

CHAPTER

49

**AIRBORNE
AUXILIARY
POWER**



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 49
AIRBORNE AUXILIARY POWER

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1 thru 9	Sep 15/2023		R 915	Sep 15/2023		O 222	Sep 15/2023	
10	BLANK		R 916	Sep 15/2023		O 223	Sep 15/2023	
49-CONTENTS			O 917	Sep 15/2023		O 224	Sep 15/2023	
O 1	Sep 15/2023		O 918	Sep 15/2023		O 225	Sep 15/2023	
O 2	Sep 15/2023		R 919	Sep 15/2023		O 226	Sep 15/2023	
O 3	Sep 15/2023		R 920	Sep 15/2023		R 227	Sep 15/2023	
4	Jan 15/2023		921	Sep 15/2022		O 228	Sep 15/2023	
5	Jan 15/2023		R 922	Sep 15/2023		O 229	Sep 15/2023	
6	May 15/2023		R 923	Sep 15/2023		O 230	Sep 15/2023	
7	Jan 15/2023		R 924	Sep 15/2023		O 231	Sep 15/2023	
8	May 15/2022		R 925	Sep 15/2023		O 232	Sep 15/2023	
R 9	Sep 15/2023		R 926	Sep 15/2023		O 233	Sep 15/2023	
O 10	Sep 15/2023		A 927	Sep 15/2023		R 234	Sep 15/2023	
O 11	Sep 15/2023		A 928	BLANK		O 235	Sep 15/2023	
O 12	Sep 15/2023		49-11-00			O 236	Sep 15/2023	
O 13	Sep 15/2023		201	Sep 15/2021		O 237	Sep 15/2023	
O 14	Sep 15/2023		202	Jan 15/2022		O 238	Sep 15/2023	
O 15	Sep 15/2023		203	Jan 15/2022		O 239	Sep 15/2023	
O 16	Sep 15/2023		204	Jan 15/2022		O 240	Sep 15/2023	
O 17	Sep 15/2023		205	Jan 15/2022		R 241	Sep 15/2023	
18	BLANK		206	Jan 15/2022		O 242	Sep 15/2023	
49-00-00			207	Sep 15/2021		O 243	Sep 15/2023	
901	May 15/2022		208	Sep 15/2021		O 244	Sep 15/2023	
902	May 15/2022		209	Jan 15/2023		O 245	Sep 15/2023	
903	May 15/2022		210	Sep 15/2021		O 246	Sep 15/2023	
904	May 15/2022		211	Sep 15/2021		O 247	Sep 15/2023	
905	May 15/2022		212	Sep 15/2021		O 248	Sep 15/2023	
R 906	Sep 15/2023		213	Sep 15/2021		O 249	Sep 15/2023	
R 907	Sep 15/2023		R 214	Sep 15/2023		O 250	Sep 15/2023	
908	May 15/2022		R 215	Sep 15/2023		O 251	Sep 15/2023	
909	May 15/2022		R 216	Sep 15/2023		O 252	Sep 15/2023	
910	May 15/2022		R 217	Sep 15/2023		O 253	Sep 15/2023	
911	May 15/2022		R 218	Sep 15/2023		O 254	Sep 15/2023	
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O 259	Sep 15/2023		418	Sep 15/2022		O 454	Sep 15/2023	
O 260	Sep 15/2023		419	Sep 15/2022		O 455	Sep 15/2023	
O 261	Sep 15/2023		420	Sep 15/2022		O 456	Sep 15/2023	
O 262	Sep 15/2023		421	Sep 15/2022		O 457	Sep 15/2023	
O 263	Sep 15/2023		422	Sep 15/2022		O 458	Sep 15/2023	
O 264	Sep 15/2023		R 423	Sep 15/2023		R 459	Sep 15/2023	
O 265	Sep 15/2023		O 424	Sep 15/2023		O 460	Sep 15/2023	
O 266	Sep 15/2023		R 425	Sep 15/2023		R 461	Sep 15/2023	
O 267	Sep 15/2023		O 426	Sep 15/2023		R 462	Sep 15/2023	
O 268	Sep 15/2023		R 427	Sep 15/2023		R 463	Sep 15/2023	
O 269	Sep 15/2023		R 428	Sep 15/2023		O 464	Sep 15/2023	
O 270	Sep 15/2023		R 429	Sep 15/2023		R 465	Sep 15/2023	
O 271	Sep 15/2023		R 430	Sep 15/2023		O 466	Sep 15/2023	
O 272	Sep 15/2023		O 431	Sep 15/2023		R 467	Sep 15/2023	
O 273	Sep 15/2023		R 432	Sep 15/2023		O 468	Sep 15/2023	
O 274	Sep 15/2023		O 433	Sep 15/2023		49-11-00		
A 275	Sep 15/2023		R 434	Sep 15/2023		501	Sep 15/2021	
A 276	BLANK		O 435	Sep 15/2023		502	Sep 15/2021	
49-11-00			O 436	Sep 15/2023		503	Sep 15/2021	
401	Sep 15/2021		O 437	Sep 15/2023		504	BLANK	
402	May 15/2023		O 438	Sep 15/2023		49-11-00		
403	Jan 15/2023		R 439	Sep 15/2023		R 601	Sep 15/2023	
404	Jan 15/2023		R 440	Sep 15/2023		602	May 15/2023	
R 405	Sep 15/2023		O 441	Sep 15/2023		R 603	Sep 15/2023	
406	Jan 15/2023		R 442	Sep 15/2023		604	May 15/2023	
407	Jan 15/2023		O 443	Sep 15/2023		605	May 15/2023	
R 408	Sep 15/2023		O 444	Sep 15/2023		606	May 15/2023	
R 409	Sep 15/2023		O 445	Sep 15/2023		607	May 15/2023	
R 410	Sep 15/2023		O 446	Sep 15/2023		608	May 15/2023	
411	Sep 15/2022		R 447	Sep 15/2023		609	May 15/2023	
412	Sep 15/2022		O 448	Sep 15/2023		610	May 15/2023	
R 413	Sep 15/2023		O 449	Sep 15/2023		611	May 15/2023	
414	Sep 15/2022		O 450	Sep 15/2023		612	May 15/2023	
415	Sep 15/2022		O 451	Sep 15/2023		49-11-00		
416	Sep 15/2022		O 452	Sep 15/2023		801	Sep 15/2021	
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803	Sep 15/2021		803	Sep 15/2021		601	Jan 15/2023	
804	Sep 15/2021		804	Sep 15/2021		602	Sep 15/2021	
49-11-01			805	Sep 15/2021		603	Jan 15/2023	
401	Sep 15/2021		806	Sep 15/2021		R 604	Sep 15/2023	
402	Sep 15/2021		807	Sep 15/2021		O 605	Sep 15/2023	
403	Sep 15/2021		808	BLANK		R 606	Sep 15/2023	
404	Sep 15/2021		49-11-02			607	May 15/2022	
405	Sep 15/2021		R 201	Sep 15/2023		608	Sep 15/2021	
406	Sep 15/2021		R 202	Sep 15/2023		609	Sep 15/2021	
407	Sep 15/2021		R 203	Sep 15/2023		610	Sep 15/2021	
408	Sep 15/2021		O 204	Sep 15/2023		611	Sep 15/2021	
409	Sep 15/2021		205	Sep 15/2021		612	Sep 15/2021	
410	Sep 15/2021		206	Sep 15/2021		49-15-00		
411	Sep 15/2021		R 207	Sep 15/2023		201	Sep 15/2021	
412	Sep 15/2021		208	Sep 15/2021		202	Sep 15/2021	
413	Sep 15/2021		R 209	Sep 15/2023		203	Sep 15/2021	
414	Sep 15/2021		210	BLANK		204	Sep 15/2021	
415	Sep 15/2021		49-13-00			205	Sep 15/2021	
416	Sep 15/2021		401	Sep 15/2022		206	BLANK	
417	Sep 15/2021		402	Sep 15/2021		49-15-00		
418	Sep 15/2021		403	Sep 15/2021		501	Sep 15/2021	
419	Sep 15/2021		404	May 15/2022		502	Sep 15/2021	
420	Sep 15/2021		405	Sep 15/2021		503	Sep 15/2021	
421	Sep 15/2021		406	May 15/2022		504	Sep 15/2021	
422	Sep 15/2021		407	Sep 15/2021		505	Sep 15/2021	
R 423	Sep 15/2023		408	Sep 15/2021		506	Sep 15/2021	
R 424	Sep 15/2023		409	Sep 15/2021		507	Sep 15/2022	
R 425	Sep 15/2023		410	Sep 15/2021		508	Sep 15/2021	
R 426	Sep 15/2023		411	May 15/2023		509	Sep 15/2021	
49-11-01			412	May 15/2023		510	Sep 15/2021	
601	Sep 15/2021		413	May 15/2022		511	Sep 15/2021	
602	Sep 15/2021		414	May 15/2022		512	BLANK	
603	Sep 15/2021		415	May 15/2022		49-15-11		
604	BLANK		416	May 15/2022		401	Sep 15/2021	
49-11-01			417	May 15/2022		402	Sep 15/2021	
801	Sep 15/2021		418	BLANK		403	Sep 15/2022	
802	Sep 15/2021					404	Jan 15/2022	

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602	Sep 15/2021		411	May 15/2023		710	Sep 15/2021	
603	Sep 15/2021		412	May 15/2023		711	Sep 15/2021	
604	BLANK		413	May 15/2023		712	Sep 15/2021	
49-15-15			414	BLANK		49-16-12		
401	Sep 15/2022		49-15-41			401	Sep 15/2021	
402	Jan 15/2022		401	Sep 15/2021		402	Sep 15/2021	
403	Sep 15/2021		402	Sep 15/2021		403	Sep 15/2021	
404	Sep 15/2021		403	Sep 15/2021		R 404	Sep 15/2023	
405	Sep 15/2022		404	Sep 15/2021		R 405	Sep 15/2023	
406	Sep 15/2021		405	Sep 15/2021		406	Sep 15/2021	
407	Sep 15/2022		406	Sep 15/2021		49-16-12		
408	Jan 15/2022		407	Sep 15/2021		701	Sep 15/2021	
409	Sep 15/2022		408	BLANK		702	BLANK	
410	Jan 15/2022		49-16-11			49-17-11		
49-15-15			301	Sep 15/2021		401	May 15/2023	
601	Sep 15/2021		302	Sep 15/2021		402	May 15/2023	
602	Sep 15/2021		303	Sep 15/2021		403	May 15/2023	
49-15-22			304	Sep 15/2021		R 404	Sep 15/2023	
401	Sep 15/2022		305	Sep 15/2021		R 405	Sep 15/2023	
402	Jan 15/2022		306	Sep 15/2021		R 406	Sep 15/2023	
403	Sep 15/2021		307	Sep 15/2021		R 407	Sep 15/2023	
404	Sep 15/2021		308	BLANK		O 408	Sep 15/2023	
405	Sep 15/2021		49-16-11			409	Sep 15/2021	
406	May 15/2023		601	Sep 15/2021		410	Sep 15/2021	
407	Sep 15/2021		602	Sep 15/2021		411	Sep 15/2021	
408	Sep 15/2021		603	Sep 15/2021		412	Sep 15/2021	
49-15-31			604	Sep 15/2021		413	May 15/2023	
401	May 15/2023		49-16-11			414	Sep 15/2021	
402	May 15/2023		701	Sep 15/2022		415	Sep 15/2021	
403	May 15/2023		702	Sep 15/2021		416	May 15/2023	
404	May 15/2023		R 703	Sep 15/2023		417	Sep 15/2021	
405	May 15/2023		R 704	Sep 15/2023		418	Sep 15/2021	
406	May 15/2023		R 705	Sep 15/2023		419	Sep 15/2022	
407	May 15/2023		706	Sep 15/2021		420	May 15/2023	
408	May 15/2023		707	Sep 15/2021		421	May 15/2023	
409	May 15/2023		708	Sep 15/2021		422	May 15/2023	

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423	Sep 15/2021		209	Jan 15/2023		632	Jan 15/2023	
R 424	Sep 15/2023		210	Jan 15/2023		633	Jan 15/2023	
R 425	Sep 15/2023		211	Jan 15/2023		634	Jan 15/2023	
O 426	Sep 15/2023		212	Jan 15/2023		635	Jan 15/2023	
O 427	Sep 15/2023		49-21-00			636	Jan 15/2023	
O 428	Sep 15/2023		601	Jan 15/2023		637	Sep 15/2022	
O 429	Sep 15/2023		602	Jan 15/2023		638	BLANK	
430	BLANK		603	Jan 15/2023		49-21-00		
49-17-11			604	Jan 15/2023		701	May 15/2023	
601	May 15/2023		605	Jan 15/2023		702	May 15/2023	
602	Sep 15/2021		606	Jan 15/2023		703	May 15/2023	
603	Sep 15/2021		607	Jan 15/2023		704	May 15/2023	
604	Sep 15/2021		608	Jan 15/2023		705	May 15/2023	
605	Sep 15/2021		609	May 15/2023		706	May 15/2023	
606	Sep 15/2021		610	Jan 15/2023		707	May 15/2023	
607	Sep 15/2021		611	Jan 15/2023		708	BLANK	
608	Sep 15/2021		612	Sep 15/2021		49-31-00		
609	Sep 15/2021		613	Sep 15/2021		201	Sep 15/2021	
610	Sep 15/2021		614	Sep 15/2021		202	Sep 15/2021	
611	Sep 15/2021		615	Sep 15/2021		203	Sep 15/2021	
612	Sep 15/2021		616	Sep 15/2021		204	Sep 15/2021	
49-17-11			617	Sep 15/2021		205	Sep 15/2021	
801	Sep 15/2022		618	Sep 15/2021		206	Sep 15/2021	
802	Jan 15/2022		619	Sep 15/2021		207	Sep 15/2021	
803	Sep 15/2021		620	Sep 15/2021		208	Sep 15/2021	
804	Sep 15/2021		621	Sep 15/2021		209	Sep 15/2021	
805	Sep 15/2021		622	Sep 15/2021		210	Sep 15/2021	
806	Sep 15/2021		623	Sep 15/2021		49-31-11		
49-21-00			624	Sep 15/2021		401	Sep 15/2021	
201	Jan 15/2022		625	Sep 15/2021		402	Sep 15/2021	
202	Jan 15/2022		626	Sep 15/2021		403	Sep 15/2021	
203	Jan 15/2022		627	Sep 15/2021		404	Sep 15/2021	
204	Sep 15/2021		628	Sep 15/2021		405	Sep 15/2021	
205	Jan 15/2023		629	Sep 15/2021		406	Sep 15/2022	
206	Jan 15/2023		630	Sep 15/2021		407	Sep 15/2021	
207	Jan 15/2023		631	Sep 15/2021		408	Sep 15/2021	
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49-31-11			402	Sep 15/2021		402	Sep 15/2021	
601	Sep 15/2021		403	Sep 15/2021		403	Sep 15/2021	
602	Sep 15/2021		404	Sep 15/2022		404	Sep 15/2021	
603	Sep 15/2021		405	Sep 15/2021		405	Sep 15/2021	
604	BLANK		406	Sep 15/2021		406	BLANK	
49-31-14			49-41-01			49-41-51		
401	Sep 15/2021		A 401	Sep 15/2023		601	Sep 15/2021	
402	Sep 15/2021		A 402	Sep 15/2023		602	Sep 15/2021	
403	Sep 15/2021		A 403	Sep 15/2023		603	Sep 15/2021	
404	Sep 15/2022		A 404	Sep 15/2023		604	Sep 15/2021	
405	Sep 15/2021		49-41-21			605	Sep 15/2021	
406	Sep 15/2021		R 401	Sep 15/2023		606	Sep 15/2021	
49-31-14			R 402	Sep 15/2023		49-41-51		
601	Sep 15/2021		R 403	Sep 15/2023		701	Sep 15/2022	
602	BLANK		O 404	Sep 15/2023		702	Jan 15/2022	
49-31-15			O 405	Sep 15/2023		49-41-52		
401	Sep 15/2021		406	Sep 15/2021		401	Sep 15/2021	
402	Sep 15/2021		407	Sep 15/2021		402	Sep 15/2021	
403	Sep 15/2021		408	Sep 15/2021		403	Sep 15/2021	
404	Sep 15/2021		409	May 15/2023		404	Sep 15/2021	
405	Sep 15/2021		R 410	Sep 15/2023		405	Sep 15/2021	
406	Sep 15/2021		411	Jan 15/2023		406	BLANK	
407	Sep 15/2021		412	Jan 15/2023		49-41-52		
408	Sep 15/2021		R 413	Sep 15/2023		601	Sep 15/2021	
49-31-16			R 414	Sep 15/2023		602	BLANK	
401	Sep 15/2021		R 415	Sep 15/2023		49-41-52		
402	Sep 15/2021		416	BLANK		701	Sep 15/2022	
403	Sep 15/2021		49-41-31			702	BLANK	
404	Sep 15/2021		401	Sep 15/2021		49-41-61		
405	Sep 15/2021		402	Sep 15/2021		R 401	Sep 15/2023	
406	Sep 15/2021		403	Sep 15/2021		R 402	Sep 15/2023	
407	Sep 15/2021		404	Sep 15/2021		403	Sep 15/2021	
408	Sep 15/2021		405	Sep 15/2021		R 404	Sep 15/2023	
409	Sep 15/2021		406	BLANK		R 405	Sep 15/2023	
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R 401	Sep 15/2023		406	Sep 15/2021		403	May 15/2023	
R 402	Sep 15/2023		49-52-31			404	May 15/2023	
R 403	Sep 15/2023		401	Jan 15/2022		405	May 15/2023	
O 404	Sep 15/2023		402	Sep 15/2021		406	May 15/2023	
R 405	Sep 15/2023		403	Sep 15/2021		407	May 15/2023	
R 406	Sep 15/2023		404	Sep 15/2021		408	May 15/2023	
R 407	Sep 15/2023		405	Sep 15/2022		409	May 15/2023	
R 408	Sep 15/2023		406	Jan 15/2022		410	BLANK	
A 409	Sep 15/2023		407	Jan 15/2022		49-61-00		
A 410	BLANK		408	BLANK		201	Sep 15/2021	
49-52-11			49-52-32			202	May 15/2022	
401	Sep 15/2021		401	Jan 15/2022		203	Sep 15/2022	
402	Sep 15/2021		402	Sep 15/2021		204	May 15/2022	
403	Sep 15/2021		403	Sep 15/2021		205	May 15/2022	
404	Sep 15/2022		404	Jan 15/2023		206	May 15/2022	
405	Sep 15/2021		405	Jan 15/2022		207	Jan 15/2023	
406	Sep 15/2021		406	Jan 15/2022		208	May 15/2022	
49-52-12			49-52-32			209	May 15/2022	
401	May 15/2023		601	Sep 15/2021		210	BLANK	
402	May 15/2023		602	Sep 15/2021		49-61-12		
403	May 15/2023		603	Sep 15/2021		R 401	Sep 15/2023	
404	Sep 15/2021		604	BLANK		R 402	Sep 15/2023	
405	Sep 15/2021		49-52-33			403	Sep 15/2021	
406	May 15/2023		401	Sep 15/2021		R 404	Sep 15/2023	
407	May 15/2023		402	Sep 15/2021		R 405	Sep 15/2023	
408	May 15/2023		403	Sep 15/2021		406	BLANK	
49-52-12			404	Sep 15/2022		49-61-21		
501	Sep 15/2021		405	Jan 15/2022		401	Sep 15/2021	
502	Sep 15/2021		406	Jan 15/2022		402	Sep 15/2021	
503	Sep 15/2021		49-52-33			403	Sep 15/2021	
504	Sep 15/2021		601	Sep 15/2021		404	Sep 15/2022	
49-52-13			602	Sep 15/2021		405	Sep 15/2021	
401	Sep 15/2021		603	Sep 15/2021		406	Sep 15/2021	
402	Sep 15/2021		604	BLANK		49-61-31		
403	Sep 15/2021		49-52-41			R 401	Sep 15/2023	
404	Sep 15/2022		401	May 15/2023		R 402	Sep 15/2023	
405	Sep 15/2021		402	May 15/2023		403	Sep 15/2021	

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405	Sep 15/2021		406	Sep 15/2021		412	BLANK	
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<u>IGNITER PLUG LEAD - CLEANING/PAINTING</u>	49-41-52		701	SIA ALL
Igniter Plug Lead Cleaning TASK 49-41-52-100-801			701	SIA ALL
<u>START CONVERTER UNIT - REMOVAL/INSTALLATION</u>	49-41-61		401	SIA ALL
Start Converter Unit Removal TASK 49-41-61-000-801			401	SIA ALL
Start Converter Unit Installation TASK 49-41-61-400-801			404	SIA ALL
<u>START POWER UNIT - REMOVAL/INSTALLATION</u>	49-41-71		401	SIA ALL
Start Power Unit Removal TASK 49-41-71-000-801			401	SIA ALL
Start Power Unit Installation TASK 49-41-71-400-801			405	SIA ALL
<u>BLEED AIR VALVE - REMOVAL/INSTALLATION</u>	49-52-11		401	SIA ALL
Bleed Air Valve Removal TASK 49-52-11-000-801			401	SIA ALL
Bleed Air Valve - Installation TASK 49-52-11-400-801			404	SIA ALL

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<u>INLET GUIDE VANE (IGV) ACTUATOR - REMOVAL/INSTALLATION</u>	49-52-12		401	SIA ALL
Inlet Guide Vane (IGV) Actuator Removal TASK 49-52-12-000-801			401	SIA ALL
Inlet Guide Vane (IGV) Actuator Installation TASK 49-52-12-400-801			406	SIA ALL
<u>INLET GUIDE VANE (IGV) ACTUATOR - ADJUSTMENT/TEST</u>	49-52-12		501	SIA ALL
Inlet Guide Vane (IGV) Actuator Operational Test TASK 49-52-12-710-801			501	SIA ALL
<u>BLEED AIR DUCT - REMOVAL/INSTALLATION</u>	49-52-13		401	SIA ALL
Bleed Air Duct Removal TASK 49-52-13-000-801			401	SIA ALL
Bleed Air Duct Installation TASK 49-52-13-400-801			404	SIA ALL
<u>INLET PRESSURE SENSOR - REMOVAL/INSTALLATION</u>	49-52-31		401	SIA ALL
Inlet Pressure Sensor Removal TASK 49-52-31-000-801			401	SIA ALL
Inlet Pressure Sensor Installation TASK 49-52-31-400-801			405	SIA ALL
<u>TOTAL PRESSURE SENSOR - REMOVAL/INSTALLATION</u>	49-52-32		401	SIA ALL
Total Pressure Sensor Removal TASK 49-52-32-000-801			401	SIA ALL
Total Pressure Sensor Installation TASK 49-52-32-400-801			404	SIA ALL
<u>TOTAL PRESSURE SENSOR - INSPECTION/CHECK</u>	49-52-32		601	SIA ALL
Total Pressure Sensor Inspection TASK 49-52-32-200-801			601	SIA ALL
<u>DELTA PRESSURE SENSOR - REMOVAL/INSTALLATION</u>	49-52-33		401	SIA ALL
Delta Pressure Sensor Removal TASK 49-52-33-000-801			401	SIA ALL

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<u>DELTA PRESSURE SENSOR - INSPECTION/CHECK</u>	49-52-33		601	SIA ALL
Delta Pressure Sensor Inspection TASK 49-52-33-200-801			601	SIA ALL
<u>SURGE CONTROL VALVE - REMOVAL/INSTALLATION</u>	49-52-41		401	SIA ALL
Surge Control Valve Removal TASK 49-52-41-000-801			401	SIA ALL
Surge Control Valve Installation TASK 49-52-41-400-801			406	SIA ALL
<u>APU CONTROLS - MAINTENANCE PRACTICES</u>	49-61-00		201	SIA ALL
APU BITE Procedure TASK 49-61-00-700-801			201	SIA ALL
APU Configuration Report TASK 49-61-00-710-801			206	SIA ALL
APU ECU Software Installation with the Onboard Network System TASK 49-61-00-470-801			207	SIA ALL
Ice Logic Deactivation TASK 49-61-00-040-801			207	SIA ALL
Ice Logic Activation TASK 49-61-00-440-801			208	SIA ALL
<u>ELECTRONIC CONTROL UNIT - REMOVAL/INSTALLATION</u>	49-61-12		401	SIA ALL
Electronic Control Unit Removal TASK 49-61-12-000-801			401	SIA ALL
Electronic Control Unit Installation TASK 49-61-12-400-801			404	SIA ALL
<u>SPEED SENSOR - REMOVAL/INSTALLATION</u>	49-61-21		401	SIA ALL
Speed Sensor Removal TASK 49-61-21-000-801			401	SIA ALL
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<u>EXHAUST GAS TEMPERATURE THERMOCOUPLE - REMOVAL/INSTALLATION</u>	49-71-21		401	SIA ALL
Exhaust Gas Temperature Thermocouple Removal TASK 49-71-21-000-801			401	SIA ALL
Exhaust Gas Temperature Thermocouple Installation TASK 49-71-21-400-801			404	SIA ALL
<u>DATA MEMORY MODULE - REMOVAL/INSTALLATION</u>	49-72-11		401	SIA ALL
Data Memory Module Removal TASK 49-72-11-000-801			401	SIA ALL
Data Memory Module Installation TASK 49-72-11-400-801			404	SIA ALL
<u>EXHAUST DUCT MUFFLER - REMOVAL/INSTALLATION</u>	49-81-11		401	SIA ALL
Exhaust Duct Muffler Removal TASK 49-81-11-000-801			401	SIA ALL
Exhaust Duct Muffler Installation TASK 49-81-11-400-801			408	SIA ALL
<u>EXHAUST DUCT MUFFLER - INSPECTION/CHECK</u>	49-81-11		601	SIA ALL
Exhaust Duct Muffler General Visual Inspection TASK 49-81-11-200-801			601	SIA ALL
Exhaust Duct Muffler Inspection TASK 49-81-11-200-802			602	SIA ALL
Exhaust Duct Muffler Seal Inspection TASK 49-81-11-200-803			606	SIA ALL

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Exhaust Duct Muffler Cleaning TASK 49-81-11-100-801			701	SIA ALL
<u>EXHAUST DUCT INSULATION BLANKET - REMOVAL/INSTALLATION</u>	49-81-13		401	SIA ALL
Exhaust Duct Muffler Insulation Blanket - Removal TASK 49-81-13-000-801			401	SIA ALL
Exhaust Duct Muffler Insulation Blanket - Installation TASK 49-81-13-400-801			405	SIA ALL
<u>EXHAUST DUCT INSULATION BLANKET - INSPECTION/CHECK</u>	49-81-13		601	SIA ALL
Exhaust Duct Insulation Blanket - General Visual Inspection TASK 49-81-13-200-801			601	SIA ALL
Exhaust Duct Insulation Blanket - Detailed Inspection TASK 49-81-13-200-802			604	SIA ALL
<u>EXHAUST DUCT INSULATION BLANKET - REPAIRS</u>	49-81-13		801	SIA ALL
Exhaust Duct Insulation Blanket Repair TASK 49-81-13-300-801			801	SIA ALL
<u>EXHAUST FAIRING ASSEMBLY - REMOVAL/INSTALLATION</u>	49-81-31		401	SIA ALL
Exhaust Fairing Assembly Removal TASK 49-81-31-000-801			401	SIA ALL
Exhaust Fairing Assembly Installation TASK 49-81-31-400-801			404	SIA ALL
<u>EDUCTOR HOUSING - INSPECTION/CHECK</u>	49-81-41		601	SIA ALL
Eductor Housing Inspection TASK 49-81-41-200-801			601	SIA ALL
<u>LUBE MODULE - REMOVAL/INSTALLATION</u>	49-91-11		401	SIA ALL
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<u>LUBE MODULE - INSPECTION/CHECK</u>	49-91-11		601	SIA ALL
Lube Module Inspection TASK 49-91-11-200-801			601	SIA ALL
<u>OIL FILTER ELEMENTS - REMOVAL/INSTALLATION</u>	49-91-12		401	SIA ALL
Lube Filter Element Removal TASK 49-91-12-000-801			401	SIA ALL
Lube Filter Element Installation TASK 49-91-12-400-801			405	SIA ALL
Starter-Generator Filter Element Removal TASK 49-91-12-000-802			407	SIA ALL
Starter-Generator Filter Element Installation TASK 49-91-12-400-802			409	SIA ALL
<u>OIL FILTER INDICATOR - SERVICING</u>	49-91-13		301	SIA ALL
Oil Filter Indicator Servicing TASK 49-91-13-600-801			301	SIA ALL
<u>OIL FILTER INDICATOR - REMOVAL/INSTALLATION</u>	49-91-13		401	SIA ALL
Oil Filter Indicator Removal - Lube Filter Housing TASK 49-91-13-000-801			401	SIA ALL
Oil Filter Indicator Installation - Lube Filter Housing TASK 49-91-13-400-801			403	SIA ALL
Oil Filter Indicator Removal - Starter-Generator Filter Housing TASK 49-91-13-000-802			404	SIA ALL
Oil Filter Indicator Installation - Starter-Generator Filter Housing TASK 49-91-13-400-802			405	SIA ALL
<u>OIL FILTER INDICATOR - INSPECTION/CHECK</u>	49-91-13		601	SIA ALL
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Temperature Control Valve Installation TASK 49-91-21-400-801			406	SIA ALL
<u>OIL COOLER - REMOVAL/INSTALLATION</u>	49-91-41		401	SIA ALL
Oil Cooler Removal TASK 49-91-41-000-801			401	SIA ALL
Oil Cooler Installation TASK 49-91-41-400-801			405	SIA ALL
<u>OIL COOLER - INSPECTION/CHECK</u>	49-91-41		601	SIA ALL
Oil Cooler Inspection TASK 49-91-41-200-801			601	SIA ALL
<u>EDUCTOR INLET DUCT - REMOVAL/INSTALLATION</u>	49-91-71		401	SIA ALL
Eductor Inlet Duct Removal TASK 49-91-71-000-801			401	SIA ALL
Eductor Inlet Duct Installation TASK 49-91-71-400-801			406	SIA ALL
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<u>MAGNETIC DRAIN PLUG - REMOVAL/INSTALLATION</u>	49-91-81		401	SIA ALL
Magnetic Drain Plug Removal TASK 49-91-81-000-801			401	SIA ALL
Magnetic Drain Plug Installation TASK 49-91-81-400-801			406	SIA ALL
<u>MAGNETIC DRAIN PLUG - INSPECTION/CHECK</u>	49-91-81		601	SIA ALL
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Oil Level Sensor Installation TASK 49-94-11-400-801			404	SIA ALL
<u>OIL TEMPERATURE SENSOR - REMOVAL/INSTALLATION</u>	49-94-21		401	SIA ALL
Oil Temperature Sensor Removal TASK 49-94-21-000-801			401	SIA ALL
Oil Temperature Sensor Installation TASK 49-94-21-400-801			404	SIA ALL
<u>LOW OIL PRESSURE SWITCH - REMOVAL/INSTALLATION</u>	49-94-22		401	SIA ALL
Low Oil Pressure Switch Removal TASK 49-94-22-000-801			401	SIA ALL
Low Oil Pressure Switch Installation TASK 49-94-22-400-801			404	SIA ALL
<u>OIL SIGHT GLASS - REMOVAL/INSTALLATION</u>	49-94-51		401	SIA ALL
Oil Sight Glass Removal TASK 49-94-51-000-801			401	SIA ALL
Oil Sight Glass Installation TASK 49-94-51-400-801			404	SIA ALL
<u>OIL SIGHT GLASS - CLEANING/PAINTING</u>	49-94-51		701	SIA ALL
Oil Sight Glass Cleaning TASK 49-94-51-100-801			701	SIA 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 systems/components that are 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) DDG 49-11-01 APU Inoperative - Preparation
 - (2) DDG 49-11-01 APU Inoperative - Restoration
 - (3) DDG 49-15-01A APU Air Inlet Door Inoperative in Open Position - Preparation
 - (4) DDG 49-15-01A APU Air Inlet Door Inoperative in Open Position - Restoration
 - (5) DDG 49-15-01B APU Air Inlet Door Inoperative in Closed Position - Preparation
 - (6) DDG 49-15-01B APU Air Inlet Door Inoperative in Closed Position - Restoration
 - (7) DDG 49-15-01-01 APU Air Inlet DOOR Light System Inoperative - Preparation
 - (8) DDG 49-15-01-01 APU Air Inlet DOOR Light System Inoperative - Restoration
 - (9) DDG 49-40-01 Start Power Unit Inoperative - Preparation
 - (10) DDG 49-40-01 Start Power Unit Inoperative - Restoration
 - (11) DDG 49-40-02 Start Converter Unit Inoperative - Preparation
 - (12) DDG 49-40-02 Start Converter Unit Inoperative - Restoration
 - (13) DDG 49-52-01 APU Bleed Air Valve Closed Inoperative - Preparation
 - (14) DDG 49-52-01 APU Bleed Air Valve Closed Inoperative - Restoration.

TASK 49-00-00-040-819

2. **DDG 49-11-01 APU Inoperative - Preparation**

(Figure 901)

A. General

- (1) This task gives the instructions to prepare the airplane for flight with the Auxiliary Power Unit (APU) inoperative. To prepare the airplane for flight with the APU inoperative, deactivate the APU master switch, check that the both engine driven generator systems and at least one engine Pressure Regulating and Shutoff Valve (PRSOV) operate normally, and do a visual check of the APU fuel shutoff valve.

B. References

Reference	Title
28-00-00-040-805	DDG 28-25-02 APU Fuel Shutoff Valve Inoperative - Preparation (P/B 901)
49-11-02 P/B 201	APU SYSTEM - MAINTENANCE PRACTICES

C. Tools/Equipment

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

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Reference	Description
SPL-11395	Tool Kit - APU Deletion **Dispatch Tool** Part #: C49009-1 Supplier: 81205

D. Location Zones

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

E. APU Inoperative Preparation

SUBTASK 49-00-00-860-055

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

NOTE: The APU FAULT light may be illuminated and may automatically extinguish 5 minutes after the APU master switch is positioned to the OFF position.

- (a) If the APU FAULT light remains illuminated after 5 minutes, do this step:

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

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

- (b) Install the APU INOP tag.

SUBTASK 49-00-00-010-011

- (2) Get access to the APU fuel shutoff valve [2].

NOTE: The APU fuel shutoff valve is on the rear spar of the left wing in the wheel well.

SUBTASK 49-00-00-860-059

- (3) Make sure that the APU fuel shutoff valve [2] is fully closed.

NOTE: The manual override handle on the APU fuel shutoff valve gives an OPEN or CLOSED indication of the shutoff valve position.

- (a) If the APU fuel shutoff valve [2] is not closed, the APU fuel shutoff valve [2] may be inoperative, do this task: DDG 28-25-02 APU Fuel Shutoff Valve Inoperative - Preparation, TASK 28-00-00-040-805.

SUBTASK 49-00-00-860-064

- (4) Aircraft may be operated with the APU removed. Requires APU deletion tool kit, SPL-11395 (PAGEBLOCK 49-11-02/201).

————— END OF TASK —————

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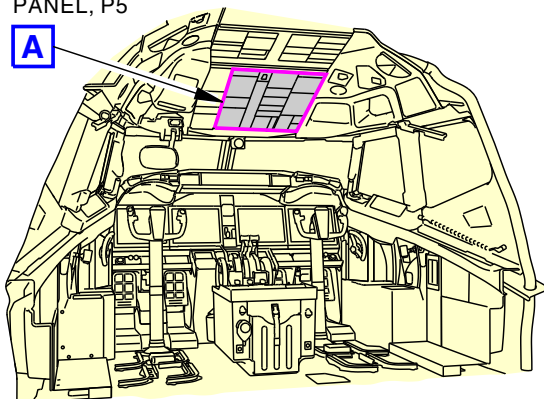
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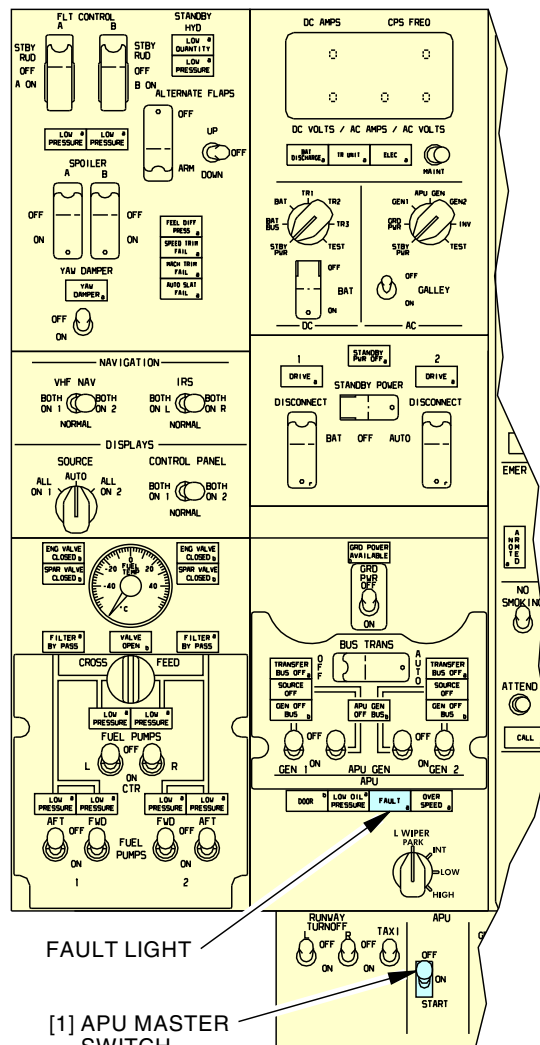
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FORWARD OVERHEAD
PANEL, P5

A



FLIGHT COMPARTMENT



FORWARD OVERHEAD PANEL, P5

A

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APU - DDG Procedures, APU Inoperative
Figure 901/49-00-00-990-807 (Sheet 1 of 2)

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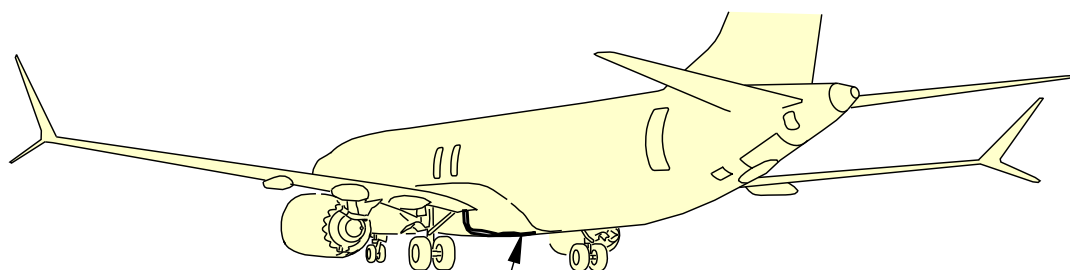
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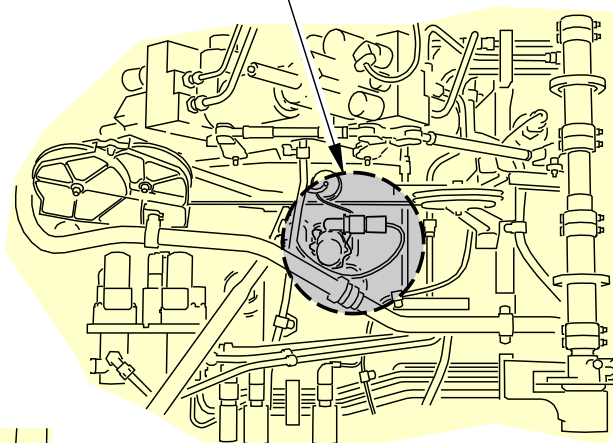


MAIN LANDING GEAR
WHEEL WELL

B

APU FUEL
SHUTOFF VALVE

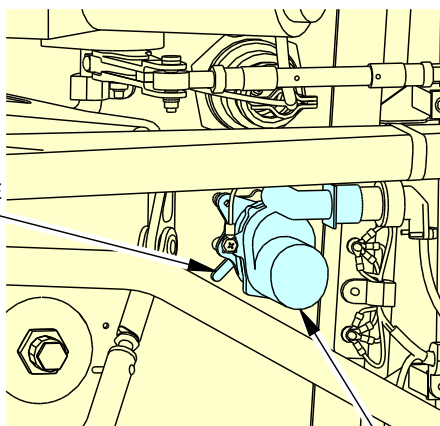
C



MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)

B

[3] MANUAL
OVERRIDE
HANDLE



[2] APU FUEL
SHUTOFF VALVE

APU FUEL SHUTOFF VALVE

C



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APU - DDG Procedures, APU Inoperative
Figure 901/49-00-00-990-807 (Sheet 2 of 2)

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TASK 49-00-00-440-819

3. DDG 49-11-01 APU Inoperative - Restoration

(Figure 901)

A. General

- (1) This task gives the instructions to prepare the Auxiliary Power Unit (APU) for operation after the deactivation.

B. References

Reference	Title
26-15-00-710-801	APU Fire Detection - Operational Test (P/B 501)
49-11-00-710-802	APU Operational Test (P/B 501)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

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

D. APU Inoperative Restoration

SUBTASK 49-00-00-860-063

- (1) Remove the APU INOP tag from the APU master switch [1] on the P5 forward overhead panel.

SUBTASK 49-00-00-710-004

- (2) Do this task: APU Operational Test, TASK 49-11-00-710-802.

SUBTASK 49-00-00-740-001

- (3) During the APU operational test, do this task: APU BITE Procedure, TASK 49-61-00-700-801.

- (a) If maintenance message(s) show for the APU, refer to the IFIM and do the applicable procedure(s).

SUBTASK 49-00-00-710-005

- (4) Do this task: APU Fire Detection - Operational Test, TASK 26-15-00-710-801.

SUBTASK 49-00-00-860-065

- (5) If it is necessary, do this step:

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

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

————— END OF TASK —————

TASK 49-00-00-040-820

4. DDG 49-15-01A APU Air Inlet Door Inoperative in Flight Open Position - Preparation

(Figure 902, Figure 903)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU air inlet door inoperative in the flight open position.

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B. References

Reference	Title
31-65-00-750-801	Fault Interrogation for a Maintenance Message (P/B 201)

C. Tools/Equipment

Reference	Description
STD-12636	Wrench - Socket, 1/4 Inch Square Drive
STD-23466	Extension - Socket, 1/4 Inch Square Drive, 6 Inch Length

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
314	Stabilizer Torsion Box Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. APU Air Inlet Door Preparation

SUBTASK 49-00-00-860-002

- (1) Make sure that the APU master switch [5] on the P5 forward overhead panel is in the OFF position.

SUBTASK 49-00-00-480-001

- (2) Attach an INOP placard to the APU master switch [5].

SUBTASK 49-00-00-860-003

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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

F/O Electrical System Panel, P6-5

Row	Col	Number	Name
A	12	C04011	APU INLET DOOR

SUBTASK 49-00-00-010-008

- (5) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 49-00-00-040-001

- (6) Do these steps to manually deactivate the APU air inlet door in the flight open position:
- (a) Remove the manual drive access cover (transfer cover) on the APU inlet door actuator.

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SIA ALL

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- (b) Insert a socket wrench, STD-12636, into the transfer drive socket and turn in the counterclockwise direction until the mark on the transfer cover aligns with "M".

NOTE: The manual drive socket is now exposed.

- (c) Insert the socket extension, STD-23466, into the manual drive socket and turn in the counterclockwise direction 22-28 revolutions.

NOTE: 22-28 is an estimated number of revolutions required to move the door from the closed position to the flight open position.

- (d) Measure the open door distance from the tip of the door to the door fairing (Figure 902).

1) Make sure that the flight open distance is 6.625 ± 0.250 in. (16.827 ± 0.635 cm).

- (e) Turn the transfer cover socket in the clockwise direction until the mark on the cover aligns with "E".

- (f) Make sure that the transfer cover is fully in the electrical mode position.

NOTE: When the actuator is in the electrical mode, the actuator will lock in its current position.

- (g) Install the manual drive access cover (transfer cover) on the actuator.

SUBTASK 49-00-00-410-010

- (7) Close this access panel:

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

311BL	Stabilizer Trim Access Door
-------	-----------------------------

SUBTASK 49-00-00-860-004

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-00-00-810-001

- (9) If necessary, extinguish the MAINT light on the P5-1 panel. Do this task: Fault Interrogation for a Maintenance Message, TASK 31-65-00-750-801.

———— **END OF TASK** ————

EFFECTIVITY
SIA ALL

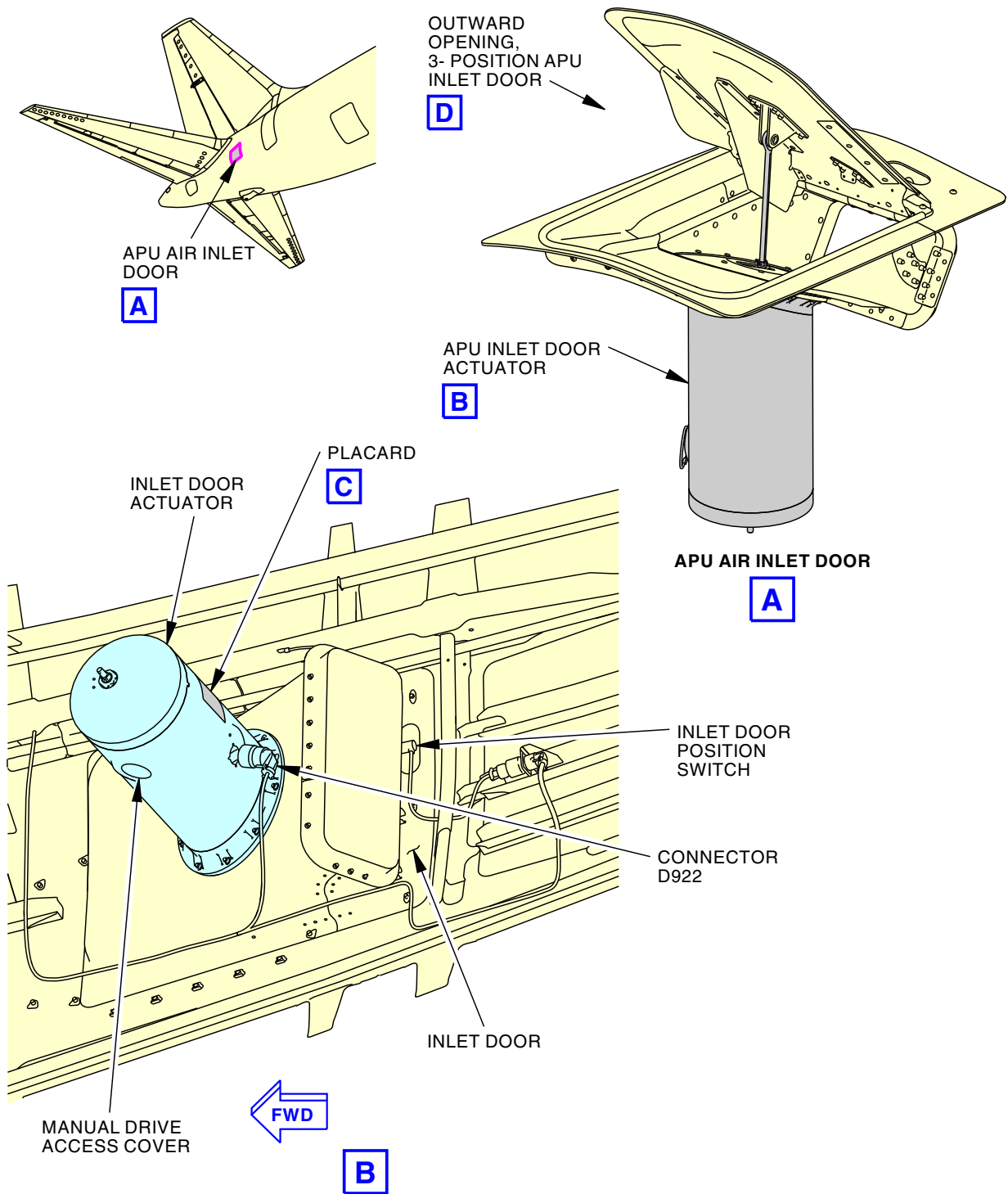
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2415410 S00061537772_V3

APU - DDG Procedures, Air Inlet Door
Figure 902/49-00-00-990-801 (Sheet 1 of 2)

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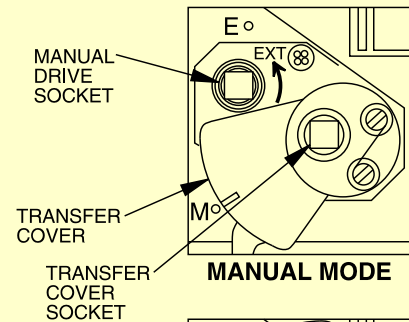
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APU INLET DOOR ACTUATOR MANUAL OPERATION

TO OPEN INLET DOOR (EXTEND ACTUATOR)

1. ROTATE TRANSFER COVER SOCKET COUNTERCLOCKWISE USING A 1/4" SOCKET UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "M" AND THE MANUAL DRIVE SOCKET WILL BE EXPOSED. THE ACTUATOR IS NOW IN MANUAL MODE. DO NOT EXCEED 15 IN-LBS (1.7 N-M) OF TORQUE.
2. WITH HAND TOOL ONLY ROTATE MANUAL DRIVE SOCKET COUNTERCLOCKWISE APPROXIMATELY 60 REVOLUTIONS UNTIL A SHARP TORQUE RISE IS FELT. DO NOT EXCEED 100 IN-LBS (11.3 N-M) OF TORQUE. THE INLET DOOR IS NOW OPEN (ACTUATOR EXTENDED).

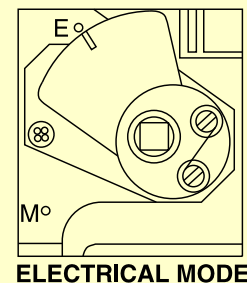


TO CLOSE INLET DOOR (RETRACT ACTUATOR)

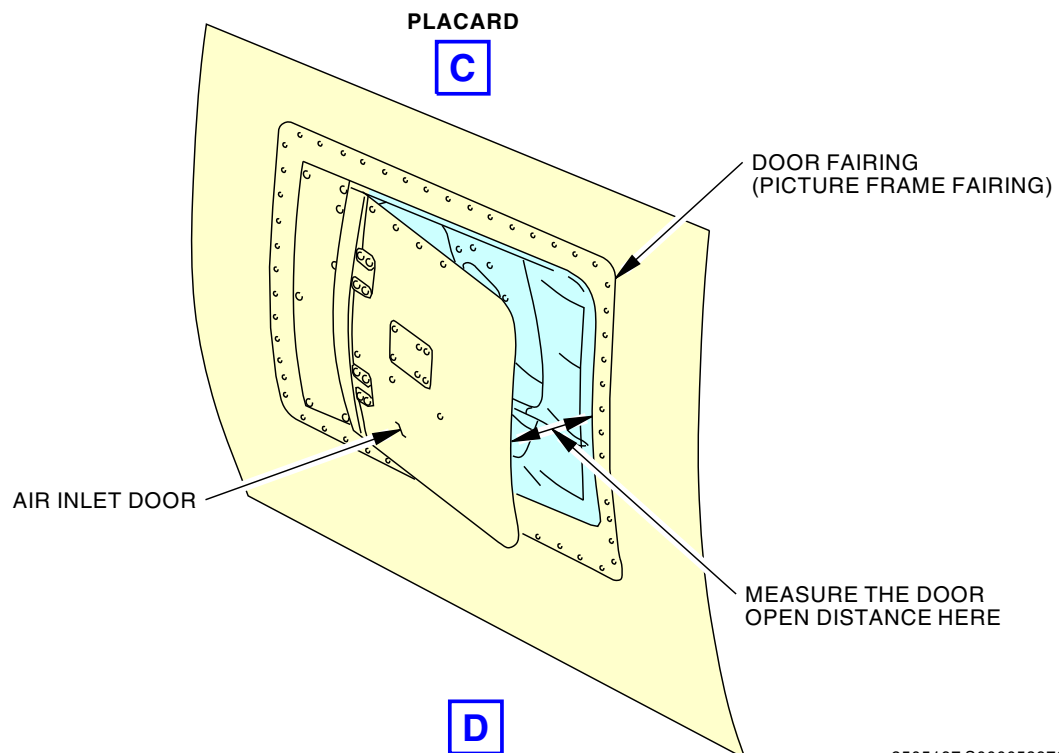
PERFORM ITEMS ABOVE IN REVERSE ORDER. ACTUATOR IS IN ELECTRICAL MODE WHEN THE TRANSFER COVER SOCKET IS ROTATED CLOCKWISE UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "E".

CAUTION

IF NOTED TORQUE LIMITS ARE EXCEEDED, INTERNAL DAMAGE TO ACTUATOR MAY RESULT. IF ACTUATOR IS NOT FULLY ENGAGED IN MANUAL OR ELECTRICAL MODE, ACTUATOR FAILURE MAY RESULT.



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2505197 S0000589707_V3

**APU - DDG Procedures, Air Inlet Door
Figure 902/49-00-00-990-801 (Sheet 2 of 2)**

EFFECTIVITY
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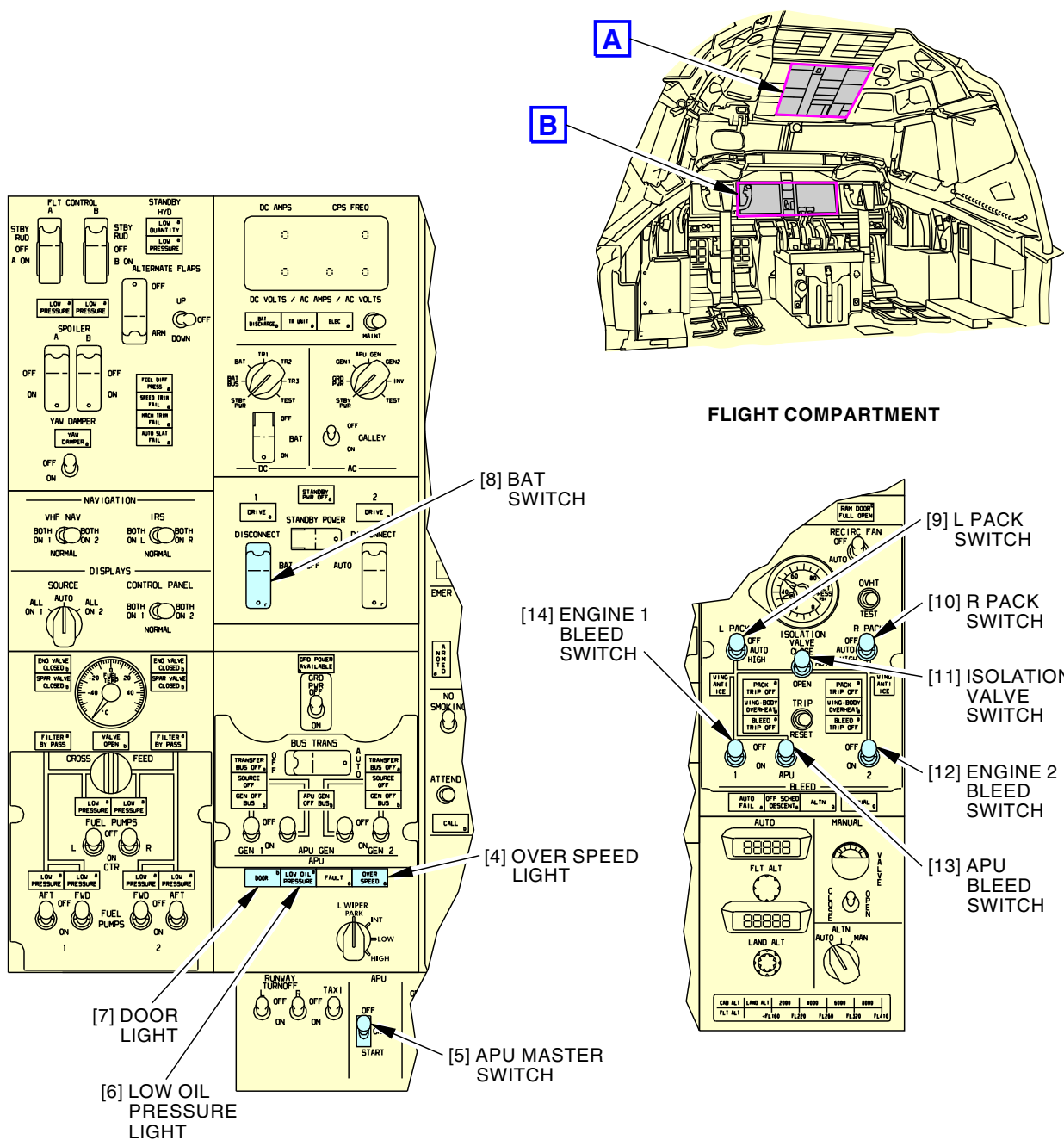
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FORWARD OVERHEAD PANEL, P5

A

2415407 S00061537769_V4

APU - DDG Procedures, Flight Deck Indications
Figure 903/49-00-00-990-802 (Sheet 1 of 2)

EFFECTIVITY
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 SYS MENU	STATUS	MAINT DATA PGS	MAINT CTRL PGS	ONBD MAINT
<u>APU</u>				
MODE	XXXXXXXXXXXX	APU GEN LOAD		XXX.X
RPM	XXX.X			
EGT	XXXXX	- - - - -INLET DOOR- - - - -		
OIL TEMP	XXXX	OPEN COMMAND		XXXXXXXXXX
OIL QTY	XXXX	CLOSE COMMAND		XXXXXXXXXX
COMP INLET TEMP	XXXX	POSITION SW		XXXXXXXXXX
INLET STATIC PRESS	XX.XX	COR EGT		XXXXX
LOAD COMP TOTAL PRESS	XX.XX	COR TOTALPRESS		XXX
LOAD COMP DIFF PRESS	XX.XX	COR FUEL FLOW		XXX
SURGE CTRL VLV POS	XX.X	COR IGV POS		XXX
IGV ACTUATOR POS	XX.X	APU HOURS		XXXXXXX.X
BLD CORRECTED FLOW	XXX	APU CYCLES		XXXXXX
FUEL FLOW MEAS	XXX	HOURS SINCE INSTALLATION		XXXXX.X
		ON AIRPLANE		
:- - - - -STATUS CODE- - - - -:				
BIT# 1 5				
STATUS 1 [XXXX] [XXXX]				
STATUS 2 [XXXX] [XXXX]				
STATUS 3 [XXXX] [XXXX]				
STATUS 4 [XXXX] [XXXX]				
AUTO EVENT MESSAGE DATE XX XXX XX UTC XX:XX:XX				
PREV MENU	PRINT	SEND	RECORD	PREV PAGE
				NEXT PAGE

MAX DISPLAY SYSTEM (MDS)
APU MAINTENANCE PAGE

B

2415408 S00061537770_V3

APU - DDG Procedures, Flight Deck Indications
Figure 903/49-00-00-990-802 (Sheet 2 of 2)

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TASK 49-00-00-440-820

5. DDG 49-15-01A APU Air Inlet Door Inoperative in Flight Open Position - Restoration

(Figure 902, Figure 903)

A. General

- (1) This task restores the airplane back to its usual condition after operation with the APU inlet door inoperative in the flight open position.

B. References

Reference	Title
31-65-00-750-801	Fault Interrogation for a Maintenance Message (P/B 201)

C. Tools/Equipment

Reference	Description
STD-23466	Extension - Socket, 1/4 Inch Square Drive, 6 Inch Length

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
314	Stabilizer Torsion Box Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. APU Air Inlet Door Restoration

SUBTASK 49-00-00-860-009

- (1) Make sure that the APU master switch [5] on the P5 forward overhead panel is in the OFF position.

SUBTASK 49-00-00-860-071

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-00-00-010-001

- (3) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 49-00-00-420-001

- (4) Do these steps:

- (a) Remove the manual drive access cover (transfer cover) on the APU inlet door actuator.

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- (b) Insert a socket extension, STD-23466, into the transfer drive socket and turn in the counterclockwise direction until the mark on the transfer cover aligns with "M".

NOTE: The manual drive socket is now exposed.

- (c) Insert socket extension, STD-23466, into the manual drive socket and turn in the clockwise direction 22-28 revolutions.

NOTE: 22-28 is an estimated number of revolutions required to move the door from the flight open position to the closed position.

- (d) Insert a socket extension, STD-23466, into the transfer drive socket and turn the transfer cover socket in the clockwise direction until the mark on the cover aligns with "E".
(e) Make sure that the transfer cover is fully in the electrical mode position.
(f) Install the manual drive access cover (transfer cover) on the actuator.

SUBTASK 49-00-00-410-001

- (5) Close this access panel:

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

SUBTASK 49-00-00-860-011

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-00-00-080-001

- (1) Remove the INOP placard from the APU master switch [5].

SUBTASK 49-00-00-750-001

- (2) Uncheck the applicable MAINT light Status Message(s) on the MAINT LIGHT menu (TASK 31-65-00-750-801).

————— END OF TASK —————

TASK 49-00-00-040-821

6. DDG 49-15-01B APU Air Inlet Door Inoperative in Closed Position - Preparation

(Figure 902, Figure 903)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU air inlet door inoperative in the closed position.

EFFECTIVITY
SIA ALL

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B. References

Reference	Title
31-65-00-750-801	Fault Interrogation for a Maintenance Message (P/B 201)

C. Tools/Equipment

Reference	Description
STD-23466	Extension - Socket, 1/4 Inch Square Drive, 6 Inch Length

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
314	Stabilizer Torsion Box Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. APU Air Inlet Door Preparation

SUBTASK 49-00-00-860-054

- (1) Make sure that the APU master switch [5] on the P5 forward overhead panel is in the OFF position.

SUBTASK 49-00-00-480-002

- (2) Attach an INOP placard to the APU master switch [5].

SUBTASK 49-00-00-860-041

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

F/O Electrical System Panel, P6-5

Row	Col	Number	Name
A	12	C04011	APU INLET DOOR

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	11	C01336	APU START CONV

SUBTASK 49-00-00-010-009

- (4) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 49-00-00-860-042

- (5) Do these steps to manually deactivate the APU air inlet door in the closed position:

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- (a) Remove the manual drive access cover (transfer cover) on the APU inlet door actuator.
- (b) Follow the instructions on the actuator placard and use socket extension, STD-23466, to retract the actuator.
- NOTE: There are two sockets on the actuator, a manual drive socket and a transfer cover socket.
- (c) Insert a socket extension, STD-23466, into the transfer drive socket and turn in the counterclockwise direction until the mark on transfer cover aligns with "M".
- NOTE: The manual drive socket is now exposed.
- (d) Insert socket extension, STD-23466, into the manual drive socket and turn in the clockwise direction approximately 60 revolutions until a sharp torque increase is felt.
- NOTE: 60 is an estimated number of revolutions required to move the door from the ground open position to the closed position.
- (e) Turn the transfer cover socket in the clockwise direction until the mark on the cover aligns with "E".
- (f) Make sure the transfer cover is fully in the electrical mode position.
- NOTE: When the actuator is in the electrical mode, the actuator will lock in its current position.
- (g) Install the manual drive access cover (transfer cover) on the actuator.

SUBTASK 49-00-00-410-011

- (6) Close this access panel:

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

SUBTASK 49-00-00-810-002

- (7) If necessary, extinguish the MAINT light on the P5-1 panel. Do this task: Fault Interrogation for a Maintenance Message, TASK 31-65-00-750-801.

————— END OF TASK —————

TASK 49-00-00-440-821

7. DDG 49-15-01B APU Air Inlet Door Inoperative in Closed Position - Restoration

(Figure 902, Figure 903)

A. General

- (1) This task restores the airplane back to its usual condition after operation with the APU inlet door inoperative in closed position.

B. References

<u>Reference</u>	<u>Title</u>
31-65-00-750-801	Fault Interrogation for a Maintenance Message (P/B 201)

C. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-23466	Extension - Socket, 1/4 Inch Square Drive, 6 Inch Length

D. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

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E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. APU Air Inlet Door Restoration

SUBTASK 49-00-00-420-002

- (1) Make sure that the APU master switch [5] on the P5 forward overhead panel is in the OFF position.

SUBTASK 49-00-00-010-010

- (2) Open this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 49-00-00-860-045

- (3) Make sure the transfer cover is fully in the electrical mode position:
- (a) If the transfer cover aligns with "M", Insert socket extension, STD-23466 and turn the transfer cover socket in the clockwise direction until the mark on the cover aligns with "E".
- (b) Install the manual drive access cover (transfer cover) on the actuator.

SUBTASK 49-00-00-410-012

- (4) Close this access panel:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 49-00-00-860-070

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

F/O Electrical System Panel, P6-5

Row	Col	Number	Name
A	12	C04011	APU INLET DOOR

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	11	C01336	APU START CONV

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-00-00-080-002

- (1) Remove the INOP placard from the APU master switch [5].

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SUBTASK 49-00-00-750-002

- (2) Uncheck the applicable MAINT light Status Message(s) on the MAINT LIGHT menu (TASK 31-65-00-750-801).

————— END OF TASK —————

TASK 49-00-00-040-822

8. DDG 49-15-01-01 APU Air Inlet DOOR Light System Inoperative - Preparation

(Figure 903)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU air inlet DOOR light system inoperative.

B. References

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

C. Location Zones

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

D. APU Air Inlet DOOR Light System Preparation

SUBTASK 49-00-00-420-003

- (1) Attach an INOP placard on the DOOR light [7] on the P5 overhead panel.

NOTE: The door light will remain on.

SUBTASK 49-00-00-720-001

- (2) Do these steps with APU off:
 - (a) Make sure that the APU master switch [5] on the P5 forward overhead panel is in the OFF position.
 - (b) On the MAX Display System (MDS) APU maintenance page, make sure that the APU INLET DOOR POSITION shows NOT OPEN.
 - (c) Look at the right aft side of the airplane and make sure that the APU air inlet door is closed.
 - (d) Set the APU master switch [5] to the ON position.
 - (e) Wait two minutes, and make sure that the APU maintenance page display for the APU INLET DOOR POSITION shows OPEN.
 - (f) Look at the right aft side of the airplane and make sure that the APU air inlet door is open.
 - (g) Set the APU master switch [5] to the OFF position.
 - (h) Wait two minutes, and make sure that the APU maintenance page display for APU INLET DOOR POSITION shows NOT OPEN.
 - (i) Look at the right aft side of the airplane and make sure that the APU air inlet door is closed.

SUBTASK 49-00-00-720-002

- (3) Do these steps with the APU on:

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- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) On the MDS APU maintenance page, make sure that the display for APU INLET DOOR POSITION shows OPEN.
- (c) Look at the right aft side of the airplane and make sure that the APU air inlet door is open.
- (d) Set the APU master switch [5] on the P5 forward overhead panel to the OFF position.
- (e) Wait two minutes, and make sure that the APU maintenance page display for APU INLET DOOR POSITION shows NOT OPEN.
- (f) Look at the right aft side of the airplane and make sure that the APU air inlet door is closed.
- (g) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (h) Wait two minutes, and make sure that the APU maintenance page display for APU INLET DOOR POSITION shows OPEN.
- (i) Look at the right aft side of the airplane and make sure that the APU air inlet door is open.
- (j) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- (k) Wait two minutes, and make sure that the APU maintenance page display for APU INLET DOOR POSITION shows NOT OPEN.
- (l) Look at the right aft side of the airplane and make sure that the APU air inlet door is closed.

————— **END OF TASK** —————

TASK 49-00-00-440-822

9. DDG 49-15-01-01 APU Air Inlet DOOR Light System Inoperative - Restoration

(Figure 903)

A. General

- (1) This task restores the airplane back to its usual condition after operation with the APU air inlet DOOR light system inoperative

B. Location Zones

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

C. Put the Airplane Back to Its Usual Condition

SUBTASK 49-00-00-080-003

- (1) Remove the INOP placard from the DOOR light [7] on the P5 overhead panel.

————— **END OF TASK** —————

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TASK 49-00-00-040-823

10. **DDG 49-40-01 Start Power Unit Inoperative - Preparation**

(Figure 903, Figure 904)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the start power unit inoperative.

B. Location Zones

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

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. Start Power Unit Preparation

SUBTASK 49-00-00-860-018

- (1) Make sure that the APU master switch [5], on the P5 forward overhead panel, is in the OFF position (Figure 903).

SUBTASK 49-00-00-860-039

- (2) Attach an INOP placard on the APU master switch [5].

SUBTASK 49-00-00-860-019

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-00-00-010-006

- (4) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 49-00-00-860-066



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

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(WARNING PRECEDES)



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-00-00-860-020

- (6) Do these steps:

- (a) Disconnect the battery connector D11798 from the start power unit (Figure 904).
 - 1) Remove the safety wire.
- (b) Install a protective cover on the battery connector D11798 and start power unit receptacle.
- (c) Stow the battery connector D11798.

SUBTASK 49-00-00-410-008

- (7) Close this access panel:

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

————— **END OF TASK** —————

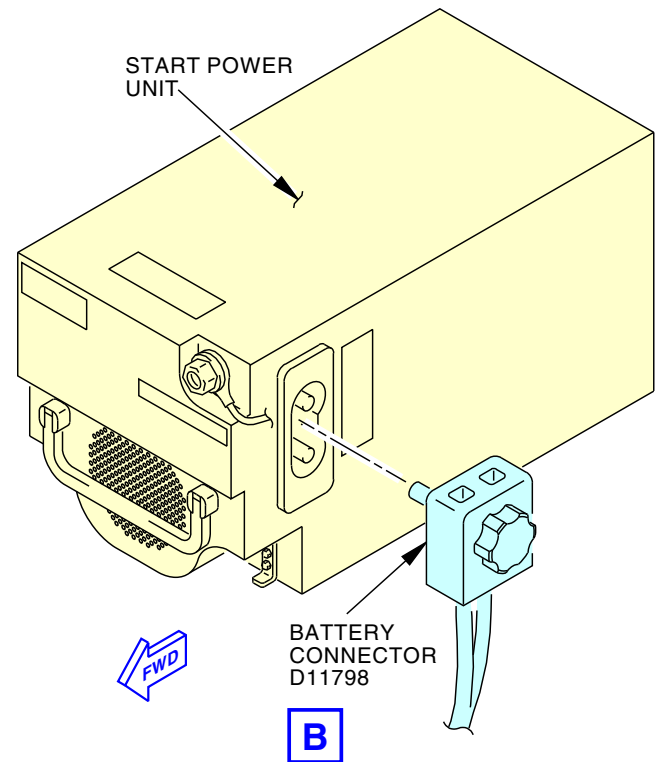
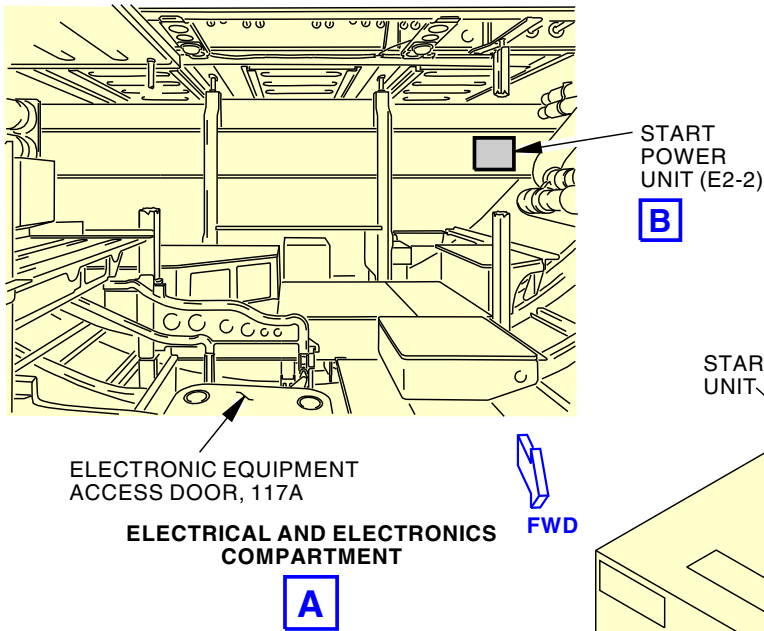
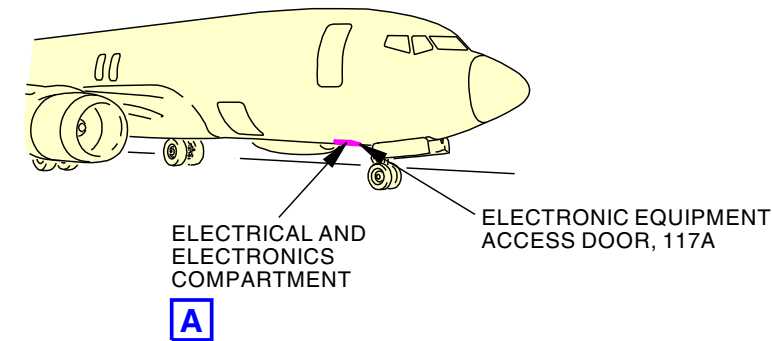
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APU - DDG Procedures, Start Power Unit
Figure 904/49-00-00-990-804

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TASK 49-00-00-440-823

11. **DDG 49-40-01 Start Power Unit Inoperative - Restoration**

(Figure 903, Figure 904)

A. General

- (1) This task restores the airplane back to its usual condition after operation with the start power unit inoperative.

B. Consumable Materials

Reference	Description	Specification
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Location Zones

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

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Start Power Unit Restoration

SUBTASK 49-00-00-010-007

- (1) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 49-00-00-860-021

- (2) Remove the protection covers from the start power unit and battery connector D11798 (Figure 904).

SUBTASK 49-00-00-860-050

- (3) Connect the battery connector D11798 to the start power unit.
(a) Install the MS20995NC20 lockwire, G02166, on the battery connector.

SUBTASK 49-00-00-860-067



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

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(WARNING PRECEDES)



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-00-00-410-009

- (5) Close this access panel:

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

SUBTASK 49-00-00-860-022

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-00-00-410-004

- (1) Remove the INOP placard from the APU master switch [5], on the P5 forward overhead panel.

————— END OF TASK —————

TASK 49-00-00-040-824

12. DDG 49-40-02 Start Converter Unit Inoperative - Preparation

(Figure 903)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the start converter unit inoperative.

B. Location Zones

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

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C. Access Panels

Number	Name/Location
--------	---------------

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

D. Start Converter Unit Preparation

SUBTASK 49-00-00-860-023

- (1) Make sure that the APU master switch [5], on the P5 forward overhead panel, is in the OFF position.

SUBTASK 49-00-00-860-053

- (2) Attach an INOP placard on the APU master switch [5].

SUBTASK 49-00-00-860-024

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-00-00-010-012

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

Number	Name/Location
--------	---------------

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

SUBTASK 49-00-00-860-068



WARNING

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



WARNING

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

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

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	11	C01336	APU START CONV

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SUBTASK 49-00-00-410-014

- (6) Close this access panel:

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

————— END OF TASK —————

TASK 49-00-00-440-824

13. DDG 49-40-02 Start Converter Unit Inoperative - Restoration

(Figure 903)

A. General

- (1) This task restores the airplane back to its usual condition after operation with the start converter unit inoperative.

B. Location Zones

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

C. Access Panels

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

D. Start Converter Unit Restoration

SUBTASK 49-00-00-010-013

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

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

SUBTASK 49-00-00-860-069



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

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SUBTASK 49-00-00-410-015

- (3) Close this access panel:

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

SUBTASK 49-00-00-860-047

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

E. Put the Airplane Back to Its Usual Condition

SUBTASK 49-00-00-020-002

- (1) Remove the INOP placard from the APU master switch [5], on the P5 forward overhead panel.

————— **END OF TASK** —————

TASK 49-00-00-040-825

14. DDG 49-52-01 APU Bleed Air Valve Closed Inoperative - Preparation

(Figure 903)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU bleed air valve closed inoperative.

B. Location Zones

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

C. APU Bleed Air System Preparation

SUBTASK 49-00-00-860-026

- (1) Set the APU BLEED switch [13], on the P5 overhead panel, to the OFF position.

SUBTASK 49-00-00-860-051

- (2) Attach an INOP placard to the APU BLEED switch [13].

SUBTASK 49-00-00-860-048

- (3) Attach an INOP placard on the APU master switch [5], on the P5 overhead panel.

SUBTASK 49-00-00-860-038

- (4) Access the MAX Display System (MDS) APU maintenance page and set the APU ECU Power to TEST.
- (a) Make sure that the STATUS CODE: STATUS 2, BIT 2 shows 0.

————— **END OF TASK** —————

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TASK 49-00-00-440-825

15. DDG 49-52-01 APU Bleed Air Valve Closed Inoperative - Restoration

(Figure 903)

A. General

- (1) This task restores the airplane back to its usual condition after operation with the APU bleed air valve closed inoperative.

B. Location Zones

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

C. Put the Airplane Back to Its Usual Condition

SUBTASK 49-00-00-860-028

- (1) Remove the INOP placard from the APU BLEED switch [13], on the P5 overhead panel.

SUBTASK 49-00-00-860-052

- (2) Set the APU BLEED switch [13], on the P5 overhead panel, to the ON position.

SUBTASK 49-00-00-860-049

- (3) Remove the INOP placard from the APU master switch [5], on the P5 overhead panel.

————— **END OF TASK** —————

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APU POWER PLANT - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Auxiliary Power Unit (APU) System - Safety Precaution
- (2) APU Operation Limits
- (3) APU System - Deactivation
- (4) APU System - Activation
- (5) APU Starting and Operation
- (6) APU Usual Shutdown
- (7) APU Emergency Shutdown
- (8) APU Protective Shutdown
- (9) Motor the APU
- (10) APU Preservation - Mild Environment
- (11) APU Preservation - Severe Environment
- (12) APU Depreservation
- (13) APU DMM Re-initialization.

B. The APU Preservation procedures give protection to the APU when it is not used (and stored on the airplane). The preservation can be done for time periods of one month to two years. The APU starting and operation and APU motoring procedures are used in the APU Preservation Procedures.

C. The Depreservation procedures put the APU back to a serviceable condition after it has been preserved.

TASK 49-11-00-750-801

2. APU System - Safety Precaution

A. **General**

- (1) This procedure contains the steps for the general safety precautions of the Auxiliary Power Unit (APU) system.

B. **General Safety Precautions for Maintenance Tasks**



MAKE SURE THAT YOU USE THE APPLICABLE PERSONNEL PROTECTIVE EQUIPMENT (PPE) WHILE YOU WORK ON THE APU. HEAVY METALS, SUCH AS HEXAVALENT CHROMIUM, CAN EXIST IN THE APU COMPONENTS. PERSONNEL MUST EXAMINE APPLICABLE MATERIAL SAFETY DATA SHEETS AND USE GOOD PERSONAL HYGIENE. CLEAN HANDS FULLY AFTER YOU WORK ON MAINTENANCE PROCEDURES BEFORE YOU EAT, DRINK, OR SMOKE. HEXAVALENT CHROMIUM IS DANGEROUS AND CAN CAUSE INJURY TO PERSONNEL.

SUBTASK 49-11-00-750-002

- (1) This APU and attaching parts may have visible residue on their surfaces that may contain hexavalent chromium. It may range in color from pale white-beige to yellow, orange, light brown and/or dark brown.

NOTE: Even if the residue is not visible, hexavalent chromium residue may be present on the surface of hot section components after operation.

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SUBTASK 49-11-00-750-003

- (2) When performing maintenance operations on the APU, you must obey the following precautions:
- (a) Obey all applicable environmental, health and safety precautions before you move, touch, replace or discard hardware that contains hexavalent chromium.
 - (b) Avoid creating airborne dust.
 - (c) Do not use compressed air to blow off parts.

NOTE: Operations such as grinding, buffing or media blasting should be conducted after part cleaning and removal of residue, and only with the appropriate controls in place to limit potential exposure to hexavalent chromium.

————— **END OF TASK** —————

TASK 49-11-00-710-801

3. APU Operation Limits

(Figure 201)

A. General

- (1) The Auxiliary Power Unit (APU) operation limits (guidelines) are used when you operate, motor or troubleshoot the APU. The APU parameter indications for the APU operation with no load, with 100-ampere electrical load and with two-pack high Environmental Control System (ECS)(no electrical load) are shown in Table 202, Table 203, Table 201. These indications can help identify and isolate a problem to the fuel system, ignition system or bleed air system if there are more than one component or system to be replaced or repaired. If there are no evidence of an APU problem, operation outside these limits should not require an APU maintenance action.
- (2) The switch positions and command signals for the applicable APU parameters are shown in Table 204 for a serviceable APU. Use the four tables together to make sure the APU and airplane systems operate correctly.
- (3) The oil consumption limit is shown in Figure 201.

B. References

Reference	Title
49-61-00-700-801	APU BITE Procedure (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left

D. APU Operation Limits

SUBTASK 49-11-00-710-001

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

NOTE: It is necessary to do the APU BITE procedure to see the APU parameters.

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Table 201/49-11-00-993-801 APU Operation Guidelines with No Load - Indications

Outside Air Temperature °F (°C)	0 (-17)	59 (15)	103 (39)	0 (-17)	59 (15)	103 (39)
Altitude ft (m)	Sea Level	Sea Level	Sea Level	5000 (1524)	5000 (1524)	5000 (1524)
Speed (%)	99-101	99-101	99-101	99-101	99-101	99-101
EGT (°C)	329-454	374-499	418-543	329-454	374-499	418-543
IGV Position (°)	20-24	20-24	20-24	20-24	20-24	20-24
SCV Position (°)	5-20	5-20	5-20	5-20	5-20	5-20
Delta Pressure (DP) (psid)	2-13	2-13	2-13	2-12	2-12	2-12
Total Pressure (PT) (psia)	16-26	16-26	16-26	12-23	12-23	12-23
Inlet Pressure (P2) (psia)	13.9-15	13.9-15	13.9-15	11.5-12.5	11.5-12.5	11.5-12.5
Inlet Temperature (T2) (°C)	-23 to -12	9-20	34-45	-23 to -12	9-20	34-45
Fuel TMC (milli-amperes)	120-153	110-148	110-148	105-137	100-133	100-133
Fuel Flow (pounds per hour)	181-240	173-231	168-230	151-210	144-202	140-202
Generator Load (kilowatt)	---	---	---	---	---	---

Table 202/49-11-00-993-802 APU Operation Guidelines with 100-ampere Electrical Load (maximum) - Indications

Outside Air Temperature °F (°C)	0 (-17)	59 (15)	103 (39)	0 (-17)	59 (15)	103 (39)
Altitude ft (m)	Sea Level	Sea Level	Sea Level	5000 (1524)	5000 (1524)	5000 (1524)
Speed (%)	99-101	99-101	99-101	99-101	99-101	99-101
EGT (°C)	352-474	400-524	447-573	356-482	405-532	453-582
IGV Position (°)	20-24	20-24	20-24	20-24	20-24	20-24

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Table 202/49-11-00-993-802 APU Operation Guidelines with 100-ampere Electrical Load (maximum) - Indications (Continued)

Outside Air Temperature °F (°C)	0 (-17)	59 (15)	103 (39)	0 (-17)	59 (15)	103 (39)
Altitude ft (m)	Sea Level	Sea Level	Sea Level	5000 (1524)	5000 (1524)	5000 (1524)
SCV Position (°)	5-20	5-20	5-20	5-20	5-20	5-20
Delta Pressure (DP) (psid)	2-13	2-13	2-13	2-12	2-12	2-12
Total Pressure (PT) (psia)	16-26	16-26	16-26	12-23	12-23	12-23
Inlet Pressure (P2) (psia)	13.9-15	13.9-15	13.9-15	11.5-12.5	11.5-12.5	11.5-12.5
Inlet Temperature (T2) (°C)	-23 to -12	9-20	34-45	-23 to -12	9-20	34-45
Fuel TMC (milliamperes)	130-164	125-159	130-158	110-148	110-145	105-143
Fuel Flow (pounds per hour)	200-260	195-252	190-250	170-231	165-225	160-220
Generator Load (kilowatt)	28-35	28-35	28-35	28-35	28-35	28-35

Table 203/49-11-00-993-803 APU Operation Guidelines with Two-Pack High ECS (No Electrical Load) - Indications

Outside Air Temperature °F (°C)	0 (-17)	59 (15)	103 (39)	0 (-17)	59 (15)	103 (39)
Altitude ft (m)	Sea Level	Sea Level	Sea Level	5000 (1524)	5000 (1524)	5000 (1524)
Speed (%)	99-101	99-101	99-101	99-101	99-101	99-101
EGT (°C)	365-632	418-649	520-655	380-632	435-649	519-665
IGV Position (°)	35-48	39-52	84-97	45-58	51-64	83-97
SCV Position (°)	85-95	85-95	85-95	85-95	85-95	85-95
Delta Pressure (DP) (psid)	3-9	3-9	4-11	3-9	3-9	3-10
Total Pressure (PT) (psia)	34-45	35-45	47-57	32-42	33-43	38-48

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Table 203/49-11-00-993-803 APU Operation Guidelines with Two-Pack High ECS (No Electrical Load) -
Indications (Continued)

Outside Air Temperature °F (°C)	0 (-17)	59 (15)	103 (39)	0 (-17)	59 (15)	103 (39)
Altitude ft (m)	Sea Level	Sea Level	Sea Level	5000 (1524)	5000 (1524)	5000 (1524)
Inlet Pressure (P2) (psia)	13.9-15	13.9-15	13.9-15	11.5-12.5	11.5-12.5	11.5-12.5
Inlet Temperature (T2) (°C)	-23 to -12	9-20	34-45	-23 to -12	9-20	34-45
Fuel TMC (milliamperes)	130-256	130-224	150-200	120-222	120-193	125-172
Fuel Flow (pounds per hour)	210-435	205-375	240-330	185-370	182-315	198-275
Generator Load (kilowatt)	---	---	---	---	---	---

Table 204/49-11-00-993-804 APU Operation Limits - Switch/Component Positions and Command
Signals

APU PARAMETER	APU MASTER SWITCH ON - NO START	APU OPERATION - NO BLEED AIR	APU OPERATION - DUCT PRESSURE MODE	APU OPERATION - MAIN ENGINE START MODE
Start Switch	NO	YES	YES	YES
APU ON Switch	YES	YES	YES	YES
APU OFF Switch	NO	NO	NO	NO
MES Switch(es) (ENGINE START 1 and 2 Position)	OFF, 1, 2 or Both 1 and 2	OFF, 1, 2 or Both 1 and 2	OFF	1, 2 or Both 1 and 2
Air/Ground	GRD	GRD	GRD	GRD
Left Pack (Switch Position)	OFF, AUTO or HIGH	OFF, AUTO or HIGH	OFF	OFF, AUTO or HIGH
Right Pack (Switch Position)	OFF, AUTO or HIGH	OFF, AUTO or HIGH	OFF	OFF, AUTO or HIGH
Bleed Command Switch (APU Bleed Switch Position)	OFF or ON	OFF	ON	ON
Inlet Door Open	NO/YES	YES	YES	YES
Door Not Full Open	YES/NO	NO	NO	NO
Fire Cockpit	NO	NO	NO	NO
Fire Remote Handle	NO	NO	NO	NO
Fire Detection	NO	NO	NO	NO
Bleed Air Valve Position	Close	Close	Open	Open

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Table 204/49-11-00-993-804 APU Operation Limits - Switch/Component Positions and Command Signals (Continued)

APU PARAMETER	APU MASTER SWITCH ON - NO START	APU OPERATION - NO BLEED AIR	APU OPERATION - DUCT PRESSURE MODE	APU OPERATION - MAIN ENGINE START MODE
Fuel Valve Closed Position	No	No	No	No
Fuel Valve Open Position	Yes	Yes	Yes	Yes
Ready to Load (Received Signal)	No	Yes	Yes	Yes
Start Command (Received Signal)	No	No	No	No
Load Shed Command (Received Signal)	No	No	No	No
Ignition Command (Received Signal)	No	No	No	No
Fuel Solenoid Command (Received Signal)	No	Yes	Yes	Yes
Bleed Solenoid Command (Received Signal)	No	No	Yes	Yes
OVER SPEED Indicator Light	Off	Off	Off	Off
FAULT Indicator Light	Off	Off	Off	Off
LOW OIL PRESSURE Indicator Light	On	Off	Off	Off
DOOR Indicator Light	Off	Off	Off	Off

————— END OF TASK —————

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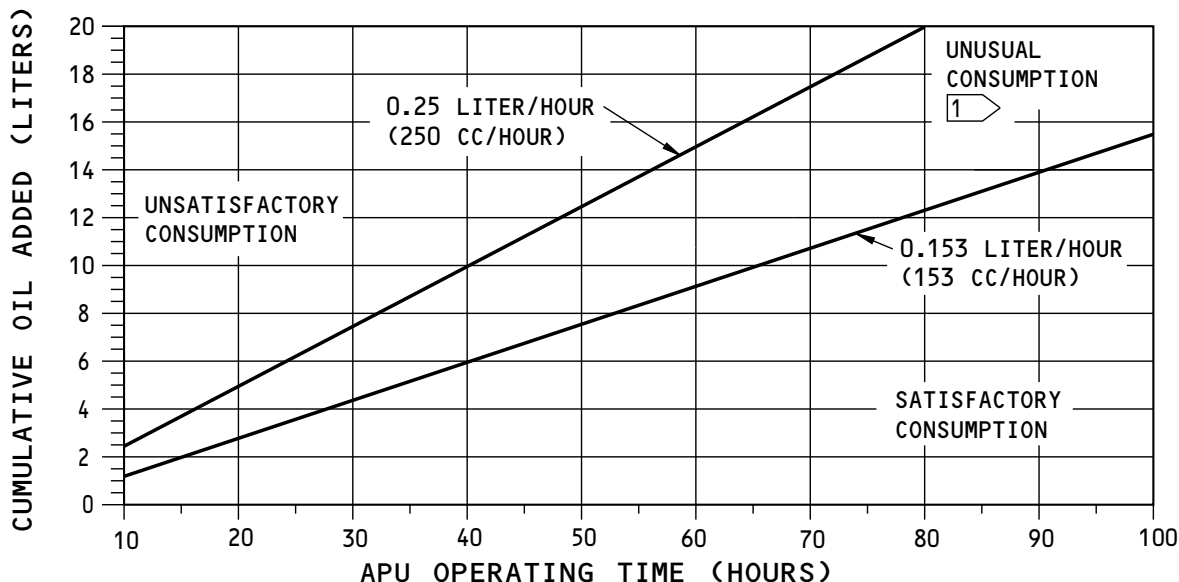
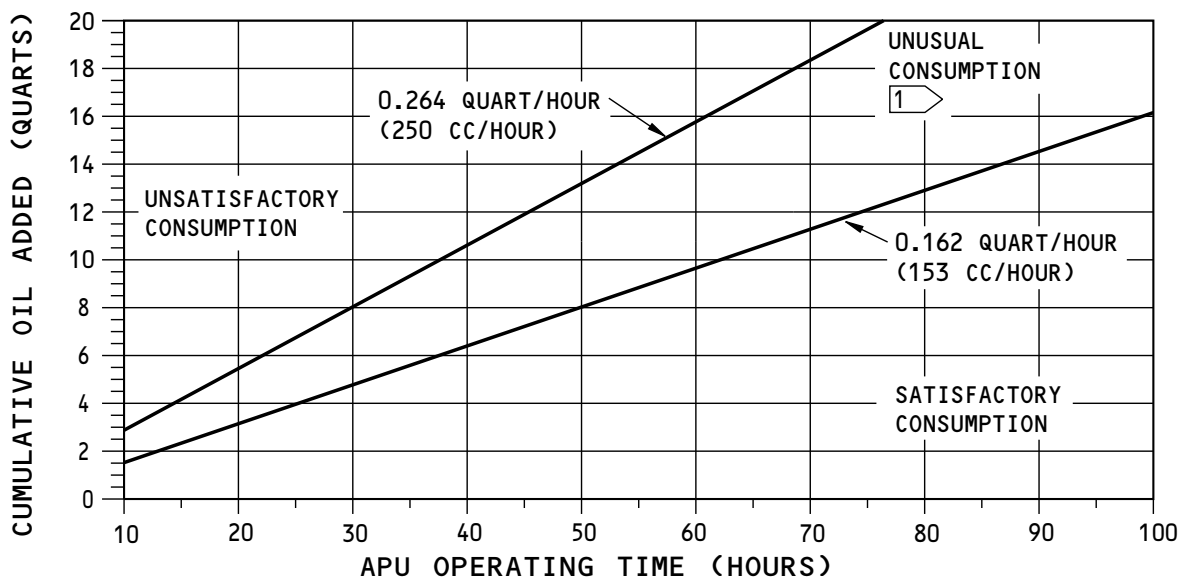
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NOTE: THESE GRAPHS ARE USED TO MONITOR THE APU OIL CONSUMPTION FOR INSTALLED APU'S. THE OIL CONSUMPTION FOR A NEW OR NEWLY OVERHAULED APU IS 0.008 QT/HOUR (8 CC/HOUR).

TOTAL OIL CAPACITY IN APU GEARBOX = 5.7 QUARTS (5.4 LITERS)
OIL QUANTITY WITH MAINT INDICATION = 3.8 QUARTS (3.6 LITERS)

1 USE APU ONLY WHEN THE APU GEARBOX IS FILLED BEFORE EACH FLIGHT.

2415412 S00061537789_V1

Oil Consumption Limit
Figure 201/49-11-00-990-801

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TASK 49-11-00-040-801

4. APU System - Deactivation

(Figure 202)

A. General

(1) This task will deactivate the following components of the APU system:

- APU Harness
- APU System
- APU Mounts
- APU Air Inlet
- APU Drains
- APU Firewall
- APU Engine
- APU Fuel System
- APU Ignition and Start System
- APU Bleed Air System
- APU Controls
- EGT Indicating System
- APU Lubrication System
- APU Exhaust System
- APU Oil Indicating System

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

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

D. Procedure

SUBTASK 49-11-00-020-001

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

SUBTASK 49-11-00-420-001

(2) Put the APU master switch on the P5 forward overhead panel to the OFF position.

NOTE: After the APU master switch is set to the OFF position, the APU continues to operate for approximately 60 seconds during its cool-down cycle. The BAT switch must not be set to the OFF position until after the APU cool-down cycle and the APU engine stops its operations.

SUBTASK 49-11-00-420-002

(3) Put the BAT switch on the P5 forward overhead panel to the OFF position.

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SUBTASK 49-11-00-020-002

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

E. APU Harness - Tryout

NOTE: This tryout is to make sure that the APU harness is in a zero energy state.

SUBTASK 49-11-00-420-003

- (1) Put the BAT switch on the P5 forward overhead panel to the ON position.

SUBTASK 49-11-00-420-004

- (2) Put the APU master switch on the P5 forward overhead panel to the ON position.

SUBTASK 49-11-00-210-001

- (3) Make sure that the air inlet door remains in the closed position.

SUBTASK 49-11-00-210-002

- (4) Make sure that the APU fuel shutoff valve is fully closed.

NOTE: The manual override handle [8] on the APU fuel shutoff valve [10] gives an OPEN or CLOSED indication of the shutoff valve position.

SUBTASK 49-11-00-020-003

- (5) Put the APU master switch to the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-11-00-020-004

- (6) Put the BAT switch to the OFF position and install a DO NOT OPERATE tag, STD-858.

————— **END OF TASK** —————

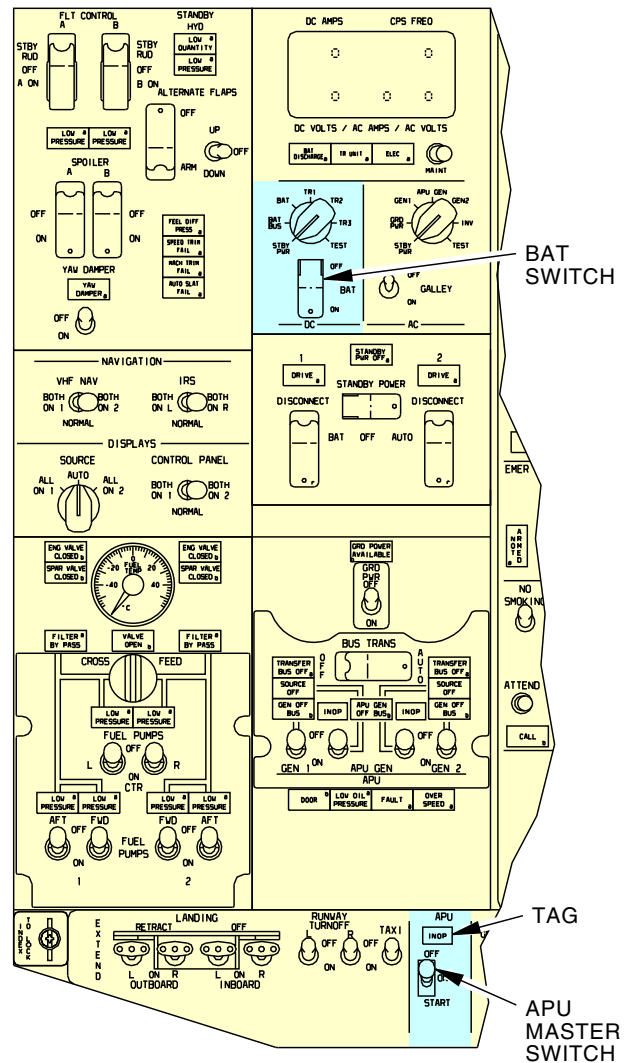
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FORWARD OVERHEAD PANEL, P5

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APU System
Figure 202/49-11-00-990-802 (Sheet 1 of 3)

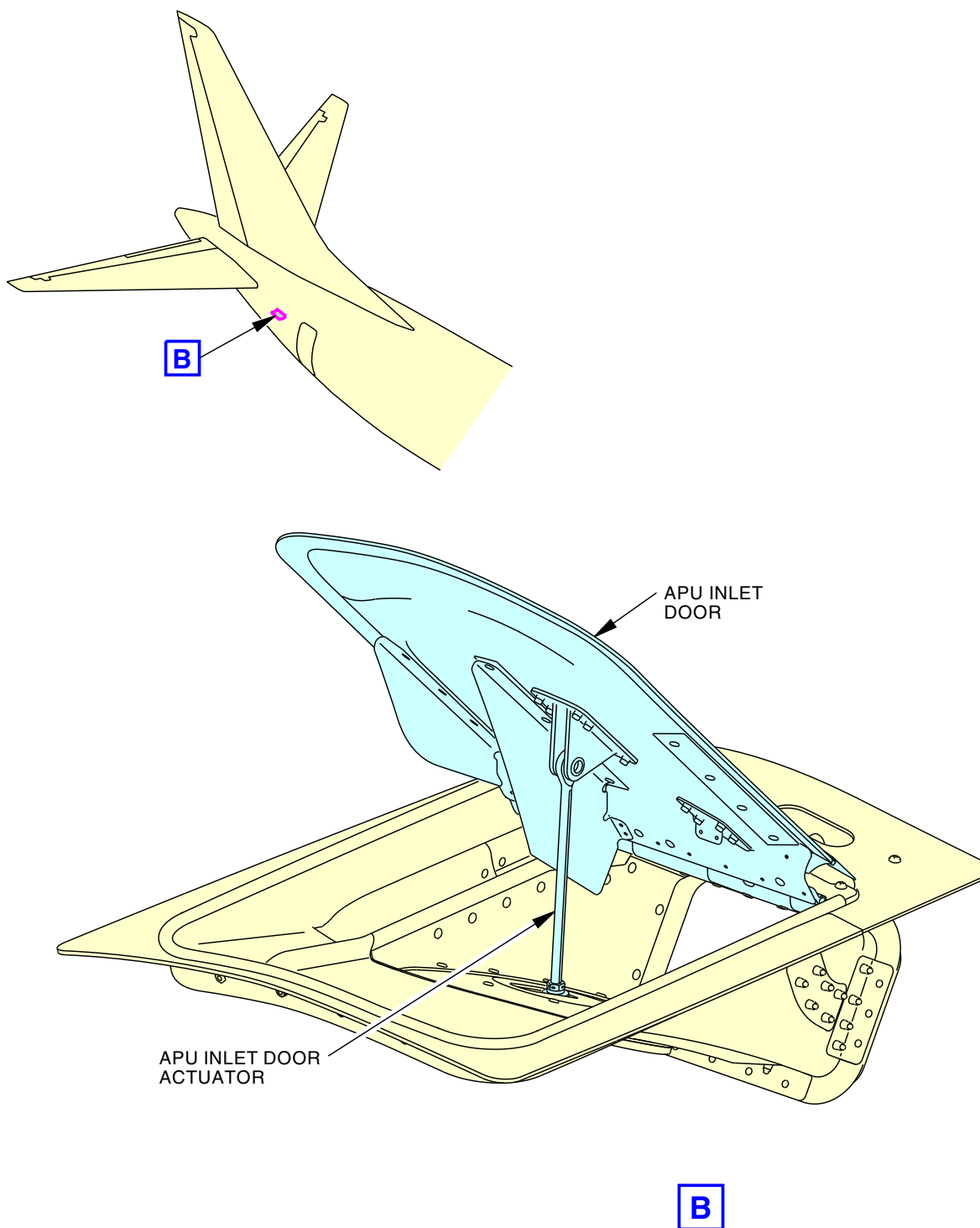
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2415414 S00061537792_V1

APU System
Figure 202/49-11-00-990-802 (Sheet 2 of 3)

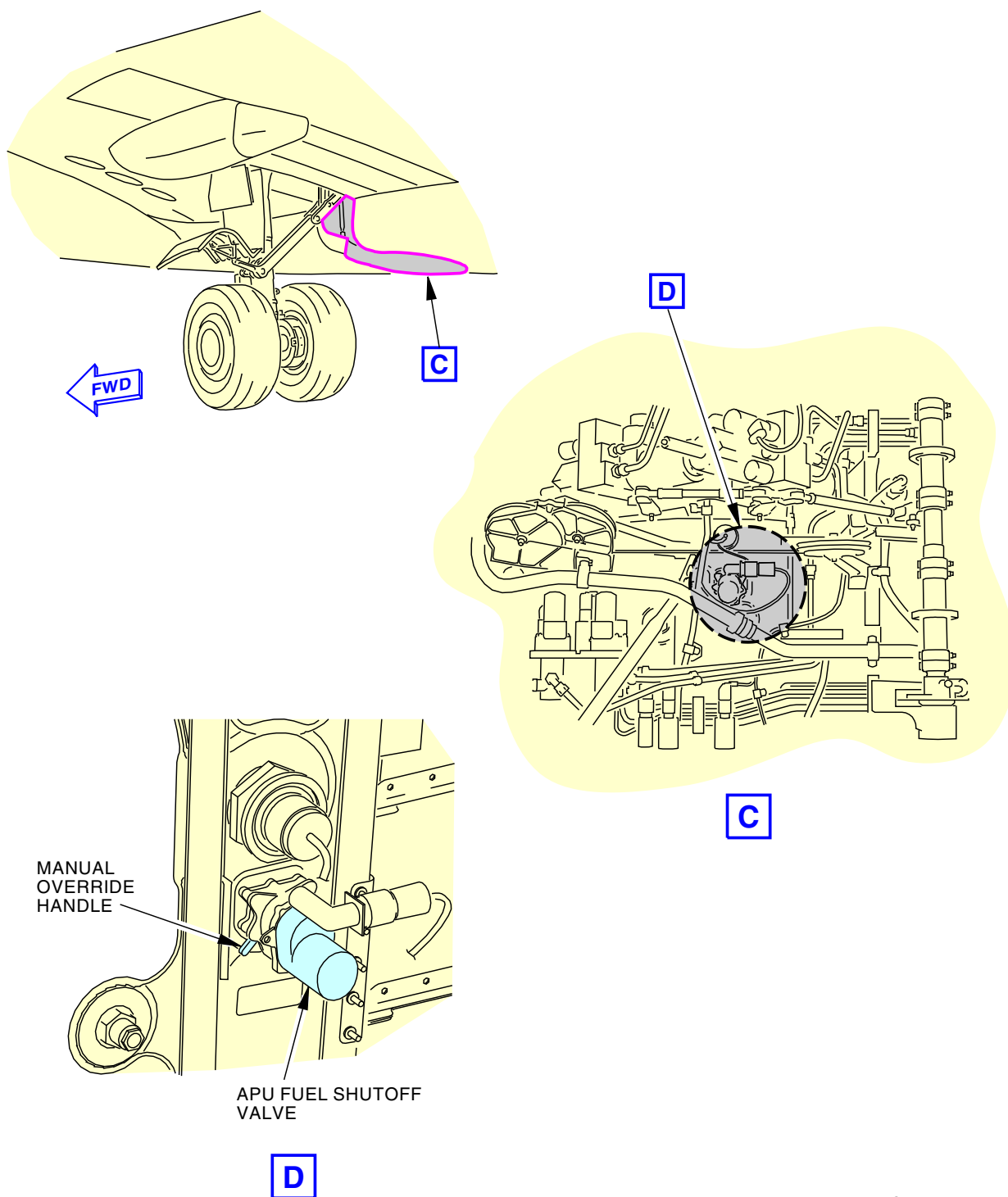
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APU System
Figure 202/49-11-00-990-802 (Sheet 3 of 3)

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TASK 49-11-00-440-801

5. **APU System - Activation**

(Figure 202)

A. General

(1) This task will activate the following components of the APU system:

- APU Harness
- APU System
- APU Mounts
- APU Air Inlet
- APU Drains
- APU Firewall
- APU Engine
- APU Fuel System
- APU Ignition and Start System
- APU Bleed Air System
- APU Controls
- APU Lubrication System
- EGT Indicating System
- APU Exhaust System
- APU Oil Indicating System

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

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

D. Procedure

SUBTASK 49-11-00-420-005

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-11-00-020-005

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

SUBTASK 49-11-00-420-006

- (3) Put the APU master switch to the ON position.

SUBTASK 49-11-00-860-001

- (4) Make sure that the air inlet door opens.

SUBTASK 49-11-00-020-006

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

SUBTASK 49-11-00-420-007

- (6) Put the BAT switch to the ON position.

————— END OF TASK —————

TASK 49-11-00-860-801

6. APU Starting and Operation

(Figure 203)

A. General

- (1) It is recommended that you do an Auxiliary Power Unit (APU) starting and operation procedure a minimum of one time every 7 days 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 7 day interval will prevent internal/external corrosion and damage to the fuel and oil seals/components.

- (a) If the APU is in a severe environment of high moisture and salt air, it is recommended that you start the APU once every 3 days to prevent corrosion; which can lead to an APU no-start condition, due to seizure of the rotating group.

NOTE: It is recommended to run the APU every 3 days in cold weather below 32°F (0°C) or in humidity above 40%.

- 1) If the APU cannot be motored or operated normally, do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- 2) For extended APU service life, it is recommended that you operate the APU for two minutes before you apply a pneumatic load. You can apply an electrical load when the APU GEN OFF BUS light comes on.

NOTE: 22 VDC is the minimum voltage required for APU starting and operation.

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B. References

Reference	Title
12-11-00-650-803	Pressure Refuel Procedure (P/B 301)
12-33-01-600-801	Cold Weather Maintenance Procedure (P/B 301)
24-41-00-440-801	AC External Power - Activation (P/B 201)
49-21-00-980-801	Manually Turn the APU Engine (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. APU Starting and Operation

SUBTASK 49-11-00-860-002



IF A REFUELING OPERATION IS IN THE AREA, OBEY THE WARNINGS AND CAUTIONS IN THE PRESSURE REFUEL 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 that you obey the WARNINGS and CAUTIONS in the pressure refuel procedure (TASK 12-11-00-650-803).

SUBTASK 49-11-00-210-003



DO NOT TRY AN APU START IF THERE IS ICE AROUND THE OPENING OF THE INLET DOOR. YOU CAN CAUSE DAMAGE TO THE MOTOR FOR THE INLET DOOR ACTUATOR IF THERE IS ICE.

- (2) Make sure that there is no ice around the opening for the air inlet door.
- (a) If you find ice, do this task: Cold Weather Maintenance Procedure, TASK 12-33-01-600-801.

SUBTASK 49-11-00-210-004



THE LOOSE OBJECTS CAN GO INTO THE AIR INLET PLENUM AND COMPRESSOR INLET PLENUM OF THE APU DURING APU OPERATION. THIS CAN CAUSE DAMAGE TO THE APU.

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

SUBTASK 49-11-00-860-003

- (4) Make sure that the BAT switch [1], on the P5 forward overhead panel, is set to the ON position.

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SUBTASK 49-11-00-210-005



MAKE SURE THAT THERE IS SUFFICIENT FUEL IN THE NO. 1 FUEL-TANK TO COVER THE BOOST-PUMP-INLETS DURING THE SCHEDULED APU-OPERATION. DO NOT OPERATE BOOST PUMPS IN A DRY CONDITION WITH FLAMMABLE FUMES IN THE TANK. FUEL FUMES IN THE TANK CAN IGNITE AND CAUSE A FIRE OR EXPLOSION.

- (5) Look at the fuel quantity display, on the P2 center instrument panel, for the No. 1 fuel tank.

NOTE: A minimum of 500 lb (227 kg) of fuel must be in the No. 1 fuel tank.

SUBTASK 49-11-00-010-013

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

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

SUBTASK 49-11-00-860-005



DO NOT START THE APU IN THE BUILDING WITHOUT GOOD AIRFLOW AND EAR PROTECTION. IF YOU DO NOT OBEY, INJURY TO PERSONNEL CAN OCCUR.

- (7) APU Start Power Source

NOTE: Unless specifically required by another AMM task, do a standard APU start.



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



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

- (a) For a standard operation (AC power) start of the APU:

- 1) Make sure that this circuit breaker is closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

NOTE: A DC start of the APU will occur automatically if there is a problem with an AC start regardless of the position of the circuit breaker APU START CONV.

- 2) Apply AC power to the 115V AC TRANS BUS 1 (AC External Power - Activation, TASK 24-41-00-440-801)

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



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

- (b) For a DC power start of the APU:

NOTE: Wait a minimum of 30 seconds after DC power is applied for the DPCs to complete their internal BITE before attempting to start the APU.

NOTE: A DC start of the APU is accomplished by either that there is no AC power source is on the aircraft during the start OR by opening the C01336 CB.

Open this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-11-00-860-006

- (8) Make sure that these switches, on the P5 forward overhead panel, are set correctly:

- Set the APU master switch [16] to the OFF position.
 - Set the APU BLEED switch [8] to the OFF position.
 - Set the L PACK switch [4] and R PACK switch [5] to the OFF position.
 - Set the ISOLATION VALVE switch [6] to the CLOSE position.
 - Make sure that the STANDBY POWER switch [10] is in the AUTO position.
 - Make sure that the BUS TRANS switch [11] is in the AUTO position.
- (g) Obey these fuel pump limitations during the pump operation:
- The fuel boost pumps in the No. 1 or No. 2 fuel tanks should only be operated if there is a person in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication of the No. 1 and No. 2 fuel pumps when the quantity of fuel is less than 250 lb (113 kg).
 - The center tank fuel pump switches should only be positioned ON if there is a person in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication of the center tank fuel pump.
 - Immediately set the applicable fuel pump switch(es) to OFF position if the LOW PRESSURE light comes on and stays on.

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DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (h) Set the AFT or FWD No. 1 FUEL PUMP switch [17] to the ON position.
- 1) Look at the fuel quantity display, on the P2 center instrument panel, for the No. 1, No. 2 or center fuel tank.
 - 2) Make sure that there is sufficient fuel in the No. 1 or No. 2 or center fuel tank for continuous APU operation.
 - 3) If you operate the center fuel tank pump, you must have a person in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication of the center fuel tank pump.
- NOTE: A minimum of 500 lb (227 kg) of fuel is necessary to operate the APU for one hour. If continuous APU operation is more than one hour, calculate the quantity of fuel necessary to operate the APU as follows: multiply the number of hours by 500 lb (227 kg) of fuel.
- 4) If the quantity of fuel in the No. 1 or No. 2 fuel tank is more than 250 lb (113 kg), or center tank is more than 1000 lb (454 kg), do one of these two alternatives:
 - a) An observer is not required in the flight compartment if you do not operate the center fuel tank pump and you calculate the time that you must go back to the flight compartment when the quantity of fuel for the No.1 or No.2 fuel tank is less than these limits.
 - b) An observer is in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE lights.
 - 5) If the quantity of fuel in the No. 1 or No. 2 fuel tank is less than 250 lb (113 kg) or center tank is less than 1000 lb (454 kg), do these steps:
 - a) To operate any of the fuel pumps, you must have an observer in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE lights.
 - b) Immediately set the applicable fuel pump switch(es) to OFF if the LOW PRESSURE light comes on and stays on.

SUBTASK 49-11-00-710-002

- (9) Do a check of the fire detection system for the APU:
- (a) Move and hold the TEST switch [21], on the P8 aft electronic panel, to the OVHT/FIRE position.
 - 1) Make sure that these lights come on:
 - a) The APU fire switch [19] light (red) on the P8 aft electronic panel.
 - b) The LEFT MASTER CAUTION light [27] and RIGHT MASTER CAUTION light [24] (amber) on the P7 glareshield panel.
 - c) The LEFT FIRE WARN light [22] and RIGHT FIRE WARN light [23] (red) on the P7 glareshield panel.
 - d) The OVHT/DET annunciator light [25] (amber) on the P7 glareshield panel.

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- 2) Make sure that the fire alarm bell in the aural warning module, M315, comes on.
NOTE: The aural warning module, M315, is in the flight compartment.
 - 3) Make sure that the APU remote fire light [29] (red) in the right main wheel well flashes on and off continuously.
 - 4) Make sure that the APU remote warning horn [28] in the right main wheel well comes on.
- (b) Release the TEST switch [21].
- 1) Make sure that these lights go off:
 - a) The APU fire switch [19] light (red) on the P8 aft electronic panel.
 - b) The LEFT MASTER CAUTION light [27] and RIGHT MASTER CAUTION light [24] (amber) on the P7 glareshield panel.
 - c) The LEFT FIRE WARN light [22] and RIGHT FIRE WARN light [23] (red) on the P7 glareshield panel.
 - d) The OVHT/DET annunciator light [25] on the P7 glareshield panel.
 - 2) Make sure that the fire alarm bell in the aural warning module, M315, stops (no sound).
 - 3) Make sure that the APU remote fire light [29] (red) in the right main wheel well goes off.
 - 4) Make sure that the APU remote warning horn [28] in the right main wheel well stops (no sound).
- (c) Move and hold the TEST switch [21] to the FAULT/INOP position.
- 1) Make sure that these lights come on:
 - a) The FAULT light [34] (amber) on the P8 aft electronic panel.
 - b) The APU DET INOP light [18] (amber) on the P8 aft electronic panel.
 - c) The LEFT MASTER CAUTION light [27] and RIGHT MASTER CAUTION light [24] (amber) on the P7 glareshield panel.
 - d) The OVHT/DET annunciator light [25] (amber) on the P7 glareshield panel.
- (d) Release the TEST switch [21].
- 1) Make sure that these lights go off:
 - a) The FAULT light [34] (amber) on the P8 aft electronic panel.
 - b) The APU DET INOP light [18] (amber) on the P8 aft electronic panel.
 - c) The LEFT MASTER CAUTION light [27] and RIGHT MASTER CAUTION light [24] (amber) on the P7 glareshield panel.
 - d) The OVHT/DET annunciator light [25] (amber) on the P7 glareshield panel.
- (e) Move and hold the EXT TEST switch [20], on the P8 aft electronic panel, to the 1 position.
- 1) Make sure that the APU, L, and R lights come on.
- (f) Move and hold the EXT TEST switch [20] to the 2 position.
- 1) Make sure that the APU, L, and R lights come on.
- (g) Release the EXT TEST switch [20].
- 1) Make sure that the APU, L, and R lights go off.



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SUBTASK 49-11-00-280-001



PUT A PERSON NEAR THE APU COMPARTMENT TO LOOK FOR FIRE. IF A FIRE OCCURS WHILE THE APU COWL DOOR IS OPEN, IT IS POSSIBLE THAT THE FIRE EXTINGUISHING AGENT WILL NOT STOP THE FIRE. FIRE WILL CAUSE DAMAGE TO THE AIRPLANE.

- (10) Make sure that there is an observer near the APU compartment to watch for a fire if the APU cowl door is 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 (includes the use of fire extinguishers).

SUBTASK 49-11-00-860-072

- (11) Set the AC selector switch [3] to the APU GEN position.

SUBTASK 49-11-00-860-071

- (12) Momentarily set one of the two APU GEN switches [13] to the ON position and then release.

NOTE: It is necessary to set one of the two APU GEN switches [13] to the ON position before an APU start. This step will make sure that the AC indications on the P5-13 panel, for voltage and frequency are available before you set the APU generator on line.

SUBTASK 49-11-00-860-007

- (13) Set the APU master switch [16] to the START position and release it to the ON position.

NOTE: Wait a minimum of 30 seconds after DC power is applied for the DPCs to complete their internal BITE before attempting to start the APU.

NOTE: It is recommended that you obey the start duty cycle when you try to start the APU. The start duty cycle for the APU is three times in a 15 minute interval. If you do three successful or unsuccessful start cycles in a 15 minute interval, it is recommended that you wait 15 minutes after the third start cycle for the power electronics to cool. This 15 minute interval is necessary to cool the temperature of the power electronics in the start power unit and/or start converter unit. If the duty cycle is exceeded and the temperature limit is reached, the APU will not start.

SUBTASK 49-11-00-860-008

- (14) Make sure that the LOW OIL PRESSURE light [15] comes on.

SUBTASK 49-11-00-860-009

- (15) Make sure that the air inlet door opens.

SUBTASK 49-11-00-860-010

- (16) Monitor these indications on the P5 forward overhead panel:

- (a) Make sure that the LOW OIL PRESSURE light [15] goes off before the APU engine speed is 95%.
- (b) Look at the CPS FREQ display [2].

NOTE: With no load applied to the APU, CPS FREQ display must become stable at 395-405 CPS when the APU engine speed is 100%.

NOTE: The time necessary for an APU start must be less than 90 seconds.

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- (c) Make sure that the APU GEN OFF BUS light [12] comes on when the APU engine speed is 100%.

NOTE: When the APU GEN OFF BUS light comes on or the CPS FREQ display is stable at 395-405 CPS, the APU is prepared for pneumatic and/or electrical loads.

———— **END OF TASK** ————

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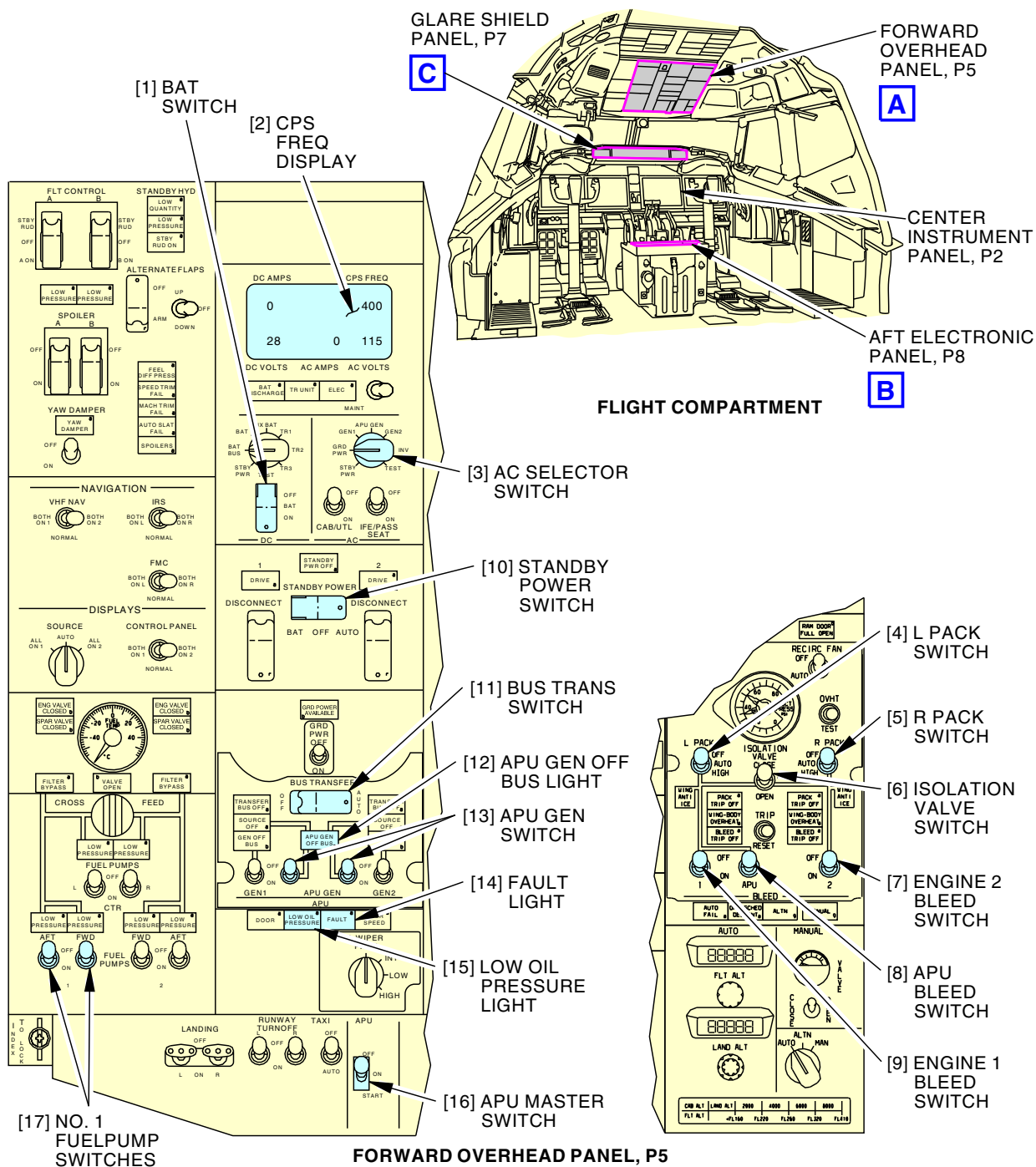
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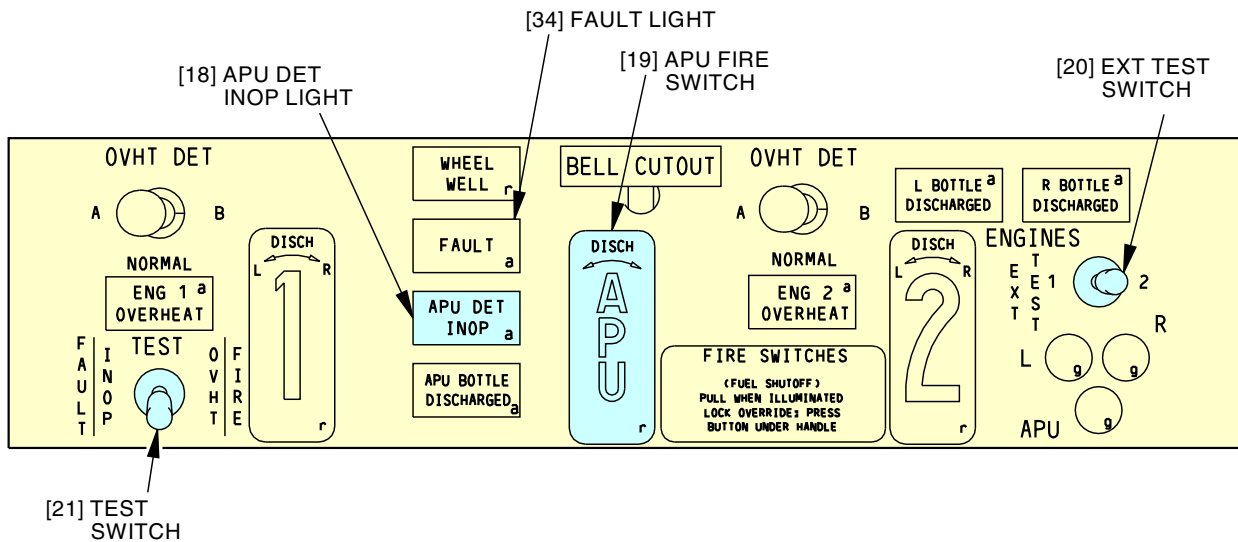


APU Start and Operation
Figure 203/49-11-00-990-803 (Sheet 1 of 5)

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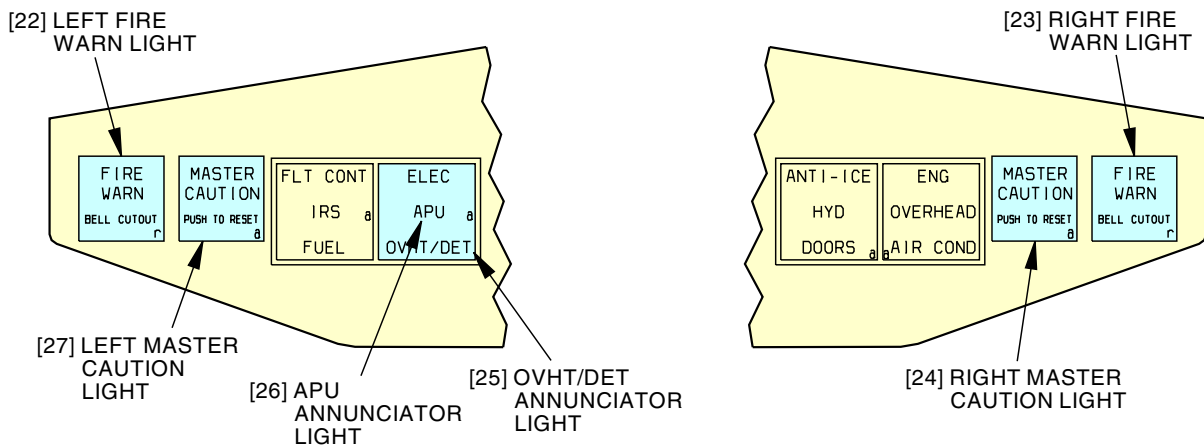
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AFT ELECTRONIC PANEL, P8

B



GLARESHIELD PANEL, P7

C

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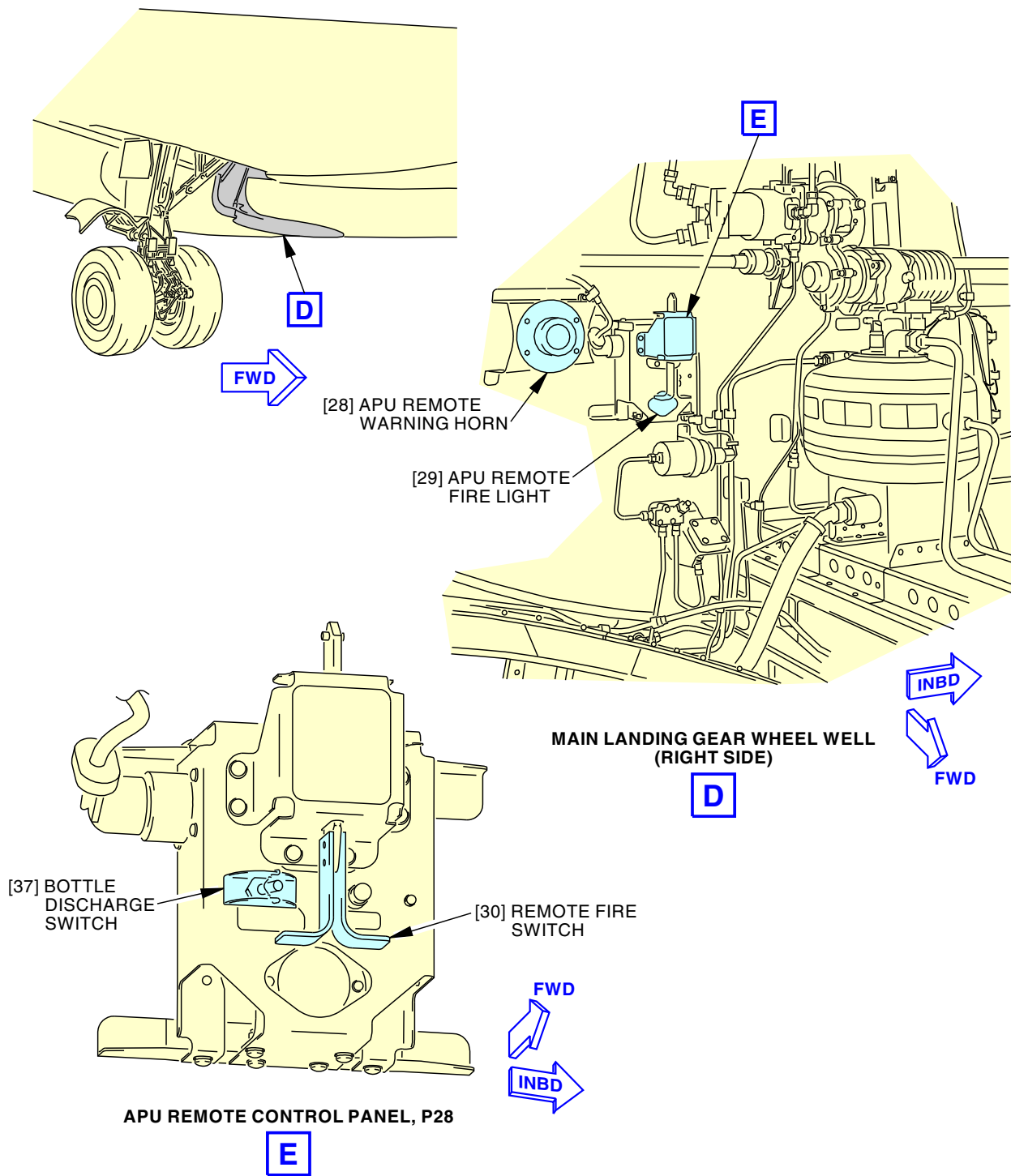
APU Start and Operation
Figure 203/49-11-00-990-803 (Sheet 2 of 5)

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2415418 S00061537798_V2

APU Start and Operation
Figure 203/49-11-00-990-803 (Sheet 3 of 5)

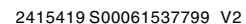
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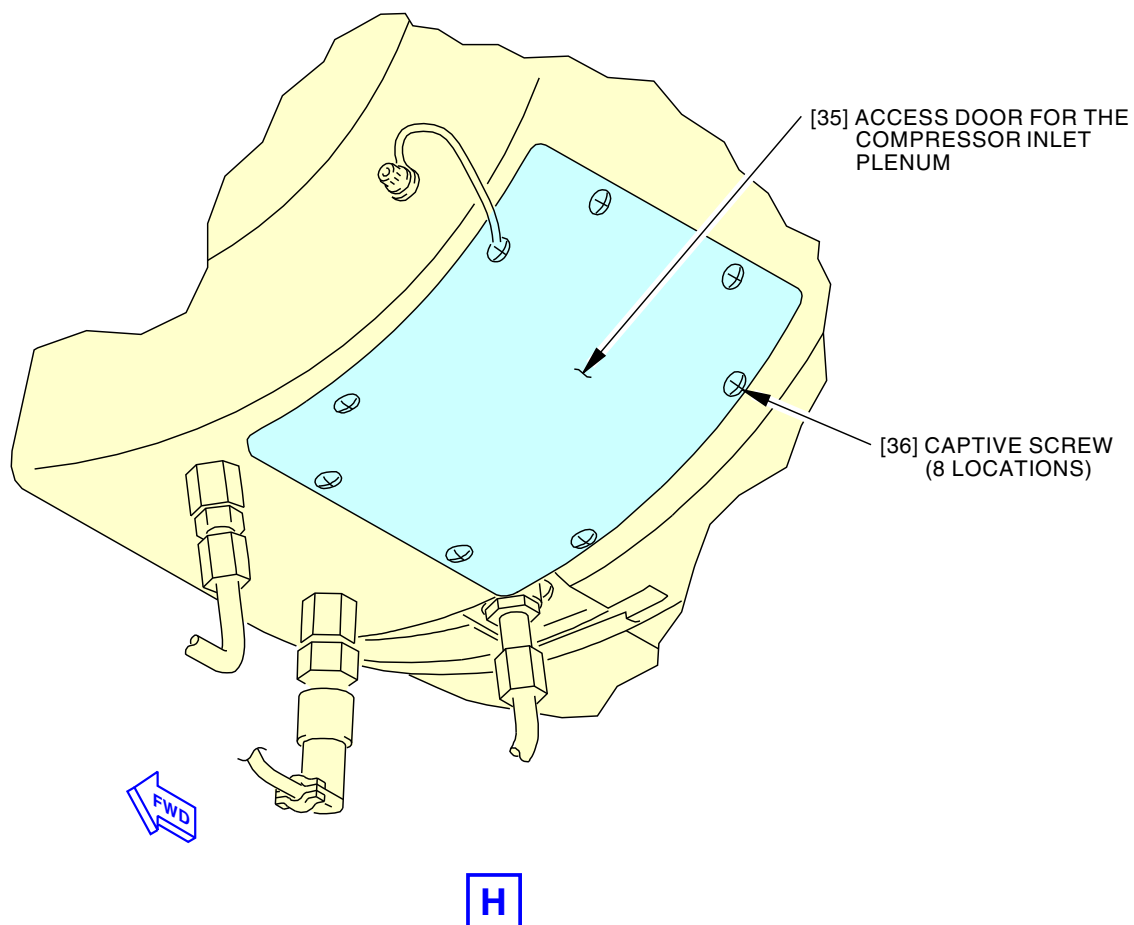
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APU Start and Operation
Figure 203/49-11-00-990-803 (Sheet 4 of 5)



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2415420 S00061537800_V1

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TASK 49-11-00-860-802

7. APU Usual Shutdown

(Figure 203)

A. Location Zones

Zone	Area
------	------

211	Flight Compartment - Left
-----	---------------------------

B. APU Usual Shutdown

SUBTASK 49-11-00-860-011

(1) Remove all the pneumatic and/or electrical loads from the APU starter-generator.

SUBTASK 49-11-00-860-012

(2) Make sure that the BUS TRANS switch [11] is in the AUTO position.

SUBTASK 49-11-00-860-013

(3) Set the APU master switch [16] to the OFF position.

NOTE: It can take up to 3 minutes for the APU cool down cycle to complete, and for the APU fuel shutoff valve and APU inlet door to close.

NOTE: If the APU inlet door does not close within two minutes and forty-five seconds, a fault will occur and the DOOR light will illuminate.

SUBTASK 49-11-00-860-014

(4) Set the AFT or FWD No. 1 FUEL PUMP switch [17] to the OFF position.

SUBTASK 49-11-00-860-015

(5) After 3 minutes, set the BAT switch [1], on the P5 forward overhead panel, to the OFF position if ground power is not selected.

NOTE: The BAT switch must not be set to the OFF position until after the APU cool-down cycle.

NOTE: The ground crew call horn will sound a continuous tone 2 minutes after a battery discharge condition is detected. A battery discharge condition is indicated when the airplane is on the ground with the battery switch selected on and battery charger is powered off.

————— END OF TASK —————

TASK 49-11-00-860-803

8. APU Emergency Shutdown

(Figure 203)

A. References

Reference	Title
-----------	-------

49-11-00-200-802	Inspection After an APU Fire (P/B 601)
------------------	--

B. Location Zones

Zone	Area
------	------

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

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C. APU Emergency Shutdown

SUBTASK 49-11-00-860-016

(1) Do these steps for the APU emergency shutdown:



WHEN YOU USE THE FIRE SWITCH TO STOP THE APU, YOU ARM THE FIRE EXTINGUISHING BOTTLE FOR THE APU. DO NOT TURN THE FIRE SWITCH BEFORE YOU MAKE SURE THAT THERE IS A FIRE IN THE APU COMPARTMENT. WHEN YOU TURN THE FIRE SWITCH, THE FIRE EXTINGUISHING BOTTLE RELEASES ITS CONTENTS INTO THE APU COMPARTMENT.

- (a) If you are in the airplane, push the manual override button and pull the APU fire switch [19], on the P8 aft electronic panel.
NOTE: The APU fire switch, on the P8 aft electronic panel, is also referred to as the fire handle.
- (b) If you are not in the airplane, pull the remote fire switch [30], on the P28 APU remote control panel.
NOTE: The remote fire switch, on the P28 APU remote control panel, is also referred to as the fire handle.
- (c) If there is a fire in the APU compartment, turn the APU fire switch [19] or remote fire switch [30], do one of the following steps:
NOTE: The fire extinguishing bottle will release its contents.
 - 1) Turn the APU fire switch [19].
 - 2) Use the bottle discharge switch [37].
- (d) Make sure that the APU immediately stops its operation.
NOTE: The APU will do an emergency shutdown. When the APU does an emergency shutdown, it will not do the cool-down cycle.
- (e) Make sure that the FAULT light [14], on the P5 forward overhead panel, comes on.
- (f) Make sure that the LEFT MASTER CAUTION light [27] and RIGHT MASTER CAUTION light [24], on the P7 glareshield panel, come on.
- (g) Make sure that the APU annunciator light [26], on the P7 glareshield panel, comes on.
- (h) Set the APU master switch [16] to the OFF position.
- (i) Set the AFT and FWD No. 1 FUEL PUMP switches [17] to the OFF position.
- (j) Set the applicable APU fire switch [19] or remote fire switch [30] back to its initial position.
- (k) Set the APU master switch [16] to the ON position.
- (l) After 30 seconds, make sure the FAULT light [14] goes off.
- (m) Make sure that the APU annunciator light [26] goes off.
- (n) Push and release the APU annunciator light [26].
- (o) Make sure that the LEFT MASTER CAUTION light [27] and RIGHT MASTER CAUTION light [24] go off.
NOTE: The LEFT MASTER CAUTION light and RIGHT MASTER CAUTION light stay on if the airplane finds other system faults.
- (p) Set the APU master switch [16] to the OFF position.

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SUBTASK 49-11-00-200-001

- (2) Do this task: Inspection After an APU Fire, TASK 49-11-00-200-802.

————— END OF TASK —————

TASK 49-11-00-860-804

9. APU Protective Shutdown

(Figure 203)

A. General

- (1) The APU FAULT light on the P5 forward overhead panel comes on when an APU protective shutdown has occurred.

NOTE: Refer to SDS 49-00-00 (Auxiliary Airborne Power - Protective Shutdown) for additional fault light that may turn on.

B. Location Zones

Zone	Area
211	Flight Compartment - Left

C. APU Protective Shutdown

SUBTASK 49-11-00-860-017

- (1) Set the APU master switch [16] to the OFF position.

SUBTASK 49-11-00-860-018

- (2) Set the AFT or FWD No. 1 FUEL PUMP switch [17] to the OFF position.

SUBTASK 49-11-00-810-001

- (3) Refer to the FIM to correct the cause of the APU shutdown.
(4) Reset the fault code after the fault is corrected at the OMF.

————— END OF TASK —————

TASK 49-11-00-860-805

10. Motor the APU

(Figure 203)

A. References

Reference	Title
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)
STD-7394	Cap - Dust, Electrical Connector

C. Location Zones

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

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D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Motor the APU

SUBTASK 49-11-00-860-019

- (1) Make sure the APU master switch [16] on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-11-00-860-020

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
(b) Open the three latches.

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

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

SUBTASK 49-11-00-940-001

- (4) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the APU drain seal [31].

SUBTASK 49-11-00-020-007



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.

- (5) Do these steps to release the high voltage from the ignition unit [32]:
(a) Make sure five minutes have gone by since the last APU start.
(b) Disconnect the electrical connector (P13) [33] from the ignition unit [32].
(c) Make sure you install all necessary dust caps, STD-7394.

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SUBTASK 49-11-00-910-001

- (6) Do this task: Supply External Power, TASK 24-22-00-860-803.

SUBTASK 49-11-00-860-021

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-022

- (8) Remove the DO NOT OPERATE tag, STD-858 from the APU master switch [16].

SUBTASK 49-11-00-860-023

- (9) Make sure the BAT switch [1] is ON.

SUBTASK 49-11-00-860-024

- (10) Set the AFT or FWD No. 1 FUEL PUMP switch [17] to the ON position.
- (a) If you must use the fuel boost pumps in the center tank, you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights.
 - (b) Turn the applicable fuel boost pump to the OFF position if the LOW PRESSURE light for the center tank stays on.

SUBTASK 49-11-00-860-025

- (11) Set the APU master switch [16] to the START position and release it to the ON position.

SUBTASK 49-11-00-860-026

- (12) Make sure a fuel fog comes out of the exhaust duct muffler during the APU motor operation.

SUBTASK 49-11-00-860-027

- (13) Motor the APU engine until the APU has a protective shutdown.

SUBTASK 49-11-00-860-028

- (14) Make sure the FAULT light [14] comes on.

SUBTASK 49-11-00-860-029

- (15) Set the APU master switch [16] to the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-11-00-860-030

- (16) Set the AFT or FWD No. 1 FUEL PUMP switch [17] to the OFF position.

SUBTASK 49-11-00-860-031

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

F/O Electrical System Panel, P6-2

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

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-940-002

- (18) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-11-00-420-008

- (19) Remove the dust caps, STD-7394, and connect the electrical connector (P13) [33] to the ignition unit [32].

SUBTASK 49-11-00-910-002

- (20) Do this task: Remove External Power, TASK 24-22-00-860-804.

SUBTASK 49-11-00-860-032

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-033

- (22) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch [16].

SUBTASK 49-11-00-410-001

- (23) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

————— **END OF TASK** —————

TASK 49-11-00-600-801

11. APU Preservation - Mild Environment

A. General

- (1) In a mild environment, do this preservation task within two months of the last APU operation when the APU will not be used. If the APU is sent to engine shop, continue the preservation until it goes to the shop.

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- (2) 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°F (-1°C) to 125°F (52°C), the humidity is below 40%, and there is no salt air present.
 - (b) If the environment does not meet the mild definition, use this task: APU Preservation - Severe Environment, TASK 49-11-00-600-802.
- (3) The factors that control the APU preservation and storage are:
 - (a) Where the aircraft or vehicle will be parked or stored.
 - (b) How long the aircraft or vehicle will be parked or stored.
 - (c) If the APU can be periodically motored.
 - (d) If the APU can be periodically operated.
 - (e) If the aircraft or vehicle fuel system have been preserved.
- (4) 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.
- (5) The best general practices are to:
 - (a) Operate the APU a minimum of five minutes before the preservation procedure to dry out the APU and APU compartment.

NOTE: It is recommended to use the APU supply bleed to operate both packs during the APU operation. Pack operation will raise the temperature of the load compressor and provide better dry out conditions.

NOTE: In high humidity environments, it is recommended to operate the APU for 20 to 30 minutes (APU Preservation - Severe Environment, TASK 49-11-00-600-802).
 - (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.
- (6) 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.
- (7) The preservation of the APU fuel control unit with preservation oil is not necessary, if the APU stays in the airplane and the APU fuel control unit is not removed or replaced. The low pressure fuel filter replacement is permitted. If the fuel control unit is replaced, the fuel system can be preserved by motoring or operating the APU at no load for one minute.

B. References

Reference	Title
12-13-31-610-801	Drain the APU Oil (P/B 301)

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C. Tools/Equipment

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

Reference	Description
SPL-1518	Plug - Auxiliary Power Unit (APU) Part #: B737-277 Supplier: 1LE67 Part #: JB-BBJ-APU-K Supplier: 4VVY1 Part #: R10009-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

D. Consumable Materials

Reference	Description	Specification
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)
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
G00920	Tape - Waterproof, Packaging	ASTM D5486
G50463	Pad - Fluid Absorbent (Anti-static)	
G51576	Tape - Pressure Sensitive Adhesive - BA6866	BAC5034-4
G51624	Card - Humidity Indicator, 10-100% Moisture Detection Reversible	

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Prepare for the Preservation

SUBTASK 49-11-00-860-034

- (1) Operate the APU for a minimum of five minutes to dry out the APU and APU compartment (TASK 49-11-00-860-801).

NOTE: It is recommended to use the APU supply bleed to operate both packs during the APU operation. Pack operation will raise the temperature of the load compressor and provide better dry out conditions.

NOTE: In high humidity environments, it is recommended to operate the APU for 20 to 30 minutes (APU Preservation - Severe Environment, TASK 49-11-00-600-802).

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

H. Preservation Guidelines - Less Than Two Months

SUBTASK 49-11-00-620-001

- (1) No preservation steps are necessary.

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I. Preservation Guidelines - More Than Two Months, Less Than Three Months

SUBTASK 49-11-00-680-001

- (1) Do this task: Drain the APU Oil, TASK 12-13-31-610-801.

J. Preservation Guidelines - More Than Three Months, Less Than One Year:

SUBTASK 49-11-00-680-002

- (1) Do this task: Drain the APU Oil, TASK 12-13-31-610-801.

SUBTASK 49-11-00-620-002

- (2) Add a minimum of 2.00 lb (0.91 kg) of desiccant, G00626, to the gas path.
- (a) Add a minimum of 1.00 lb (0.45 kg) each of desiccant, G00626, at the inlet and the exhaust.
 - (b) DO NOT put the desiccant, G00626, in the bleed air ducts or directly on metal surfaces.
 - (c) Put the desiccant, G00626, on fluid absorbent pads, G50463.
 - (d) Add a humidity indicator card, G51624, in a location that you can easily monitor.
 - 1) Do a check of the humidity indicator card, G51624, initially after 7 days and then every 30 days.
 - a) Make sure that the humidity shown on the humidity indicator is less than 40%.
 - b) If the humidity shown on the humidity indicator is greater than 40%, do the following steps:
 - <1> Make sure that there is no corrosion on the external surfaces of the APU.
 - <a> If there is corrosion on the external surfaces of the APU, contact Boeing for further evaluation.
 - <2> Replace any desiccant that is saturated or hardened.
 - <3> Add additional desiccant as necessary.

SUBTASK 49-11-00-860-035

- (3) Replace the DO NOT OPERATE tag, STD-858, on the APU control switch on the P5 panel with an APU PRESERVATION tag.
- (a) Add a note on the APU PRESERVATION tag that says where the desiccant was added.

SUBTASK 49-11-00-410-002

- (4) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

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SUBTASK 49-11-00-680-003

- (5) Seal the APU openings at the fuselage as follows:
- (a) Make sure that the APU is at ambient temperature.
 - (b) Install the APU exhaust plug, SPL-1518.



DO NOT APPLY THE G00920 TAPE TO THE PAINTED SURFACES. THE TAPE IS HARD TO REMOVE. IT CAN CAUSE DAMAGE TO THESE SURFACES.

- 1) If the APU exhaust cover is not available, use barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920.
- (c) Install barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920, on the following areas:
 - 1) APU inlet door
 - 2) Drain mast on the APU cowl door
 - 3) Cowl door latches
 - 4) Split lines.

K. Preservation Guidelines - More Than One Year, Less Than Two Years

SUBTASK 49-11-00-680-004

- (1) Do this task: Drain the APU Oil, TASK 12-13-31-610-801.

SUBTASK 49-11-00-020-008

- (2) Do these steps to disconnect and cap the fuel supply tube to the Fuel Control Unit (Figure 204):



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube.
- (b) Disconnect the fuel supply tube from the fitting on the 1088 bulkhead.
- (c) Drain the fuel from the fuel supply tube into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (d) Install the plugs on the fuel supply tube and the fitting on the 1088 bulkhead.

SUBTASK 49-11-00-620-003

- (3) Add a minimum of 2.00 lb (0.91 kg) of desiccant, G00626, to the gas path.
- (a) Add a minimum of 1.00 lb (0.45 kg) each of desiccant, G00626, at the inlet and the exhaust.
 - (b) DO NOT put the desiccant, G00626, in the bleed air ducts or directly on metal surfaces.
 - (c) Put the desiccant, G00626, on fluid absorbent pads, G50463.
 - (d) Add a humidity indicator card, G51624, in a location that you can easily monitor.
 - 1) Do a check of the humidity indicator card, G51624, initially after 7 days then every 30 days.

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- a) Make sure that the humidity shown on the humidity indicator is less than 40%.
- b) If the humidity shown on the humidity indicator is greater than 40%, do the following steps:
 - <1> Make sure that there is no corrosion on the external surfaces of the APU.
 - <a> If there is corrosion on the external surfaces of the APU, contact Boeing for further evaluation.
 - <2> Replace any desiccant that is saturated or hardened.
 - <3> Add additional desiccant as necessary.

SUBTASK 49-11-00-860-036

- (4) Replace the DO NOT OPERATE tag, STD-858, on the APU control switch on the P5 panel with an APU PRESERVATION tag.

- (a) Add a note on the APU PRESERVATION tag that says where the desiccant was added.

SUBTASK 49-11-00-410-003

- (5) To close the access panel, do these steps:

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

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

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

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

SUBTASK 49-11-00-620-004

- (6) Seal the APU openings at the fuselage as follows:

- (a) Make sure that the APU is at ambient temperature.
 - (b) Install the APU exhaust plug, SPL-1518.



DO NOT APPLY THE G00920 TAPE TO THE PAINTED SURFACES. THE TAPE IS HARD TO REMOVE. IT CAN CAUSE DAMAGE TO THESE SURFACES.

- 1) If the APU exhaust cover is not available, use barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920.
- (c) Install barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920, on the following areas:
 - 1) APU inlet door
 - 2) Drain mast on the APU cowl door
 - 3) Cowl door latches

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4) Split lines.

————— END OF TASK —————

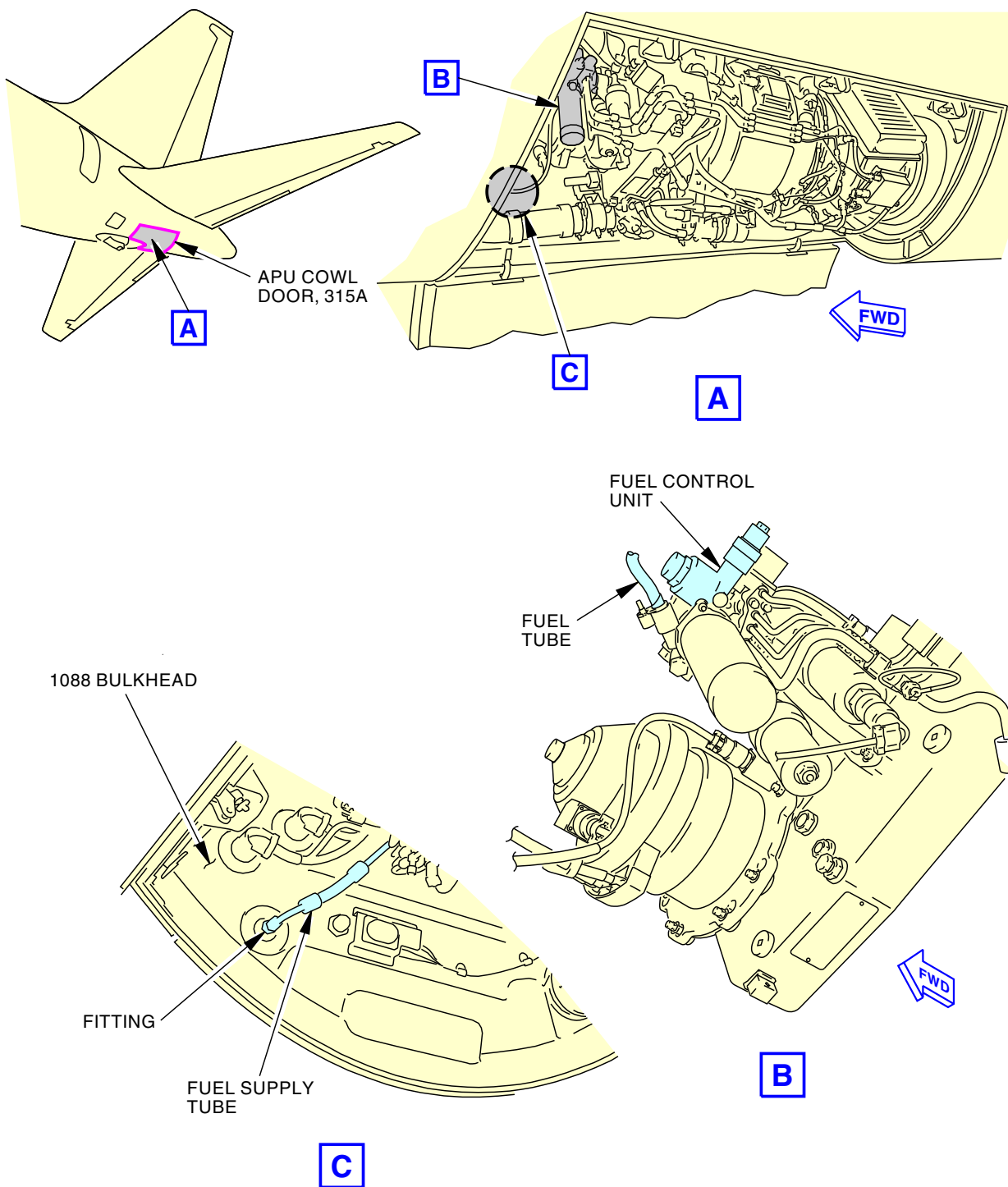
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APU Preservation - Fuel Supply Tube
Figure 204/49-11-00-990-804

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TASK 49-11-00-600-802

12. APU Preservation - Severe Environment

A. General

- (1) In a severe environment, do this preservation task within three days of the last APU operation when the APU will not be used. If the APU is sent to engine shop, continue the preservation until it goes to the shop.
- (2) 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°F (-1°C) to 125°F (52°C), or the humidity is above 40%, or there is salt air present.
- (3) The factors that control the APU preservation and storage are:
 - (a) Where the aircraft or vehicle will be parked or stored.
 - (b) How long the aircraft or vehicle will be parked or stored.
 - (c) If the APU can be periodically motored.
 - (d) If the APU can be periodically operated.
 - (e) If the aircraft or vehicle fuel system have been preserved.
- (4) 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 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.
- (5) The best general practices are to:
 - (a) Operate the APU a minimum of five minutes before the preservation procedure to dry out the APU and APU compartment.

NOTE: It is recommended to use the APU supply bleed to operate both packs during the APU operation. Pack operation will raise the temperature of the load compressor and provide better dry out conditions.

NOTE: In high humidity environments, it is recommended to operate the APU for 20 to 30 minutes.
 - (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, and up to 30 minutes to make sure that the APU and APU compartment are dried out.
 - (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 do a check of the desiccant and the seal on the fuselage openings.
- (6) The storage guidelines below are shown in terms of maximum desired storage periods without APU operation.
- (7) The preservation of the APU fuel control unit with preservation oil is not necessary, if the APU stays in the airplane and the APU fuel control unit is not removed or replaced. The low pressure fuel filter replacement is permitted. If the fuel control unit is replaced, the fuel system can be preserved by motoring or operating the APU at no load for one minute.

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B. References

Reference	Title
12-13-31-610-801	Drain the APU Oil (P/B 301)

C. Tools/Equipment

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

Reference	Description
SPL-1518	Plug - Auxiliary Power Unit (APU) Part #: B737-277 Supplier: 1LE67 Part #: JB-BBJ-APU-K Supplier: 4VVY1 Part #: R10009-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

D. Consumable Materials

Reference	Description	Specification
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)
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
G00920	Tape - Waterproof, Packaging	ASTM D5486
G50463	Pad - Fluid Absorbent (Anti-static)	
G51576	Tape - Pressure Sensitive Adhesive - BA6866	BAC5034-4
G51624	Card - Humidity Indicator, 10-100% Moisture Detection Reversible	

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Prepare for the Preservation

SUBTASK 49-11-00-860-037

- (1) Operate the APU for a minimum of five minutes to dry out the APU and APU compartment (TASK 49-11-00-860-801).

NOTE: It is recommended to use the APU supply bleed to operate both packs during the APU operation. Pack operation will raise the temperature of the load compressor and provide better dry out conditions.

NOTE: In high humidity environments, it is recommended to operate the APU for 20 to 30 minutes.

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

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H. Preservation Guidelines - Less Than Two Weeks

SUBTASK 49-11-00-680-005

(1) Do one of the following steps:

- (a) Operate the APU every three days for a minimum of five minutes to dry out the APU and APU compartment.

NOTE: It is recommended to use the APU supply bleed to operate both packs during the APU operation. Pack operation will raise the temperature of the load compressor and provide better dry out conditions.

NOTE: In high humidity environments, it is recommended to operate the APU for 20 to 30 minutes.

- (b) If it is not possible to operate the APU every three days, add desiccant and seal the APU inlet and exhaust openings at the fuselage as follows:

- 1) Add a minimum of 2.00 lb (0.91 kg) of desiccant, G00626, to the gas path.

NOTE: In high humidity environments, it is recommended to add more desiccant as necessary to keep the humidity low in the gas path.

NOTE: In high humidity environments, it is recommended to add desiccant to the APU compartment as necessary to keep the humidity low in the APU compartment.

- a) Add a minimum of 1.00 lb (0.45 kg) each of desiccant, G00626, at the inlet and the exhaust.

- b) DO NOT put the desiccant, G00626, in the bleed air ducts or directly on metal surfaces.

- c) Put the desiccant, G00626, on fluid absorbent pads, G50463.

- 2) Seal the APU openings at the fuselage as follows:

- a) Make sure that the APU is at ambient temperature.

- b) Install the APU exhaust plug, SPL-1518.



DO NOT APPLY THE G00920 TAPE TO THE PAINTED SURFACES. THE TAPE IS HARD TO REMOVE. IT CAN CAUSE DAMAGE TO THESE SURFACES.

<1> If the APU exhaust cover is not available, use barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920.

- c) Install barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920, on the following areas:

<1> APU inlet door

<2> Drain mast on the APU cowl door

<3> Cowl door latches

<4> Split lines.

I. Preservation Guidelines - More Than Two Weeks, Less Than Two Years

SUBTASK 49-11-00-620-006

- (1) Do this task: Drain the APU Oil, TASK 12-13-31-610-801.

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SUBTASK 49-11-00-620-007

- (2) Do these steps to disconnect and cap the fuel supply tube to the Fuel Control Unit (Figure 204):



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube.
- (b) Disconnect the fuel supply tube from the fitting on the 1088 bulkhead.
- (c) Drain the fuel from the fuel supply tube into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (d) Install the plugs on the fuel supply tube and the fitting on the 1088 bulkhead.

SUBTASK 49-11-00-620-008

- (3) Add a minimum of 2.00 lb (0.91 kg) of desiccant, G00626, to the gas path.

NOTE: In high humidity environments, it is recommended to add more desiccant as necessary to keep the humidity low in the gas path.

NOTE: In high humidity environments, it is recommended to add desiccant to the APU compartment as necessary to keep the humidity low in the APU compartment.

- (a) Add a minimum of 1.00 lb (0.45 kg) each of desiccant, G00626, at the inlet and the exhaust.
- (b) DO NOT put the desiccant, G00626, in the bleed air ducts or directly on metal surfaces.
- (c) Put the desiccant, G00626, on fluid absorbent pads, G50463.
- (d) Add a humidity indicator card, G51624, in a location that you can easily monitor.
 - 1) Do a check of the humidity indicator card, G51624, initially after 7 days and then every 30 days.

NOTE: It is recommended to do a check of the humidity indicator more frequently in high humidity environments.

- a) Make sure that the humidity shown on the humidity indicator is less than 40%.
- b) If the humidity shown on the humidity indicator is greater than 40%, do the following steps:
 - <1> Make sure that there is no corrosion on the external surfaces of the APU.
 - <a> If there is corrosion on the external surfaces of the APU, contact Boeing for further evaluation.
 - <2> Replace any desiccant that is saturated or hardened.
 - <3> Add additional desiccant as necessary.

SUBTASK 49-11-00-860-038

- (4) Replace the DO NOT OPERATE tag, STD-858, on the APU control switch on the P5 panel with an APU PRESERVATION tag.
- (a) Add a note on the APU PRESERVATION tag that says where the desiccant was added.

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SUBTASK 49-11-00-410-015

(5) To close the access panel, do these steps:

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

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

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

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

SUBTASK 49-11-00-620-009

(6) Seal the APU openings at the fuselage as follows:

- Make sure that the APU is at ambient temperature.
- Install the APU exhaust plug, SPL-1518.



DO NOT APPLY THE G00920 TAPE TO THE PAINTED SURFACES. THE TAPE IS HARD TO REMOVE. IT CAN CAUSE DAMAGE TO THESE SURFACES.

- If the APU exhaust cover is not available, use barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920.
- Install barrier material, G00253, polyethylene film, G00252, or equivalent 6 MIL or greater thickness material, and tape, G51576, or tape, G00920, on the following areas:
 - APU inlet door
 - Drain mast on the APU cowl door
 - Cowl door latches
 - Split lines.

————— END OF TASK —————

TASK 49-11-00-600-803

13. APU Depreservation

A. General

- This task contains the steps to do the depreservation of an Auxiliary Power Unit (APU). These steps apply for an APU preservation for all lengths of time.

B. References

Reference	Title
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-91-12-000-801	Lube Filter Element Removal (P/B 401)
49-91-12-000-802	Starter-Generator Filter Element Removal (P/B 401)
49-91-12-400-801	Lube Filter Element Installation (P/B 401)

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Reference	Title
49-91-12-400-802	Starter-Generator Filter Element Installation (P/B 401)
49-91-81-200-801	Magnetic Drain Plug Inspection (P/B 601)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00626	Desiccant - Activated, Bagged, Packaging Use And Static Dehumidification	MIL-D-3464
G50463	Pad - Fluid Absorbent (Anti-static)	
G51624	Card - Humidity Indicator, 10-100% Moisture Detection Reversible	

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. APU Depreservation

SUBTASK 49-11-00-860-040

- (1) Make sure that the APU selector is OFF and replace the APU PRESERVATION tag with a DO NOT OPERATE tag, STD-858.

SUBTASK 49-11-00-420-034

- (2) If installed remove the plugs and covers from the APU openings:
 - (a) APU inlet door
 - (b) APU exhaust
 - (c) Drain mast on the APU cowl door
 - (d) Cowl door latches
 - (e) Split lines.

SUBTASK 49-11-00-010-003

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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

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- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-11-00-420-009

- (4) If it is necessary, do these steps to connect the fuel supply tube from the fuel control unit to the fitting on the 1088 bulkhead:
 - (a) Remove the caps or plugs from the fuel supply tube and the fitting on the 1088 bulkhead.
 - (b) If Christo-lube MCG111 grease, D50011, is not used on the fitting on the 1088 bulkhead, do these steps:
 - 1) Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting.
 - 2) Connect the fuel supply tube to the fitting on the 1088 bulkhead.
 - a) Tighten to 470 in-lb (53 N·m) - 510 in-lb (58 N·m).
 - (c) If Christo-lube MCG111 grease, D50011, is used on the fitting on the 1088 bulkhead, do these steps:
 - 1) Lubricate the external threads of the fitting with Christo-lube MCG111 grease, D50011.
NOTE: The grease should be applied to the external threads only. The grease should not be applied to the internal threads or sealing surface of the fitting.
 - 2) Connect the fuel supply tube to the fitting on the 1088 bulkhead.
 - a) Tighten to 266 in-lb (30 N·m) - 294 in-lb (33 N·m).

SUBTASK 49-11-00-630-001

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

- (b) If it is installed, remove the desiccant, G00626, humidity indicator cards, G51624, and fluid absorbent pads, G50463 from the APU and APU compartment.
- (c) Do a visual inspection of the APU inlet, exhaust, and APU compartment to check for any unwanted objects.
- (d) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

- (f) Remove the DO NOT OPERATE tag, STD-858, from the APU control switch.
(g) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

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

- 1) Let the APU operate for a minimum of 5 minutes.
- (h) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
(i) Do this task: Magnetic Drain Plug Inspection, TASK 49-91-81-200-801.
(j) Do an inspection of the lube filter element.

NOTE: It is not necessary to install a new lube filter element for this inspection.

- 1) Remove the lube filter element (TASK 49-91-12-000-801).
- 2) Examine the lube filter element for metal particles and other unwanted materials.
 - a) If there are metal particles or other unwanted materials on the lube filter element, contact Boeing for evaluation.
- 3) Install the lube filter element (TASK 49-91-12-400-801).

NOTE: It is recommended to install new packing (for the filter housing) during the installation of the lube filter element.

- (k) Do an inspection of the starter-generator filter element.

NOTE: It is not necessary to install a new starter-generator filter element for this inspection.

- 1) Remove the starter-generator filter element (TASK 49-91-12-000-802).
- 2) Examine the starter-generator filter element for metal particles and other unwanted materials.
 - a) If there are metal particles or other unwanted materials on the starter-generator filter element, contact Boeing for evaluation.
- 3) Install the starter-generator filter element (TASK 49-91-12-400-802).

NOTE: It is recommended to install new packing (for the filter housing) during the installation of the starter-generator filter element.

SUBTASK 49-11-00-410-005

- (6) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

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

———— **END OF TASK** ————

TASK 49-11-00-470-801

14. APU DMM Re-initialization

A. General

- (1) This task is for the re-initialization of the Auxiliary Power Unit (APU) Data Memory Module (DMM).

B. References

Reference	Title
46-13-00-710-802	System Configuration Check (P/B 201)
46-13-02-860-805	Maintenance Data Pages (P/B 201)
49-72-11-000-801	Data Memory Module Removal (P/B 401)
49-72-11-400-801	Data Memory Module Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Prepare for the Re-initialization

SUBTASK 49-11-00-210-018

- (1) Determine the correct data to be installed in the DMM.

NOTE: The ECS_OFFSET is on the APU ATP data sheet in the APU log book.

NOTE: The DMM data will be transmitted to the FMCs via the ECU.

- (a) Make sure to download the latest DMM reader software version to the computer.

NOTE: Contact the Honeywell representative for the software and download instructions.

- (b) Determine the APU hours since the last shop visit (if any) and if not available, use "0" hours.

NOTE: These hours will be entered for DMM entry (OVRHAUL_HR) in the procedure.

- (c) Determine the APU cycles since last shop visit (if any) and if not available, use "0" cycles.

NOTE: This cycle count will be entered for the three DMM entries (TURB_CYCLES, LC_CYCLES and EC_CYCLES) in the procedure that follows.

- (d) Refer to the example data in the Table 205.

Table 205/49-11-00-993-805 Example Data

APU SN	HOURS	MINUTES	CYCLES	ECS OFFSET
P6021	5000	35	4802	-8.0
APU Hours Since Last Shop Visit			APU Cycles Since Last Shop Visit	
1500			1802	

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NOTE: Use the actual APU data similar to the sample data for the initialization of the DMM.

- (e) Initialize the DMM with the actual APU serial number, corrected APU hours, corrected APU cycles and ECS_OFFSET.

SUBTASK 49-11-00-860-065

- (2) Make sure that the APU master switch is in the "OFF" position.

SUBTASK 49-11-00-480-014

- (3) Attach a DO NOT OPERATE tag, STD-858, to the APU master switch.

SUBTASK 49-11-00-860-066

- (4) Make sure that the ECU is powered down as follows:
 - (a) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-020-039

- (5) Disconnect the harness from the DMM (TASK 49-72-11-000-801).

SUBTASK 49-11-00-480-015

- (6) Connect the DMM reader with the PC and the DMM.

NOTE: Contact the Honeywell service representative for the DMM reader.

SUBTASK 49-11-00-210-019

- (7) Make sure that the DMM reader has power.

E. APU DMM Re-initialization

SUBTASK 49-11-00-440-001

- (1) Double click on the Windmm icon to activate the PC program.

SUBTASK 49-11-00-750-001

- (2) Do a wrap and port test to make sure of proper DMM reader installation.

SUBTASK 49-11-00-480-016

- (3) After the test, look for the SELECT AN ENGINE APPLICATION menu and do these steps (Figure 205):

NOTE: The buttons may show in a different order than the one in the figure.

- (a) Click the 131-9B button and look for the Main DMM Menu that will show after a brief message window (Figure 206).
- (b) Select the menu item "About" to check the proper software version (Figure 207).

NOTE: The Data Memory Module Communication Build Version must be Version 171212 or higher. If the version is not correct, abort the procedure and contact the Honeywell service representative.

- (c) Select the option "CHANGE SPECIFIC DMM ENTRY CONTENTS" button from the main DMM menu screen (Figure 206).
- (d) Make sure that the DMM "Change DMM entry" screen appears (Figure 208).

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- (e) Click on "SB8260" to continue and a warning will appear (Figure 209).
- (f) Click "OK" to acknowledge the warning and continue to the next screen (Figure 210).
- (g) Type in the numeric portion of the APU Serial Number in the engine serial number box.
- (h) Click "OK" to continue to the next screen (Figure 211).
- (i) Enter in the predetermined value for APU hours since new (Figure 212).
- (j) Click "OK" to continue to the next screen (Figure 213).
- (k) Click "Yes" to check the APU hours is correct and continue to the next screen or "No" if it is not correct.
- (l) Enter in the predetermined value for APU minutes since new (Figure 214).
- (m) Click "OK" to continue to this next screen (Figure 215).
- (n) Click "Yes" to check the APU minutes is correct and continue to the next screen or "No" if it is not correct.
- (o) Enter in the predetermined value for APU cycles since new (Figure 216).
- (p) Click "OK" to continue to the next screen (Figure 217).
- (q) Click "Yes" to check the APU cycles is correct and continue to the next screen or "No" if it is not correct.
- (r) Enter in the ECS_OFFSET value from the APU ATP data sheet in the APU log book for the APU serial number (Figure 218).
NOTE: All ECS_OFFSET values are negative or zero.
- (s) Click "OK" to continue to this next screen (Figure 219).
- (t) Click "Yes" to check the ECS_OFFSET is correct and continue to the next screen or "No" if it is not correct.
- (u) Enter the TURB_CYCLES to APU cycles since last shop visit or zero (Figure 220).
- (v) Click "OK" to continue to this next screen (Figure 221).
- (w) Click "Yes" to check the TURB_CYCLES is correct and continue to the next screen or "No" if it is not correct.
- (x) Enter the LC_CYCLES since last shop visit or zero (Figure 222).
- (y) Click "OK" to continue to this screen (Figure 223).
- (z) Click "Yes" to check the LC_CYCLES is correct and continue to the next screen or "No" if it is not correct.
- (aa) Enter the EC_CYCLES since last shop visit or zero (Figure 224).
- (ab) Click "OK" to continue to this screen (Figure 225).
- (ac) Click "Yes" to check the EC_CYCLES is correct and continue to the next screen or "No" if it is not correct.
- (ad) Enter the OVRHAUL_HR since last shop visit or zero (Figure 226).
- (ae) Click "OK" to continue to this screen (Figure 227).
- (af) Click "Yes" to check the OVRHAUL_HR is correct or "No" if it is not correct.

SUBTASK 49-11-00-210-025

- (4) Look for the DMM to now initialize and automatically download the contents to a file with the name of the APU and extension '.DAT'.

NOTE: This file will be located in the C:\Honeywell\WinDMM\131-9B directory of the PC.

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- (a) Look for this message screen (Figure 228).
- (b) Click "OK" to go back to the main DMM menu screen (Figure 206).
- (c) Select "RETURN TO ENGINE SELECTION" to return to Engine Selection Page (Figure 205).

SUBTASK 49-11-00-080-008

- (5) Disconnect the DMM Reader.

SUBTASK 49-11-00-420-033

- (6) Reconnect the APU harness to the DMM (TASK 49-72-11-400-801).

SUBTASK 49-11-00-860-067

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-068

- (8) Select APU master switch to the ON position for 30 seconds.

NOTE: Do not start the APU.

SUBTASK 49-11-00-860-069

- (9) After 30 seconds, set the APU master switch to the OFF position.

SUBTASK 49-11-00-210-026

- (10) After 120 seconds, make sure that the APU hours, cycles, and serial number that are on the APU SERVICE DATA page are equal to the values during the DMM re-initialization:
 - (a) Check the APU serial number (TASK 46-13-00-710-802).
 - (b) Check the APU hours and cycles (TASK 46-13-02-860-805).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-080-009

- (1) Remove the DO NOT OPERATE tag, from the APU master switch.

SUBTASK 49-11-00-970-001

- (2) Make a record of the service bulletin number and/or revision number in the APU log book.

————— **END OF TASK** —————

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DMM Communication Honeywell Aerospace

X

Port Assignment

SELECT AN ENGINE APPLICATION

131-9A

131-9B

131-9BMX

131-9C

131-9D

131-9J

131-9JC

331-350C

331-350J

331-400B

331-400C

331-500B

331-500B2

331-600A

36-170

36-280B

36-280D

HGT-1700A

HGT-750C

HGT-750M

Close

2840021 S0000662239_V1

Select An Engine Application
Figure 205/49-11-00-990-811

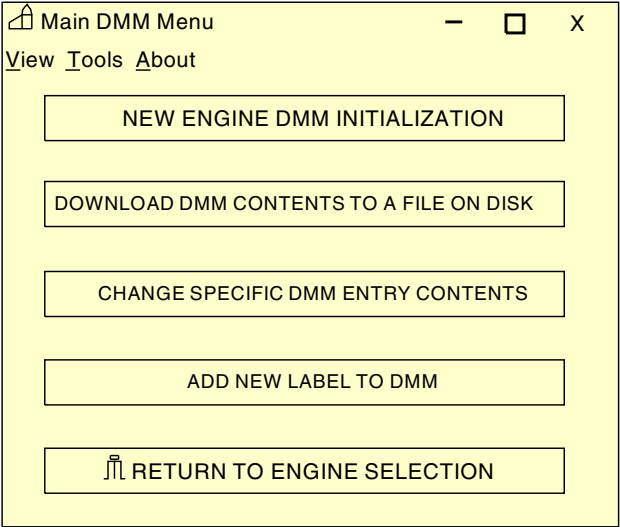
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2840022 S0000662240_V1

Main DMM Menu
Figure 206/49-11-00-990-812

EFFECTIVITY

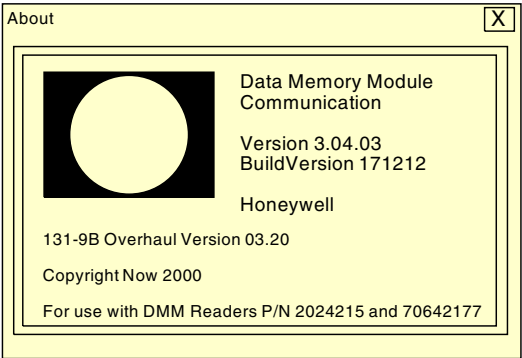
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2840023 S0000662241_V1

DMM "About" Screen
Figure 207/49-11-00-990-813

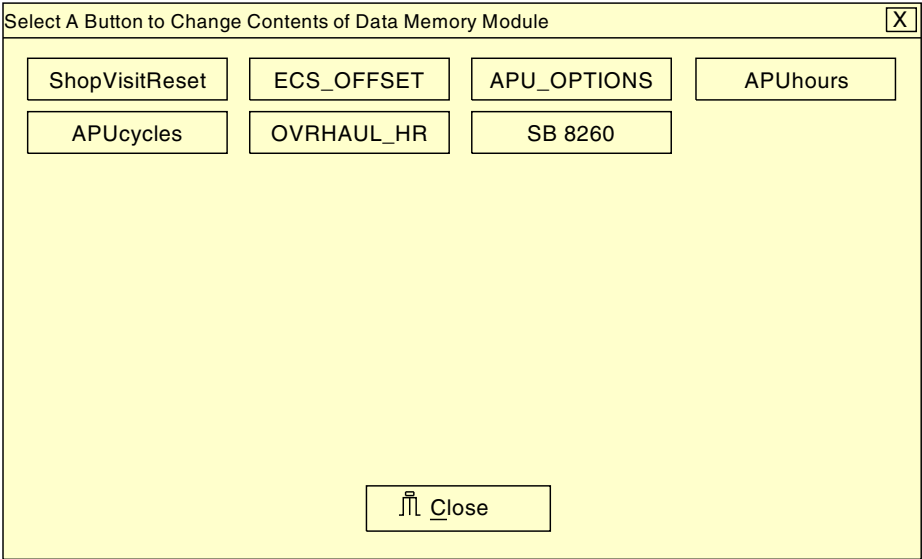
EFFECTIVITY SIA ALL

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2840146 S0000662242_V1

DMM “Change DMM entry” Screen
Figure 208/49-11-00-990-814

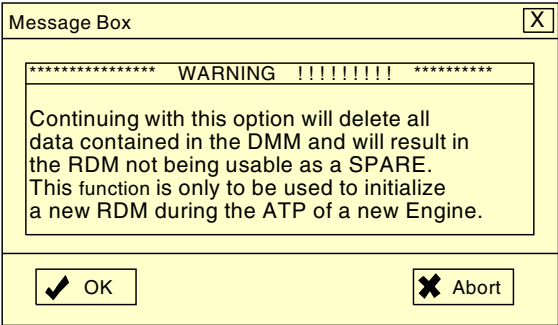
EFFECTIVITY SIA ALL

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2840159 S0000662243_V1

Delete Warning Message
Figure 209/49-11-00-990-815

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DMM Initialization

Engine Prefix

P

Engine Serial Number

6021

Engine Suffix

✓

OK

✕

Abort

2840167 S0000662244_V1

Enter Engine Serial Number
Figure 210/49-11-00-990-816

EFFECTIVITY

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Confirmation

X

IS THE CORRECT ENGINE SERIAL NUMBER P6021 ?

☒ Yes

☐ No

2840170 S0000662245_V1

Verify Serial Number
Figure 211/49-11-00-990-817

EFFECTIVITY	
SIA ALL	

49-11-00

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DMM Initialization X

ENTER VALUE IN ENGINEERING UNITS FOR:

APUhours :

HOURS

☒ OK ☐ Cancel

2840174 S0000662246_V1

Enter Pre-Determined APU Hours
Figure 212/49-11-00-990-818

EFFECTIVITY
SIA ALL

D633AM101-SIA

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Confirmation

IS THE CORRECT VALUE FOR APUhours = 5000 ?

☒ Yes

☐ No

2840175 S0000662247_V1

Verify Pre-Determined APU Hours
Figure 213/49-11-00-990-819

EFFECTIVITY	
SIA ALL	

49-11-00

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DMM Initialization

ENTER VALUE IN ENGINEERING UNITS FOR:

APUminutes : 35
MINUTES

☒ Ok

☐ Cancel

2840176 S0000662248_V1

Enter Pre-Determined APU Minutes
Figure 214/49-11-00-990-820

EFFECTIVITY
SIA ALL

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Confirmation

X

IS THE CORRECT VALUE FOR APUminutes = 35 ?

☒ Yes

☐ No

2840184 S0000662249_V1

Verify Pre-Determined APU Minutes
Figure 215/49-11-00-990-821

EFFECTIVITY	
SIA ALL	

49-11-00

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DMM Initialization

ENTER VALUE IN ENGINEERING UNITS FOR:

APUcycles : 4802
CYCLES

OK

Cancel

2840281 S0000662250_V1

Enter Pre-Determined APU Cycles
Figure 216/49-11-00-990-822

EFFECTIVITY
SIA ALL

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Confirmation

X

IS THE CORRECT VALUE FOR APUcycles = 4802 ?

☒ Yes

☐ No

2840283 S0000662251_V1

Verify Pre-Determined APU Cycles
Figure 217/49-11-00-990-823

EFFECTIVITY
SIA ALL

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DMM Initialization

ENTER VALUE IN ENGINEERING UNITS FOR:

ECS_OFFSET :

ECS OFFSET DEGREES

☒ OK

☐ Cancel

2840284 S0000662252_V1

Enter ECS_OFFSET
Figure 218/49-11-00-990-824

EFFECTIVITY
SIA ALL

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Confirmation

X

IS THE CORRECT VALUE FOR ECS_OFFSET = -8 ?

☒ Yes

☐ No

2840285 S0000662253_V1

Verify ECS_OFFSET
Figure 219/49-11-00-990-825

EFFECTIVITY	
SIA ALL	

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DMM Initialization

ENTER VALUE IN ENGINEERING UNITS FOR:
TURB_CYCLES : 1802
CYCLES SINCE TURBINE REPAIR

☒ OK

☐ Cancel

2840286 S0000662254_V1

Enter TURB_CYCLES
Figure 220/49-11-00-990-826

EFFECTIVITY
SIA ALL

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Confirmation

X

IS THE CORRECT VALUE FOR TURB_CYCLES = 1802 ?

☒ Yes

☐ No

2840287 S0000662255_V1

Verify TURB_CYCLES
Figure 221/49-11-00-990-827

EFFECTIVITY
SIA ALL

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DMM Initialization

ENTER VALUE IN ENGINEERING UNITS FOR:

LC_CYCLES : 1802

CYCLES SINCE LOAD COMP REPAIR

☒ OK

☐ Cancel

2840290 S0000662256_V1

Enter LC_CYCLES
Figure 222/49-11-00-990-828

EFFECTIVITY
SIA ALL

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Confirmation

X

IS THE CORRECT VALUE FOR LC_CYCLES = 1802 ?

☒ Yes

☐ No

2840292 S0000662257_V1

Verify LC_CYCLES
Figure 223/49-11-00-990-829

EFFECTIVITY	
SIA ALL	

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DMM Initialization

ENTER VALUE IN ENGINEERING UNITS FOR:
EC_CYCLES : 1802
CYCLES SINCE ENGINE COMP REPAIR

☒ OK

☒ Cancel

2840293 S0000662258_V1

Enter EC_CYCLES
Figure 224/49-11-00-990-830

EFFECTIVITY
SIA ALL

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Confirmation

X

IS THE CORRECT VALUE FOR EC_CYCLES = 1802 ?

☒ Yes

☐ No

2840294 S0000662259_V1

Verify EC_CYCLES
Figure 225/49-11-00-990-831

EFFECTIVITY	
SIA ALL	

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DMM Initialization

ENTER VALUE IN ENGINEERING UNITS FOR:

OVERHAUL_HOURS : 1500

HOURS SINCE LAST SHOP VISIT

☒ OK

☐ Cancel

2840295 S0000662260_V1

Enter OVRHAUL_HR
Figure 226/49-11-00-990-832

EFFECTIVITY
SIA ALL

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Confirmation

IS THE CORRECT VALUE FOR OVRHAUL_HR = 1500 ?

☒ YES

☐ No

2840296 S0000662261_V1

Verify OVRHAUL_HR
Figure 227/49-11-00-990-833

EFFECTIVITY
SIA ALL

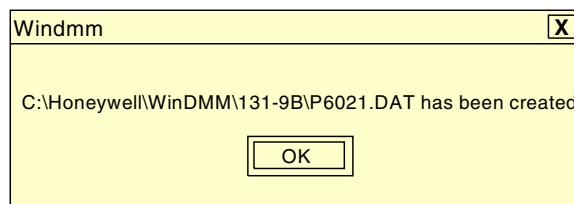
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P6021.DAT Message
Figure 228/49-11-00-990-834

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APU POWER PLANT - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) APU power plant removal (selection)
- (2) APU power plant installation (selection)
- (3) APU power plant removal (fishpole hoist procedure)
- (4) APU power plant installation (fishpole hoist procedure)
- (5) APU power plant removal (hydraulic jack procedure)
- (6) APU power plant installation (hydraulic jack procedure).

TASK 49-11-00-000-801

2. APU Power Plant Removal (Selection)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) Select the task that is applicable for the tool that you will use to remove the APU.

B. **Location Zones**

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

C. **APU Power Plant Removal (Selection)**

SUBTASK 49-11-00-020-009

- (1) If you will use the fishpole hoist, do this task: APU Power Plant Removal - Fishpole Hoist, TASK 49-11-00-000-802.

SUBTASK 49-11-00-020-031

- (2) If you will use the hydraulic jack, do this task: APU Power Plant Removal - Hydraulic Jack, TASK 49-11-00-000-803.

————— **END OF TASK** —————

TASK 49-11-00-400-801

3. APU Power Plant Installation (Selection)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) Select the task that is applicable for the tool that you will use to install the APU.

B. **Location Zones**

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

C. **APU Power Plant Installation**

SUBTASK 49-11-00-420-010

- (1) If you will use the fishpole hoist, do this task: APU Power Plant Installation - Fishpole Hoist, TASK 49-11-00-400-802.

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SUBTASK 49-11-00-420-032

- (2) If you will use the hydraulic jack, do this task: APU Power Plant Installation - Hydraulic Jack, TASK 49-11-00-400-803.

————— END OF TASK —————

TASK 49-11-00-000-802

4. APU Power Plant Removal - Fishpole Hoist

(Figure 401)

A. General

- (1) This task is for the removal of the Auxiliary Power Unit (APU) using the fishpole hoist.

B. References

Reference	Title
21-00-01-100-801	Oil Contamination Removal from Air Conditioning and Pneumatic Systems (P/B 201)
36-13-01-100-801	Pneumatic Duct Cleaning (P/B 701)
49-13-00-200-803	APU Mounts Inspection (APU Removed) (P/B 601)
49-15-11-200-801	Air Inlet Seal Inspection (P/B 601)
49-15-15-000-802	Forward Air Inlet Plenum Removal (P/B 401)
49-15-15-400-802	Forward Air Inlet Plenum Installation (P/B 401)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-17-11-210-801	APU Firewall Covers Inspection (with APU Removed) (P/B 601)
49-81-11-200-802	Exhaust Duct Muffler Inspection (P/B 601)
49-91-71-200-801	Eductor Inlet Duct Inspection (P/B 601)
52-48-21-000-801	Auxiliary Power Unit (APU) Cowl Door Removal (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-1563	Hoist - Fishpole, 500 lb Safe Working Limit (SWL) Part #: 10/4180 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: 10/3641 Supplier: K1425 Opt Part #: 10/3641C1 Supplier: K1425 Opt Part #: MINILIFT Supplier: K1425
COM-1592	Hoist - Fishpole, Chain, 1,000 lb Safe Working Limit (SWL) Part #: AP6108 Supplier: 4Y309
SPL-1957	Base - Transportation, APU Part #: F72950-158 Supplier: 81205
SPL-1968	Equipment - Hoist, Auxiliary Power Unit (AE131-9 APU) Part #: C49007-36 Supplier: 81205 Part #: C49007-42 Supplier: 81205 Opt Part #: C49007-35 Supplier: 81205
SPL-1970	Assembly - Cradle, AE131-9B APU Part #: C49010-50 Supplier: 81205

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Reference	Description
SPL-1971	Protector - Thread, APU Mount Bolt Part #: C49006-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-1081	Flashlight - Explosion Proof
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)
STD-7394	Cap - Dust, Electrical Connector

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Removal

SUBTASK 49-11-00-860-041

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

SUBTASK 49-11-00-480-010

- (2) Attach a DO NOT OPERATE tag, STD-858 to the APU master switch.

SUBTASK 49-11-00-860-042

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER
B	21	C00452	FIRE PROTECTION EXTINGUISHERS APU

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-004

- (4) If it is necessary, remove the APU cowl door (TASK 52-48-21-000-801).

SUBTASK 49-11-00-010-005

- (5) If it is not necessary to remove this APU cowl door, open this APU cowl door:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel under the center latch.
(b) Open the three latches.

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

- (c) Open the APU cowl door.
(d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU cowl door.

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- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-11-00-020-010

- (6) Disconnect the electrical connector D10436 (P2) [1], and electrical connector D10912 (P1) [2] from the APU firewall receptacles on the 1088 bulkhead.

SUBTASK 49-11-00-020-033

- (7) Disconnect the electrical connector D10434 (P3) [3], and electrical connector D11118 (P4) [4] from the APU firewall receptacles on the 1088 bulkhead.

SUBTASK 49-11-00-480-011

- (8) Install the dust caps, STD-7394, on the electrical connectors.

SUBTASK 49-11-00-020-032

- (9) Remove the wire clamp [112], nut [113] and washer [114].

G. APU Power Plant Removal

SUBTASK 49-11-00-020-011



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Remove the fuel supply tube [5] as follows:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube [5].
 - (b) Disconnect the fuel supply tube [5] from the fitting [6] on the 1088 bulkhead.
 - (c) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
 - (d) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit.
 - (e) Loosen the nut [8] that attaches the fuel supply tube [5] to the fuel control unit.
 - (f) Turn the tube retainer on the fuel supply tube [5] in the counterclockwise direction until the flange disengages from the stud.
 - (g) Disconnect the fuel supply tube [5] from the fuel control unit.
 - (h) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
 - (i) Remove the fuel supply tube [5].
 - (j) Remove the packings [7] from the fuel supply tube [5].
 - (k) Discard the packings [7].
 - (l) Install the caps or plugs on the fuel supply tube [5], fitting [6] and fuel control unit.
 - (m) Install a protection cover on the fuel supply tube [5] to prevent contamination.
 - (n) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-11-00-020-012

- (2) Remove the bleed air duct [11] as follows:

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- (a) Remove the two coupling clamps [9] that hold the bleed air duct [11] to the bleed air valve and bleed duct assembly.

NOTE: The bleed duct assembly extends through the 1088 bulkhead.

- (b) Remove the bleed air duct [11].



BE CAREFUL WHEN YOU REMOVE THE TWO SEALS FROM THE BLEED AIR DUCT. DAMAGE TO THE SEALS CAN OCCUR.

- (c) Carefully remove the seals [10] from the bleed air duct [11].
- (d) Install the protection covers on the bleed duct assembly, bleed air duct [11], seals [10] and bleed air valve.

SUBTASK 49-11-00-020-013

- (3) Disconnect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18]:

- (a) Disengage the terminal block cover [19] from the four pins on the starter-generator.
- (b) Remove the terminal block cover [19].
- (c) Remove the four nuts [12] from the four terminal studs.

- (d) Disconnect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18] from the four terminal studs.

NOTE: The terminal strip and the fanning strip [15] show the identification of the terminal studs for terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18].

- (e) Install the four nuts [12] on the four terminal studs.
- (f) Install the terminal block cover [19] on the starter-generator as follows:
 - 1) Put the terminal block cover [19] on the starter-generator.
 - 2) Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-020-014

- (4) Disconnect the bonding jumper [20] as follows:

- (a) Remove the two nuts [21] and two washers [22] that attach the bonding jumper [20] to the APU.
- (b) Disconnect the bonding jumper [20] from the two studs.
- (c) Keep the two nuts [21] and two washers [22] for the replacement APU.

SUBTASK 49-11-00-020-015

- (5) Remove the drain tube [29] for the exhaust duct muffler [23]:

- (a) Disconnect the drain tube [29] from the fitting [30] on the exhaust duct muffler [23].
- (b) Disconnect the drain tube [29] from the fitting [80] on the aft drain tube of the APU [71].
- (c) Remove the drain tube [29].
- (d) Install the caps or plugs on the drain tube [29], fitting [30] and fitting [80].
- (e) Install a protection cover on the drain tube [29] to prevent contamination.

SUBTASK 49-11-00-020-016

- (6) Disconnect the exhaust duct muffler [23]:

- (a) Remove the V-band clamp [27] from the exhaust duct muffler [23].

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- (b) Disconnect and move the exhaust duct muffler [23] aft about 0.25 in. (6.4 mm) from the APU.

SUBTASK 49-11-00-480-017

- (7) Install the Fishpole Hoist Equipment.
 - (a) Make sure that the equipment, SPL-1968 has these parts:
 - 1) forward arm assembly [31]
 - 2) aft arm assembly [37]
 - 3) center beam assembly [33].

SUBTASK 49-11-00-210-006



AN APU LIFT FITTING WITH DAMAGE CAN CAUSE INCORRECT SUPPORT OF THE APU. DAMAGE TO THE APU CAN OCCUR.

- (8) Visually examine the APU lift fitting [32] and APU lift fitting [34] with a explosion proof flashlight, STD-1081.
 - (a) Make sure that there are no signs of cracks or elongations.

SUBTASK 49-11-00-480-001

- (9) Install the center beam assembly [33] to the APU lift fitting [32] and APU lift fitting [34]:
 - (a) Remove the two lanyard pins [35] from the center beam assembly [33].



BE CAREFUL WHEN YOU REMOVE THE CENTER BEAM ASSEMBLY FROM THE APU COMPARTMENT. YOU CAN TILT THE CENTER BEAM ASSEMBLY AS NECESSARY TO PREVENT THE CENTER BEAM ASSEMBLY FROM TOUCHING THE FIRE DETECTOR ASSEMBLY. DAMAGE TO THE FIRE DETECTOR ASSEMBLY AND WIRING CAN OCCUR.

- (b) Put the center beam assembly [33] below the APU lift fitting [32] and the APU lift fitting [34].

NOTE: To install the center beam assembly [33], make sure that the directional FWD arrow points to the front of the APU [71].

NOTE: You can install the center beam assembly [33] from the rear side or front side of the APU [71].
- (c) Align the holes of the center beam assembly [33] to the APU lift fitting [32] and APU lift fitting [34].
- (d) Install the two lanyard pins [35] that attach the center beam assembly [33] to the APU lift fitting [32] and APU lift fitting [34].

SUBTASK 49-11-00-480-002



MAKE SURE THAT THE TWO FISHPOLE HOISTS ARE IN A SERVICEABLE CONDITION. MAKE SURE THAT THERE ARE NO SIGNS OF DAMAGE ON THE CABLES OR CHAINS. IF THERE IS DAMAGE, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)



MAKE SURE THAT THE CABLE IS ON THE PULLEYS FOR THE FORWARD/ AFT ARM ASSEMBLY. MAKE SURE THAT THEY ARE ON THE SAME VERTICAL PLANE WITH THE RELATED FISHPOLE HOIST PULLEY. IF YOU DO NOT OBEY INSTRUCTIONS, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



IF YOU HAVE A FISHPOLE HOIST WITH A CABLE AND A DRUM ASSEMBLY, MAKE SURE THAT YOU EXAMINE THE CABLE. BEFORE YOU USE THE FISHPOLE HOIST, YOU MUST EQUALLY WIND THE CABLE OF THE FISHPOLE HOIST AROUND THE DRUM ASSEMBLY. IF YOU DO NOT EQUALLY WIND THE CABLE, THE APU CAN FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE APU.

- (10) Install the two fishpole hoist [40] (fishpole hoist, COM-1563, or chain fishpole hoists, COM-1592), to the forward arm assembly [31] and aft arm assembly [37] as follows:
- (a) Install the two fishpole hoists [40] to the forward arm assembly [31] and aft arm assembly [37].
 - 1) Make sure that the two pins on the two fishpole hoists [40] engage the forward arm assembly [31] and aft arm assembly [37].
 - (b) Extend the two fishpole hoists [40] to a length that is easy to use.
 - (c) Remove the two detent pins [39] from the forward arm assembly [31] and aft arm assembly [37].
 - (d) While you unwind the two cables or chains of the two fishpole hoists [40], do this step:
 - 1) Pull the cables or chains below the bottom pulley [38] and above the top pulley [38] until the two clevis fittings [44] are below the top pulley [38].
 - (e) Install the two detent pins [39] in the forward arm assembly [31] and aft arm assembly [37].

SUBTASK 49-11-00-480-003

- (11) Install the forward arm assembly [31] and aft arm assembly [37] to the center beam assembly [33] as follows:
- (a) Remove the two lanyard pins [36] from the forward arm assembly [31] and aft arm assembly [37].
 - (b) Put the forward arm assembly [31] and fishpole hoist [40] below the center beam assembly [33].

NOTE: You can see the FWD stencil on the forward arm assembly [31].
 - (c) Align the holes of the center beam assembly [33] to the forward arm assembly [31].
 - (d) Install the lanyard pin [36] that attaches the forward arm assembly [31] to the center beam assembly [33].
 - (e) Put the aft arm assembly [37] and fishpole hoist [40] below the center beam assembly [33].

NOTE: You can see the AFT stencil on the aft arm assembly [37].
 - (f) Align the holes of the center beam assembly [33] to the aft arm assembly [37].
 - (g) Install the lanyard pin [36] that attaches the aft arm assembly [37] to the center beam assembly [33].

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SUBTASK 49-11-00-480-004

- (12) Install the two fishpole hoists [40] to the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71] as follows:
- Make sure that the two cables or chains of the two fishpole hoists [40] are wound around the four pulleys [38].
 - While you unwind the two cables or chains of the two fishpole hoists [40], do this step:
 - Pull the cables or chains until the two clevis fittings [44] align with the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
 - Install the two pins [43] that attach the two clevis fittings [44] to the forward hoist bracket [42] and aft hoist bracket [41].

NOTE: You install the pin [43] into the aft hoist bracket [41] and clevis fitting [44] from the forward side of the APU [71].
 - Wind and tighten the two cables or chains of the two fishpole hoists [40] enough to take the weight off of the four APU mounts.

NOTE: The weight of the APU [71] is approximately 410 lb (186 kg).

SUBTASK 49-11-00-020-038

- (13) Disconnect the left forward mount for the APU [48] as follows:
- Remove the nut [46], washers [50], and bolt [51] from the left forward bracket [45].
 - Disconnect the left forward mount for the APU [48] from the left forward bracket [45].
 - Let the left forward mount for the APU [48] hang vertically.
 - Make sure that the bushing [57] is in the left forward mount for the APU [48].
 - Install the bolt [51], two washers [50], and nut [46] on the left forward mount for the APU [48].

SUBTASK 49-11-00-020-017

- (14) Disconnect the left aft mount for the APU [52], right aft mount for the APU [59], and right forward mount for the APU [63] as follows:
- Remove the lockwire from the two capstans on the Fire Shield Cover Assembly [115] to get access to nut [66] on the right forward mount for the APU [63].
 - Loosen the nut [56], nut [62], and nut [66] about four or five full turns.
 - Examine the washer [55], washer [61], washer [65], and the bottom of the left aft mount for the APU [52], right aft mount for the APU [59], and right forward mount for the APU [63] for clearance as follows:
 - Make sure that the clearance is 0.20 in. (5 mm) - 0.25 in. (6 mm).
 - If there is no clearance between the washer(s) and the bottom of the mount(s), do this step:
 - Wind and tighten the two cables or chains of the two fishpole hoists [40].

NOTE: This will get the correct clearance and take the weight off of the three APU mounts.
 - Remove the nut [56] and washer [55] from the cone bolt [53] on the left aft mount for the APU [52].
 - Remove the nut [62] and washer [61] from the cone bolt [53] on the right aft mount for the APU [59].

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- (f) Remove the nut [66] and washer [65] from the cone bolt [53] on the right forward mount for the APU [63].



WARNING

FULLY ENGAGED THE THREAD PROTECTORS ON THE CONE BOLTS. IF THE THREAD PROTECTORS ARE NOT FULLY ENGAGED, THE APU MOUNTING BRACKETS WILL CATCH ON THE THREAD PROTECTORS. THIS CAN CAUSE THE APU TO MOVE SUDDENLY. A SUDDEN MOVEMENT OF THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (g) Install the thread protector [58] (protector, SPL-1971), on the three cone bolts [53].

NOTE: The cone bolt [53] is a part of the vibration isolator for the APU mount.

SUBTASK 49-11-00-020-018

- (15) Remove the APU [71] as follows:



CAUTION

BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15 DEGREES IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE INSULATION AROUND THE RIGHT FRONT MOUNT, THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- (a) Tilt the APU [71] so that the forward end of the APU [71] is lower than the aft end.

NOTE: The APU [71] is installed in the 11° forward-end-down position.

- (b) Slowly unwind the two cables or chains of the two fishpole hoists [40] to lower the APU [71] out of the APU compartment.
- (c) Install the forward attach assembly [76] on the right forward bracket [64] with the washer [78] and nut [79].

NOTE: The cradle assembly [69] (assembly, SPL-1970), has these three components, a forward attach assembly and two aft attach assemblies. These three assemblies attach the three APU brackets to the cradle assembly.

- (d) Install the two aft attach assemblies [77] on the left aft bracket [54] and right aft bracket [60] with the two washers [78] and two nuts [79].
- (e) Loosen the three jamnuts [72] from the knobs [73] on the cradle assembly [69].
- (f) Loosen the three knobs [73] until the three top clamp blocks [74] disengage from the three bottom clamp blocks [75].
- (g) Open the three top clamp blocks [74].
- (h) Slowly lower the APU [71] on the cradle assembly [69] and base, SPL-1957 (transportation base [70]), until the forward attach assembly [76] and two aft attach assemblies [77] engage the three bottom clamp blocks [75].
- (i) Close the three top clamp blocks [74].
- (j) Tighten the three knobs [73].
- (k) Tighten the three jamnuts [72] on the three knobs [73].
- (l) Remove the two pins [43] from the two clevis fittings [44].
- (m) Wind the two cables or chains of the two fishpole hoists [40] until the two clevis fittings [44] touch the forward arm assembly [31] and aft arm assembly [37].
- (n) Remove the two fishpole hoists [40] from the APU [71].

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SUBTASK 49-11-00-020-019

- (16) Remove the APU [71], assembly, SPL-1970 (cradle assembly [69]), and base, SPL-1957 (transportation base [70]), from the area.

SUBTASK 49-11-00-010-012

- (17) Remove the Fire Shield Cover Assembly [115] from the right forward mount for the APU [63] as follows:
- (a) Remove the screw [116] and washer [117].
 - (b) Remove the Fire Shield Cover Assembly [115] from the right forward mount for the APU [63].

SUBTASK 49-11-00-210-007

- (18) Do a general visual inspection of the APU compartment as follows:
- (a) Do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.
 - (b) Do this task: APU Firewall Covers Inspection (with APU Removed), TASK 49-17-11-210-801.
 - (c) Do this task: Air Inlet Seal Inspection, TASK 49-15-11-200-801.
 - (d) Visually examine the front area and inner surfaces of the exhaust duct muffler [23] for cracks and damage.
NOTE: Examine the areas that you access from the APU compartment.
 - (e) If you find cracks or damage on the exhaust duct muffler, do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-802.
 - (f) Visually examine the inner surfaces of the APU air inlet plenum for cracks and damage.
NOTE: Examine the areas that you access from the APU compartment.
 - (g) If you find cracks or damage on the APU air inlet plenum, replace the APU air inlet plenum (TASK 49-15-15-000-802 and TASK 49-15-15-400-802).
 - (h) Do this task: Eductor Inlet Duct Inspection, TASK 49-91-71-200-801.
 - (i) Visually examine the bleed air duct for signs of oil and other contamination.
 - (j) If you find signs of oil and other contamination, then do these steps:
 - 1) Clean the bleed air duct (TASK 36-13-01-100-801).
 - 2) Remove the oil contamination from the air conditioning and pneumatic systems (TASK 21-00-01-100-801).
 - (k) Visually examine the four APU mounts for cracks, corrosion and damage.
 - (l) If you find cracks or signs of corrosion or damage, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-00-200-803.

SUBTASK 49-11-00-020-020

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

————— **END OF TASK** —————

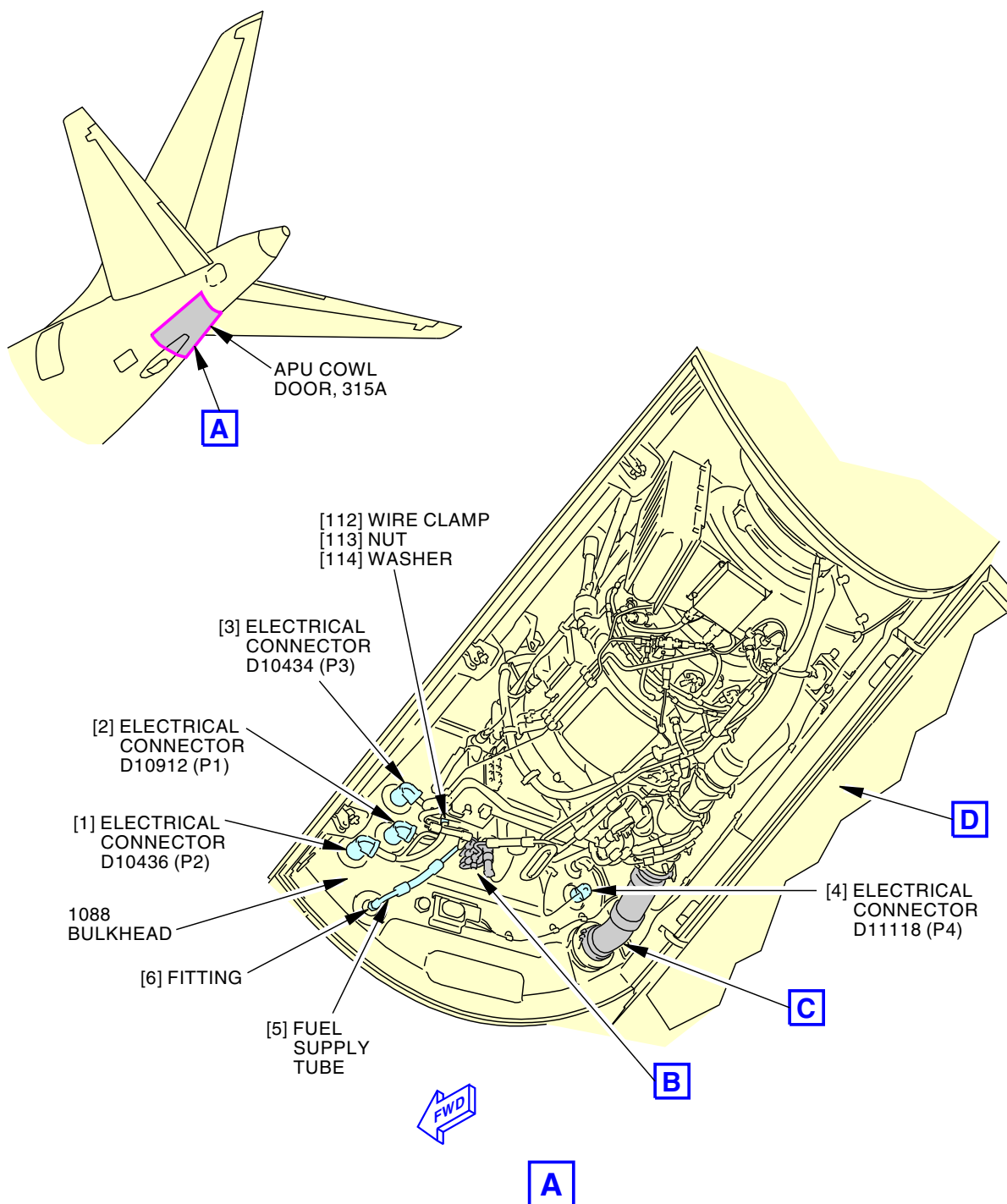
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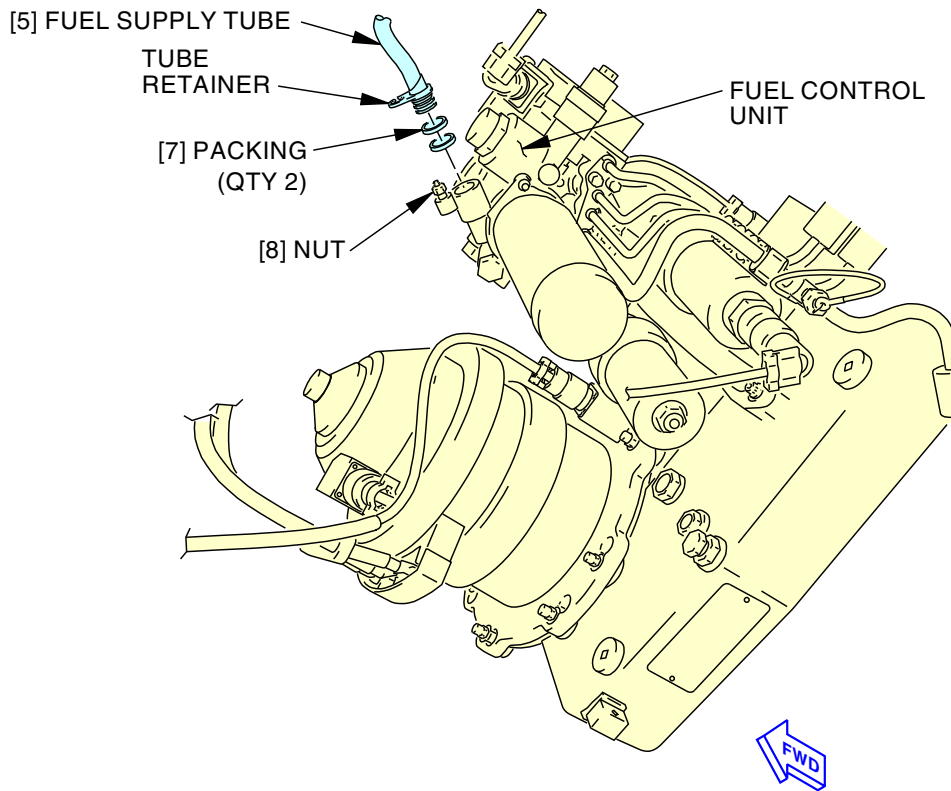
Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 1 of 11)

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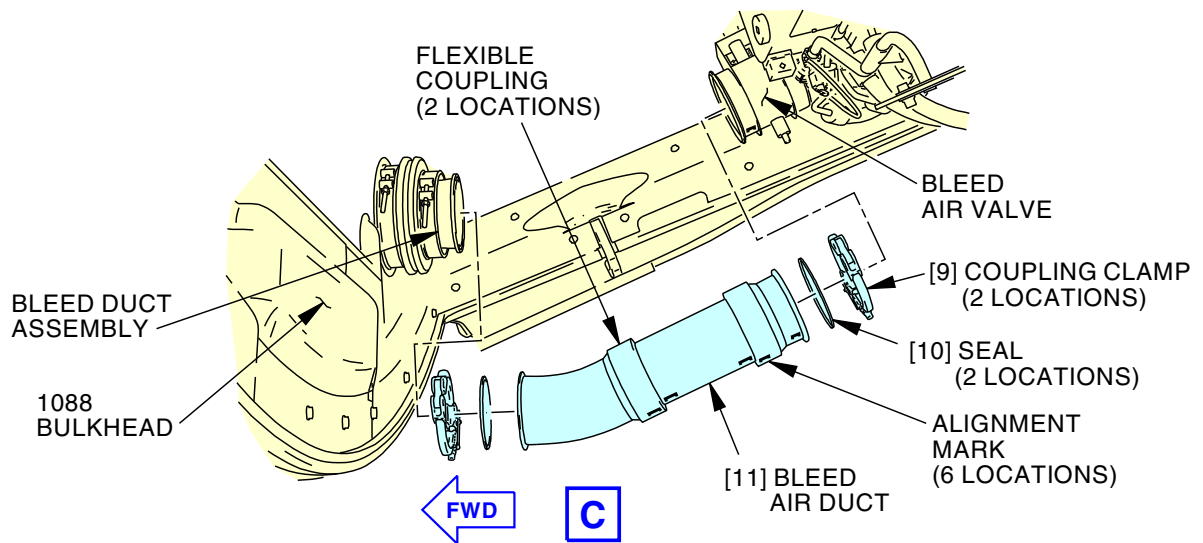
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Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 2 of 11)

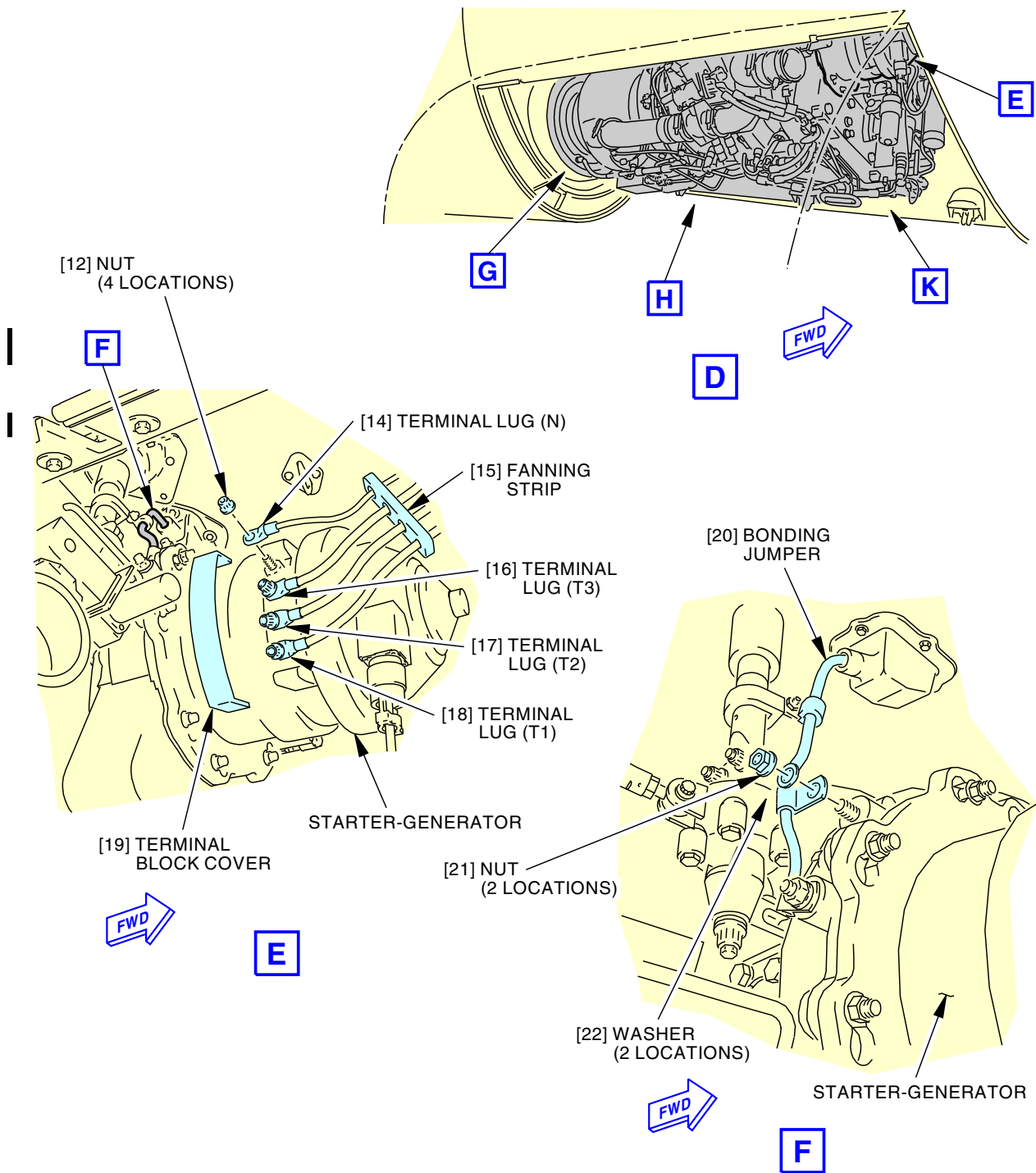
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Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 3 of 11)

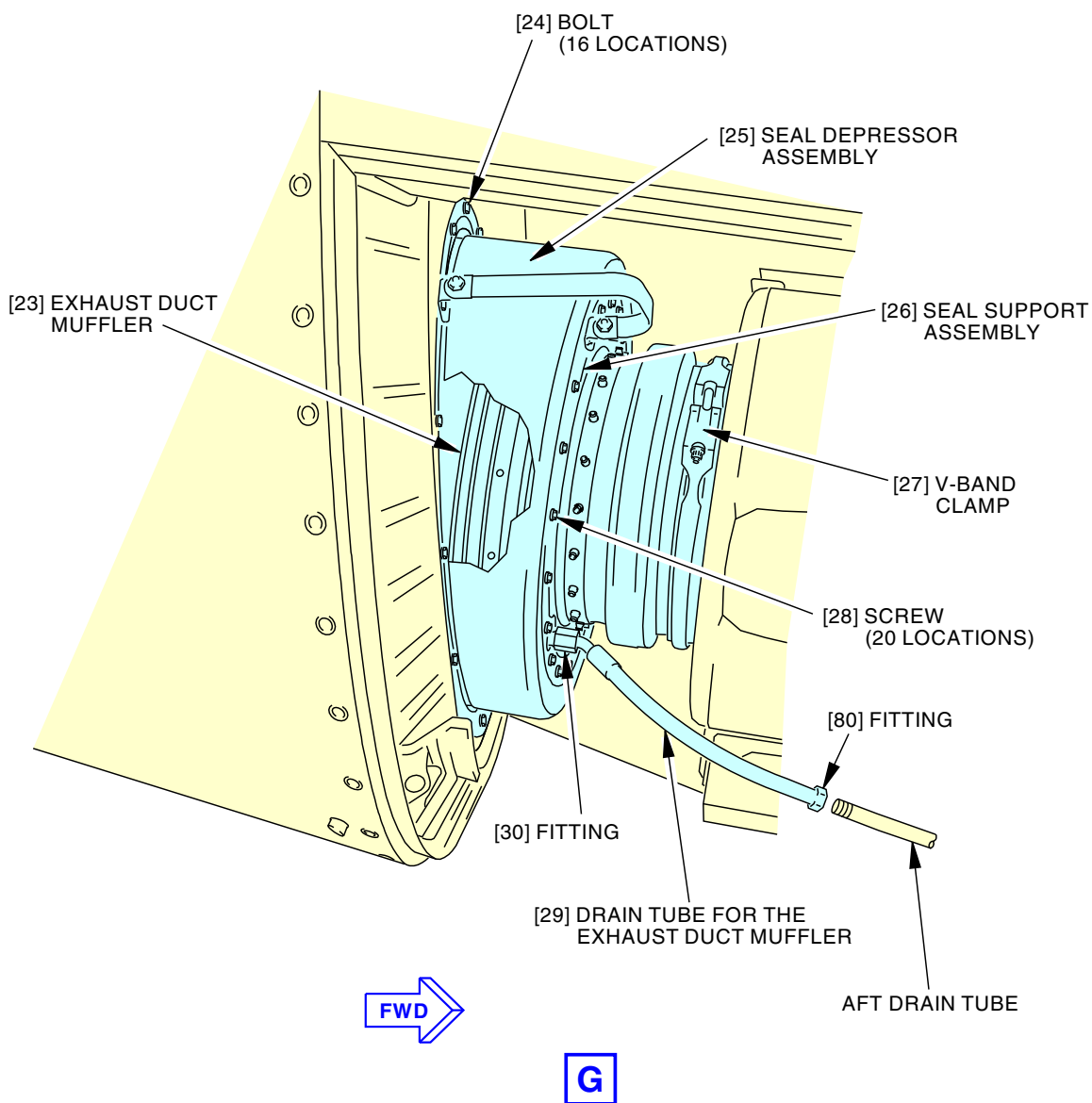
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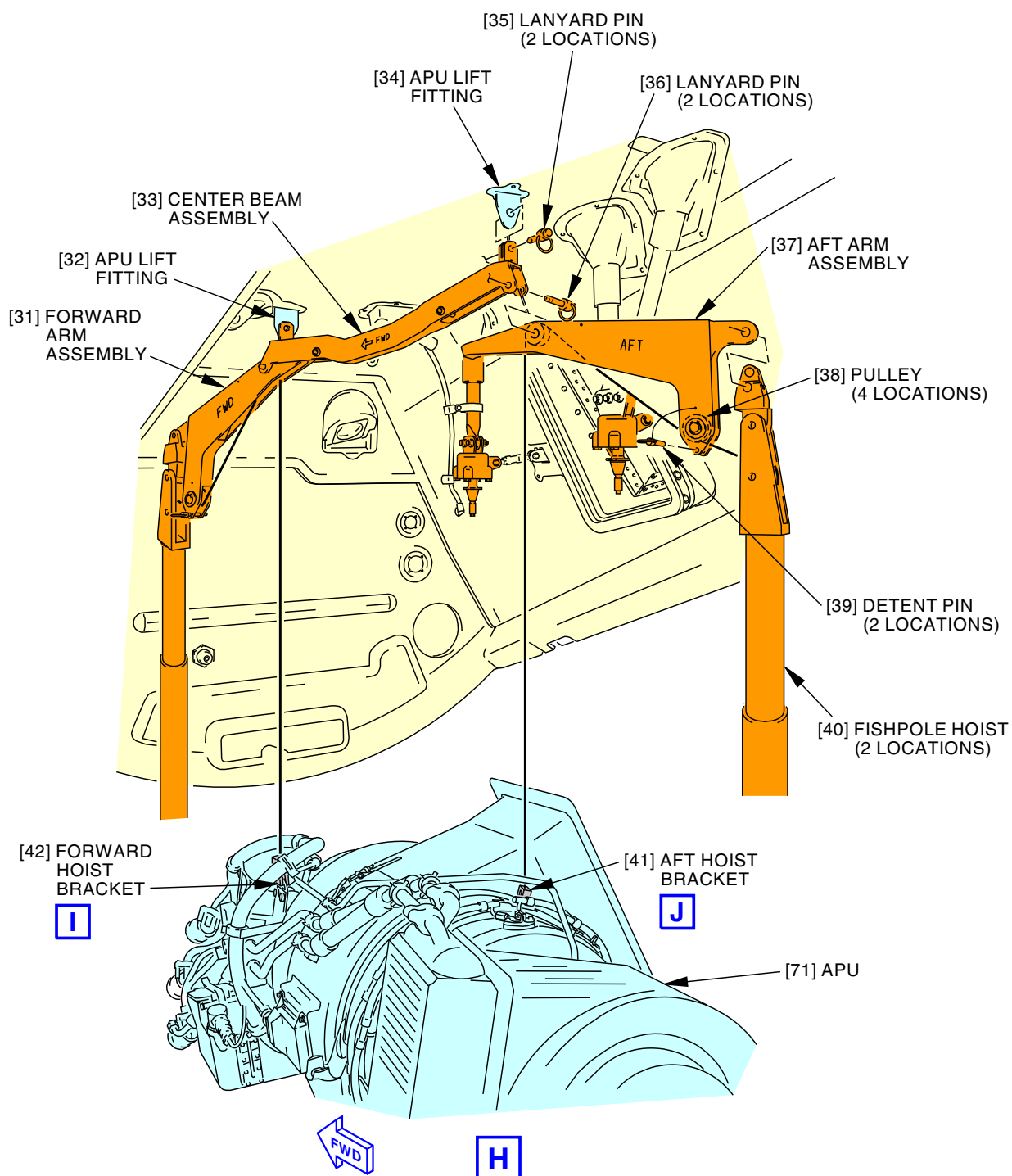
Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 4 of 11)

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Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 5 of 11)

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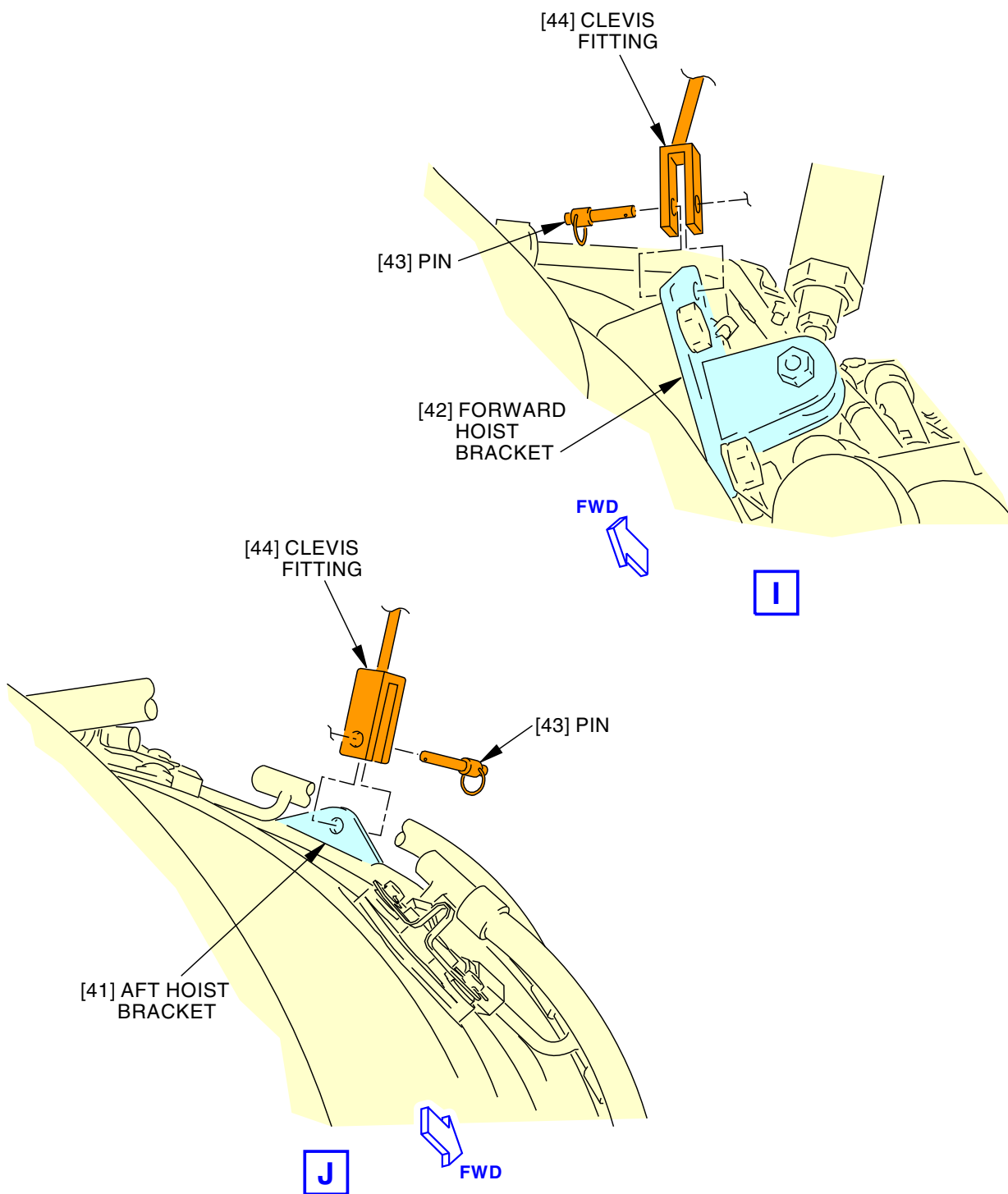
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Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 6 of 11)

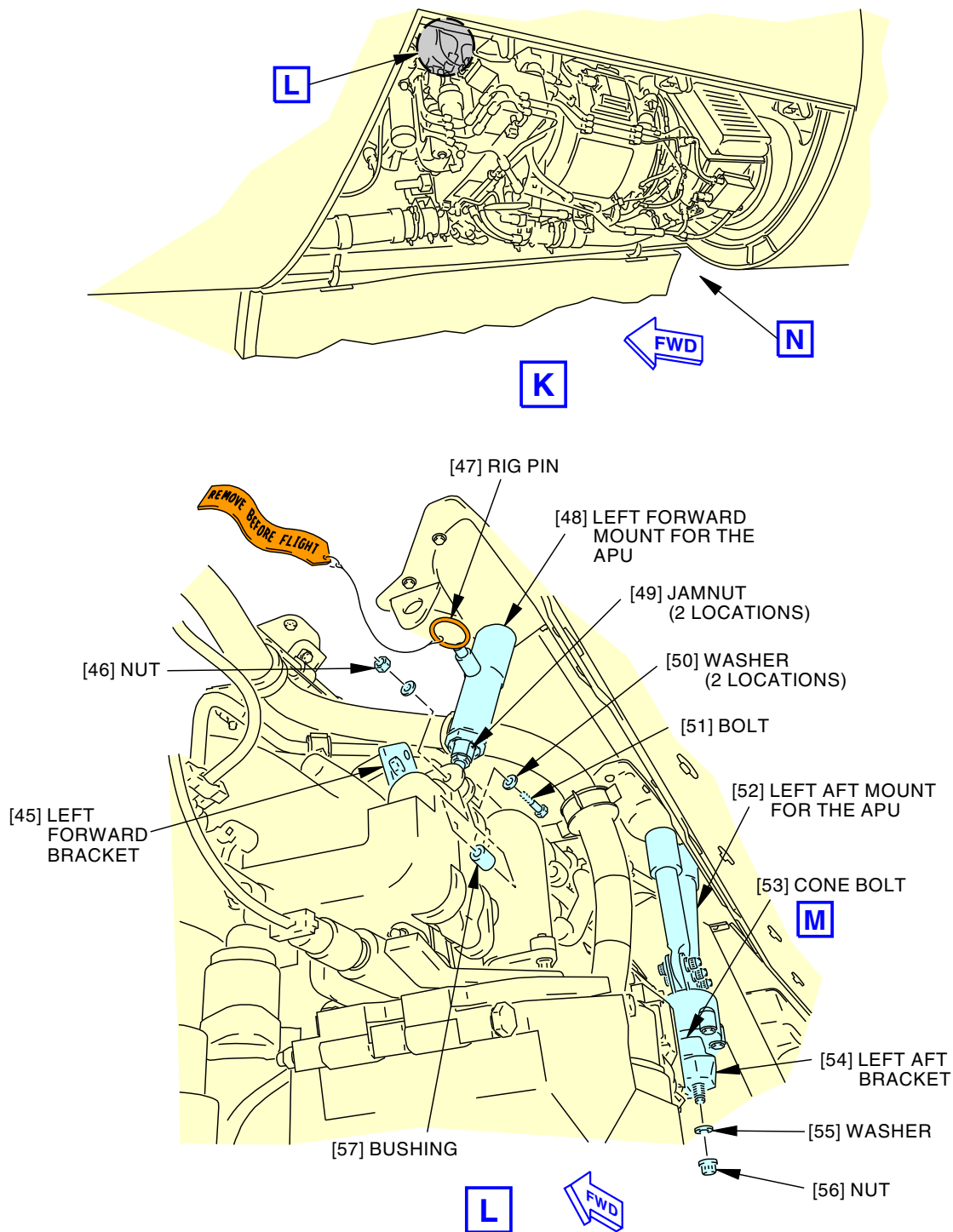
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Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 7 of 11)

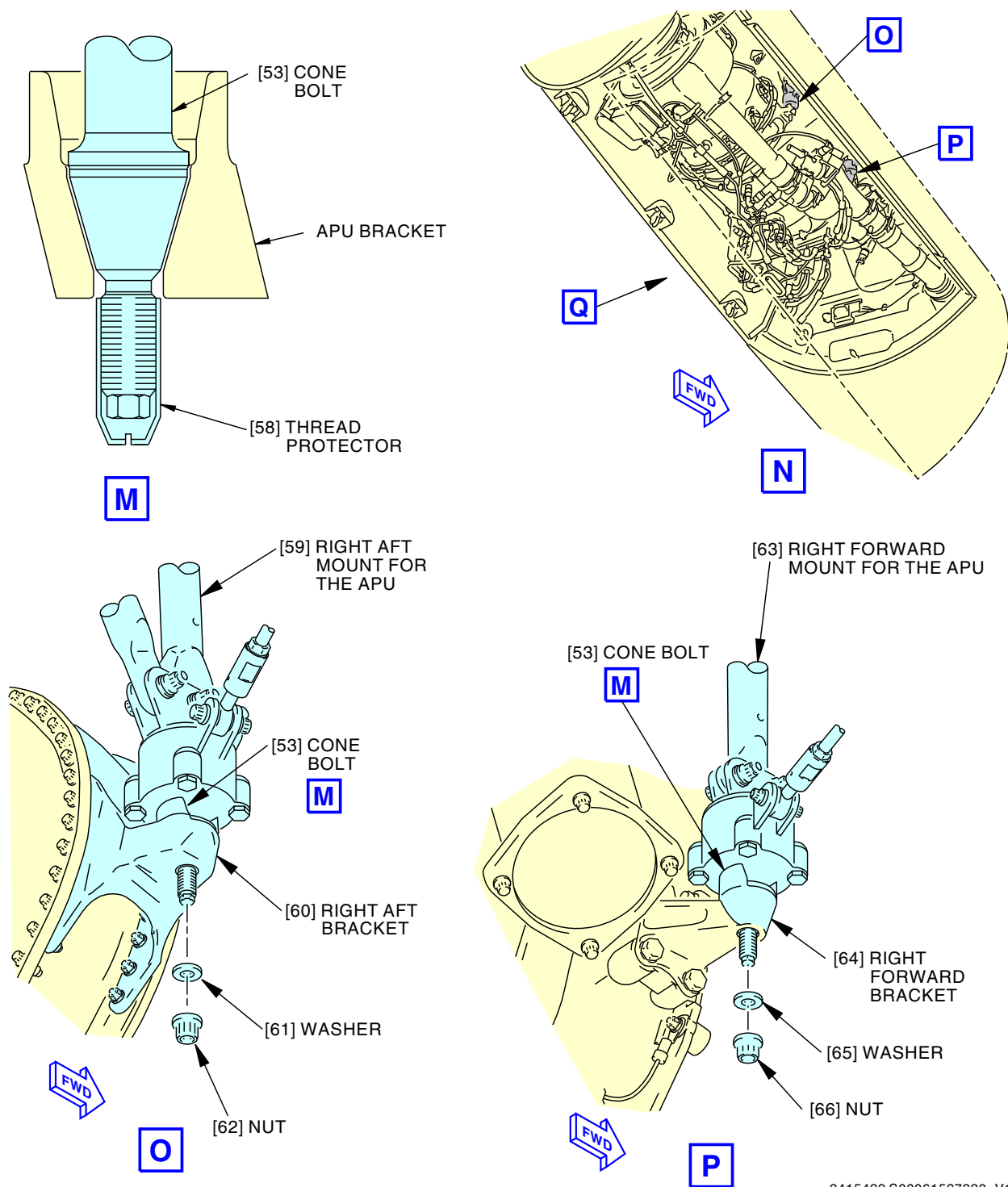
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2415429 S00061537820_V1

Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 8 of 11)

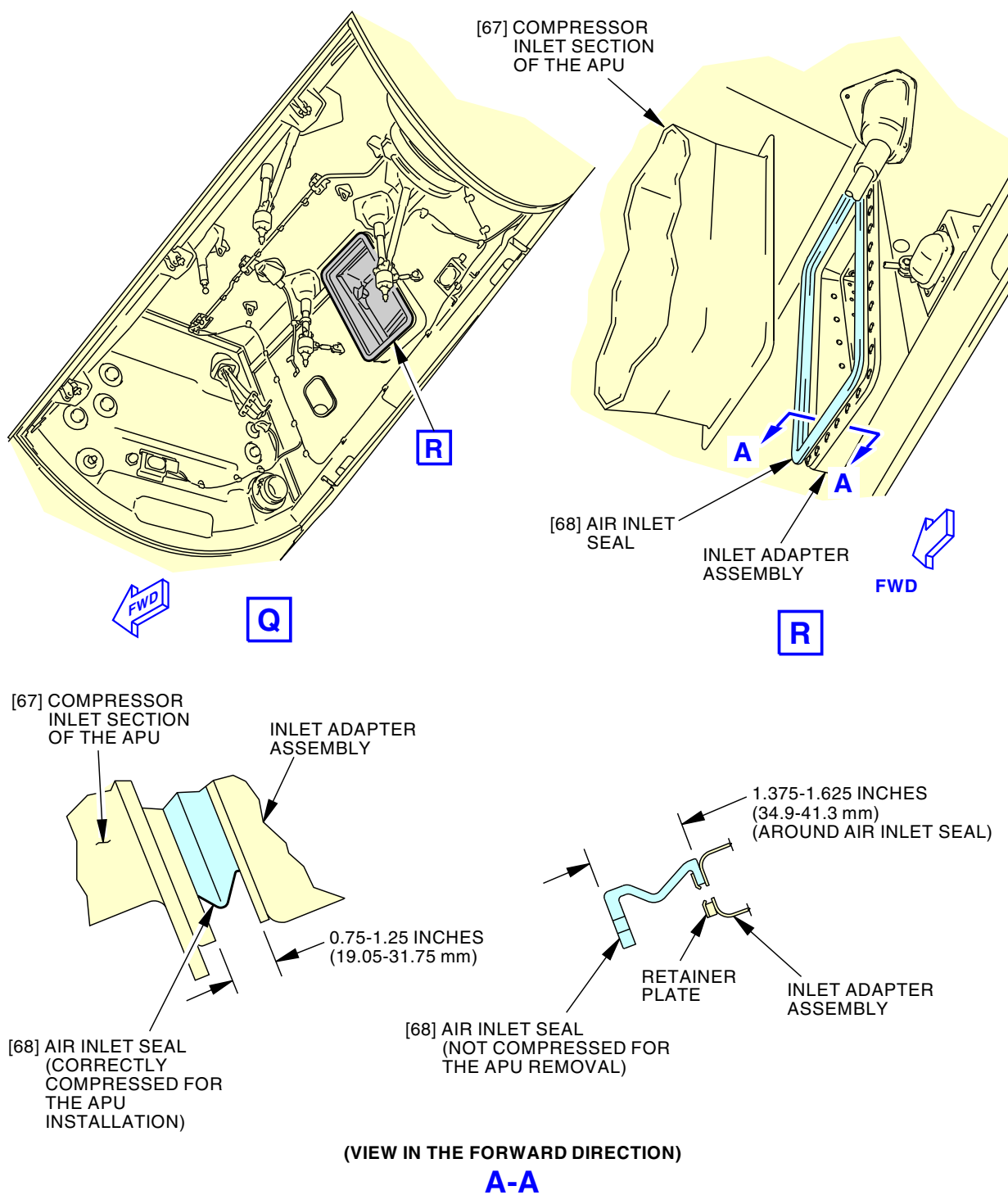
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2415430 S00061537821_V2

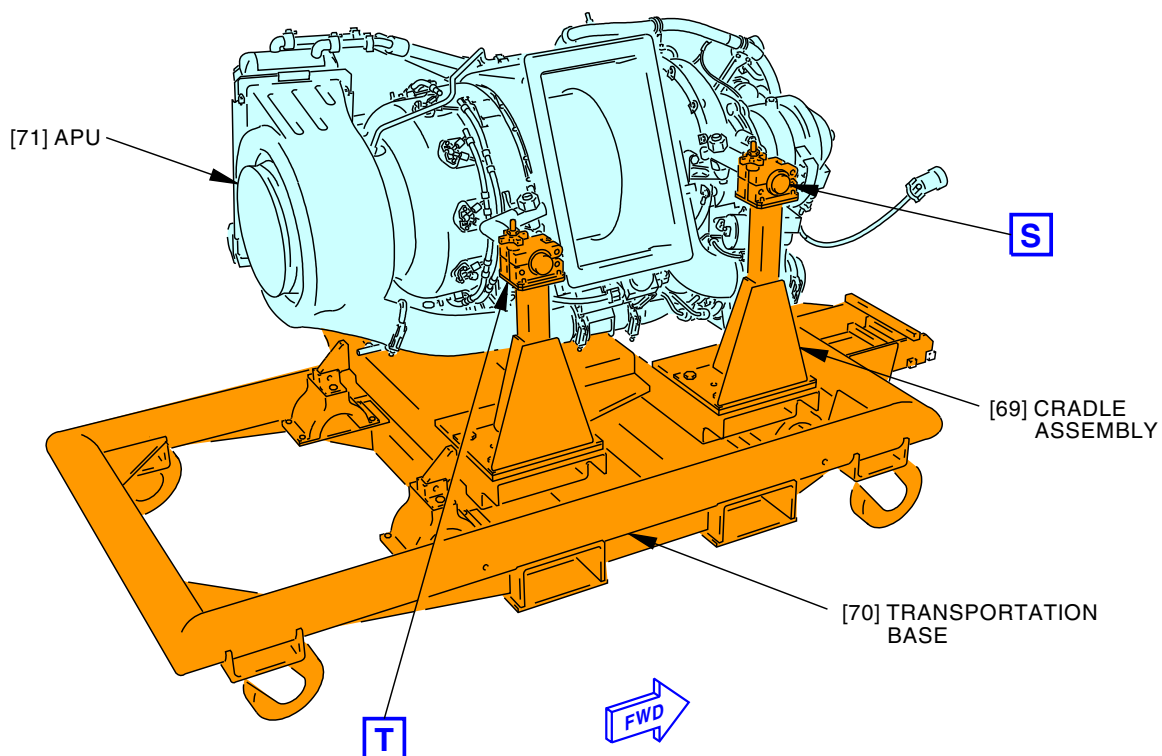
Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
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2415431 S00061537822_V1

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Figure 401/49-11-00-990-805 (Sheet 10 of 11)

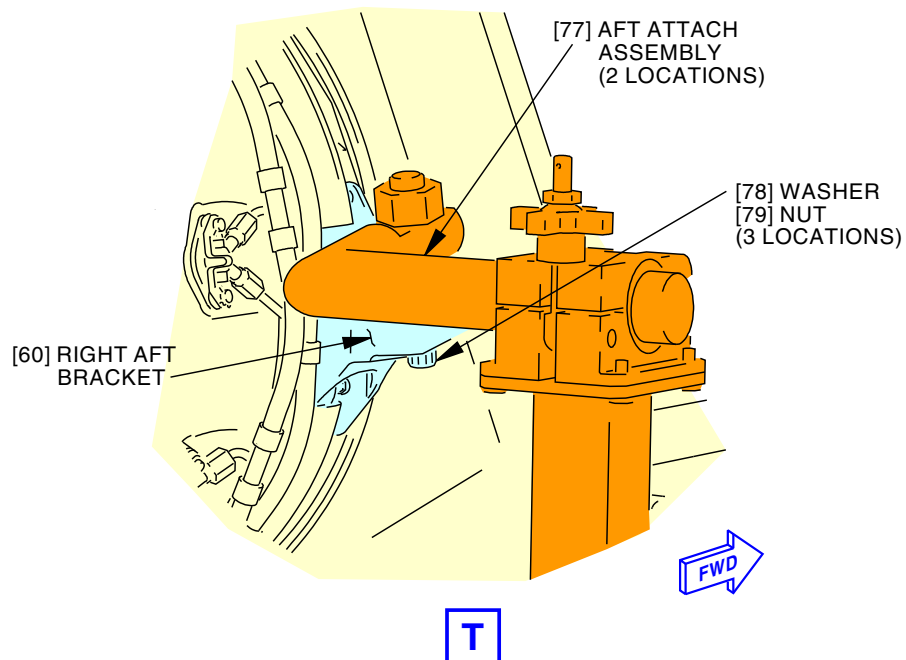
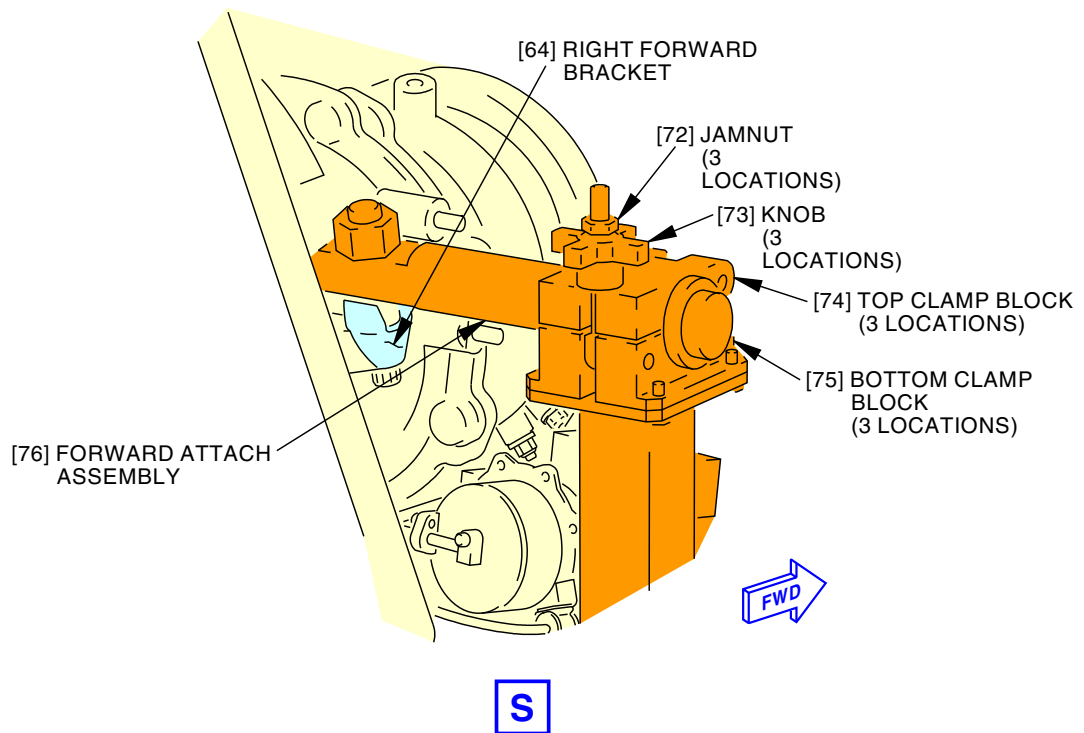
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Auxiliary Power Unit (APU) Installation (Fishpole Hoist Procedure)
Figure 401/49-11-00-990-805 (Sheet 11 of 11)

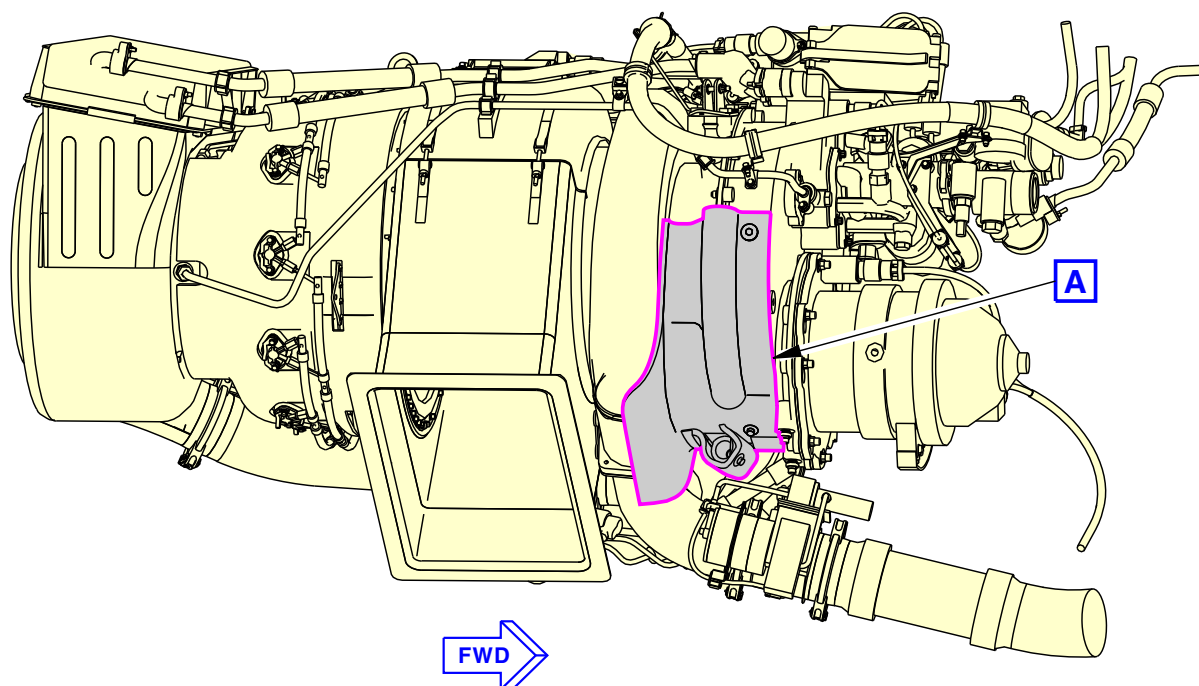
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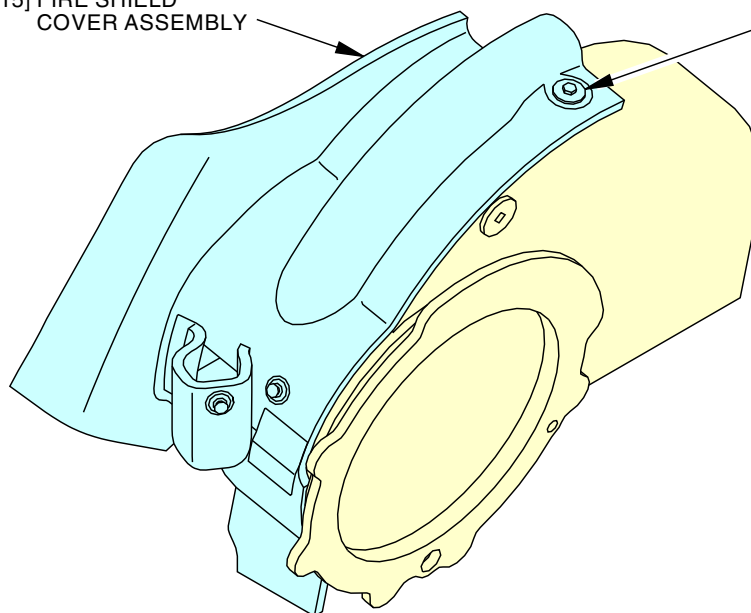
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[115] FIRE SHIELD
COVER ASSEMBLY

[116] SCREW
[117] WASHER



A

2830628 S0000656766_V2

Fire Shield Cover Assembly Installation
Figure 402/49-11-00-990-809

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TASK 49-11-00-400-802

5. APU Power Plant Installation - Fishpole Hoist

(Figure 401)

A. General

(1) This task is for the installation of the Auxiliary Power Unit (APU) using the fishpole hoist.

B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
20-60-07-910-802	Inspection, Cleaning and Sealing of Electrical Connectors (P/B 201)
46-13-02	ONBOARD MAINTENANCE FUNCTION
49-11-00-710-802	APU Operational Test (P/B 501)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-13-00-200-803	APU Mounts Inspection (APU Removed) (P/B 601)
49-15-11-000-801	Air Inlet Seal Removal (P/B 401)
49-15-11-400-801	Air Inlet Seal Installation (P/B 401)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-61-00-700-801	APU BITE Procedure (P/B 201)
49-61-00-710-801	APU Configuration Report (P/B 201)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-1563	Hoist - Fishpole, 500 lb Safe Working Limit (SWL) Part #: 10/4180 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: 10/3641 Supplier: K1425 Opt Part #: 10/3641C1 Supplier: K1425 Opt Part #: MINILIFT Supplier: K1425
COM-1592	Hoist - Fishpole, Chain, 1,000 lb Safe Working Limit (SWL) Part #: AP6108 Supplier: 4Y309

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Reference	Description
SPL-1957	Base - Transportation, APU Part #: F72950-158 Supplier: 81205
SPL-1968	Equipment - Hoist, Auxiliary Power Unit (AE131-9 APU) Part #: C49007-36 Supplier: 81205 Part #: C49007-42 Supplier: 81205 Opt Part #: C49007-35 Supplier: 81205
SPL-1970	Assembly - Cradle, AE131-9B APU Part #: C49010-50 Supplier: 81205
SPL-1971	Protector - Thread, APU Mount Bolt Part #: C49006-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin
STD-1208	Lever - Wood, 2 Inch by 4 Inch, 4-7 Feet Long
STD-1242	Hammer - Standard
STD-3906	Mallet - Rubber
STD-7394	Cap - Dust, Electrical Connector

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02272	Fuel - Turbine, Aviation (Grades JP-4, JP-5, JP-5/JP-8ST)	MIL-DTL-5624
G50222	Brush - Tampico Fiber, Non-Metallic	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Fuel supply tube	49-31-11-01-030	SIA ALL
7	Packing	49-31-11-01-015	SIA ALL
10	Seal	49-52-11-01-010	SIA ALL
11	Bleed air duct	49-52-11-01-015	SIA ALL
29	Drain tube	49-11-00-10-075	SIA ALL

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AMM Item	Description	AIPC Reference	AIPC Effectivity
71	APU	49-11-00-03-130	SIA ALL
		49-11-00-03-135	SIA ALL

F. Location Zones

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

G. Access Panels

Number	Name/Location
315A	APU Cowl Door

H. Prepare for the Installation

SUBTASK 49-11-00-210-008

(1) Visually examine these components for wear, cracks, and damage:

- (a) The left forward mount for the APU [48]
- (b) The left aft mount for the APU [52]
- (c) The right aft mount for the APU [59]
- (d) The right forward mount for the APU [63].

SUBTASK 49-11-00-211-001

(2) If wear, cracks or damage are found, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-00-200-803.

SUBTASK 49-11-00-210-009

(3) Visually examine the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71] for wear, cracks, and damage.

SUBTASK 49-11-00-220-001

(4) Measure the height of the air inlet seal [68] before the APU [71] installation.

- (a) Make sure that the height from the bottom to the top of the air inlet seal [68] is 1.375 in. (34.9 mm) - 1.625 in. (41.3 mm).
- (b) If it is necessary, remove and install the air inlet seal (TASK 49-15-11-000-801 and TASK 49-15-11-400-801).

SUBTASK 49-11-00-420-011

(5) If it is necessary, remove the protection covers from the compressor inlet section of the APU [71] and APU exhaust duct.

SUBTASK 49-11-00-480-005



MAKE SURE THAT THE TWO FISHPOLE HOISTS ARE IN A SERVICEABLE CONDITION. MAKE SURE THAT THERE ARE NO SIGNS OF DAMAGE ON THE CABLES OR CHAINS. IF THERE IS DAMAGE, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)



MAKE SURE THAT THE CABLE IS ON THE PULLEYS FOR THE FORWARD/ AFT ARM ASSEMBLY. MAKE SURE THAT THEY ARE ON THE SAME VERTICAL PLANE WITH THE RELATED FISHPOLE HOIST PULLEY. IF YOU DO NOT OBEY INSTRUCTIONS, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



IF YOU HAVE A FISHPOLE HOIST WITH A CABLE AND A DRUM ASSEMBLY, MAKE SURE THAT YOU EXAMINE THE CABLE. BEFORE YOU USE THE FISHPOLE HOIST, YOU MUST EQUALLY WIND THE CABLE OF THE FISHPOLE HOIST AROUND THE DRUM ASSEMBLY. IF YOU DO NOT EQUALLY WIND THE CABLE, THE APU CAN FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE APU.

- (6) Install the two fishpole hoist, COM-1563, or chain fishpole hoists, COM-1592, (fishpole hoists [40]), to the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71]:
 - (a) Put the APU [71] in position below the APU compartment.
NOTE: The APU weighs approximately 410 lb (186 kg).
 - (b) Extend the two fishpole hoists [40] to a length that is easy to use.
 - (c) Unwind the two cables or chains of the two fishpole hoists [40] until the two clevis fittings [44] align with the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
 - (d) Install the two pins [43] that attach the two clevis fittings [44] to the forward hoist bracket [42] and aft hoist bracket [41] as follows:
 - 1) Install the pin [43] into the aft hoist bracket [41] and clevis fitting [44] from the forward side of the APU [71].
 - (e) Wind and tighten the two cables or chains of the two fishpole hoists [40].

I. APU Power Plant Installation - Fishpole Hoist

SUBTASK 49-11-00-420-012



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

- (1) Remove the protection covers from the compressor inlet section of the APU exhaust duct and any other openings.

SUBTASK 49-11-00-410-013

- (2) Install the Fire Shield Cover Assembly [115] on the right forward mount for the APU [63] as follows:
 - (a) Put the Fire Shield Cover Assembly [115] on the APU gearbox in its installed position.
 - (b) Make sure that the flap on the insulation engages the hook and loop fasteners on the APU gearbox.
 - (c) Install the screw [116] and washer [117].
 - (d) Tighten the screw [116] to 35 in-lb (4 N·m).
 - (e) Make sure that the Fire shield cover assembly wraps around the right front mount bracket (Figure 402).

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SUBTASK 49-11-00-080-001

- (3) Remove the APU [71] from the cradle assembly [69] (assembly, SPL-1970), and transportation base [70] (base, SPL-1957), as follows:
- (a) Make sure that the two cables or chains of the fishpole hoists [40] are tight to hold the weight of the APU [71].
 - (b) Loosen the three jamnuts [72] from the three knobs [73] on the cradle assembly [69].
 - (c) Loosen the three knobs [73] until the three top clamp blocks [74] disengage the three bottom clamp blocks [75].
 - (d) Open the three top clamp blocks [74].
 - (e) Remove the three nuts [79] and three washers [78] that attach these components to the cradle assembly [69]:
 - 1) The left aft bracket [54]
 - 2) The right aft bracket [60]
 - 3) The right forward bracket [64].
 - (f) Remove the forward attach assembly [76] from the right forward bracket [64].
 - (g) Remove the two aft attach assemblies [77] from the left aft bracket [54] and right aft bracket [60].
 - (h) Slowly wind the two cables or chains of the two fishpole hoists [40] to lift the APU [71] from the cradle assembly [69].
 - (i) Close the three top clamp blocks [74].
 - (j) Tighten the three knobs [73].
 - (k) Tighten the three jamnuts [72] on the three knobs [73].
 - (l) Remove the cradle assembly [69] and transportation base [70] from the area.

SUBTASK 49-11-00-420-013

- (4) Install the APU [71] into the APU compartment as follows:
- (a) Make sure that the APU [71] is directly under the APU compartment.
 - (b) Make sure that the three thread protectors [58] (protectors, SPL-1971), are on the three cone bolts [53].
 - (c) Align each cone bolt [53] so that the notch in the cone bolt [53] aligns with the corresponding APU mount bracket.
 - (d) Hold the left aft mount for the APU [52] and right aft mount for the APU [59] in position.



CAUTION

BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15 DEGREES IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE INSULATION AROUND THE RIGHT FRONT MOUNT, THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- (e) Tilt the APU [71] so that the forward end of the APU [71] is approximately 11° lower than the aft end.

NOTE: The APU [71] is installed at an 11° forward-end-down position.
- (f) Slowly lift the APU [71] until the left aft bracket [54], right aft bracket [60], and right forward bracket [64] are below the three cone bolts [53].

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- (g) Make sure that the left aft mount for the APU [52], right aft mount for the APU [59], and right forward mount for the APU [63] are engaged at the same time.



CAREFULLY LIFT THE APU SO THAT YOU DO NOT DAMAGE THE CONED SURFACES OF THE APU MOUNTS. IF YOU DO NOT, IT CAN CAUSE DAMAGE.

- (h) Lift the APU [71] until the three cone bolts [53] engage.
- (i) Continue to lift the APU [71] until the air inlet seal [68] fully engages with the compressor inlet section of the APU.
- NOTE: Make sure that the compressed area of the air inlet seal [68] does not show signs of buckling or is not caught on the edge of the compressor inlet section of the APU [71].
- (j) Measure the height of the compressed area of the air inlet seal [68] as follows:
- 1) Make sure that the height from the bottom to the top of the air inlet seal [68] is between 0.75 in. (19.05 mm) - 1.25 in. (31.75 mm).
- NOTE: Between the inlet adapter assembly and the APU [71].
- 2) If it is necessary, remove and install the air inlet seal (TASK 49-15-11-000-801 and TASK 49-15-11-400-801).
- (k) Connect the APU [71] to the left aft mount for the APU [52], right aft mount for the APU [59], and right forward mount for the APU [63] as follows:
- 1) Remove the protector, SPL-1971 (thread protector [58]), from the three cone bolts [53].
 - 2) Apply the Never-Seez NSBT compound, D00006, to the threads of the three cone bolts [53].
 - 3) Install the washer [55], washer [61], washer [65], nut [56], nut [62], and nut [66] on the three cone bolts [53].
 - 4) Do the torque limit test for the nut [56], nut [62], and nut [66] as follows:
 - a) Tighten the nut [56], nut [62], and nut [66] to a run-on torque of not more than 100 in-lb (11.3 N·m).
 - b) Stop when a minimum of one full thread and the cone bolt chamfer extends below each nut [56], nut [62], and nut [66] but not before the washer [55], washer [61], and washer [65] touches the APU mount.
 - c) Make sure that the break-away torque necessary to turn the nut [56], nut [62], and nut [66] from this position is more than 14 in-lb (1.6 N·m).
 - d) Replace the nut [56], nut [62], or nut [66] that does not meet these torque limits.
 - e) If the nut [56], nut [62], or nut [66] was replaced, do the torque limit test again for the new nut [56], nut [62], or nut [66].
 - 5) Tighten the nut [56], nut [62], and nut [66] to 400 ±25 in-lb (45.2 ±2.8 N·m).
 - 6) Secure the two capstans on the Fire Shield Cover Assembly [115] with MS20995C32 lockwire, G01048.
- (l) Connect the APU [71] to the left forward mount for the APU [48] as follows:
- 1) Remove the nut [46], two washers [50], and bolt [51] from the left forward mount for the APU [48].

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- 2) Make sure that the bushing [57] is installed in the left forward mount for the APU [48].
- 3) Install the rig pin [47] in the left forward mount for the APU [48].
NOTE: The rig pin [47] is a component of the protector, SPL-1971.
- 4) Align the holes of the left forward bracket [45] to the left forward mount for the APU [48].
- 5) If the holes of the left forward bracket [45] and left forward mount for the APU [48] do not align, adjust the left forward mount for the APU [48] as follows:
 - a) Remove the MS20995C32 lockwire, G01048, and loosen the bottom jamnut [49] on the left forward mount for the APU [48].
 - b) Turn the bottom rod end until it aligns with the holes of the left forward bracket [45].
NOTE: One full turn will change the length by 0.04 in. (1.0 mm).
 - c) Make sure that the bottom rod end threads are visible through the inspection hole in the strut, and that a minimum of one thread protrudes from the bottom jamnut [49].
 - d) If more adjustments are necessary, remove the seven screws and seven washers that attach the firewall cover to the top insulation panel.
 - <1> Move the firewall cover down until you can get access to the top jamnut [49].
 - <2> Remove the MS20995C32 lockwire, G01048, and loosen the top jamnut [49].
 - <3> Turn the left forward mount for the APU [48] until the bottom rod end aligns with the holes of the left forward bracket [45].
NOTE: One full turn will change the length by 0.04 in. (1.0 mm).
 - <4> Make sure that the top rod end threads are visible through the inspection hole in the strut and that a minimum of one thread protrudes from the top jamnut [49].
 - <5> Tighten the top jamnut [49] to 35 in-lb (4 N·m).
 - <6> Install MS20995C32 lockwire, G01048, on the top jamnut [49].
 - <7> Remove the remaining sealant from the surface of the firewall cover and the top insulation panel with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - <8> Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - <9> Use 75 ±15 psig (517 ±103 kPa) air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - <10> Install the firewall cover to the top insulation panel with the seven washers and seven screws.
 - <11> Apply a fillet seal of sealant, A00160, around the firewall cover.
 - <12> Remove the unwanted sealant from the firewall cover and the top insulation panel with a cotton wiper, G00034.
NOTE: It is not necessary for the sealant to dry.
- 6) Install the bolt [51], two washers [50], and nut [46].

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- 7) Tighten the nut [46] to 110 in-lb (12 N·m).
- 8) Tighten the bottom jamnut [49] to 35 in-lb (4 N·m).
- 9) Install MS20995C32 lockwire, G01048 on the bottom jamnut [49].
- 10) Remove the rig pin [47] from the left forward mount for the APU [48].

SUBTASK 49-11-00-080-002

- (5) Remove the two fishpole hoists [40] from the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
 - (a) Remove the two pins [43] that attach the clevis fittings [44] to the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
 - (b) Wind the two cables or chains of the two fishpole hoists [40] until the two clevis fittings [44] touch the forward arm assembly [31] and aft arm assembly [37].

SUBTASK 49-11-00-080-003

- (6) Remove the forward arm assembly [31] and aft arm assembly [37] from the center beam assembly [33].

NOTE: The forward arm assembly [31], center beam assembly [33], and aft arm assembly [37] are components of the equipment, SPL-1968.

- (a) While you hold the fishpole hoist [40] and forward arm assembly [31], remove the lanyard pin [36] that attaches the forward arm assembly [31] to the center beam assembly [33].
- (b) Remove the forward arm assembly [31] and fishpole hoist [40].
- (c) While you hold the fishpole hoist [40] and aft arm assembly [37], remove the lanyard pin [36] that attaches the aft arm assembly [37] to the center beam assembly [33].
- (d) Remove the aft arm assembly [37] and fishpole hoist [40].
- (e) Install the two lanyard pins [36] to the forward arm assembly [31] and aft arm assembly [37].
- (f) Remove the two detent pins [39] from the forward arm assembly [31] and aft arm assembly [37].
- (g) Fully wind the two cables or chains of the two fishpole hoists [40].
- (h) Install the two detent pins [39] to the forward arm assembly [31] and aft arm assembly [37].
- (i) Remove the two fishpole hoists [40] from the forward arm assembly [31] and aft arm assembly [37].

SUBTASK 49-11-00-080-004

- (7) Remove the center beam assembly [33] from the APU lift fitting [32] and APU lift fitting [34].
 - (a) Remove the two lanyard pins [35] that attach the center beam assembly [33] to the APU lift fitting [32] and APU lift fitting [34].

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BE CAREFUL WHEN YOU REMOVE THE CENTER BEAM ASSEMBLY FROM THE APU COMPARTMENT. YOU CAN TILT THE CENTER BEAM ASSEMBLY AS NECESSARY TO PREVENT THE CENTER BEAM ASSEMBLY FROM TOUCHING THE FIRE DETECTOR ASSEMBLY. DAMAGE TO THE FIRE DETECTOR ASSEMBLY AND WIRING CAN OCCUR.

- (b) Remove the center beam assembly [33].

NOTE: The center beam assembly [33] can be removed from the rear side or front side of the APU [71].

- (c) Install the two lanyard pins [35] to the center beam assembly [33].

SUBTASK 49-11-00-420-014

- (8) Connect the exhaust duct muffler [23]:

- (a) Make sure that the exhaust duct muffler [23] touches the APU [71].
- 1) Pull the exhaust duct muffler [23] forward to the APU [71] until the exhaust duct muffler [23] touches the APU [71].
 - 2) If it is necessary, use a 2 inch by 4 inch, 4-7 feet long wood lever, STD-1208, and standard hammer, STD-1242, to lightly tap the exhaust duct muffler [23] forward to the APU [71] until the exhaust duct muffler [23] touches the APU [71].
- (b) If the exhaust duct muffler [23] does not touch the APU [71] or the flanges are not aligned, do these steps:
- 1) Loosen the 16 bolts [24] that attach the seal depressor assembly [25] to the 1156 bulkhead.
 - 2) Move the exhaust duct muffler [23] until the exhaust duct muffler [23] touches the APU [71].
 - 3) If more adjustments are necessary, loosen the screws [28] that attach the seal support assembly [26] to the exhaust duct muffler [23].
 - 4) Move the exhaust duct muffler [23] until the exhaust duct muffler [23] touches the APU [71] and flanges are aligned.
- (c) Install the V-band clamp [27] on the exhaust duct muffler [23]:
- 1) Put the V-band clamp [27] on the exhaust duct muffler [23].
 - 2) Tighten the V-band clamp [27] to 80 ±10 in-lb (9.0 ±1.2 N·m).
 - 3) Lightly hit the edge of the V-band clamp [27] with a rubber mallet, STD-3906.
 - 4) Continue to tighten and hit the V-band clamp [27] until the torque value stays constant.
- (d) If the 20 screws [28] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 20 screws [28] on the seal support assembly [26].
- (e) If the 16 bolts [24] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 16 bolts [24] on the seal depressor assembly [25].

SUBTASK 49-11-00-420-015

- (9) Install the drain tube [29] for the exhaust duct muffler [23].
- (a) Remove the caps or plugs from the drain tube [29] and fitting [30] on the exhaust duct muffler [23] and fitting [80] on the aft drain tube of the APU [71].
- (b) Apply a thin layer of Never-Seez NSBT compound, D00006, on the threads of the fitting [30] and fitting [80].

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- (c) Connect the drain tube [29] to the fitting [80] on the aft drain tube of the APU [71].
- (d) Connect the drain tube [29] to the fitting [30] on the exhaust duct muffler [23].
- (e) Tighten the two ends of the drain tube [29] to 230 in-lb (26.0 N·m).

SUBTASK 49-11-00-420-016

- (10) Connect the bonding jumper [20].
 - (a) Clean the surfaces of the two studs:
 - 1) Apply alcohol, B00130, to a tampico fiber brush, G50222, or cotton wiper, G00034.
 - 2) Use a small amount of pressure on the tampico fiber brush, G50222, or cotton wiper, G00034, while you clean the surfaces of the two studs.
 - 3) Continue to clean the surfaces until there are no visible residue on the surfaces.
 - (b) Connect the bonding jumper [20] to the two studs with the two washers [22] and two nuts [21].
 - 1) Tighten the two nuts [21] to 180 ±10 in-lb (20 ±1 N·m).
 - 2) Measure the bonding resistance between the APU [71] and airplane structure.
 - a) To measure the bonding resistance use an intrinsically safe approved bonding meter, COM-1550.
 - b) Make sure that the bonding resistance is 0.0005 ohm (0.5 miliohm) or less (SWPM 20-20-00).

SUBTASK 49-11-00-420-017

- (11) Connect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18].
 - (a) Disengage the terminal block cover [19] from the four pins on the starter-generator.
 - (b) Remove the terminal block cover [19].
 - (c) Remove the four nuts [12] from the four terminal studs.
 - (d) Connect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18] to the related terminal studs.

NOTE: The terminal strip and the fanning strip [15] show the identification of the terminal studs for each of the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18].
 - (e) Install the four nuts [12] on the four terminal studs.
 - (f) Tighten the four nuts [12] to 125 ±10 in-lb (14.1 ±1.2 N·m).
 - (g) Put the terminal block cover [19] on the starter-generator.
 - (h) Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-420-018

- (12) Install the bleed air duct [11] as follows:
 - (a) Install the seals [10] on the bleed air duct [11].
 - (b) Put the two coupling clamps [9] on the bleed air valve and bleed duct assembly.

NOTE: The bleed duct assembly extends through the 1088 bulkhead.
 - (c) Put the bleed air duct [11] in its position as follows:
 - 1) Make sure that the directional flow arrow on the bleed air duct [11] points away from the front of the APU [71].

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- 2) Open the two coupling clamps [9] to permit alignment of the bleed air duct [11] to the bleed air valve and bleed duct assembly.
 - 3) Make sure that the alignment marks on the two flexible couplings align with the two alignment marks on the bleed air duct [11].
 - 4) Make sure that the center of the alignment mark on the bleed air duct [11] is ± 0.16 in. (4.1 mm) from the center of the alignment mark on the bleed air valve.
- (d) Put the two coupling clamps [9] over the flanges of the bleed air valve, bleed air duct [11], and bleed duct assembly.
- (e) Tighten the two coupling clamps [9] as follows:
- 1) For AS1895 or 234-591 clamps: tighten the two coupling clamps [9] to 95 in-lb (10.7 N·m) - 110 in-lb (12.4 N·m).
 - 2) For 543227A or 234-607 clamps: tighten the two coupling clamps [9] to 35 in-lb (4.0 N·m) - 40 in-lb (4.5 N·m).

SUBTASK 49-11-00-420-020

- (13) Connect the electrical connector D10436 (P2) [1], electrical connector D10912 (P1) [2], electrical connector D10434 (P3) [3], and electrical connector D11118 (P4) [4] to the APU firewall receptacles on the 1088 bulkhead (TASK 20-60-07-910-802):
- (a) Remove the dust caps, STD-7394, from the electrical connectors.
 - (b) Connect and tighten the electrical connector D11118 (P4) [4] to 85 in-lb (10 N·m).
 - (c) Connect and tighten the electrical connector D10434 (P3) [3] to 100 in-lb (11 N·m).
 - (d) Connect and tighten the electrical connector D10912 (P1) [2] to 100 in-lb (11 N·m).
 - (e) Connect and tighten the electrical connector D10436 (P2) [1] to 100 in-lb (11 N·m).
 - (f) Install the wire clamp [112], nut [113], and washer [114].

SUBTASK 49-11-00-420-019

- (14) Install the fuel supply tube [5].
- (a) Remove the caps or plugs from the fuel supply tube [5], fitting [6], and fuel control unit.
 - (b) Lubricate the new packings [7] with a light coat of fuel, G02272.
 - (c) Install the new packings [7] on the fuel supply tube [5].
 - (d) Connect the fuel supply tube [5] to the fuel control unit.
 - (e) Turn the tube retainer on the fuel supply tube [5] in the clockwise direction until the flange fully engages the stud.
 - (f) Tighten the nut [8] to 40 $\pm$ 5 in-lb (4.5 $\pm$ 0.6 N·m).
 - (g) If Christo-lube MCG111 grease, D50011, is not used on the fitting [6], do these steps:
 - 1) Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting [6].
 - 2) Connect the fuel supply tube [5] to the fitting [6] on the 1088 bulkhead.
 - a) Tighten to 470 in-lb (53 N·m) - 510 in-lb (58 N·m).
 - (h) If Christo-lube MCG111 grease, D50011, is used on the fitting [6], do these steps:
 - 1) Lubricate the external threads of the fitting [6] with Christo-lube MCG111 grease, D50011.

NOTE: The grease should be applied to the external threads only. The grease should not be applied to the internal threads or sealing surface of the fitting.

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- 2) Connect the fuel supply tube [5] to the fitting [6] on the 1088 bulkhead.
 - a) Tighten to 266 in-lb (30 N·m) - 294 in-lb (33 N·m).

J. APU Installation Test

SUBTASK 49-11-00-410-016

- (1) If the APU Cowl Door, 315A was removed, do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

NOTE: Do not close the APU Cowl Door. Use the two hold-open rods to hold the APU Cowl Door, 315A open.

SUBTASK 49-11-00-210-027

- (2) Do a general visual inspection of the seven insulation panels.
 - (a) Visually examine the seven insulation panels that you can access from the APU compartment for holes, tears, separation and damage.
 - (b) If holes, tears, separation, or damage on the insulation panels are found, do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.

SUBTASK 49-11-00-860-073

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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER
B	21	C00452	FIRE PROTECTION EXTINGUISHERS APU

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-044

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

SUBTASK 49-11-00-710-003

- (5) Do the installation test for the APU [71] as follows:
 - (a) Do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.
 - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (c) During the APU operation, examine the APU [71] for signs of oil and fuel leakage.

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.
 - (d) If oil leakage or more than the fuel leakage rate is found, repair the leakage as follows:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch, on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel or oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the APU [71] for signs of oil and fuel leakage.

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- 7) If you find oil leakage or more than the fuel leakage rate, do the leakage repair again.
- (e) Do this task: APU Configuration Report, TASK 49-61-00-710-801.
- (f) Make sure that the APU configuration data for the APU Electronic Control Unit (ECU) and APU hardware is correct.
- (g) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- (h) If maintenance message(s) show for the APU [71], go to IFIM and do the applicable procedure(s).
- (i) Look at the APU Maintenance page - lower right for the HOURS SINCE INSTALLATION ON AIRPLANE, APU CYCLES, and APU HOURS.
- NOTE: See ONBOARD MAINTENANCE FUNCTION, SUBJECT 46-13-02 for detailed information on how to use the Onboard Maintenance Function (OMF).
- (j) If it is necessary, use the OMF to reset the HOURS SINCE INSTALLATION ON AIRPLANE:
- 1) Select ONS Maintenance
 - 2) Select ONBD MAINT
 - 3) Select OTHER FUNCTIONS
 - 4) Select SPECIAL FUNCTIONS
 - 5) Select ATA Systems: 49 - Airborne Auxiliary Power System
 - 6) Select System Function: APU - Reset Hours since Installation.
 - 7) Follow the instructions on the screen, and select CONTINUE.
 - 8) Select YES for the question 'Do you want to reset hours since installation on airplane?' and select CONTINUE.
 - 9) Select FINISHED and select CONTINUE.
- (k) Do this task: APU Operational Test, TASK 49-11-00-710-802.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-410-007

- (1) Close this APU cowl door:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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TASK 49-11-00-000-803

6. APU Power Plant Removal - Hydraulic Jack

(Figure 403)

A. General

(1) This task is for the removal of the Auxiliary Power Unit (APU) using the hydraulic jack.

B. References

Reference	Title
21-00-01-100-801	Oil Contamination Removal from Air Conditioning and Pneumatic Systems (P/B 201)
36-13-01-100-801	Pneumatic Duct Cleaning (P/B 701)
49-13-00-200-803	APU Mounts Inspection (APU Removed) (P/B 601)
49-15-11-200-801	Air Inlet Seal Inspection (P/B 601)
49-15-15-000-802	Forward Air Inlet Plenum Removal (P/B 401)
49-15-15-400-802	Forward Air Inlet Plenum Installation (P/B 401)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-17-11-210-801	APU Firewall Covers Inspection (with APU Removed) (P/B 601)
49-81-11-200-802	Exhaust Duct Muffler Inspection (P/B 601)
49-91-71-200-801	Eductor Inlet Duct 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: FA2A9 Part #: J20009-110 Supplier: 81205 Opt Part #: J20009-108 Supplier: 81205 Opt Part #: J20009-109 Supplier: 81205
SPL-1957	Base - Transportation, APU Part #: F72950-158 Supplier: 81205
SPL-1969	Sling - Shop Handling, used with AlliedSignal AE131-9 APU Part #: C49004-40 Supplier: 81205
SPL-1970	Assembly - Cradle, AE131-9B APU Part #: C49010-50 Supplier: 81205
SPL-1971	Protector - Thread, APU Mount Bolt Part #: C49006-1 Supplier: 81205
SPL-1972	Equipment - Adapter, APU Jacking Part #: C49008-37 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)
STD-7394	Cap - Dust, Electrical Connector
STD-14686	Fittings - Hydraulic, Caps/Plugs (ref. AMM 20-10-XX)

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D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Removal

SUBTASK 49-11-00-860-045

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

SUBTASK 49-11-00-480-012

- (2) Attach a DO NOT OPERATE tag, STD-858, to the APU master switch.

SUBTASK 49-11-00-860-046

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER
B	21	C00452	FIRE PROTECTION EXTINGUISHERS APU

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-006

- (4) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-11-00-480-006

- (5) Position the adapter [101] (equipment, SPL-1972) on the jack assembly [105] (hydraulic jack, SPL-1561).

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SUBTASK 49-11-00-480-007

- (6) Install the four bolts [104], four washers [103], and four nuts [102] that attach the adapter [101] (equipment, SPL-1972) to the jack assembly [105] (hydraulic jack, SPL-1561).

SUBTASK 49-11-00-020-034

- (7) Disconnect the electrical connector D10436 (P2) [1] and electrical connector D10912 (P1) [2] from the APU firewall receptacles on the 1088 bulkhead.

SUBTASK 49-11-00-020-035

- (8) Disconnect the electrical connector D10434 (P3) [3] and electrical connector D11118 (P4) [4] from the APU firewall receptacles on the 1088 bulkhead.

SUBTASK 49-11-00-480-013

- (9) Install the dust caps, STD-7394, on the electrical connectors.

SUBTASK 49-11-00-020-036

- (10) Remove the wire clamp [112], nut [113], and washer [114].

G. APU Power Plant Removal

SUBTASK 49-11-00-020-022



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Remove the fuel supply tube [5] as follows:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube [5].
 - (b) Disconnect the fuel supply tube [5] from the fitting [6] on the 1088 bulkhead.
 - (c) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
 - (d) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit.
 - (e) Loosen the nut [8] that attaches the fuel supply tube [5] to the fuel control unit.
 - (f) Turn the tube retainer on the fuel supply tube [5] in the counterclockwise direction until the flange disengages from the stud.
 - (g) Disconnect the fuel supply tube [5] from the fuel control unit.
 - (h) Drain the fuel from the fuel supply tube [5] into the 1 gallon (4 l) fuel resistant container, STD-4049.
 - (i) Remove the fuel supply tube [5].
 - (j) Remove and discard the two packings [7] from the fuel supply tube [5].
 - (k) Install the caps/plugs, STD-14686, on the fuel supply tube [5], fitting [6], and fuel control unit.
 - (l) Install a protection cover on the fuel supply tube [5] to prevent contamination.
- (m) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-11-00-020-023

- (2) Remove the bleed air duct [11] as follows:

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- (a) Remove the two coupling clamps [9] that hold the bleed air duct [11] to the bleed air valve and bleed duct assembly.

NOTE: The bleed duct assembly extends through the 1088 bulkhead.

- (b) Remove the bleed air duct [11].



BE CAREFUL WHEN YOU REMOVE THE TWO SEALS FROM THE BLEED AIR DUCT. DAMAGE TO THE SEALS CAN OCCUR.

- (c) Carefully remove the two seals [10] from the bleed air duct [11].
- (d) Install the protection covers on the bleed duct assembly, bleed air duct [11], two seals [10], and bleed air valve to prevent contamination.

SUBTASK 49-11-00-020-024

- (3) Disconnect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18] as follows:

- (a) Disengage the terminal block cover [19] from the four pins on the starter-generator.
- (b) Remove the terminal block cover [19].
- (c) Remove the four nuts [12] from the four terminal studs.

- (d) Disconnect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18] from the four terminal studs.

NOTE: The terminal strip and fanning strip [15] show the identification of the terminal studs for terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18].

- (e) Install the four nuts [12] on the four terminal studs.
- (f) Install the terminal block cover [19] on the starter-generator:
 - 1) Put the terminal block cover [19] on the starter-generator.
 - 2) Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-020-025

- (4) Disconnect the bonding jumper [20] as follows:

- (a) Remove the two nuts [21] and two washers [22] that attach the bonding jumper [20] to the APU [71].
- (b) Disconnect the bonding jumper [20] from the two studs.
- (c) Keep the two nuts [21] and two washers [22] for the replacement APU [71].

SUBTASK 49-11-00-020-026

- (5) Remove the drain tube [29] from the exhaust duct muffler [23]:

- (a) Disconnect the drain tube [29] from the fitting [30] on the exhaust duct muffler [23].
- (b) Disconnect the drain tube [29] from the fitting [80] on the aft drain tube of the APU [71].
- (c) Remove the drain tube [29].
- (d) Install the caps or plugs on the drain tube [29], fitting [30], and fitting [80].

SUBTASK 49-11-00-020-027

- (6) Disconnect the exhaust duct muffler [23]:

- (a) Remove the V-band clamp [27] from the exhaust duct muffler [23].

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- (b) Disconnect and move the exhaust duct muffler [23] aft to approximately 0.25 in. (6.35 mm) from the APU [71].

SUBTASK 49-11-00-480-008

- (7) Attach the adapter [101] (equipment, SPL-1972) to the APU [71] as follows:
 - (a) Put the adapter [101] and jack assembly [105] (hydraulic jack, SPL-1561) on the maintenance stand.
 - 1) Make sure that the jack assembly [105] is centered under the APU [71].
 - (b) Lift the maintenance stand to the APU compartment.
 - (c) Lift the jack assembly [105] until the adapter [101] and three ground handling mounts [106] engage.
 - (d) Install the three pins [107] that attach the adapter [101] to the three ground handling mounts [106].
 - (e) Install the three spring clips [108] in the three pins [107].
 - (f) Use the jack assembly [105] to lift the APU [71] sufficiently to remove the weight of the APU [71] from the forward and aft mounts.

SUBTASK 49-11-00-020-028

- (8) Disconnect the left forward mount for the APU [48] as follows:
 - (a) Remove the nut [46], two washers [50], and bolt [51] from the left forward bracket [45].
 - (b) Disconnect the left forward mount for the APU [48] from the left forward bracket [45].
 - (c) Let the left forward mount for the APU [48] hang vertically.
 - (d) Make sure that the bushing [57] is installed in the left forward mount for the APU [48].
 - (e) Install the bolt [51], two washers [50], and nut [46] on the left forward mount for the APU [48].

SUBTASK 49-11-00-020-037

- (9) Disconnect the left aft mount for the APU [52], right aft mount for the APU [59], and right forward mount for the APU [63] as follows:
 - (a) Remove the lockwire from the two capstans on the Fire Shield Cover Assembly [115] to get access to nut [66] on the right forward mount for the APU [63].
 - (b) Remove the nut [56] and washer [55] from the cone bolt [53] on the left aft mount for the APU [52].
 - (c) Remove the nut [62] and washer [61] from the cone bolt [53] on the right aft mount for the APU [59].
 - (d) Remove the nut [66] and washer [65] from the cone bolt [53] on the right forward mount for the APU [63].



FULLY ENGAGED THE THREAD PROTECTORS ON THE CONE BOLTS. IF THE THREAD PROTECTORS ARE NOT FULLY ENGAGED, THE APU MOUNTING BRACKETS WILL CATCH ON THE THREAD PROTECTORS. THIS CAN CAUSE THE APU TO MOVE SUDDENLY. A SUDDEN MOVEMENT OF THE APU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (e) Install the thread protector [58] (protector, SPL-1971) on the three cone bolts [53].

NOTE: The cone bolt [53] is a part of the vibration isolator for the APU mount.

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SUBTASK 49-11-00-020-029

- (10) Remove the APU [71].

NOTE: The weight of the APU [71] is approximately 410 lb (186 kg).



BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15 DEGREES IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE INSULATION AROUND THE RIGHT FRONT MOUNT, THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- (a) Tilt the APU [71] so that the forward end of the APU [71] is lower than the aft end.

NOTE: When the APU [71] is installed, it is in the 11° forward-end-down position.

- (b) Slowly lower the APU [71] out of the APU compartment.



DO NOT USE THE ADAPTER AND THE JACK ASSEMBLY TO MOVE THE APU. DAMAGE TO THE APU CAN OCCUR.

- (c) Move the APU [71] away from the APU compartment and maintenance stand as follows:

- 1) Use the cradle assembly [69] (assembly, SPL-1970) and transportation base [70] (base, SPL-1957) to move the APU [71] to a different area.

- (d) Make sure that the two rings [111] and two bow shackles [110] are on the sling [109] (sling, SPL-1969).

- (e) Attach the two bow shackles [110] of the sling, SPL-1969, to the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].

- (f) Use the sling [109] to lift the APU [71] sufficiently to remove the weight of the APU [71] from the jack assembly [105].

NOTE: The sling [109] must be used in conjunction with the overhead crane or hoist.

- (g) Remove the four nuts [102], four washers [103], and four bolts [104] that attach the adapter [101] to the jack assembly [105].

- (h) Remove the jack assembly [105].

- (i) Remove the adapter [101] from the APU [71]:

- 1) Remove the three spring clips [108] from the three pins [107].
- 2) Remove the three pins [107] that attach the adapter [101] to the three ground handling mounts [106].
- 3) Remove the adapter [101].

- (j) Install the forward attach assembly [76] on the right forward bracket [64] with the washer [78] and nut [79].

NOTE: The cradle assembly [69] (assembly, SPL-1970), has three components, a forward attach assembly [76] and two aft attach assemblies [77]. These three assemblies attach the three APU brackets to the cradle assembly [69].

- (k) Install the two aft attach assemblies [77] on the left aft bracket [54] and right aft bracket [60] with the two washers [78] and two nuts [79].

- (l) Loosen the three jamnuts [72] from the three knobs [73] on the cradle assembly [69].

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- (m) Loosen the knobs [73] until the three top clamp blocks [74] disengage from the three bottom clamp blocks [75].
- (n) Open the three top clamp blocks [74].
- (o) Slowly lower the APU [71] on the cradle assembly [69] and transportation base [70] until the forward attach assembly [76] and two aft attach assemblies [77] engage the three bottom clamp blocks [75].
- (p) Close the three top clamp blocks [74].
- (q) Tighten the knobs [73].
- (r) Tighten the three jamnuts [72] on the three knobs [73].
- (s) Disconnect the two bow shackles [110] of the sling [109] (sling, SPL-1969) from the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
- (t) Remove the APU [71], cradle assembly [69], and transportation base [70] from the area.

SUBTASK 49-11-00-010-011

- (11) Remove the Fire Shield Cover Assembly [115] from the right forward mount for the APU [63] as follows:
 - (a) Remove the screw [116] and washer [117].
 - (b) Remove the Fire Shield Cover Assembly [115] from the right forward mount for the APU [63].

SUBTASK 49-11-00-210-011

- (12) Do a general visual inspection of the APU compartment as follows:
 - (a) Do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.
 - (b) Do this task: APU Firewall Covers Inspection (with APU Removed), TASK 49-17-11-210-801.
 - (c) Do this task: Air Inlet Seal Inspection, TASK 49-15-11-200-801.
 - (d) Visually examine the front area and inner surfaces of the exhaust duct muffler [23] for cracks and damage.

NOTE: Examine the areas that you can access from the APU compartment.
 - (e) If cracks or damage are found on the exhaust duct muffler [23], do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-802.
 - (f) Visually examine the inner surfaces of the APU air inlet plenum for cracks and damage.

NOTE: Examine the areas that you can access from the APU compartment.
 - (g) If cracks or damage are found on the APU air inlet plenum, replace the APU air inlet plenum (TASK 49-15-15-000-802 and TASK 49-15-15-400-802).
 - (h) Do this task: Eductor Inlet Duct Inspection, TASK 49-91-71-200-801.
 - (i) Visually examine the bleed air duct for signs of oil and other contamination.
 - (j) If signs of oil and other contamination are found, do these steps:
 - 1) Clean the bleed air duct (TASK 36-13-01-100-801).
 - 2) Remove the oil contamination from the air conditioning and pneumatic systems (TASK 21-00-01-100-801).
 - (k) Visually examine the four APU mounts for cracks, corrosion and damage.
 - (l) If cracks or signs of corrosion, or damage are found, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-00-200-803.

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SUBTASK 49-11-00-020-030

- (13) Install all necessary protection covers.

————— **END OF TASK** —————

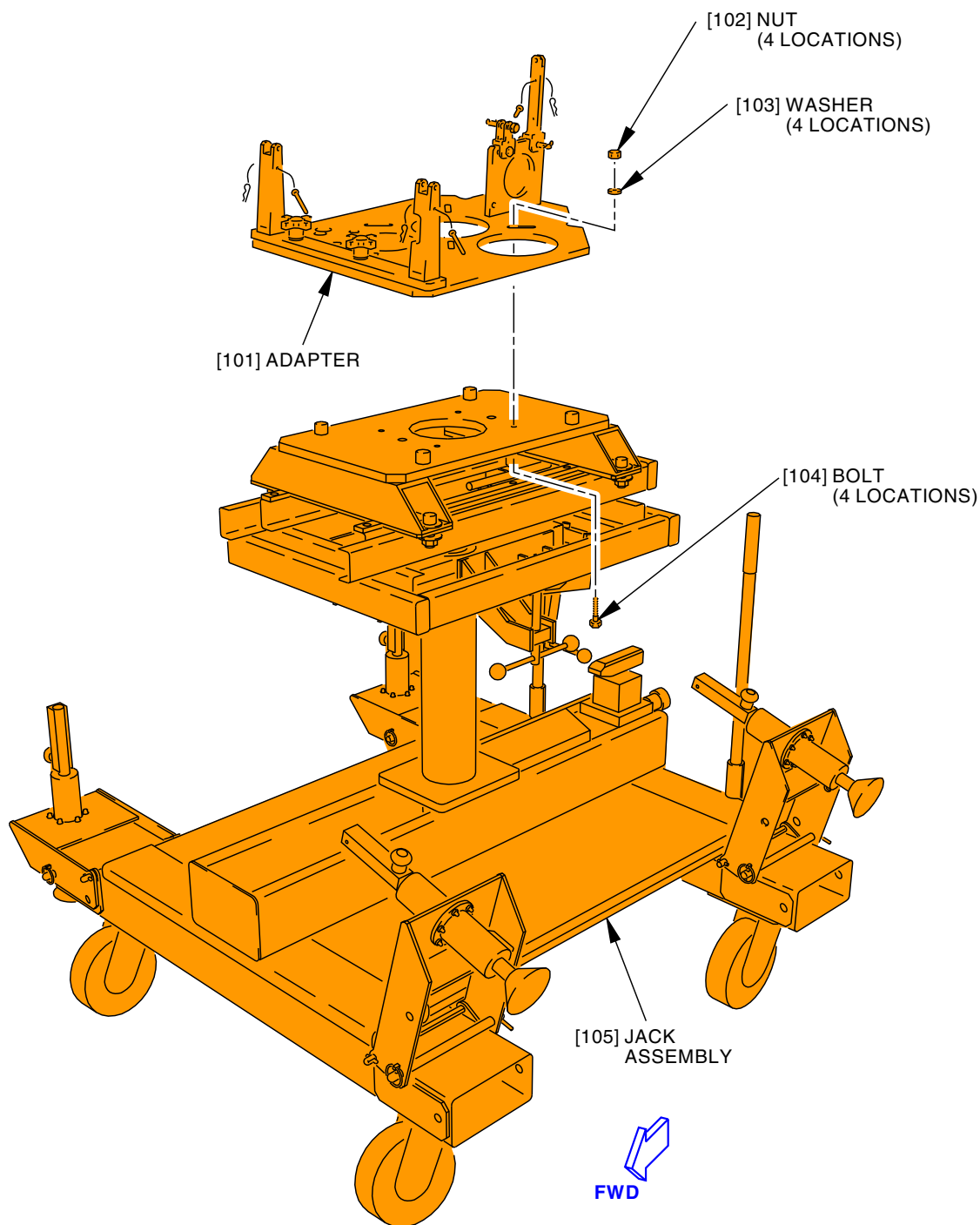
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2415433 S00061537826_V2

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 1 of 12)

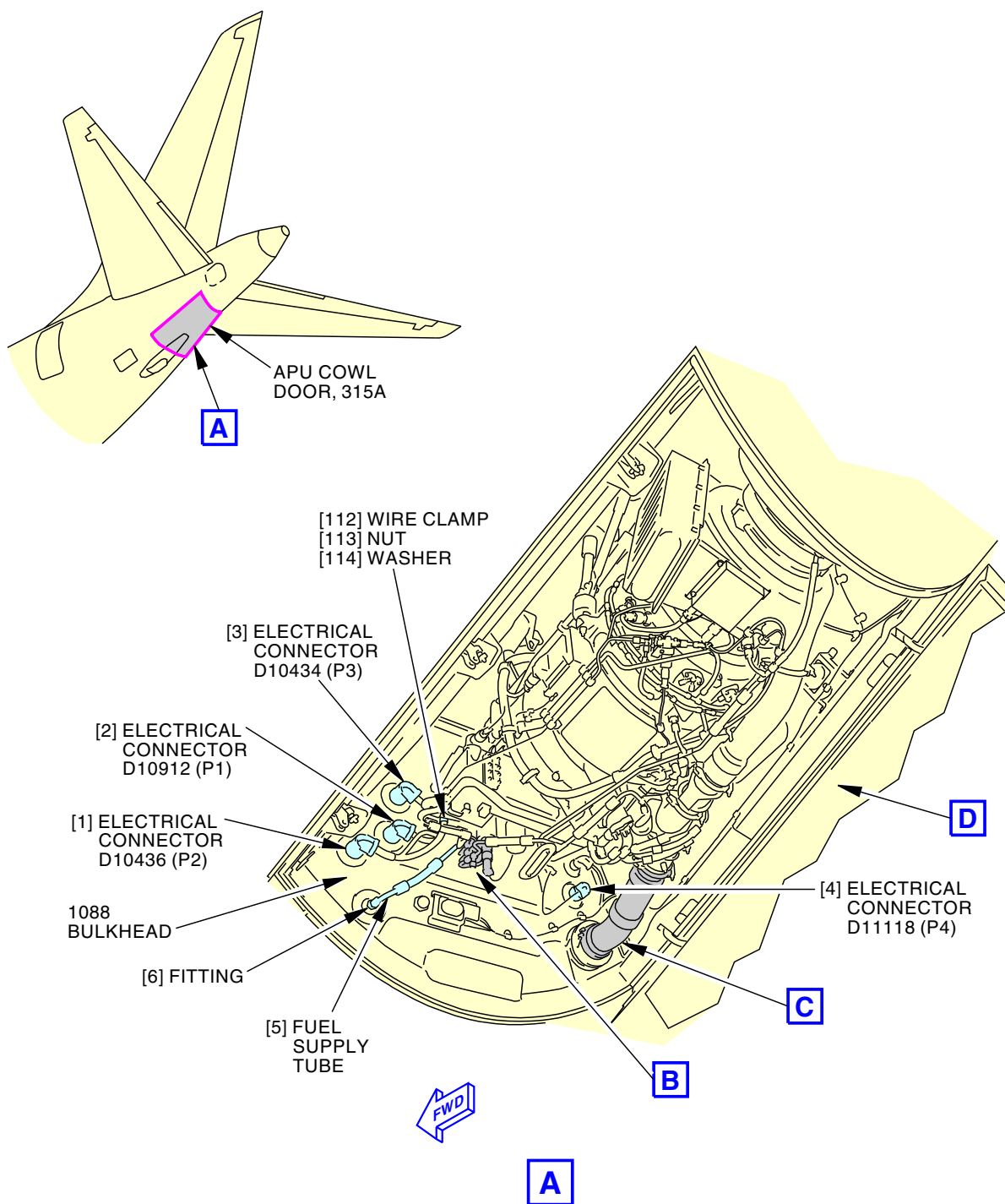
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2415434 S00061537827_V2

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 2 of 12)

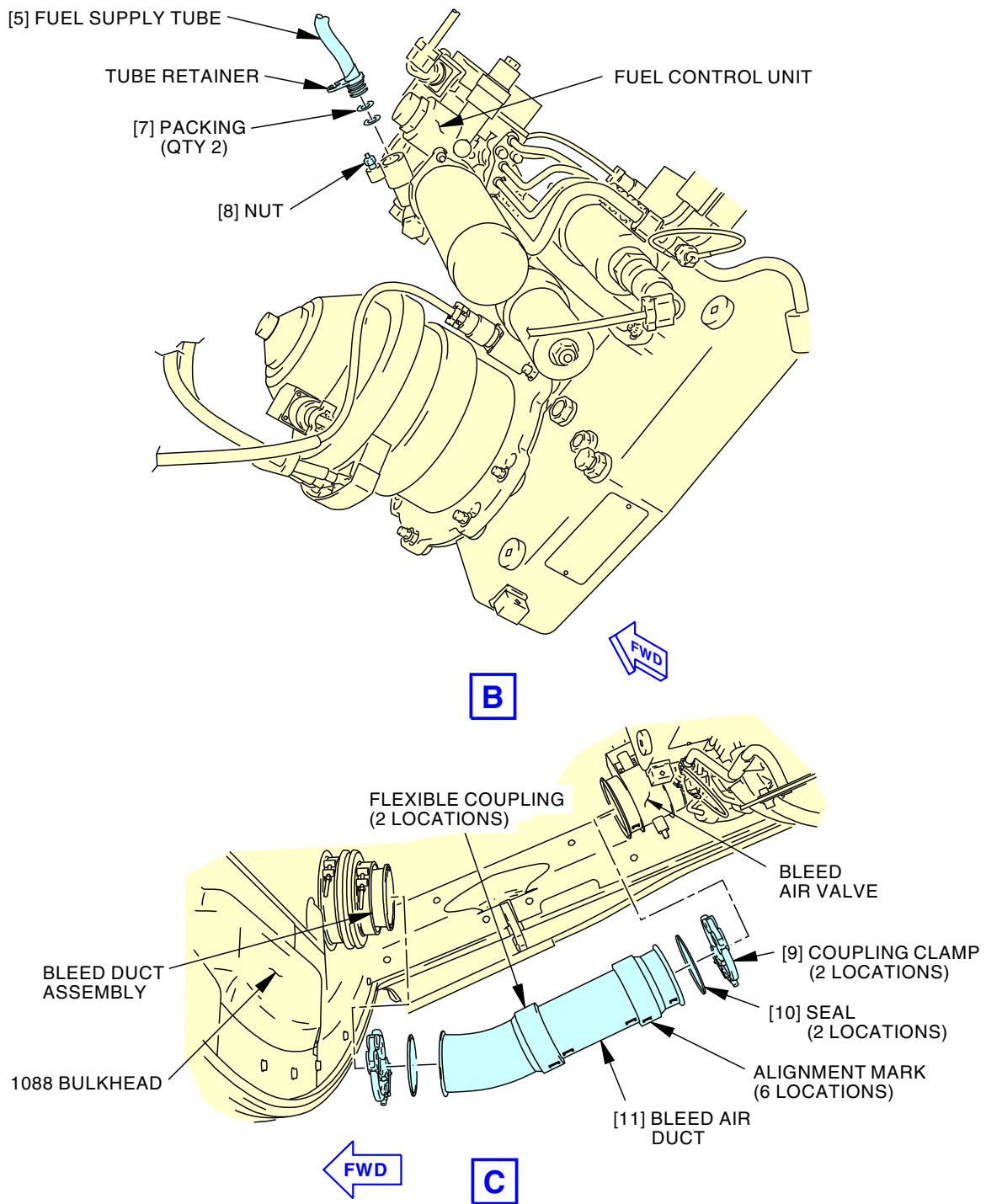
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2415435 S00061537828_V1

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 3 of 12)

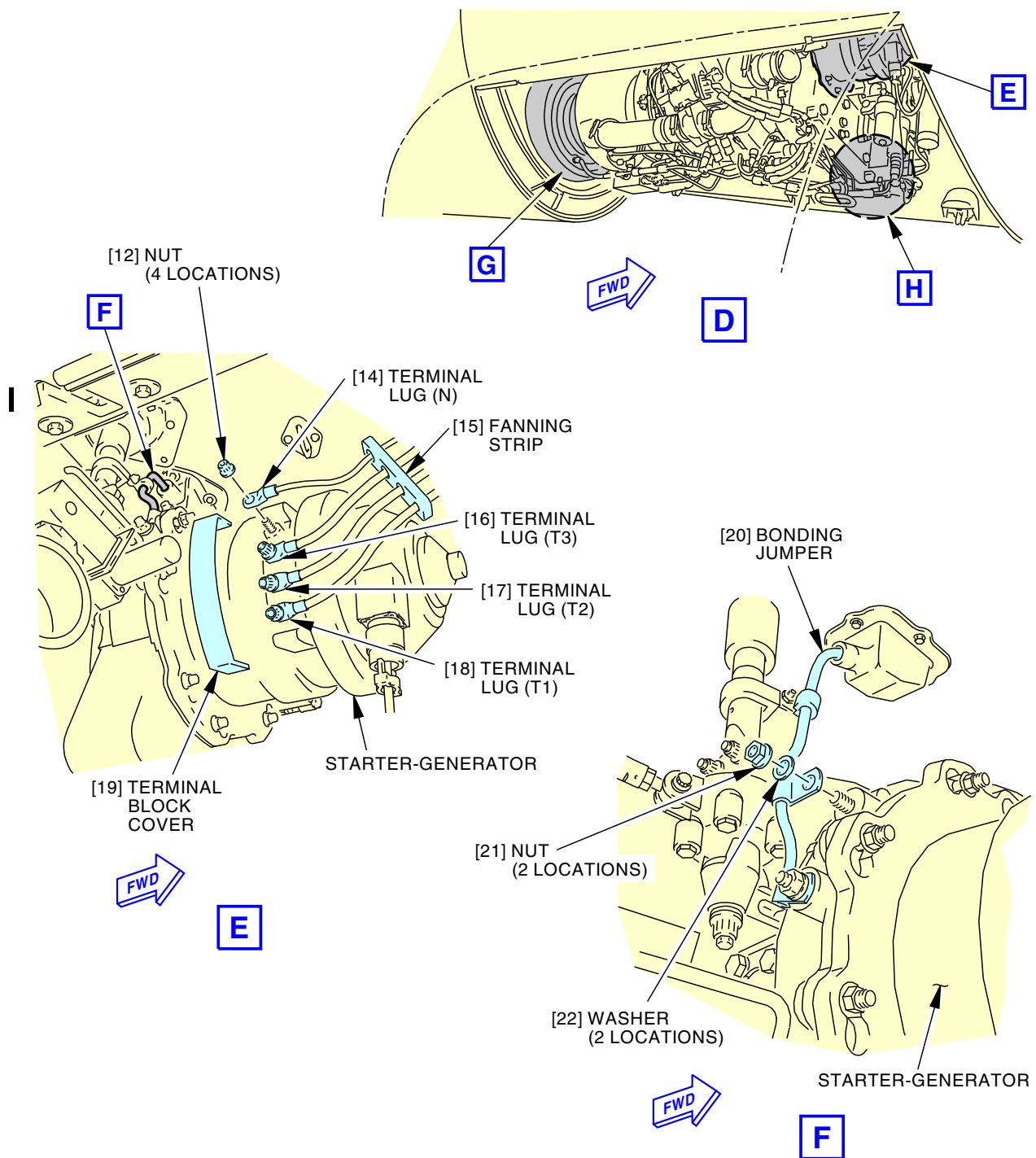
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2415436 S00061537829_V3

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 4 of 12)

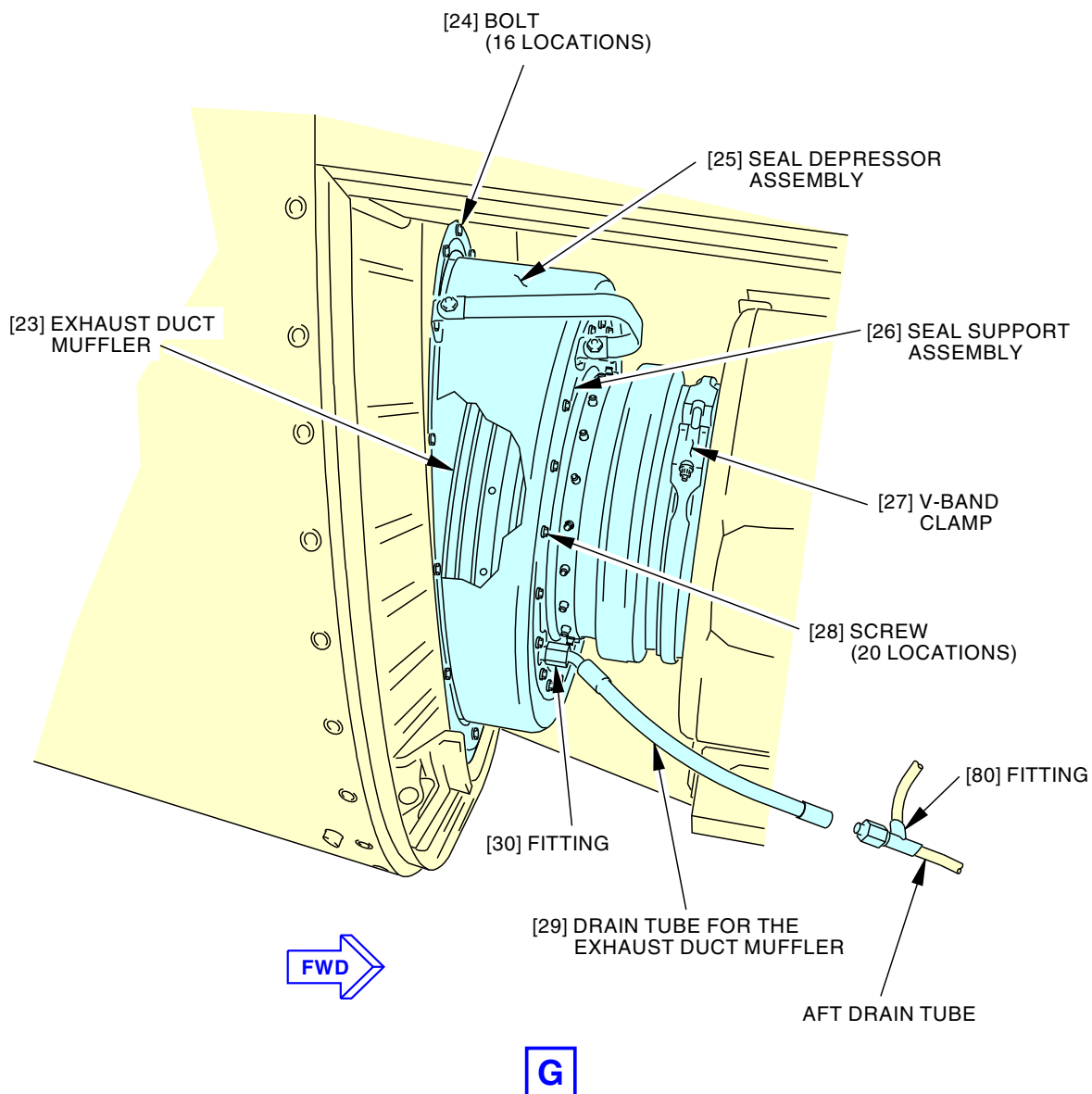
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2415437 S00061537830_V2

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 5 of 12)

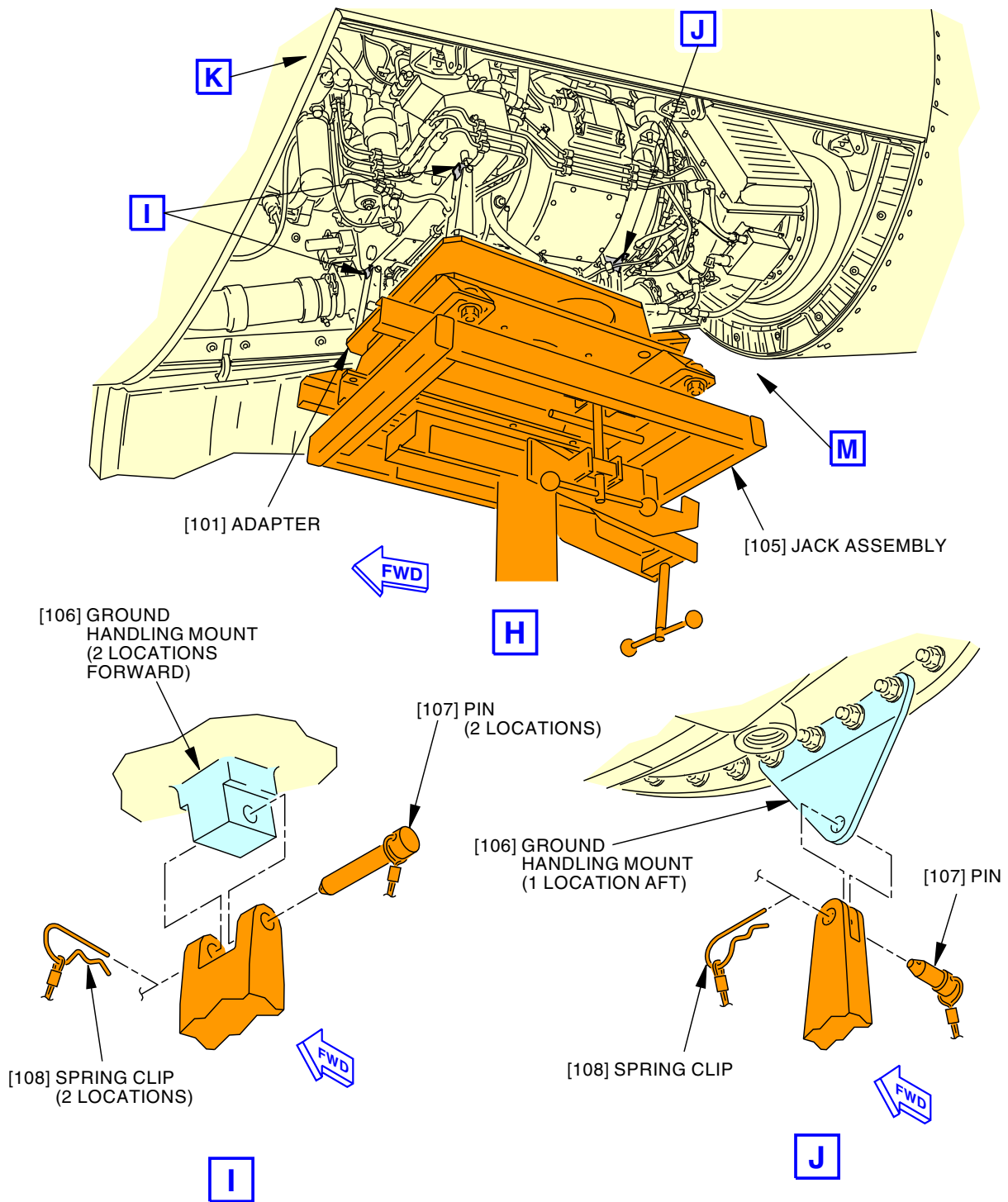
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2415438 S00061537831_V1

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 6 of 12)

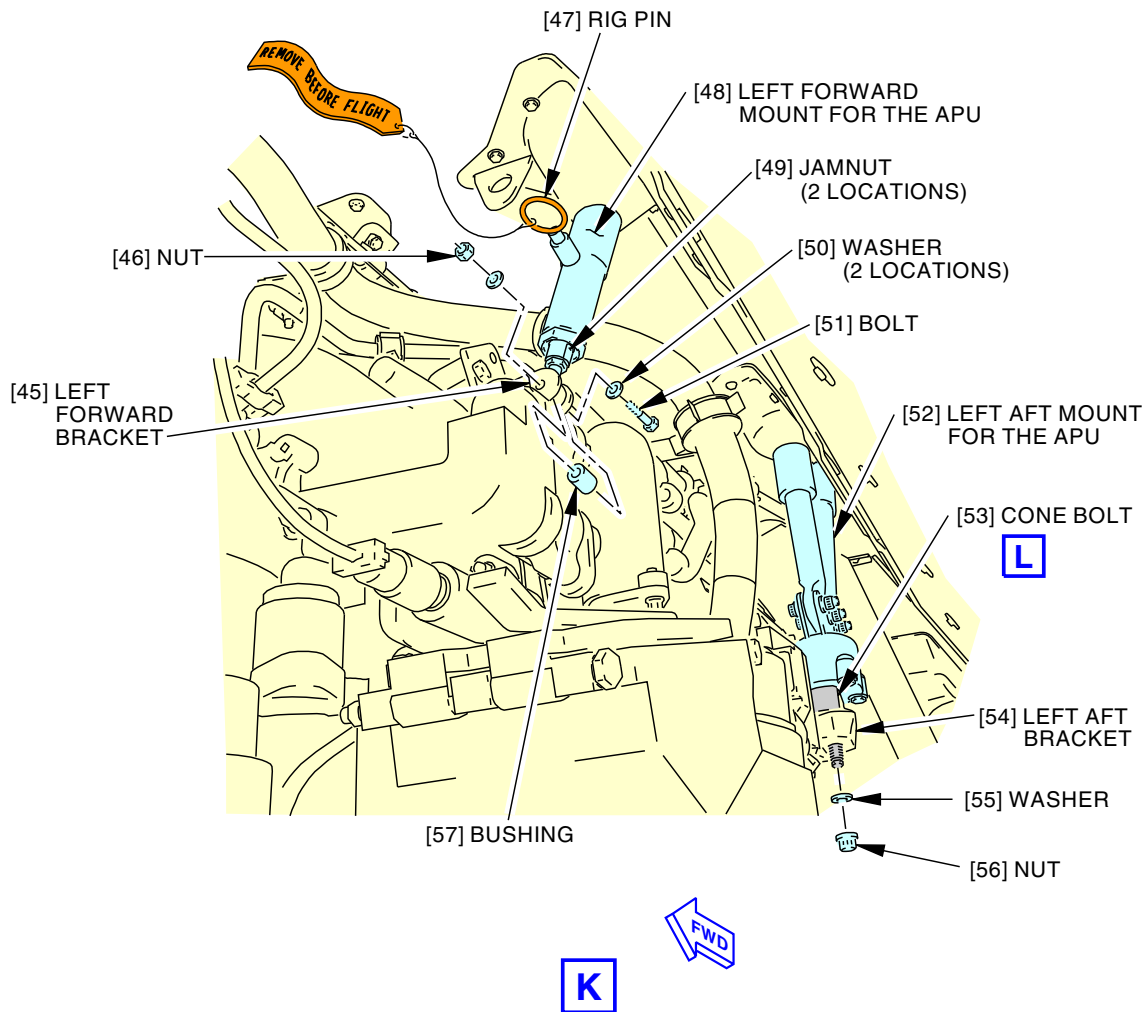
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2415439 S00061537832_V2

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 7 of 12)

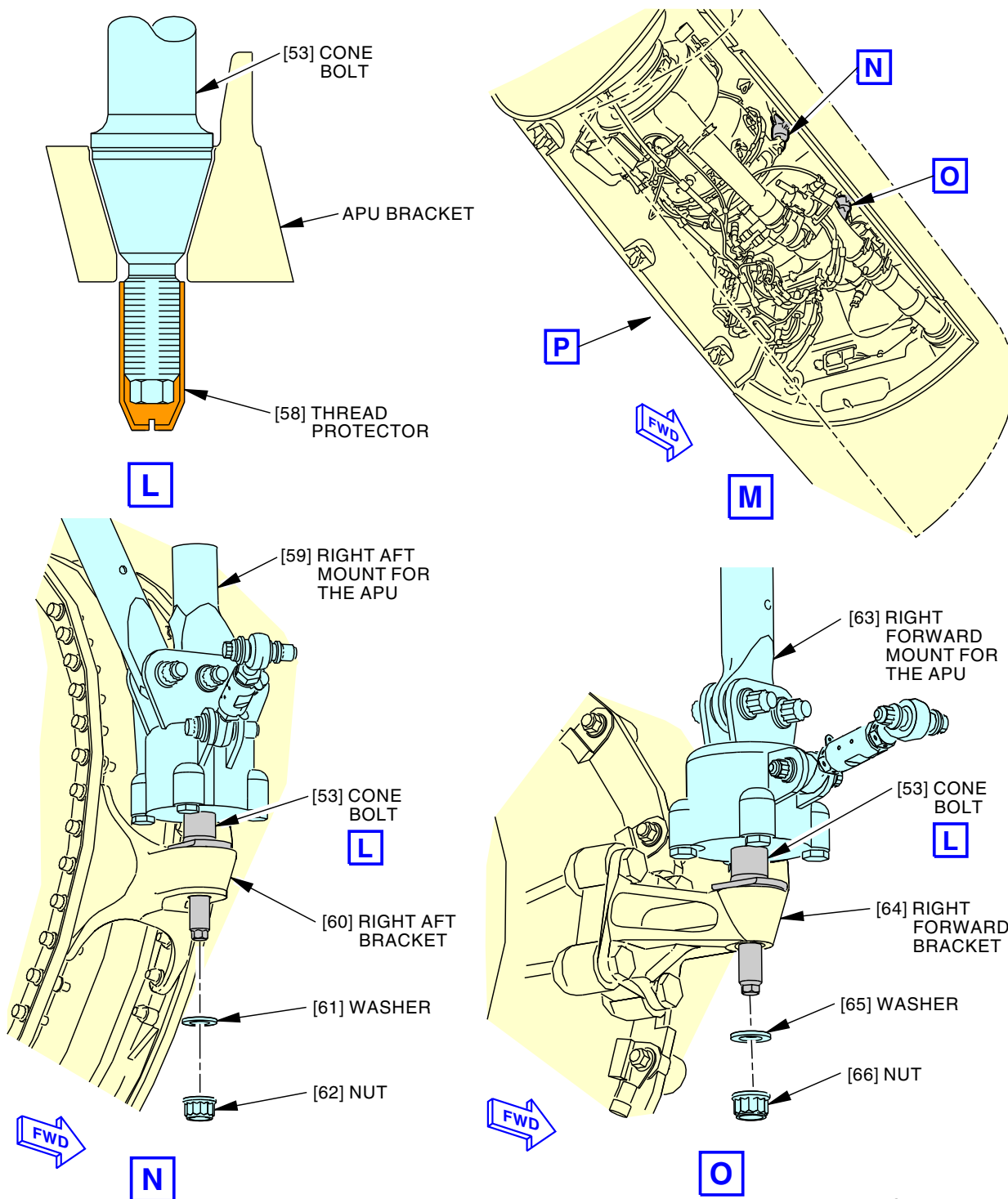
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2415440 S00061537833_V2

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 8 of 12)

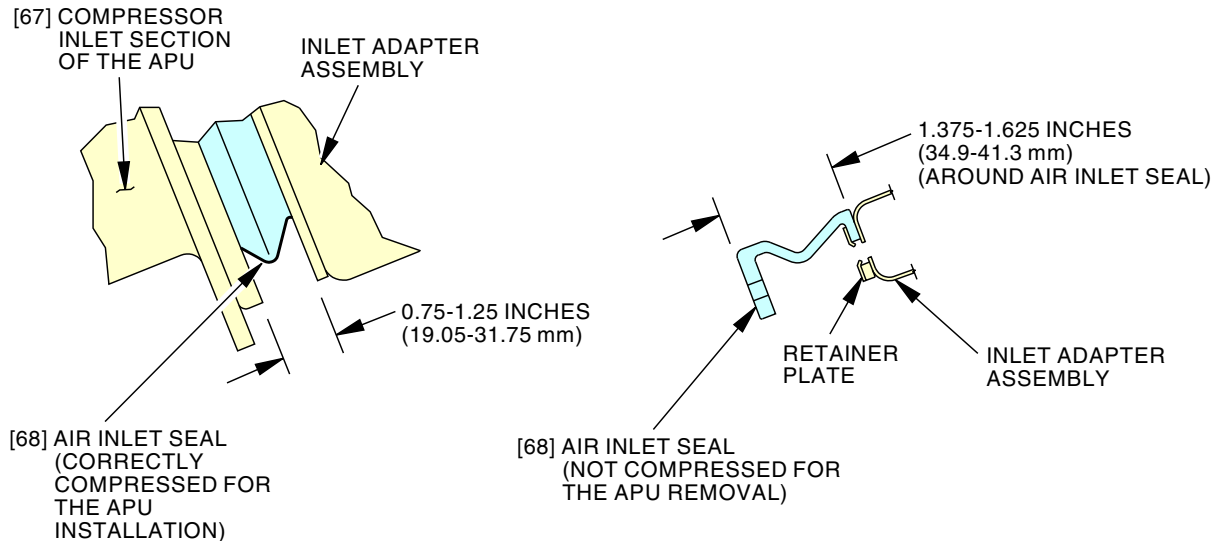
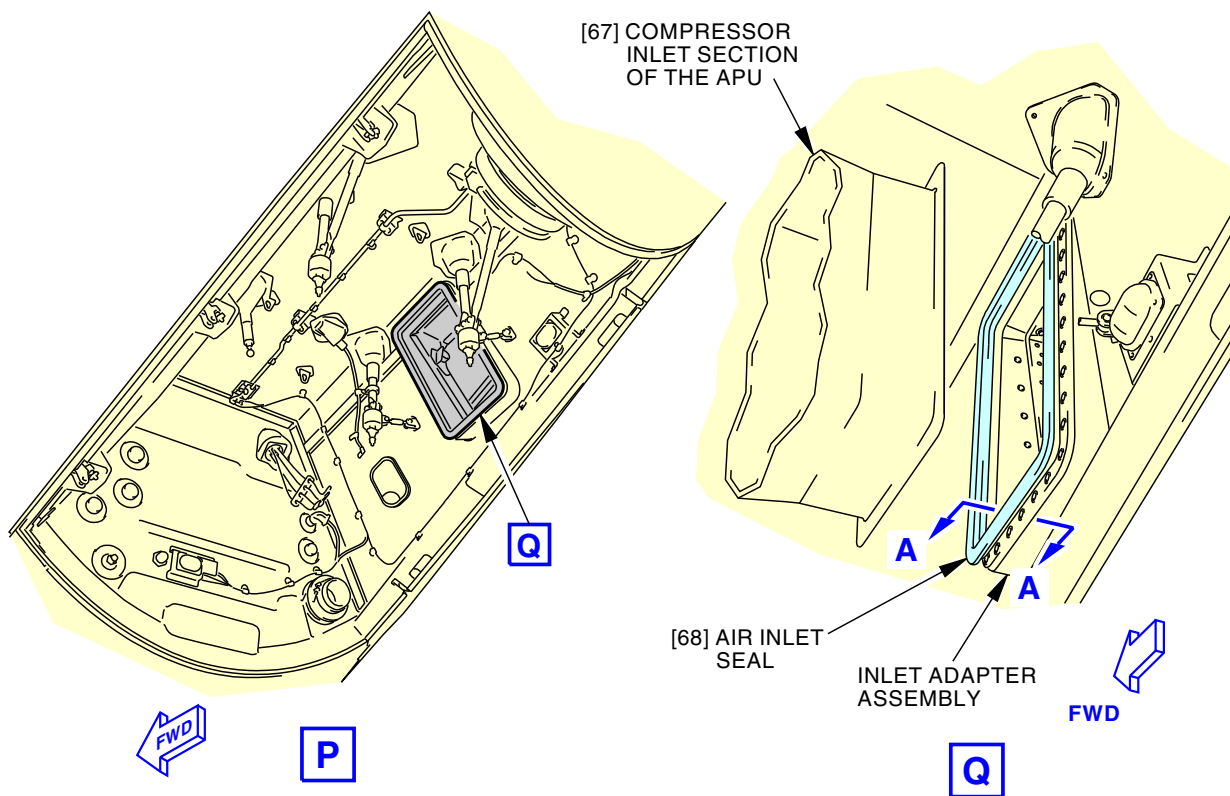
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(VIEW IN THE FORWARD DIRECTION)

A-A

2415441 S00061537834_V2

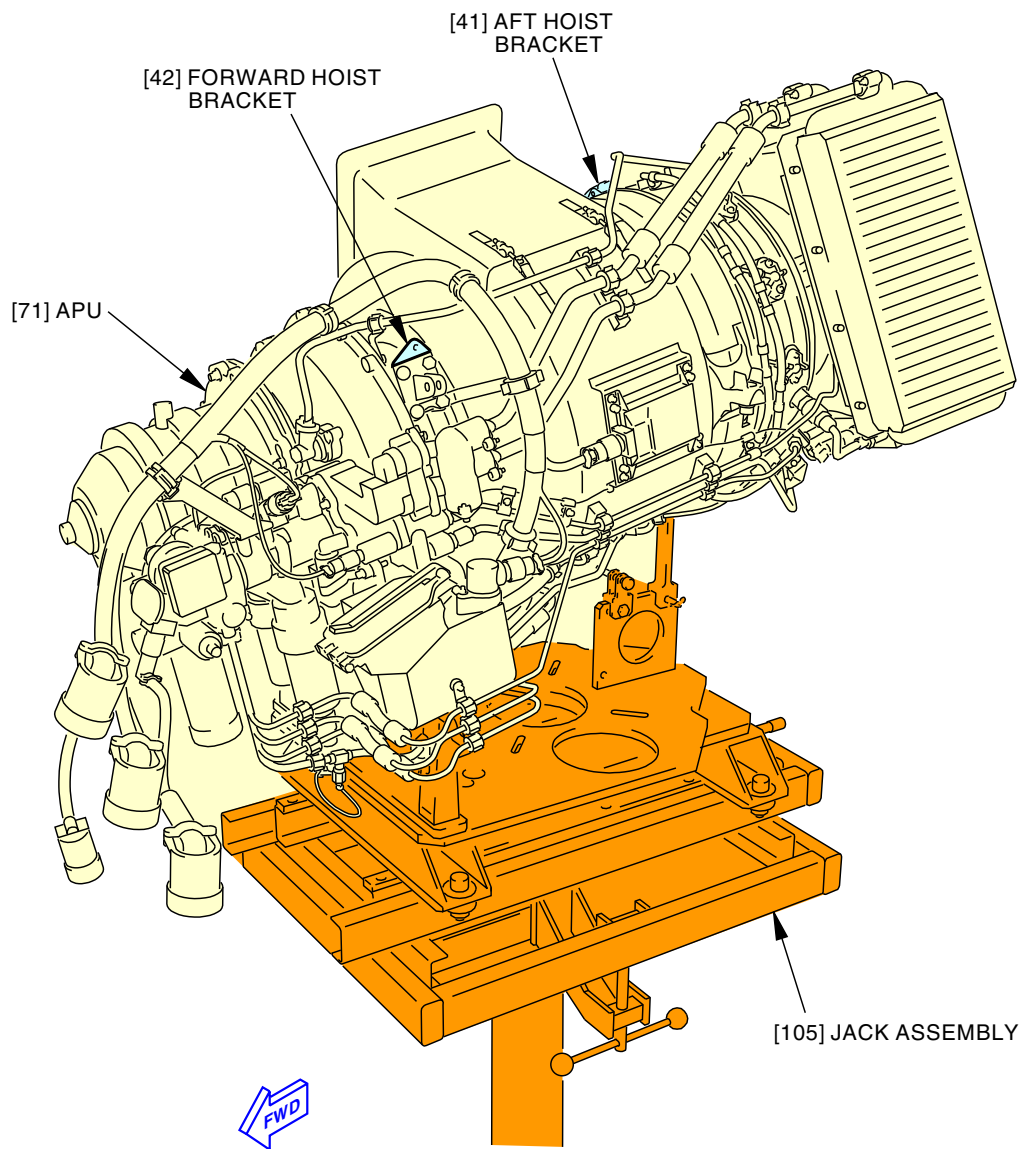
APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 9 of 12)

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2415442 S00061537835_V1

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 10 of 12)

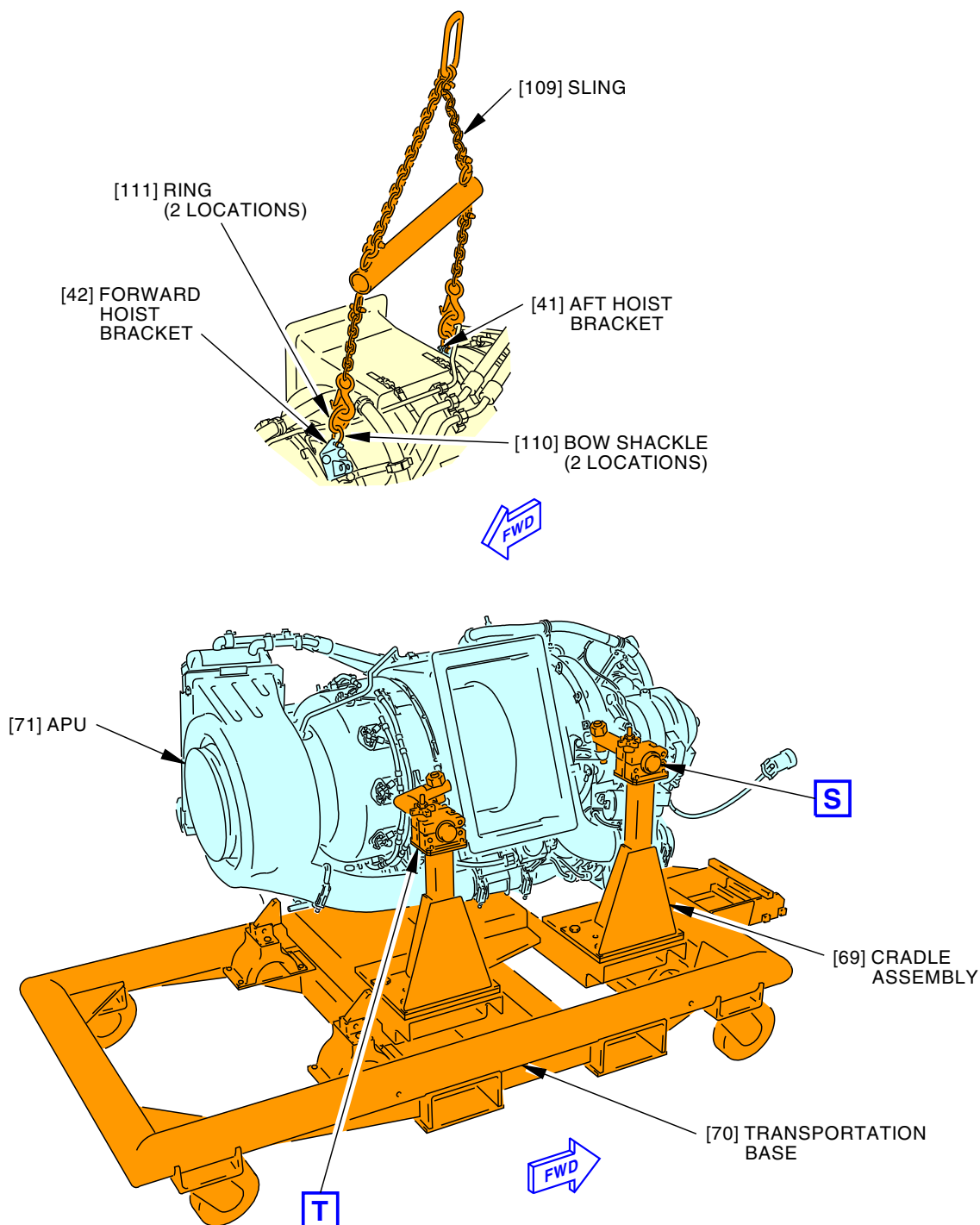
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2415443 S00061537836_V2

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 11 of 12)

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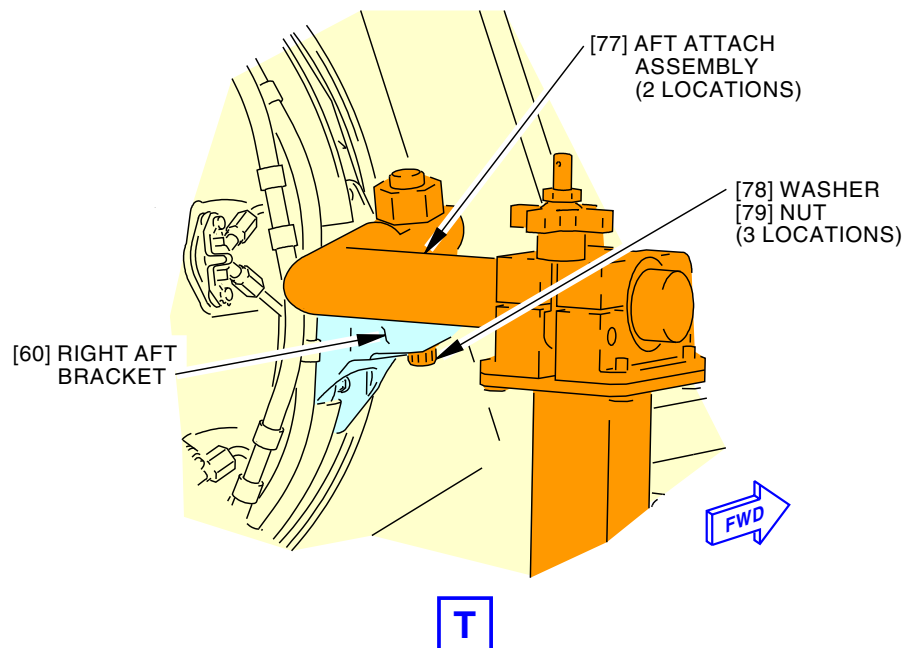
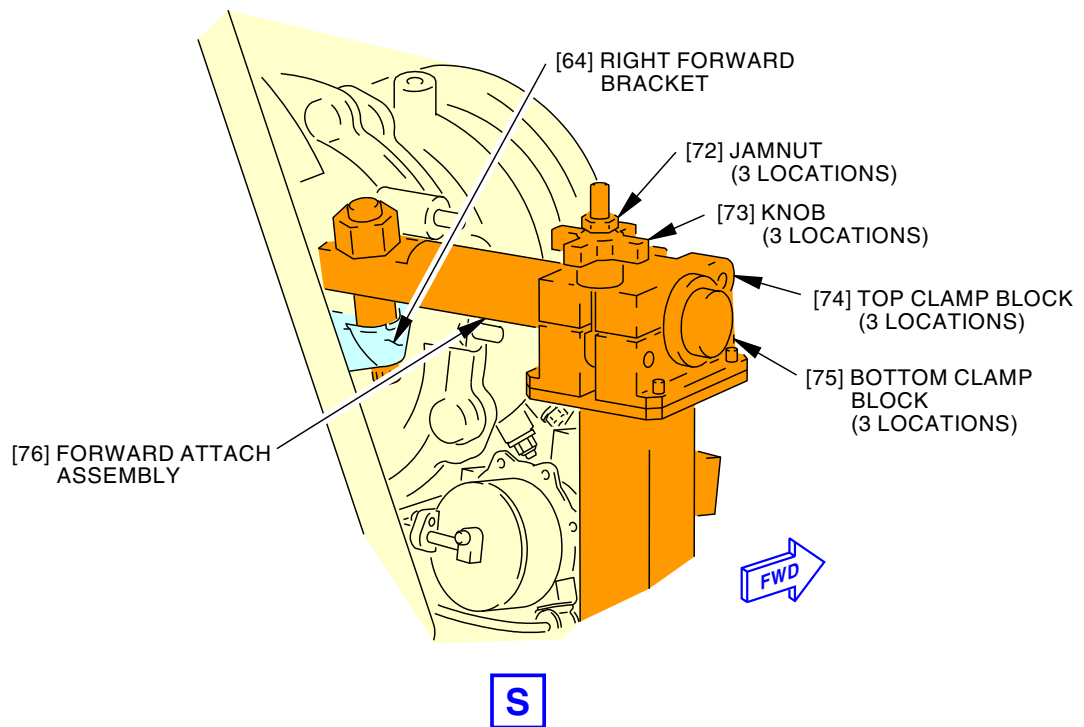
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2415444 S00061537837_V2

APU Power Plant Installation (Hydraulic Jack)
Figure 403/49-11-00-990-806 (Sheet 12 of 12)

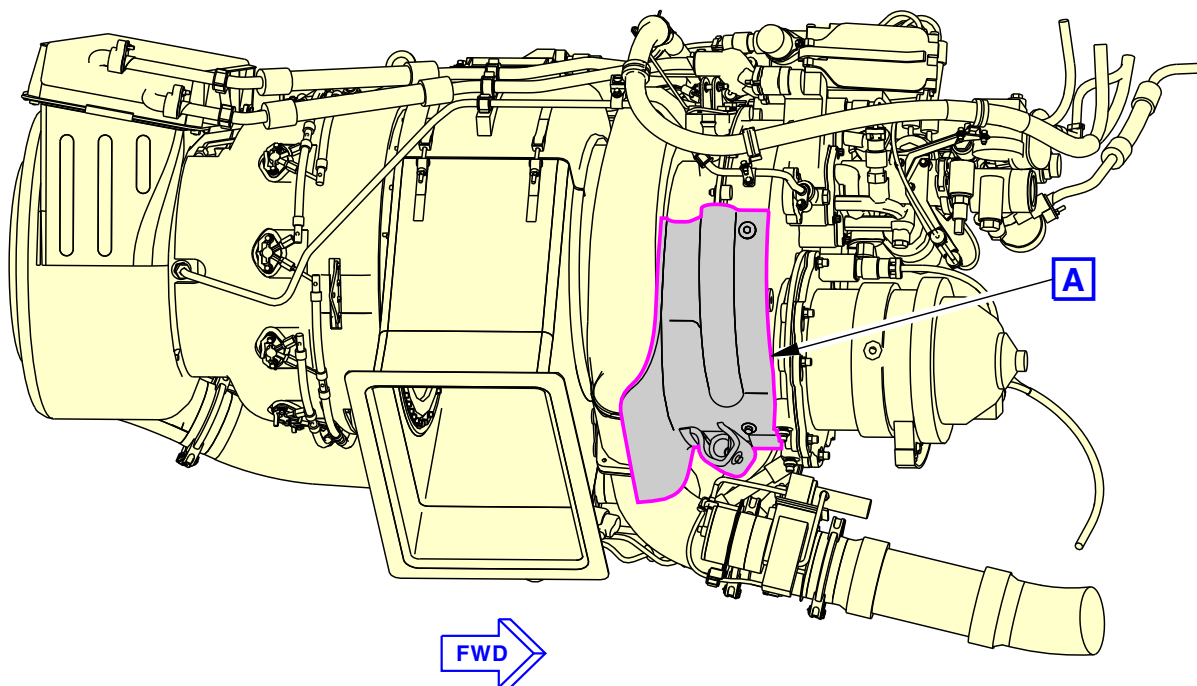
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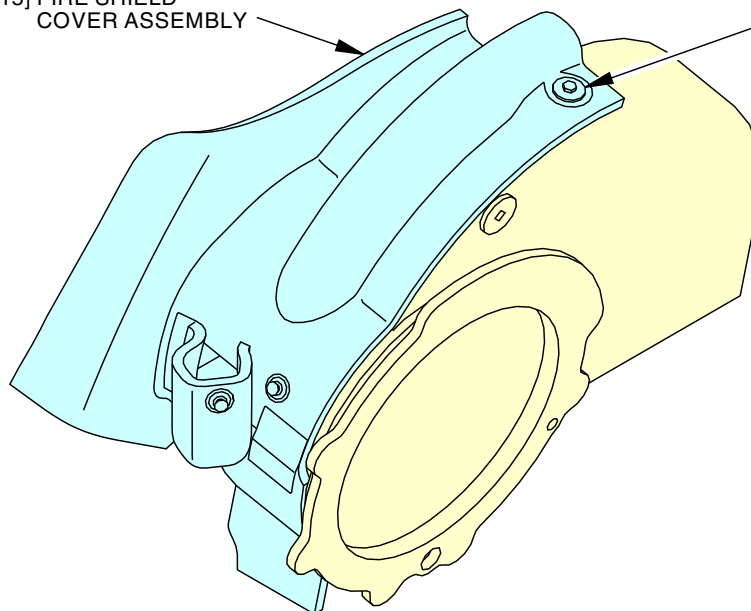
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[115] FIRE SHIELD
COVER ASSEMBLY

[116] SCREW
[117] WASHER



A

2830628 S0000656766_V2

Fire Shield Cover Assembly Installation
Figure 404/49-11-00-990-810

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TASK 49-11-00-400-803

7. APU Power Plant Installation - Hydraulic Jack

(Figure 403)

A. General

(1) This task is for the installation of the Auxiliary Power Unit (APU) using the hydraulic jack.

B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
20-60-07-910-802	Inspection, Cleaning and Sealing of Electrical Connectors (P/B 201)
46-13-02	ONBOARD MAINTENANCE FUNCTION
49-11-00-710-802	APU Operational Test (P/B 501)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-13-00-200-803	APU Mounts Inspection (APU Removed) (P/B 601)
49-15-11-000-801	Air Inlet Seal Removal (P/B 401)
49-15-11-400-801	Air Inlet Seal Installation (P/B 401)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-61-00-700-801	APU BITE Procedure (P/B 201)
49-61-00-710-801	APU Configuration Report (P/B 201)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
SPL-1561	Jack - Hydraulic Part #: 930002 Supplier: FA2A9 Part #: J20009-110 Supplier: 81205 Opt Part #: J20009-108 Supplier: 81205 Opt Part #: J20009-109 Supplier: 81205
SPL-1957	Base - Transportation, APU Part #: F72950-158 Supplier: 81205
SPL-1969	Sling - Shop Handling, used with AlliedSignal AE131-9 APU Part #: C49004-40 Supplier: 81205

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(Continued)

Reference	Description
SPL-1970	Assembly - Cradle, AE131-9B APU Part #: C49010-50 Supplier: 81205
SPL-1971	Protector - Thread, APU Mount Bolt Part #: C49006-1 Supplier: 81205
SPL-1972	Equipment - Adapter, APU Jacking Part #: C49008-37 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin
STD-1208	Lever - Wood, 2 Inch by 4 Inch, 4-7 Feet Long
STD-1242	Hammer - Standard
STD-3906	Mallet - Rubber
STD-7394	Cap - Dust, Electrical Connector

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02272	Fuel - Turbine, Aviation (Grades JP-4, JP-5, JP-5/JP-8ST)	MIL-DTL-5624
G50222	Brush - Tampico Fiber, Non-Metallic	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Packing	49-31-11-01-015	SIA ALL
11	Bleed air duct	49-52-11-01-015	SIA ALL
29	Drain tube	49-11-00-10-075	SIA ALL
71	APU	49-11-00-03-130	SIA ALL
		49-11-00-03-135	SIA ALL

F. Location Zones

Zone	Area
211	Flight Compartment - Left

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(Continued)

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

G. Access Panels

Number	Name/Location
315A	APU Cowl Door

H. Prepare for the Installation

SUBTASK 49-11-00-210-012

(1) Visually examine these components for wear, cracks, and damage:

- (a) The left forward mount for the APU [48]
- (b) The left aft mount for the APU [52]
- (c) The right aft mount for the APU [59]
- (d) The right forward mount for the APU [63].

SUBTASK 49-11-00-211-003

(2) If wear, cracks, or damage are found, do this task: APU Mounts Inspection (APU Removed), TASK 49-13-00-200-803.

SUBTASK 49-11-00-210-013

(3) Visually examine the three ground handling mounts [106] on the APU for wear, cracks, and damage.

SUBTASK 49-11-00-220-002

(4) Measure the height of the air inlet seal [68] before you install the APU [71] as follows:

- (a) Make sure that the height from the bottom to the top of the air inlet seal [68] is 1.500 ± 0.125 in. (38.100 ± 3.175 mm).
- (b) If it is necessary, remove and install the air inlet seal (TASK 49-15-11-000-801 and TASK 49-15-11-400-801).

SUBTASK 49-11-00-420-021

(5) If it is necessary, remove the protection covers from the compressor inlet section of the APU [67] and APU exhaust duct.

I. APU Power Plant Installation - Hydraulic Jack

SUBTASK 49-11-00-080-005

(1) Remove the APU [71] from the assembly, SPL-1970 (cradle assembly [69]), and base, SPL-1957 (transportation base [70]) as follows:

- (a) Make sure that the APU [71], cradle assembly [69], and transportation base [70] is centered under the sling, SPL-1969 (sling [109]).
- (b) Make sure that the two rings [111] and two bow shackles [110] are attached to the sling, SPL-1969 (sling [109]).
- (c) Attach the two bow shackles [110] of the sling, SPL-1969, to the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
- (d) Make sure that the chains of the sling [109] (sling, SPL-1969) are tight to hold the weight of the APU [71].

NOTE: The sling [109] must be used in conjunction with an overhead crane or hoist.

NOTE: The weight of the APU [71] is approximately 410 lb (186 kg).

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- (e) Loosen the jamnuts [72] from the three knobs [73] on the cradle assembly [69].
- (f) Loosen the three knobs [73] until the three top clamp blocks [74] disengage the bottom clamp blocks [75].
- (g) Open the top clamp blocks [74].
- (h) Remove the nuts [79] and three washers [78] that attach the left aft bracket [54], right aft bracket [60], and right forward bracket [64] to the cradle assembly [69].
- (i) Remove the forward attach assembly [76] from the right forward bracket [64].
- (j) Remove the two aft attach assemblies [77] from the left aft bracket [54] and right aft bracket [60].
- (k) Slowly lift the APU [71] from the cradle assembly [69].
- (l) Close the three top clamp blocks [74].
- (m) Tighten the three knobs [73].
- (n) Tighten the three jamnuts [72] on the knobs [73].
- (o) Remove the cradle assembly [69] and transportation base [70] from the area.

SUBTASK 49-11-00-480-009

- (2) Attach the APU [71] to the adapter [101] (equipment, SPL-1972) and jack assembly [105] (hydraulic jack, SPL-1561) as follows:
 - (a) Put the adapter [101] in position on the jack assembly [105].
 - (b) Install the four bolts [104], four washers [103], and four nuts [102] that attach the adapter [101] to the jack assembly [105].
 - (c) Put the sling [109] (sling, SPL-1969) and APU [71] above the adapter [101].
 - (d) Lower the APU [71] until the adapter [101] and ground handling mounts [106] engage.
 - (e) Install the three pins [107] that attach the adapter [101] to the three ground handling mounts [106] on the APU [71].
 - (f) Install the three spring clips [108] in the three pins [107].
 - (g) Disconnect the two bow shackles [110] of the sling [109] from the forward hoist bracket [42] and aft hoist bracket [41] on the APU [71].
 - (h) Remove the sling [109], from the area.
 - (i) Put the APU [71] on the maintenance stand.

SUBTASK 49-11-00-420-022



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

- (3) Remove the protection covers from the compressor inlet section of the APU exhaust duct and any other openings.

SUBTASK 49-11-00-410-014

- (4) Install the Fire Shield Cover Assembly [115] on the right forward mount for the APU [63] as follows:
 - (a) Put the Fire Shield Cover Assembly [115] on the APU gearbox.
 - (b) Make sure that the flap on the insulation engages the hook and loop fasteners on the APU gearbox.

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- (c) Install the screw [116] and washer [117].
- (d) Tighten the screw [116] to 35 in-lb (4 N·m).
- (e) Make sure that the Fire Shield Cover Assembly [115] wraps around the right forward bracket [64]. (Figure 404).

SUBTASK 49-11-00-420-023

- (5) Install the APU [71] into the APU compartment:
 - (a) Make sure that the APU [71] is directly under the APU compartment.
 - (b) Make sure that the protector, SPL-1971 (thread protector [58]), are installed on the three cone bolts [53].
 - (c) Align each cone bolt [53] so that the notch in the cone bolt [53] aligns with the corresponding APU mount bracket.
 - (d) Lift the APU [71] into position:
 - 1) Hold the left aft mount for the APU [52] and right aft mount for the APU [59] in position.



CAUTION

BE CAREFUL WHEN YOU MOVE THE APU IN THE APU COMPARTMENT. YOU MUST TILT THE APU APPROXIMATELY 10-15 DEGREES IN THE FORWARD-END-DOWN POSITION WHILE THE APU IS IN THE APU COMPARTMENT. DAMAGE TO THE INSULATION AROUND THE RIGHT FRONT MOUNT, THE FUEL SUPPLY LINE, STARTER-GENERATOR WIRE HARNESS AND ENGINE WIRE HARNESS CAN OCCUR.

- 2) Tilt the APU [71] so that the forward end of the APU is approximately 11° lower than the aft end.

NOTE: An installed APU is at an 11° forward-end-down position.
- 3) Slowly lift the APU [71] until the left aft bracket [54], right aft bracket [60], and right forward bracket [64] are below the three cone bolts [53].
- 4) Make sure that the left aft mount for the APU [52], right aft mount for the APU [59], and right forward mount for the APU [63] are engaged at the same time.



CAUTION

CAREFULLY LIFT THE APU SO THAT YOU DO NOT DAMAGE THE CONED SURFACES OF THE APU MOUNTS. IF YOU DO NOT, IT CAN CAUSE DAMAGE.

- 5) Lift the APU [71] until the three cone bolts [53] are engaged.
- 6) Lift the APU [71] until the air inlet seal [68] fully engages with the compressor inlet section of the APU [67].
- 7) Measure the height of the compressed area of the air inlet seal [68] with the APU [71] in position for the installation as follows:
 - a) Make sure that the height from the bottom to the top of the air inlet seal is less than 1.25 in. (31.75 mm).

NOTE: This is the height between the inlet adapter assembly and the APU.
 - b) If it is necessary, remove and install the air inlet seal (TASK 49-15-11-000-801 and TASK 49-15-11-400-801).
- (e) Connect the APU [71] to the forward and aft mounts as follows:

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- 1) Remove the thread protector [58] (protector, SPL-1971) from the three cone bolts [53].
 - 2) Apply the Never-Seez NSBT compound, D00006, to the threads of the three cone bolts [53].
 - 3) Install the washer [55], washer [61], washer [65], nut [56], nut [62], and nut [66] on the three cone bolts [53].
 - 4) Do the torque limit test for the nut [56], nut [62], and nut [66]:
 - a) Tighten the nut [56], nut [62], and nut [66] to a run-on torque of 100 in-lb (11.3 N·m) or less.
 - b) Stop when a minimum of one full thread and the cone bolt [53] chamfer extends below each nut but not before the washer touches the APU mount.
 - c) Make sure that the break-away torque necessary to turn the nut [56], nut [62], and nut [66] from this position is more than 14 in-lb (1.6 N·m).
 - d) Replace the nut [56], nut [62], or nut [66] that does not meet these torque limits.
 - e) If the nut [56], nut [62], or nut [66] is replaced, do the torque limit test again for the new nut [56], nut [62], or nut [66].
 - 5) Tighten the nut [56], nut [62], and nut [66] to 400 ±25 in-lb (45 ±3 N·m).
 - 6) Secure the two capstans on the Fire Shield Cover Assembly [115] with MS20995C32 lockwire, G01048.
- (f) Connect the APU [71] to the left forward mount for the APU [48] as follows:
- 1) Remove the nut [46], two washers [50], and bolt [51] from the left forward mount for the APU [48].
 - 2) Make sure that the bushing [57] is installed in the left forward mount for the APU [48].
 - 3) Install the rig pin [47] in the left forward mount for the APU [48].
NOTE: The rig pin [47] is a component of the thread protector [58].
 - 4) Align the holes of the left forward bracket [45] to the left forward mount for the APU [48].
 - 5) If the holes of the left forward bracket [45] and left forward mount for the APU [48] do not align, adjust the left forward mount for the APU [48] as follows:
 - a) Remove the MS20995C32 lockwire, G01048, and loosen the bottom jamnut [49] on the left forward mount for the APU [48].
 - b) Turn the bottom rod end until it aligns with the holes of the left forward bracket [45].
NOTE: One full turn will change the length by 0.04 in. (1.0 mm).
 - c) Make sure that the bottom rod end threads are visible through the inspection hole in the strut, and that a minimum of one thread protrudes from the bottom jamnut [49].
 - d) If more adjustments are necessary, remove the seven screws and seven washers that attach the firewall cover to the top insulation panel.
<1> Move the firewall cover down until you can get access to the top jamnut [49].

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- <2> Remove the MS20995C32 lockwire, G01048, and loosen the top jamnut [49].
- <3> Turn the left forward mount for the APU [48] until the bottom rod end aligns with the holes of the left forward bracket [45].
NOTE: One full turn will change the length by 0.04 in. (1.0 mm).
- <4> Make sure that the top rod end threads are visible through the inspection hole in the strut, and that a minimum of one thread protrudes from the top jamnut [49].
- <5> Tighten the top jamnut [49] to 35 in-lb (4 N·m).
- <6> Install MS20995C32 lockwire, G01048, on the top jamnut [49].
- <7> Remove the remaining sealant from the surface of the firewall cover and top insulation panel with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
- <8> Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
- <9> Use 75 ±15 psig (517 ±104 kPa) air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
- <10> Install the firewall cover to the top insulation panel with the seven washers and seven screws.
- <11> Apply a fillet seal of sealant, A00160, around the firewall cover.
- <12> Remove the unwanted sealant from the firewall cover and top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry.

- 6) Install the bolt [51], washers [50], and nut [46].
- 7) Tighten the nut [46] to 110 in-lb (12 N·m).
- 8) Tighten the bottom jamnut [49] to 35 in-lb (4 N·m).
- 9) Install MS20995C32 lockwire, G01048 on the bottom jamnut [49].
- 10) Remove the rig pin [47] from the left forward mount for the APU [48].

SUBTASK 49-11-00-080-006

- (6) Remove the adapter [101] from the APU [71] as follows:
 - (a) Remove the three spring clips [108] from the three pins [107].
 - (b) Remove the three pins [107] that attach the adapter [101] to the three ground handling mounts [106].
 - (c) Use the jack assembly [105] to slowly lower the adapter [101] out of the APU compartment.

SUBTASK 49-11-00-080-007

- (7) Remove the adapter [101] from the jack assembly [105] as follows:
 - (a) Move the adapter [101] and jack assembly [105] away from the APU compartment.
 - (b) Remove the four nuts [102], washers [103], and four bolts [104] that attach the adapter [101] to the jack assembly [105].
 - (c) Remove the adapter [101].

SUBTASK 49-11-00-420-024

- (8) Connect the exhaust duct muffler [23] as follows:

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- (a) Make sure that the exhaust duct muffler [23] touches the APU [71].
 - 1) Pull the exhaust duct muffler [23] forward to the APU [71] until the exhaust duct muffler [23] touches the APU [71].
 - 2) If it is necessary, use a 2 inch by 4 inch, 4-7 feet long wood lever, STD-1208, and standard hammer, STD-1242, to lightly tap the exhaust duct muffler [23] forward to the APU [71] until the exhaust duct muffler [23] touches the APU [71].
- (b) If the exhaust duct muffler [23] does not touch the APU [71] or the flanges are not aligned, do these steps:
 - 1) Loosen the 16 bolts [24] that attach the seal depressor assembly [25] to the 1156 bulkhead.
 - 2) Move the exhaust duct muffler [23] until the exhaust duct muffler [23] touches the APU [71].
 - 3) If more adjustments are necessary, loosen the 20 screws [28] that attach the seal support assembly [26] to the exhaust duct muffler [23].
 - 4) Move the exhaust duct muffler [23] until the exhaust duct muffler [23] touches the APU [71] and flanges are aligned.
- (c) Install the V-band clamp [27] on the exhaust duct muffler [23].
 - 1) Put the V-band clamp [27] on the exhaust duct muffler [23].
 - 2) Tighten the V-band clamp [27] to 80 ±10 in-lb (9.0 ±1.2 N·m).
 - 3) Lightly hit the edge of the V-band clamp [27] with a rubber mallet, STD-3906.
 - 4) Continue to tighten and hit the V-band clamp [27] until the torque value stays constant.
- (d) If the 20 screws [28] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 20 screws [28] on the seal support assembly [26].
- (e) If the 16 bolts [24] were loosened during the adjustment of the exhaust duct muffler [23], tighten the 16 bolts [24] on the seal depressor assembly [25].

SUBTASK 49-11-00-420-025

- (9) Install the drain tube [29] for the exhaust duct muffler [23] as follows:
 - (a) Remove the caps or plugs from the drain tube [29], fitting [30] on the exhaust duct muffler [23] and fitting [80] on the aft drain tube of the APU [71].
 - (b) Apply a thin layer of Never-Seez NSBT compound, D00006, on the threads of the fitting [30] and fitting [80].
 - (c) Connect the drain tube [29] to the fitting [80] on the aft drain tube of the APU [71].
 - (d) Connect the drain tube [29] to the fitting [30] on the exhaust duct muffler [23].
 - (e) Tighten the two ends of the drain tube [29] to 230 in-lb (26 N·m).

SUBTASK 49-11-00-420-026

- (10) Connect the bonding jumper [20] as follows:
 - (a) Clean the surfaces of the two studs with a tampico fiber brush, G50222, or cotton wiper, G00034, and alcohol, B00130.

NOTE: Use a small amount of pressure on the tampico fiber brush, G50222, or cotton wiper, G00034, while you clean the surfaces of the two studs.
 - (b) Continue to clean the surfaces until there are no visible residue on the surfaces.

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- (c) Connect the bonding jumper [20] to the two studs with the two washers [22] and two nuts [21].
- (d) Tighten the two nuts [21] to 180 ±10 in-lb (20 ±1 N·m).
- (e) Measure the bonding resistance between the APU [71] and airplane structure.
 - 1) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance.
 - 2) Make sure that the bonding resistance is 0.0005 ohm (0.5 milliohm) or less (SWPM 20-20-00).

SUBTASK 49-11-00-420-027

- (11) Connect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18] as follows:
 - (a) Disengage the terminal block cover [19] from the four pins on the starter-generator.
 - (b) Remove the terminal block cover [19].
 - (c) Remove the four nuts [12] from the four terminal studs.
 - (d) Connect the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18] to the related terminal studs.
- NOTE:** The terminal strip and the fanning strip [15] show the identification of the terminal studs for each of the terminal lug (N) [14], terminal lug (T3) [16], terminal lug (T2) [17], and terminal lug (T1) [18].
- (e) Install the four nuts [12] on the four terminal studs.
 - (f) Tighten the four nuts [12] to 125 ±10 in-lb (14 ±1 N·m).
 - (g) Put the terminal block cover [19] on the starter-generator.
 - (h) Engage the terminal block cover [19] to the four pins on the starter-generator.

SUBTASK 49-11-00-420-028

- (12) Install the bleed air duct [11] as follows:
 - (a) Install the two seals [10] on the bleed air duct [11].
 - (b) Put the two coupling clamps [9] on the bleed air valve and bleed duct assembly.
- NOTE:** The bleed duct assembly extends through the 1088 bulkhead.
- (c) Put the bleed air duct [11] in its position as follows:
 - 1) Make sure that the directional flow arrow on the bleed air duct [11] points away from the front of the APU [71].
 - 2) Open the two coupling clamps [9] to permit alignment of the bleed air duct [11] to the bleed air valve and the bleed duct assembly.
 - 3) Make sure that the alignment marks on the two flexible couplings align with the two alignment marks on the bleed air duct [11].
 - 4) Make sure that the center of the alignment mark on the bleed air duct [11] is ±0.16 in. (4 mm) from the center of the alignment mark on the bleed air valve.
 - (d) Put the two coupling clamps [9] over the flanges of the bleed air valve, bleed air duct [11], and bleed duct assembly.
 - (e) Tighten the coupling clamps [9] as follows:
 - 1) For AS1895 or 234-591 clamps, tighten to 95 in-lb (10.7 N·m) - 110 in-lb (12.4 N·m).
 - 2) For 543227A or 234-607 clamps, tighten to 35 in-lb (4.0 N·m) - 40 in-lb (4.5 N·m).

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SUBTASK 49-11-00-420-031

- (13) Connect the electrical connectors to the APU firewall receptacles on the 1088 bulkhead as follows (TASK 20-60-07-910-802):
- (a) Remove the dust caps, STD-7394, from the electrical connectors.
 - (b) Connect and tighten the electrical connector D11118 (P4) [4] to 85 in-lb (10 N·m).
 - (c) Connect and tighten the electrical connector D10434 (P3) [3] to 100 in-lb (11 N·m) .
 - (d) Connect and tighten the electrical connector D10912 (P1) [2] to 100 in-lb (11 N·m).
 - (e) Connect and tighten the electrical connector D10436 (P2) [1] to 100 in-lb (11 N·m).
 - (f) Install the wire clamp [112], nut [113], and washer [114].

SUBTASK 49-11-00-420-029

- (14) Install the fuel supply tube [5] as follows:
- (a) Remove the caps or plugs from the fuel supply tube [5], fitting [6], and fuel control unit.
 - (b) Lubricate the two new packings [7] with a light coat of fuel, G02272.
 - (c) Install the two new packings [7] on the fuel supply tube [5].
 - (d) Connect the fuel supply tube [5] to the fuel control unit.
 - (e) Turn the tube retainer on the fuel supply tube [5] clockwise until the flange fully engages the stud.
 - (f) Tighten the nut [8] to 40 ±5 in-lb (4.5 ±0.6 N·m).
 - (g) If Christo-lube MCG111 grease, D50011, is not used on the fitting [6], do these steps:
 - 1) Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting [6].
 - 2) Connect the fuel supply tube [5] to the fitting [6] on the 1088 bulkhead.
 - a) Tighten to 470 in-lb (53 N·m) - 510 in-lb (58 N·m).
 - (h) If Christo-lube MCG111 grease, D50011, is used on the fitting [6], do these steps:
 - 1) Lubricate the external threads of the fitting [6] with Christo-lube MCG111 grease, D50011.

NOTE: The grease should be applied to the external threads only. The grease should not be applied to the internal threads or sealing surface of the fitting.
 - 2) Connect the fuel supply tube [5] to the fitting [6] on the 1088 bulkhead.
 - a) Tighten the fitting [6] to 266 in-lb (30 N·m) - 294 in-lb (33 N·m).

J. APU Installation Test

SUBTASK 49-11-00-410-008

- (1) If the APU Cowl Door, 315A was removed, do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

NOTE: Do not close the APU cowl door. Use the two hold-open rods to hold the APU Cowl Door, 315A open.

SUBTASK 49-11-00-210-014

- (2) Do a general visual inspection of the seven insulation panels.
- (a) Visually examine the seven insulation panels that you can get access from the APU compartment for holes, tears, separation and damage.
 - (b) If the holes, tears, separation, or damage on the insulation panels are found, do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.

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SUBTASK 49-11-00-860-047

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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER
B	21	C00452	FIRE PROTECTION EXTINGUISHERS APU

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-048

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

SUBTASK 49-11-00-710-004

- (5) Do the installation test for the APU.
- (a) Do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.
 - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (c) During the APU operation, examine the APU [71] for signs of oil and fuel leakage.
 - 1) A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.
 - (d) If you find oil leakage or more than the fuel leakage rate, repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch, on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel or oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the APU [71] for signs of oil and fuel leakage.
 - 7) If oil leakage or more than the fuel leakage rate is found, do the leakage repair again.
 - (e) Do this task: APU Configuration Report, TASK 49-61-00-710-801.
 - 1) Make sure that the APU configuration data for the APU controller (ECU) and APU hardware is correct.
 - (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

NOTE: If maintenance message(s) show for the APU [71], refer to the IFIM and do the applicable procedure(s) for troubleshooting.
 - (g) Look at the APU Maintenance page - lower right for the HOURS SINCE INSTALLATION ON AIRPLANE, APU CYCLES, and APU HOURS.

NOTE: See ONBOARD MAINTENANCE FUNCTION, SUBJECT 46-13-02 for detailed information on how to use the OMF (Onboard Maintenance Function).
 - (h) If it is necessary, use the Onboard Maintenance Function (OMF) to reset the HOURS SINCE INSTALLATION ON AIRPLANE:

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- 1) Select ONS Maintenance
- 2) Select ONBD MAINT
- 3) Select OTHER FUNCTIONS
- 4) Select SPECIAL FUNCTIONS
- 5) Select ATA Systems: 49 - Airborne Auxiliary Power System
- 6) Select System Function: APU - Reset Hours since Installation
- 7) Follow the instructions on the screen, and select CONTINUE
- 8) Select YES for the question 'Do you want to reset hours since installation on airplane?' and select CONTINUE
- 9) Select FINISHED and select CONTINUE.

(i) Do this task: APU Operational Test, TASK 49-11-00-710-802.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-410-009

(1) To close the access panel, do these steps:

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

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

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

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

———— **END OF TASK** ————

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APU POWER PLANT - ADJUSTMENT/TEST

1. General

- A. This procedure has the task to do the APU operational test.

TASK 49-11-00-710-802

2. APU Operational Test

(Figure 501)

A. References

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

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
220	Subzone - Passenger Compartment - Body Station 259.50 to 360.00
240	Subzone - Passenger Compartment - Body Station 663.75 to Body Station 1016.00

C. APU Operational Test

SUBTASK 49-11-00-860-049

- (1) Do the APU operational test as follows:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU with no load for two minutes.

NOTE: For extended Auxiliary Power Unit (APU) service life, it is recommended that you operate the APU for two minutes from when the APU Ready-to-Load light illuminates before you apply a pneumatic load. You can apply an electrical load when the APU GEN OFF BUS light comes on.

- (c) Make sure that the BUS TRANS switch [12] on the forward overhead panel, P5, is in the AUTO position.
- (d) Make sure that the APU GEN OFF BUS light [11] comes on.
- (e) Set the AC selector switch [2] to the APU GEN position.
- (f) Look at the CPS FREQ display [1].
 - 1) Make sure that the CPS FREQ display [1] shows 395 - 405 CPS.
- (g) Set the two APU GEN switches [10] to the ON position and then release.
- (h) Make sure that the APU GEN OFF BUS light [11] goes off.
- (i) Put an electrical load of 60 amps on the APU starter-generator.
- (j) Set these switches on the forward overhead panel, P5:
 - 1) Set the ISOLATION VALVE switch [6] to the OPEN position.
 - 2) Make sure that the ENGINE 1 BLEED switch [9] and ENGINE 2 BLEED switch [7] are in the OFF position.
 - 3) Make sure that the L PACK switch [4] and R PACK switch [5] are in the OFF position.
 - 4) Set the APU BLEED switch [8] to the ON position.

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- 5) Set the three switches for cabin temperature controls [3] to the AUTO position.
- 6) Set the L PACK switch [4] and R PACK switch [5] to the AUTO position.
- (k) Let the APU exhaust gas temperature (EGT) become stable (one to two minutes).
- (l) Set the L PACK switch [4] and R PACK switch [5] to the HIGH position.
- (m) Let the APU exhaust gas temperature (EGT) become stable (one to two minutes).
- (n) Look at the CPS FREQ display [1].
 - 1) Make sure that the CPS FREQ display [1] shows 395 - 405 CPS.

NOTE: With the APU fully loaded, the CPS FREQ display [1] must become stable at 395 - 405 CPS. A small change in the APU starter-generator frequency (2 - 4 CPS) and the bleed duct pressure (1 psi (7 kPa) - 2 psi (14 kPa)) are permitted for the fully loaded condition.

- (o) Set these switches on the forward overhead panel, P5, to remove the pneumatic load:
 - 1) Set the L PACK switch [4] and R PACK switch [5] to the OFF position.
 - 2) Set the three switches for cabin temperature controls [3] to the OFF position.
 - 3) Set the APU BLEED switch [8] to the OFF position.
 - 4) Set the ISOLATION VALVE switch [6] to the CLOSE position.
- (p) Remove the electrical load from the APU starter-generator.
- (q) Set the two APU GEN switches [10] to the OFF position.
- (r) Make sure that the APU GEN OFF BUS light [11] comes on.
- (s) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

———— **END OF TASK** ————

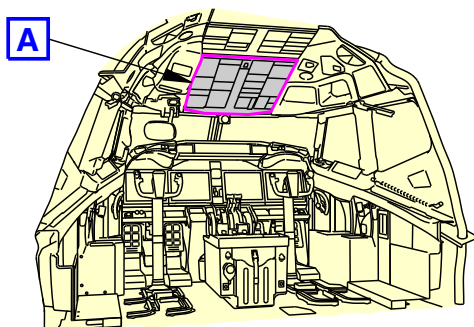
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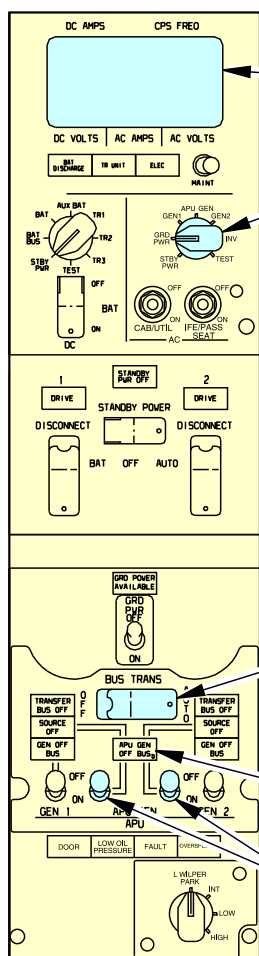
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FLIGHT COMPARTMENT



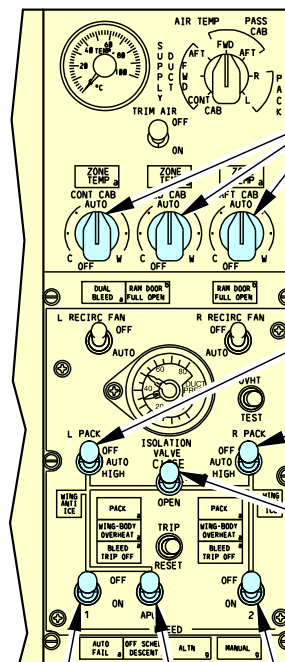
[1] CPS FREQ
DISPLAY

[2] AC
SELECTOR
SWITCH

[12] BUS
TRANS
SWITCH

[11] APU GEN
OFF BUS
LIGHT

[10] APU GEN
SWITCH



[3] SWITCH FOR
THE CABIN
TEMPERATURE
CONTROL

[4] L PACK
SWITCH

[5] R PACK
SWITCH

[6] ISOLATION
VALVE
SWITCH

[9] ENGINE 1
BLEED
SWITCH

[7] ENGINE 2
BLEED
SWITCH

[8] APU BLEED
SWITCH

FORWARD OVERHEAD PANEL, P5



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APU Operational Test
Figure 501/49-11-00-990-807

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APU POWER PLANT - INSPECTION/CHECK

1. General

- A. This procedure has these tasks:
- (1) Visual inspection of the APU power plant
 - (2) Inspection after an APU power plant fire.

TASK 49-11-00-200-801

2. APU Power Plant Inspection

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-15-11-200-801	Air Inlet Seal Inspection (P/B 601)
49-16-11-100-801	APU Drain Cleaning (P/B 701)
49-16-11-200-801	Drain Mast Inspection (P/B 601)
49-17-11-200-801	Insulation Panel Inspection (P/B 601)
49-81-11-200-802	Exhaust Duct Muffler Inspection (P/B 601)
49-81-11-200-803	Exhaust Duct Muffler Seal Inspection (P/B 601)
49-91-13-200-801	Oil Filter Indicator Inspection (P/B 601)
49-91-41-200-801	Oil Cooler Inspection (P/B 601)
49-91-71-200-801	Eductor Inlet Duct Inspection (P/B 601)
49-91-81-200-801	Magnetic Drain Plug Inspection (P/B 601)
SOPM 20-50-22	How to Install Threaded Inserts

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

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

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-11-00-860-050

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

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SUBTASK 49-11-00-860-051

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-010-007

- (3) To open the access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

F. APU Power Plant Inspection

SUBTASK 49-11-00-210-015

- (1) Do these steps to do the inspection of the Auxiliary Power Unit (APU) power plant:

- (a) If the APU is removed from the APU compartment, then do these steps:

- 1) Visually examine the air inlet seal for deformation, wear and damage.

- a) If you find signs of deformation, wear or damage, do this task: Air Inlet Seal Inspection, TASK 49-15-11-200-801.

- 2) Visually examine the front area and inner surfaces of the exhaust duct muffler that you can get access from the APU compartment for cracks and damage.

- a) If you find cracks or signs of damage, do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-802.

- 3) Do this task: Exhaust Duct Muffler Seal Inspection, TASK 49-81-11-200-803.

- (b) Visually examine the air inlet duct that you can get access for blockage of unwanted materials and damage that can cause a decrease in airflow.

- 1) If you find blockage of unwanted materials, remove the blockage.

- 2) If you find damage that can cause a decrease in airflow, then repair the problems that you find.

- (c) Measure the height of the air inlet seal with the APU installed.

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- 1) Make sure that the height from the bottom to the top of the air inlet seal (between the inlet adapter assembly and APU) is less than 1.25 in. (31.75 mm).
- (d) Do these steps to visually examine the compressor inlet plenum for blockage of unwanted materials:
 - 1) Loosen the eight captive screws that attach the access door to the compressor inlet plenum.
 - 2) Remove the access door from the compressor inlet plenum.

NOTE: A lanyard is attached to the access door to keep the access door with the APU.
 - 3) Visually examine the compressor inlet plenum for blockage of unwanted materials.
 - a) If you find blockage of unwanted materials, then remove the blockage.
 - 4) Install the access door to the compressor inlet plenum with the eight captive screws.
- (e) Visually examine the load compressor scroll housing for cracks (Figure 601).
 - 1) Cracks on the scroll housing near the exit duct are permitted.
 - a) Intersecting cracks or missing material on the scroll housing near the exit duct are not permitted.
 - b) If you find intersecting cracks or missing material, remove and repair the APU.
- (f) Visually examine the compressor scroll housing flange to discharge duct interface for loose or missing fasteners, loose or missing inserts, and damaged or missing seal (View D, Figure 601).
 - 1) If you find loose or missing inserts, damaged or missing seal, or loose or missing fasteners:
 - a) Repair or replace inserts (SOPM 20-50-22).
 - b) Replace damaged or missing seal.
 - c) Replace missing or damaged fasteners.
- (g) Visually examine the seven insulation panels for holes, tears, separation and damage.
 - 1) If you find holes, tears, separation or signs of damage, do this task: Insulation Panel Inspection, TASK 49-17-11-200-801.
- (h) Visually examine the front area and inner surfaces of the eductor inlet duct that you can get access from the APU compartment for damage.
 - 1) If you find signs of damage, do this task: Eductor Inlet Duct Inspection, TASK 49-91-71-200-801.
- (i) Visually examine the APU compartment structure for cracks, wear, and damage.
- (j) Examine these components of the APU power plant for tightness, worn areas, cracks, and corrosion:
 - 1) Electrical connectors for the starter-generator wire harness
 - 2) Electrical connectors for the engine wire harness
 - 3) Four terminal lugs (T1), (T2), (T3), and (T4) on the fanning strip for the starter-generator
 - 4) Four Exhaust Gas Temperature (EGT) thermocouple leads for the EGT thermocouple 1 and EGT thermocouple 2
 - 5) Spring clips and quick-release clamps that attach the engine wire harness to the APU.

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- 6) Clamps and connections that attach the fuel and oil tubes to the APU.
- (k) Visually examine the oil and fuel tubes for kinks, cracks, and leakage.
 - 1) During APU operation, a fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted from the forward drain on the APU drain seal.
 - a) If the fuel leakage is more than permitted, do this task: Drain Mast Inspection, TASK 49-16-11-200-801.
 - 2) If you find kinks, cracks, or leakage from the oil or fuel tubes, repair the problems that you find.
- (l) Do this task: APU Drain Cleaning, TASK 49-16-11-100-801.
- (m) Do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.
- (n) Visually examine the red button on the oil filter indicator for the lube filter housing.
 - 1) If the red button on the oil filter indicator has extended, do this task: Oil Filter Indicator Inspection, TASK 49-91-13-200-801.
- (o) Do this task: Magnetic Drain Plug Inspection, TASK 49-91-81-200-801.
- (p) Visually inspect the oil cooler for blockage of unwanted materials, contamination and damage.
 - 1) If you find blockage of unwanted materials, remove the blockage.
 - 2) If you find contamination or signs of damage, do this task: Oil Cooler Inspection, TASK 49-91-41-200-801.
- (q) Examine these systems of the APU power plant for tightness and damage:
 - 1) The APU fuel system:
 - a) Fuel control unit
 - b) Ten fuel nozzles
 - c) Fuel flow divider
 - d) Primary and secondary fuel manifolds.
<1> No damage allowed.
 - 2) The APU ignition and start system:
 - a) Starter-generator
 - b) Ignition unit
 - c) Igniter plug
 - d) Igniter plug lead.
 - 3) The bleed air system for the APU:
 - a) Bleed air valve
 - b) Inlet Guide Vane (IGV) actuator
 - c) Inlet pressure sensor (P2)
 - d) Total pressure sensor (PT)
NOTE: The drain hole on the total pressure tube removes unwanted fluids from the total pressure sensor (PT).
 - e) Delta pressure sensor (DP)
NOTE: The drain holes on the static and total pressure tubes remove fluids from the delta pressure sensor (DP).

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- f) Surge control valve.
- 4) The APU controls system:
 - a) Speed sensor
 - b) Inlet temperature sensor (T2).
- 5) The EGT indicating system:
 - a) EGT thermocouple 1
 - b) EGT thermocouple 2.
- 6) The APU indicating system:
 - a) Data memory module.
- 7) The APU lubrication system:
 - a) Lube module
 - b) Temperature control valve
 - c) Oil cooler
 - d) Magnetic drain plug
 - e) Oil level sensor
 - f) Oil temperature sensor
 - g) Low oil pressure switch.
- 8) The APU drains:
 - a) No damage allowed.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-860-052

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-053

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

SUBTASK 49-11-00-410-010

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

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

———— **END OF TASK** ————

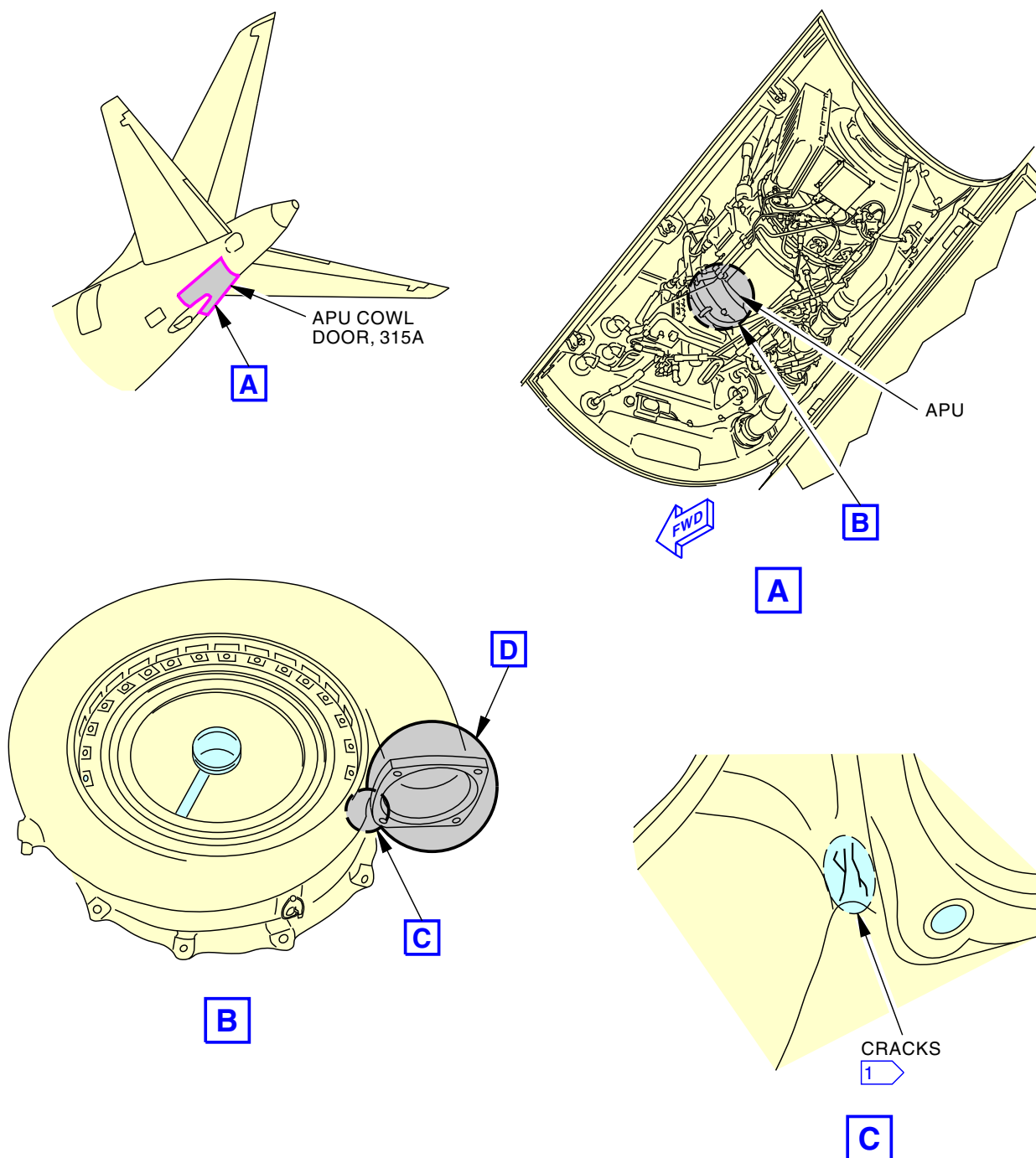
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1 CRACKS ARE PERMITTED IN THIS AREA.
INTERSECTING CRACKS OR MISSING MATERIAL ARE NOT PERMITTED.

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APU Scroll Housing Cracks Inspection
Figure 601/49-11-00-990-835 (Sheet 1 of 2)

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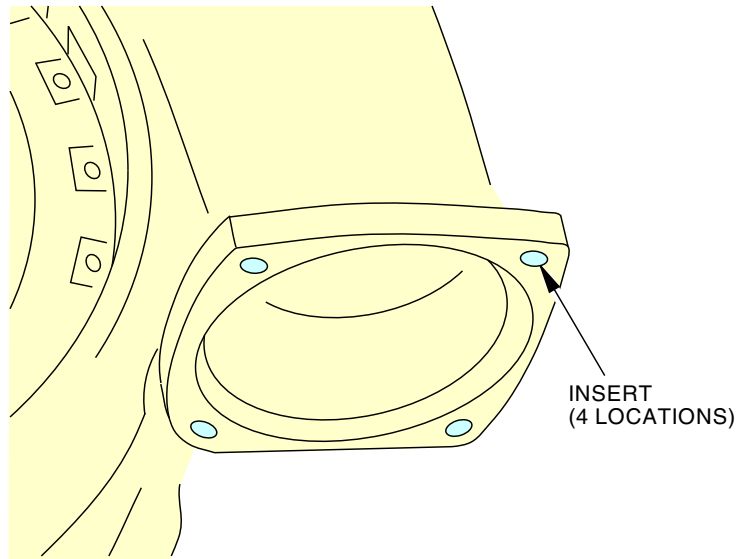
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D

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APU Scroll Housing Cracks Inspection
Figure 601/49-11-00-990-835 (Sheet 2 of 2)

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TASK 49-11-00-200-802

3. Inspection After an APU Fire

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1134	Vacuum Source, 24 Inches Hg Minimum

C. Consumable Materials

Reference	Description	Specification
B01023	Cleaner - Primary - Ardrox 6025	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)
G00116	Sponge - Synthetic	
G02418	Water - De-ionized	
G02439	Brush - Nylon Bristle	
G50140	Gloves - Protective, Latex or Nitrile	

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Inspection

SUBTASK 49-11-00-860-054

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

SUBTASK 49-11-00-860-055

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-11-00-010-008

- (3) To open the access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

G. Procedure

SUBTASK 49-11-00-210-016

- (1) Visually examine the APU power plant 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:

APU Power Plant Removal (Selection), TASK 49-11-00-000-801,

APU Power Plant Installation (Selection), TASK 49-11-00-400-801.

- (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 49-11-00-210-017

- (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 four APU mounts and seven insulation panels 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 or clean the fire extinguishing agent used for the APU power plant fire from the external surfaces of the APU and APU compartment:

- (a) Do these steps if foam was the fire extinguishing agent:

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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 de-ionized water, G02418, cotton wiper, G00034, brush, G02439, sponge, G00116, 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 the fire extinguishing agent:



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. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT CAN OCCUR.

- 1) Clean the areas of the APU and APU compartment where the dry chemical powder was used with a vacuum source (24 inches Hg minimum), STD-1134 or other equivalent tool, to remove the dry chemical powder.
 - 2) If the dry chemical powder has changed to a glaze-like formation due to high temperatures, clean the areas with Ardrex 6025 cleaner, B01023, cotton wiper, G00034, brush, G02439, sponge, G00116, 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 the fire extinguishing agent:
- 1) In-flight use of the fire extinguishing system is permitted with no special cleaning procedure if there is no residue.



DO NOT BREATHE THE FUMES FROM THE FIRE EXTINGUISHING AGENT IN THE APU COMPARTMENT AFTER THE SYSTEM RELEASES ITS CONTENTS. DO NOT LET THE FIRE EXTINGUISHING AGENT TOUCH YOUR SKIN. MAKE SURE THAT THERE IS GOOD AIRFLOW IN THE AREA. FIRE EXTINGUISHING AGENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- 2) If halon is used on the ground, open the APU cowl door for a minimum of 30 minutes to remove all halogen or halon gases.
NOTE: No special cleaning procedure is necessary if there is no residue.
- 3) If it is necessary, clean the external surfaces of the APU from the power section (combustion chamber) to the turbine exhaust port with de-ionized water, G02418, cotton wiper, G00034, brush, G02439, sponge, G00116, protective gloves, G50140, or equivalent.



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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-860-056

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-057

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

SUBTASK 49-11-00-410-011

- (3) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

————— **END OF TASK** —————

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APU POWER PLANT - REPAIR

1. General

A. This procedure has this task:

- (1) Repair of the APU compressor inlet door fasteners.

TASK 49-11-00-300-801

2. APU Compressor Inlet Access Door Fasteners Repair

A. Tools/Equipment

Reference	Description
STD-725	Punch
STD-858	Tag - DO NOT OPERATE

B. Consumable Materials

Reference	Description	Specification
B50126	Solvent - Degreasing, General Purpose	MIL-PRF-680
G50316	Cloth - Clean, Dry, Lint-free, White, Cotton	

C. Location Zones

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

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Repair

SUBTASK 49-11-00-860-058

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

SUBTASK 49-11-00-860-059

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-00-010-009

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

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

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- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

F. APU Compressor Inlet Access Door Fasteners Repair

SUBTASK 49-11-00-000-001

- (1) To remove the access door [1], do these steps:
 - (a) Remove the bolt [2] that attaches the lanyard [6] to the compressor inlet plenum.
 - (b) Loosen the eight captive screws that attach the access door [1] to the compressor inlet plenum.
 - (c) Remove the access door [1] from the compressor inlet plenum.

SUBTASK 49-11-00-300-001

- (2) To repair the compressor inlet access door fasteners do these steps:
 - (a) Remove all damaged studs [3], retaining springs [4], or grommets [5] from the access door [1].



WARNING

CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN A WELL-VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE. REPEATED OR PROLONGED CONTACT WITH THE SKIN COULD CAUSE INJURY TO PERSONNEL.

- (b) Clean the studs [3], retaining springs [4], grommets [5], and holes of the access door [1] with a cotton cloth, G50316, and degreasing solvent, B50126.
- (c) Install the new grommets [5] into the access door [1] with a punch, STD-725.
- (d) Install the new retaining springs [4] and new studs [3] on the access door [1].

SUBTASK 49-11-00-400-001

- (3) To install the access door [1], do these steps:
 - (a) Install the bolt [2] that attaches the lanyard [6] to the compressor inlet plenum.
 - (b) Install the access door [1] to the compressor inlet plenum with the eight captive screws.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-00-860-060

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

F/O Electrical System Panel, P6-2

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

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-00-860-061

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

SUBTASK 49-11-00-410-012

- (3) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

————— **END OF TASK** —————

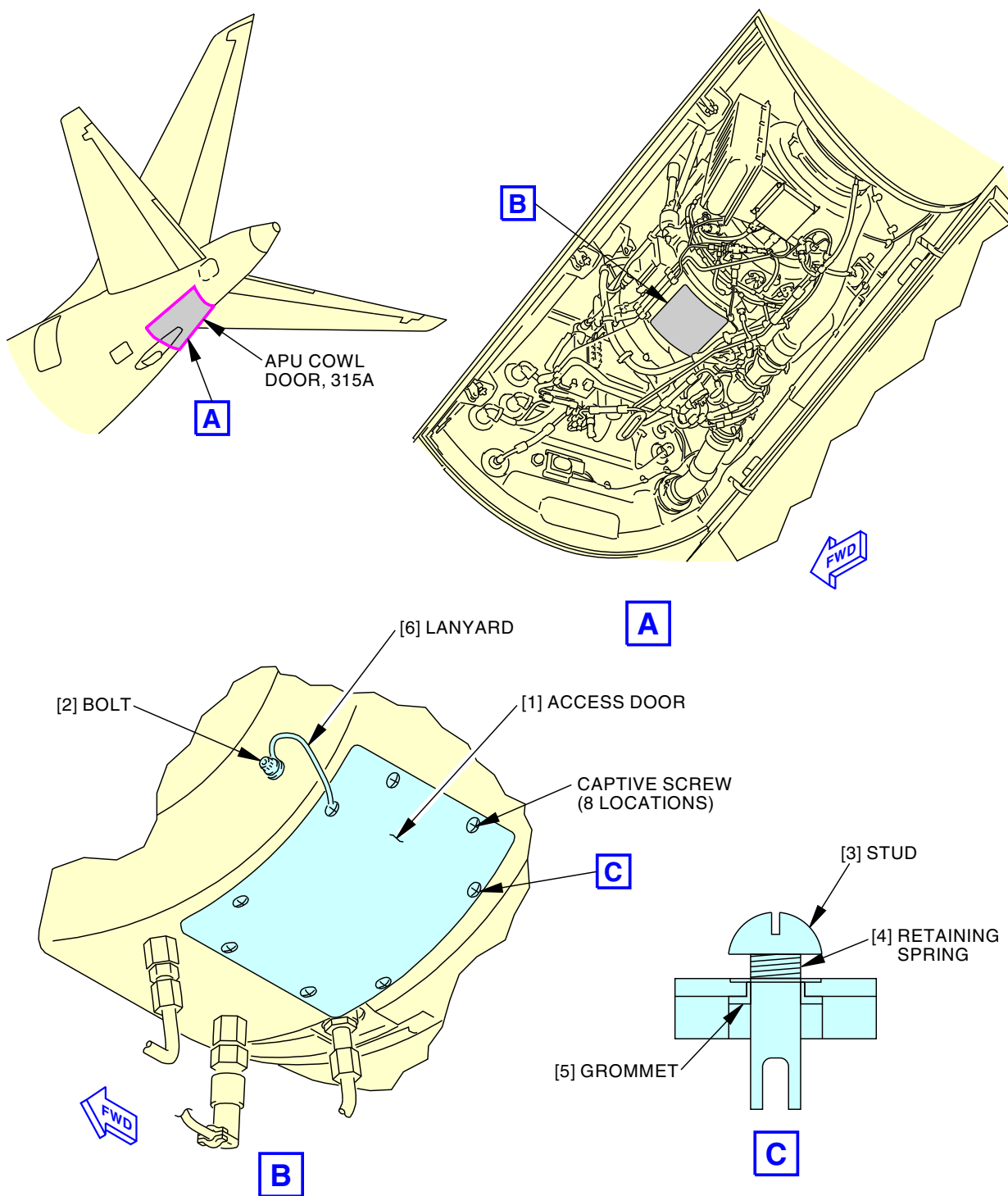
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APU Compressor Inlet Access Door Fastener Repair
Figure 801/49-11-00-990-808

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APU HARNESS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the starter-generator wire harness
- (2) An installation of the starter-generator wire harness
- (3) A removal of the engine wire harness
- (4) An installation of the engine wire harness.

TASK 49-11-01-000-801

2. Starter-Generator Wire Harness Removal

(Figure 401)

A. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-858	Tag - DO NOT OPERATE
STD-7394	Cap - Dust, Electrical Connector

B. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-11-01-860-001

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

SUBTASK 49-11-01-860-002

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-01-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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- (b) Open the three latches.

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

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

E. Starter-Generator Wire Harness Removal

SUBTASK 49-11-01-020-001

- (1) Do these steps to remove the starter-generator wire harness [2]:
 - (a) Disconnect the electrical connector D11118 (P4) [1] from the APU firewall receptacle on the 1088 bulkhead.
 - (b) Disconnect the electrical connector (P5) [3] from the starter-generator.
 - (c) Disconnect the electrical connector (P6) [4] from the starter-generator.
 - (d) Remove the starter-generator wire harness [2].
 - (e) Install the dust caps, STD-7394, on the electrical connectors to prevent contamination.

————— **END OF TASK** —————

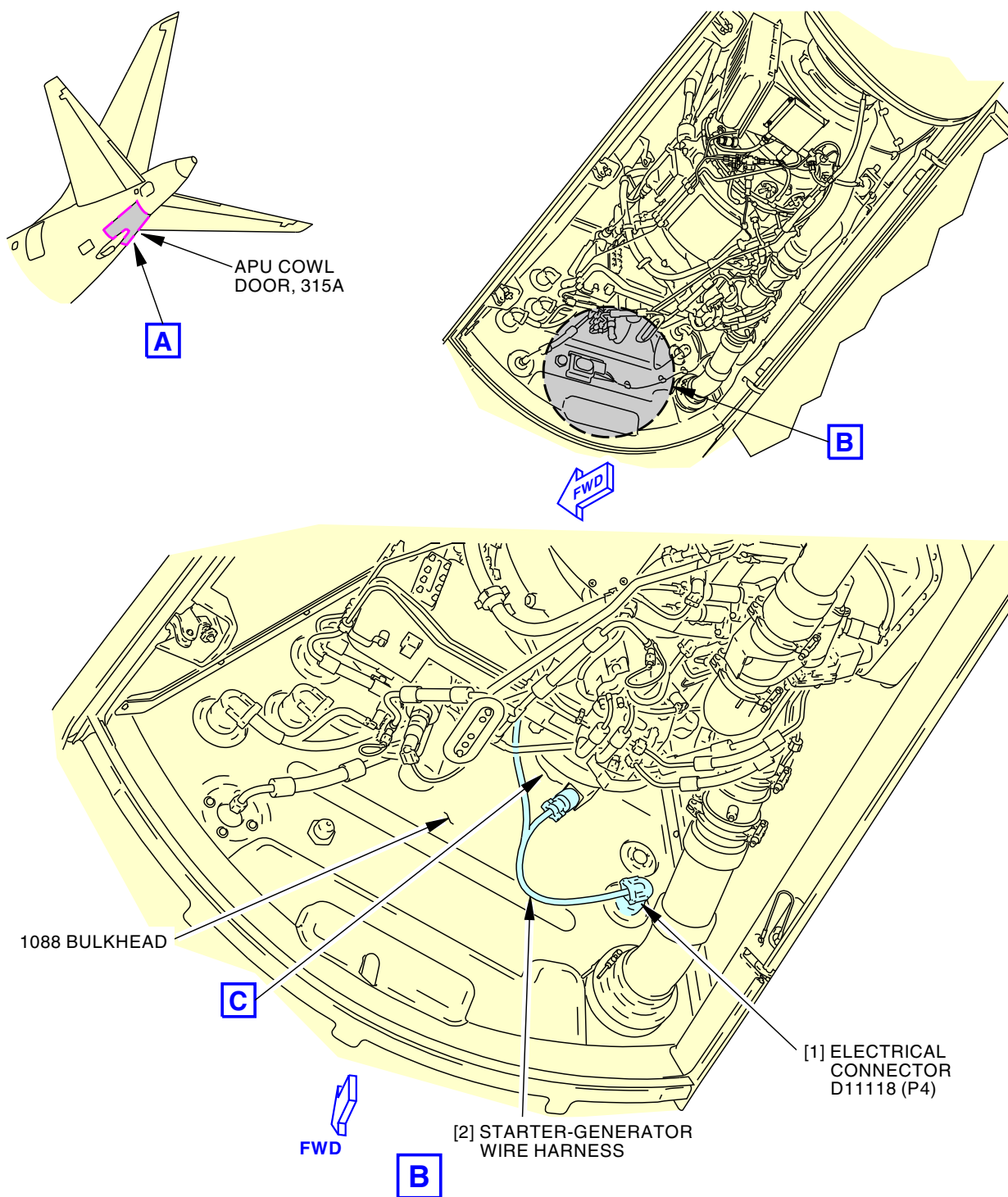
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Starter-Generator Wire Harness Installation
Figure 401/49-11-01-990-801 (Sheet 1 of 2)

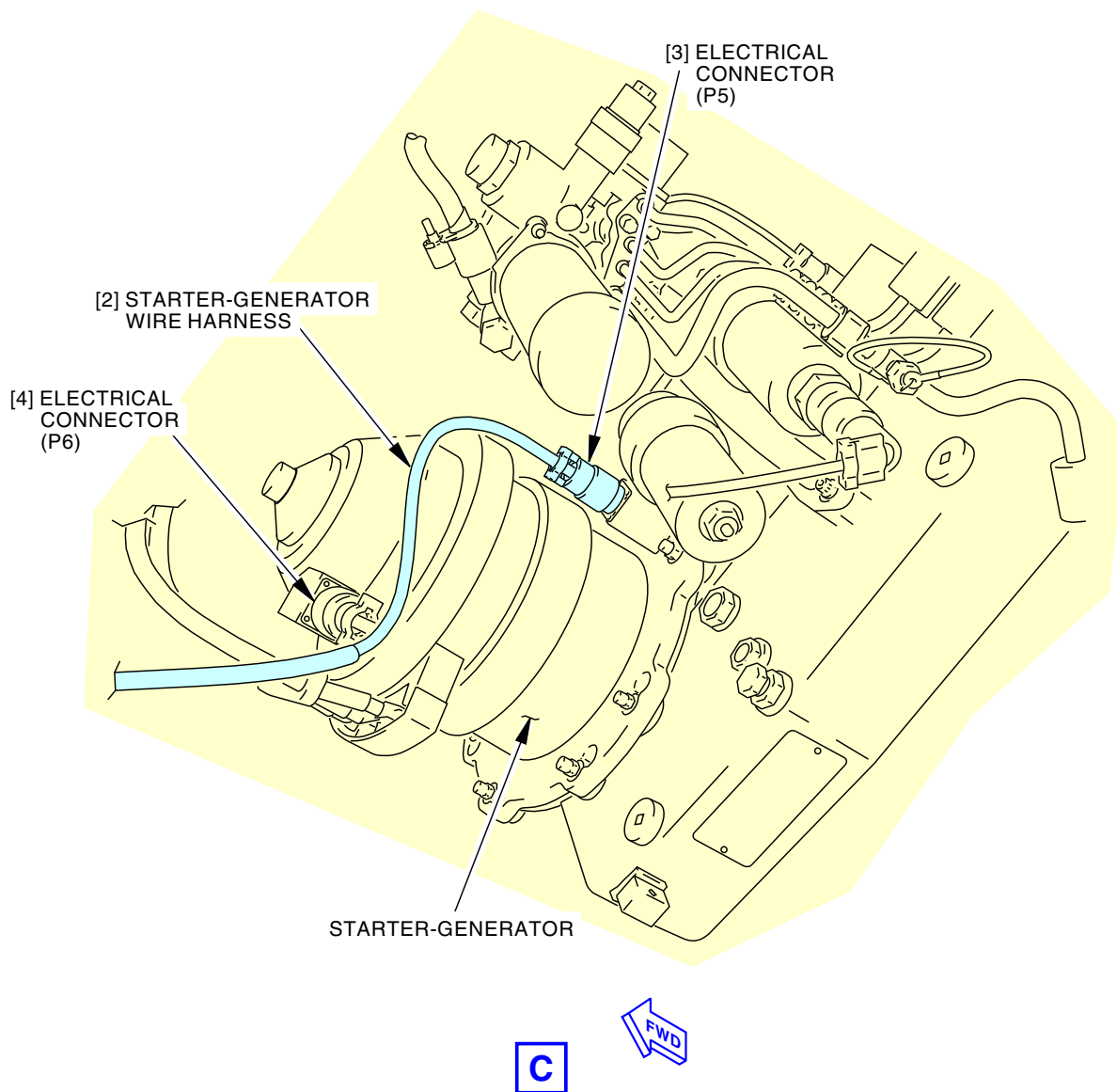
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Starter-Generator Wire Harness Installation
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TASK 49-11-01-400-801

3. Starter-Generator Wire Harness Installation

(Figure 401, Figure 403)

A. References

Reference	Title
49-11-00-710-802	APU Operational Test (P/B 501)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-11-01-200-801	APU Wire Harness, Electrical Connectors and Terminals Inspection (P/B 601)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-7394	Cap - Dust, Electrical Connector

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Starter-generator wire harness	49-11-01-01-010	SIA ALL

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Starter-Generator Wire Harness Installation

SUBTASK 49-11-01-210-001

- (1) Do this task: APU Wire Harness, Electrical Connectors and Terminals Inspection, TASK 49-11-01-200-801.

SUBTASK 49-11-01-420-001

- (2) Do these steps to install the starter-generator wire harness [2]:

NOTE: See Figure 403 for examples of fully tightened connectors.

- (a) Remove the dust caps, STD-7394, from the electrical connectors.
- (b) Put the starter-generator wire harness [2] near the 1088 bulkhead.
- (c) Connect the electrical connector (P6) [4] to the starter-generator.
- (d) Connect the electrical connector (P5) [3] to the starter-generator.
- (e) Connect the electrical connector D11118 (P4) [1] to the APU firewall receptacle on the 1088 bulkhead.

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G. Starter-Generator Wire Harness Installation Test

SUBTASK 49-11-01-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-01-860-004

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

SUBTASK 49-11-01-710-001

- (3) Do this task: APU Operational Test, TASK 49-11-00-710-802.

SUBTASK 49-11-01-740-001

- (4) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- (a) If maintenance message(s) show for the APU electrical system or the starter-generator, refer to the IFIM and do the applicable procedure(s).

SUBTASK 49-11-01-860-005

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

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

————— **END OF TASK** —————

TASK 49-11-01-000-802

4. Engine Wire Harness Removal

(Figure 402 and Figure 403)

A. Tools/Equipment

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

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(Continued)

Reference	Description
STD-7394	Cap - Dust, Electrical Connector

B. Location Zones

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

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-11-01-860-006

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

SUBTASK 49-11-01-860-007

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-11-01-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
--------	---------------

315A APU Cowl Door

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

- (b) Open the three latches.

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

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

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

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

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

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

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

E. Engine Wire Harness Removal

SUBTASK 49-11-01-020-002

- (1) Do these steps to remove the engine wire harness [5]:

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- (a) Disconnect the electrical connector (P13) [31] from the ignition unit.
- (b) Disconnect the Exhaust Gas Temperature (EGT) thermocouple 1 lead (EGT lead [41]).
NOTE: There are two different nuts that attach the EGT leads [41] to each thermocouple. The nut for the alumel stud is larger than the nut for the chromel stud.
 - 1) Put labels on the EGT leads [41] and studs to show which EGT lead [41] is attached to the alumel stud and which is attached to the chromel stud.
 - 2) Remove the nuts [40] that attach the EGT leads [41] to the EGT thermocouple 1.
- (c) Disconnect the EGT thermocouple 2 lead (EGT lead [39]).
NOTE: There are two different nuts that attach the EGT leads [39] to each thermocouple. The nut for the alumel stud is larger than the nut for the chromel stud.
 - 1) Put labels on the EGT leads [39] and studs to show which EGT lead [39] is attached to the alumel stud and which is attached to the chromel stud.
 - 2) Remove the nuts [43] that attach the EGT leads [39] to the EGT thermocouple 2.
- (d) Release the engine wire harness [5] from the spring clip [32], spring clip [33], and spring clip [34].
- (e) Disconnect the electrical connector (P9) [37] from the surge control valve.
- (f) Release the engine wire harness [5] from the spring clip [35], spring clip [36], and spring clip [42].
- (g) Disconnect the electrical connector (P23) [30] from the flow divider solenoid for the fuel flow divider.
- (h) Release the engine wire harness [5] from the spring clip [29] and spring clip [19].
- (i) Disconnect the electrical connector (P21) [20] from the inlet temperature sensor.

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- 1) Disconnect the ground jumper [49] from the electrical connector (P21) backshell clamp.

SIA ALL

- 2) Remove lockwire from the electrical connector (P21) [20].
- 3) Disconnect the electrical connector (P21) [20].
- (j) Disconnect the electrical connector (P20) [21] from the differential pressure sensor.
- (k) Disconnect the electrical connector (P19) [22] from the total pressure sensor.
- (l) Release the engine wire harness [5] from the spring clip [18] and spring clip [38].
- (m) Disconnect the electrical connector (P10) [28] from the bleed air valve.
- (n) Disconnect the electrical connector (P18) [23] from the inlet pressure sensor.
- (o) Disconnect the electrical connector (P12) [24] from the speed sensor.
- (p) Disconnect the electrical connector (P17) [27] from the Inlet Guide Vane (IGV) actuator.
- (q) Release the engine wire harness [5] from the spring clip [15], spring clip [16], spring clip [17], spring clip [25], spring clip [26], and spring clips [29].
- (r) Disconnect the electrical connector (P11) [14] from the data memory module.
- (s) Disconnect the electrical connector (P16) [12] from the oil level sensor.
- (t) Release the engine wire harness [5] from the spring clip [13].
- (u) Open the quick -release clamps [6].

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- 1) Release the engine wire harness [5] from the quick -release clamps [6].
- (v) Disconnect the electrical connector (P24) [8] from the filter bypass switch (oil filter indicator on the generator filter housing).
- (w) Release the engine wire harness [5] from the spring clips [9].
- (x) Disconnect the electrical connector (P14) [11] from the low oil pressure switch.
- (y) Disconnect the electrical connector (P15) [10] from the oil temperature sensor.

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- 1) Disconnect the ground jumper [48] from the electrical connector (P15) backshell clamp.

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- 2) Remove lockwire from the electrical connector (P15) [10].
- 3) Disconnect the electrical connector (P15) [10].
- (z) Open the quick -release clamp [7].
 - 1) Release the engine wire harness [5] from the quick -release clamp [7]].
- (aa) Disconnect the electrical connector (P22) [47] from the fuel control unit.
- (ab) Disconnect the three electrical connectors from the APU firewall receptacles on the 1088 bulkhead.
 - 1) Disconnect the electrical connector (P2) [44].
 - 2) Disconnect the electrical connector (P1) [45].
 - 3) Disconnect the electrical connector (P3) [46].
- (ac) Remove the engine wire harness [5].
- (ad) Install dust caps, STD-7394, on the electrical connectors.

———— **END OF TASK** ————

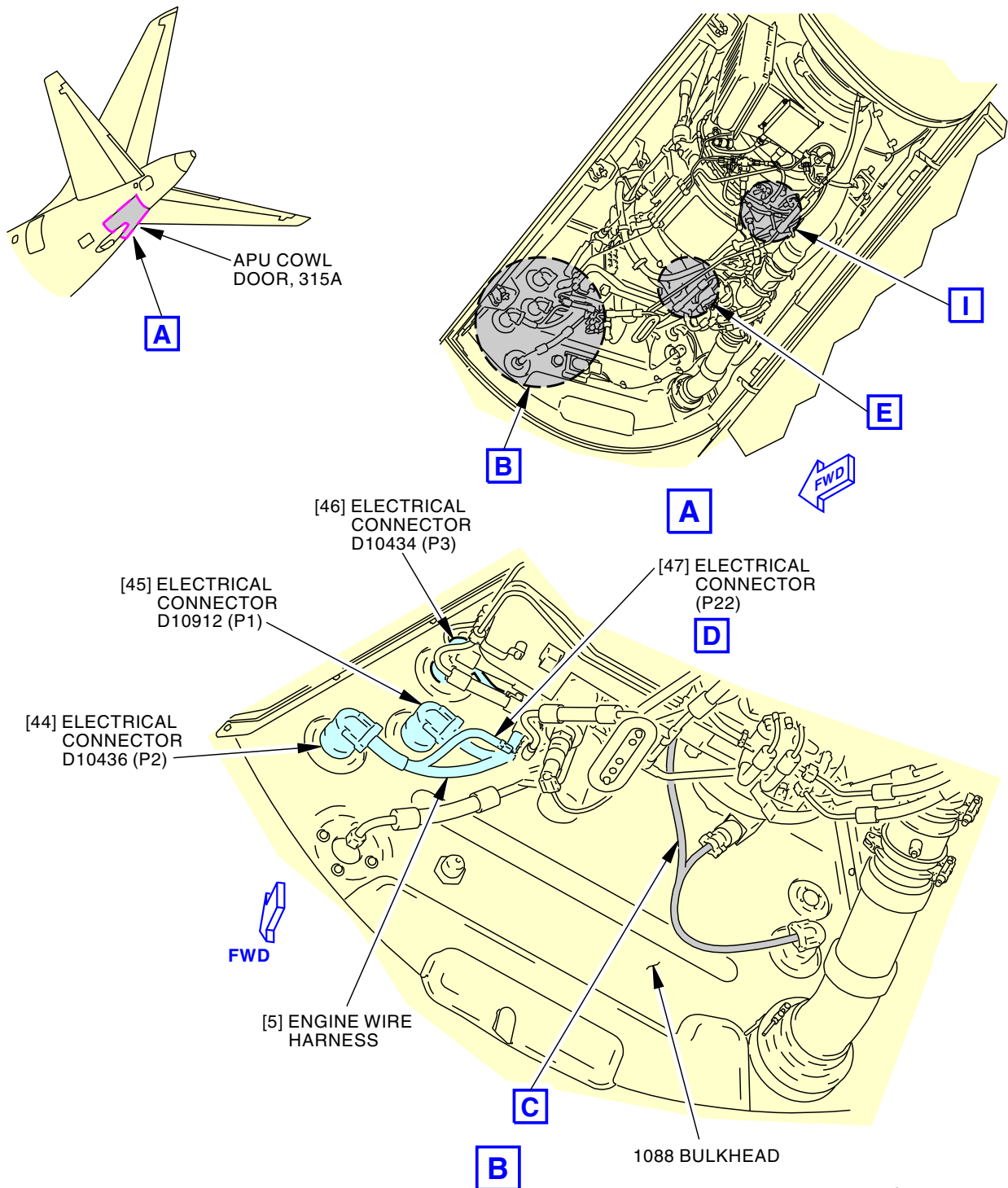
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Engine Wire Harness Installation
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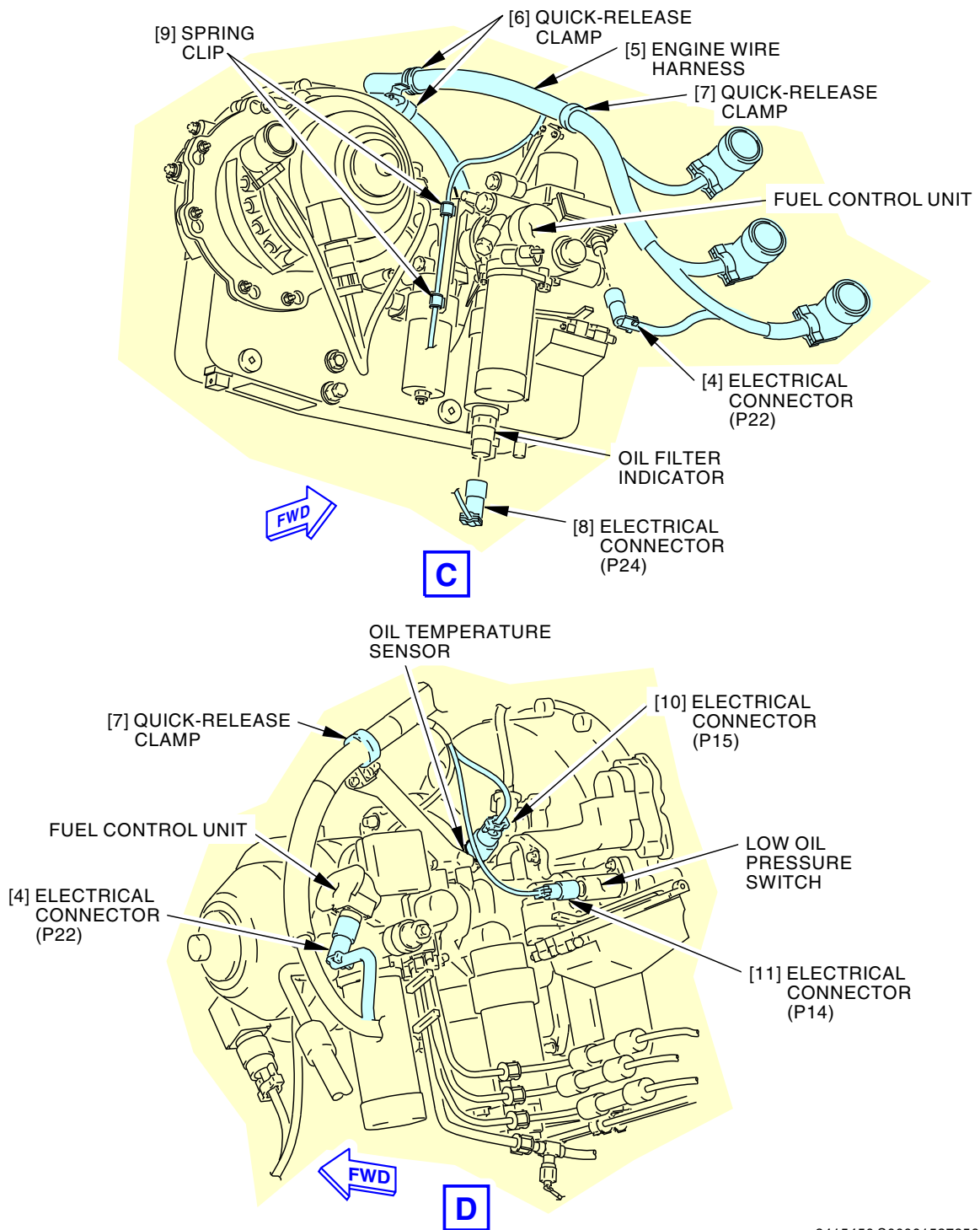
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**Engine Wire Harness Installation
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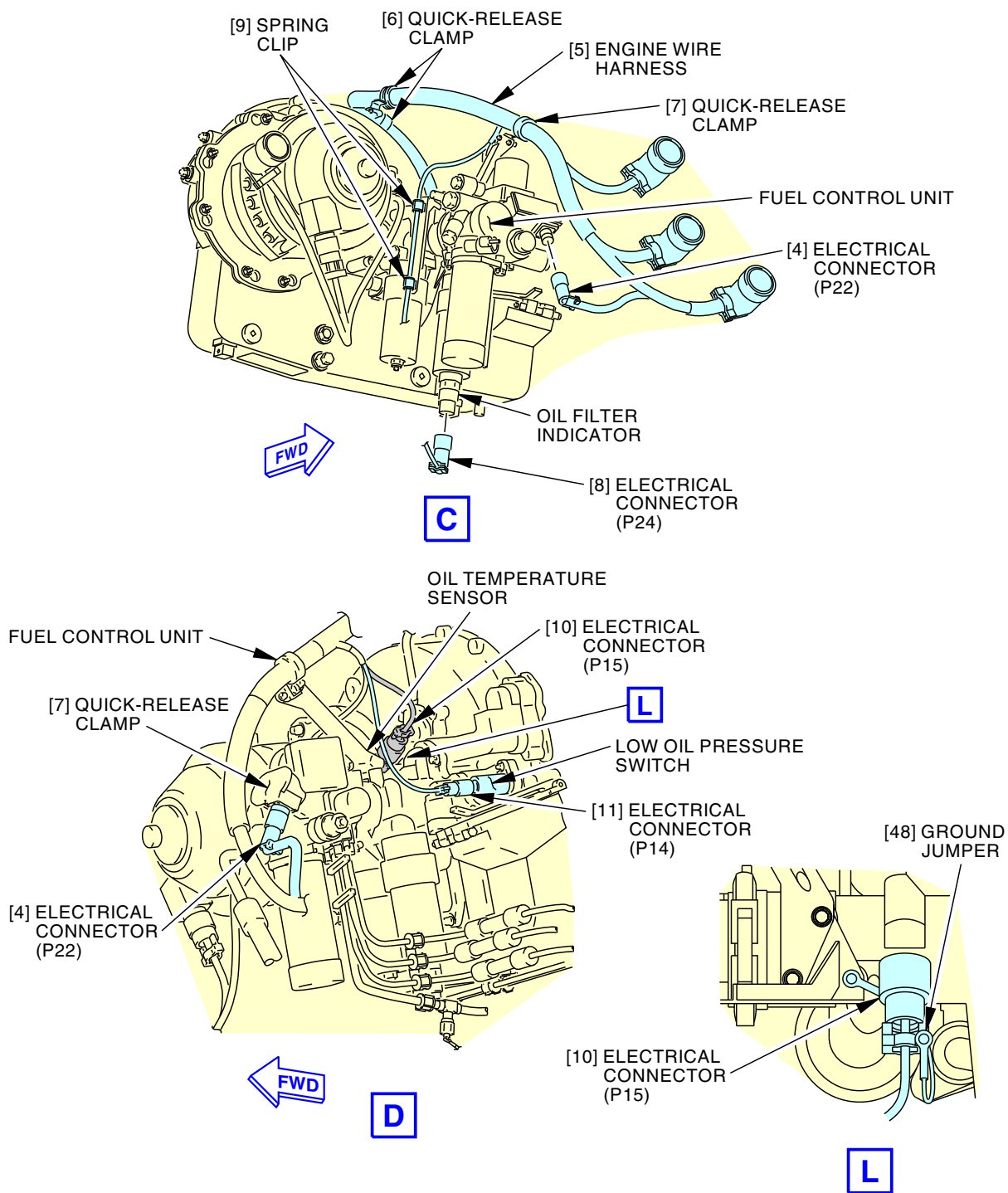
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Engine Wire Harness Installation
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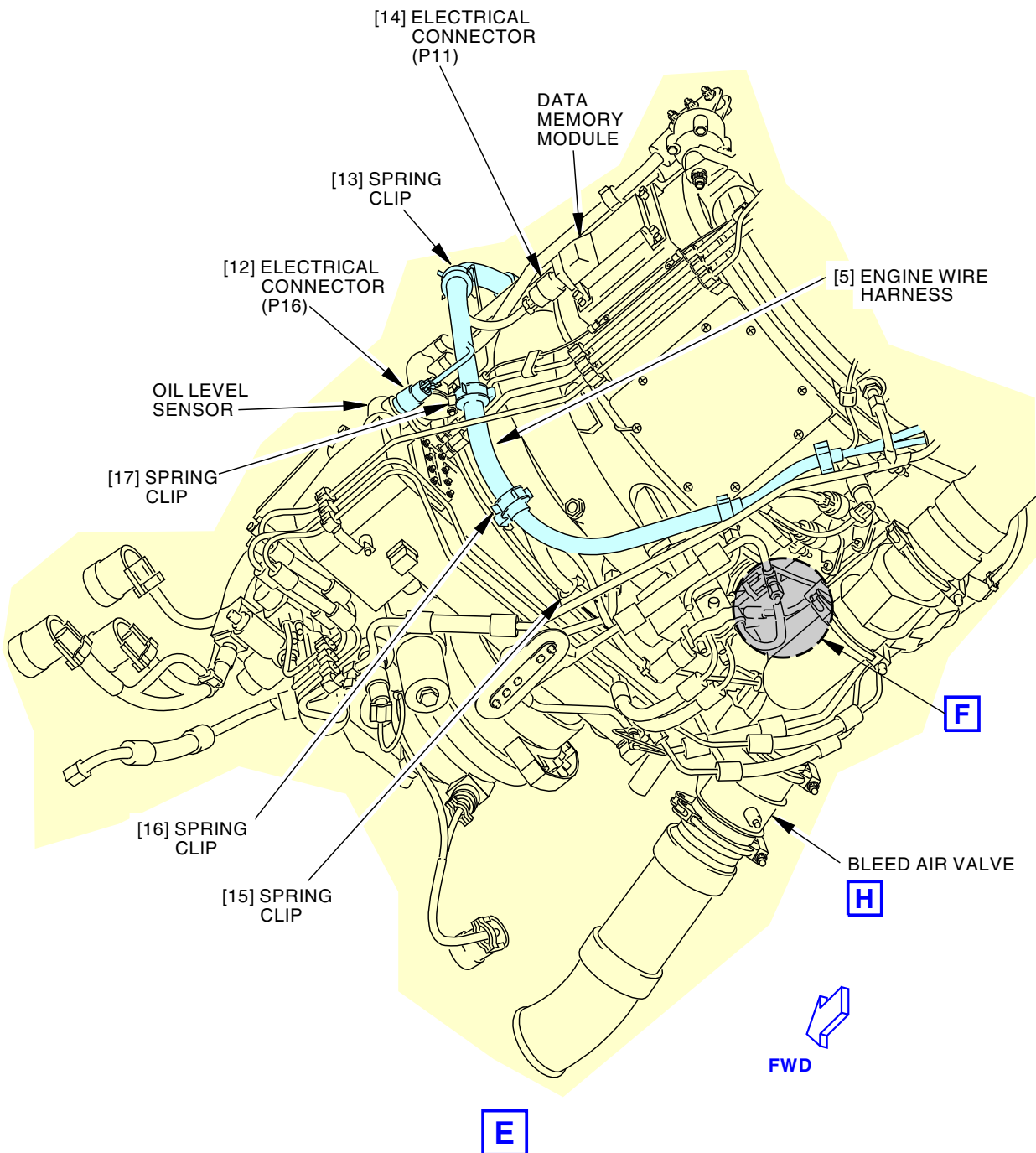
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**Engine Wire Harness Installation
Figure 402/49-11-01-990-802 (Sheet 4 of 9)**

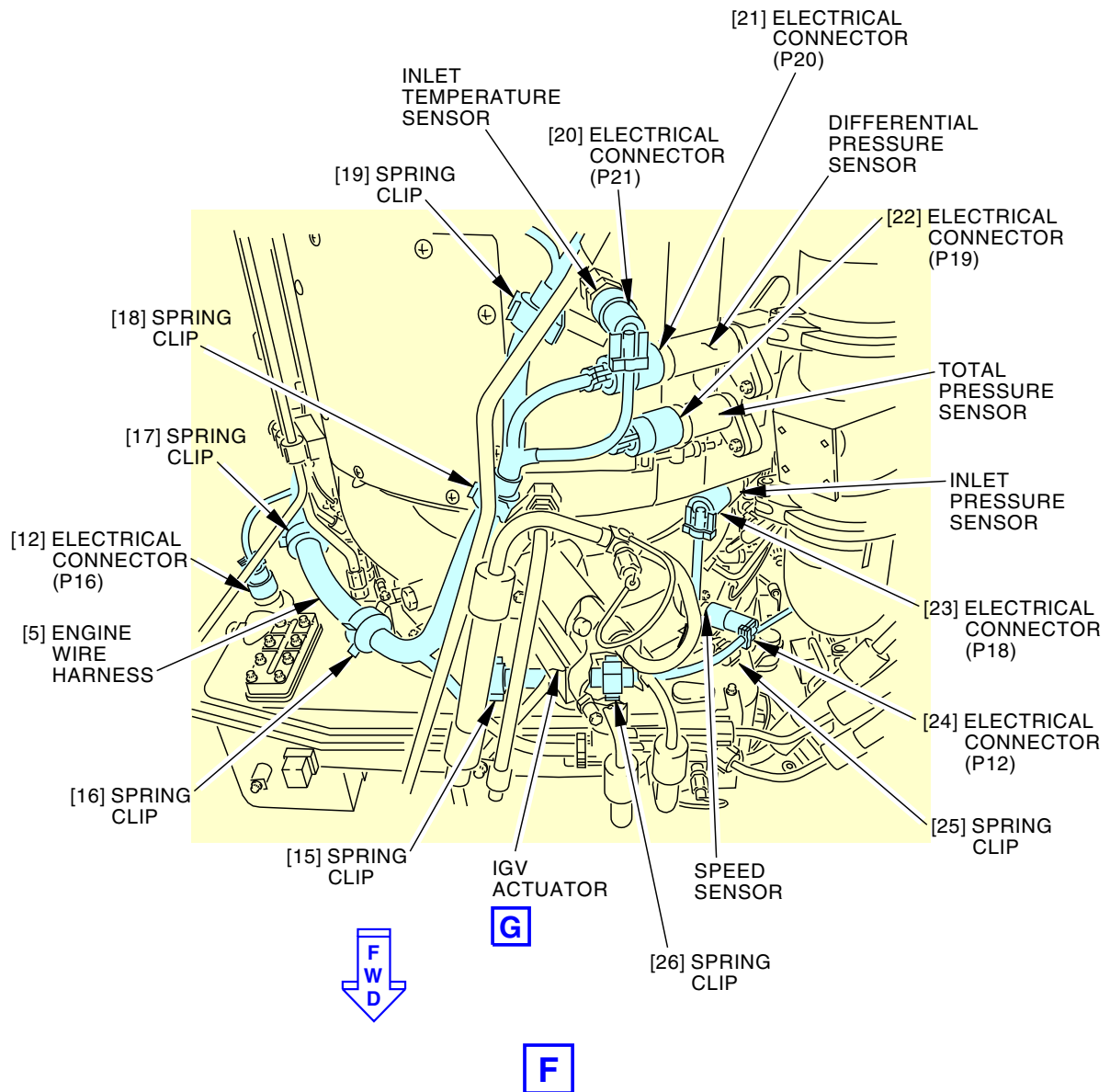
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Engine Wire Harness Installation
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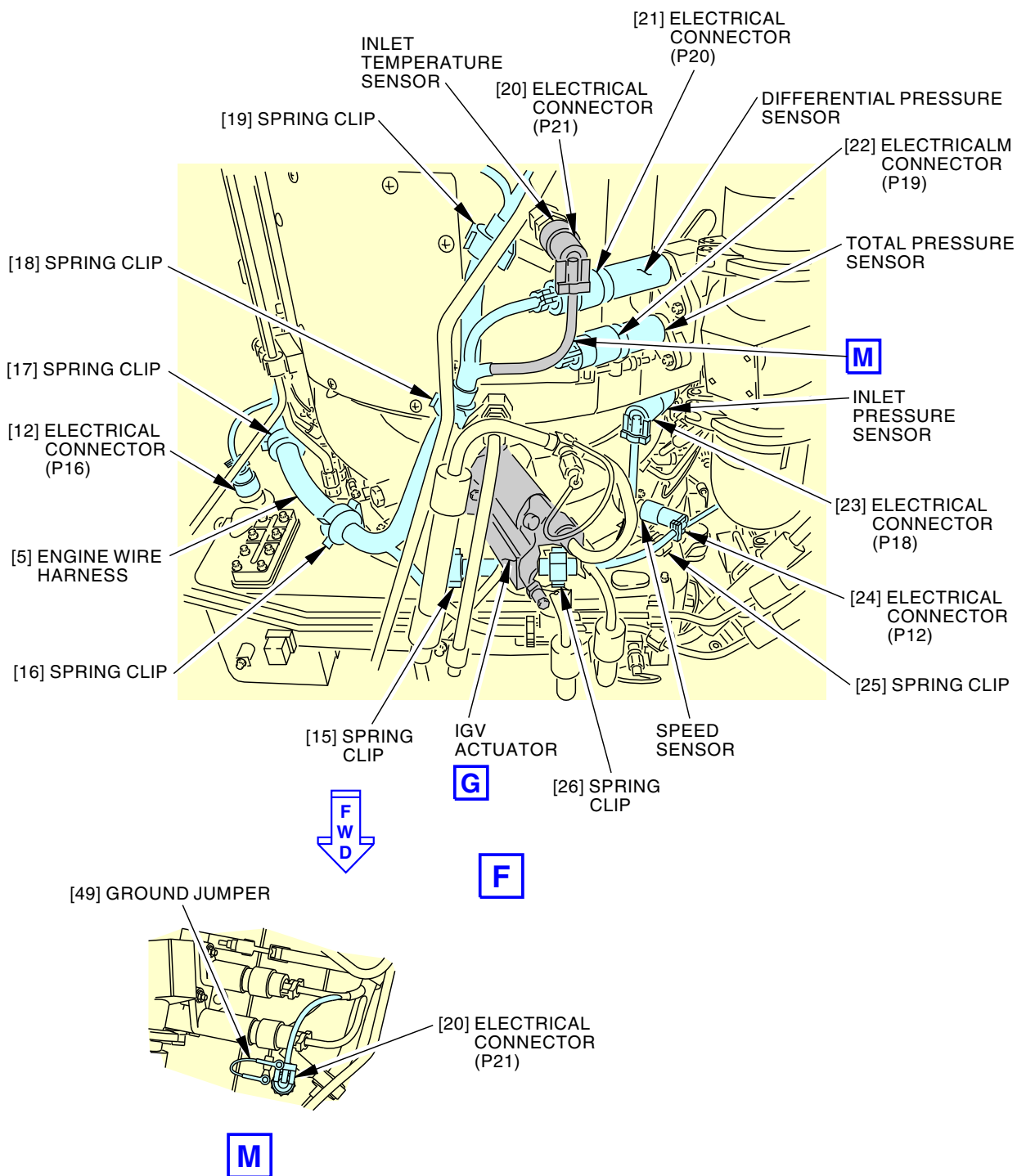
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Engine Wire Harness Installation
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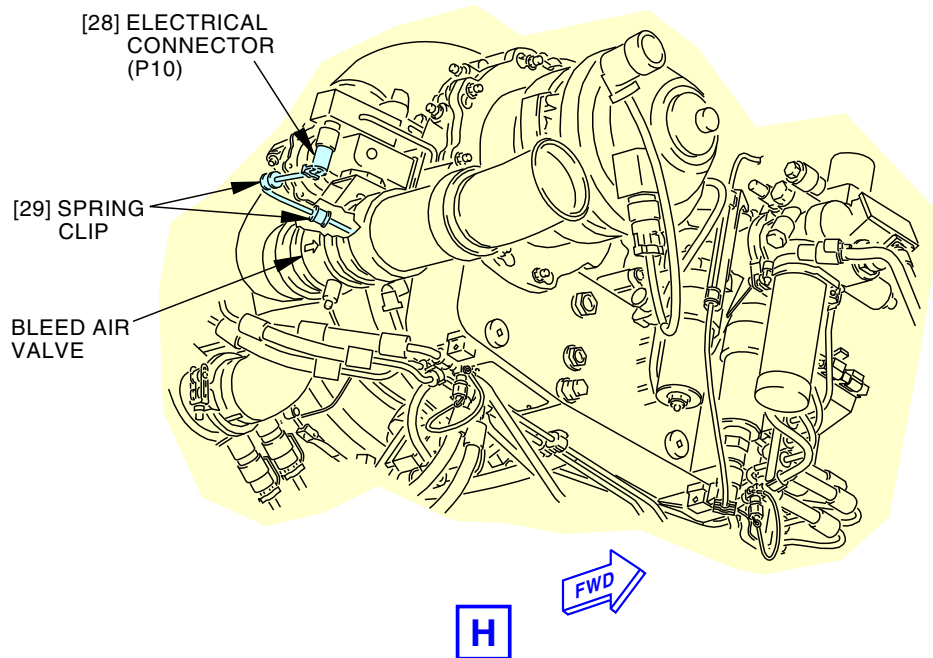
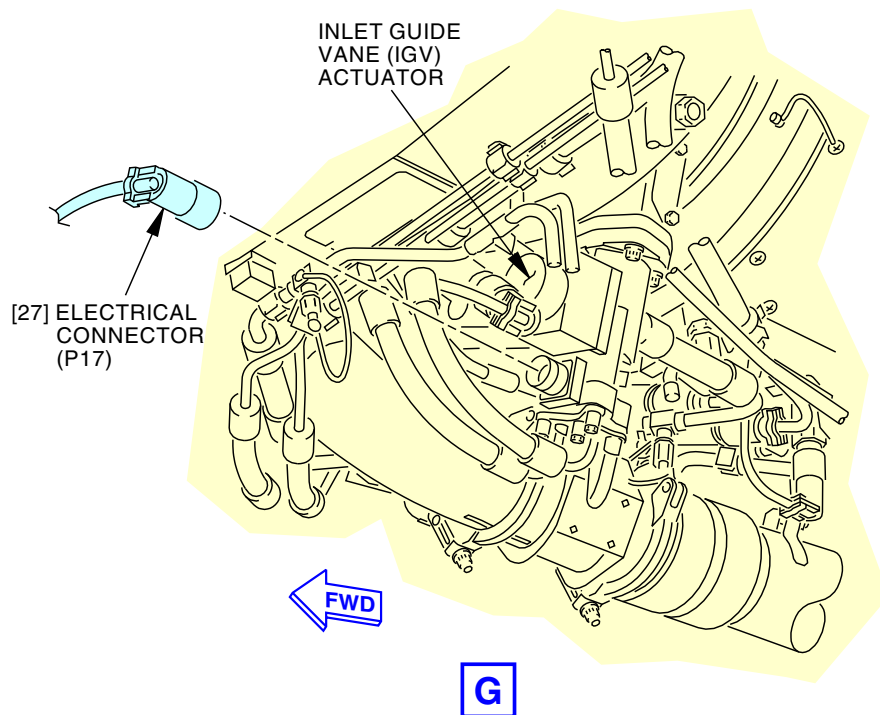
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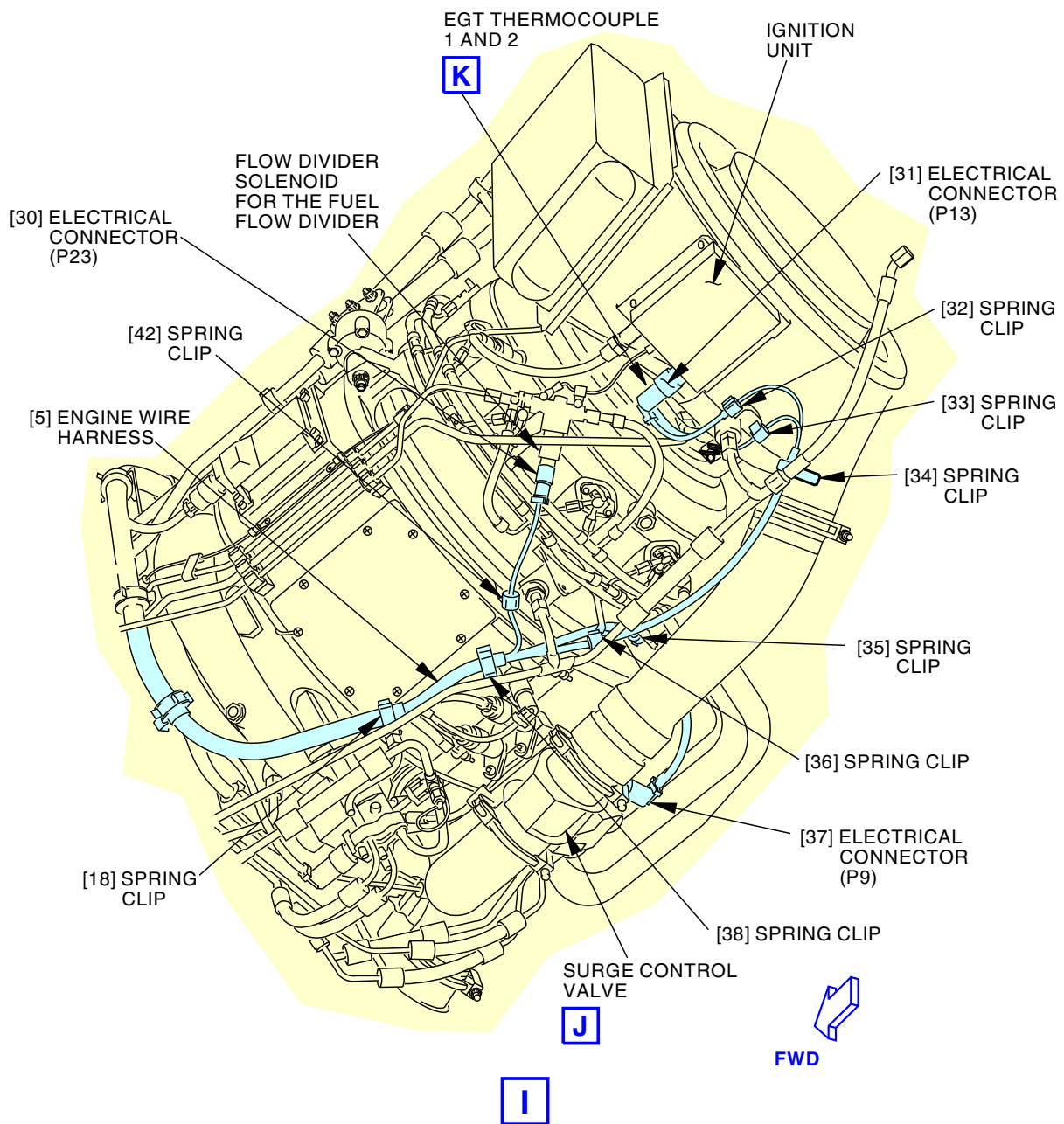
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2415454 S00061537860_V1

Engine Wire Harness Installation
Figure 402/49-11-01-990-802 (Sheet 8 of 9)

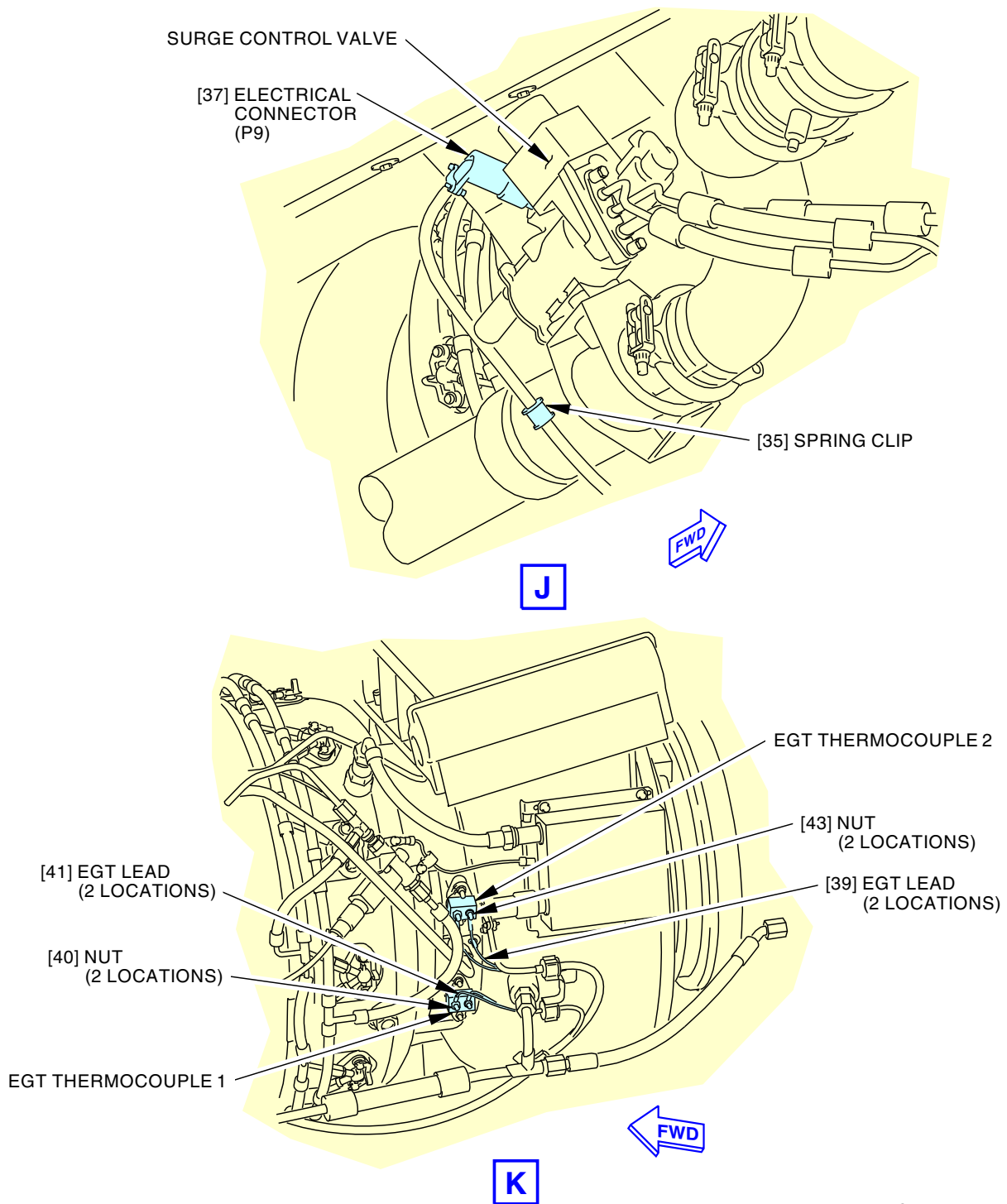
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2415455 S00061537861_V3

**Engine Wire Harness Installation
Figure 402/49-11-01-990-802 (Sheet 9 of 9)**

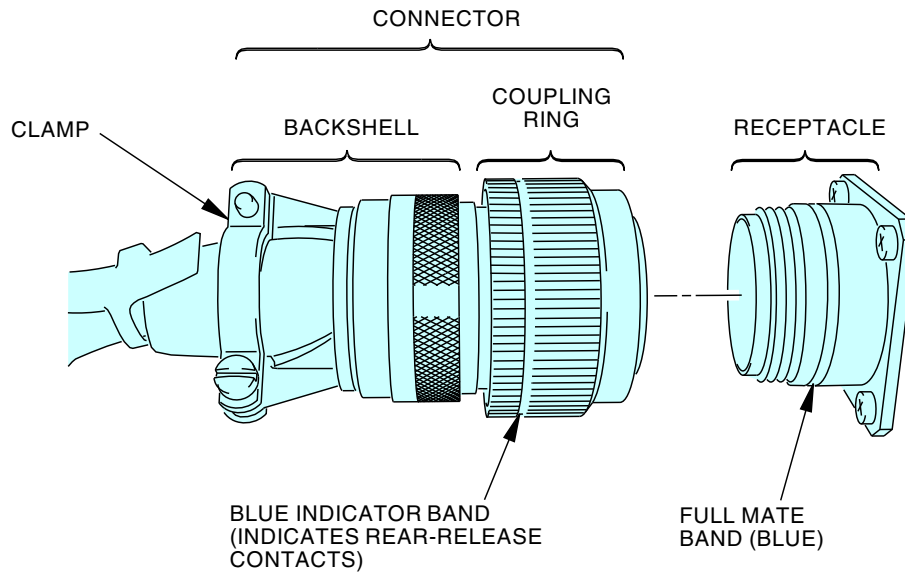
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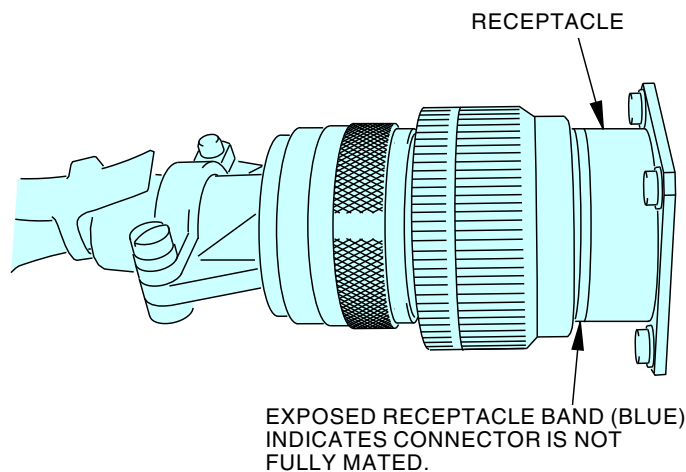
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RATCHETING SELF-LOCKING CONNECTOR AND RECEPTACLE



RATCHETING SELF-LOCKING CONNECTOR - NOT FULLY MATED

2415456 S00061537862_V1

APU Electrical Connectors - Examples of Fully Tightened Connectors
Figure 403/49-11-01-990-803 (Sheet 1 of 4)

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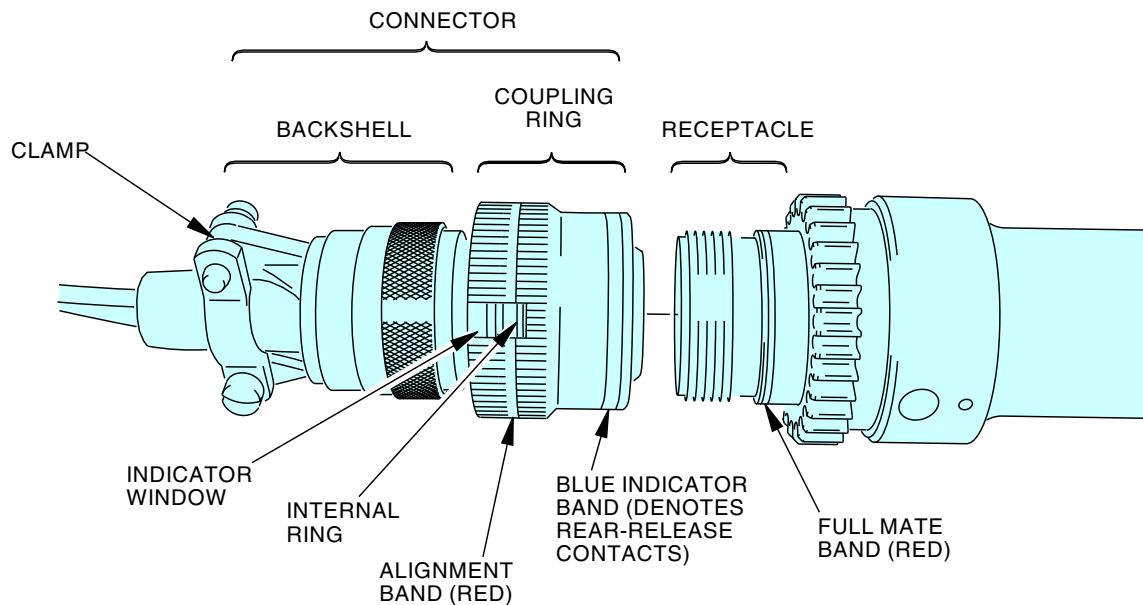
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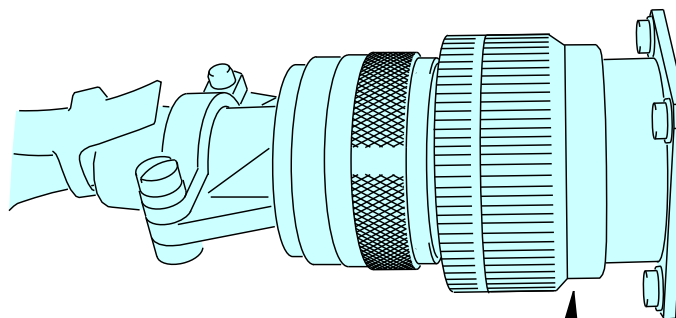
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RATCHETING SELF-LOCKING CONNECTOR WITH OPTIONAL INDICATOR WINDOW



RATCHETING SELF-LOCKING CONNECTOR - FULLY MATED

2415457 S00061537863_V1

**APU Electrical Connectors - Examples of Fully Tightened Connectors
Figure 403/49-11-01-990-803 (Sheet 2 of 4)**

EFFECTIVITY
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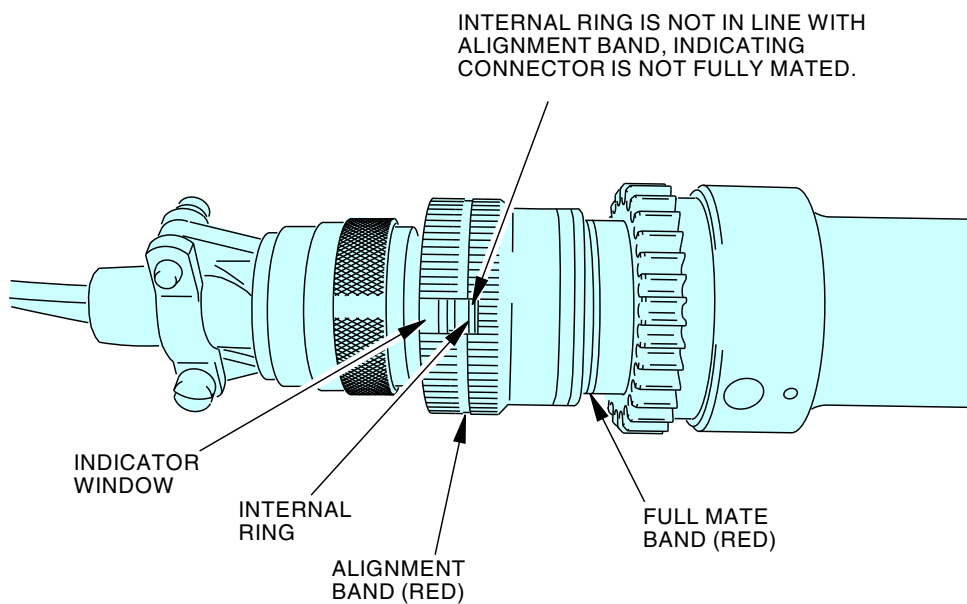
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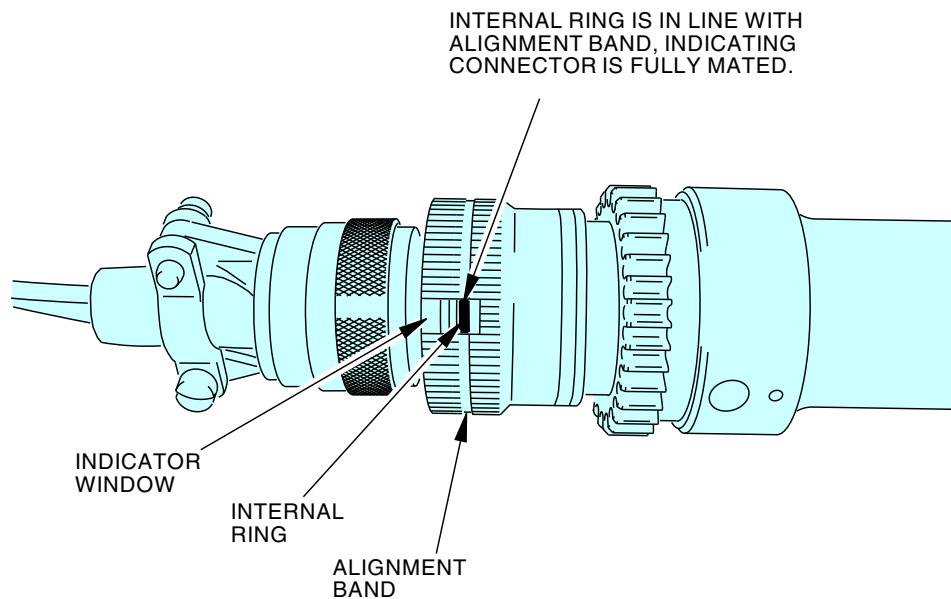
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RATCHETING SELF-LOCKING CONNECTOR - NOT FULLY MATED



RATCHETING SELF-LOCKING CONNECTOR WITH OPTIONAL INDICATOR WINDOW - FULLY MATED

2415458 S00061537864_V1

APU Electrical Connectors - Examples of Fully Tightened Connectors
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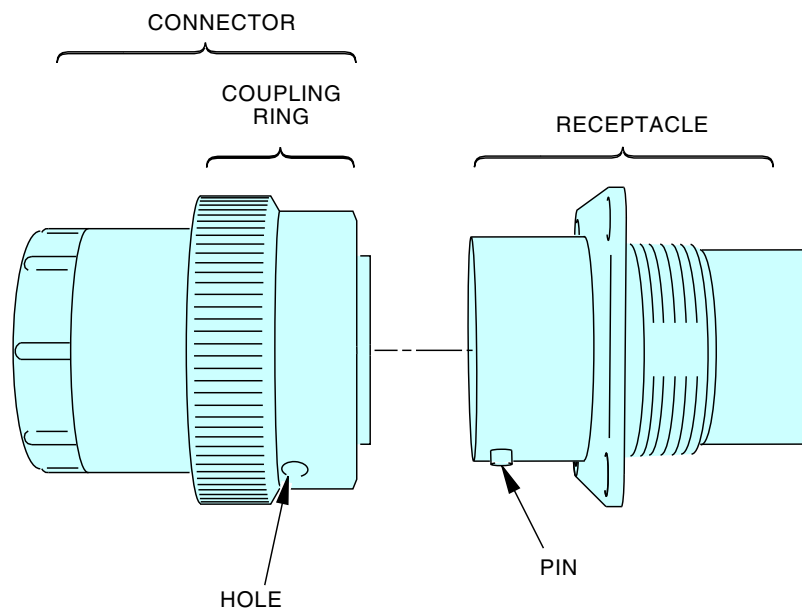
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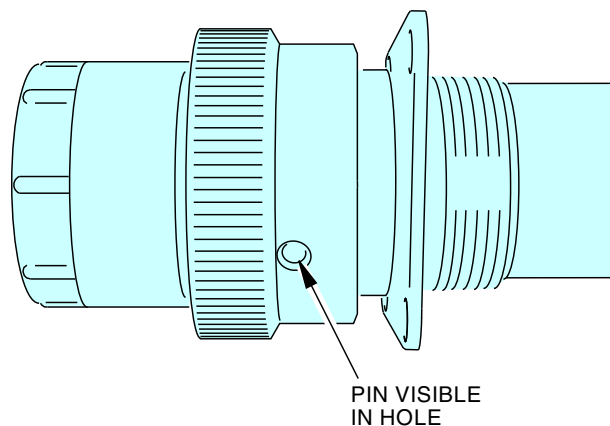
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BAYONET CONNECTOR AND RECEPTACLE



BAYONET CONNECTOR - FULLY MATED

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APU Electrical Connectors - Examples of Fully Tightened Connectors
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TASK 49-11-01-400-802

5. **Engine Wire Harness Installation**

(Figure 402 and Figure 403)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
49-11-00-710-802	APU Operational Test (P/B 501)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-11-01-200-801	APU Wire Harness, Electrical Connectors and Terminals Inspection (P/B 601)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-592	Meter - Milliohms, Range from 0.001 to 100 milliohms
STD-7394	Cap - Dust, Electrical Connector

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G50021	Pad - General Purpose Scrubbing - Scotch-Brite 96W	
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Engine wire harness	49-11-01-01-005	SIA ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Engine Wire Harness Installation

SUBTASK 49-11-01-210-002

- (1) Do this task: APU Wire Harness, Electrical Connectors and Terminals Inspection, TASK 49-11-01-200-801.

SUBTASK 49-11-01-420-002

- (2) Do these steps to install the engine wire harness [5]:

NOTE: Refer to Figure 403 for examples of fully tightened connectors.

- (a) Remove the dust caps, STD-7394, from the electrical connectors.

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- (b) Connect the three electrical connectors to the APU firewall receptacles on the 1088 bulkhead.
 - 1) Connect the electrical connector (P3) [46].
 - 2) Connect the electrical connector (P1) [45].
 - 3) Connect the electrical connector (P2) [44].
- (c) Connect the electrical connector (P22) [47] to the fuel control unit.
- (d) Put the engine wire harness [5] into the quick -release clamp [7].

NOTE: Grommets are installed on the engine wire harness to correctly position the engine wire harness on the quick-release clamps and spring clips.

 - 1) Close the quick -release clamp [7].
- (e) Connect the electrical connector (P15) [10] to the oil temperature sensor.
 - 1) Install lockwire on the electrical connector (P15) [10] (TASK 20-10-44-400-801).

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- (f) Connect the ground jumper [48] as follows:
 - 1) Clean the contact of the ground jumper [48] using alcohol, B00130, and Scotch-Brite 96W pad, G50021.
 - 2) Secure the ground jumper [48] to the electrical connector (P15) backshell clamp.
 - 3) Use milliohm meter .001 to 100 milliohms, STD-592, to make sure that the bonding resistance for the ground jumper [48] is not more than 0.008 ohms (8 milliohms).

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- (g) Connect the electrical connector (P14) [11] to the low oil pressure switch.
- (h) Put the engine wire harness [5] into the spring clips [9].
- (i) Connect the electrical connector (P24) [8] to the filter bypass switch (oil filter indicator on the generator filter housing).
- (j) Put the engine wire harness [5] into the quick -release clamps [6].
 - 1) Close the quick -release clamps [6].
- (k) Put the engine wire harness [5] into the spring clip [13].
- (l) Connect the electrical connector (P16) [12] to the oil level sensor.
- (m) Connect the electrical connector (P11) [14] to the data memory module.
- (n) Put the engine wire harness [5] into the spring clip [17], spring clip [16], spring clip [15], spring clip [26], spring clip [25], and spring clips [29].
- (o) Connect the electrical connector (P17) [27] to the Inlet Guide Vane (IGV) actuator.
- (p) Connect the electrical connector (P12) [24] to the speed sensor.
- (q) Connect the electrical connector (P18) [23] to the inlet pressure sensor.
- (r) Connect the electrical connector (P10) [28] to the bleed air valve.
- (s) Put the engine wire harness [5] into the spring clip [18] and spring clip [38].
- (t) Connect the electrical connector (P19) [22] to the total pressure sensor.
- (u) Connect the electrical connector (P20) [21] to the delta pressure sensor.
- (v) Connect the electrical connector (P21) [20] to the inlet temperature sensor.
 - 1) Install MS20995C20 lockwire, G50225, on the electrical connector (P21) [20] (TASK 20-10-44-400-801).

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- (w) Connect the ground jumper [49] as follows:
- 1) Clean the contact of the ground jumper [49] using alcohol, B00130 and Scotch-Brite 96W pad, G50021.
 - 2) Secure the ground jumper [49] to the electrical connector (P21) backshell clamp.
 - 3) Use milliohm meter .001 to 100 milliohms, STD-592, to make sure that the bonding resistance for the ground jumper [49] is not more than 0.008 ohms (8 milliohms).

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- (x) Put the engine wire harness [5] into the spring clip [19] and spring clip [29].
- (y) Connect the electrical connector (P23) [30] to the flow divider solenoid for the fuel flow divider.
- (z) Put the engine wire harness [5] into the spring clip [35] and spring clip [36].
- (aa) Connect the electrical connector (P9) [37] to the surge control valve.
- (ab) Put the engine wire harness [5] into the spring clip [32], spring clip [33], and spring clip [34].
- (ac) Connect the EGT lead [39] and EGT lead [41].
- 1) Connect the EGT leads [41] to the EGT thermocouple 1.
 - a) Install the nuts [40] that attach the EGT leads [41] to the EGT thermocouple 1.
NOTE: There are two different nuts that attach the EGT leads [41] to the EGT thermocouple. The nut for the alumel stud is larger than the nut for the chromel stud. See the labels on the EGT leads [41] and studs.
 - b) Make sure that you install the correct nuts [40] on the alumel and chromel studs.
 - c) Tighten the nut [40] for the alumel stud to 32 ± 8 in-lb (3.6 ± 0.9 N·m).
 - d) Tighten the nut [40] for the chromel stud to 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m).
 - 2) Connect the EGT leads [39] to the EGT thermocouple 2.
 - a) Install the nuts [43] that attach the EGT leads [39] to the EGT thermocouple 2.
NOTE: There are two different nuts that attach the EGT leads [39] to the EGT thermocouple. The nut for the alumel stud is larger than the nut for the chromel stud. See the labels on the EGT leads [39] and studs.
 - b) Make sure that you install the correct nuts [43] on the alumel and chromel studs.
 - c) Tighten the nut [43] for the alumel stud to 32 ± 8 in-lb (3.6 ± 0.9 N·m) .
 - d) Tighten the nut [43] for the chromel stud to 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m).
- (ad) Connect the electrical connector (P13) [31] to the ignition unit.

H. Engine Wire Harness Installation Test

SUBTASK 49-11-01-860-008

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

F/O Electrical System Panel, P6-2

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

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-01-860-009

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

SUBTASK 49-11-01-710-002

- (3) Do this task: APU Operational Test, TASK 49-11-00-710-802.

SUBTASK 49-11-01-740-002

- (4) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

- (a) If maintenance message(s) show, refer to the IFIM and do the applicable procedure(s).

SUBTASK 49-11-01-860-010

- (5) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-002

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

————— **END OF TASK** —————

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WIRE HARNESS - INSPECTION/CHECK

1. General

- A. This procedure has one task:
- (1) An inspection of the APU wire harnesses, Electrical Connectors and Terminals
- B. The APU has two wire harnesses. The starter-generator wire harness is installed on the starter-generator and the 1088 bulkhead. The APU engine wire harness is installed on the APU and the 1088 bulkhead.

TASK 49-11-01-200-801

2. APU Wire Harness, Electrical Connectors and Terminals Inspection

A. **References**

Reference	Title
20-60-02-100-802	Detailed Inspection of EWIS (P/B 601)
20-60-02-100-803	Cleaning to Remove Combustible Material (P/B 701)
49-11-01 P/B 801	APU HARNESS - REPAIRS
49-11-01-000-801	Starter-Generator Wire Harness Removal (P/B 401)
49-11-01-000-802	Engine Wire Harness Removal (P/B 401)
49-11-01-400-801	Starter-Generator Wire Harness Installation (P/B 401)
49-11-01-400-802	Engine Wire Harness Installation (P/B 401)
49-11-01-960-801	Wire Harness Terminal Replacement (P/B 801)
49-11-01-960-802	Electrical Connector Contact Replacement (P/B 801)
49-11-01-960-803	Electrical Connector Replacement (P/B 801)

B. **Consumable Materials**

Reference	Description	Specification
G00150	Tape - Nitto P-421 NAT (Formerly Permacel) PTFE Film Tape	
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. **Location Zones**

Zone	Area
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
142	Aft Cargo Compartment - Right
314	Stabilizer Torsion Box Compartment - Right
315	APU Compartment - Left
316	APU Compartment - Right

D. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

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E. Prepare for the Inspection

SUBTASK 49-11-01-010-003

- (1) To open the access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

F. APU Wire Harness Inspection

SUBTASK 49-11-01-210-003

- (1) Do these steps to inspect the APU wire harnesses:

- (a) Examine the APU wire harnesses for disconnected and loose electrical connectors and terminal lugs.

- 1) If you find a disconnected or loose electrical connector or terminal lug, connect or tighten the electrical connector or terminal lug.

- (b) Examine the APU wire harnesses for damaged insulation, shields and splices.

- 1) If you find damage to the starter-generator wire harness on the APU, repair the problems that you find or replace the wire harness.

These are the tasks:

- APU HARNESS - REPAIRS, PAGEBLOCK 49-11-01/801,
- Starter-Generator Wire Harness Removal, TASK 49-11-01-000-801,
- Starter-Generator Wire Harness Installation, TASK 49-11-01-400-801.

- 2) If you find damage to the engine wire harness on the APU, repair the problems that you find or replace the wire harness.

These are the tasks:

- APU HARNESS - REPAIRS, PAGEBLOCK 49-11-01/801,
- Engine Wire Harness Removal, TASK 49-11-01-000-802,
- Engine Wire Harness Installation, TASK 49-11-01-400-802.

G. Electrical Connector and Terminal Inspection

SUBTASK 49-11-01-211-001

- (1) Do these steps to inspect the electrical connectors and terminals:

- (a) Examine the electrical connector or terminal that you disconnected for contamination and damage.

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- 1) If the airplane electrical connector or terminal has contamination, clean the connector or terminal (TASK 20-60-02-100-803).
 - 2) If an airplane electrical connector or terminal shows signs of damage, do this task: Detailed Inspection of EWIS, TASK 20-60-02-100-802.
 - 3) If an APU wire harness has a damaged terminal, do this task: Wire Harness Terminal Replacement, TASK 49-11-01-960-801.
 - 4) If an APU wire harness electrical connector has a bent or pushed pin, do this task: Electrical Connector Contact Replacement, TASK 49-11-01-960-802.
 - 5) If an APU wire harness electrical has damage and needs to be replaced, do this task: Electrical Connector Replacement, TASK 49-11-01-960-803.
- (2) Do these steps to examine the APU internal connections of the electrical connector:
- (a) Remove the lockwire from the backshell.
 - (b) Loosen the saddle clamp and coupling collar from the electrical connector.
 - (c) Disconnect the backshell from the electrical connector.
 - (d) Remove the tape from the wires.
 - (e) Examine the internal connections for signs of damage.
 - 1) If it is necessary, do this task: Electrical Connector Contact Replacement, TASK 49-11-01-960-802.
 - (f) Connect the backshell on the new electrical connector.
 - (g) Tighten the coupling collar finger tight.
 - (h) Install the Nitto P-421 tape, G00150, around the wires that are in the saddle clamp area.
 - (i) Tighten the saddle clamp on the backshell.
 - (j) Install the MS20995C20 lockwire, G50225, on the backshell.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-01-410-003

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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APU HARNESS - REPAIRS

1. General

A. This procedure has these tasks for the repair of the APU harness:

- (1) Wire harness terminal replacement
- (2) Electrical connector contact replacement
- (3) Electrical connector replacement.

TASK 49-11-01-300-801

2. APU Harness Repair

A. Location Zones

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

B. APU Harness Repair

SUBTASK 49-11-01-960-001

- (1) If the APU harness has a damaged terminal, do this task: Wire Harness Terminal Replacement, TASK 49-11-01-960-801.

SUBTASK 49-11-01-960-002

- (2) If the electrical connector on the APU harness has a bent or pushed pin, do this task: Electrical Connector Contact Replacement, TASK 49-11-01-960-802.

SUBTASK 49-11-01-960-003

- (3) If the electrical connector on the APU harness has damage and needs to be replaced, do this task: Electrical Connector Replacement, TASK 49-11-01-960-803.

————— **END OF TASK** —————

TASK 49-11-01-960-801

3. Wire Harness Terminal Replacement

(Figure 801)

A. Tools/Equipment

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

Reference	Description
COM-1593	Kit - Crimp Tool, 737 Part #: DMC1264 Supplier: 11851 Part #: G01P3 Supplier: 54443
STD-2489	Cutter - Diagonal, Side-Cushioned

B. Procedure

SUBTASK 49-11-01-020-003

- (1) Do these steps to remove the damaged terminal from the wire harness:
 - (a) Disconnect the damaged terminal from the component.
 - (b) Cut the wire near the damaged terminal with the side-cushioned diagonal cutter, STD-2489.

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SUBTASK 49-11-01-420-003

- (2) Do these steps to install a new terminal on the wire harness:
- (a) Remove 0.2 in. (5.1 mm)-0.3 in. (7.6 mm) of insulation from the wire.
 - (b) Put the bare wire in the center of the new terminal.
 - (c) Use the crimp tool in the tool kit, COM-1593, to crimp the terminal.
 - (d) Pull back lightly on the wire to make sure the terminal is attached correctly.
 - (e) Connect the terminal to the component.

———— **END OF TASK** ————

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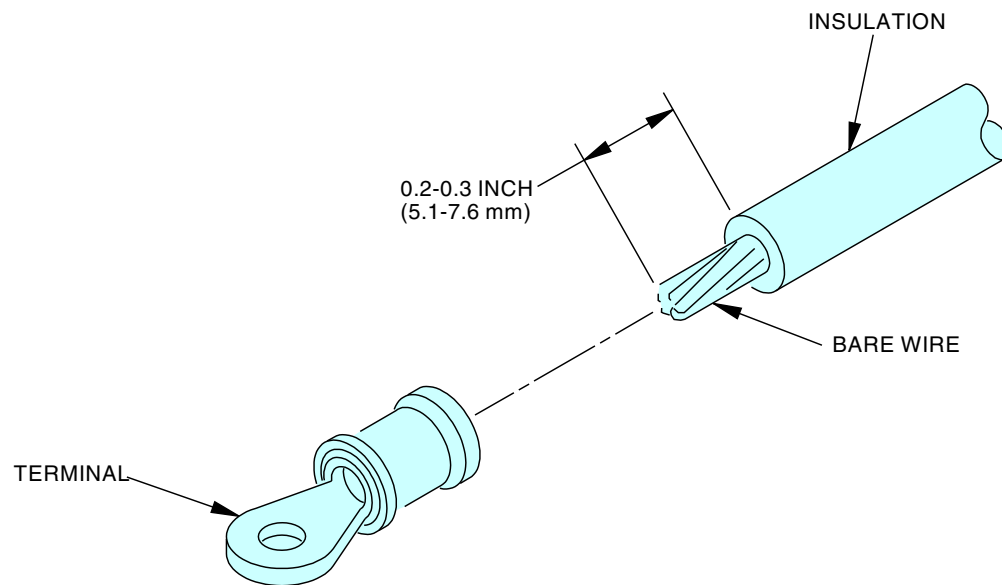
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WIRE/TERMINAL CONNECTION

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APU Harness Repair (Terminal)
Figure 801/49-11-01-990-804

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TASK 49-11-01-960-802

4. Electrical Connector Contact Replacement

(Figure 802)

A. Tools/Equipment

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

Reference	Description
COM-1593	Kit - Crimp Tool, 737 Part #: DMC1264 Supplier: 11851 Part #: G01P3 Supplier: 54443

B. Consumable Materials

Reference	Description	Specification
G00150	Tape - Nitto P-421 NAT (Formerly Permacel) PTFE Film Tape	
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Procedure

SUBTASK 49-11-01-020-004

- (1) Do these steps to remove the damaged electrical connector contact:
 - (a) Disconnect the electrical connector from the component.
 - (b) Remove the lockwire from the backshell.
 - (c) Loosen the saddle clamp and coupling collar from the electrical connector.
 - (d) Disconnect the backshell from the electrical connector.
 - (e) Remove the tape from the wires.
 - (f) Use the contact removal tool in the tool kit, COM-1593, to remove the damaged contact from the electrical connector.
 - (g) Cut the wire near the damaged contact.

SUBTASK 49-11-01-420-004

- (2) Do these steps to install a new electrical connector contact:
 - (a) Remove 0.125 in. (3.2 mm) of insulation from the end of the wire.
 - (b) Put the bare wire into the new contact until the bare wire touches the bottom barrel of the contact.
 - (c) Use the crimp tool in the tool kit, COM-1593, to crimp the contact.
 - (d) Use the contact insertion tool in the tool kit, COM-1593, to put the contact into the electrical connector.
 - (e) Pull back lightly on the wire to make sure the contact is attached correctly.
 - (f) Connect the backshell on the electrical connector.
 - (g) Tighten the coupling collar finger tight.
 - (h) Install the Nitto P-421 tape, G00150, around the wires that are in the saddle clamp area.
 - (i) Tighten the saddle clamp on the backshell.
 - (j) Install the MS20995C20 lockwire, G50225, on the backshell.

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- (k) Connect the electrical connector to the component.

———— **END OF TASK** ————

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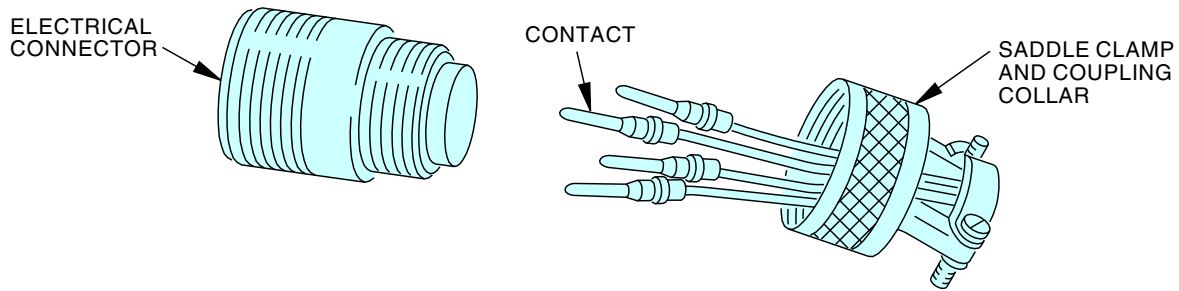
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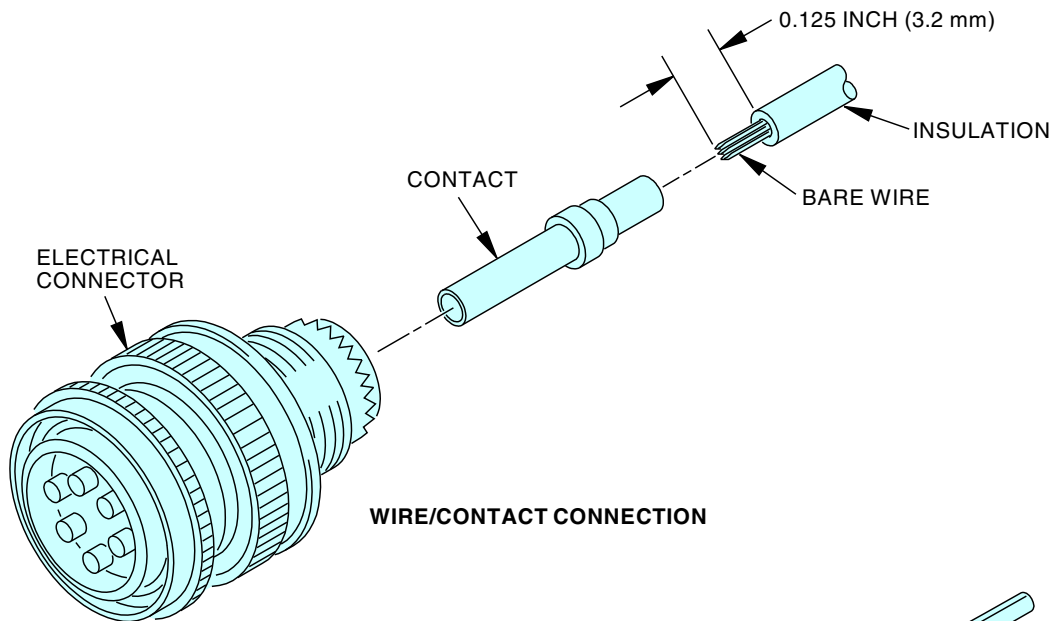
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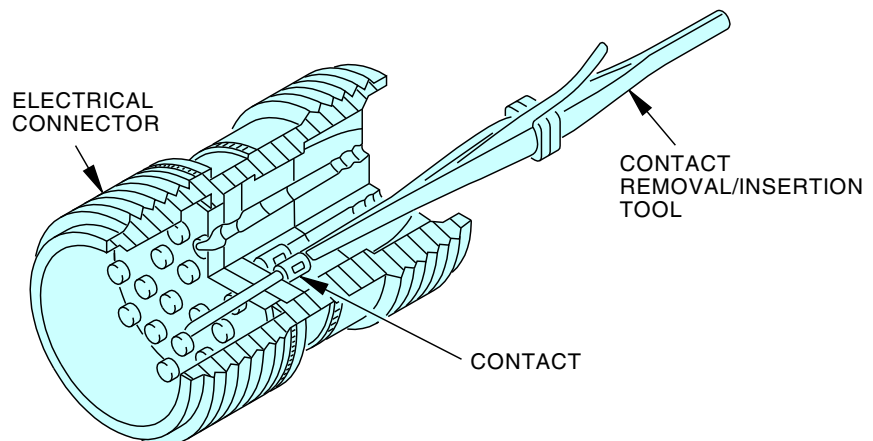
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ELECTRICAL CONNECTOR COMPONENTS



WIRE/CONTACT CONNECTION



CONTACT INSTALLATION

2415461 S00061537875_V1

**APU Harness Repair (Electrical Connector)
Figure 802/49-11-01-990-805**

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TASK 49-11-01-960-803

5. Electrical Connector Replacement

(Figure 802)

A. Tools/Equipment

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

Reference	Description
COM-1593	Kit - Crimp Tool, 737 Part #: DMC1264 Supplier: 11851 Part #: G01P3 Supplier: 54443

B. Consumable Materials

Reference	Description	Specification
G00150	Tape - Nitto P-421 NAT (Formerly Permacel) PTFE Film Tape	
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Procedure

SUBTASK 49-11-01-960-004

- (1) Do these steps to replace the damaged electrical connector:
 - (a) Disconnect the damaged electrical connector from the component.
 - (b) Remove the lockwire from the backshell.
 - (c) Loosen the saddle clamp and coupling collar from the electrical connector.
 - (d) Disconnect the backshell from the electrical connector.
 - (e) Remove the tape from the wires.
 - (f) Use the contact removal tool in the tool kit, COM-1593, to remove one contact from the damaged electrical connector.
 - (g) Use the contact insertion tool to install the contact in the new electrical connector at the correct pin location.
 - (h) Pull back lightly on the wire to make sure the contact is attached correctly.
 - (i) Continue to remove one contact from the damaged electrical connector and install the contact to the new electrical connector until all contacts are installed on the new connector.
 - (j) Connect the backshell on the new electrical connector.
 - (k) Tighten the coupling collar finger tight.
 - (l) Install the Nitto P-421 tape, G00150, around the wires that are in the saddle clamp area.
 - (m) Tighten the saddle clamp on the backshell.
 - (n) Install the MS20995C20 lockwire, G50225, on the backshell.
 - (o) Connect the electrical connector to the component.

————— END OF TASK —————

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AIRCRAFT MAINTENANCE MANUAL
APU SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) APU system deactivation
 - (2) APU system activation.
- B. The removal of the APU system decreases the weight of the airplane. Refer to the Weight and Balance Manual to correct the operational characteristics for the airplane.

TASK 49-11-02-040-801

2. APU System Deactivation - After APU Removal

(Figure 201)

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-200-801	APU Power Plant Inspection (P/B 601)
49-15-00-420-801	Manually Close the APU Air Inlet Door (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-1971	Protector - Thread, APU Mount Bolt Part #: C49006-1 Supplier: 81205
SPL-11395	Tool Kit - APU Deletion **Dispatch Tool** Part #: C49009-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
315A	APU Cowl Door

E. Prepare for the Deactivation

SUBTASK 49-11-02-860-009

- (1) Make sure the APU air inlet door is fully closed.
- (a) If it is necessary, do this task: Manually Close the APU Air Inlet Door, TASK 49-15-00-420-801.

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SUBTASK 49-11-02-860-017

- (2) Set the APU master switch (on the P5 forward overhead panel) to the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-11-02-860-018

- (3) Set the two APU GEN switches on the P5 forward overhead panel to the OFF position and install two DO NOT OPERATE tags, STD-858.

SUBTASK 49-11-02-860-019

- (4) Set the APU BLEED switch on the P5 forward overhead panel to the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-11-02-210-002

- (5) Make sure the APU fuel shutoff valve (located on the rear spar of the left wing, in the wheel well) is fully closed.

SUBTASK 49-11-02-860-014

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-02-010-005

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

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

SUBTASK 49-11-02-860-020



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

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SUBTASK 49-11-02-210-003

- (9) Close this access panel:

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

F. APU System Deactivation - After APU Removal

SUBTASK 49-11-02-020-001

- (1) Do this task: APU Power Plant Removal (Selection), TASK 49-11-00-000-801.

SUBTASK 49-11-02-480-002

- (2) Make sure plug [5] is installed on the fuel supply line [6].

SUBTASK 49-11-02-480-001

- (3) Do these steps to install the APU deletion tool kit, SPL-11395:

- (a) Do these steps to install the plug [1] on the bleed duct assembly [4]:

- 1) Remove the protection cover from the bleed duct assembly [4].
- 2) Make sure the seal [3] is in position on the bleed duct assembly [4].

NOTE: The seal [3] is a part of the bleed air duct.

- 3) Install the plug [1] on the bleed duct assembly [4].
- 4) Put the clamp [2] over the plug [1] and the flange of the bleed duct assembly [4].

NOTE: The clamp [2] is a part of the bleed air duct.

- a) Tighten the clamp [2] to 102.5 $\pm$ 7.5 in-lb (11.6 $\pm$ 0.9 N·m).

- (b) Do these steps to install the support frame [19] to the left forward mount [24], left aft mount [7], right forward mount [25] and right aft mount [11]:

- 1) Remove the protector, SPL-1971, from the three cone bolts [12] on the left aft mount [7], right aft mount [11] and right forward mount [25].
- 2) Remove the three cone bolts [12], three washers [13] and three nuts [14] from the left aft mount [7], right aft mount [11] and right forward mount [25].

NOTE: The three washers [13] and three nuts [14] are parts of the APU mount system.

- 3) Put the support frame [19] in position.
- 4) Install the three cone bolts [12], three washers [13] and three nuts [14] that hold the support frame [19] to the three mounts (left aft mount [7], right aft mount [11] and right forward mount [25]).

- a) Tighten the three nuts [14] to 400 $\pm$ 25 in-lb (45.2 $\pm$ 2.8 N·m).

- 5) Remove the nut [22], two washers [21] and bolt [20] from the left forward mount [24].

- 6) Make sure the bushing [23] is in position on the left forward mount [24].

- 7) Install and tighten the bolt [20], two washers [21] and nut [22] to hold the support frame [19] to the left forward mount [24].

- (c) Connect the four terminal lugs [17] for the starter-generator to the terminal board [18].

- 1) Install and tighten the four nuts [16].

- (d) Connect the bonding jumper [29] to the support frame [19] with the two nuts [15].

- (e) Install the plug [27] on the exhaust duct muffler [30].

- 1) Put the clamp [28] over the plug [27] and the exhaust duct muffler [30].

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- a) Tighten the clamp [28] to 80 ±10 in-lb (9.0 ±1.2 N·m).
- (f) Do these steps to connect the turn buckle [26] to the support frame [19]:
 - 1) Align the hole of the turn buckle [26] to the support frame [19].
 - 2) If the holes of the support frame [19] and the turn buckle [26] do not align, adjust the turn buckle [26]:
 - a) Turn the adjustment nuts on the turn buckle [26] in the clockwise or counterclockwise direction until the holes of the turn buckle [26] and the support frame [19] align.
 - 3) Install the bolt [8] and nut [9].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-11-02-410-001

- (1) To close the access panel, do these steps

Number	Name/Location
---------------	----------------------

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

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

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

SUBTASK 49-11-02-210-001

- (2) Do a general visual inspection of the APU compartment (TASK 49-11-00-200-801) after the first flight and then every 100 hours until you do the APU system activation procedure (TASK 49-11-02-440-801).

———— **END OF TASK** ————

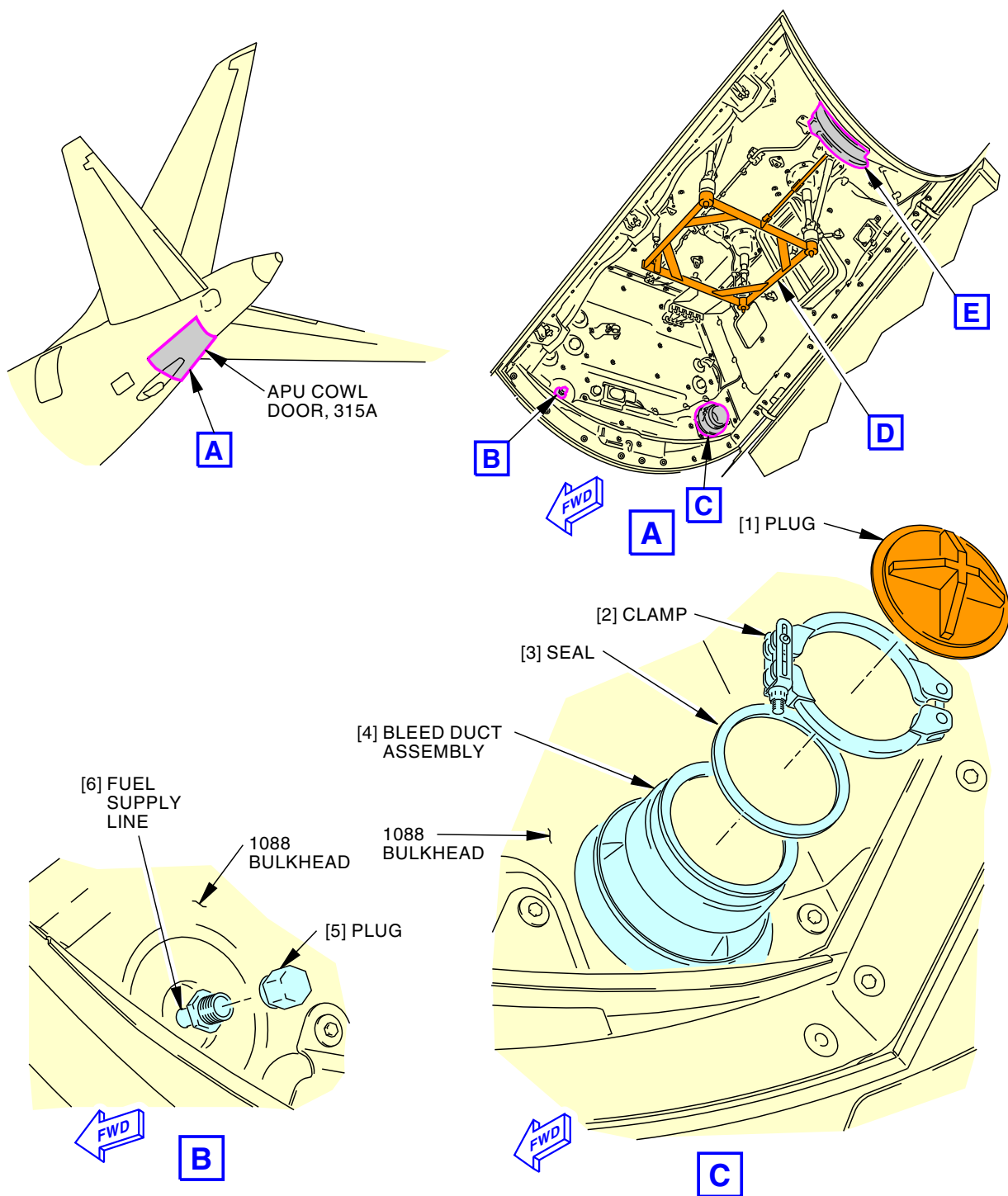
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APU System Deactivation - After APU Removal
Figure 201/49-11-02-990-801 (Sheet 1 of 2)

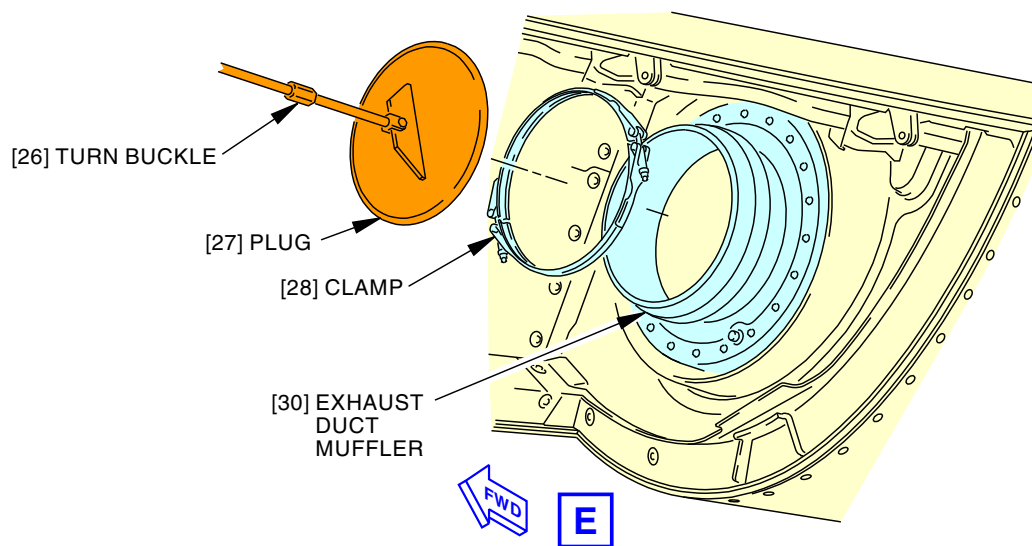
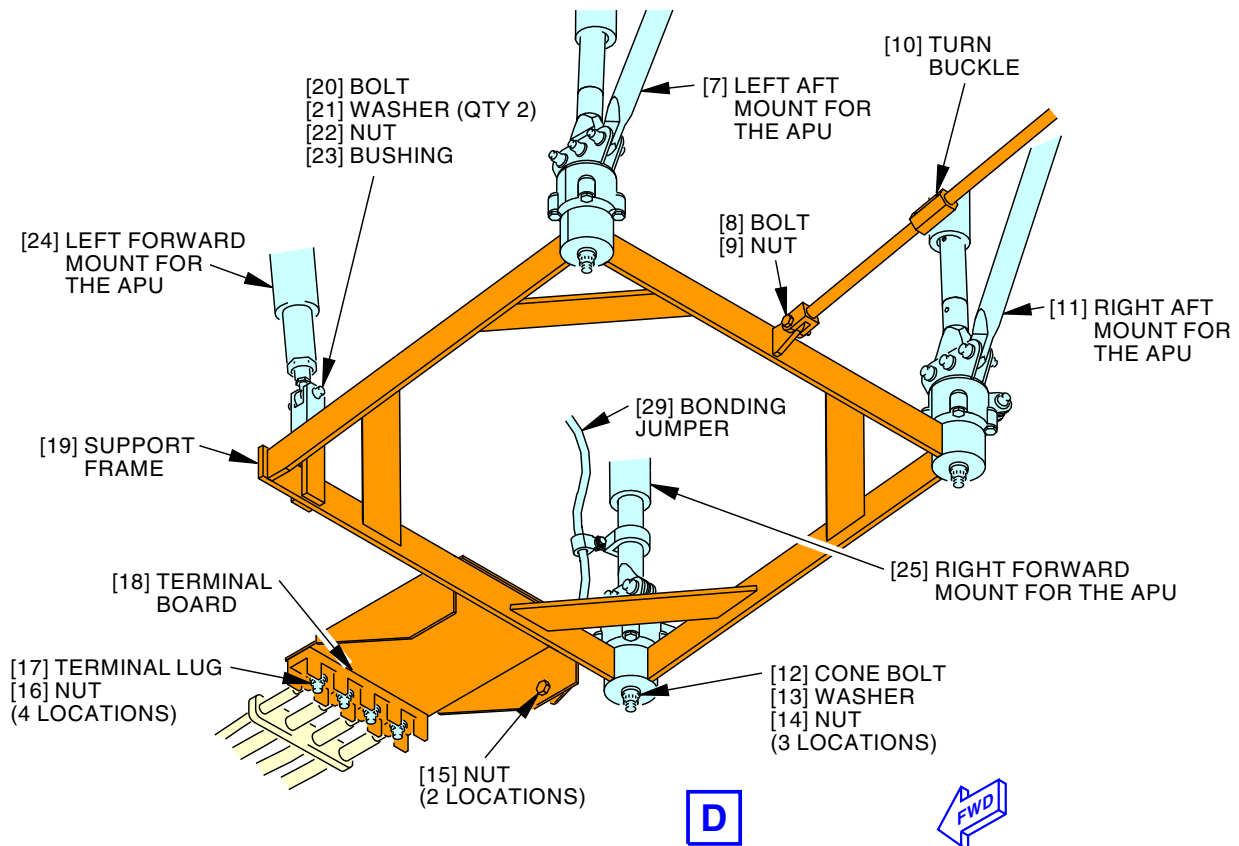
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APU System Deactivation - After APU Removal
Figure 201/49-11-02-990-801 (Sheet 2 of 2)

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TASK 49-11-02-440-801

3. APU System Activation - After APU Installation

(Figure 201)

A. References

Reference	Title
49-11-00-400-801	APU Power Plant Installation (Selection) (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-1971	Protector - Thread, APU Mount Bolt Part #: C49006-1 Supplier: 81205
SPL-11395	Tool Kit - APU Deletion **Dispatch Tool** Part #: C49009-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
315A	APU Cowl Door

E. Prepare for the Activation

SUBTASK 49-11-02-010-004

(1) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

(a) Support the APU panel (cowl door) under the center latch.

(b) Open the three latches.

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

(c) Open the APU Cowl Door, 315A.

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

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

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

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

(h) Install the two retainer pins in the two rod ends.

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F. APU System Activation - After APU Installation

SUBTASK 49-11-02-080-001

- (1) Do these steps to remove the APU deletion tool kit, SPL-11395:
 - (a) Remove the nut [9] and bolt [8] that attach the turn buckle [10] to the support frame [19].
 - (b) Do these steps to remove the plug [27] from the exhaust duct muffler [30]:
 - 1) Remove the clamp [28].
 - 2) Remove the plug [27].
 - (c) Remove the two nuts [15] that attach the bonding jumper [29] to the support frame [19].
 - (d) Remove the four nuts [16] that attach the four terminal lugs [17] for the starter-generator to the terminal board [18].
 - (e) Do these steps to remove the support frame [19] from the left forward mount [24], left aft mount [7], right forward mount [25] and right aft mount [11]:
 - 1) Remove the nut [22], two washers [21] and bolt [20] from the left forward mount [24].
 - 2) Disconnect the support frame [19] from the left forward mount [24].
 - 3) Make sure the bushing [23] is installed in the left forward mount [24].
 - 4) Install and tighten the bolt [20], two washers [21] and nut [22] to the left forward mount [24].
 - 5) Remove the three cone bolts [12], three washers [13] and three nuts [14] that hold the support frame [19] to the three mounts (left aft mount [7], right aft mount [11] and right forward mount [25]).
 - 6) Remove the support frame [19].
 - 7) Install and tighten the three cone bolts [12], three washers [13] and three nuts [14] that are attached to the three mounts (left aft mount [7], right aft mount [11] and right forward mount [25]).



MAKE SURE THAT THE THREAD PROTECTORS ARE FULLY ENGAGED ON THE CONE BOLTS. 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.

- 8) Install the protector, SPL-1971, on the three cone bolts [12].
- (f) Do these steps to remove the plug [1] from the bleed duct assembly [4]:
 - 1) Remove the clamp [2] from the bleed duct assembly [4].
 - 2) Remove the plug [1].
 - 3) Remove the seal [3] from the bleed duct assembly [4].

SUBTASK 49-11-02-860-011

- (2) Remove the plug [5] from the fuel supply line [6].

SUBTASK 49-11-02-860-015

- (3) Set the two APU GEN switches on the P5 forward overhead panel to the ON position and remove the two DO NOT OPERATE tags, STD-858.

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SUBTASK 49-11-02-860-016

- (4) Set the APU BLEED switch on the P5 forward overhead panel to the ON position and remove the DO NOT OPERATE tag, STD-858.

SUBTASK 49-11-02-010-006

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

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

SUBTASK 49-11-02-860-021



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-11-02-210-004

- (7) Close this access panel:

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

SUBTASK 49-11-02-860-013

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-11-02-420-003

- (9) Do this task: APU Power Plant Installation (Selection), TASK 49-11-00-400-801.

————— END OF TASK —————

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APU MOUNTS - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the APU mounts
 - (2) Installation of the APU mounts.
- B. There are four APU mounts installed on the top of the section 48 compartment. You can remove one or more APU mounts independently from each other.

TASK 49-13-00-000-801

2. APU Mounts Removal

(Figure 401)

A. **General**

- (1) This task is for the removal of the Auxiliary Power Unit (APU) mounts.

B. **References**

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (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)
STD-1064	Scraper - Phenolic, Hard Resin

D. **Consumable Materials**

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

E. **Location Zones**

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

F. **Prepare for the Removal**

SUBTASK 49-13-00-010-001

- (1) Remove the APU(TASK 49-11-00-000-801).

G. **APU Mounts Removal**

SUBTASK 49-13-00-020-001

- (1) Do these steps to remove the left forward mount for the APU [1]:
 - (a) Remove the seven screws [12] and seven washers [11] that attach the firewall cover [5] and flameshield [10] to the top insulation panel.

NOTE: The firewall cover [5] is attached to the top insulation panel with sealant. The flameshield [10] is attached to the firewall cover [5] with sealant.

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- 1) Carefully remove the sealant with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - a) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.



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- b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.

- (b) Move the firewall cover [5] down until you can get access to the top end of the left forward mount for the APU [1].
 - (c) Remove the nut [9], two washers [7], bushing [8] and bolt [6] that attach the left forward mount for the APU [1] to the support bracket.
 - (d) Remove the left forward mount for the APU [1] and firewall cover [5].
 - (e) Remove the firewall cover [5] from the left forward mount for the APU [1].

SUBTASK 49-13-00-020-002

- (2) Do these steps to remove the left aft mount for the APU [2]:

NOTE: The left aft mount for the APU [2] has the forward strut assembly [22], aft strut assembly [28] and vibration isolator [27].

- (a) Remove the five screws [21] and five washers [20] that attach the forward firewall cover [19] to the top insulation panel.

NOTE: The forward firewall cover [19] and aft firewall cover [29] are attached to the top insulation panel with sealant.

- 1) Carefully remove the sealant with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - a) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.



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- b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.

- (b) Remove the five screws [13] and five washers [14] that attach the aft firewall cover [29] to the top insulation panel.
 - (c) Move the forward firewall cover [19] and aft firewall cover [29] down until you can get access to the two top ends of the left aft mount for the APU [2].

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- (d) Remove the two nuts [18], four washers [17], two bushings [16] and two bolts [15] that attach the left aft mount for the APU [2] to the two support brackets.
- (e) Remove the left aft mount for the APU [2], forward firewall cover [19] and aft firewall cover [29].
- (f) Remove the forward firewall cover [19] and aft firewall cover [29] from the left aft mount for the APU [2].
- (g) Remove the vibration isolator [27], forward strut assembly [22] and/or aft strut assembly [28]:
 - 1) Remove the three nuts [26], six washers [25], three bushings [24] and three bolts [23] that attach the vibration isolator [27] to the forward strut assembly [22] and the aft strut assembly [28].
 - 2) Remove the forward strut assembly [22] and aft strut assembly [28] from the vibration isolator [27].
 - 3) Remove the vibration isolator [27].

SUBTASK 49-13-00-020-003

- (3) Do these steps to remove the right aft mount for the APU [3]:

NOTE: The right aft mount for the APU [3] has the aft strut assembly [40], side strut assembly [44], forward strut assembly [51] and vibration isolator [46].

- (a) Remove the two nuts [45], four washers [42], two bushings [43] and two bolts [41] that attach the side strut assembly [44] to the support bracket and vibration isolator [46].
- (b) Remove the side strut assembly [44].
- (c) Remove the five screws [30] and five washers [31] that attach the forward firewall cover [32] to the top insulation panel.

NOTE: The forward firewall cover [32] and aft firewall cover [39] are attached to the top insulation panel with sealant.

- 1) Remove the sealant with a hard resin phenolic scraper, STD-1064, or an equivalent tool.



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- a) Clean the surface 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 surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.

- (d) Remove the five screws [38] and five washers [37] that attach the aft firewall cover [39] to the top insulation panel.
- (e) Move the forward firewall cover [32] and aft firewall cover [39] down until you can get access to the two top ends of the right aft mount for the APU [3].
- (f) Remove the two nuts [33], four washers [35], two bushings [34] and two bolts [36] that attach the right aft mount for the APU [3] to the two support brackets.

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- (g) Remove the right aft mount for the APU [3], forward firewall cover [32] and aft firewall cover [39].
- (h) Remove the forward firewall cover [32] and aft firewall cover [39].
- (i) Remove the aft strut assembly [40], forward strut assembly [51] and vibration isolator [46]:
 - 1) Remove the three nuts [47], six washers [49], three bushings [48] and three bolts [50] that attach the vibration isolator [46] to the aft strut assembly [40] and forward strut assembly [51].
 - 2) Remove the aft strut assembly [40] and forward strut assembly [51] from the vibration isolator [46].
 - 3) Remove the vibration isolator [46].

SUBTASK 49-13-00-010-005

- (4) Remove the fire shield cover assembly from the right forward mount for the APU [4] as follows:
 - (a) Remove the safety wire from the capstans.
 - (b) Remove the screw and washer.
 - (c) Remove the fire shield cover assembly from the right forward mount for the APU [4].

SUBTASK 49-13-00-020-004

- (5) Do these steps to remove the right forward mount for the APU [4]:
 - (a) Remove the two nuts [64], four washers [60], two bushings [62] and two bolts [61] that attach the side strut assembly [63] to the support bracket and vibration isolator [66].
 - (b) Remove the side strut assembly [63].
 - (c) Remove the nut [71], two washers [72] and screw [59] that attach clamp [70] and clamp [73] to the bonding jumper [78] and right forward mount for the APU [4].
 - (d) Remove clamp [70] and clamp [73].
 - (e) Remove the left firewall cover [79] for the bonding jumper:

NOTE: The left firewall cover [79] and right firewall cover [58] are attached to the top insulation panel with sealant.
 - 1) Remove the sealant with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - a) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.

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- b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.
 - 2) Remove the four screws [80] and four washers [81] that attach the left firewall cover [79] to the top insulation panel.
 - 3) Move the left firewall cover [79] down until you can get access to the top end of the bonding jumper [78].

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- 4) Remove the two nuts [74], four washers [75] and two bolts [76] that attach the bonding jumper [78] to the support bracket.

NOTE: The mounting parts and the lug for the bonding jumper [78] are sealed with sealant.

- 5) Remove the sealant with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
- 6) Remove the bonding jumper [78] and left firewall cover [79].
- 7) Remove the left firewall cover [79] from the bonding jumper [78].
- (f) Remove the five screws [57] and five washers [56] that attach the right firewall cover [58] to the top insulation panel.
- (g) Move the right firewall cover [58] down until you can get access to the top end of the right forward mount for the APU [4].
- (h) Remove the nut [52], two washers [54], bushing [53] and bolt [55] that attach the right forward mount for the APU [4] to the support bracket.
- (i) Remove the right forward mount for the APU [4] and right firewall cover [58].
- (j) Remove the right firewall cover [58] from the right forward mount for the APU [4].
- (k) Remove the vibration isolator [66] or the right forward mount for the APU [4]:
 - 1) Remove the two nuts [65], four washers [68], two bushings [67] and two bolts [69] that attach the vibration isolator [66] to the right forward mount for the APU [4].
 - 2) Remove the right forward mount for the APU [4] from the vibration isolator [66].
 - 3) Remove the vibration isolator [66].

———— **END OF TASK** ————

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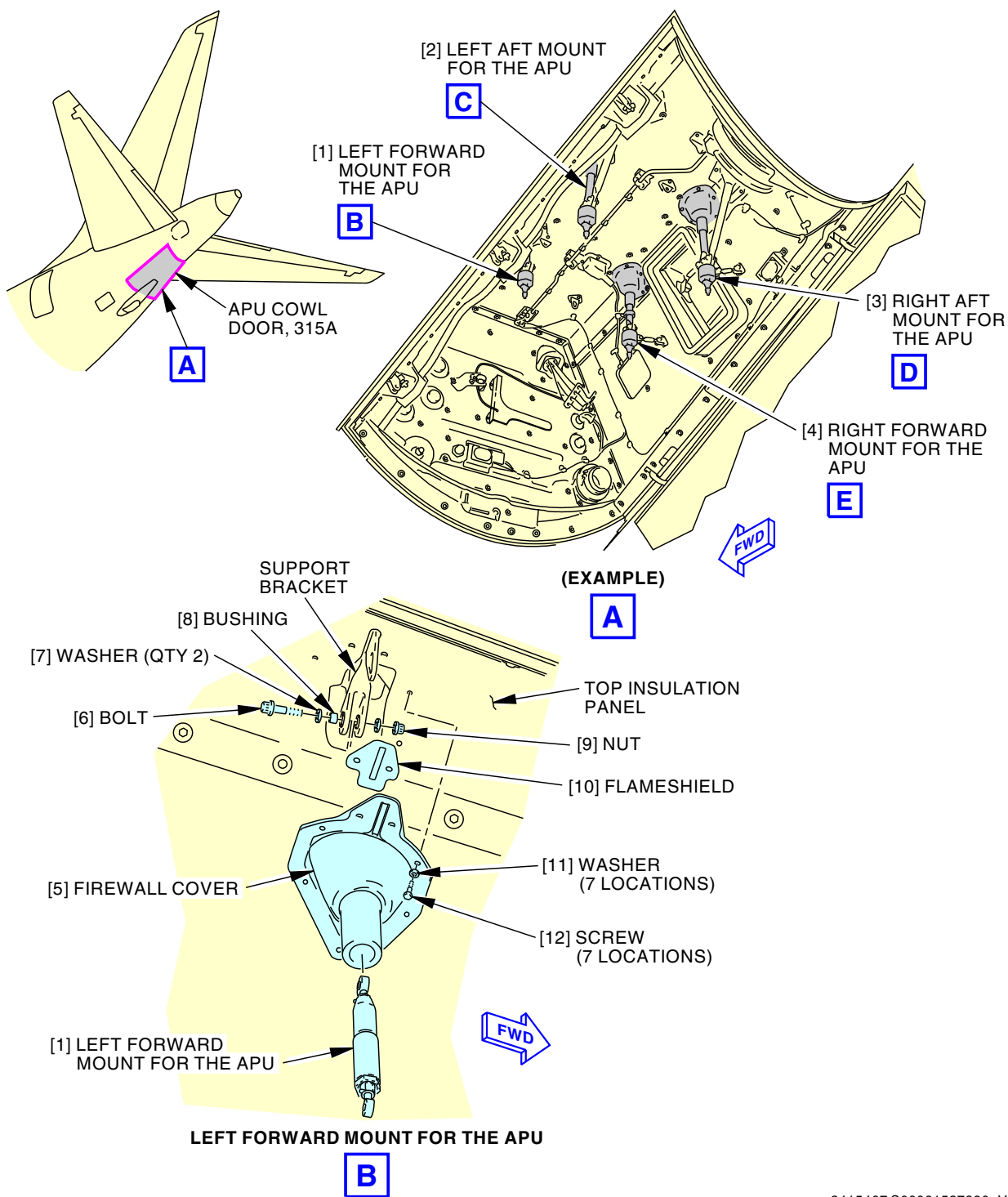
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2415467 S00061537890_V2

APU Mounts Installation
Figure 401/49-13-00-990-801 (Sheet 1 of 5)

EFFECTIVITY
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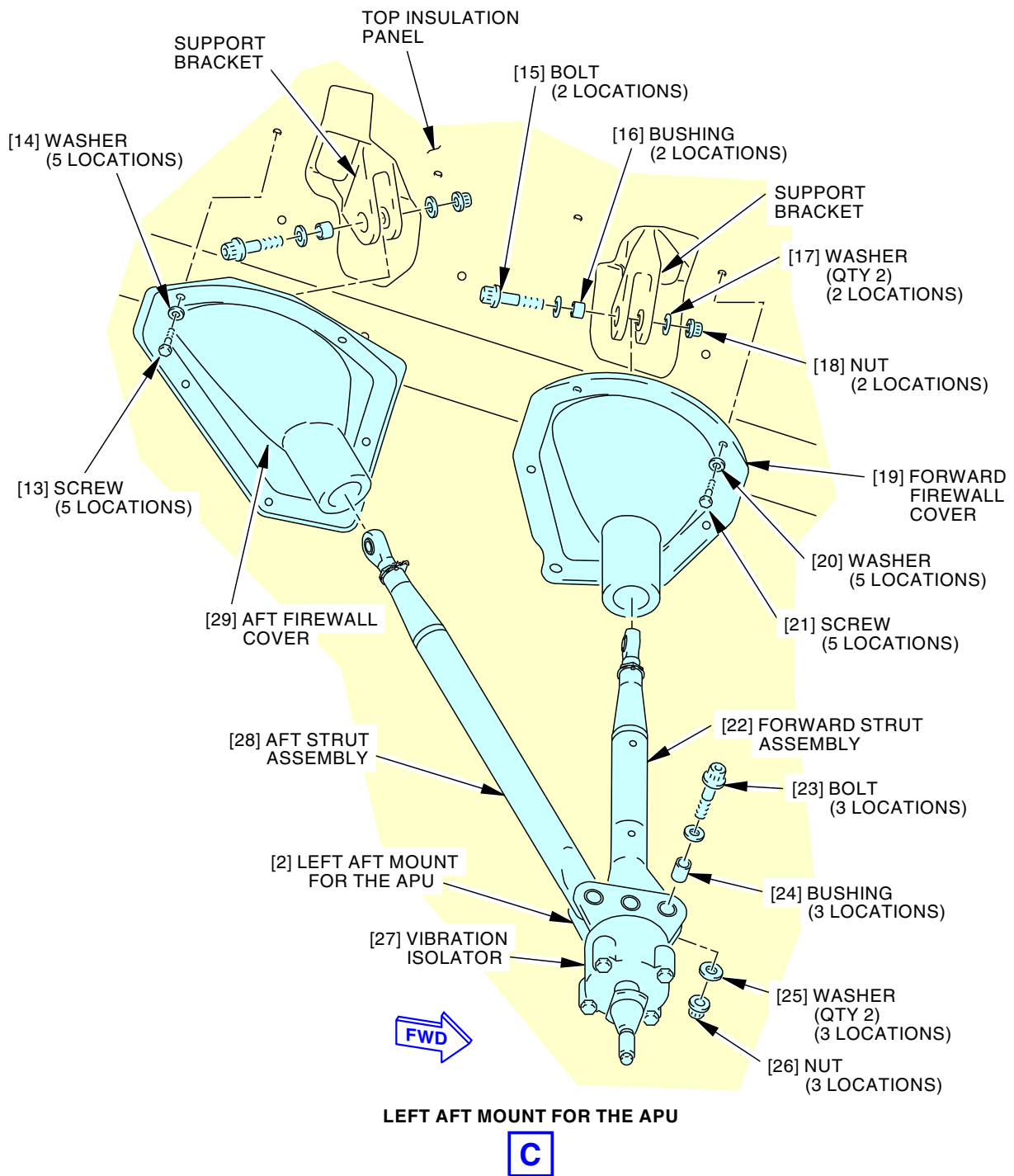
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LEFT AFT MOUNT FOR THE APU

C

2415468 S00061537891_V1

APU Mounts Installation
Figure 401/49-13-00-990-801 (Sheet 2 of 5)

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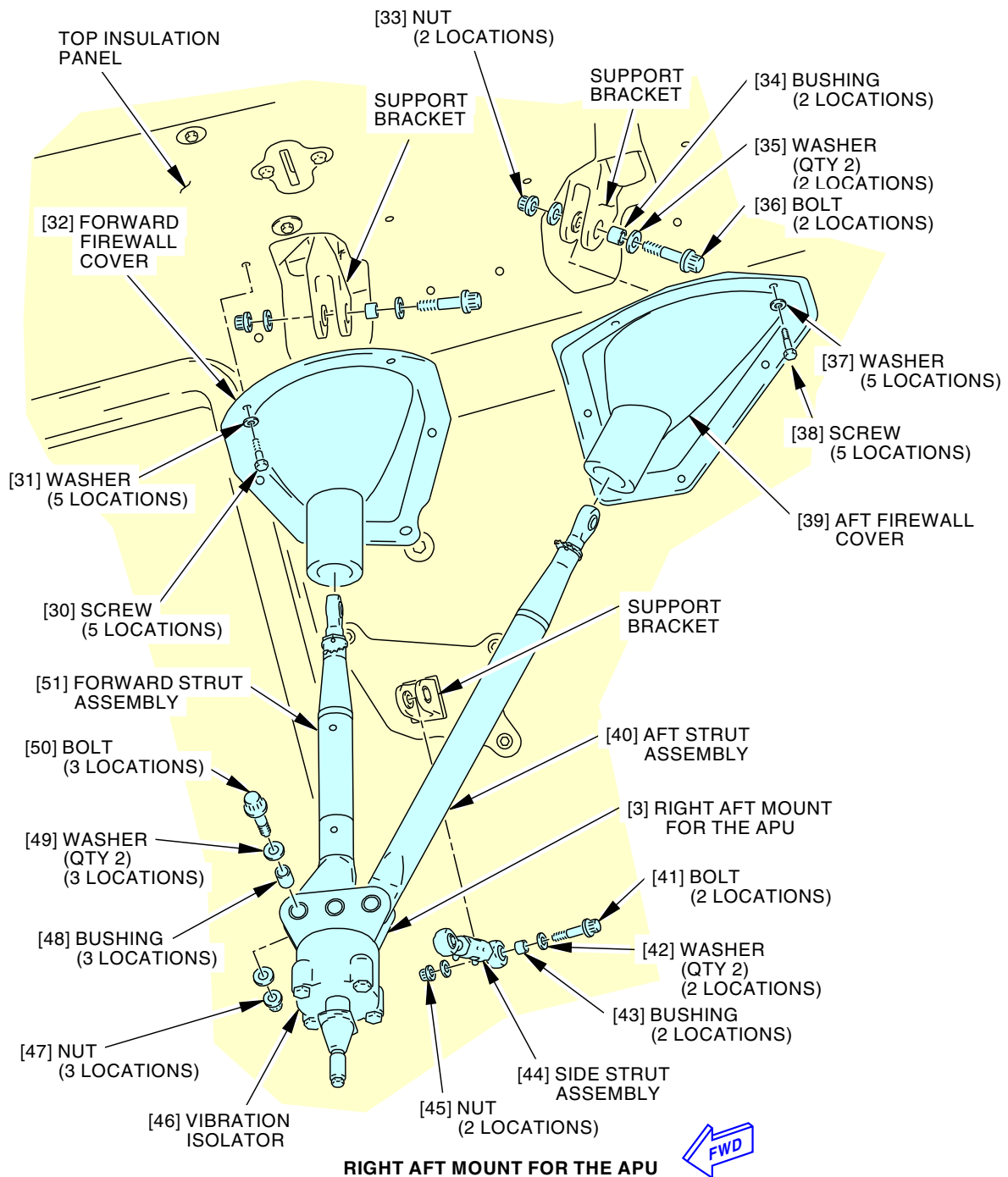
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D

APU Mounts Installation
Figure 401/49-13-00-990-801 (Sheet 3 of 5)

2415469 S00061537892_V1

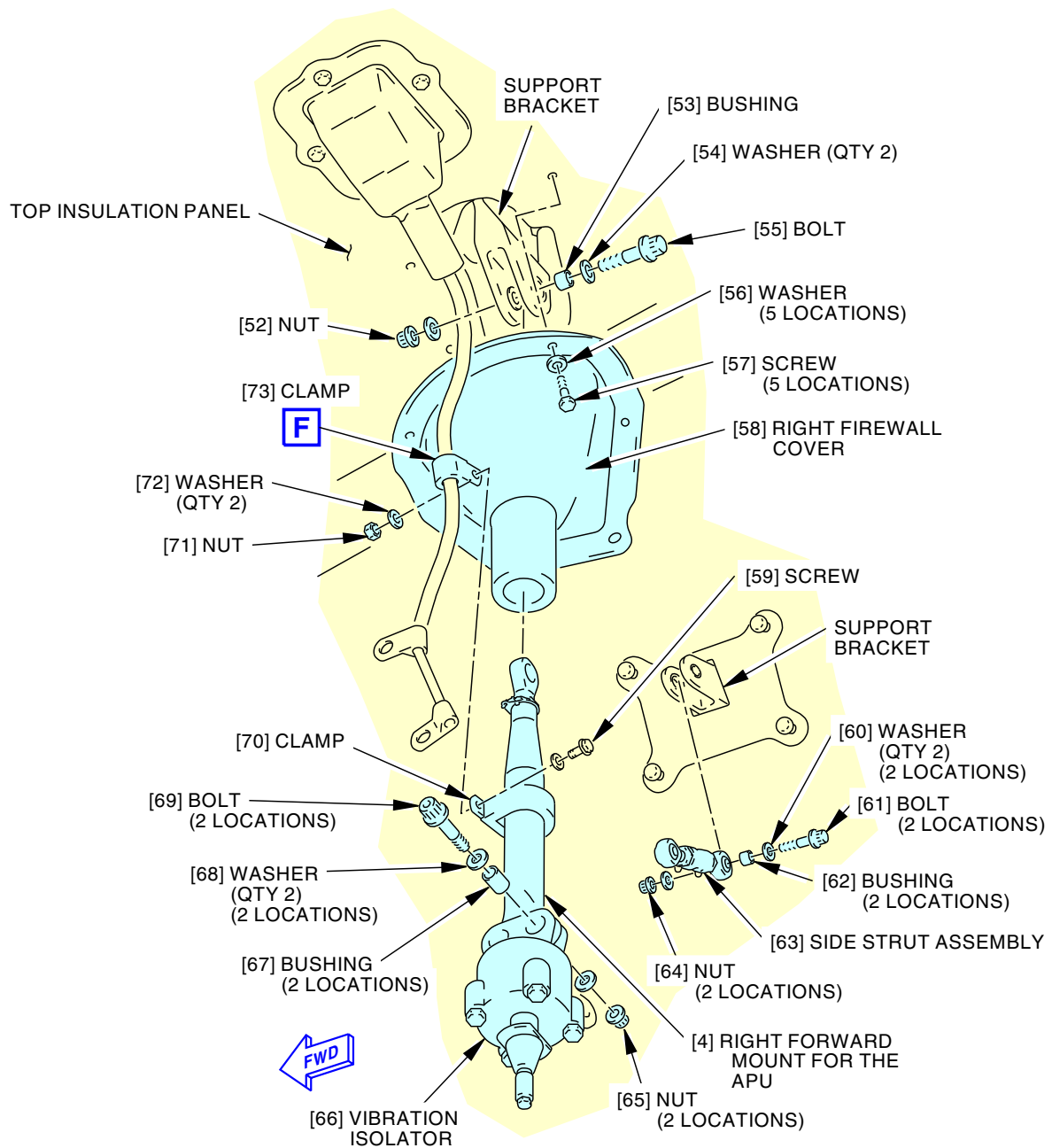
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RIGHT FORWARD MOUNT FOR THE APU

E

2415470 S00061537893_V1

APU Mounts Installation
Figure 401/49-13-00-990-801 (Sheet 4 of 5)

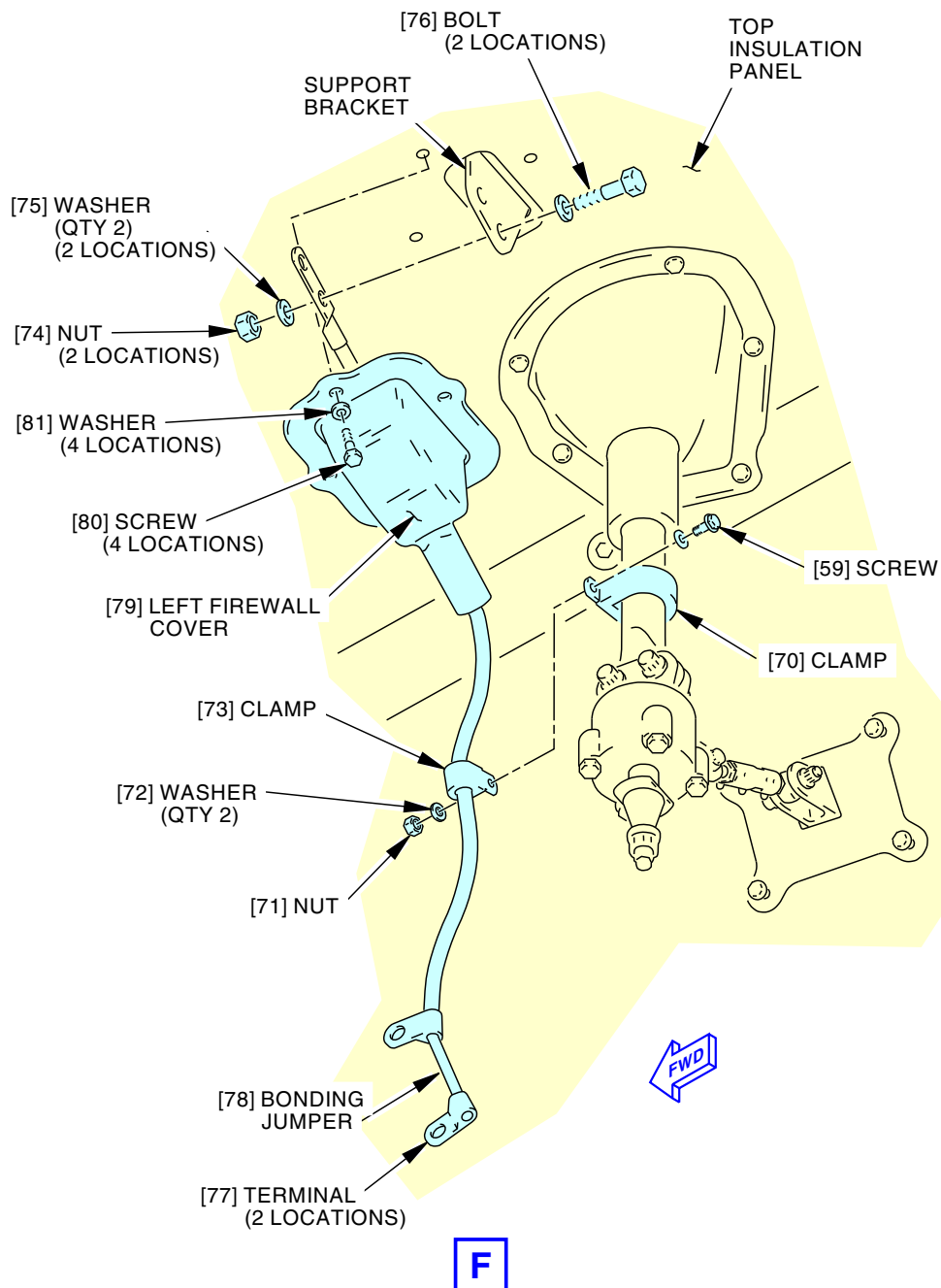
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2415471 S00061537894_V1

APU Mounts Installation
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TASK 49-13-00-400-801

3. APU Mounts Installation

(Figure 401)

A. General

(1) This task is for the installation of the Auxiliary Power Unit (APU) mounts.

B. References

Reference	Title
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

D. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010 Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Left forward mount for the APU	49-13-51-01-465	SIA ALL
2	Left aft mount for the APU	49-13-51-01-535	SIA ALL
3	Right aft mount for the APU	49-13-51-01-530	SIA ALL
4	Right forward mount for the APU	49-13-51-01-525	SIA ALL
5	Firewall cover	49-13-51-01-210	SIA ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
19	Forward firewall cover	49-13-51-01-160	SIA ALL
29	Aft firewall cover	49-13-51-01-135	SIA ALL
32	Forward firewall cover	49-13-51-01-110	SIA ALL
39	Aft firewall cover	49-13-51-01-080	SIA ALL
58	Right firewall cover	49-13-51-01-110	SIA ALL

F. Location Zones

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

G. APU Mounts Installation

SUBTASK 49-13-00-420-001

- (1) Do these steps to install the left forward mount for the APU [1]:
 - (a) Examine the firewall cover [5] and the top insulation panel for old sealant.
 - (b) If you see old sealant on the firewall cover [5] and the top insulation panel, remove it with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - (c) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.



WARNING

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- (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.
- (e) Apply the RTV 106 adhesive, A00081, or sealant, A00160, to the faying surface of the flameshield [10].
- (f) Install the flameshield [10] on the firewall cover [5].
- (g) Remove the excess adhesive or sealant from the firewall cover [5] with a cotton wiper, G00034.

NOTE: It is not necessary for the adhesive or sealant to dry. You can install the firewall cover [5] with the wet adhesive or sealant on the top insulation panel.
- (h) Clean the surface with alcohol, B00130, and a cotton wiper, G00034

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- (i) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.

- (j) Put the firewall cover [5] on the left forward mount for the APU [1].
- (k) Move the firewall cover [5] down until you can get access to the top end of the left forward mount for the APU [1].
- (l) Install the top end of the left forward mount for the APU [1] to the support bracket with the bushing [8], two washers [7], bolt [6] and nut [9].
- (m) Install the firewall cover [5] to the top insulation panel with the seven washers [11] and seven screws [12].
- (n) Apply a fillet seal of sealant, A00160, around the firewall cover [5].
- (o) Remove the excess sealant from the firewall cover [5] and the top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.

SUBTASK 49-13-00-420-002

- (2) Do these steps to install the left aft mount for the APU [2]:

NOTE: The left aft mount for the APU [2] has the forward strut assembly [22], aft strut assembly [28] and vibration isolator [27].

- (a) Put the forward strut assembly [22] and aft strut assembly [28] on the vibration isolator [27].
- (b) Make sure that the two directional FWD arrows on the vibration isolator [27] point to the front of the airplane.
- (c) Install the three bushings [24], six washers [25], three bolts [23] and three nuts [26].
- (d) Examine the forward firewall cover [19], aft firewall cover [29] or the top insulation panel for old sealant.
- (e) Remove the old sealant from the forward firewall cover [19], aft firewall cover [29] or the top insulation panel with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
- (f) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
- (g) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.
- (h) Put the forward firewall cover [19] and aft firewall cover [29] on the forward strut assembly [22] and aft strut assembly [28].
- (i) Move the forward firewall cover [19] down until you can get access to the top end of the forward strut assembly [22].

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- (j) Move the aft firewall cover [29] down until you can get access to the top end of the aft strut assembly [28].
- (k) Install the top ends of the forward strut assembly [22] and aft strut assembly [28] to the two support brackets with the two bushings [16], four washers [17], two bolts [15] and two nuts [18].
- (l) Install the forward firewall cover [19] to the top insulation panel with the five washers [20] and five screws [21].
- (m) Install the aft firewall cover [29] to the top insulation panel with the five washers [14] and five screws [13].
- (n) Apply a fillet seal of sealant, A00160, around the forward firewall cover [19] and aft firewall cover [29].

NOTE: If it is necessary, clean the edges of the sealant with a cotton wiper, G00034.

SUBTASK 49-13-00-420-003

- (3) Do these steps to install the right aft mount for the APU [3]:

NOTE: The right aft mount for the APU [3] has the aft strut assembly [40], side strut assembly [44], forward strut assembly [51] and vibration isolator [46].

- (a) Put the aft strut assembly [40] and forward strut assembly [51] on the vibration isolator [46].
- (b) Install the vibration isolator [46] on the aft strut assembly [40] and forward strut assembly [51] with the three bushings [48], six washers [49], three bolts [50] and three nuts [47].
- (c) Examine the forward firewall cover [32], aft firewall cover [39] or the top insulation panel for old sealant.
- (d) Remove the old sealant from the forward firewall cover [32], aft firewall cover [39] and the top insulation panel with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
- (e) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.



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- (f) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.
- (g) Put the forward firewall cover [32] and aft firewall cover [39] on the forward strut assembly [51] and aft strut assembly [40].
- (h) Move the forward firewall cover [32] down until you can get access to the top end of the forward strut assembly [51].
- (i) Move the aft firewall cover [39] down until you can get access to the top end of the aft strut assembly [40].
- (j) Install the top ends of the aft strut assembly [40] and forward strut assembly [51] to the two support brackets with the two bushings [34], four washers [35], two bolts [36] and two nuts [33].

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- (k) Install the forward firewall cover [32] to the top insulation panel with the five washers [31] and five screws [30].
- (l) Install the aft firewall cover [39] to the top insulation panel with the five washers [37] and five screws [38].
- (m) Apply a fillet seal of sealant, A00160, around the forward firewall cover [32] and aft firewall cover [39].
- (n) Remove the excess sealant from the forward firewall cover [32], aft firewall cover [39] and the top insulation panel with a cotton wiper, G00034.

NOTE: It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.

- (o) Put the side strut assembly [44] into the support bracket and vibration isolator [46].
- (p) Install the two bushings [43], four washers [42], two bolts [41] and two nuts [45] that attach the side strut assembly [44] to the support bracket and vibration isolator [46].

SUBTASK 49-13-00-420-005

- (4) Do these steps before you install right forward mount for the APU [4]:
 - (a) If the vibration isolator [66] was removed, put the right forward mount for the APU [4] on the vibration isolator [66].
 - (b) Install the vibration isolator [66] on the right forward mount for the APU [4] with the two bushings [67], four washers [68], two bolts [69] and two nuts [65].

NOTE: There are preferred and optional configuration of the bushings installation.
Preferred configuration is the installation of the bushing adjacent to the nut.
Optional is the installation of the bushing adjacent to the bolt head.

SUBTASK 49-13-00-420-004

- (5) Do these steps to install the right forward mount for the APU [4]:
 - (a) Examine the right firewall cover [58], left firewall cover [79] or the top insulation panel for old sealant.
 - (b) Remove the old sealant from the right firewall cover [58], left firewall cover [79] and the top insulation panel with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - (c) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.



WARNING

USE EYE PROTECTION WHEN YOU USE COMPRESSED AIR TO CLEAN, COOL, OR DRY PARTS OR TOOLS. PARTICLES CAN CAUSE AN INJURY TO YOUR EYES. DO NOT USE MORE THAN 30 PSIG (200 KPA). DO NOT POINT COMPRESSED AIR AT YOURSELF OR OTHER PERSONS.

- (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.
- (e) Put the right firewall cover [58] on the right forward mount for the APU [4].
- (f) Move the right firewall cover [58] down until you can get access to the top end of the right forward mount for the APU [4].
- (g) Install the top end of the right forward mount for the APU [4] to the support bracket with the bushing [53], two washers [54], bolt [55] and nut [52].

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- (h) Install the right firewall cover [58] to the top insulation panel with the five washers [56] and five screws [57].
- (i) Apply a fillet seal of sealant, A00160, around the right firewall cover [58].
- (j) Remove the excess sealant from the right firewall cover [58] and the top insulation panel with a cotton wiper, G00034.
NOTE: It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.
- (k) Put the left firewall cover [79] on the bonding jumper [78].
- (l) Move the left firewall cover [79] down until you can get access to the top end of the bonding jumper [78].
- (m) Install the top end of the bonding jumper [78] to the support bracket with the four washers [75], two bolts [76] and two nuts [74].
- (n) Use an intrinsically safe approved bonding meter, COM-1550, to make sure the bonding resistance between the bonding jumper [78] and the airplane structure is 0.0025 ohm (2.5 milliohms) or less.
- (o) Apply the sealant, A00247, over the four washers [75], two bolts [76], two nuts [74] and the lug of the bonding jumper [78] to prevent corrosion.
NOTE: It is not necessary for the sealant to dry.
- (p) Install the left firewall cover [79] to the top insulation panel with the four washers [81] and four screws [80].
- (q) Apply a fillet seal of sealant, A00160, around the left firewall cover [79].
NOTE: It is not necessary for the sealant to dry. You can install the other APU mounts or the APU with the wet sealant on the top insulation panel.
- (r) Remove the unwanted sealant from the left firewall cover [79] and the top insulation panel with a cotton wiper, G00034.
- (s) Make sure the two terminals [77] for the bonding jumper [78] are installed correctly.
- (t) Put the clamp [70] and clamp [73] on the bonding jumper [78] and right forward mount for the APU [4].
- (u) Install the two washers [72], screw [59] and nut [71] on clamp [70] and clamp [73].
- (v) Put the side strut assembly [63] into the support bracket and vibration isolator [66].
 - 1) If the side strut assembly [63] needs adjustment, do these steps:
 - a) Remove the lockwire from the rod ends.
 - b) Turn the rod ends to adjust the length of the side strut assembly [63]
NOTE: One half turn of the rod end equals 0.020 in. (0.508 mm) in length.
 - c) Make sure you can see one full thread at both inspection holes.
 - d) Tighten the jam nuts on the rod ends
 - e) Install the MS20995NC32 lockwire, G01912, on the rod ends.
- (w) Install the two bushings [62], four washers [60], two bolts [61] and two nuts [64] that attach the side strut assembly [63] to the support bracket and vibration isolator [66].



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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-00-410-001

(1) Do this task: APU Power Plant Installation (Selection), TASK 49-11-00-400-801.

———— **END OF TASK** ————

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APU MOUNTS - INSPECTION/CHECK

1. General

- A. This procedure has tasks which do an:
- (1) A general visual inspection of the APU mounts (APU installed).
 - (2) A general visual Inspection of the APU mounts (APU removed).
 - (3) A general visual inspection of the insulation panel.
- B. There are three tasks available for the inspection of the APU mounts. You can do a general visual inspection of the APU mounts with the APU installed (there is very limited access to these parts). With the APU removed, you can get access to all parts of the APU mounts for the inspection.

TASK 49-13-00-200-801

2. APU Mounts Inspection

A. **Location Zones**

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

B. **APU Mounts Inspection**

SUBTASK 49-13-00-200-001

- (1) Do one of these tasks to inspect the APU mounts:
- (a) Do this task: APU Mounts Inspection (APU Installed), TASK 49-13-00-200-802.
 - (b) Do this task: APU Mounts Inspection (APU Removed), TASK 49-13-00-200-803.

————— **END OF TASK** —————

TASK 49-13-00-200-802

3. APU Mounts Inspection (APU Installed)

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

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

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

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D. Prepare for the Inspection

SUBTASK 49-13-00-860-001

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

SUBTASK 49-13-00-860-002

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-13-00-010-002

- (3) To open the access panel, do these steps:

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

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

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. APU Mounts Inspection (APU Installed)

SUBTASK 49-13-00-210-001

- (1) Do these steps to inspect the APU mounts (Figure 601):
 - (a) Make sure all connections for the APU mounts are tight.
 - (b) Visually examine these parts of the APU mounts that you can get access to for corrosion, cracks and damage:
 - 1) Strut assemblies (APU mounts)
 - 2) Vibration isolators
 - 3) Cone bolts and nuts for the vibration isolator.
 - (c) If you find corrosion, cracks or damage to these parts, then you must inspect the APU mounts with the APU removed (TASK 49-13-00-200-803).

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-00-410-002

- (1) To close the access panel, do these steps

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

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

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

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

SUBTASK 49-13-00-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-13-00-860-004

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

————— **END OF TASK** —————

TASK 49-13-00-200-803

4. APU Mounts Inspection (APU Removed)

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)
49-13-00-000-801	APU Mounts Removal (P/B 401)
49-13-00-400-801	APU Mounts Installation (P/B 401)
49-17-11-000-801	Insulation Panel Removal (P/B 401)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

B. Location Zones

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

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(Continued)

Zone	Area
------	------

315	APU Compartment - Left
-----	------------------------

316	APU Compartment - Right
-----	-------------------------

C. APU Mounts Inspection (APU Removed)

SUBTASK 49-13-00-010-003

(1) Do this task: APU Power Plant Removal (Selection), TASK 49-11-00-000-801.

SUBTASK 49-13-00-210-002

(2) Do these steps to inspect the Auxiliary Power Unit (APU) mounts:

- (a) If it is necessary, remove the firewall cover and flameshield from the mount to view the mount (TASK 49-17-11-000-801).
- (b) Visually examine these parts for corrosion, cracks, and damage:
 - 1) Strut assemblies (APU mounts)
 - 2) Vibration isolators
 - 3) Cone bolts and nuts for the vibration isolator.
- (c) If corrosion, cracks, or damage are found, do these steps:
 - 1) Remove the parts for the APU mounts that are found with corrosion, cracks, or damage (TASK 49-13-00-000-801).
 - 2) Visually examine the bolts and bushings for corrosion, wear, and damage.
 - a) Replace the bolts and bushings that are found with corrosion or damage.
 - b) Replace all the parts that have more than the permitted wear limits (Table 601).

Table 601/49-13-00-993-801 APU Mount Inspection

		DIMENSION	DESIGN LIMITS		WEAR LIMITS		
ITEM NUMBER	PART	INNER DIAMETER (ID) / OUTER DIAMETER (OD)	DIAMETER		PERMIT- TED WEAR	MAXIMUM CLEAR- ANCE	REPAIR
			MINI- MUM	MAXI- MUM			
			INCH (MM)	INCH (MM)	INCH (MM)	INCH (MM)	
1	ROD END	ID	0.3120 (7.92)	0.3125 (7.94)	0.3175 (8.06)	0.0100 (0.25)	*[1]
2	BOLT	OD	0.3115 (7.91)	0.3120 (7.92)	0.3060 (7.77)	0.0100 (0.25)	*[1]
3	ROD END	ID	0.2495 (6.34)	0.2500 (6.35)	0.2550 (6.48)	0.0100 (0.25)	*[1]
4	BOLT	OD	0.2490 (6.32)	0.2495 (6.34)	0.2435 (6.18)	0.0100 (0.25)	*[1]
5	ROD END	ID	0.3120 (7.92)	0.3125 (7.94)	0.3175 (8.06)	0.0100 (0.25)	*[1]
6	BOLT	OD	0.3115 (7.91)	0.3120 (7.92)	0.3060 (7.77)	0.0100 (0.25)	*[1]

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Table 601/49-13-00-993-801 APU Mount Inspection (Continued)

		DIMENSION	DESIGN LIMITS		WEAR LIMITS		
ITEM NUMBER	PART	INNER DIAMETER (ID) / OUTER DIAMETER (OD)	DIAMETER		PERMIT- TED WEAR	MAXIMUM CLEAR- ANCE	REPAIR
			MINI- MUM	MAXI- MUM			
			INCH (MM)	INCH (MM)	INCH (MM)	INCH (MM)	
7	STRUT	ID	0.5625 (14.29)	0.5631 (14.30)	-----	-----	*[2]
8	BUSHING	OD	0.4365 (11.09)	0.4370 (11.10)	0.4315 (10.96)	0.0100 (0.25)	*[1]
9	BUSHING	OD	0.5631 (14.30)	0.5638 (14.32)	-----	-----	*[3]
		ID	0.4400 (11.18)	0.4415 (11.21)	0.4465 (11.34)	0.0100 (0.25)	*[1]
10	BOLT	OD	0.2490 (6.32)	0.2495 (6.34)	0.2435 (6.18)	0.0100 (0.25)	*[1]
11	ROD END	ID	0.2497 (6.34)	0.2502 (6.36)	0.2552 (6.48)	0.0100 (0.25)	*[1]
12	STRUT	ID	0.5625 (14.29)	0.5631 (14.30)	-----	-----	*[2]
13	BUSHING	OD	0.4365 (11.09)	0.4370 (11.10)	0.4315 (10.96)	0.0100 (0.25)	*[1]
14	BUSHING	OD	0.5631 (14.30)	0.5638 (14.32)	-----	-----	*[3]
		ID	0.4400 (11.18)	0.4415 (11.21)	0.4465 (11.34)	0.0100 (0.25)	*[1]

*[1] REPLACE WHEN WORN

*[2] OVERSIZE STRUT HOLE MUST NOT BE MORE THAN 0.625 INCH (15.88 MM) IN DIAMETER

*[3] REPLACE WITH OVERSIZE BUSHING

- 3) Examine the four bolts and four lockwashers that attach each housing assembly to each vibration isolator for tightness and missing part(s).
 - a) If it is necessary, tighten the bolts or replace the missing part(s).
- 4) Visually examine the surface of each vibration isolator for scratches, nicks, burrs, corrosion, galling, fretting, and wear.
 - a) If the individual damaged area is more than 0.500 in. (12.7 mm) diameter by 0.020 in. (0.51 mm) depth or 1.000 in. (25 mm) length by 0.100 in. (2.5 mm) width by 0.020 in. (0.51 mm) depth, replace the vibration isolator.
 - b) If the total damaged area is more than 15% of the total surface area for the vibration isolator, replace the vibration isolator.
- 5) Visually examine the threads of the cone bolts and nuts on the vibration isolator for galling, wear, and damage.
 - a) Replace the vibration isolator and nuts that are found with galling, wear, or damage.

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- 6) Install the new or serviceable part(s) for the APU mounts (TASK 49-13-00-400-801).
- (d) Make sure that all connections for the APU mounts and support brackets are tight.
- (e) If they are removed, examine and install the firewall cover and flameshield (TASK 49-17-11-400-801).

SUBTASK 49-13-00-410-005

- (3) Do this task: APU Power Plant Installation (Selection), TASK 49-11-00-400-801.

———— **END OF TASK** ————

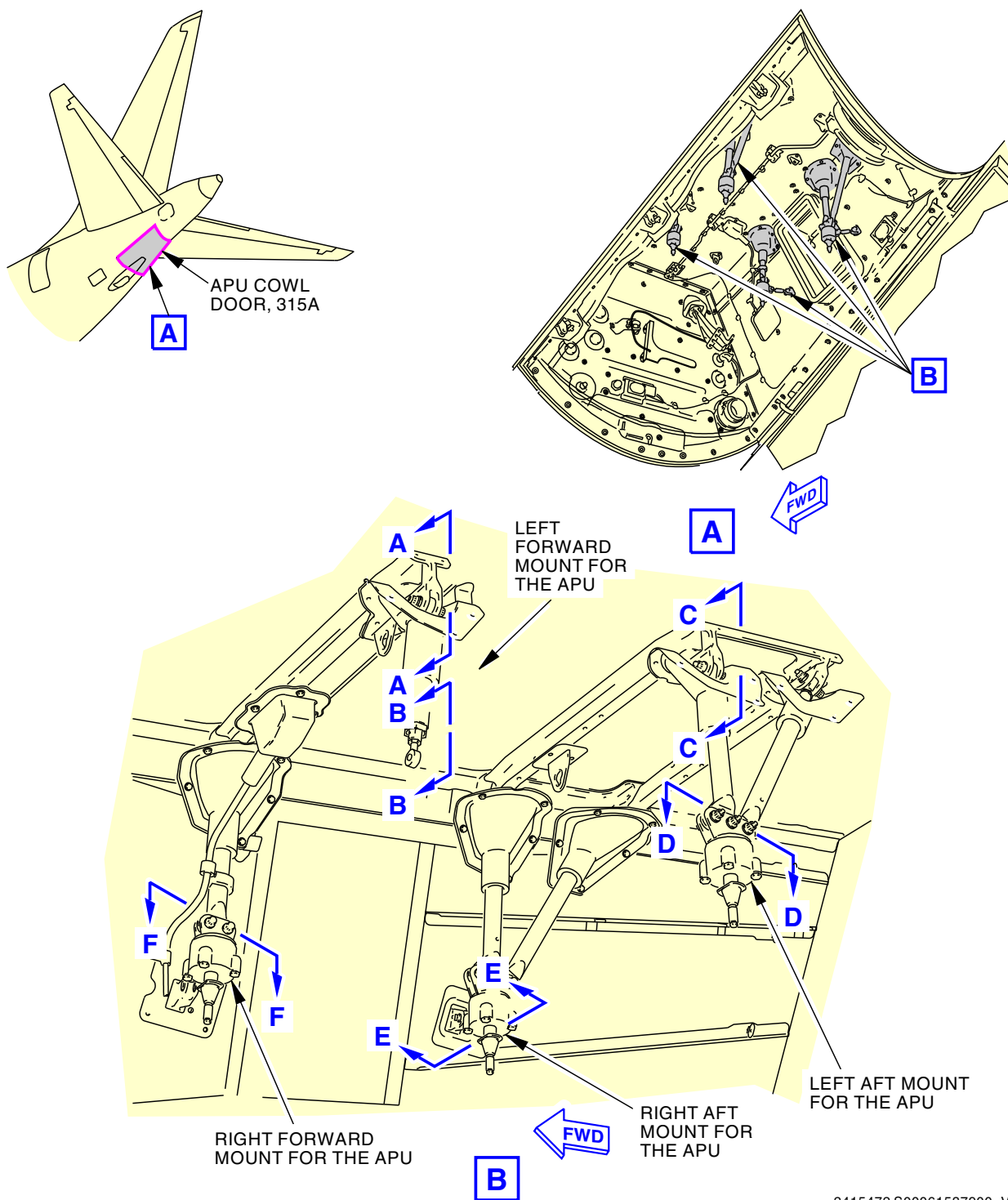
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APU Mounts Inspection
Figure 601/49-13-00-990-802 (Sheet 1 of 2)

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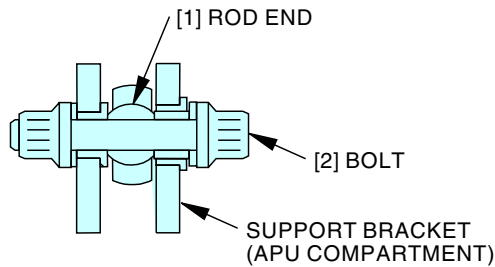
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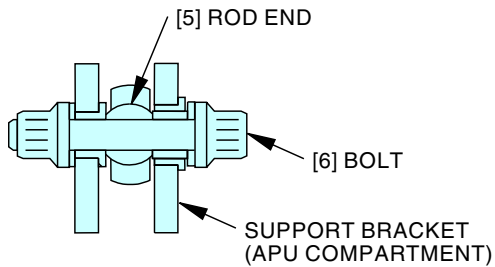
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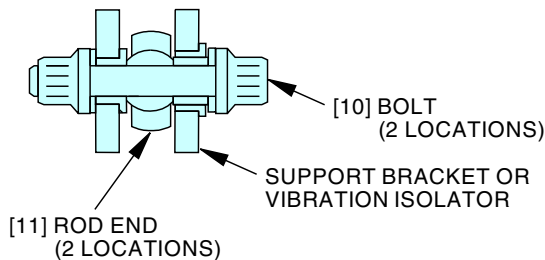
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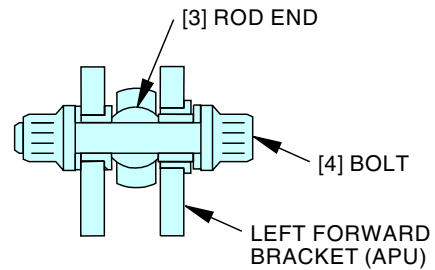
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TWO FORWARD MOUNTS)
A-A



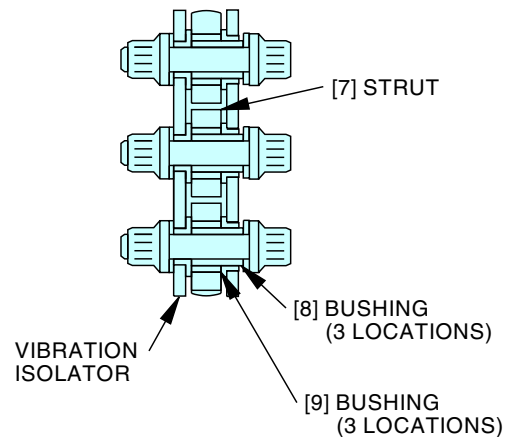
(4 LOCATIONS ON THE
TWO AFT MOUNTS)
C-C



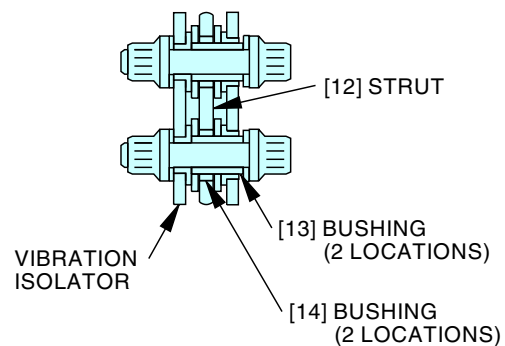
E-E



B-B



(2 LOCATIONS ON THE
TWO AFT MOUNTS)
D-D



F-F

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Figure 601/49-13-00-990-802 (Sheet 2 of 2)

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TASK 49-13-00-200-805

5. Insulation Panel General Visual Inspection

(Figure 602)

A. References

Reference	Title
49-17-11-000-801	Insulation Panel Removal (P/B 401)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

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

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-13-00-860-005

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

SUBTASK 49-13-00-860-006

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-13-00-010-006

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
(b) Open the three latches.

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

- (c) Open the APU Cowl Door, 315A.
(d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
(e) Remove the retainer pin from the spring clip on the aft hold-open rod.

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- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

F. Insulation Panel Inspection Procedure

SUBTASK 49-13-00-210-003

- (1) Do these steps to inspect the insulation panels for fluid contamination and structural damage:
 - (a) Examine the insulation panels for signs of fluid contamination to the core insulation material.
 - (b) Examine the surface of the insulation panels for missing metal sheets, ruptured seams or structural metal deterioration.
 - (c) Examine the insulation panels for holes that have gone through the inner and outer metal sheets.
 - (d) If you find any of the above damage, replace the insulation panel(s). These are the tasks:
 - Insulation Panel Removal, TASK 49-17-11-000-801.
 - Insulation Panel Installation, TASK 49-17-11-400-801.
- 1) After the insulation panel(s) are removed, do these steps:
 - a) Examine the structure behind the insulation panel(s) for contamination and damage.
 - b) Examine the air inlet scoop for blockage of unwanted materials and damage that can cause a decrease in air flow.

NOTE: You can find the air inlet scoop behind the forward insulation panel.
 - c) If you find blockage of unwanted materials, remove the blockage.
 - d) If you find contamination or damage, clean and repair the problems that you find.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-13-00-410-006

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

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SUBTASK 49-13-00-860-007

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-13-00-860-008

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

————— **END OF TASK** —————

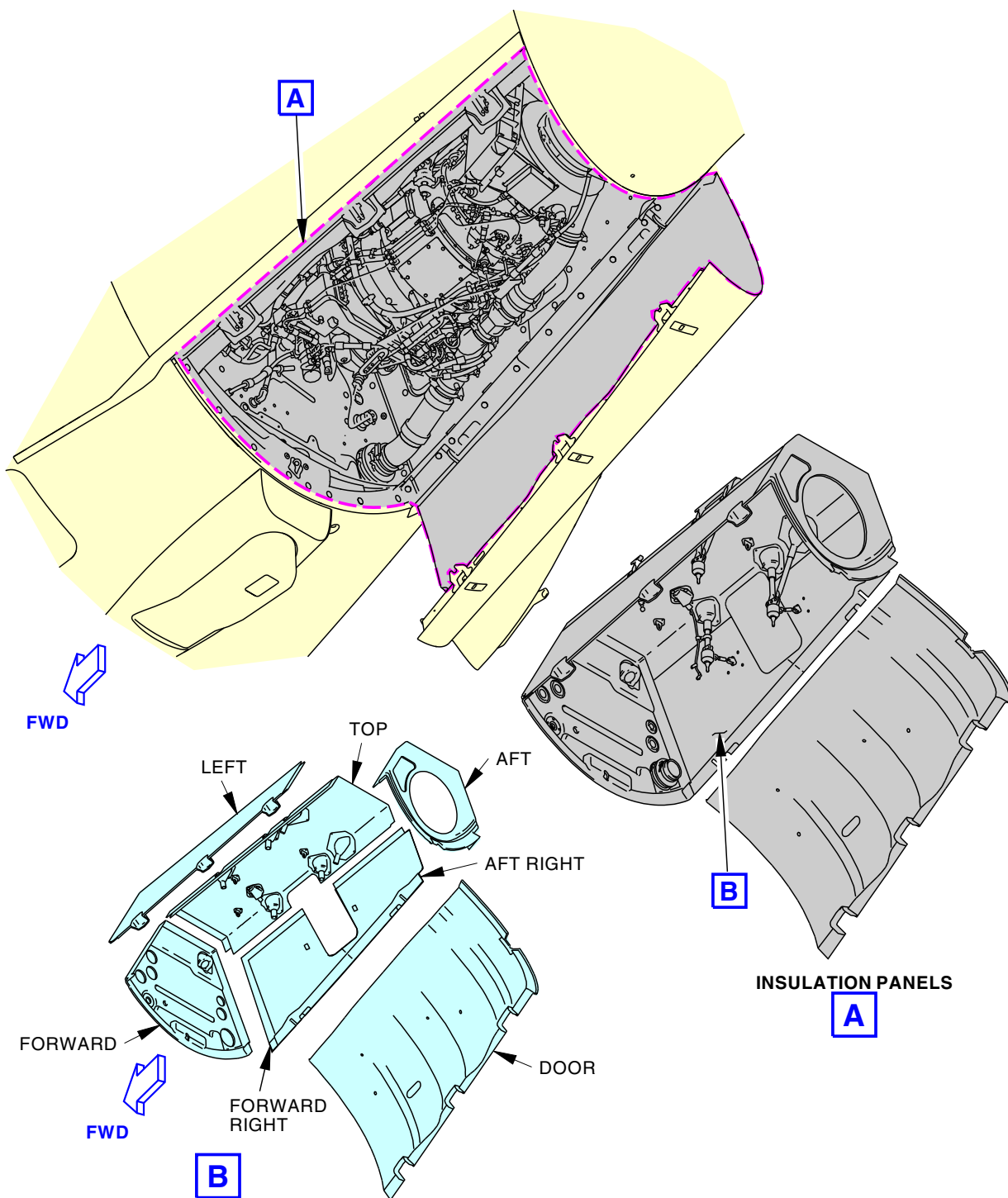
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APU Insulation Panels Inspection
Figure 602/49-13-00-990-803

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AIRCRAFT MAINTENANCE MANUAL
APU AIR INLET - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) Manually Open the APU Air Inlet Door
 - (2) Manually Close the APU Air Inlet Door

TASK 49-15-00-020-801

2. Manually Open the APU Air Inlet Door

A. Tools/Equipment

Reference	Description
STD-12636	Wrench - Socket, 1/4 Inch Square Drive

B. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

C. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

D. Manually Open the APU Air Inlet Door

SUBTASK 49-15-00-860-031

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-860-032

- (2) Open this access door:

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

SUBTASK 49-15-00-010-005

- (3) Do these steps to manually open the air inlet door (open to the "ground open" position):
- (a) Remove the manual drive access cover (transfer cover) on the APU inlet door actuator.

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- (b) Follow the instructions on the actuator placard and use a socket wrench, STD-12636, to open the inlet door (extend the actuator).

NOTE: There are two sockets on the actuator, a manual drive socket and a transfer cover socket.

- 1) Insert a socket wrench, STD-12636, into the transfer drive socket and turn in the counterclockwise direction until the mark on transfer cover aligns with "M".

NOTE: The manual drive socket is now exposed.

- 2) Insert the socket wrench, STD-12636, in the manual drive socket and turn the socket wrench, STD-12636, in the counterclockwise direction approximately 50 to 60 revolutions until a sharp torque increase is felt.
- 3) The "ground open" distance is 15.75 ± 0.50 in. (40.00 ± 1.27 cm) (~ 50 to 60 revolutions).
- 4) Turn the transfer cover socket in the clockwise direction until the mark on the cover aligns with "E".
- 5) Make sure the transfer cover is fully in the electrical mode position.

NOTE: When the actuator is in the electrical mode, the actuator will lock in its current position.

- (c) Install the manual drive access cover (transfer cover) on the actuator.

———— **END OF TASK** ————

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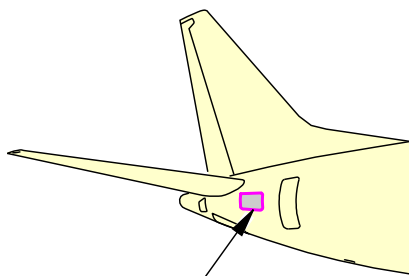
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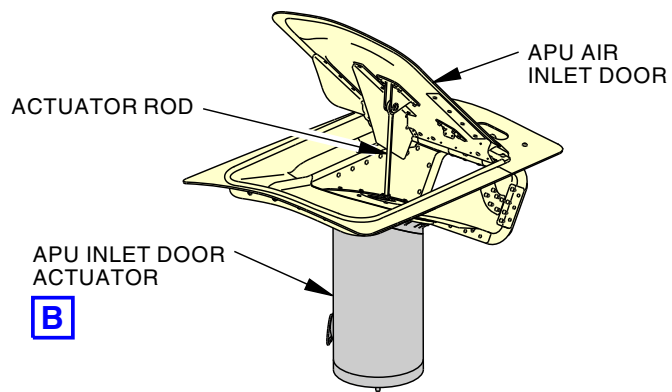
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APU AIR INLET
DOOR

A



ACTUATOR ROD

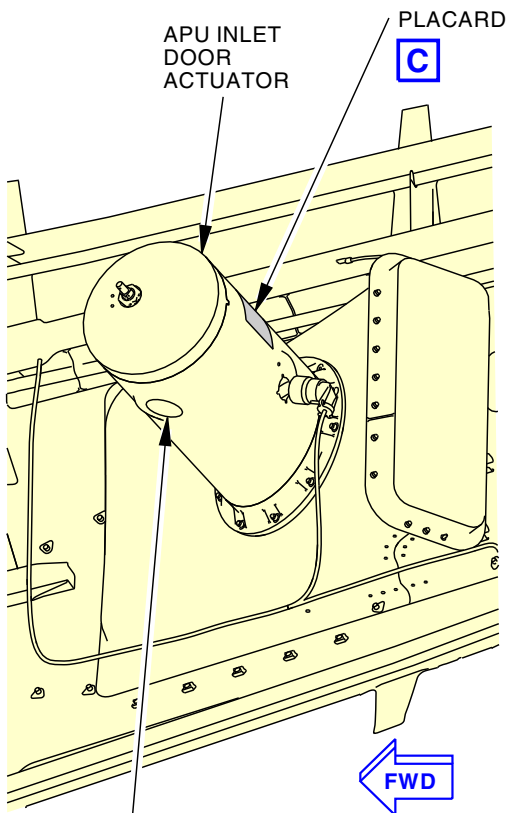
APU AIR
INLET DOOR

APU INLET DOOR
ACTUATOR

B

APU AIR INLET DOOR

A



APU INLET
DOOR
ACTUATOR

PLACARD

C

MANUAL DRIVE
ACCESS COVER
(TRANSFER COVER)

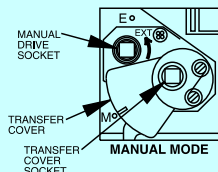
B



APU INLET DOOR ACTUATOR MANUAL OPERATION

TO OPEN INLET DOOR (EXTEND ACTUATOR)

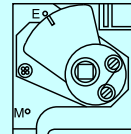
1. ROTATE TRANSFER COVER SOCKET COUNTERCLOCKWISE USING A 1/4" SOCKET UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "M" AND THE MANUAL DRIVE SOCKET WILL BE EXPOSED. THE ACTUATOR IS NOW IN MANUAL MODE. DO NOT EXCEED 15 IN-LBS (1.7 N-M) OF TORQUE.
2. WITH HAND TOOL ONLY ROTATE MANUAL DRIVE SOCKET COUNTERCLOCKWISE APPROXIMATELY 60 REVOLUTIONS UNTIL A SHARP TORQUE RISE IS FELT. DO NOT EXCEED 100 IN-LBS (11.3 N-M) OF TORQUE. THE INLET DOOR IS NOW OPEN (ACTUATOR EXTENDED).



MANUAL MODE

TO CLOSE INLET DOOR (RETRACT ACTUATOR)

PERFORM ITEMS ABOVE IN REVERSE ORDER. ACTUATOR IS IN ELECTRICAL MODE WHEN THE TRANSFER COVER SOCKET IS ROTATED CLOCKWISE UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "E".



ELECTRICAL MODE

CAUTION IF NOTED TORQUE LIMITS ARE EXCEEDED, INTERNAL DAMAGE TO ACTUATOR MAY RESULT. IF ACTUATOR IS NOT FULLY ENGAGED IN MANUAL OR ELECTRICAL MODE, ACTUATOR FAILURE MAY RESULT.

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PLACARD

C

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Manually Open/Close the APU Air Inlet Door Figure 201/49-15-00-990-805

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TASK 49-15-00-420-801

3. **Manually Close the APU Air Inlet Door**

(Figure 49-15-31-990-802)

A. References

Reference	Title
49-15-31-990-802	Figure: Air Inlet Door Actuator Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-12636	Wrench - Socket, 1/4 Inch Square Drive

C. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

E. Manually Close the APU Air Inlet Door

SUBTASK 49-15-00-860-026

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

F/O Electrical System Panel, P6-5

Row	Col	Number	Name
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-860-027

- (2) Open this access door:

Number	Name/Location
311BL	Stabilizer Trim Access Door

SUBTASK 49-15-00-410-003

- (3) Do these steps to close (retract) the air inlet door:

- Remove the manual drive access cover (transfer cover) on the APU inlet door actuator.
- Follow the instructions on the actuator placard and use a socket wrench, STD-12636, to retract the actuator.

NOTE: There are two sockets on the actuator, a manual drive socket and a transfer cover socket.

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- 1) Insert a socket wrench, STD-12636, into the transfer drive socket and turn in the counterclockwise direction until the mark on transfer cover aligns with "M".
NOTE: The manual drive socket is now exposed.
- 2) Insert the socket wrench, STD-12636, in the manual drive socket and turn the socket wrench, STD-12636, in the clockwise direction approximately 60 revolutions until a sharp torque increase is felt.
- 3) Turn the transfer cover socket in the clockwise direction until the mark on the cover aligns with "E".
- 4) Make sure the transfer cover is fully in the electrical mode position.
NOTE: When the actuator is in the electrical mode, the actuator will lock in its current position.

(c) Install the manual drive access cover (transfer cover) on the inlet door actuator.

SUBTASK 49-15-00-860-029

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-860-030

- (5) Close this access panel:

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

————— **END OF TASK** —————

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APU AIR INLET - ADJUSTMENT/TEST

1. **General**

- A. This procedure has these tasks:
- (1) A test of the air inlet door.
 - (2) An adjustment of the air inlet door
 - (3) An adjustment of the position switch for the air inlet door
- B. The adjustments and the test for the air inlet door are necessary for the air inlet system to operate correctly.
- C. The position switch for the air inlet door must be adjusted each time you replace it or adjust the air inlet door.

TASK 49-15-00-710-801

2. **APU Air Inlet Door Test**

(Figure 501)

A. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

B. APU Air Inlet Door Test

SUBTASK 49-15-00-860-025

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-820-006

- (2) Do these steps:
- (a) Make sure that the BAT switch on the P5 forward overhead panel is ON.
 - (b) Make sure that the on the APU master switch on the P5 forward overhead panel is set to OFF.
 - (c) Access the MAX Display System (MDS) APU maintenance page, and set the APU ECU Power to TEST.
 - (d) On the MDS APU maintenance page, make sure the APU INLET DOOR POSITION shows NOT OPEN.
 - (e) Look at the right aft side of the airplane and make sure the APU air inlet door is closed.
 - (f) Set the APU master switch on the P5 forward overhead panel to ON.

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- (g) Wait up to 30 seconds, and make sure the APU maintenance page display for APU INLET DOOR POSITION shows OPEN.

NOTE: If the APU inlet door does not open within two minutes and forty-five seconds, a fault will occur.

- (h) Look at the right aft side of the airplane and make sure the APU air inlet door is open.
(i) Set the APU master switch on the P5 forward overhead panel to OFF.
(j) Wait two minutes, and make sure the APU maintenance page display for APU INLET DOOR POSITION shows NOT OPEN.
(k) Look at the right aft side of the airplane and make sure the APU air inlet door is closed.

SUBTASK 49-15-00-820-008

- (3) Measure the fair alignment of the APU air inlet door and the inlet door fairing.
(a) If the fair alignment is within the tolerance of 0.000 +0.060 / -0.000 in. (0.000 +1.524 / -0.000 mm) and the seal is slightly compressed, no adjustment is necessary.
(b) If the fair alignment is not correct, do this task: APU Air Inlet Door Adjustment, TASK 49-15-00-800-801.

SUBTASK 49-15-00-820-007

- (4) If it is necessary (if the APU maintenance page display is not the same as the actual APU air inlet door position), do this task: APU Air Inlet Door Position Switch Adjustment, TASK 49-15-00-800-802.

————— **END OF TASK** —————

TASK 49-15-00-800-801

3. APU Air Inlet Door Adjustment

(Figure 501)

A. General

- (1) The APU air inlet door can only be adjusted using the adjustment nut [4].

NOTE: The actuator travel length is set.

NOTE: The actuator will stop at either end of 7.140 ±0.075 in. (18.136 ±0.191 cm) travel in either direction.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

D. APU Air Inlet Door Adjustment

SUBTASK 49-15-00-860-035

- (1) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-5

Row	Col	Number	Name
A	12	C04011	APU INLET DOOR

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SUBTASK 49-15-00-860-036

- (2) Cycle the APU air inlet door [1] as follows:
 - (a) Put the APU master switch to the OFF position until the APU air inlet door [1] is in the full closed position.
 - (b) Put the APU master switch to the ON position until the APU air inlet door [1] is in the full open position.
- (3) Close the APU air inlet door [1] as follows:
 - (a) Put the APU master switch to the OFF position until the APU air inlet door [1] is in the full closed position.
- (4) Put a tag on the APU master switch that states: APU INLET DOOR INOP - DEACTIVATED CLOSED.

SUBTASK 49-15-00-860-005

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-820-009

- (6) Measure the fair alignment of the APU air inlet door [1] and the inlet door fairing.
 - (a) If the fair alignment is within the tolerance of 0.000 +0.060 / -0.000 in. (0.000 +1.524 / -0.000 mm) and the seal is slightly compressed, then no adjustment is necessary.

SUBTASK 49-15-00-820-001

- (7) Do the steps that follow to adjust the APU air inlet door [1]:
 - (a) If necessary, remove the lockwire from the locknut [3], adjustment nut [4], and locknut [5].
 - (b) Loosen the locknut [5], locknut [3] and adjustment nut [4].
 - (c) Turn the adjustment nut [4] until the APU air inlet door [1] and the inlet door fairing are aligned.
 - 1) Make sure the alignment is within the tolerance of 0.000 +0.060 / -0.000 in. (0.000 +1.524 / -0.000 mm) and the seal is slightly compressed. (Figure 501, View A-A)
 - (d) Tighten the locknut [5] to 127.5 ±32.5 in-lb (14.4 ±3.7 N·m).
 - (e) Tighten the locknut [3] to 45 in-lb (5 N·m).
 - (f) Install the lockwire on the locknut [3], adjustment nut [4], and locknut [5].
 - 1) Use the double twist method (TASK 20-10-44-400-801).

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SUBTASK 49-15-00-860-010

- (8) Make sure these circuit breakers are closed:

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-860-011

- (9) Make sure the APU master switch on the P5 forward overhead panel is OFF and remove the APU INLET DOOR INOP - DEACTIVATED CLOSED tag.

SUBTASK 49-15-00-710-004

- (10) Do this task: APU Air Inlet Door Test, TASK 49-15-00-710-801.

SUBTASK 49-15-00-820-002

- (11) Do this task: APU Air Inlet Door Position Switch Adjustment, TASK 49-15-00-800-802.

———— **END OF TASK** ————

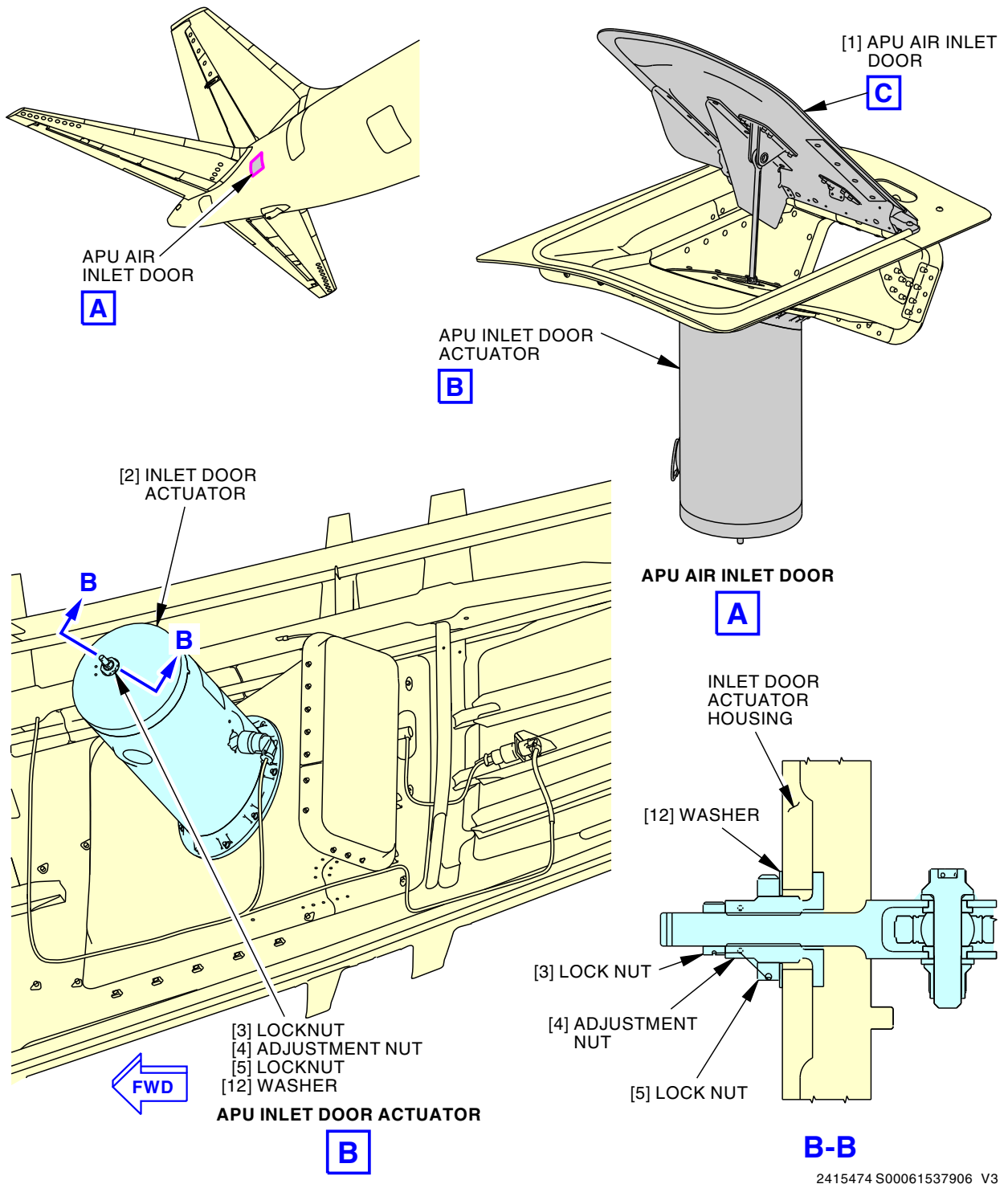
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APU Air Inlet Door Adjustment
Figure 501/49-15-00-990-801 (Sheet 1 of 2)

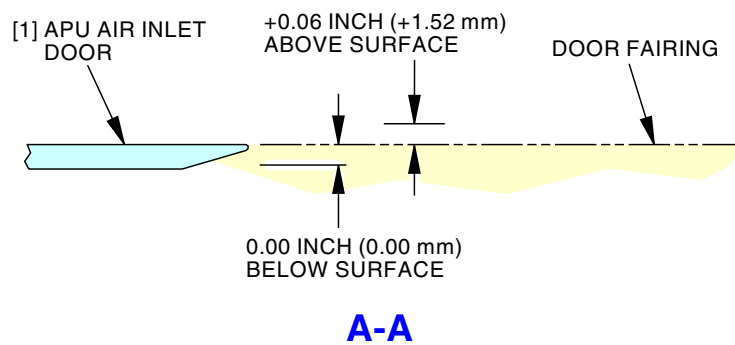
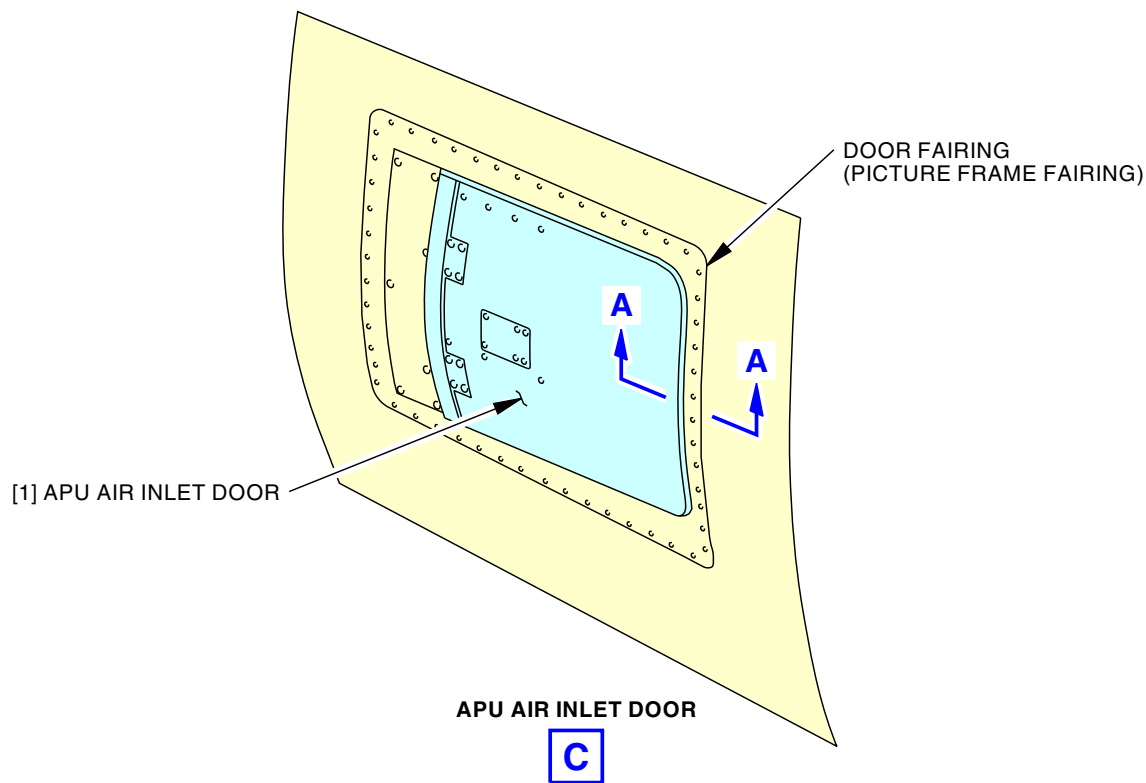
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APU Air Inlet Door Adjustment
Figure 501/49-15-00-990-801 (Sheet 2 of 2)

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TASK 49-15-00-800-802

4. **APU Air Inlet Door Position Switch Adjustment**

(Figure 502)

A. References

Reference	Title
49-15-00-020-801	Manually Open the APU Air Inlet Door (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-7618	Ohmmeter - Standard

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50079	Scraper - Wood or Plastic	

D. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. APU Air Inlet Door Position Switch Adjustment

SUBTASK 49-15-00-700-002

- (1) Do this task: APU Air Inlet Door Test, TASK 49-15-00-710-801.
 - (a) If it is necessary, do this task: APU Air Inlet Door Adjustment, TASK 49-15-00-800-801.

NOTE: The APU air inlet door actuator must be correctly adjusted before you adjust the inlet door position switch [7].

SUBTASK 49-15-00-010-006

- (2) Use a scraper, G50079, to remove the sealant from the hinge cover panel [11].
 - (a) Clean the area with a cotton wiper, G00034, and alcohol, B00130 or solvent, B00184.
 - (b) Remove the seven bolts [10] that attach the hinge cover panel [11].

SUBTASK 49-15-00-860-012

- (3) Make sure the BAT switch on the P5 forward overhead panel is ON.

SUBTASK 49-15-00-860-013

- (4) Set the APU master switch on the P5 forward overhead panel to the ON position and attach a DO NOT OPERATE tag, STD-858.

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SUBTASK 49-15-00-860-014

- (5) Make sure the air inlet door opens in approximately 30 seconds.

NOTE: It is 'normal' for the air inlet door to pause briefly for approximately 0.5 second as the door opens. This is because the ECU pauses to do a diagnostic check for the quality of the power to the door actuator and door position switch. The brief pause is considered normal.

NOTE: If the APU inlet door does not open within two minutes and forty-five seconds, a fault will occur.

SUBTASK 49-15-00-720-001

- (6) If it is necessary, do this task: Manually Open the APU Air Inlet Door, TASK 49-15-00-020-801.

SUBTASK 49-15-00-860-015

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-010-002

- (8) Open this access door:

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

SUBTASK 49-15-00-010-004

- (9) Remove the hinge cover panel [11] on the APU air inlet door to show the access hole for the inlet door position switch [7]:

SUBTASK 49-15-00-020-003

- (10) Do the steps that follow:
- Disconnect the connector D16494 [6].
 - Turn the inlet door position switch [7] in the clockwise direction until a standard ohmmeter, STD-7618, measures continuity between connector D16494 [6] pin # 1 and pin # 4 (the inlet door position switch is actuated open).
 - Turn the inlet door position switch [7] in the clockwise direction again approximately 2.75 turns.
 - Make sure the wire [8] has a clearance of 0.25 in. (6.35 mm) or more.
 - Tighten the jam nut [9] to 60 ±10 in-lb (6.8 ±1.2 N·m).
 - Install the lockwire.
 - Connect the connector D16494 [6].

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SUBTASK 49-15-00-410-004

- (11) Close this access door:

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

SUBTASK 49-15-00-860-033

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-00-750-001

- (13) Set the APU master switch on the P5 forward overhead panel to the OFF position and remove the DO NOT OPERATE tag, STD-858.

SUBTASK 49-15-00-410-005

- (14) Install the hinge cover panel [11]:
- (a) Install the seven bolts [10] that attach the hinge cover panel [11].
- 1) Apply sealant, A00160, to fillet seal the hinge cover panel [11].

SUBTASK 49-15-00-750-002

- (15) Do this task: APU Air Inlet Door Test, TASK 49-15-00-710-801.

END OF TASK

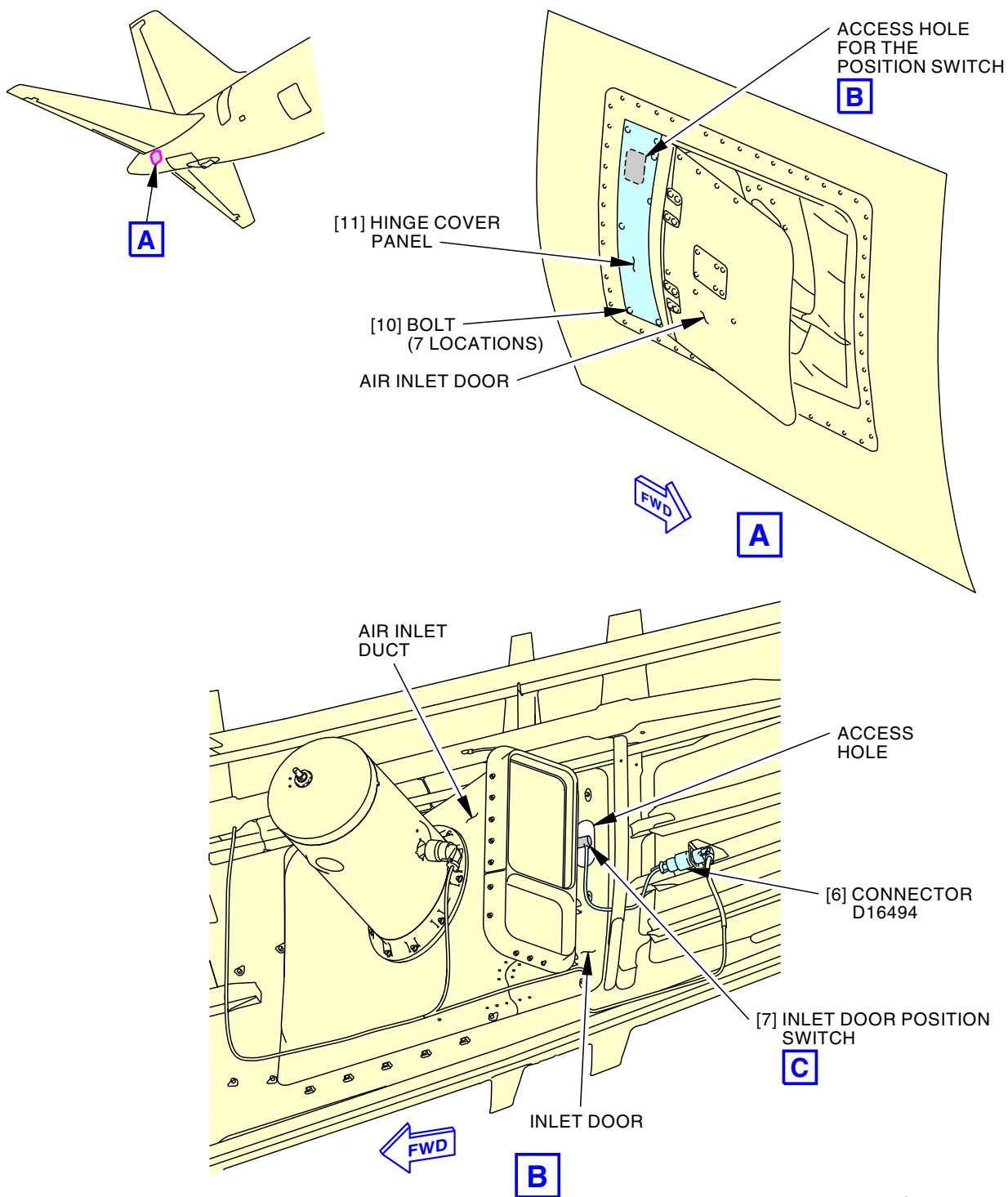
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APU Air Inlet Door Position Switch Adjustment
Figure 502/49-15-00-990-803 (Sheet 1 of 2)

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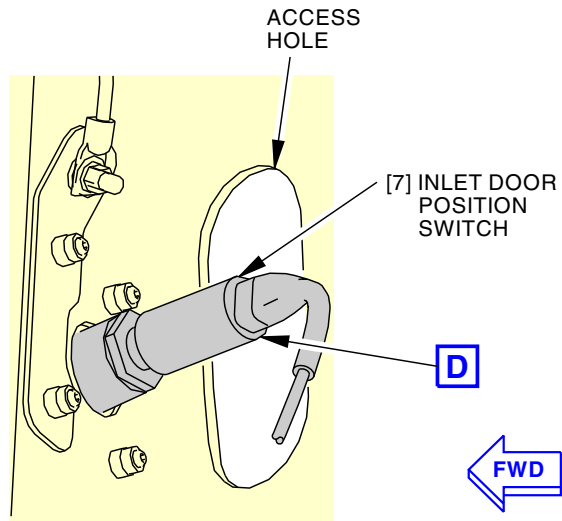
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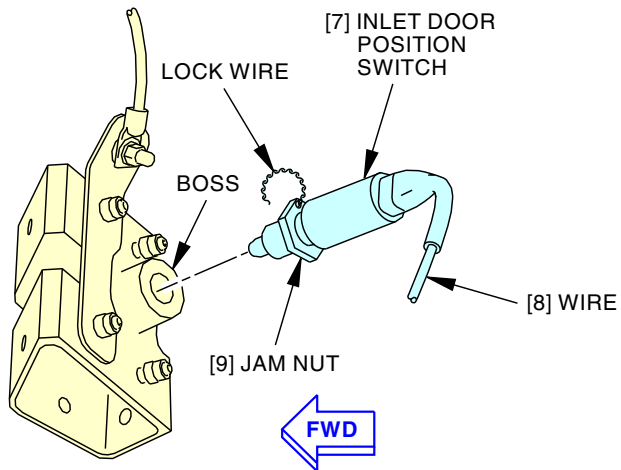
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C



D

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APU Air Inlet Door Position Switch Adjustment
Figure 502/49-15-00-990-803 (Sheet 2 of 2)

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AIR INLET SEAL - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the air inlet seal
 - (2) Installation of the air inlet seal.
- B. The air inlet seal is installed on the inlet adapter assembly.

TASK 49-15-11-000-801

2. Air Inlet Seal Removal

(Figure 401)

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)

B. Location Zones

Zone	Area
316	APU Compartment - Right

C. Prepare for the Removal

SUBTASK 49-15-11-020-001

- (1) Remove the APU (TASK 49-11-00-000-801).

D. Air Inlet Seal Removal

SUBTASK 49-15-11-020-002

- (1) Do these steps to remove the air inlet seal [1]:



CAUTION

BE CAREFUL WHEN YOU INSTALL THE SCREWDRIVER THROUGH THE TOP ACCESS HOLES ON THE AIR INLET SEAL. DAMAGE TO THE AIR INLET SEAL CAN OCCUR.

- (a) Remove the 32 screws [2] that attach the air inlet seal [1] to the inlet adapter assembly [3].

NOTE: You can install a screwdriver through the top access holes on the air inlet seal [1] to help you remove the screws.

- (b) Remove the air inlet seal [1].
- (c) Make sure that you install all necessary protection covers.

———— **END OF TASK** ————

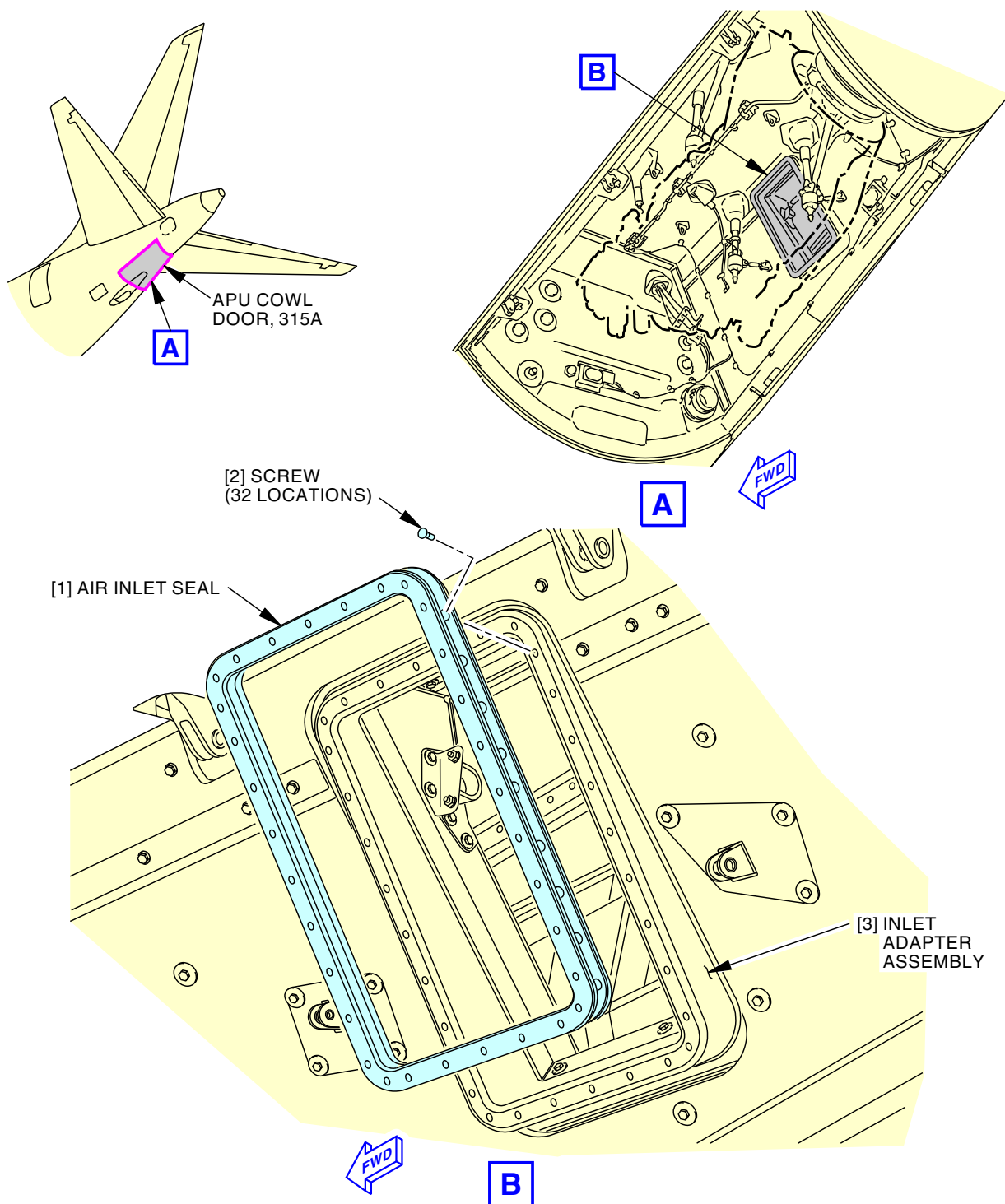
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Air Inlet Seal Installation
Figure 401/49-15-11-990-801

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TASK 49-15-11-400-801

3. Air Inlet Seal Installation

(Figure 401)

A. References

Reference	Title
49-11-00-400-801	APU Power Plant Installation (Selection) (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)
STD-1064	Scraper - Phenolic, Hard Resin

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Air inlet seal	49-15-11-04-030	SIA ALL

E. Location Zones

Zone	Area
316	APU Compartment - Right

F. Air Inlet Seal Installation

SUBTASK 49-15-11-110-001



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 clean the surfaces of the inlet adapter assembly [3]:
 - (a) Remove the sealant from the surfaces of the inlet adapter assembly [3] with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - (b) Clean the surfaces of the inlet adapter assembly [3] with alcohol, B00130, and a cotton wiper, G00034.
 - (c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surfaces of the inlet adapter assembly [3].

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surfaces of the inlet adapter assembly [3].

SUBTASK 49-15-11-420-001

- (2) Do these steps to install the air inlet seal [1]:
 - (a) Apply the sealant, A00160, to the faying surfaces of the air inlet seal [1].

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- (b) Install the air inlet seal [1] on the inlet adapter assembly [3].
- (c) Inject sealant, A00160, into the gaps at the corners of the air inlet seal [1].

NOTE: It is not necessary to let the sealant dry.



CAUTION

BE CAREFUL WHEN YOU INSTALL THE SCREWDRIVER THROUGH THE TOP ACCESS HOLES ON THE AIR INLET SEAL. DAMAGE TO THE AIR INLET SEAL CAN OCCUR.

- (d) Install the 32 screws [2] that attach the air inlet seal [1] to the inlet adapter assembly [3].

NOTE: You can install a screwdriver through the top access holes on the air inlet seal [1] to help you install the screws.

- (e) Remove the unwanted sealant from the inlet adapter assembly [3] with a cotton wiper, G00034.
- (f) Make sure that the surfaces of the air inlet seal [1] shows no wrinkles, bubbles or inclusions.

SUBTASK 49-15-11-420-002

- (3) Install the APU (TASK 49-11-00-400-801).

NOTE: It is not necessary for the sealant to dry. You can install the APU with wet sealant on the inlet adapter assembly.

———— **END OF TASK** ————

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AIR INLET SEAL - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the air inlet seal (also called the sigma seal).

TASK 49-15-11-200-801

2. Air Inlet Seal Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)
49-15-11-000-801	Air Inlet Seal Removal (P/B 401)
49-15-11-400-801	Air Inlet Seal Installation (P/B 401)

B. Location Zones

Zone	Area
316	APU Compartment - Right

C. Prepare for the Inspection

SUBTASK 49-15-11-010-001

- (1) Remove the APU (TASK 49-11-00-000-801).

D. Air Inlet Seal Inspection

SUBTASK 49-15-11-210-001

- (1) Do these steps to examine the air inlet seal [1]:
- Examine the air inlet seal [1] for signs of folding, tears or deformation.
 - Measure the height of the air inlet seal [1].
 - Make sure the height from the bottom to the top of the air inlet seal [1] is 1.375 in. (34.925 mm) - 1.625 in. (41.275 mm).
 - Examine the mating surfaces of the air inlet seal [1] for wrinkles, bubbles, unwanted materials or wear damage through the top surface.
 - Examine the air inlet seal [1] for separations, missing materials, cracks and tears.
 - If you find signs of the above damage or the height of the air inlet seal [1] is not in the limits, replace the air inlet seal [1].

These are the tasks:

- Air Inlet Seal Removal, TASK 49-15-11-000-801
- Air Inlet Seal Installation, TASK 49-15-11-400-801

SUBTASK 49-15-11-410-001

- (2) Install the APU (TASK 49-11-00-400-801).

————— **END OF TASK** —————

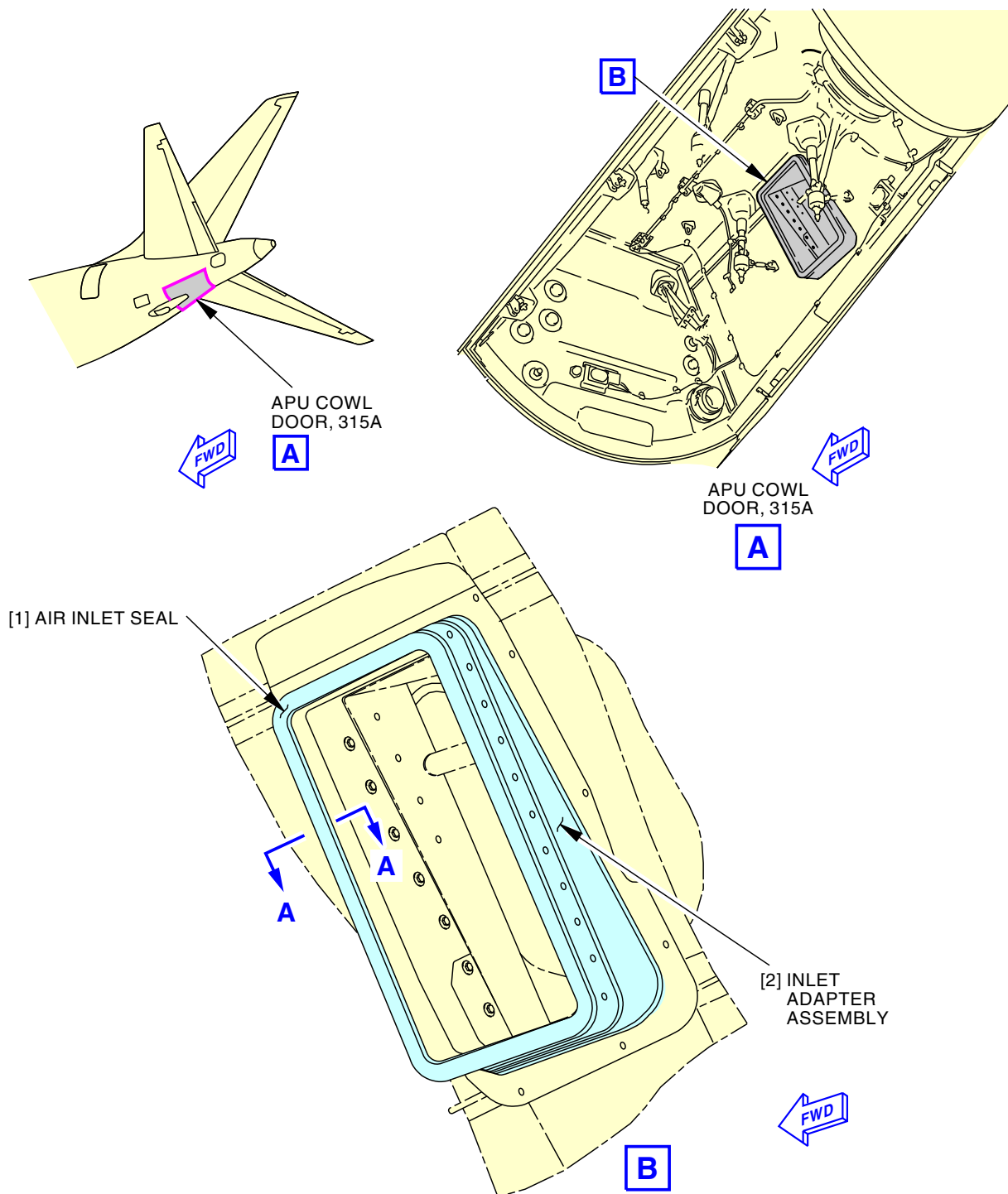
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Air Inlet Seal Inspection
Figure 601/49-15-11-990-802 (Sheet 1 of 2)

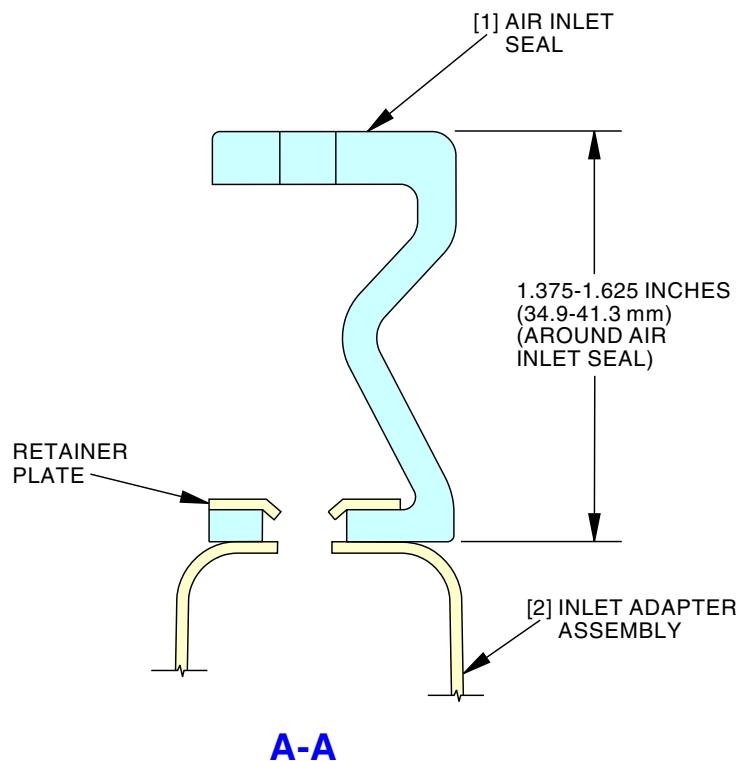
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Air Inlet Seal Inspection
Figure 601/49-15-11-990-802 (Sheet 2 of 2)

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APU AIR INLET DUCTS - REMOVAL/INSTALLATION

1. General

- A. The APU air inlet ducts have two sections, the air inlet diffuser ducts (forward and aft diffuser duct segments) and the air inlet plenum.
- B. The aft diffuser duct (double flanged) must always be removed first (before the forward diffuser duct and the forward air inlet plenum), and installed last.
- C. The air inlet plenum is installed between the aft diffuser duct and the APU.
- D. The plenum has three sections: forward, aft, and the joint interconnect frame (which connects the forward and aft sections of the plenum). Only the forward plenum duct is replaced in this procedure.
- E. Replacement of the aft plenum and joint interconnect frame require removal of the APU. The aft plenum assembly is curved to mate with the air inlet seal in the APU compartment, and contains the cable guard tube (which holds the right hand elevator control cable).
- F. The APU cooling air compartment has an eductor duct assembly (refer to EDUCTOR INLET DUCT, SUBJECT 49-91-71) which is located immediately below the air inlet ducts. The eductor ducts must be removed before removal and installation of the air inlet ducts.
- G. This procedure has these tasks:
 - (1) Removal of the air inlet diffuser ducts.
 - (2) Installation of the air inlet diffuser ducts.
 - (3) Removal of the forward air inlet plenum.
 - (4) Installation of the forward air inlet plenum.

TASK 49-15-15-000-801

2. Air Inlet Diffuser Ducts Removal

(Figure 401)

A. **References**

Reference	Title
49-91-71-000-801	Eductor Inlet Duct Removal (P/B 401)

B. **Tools/Equipment**

Reference	Description
STD-765	Scraper - Plastic
STD-858	Tag - DO NOT OPERATE
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)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. **Location Zones**

Zone	Area
211	Flight Compartment - Left

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(Continued)

Zone	Area
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right

E. Prepare for the Removal

SUBTASK 49-15-15-860-001

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

SUBTASK 49-15-15-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

F. Air Inlet Diffuser Ducts Removal

NOTE: The air inlet diffuser ducts will be removed as follows: first the aft diffuser duct [2] (double flanged), then the forward diffuser duct [1] (next to the air inlet door) will be removed.

SUBTASK 49-15-15-010-002

- (1) Do this task: Eductor Inlet Duct Removal, TASK 49-91-71-000-801.

SUBTASK 49-15-15-410-001

- (2) Do these steps to remove the aft diffuser duct [2]:
 - (a) If it is necessary, use a plastic scraper, STD-765, to break the fillet sealant.
 - 1) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 2) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - a) It is recommended that you use a pressure of 75 psig (517 kPa) of air or nitrogen to dry the surface.
 - (b) Remove the 18 bolts and washers [4] that hold the aft diffuser duct [2] to the forward air inlet plenum [3].
 - (c) Remove the 18 bolts and washers [4] that hold the aft diffuser duct [2] to the forward diffuser duct [1].
 - (d) Remove the aft diffuser duct [2].
 - (e) Install protective covers on the duct openings.

SUBTASK 49-15-15-410-002

- (3) Do these steps to remove the forward diffuser duct [1]:
 - (a) Use a plastic scraper, STD-765, to break the fillet seal between the forward diffuser duct [1] and the interconnect frame of the air inlet port.
 - (b) Remove the forward diffuser duct [1].
 - (c) Install protective covers on the duct openings.

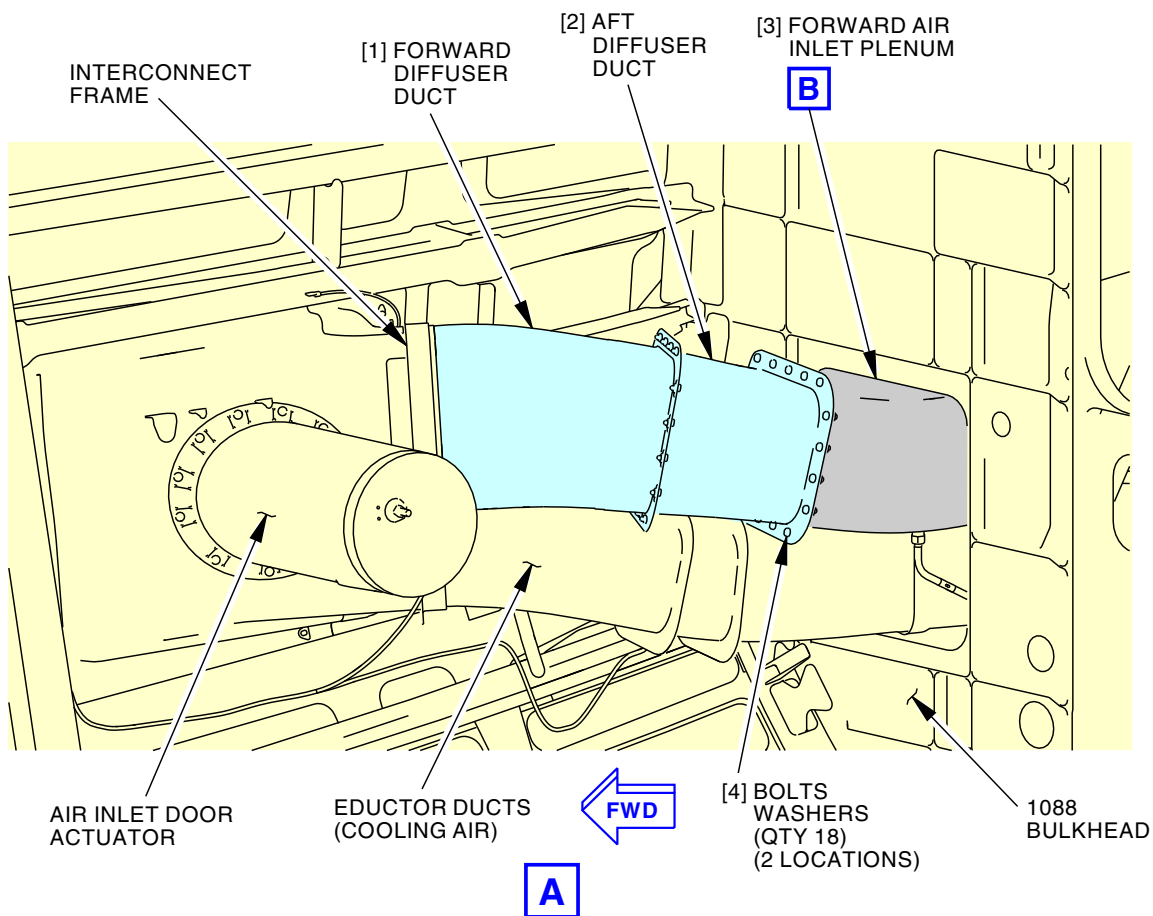
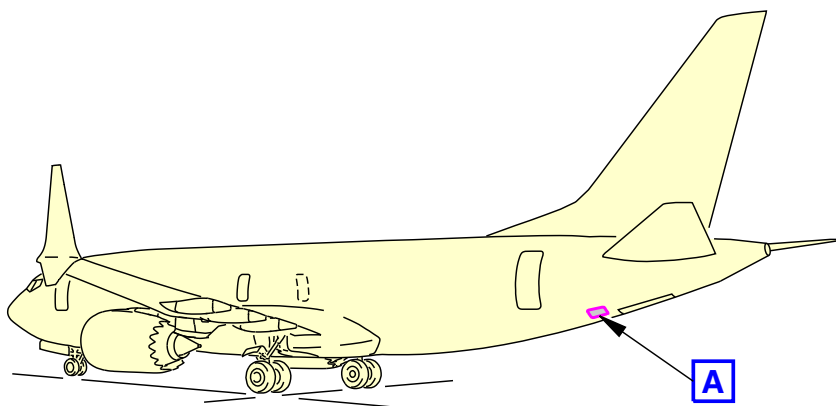
————— **END OF TASK** —————

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Air Inlet Ducts Installation
Figure 401/49-15-15-990-802 (Sheet 1 of 2)

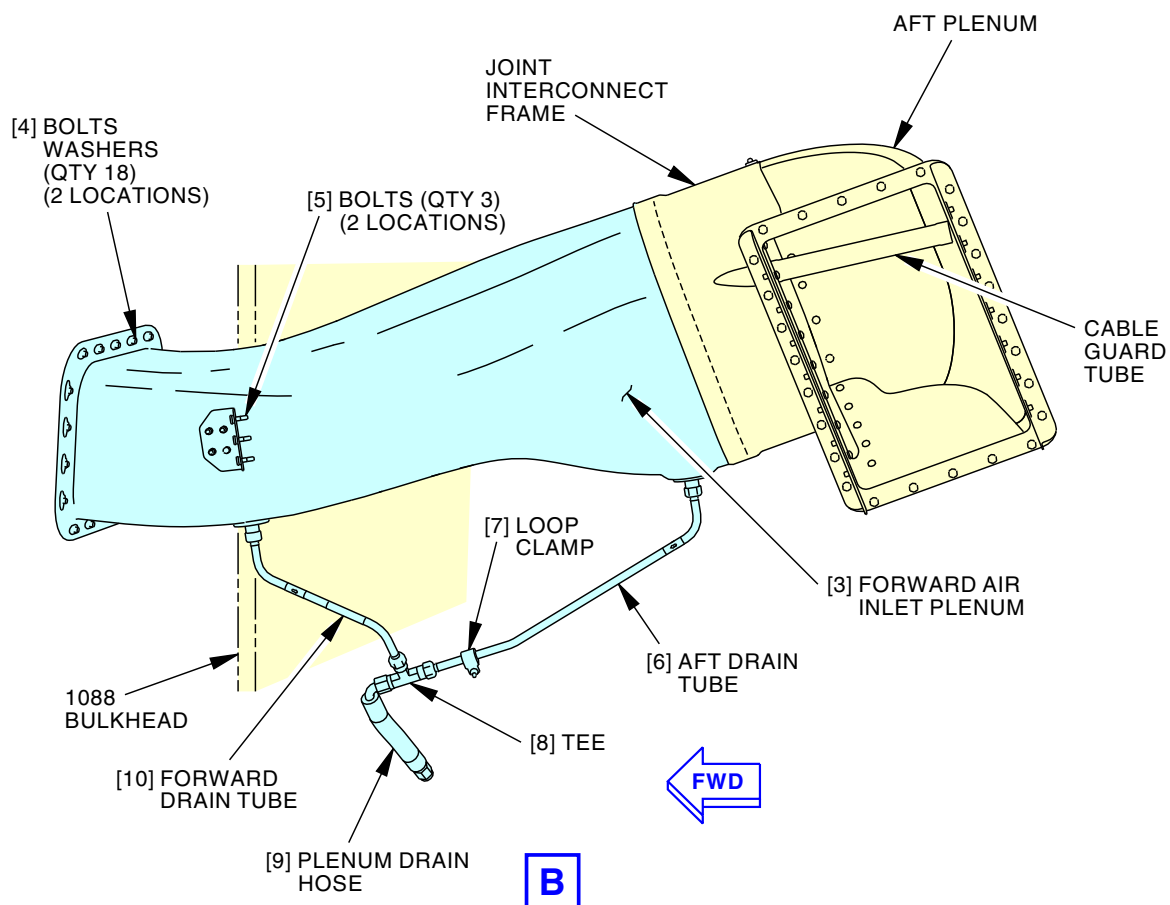
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Air Inlet Ducts Installation
Figure 401/49-15-15-990-802 (Sheet 2 of 2)

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TASK 49-15-15-400-801

3. Air Inlet Diffuser Ducts Installation

(Figure 401)

A. References

Reference	Title
49-11-00-710-802	APU Operational Test (P/B 501)
49-91-71-400-801	Eductor Inlet Duct Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-764	Scraper - Non-metallic
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Forward diffuser duct	49-15-00-01-040	SIA ALL
2	Aft diffuser duct	49-15-00-01-060	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right

F. Air Inlet Diffuser Ducts Installation

NOTE: The air inlet diffuser ducts will be installed as follows: first the forward diffuser duct [1] (next to the air inlet door), then the aft diffuser duct [2] (double flanged) will be installed.

SUBTASK 49-15-15-100-002

- (1) If you see old sealant on the forward diffuser duct [1] or aft diffuser duct [2], do these steps:
 - (a) Remove the old sealant from the surface with a non-metallic scraper, STD-764, or an equivalent tool.
 - (b) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - (c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - 1) It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the surface.

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SUBTASK 49-15-15-420-003



CAUTION

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

- (2) Do these steps to install the forward diffuser duct [1]:
- Remove the protective covers from the duct openings.
 - Carefully put the forward diffuser duct [1] in position where it mates the interconnect frame of the air inlet port.

SUBTASK 49-15-15-420-001

- (3) Do these steps to install the aft diffuser duct [2]:
- Make sure that the forward air inlet plenum [3] is in position.
 - If it is necessary, do this task: Forward Air Inlet Plenum Installation, TASK 49-15-15-400-802.



CAUTION

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

- Remove the protective covers from the duct openings.
- Make sure that the seals are in position at the two ends of the aft diffuser duct [2].
- Carefully put the aft diffuser duct [2] in position where it mates with the forward air inlet plenum [3] and the forward diffuser duct [1].
- Install and tighten the 18 bolts and washers [4] that hold the forward diffuser duct [1] to the aft diffuser duct [2].
- Install and tighten the 18 bolts and washers [4] to hold the aft diffuser duct [2] to the forward air inlet plenum [3].
- Make sure that the forward end of the forward diffuser duct [1] walls are flush with the interconnect frame of the air inlet port.
 - Apply sealant, A00160, to fill the gaps (fillet seal).

SUBTASK 49-15-15-010-001

- (4) Do this task: Eductor Inlet Duct Installation, TASK 49-91-71-400-801.

G. Air Inlet Diffuser Ducts Installation Test

SUBTASK 49-15-15-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

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SUBTASK 49-15-15-860-004

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

SUBTASK 49-15-15-700-001

- (3) Do this task: APU Operational Test, TASK 49-11-00-710-802.

————— END OF TASK —————

TASK 49-15-15-000-802

4. Forward Air Inlet Plenum Removal

(Figure 401)

A. General

- (1) The Air Inlet Plenum assembly has three parts: the forward plenum assembly, interconnect frame, and aft plenum assembly. The forward air inlet plenum is between the aft diffuser duct and the interconnect frame assembly. Only the forward air inlet plenum is removed in this task.

B. References

Reference	Title
49-91-71-000-801	Eductor Inlet Duct Removal (P/B 401)

C. Tools/Equipment

Reference	Description
STD-765	Scraper - Plastic
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

D. Consumable Materials

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

E. Location Zones

Zone	Area
211	Flight Compartment - Left
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right

F. Prepare for the Removal

SUBTASK 49-15-15-860-010

- (1) Do this task: Eductor Inlet Duct Removal, TASK 49-91-71-000-801.

SUBTASK 49-15-15-010-003

- (2) Make sure that the aft diffuser duct [2] has been removed.
 - (a) If it is necessary, do this task: Air Inlet Diffuser Ducts Removal, TASK 49-15-15-000-801.

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SUBTASK 49-15-15-000-001

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

SUBTASK 49-15-15-860-011

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

G. Forward Air Inlet Plenum Removal

SUBTASK 49-15-15-020-001

- (1) Put a 1 gallon (4 l) fuel resistant container, STD-4049, below the tee [8].

SUBTASK 49-15-15-020-004

- (2) Disconnect the tee [8] from the plenum drain hose [9].

SUBTASK 49-15-15-020-005

- (3) Disconnect the forward drain tube [10] and aft drain tube [6] from the tee [8] and the forward air inlet plenum [3].

SUBTASK 49-15-15-020-006

- (4) Remove the loop clamp [7].

SUBTASK 49-15-15-860-012

- (5) Do these steps to remove the forward air inlet plenum [3]:
 - (a) Remove the two sets of three bolts [5] that attach the two brackets on the forward air inlet plenum [3] to the 1088 bulkhead.
 - (b) Use a plastic scraper, STD-765, to break the fillet seal between the forward air inlet plenum [3] and the joint interconnect frame.
 - (c) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - 1) It is recommended that you use a pressure of 75 psig (517 kPa) of air or nitrogen to dry the surface.
 - (e) Remove the forward air inlet plenum [3].
 - (f) Install protective covers on the duct openings.

SUBTASK 49-15-15-860-018

- (6) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

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TASK 49-15-15-400-802

5. **Forward Air Inlet Plenum Installation**

(Figure 401)

A. General

- (1) The Air Inlet Plenum assembly has three parts: the forward plenum assembly, interconnect frame, and aft plenum assembly. The forward air inlet plenum is between the aft diffuser duct and the interconnect frame assembly. Only the forward air inlet plenum is installed in this task.

B. References

Reference	Title
49-11-00-710-802	APU Operational Test (P/B 501)
49-91-71-400-801	Eductor Inlet Duct Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-764	Scraper - Non-metallic
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Aft diffuser duct	49-15-00-01-060	SIA ALL
3	Forward air inlet plenum	49-15-15-01-095	SIA ALL

F. Location Zones

Zone	Area
211	Flight Compartment - Left
311	Area Aft of Pressure Bulkhead - Left
314	Stabilizer Torsion Box Compartment - Right

G. Prepare for the Installation

SUBTASK 49-15-15-100-001

- (1) Do these steps before you install the forward air inlet plenum [3]:
- (a) If you see old sealant on the forward air inlet plenum [3] or joint interconnect frame, do these steps:
- 1) Remove the old sealant from the surface with a non-metallic scraper, STD-764, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.

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- 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - a) It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the surface.

H. Forward Air Inlet Plenum Installation

SUBTASK 49-15-15-020-002

- (1) Do these steps to install the forward air inlet plenum [3]:
 - (a) Put (slide) the forward air inlet plenum [3] in position through the bulkhead and into the interconnect frame.
 - (b) Install the two sets of three bolts [5] that attach the two brackets on the forward air inlet plenum [3] to the 1088 bulkhead.
 - (c) Apply edge fillet sealant, A00160, to the joint of the forward air inlet plenum [3] and the joint interconnect frame.

SUBTASK 49-15-15-020-007

- (2) Connect the tee [8] to the plenum drain hose [9].

SUBTASK 49-15-15-020-008

- (3) Connect the forward drain tube [10] and aft drain tube [6] to the tee [8].

SUBTASK 49-15-15-020-009

- (4) Connect the forward drain tube [10] and aft drain tube [6] to the forward air inlet plenum [3].

SUBTASK 49-15-15-020-010

- (5) Install the loop clamp [7].

SUBTASK 49-15-15-860-013

- (6) Install the aft diffuser duct [2] (TASK 49-15-15-400-801).

SUBTASK 49-15-15-860-019

- (7) Do this task: Eductor Inlet Duct Installation, TASK 49-91-71-400-801.

I. Forward Air Inlet Plenum Installation Test

SUBTASK 49-15-15-860-015

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-15-15-860-016

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

SUBTASK 49-15-15-860-017

- (3) Do this task: APU Operational Test, TASK 49-11-00-710-802.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL
APU AIR INLET DUCTS - INSPECTION/CHECK

1. General

- A. This procedure has one task. The task contains the information to do an inspection of the APU air inlet diffuser ducts.

TASK 49-15-15-200-801

2. APU Air Inlet Diffuser Ducts Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-15-15-000-801	Air Inlet Diffuser Ducts Removal (P/B 401)
49-15-15-400-801	Air Inlet Diffuser Ducts Installation (P/B 401)

B. Location Zones

Zone	Area
311	Area Aft of Pressure Bulkhead - Left

C. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

D. Prepare for the Inspection

SUBTASK 49-15-15-010-004

- (1) Open this access door:

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

SUBTASK 49-15-15-020-003

- (2) Do this task: Air Inlet Diffuser Ducts Removal, TASK 49-15-15-000-801.

E. APU Air Inlet Diffuser Ducts Inspection

SUBTASK 49-15-15-200-001

- (1) Examine the flanges and the internal and external surfaces of the APU air inlet diffuser ducts for these conditions:
- (a) Warping
 - (b) Delamination
 - (c) Cracks
 - (d) Damage.

SUBTASK 49-15-15-420-004

- (2) Replace all damaged APU air inlet diffuser ducts (TASK 49-15-15-400-801).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-15-420-005

- (1) If it is not already done, install the APU air inlet diffuser ducts (TASK 49-15-15-400-801).

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SUBTASK 49-15-15-410-003

(2) Close this access door:

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

————— END OF TASK —————

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AIR INLET DOOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the air inlet door.
 - (2) Installation of the air inlet door.
- B. The inlet door actuator must be adjusted when the APU air inlet door is replaced.
- (1) After the inlet door actuator is adjusted, the inlet door position switch must be adjusted.

TASK 49-15-22-000-801

2. Air Inlet Door Removal

(Figure 401)

A. References

Reference	Title
49-15-00-020-801	Manually Open the APU Air Inlet Door (P/B 201)

B. Consumable Materials

Reference	Description	Specification
B00068	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002, MIL-E-51454 Type II
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50079	Scraper - Wood or Plastic	

C. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

D. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

E. Prepare for the Removal

SUBTASK 49-15-22-860-014

- (1) To open the air inlet door, set the APU master switch on the P5 forward overhead panel to the ON position.
 - (a) Put a tag on the APU master switch that states "APU INLET DOOR INOP - DEACTIVATED FULL OPEN".
- (2) If the APU air inlet door does not open, do this task: Manually Open the APU Air Inlet Door, TASK 49-15-00-020-801.

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SUBTASK 49-15-22-860-006

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-22-010-001

- (4) Open this access door:

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

F. Air Inlet Door Removal

SUBTASK 49-15-22-020-003

- (1) Do the steps that follow to remove the air inlet door [1]:
- (a) If necessary, use a scraper, G50079, to remove the sealant from the hinge cover plate [10].
 - 1) Clean the area with a cotton wiper, G00034, and solvent, B00184, or alcohol, B00068.
 - (b) Remove the bolt [2], washer (plain) [4], washer (countersunk) [5], bushing (plain) [3], and nut [26] that attach the actuator rod [9] to the air inlet door [1].
 - (c) Remove the seven bolts [11] and seven washers [16] that attach the hinge cover plate [10].

NOTE: It is not necessary to remove the three small bolts on the hinge cover plate.
 - (d) Use a scraper, G50079, to remove the sealant from the ground jumper [20].
 - 1) Clean the area with a cotton wiper, G00034, and solvent, B00184, or alcohol, B00068.
 - (e) Remove the nut [12], three washers [13], and screw [14] that attach the ground jumper [20].
 - (f) Remove the nut [18], washer (plain) [17], bolt [15], and cotter pin [19] that attach the lower door hinge.
 - (g) Remove the nut [21], washer (plain) [25], bushing (plain) [24], washer (countersunk) [23], and bolt [22] that attach the upper door hinge.
 - (h) Remove the air inlet door [1].

————— **END OF TASK** —————

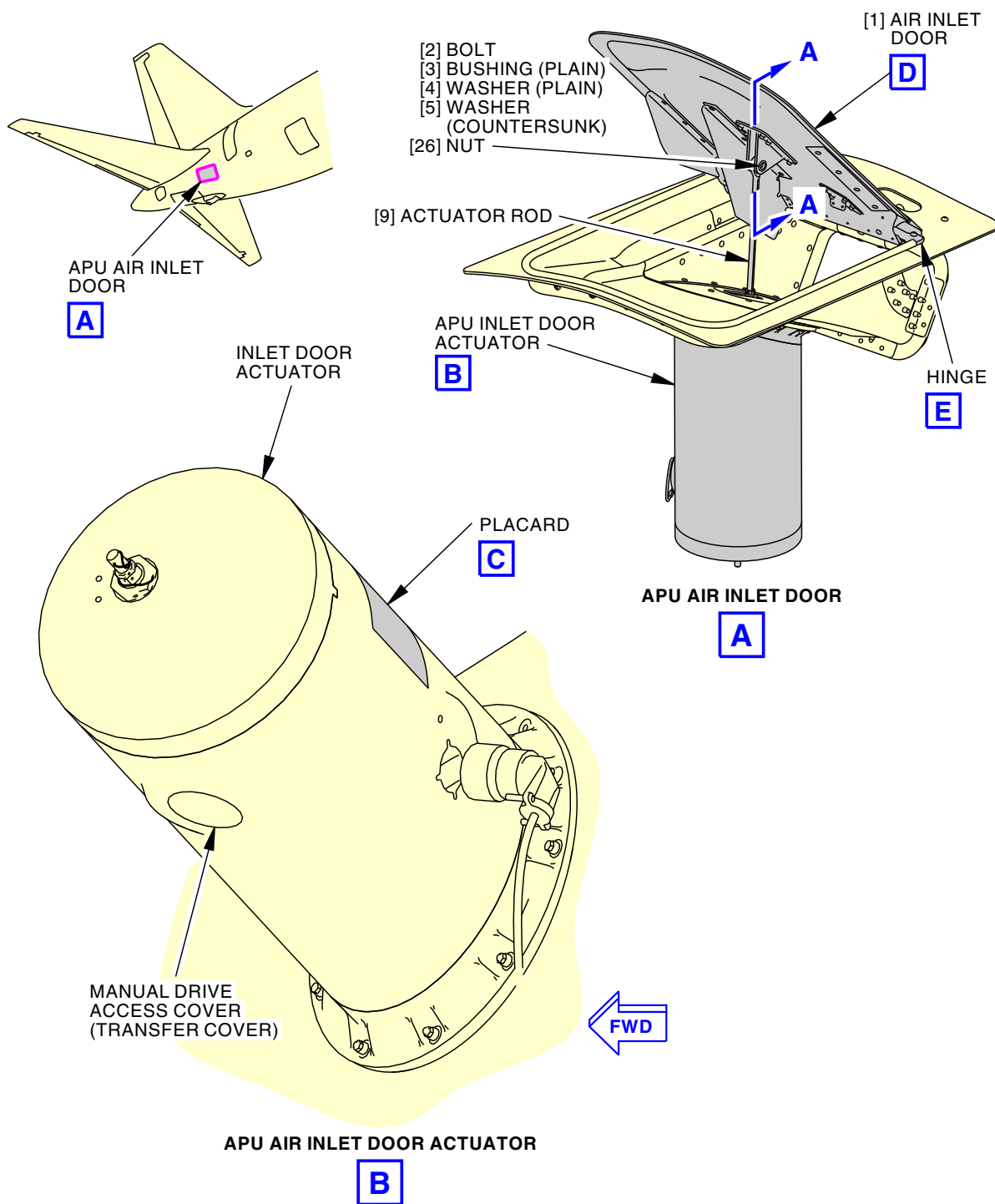
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Air Inlet Door Installation
Figure 401/49-15-22-990-802 (Sheet 1 of 3)

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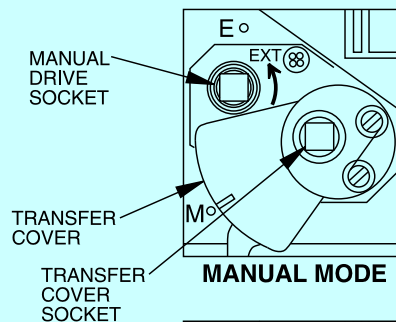
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APU INLET DOOR ACTUATOR MANUAL OPERATION

TO OPEN INLET DOOR (EXTEND ACTUATOR)

1. ROTATE TRANSFER COVER SOCKET COUNTERCLOCKWISE USING A 1/4" SOCKET UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "M" AND THE MANUAL DRIVE SOCKET WILL BE EXPOSED. THE ACTUATOR IS NOW IN MANUAL MODE. DO NOT EXCEED 15 IN-LBS (1.7 N-M) OF TORQUE.
2. WITH HAND TOOL ONLY ROTATE MANUAL DRIVE SOCKET COUNTERCLOCKWISE APPROXIMATELY 60 REVOLUTIONS UNTIL A SHARP TORQUE RISE IS FELT. DO NOT EXCEED 100 IN-LBS (11.3 N-M) OF TORQUE. THE INLET DOOR IS NOW OPEN (ACTUATOR EXTENDED).

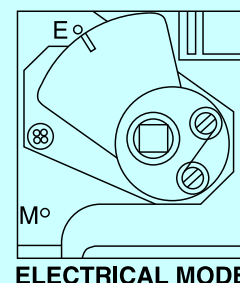


TO CLOSE INLET DOOR (RETRACT ACTUATOR)

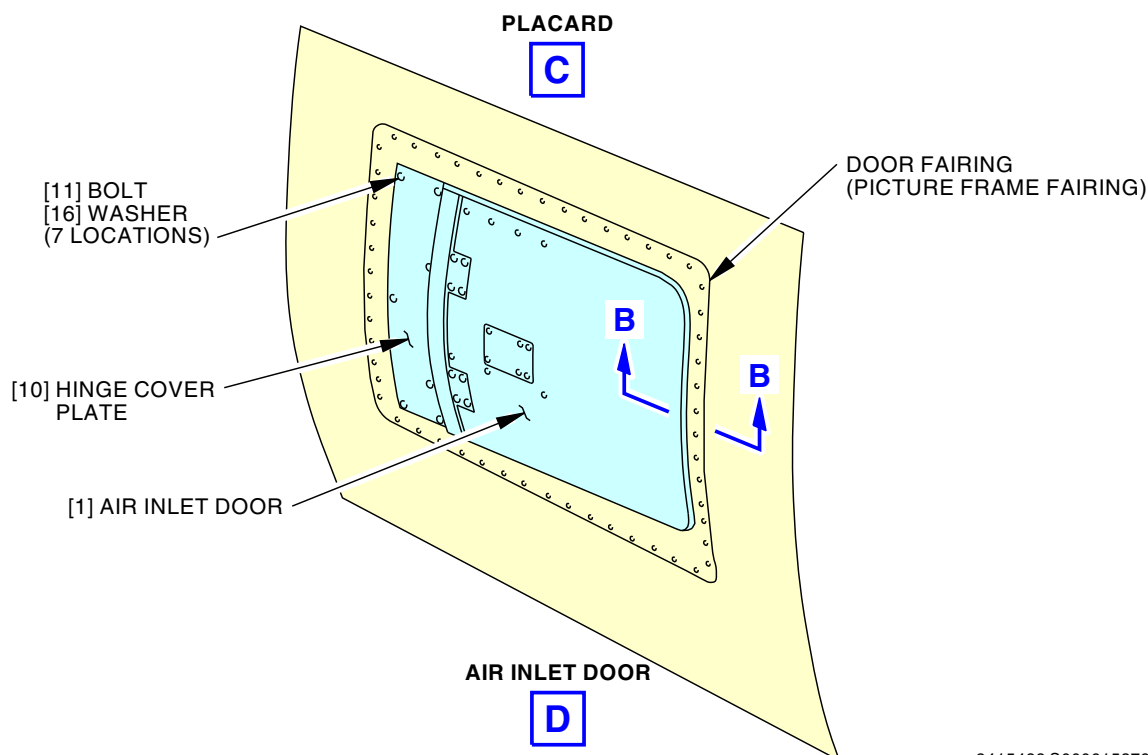
PERFORM ITEMS ABOVE IN REVERSE ORDER. ACTUATOR IS IN ELECTRICAL MODE WHEN THE TRANSFER COVER SOCKET IS ROTATED CLOCKWISE UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "E".

CAUTION

IF NOTED TORQUE LIMITS ARE EXCEEDED, INTERNAL DAMAGE TO ACTUATOR MAY RESULT. IF ACTUATOR IS NOT FULLY ENGAGED IN MANUAL OR ELECTRICAL MODE, ACTUATOR FAILURE MAY RESULT.



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Air Inlet Door Installation
Figure 401/49-15-22-990-802 (Sheet 2 of 3)

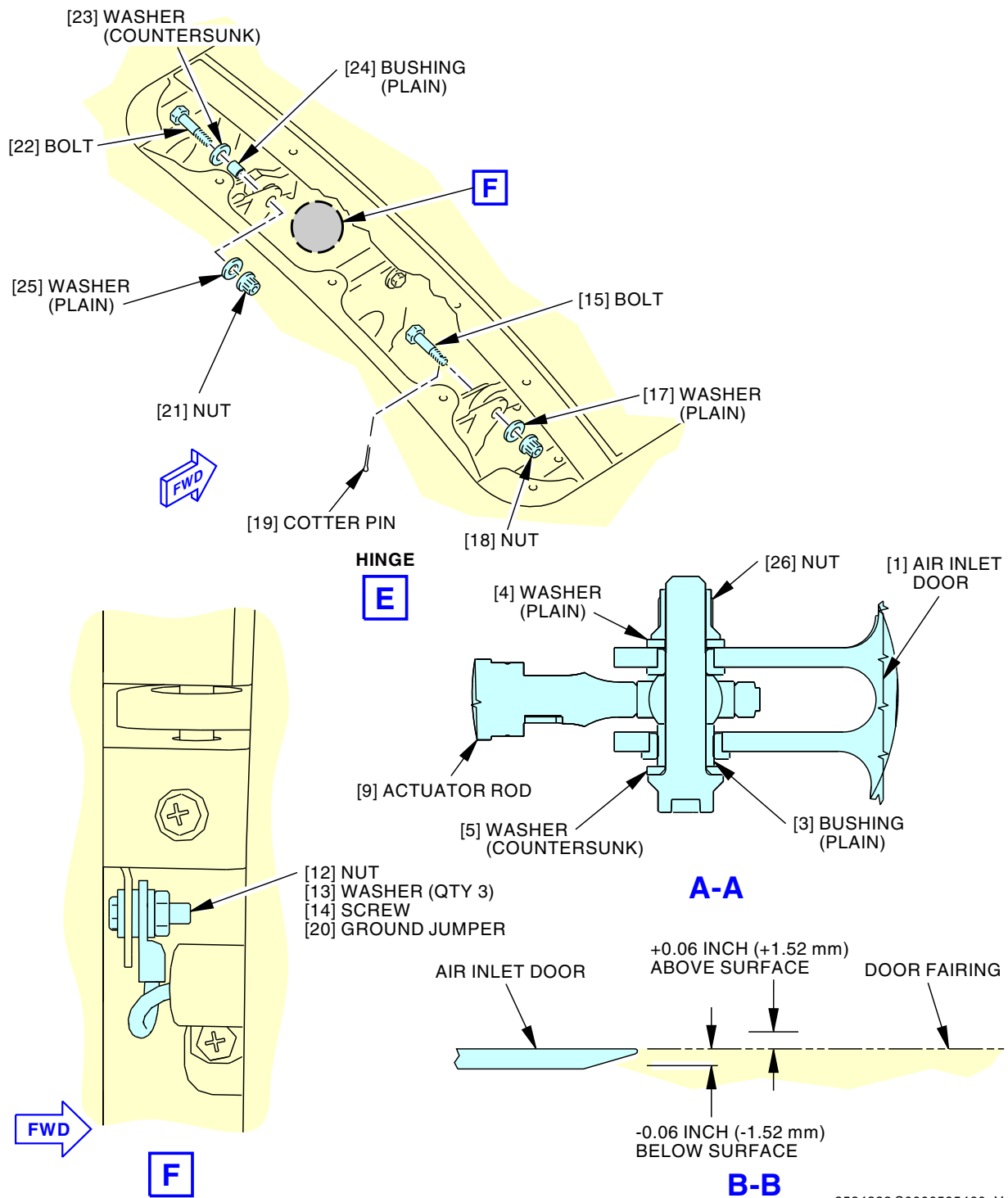
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Air Inlet Door Installation
Figure 401/49-15-22-990-802 (Sheet 3 of 3)

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TASK 49-15-22-400-801

3. Air Inlet Door Installation

(Figure 401)

A. References

Reference	Title
49-15-00-420-801	Manually Close the APU Air Inlet Door (P/B 201)
49-15-00-800-801	APU Air Inlet Door Adjustment (P/B 501)
49-15-00-800-802	APU Air Inlet Door Position Switch Adjustment (P/B 501)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Tools/Equipment

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

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

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A50446	Sealant - Non-Curing, (PRC Desoto CA 1000)	BAC5117-6
B00130	Alcohol - Isopropyl	TT-I-735
D00633	Grease - Aircraft General Purpose	BMS3-33
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50222	Brush - Tampico Fiber, Non-Metallic	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Air inlet door	49-15-22-02-525	SIA ALL
19	Cotter pin	49-15-22-02-472	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

F. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

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G. Prepare for the Installation

SUBTASK 49-15-22-860-009

- (1) Make sure that there is a tag on the APU master switch that states "APU INLET DOOR INOP - DEACTIVATED FULL OPEN".

H. Air Inlet Door Installation

SUBTASK 49-15-22-420-002

- (1) Do the steps that follow to install the air inlet door [1]:
 - (a) Set the air inlet door [1] on the door fairing of the airplane.
 - (b) Apply a thin layer of grease, D00633, to the bolt [22] and bolt [15].
 - (c) Install the bolt [22], washer (countersunk) [23], bushing (plain) [24], washer (plain) [25], and nut [21] to attach the upper door hinge.
 - (d) Install the bolt [15], washer (plain) [17], nut [18], and cotter pin [19] to attach the lower door hinge.
 - (e) Clean the surfaces of the aluminum stud and the ground jumper [20]:
 - 1) Apply alcohol, B00130, to a tampico fiber brush, G50222, or cotton wiper, G00034.
 - 2) Use a small amount of pressure on the tampico fiber brush, G50222, or cotton wiper, G00034, while you clean the surfaces.
 - 3) Continue to clean the surfaces until there are no visible residue on the surfaces.
 - (f) Install the screw [14], three washers [13], and nut [12] to attach the ground jumper [20].
 - 1) Use an intrinsically safe approved bonding meter, COM-1550, to make sure that the bonding resistance between aluminum stud and the ground jumper [20] is 0.0005 ohm (0.5 milliohm) or less (SWPM 20-20-00).
 - (g) Apply sealant, A50446, to fay seal the ground jumper [20] to the aluminum stud.
 - (h) Install the seven bolts [11] and seven washers [16] that attach the hinge cover plate [10].
 - 1) Apply sealant, A00160, to fillet seal the hinge cover plate [10].
 - (i) Apply a thin layer of grease, D00633, to the bushing (plain) [3].
 - (j) Install the bolt [2], washer (plain) [4], washer (countersunk) [5], bushing (plain) [3], and nut [26] that attach the actuator rod [9] to the air inlet door [1].

I. APU Air Inlet Door Adjustment

SUBTASK 49-15-22-860-017

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-22-860-016

- (2) Remove the tag on the APU master switch on the P5 forward overhead panel that states: "APU INLET DOOR INOP - DEACTIVATED FULL OPEN".
- (3) Set the APU master switch to the OFF position.
- (4) If the APU air inlet door does not close, do this task: Manually Close the APU Air Inlet Door, TASK 49-15-00-420-801.

SUBTASK 49-15-22-820-003

- (5) Do this task: APU Air Inlet Door Adjustment, TASK 49-15-00-800-801.

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SUBTASK 49-15-22-820-007

- (6) Do this task: APU Air Inlet Door Position Switch Adjustment, TASK 49-15-00-800-802.

NOTE: The APU Air Inlet Door Test will be done in the task for the position switch adjustment.

SUBTASK 49-15-22-410-002

- (7) Close this access panel:

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

SUBTASK 49-15-22-860-011

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

———— **END OF TASK** ————

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AIR INLET DOOR ACTUATOR - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has these tasks:
- (1) A removal of the air inlet door actuator
 - (2) An installation of the air inlet door actuator.
- B. The APU air inlet door actuator is referred to as the actuator.
- C. The actuator is located aft of the rear pressure bulkhead on the inner side of the APU air inlet door.
- D. The APU inlet door actuator is installed in an enclosure and the actuator assembly is attached to the air inlet port. The actuator assembly is removed in one piece. There are optional steps to remove and install the actuator from the actuator assembly enclosure.

TASK 49-15-31-000-801

2. **Air Inlet Door Actuator Removal**

(Figure 401)

A. References

Reference	Title
49-15-00-020-801	Manually Open the APU Air Inlet Door (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-13571	Screwdriver - Flat Tip

C. Consumable Materials

Reference	Description	Specification
B00068	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002, MIL-E-51454 Type II
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50079	Scraper - Wood or Plastic	
G50222	Brush - Tampico Fiber, Non-Metallic	

D. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

E. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

F. Prepare for the Removal

SUBTASK 49-15-31-860-001

- (1) Make sure that the BAT switch, on the P5 forward overhead panel, is in the ON position.

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SUBTASK 49-15-31-860-002

- (2) Set the APU master switch, on the P5 forward overhead panel, to the ON position.
 - (a) Attach the DO NOT OPERATE tag, STD-858, on the APU master switch.

SUBTASK 49-15-31-860-003

- (3) Wait for a maximum of 30 seconds, and make sure that the APU maintenance page display for APU INLET DOOR POSITION shows OPEN.

NOTE: If the APU inlet door does not open within two minutes and forty-five seconds, a fault will occur.

- (a) If the APU air inlet door does not open, do this task: Manually Open the APU Air Inlet Door, TASK 49-15-00-020-801.

SUBTASK 49-15-31-860-004

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-31-010-001

- (5) Open this access door:

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

G. Air Inlet Door Actuator Removal

SUBTASK 49-15-31-020-004

- (1) Do the steps that follow to remove the inlet door actuator assembly [1] from the air inlet port:
 - (a) Disconnect the connector D922 [6].
 - (b) Remove the bolt [2], bushing [3], washer (plain) [4], washer (countersunk) [5], and nut [21] to disconnect the rod [11] from the air inlet door.
 - (c) Remove the nut [30], washer [29], and bonding jumper [28] from the screw [16].
 - (d) Use scraper, G50079, or tampico fiber brush, G50222, to remove the sealant from the screw [16], nut [17], bonding jumper [28], washer [29], and nut [30].
 - 1) Clean the areas with cotton wiper, G00034, and solvent, B00184, or alcohol, B00068.
 - (e) Remove and discard the hex nuts (self locking) [10] that hold the inlet door actuator assembly [1] to the air inlet port.
 - (f) Remove the inlet door actuator assembly [1]:

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BE CAREFUL WITH THE COMPOSITE MATERIAL WHEN YOU SEPARATE THE INLET-DOOR ACTUATOR-ASSEMBLY FROM THE AIR INLET PORT. IF NOT, YOU CAN CAUSE DAMAGE TO THE COMPOSITE MATERIAL.

- 1) Use a Flat Tip Screwdriver, STD-13571, or equivalent to separate the inlet door actuator assembly [1] from the air inlet port.
 - a) Place the Flat Tip Screwdriver, STD-13571, in the open slot of the inlet door actuator assembly [1] flange at the 7 O'clock position.
 - b) Torque the Flat Tip Screwdriver, STD-13571, until the inlet door actuator assembly [1] disengages from the air inlet port.
- 2) Remove inlet door actuator assembly [1] from the air inlet port.
- (g) Use scraper, G50079, or tampico fiber brush, G50222, to remove the sealant from the inlet door actuator assembly [1] and air inlet port.



DO NOT GET SOLVENTS IN YOUR MOUTH, IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE SOLVENTS. KEEP SOLVENTS AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASH POINT. SOLVENTS ARE A POISONOUS AND FLAMMABLE MATERIAL WHICH CAN CAUSE INJURY PERSONS AND DAMAGE TO EQUIPMENT.

- 1) Clean the area with cotton wiper, G00034, and solvent, B00184, or alcohol, B00068.

SUBTASK 49-15-31-020-005

- (2) If it is necessary, do the steps that follow to remove the actuator [13] from the actuator enclosure [12].
 - (a) Remove the bolts [14] and nut rings [18] that hold the connector D922 receptacle [20] to the actuator enclosure [12].
 - (b) Use scraper, G50079, or tampico fiber brush, G50222, to remove the sealant from the bolts [14] and nut rings [18].
 - 1) Clean the areas with cotton wiper, G00034, and solvent, B00184, or alcohol, B00068.
 - (c) Remove the screw [16], washer [31], washers [15], nut [17], and bonding jumper [19].
 - (d) Use scraper, G50079, or tampico fiber brush, G50222, to remove the sealant from the screw [16], washer [31], washers [15], nut [17], and bonding jumper [19].
 - 1) Clean the areas with cotton wiper, G00034, and solvent, B00184, or alcohol, B00068.
 - (e) Remove the lockwire between the locknut [9] and adjustment nut [8].
 - (f) Remove the locknut [9], washer [23], and locknut [7] to disconnect the fork fitting [22] from the actuator enclosure [12].
 - (g) Remove the actuator [13] from the actuator enclosure [12].
 - (h) Remove the adjustment nut [8] from the fork fitting [22].
 - (i) If it is necessary, remove the bolt [24], washer [25], washer [26], nut [27], and fork fitting [22] from the actuator [13].

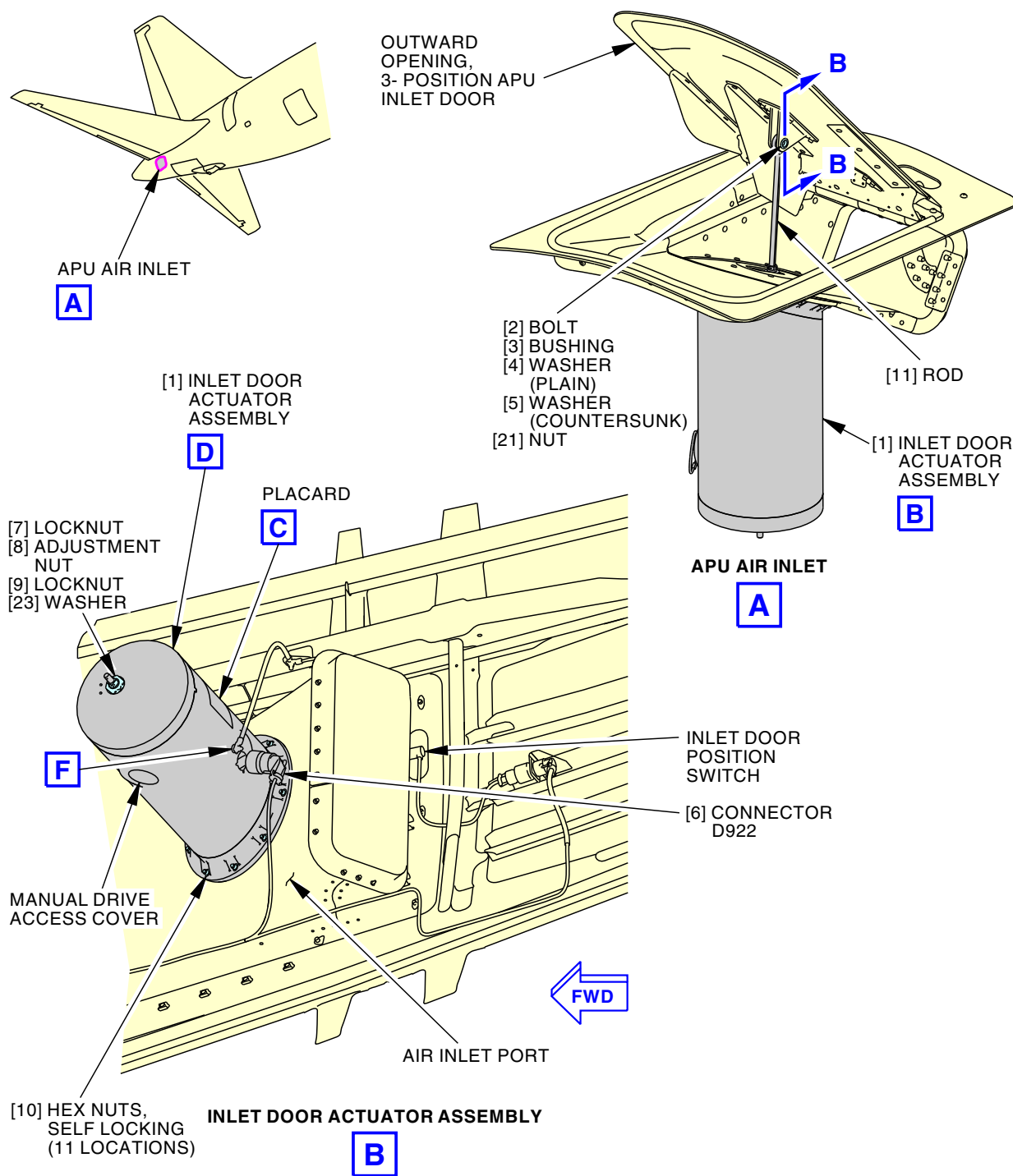
————— **END OF TASK** —————

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2415495 S00061537958_V3

Air Inlet Door Actuator Installation
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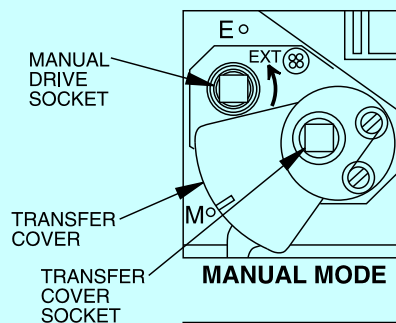
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APU INLET DOOR ACTUATOR MANUAL OPERATION

TO OPEN INLET DOOR (EXTEND ACTUATOR)

1. ROTATE TRANSFER COVER SOCKET COUNTERCLOCKWISE USING A 1/4" SOCKET UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "M" AND THE MANUAL DRIVE SOCKET WILL BE EXPOSED. THE ACTUATOR IS NOW IN MANUAL MODE. DO NOT EXCEED 15 IN-LBS (1.7 N-M) OF TORQUE.
2. WITH HAND TOOL ONLY ROTATE MANUAL DRIVE SOCKET COUNTERCLOCKWISE APPROXIMATELY 60 REVOLUTIONS UNTIL A SHARP TORQUE RISE IS FELT. DO NOT EXCEED 100 IN-LBS (11.3 N-M) OF TORQUE. THE INLET DOOR IS NOW OPEN (ACTUATOR EXTENDED).

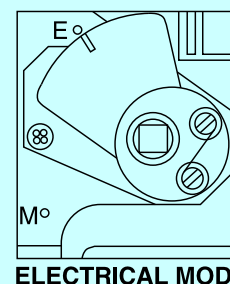


TO CLOSE INLET DOOR (RETRACT ACTUATOR)

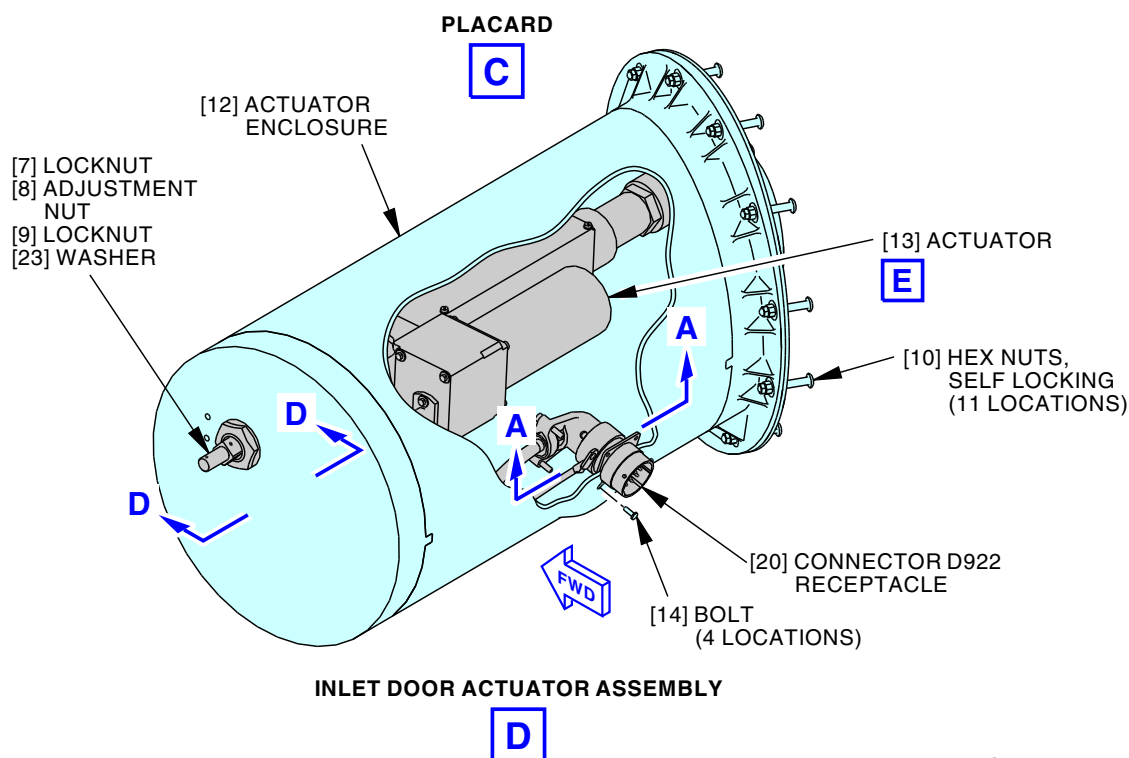
PERFORM ITEMS ABOVE IN REVERSE ORDER. ACTUATOR IS IN ELECTRICAL MODE WHEN THE TRANSFER COVER SOCKET IS ROTATED CLOCKWISE UNTIL A HARD STOP IS FELT. TRANSFER COVER SCRIBE LINE MUST BE ALIGNED WITH THE LETTER "E".

CAUTION

IF NOTED TORQUE LIMITS ARE EXCEEDED, INTERNAL DAMAGE TO ACTUATOR MAY RESULT. IF ACTUATOR IS NOT FULLY ENGAGED IN MANUAL OR ELECTRICAL MODE, ACTUATOR FAILURE MAY RESULT.



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INLET DOOR ACTUATOR ASSEMBLY

2415496 S00061537959_V3

Air Inlet Door Actuator Installation
Figure 401/49-15-31-990-802 (Sheet 2 of 5)

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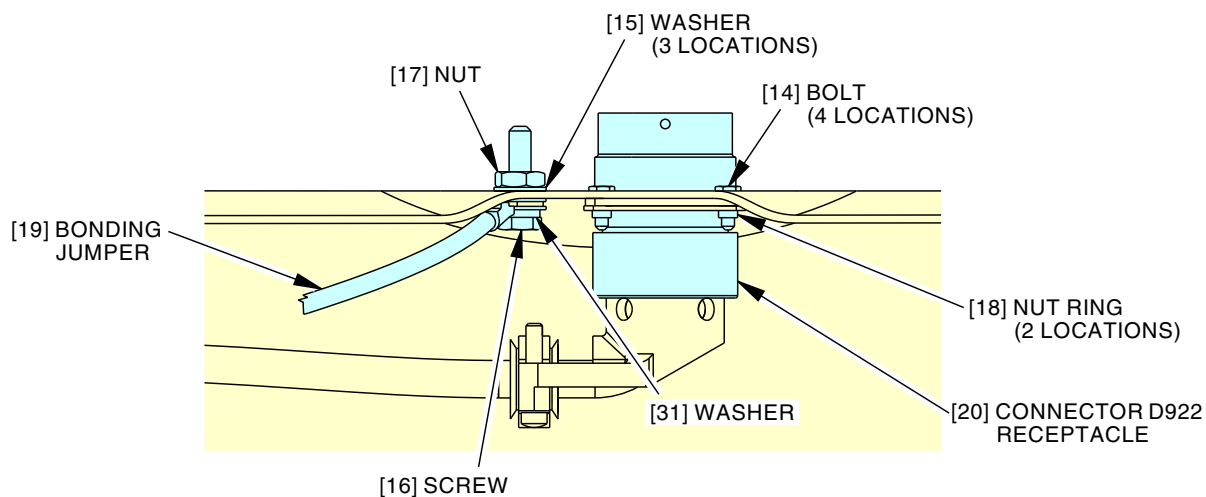
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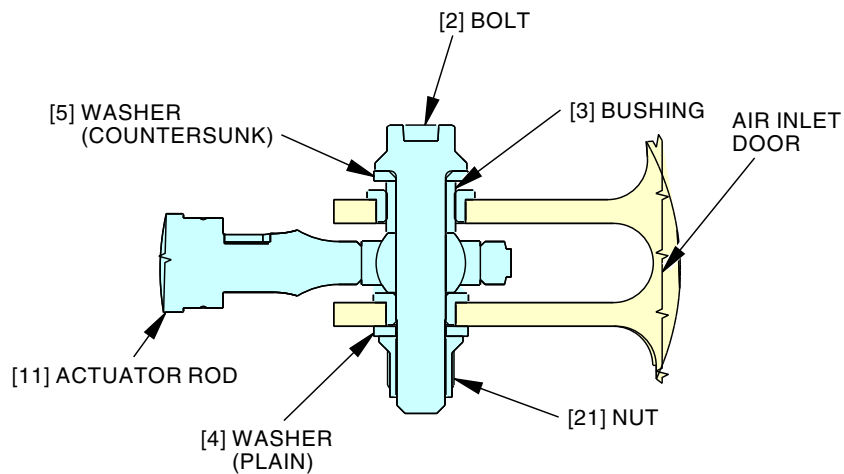
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A-A



B-B

2531008 S0000596612_V3

Air Inlet Door Actuator Installation
Figure 401/49-15-31-990-802 (Sheet 3 of 5)

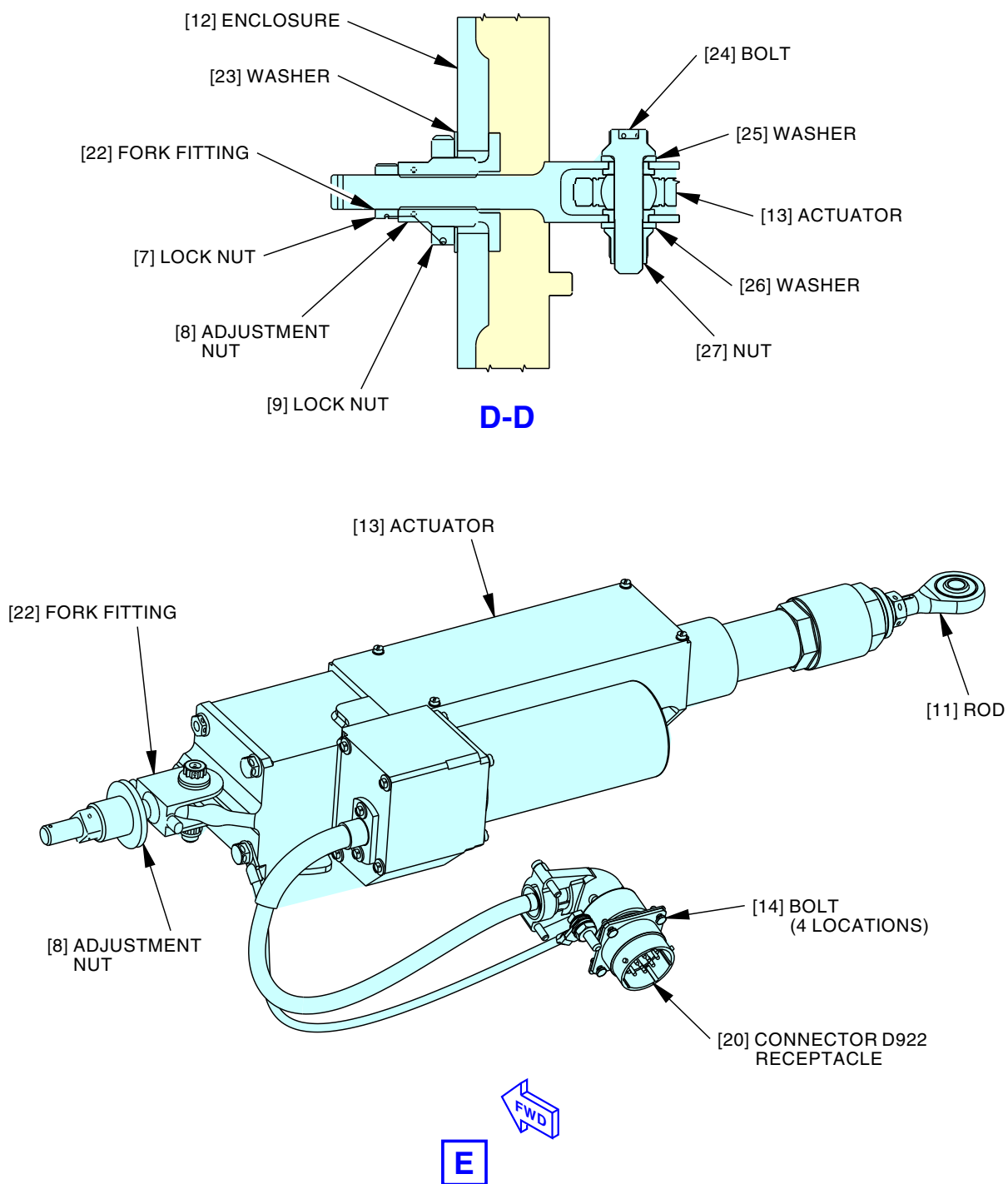
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2533974 S0000600271_V2

Air Inlet Door Actuator Installation
Figure 401/49-15-31-990-802 (Sheet 4 of 5)

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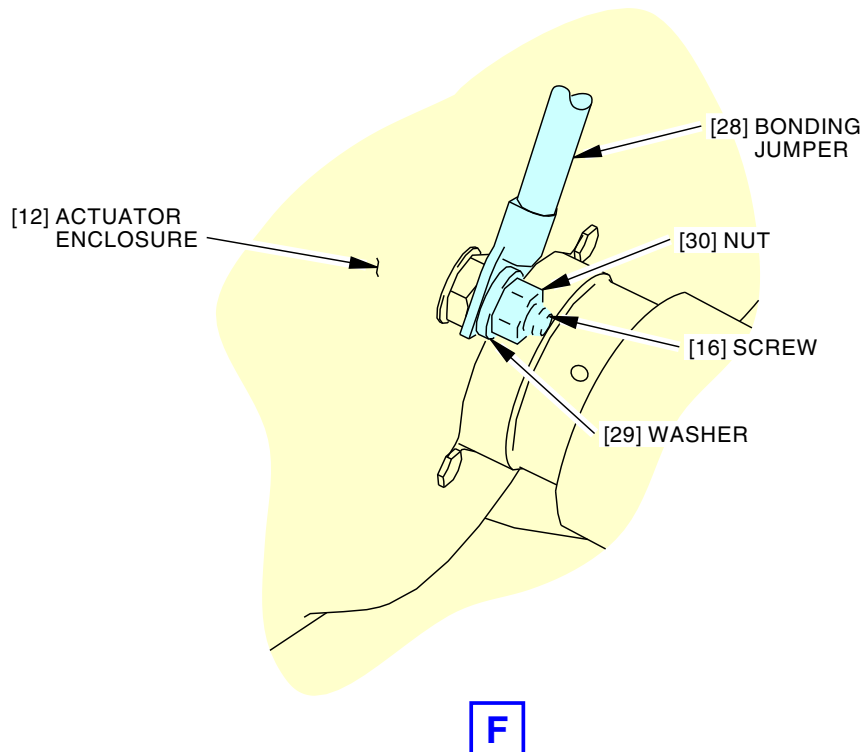
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2791027 S0000635351_V1

Air Inlet Door Actuator Installation
Figure 401/49-15-31-990-802 (Sheet 5 of 5)

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TASK 49-15-31-400-801

3. Air Inlet Door Actuator Installation

(Figure 401)

A. References

Reference	Title
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
49-15-00-020-801	Manually Open the APU Air Inlet Door (P/B 201)
49-15-00-800-801	APU Air Inlet Door Adjustment (P/B 501)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
COM-5922	Multimeter - Digital, Auto Ranging
STD-12636	Wrench - Socket, 1/4 Inch Square Drive

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A50110	Sealant - Fuel Tank	BMS5-45 Class B-2
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
B00130	Alcohol - Isopropyl	TT-I-735
D00633	Grease - Aircraft General Purpose	BMS3-33
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G50222	Brush - Tampico Fiber, Non-Metallic	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Inlet door actuator assembly	49-15-31-01-005	SIA ALL
10	Hex nuts (self locking)	49-15-22-02-102	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left

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(Continued)

Zone	Area
314	Stabilizer Torsion Box Compartment - Right

F. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

G. Air Inlet Door Actuator Installation

SUBTASK 49-15-31-910-001



DO NOT TOUCH THE CONNECTOR PINS, OR OTHER CONDUCTORS. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE COMPONENTS.

- (1) Before the actuator [13] is touched, do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 49-15-31-420-007

- (2) If it is necessary, connect the fork fitting [22] to the actuator [13]:
 - (a) Put the fork fitting [22] on the actuator [13].
 - (b) Install the bolt [24], washer [25], washer [26], and nut [27] that attach the fork fitting [22] to the actuator [13].
 - (c) Install the adjustment nut [8] on the fork fitting [22].

SUBTASK 49-15-31-420-005

- (3) If it is necessary, install the actuator [13] in the actuator enclosure [12]:
 - (a) Put the actuator [13] in the actuator enclosure [12].
 - (b) Install the washer [23], locknut [9], and locknut [7] to connect the actuator [13] to the actuator enclosure [12].
 - 1) Do not install the lockwire at this time.

NOTE: The lockwire will be installed after the air inlet door adjustment.



IF THE ADJUSTMENT NUT IS NOT IN THE CORRECT POSITION, DAMAGE TO THE INLET DUCT CAN OCCUR DURING THE ADJUSTMENT PROCEDURE.

- 2) Make sure that approximately 0.25 in. (0.64 cm) of the fork fitting [22] extends through the locknut [7].

NOTE: This is a starting point to make sure that there is enough clearance to close the APU door without causing damage. The actuator will be adjusted at a later time.

- (c) Install the bonding jumper [19] to the actuator enclosure [12] as follows:
 - 1) Apply alcohol, B00130, to tampico fiber brush, G50222, or cotton wiper, G00034.
 - 2) Use a small quantity of pressure on tampico fiber brush, G50222, or cotton wiper, G00034, to clean the mating surfaces of the screw [16], washers [15], and bonding jumper [19].
 - 3) Apply sealant, A50231, sealant, A50110, or equivalent to fay seal the screw [16] and bonding jumper [19].

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- 4) Install the screw [16], washer [31], washers [15], bonding jumper [19], and nut [17].
 - a) Tighten the nut [17] to 35 in-lb (4 N·m) - 40 in-lb (5 N·m).
 - 5) Measure the electrical bonding resistance between the actuator enclosure [12] and bonding jumper [19] (SWPM 20-20-00).
 - a) Use an intrinsically safe approved bonding meter, COM-1550.
 - b) Make sure that the resistance is 0.001 ohm (1.0 milliohm) or less.
- (d) Install the connector D922 receptacle [20] to the actuator enclosure [12] as follows:
- 1) Apply alcohol, B00130, to tampico fiber brush, G50222, or cotton wiper, G00034.
 - 2) Use a small quantity of pressure on tampico fiber brush, G50222, or cotton wiper, G00034, to clean the mating surfaces of the bolts [14], nut rings [18], and connector D922 receptacle [20].
 - 3) Install the bolts [14] and nut rings [18].
 - 4) Measure the electrical bonding resistance between the connector D922 receptacle [20] and actuator enclosure [12] (SWPM 20-20-00).
 - a) Use an intrinsically safe approved bonding meter, COM-1550.
 - b) Make sure that the resistance is 0.0015 ohm (1.5 milliohm) or less.
 - 5) Apply a fillet seal with sealant, A50231, sealant, A50110, or equivalent to the bolts [14], nut rings [18], and connector D922 receptacle [20].

NOTE: Full encapsulate seal is an approved optional method.

SUBTASK 49-15-31-410-002

- (4) Make sure that the actuator rod is fully extended, do this task: Manually Open the APU Air Inlet Door, TASK 49-15-00-020-801.

SUBTASK 49-15-31-420-003

- (5) Do these steps to install the inlet door actuator assembly [1]:
 - (a) Apply a fay surface seal with sealant, A00160, to the inlet door actuator assembly [1].
 - (b) Put the inlet door actuator assembly [1] on the air inlet port.
 - (c) Install the new hex nuts (self locking) [10] that hold the inlet door actuator assembly [1] to the air inlet port.
 - (d) Apply alcohol, B00130, to tampico fiber brush, G50222, or cotton wiper, G00034.
 - (e) Use a small quantity of pressure on tampico fiber brush, G50222, or cotton wiper, G00034, to clean the mating surfaces of the nut [17] and bonding jumper [28].
 - (f) Apply sealant, A50231, sealant, A50110, or equivalent to fay seal the nut [17] and bonding jumper [28].
 - (g) Install the bonding jumper [28], washer [29], and nut [30] to the screw [16].
 - 1) Tighten the nut [30] to 35 in-lb (4 N·m) - 40 in-lb (5 N·m).
 - (h) Measure the electrical bonding resistance between the actuator enclosure [12] and bonding jumper [28] (SWPM 20-20-00).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.
 - 2) Make sure that the resistance is 0.001 ohm (1.0 milliohm) or less.
 - (i) Measure the electrical bonding resistance between the actuator enclosure [12] and bonding jumper at the aircraft structure (SWPM 20-20-00).
 - 1) Use an intrinsically safe approved bonding meter, COM-1550.

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- 2) Make sure that the resistance is 0.001 ohm (1.0 milliohm) or less.
- (j) Apply a light coat of grease, D00633, to the bolt [2] and rod [11].
- (k) Connect the bolt [2], bushing [3], washer (plain) [4], washer (countersunk) [5], and nut [21] that hold the rod [11] to the air inlet door.
- (l) Connect a digital multimeter, COM-5922, to pin 4 and pin 5 of connector D922 receptacle [20].
- (m) Insert the socket wrench, STD-12636, in the manual drive socket.
 - 1) Turn the socket wrench, STD-12636, in the clockwise direction until there is continuity between pin 4 and pin 5.
- (n) Make sure that the fair between the APU air inlet door and inlet door fairing is greater than 0.06 in. (1.52 mm) and the door seal is not compressed.
 - 1) If the fair is less than 0.06 in. (1.52 mm) or the door seal is more than slightly compressed, adjust the adjustment nut [8].
- (o) Remove the digital multimeter, COM-5922, from pin 4 and pin 5 of connector D922 receptacle [20].
- (p) Connect a digital multimeter, COM-5922, to pin 7 and pin 8 of connector D922 receptacle [20].
- (q) Turn the socket wrench, STD-12636, in the counter-clockwise direction.
 - 1) Make sure that there is continuity between pin 7 and pin 8.
- (r) Remove the digital multimeter, COM-5922, from pin 7 and pin 8 of connector D922 receptacle [20].
- (s) Connect the connector D922 [6].



CAUTION

MAKE SURE THAT THE TRANSFER-COVER IS IN THE ELECTRICAL MODE DETENT POSITION. IF NOT, DAMAGE TO THE ACTUATOR CAN OCCUR.



CAUTION

DO NOT APPLY MORE THAN 15 INCH-POUNDS (2 NEWTON-METERS) OF TORQUE ON THE TRANSFER-COVER SOCKET. DAMAGE CAN OCCUR IF YOU APPLY TOO MUCH TORQUE ON THE TRANSFER COVER SOCKET.

- (t) Make sure that the transfer cover mark aligns with the letter "E".
 - 1) If it is necessary, turn the transfer cover socket in the clockwise direction until a hard stop is felt.
 - 2) Install the manual drive access cover (transfer cover) on the APU inlet door actuator.

SUBTASK 49-15-31-860-005

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

F/O Electrical System Panel, P6-2

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

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F/O Electrical System Panel, P6-4

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

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C04011	APU INLET DOOR

SUBTASK 49-15-31-860-012

(7) Do this task: APU Air Inlet Door Adjustment, TASK 49-15-00-800-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-31-860-014

(1) Make sure that this access panel is closed:

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

———— **END OF TASK** ————

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AIR INLET DOOR POSITION SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the air inlet door position switch
 - (2) Installation of the air inlet door position switch.

TASK 49-15-41-000-801

2. Air Inlet Door Position Switch Removal

(Figure 401)

A. **References**

Reference	Title
49-15-15-000-801	Air Inlet Diffuser Ducts Removal (P/B 401)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

D. **Access Panels**

Number	Name/Location
311BL	Stabilizer Trim Access Door

E. **Prepare for the Removal**

SUBTASK 49-15-41-860-001

- (1) Make sure that the BAT switch on the P5 forward overhead panel is ON.

SUBTASK 49-15-41-860-002

- (2) Set the APU master switch on the P5 forward overhead panel to the ON position and attach a DO NOT OPERATE tag, STD-858.
 - (a) Wait up to 30 seconds, and make sure that the APU maintenance page display for APU INLET DOOR POSITION shows OPEN.

NOTE: If the APU inlet door does not open within two minutes and forty-five seconds, a fault will occur.

SUBTASK 49-15-41-860-003

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-15-41-410-006

- (4) Open this access panel:

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

SUBTASK 49-15-41-020-005

- (5) Do this task: Air Inlet Diffuser Ducts Removal, TASK 49-15-15-000-801.

- (a) You must remove the mid (double flanged) diffuser duct segment first, then the forward diffuser duct segment (next to the air inlet door).

NOTE: It is not necessary to remove the air inlet plenum duct. The inlet door position switch [1] is behind the forward diffuser duct segment. The mid diffuser duct must be removed first, in order to remove the forward diffuser duct.

F. Air Inlet Door Position Switch Removal

SUBTASK 49-15-41-020-001

- (1) Do the steps that follow to remove the inlet door position switch [1]:
- (a) Disconnect the connector D16494 [6].
 - (b) Remove the screw [7], washer [8] and clamp [9] that secure the inlet door position switch [1] wire to the frame.
 - 1) Move the inlet door position switch [1] wire through the hole cut-out in the frame.
 - (c) Remove the lock wire [5].
 - (d) Loosen the jam nut [3].
 - (e) Remove the inlet door position switch [1] from the boss [4].

————— **END OF TASK** —————

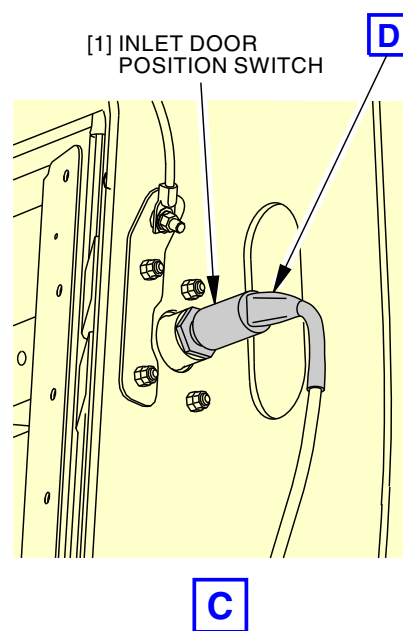
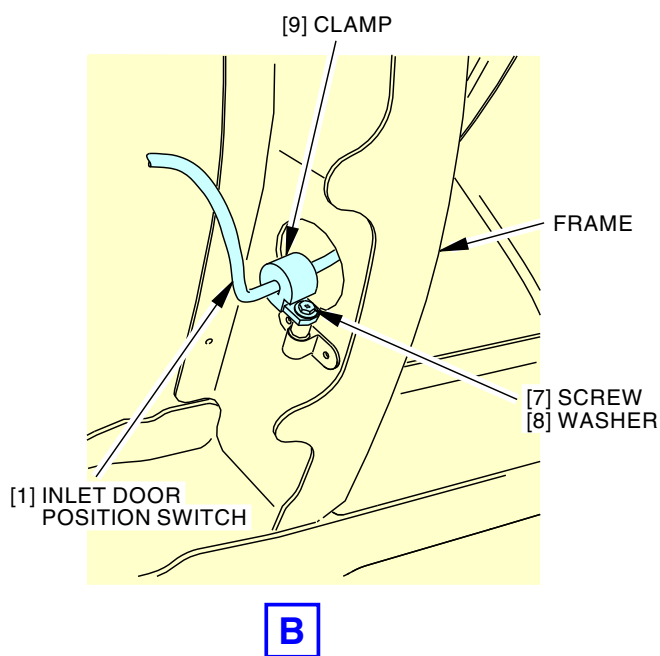
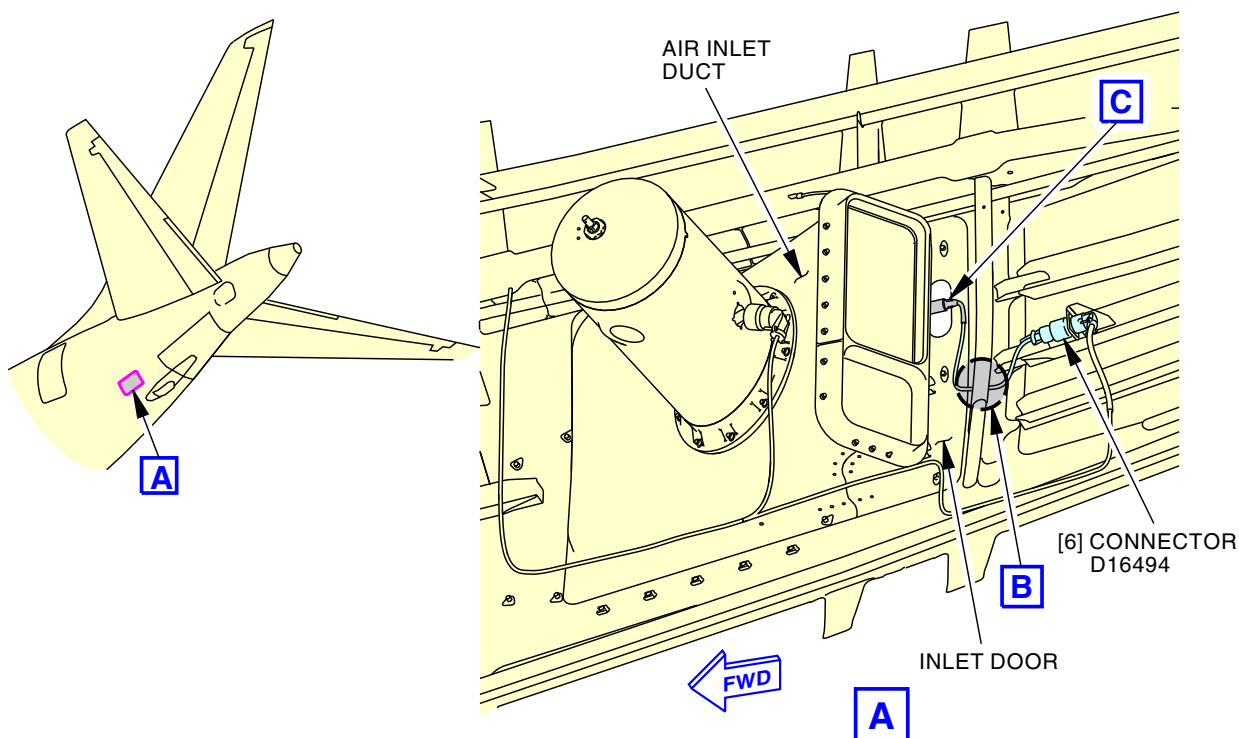
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Air Inlet Door Position Switch
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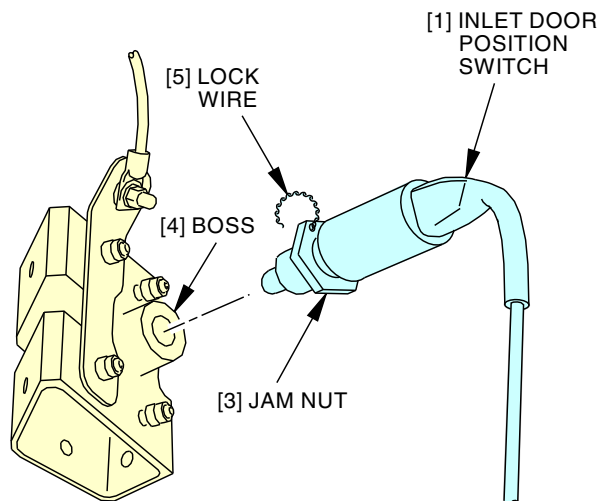
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Air Inlet Door Position Switch
Figure 401/49-15-41-990-801 (Sheet 2 of 2)

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TASK 49-15-41-400-801

3. Air Inlet Door Position Switch Installation

(Figure 401)

A. General

- (1) After the inlet door position switch is installed, you must adjust it to make sure that it functions correctly.
 - (a) The APU air inlet door actuator must be correctly adjusted before you install and adjust the inlet door position switch.

B. References

Reference	Title
49-15-00-800-801	APU Air Inlet Door Adjustment (P/B 501)
49-15-00-800-802	APU Air Inlet Door Position Switch Adjustment (P/B 501)
49-15-15-400-801	Air Inlet Diffuser Ducts Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Inlet door position switch	49-15-41-01-005	SIA ALL

F. Location Zones

Zone	Area
211	Flight Compartment - Left
314	Stabilizer Torsion Box Compartment - Right

G. Access Panels

Number	Name/Location
311BL	Stabilizer Trim Access Door

H. Prepare for the Installation

SUBTASK 49-15-41-860-004

- (1) Make sure that the BAT switch on the P5 forward overhead panel is ON.

SUBTASK 49-15-41-860-005

- (2) Make sure that the APU Master switch on the P5 panel is set to the ON position and has a DO NOT OPERATE tag, STD-858.

SUBTASK 49-15-41-860-007

- (3) Make sure that the actuator for the air inlet door is in the 'door ground open' position (full open).
 - (a) If it is necessary, do this task: APU Air Inlet Door Adjustment, TASK 49-15-00-800-801, to make sure that the air inlet door and actuator are adjusted correctly.

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SUBTASK 49-15-41-040-001

- (4) Examine the new inlet door position switch [1] to make sure that the internal tooth lock washer is installed between the jam nut [3] and the hinge fitting boss [4].
 - (a) Discard the keying washer (if it is still installed).

I. Air Inlet Door Position Switch Installation

SUBTASK 49-15-41-420-001

- (1) Install the inlet door position switch [1] into the boss [4].

SUBTASK 49-15-41-420-011

- (2) Install the lock wire [5] onto the jam nut [3] and the internal tooth lock washer.
 - (a) Install the MS20995NC32 lockwire, G50347, with the double-twist method.

SUBTASK 49-15-41-860-008

- (3) Do this task: APU Air Inlet Door Position Switch Adjustment, TASK 49-15-00-800-802.

SUBTASK 49-15-41-420-007

- (4) Place the inlet door position switch [1] wire through the cut-out hole in the frame.
 - (a) Connect the connector D16494 [6].

SUBTASK 49-15-41-420-008

- (5) Install the screw [7], washer [8] and clamp [9] that attach the inlet door position switch [1] wire to the frame.

SUBTASK 49-15-41-420-010

- (6) Do this task: Air Inlet Diffuser Ducts Installation, TASK 49-15-15-400-801.
 - (a) Install the forward diffuser duct segment (next to the air inlet door) first, then the mid (double flanged) diffuser duct segment.

J. Air Inlet Door Position Switch Installation Test

SUBTASK 49-15-41-860-009

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-15-41-860-010

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

SUBTASK 49-15-41-860-011

- (3) Set the APU master switch to the OFF position.

SUBTASK 49-15-41-860-012

- (4) Make sure that the air inlet door closes in approximately 60 seconds.

NOTE: If the APU inlet door does not close within two minutes and forty-five seconds, a fault will occur.

SUBTASK 49-15-41-760-001

- (5) Make sure the that inlet door position switch [1] is closed as follows:

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- (a) Get access to the MDS (Max Display System) APU maintenance page, make sure that the 'APU INLET DOOR POSITION' shows NOT OPEN.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 49-15-41-860-013

- (1) Set the BAT switch to the OFF position.

SUBTASK 49-15-41-410-008

- (2) Close this access panel:

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

————— **END OF TASK** —————

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DRAIN MAST - SERVICING

1. General

- A. This procedure has the task to do the servicing (to isolate fuel leakage) for the drain tubes that lead to the forward drain of the drain seal, which mates to the drain mast on the APU cowl door.
- (1) Use the task: APU Drain Cleaning, TASK 49-16-11-100-801, to clean all the drain tubes that lead to the forward, middle and aft drains of the drain mast/drain seal.
- B. There are two drain tee's that are used to isolate fuel leakage from the drain tubes for the fuel control unit (FCU), surge control valve (SCV), and inlet guide vane actuator (IGV).

TASK 49-16-11-680-801

2. Drain Mast Servicing

(Figure 301)

A. General

- (1) There are two drain tee's that help isolate the fuel leakage to the drain tube assembly, which leads to the forward drain of the drain mast [1].
- (a) Drain tee [2] is connected to the drain tubes for the inlet guide vane actuator (IGV) and the drain tube for the fuel control unit (FCU). Drain tee [3] is connected to the surge control valve (SCV) drain tube and also connects to tee [2].

B. References

Reference	Title
49-16-11-200-801	Drain Mast Inspection (P/B 601)
49-31-11-000-801	Fuel Control Unit Removal (P/B 401)
49-31-11-400-801	Fuel Control Unit Installation (P/B 401)
49-52-12-000-801	Inlet Guide Vane (IGV) Actuator Removal (P/B 401)
49-52-12-400-801	Inlet Guide Vane (IGV) Actuator Installation (P/B 401)
49-52-41-000-801	Surge Control Valve Removal (P/B 401)
49-52-41-400-801	Surge Control Valve Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
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
315A	APU Cowl Door

F. Prepare for the Drain Mast Servicing

SUBTASK 49-16-11-860-005

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

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SUBTASK 49-16-11-860-006

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-16-11-010-001

- (3) To open the access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

G. Drain Mast Servicing

SUBTASK 49-16-11-360-001



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Do the servicing of the drain mast [1] on the APU cowl door:

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during APU operation from the forward drain on the APU drain seal.

- (a) Do these steps to isolate the fuel leakage:

- 1) Put a 1 gallon (4 l) fuel resistant container, STD-4049, below the drain tee [3].
- 2) Loosen the B-nut for the drain tee [3].
- 3) If you did not find fuel in the drain tee [3], there is no leakage to the drain tube assembly that leads to the drain mast forward drain.
 - a) Tighten the B-nut for the drain tee [3].

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- 4) If you find fuel leakage from drain tee [3], isolate the leakage as follows (it can be from the surge control valve (SCV) drain tube or from drain tee [2] (IGV and FCU drain tubes):
 - a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the area you will work.
 - b) Loosen the SCV drain tube connection to the SCV.
 - <1> If the leak is from the surge control valve, do these tasks:
 - Surge Control Valve Removal, TASK 49-52-41-000-801,
 - Surge Control Valve Installation, TASK 49-52-41-400-801.
 - c) If the leak is not from the SCV, do the steps that follow to isolate the leakage from drain tee [2].
 - d) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the area you will work.
 - e) Loosen the B-nut for drain tee [2].
 - f) Loosen the FCU drain tube connection to the FCU.
 - <1> If the leak is from the fuel control unit, do these tasks:
 - Fuel Control Unit Removal, TASK 49-31-11-000-801.
 - Fuel Control Unit Installation, TASK 49-31-11-400-801.
 - g) Loosen the IGV drain tube connection to the IGV.
 - <1> If the leak is from the IGV, do these tasks:
 - Inlet Guide Vane (IGV) Actuator Removal, TASK 49-52-12-000-801,
 - Inlet Guide Vane (IGV) Actuator Installation, TASK 49-52-12-400-801.
- (2) Connect all the drain tube connections that were loosened.
- (3) Tighten the B-nuts for drain tee [2] and drain tee [3].
- (4) If a leak remains, do this task: Drain Mast Inspection, TASK 49-16-11-200-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-11-860-007

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-16-11-860-008

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

SUBTASK 49-16-11-410-001

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

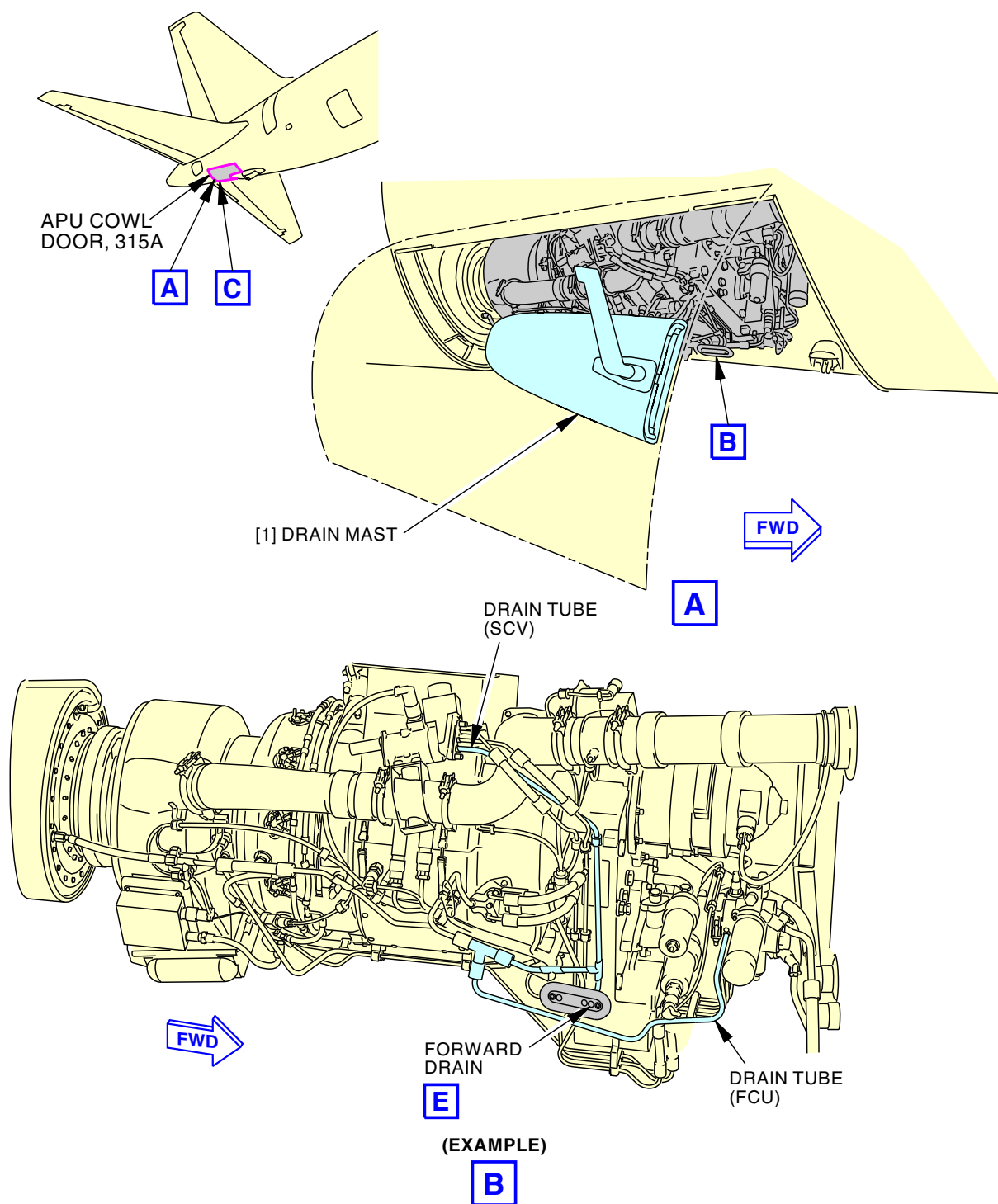
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Drain Mast Servicing
Figure 301/49-16-11-990-801 (Sheet 1 of 3)

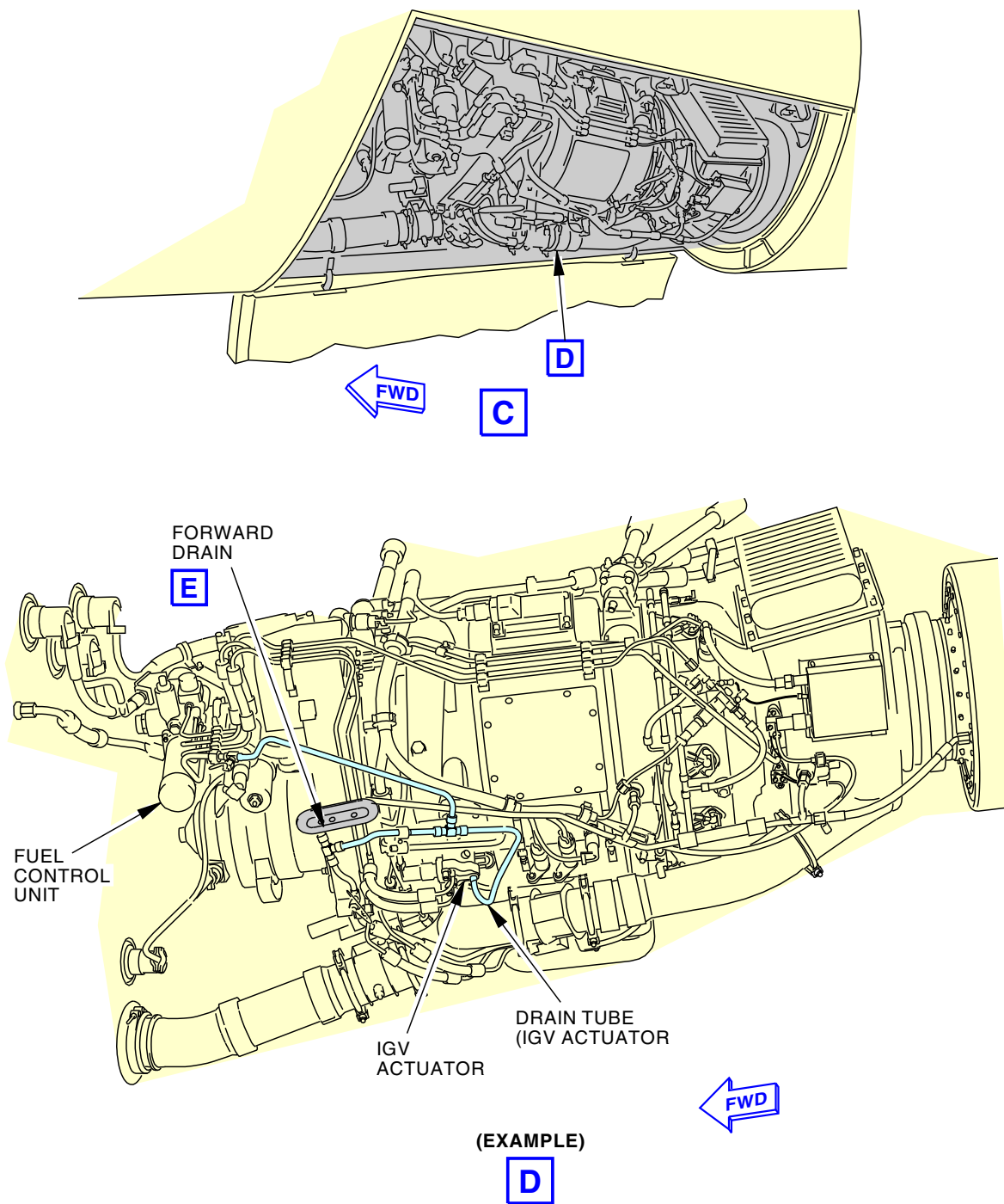
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Drain Mast Servicing
Figure 301/49-16-11-990-801 (Sheet 2 of 3)

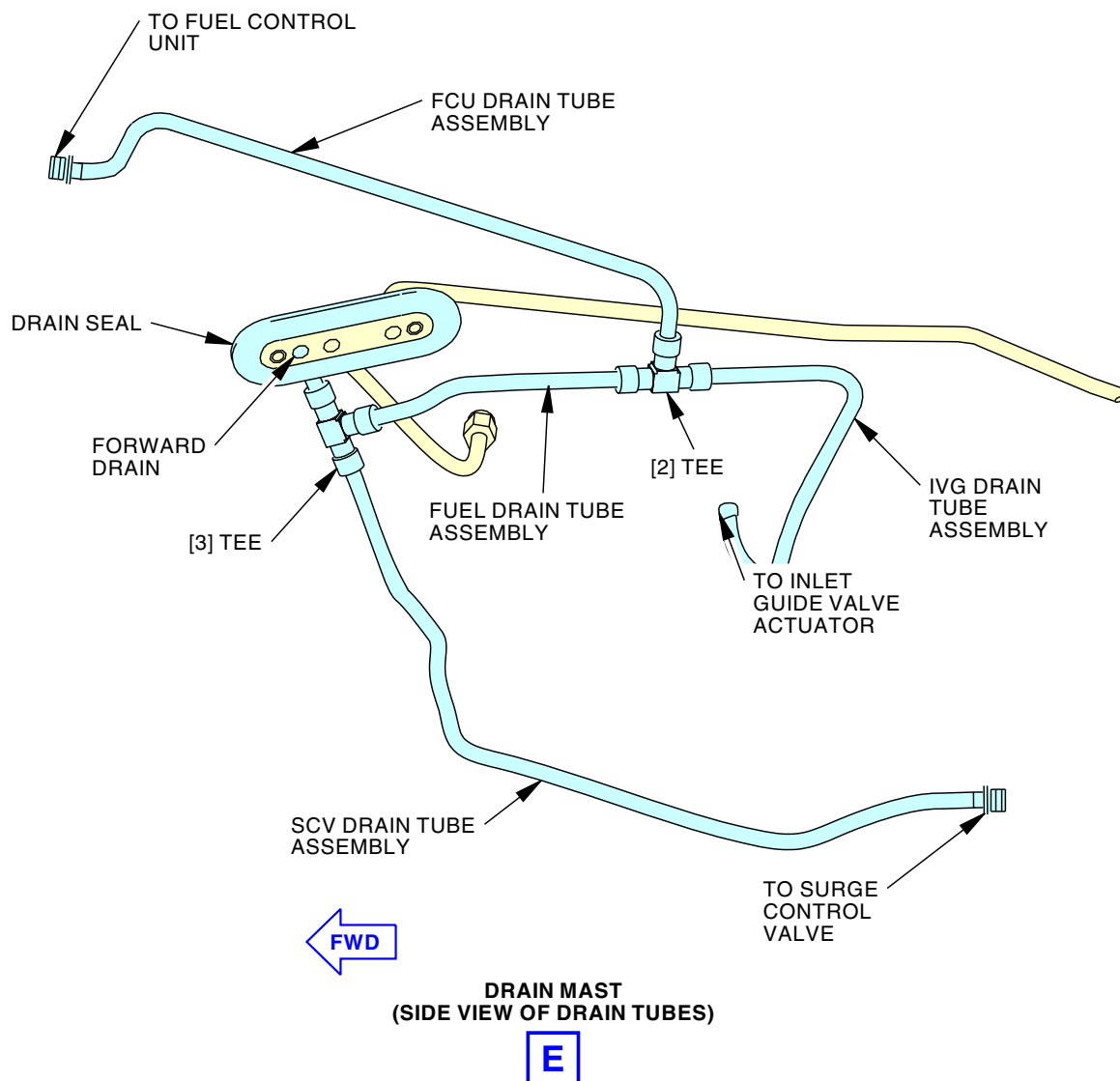
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Drain Mast Servicing
Figure 301/49-16-11-990-801 (Sheet 3 of 3)

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DRAIN MAST - INSPECTION/CHECK

1. General

A. This procedure has the task to do an inspection of the drain mast on the APU cowl door.

TASK 49-16-11-200-801

2. Drain Mast Inspection

(Figure 601)

A. **General**

- (1) Fuel leakage from the Fuel Control Unit (FCU), Inlet Guide Vane (IGV) actuator and the Surge Control Valve (SCV) will drain from the forward drain.
- (2) Oil leakage from the load compressor seal will drain from the middle drain.
- (3) Fuel, oil or water leakage from the exhaust duct muffler, eductor housing and the combustor will drain from the aft drain.

B. **References**

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-11-00-990-801	Figure: Oil Consumption Limit (P/B 201)
49-16-11-100-801	APU Drain Cleaning (P/B 701)
49-16-11-680-801	Drain Mast Servicing (P/B 301)

C. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

F. **Prepare for the Inspection**

SUBTASK 49-16-11-860-009

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

SUBTASK 49-16-11-860-010

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-16-11-860-011

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- Support the APU panel (cowl door) under the center latch.
- Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- Open the APU Cowl Door, 315A.
- Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- Remove the retainer pin from the spring clip on the aft hold-open rod.
- Disconnect the two hold-open rods from the two spring clips.
- Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- Install the two retainer pins in the two rod ends.

G. Drain Mast Inspection

SUBTASK 49-16-11-211-001

- (1) Do these steps to examine the APU drains:
- Examine the drain tubes, APU drain seal [2] and drain mast [1] for cracks, worn areas and corrosion.
 - Examine the drain tube fittings for damaged threads and cracks.
 - If you find damage, replace the applicable part.

SUBTASK 49-16-11-210-001

- (2) Do these steps to examine the drain mast [1] on the APU cowl door:
- Visually examine the drain mast [1] for fuel, oil and other fluid leakage.
NOTE: Fuel, oil and other fluids from the APU and the APU compartment will come out of the drain mast hole.
 - If there is no fuel, oil or other fluid leakage, the APU is satisfactory.
 - If there is fuel, oil or other fluid leakage, then do the steps that follow:

SUBTASK 49-16-11-210-002

- (3) Do these steps that follow to find the leak:
- Do these steps:
 - Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - Operate the APU for a minimum of five minutes.
 - During the APU operation, examine the forward drain [5], middle drain [4] and aft drain [3] for fuel, oil or other fluid leakage.
 - A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during APU operation from the forward drain [5].

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- b) No oil leakage permitted from the middle drain [4] and aft drain [3].
 - <1> If you find oil leakage, clean the drain (TASK 49-16-11-100-801) and operate the APU (TASK 49-11-00-860-801) for a minimum of 5 minutes.
 - <2> If the oil leakage continues, you must repair the oil leakage and make sure that the APU oil consumption limit is satisfactory during flight (Figure 49-11-00-990-801).
- 4) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- 5) If the fuel leakage is more than the fuel leakage rate, do this task: Drain Mast Servicing, TASK 49-16-11-680-801.
- 6) If the fuel leakage is less than the fuel leakage rate, the APU is satisfactory.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-11-410-002

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

SUBTASK 49-16-11-860-012

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-16-11-860-013

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

————— **END OF TASK** —————

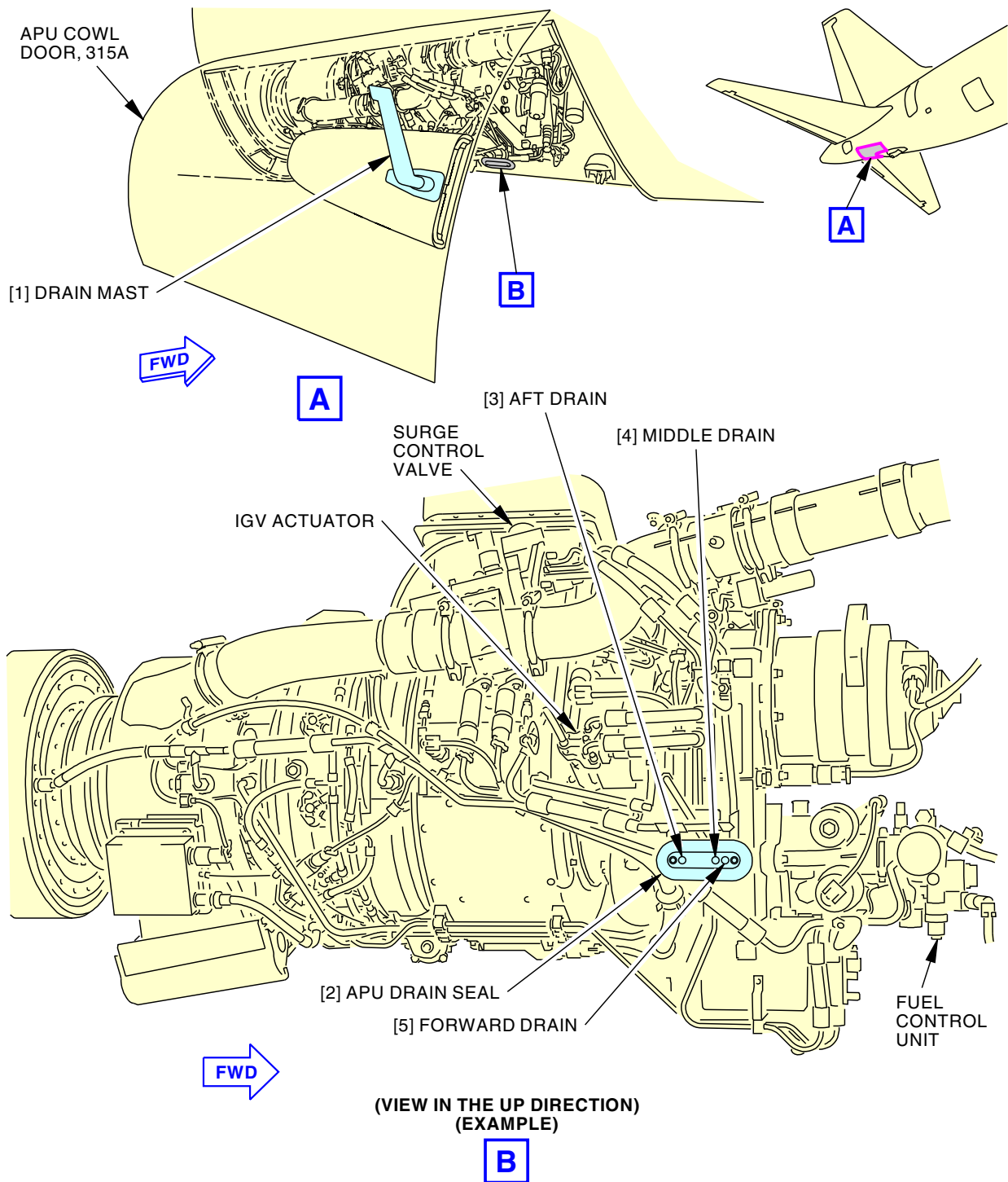
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Drain Mast Inspection
Figure 601/49-16-11-990-802

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APU DRAIN - CLEANING/PAINTING

1. General

- A. This procedure gives the task to clean the APU drains.
- B. The drain tubes and APU drain seal are installed on the bottom of the APU. The drain mast is installed on the APU cowl door.

TASK 49-16-11-100-801

2. APU Drain Cleaning

(Figure 701)

A. **References**

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-16-12-000-801	Combustor Drain Removal (P/B 401)
49-16-12-400-801	Combustor Drain Installation (P/B 401)
49-17-11-000-801	Insulation Panel Removal (P/B 401)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1249	Bit - Drill, Size 54 (0.0550 Inch Diameter)
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

C. **Consumable Materials**

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

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F. Prepare for the Cleaning

SUBTASK 49-16-11-860-001

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

SUBTASK 49-16-11-860-002

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-16-11-010-003

- (3) To open the access panel, do these steps:

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

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

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

G. APU Drain Cleaning

SUBTASK 49-16-11-160-001

- (1) Do these steps to clean the APU drain tubes:
 - (a) Clean the drain tube [11] for the exhaust duct muffler, drain tube [14] for the eductor housing, drain tube [15] for the combustor drain and duct drain tube [19] for the compressor inlet plenum:
 - 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the exhaust duct muffler.
 - 2) Disconnect the drain tube [11] from the fitting [12] on the exhaust duct muffler.
 - 3) Drain the water and fuel from the drain tube [11] and exhaust duct muffler into the 1 gallon (4 l) fuel resistant container, STD-4049.
 - 4) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the eductor housing.
 - 5) Disconnect the drain tube [14] from the fitting [13] on the eductor housing.
 - 6) Drain the water and oil from the drain tube [14] and eductor housing into the 1 gallon (4 l) fuel resistant container, STD-4049.

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- 7) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the diffuser housing.



WARNING

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- 8) Disconnect the drain tube [15] from the combustor drain.
- 9) Drain the fuel from the drain tube [15] and combustor drain into the 1 gallon (4 l) fuel resistant container, STD-4049.
- 10) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the compressor inlet plenum.
- 11) Disconnect the duct drain tube [19] from the fitting [16] on the compressor inlet plenum.
- 12) Drain the water and other fluids from the duct drain tube [19] and compressor inlet plenum into the 1 gallon (4 l) fuel resistant container, STD-4049.
- 13) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain tube [11], drain tube [14], drain tube [15], and duct drain tube [19].
- a) Use a pressure of 60 psig (413.7 kPa)-90 psig (620.5 kPa) of air or nitrogen to blow the air through the four drain tubes.
- 14) Make sure the air flows through the drain tube [11], drain tube [14], and drain tube [15] to the aft drain [8] on the APU drain seal [9].
- 15) Make sure the air flows through the duct drain tube [19] to the APU compartment.
- 16) Do this task: Combustor Drain Removal, TASK 49-16-12-000-801.
- 17) Use a drill bit, STD-1249, to clear the combustor drain hole of blockage.
- NOTE: The inner diameter of the combustor drain hole is 0.060 in. (1.5 mm).
- 18) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the four drain holes of the exhaust duct muffler, eductor housing, diffuser housing boss and compressor inlet plenum.
- NOTE: You will hear a different noise from the diffuser housing boss when you blow air through the drain hole. This noise is satisfactory.
- 19) Do this task: Combustor Drain Installation, TASK 49-16-12-400-801.
- NOTE: The drain tube [15] is connected to the combustor drain during the combustor drain installation.
- 20) Apply a thin layer of Never-Seez NSBT compound, D00006, on the threads of the fitting [16].
- 21) Connect the duct drain tube [19] to the fitting [16] on the compressor inlet plenum.
- a) Tighten the duct drain tube [19] to 230 in-lb (26.0 N·m).
- 22) Apply a thin layer of Never-Seez NSBT compound, D00006, on the threads of the fitting [13].
- 23) Connect the drain tube [14] to the fitting [13] on the eductor housing.

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- 24) Apply a thin layer of Never-Seez NSBT compound, D00006, on the threads of the fitting [12].
- 25) Connect the drain tube [11] to the fitting [12] on the exhaust duct muffler.
- 26) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.
- (b) Clean the drain tube [10] for the APU engine:
- 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the APU engine.
 - 2) Disconnect the drain tube [10] from the APU engine.
 - 3) Drain the oil from the drain tube [10] and APU engine into the 1 gallon (4 l) fuel resistant container, STD-4049.
 - 4) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain tube [10].
 - 5) Make sure the air flows through the drain tube [10] to the middle drain [7] on the APU drain seal [9].
 - 6) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain hole of the APU engine.
 - 7) If you find blockage in the drain tube [10] or the drain hole of the APU engine, do a visual inspection of the compressor inlet plenum:
 - a) Loosen the eight captive screws [24] that attach the access door [23] to the compressor inlet plenum.
 - b) Remove the access door [23] from the compressor inlet plenum.

NOTE: A lanyard is attached to the access door [23] to keep the access door [23] with the APU.
 - c) Visually examine the compressor inlet plenum for blockage of unwanted materials.
 - d) If you find blockage of unwanted materials, remove all the unwanted materials from the area.
 - e) Install the access door [23] to the compressor inlet plenum with the eight captive screws [24].
 - 8) Connect the drain tube [10] to the APU engine.
 - 9) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.
- (c) Clean the drain tube [2] for the surge control valve, drain tube [4] for the fuel control unit and drain tube [18] for the inlet guide vane (IGV) actuator:
- 1) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the surge control valve.
 - 2) Loosen the two bolts [21] that attach the bracket [20] to the surge control valve.
 - 3) Disconnect the drain tube [2] from the surge control valve.
 - 4) Remove the two packings [22] from the drain tube [2].
 - a) Discard the two packings [22].
 - 5) Drain the fuel from the drain tube [2] and surge control valve into the 1 gallon (4 l) fuel resistant container, STD-4049.
 - 6) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the IGV actuator.
 - 7) Loosen the three bolts [29] that attach the bracket [30] to the IGV actuator.
 - 8) Disconnect the drain tube [18] from the IGV actuator.

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- 9) Remove the two packings [28] from the drain tube [18].
 - a) Discard the two packings [28].
- 10) Drain the fuel from the drain tube [18] and IGV actuator into the 1 gallon (4 l) fuel resistant container, STD-4049.
- 11) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit.
- 12) Loosen the three bolts [26] that attach the bracket [27] to the fuel control unit.
- 13) Disconnect the drain tube [4] from the fuel control unit.
- 14) Remove the two packings [25] from the drain tube [4].
 - a) Discard the two packings [25].
- 15) Drain the fuel from the drain tube [4] and fuel control unit into the 1 gallon (4 l) fuel resistant container, STD-4049.



DO NOT BLOW THE AIR THROUGH THE SUPPLY, RETURN AND DRAIN HOLES OF THE SURGE CONTROL VALVE, IGV ACTUATOR AND FUEL CONTROL UNIT. DAMAGE TO THE EQUIPMENT CAN OCCUR.

- 16) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain tube [2], drain tube [4], and drain tube [18].
- 17) Make sure the air flows through the drain tube [2], drain tube [4], and drain tube [18] to the forward drain [6] on the APU drain seal [9] .
- 18) Lubricate the two new packings [22] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- 19) Install the two packings [22] on the drain tube [2].
- 20) Connect the drain tube [2] with the bracket [20] to the surge control valve.
- 21) Tighten the two bolts [21] that attach the bracket [20] to the surge control valve to 50 in-lb (5.6 N·m).
- 22) Lubricate the two new packings [28] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- 23) Install the two packings [28] on the drain tube [18].
- 24) Connect the drain tube [18] with the bracket [30] to the IGV actuator.
- 25) Tighten the three bolts [29] that attach the bracket [30] to the IGV actuator to 50 in-lb (5.6 N·m).
- 26) Lubricate the two new packings [25] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- 27) Install the two packings [25] on the drain tube [4].
- 28) Connect the drain tube [4] with the bracket [27] to the fuel control unit.
- 29) Tighten the three bolts [26] that attach the bracket [27] to the fuel control unit to 50 in-lb (5.6 N·m).
- 30) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-16-11-110-001

- (2) Do these steps to clean the APU drain seal [9]:
 - (a) Clean the APU drain seal [9] with alcohol, B00130, and a cotton wiper, G00034.

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- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the APU drain seal [9].
 - 1) Use a pressure of 60 psig (413.7 kPa)-90 psig (620.5 kPa) of air or nitrogen to dry the surfaces of the APU drain seal and drain mast [1].

SUBTASK 49-16-11-110-002

- (3) Do these steps to clean the drain mast [1] and drain cup [31] on the APU cowl door:
 - (a) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain hole on the drain mast [1] or the drain hole in the drain cup [31].
 - (b) Make sure the air flows through the drain tube [33] to the drain mast [1] or drain cup [31].
 - (c) If the air does not flow through the drain tube [33] or the drain mast [1], do these steps to clean the drain tube [33] or drain tube [15]:

NOTE: It is not always necessary to remove the insulation panel from the APU cowl door or to disconnect the two clamps [32] from the drain tube [33] if you can get access to the unwanted materials or the blockage in the drain tube [33].

 - 1) If it is necessary, remove the insulation panel from the APU cowl door (TASK 49-17-11-000-801).
 - 2) Disconnect the two clamps [32] and remove the drain tube [33] from the drain cup [31].
 - 3) Remove the unwanted materials or blockage from the drain tube [33].
 - 4) Use a plastic or nylon-coated wire, flexible non-metal brush or equivalent tool to clear the inner tube of the drain mast [1].
 - 5) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to clear the drain tube [33] and drain mast [1].
 - 6) If the two clamps [32] were disconnected during the drain tube [33] removal, install the drain tube [33] to the drain cup [31] and connect the two clamps [32].
 - 7) If the insulation panel was removed from the APU cowl door, install the insulation panel (TASK 49-17-11-400-801).
 - (d) Clean the drain cup [31] with alcohol, B00130, and a cotton wiper, G00034.
 - (e) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the drain cup [31].

SUBTASK 49-16-11-210-003

- (4) To make sure the APU drain seal [9] aligns with the drain cup [31] on the APU cowl door, do these steps:
 - (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
 - (b) Disconnect the two hold-open rods from the two brackets.
 - (c) Put the two hold-open rods in the two spring clips on the APU cowl door.
 - (d) Make sure the APU drain seal [9] correctly engages the drain cup [31] while you close the APU cowl door.
 - (e) Open the APU cowl door.
 - (f) Disconnect the two hold-open rods from the two spring clips.
 - (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
 - (h) Install the two retainer pins in the two rod ends.

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H. APU Drain Installation Test

SUBTASK 49-16-11-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-16-11-860-004

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

SUBTASK 49-16-11-790-001

- (3) Do the installation test for the APU drains:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU for a minimum of five minutes.
- (c) During the APU operation, examine the fuel supply, return and drain tube connections for the surge control valve, IGV actuator and fuel control unit for signs of fuel leakage.

NOTE: A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain [6] on the APU drain seal [9].

- (d) Examine the APU drain tubes, drain tube fittings and APU drain seal for signs of fuel leakage.
- (e) If you find fuel leakage in the tube connections, tubes and APU drain seal or more than the fuel leakage rate from the forward drain, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the fuel leakage area(s) that you found before for signs of leakage.
 - 7) If you find fuel leakage or more than the fuel leakage rate, do the leakage repair again.
- (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-11-410-003

(1) To close the access panel, do these steps:

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

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

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

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

————— **END OF TASK** —————

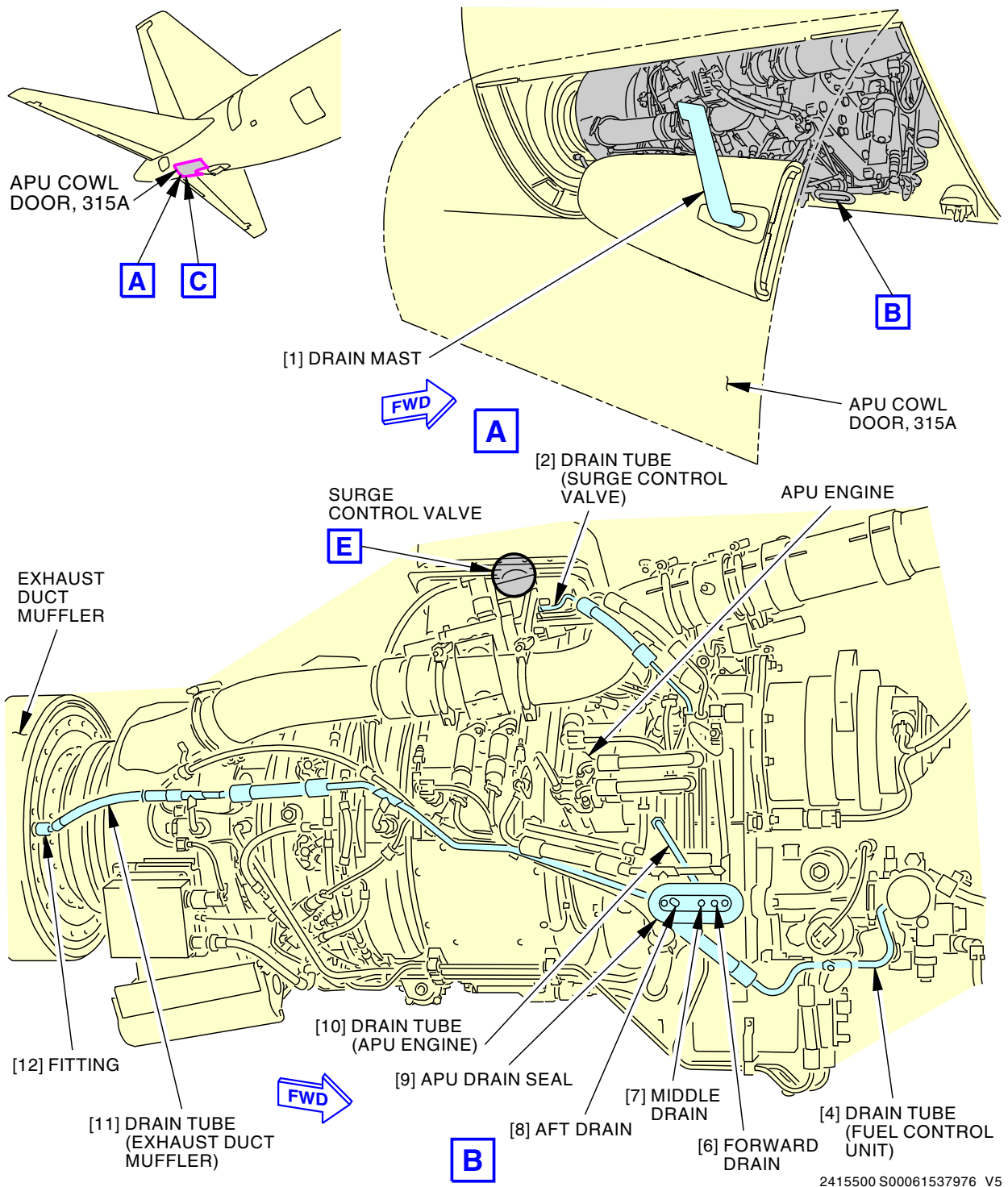
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APU Drains Cleaning
Figure 701/49-16-11-990-803 (Sheet 1 of 4)

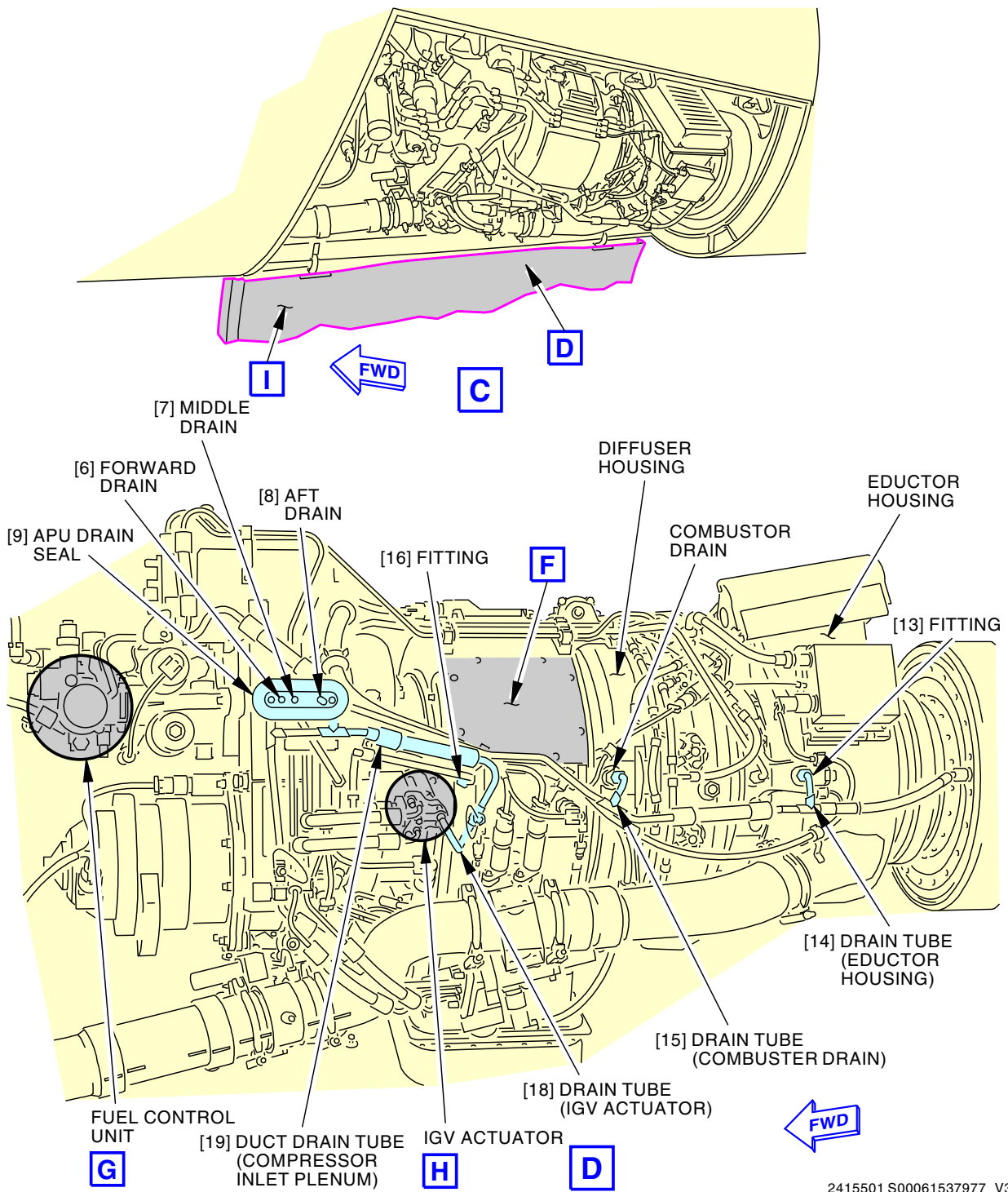
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APU Drains Cleaning
Figure 701/49-16-11-990-803 (Sheet 2 of 4)

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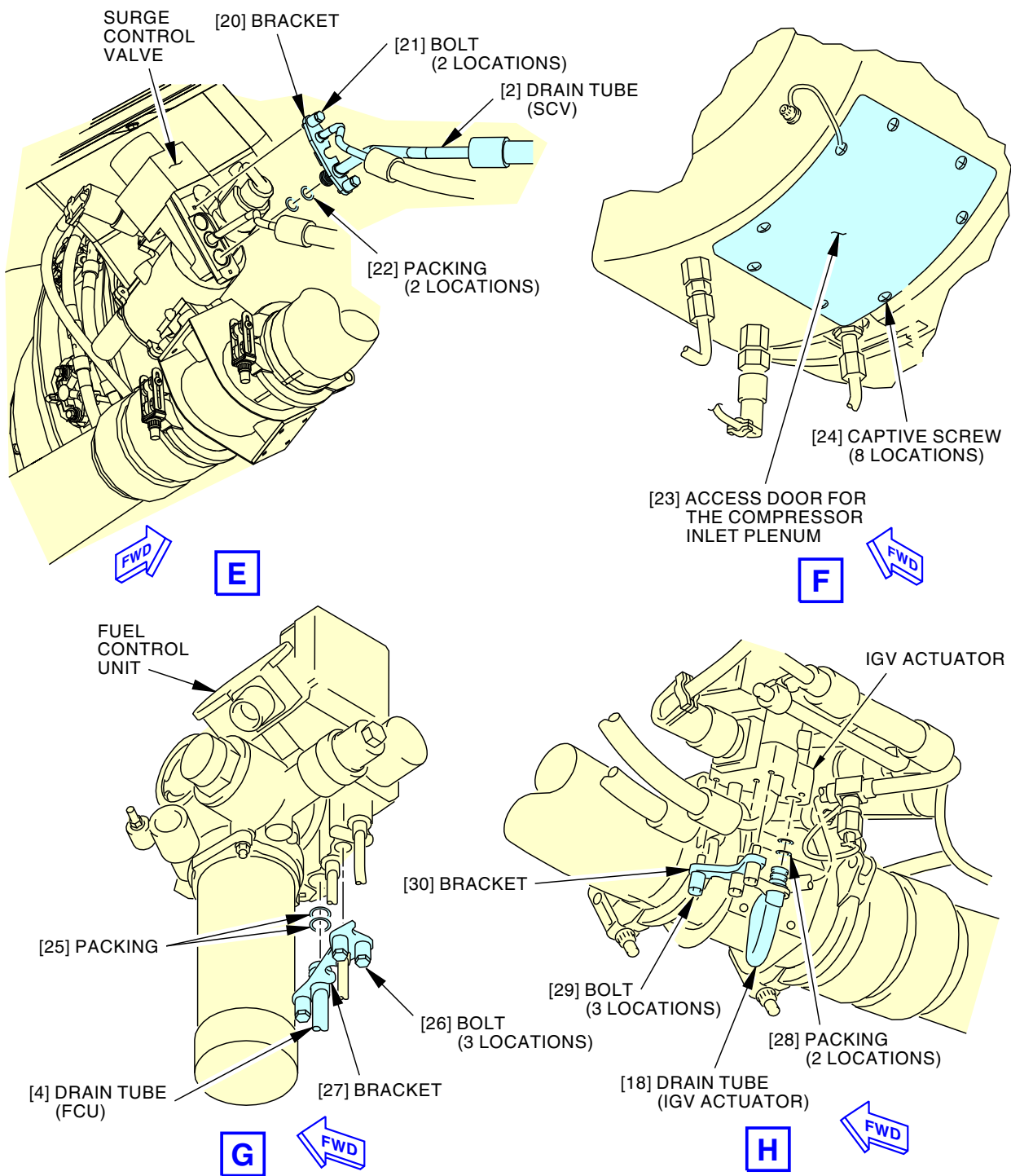
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APU Drains Cleaning
Figure 701/49-16-11-990-803 (Sheet 3 of 4)

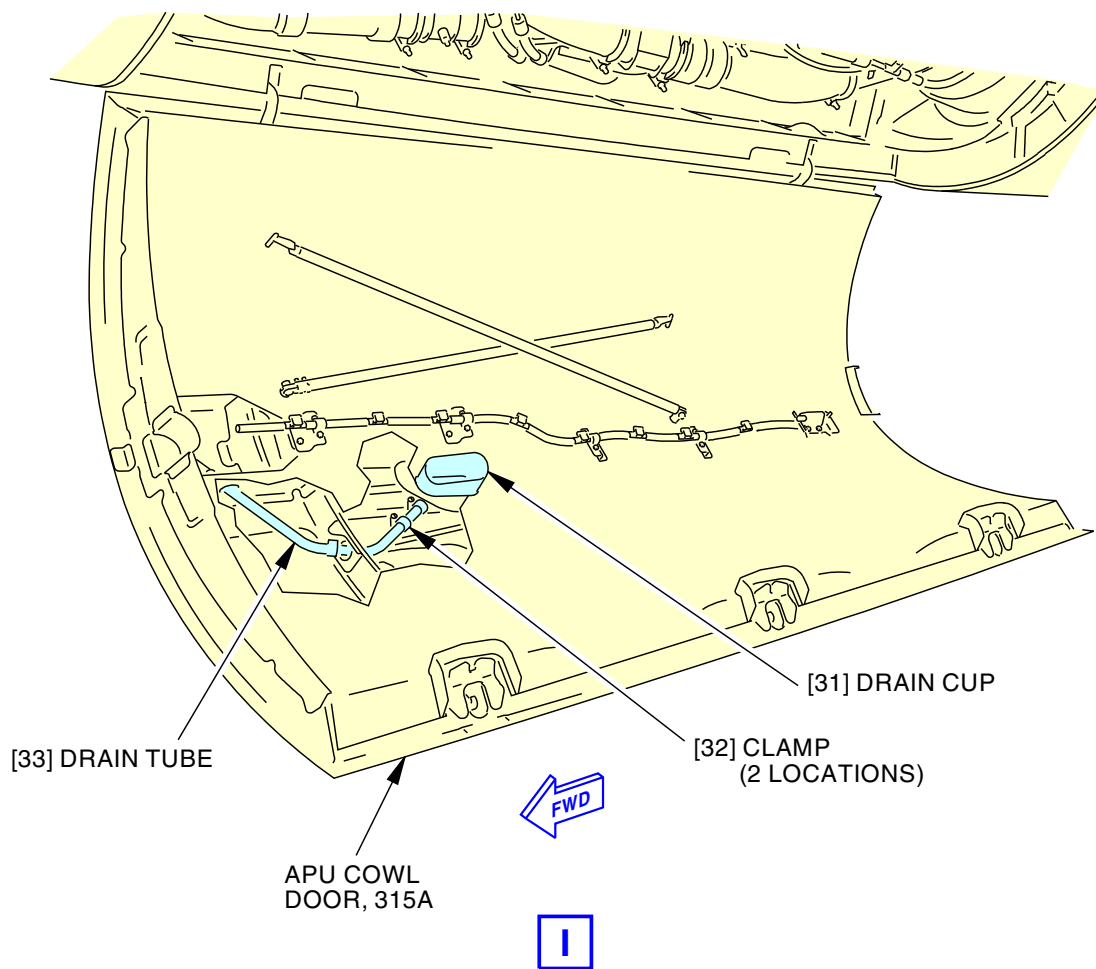
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APU Drains Cleaning
Figure 701/49-16-11-990-803 (Sheet 4 of 4)

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COMBUSTOR DRAIN - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the combustor drain
 - (2) Installation of the combustor drain.
- B. The combustor drain is also referred to as the orificed tube adapter.
- C. The combustor drain is installed on the bottom of the diffuser housing.

TASK 49-16-12-000-801

2. Combustor Drain Removal

(Figure 401)

A. **References**

Reference	Title
49-16-12-100-801	Combustor Drain Cleaning (P/B 701)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

C. **Location Zones**

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

D. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

E. **Prepare for the Removal**

SUBTASK 49-16-12-860-001

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

SUBTASK 49-16-12-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-16-12-010-001

- (3) To open the access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

F. Combustor Drain Removal

SUBTASK 49-16-12-020-001

- (1) Do these steps to remove the drain tube [2]:

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the drain tube [2].



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the drain tube [2] from the combustor drain adapter [3].

- (c) Drain the fuel from the drain tube [2] and combustor drain adapter [3] into the 1 gallon (4 l) fuel resistant container, STD-4049.

NOTE: Fuel is usually not found in the combustor drain adapter [3]. If there is fuel, this shows that there is a problem with the fuel system.

- (d) Remove the combustor drain adapter [3] from the diffuser housing boss [1].

- (e) Remove the gasket [4] from the combustor drain adapter [3].

- 1) Discard the gasket [4].

- (f) Install the caps on the drain tube [2] and the diffuser housing boss [1].

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

- (h) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-16-12-100-001

- (2) Do this task: Combustor Drain Cleaning, TASK 49-16-12-100-801.

————— **END OF TASK** —————

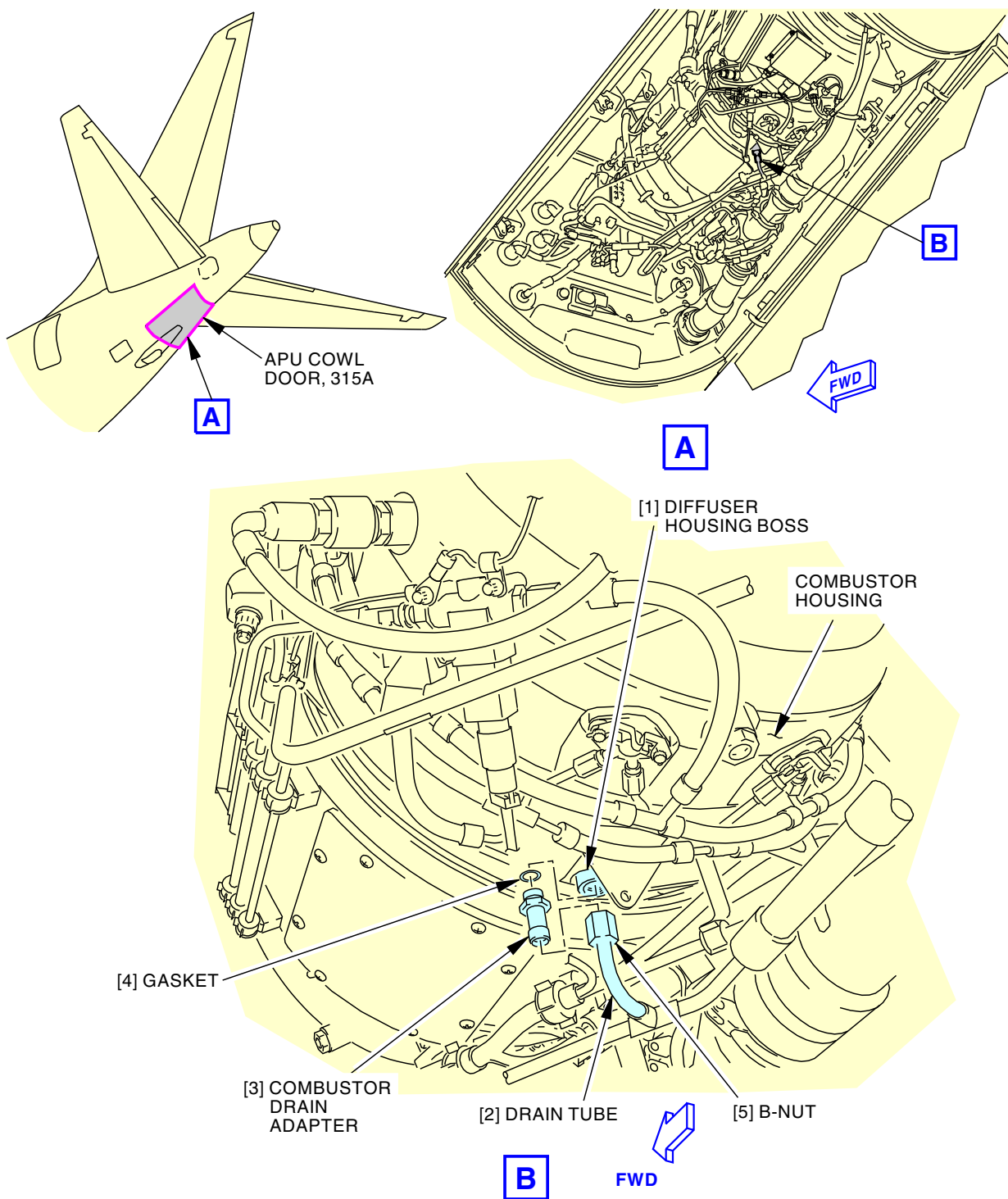
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Combustor Drain Installation
Figure 401/49-16-12-990-801

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TASK 49-16-12-400-801

3. Combustor Drain Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-16-12-100-801	Combustor Drain Cleaning (P/B 701)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Combustor drain adapter	49-16-12-01-050	SIA ALL
4	Gasket	49-16-12-01-055	SIA ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Combustor Drain Installation

SUBTASK 49-16-12-160-001



CAUTION

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

- (1) Make sure the combustor drain adapter [3] is clean.
 - (a) If it is necessary, do this task: Combustor Drain Cleaning, TASK 49-16-12-100-801.

SUBTASK 49-16-12-420-001

- (2) Do these steps to install the drain tube [2] :
 - (a) Apply a thin layer of Never-Seez NSBT compound, D00006, on the two threaded ends of the combustor drain adapter [3].
 - (b) Install the gasket [4] on the combustor drain adapter [3].
 - (c) Install the combustor drain adapter [3] in the diffuser housing boss [1].
 - 1) Tighten the B-nut on the combustor drain adapter [3] to 95 in-lb (10.7 N·m).

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- (d) Connect the drain tube [2] to the combustor drain adapter [3].
- 1) Tighten the B-nut [5] to 250 in-lb (28 N·m).

H. Combustor Drain Installation Test

SUBTASK 49-16-12-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-16-12-860-004

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

SUBTASK 49-16-12-790-001

- (3) Do the installation test for the drain tube [2]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (b) Operate the APU for a minimum of five minutes.
- (c) During the APU operation, examine the drain tube [2] for signs of air leakage.
- (d) If you find air leakage, do these steps to repair the leakage:
- 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
- 3) Repair the cause of the air leakage.
- 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
- 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- 6) During the APU operation, examine the drain tube [2] for signs of air leakage.
- 7) If you find air leakage, do the leakage repair again.
- (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-16-12-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

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

———— **END OF TASK** ————

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COMBUSTOR DRAIN - CLEANING/PAINTING

1. General

- A. This procedure has the task to clean the combustor drain. The combustor drain is installed on the bottom of the diffuser housing.

TASK 49-16-12-100-801

2. Combustor Drain Cleaning

A. References

Reference	Title
49-16-12-000-801	Combustor Drain Removal (P/B 401)
49-16-12-400-801	Combustor Drain 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)
STD-1249	Bit - Drill, Size 54 (0.0550 Inch Diameter)

C. Location Zones

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

D. Combustor Drain Cleaning

SUBTASK 49-16-12-160-002

- (1) Do these steps to clean the combustor drain:

NOTE: There is no operational checkout for the combustor drain. You must clean the combustor drain to make sure there is no blockage of unwanted materials in the diffuser housing.

- (a) Do this task: Combustor Drain Removal, TASK 49-16-12-000-801.
- (b) Examine the combustor drain and the drain tube for damaged threads and cracks.
- (c) Use a drill bit, STD-1249, or equivalent tool, to clear the combustor drain hole of blockage.

NOTE: The inner diameter of the combustor drain hole is 0.060 in. (1.52 mm).

- (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the drain hole of the diffuser housing boss.

NOTE: It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to blow the air through the drain hole of the diffuser housing boss.

NOTE: You will hear a different noise from the diffuser housing boss when you blow air through the drain hole. The noise you hear is satisfactory.

- (e) Do this task: Combustor Drain Installation, TASK 49-16-12-400-801.

———— **END OF TASK** ————

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INSULATION PANEL - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) Insulation Panel Removal
 - (2) Insulation Panel Installation.
- B. There are seven insulation panels installed on the Auxiliary Power Unit (APU) cowl door and on the APU compartment walls.
- C. You can replace the insulation panel on the APU cowl door with the APU cowl door removed or installed on the airplane.
- D. You must remove the APU to replace the other six insulation panels on the APU compartment walls.

TASK 49-17-11-000-801

2. Insulation Panel Removal

(Figure 401)

A. **References**

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-13-00-000-801	APU Mounts Removal (P/B 401)
52-48-21-000-801	Auxiliary Power Unit (APU) Cowl Door Removal (P/B 401)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Consumable Materials**

Reference	Description	Specification
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

F. **Prepare for the Removal**

SUBTASK 49-17-11-020-001

- (1) If it is necessary, do this task: APU Power Plant Removal (Selection), TASK 49-11-00-000-801.

NOTE: It is not necessary to remove the Auxiliary Power Unit (APU) for the removal of the insulation panel [13] from the APU Cowl Door, 315A. If you will replace the insulation panels in the APU compartment walls, you must first remove the APU.

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SUBTASK 49-17-11-860-001

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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	23	C00403	FIRE PROTECTION DETECTION APU

SUBTASK 49-17-11-010-001

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- Support the APU panel (cowl door) under the center latch.
- Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- Open the APU Cowl Door, 315A.
- Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- Remove the retainer pin from the spring clip on the aft hold-open rod.
- Disconnect the two hold-open rods from the two spring clips.
- Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- Install the two retainer pins in the two rod ends.

SUBTASK 49-17-11-010-002

- (4) If you must remove the insulation panel [13] from the APU Cowl Door, 315A, do these steps to get access to the insulation panel [13]:

- Make sure that the APU master switch on the P5 forward overhead panel is OFF and attach a DO NOT OPERATE tag, STD-858.
- Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

- (c) If it is necessary, remove the access panel:

Number Name/Location

315A APU Cowl Door

- Do this task: Auxiliary Power Unit (APU) Cowl Door Removal, TASK 52-48-21-000-801.
- Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- Remove the retainer pin from the spring clip on the aft hold-open rod.
- Disconnect the two hold-open rods from the two spring clips.

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G. Insulation Panel Removal

SUBTASK 49-17-11-020-002

- (1) Do these steps to remove the insulation panel [13] from the APU Cowl Door, 315A:
 - (a) Remove the cotter pins [22], two nuts [23], four washers [24] and two bolts [25] from the two hold-open rods [3] (View D).
 - (b) Remove the two hold-open rods [3].
 - (c) Remove the two screws [19] and two washers [20] from the two spring clips [21] (View C).
 - (d) Remove the two spring clips [21].
 - (e) If the APU Cowl Door, 315A was not removed from the airplane, disconnect the electrical connector D40062 [10] from the APU fire detector [14].
 - (f) Remove the two screws [6] and four washers [7] from the two clamps [5].
 - (g) Remove the two clamps [5] from the wire harness [4] for the APU fire detector [14].
 - (h) Remove the two screws [150] and the four washers [151] that attach bracket [152] to the APU Cowl Door, 315A (View B).
 - (i) Remove the six screws [11] and six washers [12] that attach the APU fire detector [14] to the APU Cowl Door, 315A.
 - (j) Remove the two screws [15], two washers [16] and spacer [17] that attach the APU fire detector [14] to the APU Cowl Door, 315A.
 - (k) Remove the two bolts [8] and two washers [9] that attach the APU fire detector [14] to the APU Cowl Door, 315A.
 - (l) Remove the APU fire detector [14] from the APU Cowl Door, 315A.
 - (m) Remove the seven bolts [155] and seven washers [156] that attach the insulation panel [13] to the APU Cowl Door, 315A.
 - (n) Remove the 27 screws [1] and 27 washers [2] that attach the insulation panel [13] to the APU Cowl Door, 315A.



CAUTION

BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (o) Remove the insulation panel [13].

SUBTASK 49-17-11-020-009

- (2) Do these steps to remove the support ring bracket [134] from the aft insulation panel [133] (View K):
 - (a) Remove the 16 bolts [140] and 16 washers [141] that attach the support ring bracket [134] and drip shield to the aft insulation panel [133].
 - (b) Remove the support ring bracket [134].

SUBTASK 49-17-11-020-010

- (3) Do these steps to remove the aft drip shield from the aft insulation panel [133] (View K):
 - (a) Make sure that the support ring bracket [134] is removed.
 - (b) Remove the eight screws [142], eight washers [143], two screws [148] and two washers [149] that attach the aft drip shield to the aft insulation panel [133].
 - (c) Remove the aft drip shield.

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SUBTASK 49-17-11-020-011

- (4) Do these steps to remove the left drip shield from the left insulation panel [40] (View E):
- (a) Make sure that the aft drip shield is removed.
 - (b) Remove the three screws [41], three washers [42], six screws [153] and six washers [154] that attach the left drip shield to the left insulation panel [40].
 - (c) Remove the left drip shield.

SUBTASK 49-17-11-020-012

- (5) Do these steps to remove the right aft drip shield from the right aft insulation panel [123] (View J):
- (a) Remove the two screws [125] and four washers [126] that attach the bracket [124] to the right aft drip shield.
 - (b) Remove the two screws [128] and four washers [129] that attach two clamps [127] to the right aft drip shield.
 - (c) Remove the screw [148] and washer [149] that attach right aft drip shield to the right aft insulation panel [123].
 - (d) Remove the right aft drip shield.

SUBTASK 49-17-11-020-013

- (6) Do these steps to remove the right forward drip shield from the right forward insulation panel [107] (View I):
- (a) Make sure that the right aft drip shield is removed.
 - (b) Remove the screws [109] and washers [110] that attach clamps [108] to the right forward drip shield.
 - (c) Remove the two screws [59] and two washers [60] that attach right forward drip shield to the right forward insulation panel [107].

SUBTASK 49-17-11-020-014

- (7) Do these steps to remove the forward drip shield from the forward insulation panel [43] (View F):
- (a) Make sure that the left drip shield and the right forward drip shield are removed.
 - (b) Remove the screw [54] and two washers [55] that attach clamp [53] to the forward drip shield.
 - (c) Remove the two screws [71] and four washers [72] that attach the bracket [69] to the forward drip shield (View G).
 - (d) Remove the two bolts [157] and two washers [158] that attach forward drip shield to the forward insulation panel [43].
 - (e) Remove the nine screws [59] and nine washers [60] that attach forward drip shield to the forward insulation panel [43] (View L).

SUBTASK 49-17-11-020-004

- (8) Do these steps to remove the forward insulation panel [43] (View F):
- (a) Disconnect the electrical connector D40060 [50] from the APU firewall receptacle on the 1088 bulkhead.
 - (b) Remove the two screws [54] and four washers [55] from the two clamps [53].
 - (c) Remove the two clamps [53] from the wire harness.

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- (d) Remove the fanning strip [58] from the four wire harnesses [49].

NOTE: The fanning strip [58] shows the identification of the terminal lugs (T1), (T2), (T3) and (T4) for the four wire harnesses [49].

- (e) Apply four identification tags to the four terminal lugs on the four wire harnesses [49] for the correct installation to the four hole locations on the starter-generator firewall cover [44].

- (f) Remove the five screws [71], five washers [72] and five washers [163] that attach the bracket [69] to the forward insulation panel [43] (View G).

- (g) Use a twine, G00472 or equivalent, to temporarily attach the forward compartment light [70] and bracket [69] to the support structure.

- (h) Remove the three screws [138] and three washers [139] that attach the L bracket [137] and the bracket [64].

1) Remove the L bracket [137], wire, and wire clamps.

- (i) Remove the screw [65] and washer [66] that attach the bracket [64] to the forward insulation panel [43].

- (j) Remove the bracket [64].

- (k) Remove the two bolts [157] and two washers [158] that attach the forward insulation panel [43].

- (l) Remove the 41 screws [59] and 41 washers [60] that attach the forward insulation panel [43] (View L).

NOTE: Put the wire harness [49] through the starter-generator firewall cover [44] panel opening while you remove the forward insulation panel [43].

- (m) If it is necessary, remove the starter-generator firewall cover [44] from the forward insulation panel [43]:

NOTE: It is necessary to remove the firewall cover(s) if there is damage to the firewall cover(s) or to install these five firewall covers to a new or serviceable forward insulation panel [43].

1) Remove the two screws [61] and two washers [62] that attach the starter-generator firewall cover [44] to the forward insulation panel [43].

2) Remove the starter-generator firewall cover [44].

- (n) If it is necessary, remove the forward rod firewall cover [73] from the forward insulation panel [43]:

1) Remove the clamp [160] and seal [161] that attach the bleed duct assembly [159].

2) Remove the bleed duct assembly [159].

3) Remove the forward rod firewall cover [73].



CAUTION

BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (o) Carefully remove the forward insulation panel [43].

SUBTASK 49-17-11-020-005

- (9) Do these steps to remove the top insulation panel [32] (View H):

- (a) Make sure that the forward insulation panel [43] is removed.

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- (b) Do this task: APU Mounts Removal, TASK 49-13-00-000-801.
 - 1) Make sure that the firewall covers and the forward flameshield [84] are removed.
 - 2) Make sure that all drip shields are removed.
- (c) Remove the three screws [97] and six washers [98] from the three clamps [96].
- (d) Remove the three clamps [96] from the wire harness [4] for the APU fire detector [87].
- (e) Remove the six screws [88] and six washers [89] that attach the APU fire detector [87] and the three brackets to the top insulation panel [32].
- (f) Remove the two bolts [82] and two washers [83] that attach the APU fire detector [87] to the top insulation panel [32].
- (g) Use a twine, G00472 or equivalent, to temporarily attach the APU fire detector [87] and the wire harness [4] to the support structure.
- (h) Remove the two screws [93] and two washers [94] that attach the starter-generator flameshield [95] to the top insulation panel [32].
- (i) Remove the starter-generator flameshield [95].
- (j) Remove the two screws [90] and two washers [91] that attach the aft flameshield [92] to the top insulation panel [32].
- (k) Remove the aft flameshield [92].
- (l) Remove the 43 screws [85] and 43 washers [86] that attach the top insulation panel [32] to the APU compartment wall.



BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (m) Carefully remove the top insulation panel [32].

SUBTASK 49-17-11-020-015

- (10) Do these steps to remove the left insulation panel [40] (View E):
 - (a) If the top insulation panel [32] has not been removed, remove the firewall cover [35], forward firewall cover [31] and the aft firewall cover [28]:
 - 1) Remove the seven screws [33] and seven washers [34] that attach the firewall cover [35] to the left forward mount for the APU.
 - 2) Remove the five screws [29] and five washers [30] that attach the forward firewall cover [31] to the left aft mount for the APU.
 - 3) Remove the five screws [26] and five washers [27] that attach the aft firewall cover [28] to the left aft mount for the APU.
 - 4) Move the aft firewall cover [28], forward firewall cover [31] and firewall cover [35] down on the APU mounts.
 - (b) Do this task: APU Mounts Removal, TASK 49-13-00-000-801.
 - (c) Remove the 18 screws [41] and 18 washers [42] that attach the left insulation panel [40] to the APU compartment wall.

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BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (d) Carefully remove the left insulation panel [40].

SUBTASK 49-17-11-020-006

- (11) Do these steps to remove the right forward insulation panel [107] (View I):
- (a) If the forward insulation panel [43] was not removed, disengage the forward insulation panel [43] from the right forward insulation panel [107]:
 - 1) Remove the five screws [59] and five washers [60] that attach the forward insulation panel [43] to the right forward insulation panel [107].
 - 2) Remove the two screws [59], two washers [60], screw [109] and washer [110] that attach the right forward drip shield to the right forward insulation panel [107].
 - 3) Remove the screw [41] and washer [42] that attach forward drip shield to the left insulation panel [40] (View M).
 - (b) If the top insulation panel [32] was not removed, disengage the top insulation panel from the right forward insulation panel [107] (View I):
 - 1) Remove the four screws [85] and four washers [86] that attach the top insulation panel [32] to the right forward insulation panel [107].
 - 2) Remove the screw [97] and two washers [98] that attach the clamp [96] on the top insulation panel [32] and the right forward insulation panel [107].
 - 3) Remove the five screws [101] and five washers [102] that attach the right firewall cover [103] to the right forward mount for the APU.
 - 4) Move the right firewall cover [103] down on the right forward mount for the APU.
 - (c) Remove the four screws [109] and eight washers [110] from the four clamps [108].
 - (d) Remove the five clamps [108] from the wire harness [4] for the APU fire detector.
 - (e) Use a twine, G00472 or equivalent, to temporarily attach the wire harness [4] to the support structure.
 - (f) Remove the four screws [104] and four washers [105] that attach the forward link flameshield [106] to the right forward insulation panel [107].
 - (g) Remove the forward link flameshield [106].
 - (h) Remove the 14 screws [99] and 14 washers [100] that attach the right forward insulation panel [107] and the firewall cover [162] to the APU compartment wall.



BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (i) Carefully remove the right forward insulation panel [107].

SUBTASK 49-17-11-020-007

- (12) Do these steps to remove the right aft insulation panel [123] (Views J, V):
- (a) Make sure that the top insulation panel [32], right forward insulation panel [107] and right aft drip shield are removed.
 - (b) If the top insulation panel [32] was not removed, disengage the top insulation panel [32] from the right aft insulation panel [123]:

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- 1) Remove the five screws [85] and washers [86] that attach the top insulation panel [32] to the right aft insulation panel [123] (View H).
 - 2) Remove the five screws [111] and five washers [112] that attach the forward firewall cover [113] to the right aft mount for the APU (View J).
 - 3) Remove the five screws [117] and five washers [118] that attach the aft firewall cover [116] to the right aft mount for the APU.
 - 4) Move the forward firewall cover [113] and aft firewall cover [116] down on the right aft mount for the APU .
- (c) Disconnect the electrical connector [120] for the APU fire detector from the bracket [119].
 - (d) Remove the two screws [121] and four washers [122] from the bracket [119].
 - (e) Remove the bracket [119].
 - (f) Remove the three screws [128] and six washers [129] from the three clamps [127].
 - (g) Remove the three clamps [127] from the wire harness [4] for the APU fire detector.
 - (h) Remove the four screws [125], four washers [126] and four washers [164] that attach the bracket [124] to the right aft insulation panel [123].
 - (i) Use a twine, G00472 or equivalent, to temporarily attach the aft compartment light and bracket [124] to the support structure.
 - (j) Remove the three screws [114] and three washers [115] that attach the aft link flameshield [130] to the right aft insulation panel [123].
 - (k) Remove the aft link flameshield [130].
 - (l) Remove the 14 screws [131] and 14 washers [132] that hold the right aft insulation panel [123] to the APU compartment wall.



CAUTION

BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (m) Carefully remove the right aft insulation panel [123].

SUBTASK 49-17-11-020-008

- (13) Do these steps to remove the aft insulation panel [133] (View K):
 - (a) Make sure that the top insulation panel [32], right aft insulation panel [123], left insulation panel [40] and all drip shield are removed.
 - (b) Remove the seven screws [142] and seven washers [143] that attach the aft insulation panel [133] to the 1156 lower bulkhead.
 - (c) Remove the eight screws [135] and eight washers [136] that attach the aft insulation panel [133].



CAUTION

BE CAREFUL WHEN YOU REMOVE THE INSULATION PANEL. USE TWO PERSONS TO REMOVE THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (d) Carefully remove the aft insulation panel [133].

— END OF TASK —

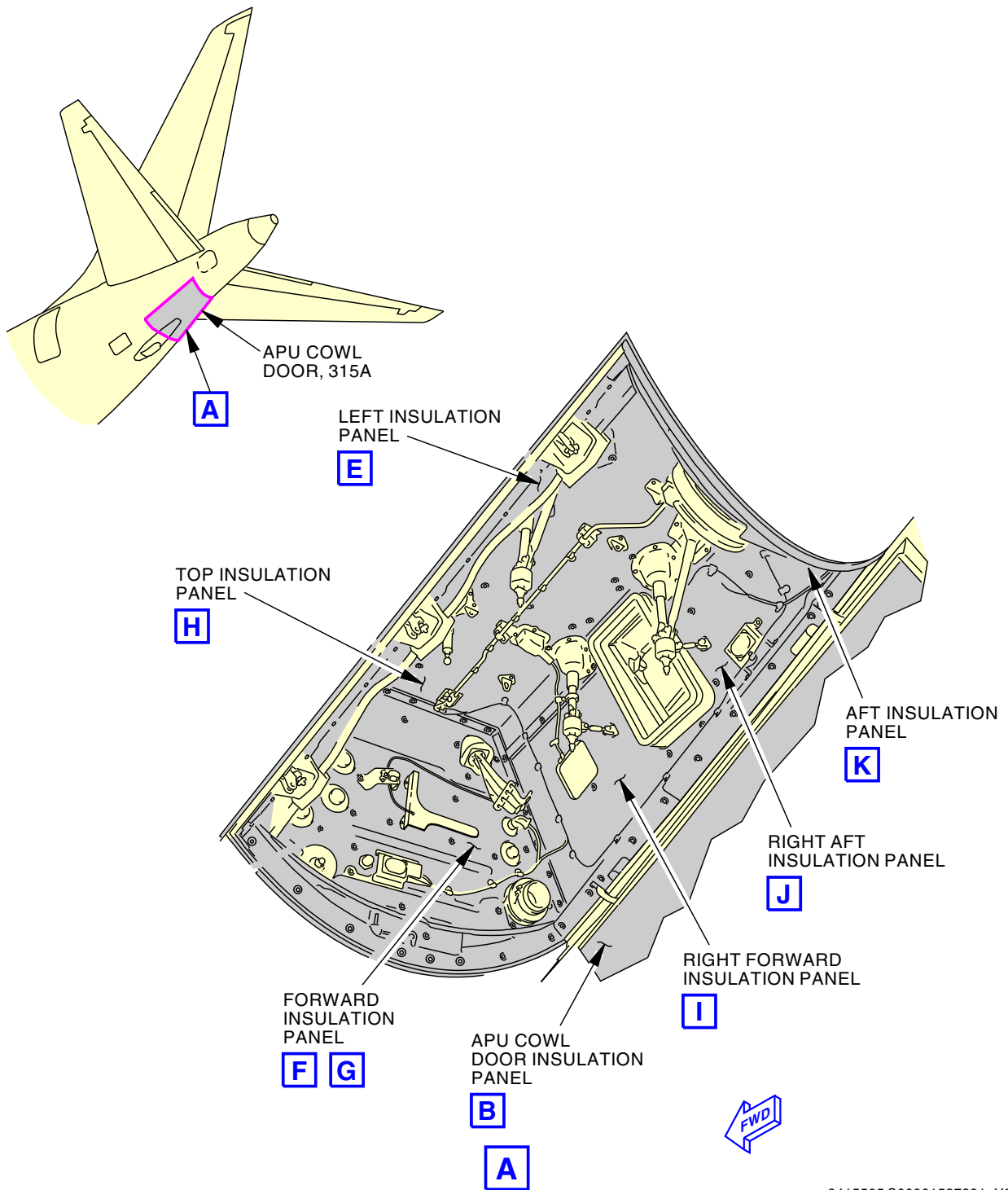
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2415505 S00061537991_V3

Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 1 of 10)

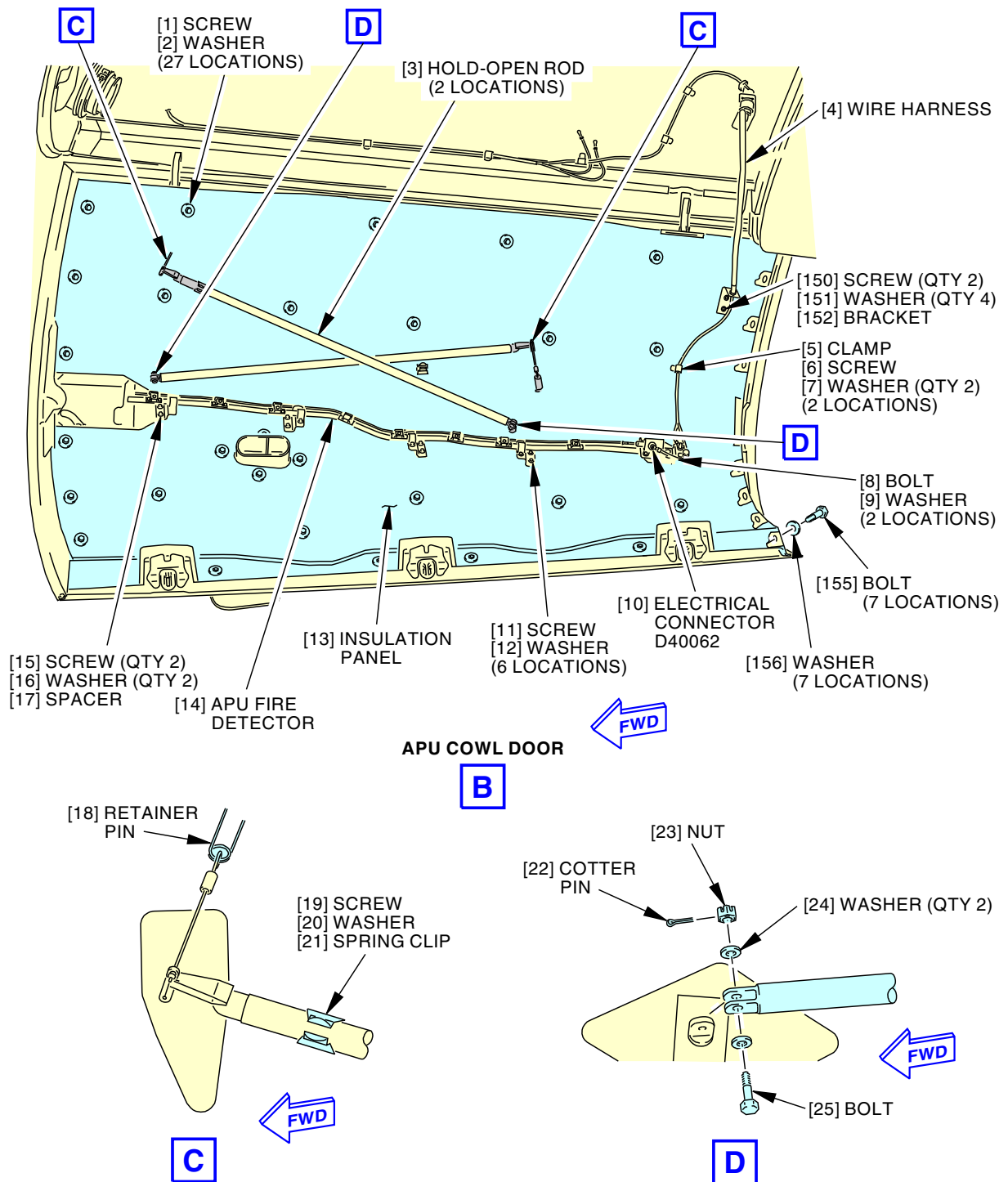
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2415506 S00061537992_V4

Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 2 of 10)

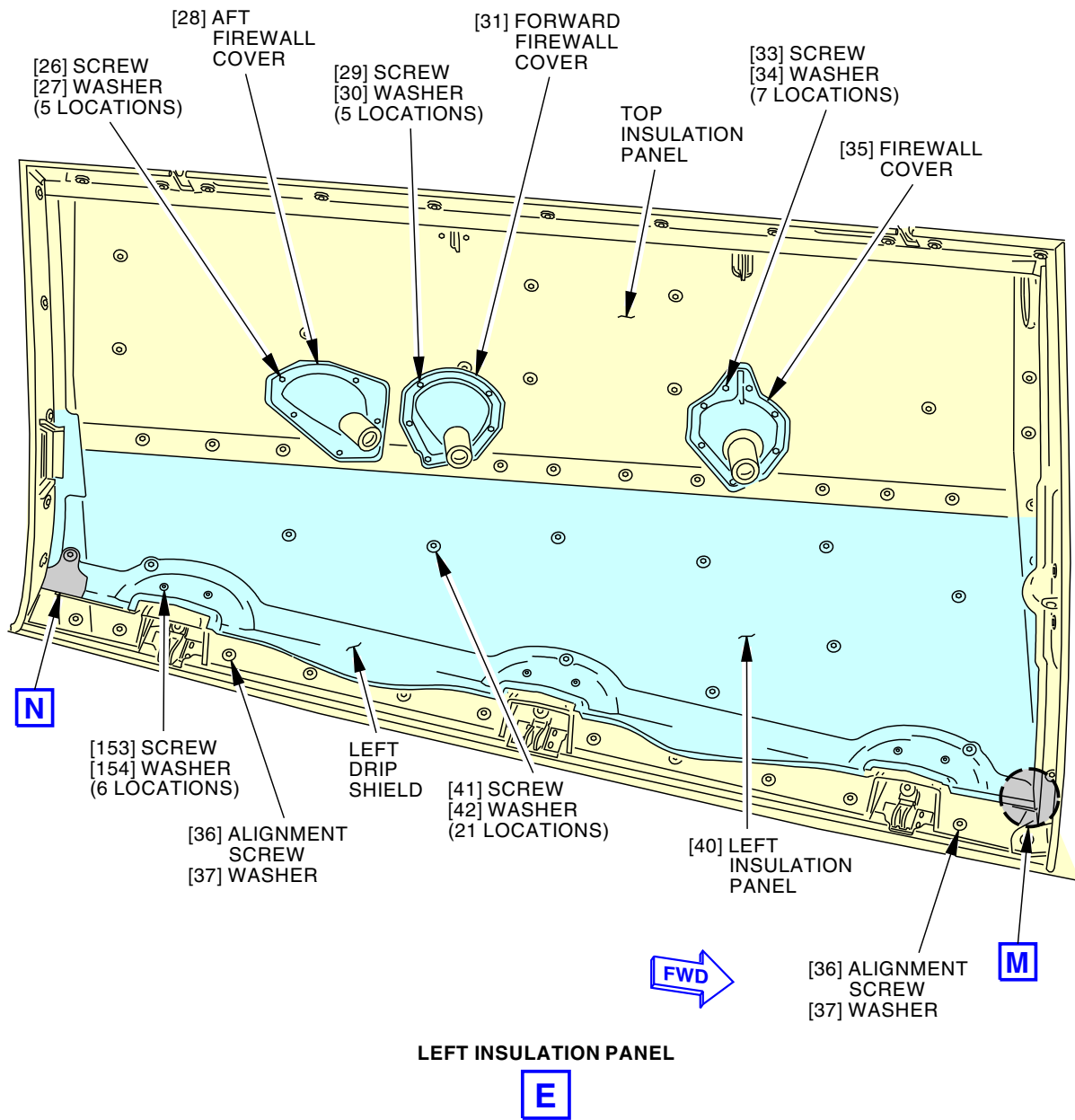
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2415507 S00061537993_V4

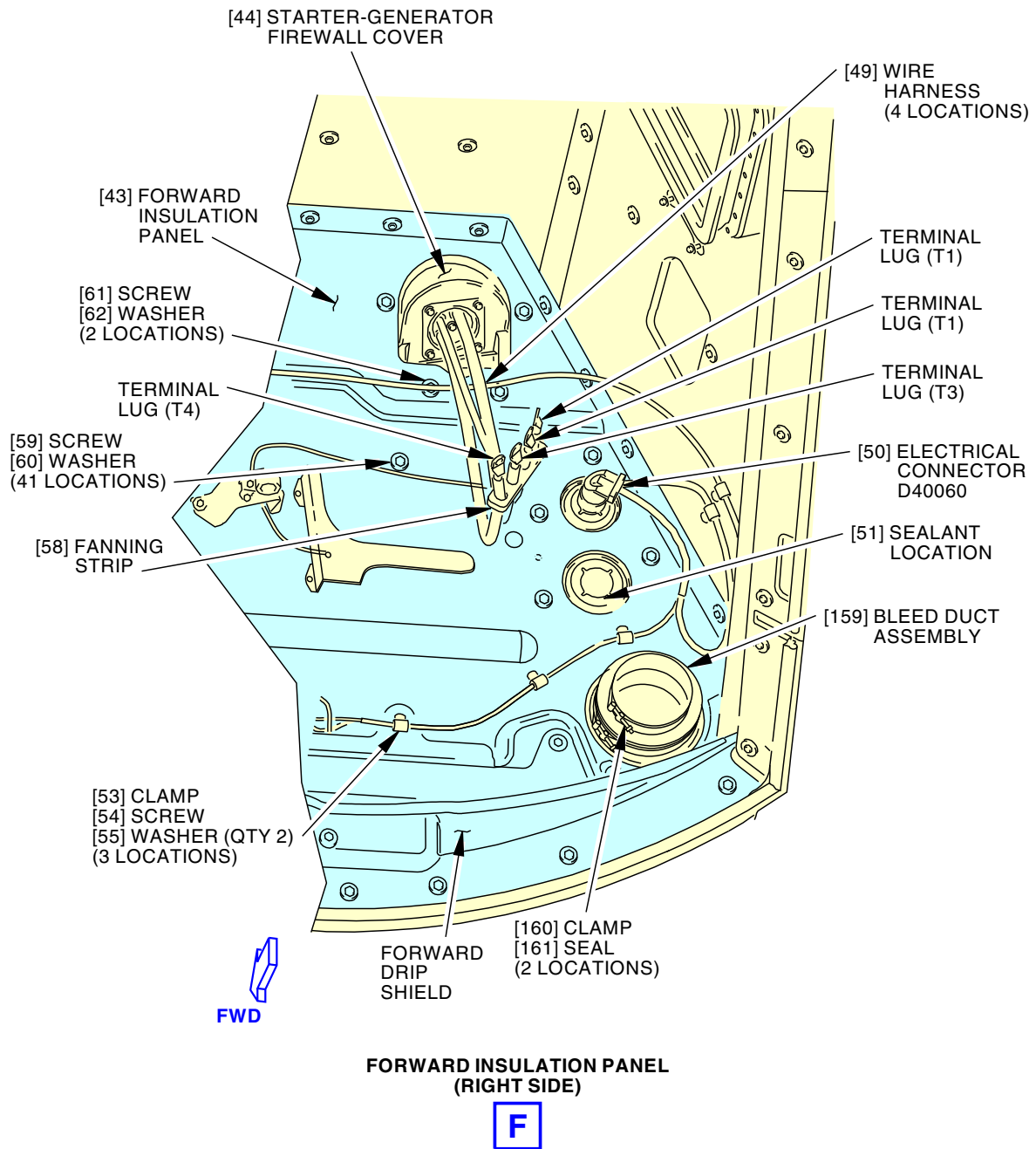
Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 3 of 10)

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2415508 S00061537994_V5

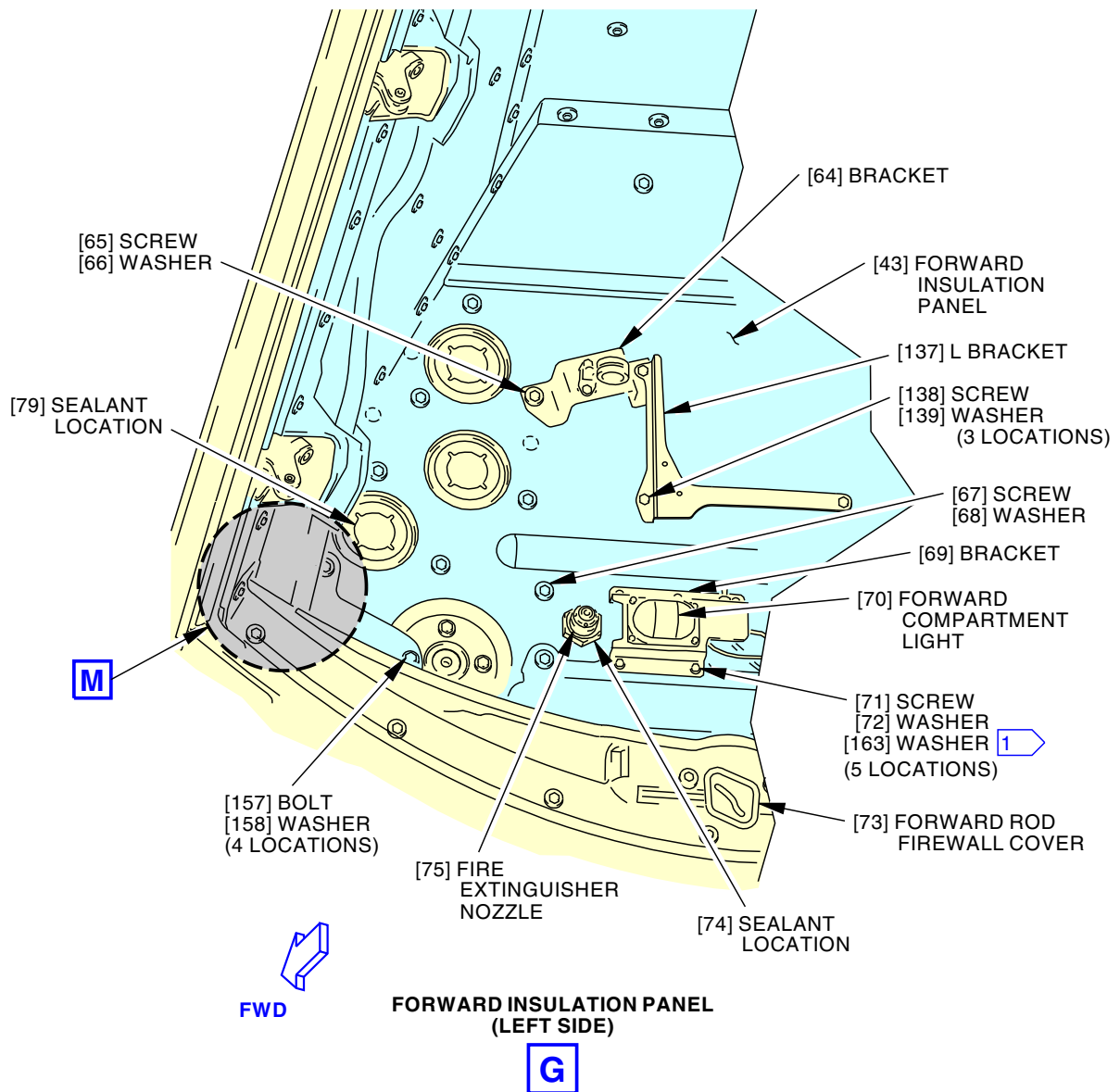
Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 4 of 10)

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1 THE [163] WASHER IS INSTALLED BETWEEN THE [43] FORWARD INSULATION PANEL AND THE [69] BRACKET.

2415509 S00061537995_V5

Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 5 of 10)

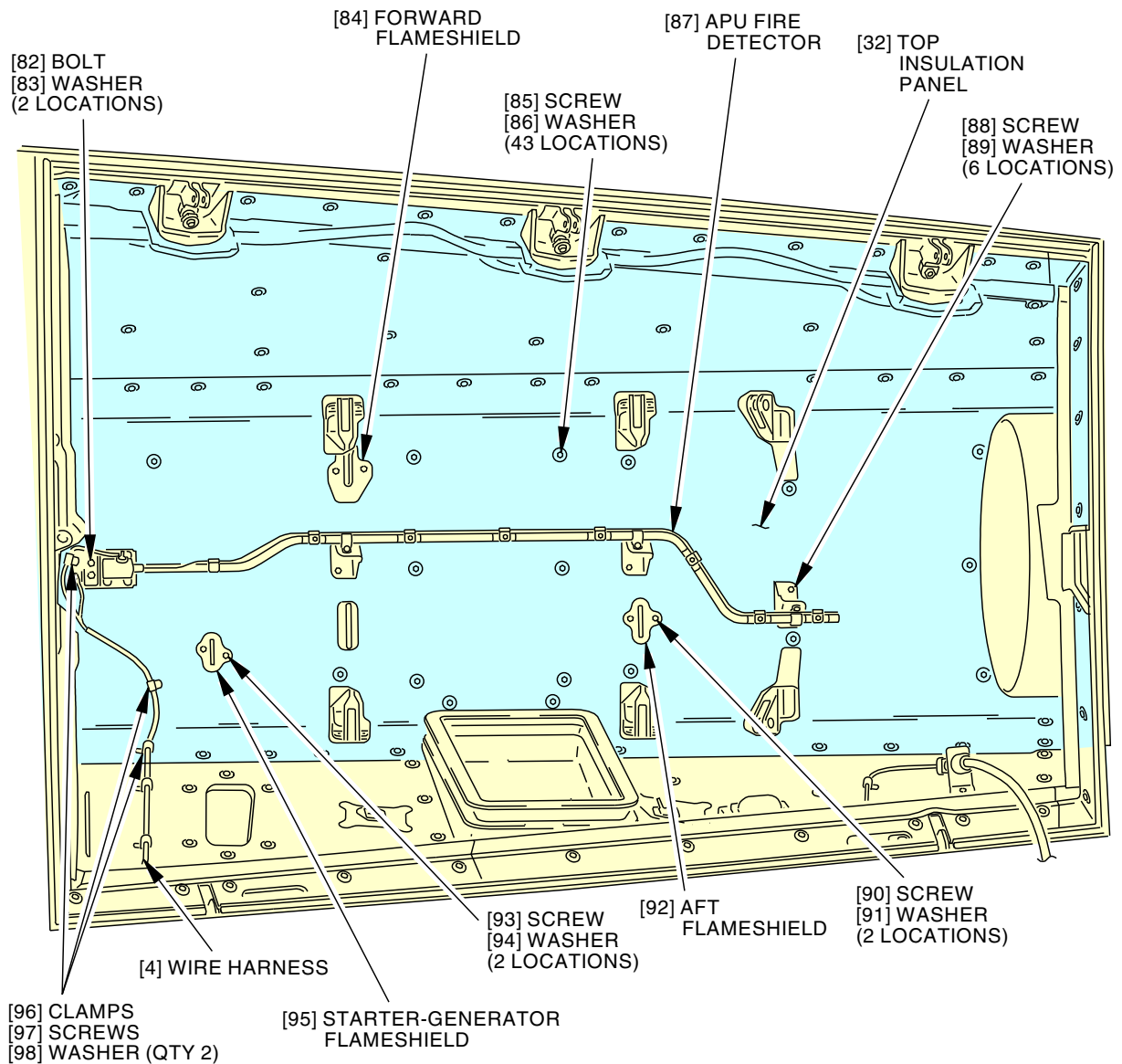
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TOP INSULATION PANEL



2415510 S00061537996_V4

Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 6 of 10)

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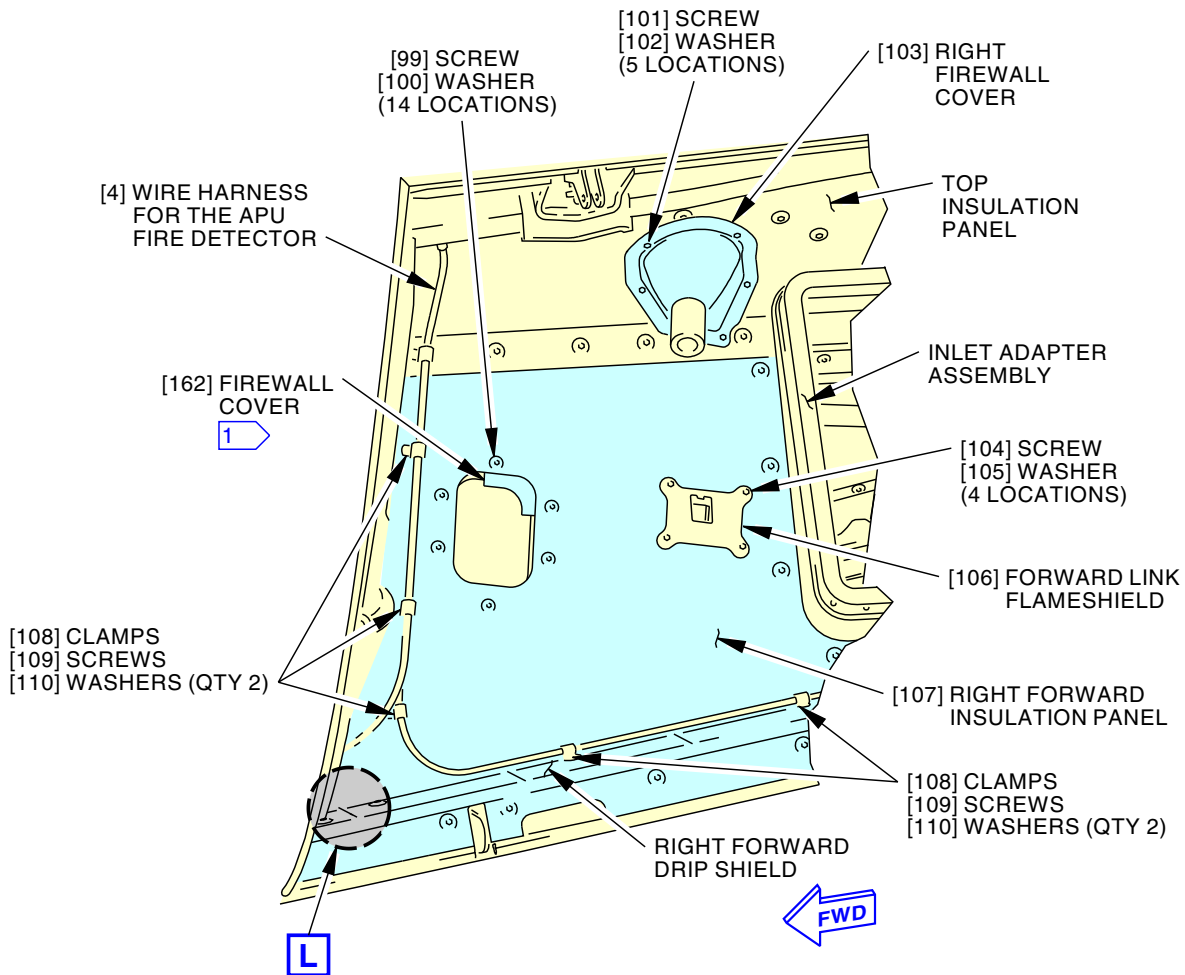
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RIGHT FORWARD INSULATION PANEL



1 IF INSTALLED

2415511 S00061537997_V4

Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 7 of 10)

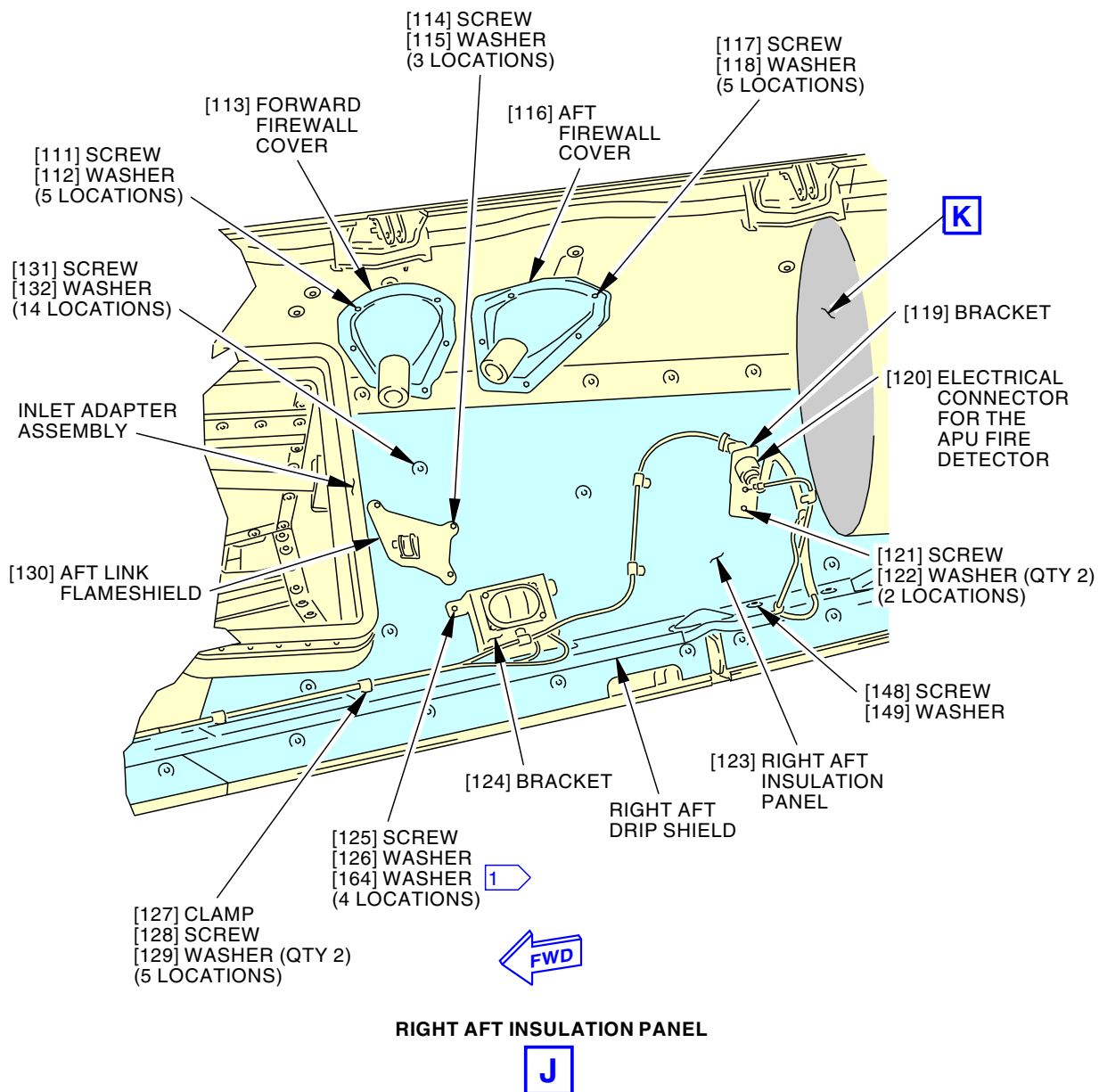
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1 THE [164] WASHER IS INSTALLED BETWEEN THE [123] RIGHT AFT INSULATION PANEL AND THE [124] BRACKET.

2415512 S00061537998_V4

Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 8 of 10)

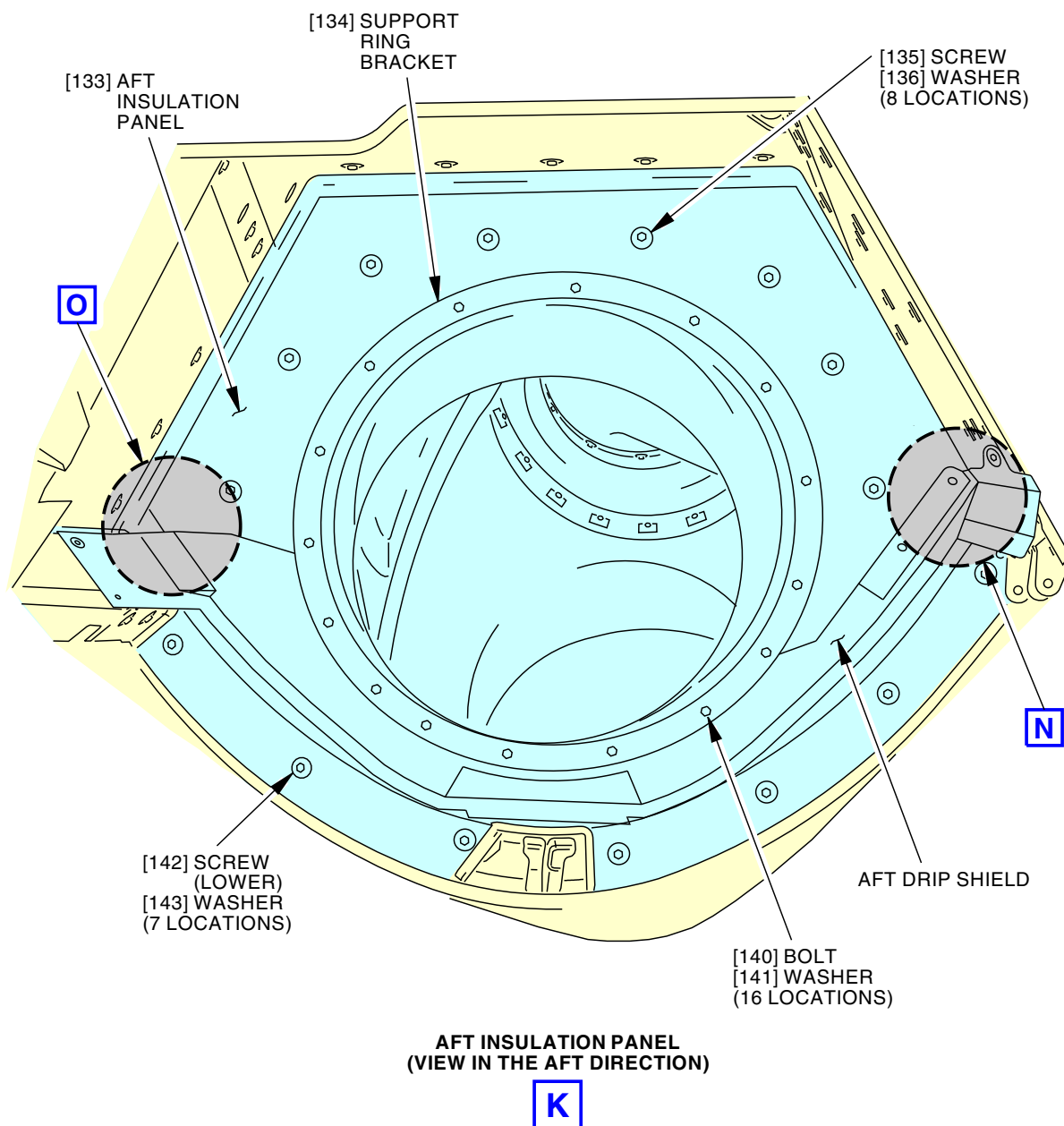
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2415513 S00061537999_V3

Insulation Panel Installation
Figure 401/49-17-11-990-801 (Sheet 9 of 10)

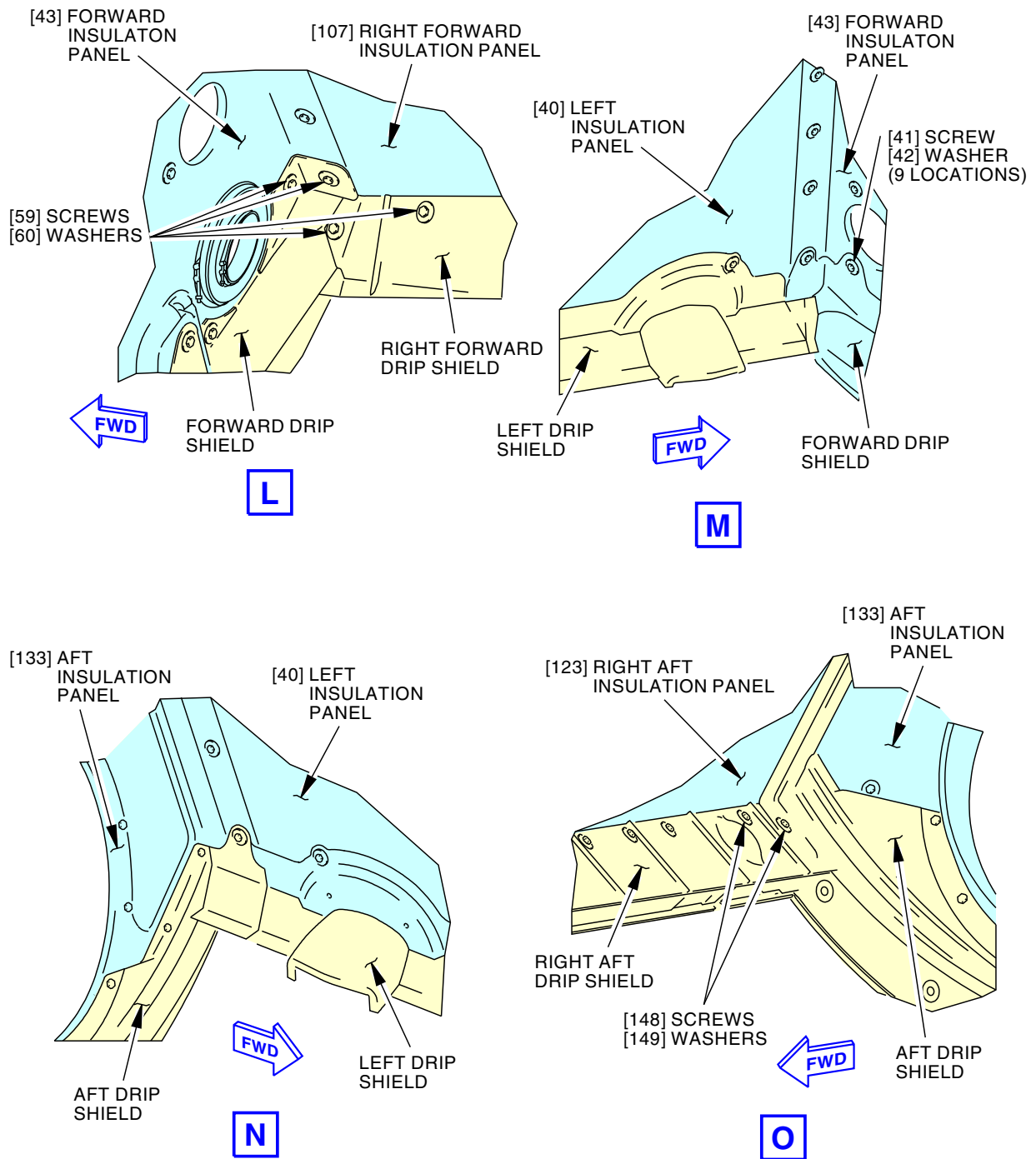
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2415514 S00061538000_V3

Insulation Panel Installation
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AIRCRAFT MAINTENANCE MANUAL

TASK 49-17-11-400-801

3. Insulation Panel Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)
49-13-00-400-801	APU Mounts Installation (P/B 401)
52-48-21-400-801	Auxiliary Power Unit (APU) Cowl Door Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-418	Gloves
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Insulation panel	52-48-21-10-005	SIA ALL
22	Cotter pin	52-48-21-05-155	SIA ALL
		52-48-21-05-235	SIA ALL
28	Aft firewall cover	49-13-51-01-135	SIA ALL
31	Forward firewall cover	49-13-51-01-160	SIA ALL
32	Top insulation panel	49-17-11-01-425	SIA ALL
35	Firewall cover	49-13-51-01-210	SIA ALL
40	Left insulation panel	49-17-11-01-430	SIA ALL
43	Forward insulation panel	49-17-11-01-415	SIA ALL
44	Starter-generator firewall cover	49-17-11-01-115	SIA ALL
73	Forward rod firewall cover	49-17-11-01-410	SIA ALL
103	Right firewall cover	49-13-51-01-110	SIA ALL
107	Right forward insulation panel	49-17-11-01-435	SIA ALL
113	Forward firewall cover	49-13-51-01-110	SIA ALL
116	Aft firewall cover	49-13-51-01-080	SIA ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
123	Right aft insulation panel	49-17-11-01-420	SIA ALL
133	Aft insulation panel	49-17-11-01-440	SIA ALL
161	Seal	49-17-11-01-170	SIA ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Insulation Panel Installation

SUBTASK 49-17-11-420-001

- (1) Do these steps to install the aft insulation panel [133] (View K):
 - (a) If you see remaining sealant on the parts of the aft insulation panel [133], then do these steps:
 - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.



CAUTION

BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. USE TWO PERSONS TO INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (b) Carefully put the aft insulation panel [133] on the 1156 bulkhead.
- (c) Use leather or thick cotton gloves, STD-418, to bend the bottom edge of the aft insulation panel [133] until there is a maximum clearance of 0.075 in. (2 mm) between the aft insulation panel [133] and the arooseal support bracket.
 - 1) The bottom edge of the aft insulation panel [133] must not touch the Auxiliary Power Unit (APU) Cowl Door, 315A in the open and close positions.
- (d) Place the aft drip shield in its position.
 - 1) Make sure that the left drip shield and right aft drip shield are installed.
 - 2) Install the aft drip shield.
 - 3) Install the two screws [148] and two washers [149] in the left and the right corner of aft drip shield.
- (e) Install the seven screws [142] and seven washers [143] that attach the aft insulation panel [133] to the 1156 lower bulkhead.
- (f) Install the eight screws [135] and eight washers [136] that attach the aft insulation panel [133].
- (g) Put the support ring bracket [134] on the aft insulation panel [133].

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- 1) Make sure that the aft drip shield is installed.
- 2) Install the support ring bracket [134].
- (h) Install the 16 washers [141] and 16 bolts [140] that attach the support ring bracket [134] to the aft insulation panel [133].

SUBTASK 49-17-11-420-002

- (2) Do these steps to install the right aft insulation panel [123] (View J):
 - (a) Make sure that the aft insulation panel [133] is installed.
 - (b) If you see remaining sealant on the parts of the right aft insulation panel [123] and the inlet adapter assembly, then do these steps:
 - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.



BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. USE TWO PERSONS TO INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (c) Carefully put the right aft insulation panel [123] on the APU compartment wall.
- (d) Install the 14 screws [131] and 14 washers [132] that hold the right aft insulation panel [123] to the APU compartment wall.
- (e) Clean the surfaces of the bracket [119] and bracket [124] for the aft compartment light and the four washers [122], four washers [126] and four washers [164]:
 - 1) Remove the remaining sealant from the surfaces with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surfaces with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Dry the surfaces with a cotton wiper, G00034.
- (f) Apply the sealant, A00160, to the eight washers [126].
- (g) Remove the temporary materials (cord or equivalent) that attach the aft compartment light and bracket [124] to the support structure.
- (h) Install the aft compartment light and bracket [124] with the four washers [164], four washers [126] and four screws [125].
- (i) Install the four clamps [127] on the wire harness [4] for the APU fire detector with the eight washers [129] and four screws [128].
- (j) Apply the sealant, A00160, to the four washers [122].
- (k) Install the bracket [119] with the four washers [122] and two screws [121].
- (l) Connect the electrical connector [120] for the APU fire detector to the bracket [119].
- (m) If the top insulation panel [32] was not removed, engage the top insulation panel to the right aft insulation panel [123]:
 - 1) If you see remaining sealant on the aft firewall cover [116], forward firewall cover [113] and the top insulation panel [32], then do these steps:
 - a) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.

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- b) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
- 2) Use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
- 3) Install the aft firewall cover [116] to the right aft mount for the APU with the five washers [118] and five screws [117].
- 4) Install the forward firewall cover [113] to the right aft mount for the APU with the five washers [112] and five screws [111].
- 5) Install the five washers [86] and five screws [85] that attach the top insulation panel [32] to the right aft insulation panel [123] (View H).
- 6) Apply a fillet seal of sealant, A00160, between the forward firewall cover [113], aft firewall cover [116] and the top insulation panel [32].
- 7) Apply a fillet seal of sealant, A00160, between the top insulation panel [32] and the right aft insulation panel [123].
- 8) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.
- (n) Apply a fillet seal of sealant, A00160, between the inlet adapter assembly and the right aft insulation panel [123].
- (o) Apply a fillet seal of sealant, A00160, between the right aft insulation panel [123], aft insulation panel [133], right aft drip shield and aft drip shield.
- (p) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-003

- (3) Do these steps to install the right forward insulation panel [107] (View I):
 - (a) Make sure that the right aft insulation panel [123] is installed.
 - (b) If you see remaining sealant on the parts of the right forward insulation panel [107] and the inlet adapter assembly, then do these steps:
 - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - (c) Carefully put the right forward insulation panel [107] on the APU compartment wall.
 - (d) Install the 14 screws [99] and 14 washers [100] that attach the right forward insulation panel [107] and the firewall cover [162] to the APU compartment wall.
 - (e) Place the forward drip shield in its position.
 - 1) Make sure that the forward drip shield is installed.
 - 2) Install the right forward drip shield.
 - 3) Install the two screws [59] and two washers [60] to attach the right forward drip shield to the right forward insulation panel [107].
 - (f) Install the forward link flameshield [106] with the four washers [105] and four screws [104].
 - (g) Remove the temporary materials (cord or equivalent) that attach the wire harness [4] to the support structure.
 - (h) Install the five clamps [108] on the wire harness [4] for the APU fire detector with the 10 washers [110] and five screws [109].

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- (i) If the top insulation panel [32] is not removed, engage the top insulation panel to the right forward insulation panel [107]:
- 1) If you see remaining sealant on the right firewall cover [103] and the top insulation panel [32], then do these steps:
 - a) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - b) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the surface.
 - 2) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - 3) Install the clamp [96] on the top insulation panel [32] and the right forward insulation panel [107] with the two washers [98] and screw [97].
 - 4) Install the four washers [86] and four screws [85] that attach the top insulation panel [32] to the right forward insulation panel [107].
 - 5) Apply a fillet seal of sealant, A00160, between the right firewall cover [103] and the top insulation panel [32].
 - 6) Apply a fillet seal of sealant, A00160, between the top insulation panel [32] and the right forward insulation panel [107].
 - 7) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.
- (j) If the forward insulation panel [43] was not removed, engage the forward insulation panel to the right forward insulation panel [107]:
- 1) If you see remaining sealant on the right firewall cover [103] and the forward insulation panel [43], then do these steps:
 - a) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - b) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.

NOTE: It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the surface.
 - 2) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - 3) Install the three washers [60] and three screws [59] on the bottom forward corner of the forward drip shield and right forward drip shield.
 - 4) Apply a fillet seal of sealant, A00160, between the forward insulation panel [43] and the right forward insulation panel [107].
 - 5) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.
- (k) Apply a fillet seal of sealant, A00160, between the inlet adapter assembly and the right forward insulation panel [107].
- (l) Apply a fillet seal of sealant, A00160, between the right forward insulation panel [107], right aft insulation panel [123] and right forward drip shield.

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(m) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-009

(4) Do these steps to install the left insulation panel [40] (View E):

- (a) If you see remaining sealant on the parts of the left insulation panel [40], then do these steps:
- 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.



BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. USE TWO PERSONS TO INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (b) Carefully put the left insulation panel [40] on the APU compartment wall.
- (c) Install the two washers [37] and two alignment screws [36] that attach the left insulation panel [40] to the APU compartment wall.
- NOTE: It is necessary to align the left insulation panel [40] with the two alignment screws [36] because of the small clearance between the lower edge of the left insulation panel [40] and the APU Cowl Door, 315A.
- (d) Install the 18 washers [42] and 18 screws [41] that attach the left insulation panel [40] to the APU compartment wall.
- (e) Place the left drip shield in its position.
- 1) Install the six washers [154], six screws [153], three washers [42] and three screws [41] to attach left drip shield to the left insulation panel [40].
- (f) If you see remaining sealant on the aft firewall cover [28], forward firewall cover [31], firewall cover [35] and the top insulation panel [32], then do these steps:
- 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
- (g) If the top insulation panel [32] is installed, install the aft firewall cover [28], forward firewall cover [31] and the firewall cover [35].
- 1) Install the aft firewall cover [28] to the left aft mount for the APU with the five washers [27] and five screws [26].
 - 2) Install the forward firewall cover [31] to the left aft mount for the APU with the five washers [30] and five screws [29].
 - 3) Install the firewall cover [35] to the left forward mount for the APU with the seven washers [34] and seven screws [33].
 - 4) Apply a fillet sealant, A00160 between the aft firewall cover [28], forward firewall cover [31], firewall cover [35] and the top insulation panel [32].
 - 5) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

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- (h) Apply a fillet seal of sealant, A00160, between the left insulation panel [40], aft insulation panel [133], top insulation panel [32], forward insulation panel [43], aft drip shield, forward drip shield and left drip shield.
- (i) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-004

- (5) Do these steps to install the top insulation panel [32] (View H):
 - (a) If you see remaining sealant on the parts of the top insulation panel [32], then do these steps:
 - 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
 - 4) Make sure that the right aft insulation panel [123] and right forward insulation panel [107] are installed.



CAUTION

BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. USE TWO PERSONS TO INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (b) Carefully put the top insulation panel [32] on the APU compartment wall.
- (c) Place the drip shield in its position.
- (d) Install the 43 washers [86] and 43 screws [85] that attach the top insulation panel [32] to the APU compartment wall.
- (e) Install the aft flameshield [92] with the two washers [91] and two screws [90].
- (f) Install the starter-generator flameshield [95] with the two washers [94] and two screws [93].
- (g) Remove the temporary materials (cord or equivalent) that attach the APU fire detector [87] and wire harness [4] to the support structure.
- (h) Install the APU fire detector [87] and the three brackets to the top insulation panel [32] with the six washers [89], six screws [88], two washers [83] and two bolts [82].
- (i) Install the three clamps [96] on the wire harness [4] for the APU fire detector [87] with the six washers [98] and three screws [97].
- (j) Do this task: APU Mounts Installation, TASK 49-13-00-400-801.
NOTE: The firewall covers and the forward flameshield [84] are installed during the APU mounts installation.
- (k) Apply a fillet seal of sealant, A00160, between the top insulation panel [32] and the adjacent insulation panels.
- (l) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-005

- (6) Do these steps to install the forward insulation panel [43] (View F):
 - (a) Make sure that the aft, right aft, right forward, left and top insulation panels are installed.
 - (b) If you see remaining sealant on the parts of the forward insulation panel [43], then do these steps:

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- 1) Remove the remaining sealant from the surface with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surface with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surface.
- (c) If the starter-generator firewall cover [44] and/or forward rod firewall cover [73] were removed from the forward insulation panel [43], install the firewall covers:
- 1) Do these steps to install the forward rod firewall cover [73]:
 - a) Install the forward rod firewall cover [73] on the forward insulation panel [43].
 - b) Install the bleed duct assembly [159].
 - c) Install the clamp [160] and seal [161] that attach the bleed duct assembly [159].
 - 2) Install the starter-generator firewall cover [44] with the two washers [62] and two screws [61].
 - 3) Fill the space at sealant location [51] and sealant location [79] with sealant, A00160.
NOTE: It is necessary to fill the space with sealant to prevent fluids to collect there.
 - 4) Fill the space in the rear side of the union for the fire extinguisher nozzle [75] with the sealant, A00160, at the sealant location [74].



BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. USE TWO PERSONS TO INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (d) Carefully put the forward insulation panel [43] on the 1088 bulkhead.
- (e) Put the four wire harnesses [49] through the starter-generator firewall cover [44] while you install the forward insulation panel [43].
NOTE: Use the four identification tags for the correct installation of the four wire harnesses [49] to the four hole locations on the starter-generator firewall cover [44].
- (f) If it is necessary, remove the four identification tags.
- (g) If it is needed, install the starter-generator firewall cover [44] to the forward insulation panel [43]:
 - 1) Install the two screws [61] and two washers [62] to attach the starter-generator firewall cover [44] to the forward insulation panel [43].
- (h) If it is needed, install the forward rod firewall cover [73] to the forward insulation panel [43].
- (i) Install the 41 screws [59] and 41 washers [60] that attach the forward insulation panel [43].
- (j) Place the forward drip shield in its position (View G).
 - 1) Install the nine screws [59] and nine washers [60] to attach the forward drip shield to the forward insulation panel [43].
 - 2) Install the four bolts [157] and four washers [158].

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- (k) Install the fanning strip [58] to the four wire harnesses [49].

NOTE: The fanning strip [58] show the identification of the four terminal lugs (T1), (T2), (T3) and (T4) for the four wire harnesses [49].

- (l) Make sure that you install the four wire harnesses [49] to the correct locations on the fanning strip [58].
- (m) Install the MS20995C32 lockwire, G01048, to the screw [67] and the fire extinguisher nozzle [75] (TASK 20-10-44-400-801).
- (n) Install the bracket [64] with the two washers [66] and two screws [65].
- (o) Install the L bracket [137] with the three screws [138] and attach the wire and the wire clamps.
- (p) Clean the surfaces of the bracket [69] for the forward compartment light, the five washers [72] and five washers [163]:
- 1) Remove the remaining sealant from the surfaces with a hard resin phenolic scraper, STD-1064, or an equivalent tool.
 - 2) Clean the surfaces with alcohol, B00130, and a cotton wiper, G00034.
 - 3) Dry the surfaces with a cotton wiper, G00034.
- (q) Apply the sealant, A00160, to the five washers [72] and five washers [163].
- (r) Remove the temporary materials (cord or equivalent) that attach the forward compartment light [70] and bracket [69] to the support structure.
- (s) Install the bracket [69] to the forward insulation panel [43] with the five washers [163], five washers [72] and five screws [71].
- (t) Install the three clamps [53] on the wire harness with the six washers [55] and three screws [54].
- (u) Connect the electrical connector D40060 [50] to the APU firewall receptacle on the 1088 bulkhead.
- (v) Apply a fillet seal of sealant, A00160, between the forward insulation panel [43], forward drip shield, right forward drip shield and the adjacent insulation panels.
- (w) Remove the unwanted sealant from the surfaces with a cotton wiper, G00034.

SUBTASK 49-17-11-420-007

- (7) Do these steps to install the insulation panel [13] on the APU Cowl Door, 315A:



CAUTION

BE CAREFUL WHEN YOU INSTALL THE INSULATION PANEL. USE TWO PERSONS TO INSTALL THE INSULATION PANEL. DAMAGE OR A BEND TO THE INSULATION PANEL CAN OCCUR.

- (a) Carefully put the insulation panel [13] on the APU Cowl Door, 315A.
- (b) Install the 27 washers [2] and 27 screws [1] that attach the insulation panel [13] to the APU Cowl Door, 315A.
- (c) Install the seven bolts [155] and seven washers [156] to attach the insulation panel [13] to the APU Cowl Door, 315A.
- (d) Install the APU fire detector [14] with the two washers [9], two bolts [8], six washers [12], six screws [11], spacer [17], two washers [16] and two screws [15].
- (e) Install the two clamps [5] on the wire harness [4] for the APU fire detector [14] with the four washers [7] and two screws [6].

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- (f) Install the two screws [150] and the four washers [151] to attach bracket [152] to the APU Cowl Door, 315A.
- (g) If the APU Cowl Door, 315A was not removed from the airplane, connect the electrical connector D40062 [10] to the APU fire detector [14].
- (h) Install the two spring clips [21] with the two washers [20] and two screws [19].
- (i) Install the two hold-open rods [3] with the two bolts [25], four washers [24] and two nuts [23].
- (j) Install the cotter pins [22] in the two nuts [23].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-17-11-410-001

- (1) If it is necessary, do these steps:
 - (a) If the access panel was removed from the airplane, install it by the following steps:

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

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

- 1) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- 2) Install the retainer pin in the rod end of the forward hold-open rod.
- 3) Install the retainer pin to the spring clip on the aft hold-open rod.
- 4) Do this task: Auxiliary Power Unit (APU) Cowl Door Installation, TASK 52-48-21-400-801.

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

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

SUBTASK 49-17-11-860-002

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

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	23	C00403	FIRE PROTECTION DETECTION APU

SUBTASK 49-17-11-420-008

- (3) If you replaced one or more insulation panels on the APU compartment walls, install the APU (TASK 49-11-00-400-801).

SUBTASK 49-17-11-410-002

- (4) To close the access panel, do these steps:

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

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

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

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

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

———— **END OF TASK** ————

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INSULATION PANEL - INSPECTION/CHECK

1. General

A. This procedure has these tasks:

- (1) An inspection of the insulation panels.
- (2) An inspection of the APU firewall covers (with the APU removed).

TASK 49-17-11-200-801

2. Insulation Panel Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
49-17-11-000-801	Insulation Panel Removal (P/B 401)
49-17-11-400-801	Insulation Panel Installation (P/B 401)

B. Tools/Equipment

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

C. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-17-11-860-003

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

SUBTASK 49-17-11-860-004

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-17-11-010-003

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

F. Insulation Panel Inspection Procedure

SUBTASK 49-17-11-210-001

- (1) Do these steps to inspect the insulation panels for fluid contamination and structural damage:
 - (a) Examine the insulation panels for signs of fluid contamination to the core insulation material.
 - (b) Examine the surface of the insulation panels for missing metal sheets, ruptured seams or structural metal deterioration.
 - (c) Examine the insulation panels for holes that have gone through the inner and outer metal sheets.
 - (d) If you find any of the above damage, replace the insulation panel(s). These are the tasks:
 - Insulation Panel Removal, TASK 49-17-11-000-801
 - Insulation Panel Installation, TASK 49-17-11-400-801
- 1) After the insulation panel(s) are removed, do these steps:
 - a) Examine the structure behind the insulation panel(s) for contamination and damage.
 - b) Examine the air inlet scoop for blockage of unwanted materials and damage that can cause a decrease in air flow.
NOTE: You can find the air inlet scoop behind the forward insulation panel.
 - c) If you find blockage of unwanted materials, remove the blockage.
 - d) If you find contamination or damage, clean and repair the problems that you find.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-17-11-410-004

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

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

SUBTASK 49-17-11-860-005

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-17-11-860-006

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

———— **END OF TASK** ————

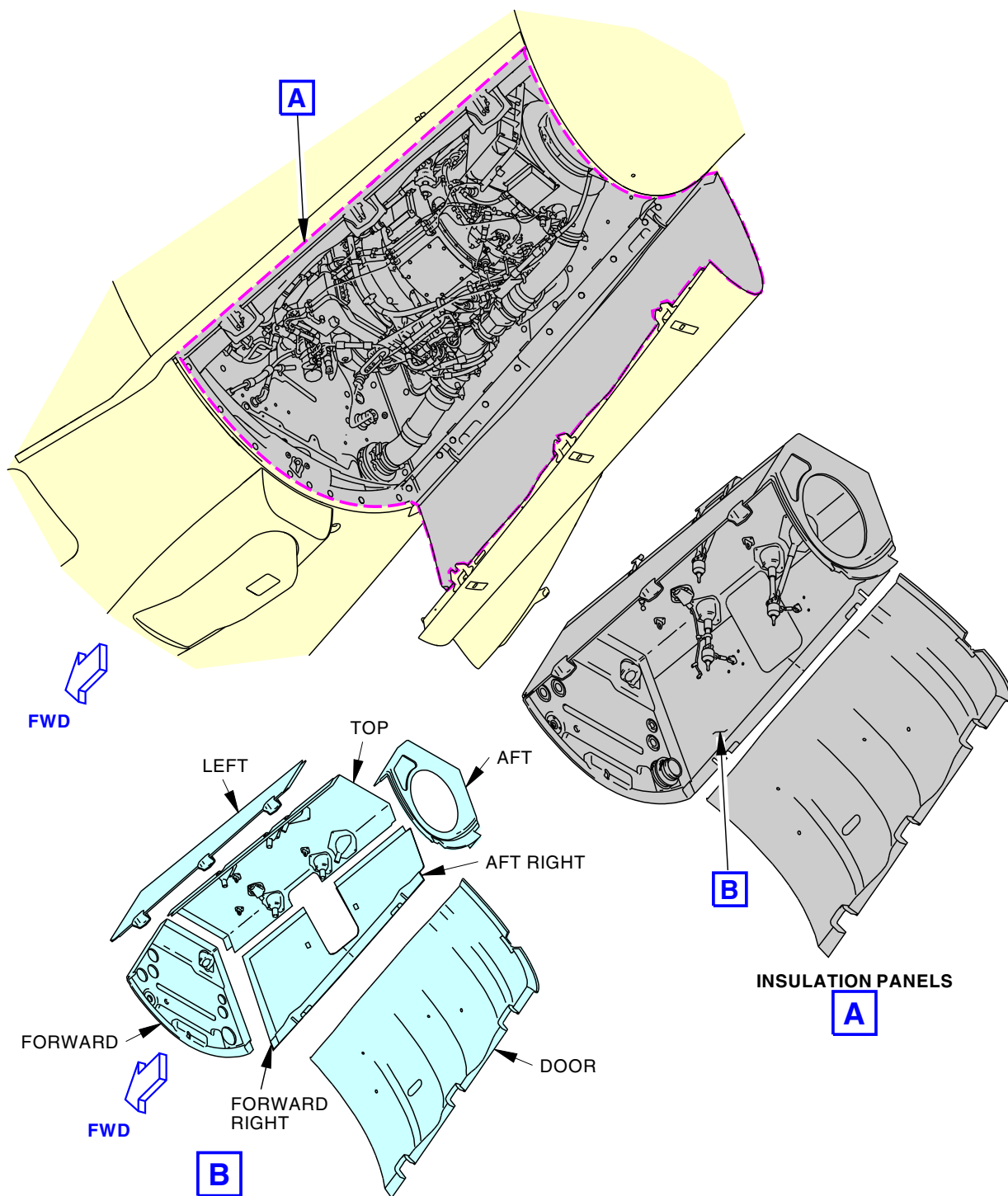
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APU Insulation Panels Inspection
Figure 601/49-17-11-990-803

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TASK 49-17-11-210-801

3. **APU Firewall Covers Inspection (with APU Removed)**

(Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

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

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-17-11-860-011

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

SUBTASK 49-17-11-860-012

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-17-11-010-006

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
(b) Open the three latches.

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

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

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- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-17-11-010-007

- (4) Do this task: APU Power Plant Removal (Selection), TASK 49-11-00-000-801.

F. Firewall Covers Inspection Procedure

SUBTASK 49-17-11-211-001

- (1) Do a detailed inspection of the APU firewall covers for cracking.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-17-11-410-006

- (1) Do this task: APU Power Plant Installation (Selection), TASK 49-11-00-400-801.

SUBTASK 49-17-11-410-007

- (2) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

SUBTASK 49-17-11-860-013

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-17-11-860-014

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

———— **END OF TASK** ————

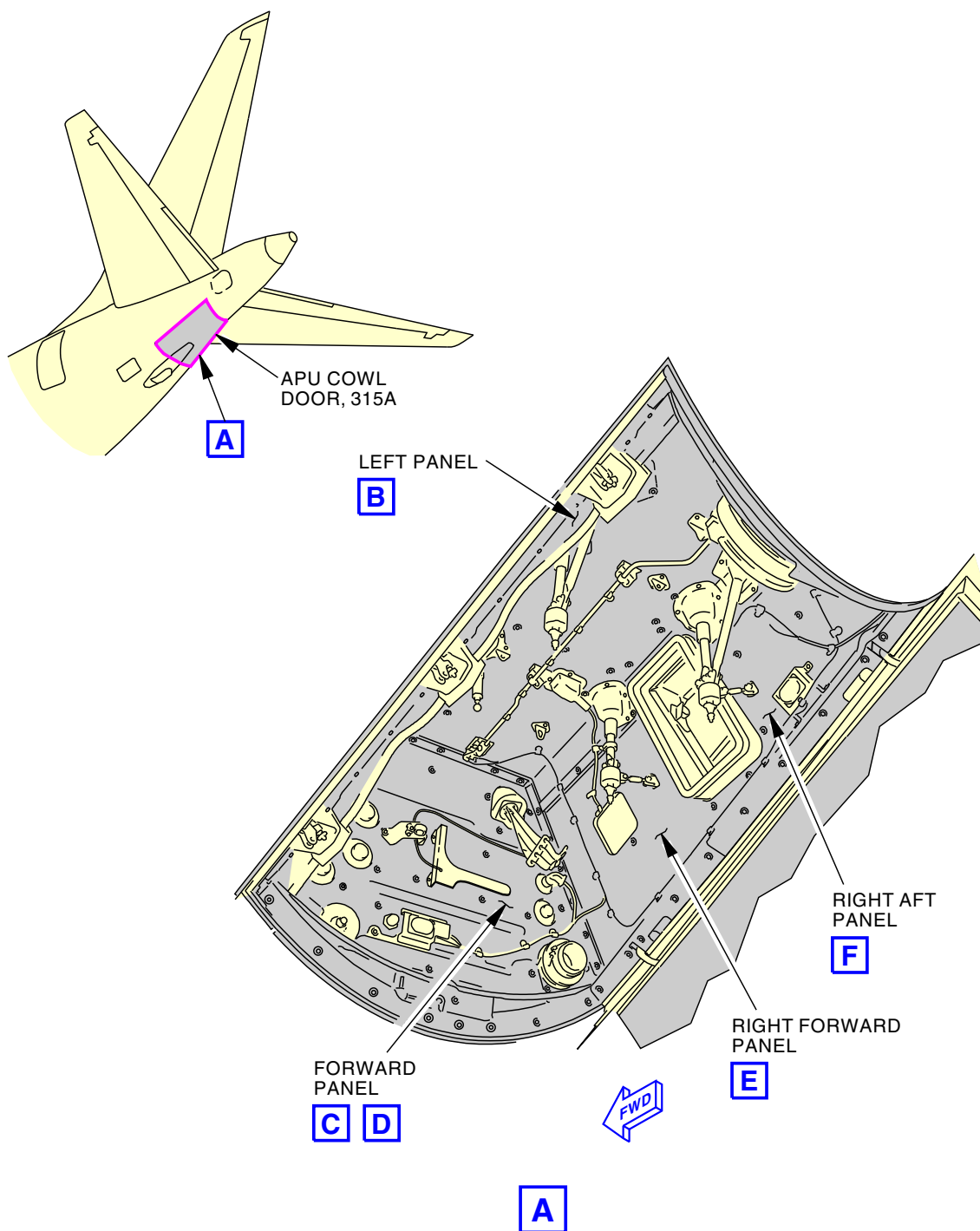
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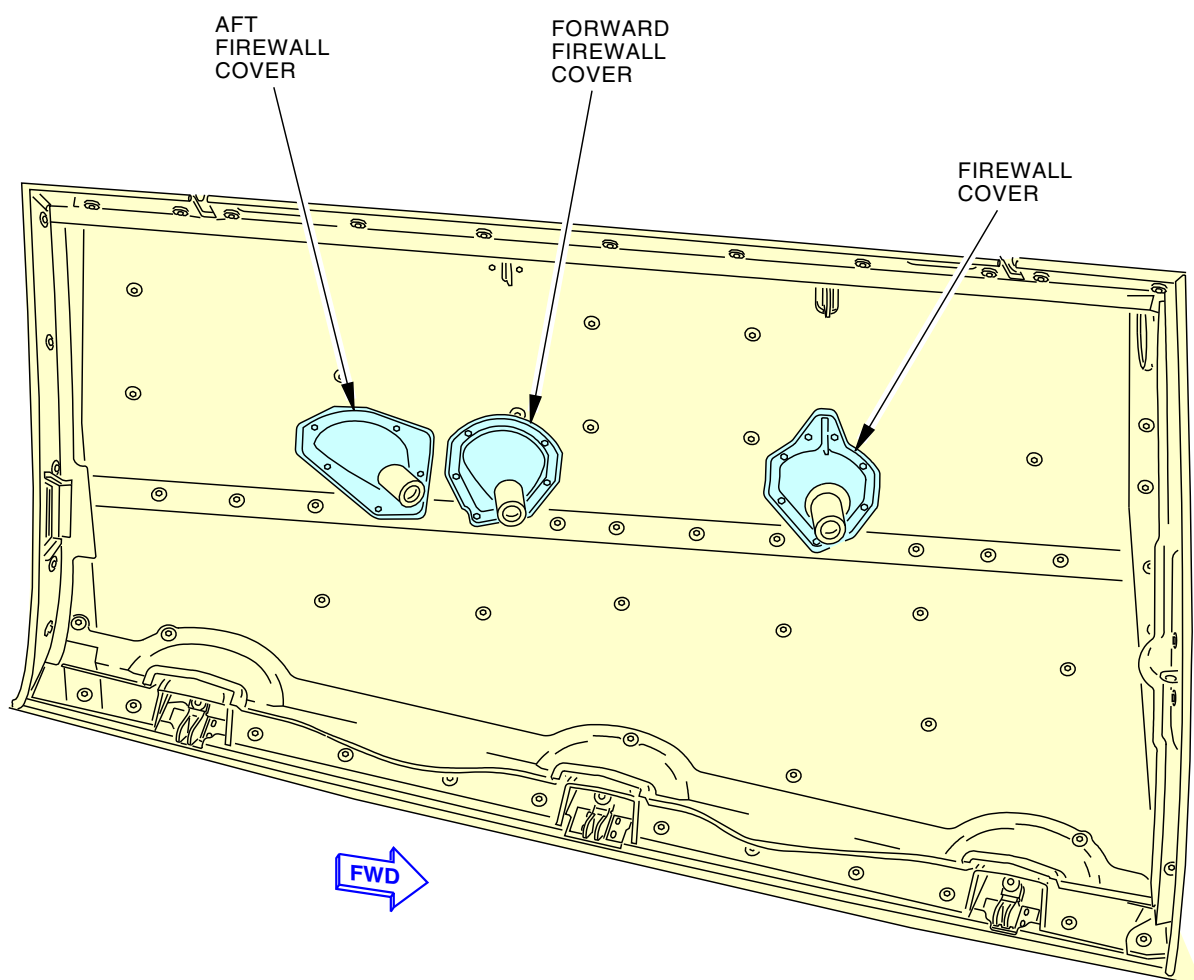
APU Firewall Covers Inspection
Figure 602/49-17-11-990-804 (Sheet 1 of 6)

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LEFT PANEL

B

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APU Firewall Covers Inspection
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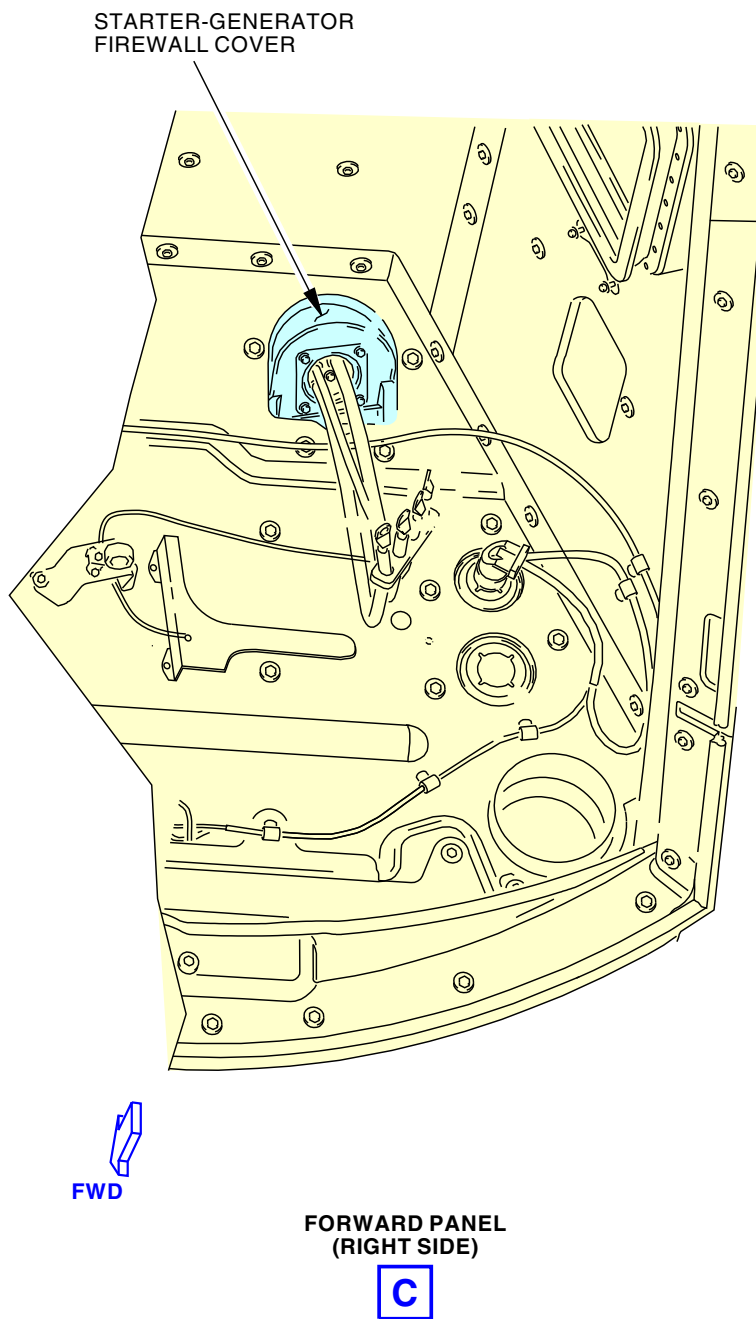
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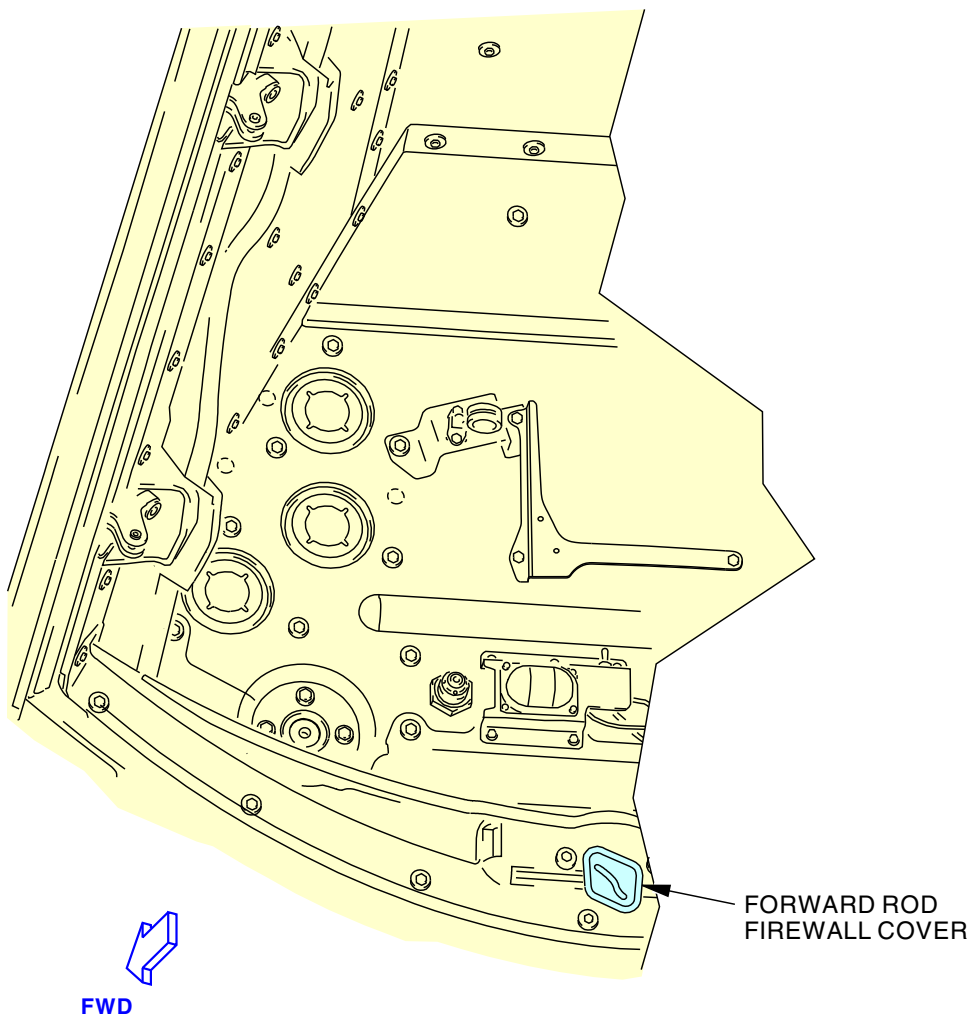
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FWD

FORWARD PANEL
(LEFT SIDE)

D

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APU Firewall Covers Inspection
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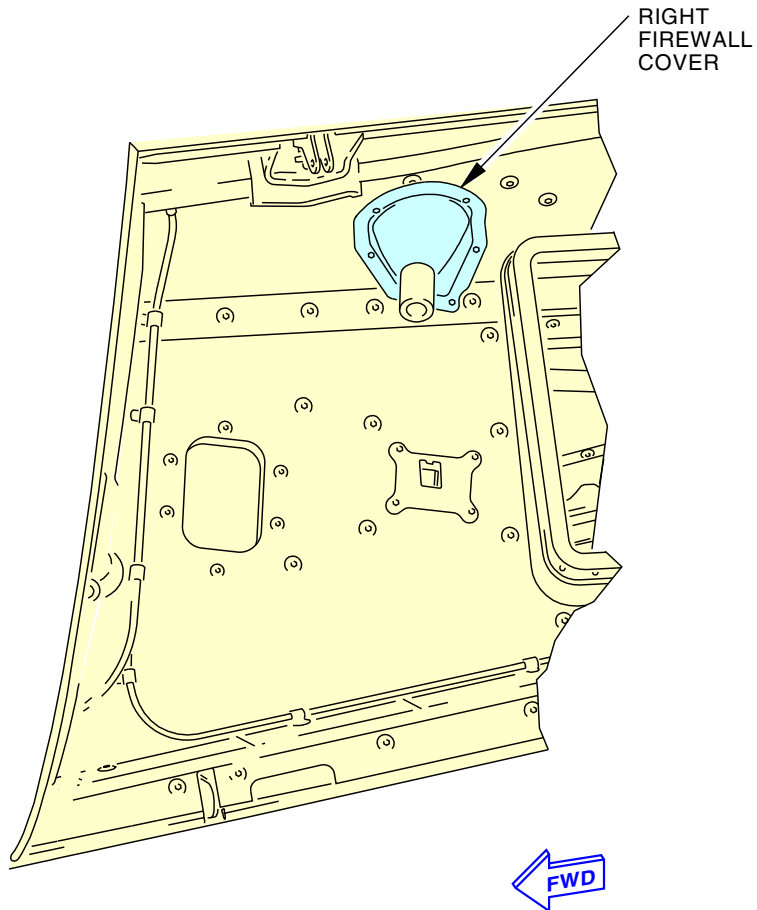
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RIGHT FORWARD PANEL

E

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APU Firewall Covers Inspection
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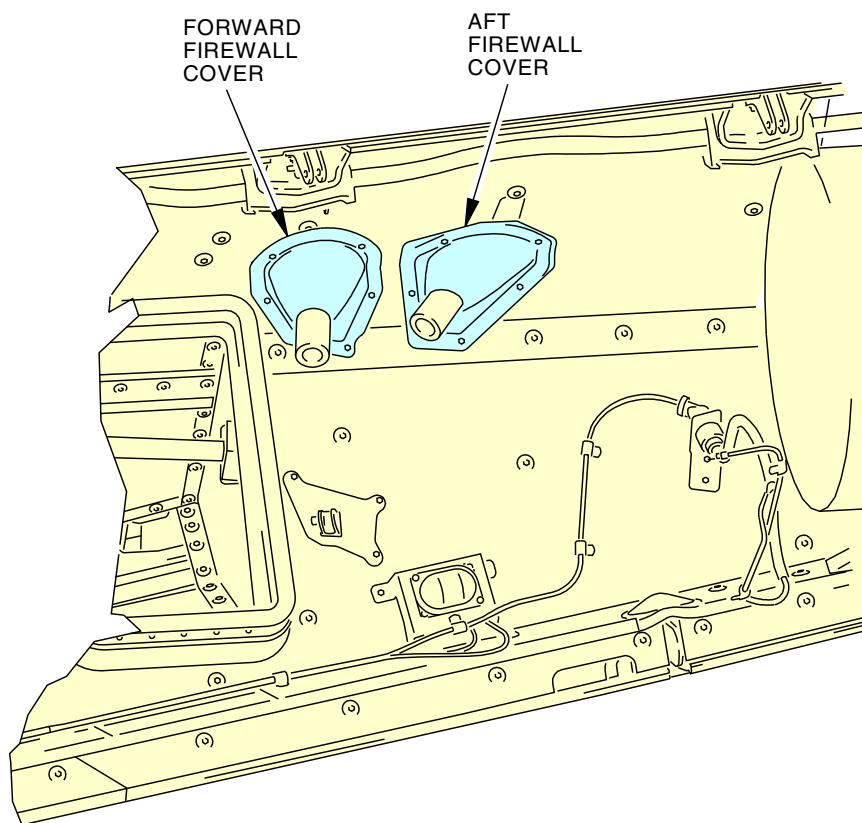
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RIGHT AFT PANEL



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APU Firewall Covers Inspection
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INSULATION PANEL - REPAIRS

1. General

- A. This procedure has the task for a repair to the insulation panel.
- B. There are seven insulation panels installed on the APU cowl door and in the APU compartment.

TASK 49-17-11-300-801

2. Repair of the APU Insulation Panel

(Figure 801)

A. References

Reference	Title
49-17-11-200-801	Insulation Panel Inspection (P/B 601)

B. Tools/Equipment

Reference	Description
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic
STD-858	Tag - DO NOT OPERATE
STD-1080	Brush - Paint

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A50396	Sealant - Dapco 2200 Primerless Silicone Firewall Sealant	BMS5-63 Type II Class B-1/2
B00130	Alcohol - Isopropyl	TT-I-735
C00944	Primer - Firewall - Dapco No. 1-100	BMS5-63 Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00744	Cloth - Emery	

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Repair

SUBTASK 49-17-11-860-007

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

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SUBTASK 49-17-11-860-008

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-17-11-010-005

- (3) To open the access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

G. Damage Limits

SUBTASK 49-17-11-800-001

- (1) Refer to the task: Insulation Panel Inspection, TASK 49-17-11-200-801, for the damage limits.

H. Insulation Panel Repair

SUBTASK 49-17-11-220-001

- (1) Measure the damaged area of the insulation panel (Figure 801).

- (a) Make sure the damaged area is in limits shown in the insulation panel inspection above.

SUBTASK 49-17-11-390-001

- (2) Do these steps to apply sealant to the damaged area (small holes and cracks as shown in Figure 801:



WARNING

DO NOT LET THE SHARP METAL EDGES CUT YOU. PUT ON GLOVES.
INJURIES TO PERSONS CAN OCCUR.

- (a) Remove the sharp metal edges and loose materials from the damaged area of the outer metal sheet.

- 1) Deburr the edges of the damaged area of the outer metal sheet with an emery cloth, G00744, or equivalent.

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BE CAREFUL THAT YOU DO NOT LET ALCOHOL TO TOUCH OR GO THROUGH THE CORE INSULATION MATERIAL. ALCOHOL AND OTHER FLUIDS WILL DECREASE THE PERFORMANCE AND MATERIAL PROPERTIES OF THE INSULATION PANEL. THIS CAN CAUSE DAMAGE TO THE INSULATION PANEL.

- (b) Clean the damaged area with alcohol, B00130, and a cotton wiper, G00034.
- (c) Dry the surface of the outer metal sheet with a cotton wiper, G00034.
NOTE: You must apply the Dapco No. 1-100 primer, C00944, and sealant, A00160, in four hours after you clean the damaged area.
- (d) Make the surface of the outer metal sheet rough with a emery cloth, G00744, or equivalent.
NOTE: The rough surface of the outer metal sheet must extend a minimum of 0.25 in. (6.35 mm) around the damaged area.
- (e) Clean the surface of the outer metal sheet again with alcohol, B00130, and a cotton wiper, G00034.
- (f) Dry the surface of the outer metal sheet with a cotton wiper, G00034.
- (g) Optional (if you will use sealant, A00160), within four hours, use a paint brush, STD-1080, to apply a thin layer of Dapco No. 1-100 primer, C00944, to the rough surface of the outer metal sheet.
 - 1) Let the Dapco No. 1-100 primer, C00944, dry for one hour, but not more than two hours.
NOTE: A chalky color on the outer metal sheet shows when the Dapco No. 1-100 primer, C00944, is dry.
- (h) Use a hardwood or plastic fillet smoothing spatula, STD-810, to apply the sealant, A00160, or Dapco 2200 firewall sealant, A50396, (which does not require primer) as follows:
 - 1) The sealant must extend a minimum of 0.25 in. (6.35 mm) from the edge of damaged area.
 - 2) The maximum thickness of the sealant over the damaged area must be approximately 0.1 in. (2.5 mm), tapering at the edges.
 - 3) Make sure that the roughed area is completely covered with sealant.
- (i) Use a hardwood or plastic fillet smoothing spatula, STD-810, to make the sealant area smooth.
- (j) Remove the unwanted sealant, A00160, from the outer metal sheet with a cotton wiper, G00034.
- (k) Let the sealant, A00160, dry for a minimum of 48 hours at 75 ±5°F (24 ±3°C).
NOTE: You can use a heat lamp to decrease the time for the sealant, A00160, to dry. The time to dry with a heat lamp is four hours at 120°F (49°C).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-17-11-410-005

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

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

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

SUBTASK 49-17-11-860-009

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-17-11-860-010

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

———— **END OF TASK** ————

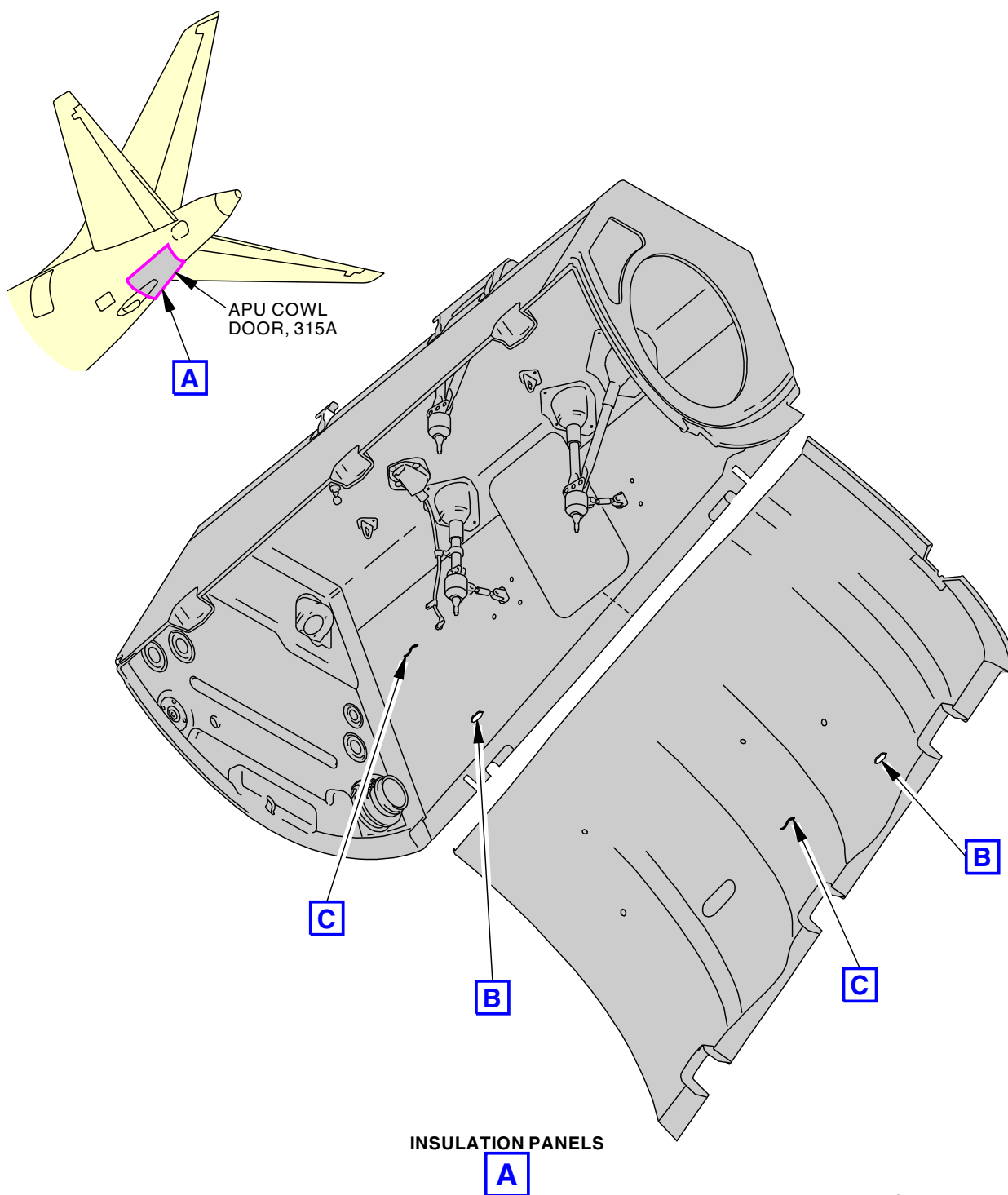
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APU Insulation Panel Repair
Figure 801/49-17-11-990-802 (Sheet 1 of 2)

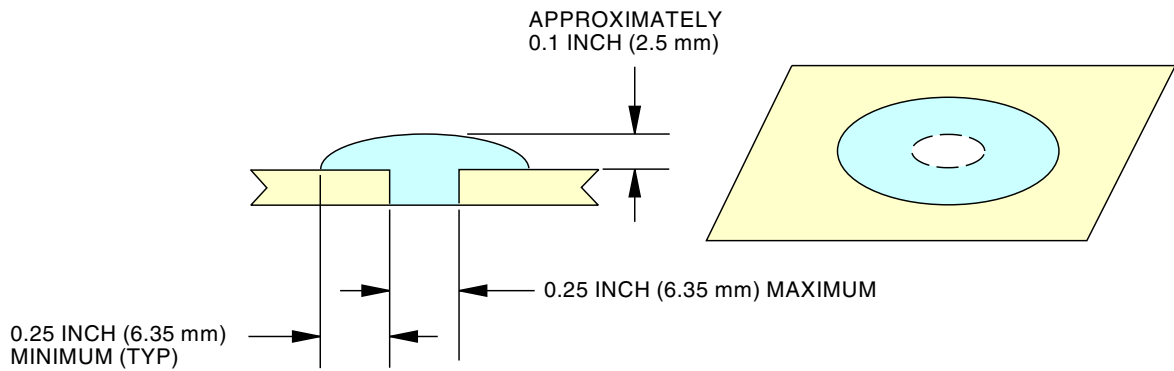
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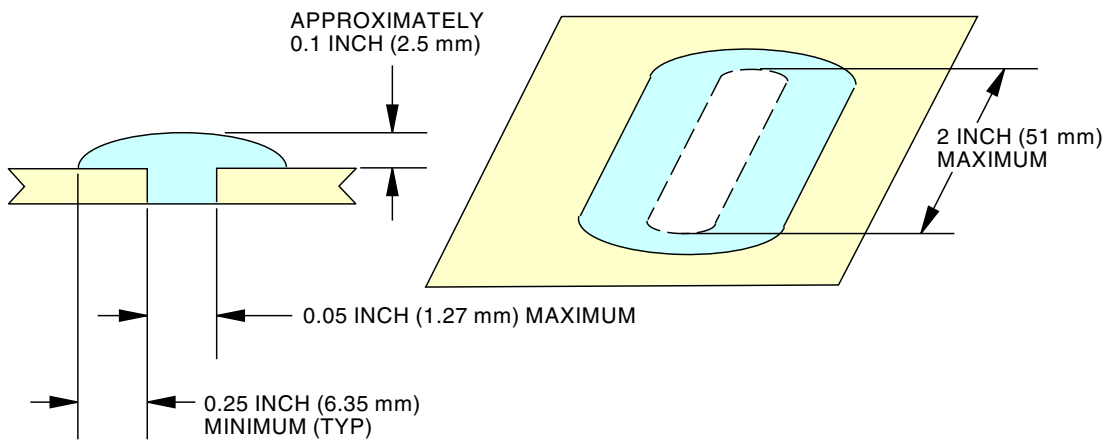
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REPAIR OF A SMALL HOLE IN
INSULATION PANEL

B



REPAIR OF A SMALL CRACK IN
INSULATION PANEL

C

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APU Insulation Panel Repair
Figure 801/49-17-11-990-802 (Sheet 2 of 2)

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APU ENGINE - MAINTENANCE PRACTICES

1. General

A. This procedure has the following tasks:

- (1) Manually Turn the APU Engine
- (2) Air-Oil Separator Adapter Stationary Seal - Removal
- (3) Air-Oil Separator Adapter Stationary Seal - Installation.

TASK 49-21-00-980-801

2. Manually Turn the APU Engine

(Figure 201)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-13964	Wrench - Torque, 200 to 1000 in-lb

B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Location Zones

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

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Procedure

SUBTASK 49-21-00-860-001

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

SUBTASK 49-21-00-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-21-00-010-001

(3) To open the access panel, do these steps:

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

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

(a) Support the APU panel (cowl door) under the center latch.

(b) Open the three latches.

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

(c) Open the APU Cowl Door, 315A.

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

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

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

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

(h) Install the two retainer pins in the two rod ends.

F. Manually Turn the APU Engine

SUBTASK 49-21-00-980-001

(1) Do these steps to manually turn the APU engine:

(a) Remove the lockwire that attaches the plug [1] to the air/oil separator adapter [3].

(b) Remove the plug [1] from the air/oil separator adapter [3].

(c) Remove the packing [2] from the plug [1].

1) Discard the packing [2].

(d) Use a 1/4 inch hexagonal driver, a six inch extension and a torque wrench, STD-13964, to turn the pinion gear of the air/oil separator adapter [3] in the clockwise or counterclockwise direction.

1) Do not use more than 372 in-lb (42 N·m) to turn the APU .

NOTE: When you turn the pinion gear of the air/oil separator adapter [3], the APU will turn in the opposite direction.

SUBTASK 49-21-00-420-001

(2) Do these steps after you complete the procedure to manually turn the APU engine:

(a) Remove the 1/4 inch hexagonal driver, six inch extension and torque wrench, STD-13964, from the pinion gear of the air/oil separator adapter [3].

(b) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.

(c) Install the packing [2] on the plug [1].

(d) Install the plug [1] in the air/oil separator adapter [3].

1) Tighten the plug [1] to 65 in-lb (7.3 N·m).

(e) Install the MS20995C20 lockwire, G50225, on the plug [1].

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-21-00-860-004

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

SUBTASK 49-21-00-410-001

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

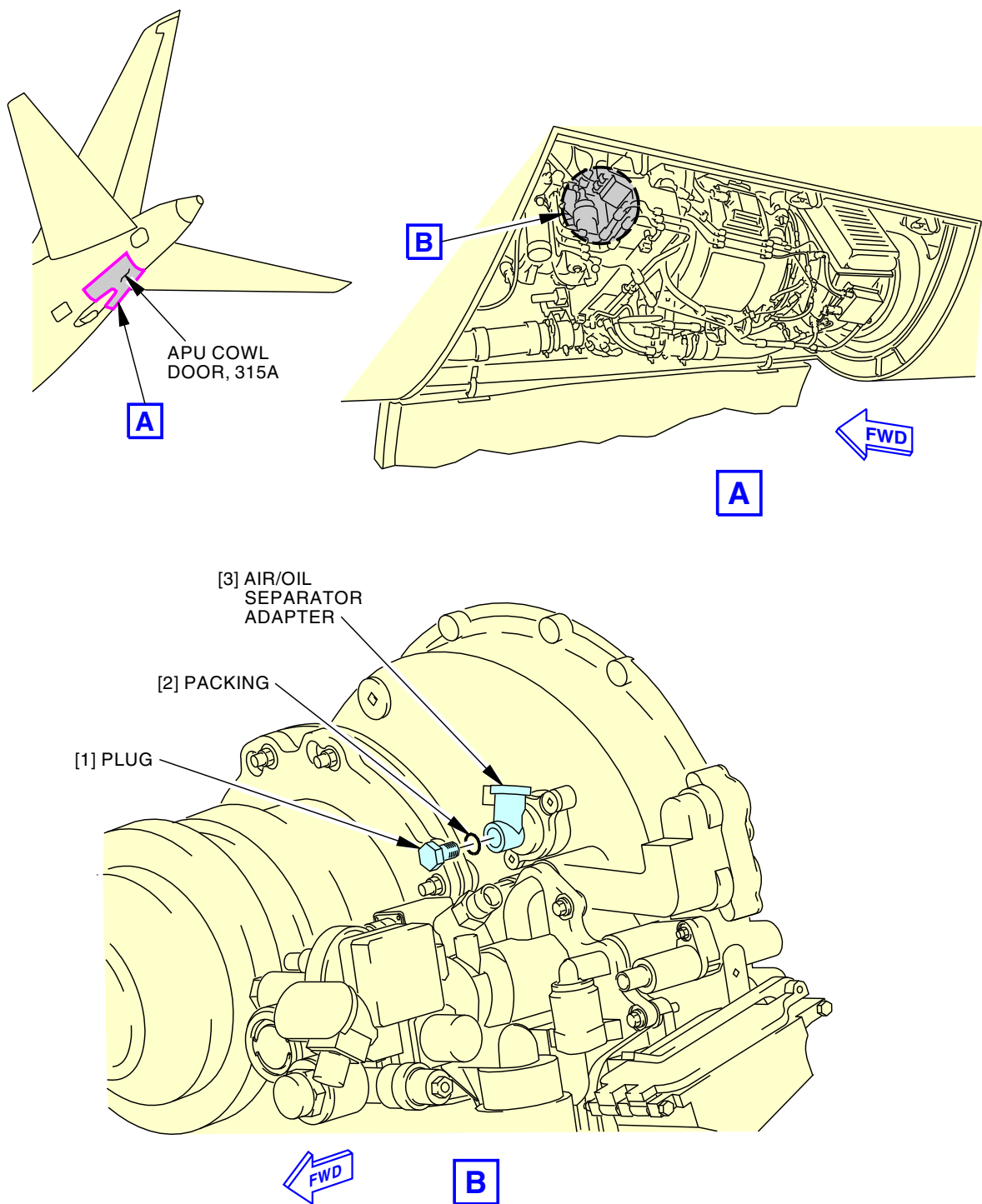
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Manually Turn the APU Engine
Figure 201/49-21-00-990-801

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TASK 49-21-00-000-801

3. **Air-Oil Separator Adapter Stationary Seal - Removal**

(Figure 202)

A. General

- (1) This task includes the steps to remove the Carbon/Stationary air-oil seal of the Auxiliary Power Unit (APU) air-oil separator adapter.

B. References

Reference	Title
49-21-00-200-803	APU Engine Compressor Cleaning (P/B 701)

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-14878	Puller - Seal Part #: 834829-1 Supplier: 99193
STD-858	Tag - DO NOT OPERATE

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Removal of the Air-Oil Separator Adapter Stationary Seal

SUBTASK 49-21-00-840-001

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

SUBTASK 49-21-00-860-020

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-21-00-010-005

- (3) To open this access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

G. Air-Oil Separator Adapter Stationary Seal Removal

SUBTASK 49-21-00-210-002

- (1) Do a visual inspection of the gearbox surface around the air/oil separator adapter for dirt or debris.

- (a) If you see dirt or debris, clean the gearbox surface area before proceeding (TASK 49-21-00-200-803).

SUBTASK 49-21-00-000-001

- (2) Do these steps to remove the air-oil separator adapter stationary seal:

- (a) If it is necessary, remove the lockwire that attaches the plug [1] to the air/oil separator adapter [3].

NOTE: Do this step only if it is necessary to replace or repair the air/oil separator adapter.

- 1) Remove the plug [1] and packing [2] from the air/oil separator adapter [3].

- (b) Remove the packing [2] from the plug [1].

NOTE: Do this step only if it is necessary to replace or repair the air/oil separator adapter.

- 1) Discard the packing [2].

- (c) Remove the bolts [5], washers [6], and air/oil separator adapter [3] from the gearbox assembly [11].

NOTE: If there is oil loss past the seal and into the vent system, only the carbon seal/stationary air-oil seal and shim pack should be replaced.

- 1) Make sure that the dirt or other contamination does not get into the drive adapter mounting pad opening.

- (d) Remove the packing [7] and packing [8].

- 1) Discard the packing [7] and packing [8].

- (e) Remove the shim [9] and carbon seal/stationary air-oil seal [10].

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- 1) To remove the carbon seal/stationary air-oil seal [10] use seal puller, COM-14878, or an equivalent.
 - 2) Discard the carbon seal/stationary air-oil seal [10].
- (f) Do a visual inspection of the seal disk [12] for signs of damage or excessive rough surface.

NOTE: If the seal disk is damaged or rough it must be replaced or repaired prior to installation of the carbon seal/stationary air-oil seal.

- 1) If it is necessary, remove the seal disk [12].
 - a) Discard the seal ring [13].

———— **END OF TASK** ————

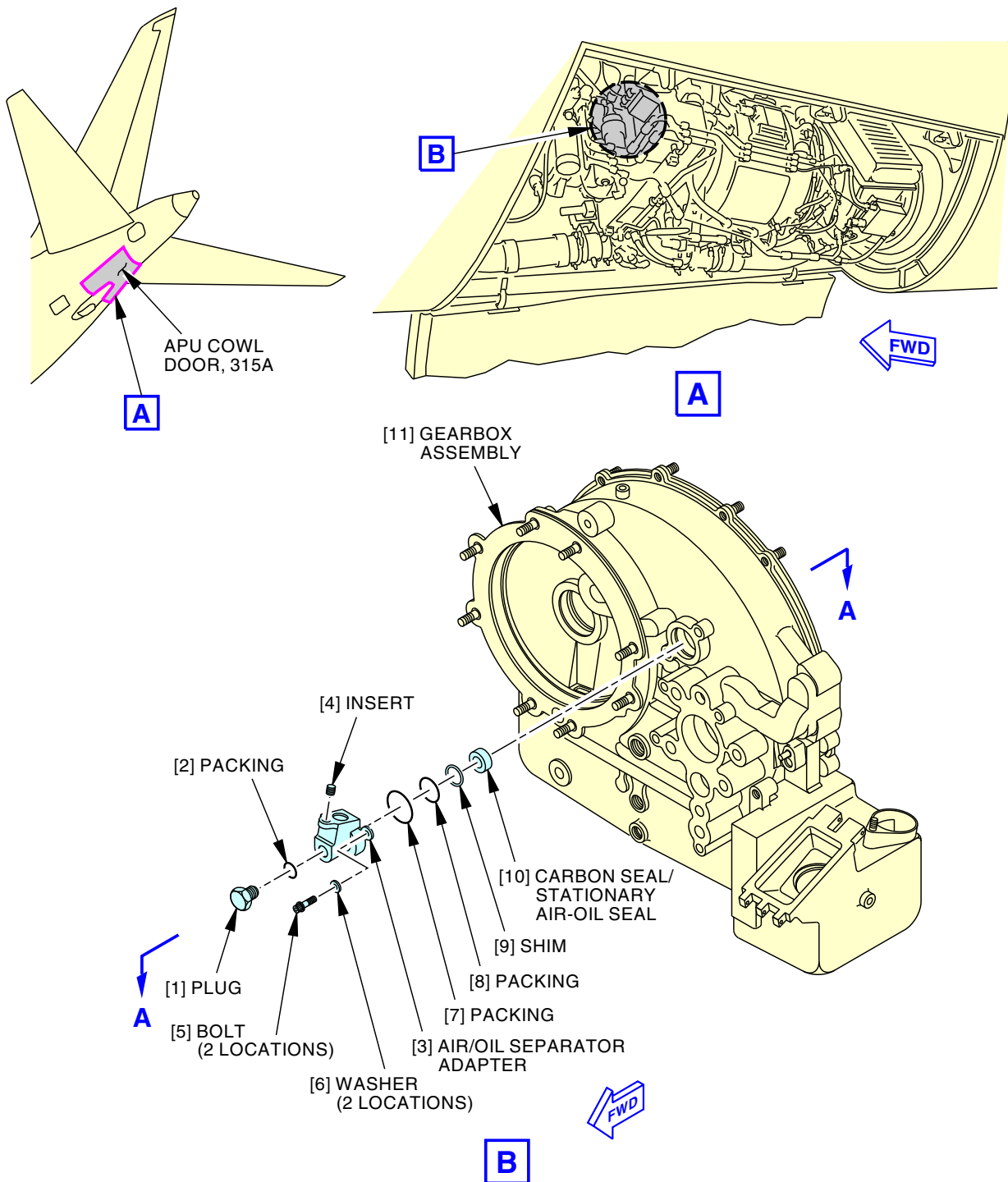
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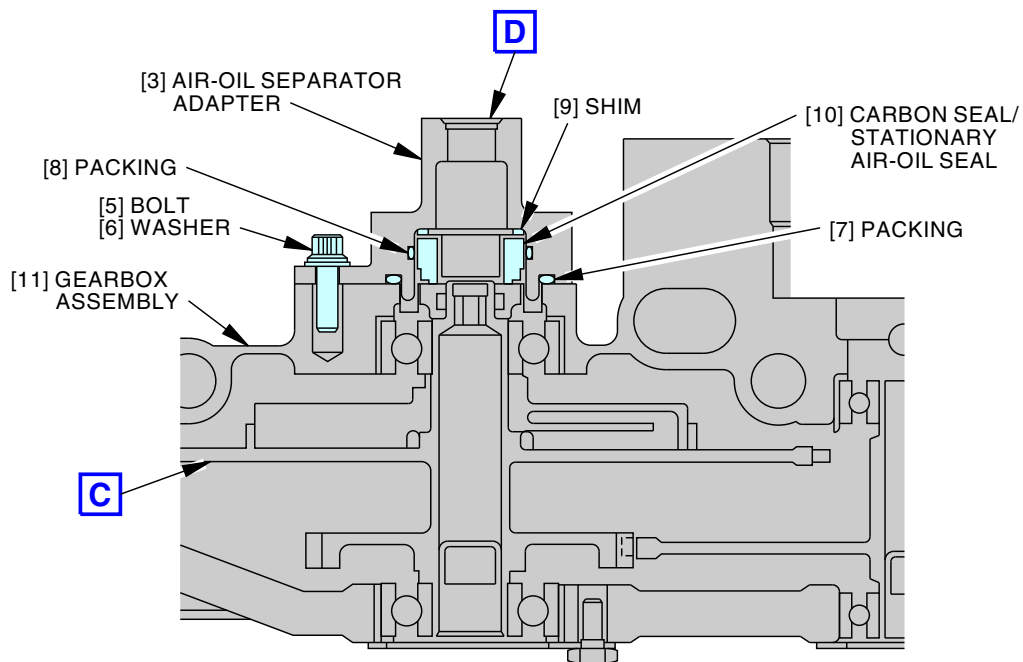
Air-Oil Separator Adapter Stationary Seal Installation
Figure 202/49-21-00-990-804 (Sheet 1 of 2)

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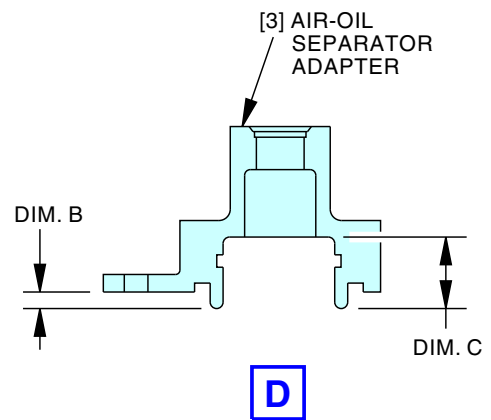
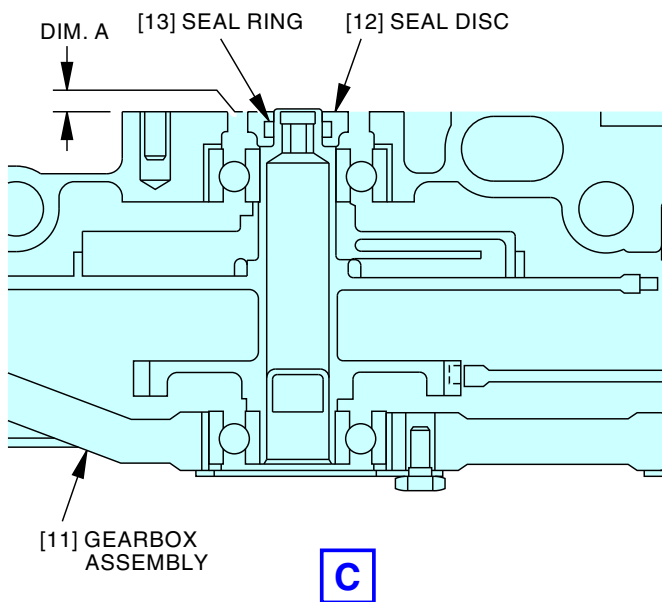
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A-A



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Air-Oil Separator Adapter Stationary Seal Installation
Figure 202/49-21-00-990-804 (Sheet 2 of 2)

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TASK 49-21-00-400-801

4. Air-Oil Separator Adapter Stationary Seal - Installation

(Figure 202)

A. General

- (1) This task includes the steps to install the carbon/stationary air-oil seal of the Auxiliary Power Unit (APU) air-oil separator adapter.

B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Tools/Equipment

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-14877	Driver - Shaft Part #: 834824-1 Supplier: 99193
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Air-Oil Separator Adapter Stationary Seal Installation

SUBTASK 49-21-00-860-021

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-21-00-400-001

- (2) Do these steps to install the air-oil separator adapter stationary seal:

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- (a) If the seal disk [12] was removed, do these steps:
 - 1) Apply compound, C00528, on the seal ring [13].
 - 2) Install the seal ring [13] in the seal disk [12].
 - 3) Install the seal disk [12] to the gearbox assembly [11] with the seal ring [13] installed.
- (b) Determine the shim [9] pack necessary for the carbon seal/stationary air-oil seal [10], as follows:
 - 1) Measure from the face of the gearbox assembly [11] to the face of the seal disk [12], record as Dimension A.
 - 2) Measure from the top of the air/oil separator adapter [3] to the face of the air/oil separator adapter flange, record as Dimension B.
 - 3) Measure from the top of the air/oil separator adapter [3] to the air-oil separator adapter seal land, record as Dimension C.
 - 4) Make sure that all dimensions are measured per inch (mm).
- (c) Calculate the necessary shims as follows:
 - 1) Necessary shim [9] pack = Dimension A - Dimension B + Dimension C - 0.45 in. (11.43 mm).
- (d) Lubricate the new packing [7] and new packing [8] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- (e) Install the packing [7], packing [8], shim [9] pack, and carbon seal/stationary air-oil seal [10] onto the air/oil separator adapter [3].
 - 1) To install carbon seal/stationary air-oil seal use shaft driver, COM-14877, or an equivalent.
- (f) Install the bolts [5], washers [6], and air/oil separator adapter [3].
 - 1) Tighten the bolts [5] to 50 in-lb (5.6 N·m).
- (g) If it is necessary, lubricate the packing [2] with Santovac 5 lubricant, D00341, or grease, D00504, install the packing [2] on the plug [1] onto the air/oil separator adapter [3].

NOTE: Do this step only if the air/oil separator adapter was replaced or repaired.

 - 1) Tighten the plug [1] to 65 in-lb (7.3 N·m).
- (h) Install MS20995C20 lockwire, G50225, on the plug [1].

SUBTASK 49-21-00-860-022

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-21-00-860-023

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

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SUBTASK 49-21-00-710-001

- (5) Do these steps to start and operate the APU:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Check the APU oil level, do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.
 - (c) During the APU operation, examine the APU for signs of oil leakage.

SUBTASK 49-21-00-360-001

- (6) If you find oil leakage, do these steps to repair the leakage:
- (a) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - (b) Install a DO NOT OPERATE tag, STD-858, to the APU master switch, on the P5 overhead panel.
 - (c) Repair the cause of the oil leakage.
 - (d) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 overhead panel.
 - (e) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (f) During the APU operation, examine the APU for signs of the oil leakage.
 - (g) If the oil leakage is found, do the leakage repair again.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-410-005

- (1) To close this access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (g) Close the three latches.

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

————— END OF TASK —————

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APU ENGINE - INSPECTION/CHECK

1. General

A. This procedure has these tasks to do an inspection of the internal parts of the APU engine. To do these inspections, you use a borescope to see the APU engine. These inspections are recommended when the performance of the APU engine decreases. You can see the performance data of the APU engine on the maintenance page for the APU BITE TEST (TASK 49-61-00-700-801).

- (1) APU Engine Inspection
- (2) First Stage Stator and First Stage Turbine Inspection.

TASK 49-21-00-200-801

2. APU Engine Borescope Inspection

(Figure 601)

A. General

- (1) This borescope inspection is intended for troubleshooting the APU when recommended by the Fault Isolation Manual (FIM).
- (2) If the APU provides bleed air, electrical power and does not exceed the operational limits identified in the AMM, this inspection is not necessary (TASK 49-11-00-710-801).

B. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)
49-11-00-710-801	APU Operation Limits (P/B 201)
49-21-00-980-801	Manually Turn the APU Engine (P/B 201)
49-31-14-000-801	Fuel Nozzle Removal (P/B 401)
49-31-14-400-801	Fuel Nozzle Installation (P/B 401)
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	Igniter Plug Installation (P/B 401)
49-52-12-000-801	Inlet Guide Vane (IGV) Actuator Removal (P/B 401)
49-52-12-400-801	Inlet Guide Vane (IGV) Actuator Installation (P/B 401)
49-71-21-000-801	Exhaust Gas Temperature Thermocouple Removal (P/B 401)
49-71-21-400-801	Exhaust Gas Temperature Thermocouple 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-4316	Fiberscope - Flexible Borescope Part #: IF2D5 Supplier: 32212 Part #: IF6C5X1-8 Supplier: 32212 Opt Part #: 7110561 Supplier: 32212
COM-4964	Light Source - Borescope Part #: ILH-2A Supplier: 32212 Opt Part #: 7502152 Supplier: 32212

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(Continued)

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-21-01-01-100	SIA ALL

F. Location Zones

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

G. Access Panels

Number	Name/Location
315A	APU Cowl Door

H. Prepare for the Inspection

SUBTASK 49-21-00-860-005

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

SUBTASK 49-21-00-910-001

- (2) Install a DO NOT OPERATE tag, STD-858 on the APU master switch.

SUBTASK 49-21-00-860-006

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-21-00-010-002

- (4) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
(b) Open the three latches.

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

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

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-21-00-010-004

- (5) Remove the access door [4] as follows:

NOTE: Examination of each blade [14] on the load compressor impeller [13] requires that you open the access door [4].

- (a) Loosen the eight captive screws [3] that attach the access door [4] to the compressor inlet plenum.
- (b) Remove the access door [4] from the compressor inlet plenum.

NOTE: A lanyard is attached to the access door [4] to keep the access door [4] with the APU.

I. APU Engine Borescope Inspection

SUBTASK 49-21-00-940-001

- (1) Prepare the fiberscope, COM-4316, and the light source, COM-4964 or equivalent, for inspection of the internal parts of the APU.

SUBTASK 49-21-00-290-010

- (2) Examine the compressor housing [32] for cracks on the scroll housing situated near the exit duct:
 - (a) Cracks will not require action unless they are intersecting or have resulted in material loss. See Figure 601 (Sheet 18) for an example of a permitted crack.
 - (b) Replace the APU if you found damage that was not permitted (APU Power Plant Removal (Selection), TASK 49-11-00-000-801 and APU Power Plant Installation (Selection), TASK 49-11-00-400-801).

SUBTASK 49-21-00-290-001

- (3) Examine the vanes [17] of the load compressor diffuser [16], the blades [14] of the load compressor impeller [13], and the load compressor scroll housing bridges as follows:

NOTE: Examine the trailing edge of each blade [14] on the load compressor impeller [13] through the compressor housing boss [5]. Examine the leading edge of each blade [14] on the load compressor impeller [13] through the access door [4] at the bottom of the compressor inlet plenum.

 - (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
 - (b) Remove the lockwire that attaches the plug [1] to the compressor housing boss [5].
 - (c) Remove the plug [1] from the compressor housing boss [5].
 - (d) Remove the packing [2] from the plug [1].
 - 1) Discard the packing [2].
 - (e) Put the fiberscope, COM-4316, through the compressor housing boss [5] and into the area of the load compressor diffuser [16].
 - (f) Examine the load compressor scroll housing bridges for damage:

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- 1) Damage, cracks, or missing material to the scroll housing bridges is permitted. See Figure 601 (Sheet 17) for an example of permitted damage.
- (g) Look at each vane [17] for these conditions:
 - 1) Bucket-shaped erosion damage
 - a) Not Permitted.
 - 2) Nicks and small erosion edge damage on the leading edge
 - a) Permitted.
 - 3) Cracks in the brazed fillet area and across the vane
 - a) Permitted.
 - 4) Vane discoloration
 - a) Permitted.
- (h) Put the fiberscope, COM-4316, between the vanes [17] of the load compressor diffuser [16] to get access to the blades [14] of the load compressor impeller [13].



MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE LOAD COMPRESSOR IMPELLER. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- (i) Look at the trailing edge and the surface of each blade [14] for these conditions:
 - 1) Missing pieces
 - a) Not permitted.
 - 2) Cracks on the trailing edge, shroud line or hub
 - a) Not permitted.
 - 3) Rub damage between the impeller and shroud or blade discoloration
 - a) Permitted.
 - 4) Shroud abradable material on the trailing edge
 - a) Permitted.
 - 5) Nicks and small erosion edge damage on the trailing edge
 - a) Permitted.
- (j) Replace the APU if you find damage that is not permitted (TASK 49-11-00-000-801 and TASK 49-11-00-400-801).
- (k) Slowly remove the fiberscope, COM-4316, from the load compressor diffuser [16] and compressor housing boss [5].
- (l) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
- (m) Install the packing [2] on the plug [1].
- (n) Install the plug [1] in the compressor housing boss [5].
- (o) Tighten the plug [1] to 80 in-lb (9.0 N·m).
- (p) Install the MS20995C32 lockwire, G01048, on the plug [1].



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SUBTASK 49-21-00-290-002

- (4) Examine the inlet guide vanes [15] and the blades [14] of the load compressor impeller [13]:

NOTE: You can examine the trailing edge of each blade [14] on the load compressor impeller [13] through the compressor housing boss [5]. You can examine the leading edge of each blade [14] on the load compressor impeller [13] through the access door [4] at the bottom of the compressor inlet plenum.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Do this task: Inlet Guide Vane (IGV) Actuator Removal, TASK 49-52-12-000-801.
- (c) Use your hands to pull the linkage for the inlet guide vanes [15] into the APU until the linkage stops and the inlet guide vanes [15] are fully closed.
- (d) Put the fiberscope, COM-4316, through the compressor inlet duct and inlet housing to the inlet guide vanes [15].
- (e) Look at each of the closed inlet guide vanes [15] for these conditions:
 - 1) Missing vane(s)
 - a) Not permitted.
 - 2) Bent vane
 - a) Not permitted.
 - 3) Cracks on the vane
 - a) Not permitted.
 - 4) Hit damage on all 16 IGV tips
 - a) Not permitted.
 - 5) Nicks on the leading edge
 - a) Permitted.
 - 6) Vane discoloration is permitted.
 - a) Permitted.
- (f) Use your hands to push the linkage for the inlet guide vanes [15] into the APU until the linkage stops and the inlet guide vanes [15] are fully open.
- (g) Look at each of the open inlet guide vanes [15] for these conditions:
 - 1) Missing vane(s)
 - a) Not permitted.
 - 2) Bent vane
 - a) Not permitted.
 - 3) Cracks on the vane
 - a) Not permitted.
 - 4) Hit damage on all 16 IGV tips
 - a) Not permitted.
 - 5) Nicks on the leading edge
 - a) Permitted.
 - 6) Vane discoloration
 - a) Permitted.

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- (h) Put the fiberscope, COM-4316, through the inlet guide vanes [15].

NOTE: This will you access the blade [14].



CAUTION

MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE LOAD COMPRESSOR IMPELLER. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- (i) Look at the leading edge and the surface of each blade [14] for these conditions:
- 1) More than two bent inducer blade tips
 - a) Not permitted.
 - 2) Missing pieces
 - a) Not permitted.
 - 3) Cracks on the leading edge, fillets and/or hub
 - a) Not permitted.
 - 4) Nicks and small erosion edge damage on the leading edge
 - a) Permitted.
 - 5) Blade discoloration
 - a) Permitted.
- (j) Replace the APU if you find damage that is not permitted (TASK 49-11-00-000-801 and TASK 49-11-00-400-801).
- (k) Slowly remove the fiberscope, COM-4316, from the compressor inlet plenum and inlet duct.
- (l) Do this task: Inlet Guide Vane (IGV) Actuator Installation, TASK 49-52-12-400-801.

SUBTASK 49-21-00-290-003

- (5) Examine the blades [19] of the engine compressor impeller [18]:

NOTE: You will examine the leading edge of each blade [19] of the engine compressor impeller [18] through the access door [4] opening at the bottom of the compressor inlet plenum.

NOTE: There is no access to the trailing edge of the blades [19] with the APU installed in the APU compartment.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Put the fiberscope, COM-4316, through the compressor inlet duct access door and perforated inlet housing to examine the blades [19] for the engine compressor impeller [18].



CAUTION

MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE ENGINE COMPRESSOR IMPELLER. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- (c) Look at the leading edge and the surface of each blade [19] for these conditions:
- 1) Cracks on the leading edge, fillets and hub
 - a) Not permitted.
 - 2) Missing pieces

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- a) Not permitted.
- 3) Rub damage between the impeller and shroud
 - a) Permitted.
- 4) Bent inducer main and splitter blade tip for one blade only
 - a) Permitted.
- 5) Nicks and small erosion edge damage on the leading edge
 - a) Permitted.
- 6) Blade discoloration
 - a) Permitted.
- (d) Put the fiberscope, COM-4316, through the engine compressor impeller [18] to examine the engine compressor diffuser vanes [17].
- (e) Look at each vane [17] on the engine compressor diffuser for these conditions:
 - 1) Bucket-shaped erosion damage
 - a) Not permitted.
 - 2) Nicks and small erosion edge damage on the leading edge
 - a) Permitted.
 - 3) Cracks in the brazed fillet area and across the vane
 - a) Permitted.
 - 4) Vane discoloration
 - a) Permitted.
- (f) Replace the APU if you find damage that is not permitted (TASK 49-11-00-000-801 and TASK 49-11-00-400-801).
- (g) Slowly remove the fiberscope, COM-4316, from the compressor inlet plenum.

SUBTASK 49-21-00-290-004

- (6) Examine the combustion chamber [25] and the 10 fuel nozzles [30] through the igniter plug boss [6] as follows:

NOTE: You can get access to the combustion chamber [25] and the 10 fuel nozzles [30] through the igniter plug boss [6] or through the fuel nozzle port [9] on the combustor housing.

- (a) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.



MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- (b) Put the fiberscope, COM-4316, through the igniter plug boss [6].
- (c) Look at the combustion chamber [25] and 10 fuel nozzles [30] for these conditions:
 - 1) Hot spots with oxidation or erosion damage
 - a) Not permitted.
 - 2) Fuel nozzle shroud [31] with cracks, distortion or burn-through
 - a) Replace the shroud [31] (TASK 49-31-14-000-801 and TASK 49-31-14-400-801).

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- 3) Missing thermal barrier coating
 - a) Permitted.
- 4) Cracks between holes
 - a) Permitted.
- 5) Panel discoloration
 - a) Permitted.
- (d) Replace the APU if you find damage that is not permitted (TASK 49-11-00-000-801 and TASK 49-11-00-400-801).
- (e) Slowly remove the fiberscope, COM-4316, from the igniter plug boss [6].
- (f) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.

SUBTASK 49-21-00-290-008

- (7) Do these steps to examine the combustion chamber [25] and the 10 fuel nozzles [30] through the fuel nozzle port [9] on the combustor housing:

- (a) Do this task: Fuel Nozzle Removal, TASK 49-31-14-000-801.

NOTE: You can remove up to five fuel nozzles at the same time. Do not remove all the fuel nozzles. If you do, the combustor liner will not align with the fuel nozzles on the combustor housing.



MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- (b) Put the fiberscope, COM-4316, through the fuel nozzle port [9].
 - (c) Look at the combustion chamber [25] and 10 fuel nozzles [30] for these conditions:
 - 1) Hot spots with oxidation or erosion damage
 - a) Not permitted.
 - 2) Fuel nozzle shroud [31] with cracks, distortion or burn-through
 - a) Replace the shroud [31] (TASK 49-31-14-000-801 and TASK 49-31-14-400-801).
 - 3) Missing thermal barrier coating
 - a) Permitted.
 - 4) Cracks between holes
 - a) Permitted.
 - 5) Panel discoloration
 - a) Permitted.
 - (d) Replace the APU if you find damage that is not permitted (TASK 49-11-00-000-801 and TASK 49-11-00-400-801).
 - (e) Slowly remove the fiberscope, COM-4316, from the fuel nozzle port [9].
 - (f) Do this task: Fuel Nozzle Installation, TASK 49-31-14-400-801.



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SUBTASK 49-21-00-290-005

- (8) Examine the blades [22] of the second stage turbine [23] as follows:

NOTE: You can get access to the blades [22] through the fitting boss [12] on the turbine exhaust port or through the port for the EGT thermocouple 1 [7] or the port for the EGT thermocouple 2 [8].

NOTE: There is no access to the second stage stator vanes with the borescope.

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Do these steps to examine the blades [22] of the second stage turbine [23] through the fitting boss [12] on the turbine exhaust port:
- 1) Disconnect the vent tube [10] from the fitting [11] on the turbine exhaust port.
 - 2) Remove the fitting [11].



CAUTION

MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 3) Put the fiberscope, COM-4316, through the fitting boss [12].



CAUTION

MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE SECOND STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- 4) Look at each blade [22] for these conditions:
- a) Missing blade
<1> Not permitted.
 - b) Cracks
<1> Not permitted.
 - c) Nicks on the leading edge, trailing edge and blade tip
<1> Permitted.
 - d) Erosion damage on the blade tip
<1> Permitted.
 - e) Missing flow discourager on the leading edge
<1> Permitted.
 - f) Blade discoloration
<1> Permitted.
- 5) Replace the APU if you find damage that is not permitted (TASK 49-11-00-000-801 and TASK 49-11-00-400-801).
- 6) Slowly remove the fiberscope, COM-4316, from the fitting boss [12].
- 7) Install the fitting [11] in the fitting boss [12] on the turbine exhaust port.
- 8) Connect the vent tube [10] to the fitting [11].

SUBTASK 49-21-00-290-009

- (9) Do these steps to examine the blades [22] of the second stage turbine [23] through the port for the EGT thermocouple 1 [7] or the port for the EGT thermocouple 2 [8]:

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- (a) Remove one EGT thermocouple (TASK 49-71-21-000-801).

NOTE: It is necessary to remove only one of the two EGT thermocouples.

NOTE: There is no access to the second stage stator vanes with the borescope.



CAUTION

MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- (b) Put the fiberscope, COM-4316, through the port for the EGT thermocouple 1 [7] or the port for the EGT thermocouple 2 [8].



CAUTION

MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE SECOND STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- (c) Look at each blade [22] for these conditions:
- 1) Missing blade
 - a) Not permitted.
 - 2) Cracks
 - a) Not permitted.
 - 3) Nicks on the leading edge, trailing edge and blade tip
 - a) Permitted.
 - 4) Erosion damage
 - a) Permitted.
 - 5) Missing flow discourager on the leading edge is permitted.
 - a) Permitted.
 - 6) Blade discoloration
 - a) Permitted.
- (d) Replace the APU if you find damage that is not permitted (TASK 49-11-00-000-801 and TASK 49-11-00-400-801).
- (e) Slowly remove the fiberscope, COM-4316, from the port for the EGT thermocouple 1 [7] or port for the EGT thermocouple 2 [8].
- (f) Do this task: Exhaust Gas Temperature Thermocouple Installation, TASK 49-71-21-400-801.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-410-004

- (1) Install the access door [4] as follows:
- (a) Install the access door [4] on the compressor inlet plenum.

NOTE: Make sure that there is a lanyard that attaches the access door [4] to the APU.
 - (b) Tighten the eight captive screws [3] that attach the access door [4] to the compressor inlet plenum.

SUBTASK 49-21-00-860-019

- (2) Complete the procedure to manually turn the APU engine (TASK 49-21-00-980-801).

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SUBTASK 49-21-00-410-002

- (3) To close the access panel, do these steps:

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

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

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

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

SUBTASK 49-21-00-860-007

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-21-00-860-008

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

————— **END OF TASK** —————

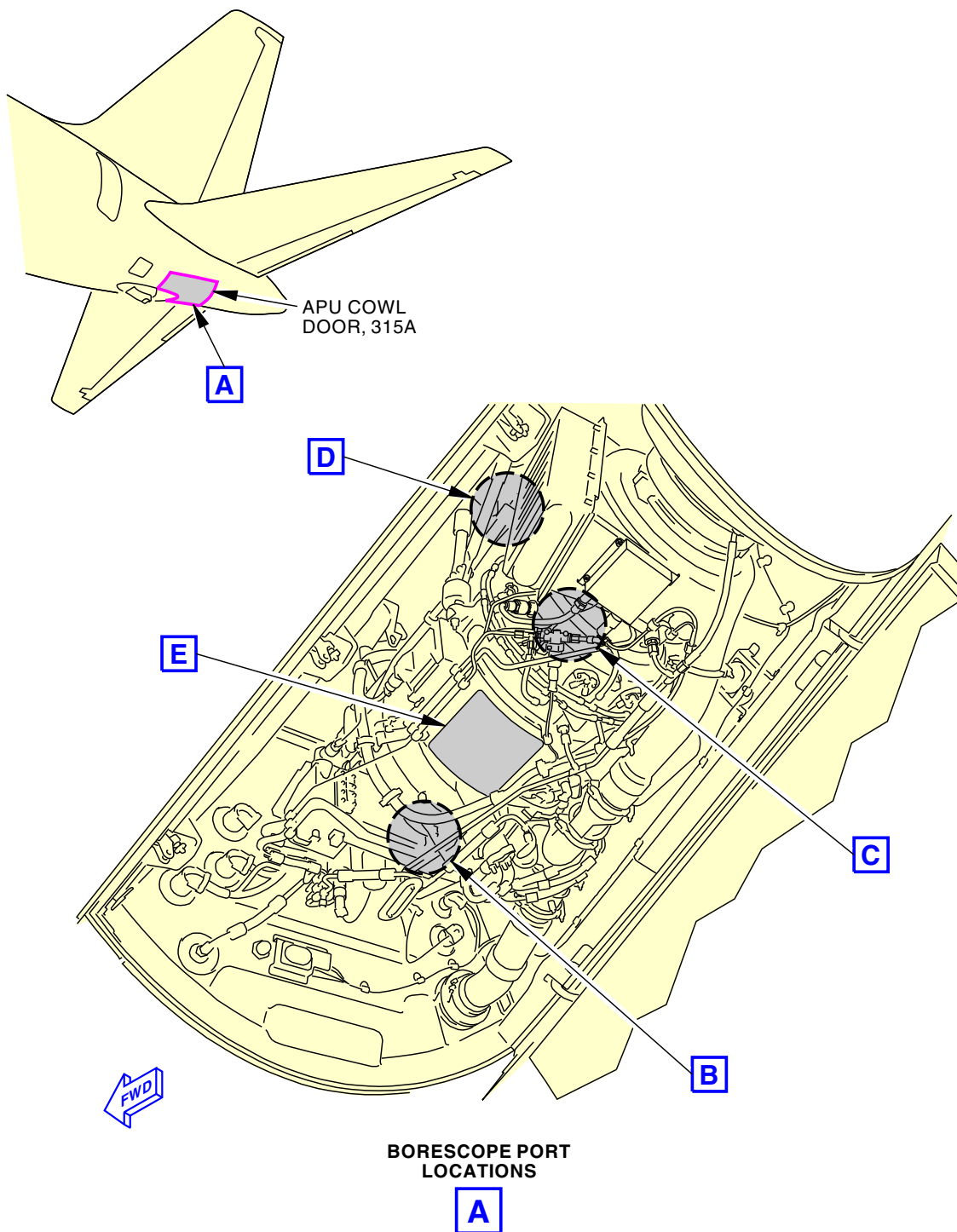
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415519 S00061538019_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 1 of 20)

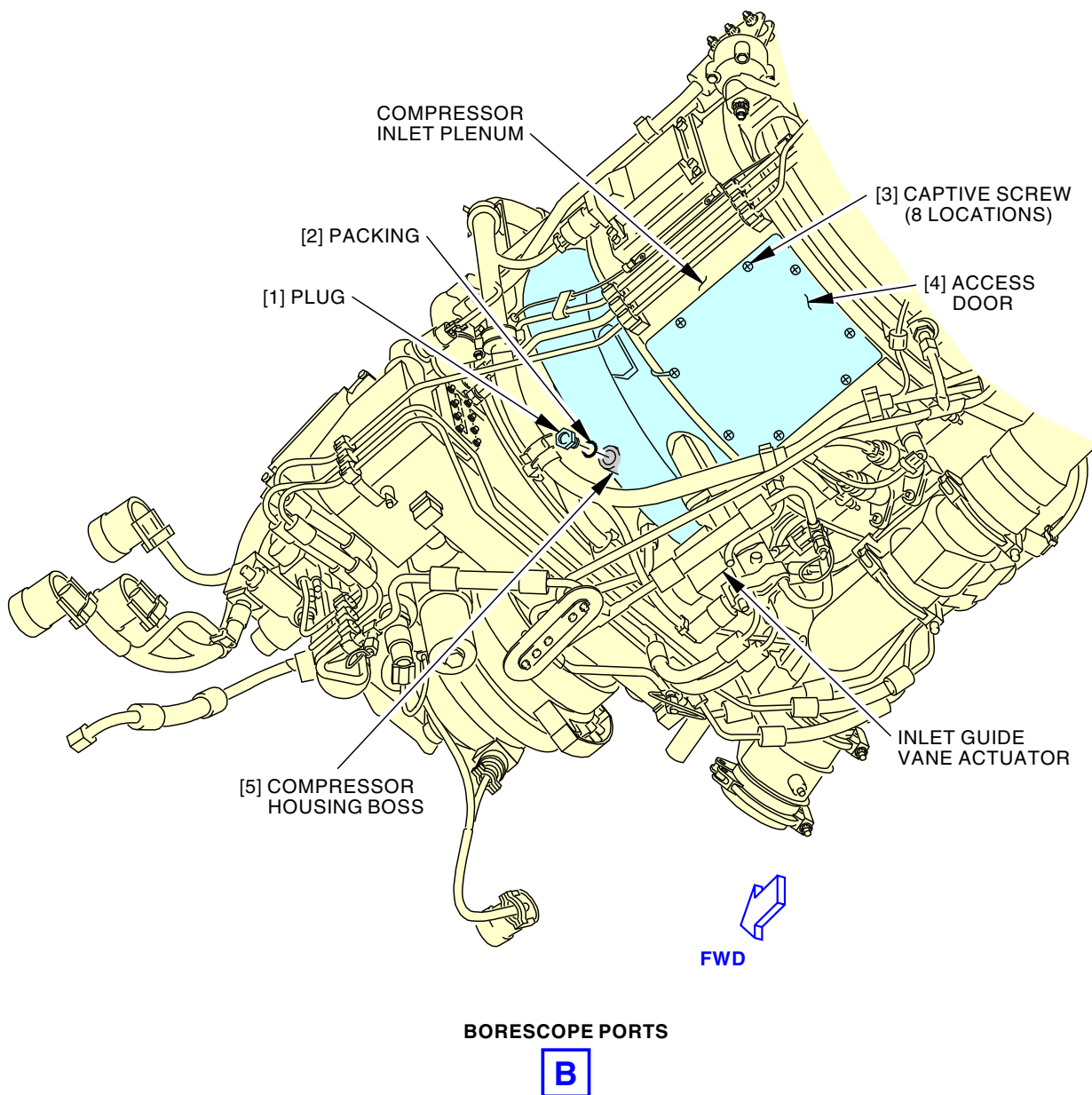
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415520 S00061538020_V3

APU Engine Inspection
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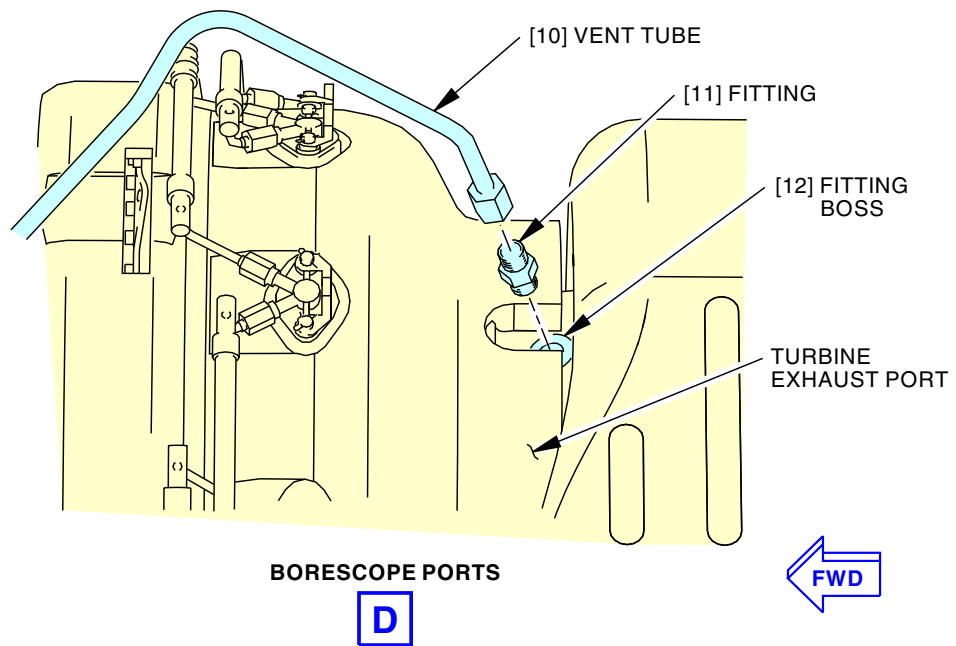
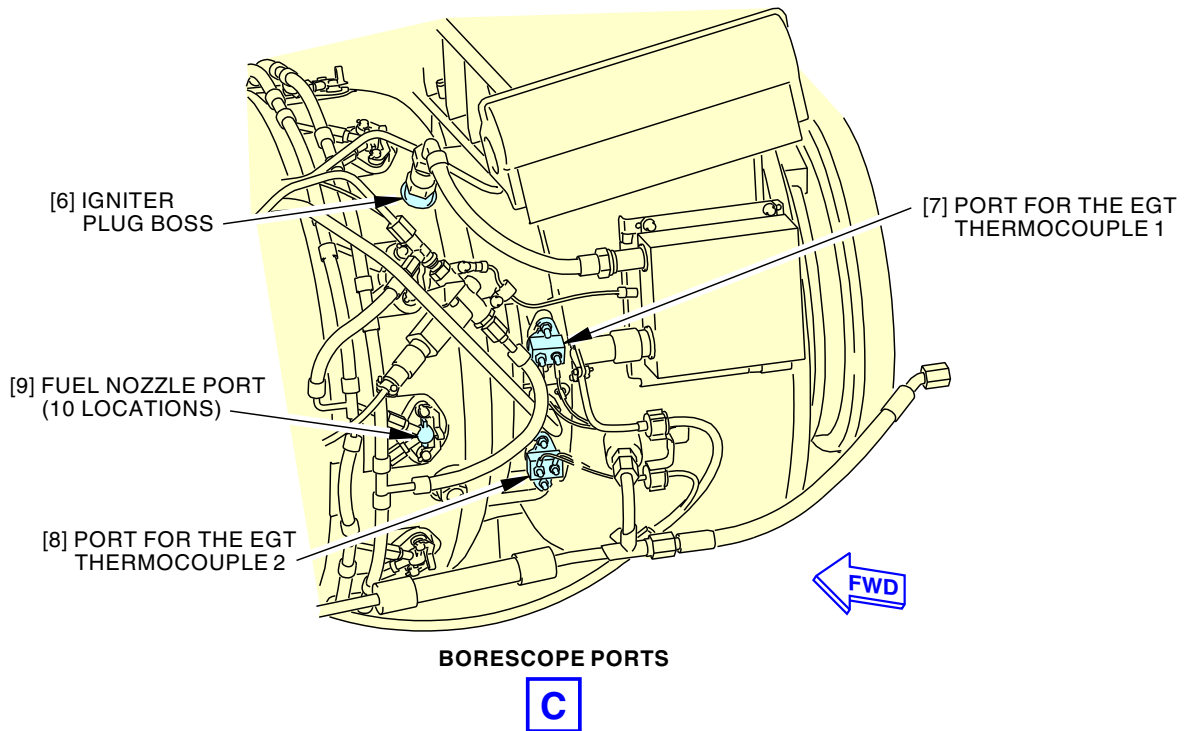
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415521 S00061538021_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 3 of 20)

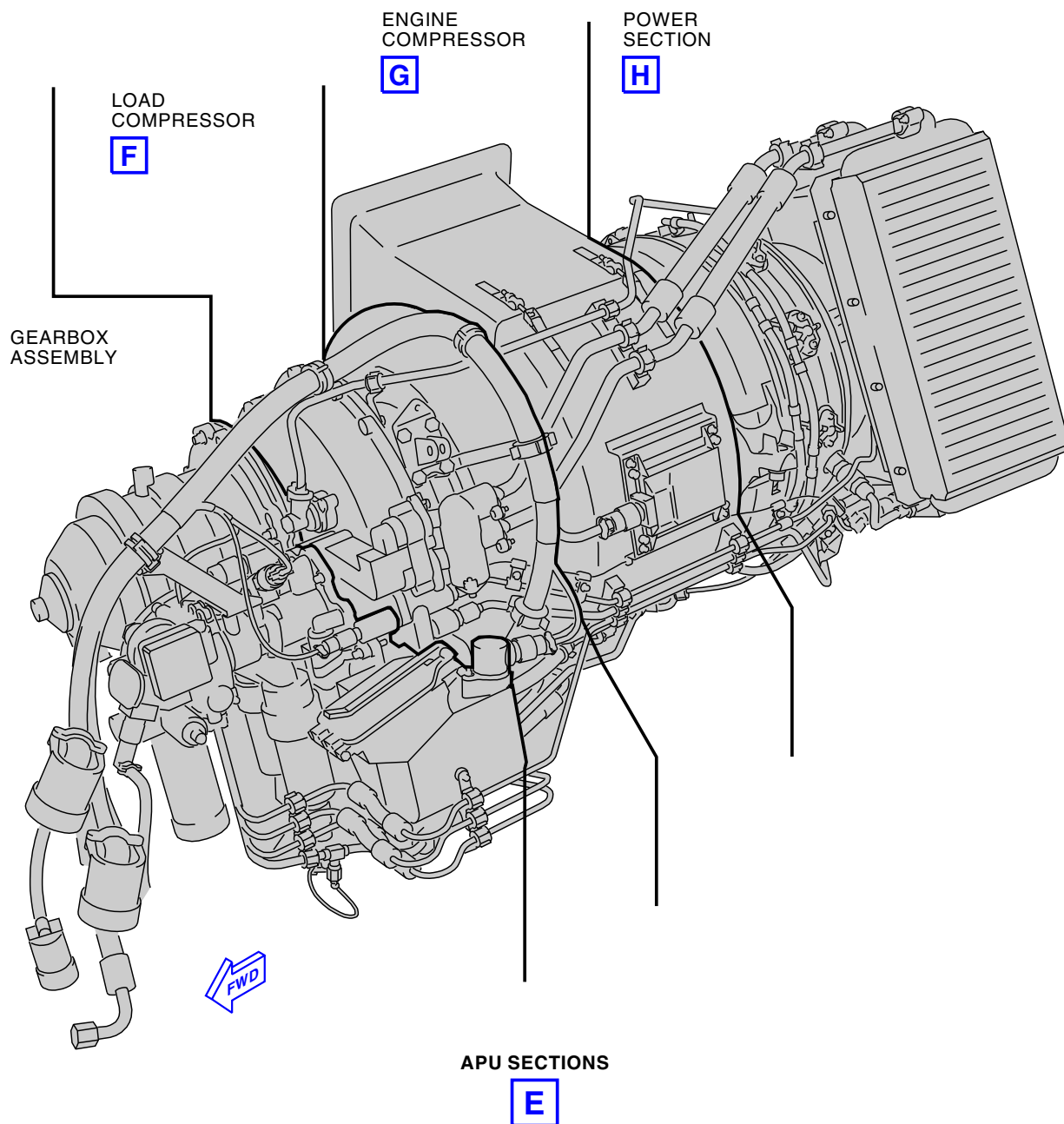
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415522 S00061538022_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 4 of 20)

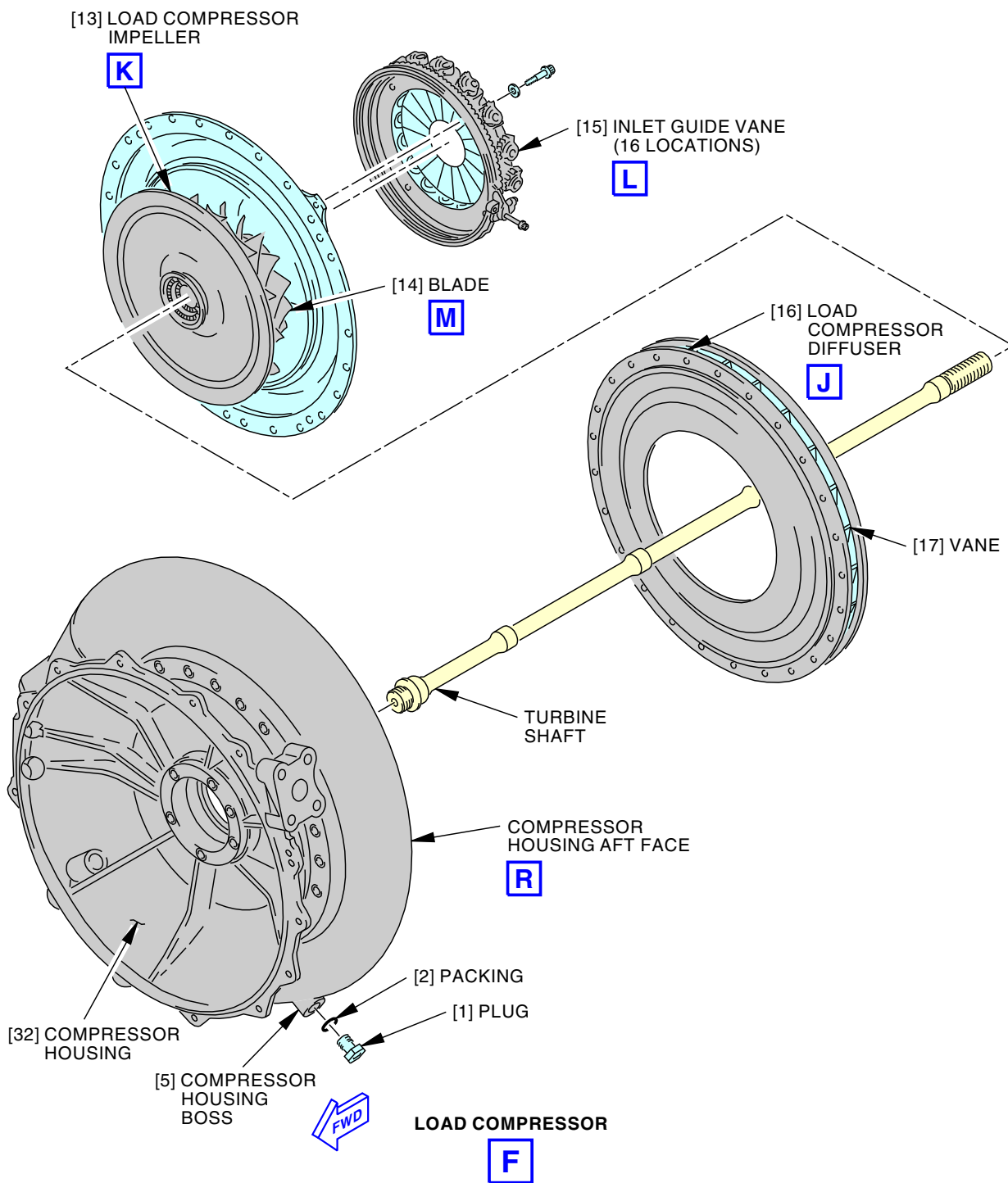
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415523 S00061538023_V2

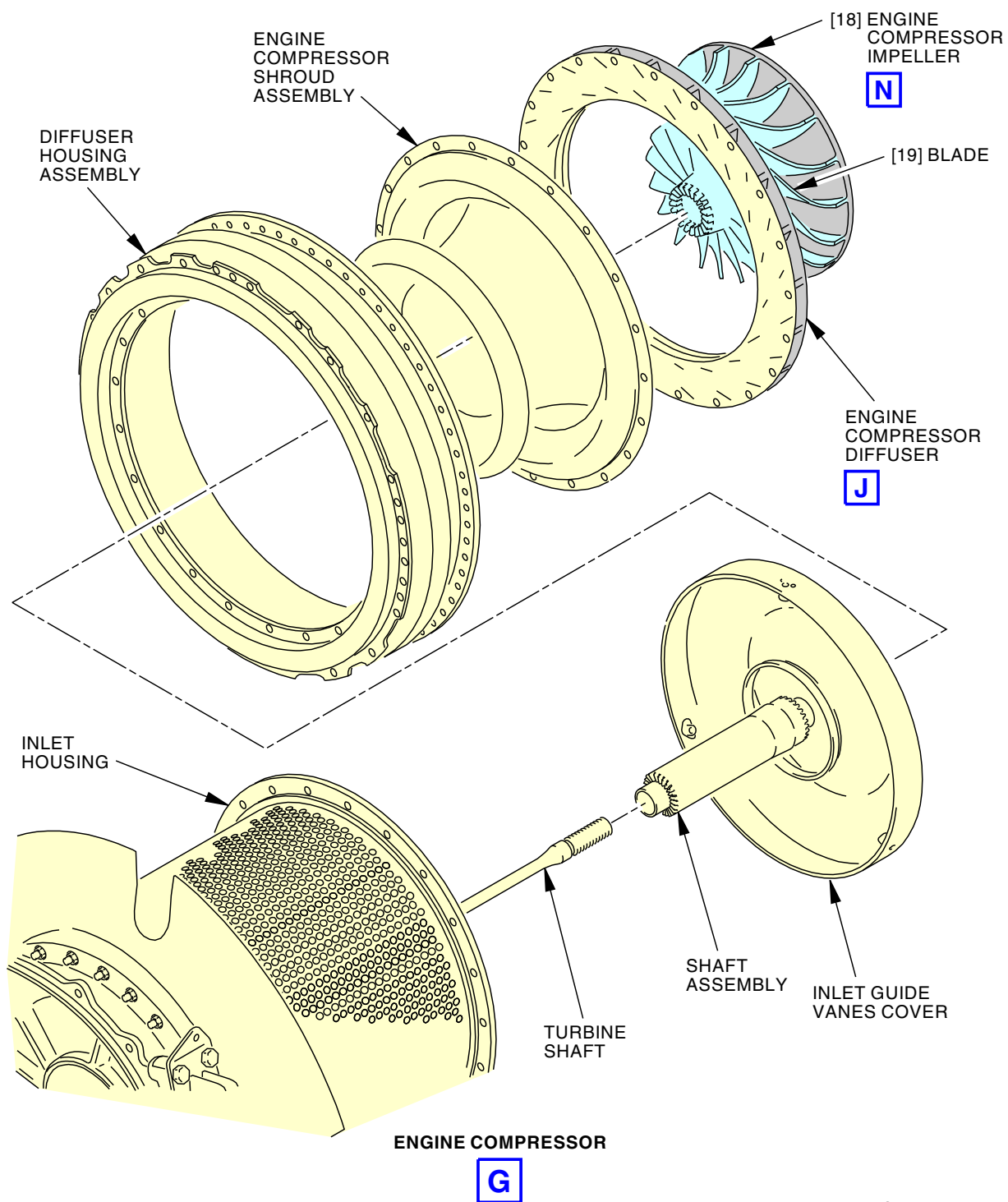
APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 5 of 20)

EFFECTIVITY
SIA ALL

49-21-00

D633AM101-SIA

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2415524 S00061538024_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 6 of 20)

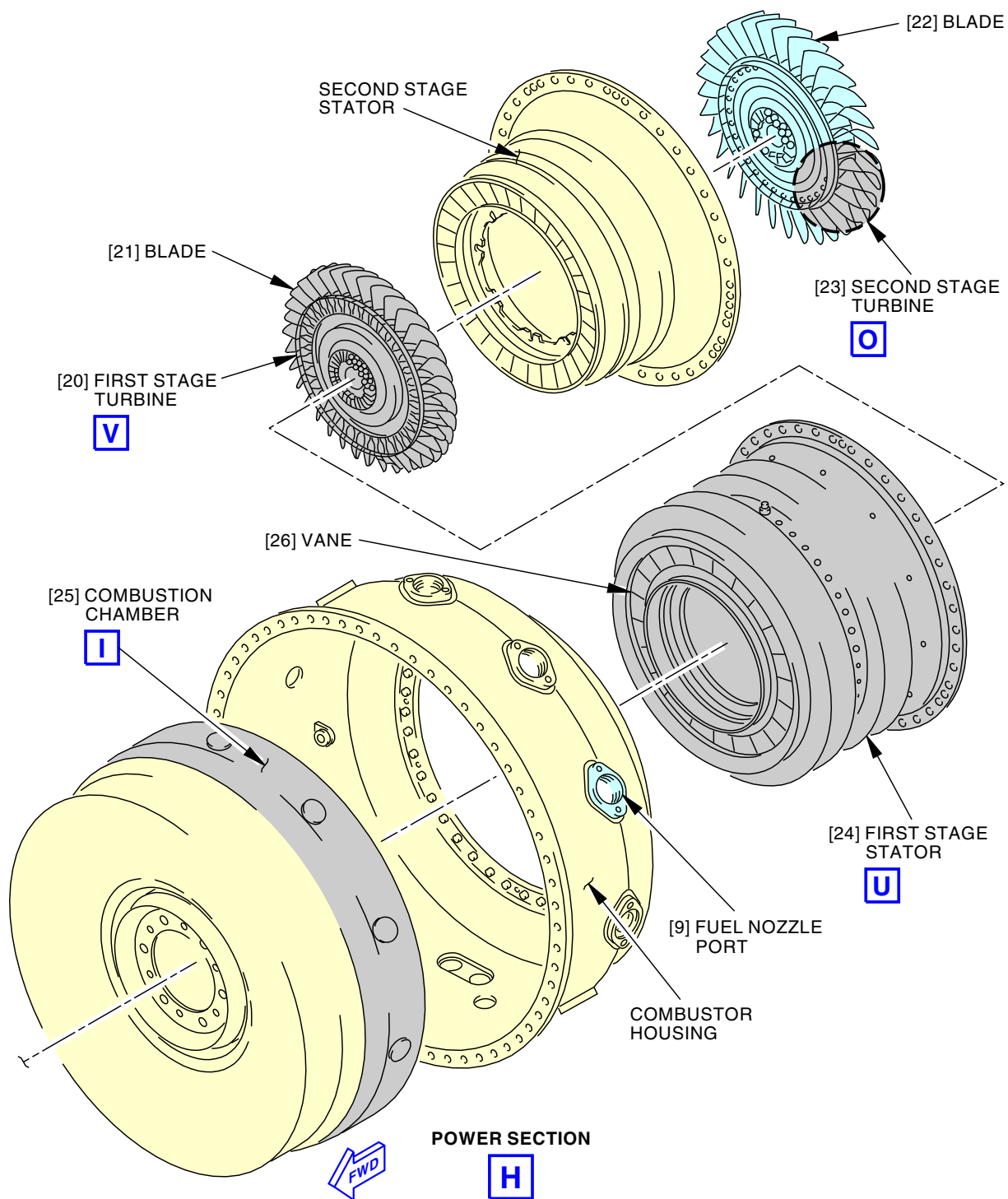
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415525 S00061538025_V2

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 7 of 20)

EFFECTIVITY
SIA ALL

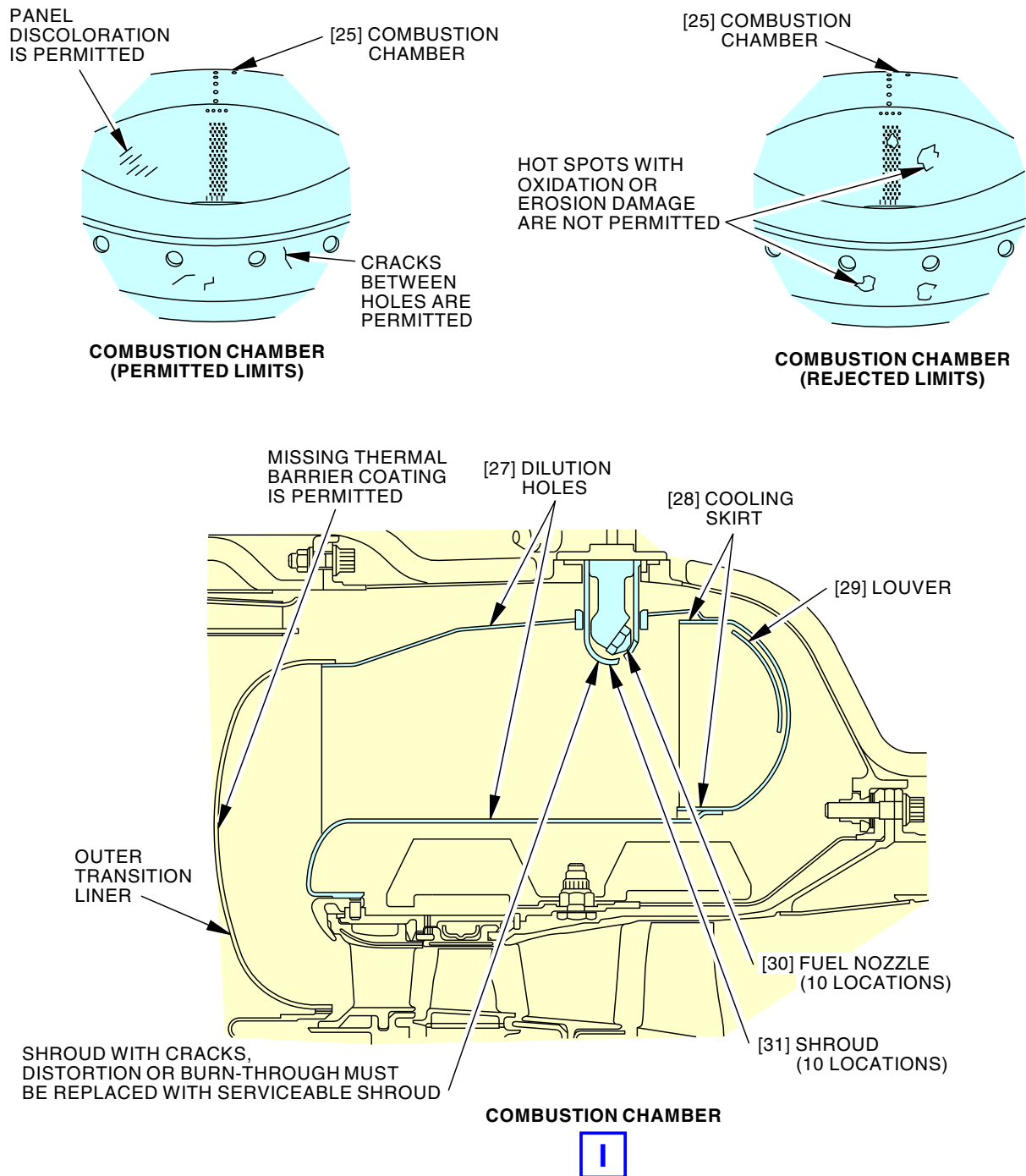
D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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AIRCRAFT MAINTENANCE MANUAL



2415526 S00061538026_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 8 of 20)

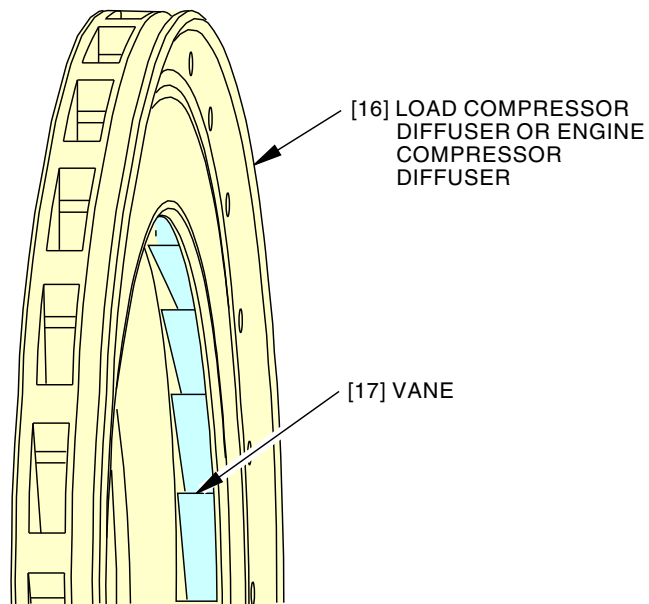
EFFECTIVITY
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D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

49-21-00

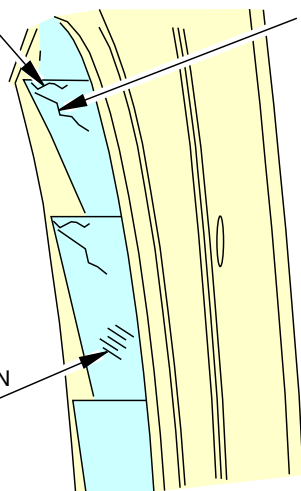
Page 619
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NICKS AND SMALL EROSION
EDGE DAMAGE ON THE
LEADING EDGE ARE
PERMITTED

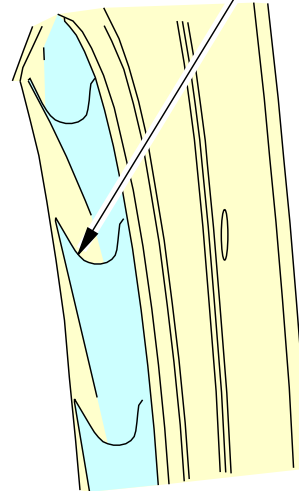
CRACKS IN BRAZED
FILLET AREA AND
ACROSS THE VANE
ARE PERMITTED

VANE
DISCOLORATION
IS PERMITTED



(PERMITTED LIMITS)

BUCKET-SHAPED
EROSION DAMAGE
IS NOT PERMITTED



(REJECTED LIMITS)

LOAD COMPRESSOR DIFFUSER/ENGINE COMPRESSOR DIFFUSER

J

2415527 S00061538027_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 9 of 20)

EFFECTIVITY
SIA ALL

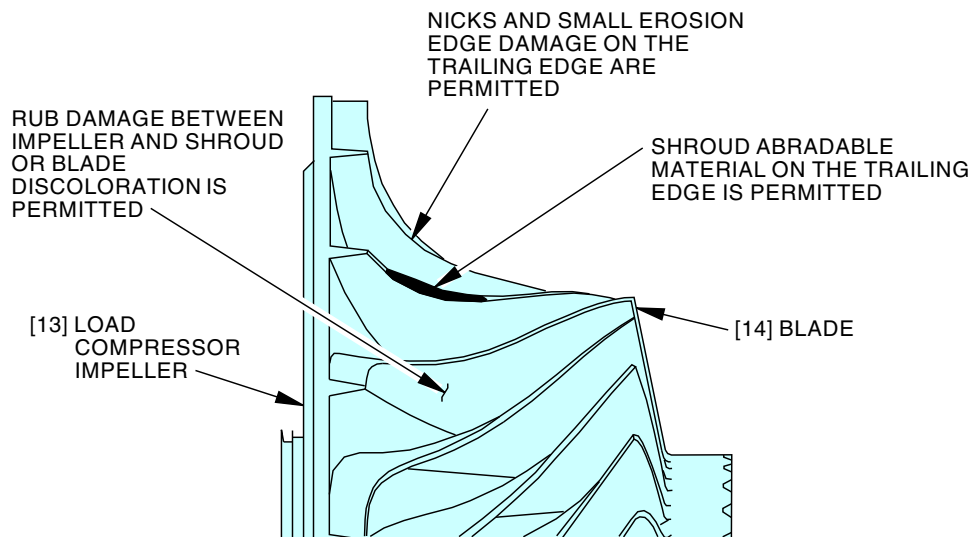
D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

49-21-00

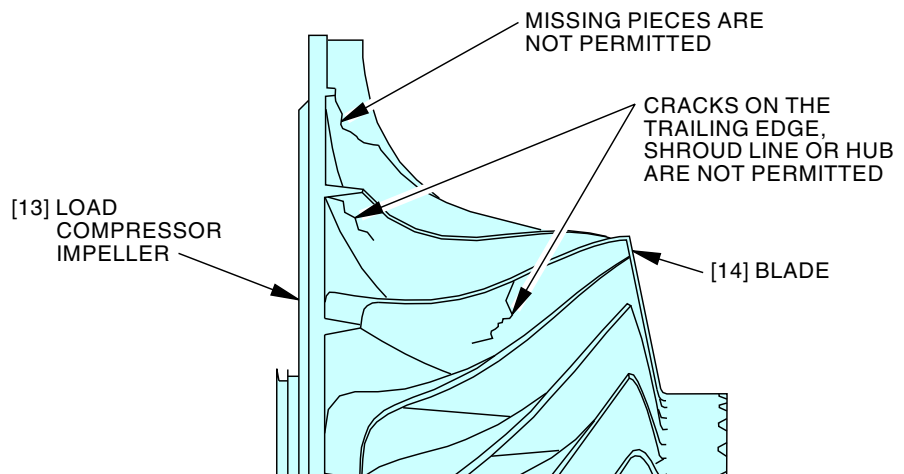
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**LOAD COMPRESSOR IMPELLER
(PERMITTED LIMITS)**

K



**LOAD COMPRESSOR IMPELLER
(REJECTED LIMITS)**

K

2415528 S00061538028_V1

**APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 10 of 20)**

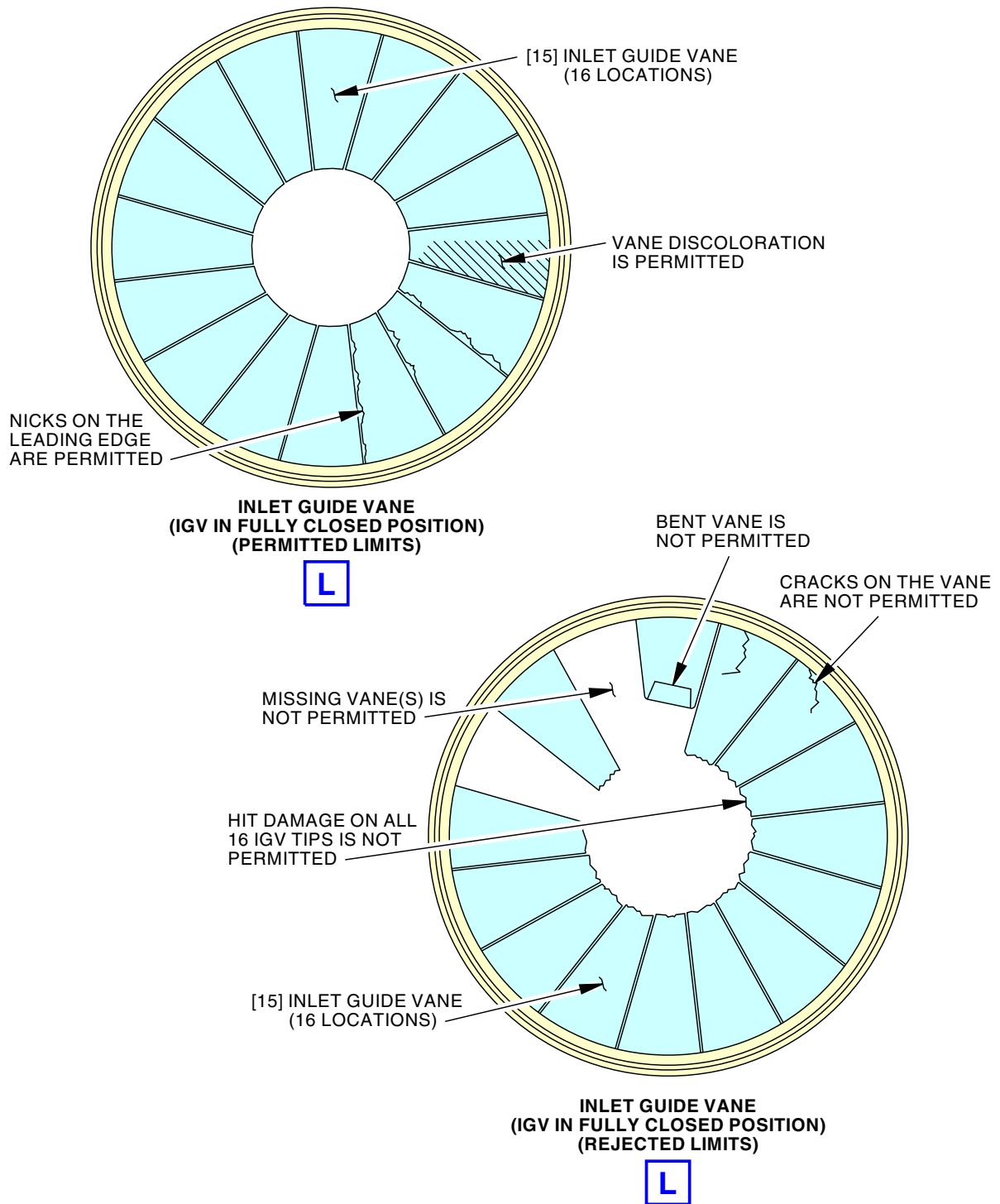
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415529 S00061538029_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 11 of 20)

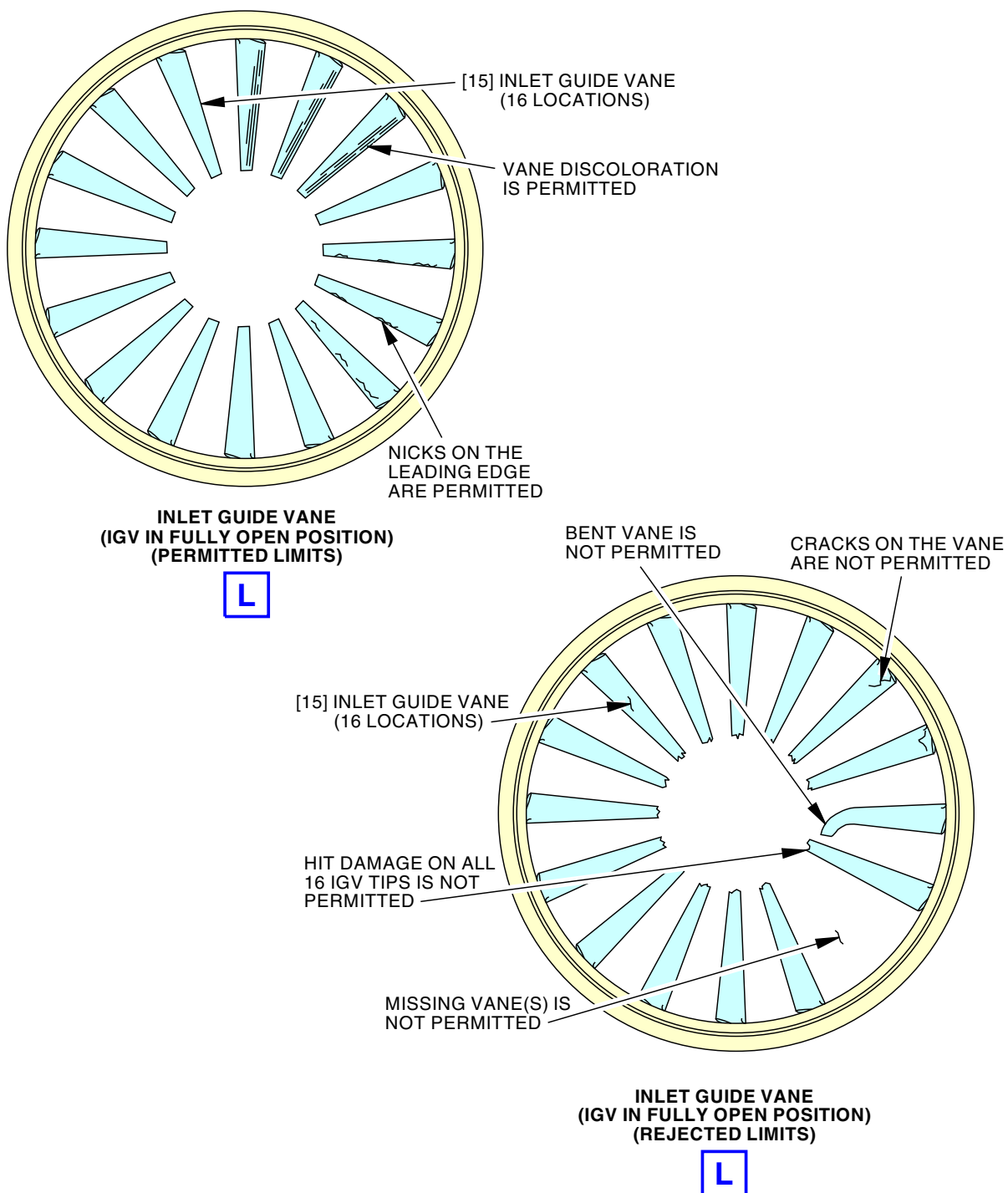
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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2415530 S00061538030_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 12 of 20)

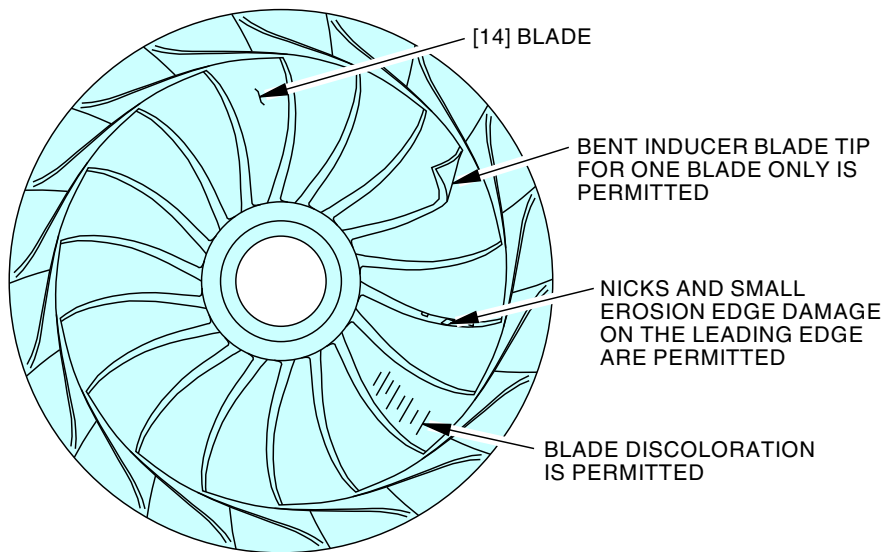
EFFECTIVITY
SIA ALL

D633AM101-SIA

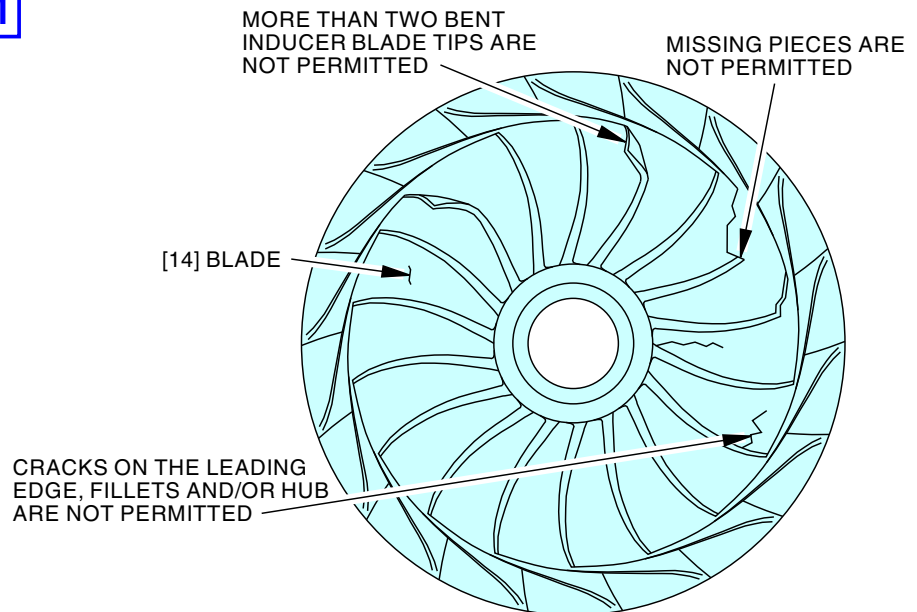
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**BLADE
(LOAD COMPRESSOR IMPELLER)
(PERMITTED LIMITS)**



**BLADE
(LOAD COMPRESSOR IMPELLER)
(REJECTED LIMITS)**



2415531 S00061538031_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 13 of 20)

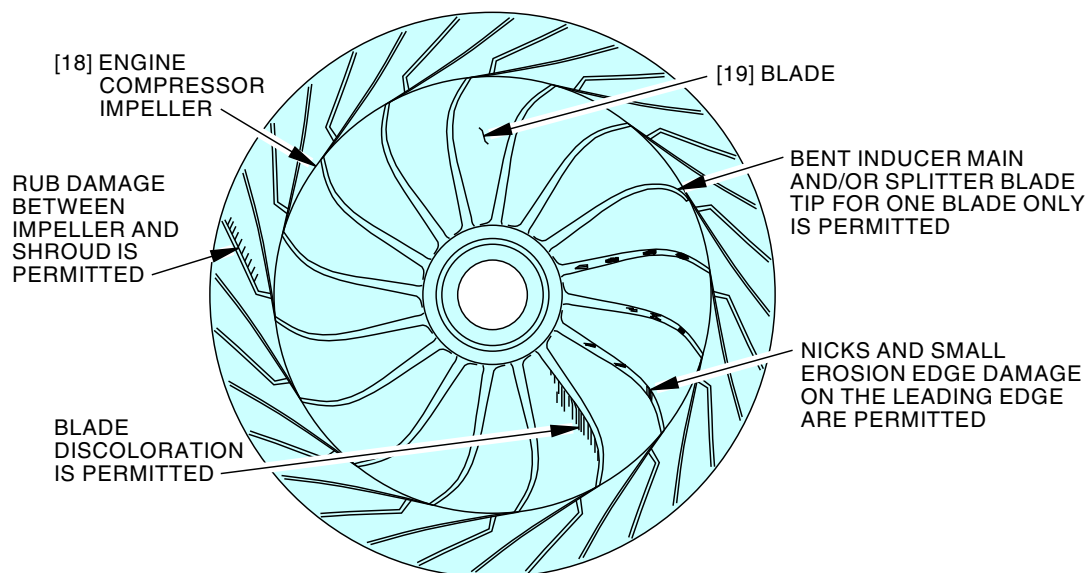
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

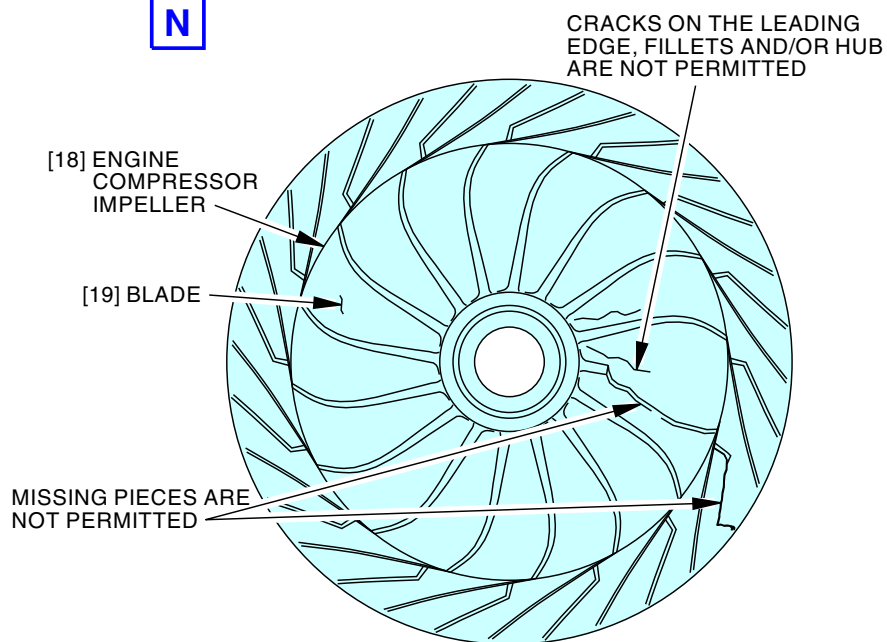
49-21-00

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**ENGINE COMPRESSOR IMPELLER
(PERMITTED LIMITS)**

N



**ENGINE COMPRESSOR IMPELLER
(REJECTED LIMITS)**

N

2415532 S00061538032_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 14 of 20)

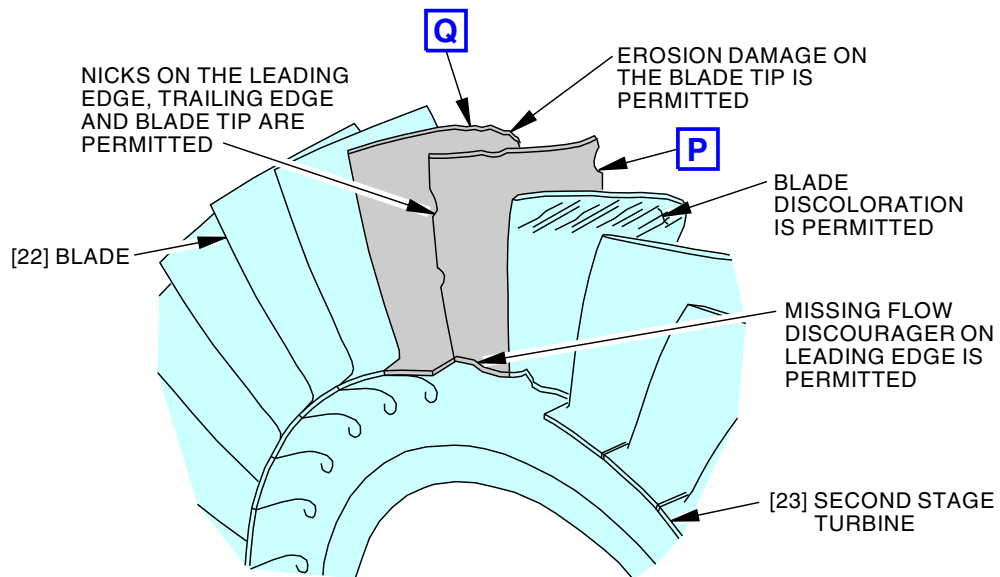
EFFECTIVITY
SIA ALL

D633AM101-SIA

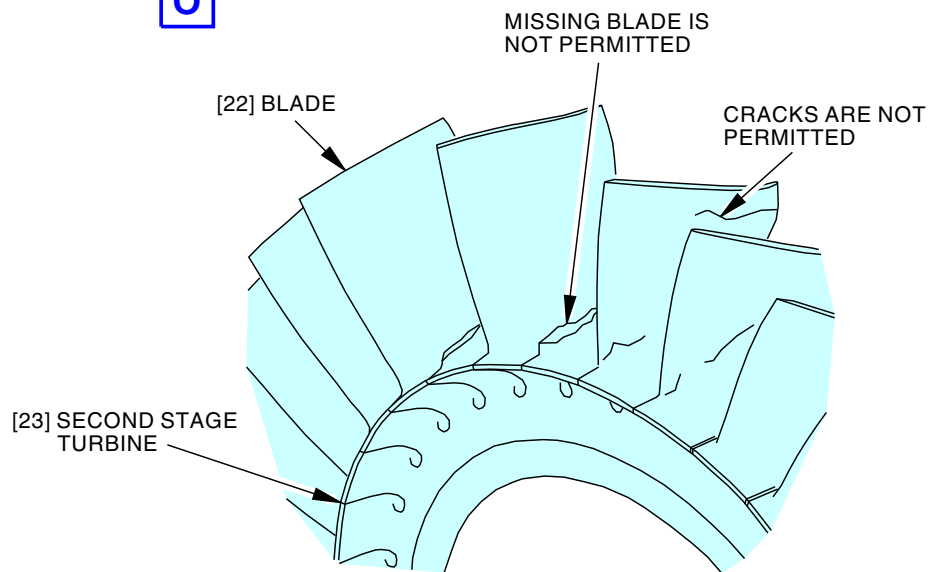
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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**SECOND STAGE TURBINE
(PERMITTED LIMITS)**



**SECOND STAGE TURBINE
(REJECTED LIMITS)**



2415534 S00061538034_V2

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 15 of 20)

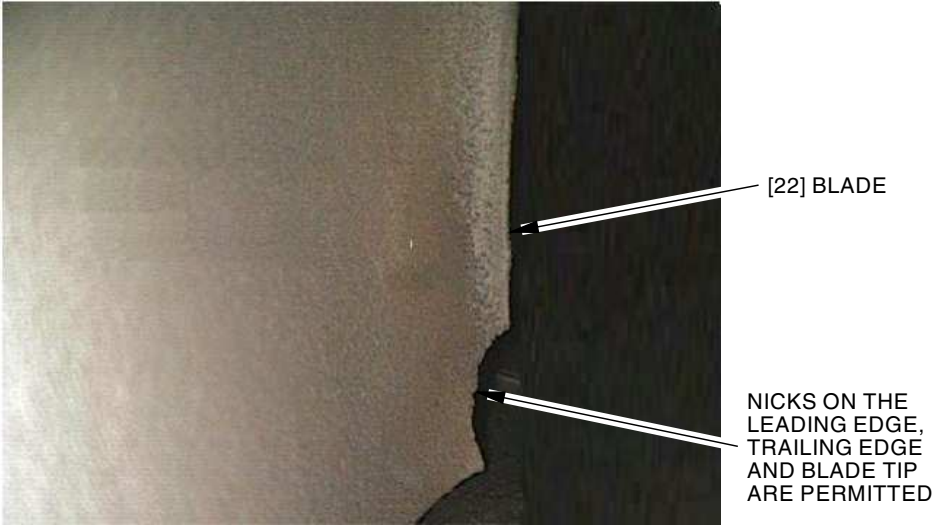
EFFECTIVITY
SIA ALL

D633AM101-SIA

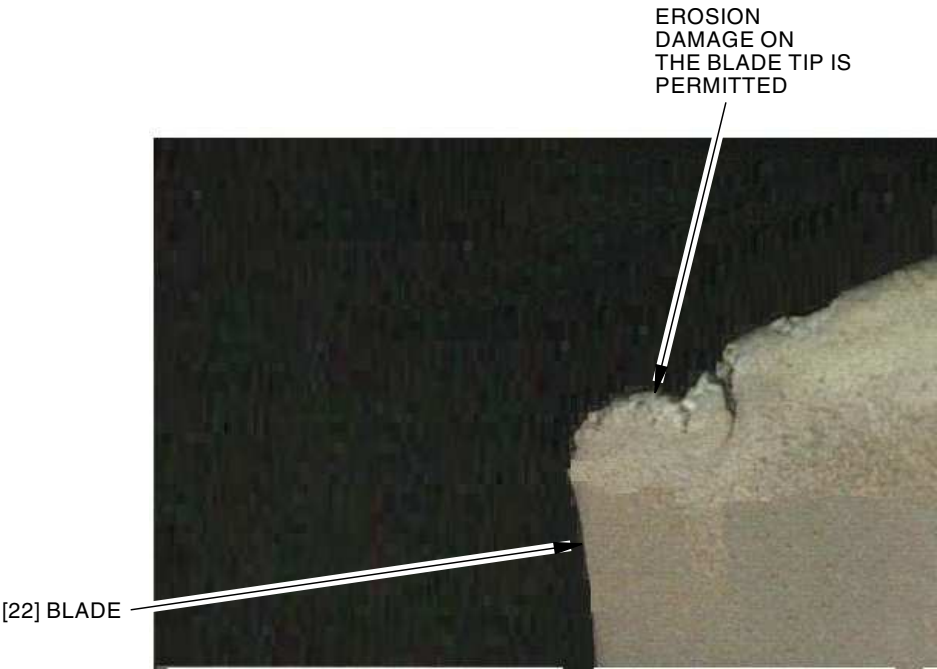
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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P



Q

2935203 S0000711505_V1

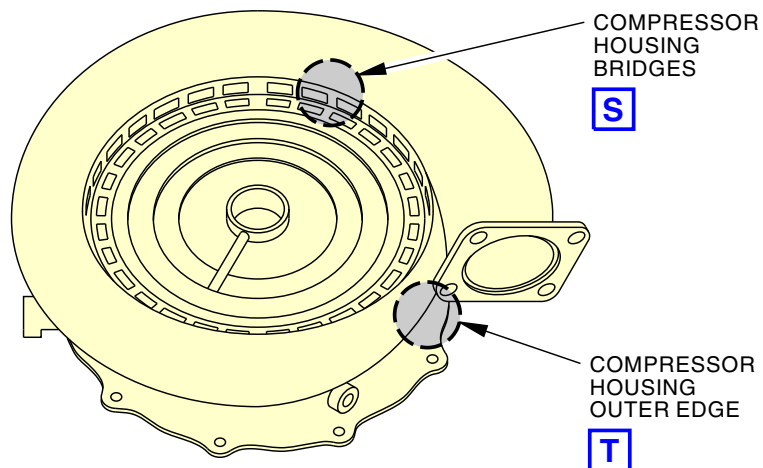
APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 16 of 20)

EFFECTIVITY SIA ALL

D633AM101-SIA

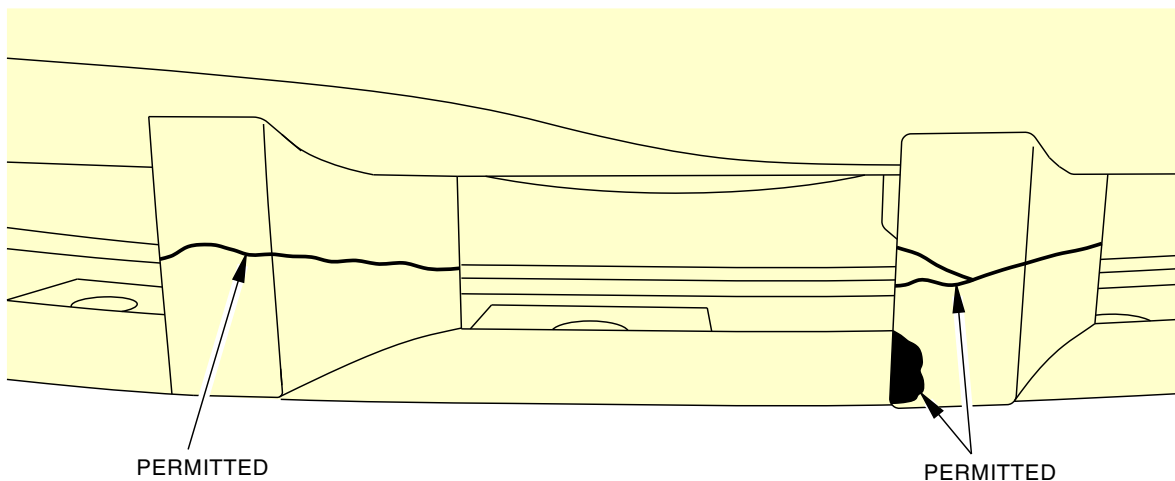
ECCN 9E991 BOEING PROPRIETARY - See title page for details

49-21-00



COMPRESSOR HOUSING AFT FACE

R



COMPRESSOR HOUSING BRIDGES

S

NOTE:

DURING BORESCOPE INSPECTION, ANY DAMAGE TO THE LOAD COMPRESSOR SCROLL HOUSING BRIDGES IS PERMITTED, INCLUDING:

- CRACKS AND INTERSECTING CRACKS
- MISSING PORTIONS OF BRIDGE
- MORE THAN ONE CRACK PER VANE

2804776 S0000643414_V2

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 17 of 20)

EFFECTIVITY
SIA ALL

D633AM101-SIA

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PERMITTED

COMPRESSOR HOUSING OUTER EDGE



NOT
PERMITTED

COMPRESSOR HOUSING OUTER EDGE



2935356 S0000711503_V1

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 18 of 20)

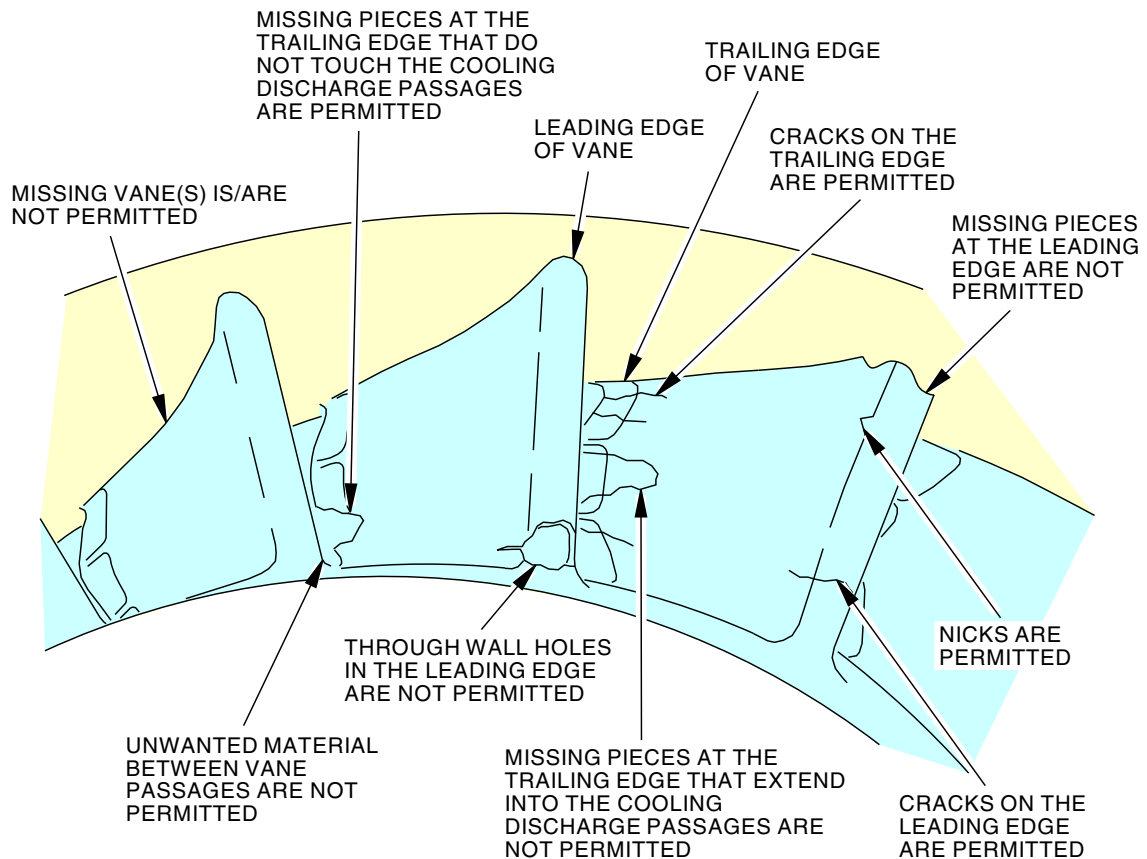
EFFECTIVITY
SIA ALL

D633AM101-SIA

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FIRST STAGE STATOR



2415535 S00061538036_V3

APU Engine Inspection
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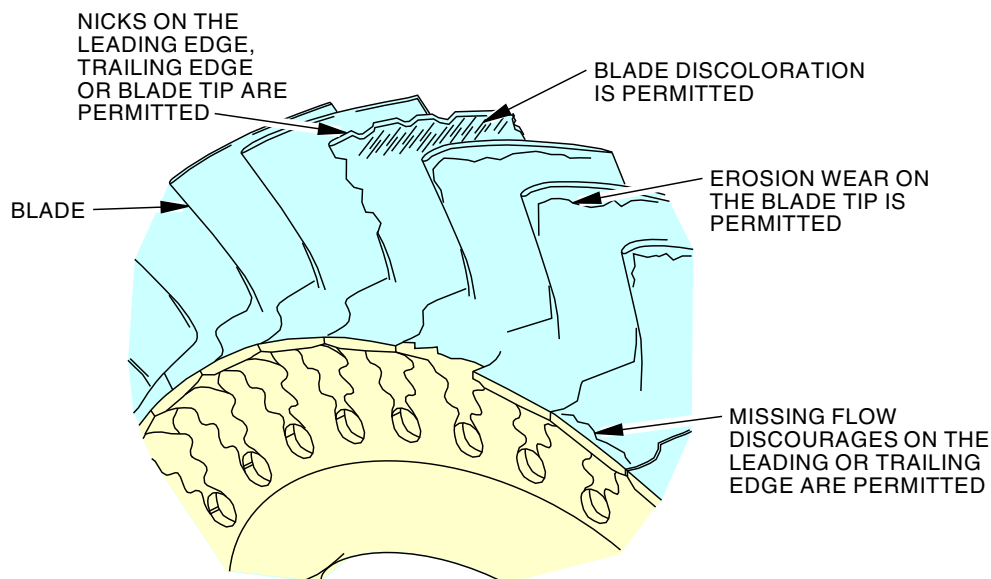
EFFECTIVITY
SIA ALL

49-21-00

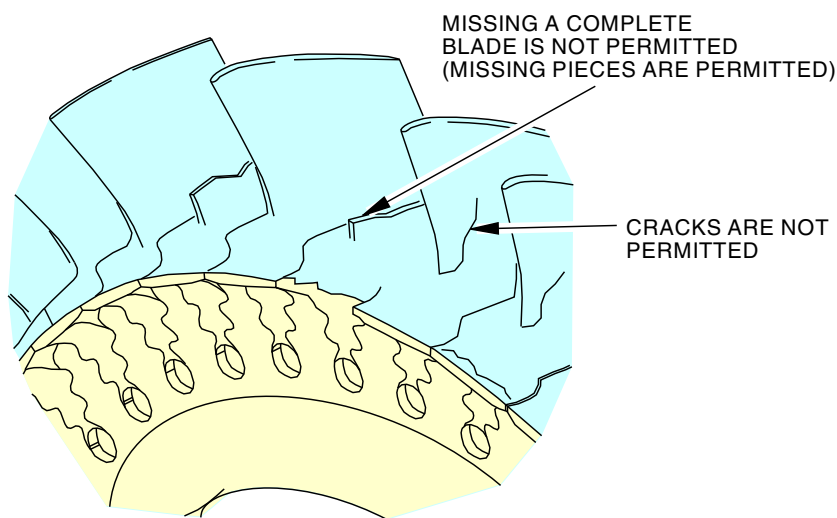
D633AM101-SIA

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AIRCRAFT MAINTENANCE MANUAL



FIRST STAGE TURBINE
(PERMITTED LIMITS)



FIRST STAGE TURBINE
(REJECTED LIMITS)



2415536 S00061538037_V3

APU Engine Inspection
Figure 601/49-21-00-990-802 (Sheet 20 of 20)

EFFECTIVITY
SIA ALL

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TASK 49-21-00-200-802

3. First Stage Stator and First Stage Turbine Inspection

(Figure 601)

A. References

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)
49-21-00-980-801	Manually Turn the APU Engine (P/B 201)
49-31-14-000-801	Fuel Nozzle Removal (P/B 401)
49-31-14-400-801	Fuel Nozzle Installation (P/B 401)
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	Igniter Plug Installation (P/B 401)

B. Tools/Equipment

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

Reference	Description
COM-4316	Fiberscope - Flexible Borescope Part #: IF2D5 Supplier: 32212 Part #: IF6C5X1-8 Supplier: 32212 Opt Part #: 7110561 Supplier: 32212
COM-4964	Light Source - Borescope Part #: ILH-2A Supplier: 32212 Opt Part #: 7502152 Supplier: 32212

C. Location Zones

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

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-21-00-860-009

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

SUBTASK 49-21-00-860-010

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

EFFECTIVITY
SIA ALL

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-21-00-010-003

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

F. Procedure

SUBTASK 49-21-00-940-002

- (1) Prepare the fiberscope, COM-4316, and light source, COM-4964 or equivalent, to examine the internal parts of the APU.

SUBTASK 49-21-00-290-006

- (2) Examine the vanes [26] (Figure 601) of the first stage stator [24]:

NOTE: You can get access to the vanes [26] through the igniter plug boss [6] or through the fuel nozzle port on the combustor housing.

- (a) Do these steps to examine the vanes [26] of the first stage stator [24] through the igniter plug boss [6]:
 - 1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.



MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the fiberscope, COM-4316, through the igniter plug boss [6] to get access to the vanes [26].
- 3) Look at each vane [26] for these items:
 - a) Through wall holes in the leading edge are not permitted (Figure 601).
 - b) Missing vane(s) is/are not permitted.
 - c) Unwanted material between the vane passages is not permitted.
 - d) Missing pieces at the leading edge are not permitted.
 - e) Missing pieces at the trailing edge that extend into the cooling discharge passages are not permitted.

EFFECTIVITY
SIA ALL

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- f) Cracks on the leading edge and trailing edge are permitted.
 - g) Missing pieces at the trailing edge that do not touch the cooling discharge passages are permitted.
 - h) Nicks are permitted.
- 4) Slowly remove the fiberscope, COM-4316, from the igniter plug boss [6] (Figure 601).
- 5) Replace the APU if you found damage that was not permitted.

These are the tasks:

- APU Power Plant Removal (Selection), TASK 49-11-00-000-801,
- APU Power Plant Installation (Selection), TASK 49-11-00-400-801.

- (b) Do these steps to examine the vanes [26] (Figure 601) of the first stage stator [24] through the fuel nozzle port [9] on the combustor housing:

NOTE: You can remove more than one fuel nozzle [30] to get access to the vanes [26] vanes . Obey the limits on the number of fuel nozzles [30] that you can remove at the same time.

- 1) Do this task: Fuel Nozzle Removal, TASK 49-31-14-000-801.



MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 2) Put the fiberscope, COM-4316, through the fuel nozzle port [9] to get access to the vanes [26].
- 3) Look at each vane [26] for these inspections:
- a) Through wall holes in the leading edge are not permitted (Figure 601).
 - b) Missing vane(s) is not permitted.
 - c) Unwanted materials between the vane passages are not permitted.
 - d) Missing pieces at the leading edge are not permitted.
 - e) Missing pieces at the trailing edge that extend into the cooling discharge passages are not permitted.
 - f) Cracks on the leading edge and trailing edge are permitted.
 - g) Missing pieces at the trailing edge that do not touch the cooling discharge passages are permitted.
 - h) Nicks are permitted.
- 4) Slowly remove the fiberscope, COM-4316, from the fuel nozzle port [9] (Figure 601).
- 5) Replace the APU if you found damage that was not permitted.

These are the tasks:

- APU Power Plant Removal (Selection), TASK 49-11-00-000-801,
- APU Power Plant Installation (Selection), TASK 49-11-00-400-801.

SUBTASK 49-21-00-290-007

- (3) Examine the blades [21] (Figure 601) of the first stage turbine [20]:

NOTE: You can get access to the blades [21] through the igniter plug boss [6] or through the fuel nozzle port on the combustor housing.

EFFECTIVITY
SIA ALL

49-21-00

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AIRCRAFT MAINTENANCE MANUAL

- (a) Do this task: Manually Turn the APU Engine, TASK 49-21-00-980-801.
- (b) Do these steps to examine the blades [21] of the first stage turbine [20] through the igniter plug boss [6]:



MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 1) Put the fiberscope, COM-4316, through the igniter plug boss [6] to get access to the blades [21].



MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE FIRST STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- 2) Look at each blade [21] for these items (Figure 601):
 - a) Cracks are not permitted.
 - b) Missing blades are not permitted.
 - c) Missing pieces are permitted.
 - d) Nicks on the leading edge, trailing edge or blade tip are permitted.
 - e) Blade discoloration is permitted.
 - f) Erosion wear on the blade tip is permitted.
 - g) Missing flow discouragers on the leading or the trailing edge are permitted.
- 3) Slowly remove the fiberscope, COM-4316, from the igniter plug boss [6] (Figure 601).
- 4) Replace the APU if you found damage that was not permitted.

These are the tasks:

 - APU Power Plant Removal (Selection), TASK 49-11-00-000-801,
 - APU Power Plant Installation (Selection), TASK 49-11-00-400-801.
- 5) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.
- (c) Do these steps to examine the blades [21] (Figure 601) of the first stage turbine [20] through the fuel nozzle port [9] on the combustor housing:

NOTE: You can remove more than one fuel nozzle [30] to get access to the blades [21]. Obey the limits on the number of fuel nozzles [30] that you can remove at the same time.



MAKE SURE THAT THE INTERNAL TEMPERATURE OF THE APU IS LESS THAN 176°F (80°C) BEFORE YOU PUT THE BORESCOPE INTO THE APU. DAMAGE TO THE BORESCOPE CAN OCCUR.

- 1) Put the fiberscope, COM-4316, through the fuel nozzle port [9] to get access to the blades [21].



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MAKE SURE THAT THE FORWARD END OF THE BORESCOPE IS CLEAR OF THE BLADES OF THE FIRST STAGE TURBINE. DAMAGE TO THE BLADES AND THE BORESCOPE CAN OCCUR WHEN YOU TURN THE APU.

- 2) Look at each blade [21] for these items (Figure 601):
 - a) Cracks are not permitted.
 - b) Missing blades are not permitted.
 - c) Missing pieces are permitted.
 - d) Nicks on the leading edge, trailing edge or blade tip are permitted.
 - e) Blade discoloration is permitted.
 - f) Erosion wear on the blade tip is permitted.
 - g) Missing flow discouragers on the leading or the trailing edge are permitted.
- 3) Slowly remove the fiberscope, COM-4316, from the fuel nozzle port [9] (Figure 601).
- 4) Replace the APU if you found damage that was not permitted.

These are the tasks:

 - APU Power Plant Removal (Selection), TASK 49-11-00-000-801,
 - APU Power Plant Installation (Selection), TASK 49-11-00-400-801.
- 5) Do this task: Fuel Nozzle Installation, TASK 49-31-14-400-801.
- (d) If it is not necessary to manually turn the APU engine for other inspection tasks, complete the procedure to manually turn the APU engine (TASK 49-21-00-980-801).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-410-003

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

SUBTASK 49-21-00-860-011

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

F/O Electrical System Panel, P6-2

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

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-21-00-860-012

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

————— END OF TASK —————

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APU ENGINE - CLEANING/PAINTING

1. General

- A. This procedure has the task to clean the power and load compressor sections of the APU engine.
- B. The APU engine must be shutdown for a minimum of sixty (60) minutes before you can do the APU engine compressor cleaning procedure. The sixty (60) minutes are necessary to make sure the APU engine is sufficiently cool and for maximum performance of the cleaning solution.

TASK 49-21-00-200-803

2. APU Engine Compressor Cleaning

A. References

Reference	Title
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-52-13-000-801	Bleed Air Duct Removal (P/B 401)
49-52-13-400-801	Bleed Air Duct Installation (P/B 401)

B. Tools/Equipment

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

Reference	Description
COM-3862	Cart - Compressor Washer Part #: 08-4048-0013 Supplier: 59603 Part #: 08-4049-0013 Supplier: 59603 Opt Part #: 08-4048-1012 Supplier: 59603 Opt Part #: 08-4049-1012 Supplier: 59603
STD-858	Tag - DO NOT OPERATE
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1056	Container - Solvent Resistant, 5 Gallon (19 Liter)
STD-7394	Cap - Dust, Electrical Connector

C. Consumable Materials

Reference	Description	Specification
B50032	Compound - Gas Turbine Compressor Cleaner, Water Based, ZOKmx	
B50033	Compound - Cleaning, Turbine Engine Gas Path (aqueous, no hydrocarbons, for on-line cleaning)	MIL-PRF-85704 Type III
G02418	Water - De-ionized	
G50228	Tape - 3M 436 Vibration Damping Tape (Formerly 3M Y436)	

D. Location Zones

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

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(Continued)

Zone	Area
------	------

316	APU Compartment - Right
-----	-------------------------

E. Prepare for the Cleaning Procedure

SUBTASK 49-21-00-860-013

- (1) Make sure sixty (60) minutes have gone by since the last APU start.

NOTE: The sixty (60) minutes are necessary to make sure the APU engine is sufficiently cool and for maximum performance of the cleaning solution.

SUBTASK 49-21-00-860-014

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

SUBTASK 49-21-00-020-001

- (3) Remove the bleed air duct (TASK 49-52-13-000-801).

SUBTASK 49-21-00-860-015

- (4) Make sure there is a protection cover on the bleed duct assembly.

NOTE: No protection cover is necessary on the bleed air valve.

SUBTASK 49-21-00-490-001

- (5) Install a locally-fabricated flexible duct with a clamp on the bleed air valve to change the direction of the steam (cleaning solution or de-ionized water) from the 1088 bulkhead to the ground.

SUBTASK 49-21-00-020-002

- (6) Disconnect the electrical connector P10 from the bleed air valve and install dust caps, STD-7394, on the electrical connector and bleed air valve.

SUBTASK 49-21-00-210-001

- (7) Look at the two indications on the position switch for the bleed air valve.

NOTE: There are two indications on the position switch to show the position of the bleed air valve. You can find the OPEN and CLOSED indications on the top of the bleed air valve.

- (a) Make sure the indication for the bleed air valve shows CLOSED.

SUBTASK 49-21-00-950-001

- (8) Install the 3M 436 Tape, G50228, over the plenum drain hole (location on the right side above the forward end of the APU cowl door).

SUBTASK 49-21-00-110-001

- (9) Do these steps to prepare the cleaning solution and compressor washer cart, COM-3862, or equivalent compressor washer equipment:

- (a) Prepare approximately 3 gal (11 l) of cleaning solution with the ZOKmx compound, B50032 (concentrated), or compound, B50033, per the manufacturer's instructions.

NOTE: The cleaning solution comes in a ready-to-use container or a concentrated compound container.

NOTE: It is recommended that de-ionized water, G02418, be used if water is a component of the cleaning solution.

NOTE: The manufacturer's instructions for the ZOKmx compound, B50032 (concentrated), is one part of compound to four parts of de-ionized water, G02418.

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- (b) Put the cleaning solution in the compressor washer cart, COM-3862, or equivalent compressor washer equipment.

NOTE: The compressor washer equipment must have a wand assembly and supply approximately 3 gal (11 l) of cleaning solution at a flow rate of approximately 1.25 ±0.25 gpm (4.73 ±0.95 l/min).



WARNING

MAKE SURE THAT YOU WEAR PROTECTION EQUIPMENT WHEN YOU USE THE COMPRESSOR WASHER EQUIPMENT AND CLEANING SOLUTION. WEAR PROTECTIVE SPLASH GOGGLES OR FACE SHIELD, EAR PROTECTION, GLOVES AND OTHER PERSONNEL PROTECTION. IF YOU DO NOT OBEY, INJURY TO PERSONNEL CAN OCCUR.

- (c) Use the compressor washer cart, COM-3862, to put the cleaning solution as a spray into the opening of the air inlet door.
- (d) Make sure you have an empty solvent resistant container (5 gal)(19 Liter), STD-1056, and approximately 2 gal (8 l) of de-ionized water, G02418, with the compressor washer cart, COM-3862.
- (e) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

F. APU Engine Compressor Cleaning

SUBTASK 49-21-00-110-002

- (1) Do these steps to do the APU engine cold-wash procedure:
- (a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the APU drain seal.



WARNING

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.

- (b) Do these steps to release the high voltage from the ignition unit:
- 1) Make sure five minutes have gone by since the last APU start.
 - 2) Disconnect the electrical connector P13 from the ignition unit.
 - 3) Make sure you install all necessary protection covers.
- (c) Do these steps to disconnect the fuel supply tube from the fuel flow divider:
- 1) Disconnect the electrical connector P23 from the flow divider solenoid and install the dust caps, STD-7394, on the electrical connector and flow divider solenoid.
 - 2) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the fuel flow divider to drain the fuel from the fitting.
 - 3) Disconnect the fitting for the fuel supply tube from the fuel flow divider and install a cap on the fitting.
- (d) Do this task: Supply External Power, TASK 24-22-00-860-803.

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- (e) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
- (f) Make sure the BAT switch on the P5 forward overhead panel is ON.



WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (g) Set the No. 1 AFT FUEL PUMP switch or No. 1 FWD FUEL PUMP switch to the ON position.
 - 1) If you must use the fuel boost pumps in the center tank, you must have a maintenance person or observer in the flight compartment to continuously monitor the LOW PRESSURE lights.
 - 2) You must set the applicable fuel boost pump to the OFF position if the LOW PRESSURE light for the center tank stays on.



WARNING

MAKE SURE THAT YOU DO NOT STAND IN FRONT OF THE AREA OF THE AIR INLET DOOR. DO NOT HAVE LOOSE OBJECTS THAT CAN GO INTO THE AIR INLET PLENUM DURING THE APU OPERATION. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

- (h) Get access to the side of the air inlet door area from the outside of the airplane with the compressor washer cart, COM-3862, solvent resistant container (5 gal)(19 Liter), STD-1056 and approximately 2 gal (8 l) of de-ionized water, G02418.

NOTE: It is recommended that you use three persons to do the APU engine compressor cleaning. The location of the first person is on the side of the air inlet door area and outside of the airplane. The location of the second person is in the flight compartment to motor the APU and for the APU starting procedure. The location of the third person is at the APU compartment and to help the first person when to start the spray of the cleaning solution.
- (i) Do these steps to motor the APU engine and to apply the cleaning solution into the opening of the air inlet door:
 - 1) Set the APU master switch to the ON position.
 - 2) Make sure the air inlet door opens in approximately 30 seconds.

NOTE: If the APU inlet door does not open within two minutes and forty-five seconds, a fault will occur.
 - 3) Put the wand assembly in the opening of the air inlet door and make sure the cleaning solution spray will go in the APU inlet duct.
 - a) Make sure you install the wand assembly as far into the opening of the air inlet door as possible to get the maximum amount of cleaning solution into the APU inlet duct.
 - 4) Set the APU master switch to the START position and release it to the ON position.
 - 5) When you hear the APU engine start to turn, use the compressor washer cart, COM-3862, to apply the cleaning solution into the APU inlet duct until the APU engine has a protective shutdown.

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- 6) Motor the APU engine until the APU has a protective shutdown.

NOTE: The APU engine will have a protective shutdown between 17-20 seconds.

- 7) Make sure a fuel fog comes out of the exhaust duct muffler during the APU engine motor operation.

- 8) Remove the wand assembly from the opening of the air inlet door.

- 9) Set the APU master switch to the OFF position.

NOTE: The air inlet door can take up to 60 seconds before the door closes. The APU maintenance page display for APU INLET DOOR POSITION will show CLOSED.

NOTE: If the APU inlet door does not close within two minutes and forty-five seconds, a fault will occur.

- 10) If it is necessary to motor the APU engine and to apply more cleaning solution again, it is recommended that you obey the start duty cycle.

NOTE: The start duty cycle for the APU is three times in a 15 minute interval. If you do three successful or unsuccessful start cycles in a 15 minute interval, it is recommended that you wait 15 minutes after the third start cycle for the power electronics to cool. This 15 minute interval is necessary to cool the temperature of the power electronics in the start power unit and/or start converter unit. If the duty cycle is exceeded and the temperature limit is reached, the APU will not start.

- (j) After you motor the APU engine, let the cleaning solution soak on the internal parts of the power and load compressor sections for 15-30 minutes.

- (k) Install a DO-NOT-OPERATE tag on the APU master switch.

- (l) Set the No. 1 AFT FUEL PUMP switch or No. 1 FWD FUEL PUMP switch to the OFF position.

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

- (n) Remove the 5-gallon (19-liter) fuel resistant container, STD-1054.

- (o) Remove the dust caps, STD-7394, and connect the electrical connector P13 to the ignition unit.

- (p) Remove the protection covers and cap and connect the fitting for the fuel supply tube to the fuel flow divider.

- 1) Tighten the fitting to 140 in-lb (15.8 N·m).

- (q) Remove the dust caps, STD-7394, and connect the electrical connector P23 to the flow divider solenoid.

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

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

SUBTASK 49-21-00-110-003

- (2) Do these steps to do the APU engine hot-wash procedure:

- (a) Make sure you have a minimum of 2 gal (8 l) of cleaning solution in the compressor washer cart, COM-3862.
- (b) Make sure 15-30 minutes have gone by since you completed the APU engine cold-wash procedure.
- (c) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (d) During the APU starting and operation, put the wand assembly in the opening of the air inlet door and use the compressor washer cart, COM-3862, to apply the cleaning solution into the APU inlet duct until the compressor washer cart, COM-3862, is empty (no remaining cleaning solution).
- (e) Remove the wand assembly from the opening of the air inlet door.
- (f) Do these steps to prepare the compressor washer cart, COM-3862, and replace the cleaning solution with de-ionized water, G02418:
 - 1) Remove the remaining cleaning solution from the compressor washer cart, COM-3862, and put it in the solvent resistant container (5 gal)(19 Liter), STD-1056.
 - 2) Put the approximately 2 gal (8 l) of de-ionized water, G02418, in the compressor washer cart, COM-3862.
- (g) During the APU operation, put the wand assembly in the opening of the air inlet door and use the compressor washer cart, COM-3862, to apply the de-ionized water, G02418, into the APU inlet duct until the compressor washer cart, COM-3862, is empty (no remaining de-ionized water, G02418).
- (h) Remove the wand assembly from the opening of the air inlet door.
- (i) Remove the compressor washer cart, COM-3862, solvent resistant container (5 gal)(19 Liter), STD-1056, and other equipment from the air inlet door area.
- (j) Operate the APU for a minimum of 15 minutes after the rinse cycle to dry the APU engine.
- (k) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-21-00-090-001

- (1) Remove the clamp and locally-fabricated flexible duct from the bleed air valve.

SUBTASK 49-21-00-420-002

- (2) Remove the protection covers and connect the electrical connector P10 to the bleed air valve.

SUBTASK 49-21-00-420-003

- (3) Install the bleed air duct (TASK 49-52-13-400-801).

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SUBTASK 49-21-00-860-016

- (4) Remove the 3M 436 Tape, G50228, from the plenum drain hole.

SUBTASK 49-21-00-860-017

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

SUBTASK 49-21-00-860-018

- (6) Do this task: Remove External Power, TASK 24-22-00-860-804.

———— **END OF TASK** ————

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APU FUEL SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) Fuel Leakage Check
 - (2) APU Fuel Supply Flow Check.
- B. The fuel leakage check makes sure the APU fuel system is not damaged.
- C. The flow check for the APU fuel supply makes sure the correct quantity of fuel is supplied to the APU.

TASK 49-31-00-700-801

2. Fuel Leakage Check

(Figure 201)

A. Tools/Equipment

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

Reference	Description
SPL-1973	Equipment - Test, Fuel Feed, Auxiliary Power Unit Part #: C49011-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. Consumable Materials

Reference	Description	Specification
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

C. Location Zones

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

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Fuel Leakage Check

SUBTASK 49-31-00-860-001

- (1) Make sure that the APU master switch [3] on the forward overhead panel, P5, is OFF and install a DO NOT OPERATE tag, STD-858.

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SUBTASK 49-31-00-860-002

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-00-010-001

- (3) To open the access panel, do these steps:

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

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

F. Fuel Leakage Check

SUBTASK 49-31-00-780-001

- (1) Do the fuel leakage check:

- (a) Make sure that the center left fuel pump switch [1], No. 1 forward fuel pump switch [4] and No. 1 aft fuel pump switch [5] are in the OFF position.

- (b) Make sure that the crossfeed valve switch [2] is in the CLOSED position.

- (c) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube [7].



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (d) Disconnect the fuel supply tube [7] from the fitting [6] on the 1088 bulkhead.

- (e) Let the fuel drain into the 1 gallon (4 l) fuel resistant container, STD-4049.

- (f) Install the equipment, SPL-1973, to the fitting [6] and fuel supply tube [7].

- (g) Make sure that the valve handle [8] is in the OFF position.

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

- (i) Set the No. 1 aft fuel pump switch [5] or the No. 1 forward fuel pump switch [4] to the ON position.
- (j) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch [3].
- (k) Set the APU master switch [3] to the ON position.
- 1) Do not set the APU master switch [3] to the START position, it is not necessary to start the APU for this fuel leakage check.
- (l) Make sure that the fuel pressure gage shows 20.5 $\pm$ 5.5 psig (141.3 $\pm$ 38.0 kPa).
- (m) Set the No. 1 aft fuel pump switch [5] or the No. 1 forward fuel pump switch [4] to the OFF position.
- (n) Set the APU master switch [3] to the OFF position and install a DO NOT OPERATE tag, STD-858.
- (o) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

- (p) Make sure that the manual override handle on the APU fuel shutoff valve is in the CLOSED position.
- NOTE:** The APU fuel shutoff valve is on the rear spar of the left wing in the wheel well. The manual override handle on the APU fuel shutoff valve gives an OPEN or CLOSED indication of the shutoff valve position.
- (q) Do these steps to monitor the fuel pressure to make sure there are no leaks in the APU fuel system:
- 1) Make sure that the fuel pressure gage shows 20.5 $\pm$ 5.5 psig (141.3 $\pm$ 38.0 kPa) for five minutes.
- 2) If the fuel pressure gage shows less than 15 psig (103 kPa), correct all leaks or damage to the APU fuel system.
- a) A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal
- 3) If the fuel pressure gage shows 20.5 $\pm$ 5.5 psig (141.3 $\pm$ 38.0 kPa), the APU fuel system is satisfactory.

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- (r) Set the valve handle [8] to the ON position to bleed the fuel pressure and to drain the fuel into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (s) Disconnect the equipment, SPL-1973.
- (t) If Christo-lube MCG111 grease, D50011, is not used on the fitting [6], do these steps:
 - 1) Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting [6].
 - 2) Connect the fuel supply tube [7] to the fitting [6] on the 1088 bulkhead.
 - a) Tighten to 470 in-lb (53 N·m) - 510 in-lb (58 N·m).
- (u) If Christo-lube MCG111 grease, D50011, is used on the fitting [6], do these steps:
 - 1) Lubricate the external threads of the fitting [6] with Christo-lube MCG111 grease, D50011.

NOTE: The grease should be applied to the external threads only. The grease should not be applied to the internal threads or sealing surface of the fitting.
 - 2) Connect the fuel supply tube [7] to the fitting [6] on the 1088 bulkhead.
 - a) Tighten to 266 in-lb (30 N·m) - 294 in-lb (33 N·m).
- (v) Remove the 1 gallon (4 l) fuel resistant container, STD-4049, and equipment, SPL-1973.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-00-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

SUBTASK 49-31-00-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-00-860-004

- (3) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch [3].

————— **END OF TASK** —————

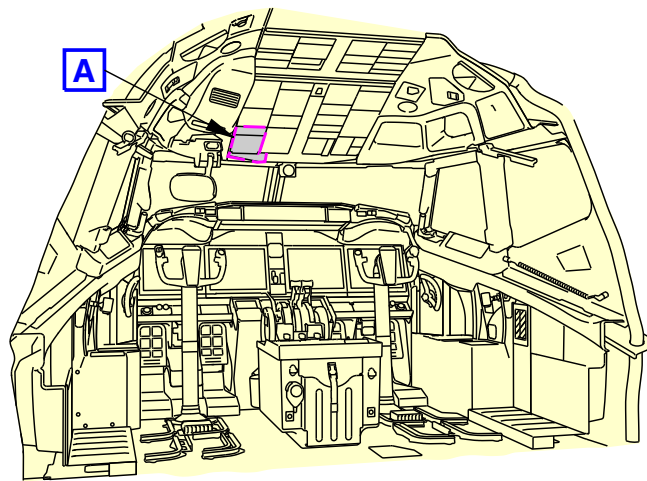
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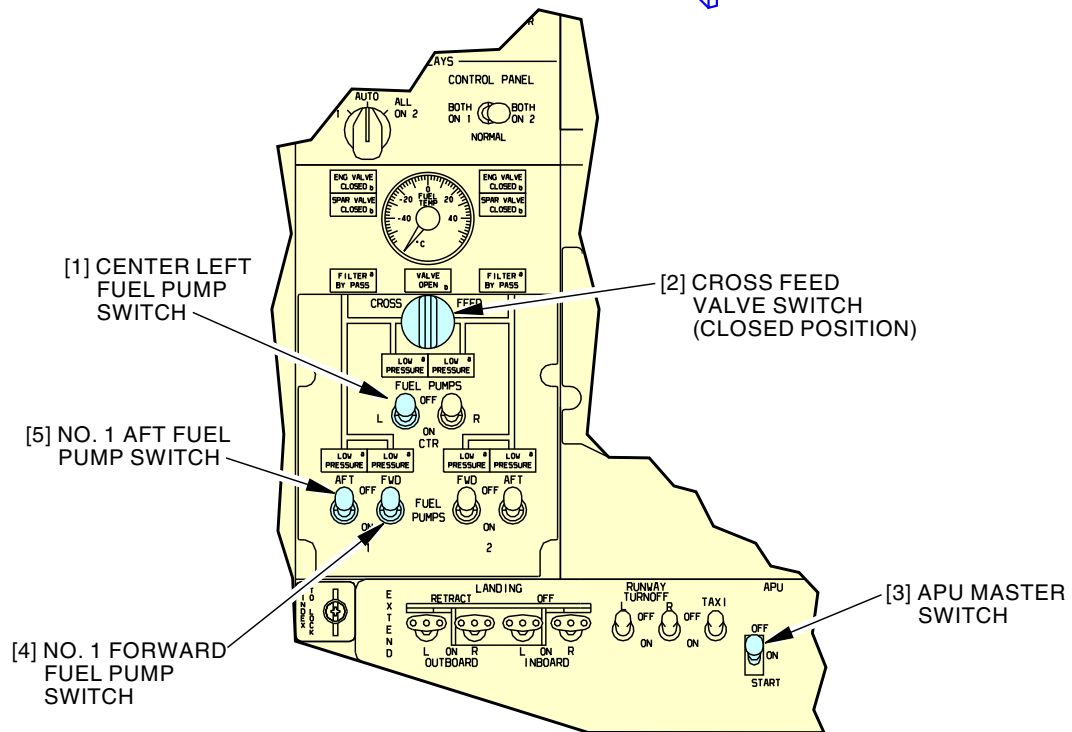
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FLIGHT COMPARTMENT FWD



FORWARD OVERHEAD PANEL, P5



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APU Fuel System Checks
Figure 201/49-31-00-990-801 (Sheet 1 of 2)

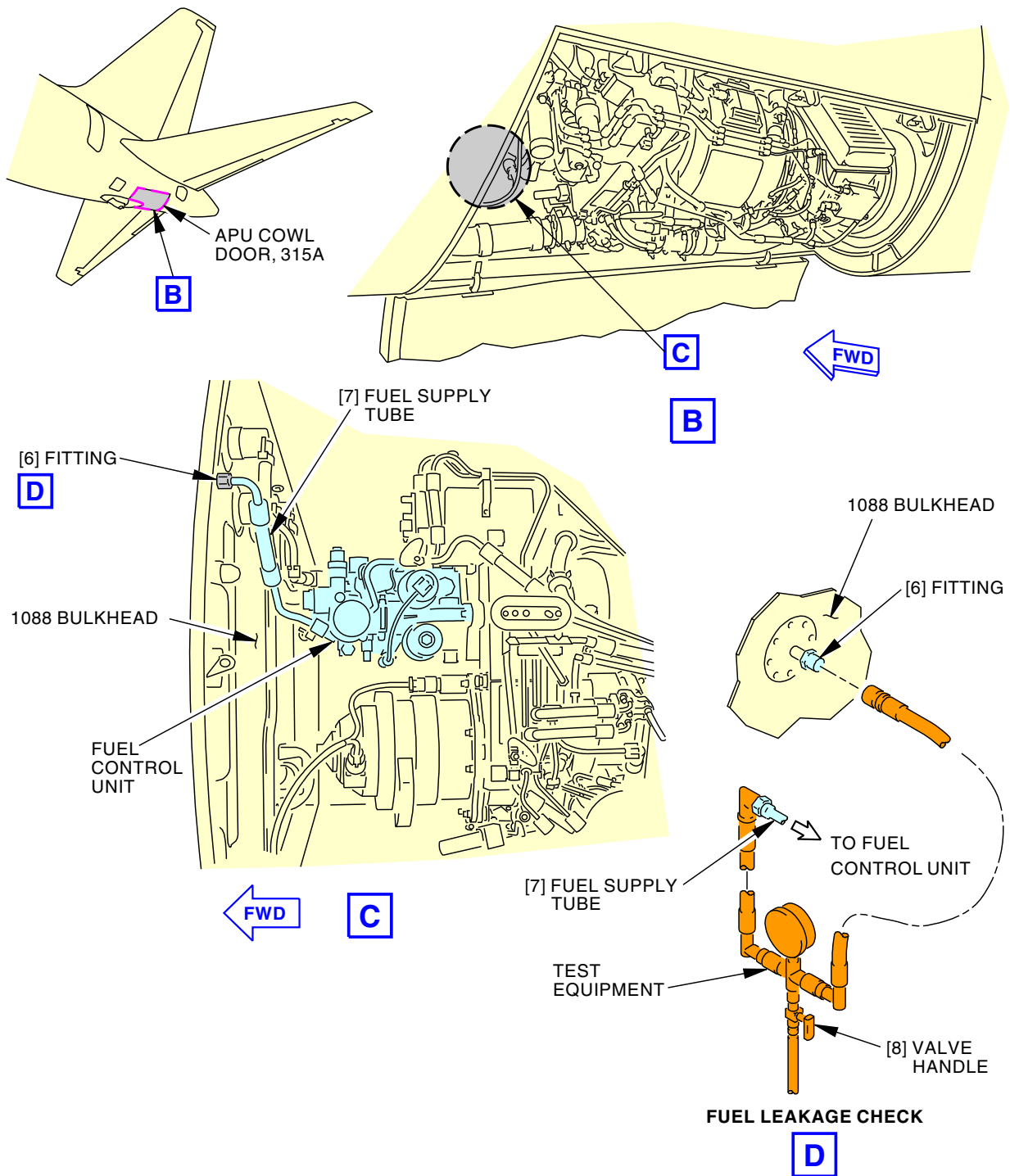
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APU Fuel System Checks
Figure 201/49-31-00-990-801 (Sheet 2 of 2)

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TASK 49-31-00-700-802

3. APU Fuel Supply Flow Check

(Figure 201)

A. References

Reference	Title
28-25-00-710-801	APU Fuel Feed System - Operational Test (P/B 501)
28-25-02-200-801	APU Fueling Shutoff Valve Actuator - Bonding Resistance Check (P/B 601)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Check

SUBTASK 49-31-00-860-005

- (1) Make sure that the APU master switch [3] on the forward overhead panel, P5, is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-31-00-860-006

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-00-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

G. APU Fuel Supply Flow Check

SUBTASK 49-31-00-720-001

- (1) Do the flow check for the APU fuel supply:
 - (a) Make sure that the center left fuel pump switch [1], No. 1 forward fuel pump switch [4] and No. 1 aft fuel pump switch [5] are in the OFF position.
 - (b) Make sure that the crossfeed valve switch [2] is in the CLOSED position.
 - (c) Put the 10 gallon (38 l) fuel resistant container, STD-200, under the fuel supply tube [7].



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (d) Disconnect the fuel supply tube [7] from the fitting [6] on the 1088 bulkhead.
- (e) Let the fuel drain into the 10 gallon (38 l) fuel resistant container, STD-200.
- (f) Install a plug on the fuel supply tube [7].
- (g) Connect a fuel hose to the fitting [6] on the 1088 bulkhead.
- (h) Put the other end of the fuel hose in the 10 gallon (38 l) fuel resistant container, STD-200.
- (i) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

- (j) Set the No. 1 aft fuel pump switch [5] or No. 1 forward fuel pump switch [4] to the ON position.
- (k) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch [3].

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WHEN YOU SET THE APU MASTER SWITCH TO THE ON POSITION, FUEL AND AIR WILL START TO FLOW INTO THE CONTAINER. THE FUEL FLOW CAN BE MORE THAN THREE GALLONS FOR EACH MINUTE (11.4 LITERS FOR EACH MINUTE). BE CAREFUL THAT YOU DO NOT SPILL FUEL FROM THE CONTAINER. DAMAGE TO EQUIPMENT CAN OCCUR.

- (l) Set the APU master switch [3] to the ON position.
- 1) Do not set the APU master switch [3] to the START position.
- NOTE: It is not necessary to start the APU for this fuel flow check.
- (m) Do these steps to monitor the fuel flow to make sure there is sufficient fuel to the APU fuel system:
- 1) Make sure that the fuel flows into the 10 gallon (38 l) fuel resistant container, STD-200.
- 2) After two minutes, set the APU master switch [3] to the OFF position.
- 3) Make sure that the fuel flow stops in less than 10 seconds.
- 4) If the fuel flow does not stop in less than 10 seconds, do this task: APU Fueling Shutoff Valve Actuator - Bonding Resistance Check, TASK 28-25-02-200-801.
- 5) If the fuel flow stops in less than 10 seconds, the APU fuel shutoff valve is satisfactory.
- 6) Open these circuit breakers and install safety tags:
- F/O Electrical System Panel, P6-2**
- | <u>Row</u> | <u>Col</u> | <u>Number</u> | <u>Name</u> |
|------------|------------|---------------|-------------------|
| B | 19 | C01344 | APU FIRE SW POWER |
- F/O Electrical System Panel, P6-4**
- | <u>Row</u> | <u>Col</u> | <u>Number</u> | <u>Name</u> |
|------------|------------|---------------|---------------------|
| A | 14 | C00033 | AUX POWER UNIT CONT |
- 7) Set the No. 1 aft fuel pump switch [5] or the No. 1 forward fuel pump switch [4] to the OFF position.
- 8) Measure the fuel in the 10 gallon (38 l) fuel resistant container, STD-200.
- 9) If there is less than 3 gal (11.4 l) in the 10 gallon (38 l) fuel resistant container, STD-200, do this task: APU Fuel Feed System - Operational Test, TASK 28-25-00-710-801.
- 10) If there is more than 3 gal (11.4 l) in the 10 gallon (38 l) fuel resistant container, STD-200, the APU fuel system is satisfactory.
- (n) Disconnect the fuel hose from the fitting [6] on the 1088 bulkhead.
- (o) Remove the fuel hose and 10 gallon (38 l) fuel resistant container, STD-200.
- (p) Remove the plug from the fuel supply tube [7].
- (q) If Christo-lube MCG111 grease, D50011, is not used on the fitting [6], do these steps:
- 1) Apply a thin layer of aircraft turbine engine oil, D50055, on the threads of the fitting [6].
- 2) Connect the fuel supply tube [7] to the fitting [6] on the 1088 bulkhead.
- a) Tighten to 470 in-lb (53 N·m) - 510 in-lb (58 N·m).

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(r) If Christo-lube MCG111 grease, D50011, is used on the fitting [6], do these steps:

- 1) Lubricate the external threads of the fitting [6] with Christo-lube MCG111 grease, D50011.

NOTE: The grease should be applied to the external threads only. The grease should not be applied to the internal threads or sealing surface of the fitting.

- 2) Connect the fuel supply tube [7] to the fitting [6] on the 1088 bulkhead.

- a) Tighten to 266 in-lb (30 N·m) - 294 in-lb (33 N·m).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-00-860-007

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-00-410-002

- (2) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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FUEL CONTROL UNIT - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has these tasks:
- (1) Removal of the fuel control unit
 - (2) Installation of the fuel control unit.
- B. The fuel control unit is installed on the lube module. You can get access to the fuel control unit through the APU cowl door.

TASK 49-31-11-000-801

2. **Fuel Control Unit Removal**

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. **Location Zones**

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

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-31-11-860-001

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

SUBTASK 49-31-11-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-11-010-001

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

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

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- (b) Open the three latches.

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

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

E. Fuel Control Unit Removal

SUBTASK 49-31-11-020-001

- (1) Disconnect the electrical connector (P22) [14] from the fuel control unit [3].

SUBTASK 49-31-11-020-003

- (2) Do these steps to disconnect the four fuel tubes: manifold supply tube [7], supply tube for the IGV and surge control [8], return tube for IGV and surge control valve [9], and fuel drain tube [10], from the fuel control unit [3]:



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel control unit [3].
- (b) Loosen the bolts [11] that attach the bracket [6] to the fuel control unit [3].
- (c) Disconnect the manifold supply tube [7] from the fuel control unit [3].
 - 1) Remove and discard the two packings [13].
- (d) Disconnect the supply tube for the IGV and surge control [8] from the fuel control unit [3].
 - 1) Remove and discard the two packings [13].
- (e) Disconnect the return tube for IGV and surge control valve [9] from the fuel control unit [3].
 - 1) Remove and discard the two packings [13].
- (f) Disconnect the fuel drain tube [10] from the fuel control unit [3].
 - 1) Remove and discard the two packings [12].
- (g) Drain the fuel from the manifold supply tube [7], supply tube for the IGV and surge control [8], return tube for IGV and surge control valve [9], and fuel drain tube [10] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (h) Install the caps on the manifold supply tube [7], supply tube for the IGV and surge control [8], return tube for IGV and surge control valve [9], and fuel drain tube [10].

SUBTASK 49-31-11-020-005

- (3) Do these steps to disconnect the fuel supply tube [2]:
 - (a) Loosen the nut [15] that attaches the fuel supply tube [2] to the fuel control unit [3].

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- (b) Turn the tube retainer on the fuel supply tube [2] in the counterclockwise direction until the flange disengages from the stud.
- (c) Remove the fuel supply tube [2] from the fuel control unit [3].
- (d) Remove the two packings [16] from the fuel control unit [3].
 - 1) Discard the two packings [16].
- (e) Drain the fuel from the fuel supply tube [2] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (f) Install a cap on the fuel supply tube [2].

SUBTASK 49-31-11-020-004

- (4) Do these steps to remove the fuel control unit [3]:
 - (a) Remove the coupling clamp [5] that attaches the fuel control unit [3] to the lube module.
 - (b) Remove the fuel control unit [3].
 - (c) Remove the packing [4] from the fuel control unit [3].
 - 1) Discard the packing [4].
 - (d) Make sure that you install all necessary protection covers.
 - (e) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

———— **END OF TASK** ————

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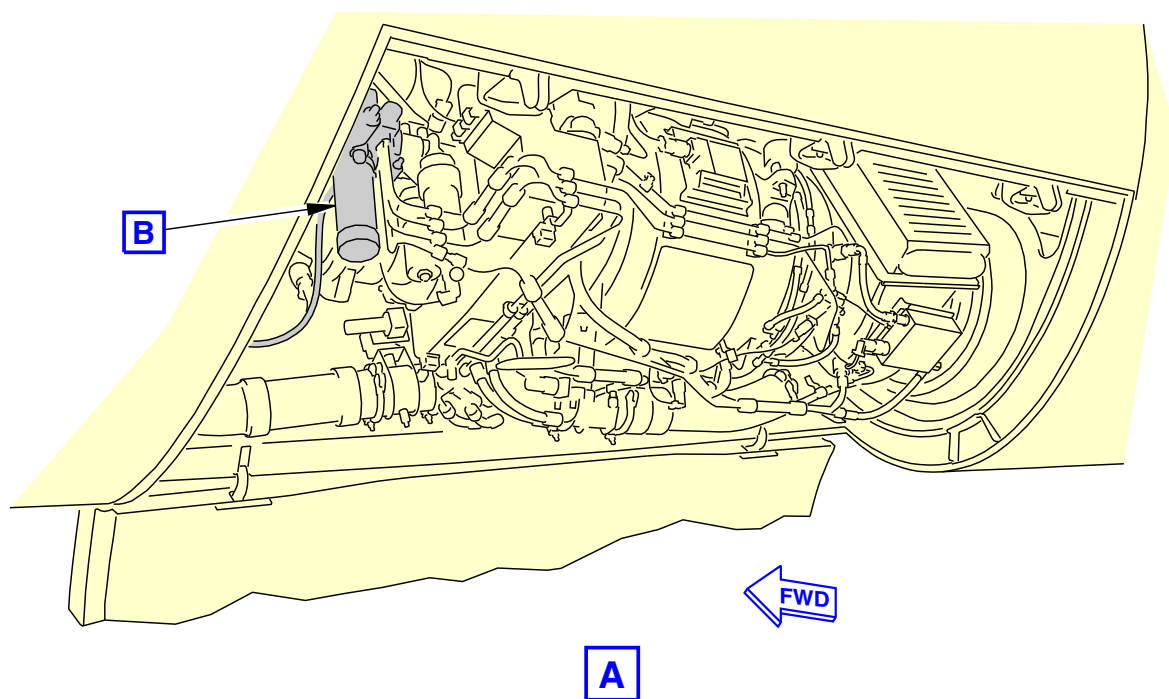
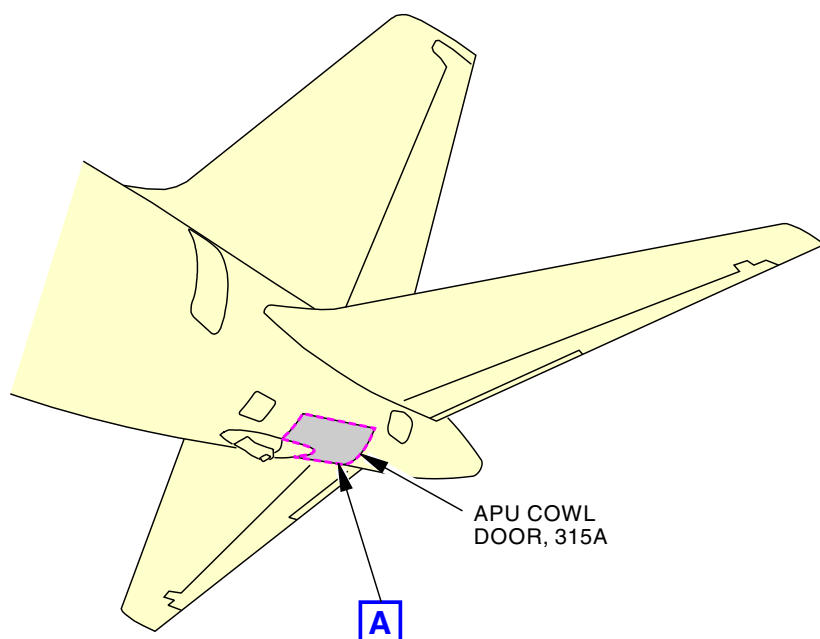
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Fuel Control Unit Installation
Figure 401/49-31-11-990-801 (Sheet 1 of 2)

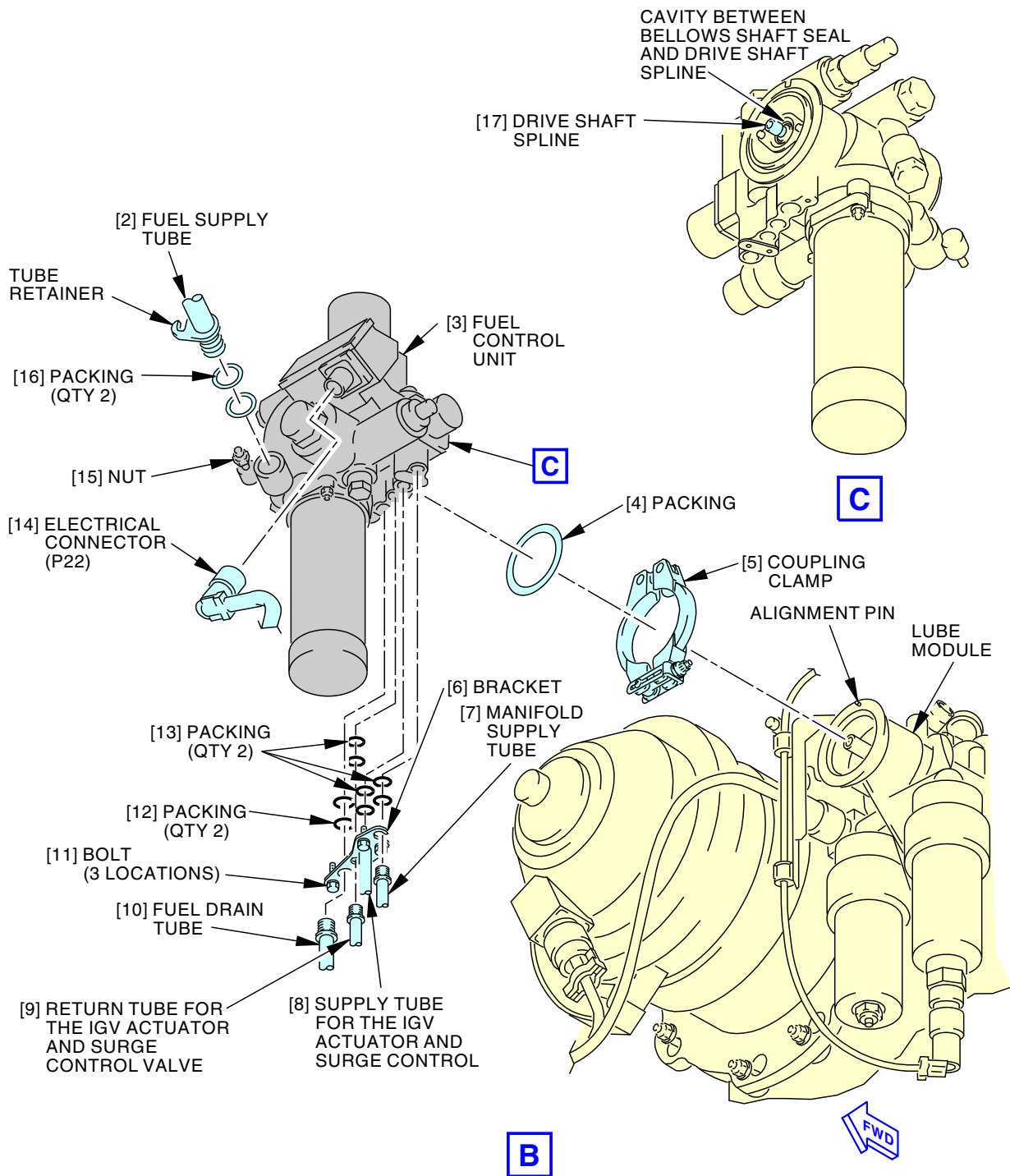
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Fuel Control Unit Installation
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TASK 49-31-11-400-801

3. Fuel Control Unit Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-2616	Dropper - Medicine, Conventional for adding equal drops of catalyst or curing agents to sealants and potting materials

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Fuel control unit	49-31-11-01-035	SIA ALL
4	Packing	49-31-11-01-007	SIA ALL
12	Packing	49-31-11-01-025	SIA ALL
13	Packing	49-31-11-01-020	SIA ALL
15	Nut	49-31-11-01-027	SIA ALL
16	Packing	49-31-11-01-015	SIA ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

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G. Fuel Control Unit Installation

SUBTASK 49-31-11-420-001



MAKE SURE THAT YOU REMOVE THE PROTECTIVE COVERS AND PLUGS IMMEDIATELY BEFORE YOU INSTALL THE COMPONENT. IF YOU DO NOT REMOVE THE COVERS AND PLUGS, DAMAGE TO THE ENGINE AND THE COMPONENT CAN OCCUR.

- (1) Remove all the protective covers and plugs.

SUBTASK 49-31-11-420-002



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

- (2) Do these steps to install the fuel control unit [3]:
- (a) Remove the protective covers from the openings, as necessary.
 - (b) Lubricate the new packing [4] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (c) Install the packing [4] on the fuel control unit [3].
 - (d) Put the coupling clamp [5] on the lube module (do not tighten).



DO NOT LET OIL STAY ON YOUR SKIN. THE SYNTHETIC OIL CONTAINS ADDITIVES THAT CAN BE POISONOUS IF THEY ARE ABSORBED THROUGH THE SKIN. CLEAN AWAY ALL OIL THAT GETS ON THE SKIN.



MAKE SURE THAT YOU LUBRICATE THE BELLOWS SHAFT SEAL OF THE FUEL CONTROL UNIT WITH OIL. THE BELLOWS SHAFT SEAL LIFE CAN DECREASE WITHOUT OIL.

- (e) Lubricate the fuel control unit [3]:
- 1) Make sure that the drive shaft spline [17] of the fuel control unit [3] points up.
 - 2) Use the medicine dropper, STD-2616, to apply 40 drops (3 cc) of aircraft turbine engine oil, D50055, into the cavity between the drive shaft spline [17] and the bellows shaft seal of the fuel control unit [3].
 - 3) Use the medicine dropper, STD-2616, to apply 3 drops (0.2 cc) or 4 drops (0.3 cc) of aircraft turbine engine oil, D50055, on the drive shaft spline [17] of the fuel control unit [3].



YOU MUST HOLD THE FUEL CONTROL UNIT WHILE YOU INSTALL THE COUPLING CLAMP. IF YOU DO NOT HOLD THE FUEL CONTROL UNIT, IT CAN BEND THE DRIVE SHAFT IN THE LUBE MODULE. IT CAN ALSO FALL AND BECOME DAMAGED.

- (f) Carefully put the fuel control unit [3] in position on the lube module.

NOTE: The fuel control unit [3] weighs approximately 7 lb (3 kg).

- 1) Open the coupling clamp [5] to let the hole on the fuel control unit [3] engage the alignment pin on the lube module flange.



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- 2) Make sure that the alignment pin on the lube module is aligned and engages the hole on the fuel control unit [3].
- (g) Put the coupling clamp [5] over the flanges of the fuel control unit [3] and the lube module.
 - 1) Tighten the nut on the coupling clamp [5] (part number 234-591-3030) to 60 in-lb (6.8 N·m).
 - 2) Tighten the nut on the coupling clamp [5] (part number 234-511-9059) to 20 in-lb (2.3 N·m).

SUBTASK 49-31-11-420-003

- (3) Do these steps to connect the four fuel tubes (manifold supply tube [7], supply tube for the IGv and surge control [8], return tube for IGv and surge control valve [9], and fuel drain tube [10]) to the fuel control unit [3]:
 - (a) Remove the caps from the manifold supply tube [7], supply tube for the IGv and surge control [8], return tube for IGv and surge control valve [9], and fuel drain tube [10].
 - (b) Lubricate the two new packings [12] and six new packings [13] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (c) Install the two packings [12] on the fuel drain tube [10].
 - (d) Install the four packings [13] on the supply tube for the IGv and surge control [8] and the return tube for IGv and surge control valve [9].
 - (e) Install the two packings [13] on the manifold supply tube [7].
 - (f) Connect the four tubes (manifold supply tube [7], supply tube for the IGv and surge control [8], return tube for IGv and surge control valve [9], and fuel drain tube [10]) to the fuel control unit [3].
 - (g) Tighten the three bolts [11] that attach the bracket [6] to the fuel control unit [3] to 50 in-lb (5.6 N·m).
 - (h) Make sure that the four fuel tubes are installed in the clamps.

SUBTASK 49-31-11-420-006

- (4) Do these steps to connect the fuel supply tube [2] to the fuel control unit [3]:
 - (a) If it is installed, remove and discard the shipping hardware (nut and plug) from the fuel supply tube [2].
 - (b) Lubricate the two new packings [16] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (c) Install the two packings [16] on the fuel supply tube [2].



OBEY THESE PRECAUTIONS. IF YOU IGNORE THESE PRECAUTIONS, DAMAGE TO EQUIPMENT WILL OCCUR.

- (d) Install a new nut [15].
 - 1) Do not reinstall the old nut (shipping hardware) that was discarded.

NOTE: It is a different part number nut and can cause possible fuel leakage.
- (e) Connect the fuel supply tube [2] to the fuel control unit [3].
- (f) Turn the tube retainer on the fuel supply tube [2] in the clockwise direction until the flange fully engages the stud.
- (g) Tighten the new nut [15] to 40 in-lb (4.5 N·m).

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SUBTASK 49-31-11-420-005

- (5) Connect the electrical connector (P22) [14] to the fuel control unit [3].

H. Fuel Control Unit Installation Test

SUBTASK 49-31-11-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-11-860-004

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

SUBTASK 49-31-11-740-001

- (3) Do the installation test for the fuel control unit [3].
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

NOTE: It can be necessary to start the APU more than three times after you replace the fuel control unit [3].

 - 1) Make sure that you obey the start duty cycle of three times during a 15 minute interval.
 - (b) Operate the APU for a minimum of 5 minutes.
 - (c) During APU operation, examine the fuel control unit [3] for signs of fuel leakage.
 - 1) A fuel leakage rate of 1 drop (0.06 cc) for each minute is permitted during an APU operation from the forward drain on the APU drain seal.
 - (d) If you find more than the fuel leakage rate, then do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the fuel control unit [3] for signs of fuel leakage.
 - 7) If you find more than the fuel leakage rate, then do the leakage repair again.
 - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU fuel system or the fuel control unit [3], refer to the IFIM and do the applicable procedure(s).
 - (f) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-11-410-001

(1) To close the access panel, do these steps

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

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

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

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

————— **END OF TASK** —————

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FUEL CONTROL UNIT - INSPECTION/CHECK

1. General

- A. This procedure has the task to do an inspection of the fuel control unit and the five fuel tubes.

TASK 49-31-11-200-801

2. Fuel Control Unit Inspection

(Figure 601)

A. References

<u>Reference</u>	<u>Title</u>
49-31-11-000-801	Fuel Control Unit Removal (P/B 401)
49-31-11-400-801	Fuel Control Unit Installation (P/B 401)

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>
315A	APU Cowl Door

D. Prepare for the Inspection

SUBTASK 49-31-11-010-002

- (1) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Fuel Control Unit Inspection

SUBTASK 49-31-11-210-001

- (1) Do these steps to inspect the fuel control unit [1] and the five fuel tubes [2]:
- (a) Visually examine the fuel control unit [1] and the five fuel tubes [2] for tightness and damage.
 - (b) Visually examine the fuel control unit [1] and the five fuel tubes [2] for fuel leakage.
 - (c) Visually examine the five fuel tubes [2] for general condition and security.

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- (d) If there are signs of fuel leakage from the fuel control unit [1] or the fuel tubes [2], then replace the fuel control unit [1] or damaged fuel tube [2] (as necessary).

These are the tasks:

- Fuel Control Unit Removal, TASK 49-31-11-000-801,
- Fuel Control Unit Installation, TASK 49-31-11-400-801.

- (e) If there is no fuel leakage, then the fuel control unit [1] and the five fuel tubes [2] are satisfactory.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-11-410-002

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

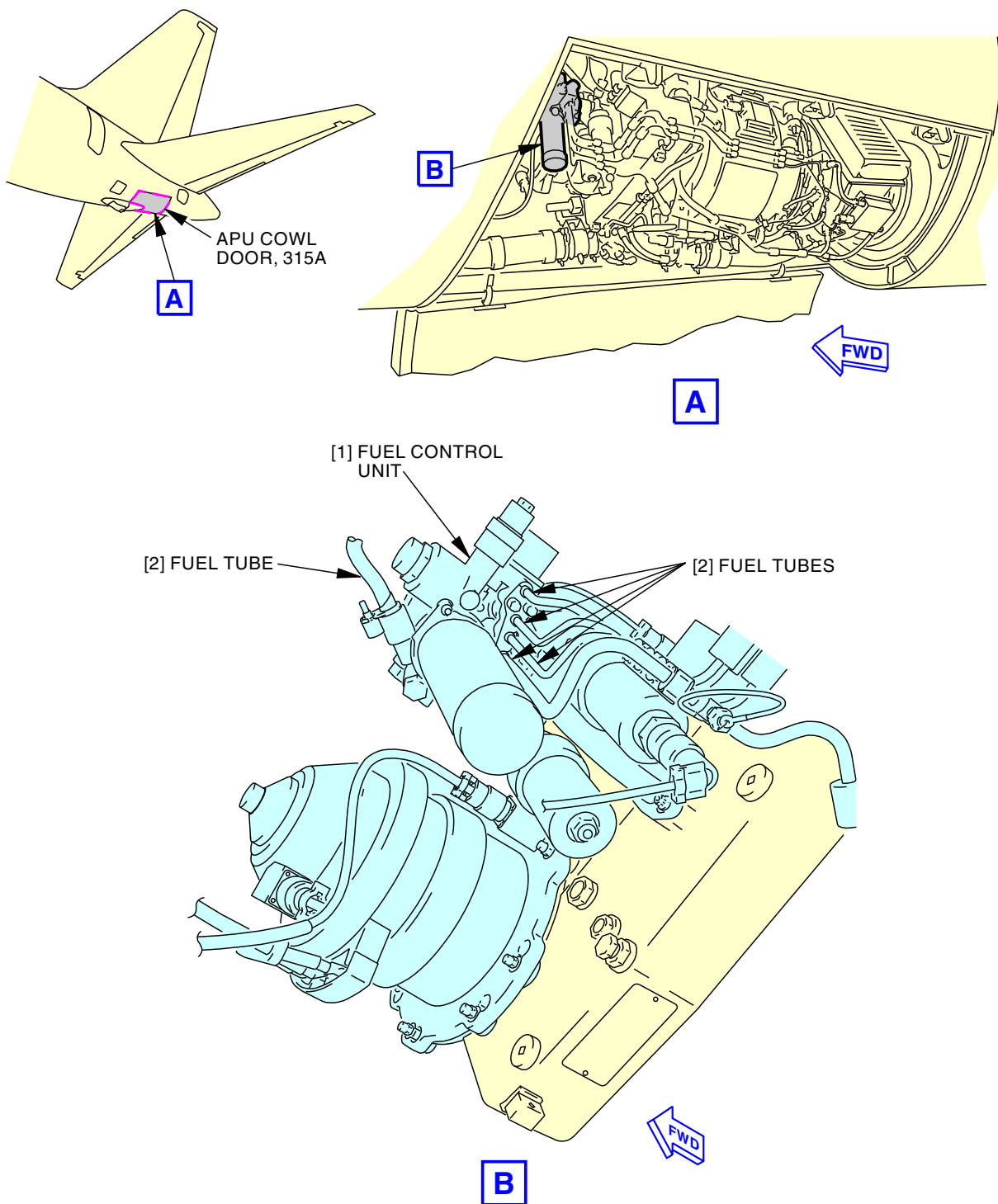
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Fuel Control Unit Inspection
Figure 601/49-31-11-990-802

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FUEL NOZZLE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the fuel nozzle
 - (2) Installation of the fuel nozzle.
- B. Ten fuel nozzles are installed on the combustor housing.

TASK 49-31-14-000-801

2. Fuel Nozzle Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. Location Zones

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

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-31-14-860-001

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

SUBTASK 49-31-14-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-14-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

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

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

E. Fuel Nozzle Removal

SUBTASK 49-31-14-020-001



DO NOT REMOVE ALL THE FUEL NOZZLES FROM THE COMBUSTOR HOUSING AT THE SAME TIME. YOU CAN REMOVE THE FUEL NOZZLE IF THERE ARE TWO ADJACENT FUEL NOZZLES. THE MAXIMUM NUMBER OF FUEL NOZZLES THAT YOU CAN REMOVE AT THE SAME TIME IS FIVE. IF YOU REMOVE ALL THE FUEL NOZZLES, THE COMBUSTOR LINER WILL NOT ALIGN WITH THE FUEL NOZZLES ON THE COMBUSTOR HOUSING.

- (1) Do these steps to remove the fuel nozzle [4]:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the combustor housing.



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect fitting [1] and fitting [2] for the primary and secondary fuel manifolds from the fuel nozzle [4].
- (c) Let the fuel drain into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (d) Install the caps on the two fittings, fitting [1] and fitting [2].
- (e) Remove the two pins [7] and plate [6] from the two bolts [5].
 - 1) Discard the two pins [7].
- (f) Remove the two bolts [5] from the fuel nozzle [4].
- (g) Remove the fuel nozzle [4], gasket [8] and shroud [3] from the combustor housing.
 - 1) Discard the gasket [8].
- (h) Make sure that you install all necessary protection covers.
- (i) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— **END OF TASK** —————

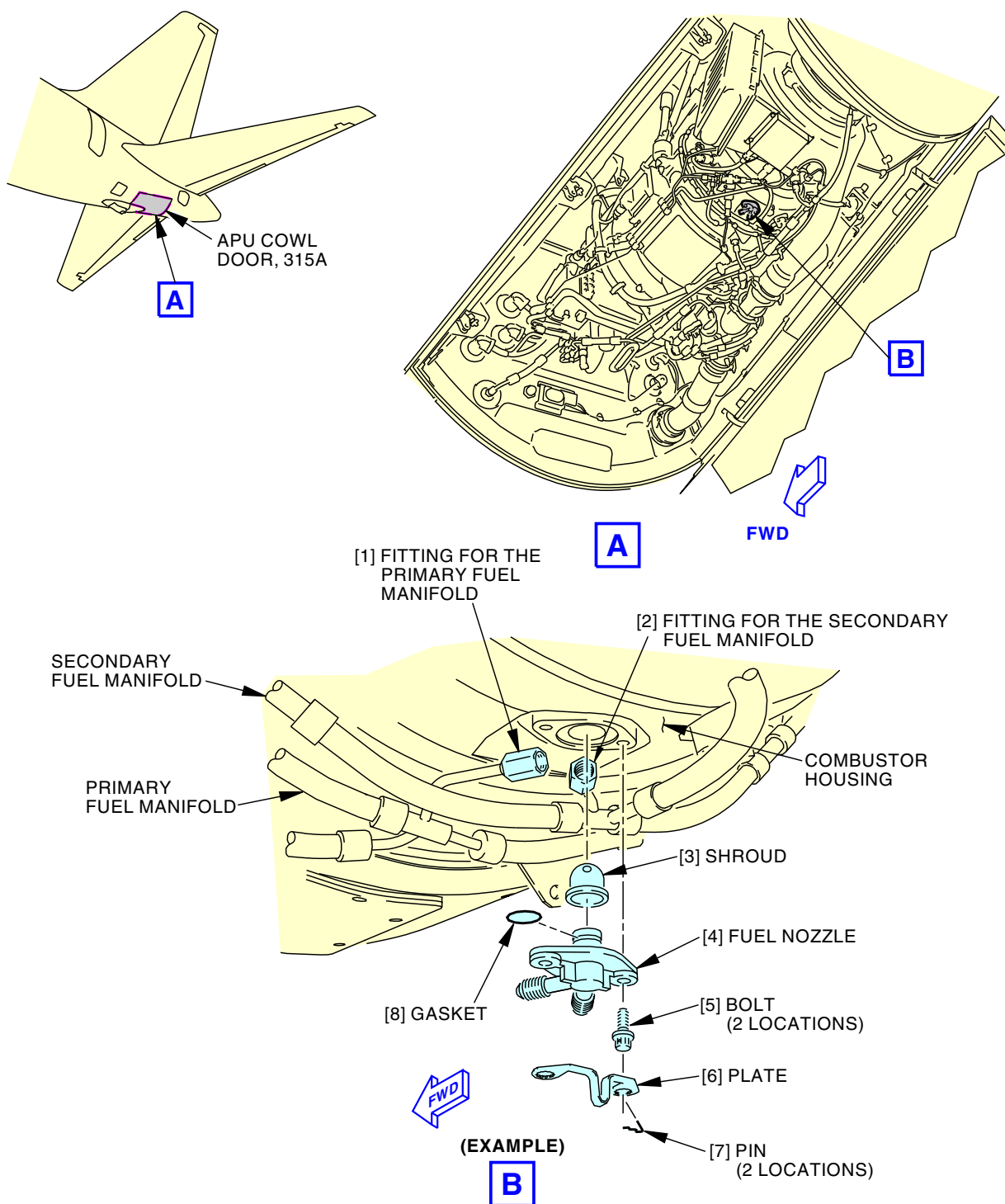
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Fuel Nozzle Installation
Figure 401/49-31-14-990-801

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TASK 49-31-14-400-801

3. **Fuel Nozzle Installation**

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-31-14-200-801	Fuel Nozzle Inspection (P/B 601)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Fuel nozzle	49-31-14-01-020	SIA ALL
7	Pin	49-31-14-01-005	SIA ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Fuel Nozzle Installation

SUBTASK 49-31-14-420-001



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 fuel nozzle [4]:
 - (a) Remove the protection covers as necessary.
 - (b) Do this task: Fuel Nozzle Inspection, TASK 49-31-14-200-801.
 - (c) Apply a thin layer of Never-Seez NSBT compound, D00006, on the threads of the two bolts [5].
 - (d) Install the new gasket [8] on the fuel nozzle [4].

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MAKE SURE THAT YOU CENTER THE HOLE IN THE SHROUD OVER THE ALIGNMENT PIN ON THE FUEL NOZZLE. IF THE SHROUD IS NOT INSTALLED CORRECTLY ON THE FUEL NOZZLE, DAMAGE TO THE APU CAN OCCUR.

- (e) Install the shroud [3], and fuel nozzle [4] with the gasket [8] in the combustor housing with the two bolts [5].
 - 1) Tighten the two bolts [5] to 60 in-lb (6.8 N·m).
- (f) Install the plate [6] on the bolts [5].
- (g) Install the two pins [7] in the two bolts [5] to attach the plate [6].
- (h) Remove the caps from fitting [1] and fitting [2].
- (i) Connect fitting [1] and fitting [2] for the primary and secondary fuel manifolds to the fuel nozzle [4].
 - 1) Tighten fitting [1] and fitting [2] to 120 in-lb (13.6 N·m).

H. Fuel Nozzle Installation Test

SUBTASK 49-31-14-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-14-860-004

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

SUBTASK 49-31-14-790-001

- (3) Do the installation test for the fuel nozzle:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 1) It can be necessary to start the APU more than three times after you replace the fuel nozzle.
 - a) If you start the APU again, make sure that you obey the start duty cycle of three times during a 15 minute interval.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the fuel nozzle for signs of fuel leakage.
 - (d) If you find fuel leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

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- 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- 6) During the APU operation, examine the fuel nozzle for signs of fuel leakage.
- 7) If you find fuel leakage, do the leakage repair again.
- (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-14-410-001

- (1) To close the access panel, do these steps

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

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

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

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

———— **END OF TASK** ————

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FUEL NOZZLE - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the fuel nozzle. Ten fuel nozzles are installed on the combustor housing.

TASK 49-31-14-200-801

2. Fuel Nozzle Inspection

A. **References**

Reference	Title
49-31-14-000-801	Fuel Nozzle Removal (P/B 401)
49-31-14-400-801	Fuel Nozzle Installation (P/B 401)

B. **Location Zones**

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

C. **Fuel Nozzle Inspection**

SUBTASK 49-31-14-020-002

- (1) Do this task: Fuel Nozzle Removal, TASK 49-31-14-000-801.

SUBTASK 49-31-14-210-001

- (2) Do these steps to inspect the fuel nozzle:
- (a) Examine the two inlet fittings for the fuel nozzle for crossed, stripped and peened threads.
 - (b) Examine the mounting flange for burrs and nicks.
 - (c) Examine the fuel nozzle for burrs, nicks, scratches and carbon buildup.
 - (d) Examine the fuel nozzle for blockage.
 - (e) Examine the locating pin for damage.
 - (f) If you find any of the above damage, replace the fuel nozzle.

SUBTASK 49-31-14-420-002

- (3) Do this task: Fuel Nozzle Installation, TASK 49-31-14-400-801.

———— **END OF TASK** ————

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FUEL FLOW DIVIDER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the fuel flow divider
 - (2) Installation of the fuel flow divider.
- B. The fuel flow divider is installed between the compressor inlet section and eductor housing at the 6 o'clock position.
- C. The flow divider solenoid is a part of the fuel flow divider.

TASK 49-31-15-000-801

2. Fuel Flow Divider Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. **Location Zones**

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

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-31-15-860-001

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

SUBTASK 49-31-15-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-15-010-001

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

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

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- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Fuel Flow Divider Removal

SUBTASK 49-31-15-020-001

- (1) Disconnect the electrical connector (P23) [17] from the flow divider solenoid [16].

SUBTASK 49-31-15-020-002

- (2) Do these steps to disconnect the fitting for the fuel supply tube [3], fitting for the primary fuel manifold [2] and the fitting for the secondary fuel manifold [13] from the fuel flow divider [1]:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel flow divider [1].



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the fitting for the fuel supply tube [3] from the fuel flow divider [1].
- (c) Disconnect the fitting for the primary fuel manifold [2] from the fuel flow divider [1].
- (d) Disconnect the fitting for the secondary fuel manifold [13] from the fuel flow divider [1].
- (e) Let the fuel drain into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (f) Install the caps on the three fittings: fitting for the primary fuel manifold [2], fitting for the fuel supply tube [3], and fitting for the secondary fuel manifold [13].

SUBTASK 49-31-15-020-003

- (3) Do these steps to remove the fuel flow divider [1]:
 - (a) Remove the two nuts [10] and two bolts [7] that attach the two ground straps [9] to the flow divider solenoid [16].
 - (b) Remove the bolt [15] that attaches the clamp [14] to the bracket [18].
 - (c) Remove the fuel flow divider [1] and clamp [14].
 - (d) Make sure that you install all necessary protection covers.
 - (e) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

SUBTASK 49-31-15-020-004

- (4) Do these steps to remove the flow divider solenoid [16]:
 - (a) Loosen the nut [4] to disconnect the flow divider solenoid [16] from the fuel flow divider [1].
 - (b) Remove the flow divider solenoid [16].

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- (c) Remove the nut [4], packing retainer [5] and packing [6].
 - 1) Discard the packing [6].
- (d) Remove the union [12] and packing [11] from the flow divider solenoid [16].
 - 1) Discard the packing [11].

———— **END OF TASK** ————

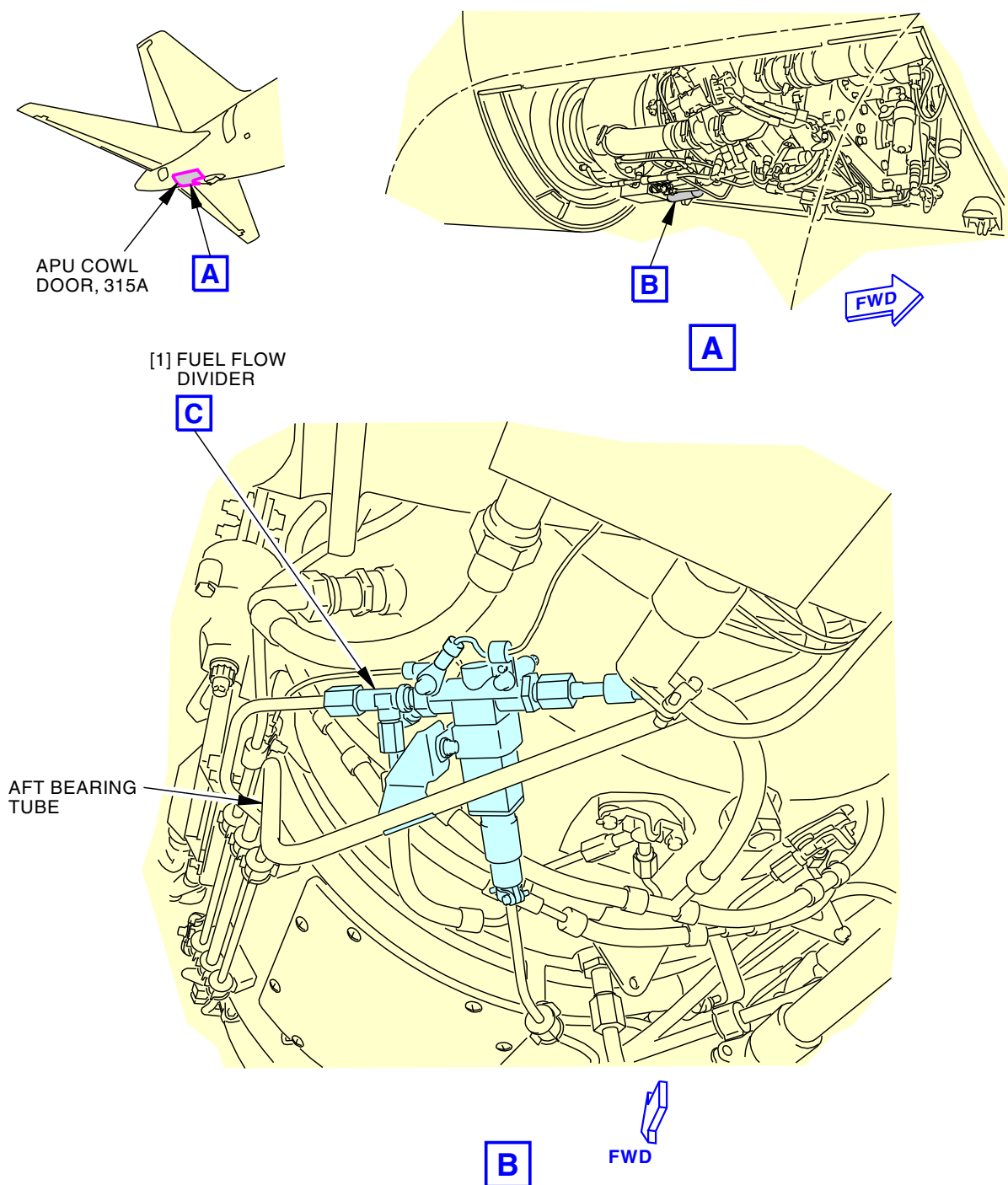
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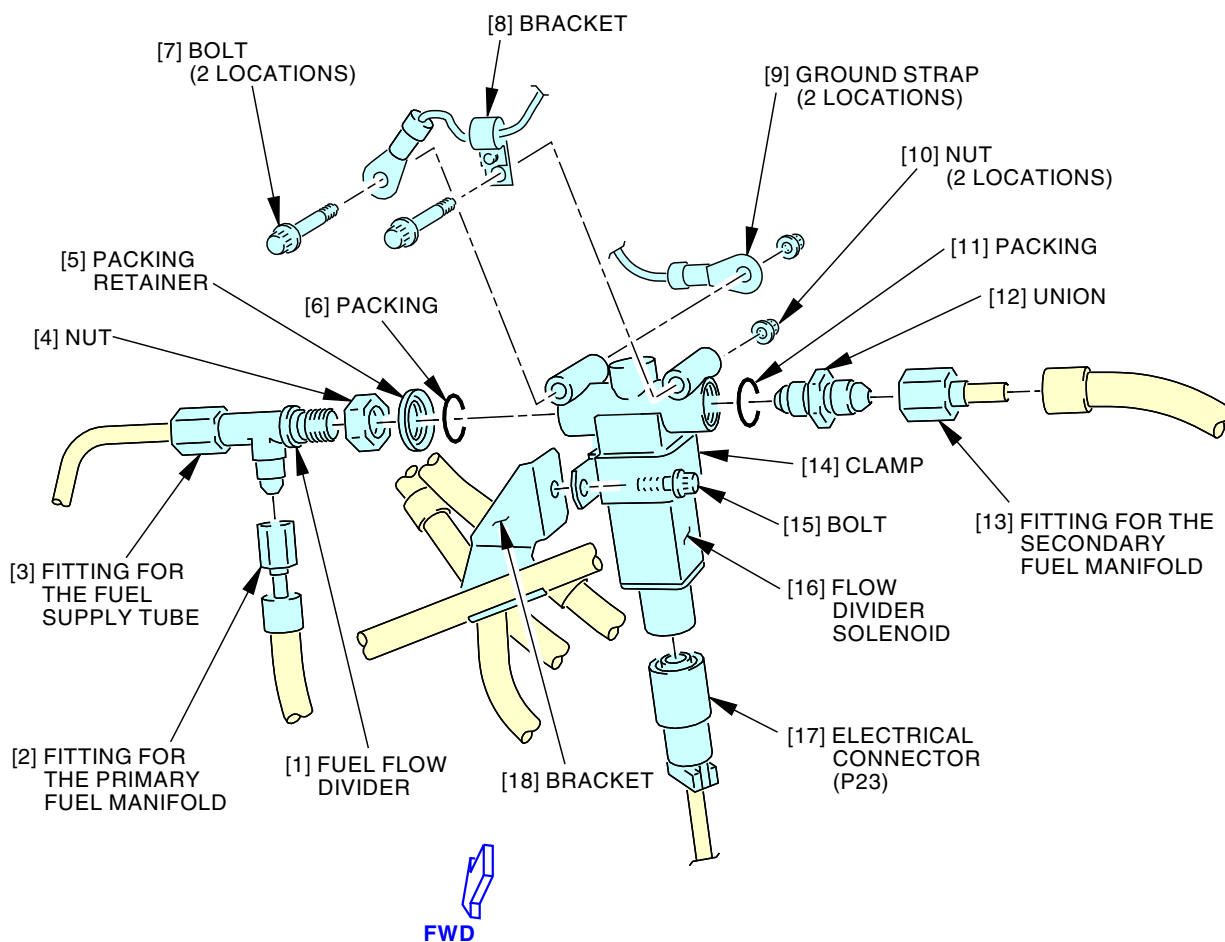
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TASK 49-31-15-400-801

3. **Fuel Flow Divider Installation**

(Figure 401)

A. References

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

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fuel flow divider	49-31-15-01-030	SIA ALL
6	Packing	49-31-15-01-015	SIA ALL
11	Packing	49-31-15-01-015	SIA ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Fuel Flow Divider Installation

SUBTASK 49-31-15-420-001

- (1) Prepare to install the fuel flow divider [1] and flow divider solenoid [16]:
 - (a) Lubricate the new packing [6] and new packing [11] for the flow divider solenoid [16] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (b) Put the packing [6] and packing retainer [5] on the flow divider solenoid [16].
 - (c) Install the nut [4].
 - (d) Install the fuel flow divider [1] on the flow divider solenoid [16].

NOTE: It is not necessary to tighten the nut [4] at this time.
 - (e) Install the packing [11] on the union [12].
 - (f) Install the union [12] on the flow divider solenoid [16].
 - 1) Tighten the union [12] to 140 in-lb (15.8 N·m).

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SUBTASK 49-31-15-420-002



CAUTION

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

- (2) Do these steps to install the fuel flow divider [1] and flow divider solenoid [16]:
- (a) Remove the protection covers as necessary.
 - (b) Install the clamp [14] and flow divider solenoid [16] to the bracket [18] with the bolt [15].
NOTE: It is not necessary to tighten the bolt [15] at this time.
 - (c) Install the two ground straps [9] and bracket [8] to the flow divider solenoid [16] with the two bolts [7] and two nuts [10].
 - 1) Tighten the bolts [7] to 60 in-lb (6.8 N·m).

SUBTASK 49-31-15-420-003

- (3) Do these steps to connect the fitting for the fuel supply tube [3], fitting for the primary fuel manifold [2] and the fitting for the secondary fuel manifold [13] to the fuel flow divider [1]:
- (a) Remove the caps from the three fittings.
 - (b) Connect the fitting for the primary fuel manifold [2] to the fuel flow divider [1].
 - 1) Tighten the fitting for the primary fuel manifold [2] to 140 in-lb (15.8 N·m).
 - (c) Connect the fitting for the secondary fuel manifold [13] to the flow divider solenoid [16].
 - 1) Tighten the fitting for the secondary fuel manifold [13] to 140 in-lb (15.8 N·m).
 - (d) Connect the fitting for the fuel supply tube [3] to the fuel flow divider [1].
 - 1) Tighten the fitting for the fuel supply tube [3] to 140 in-lb (15.8 N·m).
 - (e) Tighten the bolt [15] on the clamp [14] to 50 in-lb (5.6 N·m).
 - (f) Tighten the nut [4] on the fuel flow divider [1] to 140 in-lb (15.8 N·m).
 - (g) Make sure that the fitting for the primary fuel manifold [2] does not touch the aft bearing tube.

SUBTASK 49-31-15-420-004

- (4) Connect the electrical connector (P23) [17] to the flow divider solenoid [16].

H. Fuel Flow Divider Installation Test

SUBTASK 49-31-15-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-15-860-004

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

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SUBTASK 49-31-15-790-001

- (3) Do the installation test for the fuel flow divider [1]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the fuel flow divider [1] for signs of fuel leakage.
 - (d) If you find fuel leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the fuel flow divider [1] for signs of fuel leakage.
 - 7) If you find fuel leakage, do the leakage repair again.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-15-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

————— **END OF TASK** —————

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FUEL MANIFOLD ASSEMBLY - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the primary fuel manifold
 - (2) Installation of the primary fuel manifold
 - (3) Removal of the secondary fuel manifold
 - (4) Installation of the secondary fuel manifold.
- B. The fuel manifold assembly has two fuel manifolds on the APU. The primary and the secondary fuel manifolds are installed on the combustor housing.

TASK 49-31-16-000-801

2. Primary Fuel Manifold Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. **Location Zones**

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

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-31-16-860-001

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

SUBTASK 49-31-16-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-16-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Primary Fuel Manifold Removal

SUBTASK 49-31-16-020-001



DO NOT TOUCH THE FUEL MANIFOLD IF THE APU IS HOT. THE FUEL MANIFOLD IS HOT AFTER THE APU OPERATION AND SHUTDOWN. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the primary fuel manifold [1]:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the combustor housing.



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the fitting for the primary fuel manifolds [10] from the fuel flow divider [6].
- (c) Disconnect the 10 fittings for the primary fuel manifold [3] from the ten fuel nozzles [4].
- (d) Let the fuel drain into a 1 gallon (4 l) fuel resistant container, STD-4049.
- (e) Install the caps on the eleven fittings (fittings for the primary fuel manifold [3] and fitting for the primary fuel manifold [10]).
- (f) Remove the primary fuel manifold [1].
- (g) Make sure that you install all necessary protection covers.
- (h) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

———— **END OF TASK** ————

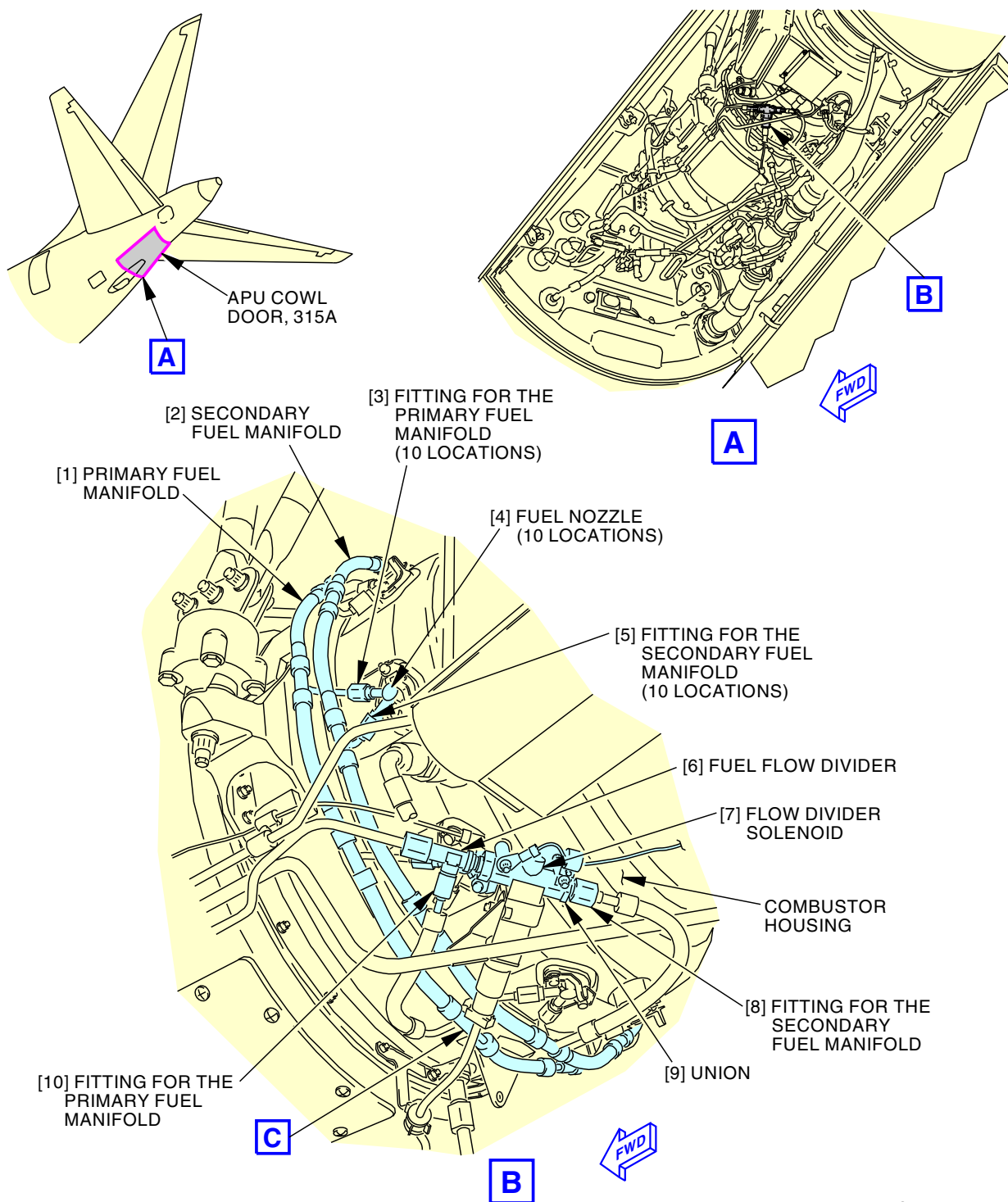
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Fuel Manifold Assembly Installation
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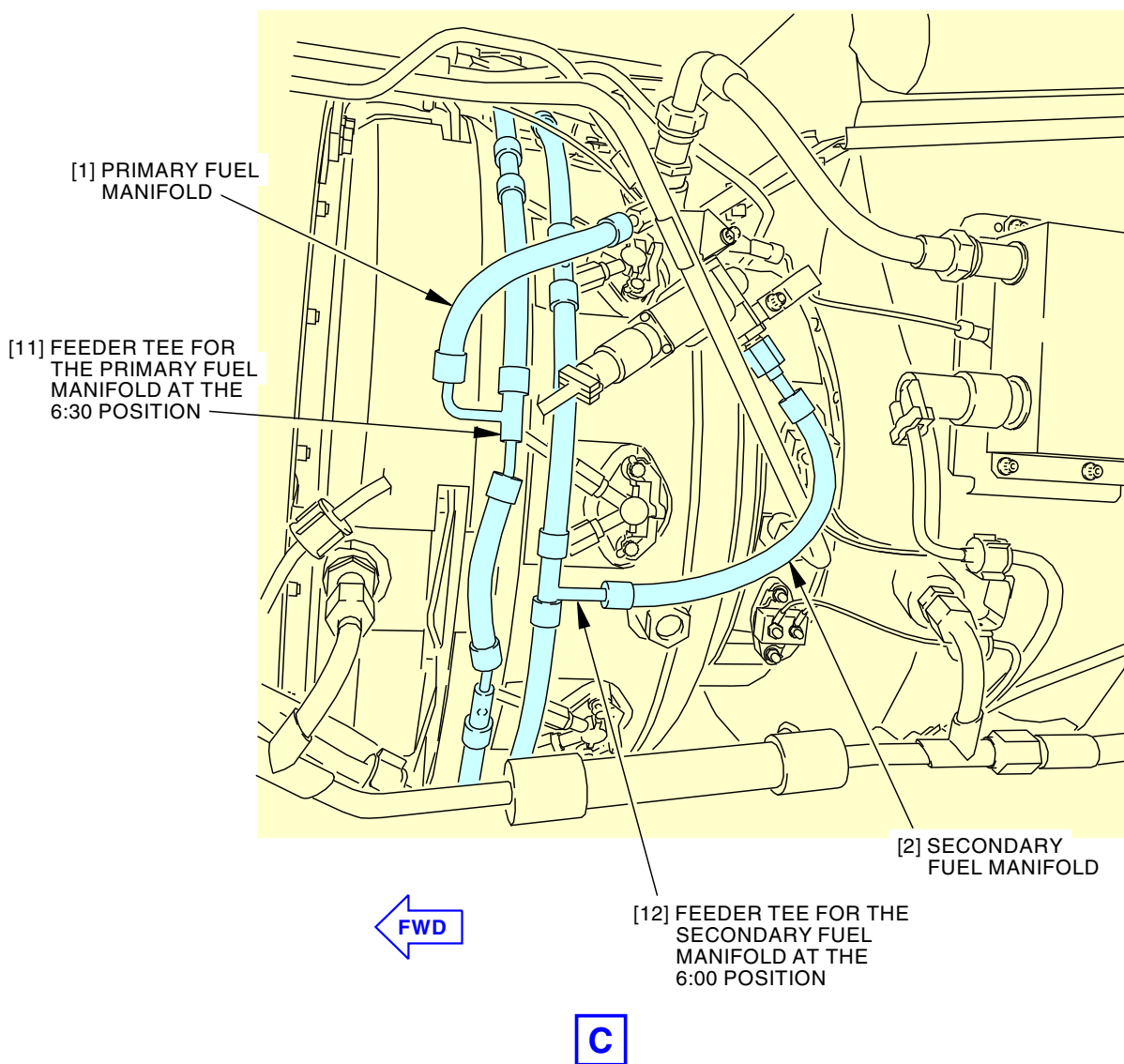
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Fuel Manifold Assembly Installation
Figure 401/49-31-16-990-801 (Sheet 2 of 2)

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TASK 49-31-16-400-801

3. Primary Fuel Manifold Installation

(Figure 401)

A. References

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

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Primary fuel manifold	49-31-16-01-010	SIA ALL

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Primary Fuel Manifold Installation

SUBTASK 49-31-16-420-001



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 primary fuel manifold [1]:
 - (a) Remove the caps from the 10 fittings for the primary fuel manifold [3] and the fitting for the primary fuel manifold [10].
 - (b) Install the primary fuel manifold [1] on the combustor housing.
 - 1) Make sure that the feeder tee for the primary fuel manifold [11] is at the 6:30 position.
 - (c) Connect the 10 fittings for the primary fuel manifold [3] to the 10 fuel nozzles [4].
 - 1) Tighten each fitting to 120 in-lb (13.6 N·m).
 - (d) Connect the fitting for the primary fuel manifold [10] to the fuel flow divider [6].
 - 1) Tighten to 140 in-lb (15.8 N·m).

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G. Primary Fuel Manifold Installation Test

SUBTASK 49-31-16-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-16-860-004

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

SUBTASK 49-31-16-790-001

- (3) Do the installation test for the primary fuel manifold [1]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the primary fuel manifold [1] for signs of fuel leakage.
 - (d) If you find fuel leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the primary fuel manifold [1] for signs of fuel leakage.
 - 7) If you find fuel leakage, do the leakage repair again.
 - (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-16-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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- (g) Close the three latches.

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

————— END OF TASK —————

TASK 49-31-16-000-802

4. Secondary Fuel Manifold Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. Location Zones

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

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-31-16-860-005

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

SUBTASK 49-31-16-860-006

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-16-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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

- (b) Open the three latches.

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

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

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

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- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Secondary Fuel Manifold Removal

SUBTASK 49-31-16-020-002



DO NOT TOUCH THE FUEL MANIFOLD IF THE APU IS HOT. THE FUEL MANIFOLD IS HOT AFTER THE APU OPERATION AND SHUTDOWN. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the secondary fuel manifold [2]:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the combustor housing.



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the fitting for the secondary fuel manifold [8] from the union [9] on the flow divider solenoid [7].
- (c) Disconnect the 10 fittings for the secondary fuel manifold [5] from the 10 fuel nozzles [4].
- (d) Let the fuel drain into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (e) Install the caps on the eleven fittings (fittings for the secondary fuel manifold [5] and fitting for the secondary fuel manifold [8]).
- (f) Remove the secondary fuel manifold [2].
- (g) Make sure that you install all necessary protection covers.
- (h) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

————— END OF TASK —————

TASK 49-31-16-400-802

5. Secondary Fuel Manifold Installation

(Figure 401)

A. References

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

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Secondary fuel manifold	49-31-16-01-005	SIA ALL

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D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Secondary Fuel Manifold Installation

SUBTASK 49-31-16-420-002



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 secondary fuel manifold [2]:
 - (a) Remove the caps from the fitting for the secondary fuel manifold [8] and the 10 fittings for the secondary fuel manifold [5].
 - (b) Install the secondary fuel manifold [2] on the combustor housing.
 - 1) Make sure that the feeder tee for the secondary fuel manifold [12] is at the 6:00 position.
 - (c) Connect the 10 fittings for the secondary fuel manifold [5] to the 10 fuel nozzles [4] on the secondary fuel manifold [2].
 - 1) Tighten each fittings for the secondary fuel manifold [5] to 120 in-lb (13.6 N·m).
 - (d) Connect the fitting for the secondary fuel manifold [8] to the union [9] on the flow divider solenoid [7].
 - 1) Tighten to 140 in-lb (15.8 N·m).

G. Secondary Fuel Manifold Installation Test

SUBTASK 49-31-16-860-007

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-16-860-008

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

SUBTASK 49-31-16-790-002

- (3) Do the installation test for the secondary fuel manifold [2]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.

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- (c) During the APU operation, examine the secondary fuel manifold [2] for signs of fuel leakage.
- (d) If you find fuel leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the secondary fuel manifold [2] for signs of fuel leakage.
 - 7) If you find fuel leakage, do the leakage repair again.
- (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-16-410-002

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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INLET FUEL FILTER ELEMENT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the inlet fuel filter element
 - (2) Installation of the inlet fuel filter element.
- B. The inlet fuel filter element is referred to as the fuel filter element.
- C. The fuel filter element is installed on the fuel control unit. You can get access to the fuel filter element through the APU cowl door.

TASK 49-31-21-000-801

2. Inlet Fuel Filter Element Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. Location Zones

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

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-31-21-860-001

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

SUBTASK 49-31-21-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-31-21-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

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- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Inlet Fuel Filter Element Removal

SUBTASK 49-31-21-020-001

- (1) Do these steps to remove the fuel filter element [3]:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the fuel filter housing [1].



DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Loosen the two nuts [4] that attach the fuel filter housing [1] to the fuel control unit.
- (c) Turn the fuel filter housing [1] in the counterclockwise direction until the flange disengages from the two studs.
- (d) Remove the fuel filter housing [1].
- (e) Remove the packing [2] from the fuel filter housing [1].
 - 1) Discard the packing [2].
- (f) Remove the packing [5] from between the fuel control unit and the fuel filter element [3].
 - 1) Discard the packing [5].
- (g) Remove the fuel filter element [3].
 - 1) Discard the fuel filter element [3].
- (h) Make sure that you install all necessary protection covers.
- (i) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

———— **END OF TASK** ————

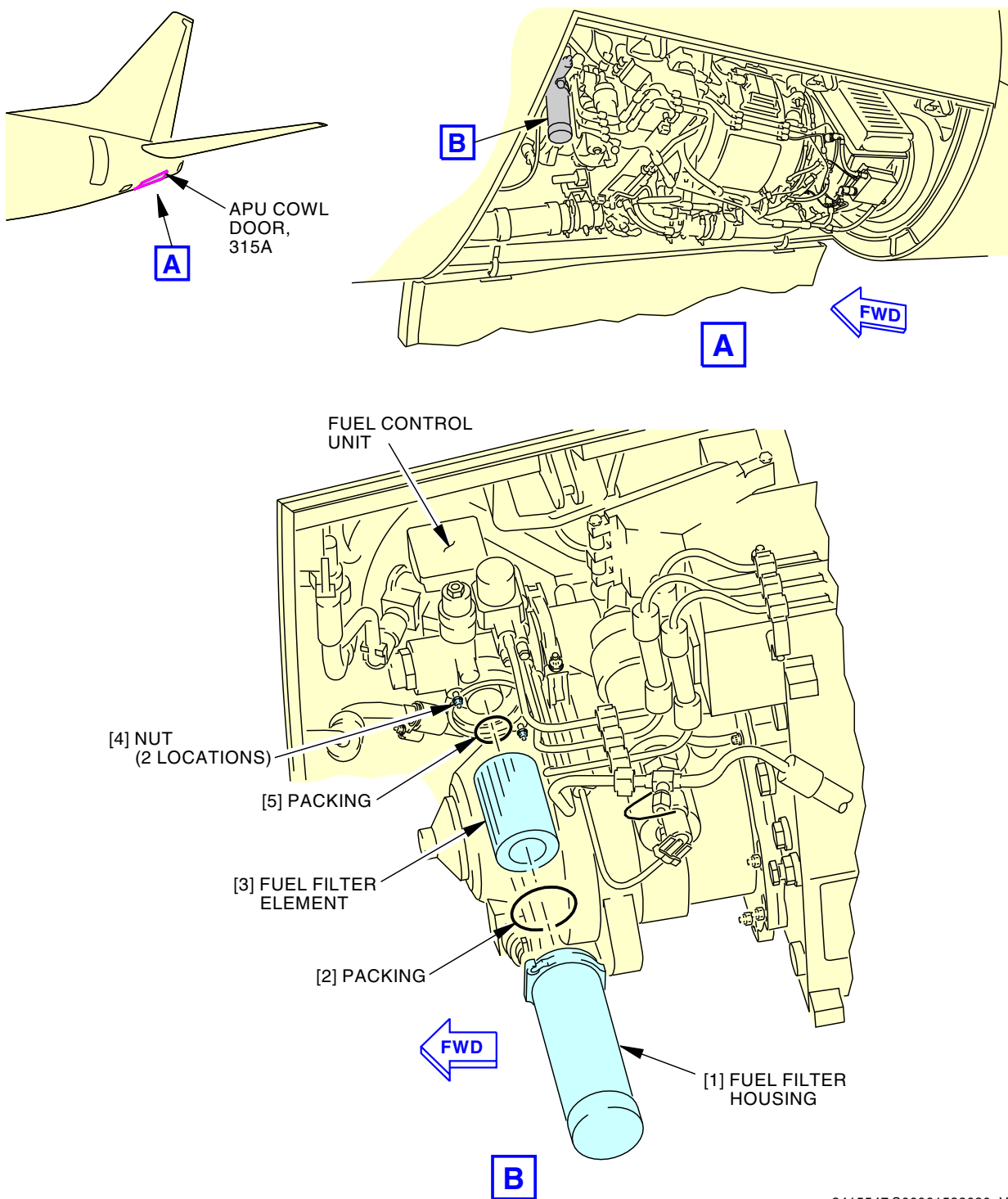
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Inlet Fuel Filter Element Installation
Figure 401/49-31-21-990-801

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TASK 49-31-21-400-801

3. **Inlet Fuel Filter Element Installation**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

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

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
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
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-31-21-01-060	SIA ALL
3	Fuel filter element	49-31-21-01-065	SIA ALL
5	Packing	49-31-21-01-055	SIA ALL

E. **Location Zones**

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

F. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

G. **Inlet Fuel Filter Element Installation**

SUBTASK 49-31-21-110-001

(1) Do these steps to clean the fuel filter housing [1]:

- (a) Clean the fuel filter housing [1] 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 fuel filter housing [1].
 - 1) Use a pressure of 75 ±15 psig (517 ±104 kPa).

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SUBTASK 49-31-21-420-001



CAUTION

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

- (2) Do these steps to install the fuel filter element [3]:
 - (a) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (b) Install the packing [2] on the fuel filter housing [1].
 - (c) Lubricate the new packing [5] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (d) Install the new packing [5] on the fuel filter element [3].
 - (e) Install the fuel filter element [3] in the fuel control unit.
 - (f) Install the fuel filter housing [1] on the fuel control unit.
 - (g) Turn the fuel filter housing [1] in the clockwise direction until the flange fully engages the two studs.
 - (h) Tighten the two nuts [4] to 40 in-lb (4.5 N·m).

H. Inlet Fuel Filter Element Installation Test

SUBTASK 49-31-21-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-31-21-860-004

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

SUBTASK 49-31-21-790-001

- (3) Do the installation test for the fuel filter element [3]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
NOTE: Air in the airplane fuel system or fuel filter housing [1] can cause an APU maintenance message to show.
 - 1) It may be necessary to start the APU more than three times after you replace the fuel filter element [3].
 - a) If you start the APU again, make sure that you obey the start duty cycle of three times during a 15 minute interval.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the fuel filter housing [1] for signs of fuel leakage.
 - (d) If you find fuel leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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- 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the fuel filter housing [1] for signs of fuel leakage.
 - 7) If you find fuel leakage, do the leakage repair again.
- (e) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-31-21-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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MASTER SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure contains these tasks:

- (1) Removal of the Auxiliary Power Unit (APU) master switch.
- (2) Installation of the APU master switch.

TASK 49-41-01-000-801

2. Master Switch - Removal

(Figure 401)

A. **General**

- (1) The task gives the instructions on how to remove the Auxiliary Power Unit (APU) master switch, S248.
- (2) The APU master switch, S248 is located on the P5 forward overhead panel.

B. **Location Zones**

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

C. **Prepare for the Removal**

SUBTASK 49-41-01-860-001

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

F/O Electrical System Panel, P6-4

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

- (2) Make sure that the master switch [1] is off.

D. **Master Switch Removal**

SUBTASK 49-41-01-020-001

- (1) Remove the master switch [1] as follows:
 - (a) Remove the screws [3] and knobs (if it is necessary) to remove the lightplate [2].
 - (b) Unlatch the P5 forward overhead panel and put it in the open position.
 - (c) Disconnect the applicable wires from the master switch [1].
 - 1) Remove each wire lug from the terminal.
 - (d) Remove the screws [4] from the master switch [1].
 - (e) Remove the master switch [1].

————— **END OF TASK** —————

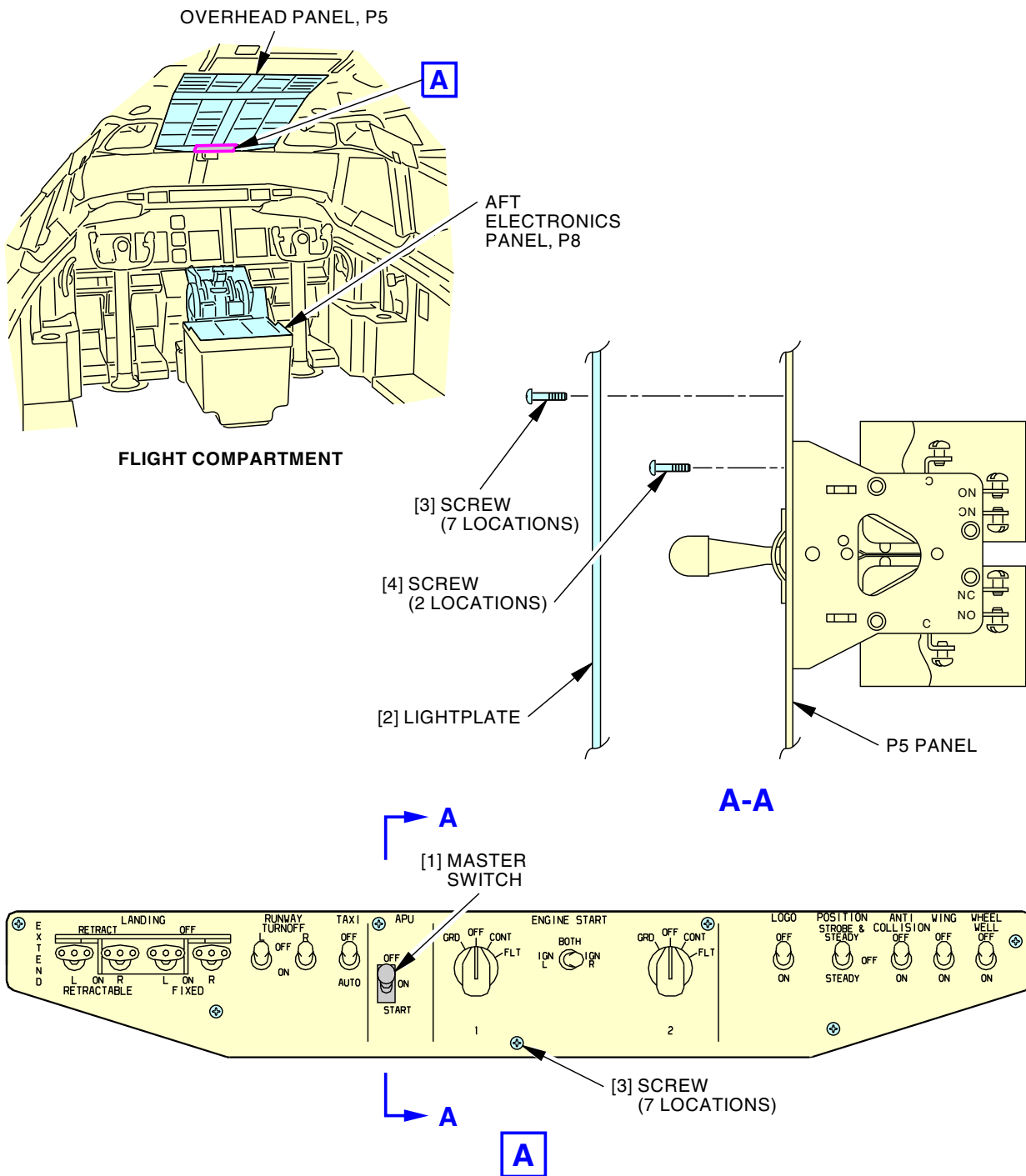
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APU Master Switch
Figure 401/49-41-01-990-801

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TASK 49-41-01-400-801

3. **Master Switch - Installation**

(Figure 401)

A. General

- (1) The task gives the instructions on how to install the Auxiliary Power Unit (APU) master switch, S248.
- (2) The APU master switch, S248 is located on the P5 forward overhead panel.

B. References

Reference	Title
20-10-34-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-614	Bonding Meters - Non-Intrinsically Safe (For use in outside Class I, Divisions I & II non-hazardous locations. For hazardous locations, use COM-1550). Part #: 247000 Supplier: 00426 Part #: 620LK Supplier: 1CRL2 Part #: BLR-0003-XX Supplier: KC432 Part #: BT51 Supplier: 00426 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659 Opt Part #: 247001 Supplier: 00426

D. Consumable Materials

Reference	Description	Specification
B50095	Solvent	BAC5750
G50262	Wiper - Cleaning	BMS15-5
G50590	Metallic Wool - Aluminum	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Master switch	49-61-51-19-050	SIA ALL

F. Location Zones

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

G. Prepare for the Installation

SUBTASK 49-41-01-840-001

- (1) Prepare the mount surface of the aircraft structure.
 - (a) Do these steps to prepare one of the two screws locations for electrical bond.

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- 1) Using aluminum wool, G50590, abrasive clean a circular pattern around one screw hole (Hand Clean Metal Surfaces with Abrasives, TASK 20-10-34-120-801).
- 2) Using solvent, B50095, and wiper, G50262, wipe clean the mating surfaces.

H. Master Switch Installation

SUBTASK 49-41-01-420-001

- (1) Install the master switch [1] as follows:
 - (a) Put the master switch [1] in its position in the P5 forward overhead panel.
 - 1) Make sure that the master switch [1] is in the off position.
 - (b) Install the screws [4] into the master switch [1].
 - (c) Connect the applicable wires back to the master switch [1].
 - 1) Install each wire lug to its terminal.

SUBTASK 49-41-01-410-001

- (2) Install the lightplate [2] as follows:
 - (a) Put the lightplate [2] in the P5 forward overhead panel.
 - (b) Install the screws [3] and knobs (if it is necessary) to the lightplate [2].

SUBTASK 49-41-01-760-001

- (3) Do the bonding resistance check between the master switch [1] and P5 forward overhead panel.
 - (a) Use a non-intrinsically safe bonding meter, COM-614.
 - (b) Make sure that the bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

SUBTASK 49-41-01-860-002

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

F/O Electrical System Panel, P6-4

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

I. Master Switch Operational Test

SUBTASK 49-41-01-860-003

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

SUBTASK 49-41-01-860-004

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

J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-01-410-002

- (1) Close and latch the P5 forward overhead panel.

————— END OF TASK —————

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STARTER-GENERATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the starter-generator
 - (2) Installation of the starter-generator.
- B. The starter-generator is installed on the front of the APU.

TASK 49-41-21-000-801

2. Starter-Generator Removal

(Figure 401)

A. General

- (1) The starter-generator is a brushless AC starter-generator and weights approximately 60 lb (27 kg).
- (2) It is a permanent-magnet generator, exciter generator and a main AC generator (all of which share a common shaft and housing).
- (3) The starter-generator is located on the upper right side of the Auxiliary Power Unit (APU) gearbox.

B. References

Reference	Title
49-52-13-000-801	Bleed Air Duct Removal (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-1563	Hoist - Fishpole, 500 lb Safe Working Limit (SWL) Part #: 10/4180 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: 10/3641 Supplier: K1425 Opt Part #: 10/3641C1 Supplier: K1425 Opt Part #: MINILIFT Supplier: K1425
COM-1592	Hoist - Fishpole, Chain, 1,000 lb Safe Working Limit (SWL) Part #: AP6108 Supplier: 4Y309
SPL-1626	Eye - Lifting, Generator Part #: A49002-2 Supplier: 81205
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE
STD-1081	Flashlight - Explosion Proof
STD-7394	Cap - Dust, Electrical Connector

D. Location Zones

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

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(Continued)

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

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
315A	APU Cowl Door

F. Prepare for the Removal

SUBTASK 49-41-21-010-001

- (1) To open the access panel, do these steps:

Number	Name/Location
--------	---------------

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

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

- (b) Open the three latches.

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

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

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

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

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

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

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

SUBTASK 49-41-21-860-006

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

SUBTASK 49-41-21-020-001

- (3) Optional: Do this task: Bleed Air Duct Removal, TASK 49-52-13-000-801.

SUBTASK 49-41-21-860-001

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

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-21-010-003

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

Number	Name/Location
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117A	Electronic Equipment Access Door
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SUBTASK 49-41-21-860-002



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

G. Starter-Generator Removal

SUBTASK 49-41-21-020-002



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.

- (1) Do these steps to disconnect the electrical connectors:
- Disconnect the electrical connector (P5) [2] from the starter-generator [1].
 - Disconnect the electrical connector (P6) [3] from the starter-generator [1].
 - Install the dust caps, STD-7394, on the electrical connectors to prevent contamination.

SUBTASK 49-41-21-020-003

- (2) Do these steps to disconnect the four terminal lugs:
- Disengage the terminal block cover [12] from the four pins on the starter-generator [1].
 - Remove the terminal block cover [12].
 - Remove the four nuts [4] from the four terminal studs.
 - Disconnect terminal lug (T1) [10], terminal lug (T2) [9], terminal lug (T3) [8], and terminal lug (N) [6] from the four terminal studs.

NOTE: The fanning strip [7] shows the identification of the terminal studs for each of the terminal lugs. The fanning strip [7] does not need to be removed to remove the starter-generator [1].

SUBTASK 49-41-21-020-004



BE CAREFUL WHEN YOU MOVE THE COMPONENT. THE COMPONENT IS HEAVY. INJURIES TO PERSONS CAN OCCUR.

- (3) Do these steps to remove the starter-generator [1] from the APU:

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- (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the starter-generator [1].
- (b) Loosen seven of the eight nuts [11] that attach the starter-generator [1] to the APU.

NOTE: Keep one of the top nuts [11] tight to help you with the removal of the starter-generator [1].

NOTE: The starter-generator [1] weighs approximately 60 lb (27 kg).



MAKE SURE THAT YOU DO THE INSPECTION OF THE STARTER-GENERATOR LIFT FITTING. A DAMAGED LIFT FITTING CAN CAUSE INCORRECT SUPPORT OF THE STARTER-GENERATOR. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (c) Visually examine the starter-generator lift fitting [14] with a explosion proof flashlight, STD-1081, to make sure there are no signs of cracks or elongations.



MAKE SURE THAT THE FISHPOLE HOIST IS IN A SERVICEABLE CONDITION. MAKE SURE THAT THERE ARE NO SIGNS OF DAMAGE ON THE CABLES OR CHAINS. IF THERE IS DAMAGE, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.



MAKE SURE THE CABLE OF THE FISHPOLE HOIST IS EQUALLY WOUND AROUND THE DRUM BEFORE YOU USE THE FISHPOLE HOIST TO HOLD THE STARTER-GENERATOR. A CABLE THAT IS NOT EQUALLY WOUND CAN CAUSE THE STARTER-GENERATOR TO FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (d) Install the fishpole hoist [13] (fishpole hoist, COM-1563, or chain fishpole hoist, COM-1592) to the starter-generator [1]:
 - 1) Install the adapter [17] (generator lifting eye, SPL-1626) on the starter-generator boss [18].
 - 2) Install the fishpole hoist [13] to the starter-generator lift fitting [14].
 - a) Make sure that the pin of the fishpole hoist [13] is engaged in the starter-generator lift fitting [14].
 - 3) Extend the fishpole hoist [13] to a length that is easy to use.
 - 4) Unwind the cable or chain of the fishpole hoist [13] until the clevis fitting [15] is aligned with the adapter [17].
 - 5) Install the pin [16] in the clevis fitting [15] and adapter [17].
 - 6) Wind and tighten the cable or chain of the fishpole hoist [13].
- (e) Loosen the last nut [11] that attaches the starter-generator [1] to the APU.
- (f) Turn the starter-generator [1] in the clockwise direction until the eight nuts [11] are free from the eight keyhole slots.

NOTE: It may be necessary to unwind the cable or chain of the fishpole hoist [13] a sufficient quantity to turn and move the starter-generator [1] from the drive shaft assembly [21].
- (g) Slowly move the starter-generator [1] approximately 1.5 in. (38.1 mm) away from the APU to disengage the drive shaft assembly [21].



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- (h) Slowly unwind the cable or chain of the fishpole hoist [13] to lower the starter-generator [1] out of the APU compartment.
- (i) Remove the packing [20] from the drive shaft assembly [21].
 - 1) Discard the packing [20].
- (j) Install the four nuts [4] on the four terminal studs.
- (k) Install the terminal block cover [12] on the starter-generator [1]:
 - 1) Put the terminal block cover [12] on the starter-generator [1].
 - 2) Engage the terminal block cover [12] to the four pins on the starter-generator [1].
- (l) Make sure that you install all necessary protection covers.
- (m) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-41-21-080-001

- (4) Remove the fishpole hoist [13] from the starter-generator [1]:
 - (a) Remove the pin [16] from the clevis fitting [15] and adapter [17].
 - (b) Disconnect the clevis fitting [15] from the adapter [17].
 - (c) Remove the adapter [17] from the starter-generator boss [18].
 - (d) Remove the fishpole hoist [13]:
 - 1) Wind the cable or chain.
 - 2) Disconnect the pin of the fishpole hoist [13] from the starter-generator lift fitting [14].
 - 3) Remove the fishpole hoist [13].

SUBTASK 49-41-21-020-005

- (5) Do these steps to remove the seal plate [19] for the starter-generator [1]:

NOTE: It is necessary to replace the seal plate if you find signs of oil leakage around the starter-generator.

NOTE: It is permissible to continue to use the existing seal plate if there are no signs of oil leakage around the starter-generator and no damage to the seal plate.

NOTE: The seal plate should be sent to the repair shop together with the starter-generator.

- (a) Remove the eight nuts [11] that attach the seal plate [19] to the mounting flange of the starter-generator [1].
- (b) Remove the seal plate [19].

———— **END OF TASK** ————

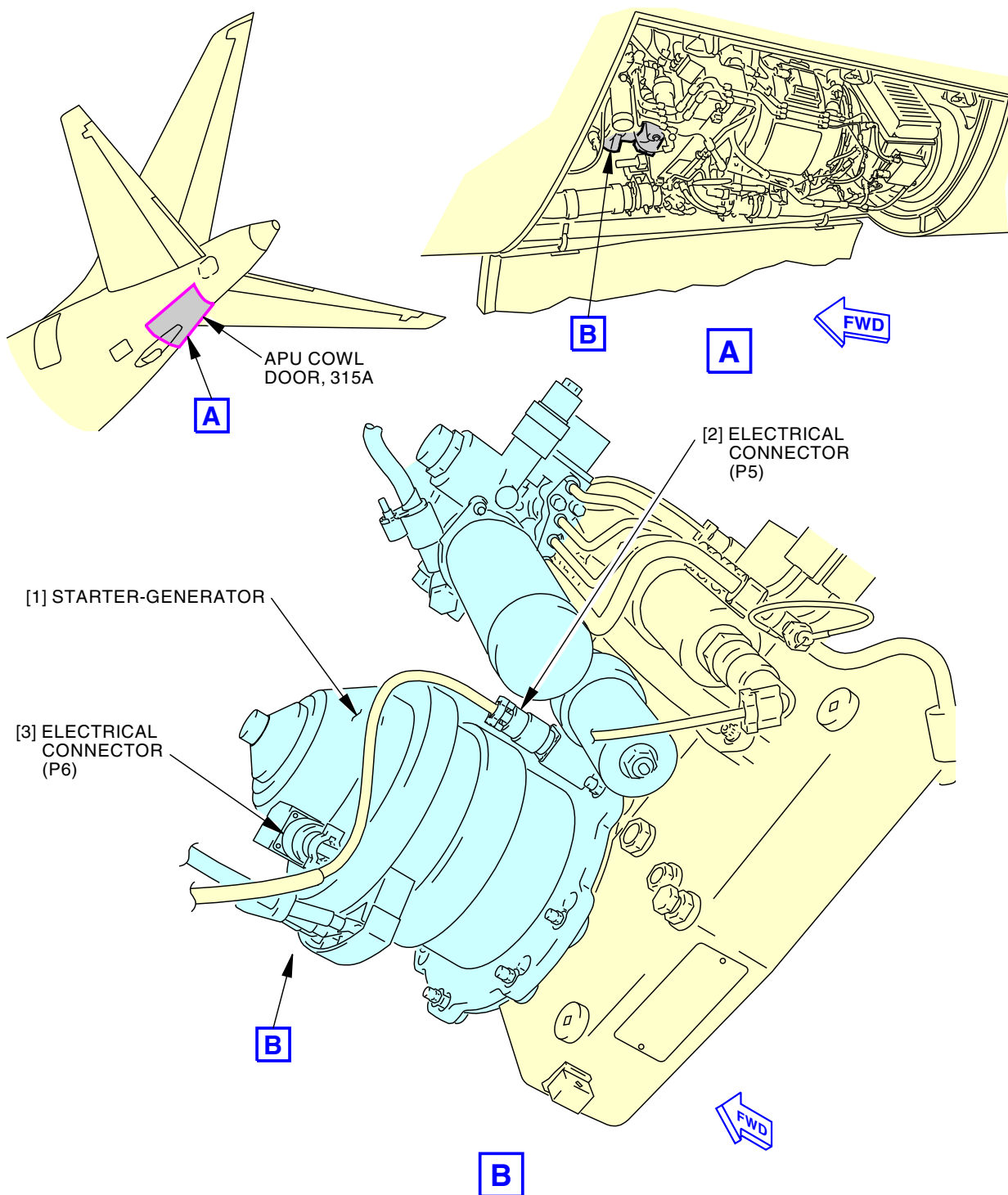
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Starter-Generator Installation
Figure 401/49-41-21-990-801 (Sheet 1 of 3)

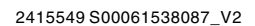
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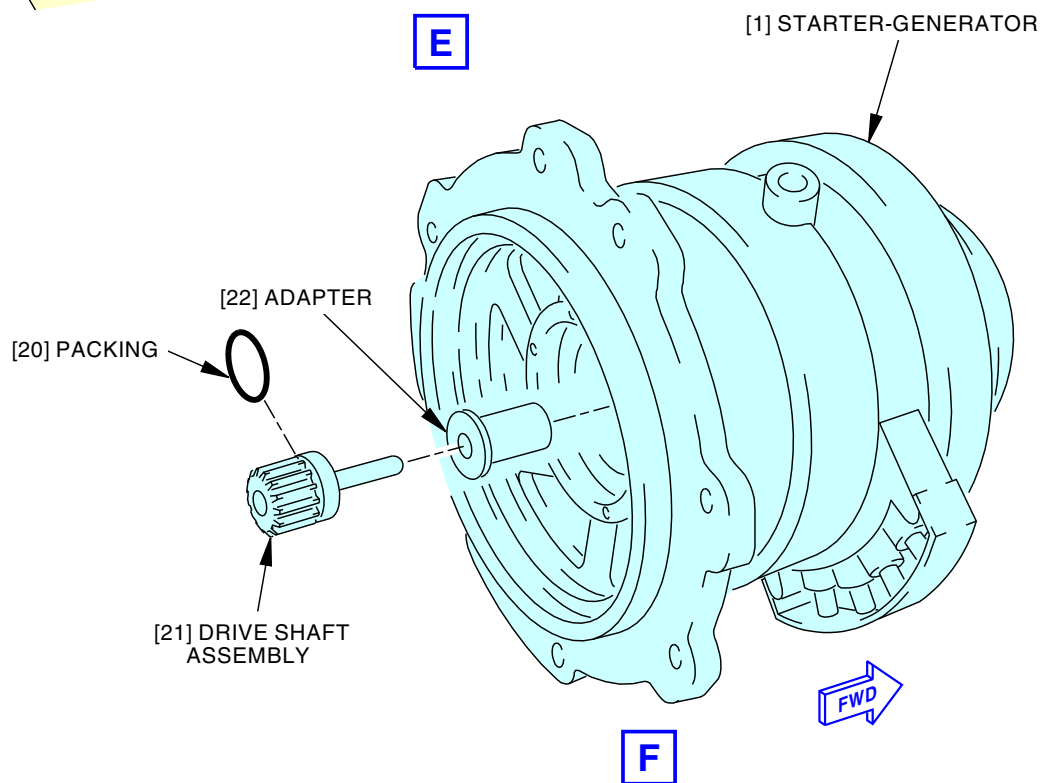
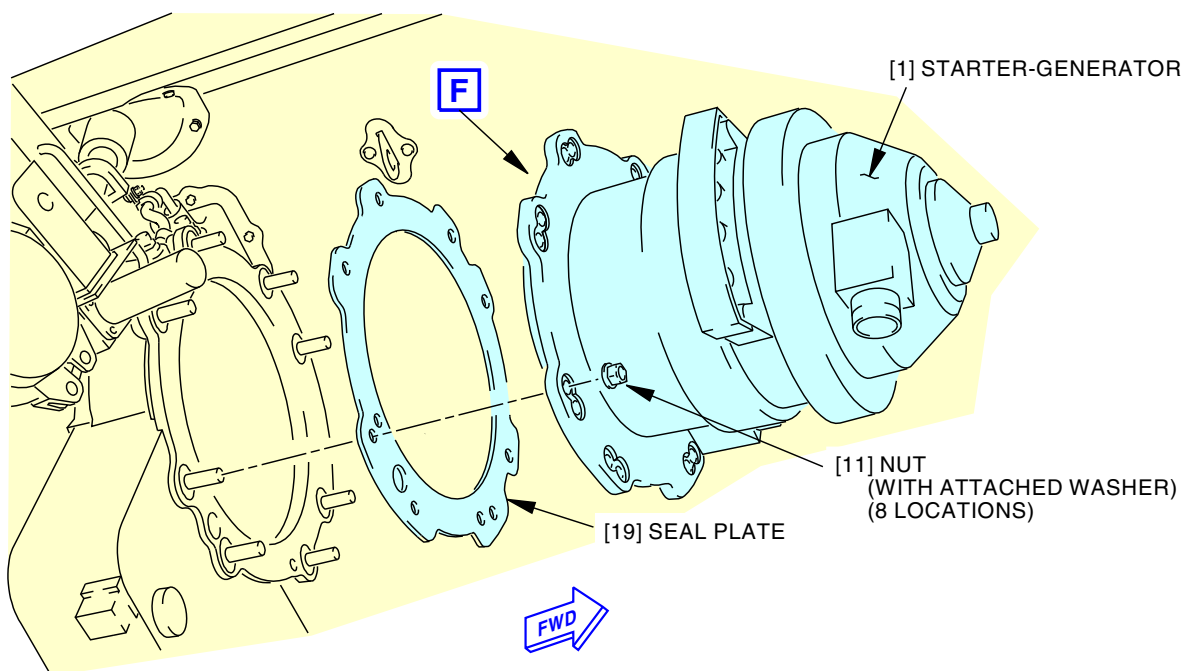
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Starter-Generator Installation
Figure 401/49-41-21-990-801 (Sheet 3 of 3)

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TASK 49-41-21-400-801

3. Starter-Generator Installation

(Figure 401)

A. General

- (1) The starter-generator is located on the upper right side of the Auxiliary Power Unit (APU) gearbox.
- (2) The starter-generator weighs approximately 60 lb (27 kg).

B. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-52-13-400-801	Bleed Air Duct Installation (P/B 401)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Tools/Equipment

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

Reference	Description
COM-1563	Hoist - Fishpole, 500 lb Safe Working Limit (SWL) Part #: 10/4180 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: 10/3641 Supplier: K1425 Opt Part #: 10/3641C1 Supplier: K1425 Opt Part #: MINILIFT Supplier: K1425
COM-1592	Hoist - Fishpole, Chain, 1,000 lb Safe Working Limit (SWL) Part #: AP6108 Supplier: 4Y309
SPL-1626	Eye - Lifting, Generator Part #: A49002-2 Supplier: 81205
STD-858	Tag - DO NOT OPERATE
STD-1081	Flashlight - Explosion Proof
STD-7394	Cap - Dust, Electrical Connector
STD-7502	Screwdriver
STD-11392	Fire Extinguisher - 150lb Portable, Carbon Dioxide, Dry Chemical, Halon, or Aqueous Film Forming Foam (AFFF)

D. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

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E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Starter-generator	49-41-21-01-015	SIA ALL
19	Seal plate	49-41-21-01-165	SIA ALL
20	Packing	49-41-21-01-062	SIA ALL

F. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

G. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
315A	APU Cowl Door

H. Starter-Generator Installation



BE CAREFUL WHEN YOU MOVE THE COMPONENT. THE COMPONENT IS HEAVY. INJURIES TO PERSONS CAN OCCUR.

SUBTASK 49-41-21-300-001

- (1) Do these steps to examine the drive shaft assembly [21]:
 - (a) Turn the lock screw inside the drive shaft assembly [21] one half turn in the counterclockwise direction with a screwdriver, STD-7502.
 - (b) Remove the drive shaft assembly [21] and adapter [22].
 - (c) Visually examine the inside of the drive shaft assembly [21] for signs of wear and debris.
NOTE: Signs of wear and debris are not permitted.
 - (d) If it is necessary, install a new adapter [22] and then a new drive shaft assembly [21].
 - (e) Turn the lock screw inside the drive shaft assembly [21] one half turn in the clockwise direction with a screwdriver, STD-7502.
 - (f) Pull on the drive shaft assembly [21] to make sure that it is locked in position.

SUBTASK 49-41-21-420-001

- (2) Do these steps to install the seal plate [19] of the starter-generator [1]:
 - (a) Lubricate the packings on the seal plate [19] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (b) Install the seal plate [19] on the mounting flange of the starter-generator [1].
 - (c) Loosely install the eight nuts [11].
NOTE: A clearance between the seal plate and the eight nuts is necessary to install the eight keyhole slots of the starter-generator.

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SUBTASK 49-41-21-210-001



MAKE SURE THAT YOU DO THE INSPECTION OF THE STARTER-GENERATOR LIFT FITTING. A DAMAGED LIFT FITTING CAN CAUSE INCORRECT SUPPORT OF THE STARTER-GENERATOR. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (3) Visually examine the starter-generator lift fitting [14] with a explosion proof flashlight, STD-1081, to make sure that there are no signs of cracks or elongations.

SUBTASK 49-41-21-480-001



MAKE SURE THAT THE FISHPOLE HOIST IS IN A SERVICEABLE CONDITION. MAKE SURE THAT THERE ARE NO SIGNS OF DAMAGE ON THE CABLES OR CHAINS. IF THERE IS DAMAGE, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.



MAKE SURE THE CABLE OF THE FISHPOLE HOIST IS EQUALLY WOUND AROUND THE DRUM BEFORE YOU USE THE FISHPOLE HOIST TO HOLD THE STARTER-GENERATOR. A CABLE THAT IS NOT EQUALLY WOUND CAN CAUSE THE STARTER-GENERATOR TO FALL SUDDENLY. THIS CAN CAUSE DAMAGE TO THE STARTER-GENERATOR.

- (4) Do these steps to install the fishpole hoist [13] (fishpole hoist, COM-1563, or chain fishpole hoist, COM-1592) to the starter-generator [1]:
- (a) Make sure that the starter-generator [1] is directly under the starter-generator lift fitting [14].
 - (b) Install the adapter [17] (generator lifting eye, SPL-1626) in the starter-generator boss [18].
 - (c) Attach the fishpole hoist [13] to the starter-generator lift fitting [14].
 - 1) Make sure that the pin of the fishpole hoist [13] is engaged in the starter-generator lift fitting [14].
 - (d) Extend the fishpole hoist [13] to a length that is easy to use.
 - (e) Unwind the cable or chain of the fishpole hoist [13] until the clevis fitting [15] is aligned with the adapter [17].
 - (f) Install the pin [16] in the clevis fitting [15] and adapter [17].

SUBTASK 49-41-21-420-002



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

- (5) Do these steps to install the starter-generator [1]:
- (a) Lubricate the new packing [20] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (b) Install the packing [20] on the drive shaft assembly [21].
 - (c) Disengage the terminal block cover [12] from the four pins on the starter-generator [1].
 - (d) Remove the terminal block cover [12].
 - (e) Remove the four nuts [4] from the four terminal studs.

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- (f) Wind the cable or chain of the fishpole hoist [13] to lift the starter-generator [1] into position.

NOTE: The starter-generator [1] weighs approximately 60 lb (27 kg).

- (g) Put the starter-generator [1] on the APU.
(h) Align the eight nuts [11] on the APU with the eight keyhole slots on the starter-generator [1].
(i) Make sure that the drive shaft assembly [21] engages with the drive shaft.
(j) Turn the starter-generator [1] in the counterclockwise direction until the eight nuts [11] fully engage the eight keyhole slots.
(k) Tighten one of the eight nuts [11] to 240 in-lb (27.1 N·m).

NOTE: Keep seven of the top nuts [11] loose to help you with the removal of the fishpole hoist [13].

- (l) Remove the fishpole hoist [13]:
 1) Remove the pin [16] from the clevis fitting [15] and adapter [17].
 2) Disconnect the clevis fitting [15] from the adapter [17].
 3) Remove the adapter [17] from the starter-generator boss [18].
 4) Wind the cable or chain of the fishpole hoist [13].
 5) Disconnect the pin of the fishpole hoist [13] from the starter-generator lift fitting [14].
 6) Remove the fishpole hoist [13].
(m) Tighten the other seven of the eight nuts [11] to 240 in-lb (27.1 N·m).

SUBTASK 49-41-21-420-003

- (6) Do these steps to connect electrical connector (P5) [2] and electrical connector (P6) [3]:
(a) Remove the dust caps, STD-7394, from the electrical connectors.
(b) Connect the electrical connector (P6) [3] to the starter-generator [1].
(c) Connect electrical connector (P5) [2] to the starter-generator [1].

SUBTASK 49-41-21-420-004

- (7) Do these steps to connect the four terminal lugs:
(a) Connect the four terminal lugs (terminal lug (T1) [10], terminal lug (T2) [9], terminal lug (T3) [8], and terminal lug (N) [6]) to the four corresponding terminal studs.
NOTE: The fanning strip [7] shows the identification of the terminal studs for each of the terminal lugs ((terminal lug (T1) [10], terminal lug (T2) [9], terminal lug (T3) [8], and terminal lug (N) [6]).
(b) Install the four nuts [4] on the four terminal studs.
 1) Tighten the four nuts [4] to 125 ±10 in-lb (14.1 ±1.2 N·m).
(c) Install the terminal block cover [12] on the starter-generator [1]:
 1) Put the terminal block cover [12] on the starter-generator [1].
 2) Engage the terminal block cover [12] to the four pins on the starter-generator [1].



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SUBTASK 49-41-21-860-003



WARNING

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



WARNING

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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-41-21-410-003

- (9) Close this access panel:

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

SUBTASK 49-41-21-420-005

- (10) If it is necessary, do this task: Bleed Air Duct Installation, TASK 49-52-13-400-801.

I. Starter-Generator Installation Test

SUBTASK 49-41-21-860-004

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-41-21-860-005

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

SUBTASK 49-41-21-890-001



CAUTION

PUT A PERSON NEAR THE APU COMPARTMENT TO LOOK FOR FIRE. IF A FIRE OCCURS WHILE THE APU COWL DOOR IS OPEN, IT IS POSSIBLE THAT THE FIRE EXTINGUISHING AGENT WILL NOT STOP THE FIRE. FIRE WILL CAUSE DAMAGE TO THE AIRPLANE.

- (3) Put an observer near the APU compartment to watch for a fire.
- (a) If a fire occurs, immediately tell the persons in the flight compartment to do an emergency APU shutdown.

NOTE: The APU fire detection system may not sense a small fire and most of the fire extinguishing agent will go out from the open APU cowl door and away from the starter-generator [1].

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- (b) Use a fire extinguisher, STD-11392, to put out the fire.

SUBTASK 49-41-21-710-001

- (4) Do the installation test for the starter-generator [1]:

- (a) Make sure that the BUS TRANS switch, on the P5 forward overhead panel, is in the AUTO position (TASK 49-11-00-860-801).
- (b) Operate the APU for a minimum of five minutes.
- (c) During the APU operation, examine the starter-generator for signs of oil leakage.
- (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch, on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the starter-generator for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again.
- (e) Make sure that the APU GEN OFF BUS light, on the P5 forward overhead panel, comes on.
- (f) Set the two APU GEN switches, on the P5 forward overhead panel, to the ON position.
NOTE: One of the two APU GEN switches will connect the APU starter-generator to the two 115V AC transfer busses. It is necessary to set the two APU GEN switches to the ON position for the two SOURCE OFF lights to go off.
- (g) Make sure that these lights, on the P5 forward overhead panel, go off:
 - 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF
 - 4) 1 TRANSFER BUS OFF
 - 5) 2 TRANSFER BUS OFF.
- (h) Set the two APU GEN switches to the OFF position.
- (i) Make sure that these lights come on:
 - 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF
 - 4) 1 TRANSFER BUS OFF
 - 5) 2 TRANSFER BUS OFF.
- (j) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU electrical system or the starter-generator, refer to the IFIM and do the applicable procedure(s).
- (k) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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SUBTASK 49-41-21-210-002

- (5) Make sure that the APU oil system is full (TASK 12-13-31-200-801).

J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-21-410-002

- (1) To close the access panel, do these steps

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

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

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

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

————— **END OF TASK** —————

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IGNITION UNIT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the ignition unit
 - (2) Installation of the ignition unit.
- B. The ignition unit is installed on the eductor housing.

TASK 49-41-31-000-801

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 electrical connector must be disconnected from the ignition unit.

B. Tools/Equipment

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

C. Location Zones

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

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

E. Prepare for the Removal

SUBTASK 49-41-31-860-001

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

SUBTASK 49-41-31-860-002

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-41-31-010-001

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

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

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- (b) Open the three latches.

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

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

F. Ignition Unit Removal

SUBTASK 49-41-31-020-001

 WARNING	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 [4]:
 - (a) You must wait a minimum of five minutes since the last APU start.
 - (b) Disconnect the electrical connector (P13) [7] from the ignition unit [4].

SUBTASK 49-41-31-020-002

- (2) Do these steps to remove the ignition unit [4]:
 - (a) Disconnect the igniter plug lead [1] from the ignition unit [4].
 - (b) Remove the three bolts [3], three washers [2], bolt [6] and washer [5] that attach the ignition unit [4] to the bracket.
 - (c) Remove the ignition unit [4].
 - (d) Install protection covers as necessary.

———— **END OF TASK** ————

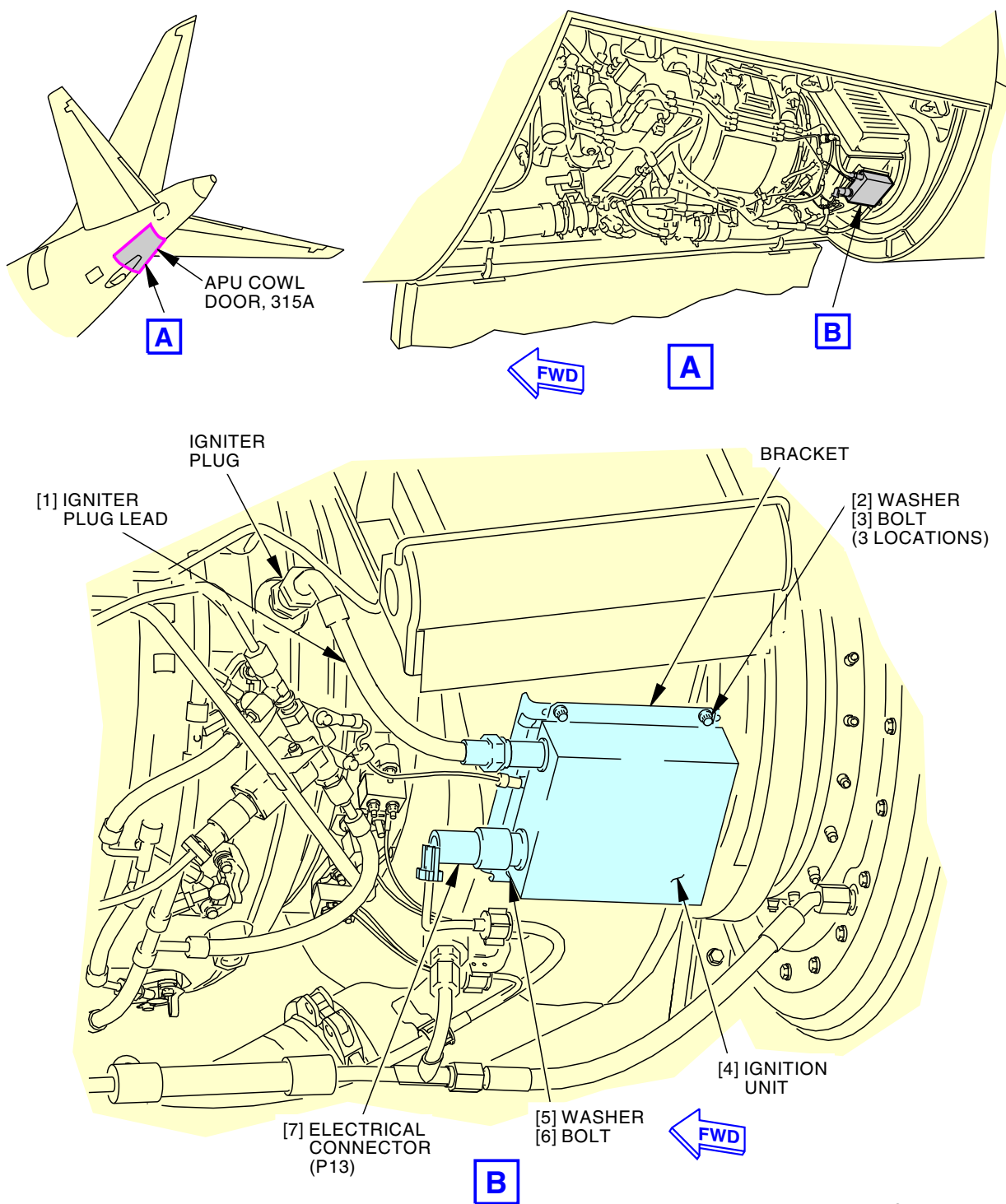
EFFECTIVITY
SIA ALL

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2415551 S00061538093_V1

Ignition Unit Installation
Figure 401/49-41-31-990-801

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TASK 49-41-31-400-801

3. **Ignition Unit Installation**

(Figure 401)

A. **References**

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

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Ignition unit	49-41-31-01-005	SIA ALL
		49-41-31-01-007	SIA ALL

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

F. **Ignition Unit Installation**

SUBTASK 49-41-31-420-001



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 unit [4]:
 - (a) Remove the protection covers.
 - (b) Install the three bolts [3], three washers [2], bolt [6] and washer [5] to attach the ignition unit [4] on the bracket.
 - 1) Tighten the three bolts [3] and bolt [6] to 50 in-lb (5.6 N·m).
 - (c) Connect the igniter plug lead [1] to the ignition unit [4].
 - 1) Tighten the igniter plug lead [1] to 225 in-lb (25.4 N·m).
 - (d) Connect the electrical connector (P13) [7] to the ignition unit [4].

G. **Ignition Unit Installation Test**

SUBTASK 49-41-31-860-003

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-41-31-860-004

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

SUBTASK 49-41-31-710-001

- (3) Do the installation test for the ignition unit [4]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-31-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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IGNITER PLUG - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the igniter plug
 - (2) Installation of the igniter plug.
- B. The igniter plug is installed in the combustor housing.

TASK 49-41-51-000-801

2. Igniter Plug Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. Location Zones

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

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-41-51-860-001

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

SUBTASK 49-41-51-860-002

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-41-51-010-001

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

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

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

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Igniter Plug Removal

SUBTASK 49-41-51-020-001



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 igniter plug [2]:
 - (a) You must wait a minimum of five minutes since the last APU start.



MAKE SURE THAT YOU DISCONNECT THE ELECTRICAL CONNECTOR (P13) FROM THE IGNITION UNIT TO RELEASE THE HIGH VOLTAGE. INJURIES TO PERSONNEL CAN OCCUR.

- (b) Disconnect the electrical connector (P13) [4] from the ignition unit.
- (c) Disconnect the igniter plug lead [3] from the ignition unit.
- (d) Disconnect the igniter plug lead [3] from the igniter plug [2].
- (e) Remove the igniter plug [2].
- (f) Remove the gasket [1] from the igniter plug [2].
 - 1) Discard the gasket [1].
- (g) Make sure that you install all necessary protection covers.

———— **END OF TASK** ————

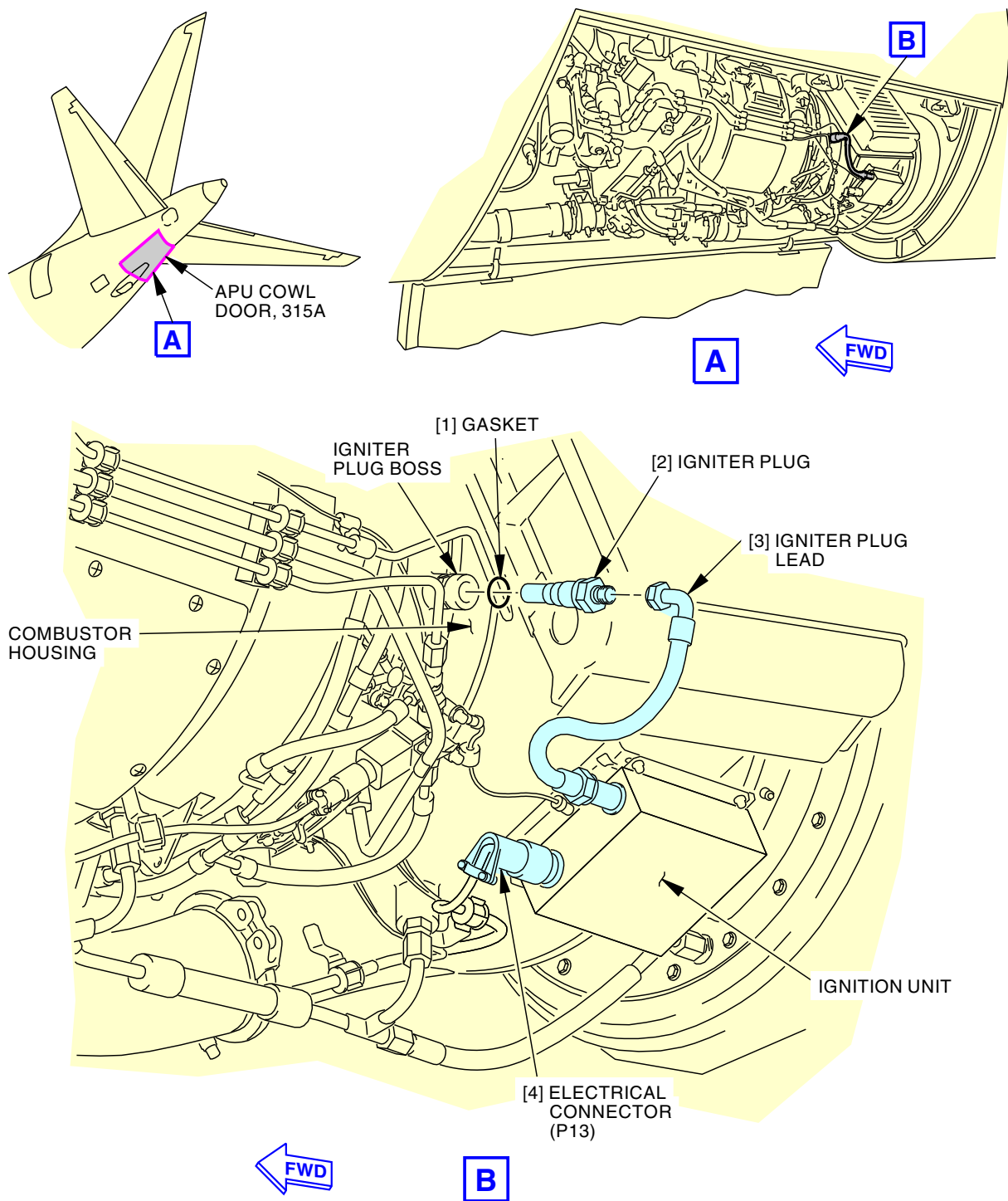
EFFECTIVITY
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Igniter Plug Installation
Figure 401/49-41-51-990-801

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TASK 49-41-51-400-801

3. Igniter Plug Installation

(Figure 401)

A. References

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

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Gasket	49-41-51-01-010	SIA ALL
2	Igniter plug	49-41-51-01-005	SIA ALL

E. Location Zones

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

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Igniter Plug Installation

SUBTASK 49-41-51-420-001



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 igniter plug [2]:
 - (a) Remove the protection covers.
 - (b) Install the new gasket [1] on the igniter plug [2].



DO NOT APPLY GREASE OR LUBRICANT TO THE THREADS OF THE CONNECTOR ON THE IGNITION LEAD. GREASE AND LUBRICANTS WILL CAUSE DAMAGE TO THE IGNITION LEAD AND THE IGNITER PLUG.

- (c) Lubricate the igniter plug [2] threads with a light coat of Never-Seez NSBT compound, D00006.
- (d) Install the igniter plug [2] in the igniter plug boss on the combustor housing.
 - 1) Tighten the igniter plug [2] to 225 in-lb (25.4 N·m).

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- (e) Connect the igniter plug lead [3] to the igniter plug [2].
 - 1) Tighten the igniter plug lead [3] to 225 in-lb (25.4 N·m).
- (f) Connect the electrical connector (P13) [4] to the ignition unit.

H. Igniter Plug Installation Test

SUBTASK 49-41-51-860-003

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

F/O Electrical System Panel, P6-2

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-41-51-860-004

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

SUBTASK 49-41-51-710-001

- (3) Do the installation test for the igniter plug:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-51-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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SIA ALL

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IGNITER PLUG - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the igniter plug.

TASK 49-41-51-200-801

2. Igniter Plug Inspection

(Figure 601)

A. References

Reference	Title
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	Igniter Plug Installation (P/B 401)

B. Location Zones

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

C. Igniter Plug Inspection

SUBTASK 49-41-51-020-002

- (1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.

SUBTASK 49-41-51-210-001

- (2) Inspect the semiconductor (firing tip) for radial cracks and wear.
(a) Replace the igniter plug if you find damage on the semiconductor.

SUBTASK 49-41-51-220-001

- (3) Examine the electrode (center electrode and outer (shell) electrode):
(a) Measure the diameter of the center electrode.
1) If the diameter is more than 0.335 in. (8.509 mm), replace the igniter plug.
(b) Measure the distance from the outer edge of the center electrode to the outer edge of the outer (shell) electrode.
1) If the distance is less than 0.085 in. (2.159 mm), replace the igniter plug.
(c) If the outer (shell) electrode shows wear over 90 degrees, replace the igniter plug.
(d) Examine the outer electrode for signs of burned material.
1) If you find missing material that is burned away, replace the igniter plug.

SUBTASK 49-41-51-210-002

- (4) Examine the igniter plug:
(a) Shake the igniter plug and listen for noise.
(b) Examine the body of the igniter plug for wear that is more than 0.015 in. (0.381 mm).
(c) Examine the ceramic insulator for cracks and broken areas.
(d) Examine the electrical connector for bent or damaged pin.
(e) Examine the inlet and exit holes for contamination and clogged areas.
(f) If you find any of the above damage or you hear noise, replace the igniter plug.

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SIA ALL

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SUBTASK 49-41-51-420-002

(5) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.

———— **END OF TASK** ————

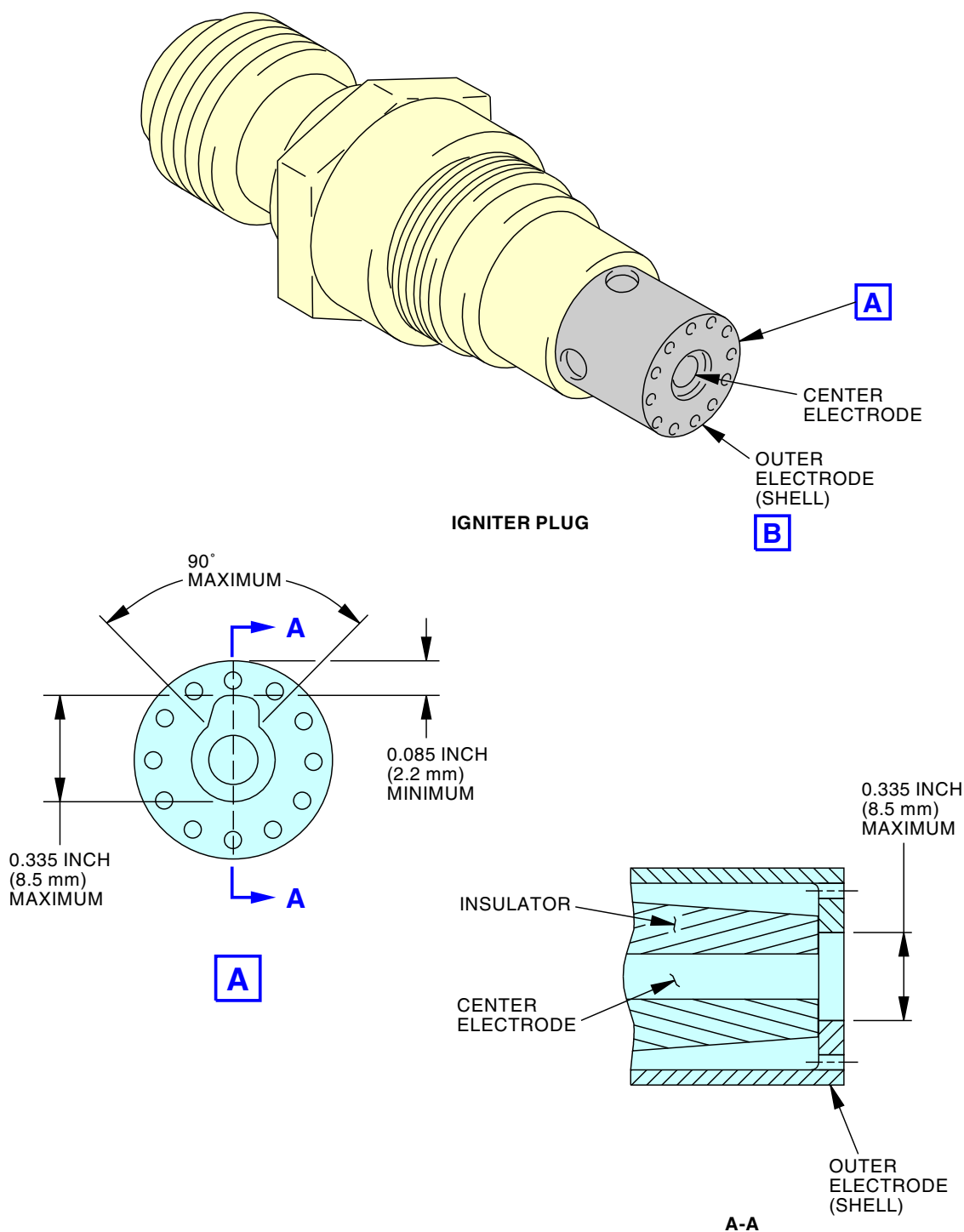
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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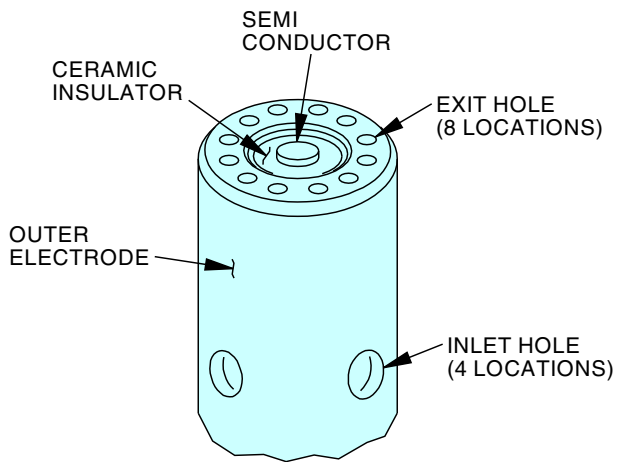
Igniter Plug Inspection
Figure 601/49-41-51-990-802 (Sheet 1 of 4)

EFFECTIVITY
SIA ALL; AIRPLANES WITHOUT IGNITER PLUG
WITH DRAIN SLOTS

D633AM101-SIA

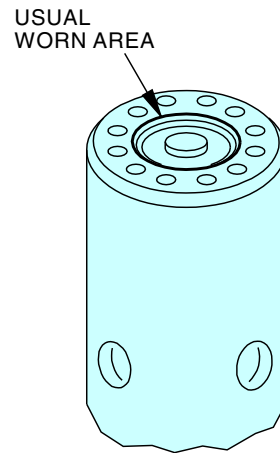
ECCN 9E991 BOEING PROPRIETARY - See title page for details

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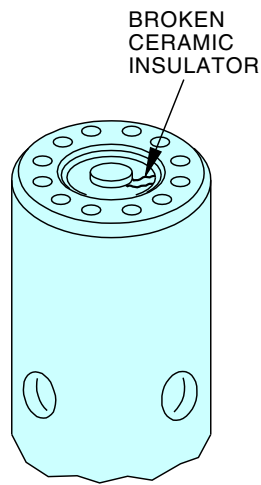
NEW IGNITER PLUG

B



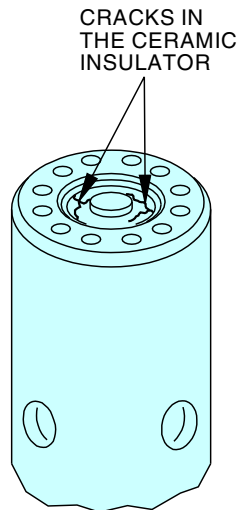
USUAL EROSION

B



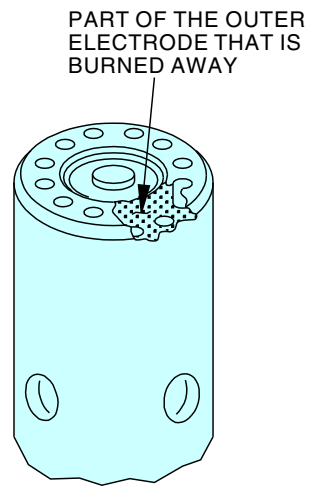
BROKEN INSULATOR

B



CRACKED INSULATOR

B



BURNED OUTER ELECTRODE

B

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Igniter Plug Inspection
Figure 601/49-41-51-990-802 (Sheet 2 of 4)

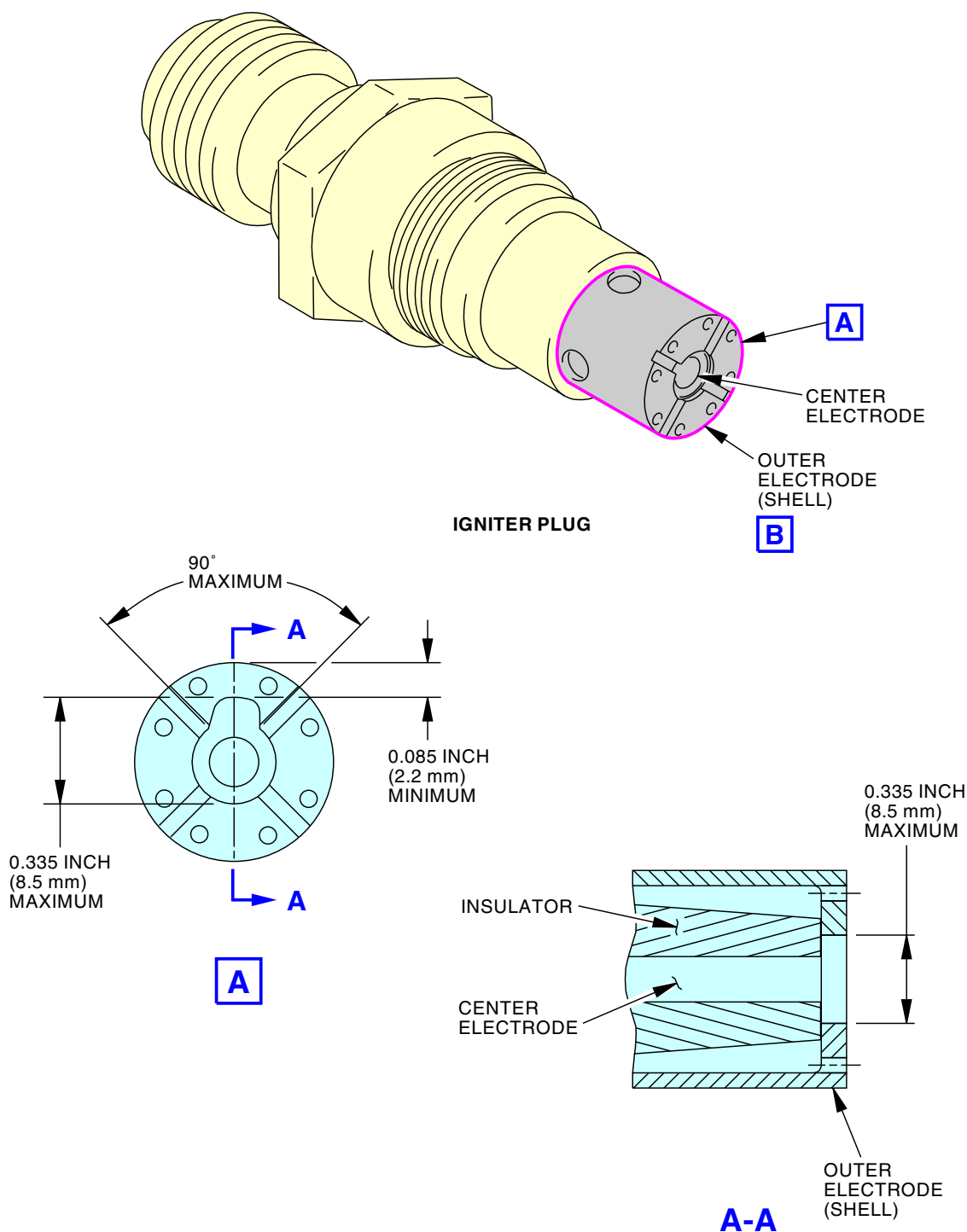
EFFECTIVITY
SIA ALL; AIRPLANES WITHOUT IGNITER PLUG
WITH DRAIN SLOTS

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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Igniter Plug Inspection
Figure 601/49-41-51-990-802 (Sheet 3 of 4)

EFFECTIVITY
SIA ALL; AIRPLANES WITH IGNITER PLUG WITH
DRAIN SLOTS

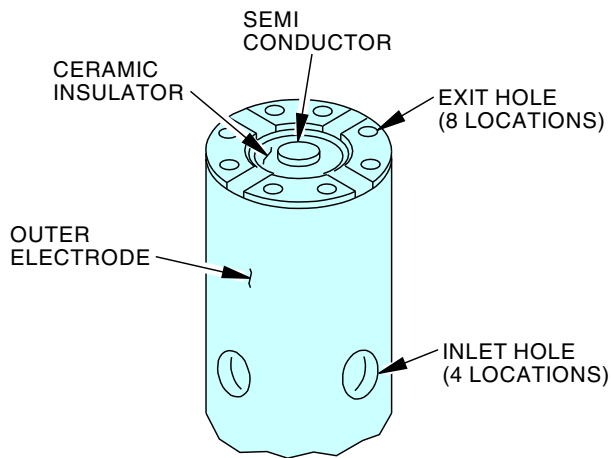
D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

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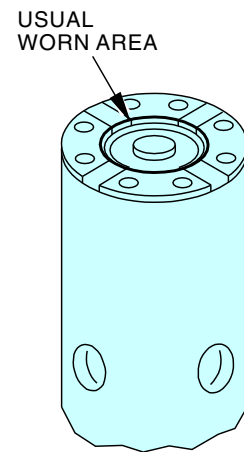
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NEW IGNITER PLUG

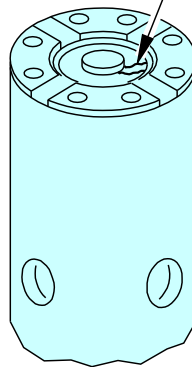
B



USUAL EROSION

B

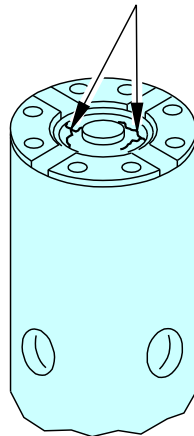
BROKEN
CERAMIC
INSULATOR



BROKEN INSULATOR

B

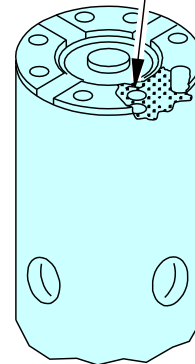
CRACKS IN
THE CERAMIC
INSULATOR



CRACKED INSULATOR

B

PART OF THE OUTER
ELECTRODE THAT IS
BURNED AWAY



BURNED OUTER ELECTRODE

B

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Igniter Plug Inspection
Figure 601/49-41-51-990-802 (Sheet 4 of 4)

EFFECTIVITY
SIA ALL; AIRPLANES WITH IGNITER PLUG WITH
DRAIN SLOTS

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IGNITER PLUG - CLEANING/PAINTING

1. General

- A. This procedure has the task to clean the igniter plug.

TASK 49-41-51-100-801

2. Igniter Plug Cleaning

A. **References**

Reference	Title
49-41-51-000-801	Igniter Plug Removal (P/B 401)
49-41-51-400-801	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)
STD-1236	Brush - Brass Bristles

C. **Consumable Materials**

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

D. **Location Zones**

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

E. **Igniter Plug Cleaning**

SUBTASK 49-41-51-020-003

- (1) Do this task: Igniter Plug Removal, TASK 49-41-51-000-801.

SUBTASK 49-41-51-110-001

- (2) Do these steps to clean the igniter plug:
- (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.
 - 1) It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the igniter plug or to blow away loose material off the igniter plug



CAUTION

DO NOT USE HARD GRIT OR A STEEL BRUSH TO CLEAN THE IGNITER PLUG. DAMAGE TO THE IGNITER PLUG CAN OCCUR.

- (c) Carefully clean all the unwanted materials off the igniter plug with a brass bristles brush, STD-1236.

EFFECTIVITY
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- (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow away all the loose material off the igniter plug.

SUBTASK 49-41-51-420-003

- (3) Do this task: Igniter Plug Installation, TASK 49-41-51-400-801.

———— **END OF TASK** ————

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IGNITER PLUG LEAD - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the igniter plug lead
 - (2) Installation of the igniter plug lead.
- B. The igniter plug lead is installed between the ignition unit and the igniter plug.

TASK 49-41-52-000-801

2. Igniter Plug Lead Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

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

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-41-52-860-001

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

SUBTASK 49-41-52-860-002

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-52-010-001

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

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

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

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Igniter Plug Lead Removal

SUBTASK 49-41-52-020-001



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 igniter plug lead [1]:
 - (a) You must wait a minimum of five minutes since the last APU start.



MAKE SURE THAT YOU DISCONNECT THE ELECTRICAL CONNECTOR (P13) FROM THE IGNITION UNIT TO RELEASE THE HIGH VOLTAGE. INJURIES TO PERSONNEL CAN OCCUR.

- (b) Disconnect the electrical connector (P13) [2] from the ignition unit.
- (c) Disconnect the igniter plug lead [1] from the ignition unit.
- (d) Disconnect the igniter plug lead [1] from the igniter plug.
- (e) Remove the igniter plug lead [1].
- (f) Make sure that you install all necessary protection covers.

———— **END OF TASK** ————

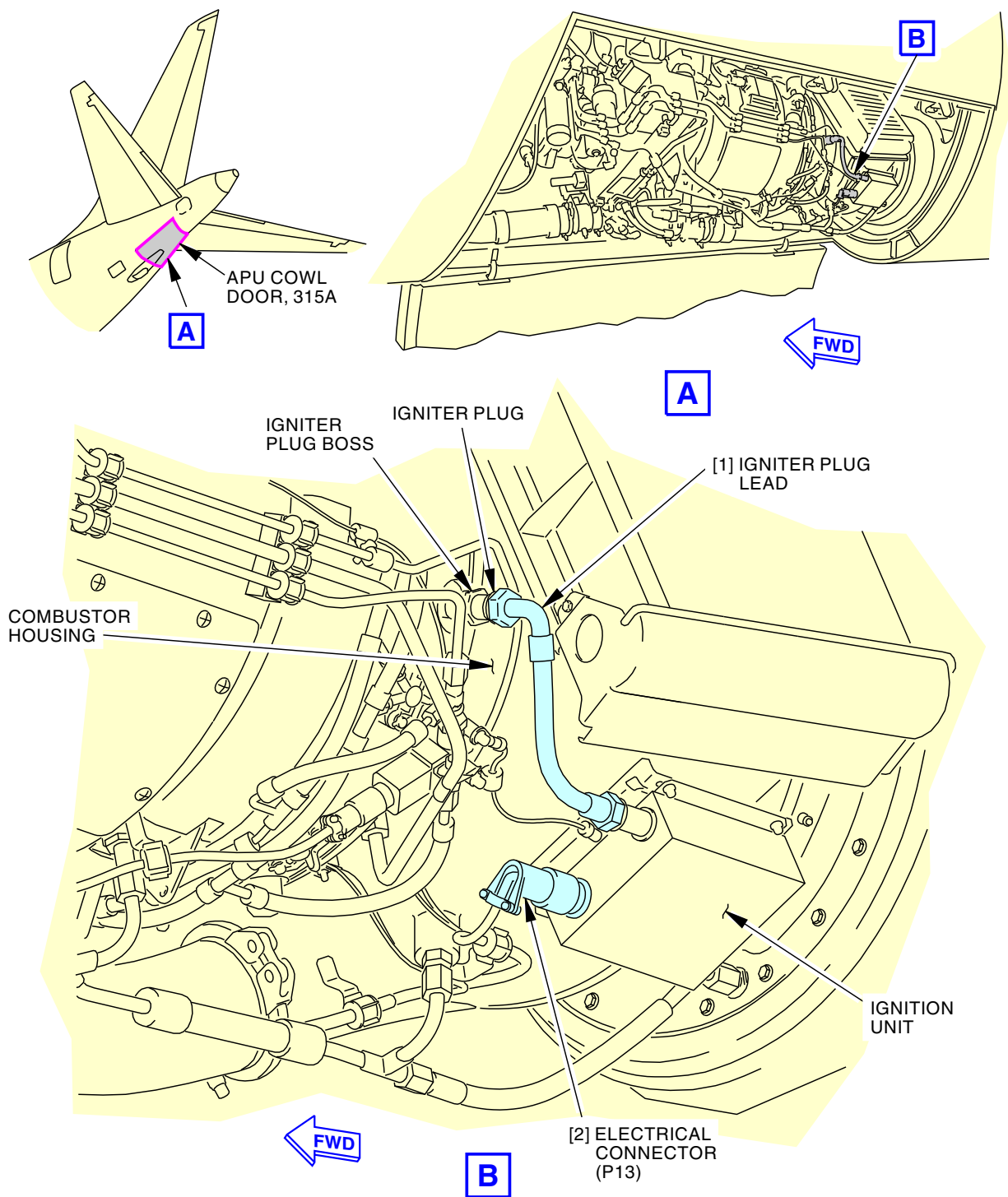
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Igniter Plug Lead Installation
Figure 401/49-41-52-990-801

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TASK 49-41-52-400-801

3. Igniter Plug Lead Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-41-52-200-801	Igniter Plug Lead Inspection (P/B 601)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Igniter plug lead	49-41-52-01-005	SIA ALL

D. Location Zones

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

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Igniter Plug Lead Installation

SUBTASK 49-41-52-210-002

(1) Do this task: Igniter Plug Lead Inspection, TASK 49-41-52-200-801.

SUBTASK 49-41-52-420-001



CAUTION

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

(2) Do these steps to install the igniter plug lead [1]:

- (a) Connect the igniter plug lead [1] to the igniter plug.
 - 1) Tighten the igniter plug lead [1] to 225 in-lb (25.4 N·m).
- (b) Connect the igniter plug lead [1] to the ignition unit.
 - 1) Tighten the igniter plug lead [1] to 225 in-lb (25.4 N·m).
- (c) Connect the electrical connector (P13) [2] to the ignition unit.

G. Igniter Plug Lead Installation Test

SUBTASK 49-41-52-860-003

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

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

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

SUBTASK 49-41-52-860-004

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

SUBTASK 49-41-52-710-001

- (3) Do the installation test for the igniter plug lead:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-52-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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

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

———— **END OF TASK** ————

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IGNITER PLUG LEAD - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the igniter plug lead.

TASK 49-41-52-200-801

2. Igniter Plug Lead Inspection

A. References

Reference	Title
49-41-52-000-801	Igniter Plug Lead Removal (P/B 401)
49-41-52-100-801	Igniter Plug Lead Cleaning (P/B 701)
49-41-52-400-801	Igniter Plug Lead Installation (P/B 401)

B. Location Zones

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

C. Igniter Plug Lead Inspection

SUBTASK 49-41-52-020-002

- (1) Do this task: Igniter Plug Lead Removal, TASK 49-41-52-000-801.

SUBTASK 49-41-52-100-001

- (2) If it is necessary, do this task: Igniter Plug Lead Cleaning, TASK 49-41-52-100-801.

SUBTASK 49-41-52-210-001

- (3) Do these steps to inspect the igniter plug lead:
- (a) Examine the coupling nut for cracks and corrosion.
 - (b) Examine the coupling nut for crossed, stripped and worn threads.
 - (c) Examine the Teflon or silicone grommet that surrounds the insulator for cracks and distortion.
 - (d) Examine the outer shielding of the igniter plug lead for wear.
 - (e) Examine the igniter plug lead for cracks and separation between the shielding and the terminal end.
 - (f) If you find any of the above damage, replace the igniter plug lead.

SUBTASK 49-41-52-420-002

- (4) Do this task: Igniter Plug Lead Installation, TASK 49-41-52-400-801.

————— **END OF TASK** —————

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IGNITER PLUG LEAD - CLEANING/PAINTING

1. General

- A. This procedure has the task to clean the igniter plug lead.

TASK 49-41-52-100-801

2. Igniter Plug Lead Cleaning

A. References

Reference	Title
49-41-52-000-801	Igniter Plug Lead Removal (P/B 401)
49-41-52-400-801	Igniter Plug Lead Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle
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)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Location Zones

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

E. Igniter Plug Lead Cleaning

SUBTASK 49-41-52-020-003

- (1) Do this task: Igniter Plug Lead Removal, TASK 49-41-52-000-801.

SUBTASK 49-41-52-110-001

- (2) Do these steps to clean the igniter plug lead:
- (a) Clean the igniter plug lead 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 lead.
 - 1) It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the igniter plug lead and to blow away the loose material.
 - (c) Carefully clean the unwanted materials off the connectors for the igniter plug lead with a soft bristle brush, STD-123.
 - (d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow away all the loose material off the igniter plug lead.

SUBTASK 49-41-52-420-003

- (3) Do this task: Igniter Plug Lead Installation, TASK 49-41-52-400-801.

————— **END OF TASK** —————

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START CONVERTER UNIT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the start converter unit
 - (2) Installation of the start converter unit.
- B. The start converter unit is installed on the E2-2 electrical shelf. The E2-2 electrical shelf is found in the electrical and electronics compartment (section 43).
- C. The start converter unit is referred to as the SCU.

TASK 49-41-61-000-801

2. Start Converter Unit Removal

(Figure 401)

A. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

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

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 49-41-61-860-001

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

SUBTASK 49-41-61-860-005

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

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-61-010-001

- (3) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

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SUBTASK 49-41-61-860-002



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

F. Start Converter Unit Removal

SUBTASK 49-41-61-020-001



DO NOT TOUCH THE HOT SURFACE OF A METAL ENCASED ELECTRICAL COMPONENT. A HOT SURFACE CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.



YOU MUST CAREFULLY DO THE STEPS BELOW TO REMOVE THE START CONVERTER UNIT. IF YOU DO NOT DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (1) Do these steps to remove the start converter unit [1]:
- (a) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.
 - (b) Remove the start converter unit [1] (TASK 20-10-07-000-801).
- NOTE: The weight of the start converter unit [1] is approximately 40 lb (18 kg).

————— END OF TASK —————

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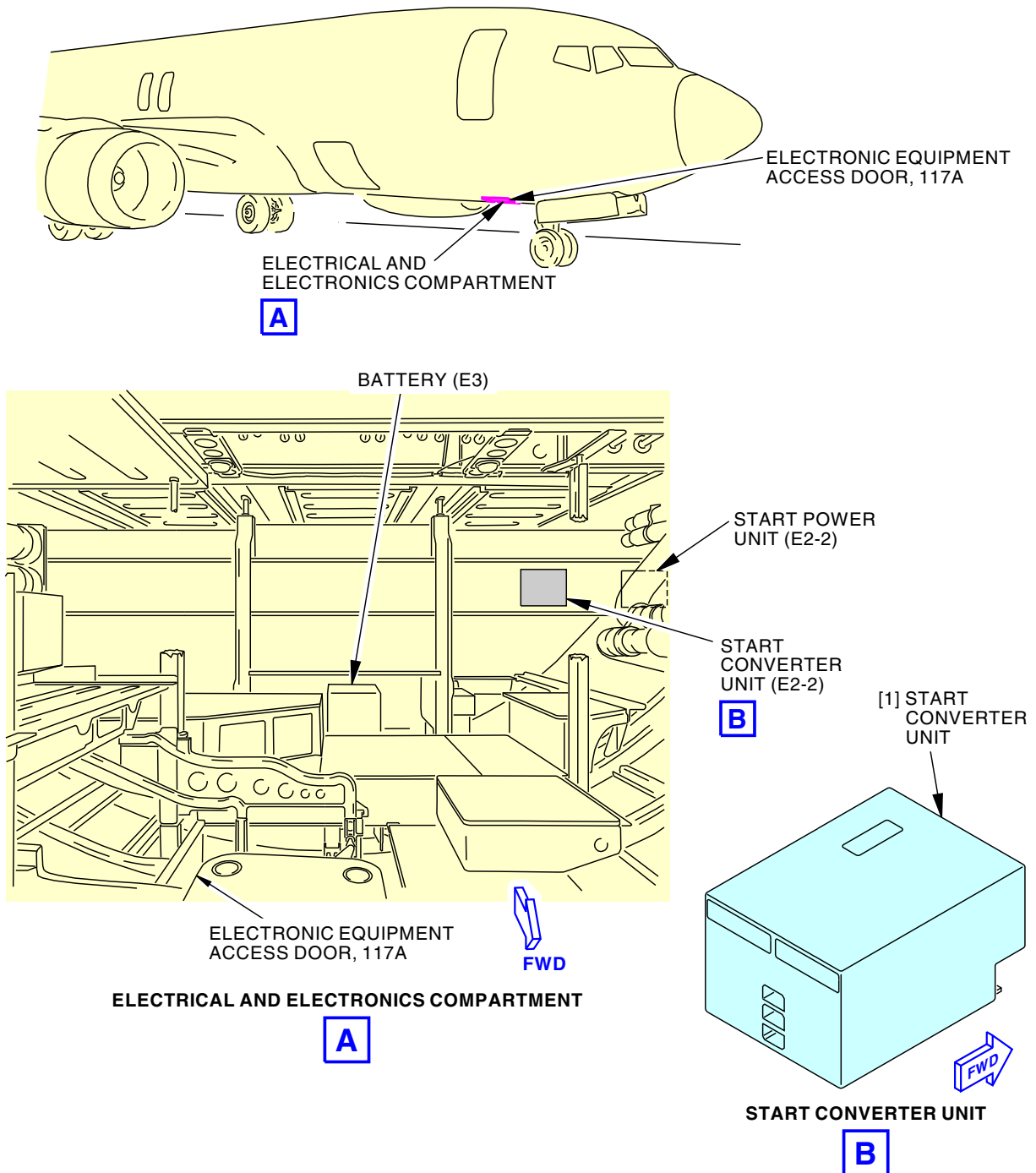
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Start Converter Unit Installation
Figure 401/49-41-61-990-801

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TASK 49-41-61-400-801

3. **Start Converter Unit Installation**

(Figure 401)

A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Start converter unit	49-41-61-01-020	SIA ALL

D. Location Zones

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

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Start Converter Unit Installation

SUBTASK 49-41-61-420-001



CAUTION

YOU MUST CAREFULLY DO THE STEPS BELOW TO INSTALL THE START CONVERTER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (1) Do these steps to install the start converter unit [1]:
 - (a) Install the start converter unit [1] (TASK 20-40-12-400-802).
NOTE: The weight of the start converter unit [1] is 40 lb (18 kg)4.
 - (b) Do this task: E/E Box Installation, TASK 20-10-07-400-801.

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G. Start Converter Unit Installation Test

SUBTASK 49-41-61-860-003



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



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

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

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-41-61-410-001

- (2) Close this access panel:

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

SUBTASK 49-41-61-860-006

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

F/O Electrical System Panel, P6-4

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

SUBTASK 49-41-61-860-004

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

SUBTASK 49-41-61-710-001

- (5) Do the installation test for the start converter unit [1]:

- Set the BUS TRANS switch on the P5 forward overhead panel to the AUTO position.
- Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- Make sure that the APU GEN OFF BUS light on the P5 forward overhead panel comes on.
- Set the two APU GEN switches on the P5 forward overhead panel to the ON position.

NOTE: One of the two APU GEN switches will connect the APU starter-generator to the two 115V AC transfer busses. It is necessary to set the two APU GEN switches to the ON position for the two SOURCE OFF lights to go off.

- Make sure that these lights on the P5 forward overhead panel go off:
 - APU GEN OFF BUS

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- 2) 1 SOURCE OFF
- 3) 2 SOURCE OFF
- 4) 1 TRANSFER BUS OFF
- 5) 2 TRANSFER BUS OFF
- (f) Set the two APU GEN switches to the OFF position.
- (g) Make sure that these lights come on:
 - 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF
 - 4) 1 TRANSFER BUS OFF
 - 5) 2 TRANSFER BUS OFF
- (h) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU electrical system, ignition system or the start converter unit, refer to the IFIM and do the applicable procedure(s).
- (i) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I

———— **END OF TASK** ————

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START POWER UNIT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the start power unit
 - (2) Installation of the start power unit.
- B. The start power unit is installed on the E2-2 electrical shelf. The E2-2 electrical shelf is found in the electrical and electronics compartment (section 43).
- C. The start power unit is referred to as the SPU.

TASK 49-41-71-000-801

2. Start Power Unit Removal

(Figure 401)

A. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

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

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 49-41-71-860-001

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

SUBTASK 49-41-71-860-005

- (2) Make sure the BAT switch, on the P5-13 panel, is set to the OFF position.

SUBTASK 49-41-71-860-006

- (3) Make sure the STANDBY POWER switch, on the P5-5 panel, is set to the AUTO position.

SUBTASK 49-41-71-010-001

- (4) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

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SUBTASK 49-41-71-860-002

- (5) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-71-860-009



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (6) Open these circuit breakers and install safety tags:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00142	BATTERY CHARGER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

F. Start Power Unit Removal

SUBTASK 49-41-71-040-001



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the start power unit [1], do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-40-12-000-802).

SUBTASK 49-41-71-020-001



YOU MUST CAREFULLY DO THE STEPS BELOW TO REMOVE THE START POWER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (2) Do these steps to remove the start power unit [1]:
(a) Remove the lockwire from the start power unit [1] D44 connector at the battery.

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MAKE SURE THAT YOU ISOLATE THE BATTERY CONNECTOR FROM THE AIRPLANE STRUCTURE. A BATTERY POWER VOLTAGE OF 28V DC IS PRESENT AT THE BATTERY CONNECTOR. THE ELECTRICAL SHOCK CAN CAUSE INJURY TO PERSONNEL OR CAUSE DAMAGE TO THE AIRPLANE.

- (b) Disconnect and install a protective cover to isolate the battery connector D44 from the battery.
- (c) Disconnect the battery connector D11798 [2] from the start power unit [1]:
 - 1) Remove the lockwire from the battery connector D11798 [2] at the start power unit [1].
 - 2) Remove the nut [5], washer [4], and ground wire [3] from the terminal stud.
 - 3) Install a protective cover on the battery connector D11798 [2].
- (d) Remove the start power unit [1] (TASK 20-10-07-000-801).

NOTE: The weight of the start power unit [1] is approximately 40 lb (18 kg).

————— **END OF TASK** —————

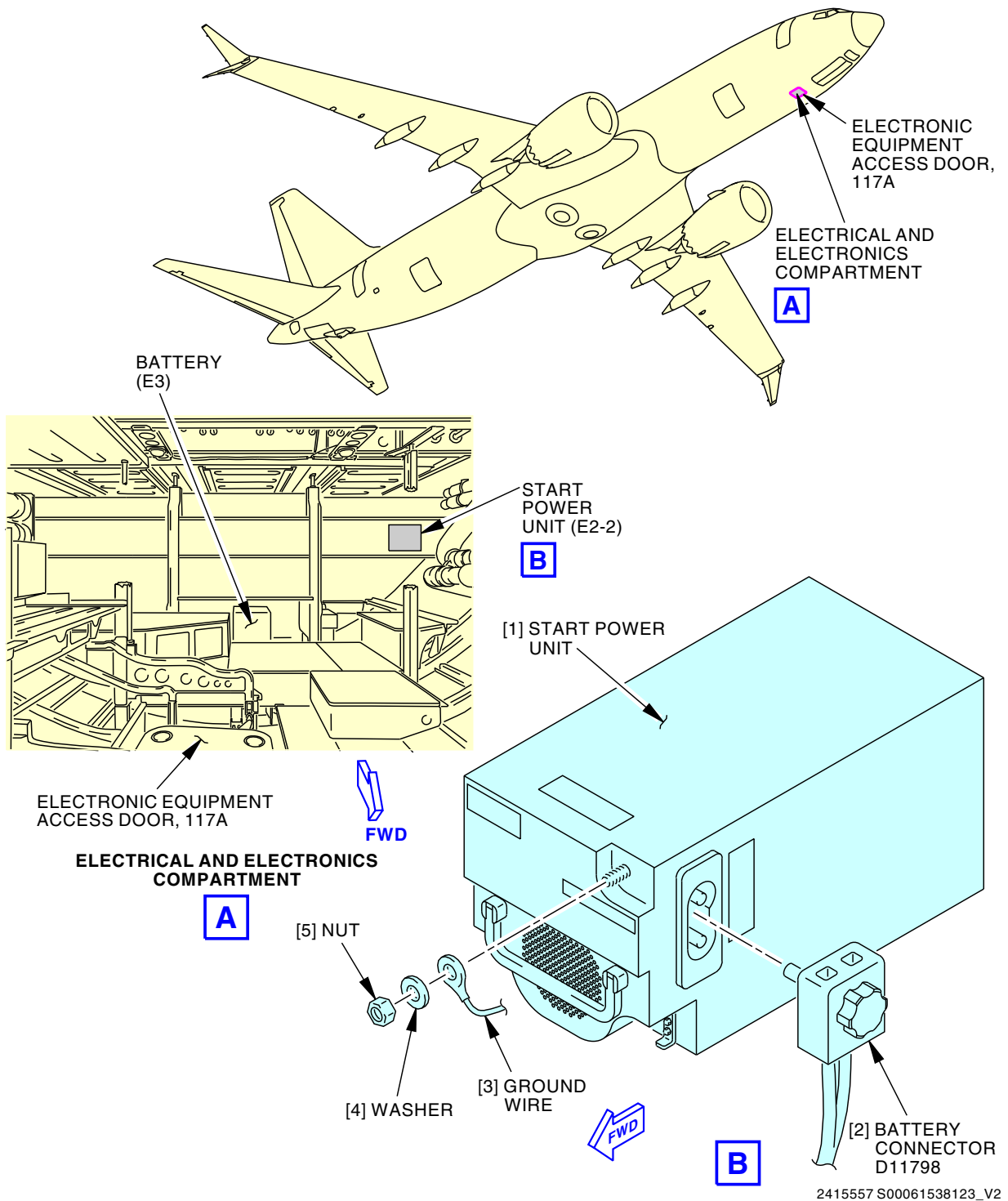
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Start Power Unit Installation
Figure 401/49-41-71-990-801

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TASK 49-41-71-400-801

3. Start Power Unit Installation

(Figure 401)

A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Consumable Materials

Reference	Description	Specification
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Start power unit	49-41-71-01-005	SIA ALL

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Start Power Unit Installation

SUBTASK 49-41-71-040-002



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the start power unit [1], do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-40-12-000-802).

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SUBTASK 49-41-71-420-001



CAUTION

YOU MUST CAREFULLY DO THE STEPS BELOW TO INSTALL THE START POWER UNIT. A FAILURE TO DO THE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE EQUIPMENT.

(2) Do these steps to install the start power unit [1]:

(a) Remove the protective covers.

(b) Do this task: E/E Box Installation, TASK 20-10-07-400-801, to install the start power unit [1].

NOTE: The weight of the start power unit [1] is approximately 40 lb (18 kg).

(c) Connect the battery connector D11798 [2] to the start power unit [1].

1) Install the MS20995NC20 lockwire, G02166, on the battery connector D11798 [2].

(d) Install the nut [5], washer [4], and ground wire [3] to the terminal stud.

1) Clean the nut [5], washer [4], ground wire [3] and terminal stud with solvent.

2) Apply sealant, A50231, or sealant, A50296, to the mating surfaces of the nut [5], washer [4], ground wire [3] and terminal stud.

NOTE: Refer to the category 2 faying sealing procedure in SWPM 20-20-10.

3) Install the nut [5], washer [4], and ground wire [3] to the terminal stud.

4) Tighten the nut [5] to 102.5 ± 7.5 in-lb (11.6 ± 0.9 N·m).

NOTE: Make sure that the sealant squeeze-out is continuous and visible around the installed parts.

5) Measure the electrical bonding resistance across the terminal stud.

NOTE: The maximum resistance is 0.50 milliohms (0.0005 ohms).

(e) Connect the connector D44 to the battery.

1) Install the MS20995CY20 lockwire, G02479, on the battery connector D44.

G. Start Power Unit Installation Test

SUBTASK 49-41-71-860-010



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (1) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00142	BATTERY CHARGER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	11	C01336	APU START CONV

SUBTASK 49-41-71-860-003

- (2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-41-71-860-004

- (3) Remove the DO NOT OPERATE tag, from the APU master switch, on the P5 forward overhead panel.

SUBTASK 49-41-71-860-007

- (4) Make sure that the BAT switch, on the P5-13 panel, is set to the ON position.

SUBTASK 49-41-71-860-008

- (5) Make sure that the STANDBY POWER switch, on the P5-5 panel, is set to the AUTO position.

SUBTASK 49-41-71-710-001

- (6) Do the installation test for the start power unit [1] using AC power:

- (a) Set the BUS TRANS switch, on the P5 forward overhead panel, to the AUTO position.
- (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (c) Make sure that the APU GEN OFF BUS light, on the P5 forward overhead panel, comes on.
- (d) Operate the APU for a minimum of five minutes.
- (e) Set the two APU GEN switches, on the P5 forward overhead panel, to the ON position.

NOTE: One of the two APU GEN switches will connect the APU starter-generator to the two 115V AC transfer busses. It is necessary to set the two APU GEN switches to the ON position for the two SOURCE OFF lights to go off.

- (f) Make sure that these lights, on the P5 forward overhead panel, go off:
 - 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF

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- 4) 1 TRANSFER BUS OFF
- 5) 2 TRANSFER BUS OFF.
- (g) Set the two APU GEN switches to the OFF position.
- (h) Make sure that these lights come on:
 - 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF
 - 4) 1 TRANSFER BUS OFF
 - 5) 2 TRANSFER BUS OFF.
- (i) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU electrical system, ignition system or the start power unit, refer to the IFIM and do the applicable procedure(s).
- (j) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-41-71-710-002

- (7) Do the installation test for the start power unit [1] using DC power:
 - (a) Set the BUS TRANS switch, on the P5 forward overhead panel, to the AUTO position.
 - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (c) Make sure that the APU GEN OFF BUS light, on the P5 forward overhead panel, comes on.
 - (d) Operate the APU for a minimum of five minutes.
 - (e) Set the two APU GEN switches, on the P5 forward overhead panel, to the ON position.
NOTE: One of the two APU GEN switches will connect the APU starter-generator to the two 115V AC transfer busses. It is necessary to set the two APU GEN switches to the ON position for the two SOURCE OFF lights to go off.
 - (f) Make sure that these lights, on the P5 forward overhead panel, go off:
 - 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF
 - 4) 1 TRANSFER BUS OFF
 - 5) 2 TRANSFER BUS OFF.
 - (g) Set the two APU GEN switches to the OFF position.
 - (h) Make sure that these lights come on:
 - 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF
 - 4) 1 TRANSFER BUS OFF
 - 5) 2 TRANSFER BUS OFF.
 - (i) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU electrical system, ignition system or the start power unit, refer to the IFIM and do the applicable procedure(s).

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(j) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-41-71-410-002

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

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BLEED AIR VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the bleed air valve
 - (2) Installation of the bleed air valve.
- B. The bleed air valve is installed between the bleed air duct and the compressor discharge duct. You can get access to the bleed air valve through the APU cowl door.

TASK 49-52-11-000-801

2. Bleed Air Valve Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-52-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-52-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-11-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Bleed Air Valve Removal

SUBTASK 49-52-11-020-001

- (1) Do these steps to remove the bleed air valve [3]:
 - (a) Disconnect the electrical connector (P10) [1] from the bleed air valve [3].
 - (b) Remove the two coupling clamps [2] that hold the bleed air valve [3] to the bleed air duct and compressor discharge duct.
 - (c) Move the bleed air duct forward and up to get access to the bleed air valve [3].
 - (d) Remove the bleed air valve [3].
 - (e) Remove the seals [4] from the bleed air valve [3].
 - (f) Examine the seals [4] for signs of deterioration and leakage.
 - 1) Discard the seals [4] if you find signs of deterioration or leakage.
 - (g) Install the necessary protection covers.

———— **END OF TASK** ————

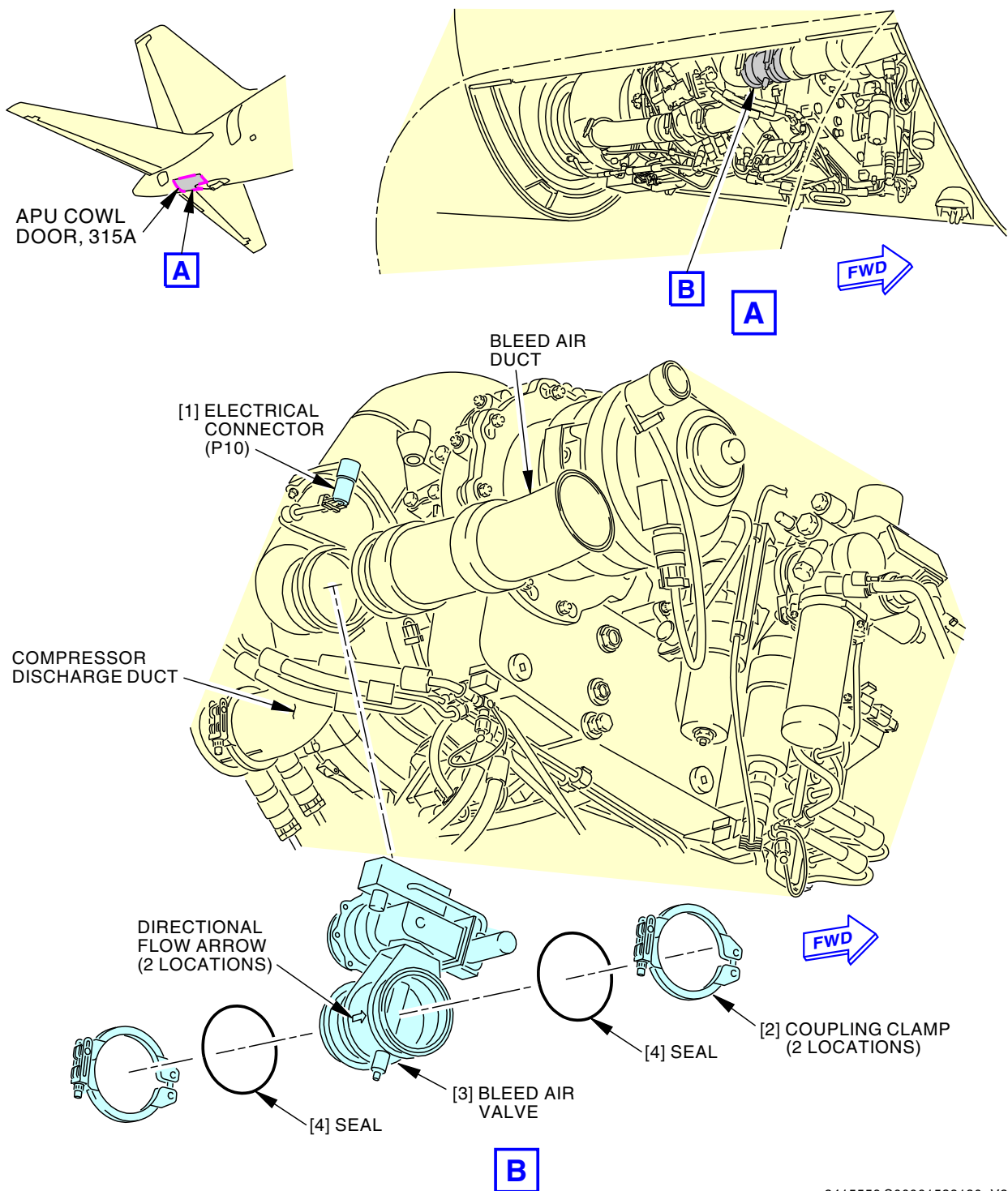
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Bleed Air Valve Installation
Figure 401/49-52-11-990-801

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TASK 49-52-11-400-801

3. **Bleed Air Valve - Installation**

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Bleed air valve	49-52-11-01-035	SIA ALL
4	Seal	49-52-11-01-010	SIA ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Bleed Air Valve Installation

SUBTASK 49-52-11-420-001



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 bleed air valve [3]:
 - (a) Remove the protective covers.
 - (b) Install the seals [4] on the bleed air valve [3].
 - (c) Put the two coupling clamps [2] on the bleed air duct and compressor discharge duct.
 - (d) Carefully put the bleed air valve [3] between the bleed air duct and the compressor discharge duct (the directional flow arrow points to the bleed air duct).
 - 1) Open the two coupling clamps [2] to permit the mark on the bleed air valve [3] to align with the marks on the bleed air duct and compressor discharge duct.
 - 2) Make sure that the mark on the bleed air valve [3] aligns with the marks on the bleed air duct and compressor discharge duct.
 - (e) Put the two coupling clamps [2] over the flanges of the bleed air valve [3], bleed air duct and compressor discharge duct.

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- 1) For AS1895 or 234-591 clamps: tighten the two coupling clamps [2] to 95 in-lb (10.7 N·m) - 110 in-lb (12.4 N·m).
 - 2) For 543227A or 234-607 clamps: tighten the two coupling clamps [2] to 35 in-lb (4.0 N·m) - 40 in-lb (4.5 N·m).
- (f) Connect the electrical connector (P10) [1] to the bleed air valve [3].

G. Bleed Air Valve Installation Test

SUBTASK 49-52-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-11-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel.

SUBTASK 49-52-11-710-001

- (3) Do the installation test for the bleed air valve [3].
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the bleed air valve [3] for signs of air leakage.
 - (d) If you find air leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch, on the P5 forward overhead panel.
 - 3) Repair the cause of the air leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the bleed air valve [3] for signs of air leakage.
 - 7) If you find air leakage, do the leakage repair again.
 - (e) Set these switches, on the P5 forward overhead panel:
 - 1) Set the ISOLATION VALVE switch to the OPEN position.
 - 2) Make sure that the engines 1 and 2 BLEED switches are in the OFF position.
 - 3) Make sure that the L PACK and R PACK switches are in the OFF position.
 - 4) Set the APU BLEED switch to the ON position.
 - (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU bleed air system or the bleed air valve, refer to the IFIM and do the applicable procedure(s) for corrective action.
 - (g) Set these switches, on the P5 forward overhead panel:

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- 1) Set the APU BLEED switch to the OFF position.

NOTE: The duct pressure will be 0 psig (0 kPa) - 6 psig (41 kPa) when the bleed switch is in the OFF position, because the bleed air valve is not fully sealed.

- 2) Set the ISOLATION VALVE switch to the CLOSE position.

- (h) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-11-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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INLET GUIDE VANE (IGV) ACTUATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the inlet guide vane actuator
 - (2) Installation of the inlet guide vane actuator.
- B. The inlet guide vane (IGV) actuator is referred to as the IGV actuator.

TASK 49-52-12-000-801

2. Inlet Guide Vane (IGV) Actuator Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-52-12-860-001

- (1) Make sure that the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel, is in the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-52-12-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-12-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

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- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Inlet Guide Vane (IGV) Actuator Removal

SUBTASK 49-52-12-020-001

- (1) Disconnect the electrical connector (P17) [13] from the IGV actuator [14].

SUBTASK 49-52-12-020-002

- (2) Do these steps to disconnect the supply tube [9], return tube [10], and fuel drain tube [8] from the IGV actuator [14]:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the IGV actuator [14].



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Loosen the bolts [11] that attach the bracket to the IGV actuator [14].
- (c) Disconnect the fuel drain tube [8] from the IGV actuator [14].
- (d) Disconnect the supply tube [9] and return tube [10] from the fuel control unit and surge control valve from the IGV actuator [14].
- (e) Remove the packings [6], packings [7], and packings [12] from the supply tube [9], fuel drain tube [8], and return tube [10].
 - 1) Discard the packings [6], packings [7], and packings [12].
- (f) Drain the fuel from the fuel drain tube [8], supply tube [9], and return tube [10] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (g) Install a caps on the fuel drain tube [8], supply tube [9], and return tube [10].

SUBTASK 49-52-12-020-003

- (3) Do these steps to remove the IGV actuator [14]:
 - (a) Loosen the bolts [2] that attach the cover [1] to the APU.
 - (b) Turn the cover [1] in the clockwise direction to show the bolt [16] and washer [17] for the clevis assembly.
 - (c) Remove the bolt [16] and washer [17] that attach the rod end [3] to the clevis assembly.
 - (d) Remove the bolts [5] and washers [4] that attach the IGV actuator [14] to the APU.



CAUTION

MAKE SURE THAT THE CLEVIS ASSEMBLY AND CAPTIVE BOLT ARE DISENGAGED FROM THE IGV ACTUATOR. IF YOU REMOVE THE IGV ACTUATOR WITH THE CLEVIS ASSEMBLY AND CAPTIVE BOLT ENGAGED, DAMAGE TO THE CLEVIS ASSEMBLY CAN OCCUR.

- (e) Pull out the IGV actuator [14] slowly.

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- (f) Remove the IGV actuator [14].
- (g) Remove the rod end [3] from the IGV actuator [14].
- (h) Make sure that all necessary protection covers are installed.
- (i) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

———— **END OF TASK** ————

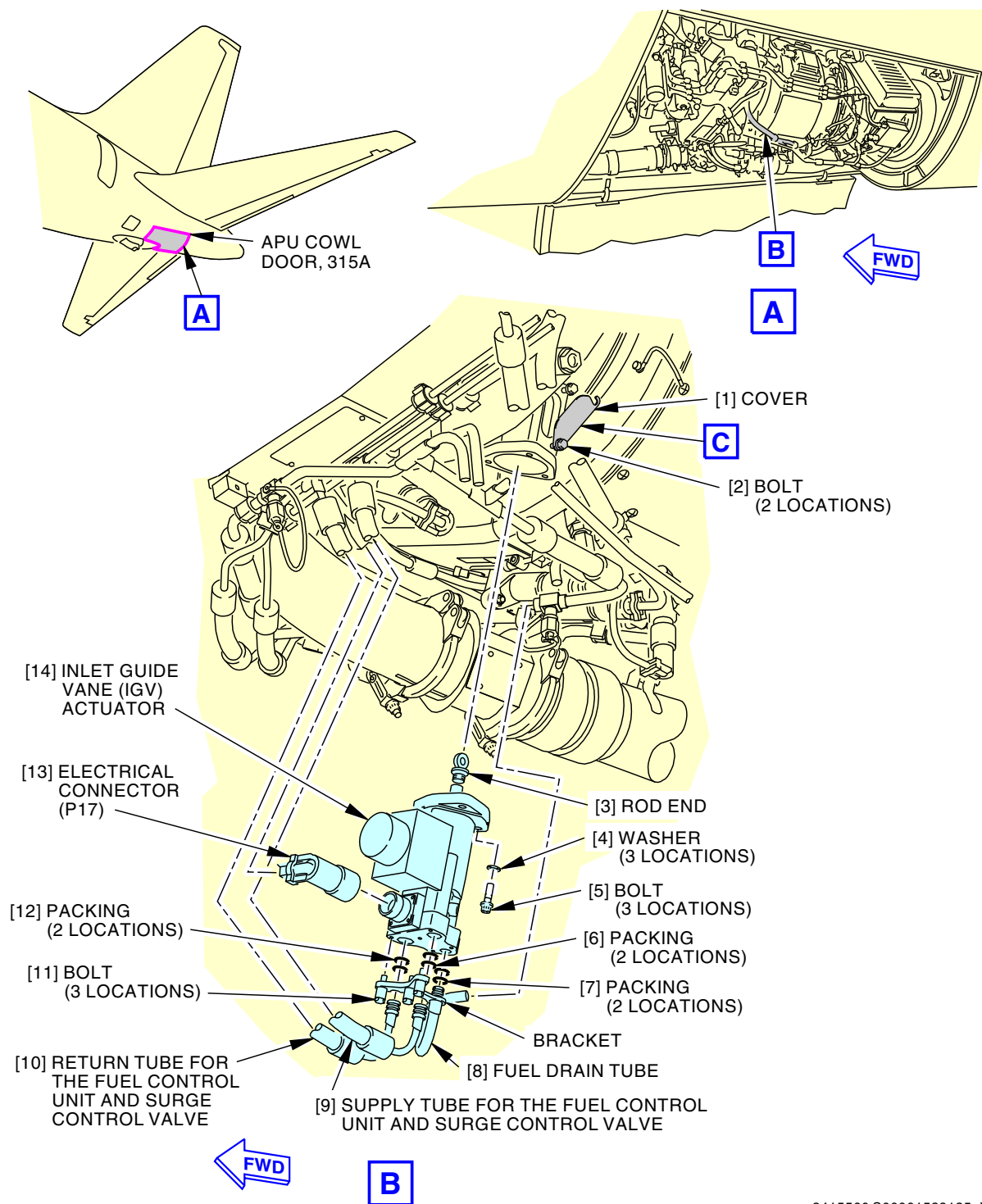
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Inlet Guide Vane Actuator Installation
Figure 401/49-52-12-990-801 (Sheet 1 of 2)

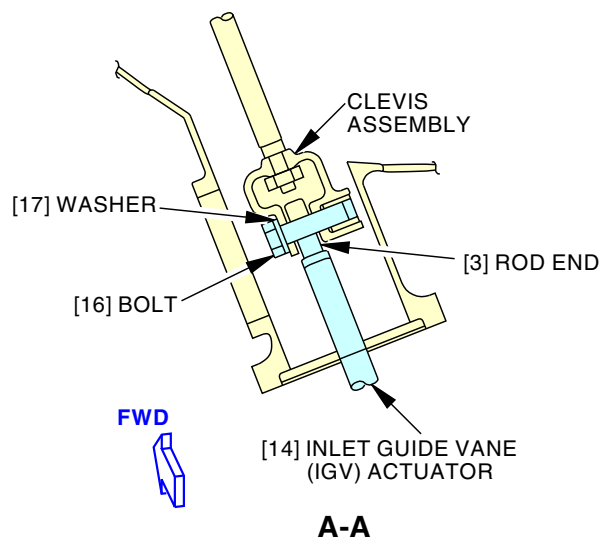
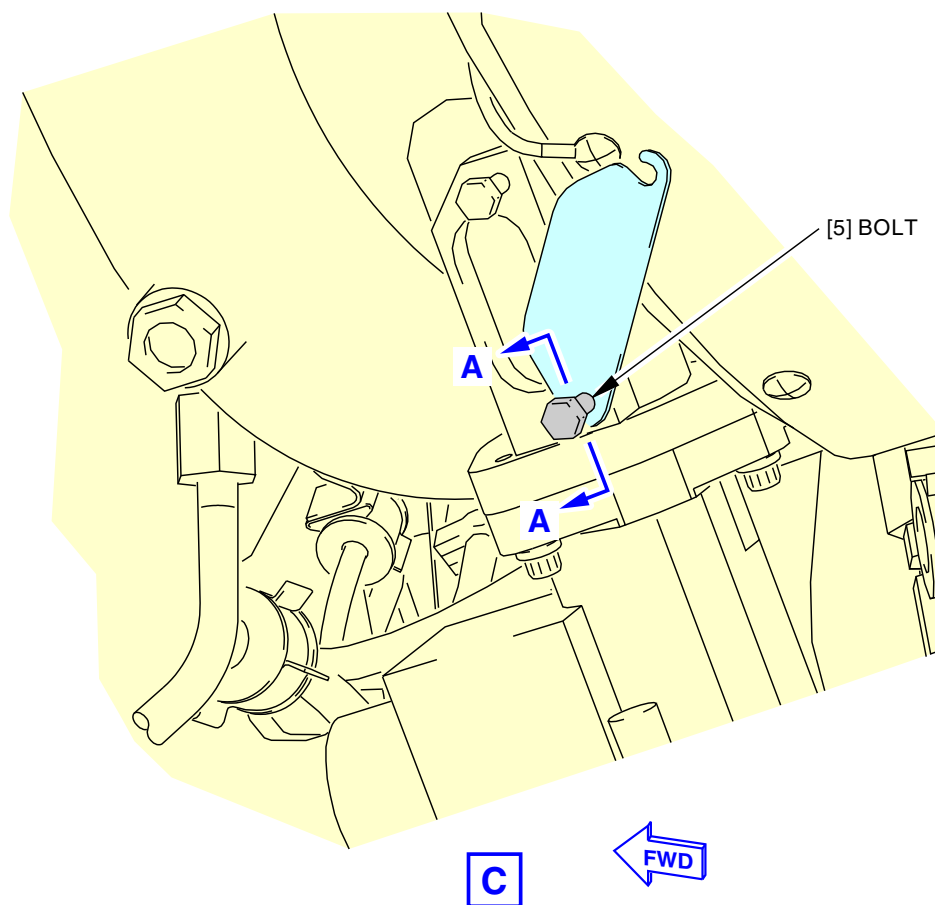
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Inlet Guide Vane Actuator Installation
Figure 401/49-52-12-990-801 (Sheet 2 of 2)

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TASK 49-52-12-400-801

3. **Inlet Guide Vane (IGV) Actuator Installation**

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Packing	49-52-12-01-030	SIA ALL
7	Packing	49-52-12-01-025	SIA ALL
12	Packing	49-52-12-01-035	SIA ALL
14	IGV actuator	49-52-12-01-015	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Inlet Guide Vane (IGV) Actuator Installation

SUBTASK 49-52-12-420-001



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 IGV actuator [14]:
 - (a) Clean the mating surfaces of the IGV actuator [14].
 - (b) Install the rod end [3] on the IGV actuator [14].
 - 1) Tighten the rod end [3] to 50 in-lb (5.6 N·m).

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- (c) Put the IGV actuator [14] in its position on the Auxiliary Power Unit (APU).
- (d) Align the rod end [3] with the clevis assembly and install the washer [17] and bolt [16].
 - 1) Tighten the bolt [16] to 50 in-lb (5.6 N·m).
- (e) Install the bolts [5] and washers [4] that attach the IGV actuator [14] to the APU.
 - 1) Tighten the bolts [5] to 120 in-lb (13.6 N·m).
- (f) Turn the cover [1] in the counterclockwise direction until the flange fully engages the top bolt [2].
 - 1) Tighten the bolts [2] to 50 in-lb (5.6 N·m).

SUBTASK 49-52-12-420-002

- (2) Do these steps to connect the supply tube [9], return tube [10], and fuel drain tube [8] to the IGV actuator [14]:
 - (a) Lubricate the new packings [6] and new packings [12] on the supply tube [9] and return tube [10] for the fuel control unit and surge control valve with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (b) Lubricate the new packings [7] for the fuel drain tube [8] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (c) Remove the caps from the supply tube [9], return tube [10], and fuel drain tube [8].
 - (d) Install the packings [6] and packings [12] on the supply tube [9] and return tube [10] for the fuel control unit and surge control valve.
 - (e) Install the packings [7] on the fuel drain tube [8].
 - (f) Connect the supply tube [9], return tube [10], and fuel drain tube [8] with the bracket to the IGV actuator [14].
 - (g) Tighten the bolts [11] that attach the bracket to the IGV actuator [14] to 50 in-lb (5.6 N·m).

SUBTASK 49-52-12-420-003

- (3) Connect the electrical connector (P17) [13] to the IGV actuator [14].

H. Inlet Guide Vane (IGV) Actuator Installation Test

SUBTASK 49-52-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-12-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.

SUBTASK 49-52-12-710-001

- (3) Do the installation test for the IGV actuator [14]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.

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- (c) During the APU operation, examine the IGV actuator [14] for signs of fuel leakage.
 - 1) A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) from the forward drain on the APU drain seal is permitted.
- (d) If you find more than the fuel leakage rate, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch, on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the IGV actuator [14] for signs of fuel leakage.
 - 7) If you find more than the fuel leakage rate, do the leakage repair again.
- (e) Set these switches, on the P5 forward overhead panel:
 - 1) Set the ISOLATION VALVE switch to the OPEN position.
 - 2) Make sure that the engines 1 and/or 2 BLEED switches are in the OFF position.
 - 3) Make sure that the L PACK and R PACK switches are in the OFF position.
 - 4) Set the APU BLEED switch to the ON position.
- (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If you see a fault message for the APU bleed air system or the Inlet Guide Vane (IGV) actuator, refer to the IFIM and do the applicable procedure(s).
- (g) Set these switches, on the P5 forward overhead panel:
 - 1) Set the APU BLEED switch to the OFF position.
 - 2) Set the ISOLATION VALVE switch to the CLOSE position.
- (h) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-12-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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INLET GUIDE VANE (IGV) ACTUATOR - ADJUSTMENT/TEST

1. **General**

- A. This procedure has the task to do the operational test for the inlet guide vane actuator.
- B. The inlet guide vane (IGV) actuator is referred to as the IGV actuator.

TASK 49-52-12-710-801

2. **Inlet Guide Vane (IGV) Actuator Operational Test**

(Figure 501)

A. References

Reference	Title
49-11-00 P/B 401	APU POWER PLANT - REMOVAL/INSTALLATION

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Operational Test

SUBTASK 49-52-12-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-52-12-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-12-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

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- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-52-12-010-003

- (4) Do these steps to remove the access door [1] for the compressor inlet plenum:
 - (a) Loosen the eight captive screws [2] that attach the access door [1] to the compressor inlet plenum.
 - (b) Remove the access door [1] from the compressor inlet plenum.
- NOTE: A lanyard is attached to the access door to keep the access door with the APU.

F. Inlet Guide Vane (IGV) Actuator Operational Test

SUBTASK 49-52-12-860-007

- (1) Do the operational test for the IGV actuator [3]:
 - (a) Loosen the two bolts [5] that attach the cover [4] to the APU.
 - (b) Turn the cover [4] in the clockwise direction to show the inlet guide vanes.
 - (c) Remove the three bolts [7] and three washers [6] that attach the IGV actuator [3] to the APU.
 - (d) While you pull the IGV actuator [3] down approximately 1 in. (25 mm), make sure the inlet guide vanes move smoothly:
 - 1) Use 8 ± 2 lbf (36 ± 9 N) of force.
 - 2) Use a flashlight to view the inlet guide vanes through the access door [1] for the compressor inlet plenum.
 - 3) All of the vanes should open and close together.
 - a) If one or more of the vanes does not move or is out of sequence, replace the APU (PAGEBLOCK 49-11-00/401).
 - (e) Put the IGV actuator [3] in its position on the APU.
 - (f) Install the three washers [6] and three bolts [7] that attach the IGV actuator [3] to the APU.
 - 1) Tighten the three bolts [7] to 120 in-lb (14 N·m).
 - (g) Turn the cover [4] in the counterclockwise direction until the flange fully engages the top bolt [5].
 - 1) Tighten the two bolts [5] to 50 in-lb (5.6 N·m).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-12-410-002

- (1) Install the access door [1] to the compressor inlet plenum with the eight captive screws [2].

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SUBTASK 49-52-12-410-003

- (2) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

SUBTASK 49-52-12-860-008

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-12-860-009

- (4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

————— **END OF TASK** —————

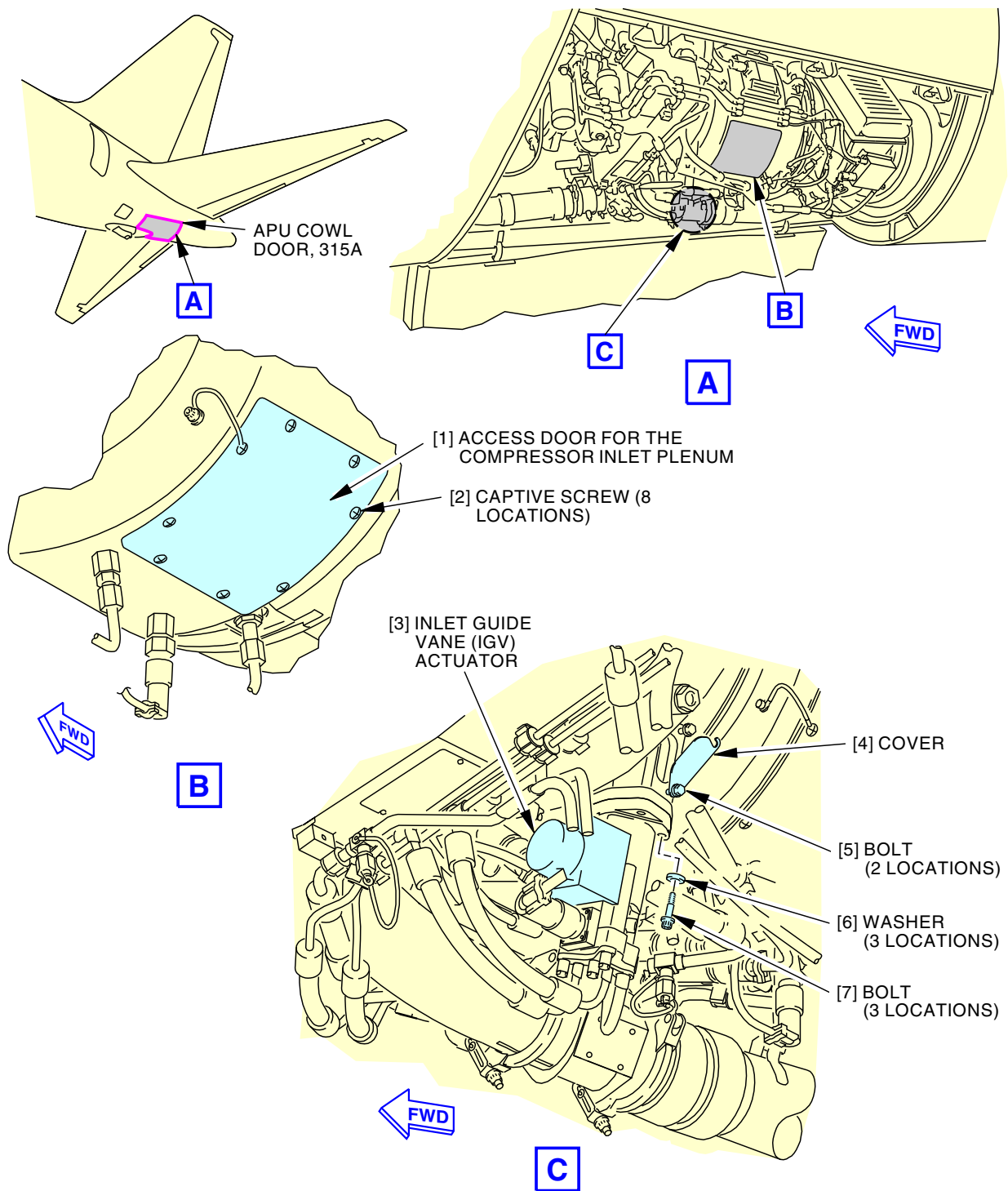
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Inlet Guide Vane Actuator Test
Figure 501/49-52-12-990-802

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BLEED AIR DUCT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the bleed air duct
 - (2) Installation of the bleed air duct.
- B. The bleed air duct is installed between the bleed air valve and bleed duct assembly.

TASK 49-52-13-000-801

2. Bleed Air Duct Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-52-13-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-52-13-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-13-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Bleed Air Duct Removal

SUBTASK 49-52-13-020-001

- (1) Do these steps to remove the bleed air duct [3]:
 - (a) Remove the two coupling clamps [1] that attach the bleed air duct [3] to the bleed air valve and bleed duct assembly.
NOTE: The bleed duct assembly extends through the 1088 bulkhead.
 - (b) Remove the bleed air duct [3].



CAUTION

BE CAREFUL WHEN YOU REMOVE THE TWO SEALS FROM THE BLEED AIR DUCT. DAMAGE TO THE SEALS CAN OCCUR.

- (c) Carefully remove the two seals [2] from the bleed air duct [3].
- (d) Examine the two seals [2] for signs of deterioration and leakage.
 - 1) Discard the two seals [2] if you find signs of deterioration or leakage.
- (e) Install the necessary protection covers.

———— **END OF TASK** ————

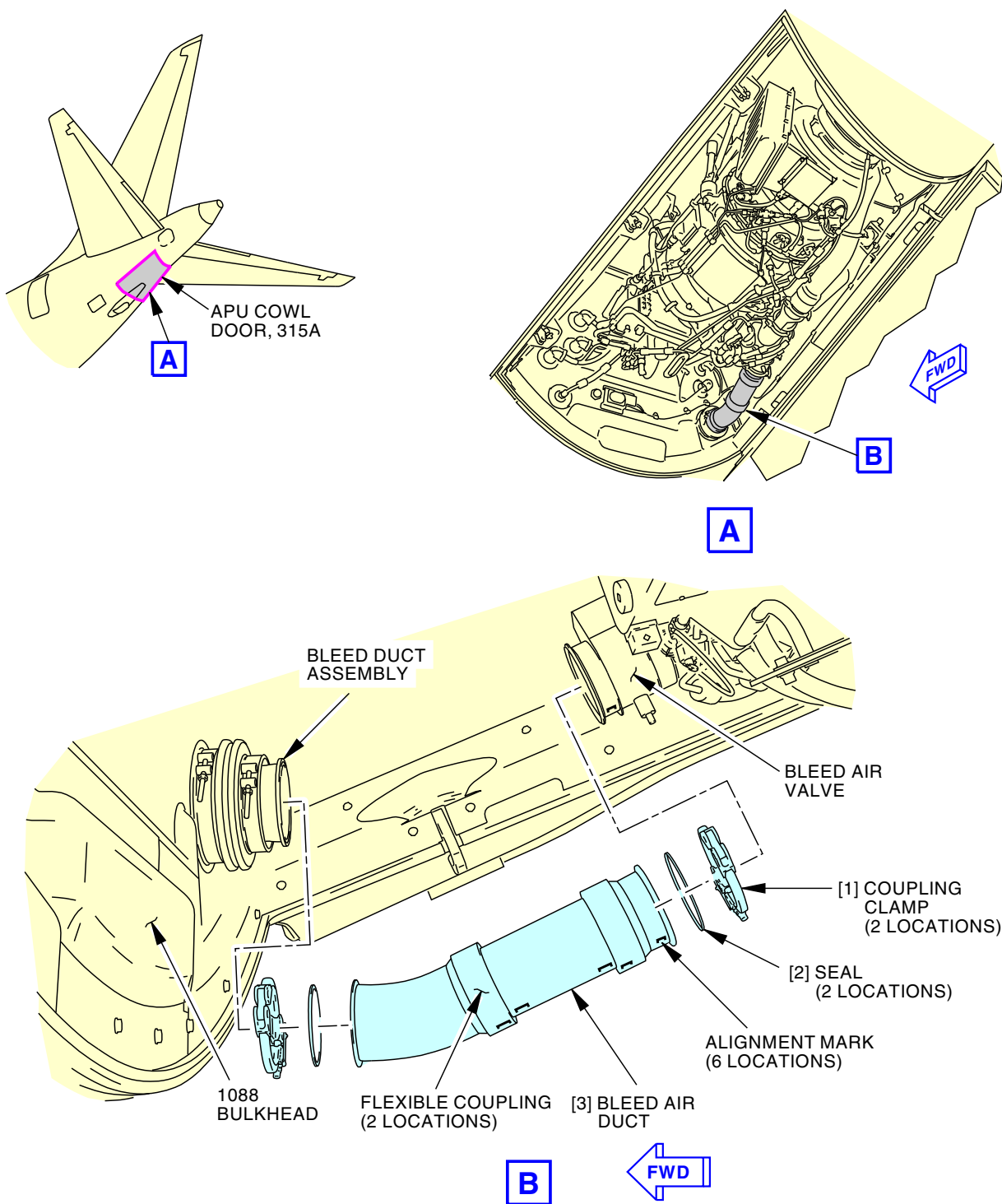
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Bleed Air Duct Installation
Figure 401/49-52-13-990-801

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TASK 49-52-13-400-801

3. **Bleed Air Duct Installation**

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Seal	49-52-11-01-010	SIA ALL
3	Bleed air duct	49-52-11-01-015	SIA ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Bleed Air Duct Installation

SUBTASK 49-52-13-420-001



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the protective covers from the openings.
- (2) Do these steps to install the bleed air duct [3]:
 - (a) Install the two seals [2] on the bleed air duct [3].
 - (b) Put the two coupling clamps [1] on the bleed air valve and bleed duct assembly.
NOTE: The bleed duct assembly extends through the 1088 bulkhead.
 - (c) Put the bleed air duct [3] between the bleed duct assembly and bleed air valve.
 - (d) Open the two coupling clamps [1] to permit alignment of the bleed air duct [3] to the bleed air valve and the bleed duct assembly.
 - (e) Make sure that the alignment marks on the two flexible couplings align with the two alignment marks on the bleed air duct [3].
 - (f) Make sure that the center of the alignment mark on the bleed air duct [3] is ± 0.16 in. (4 mm) from the center of the alignment mark on the bleed air valve.
 - (g) Put the two coupling clamps [1] over the flanges of the bleed air valve, bleed air duct [3] and bleed duct assembly.

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- 1) For AS1895 or 234-591 clamps: tighten the two coupling clamps [1] to 95 in-lb (10.7 N·m) - 110 in-lb (12.4 N·m).
- 2) For 543227A or 234-607 clamps: tighten the two coupling clamps [1] to 35 in-lb (4.0 N·m) - 40 in-lb (4.5 N·m).

G. Bleed Air Duct Installation Test

SUBTASK 49-52-13-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-13-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-13-710-001

- (3) Do the installation test for the bleed air duct [3].
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) Set these switches, on the P5 forward overhead panel:
 - 1) Set the ISOLATION VALVE switch to the OPEN position.
 - 2) Make sure that the engines 1 and 2 BLEED switches are in the OFF position.
 - 3) Make sure that the L PACK and R PACK switches are in the OFF position.
 - 4) Set the APU BLEED switch to the ON position.
 - (d) During the APU operation, examine the bleed air duct [3] for signs of air leakage.
 - (e) If you find air leakage, do these steps to repair the leakage:
 - 1) Set these switches, on the P5 forward overhead panel:
 - a) Set the APU BLEED switch to the OFF position.
 - b) Set the ISOLATION VALVE switch to the CLOSE position.
 - 2) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 3) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 4) Repair the cause of the air leakage.
 - 5) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 6) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 7) Set these switches, on the P5 forward overhead panel:
 - a) Set the ISOLATION VALVE switch to the OPEN position.
 - b) Set the APU BLEED switch to the ON position.

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- 8) During the APU operation, examine the bleed air duct [3] for signs of air leakage.
- 9) If you find air leakage, do the leakage repair again.
- (f) If you did not find air leakage, set these switches, on the P5 forward overhead panel:
 - 1) Set the APU BLEED switch to the OFF position.
 - 2) Set the ISOLATION VALVE switch to the CLOSE position.
- (g) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-13-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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INLET PRESSURE SENSOR - 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 (P2) is installed on the compressor inlet section of the APU.

TASK 49-52-31-000-801

2. Inlet Pressure Sensor Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-52-31-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-52-31-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-31-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Inlet Pressure Sensor Removal

SUBTASK 49-52-31-020-001

- (1) Do these steps to remove the inlet pressure sensor [1]:
 - (a) Disconnect the electrical connector (P18) [2] from the inlet pressure sensor [1].
 - (b) Loosen the nut [4] that attaches the inlet pressure sensor [1] to the compressor inlet section of the APU.
 - (c) Turn the inlet pressure sensor [1] in the counterclockwise direction until the flange disengages from the stud.
 - (d) Remove the inlet pressure sensor [1].
 - (e) Remove the packing [3] from the inlet pressure sensor [1].
 - 1) Discard the packing [3].
 - (f) Install the necessary protection covers.

———— **END OF TASK** ————

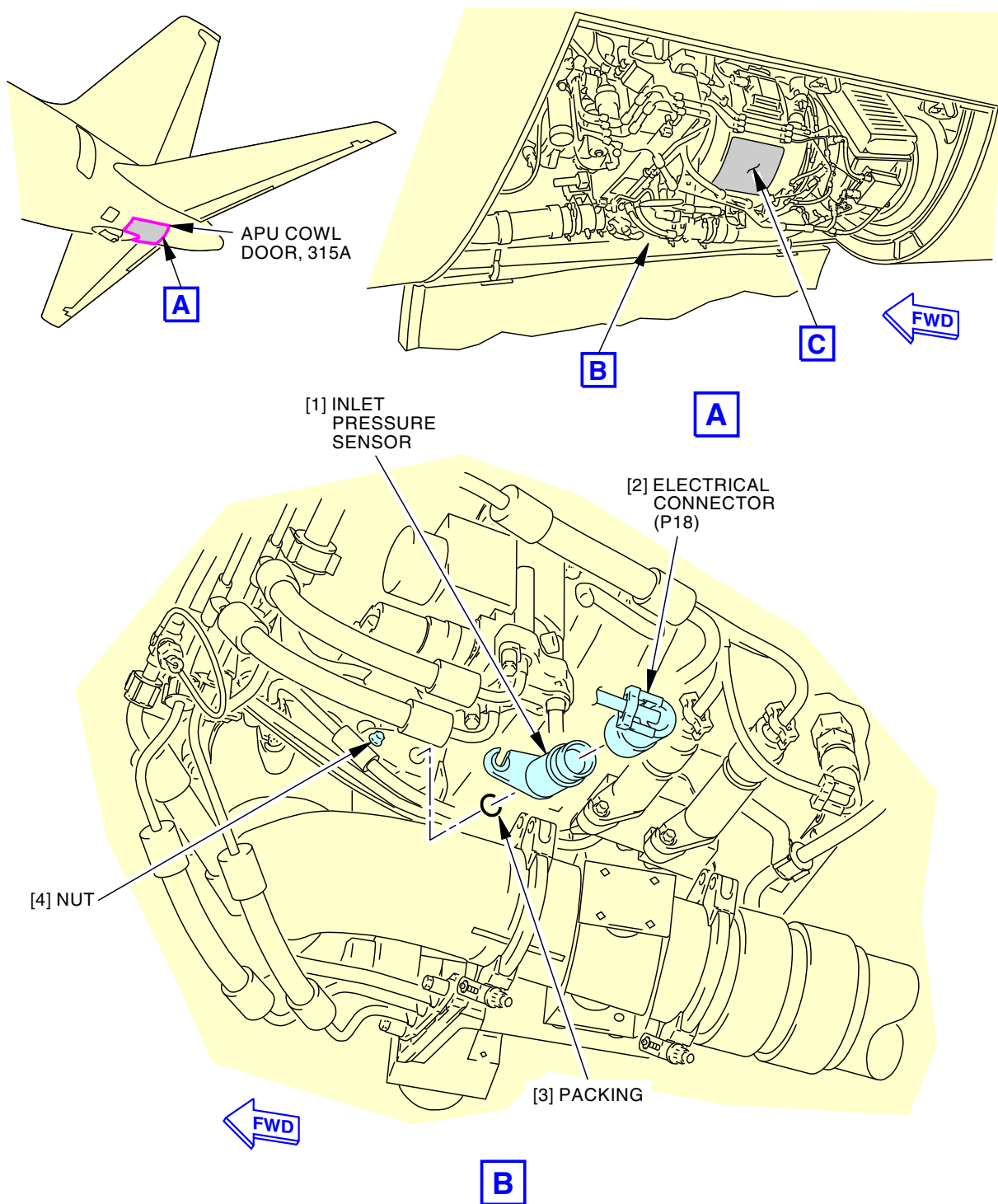
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Inlet Pressure Sensor Installation
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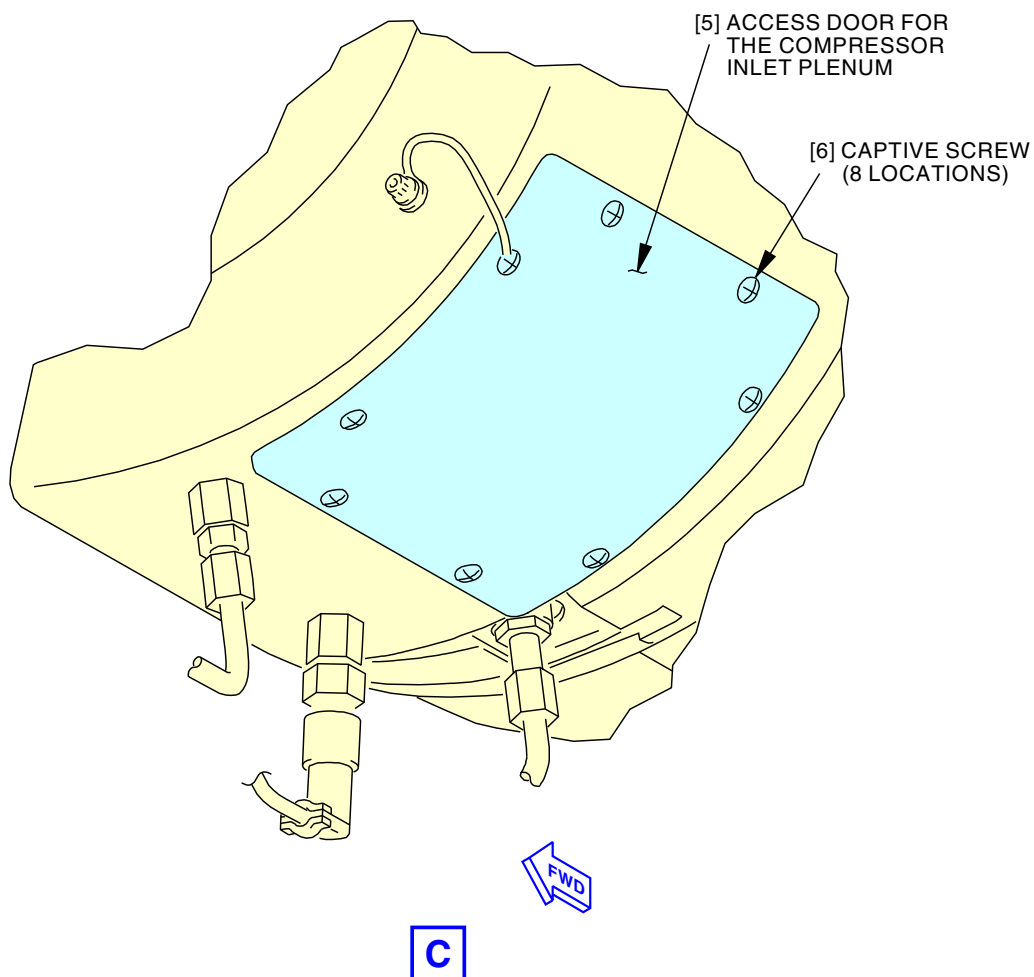
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Inlet Pressure Sensor Installation
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TASK 49-52-31-400-801

3. Inlet Pressure Sensor Installation

(Figure 401)

A. References

Reference	Title
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

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
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00418	Oil - Aircraft Turbine Engine Synthetic Base	MIL-PRF-7808
G50138	Cloth - Soft Cotton	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Inlet pressure sensor	49-52-31-01-010	SIA ALL
3	Packing	49-52-31-01-015	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Inlet Pressure Sensor Installation

SUBTASK 49-52-31-160-001

 CAUTION	MAKE SURE THAT YOU REMOVE PROTECTIVE COVERS FROM INSIDE OF THE OF THE TUBE OPENING. THESE TYPES OF COVERS HAVE CAUSED IN-FLIGHT SHUTDOWNS IF YOU DO NOT REMOVE FROM THE ENGINE.
---	---

- (1) Remove the protective covers from the openings.

SUBTASK 49-52-31-160-002

- (2) Do these steps to clean the tube for the inlet pressure sensor [1]:
- (a) Loosen the eight captive screws [6] that attach the access door [5] to the compressor inlet plenum.

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- (b) Remove the access door [5] from the compressor inlet plenum.

NOTE: A lanyard is attached to the access door to keep the access door with the Auxiliary Power Unit (APU).

- (c) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen from a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to blow the air through the outer tube for the inlet pressure sensor [1].

- (d) Make sure that the air flows through the outer tube to the inner tube.

NOTE: You can find the inner tube for the inlet pressure sensor in the left forward side of the compressor inlet plenum. You get access to the inner tube through the access door.

- (e) If there is no or very minimum air flow from the inner tube, remove the blockage of unwanted materials or repair the problems that you find.

- (f) Install the access door [5] to the compressor inlet plenum with the captive screws [6].

SUBTASK 49-52-31-420-001

- (3) Do these steps to install the inlet pressure sensor [1]:

- (a) Inspect the inlet pressure sensor [1] and mating housing for residual lubricant.

- 1) If the inlet pressure sensor [1] being installed is not new, examine the inlet pressure sensor [1] and sense ports for residual lubricant.

a) If it is necessary, clean with soft cotton cloth, G50138.

b) If lubricant is seen in the sense port, replace the inlet pressure sensor [1].

- 2) Examine the sensor mating housing for debris build up and residual lubricant.

a) Look inside small pockets within the housing for lubricant that was used to aid installation of the inlet pressure sensor [1].

NOTE: This residual lubricant can clog the sensor.

b) If it is necessary, clean with soft cotton cloth, G50138.

- (b) Lubricate the new packing [3] with a light coat of oil, D00068, or aircraft turbine engine oil, D00418, or Santovac 5 lubricant, D00341.

NOTE: D00504 grease is no longer an acceptable packing lubricant. Excessive application of grease was found to block the pressure port resulting in erratic or failed pressure indication. As such, grease is no longer allowed.

- (c) Install the packing [3] on the inlet pressure sensor [1].

- (d) Install the inlet pressure sensor [1].

- (e) Turn the inlet pressure sensor [1] in the clockwise direction until the flange fully engages the stud.

- (f) Tighten the nut [4] to 40 in-lb (4.5 N·m).

- (g) Connect the electrical connector (P18) [2] to the inlet pressure sensor [1].

H. Inlet Pressure Sensor Installation Test

SUBTASK 49-52-31-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-31-860-004

- (2) Remove the DO NOT OPERATE tag from the APU master switch, on the P5 forward overhead panel.

SUBTASK 49-52-31-740-001

- (3) Do the installation test for the inlet pressure sensor [1]:
- (a) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- 1) If maintenance message(s) show for the APU bleed air system or the inlet pressure sensor [1] (P2), refer to the IFIM and do the applicable procedure(s) for corrective action.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-31-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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TOTAL PRESSURE SENSOR - 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 (PT) is installed on the compressor inlet section of the APU.

TASK 49-52-32-000-801

2. Total Pressure Sensor Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-52-32-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-52-32-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-32-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Total Pressure Sensor Removal

SUBTASK 49-52-32-020-001

- (1) Do these steps to remove the total pressure sensor [1]:
 - (a) Disconnect the electrical connector (P19) [2] from the total pressure sensor [1].
 - (b) Loosen the nut [4] that attaches the total pressure sensor [1] to the compressor inlet section of the APU.
 - (c) Turn the total pressure sensor [1] in the counterclockwise direction until the flange disengages from the stud.
 - (d) Remove the total pressure sensor [1].
 - (e) Remove the packing [3] from the total pressure sensor [1].
 - 1) Discard the packing [3].
 - (f) Install the necessary protective covers.

———— **END OF TASK** ————

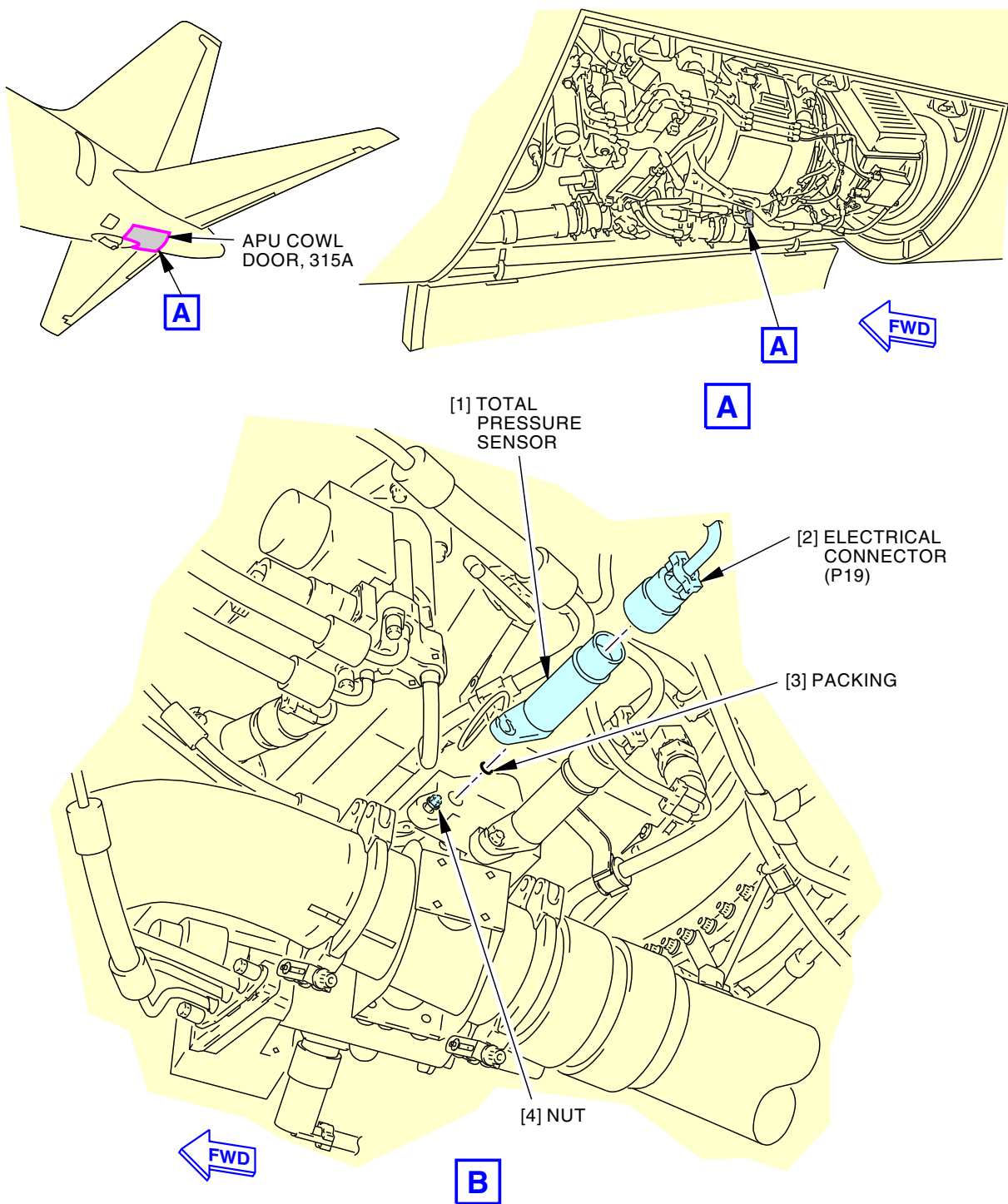
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Total Pressure Sensor Installation
Figure 401/49-52-32-990-801

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TASK 49-52-32-400-801

3. Total Pressure Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00418	Oil - Aircraft Turbine Engine Synthetic Base	MIL-PRF-7808
G50138	Cloth - Soft Cotton	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Total pressure sensor	49-52-32-01-010	SIA ALL
3	Packing	49-52-32-01-015	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Total Pressure Sensor Installation

SUBTASK 49-52-32-420-001



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the protective covers from the openings.

SUBTASK 49-52-32-420-002

- (2) Do these steps to install the total pressure sensor [1]:
- (a) Inspect the total pressure sensor [1] and mating housing for residual lubricant.

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- 1) If the total pressure sensor [1] being installed is not new, examine the total pressure sensor [1] and sense ports for residual lubricant.
 - a) If it is necessary, clean with soft cotton cloth, G50138.
 - b) If lubricant is seen in the sense port, replace the total pressure sensor [1].
- 2) Examine the sensor mating housing for debris build up and residual lubricant.
 - a) Look inside small pockets within the housing for lubricant that was used to aid installation of the total pressure sensor [1].

NOTE: This residual lubricant can clog the sensor.
 - b) If it is necessary, clean with soft cotton cloth, G50138.
- (b) Lubricate the new packing [3] with a light coat of oil, D00068, or aircraft turbine engine oil, D00418, or Santovac 5 lubricant, D00341.

NOTE: D00504 grease is no longer an acceptable packing lubricant. Excessive application of grease was found to block the pressure port resulting in erratic or failed pressure indication. As such, grease is no longer allowed.
- (c) Install the packing [3] on the total pressure sensor [1].
- (d) Install the total pressure sensor [1].
- (e) Turn the total pressure sensor [1] in the clockwise direction until the flange fully engages the stud.
- (f) Tighten the nut [4] to 40 in-lb (4.5 N·m).
- (g) Connect the electrical connector (P19) [2] to the total pressure sensor [1].

H. Total Pressure Sensor Installation Test

SUBTASK 49-52-32-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-32-860-004

- (2) Remove the DO-NOT-OPERATE tag from the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel.

SUBTASK 49-52-32-710-001

- (3) Do the installation test for the total pressure sensor [1]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the total pressure sensor [1] for signs of air leakage.
 - (d) If you find air leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.

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- 3) Repair the cause of the air leakage.
- 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
- 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- 6) During the APU operation, examine the total pressure sensor [1] for signs of air leakage.
- 7) If you find air leakage, do the leakage repair again.
- (e) Set these switches on the P5 forward overhead panel:
 - 1) Set the ISOLATION VALVE switch to the OPEN position.
 - 2) Make sure that the engines 1 and 2 BLEED switches are in the OFF position.
 - 3) Make sure that the L PACK and R PACK switches are in the OFF position.
 - 4) Set the APU BLEED switch to the ON position.
- (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU bleed air system or the total pressure sensor [1] (PT), refer to the IFIM and do the applicable procedure(s) for corrective action.
- (g) Set these switches on the P5 forward overhead panel:
 - 1) Set the APU BLEED switch to the OFF position.
 - 2) Set the ISOLATION VALVE switch to the CLOSE position.
- (h) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-32-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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TOTAL PRESSURE SENSOR - INSPECTION/CHECK

1. General

- A. This procedure has the task to do an inspection of the total pressure sensor.

TASK 49-52-32-200-801

2. Total Pressure Sensor Inspection

A. References

Reference	Title
49-52-32-000-801	Total Pressure Sensor Removal (P/B 401)
49-52-32-400-801	Total Pressure Sensor Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
G50138	Cloth - Soft Cotton	

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-52-32-860-008

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-52-32-860-005

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-32-010-002

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

F. Total Pressure Sensor Inspection

SUBTASK 49-52-32-200-001

- (1) Do an inspection of the pneumatic tubes and housings for the total pressure sensor:
 - (a) Remove the total pressure sensor. Do this task: Total Pressure Sensor Removal, TASK 49-52-32-000-801.
 - 1) Remove the total pressure sensor drain tube.
 - (b) Examine the tubes for cracks, worn areas, corrosion or damage.
 - 1) If you find cracks, worn areas, corrosion or damage, then replace the tubes or repair the problems that you find.
 - (c) Examine the housings for debris build up and residual lubricant.

NOTE: Look inside small pockets within the housing for lubricant that was used to aide installation of the sensors. This residual lubricant can clog the sensor.

 - 1) Clean as necessary with a soft cotton cloth, G50138.
 - (d) Clean the tubes and sensor housing as follows:
 - 1) Use the air source to blow air through the tubes to remove unwanted materials.

NOTE: It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of filtered air or nitrogen to blow the air through the tubes.
 - 2) Cap one end of the tube, and use the air source to blow the air through the tube to be sure that air will come out of the small orifice drain holes.
 - a) If no air comes out of the small orifice drain holes, replace the tube.
 - 3) If installed, remove the plug from the opening of the removed total pressure sensor.
 - (e) Install the total pressure sensor. Do this task: Total Pressure Sensor Installation, TASK 49-52-32-400-801.
 - 1) Install the total pressure sensor drain tube.

G. Return The Airplane to Its Usual Condition

SUBTASK 49-52-32-410-002

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.

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- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

SUBTASK 49-52-32-860-006

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-32-860-007

- (3) Remove the DO-NOT-OPERATE tag from the APU master switch.

———— **END OF TASK** ————

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DELTA PRESSURE SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Removal of the delta pressure sensor
- (2) Installation of the delta pressure sensor.

B. The delta pressure sensor (DP) is installed on the compressor inlet section of the APU.

TASK 49-52-33-000-801

2. Delta Pressure Sensor Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-52-33-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-52-33-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-33-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Delta Pressure Sensor Removal

SUBTASK 49-52-33-020-001

- (1) Do these steps to remove the delta pressure sensor [1]:
 - (a) Disconnect the electrical connector (P20) [2] from the delta pressure sensor [1].
 - (b) Loosen the nut [5] that attaches the delta pressure sensor [1] to the compressor inlet section of the APU.
 - (c) Turn the delta pressure sensor [1] in the counterclockwise direction until the flange disengages from the stud.
 - (d) Remove the delta pressure sensor [1].
 - (e) Remove the packing [4] and packing [3] from the delta pressure sensor [1].
 - 1) Discard the packing [4] and packing [3].
 - (f) Install the necessary protection covers.

———— **END OF TASK** ————

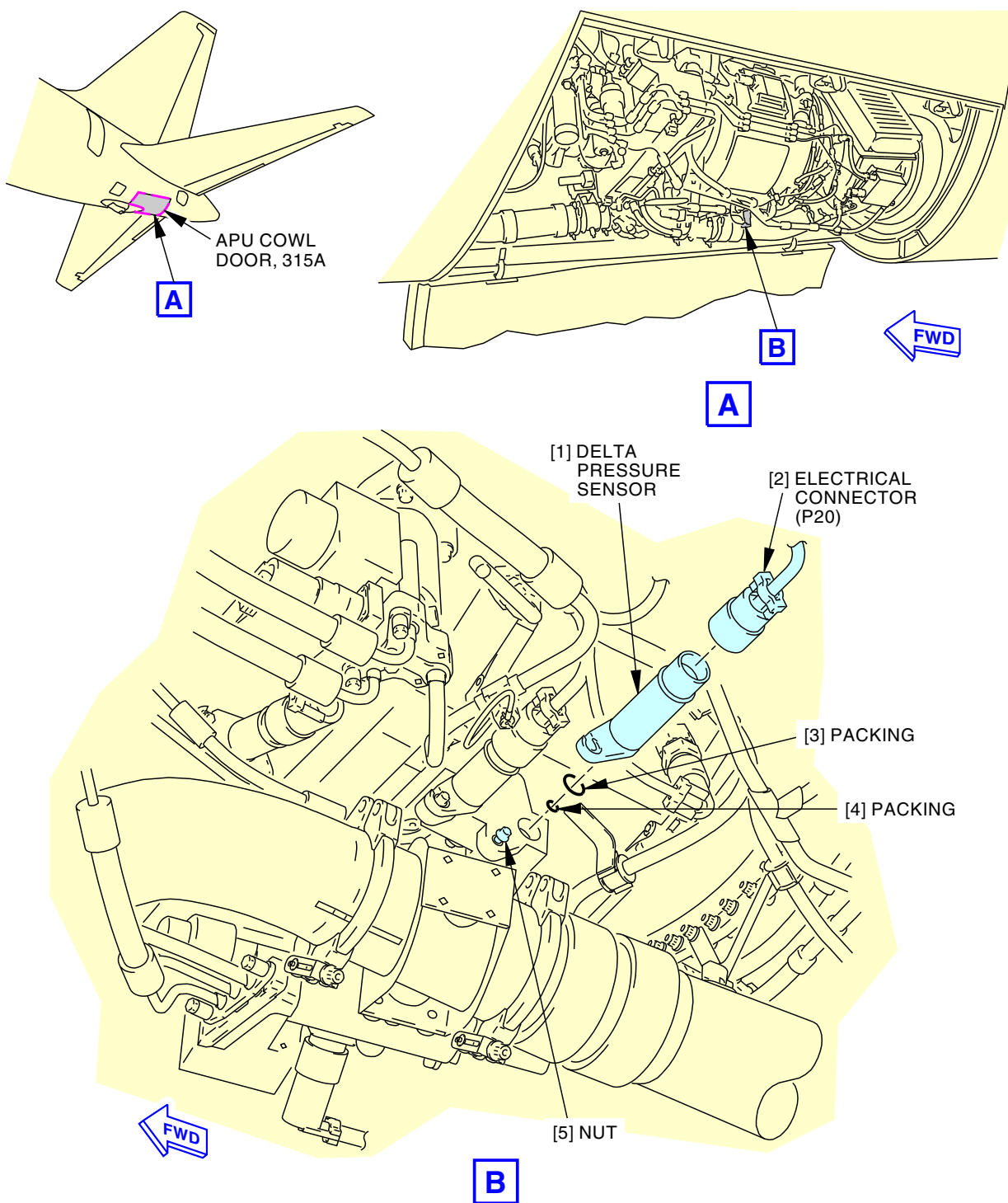
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Delta Pressure Sensor Installation
Figure 401/49-52-33-990-801

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TASK 49-52-33-400-801

3. Delta Pressure Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00418	Oil - Aircraft Turbine Engine Synthetic Base	MIL-PRF-7808
G50138	Cloth - Soft Cotton	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Delta pressure sensor	49-52-33-01-010	SIA ALL
3	Packing	49-52-33-01-020	SIA ALL
4	Packing	49-52-33-01-015	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Delta Pressure Sensor Installation

SUBTASK 49-52-33-420-001



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the protective covers from the openings.

SUBTASK 49-52-33-420-002

- (2) Do these steps to install the delta pressure sensor [1]:

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- (a) Inspect the delta pressure sensor [1] and mating housing for residual lubricant.
 - 1) If the delta pressure sensor [1] being installed is not new, examine the delta pressure sensor [1] and sense ports for residual lubricant.
 - a) If it is necessary, clean with soft cotton cloth, G50138.
 - b) If lubricant is seen in the sense port, replace the delta pressure sensor [1].
 - 2) Examine the sensor mating housing for debris build up and residual lubricant.
 - a) Look inside small pockets within the housing for lubricant that was used to aid installation of the delta pressure sensor [1].

NOTE: This residual lubricant can clog the sensor.
 - b) If it is necessary, clean with soft cotton cloth, G50138.
- (b) Lubricate the new packing [3] and new packing [4] with a light coat of oil, D00068, or aircraft turbine engine oil, D00418, or Santovac 5 lubricant, D00341.

NOTE: D00504 grease is no longer an acceptable packing lubricant. Excessive application of grease was found to block the pressure ports resulting in erratic or failed pressure indications. As such, grease is no longer allowed.
- (c) Install the packing [3] and packing [4] on the delta pressure sensor [1].
- (d) Install the delta pressure sensor [1].
- (e) Turn the delta pressure sensor [1] in the clockwise direction until the flange fully engages the stud.
- (f) Tighten the nut [5] to 40 in-lb (4.5 N·m).
- (g) Connect the electrical connector (P20) [2] to the delta pressure sensor [1].

H. Delta Pressure Sensor Installation Test

SUBTASK 49-52-33-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-33-860-004

- (2) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-52-33-710-001

- (3) Do the installation test for the delta pressure sensor [1]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the delta pressure sensor [1] for signs of air leakage.
 - (d) If you find air leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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- 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the air leakage.
 - 4) Remove the DO-NOT-OPERATE tag from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the delta pressure sensor [1] for signs of air leakage.
 - 7) If you find air leakage, do the leakage repair again.
- (e) Set these switches on the P5 forward overhead panel:
- 1) Set the ISOLATION VALVE switch to the OPEN position.
 - 2) Make sure that the engines 1 and 2 BLEED switches are in the OFF position.
 - 3) Make sure that the L PACK and R PACK switches are in the OFF position.
 - 4) Set the APU BLEED switch to the ON position.
- (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- 1) If maintenance message(s) show for the APU bleed air system or the delta pressure sensor [1] (DP), refer to the IFIM and do the applicable procedure(s) for corrective action.
- (g) Set these switches on the P5 forward overhead panel:
- 1) Set the APU BLEED switch to the OFF position.
 - 2) Set the ISOLATION VALVE switch to the CLOSE position.
- (h) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-33-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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DELTA PRESSURE SENSOR - INSPECTION/CHECK

1. General

- A. This procedure has the task to do an inspection of the delta pressure sensor.

TASK 49-52-33-200-801

2. Delta Pressure Sensor Inspection

A. References

Reference	Title
49-52-33-000-801	Delta Pressure Sensor Removal (P/B 401)
49-52-33-400-801	Delta Pressure Sensor Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
G50138	Cloth - Soft Cotton	

C. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-52-33-860-007

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and attach a DO-NOT-OPERATE tag.

SUBTASK 49-52-33-860-005

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-33-010-002

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

F. Delta Pressure Sensor Inspection

SUBTASK 49-52-33-200-001

- (1) Do an inspection of the pneumatic tubes and housings for the delta pressure sensor:
 - (a) Remove the delta pressure sensor. Do this task: Delta Pressure Sensor Removal, TASK 49-52-33-000-801.
 - 1) Remove the delta pressure sensor drain tube.
 - (b) Examine the tubes for cracks, worn areas, corrosion or damage.
 - 1) If you find cracks, worn areas, corrosion or damage, then replace the tubes or repair the problems that you find.
 - (c) Examine the housings for debris build up and residual lubricant.

NOTE: Look inside small pockets within the housing for lubricant that was used to aide installation of the sensors. This residual lubricant can clog the sensor.

 - 1) Clean as necessary with a soft cotton cloth, G50138.
 - (d) Clean the tubes and sensor housing as follows:
 - 1) Use the air source to blow air through the tubes to remove unwanted materials.

NOTE: It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of filtered air or nitrogen to blow the air through the tubes.
 - 2) Cap one end of the tube, and use the air source to blow the air through the tube to be sure that air will come out of the small orifice drain holes.
 - a) If no air comes out of the small orifice drain holes, replace the tube.
 - 3) If installed, remove the plug from the opening of the removed total pressure sensor.
 - (e) Install the delta pressure sensor. Do this task: Delta Pressure Sensor Installation, TASK 49-52-33-400-801.
 - 1) Install the delta pressure sensor drain tube.

G. Return The Airplane to Its Usual Condition

SUBTASK 49-52-33-410-002

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.

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- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

SUBTASK 49-52-33-860-008

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-33-860-009

- (3) Remove the DO-NOT-OPERATE tag from the APU master switch.

———— **END OF TASK** ————

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SURGE CONTROL VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the surge control valve
 - (2) An installation of the surge control valve.
- B. The surge control valve is installed between the compressor discharge duct and surge duct.

TASK 49-52-41-000-801

2. Surge Control Valve Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-52-41-860-001

- (1) Make sure that the APU master switch, on the P5 forward overhead panel, is in the OFF position.
 - (a) Install the DO NOT OPERATE tag, STD-858, on the APU master switch.

SUBTASK 49-52-41-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-52-41-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

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- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Surge Control Valve Removal

SUBTASK 49-52-41-020-001

- (1) Disconnect the electrical connector (P9) [1] from the surge control valve [9].

SUBTASK 49-52-41-020-002

- (2) Do these steps to disconnect the supply tube [5], return tube [6], and fuel drain tube [7] from the surge control valve [9]:
 - (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, below the surge control valve [9].
 - (b) Loosen the bolts [4] that attach the bracket to the surge control valve [9].



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) Disconnect the fuel drain tube [7] from the surge control valve [9].
- (d) Disconnect the supply tube [5] and return tube [6] for the Inlet Guide Vane (IGV) from the surge control valve [9].
- (e) Remove the packings [2], packings [3], and packings [8] from the return tube [6], supply tube [5], and fuel drain tube [7].
 - 1) Discard the packings [2], packings [3], and packings [8].
- (f) Drain the fuel from the supply tube [5], return tube [6], and fuel drain tube [7] into the 1 gallon (4 l) fuel resistant container, STD-4049.
- (g) Install a cap on each supply tube [5], return tube [6], and fuel drain tube [7].

SUBTASK 49-52-41-020-003

- (3) Do these steps to remove the surge control valve [9]:
 - (a) Remove the coupling clamps [11] that hold the surge control valve [9] to the compressor discharge duct and surge duct.
 - (b) Remove the surge control valve [9].
 - (c) Remove the seals [10] from the surge control valve [9].
 - (d) Examine the seals [10] for signs of deterioration and leakage.
 - 1) If there are signs of deterioration or leakage, discard the seals [10].
 - (e) Use the 1 gallon (4 l) fuel resistant container, STD-4049, to drain the fuel from the surge control valve [9].
 - (f) Install the necessary protection covers.

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- (g) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

———— **END OF TASK** ————

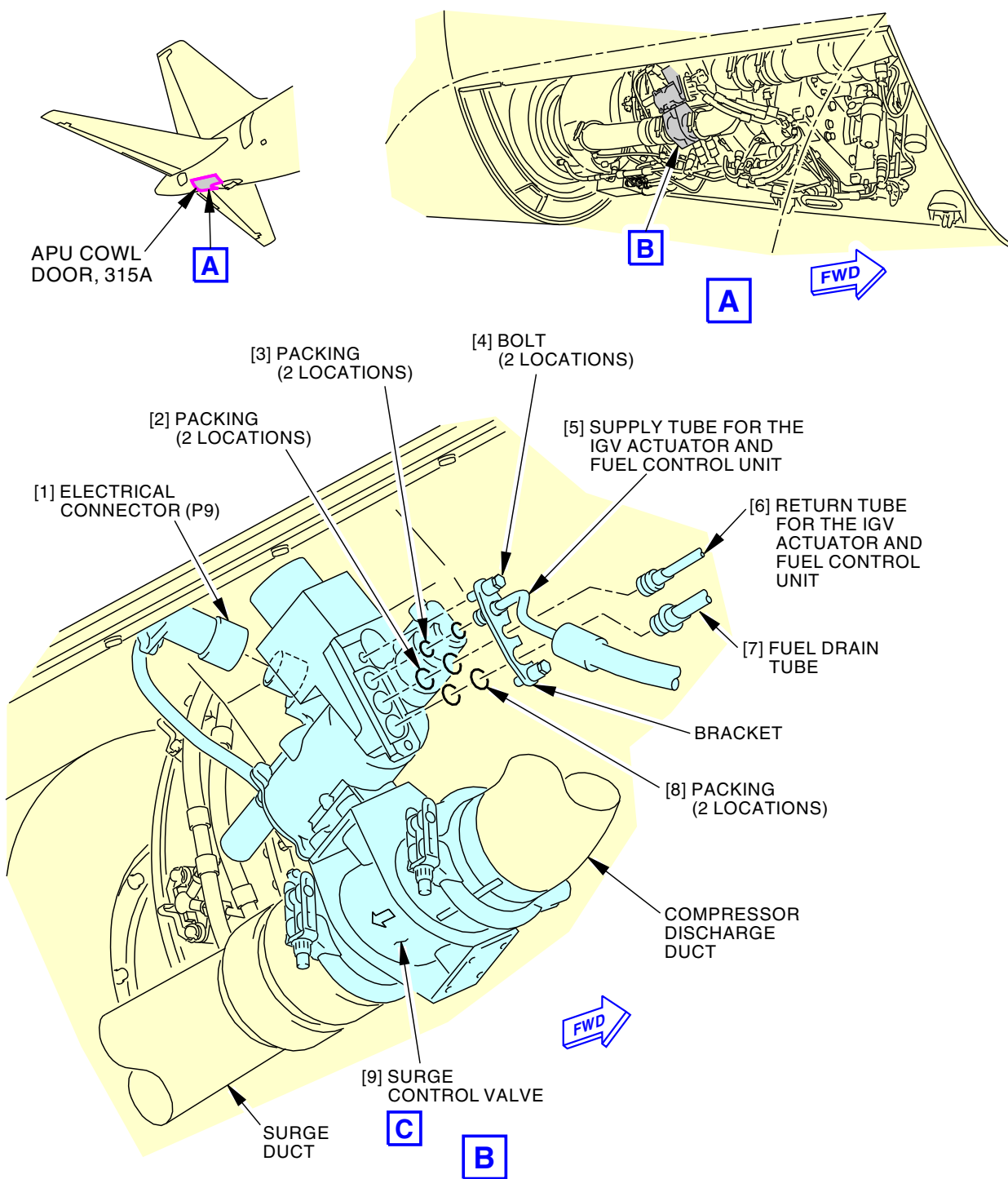
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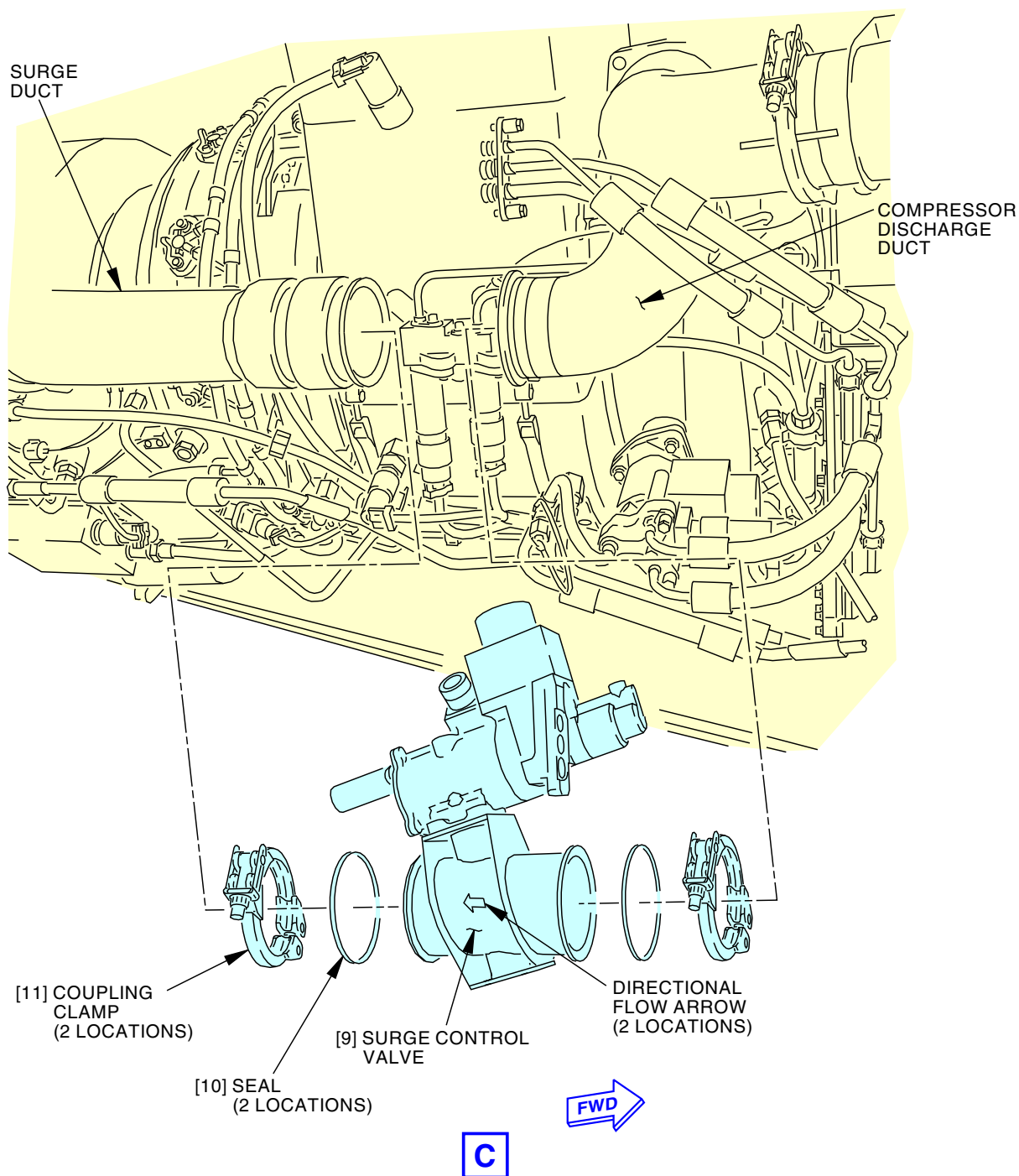
Surge Control Valve Installation
Figure 401/49-52-41-990-801 (Sheet 1 of 2)

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2415570 S00061538167_V1

Surge Control Valve Installation
Figure 401/49-52-41-990-801 (Sheet 2 of 2)

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TASK 49-52-41-400-801

3. Surge Control Valve Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-52-12-01-030	SIA ALL
3	Packing	49-52-12-01-025	SIA ALL
8	Packing	49-52-12-01-035	SIA ALL
9	Surge control valve	49-52-41-01-030	SIA ALL
10	Seal	49-52-41-01-022	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Surge Control Valve Installation

SUBTASK 49-52-41-420-001



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (1) Remove the protective covers from the openings.

SUBTASK 49-52-41-420-004

- (2) Do these steps to install the surge control valve [9]:
- (a) Install the seals [10] on the surge control valve [9].

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- 1) If the seals [10] were discarded, install the new seals [10].
- (b) Put the coupling clamps [11] on the compressor discharge duct and surge duct.
- (c) Carefully put the surge control valve [9] between the compressor discharge duct and surge duct (the directional flow arrow points to the aft of the Auxiliary Power Unit (APU)).
 - 1) Open the coupling clamps [11] to let the mark on the surge control valve [9] align with the mark on the compressor discharge duct.
 - 2) Make sure that the mark on the surge control valve [9] aligns with the mark on the compressor discharge duct.
- (d) Put the coupling clamps [11] over the flanges of the surge control valve [9], compressor discharge duct, and surge duct.
 - 1) For AS1895 or 234-591 clamps: tighten the coupling clamps [11] to 95 in-lb (10.7 N·m) - 110 in-lb (12.4 N·m).
 - 2) For 543227A or 234-607 clamps: tighten the coupling clamps [11] to 35 in-lb (4.0 N·m) - 40 in-lb (4.5 N·m).

SUBTASK 49-52-41-420-002

- (3) Do these steps to connect the supply tube [5], return tube [6], and fuel drain tube [7] to the surge control valve [9]:
 - (a) Lubricate the new packings [3] and new packings [2] for the supply tube [5] and return tube [6] for the Inlet Guide Vane (IGV) actuator and fuel control unit with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (b) Lubricate the new packings [8] for the fuel drain tube [7] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (c) Remove the caps from the supply tube [5], return tube [6], and fuel drain tube [7].
 - (d) Install the packings [3] on the supply tube [5] for the IGV actuator and fuel control unit.
 - (e) Install the packings [2] on the return tube [6] for the IGV actuator and fuel control unit.
 - (f) Install the packings [8] on the fuel drain tube [7].
 - (g) Connect the supply tube [5], return tube [6], and fuel drain tube [7] with the bracket to the surge control valve [9].
 - (h) Tighten the bolts [4] that attach the bracket to the surge control valve [9] to 50 in-lb (5.6 N·m).

SUBTASK 49-52-41-420-003

- (4) Connect the electrical connector (P9) [1] to the surge control valve [9].

H. Surge Control Valve Installation Test

SUBTASK 49-52-41-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-52-41-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.

SUBTASK 49-52-41-710-001

- (3) Do the installation test for the surge control valve [9].
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the surge control valve [9] for signs of air and fuel leakage.
 - 1) A fuel leakage rate of 1 drop for each minute (0.04 cc for each minute) is permitted during an APU operation from the forward drain on the APU drain seal.
 - (d) If there are air leakage or more than the fuel leakage rate, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch, on the P5 forward overhead panel.
 - 3) Repair the cause of the fuel or air leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the surge control valve [9] for signs of air and fuel leakage.
 - 7) If there are air leakage or more than the fuel leakage rate, do the leakage repair again.
 - (e) Set these switches, on the P5 forward overhead panel:
 - 1) Set the ISOLATION VALVE switch to the OPEN position.
 - 2) Make sure that the engines 1 and 2 BLEED switches are in the OFF position.
 - 3) Make sure that the L PACK and R PACK switches are in the OFF position.
 - 4) Set the APU BLEED switch to the ON position.
 - (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU bleed air system or the surge control valve [9], refer to the IFIM and do the applicable procedure(s) for corrective action.
 - (g) Set these switches, on the P5 forward overhead panel:
 - 1) Set the APU BLEED switch to the OFF position.
 - 2) Set the ISOLATION VALVE switch to the CLOSE position.
 - (h) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-52-41-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

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- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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AIRCRAFT MAINTENANCE MANUAL
APU CONTROLS - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) APU BITE (Built-In Test Equipment) Procedure
- (2) APU Configuration Report and APU ECU (Electronic Control Unit) Software Verification
- (3) APU ECU Software Installation with the Onboard Network System
- (4) Ice Logic Deactivation
- (5) Ice Logic Activation.

TASK 49-61-00-700-801

2. APU BITE Procedure

(Figure 201)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The APU Electronic Control Unit (ECU) sends periodic fault reports to the Onboard Maintenance Function (OMF).
- (2) The built in test (BITE) uses the Max Display System (MDS) to show the APU ECU record of APU functions. The APU ECU stores unsatisfactory conditions and the cause for APU protective shutdowns. The unsatisfactory conditions are called maintenance messages and are shown on the MDS.

B. References

Reference	Title
32-09-00-860-802	Return the Airplane to the Ground Mode (P/B 201)
46-13-02-700-805	Existing Faults Check (P/B 201)
46-13-02-700-806	Fault History Check (P/B 201)
46-13-02-860-805	Maintenance Data Pages (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 49-61-00-860-012

- (1) Make sure that the airplane is in "ON GROUND" mode.
 - (a) If necessary, do this task to set the airplane to ON GROUND mode: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802.

SUBTASK 49-61-00-860-013

- (2) Select the left or right Multi-Function Display (MFD).
 - (a) Push the SYS button on the Multi-Function Display Panel to activate the MFD screen.

E. APU BITE Procedure

SUBTASK 49-61-00-740-001

- (1) Do the APU BITE procedure as follows:
 - (a) Power up the APU ECU for BITE (use one of these two optional steps):
 - 1) Set the APU master switch on the P5 forward overhead panel to ON.

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- 2) Optional - Make these selections on the MFD main function menu:
 - a) MAIN CTRL PGS
 - b) MISC SYS CTRLS (MSC)
 - c) APU Maint Power = TEST.
- (b) Do this task: Existing Faults Check, TASK 46-13-02-700-805.
 - 1) Make sure that there are no APU related maintenance messages for ATA chapter 49.
- (c) If it is necessary to see the APU maintenance data page, do this task: Maintenance Data Pages, TASK 46-13-02-860-805. (Figure 201):

NOTE: APU system data like COR EGT, RPM, EGT, OIL TEMP, or COMP INLET TEMP are displayed on the APU maintenance data page.
- (d) The status discrete definitions shown on maintenance page are given in these tables:
 - 1) Status 1 Discrete Map/Table 201
 - 2) Status 2 Discrete Map/Table 202
 - 3) Status 3 Discrete Map/Table 203
 - 4) Status 4 Discrete Map/Table 204 .

Table 201/49-61-00-993-805 Status 1 Discrete Map

APU Bit	Output Parameter	ARINC Label
11	Ready to Load	270
12	Main Engine Start 1	270
13	Main Engine Start 2	270
14	Right Pack ON	270
15	Left Pack ON	270
16	Bleed Air Switch	270
17	WFT Sum > 0	270
18	In Air	270

Table 202/49-61-00-993-806 Status 2 Discrete Map

APU Bit	Output Parameter	ARINC Label
11	APU On Switch	145
12	APU Start Switch	145
13	APU Off Switch	145
14	APU Maint Switch	145
18	Fire (Cockpit Handle)	145
19	Fire (Detection System)	145
21	Prot SDN	270
22	Bleed Valve Open	270

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Table 203/49-61-00-993-807 Status 3 Discrete Map

APU Bit	Output Parameter	ARINC Label
11	APU Generator (EICAS)	146
12	APU Oil Quantity (EICAS)	146
13	Spare	146
14	APU Door (EICAS)	146
15	MES SMM	146
17	APU Low Oil Pressure Light	146
18	APU Fault Light	146
20	Fire (Remote Handle)	145

Table 204/49-61-00-993-808 Status 4 Discrete Map

APU Bit	Output Parameter	ARINC Label
19	APU Overspeed Light	146
20	APU Door Light	146
23	Inlet Door Fully Open Limit	146
24	Inlet Door Fully Closed Limit	146
25	Inlet Door Closed/ Intermediate Limit	146
26	Inlet Door Open/ Intermediate Limit	146
28	Start Enable	146
29	Ignition Unit (Command)	146

- (e) Do this task: Fault History Check, TASK 46-13-02-700-806.
- (f) Do a check for maintenance message 49-52236. If the maintenance message shows in OMF Existing Faults, or in the Fault History, then do the applicable fault isolation task in the Fault Isolation Manual for that maintenance message.
- (g) Set the APU master switch on the P5 forward overhead panel to OFF.
- (h) Set the APU Maint Power back to NORM on the MFD main function menu (only for optional).

———— **END OF TASK** ————

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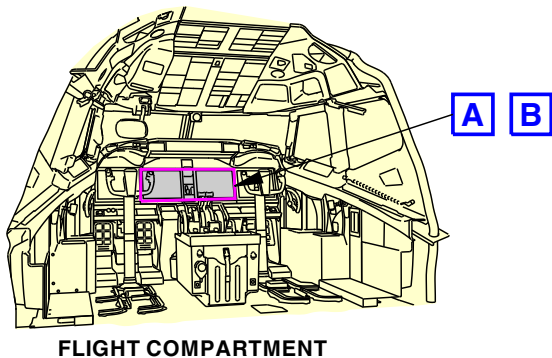
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SYS MENU	STATUS	MAINT DATA PGS	MAINT CTRL PGS	ONBD MAINT								
<u>MICS SYSTEM CTRLS (MSC)</u>												
EEC MAINT POWER <table border="1"> <tr> <td>ENG 1</td> <td>ENG 2</td> </tr> <tr> <td>STATUS: PWR</td> <td>STATUS: PWR</td> </tr> <tr> <td>◇ NORM</td> <td>NORM ◇</td> </tr> <tr> <td>◇ TEST</td> <td>TEST ◇</td> </tr> </table>		ENG 1	ENG 2	STATUS: PWR	STATUS: PWR	◇ NORM	NORM ◇	◇ TEST	TEST ◇	APU MAINT POWER ◇ NORM ◇ TEST		
ENG 1	ENG 2											
STATUS: PWR	STATUS: PWR											
◇ NORM	NORM ◇											
◇ TEST	TEST ◇											
MFD MODE ◇ SINGLE MFD ◇ DUAL MFD		IN AIR MAINTENANCE ◇ ENABLE ◇ DISABLE										
PREV MENU												

**MAX DISPLAY SYSTEM (MDS)
APU TEST**

A

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APU BITE Procedure
Figure 201/49-61-00-990-802 (Sheet 1 of 2)

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 SYS MENU	STATUS	MAINT DATA PGS	MAINT CTRL PGS	ONBD MAINT
APU				
MODE	XXXXXXXXXXXX	APU GEN LOAD	XXX.X	
RPM	XXX.X			
EGT	XXXXX	- - - - -INLET DOOR- - - - -		
OIL TEMP	XXXX	OPEN COMMAND	XXXXXXXXXX	
OIL QTY	XXXX	CLOSE COMMAND	XXXXXXXXXX	
COMP INLET TEMP	XXXX	POSITION SW	XXXXXXXXXX	
INLET STATIC PRESS	XX.XX	COR EGT	XXXXX	
LOAD COMP TOTAL PRESS	XX.XX	COR TOTALPRESS	XXX	
LOAD COMP DIFF PRESS	XX.XX	COR FUEL FLOW	XXX	
SURGE CTRL VLV POS	XX.X	COR IGV POS	XXX	
IGV ACTUATOR POS	XX.X	APU HOURS	XXXXXXXX.X	
BLD CORRECTED FLOW	XXX	APU CYCLES	XXXXXX	
FUEL FLOW MEAS	XXX	HOURS SINCE INSTALLATION	XXXXX.X	
: - - - -STATUS CODE- - - - : BIT# 1 5				
STATUS 1 [XXXX] [XXXX] STATUS 2 [XXXX] [XXXX] STATUS 3 [XXXX] [XXXX] STATUS 4 [XXXX] [XXXX]				
AUTO EVENT MESSAGE DATE XX XXX XX UTC XX:XX:XX				
PREV MENU	PRINT	SEND	RECORD	PREV PAGE
				NEXT PAGE

MAX DISPLAY SYSTEM (MDS)
APU MAINTENANCE PAGE

B

2485299 S0000584358_V1

APU BITE Procedure
Figure 201/49-61-00-990-802 (Sheet 2 of 2)

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TASK 49-61-00-710-801

3. APU Configuration Report

A. General

- (1) This procedure gives instructions on how to check the hardware configuration for the APU, and hardware and software configuration for the APU ECU.
- (2) You must know the correct part number for the ECU software or the ECU to be an approved installation. You must install the software with the correct part number.

B. References

Reference	Title
46-13-00-710-802	System Configuration Check (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment - Right

D. APU Configuration Report

SUBTASK 49-61-00-860-014

- (1) Do these steps to do set up the system to do a software check:
 - (a) Set the APU Master switch on the P5 panel to OFF.
 - (b) Set the APU MAINT POWER to TEST.
 - 1) Push the SYS key on the Multi-Function Panel (P9-82).
 - 2) On the Max Display System (MDS), Select the MAINT button if it is in view.
 - 3) On the MDS, push the MAINT CTRL PGS button.
 - 4) Select MISC SYSTEM CTRLS (MSC).
 - 5) Select TEST under APU MAINT POWER.
 - (c) Do these steps to make sure that the APU is not running:
 - 1) Select MAINT DATA PGS from the MDS Maintenance Menu.
 - 2) Select 49 APU.
 - 3) Select DISPLAY.
 - 4) Make sure that the RPM value is less than 7%.

SUBTASK 49-61-00-750-001

- (2) Do a software configuration check of the ECU: (TASK 46-13-00-710-802).

SUBTASK 49-61-00-860-015

- (3) Do these steps to set the APU MAIN POWER to NORM:
 - (a) Push the SYS key on the Multi-Function Panel (P9-82).
 - (b) On the Max Display System (MDS), select the MAINT button if it is visible.
 - (c) On the MDS, select the MAINT CTRL PGS button.
 - (d) Select MISC SYSTEM CTRLS (MSC).
 - (e) Select NORM under APU MAINT POWER.

SUBTASK 49-61-00-470-004

- (4) If the ECU part number is not correct, do this task: APU ECU Software Installation with the Onboard Network System, TASK 49-61-00-470-801.

END OF TASK

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TASK 49-61-00-470-801

4. APU ECU Software Installation with the Onboard Network System

A. General

- (1) This procedure gives instructions how to install the APU ECU software into the ECU with the Onboard Network System (ONS).
- (2) The airplane must be on the ground with the APU and main engines shutdown before you can install the ECU software.

B. References

Reference	Title
46-13-00-470-801	LRU Software Parts Installation (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment - Right

D. APU ECU Software Installation

SUBTASK 49-61-00-700-005

- (1) Check for the APU ECU installed software, as follows: (APU Configuration Report, TASK 49-61-00-710-801).

SUBTASK 49-61-00-860-001

- (2) Do these steps to prepare for the software installation:
 - (a) Make sure that you know the correct software part number for the ECU.
NOTE: The correct software part number must be installed for the ECU to be an approved installation.
 - (b) Set the APU master switch on the P5 forward overhead panel to OFF.
 - (c) Set the GND TEST switch on the P61 panel to ENABLE.
 - (d) Do these steps at the data loader control panel (P61):
 - 1) Set the upper switch to C SINGLE SYS.
 - 2) Set the system select switch to APU.

SUBTASK 49-61-00-470-002

- (3) To load the ECU software, do this task: TASK 46-13-00-470-801.

SUBTASK 49-61-00-860-006

- (4) Set the system select switch on the data loader control panel (P61) to NORMAL.

SUBTASK 49-61-00-860-007

- (5) Set the GND TEST switch on the P61 panel to NORM.

SUBTASK 49-61-00-700-002

- (6) Make sure that you load the software, as follows: (TASK 49-61-00-710-801).

————— END OF TASK —————

TASK 49-61-00-040-801

5. Ice Logic Deactivation

A. General

- (1) This task gives the instructions to deactivate the ICE LOGIC on the Multi Function Display (MFD).

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B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Ice Logic Deactivation

SUBTASK 49-61-00-740-003

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

NOTE: Do not power down ECU after BITE procedure.

SUBTASK 49-61-00-040-001

- (2) Do these steps to deactivate the ICE LOGIC:

- (a) Make sure that the APU ECU is powered on, either through the APU master switch or through the MFD main function menu.
- (b) Select SYS on the MFD panel
- (c) Select MAINT with the selector knob
- (d) Select ONBD MAINT
- (e) Select OTHER FUNCTIONS
- (f) Select SPECIAL FUNCTIONS
- (g) Select ATA Systems: 49 - Airborne Auxiliary Power System
- (h) Select System Function: APU - Ice Break Logic
- (i) Select CONTINUE
- (j) Select START FUNCTION; a screen titled "SPECIAL FUNCTION" will appear
- (k) Select OFF
- (l) Select CONTINUE
- (m) Select CONTINUE

NOTE: The screen will briefly say "Starting Special Function".

NOTE: The screen will say "Ice Break Logic is OFF".

NOTE: The screen will say "SPECIAL FUNCTION CONDITION: COMPLETE".

————— **END OF TASK** —————

TASK 49-61-00-440-801

6. Ice Logic Activation

A. General

- (1) This task gives the instructions to activate the ICE LOGIC on the Multi Function Display (MFD).

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Ice Logic Activation

SUBTASK 49-61-00-740-004

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

NOTE: Do not power down ECU after BITE procedure.

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SUBTASK 49-61-00-440-001

- (2) Do these steps to activate the ICE LOGIC:
- (a) Make sure that the APU ECU is powered on, either through the APU master switch or through the MFD main function menu.
 - (b) Select SYS on the MFD panel
 - (c) Select MAINT with the selector knob
 - (d) Select ONBD MAINT
 - (e) Select OTHER FUNCTIONS
 - (f) Select SPECIAL FUNCTIONS
 - (g) Select ATA Systems: 49 - Airborne Auxiliary Power System
 - (h) Select System Function: APU - Ice Break Logic
 - (i) Select CONTINUE
 - (j) Select START FUNCTION; a screen titled "SPECIAL FUNCTION" will appear
NOTE: The screen will briefly say "Starting Special Function".
 - (k) Select ON
 - (l) Select CONTINUE
NOTE: The screen will say "Ice Break Logic is ON".
 - (m) Select CONTINUE
NOTE: The screen will say "SPECIAL FUNCTION CONDITION: COMPLETE".

———— **END OF TASK** ————

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ELECTRONIC CONTROL UNIT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the electronic control unit (ECU)
 - (2) An installation of the electronic control unit (ECU).
- B. The ECU is installed on E6-2 shelf in the aft cargo compartment. The E6-2 electrical shelf (rack) is found on the aft right side of the aft cargo compartment.
- C. If you must remove the electronic control unit and the data memory module (DMM) at the same time, you must replace the electronic control unit first and do the installation test for the electronic control unit. If you do not do the installation test for the electronic control unit before you remove the DMM, you will lose the DMM data for the APU.
- D. The electronic control unit is referred to as the ECU.

TASK 49-61-12-000-801

2. Electronic Control Unit Removal

(Figure 401)

A. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

Zone	Area
142	Aft Cargo Compartment - Right
212	Flight Compartment - Right

D. **Access Panels**

Number	Name/Location
822	Aft Cargo Door

E. **Prepare for the Removal**

SUBTASK 49-61-12-740-001



DO NOT REMOVE THE ELECTRONIC CONTROL UNIT (ECU) UNTIL YOU DO THE APU-BITE-PROCEDURE. WHEN YOU DO THE APU-BITE-PROCEDURE, LOOK AT MAINTENANCE MESSAGES FOR THE DATA MEMORY MODULE (DMM). IF YOU REPLACE THE ECU AND THERE IS A PROBLEM WITH THE DMM, THE FOLLOWING APU DATA WILL BE LOST: APU SERIAL NUMBER, APU HOURS AND APU CYCLES.

- (1) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - (a) If maintenance message(s) show for the Data Memory Module (DMM), refer to the IFIM and do the applicable procedure(s).

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SUBTASK 49-61-12-860-001

- (2) Make sure that the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel, is set to the OFF position.
 - (a) Install the DO NOT OPERATE tag, STD-858.

SUBTASK 49-61-12-860-002

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-12-010-001

- (4) Open this access door:

<u>Number</u>	<u>Name/Location</u>
822	Aft Cargo Door

SUBTASK 49-61-12-010-002

- (5) Remove the access panel on the E6 rack to get access to the electronic control unit [1].

F. Electronic Control Unit Removal

SUBTASK 49-61-12-020-001



DO NOT REMOVE THE ELECTRONIC CONTROL UNIT AND THE DATA MEMORY MODULE AT THE SAME TIME. IF YOU REMOVE THE ELECTRONIC CONTROL UNIT AND THE DATA MEMORY MODULE AT THE SAME TIME, YOU LOSE APU DATA.

- (1) Remove the electronic control unit [1] (TASK 20-10-07-000-801).

————— **END OF TASK** —————

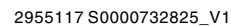
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Electronic Control Unit Installation

Figure 401/49-61-12-990-801

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TASK 49-61-12-400-801

3. **Electronic Control Unit Installation**

(Figure 401)

A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-470-801	APU ECU Software Installation with the Onboard Network System (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
49-61-00-710-801	APU Configuration Report (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Electronic control unit	49-61-12-02-010	SIA ALL

D. Location Zones

Zone	Area
142	Aft Cargo Compartment - Right
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
822	Aft Cargo Door

F. Electronic Control Unit Installation

SUBTASK 49-61-12-420-001

- (1) Install the electronic control unit [1] (TASK 20-10-07-400-801).

G. Electronic Control Unit Installation Test

SUBTASK 49-61-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-12-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

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SUBTASK 49-61-12-710-001

- (3) Do the installation test for the electronic control unit [1], as follows:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU controls system or the electronic control unit [1], refer to the IFIM and do the applicable procedure(s).
 - 2) Do these steps to make sure that the ECU software installation is correct:
 - a) Do this task: APU Configuration Report, TASK 49-61-00-710-801.
 - <1> Look at the part number for the ECU software.
 - <2> If the ECU part number is not correct, do this task: APU ECU Software Installation with the Onboard Network System, TASK 49-61-00-470-801.
 - (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-61-12-410-002

- (1) Install the access panel on the E6 rack.

SUBTASK 49-61-12-410-001

- (2) Close this access door:

<u>Number</u>	<u>Name/Location</u>
822	Aft Cargo Door

————— END OF TASK —————

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SPEED SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the speed sensor
 - (2) Installation of the speed sensor.
- B. The speed sensor is installed aft of the APU gearbox at the 4 o'clock position.

TASK 49-61-21-000-801

2. Speed Sensor Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-61-21-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-61-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-21-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Speed Sensor Removal

SUBTASK 49-61-21-020-001

- (1) Do these steps to remove the speed sensor [2]:
 - (a) Disconnect the electrical connector (P12) [3] from the speed sensor [2].
 - (b) Loosen the nut [1] that attaches the speed sensor [2] to the APU.
 - (c) Turn the speed sensor [2] in the clockwise direction until the flange disengages from the stud.
 - (d) Remove the speed sensor [2].
 - (e) Remove the packing [4] and packing [5] from the speed sensor [2].
 - 1) Discard the packing [4] and packing [5].
 - (f) Make sure that you install all necessary protection covers.

———— **END OF TASK** ————

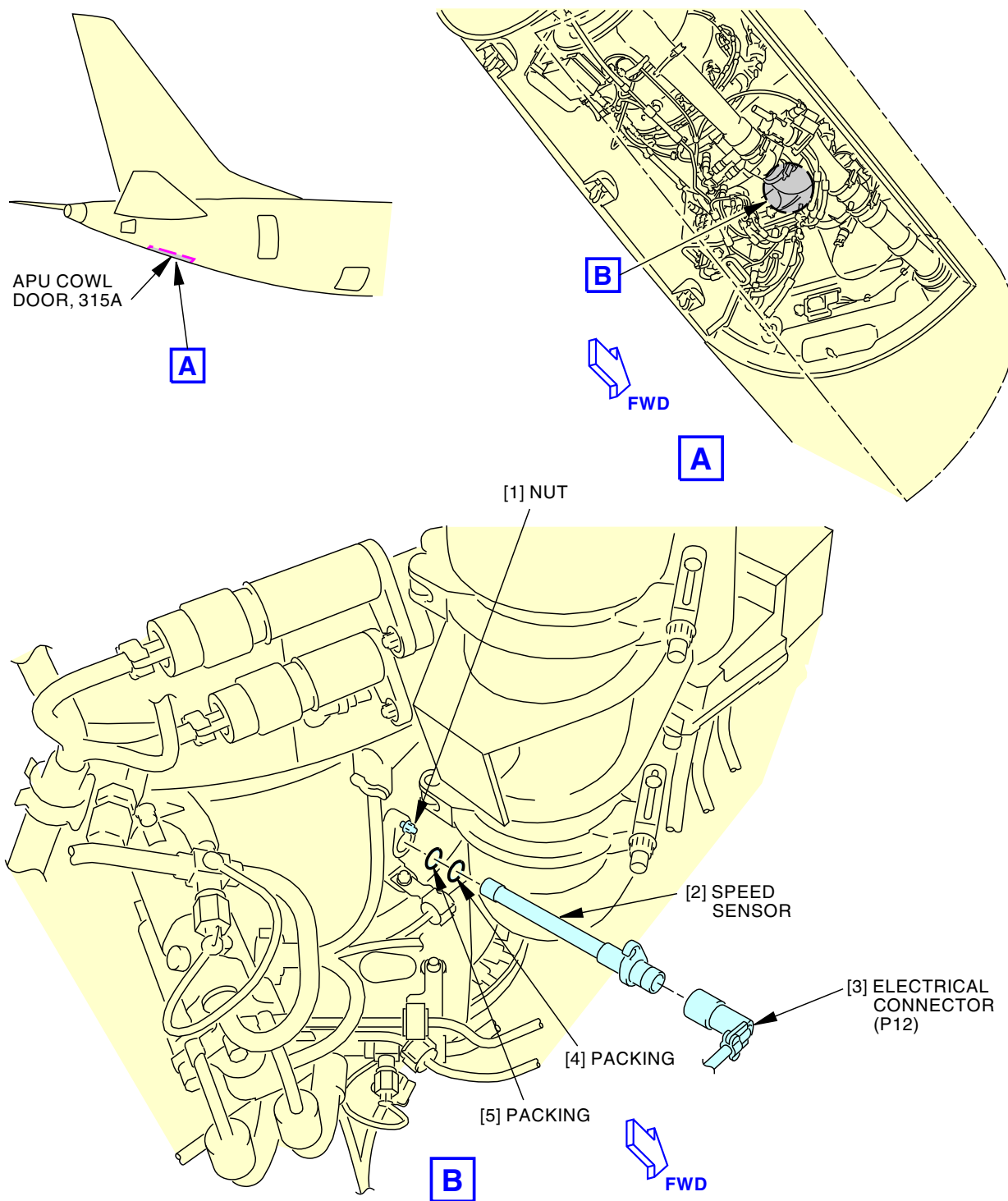
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Speed Sensor Installation
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TASK 49-61-21-400-801

3. Speed Sensor Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Speed sensor	49-61-21-01-010	SIA ALL
4	Packing	49-61-21-01-020	SIA ALL
5	Packing	49-61-21-01-015	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Speed Sensor Installation

SUBTASK 49-61-21-420-001



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 speed sensor [2]:
 - (a) Remove the protection covers.
 - (b) Lubricate the new packing [4] and new packing [5] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (c) Install the packing [4] and packing [5] on the speed sensor [2].
 - (d) Install the speed sensor [2].

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- (e) Turn the speed sensor [2] in the counterclockwise direction until the flange fully engages the stud.
- (f) Tighten the nut [1] to 40 in-lb (4.5 N·m).
- (g) Connect the electrical connector (P12) [3] to the speed sensor [2].

H. Speed Sensor Installation Test

SUBTASK 49-61-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-21-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858D, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-61-21-710-001

- (3) Do the installation test for the speed sensor [2]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the speed sensor [2] for signs of oil leakage.
 - (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, tag to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the speed sensor [2] for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again.
 - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU control system or the speed sensor, refer to the IFIM and do the applicable procedure(s).
 - (f) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-61-21-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.

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- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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INLET TEMPERATURE SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the inlet temperature sensor
 - (2) Installation of the inlet temperature sensor.
- B. The inlet temperature sensor is installed on the compressor inlet section of the APU at the 6 o'clock position.

TASK 49-61-31-000-801

2. Inlet Temperature Sensor Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-61-31-860-001

- (1) Make sure that the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel, is in the OFF position.
 - (a) Install DO NOT OPERATE tag, STD-858, on the APU master switch.

SUBTASK 49-61-31-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-31-010-001

- (3) To open the access panel, do these steps:

Number Name/Location

315A APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.

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- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Inlet Temperature Sensor Removal

SUBTASK 49-61-31-020-001

- (1) Do these steps to remove the inlet temperature sensor [2]:
 - (a) Remove lockwire from the electrical connector (P21) [3].
 - (b) Disconnect the electrical connector (P21) [3] from the inlet temperature sensor [2].
 - (c) Hold the nut [4] on the compressor inlet section of the APU while you turn the inlet temperature sensor [2] in the counterclockwise direction and remove it.
 - (d) Remove the gasket [1] from the inlet temperature sensor [2].
 - 1) Discard the gasket [1].
 - (e) Install all necessary protection covers.

———— **END OF TASK** ————

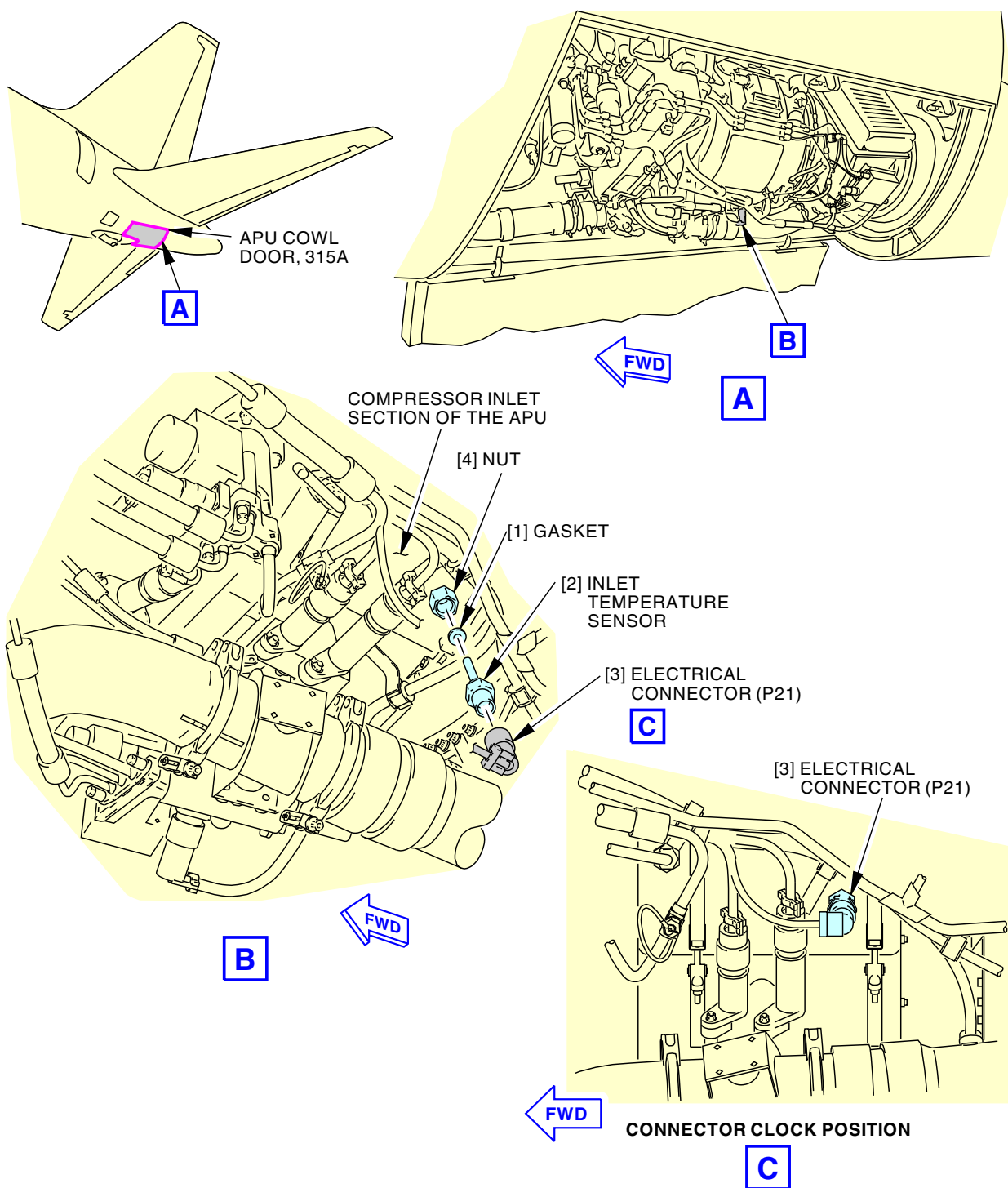
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TASK 49-61-31-400-801

3. Inlet Temperature Sensor Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
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	Gasket	49-61-31-01-010	SIA ALL
2	Inlet temperature sensor	49-61-31-01-005	SIA ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Inlet Temperature Sensor Installation

SUBTASK 49-61-31-420-001



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 inlet temperature sensor [2]:
 - (a) Remove the protection covers.
 - (b) Lubricate the new gasket [1] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (c) Install the gasket [1] on the inlet temperature sensor [2].
 - 1) Make sure that the full copper face of the gasket [1] is against the flange of the inlet temperature sensor [2].
 - (d) Install the inlet temperature sensor [2] and turn it in the clockwise direction.

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- 1) Hold the nut [4] on the compressor inlet section of the Auxiliary Power Unit (APU) while you tighten the inlet temperature sensor [2] to 230 in-lb (26.0 N·m).
- (e) Connect the electrical connector (P21) [3] to the inlet temperature sensor [2].
 - 1) Make sure that the clock position for the electrical connector (P21) [3] is at the 9 o'clock position.
 - 2) Install MS20995C20 lockwire, G50225, on the electrical connector (P21) [3] (TASK 20-10-44-400-801).

G. Inlet Temperature Sensor Installation Test

SUBTASK 49-61-31-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-61-31-860-004

- (2) Remove the DO NOT OPERATE tag, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-61-31-740-001

- (3) Do the installation test for the inlet temperature sensor [2]:
 - (a) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - (b) If maintenance message(s) show for the APU control system or the inlet temperature sensor [2], refer the IFIM and do the applicable procedure(s).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-61-31-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— **END OF TASK** —————

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EXHAUST GAS TEMPERATURE THERMOCOUPLE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the exhaust gas temperature thermocouple
 - (2) Installation of the exhaust gas temperature thermocouple.
- B. The exhaust gas temperature thermocouple is referred to as the EGT thermocouple.
- C. Two EGT thermocouples are installed on the bottom of the turbine exhaust port.

TASK 49-71-21-000-801

2. Exhaust Gas Temperature Thermocouple Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-71-21-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-71-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-71-21-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

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- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Exhaust Gas Temperature Thermocouple Removal

SUBTASK 49-71-21-020-001

- (1) Do these steps to remove the EGT thermocouple 2 [3] or EGT thermocouple 1 [6]:
 - (a) Remove the two nuts [4] that attach the two EGT leads [5] to the EGT thermocouple 2 [3] or EGT thermocouple 1 [6].

NOTE: There are two different nuts [4] that attach the two EGT leads [5] to each thermocouple. The nut [4] for the alumel stud is larger than the nut [4] for the chromel stud.
 - (b) Put labels on the alumel and chromel EGT leads [5] (for the installation task).
 - (c) Remove the two EGT leads [5].
 - (d) Loosen the two nuts [1] that attach the EGT thermocouple 2 [3] or EGT thermocouple 1 [6] to the turbine exhaust port.
 - (e) Turn the EGT thermocouple 2 [3] or EGT thermocouple 1 [6] in the clockwise direction until the flange disengages from the two studs.
 - (f) Remove the EGT thermocouple 2 [3] or EGT thermocouple 1 [6].
 - (g) Remove the gasket [2] from the EGT thermocouple 2 [3] or EGT thermocouple 1 [6].
 - (h) Make sure that you install all necessary protection covers.

———— **END OF TASK** ————

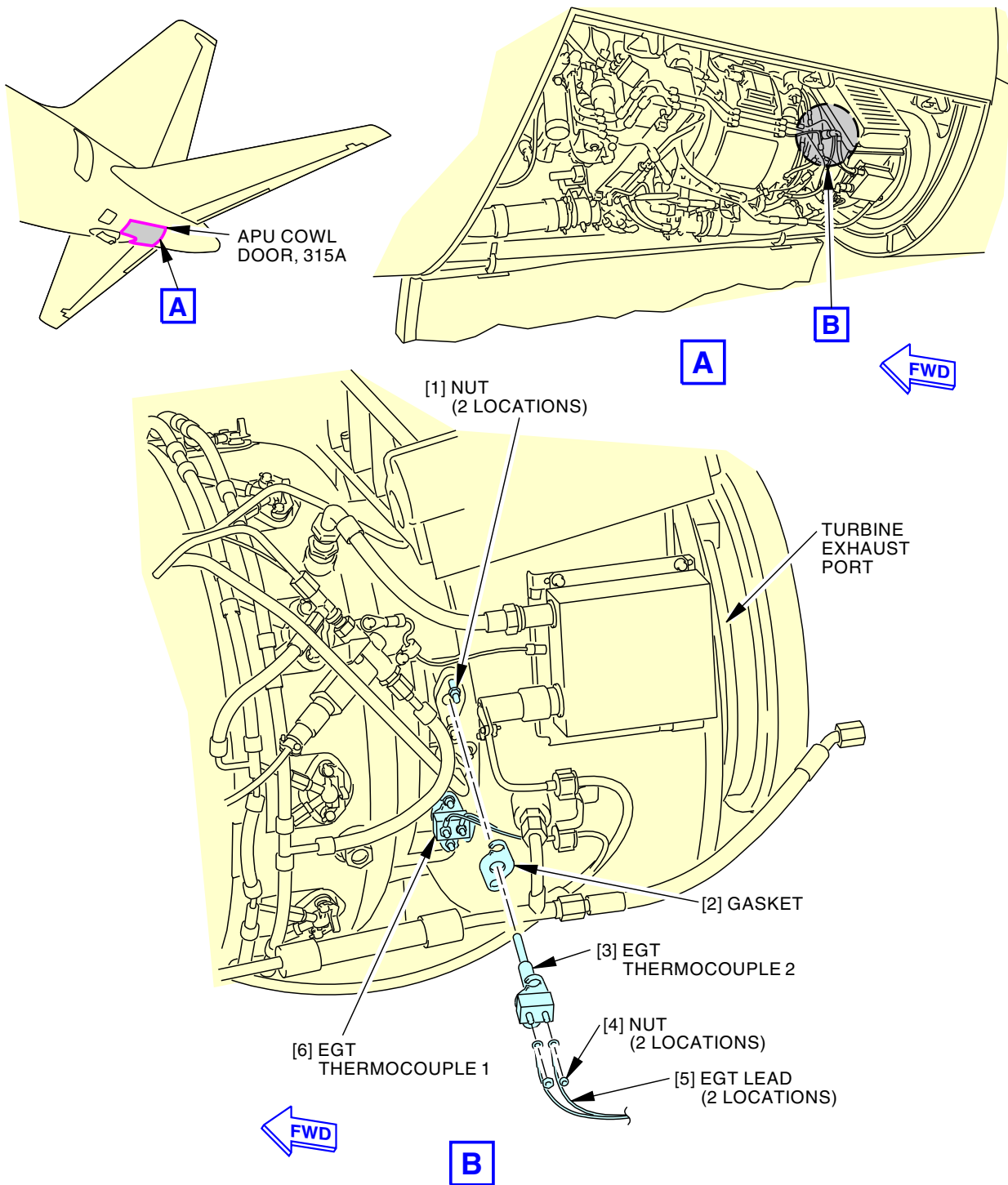
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Exhaust Gas Temperature Thermocouple Installation
Figure 401/49-71-21-990-801

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TASK 49-71-21-400-801

3. Exhaust Gas Temperature Thermocouple Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Gasket	49-71-21-01-015	SIA ALL
3	EGT thermocouple 2	49-71-21-01-010	SIA ALL
6	EGT thermocouple 1	49-71-21-01-010	SIA ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Exhaust Gas Temperature Thermocouple Installation

SUBTASK 49-71-21-420-001



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 EGT thermocouple 2 [3] or EGT thermocouple 1 [6]:
 - (a) Remove the protection covers(s).
 - (b) Install the gasket [2] on the EGT thermocouple 2 [3] or EGT thermocouple 1 [6].
 - (c) Put the EGT thermocouple 2 [3] or EGT thermocouple 1 [6] in the turbine exhaust port.
 - (d) Turn the EGT thermocouple 2 [3] or EGT thermocouple 1 [6] in the counterclockwise direction until the flange fully engages the two studs.
 - (e) Tighten the two nuts [1] to 40 in-lb (4.5 N·m).
 - (f) Connect the two EGT leads [5] to the EGT thermocouple 2 [3] or EGT thermocouple 1 [6].

NOTE: The alumel stud on the EGT thermocouple is larger than the chromel stud. Make sure the two EGT leads [5] are connected to the correct studs.

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- 1) Connect the alumel EGT lead [5] to the larger stud.
 - 2) Connect the chromel EGT lead [5] to the smaller stud.
 - 3) Remove the labels from the EGT leads [5].
- (g) Install the two nuts [4] on the EGT thermocouple 2 [3] or EGT thermocouple 1 [6].
- 1) Tighten the nut [4] for the alumel stud to 32 ± 8 in-lb (3.6 ± 0.9 N·m).
 - 2) Tighten the nut [4] for the chromel stud to 17.5 ± 2.5 in-lb (2.0 ± 0.3 N·m).

G. Exhaust Gas Temperature Thermocouple Installation Test

SUBTASK 49-71-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-71-21-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-71-21-740-001

- (3) Do the installation test for the EGT thermocouple 1 [6] or EGT thermocouple 2 [3]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If maintenance message(s) show for the APU EGT indicating system, EGT thermocouple 1 [6] or EGT thermocouple 2 [3], refer to the IFIM and do the applicable procedure(s).
 - (c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-71-21-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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DATA MEMORY MODULE - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has these tasks:
- (1) Removal of the data memory module
 - (2) Installation of the data memory module.
- B. The data memory module (DMM) is installed on the compressor inlet section of the APU.
- C. If you must remove the DMM and the electronic control unit (ECU) at the same time, you must replace the ECU first and do the ECU installation test. If you do not do the ECU installation test before you remove the DMM, you will lose the data for the APU.

TASK 49-72-11-000-801

2. **Data Memory Module Removal**

(Figure 401)

A. **General**

- (1) The data memory module (DMM) contains the APU data.
- (2) After the DMM is removed, it needs to be erased before it is used again on a different APU. If a removed DMM is used on a different APU without being erased, the APU ECU will erroneously detect that a new APU has been installed, and it will upload the old DMM information to the new ECU.

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

D. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

E. **Prepare for the Removal**

SUBTASK 49-72-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-72-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-72-11-010-001

(3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

(a) Support the APU panel (cowl door) under the center latch.

(b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

(c) Open the APU Cowl Door, 315A.

(d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

(e) Remove the retainer pin from the spring clip on the aft hold-open rod.

(f) Disconnect the two hold-open rods from the two spring clips.

(g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

(h) Install the two retainer pins in the two rod ends.

F. Data Memory Module Removal

SUBTASK 49-72-11-020-001



DO NOT REMOVE THE DATA MEMORY MODULE AND THE ELECTRONIC CONTROL UNIT AT THE SAME TIME. IF YOU REMOVE THE DATA MEMORY MODULE AND THE ELECTRONIC CONTROL UNIT AT THE SAME TIME, YOU WILL LOSE DATA FOR THE APU.

(1) Do these steps to remove the data memory module [2]:

(a) Disconnect the electrical connector (P11) [1] from the data memory module [2].

(b) Remove the four bolts [3] and four washers [4] that attach the data memory module [2] to the bracket.

(c) Remove the data memory module [2] from the bracket.

(d) Make sure you install all necessary protection covers.



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.

(e) If the DMM (data memory module [2]) will be installed on a different APU, send it to Honeywell to be erased.

————— **END OF TASK** —————

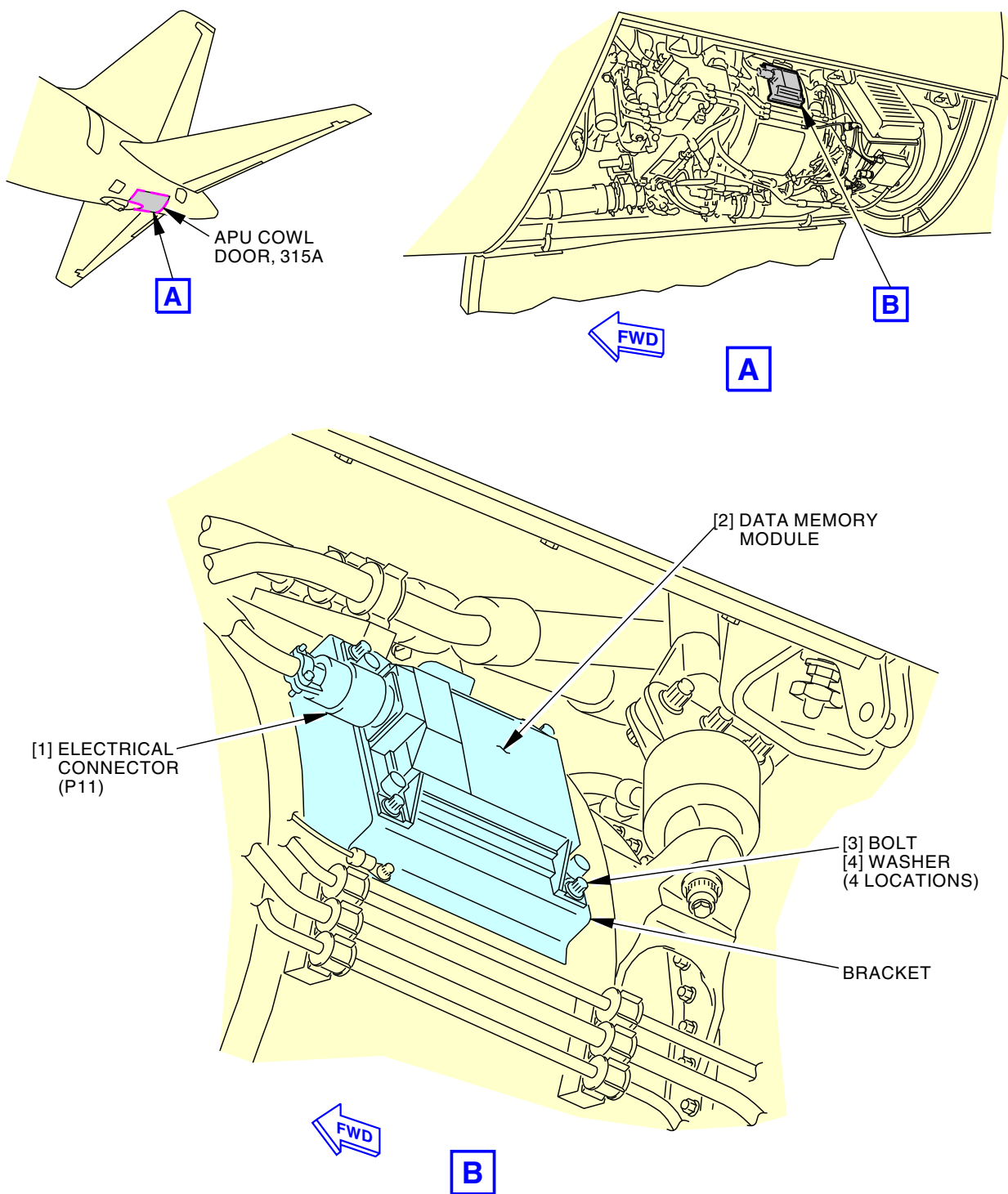
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Data Memory Module Installation
Figure 401/49-72-11-990-801

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TASK 49-72-11-400-801

3. Data Memory Module Installation

(Figure 401)

A. General

- (1) The data memory module (DMM) contains the APU data.

B. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Data memory module	49-72-11-01-005	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Procedure

SUBTASK 49-72-11-420-001



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.



CAUTION

DO NOT INSTALL A DATA MEMORY MODULE FROM A DIFFERENT APU OR A DATA MEMORY MODULE WITH APU DATA. IF YOU DO NOT USE A BLANK DATA MEMORY MODULE, LOSS OF DATA OR INCORRECT DATA CAN OCCUR.

- (1) Do these steps to install the data memory module [2]:
- (a) Install the data memory module [2] on the bracket with the four washers [4] and four bolts [3].
- 1) Tighten the four bolts [3] to 50 in-lb (5.6 N·m).
- (b) Connect the electrical connector (P11) [1] to the data memory module [2].

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H. Data Memory Module Installation Test

SUBTASK 49-72-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-72-11-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-72-11-740-001

- (3) Do the installation test for the data memory module [2]:

- (a) Set the APU master switch on the P5 forward overhead panel to the ON position.

NOTE: It is not necessary to start the APU to load the APU data to the blank data memory module [2].

- (b) After 30 seconds, set the APU master switch on the P5 forward overhead panel to the OFF position.

NOTE: The time period to load the APU data to the blank data memory module [2] is 10 seconds.

- (c) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

- (d) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.

- 1) If maintenance message(s) show for the APU indicating system or the data memory module, refer to the IFIM and do the applicable procedure(s).

- (e) If APU power is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-72-11-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— END OF TASK —————

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EXHAUST DUCT MUFFLER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the exhaust duct muffler
- (2) An installation of the exhaust duct muffler.

TASK 49-81-11-000-801

2. Exhaust Duct Muffler Removal

(Figure 401 and Figure 402)

A. **References**

Reference	Title
49-81-13-000-801	Exhaust Duct Muffler Insulation Blanket - Removal (P/B 401)
49-81-31-000-801	Exhaust Fairing Assembly 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-1561	Jack - Hydraulic Part #: 930002 Supplier: FA2A9 Part #: J20009-110 Supplier: 81205 Opt Part #: J20009-108 Supplier: 81205 Opt Part #: J20009-109 Supplier: 81205
SPL-1584	Adapter Assembly - Telescoping Hydraulic Part #: J20009-136 Supplier: 81205 Opt Part #: J20009-68 Supplier: 81205
SPL-13997	Adapter - Load Positioner Part #: J20009-50 Supplier: 81205
SPL-14590	Equipment - Instl/Removal, APU Exhaust Part #: C49012-1 Supplier: 81205
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. **Access Panels**

Number	Name/Location
315A	APU Cowl Door
318BR	Tailcone Access Door

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E. Prepare for the Removal

SUBTASK 49-81-11-860-001

- (1) Make sure that the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel, is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-81-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-11-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-81-11-010-002

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

318BR	Tailcone Access Door
-------	----------------------

F. Exhaust Duct Muffler Removal

SUBTASK 49-81-11-020-001

- (1) Do these steps to remove the exhaust duct muffler [1]:
 - (a) Disconnect the jumper [12] from the forward support ring assembly [8] as follows:
 - 1) Remove the screw [13] and washer [14] that attaches the bracket [11] and jumper [12] to the forward support ring assembly [8] on the exhaust duct muffler [1].
NOTE: The bracket and jumper will stay temporarily attached to the seal depressor assembly on the bulkhead.
 - 2) Move the bracket [11] with the jumper [12] away from the exhaust duct muffler [1].

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- 3) Temporarily install the washer [14] and screw [13] to hold the bracket [11] and one side of the jumper [12] to the seal depressor assembly [2] (to be used in the installation).
- (b) Disconnect the drain hose [4] from the drain hose fitting [3] on the exhaust duct muffler [1].
NOTE: The drain hose is nonfunctional. The drain hose and drain hose fitting are permanently plugged.
 - 1) If it is necessary, install a permanent plug in the drain hose [4].
- (c) Remove the clamp [5] from the exhaust duct muffler [1].
- (d) Do this task: Exhaust Fairing Assembly Removal, TASK 49-81-31-000-801.
- (e) Use the equipment, SPL-14590, load positioner adapter, SPL-13997, telescoping hydraulic adapter assembly, SPL-1584, and hydraulic jack, SPL-1561 to slowly remove the exhaust duct muffler [1] from the tail cone compartment.
NOTE: The weight of the exhaust duct muffler is approximately 110 lb (50 kg).
- (f) Install all necessary protective covers.

SUBTASK 49-81-11-010-003

- (2) If it is necessary, do this task: Exhaust Duct Muffler Insulation Blanket - Removal, TASK 49-81-13-000-801.

———— **END OF TASK** ————

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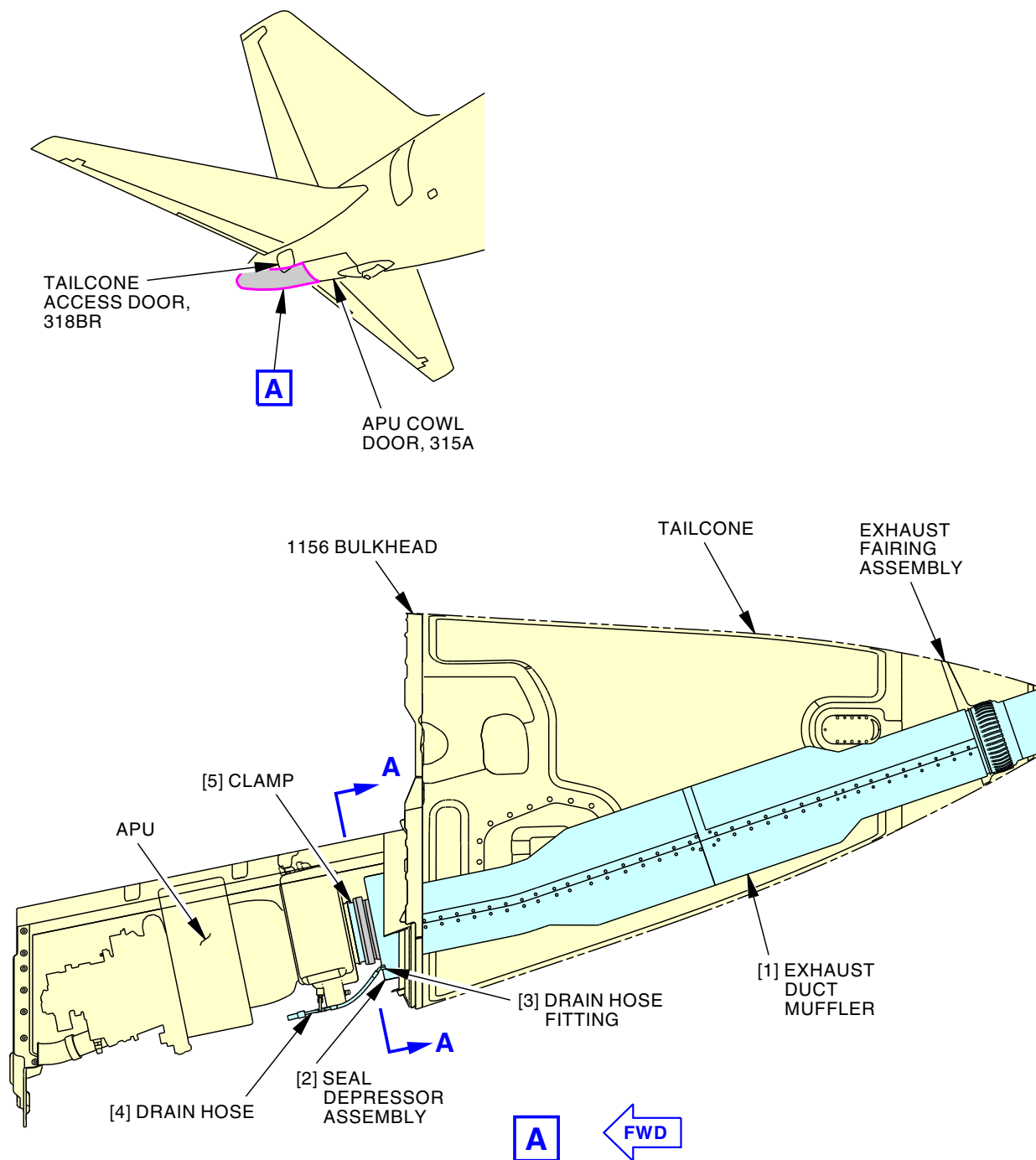
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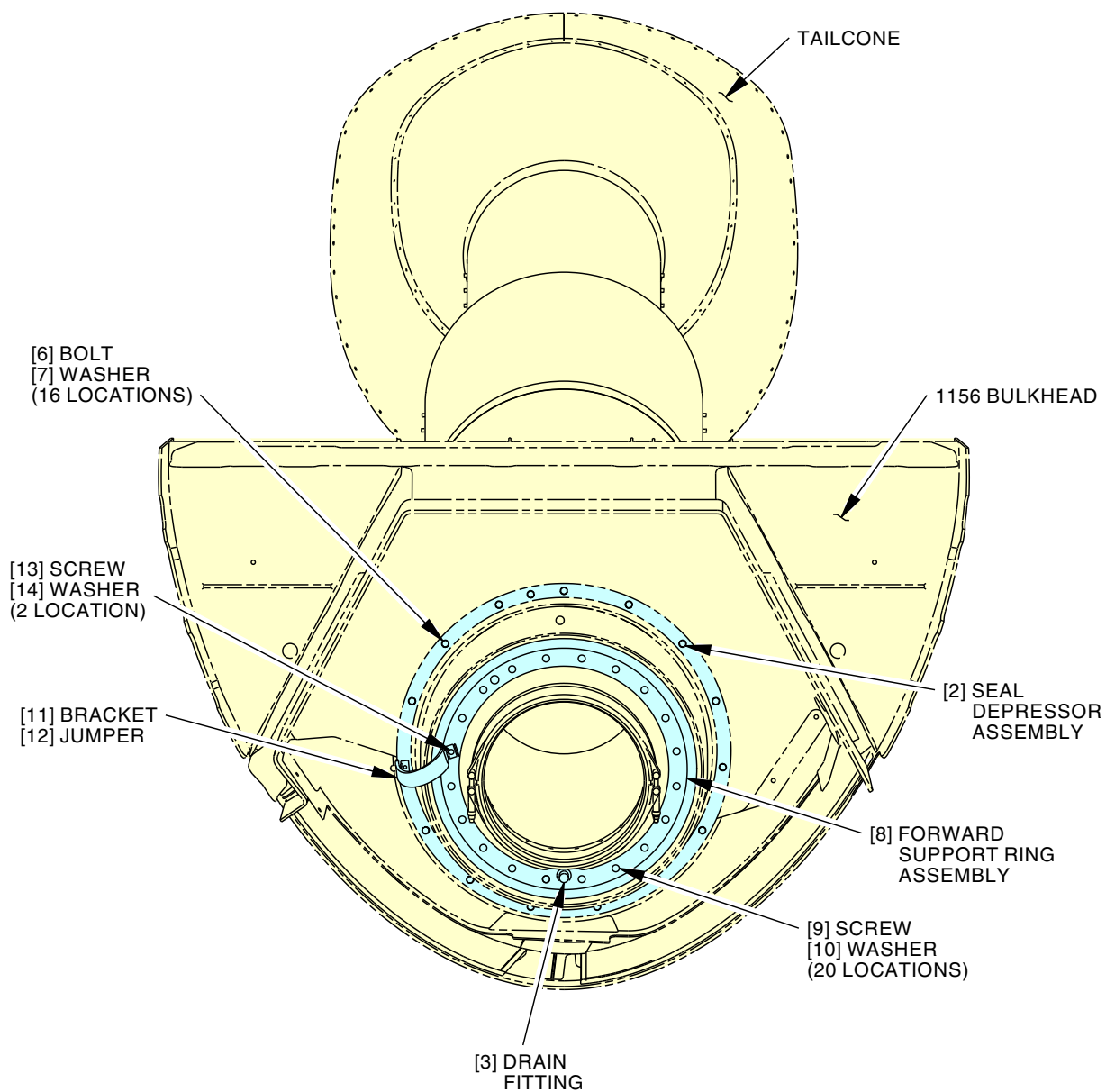
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Exhaust Duct Muffler Installation
Figure 401/49-81-11-990-801 (Sheet 2 of 2)

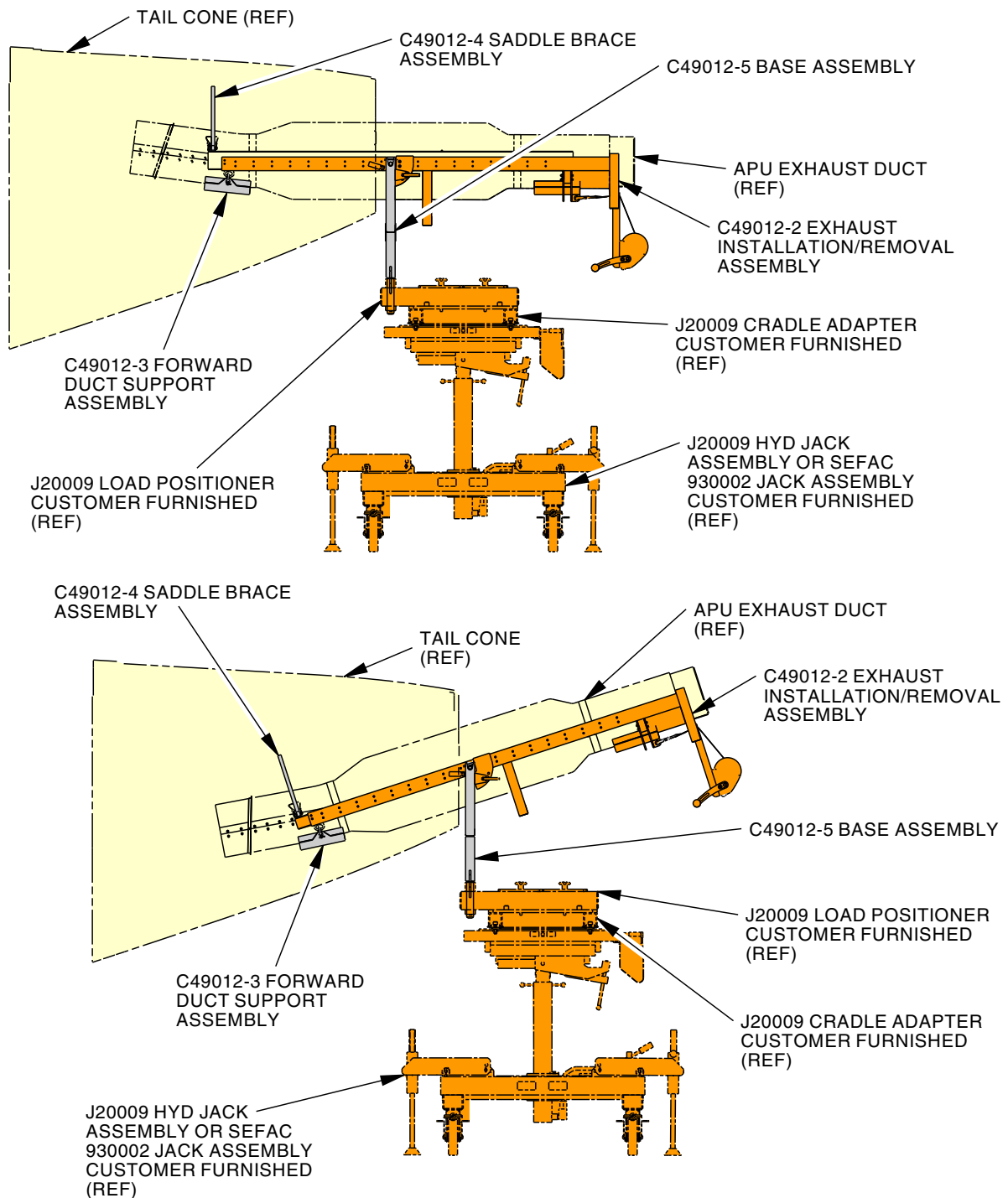
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Exhaust Duct Muffler Removal/Installation Tool
Figure 402/49-81-11-990-803 (Sheet 1 of 2)

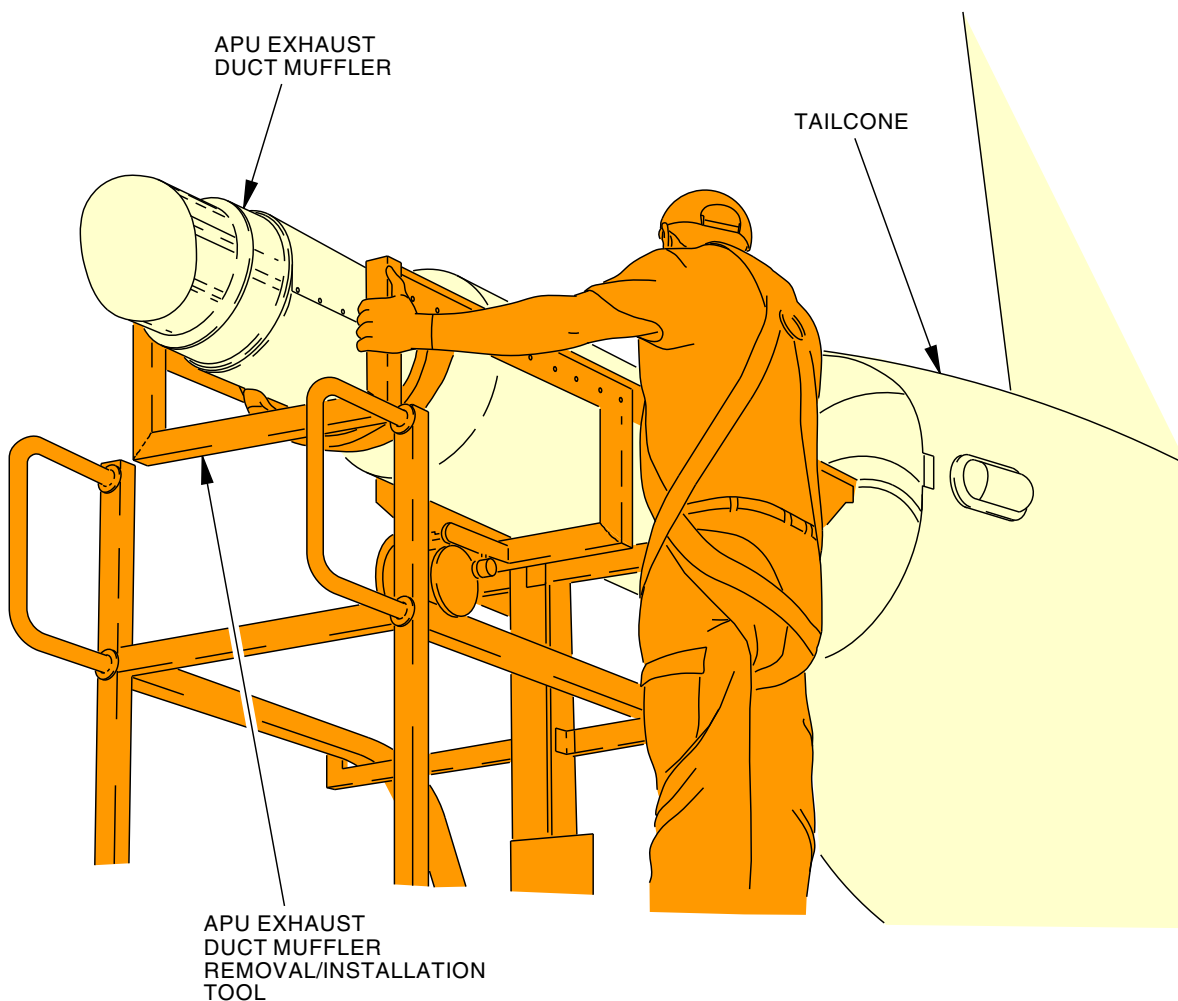
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Exhaust Duct Muffler Removal/Installation Tool
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TASK 49-81-11-400-801

3. **Exhaust Duct Muffler Installation**

(Figure 401 and Figure 402)

A. References

Reference	Title
49-81-13-400-801	Exhaust Duct Muffler Insulation Blanket - Installation (P/B 401)
49-81-31-000-801	Exhaust Fairing Assembly Removal (P/B 401)
49-81-31-400-801	Exhaust Fairing Assembly Installation (P/B 401)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meter - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: M1B Supplier: 3AD17 Part #: T477W (C15292) Supplier: 06659
SPL-1561	Jack - Hydraulic Part #: 930002 Supplier: FA2A9 Part #: J20009-110 Supplier: 81205 Opt Part #: J20009-108 Supplier: 81205 Opt Part #: J20009-109 Supplier: 81205
SPL-1584	Adapter Assembly - Telescoping Hydraulic Part #: J20009-136 Supplier: 81205 Opt Part #: J20009-68 Supplier: 81205
SPL-13997	Adapter - Load Positioner Part #: J20009-50 Supplier: 81205
SPL-14590	Equipment - Instl/Removal, APU Exhaust Part #: C49012-1 Supplier: 81205
STD-3906	Mallet - Rubber

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00173	Grease - Aircraft and Instrument, Fuel And Oxidizer Resistant	MIL-PRF-27617 (Supersedes MIL-G-27617)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

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(Continued)

Reference	Description	Specification
G50222	Brush - Tampico Fiber, Non-Metallic	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Exhaust duct muffler	49-81-00-01-070	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door
318BR	Tailcone Access Door

G. Exhaust Duct Muffler Installation

SUBTASK 49-81-11-410-001

- (1) If it is necessary, do this task: Exhaust Duct Muffler Insulation Blanket - Installation, TASK 49-81-13-400-801.

NOTE: The insulation blanket for the exhaust duct muffler [1] must be installed before installation of the exhaust duct muffler [1].

SUBTASK 49-81-11-420-001



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the exhaust duct muffler [1]:
- (a) Remove the protective covers from the exhaust duct muffler [1] openings.
 - (b) Make sure that the exhaust fairing has been removed (TASK 49-81-31-000-801).
 - (c) Loosen the 16 bolts [6] that attach the seal depressor assembly [2] to the 1156 bulkhead.
 - (d) Loosen the 20 screws [9] that attach the forward support ring assembly [8] to the exhaust duct muffler [1].
 - (e) Lubricate the inner mating surfaces of the seal depressor assembly [2] with a light coat of grease, D00173.
 - (f) Use equipment, SPL-14590, load positioner adapter, SPL-13997, telescoping hydraulic adapter assembly, SPL-1584, and hydraulic jack, SPL-1561, to carefully put the exhaust duct muffler [1] into the tail cone compartment.
- NOTE: The weight of the exhaust duct muffler [1] is approximately 110 lb (50 kg).
- (g) Use equipment, SPL-14590, load positioner adapter, SPL-13997, telescoping hydraulic adapter assembly, SPL-1584, and hydraulic jack, SPL-1561, to support the exhaust duct muffler [1].

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- (h) Carefully push the exhaust duct muffler [1] through the seal depressor assembly [2] on the bulkhead.
- (i) Make sure that the exhaust duct muffler [1] is in contact with (mates with) the Auxiliary Power Unit (APU).
 - 1) Make sure that the exhaust duct muffler [1] flange is aligned with the APU flange.
- (j) Turn the exhaust duct muffler [1] until the drain hose fitting [3] is at the 6 o'clock position and aligned with the split line on the tailcone assembly.
- (k) Do this task: Exhaust Fairing Assembly Installation, TASK 49-81-31-400-801.
- (l) Put the clamp [5] on the exhaust duct muffler [1].
- (m) Lightly tap the outer periphery of the clamp [5] with a rubber mallet, STD-3906, to seat the clamp [5].
- (n) Torque the nuts on both sides of the clamp [5] to 70 in-lb (7.9 N·m) - 90 in-lb (10.2 N·m).
- (o) Repeat the steps to lightly tap the outer periphery and torque nuts of the clamp [5] until the nuts on both sides of the clamp [5] retains the torque value.
- (p) Torque the 20 screws [9] on the forward support ring assembly [8] to 35.0 in-lb (4.0 N·m).
- (q) Torque the 16 bolts [6] on the seal depressor assembly [2] to 35.0 in-lb (4.0 N·m).
- (r) Apply a thin layer of Never-Seez NSBT compound, D00006, on the threads of the drain hose fitting [3].
- (s) Connect the drain hose [4] to the drain hose fitting [3] on the exhaust duct muffler [1].

NOTE: The drain hose is nonfunctional (the drain hose is permanently plugged).

 - 1) If it is necessary, install a permanent plug in the drain hose [4].
- (t) Connect the jumper [12] to the forward support ring assembly [8]:
 - 1) Remove the screw [13] and washer [14] that temporarily attached the bracket [11] and jumper [12] to the seal depressor assembly [2].

NOTE: This was done at the time of the exhaust duct muffler [1] removal.
 - 2) Clean the faying surfaces of the bracket [11] and area where the bracket [11] will be installed on the forward support ring assembly [8]:
 - a) Apply alcohol, B00130, to a tampico fiber brush, G50222, or cotton wiper, G00034.
 - b) Use a small quantity of pressure on the tampico fiber brush, G50222, or cotton wiper, G00034, while you clean the faying surfaces of the forward support ring assembly [8], seal depressor assembly [2], and bracket [11].
 - c) Continue to clean the surfaces until there is no visible residue on the surfaces.
 - 3) Connect the bracket [11] with the jumper [12] to the forward support ring assembly [8] with the washer [14] and screw [13].
 - 4) Make sure that the position of the bracket [11] does not cause the jumper [12] to twist or turn.
 - 5) Measure the bonding resistance across each faying surface between the exhaust duct muffler [1] and airplane structure (SWPM 20-20-00).
 - a) Use an intrinsically safe approved bonding meter, COM-1550.
 - b) Make sure that the bonding resistance is 0.001 ohm (1.0 milliohm) or less.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-11-410-002

- (1) Remove the equipment, SPL-14590, load positioner adapter, SPL-13997, telescoping hydraulic adapter assembly, SPL-1584, and hydraulic jack, SPL-1561.

SUBTASK 49-81-11-860-005

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-11-860-006

- (3) Remove the DO NOT OPERATE tag from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-81-11-410-003

- (4) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

SUBTASK 49-81-11-410-004

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

———— **END OF TASK** ————

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EXHAUST DUCT MUFFLER - INSPECTION/CHECK

1. General

A. This procedure has these tasks:

- (1) A general visual inspection of exhaust duct muffler
- (2) An inspection of exhaust duct muffler
 - (a) The exhaust duct muffler must be removed from the airplane to do this task.
- (3) An inspection of exhaust duct muffler seal.

TASK 49-81-11-200-801

2. Exhaust Duct Muffler General Visual Inspection

(Figure 601)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1081	Flashlight - Explosion Proof

B. **Location Zones**

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Exhaust Duct Muffler General Visual Inspection**

SUBTASK 49-81-11-860-007

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858

SUBTASK 49-81-11-860-008

- (2) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

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- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-81-11-210-001

- (3) Do these steps to visually inspect the exhaust duct muffler [1]:

- (a) Use an explosion proof flashlight, STD-1081, to visually examine the external forward area and inner surfaces of the exhaust duct muffler [1] (that you can access from the APU compartment) for cracks and damage.
- 1) If you find cracks or damage on the exhaust duct muffler [1], do this task: Exhaust Duct Muffler Inspection, TASK 49-81-11-200-802.

SUBTASK 49-81-11-860-009

- (4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-81-11-860-010

- (5) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— END OF TASK —————

TASK 49-81-11-200-802

3. Exhaust Duct Muffler Inspection

(Figure 601)

A. References

Reference	Title
49-81-11 P/B 401	EXHAUST DUCT MUFFLER - REMOVAL/INSTALLATION
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)
49-81-13-000-801	Exhaust Duct Muffler Insulation Blanket - Removal (P/B 401)
49-81-13-200-801	Exhaust Duct Insulation Blanket - General Visual Inspection (P/B 601)
49-81-13-400-801	Exhaust Duct Muffler Insulation Blanket - Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1081	Flashlight - Explosion Proof

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C. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. Exhaust Duct Muffler Inspection

SUBTASK 49-81-11-020-002

- (1) Remove the exhaust duct muffler [1] (TASK 49-81-11-000-801).

SUBTASK 49-81-11-010-006

- (2) Do this task: Exhaust Duct Muffler Insulation Blanket - Removal, TASK 49-81-13-000-801.
(a) Do this task: Exhaust Duct Insulation Blanket - General Visual Inspection, TASK 49-81-13-200-801.

SUBTASK 49-81-11-211-001

- (3) Visually examine the external surfaces of the exhaust duct muffler [1] for cracks and missing parts.
(a) If there are cracks and missing parts, replace the exhaust duct muffler (TASK 49-81-11-400-801).

SUBTASK 49-81-11-211-002

- (4) Do this task: Exhaust Duct Muffler Seal Inspection, TASK 49-81-11-200-803.

SUBTASK 49-81-11-210-002

- (5) Do these steps to examine the internal surfaces of the exhaust duct muffler [1]:
(a) Use a explosion proof flashlight, STD-1081, to visually examine the internal surfaces of the exhaust duct muffler acoustic liner for cracks, tears, punctures and missing pieces.
1) Cracks, tears and punctures are permitted on the acoustic liner.
2) If there are missing pieces, replace the exhaust duct muffler (PAGEBLOCK 49-81-11/401).

SUBTASK 49-81-11-420-002

- (6) Do this task: Exhaust Duct Muffler Insulation Blanket - Installation, TASK 49-81-13-400-801.

SUBTASK 49-81-11-420-003

- (7) Install the exhaust duct muffler [1] (TASK 49-81-11-400-801).

———— **END OF TASK** ————

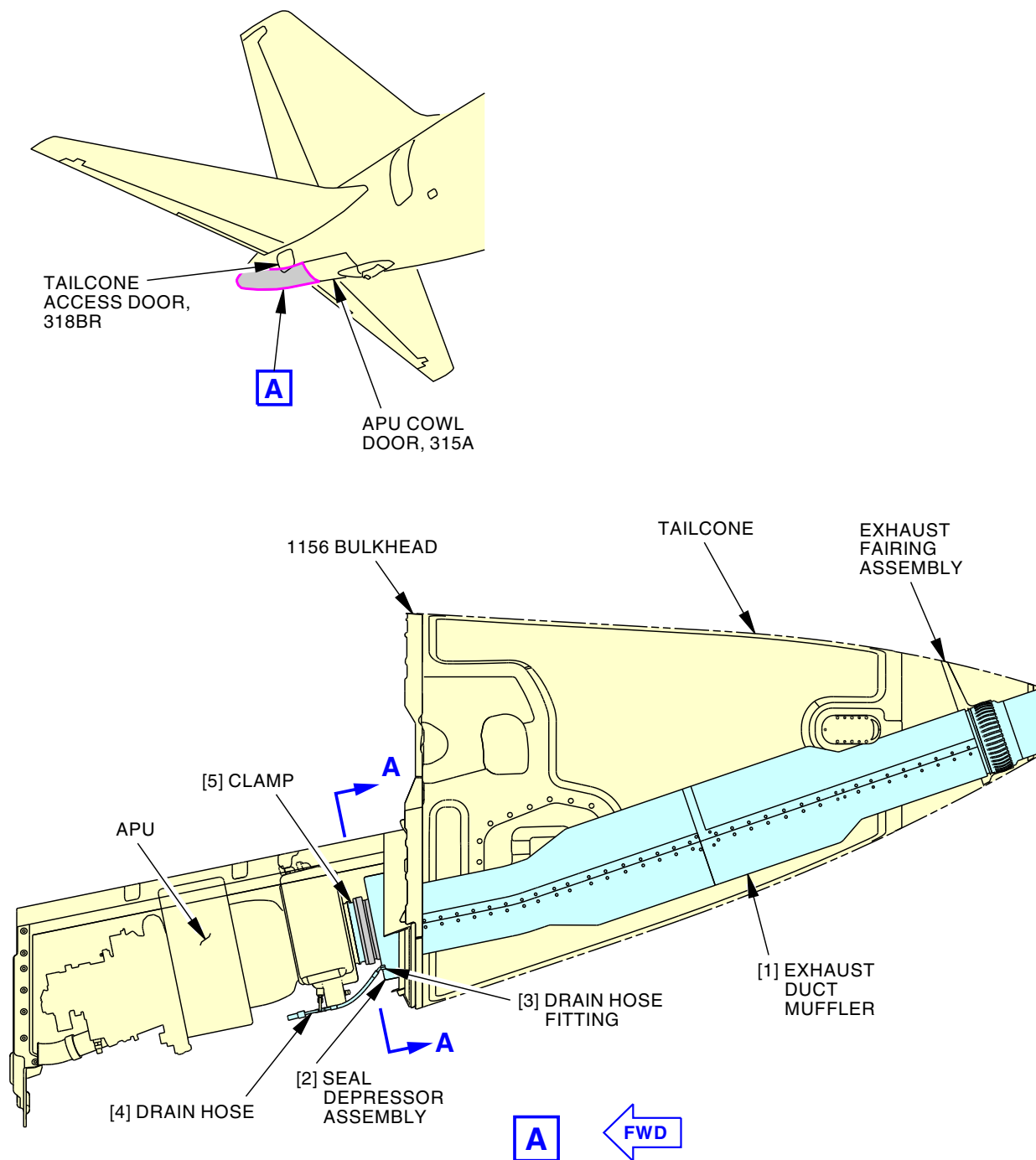
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Exhaust Duct Muffler Inspection
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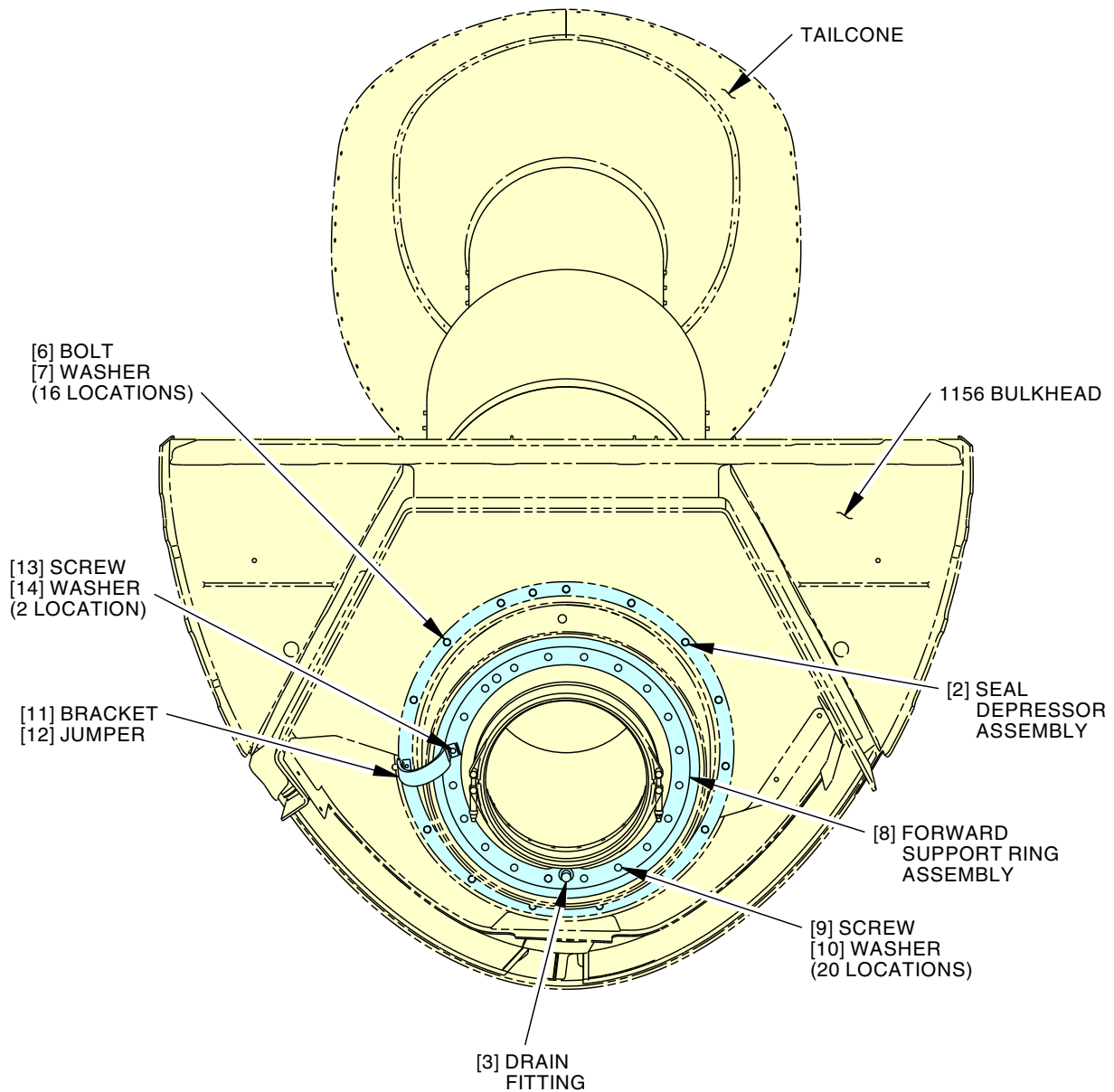
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Exhaust Duct Muffler Inspection
Figure 601/49-81-11-990-802 (Sheet 2 of 2)

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TASK 49-81-11-200-803

4. Exhaust Duct Muffler Seal Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)

B. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. Exhaust Duct Muffler Seal Inspection

SUBTASK 49-81-11-000-001

(1) Do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.

- (a) Remove as much of the exhaust duct muffler [1] as necessary to move the exhaust duct muffler [1] aft to be able to examine the seal depressor assembly [2].

NOTE: The complete removal of the exhaust duct muffler is not necessary.

SUBTASK 49-81-11-200-001

(2) Visually examine the seal depressor assembly [2] for tears, deformation or wear damage.

SUBTASK 49-81-11-200-002

(3) Visually examine the inner surfaces of the seal depressor assembly [2] for damage.

- (a) Signs of paint peeling or missing paint are permitted on the inner surfaces of the seal depressor assembly [2].

SUBTASK 49-81-11-400-002

(4) If you see damage that is not permitted, replace the seal depressor assembly [2].

SUBTASK 49-81-11-400-001

(5) Do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

————— END OF TASK —————

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EXHAUST DUCT MUFFLER - CLEANING/PAINTING

1. General

- A. This procedure has the task to clean the exhaust duct muffler. To clean the exhaust duct muffler, it must first be removed from the airplane.

TASK 49-81-11-100-801

2. Exhaust Duct Muffler Cleaning

A. **References**

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)
49-81-13-000-801	Exhaust Duct Muffler Insulation Blanket - Removal (P/B 401)
49-81-13-400-801	Exhaust Duct Muffler Insulation Blanket - 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
B00012	Cleaner - Alkaline - Turco Jet Clean C	
B00541	Cleaner - General Purpose Household Detergent	
B00666	Solvent - Methyl Propyl Ketone	BMS11-9
G50222	Brush - Tampico Fiber, Non-Metallic	

D. **Location Zones**

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

E. **Prepare for the Cleaning**

SUBTASK 49-81-11-020-003

- (1) Do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.

SUBTASK 49-81-11-020-004

- (2) Do this task :Exhaust Duct Muffler Insulation Blanket - Removal, TASK 49-81-13-000-801.
(a) Make sure you remove all five exhaust duct muffler blankets.

F. **Exhaust Duct Muffler Cleaning**

SUBTASK 49-81-11-110-001

- (1) Do these steps to clean the exhaust duct muffler:

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DO NOT GET SOLVENT IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE SOLVENT. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME AND HEAT. SOLVENT IS POISONOUS AND FLAMMABLE WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Flush the exhaust duct muffler with approximately 1 gal (3.8 l) of solvent, B00666.
 - 1) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the exhaust duct muffler.
 - a) Use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen.
- (b) Clean the exhaust duct muffler with the alkaline Turco Jet Clean C cleaner, B00012:
 - 1) Apply heat and mix the alkaline solution until the temperature is 175°F (79°C).
NOTE: Refer to the manufacturer's mixture instructions for the alkaline solution.
 - 2) Use a tampico fiber brush, G50222, to clean all the unwanted materials from the external and internal areas (exhaust duct liner) of the forward and aft ends of the exhaust duct muffler.
 - 3) Rinse the exhaust duct muffler with water.
NOTE: You can apply the water as a spray or use a water hose.
 - 4) Drain the water from the exhaust duct muffler.
- (c) Clean the exhaust duct muffler with the general purpose household detergent cleaner, B00541:
 - 1) Apply heat and mix the detergent solution until the temperature is 175°F (79°C).
NOTE: Refer to the manufacturer's mixture instructions for the detergent solution.
 - 2) Use a tampico fiber brush, G50222, to clean all the unwanted materials from the external and internal areas (exhaust duct liner) of the forward and aft ends of the exhaust duct muffler.
 - 3) Rinse the exhaust duct muffler with water.
NOTE: You can apply the water as a spray or use a water hose.
 - 4) Drain the water from the exhaust duct muffler.
- (d) Dry the exhaust duct muffler:
 - 1) Put the exhaust duct muffler in a hot air environment at 150°F (66°C) for approximately five hours.
 - 2) Remove the exhaust duct muffler from the hot air environment.
 - 3) Permit the temperature of the exhaust duct muffler to decrease to 65°F (18°C)-75°F (24°C).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-11-420-004

- (1) Do this task: Exhaust Duct Muffler Insulation Blanket - Installation, TASK 49-81-13-400-801.

SUBTASK 49-81-11-420-005

- (2) Do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

————— **END OF TASK** —————

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EXHAUST DUCT INSULATION BLANKET - REMOVAL/INSTALLATION

1. **General**

- A. This procedure contains the following tasks:
 - (1) A removal exhaust duct muffler insulation blanket
 - (2) An installation exhaust duct muffler insulation blanket.
- B. The exhaust duct muffler must be removed before the insulation blankets can be removed.
- C. It is recommended that the insulation blankets be removed and installed by two persons to prevent damage.
- D. There are five insulation blankets on the exhaust duct muffler:
 - (1) Upper Forward Blanket
 - (2) Lower Forward Blanket
 - (3) Upper Aft Blanket
 - (4) Lower Aft Blanket
 - (5) Aft Blanket.

TASK 49-81-13-000-801

2. **Exhaust Duct Muffler Insulation Blanket - Removal**

(Figure 401)

A. **References**

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)

B. **Location Zones**

Zone	Area
318	Tail Cone Compartment - Right

C. **Prepare for the Removal**

SUBTASK 49-81-13-010-001

- (1) Remove the exhaust duct muffler (TASK 49-81-11-000-801).

NOTE: There are five insulation blankets. The insulation blankets can only be removed and installed on the exhaust duct muffler after it has been removed from the airplane.

D. **Exhaust Duct Muffler Insulation Blanket Removal**

NOTE: There are 37 lacings and 74 capstans on each side of four insulation blankets (forward upper blanket, aft upper blanket, forward lower blanket, aft lower blanket, all except the aft blanket). There is a total of 74 lacings and 148 capstans on the four blankets.

NOTE: The aft blanket is made of two halves welded together and it is installed permanently on the muffler. The aft blanket can be slid in and out of its position for inspection purposes.

SUBTASK 49-81-13-020-001

- (1) Remove the insulation blankets from the exhaust duct muffler.
 - (a) Carefully remove the lacing that holds the forward upper blanket [4] to the aft lower blanket [2].
 - (b) Carefully remove the lacing that holds the aft upper blanket [5] to the forward lower blanket [3].

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- (c) Carefully remove the lacings that hold the forward upper blanket [4] to the forward lower blanket [3].
- (d) Carefully remove the lacings that hold the aft upper blanket [5] to the aft lower blanket [2].
- (e) Remove the four insulation blankets from the exhaust duct muffler.

———— **END OF TASK** ————

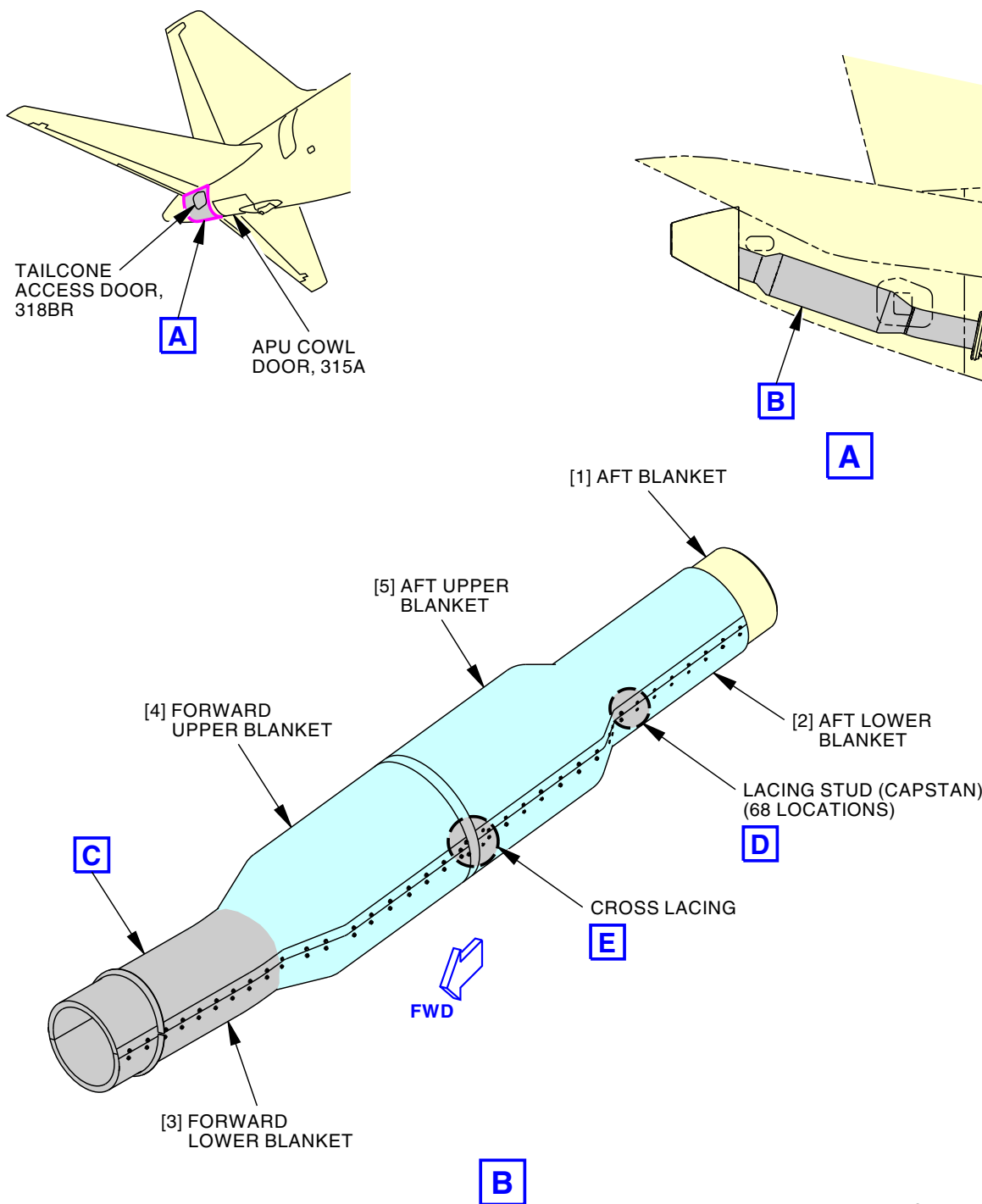
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Exhaust Duct Muffler Insulation Blanket Installation
Figure 401/49-81-13-990-802 (Sheet 1 of 2)

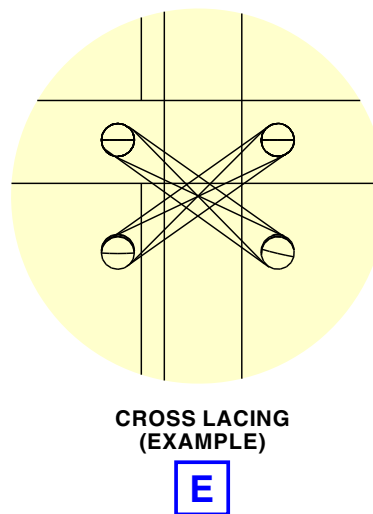
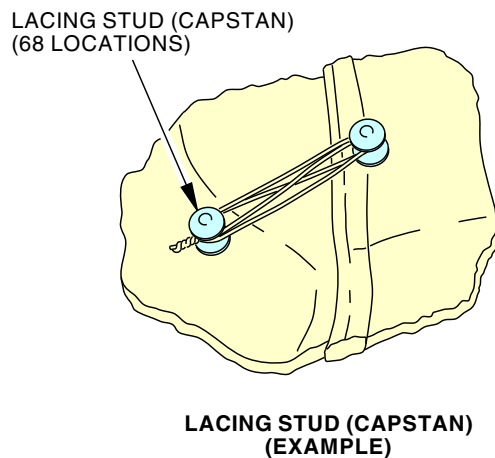
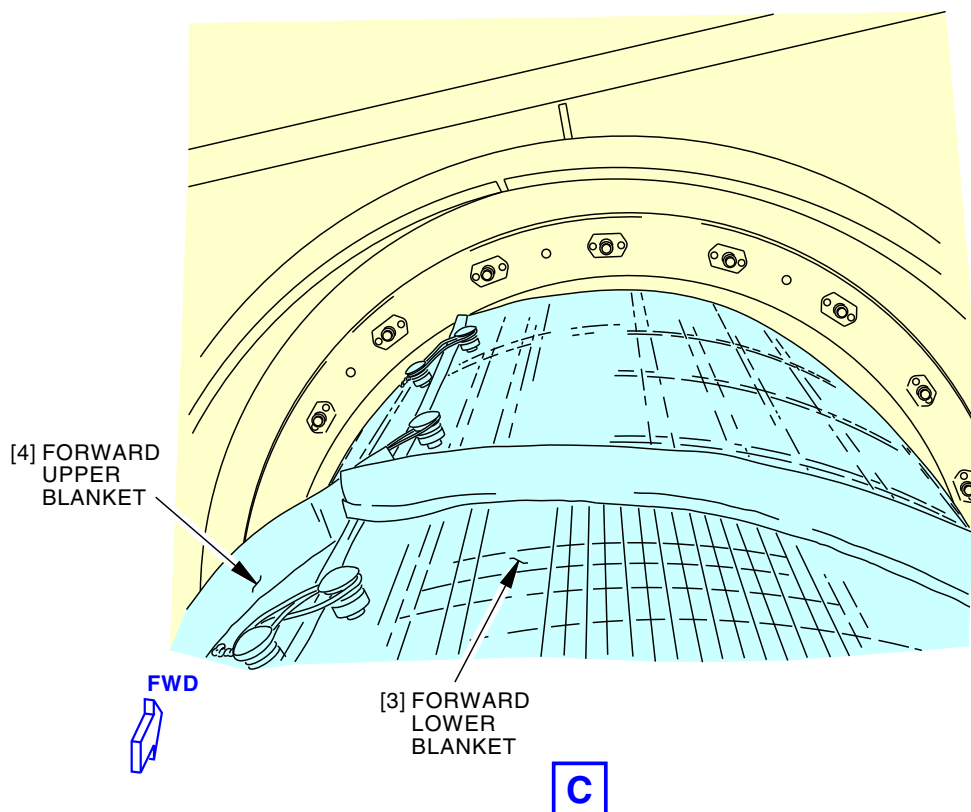
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Exhaust Duct Muffler Insulation Blanket Installation
Figure 401/49-81-13-990-802 (Sheet 2 of 2)

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TASK 49-81-13-400-801

3. Exhaust Duct Muffler Insulation Blanket - Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
G00440	Lockwire - MS20995C41, Corrosion Resistant Steel - 0.041 Inch (1.0414 mm) Diameter	NASM20995
G50177	Lockwire - MS20995N32, Inconel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Aft lower blanket	49-81-11-01-095	SIA ALL
3	Forward lower blanket	49-81-11-01-085	SIA ALL
4	Forward upper blanket	49-81-11-01-080	SIA ALL
5	Aft upper blanket	49-81-11-01-090	SIA ALL

D. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. Exhaust Duct Muffler Insulation Blanket Installation

NOTE: There are 37 lacings and 74 capstans on each side of four insulation blankets (forward upper blanket [4], aft upper blanket [5], forward lower blanket [3], aft lower blanket [2], all except the aft blanket [1]). There is a total of 74 lacings and 148 capstans on the four blankets.

SUBTASK 49-81-13-010-002

- (1) If it is necessary, do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.

NOTE: There are five insulation blankets. The insulation blankets can only be installed on the exhaust duct muffler after it has been removed from the airplane.

SUBTASK 49-81-13-420-001

- (2) Install the four insulation blankets on the exhaust duct muffler.
- (a) Make sure that the aft blanket [1] is on the exhaust duct muffler.
 - 1) Make sure that the aft blanket [1] is between the aft liner and the aft support.
 - (b) Put the aft upper blanket [5] and the aft lower blanket [2] on the exhaust duct muffler.
 - 1) Make sure that you align the lacing studs along the exhaust duct muffler.

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- 2) While one person holds the aft upper blanket [5] and aft lower blanket [2] together, attach the lacings with MS20995C41 lockwire, G00440, or MS20995N32 lockwire, G50177 (TASK 20-10-44-400-801).
 - a) Do not use the lacings to align the insulation blankets.
 - b) Make sure that the distance between the aft upper blanket [5] and aft lower blanket [2] is less than 0.15 in. (3.8 mm) and not so tight as to cause damage to the blankets.
 - c) Install each lacing with a minimum of one full turn around each lacing stud.
 - d) Make three to six twists at the end of the lockwire and bend the twists back or under the lockwire to hold the lacing in position.
- (c) Put the forward upper blanket [4] and forward lower blanket [3] on the exhaust duct muffler.
 - 1) Make sure that you align the lacing studs along the exhaust duct muffler.
 - 2) While one person holds the forward upper blanket [4] and forward lower blanket [3] together, attach the lacings with MS20995C41 lockwire, G00440, or MS20995N32 lockwire, G50177 (TASK 20-10-44-400-801).
 - a) Do not use the lacings to align the insulation blankets.
 - b) Make sure that the distance between the forward upper blanket [4] and forward lower blanket [3] is less than 0.15 in. (3.8 mm) and not so tight as to cause damage to the blankets.
 - c) Install each lacing with a minimum of one full turn around each lacing stud.
 - d) Make three to six twists at the end of the lockwire and bend the twists back or under the lockwire to hold the lacing in position.

F. Put the Airplane Back to Its Usual Position

SUBTASK 49-81-13-410-001

- (1) If it is necessary, do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

————— **END OF TASK** —————

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EXHAUST DUCT INSULATION BLANKET - INSPECTION/CHECK

1. General

- A. This procedure has the following tasks:
- (1) Exhaust Duct Insulation Blanket - General Visual Inspection (GVI).
 - (2) Exhaust Duct Insulation Blanket - Detailed Inspection.
- B. For the detailed inspection, the exhaust duct muffler and exhaust duct muffler insulation blankets must be removed before the insulation blankets can be examined.

TASK 49-81-13-200-801

2. Exhaust Duct Insulation Blanket - General Visual Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-14360	Flashlight

B. **Location Zones**

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Inspection**

SUBTASK 49-81-13-860-003

- (1) Make sure that the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel is OFF and install DO NOT OPERATE tag, STD-858.

SUBTASK 49-81-13-010-009

- (2) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

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E. Exhaust Duct Insulation Blanket General Visual Inspection

SUBTASK 49-81-13-210-001

- (1) Do these steps to visually inspect the exhaust duct insulation blankets:
- (a) Use a flashlight, STD-14360 to visually examine the insulation blankets on the exhaust duct muffler for general condition and security of installation.
 - 1) If you find damage on the insulation blankets, do this task: Exhaust Duct Insulation Blanket - Detailed Inspection, TASK 49-81-13-200-802.
- NOTE:** There are 37 lacings and 74 capstans on each side of four insulation blankets (forward upper blanket, aft upper blanket, forward lower blanket, aft lower blanket, all except the aft blanket). There is a total of 74 lacings and 148 capstans on the four blankets. There are five insulation blankets in total.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-13-410-007

- (1) To close the access panel, do these steps
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|----------------------|
| 315A | APU Cowl Door |
- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
 - (b) Disconnect the two hold-open rods from the two brackets.
 - (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
 - (d) Install the retainer pin in the rod end of the forward hold-open rod.
 - (e) Install the retainer pin to the spring clip on the aft hold-open rod.
 - (f) Close the APU Cowl Door, 315A.
 - (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

SUBTASK 49-81-13-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858 from the master switch on the P5 forward overhead panel.

————— **END OF TASK** —————

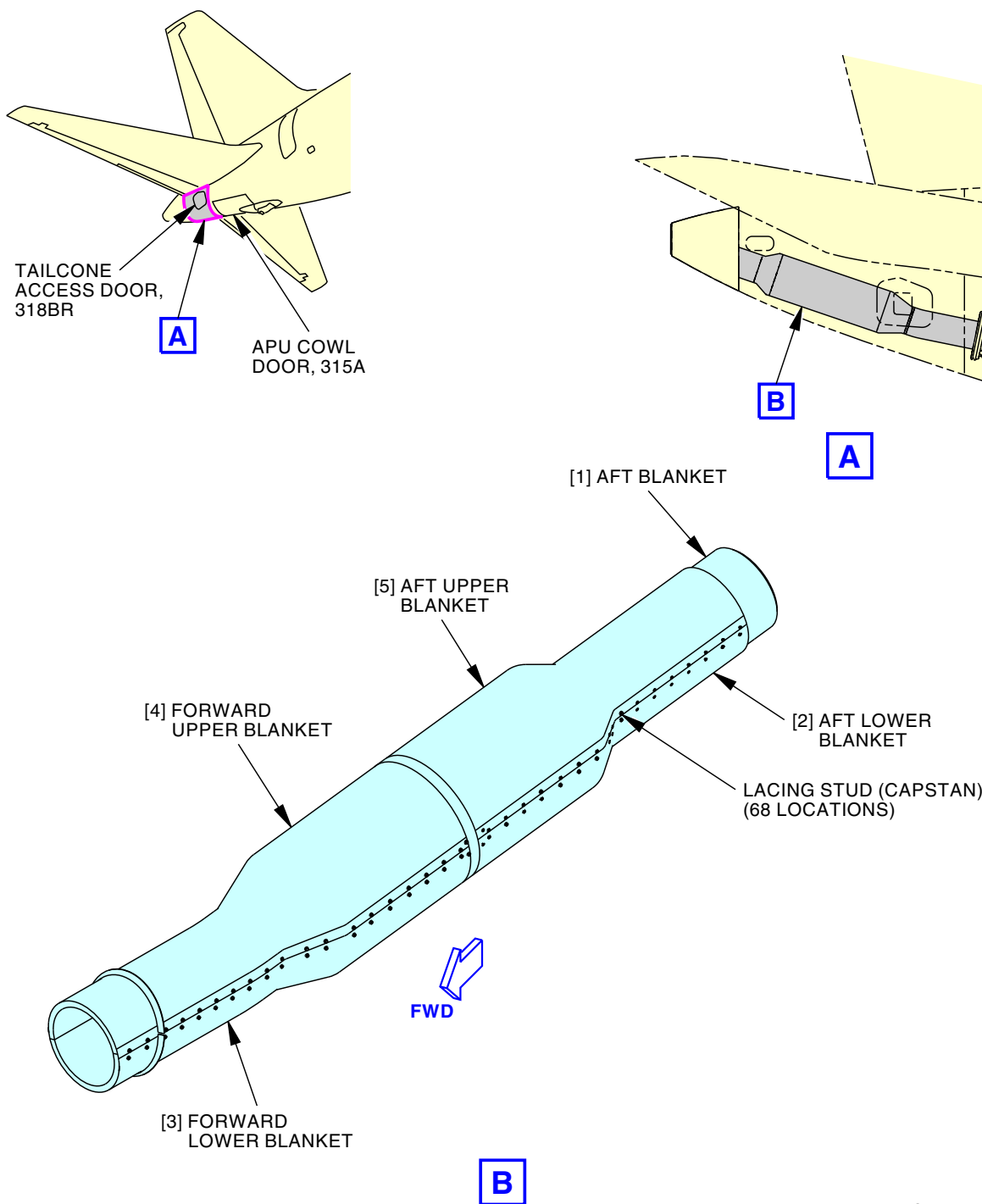
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Exhaust Duct Muffler Insulation Blanket Inspection
Figure 601/49-81-13-990-803

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TASK 49-81-13-200-802

3. Exhaust Duct Insulation Blanket - Detailed Inspection

(Figure 601)

A. References

Reference	Title
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)
49-81-13-000-801	Exhaust Duct Muffler Insulation Blanket - Removal (P/B 401)
49-81-13-300-801	Exhaust Duct Insulation Blanket Repair (P/B 801)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
318	Tail Cone Compartment - Right

D. Access Panels

Number	Name/Location
315A	APU Cowl Door

E. Prepare for the Inspection

SUBTASK 49-81-13-860-005

- (1) Make sure that the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel is OFF and install DO NOT OPERATE tag, STD-858.

SUBTASK 49-81-13-010-010

- (2) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-81-13-000-001

- (3) Do this task: Exhaust Duct Muffler Insulation Blanket - Removal, TASK 49-81-13-000-801.

F. Exhaust Duct Insulation Blanket Detailed Inspection

SUBTASK 49-81-13-210-002

- (1) Do these steps to visually inspect the exhaust duct insulation blankets:

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- (a) There is no damage permitted to the hot face side (inner surfaces of the insulation blanket that are adjacent to the exhaust duct muffler).
 - 1) If damage is found, replace the damaged insulation blanket.
- (b) A hole in the cold face side (external/outer surfaces of the insulation blanket) is permitted if less than 1.5 in. (38.1 mm) in diameter.
- (c) A tear or crack in the cold face side is permitted if less than 23.5 in. (0.6 m) in length (from the radial direction) and less than 6 in. (152.4 mm) in length (from the longitudinal direction).
- (d) There must be a minimum of 1 in. (25.4 mm) of no damage in all directions between the damaged area(s).
- (e) There must be a minimum of 1 in. (25.4 mm) of no damage between a lacing stud (capstan) or the edge of the insulation blanket and the damaged area(s).
- (f) Lacing stud (capstan) damage is not permitted.
- (g) There is no missing core insulation material permitted and no fluid contamination permitted in the core insulation material.

NOTE: The blanket insulation can be damaged by fluid ingress (including water) and may not insulate properly afterwards.

 - 1) If fluid contamination has occurred, or is suspected to have occurred, replace the insulation blanket.
- (h) There must be no overlap between two insulation blanket repair patches.
- (2) If the damage found is in the permitted limits above, do this task: Exhaust Duct Insulation Blanket Repair, TASK 49-81-13-300-801.
- (3) If the damage found is more than the limits above, replace the insulation blanket.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-13-410-006

- (1) Do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

SUBTASK 49-81-13-410-008

- (2) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

SUBTASK 49-81-13-860-006

- (3) Remove the DO NOT OPERATE tag, STD-858 from the master switch on the P5 forward overhead panel.

———— **END OF TASK** ————

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EXHAUST DUCT INSULATION BLANKET - REPAIRS

1. **General**

- A. This procedure has the task to do a temporary repair of the exhaust duct insulation blanket.
- B. You must remove the exhaust duct muffler from the airplane to repair the insulation blankets.
- C. You must do the repairs on the cold face side (external/outer) surfaces of the insulation blanket only.

TASK 49-81-13-300-801

2. **Exhaust Duct Insulation Blanket Repair**

(Figure 801)

A. References

Reference	Title
49-81-11-000-801	Exhaust Duct Muffler Removal (P/B 401)
49-81-11-400-801	Exhaust Duct Muffler Installation (P/B 401)
49-81-13 P/B 401	EXHAUST DUCT INSULATION BLANKET - REMOVAL/INSTALLATION
49-81-13-000-801	Exhaust Duct Muffler Insulation Blanket - Removal (P/B 401)
49-81-13-200-801	Exhaust Duct Insulation Blanket - General Visual Inspection (P/B 601)
49-81-13-400-801	Exhaust Duct Muffler Insulation Blanket - Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic
STD-1080	Brush - Paint

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A50096	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type II
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00666	Solvent - Methyl Propyl Ketone	BMS11-9
C00944	Primer - Firewall - Dapco No. 1-100	BMS5-63 Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G00744	Cloth - Emery	
G50331	Foil - Stainless Steel 321 per SAE AMS5510, 0.003 - 0.006 inches thick, Texturized, Diamond Pattern	AMS5510

D. Location Zones

Zone	Area
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

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E. Prepare for the Repair

SUBTASK 49-81-13-020-002

- (1) Do this task: Exhaust Duct Muffler Removal, TASK 49-81-11-000-801.

SUBTASK 49-81-13-010-005

- (2) If it is necessary, do this task: Exhaust Duct Muffler Insulation Blanket - Removal, TASK 49-81-13-000-801.

NOTE: There are five exhaust duct insulation blankets: forward upper blanket [4], aft upper blanket [5], forward lower blanket [3], aft lower blanket [2], and an aft blanket [1].

SUBTASK 49-81-13-860-001

- (3) You must do the repairs on the cold face side (external/outer) surfaces of the insulation blanket only.

F. Exhaust Duct Insulation Blanket Repair

SUBTASK 49-81-13-220-001

- (1) Measure the damaged area(s) of the insulation blanket.
- (a) Make sure the damaged area(s) of the insulation blanket is in the damage limits (TASK 49-81-13-200-801).
- (b) If the damage is more than the limits, you must replace the insulation blanket (PAGEBLOCK 49-81-13/401).

SUBTASK 49-81-13-341-001

- (2) Do these steps to repair the damaged area(s) of the insulation blanket:



DO NOT LET THE SHARP METAL EDGES CUT YOU. PUT ON GLOVES.
INJURIES TO PERSONS CAN OCCUR.

- (a) If there are ragged and sharp edges around the damaged area of the insulation blanket, trim and remove the ragged and sharp edges and loose materials that you can find.
- (b) If there is a crack or tear in the damaged area of the insulation blanket, use a punch or blank stop hole of approximately 0.12 in. (3.0 mm)-0.16 in. (4.1 mm) in diameter at each end of the crack to prevent crack growth.
- (c) Cut a patch from stainless steel foil, G50331, that can overlap the damaged area by 1 in. (25.4 mm) in all directions.
- (d) Make sure that the patch is the same shape as the damaged area, but do not bend the dimpled foil more than one time.

NOTE: If you bend the dimpled foil more than one time, it will weaken the strength of the material.

- (e) If it is necessary, deburr the edges of the damaged area of the insulation blanket and the patch with an emery cloth, G00744, or equivalent.
- (f) Clean the damaged area of the insulation blanket and the patch with solvent, B00184, solvent, B00666, or solvent, B00666, and a cotton wiper, G00034, but make sure that the solvent does not touch or go through the core insulation material.
- (g) Dry the surface of the damaged area of the insulation blanket and the patch with a cotton wiper, G00034.

NOTE: No primer is necessary if you use the sealant, A50096.

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- (h) If you use sealant, A00160, then you must use Dapco No. 1-100 primer, C00944, to prepare the damaged area of the insulation blanket and the patch as follows:
- 1) Apply the Dapco No. 1-100 primer, C00944, and sealant, A00160, in four hours or less after you clean the damaged area and the patch.
 - 2) Use a paint brush, STD-1080 to apply a thin layer of Dapco No. 1-100 primer, C00944, to the damaged area surface of the insulation blanket and the faying surface of the patch.
 - 3) Let the Dapco No. 1-100 primer, C00944, dry for a minimum of one hour, but less than two hours.

NOTE: A chalky color on the damaged area surface of the insulation blanket and the faying surface of the patch shows when the Dapco No. 1-100 primer, C00944, is dry.

- (i) Use a hardwood or plastic fillet smoothing spatula, STD-810, to apply a sufficient quantity of sealant, A00160, or sealant, A50096, to fill the empty area between the core insulation material, damaged area of the insulation blanket and the faying surface of the patch.

NOTE: The maximum thickness of the sealant between the damaged area of the insulation blanket and the patch is 0.125 in. (3.2 mm).

- (j) Remove the unwanted sealant from the damaged area of the insulation blanket and the patch with a cotton wiper, G00034.
- (k) Let the sealant dry for a minimum of 48 hours at 70°F (21.1°C)-80°F (26.7°C).

NOTE: You can use a heat lamp to decrease the time for the sealant to dry. The time to dry with a heat lamp is four hours at 120°F (48.9°C).

SUBTASK 49-81-13-860-002

- (3) You must inspect the repaired area(s) of the exhaust duct insulation blanket (TASK 49-81-13-200-801) in 60 day intervals or until the exhaust duct insulation blanket is replaced (TASK 49-81-13-400-801).
- (a) It is recommended that you replace the exhaust duct insulation blanket in six months maximum after the repair.

SUBTASK 49-81-13-410-004

- (4) If it is necessary, do this task: Exhaust Duct Muffler Insulation Blanket - Installation, TASK 49-81-13-400-801.

SUBTASK 49-81-13-420-002

- (5) Do this task: Exhaust Duct Muffler Installation, TASK 49-81-11-400-801.

———— **END OF TASK** ————

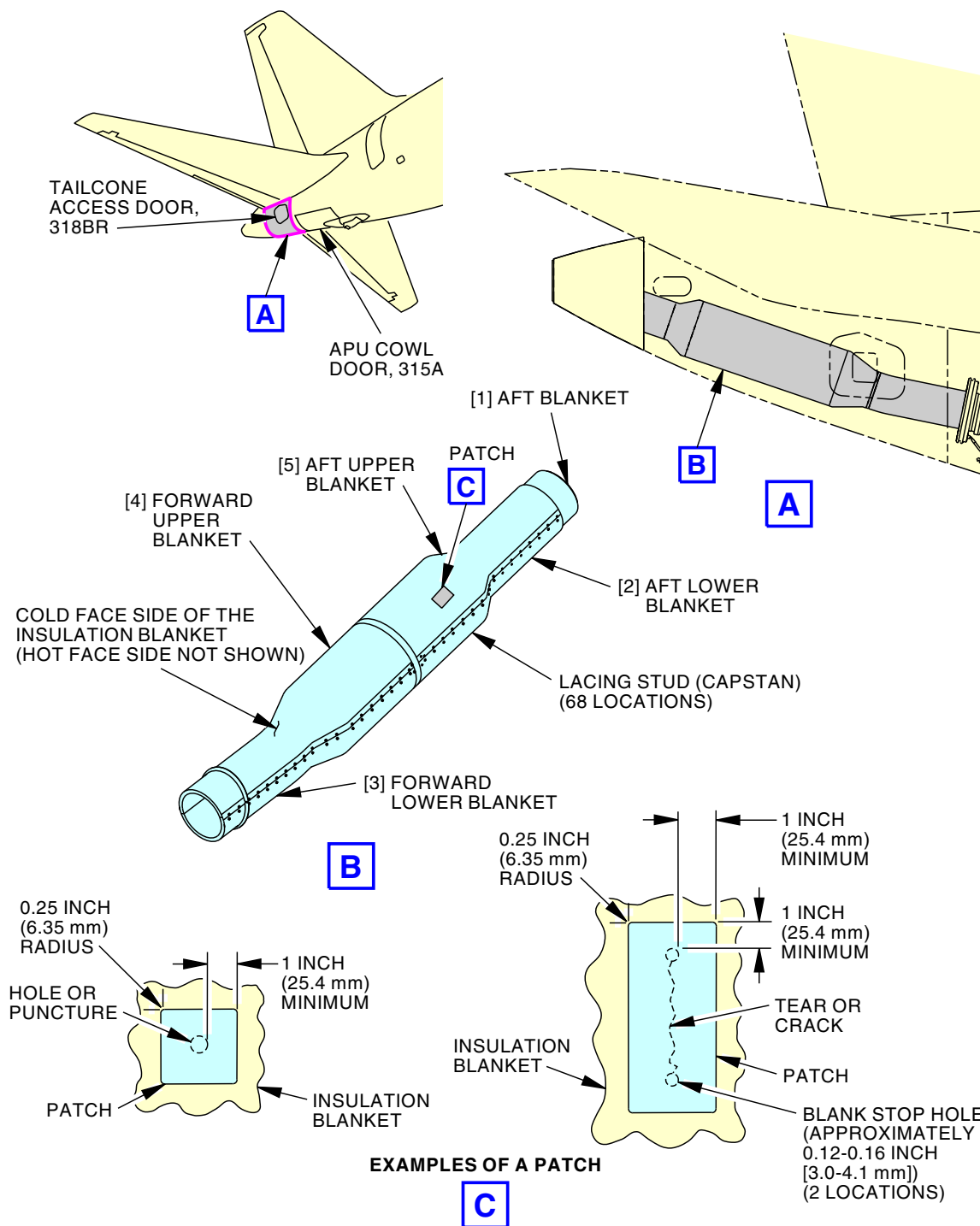
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Exhaust Duct Insulation Blanket Repair
Figure 801/49-81-13-990-801

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EXHAUST FAIRING ASSEMBLY - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the exhaust fairing assembly
 - (2) Installation of the exhaust fairing assembly.

TASK 49-81-31-000-801

2. Exhaust Fairing Assembly Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Consumable Materials**

Reference	Description	Specification
B00068	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002, MIL-E-51454 Type II
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
G00077	Foam - Flame Retardant Rigid Urethane	BMS8-133
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713
G50079	Scraper - Wood or Plastic	
G50316	Cloth - Clean, Dry, Lint-free, White, Cotton	

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. **Access Panels**

Number	Name/Location
318BR	Tailcone Access Door

E. **Prepare for the Removal**

SUBTASK 49-81-31-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-81-31-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-81-31-010-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

F. Exhaust Fairing Assembly Removal

SUBTASK 49-81-31-020-001

- (1) Do these steps to remove the exhaust fairing [1]:
- (a) Use a scraper, G50079, to remove the sealant from the edge of the exhaust fairing [1].
 - (b) Remove the 62 pan-head screws [2] and packings [3] that hold the exhaust fairing [1] to the tail cone.



WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE SOLVENTS. KEEP SOLVENTS AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASH POINT. SOLVENTS ARE A POISONOUS AND FLAMMABLE MATERIAL WHICH CAN CAUSE INJURY PERSONS AND DAMAGE TO EQUIPMENT.

- (c) Clean the area with a cotton cloth, G50316, and solvent, B00184 or alcohol, B00068.
- (d) Temporarily support the aft end of the exhaust duct muffler:
 - 1) Put a foam, G00077, pad below the aft end of the exhaust duct muffler.
 - 2) Optional: Use twine, G00472, to temporarily attach the muffler to the support structure.
- (e) Remove the exhaust fairing [1].

———— **END OF TASK** ————

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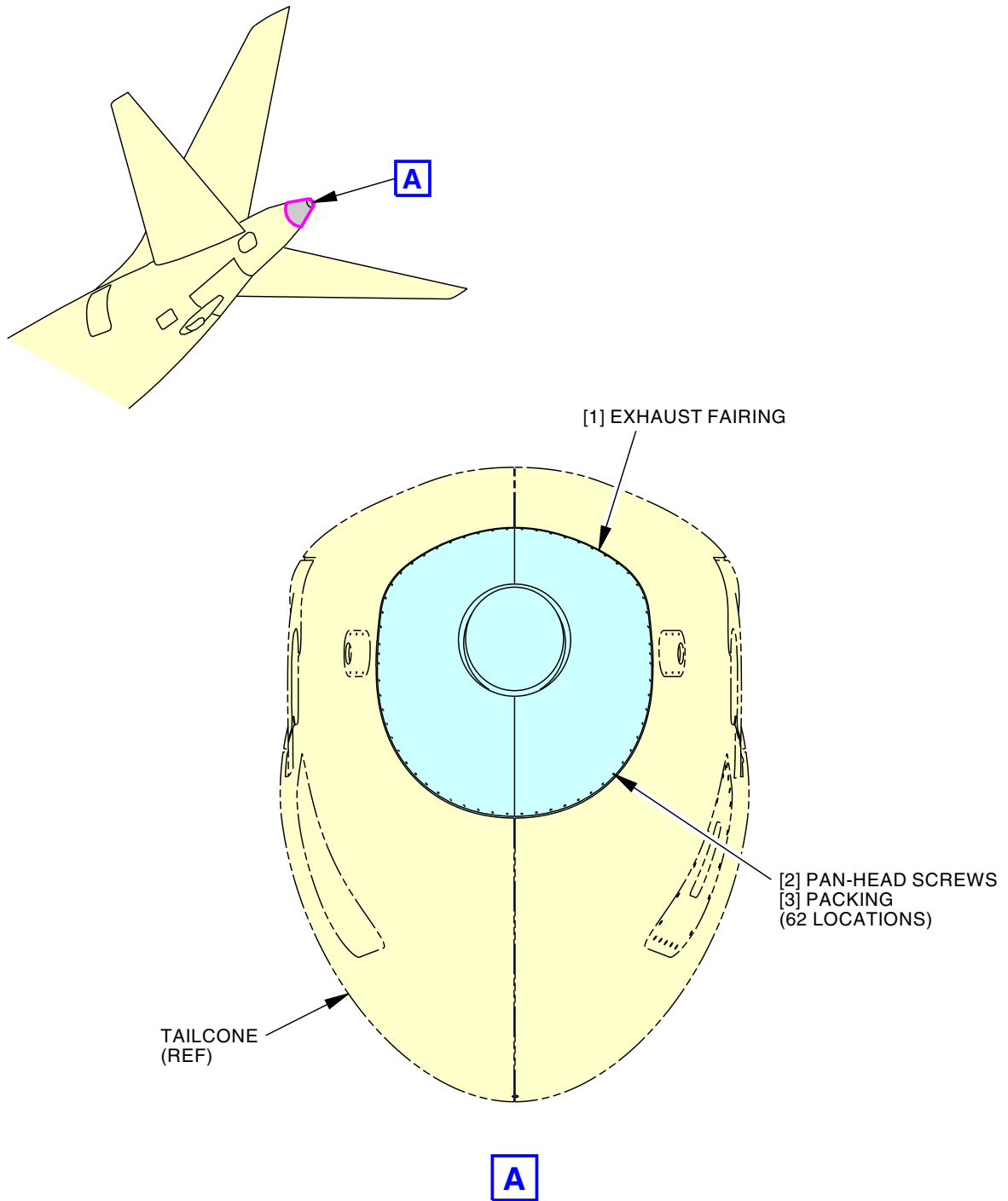
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Exhaust Fairing Assembly Installation
Figure 401/49-81-31-990-801

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TASK 49-81-31-400-801

3. Exhaust Fairing Assembly Installation

(Figure 401)

A. References

Reference	Title
20-50-11-910-801	Standard Torque Values (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1064	Scraper - Phenolic, Hard Resin

C. Consumable Materials

Reference	Description	Specification
A50419	Sealant - Pressure And Environmental-Chromate, Type I, Class B-2	BMS5-95 Type I Class B-2
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)
G00077	Foam - Flame Retardant Rigid Urethane	BMS8-133
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Exhaust fairing	53-53-51-01-005	SIA ALL
3	Packing	49-81-00-01-042	SIA 012-999
		49-81-00-01-045	SIA 001-011, 015-999
		49-81-00-01-047	SIA 012-999

E. Location Zones

Zone	Area
211	Flight Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

F. Access Panels

Number	Name/Location
318BR	Tailcone Access Door

G. Exhaust Fairing Assembly Installation Procedure

SUBTASK 49-81-31-420-001

(1) Do these steps to install the exhaust fairing [1]:

(a) Do these steps to clean the surfaces of the exhaust fairing [1]:

- 1) If it is necessary, remove the remaining sealant from the surfaces of the exhaust fairing [1] with a hard resin phenolic scraper, STD-1064, or an equivalent tool.

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- 2) Clean the mating surfaces of the exhaust fairing [1] with alcohol, B00130, and a cotton wiper, G00034.
- 3) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surfaces of the exhaust fairing [1].
 - a) It is recommended that you use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen.
 - b) Loosely put the exhaust duct muffler inside the exhaust fairing [1].
 - c) Remove the foam, G00077, pad and the twine, G00472 (if it is necessary), that temporally support the exhaust duct muffler.
 - d) Install the exhaust fairing [1] on the tail cone.
 - 1) Install and tighten the 62 pan-head screws [2] and packings [3] (TASK 20-50-11-910-801).
- (2) Apply sealant, A50419, to fillet seal the edge of the exhaust fairing [1].
 - a) Remove unwanted sealant with a cotton wiper, G00034.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-31-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

SUBTASK 49-81-31-860-003

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-81-31-860-004

- (3) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

————— **END OF TASK** —————

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EDUCTOR HOUSING - INSPECTION/CHECK

1. General

- A. This procedure has the task to do an inspection of the eductor housing. The eductor housing is installed on the aft end of the power section assembly and forward of the turbine exhaust port.

TASK 49-81-41-200-801

2. Eductor Housing Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
49-11-00 P/B 401	APU POWER PLANT - REMOVAL/INSTALLATION

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)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. Location Zones

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Inspection

SUBTASK 49-81-41-010-001

- (1) To open the access panel, do these steps:

Number	Name/Location
--------	---------------

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.

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- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

G. Eductor Housing Inspection

SUBTASK 49-81-41-210-001

- (1) Do these steps to inspect the eductor housing [1] (Figure 601):

- (a) Visually examine the eductor housing [1] for cracks and surface contamination.

NOTE: No cracks are permitted.

- 1) Clean the eductor housing [1]:

- a) Clean the surfaces of the eductor housing [1] 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 surfaces of the eductor housing [1].

NOTE: It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the surfaces of the eductor housing [1].

- 2) Replace the eductor housing [1] if you find cracks on the eductor housing [1].

NOTE: The eductor housing [1] is replaced with the APU removed from the airplane. Refer to Honeywell Engine Manual 49-22-00 and Honeywell IPC 49-26-93.

- (b) Visually examine the eductor housing [1] for missing or damaged bolts and nuts.

- 1) Examine all of the sides of the eductor housing [1] that you can get access to from the APU compartment.
- 2) If you find missing or damaged bolts and nuts, install the missing parts or replace the damaged parts.

SUBTASK 49-81-41-210-002

- (2) Do these steps to inspect the APU exciter support bracket on the eductor housing [1] (Figure 601):

- (a) Visually examine the exciter support bracket (including the weld joint).

- 1) Cracks less than 67% (2/3) of the bracket are permitted

NOTE: Repair the crack the next time the eductor housing [1] is removed from the APU during a shop visit. Cracks cannot be repaired with the APU on the airplane.

- 2) If you see a crack that is more than 67% (2/3) of the bracket or more than 67% (2/3) of the weld joint, you must remove the APU (PAGEBLOCK 49-11-00/401).
- 3) If the crack (any length) extends into the plenum, you must remove the APU (PAGEBLOCK 49-11-00/401).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-81-41-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

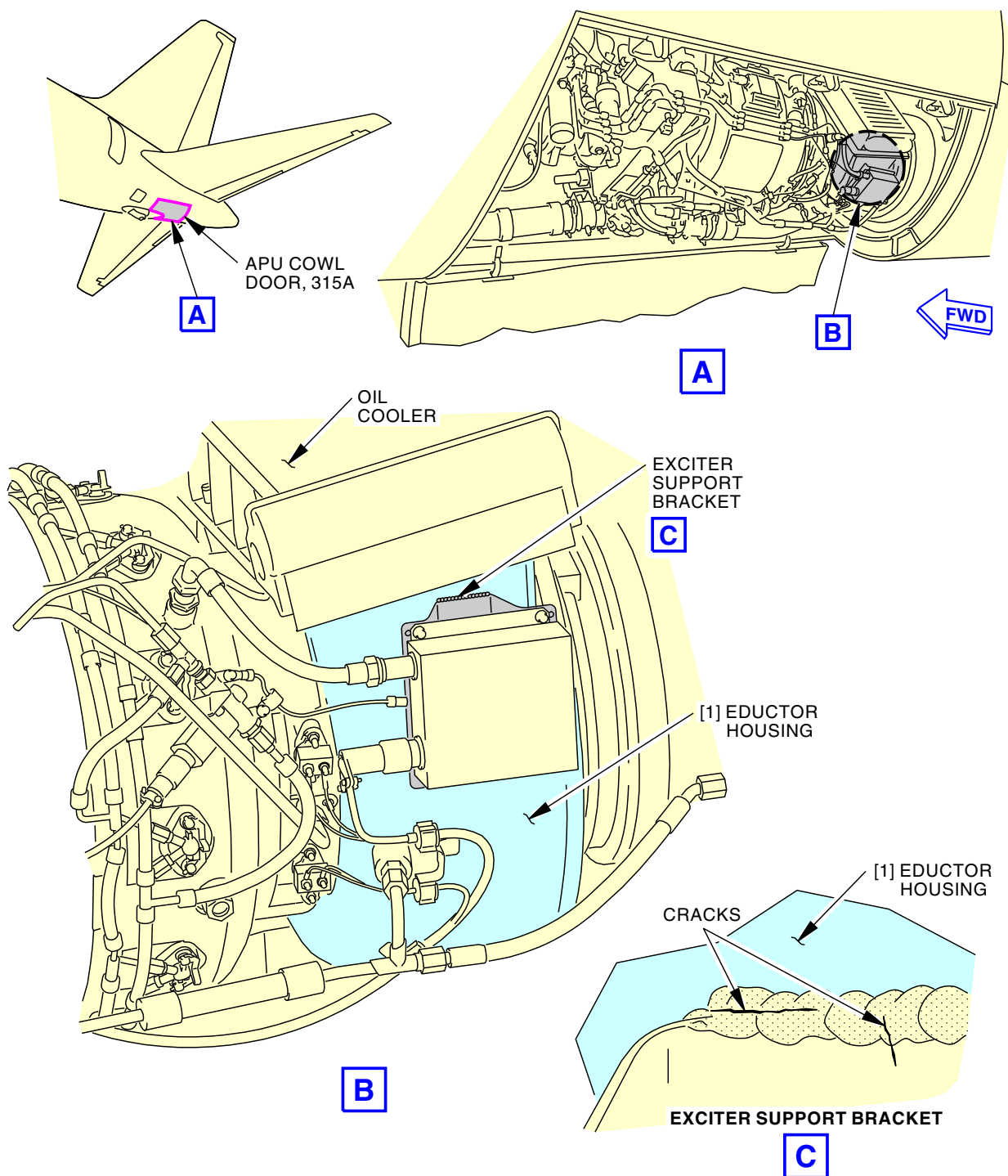
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Eductor Housing Inspection
Figure 601/49-81-41-990-801

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LUBE MODULE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) A removal of the lube module
 - (2) An installation of the lube module.
- B. The lube module is installed on the APU gearbox.
- C. You can remove and install the lube module with the fuel control unit installed on the APU (temporarily attached to the APU during removal of the lube module) or with the fuel control unit removed from the APU.

TASK 49-91-11-000-801

2. Lube Module Removal

(Figure 401)

A. References

Reference	Title
49-31-11-000-801	Fuel Control Unit Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)
STD-7394	Cap - Dust, Electrical Connector

C. Consumable Materials

Reference	Description	Specification
G00472	Twine - Impregnated Fibrous, Lacing And Tying	MIL-T-713

D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Prepare for the Removal

SUBTASK 49-91-11-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

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SUBTASK 49-91-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-11-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.

- (f) Disconnect the two hold-open rods from the two spring clips.

- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-91-11-010-002

- (4) Do this task: Fuel Control Unit Removal, TASK 49-31-11-000-801.

NOTE: It is permitted to do the optional steps that follow to temporarily disconnect the Fuel Control Unit (FCU) instead of removing it from the Auxiliary Power Unit (APU).

- (5) Optional: to temporarily disconnect the fuel control unit [4] from the lube module [7]:

- (a) Put the 1 gallon (4 l) fuel resistant container, STD-4049, under the fuel supply tube [2].



WARNING

DO NOT GET FUEL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE FUEL. PUT ON GOGGLES, AND GLOVES WHEN YOU USE FUEL. KEEP FUEL AWAY FROM SPARKS, FLAME, AND HEAT. FUEL IS POISONOUS AND FLAMMABLE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Disconnect the fuel supply tube [2] from the fitting [1] on the 1088 bulkhead.

- (c) Drain the fuel from the fuel supply tube [2] into the 1 gallon (4 l) fuel resistant container, STD-4049.

- (d) Install the plugs on the fuel supply tube [2] and fitting [1] on the 1088 bulkhead.

- (e) Remove the 1 gallon (4 l) fuel resistant container, STD-4049.

- (f) Remove the coupling clamp [6] that attaches the fuel control unit [4] to the lube module [7].

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- (g) Carefully pull the fuel control unit [4] away from the lube module [7].
- (h) Move the fuel control unit [4] to the left and use the hinge on the oil fill cap as a support structure.
NOTE: The engine wire harness must not be used as a support structure for the FCU.
- (i) Use twine, G00472, or equivalent, to temporarily attach the fuel control unit [4] to the support structure.
- (j) Remove the packing [5] from the fuel control unit [4].
 - 1) Discard the packing [5].

G. Lube Module Removal

SUBTASK 49-91-11-020-001

- (1) Do these steps to disconnect the electrical connector [3], electrical connector [8], and electrical connector [9]:
 - (a) Disconnect the electrical connector [3] (P22) from the fuel control unit [4].
 - (b) Disconnect the electrical connector [8] (P15) from the oil temperature sensor.
 - (c) Disconnect the electrical connector [9] (P24) from the oil filter indicator.
NOTE: The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.
 - (d) Install the dust caps, STD-7394, on the electrical connector [3], electrical connector [8], and electrical connector [9] to prevent contamination.

SUBTASK 49-91-11-020-002



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (2) Do these steps to remove the lube module [7]:
 - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the lube module [7].
 - (b) Release the engine wire harness from the two spring clips [10].
 - (c) Open the quick-release clamp [12] on the bracket [11].
 - 1) Release the engine wire harness from the quick-release clamp [12].
 - (d) Loosen the five bolts [15] that attach the lube module [7] to the APU gearbox.
 - (e) Make sure that the lube module [7] does not touch the fuel control unit [4] during the lube module [7] removal.
 - (f) Carefully remove the lube module [7].
NOTE: The lube module weighs approximately 9 lb (4 kg).
 - (g) Remove the packing [18] from the lube module [7].
 - 1) Discard the packing [18].
 - (h) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, to drain the oil from the APU gearbox and lube module [7].
 - (i) Remove the three bolts [13] and three washers [14] that attach the bracket [11] to the lube module [7].
 - 1) Disconnect the ground jumper [19] from the bracket [11].
 - (j) Remove the bracket [11].

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- (k) Make sure you install all necessary protection covers.
- (l) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-91-11-020-003

- (3) Do these steps to remove the seal plate [16] for the lube module [7]:

NOTE: It is necessary to replace the seal plate if you find signs of oil leakage around the lube module.

- (a) Remove the two screws [17] that attach the seal plate [16] to the lube module [7].
- (b) Remove the seal plate [16].
 - 1) Replace the seal plate [16].

———— **END OF TASK** ————

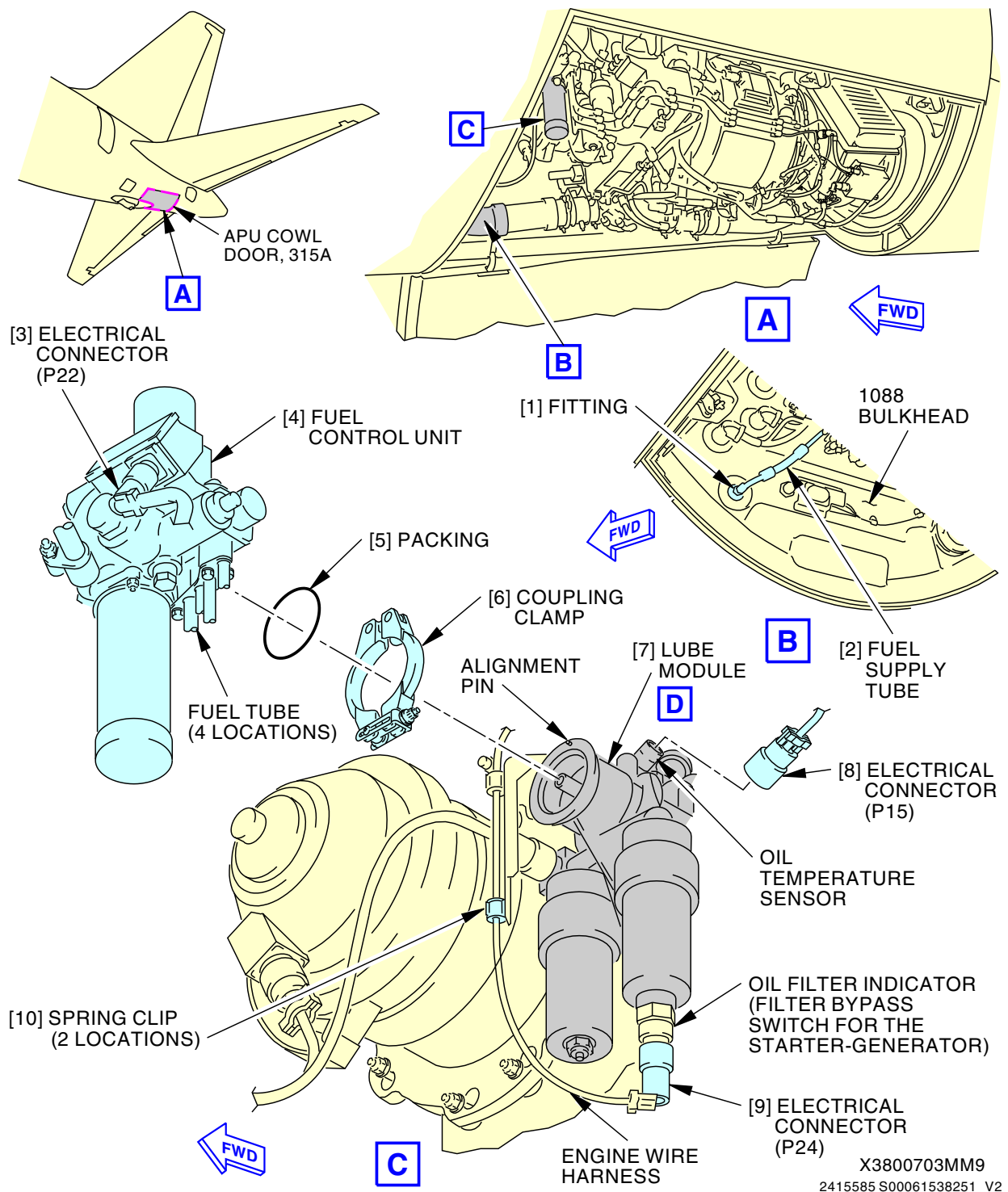
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APU Lube Module Installation
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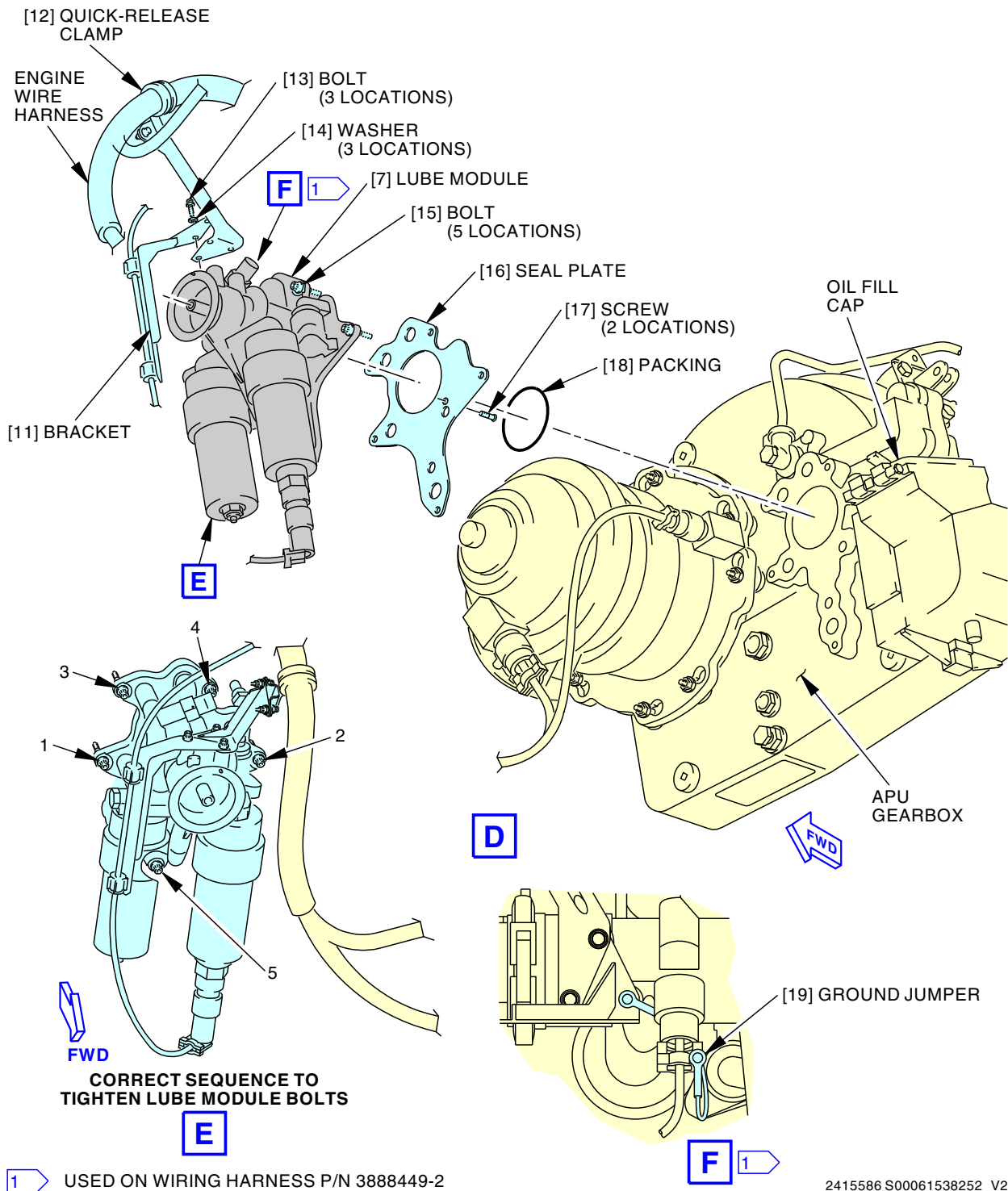
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APU Lube Module Installation
Figure 401/49-91-11-990-801 (Sheet 2 of 2)

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TASK 49-91-11-400-801

3. Lube Module Installation

(Figure 401)

A. References

Reference	Title
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-31-11-400-801	Fuel Control Unit Installation (P/B 401)
49-61-00-700-801	APU BITE Procedure (P/B 201)
SWPM 20-20-00	ELECTRICAL BONDING PROCESSES

B. Tools/Equipment

Reference	Description
STD-592	Meter - Milliohms, Range from 0.001 to 100 milliohms
STD-858	Tag - DO NOT OPERATE
STD-7394	Cap - Dust, Electrical Connector

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D00504	Grease - Petrolatum	VV-P-236
D00633	Grease - Aircraft General Purpose	BMS3-33
D50011	Grease - Perfluoropolyether - Christo-lube MCG111	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G50021	Pad - General Purpose Scrubbing - Scotch-Brite 96W	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Packing	49-31-11-01-007	SIA ALL
7	Lube module	49-91-11-01-005	SIA ALL
18	Packing	49-91-11-01-120	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

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G. Lube Module Installation

SUBTASK 49-91-11-420-001

- (1) If the seal plate [16] was removed from the lube module [7], install the seal plate [16]:
 - (a) Lubricate the new seal plate [16] with a light coat of aircraft turbine engine oil, D50055.
 - (b) Install the seal plate [16] on the lube module [7] with the two screws [17].
 - 1) Tighten the two screws [17].

SUBTASK 49-91-11-420-002



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the lube module [7]:
 - (a) If it is necessary, lubricate the seal plate [16] with a light coat of aircraft turbine engine oil, D50055.
 - (b) Install the bracket [11] on the lube module [7] with the three washers [14] and three bolts [13].
 - 1) For wiring harness P/N 3888449-2, connect the ground jumper [19] to the bracket [11].
 - a) Clean the mating surfaces of the ground jumper [19] and bracket [11] with alcohol, B00130, and Scotch-Brite 96W pad, G50021.
 - 2) Torque the three bolts [13] to 50 in-lb (5.6 N·m).
 - 3) For wiring harness P/N 3888449-2, measure the electrical bonding resistance between the ground jumper [19] and bracket [11] (SWPM 20-20-00).
 - a) Use milliohm meter .001 to 100 milliohms, STD-592.
 - b) Make sure that the electrical bonding resistance is 0.008 ohm (8.0 milliohm) or less.
 - (c) Lubricate the new packing [18] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (d) Install the packing [18] in the groove of the drive spline for the lube module [7].
 - (e) Make sure that the lube module [7] does not touch the fuel control unit [4] during the lube module [7] installation.
 - (f) Carefully install the lube module [7] in the Auxiliary Power Unit (APU) gearbox.

NOTE: The lube module [7] weighs approximately 9 lb (4 kg).



TIGHTEN THE LUBE MODULE BOLTS IN THE CORRECT SEQUENCE. IF YOU DO NOT TIGHTEN THE BOLTS IN THE CORRECT ORDER, OIL LEAKAGE CAN OCCUR.

- (g) Use the sequence shown in Figure 401 to torque the five bolts [15] to 120 in-lb (13.6 N·m).
- (h) Put the engine wire harness into the quick-release clamp [12] on the bracket [11].

NOTE: Grommets are installed on the engine wire harness to correctly position the engine wire harness on the quick-release clamp [12] and the two spring clips [10].

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- 1) Close the quick-release clamp [12].
- (i) Put the engine wire harness into the two spring clips [10].

SUBTASK 49-91-11-410-001

- (3) Do this task: Fuel Control Unit Installation, TASK 49-31-11-400-801.

SUBTASK 49-91-11-420-003

- (4) If the optional steps to temporarily disconnect the Fuel Control Unit (FCU) instead of removing it from the APU were used, do the optional steps that follow to connect the fuel control unit [4] to the lube module [7]:
 - (a) Lubricate the drive spline for the fuel control unit [4] with a light coat of grease, D00633.
 - (b) Lubricate the new packing [5] with a light coat of Santovac 5 lubricant, D00341, or grease, D00504.
 - (c) Install the packing [5] on the fuel control unit [4].
 - (d) Put the coupling clamp [6] on the lube module [7].
 - (e) Remove the temporary materials (cord or equivalent) that attach the fuel control unit [4] to the support structure.
 - (f) Carefully put the fuel control unit [4] in position on the lube module [7].
 - (g) Open the coupling clamp [6] to let the hole on the flange of the fuel control unit [4] to engage the alignment pin on the lube module [7] flange.
 - (h) Make sure the alignment pin on the lube module [7] is aligned and engages the hole on the flange of the fuel control unit [4].
 - (i) Put the coupling clamp [6] over the flanges of the fuel control unit [4] and the lube module [7].
 - 1) Torque the nut on the coupling clamp [6] (part number 234-591-3030) to 60 in-lb (6.8 N·m).
 - 2) Torque the nut on the coupling clamp [6] (part number 234-511-9059) to 20 in-lb (2.3 N·m).
 - (j) Remove the plugs from the fuel supply tube [2] and fitting [1] on the 1088 bulkhead.
 - (k) If Christo-lube MCG111 grease, D50011, is not used on the fitting [1], do these steps:
 - 1) Connect the fuel supply tube [2] to the fitting [1] on the 1088 bulkhead.
 - a) Torque to 470 in-lb (53 N·m) - 510 in-lb (58 N·m).
 - (l) If Christo-lube MCG111 grease, D50011, is used on the fitting [1], do these steps:
 - 1) Lubricate the external threads of the fitting [1] with Christo-lube MCG111 grease, D50011.

NOTE: The grease should be applied to the external threads only. The grease should not be applied to the internal threads or sealing surface of the fitting.
 - 2) Connect the fuel supply tube [2] to the fitting [1] on the 1088 bulkhead.
 - a) Torque to 266 in-lb (30 N·m) - 294 in-lb (33 N·m).

SUBTASK 49-91-11-420-004

- (5) Do these steps to connect the electrical connector [3], electrical connector [8], and electrical connector [9]:
 - (a) Remove the dust caps, STD-7394, from the electrical connector [3], electrical connector [8], and electrical connector [9].

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- (b) Connect the electrical connector [9] (P24) to the oil filter indicator.

NOTE: The oil filter indicator is also referred to as the filter bypass switch for the starter-generator.

- (c) Connect the electrical connector [8] (P15) to the oil temperature sensor.
(d) Connect the electrical connector [3] (P22) to the fuel control unit [4].

SUBTASK 49-91-11-610-001

- (6) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

H. Lube Module Installation Test

SUBTASK 49-91-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-11-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-11-710-001

- (3) Do the installation test for the lube module [7]:

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
(b) Operate the APU for a minimum of five minutes.
(c) During the APU operation, examine the lube module [7] and fuel control unit [4] for signs of oil and fuel leakage.
(d) If you find oil or fuel leakage, do these steps to repair the leakage:
 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 3) Repair the cause of the oil or fuel leakage.
 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 6) During the APU operation, examine the lube module [7] and fuel control unit [4] for signs of oil and fuel leakage.
 7) If you find oil or fuel leakage, do the leakage repair again.
(e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
(f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-11-410-002

(1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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LUBE MODULE - INSPECTION/CHECK

1. General

- A. This procedure has the task to do an inspection of the lube module and the two electrical connectors.

TASK 49-91-11-200-801

2. Lube Module Inspection

(Figure 601)

A. **References**

Reference	Title
49-91-11-000-801	Lube Module Removal (P/B 401)
49-91-11-400-801	Lube Module Installation (P/B 401)

B. **Location Zones**

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Inspection**

SUBTASK 49-91-11-010-003

- (1) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
- NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. **Lube Module Inspection**

SUBTASK 49-91-11-210-001

- (1) Do these steps to inspect the lube module and the two electrical connectors:
- (a) Visually examine the lube module and the two electrical connectors for tightness and damage.
- (b) Visually examine the oil lines for general condition and security.
- (c) Visually examine the lube module for oil leakage.

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- (d) If there are signs of oil leakage from the lube module, replace the lube module.

These are the tasks:

- Lube Module Removal, TASK 49-91-11-000-801
- Lube Module Installation, TASK 49-91-11-400-801

- (e) If there is no oil leakage, the lube module is satisfactory.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-11-410-003

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

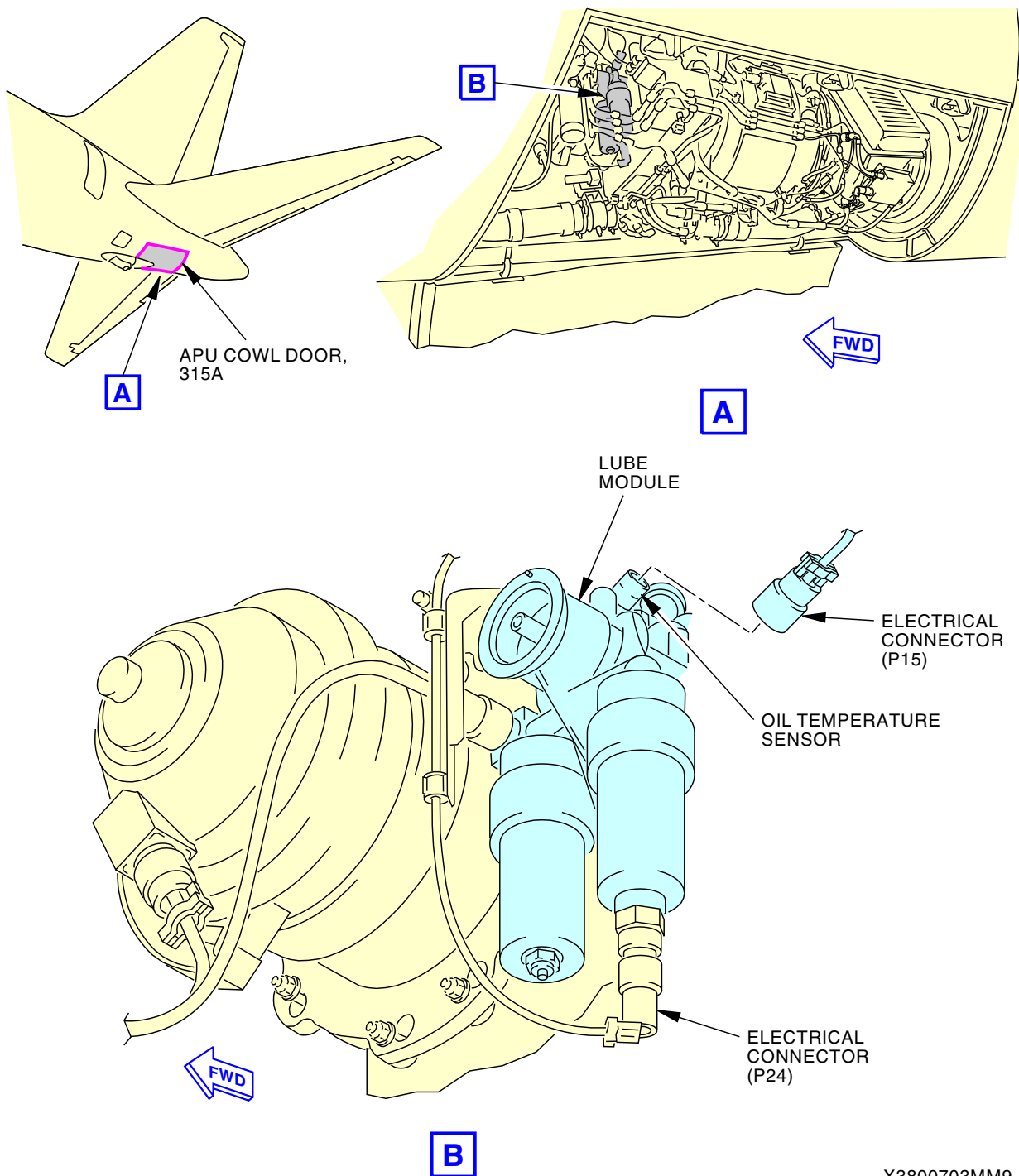
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APU Lube Module Inspection
Figure 601/49-91-11-990-802

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OIL FILTER ELEMENTS - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the lube filter element
 - (2) An installation of the lube filter element
 - (3) A removal of the starter-generator filter element
 - (4) An installation of the starter-generator filter element.
- B. The starter-generator filter element is also referred to as the starter-generator scavenge filter element.
- C. The oil filter elements are installed on the lube module.

TASK 49-91-12-000-801

2. Lube Filter Element Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-91-12-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-12-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-91-12-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.

- (f) Disconnect the two hold-open rods from the two spring clips.

- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

- (h) Install the two retainer pins in the two rod ends.

E. Lube Filter Element Removal

SUBTASK 49-91-12-020-001



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.



DO NOT LET OIL STAY ON YOUR SKIN. THE SYNTHETIC OIL CONTAINS ADDITIVES THAT CAN BE POISONOUS IF THEY ARE ABSORBED THROUGH THE SKIN. CLEAN AWAY ALL OIL THAT GETS ON THE 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 these steps to remove the lube filter element [1]:
- (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the lube module.
 - (b) Remove the lube filter housing [7].
 - (c) Remove the packing [8] from the lube filter housing [7].
 - 1) Discard the packing [8].
 - (d) Remove the lube filter element [1].
 - 1) Discard the lube filter element [1].
 - (e) Make sure you install all necessary protection covers.

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- (f) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

———— **END OF TASK** ————

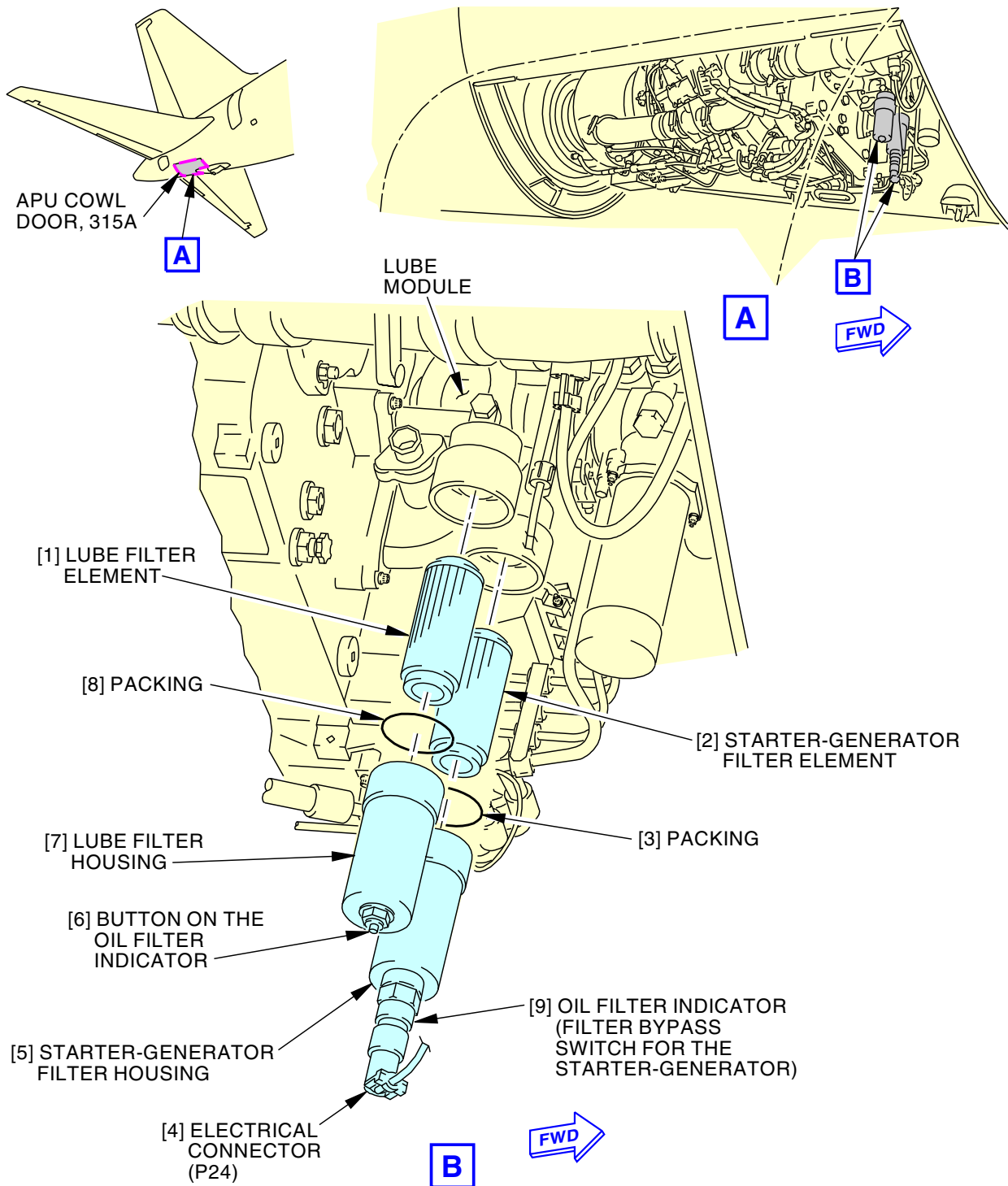
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Oil Filter Elements Installation
Figure 401/49-91-12-990-801

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TASK 49-91-12-400-801

3. Lube Filter Element Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
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
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Lube filter element	49-91-12-01-070	SIA ALL
8	Packing	49-91-12-01-065	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Lube Filter Element Installation

SUBTASK 49-91-12-110-001

(1) Do these steps to clean the lube filter housing [7]:

(a) Clean the lube filter housing [7] with alcohol, B00130, and a cotton wiper, G00034.

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- (b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the lube filter housing [7].
 - 1) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the lube filter housing [7]

SUBTASK 49-91-12-420-001



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the lube filter element [1]:
 - (a) If the button [6] has extended, push the button [6] in to put the oil filter indicator back to the serviceable condition.

NOTE: You must turn the lube filter housing [7] with the opening in the down position to push in the button [6]. A locking ball in the oil filter indicator will not let the button [6] be pushed in if the opening is in the up position.

NOTE: There are three locations on the lube filter housing [7] with an etched "INVERT TO RESET" marking.
 - (b) Lubricate the packing [8] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (c) Install the packing [8] on the lube filter housing [7].
 - (d) Lubricate the packing [8] on the new lube filter element [1] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (e) Install the lube filter element [1] in the lube module.
 - (f) Install the lube filter housing [7] on the lube module.
 - 1) Tighten the lube filter housing [7] to 35 ± 5 in-lb (4.0 ± 0.6 N·m).
 - (g) Make sure the APU oil system is full (TASK 12-13-31-200-801).

H. Lube Filter Element Installation Test

SUBTASK 49-91-12-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-12-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-12-790-001

- (3) Do the installation test for the lube filter element:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.

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- (c) During the APU operation, examine the lube filter housing for signs of oil leakage.
- (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the lube filter housing for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again.
- (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) Make sure that it passes. If it does not pass, refer to the IFIM and do the applicable procedure(s) to correct the problem.
- (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-91-12-640-001

- (4) Make sure the APU oil system is full (TASK 12-13-31-200-801).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-12-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— **END OF TASK** —————

TASK 49-91-12-000-802

4. Starter-Generator Filter Element Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE

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B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-91-12-860-005

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-12-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-12-010-002

- (3) To open the access panel, do these steps:

Number	Name/Location
--------	---------------

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.

- (f) Disconnect the two hold-open rods from the two spring clips.

- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

- (h) Install the two retainer pins in the two rod ends.

E. Starter-Generator Filter Element Removal

SUBTASK 49-91-12-020-002



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

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(WARNING PRECEDES)



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. THE SYNTHETIC OIL CONTAINS ADDITIVES THAT CAN BE POISONOUS IF THEY ARE ABSORBED THROUGH THE SKIN. CLEAN AWAY ALL OIL THAT GETS ON THE SKIN.



CAUTION

DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (1) Do these steps to remove the starter-generator filter element [2]:
 - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the lube module.
 - (b) Disconnect the electrical connector [4] (P24) from the oil filter indicator [9].

NOTE: The oil filter indicator [9] is also referred to as the filter bypass switch for the starter-generator.
 - (c) Remove the starter-generator filter housing [5].
 - (d) Remove the packing [3] from the starter-generator filter housing [5].
 - 1) Discard the packing [3].
 - (e) Remove the starter-generator filter element [2].
 - 1) Discard the starter-generator filter element [2].
 - (f) Make sure you install all necessary protection covers.
 - (g) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

————— **END OF TASK** —————

TASK 49-91-12-400-802

5. Starter-Generator Filter Element Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

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C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Starter-generator filter element	49-91-12-01-070	SIA ALL
3	Packing	49-91-12-01-065	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Starter-Generator Filter Element Installation

SUBTASK 49-91-12-110-002

- (1) Do these steps to clean the starter-generator filter housing [5]:
 - (a) Clean the starter-generator filter housing [5] 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 starter-generator filter housing [5].
 - 1) Use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen to dry the starter-generator filter housing [5]

SUBTASK 49-91-12-420-002



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the starter-generator filter element [2]:
 - (a) Lubricate the new packing [3] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (b) Install the packing [3] on the starter-generator filter housing [5].
 - (c) Lubricate the packing [3] on the new starter-generator filter element [2] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (d) Install the starter-generator filter element [2] in the lube module.

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- (e) Install the starter-generator filter housing [5] on the lube module.
 - 1) Tighten the starter-generator filter housing [5] to 35 ±5 in-lb (4.0 ±0.6 N·m)3.
- (f) Connect the electrical connector [4] (P24) to the oil filter indicator [9].

NOTE: The oil filter indicator [9] is also referred to as the filter bypass switch for the starter-generator.
- (g) Make sure the APU oil system is full (TASK 12-13-31-200-801).

H. Starter-Generator Filter Element Installation Test

SUBTASK 49-91-12-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-12-860-008

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-12-710-001

- (3) Do the installation test for the starter-generator filter element:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the starter-generator filter housing for signs of oil leakage.
 - (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the starter-generator filter housing for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again.
 - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) Make sure that it passes. If it does not pass, refer to the IFIM and do the applicable procedure(s) to correct the problem.
 - (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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SUBTASK 49-91-12-640-002

- (4) Make sure the APU oil system is full (TASK 12-13-31-200-801).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-12-410-002

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
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- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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OIL FILTER INDICATOR - SERVICING

1. General

- A. The lube filter element is clogged (needs servicing) when the red button is extended from the surface of the oil filter indicator. If the red button is flush with or below the surface of the oil filter indicator, the lube filter element is not clogged (serviceable).
- B. This procedure has the task to do the servicing of the oil filter indicator on the lube filter housing.
- C. When you replace the lube filter element, the oil filter indicator will be put back to the serviceable condition.

TASK 49-91-13-600-801

2. Oil Filter Indicator Servicing

(Figure 301)

A. **References**

Reference	Title
49-91-12-000-801	Lube Filter Element Removal (P/B 401)
49-91-12-400-801	Lube Filter Element Installation (P/B 401)
49-91-13-000-801	Oil Filter Indicator Removal - Lube Filter Housing (P/B 401)
49-91-13-400-801	Oil Filter Indicator Installation - Lube Filter Housing (P/B 401)
49-91-81-200-801	Magnetic Drain Plug Inspection (P/B 601)

B. **Location Zones**

Zone	Area
316	APU Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Servicing of the Oil Filter Indicator**

SUBTASK 49-91-13-010-001

- (1) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

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E. Procedure

SUBTASK 49-91-13-610-001

- (1) Do these steps to put the red button [3] of the oil filter indicator [1] on the lube filter housing [2] back to the serviceable condition (Figure 301):
 - (a) Make sure the red button [3] is extended.
 - (b) Do this task: Magnetic Drain Plug Inspection, TASK 49-91-81-200-801.
 - (c) Replace the lube filter element.
Do these tasks:
 - Lube Filter Element Removal, TASK 49-91-12-000-801,
 - Lube Filter Element Installation, TASK 49-91-12-400-801.

NOTE: When you replace the lube filter element, the oil filter indicator [1] will be put back to the serviceable condition.
 - (d) If the red button [3] extends again, replace the oil filter indicator [1] on the lube filter housing [2]. These are the tasks:
 - Oil Filter Indicator Removal - Lube Filter Housing, TASK 49-91-13-000-801,
 - Oil Filter Indicator Installation - Lube Filter Housing, TASK 49-91-13-400-801.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-13-410-001

- (1) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— **END OF TASK** —————

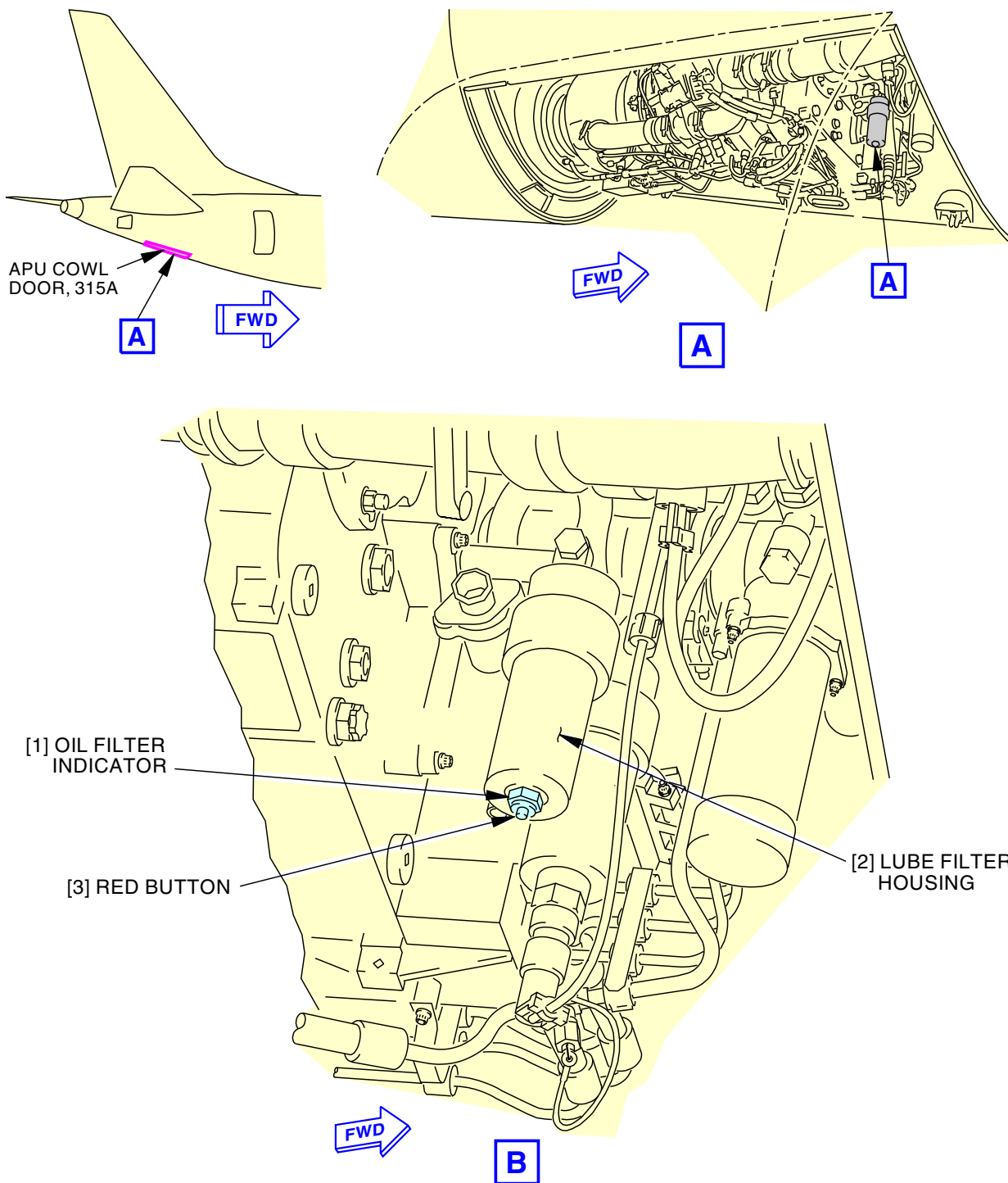
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Oil Filter Indicator Servicing
Figure 301/49-91-13-990-803

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OIL FILTER INDICATOR - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has four tasks:
- (1) A removal of the oil filter indicator (lube filter housing)
 - (2) An installation of the oil filter indicator (lube filter housing)
 - (3) A removal of the oil filter indicator (starter-generator filter housing)
 - (4) An installation of the oil filter indicator (starter-generator filter housing).
- B. There are two oil filter indicators on the APU. One oil filter indicator is installed on the lube filter housing. The other oil filter indicator is installed on the starter-generator filter housing.
- C. The oil filter indicator on the starter-generator filter housing is also referred to as the filter bypass switch for the starter-generator.

TASK 49-91-13-000-801

2. **Oil Filter Indicator Removal - Lube Filter Housing**

(Figure 401)

A. **References**

Reference	Title
49-91-12-000-801	Lube Filter Element Removal (P/B 401)

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. **Prepare for the Removal**

SUBTASK 49-91-13-020-001

- (1) Do this task: Lube Filter Element Removal, TASK 49-91-12-000-801.

D. **Oil Filter Indicator Removal**

SUBTASK 49-91-13-020-002



DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

- (1) Do these steps to remove the oil filter indicator [1] for the lube filter housing:
 - (a) Remove the retaining ring [7] that attaches the oil filter indicator [1] to the lube filter housing.
 - (b) Remove the oil filter indicator [1].
 - (c) Remove the packing [8] from the oil filter indicator [1].
 - 1) Discard the packing [8].
 - (d) Make sure you install all the necessary protection covers.

———— **END OF TASK** ————

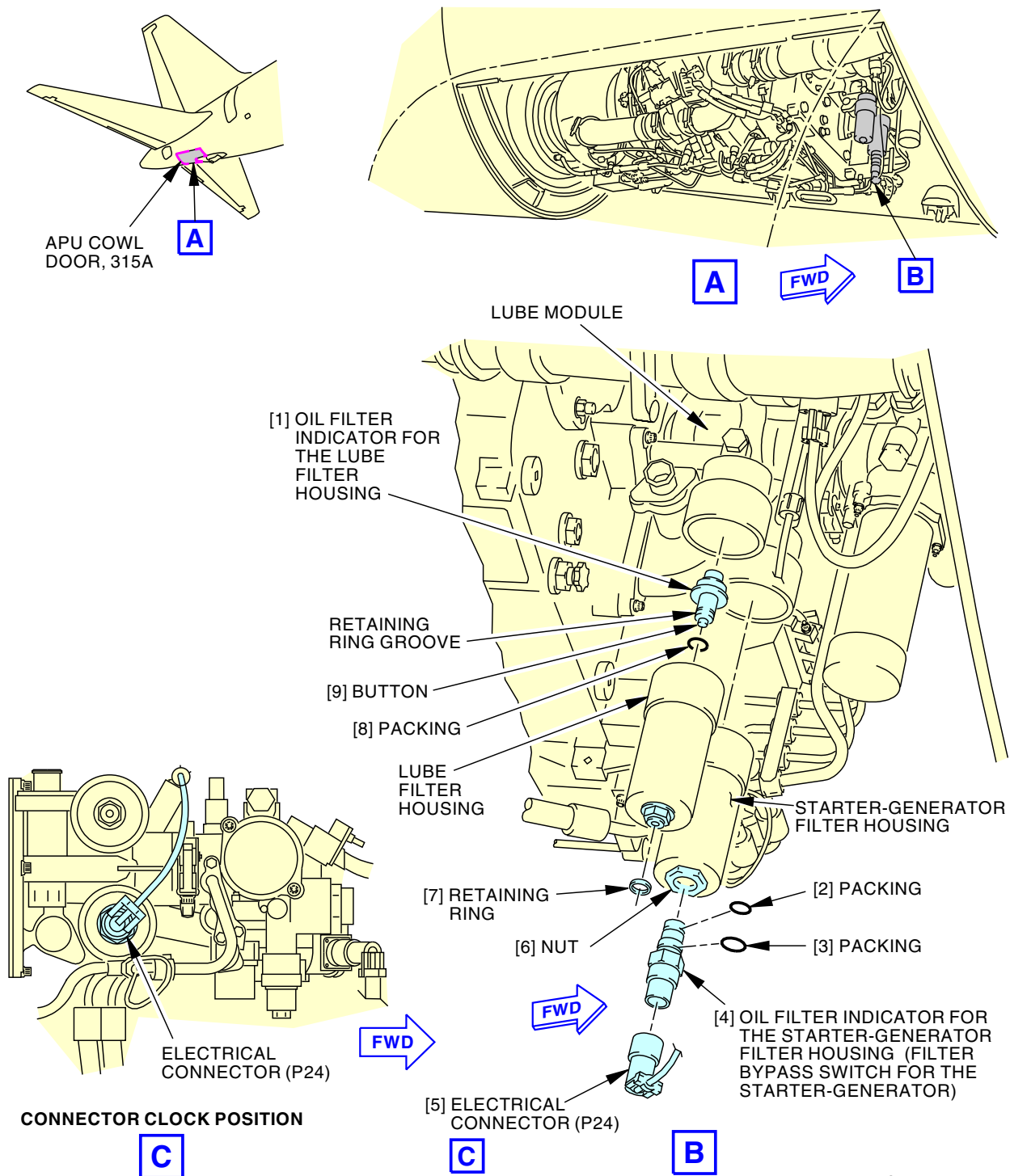
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Oil Filter Indicator Installation
Figure 401/49-91-13-990-801

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TASK 49-91-13-400-801

3. **Oil Filter Indicator Installation - Lube Filter Housing**

(Figure 401)

A. References

Reference	Title
49-91-12-400-801	Lube Filter Element 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
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CLA)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oil filter indicator	49-91-13-01-060	SIA ALL
8	Packing	49-91-13-01-070	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Oil Filter Indicator Installation - Lube Filter Housing

SUBTASK 49-91-13-110-001

(1) Do these steps to clean the lube filter housing:

- (a) Clean the lube filter housing 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 lube filter housing.
 - 1) Use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the lube filter housing.

SUBTASK 49-91-13-420-001



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

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(CAUTION PRECEDES)



CAUTION

DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

- (2) Do these steps to install the oil filter indicator [1] for the lube filter housing:
- (a) Lubricate the new packing [8] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (b) Install the packing [8] on the oil filter indicator [1].
 - (c) Put the oil filter indicator [1] in the lube filter housing.
 - (d) Push the oil filter indicator [1] into the lube filter housing until the retaining ring groove shows on the outer surface of the lube filter housing.
 - (e) Install the retaining ring [7] on the retaining ring groove.
 - (f) Push the button [9] in to put the oil filter indicator [1] back to the serviceable condition.

NOTE: You must turn the lube filter housing with the opening in the down position to push in the button [9]. A locking ball in the oil filter indicator [1] will not let the button [9] be pushed in if the opening is in the up position.

NOTE: There are three locations on the lube filter housing with an etched "INVERT TO RESET" marking.

SUBTASK 49-91-13-420-002

- (3) Do this task: Lube Filter Element Installation, TASK 49-91-12-400-801.

————— **END OF TASK** —————

TASK 49-91-13-000-802

4. Oil Filter Indicator Removal - Starter-Generator Filter Housing

(Figure 401)

A. References

Reference	Title
49-91-12-000-802	Starter-Generator Filter Element Removal (P/B 401)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

C. Prepare for the Removal

SUBTASK 49-91-13-020-003

- (1) Do this task: Starter-Generator Filter Element Removal, TASK 49-91-12-000-802.

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D. Oil Filter Indicator Removal

SUBTASK 49-91-13-020-004



DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

- (1) Do these steps to remove the oil filter indicator [4] for the starter-generator filter housing:
- (a) Hold the nut [6] on the starter-generator filter housing while you loosen the nut on the oil filter indicator [4].
NOTE: The oil filter indicator [4] is also referred to as the filter bypass switch for the starter-generator.
 - (b) Remove the oil filter indicator [4].
 - (c) Remove the packing [2] and packing [3] from the oil filter indicator [4].
 - 1) Discard the packing [2] and packing [3].
 - (d) Make sure you install all necessary protection covers.

————— END OF TASK —————

TASK 49-91-13-400-802

5. Oil Filter Indicator Installation - Starter-Generator Filter Housing

(Figure 401)

A. References

Reference	Title
49-91-12-400-802	Starter-Generator Filter Element 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
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-91-13-01-075	SIA ALL
3	Packing	49-91-13-01-080	SIA ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Oil filter indicator	49-91-13-01-065	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Oil Filter Indicator Installation - Starter-Generator Filter Housing

SUBTASK 49-91-13-110-002

- (1) Do these steps to clean the starter-generator filter housing:
 - (a) Clean the starter-generator filter housing 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 starter-generator filter housing.
 - 1) It is recommended that you use a pressure of 75 ± 15 psig (517 ± 104 kPa) of air or nitrogen to dry the starter-generator filter housing.

SUBTASK 49-91-13-420-003



REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.



DO NOT USE MAGNETIC TOOLS AROUND THE OIL FILTER INDICATOR. THERE ARE INTERNAL MAGNETS IN THE OIL FILTER INDICATOR. DAMAGE TO THE OIL FILTER INDICATOR CAN OCCUR.

- (2) Do these steps to install the oil filter indicator [4] for the starter-generator filter housing:
 - (a) Lubricate the new packing [2] and new packing [3] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (b) Install the packing [3] on the oil filter indicator [4].

NOTE: The oil filter indicator [4] is also referred to as the filter bypass switch for the starter-generator.
 - (c) Install the packing [2] on the oil filter indicator [4].
 - (d) Put the oil filter indicator [4] in the starter-generator filter housing.
 - (e) Hold the nut [6] on the starter-generator filter housing while you tighten the nut on the oil filter indicator [4] to 115 ± 5 in-lb (13.0 ± 0.6 N·m).
 - (f) Install the MS20995C32 lockwire, G01048, to the nut on the oil filter indicator [4].

SUBTASK 49-91-13-420-004

- (3) Do this task: Starter-Generator Filter Element Installation, TASK 49-91-12-400-802.
 - (a) Make sure the oil filter indicator [4] aligns with the electrical connector [5] (P24) at the 2 o'clock position.

————— END OF TASK —————

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OIL FILTER INDICATOR - INSPECTION/CHECK

1. General

A. This procedure has the task to do an inspection of the oil filter indicator on the lube filter housing.

TASK 49-91-13-200-801

2. Oil Filter Indicator Inspection

(Figure 601)

A. References

Reference	Title
49-91-13-600-801	Oil Filter Indicator Servicing (P/B 301)

B. Location Zones

Zone	Area
316	APU Compartment - Right

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Inspection

SUBTASK 49-91-13-010-002

(1) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Oil Filter Indicator Inspection

SUBTASK 49-91-13-210-001

- (1) Do these steps to inspect the oil filter indicator [1] on the lube filter housing [2]:
 - (a) Visually examine the red button [3] on the oil filter indicator [1].
 - (b) If the red button [3] on the oil filter indicator [1] has extended, do this task: Oil Filter Indicator Servicing, TASK 49-91-13-600-801.

NOTE: The lube filter element is clogged when the red button [3] is extended from the surface of the oil filter indicator [1]. If the red button [3] is flush with or below the surface of the oil filter indicator [1], the lube filter element is not clogged.

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- (c) If the red button [3] on the oil filter indicator [1] has not extended, the oil filter indicator [1] is satisfactory.

NOTE: The lube filter element is not clogged.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-13-410-002

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

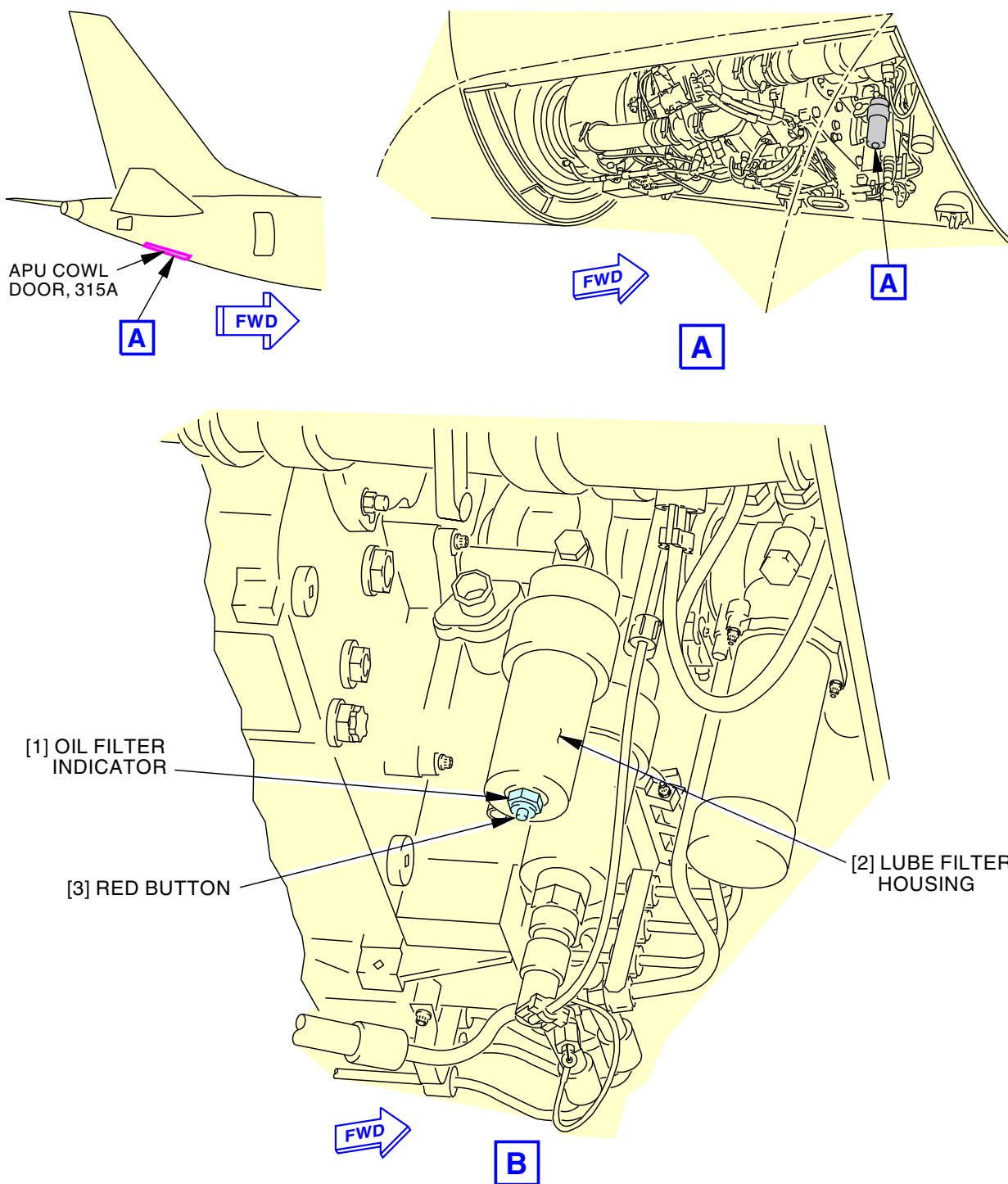
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Oil Filter Indicator Inspection
Figure 601/49-91-13-990-802

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TEMPERATURE CONTROL VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the temperature control valve
 - (2) An installation of the temperature control valve.
- B. The temperature control valve is installed on the APU gearbox.

TASK 49-91-21-000-801

2. Temperature Control Valve Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-91-21-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-21-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Temperature Control Valve Removal

SUBTASK 49-91-21-020-001



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 disconnect the supply tube [1] and return tube [2] for the oil cooler:
 - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the APU gearbox.
 - (b) Loosen the two nuts [4] that attach the supply tube [1] and return tube [2] for the oil cooler to the temperature control valve [3].
 - (c) Turn the two tube retainers on the supply tube [1] and return tube [2] in the counterclockwise direction until the flanges disengage from the two studs.
 - (d) Disconnect the supply tube [1] and return tube [2] from the temperature control valve [3].
 - (e) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, to drain the oil from the supply tube [1] and return tube [2].
 - (f) Remove the four packings [5] from the supply tube [1] and return tube [2].
 - 1) Discard the four packings [5].

SUBTASK 49-91-21-020-002

- (2) Do these steps to remove the temperature control valve [3]:
 - (a) Loosen the two nuts [7] that attach the temperature control valve [3] to the APU gearbox.
 - (b) Turn the temperature control valve [3] in the clockwise direction until the flanges disengage from the two studs.
 - (c) Remove the temperature control valve [3].
 - (d) Use the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, to drain the oil from the temperature control valve [3].
 - (e) Make sure you install all necessary protection covers.
 - (f) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-91-21-020-003

- (3) Do these steps to remove the seal plate [8] for the temperature control valve [3]:

NOTE: It is necessary to replace the seal plate [8] if you find signs of oil leakage around the temperature control valve [3].

 - (a) Remove the two screws [6] that attach the seal plate [8] to the temperature control valve [3].
 - (b) Remove the seal plate [8].

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- 1) Replace the seal plate [8] if you find damage that can cause an oil leakage.

———— **END OF TASK** ————

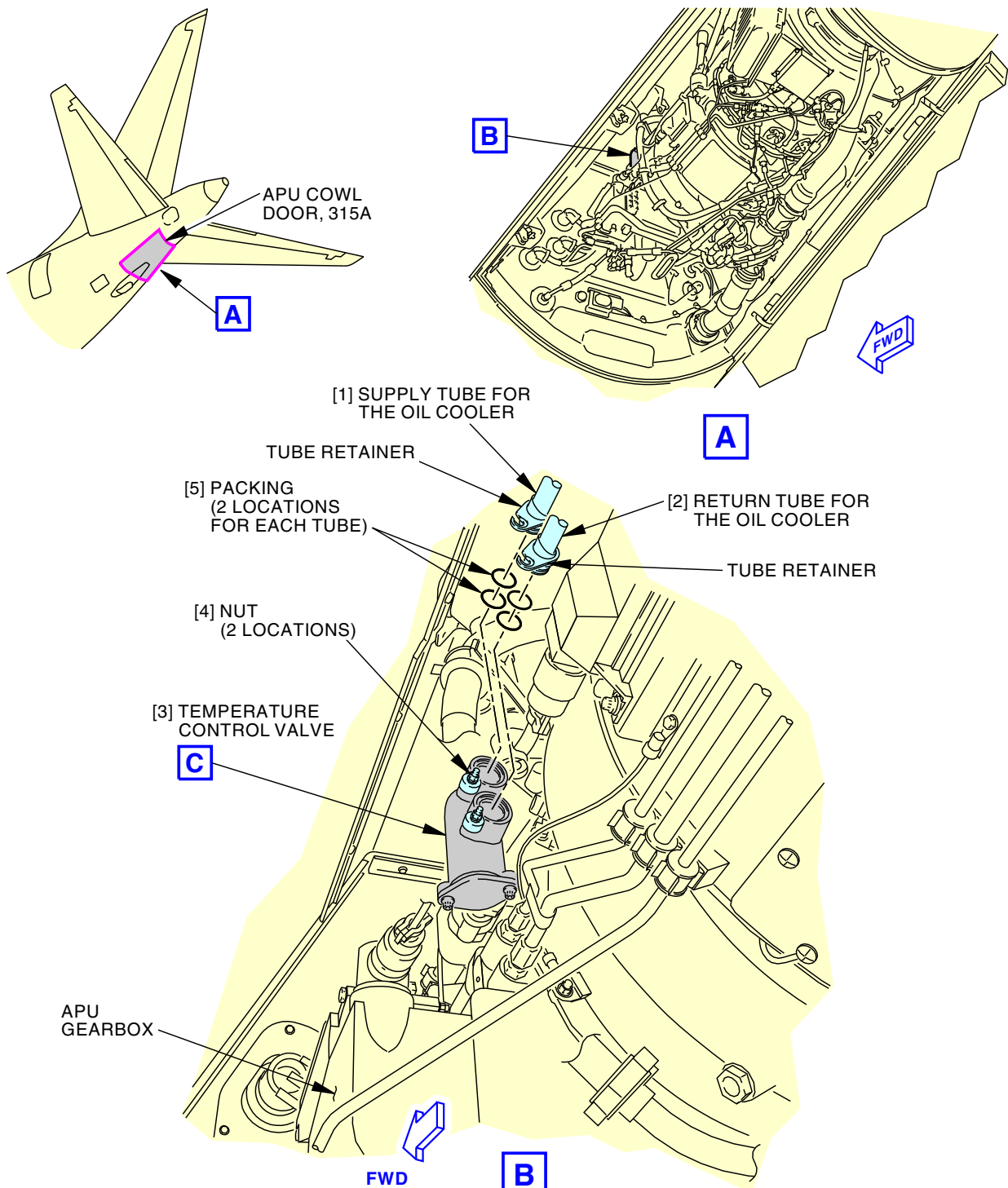
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Temperature Control Valve Installation
Figure 401/49-91-21-990-801 (Sheet 1 of 2)

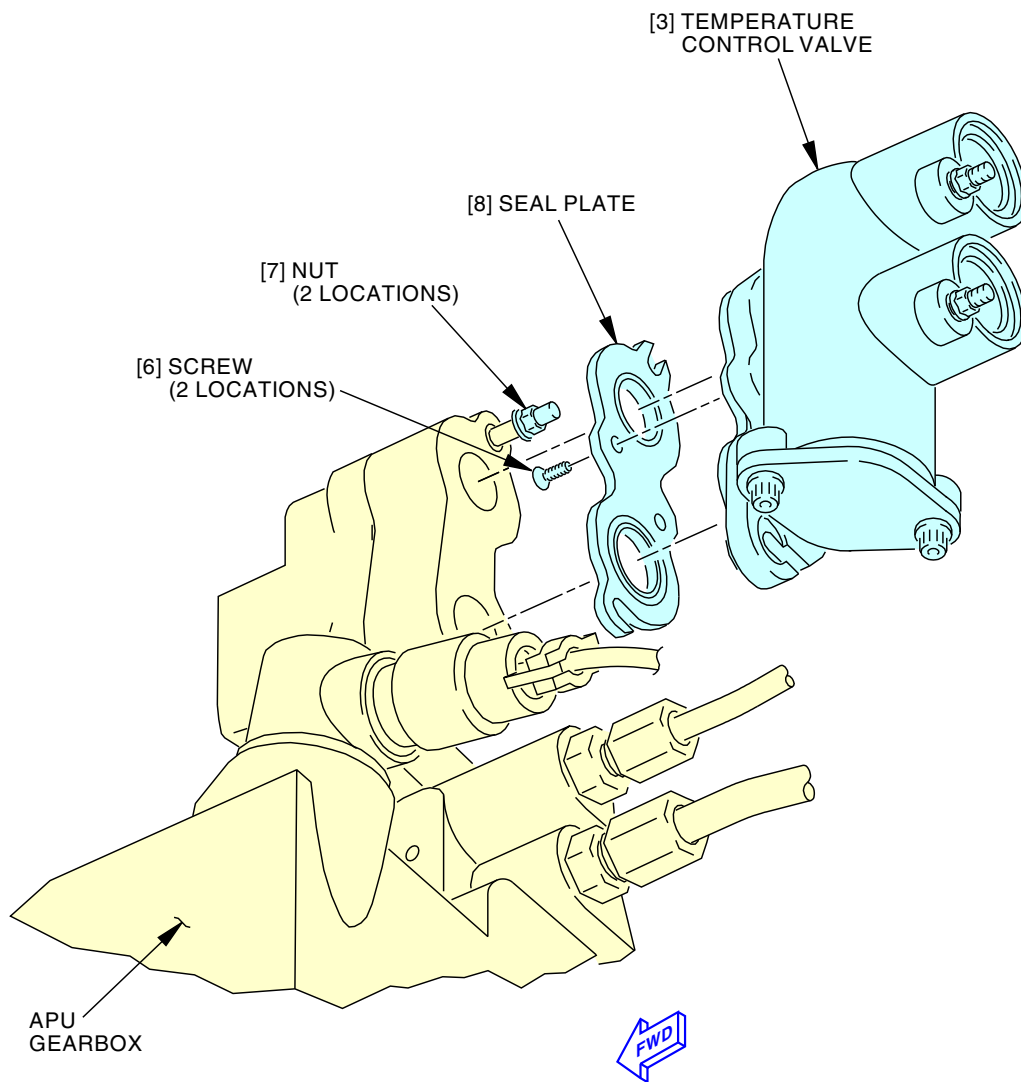
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Temperature Control Valve Installation
Figure 401/49-91-21-990-801 (Sheet 2 of 2)

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TASK 49-91-21-400-801

3. Temperature Control Valve Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Temperature control valve	49-91-21-01-045	SIA ALL
5	Packing	49-91-21-01-015	SIA ALL
8	Seal plate	49-91-21-01-005	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Temperature Control Valve Installation

SUBTASK 49-91-21-420-001

- (1) If the seal plate [8] was removed from the temperature control valve [3], install the seal plate [8]:
 - (a) Lubricate the new seal plate [8] with a light coat of aircraft turbine engine oil, D50055.
 - (b) Install the seal plate [8] on the temperature control valve [3] with the two screws [6].
 - 1) Tighten the two screws [6] to 32 ±2 in-lb (3.6 ±0.2 N·m).

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SUBTASK 49-91-21-420-002



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the temperature control valve [3]:
 - (a) If the seal plate [8] is not lubricated, lubricate the seal plate [8] with a light coat of aircraft turbine engine oil, D50055.
 - (b) Install the temperature control valve [3] on the APU gearbox.
 - (c) Make sure the top flange of the temperature control valve [3] engages the top stud.
 - (d) Turn the temperature control valve [3] in the counterclockwise direction until the bottom flange fully engages the bottom stud.
 - (e) Tighten the two nuts [7] to 40 in-lb (4.5 N·m).

SUBTASK 49-91-21-420-003

- (3) Do these steps to connect the supply tube [1] and return tube [2] for the oil cooler:
 - (a) Lubricate the four new packings [5] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (b) Install the four packings [5] on the supply tube [1] and return tube [2].
 - (c) Connect the supply tube [1] and return tube [2] to the temperature control valve [3].
 - (d) Turn the two tube retainers on the supply tube [1] and return tube [2] in the clockwise direction until the flanges engage the two studs.
 - (e) Tighten the two nuts [4] to 40 in-lb (4.5 N·m).

H. Temperature Control Valve Installation Test

SUBTASK 49-91-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-21-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-21-710-001

- (3) Do the installation test for the temperature control valve [3]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the temperature control valve [3] for signs of oil leakage.
 - (d) If you find oil leakage, do these steps to repair the leakage:

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- 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the temperature control valve [3] for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again.
- (e) Make sure the BUS TRANS switch on the P5 forward overhead panel is in the AUTO position.
- (f) Make sure the APU GEN OFF BUS light on the P5 forward overhead panel is on.
- (g) Set the two APU GEN switches on the P5 forward overhead panel to the ON position.
- (h) Put a maximum electrical load on the APU starter-generator.
- (i) Operate the APU in the loaded condition for 15 minutes.
- (j) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
- 1) Look at the maintenance page for the APU oil temperature (OIL TEMP).
 - a) With an electrical load applied on the APU, the oil temperature is less than 250°F (121°C).
 - 2) If maintenance message(s) show for the APU lubrication system, go to IFIM and do the applicable procedure(s).
- (k) Remove the electrical load from the APU starter-generator.
- (l) Set the two APU GEN switches to the OFF position.
- (m) Operate the APU in the no load condition for a minimum of one minute.
- (n) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-91-21-640-001

- (4) Make sure the APU oil system is full.
- (a) To do a check of the oil level, do this task: TASK 12-13-31-200-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-21-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.

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- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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OIL COOLER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the oil cooler
 - (2) Installation of the oil cooler.
- B. The oil cooler is installed on the eductor housing.

TASK 49-91-41-000-801

2. Oil Cooler Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-91-41-860-001

- (1) Make sure that the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel, is OFF.
 - (a) Install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-41-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-41-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

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- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Oil Cooler Removal

SUBTASK 49-91-41-020-001



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 GOGGLE AND PROTECTIVE EQUIPMENT OR LET THE APU BECOME COOL. LET 5 MINUTES GO BY AFTER AN APU SHUTDOWN TO LET THE OIL SYSTEM PRESSURE GO TO ZERO. IF YOU OPEN THE OIL SYSTEM WHEN IT HAS PRESSURE, A SPRAY OF HOT OIL CAN BURN YOU.



DO NOT LET 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 these steps to disconnect the supply tube [1] and return tube [3] for the oil cooler [7]:
 - (a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the oil cooler [7].
 - (b) Loosen the nut [6] that attaches the supply tube [1] to the oil cooler [7].
 - (c) Turn the tube retainer on the supply tube [1] in the counterclockwise direction until the flange disengages from the stud.
 - (d) Loosen the nut [5] that attaches the return tube [3] to the oil cooler [7].
 - (e) Turn the tube retainer on the return tube [3] in the counterclockwise direction until the flange disengages from the stud.
 - (f) Disconnect the supply tube [1] from the oil cooler [7].
 - (g) Disconnect the return tube [3] from the oil cooler [7].
 - (h) Drain the oil from the supply tube [1] and return tube [3] into the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.
 - (i) Remove the two packings [2] and two packings [4] from the supply tube [1] and return tube [3].
 - 1) Discard the two packings [2] and two packings [4].

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- (j) Install all the necessary protection covers.

SUBTASK 49-91-41-020-002

- (2) Do these steps to remove the oil cooler [7]:

- (a) Install the plugs or covers in the oil cooler [7] ports.

NOTE: This will prevent oil spillage as the oil cooler is removed. The oil will be drained from the oil cooler after it is removed.

- (b) Loosen the eight bolts [11] that attach the oil cooler [7] to the eductor housing.

- (c) Push up on the oil cooler [7] until the oil cooler flange disengages from the eductor housing flange.

- (d) Remove the oil cooler [7].

NOTE: The oil cooler with the oil weighs approximately 20 lb (9 kg).

- (e) Remove the plugs or covers from the oil cooler [7] ports.

- (f) Drain the oil from the oil cooler [7] into the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

- (g) Make sure that all necessary protection covers are installed.

- (h) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 49-91-41-020-003

- (3) Do these steps to remove the fire shield [9] for the oil cooler [7]:

NOTE: The fire shield is removed so that it can be reinstalled on the new oil cooler.

- (a) Remove the three screws [12] that attach the fire shield [9] to the oil cooler [7].

- (b) Remove the two bolts [10] that attach the two brackets [8] to the oil cooler [7].

- (c) Remove the fire shield [9] and the two brackets [8].

- (d) Keep the fire shield [9] to install again on the new oil cooler [7].

———— **END OF TASK** ————

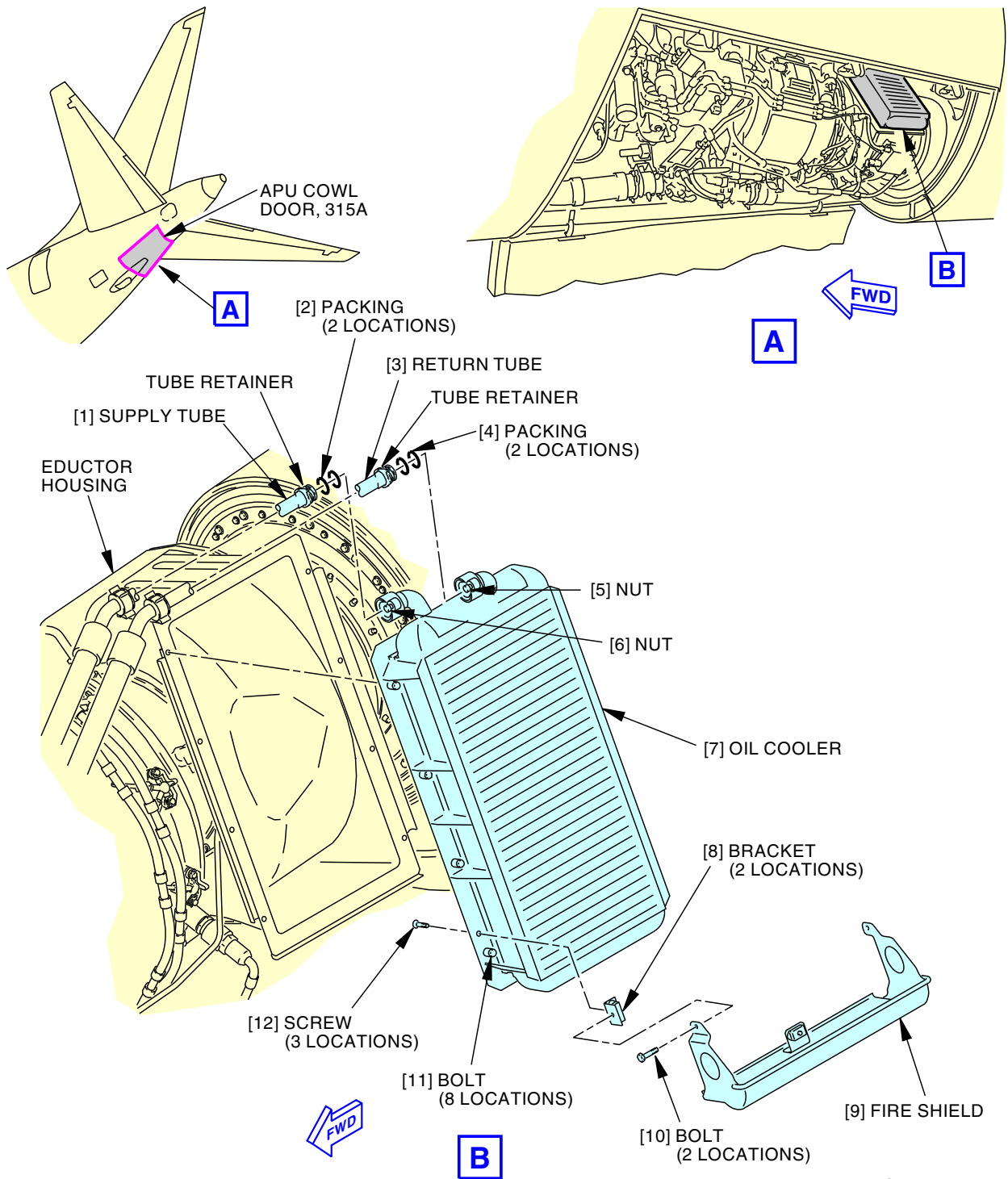
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Oil Cooler Installation
Figure 401/49-91-41-990-801

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TASK 49-91-41-400-801

3. Oil Cooler Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-91-41-200-801	Oil Cooler Inspection (P/B 601)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-91-21-01-015	SIA ALL
4	Packing	49-91-21-01-015	SIA ALL
7	Oil cooler	49-91-41-01-035	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Oil Cooler Installation

SUBTASK 49-91-41-420-001

- (1) Do these steps to install the fire shield [9] to the new or serviceable oil cooler [7]:
 - (a) Install the two brackets [8] and fire shield [9] on the oil cooler [7] with the two bolts [10].
 - 1) Tighten the two bolts [10] to 30 in-lb (3.4 N·m).
 - (b) Install the three screws [12] that attach the two brackets [8] and fire shield [9] to the oil cooler [7].
 - 1) Tighten the three screws [12] to 22 in-lb (2.5 N·m).

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SUBTASK 49-91-41-420-002



CAUTION

REMOVE ANY INSTALLED PROTECTION COVERS FROM THE OPENINGS. IF YOU DO NOT REMOVE THE PROTECTION COVERS, DAMAGE TO THE APU CAN OCCUR.

- (2) Do these steps to install the oil cooler [7]:



CAUTION

DO NOT MIX TWO TYPES OF OIL WHEN YOU ADD THE OIL IN THE APU. IT IS PERMITTED TO MIX DIFFERENT BRANDS OF OIL WITH THE SAME TYPE OF OIL WHEN YOU ADD THE OIL IN THE APU. A MIXTURE OF TWO TYPES OF OIL IN THE APU CAN CAUSE DAMAGE TO THE APU.



CAUTION

BE CAREFUL NOT TO OVERFILL THE OIL COOLER TO PREVENT AN OIL SPILL. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (a) Slowly fill the oil cooler [7] with 2.0 qt (1.9 l) of the same type of oil that was previously in the oil cooler [7].
- NOTE: The oil capacity of the oil cooler [7] is 2.4 qt (2.3 l).
- (b) Install the plugs or covers in the oil cooler [7] ports to prevent an oil spill.
- (c) Install the oil cooler [7] on the eductor housing.
- (d) Make sure the flange on the bottom of the oil cooler [7] engages the eductor housing flange.
- (e) Tighten the eight bolts [11] to 50 in-lb (5.6 N·m).

SUBTASK 49-91-41-420-003

- (3) Do these steps to connect the supply tube [1] and return tube [3] for the oil cooler [7]:
- (a) Remove the plugs or covers from the oil cooler [7] ports.
- (b) Lubricate the two new packings [2] and two new packings [4] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
- (c) Install the two packings [2] on the supply tube [1].
- (d) Install the two packings [4] on the return tube [3].
- (e) Connect the return tube [3] to the oil cooler [7].
- (f) Connect the supply tube [1] to the oil cooler [7].
- (g) Turn the tube retainer on the supply tube [1] in the clockwise direction until the flange engages the stud.
- (h) Tighten the nut [6] to 40 in-lb (4.5 N·m).
- (i) Turn the tube retainer on the return tube [3] in the clockwise direction until the flange engages the stud.
- (j) Tighten the nut [5] to 40 in-lb (4.5 N·m).

SUBTASK 49-91-41-610-001

- (4) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

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H. Oil Cooler Installation Test

SUBTASK 49-91-41-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-41-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel.

SUBTASK 49-91-41-790-001

- (3) Do the installation test for the oil cooler [7]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the oil cooler [7] for signs of oil leakage.
 - (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage (TASK 49-91-41-200-801).
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the oil cooler [7] for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again (TASK 49-91-41-200-801).
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 49-91-41-610-002

- (4) Do this task: APU Oil Level Inspection, TASK 12-13-31-200-801.

SUBTASK 49-91-41-610-003

- (5) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-41-410-001

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.

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- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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OIL COOLER - INSPECTION/CHECK

1. **General**

- A. This procedure has this task:
(1) An inspection of the oil cooler.
B. The oil cooler is installed on the eductor housing.

TASK 49-91-41-200-801

2. **Oil Cooler Inspection**

(Figure 601)

A. **General**

- (1) The oil cooler is not removed from the Auxiliary Power Unit (APU) for this task.

B. **References**

Reference	Title
49-91-41-000-801	Oil Cooler Removal (P/B 401)
49-91-41-400-801	Oil Cooler Installation (P/B 401)

C. **Tools/Equipment**

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1087	Source - Steam, Saturated

D. **Consumable Materials**

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

E. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-91-21-01-015	SIA ALL
4	Packing	49-91-21-01-015	SIA ALL
7	Oil cooler	49-91-41-01-035	SIA ALL

F. **Location Zones**

Zone	Area
315	APU Compartment - Left
316	APU Compartment - Right

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G. Access Panels

Number	Name/Location
315A	APU Cowl Door

H. Prepare for the Inspection

SUBTASK 49-91-41-010-002

- (1) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

I. Oil Cooler Inspection

SUBTASK 49-91-41-210-001

- (1) Do these steps to inspect the oil cooler [7]:
- (a) Visually examine the oil cooler [7], supply tube [1], and return tube [3] for oil leakage.
 - 1) Examine all the areas of the oil cooler [7] that can be seen (without removal of the oil cooler [7]).
 - 2) Replace the oil cooler [7] if signs of oil leakage are found, do these tasks:
 - Oil Cooler Removal, TASK 49-91-41-000-801
 - Oil Cooler Installation, TASK 49-91-41-400-801.
 - 3) If signs of oil leakage from the supply tube [1] are found, repair the oil leakage:
 - a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the oil cooler [7].
 - b) Loosen the nut [6] that attaches the supply tube [1].
 - c) Turn the tube retainer on the supply tube [1] in the counterclockwise direction until the flange disengages from the stud.
 - d) Disconnect the supply tube [1] from the oil cooler [7].
 - e) Drain the oil from the supply tube [1] into the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.
 - f) Remove the packings [2] from the supply tube [1].
 - g) Discard the packings [2].
 - h) Lubricate the new packings [2] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.

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- i) Install the packings [2] on the supply tube [1].
 - j) Connect the supply tube [1] to the oil cooler [7].
 - k) Turn the tube retainer on the supply tube [1] in the clockwise direction until the flange engages with the stud.
 - l) Tighten the nut [6] to 40 in-lb (4.5 N·m).
 - m) If signs of oil leakage are found again, repair or replace the supply tube [1].
 - n) Replace the oil cooler [7] if signs of oil leakage are found again, do these tasks:
 - Oil Cooler Removal, TASK 49-91-41-000-801
 - Oil Cooler Installation, TASK 49-91-41-400-801.
- 4) If signs of oil leakage from the return tube [3] are found, repair the oil leakage:
- a) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the oil cooler [7].
 - b) Loosen the nut [5] that attaches the return tube [3].
 - c) Turn the tube retainer on the return tube [3] in the counterclockwise direction until the flange disengages from the stud.
 - d) Disconnect the return tube [3] from the oil cooler [7].
 - e) Drain the oil from the return tube [3] into the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.
 - f) Remove the packings [4] from the return tube [3].
 - g) Discard the packings [4].
 - h) Lubricate the new packings [4] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - i) Install the packings [4] on the return tube [3].
 - j) Connect the return tube [3] to the oil cooler [7].
 - k) Turn the tube retainer on the return tube [3] in the clockwise direction until the flange engages with the stud.
 - l) Tighten the nut [5] to 40 in-lb (4.5 N·m).
 - m) If signs of oil leakage are found again, repair or replace the return tube [3].
 - n) Replace the oil cooler [7] if signs of oil leakage are found again, do these tasks:
 - Oil Cooler Removal, TASK 49-91-41-000-801
 - Oil Cooler Installation, TASK 49-91-41-400-801.
- (b) Visually examine the oil cooler [7] for missing and damaged parts.
- 1) If missing or damaged parts are found, install the missing parts or replace the damaged parts.
- (c) Visually examine these components of the oil cooler [7]:
- 1) Air fins for bends.
 - a) Needle-nosed pliers can be used to make the air fins straight if the following conditions are true:
 - <1> On any one row, less than 50% of fins are folded
 - <2> There are no adjacent rows of folded fins

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- <3> The total number of folded fins is less than the equivalent of one row
- <4> Access to the folded fins can be gotten.
- 2) Two side plates for gouges and dents:
- a) Gouges 0.03 in. (0.76 mm) or less in depth
 - b) Gouges 4.2 in. (106.7 mm) or less in length
 - c) The width of the gouges is 0.65 in. (16.51 mm) or less
 - d) Dents 0.06 in. (1.52 mm) or less in depth
 - e) Dents not longer than the width of the side plate.
 - f) Replace the oil cooler [7] if the visual inspection is not in the limits, do these tasks:
 - Oil Cooler Removal, TASK 49-91-41-000-801
 - Oil Cooler Installation, TASK 49-91-41-400-801.
- (d) Visually examine the oil cooler [7] for cracks, blockage of unwanted materials, and surface contamination.
- 1) No cracks are permitted.
 - 2) If blockage of unwanted materials is found, remove the blockage.
 - 3) If external surface contamination is found, clean the oil cooler [7]:
 - a) Clean the surfaces of the oil cooler [7] with alcohol, B00130, and cotton wiper, G00034.
 - b) Use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surfaces of the oil cooler [7].
 - 4) If more than 25 percent of the total area for the air fins on the oil cooler [7] with internal surface contamination and blockage of unwanted materials are found, replace the oil cooler [7] or steam clean the oil cooler [7], do these tasks:
 - Oil Cooler Removal, TASK 49-91-41-000-801
 - Oil Cooler Installation, TASK 49-91-41-400-801.
 - a) Do these steps to steam clean the oil cooler [7]:
 - <1> Do this task: Oil Cooler Removal, TASK 49-91-41-000-801.
 - <2> Make sure that the plugs or covers are installed in the oil cooler [7] ports and tape, as necessary, to prevent any internal contamination.



MAKE SURE THAT THE STEAM PRESSURE DOES NOT CAUSE DAMAGE OR BEND THE ALUMINUM FINS ON THE OIL COOLER. DAMAGE TO THE OIL COOLER CAN OCCUR.

- <3> Use the steam source, STD-1087, to clean the surfaces of the air fins and oil cooler [7].
- <a> Steam clean with a pressure high enough to be effective but not more than 70 psig (483 kPa).
- <4> Clean the surfaces of the air fins and oil cooler [7].
- <a> Remove the unwanted water with alcohol, B00130, and cotton wiper, G00034.

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- <5> Use a pressure of 75 ±15 psig (517 ±104 kPa) of air or nitrogen with a compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to dry the surfaces of the oil cooler [7].
- <6> Do this task: Oil Cooler Installation, TASK 49-91-41-400-801.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-41-410-002

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

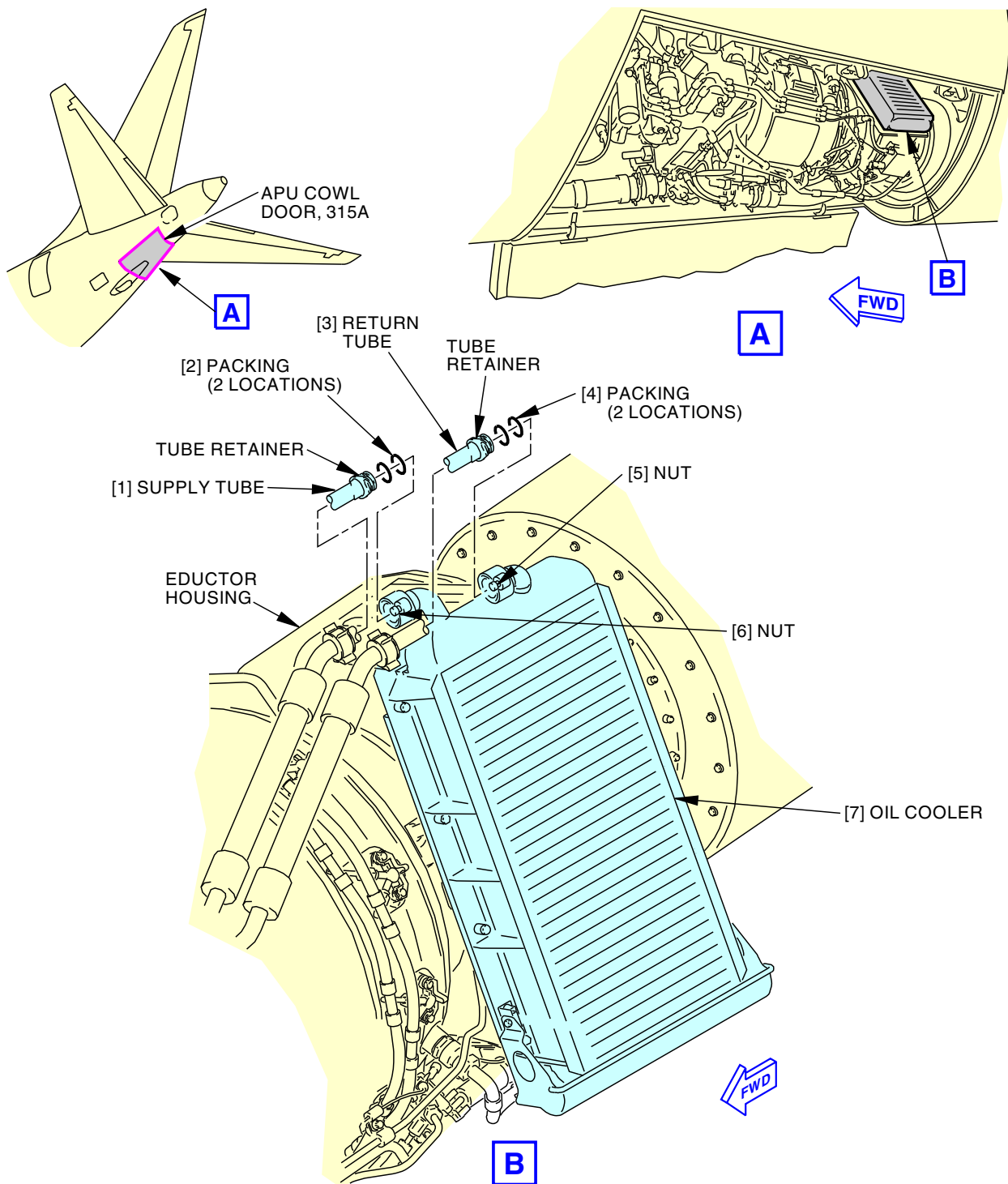
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Oil Cooler Inspection
Figure 601/49-91-41-990-802

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EDUCTOR INLET DUCT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the eductor inlet duct
 - (2) An installation of the eductor inlet duct.
- B. The eductor inlet duct is installed between the 1088 bulkhead and the APU air inlet duct.
- C. The eductor moves air through the oil cooler to control oil temperature. It also takes in the ambient air to cool the APU compartment.

TASK 49-91-71-000-801

2. Eductor Inlet Duct Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-765	Scraper - Plastic
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-91-71-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-71-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

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SUBTASK 49-91-71-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.

- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.

- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.

- (f) Disconnect the two hold-open rods from the two spring clips.

- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.

- (h) Install the two retainer pins in the two rod ends.

E. Eductor Inlet Duct Removal

SUBTASK 49-91-71-020-001

- (1) Do these steps to remove the eductor inlet duct:

NOTE: The eductor inlet duct will be removed in three sections: first the mid eductor duct [2] (double flanged), then the aft eductor duct [1], and finally the forward eductor duct [3] will be removed.

- (a) Remove the two sets of 14 (28 total) bolts [4] and washers [5] that attach the mid eductor duct [2] (double flanged) to the forward eductor duct [3] (View D-D) and aft eductor duct [1] (View C-C).

- (b) Remove the mid eductor duct [2].

- (c) Remove the two sets of three (six total) bolts [6] and washers [7] that attach the aft eductor duct [1] to the 1088 pressure bulkhead (View B-B).

- (d) Use a plastic scraper, STD-765, to break the fillet seal between the aft eductor duct [1] (View A-A) and the instrumented (elbow) duct.

- (e) Use a plastic scraper, STD-765, to break the fillet seal between the forward eductor duct [3] and the air inlet (View E-E).

- (f) Remove the aft eductor duct [1].

- (g) Remove the forward eductor duct [3] section.

- (h) Install protective covers on the duct openings.

————— **END OF TASK** —————

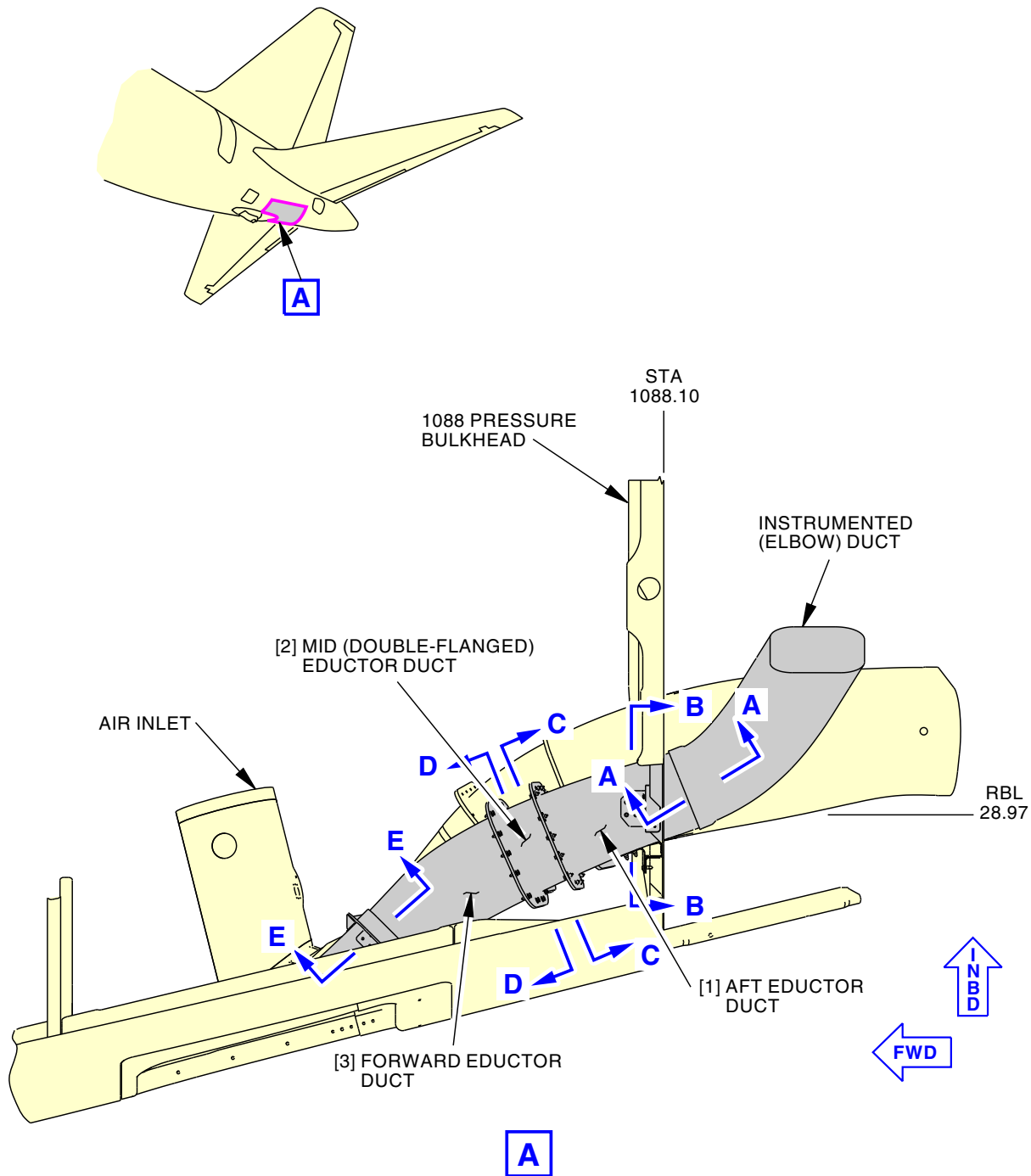
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Educator Inlet Duct Installation
Figure 401/49-91-71-990-801 (Sheet 1 of 3)

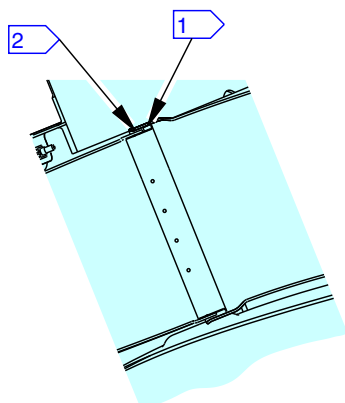
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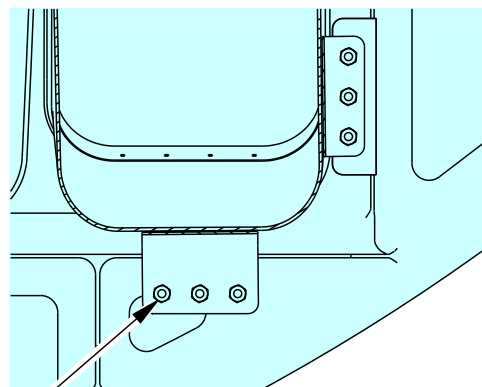
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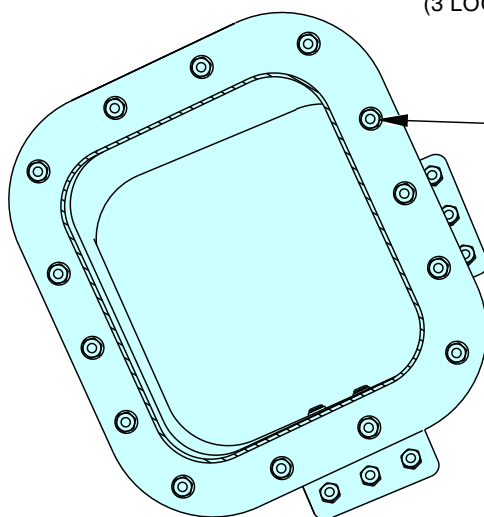
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A-A



B-B



C-C

- 1 OPTIONAL: APPLY LUBRICANT
- 2 APPLY SEALANT HERE

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Educator Inlet Duct Installation
Figure 401/49-91-71-990-801 (Sheet 2 of 3)

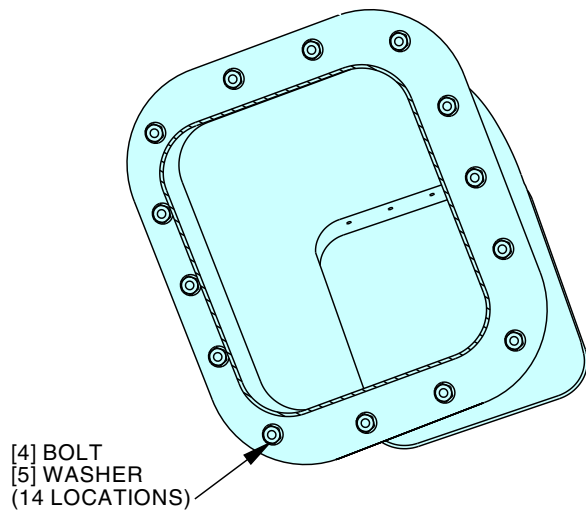
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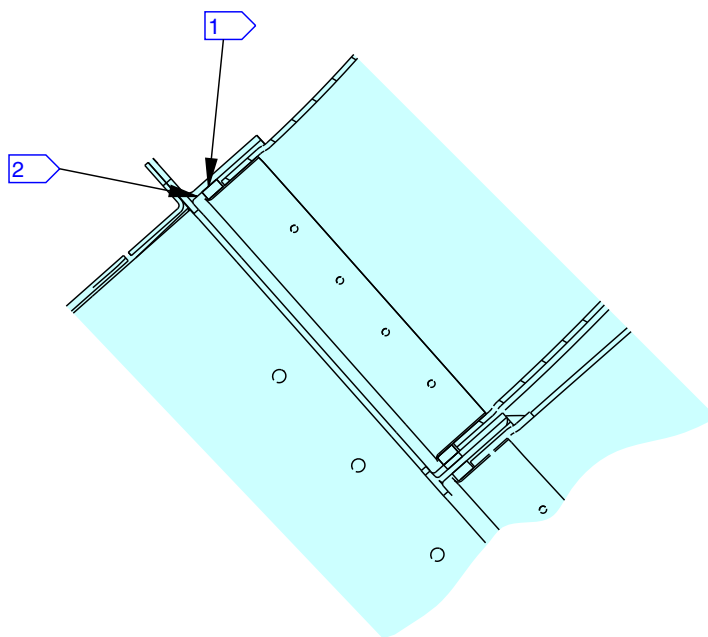
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D-D



E-E

- 1 OPTIONAL: APPLY LUBRICANT
- 2 APPLY SEALANT HERE

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Eductor Inlet Duct Installation
Figure 401/49-91-71-990-801 (Sheet 3 of 3)

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TASK 49-91-71-400-801

3. Eductor Inlet Duct Installation

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
D50080	Lubricant - Solid Film	SAE AS5272 Type1, MIL-PRF-46010

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Aft eductor duct	49-91-71-01-080	SIA ALL
2	Mid eductor duct	49-91-71-01-060	SIA ALL
3	Forward eductor duct	49-91-71-01-030	SIA ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

E. Access Panels

Number	Name/Location
315A	APU Cowl Door
318BR	Tailcone Access Door

F. Eductor Inlet Duct Installation

SUBTASK 49-91-71-420-001



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 eductor inlet duct:

NOTE: The eductor inlet duct has three sections: forward eductor duct [3], mid eductor duct [2] and aft eductor duct [1]. The forward eductor duct [3] will be installed first, then the aft eductor duct [1], and finally the mid eductor duct [2] (double flanged) will be installed and bolted to the forward eductor duct [3] and aft eductor duct [1].

- (a) Remove the protective covers from the duct openings.
- (b) Optional: apply a thin layer of solid film lubricant, D50080, around the inner diameter of the forward eductor duct [3] (View E-E).
- (c) Carefully put the forward eductor duct [3] in position where it mates with the air inlet duct.

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- (d) Optional: apply a thin layer of solid film lubricant, D50080, around the inner diameter of the aft eductor duct [1] where it will mate with the instrumented (elbow) duct (View A-A) .
- (e) Carefully put the aft eductor duct [1] through the 1088 pressure bulkhead so the aft eductor duct [1] mates with the instrumented (elbow) duct.
- (f) Tighten the two sets of three (six total) bolts [6] and washers [7] that hold the aft eductor duct [1] in position against the 1088 pressure bulkhead (View B-B).
- (g) Carefully put the mid eductor duct [2] (double flanged) in position between the aft eductor duct [1] and forward eductor duct [3].
 - 1) Tighten the two sets of 14 (28 total) bolts [4] and washers [5] to hold the mid eductor duct [2] to the aft eductor duct [1] (View C-C) and forward eductor duct [3] (View D-D) .
- (h) Apply sealant, A00160, to fill the gap (fillet seal) between the instrumented duct section and the seal support (View A-A).
 - 1) The joint inside the duct must be filled and flush with the duct walls.
- (i) Apply sealant, A00160, to fill the gap (fillet seal) between the forward eductor duct [3] and the air inlet (View E-E).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-71-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-71-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-91-71-410-001

- (3) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

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SUBTASK 49-91-71-410-002

(4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

————— END OF TASK —————

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EDUCTOR INLET DUCT - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the eductor inlet duct.
- B. The eductor inlet duct is installed between the left side of the 1156 bulkhead and the upper fairing assembly on the tail cone.

TASK 49-91-71-200-801

2. Eductor Inlet Duct Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
49-91-71-000-801	Eductor Inlet Duct Removal (P/B 401)
49-91-71-400-801	Eductor Inlet Duct Installation (P/B 401)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-858	Tag - DO NOT OPERATE

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment - Left
317	Tail Cone Compartment - Left
318	Tail Cone Compartment - Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door
318BR	Tailcone Access Door

E. Prepare for the Inspection

SUBTASK 49-91-71-860-005

- (1) Make sure that the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-71-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-71-010-002

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

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- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-91-71-010-003

- (4) Open this access door:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

F. Eductor Inlet Duct Inspection

SUBTASK 49-91-71-210-001

- (1) Do these steps to inspect the eductor inlet duct from the APU inlet air door:
 - (a) Visually examine the forward end and inner surfaces of the eductor inlet duct for blockage and contamination.
 - 1) If you find blockage or contamination, remove the blockage or contamination from the eductor inlet duct.
 - (b) Visually examine the inner and outer surfaces of the eductor inlet duct for holes and cracks.
 - 1) If you can see holes or cracks, replace the eductor inlet duct.
 - a) Do these tasks:
 - <1> Eductor Inlet Duct Removal, TASK 49-91-71-000-801
 - <2> Eductor Inlet Duct Installation, TASK 49-91-71-400-801.
 - (c) Visually examine the inner and outer surfaces of the eductor inlet duct for separations of the fiberglass material.
 - 1) Separations of one or two plies of fiberglass material are permitted.
 - 2) If you see separations of more than two plies of fiberglass material, replace the eductor inlet duct.
 - a) Do these tasks:
 - <1> Eductor Inlet Duct Removal, TASK 49-91-71-000-801
 - <2> Eductor Inlet Duct Installation, TASK 49-91-71-400-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-71-410-003

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
318BR	Tailcone Access Door

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SUBTASK 49-91-71-410-004

- (2) To close the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

SUBTASK 49-91-71-860-007

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-71-860-008

- (4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

————— **END OF TASK** —————

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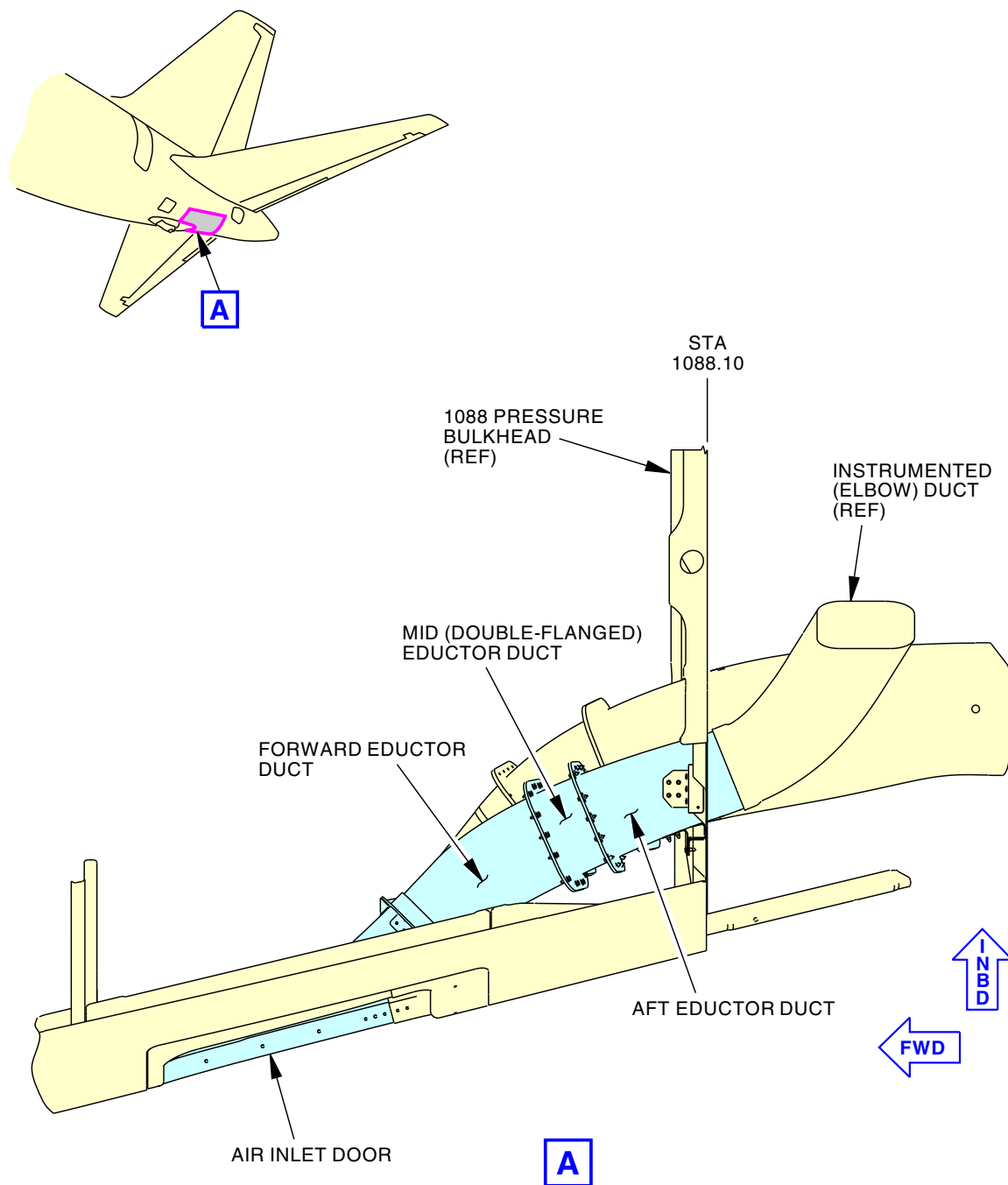
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Eductor Inlet Duct Inspection
Figure 601/49-91-71-990-802

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MAGNETIC DRAIN PLUG - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the magnetic drain plug
 - (2) An installation of the magnetic drain plug.
- B. The magnetic drain plug, referred to as the plug assembly, is installed on the lower front of the APU gearbox. The plug assembly has a magnetic element and plug.
- C. When the plug assembly is removed from the APU gearbox, oil will drain from the APU gearbox.
- (1) You can examine the magnetic element for metal particles without removing the plug assembly (TASK 49-91-81-200-801). This will prevent oil from draining out of the APU gearbox for the inspection.

TASK 49-91-81-000-801

2. Magnetic Drain Plug Removal

(Figure 401)

A. **References**

Reference	Title
49-91-81-200-801	Magnetic Drain Plug Inspection (P/B 601)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

D. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

E. **Prepare for the Removal**

SUBTASK 49-91-81-860-001

- (1) Make sure that the Auxiliary Power Unit (APU) master switch, on the P5 forward overhead panel, is in the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-81-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-81-010-001

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

F. Magnetic Drain Plug Removal

SUBTASK 49-91-81-020-001



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 plug assembly [4]:

NOTE: The plug assembly [4] has the magnetic element [3], plug [5], packing [1], and packings [2].

- (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055, below the plug assembly [4].
- (b) Push in on the magnetic element [3] and turn the magnetic element [3] in the counterclockwise direction to remove the magnetic element [3] from the plug [5].
- (c) Remove the packings [2] from the magnetic element [3].
 - 1) Discard the packings [2].
- (d) Do this task: Magnetic Drain Plug Inspection, TASK 49-91-81-200-801.



CAUTION

IF OIL LEVEL IS AT TOP OF OIL LEVEL SIGHT GLASS, OIL CAN FLOW OUT WHEN FILL CAP IS LOOSENED. HOT OIL CAN BURN SKIN.

- (e) Pull the latch handle away from the oil fill cap.
- (f) Loosen the oil fill cap to help the oil drain from the APU gearbox.
- (g) Remove the lockwire from the plug [5].
- (h) Remove the plug [5] from the APU gearbox.

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- (i) Use the oil resistant container (5 gal)(19 Liter), STD-1055, to drain the oil from the APU gearbox.
- (j) Remove the packing [1] from the plug [5].
 - 1) Discard the packing [1].
- (k) Close the oil fill cap.
- (l) Engage the latch handle on the oil fill cap.
- (m) Make sure that all necessary protection covers are installed.
- (n) Remove the oil resistant container (5 gal)(19 Liter), STD-1055.

———— **END OF TASK** ————

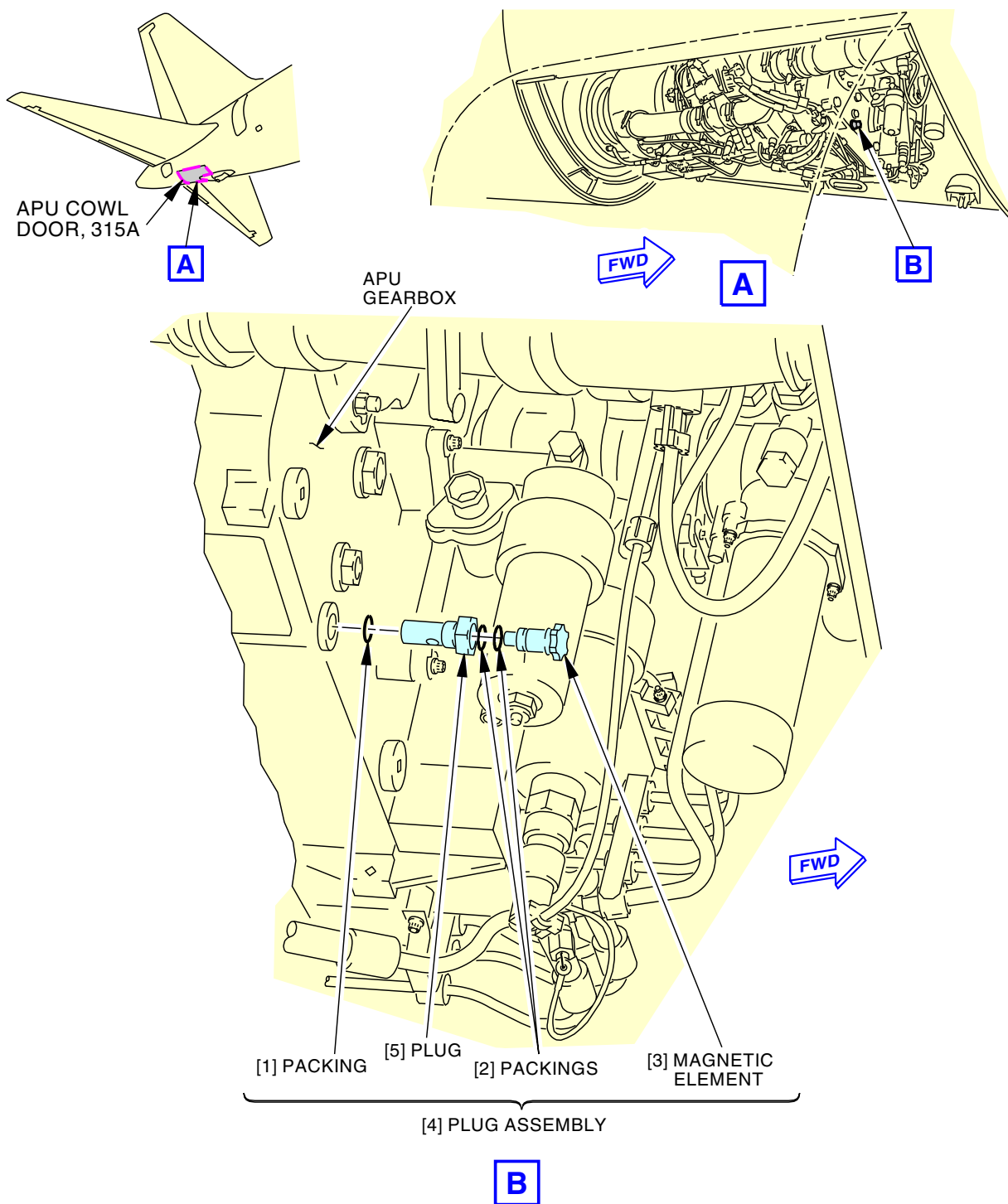
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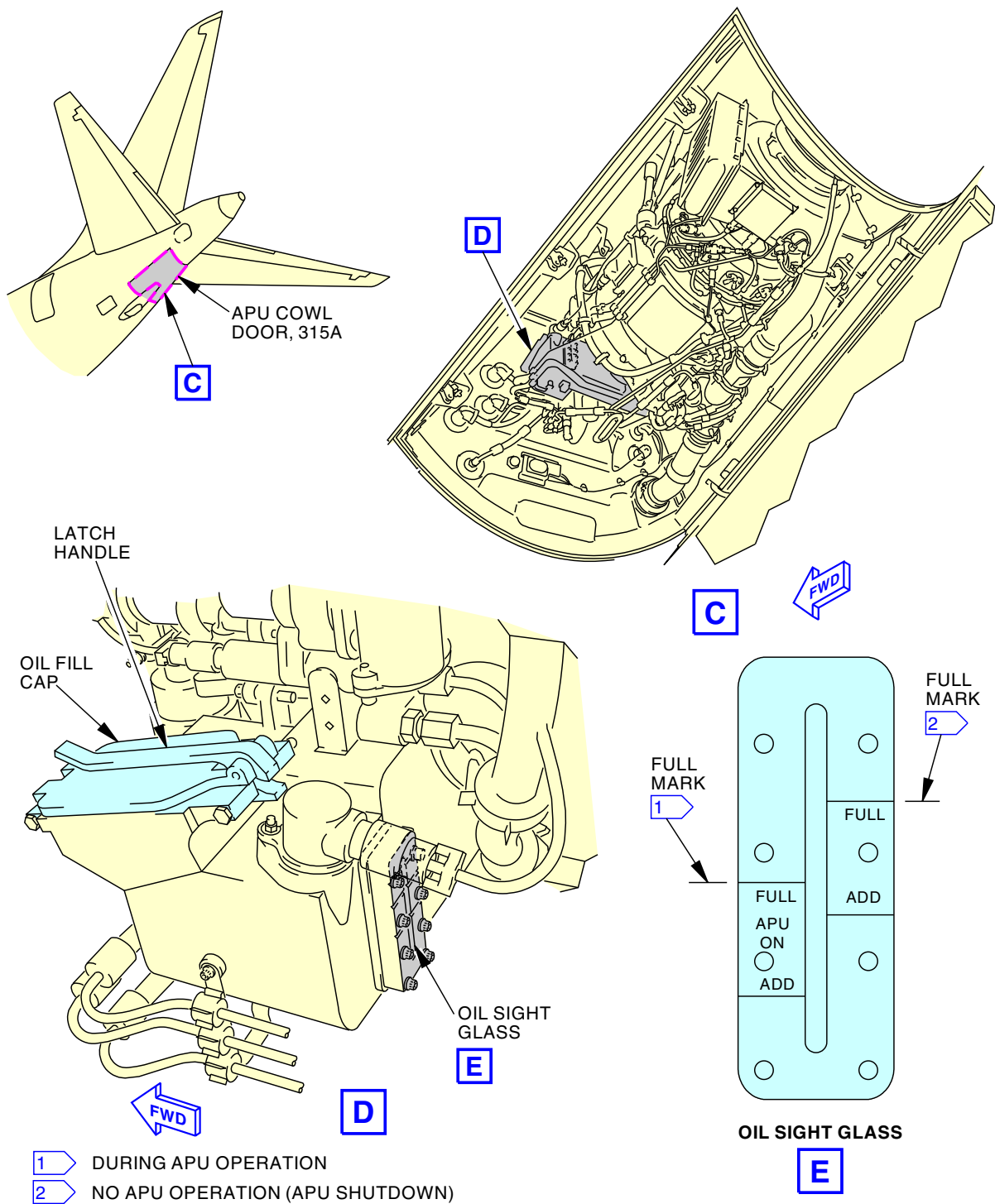
Magnetic Drain Plug Installation
Figure 401/49-91-81-990-801 (Sheet 1 of 2)

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Magnetic Drain Plug Installation
Figure 401/49-91-81-990-801 (Sheet 2 of 2)

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TASK 49-91-81-400-801

3. Magnetic Drain Plug Installation

(Figure 401)

A. References

Reference	Title
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G50225	Lockwire - MS20995C20, Corrosion Resistant Steel - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	49-91-81-01-035	SIA ALL
2	Packing	49-91-81-01-030	SIA ALL
4	Plug assembly	49-91-81-01-025	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Magnetic Drain Plug Installation

SUBTASK 49-91-81-420-001



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 plug assembly [4]:

NOTE: The plug assembly [4] has the magnetic element [3], plug [5], packing [1], and packings [2]. Install the plug [5] in the Auxiliary Power Unit (APU) gearbox first before the magnetic element [3] installation.

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- (a) Lubricate the new packing [1] and new packings [2] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
- (b) Install the packing [1] on the plug [5].
- (c) Install the packings [2] on the magnetic element [3].
- (d) Install the plug [5] in the APU gearbox.
 - 1) Tighten the plug [5] to 85 ±5 in-lb (9.6 ±0.6 N·m).
- (e) Install MS20995C20 lockwire, G50225, on the plug [5].
- (f) Push in on the magnetic element [3] and turn in the clockwise direction to install the magnetic element [3] in the plug [5].

SUBTASK 49-91-81-610-001

- (2) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

H. Magnetic Drain Plug Installation Test

SUBTASK 49-91-81-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-81-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.

SUBTASK 49-91-81-790-001

- (3) Do the installation test for the plug assembly [4]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the plug assembly [4] for signs of oil leakage.
 - (d) If oil leakage is found, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, on the APU master switch, on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch, on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the plug assembly [4] for signs of oil leakage.
 - 7) If oil leakage is found, do the leakage repair again.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-81-410-001

(1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL

MAGNETIC DRAIN PLUG - INSPECTION/CHECK

1. General

- A. This procedure has the task to inspect the magnetic element for the magnetic drain plug.
- B. The magnetic drain plug has a magnetic element, and a plug. Only the magnetic element is removed for this task. The entire magnetic drain plug assembly is not removed. This will prevent the oil from draining out of the APU gearbox when you examine the magnetic element.
- C. The magnetic element retains metal particles from the engine oil. The magnetic element is used to isolate internal engine problems.

TASK 49-91-81-200-801

2. Magnetic Drain Plug Inspection

(Figure 601)

A. **References**

Reference	Title
49-11-00-000-801	APU Power Plant Removal (Selection) (P/B 401)
49-11-00-400-801	APU Power Plant Installation (Selection) (P/B 401)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-4107	Source - Air, Clean, Dry, 0 to 60 psi

C. **Consumable Materials**

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	AMS3819 Class 1 Grade A or B Form 1 (Supersede BMS15-5 CL A)

D. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	49-91-81-01-030	SIA ALL

E. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left
316	APU Compartment - Right

F. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

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G. Prepare for the Inspection

SUBTASK 49-91-81-860-005

- (1) Make sure that the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-91-81-860-006

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-81-010-002

- (3) To open the access panel, do these steps:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.
- NOTE: Use this sequence: forward latch, aft latch, middle latch.
- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-91-81-020-002



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (4) Do these steps to remove the magnetic element [1] from the plug:
- (a) Push in on the magnetic element [1] and turn in the counterclockwise direction to remove the magnetic element [1] from the plug.
- 1) Do not remove the plug, only the magnetic element [1] is required to be removed for the inspection (if the plug is removed, oil will drain from the gearbox).
- (b) Remove the two packings [2] from the magnetic element [1].
- 1) Discard the two packings [2].

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H. Magnetic Element Inspection

SUBTASK 49-91-81-210-001

(1) Do these steps to inspect the magnetic element [1] for metal particles (Figure 601 (Sheet 2)):

- (a) If the magnetic element [1] is free of metal particles, the APU is satisfactory.
- (b) A small quantity of metal particles that are not silver color are permitted.
- (c) Silver color particles are not permitted.

NOTE: Silver color particles give an indication of damage to the APU.

- 1) If the silver color particles are found, then replace the APU. These are the tasks:
 - APU Power Plant Removal (Selection), TASK 49-11-00-000-801,
 - APU Power Plant Installation (Selection), TASK 49-11-00-400-801.
- (d) If a medium quantity of metal particles that are not silver color are found, then do these steps:
 - 1) Clean the magnetic element [1] with alcohol, B00130, and a cotton wiper, G00034.
 - 2) Dry the magnetic element [1] with a pressure of 45 ± 15 psig (310 ± 104 kPa) of air or nitrogen with a dry, clean air source 0 to 60 psi, STD-4107.
 - 3) Install the magnetic element [1]:
 - a) Lubricate the two new packings [2] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - b) Install the two packings [2] on the magnetic element [1].
 - c) Push the magnetic element [1] into the plug and turn in the clockwise direction
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

- 6) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- 7) Operate the APU for a minimum of 15 minutes.
- 8) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
- 9) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
- 10) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- 11) Remove the magnetic element [1]:
 - a) Push in the magnetic element [1] and turn in the counterclockwise direction .
 - b) Remove and discard the two packings [2].
- 12) Examine the magnetic element [1] for metal particles.
 - a) If the more metal particles are found, then replace the APU. These are the tasks:
 - APU Power Plant Removal (Selection), TASK 49-11-00-000-801,
 - APU Power Plant Installation (Selection), TASK 49-11-00-400-801.
 - b) If the more metal particles are not found, then the APU is satisfactory.
- (e) A large quantity of metal particles is not permitted.

NOTE: A large quantity of metal particles give an indication of internal damage to the engine.

 - 1) If a large quantity of metal particles are found, then replace the APU, these are the tasks:
 - APU Power Plant Removal (Selection), TASK 49-11-00-000-801,
 - APU Power Plant Installation (Selection), TASK 49-11-00-400-801.
- (f) Install the magnetic element [1]:
 - 1) Lubricate the two new packings [2] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - 2) Install the two packings [2] on the magnetic element [1].
 - 3) Push the magnetic element [1] into the plug and turn in the clockwise direction.

I. Magnetic Drain Plug Installation Test

SUBTASK 49-91-81-860-007

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-91-81-860-008

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

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SUBTASK 49-91-81-790-002

- (3) Do the installation test for the magnetic element [1]:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) Examine the magnetic drain plug for signs of oil leakage, during the APU operation.
 - (d) If the oil leakage is found, then repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) Look for signs of oil leakage, during the APU operation.
 - 7) If the oil leakage is found, then do the leakage repair again.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 49-91-81-410-002

- (1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— **END OF TASK** —————

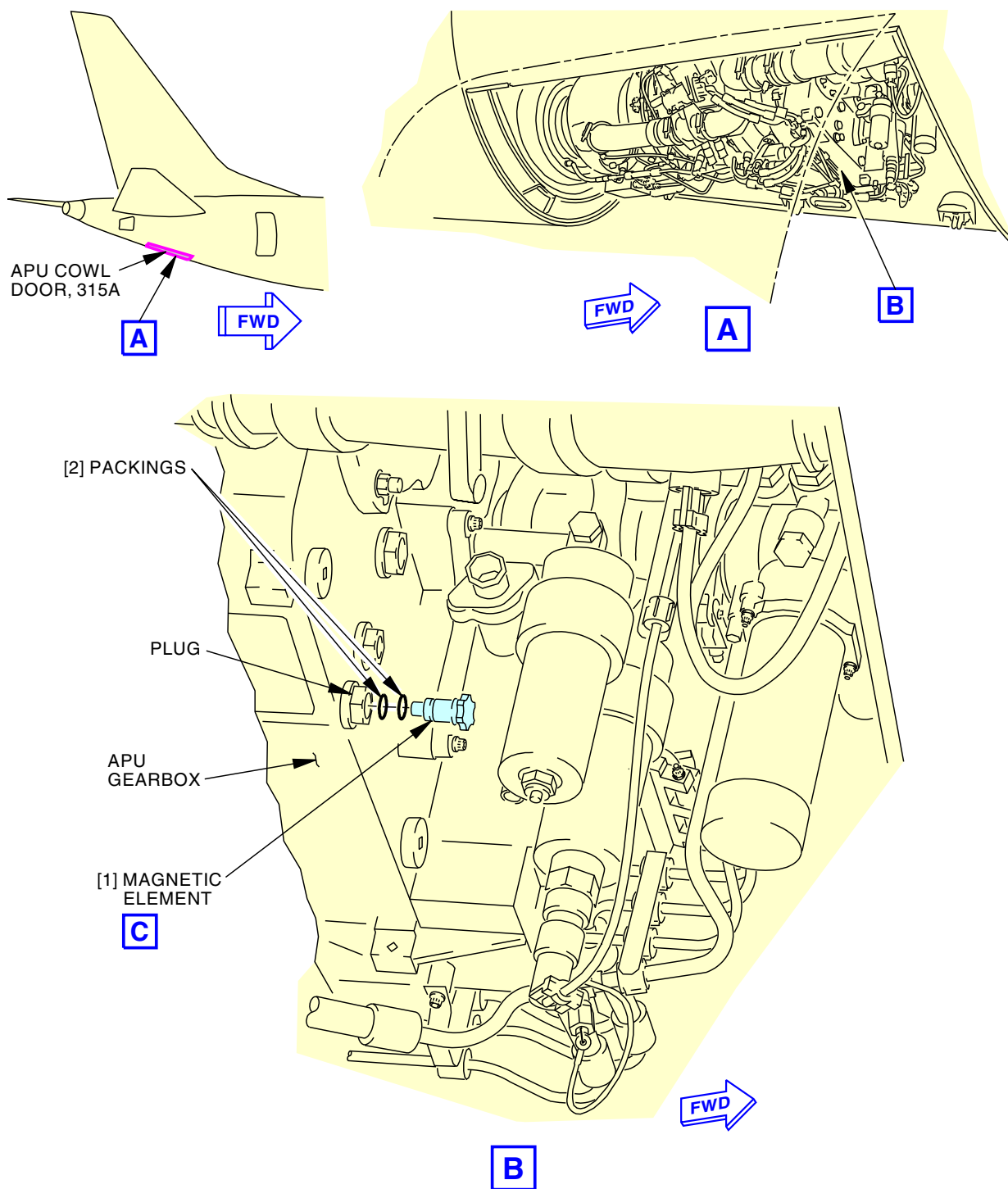
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Magnetic Drain Plug Inspection
Figure 601/49-91-81-990-802 (Sheet 1 of 2)

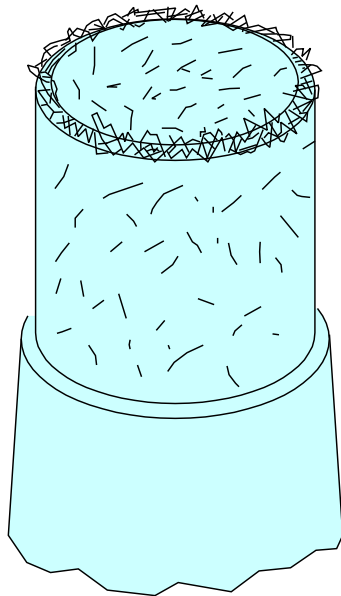
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SMALL QUANTITY OF
METAL PARTICLES



MEDIUM QUANTITY OF
METAL PARTICLES



LARGE QUANTITY OF
METAL PARTICLES



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Magnetic Drain Plug Inspection
Figure 601/49-91-81-990-802 (Sheet 2 of 2)

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OIL LEVEL SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the oil level sensor
 - (2) Installation of the oil level sensor.
- B. The oil level sensor is installed in the APU gearbox.

TASK 49-94-11-000-801

2. Oil Level Sensor Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-94-11-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-94-11-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-11-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Oil Level Sensor Removal

SUBTASK 49-94-11-020-001



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the oil level sensor [2]:
 - (a) Disconnect the electrical connector (P6) [1] from the oil level sensor [2].
 - (b) Loosen the nut [4] on the APU gearbox.
 - (c) Turn the oil level sensor [2] in the counterclockwise direction until the oil level sensor [2] flange disengages from the gearbox stud.
 - (d) Remove the oil level sensor [2].
 - (e) Remove the packing [3] from the oil level sensor [2].
 - 1) Discard the packing [3].
 - (f) Make sure that you install all necessary protection covers.

———— **END OF TASK** ————

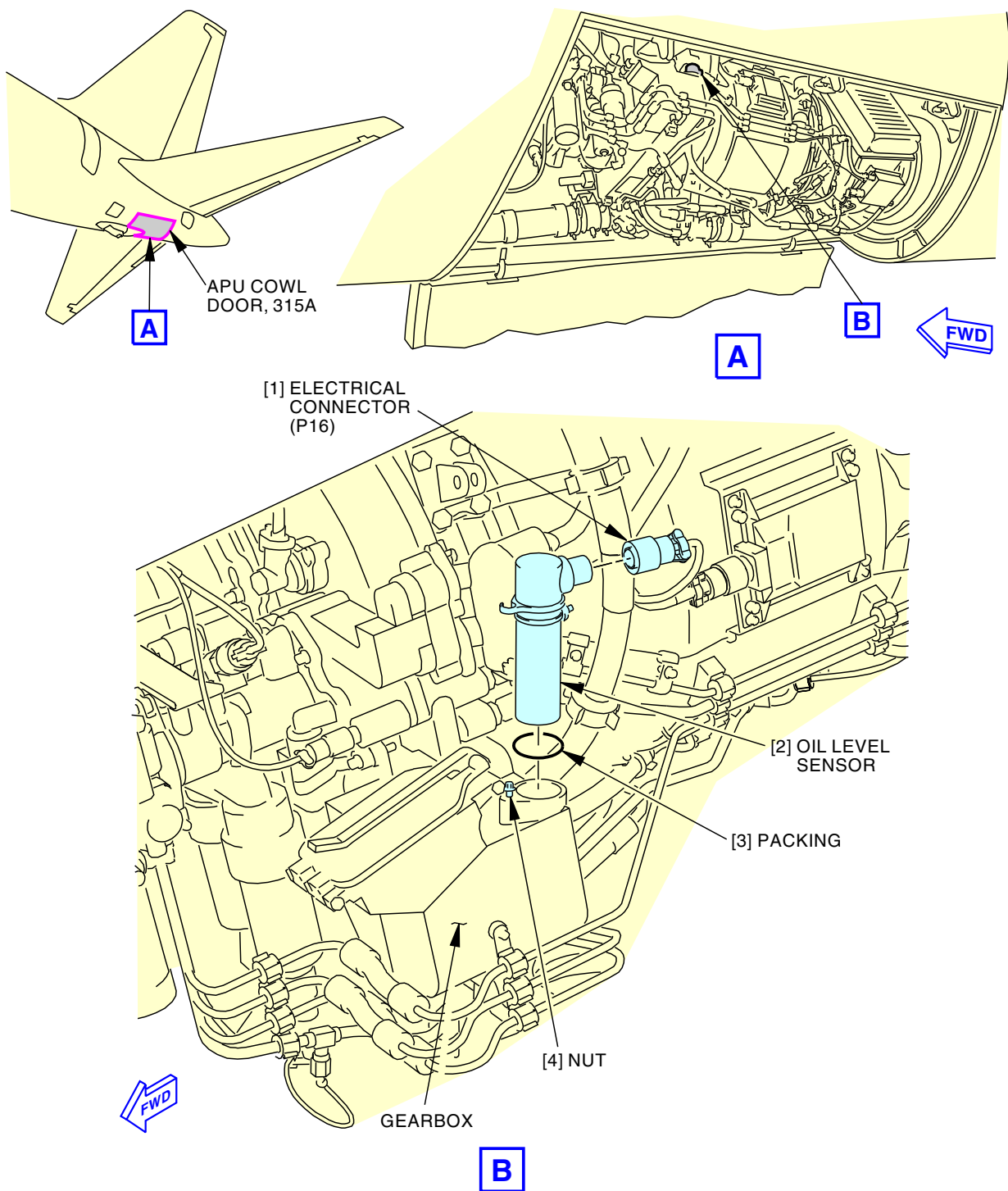
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Oil Level Sensor Installation
Figure 401/49-94-11-990-801

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TASK 49-94-11-400-801

3. Oil Level Sensor Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Oil level sensor	49-94-11-01-010	SIA ALL
3	Packing	49-94-11-01-015	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Oil Level Sensor Installation

SUBTASK 49-94-11-420-001



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 oil level sensor [2]:
 - (a) Remove the protective covers.
 - (b) Lubricate the new packing [3] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (c) Install the packing [3] on the oil level sensor [2].

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- (d) Hold the oil level sensor [2] in the vertical position near the APU gearbox while you connect the electrical connector (P6) [1] to the oil level sensor [2].
- (e) Install the oil level sensor [2] in the APU gearbox.
- (f) Turn the oil level sensor [2] in the clockwise direction until the oil level sensor [2] flange fully engages the gearbox stud.
- (g) Tighten the nut [4] to 40 in-lb (4.5 N·m).

H. Oil Level Sensor Installation Test

SUBTASK 49-94-11-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-11-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-94-11-790-001

- (3) Do the installation test for the oil level sensor [2]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the oil level sensor [2] for signs of oil leakage.
 - (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - a) Make sure that the APU oil system is full (TASK 12-13-31-200-801).
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the oil level sensor [2] for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again.
 - (e) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - (f) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) Look at OIL QTY on the MDS for the APU oil level.
 - a) If a fault message shows for the APU oil indicating system or the oil quantity, go to IFIM and do the applicable procedure(s).
 - b) Make sure that OIL QTY shows FULL for the oil level.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-11-410-001

(1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— **END OF TASK** —————

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OIL TEMPERATURE SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the oil temperature sensor
 - (2) Installation of the oil temperature sensor.
- B. The oil temperature sensor is installed on the lube module.

TASK 49-94-21-000-801

2. Oil Temperature Sensor Removal

(Figure 401)

A. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. **Access Panels**

Number	Name/Location
315A	APU Cowl Door

D. **Prepare for the Removal**

SUBTASK 49-94-21-860-001

- (1) Make sure the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-94-21-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-21-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

- (c) Open the APU Cowl Door, 315A.

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- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Oil Temperature Sensor Removal

SUBTASK 49-94-21-020-001



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the oil temperature sensor [1]:
 - (a) Disconnect the electrical connector (P15) [2] from the oil temperature sensor [1].
 - (b) Remove the oil temperature sensor [1] from the lube module.
 - (c) Remove the packing [3] from the oil temperature sensor [1].
 - 1) Discard the packing [3].
 - (d) Make sure you install all necessary protection covers.

———— **END OF TASK** ————

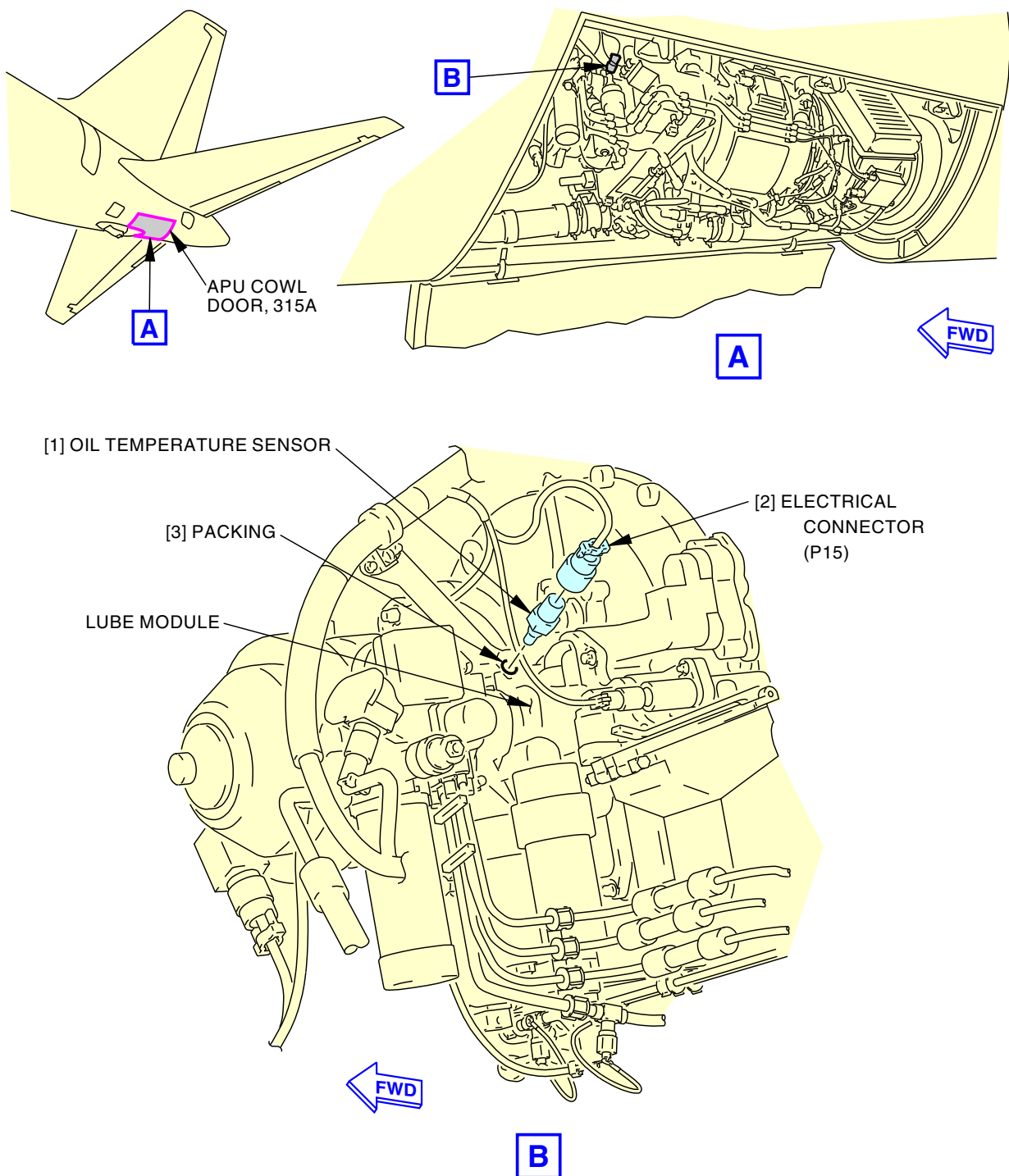
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Oil Temperature Sensor Installation
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TASK 49-94-21-400-801

3. Oil Temperature Sensor Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oil temperature sensor	49-94-21-01-055	SIA ALL
3	Packing	49-94-21-01-060	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Oil Temperature Sensor Installation

SUBTASK 49-94-21-420-001



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 oil temperature sensor [1]:

(a) Remove the protective covers.

(b) Lubricate the new packing [3] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.

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- (c) Install the packing [3] on the oil temperature sensor [1].
- (d) Install the oil temperature sensor [1] on the lube module.
 - 1) Tighten the oil temperature sensor [1] to 67.5 $\pm$ 2.5 in-lb (7.6 $\pm$ 0.3 N·m).
- (e) Install the MS20995C32 lockwire, G01048, on the oil temperature sensor [1].
- (f) Connect the electrical connector (P15) [2] to the oil temperature sensor [1].

H. Oil Temperature Sensor Installation Test

SUBTASK 49-94-21-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-21-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-94-21-710-001

- (3) Do the installation test for the oil temperature sensor [1]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the oil temperature sensor [1] for signs of oil leakage.
 - (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Make sure the APU oil system is full (TASK 12-13-31-200-801).
 - 5) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 6) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 7) During the APU operation, examine the oil temperature sensor [1] for signs of oil leakage.
 - 8) If you find oil leakage, do the leakage repair again.
 - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If a fault message shows for the APU oil indicating system or the oil temperature sensor [1], refer to the IFIM and do the applicable procedure(s) for troubleshooting.
 - (f) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-21-410-001

(1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

————— **END OF TASK** —————

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LOW OIL PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Removal of the low oil pressure switch
 - (2) Installation of the low oil pressure switch.
- B. The low oil pressure switch is installed on the APU gearbox.

TASK 49-94-22-000-801

2. Low Oil Pressure Switch Removal

(Figure 401)

A. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE
STD-7394	Cap - Dust, Electrical Connector

B. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

C. Access Panels

Number	Name/Location
315A	APU Cowl Door

D. Prepare for the Removal

SUBTASK 49-94-22-860-001

- (1) Make sure that the APU master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-94-22-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-22-010-001

- (3) To open the access panel, do these steps:

Number	Name/Location
315A	APU Cowl Door

- (a) Support the APU panel (cowl door) under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

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- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

E. Low Oil Pressure Switch Removal

SUBTASK 49-94-22-020-001



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 low oil pressure switch [2]:
 - (a) Disconnect the electrical connector (P14) [1] from the low oil pressure switch [2].
 - 1) Install a dust cap, STD-7394, on the electrical connector (P14) [1] to prevent contamination.
 - (b) Put the 1 U.S.-gal (3.81 l) oil resistant container, STD-203, below the low oil pressure switch [2].
 - (c) Loosen the nut [3] on the APU gearbox.
 - (d) Turn the low oil pressure switch [2] in the clockwise direction until it is disengaged from the gearbox.
 - (e) Remove the low oil pressure switch [2] from the gearbox.
 - (f) Remove the packing [4] from the low oil pressure switch [2].
 - 1) Discard the packing [4].
 - (g) Make sure that you install all necessary protection covers.
 - (h) Remove the 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

———— **END OF TASK** ————

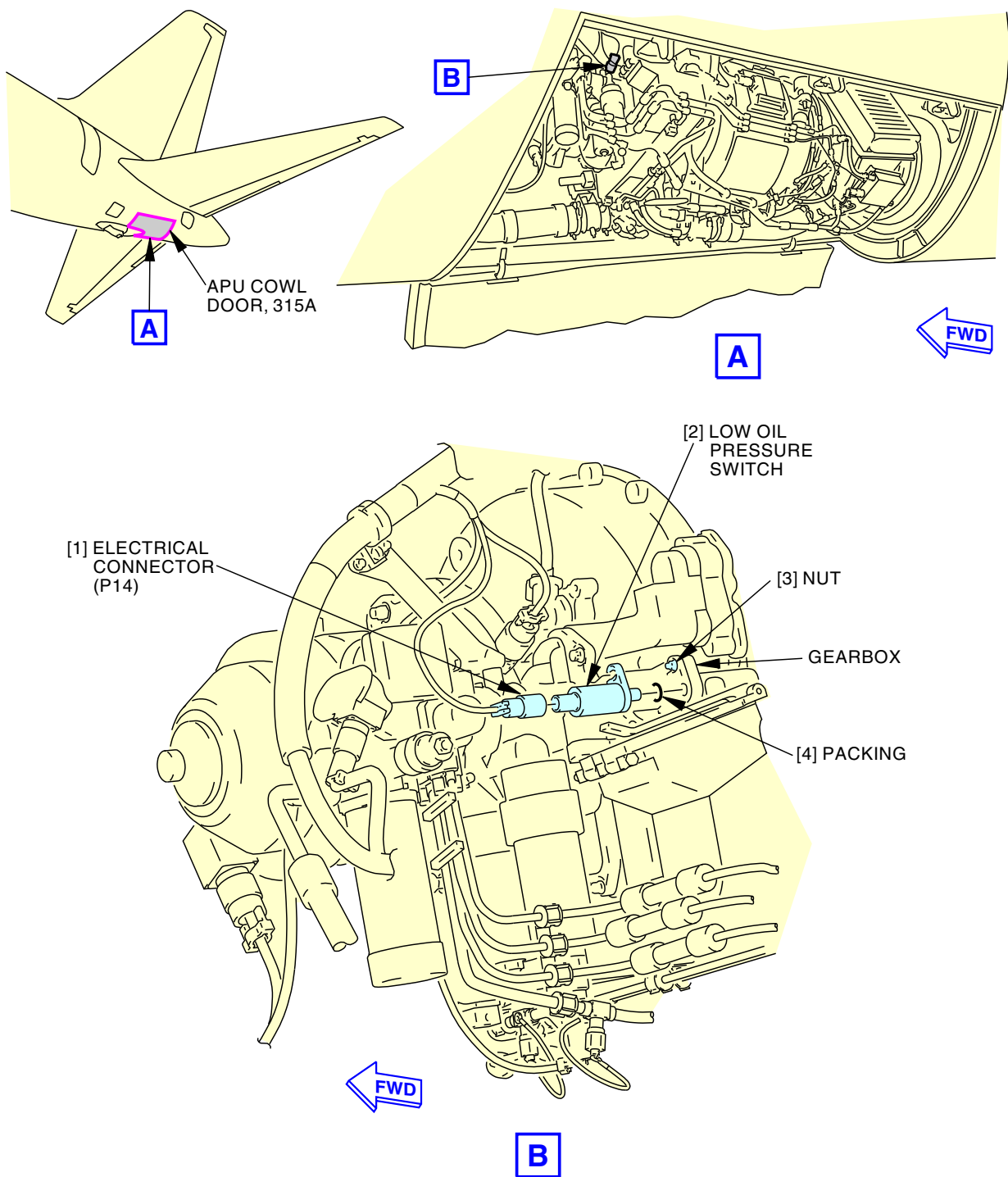
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Low Oil Pressure Switch Installation
Figure 401/49-94-22-990-801

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TASK 49-94-22-400-801

3. Low Oil Pressure Switch Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
49-61-00-700-801	APU BITE Procedure (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE
STD-7394	Cap - Dust, Electrical Connector

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Low oil pressure switch	49-94-22-01-010	SIA ALL
4	Packing	49-94-22-01-015	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left
315	APU Compartment - Left

F. Access Panels

Number	Name/Location
315A	APU Cowl Door

G. Low Oil Pressure Switch Installation

SUBTASK 49-94-22-420-001



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 low oil pressure switch [2]:
 - (a) Remove the protective covers.
 - (b) Lubricate the new packing [4] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (c) Install the packing [4] on the low oil pressure switch [2].

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- (d) Install the low oil pressure switch [2] on the APU gearbox.
- (e) Turn the low oil pressure switch [2] in the counterclockwise direction until the low oil pressure switch [2] flange fully engages the gearbox stud.
- (f) Tighten the nut [3] to 40 in-lb (4.5 N·m)4.
- (g) Remove the dust cap, STD-7394, from the electrical connector (P14) [1].
- (h) Connect the electrical connector (P14) [1] to the low oil pressure switch [2].
- (i) Make sure that the APU oil system is full (TASK 12-13-31-200-801).

H. Low Oil Pressure Switch Installation Test

SUBTASK 49-94-22-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-22-860-004

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 49-94-22-740-001

- (3) Do the installation test for the low oil pressure switch [2]:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Operate the APU for a minimum of five minutes.
 - (c) During the APU operation, examine the low oil pressure switch [2] for signs of oil leakage.
 - (d) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Make sure that the APU oil system is full (TASK 12-13-31-200-801).
 - 5) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 6) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 7) During the APU operation, examine the low oil pressure switch [2] for signs of oil leakage.
 - 8) If you find oil leakage, do the leakage repair again.
 - (e) Do this task: APU BITE Procedure, TASK 49-61-00-700-801.
 - 1) If a fault message shows for the APU oil indicating system or the low oil pressure switch [2], refer to the IFIM and do the applicable procedure(s) for troubleshooting.
 - (f) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-22-410-001

(1) To close the access panel, do these steps

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

315A	APU Cowl Door
------	---------------

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.
- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
- (g) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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OIL SIGHT GLASS - REMOVAL/INSTALLATION

1. General

- A. This procedure has the following tasks:
- (1) A removal of the oil sight glass
 - (2) An installation of the oil sight glass.
- B. The oil sight glass is installed on the Auxiliary Power Unit (APU) gearbox.

TASK 49-94-51-000-801

2. Oil Sight Glass Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
12-13-31-610-801	Drain the APU Oil (P/B 301)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-858	Tag - DO NOT OPERATE

C. Location Zones

<u>Zone</u>	<u>Area</u>
315	APU Compartment - Left

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

E. Prepare for the Removal

SUBTASK 49-94-51-860-001

- (1) Make sure that the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel is OFF and install a DO NOT OPERATE tag, STD-858.

SUBTASK 49-94-51-860-002

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-51-860-003

- (3) Open this access door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Support the APU access door under the center latch.
- (b) Open the three latches.

NOTE: Use this sequence: forward latch, aft latch, middle latch.

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- (c) Open the APU Cowl Door, 315A.
- (d) Remove the retainer pin from the rod end of the forward hold-open rod on the APU Cowl Door, 315A.
- (e) Remove the retainer pin from the spring clip on the aft hold-open rod.
- (f) Disconnect the two hold-open rods from the two spring clips.
- (g) Connect the two rod ends of the two hold-open rods to the two brackets in the APU compartment.
- (h) Install the two retainer pins in the two rod ends.

SUBTASK 49-94-51-860-004

- (4) Do this task: Drain the APU Oil, TASK 12-13-31-610-801.

F. Oil Sight Glass Removal

SUBTASK 49-94-51-020-001



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

- (1) Do these steps to remove the oil sight glass [1]:
 - (a) Remove the bolts [3] and washers [4] that attach oil sight glass [1] to the gearbox housing.
 - (b) Remove the oil sight glass [1] and packing [2] from the gearbox housing.
 - 1) Discard the packing [2].

———— **END OF TASK** ————

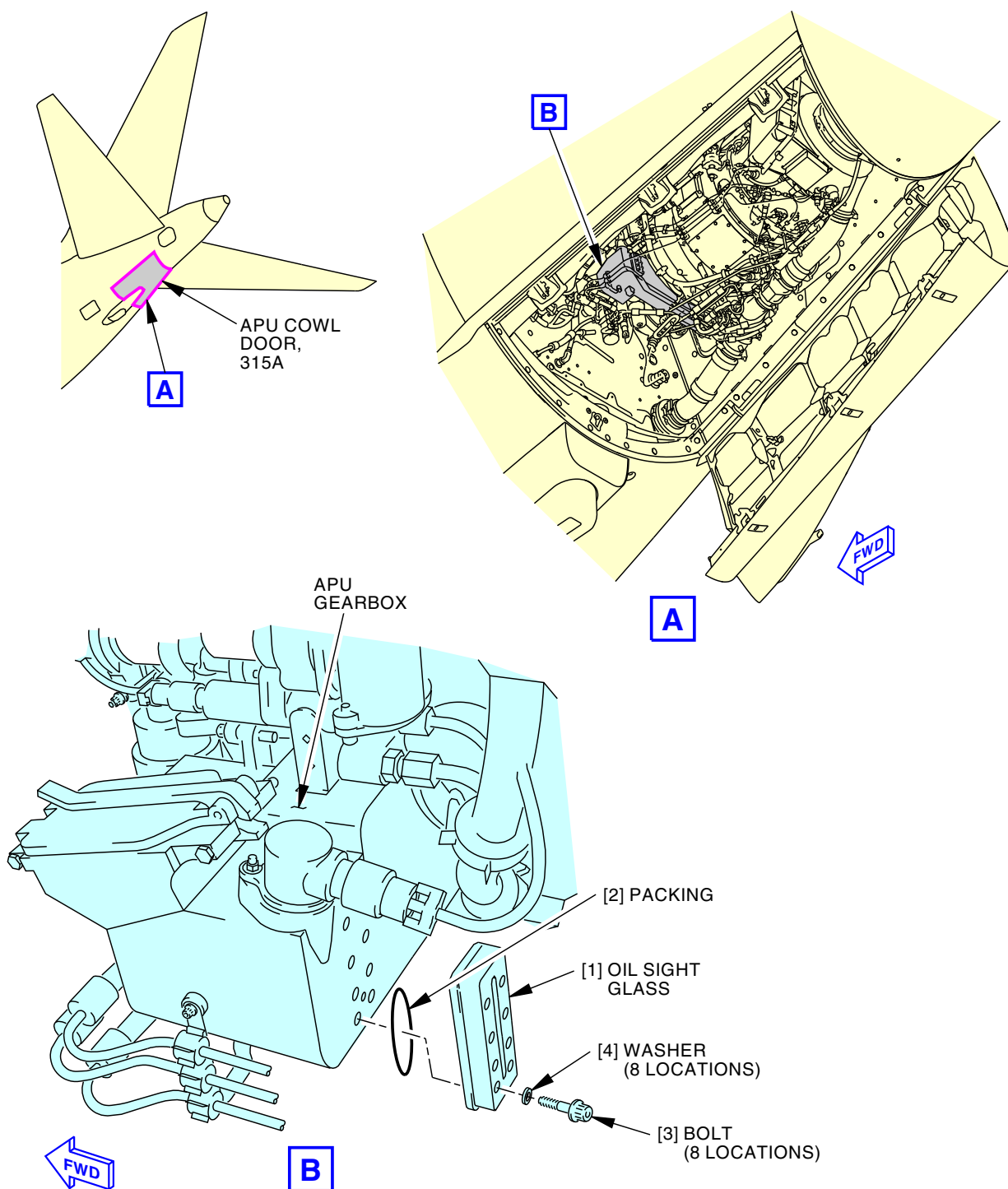
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Oil Sight Glass Installation
Figure 401/49-94-51-990-801

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TASK 49-94-51-400-801

3. Oil Sight Glass Installation

(Figure 401)

A. References

Reference	Title
12-13-31-200-801	APU Oil Level Inspection (P/B 301)
12-13-31-610-803	Fill the APU Gearbox (P/B 301)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Consumable Materials

Reference	Description	Specification
D00341	Lubricant - Polyphenyl Ether, Vacuum Pump - Santovac 5	
D50055	Oil - Aircraft Turbine Engine Oil for AE 131-9[B] APU (AMM 12-13-31/301)	

D. Location Zones

Zone	Area
315	APU Compartment - Left

E. Access Panels

Number	Name/Location
315A	APU Cowl Door

F. Oil Sight Glass Installation

SUBTASK 49-94-51-420-001

 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 these steps to install the oil sight glass [1]:
 - (a) Lubricate the new packing [2] with a light coat of Santovac 5 lubricant, D00341, or aircraft turbine engine oil, D50055.
 - (b) Install the packing [2] on the oil sight glass [1].
 - (c) Attach the oil sight glass [1] to the gearbox housing.
 - (d) Install the bolts [3] and washers [4].
 - 1) Tighten the bolts [3] to 50 in-lb (6 N·m).

SUBTASK 49-94-51-860-005

- (2) Do this task: Fill the APU Gearbox, TASK 12-13-31-610-803.

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G. Oil Sight Glass Installation Test

SUBTASK 49-94-51-860-006

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	14	C00033	AUX POWER UNIT CONT

SUBTASK 49-94-51-860-007

- (2) Remove the DO NOT OPERATE tag, STD-858, from the Auxiliary Power Unit (APU) master switch on the P5 forward overhead panel.

SUBTASK 49-94-51-710-001

- (3) Do a leak check for the plug assembly and sight glass:
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) During the APU operation, examine the plug assembly and sight glass for signs of oil leakage.
 - (c) If you find oil leakage, do these steps to repair the leakage:
 - 1) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - 2) Install a DO NOT OPERATE tag, STD-858, to the APU master switch on the P5 forward overhead panel.
 - 3) Repair the cause of the oil leakage.
 - 4) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.
 - 5) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - 6) During the APU operation, examine the plug assembly and sight glass for signs of oil leakage.
 - 7) If you find oil leakage, do the leakage repair again.
 - (d) If it is not necessary to do other tasks, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - (e) Make sure that the APU oil system is full (APU Oil Level Inspection, TASK 12-13-31-200-801).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 49-94-51-410-001

- (1) Close this access door, do these steps:

<u>Number</u>	<u>Name/Location</u>
315A	APU Cowl Door

- (a) Remove the two retainer pins from the two hold-open rods in the APU compartment.
- (b) Disconnect the two hold-open rods from the two brackets.
- (c) Put the two hold-open rods in the two spring clips on the APU Cowl Door, 315A.
- (d) Install the retainer pin in the rod end of the forward hold-open rod.

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- (e) Install the retainer pin to the spring clip on the aft hold-open rod.
- (f) Close the APU Cowl Door, 315A.
 - 1) Close the three latches.

NOTE: Use this sequence: middle latch, aft latch, forward latch.

———— **END OF TASK** ————

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OIL SIGHT GLASS - CLEANING/PAINTING

1. General

- A. This procedure has the following task:
- (1) A cleaning of the oil sight glass.

TASK 49-94-51-100-801

2. Oil Sight Glass Cleaning

A. References

Reference	Title
49-94-51-000-801	Oil Sight Glass Removal (P/B 401)
49-94-51-400-801	Oil Sight Glass Installation (P/B 401)

B. Oil Sight Glass Cleaning

SUBTASK 49-94-51-020-002

- (1) Do this task: Oil Sight Glass Removal, TASK 49-94-51-000-801.

SUBTASK 49-94-51-140-001

- (2) Clean the oil sight glass:
 - (a) Use a mild detergent and soft fiber bristled brush to scrub sight glass to remove contamination.
 - (b) Rinse sight glass with water at 80°F (27°C) - 110°F (43°C).



WARNING

USE EYE PROTECTION WHEN YOU USE COMPRESSED AIR TO CLEAN, COOL, OR DRY PARTS OR TOOLS. PARTICLES CAN CAUSE AN INJURY TO YOUR EYES. DO NOT USE MORE THAN 30 PSIG (200 KPA). DO NOT POINT COMPRESSED AIR AT YOURSELF OR OTHER PERSONS.

- (c) Pressure air-dry with clean dry compressed air until free of moisture.

NOTE: Air pressure - Refer to Repair Station Health and Safety rules or National safety guidance.

SUBTASK 49-94-51-420-002

- (3) Do this task: Oil Sight Glass Installation, TASK 49-94-51-400-801.

————— END OF TASK —————

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