

CHAPTER

24

**ELECTRICAL
POWER**



**777-200/300
AIRCRAFT MAINTENANCE MANUAL**

**CHAPTER 24
ELECTRICAL POWER**

Subject/Page	Date	COC	Subject/Page	Date	COC	Subject/Page	Date	COC
24-EFFECTIVE PAGES			24-00-00 Config 1 (cont)			24-09-00 Config 2 (cont)		
1 thru 8	SEP 05/2018		211	Sep 05/2017		209	Sep 05/2017	
24-CONTENTS			212	Sep 05/2017		210	Sep 05/2017	
1	Jul 25/2018		213	Sep 05/2017		211	Sep 05/2017	
2	Sep 05/2017		214	Sep 05/2017		212	Sep 05/2017	
3	Sep 05/2017		215	Sep 05/2017		213	Sep 05/2017	
4	Sep 05/2017		216	Sep 05/2017		214	Sep 05/2017	
5	Sep 05/2017		217	Sep 05/2017		215	Sep 05/2017	
6	May 05/2017		218	Sep 05/2017		216	Sep 05/2017	
7	May 05/2017		219	Sep 05/2017		217	Sep 05/2017	
O 8	Sep 05/2018		220	BLANK		218	Sep 05/2017	
9	Jan 05/2017		24-00-00			219	Sep 05/2017	
10	Sep 05/2017		901	Jan 05/2015		220	Sep 05/2017	
11	Sep 05/2017		902	Jan 05/2015		221	Sep 05/2017	
12	Jul 25/2018		903	Jul 25/2018		222	Sep 05/2017	
13	Jan 05/2017		904	Jul 25/2018		223	Sep 05/2017	
14	Sep 05/2017		905	Jul 25/2018		224	Sep 05/2017	
15	Jan 05/2017		R 906	Sep 05/2018		225	Sep 05/2017	
16	Jul 25/2018		907	Jul 25/2018		226	Sep 05/2017	
O 17	Sep 05/2018		908	Jul 25/2018		227	Sep 05/2017	
18	Jul 25/2018		909	Jul 25/2018		228	Sep 05/2017	
19	Jul 25/2018		910	Jul 25/2018		229	Sep 05/2017	
20	BLANK		911	Jul 25/2018		230	Sep 05/2017	
24-00-00			912	Jul 25/2018		231	Sep 05/2017	
201	Jan 05/2015		913	Jul 25/2018		232	Sep 05/2017	
202	BLANK		914	Jul 25/2018		233	Sep 05/2017	
24-00-00 Config 1			915	Sep 05/2017		234	Sep 05/2017	
201	Sep 05/2017		916	BLANK		235	Sep 05/2017	
202	Sep 05/2017		24-09-00 Config 2			236	Sep 05/2017	
203	Sep 05/2017		201	Sep 05/2017		237	Sep 05/2017	
204	Sep 05/2017		202	Sep 05/2017		238	Sep 05/2017	
205	Sep 05/2017		203	May 05/2018		239	Sep 05/2017	
206	Sep 05/2017		204	Sep 05/2017		240	Sep 05/2017	
207	Sep 05/2017		205	Sep 05/2017		241	Sep 05/2017	
208	Sep 05/2017		206	Sep 05/2017		242	Sep 05/2017	
209	Sep 05/2017		207	Sep 05/2017		243	Sep 05/2017	
210	Sep 05/2017		208	Sep 05/2017		244	Sep 05/2017	

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24-09-00 Config 2 (cont)			24-09-01 (cont)			24-11-01 Config 1		
245	Sep 05/2017		411	Sep 05/2017		401	Sep 05/2016	
246	Sep 05/2017		412	Jan 05/2017		402	Jul 25/2018	
247	Sep 05/2017		413	Sep 05/2017		403	Sep 05/2017	
248	Sep 05/2017		414	Sep 05/2017		404	Sep 05/2017	
249	Sep 05/2017		415	Sep 05/2017		405	Sep 05/2017	
250	Sep 05/2017		416	Sep 05/2017		406	Sep 05/2017	
251	Sep 05/2017		417	Sep 05/2017		407	Sep 05/2017	
252	Sep 05/2017		418	BLANK		408	Sep 05/2017	
253	Sep 05/2017		24-11-00			409	Sep 05/2017	
254	Sep 05/2017		201	May 05/2017		410	Sep 05/2017	
255	Sep 05/2017		202	Sep 05/2017		411	Sep 05/2017	
256	Sep 05/2017		203	Sep 05/2017		412	Jan 05/2018	
257	Sep 05/2017		204	Sep 05/2017		413	Jul 25/2018	
258	Sep 05/2017		205	Sep 05/2017		414	Jul 25/2018	
259	Sep 05/2017		206	Sep 05/2017		415	Jul 25/2018	
260	Sep 05/2017		207	Sep 05/2017		416	Jan 05/2018	
261	Sep 05/2017		208	Sep 05/2017		417	Jan 05/2018	
262	Sep 05/2017		24-11-00			418	Jan 05/2018	
263	Sep 05/2017		501	Jan 05/2015		419	Jan 05/2018	
264	Sep 05/2017		502	Sep 05/2017		420	BLANK	
265	Sep 05/2017		503	Sep 05/2017		24-11-01		
266	BLANK		504	Sep 05/2017		601	Jan 05/2016	
24-09-00			505	Sep 05/2017		602	Sep 05/2017	
501	Jan 05/2018		506	Sep 05/2017		603	Sep 05/2017	
502	Jan 05/2018		507	Jan 05/2015		604	Sep 05/2017	
24-09-01			508	BLANK		605	Sep 05/2017	
401	Jan 05/2017		24-11-00			606	Sep 05/2017	
402	Jan 05/2017		601	Jan 05/2016		607	Sep 05/2017	
403	Sep 05/2017		602	Sep 05/2017		608	Sep 05/2017	
404	Sep 05/2017		603	Sep 05/2017		609	Sep 05/2017	
405	Sep 05/2017		604	Sep 05/2017		610	Sep 05/2017	
406	Jan 05/2017		605	Sep 05/2017		611	Sep 05/2017	
407	Sep 05/2017		606	Sep 05/2017		612	Sep 05/2017	
408	Jan 05/2017		607	Sep 05/2017		613	Sep 05/2017	
409	Sep 05/2017		608	BLANK		614	Sep 05/2017	
410	Jan 05/2017					615	Sep 05/2017	

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Subject/Page	Date	COC	Subject/Page	Date	COC	Subject/Page	Date	COC
24-11-01 (cont)			24-11-04 Config 2 (cont)			24-11-10 Config 2		
616	Sep 05/2017		405	Sep 05/2017		401	Sep 05/2017	
617	Sep 05/2017		406	Sep 05/2017		402	Jan 05/2018	
618	BLANK		407	Sep 05/2017		403	Jan 05/2018	
24-11-02			408	Sep 05/2017		404	Sep 05/2017	
201	Sep 05/2017		409	Sep 05/2017		405	Sep 05/2017	
202	May 05/2017		410	Sep 05/2017		406	Sep 05/2016	
24-11-02 Config 2			411	Sep 05/2017		407	Sep 05/2017	
401	May 05/2017		412	Sep 05/2017		408	BLANK	
402	Sep 05/2017		413	Sep 05/2017		24-11-14 Config 1		
403	Sep 05/2017		414	BLANK		401	Sep 05/2017	
404	Sep 05/2017		24-11-04			402	Sep 05/2017	
405	Sep 05/2017		601	Sep 05/2017		403	Sep 05/2017	
406	Sep 05/2017		602	Jan 05/2016		404	Sep 05/2016	
407	Sep 05/2017		603	May 05/2015		405	Sep 05/2017	
408	BLANK		604	Sep 05/2017		406	Sep 05/2017	
24-11-03			605	May 05/2015		407	Sep 05/2017	
401	Jan 05/2016		606	Sep 05/2017		408	Sep 05/2017	
402	Sep 05/2017		607	Sep 05/2017		409	Sep 05/2016	
403	Sep 05/2017		608	Sep 05/2017		410	Sep 05/2017	
404	Sep 05/2017		24-11-04			24-11-15		
405	Sep 05/2017		701	Sep 05/2017		401	May 05/2017	
406	Sep 05/2017		702	Sep 05/2017		402	Sep 05/2017	
24-11-03			24-11-04			403	Sep 05/2017	
601	Jan 05/2016		801	Jan 05/2016		404	Sep 05/2017	
602	Sep 05/2017		802	Sep 05/2017		405	May 05/2015	
603	Sep 05/2017		803	Jan 05/2015		406	Jul 25/2018	
604	Sep 05/2017		804	BLANK		407	Sep 05/2017	
605	Sep 05/2017		24-11-06			408	BLANK	
606	Sep 05/2017		401	May 05/2017		24-11-17		
607	Sep 05/2017		402	Sep 05/2017		401	May 05/2017	
608	BLANK		403	Sep 05/2017		402	Sep 05/2017	
24-11-04 Config 2			404	Sep 05/2017		403	Jan 05/2018	
401	Sep 05/2017		405	Sep 05/2017		404	Sep 05/2017	
402	Sep 05/2017		406	Sep 05/2017		405	May 05/2015	
403	Sep 05/2017		407	Sep 05/2017		406	Sep 05/2017	
404	Sep 05/2017		408	Sep 05/2017				

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24-11-19 Config 2			24-21-01 (cont)			24-22-00		
401	Sep 05/2017		406	May 05/2017		501	Jan 05/2015	
402	May 05/2018		407	Sep 05/2017		502	Jan 05/2015	
403	May 05/2018		408	Sep 05/2017		503	Sep 05/2016	
404	May 05/2017		409	Sep 05/2017		504	Sep 05/2016	
405	May 05/2017		410	Sep 05/2017		505	Jan 05/2015	
406	May 05/2017		24-21-02			506	Jan 05/2015	
407	May 05/2017		401	Jan 05/2015		507	Sep 05/2017	
408	May 05/2017		402	Jan 05/2015		508	Sep 05/2017	
409	May 05/2017		403	May 05/2017		509	Sep 05/2017	
410	Jan 05/2018		404	Sep 05/2017		510	Sep 05/2017	
411	May 05/2018		405	Sep 05/2017		511	Sep 05/2017	
412	May 05/2018		406	BLANK		512	BLANK	
413	Sep 05/2017		24-21-02			24-22-01		
414	BLANK		601	Jan 05/2015		401	Sep 05/2017	
24-11-20 Config 1			602	BLANK		402	May 05/2017	
401	Sep 05/2017		24-22-00			403	Sep 05/2017	
402	Jan 05/2018		201	Jan 05/2015		404	BLANK	
403	Jan 05/2018		202	Jan 05/2015		24-22-02		
404	Sep 05/2017		203	Jan 05/2015		201	Sep 05/2017	
405	Sep 05/2017		R 204	Sep 05/2018		202	May 05/2018	
406	May 05/2017		R 205	Sep 05/2018		203	May 05/2018	
407	Sep 05/2017		O 206	Sep 05/2018		204	BLANK	
408	Jan 05/2018		O 207	Sep 05/2018		24-22-02		
409	Sep 05/2017		O 208	Sep 05/2018		401	May 05/2015	
410	BLANK		O 209	Sep 05/2018		402	May 05/2015	
24-21-00			O 210	Sep 05/2018		403	May 05/2017	
501	Sep 05/2017		O 211	Sep 05/2018		404	May 05/2015	
502	Jan 05/2015		R 212	Sep 05/2018		405	Jan 05/2016	
503	Sep 05/2017		R 213	Sep 05/2018		406	Jan 05/2016	
504	Jan 05/2015		R 214	Sep 05/2018		407	Sep 05/2016	
24-21-01			O 215	Sep 05/2018		408	May 05/2015	
401	Sep 05/2015		O 216	Sep 05/2018		409	May 05/2015	
402	Sep 05/2017		R 217	Sep 05/2018		410	BLANK	
403	Sep 05/2017		O 218	Sep 05/2018		24-22-03		
404	Sep 05/2017		A 219	Sep 05/2018		401	Sep 05/2017	
405	May 05/2017		A 220	Sep 05/2018		402	Sep 05/2017	

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24-22-03 (cont)			24-25-01 Config 1			24-25-02 Config 2		
403	May 05/2017		401	Sep 05/2016		401	May 05/2017	
404	May 05/2017		402	Sep 05/2017		402	Sep 05/2017	
405	Jan 05/2017		403	Jul 25/2018		403	Sep 05/2017	
406	Sep 05/2017		404	Jul 25/2018		404	May 05/2017	
407	Jan 05/2017		405	Jul 25/2018		405	Sep 05/2017	
408	Jan 05/2017		406	Jul 25/2018		406	Sep 05/2017	
24-22-05			407	Jul 25/2018		407	Sep 05/2017	
401	Sep 05/2017		408	May 05/2017		408	BLANK	
402	Jan 05/2018		409	Jul 25/2018		24-25-05 Config 1		
403	Sep 05/2017		410	May 05/2017		401	Sep 05/2017	
404	Sep 05/2017		411	May 05/2017		402	Sep 05/2017	
405	Sep 05/2017		412	Jan 05/2018		403	May 05/2017	
406	Jan 05/2018		413	Jan 05/2018		404	May 05/2015	
407	Jan 05/2018		414	Jan 05/2018		405	Sep 05/2017	
408	Jan 05/2018		415	Jan 05/2018		406	BLANK	
409	Sep 05/2017		416	Jan 05/2018		24-25-06		
410	BLANK		417	Jan 05/2018		401	Sep 05/2017	
24-25-00			418	Jan 05/2018		402	Sep 05/2017	
201	May 05/2017		419	Jan 05/2018		403	Sep 05/2017	
202	Sep 05/2017		420	Jan 05/2018		404	May 05/2017	
203	May 05/2017		24-25-01			405	May 05/2015	
204	Sep 05/2016		801	Sep 05/2017		406	Sep 05/2017	
205	Sep 05/2017		802	Jan 05/2015		24-25-07		
206	Sep 05/2017		803	Sep 05/2017		401	May 05/2017	
207	Sep 05/2017		804	Sep 05/2017		402	Sep 05/2017	
208	Sep 05/2017		805	May 05/2017		403	Sep 05/2017	
24-25-00			806	May 05/2017		404	Sep 05/2017	
501	Jan 05/2015		807	Sep 05/2017		405	Sep 05/2017	
502	Jan 05/2015		808	Sep 05/2017		406	Sep 05/2017	
24-25-00			809	Sep 05/2017		407	Sep 05/2017	
601	Sep 05/2017		810	May 05/2017		408	Sep 05/2017	
602	Sep 05/2017		811	May 05/2017		409	Sep 05/2017	
603	Sep 05/2017		812	BLANK		410	Sep 05/2017	
604	May 05/2017		24-25-02			24-25-09		
605	May 05/2017		201	Sep 05/2017		201	Sep 05/2017	
606	BLANK		202	May 05/2016		202	May 05/2018	

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24-25-09 (cont)			24-30-00			24-31-02		
203	May 05/2018		501	Jul 25/2018		401	May 05/2015	
204	BLANK		502	May 05/2015		402	Sep 05/2017	
24-25-09			503	May 05/2015		403	May 05/2017	
401	May 05/2015		504	Jul 25/2018		R 404	Sep 05/2018	
402	Sep 05/2017		505	Jul 25/2018		405	Jan 05/2015	
403	May 05/2017		506	Jul 25/2018		406	BLANK	
404	May 05/2017		507	Jul 25/2018		24-31-03		
405	Sep 05/2017		508	Jul 25/2018		401	Jan 05/2015	
406	Jan 05/2016		509	Jul 25/2018		402	Jan 05/2015	
407	Jan 05/2016		510	Jul 25/2018		403	May 05/2017	
408	Jan 05/2016		511	Jul 25/2018		404	May 05/2017	
24-25-10			512	Jul 25/2018		405	Sep 05/2017	
401	Sep 05/2017		513	Jul 25/2018		406	Jan 05/2015	
402	Sep 05/2017		514	BLANK		24-31-05		
403	May 05/2017		24-31-01			201	Jan 05/2015	
404	May 05/2017		201	Jan 05/2015		202	May 05/2017	
405	Jan 05/2017		202	Sep 05/2017		203	Jan 05/2015	
406	Jan 05/2017		203	May 05/2017		204	May 05/2015	
407	Jan 05/2017		204	Jan 05/2015		205	Jan 05/2015	
408	BLANK		205	May 05/2015		206	Jan 05/2015	
24-25-13			206	May 05/2015		207	Jan 05/2015	
401	Sep 05/2017		207	May 05/2015		208	Jan 05/2015	
402	Jan 05/2015		208	May 05/2015		24-31-05		
403	May 05/2017		209	Jan 05/2015		401	Sep 05/2015	
404	May 05/2017		210	Jan 05/2015		402	Sep 05/2017	
405	May 05/2015		24-31-01			403	Sep 05/2017	
406	Jan 05/2015		401	May 05/2018		404	Sep 05/2017	
24-25-16			R 402	Sep 05/2018		405	Sep 05/2017	
401	Sep 05/2017		R 403	Sep 05/2018		406	Sep 05/2017	
402	Sep 05/2017		404	May 05/2017		407	Sep 05/2017	
403	Sep 05/2017		405	May 05/2017		408	Sep 05/2017	
404	Sep 05/2017		406	May 05/2018		24-31-06		
405	Sep 05/2017		407	May 05/2018		401	Jan 05/2015	
406	May 05/2015		R 408	Sep 05/2018		402	Sep 05/2017	
407	Sep 05/2017		A 409	Sep 05/2018		403	May 05/2017	
408	BLANK		A 410	BLANK		404	Sep 05/2017	

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24-31-06 (cont)			24-32-09 (cont)			24-33-06 (cont)		
405	Jan 05/2015		404	Sep 05/2017		405	Sep 05/2017	
406	BLANK		405	Sep 05/2017		406	Sep 05/2016	
24-31-07			406	BLANK		24-33-07		
401	Jan 05/2015		24-32-10			401	Sep 05/2017	
402	Jan 05/2015		401	Sep 05/2017		402	Sep 05/2017	
403	May 05/2017		402	Sep 05/2017		403	May 05/2017	
404	May 05/2017		403	May 05/2017		404	May 05/2017	
405	Jan 05/2015		404	May 05/2017		405	May 05/2016	
406	Jan 05/2015		405	Jan 05/2015		406	Jan 05/2015	
24-31-09			406	Jan 05/2015		407	Jan 05/2015	
401	Jan 05/2015		24-33-02			408	BLANK	
402	Jan 05/2015		401	May 05/2015		24-35-00		
403	May 05/2017		402	Sep 05/2017		201	Jan 05/2016	
404	Sep 05/2015		403	May 05/2017		202	Sep 05/2017	
405	Sep 05/2015		404	May 05/2017		203	Jan 05/2017	
406	BLANK		405	Sep 05/2017		204	Jan 05/2017	
24-32-01			406	May 05/2015		205	Jan 05/2017	
401	Jan 05/2017		24-33-03			206	Sep 05/2017	
402	Jan 05/2018		401	May 05/2015		207	Jan 05/2017	
403	Jan 05/2018		402	May 05/2017		208	May 05/2017	
404	May 05/2017		403	May 05/2017		209	May 05/2017	
405	May 05/2017		404	Jan 05/2017		210	Sep 05/2017	
406	Jan 05/2017		24-33-05			211	Sep 05/2017	
407	Jan 05/2017		401	May 05/2015		212	Sep 05/2017	
408	Jan 05/2017		402	May 05/2015		213	Sep 05/2017	
24-32-08			403	May 05/2017		214	BLANK	
401	Sep 05/2017		404	May 05/2017		24-35-00		
402	Sep 05/2017		405	May 05/2015		501	Jul 25/2018	
403	May 05/2017		406	May 05/2015		502	Jul 25/2018	
404	May 05/2017		407	May 05/2015		503	Jul 25/2018	
405	Jan 05/2015		408	BLANK		504	Jul 25/2018	
406	Jan 05/2015		24-33-06			505	Jul 25/2018	
24-32-09			401	Jan 05/2015		506	Jul 25/2018	
401	Sep 05/2017		402	Sep 05/2017		24-35-01		
402	Sep 05/2017		403	May 05/2017		401	Sep 05/2017	
403	May 05/2017		404	May 05/2017		402	Sep 05/2017	

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24-35-01 (cont)			24-41-04			24-51-05 (cont)		
403	May 05/2015		R 401	Sep 05/2018		408	Jan 05/2018	
404	May 05/2017		R 402	Sep 05/2018		409	Jan 05/2017	
405	May 05/2015		R 403	Sep 05/2018		410	Jan 05/2017	
406	May 05/2015		R 404	Sep 05/2018		411	Jan 05/2017	
24-35-02			R 405	Sep 05/2018		412	Sep 05/2017	
401	Sep 05/2017		R 406	Sep 05/2018		413	Jul 25/2018	
402	Sep 05/2017		R 407	Sep 05/2018		414	Jul 25/2018	
403	Jan 05/2015		R 408	Sep 05/2018		415	Jul 25/2018	
404	May 05/2017		R 409	Sep 05/2018		416	Jul 25/2018	
405	May 05/2015		R 410	Sep 05/2018		417	Sep 05/2017	
406	May 05/2015		A 411	Sep 05/2018		418	Jan 05/2017	
24-41-00			A 412	Sep 05/2018		24-51-21		
501	Jan 05/2015		A 413	Sep 05/2018		401	Sep 05/2017	
502	Sep 05/2017		A 414	Sep 05/2018		402	Jan 05/2015	
503	Sep 05/2017		24-41-05			403	May 05/2017	
504	Sep 05/2017		201	Sep 05/2017		404	Sep 05/2017	
505	May 05/2017		202	May 05/2018		405	Sep 05/2017	
506	BLANK		203	May 05/2018		406	BLANK	
24-41-01			204	May 05/2018		24-61-01		
401	Sep 05/2017		24-41-05			401	Sep 05/2015	
402	Sep 05/2017		401	Sep 05/2017		402	Sep 05/2015	
403	May 05/2017		402	Sep 05/2017		403	May 05/2017	
404	May 05/2017		403	May 05/2017		404	Sep 05/2015	
405	Jan 05/2017		404	Jan 05/2017		405	Sep 05/2015	
406	Sep 05/2017		405	Sep 05/2017		406	BLANK	
407	Sep 05/2017		406	Sep 05/2017				
408	BLANK		407	Sep 05/2017				
24-41-03			408	BLANK				
601	Jan 05/2015		24-51-05					
602	Sep 05/2017		401	Sep 05/2017				
603	May 05/2017		402	Sep 05/2017				
604	May 05/2017		403	May 05/2017				
605	May 05/2015		404	May 05/2017				
606	Sep 05/2017		405	May 05/2017				
607	May 05/2017		406	Sep 05/2017				
608	May 05/2017		407	Jan 05/2018				

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<u>APU BATTERY CURRENT SENSOR - REMOVAL/INSTALLATION</u>	24-31-07		401	ARO ALL
APU Battery Current Sensor Removal TASK 24-31-07-000-801			401	ARO ALL
APU Battery Current Sensor Installation TASK 24-31-07-400-801			405	ARO ALL
<u>APU CRANK CONTACTOR - REMOVAL/INSTALLATION</u>	24-31-09		401	ARO ALL
APU Crank Contactor Removal TASK 24-31-09-000-801			401	ARO ALL
APU Crank Contactor Installation TASK 24-31-09-400-801			404	ARO ALL
<u>TRANSFORMER RECTIFIER UNITS (TRU) (4) - REMOVAL/INSTALLATION</u>	24-32-01		401	ARO ALL
Transformer Rectifier Unit Removal TASK 24-32-01-000-801			401	ARO ALL
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<u>CAPT - F/O BUS TIE RELAY - REMOVAL/INSTALLATION</u>	24-32-08		401	ARO ALL
Capt - F/O Bus Tie Relay Removal TASK 24-32-08-000-801			401	ARO ALL
Capt - F/O Bus Tie Relay Installation TASK 24-32-08-400-801			405	ARO ALL
<u>TRU RELAY - REMOVAL/INSTALLATION</u>	24-32-09		401	ARO ALL
TRU Relay Removal TASK 24-32-09-000-801			401	ARO ALL

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<u>DC TIE RELAY - REMOVAL/INSTALLATION</u>	24-32-10		401	ARO ALL
DC Tie Relay Removal TASK 24-32-10-000-801			401	ARO ALL
DC Tie Relay Installation TASK 24-32-10-400-801			405	ARO ALL
<u>RAM AIR TURBINE (RAT) GENERATOR AND GOVERNOR ASSEMBLY - REMOVAL/INSTALLATION</u>	24-33-02		401	ARO ALL
Ram Air Turbine (RAT) Generator and Governor Assembly Removal TASK 24-33-02-000-801			401	ARO ALL
RAT Generator and Governor Assembly Installation TASK 24-33-02-400-801			405	ARO ALL
<u>RAM AIR TURBINE (RAT) GENERATOR CONTROL UNIT (GCU) - REMOVAL/INSTALLATION</u>	24-33-03		401	ARO ALL
RAT GCU Removal TASK 24-33-03-000-801			401	ARO ALL
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<u>STATIC INVERTER - REMOVAL/INSTALLATION</u>	24-33-05		401	ARO ALL
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Static Inverter Installation TASK 24-33-05-400-801			405	ARO ALL
<u>TOWING STATIC INVERTER - REMOVAL/INSTALLATION</u>	24-33-06		401	ARO ALL
Towing Static Inverter Removal TASK 24-33-06-000-801			401	ARO ALL
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<u>FLIGHT CONTROLS DC POWER - MAINTENANCE PRACTICES</u>	24-35-00		201	ARO ALL
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BPCU Software Installation TASK 24-41-05-400-802			201	ARO ALL
<u>BUS POWER CONTROL UNIT (BPCU) - REMOVAL/INSTALLATION</u>	24-41-05		401	ARO ALL
BPCU Removal TASK 24-41-05-000-801			401	ARO ALL
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ELECTRICAL POWER - AIRPLANE CIRCUIT BREAKER LIST

1. General

- A. The list of circuit breakers can be found in the AMM front matter.

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ELECTRICAL POWER - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Electrical Power and Power Panels Deactivation
- (2) Electrical Power and Power Panels Activation

TASK 24-00-00-040-805-001

2. Electrical Power/Power Panels - Deactivation

(Figure 201)

A. **General**

- (1) This task removes electrical power from the aircraft.

B. **References**

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
49-11-00-040-801	APU Deactivation (P/B 201)
71-11-04 P/B 201	FAN COWL PANELS - MAINTENANCE PRACTICES
78-31-00 P/B 201	THRUST REVERSER SYSTEM - MAINTENANCE PRACTICES
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. **Location Zones**

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door
118AR	External Ground Power Supply Door

F. **Prepare for Deactivation**

SUBTASK 24-00-00-860-092-001



MAKE SURE THAT THE AREA AROUND THE DOOR FOR THE MAIN LANDING GEAR IS CLEAR OF PERSONNEL, AND EQUIPMENT. THE DOORS CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE AREA AROUND THE THRUST REVERSERS. THE THRUST REVERSERS EXTEND AND RETRACT QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)

 WARNING	KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure clearance zones are established at the following areas of flight control surfaces:
 - (a) Ailerons
 - (b) Rudders
 - (c) Elevators
 - (d) Flaps
 - (e) Slats
 - (f) Spoilers
 - (g) Landing Gear
 - (h) Thrust Reversers
 - (i) Drive mechanisms

SUBTASK 24-00-00-010-001-001

- (2) Do the following steps to open the thrust reversers.
 - (a) Retract and Deactivate Leading Edge Slats. Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (b) Deactivate Thrust Reversers. Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 24-00-00-010-002-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

G. Primary External Power

SUBTASK 24-00-00-020-001-001

- (1) Remove external power from the Ground Handling Bus.
 - (a) Remove power from the external power cable.
 - 1) At the P30 panel make sure these lights go off:
 - a) PRIMARY POWER CONNECTED light.
 - b) PRIMARY POWER NOT IN USE light.

 WARNING	REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Remove the external power cable.
 - 1) Attach a DO NOT OPERATE tag, STD-858 to the power cable receptacle.
- (c) Install the power chord restraining straps.

NOTE: Make sure you install the strap hooks properly. The strap hooks can cause the door to close improperly and allow airflow inside the panel.

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- (d) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

SUBTASK 24-00-00-020-002-001

- (2) Remove external power from the Ground Handling Service Bus.
- (a) At FWD L Attendant Panel set GROUND SERVICE switch to the OFF position (Figure 202).
- 1) Make sure the light in the switch goes off.
- (b) Remove power from the external power cable.
- 1) At the P30 panel make sure these lights go off:
 - a) PRIMARY POWER CONNECTED light.
 - b) PRIMARY POWER NOT IN USE light.



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) Remove the external power cable.
- 1) Attach a DO NOT OPERATE tag, STD-858 to the power cable receptacle.
- (d) Install the power chord restraining straps.
- NOTE: Make sure you install the strap hooks properly. The strap hooks can cause the door to close improperly and allow airflow inside the panel.
- (e) Close this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 118AR | External Ground Power Supply Door |

SUBTASK 24-00-00-020-003-001

- (3) Remove external power from the Main 115V AC Buses.
- (a) At pilot's overhead panel, P5, push the PRIMARY EXT POWER switch (Figure 205).
- 1) Make sure the AVAIL light in the switch comes on.
- (b) Remove power from the external power cable.
- 1) At the P30 panel make sure these lights go off:
 - a) PRIMARY POWER CONNECTED light.
 - b) PRIMARY POWER NOT IN USE light.



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) Remove the external power cable.
- 1) Attach a DO NOT OPERATE tag, STD-858 to the power cable receptacle.
- (d) Install the power chord restraining straps.
- NOTE: Make sure you install the strap hooks properly. The strap hooks can cause the door to close improperly and allow airflow inside the panel.

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- (e) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

H. Secondary External Power

SUBTASK 24-00-00-020-004-001

- (1) Remove power from the 115V AC buses.
 - (a) At the pilot's overhead panel, P5, do these steps:
 - 1) Push the SECONDARY EXT PWR switch.
 - a) Make sure the AVAIL light in the switch comes on..
 - 2) Set the BATTERY switch to the OFF (unlatched) position.
 - a) Make sure the SECONDARY POWER NOT IN USE light on the P30 panel is on.
 - (b) Remove power from the external power cable.
 - 1) At the P30 panel make sure these lights go off:
 - a) SECONDARY POWER CONNECTED light.
 - b) SECONDARY POWER NOT IN USE light.



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) Remove the external power cable.
 - 1) Attach a DO NOT OPERATE tag, STD-858 to the power cable receptacle.
 - (d) Install the power chord restraining straps.

NOTE: Make sure you install the strap hooks properly. The strap hooks can cause the door to close improperly and allow airflow inside the panel.
 - (e) Close this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 118AR | External Ground Power Supply Door |

I. APU Generator Power

SUBTASK 24-00-00-020-005-001

- (1) Remove power from the APU generator.
 - (a) Deactivate the APU. Do this task: APU Deactivation, TASK 49-11-00-040-801.
 - (b) At the pilot's overhead panel, P5, do these steps:
 - 1) Set the BATTERY switch to the OFF (unlatched) position.
 - (c) Disconnect the main battery connector (DM24013) and the APU battery connector (DM24012) from the batteries and install a DO NOT OPERATE tag, STD-858 to the connectors (Figure 203).
 - (d) Install a Battery Connection cover and attach a DO NOT OPERATE tag, STD-858.

J. Integrated Drive Generator (IDG) Power

SUBTASK 24-00-00-020-006-001

- (1) Remove Left and Right IDG Power from the 115V AC Buses.

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	25	C24603	L IDG DISC

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	1	C24302	TRU R
ARO 011-999			
A	6	C24302	TRU R

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- (b) Deactivate the Left and Right Engines. Do this task: FAN COWL PANELS - MAINTENANCE PRACTICES, PAGEBLOCK 71-11-04/201 and THRUST REVERSER SYSTEM - MAINTENANCE PRACTICES, PAGEBLOCK 78-31-00/201.
- (c) At the pilot's overhead panel, P5, Set the BATTERY switch to the OFF (unlatched) position.

K. Electrical Power/Power Panels - Tryout

NOTE: This tryout is to make sure the Electrical Power/Power Panels are in a zero energy state.

SUBTASK 24-00-00-860-086-001

- (1) Make sure the aircraft's engines are NOT running.

SUBTASK 24-00-00-860-087-001

- (2) Make sure the APU is NOT running.

SUBTASK 24-00-00-860-088-001

- (3) Make sure that these circuit breakers are open and have safety tags:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	25	C24603	L IDG DISC

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	2	C24602	R IDG DISC

SUBTASK 24-00-00-860-089-001

- (4) Make sure DO NOT OPERATE tag, STD-858 is attached at the following locations:
- (a) Power cable receptacle.
- (b) Main battery connector (DM24013).
- (c) APU battery connector.

SUBTASK 24-00-00-860-090-001

- (5) At the pilot's overhead panel, P5, do these steps:
- (a) Push the BATTERY switch to the ON position.
- 1) Make sure the light does NOT ILLUMINATE.
- (b) Make sure that the PRIMARY EXT PWR AVAIL indication is NOT ILLUMINATED.
- (c) Make sure that the SECONDARY EXT PWR AVAIL indication is NOT ILLUMINATED.

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- (d) Make sure the DRIVE lights on the L and R DRIVE DISC switches do not illuminate.

———— **END OF TASK** ————

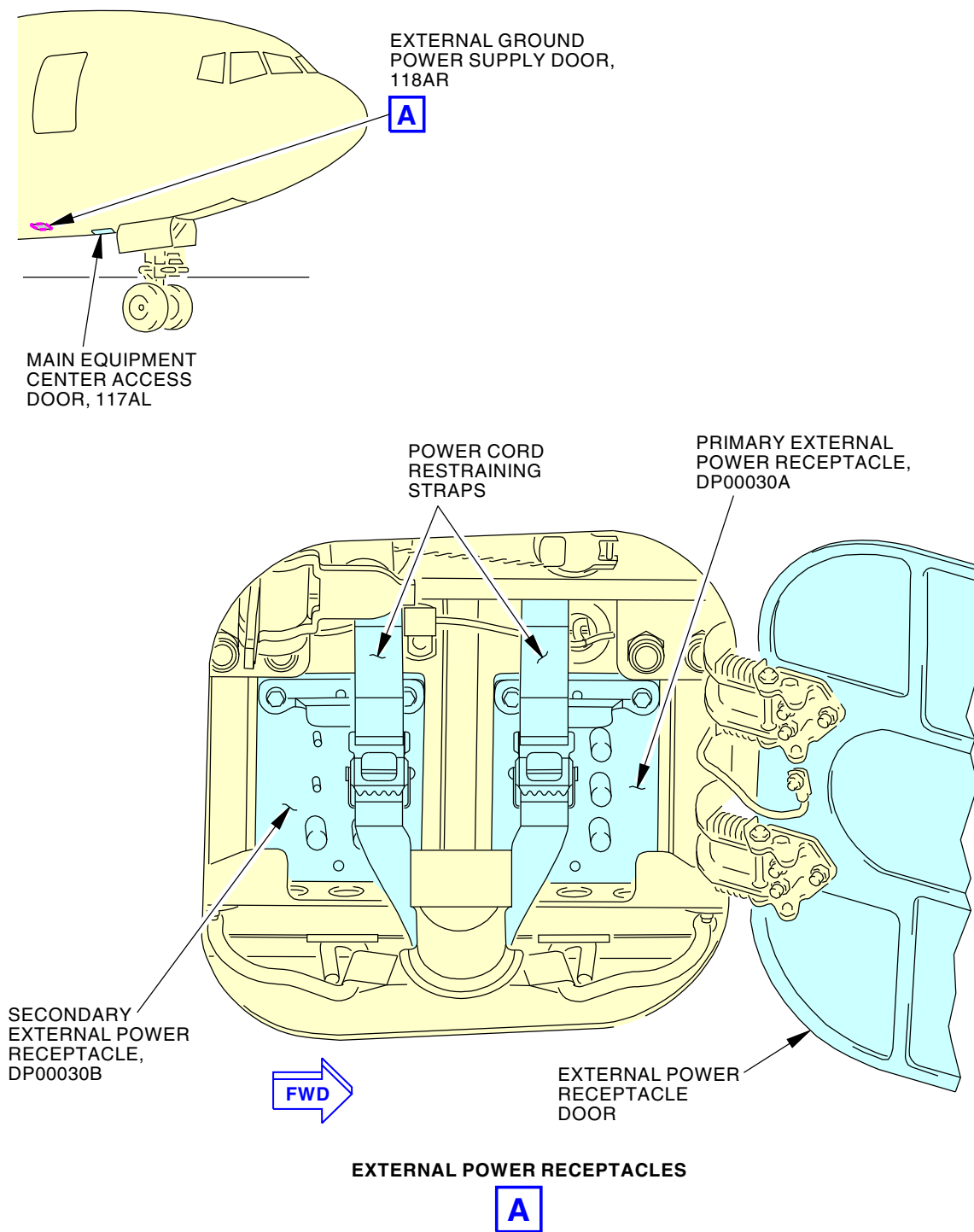
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2405319 S0000556248_V2

External Power Receptacle
Figure 201/24-00-00-990-801-001

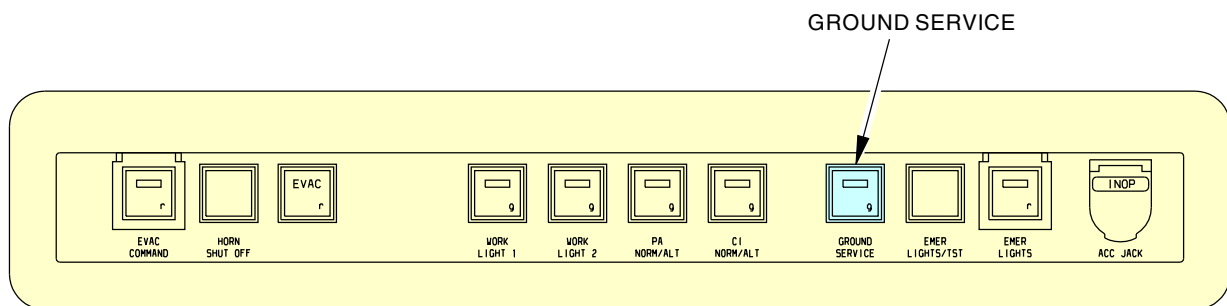
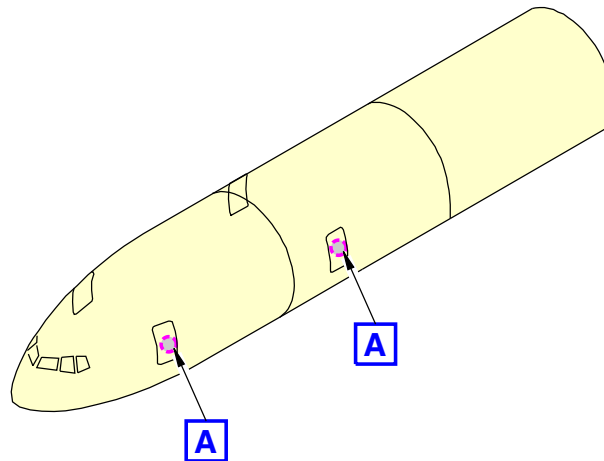
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FORWARD LEFT ATTENDANT PANEL

A

2405333 S0000556255_V2

Forward Left Attendant Panel
Figure 202/24-00-00-990-802-001

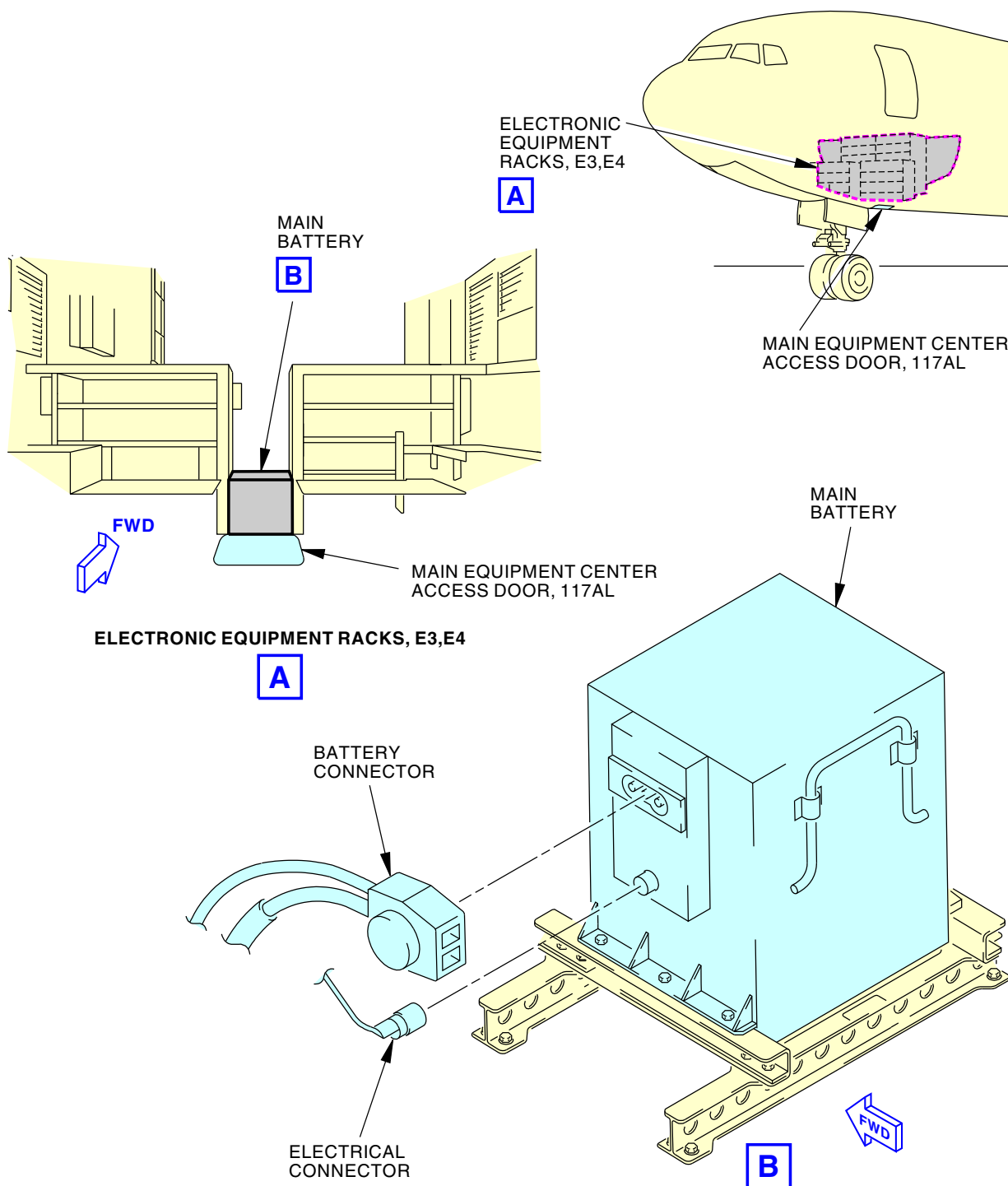
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2405336 S0000556257_V2

Main Battery Location
Figure 203/24-00-00-990-803-001

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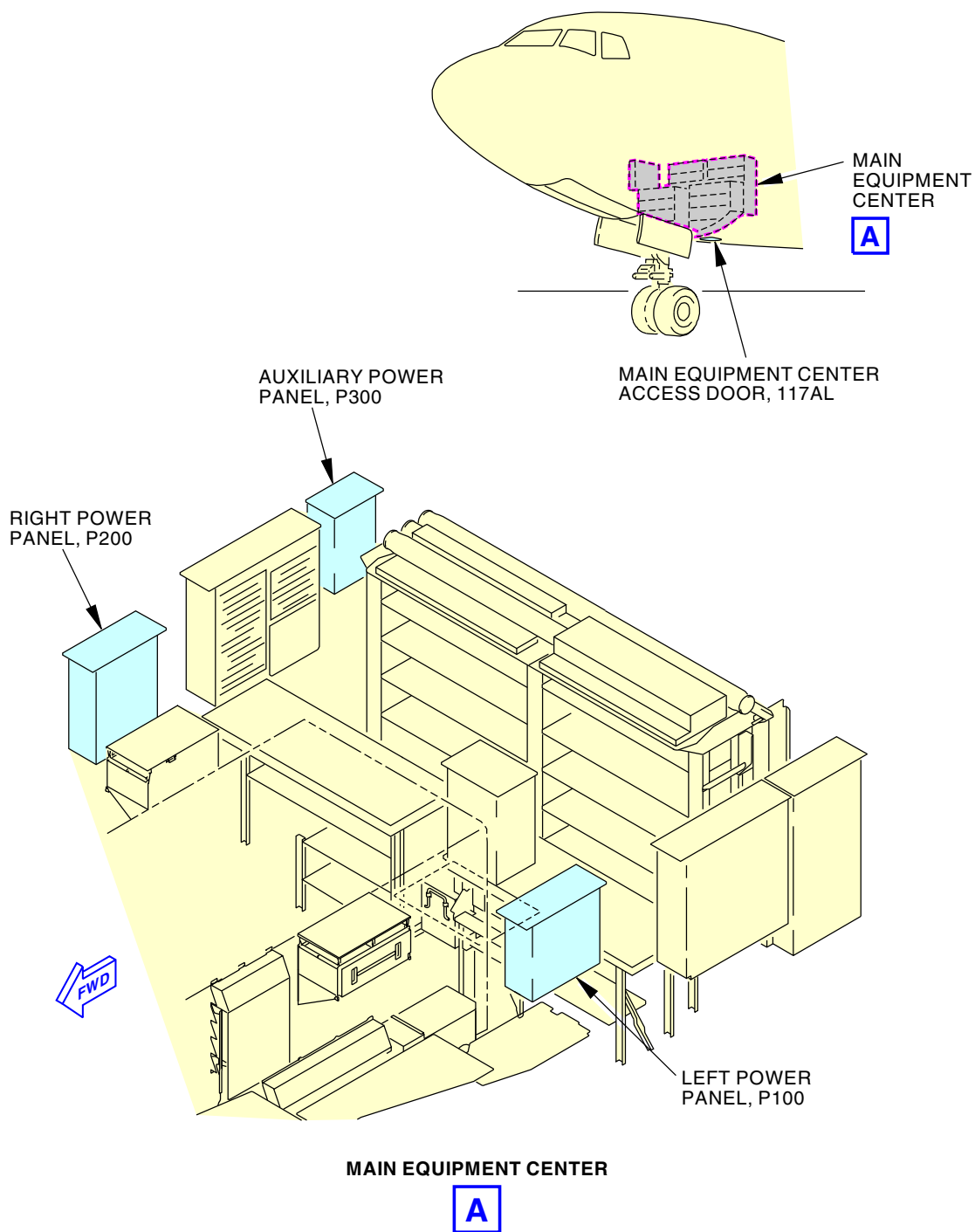
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2405342 S0000556259_V2

Power Panel
Figure 204/24-00-00-990-804-001

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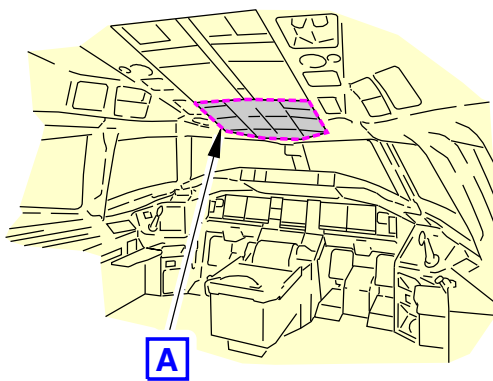
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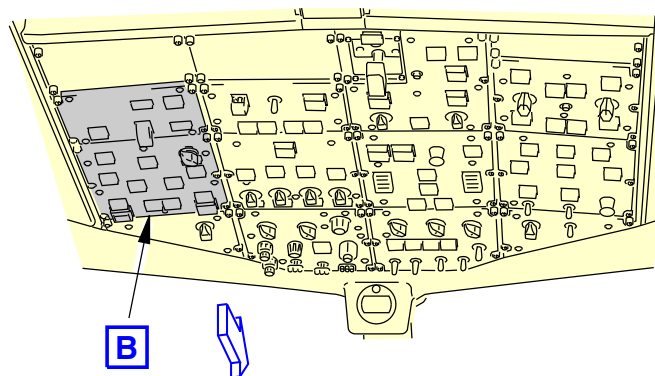
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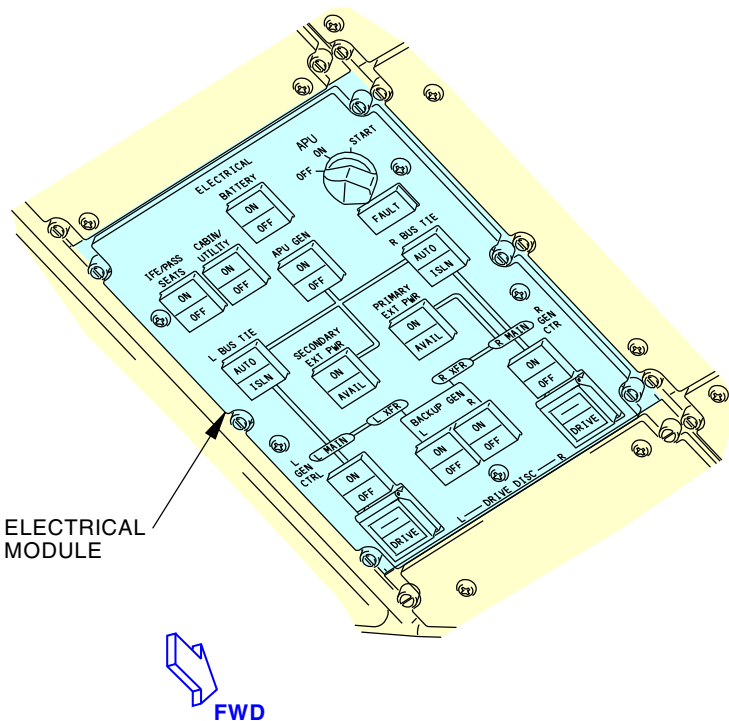
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FLIGHT COMPARTMENT



P5 PANEL



ELECTRICAL
MODULE

B

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Electrical System Control Panel
Figure 205/24-00-00-990-805-001

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TASK 24-00-00-440-805-001

3. Electrical Power/Power Panels - Activation

(Figure 201)

A. General

(1) This task adds electrical power to the aircraft.

B. References

Reference	Title
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
118AR	External Ground Power Supply Door

F. Prepare for Activation

SUBTASK 24-00-00-860-093-001



MAKE SURE THAT THE AREA AROUND THE DOOR FOR THE MAIN LANDING GEAR IS CLEAR OF PERSONNEL, AND EQUIPMENT. THE DOORS CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE AREA AROUND THE THRUST REVERSERS. THE THRUST REVERSERS EXTEND AND RETRACT QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.



KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure clearance zones are established at the following areas of flight control surfaces:
 - (a) Ailerons
 - (b) Rudders
 - (c) Elevators
 - (d) Flaps

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- (e) Slats
- (f) Spoilers
- (g) Landing Gear
- (h) Thrust Reversers
- (i) Drive mechanisms

SUBTASK 24-00-00-010-003-001

- (2) Remove DO NOT OPERATE tag, STD-858 from the following locations:
 - (a) Power cable receptacle.
 - (b) Main battery connector (DM24013).
 - (c) APU battery connector.

SUBTASK 24-00-00-420-004-001

- (3) Connect the main battery connector (DM24013) and the APU battery connector (DM24012) to the batteries (Figure 203).

SUBTASK 24-00-00-420-005-001

- (4) Remove Battery Connection cover and remove the DO NOT OPERATE tag, STD-858 from battery.

G. Primary External Power

SUBTASK 24-00-00-420-006-001

- (1) Supply external power to the Ground Handling Bus.
 - (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door
 - (b) Remove the DO NOT OPERATE tag, STD-858 from the external power receptacle.



WARNING

MAKE SURE THAT THERE IS NO OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT OF THE POWER SUPPLY OR THE AIRCRAFT. AN OPEN OR FLOATING GROUND CAN CAUSE ELECTRICAL SHOCK TO PERSONNEL WHO TOUCH THE AIRCRAFT.

- (c) Make sure the external power supply operates correctly before you supply external power to the airplane.
- (d) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, make sure the static ground is installed



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (e) Install the power cable to the primary external power receptacle.

NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.

 - 1) Hold the power cable with the power chord restraining straps.
- (f) Supply power to the external power cable.
 - 1) At the P30 panel make sure these lights come on:

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- a) PRIMARY POWER CONNECTED light.
 - b) PRIMARY POWER NOT IN USE light.
 - (g) At the pilot's overhead panel, P5:
 - 1) Make sure the AVAIL light in the PRIMARY EXT PWR switch comes on (Figure 205).
- NOTE:** The ground handling bus energizes automatically when the external power is supplied to the primary external power receptacle.

SUBTASK 24-00-00-420-007-001

- (2) Supply external power to the Ground Service Bus.

- (a) Open this access panel:

Number	Name/Location
118AR	External Ground Power Supply Door

- (b) Remove DO NOT OPERATE tag, STD-858 from the external power receptacle.



WARNING

MAKE SURE THAT THERE IS NO OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT OF THE POWER SUPPLY OR THE AIRCRAFT. AN OPEN OR FLOATING GROUND CAN CAUSE ELECTRICAL SHOCK TO PERSONNEL WHO TOUCH THE AIRCRAFT.

- (c) Make sure the external power supply operates correctly before you supply external power to the airplane.
- (d) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, make sure the static ground is installed



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (e) Install the power cable to the primary external power receptacle.

NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.

- 1) Hold the power cable with the power chord restraining straps.
- (f) Supply power to the external power cable.
 - 1) At the P30 panel make sure these lights come on:
 - a) PRIMARY POWER CONNECTED light.
 - b) PRIMARY POWER NOT IN USE light.
- (g) At the pilot's overhead panel, P5, make sure the AVAIL light in the PRIMARY EXT PWR switch comes on.

NOTE: The ground handling bus energizes automatically when the external power is supplied to the primary external power receptacle.
- (h) At FWD L Attendant Panel set GROUND SERVICE switch to the ON position (Figure 202).
 - 1) Make sure the light in the switch comes on.

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- (i) At the P30 panel make sure the PRIMARY POWER NOT IN USE light is off.

NOTE: The ground service bus energizes when the external power is supplied to the receptacle and the GROUND SERVICE switch is set to ON.

SUBTASK 24-00-00-420-008-001

- (3) Supply external power to the Main 115V AC Buses.



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

- (a) If the airplane has been without power for more than 24 hours, then do this step:

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

- (b) Open this access panel:

Number Name/Location

118AR External Ground Power Supply Door

- (c) Remove the DO NOT OPERATE tag, STD-858 from the external power receptacle.



WARNING

MAKE SURE THAT THERE IS NO OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT OF THE POWER SUPPLY OR THE AIRCRAFT. AN OPEN OR FLOATING GROUND CAN CAUSE ELECTRICAL SHOCK TO PERSONNEL WHO TOUCH THE AIRCRAFT.

- (d) Make sure the external power supply operates correctly before you supply external power to the airplane.

- 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, make sure the static ground is installed.



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (e) Install the power cable to the primary external power receptacle.

NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.

- 1) Hold the power cable with the power chord restraining straps.

- (f) Supply power to the external power cable.

- 1) At the P30 panel make sure these lights come on:
a) PRIMARY POWER CONNECTED light.
b) PRIMARY POWER NOT IN USE light.

- (g) At the pilot's overhead panel, P5, do the following steps:

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- 1) Make sure the AVAIL light in the PRIMARY EXT PWR switch comes on.
NOTE: The ground handling bus energizes automatically when the external power is supplied to the primary external power receptacle.
- 2) Set the BATTERY switch to the ON (latched) position.
 - a) If the battery is discharged, then do the steps that follow:
 - <1> Set the GROUND SERVICE switch to the ON position.
 - <a> Make sure the ON light in the GROUND SERVICE switch comes on.
 - <2> Wait approximately 10 minutes for the battery to partially charge, then continue with the procedure to supply primary external power.
- 3) Push the PRIMARY EXT PWR switch.
 - a) Make sure the ON light in the PRIMARY EXT PWR switch comes on.
 - b) If the ON light does not come on, do the steps that follow:
 - <1> Open these circuit breakers and install safety tags:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C24307	L MAIN AC SECT 1 BUS DISTR P110

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-004			
B	2	C24306	R MAIN AC SECT 1 BUS DISTR P210
ARO 006-999			
C	6	C24306	R MAIN AC SECT 1 BUS DISTR P210

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- c) Push the PRIMARY EXT PWR switch and make sure the ON light comes on.
- d) Remove the safety tags and close these circuit breakers:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C24307	L MAIN AC SECT 1 BUS DISTR P110

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-004			
B	2	C24306	R MAIN AC SECT 1 BUS DISTR P210
ARO 006-999			
C	6	C24306	R MAIN AC SECT 1 BUS DISTR P210

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- e) Set the BATTERY switch to the OFF (unlatched) position.
- f) Make sure the L BUS TIE and R BUS TIE switches are in the AUTO (latched) position
- g) Make sure the PRIMARY POWER NOT IN USE light on the P30 panel is off.

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- h) If applicable remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

H. Secondary External Power

SUBTASK 24-00-00-420-009-001

- (1) Supply secondary external power to the 115V AC buses:

NOTE: The ground service bus will automatically energize when the external power is supplied to the right 115V AC bus.

- (a) At the pilot's overhead panel, P5, do these steps:
- 1) Set the BATTERY switch to the ON (latched) position

- (b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

- (c) Remove the DO NOT OPERATE tag, STD-858 from the external power receptacle.



WARNING

MAKE SURE THAT THERE IS NO OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT OF THE POWER SUPPLY OR THE AIRCRAFT. AN OPEN OR FLOATING GROUND CAN CAUSE ELECTRICAL SHOCK TO PERSONNEL WHO TOUCH THE AIRCRAFT.

- (d) Make sure the external power supply operates correctly before you supply external power to the airplane.
- (e) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, make sure the static ground is installed



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (f) Install the power cable to the secondary external power receptacle.

NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.

- 1) Hold the power cable with the power chord restraining straps.

- (g) Supply power to the external power cable.

- 1) At the P30 panel make sure these lights come on:
 - a) SECONDARY POWER CONNECTED light.
 - b) SECONDARY POWER NOT IN USE light.

- (h) At the pilot's overhead panel, P5, do these steps:

- 1) Make sure the AVAIL light in the SECONDARY EXT PWR switch comes on.

NOTE: The ground handling bus energizes automatically when the external power is supplied to the primary external power receptacle.

- 2) Make sure the L BUS TIE and R BUS TIE switches are in the AUTO (latched) position.

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I. APU Generator

SUBTASK 24-00-00-420-010-001

- (1) Supply the APU generator power to the 115V AC buses:

NOTE: The ground handling bus will automatically energize when the external power is supplied to the receptacle. The ground service bus will automatically energize when the external power is supplied to the right 115V AC bus.

- (a) At the pilot's overhead panel, P5, do these steps:

- 1) Set the BATTERY switch to the ON (latched) position.
- 2) Set the APU GEN switch to the ON (latched) position.
- 3) Set the L BUS TIE and R BUS TIE switches to the AUTO (latched) position.

NOTE: The ground service bus will automatically energize when the external power is supplied to the right 115V AC bus.

J. Integrated Drive Generator (IDG)

SUBTASK 24-00-00-420-011-001

- (1) Supply the Left and Right IDG power to the 115V AC buses:

- (a) At the pilot's overhead panel, P5, do these steps:

- 1) Set the BATTERY switch to the ON (latched) position.
- 2) Set the L GEN CTRL switch to the ON (latched) position.
- 3) Set the R GEN CTRL switch to the ON (latched) position.

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	25	C24603	L IDG DISC

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	1	C24302	TRU R
ARO 011-999			
A	6	C24302	TRU R

ARO ALL

K. Put the Airplane Back to Its Usual Condition

SUBTASK 24-00-00-410-001-001

- (1) Do the following steps to close the thrust reversers.

- (a) Retract and Activate the Leading Edge Slats. Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801
- (b) Activate the Thrust Reversers. Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 24-00-00-420-013-001

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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———— END OF TASK ————

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ELECTRICAL POWER - DDG MAINTENANCE PROCEDURES

1. General

- A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG). These tasks prepare the airplane for flight with certain systems/components inoperative.
- B. This procedure also has the tasks that put the airplane back to its usual condition.
- C. These are the tasks for the components in the electrical power system:
 - (1) MMEL 24-09-1 (DDG) Preparation - Electrical Load Management System (ELMS) Power Management Channels Inoperative
 - (2) MMEL 24-09-1 (DDG) Restoration - Electrical Load Management System (ELMS) Power Management Channels Inoperative
 - (3) MMEL 24-11-1 (DDG) Preparation - Engine Driven Generator Systems (IDG, GCB) Inoperative
 - (4) MMEL 24-11-1 (DDG) Restoration - Engine Driven Generator Systems (IDG, GCB) Inoperative
 - (5) MMEL 24-21-1 (DDG) Preparation - APU Driven Generator System (Generator, AGCU, APB) Inoperative
 - (6) MMEL 24-21-1 (DDG) Restoration - APU Driven Generator System (Generator, AGCU, APB) Inoperative
 - (7) MMEL 24-22-1 (DDG) Preparation - Relays-AC (Ground Handling, Ground Service Select, Ground Service Transfer) Inoperative
 - (8) MMEL 24-22-1 (DDG) Restoration - Relays-AC (Ground Handling, Ground Service Select, Ground Service Transfer) Inoperative
 - (9) MMEL 24-25-1 (DDG) Preparation - Backup Electrical Power System (Backup Generators, Converter and CCBs) Inoperative
 - (10) MMEL 24-25-1 (DDG) Restoration - Backup Electrical Power System (Backup Generators, Converter and CCBs) Inoperative
 - (11) MMEL 24-31-2 (DDG) Preparation - APU Battery Charger Inoperative
 - (12) MMEL 24-31-2 (DDG) Restoration - APU Battery Charger Inoperative

TASK 24-00-00-040-804

2. MMEL 24-09-1 (DDG) Preparation - ELMS Power Management Channels Inoperative

A. **General**

- (1) This task gives the maintenance steps which prepare the airplane for flight with ELMS Power Management Channels Inoperative.

B. **References**

Reference	Title
24-09-00-730-801	ELMS Power Management Panel - System Test (P/B 501)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. **Location Zones**

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

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D. ELMS Power Management Panel System Test

SUBTASK 24-00-00-860-029

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

SUBTASK 24-00-00-730-001

- (2) Do this task: ELMS Power Management Panel - System Test, TASK 24-09-00-730-801.
 - (a) Make sure at least one ELMS Power Management Channel is operating normally in each ELMS Power Management Panel (P110, P210, P310).

SUBTASK 24-00-00-860-030

- (3) Make sure EICAS status messages ELMS P110 PANEL, ELMS P210 PANEL, or ELMS P310 PANEL are not displayed.

SUBTASK 24-00-00-860-031

- (4) Install an INOP placard in the flight compartment indicating which ELMS Power Management Channel is inoperative.

E. Put The Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-032

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

TASK 24-00-00-440-804

3. MMEL 24-09-1 (DDG) Restoration - ELMS Power Management Channels Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with ELMS Power Management Channels Inoperative.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

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

D. ELMS Power Management Channel Activation

SUBTASK 24-00-00-860-033

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

SUBTASK 24-00-00-740-005

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

SUBTASK 24-00-00-810-009

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

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SUBTASK 24-00-00-810-010

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

SUBTASK 24-00-00-860-034

- (5) Remove the ELMS Power Management Channel INOP placard.

E. Put The Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-035

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

TASK 24-00-00-040-802

4. MMEL 24-11-1 (DDG) Preparation - Engine Driven Generator Systems (IDG, GCB) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Engine Driven Generator Systems Integrated Drive Generator (IDG) and Generator Control Breaker (GCB) inoperative.
- (2) Engine Indication and Crew Alerting System (EICAS) status messages.
 - (a) ELEC GEN SYS L
 - (b) ELEC GEN SYS R
 - (c) IDG VALVE CLOSED L
 - (d) IDG VALVE CLOSED R

B. References

Reference	Title
12-13-07-200-801	Backup Generator Oil Level Check (P/B 301)
12-22-07-200-803	IDG Oil Level Check (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
71-71-00 P/B 601	ENGINE VENTS AND DRAINS - INSPECTION/CHECK

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
411	Engine, Left
421	Engine, Right

D. Integrated Drive Generator (IDG) Deactivation

SUBTASK 24-00-00-860-036

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

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SUBTASK 24-00-00-860-037

- (2) Make sure that the left, right and Auxiliary Power Unit (APU) Generator Control Units (Generator Control Unit (GCU)s) operate normally.
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Wait 60 seconds after APU starts and then set the APU GEN switch to the ON position.
 - (c) Make sure that the ON light comes on and the OFF light extinguishes.
 - (d) Set both the L BUS TIE and the R BUS TIE switches to the AUTO position.
 - (e) Make sure that the ISLN light extinguishes.
 - (f) Set both the L GEN CTRL and the R GEN CTRL switches to the OFF position.
 - (g) Make sure that both OFF lights come on.
 - (h) Set the PRIMARY EXT PWR switch to the OFF position.
 - (i) Make sure that the ON light extinguishes.
 - (j) Look at the electrical synoptic and make sure both the L BUS TIE and R BUS TIE breakers are closed.
 - (k) Confirm the APU generator is providing power to the left and right main AC buses.
 - 1) On Electrical Maintenance page 1/2, confirm the only AC electrical source with a Load readout greater than 0.0 is the APU generator.
 - 2) On Electrical Maintenance page 2/2, confirm the AC power for both L and R Main Busses is ON.
 - 3) Confirm the ELEC AC BUS L and ELEC AC BUS R caution messages are not displayed.
 - (l) Set the L BUS TIE switch to the ISLN position.
 - (m) Make sure that the ISLN light comes on and the ELEC AC BUS L caution message is displayed.
 - (n) Set the L BUS TIE switch to the AUTO position.
 - (o) Make sure that the ISLN light goes out and the ELEC AC BUS L caution message is not displayed.
 - (p) Set the R BUS TIE switch to the ISLN position.
 - (q) Make sure that the ISLN light comes on and the ELEC AC BUS R caution message is displayed.
 - (r) Set the R BUS TIE switch to the AUTO position.
 - (s) Make sure that the ISLN light goes out and the ELEC AC BUS R caution message is not displayed.
 - (t) Set the operative Electrical Panel GEN CTRL switch to the ON position.

SUBTASK 24-00-00-000-002

- (3) Disconnect the inoperative IDG.

NOTE: During the authorized repair interval, if the associated engine is operated for more than 50 hours with the IDG disconnected, then the IDG should be removed for shop inspection before the airplane is returned to service.

 - (a) To prevent oil loss, cap the IDG/Accessory Gear Box (AGB) seal pad drain if oil leakage beyond Aircraft Maintenance Manual (AMM) allowable limits is observed from the engine drain mast, IDG/AGB drain port (ENGINE VENTS AND DRAINS - INSPECTION/CHECK, PAGEBLOCK 71-71-00/601).

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- (b) On Electrical Maintenance page 1/2, confirm the Oil Level for the associated IDG is NORMAL.

NOTE: The IDG must have sufficient oil to prevent more damage.

NOTE: The oil level can also be checked by viewing the IDG oil level sightglass.

- 1) Do this task: IDG Oil Level Check, TASK 12-22-07-200-803.
- (c) On Electrical Maintenance page 1/2, confirm the oil filter status for the backup generators is NORMAL.
- 1) Do this task: Backup Generator Oil Level Check, TASK 12-13-07-200-801.
- (d) Set the applicable GEN CTRL switch to OFF.
- (e) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
- (f) When the engine is at idle speed or higher, push and release the applicable DRIVE DISC switch.
- 1) Make sure that the DRIVE light on the DRIVE DISC switch is on.
- (g) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
- (h) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
- (i) Install an INOP placard on the applicable GEN CTRL switch.
- (j) If necessary, install lockwire on the applicable DRIVE DISC switch guard (TASK 20-10-23-400-801).

E. Put The Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-017

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

TASK 24-00-00-440-802

5. MMEL 24-11-1 (DDG) Restoration - Engine Driven Generator Systems (IDG, GCB) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Engine Driven Generator Systems (IDG, GCB) Inoperative.

B. References

Reference	Title
24-11-01-200-801	IDG Input Shaft Connection (P/B 601)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
71-71-00-700-801-H01	Engine Vents and Drains Examination (P/B 601)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
411	Engine, Left
421	Engine, Right

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D. Engine Driven Generator Systems (IDG, GCB) Activation

SUBTASK 24-00-00-000-003

- (1) If installed, remove the cap from the Integrated Drive Generator (IDG)/Accessory Gear Box (AGB) seal pad drain (Engine Vents and Drains Examination, TASK 71-71-00-700-801-H01).

SUBTASK 24-00-00-860-018

- (2) Do this task: IDG Input Shaft Connection, TASK 24-11-01-200-801.

NOTE: Do these steps if the IDG input shaft is disconnected.

SUBTASK 24-00-00-860-019

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

SUBTASK 24-00-00-740-002

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

SUBTASK 24-00-00-810-003

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

SUBTASK 24-00-00-810-004

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

SUBTASK 24-00-00-080-001

- (7) Remove the INOP placard from the applicable GEN CTRL switch.

E. Put The Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-020

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

TASK 24-00-00-040-803

6. M MEL 24-21-1 (DDG) Preparation - APU Driven Generator System (Generator, AGCU, APB) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU Driven Generator System (Generator, AGCU, APB) Inoperative.

B. Location Zones

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

C. APU Driven Generator System Deactivation

SUBTASK 24-00-00-860-021

- (1) Put the APU GEN switch in the OFF position.

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SUBTASK 24-00-00-860-022

- (2) Install an INOP placard on the APU GEN switch.

————— END OF TASK —————

TASK 24-00-00-440-803

7. M MEL 24-21-1 (DDG) Restoration - APU Driven Generator System (Generator, AGCU, APB) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the APU Driven Generator System (Generator, AGCU, APB) Inoperative.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

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

D. APU Driven Generator System Activation

SUBTASK 24-00-00-860-024

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

SUBTASK 24-00-00-740-004

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

SUBTASK 24-00-00-810-007

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

SUBTASK 24-00-00-810-008

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

SUBTASK 24-00-00-860-040

- (5) Remove the INOP placard from the APU GEN switch.

E. Put The Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-041

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

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TASK 24-00-00-860-801

8. MMEL 24-22-1 (DDG) Preparation - AC Relays (Ground Handling, Ground Service Select, Ground Service Transfer) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with AC relays (Ground Handling, Ground Service Select, Ground Service Transfer) Inoperative.

B. References

Reference	Title
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Ground Handling Relay Deactivation

SUBTASK 24-00-00-810-011

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

Auxiliary Power Panel, P300

Row	Col	Number	Name
ARO 006-999			
A	1	C24342	GND HDLG AC BUS DISTR P320
ARO 011-999			
A	2	C25309	CARGO HDLG AFT COMPT L
ARO 001-010			
A	2	C25307	CARGO HDLG FWD COMPT L
A	3	C25309	CARGO HDLG AFT COMPT L
ARO 011-999			
A	3	C25307	CARGO HDLG FWD COMPT L
ARO 001-010			
A	5	C25310	CARGO HDLG AFT COMPT R
ARO 001-004			
B	2	C24342	GND HDLG AC BUS DISTR P320
ARO ALL			
B	3	C25308	CARGO HDLG FWD COMPT R
ARO 011-999			
C	3	C25310	CARGO HDLG AFT COMPT R

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SUBTASK 24-00-00-860-042

- (2) Install an INOP placard in the flight compartment indicating that the Ground Handling Relay is inoperative.

E. Ground Service Select Relay Inoperative

SUBTASK 24-00-00-810-021

- (1) For using Secondary External Power:
 - (a) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.
 - 1) Set the BATTERY switch on the P5 panel to the ON position.
 - 2) Apply secondary external power.
 - (b) Set the APU GEN switch on the P5 panel to the OFF position.
 - (c) Remove Primary External Power.

NOTE: The Primary External Power cord must be removed from the receptacle. Selecting the Electrical Panel (P5) PRIMARY EXT PWR switch off is not sufficient.
 - (d) Make sure ELEC AC BUS R caution message is not displayed.
 - (e) Use the Electrical Maintenance Page 2/2 to make sure all Ground Service Buses are ON.

SUBTASK 24-00-00-810-020

- (2) For using an Engine:
 - (a) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
 - (b) Set the GEN CTRL switch on the P5 panel to the ON position.
 - (c) Set the L and R BUS TIE switches to the AUTO position for left Engine started.
 - (d) Set the APU GEN control switch on the P5 panel to the OFF position..
 - (e) Remove Primary External Power.

NOTE: The Primary External Power cord must be removed from the receptacle. Selecting the Electrical Panel (P5) PRIMARY EXT PWR switch off is not sufficient.
 - (f) Make sure ELEC AC BUS R caution message is not displayed.
 - (g) Use the Electrical Maintenance Page 2/2 to make sure all Ground Service Buses are ON.
 - (h) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00

F. Ground Service Transfer Relay Inoperative

SUBTASK 24-00-00-860-050

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

SUBTASK 24-00-00-860-051

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

SUBTASK 24-00-00-860-052

- (3) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.

SUBTASK 24-00-00-810-013

- (4) Do these steps to make sure the Ground Service Transfer Relay is in the R MAIN BUS position:
 - (a) Make sure the R Main AC Bus is powered from either the left or right IDG.
 - (b) Remove Primary External Power from the airplane.

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- (c) Remove Secondary External Power from the airplane.
- (d) Set the APU GEN switch on the P5 panel to the OFF position.
- (e) Use the Electrical Maintenance Page to make sure the Ground Service Bus is powered.

SUBTASK 24-00-00-860-053

- (5) Install an INOP placard in the flight compartment indicating that the Ground Service Transfer Relay is inoperative.

SUBTASK 24-00-00-860-054

- (6) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 24-00-00-860-055

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

SUBTASK 24-00-00-860-056

- (8) Put The Airplane Back to Its Usual Condition
 - (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— **END OF TASK** —————

TASK 24-00-00-860-802

9. M MEL 24-22-1 (DDG) Restoration - AC Relays (Ground Handling, Ground Service Select, Ground Service Transfer) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with AC relays (Ground Handling, Ground Service Select, Ground Service Transfer) Inoperative.

B. References

Reference	Title
24-22-05-000-801	Ground Handling and Ground Service Relay Removal (P/B 401)
24-22-05-400-801	Ground Handling and Ground Service Relay Installation (P/B 401)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Ground Handling Relay Replacement

SUBTASK 24-00-00-860-057

- (1) Do this task: Ground Handling and Ground Service Relay Removal, TASK 24-22-05-000-801.

SUBTASK 24-00-00-860-058

- (2) Do this task: Ground Handling and Ground Service Relay Installation, TASK 24-22-05-400-801.

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SUBTASK 24-00-00-810-014

- (3) Close these circuit breakers:

Auxiliary Power Panel, P300

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 006-999			
A	1	C24342	GND HDLG AC BUS DISTR P320
ARO 011-999			
A	2	C25309	CARGO HDLG AFT COMPT L
ARO 001-010			
A	2	C25307	CARGO HDLG FWD COMPT L
A	3	C25309	CARGO HDLG AFT COMPT L
ARO 011-999			
A	3	C25307	CARGO HDLG FWD COMPT L
ARO 001-010			
A	5	C25310	CARGO HDLG AFT COMPT R
ARO 001-004			
B	2	C24342	GND HDLG AC BUS DISTR P320
ARO ALL			
B	3	C25308	CARGO HDLG FWD COMPT R
ARO 011-999			
C	3	C25310	CARGO HDLG AFT COMPT R

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SUBTASK 24-00-00-860-059

- (4) Remove the Ground Handling Relay INOP placard.

SUBTASK 24-00-00-860-060

- (5) Put The Airplane Back to Its Usual Condition

E. Ground Service Select Relay Replacement

SUBTASK 24-00-00-860-061

- (1) Do this task: Ground Handling and Ground Service Relay Removal, TASK 24-22-05-000-801.

SUBTASK 24-00-00-860-062

- (2) Do this task: Ground Handling and Ground Service Relay Installation, TASK 24-22-05-400-801.

SUBTASK 24-00-00-860-063

- (3) Remove the Ground Service Select Relay INOP placard.

SUBTASK 24-00-00-860-064

- (4) Put The Airplane Back to Its Usual Condition

F. Ground Service Transfer Relay Replacement

SUBTASK 24-00-00-860-065

- (1) Do this task: Ground Handling and Ground Service Relay Removal, TASK 24-22-05-000-801.

SUBTASK 24-00-00-860-066

- (2) Do this task: Ground Handling and Ground Service Relay Installation, TASK 24-22-05-400-801.

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SUBTASK 24-00-00-860-067

- (3) Remove the Ground Service Transfer Relay INOP placard.

SUBTASK 24-00-00-860-068

- (4) Put The Airplane Back to Its Usual Condition

————— END OF TASK —————

TASK 24-00-00-600-801

10. M MEL 24-25-1 (DDG) Preparation - Backup Electrical Power System (Backup Generators, Converter and CCBs) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with Backup Electrical Power System (Backup Generators, Converter and CCBs) Inoperative.
- (2) You can use the GSE-Laptop, maintenance device, SPL-5704, as an alternative to the PMAT in this task.

NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.

B. References

Reference	Title
24-25-16-400-803	Backup Generator Blanking Plate 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
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

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

E. Backup Electrical Power System Inoperative with Backup Generator (BUG) Installed.

SUBTASK 24-00-00-860-083

- (1) Install an INOP placard on the applicable BUG switch on the P5 Panel.

F. Backup Electrical Power System Inoperative with Backup Generator (BUG) Removed.

SUBTASK 24-00-00-420-001

- (1) Do this task: Backup Generator Blanking Plate Installation, TASK 24-25-16-400-803.

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SUBTASK 24-00-00-860-077

- (2) Install an INOP placard on the applicable BUG switch on the P5 Panel.

————— END OF TASK —————

TASK 24-00-00-600-802

11. MMEL 24-25-1 (DDG) Restoration - Backup Electrical Power System (Backup Generators, Converter and CCBs) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with Backup Electrical Power System (Backup Generators, Converter and CCBs) Inoperative.
- (2) You can use the GSE-Laptop, maintenance device, SPL-5704, as an alternative to the PMAT in this task.

NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-25-01-400-804-001	Backup Generator Installation (P/B 401)
24-25-16-000-803	Backup Generator Blanking Plate Removal (P/B 401)
45-10-00 P/B 201	CENTRAL MAINTENANCE COMPUTING SYSTEM (CMCS) - 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.

Reference	Description
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

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

E. Backup Electrical Power System (Backup Generators, Converter and CCBs) Activation

SUBTASK 24-00-00-440-002

- (1) Do this task: Backup Generator Blanking Plate Removal, TASK 24-25-16-000-803.

SUBTASK 24-00-00-440-001

- (2) Do this task: Backup Generator Installation, TASK 24-25-01-400-804-001.

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SUBTASK 24-00-00-860-071

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

SUBTASK 24-00-00-740-006

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

SUBTASK 24-00-00-810-015

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

SUBTASK 24-00-00-810-016

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

F. Remove the INOP placard from the applicable BACKUP GEN switch on the P5 Panel.

G. Use the MAT or PMAT to examine CMC data. Look for the maintenance messages:

SUBTASK 24-00-00-200-002

- (1) Do this task: CENTRAL MAINTENANCE COMPUTING SYSTEM (CMCS) - MAINTENANCE PRACTICES, PAGEBLOCK 45-10-00/201
- (a) Left Engine Maintenance Message No.: 24-46000, 24-46080.
- (b) Right Engine Maintenance Message No.: 24-46010, 24-46090.
- (2) If any of the above maintenance messages is active, remove and replace the applicable BUG.

H. Put The Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-072

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— **END OF TASK** —————

TASK 24-00-00-860-803

12. MMEL 24-31-2 (DDG) Preparation - APU Battery Charger Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the APU Battery Charger Inoperative.

B. Location Zones

Zone	Area
117	Main Equipment Center, Left

C. Deactivate the APU Battery Charger

SUBTASK 24-00-00-860-073

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	12	C24301	APU BAT CHARGER PWR

————— **END OF TASK** —————

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TASK 24-00-00-860-804

13. M MEL 24-31-2 (DDG) Restoration - APU Battery Charger Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the APU Battery Charger Inoperative.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left

D. APU Battery Charger Activation

SUBTASK 24-00-00-860-074

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

SUBTASK 24-00-00-860-075

- (2) Close this circuit breaker:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
K	12	C24301	APU BAT CHARGER PWR

SUBTASK 24-00-00-740-007

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

SUBTASK 24-00-00-810-017

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

SUBTASK 24-00-00-810-018

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

E. Put The Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-076

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

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ELECTRICAL LOAD MANAGEMENT SYSTEM (ELMS) PANELS - MAINTENANCE PRACTICES

1. General

- A. This procedure supplies tasks to load software into the Electrical Load Management System (ELMS) and to replace the components in the ELMS power panels P100, P200 and P300 and in the ELMS power management panels P110, P210 and P310.
- B. These tasks are:
- (1) Software loading of the ELMS system.
 - (2) A removal of the Signal Interface Unit (SIU).
 - (3) An installation of the SIU.
 - (4) A removal of the Computing and Communications Unit (CCU).
 - (5) An installation of the CCU.
 - (6) A removal of the Power Panel Controller (PPC).
 - (7) An installation of the PPC.
 - (8) A removal of the current monitor card.
 - (9) An installation of the current monitor card.
 - (10) A removal of the circuit breaker.
 - (11) An installation of the circuit breaker.
 - (12) A removal of the monitor card.
 - (13) An installation of the monitor card.
 - (14) An exchange check of the SIU.
 - (15) An exchange check of the CCU.

TASK 24-09-00-400-809-002

2. Electrical Load Management System - Software Installation

A. General

- (1) This procedure tells you how to install software in the Electrical Load Management System (ELMS).
 - (a) The names of the software parts that are loaded into the ELM CPU Card follow:
 - ELMS Operational Program Software (OPS)
 - ELMS Operational Program Configuration (OPC)
 - (b) Using the names, the specific software part numbers for an aircraft can be identified in the IPC.
- (2) You can install the software in any sequence.

NOTE: After you load the second software, the ELMS OPS and OPC software part numbers show with the ELMS system configuration on the Maintenance Access Terminal (MAT). If any part numbers are not correct or do not show for either channel, then load that software. If you see a "Load Failed" message after the first software load is complete, then continue to load the second software and then make sure all software part numbers show correctly.

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- (3) When installation of the first software part number is complete, ELMS will perform a software integrity check of both OPS and OPC. If both new software part numbers are not loaded, ELMS will return the error message "LRU Cannot Verify the Software Part Number" and suggest reloading the software. Continue with the software installation by loading the second software part number. The message should not reappear after the installation of the second software part number is complete.
- (4) A MAT is necessary for this procedure. For instructions on how to use a MAT, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
 - (a) The Portable Maintenance Access Terminal (PMAT) is necessary to install software in the ELMS P210 Power Management Panel.
- (5) If you do not know if the ELMS Computing and Communication Unit (CCU) needs new software, you can first do the software configuration check. It will save time if you only install software when the software is missing or the part number is incorrect. You can find the software configuration check in this task: Computing and Communications Unit - Installation, TASK 24-09-00-400-811-002.
- (6) You can use the GSE-Laptop, maintenance device, SPL-5704, as an alternative to the PMAT in this task.

NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.
- (7) You can install the software from disks, the MAT hard drive or the PMAT hard drive (if available). It is recommended that you install software from the MAT or PMAT hard drive. To install new software on the MAT or PMAT hard drive, do this task: How to Add Software to the Hard Drive, TASK 45-10-00-860-812.

NOTE: When new software is installed in the ELMS CCU, the load process first erases the old software and then installs the new software. If you install software directly to the ELMS CCU from a faulty disk, the load process may erase the old software and then fail, so that no software is installed. If you install a faulty disk to the MAT or PMAT hard drive, the load may fail, but you will not erase the software from the ELMS CCU.

 - (a) It is recommended that you remove old software part numbers from the MAT or PMAT hard drive after new software is installed. To remove software from the hard drive, do this task: How to Remove Software from the Hard Drive, TASK 45-10-00-860-813.

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- (8) You can also install the software from the Onboard Network System (ONS) Mass Storage Device (MSD). To install new software on the ONS MSD, do this task: Mass Storage Device Software Part Installation, TASK 46-13-00-470-802.
 - (a) It is recommended that you remove old software part numbers from the ONS MSD after new software is installed. To remove software from the ONS MSD, do this task: Mass Storage Device Software Removal, TASK 46-13-00-070-801.

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- (9) The airplane must be on the ground with the engines off before you can install software.
- (10) To read about the time that is necessary for software installation, do this task: On-Airplane Software Installation, TASK 20-15-11-400-801.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
21-00-00-800-804	Remove Conditioned Air Supplied by a Cooling Pack (P/B 201)

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Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-860-812	How to Add Software to the Hard Drive (P/B 201)
45-10-00-860-813	How to Remove Software from the Hard Drive (P/B 201)
46-13-00-070-801	Mass Storage Device Software Removal (P/B 201)
46-13-00-470-802	Mass Storage Device Software Part Installation (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

Zone	Area
212	Flight Compartment, Right

E. Procedure

SUBTASK 24-09-00-860-070-002

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

SUBTASK 24-09-00-860-071-002

(2) Shut down the left and right cooling packs.

(a) Do this task: Remove Conditioned Air Supplied by a Cooling Pack, TASK 21-00-00-800-804.

SUBTASK 24-09-00-420-008-002

(3) Use a MAT or PMAT to install software in the ELMS:

NOTE: Make sure you know the correct software part number for the ELMS before you select the software part number on the display. For the ELMS to be an approved installation, the correct software must be installed in each channel.

NOTE: The PMAT is necessary to install software in the ELMS P210 Power Management Panel.

(a) If the software is on a disk, put the correct disk in the disk drive.

(b) Make these selections on the MAT or PMAT for ELMS P110 and P310:

NOTE: Use the PMAT only for ELMS P210.

1) ONBOARD MAINTENANCE

2) EXTENDED MAINTENANCE

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- 3) DATA LOAD
- (c) Make these selections to select the component that will receive the software:
 - 1) SELECT DESTINATION
 - 2) 24 ELMS P110 Power Management Panel; or 24 ELMS P210 Power Management Panel; or 24 ELMS P310 Power Management Panel
 - 3) ELMS P110 Electronics Unit (Channel A or B); or ELMS P210 Electronics Unit (Channel A or B); or ELMS P310 Electronics Unit (Channel A or B)
 - 4) CONTINUE
- (d) Make these selections to select the source of the software:
 - 1) SELECT SOURCE
 - 2) Select the source of the software (if Disk Drive is the only selection, it is automatically selected).
 - 3) Select the correct software part number from the display.
 - 4) CONTINUE
- (e) Select START to start the software installation.
 - 1) If a Cyclic Redundancy Check (CRC) error occurs at the completion of the first software part number data load, then do the following steps:

NOTE: A CRC error will cause the following message to show: "The destination cannot make sure the new load part number is loaded correctly".

 - a) Select STOP, which will cause the following message to show: "If you stop now, the destination LRU cannot operate".
 - b) Select STOP again.
- (f) Repeat the above data load steps to install the second software part number.

NOTE: After you load the second software, the ELMS OPS and OPC software part numbers show with the ELMS system configuration on the MAT. If any part numbers are not correct or do not show for either channel, then load that software. If you see a "Load Failed" message after the first software load is complete, then continue to load the second software and then make sure all software part numbers show correctly.

NOTE: Both software part numbers must be properly installed in the first channel before starting to data load the other channel.
- (g) When the software installation is completed, make sure the correct software part number shows on the display.
- (h) Select CONTINUE to remove the configuration display.

SUBTASK 24-09-00-420-009-002

- (4) Install software in the other channel.

————— **END OF TASK** —————

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TASK 24-09-00-000-814-002

3. Signal Interface Unit - Removal

(Figure 201)

A. General

- (1) The signal interface unit (SIU) is a line replaceable module. There are two SIUs in each power management panel P110, P210 and P310.

B. References

Reference	Title
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare For Removal

SUBTASK 24-09-00-700-003-002

- (1) If the SIU is to be replaced for fault isolation, do an exchange check of the SIU first. To do the check, do this task: Signal Interface Unit - Exchange Check, TASK 24-09-00-700-801-002.

SUBTASK 24-09-00-860-072-002

- (2) If you are replacing components in the P110 or P210 panel, then do these steps:



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
- (b) Open this access door:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-073-002

- (3) If you are replacing components in the P310 panel, then do these steps:

NOTE: The Airplane Information Management System (AIMS) will lose information when all power is removed from AIMS. The information lost will be Central Maintenance Computing Function (CMCF) fault history, Airplane Condition Monitoring Function (ACMF) stored reports, programmable and quick report definitions and results, and modifiable constants.

- (a) If CMCF fault history is required, move the CMCF fault history database to diskette using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

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- (b) If the ACMF modified constants are required, make a print of the constants by selecting the "Print" button on the ACMF modifiable constants page before power is removed.

NOTE: Only the constants that have been modified will print. The constants must be manually reentered after power is restored

NOTE: ACMF reports that have not been downlinked via ACARS or saved to the optional Quick Access Recorder will be lost. Programmable and quick report definitions and results will be lost.



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (c) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
- (d) Set the BATTERY switch on the P5 panel to the OFF position.
- NOTE: The generator control lights may continue to come on for three to four minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

- (e) Open this access door:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door



MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C



DISCONNECTING THE MAIN BATTERY WITH AC POWER NOT CONNECTED WILL RESULT IN THE CONTENTS OF THE AIMS BATTERY-BACKED MEMORY BEING ERASED.

- (g) Remove the battery connector and electrical connector to disconnect main aircraft battery.

F. Removal

SUBTASK 24-09-00-860-074-002



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the unit, do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-41-01-000-803).

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SUBTASK 24-09-00-020-008-002

- (2) Do these steps to remove the applicable Signal Interface Unit (SIU) [1]:

NOTE: In the left P110 and the right P210 power management panels, there are two SIUs installed. They are mounted horizontally inside, at the top. The SIU-2 is the upper unit and it attaches to brackets mounted on top of the cabinet. The SIU-1 is the lower unit and it partially mounts to SIU-2. If you replace SIU-2, then you must remove SIU-1 first to allow access to SIU-2.

NOTE: In the P310 standby power management panel, there are two SIUs installed. They are mounted vertically inside, at the bottom on opposite sides of the panel. SIU-1 is installed on the left. SIU-2 is installed on the right.

- (a) Open the power management panel access doors as follows:
 - 1) For the P110 panel, open the left and right main doors. Then, remove the upper left louvered vent panel.
 - 2) For the P210 panel, open the left and right main doors. Then, remove the upper right louvered vent panel.
 - 3) For the P310 panel, open the access cover panel at the bottom.
- (b) Disconnect the three electrical connectors from the applicable SIU [1].
- (c) Put protective caps on the SIU [1] electrical receptacles and on the power management panel electrical connectors.
- (d) While you hold the SIU [1], turn the four captive screws counterclockwise to loosen and unlock them.
- (e) Remove the applicable SIU [1].

————— **END OF TASK** —————

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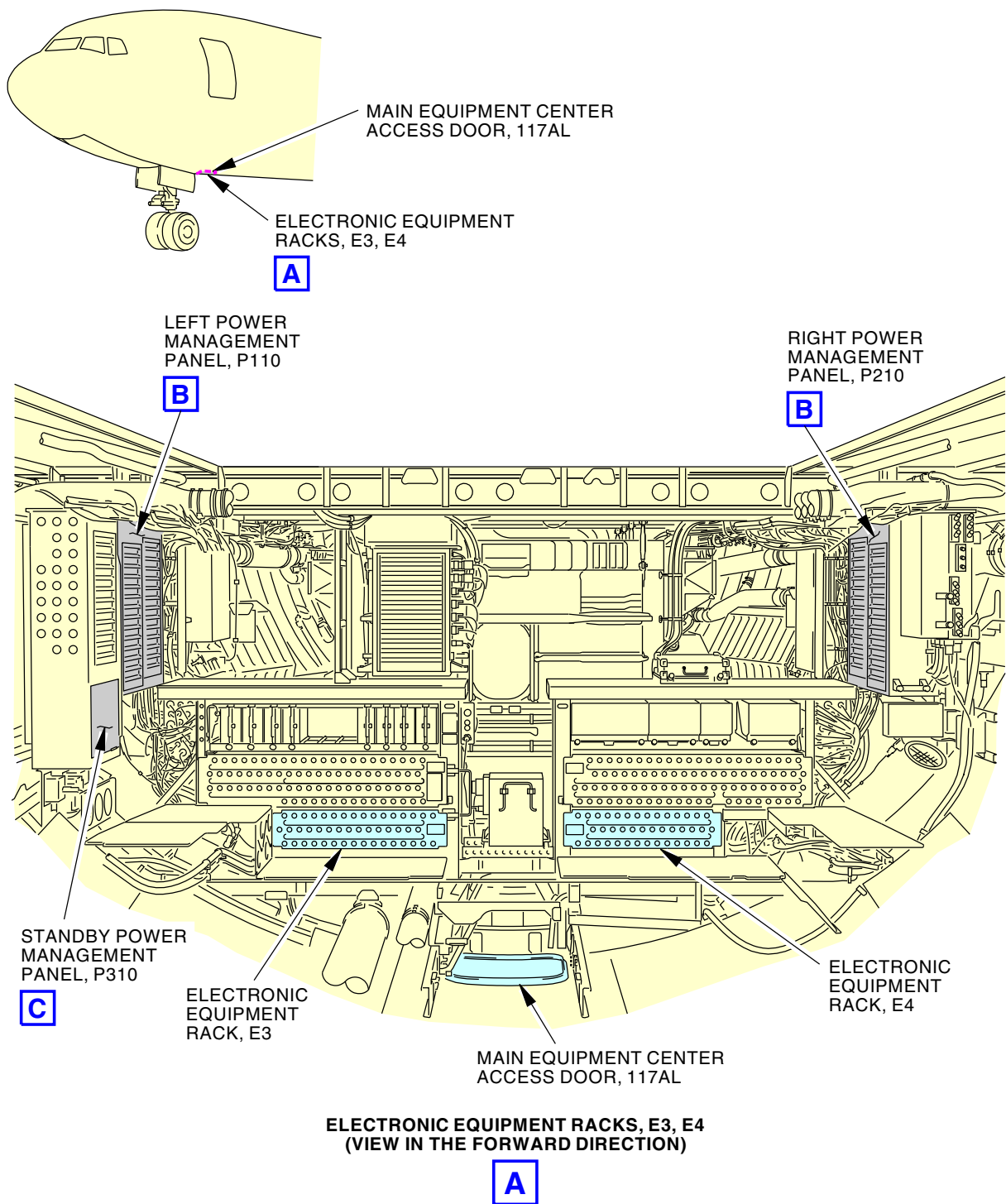
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N00957 S0006407746_V2

Signal Interface Unit (SIU) Installation
Figure 201/24-09-00-990-806-002 (Sheet 1 of 3)

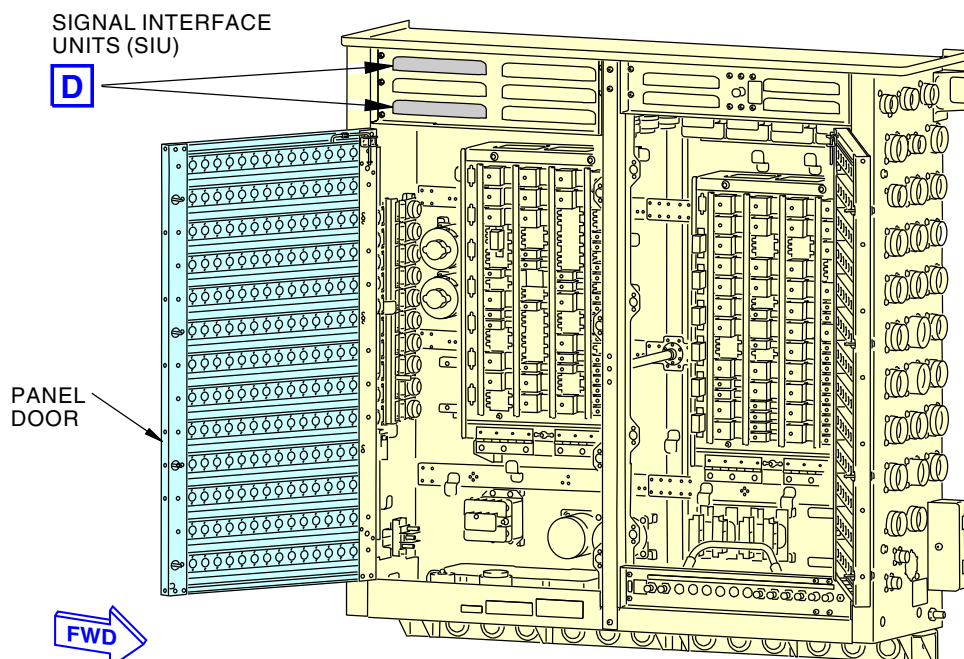
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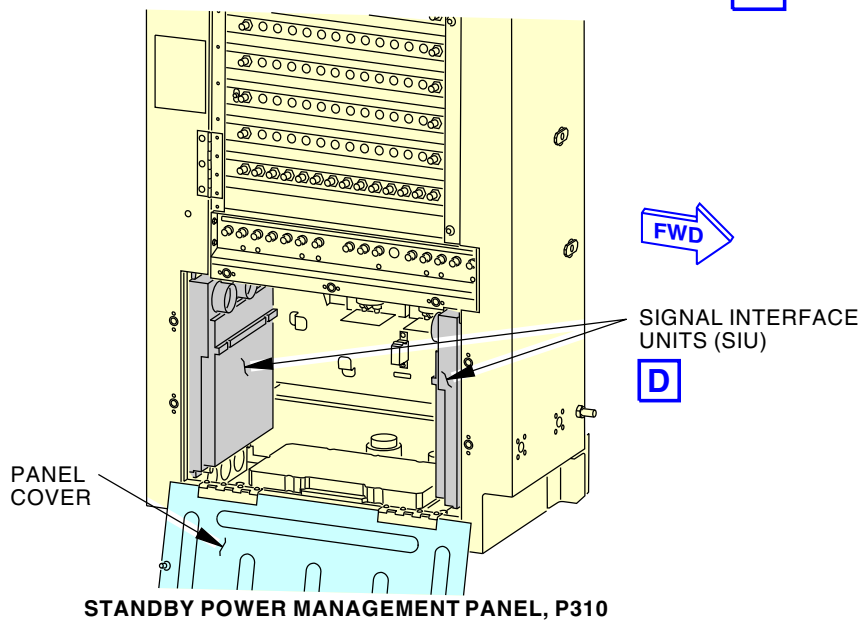
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**LEFT POWER MANAGEMENT PANEL, P110
(RIGHT POWER MANAGEMENT PANEL, P210 IS OPPOSITE)**

B



C

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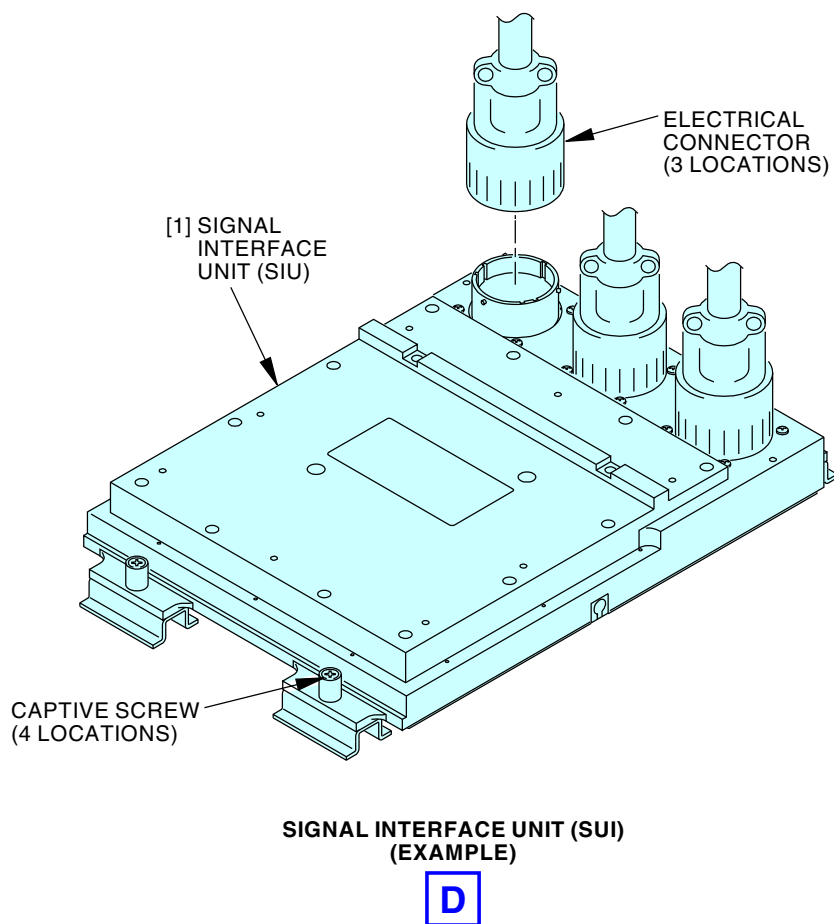
**Signal Interface Unit (SIU) Installation
Figure 201/24-09-00-990-806-002 (Sheet 2 of 3)**

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N00969 S0006407748_V2

Signal Interface Unit (SIU) Installation
Figure 201/24-09-00-990-806-002 (Sheet 3 of 3)

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TASK 24-09-00-400-810-002

4. Signal Interface Unit - Installation

(Figure 201)

A. General

- (1) The signal interface unit is a line replaceable module. There are two signal interface units in each power management panel P110, P210 and P310.

B. References

Reference	Title
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Installation

SUBTASK 24-09-00-860-075-002



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure electrical power is removed from the airplane. If not, do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (a) If you are replacing a component in the P310 panel, follow the power removal steps from this task: Signal Interface Unit - Removal, TASK 24-09-00-000-814-002.

SUBTASK 24-09-00-010-016-002

- (2) To get access to the power management panels,

Open this access door:

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-076-002



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (3) Before you touch the unit, do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-41-01-000-803).

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SUBTASK 24-09-00-020-009-002

(4) Do these steps to install the applicable SIU Signal Interface Unit (SIU) [1].

(a) Hold the SIU Signal Interface Unit (SIU) [1] in position.

NOTE: For the P310 standby power management panel, there are two SIUs installed. They are mounted vertically inside, at the bottom. The SIU-1 is the unit on the left and SIU-2 is on the right.

NOTE: For the left P110 and the right P210 power management panels, there are two SIUs installed. They are mounted horizontally inside, at the top. The SIU-2 is the upper unit and it attaches to brackets mounted to the top of the cabinet. The SIU-1 is the lower unit and it partially mounts to SIU-2. If you replace SIU-2, then make sure you re-install SIU-1 after you install SIU-2.

(b) Turn the four captive screws clockwise to loosen and lock the applicable SIU Signal Interface Unit (SIU) [1] in place.

(c) Remove the protective dust caps from the SIU Signal Interface Unit (SIU) [1] electrical receptacles and from the power management panel electrical connectors.

(d) Start at the rear of the SIU and connect the three electrical connectors.

(e) If you removed SIU-1 to get access to SIU-2, make sure you install both SIUs.

(f) Close and secure all louvered vent panels, access covers and main doors for the applicable power management panels.

SUBTASK 24-09-00-410-012-002

(5) If a component in the P310 panel was replaced, then do this step:

(a) Re-connect the main battery connectors.

F. SIU Installation Test

SUBTASK 24-09-00-860-077-002

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

SUBTASK 24-09-00-860-078-002

(2) Make sure all electrical fuel pumps, electrical hydraulic pumps, external lights and recirculation fans are off.

SUBTASK 24-09-00-710-006-002

(3) Do a test of the SIU-1 (P110 Panel) as follows:

(a) On the EICAS status page, make sure you do not see the following messages: "ELMS P110 PANEL" or "ELMS P110 CHANNEL".

(b) On the MAT, select 24 ELMS P110 EU Self-Test under SPECIAL FUNCTIONS.

1) After the EU Self-Test is complete, look at ATA 24 "EXISTING FAULTS" on the MAT and make sure you see no faults.

SUBTASK 24-09-00-710-007-002

(4) Do a test of the SIU-2 (P110 Panel) as follows:

(a) On the EICAS status page, make sure you do not see the following messages: "ELMS P110 PANEL" or "ELMS P110 CHANNEL".

(b) On the MAT, select 24 ELMS P110 EU Self-Test under SPECIAL FUNCTIONS.

1) After the EU Self-Test is complete, look at ATA 24 "EXISTING FAULTS" on the MAT and make sure you see no faults.

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SUBTASK 24-09-00-710-008-002

- (5) Do a test of the SIU-1 (P210 Panel) as follows:
- (a) On the EICAS status page, make sure you do not see the following messages: "ELMS P210 PANEL" or "ELMS P210 CHANNEL".
 - (b) On the MAT, select 24 ELMS P210 EU Self-Test under SPECIAL FUNCTIONS.
 - 1) After the EU Self-Test is complete, look at ATA 24 "EXISTING FAULTS" on the MAT and make sure you see no faults.

SUBTASK 24-09-00-710-009-002

- (6) Do a test of the SIU-2 (P210 Panel) as follows:
- (a) On the EICAS status page, make sure you do not see the following messages: "ELMS P210 PANEL" or "ELMS P210 CHANNEL".
 - (b) On the MAT, select 24 ELMS P210 EU Self-Test under SPECIAL FUNCTIONS.
 - 1) After the EU Self-Test is complete, look at ATA 24 "EXISTING FAULTS" on the MAT and make sure you see no faults.

SUBTASK 24-09-00-710-010-002

- (7) Do a test of the SIU-1 (P310 Panel) as follows:
- (a) On the EICAS status page, make sure you do not see the following messages: "ELMS P310 PANEL" or "ELMS P310 CHANNEL".
 - (b) On the MAT, select 24 ELMS P310 EU Self-Test under SPECIAL FUNCTIONS.
 - 1) After the EU Self-Test is complete, look at ATA 24 "EXISTING FAULTS" on the MAT and make sure you see no faults.
 - (c) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.
 - 1) Look at ATA 24 "EXISTING FAULTS" on the MAT and make sure you see no faults.

SUBTASK 24-09-00-710-011-002

- (8) Do a test of the SIU-2 (P310 Panel) as follows:
- (a) On the EICAS status page, make sure you do not see the following messages: "ELMS P310 PANEL" or "ELMS P310 CHANNEL".
 - (b) On the MAT, select 24 ELMS P310 EU Self-Test under SPECIAL FUNCTIONS.
 - 1) After the EU Self-Test is complete, look at ATA 24 "EXISTING FAULTS" on the MAT and make sure you see no faults.

SUBTASK 24-09-00-710-012-002

- (9) If a component in the P310 panel was replaced, do these steps:

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

- (b) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:
- 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS

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- d) 26 Fire Extinguishing System
 - e) OPERATIONAL TEST
 - f) Cargo Squibs
 - g) CONTINUE
 - 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.
 - (c) Make sure the FMCS has the appropriate thrust rating selected.
 - 1) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the TEST position.
 - 2) Make sure the EICAS message, ENG CONTROL L (R) does not show.
 - 3) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the NORM position.
 - (d) If CMCF fault history was saved prior to removing electrical power, then replace the CMCF fault history data using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.
 - (e) If the ACMF modified constants were printed out before power was removed, then reenter the constants on the ACMF modifiable constants page.
- NOTE:** Only the constants that had been modified were printed. The constants must be manually reentered.

G. Put the airplane back to its usual condition

SUBTASK 24-09-00-860-079-002

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-09-00-410-013-002

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

TASK 24-09-00-000-815-002

5. Computing and Communications Unit - Removal

(Figure 202)

A. General

- (1) The computing and communications unit (CCU) is a line replaceable module. There is one CCU in each power management panel P110, P210 and P310.

B. References

<u>Reference</u>	<u>Title</u>
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)

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(Continued)

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare for Removal

SUBTASK 24-09-00-700-002

- (1) If the CCU is to be replaced for fault isolation, do an exchange check of the CCU first. To do the check, do this task: Computing and Communication Unit - Exchange Check, TASK 24-09-00-700-802-002.

SUBTASK 24-09-00-860-080-002

- (2) If you are replacing components in the P110 or P210 panel, then do these steps:



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
(b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-081-002

- (3) If you are replacing components in the P310 panel, then do these steps:

NOTE: The Airplane Information Management System (AIMS) will lose information when all power is removed from AIMS. The information lost will be Central Maintenance Computing Function (CMCF) fault history, Airplane Condition Monitoring Function (ACMF) stored reports, programmable and quick report definitions and results, and modifiable constants.

- (a) If CMCF fault history is required, move the CMCF fault history database to diskette using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.
(b) If the ACMF modified constants are required, make a print of the constants by selecting the "Print" button on the ACMF modifiable constants page before power is removed.

NOTE: Only the constants that have been modified will print. The constants must be manually reentered after power is restored.

NOTE: ACMF reports that have not been downlinked via ACARS or saved to the optional Quick Access Recorder will be lost. Programmable and quick report definitions and results will be lost.

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WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(c) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

(d) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to illuminate for 3 to 4 minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

(e) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C



CAUTION

DISCONNECTING THE MAIN BATTERY WITH AC POWER NOT CONNECTED WILL RESULT IN THE CONTENTS OF THE AIMS BATTERY-BACKED MEMORY BEING ERASED.

(g) Remove the battery connector and electrical connector to disconnect main aircraft battery.

F. Removal

SUBTASK 24-09-00-860-082-002



CAUTION

DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

(1) Before you touch the unit, do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-41-01-000-803).

SUBTASK 24-09-00-020-010-002

(2) Do the steps that follow to remove the applicable computing and communications unit (CCU) [21]:

NOTE: There is one CCU installed at the bottom of the left P110, the right P210 and the standby P310 power management panels.

(a) Open the power management panel access doors as follows:

- 1) For the P110 panel, open the left main door.
- 2) For the P210 panel, open the right main door.
- 3) For the P310 panel, open the access cover panel at the bottom.

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- (b) Disconnect the electrical connector from the applicable CCU [21].
- (c) Put a protective cap on the CCU [21] electrical receptacle and on the power management panel electrical connector.
- (d) While you hold the CCU [21], turn the four captive screws counterclockwise 1/4 turn to unlock them.
- (e) Remove the CCU [21].

———— **END OF TASK** ————

EFFECTIVITY
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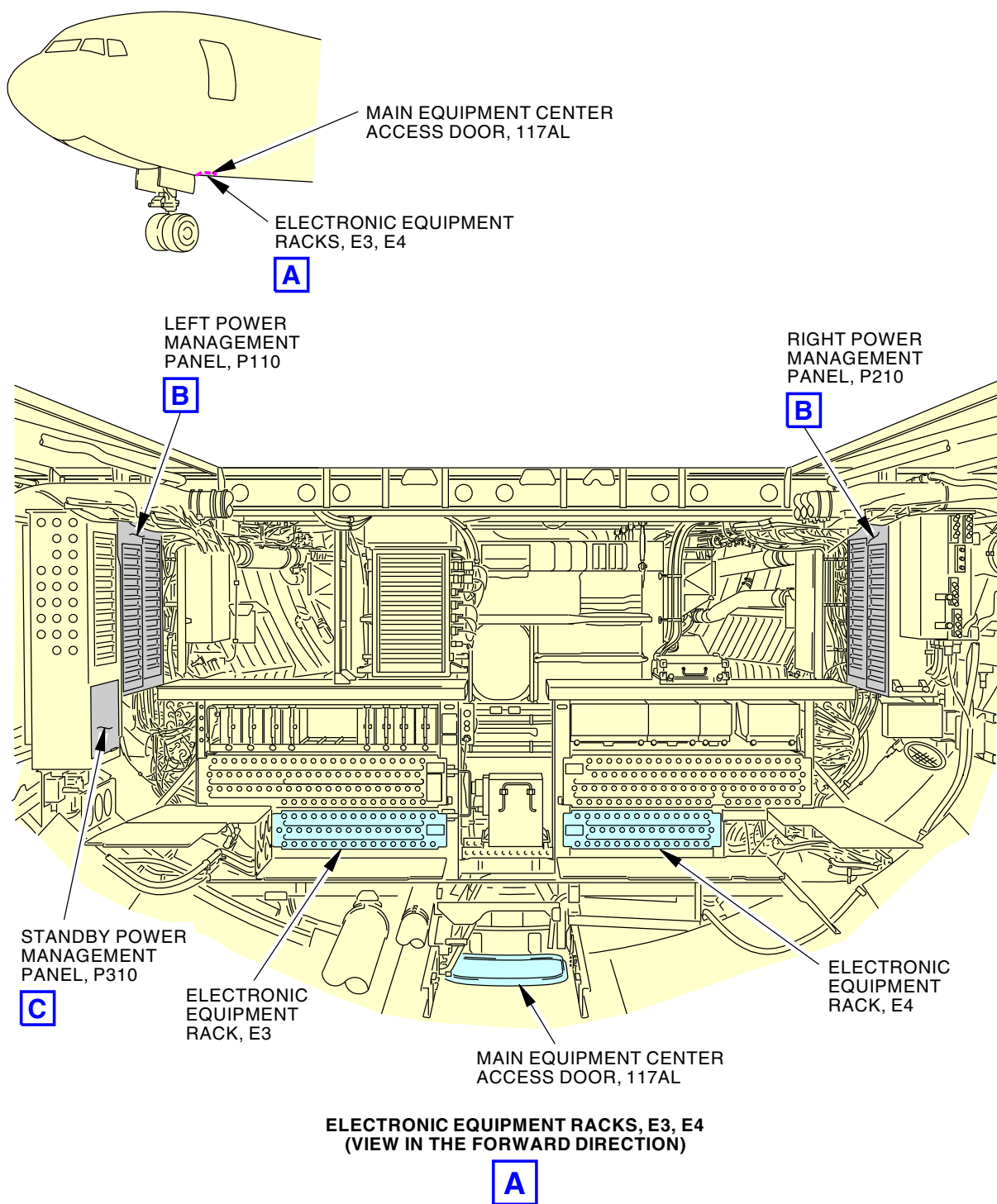
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Computing and Communications Unit (CCU) Installation
Figure 202/24-09-00-990-807-002 (Sheet 1 of 3)

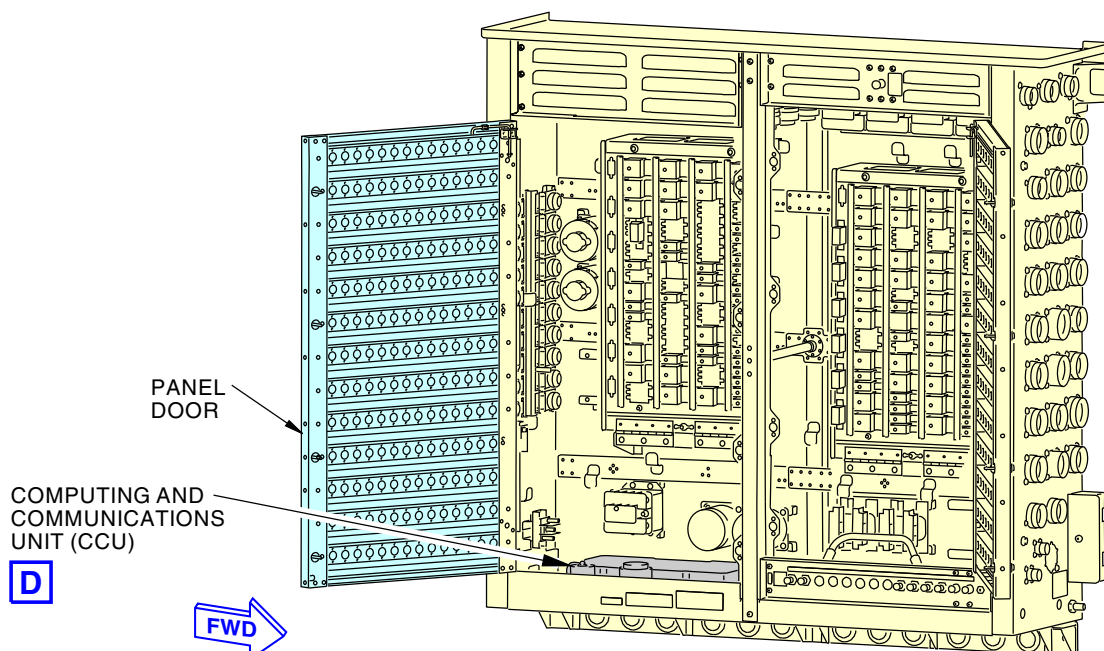
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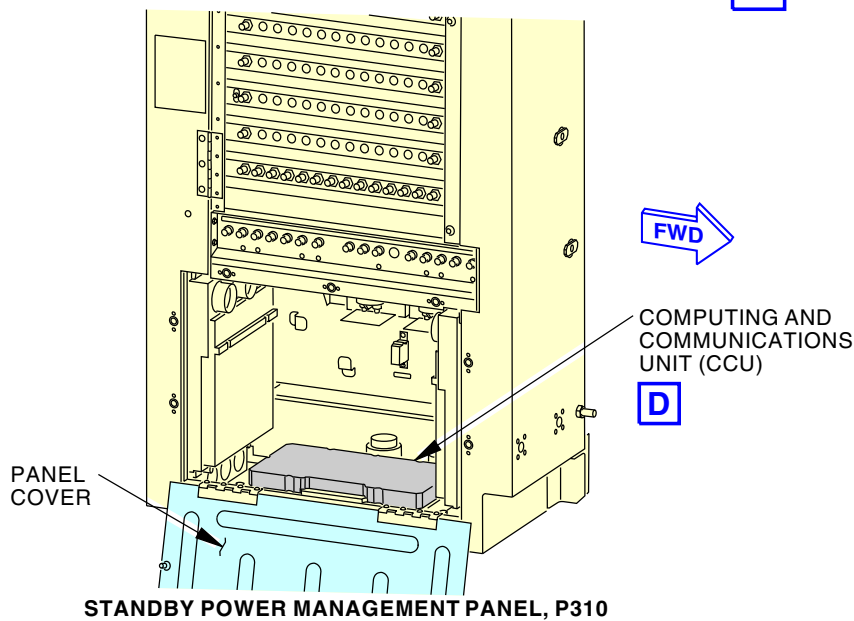
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**LEFT POWER MANAGEMENT PANEL, P110
(RIGHT POWER MANAGEMENT PANEL, P210 IS OPPOSITE)**

B



C

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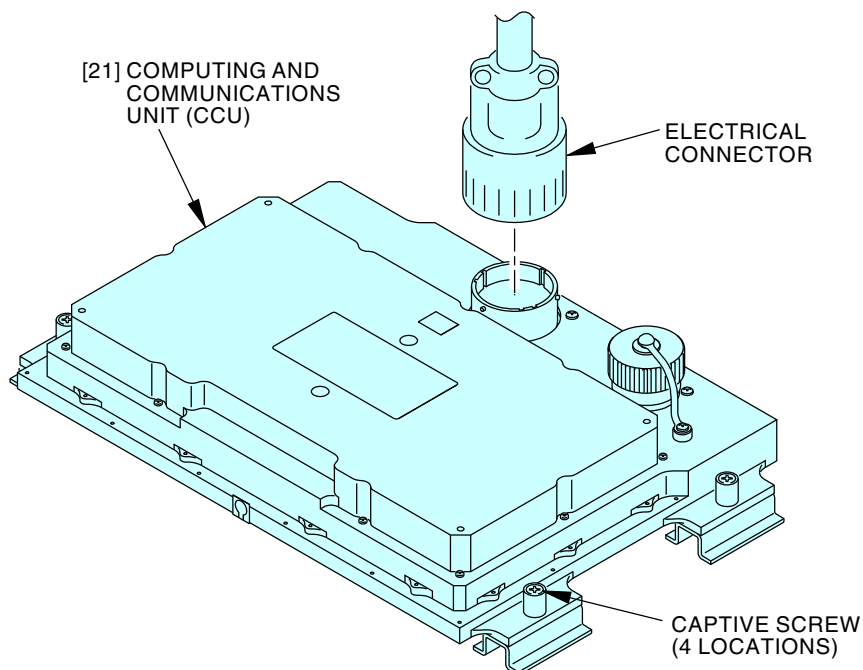
**Computing and Communications Unit (CCU) Installation
Figure 202/24-09-00-990-807-002 (Sheet 2 of 3)**

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COMPUTING AND COMMUNICATIONS UNIT (CCU)
(EXAMPLE)

D

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Computing and Communications Unit (CCU) Installation
Figure 202/24-09-00-990-807-002 (Sheet 3 of 3)

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TASK 24-09-00-400-811-002

6. Computing and Communications Unit - Installation

(Figure 202)

A. General

- (1) The computing and communications unit (CCU) is a line replaceable module. There is one CCU in each power management panel P110, P210 and P310.

B. References

Reference	Title
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)
45-10-00-750-803	How to Find the Hardware or Software Configuration of a System (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Installation

SUBTASK 24-09-00-860-083-002



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure electrical power is removed from the airplane. If not, do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (a) If you are replacing a component in the P310 panel, follow the power removal steps from this task: Computing and Communications Unit - Removal, TASK 24-09-00-000-815-002

SUBTASK 24-09-00-010-017-002

- (2) To get access to the power management panels,
Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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SUBTASK 24-09-00-860-084-002



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURES FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (3) Before you touch the unit, do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-41-01-000-803).

SUBTASK 24-09-00-020-011-002

- (4) Do these steps to install the CCU [21]:
- (a) Hold the CCU [21] in position.
 - (b) While you hold the CCU [21], push and turn the four captive screws clockwise 1/4 turn to lock the CCU in place.
 - (c) Remove the protective caps from the CCU electrical receptacle and from the electrical connector.
 - (d) Connect the electrical connector to the CCU [21].

SUBTASK 24-09-00-410-014-002

- (5) If a component in the P310 panel was replaced, then do this step:
- (a) Re-connect the main battery connectors.

F. Installation Test

SUBTASK 24-09-00-860-085-002

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

SUBTASK 24-09-00-470-001

- (2) Make sure the correct software part numbers show on the display (TASK 45-10-00-750-803).
- (a) If the correct software part number does not show, do this task: Electrical Load Management System - Software Installation, TASK 24-09-00-400-809-002.

SUBTASK 24-09-00-470-005-002

- (3) Alternatively, for the P110 and P210 software configuration, do the following:
- (a) Temporarily install the ELMS CCU that was removed from the P210 Power Management Panel into the P110 Power Management Panel.
 - (b) Install the software into the P110 ELMS CCU.
 - (c) Remove the ELMS CCU from the P110 Power Management Panel.
 - (d) Install the ELMS CCU that was removed from the P110 Power Management Panel into the P210 Power Management Panel.
 - (e) Reinstall the remaining ELMS CCU into the P110 Power Management Panel.

SUBTASK 24-09-00-710-013-002

- (4) Do the test of the CCU as follows:
- (a) On the MAT under SPECIAL FUNCTIONS, select 24 ELMS EU Self-Test for the applicable power management panel (P110, P210 or P310) CCU replacement.
 - 1) On the MAT, make sure there are no EXISTING FAULTS.
 - (b) FOR P310 CCU REPLACEMENT ONLY:
do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801
 - 1) On the MAT, make sure there are no EXISTING FAULTS.

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SUBTASK 24-09-00-710-014-002

(5) If a component in the P310 panel was replaced, do these steps:

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

(b) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:

1) Make these selections on the MAT:

- a) ONBOARD MAINTENANCE
- b) LINE MAINTENANCE
- c) GROUND TESTS
- d) 26 Fire Extinguishing System
- e) OPERATIONAL TEST
- f) Cargo Squibs
- g) CONTINUE

2) Do the instructions that show on the MAT and then make these selections:

- a) CONTINUE
- b) START TEST

3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

4) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.

(c) Make sure the FMCS has the appropriate thrust rating selected.

- 1) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the TEST position.
- 2) Make sure the EICAS message, ENG CONTROL L (R) does not show.
- 3) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the NORM position.

(d) If CMCF fault history was saved prior to removing electrical power, then replace the CMCF fault history data using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

(e) If the ACMF modified constants were printed out before power was removed, then reenter the constants on the ACMF modifiable constants page.

NOTE: Only the constants that had been modified were printed. The constants must be manually reentered.

G. Configuration Check of the ELMS CCU

SUBTASK 24-09-00-750-015

(1) The configuration check makes sure that the ELMS CCU has correct software.

SUBTASK 24-09-00-750-016

(2) The configuration check will show a failure if the operational program software (OPS) is not installed.

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SUBTASK 24-09-00-860-150

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

SUBTASK 24-09-00-750-017

- (4) Use a maintenance access terminal (MAT) to do a software configuration check of the ELMS CCU:

NOTE: Make sure you know the correct software part numbers for the ELMS CCU when you look at the software part numbers on the display. For the ELMS CCU to be an approved installation, the correct software part numbers must be installed in each channel.

- (a) Make these selections on the MAT:
- 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) SYSTEM CONFIGURATION
 - 4) 24 ELMS P110 Power Management Panel; or 24 ELMS P210 Power Management Panel; or 24 ELMS P310 Power Management Panel
 - 5) CONTINUE
- (b) Find ELMS CCU on the display and make sure that the software part numbers are correct.

NOTE: The configuration check will show a failure if the operational program software (OPS) is not installed. The ELMS CCU must also contain the operational program configuration (OPC).

- (c) Select GO BACK to remove the configuration display.

SUBTASK 24-09-00-750-018

- (5) If the part numbers are incorrect, do this task: Electrical Load Management System - Software Installation, TASK 24-09-00-400-809-002.

SUBTASK 24-09-00-470-006-002

- (6) Alternatively, for the P110 and P210 software configuration, do the following:
- (a) Temporarily install the ELMS CCU that was removed from the P210 Power Management Panel into the P110 Power Management Panel.
 - (b) Install the software into the P110 ELMS CCU.
 - (c) Remove the ELMS CCU from the P110 Power Management Panel.
 - (d) Install the ELMS CCU that was removed from the P110 Power Management Panel into the P210 Power Management Panel.
 - (e) Reinstall the remaining ELMS CCU into the P110 Power Management Panel.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-09-00-860-086-002

- (1) Do the steps that follow to put the airplane back to its usual condition:
- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (b) Close all power management panel access doors.

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- (c) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

TASK 24-09-00-000-816-002

7. Power Panel Controller - Removal

(Figure 203)

A. General

- (1) The Power Panel Controller (PPC) is a line replaceable module. There are two PPCs. One PPC is installed in the P100 Left Power Panel and one PPC is in the P200 Right Power Panel.

B. References

<u>Reference</u>	<u>Title</u>
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

E. Prepare For Removal

SUBTASK 24-09-00-860-087-002



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-09-00-010-023-002

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-158



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (3) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100 and P200.

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F. Removal

SUBTASK 24-09-00-860-088-002



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 unit, do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-41-01-000-803).

ARO 001-010

SUBTASK 24-09-00-020-012-002

- (2) Do the steps that follow to remove the Power Panel Controller [41]:
 - (a) Open the applicable power panel access door.
 - (b) Turn the two captive fixing bolts counterclockwise until they are loose.



BE CAREFUL WHEN YOU DISCONNECT AND CONNECT THE POWER PANEL CONTROLLER. TOO MUCH FORCE CAN CAUSE DAMAGE TO THE PINS.

- (c) Turn the center handle fully counterclockwise and remove the Power Panel Controller [41].

ARO 011-999

SUBTASK 24-09-00-020-026-002

- (3) Do the steps that follow to remove the Power Panel Controller [41]:
 - (a) Open the applicable power panel access door.
 - (b) Turn the two mounting bolts until they are loose.
 - (c) Loosen the PPC mounting bolt by turning the mounting bolt endcover gently counterclockwise.



BE CAREFUL WHEN YOU DISCONNECT AND CONNECT THE POWER PANEL CONTROLLER. TOO MUCH FORCE CAN CAUSE DAMAGE TO THE PINS.

- (d) Carefully lift the Power Panel Controller [41] away from the panel assembly.

ARO ALL

————— END OF TASK —————

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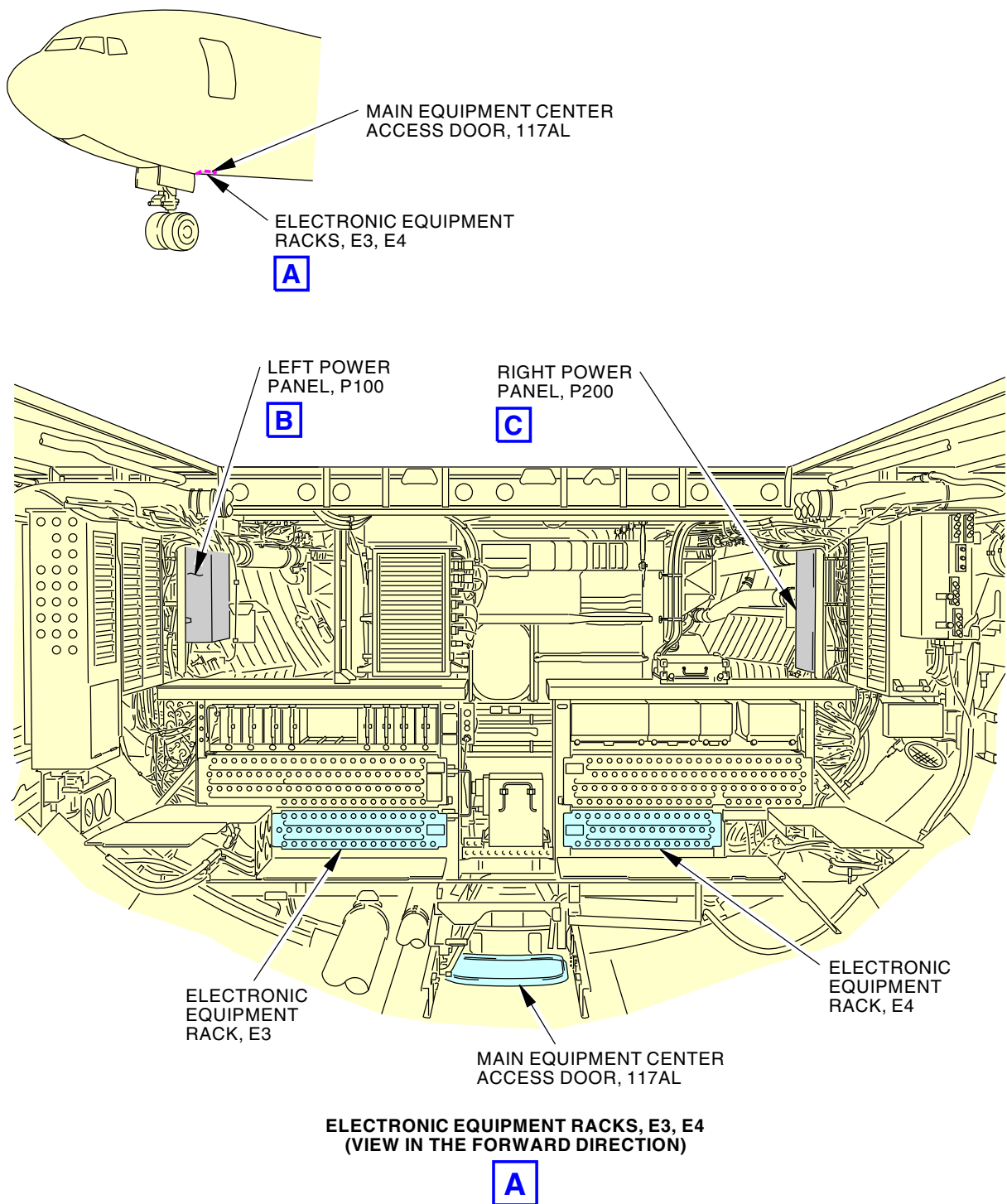
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

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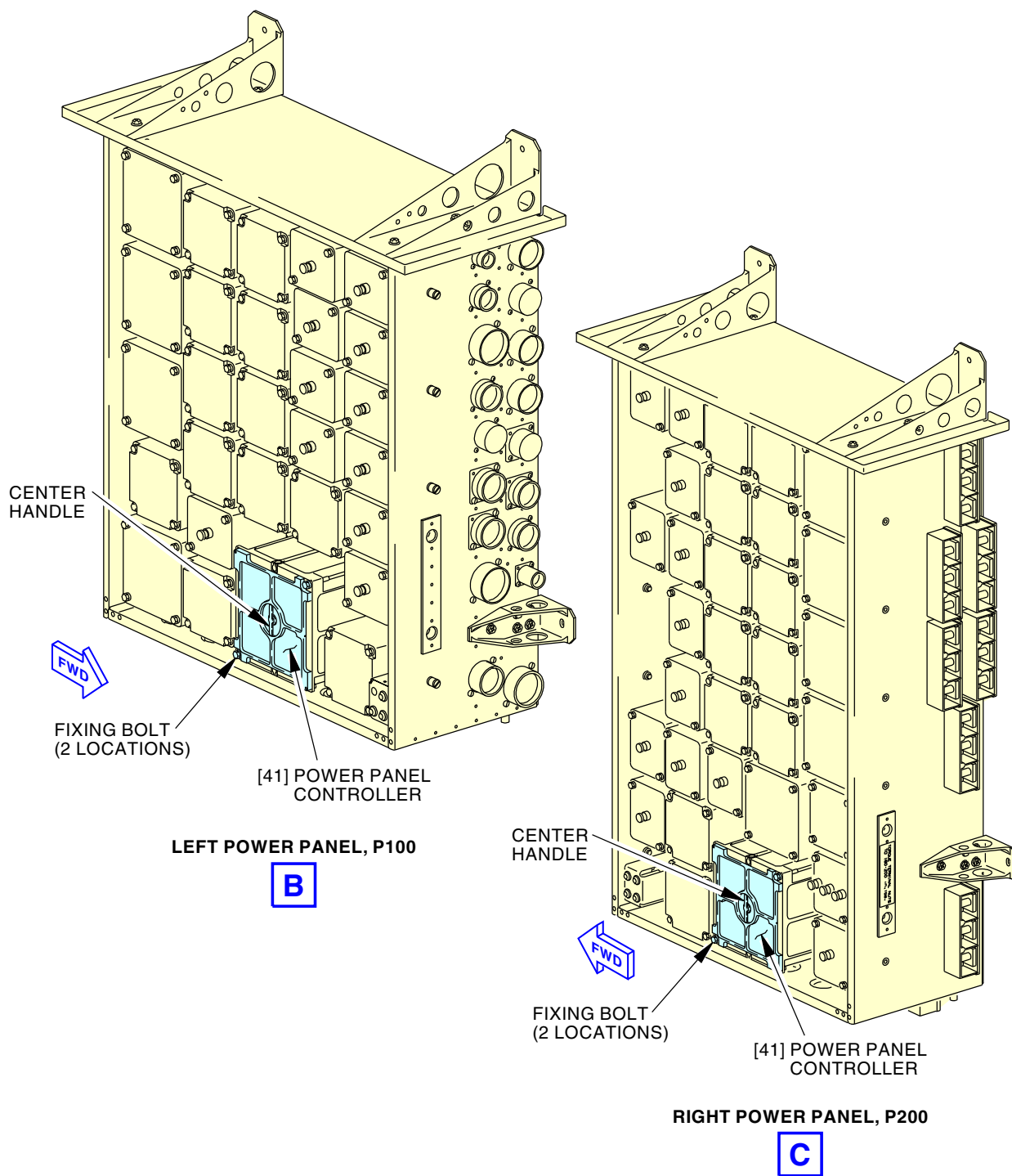
Power Panel Controller (PPC) Installation
Figure 203/24-09-00-990-808-002 (Sheet 1 of 3)

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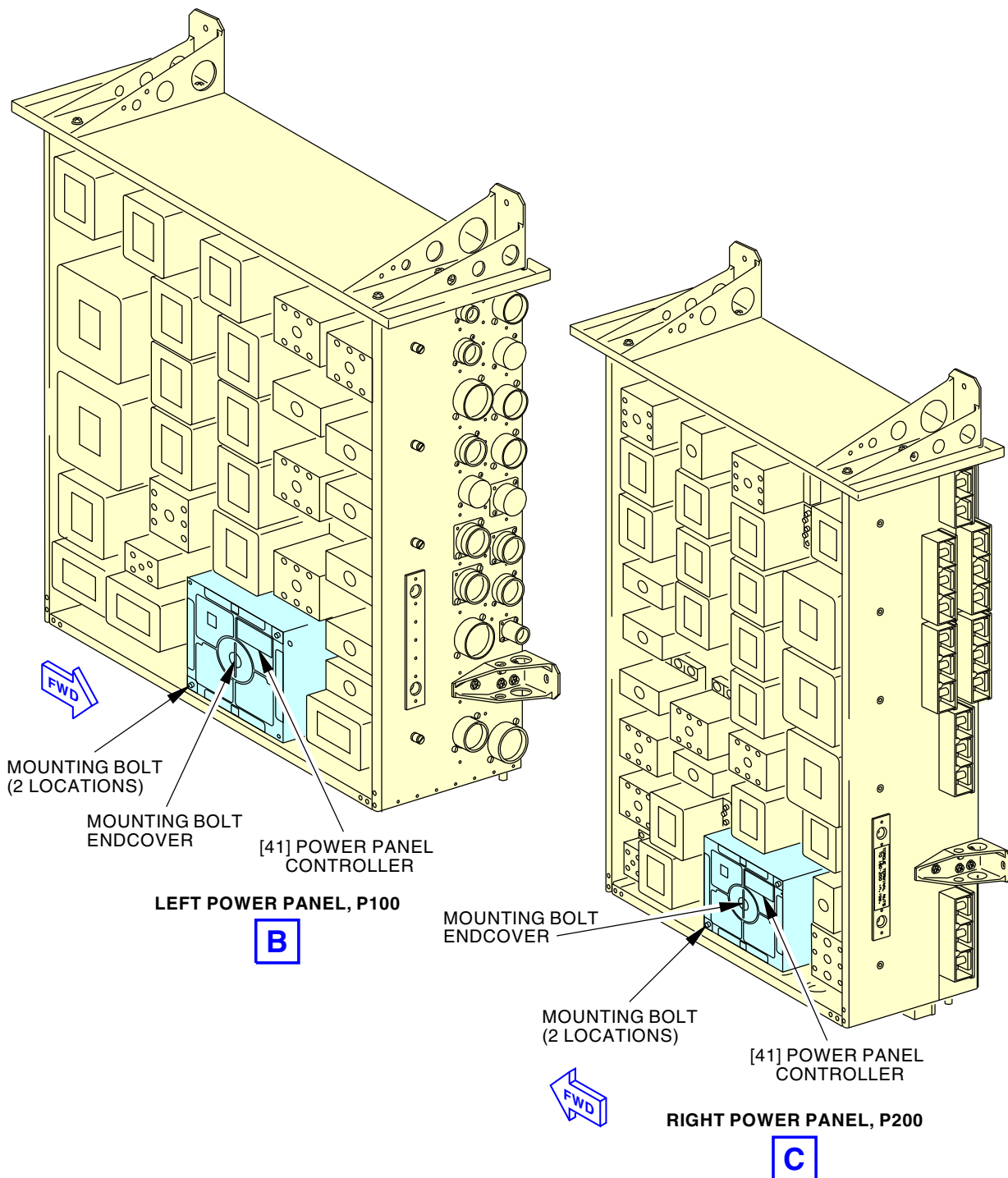
**Power Panel Controller (PPC) Installation
Figure 203/24-09-00-990-808-002 (Sheet 2 of 3)**

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**Power Panel Controller (PPC) Installation
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TASK 24-09-00-400-812-002

8. Power Panel Controller - Installation

(Figure 203)

A. General

- (1) The power panel controller (PPC) is a line replaceable module. There is one PPC in the P100 power panel and one in the P200 power panel.

B. References

Reference	Title
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Installation

SUBTASK 24-09-00-860-089-002



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Make sure electrical power is removed from the airplane. If not, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-09-00-010-018-002

- (2) To get access to the power management panels,
Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-159



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (3) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100 and P200.

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SUBTASK 24-09-00-860-090-002



CAUTION

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.

- (4) Before you touch the unit, do the procedure for devices that are sensitive to electrostatic discharge (TASK 20-41-01-000-803).

ARO 001-010

SUBTASK 24-09-00-420-010-002

- (5) Do the steps that follow to install the Power Panel Controller [41]:



CAUTION

MAKE SURE THAT YOU STOP TURNING THE PPC CENTER HANDLE WHEN THE REAR OF THE PPC FIRST TOUCHES THE POWER PANEL. IF YOU DO NOT STOP AND IF YOU CONTINUE TO TURN THE HANDLE MORE THAN 15 POUND-INCH OF TORQUE (1.7 NM), YOU CAN DAMAGE THE POWER-PANEL-CONTROLLER JACKSCREW INSERT.

- (a) Put the Power Panel Controller [41] in position and slowly and carefully turn the center handle clockwise until the back of the Power Panel Controller [41] just touches the power panel.
- (b) Engage and torque the two captive fixing bolts to 15 pound-inches (1.7 newton-meters).
- (c) Close the P100 or P200 power panel access cover.

ARO 011-999

SUBTASK 24-09-00-420-024-002

- (6) Do the steps that follow to install the Power Panel Controller [41]:
 - (a) Align the Power Panel Controller [41] in the correct orientation.



CAUTION

BE CAREFUL WHEN YOU DISCONNECT AND CONNECT THE POWER PANEL CONTROLLER. TOO MUCH FORCE CAN CAUSE DAMAGE TO THE PINS.

- (b) Connect the Power Panel Controller [41] into the power panel.



CAUTION

MAKE SURE THAT YOU DO NOT TURN THE MOUNTING-BOLT END-COVER WHEN THE REAR OF THE PPC FIRST TOUCHES THE POWER PANEL. IF YOU DO NOT STOP, AND IF YOU CONTINUE TO TURN THE MOUNTING BOLT END-COVER, YOU CAN CAUSE DAMAGE TO THE POWER PANEL.

- (c) Gently turn the mounting bolt endcover clockwise until the back of the Power Panel Controller [41] just touches the power panel.
- (d) Torque the mounting bolts between 13.5 in-lb (1.53 N·m) and 16.5 in-lb (1.86 N·m).
- (e) Close the P100 or P200 power panel access cover.

ARO ALL

F. Installation Test

SUBTASK 24-09-00-860-091-002

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

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SUBTASK 24-09-00-860-092-002

(2) Do a test of the PPC as follows:

- (a) On the MAT under SPECIAL FUNCTIONS, select 24 ELMS P110 EU Self-Test for the P100 PPC or select 24 ELMS P210 EU Self-Test for the P200 PPC.
- (b) For the applicable PPC replacement, on the MAT EXISTING FAULTS page, make sure you do not see the maintenance messages that follow (Table 201) or (Table 202):

Table 201/24-09-00-993-811-002

P100	EQPT CLG VENT FAN FUNCTION - FAULT
	EQPT CLG SPPLY FAN L FUNCTION - FAULT
	LAV/GALLEY FAN FUNCTION - FAULT
	UTIL BUS L FUNCTION - FAULT
	CTR L OVRD FUEL PUMP FUNCTION - FAULT
	JETT PUMP L FUNCTION - FAULT
	HYD ACMP R FUNCTION - FAULT
	HYD ACMP C1 FUNCTION - FAULT
	DR 2 GLY PWR FUNCTION - FAULT
	GLY PWR FUNCTION (P100) - FAULT
	ELMS P110 CCU TO P100 PPC INCOMPATIBLE
	ELMS P110 CH A P100 PPC BUS 1 FAULT
	ELMS P110 CH A P100 PPC BUS 2 FAULT
	ELMS P110 CH B P100 PPC BUS 1 FAULT
	ELMS P110 CH B P100 PPC BUS 2 FAULT
	ELMS P100 PPC PRIMARY POWER CB TRIPPED

Table 202/24-09-00-993-812-002

P200	R LWR RECIRC FAN FUNCTION - FAULT
	EQPT CLG SPPLY FAN R FUNCTION - FAULT
	LAV/GALLEY FAN R FUNCTION - FAULT
	UTIL BUS R FUNCTION - FAULT
	CTR R OVRD FUEL PUMP FUNCTION - FAULT
	JETT PUMP R FUNCTION - FAULT
	HYD ACMP L FUNCTION - FAULT
	HYD ACMP C2 FUNCTION - FAULT
	DR 1 GLY PWR FUNCTION - FAULT
	GLY PWR FUNCTION (P200) - FAULT
	ELMS P210 CCU TO P200 PPC INCOMPATIBLE
	ELMS P210 CH A P200 PPC BUS 1 FAULT
	ELMS P210 CH A P200 PPC BUS 2 FAULT

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Table 202/24-09-00-993-812-002 (Continued)

P200	R LWR RECIRC FAN FUNCTION - FAULT
	ELMS P210 CH B P200 PPC BUS 1 FAULT
	ELMS P210 CH B P200 PPC BUS 2 FAULT
	ELMS P200 PPC PRIMARY POWER CB TRIPPED

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-09-00-860-093-002

(1) Do the steps that follow to put the airplane back to its usual condition:

(a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

(b) Close this access panel:

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

117AL	Main Equipment Center Access Door

————— **END OF TASK** —————

TASK 24-09-00-000-817-002

9. Current Monitor Card - Removal

(Figure 204)

A. General

(1) The current monitor card is a line replaceable unit. There are multiple current monitor cards in the P110, the P210, and the P310 power management panels. There are some current monitor cards with transformers and some without.

(2) The types of current monitor cards are defined by the connection to the card:

(a) Type I is connected through the eight way receptacle connector, PL1.

(b) Type II is connected through the two flying leads identified by their signal names (O (IN) and Y (OUT)) and the eight way receptacle connector, PL1.

(c) Type III is connected through the four flying leads identified by their signal names (O (IN), Y (OUT), PAD1 (SIG), and PAD2 (GND)).

B. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)
SWPM 20-15-04	Standard Wiring Practices Manual

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

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E. Prepare For Removal

SUBTASK 24-09-00-860-094-002

- (1) If you are replacing components in the P310 panel, then do these steps:

NOTE: The Airplane Information Management System (AIMS) will lose information when all power is removed from AIMS. The information lost will be Central Maintenance Computing Function (CMCF) fault history, Airplane Condition Monitoring Function (ACMF) stored reports, programmable and quick report definitions and results, and modifiable constants.

- (a) If CMCF fault history is required, move the CMCF fault history database to diskette using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.
- (b) If the ACMF modified constants are required, make a print of the constants by selecting the "Print" button on the ACMF modifiable constants page before power is removed.

NOTE: Only the constants that have been modified will print. The constants must be manually reentered after power is restored.

NOTE: ACMF reports that have not been downlinked via ACARS or saved to the optional Quick Access Recorder will be lost. Programmable and quick report definitions and results will be lost.



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (c) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
- (d) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to illuminate for 3 to 4 minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

- (e) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C



CAUTION

DISCONNECTING MAIN BATTERY WITH AC POWER NOT CONNECTED WILL RESULT IN THE CONTENTS OF THE AIMS BATTERY-BACKED MEMORY BEING ERASED.

- (g) Remove the battery connector and electrical connector to disconnect the main aircraft battery .

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SUBTASK 24-09-00-860-095-002

- (2) If you are replacing components in the P110 or P210 panel, then do these steps:



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
(b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

F. Removal

ARO ALL; AIRPLANES WITH TYPE I CURRENT MONITOR CARD

SUBTASK 24-09-00-020-013-002

- (1) Remove the current monitor card [61] as follows:
- (a) Open the main doors of the applicable power management panel.
 - (b) Loosen the captive screws and carefully lower the applicable relay panel.
 - (c) Loosen the two captive screws that hold the connector halves together and carefully pull to disconnect the connector from the current monitor card [61].
 - (d) Loosen and remove the two screws [62] and washers [63] that hold the current monitor card [61] to the rail.
 - (e) Remove the applicable current monitor card [61].

ARO ALL; AIRPLANES WITH TYPE II CURRENT MONITOR CARD

SUBTASK 24-09-00-020-021-002

- (2) Remove the current monitor card [61] as follows:
- (a) Open the main doors of the applicable power management panel.
 - (b) Loosen the captive screws and carefully lower the applicable relay panel.
 - (c) Locate the applicable current monitor card [61].
 - (d) Cut away and remove any lacing tape on the wires to gain access to the splices.
 - (e) Cut and disconnect the wire that is spliced to the lead marked IN at the point where it enters the splice.
 - (f) Cut and disconnect the wire that is spliced to the lead marked OUT at the point where it enters the splice.
 - (g) Prepare the end of both wires for fitting to a new splice (SWPM 20-15-04).
 - (h) Loosen the two captive screws that hold the connector halves together and carefully pull to disconnect the connector from the current monitor card [61].
 - (i) Loosen and remove the two screws [62] and washers [63] that hold the current monitor card [61] to the rail.
 - (j) Remove the applicable current monitor card [61].

ARO ALL; AIRPLANES WITH TYPE III CURRENT MONITOR CARD

SUBTASK 24-09-00-020-023-002

- (3) Remove the current monitor card [61] as follows:

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ARO ALL; AIRPLANES WITH TYPE III CURRENT MONITOR CARD (Continued)

- (a) Open the main doors of the applicable power management panel.
- (b) Loosen the captive screws and carefully lower the applicable relay panel.
- (c) Locate the applicable current monitor card [61].
- (d) Cut away and remove any lacing tape on the wires to gain access to the splices.
- (e) Cut and disconnect the wire that is spliced to the lead marked IN at the point where it enters the splice.
- (f) Cut and disconnect the wire that is spliced to the lead marked OUT at the point where it enters the splice.
- (g) Cut and disconnect the wire that is spliced to the lead marked GND at the point where it enters the splice.
- (h) Cut and disconnect the wire that is spliced to the lead marked SIG at the point where it enters the splice.
- (i) Prepare the end of both wires for fitting to a new splice (SWPM 20-15-04).
- (j) Loosen and remove the two screws [62] and washers [63] that hold the current monitor card [61] to the rail.
- (k) Remove the applicable current monitor card [61].

ARO ALL

———— **END OF TASK** ————

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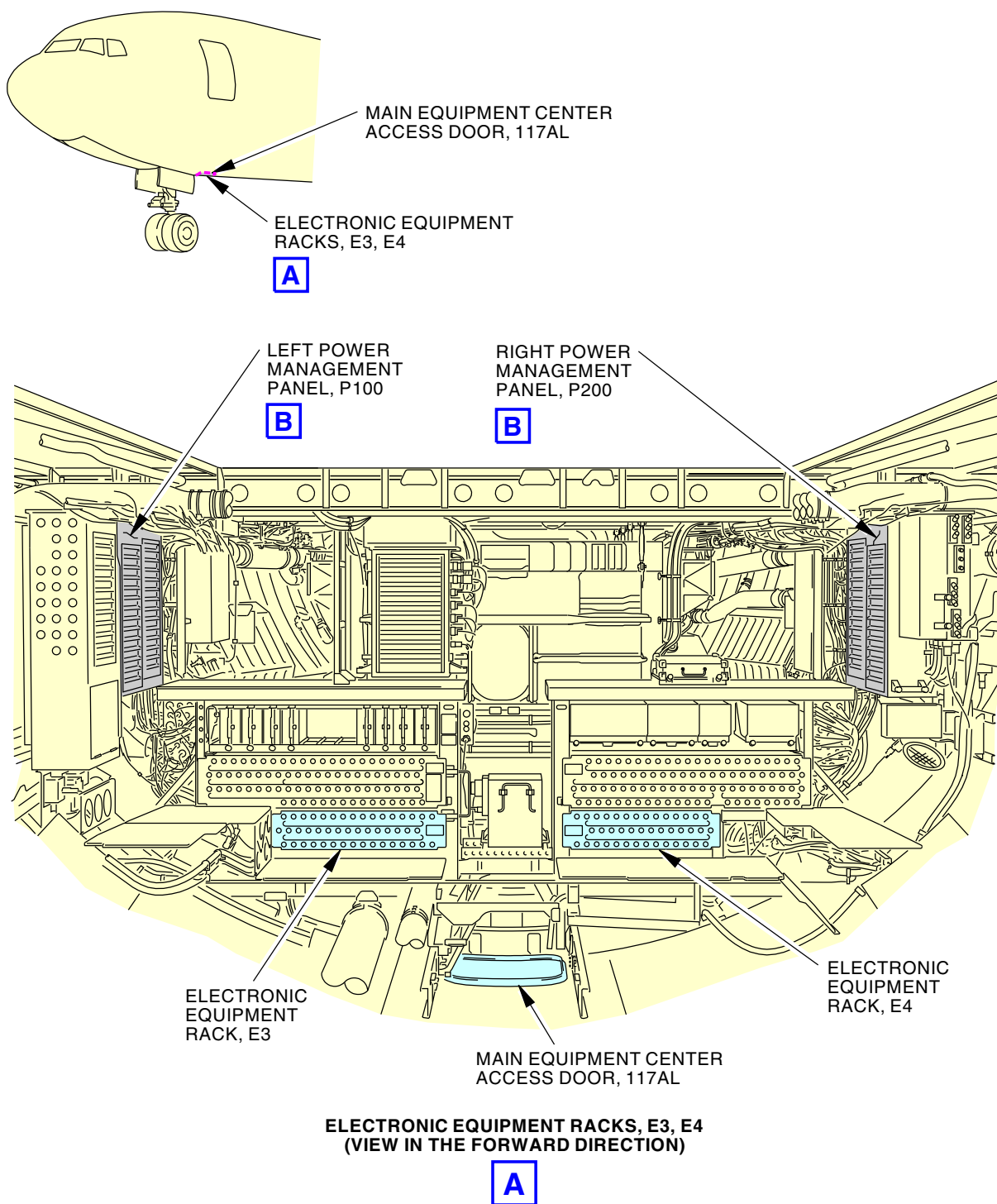
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N01002 S0006407762_V2

Current Monitor Card (CMC) Installation
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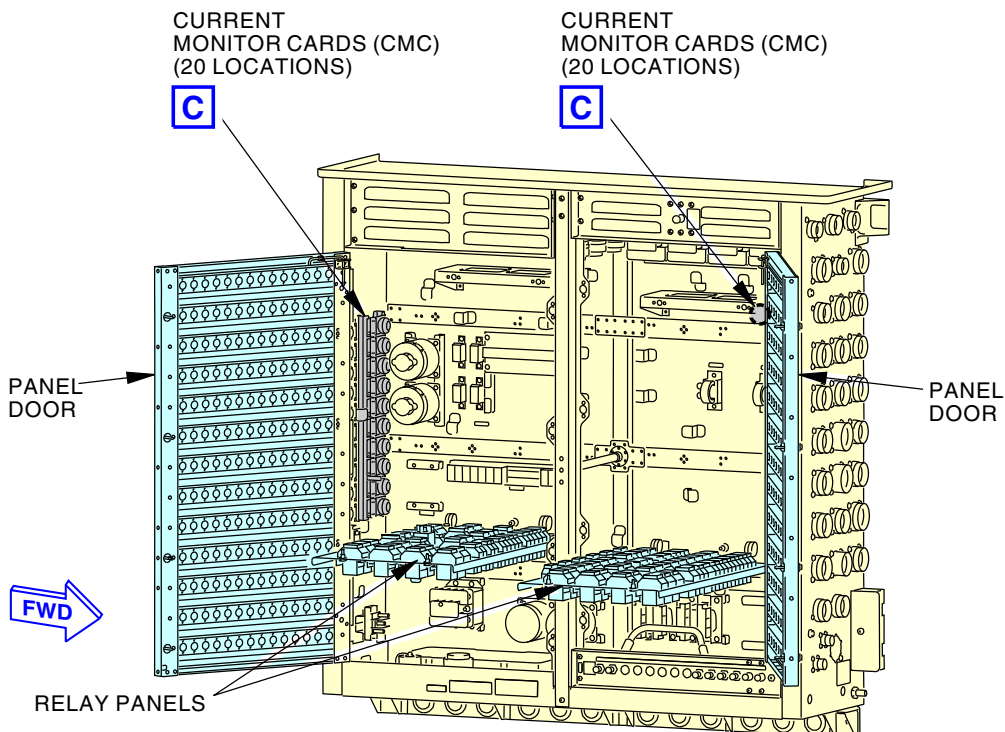
EFFECTIVITY
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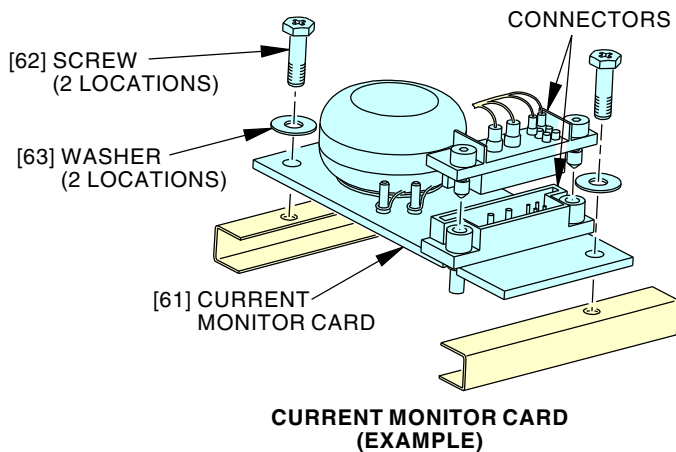
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**LEFT POWER MANAGEMENT PANEL, P110
(RIGHT POWER MANAGEMENT PANEL, P210 IS OPPOSITE)**



N01008 S0006407763_V2

**Current Monitor Card (CMC) Installation
Figure 204/24-09-00-990-809-002 (Sheet 2 of 4)**

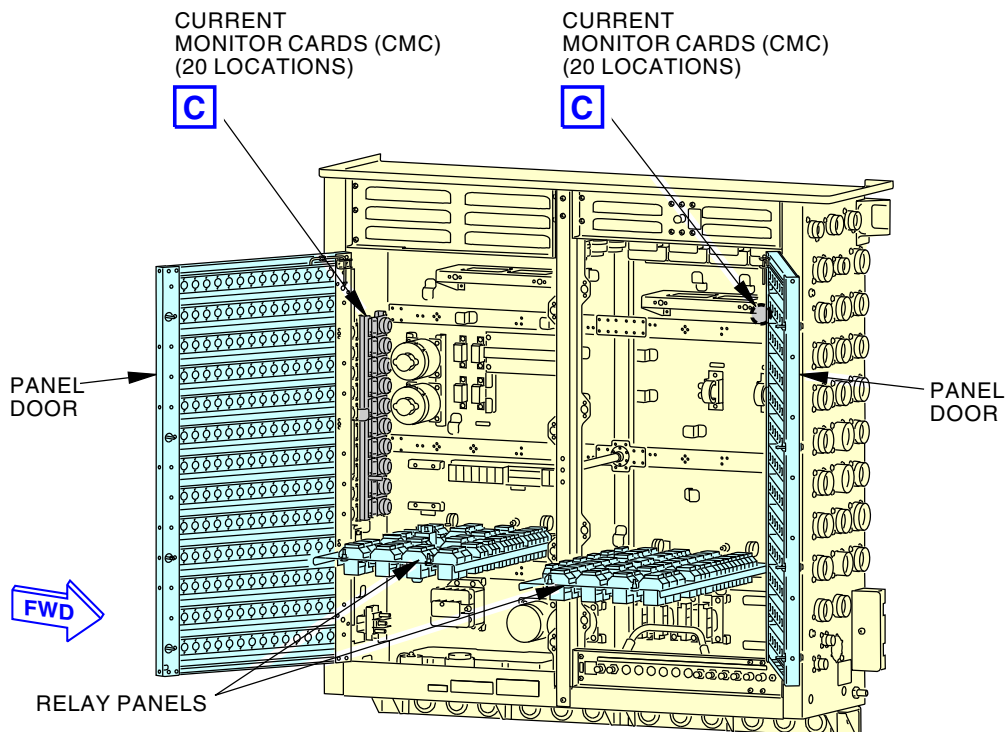
EFFECTIVITY
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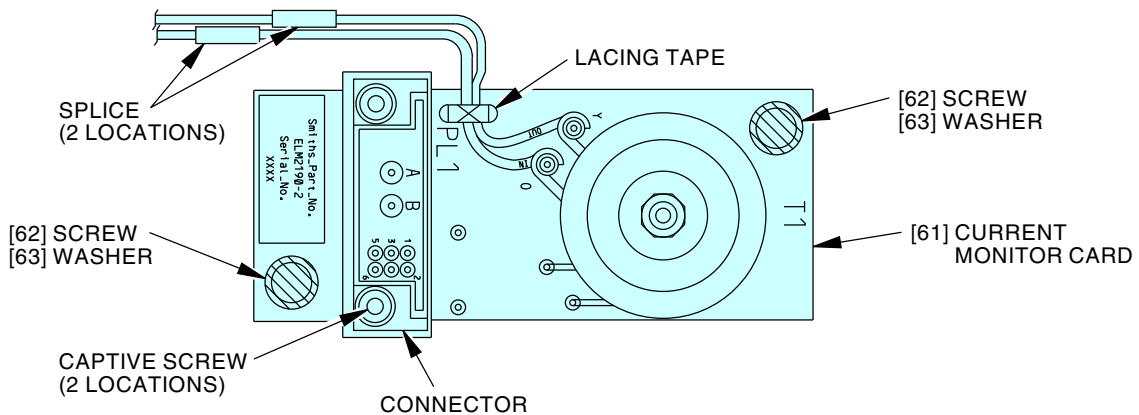
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**LEFT POWER MANAGEMENT PANEL, P110
(RIGHT POWER MANAGEMENT PANEL, P210 IS OPPOSITE)**



CURRENT MONITOR CARD

D31646 S0000148295_V2

**Current Monitor Card (CMC) Installation
Figure 204/24-09-00-990-809-002 (Sheet 3 of 4)**

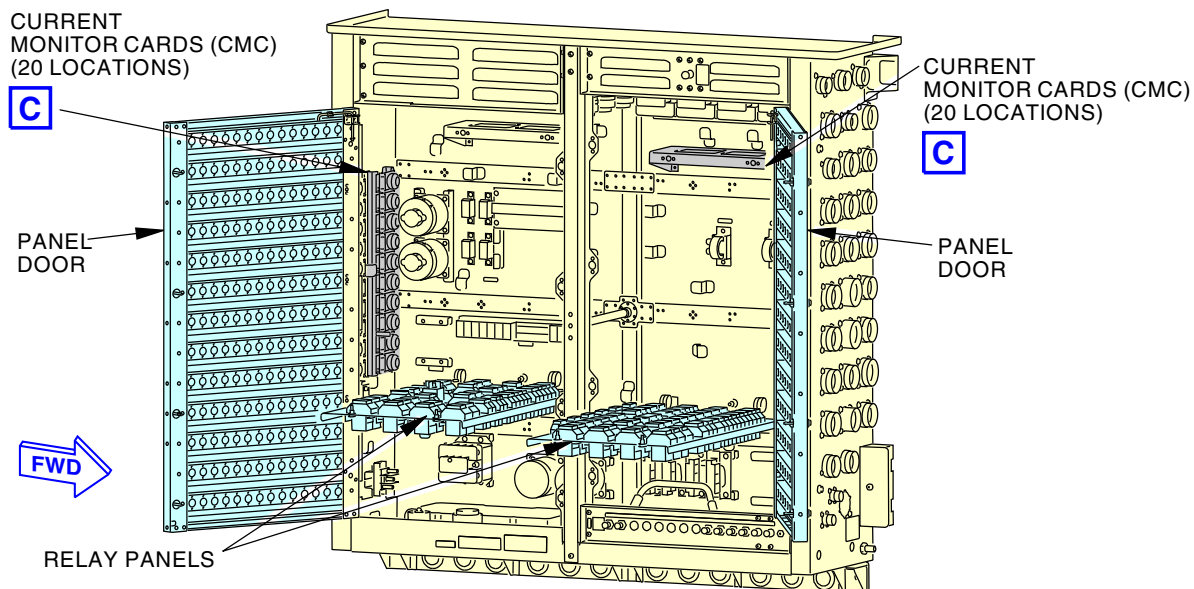
EFFECTIVITY
ARO ALL; AIRPLANES WITH TYPE II CURRENT
MONITOR CARD

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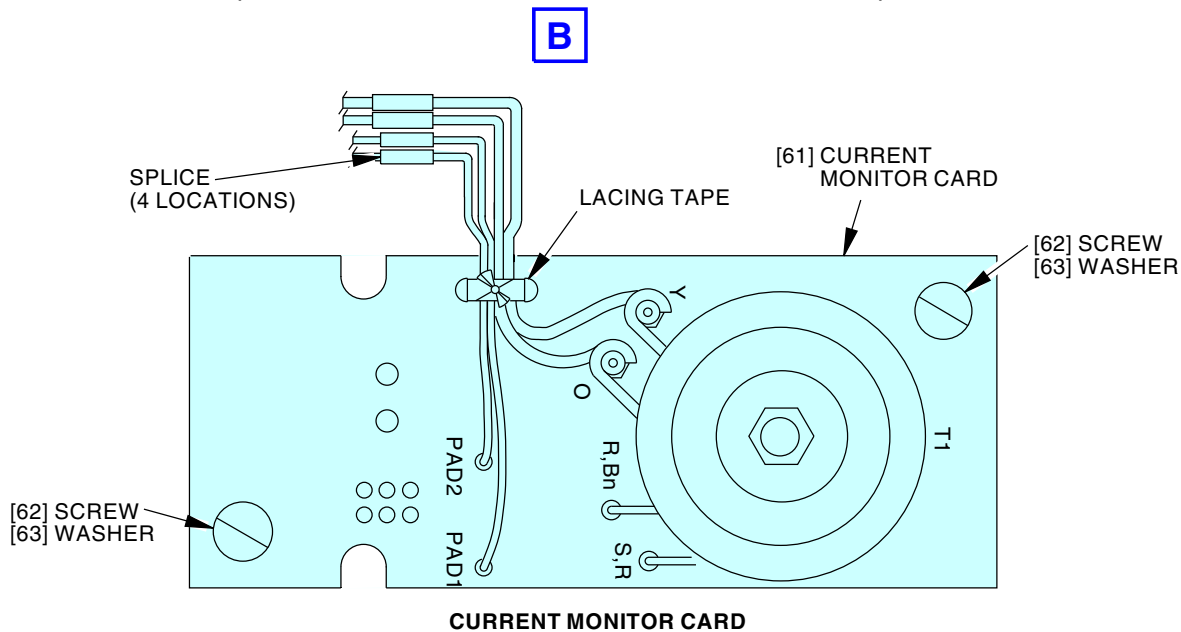
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**LEFT POWER MANAGEMENT PANEL, P110
(RIGHT POWER MANAGEMENT PANEL, P210 IS OPPOSITE)**



1835452 S0000324314_V2

**Current Monitor Card (CMC) Installation
Figure 204/24-09-00-990-809-002 (Sheet 4 of 4)**

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TASK 24-09-00-400-813-002

10. Current Monitor Card - Installation

(Figure 204)

A. General

- (1) The current monitor card is a line replaceable unit. There are multiple current monitor cards in the P110, the P210, and the P310 power management panels. There are some current monitor cards with transformers and some without.
- (2) The types of current monitor cards are defined by the connection to the card:
 - (a) Type I is connected through the eight way receptacle connector, PL1.
 - (b) Type II is connected through the two flying leads identified by their signal names (O (IN) and Y (OUT)) and the eight way receptacle connector, PL1.
 - (c) Type III is connected through the four flying leads identified by their signal names (O (IN), Y (OUT), PAD1 (SIG), and PAD2 (GND)).

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)
SWPM 20-15-04	Standard Wiring Practices Manual

C. Consumable Materials

Reference	Description	Specification
G02300	Tape - Flat Braided Lacing	BMS13-54

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Installation

SUBTASK 24-09-00-860-096-002



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU DO THIS TASK. POWER PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure electrical power is removed from the airplane. If not, do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (a) If you are replacing a component in the P310 panel, follow the power removal steps from this task: Current Monitor Card - Removal, TASK 24-09-00-000-817-002.

SUBTASK 24-09-00-010-019-002

- (2) To get access to the power management panels,

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Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-420-011-002

(3) AIRPLANES WITH TYPE I CURRENT MONITOR CARD;

Do the steps that follow to install the current monitor card [61]:

- Hold the current monitor card [61] in position and install by hand the two screws [62] and two washers [63].
- Tighten the two screws [62] to a torque of 7 pound-inches (0.8 newton-meters).
- Align the power panel connector with the receptacle on the current monitor card and carefully push the two connector halves together.
- Tighten the two captive screws that hold the two connector halves together to a torque of 4 pound-inches (0.45 newton-meters).
- Close and secure all relay panels opened for access.
- Close the main doors to the applicable power management panel.

SUBTASK 24-09-00-420-019

(4) AIRPLANES WITH TYPE II CURRENT MONITOR CARD;

Do the steps that follow to install the current monitor card [61]:

Splice Identification

P110 Left Power Management Panel				
Current Monitor No.	M24631	M24632	M24667	M24680
Splice marked	SM4058	SM4062	SM4066	SM4070
Join IN lead to wire marked	W3138-0078-16	W3138-0076-16	W3138-0095-16	W3138-0092-16
Splice marked	SM4059	SM4063	SM4067	SM4071
Join OUT lead to wire marked	W3138-0079-16	W3138-0074-16	W3138-0181-16	W3138-0093-16

Splice Identification

P210 Right Power Management Panel				
Current Monitor No.	M24636	M24661	M24668	M24660
Splice marked	SM4074	SM4078	SM4082	SM4086
Join IN lead to wire marked	W3235-0105-16	W3235-0122-16	W3235-0119-16	W3235-0100-16
Splice marked	SM4075	SM4079	SM4083	SM4087
Join OUT lead to wire marked	W3235-0106-16	W3235-0123-16	W3235-0120-16	W3235-0101-16

- Hold the current monitor card [61] in position and install by hand the two screws [62] and two washers [63].
- Tighten the two screws [62] to a torque of 11.7 - 14.3 pound-inches (1.32 - 1.61 newton-meters).
- Prepare the leads marked IN and OUT to be spliced to the appropriate wires (SWPM 20-15-04).

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- (d) Select the two appropriate Splice Identification Sleeves, part number 1837-2058-01, for the Current Monitor Assembly being replaced.
NOTE: Refer to the Splice Identification tables above.
- (e) Temporarily fit the environmental sleeve and the appropriate Splice Identification Sleeve over the prepared end of the wire to be connected to the OUT lead.
- (f) Using the Crimp Plier, crimp the splice to the wire to be connected to the OUT lead.
- (g) Place the prepared end of the wire marked OUT into the other end of the splice.
- (h) Using the Crimp Plier, crimp the splice to the wire marked OUT.
- (i) Temporarily fit the environmental sleeve and the appropriate Splice Identification Sleeve over the prepared end of the wire to be connected to the IN lead.
- (j) Using the Crimp Plier, crimp the splice to the wire to be connected to the IN lead.
- (k) Place the prepared end of the wire marked IN into the other end of the splice.
- (l) Using the Crimp Plier, crimp the splice to the wire marked IN.
- (m) Using a continuity tester, verify there is continuity between the spliced wire marked IN and the spliced wire marked OUT.
- (n) Position the environmental sleeve over each crimped splice and apply heat with a heat gun until the sleeve is secure.
- (o) Position the Splice Identification sleeve over each crimped splice and apply heat with a heat gun until the sleeve is secure.
- (p) Align the power panel connector with the receptacle on the current monitor card and carefully push the two connector halves together.
- (q) Tighten the two captive screws that hold the two connector halves together to a torque of 4 pound-inches (0.45 newton-meters).
- (r) Tie both splices to the wire loom using tape, G02300.
 - 1) Ensure that the splices are staggered such that they cannot bunch together.
 - 2) Seal the knot with knot-locking adhesive.
- (s) Close and secure all relay panels opened for access.
- (t) Close the main doors to the applicable power management panel.

SUBTASK 24-09-00-420-021-002

(5) AIRPLANES WITH TYPE III CURRENT MONITOR CARD;

Do the steps that follow to install the current monitor card [61]:

- (a) Hold the current monitor card [61] in position and install by hand the two screws [62] and two washers [63].
- (b) Tighten the two screws [62] to a torque of 11.7 - 14.3 pound-inches (1.32 - 1.61 newton-meters).
- (c) Prepare the leads marked IN, OUT, GND, and SIG to be spliced to the appropriate wires (SWPM 20-15-04).
- (d) Temporarily fit the environmental sleeve and the appropriate Splice Identification Sleeve over the prepared end of the wire to be connected to the OUT lead.
- (e) Using the Crimp Plier, crimp the splice to the wire to be connected to the OUT lead.
- (f) Place the prepared end of the wire marked OUT into the other end of the splice.
- (g) Using the Crimp Plier, crimp the splice to the wire marked OUT.

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- (h) Temporarily fit the environmental sleeve and the appropriate Splice Identification Sleeve over the prepared end of the wire to be connected to the IN lead.
- (i) Using the Crimp Plier, crimp the splice to the wire to be connected to the IN lead.
- (j) Place the prepared end of the wire marked IN into the other end of the splice.
- (k) Using the Crimp Plier, crimp the splice to the wire marked IN.
- (l) Temporarily fit the environmental sleeve and the appropriate Splice Identification Sleeve over the prepared end of the wire to be connected to the GND lead.
- (m) Using the Crimp Plier, crimp the splice to the wire to be connected to the GND lead.
- (n) Place the prepared end of the wire marked GND into the other end of the splice.
- (o) Using the Crimp Plier, crimp the splice to the wire marked GND.
- (p) Temporarily fit the environmental sleeve and the appropriate Splice Identification Sleeve over the prepared end of the wire to be connected to the SIG lead.
- (q) Using the Crimp Plier, crimp the splice to the wire to be connected to the SIG lead.
- (r) Place the prepared end of the wire marked SIG into the other end of the splice.
- (s) Using the Crimp Plier, crimp the splice to the wire marked SIG.
- (t) Using a continuity tester, verify there is continuity between the spliced wire marked IN and the spliced wire marked OUT.
- (u) Position the environmental sleeve over each crimped splice and apply heat with a heat gun until the sleeve is secure.
- (v) Position the Splice Identification sleeve over each crimped splice and apply heat with a heat gun until the sleeve is secure.
- (w) Align the power panel connector with the receptacle on the current monitor card and carefully push the connector halves together.
- (x) Tie the splices to the wire loom using tape, G02300.
 - 1) Ensure that the splices are staggered such that they cannot bunch together.
 - 2) Seal the knot with knot-locking adhesive.
- (y) Close and secure all relay panels opened for access.
- (z) Close the main doors to the applicable power management panel.

SUBTASK 24-09-00-410-015-002

- (6) If a component in the P310 panel was replaced, then do this step:
 - (a) Re-connect the main battery connectors.

SUBTASK 24-09-00-860-148

- (7) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-09-00-860-149

- (8) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.

SUBTASK 24-09-00-710-015-002

- (9) If a component in the P310 panel was replaced, do these steps:
 - (a) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

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- (b) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:
- 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 26 Fire Extinguishing System
 - e) OPERATIONAL TEST
 - f) Cargo Squibs
 - g) CONTINUE
 - 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.
- (c) Make sure the FMCS has the appropriate thrust rating selected.
- 1) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the TEST position.
 - 2) Make sure the EICAS message, ENG CONTROL L (R) does not show.
 - 3) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the NORM position.
- (d) If CMCF fault history was saved prior to removing electrical power, then replace the CMCF fault history data using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.
- (e) If the ACMF modified constants were printed out before power was removed, then reenter the constants on the ACMF modifiable constants page.
- NOTE: Only the constants that had been modified were printed. The constants must be manually reentered.

G. Put the Airplane Back to its Usual Condition

SUBTASK 24-09-00-410-016-002

- (1) Do the steps that follow to put the airplane back to its usual condition:
- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (b) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— **END OF TASK** —————

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TASK 24-09-00-000-818-002

11. Circuit Breaker - Removal

(Figure 205)

A. General

- (1) The circuit breaker is a line replaceable module. The circuit breakers are installed in the power panels P100, P200, and P300.

B. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare For Removal

SUBTASK 24-09-00-860-097-002



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-09-00-860-112-002

- (2) To get access to the power panels,

Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-160



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (3) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

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F. Removal

SUBTASK 24-09-00-020-014-002



DO NOT TOUCH THE CIRCUIT BREAKER. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE CIRCUIT BREAKER OR LET THE CIRCUIT BREAKER BECOME COOL. HIGH TEMPERATURE CAN BURN YOU.

- (1) Do the steps that follow to remove the applicable circuit breaker [81] from the power panel P100, P200, or P300:

- (a) Remove the protective cover from the applicable power panel.

ARO 001-010

- (b) Loosen the captive screws that attach the circuit breaker [81] to the panel.

ARO 011-999

- (c) Remove the cap screws, washers, and, if applicable, the bobbin housings that attach the circuit breaker [81] to the panel.

ARO ALL

- (d) Remove the applicable circuit breaker [81].

———— **END OF TASK** ————

EFFECTIVITY
ARO ALL

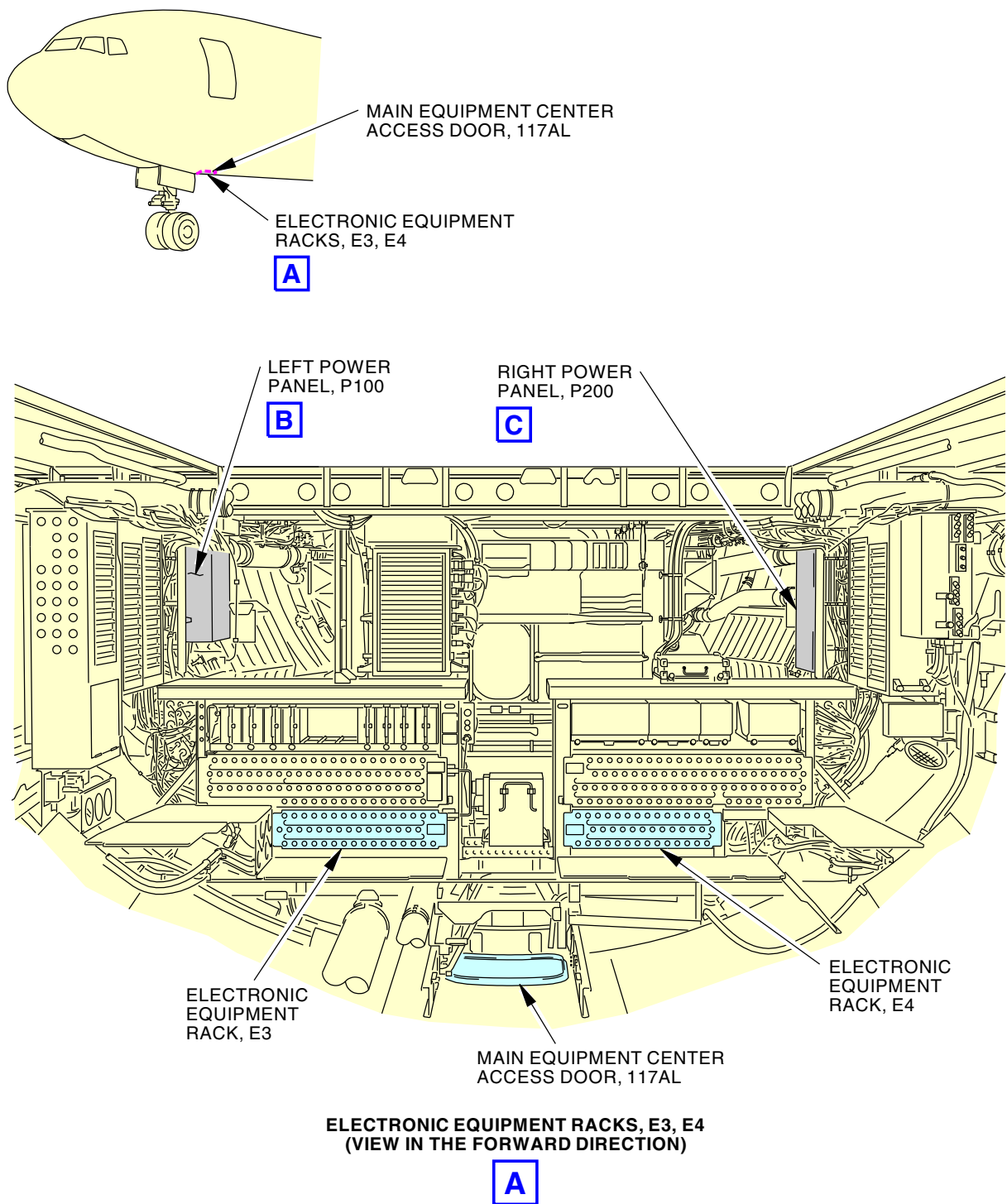
D633W101-ARO

24-09-00

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N01035 S0006407766_V3

Circuit Breaker Installation
Figure 205/24-09-00-990-810-002 (Sheet 1 of 4)

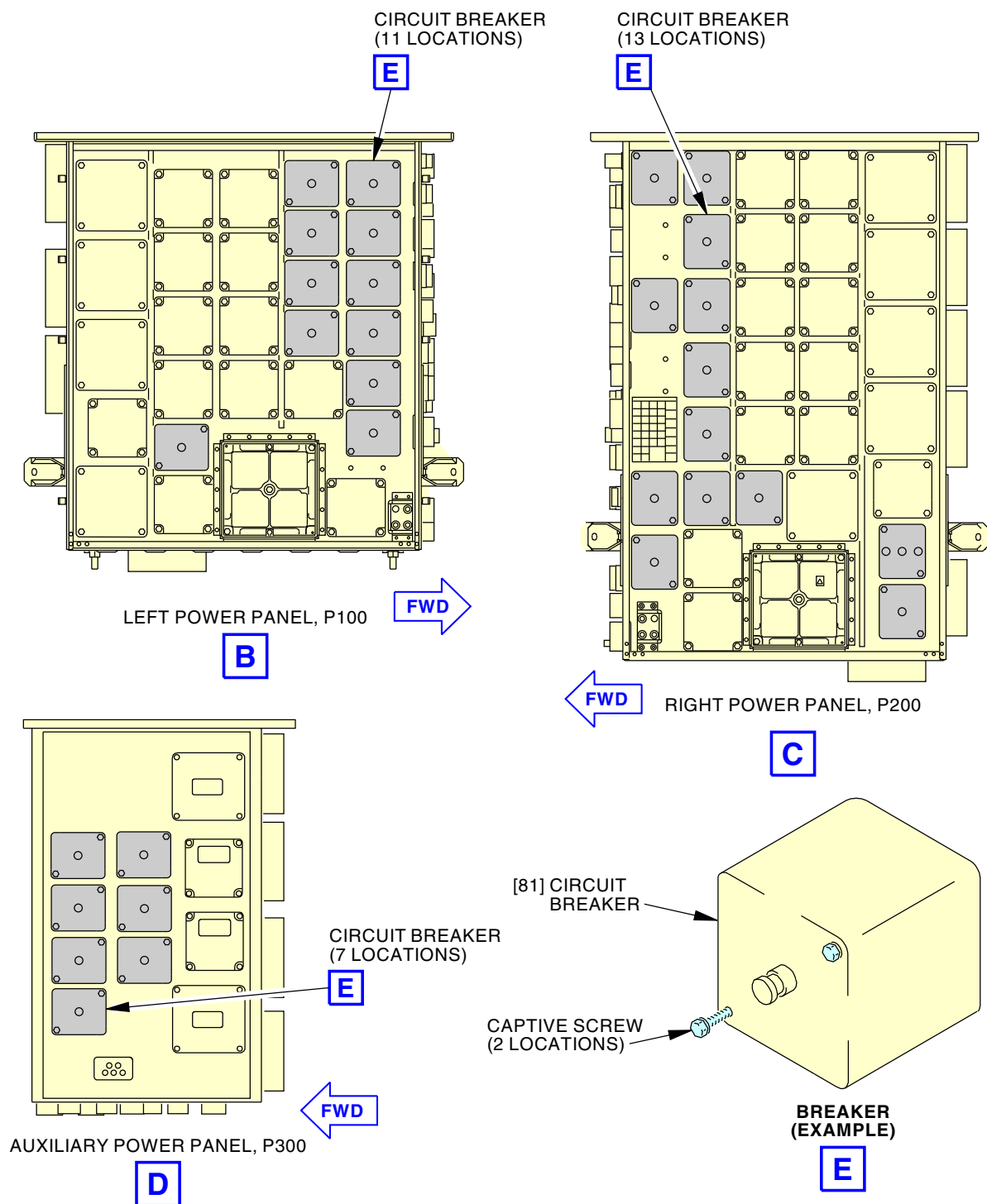
EFFECTIVITY
ARO ALL

D633W101-ARO

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N01042 S0006407767_V2

Circuit Breaker Installation
Figure 205/24-09-00-990-810-002 (Sheet 2 of 4)

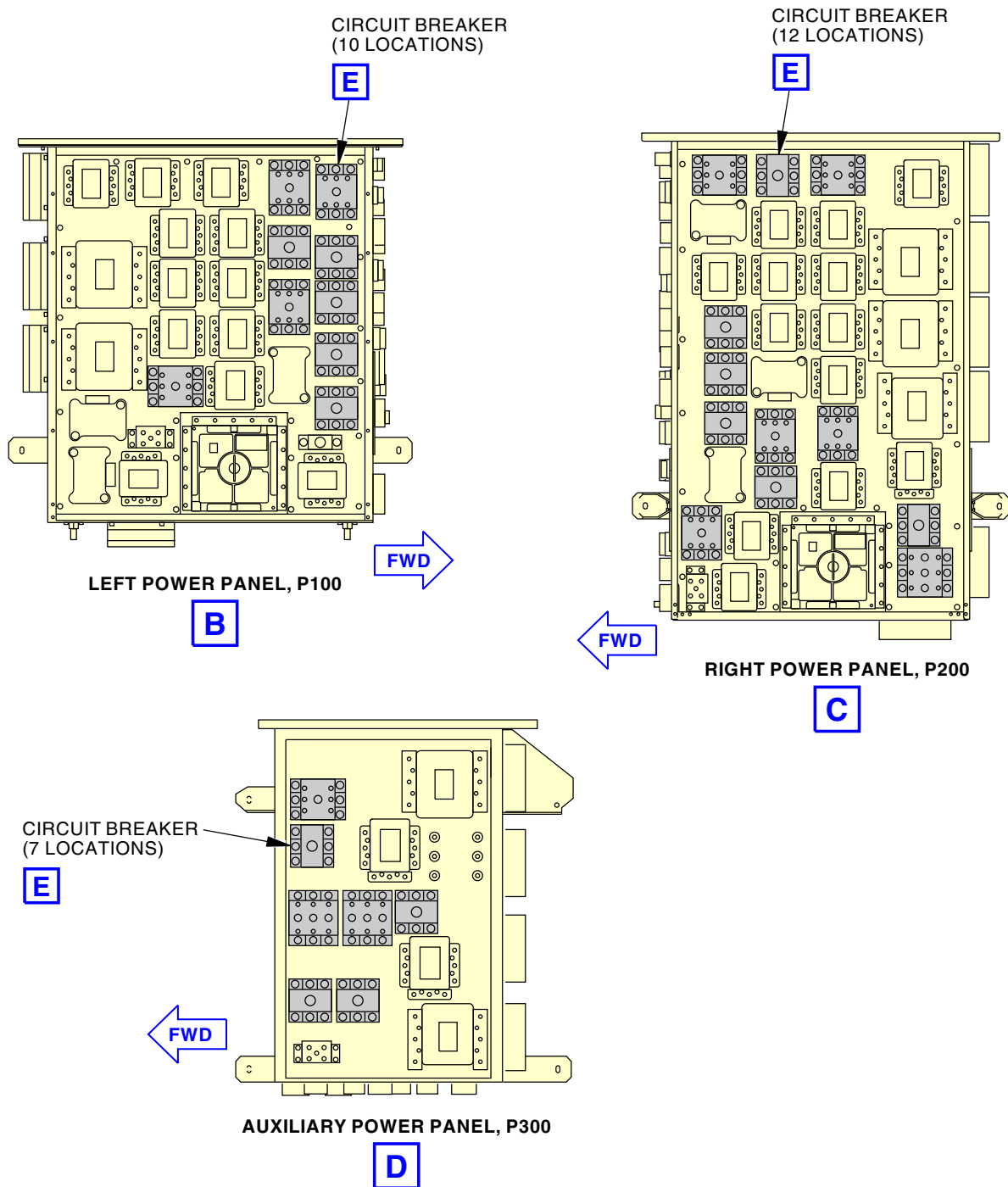
EFFECTIVITY
ARO 001-010

D633W101-ARO

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2536120 S0000601787_V1

Circuit Breaker Installation
Figure 205/24-09-00-990-810-002 (Sheet 3 of 4)

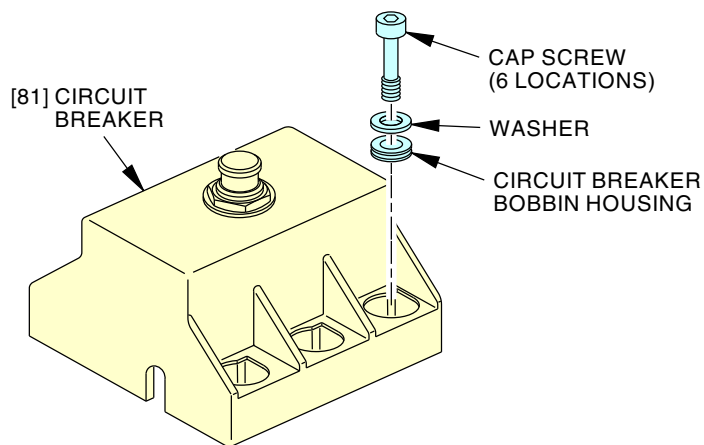
EFFECTIVITY
ARO 011-999

D633W101-ARO

24-09-00

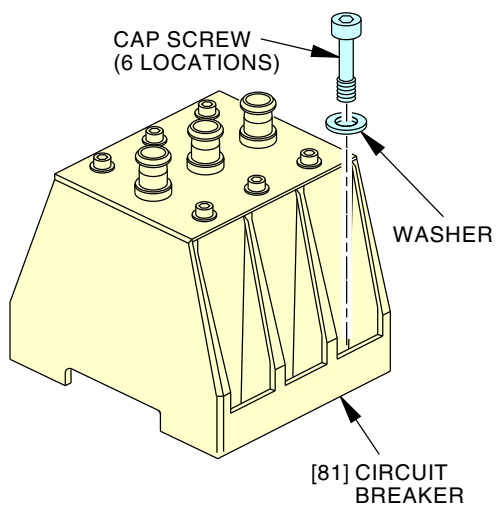
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**BREAKER
(EXAMPLE)**

E



**BREAKER
(EXAMPLE)**

E

2534638 S0000599686_V1

Circuit Breaker Installation
Figure 205/24-09-00-990-810-002 (Sheet 4 of 4)

EFFECTIVITY
ARO 011-999

D633W101-ARO

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TASK 24-09-00-400-814-002

12. Circuit Breaker - Installation

(Figure 205)

A. General

- (1) The circuit breaker is a line replaceable module. The circuit breakers are installed in the power panels P100, P200, and P300.

B. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Installation

SUBTASK 24-09-00-860-099-002



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Make sure electrical power is removed from the airplane. If not, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-09-00-860-100-002

- (2) To get access to the power panels,

Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-161



CAUTION

DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (3) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

SUBTASK 24-09-00-410-017-002

- (4) Do the steps that follow to install the applicable circuit breaker [81] in the power panel P100, P200, or P300:
 - (a) Examine the circuit breaker [81] contacts for any unwanted material.
 - (b) Hold the applicable circuit breaker [81] in the correct position.

EFFECTIVITY
ARO ALL

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- (c) Make sure the movable plungers on the circuit breaker [81] are engaged in the stationary contacts on the backplane.

NOTE: Each circuit breaker needs a small clearance between the circuit breaker and the backplane.

ARO 001-010

- (d) Make sure the gasket is correctly positioned on the backplane.

ARO ALL

- (e) Push the circuit breaker [81] down tightly against the backplane.

ARO 001-010

- (f) Install by hand the two captive screws that attach the applicable circuit breaker [81] to the panel.

ARO 011-999

- (g) Install the cap screws, washers, and, if applicable, bobbin housings that attach the circuit breaker [81] to the panel.

ARO 001-010

- (h) Tighten the two screws to 15 pound-inches (1.7 newton-meters).

ARO 011-999

- (i) Torque the cap screws between 28.8 in-lb (3.25 N·m) and 35.2 in-lb (3.98 N·m).

ARO ALL

SUBTASK 24-09-00-860-101-002

- (5) Put the airplane back to its usual condition.
 - (a) Install the protective cover for the applicable power panel.
 - (b) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— **END OF TASK** —————

TASK 24-09-00-000-826

13. Monitor Card - Removal

(Figure 206)

A. General

- (1) The monitor cards (M24518, M24519, M24520 and M24521) are line replaceable units. There are multiple monitor cards in the P110, the P210, and the P310 power management panels.

B. References

<u>Reference</u>	<u>Title</u>
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

EFFECTIVITY
ARO ALL

D633W101-ARO

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D. Access Panels

Number	Name/Location

117AL	Main Equipment Center Access Door

E. Prepare For Removal

SUBTASK 24-09-00-860-154

- (1) If you are replacing components in the P310 panel, then do these steps:

NOTE: The Airplane Information Management System (AIMS) will lose information when all power is removed from AIMS. The information lost will be Central Maintenance Computing Function (CMCF) fault history, Airplane Condition Monitoring Function (ACMF) stored reports, programmable and quick report definitions and results, and modifiable constants.

- (a) If CMCF fault history is required, move the CMCF fault history database to diskette using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.
- (b) If the ACMF modified constants are required, make a print of the constants by selecting the "Print" button on the ACMF modifiable constants page before power is removed.

NOTE: Only the constants that have been modified will print. The constants must be manually reentered after power is restored.

NOTE: ACMF reports that have not been downlinked via ACARS or saved to the optional Quick Access Recorder will be lost. Programmable and quick report definitions and results will be lost.



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (c) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
- (d) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to illuminate for 3 to 4 minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

- (e) Open this access panel:

Number	Name/Location

117AL	Main Equipment Center Access Door



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

Row	Col	Number	Name
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

EFFECTIVITY
ARO ALL

D633W101-ARO

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CAUTION

DO NOT DISCONNECT THE MAIN BATTERY WHILE AC POWER IS NOT CONNECTED. IF YOU DISCONNECT AC POWER AND THE MAIN BATTERY, IT WILL ERASE THE BATTERY-BACKED MEMORY IN AIMS.

- (g) Remove the battery connector and electrical connector to disconnect the main aircraft battery .

SUBTASK 24-09-00-860-153

- (2) If you are replacing components in the P110 or P210 panel, then do these steps:



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
(b) Open this access panel:

Number

Name/Location

117AL

Main Equipment Center Access Door

F. Monitor Card Removal

SUBTASK 24-09-00-020-022

- (1) Remove the monitor card [101] as follows:
- (a) Open the main doors of the applicable power management panel.
 - (b) Loosen the captive screws and carefully lower the applicable relay panel.
 - (c) Loosen and remove the four screws [102] and washers [103] that hold the monitor card [101] .
 - (d) Remove the applicable monitor card [101].

———— **END OF TASK** ————

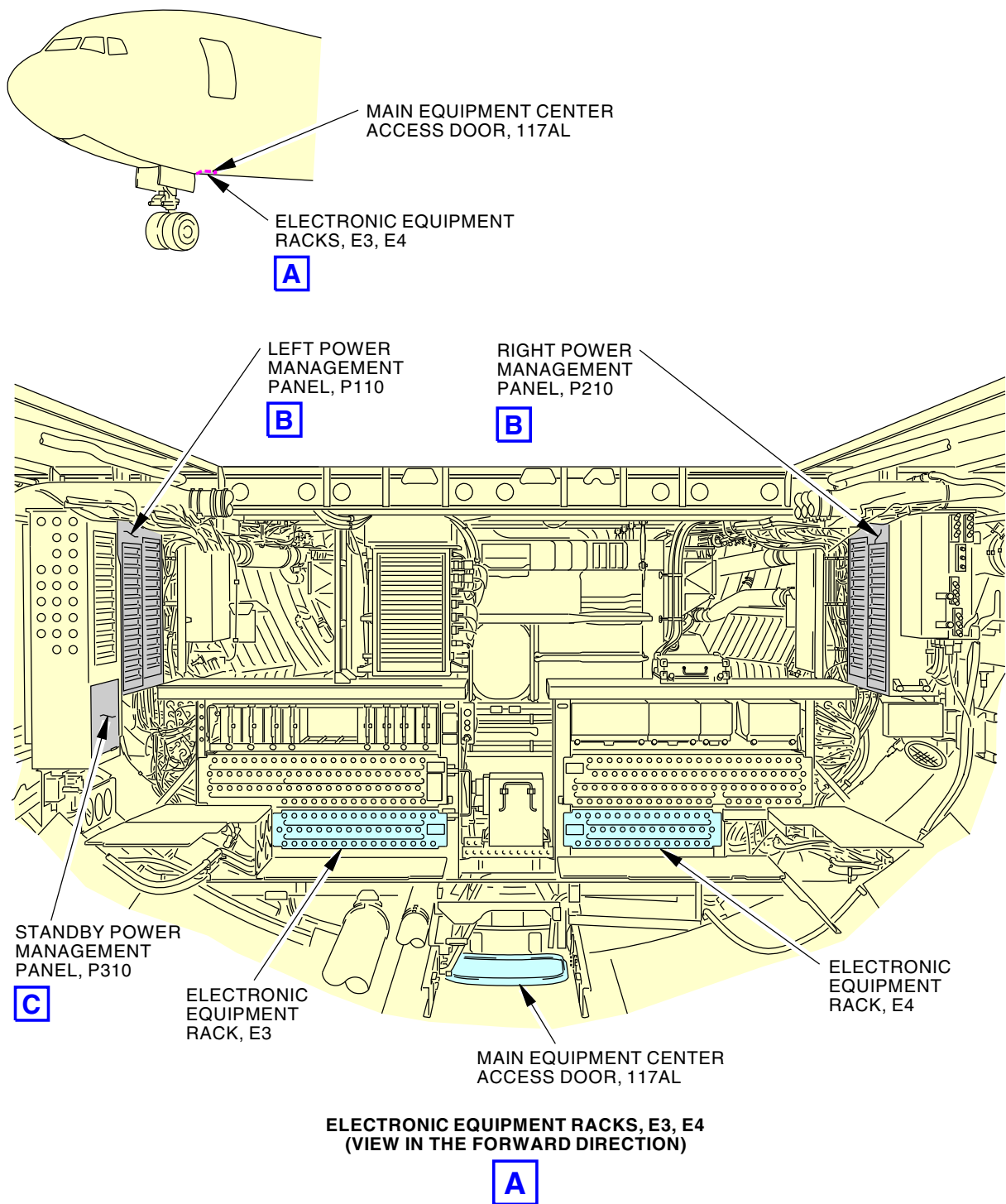
EFFECTIVITY
ARO ALL

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M91910 S0006407804_V2

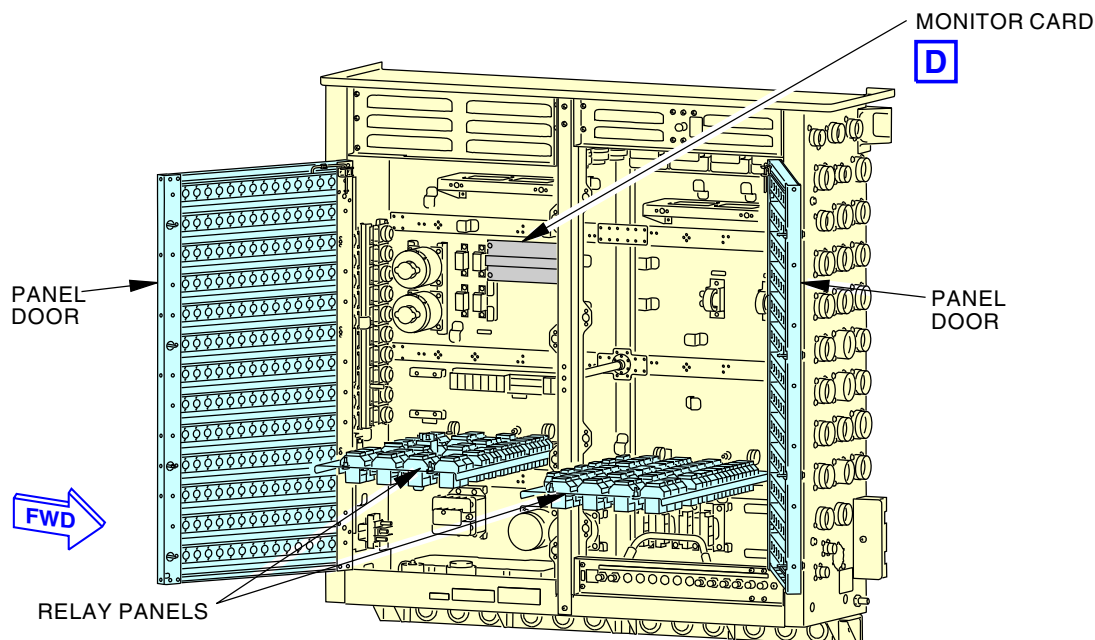
Monitor Card Installation
Figure 206/24-09-00-990-818 (Sheet 1 of 2)

EFFECTIVITY
ARO ALL

D633W101-ARO

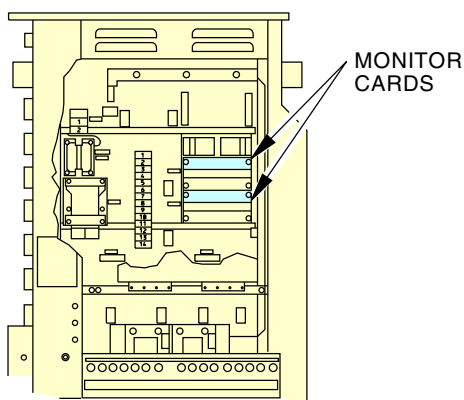
24-09-00

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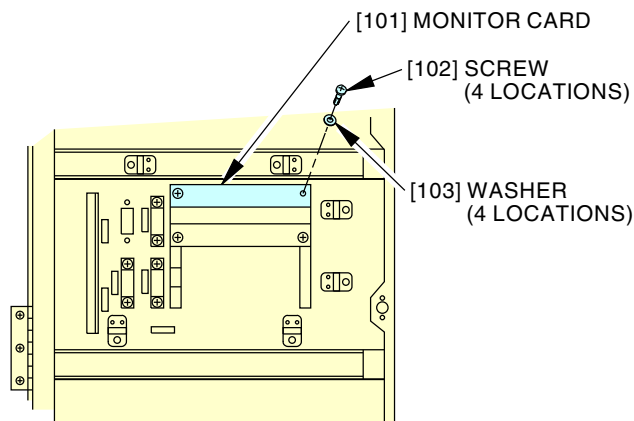
LEFT POWER MANAGEMENT PANEL, P110
(RIGHT POWER MANAGEMENT PANEL, P210 IS OPPOSITE)

B



STANDBY POWER MANAGEMENT
PANEL, P310

C



MONITOR CARD
(EXAMPLE)

D

1301686 S0000224713_V2

Monitor Card Installation
Figure 206/24-09-00-990-818 (Sheet 2 of 2)

EFFECTIVITY
ARO ALL

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TASK 24-09-00-400-824

14. Monitor Card - Installation

(Figure 206)

A. General

- (1) The monitor cards (M24518, M24519, M24520 and M24521) are line replaceable units. There are multiple monitor cards in the P110, the P210, and the P310 power management panels.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Monitor Card Installation

SUBTASK 24-09-00-860-155



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Make sure electrical power is removed from the airplane. If not, do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (a) If you are replacing a component in the P310 panel, follow the power removal steps from this task: Monitor Card - Removal, TASK 24-09-00-000-826.

SUBTASK 24-09-00-010-028

- (2) To get access to the power management panels,
Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-420-020

- (3) Do the steps that follow to install the monitor card [101]:
 - (a) Hold the monitor card [101] in position and install by hand the four screws [102] and four washers [103].
 - (b) Tighten the four screws [102] to a torque between 11.7 and 14.3 pound-inches (1.3 and 1.6 newton-meters).
 - (c) Close and secure all relay panels opened for access.
 - (d) Close the main doors to the applicable power management panel.

EFFECTIVITY
ARO ALL

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SUBTASK 24-09-00-410-030

- (4) If a component in the P310 panel was replaced, then do this step:
- (a) Re-connect the main battery connectors.

SUBTASK 24-09-00-860-156

- (5) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-09-00-860-157

- (6) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.

SUBTASK 24-09-00-710-026

- (7) If a component in the P310 panel was replaced, do these steps:
- (a) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

- (b) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:
- 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 26 Fire Extinguishing System
 - e) OPERATIONAL TEST
 - f) Cargo Squibs
 - g) CONTINUE
 - 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.
- (c) Make sure the FMCS has the appropriate thrust rating selected.
- 1) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the TEST position.
 - 2) Make sure the EICAS message, ENG CONTROL L (R) does not show.
 - 3) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the NORM position.
- (d) If CMCF fault history was saved prior to remove the electrical power, then use How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.
- (e) If the ACMF modified constants were printed out before power was removed, then reenter the constants on the ACMF modifiable constants page.

NOTE: Only the constants that had been modified were printed. The constants must be manually reentered.

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ARO ALL

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F. Put the Airplane Back to its Usual Condition

SUBTASK 24-09-00-410-031

(1) Do the steps that follow to put the airplane back to its usual condition:

(a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

(b) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

TASK 24-09-00-700-801-002

15. Signal Interface Unit - Exchange Check

A. References

<u>Reference</u>	<u>Title</u>
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

D. Prepare for the Check

SUBTASK 24-09-00-860-170-002

(1) If the signal interface unit (SIU) is in the P110 or P210 panel, then do these steps:



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

(b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-171-002

(2) If the signal interface unit (SIU) is in the P310 panel, then do these steps:

NOTE: The Airplane Information Management System (AIMS) will lose information when all power is removed from AIMS. The information lost will be Central Maintenance Computing Function (CMCF) fault history, Airplane Condition Monitoring Function (ACMF) stored reports, programmable and quick report definitions and results, and modifiable constants.

(a) If the CMCF fault history is required, move the CMCF fault history database to diskette using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

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ARO ALL

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- (b) If the ACMF modified constants are required, make a print of the constants by selecting the "Print" button on the ACMF modifiable constants page before power is removed.

NOTE: Only the constants that have been modified will print. The constants must be manually reentered after power is restored.

NOTE: ACMF reports that have not been downlinked via ACARS or saved to the optional Quick Access Recorder will be lost. Programmable and quick report definitions and results will be lost.



WARNING

REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (c) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

- (d) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to illuminate for 3 to 4 minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

- (e) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C



CAUTION

DO NOT DISCONNECT THE MAIN BATTERY WHILE AC POWER IS NOT CONNECTED. IF YOU DISCONNECT AC POWER AND THE MAIN BATTERY, IT WILL ERASE THE BATTERY-BACKED MEMORY IN AIMS.

- (g) Remove the battery connector and electrical connector to disconnect main aircraft battery.

E. Procedure

SUBTASK 24-09-00-700-004-002

- (1) Do this exchange check of the signal interface unit (SIU) for the applicable maintenance message.

- (a) Put a tag that reads "SUSPECT" on the SIU that will be replaced.
(b) Remove and re-install the "SUSPECT" SIU.

These are the tasks:

Signal Interface Unit - Removal, TASK 24-09-00-000-814-002,

Signal Interface Unit - Installation, TASK 24-09-00-400-810-002.

EFFECTIVITY
ARO ALL

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- (c) If the MAT shows NOT ACTIVE for the maintenance message (or if the message does not show) on the existing faults display, then the fault is corrected.
 - 1) Remove the tag that reads "SUSPECT".
- (d) If the MAT shows ACTIVE for the maintenance message on the existing faults display, then continue.
- (e) Put a tag that reads "OK" on the other SIU.
- (f) Exchange the locations of the "SUSPECT" SIU and the "OK" SIU.

These are the tasks:

Signal Interface Unit - Removal, TASK 24-09-00-000-814-002,
Signal Interface Unit - Installation, TASK 24-09-00-400-810-002.
- (g) If the MAT shows NOT ACTIVE for the maintenance message (or if the message does not show) on the existing faults display, then the fault is corrected.
 - 1) Remove the tags from the SIUs.
- (h) If the maintenance message shows on the existing fault display, then do these steps:
 - 1) Replace the "SUSPECT" SIU.

These are the tasks:

Signal Interface Unit - Removal, TASK 24-09-00-000-814-002,
Signal Interface Unit - Installation, TASK 24-09-00-400-810-002.
 - 2) Remove the tags from the SIUs.

————— END OF TASK —————

TASK 24-09-00-700-802-002

16. Computing and Communication Unit - Exchange Check

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Prepare for the Check

SUBTASK 24-09-00-860-172-002

- (1) If the computing and communication unit (CCU) is in the P110 or P210 panel, then do these steps:

EFFECTIVITY
ARO ALL

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REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
- (b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-09-00-860-173-002

- (2) If computing and communication unit (CCU) is in the P310 panel, then do these steps:

NOTE: The Airplane Information Management System (AIMS) will lose information when all power is removed from AIMS. The information lost will be Central Maintenance Computing Function (CMCF) fault history, Airplane Condition Monitoring Function (ACMF) stored reports, programmable and quick report definitions and results, and modifiable constants.

- (a) If the CMCF fault history is required, move the CMCF fault history database to diskette using How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.
- (b) If the ACMF modified constants are required, make a print of the constants by selecting the "Print" button on the ACMF modifiable constants page before power is removed.

NOTE: Only the constants that have been modified will print. The constants must be manually reentered after power is restored.

NOTE: ACMF reports that have not been downlinked via ACARS or saved to the optional Quick Access Recorder will be lost. Programmable and quick report definitions and results will be lost.



REMOVE ELECTRICAL POWER FROM THE AIRPLANE BEFORE YOU REPLACE A COMPONENT IN THE PANEL. THE POWER MANAGEMENT PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (c) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
- (d) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to illuminate for 3 to 4 minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

- (e) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C



CAUTION

DO NOT DISCONNECT THE MAIN BATTERY WHILE AC POWER IS NOT CONNECTED. IF YOU DISCONNECT AC POWER AND THE MAIN BATTERY, IT WILL ERASE THE BATTERY-BACKED MEMORY IN AIMS.

- (g) Remove the battery connector and electrical connector to disconnect main aircraft battery.

E. Procedure

SUBTASK 24-09-00-700-005-002

- (1) Do this exchange check of the computing and communication unit (CCU) for the applicable maintenance message.

- (a) Put a tag that reads "SUSPECT" on the CCU that will be replaced.
(b) Remove and re-install the "SUSPECT" CCU.

These are the tasks:

Computing and Communications Unit - Removal, TASK 24-09-00-000-815-002,
Computing and Communications Unit - Installation, TASK 24-09-00-400-811-002.

- (c) If the MAT shows NOT ACTIVE for the maintenance message (or if the message does not show) on the existing faults display, then the fault is corrected.
1) Remove the tag that reads "SUSPECT".
(d) If the MAT shows ACTIVE for the maintenance message on the existing faults display, then continue.
(e) Put a tag that reads "OK" on the other CCU.
(f) Exchange the locations of the "SUSPECT" CCU and the "OK" CCU.

These are the tasks:

Computing and Communications Unit - Removal, TASK 24-09-00-000-815-002,
Computing and Communications Unit - Installation, TASK 24-09-00-400-811-002.

- (g) If the MAT shows NOT ACTIVE for the maintenance message (or if the message does not show) on the existing faults display, then the fault is corrected.
1) Remove the tags from the CCUs.
(h) If the maintenance message shows on the existing fault display, then do these steps:
1) Replace the "SUSPECT" CCU.

These are the tasks:

Computing and Communications Unit - Removal, TASK 24-09-00-000-815-002,
Computing and Communications Unit - Installation, TASK 24-09-00-400-811-002.

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- 2) Remove the tags from the CCUs.

———— **END OF TASK** ————

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ELMS POWER MANAGEMENT PANEL - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

- (1) A system test of the Electrical Load Management System (ELMS) Power Management Panel.
- (2) This test is to make sure the ELMS Power Management Panel operates correctly.

TASK 24-09-00-730-801

2. ELMS Power Management Panel - System Test

A. References

Reference	Title
21-00-00-800-803	Supply Conditioned Air with a Cooling Pack (P/B 201)
21-00-00-800-804	Remove Conditioned Air Supplied by a Cooling Pack (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

B. Location Zones

Zone	Area
212	Flight Compartment, Right

C. Prepare for the ELMS Power Management Panel System Test

SUBTASK 24-09-00-860-001

- (1) Make sure the engines are not running.

SUBTASK 24-09-00-860-002

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

SUBTASK 24-09-00-860-167-001

- (3) Shut down the left and right cooling packs.
 - (a) Do this task: Remove Conditioned Air Supplied by a Cooling Pack, TASK 21-00-00-800-804.

D. ELMS Power Management Panel System Test

SUBTASK 24-09-00-730-001

- (1) Use a MAT to make sure there are no maintenance messages for the ELMS Power Management Panel. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) OTHER FUNCTIONS
 - 3) SPECIAL FUNCTIONS
 - 4) Select the applicable power management panel:
 - a) 24 P110 Power Management Panel or
 - b) 24 P210 Power Management Panel or
 - c) 24 P310 Power Management Panel
 - 5) Select the applicable EU self-test:
 - a) INITIATE P110 EU SELFTEST or

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- b) INITIATE P210 EU SELFTEST or
- c) INITIATE P310 EU SELFTEST
- 6) CONTINUE
- (b) Do the instructions that show on the MAT and then make these selections:
 - 1) CONTINUE
 - 2) START FUNCTION

NOTE: The MAT will reset during the ELMS P210 self-test. The MAT goes back to the main startup page after the self-test is complete. There will be no other indication that shows the self-test is complete. If there is a fault, it will display on the EICAS with its related maintenance message.

SUBTASK 24-09-00-860-168-002

- (2) Turn the left and right cooling packs back on.
 - (a) Do this task: Supply Conditioned Air with a Cooling Pack, TASK 21-00-00-800-803.

———— **END OF TASK** ————

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POWER PANEL - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the power panel.
 - (2) An installation of the power panel.
 - (3) All of these tasks are for the power panels that follow:
 - (a) The Left Power Panel, P100
 - (b) The Right Power Panel, P200
 - (c) The Auxiliary Power Panel, P300

TASK 24-09-01-000-801

2. Power Panel Removal

(Figure 401)

A. References

Reference	Title
24-09-00-000-816-002	Power Panel Controller - Removal (P/B 201)
24-09-00-000-818-002	Circuit Breaker - Removal (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-22-03-000-801	Generator, Bus Tie, and Auxiliary Power Breaker Removal (P/B 401)
24-22-05-000-801	Ground Handling and Ground Service Relay Removal (P/B 401)
24-25-10-000-801	Transfer Bus and Converter Circuit Breaker Removal (P/B 401)
24-41-01-000-801	External Power Contactor Removal (P/B 401)
24-51-05-000-801	ELCU Removal (P/B 401)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Prepare for the Removal

SUBTASK 24-09-01-860-001

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-09-01-860-002

- (2) Make sure all of the hot bus warning lights are off.

ARO 001-010

NOTE: The HOT BUS WARNING LIGHT LEGEND decals are on the outside of the panel doors and not on the lights.

ARO ALL

D. Power Panel Removal

SUBTASK 24-09-01-020-001

- (1) Do these steps to remove the power panel from the airplane:
 - (a) For the P100 panel, remove the following modules:

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- 1) To remove the left GCB and the left BTB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Removal, TASK 24-22-03-000-801.
 - 2) To remove the left TBB and the left CCB, do this task: Transfer Bus and Converter Circuit Breaker Removal, TASK 24-25-10-000-801.
 - 3) To remove all of the ELCUs, do this task: ELCU Removal, TASK 24-51-05-000-801.
 - a) Remove the heatshield from the panel to allow access to the ELCUs.
 - 4) To remove all of the circuit breakers, do this task: Circuit Breaker - Removal, TASK 24-09-00-000-818-002.
 - 5) To remove the Power Panel Controller (PPC), do this task: Power Panel Controller - Removal, TASK 24-09-00-000-816-002.
- (b) For the P200 panel, remove the following modules:
- 1) To remove the right GCB and the right BTB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Removal, TASK 24-22-03-000-801.
 - 2) To remove the right TBB and the right CCB, do this task: Transfer Bus and Converter Circuit Breaker Removal, TASK 24-25-10-000-801.
 - 3) To remove the GSTR, do this task: Ground Handling and Ground Service Relay Removal, TASK 24-22-05-000-801.
 - 4) To remove the PEPC, do this task: External Power Contactor Removal, TASK 24-41-01-000-801.
 - 5) To remove all of the ELCUs, do this task: ELCU Removal, TASK 24-51-05-000-801.
 - a) Remove the heatshield from the panel to allow access to the ELCUs.
 - 6) To remove all of the circuit breakers, do this task: Circuit Breaker - Removal, TASK 24-09-00-000-818-002.
 - 7) To remove the Power Panel Controller (PPC), do this task: Power Panel Controller - Removal, TASK 24-09-00-000-816-002.
- (c) For the P300 panel, remove the following modules:
- 1) To remove the APB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Removal, TASK 24-22-03-000-801.
 - 2) To remove the GSSR and the GHR, do this task: Ground Handling and Ground Service Relay Removal, TASK 24-22-05-000-801.
 - 3) To remove the SEPC, do this task: External Power Contactor Removal, TASK 24-41-01-000-801.
 - 4) To remove all of the circuit breakers, do this task: Circuit Breaker - Removal, TASK 24-09-00-000-818-002.
- (d) Remove all the applicable electrical connectors [10].
- (e) Put the protective cap on all the applicable electrical connectors.
- (f) Identify the applicable power feeders [12] for the installation.
- (g) Do these steps to remove the applicable power feeders from the terminals:
- 1) Pull back the white insulator assembly [16] to expose the fasteners [14].
 - 2) Use 7/64" Allen key to remove the fasteners [14] from the terminal guard [15] to access power feeders.
 - 3) Remove the nuts [17], washers [18] and spring washers [19] that attach the power feeders from the terminal block.

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- (h) Do these steps for the P200 or P300 panel:
 - 1) Disconnect the flex duct from the applicable panel [1] or panel [2].
 - 2) Put the protective cap on the flex duct.
- (i) Remove the two nuts [7] and washers [6] that attach the two applicable bonding jumpers [11] from the panel.



WARNING

BE CAREFUL WHEN YOU MOVE THE PANEL. THE P100/P200 PANELS CAN WEIGH UP TO 116 POUNDS AND THE P300/P330 PANELS CAN WEIGH FROM 50 POUNDS. BODILY INJURIES TO PERSONNEL CAN OCCUR.



CAUTION

ATTACH A DO-NOT-APPLY-POWER PLACARD ON THE EXTERNAL POWER CONNECTOR BEFORE YOU REMOVE THE PANEL. DAMAGE TO THE AIRPLANE CAN OCCUR IF THE EXTERNAL POWER CONNECTOR IS ENERGIZED.

- (j) Remove the four bolts [4] or bolts [8], four washers [5] or washers [9] that attach the applicable panel to the rack.
- (k) Remove the applicable panel [1], panel [2] or panel [3].
 - 1) Remove and keep the part/serial number labels attached to the panels.

———— **END OF TASK** ————

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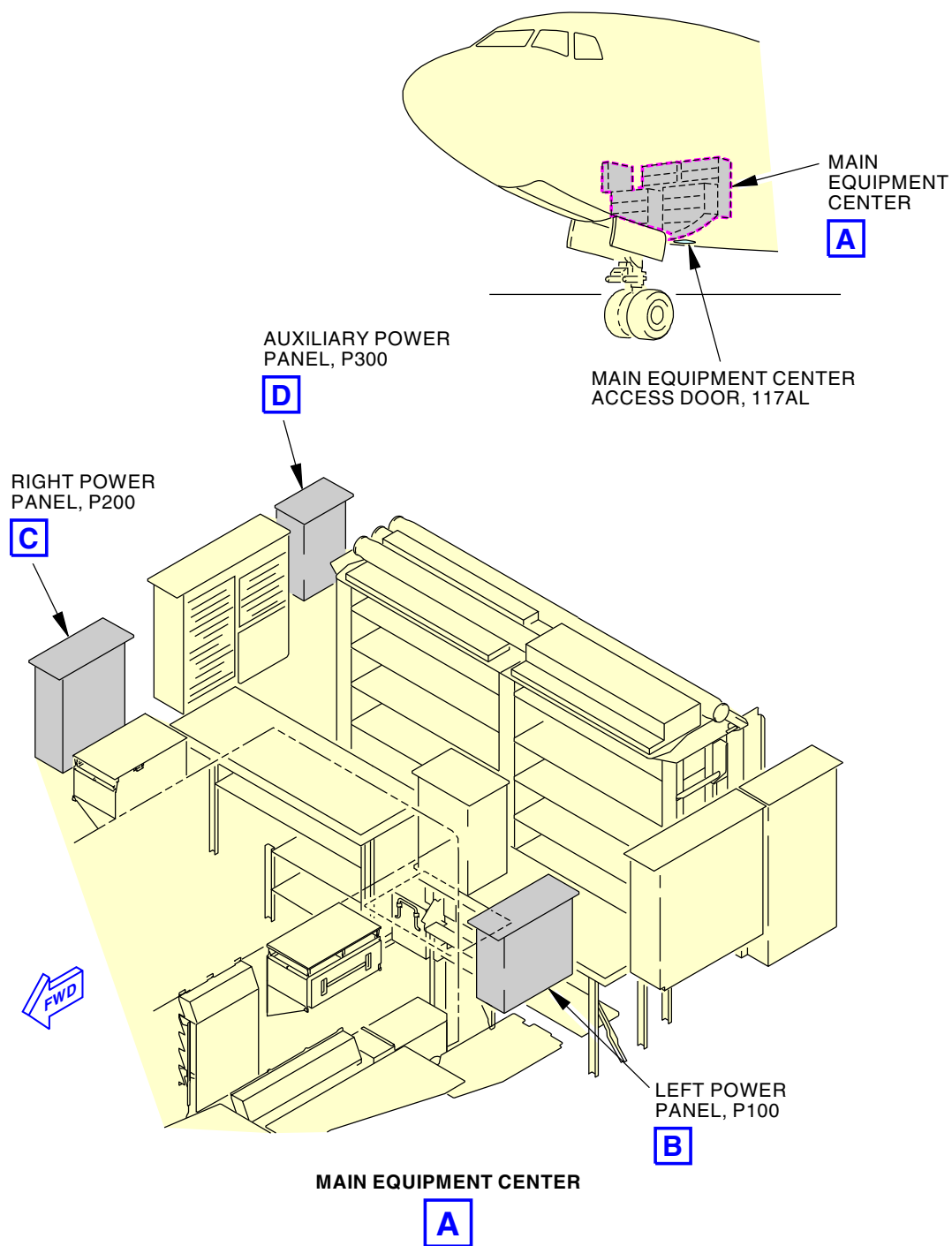
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E21812 S0006407827_V2

Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 1 of 8)

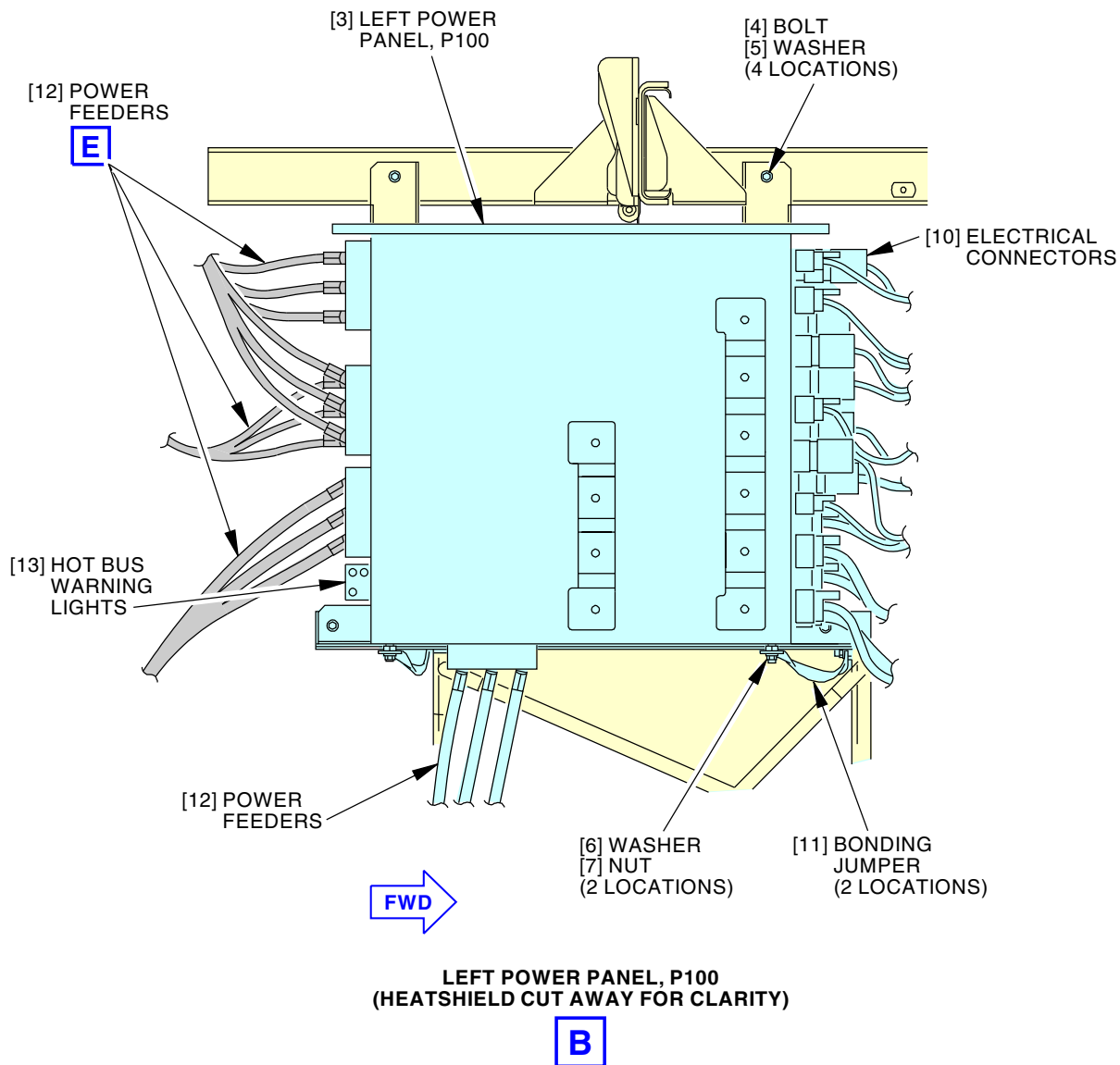
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E21856 S0006407828_V5

**Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 2 of 8)**

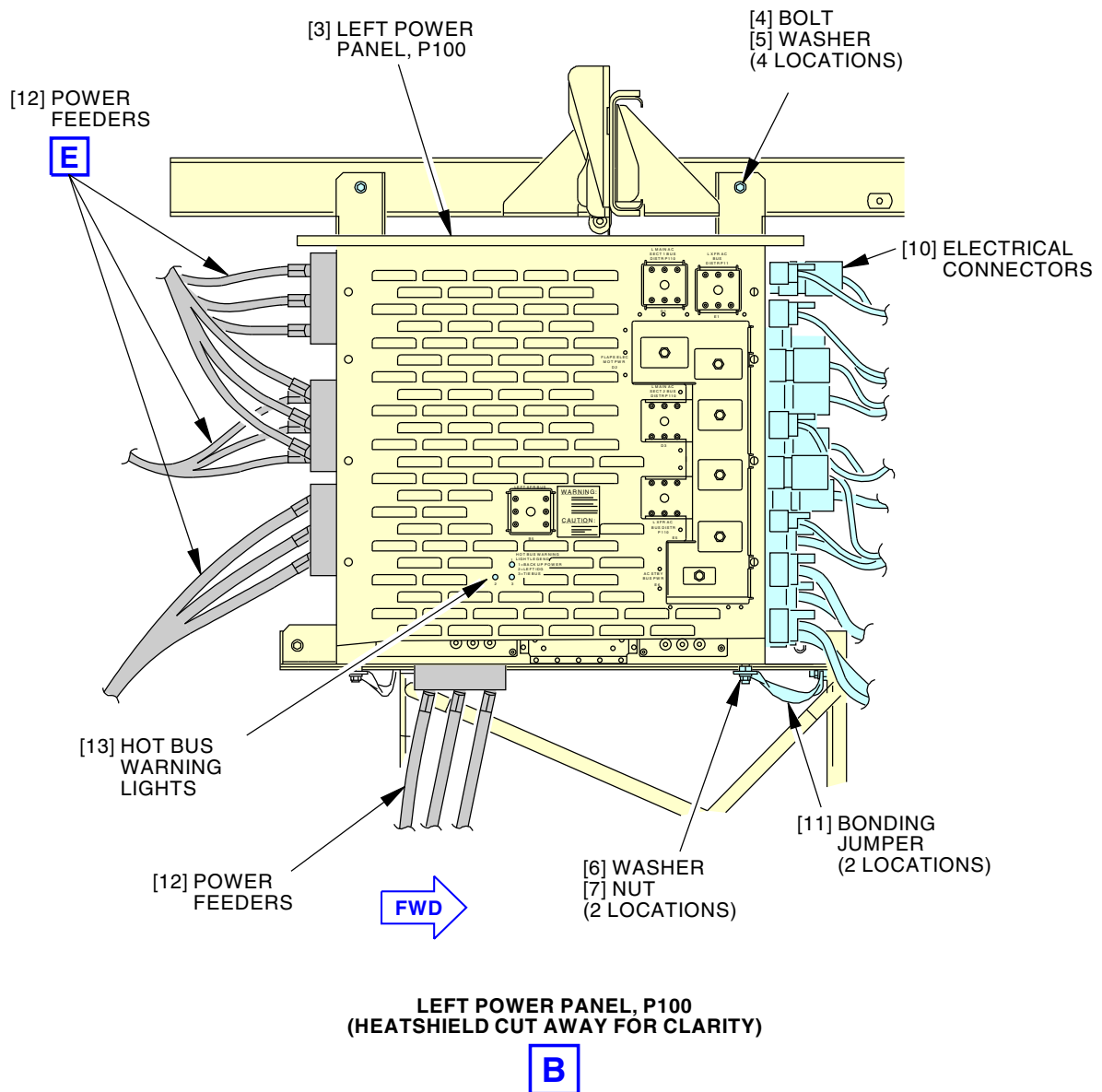
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ARO 001-010

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2534790 S0000599737_V1

**Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 3 of 8)**

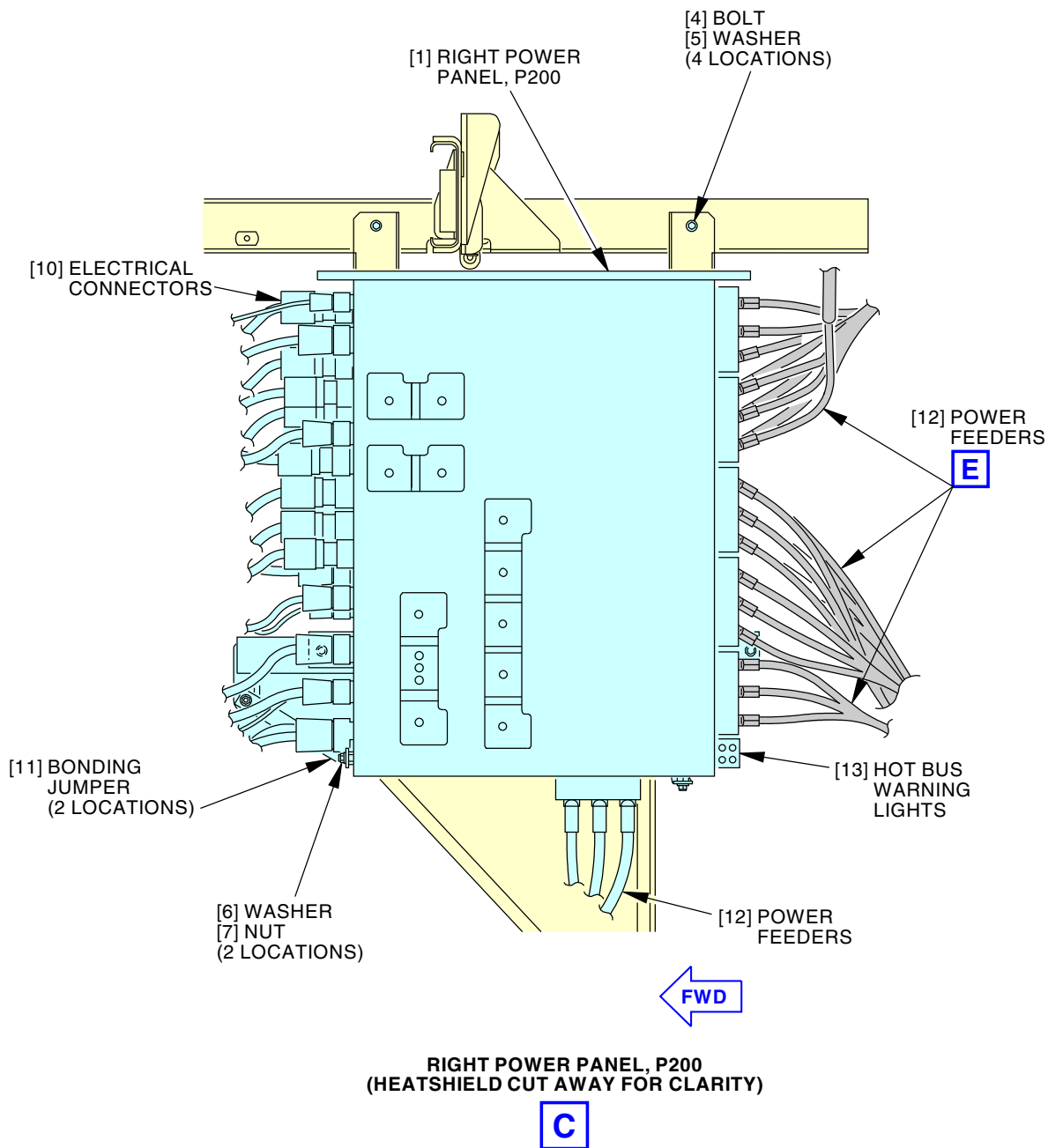
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ARO 011-999

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E27001 S0006407829_V5

**Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 4 of 8)**

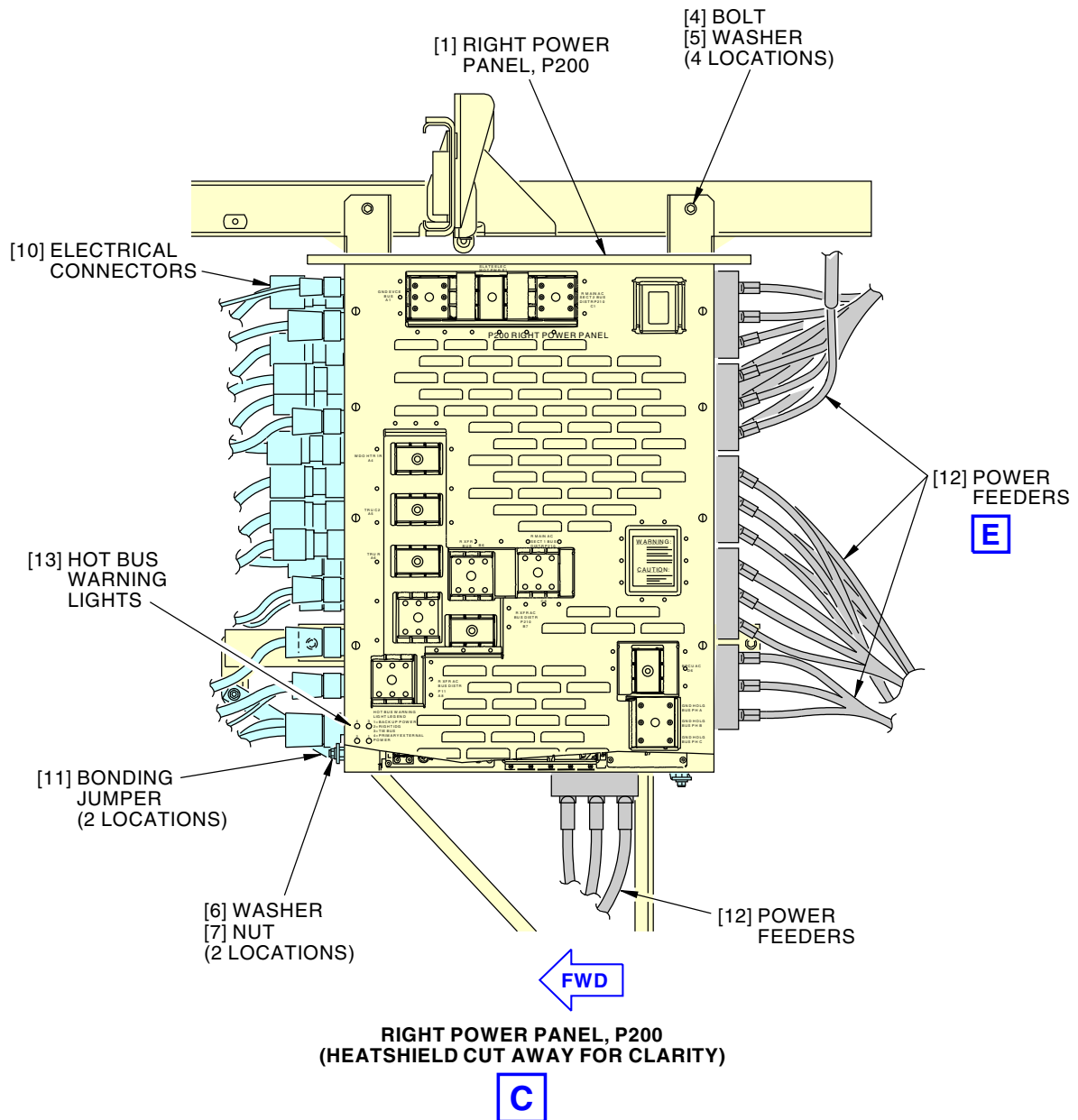
EFFECTIVITY
ARO 001-010

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2534806 S0000599738_V1

Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 5 of 8)

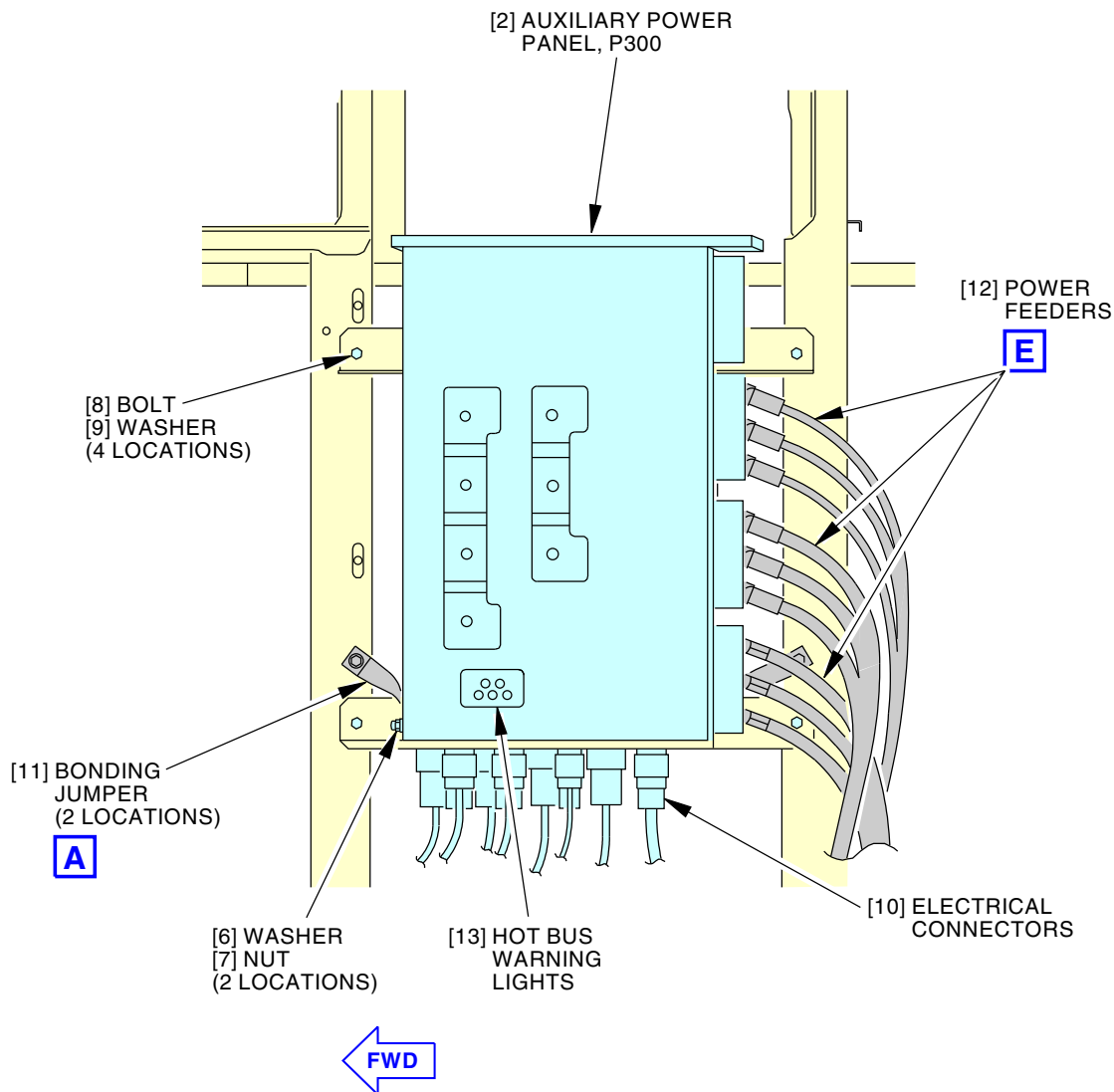
EFFECTIVITY
ARO 011-999

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**AUXILIARY POWER PANEL, P300
(HEATSHIELD CUT AWAY FOR CLARITY)**

D

E27007 S0006407830_V5

Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 6 of 8)

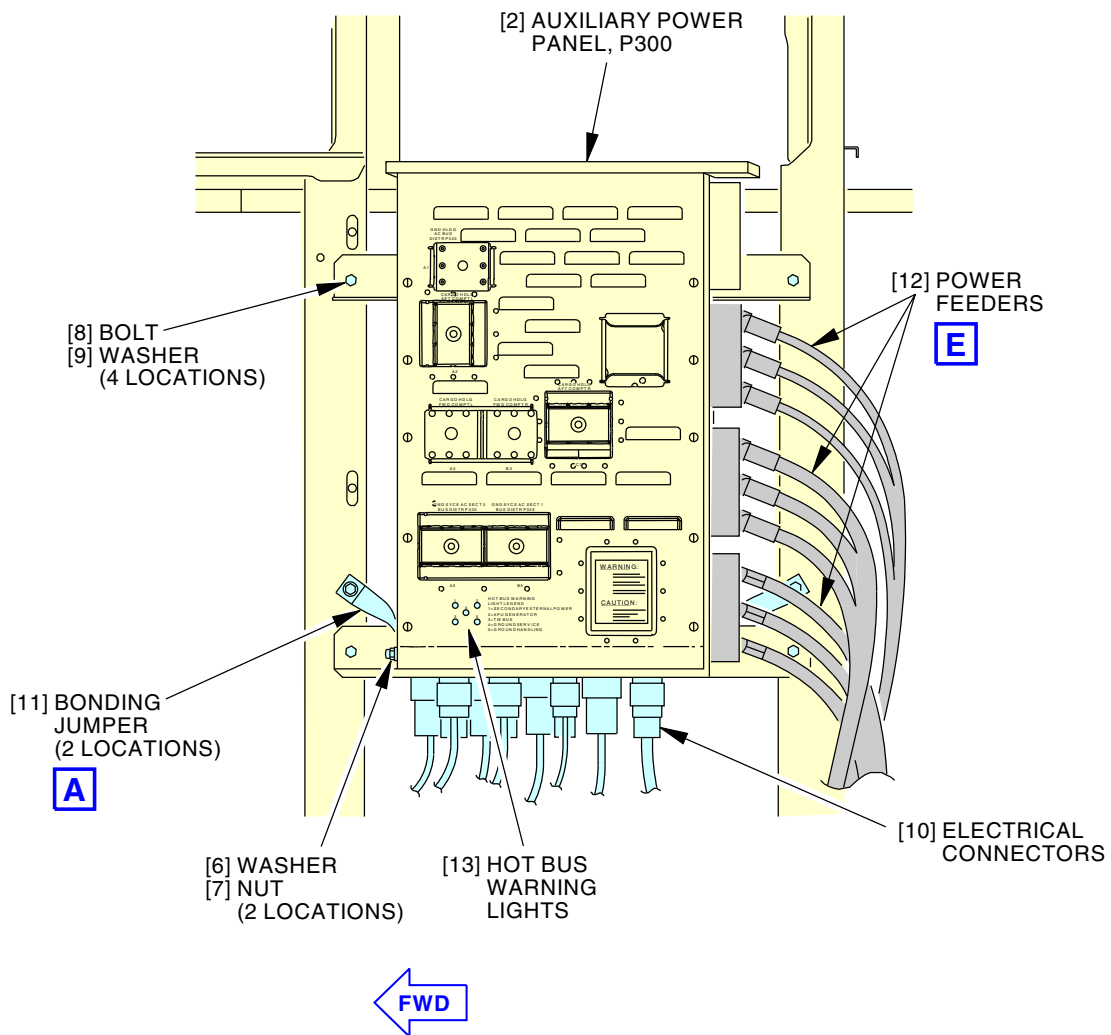
EFFECTIVITY
ARO 001-010

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**AUXILIARY POWER PANEL, P300
(HEATSHIELD CUT AWAY FOR CLARITY)**

D

2534891 S0000599739_V1

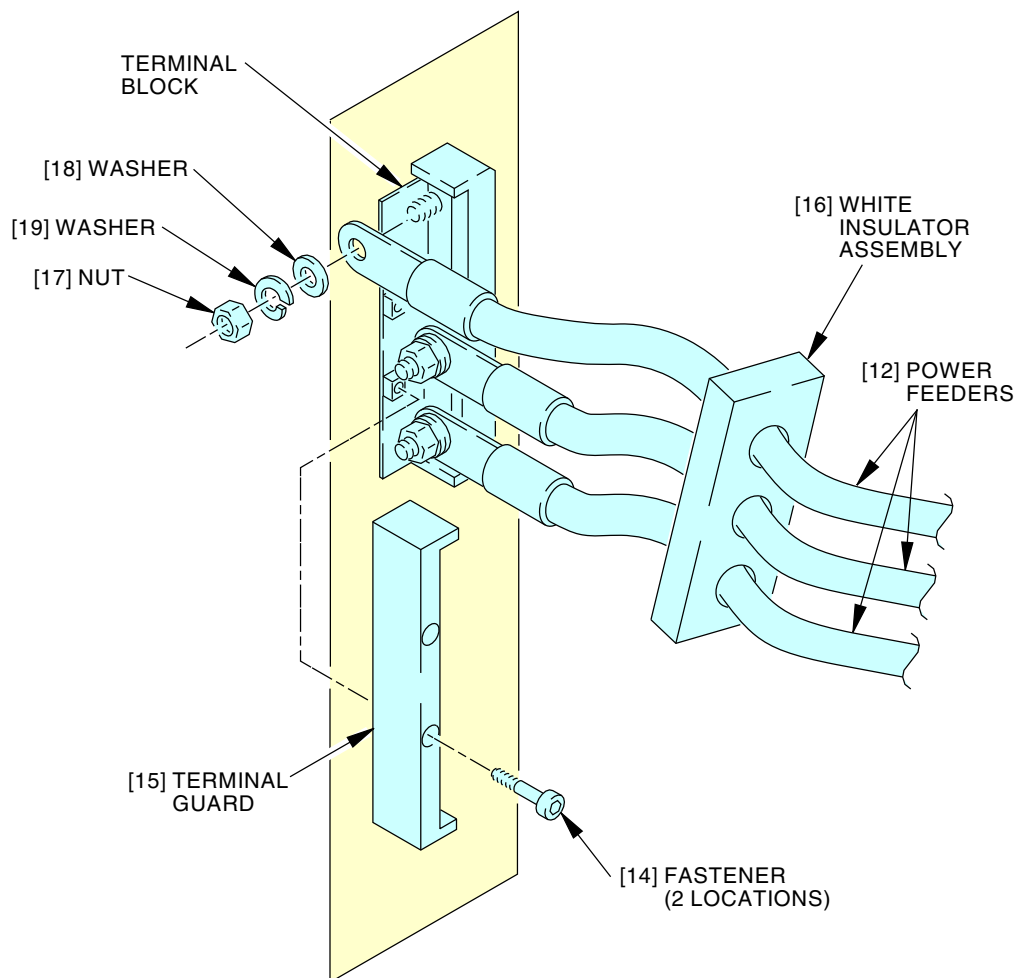
**Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 7 of 8)**

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POWER FEEDERS

A

1439168 S0000259899_V3

**Power Panel Installation
Figure 401/24-09-01-990-801 (Sheet 8 of 8)**

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TASK 24-09-01-400-801

3. Power Panel Installation

(Figure 401)

A. References

Reference	Title
21-26-00-740-801	Lavatory/Galley Ventilation Fan - System Test (P/B 501)
21-27-00-700-801	Equipment Cooling System - System Test (P/B 501)
24-09-00-400-812-002	Power Panel Controller - Installation (P/B 201)
24-09-00-400-814-002	Circuit Breaker - Installation (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-03-400-801	Generator, Bus Tie, and Auxiliary Power Breaker Installation (P/B 401)
24-22-05-400-801	Ground Handling and Ground Service Relay Installation (P/B 401)
24-25-10-400-801	Transfer Bus and Converter Circuit Breaker Installation (P/B 401)
24-32-09-400-801	TRU Relay Installation (P/B 401)
24-41-01-400-801	External Power Contactor Installation (P/B 401)
24-51-05-400-801	ELCU Installation (P/B 401)
24-51-05-700-801	Installation Test of ELCUs M24111, M24211 (P/B 401)
24-51-05-700-802	Installation test of ELCUs M21265, M21266 (P/B 401)
24-51-05-700-803	Installation test of ELCUs M21102, M21202 (P/B 401)
24-51-05-700-804	Installation Test of ELCU M21101 (P/B 401)
24-51-05-700-805	Installation Test of ELCUs M25043, M25044, M25135, M25235 (P/B 401)
24-51-05-700-806	Installation Test of ELCUs M28108, M28212 (P/B 401)
24-51-05-700-807	Installation Test of ELCUs M28109, M28213 (P/B 401)
24-51-05-700-808	Installation Test for ELCUs M29103, M29203 (P/B 401)
24-51-05-700-810	Installation Test of ELCUs M21201 (P/B 401)
24-51-05-710-801	Operational Test for ELCUs M29303, M29308 (P/B 401)
25-53-00-700-816-003	Left PDU Test (P/B 501)
25-53-00-700-817-003	Right PDU Test (P/B 501)
27-51-00-740-803	Flap System Secondary Control Test (P/B 501)
27-81-00-740-802	Slat System Secondary Control Test (P/B 501)
28-22-00-730-801	Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test (P/B 501)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
29-11-00-710-803	Center System Alternating Current Motor Pumps (ACMP) - Operational Test (P/B 501)
29-11-00-730-801	Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test (P/B 501)
30-41-00-710-801	Window Heat Control System - Operational Test (P/B 501)

B. Tools/Equipment

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

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Power Panel Installation

SUBTASK 24-09-01-420-001

- (1) Do these steps to install the power panel to the airplane:



WARNING

BE CAREFUL WHEN YOU MOVE THE PANEL. THE P100/P200 PANELS CAN WEIGH UP TO 116 POUNDS AND THE P300/P330 PANELS CAN WEIGH FROM 50 POUNDS. BODILY INJURIES TO PERSONNEL CAN OCCUR.

- (a) Install the applicable panel [1], panel [2] or panel [3].
 - 1) Apply the kept part/serial number labels to the panels. If you no longer have the labels, mark the panels with the part/serial numbers.
- (b) Install the bolts [4] or bolts [8], and washers [5] or washers [9] that attach the applicable panel to the rack.
- (c) Do these steps for the P200 or P300 panel:
 - 1) Remove the protective cap from the applicable flex duct.
 - 2) Connect the flex duct to the applicable panel [1] or panel [2].
- (d) Install the two washers [6], two nuts [7] that attach the two applicable bonding jumpers [11] to the panel.
- (e) Measure the resistance between the applicable panel ground stud and the other bracket ground stud on the rack with an intrinsically safe approved bonding meter, COM-1550.
- (f) Make sure resistance is less than 0.001 Ohm (1 milliohm).
- (g) Remove all the caps from all the applicable electrical connectors [10].
- (h) Connect all the applicable electrical connectors.



CAUTION

MAKE SURE YOU CONNECT THE POWER FEEDERS TO THE RELAY CORRECTLY. A SYSTEM MALFUNCTION AND EQUIPMENT DAMAGE CAN OCCUR IF YOU DO NOT CONNECT THE POWER FEEDERS CORRECTLY.

- (i) Connect all the applicable power feeders [12] to the terminals:
 - 1) Install the applicable lug washers [18], spring washers [19] and nuts [17].
 - 2) Torque the nuts [17] to 180 - 200 pound-inches (20 - 26 newton-meter).
 - 3) Use 7/64" Allen key to install the fasteners [14] to the terminal guard [15].

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- 4) Put back the white insulator assembly [16].
- (j) Install the following modules:
NOTE: The applicable installation tests cannot be performed until all modules have been installed and power has been supplied to the ELMS Power Panels.
 - 1) For the P100 panel:
 - a) To install the left GCB and the left BTB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Installation, TASK 24-22-03-400-801.
 - b) To install the left TBB and the left CCB, do this task: Transfer Bus and Converter Circuit Breaker Installation, TASK 24-25-10-400-801.
 - c) To install all of the ELCUs, do this task: ELCU Installation, TASK 24-51-05-400-801.
<1> Install the heatshield after installation of the ELCUs.
 - d) To install all of the circuit breakers, do this task: Circuit Breaker - Installation, TASK 24-09-00-400-814-002.
 - e) To install the Power Panel Controller (PPC), do this task: Power Panel Controller - Installation, TASK 24-09-00-400-812-002.
 - 2) For the P200 panel:
 - a) To install the right GCB and the right BTB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Installation, TASK 24-22-03-400-801.
 - b) To install the right TBB and the right CCB, do this task: Transfer Bus and Converter Circuit Breaker Installation, TASK 24-25-10-400-801.
 - c) To install the GSTR, do this task: Ground Handling and Ground Service Relay Installation, TASK 24-22-05-400-801.
 - d) To install the PEPC, do this task: External Power Contactor Installation, TASK 24-41-01-400-801.
 - e) To install all of the ELCUs, do this task: ELCU Installation, TASK 24-51-05-400-801.
<1> Install the heatshield after installation of the ELCUs.
 - f) To install all of the circuit breakers, do this task: Circuit Breaker - Installation, TASK 24-09-00-400-814-002.
 - g) To install the Power Panel Controller (PPC), do this task: Power Panel Controller - Installation, TASK 24-09-00-400-812-002.
 - 3) For the P300 panel:
 - a) To install the APB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Installation, TASK 24-22-03-400-801.
 - b) To install the GSSR and the GHR, do this task: Ground Handling and Ground Service Relay Installation, TASK 24-22-05-400-801.
 - c) To install the SEPC, do this task: External Power Contactor Installation, TASK 24-41-01-400-801.
 - d) To install all of the circuit breakers, do this task: Circuit Breaker - Installation, TASK 24-09-00-400-814-002.

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E. Power Panel Installation Test

SUBTASK 24-09-01-860-003

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

SUBTASK 24-09-01-710-001

(2) Do a test of the power panel:

(a) For the P100 panel:

- 1) Do this task: Lavatory/Galley Ventilation Fan - System Test, TASK 21-26-00-740-801.
- 2) Do this task: Equipment Cooling System - System Test, TASK 21-27-00-700-801.
- 3) To test the installation of the left GCB and the left BTB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Installation, TASK 24-22-03-400-801 Installation Test subtask.
- 4) To test the installation of the left CCB and the left TBB, do this task: Transfer Bus and Converter Circuit Breaker Installation, TASK 24-25-10-400-801 Installation Test subtask.
- 5) To test the installation of the TRU circuit breaker, do this task: TRU Relay Installation, TASK 24-32-09-400-801 Installation Test subtask.
- 6) To test the installation of the ELCUs, the following ELCU Installation Tests must be completed:
 - a) Do this task: Installation Test of ELCUs M24111, M24211, TASK 24-51-05-700-801.
 - b) Do this task: Installation test of ELCUs M21265, M21266, TASK 24-51-05-700-802.
 - c) Do this task: Installation Test of ELCUs M28109, M28213, TASK 24-51-05-700-807.
 - d) Do this task: Installation test of ELCUs M21102, M21202, TASK 24-51-05-700-803.
 - e) Do this task: Installation Test of ELCUs M28108, M28212, TASK 24-51-05-700-806.
 - f) Do this task: Installation Test for ELCUs M29103, M29203, TASK 24-51-05-700-808.
 - g) Do this task: Operational Test for ELCUs M29303, M29308, TASK 24-51-05-710-801.
 - h) Do this task: Installation Test of ELCU M21101, TASK 24-51-05-700-804.
 - i) Do this task: Installation Test of ELCUs M25043, M25044, M25135, M25235, TASK 24-51-05-700-805.
- 7) Do this task: Flap System Secondary Control Test, TASK 27-51-00-740-803.
- 8) Do this task: Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test, TASK 28-22-00-730-801.
- 9) Do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.
- 10) Do this task: Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test, TASK 29-11-00-730-801.

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- 11) Do this task: Window Heat Control System - Operational Test, TASK 30-41-00-710-801.
- (b) For the P200 panel:
 - 1) Do this task: Lavatory/Galley Ventilation Fan - System Test, TASK 21-26-00-740-801.
 - 2) Do this task: Equipment Cooling System - System Test, TASK 21-27-00-700-801.
 - 3) To test the installation of the right GCB and the right BTB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Installation, TASK 24-22-03-400-801
Installation Test subtask.
 - 4) To test the installation of the right CCB and the right TBB, do this task: Transfer Bus and Converter Circuit Breaker Installation, TASK 24-25-10-400-801
Installation Test subtask.
 - 5) To test the installation of the TRU circuit breaker, do this task: TRU Relay Installation, TASK 24-32-09-400-801
Installation Test subtask.
 - 6) To test the installation of the GSTR, do this task: Ground Handling and Ground Service Relay Installation, TASK 24-22-05-400-801
Installation Test subtask.
 - 7) To test the installation of the PEPC, do this task: External Power Contactor Installation, TASK 24-41-01-400-801
Installation Test subtask.
 - 8) To test the installation of the ELCUs, the following ELCU Installation Tests must be completed:
 - a) Do this task: Installation Test of ELCUs M24111, M24211, TASK 24-51-05-700-801.
 - b) Do this task: Installation Test of ELCUs M21201, TASK 24-51-05-700-810.
 - c) Do this task: Installation test of ELCUs M21265, M21266, TASK 24-51-05-700-802.
 - d) Do this task: Installation Test of ELCUs M28109, M28213, TASK 24-51-05-700-807.
 - e) Do this task: Installation test of ELCUs M21102, M21202, TASK 24-51-05-700-803.
 - f) Do this task: Installation Test of ELCUs M28108, M28212, TASK 24-51-05-700-806.
 - g) Do this task: Installation Test for ELCUs M29103, M29203, TASK 24-51-05-700-808.
 - h) Do this task: Operational Test for ELCUs M29303, M29308, TASK 24-51-05-710-801.
 - i) Do this task: Installation Test of ELCUs M25043, M25044, M25135, M25235, TASK 24-51-05-700-805.
 - 9) Do this task: Slat System Secondary Control Test, TASK 27-81-00-740-802.
 - 10) Do this task: Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test, TASK 28-22-00-730-801.

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- 11) Do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.
 - 12) Do this task: Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test, TASK 29-11-00-730-801.
 - 13) Do this task: Center System Alternating Current Motor Pumps (ACMP) - Operational Test, TASK 29-11-00-710-803.
 - 14) Do this task: Window Heat Control System - Operational Test, TASK 30-41-00-710-801.
- (c) For the P300 panel:
- 1) Do this task: Equipment Cooling System - System Test, TASK 21-27-00-700-801.
 - 2) Do this task: Left PDU Test, TASK 25-53-00-700-816-003.
 - 3) Do this task: Right PDU Test, TASK 25-53-00-700-817-003.
 - 4) To test the installation of the APB, do this task: Generator, Bus Tie, and Auxiliary Power Breaker Installation, TASK 24-22-03-400-801
Installation Test subtask.
 - 5) To test the installation of the GHR and the GSSR, do this task: Ground Handling and Ground Service Relay Installation, TASK 24-22-05-400-801
Installation Test subtask.
 - 6) To test the installation of the SEPC, do this task: External Power Contactor Installation, TASK 24-41-01-400-801
Installation Test subtask.

———— **END OF TASK** ————

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GENERATOR DRIVE SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) IDG Oil System Pressure Release
- (2) IDG Oil System Static Leak Check.

TASK 24-11-00-600-801

2. IDG Oil System Pressure Release

(Figure 201, Figure 202)

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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

B. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

C. Access Panels

Number	Name/Location
413BL	Oil Tank Access Door, Left Engine
415JB	Thrust Reverser Latch Panel, Left Engine
423BL	Oil Tank Access Door, Right Engine
425JB	Thrust Reverser Latch Panel, Right Engine

D. Procedure

SUBTASK 24-11-00-010-006

- (1) Open the applicable access panels:

Number	Name/Location
413BL	Oil Tank Access Door, Left Engine
415JB	Thrust Reverser Latch Panel, Left Engine
423BL	Oil Tank Access Door, Right Engine
425JB	Thrust Reverser Latch Panel, Right Engine

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SUBTASK 24-11-00-010-004



WARNING

DO NOT LET HOT OIL GET ON YOU. WEAR SPLASH GOGGLES, INSULATED GLOVES AND PROTECTION GEAR OR LET THE IDG BECOME COOL. HOT OIL CAN BURN YOU.

- (2) Remove the dust cap from the IDG overflow drain valve.

SUBTASK 24-11-00-610-001

- (3) Release the oil pressure from the IDG oil system.
- (a) Connect the overflow coupling and the hose which are on the service engine oil servicing cart, COM-1537 together.
 - (b) Put the free end of the hose into a oil resistant container (5 gal)(19 Liter), STD-1055.



WARNING

WHEN YOU CONNECT THE OUTLET ADAPTER TO THE OVERFLOW DRAIN VALVE, USE A RAG AROUND THE FITTINGS. THIS WILL PREVENT A SPRAY CAUSED BY PRESSURE IN THE IDG CASE. HOT OIL CAN BURN YOU.

- (c) Connect the overflow coupling and hose to the IDG overflow drain valve.
- NOTE: Some oil can come out of the drain hose when it is connected.
- (d) Permit the oil that drains from the hose to flow into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (e) Keep the free end of the hose above the oil in the container.
- (f) Disconnect the overflow coupling and hose from the overflow drain valve.

SUBTASK 24-11-00-410-003

- (4) Install the dust cap to the IDG overflow drain valve.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-00-010-007

- (1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
413BL	Oil Tank Access Door, Left Engine
415JB	Thrust Reverser Latch Panel, Left Engine
423BL	Oil Tank Access Door, Right Engine
425JB	Thrust Reverser Latch Panel, Right Engine

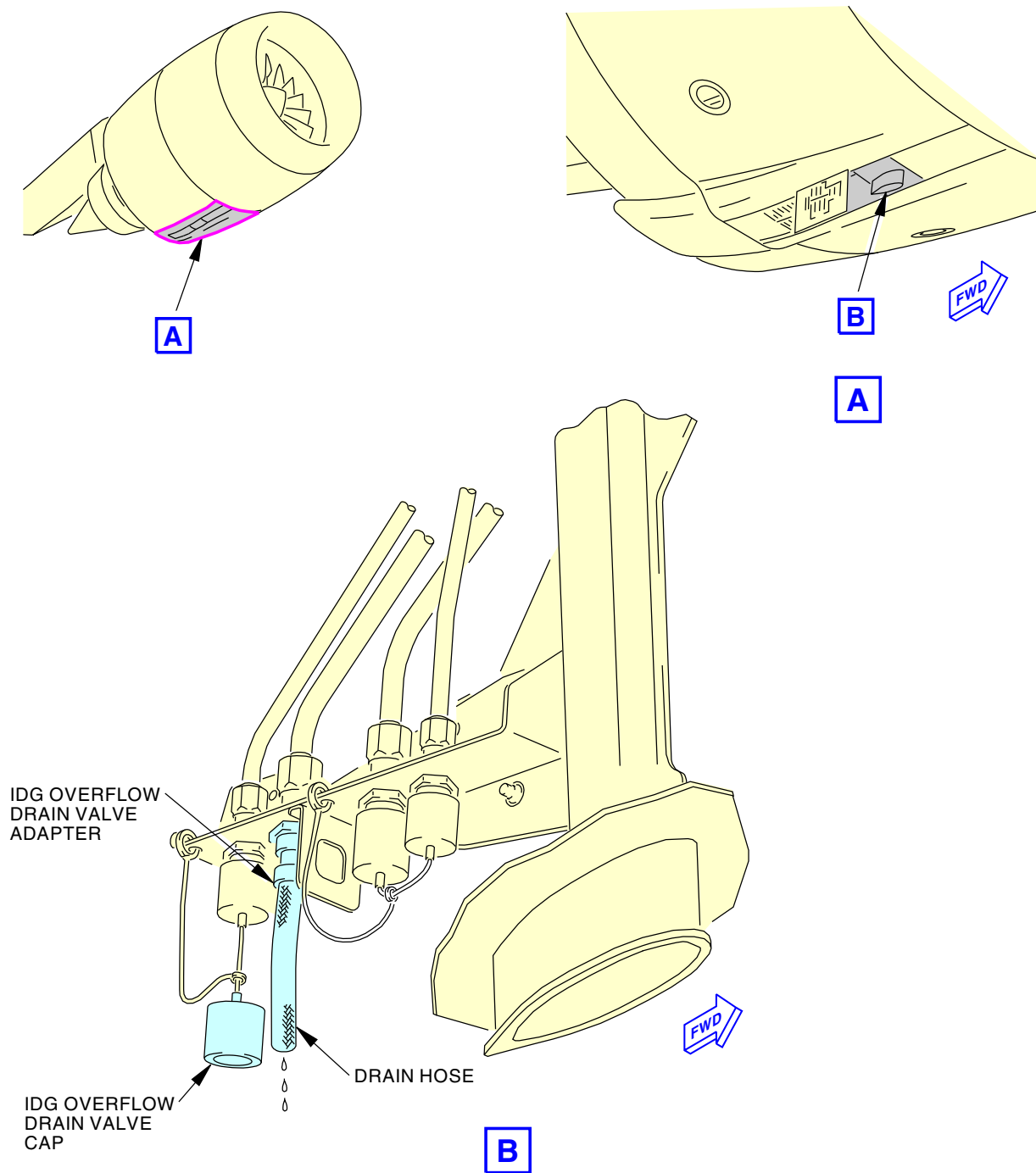
————— **END OF TASK** —————

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**Integrated Drive Generator Depressurization
Figure 201/24-11-00-990-802**

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TASK 24-11-00-700-803

3. IDG Oil System Static Leak Check

(Figure 201, Figure 202,)

A. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (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-8912	Test Equipment- Engine Generator Pressure Part #: J24015-1 Supplier: 81205
STD-1114	Air Source - Regulated, Dry, Filtered 0-150 PSIG with Pressure Gauge range 100 PSIG, 1 PSIG increment and +/-1 psi minimum accuracy

C. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

E. Prepare for the Procedure

SUBTASK 24-11-00-010-005



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

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- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

F. Procedure

SUBTASK 24-11-00-680-001

- (1) Do this task: IDG Oil System Pressure Release, TASK 24-11-00-600-801.

SUBTASK 24-11-00-480-001

- (2) Use the engine generator pressure test equipment, SPL-8912 as shown in Figure 202.

SUBTASK 24-11-00-860-013

- (3) Set the shutoff valve, on the leak test equipment, to OFF.

SUBTASK 24-11-00-860-014

- (4) Turn off the regulator valve on the leak test equipment to prevent too much pressure in the IDG case.

SUBTASK 24-11-00-860-015

- (5) Remove the cap from the IDG pressure fill valve.

SUBTASK 24-11-00-860-016

- (6) Connect the hose adapter of the leak test equipment to the IDG pressure fill valve.

SUBTASK 24-11-00-860-017

- (7) Connect the other end of the leak test equipment to the Regulated Dry Filtered Air Source, STD-1114 (0-150 PSIG).

SUBTASK 24-11-00-860-018



DO NOT APPLY MORE THAN 30 PSI. TOO MUCH PRESSURE CAN OPEN THE IDG PRESSURE RELIEF VALVE OR CAN CAUSE DAMAGE TO THE IDG.

- (8) Turn the shutoff valve to ON and adjust the regulator to 25 psi.

SUBTASK 24-11-00-860-019

- (9) Turn the shutoff valve to OFF.

NOTE: The pressure will decrease a small quantity, then the pressure gauge will become stable at a constant value.

SUBTASK 24-11-00-860-020

- (10) If the pressure gauge continues to show smaller values, do these steps:

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- (a) Visually examine the system for a leak.
- (b) If the leak is from the drain mast, repair the leak, or, if the leak is not found in the drain mast plumbing, replace the IDG.
- (c) If the leak is from the external circuit, repair the leak or replace the heat exchanger.
- (d) If you do not find a leak, do a leak check with a leak detector fluid or a soap solution.
- (e) Do this task: IDG Oil System Pressure Release, TASK 24-11-00-600-801.
- (f) Do the leak check again.

SUBTASK 24-11-00-680-002

- (11) Do this task: IDG Oil System Pressure Release, TASK 24-11-00-600-801.

SUBTASK 24-11-00-080-001

- (12) Disconnect the test equipment.

SUBTASK 24-11-00-610-002

- (13) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.
if it is necessary.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-00-410-005



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
 - (a) Do this task:
Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) Do this task:
Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

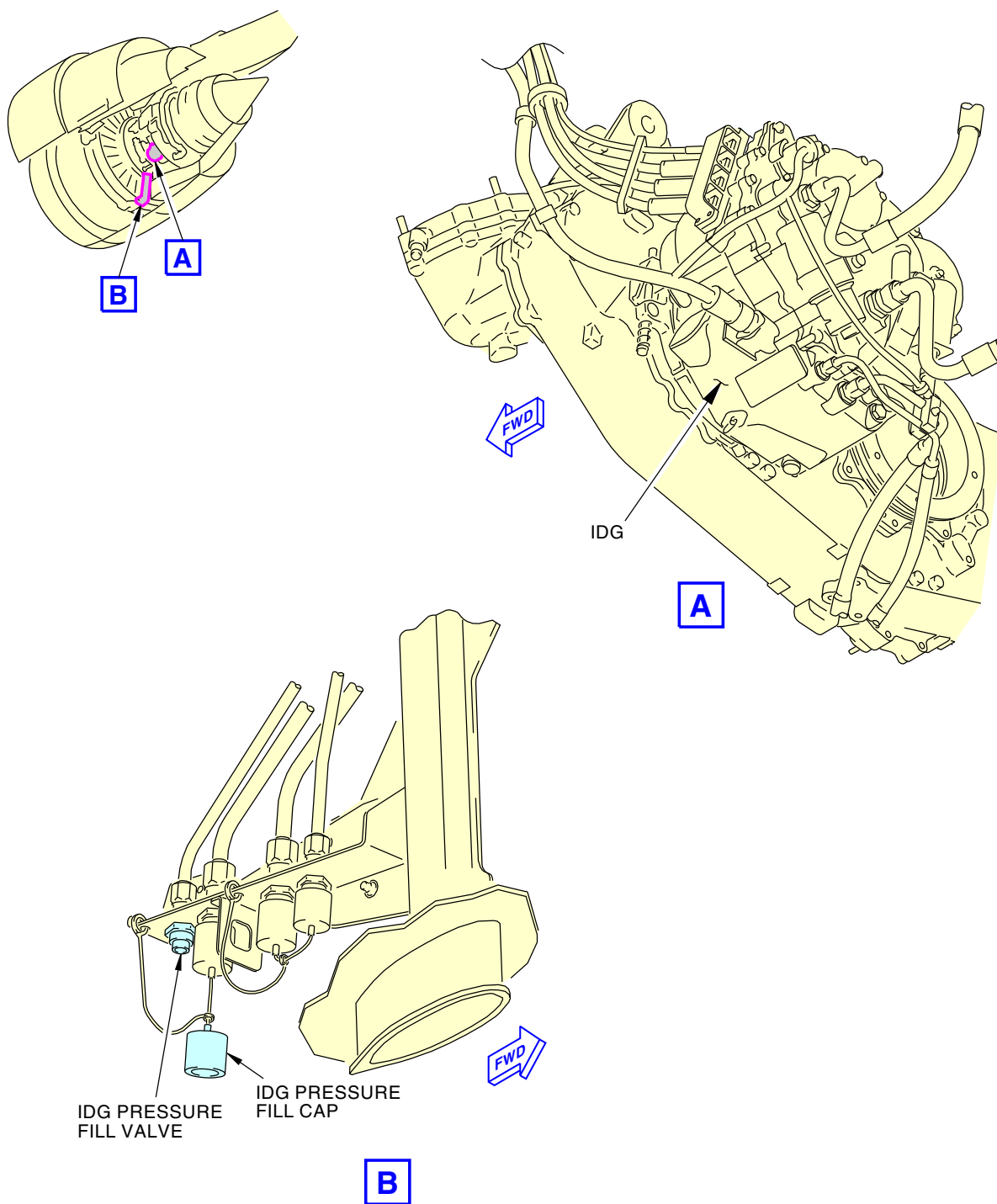
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**IDG Oil System Static Leak Test
Figure 202/24-11-00-990-803 (Sheet 1 of 2)**

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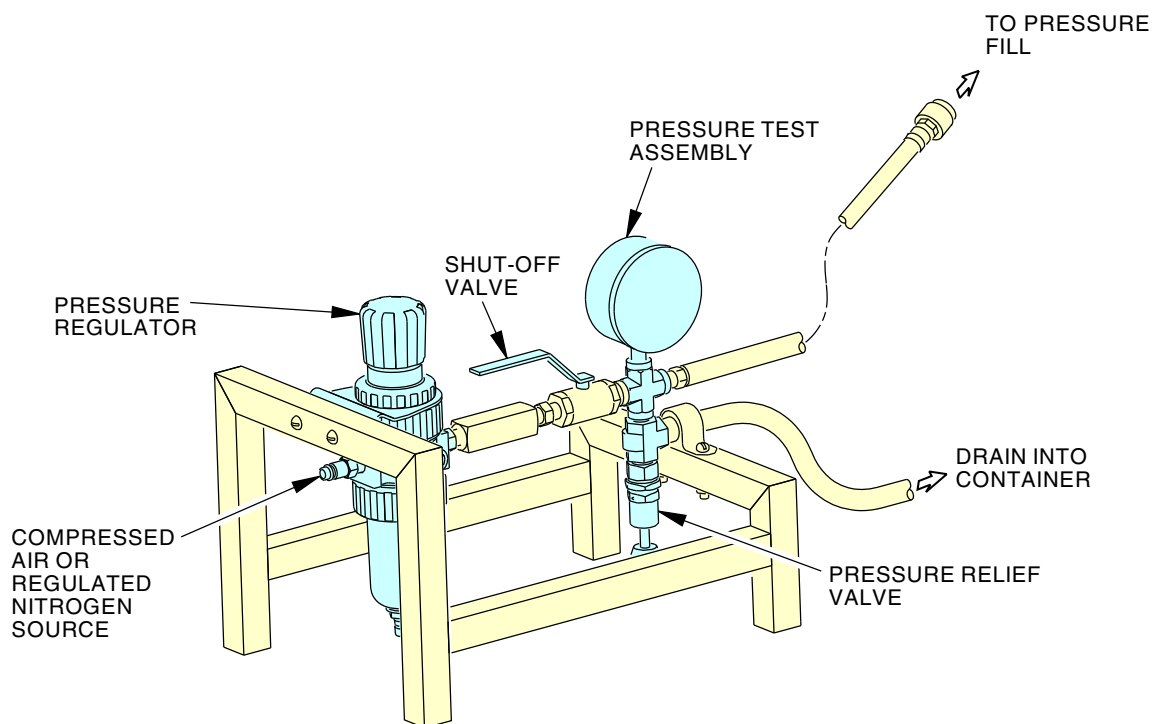
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IDG Oil System Static Leak Test
Figure 202/24-11-00-990-803 (Sheet 2 of 2)

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GENERATOR DRIVE SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has these tasks:
- (1) The Operational Test For The Left IDG
 - (2) The Operational Test For The Right IDG
- B. You must operate an engine to do the operational test of the generator drive system.

TASK 24-11-00-700-801

2. The Operational Test For The Left IDG

A. **General**

- (1) This procedure does these tests:
- (a) The Operation Test
 - (b) The Load Test
 - (c) The IDG Disconnect Test and the Connect Test.

B. **References**

Reference	Title
24-11-01-200-801	IDG Input Shaft Connection (P/B 601)
24-11-01-200-805	IDG Disconnect Check (P/B 601)
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)

C. **Location Zones**

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

D. **Prepare for the Test**

SUBTASK 24-11-00-860-011

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

SUBTASK 24-11-00-740-001

- (2) Do a test of the indicator lights for the electrical system.
- (a) Set the IND LTS switch to TEST.
 - (b) Make sure that all the indicator lights for the electrical system are on.
 - (c) Set the IND LTS switch to BRT.

E. **The Operation Test**

SUBTASK 24-11-00-860-001

- (1) Get access to the electrical system maintenance page. To get access to it, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 24-11-00-860-002

- (2) Make sure the maintenance page shows the data in the tables below.

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Table 501/24-11-00-993-801

	L IDG	R IDG
AC-V	0	0
FREQ	0	0
LOAD	0.00	0.00

Table 502/24-11-00-993-802

	L IDG	R IDG	L BACKUP GEN	R BACKUP GEN
OIL LEVEL -	NORMAL	NORMAL	NORMAL	NORMAL

SUBTASK 24-11-00-860-003

- (3) Make sure the L GEN CTRL switch is in the released position.
 - (a) Make sure the OFF light in the L GEN CTRL switch is on.

SUBTASK 24-11-00-860-004

 CAUTION	THE DRIVE LIGHT IN THE L DRIVE DISC SWITCH MUST GOES OFF AFTER THE ENGINE STARTS. IF A DRIVE LIGHT STAYS ON AFTER AN ENGINE STARTS, PUSH THE DRIVE DISC SWITCH. THIS REMOVES MECHANICAL INPUT POWER TO THE IDG. HIGH OIL TEMPERATURE OR LOW OIL PRESSURE CAN CAUSE DAMAGE TO THE IDG.

- (4) Start the left engine. To start it, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.

SUBTASK 24-11-00-710-001

- (5) Push the L GEN CTRL switch to the latched position.
 - (a) Make sure the ON light in the switch comes on and the OFF light goes off.
 - (b) Make sure the ON lights in the PRIMARY EXT PWR and SECONDARY EXT PWR switches goes off.
 - (c) Make sure these indications show on the maintenance page:
 - 1) For the left IDG,
AC-V = 110 to 120
FREQ = 395 to 405
 - (d) Make sure these indications occur on the synoptic page:
 - 1) The L GEN powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) L XFR

NOTE: The L XFR bus will be powered by left IDG for 10 seconds, then by backup generator for 15 seconds, and then by the left IDG again.
 - d) L UTIL
 - e) R UTIL

F. The Load Test

SUBTASK 24-11-00-710-002

- (1) Do the load test:

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DO NOT OPERATE THE BOOST PUMPS WITH THE FUEL TANKS EMPTY. DAMAGE TO THE BOOST PUMPS CAN OCCUR.

- (a) Put these switches on the fuel management control panel P5 to the ON position.
 - 1) L AFT PUMP
 - 2) L FWD PUMP
 - 3) R AFT PUMP
 - 4) R FWD PUMP
 - 5) L CENTER PUMP
 - 6) R CENTER PUMP
- (b) Put these switches on the hydraulic system control panel P5 to the ON position.
 - 1) L ELEC HYDRAULIC
 - 2) C1 ELEC HYDRAULIC
 - 3) C2 ELEC HYDRAULIC
 - 4) R ELEC HYDRAULIC
- (c) Push these switches on the air conditioning control module P5 panel to the ON position.
 - 1) UPPER RECIRC FAN
 - 2) LOWER RECIRC FAN
- (d) Make sure these indications show on the maintenance page:
 - 1) For the left IDG,
AC-V = 110 to 120
FREQ = 395 to 405
LOAD = 0.50 or larger
- (e) Put these switches on the P5 panel back to its normal position:
 - 1) L AFT PUMP
 - 2) L FWD PUMP
 - 3) R AFT PUMP
 - 4) R FWD PUMP
 - 5) L CENTER PUMP
 - 6) R CENTER PUMP
 - 7) L ELEC HYDRAULIC
 - 8) C1 ELEC HYDRAULIC
 - 9) C2 ELEC HYDRAULIC
 - 10) R ELEC HYDRAULIC
 - 11) UPPER RECIRC FAN
 - 12) LOWER RECIRC FAN.



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G. The IDG Disconnect Test and the Connect Test

SUBTASK 24-11-00-710-003

- (1) Do the IDG disconnect test. To do it, do this task: IDG Disconnect Check, TASK 24-11-01-200-805.

SUBTASK 24-11-00-710-007

- (2) Do the IDG connect test. To do it, do this task: IDG Input Shaft Connection, TASK 24-11-01-200-801.

————— END OF TASK —————

TASK 24-11-00-700-802

3. The Operational Test For The Right IDG

A. General

- (1) This procedure does these tests:
 - (a) The Operation Test
 - (b) The Load Test
 - (c) The IDG Disconnect Test and the Connect Test.

B. References

Reference	Title
24-11-01-200-801	IDG Input Shaft Connection (P/B 601)
24-11-01-200-805	IDG Disconnect Check (P/B 601)
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 24-11-00-860-012

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

SUBTASK 24-11-00-740-002

- (2) Do a test of the indicator lights for the electrical system.
 - (a) Set the IND LTS switch to TEST.
 - (b) Make sure that all the indicator lights for the electrical system are on.
 - (c) Set the IND LTS switch to BRT.

E. The Operation Test

SUBTASK 24-11-00-860-005

- (1) Get access to the electrical system maintenance page. To get access to it, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 24-11-00-860-006

- (2) Make sure the maintenance page shows the data in the tables below.

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Table 503/24-11-00-993-803

	L IDG	R IDG
AC-V	0	0
FREQ	0	0
LOAD	0.00	0.00

Table 504/24-11-00-993-804

	L IDG	R IDG	L BACKUP GEN	R BACKUP GEN
OIL LEVEL -	NORMAL	NORMAL	NORMAL	NORMAL

SUBTASK 24-11-00-860-007

- (3) Make sure the R GEN CTRL switch is in the released position.
 - (a) Make sure the OFF light in the R GEN CTRL switch is on.

SUBTASK 24-11-00-860-008



CAUTION

THE DRIVE LIGHT IN THE R DRIVE DISC SWITCH MUST GOES OFF AFTER THE ENGINE STARTS. IF A DRIVE LIGHT STAYS ON AFTER THE ENGINE STARTS, PUSH THE DRIVE DISC SWITCH. THIS REMOVES MECHANICAL INPUT POWER TO THE IDG. HIGH OIL TEMPERATURE OR LOW OIL PRESSURE CAN CAUSE DAMAGE TO THE IDG.

- (4) Start the right engine. To start the right engine, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.

SUBTASK 24-11-00-710-004

- (5) Push the R GEN CTRL switch to the latched position.
 - (a) Make sure the ON light in the switch comes on and the OFF light goes off.
 - (b) Make sure the ON lights in the PRIMARY EXT PWR and SECONDARY EXT PWR switches goes off.
 - (c) Make sure these indications show on the maintenance page:
 - 1) For the right IDG,
AC-V = 110 to 120
FREQ = 395 to 405
 - (d) Make sure these indications occur on the synoptic page:
 - 1) The R GEN powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) R XFR

NOTE: The R XFR bus will be powered by right IDG for 10 seconds, then by right backup generator for 15 seconds, and then by the right IDG again.

 - d) L UTIL
 - e) R UTIL

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F. The Load Test

SUBTASK 24-11-00-710-005

(1) Do the load test:



WARNING

DO NOT OPERATE THE BOOST PUMPS WITH THE FUEL TANKS EMPTY. DAMAGE TO THE BOOST PUMPS CAN OCCUR.

- (a) Put these switches on the fuel management control panel P5 to the ON position.
 - 1) L AFT PUMP
 - 2) L FWD PUMP
 - 3) R AFT PUMP
 - 4) R FWD PUMP
 - 5) L CENTER PUMP
 - 6) R CENTER PUMP
- (b) Put these switches on the hydraulic system control panel P5 to the ON position.
 - 1) L ELEC HYDRAULIC
 - 2) C1 ELEC HYDRAULIC
 - 3) C2 ELEC HYDRAULIC
 - 4) R ELEC HYDRAULIC
- (c) Put these switches on the air conditioning control module P5 panel to the ON position.
 - 1) UPPER RECIRC FAN
 - 2) LOWER RECIRC FAN
- (d) Make sure these indications show on the maintenance page:
 - 1) For the right IDG,
AC-V = 110 to 120
FREQ = 395 to 405
LOAD = 0.50 or larger
- (e) Put these switches on the P5 panel back to its normal position:
 - 1) L AFT PUMP
 - 2) L FWD PUMP
 - 3) R AFT PUMP
 - 4) R FWD PUMP
 - 5) L CENTER PUMP
 - 6) R CENTER PUMP
 - 7) L ELEC HYDRAULIC
 - 8) C1 ELEC HYDRAULIC
 - 9) C2 ELEC HYDRAULIC
 - 10) R ELEC HYDRAULIC
 - 11) UPPER RECIRC FAN
 - 12) LOWER RECIRC FAN.

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G. The IDG Disconnect Test and the Connect Test

SUBTASK 24-11-00-710-006

- (1) Do the IDG disconnect test. To do it, do this task: IDG Disconnect Check, TASK 24-11-01-200-805.

SUBTASK 24-11-00-710-008

- (2) Do the IDG connect test. To do it, do this task: IDG Input Shaft Connection, TASK 24-11-01-200-801.

———— **END OF TASK** ————

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GENERATOR DRIVE SYSTEM - INSPECTION/CHECK

1. General

A. This procedure has one task:

- (1) An inspection of the integrated drive generator system.

TASK 24-11-00-200-801

2. Generator Drive System Inspection/Check

(Figure 601)

A. **General**

- (1) This procedure examines the integrated drive generator system for damage.

B. **References**

Reference	Title
24-11-04-000-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Removal (P/B 401)
24-11-04-400-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Installation (P/B 401)
24-11-06-000-801	IDG Fuel/Oil Heat Exchanger Removal (P/B 401)
24-11-06-400-801	IDG Fuel/Oil Heat Exchanger Installation (P/B 401)
24-11-14-000-805-001	IDG Oil In Temperature Sensor Removal (P/B 401)
24-11-14-000-806-001	IDG Oil Out Temperature Sensor Removal (P/B 401)
24-11-14-400-805-001	IDG Oil In Temperature Sensor Installation (P/B 401)
24-11-14-400-806-001	IDG Oil Out Temperature Sensor Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
70-00-01-400-806-H01	Electrical Cable Installation (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. **Location Zones**

Zone	Area
411	Engine, Left
421	Engine, Right

D. **Access Panels**

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

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(Continued)

Number	Name/Location

424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

E. Integrated Drive Generator System Inspection

SUBTASK 24-11-00-010-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left and right fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location

413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location

415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

SUBTASK 24-11-00-210-001

- (2) Examine the IDG/VSCF air/oil heat exchanger:

- (a) If these signs occur,

These are the tasks:

IDG/Backup Generator Air/Oil Heat Exchanger Removal, TASK 24-11-04-000-802-002,

IDG/Backup Generator Air/Oil Heat Exchanger Installation, TASK 24-11-04-400-802-002.

- 1) Oil leaks
- 2) Damaged fins: number of damaged fins allowed, providing you do not see fluid stains or leakage.
- 3) Fluid stains or leakage
- 4) Cracks in the inlet duct

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- 5) Cracks in the outlet duct.
- (b) Tighten the bolts if there are loose bolts on the heat exchanger.
- (c) Replace the heat exchanger support bracket if there are cracks in the support bracket.

SUBTASK 24-11-00-210-002

- (3) Examine the IDG fuel/oil heat exchanger and look for these signs:
 - (a) Fuel leaks: 1) Replace the seals. To replace them,
These are the tasks:
IDG Fuel/Oil Heat Exchanger Removal, TASK 24-11-06-000-801,
IDG Fuel/Oil Heat Exchanger Installation, TASK 24-11-06-400-801.
 - (b) Oil leaks: 1)
These are the tasks:
IDG Fuel/Oil Heat Exchanger Removal, TASK 24-11-06-000-801,
IDG Fuel/Oil Heat Exchanger Installation, TASK 24-11-06-400-801.
 - (c) Cracks in the mounting flanges: 1)
These are the tasks:
IDG Fuel/Oil Heat Exchanger Removal, TASK 24-11-06-000-801,
IDG Fuel/Oil Heat Exchanger Installation, TASK 24-11-06-400-801.

SUBTASK 24-11-00-210-003

- (4) Examine the IDG oil temperature sensors:
 - (a) Make sure the bolts on the oil temperature sensor are tight.
 - 1) Tighten the bolts to a torque of 55 to 70 pound-inches (6.2 to 7.9 newton-meters) if it is loose.
 - (b) Make sure the electrical connector are tight. To do this, do this task: Electrical Cable Installation, TASK 70-00-01-400-806-H01
 - (c) Make sure there are no cracks in the mounting flange.
 - 1) If there are cracks in the mounting flange, do the applicable task to replace the oil temperature sensor. To replace it,
These are the tasks:
IDG Oil In Temperature Sensor Removal, TASK 24-11-14-000-805-001,
IDG Oil In Temperature Sensor Installation, TASK 24-11-14-400-805-001.
or
These are the tasks:
IDG Oil Out Temperature Sensor Removal, TASK 24-11-14-000-806-001,
IDG Oil Out Temperature Sensor Installation, TASK 24-11-14-400-806-001.
 - (d) Worn area of the sensor with no cracks is permitted.

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-00-410-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left and right thrust reversers on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

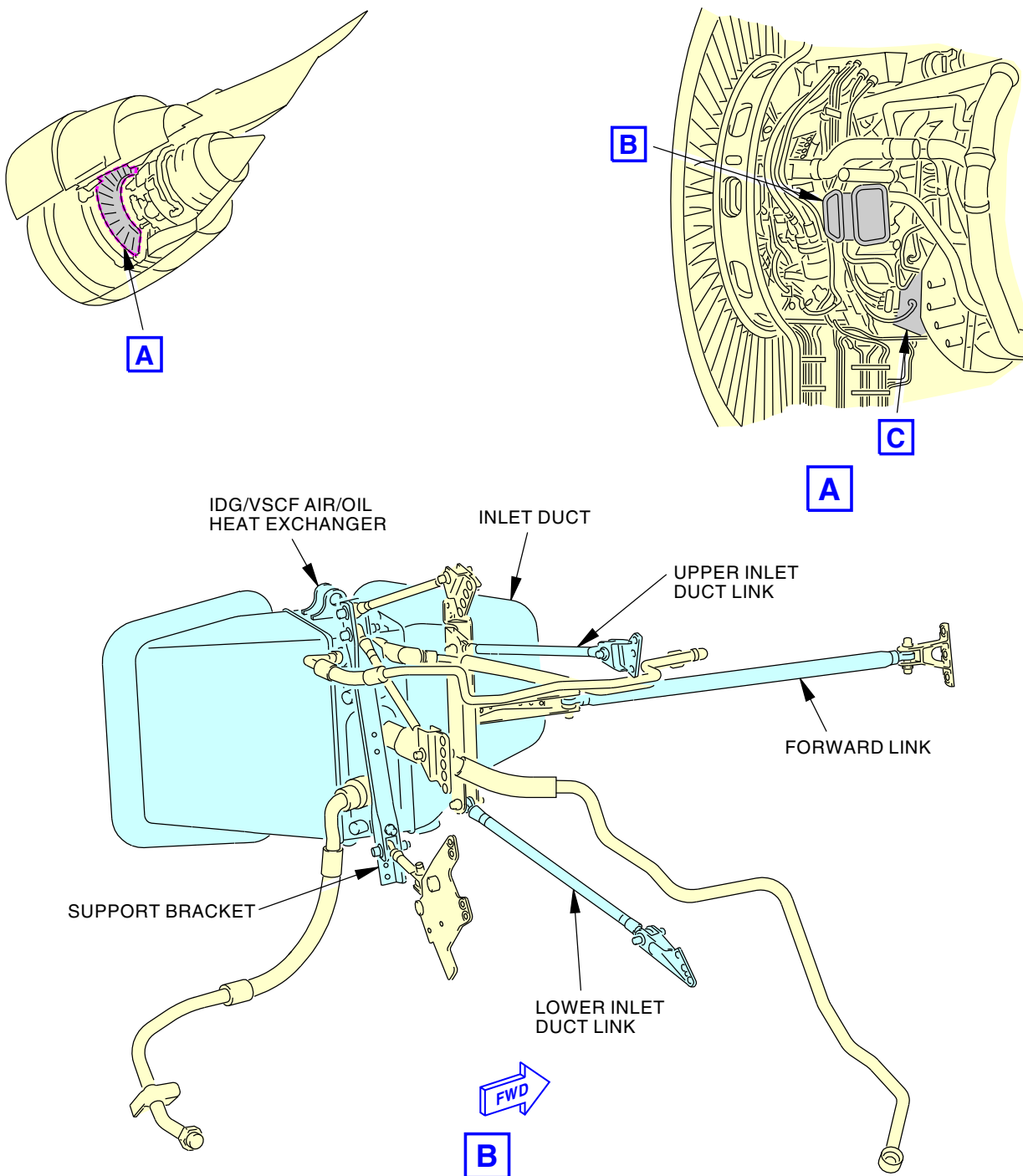
———— **END OF TASK** ————

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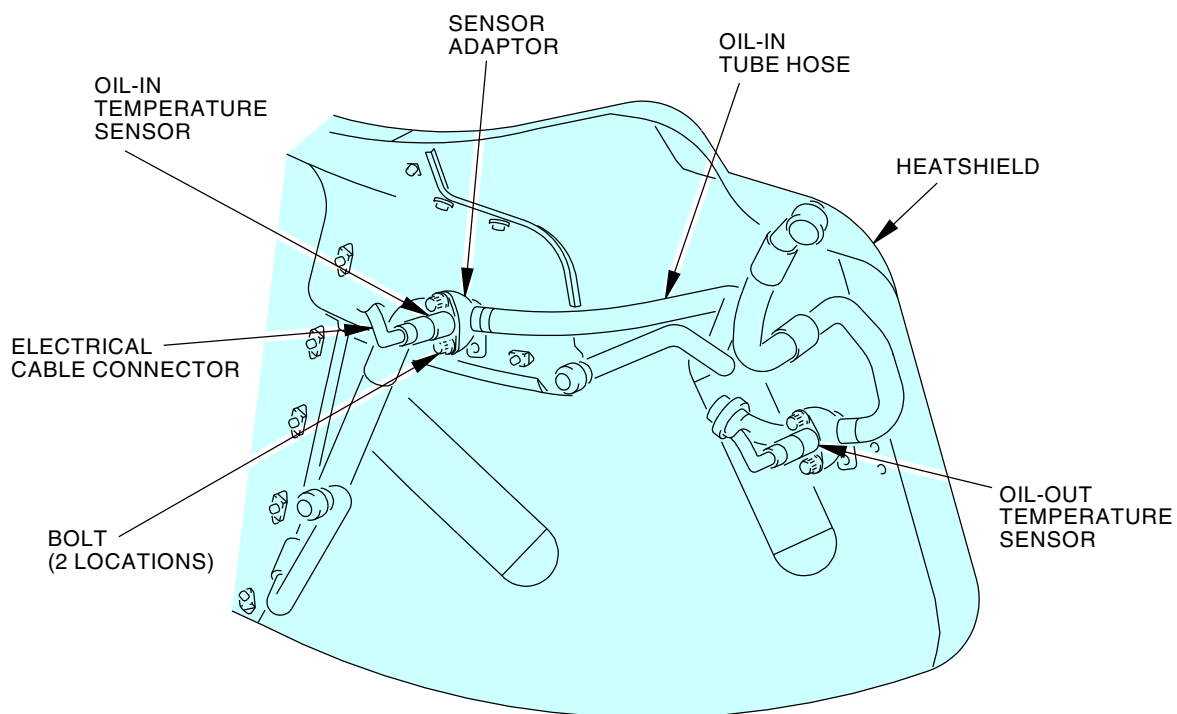
Generator Drive System Inspection
Figure 601/24-11-00-990-801 (Sheet 1 of 3)

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Generator Drive System Inspection
Figure 601/24-11-00-990-801 (Sheet 2 of 3)

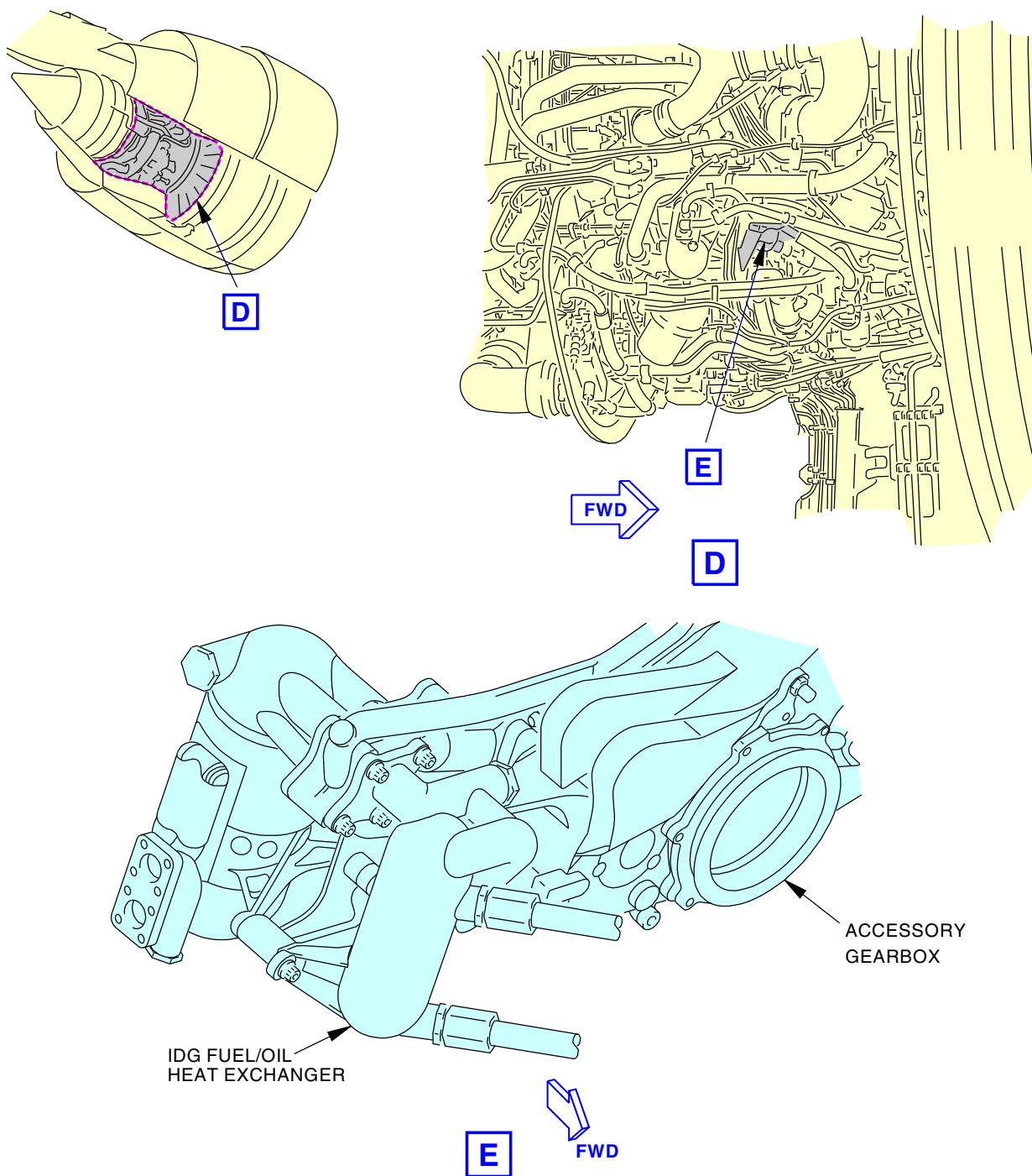
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Figure 601/24-11-00-990-801 (Sheet 3 of 3)

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INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) IDG Removal
- (2) IDG Installation.

TASK 24-11-01-000-801-001

2. IDG Removal

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives instructions to remove an IDG from the engine accessory gearbox. There is one IDG on each engine. The IDG is located on the aft accessory gearbox, at the 7 o'clock position (looking forward). The IDG weighs approximately 135 lb (61 kg) when there is no oil in the IDG case.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
SPL-331	Fixture - Installation/Removal, Line Replaceable Units Part #: 9C1132G06 Supplier: 06083 Opt Part #: 9C1132G03 Supplier: 06083 Opt Part #: 9C1132G04 Supplier: 06083 Opt Part #: 9C1132G05 Supplier: 06083

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Reference	Description
SPL-1556	Hoist - Boom, General, 400 Pound Maximum Capacity Part #: A20001-152 Supplier: 81205 Opt Part #: A20001-82 Supplier: 81205
SPL-1628	Hoist Adapter - Integrated Drive Generator Part #: A24011-1 Supplier: 81205 Opt Part #: J24002-73 Supplier: 81205
SPL-1631	Adapter - Jackstand, GE90 IDG Part #: 9C1204G01 Supplier: 06083
SPL-11069	Load Positioner - Engine Accessories, 250 lb Capacity Part #: J20002-59 Supplier: 81205 Opt Part #: J20002-43 Supplier: 81205 Opt Part #: J20002-44 Supplier: 81205
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
G01505	Lockwire - Safety And Lock	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
12	O-ring	Not Specified	

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Prepare for the Removal

SUBTASK 24-11-01-860-008-001

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

Left Power Management Panel, P110

Row	Col	Number	Name
J	25	C24603	L IDG DISC

Right Power Management Panel, P210

Row	Col	Number	Name
J	2	C24602	R IDG DISC

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SUBTASK 24-11-01-840-009-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

I. IDG Removal

SUBTASK 24-11-01-020-001-001



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

(1) Remove the pressure from the IDG oil cooling system:

- (a) Remove the dust cap from the overflow drain valve on the IDG.
- (b) Put a oil resistant container (5 gal)(19 Liter), STD-1055 below the IDG to catch the oil that drains.
- (c) Connect the overflow coupling which is on the service engine oil servicing cart, COM-1537 to the overflow hose.
- (d) Put the end of the overflow hose in the oil resistant container (5 gal)(19 Liter), STD-1055.
- (e) Connect the overflow coupling and the overflow hose to the overflow drain valve on the IDG, and allow the surplus oil to flow into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (f) Disconnect the overflow coupling and the overflow hose from the IDG.

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SUBTASK 24-11-01-680-001-001



WARNING

USE EXTREME CARE WHEN YOU DRAIN THE IDG OIL, WEAR SPLASH GOGGLES, INSULATED GLOVES, AND PROTECTION GEAR. CONTACT WITH HOT OIL CAN CAUSE SERIOUS INJURY.

(2) Drain the IDG oil as follows:

- (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055 below the IDG to catch the oil that drains from the IDG.
- (b) Remove the lockwire from the oil drain plug [11].
- (c) Remove the oil drain plug [11] and the o-ring [12] from the case drain port and let the oil drain from the IDG into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (d) Lubricate and install a new o-ring [12] on the oil drain plug if you plan to re-install this IDG.
- (e) Install the oil drain plug [11] and tighten the plug to 65 ± 10 in-lb (7 ± 1 N·m).
- (f) Install a lockwire, G01505 on the oil drain plug if you plan to re-install this IDG.

SUBTASK 24-11-01-020-023-001



CAUTION

USE TWO WRENCHES TO LOOSEN THE PRESSURE FILL LINE. IF YOU DO NOT USE THE TWO WRENCHES PROCEDURE, TOO MUCH TORQUE CAN BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

(3) Disconnect the pressure fill line [14] as follows:

- (a) Disconnect the pressure fill line [14] from the pressure fill line check valve [28].
NOTE: Let the oil drain from the line into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (b) Remove the pressure fill line check valve [28] from the IDG and save for installation.
- (c) Remove the o-ring [20] from the pressure fill line check valve [28] and discard the o-ring.
- (d) Install a shipping plug into the pressure fill port on IDG.

SUBTASK 24-11-01-420-002-001



CAUTION

USE TWO WRENCHES TO LOOSEN THE OVERFLOW DRAIN LINE. IF YOU DO NOT USE THE TWO WRENCHES PROCEDURE, TOO MUCH TORQUE CAN BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

(4) Remove the overflow drain line [13] as follows:

- (a) Disconnect the overflow drain line [13] from the overflow drain line union [27].
NOTE: Allow the oil from the line to drain into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (b) Remove the union [27] from the IDG and save for installation.
- (c) Remove the o-ring [19] from the union [27] and discard the o-ring.
- (d) Install a shipping plug into the overflow drain port on the IDG.

SUBTASK 24-11-01-020-018-001

(5) Do these steps to remove the bracket [30] from the IDG:

- (a) Loosen and remove the nuts [29] from the IDG.

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- (b) Pull the bracket [30] and the oil lines away from the IDG.

SUBTASK 24-11-01-020-006-001

- (6) Disconnect the IDG electrical connectors as follows:
 - (a) Disconnect the three IDG electrical connectors [7], [10], & [15].
 - (b) Install the protective caps on the IDG connectors.

SUBTASK 24-11-01-020-003-001



USE TWO WRENCHES TO LOOSEN THE OIL-IN AND OIL-OUT LINES. IF YOU DO NOT USE THE TWO WRENCHES PROCEDURE, TOO MUCH TORQUE CAN BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

- (7) Disconnect the oil in [9] and oil-out [8] from the IDG as follows:
 - NOTE: The tube nut for oil in line [9] stays with the check valve [26]. Turn the tube nut clockwise to remove the oil in line [9].
 - (a) Disconnect the oil in [9] and oil-out [8] lines from the check valve [26] and the oil-out line union [25].
 - NOTE: Let the oil drain from the lines into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - (b) Remove the check valve [26] and union [25] from the IDG and save for installation.
 - (c) Remove the o-ring [18] from the check valve [26] and discard the o-ring.
 - (d) Remove the o-ring [17] from the union [25] and discard the o-ring.
 - (e) Install the shipping plugs in the oil-in and oil-out ports on the IDG.

SUBTASK 24-11-01-020-004-001

- (8) Remove the power leads from the IDG.
 - (a) Remove the two screws [4] and washers [16] which attach the terminal block cover [5] to the IDG.
 - (b) Remove the four captive washer nuts [6] from the power terminals, and disconnect the power feeder lugs from the terminals.
 - (c) Remove the four power leads and make sure the phase leads are identified (N, T1, T2, and T3) for subsequent installation.
 - (d) Re-install the captive washer nut [6] on the power terminals and tighten the nuts by hand.
 - (e) Install the terminal block cover [5] and attach with washers [16] and screws [4] and tighten the screws by hand.

SUBTASK 24-11-01-020-005-001

- (9) Do these steps to remove the IDG with the boom hoist, SPL-1556:
 - (a) Remove the lockwire from the QAD tension bolt.
 - (b) Make sure the load positioner, SPL-11069 and hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate) are attached to the boom hoist, SPL-1556.
 - (c) Put the boom hoist, SPL-1556 into position to attach to the IDG.
 - (d) Attach the hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate) to the IDG.

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MAKE SURE THAT YOU APPLY ONLY SUFFICIENT PRESSURE WITH THE HOIST TO HOLD THE WEIGHT OF THE IDG. TOO MUCH PRESSURE ON THE IDG OR FAILURE TO HOLD THE IDG CORRECTLY CAN CAUSE DAMAGE TO THE INPUT SEAL.

- (e) Adjust the hoist adapter to remove most of the weight of the IDG from the QAD coupling [22].
- (f) Loosen the tension bolt to allow the movement of the IDG.
- (g) Adjust the hoist adapter to fully hold the total weight of the IDG.
 - 1) This will remove the weight of the IDG from the QAD coupling [22] and the IDG input shaft.
- (h) Loosen the QAD tension bolt until the alignment marks on the QAD coupling [22] and IDG housing align. The QAD kit is in the open position and the clamping lugs will be disengaged when the alignment marks are aligned.

NOTE: If the QAD coupling rotates off the alignment marks on the adapter plate, the IDG cannot be removed. Turn the QAD tension bolt to maintain the alignment during removal if necessary.
- (i) Pull the hoist adapter straight out, to remove the IDG from the accessory gearbox.
- (j) Remove and discard the o-ring [21] from the IDG input shaft.
- (k) Put the IDG on a cart or carrier.

SUBTASK 24-11-01-020-009-001

- (10) Do these steps to remove the IDG with the jackstand line replaceable units fixture, SPL-331:
 - (a) Remove the lockwire from the QAD tension bolt.
 - (b) Make sure the jackstand GE90 IDG jackstand adapter, SPL-1631 and hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate) are attached to the jackstand line replaceable units fixture, SPL-331.
 - (c) Put the jackstand line replaceable units fixture, SPL-331 into position to attach to the IDG.
 - (d) Attach the hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate) to the IDG.



MAKE SURE THAT YOU APPLY ONLY SUFFICIENT PRESSURE WITH THE HOIST TO HOLD THE WEIGHT OF THE IDG. TOO MUCH PRESSURE ON THE IDG OR FAILURE TO HOLD THE IDG CORRECTLY CAN CAUSE DAMAGE TO THE INPUT SEAL.

- (e) Adjust the hoist adapter to remove most of the weight of the IDG from the QAD coupling [22].
- (f) Loosen the tension bolt to allow the movement of the IDG.
- (g) Adjust the hoist adapter to fully hold the total weight of the IDG.
 - 1) This will remove the weight of the IDG from the QAD coupling [22] and the IDG input shaft.



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- (h) Loosen the QAD tension bolt until the alignment marks on the QAD coupling [22] and IDG housing align. The QAD kit is in the open position and the clamping lugs will be disengaged when the alignment marks are aligned.

NOTE: If the QAD coupling rotates off the alignment marks on the adapter plate, the IDG cannot be removed. Turn the QAD tension bolt to maintain the alignment during removal if necessary.

- (i) Pull the hoist adapter straight out, to remove the IDG from the accessory gearbox.
- (j) Remove and discard the o-ring [21] from the IDG input shaft.
- (k) Put the IDG on a cart or carrier.

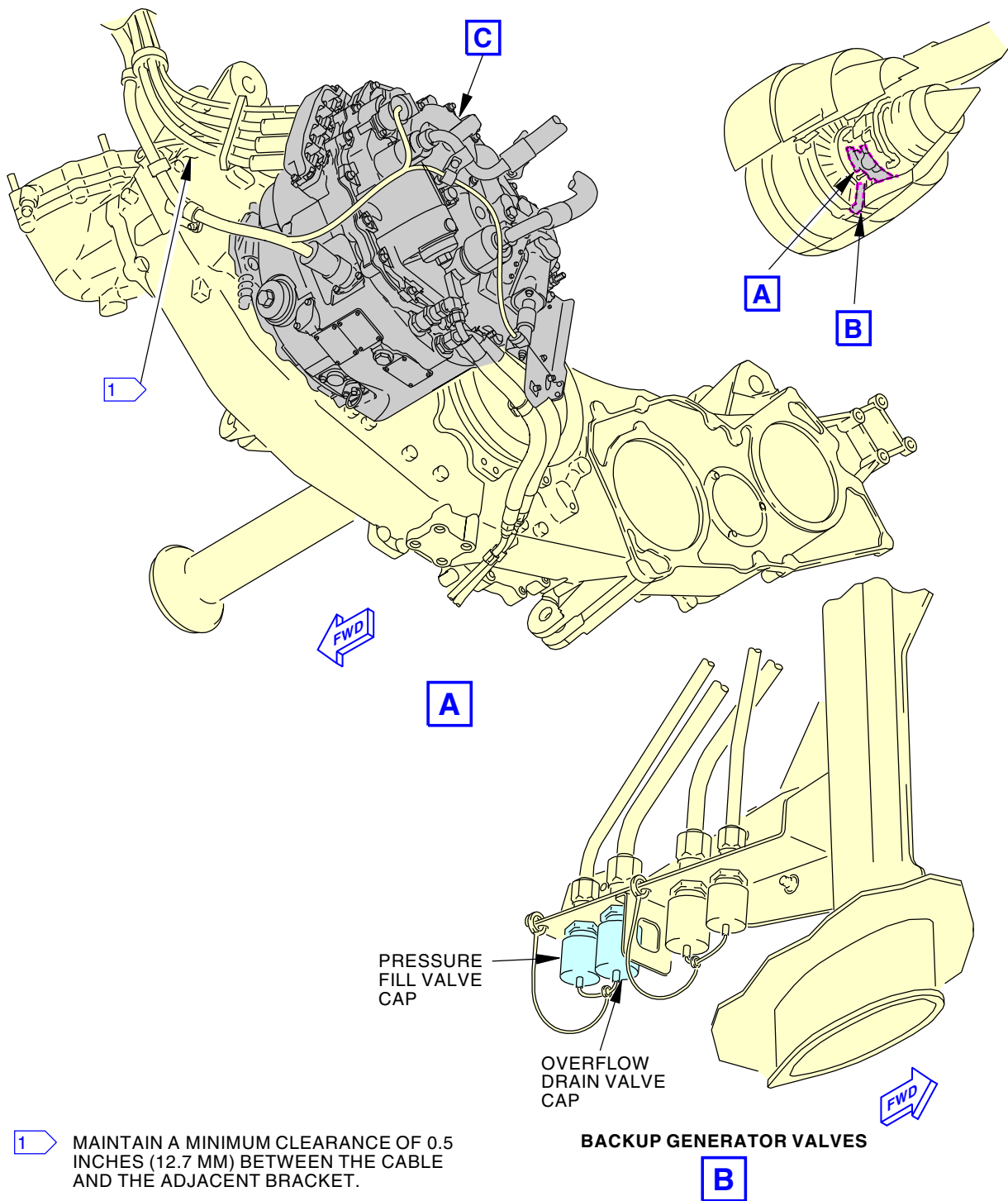
———— **END OF TASK** ————

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W46225 S0000124418_V4

**Integrated Drive Generator (IDG) Installation
Figure 401/24-11-01-990-820 (Sheet 1 of 3)**

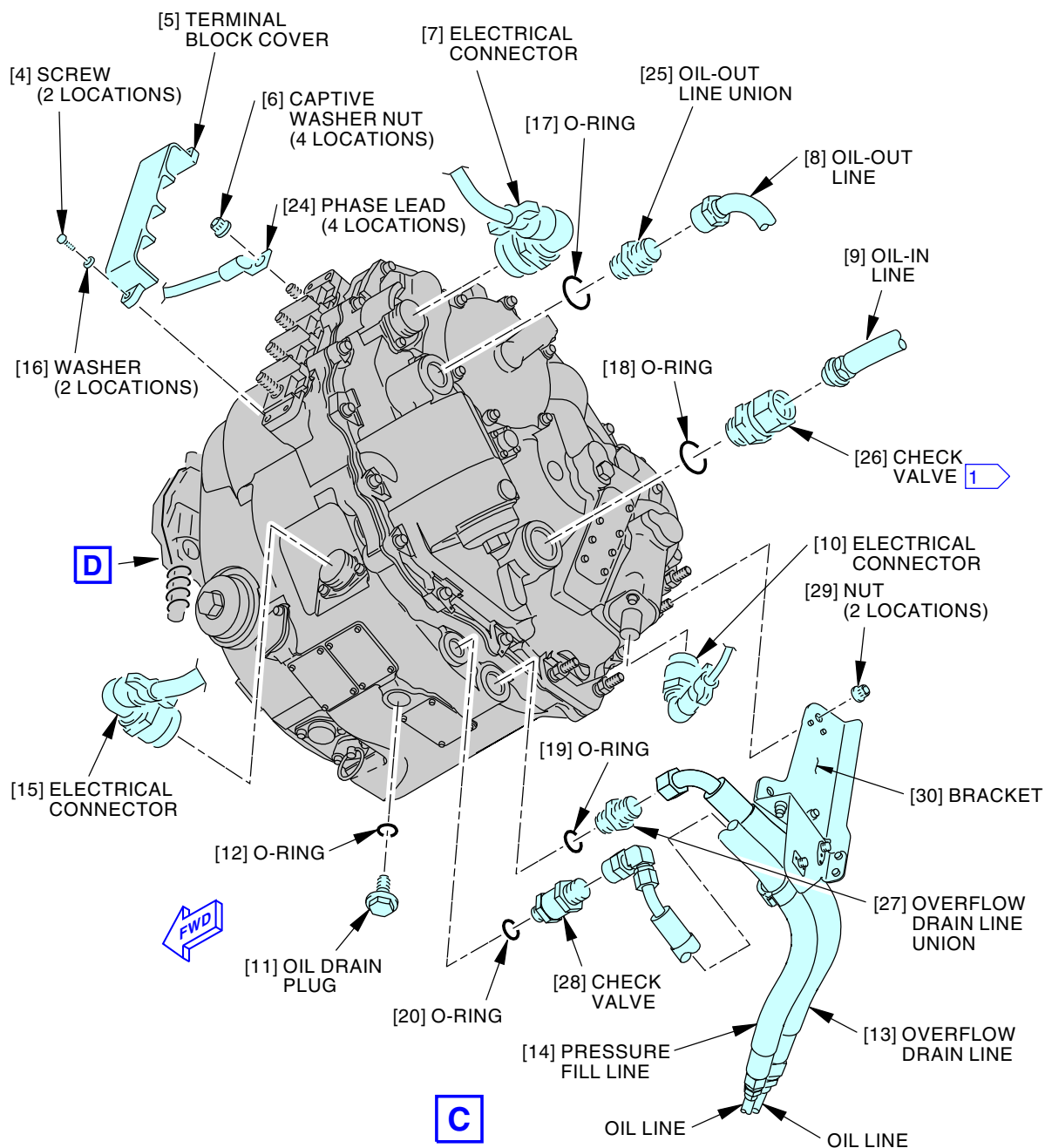
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1 TUBE NUT IS ATTACHED TO THE CHECK VALVE.

W46126 S0000124638_V2

Integrated Drive Generator (IDG) Installation
Figure 401/24-11-01-990-820 (Sheet 2 of 3)

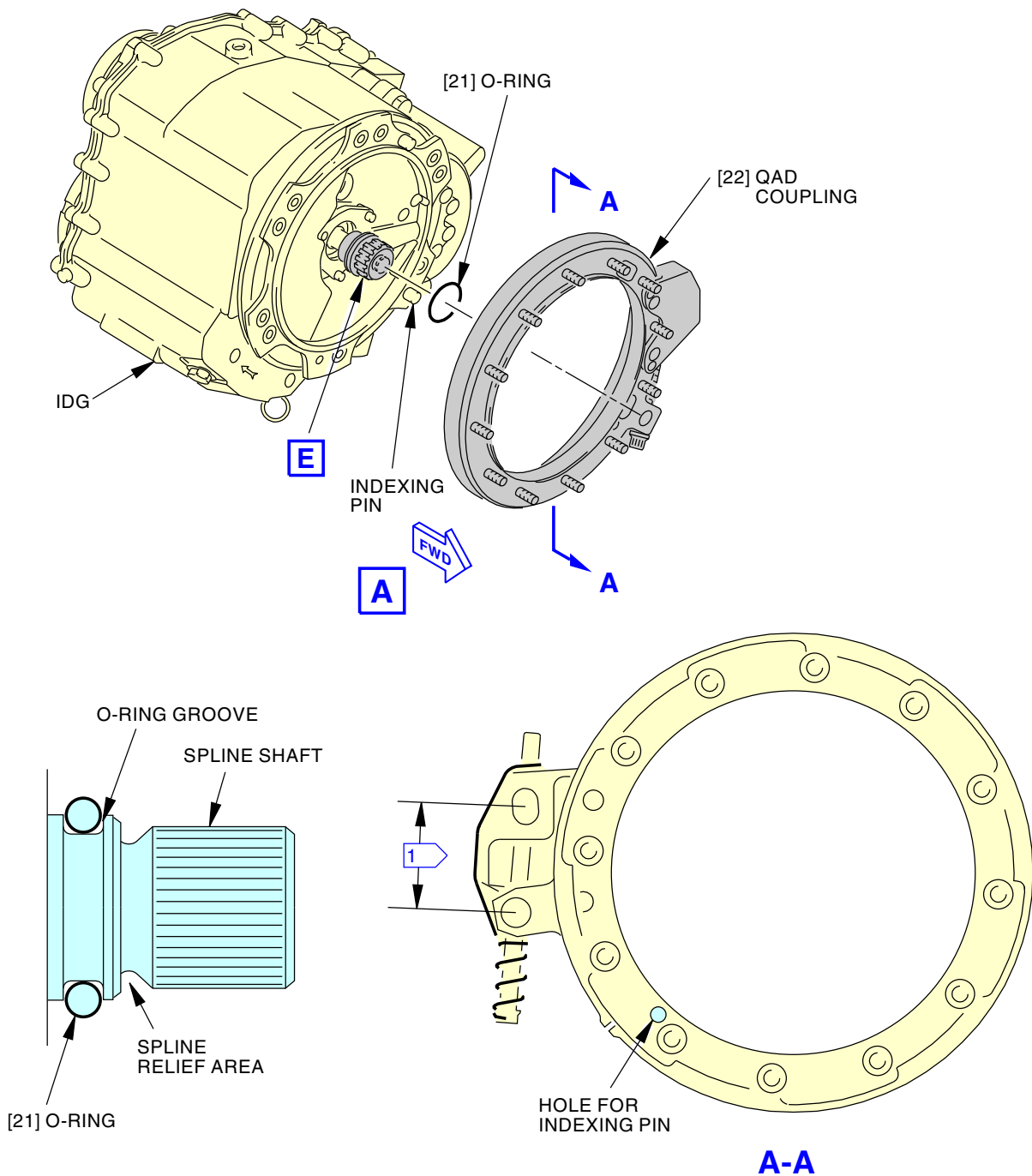
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1 DISTANCE BETWEEN CENTER OF NUTS SHOULD BE EQUAL TO OR GREATER THAN 1.75 INCHES AFTER TENSION BOLT IS TIGHTENED

E10039 S0006407896_V2

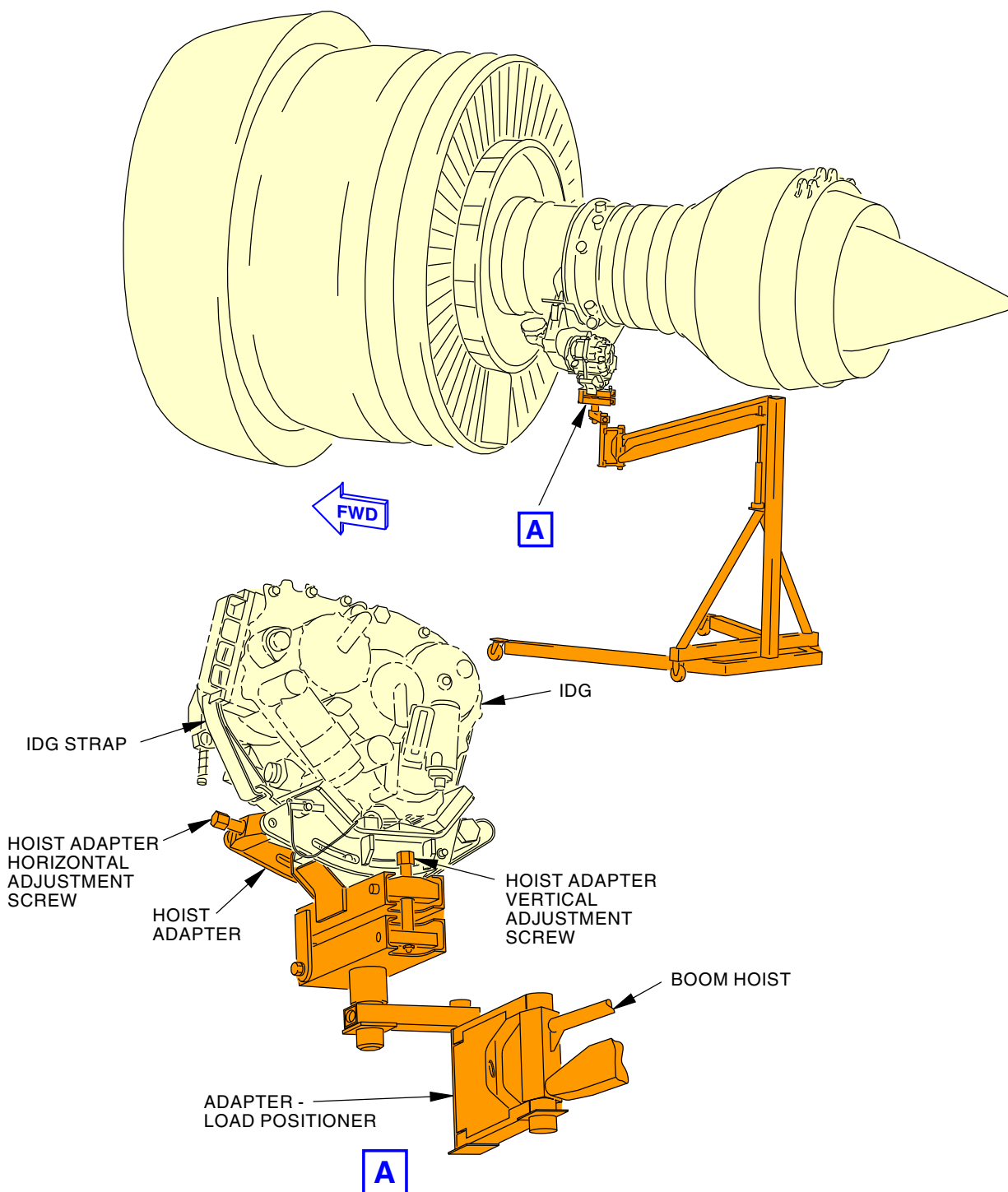
**Integrated Drive Generator (IDG) Installation
Figure 401/24-11-01-990-820 (Sheet 3 of 3)**

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E66907 S0006407897_V3

**IDG Hoist Adapter
Figure 402/24-11-01-990-821**

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TASK 24-11-01-400-801-001

3. IDG Installation

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the installation of an Integrated Drive Generator (IDG) on the engine accessory gearbox. You install the IDG on the aft accessory gearbox, at the 7 o'clock position (looking forward).
- (2) As indicated in the Power Plant Test Reference Table, if an O-ring and/or a pre-formed packing is correctly installed and is checked by an independent second mechanic, the subsequent required Test No. 6 - Part-Power Leak Check, TASK 71-00-00-700-805-H01, can be considered optional.

NOTE: After installation, make sure the O-ring/pre-formed packing is seated correctly in the groove of the spline and is free of damage.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
24-11-00-700-801	The Operational Test For The Left IDG (P/B 501)
24-11-00-700-802	The Operational Test For The Right IDG (P/B 501)
24-11-03-200-801	QAD Coupling Inspection (P/B 601)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-700-805-H01	Test No. 6 - Part-Power Leak Check (P/B 501)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-30-00	ELECTRICAL CONNECTION OF EQUIPMENT AND INSTALLATION OF TERMINAL LUGS

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-331	Fixture - Installation/Removal, Line Replaceable Units Part #: 9C1132G06 Supplier: 06083 Opt Part #: 9C1132G03 Supplier: 06083 Opt Part #: 9C1132G04 Supplier: 06083 Opt Part #: 9C1132G05 Supplier: 06083
SPL-1556	Hoist - Boom, General, 400 Pound Maximum Capacity Part #: A20001-152 Supplier: 81205 Opt Part #: A20001-82 Supplier: 81205
SPL-1628	Hoist Adapter - Integrated Drive Generator Part #: A24011-1 Supplier: 81205 Opt Part #: J24002-73 Supplier: 81205

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(Continued)

Reference	Description
SPL-1631	Adapter - Jackstand, GE90 IDG Part #: 9C1204G01 Supplier: 06083
SPL-11069	Load Positioner - Engine Accessories, 250 lb Capacity Part #: J20002-59 Supplier: 81205 Opt Part #: J20002-43 Supplier: 81205 Opt Part #: J20002-44 Supplier: 81205
STD-583	Mallet - Non-metallic

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
17	O-ring	Not Specified	
18	O-ring	Not Specified	
19	O-ring	Not Specified	
20	O-ring	Not Specified	
21	O-ring	Not Specified	
22	Coupling	Not Specified	
26	Check valve	Not Specified	
28	Check valve	Not Specified	

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. IDG Installation

SUBTASK 24-11-01-410-001-001

- (1) Do these steps to prepare the IDG for installation:
 - (a) Visually examine the gearbox mating surface and seal for signs of oil leakage prior to installing the IDG. Repair any leaks if found.
 - (b) Remove any unwanted material from the IDG with compressed air.

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- (c) Visually examine the Quick Attach/Detach (QAD) coupling for any damage (QAD Coupling Inspection, TASK 24-11-03-200-801).
- (d) Apply a thin coat of oil, D00068 or oil, D00071 to the lugs of the QAD coupling [22], and the threads of the QAD coupling tension bolt.
- (e) Clean any grease from the IDG input shaft and the engine gearbox spline with dry-cleaning solvent.



FOR THE INPUT DRIVE SHAFT O-RING [21], M83485 HIGH THERMAL STABILITY (HTS) COMPATIBLE O-RINGS BOEING RECOMMENDS WHEN YOU USE HTS OIL. USE OF M83248 OR AS3209 NON-HTS COMPATIBLE O-RINGS WITH HTS OIL WILL RESULT IN LIFE REDUCING DEGRADATION OF THE O-RING. DEGRADATION OF THE SHAFT O-RINGS CAN RESULT IN LOSS OF ENGINE OIL.

- (f) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [21], to the O-ring groove on the IDG spline shaft, and to the Accessory Gearbox lead-in chamfer for the IDG shaft.

NOTE: When you install the applicable o-ring, make sure that the o-ring is compatible with the engine oil type.

NOTE: Non-HTS or HTS compatible o-rings may be used with non-HTS oil.

- (g) Install the new o-ring [21] into the groove on the IDG spline shaft, (Figure 401) sheet 3.

SUBTASK 24-11-01-420-003-001



MAKE SURE YOU DO NOT DAMAGE THE SPLINED SHAFT O-RING WHEN YOU INSTALL THE IDG. A DAMAGED O-RING CAN CAUSE A LOSS OF ENGINE OIL, WHICH CAN AFFECT ENGINE OPERATION AND CAUSE AN IN-FLIGHT SHUTDOWN.

- (2) Install the IDG as follows:



MAKE SURE YOU USE THE CORRECT TOOLS AND PROCEDURES FOR THE IDG INSTALLATION. IF YOU DO NOT USE THE CORRECT TOOLS AND PROCEDURES, YOU MAY DAMAGE THE O-RING ON THE IDG SPLINED SHAFT. A DAMAGED O-RING CAN CAUSE A LOSS OF ENGINE OIL, WHICH CAN AFFECT ENGINE OPERATION AND CAUSE AN IN-FLIGHT SHUTDOWN.

- (a) To use the boom hoist, SPL-1556, make sure the load positioner, SPL-11069 and hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate) are attached.
- (b) To use the jackstand line replaceable units fixture, SPL-331, make sure the jackstand GE90 IDG jackstand adapter, SPL-1631 and hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate) are attached.
- (c) Attach the IDG to the hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate).
- (d) Turn the QAD tension bolt to open the QAD coupling. Align the mark on the QAD coupling with the mark on the QAD engine adapter plate.



THE IDG MUST BE MOUNTED CORRECTLY. IF THE IDG IS NOT MOUNTED CORRECTLY, YOU CAN CAUSE DAMAGE TO MATING PARTS AND THE IDG.



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(CAUTION PRECEDES)



ALIGN THE IDG GEAR SHAFT CORRECTLY. IF YOU DO NOT KEEP THE COMPONENTS ALIGNED, DAMAGE TO THE GEAR SHAFT SPLINES, AND END SHAFT CAN OCCUR.

- (e) Align the IDG with the gearbox mount pad. Hold the IDG so that no weight is put on the input shaft.
- (f) Position the IDG to allow the lugs on the IDG input flange to mate with the QAD coupling openings. Align the indexing pin on the IDG with the alignment hole on the QAD.
- (g) Tighten the QAD coupling tension bolt so that the QAD coupling lugs fully engage the input flange lugs of the IDG. Be sure that the coupling moves smoothly and does not catch.
- (h) Tighten the QAD tension bolt as follows:
 - 1) Tighten the QAD coupling tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).
 - 2) Use a non-metallic mallet, STD-583 to lightly hit the edge of the QAD coupling to prevent the incorrect values.

NOTE: If you view the IDG with the tension bolt to the left hand side, only hit the edge of the QAD coupling from the 4 O'clock to 7 O'clock positions.
 - 3) Do a check of the torque value of the tension bolt.
 - 4) If the torque is less than 180 in-lb (20 N·m), tighten the tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).
 - 5) If the torque is greater than 180 in-lb (20 N·m), lightly hit the edge of the QAD coupling again.
 - 6) Do a check of the torque value of the tension bolt again.
- (i) Do the steps to tighten the tension bolt again until the torque does not drop below 180 in-lb (20 N·m) after you hit the QAD coupling.
- (j) Tighten the tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).

SUBTASK 24-11-01-080-001-001

- (3) Remove the hoist adapter, SPL-1628 or hoist adapter, SPL-1628 (alternate).

SUBTASK 24-11-01-200-018-001

- (4) Make sure the distance between the centers of the nuts attached to the QAD coupling tension bolt is equal to or greater than 1.75 in. (44.45 mm). Replace the QAD coupling if the dimension is less than 1.75 in. (44.45 mm).

SUBTASK 24-11-01-860-010-001

- (5) Put a 0.32 in. (8.13 mm) diameter MS20995NC32 lockwire, G01912 on the QAD coupling tension bolt.

SUBTASK 24-11-01-420-004-001

- (6) Connect the phase leads [24] to the IDG as follows:
 - (a) Remove the screw [4] and washer [16] that attach the terminal block cover [5] to the IDG.
 - (b) Visually inspect the power terminal studs for any damage.

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DO NOT INSTALL WASHERS BELOW THE TERMINAL LUGS. THE TERMINAL LUGS MUST DIRECTLY TOUCH THE OTHER TERMINAL LUGS. WASHERS BELOW THE TERMINAL LUGS WILL CAUSE THE TERMINAL BLOCK TO BURN.

- (c) Install the phase leads on the power terminal studs and make sure the leads are on the correct terminal studs (SWPM 20-30-00).
- (d) Make sure the power feeder cables near the terminal block are at least 0.5 in. (12.7 mm) from the adjacent bracket.
- (e) Install the captive washer nuts [6] and tighten the nuts to 144 in-lb (16 N·m) - 168 in-lb (19 N·m).

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

- (f) Attach the terminal block cover [5] to the IDG.
- (g) Install the washers [16] and screws [4], tighten the screws to 20 in-lb (2 N·m) - 22 in-lb (2 N·m).

SUBTASK 24-11-01-020-008-001

- (7) Install unions and check valves per the steps that follow:

NOTE: If a union or check valve bonds to the insert, install a new union or check valve.

- (a) Remove the shipping plugs from the IDG.
- (b) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [18].
- (c) Install the new o-ring [18] to the check valve [26].
- (d) Install the check valve [26] and tighten to a torque of 360 in-lb (41 N·m) - 480 in-lb (54 N·m).
- (e) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [17].
- (f) Install the new o-ring [17] to the oil-out line union [25].
- (g) Install the oil-out line union [25] and tighten to a torque of 300 in-lb (34 N·m) - 420 in-lb (47 N·m).
- (h) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the o-ring [20].
- (i) Install the o-ring [20] to the pressure fill line check valve [28].
- (j) Install the check valve [28] on the IDG pressure fill port and tighten to a torque of 120 in-lb (14 N·m) - 180 in-lb (20 N·m).
- (k) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [19].
- (l) Install the new o-ring [19] to the overflow drain line union [27].
- (m) Install the overflow drain line union [27] and tighten to a torque of 240 in-lb (27 N·m) - 300 in-lb (34 N·m).

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SUBTASK 24-11-01-420-006-001



USE TWO WRENCHES TO TIGHTEN THE OIL-IN AND OIL-OUT LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR BOSSES.

- (8) Install the oil in line [9] and oil-out [8] lines.
- (a) Install the oil in [9] and oil-out [8] lines to the check valve [26] and the oil-out line union [25].
- (b) Tighten the oil in line [9] with the triple torque method as follows:
- 1) Tighten the B-nut connection to 79 ft-lb (107 N·m) - 91 ft-lb (123 N·m).
 - 2) Loosen the B-nut of the oil tube/hose and tighten it again to 79 ft-lb (107 N·m) - 91 ft-lb (123 N·m).
 - 3) Apply the specified torque again to make sure the torque of the B-nut of the oil tube/hose is 79 ft-lb (107 N·m) - 91 ft-lb (123 N·m).

NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.

- (c) Tighten the oil-out line [8] with the triple torque method as follows:
- 1) Tighten the B-nut connection to 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).
 - 2) Loosen the B-nut of the oil tube/hose and tighten it again to 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).
 - 3) Apply the specified torque again to make sure the torque of the B-nut of the oil tube/hose is 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).

NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.

SUBTASK 24-11-01-420-005-001

- (9) Connect the IDG electrical connectors as follows:
- (a) Remove the protective caps from the IDG electrical connectors.
- (b) Connect the three IDG electrical connectors [7], [10], & [15] to the electrical receptacles.

SUBTASK 24-11-01-420-007-001



USE TWO WRENCHES TO TIGHTEN THE PRESSURE FILL AND OVERFLOW DRAIN LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR BOSSES.

- (10) Install the pressure fill [14] and overflow drain [13] lines.
- (a) Connect the pressure fill [14] and overflow drain [13] lines to the pressure fill line check valve [28] and the over flow drain line union [27].

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- (b) Tighten the pressure fill line to a torque of 260 in-lb (29 N·m) - 280 in-lb (32 N·m).

NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.

NOTE: Some installations have a split-body type check valve. When the pressure fill line is tightened to this type of check valve, the two halves of the valve may rotate a small amount relative to each other.

- (c) Tighten the overflow drain line to a torque of 475 in-lb (54 N·m) - 525 in-lb (59 N·m).

NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.

SUBTASK 24-11-01-420-018-001

- (11) Do these steps to install the bracket [30] to the IDG:

- (a) Attach the bracket [30] and the oil lines to the IDG.
- (b) Attach and tighten the nuts [29] to the IDG.

SUBTASK 24-11-01-610-001-001

- (12) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-01-860-009-001

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	25	C24603	L IDG DISC

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	2	C24602	R IDG DISC

SUBTASK 24-11-01-410-002-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine

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

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

J. IDG Installation Test

SUBTASK 24-11-01-700-001

- (1) Do the test listed on the Power Plant Test Reference Table Power Plant Test Reference Table, TASK 71-00-00-800-833-H00.

SUBTASK 24-11-01-610-003-001

- (2) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

SUBTASK 24-11-01-710-001-001

- (3) For the left IDG, do this task: The Operational Test For The Left IDG, TASK 24-11-00-700-801.

NOTE: Melted assembly lube from the IDG splines can show at the bottom of the QAD ring. This melted assembly lube can collect at the bottom of the QAD ring after the aircraft goes back into service. This leakage will decrease when the aircraft completes more cycles.

SUBTASK 24-11-01-710-003-001

- (4) For the right IDG, do this task: The Operational Test For The Right IDG, TASK 24-11-00-700-802.

NOTE: Melted assembly lube from the IDG splines can show at the bottom of the QAD ring. This melted assembly lube can collect at the bottom of the QAD ring after the aircraft goes back into service. This leakage will decrease when the aircraft completes more cycles.

———— **END OF TASK** ————

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INTEGRATED DRIVE GENERATOR (IDG) - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) IDG Disconnect Function Check
 - (2) IDG Input Shaft Connection
 - (3) IDG Disconnect Check
 - (4) IDG Terminal Block Check.
 - (5) Power Feeder Terminal Block Check.

TASK 24-11-01-700-801

2. IDG Disconnect Function Check

(Figure 601, Figure 602)

A. General

- (1) This task has these checks:
 - (a) IDG Disconnect Inhibit Function Check
 - (b) IDG Disconnect Function Check.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-22-00-860-801	Supply Primary External Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

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E. Prepare for the Check

SUBTASK 24-11-01-840-001

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-11-01-840-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

F. IDG Disconnect Inhibit Function Check

SUBTASK 24-11-01-860-003

- (1) Make sure the applicable fuel cutoff switch is in the CUTOFF position.

SUBTASK 24-11-01-200-001



DO NOT PUSH THE DRIVE DISC SWITCH FOR LONGER THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN EACH OPERATION. IF YOU DO NOT OBEY THESE RULES, DAMAGE TO THE IDG DISCONNECT SYSTEM CAN OCCUR.

- (2) Momentarily push the DRIVE DISC switch on the P5 panel for the applicable IDG.

SUBTASK 24-11-01-200-002

- (3) Slowly pull the disconnect reset ring to the outer travel limit.

- (a) Make sure there is no "click" sound when you pull the disconnect reset ring.

SUBTASK 24-11-01-200-003

- (4) Slowly put the disconnect reset ring back to the maximum inner position.

NOTE: The IDG disconnect function is inhibited when the fuel cutoff switch is in the CUTOFF position.

G. IDG Disconnect Function Check

SUBTASK 24-11-01-860-004

- (1) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.

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and operate at idle speed.

SUBTASK 24-11-01-860-016

- (2) Make sure the DRIVE lights on the L and R DRIVE DISC switches on the P5 panel are off.

SUBTASK 24-11-01-200-004



DO NOT PUSH THE DRIVE DISC SWITCH FOR LONGER THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN EACH OPERATION. IF YOU DO NOT OBEY THESE RULES, DAMAGE TO THE IDG DISCONNECT SYSTEM CAN OCCUR.

- (3) Push the DRIVE DISC switch on the P5 panel for the applicable IDG.
 - (a) Make sure that the amber DRIVE light on the P5 panel comes on.

SUBTASK 24-11-01-200-006

- (4) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 24-11-01-200-007

- (5) Do this task: IDG Input Shaft Connection, TASK 24-11-01-200-801.

SUBTASK 24-11-01-420-043

- (6) If necessary, install lockwire on the applicable DRIVE DISC switch guard (TASK 20-10-23-400-801).

————— **END OF TASK** —————

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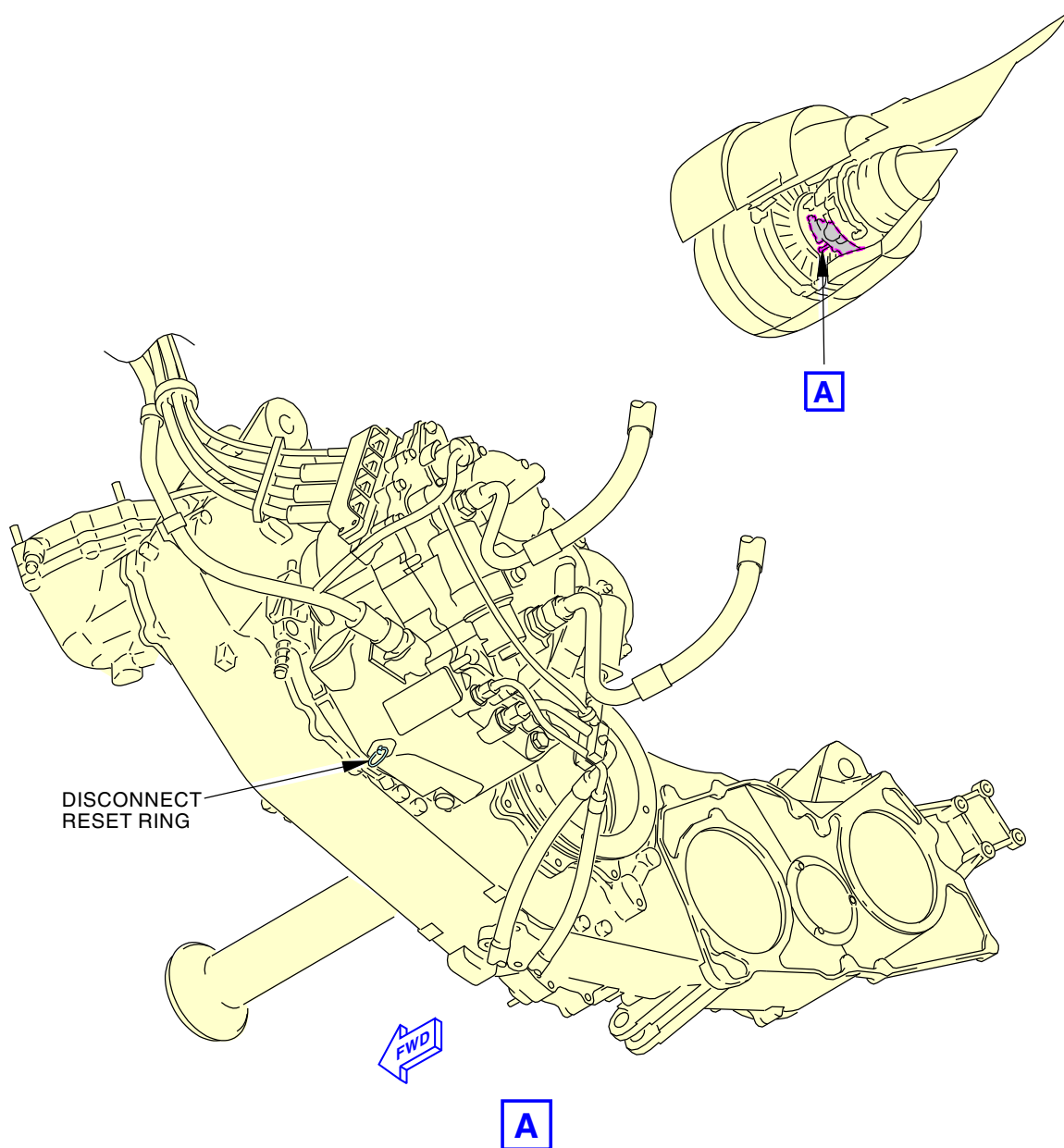
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Integrated Drive Generator (IDG) Inspection
Figure 601/24-11-01-990-801

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TASK 24-11-01-200-801

3. IDG Input Shaft Connection

(Figure 601)

A. General

- (1) This task connects the IDG input shaft to the engine. You must do this task after you do a check of the IDG disconnect function.

B. References

Reference	Title
24-11-01-000-801-001	IDG Removal (P/B 401)
24-11-01-400-801-001	IDG Installation (P/B 401)
24-22-00-860-801	Supply Primary External Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

E. Prepare to connect IDG input shaft

SUBTASK 24-11-01-840-003

- (1) Make sure the engines are stopped.

SUBTASK 24-11-01-840-004

- (2) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-11-01-200-008

- (3) Do these steps to connect the IDG input shaft:



CAUTION

YOU MUST MAKE SURE THAT THE IDG INPUT SHAFT IS CONNECTED TO THE GEARBOX SHAFT BEFORE YOU START THE ENGINE. IF THE IDG INPUT SHAFT IS NOT CONNECTED TO THE GEARBOX SHAFT, DAMAGE TO THE IDG CAN OCCUR WHEN YOU START THE ENGINE.

- (a) Slowly pull the disconnect reset ring on the IDG to the outer limit.
- (b) Make sure you feel the "click" in the disconnect reset ring as it gets near the outer limit.

NOTE: The operation of the disconnect reset ring must be smooth. The disconnect reset ring must move freely.

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- (c) Let the disconnect reset ring slowly return to the in position.
- (d) Slowly pull the disconnect reset ring to the outer limit again.
 - 1) Make sure there is no "click" when you pull the disconnect reset ring.
 - 2) If there is a "click" when you pull the disconnect reset ring, then replace the IDG.

These are the tasks:
IDG Removal, TASK 24-11-01-000-801-001,
IDG Installation, TASK 24-11-01-400-801-001.
 - 3) Make sure that the force required is less than the force required the first time you pulled the disconnect reset ring.
 - 4) If the force is not less than the force required the first time you pulled the disconnect reset ring, then replace the IDG.

These are the tasks:
IDG Removal, TASK 24-11-01-000-801-001,
IDG Installation, TASK 24-11-01-400-801-001.
- (e) Let the disconnect reset ring slowly return to the in position.
- (f) Push GEN CTRL switch to the latched position.
- (g) ENG idle run and make sure the AC-V = 110 to 120, FREQ = 395 to 405.

NOTE: This confirms that the IDG is securely connected.

F. Put the Airplane Back to Its Usual Condition.

SUBTASK 24-11-01-840-005



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
 - (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— END OF TASK —————

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TASK 24-11-01-200-805

4. IDG Disconnect Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-11-01-000-801-001	IDG Removal (P/B 401)
24-11-01-400-801-001	IDG Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
411	Engine, Left
421	Engine, Right

C. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

D. IDG Disconnect Function Check

SUBTASK 24-11-01-860-029

- (1) Operate the engine at idle (TASK 71-00-00-800-835-H00).

SUBTASK 24-11-01-860-030

- (2) Make sure the DRIVE lights on the L and R DRIVE DISC switches on the P5 panel are off.

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SUBTASK 24-11-01-200-025



CAUTION

DO NOT PUSH THE GEN DRIVE DISC SWITCH FOR MORE THAN THREE SECONDS. WAIT FOR A MINIMUM OF 60 SECONDS BEFORE YOU PUSH IT AGAIN. IF YOU DO NOT OBEY THESE INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE GENERATOR.

- (3) Push the DRIVE DISC switch on the P5 panel for the applicable IDG.
- (a) Make sure that the amber DRIVE light on the P5 panel comes on.

SUBTASK 24-11-01-200-026

- (4) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 24-11-01-840-031



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

SUBTASK 24-11-01-420-045

- (6) Reconnect the IDG input shaft.



CAUTION

MAKE SURE THAT THE IDG INPUT SHAFT IS CONNECTED TO THE GEARBOX SHAFT BEFORE YOU START THE ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE IDG CAN OCCUR.

- (a) Slowly pull the disconnect reset ring on the IDG to the outer limit.
- (b) Make sure you feel the "click" in the disconnect reset ring as it gets near the outer limit.
- NOTE: The operation of the disconnect reset ring must be smooth. The disconnect reset ring must move freely.
- (c) Let the disconnect reset ring slowly return to the in position.
- (d) Slowly pull the disconnect reset ring to the outer limit again.
- 1) Make sure there is no "click" when you pull the disconnect reset ring.

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- 2) If there is a "click" when you pull the disconnect reset ring, replace the IDG (IDG Removal, TASK 24-11-01-000-801-001 and IDG Installation, TASK 24-11-01-400-801-001).
 - 3) Make sure that the force necessary is less than the force necessary the first time you pulled the disconnect reset ring.
 - 4) If the force is not less than the force necessary the first time you pulled the disconnect reset ring, replace the IDG (IDG Removal, TASK 24-11-01-000-801-001 and IDG Installation, TASK 24-11-01-400-801-001).
- (e) Let the disconnect reset ring slowly return to the in position.
- (f) Push GEN CTRL switch to the latched position.
- (g) ENG idle run and make sure the AC-V = 110 to 120, FREQ = 395 to 405.

NOTE: This confirms that the IDG is securely connected.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-01-420-046

- (1) If necessary, install lockwire on the applicable DRIVE DISC switch guard (TASK 20-10-23-400-801).
- (a) Use DPM 5933 - Bare Copper - 0.014 in. (0.356 mm) lockwire.

SUBTASK 24-11-01-840-032



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
- (a) Do this task:
- Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|------------------------------------|
| 415AL | Left Thrust Reverser, Left Engine |
| 425AL | Left Thrust Reverser, Right Engine |
- (b) Do this task:
- Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 413AL | Left Fan Cowl Panel, Left Engine |
| 423AL | Left Fan Cowl Panel, Right Engine |
- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— END OF TASK —————

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TASK 24-11-01-200-803

5. IDG Terminal Block Check

(Figure 601, Figure 602)

A. References

Reference	Title
24-11-19-000-803-002	IDG Power Feeder Cables Removal (P/B 401)
24-11-19-400-803-002	IDG Power Feeder Cables Installation (P/B 401)
24-11-20-000-802-001	IDG Terminal Block Removal (P/B 401)
24-11-20-400-803-001	IDG Terminal Block Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
411	Engine, Left
421	Engine, Right

C. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

D. Prepare for the Check

SUBTASK 24-11-01-840-011



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

E. IDG Terminal Block Check

SUBTASK 24-11-01-420-016

- (1) Remove the two screws [3], washers [4] and the cover [5].

SUBTASK 24-11-01-420-017

- (2) Do the steps that follow to inspect the condition of the power feeder cables at the IDG.

- (a) Note the color sequence of the colored teflon identification sleeves on the feeder cables.

NOTE: Starting at the smaller feeder cable (neutral), the color sequence is: neutral - white, T3 - blue, T2 - yellow, T1 - red.

- (b) Check for signs of overheating or stress on the colored teflon identification sleeves on the power feeder cables.

- (c) Check for signs of overheating or stress on the power feeder cable terminal lugs and the IDG.

- (d) Make sure the terminal studs are securely attached to the IDG and the terminal stud threads are not damaged.

- (e) Check the general condition of the power feeder cables between the terminal block and the IDG.

SUBTASK 24-11-01-200-013

- (3) If you find damage to the IDG terminal block, then replace the IDG terminal block.

These are the tasks:

IDG Terminal Block Removal, TASK 24-11-20-000-802-001,

IDG Terminal Block Installation, TASK 24-11-20-400-803-001.

SUBTASK 24-11-01-200-014

- (4) If you find damage to the power feeder cables, replace the cables.

These are the tasks:

IDG Power Feeder Cables Removal, TASK 24-11-19-000-803-002,

IDG Power Feeder Cables Installation, TASK 24-11-19-400-803-002.

SUBTASK 24-11-01-410-006

- (5) Install the cover [5] with the two screws [3] and washers [4].

NOTE: Tighten the screws to a torque of 20 in-lb (2 N·m) - 22 in-lb (2 N·m).

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-01-840-012



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

(a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

(b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

(c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

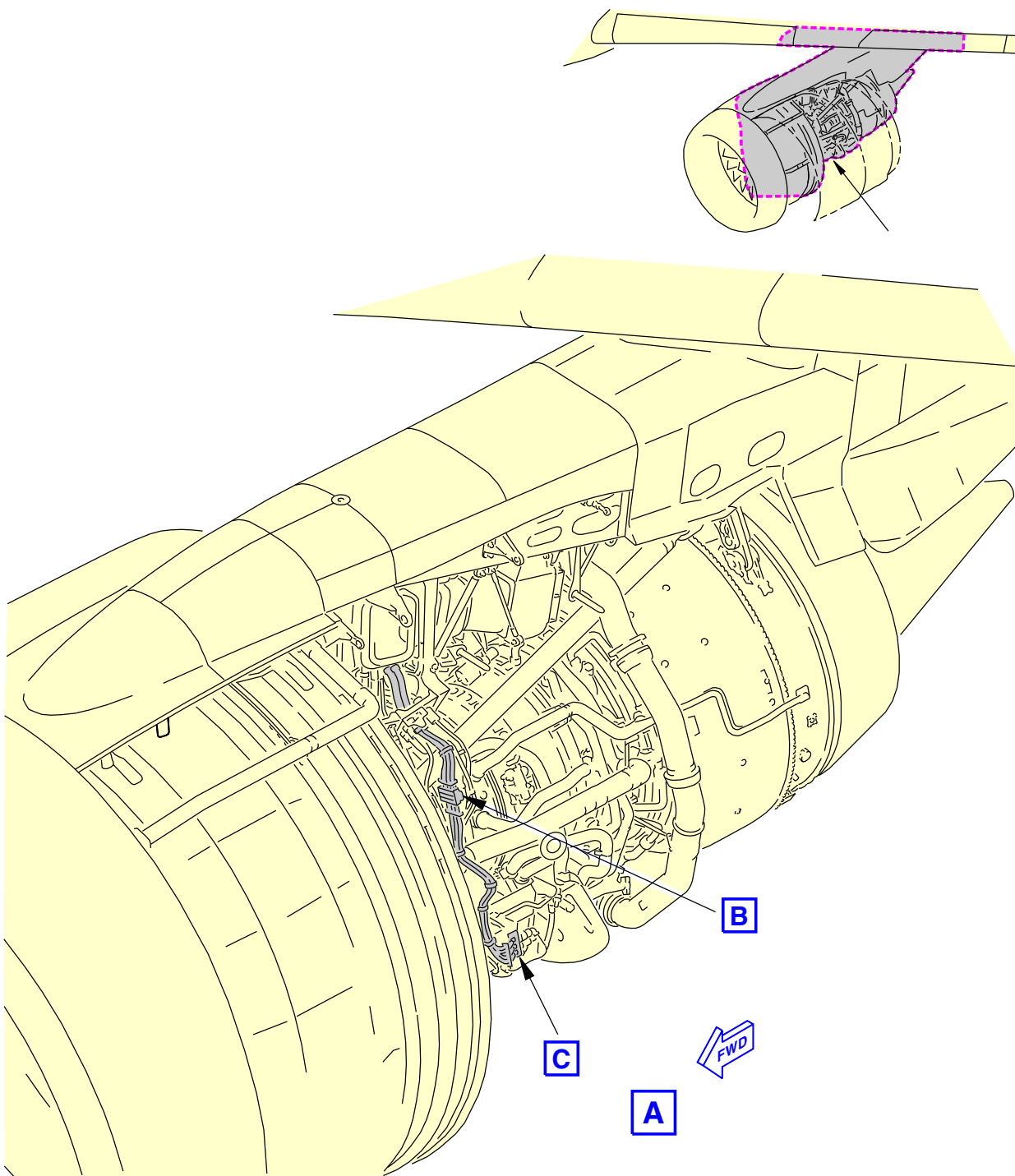
———— **END OF TASK** ————

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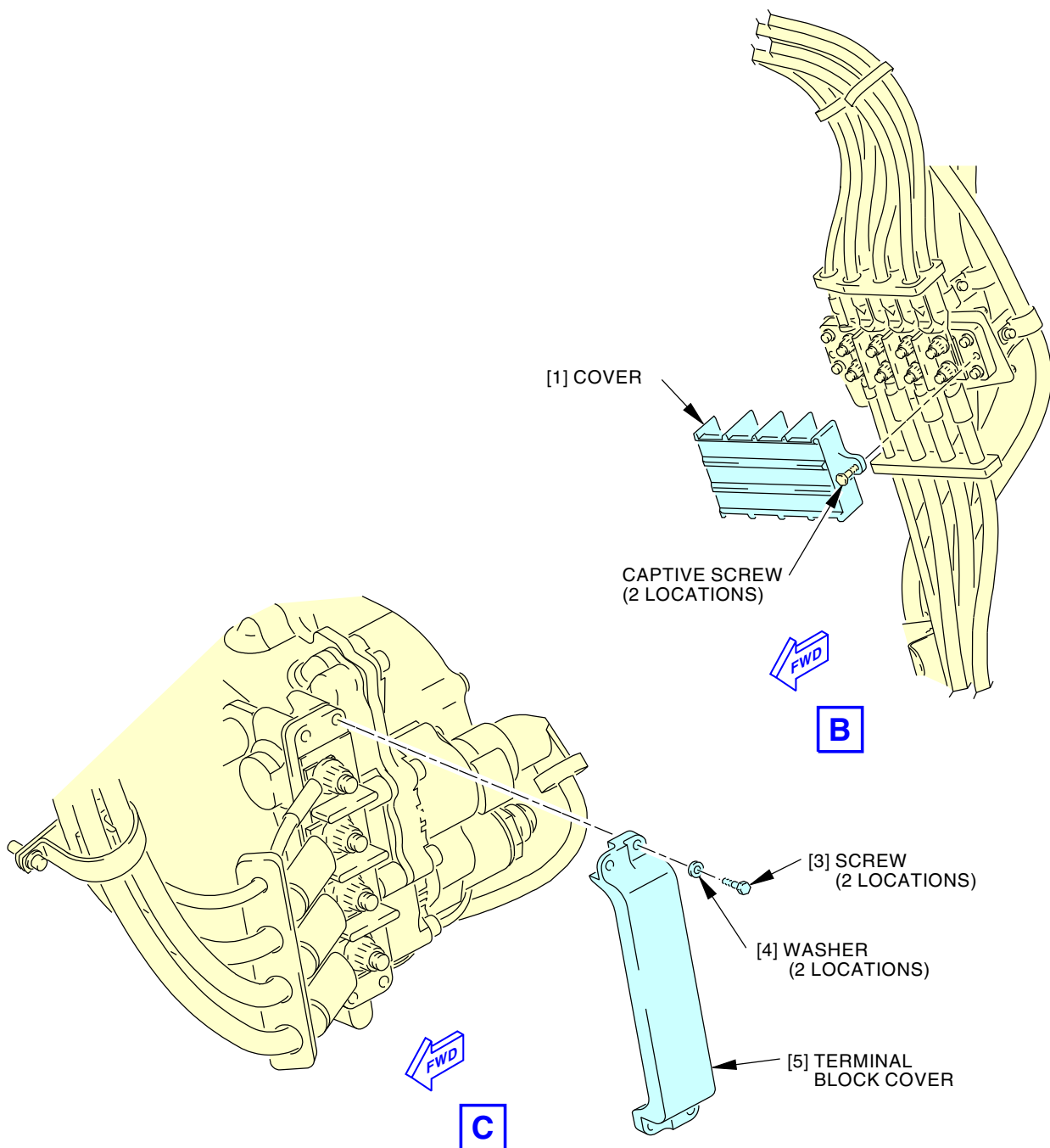
IDG Power Feeder Terminal Block Check
Figure 602/24-11-01-990-805 (Sheet 1 of 2)

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1 MIN CLEARANCE OF 0.5 INCH BETWEEN CABLE AND ADJACENT BRACKET.

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IDG Power Feeder Terminal Block Check
Figure 602/24-11-01-990-805 (Sheet 2 of 2)

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TASK 24-11-01-200-804

6. Power Feeder Terminal Block Check

(Figure 602)

A. References

Reference	Title
24-11-19-000-803-002	IDG Power Feeder Cables Removal (P/B 401)
24-11-19-400-803-002	IDG Power Feeder Cables Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
411	Engine, Left
421	Engine, Right

C. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

D. Prepare for the Check

SUBTASK 24-11-01-840-013



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left fan cowl panels, do this task:
Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

E. Power Feeder Terminal Block Check

SUBTASK 24-11-01-420-019

- (1) Loosen the two captive screws and remove the cover [1].

NOTE: The screws are captive to the cover and should not be removed.

SUBTASK 24-11-01-420-020

- (2) Do the steps that follow to inspect the condition of the power feeder cables and the terminal block.
- (a) Note the color sequence of the colored teflon identification sleeves on the feeder cables.
NOTE: Starting at the smaller feeder cable (neutral), the color sequence is: neutral - white, T3 - blue, T2 - yellow, T1 - red.
 - (b) Check for signs of overheating or stress on the colored teflon identification sleeves on the power feeder cables.
 - (c) Check for signs of overheating or stress on the power feeder cable terminal lugs and the terminal block.
 - (d) Check the general condition of the power feeder cables between the terminal block and the firewall.
 - (e) Make sure the terminal block studs are securely attached to the terminal block base and the terminal stud threads are not damaged.
 - (f) Make sure the power feeder cables near the terminal block are at least 0.5 in. (12.7 mm) from the adjacent bracket.
 - (g) FOR OPERATORS WHO CHOOSE TO USE TORQUE INDICATOR COMPOUND;
If the torque indicator compound is used on the nuts that hold the feeder cables to the terminal block, do this inspection of the nuts.
 - 1) Visually inspect the torque indicator compound on the nuts.
 - 2) Make sure there is no evidence of movement in the torque indicator compound.
 - 3) If the torque indicator compound is cracked, or appears to be partially missing, do a torque check of the nuts. The nuts should be tightened to a torque of 220 $\pm$ 20 in-lb (24.9 $\pm$ 2.3 N·m).
 - 4) If the torque indicator compound is intact and shows no evidence of movement, you do not need to do a check of the torque on the nuts.

SUBTASK 24-11-01-200-015

- (3) If you find damage to the terminal block, replace the block.

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SUBTASK 24-11-01-200-016

- (4) If you find damage to the power feeder cables, replace the cables.

NOTE: If you repair the power feeder cables on the engine with a splice, this is a temporary repair. A temporary repair must be replaced at a maximum of 500 flight hours after the splice repair.

These are the tasks:

IDG Power Feeder Cables Removal, TASK 24-11-19-000-803-002,

IDG Power Feeder Cables Installation, TASK 24-11-19-400-803-002.

SUBTASK 24-11-01-410-007

- (5) Install the cover [1] and tighten the two captive screws.

NOTE: Tighten the screws to a torque of 27.5 ± 2.5 in-lb (3.1 ± 0.3 N·m).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-01-840-014



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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IDG OIL FILTER - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
 - (1) IDG Oil Filter Inspection/Check

TASK 24-11-02-200-801

2. IDG Oil Filter Inspection/Check

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) You must remove the IDG oil filter to do an inspection of the filter.

B. References

Reference	Title
24-11-01-000-801-001	IDG Removal (P/B 401)
24-11-01-400-801-001	IDG Installation (P/B 401)
24-11-02-400-803-002	IDG Oil Filter Installation (P/B 401)
24-11-04-000-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Removal (P/B 401)
24-11-04-400-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Installation (P/B 401)
24-11-06-000-801	IDG Fuel/Oil Heat Exchanger Removal (P/B 401)
24-11-06-400-801	IDG Fuel/Oil Heat Exchanger Installation (P/B 401)

C. Tools/Equipment

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

D. Consumable Materials

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

E. Procedure

SUBTASK 24-11-02-200-001

- (1) Visually examine the filter element and do the applicable steps as follows:
 - (a) Do these steps to inspect the filter element and filter cap:
 - 1) A moderate number of scattered, small metallic flakes (bronze- or silvered-colored metal) or non-metallic items such as flakes of generator insulation, black epoxy and shreds of tie wrap are normal products of operation and should not warrant IDG removal.
 - a) Do this task: IDG Oil Filter Installation, TASK 24-11-02-400-803-002.
 - 2) If bright metal particles or larger, non-metallic, black colored, fiber-like pieces are present in considerable quantity on the filter element, in the filter cavity, or in the oil drained from the IDG, then replace the IDG.

These are the tasks:

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IDG Removal, TASK 24-11-01-000-801-001,

IDG Installation, TASK 24-11-01-400-801-001.

NOTE: The contaminated filter element should be returned with the IDG for shop analysis.

- (b) If the scavenge filter element or the O-rings are damaged such that contaminated oil has bypassed into the external oil cooling circuit, do these steps:

- 1) Replace the IDG/VSCF Air/Oil heat exchanger.

These are the tasks:

IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002,

IDG/Backup Generator Air/Oil Heat Exchanger Installation,
TASK 24-11-04-400-802-002.

NOTE: If you are going to flush the plumbing lines, flush them before you install the new cooler(s) and IDG.

- 2) Replace the IDG Fuel/Oil heat exchanger.

These are the tasks:

IDG Fuel/Oil Heat Exchanger Removal, TASK 24-11-06-000-801,

IDG Fuel/Oil Heat Exchanger Installation, TASK 24-11-06-400-801.

NOTE: If you are going to flush the plumbing lines, flush them before you install the new cooler(s) and IDG.

- 3) Replace or flush the plumbing lines in the external oil cooling circuit with oil, D00068 or oil, D00071.

NOTE: If you choose to flush the plumbing line segments, the IDG and the associated heat exchangers should not be installed until the flushing is complete.

- a) Connect the pressure fill hose from the oil service equipment to one end of the plumbing line. Use an adapter to connect the pressure fill hose to the coupling nut on the plumbing line.
- b) Position an oil resistant container (5 gal)(19 Liter), STD-1055 under the other end of the line to catch the oil.
- c) Pump oil into the line until the oil coming out the other end looks clean.
- d) Repeat this for each segment of plumbing line.

———— **END OF TASK** ————

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IDG OIL FILTER - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) IDG Oil Filter Removal
 - (2) IDG Oil Filter Installation

TASK 24-11-02-000-803-002

2. IDG Oil Filter Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task give instructions to remove the IDG oil filter.

B. References

Reference	Title
24-11-02-200-801	IDG Oil Filter Inspection/Check (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

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E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Prepare for the Removal

SUBTASK 24-11-02-010-005-002



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. Procedure

SUBTASK 24-11-02-010-006-002



WARNING

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

- (1) Disconnect the dust cap from the overflow drain valve.

SUBTASK 24-11-02-680-002-002

- (2) Do these steps to release the pressure from the IDG:
 - (a) Connect the overflow coupling which is on the service engine oil servicing cart, COM-1537 to the overflow hose.
 - (b) Put the free end of the overflow hose into a oil resistant container (5 gal)(19 Liter), STD-1055.

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WARNING

WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE TO THE OVERFLOW DRAIN COUPLING, PUT A RAG AROUND THE FITTING. THE RAG WILL PREVENT THE OIL SPRAY CAUSED BY PRESSURE IN THE IDG CASE. HOT OIL CAN CAUSE INJURIES.

- (c) Connect the overflow coupling and the overflow hose to the overflow drain valve and allow the oil to come out from the overflow hose.
- (d) Disconnect the overflow coupling and the overflow hose from the overflow drain valve.

SUBTASK 24-11-02-020-005-002



WARNING

USE SAFETY GOGGLES WHEN YOU INSTALL OR REMOVE LOCKWIRE. PIECES OF LOCKWIRE THAT BECOME AIRBORNE CAN CAUSE INJURY TO PERSONS.

- (3) Remove the lock wire from the filter cover.

SUBTASK 24-11-02-020-006-002

- (4) Put a oil resistant container (5 gal)(19 Liter), STD-1055 under the filter cavity to catch the oil.

SUBTASK 24-11-02-020-007-002

- (5) Do these steps to remove the IDG scavenge filter:
 - (a) Remove the filter cover [4].
 - (b) Remove and discard the o-ring [3] from the filter cover [4].
 - (c) Remove the filter element [2].
 - (d) Examine the filter element [2] and filter cover [4], do this task: IDG Oil Filter Inspection/Check, TASK 24-11-02-200-801.
 - (e) Discard the filter element [2] and the o-ring [1].

SUBTASK 24-11-02-020-008-002

- (6) AIRPLANES WITH IDGs THAT HAVE TWO FILTERS;

Do these steps to remove the IDG charge filter:

- (a) Remove the filter cover [8].
- (b) Remove and discard the o-ring [7] from the filter cover [8].
- (c) Remove the filter element [6].
- (d) Examine the filter element [6] and filter cover [8], do this task: IDG Oil Filter Inspection/Check, TASK 24-11-02-200-801.
- (e) Discard the filter element [6] and o-ring [5].

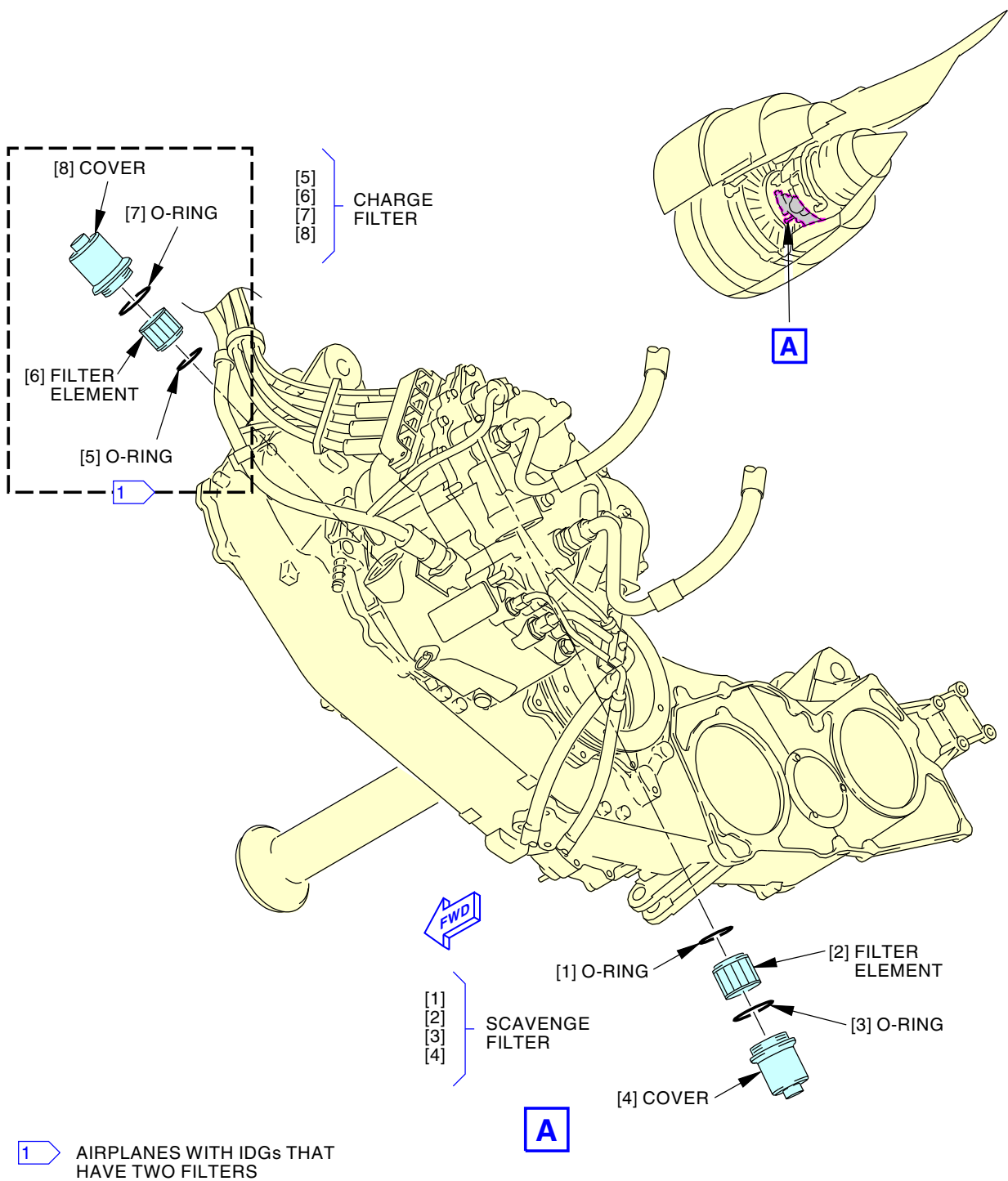
———— **END OF TASK** ————

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**IDG Oil Filter Removal
Figure 401/24-11-02-990-803-002**

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TASK 24-11-02-400-803-002

3. IDG Oil Filter Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task give instructions to install the IDG oil filter.

B. References

Reference	Title
12-22-07-200-803	IDG Oil Level Check (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	
G01505	Lockwire - Safety And Lock	NASM20995
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	O-ring	24-11-01-13E-159	ARO ALL
2	Filter element	24-11-01-13E-158	ARO ALL
3	O-ring	24-11-01-13E-156	ARO ALL
5	O-ring	24-11-01-13E-159	ARO ALL
6	Filter element	24-11-01-13E-158	ARO ALL
7	O-ring	24-11-01-13E-156	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

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G. IDG Oil Filter Installation

SUBTASK 24-11-02-640-002-002

- (1) Do these steps to install the IDG scavenge filter:
- (a) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [1].
 - (b) Make sure the new o-ring [1] is installed on the new filter element [2].
 - (c) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [3].
 - (d) Install the new o-ring [3] to the filter cover [4].
 - (e) Install the new filter element [2] into the filter cavity until the o-ring makes a seal.



MAKE SURE THAT THE FILTER ELEMENT IS INSTALLED CORRECTLY IN THE FILTER CAVITY BEFORE YOU INSTALL THE FILTER COVER. IF YOU PUSH THE FILTER ELEMENT INTO THE HOUSING WHEN YOU TIGHTEN THE FILTER COVER, DAMAGE TO THE FILTER ELEMENT CAN OCCUR.

- (f) Install the filter cover [4].
- (g) Tighten the filter cover [4] to 158 in-lb (18 N·m) - 180 in-lb (20 N·m).
- (h) Install a lockwire, G01505 on the filter cover [4].

SUBTASK 24-11-02-420-006-002

- (2) AIRPLANES WITH IDGs THAT HAVE TWO FILTERS;

Do these steps to install the IDG charge filter:

NOTE: The charge filter and scavenge filter use the same part number.

- (a) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [5].
- (b) Install the new o-ring [5] on the new filter element [6].
- (c) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [7].
- (d) Install the new o-ring [7] to the filter cover [8].
- (e) Install the new filter element [6] into the filter cavity until the o-ring makes a seal.



MAKE SURE THAT THE FILTER ELEMENT IS INSTALLED CORRECTLY IN THE FILTER CAVITY BEFORE YOU INSTALL THE FILTER COVER. IF YOU PUSH THE FILTER ELEMENT INTO THE HOUSING WHEN YOU TIGHTEN THE FILTER COVER, DAMAGE TO THE FILTER ELEMENT CAN OCCUR.

- (f) Install the filter cover [8].
- (g) Tighten the filter cover [8] to 156 in-lb (18 N·m) - 180 in-lb (20 N·m).
- (h) Install a MS20995C20 lockwire, G50225 on the filter cover [8].

SUBTASK 24-11-02-610-002-002

- (3) Do this task: IDG Oil Level Check, TASK 12-22-07-200-803.

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H. IDG Oil Filter Installation Test

SUBTASK 24-11-02-790-002-002

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-02-410-004-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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QUICK ATTACH/DETACH (QAD) COUPLING - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Quick Attach/Detach (QAD) Coupling Removal
 - (2) Quick Attach/Detach (QAD) Coupling Installation

TASK 24-11-03-000-801

2. Quick Attach/Detach (QAD) Coupling Removal

(Figure 401)

A. General

- (1) This task removes the QAD coupling from the engine accessory gearbox. You must remove the IDG before you can remove the QAD coupling.

B. References

Reference	Title
24-11-01-000-801-001	IDG Removal (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-583	Mallet - Non-metallic
STD-727	Punch - Center
STD-1242	Hammer - Standard

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	IDG	24-11-01-02B-080	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

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G. Prepare for the Removal

SUBTASK 24-11-03-010-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

SUBTASK 24-11-03-010-002

- (2) Remove the IDG [4]. To remove it, do this task: IDG Removal, TASK 24-11-01-000-801-001

H. Quick/Attach Detach (QAD) Coupling Removal

SUBTASK 24-11-03-020-001

- (1) Remove the flathead screws [5] that attach the QAD coupling [3] to the gearbox mount pad [1].

NOTE: If the screws does not turn easily, tap it at an angle with a center punch, STD-727 and standard hammer, STD-1242.

SUBTASK 24-11-03-020-002

- (2) Pull the QAD coupling [3] away from the pad.

NOTE: If the QAD coupling does not release easily from the pad, tap it with a non-metallic mallet, STD-583.

SUBTASK 24-11-03-020-003

- (3) Remove the QAD coupling [3] and gasket [2] from the gearbox.

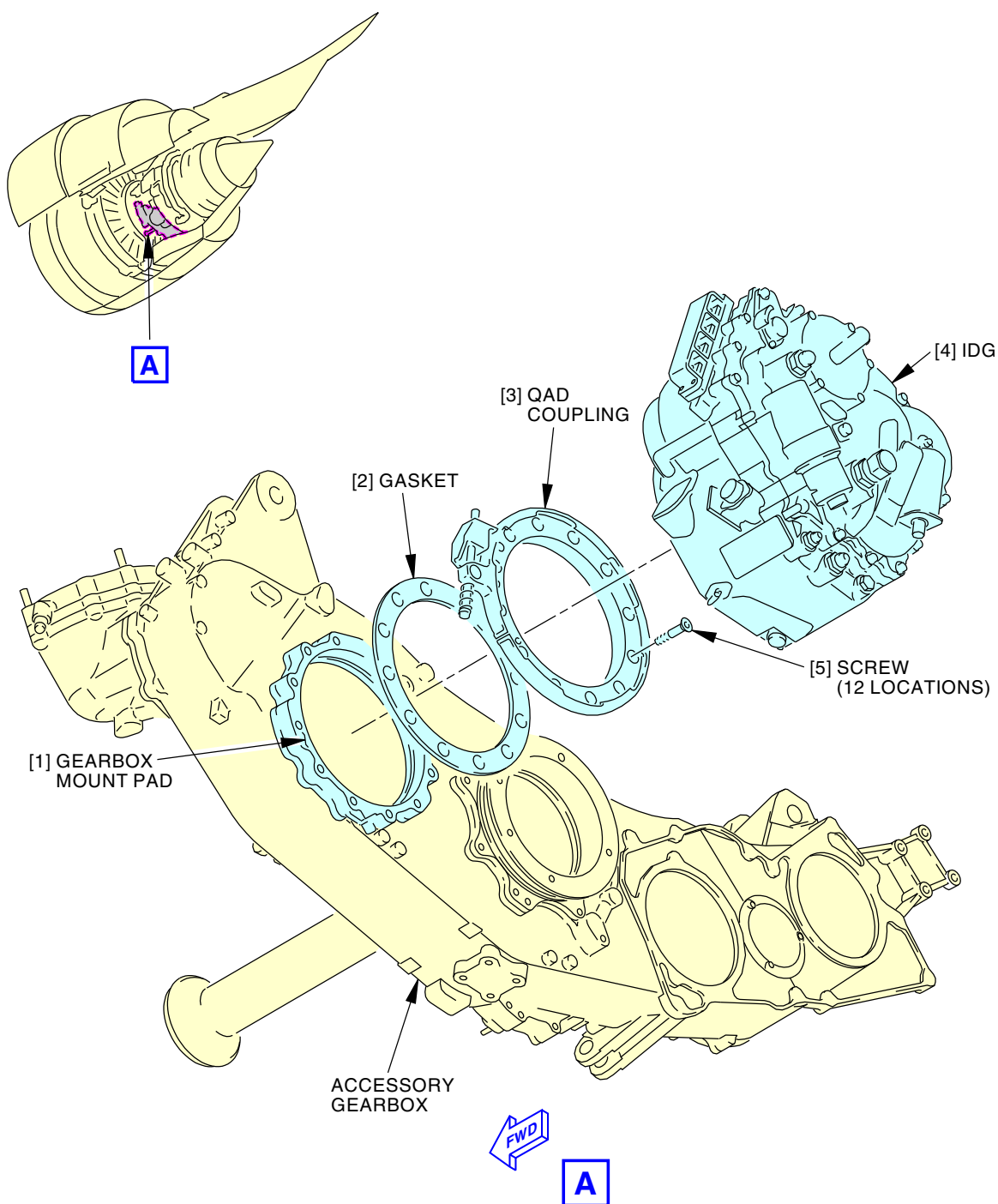
————— END OF TASK —————

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Quick Attach/Detach Coupling Installation
Figure 401/24-11-03-990-801

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TASK 24-11-03-400-801

3. Quick Attach/Detach (QAD) Coupling Installation

(Figure 401)

A. General

(1) This task installs the QAD coupling to the engine accessory gearbox.

B. References

Reference	Title
24-11-01-400-801-001	IDG Installation (P/B 401)
24-11-03-200-801	QAD Coupling Inspection (P/B 601)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	BAC5008

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Gasket	24-11-01-02B-580	ARO ALL
3	QAD coupling	24-11-01-02B-560	ARO ALL
4	IDG	24-11-01-02B-080	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

G. Prepare for the Installation

SUBTASK 24-11-03-210-001

(1) Visually examine the mating surfaces of the QAD coupling and the gearbox mount pad.

NOTE: The surfaces must be smooth and clean.

SUBTASK 24-11-03-640-001



DO NOT ALLOW EXCESS LUBRICANT TO COLLECT IN THE DOWEL PIN HOLES AND BOLT HOLES. GEARBOX DAMAGE MAY OCCUR DUE TO PRESSURE BUILD UP WHEN BOLTS ARE INSTALLED.

(2) Apply a thin layer of Never-Seez NSBT compound, D00006, to the parts that follow:

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- (a) Gearbox mount pad [1]
- (b) QAD flange
- (c) QAD coupling tension bolt threads.

H. Procedure

SUBTASK 24-11-03-420-001

- (1) Attach the gasket [2] on the side of the QAD coupling [3] that connects with the gearbox mount pad [1].

NOTE: Be sure the hole pattern of the gasket aligns with the hole pattern of the QAD coupling.

SUBTASK 24-11-03-420-002

- (2) Attach the QAD coupling [3] to the gearbox mount pad [1].

SUBTASK 24-11-03-420-003

- (3) Install the flathead screws [5] per the steps that follow:



CAUTION

DO NOT APPLY TOO MUCH COMPOUND TO THE SCREW OR DAMAGE TO THE GEARBOX CAN OCCUR.

- (a) Apply a thin layer of Never-Seez NSBT compound, D00006 to the flathead screws [5].
 - 1) Cover the threads and the countersink of the screw.
- (b) Tighten the screws to a torque of 23 ft-lb (31 N·m) - 25 ft-lb (34 N·m).

SUBTASK 24-11-03-210-002

- (4) Do this task: QAD Coupling Inspection, TASK 24-11-03-200-801.

SUBTASK 24-11-03-410-001

- (5) Install the IDG [4]. To install it, do this task: IDG Installation, TASK 24-11-01-400-801-001

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-03-410-002



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

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- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

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QUICK ATTACH/DETACH (QAD) COUPLING - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) QAD Coupling Inspection
 - (2) QAD Coupling Torque Check.

TASK 24-11-03-200-801

2. QAD Coupling Inspection

(Figure 601)

A. General

- (1) Do this inspection after you install the QAD coupling on the engine accessory gearbox, but before you install the integrated drive generator (IDG).

B. References

Reference	Title
24-11-01-400-801-001	IDG Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-1627	Gauge - Integrated Drive Generator (IDG), Quick Attach/Detach (QAD), Coupling Part #: AGE12739 Supplier: 99167 Opt Part #: 900-24999 Supplier: 99167

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine

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Number	Name/Location

423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Prepare for the QAD Coupling Inspection

SUBTASK 24-11-03-840-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

(e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. QAD Coupling Inspection

SUBTASK 24-11-03-210-003

(1) Visually examine the surface of the QAD coupling for damage.

- (a) Use a fine file to remove any burrs found on the surface of the QAD coupling.

SUBTASK 24-11-03-210-004

(2) Visually examine the holes on the QAD coupling that engage the IDG installation pins for damage.

- (a) Use a fine file to remove any burrs found in or around the guide holes.

SUBTASK 24-11-03-210-005

(3) Visually examine the tension bolts and the tension bolt nuts on the QAD coupling for damage.

SUBTASK 24-11-03-210-006

(4) Examine the inside surfaces of the clamp track area on the QAD coupling.

NOTE: The clamp track area is the area where the IDG mounting flange touches the QAD coupling when the IDG is installed.

- (a) If the contact area is more worn in one location than another location, replace the QAD coupling.

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SUBTASK 24-11-03-420-006

- (5) Install the QAD coupling gauge, Quick Attach/Detach (QAD) coupling, Integrated Drive Generator (IDG) gauge, SPL-1627, or the IDG, on to the QAD coupling and tighten the QAD tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).

NOTE: If you use the IDG, you must follow the steps outlined in (TASK 24-11-01-400-801-001).

SUBTASK 24-11-03-200-003

- (6) Measure the distance between the centers of the nuts on the QAD coupling tension bolt. If the distance is less than 1.75 in. (44.45 mm) replace the QAD coupling.

SUBTASK 24-11-03-020-004

- (7) If installed, remove the QAD coupling gauge, Quick Attach/Detach (QAD) coupling, Integrated Drive Generator (IDG) gauge, SPL-1627, from the QAD coupling.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-03-840-004



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

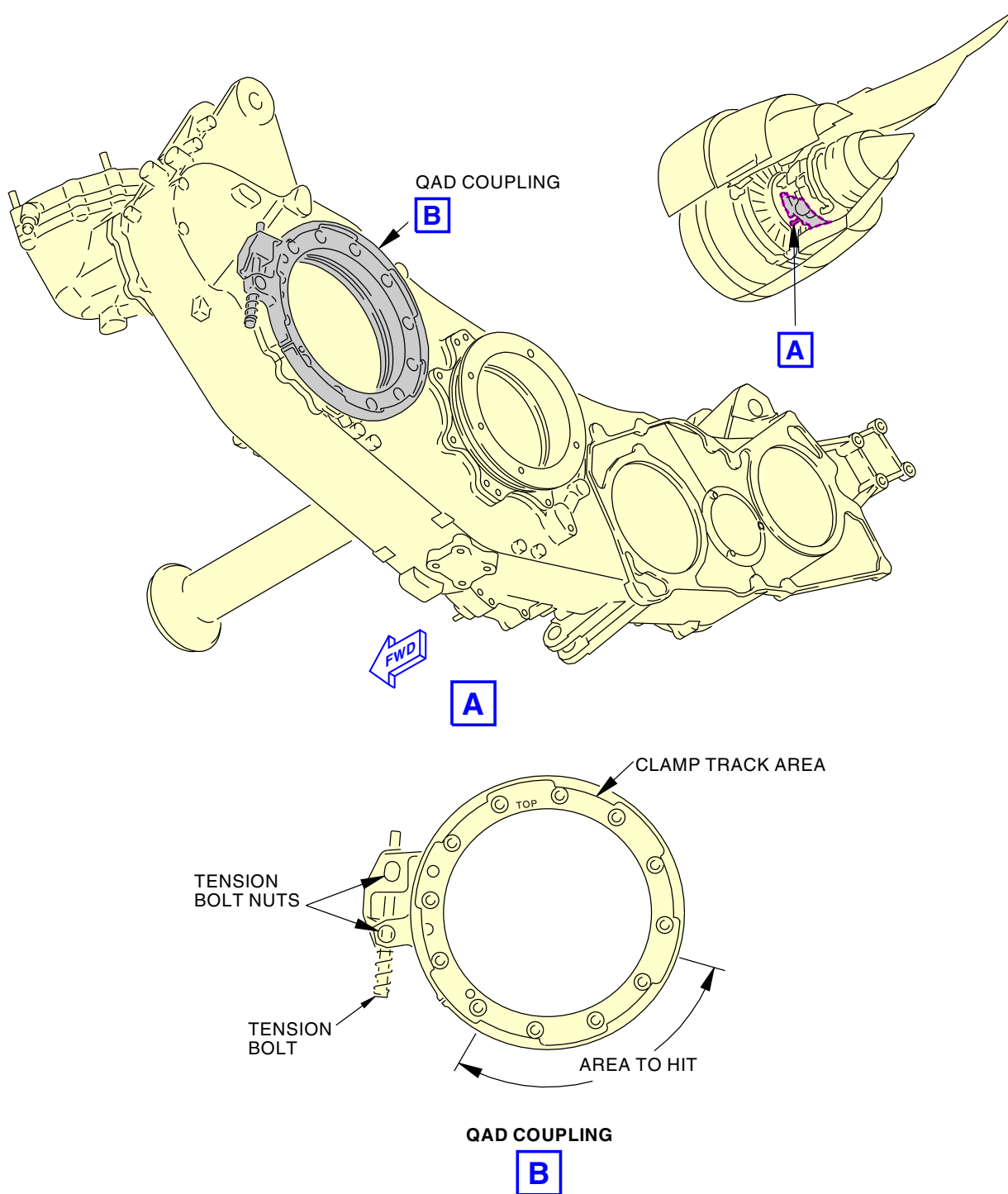
————— **END OF TASK** —————

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**IDG Quick Attach/Detach (QAD) Coupling Inspection
Figure 601/24-11-03-990-802**

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TASK 24-11-03-200-803

3. QAD Coupling Torque Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure does a check of the torque of the tension bolt on the QAD coupling with the IDG installed.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-291	Drift - Light Weight, Metal or Plastic

D. Consumable Materials

Reference	Description	Specification
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

G. Prepare for the Check

SUBTASK 24-11-03-840-011



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in this sequence to safely open the left thrust reverser.

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- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

H. QAD Coupling Torque Check

SUBTASK 24-11-03-200-004

- (1) Remove the lockwire from the tension bolt on the QAD coupling.

SUBTASK 24-11-03-200-005

- (2) Do these steps to do a check of the torque value of the tension bolt:

- (a) Use a light weight, metal or plastic drift, STD-291 to tap the edge of the QAD coupling.

NOTE: If you view the IDG with the tension bolt to the left hand side, only tap the edge of the QAD coupling from the 4 O'clock to 7 O'clock positions.

- (b) Measure the torque of the tension bolt.

- 1) If the torque is greater than 180 in-lb (20 N·m):

- a) Tighten the tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).

- b) Secure the tension bolt with a MS20995NC32 lockwire, G01912.

- 2) If the torque is less than 180 in-lb (20 N·m):

- a) Tighten the tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).

- b) Tap the QAD ring again and measure the torque on the tension bolt. Continue to tap and tighten the tension bolt until the torque does not drop below 180 in-lb (20 N·m) after you tap the QAD coupling.

- c) Tighten the tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).

- d) Secure the tension bolt with a MS20995NC32 lockwire, G01912.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-03-840-012



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

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- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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IDG/BACKUP GENERATOR (VSCF) AIR/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has two tasks
 - (1) A removal of the IDG/backup generator air/oil heat exchanger.
 - (2) An installation of the IDG/backup generator air/oil heat exchanger.

TASK 24-11-04-000-802-002

2. IDG/Backup Generator Air/Oil Heat Exchanger Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Drain the oil from the IDG/backup generator air/oil heat exchanger (referred to as the heat exchanger).
- (2) Loosen the hose clamp and disconnect the flexible joint from the inlet duct.
- (3) Disconnect the oil tube-hoses from the heat exchanger.
- (4) Remove the heat exchanger from the links.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Heat exchanger	72-00-51-31B-253	ARO ALL
30	Forward bracket	72-00-51-31B-180	ARO ALL
		72-00-51-31B-184	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

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(Continued)

Number	Name/Location

425AL	Left Thrust Reverser, Right Engine

G. Prepare for the Removal

SUBTASK 24-11-04-010-003-002



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

H. Heat Exchanger Removal

SUBTASK 24-11-04-020-017-002



WARNING

DO NOT TOUCH THE COMPONENTS OF THE IDG OR THE BACKUP GENERATOR OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOT FOR MORE TIME THAN THE OTHER ENGINE PARTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



CAUTION

DO NOT LET OIL GET ON THE ENGINE, OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE AREAS THAT OIL FALLS ON. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (1) Remove the electrical harnesses from the spring clips on the forward bracket [30] at the heat exchanger [1].

SUBTASK 24-11-04-020-018-002

- (2) Loosen the hose clamp [3] and remove the flexible joint [4] from the inlet duct [2].

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SUBTASK 24-11-04-020-019-002

- (3) Loosen the hose clamp [27] and remove the spray shield [28] from the IDG oil-in tube-hose [8] at the heat exchanger [1].

SUBTASK 24-11-04-020-020-002

- (4) Disconnect the IDG oil-in tube-hose [8] from the heat exchanger [1].
 - (a) Drain the oil in the IDG oil-in tube-hose [8] into an oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-04-020-021-002

- (5) Loosen the hose clamp [25] and remove the spray shield [26] from the IDG oil-out tube-hose [7] at the heat exchanger [1].

SUBTASK 24-11-04-020-022-002

- (6) Disconnect the IDG oil-out tube-hose [7] from the heat exchanger [1].
 - (a) Drain the oil in the IDG oil-out tube-hose [7] into an oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-04-020-023-002

- (7) Loosen the hose clamp [24] and remove the spray shield [23] from the backup generator VSCF oil-out tube-hose [6] at the heat exchanger [1].

SUBTASK 24-11-04-020-024-002

- (8) Disconnect the backup generator VSCF oil-out tube-hose [6] from the heat exchanger [1].
 - (a) Drain the oil in the backup generator VSCF oil-out tube-hose [6] into an oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-04-020-025-002

- (9) Loosen the hose clamp [21] and remove the spray shield [22] from the backup generator VSCF oil-in tube-hose [5] at the heat exchanger [1].

SUBTASK 24-11-04-020-026-002

- (10) Disconnect the backup generator VSCF oil-in tube-hose [5] from the heat exchanger [1].
 - (a) Drain the oil in the backup generator VSCF oil-in tube-hose [5] into an oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-04-860-002-002

- (11) Move the oil tube-hoses away from the heat exchanger [1].

SUBTASK 24-11-04-020-045

- (12) Remove the three bolts from the bracket that holds the exciter lead to the ignitor plug.

SUBTASK 24-11-04-020-046

- (13) Remove the four bolts from the bracket attached to the lower side of the heat exchanger [1].

SUBTASK 24-11-04-020-027-002

- (14) Remove the heat exchanger [1].

NOTE: Make sure the that bushings [20, 33, 38, 43, 46, 49] [] on the links do not fall into the engine.

- (a) Remove the bolt [11] and nut [14] that attach the forward link [13] and bushing [20] to the heat exchanger [1].
- (b) Remove the bolt [42] that attaches the upper inlet duct link [41], and bushing [43], to the inlet duct [2].
- (c) Remove the bolt [45] that attaches the lower inlet duct link [44] and bushing [46] to the inlet duct [2].

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- (d) Remove the bolt [32], washer [34] and nut [35] that attach the upper middle link [31] and bushing [38] to the heat exchanger [1].
- (e) Remove the bolt [37], bushing [38], washer [39] and nut [40] that attach the lower middle link [36] to the heat exchanger [1].
- (f) Remove the bolt [48], bushing [49], washer [50] and nut [51] that attaches the bottom link [47] to the heat exchanger [1] and remove the heat exchanger [1].

SUBTASK 24-11-04-480-002-002

- (15) Install the covers on all the tube-hoses and fittings.

SUBTASK 24-11-04-200-001-002

- (16) Examine and inspect the cooling air fin behind the Foreign Object Damage (FOD) fin for damage to the lamellas.
 - (a) If the cooling air fins that are located behind the lamellas are damaged, then the heat exchanger must be replaced.

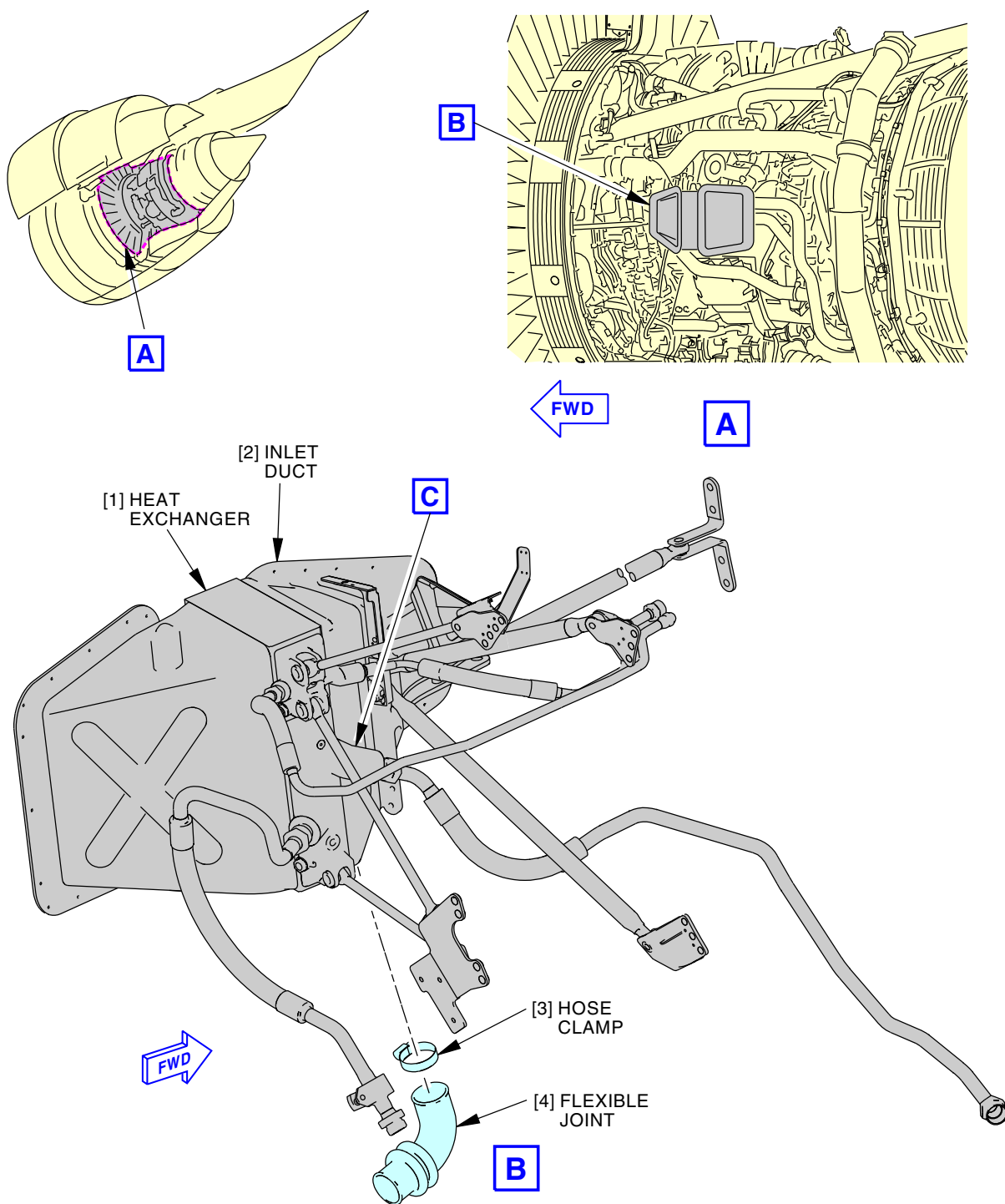
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N77194 S0006407969_V2

**IDG/VSCF Air/Oil Heat Exchanger Installation
Figure 401/24-11-04-990-803-002 (Sheet 1 of 5)**

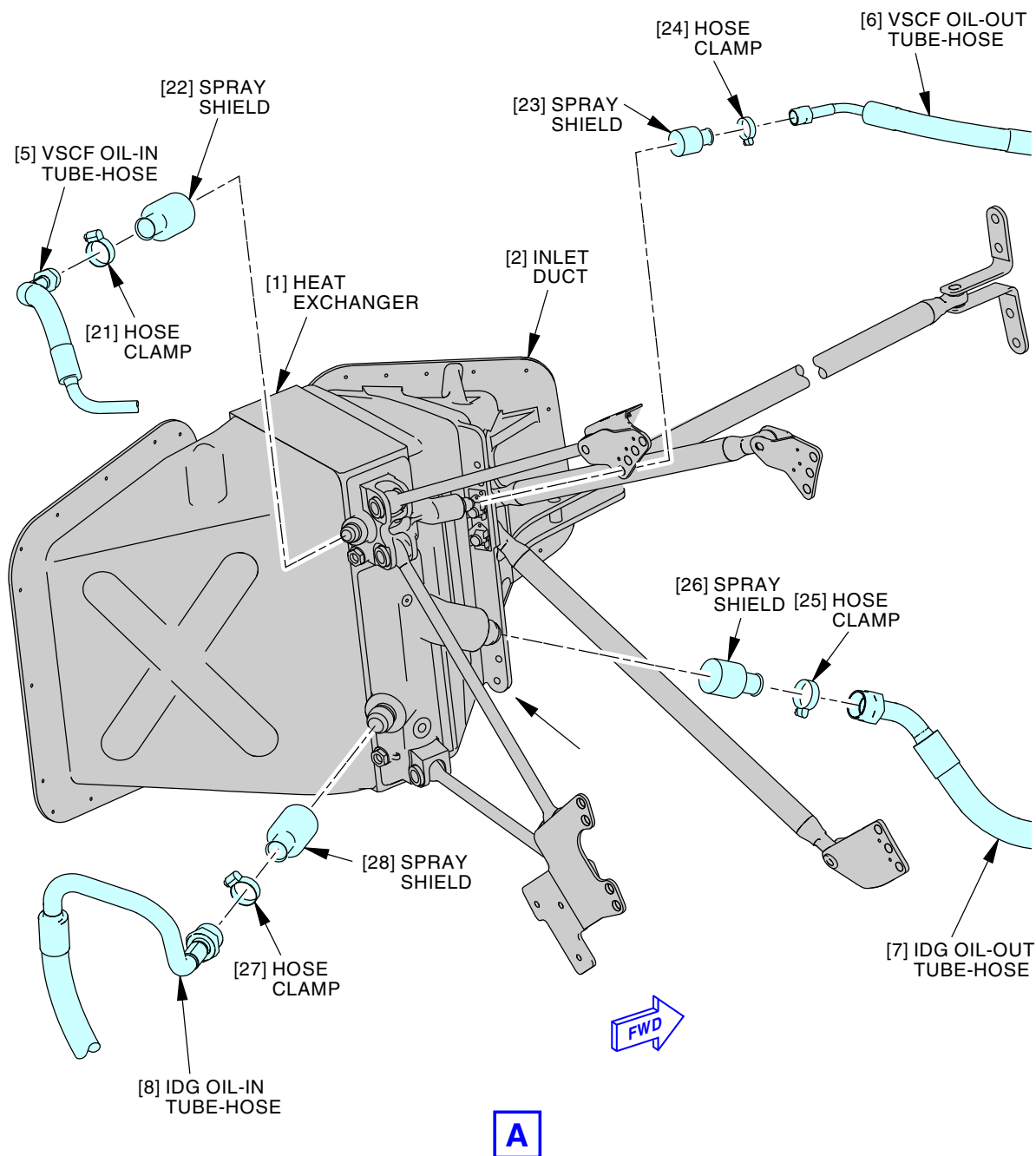
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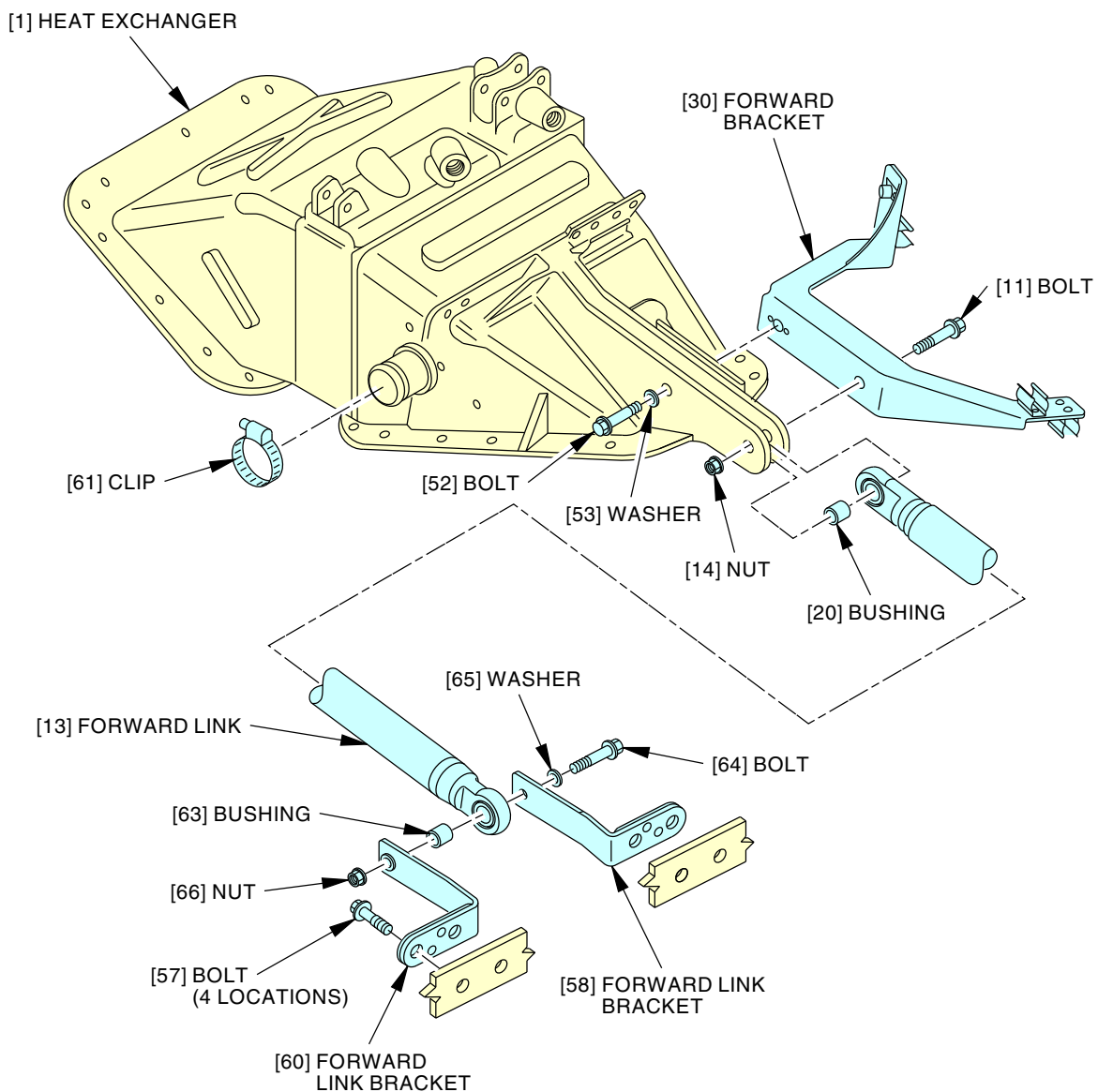
**IDG/VSCF Air/Oil Heat Exchanger Installation
Figure 401/24-11-04-990-803-002 (Sheet 2 of 5)**

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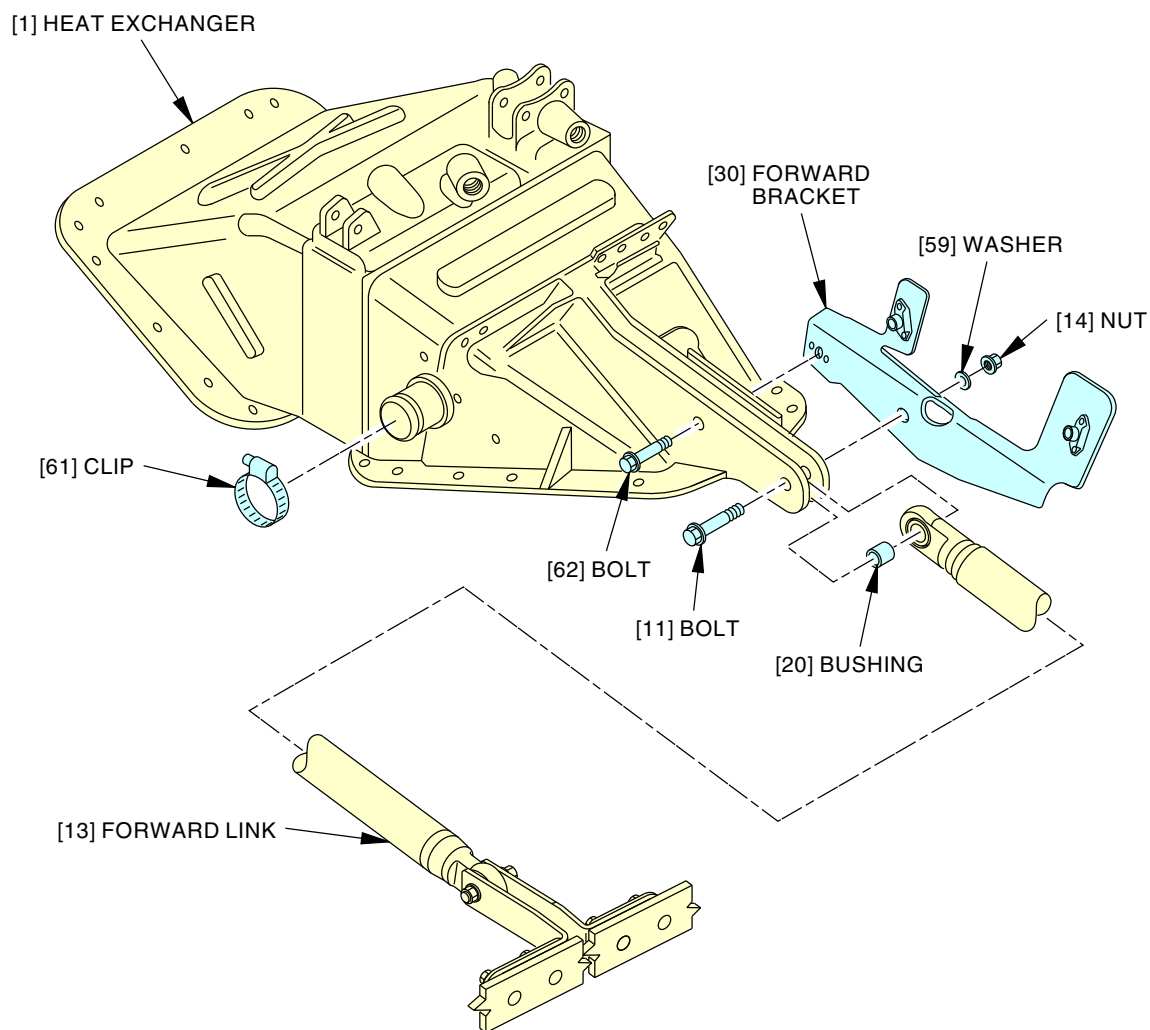
**IDG/VSCF Air/Oil Heat Exchanger Installation
Figure 401/24-11-04-990-803-002 (Sheet 3 of 5)**

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2608515 S0000626394_V1

**IDG/VSCF Air/Oil Heat Exchanger Installation
Figure 401/24-11-04-990-803-002 (Sheet 4 of 5)**

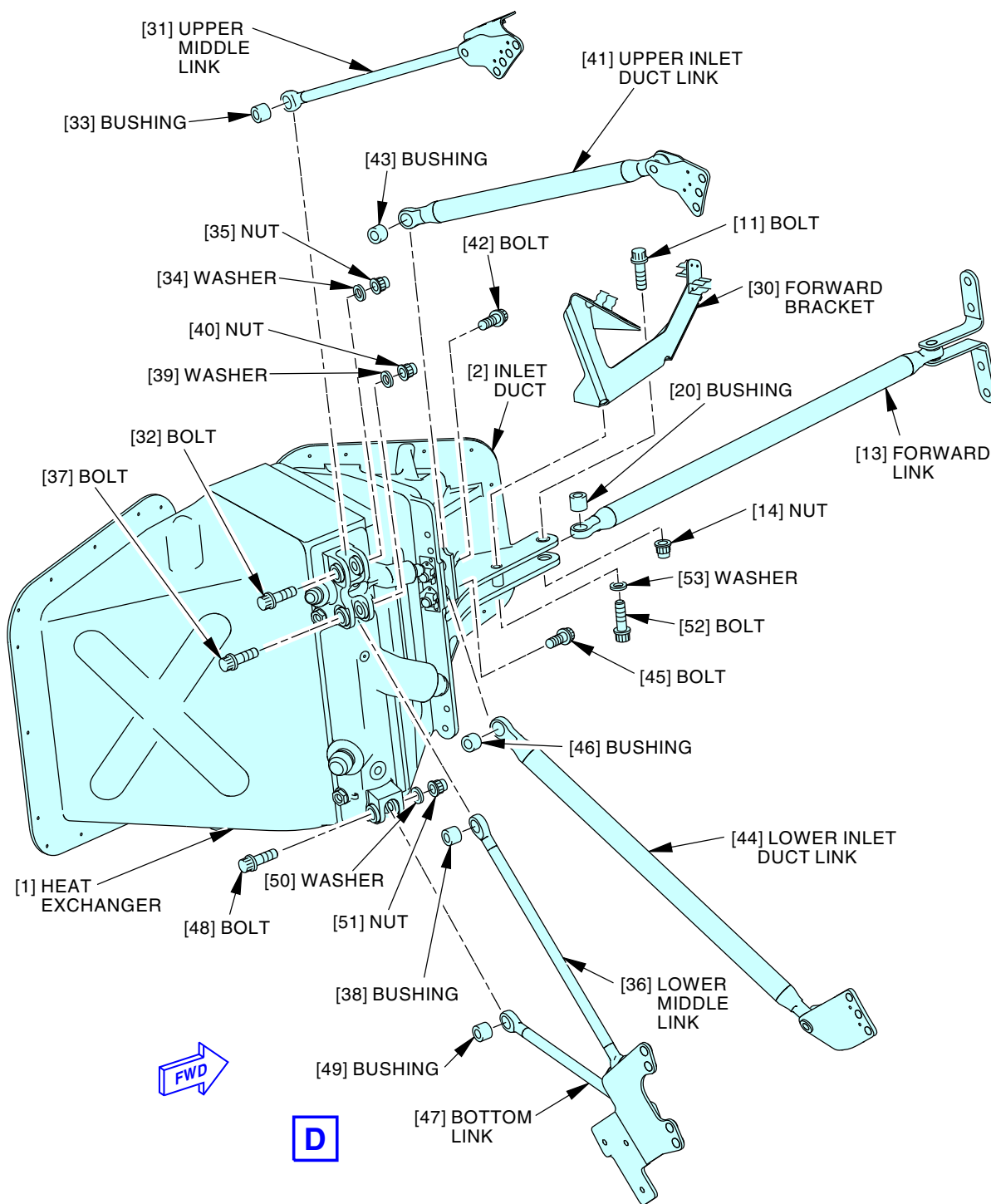
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IDG/VSCF Air/Oil Heat Exchanger Installation
Figure 401/24-11-04-990-803-002 (Sheet 5 of 5)

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TASK 24-11-04-400-802-002

3. IDG/Backup Generator Air/Oil Heat Exchanger Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Attach the IDG/backup generator air/oil heat exchanger (referred to as the heat exchanger) to the links.
- (2) Connect the oil tube-hoses to the heat exchanger.
- (3) Install the flexible joint to the inlet duct and attach with a hose clamp.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
12-13-07-600-801	Backup Generator Oil Fill (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
70-51-00-910-801-H01	Instruction for Torque (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D50043 [C02-058]	Compound - Antiseize, Acheson GP460 (For Threaded Fasteners 0.250 Inches Diameter Or Larger, C02-079 Is An Alternative)	GE A50TF201 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Heat exchanger	72-00-51-31B-253	ARO ALL
30	Forward bracket	72-00-51-31B-180	ARO ALL
		72-00-51-31B-184	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

G. Heat Exchanger Installation

SUBTASK 24-11-04-080-002-002

- (1) Remove the covers from all the tube-hoses and fittings.

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SUBTASK 24-11-04-420-019-002

- (2) Install the heat exchanger [1].
 - (a) Apply the lubricant Acheson GP460 compound, D50043 [C02-058] to the friction surfaces of all the bushings.
 - (b) Hold the heat exchanger [1] in position and attach the bottom link [47] to the heat exchanger [1] and install the bolt [48], bushing [49], washer [50] and nut [51].
 - (c) Tighten the nut [51] with your hand.
 - (d) Attach the lower middle link [36], and bushing [38], to the heat exchanger [1] and install the bolt [37], washer [39] and nut [40].
 - (e) Tighten the nut [40] with your hand.
 - (f) Attach the upper middle link [31], and bushing [33], to the heat exchanger [1] and install the bolt [32], washer [34] and nut [35].
 - (g) Tighten the nut [35] with your hand.
 - (h) Attach the lower inlet duct link [44], and bushing [46], to the inlet duct [2] and install the bolt [45].
 - (i) Tighten the bolt [45] with your hand.
 - (j) Attach the upper inlet duct link [41], and bushing [43] to the inlet duct [2] and install the bolt [42].
 - (k) Tighten the bolt [42] with your hand.
 - (l) Attach the forward link [13] to the inlet duct [2]:
 - 1) For forward bracket configuration (A) install the bolt [11], bolt head up, bushing [20] and nut [14], refer to Figure 401 Sheet 3.
 - 2) For forward bracket configuration (B) install the bolt [11], bolt head down, bushing [20], washer [59] and nut [14], refer to Figure 401 Sheet 4.
 - (m) Tighten the nut [14] with your hand.
 - (n) Tighten the nut [51] that attaches the bottom link [47], and bushing [49], to the heat exchanger [1] to 368 in-lb (42 N·m) - 432 in-lb (49 N·m).
 - (o) Tighten the nut [40] that attaches the lower middle link [36] and bushing [38], to the heat exchanger [1] to 368 in-lb (42 N·m) - 432 in-lb (49 N·m).
 - (p) Tighten the nut [35] that attaches the upper middle link [31] and bushing [33] to the heat exchanger [1] to 368 in-lb (42 N·m) - 432 in-lb (49 N·m).
 - (q) Tighten the bolt [45] that attaches the lower inlet duct link [44] to the inlet duct [2] to 368 in-lb (42 N·m) - 432 in-lb (49 N·m).
 - (r) Tighten the bolt [42] that attaches the upper inlet duct link [41] to the inlet duct [2] to 368 in-lb (42 N·m) - 432 in-lb (49 N·m).
 - (s) Tighten the nut [14] that attaches the forward link [13] to the inlet duct [2] to 368 in-lb (42 N·m) - 432 in-lb (49 N·m).

SUBTASK 24-11-04-420-020-002

- (3) Connect the backup generator VSCF oil-in tube-hose [5] to the heat exchanger [1].
 - (a) Tighten the B-nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-11-04-420-021-002

- (4) Do these steps to install the spray shield [22]:
 - (a) Clean the spray shield [22].

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- (b) Install the spray shield [22] to the backup generator VSCF oil-in tube-hose [5] at the heat exchanger [1] with the hose clamp [21].
- (c) Tighten the hose clamp [21] to a torque of 30 in-lb (3 N·m) - 40 in-lb (5 N·m).

SUBTASK 24-11-04-420-022-002

- (5) Connect the backup generator VSCF oil-out tube-hose [6] to the heat exchanger [1].
 - (a) Tighten the B-nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-11-04-420-023-002

- (6) Do these steps to install the spray shield [23]:
 - (a) Clean the spray shield [23].
 - (b) Install the spray shield [23] to the backup generator VSCF oil-out tube-hose [6] at the heat exchanger [1] with the hose clamp [24].
 - (c) Tighten the hose clamp [24] to a torque of 30 in-lb (3 N·m) - 40 in-lb (5 N·m).

SUBTASK 24-11-04-420-024-002

- (7) Connect the IDG oil-out tube-hose [7] to the heat exchanger [1].
 - (a) Tighten the B-nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-11-04-420-025-002

- (8) Do these steps to install the spray shield [26]:
 - (a) Clean the spray shield [26].
 - (b) Install the spray shield [26] to the IDG oil-out tube-hose [7] from the heat exchanger [1] with the hose clamp [25].
 - (c) Tighten the hose clamp [25] to a torque of 30 in-lb (3 N·m) - 40 in-lb (5 N·m).

SUBTASK 24-11-04-420-026-002

- (9) Connect the IDG oil-in tube-hose [8] to the heat exchanger [1].
 - (a) Tighten the B-nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-11-04-420-027-002

- (10) Do these steps to install the spray shield [28]:
 - (a) Clean the spray shield [28].
 - (b) Install the spray shield [28] to the IDG oil-in tube-hose [8] from the heat exchanger [1] with the hose clamp [27].
 - (c) Tighten the hose clamp [27] to a torque of 30 in-lb (3 N·m) - 40 in-lb (5 N·m).

SUBTASK 24-11-04-420-028-002

- (11) Install the flexible joint [4] to the inlet duct [2] and attach with a hose clamp [3].
 - (a) Tighten the hose clamp [3] to a torque of 30 in-lb (3 N·m) - 40 in-lb (5 N·m).

SUBTASK 24-11-04-420-029-002

- (12) Install the electrical harnesses to the spring clips on the forward bracket [30].

SUBTASK 24-11-04-420-047

- (13) Install the bracket with four bolts to the heat exchanger [1].
 - (a) Tighten the bolts to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

SUBTASK 24-11-04-420-048

- (14) Install the bracket with three washers [53] to the heat exchanger [1].
 - (a) Tighten bolts to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

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SUBTASK 24-11-04-610-003-002

- (15) Do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.

SUBTASK 24-11-04-610-004-002

- (16) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

H. Heat Exchanger Installation Test

SUBTASK 24-11-04-790-002-002

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

I. Put the Airplane Back to its Usual Condition

SUBTASK 24-11-04-410-003-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— END OF TASK —————

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IDG/BACKUP GENERATOR (VSCF) AIR/OIL HEAT EXCHANGER - INSPECTION/CHECK

1. General

A. This procedure has one task:

- (1) The inspection/check of the IDG/backup generator (VSCF) air/oil heat exchanger.

TASK 24-11-04-200-801

2. IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger Inspection/Check

A. General

- (1) This task is the inspection/check of the IDG/backup generator (VSCF) air/oil heat exchanger.

B. References

Reference	Title
24-11-04-000-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Removal (P/B 401)
24-11-04-300-801	IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger Repair (P/B 801)
24-11-04-400-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

E. Prepare for Inspection

SUBTASK 24-11-04-010-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

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- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

F. IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger Inspection

NOTE: With the thrust reverser open, it is normal for the links and bushings to allow movement.

SUBTASK 24-11-04-220-001

- (1) Visually inspect the upper inlet duct link [1] and lower link [3] and the forward link [2] for these conditions:

- (a) Cracks

- 1) No cracks are permitted.

- (b) Nicks or scratches on the long tubular section

- 1) Nicks or scratches are permitted with these conditions:

- a) The depth of the nick or scratch is not more than 0.010 in. (0.254 mm).

- b) The length of the nick or scratch is not more than 0.300 in. (7.620 mm) - 0.500 in. (12.700 mm) in length.

- c) The nicks or scratches are separated by more than 0.250 in. (6.350 mm).

- 2) Nicks or scratches with these conditions are repairable by blending:

- a) The depth of the nick or scratch is 0.010 in. (0.254 mm) - 0.015 in. (0.381 mm)

- b) The length of the nick or scratch is 0.300 in. (7.620 mm) - 0.500 in. (12.700 mm).

- c) The nicks or scratches are separated by more than 0.250 in. (6.350 mm).

- 3) Nicks or scratches with these conditions are not permitted:

- a) The depth of the nick or scratch is more than 0.015 in. (0.381 mm).

- b) The length of the nick or scratch is more than 0.500 in. (12.700 mm).

- c) The nicks or scratches are separated by not more than 0.250 in. (6.350 mm).

- (c) Nicks or scratches on the rod end:

- 1) Nicks or scratches are permitted with these conditions:

- a) The depth of the nick or scratch is not more than 0.020 in. (0.508 mm).

- b) The length of the nick or scratch is not more than 0.300 in. (7.620 mm).

- c) The nicks or scratches are separated by more than 0.250 in. (6.350 mm).

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- 2) Nicks or scratches with these conditions are repairable by blending:
 - a) The depth of the nick or scratch is 0.020 in. (0.508 mm) - 0.030 in. (0.762 mm).
 - b) The length of the nick or scratch is 0.300 in. (7.620 mm) - 0.500 in. (12.700 mm).
 - c) The nicks or scratches are separated by more than 0.250 in. (6.350 mm).
- 3) Nicks or scratches with these conditions are not permitted:
 - a) The depth of the nick or scratch is more than 0.30 in. (7.62 mm).
 - b) The length of the nick or scratch is more than 0.500 in. (12.700 mm).
 - c) The nicks or scratches are separated by not more than 0.250 in. (6.350 mm).
- (d) Wear on the rod end ball bearing:
 - 1) Wear is permitted if the depth is not more than 0.030 in. (0.762 mm).
 - 2) Wear is not permitted if the depth is more than 0.030 in. (0.762 mm).

NOTE: It is permitted to run the engine for 1,000 cycles after exceeding the maximum wear for the rod end ball bearing.
- (2) Visually inspect the IDG/backup generator (VSCF) air/oil heat exchanger support flanges of the forward, upper and lower inlet links for wear or damage.
 - (a) Wear on the forward inlet link support flange (Figure 601, View F):
 - 1) Wear is permitted if the minimum thickness of the lower lug is more than 0.230 in. (5.842 mm). The bushing in the lug must be flush or recessed below the flange surface.
 - 2) Wear is permitted if the minimum thickness of the upper lug is more than 0.170 in. (4.318 mm). The bushing in the lug must be flush or recessed below the flange surface.
 - (b) If minimum material thickness is below the minimum thickness allowed, replace the IDG/backup generator (VSCF) air/oil heat exchanger.
 - 1) Do these tasks:
IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002 and IDG/Backup Generator Air/Oil Heat Exchanger Installation, TASK 24-11-04-400-802-002.
 - (c) Wear on the upper and lower inlet link support flanges (Figure 601, View G):
 - 1) Wear is permitted if the minimum thickness of the right side lug of the upper/lower inlet support flange is more than 0.190 in. (4.826 mm). The bushing in the lug must be flush or recessed below the flange surface.
 - 2) Wear is permitted if the minimum thickness of the left side lug of the upper/lower inlet support flange is more than 0.130 in. (3.302 mm). The bushing in the lug must be flush or recessed below the flange surface.
 - (d) If the minimum material thickness is below the minimum thickness allowed, replace the IDG/backup generator (VSCF) air/oil heat exchanger.
 - 1) Do these tasks:
IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002 and IDG/Backup Generator Air/Oil Heat Exchanger Installation, TASK 24-11-04-400-802-002.
- (3) Visually inspect the b-nut connections for nicks, scratches, or raised metal.

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- (a) Nicks and scratches that are less than 0.010 in. (0.254 mm) deep are allowed. No raised metal or cracks are allowed.
- (b) If you find a crack, replace the IDG/backup generator (VSCF) air/oil heat exchanger.
 - 1) Do these tasks:
IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002 and IDG/Backup Generator Air/Oil Heat Exchanger Installation, TASK 24-11-04-400-802-002
- (c) If you find nicks, scratches, or raised metal that are more than 0.10 in. (2.54 mm), replace the IDG/backup generator (VSCF) air/oil heat exchanger.
 - 1) Do these tasks:
IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002 and IDG/Backup Generator Air/Oil Heat Exchanger Installation, TASK 24-11-04-400-802-002
- (d) If you find nicks, scratches, or high metal that are between 0.10 in. (2.54 mm) and 0.10 in. (2.54 mm) deep, do the repair for IDG/backup generator (VSCF) air/oil heat exchanger b-nut connection area damage, IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger Repair, TASK 24-11-04-300-801.
 - 1) Repair nicks, scratches or raised metal in less than 1,000 flight cycles.

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- (4) Do a visual inspection of the IDG/Backup Generator Air/Oil Heat Exchanger inlet.
 - (a) Look for damaged cooling fins or blockage on each side of the IDG/Backup Generator Air/Oil Heat Exchanger.
 - (b) If the length of the damaged fins and blocked layers on the IDG side of the Heat Exchanger is a total of more than 3.8 in. (96.52 mm), replace the IDG/Backup Generator Air/Oil Heat Exchanger.
 - 1) Do these tasks:
IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002 and IDG/Backup Generator Air/Oil Heat Exchanger Installation, TASK 24-11-04-400-802-002.
 - (c) If the length of the damaged fins and blocked layers on the Backup Generator side of the Heat Exchanger is a total of more than 3.8 in. (96.52 mm), replace the IDG/Backup Generator Air/Oil Heat Exchanger.
 - 1) Do these tasks:
IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002 and IDG/Backup Generator Air/Oil Heat Exchanger Installation, TASK 24-11-04-400-802-002.

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G. Put the Airplane Back to the Usual Condition.

SUBTASK 24-11-04-410-002

 WARNING	DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

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- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

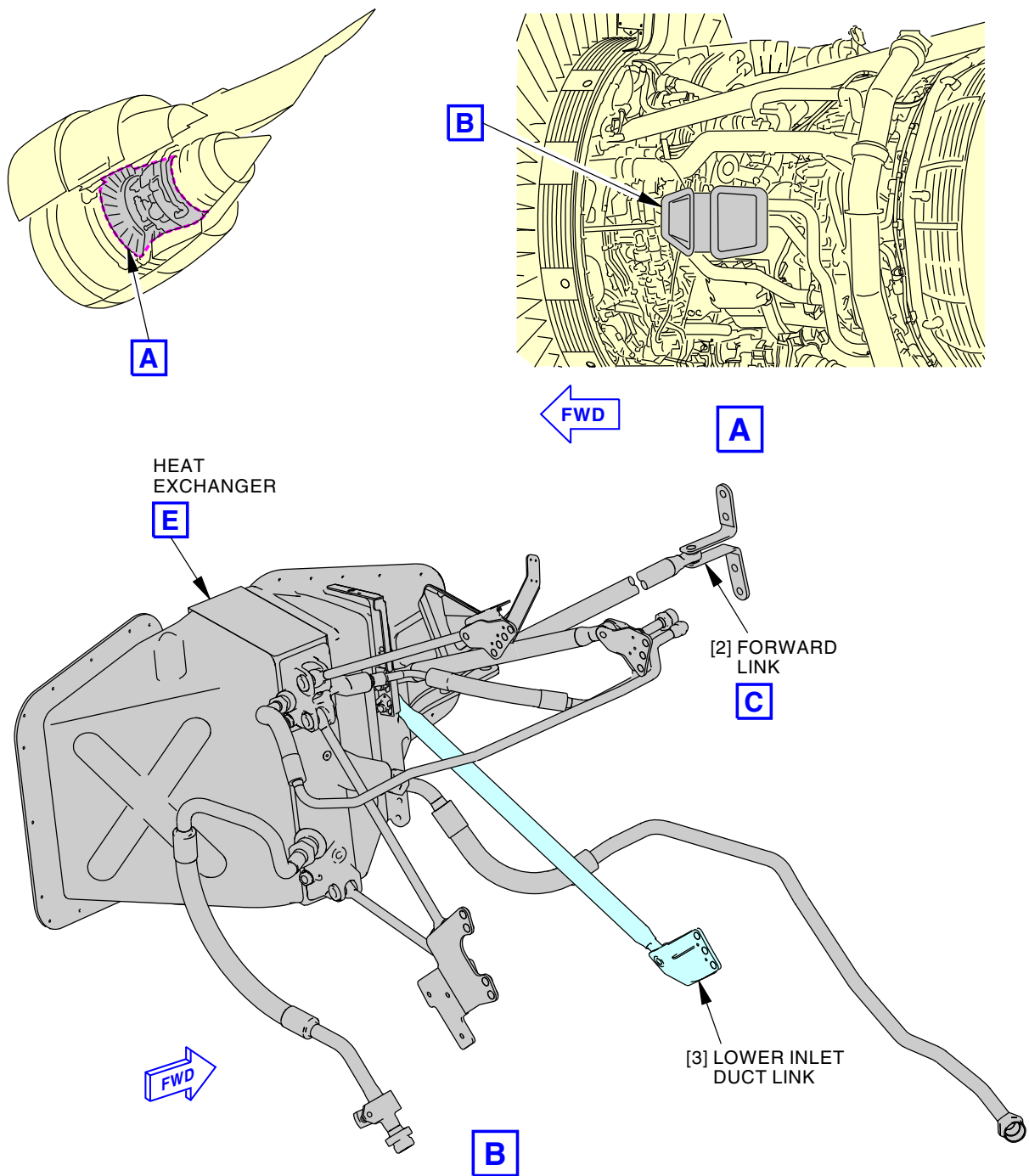
————— **END OF TASK** —————

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IDG/VSCF Air/Oil Heat Exchanger Inspection
Figure 601/24-11-04-990-802 (Sheet 1 of 3)

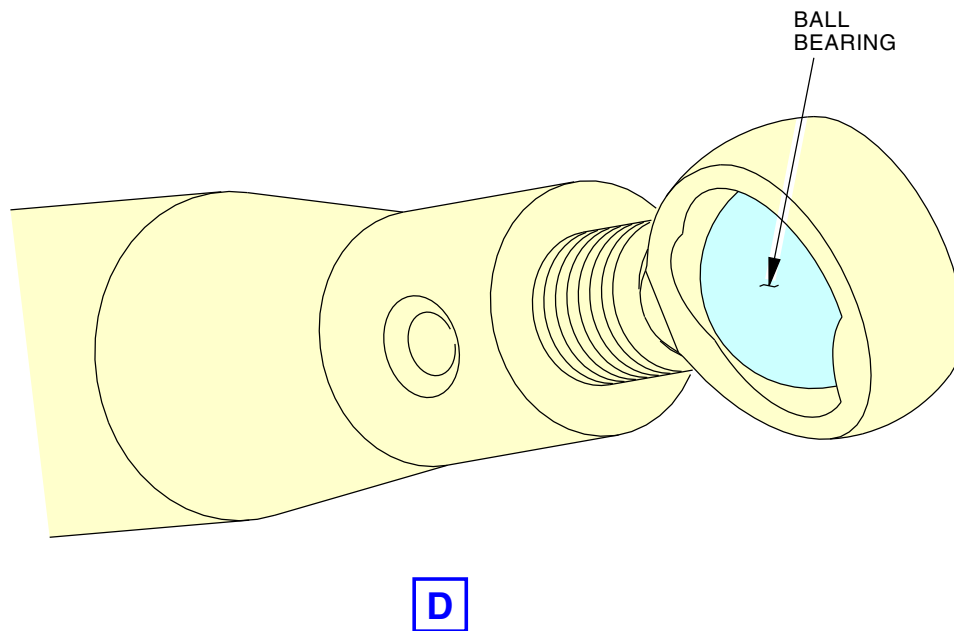
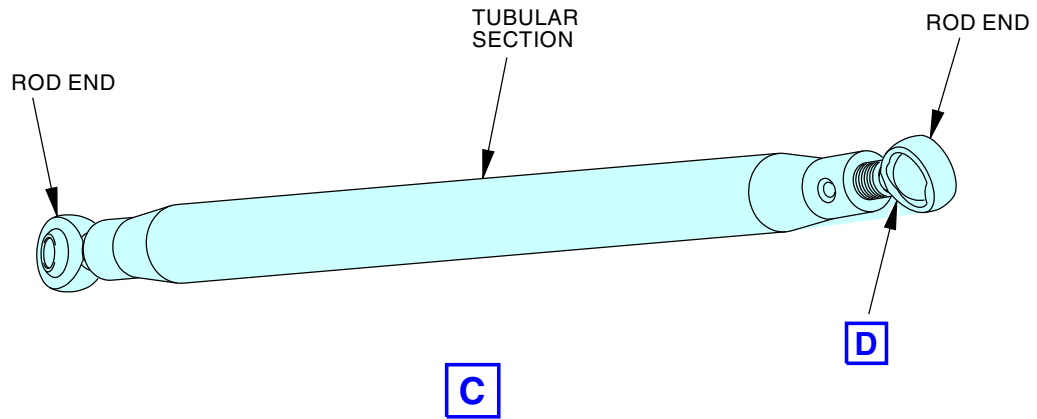
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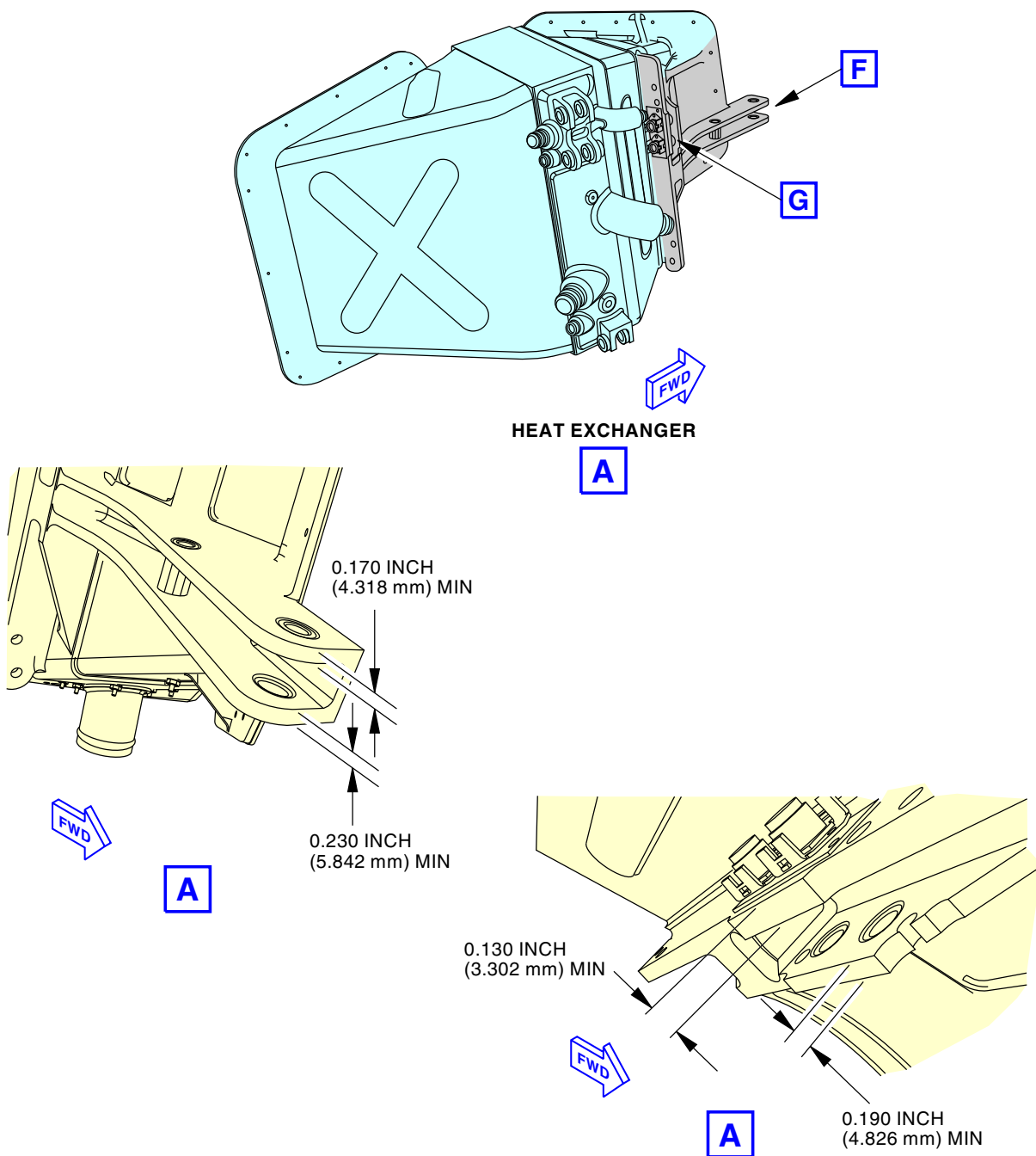
IDG/VSCF Air/Oil Heat Exchanger Inspection
Figure 601/24-11-04-990-802 (Sheet 2 of 3)

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**IDG/VSCF Air/Oil Heat Exchanger Inspection
Figure 601/24-11-04-990-802 (Sheet 3 of 3)**

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IDG/VSCF AIR/OIL HEAT EXCHANGER - CLEANING

1. General

- A. This procedure contains a task to clean the IDG/VSCF air/oil heat exchanger.
- B. You must remove the heat exchanger from the airplane before you do this task.
- C. There is one IDG/VSCF air/oil heat exchanger on each engine. The heat exchanger is attached to the high pressure compressor case (left side as viewed from the rear) at approximately the 9 o'clock position.

TASK 24-11-04-100-801

2. IDG/VSCF Air/Oil Heat Exchanger Cleaning

A. **Consumable Materials**

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
B00677	Cleaner - Water Soluble - F0268-ALO	

B. **Location Zones**

Zone	Area
411	Engine, Left
421	Engine, Right

C. **IDG/VSCF Air/Oil Heat Exchanger Cleaning**

SUBTASK 24-11-04-170-001

- (1) Do the steps that follow to clean the heat exchanger:



DRY-CLEANING SOLVENT IS TOXIC AND FLAMMABLE. DO NOT BREATHE VAPORS. USE IN WELL VENTILATED AREA FREE FROM SPARKS, FLAME, OR HOT SURFACES. WEAR SPLASH GOGGLES, SOLVENT-RESISTANT GLOVES, AND OTHER PROTECTIVE GEAR. IN CASE OF EYE CONTACT, FLUSH WITH WATER AND SEEK MEDICAL ATTENTION. IN CASE OF SKIN CONTACT, WASH WITH SOAP AND WATER.

- (a) Use solvent, B00074 to clean the external areas of the heat exchanger.
- (b) Flush the interior of the heat exchanger as follows:



DRY-CLEANING SOLVENT IS TOXIC AND FLAMMABLE. DO NOT BREATHE VAPORS. USE IN WELL VENTILATED AREA FREE FROM SPARKS, FLAME, OR HOT SURFACES. WEAR SPLASH GOGGLES, SOLVENT-RESISTANT GLOVES, AND OTHER PROTECTIVE GEAR. IN CASE OF EYE CONTACT, FLUSH WITH WATER AND SEEK MEDICAL ATTENTION. IN CASE OF SKIN CONTACT, WASH WITH SOAP AND WATER.



DO NOT USE CHLORINATED SOLVENTS TO FLUSH THE OIL CIRCUIT OR THE HEAT EXCHANGER. SOLVENT RESIDUE WILL CONTAMINATE THE OIL SUPPLY OF THE REPLACEMENT IDG AND CAUSE PREMATURE CLOGGING OF THE OIL FILTER.

- 1) Attach the IDG oil out port of the unit to the pressure test stand.

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- 2) Pressure-flush the heat exchanger at a flow that produces 25 psi (172 kPa) - 30 psi (207 kPa).
- 3) Flush the interior of the heat exchanger for 5 to 10 minutes with a F0268-ALO cleaner, B00677, at approximately 140°F (60°C).
- 4) Attach the VSCF out port of unit to pressure test stand.
- 5) Flush the heat exchanger for 5 to 10 minutes with a F0268-ALO cleaner, B00677, at approximately 140°F (60°C).
- 6) Flush the interior of the heat exchanger with clean water or steam.

———— **END OF TASK** ————

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IDG/BACKUP GENERATOR (VSCF) AIR/OIL HEAT EXCHANGER - REPAIRS

1. General

- A. This procedure is to repair the IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger b-nut connections.

TASK 24-11-04-300-801

2. IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger Repair

A. General

- (1) This procedure is a repair of the IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger.
(2) You must open the applicable thrust reverser to get access to the IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
70-43-42-300-801-H01	Blending Procedures (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
C00057	Primer - Zinc Chromate	TT-P-1757B
G01659	Swab - Cotton Or Rayon, (Disposable)	

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

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F. Prepare for the Repair

SUBTASK 24-11-04-010-005



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER(S). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR

- (1) Do these tasks in sequence to safely open the left or right thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left or right fan cowl panels, do this task:
Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (e) For the left or right thrust reversers, do this task:
Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

G. Procedure

SUBTASK 24-11-04-300-001

NOTE: This repair is only for the area of the b-nut connections on the IDG/Backup Generator (VSCF) Air/Oil Heat Exchanger.

- (1) Blend the nicks, scratches, or high metal.

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Blending Procedures, TASK 70-43-42-300-801-H01

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DO NOT GET ZINC CHROMATE PRIMER IN YOUR MOUTH OR EYES OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ZINC CHROMATE PRIMER. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ZINC CHROMATE PRIMER. KEEP ZINC CHROMATE PRIMER AWAY FROM SPARKS, FLAMES, OR HEAT. ZINC CHROMATE PRIMER IS A POISONOUS AND FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Use the swab, G01659, to apply primer, C00057 to the blended area.
- (3) Replace the related spray shield.

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H. Return the Airplane Back to its usual condition

SUBTASK 24-11-04-410-005

(1) Do these tasks in sequence to safely close the left or right thrust reverser on the applicable engine:

(a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.

1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

(b) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.

1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

(c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

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IDG FUEL/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has two tasks:
 - (1) A removal of the IDG fuel/oil heat exchanger.
 - (2) An installation of the IDG fuel/oil heat exchanger.

TASK 24-11-06-000-801

2. IDG Fuel/Oil Heat Exchanger Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The IDG fuel/oil heat exchanger (referred to as the heat exchanger) is located on the forward side of the fuel adapter on the right-hand side of the accessory gearbox.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

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

D. Consumable Materials

Reference	Description	Specification
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
414AR	Right Fan Cowl Panel, Left Engine
416AR	Right Thrust Reverser, Left Engine
424AR	Right Fan Cowl Panel, Right Engine
426AR	Right Thrust Reverser, Right Engine

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G. Prepare for the Removal

SUBTASK 24-11-06-010-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER(S). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR

(1) Do these tasks in sequence to safely open the right thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(d) For the right fan cowl panel, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

414AR	Right Fan Cowl Panel, Left Engine
424AR	Right Fan Cowl Panel, Right Engine

(e) For the right thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

416AR	Right Thrust Reverser, Left Engine
426AR	Right Thrust Reverser, Right Engine

H. IDG Fuel/Oil Heat Exchanger Removal

SUBTASK 24-11-06-680-001

(1) Drain the fuel from the fuel filter.

- (a) Put a oil resistant container (5 gal)(19 Liter), STD-1055 under the fuel filter bowl.



FUEL IS FLAMMABLE AND TOXIC TO THE SKIN, EYE, AND RESPIRATORY TRACT. SKIN AND EYE PROTECTION IS REQUIRED, AVOID REPEATED AND PROLONGED CONTACT. USE IN A WELL-VENTILATED AREA.

- (b) Remove the bleed plug [1] from the fuel filter bowl and drain the fuel into the container.
- (c) Remove and discard the o-ring [2] from the bleed plug [1].
- (d) Use a cotton wiper, G00034 to clean the bleed plug [1] to remove any possible unwanted material that is there.
- (e) Lubricate a new o-ring [2] with oil, D00552 [C02-019].
- (f) Install the o-ring [2] on the bleed plug.
- (g) Install the bleed plug [1] to the fuel filter bowl.
- (h) Tighten the bleed plug [1] to 105 in-lb (11.9 N·m) - 120 in-lb (13.6 N·m).

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SUBTASK 24-11-06-680-002



WARNING

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

- (2) Drain the oil from the heat exchanger.
 - (a) Place a oil resistant container (5 gal)(19 Liter), STD-1055 under the heat exchanger.

SUBTASK 24-11-06-020-001



WARNING

DO NOT OPEN THE IDG OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



WARNING

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

- (3) Disconnect the OIL IN tube-hose [4] from the heat exchanger.
 - (a) Drain the oil into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-06-080-001

- (4) Disconnect the OIL OUT tube-hose [3] from the heat exchanger.
 - (a) Drain the oil into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-06-020-002

- (5) Install covers on all oil tubes and fittings.

SUBTASK 24-11-06-020-003

- (6) Remove the heat exchanger [7] from the fuel adapter.
 - (a) Remove the nut [8] that attach the fuel out flange to the fuel adapter.
 - (b) Remove the nut [6] that attach the fuel in flange to the fuel adapter.
 - (c) Remove the mounting nut [9] that attaches the heat exchanger to the fuel adapter and remove the heat exchanger [7].
 - (d) Drain the oil into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - (e) Remove and discard the fuel in and fuel out seal [5] from the heat exchanger.
 - (f) Install covers over the heat exchanger to fuel adapter surfaces.

————— END OF TASK —————

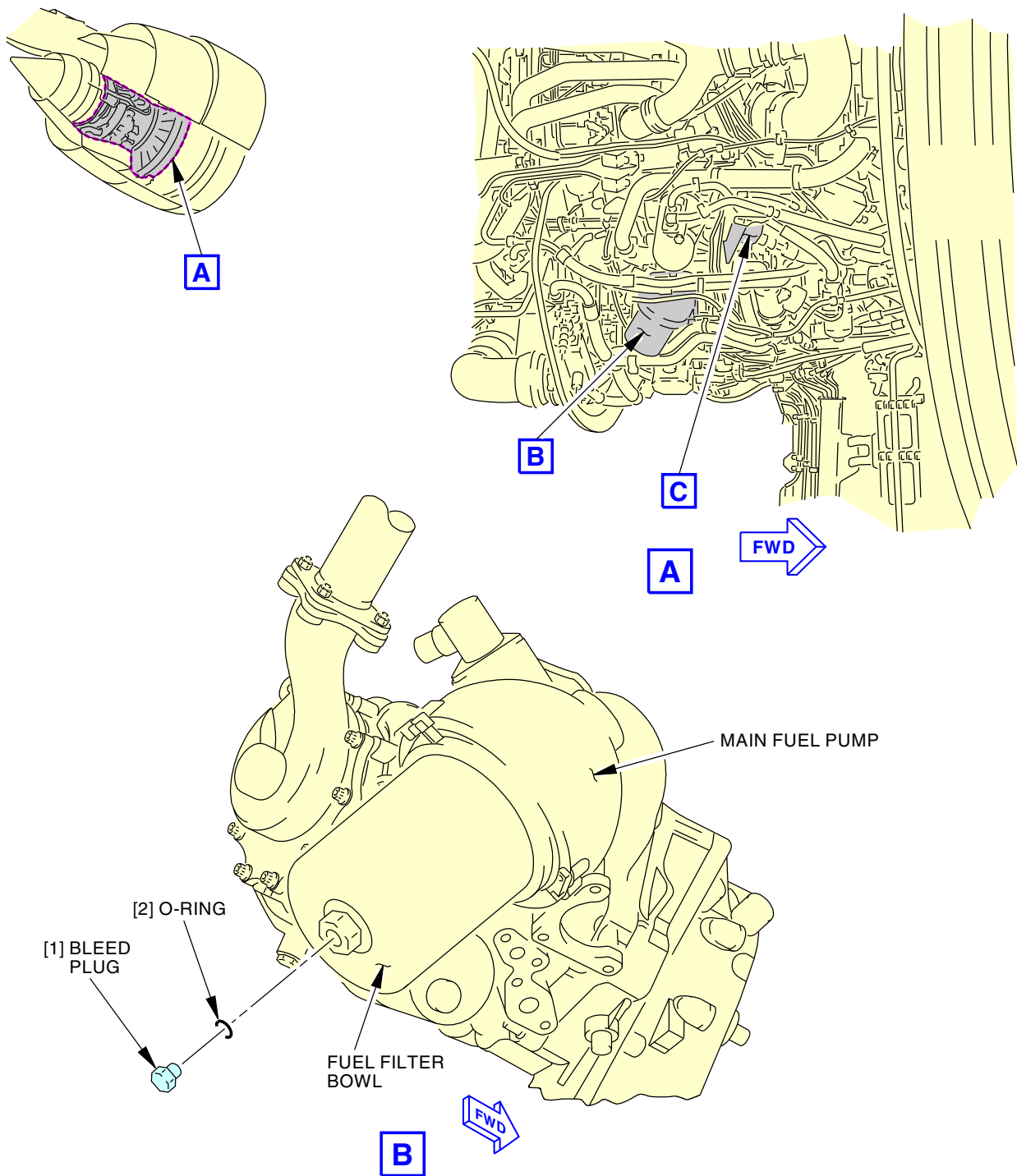
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IDG Fuel/Oil Heat Exchanger Installation
Figure 401/24-11-06-990-801 (Sheet 1 of 2)

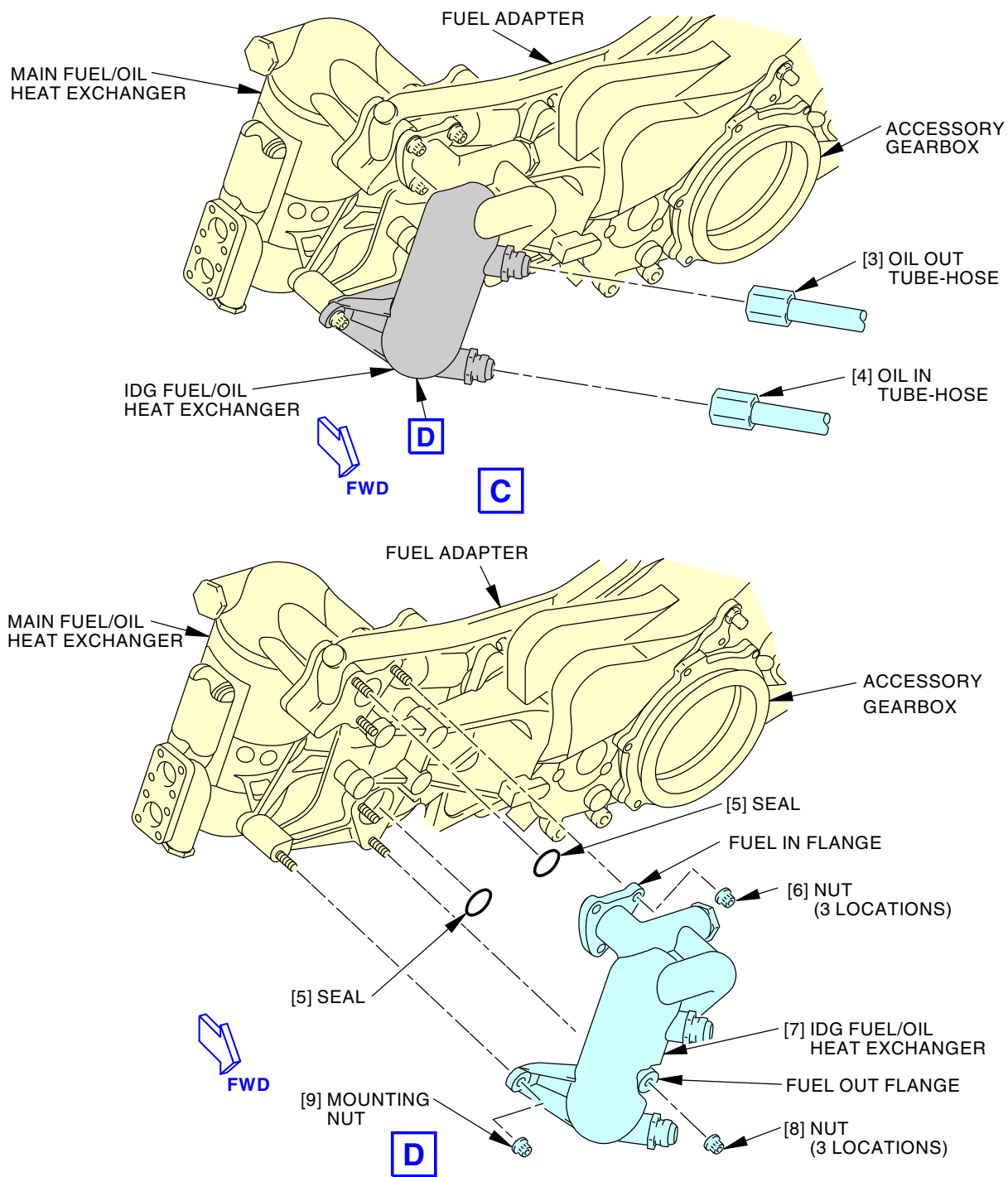
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**IDG Fuel/Oil Heat Exchanger Installation
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TASK 24-11-06-400-801

3. IDG Fuel/Oil Heat Exchanger Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The IDG fuel/oil heat exchanger (referred to as the heat exchanger) is located on the forward side of the fuel adapter on the right hand side of the accessory gearbox. The heat exchanger is located on the forward side of the fuel adapter on the right hand side of the accessory gearbox.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
70-51-00-910-801-H01	Instruction for Torque (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
D50043 [C02-058]	Compound - Antiseize, Acheson GP460 (For Threaded Fasteners 0.250 Inches Diameter Or Larger, C02-079 Is An Alternative)	GE A50TF201 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Heat exchanger	72-00-05-20E-015	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
414AR	Right Fan Cowl Panel, Left Engine
416AR	Right Thrust Reverser, Left Engine
424AR	Right Fan Cowl Panel, Right Engine
426AR	Right Thrust Reverser, Right Engine

G. IDG Fuel/Oil Heat Exchanger Installation

SUBTASK 24-11-06-420-001

- (1) Attach the heat exchanger to the fuel adapter.
- (a) Remove the covers from the heat exchanger to the fuel adapter surfaces.

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DO NOT USE OTHER ASSEMBLY AIDS. USE ONLY CLEAN OIL. OTHER ASSEMBLY AIDS MAY DISTORT THE SEALS AND CAUSE LEAKAGE.

- (b) Apply grease, D00504 on the new new seals [5].
- (c) Install the new seals [5] into the fuel-in port and fuel-out port in the heat exchanger.
- (d) Look at the ID of the seal [5] to make sure the spring did not push out of the groove when you installed them in the counterbores.
 - 1) You must replace the seal if the spring is pushed out of the grove.
- (e) Install the heat exchanger [7] over the studs in the fuel adapter.
- (f) Make sure the seals [5] are in place.
- (g) Apply Acheson GP460 compound, D50043 [C02-058] to the threads and friction surfaces of the nuts [6].
- (h) Install the nut [6] that attach the fuel in flange to the fuel adapter.
- (i) Tighten the nuts [6] with your hand.

NOTE: Tighten the outboard nut first.
- (j) Apply Acheson GP460 compound, D50043 [C02-058] to the threads and friction surfaces of the nuts [8].
- (k) Install the nut [8] that attach the fuel out flange to the fuel adapter.
- (l) Tighten the nuts [8] with your hand.
- (m) Tighten the nuts [6] to 170 in-lb (19 N·m) - 200 in-lb (23 N·m).
- (n) Tighten the nuts [8] to 170 in-lb (19 N·m) - 200 in-lb (23 N·m).
- (o) Hold the heat exchanger to the fuel adapter and install the mounting nut [9].
- (p) Tighten the mounting nut [9] with your hand.
- (q) Tighten the mounting nut [9] to 170 in-lb (19 N·m) - 200 in-lb (23 N·m).
- (r) Tighten the fuel-out nuts [8] to 226 in-lb (26 N·m) - 266 in-lb (30 N·m).
- (s) Tighten the fuel-in nut [6] to 226 in-lb (26 N·m) - 266 in-lb (30 N·m).
- (t) Tighten the mounting nut [9] to 226 in-lb (26 N·m) - 266 in-lb (30 N·m).

SUBTASK 24-11-06-080-002

- (2) Remove the covers from the oil tube-hoses and fittings.

SUBTASK 24-11-06-420-002

- (3) Connect the OIL IN tube-hose [4] to the heat exchanger.
 - (a) Tighten the nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-11-06-420-003

- (4) Connect the OIL OUT tube-hose [3] to the heat exchanger.
 - (a) Tighten the nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-11-06-610-001

- (5) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

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H. IDG Fuel/Oil Heat Exchanger Installation Test

SUBTASK 24-11-06-790-001

- (1) Do a leak check. To do the leak check, do this task: Power Plant Test Reference Table, TASK 71-00-00-800-833-H00

I. Put the Airplane Back to its Usual Condition.

SUBTASK 24-11-06-410-002

 WARNING	DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the right thrust reverser on the applicable engine:
- (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
- 1) Close these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-------------------------------------|
| 416AR | Right Thrust Reverser, Left Engine |
| 426AR | Right Thrust Reverser, Right Engine |
- (b) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
- 1) Close these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|------------------------------------|
| 414AR | Right Fan Cowl Panel, Left Engine |
| 424AR | Right Fan Cowl Panel, Right Engine |
- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

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IDG OIL CHECK VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the IDG oil check valve (Referred to as check valve).
- (2) An installation of the check valve.

TASK 24-11-10-000-803-002

2. IDG Oil Check Valve Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the check valve.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

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

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

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F. Prepare for the Removal

SUBTASK 24-11-10-010-007-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left and right fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

G. Check Valve Removal

SUBTASK 24-11-10-860-007-002



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

- (1) Put a oil resistant container (5 gal)(19 Liter), STD-1055 under the check valve.

SUBTASK 24-11-10-010-011

- (2) Remove the spray shield [10], clamp [11], spray shield [12] and clamp [13] from the check valve [3].

SUBTASK 24-11-10-010-008-002

- (3) Remove the bolt [2] that attaches the clamp [5] and the check valve [3] to the bracket [1].

SUBTASK 24-11-10-010-009-002

- (4) Remove the bolt [8] that attaches the clamp [9] and the check valve [3] to the bracket [1].

SUBTASK 24-11-10-860-008-002

- (5) Hold the check valve [3] with a wrench.

NOTE: Use the hex-nut on the check valve body that is next to the tube-hose.

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SUBTASK 24-11-10-020-007-002

- (6) Disconnect the oil tube-hose [4] from the check valve [3].

SUBTASK 24-11-10-020-008-002

- (7) Remove the clamp [5] and clamp [9] from the check valve [3].

SUBTASK 24-11-10-860-009-002

- (8) Hold the check valve [3] with a wrench.

NOTE: Use the hex-nut on the check valve body that is next to the temperature sensor.

SUBTASK 24-11-10-020-009-002

- (9) Remove the check valve [3] from the oil tube-hose [7].

SUBTASK 24-11-10-680-003-002

- (10) Drain the oil from the oil tube-hose [7] into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-10-020-010-002

- (11) Remove the preformed packing [6] from the check valve [3] and discard the packing [6].

SUBTASK 24-11-10-420-017-002

- (12) Install protective covers on all tube-hoses and fittings.

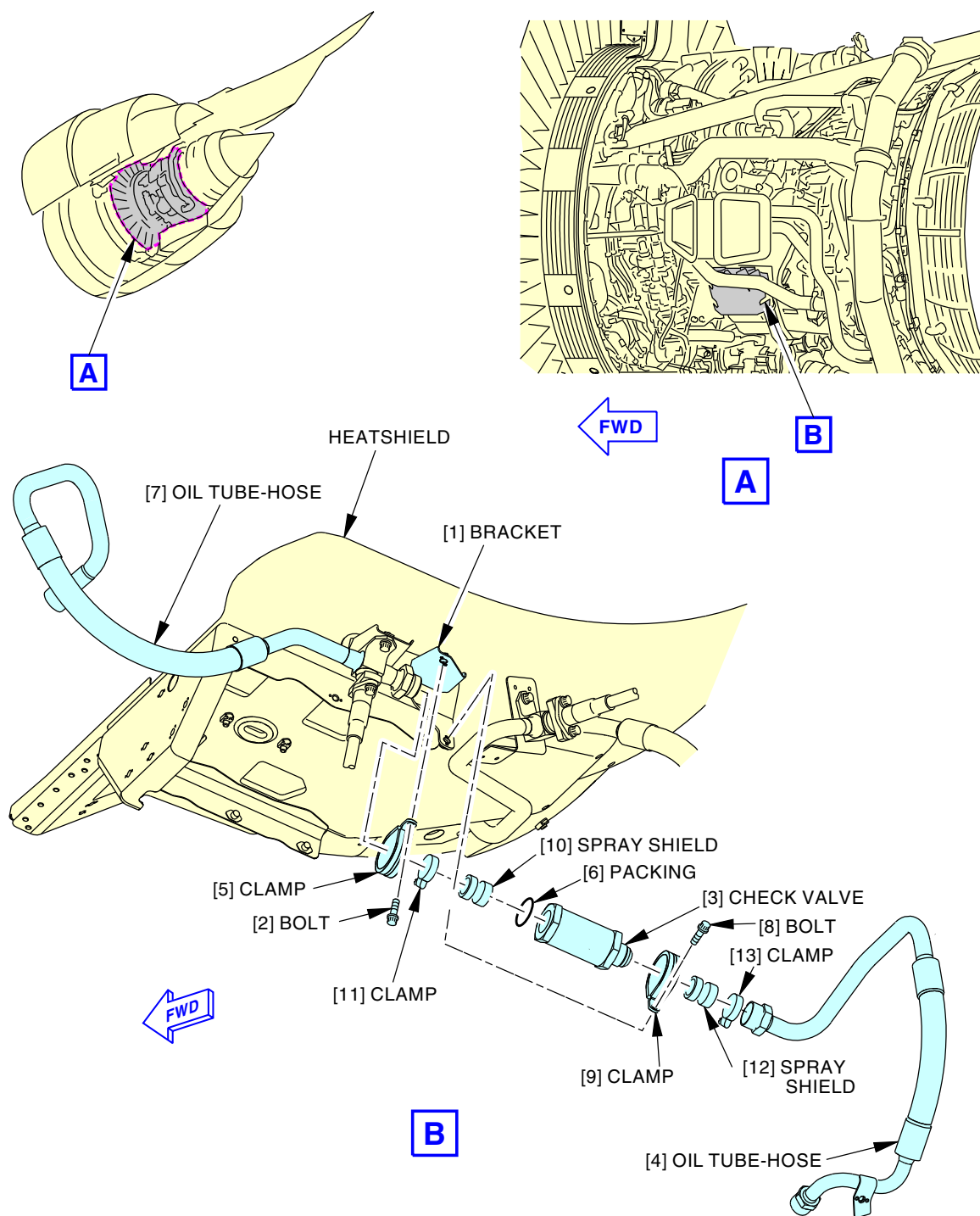
———— **END OF TASK** ————

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IDG Oil Check Valve Installation
Figure 401/24-11-10-990-803-002

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TASK 24-11-10-400-803-002

3. IDG Oil Check Valve Installation

(Figure 401)

A. General

- (1) This task gives instructions to install the check valve.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50043 [C02-058]	Compound - Antiseize, Acheson GP460 (For Threaded Fasteners 0.250 Inches Diameter Or Larger, C02-079 Is An Alternative)	GE A50TF201 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Check valve	24-11-01-02B-050	ARO ALL
6	Packing	24-11-01-02B-020	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

G. Check Valve Installation

SUBTASK 24-11-10-010-010-002

- (1) Remove the covers from all the tube-hoses and fittings.

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SUBTASK 24-11-10-420-018-002

- (2) Install the clamp [5] and the clamp [9] over the check valve [3].

SUBTASK 24-11-10-640-003-002

- (3) Lubricate a new preformed new packing [6] with clean oil, D00071 or oil, D00068.

SUBTASK 24-11-10-420-019-002

- (4) Install the preformed new packing [6] to the check valve [3].

SUBTASK 24-11-10-640-004-002

- (5) Lubricate the check valve [3] fitting that attaches to the oil tube-hose [4] with the Acheson GP460 compound, D50043 [C02-058]

SUBTASK 24-11-10-420-022-002

- (6) Connect the check valve [3] to the oil tube-hose [7].

NOTE: Use the hex-nut on the check valve body that is next to the temperature sensor.

- (a) Tighten the check valve [3] with the triple torque method as follows:

- 1) Tighten the B-nut connection to 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).
- 2) Loosen the B-nut of check valve and tighten it again to 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).
- 3) Apply the specified torque again to make sure the torque of the B-nut of the oil tube/hose is 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).

SUBTASK 24-11-10-420-020-002

- (7) Connect the oil tube-hose [4] to the check valve [3].

NOTE: Use the hex-nut on the check valve body that is next to the tube-hose.

SUBTASK 24-11-10-860-010-002

- (8) Hold the oil tube-hose [4] with a wrench.

SUBTASK 24-11-10-420-021-002

- (9) Tighten the oil tube-hose [4] with the triple torque method as follows:

- (a) Tighten the B-nut connection to 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).
- (b) Loosen the B-nut of the oil tube hose and tighten it again to 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).
- (c) Apply the specified torque again to make sure the torque of the B-nut of the oil tube/hose is 78 ft-lb (106 N·m) - 92 ft-lb (125 N·m).

SUBTASK 24-11-10-420-023-002

- (10) Install the bolt [2] that attaches the clamp [5] and the check valve [3] to the bracket [1].

SUBTASK 24-11-10-420-024-002

- (11) Install the bolt [8] that attaches the clamp [9] and the check valve [3] to the bracket [1].

SUBTASK 24-11-10-420-025-002

- (12) Tighten the bolt [2] and the bolt [8] to 55 in-lb (6 N·m) - 70 in-lb (8 N·m).

SUBTASK 24-11-10-420-026

- (13) Install the spray shield [12], clamp [13], spray shield [10] and clamp [11] on the check valve [3].
 - (a) Tighten clamp [13] and clamp [11] to 32 in-lb (3 N·m) - 38 in-lb (4 N·m).

SUBTASK 24-11-10-610-003-002

- (14) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

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H. IDG Oil Check Valve Installation Test

SUBTASK 24-11-10-710-003-002

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

I. Put the Airplane Back to its Usual Condition.

SUBTASK 24-11-10-410-003-002



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left and right thrust reversers on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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IDG OIL TEMPERATURE SENSORS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the IDG oil-in temperature sensor (Referred to as oil in temperature sensor).
- (2) An installation of the oil in temperature sensor.
- (3) A removal of the IDG oil out temperature sensor (Referred to as oil out temperature sensor).
- (4) An installation of the oil out temperature sensor.

TASK 24-11-14-000-805-001

2. IDG Oil In Temperature Sensor Removal

(Figure 401)

A. General

- (1) This task gives instructions to remove the oil in temperature sensor.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
70-00-01-400-807-H01	Electrical Connector - Disconnect and Connect (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Prepare for the Removal

SUBTASK 24-11-14-010-010-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

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- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. Oil In Temperature Sensor Removal

SUBTASK 24-11-14-020-012-001



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU DISCONNECT THEM. THE CONTAMINATION OF THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.



USE TEFLON-JAWED PLIERS TO LOOSEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTOR COULD OCCUR.

- (1) Disconnect the electrical connector [1] from the oil in temperature sensor [2] with teflon-jawed pliers, STD-664 (TASK 70-00-01-400-807-H01).

SUBTASK 24-11-14-020-013-001

- (2) Remove the two bolts [4] that attach the oil in temperature sensor [2] to the sensor adapter [3].

SUBTASK 24-11-14-020-014-001

- (3) Remove the oil in temperature sensor [2].

SUBTASK 24-11-14-480-007-001

- (4) Install a cover on the oil in temperature sensor adapter [3].

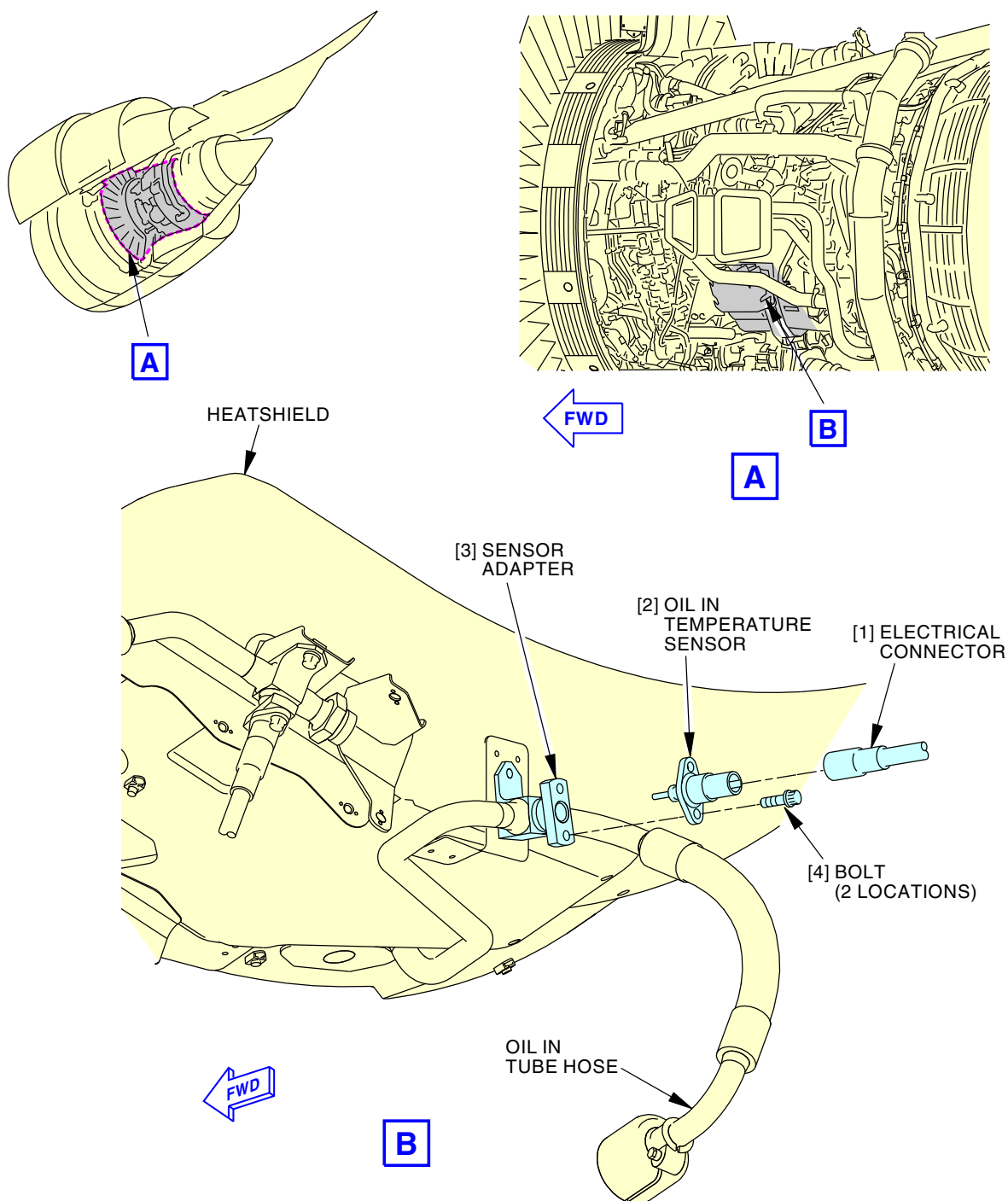
————— **END OF TASK** —————

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IDG Oil In Temperature Sensor Installation
Figure 401/24-11-14-990-807-001

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TASK 24-11-14-400-805-001

3. IDG Oil In Temperature Sensor Installation

(Figure 401)

A. General

(1) This task gives instructions to install the oil in temperature sensor.

B. References

Reference	Title
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
70-00-01-400-807-H01	Electrical Connector - Disconnect and Connect (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)

D. Consumable Materials

Reference	Description	Specification
D00634 [C02-060]	Compound - Antiseize, Lithium-Based - Never-Seize Regular Grade	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Oil in temperature sensor	79-34-01-02-015	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Oil In Temperature Sensor Installation

SUBTASK 24-11-14-010-011-001

(1) Remove the cover from the oil in temperature sensor adapter [3].

SUBTASK 24-11-14-640-002

(2) Put Never-Seize Regular Grade compound, D00634 [C02-060] on the inside of the sensor adapter [3].

SUBTASK 24-11-14-420-013-001

(3) Install the oil in temperature sensor [2] to the sensor adapter [3].

SUBTASK 24-11-14-420-014-001

(4) Install the two bolts [4].

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- (a) Tighten the bolts [4] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

SUBTASK 24-11-14-420-015-001



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU CONNECT THEM. THE CONTAMINATION OF THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.



USE TEFLON-JAWED PLIERS TO TIGHTEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTOR COULD OCCUR.

- (5) Connect the electrical connector [1] to the oil in temperature sensor [2] with teflon-jawed pliers, STD-664 (TASK 70-00-01-400-807-H01).

I. IDG Oil IN Temperature Sensor Installation Test

SUBTASK 24-11-14-710-005-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

J. Put the Airplane Back to its Usual Condition.

SUBTASK 24-11-14-410-004-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— END OF TASK —————

TASK 24-11-14-000-806-001

4. IDG Oil Out Temperature Sensor Removal

(Figure 402)

A. General

- (1) This procedure gives instructions to remove the oil out temperature sensor.

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B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
70-00-01-400-807-H01	Electrical Connector - Disconnect and Connect (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Prepare for the Removal

SUBTASK 24-11-14-010-012-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

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<u>Number</u>	<u>Name/Location</u>
425AL	Left Thrust Reverser, Right Engine

G. Oil Out Temperature Sensor Removal

SUBTASK 24-11-14-020-015-001



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU DISCONNECT THEM. THE CONTAMINATION OF THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.



USE TEFLON-JAWED PLIERS TO LOOSEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTOR COULD OCCUR.

- (1) Disconnect the electrical connector [8] from the oil out temperature sensor [6] with teflon-jawed pliers, STD-664 (TASK 70-00-01-400-807-H01).

SUBTASK 24-11-14-020-016-001

- (2) Remove the two bolts [7] that attach the oil out temperature sensor [6] to the sensor adapter [5].

SUBTASK 24-11-14-020-017-001

- (3) Remove the oil out temperature sensor [6].

SUBTASK 24-11-14-480-008-001

- (4) Install a cover on the oil out temperature sensor adapter [5].

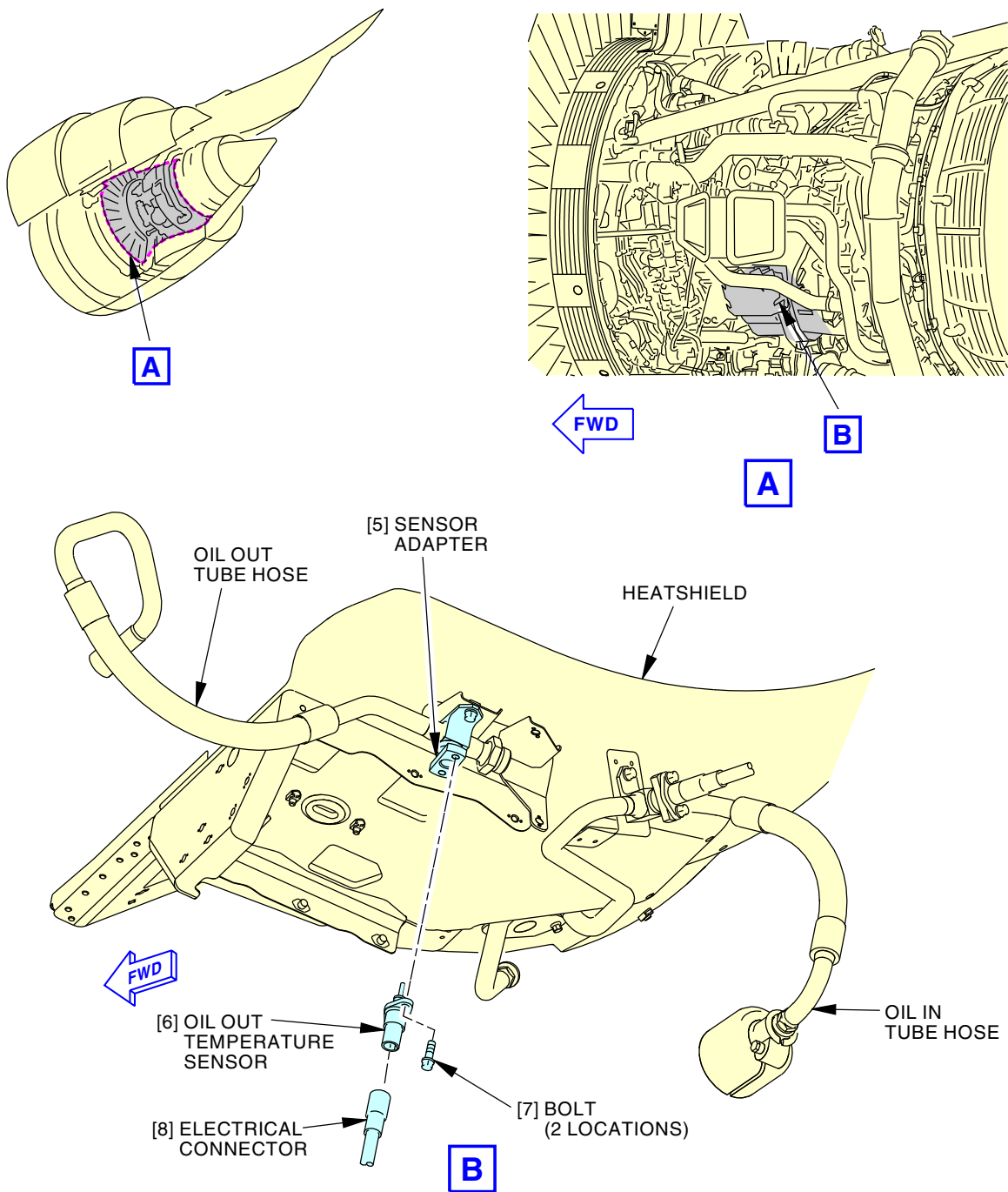
————— **END OF TASK** —————

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IDG Oil Out Temperature Sensor Installation
Figure 402/24-11-14-990-808-001

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TASK 24-11-14-400-806-001

5. IDG Oil Out Temperature Sensor Installation

(Figure 402)

A. General

- (1) This procedure gives instructions to install the oil out temperature sensor.

B. References

Reference	Title
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
70-00-01-400-807-H01	Electrical Connector - Disconnect and Connect (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)

D. Consumable Materials

Reference	Description	Specification
D00634 [C02-060]	Compound - Antiseize, Lithium-Based - Never-Seize Regular Grade	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Oil out temperature sensor	79-34-01-02-015	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Oil Out Temperature Sensor Installation

SUBTASK 24-11-14-010-013-001

- (1) Remove the cover from the oil out temperature sensor adapter [5].

SUBTASK 24-11-14-640-001

- (2) Put Never-Seize Regular Grade compound, D00634 [C02-060] on the inside of the sensor adapter [5].

SUBTASK 24-11-14-420-016-001

- (3) Install the oil out temperature sensor [6] to the sensor adapter [5].

SUBTASK 24-11-14-420-017-001

- (4) Install the two bolts [7].

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- (a) Tighten the bolts [7] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

SUBTASK 24-11-14-420-018-001



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU CONNECT THEM. THE CONTAMINATION OF THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.



USE TEFLON-JAWED PLIERS TO TIGHTEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTOR COULD OCCUR.

- (5) Connect the electrical connector [8] to the oil out temperature sensor [6] with teflon-jawed pliers, STD-664 (TASK 70-00-01-400-807-H01).

I. Integrated Drive Generator Oil Out Temperature Sensor Installation Test

SUBTASK 24-11-14-710-006-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

J. Put the Airplane Back to its Usual Condition.

SUBTASK 24-11-14-410-005-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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IDG REMOTE OIL LEVEL SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the IDG remote oil level sensor
 - (2) An installation of the IDG remote oil level sensor.

TASK 24-11-15-000-801

2. IDG Remote Oil Level Sensor Removal

(Figure 401)

A. General

- (1) This task is for the removal of the IDG remote oil level sensor.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine

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(Continued)

Number	Name/Location

423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Prepare for the Removal

SUBTASK 24-11-15-010-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

(e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. IDG Remote Oil Level Sensor Removal

SUBTASK 24-11-15-860-001

(1) Release the pressure from the IDG.

- (a) Remove the dust cap from the overflow drain valve.



BE CAREFUL WHEN YOU CONNECT THE ENGINE OIL SERVICING CART, COM-1537 TO THE OVERFLOW DRAIN VALVE, USE A RAG AROUND THE FITTING. THIS WILL PREVENT A SPRAY OF HOT OIL CAUSED BY PRESSURE IN THE IDG CASE. HOT OIL CAN BURN YOU.

- (b) Connect the hose and the overflow coupling from the engine oil servicing cart, COM-1537 to the overflow drain valve.

NOTE: It is usual for some oil to drain.

- (c) Let the oil that drains from the hose flow into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-15-020-001

- (2) Remove the case drain plug [2] and let the oil flow into the oil resistant container (5 gal)(19 Liter), STD-1055.

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SUBTASK 24-11-15-020-002

- (3) Remove and discard the o-ring [1] from the case drain plug.

SUBTASK 24-11-15-020-003

- (4) Remove the IDG remote oil level sensor [4].
- (a) Disconnect the electrical connector from the IDG remote oil level sensor.
 - (b) Remove the screw [6] and washer [5].
 - (c) Remove the IDG remote oil level sensor [4] and the o-ring [3].

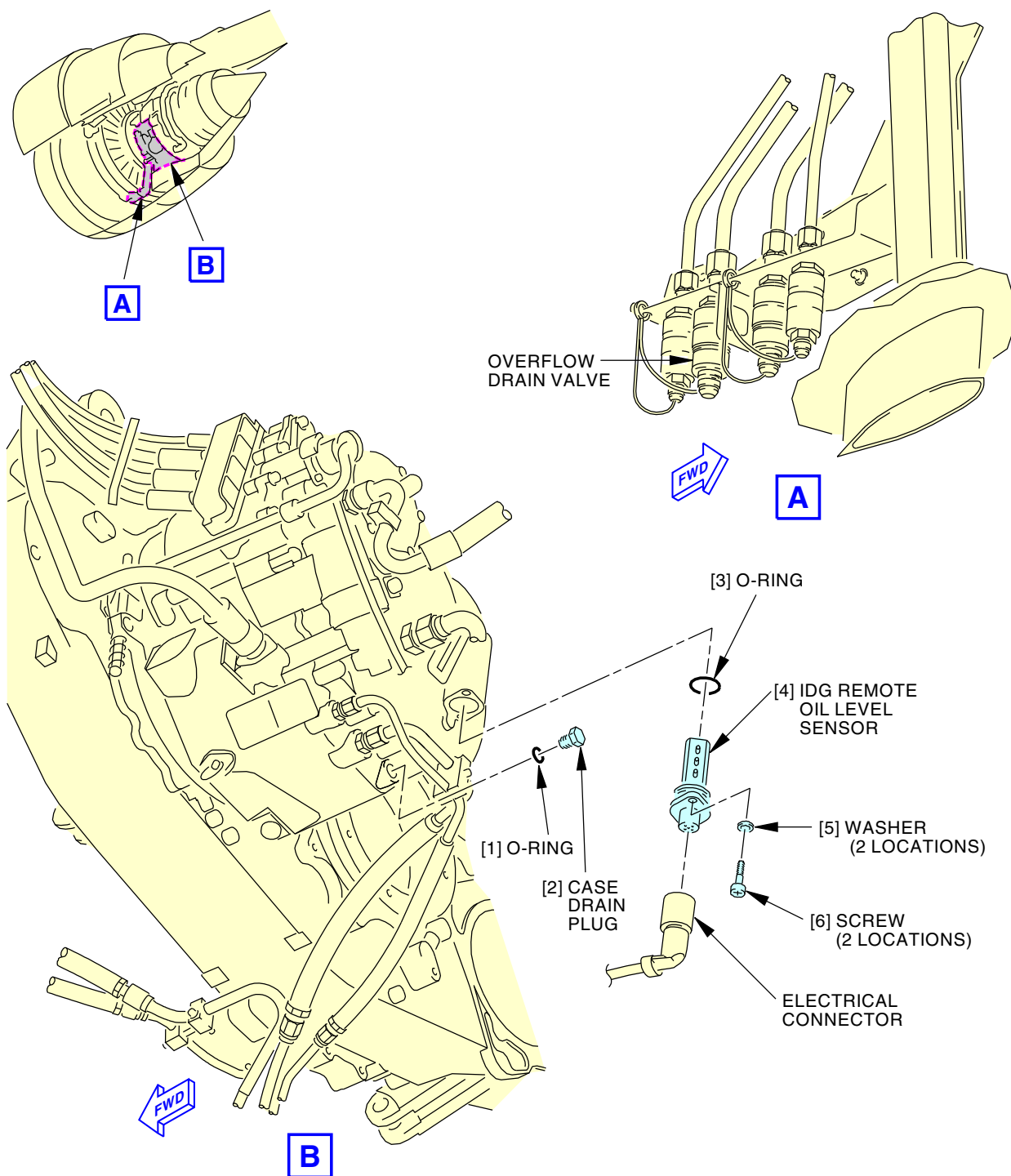
———— **END OF TASK** ————

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IDG Remote Oil Level Sensor Installation
Figure 401/24-11-15-990-801

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TASK 24-11-15-400-801

3. IDG Remote Oil Level Sensor Installation

(Figure 401)

A. General

(1) This task is for the installation of the IDG remote oil level sensor.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
24-11-00-700-803	IDG Oil System Static Leak Check (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-836-H00	Dry Motor (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G01505	Lockwire - Safety And Lock	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	24-11-01-14-315	ARO ALL
3	O-ring	24-11-01-13E-285	ARO ALL
		24-11-01-14-485	ARO ALL
4	Sensor	24-11-01-13E-270	ARO ALL
		24-11-01-14-460	ARO ALL
		24-11-01-14-470	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

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G. IDG Remote Oil Level Sensor Installation

SUBTASK 24-11-15-420-003



MAKE SURE THAT THE ROLS THAT YOU INSTALL ON THE IDG HAS THE CORRECT PART NUMBER FOR THAT IDG. AN INCORRECT ROLS CAN CAUSE DAMAGE TO THE IDG.

- (1) Do these steps to install the IDG remote oil level sensor [4]:

NOTE: Use Table 401 to make sure you install the correct ROLS on the IDG.

Table 401/24-11-15-993-807

IDG	SB	ROLS
764939/A	PRE 120EGS051-24-19	5913538-2
	PRE 120EGS051-24-19	5914637-2
764939/B	POST 120EGS051-24-19	5913538-3
	POST 120EGS051-24-19	5914637-3
767146A		5913538-1
		5914637-1



BE SURE TO HANDLE THE REMOTE OIL LEVEL SENSOR CAREFULLY. IF THE PROBE ELEMENTS ARE BUMPED OR BENT, DAMAGE TO THE SENSOR CAN OCCUR.

- (a) Install the IDG remote oil level sensor [4] and the o-ring [3].
- (b) Install the screw [6] and washer [5].
- 1) Tighten the screw [6] to 51 in-lb (6 N·m) - 56 in-lb (6 N·m).



REPLACE THE ELECTRICAL CONNECTOR IF IT HAS FRETTING WEAR. FRETTING WEAR CAN CAUSE DAMAGE TO THE NEW REMOTE OIL LEVEL SENSOR.

- (c) Examine the electrical connector and contacts for damage and wear.
- 1) If the connector or contacts are damaged or worn, then replace the connector or contacts.
- (d) Connect the electrical connector to the IDG remote oil level sensor.

SUBTASK 24-11-15-860-002

- (2) Do these steps to install the case drain plug [2]:
- (a) Lubricate the new o-ring [1] with engine oil.
- (b) Install the new o-ring [1] on the case drain plug.
- (c) Install the case drain plug [2].
- 1) Tighten the plug to 55 in-lb (6 N·m) - 75 in-lb (8 N·m).
- (d) Install a lockwire, G01505 on the case drain plug.

SUBTASK 24-11-15-860-002

- (3) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

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H. IDG Remote Oil Level Sensor Installation Test

SUBTASK 24-11-15-210-001

- (1) Do the oil level check of the IDG.
 - (a) Clean the sight glass surface with a lint-free cloth.
 - (b) Examine the sight glass for the oil level.
 - (c) Make sure the oil level is satisfactory.

SUBTASK 24-11-15-480-001

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

SUBTASK 24-11-15-860-003

- (3) Get access to the electrical maintenance page (TASK 31-61-00-800-804).

SUBTASK 24-11-15-860-004

- (4) Make sure the maintenance page shows the data in the table below:

Table 402/24-11-15-993-801

	L IDG	R IDG
OIL LEVEL -	NORMAL	NORMAL

SUBTASK 24-11-15-790-002

- (5) Do an IDG leak test.
 - (a) Do this task: IDG Oil System Static Leak Check, TASK 24-11-00-700-803.
 - (b) A satisfactory alternative to the IDG static leak test is to do a dry motor leak test. To do the dry motor leak test, (TASK 71-00-00-800-836-H00).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-15-410-001

 WARNING	DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
 - (a) Do this task:
Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) Do this task:
Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— END OF TASK —————

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IDG OIL LEVEL SIGHTGLASS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) IDG Oil Level Sightglass Removal
- (2) IDG Oil Level Sightglass Installation.

TASK 24-11-17-000-801

2. IDG Oil Level Sightglass Removal

(Figure 401)

A. **General**

- (1) This task give instructions to remove the IDG oil level sightglass.

B. **References**

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. **Consumable Materials**

Reference	Description	Specification
G01505	Lockwire - Safety And Lock	NASM20995

E. **Location Zones**

Zone	Area
411	Engine, Left
421	Engine, Right

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F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

G. Prepare for Removal

SUBTASK 24-11-17-010-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

H. Removal

SUBTASK 24-11-17-680-001

- (1) Release the pressure from the IDG.

- (a) Remove the dust cap from the overflow drain valve.



WARNING

BE CAREFUL WHEN YOU CONNECT THE ENGINE OIL SERVICING CART, COM-1537 TO THE OVERFLOW DRAIN VALVE, USE A RAG AROUND THE FITTING. THIS WILL PREVENT A SPRAY OF HOT OIL CAUSED BY PRESSURE IN THE IDG CASE. HOT OIL CAN BURN YOU.

- (b) Connect the hose and the overflow coupling from the engine oil servicing cart, COM-1537 to the overflow drain valve.

NOTE: It is usual for some oil to drain.

- (c) Let the oil that drains from the hose flow into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-11-17-020-001

- (2) Drain the oil from the IDG:

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- (a) Remove the case drain plug and let the oil flow into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (b) Remove and discard the o-ring from the case drain plug.
- (c) Lubricate the new o-ring with engine oil.
- (d) Install the new o-ring on the case drain plug.
- (e) Install the case drain plug and tighten to 55 in-lb (6 N·m) - 75 in-lb (8 N·m).
- (f) Install a lockwire, G01505 on the case drain plug.

SUBTASK 24-11-17-020-002

- (3) Do these steps to remove the oil level sightglass:
 - (a) Put a oil resistant container (5 gal)(19 Liter), STD-1055 below the IDG to collect oil.
 - (b) Remove the eight screws [6].
 - (c) Remove the plate [5].
 - (d) Remove the plate [4] (if installed).
 - (e) Remove the gasket [3].
 - (f) Remove the glass [2].
 - (g) Remove the gasket [1].

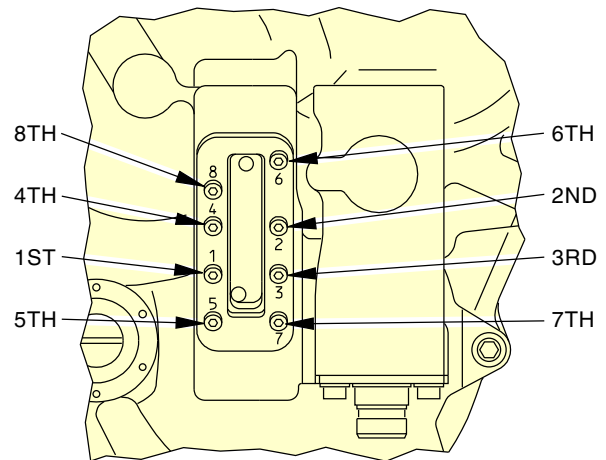
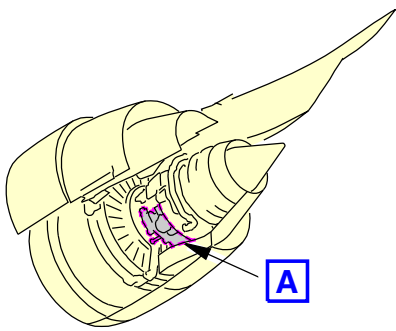
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EFFECTIVITY
ARO ALL

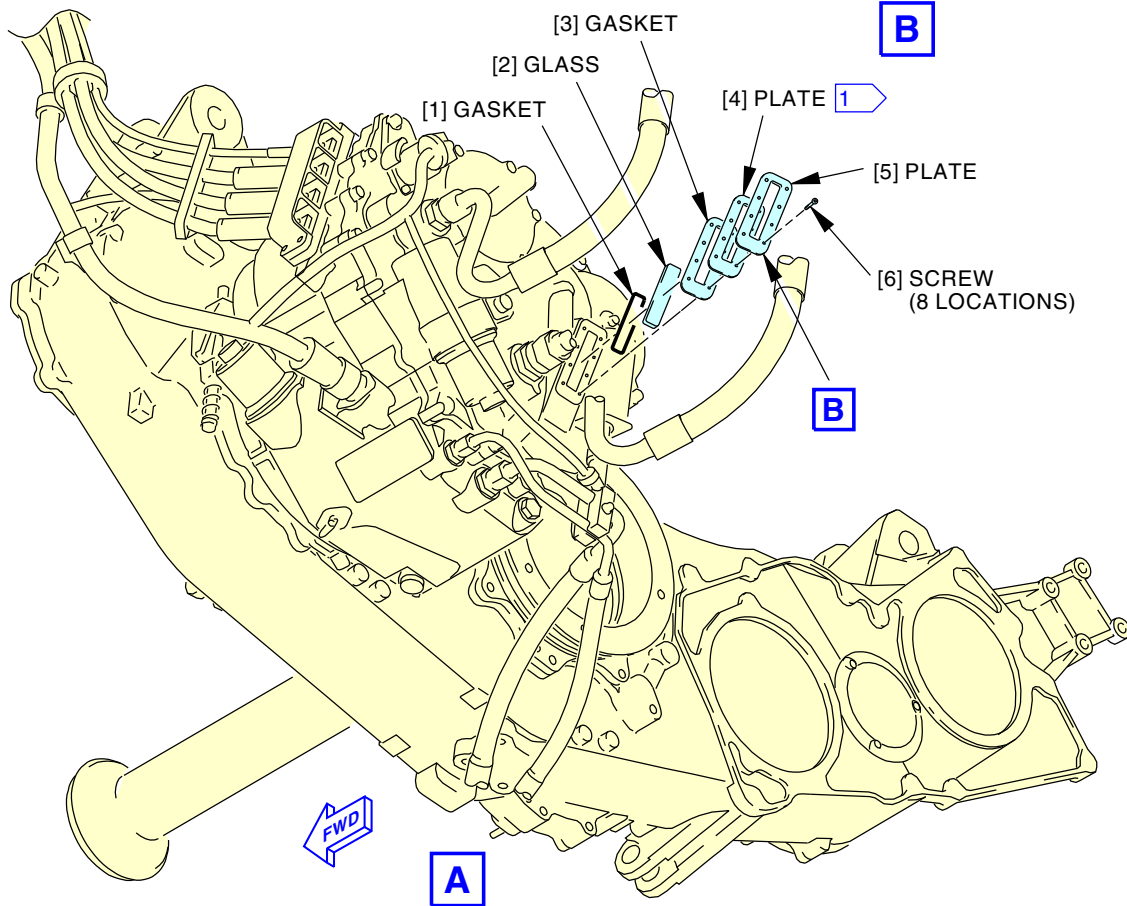
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SCREW TORQUE SEQUENCE



USED ON SOME INSTALLATIONS

L17546 S0006408094_V2

**IDG Oil Level Sightglass Installation
Figure 401/24-11-17-990-801**

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TASK 24-11-17-400-801

3. IDG Oil Level Sightglass Installation

(Figure 401)

A. General

- (1) This task give instructions to install the IDG oil level sightglass.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Gasket	24-11-01-14-525	ARO ALL
2	Glass	24-11-01-14-510	ARO ALL
3	Gasket	24-11-01-14-515	ARO ALL

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Installation

SUBTASK 24-11-17-420-001

- (1) Do these steps to install the oil level sightglass:
- Install the new gasket [1].
 - Install the glass [2].
 - Install the new gasket [3].
 - Install the plate [4] (if applicable).
 - Install the plate [5].
 - Install the eight screws [6].
 - Tighten the screws [6] to 4 in-lb (0 N·m) - 5 in-lb (1 N·m) in the sequence shown on Figure 401. Tighten the screws [6] again to 7 in-lb (1 N·m) - 9 in-lb (1 N·m) using the same sequence.

SUBTASK 24-11-17-610-001

- (2) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

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G. Installation Test

SUBTASK 24-11-17-790-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

SUBTASK 24-11-17-790-002

- (2) AIRPLANES WITH GE90 ENGINES;

Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-17-410-001

 WARNING	DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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IDG POWER FEEDER CABLES - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) IDG Power Feeder Cables Removal
 - (2) IDG Power Feeder Cables Installation.

TASK 24-11-19-000-803-002

2. IDG Power Feeder Cables Removal

(Figure 401)

A. **References**

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. **Location Zones**

Zone	Area
411	Engine, Left
421	Engine, Right

C. **Access Panels**

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

D. **Prepare for the Removal**

SUBTASK 24-11-19-860-009-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left and right thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

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- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left and right fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

SUBTASK 24-11-19-860-010-002

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

E. IDG Power Feeder Cables Removal

SUBTASK 24-11-19-020-009-002

- (1) Disconnect the power feeder cables from the IDG.

- (a) Remove the screws [3] and washers [2] and remove the terminal block cover [4].

ARO 001-014 PRE SB 777-24-0141

- (b) Remove the captive washer nuts [1] from the terminal studs.

ARO 015-999; ARO 001-014 POST SB 777-24-0141

- (c) Remove and discard the captive washer nuts [1] and spiralock nut [13] from the terminal studs.

NOTE: The nut used for the neutral terminal is smaller than the nuts used for the power terminals.

ARO ALL

- (d) Identify the power feeder cables for the subsequent installation.
(e) Disconnect the IDG power feeder cables [5] from the terminal studs.

ARO 001-014 PRE SB 777-24-0141

- (f) Install the captive washer nuts [1] and tighten the nuts with your fingers.

ARO ALL

- (g) Install the terminal block cover [4] with the screws [3] and washers [2].

SUBTASK 24-11-19-020-010-002

- (2) Remove the IDG power feeder cables from the engine.

- (a) Remove the screws [9] and washers [10].

SUBTASK 24-11-19-020-011-002

- (3) Disconnect the power feeder cables from the engine mounted terminal strip.

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- (a) Loosen the two captive screws and remove the cover [8].

NOTE: The screws are captive to the cover and should not be removed.

ARO 001-014 PRE SB 777-24-0143

- (b) Remove the nuts [6] from the terminal strip studs.

ARO 015-999; ARO 001-014 POST SB 777-24-0143

- (c) Remove the nuts [6], lock washers [11], and flat washers [12] from the terminal strip studs.

ARO ALL

- (d) Identify the power feeder cables for subsequent installation.
(e) Disconnect the power feeder cables from the terminal strip studs.

ARO 001-014 PRE SB 777-24-0143

- (f) Re-install the nuts [6] on the terminal strip studs and tighten with your fingers.

ARO 015-999; ARO 001-014 POST SB 777-24-0143

- (g) Re-install the flat washers [12], lock washers [11], and nuts [6] on the terminal strip studs and tighten with your fingers.

ARO ALL

- (h) Re-install the covers [8] with the two captive screws and tighten the screws with your fingers.

SUBTASK 24-11-19-020-012-002

- (4) Do these steps to remove the power feeder cables from the engine mounted terminal strip to the splice at the wing leading edge:
- (a) Take the seal housing apart at the strut raceway.
 - (b) Disconnect the seal block clamp where the power feeder goes through the midspar web of the strut.
 - 1) Remove the sealant from the power feeder and from around the power feeder.
 - (c) Disconnect the clamps that attach the power feeder cables to the structure.

NOTE: Mark on the power feeder cables the location of clamps and spacers as they are removed.
 - (d) Disconnect the seal fittings at the strut bulkhead.
 - (e) Pull the power feeder cables through the strut and put them on a protective mat on the top of the wing.
 - (f) Remove the splice from the damaged power feeder cable at the wing leading edge.

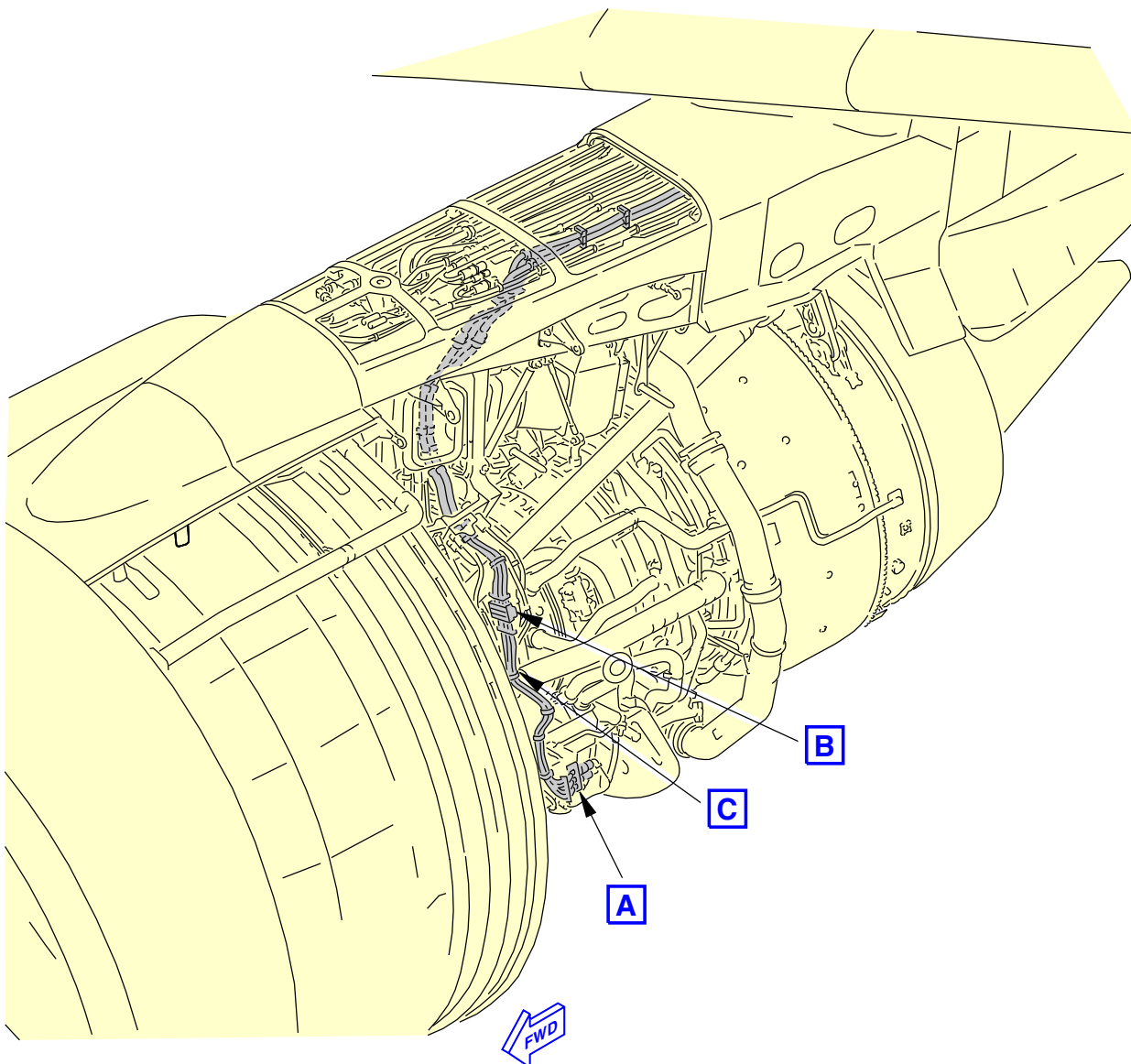
———— **END OF TASK** ————

EFFECTIVITY
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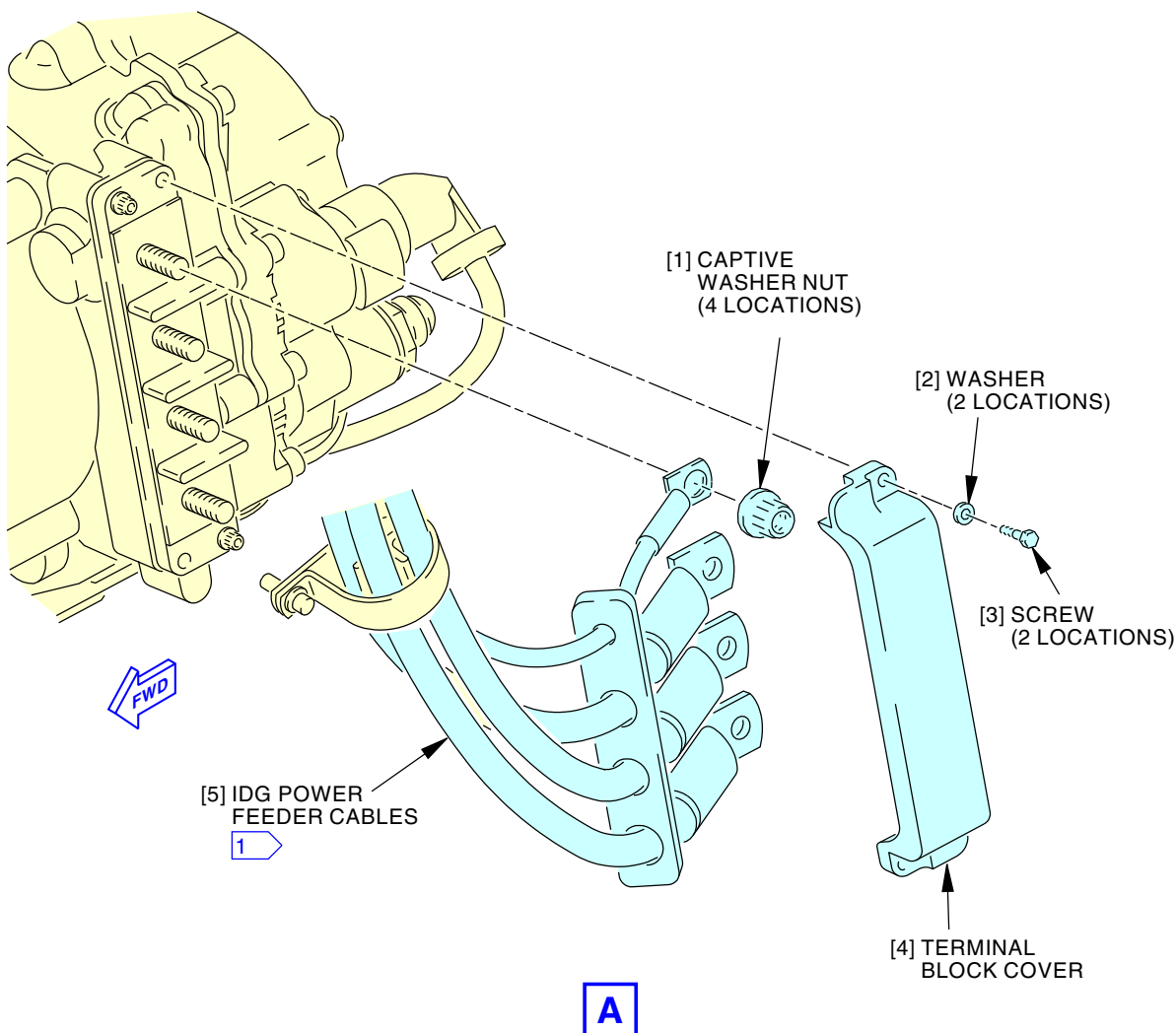
Integrated Drive Generator Power Feeder Cables Installation
Figure 401/24-11-19-990-803-002 (Sheet 1 of 5)

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1 MAINTAIN A MINIMUM CLEARANCE OF 0.5 INCHES (12.7 MM) BETWEEN THE CABLE AND THE ADJACENT BRACKET.

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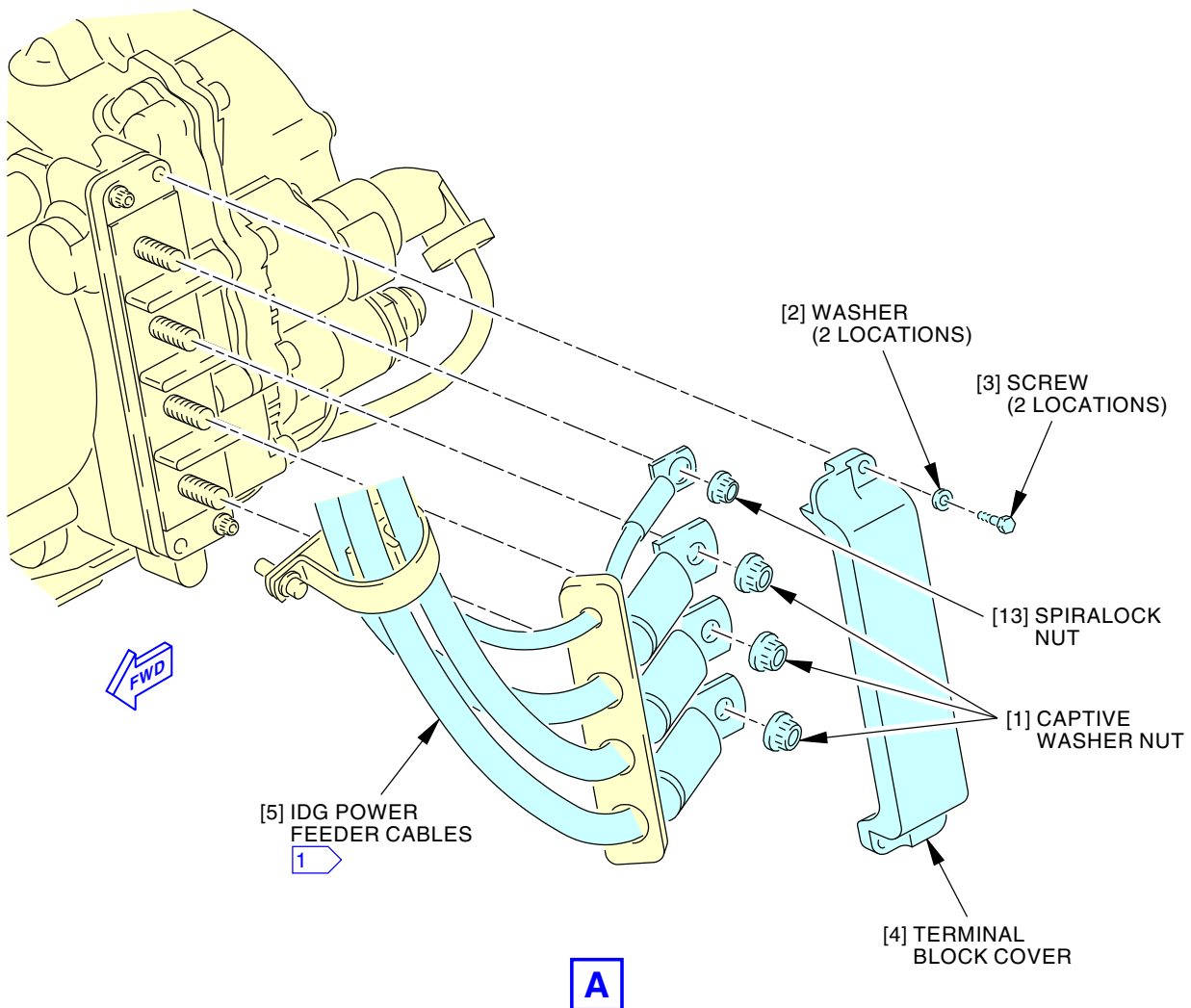
Integrated Drive Generator Power Feeder Cables Installation
Figure 401/24-11-19-990-803-002 (Sheet 2 of 5)

EFFECTIVITY
ARO 001-014 PRE SB 777-24-0141

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1 MAINTAIN A MINIMUM CLEARANCE OF 0.5 INCHES (12.7 MM) BETWEEN THE CABLE AND THE ADJACENT BRACKET.

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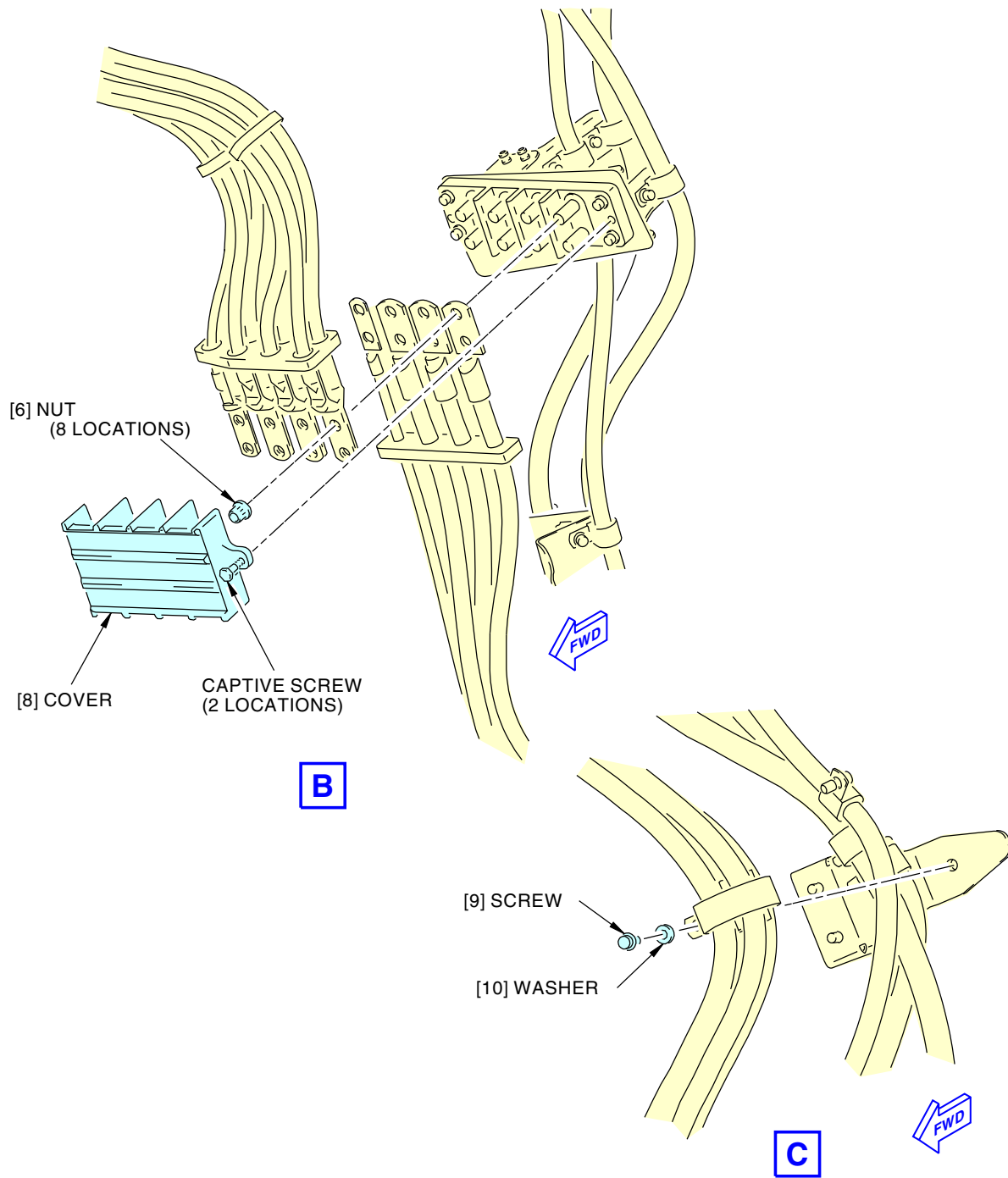
**Integrated Drive Generator Power Feeder Cables Installation
Figure 401/24-11-19-990-803-002 (Sheet 3 of 5)**

EFFECTIVITY
ARO 015-999; ARO 001-014 POST SB 777-24-0141

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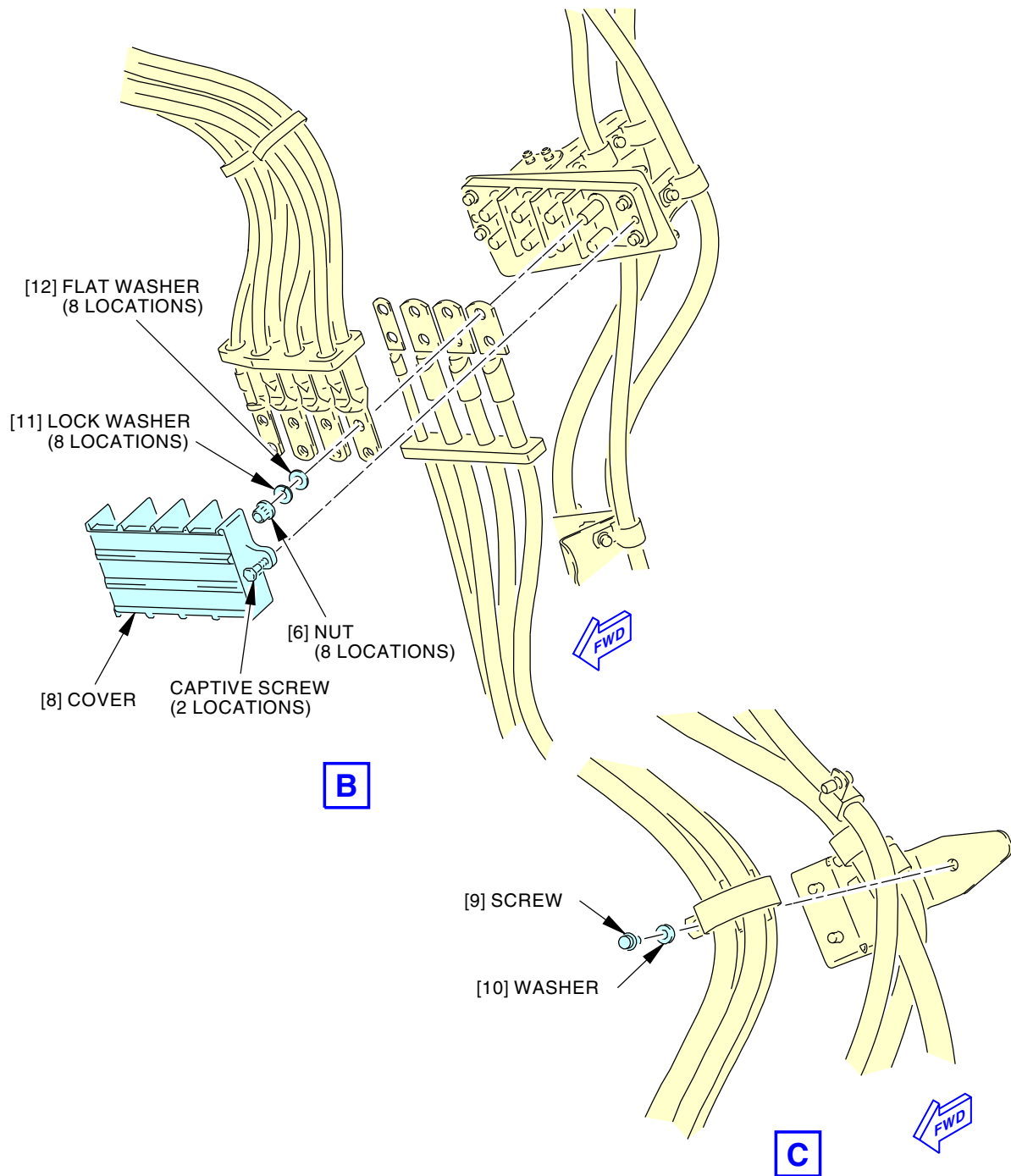
**Integrated Drive Generator Power Feeder Cables Installation
Figure 401/24-11-19-990-803-002 (Sheet 4 of 5)**

EFFECTIVITY
ARO 001-014 PRE SB 777-24-0143

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2566450 S0000613965_V1

**Integrated Drive Generator Power Feeder Cables Installation
Figure 401/24-11-19-990-803-002 (Sheet 5 of 5)**

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TASK 24-11-19-400-803-002

3. IDG Power Feeder Cables Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
54-55-01-200-840-001	Leak Check of the Left Strut Upper Spar (P/B 601)
54-55-01-200-841-001	Leak Check of the Right Strut Upper Spar (P/B 601)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-30-00	ELECTRICAL CONNECTION OF EQUIPMENT AND INSTALLATION OF TERMINAL LUGS
SWPM 20-30-13	ASSEMBLY AND REPAIR OF THE AMP AND BACS52N COPALUM SPLICES

B. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

C. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

E. IDG Power Feeder Cables Installation

SUBTASK 24-11-19-420-009-002

- (1) Do these steps to install the power feeder cables from the engine mounted terminal strip to the splice at the wing leading edge:
 - (a) Attach the replacement power feeder cables.
 - 1) Prepare the cable ends for a splice (SWPM 20-30-13).

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- 2) Connect the replacement cable with a splice (SWPM 20-30-13).
- (b) Put identification sleeves on the replacement power feeder cables.
 - 1) Use marks on cable as a guide to determine where the new cables will enter the raceway clamp block.
- (c) Hold the cables together with lacing tape (SWPM 20-10-11).
- (d) Clean the mid-spar block clamp area, brackets and structure adjacent to the mid-spar block.
- (e) Route the power feeder cables through the strut.
 - 1) Temporarily hold the remaining cable length together.
 - 2) Feed the cables through the strut access door.
 - 3) Route the power feeder cables along the original path.
- (f) Secure the power feeder cables in the strut.
 - 1) Put the power feeder cables in the clamps.
 - 2) Secure the clamps in the strut.
- (g) Connect the seal housing at the strut raceway.
- (h) Connect the clamp block at the strut bulkhead.

SUBTASK 24-11-19-420-010-002

- (2) Do these steps to connect the power feeder cables to the engine mounted terminal strip:
 - (a) Loosen the two captive screws and remove the cover [8].

NOTE: The screws are captive to the cover and should not be removed.

ARO 001-014 PRE SB 777-24-0143

- (b) Remove the nuts [6] from the terminal strip studs.

ARO 015-999; ARO 001-014 POST SB 777-24-0143

- (c) Remove the nuts [6], lock washers [11], and flat washers [12] from the terminal strip studs.

ARO ALL

- (d) Visually inspect the terminal strip studs for any damage.
- (e) Visually inspect the nuts [6] for damage or degradation. Replace if necessary.

ARO 001-014 PRE SB 777-24-0143

- (f) FOR OPERATORS WHO CHOOSE TO USE TORQUE INDICATOR COMPOUND;
Clean the surface of the nuts [6], power feeder cables, and terminal block with a cotton wiper, G00034, soaked with alcohol, B00130.

ARO 015-999; ARO 001-014 POST SB 777-24-0143

- (g) FOR OPERATORS WHO CHOOSE TO USE TORQUE INDICATOR COMPOUND;
Clean the surface of the nuts [6], lock washers [11], flat washers [12], power feeder cables, and terminal block with a cotton wiper, G00034, soaked with alcohol, B00130.

ARO ALL

- (h) Attach the power feeder cables to the terminal strip studs.

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- 1) Install the upper feeder cables on top of the lower feeder cables on the terminal strip studs. (Figure 401)

NOTE: The IDG power feeder cables must be installed in the correct stacking sequence.

ARO 001-014 PRE SB 777-24-0143

- (i) Install the nuts [6] on the terminal strip studs (ELECTRICAL CONNECTION OF EQUIPMENT AND INSTALLATION OF TERMINAL LUGS, SWPM 20-30-00).

ARO 015-999; ARO 001-014 POST SB 777-24-0143

- (j) Install the flat washers [12], lock washers [11], and nuts [6] on the terminal strip studs (ELECTRICAL CONNECTION OF EQUIPMENT AND INSTALLATION OF TERMINAL LUGS, SWPM 20-30-00).

ARO ALL

- (k) Tighten the nuts [6] to a torque of 200 in-lb (23 N·m) - 240 in-lb (27 N·m).
- (l) FOR OPERATORS WHO CHOOSE TO USE TORQUE INDICATOR COMPOUND;
Apply torque indicator compound to the nuts [6].
- (m) Install the cover [8] and tighten the two captive screws.
- (n) Tighten the two captive screws to 25 in-lb (3 N·m) - 30 in-lb (3 N·m).

SUBTASK 24-11-19-420-011-002

- (3) Install the IDG power feeder cables to the engine.
 - (a) Install the screws [9] and washers [10].

SUBTASK 24-11-19-420-012-002

- (4) Do these steps to connect the power feeder cables to the IDG.
 - (a) Remove the screws [3] and washers [2] that hold the terminal block cover [4] and remove the cover.

ARO 001-014 PRE SB 777-24-0141

- (b) Remove the captive washer nuts [1] from the terminal studs.

ARO ALL

- (c) Visually inspect the terminal studs for any damage.

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ARO 001-014 PRE SB 777-24-0141



DO NOT INSTALL ANY WASHERS EITHER UNDER OR OVER THE POWER FEEDER CABLE TERMINAL LUGS. THE POWER FEEDER CABLE TERMINAL LUGS MUST BE IN DIRECT CONTACT WITH THE IDG TERMINAL LUGS. LOCALIZED RESISTANCE HEATING CAN OCCUR WHICH COULD CAUSE THE TERMINAL BLOCK TO BURN.

ARO 015-999; ARO 001-014 POST SB 777-24-0141



DO NOT INSTALL WASHERS BELOW THE POWER-FEEDER CABLE TERMINAL-LUGS. THE POWER-FEEDER CABLE TERMINAL-LUGS MUST BE IN DIRECT CONTACT WITH THE IDG TERMINAL LUGS. LOCALIZED RESISTANCE HEATING CAN OCCUR WHICH COULD CAUSE THE TERMINAL BLOCK TO BURN.

ARO ALL

- (d) Attach the IDG power feeder cables [5] to the terminal studs.
- (e) Make sure the power feeder cables near the terminal block are at least 0.5 in. (12.7 mm) from the adjacent bracket.

ARO 001-014 PRE SB 777-24-0141

- (f) Install the captive washer nuts [1] on the terminal studs and tighten the nuts to 12 ft-lb (16 N·m) - 14 ft-lb (19 N·m).

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

ARO 015-999; ARO 001-014 POST SB 777-24-0141

- (g) Install the new captive washer nuts [1] and new spiralock nut [13] on the terminal studs and tighten the nuts to 12 ft-lb (16 N·m) - 14 ft-lb (19 N·m).

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

NOTE: The nut used for the neutral terminal is smaller than the nuts used for the power terminals.

ARO ALL

- (h) Install the terminal block cover [4], screws [3] and washers [2].



DO NOT TIGHTEN THE SCREWS TOO MUCH. IF YOU TIGHTEN THE SCREWS TOO MUCH, YOU CAN DAMAGE THE TERMINAL BLOCK COVER.

- (i) Tighten the screws [3] to a torque of 20 in-lb (2 N·m) - 22 in-lb (2 N·m).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-19-860-012-002

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

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SUBTASK 24-11-19-860-011-002



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do these tasks in sequence to safely close the left and right thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

G. IDG Power Feeder Cables Installation Test

SUBTASK 24-11-19-710-002-002

- (1) Do these steps for the test of the IDG power feeder cables:
- (a) Start the engine. To start the engine, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00
- (b) Make sure no ELEC messages show on the EICAS status page.
- (c) Make sure no related electrical maintenance messages show on the CMC.
- (d) Stop the engine. To stop the engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00

SUBTASK 24-11-19-790-002-002

- (2) Do this leak check if you remove the power feeder cables from the IDG terminal block to the splice at the wing leading edge:
- (a) Do the applicable task: Leak Check of the Left Strut Upper Spar, TASK 54-55-01-200-840-001 or Leak Check of the Right Strut Upper Spar, TASK 54-55-01-200-841-001.

————— END OF TASK —————

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IDG TERMINAL BLOCK - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) IDG Terminal Block Removal
- (2) IDG Terminal Block Installation.

TASK 24-11-20-000-802-001

2. IDG Terminal Block Removal

(Figure 401)

A. **General**

- (1) There is one IDG on each engine. The IDG is located on the aft accessory gearbox, at the 7 o'clock position (looking forward).

B. **References**

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. **Tools/Equipment**

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

D. **Location Zones**

Zone	Area
411	Engine, Left
421	Engine, Right

E. **Access Panels**

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. **Prepare for Removal**

SUBTASK 24-11-20-010-002-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

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(c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

(e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. Removal

SUBTASK 24-11-20-020-007-001



DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

(1) Remove pressure from the IDG oil cooling system as follows:

- (a) Remove the dust cap from the overflow drain valve on the IDG.
- (b) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the IDG to catch the oil.
- (c) Put the end of the overflow hose in the oil resistant container (5 gal)(19 Liter), STD-1055.
- (d) Connect the other end of the overflow hose to the overflow drain valve on the IDG. Allow the surplus oil to flow into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (e) Disconnect the overflow hose from the IDG after the excess oil has drained.

SUBTASK 24-11-20-020-008-001

(2) Remove the power feeders from the IDG as follows:

- (a) Remove the two screws [1] and washers [2] that hold the terminal block cover [3].
- (b) Remove the terminal block cover [3].

ARO 001-014 PRE SB 777-24-0141

(c) Remove the four captive washer nuts [4] and remove the power feeders from the terminal studs.

NOTE: Place identification tags on feeders (if necessary) before removing.

ARO 015-999; ARO 001-014 POST SB 777-24-0141

(d) Remove and discard the captive washer nuts [4] and spiralock nut [9], and remove the power feeders from the terminal studs.

NOTE: Place identification tags on feeders (if necessary) before removing.

NOTE: The nut used for the neutral terminal is smaller than the nuts used for the power terminals.

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SUBTASK 24-11-20-020-009-001

(3) Remove the IDG terminal block [8] as follows:

- (a) Remove the screws [5] and washers [6] that hold the terminal block to the IDG.
- (b) Remove terminal block [8] and four square washers [7] from the IDG.

NOTE: The square washers are installed between the through lead straps and the terminal block [8].

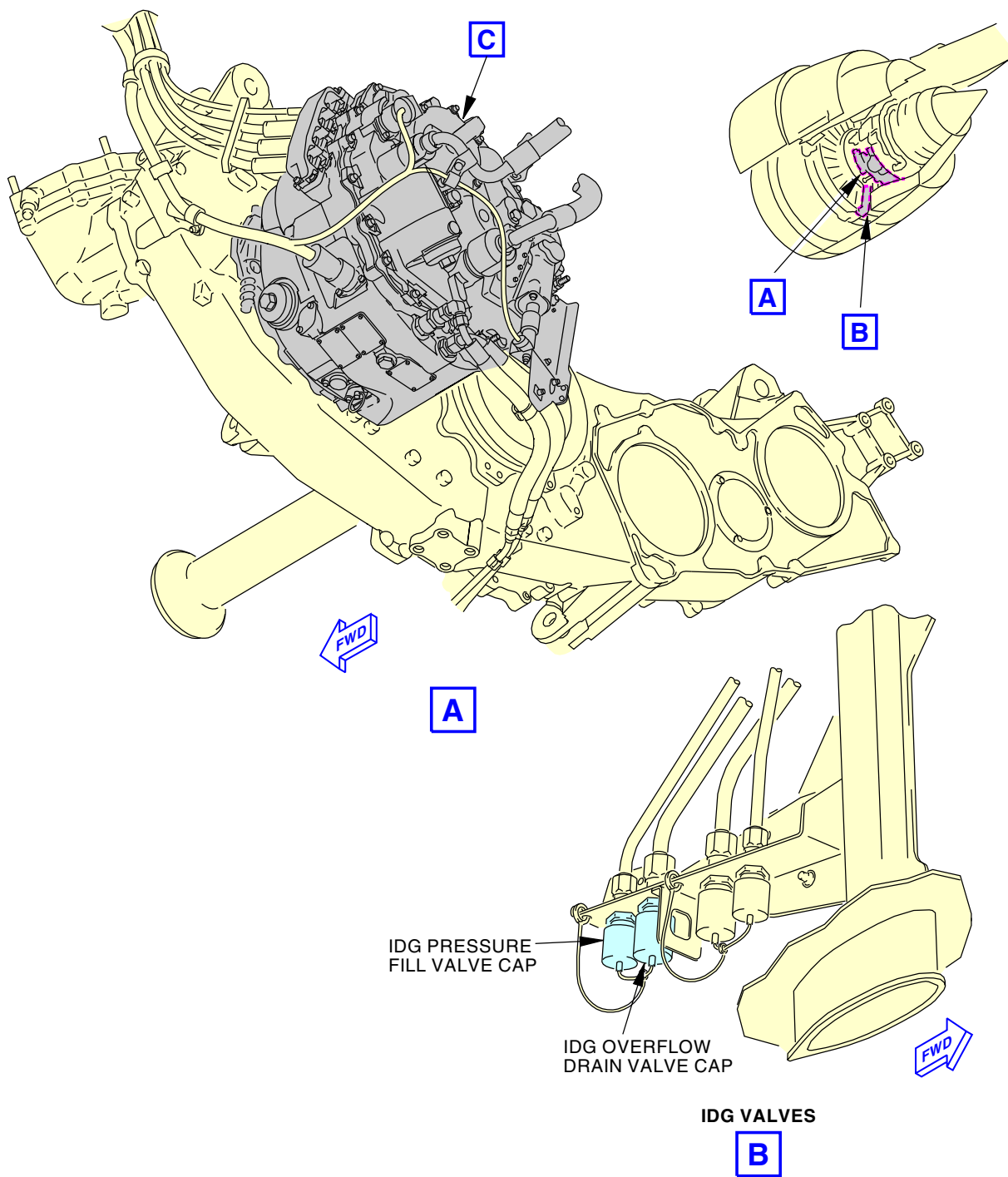
———— **END OF TASK** ————

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K52505 S0006408142_V2

IDG Terminal Block Installation
Figure 401/24-11-20-990-803-001 (Sheet 1 of 3)

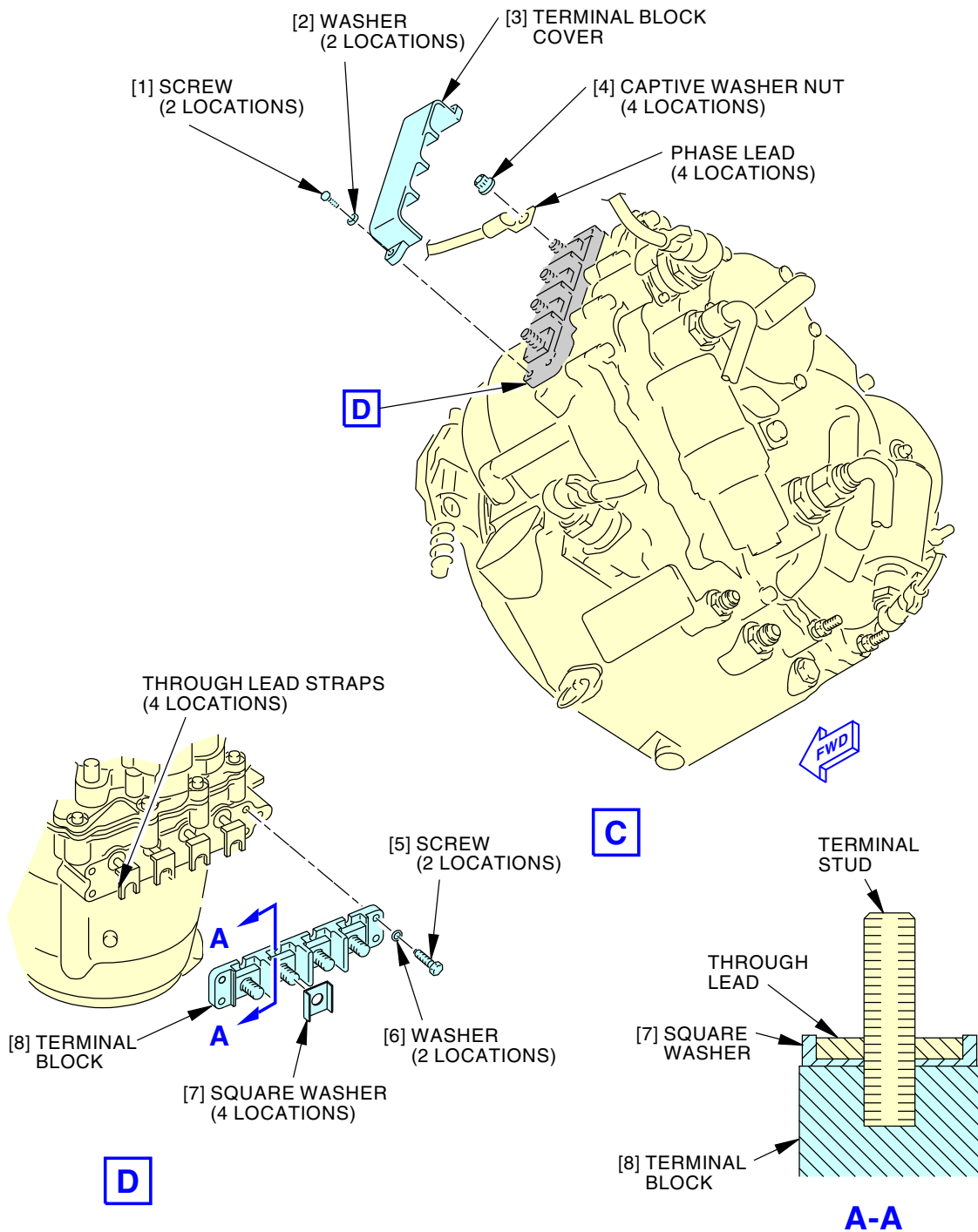
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K52506 S0006408143_V6

IDG Terminal Block Installation
Figure 401/24-11-20-990-803-001 (Sheet 2 of 3)

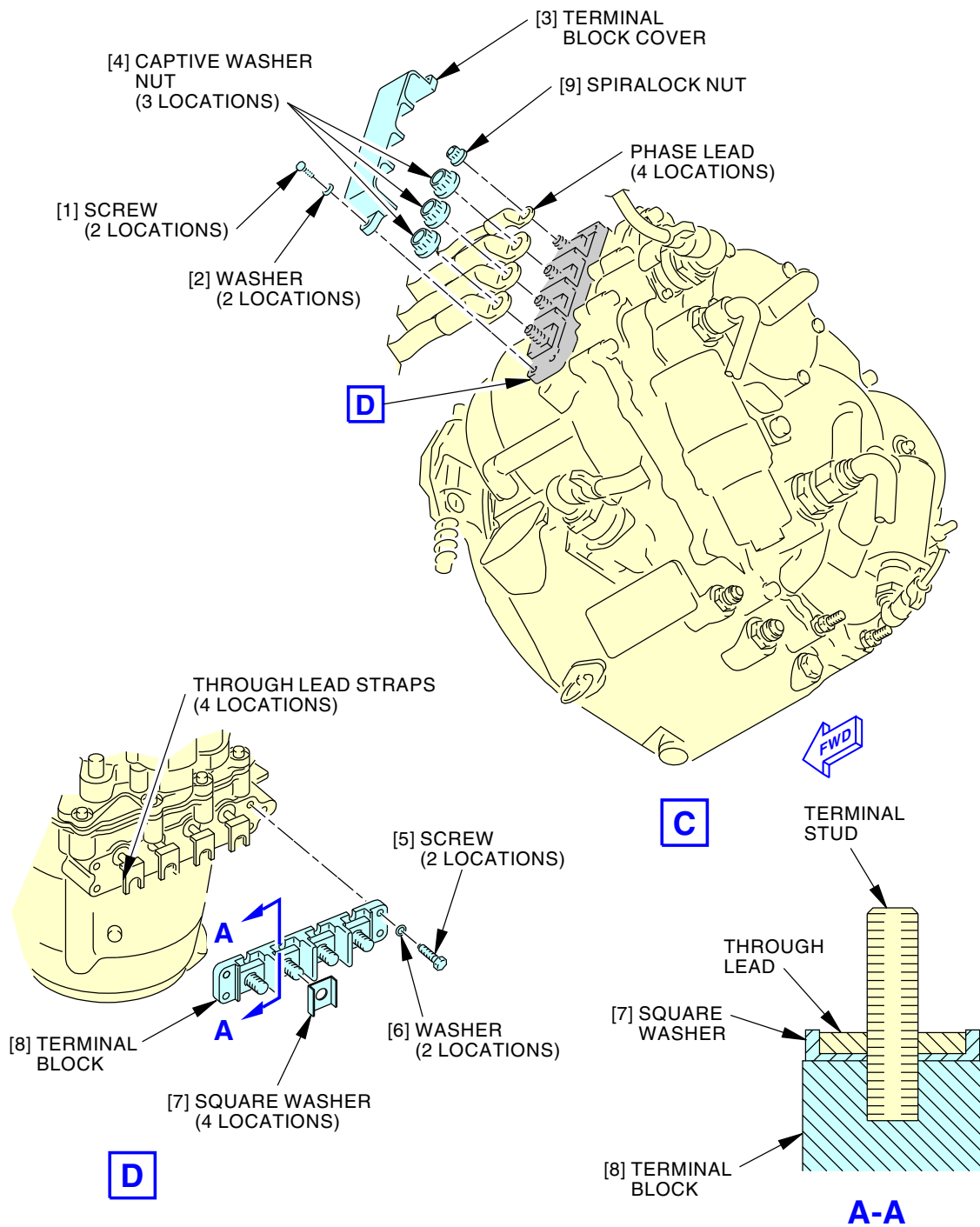
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2567669 S0000613360_V1

IDG Terminal Block Installation
Figure 401/24-11-20-990-803-001 (Sheet 3 of 3)

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TASK 24-11-20-400-803-001

3. IDG Terminal Block Installation

(Figure 401)

A. General

- (1) The IDG is located on the aft accessory gearbox, at the 7 o'clock position (looking forward).

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
24-22-00-860-804	Supply IDG Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

E. Installation

SUBTASK 24-11-20-420-005-001

- (1) Install the IDG terminal block as follows:
 - (a) Use a dry clean cloth to wipe any oil or debris from the surface of IDG where terminal block mates with the IDG.
 - (b) Install one square washer [7] on each of the studs of the terminal block [8].



CAUTION

MAKE SURE THE SQUARE WASHERS ARE INSTALLED BELOW THE IDG THROUGH LEAD STRAPS. SQUARE WASHERS INSTALLED INCORRECTLY CAN CAUSE OVERHEATING AND SUBSEQUENT DAMAGE TO THE IDG.

- (c) Position terminal block [8] and square washers [7] on IDG.
 - 1) Make sure that the four square washers [7] are below the IDG through lead straps (View A-A, Figure 401).
 - 2) Make sure that the through lead straps are between the raised edges of the square washers [7].
- (d) Install two screws [5] and washers [6] that hold the terminal block and tighten screws to 20 in-lb (2 N·m) - 22 in-lb (2 N·m).

SUBTASK 24-11-20-420-006-001

- (2) Install the IDG power feeders as follows:

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- (a) Install the power feeder lugs on the terminal studs and make sure the feeders are on the correct terminal studs.

ARO 001-014 PRE SB 777-24-0141

- (b) Install the captive washer nuts [4] and tighten to 12 ft-lb (16 N·m) - 14 ft-lb (19 N·m).

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

ARO 015-999; ARO 001-014 POST SB 777-24-0141

- (c) Install the new captive washer nuts [4] and spirallock nut [9], and tighten to 12 ft-lb (16 N·m) - 14 ft-lb (19 N·m).

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

NOTE: The nut used for the neutral terminal is smaller than the nuts used for the power terminals.

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- (d) Install the terminal block cover [3].
(e) Install the two screws [1] and washers [2] and tighten the screws.

SUBTASK 24-11-20-610-003-001

- (3) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

SUBTASK 24-11-20-410-003-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

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F. Installation Test

SUBTASK 24-11-20-760-003-001

(1) For the applicable IDG, do this task: Supply IDG Power, TASK 24-22-00-860-804.

———— **END OF TASK** ————

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POWER AND REGULATION - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) An operational test of the power and regulation
 - (2) A system test of the power and regulation.

TASK 24-21-00-700-801

2. Power and Regulation - Operational Test

A. General

- (1) The operational test does the APU generator test.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
27-61-00-440-801	Spoiler Activation (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

C. Location Zones

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

D. Prepare for the test

SUBTASK 24-21-00-040-001



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do the deactivation procedure for the spoilers (TASK 27-61-00-040-801) or move all persons and equipment away from the control surfaces.

SUBTASK 24-21-00-480-001

- (2) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

E. The Operational Test of the APU Generator

SUBTASK 24-21-00-710-001

- (1) Do the APU generator test:
 - (a) Make sure the AVAIL light in the PRIMARY EXT PWR switch is on.
 - (b) Push and release the PRIMARY EXT PWR switch.
 - 1) Make sure the ON light in the switch comes on.
 - (c) Push the APU GEN switch on the P5 panel to the OFF position.
 - 1) Make sure the OFF light in the switch comes on.
 - (d) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.

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- (e) Make sure the OFF light in the APU GEN switch stays on.
- (f) Make sure the ELEC GEN OFF APU indication shows on the EICAS display.
- (g) Make sure this indication occurs on the synoptic page:
 - 1) The PRI EXT PWR powers all of the buses.
- (h) Push the APU GEN switch to the ON position.
 - 1) Make sure the ON light in the switch comes on.
- (i) Make sure the ELEC GEN OFF APU indication is not on the EICAS display.
- (j) Make sure the maintenance page shows the data below (Table 501):

Table 501/24-21-00-993-801

LOCATION	LIMITS
AC-V	110 - 120
FREQ	395 - 405
LOAD	0.15 - 0.85

- (k) Make sure these indications occur on the synoptic page:
 - 1) The PRI EXT PWR powers these buses:
 - a) R MAIN
 - b) R XFR
 - c) R UTIL
 - 2) The APU GEN powers these buses:
 - a) L MAIN
 - b) L XFR
 - c) L UTIL
- (l) Push and release the PRIMARY EXT PWR switch.
 - 1) Make sure the ON light in the switch goes off.
- (m) Make sure these indications occur on the synoptic page:
 - 1) The APU GEN powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) L XFR
 - d) R XFR
 - e) L UTIL
 - f) R UTIL
- (n) Make sure there are no maintenance messages for the APU generator.
- (o) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

F. Put The Airplane Back To Its Usual Condition

SUBTASK 24-21-00-440-001

- (1) Do the activation procedure for the spoilers if you did the deactivation procedure (TASK 27-61-00-440-801).

———— **END OF TASK** ————

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TASK 24-21-00-700-802

3. Power and Regulation - System Test

A. General

- (1) The system test does this test:
 - (a) The Ground Service Relays Test

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
27-61-00-440-801	Spoiler Activation (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 24-21-00-040-002



DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do the deactivation procedure for the spoilers (TASK 27-61-00-040-801) or move all persons and equipment away from the spoilers.

SUBTASK 24-21-00-080-003

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

E. The Test of the Ground Service Relays

SUBTASK 24-21-00-730-001

- (1) Do the test of the ground service relays:
 - (a) Push the APU GEN switch on the P5 panel to the OFF position.
 - 1) Make sure the OFF light in the switch comes on.
 - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (c) Make sure the OFF light in the APU GEN switch stays on.
 - (d) Push the APU GEN switch to the ON position.
 - 1) Make sure the OFF light in the switch goes off.
 - (e) Make sure this indication occur on the synoptic page:
 - 1) The APU GEN powers the L (R) MAIN and L (R) XFR buses.
 - (f) Make sure the sidewall and ceiling lights on the stowage bins are on.
 - (g) Push the R BUS TIE switch on the P5 panel.
 - 1) Make sure the ISLN light in the switch comes on.

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- 2) Make sure the sidewall and ceiling lights on the stowage bins go off.
- (h) Push the GND SERV switch on the attendant switch panel P87.
 - 1) Make sure the ON light in the switch comes on.
 - 2) Make sure the sidewall lights and ceiling lights on the stowage bins come on.
- (i) Make sure the 115V GND SVCE HOT BUS WARNING light on the P300 panel is on.
- (j) Push the R BUS TIE switch on the P5 panel to the AUTO position.
 - 1) Make sure the ISLN light in the switch goes off.
 - 2) Make sure the ON light in the GND SERV switch goes off.
 - 3) Make sure the sidewall and ceiling lights on the stowage bins stay on.
- (k) Push the GND SERV switch.
 - 1) Make sure the ON light in the switch stays off.
 - 2) Make sure the sidewall and ceiling lights on the stowage bins stay on.
- (l) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
 - 1) Make sure the AVAIL light in the PRIMARY EXT PWR switch is on.
- (m) Push the R BUS TIE switch on the P5 panel.
 - 1) Make sure the ISLN light in the switch comes on.
 - 2) Make sure the sidewall and ceiling lights on the stowage bins go off.
- (n) Push the GND SERV switch on the attendant switch panel P87.
 - 1) Make sure the ON light in the switch comes on.
 - 2) Make sure the sidewall lights and ceiling lights on the stowage bins come on.
- (o) Make sure the 115V GND SVCE HOT BUS WARNING light on the P300 panel is on.
- (p) Push the R BUS TIE switch on the P5 panel to the AUTO position.
 - 1) Make sure the ISLN light in the switch goes off.
 - 2) Make sure the ON light in the GND SERV switch goes off.
 - 3) Make sure the sidewall and ceiling lights on the stowage bins stay on.
- (q) Push the GND SERV switch.
 - 1) Make sure the ON light in the switch stays off.
 - 2) Make sure the sidewall and ceiling lights on the stowage bins stay on.
- (r) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-21-00-440-002

- (1) Do the activation procedure for the spoilers if you did the deactivation procedure (TASK 27-61-00-440-801).

————— **END OF TASK** —————

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APU GENERATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU generator
- (2) An installation of the APU generator.

TASK 24-21-01-000-801

2. APU Generator Removal

(Figure 401)

A. General

- (1) This procedure gives instructions for the removal of the Auxiliary Power Unit (APU) Generator. The APU generator weighs approximately 67 pounds.

B. References

Reference	Title
49-11-02-010-801	APU Access Doors (Open) (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-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
SPL-1626	Eye - Lifting, Generator Part #: A49002-2 Supplier: 81205

D. Location Zones

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

E. Access Panels

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

F. Prepare for the Removal

SUBTASK 24-21-01-860-004

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

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SUBTASK 24-21-01-860-005

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

APU Auxiliary Panel, P49

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

Standby Power Management Panel, P310

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

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

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

SUBTASK 24-21-01-010-001

- (3) Do this task:

APU Access Doors (Open), TASK 49-11-02-010-801

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

G. APU Generator Removal



DO NOT TOUCH THE APU GEARBOX HEATERS. THE GEARBOX HEATERS STAY HOT WHEN THE AIRPLANE HAS AC POWER. 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.

SUBTASK 24-21-01-020-001

- (1) Disconnect the electrical harness connectors from the generator electrical connectors A [4] and B [5].

SUBTASK 24-21-01-420-001

- (2) Install the dust caps on the generator electrical connectors A [4] and B [5].

SUBTASK 24-21-01-020-002

- (3) Remove the leads [3] from the generator terminal studs.
- (a) Remove the screws [8] and washers [7] from the generator.
 - (b) Remove the terminal block cover [1] from the generator.
 - (c) Remove the captive washer nuts [2] from the terminal studs.
 - (d) Remove the leads [3] from the terminal studs.
 - (e) Identify the leads (N, T1, T2, T3).

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- (f) Re-install the captive washer nuts [2] on the terminal studs (tighten by hand).

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

- (g) Re-install the terminal block cover [1].
- 1) Put the terminal block cover [1] on the generator.
 - 2) Re-install the washers [7] and screws [8].
 - 3) Tighten the screw [8] to a torque of 20 - 22 pound-inches (2.3 to 2.5 newton-meters).

SUBTASK 24-21-01-020-003

- (4) Remove the generator [6].
- (a) Remove the bolt [11] from the lift boss.
 - (b) Install the generator lifting eye, SPL-1626 into the lift boss.
 - (c) Connect the cable fishpole hoist, COM-1563 to the generator lifting eye, SPL-1626.



CAUTION

DO NOT LIFT THE GENERATOR MORE THAN NECESSARY TO HOLD THE GENERATOR CORRECTLY. TOO MUCH LIFT OR INCORRECT SUPPORT CAN CAUSE DAMAGE TO THE INTERNAL SPLINE OF THE GENERATOR.

- (d) Hold the generator [6] with the cable fishpole hoist, COM-1563.
- (e) Loosen the self-locking nuts [14] until the nuts are at the end of the studs.



CAUTION

DO NOT USE A SCREWDRIVER OR OTHER METAL OBJECT TO DISCONNECT THE GENERATOR FROM THE GEARBOX. THIS CAN CAUSE DAMAGE TO THE SURFACES.

- (f) Pull the generator [6] axially away from the gearbox [15] so that the indexing dowel on the generator input flange is free from the hole.
- NOTE:** If it is necessary, use a nylon probe to disconnect the generator from the gearbox.
- (g) Turn the generator [6] clockwise until the self-locking nuts [14] are aligned with the large part of the keyhole slots in the generator input flange.
- (h) Horizontally pull the generator [6] from the gearbox [15].

SUBTASK 24-21-01-860-003

- (5) Put the generator [6] on an applicable cart.

SUBTASK 24-21-01-020-004

- (6) Remove the generator lifting eye, SPL-1626 from the lift boss.

SUBTASK 24-21-01-420-002

- (7) Install the bolt [11] on the lift boss.

SUBTASK 24-21-01-210-001

- (8) Visually examine the seal plate [13]:
- (a) Examine the generator seal plate for cracks and bends.
 - (b) Examine the seals on the plate for deterioration or damage.

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SUBTASK 24-21-01-020-005

- (9) If the generator seal plate has damage, do these steps that follows:
- (a) Remove the 3 screws [16] that attach the generator seal plate to the gearbox.
 - (b) Remove the seal plate [13] from the gearbox.

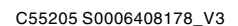
———— **END OF TASK** ————

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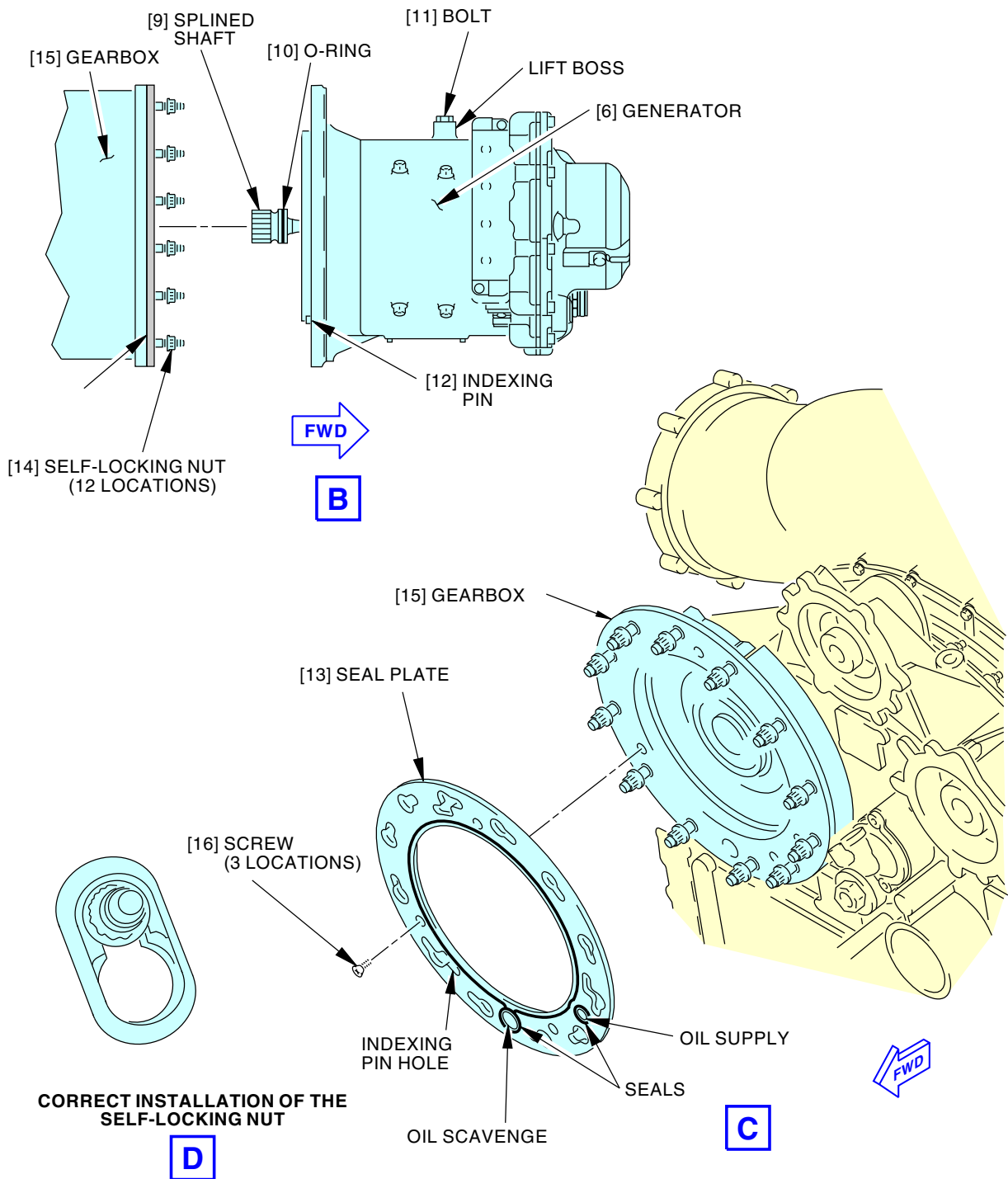
Auxiliary Power Unit (APU) Generator Installation

Figure 401/24-21-01-990-801 (Sheet 1 of 2)

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C56307 S0006408179_V3

Auxiliary Power Unit (APU) Generator Installation
Figure 401/24-21-01-990-801 (Sheet 2 of 2)

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TASK 24-21-01-400-801

3. APU Generator Installation

(Figure 401)

A. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Tools/Equipment

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

Reference	Description
COM-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
SPL-1626	Eye - Lifting, Generator Part #: A49002-2 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Generator	24-21-01-01-020	ARO ALL
10	O-ring	24-21-01-01-025	ARO ALL
13	Seal plate	24-21-01-01-075	ARO ALL

E. Location Zones

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

F. Access Panels

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

G. General

SUBTASK 24-21-01-800-002

- (1) This procedure gives instructions for the installation of the Auxiliary Power Unit (APU) Generator. The APU generator weighs approximately 67 pounds.

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H. APU Generator Installation

SUBTASK 24-21-01-640-001

- (1) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00071 or oil, D00068 to the o-ring [10].

SUBTASK 24-21-01-420-003

- (2) Install the o-ring [10] into its correct groove on the generator splined shaft [9].

SUBTASK 24-21-01-420-004

- (3) If the seal plate [13] is removed, do the steps that follow:
 - (a) Lubricate the rubber seals on both side of the seal plate [13] with Royco HF-825 lubricant, D00657.
 - (b) Put the new seal plate [13] in its position on the APU gearbox.
 - 1) Make sure the oil supply and oil scavenge holes are correctly aligned.
 - (c) Install the 3 screws [16] that attach the generator seal plate to the APU gearbox.

SUBTASK 24-21-01-420-005

- (4) Install the generator [6].
 - (a) Remove the bolt [11] from the lift boss.
 - (b) Install the generator lifting eye, SPL-1626 into the generator lift boss.



CAUTION

DO NOT ALLOW THE APU GENERATOR TO HANG ON THE SPLINED SHAFT DURING INSTALLATION. FAILURE TO HOLD THE APU GENERATOR CORRECTLY CAN CAUSE DAMAGE THE INTERNAL SPLINE.

- (c) Use the cable fishpole hoist, COM-1563 to install the generator to the gearbox mount pad.
- (d) Hold the generator correctly to make sure no weight is put on the splined shaft.
- (e) Do these steps at the same time:
 - 1) Connect the splined shaft and gearbox spline of the generator.
 - 2) Put the self-locking nuts [14] through the large part of the keyhole slots in the generator input flange.

NOTE: If the cover plate is installed, remove and discard the nuts and washers. HW42-6 are the "transportation" nuts. Replace with BACN11Z6C.
- (f) Turn the generator [6] counterclockwise.
 - 1) Make sure the indexing pin [12] on the generator is aligned with the mating hole on the gearbox mount pad.
 - 2) Make sure the gearbox studs are seated in the small part of the keyhole slots.
- (g) Tighten the self-locking nuts [14] to a torque of 175 - 200 pound-inches.
 - 1) Make sure that the self-locking nuts are installed correctly (see Figure 401 (Sheet 2)).
 - 2) Make sure that there is no visible gap between generator flange and seal plate.

SUBTASK 24-21-01-020-006

- (5) Remove the generator lifting eye, SPL-1626 from the lift boss.

SUBTASK 24-21-01-420-006

- (6) Install the bolt [11] on the lift boss.

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SUBTASK 24-21-01-420-007

- (7) Install the leads [3].
- (a) Remove the terminal block cover [1].
 - 1) Remove the screws [8] and washers [7] from the generator.
 - 2) Remove the terminal block cover [1] from the generator [6].
 - (b) Remove the captive washer nuts [2] from the terminal studs.



CAUTION

DO NOT INSTALL WASHERS BELOW THE TERMINAL LUGS. THE TERMINAL LUGS MUST DIRECTLY TOUCH THE OTHER TERMINAL LUGS. WASHERS BELOW THE TERMINAL LUGS WILL CAUSE THE TERMINAL BLOCK TO BURN.

- (c) Install the phase leads [3] on the power terminal studs.
- (d) Make sure the leads [3] labels (N, T1, T2, T3) agree with the terminal labels.
- (e) Install the 12-point captive washer nuts [2] or the preferred 6-point Spiralock (Belleville) nut.

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

- (f) Tighten the nuts 12 ft-lb (16 N·m) – 14 ft-lb (19 N·m).

SUBTASK 24-21-01-420-008

- (8) Install the terminal block cover [1].
- (a) Apply oil, D00071 or oil, D00068 to the threads of the screws [8].
 - (b) Put the terminal block cover [1] on the generator [6].
 - (c) Install the washers [7] and screws [8].
 - 1) Tighten the screws [8] to 20 in-lb (2.3 N·m) - 22 in-lb (2.5 N·m).

SUBTASK 24-21-01-420-009

- (9) Connect the electrical harness connectors.
- (a) Remove the dust caps from the generator electrical connectors.
 - (b) Connect the electrical harness connectors to the generator electrical connectors A [4] and B [5].

SUBTASK 24-21-01-860-006

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

APU Auxiliary Panel, P49

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

Standby Power Management Panel, P310

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

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

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

SUBTASK 24-21-01-860-007

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

I. APU Generator Installation Test

SUBTASK 24-21-01-710-001

- (1) Do these steps for the test of the APU generator.
- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (b) Push the APU GEN switch on the P5 panel to the ON position.
 - (c) Make sure the ELEC GEN OFF APU does not show on the EICAS page as an advisory message.
 - (d) Make sure these results show on the ELECTRICAL Maintenance Page (Table 401):

Table 401/24-21-01-993-802

CONDITION	LIMITS
AC-V	110 to 120
FREQ	396 to 404
LOAD	0.15 to 0.85

- (e) Make sure there are no related maintenance messages show on the CMC for the APU generator.
- (f) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 24-21-01-410-001

- (1) Do this task:

APU Access Doors (Close), TASK 49-11-02-410-801

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

————— END OF TASK —————

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APU GENERATOR TERMINAL BLOCK - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU generator terminal block
- (2) An installation of the APU generator terminal block.

TASK 24-21-02-000-801

2. APU Generator Terminal Block Removal

(Figure 401)

A. **References**

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

B. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Terminal Block	Not Specified	

C. **Location Zones**

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

D. **Access Panels**

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

E. **Prepare for Removal**

SUBTASK 24-21-02-860-001

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

SUBTASK 24-21-02-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

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

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This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

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

SUBTASK 24-21-02-010-001

(3) Do this task:

APU Access Doors (Open), TASK 49-11-02-010-801

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

F. Removal

SUBTASK 24-21-02-020-001

(1) Remove the power feeders from the APU generator as follows:

- Remove the two screws [1] and washers [2] which hold the terminal block cover [3].
- Remove the terminal block cover [3].
- Remove the four captive washer nuts [4] and remove the power feeders from the terminal studs.

NOTE: Place identification tags on feeders (if necessary) before removing.

SUBTASK 24-21-02-020-002

(2) Remove the APU generator Terminal Block [8] as follows:

- Remove the two screws [5] and washers [6] that hold the terminal block to the generator.
- Remove terminal block [8] and four square washers [7] from the generator.

NOTE: The square washers are installed between the through lead straps and the terminal block [8].

————— **END OF TASK** —————

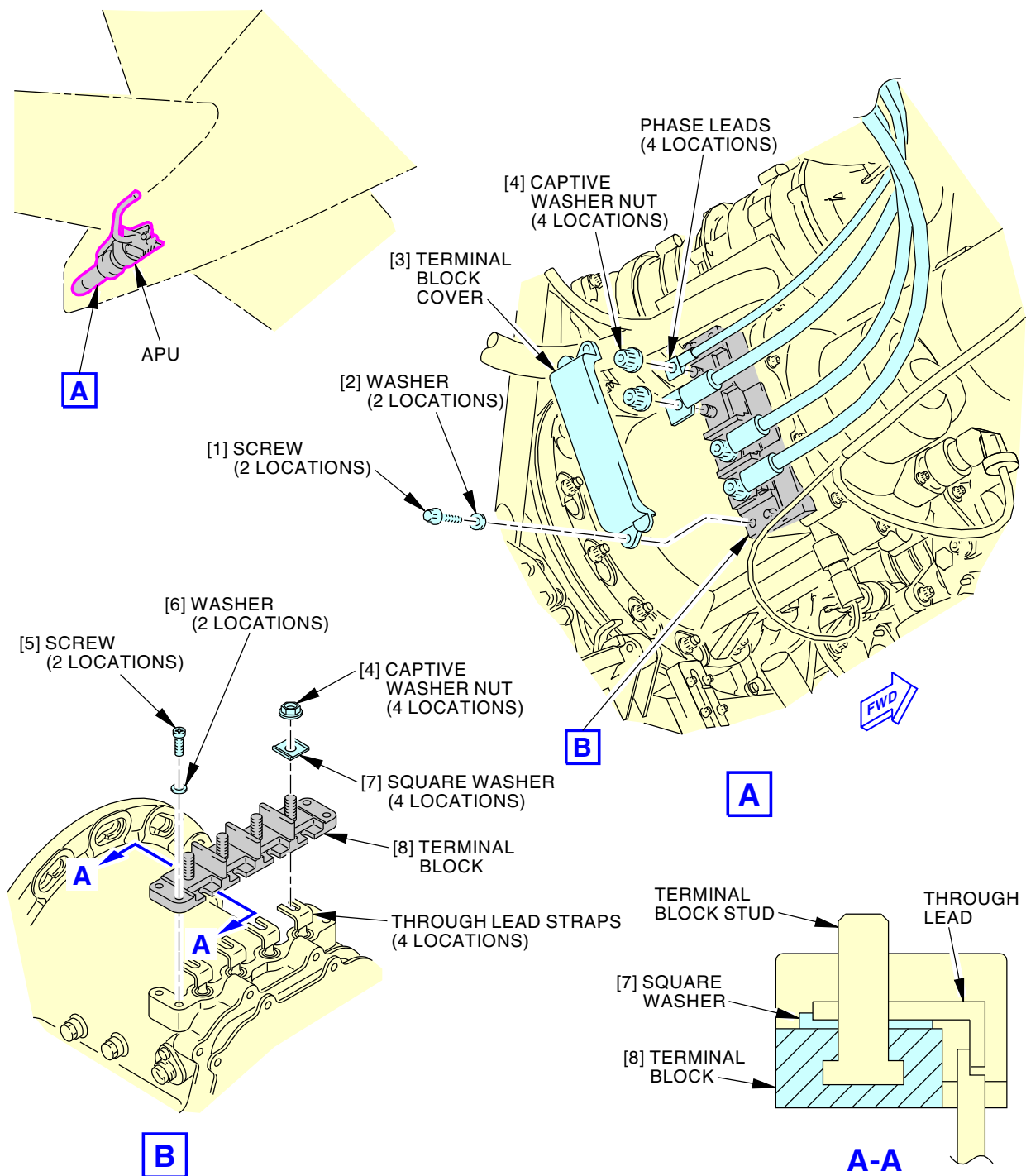
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**APU Generator Terminal Block Installation
Figure 401/24-21-02-990-801**

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TASK 24-21-02-400-801

3. APU Generator Terminal Block Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-803	Supply APU Generator Power (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Terminal Block	Not Specified	

C. Location Zones

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

D. Access Panels

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

E. Installation

SUBTASK 24-21-02-420-001

(1) Install the APU generator terminal block as follows:

- (a) Use a dry clean cloth to wipe any oil or debris from the surface of generator where terminal block mates with the generator.
- (b) Install one square washer [7] on each of the studs of the Terminal Block [8].



CAUTION

MAKE SURE THE SQUARE WASHERS ARE INSTALLED BELOW THE IDG THROUGH LEAD STRAPS. SQUARE WASHERS INSTALLED INCORRECTLY CAN CAUSE OVERHEATING AND SUBSEQUENT DAMAGE TO THE IDG.

- (c) Position terminal block [8] and square washers [7] on generator. Make sure that the four square washers [7] are below the generator through lead straps.
- (d) Install two screws [5] and washers [6] that hold the terminal block and tighten screws to 51-56 inch-pounds (5.8-6.3 Newton-meters).

SUBTASK 24-21-02-420-002

(2) Install the APU generator power feeders as follows:

- (a) Install the power feeder lugs on the terminal studs and make sure the feeders are on the correct terminal studs.
- (b) Install the 12-point captive washer nuts [4] or the preferred 6-point Spiralock (Belleville) nut and tighten to 12 ft-lb (16 N·m) - 14 ft-lb (19 N·m).

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

NOTE: Access to terminal stud T2 is blocked by APU support. Apply torque to terminal stud T2 nut using crowfoot wrench set at 90 degree angle to torque wrench.

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- (c) Install the terminal block cover [3].
- (d) Install the two screws [1] and washers [2] and tighten screws to 20 in-lb (2.3 N·m) - 22 in-lb (2.5 N·m).

SUBTASK 24-21-02-410-001

- (3) Do this task:

APU Access Doors (Close), TASK 49-11-02-410-801

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

SUBTASK 24-21-02-860-003

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

APU Auxiliary Panel, P49

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

Standby Power Management Panel, P310

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

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

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

SUBTASK 24-21-02-860-004

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

F. Installation Test

SUBTASK 24-21-02-710-001

- (1) Do this task: Supply APU Generator Power, TASK 24-22-00-860-803.

————— END OF TASK —————

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APU GENERATOR TERMINAL BLOCK - INSPECTION/CHECK

1. General

A. This procedure has this task:

- (1) APU Generator Terminal Block Inspection

TASK 24-21-02-200-801

2. APU Generator Terminal Block - Inspection

A. **Location Zones**

Zone	Area

315	APU Compartment, Left

316	APU Compartment, Right

B. **APU Generator Terminal Block Inspection**

SUBTASK 24-21-02-420-003

- (1) Do the steps that follow to inspect the condition of the power feeder cables at APU.
- (a) Check for signs of overheating or stress on the colored teflon identification sleeves on the power feeder cables.
 - (b) Check for signs of overheating or stress on the power feeder cable terminal lugs and the terminal block.
 - (c) Check for the general condition of the power feeder cables.
 - (d) Make sure the terminal studs are securely attached to the terminal block base and the terminal stud threads are not damaged.
 - (e) Check for signs of oil leakage at the generator Through Lead Straps where they exit the housing.
 - (f) Check for signs of overheating or stress on the generator Through Lead Straps.

————— **END OF TASK** —————

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AC GENERATION AND BUS CONTROL - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Supply Electrical Power To The Airplane
 - (2) Remove Electrical Power From The Airplane
 - (3) Supply Primary External Power
 - (4) Supply Primary External Power to the Ground Handling Bus
 - (5) Supply Primary External Power to the Ground Service Bus
 - (6) Supply Primary External Power to the Main 115V AC Buses
 - (7) Remove Primary External Power
 - (8) Remove Primary External Power from the Ground Handling Bus
 - (9) Remove Primary External Power from the Ground Service Bus
 - (10) Remove Primary External Power from the Main 115V AC Buses
 - (11) Supply Secondary External Power
 - (12) Remove Secondary External Power
 - (13) Supply APU Power
 - (14) Remove APU Power
 - (15) Supply IDG Power
 - (16) Remove IDG Power.
- C. If primary and secondary external power are both used to supply power to the airplane and the main battery is completely discharged or missing, then select the SECONDARY EXT PWR switch first before you select the PRIMARY EXT PWR.

NOTE: The Bus Power Control Unit (BPCU) is powered from either the main battery bus or primary external power by means of the right main AC bus. The main battery switch must be selected ON and the main battery must be providing power to the BPCU if primary external power is applied before secondary external power. If this procedure is not followed, large inrush currents due to the in-flight entertainment system will cause the BPCU to shut down, which will cause the right main AC bus to drop offline.
- D. Most of the switches you use to control the electrical power system are on the electrical system control panel. The electrical system control panel is on the P5 overhead panel.
- E. If both primary external power and secondary external power are used to supply power to the airplane, it is not necessary to have the BATTERY switch in the ON (latched) position. However, if the BATTERY switch is in the OFF position, secondary external power must be selected before primary external power.

NOTE: If the primary external power source goes off line when the BATTERY switch is in the ON position, the main battery will discharge.
- F. If the airplane is powered by only secondary external power, the BATTERY switch must be put in the ON (latched) position. The main battery will be used to supply power to the bus power control unit (BPCU) when the airplane is powered by only secondary external power.
- G. It is recommended that you put the BATTERY switch in the ON (latched) position when you transfer power sources on the airplane.

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TASK 24-22-00-860-805

2. Supply Electrical Power

A. Location Zones

Zone	Area

211	Flight Compartment, Left

B. Procedure

SUBTASK 24-22-00-860-009

- (1) Do one of these tasks to supply electrical power to the airplane:
 - (a) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.
 - (b) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.
 - (c) Do this task: Supply APU Generator Power, TASK 24-22-00-860-803.
 - (d) Do this task: Supply IDG Power, TASK 24-22-00-860-804.

———— **END OF TASK** ————

TASK 24-22-00-860-806

3. Remove Electrical Power

A. Location Zones

Zone	Area

211	Flight Compartment, Left

B. Procedure

SUBTASK 24-22-00-860-010

- (1) Do one of these tasks to remove electrical power from the airplane:
 - (a) Do this task: Remove Primary External Power, TASK 24-22-00-860-807.
 - (b) Do this task: Remove Secondary External Power, TASK 24-22-00-860-808.
 - (c) Do this task: Remove APU Generator Power, TASK 24-22-00-860-809.
 - (d) Do this task: Remove IDG Power, TASK 24-22-00-860-810.

———— **END OF TASK** ————

TASK 24-22-00-860-801

4. Supply Primary External Power

(Figure 201)

A. General

- (1) Use the applicable procedure to energize the necessary buses. To find the necessary buses, do a check of the wiring diagrams for the systems to be operated.

B. Location Zones

Zone	Area

211	Flight Compartment, Left

C. Procedure

SUBTASK 24-22-00-860-068

- (1) To supply primary external power to the ground handling bus, do this task: Supply Primary External Power to the Ground Handling Bus, TASK 24-22-00-860-811.

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SUBTASK 24-22-00-860-069

- (2) To supply primary external power to the ground service bus, do this task: Supply Primary External Power to the Ground Service Bus, TASK 24-22-00-860-812.

SUBTASK 24-22-00-860-070

- (3) To supply primary external power to the main 115V AC buses, do this task: Supply Primary External Power to the Main 115V AC Buses, TASK 24-22-00-860-813.

NOTE: This task automatically supplies power to the ground handling and ground service buses.

————— **END OF TASK** —————

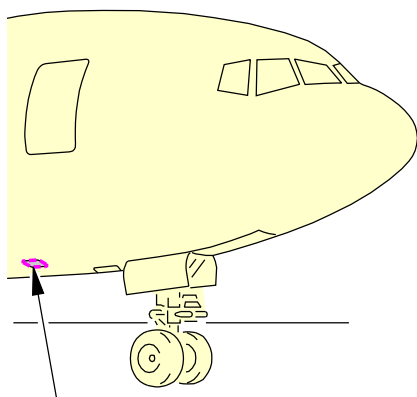
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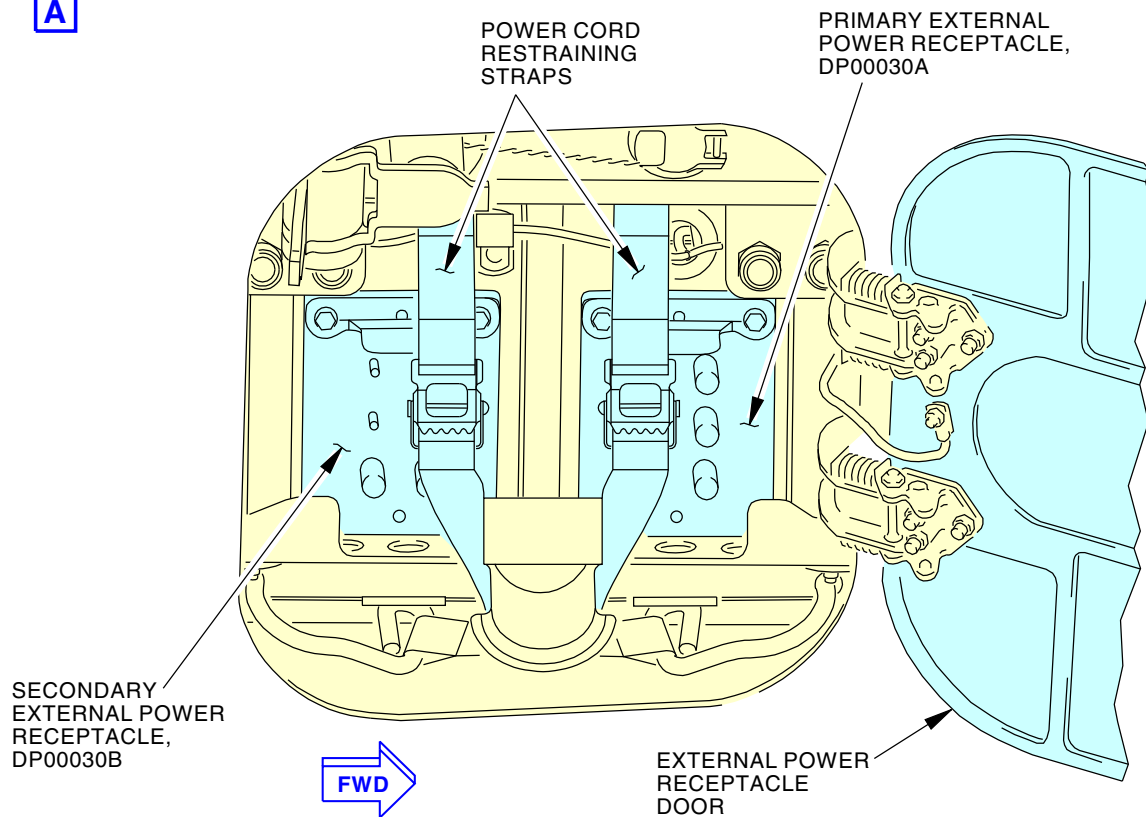
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EXTERNAL GROUND
POWER SUPPLY DOOR,
118AR

A



EXTERNAL POWER RECEPTACLES

A

F67232 S0006408197_V2

External Power Receptacles
Figure 201/24-22-00-990-801 (Sheet 1 of 2)

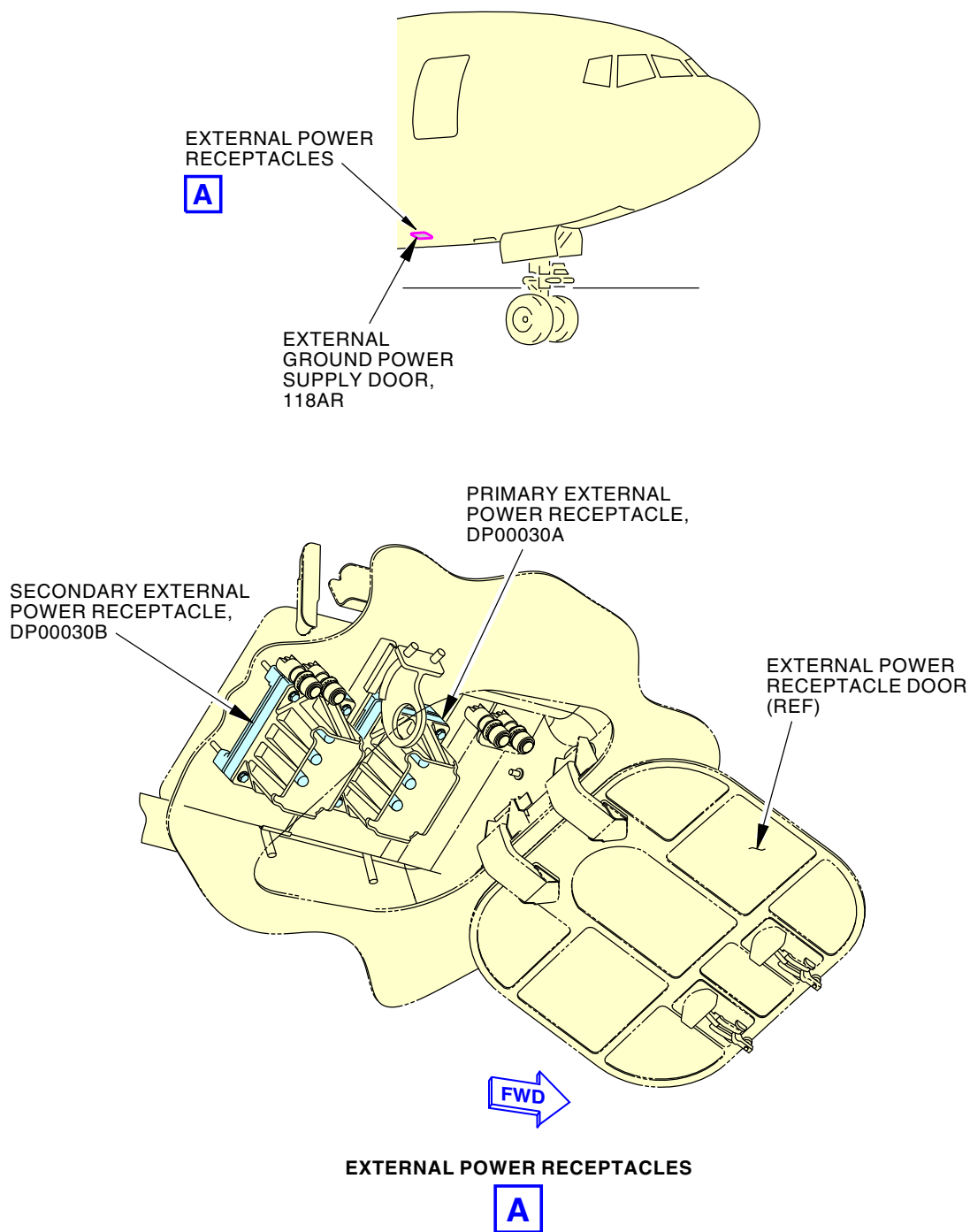
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External Power Receptacles
Figure 201/24-22-00-990-801 (Sheet 2 of 2)

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TASK 24-22-00-860-811

5. Supply Primary External Power to the Ground Handling Bus

A. General

- (1) This task has this part:
- (a) Supply primary external power to the ground handling bus

B. References

Reference	Title
20-41-00-910-801	Static Grounding (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

E. Procedure

SUBTASK 24-22-00-860-071

- (1) Do these steps to supply primary external power to the ground handling bus:
- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door



IF THE EXTERNAL POWER SUPPLY HAS AN EARTH GROUNDED NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRING OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE SEVERE INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (b) Make sure the external power supply operates correctly before you supply external power to the airplane.
- 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, do this task: Static Grounding, TASK 20-41-00-910-801.



REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (c) Install the power cable to the primary external power receptacle.
- NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.
- 1) Hold the cable with the electrical cable support.
- (d) Energize the external power cable.

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- (e) Make sure these lights on the external power panel (P30) come on:
 - 1) The PRIMARY POWER CONNECTED light
 - 2) The PRIMARY POWER NOT IN USE light.
 - (f) Make sure the AVAIL light in the PRIMARY EXT PWR switch comes on.
- NOTE: The ground handling bus energizes automatically when the external power is supplied to the primary external power receptacle.

————— **END OF TASK** —————

TASK 24-22-00-860-812

6. Supply Primary External Power to the Ground Service Bus

(Figure 201)

A. General

- (1) This task has this part:
 - (a) Supply primary external power to the ground service bus

B. References

Reference	Title
20-41-00-910-801	Static Grounding (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

E. Procedure

SUBTASK 24-22-00-860-072

- (1) Do these steps to supply primary external power to the ground service bus:
 - (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door



IF THE EXTERNAL POWER SUPPLY HAS AN EARTH GROUND NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRING OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE SEVERE INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (b) Make sure the external power supply operates correctly before you supply external power to the airplane.
 - 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, do this task: Static Grounding, TASK 20-41-00-910-801.

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WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (c) Install the power cable to the primary external power receptacle.
NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.
 - 1) Hold the cable with the electrical cable support.
- (d) Energize the external power cable.
- (e) Make sure these lights on the external power panel (P30) are on:
 - 1) The PRIMARY POWER CONNECTED light
 - 2) The PRIMARY POWER NOT IN USE light.
- (f) Make sure the AVAIL light in the PRIMARY EXT PWR switch comes on.
- (g) Set the GROUND SERVICE switch to the ON position.
 - 1) Make sure the ON light in the GROUND SERVICE switch comes on.
- (h) Make sure the PRIMARY POWER NOT IN USE light on the P30 panel is off.
NOTE: The ground service bus energizes when the external power is supplied to the receptacle and the GROUND SERVICE switch is set to ON.

————— END OF TASK —————

TASK 24-22-00-860-813

7. Supply Primary External Power to the Main 115V AC Buses

(Figure 201)

A. General

- (1) This task has this part:
 - (a) Supply primary external power to the main 115V AC buses

B. References

Reference	Title
20-41-00-910-801	Static Grounding (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

E. Procedure

SUBTASK 24-22-00-860-080

- (1) If the airplane has been without power for more than 24 hours, then do this step:

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WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-22-00-860-073

- (2) Do these steps to supply primary external power to the 115V AC buses:

NOTE: The ground handling bus energizes automatically when the external power is supplied to the receptacle. The ground service bus is energized automatically when the external power is supplied to the right 115V AC bus.

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door



WARNING

IF THE EXTERNAL POWER SUPPLY HAS AN EARTH GROUNDED NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRING OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE SEVERE INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (b) Make sure the external power supply operates correctly before you supply external power to the airplane.

- 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, do this task: Static Grounding, TASK 20-41-00-910-801.



WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (c) Install the power cable to the primary external power receptacle.

NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.

- 1) Hold the cable with the electrical cable support.
- (d) Energize the external power cable.
- (e) Make sure these lights on the external power panel (P30) are on:
- 1) The PRIMARY POWER CONNECTED light
 - 2) The PRIMARY POWER NOT IN USE light.
- (f) Make sure the AVAIL light in the PRIMARY EXT PWR switch comes on.
- (g) Set the BATTERY switch to the ON (latched) position.

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- 1) If the battery is discharged, then do the steps that follow:
 - a) Set the GROUND SERVICE switch to the ON position.
 - b) Make sure the ON light in the GROUND SERVICE switch comes on.
 - c) Wait approximately 10 minutes for the battery to partially charge, then continue with the procedure to supply primary external power.
- (h) Push the PRIMARY EXT PWR switch.
- (i) Make sure the ON light in the PRIMARY EXT PWR switch comes on. If the ON light does not come on, do the steps that follow:
 - 1) Open these circuit breakers and install safety tags:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C24307	L MAIN AC SECT 1 BUS DISTR P110

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-004			
B	2	C24306	R MAIN AC SECT 1 BUS DISTR P210
ARO 006-999			
C	6	C24306	R MAIN AC SECT 1 BUS DISTR P210

ARO ALL

- 2) Push the PRIMARY EXT PWR switch and make sure the ON light comes on.
- 3) Remove the safety tags and close these circuit breakers:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C24307	L MAIN AC SECT 1 BUS DISTR P110

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-004			
B	2	C24306	R MAIN AC SECT 1 BUS DISTR P210
ARO 006-999			
C	6	C24306	R MAIN AC SECT 1 BUS DISTR P210

ARO ALL

- (j) Set the BATTERY switch to the OFF (unlatched) position.
- (k) Make sure the L BUS TIE and R BUS TIE switches are in the AUTO (latched) position.
- (l) Make sure the PRIMARY POWER NOT IN USE light on the P30 panel is off.
- (m) If applicable, remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

- (n) To erase EICAS MSGs related to Cargo Squib, use a Maintenance Access Terminal (MAT) to do the operational test of the cargo squibs:
 - 1) Make these selections on the MAT:

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- a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 26 Fire Extinguishing System
 - e) OPERATIONAL TEST
 - f) Cargo Squibs
 - g) CONTINUE
- 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.

————— END OF TASK —————

TASK 24-22-00-860-807

8. Remove Primary External Power

(Figure 201)

A. Location Zones

Zone	Area
118	Main Equipment Center, Right
211	Flight Compartment, Left

B. Procedure

SUBTASK 24-22-00-860-074

- (1) To remove primary external power from the ground handling bus, do this task: Remove Primary External Power From the Ground Handling Bus, TASK 24-22-00-860-814.

SUBTASK 24-22-00-860-075

- (2) To remove primary external power from the ground service bus, do this task: Remove Primary External Power from the Ground Service Bus, TASK 24-22-00-860-815.

SUBTASK 24-22-00-860-076

- (3) To remove primary external power from the main 115V AC buses, do this task: Remove Primary External Power from the Main 115V AC Buses, TASK 24-22-00-860-816.

————— END OF TASK —————

TASK 24-22-00-860-814

9. Remove Primary External Power From the Ground Handling Bus

(Figure 201)

A. General

- (1) This task has this part:
 - (a) Remove primary external power from the ground handling bus

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B. Location Zones

Zone	Area
118	Main Equipment Center, Right
211	Flight Compartment, Left

C. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

D. Procedure

SUBTASK 24-22-00-860-077

(1) Do these steps to remove primary external power from the ground handling bus:

- (a) Remove the power from the external power cable.
- (b) Make sure these lights on the P30 panel go off:
 - 1) The PRIMARY PWR CONNECTED light
 - 2) The PRIMARY POWER NOT IN USE light.



WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU REMOVE THE CABLE FROM THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (c) Remove the external power cable.

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CAUTION

MAKE SURE YOU INSTALL THE STRAP HOOKS PROPERLY. THE STRAP HOOKS CAN CAUSE THE DOOR TO CLOSE IMPROPERLY AND ALLOW AIRFLOW INSIDE THE PANEL. THIS CAN CAUSE THE STRAPS TO COME OUT INTO THE AIRSTREAM AND CAUSE DAMAGE TO THE HINGE AND SKIN AROUND THE DOOR.

- (d) Install the power chord restraining straps.

ARO ALL

- (e) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

————— END OF TASK —————

TASK 24-22-00-860-815

10. Remove Primary External Power from the Ground Service Bus

(Figure 201)

A. General

- (1) This task has this part:
 - (a) Remove primary external power from the ground service bus

B. Location Zones

Zone	Area
118	Main Equipment Center, Right

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(Continued)

Zone	Area

211	Flight Compartment, Left

C. Access Panels

Number	Name/Location

118AR	External Ground Power Supply Door

D. Procedure

SUBTASK 24-22-00-860-078

(1) Do these steps to remove primary external power from the ground service bus:

- (a) Set the GROUND SERVICE switch to the OFF position.
 - 1) Make sure the light in the switch goes off.
- (b) Remove power from the external power cable.
- (c) Make sure these lights on the P30 panel go off:
 - 1) The PRIMARY POWER CONNECTED light
 - 2) The PRIMARY POWER NOT IN USE light.



WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU REMOVE THE CABLE FROM THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (d) Remove the external power cable.

ARO ALL PRE SB 777-24-0152



CAUTION

MAKE SURE YOU INSTALL THE STRAP HOOKS PROPERLY. THE STRAP HOOKS CAN CAUSE THE DOOR TO CLOSE IMPROPERLY AND ALLOW AIRFLOW INSIDE THE PANEL. THIS CAN CAUSE THE STRAPS TO COME OUT INTO THE AIRSTREAM AND CAUSE DAMAGE TO THE HINGE AND SKIN AROUND THE DOOR.

- (e) Install the power chord restraining straps.

ARO ALL

- (f) Close this access panel:

Number	Name/Location

118AR	External Ground Power Supply Door

——— **END OF TASK** ———

TASK 24-22-00-860-816

11. Remove Primary External Power from the Main 115V AC Buses

(Figure 201)

A. General

- (1) This task has this part:
 - (a) Remove primary external power from the 115V AC buses

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B. Location Zones

Zone	Area
118	Main Equipment Center, Right
211	Flight Compartment, Left

C. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

D. Procedure

SUBTASK 24-22-00-860-079

(1) Do these steps to remove the primary external power from the 115V AC buses:

- (a) Push the PRIMARY EXT POWER switch.
 - 1) Make sure the AVAIL light in the switch comes on.
- (b) Remove the power from the external power cable.
- (c) Make sure these lights on the P30 panel are off:
 - 1) The PRIMARY POWER CONNECTED light
 - 2) The PRIMARY POWER NOT IN USE light.



REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU REMOVE THE CABLE FROM THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (d) Remove the external power cable.

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MAKE SURE YOU INSTALL THE STRAP HOOKS PROPERLY. THE STRAP HOOKS CAN CAUSE THE DOOR TO CLOSE IMPROPERLY AND ALLOW AIRFLOW INSIDE THE PANEL. THIS CAN CAUSE THE STRAPS TO COME OUT INTO THE AIRSTREAM AND CAUSE DAMAGE TO THE HINGE AND SKIN AROUND THE DOOR.

- (e) Install the power chord restraining straps.

ARO ALL

- (f) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

————— END OF TASK —————

TASK 24-22-00-860-802

12. Supply Secondary External Power

(Figure 201)

A. General

- (1) This task has this part:
 - (a) Supply the secondary external power to the 115V AC buses

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- (2) The BATTERY switch must be put into the ON (latched) position if the airplane is powered by only secondary external power.

B. References

Reference	Title
20-41-00-910-801	Static Grounding (P/B 201)

C. Location Zones

Zone	Area
118	Main Equipment Center, Right
211	Flight Compartment, Left

D. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

E. Procedure

SUBTASK 24-22-00-860-005

- (1) Do these steps to supply the secondary external power to the 115V AC buses:

NOTE: The ground service bus is energized automatically when the external power is supplied to the right 115V AC bus.

- (a) Set the BATTERY switch to the ON (latched) position.
(b) Open this access panel:

Number	Name/Location
118AR	External Ground Power Supply Door



WARNING

IF THE EXTERNAL POWER SUPPLY HAS AN EARTH GROUND NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRING OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE SEVERE INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (c) Make sure the external power supply operates correctly before you supply external power to the airplane.
- 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle does not operate correctly, do this task: Static Grounding, TASK 20-41-00-910-801.



WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLES BEFORE YOU CONNECT THE CABLES TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (d) Install the power cable to the secondary external power receptacles.
- NOTE:** Make sure that the receptacle contact area is clear of FOD before you connect the power cable.
- 1) Hold the cable with the electrical cable support.
- (e) Energize the external power cable.

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- (f) Make sure these lights on the P30 panel are on:
 - 1) The SECONDARY POWER CONNECTED light
 - 2) The SECONDARY POWER NOT IN USE light.
- (g) Make sure the AVAIL light in the SECONDARY EXT PWR switch is on.
- (h) Push the SECONDARY EXT PWR switch.
 - 1) Make sure the ON light in the switch comes on.
- (i) Make sure the SECONDARY POWER NOT IN USE light on the P30 panel is off.
- (j) Make sure the L BUS TIE and R BUS TIE switches are in the AUTO (latched) position.

———— **END OF TASK** ————

TASK 24-22-00-860-808

13. Remove Secondary External Power

(Figure 201)

A. General

- (1) This task has this part:
 - (a) Remove the secondary external power from the 115V AC buses.

B. Location Zones

Zone	Area
118	Main Equipment Center, Right
211	Flight Compartment, Left

C. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

D. Procedure

SUBTASK 24-22-00-860-015

- (1) Do these steps to remove the secondary external power from the 115V AC buses:
 - (a) Push the SECONDARY EXT PWR switch.
 - 1) Make sure the AVAIL light in the switch comes on.
 - (b) Set the BATTERY switch to the OFF (unlatched) position.
 - (c) Make sure the SECONDARY POWER NOT IN USE light on the P30 panel is on.
 - (d) Remove the power from the external power cable.
 - (e) Make sure these lights on the P30 panel are off:
 - 1) The SECONDARY POWER CONNECTED light
 - 2) The SECONDARY POWER NOT IN USE light.



WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU REMOVE THE CABLE FROM THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (f) Remove the external power cable.

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MAKE SURE YOU INSTALL THE STRAP HOOKS PROPERLY. THE STRAP HOOKS CAN CAUSE THE DOOR TO CLOSE IMPROPERLY AND ALLOW AIRFLOW INSIDE THE PANEL. THIS CAN CAUSE THE STRAPS TO COME OUT INTO THE AIRSTREAM AND CAUSE DAMAGE TO THE HINGE AND SKIN AROUND THE DOOR.

- (g) Install the power chord restraining straps.

ARO ALL

- (h) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

————— END OF TASK —————

TASK 24-22-00-860-803

14. Supply APU Generator Power

A. General

- (1) This task has this part:

- (a) Supply the APU generator power to the 115V AC buses

B. References

<u>Reference</u>	<u>Title</u>
49-11-00-860-804	APU Starting and Operation (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 24-22-00-860-006

- (1) Do these steps to supply the APU generator power to the 115V AC buses:

NOTE: The ground handling bus is automatically energized by the APU generator when the APU power is satisfactory, and the external power is not connected. The ground service bus is automatically energized when the right 115V ac bus is energized.

- (a) Set the BATTERY switch to the ON (latched) position.
(b) Set the APU GEN switch to the ON (latched) position.
(c) Set the L BUS TIE and R BUS TIE switches to the AUTO (latched) position.

NOTE: The ground service bus is automatically energized by the power from the right 115V ac bus.

- (d) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
(e) Make sure the ON light in the APU GEN switch comes on.

————— END OF TASK —————

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TASK 24-22-00-860-809

15. Remove APU Generator Power

A. General

- (1) This task has this part:
- (a) Remove the APU generator power from the 115V ac buses.

B. References

Reference	Title
49-11-00-860-805	APU Usual Shutdown (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Procedure

SUBTASK 24-22-00-860-016

- (1) Do these steps to remove the APU generator power from the 115V ac buses:
- (a) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
- (b) Set the BATTERY switch to the OFF (unlatched) position.

———— **END OF TASK** ————

TASK 24-22-00-860-804

16. Supply IDG Power

A. General

- (1) This task has these parts:
- (a) Supply the left IDG power to the 115V ac buses
- (b) Supply the right IDG power to the 115V ac buses

B. References

Reference	Title
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Procedure

SUBTASK 24-22-00-860-007

- (1) Do these steps to supply the left IDG power to the 115V ac buses:
- (a) Set the BATTERY switch to the ON (latched) position.
- (b) Set the L GEN CTRL switch to the ON (latched) position.
- (c) To energize the left 115V ac bus with the left generator power:
- 1) Start the left engine. To start the left engine, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.

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MAKE SURE THE DRIVE LIGHT IN THE L DRIVE DISC SWITCH STAYS OFF AFTER YOU START THE ENGINE. HIGH OIL OUT TEMPERATURE OR LOW OIL PRESSURE CAN CAUSE DAMAGE TO THE IDG.

- 2) Make sure the DRIVE light in the L DRIVE DISC switch is off.
 - a) If the L DRIVE DISC switch is pushed because the DRIVE light comes on, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
 - b) Isolate the failure which caused the DRIVE light to come on.
- (d) To energize the right 115V ac bus with the left generator power:
 - 1) Set the L BUS TIE and R BUS TIE switches to the AUTO position.

SUBTASK 24-22-00-860-008

- (2) Do these steps to supply the right IDG power to the 115V ac buses:
 - (a) Set the BATTERY switch to the ON (latched) position.
 - (b) Set the R GEN CTRL switch to the ON (latched) position.
 - (c) To energize the right 115V ac bus with the right generator power:
 - 1) Start the right engine. To start the right engine, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.



MAKE SURE THE DRIVE LIGHT IN THE R DRIVE DISC SWITCH STAYS OFF AFTER YOU START THE ENGINE. HIGH OIL OUT TEMPERATURE OR LOW OIL PRESSURE CAN CAUSE DAMAGE TO THE IDG.

- 2) Make sure the DRIVE light in the R DRIVE DISC switch is off.
 - a) If the R DRIVE DISC switch is pushed because the DRIVE light comes on, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
 - b) Isolate the failure which caused the DRIVE light to come on.
- (d) To energize the left 115V ac bus with the right generator power:
 - 1) Set the L BUS TIE and R BUS TIE switches to the AUTO (latched) position.

————— END OF TASK —————

TASK 24-22-00-860-810

17. Remove IDG Power

A. General

- (1) This task has these parts:
 - (a) Remove the left IDG power from the 115V ac buses.
 - (b) Remove the right IDG power from the 115V ac buses.

B. References

Reference	Title
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

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D. Procedure

SUBTASK 24-22-00-860-017

- (1) Do these steps to remove the left IDG power from the 115V ac buses:
 - (a) Stop the left engine. To stop the left engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
 - (b) Set the BATTERY switch to the OFF (unlatched) position.

SUBTASK 24-22-00-860-018

- (2) Do these steps to remove the right IDG power from the 115V ac buses:
 - (a) Stop the right engine. To stop the right engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
 - (b) Set the BATTERY switch to the OFF (unlatched) position.

———— **END OF TASK** ————

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AC GENERATION AND BUS CONTROL - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) An operational test of the AC generation and bus control
 - (2) A system test of the AC generation and bus control.

TASK 24-22-00-700-804

2. AC Generation and Bus Control - Operational Test

A. **General**

- (1) The operational test does these tests:
 - (a) Primary and Secondary External Power Check
 - (b) External Power and APU Power Check
 - (c) Engine Start With APU Power and Switch Check
 - (d) Bus Tie Breaker and Generator Circuit Breaker Check
 - (e) Engine and APU Shutdown
- (2) Most of the switches and lights you use to perform the operational test are on the P5 overhead panel. The other panels you use for the test are identified in the task.

B. **References**

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
31-61-00-800-816	Showing a System Synoptic Page (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. **Location Zones**

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. **Prepare For Test**

SUBTASK 24-22-00-860-063

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-22-00-860-067

- (2) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.

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E. Primary and Secondary External Power Check

SUBTASK 24-22-00-710-017

- (1) Do this check of primary and secondary external power:
 - (a) Make sure these lights are on:
 - 1) The ON light in the SECONDARY EXT PWR switch.
 - 2) The ON light in the PRIMARY EXT PWR switch.
 - (b) Push and release the PRIMARY EXT PWR switch.
 - (c) Make sure the AVAIL light in the switch comes on.
 - (d) Get access to the electrical system synoptic page. To get access, do this task: Showing a System Synoptic Page, TASK 31-61-00-800-816.
 - (e) Make sure these indications occur on the synoptic page:
 - 1) The SEC EXT PWR powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) L XFR
 - d) R XFR
 - (f) Push and release the PRIMARY EXT PWR switch.
 - (g) Make sure the ON light in the switch comes on.
 - (h) Make sure these indications occur on the synoptic page:
 - 1) The PRI EXT PWR powers these buses:
 - a) R MAIN
 - b) R XFR
 - 2) The SEC EXT PWR powers these buses:
 - a) L MAIN
 - b) L XFR
 - (i) Push and release the SECONDARY EXT PWR switch.
 - (j) Make sure the AVAIL light in the switch comes on.
 - (k) Make sure these indications occur on the synoptic page:
 - 1) The PRI EXT PWR powers these buses:
 - a) R MAIN
 - b) L MAIN
 - c) R XFR
 - d) L XFR

F. External Power and APU Power Check

SUBTASK 24-22-00-710-018

- (1) Do this check of external power and APU power:
 - (a) Push the APU GEN switch to the ON position.
 - (b) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (c) Make sure the OFF light in the APU GEN switch remains off.
 - (d) Make sure these indications occur on the synoptic page:

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- 1) The APU GEN powers these buses:
 - a) L MAIN
 - b) L XFR
- 2) The PRI EXT PWR powers these buses:
 - a) R MAIN
 - b) R XFR
- (e) Push the APU GEN switch to the OFF position.
- (f) Make sure the OFF light in the switch comes on.
- (g) Make sure this indication shows on the EICAS display:
 - 1) ELEC GEN OFF APU
- (h) Push the APU GEN switch to the ON position.
- (i) Make sure the OFF light in the switch goes off.
- (j) Make sure this indication does not show on the EICAS display:
 - 1) ELEC GEN OFF APU
- (k) Push the PRIMARY EXT PWR switch.
- (l) Make sure the AVAIL light in the switch comes on.

G. Engine Start With APU Power and Switch Check

SUBTASK 24-22-00-710-019

- (1) Do the engine start with APU power and the switch check as follows:
 - (a) Get access to the electrical system maintenance page. To get access, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - (b) Make sure the maintenance page shows the data in the table below:

Table 501/24-22-00-993-801

	L IDG	R IDG	L BACKUP GENERATOR	R BACKUP GENERATOR
OIL LEVEL -	NORMAL	NORMAL	NORMAL	NORMAL

- (c) Push the L and R GEN CTRL and the L and R BACKUP GEN switches to the ON position.
- (d) Make sure the OFF lights in the L and R GEN CTRL and the L and R BACKUP GEN switches are on.
- (e) Operate the left engine. To operate the left engine, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
- (f) Make sure the OFF lights on these switches go off:
 - 1) L GEN CTRL

NOTE: The GEN CTRL light will take 6 to 10 seconds to go off after the engine reaches idle position.
 - 2) L BACKUP GEN
- (g) Make sure these indications occur on the synoptic page:
 - 1) The L GEN powers these buses:
 - a) L MAIN

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- b) L XFR
NOTE: The L XFR bus is powered by left IDG for 10 seconds, then by left backup generator for 15 seconds, and then by left IDG again.
- 2) The APU GEN powers these buses:
 - a) R MAIN
 - b) R XFR
- (h) Push the APU GEN switch to the OFF position.
- (i) Make sure the OFF light in the switch comes on.
- (j) Make sure this message shows on the EICAS display:
 - 1) ELEC GEN OFF APU
- (k) Make sure these indications occur on the synoptic page:
 - 1) The L GEN powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) L XFR
 - 2) The L BACKUP GEN powers the R XFR bus.
NOTE: It can take up to 15 seconds for the engine start-up electrical self test to complete. The R XFR bus will be powered by the L BACKUP GEN at the end of the test.
- (l) Operate the right engine. To operate the right engine, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
- (m) Make sure the OFF lights on these switches go off:
 - 1) R GEN CTRL
NOTE: The GEN CTRL light will take 6 to 10 seconds to go off after the engine reaches the idle position.
 - 2) R BACKUP GEN
- (n) Make sure these indications occur on the synoptic page:
 - 1) The R GEN powers these buses:
 - a) R MAIN
 - b) R XFR
 - 2) The L GEN powers these buses:
 - a) L MAIN
 - b) L XFR
- (o) Make sure the maintenance page shows the data in the tables below:

Table 502/24-22-00-993-802

For the left and right generators:	
AC Volts	110 to 120
Frequency	395 to 405
Load	0.2 to 0.6

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Table 503/24-22-00-993-803

For the backup converter:	
AC Volts	110 to 120
Frequency	395 to 405
Load	0.0 to 0.6

Table 504/24-22-00-993-804

For left and right IDGs; left and right backup generators:	
Out temperature	10 to 127 deg C or 50 to 260 deg F
Rise temperature	4 to 16 deg C or 8 to 60 deg F

- (p) Push the L GEN CTRL switch to the OFF position.
- (q) Make sure the OFF light in the switch comes on.
- (r) Make sure this message shows on the EICAS display:
 - 1) ELEC GEN OFF L
- (s) Make sure these indications occur on the synoptic page:
 - 1) The R GEN powers these buses as follows:
 - a) L MAIN
 - b) R MAIN
 - c) R XFR
 - 2) The L BACKUP GEN powers the L XFR
- (t) Push the APU GEN switch to the ON position.
- (u) Make sure the OFF light in the switch goes off.
- (v) Make sure this message does not show on the EICAS display:
 - 1) ELEC GEN OFF APU
- (w) Make sure these indications occur on the synoptic page:
 - 1) The R GEN powers these buses:
 - a) R MAIN
 - b) R XFR
 - 2) The APU GEN powers these buses:
 - a) L MAIN
 - b) L XFR

H. Bus Tie Breakers, and Generator Circuit Breakers

SUBTASK 24-22-00-710-020

- (1) Do this check of the bus tie breakers, and the generator circuit breakers:
 - (a) Push the APU GEN switch to the OFF position.
 - (b) Make sure the OFF light in the switch comes on.
 - (c) Push the L and R GEN CTRL switches to the OFF position.
 - (d) Make sure the OFF lights in both switches come on.
 - (e) Make sure these messages show on the EICAS display:

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- 1) ELEC AC BUS L
- 2) ELEC AC BUS R
- (f) Push the R BUS TIE switch to the ISLN position.
- (g) Make sure the ISLN light in the switch comes on.
- (h) Push the R GEN CTRL switch to the ON position.
- (i) Make sure the OFF light in the switch goes off.
- (j) Make sure these messages do not show on the EICAS display:
 - 1) ELEC AC BUS R
 - 2) ELEC GEN OFF R
- (k) Make sure the R BTB is open on the synoptic page.
- (l) Push the R BUS TIE switch on the P5 panel to the AUTO position.
- (m) Make sure the ISLN light in the switch goes off.
- (n) Make sure this message does not show on the EICAS display:
 - 1) ELEC AC BUS L
- (o) Make sure this message shows on the EICAS display:
 - 1) ELEC GEN OFF L
- (p) Make sure the R BTB is closed on the synoptic page.
- (q) Push the L BUS TIE switch to the ISLN position.
- (r) Make sure the ISLN light in the switch comes on.
- (s) Make sure this message shows on the EICAS display:
 - 1) ELEC AC BUS L
- (t) Make sure the L BTB is open on the synoptic page.
- (u) Push the L GEN CTRL switch to the ON position.
- (v) Make sure the OFF light in the switch goes off.
- (w) Make sure these messages do not show on the EICAS display:
 - 1) ELEC AC BUS L
 - 2) ELEC GEN OFF L
- (x) Push the L BUS TIE switch to the AUTO position.
- (y) Make sure the ISLN light in the switch goes off.
- (z) Push the R GEN CTRL switch to the OFF position.
- (aa) Make sure the OFF light in the switch comes on.
- (ab) Make sure this message shows on the EICAS display:
 - 1) ELEC GEN OFF R
- (ac) Make sure these messages do not show on the EICAS display:
 - 1) ELEC AC BUS L
 - 2) ELEC AC BUS R
 - 3) ELEC GEN OFF L



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I. Engine and APU Shutdown

SUBTASK 24-22-00-860-064

- (1) Do the left engine shutdown procedure. To shutdown the left engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 24-22-00-860-065

- (2) Do the right engine shutdown procedure. To shutdown the right engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 24-22-00-860-066

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

J. Put the Airplane Back to Its Usual Condition

SUBTASK 24-22-00-080-003

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

TASK 24-22-00-700-802

3. AC Generation and Bus Control - System Test

A. General

- (1) The system test has an Air Mode Test.

B. References

Reference	Title
24-22-00-860-804	Supply IDG Power (P/B 201)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Prepare for the Test

SUBTASK 24-22-00-040-001

 WARNING	DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN MOVE QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do the deactivation procedure for the spoilers or move all persons and equipment away from the control surfaces. To deactivate the spoilers, do this task: Spoiler Deactivation, TASK 27-61-00-040-801.

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SUBTASK 24-22-00-860-038



OBEY THE PROCEDURE THAT PUTS THE AIRPLANE IN THE AIR MODE. IF YOU DO THE PROCEDURE INCORRECTLY, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Put the airplane in the air mode. To put the airplane in the air mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

SUBTASK 24-22-00-480-001

- (3) Install the power cable to the primary external power receptacle.

NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.

- (a) Hold the power cable with the electrical power support.
- (b) Energize the power cable.

SUBTASK 24-22-00-860-039

- (4) Supply integrated drive generator power to the main AC buses. To supply integrated drive generator power to the main AC buses, do this task: Supply IDG Power, TASK 24-22-00-860-804

E. AC Generation and Bus Control - System Test

SUBTASK 24-22-00-730-001

- (1) Do a check on the air mode:
 - (a) Make sure the L (R) BUS TIE switches are in the AUTO position.
 - 1) Make sure the ISLN light in each switch is off.
 - (b) Make sure the ON lights in the L (R) GEN CTRL switches are on.
 - (c) Make sure these indications occur on the synoptic page:
 - 1) The L GEN powers these buses:
 - a) L MAIN
 - b) L XFR
 - c) L UTIL
 - 2) The R GEN powers these buses:
 - a) R MAIN
 - b) R XFR
 - c) R UTIL
 - (d) Push the R GEN CTRL switch to the OFF position.
 - 1) Make sure the OFF light in the switch comes on.
 - 2) Make sure the ELEC GEN OFF R indication shows on the EICAS display.
 - (e) Make sure these indications occur on the synoptic page:
 - 1) The L GEN powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) L XFR
 - d) R UTIL

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- e) L UTIL
 - 2) The R BACKUP GEN powers the R XFR bus.
- (f) Make sure these lights are off:
 - 1) The OFF light in the L GEN CTRL switch.
 - 2) The ON light in the PRIMARY EXT PWR switch.
- (g) Push and release the PRIMARY EXT PWR switch.
- (h) Make sure these lights stay off:
 - 1) The ON light in the PRIMARY EXT PWR switch.
 - 2) The OFF light in the L GEN CTRL switch.
- (i) Push the R GEN CTRL switch to the ON position.
 - 1) Make sure the ON light in the switch comes on.
- (j) Wait a minimum of 15 seconds before continuing.
- (k) Push the L GEN CTRL switch to the OFF position.
 - 1) Make sure the OFF light in the switch comes on.
 - 2) Make sure the ELEC GEN OFF L indication shows on the EICAS display.
- (l) Make sure these indications occur on the synoptic page:
 - 1) The R GEN powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) R XFR
 - d) R UTIL
 - e) L UTIL
 - 2) The L BACKUP GEN powers the L XFR bus.
- (m) Make sure the ON light in the PRIMARY EXT PWR switch stays off.
- (n) Push and release the PRIMARY EXT PWR switch.
- (o) Make sure these lights stay off:
 - 1) The ON light in the PRIMARY EXT PWR switch.
 - 2) The OFF light in the R GEN CTRL switch.
- (p) Push the L GEN CTRL switch to the ON position.
- (q) Make sure these lights are off:
 - 1) The OFF light in the L (R) GEN CTRL switch.
 - 2) The ON light in the PRIMARY EXT PWR switch.
- (r) Push and release the PRIMARY EXT PWR switch.
- (s) Make sure these lights are off:
 - 1) The ON light in the PRIMARY EXT PWR switch.
 - 2) The OFF light in the L (R) GEN CTRL switch.
- (t) Push the L GEN CTRL switch to the OFF position.
 - 1) Make sure the OFF light in the switch comes on.
- (u) Push the R GEN CTRL switch to the OFF position.

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- 1) Make sure the OFF light in the switch comes on.
- (v) Push the APU GEN switch to the OFF position.
 - 1) Make sure the OFF light in the switch is on.
- (w) Make sure these indications occur on the EICAS display:
 - 1) ELEC AC BUS L
 - 2) ELEC AC BUS R

SUBTASK 24-22-00-860-040

- (2) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (a) Make sure the OFF light in the APU GEN switch stays on.
 - (b) Push the APU GEN switch to the ON position.
 - 1) Make sure the OFF light in the switch goes off.
 - (c) Make sure the OFF light in the L (R) GEN CTRL switch stays on.
 - (d) Wait a minimum of 15 seconds before continuing.
 - (e) Make sure these indications occur on the synoptic page:
 - 1) The APU GEN powers these buses:
 - a) L MAIN
 - b) R MAIN
 - c) L XFR
 - d) R UTIL
 - e) L UTIL
 - 2) The R BACKUP GEN powers the R XFR buses.
 - (f) Push the L GEN CTRL switch to the ON position.
 - 1) Make sure the OFF light in the switch goes off.
 - (g) Make sure the OFF light in the APU GEN switch stays off.
 - (h) Make sure the OFF light in the R GEN CTRL switch stays on.
 - (i) Make sure these indications occur on the synoptic page:
 - 1) The L GEN powers these buses:
 - a) L MAIN
 - b) L XFR
 - c) L UTIL
 - 2) The APU GEN powers these buses:
 - a) R MAIN
 - b) R XFR
 - c) R UTIL
 - (j) Push the R GEN CTRL switch to the ON position.
 - 1) Make sure the OFF light in the switch goes off.
 - (k) Make sure these indications occur on the synoptic page:
 - 1) The L GEN powers these buses:
 - a) L MAIN

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- b) L XFR
- c) L UTIL
- 2) The R GEN powers these buses:
 - a) R MAIN
 - b) R XFR
 - c) R UTIL

SUBTASK 24-22-00-860-041

- (3) Stop the left engine. To stop the left engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
 - (a) Make sure these lights on the P5 panel come on:
 - 1) The OFF light in the L GEN CTRL switch.
 - 2) The OFF light in the L BACKUP GEN switch.
 - (b) Make sure these lights are off:
 - 1) The OFF light in the R GEN CTRL switch.
 - 2) The OFF light in the APU GEN switch.

SUBTASK 24-22-00-860-042

- (4) Stop the right engine. To stop the right engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
 - (a) Make sure these lights on the P5 panel come on:
 - 1) The OFF light in the R GEN CTRL switch.
 - 2) The OFF light in the R BACKUP GEN switch.
 - (b) Make sure the OFF light in the L GEN CTRL switch stays on.
 - (c) Make sure the OFF light in the APU GEN switch stays off.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-22-00-860-043

- (1) Put the airplane in the ground mode. To put the airplane in the ground mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

SUBTASK 24-22-00-860-044

- (2) Stop the APU. To stop the APU, do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

————— END OF TASK —————

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ELECTRICAL SYSTEM CONTROL PANEL - REMOVAL/INSTALLATION

1. **General**

A. This procedure has two tasks:

- (1) Electrical Module Assembly Removal
- (2) Electrical Module Assembly Installation.

TASK 24-22-01-000-801

2. **Electrical Module Assembly Removal**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the removal of the electrical module assembly. The electrical module assembly, M24023 is installed on the P5 overhead panel.

B. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Electrical Module Assembly Removal

SUBTASK 24-22-01-020-001

- (1) Do these steps to remove the electrical module assembly [1]:
 - (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (b) Set the BATTERY switch on the P5 panel to the OFF position.
 - (c) Hold the electrical module assembly.
 - (d) Disengage the quarter-turn fasteners on the electrical module assembly [1] (six locations).



CAREFULLY REMOVE THE ELECTRICAL MODULE ASSEMBLY. THIS WILL PREVENT DAMAGE TO THE ELECTRICAL CABLES AT THE REAR OF THE CONTROL MODULE.

- (e) Pull the electrical module assembly [1] carefully out from the overhead panel to get access to the electrical connectors.
- (f) Disconnect the electrical connectors from the electrical module assembly [1].
- (g) Put protective covers on the electrical connectors.

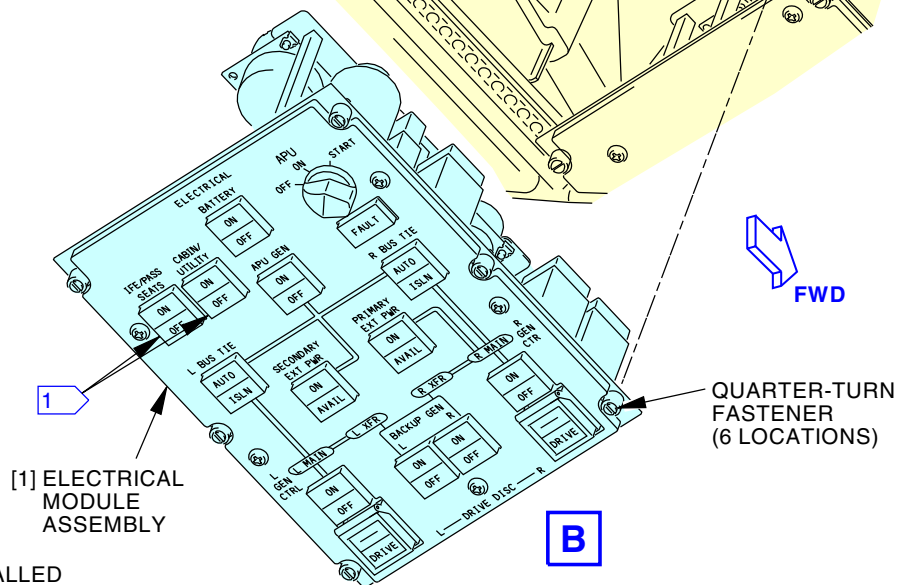
————— **END OF TASK** —————

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1 IF INSTALLED

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Electrical System Control Panel Installation
Figure 401/24-22-01-990-801

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TASK 24-22-01-400-801

3. Electrical Module Assembly Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the installation of the electrical module assembly. The electrical module assembly, M24023 is installed on the P5 overhead panel.

B. References

Reference	Title
24-22-00-700-804	AC Generation and Bus Control - Operational Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Electrical module assembly	24-21-01-10A-006	ARO ALL
		24-22-03-01-006	ARO ALL
		24-22-51-01-005	ARO ALL
		24-25-01-10-006	ARO ALL
		31-12-11-01B-060	ARO ALL

D. Location Zones

Zone	Area
211	Flight Compartment, Left

E. Electrical Module Assembly Installation

SUBTASK 24-22-01-420-001

- (1) Do these steps to install the electrical module assembly [1]:
- (a) Remove the protective covers from the electrical connectors.
 - (b) Examine the electrical connectors for bent or broken pins, dirt and damage.
 - 1) Clean or repair the electrical connectors if it is necessary.
 - (c) Connect the electrical connectors to the electrical module assembly.



CAUTION

CAREFULLY INSTALL THE ELECTRICAL MODULE ASSEMBLY. THIS WILL PREVENT DAMAGE TO THE ELECTRICAL CABLES AT THE REAR OF THE CONTROL MODULE.

- (d) Put the electrical module assembly [1] carefully in its position in the overhead panel.
- (e) Engage the quarter-turn fasteners, at the six locations, on the electrical module assembly [1].

F. Electrical Module Assembly Installation Test

SUBTASK 24-22-01-710-001

- (1) Do this task: AC Generation and Bus Control - Operational Test, TASK 24-22-00-700-804.

————— **END OF TASK** —————

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GENERATOR CONTROL UNIT (GCU) - MAINTENANCE PRACTICES

TASK 24-22-02-400-802

1. GCU Software Installation

A. General

- (1) This procedure tells you how to install software in the Generator Control Unit (GCU).
 - (a) The name of the software part loaded into an GCU follow:
GCU Operational Program Software (OPS)
Using the name, the specific software part number for an aircraft can be identified in the Illustrated Parts Catalog (IPC). All three GCUs use the same software part number.
- (2) The GCU accepts software loading only when the airplane is on the ground, the two main AC buses are energized from primary external power and associated generator control switch is off.
- (3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
- (4) If you do not know if the GCU needs new software, you can first do the software configuration check. It will save time if you only install software when the software is missing or the part number is incorrect. You can find the software configuration check in this task: Generator Control Units Software Configuration Check, TASK 24-22-02-750-801.
- (5) You can use the Ground Support Equipment (GSE)-Laptop, maintenance device, SPL-5704, as an alternative to the Portable Maintenance Access Terminal (PMAT) in this task.
NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.
- (6) You can install the software from disks, the Maintenance Access Terminal (MAT) hard drive or the PMAT hard drive (if available). It is recommended that you install software from the MAT or PMAT hard drive. To install new software on the MAT or PMAT hard drive, do this task: How to Add Software to the Hard Drive, TASK 45-10-00-860-812.
NOTE: When new software is installed in the GCU, the load process first erases the old software and then installs the new software. If you install software directly to the GCU from a faulty disk, the load process may erase the old software and then fail, so that no software is installed. If you install a faulty disk to the MAT or PMAT hard drive, the load may fail, but you will not erase the software from the GCU.
 - (a) It is recommended that you remove old software part numbers from the MAT or PMAT hard drive after new software is installed. To remove software from the hard drive, do this task: How to Remove Software from the Hard Drive, TASK 45-10-00-860-813.

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- (7) You can also install the software from the Onboard Network System (ONS) Mass Storage Device (MSD). To install new software on the ONS MSD, do this task: Mass Storage Device Software Part Installation, TASK 46-13-00-470-802.
 - (a) It is recommended that you remove old software part numbers from the ONS MSD after new software is installed. To remove software from the ONS MSD, do this task: Mass Storage Device Software Removal, TASK 46-13-00-070-801.

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- (8) The airplane must be on the ground with the engines off before you can install software.

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- (9) To read about the conditions and times necessary for software installation, do this task:
On-Airplane Software Installation, TASK 20-15-11-400-801.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-02-750-801	Generator Control Units Software Configuration Check (P/B 401)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-860-812	How to Add Software to the Hard Drive (P/B 201)
45-10-00-860-813	How to Remove Software from the Hard Drive (P/B 201)
46-13-00-070-801	Mass Storage Device Software Removal (P/B 201)
46-13-00-470-802	Mass Storage Device Software Part Installation (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

Zone	Area
212	Flight Compartment, Right

E. Procedure

SUBTASK 24-22-02-860-014

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-22-02-420-002

- (2) Use a MAT to install software in the GCU:

NOTE: Make sure you know the correct software part number for the GCU before you select the software part number on the display. For the GCU to be an approved installation, the correct software must be installed.

- Set the GND TEST switch on the P61 panel to the ENABLE position.
- Make these selections on the MAT:
 - ONBOARD MAINTENANCE
 - EXTENDED MAINTENANCE
 - DATA LOAD
- Select SELECT DESTINATION and then do these steps:
 - Select 24 Main AC Electrical Power Generation System.

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- 2) Select Generator Control Unit (GCU).
- 3) Select CONTINUE.
- (d) If the software is on a disk, put the correct disk in the disk drive.
- (e) Select SELECT SOURCE and then do these steps:
 - 1) Select the location of the software (if Disk Drive is the only selection, it is automatically selected).
 - 2) Select the correct software part number from the display.
 - 3) Select CONTINUE.
- (f) Select START to start the software installation.
- (g) When the software installation is completed, make sure the correct part number shows on the display.
- (h) Select CONTINUE to remove the configuration display.
- (i) Set the GND TEST switch on the P61 panel to the NORMAL position.

SUBTASK 24-22-02-440-001

- (3) Do these steps to stop the GCU's software installation mode:
 - (a) Set the applicable GEN CTRL switch on the P5 panel to the ON position.
 - (b) Set the applicable GEN CTRL switch on the P5 panel to the OFF position.

————— **END OF TASK** —————

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GENERATOR CONTROL UNIT - REMOVAL/INSTALLATION

1. General

- A. This procedure has three tasks:
- (1) A removal of the generator control unit.
 - (2) An installation of the generator control unit.
 - (3) A software configuration check of the generator control unit.

TASK 24-22-02-000-801

2. Generator Control Unit Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the removal of the Left (L), Right (R), and APU generator control unit (GCU). The generator control units M24105, M24205, and M24305 are installed on the E1-1, E2-2, and E2-3 equipment racks.

B. References

<u>Reference</u>	<u>Title</u>
20-10-01-000-801	E/E Box Removal (P/B 401)

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Prepare for the Removal

SUBTASK 24-22-02-860-001

- (1) Make sure the APU GEN switch on the P5 panel is in the OFF (released) position.

SUBTASK 24-22-02-860-002

- (2) Make sure the APU is not in operation.

SUBTASK 24-22-02-860-003

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	2	C24602	R IDG DISC
J	9	C24684	L GCU/BPCU

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C24601	L GCU
B	9	C24600	R GCU
H	7	C24606	APU GCU

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E. GCU Removal

SUBTASK 24-22-02-020-001

(1) Remove the GCU [1] (TASK 20-10-01-000-801).

———— **END OF TASK** ————

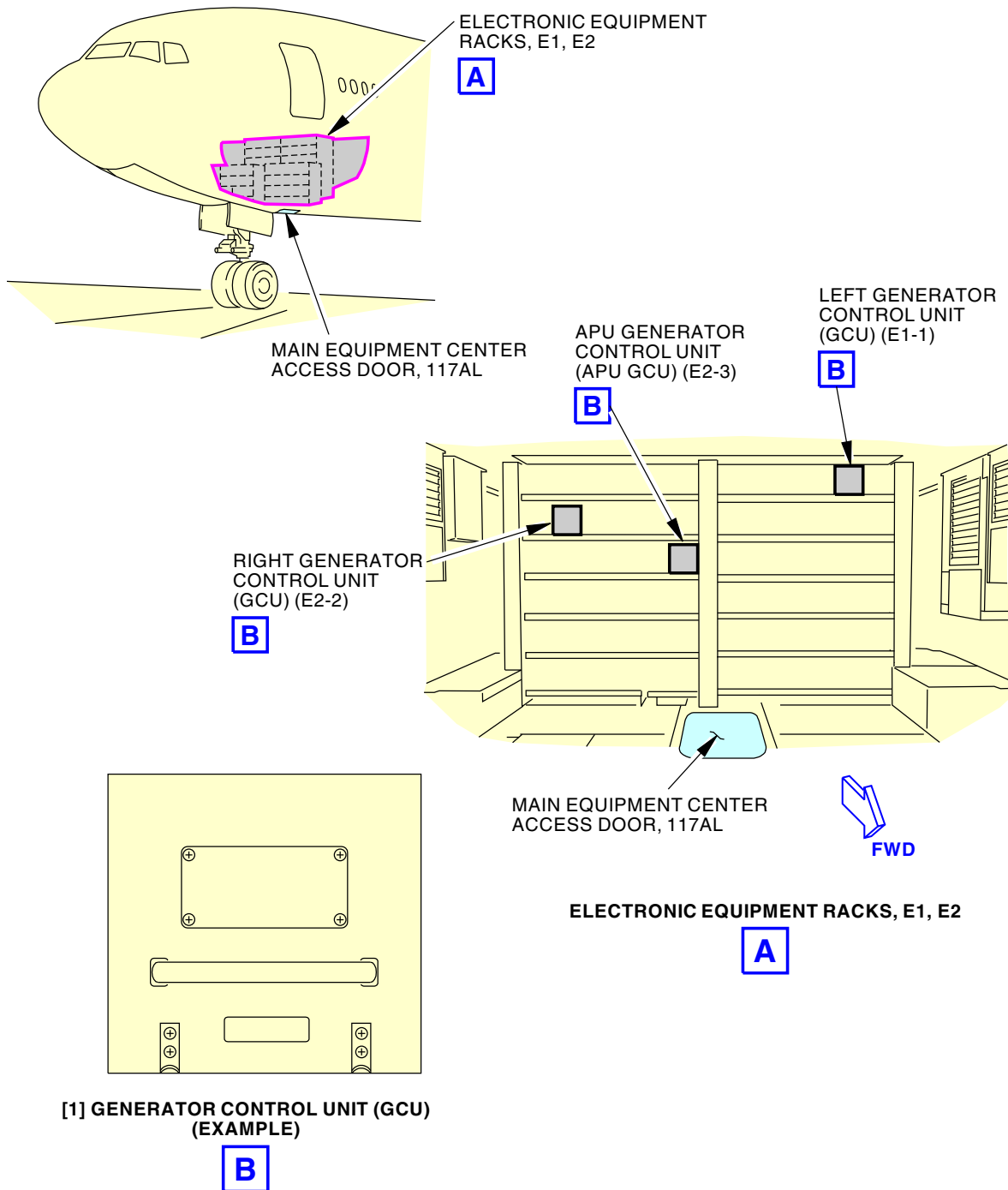
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Generator Control Unit (GCU) Installation
Figure 401/24-22-02-990-801

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TASK 24-22-02-400-801

3. Generator Control Unit Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the installation of the Left (L), Right (R), and APU generator control unit (GCU). The generator control units M24105, M24205, and M24305 are installed on the E1-1, E2-2, and E2-3 equipment racks.

B. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	GCU	24-22-02-01-009	ARO ALL

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. GCU Installation

SUBTASK 24-22-02-420-001

- (1) Install the GCU [1] (TASK 20-10-01-400-801).

F. GCU Post Installation Tests

SUBTASK 24-22-02-700-011

- (1) Do this task: Generator Control Unit Installation Test, TASK 24-22-02-710-802
- (2) Do this task: Generator Control Units Software Configuration Check, TASK 24-22-02-750-801

————— **END OF TASK** —————

TASK 24-22-02-710-802

4. Generator Control Unit Installation Test

A. General

- (1) This task is for the installation test of the generator control units (GCUs).
- (2) This task has these parts:
 - (a) Installation test of the left GCU
 - (b) Installation test of the right GCU
 - (c) Installation test of the APU GCU

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

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(Continued)

Reference	Title
24-22-00-860-807	Remove Primary External Power (P/B 201)
45-10-00-910-810	How to Operate the MAT in the Flight Compartment (P/B 201)

C. Location Zones

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

D. GCU Installation Test

SUBTASK 24-22-02-860-025

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

Right Power Management Panel, P210

Row	Col	Number	Name
J	2	C24602	R IDG DISC
J	9	C24684	L GCU/BPCU

Standby Power Management Panel, P310

Row	Col	Number	Name
B	8	C24601	L GCU
B	9	C24600	R GCU
H	7	C24606	APU GCU

SUBTASK 24-22-02-860-032

- (2) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-22-02-860-033

- (3) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.

SUBTASK 24-22-02-860-026

- (4) Do this task: Generator Control Units Software Configuration Check, TASK 24-22-02-750-801.

SUBTASK 24-22-02-860-018

- (5) Make sure the STANDBY PWR switch on the P61 panel is in the AUTO position.

SUBTASK 24-22-02-700-004

- (6) Do these steps for the test of the left GCU:
- Make sure the BATTERY switch is in the ON (latched) position.
 - Make sure the STANDBY PWR switch on the P61 panel is in the AUTO position.
 - Set the L GEN CTRL switch on the P5 panel to the OFF position.
 - Set the L GEN CTRL switch on the P5 panel to the ON position.
 - Set the L BUS TIE switch on the P5 panel to the ISLN (released) position.
 - Make sure the ISLN light on the switch comes on.
 - Make sure the ELEC AC BUS L appear on the EICAS.
 - Push the L BUS TIE switch on the P5 panel to the AUTO (latched) position.
 - Make sure the ISLN light on the switch goes off and the AUTO light comes on.
 - Make sure the ELEC AC BUS L do not appear on the EICAS.

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- (g) Use a maintenance access terminal (MAT) to do the LRU replacement test of the left generator control unit. To operate the MAT, do this task: How to Operate the MAT in the Flight Compartment, TASK 45-10-00-910-810.
- 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 24 Main AC Electrical Power Generation System
 - e) LRU REPLACEMENT TEST
 - f) Left Generator Control Unit
 - g) CONTINUE
 - 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.
 - 5) To put the MAT back to its initial condition, make these selections:
 - a) LINE MAINTENANCE
 - b) EXIT MAINTENANCE

SUBTASK 24-22-02-700-005

- (7) Do these steps for the test of the right GCU:
- (a) Make sure the BATTERY switch is in the ON (latched) position.
 - (b) Make sure the STANDBY PWR switch on the P61 panel is in the AUTO position.
 - (c) Set the R GEN CTRL switch on the P5 panel to the OFF position.
 - (d) Set the R GEN CTRL switch on the P5 panel to the ON position.
 - (e) Do this task: Remove Primary External Power, TASK 24-22-00-860-807.
 - (f) Set the R BUS TIE switch on the P5 panel to the ISLN (released) position.
 - 1) Make sure the ISLN light on the switch comes on.
 - 2) Make sure the ELEC AC BUS R appear on the EICAS.
 - (g) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.
 - (h) Push the R BUS TIE switch on the P5 panel to the AUTO (latched) position.
 - 1) Make sure the ISLN light on the switch goes off and the AUTO light comes on.
 - 2) Make sure the ELEC AC BUS R do not appear on the EICAS.
 - (i) Use a maintenance access terminal (MAT) to do the LRU replacement test of the right generator control unit. To operate the MAT, do this task: How to Operate the MAT in the Flight Compartment, TASK 45-10-00-910-810.
 - 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE

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- c) GROUND TESTS
 - d) 24 Main AC Electrical Power Generation System
 - e) LRU REPLACEMENT TEST
 - f) Right Generator Control Unit
 - g) CONTINUE
- 2) Do the instructions that show on the MAT and then make these selections:
- a) CONTINUE
 - b) START TEST
- 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
- 4) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.
- 5) To put the MAT back to its initial condition, make these selections:
- a) LINE MAINTENANCE
 - b) EXIT MAINTENANCE

SUBTASK 24-22-02-700-006

(8) Do these steps for the test of the APU GCU:

- (a) Make sure the STANDBY PWR switch on the P61 panel is in the AUTO position.
- (b) Set the APU selector switch on the P5 panel to the OFF position.
- (c) Push the APU GEN switch on the P5 panel to the ON position.
- (d) Use a maintenance access terminal (MAT) to do the LRU replacement test of the auxiliary generator control unit. To operate the MAT, do this task: How to Operate the MAT in the Flight Compartment, TASK 45-10-00-910-810.
 - 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 24 Main AC Electrical Power Generation System
 - e) LRU REPLACEMENT TEST
 - f) Auxiliary Generator Control Unit
 - g) CONTINUE
 - 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.
 - 5) To put the MAT back to its initial condition, make these selections:
 - a) LINE MAINTENANCE
 - b) EXIT MAINTENANCE

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E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-22-02-860-031

- (1) Remove electrical power if it is no longer needed, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

TASK 24-22-02-750-801

5. Generator Control Units Software Configuration Check

A. General

- (1) This task is for the software configuration check of the generator control units.

B. References

Reference	Title
24-22-02-400-802	GCU Software Installation (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

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

D. The Configuration Check of the GCUs

SUBTASK 24-22-02-750-002

- (1) The configuration check makes sure that the GCU has the correct software.

SUBTASK 24-22-02-860-021

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

SUBTASK 24-22-02-860-022

- (3) Use a maintenance access terminal (MAT) to do a software configuration check of the GCU:
NOTE: Make sure you know the correct software part number for the GCU when you look at the software number on the display. For the GCU to be an approved installation, the correct software part number must be installed.

- (a) Make these selections on the MAT:

- 1) ONBOARD MAINTENANCE
- 2) LINE MAINTENANCE
- 3) SYSTEM CONFIGURATION
- 4) 24 Main AC Electrical Power Generation System
- 5) CONTINUE

- (b) Find 24 Generator Control Unit (GCU) on the display and make sure that the software part number is correct.

- (c) Select GO BACK to remove the display.

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SUBTASK 24-22-02-860-023

- (4) If the software part number is incorrect, do this task: GCU Software Installation,
TASK 24-22-02-400-802.

———— **END OF TASK** ————

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GENERATOR, BUS TIE, AND AUXILIARY POWER BREAKER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) A removal of the circuit breaker.
- (2) An installation of the circuit breaker.
- (3) These circuit breakers are:
 - (a) The two generator circuit breakers (GCBs), C24331 and C24332.
 - (b) The two bus tie breakers (BTBs), C24333 and C24334.
 - (c) The auxiliary power breaker (APB) is C24335.

TASK 24-22-03-000-801

2. Generator, Bus Tie, and Auxiliary Power Breaker Removal

(Figure 401)

A. General

- (1) The removal task is the same for all the breakers. The breakers are installed on the different panels.

B. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Prepare for the Removal

SUBTASK 24-22-03-020-001



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-22-03-200-001

- (2) Make sure the hot bus warning lights for the applicable panel are off.

SUBTASK 24-22-03-010-001

- (3) Open the applicable panel to get access to the breaker that you will remove as follows:
 - (a) In the P100, Left Power Panel:
 - 1) C24331, Left Generator Circuit Breaker [1]
 - 2) C24333, Left Bus Tie Breaker [2]
 - (b) In the P200, Right Power Panel:
 - 1) C24332, Right Generator Circuit Breaker [4]
 - 2) C24334, Right Bus Tie Breaker [3]
 - (c) In the P300, Auxiliary Power Panel:

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ARO ALL

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1) C24335, Auxiliary Power Breaker [5]

SUBTASK 24-22-03-860-003



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (4) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

E. Removal

SUBTASK 24-22-03-020-002



DO NOT TOUCH THE CIRCUIT BREAKER. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE CIRCUIT BREAKER OR LET THE CIRCUIT BREAKER BECOME COOL. HIGH TEMPERATURE CAN BURN YOU.

- (1) Remove the applicable breaker as follows:

ARO 001-010

- (a) Remove the four captive screws [6] that attach the breaker to the panel.

ARO 011-999

- (b) Remove the cap screws [7] that attach the breaker to the panel.

ARO ALL

- (c) Remove the applicable breaker.

————— END OF TASK —————

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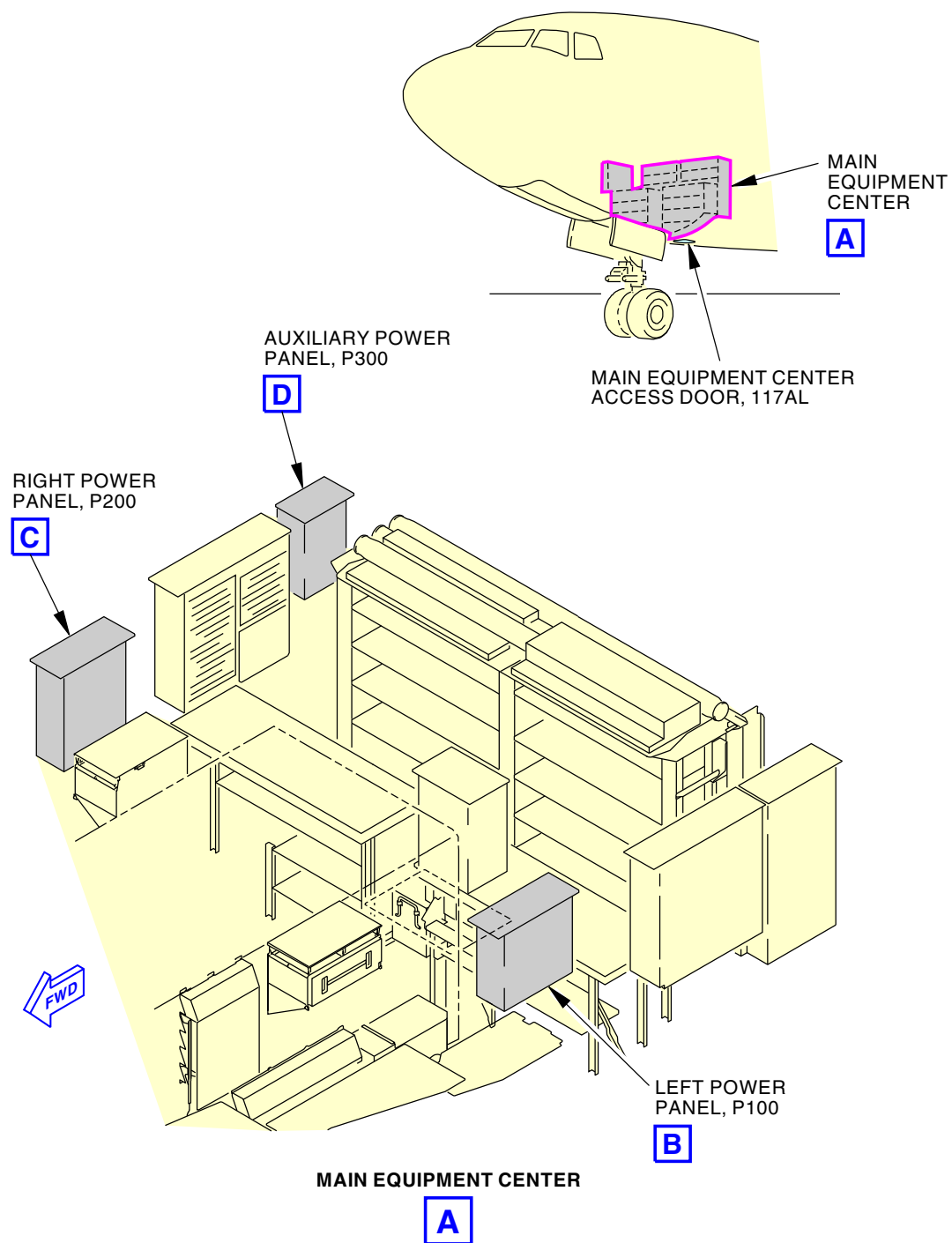
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Generator, Bus Tie, and Auxiliary Power Breaker Installation
Figure 401/24-22-03-990-801 (Sheet 1 of 3)

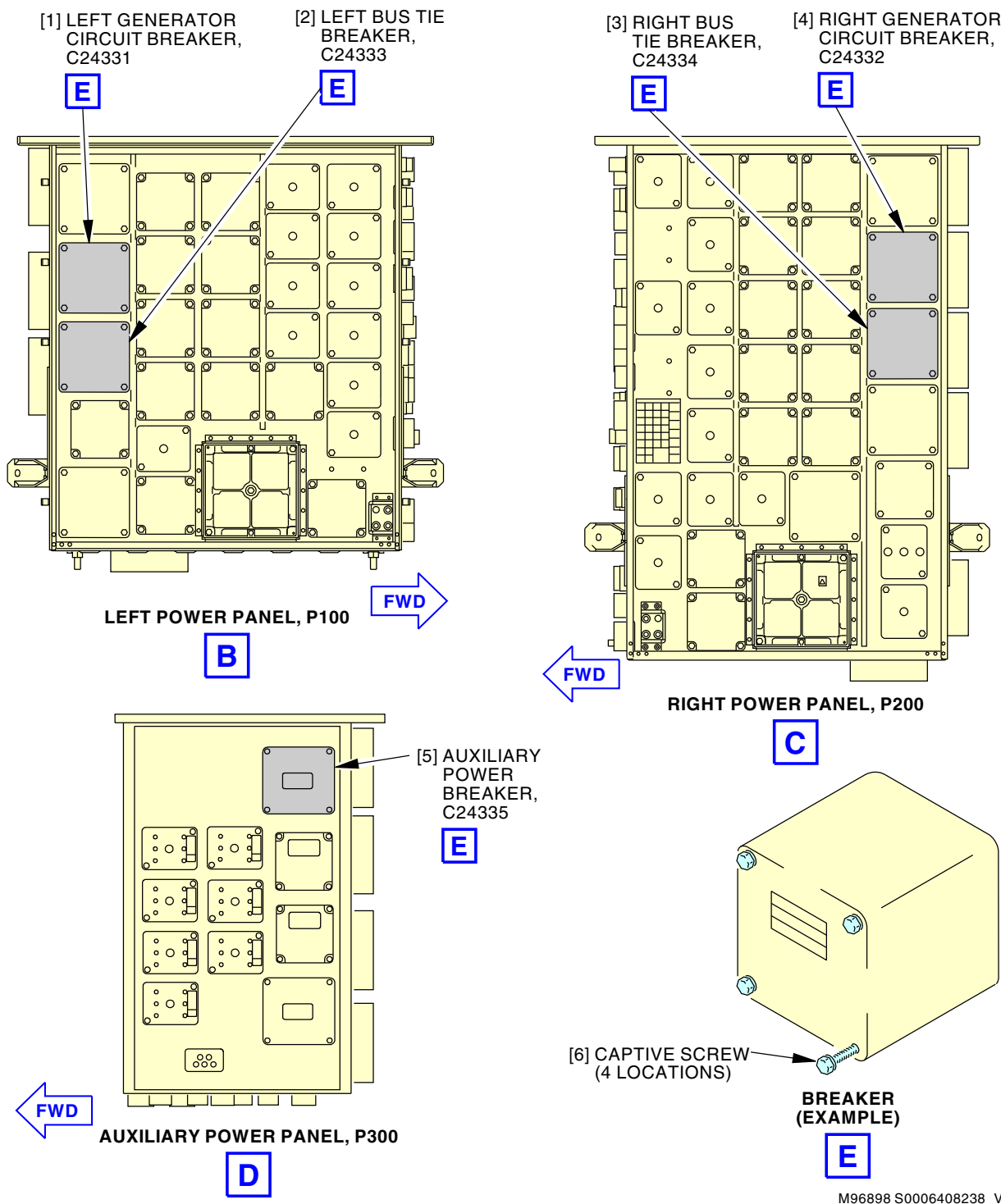
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Generator, Bus Tie, and Auxiliary Power Breaker Installation
Figure 401/24-22-03-990-801 (Sheet 2 of 3)

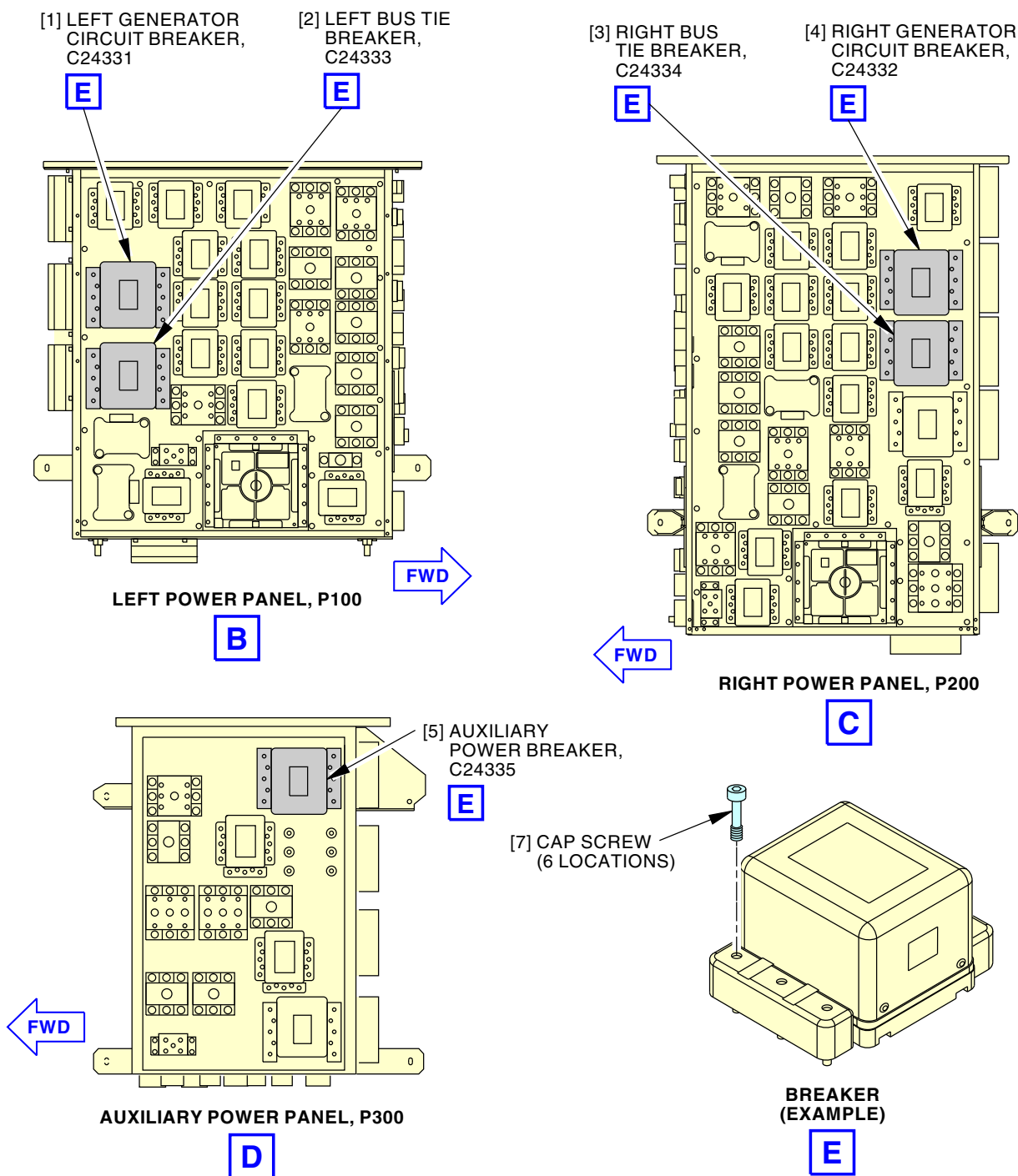
EFFECTIVITY
ARO 001-010

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2534917 S0000599743_V1

Generator, Bus Tie, and Auxiliary Power Breaker Installation
Figure 401/24-22-03-990-801 (Sheet 3 of 3)

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ARO 011-999

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TASK 24-22-03-400-801

3. Generator, Bus Tie, and Auxiliary Power Breaker Installation

(Figure 401)

A. General

- (1) The installation task is the same for all the breakers. The breakers are installed on the different panels.

 CAUTION	DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (2) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

D. Installation

SUBTASK 24-22-03-420-001

- (1) Install the applicable breaker, as follows:
 - (a) Put the applicable breaker in its position.
 - 1) Left Generator Circuit Breaker [1]
 - 2) Left Bus Tie Breaker [2]
 - 3) Right Bus Tie Breaker [3]
 - 4) Right Generator Circuit Breaker [4]
 - 5) Auxiliary Power Breaker [5]

ARO 001-010

- (b) Install the four captive screws [6] that attach the breaker to the panel.

ARO 011-999

- (c) Install the cap screws [7] that attach the breaker to the panel.

ARO 001-010

- (d) Tighten the screws to 15 pound-inches.

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ARO ALL

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ARO 011-999

- (e) Torque the screws between 28.8 in-lb (3.25 N·m) and 35.2 in-lb (3.98 N·m).

ARO ALL

- (f) Close the applicable panel.

E. Installation Test

SUBTASK 24-22-03-860-002

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

SUBTASK 24-22-03-700-001

- (2) If you replaced the left or right generator circuit breaker (GCB), do a test of GCB:
- (a) Set the applicable GEN CTRL switch on the P5 panel to the OFF position.
 - (b) Make sure the amber OFF light in each switch is on.
 - (c) Start the applicable engine (TASK 71-00-00-800-835-H00).
 - (d) Set the applicable GEN CTRL switch on the P5 panel to the ON position.
 - (e) Make sure the amber OFF light in each switch is off.
 - (f) Make sure these data show on the ELECTRICAL AUTO PAGE 1/2 for the applicable Integrated Drive Generator (IDG):

Table 401/24-22-03-993-801

AC-V	112 TO 118
FREQ	396 TO 404
LOAD	0.20 TO 0.90
OIL LEVEL	--

- (g) Stop the applicable engine (TASK 71-00-00-800-837-H00).

SUBTASK 24-22-03-700-002

- (3) If you replaced the left or right bus tie breaker (BTB), do a test of the BTB:
- (a) Set the applicable BUS TIE switches on the P5 panel to the ISLN position.
 - (b) Make sure the yellow ISLN light on the applicable BUS TIE switch is on.
 - (c) Connect the Primary External Power at the P30 panel.
 - (d) Set the PRIMARY EXT PWR switch on the P5 panel to the ON position.
 - (e) Make sure the White ON light in the PRIMARY EXT PWR switch is on.
 - (f) Set the applicable BUS TIE switches on the P5 panel to the AUTO position.
 - (g) Make sure the yellow ISLN light on the applicable BUS TIE switch is off.
 - (h) Look on the Electrical System Synoptic Display and make sure the applicable BUS TIE is closed and the Left Main AC bus is powered.

SUBTASK 24-22-03-700-003

- (4) If you replaced the auxiliary power breaker (APB), do a test of the APB:
- (a) Set the APU GEN switch on the P5 panel to the OFF position.
 - (b) Make sure the amber OFF light in the APU GEN switch is on.
 - (c) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - (d) Set the APU GEN switch on the P5 panel to the ON position.
 - (e) Make sure the amber OFF light in the APU GEN switch is off.

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ARO ALL

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- (f) Look on the Electrical System Synoptic Display and make sure the Left Main AC bus and Right Main AC bus are powered.
- (g) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

———— **END OF TASK** ————

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GROUND HANDLING AND GROUND SERVICE RELAYS - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the relay.
 - (2) An installation of the relay.
 - (3) These relays are:
 - (a) The ground handling relay is K24004.
 - (b) The ground service transfer relay is K24003.
 - (c) The ground service select relay is K24002.

TASK 24-22-05-000-801

2. Ground Handling and Ground Service Relay Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

B. Location Zones

Zone	Area
118	Main Equipment Center, Right

C. Prepare for Removal

SUBTASK 24-22-05-860-004



DO NOT OPERATE THE APU. OPERATION OF THE APU CAN CAUSE DANGEROUS VOLTAGES TO BE PRESENT AT THE GROUND HANDLING OR GROUND-SERVICE RELAYS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR IF THE APU IS OPERATING WHEN WORK IS DONE ON THESE RELAYS.



REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-22-05-860-001

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	9	C24684	L GCU/BPCU

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 011-999			
D	6	C24305	BPCU-AC

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ARO 011-999 (Continued)

(Continued)

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
E	7	C24305	BPCU-AC

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO ALL			
B	10	C24649	BPCU DC

SUBTASK 24-22-05-860-005



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (3) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

SUBTASK 24-22-05-010-001

- (4) Open the applicable panel to get access to the relay that you will remove as follows:
- (a) In the P200, Right Power Panel:
 - 1) K24003, Ground Service Transfer Relay [1]
 - (b) In the P300, Auxiliary Power Panel:
 - 1) K24002, Ground Service Select Relay [3]
 - 2) K24004, Ground Handling Relay [2]

D. Removal

SUBTASK 24-22-05-020-001



DO NOT TOUCH THE RELAY. WEAR GLOVES FOR HAND PROTECTION TO REMOVE THE RELAY OR LET THE RELAY BECOME COOL. THE HIGH TEMPERATURE CAN BURN YOU.

- (1) Remove the applicable relay from the power panel P200 or P300 as follows:

ARO 001-010

- (a) Loosen the four captive screws [4].

ARO 011-999

- (b) Loosen the captive screws [5].

ARO 001-010

- (c) Remove the applicable relay.

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ARO ALL

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ARO 011-999

- (d) Hold the relay tightly, and pull it off from its base.

ARO ALL

———— **END OF TASK** ————

EFFECTIVITY
ARO ALL

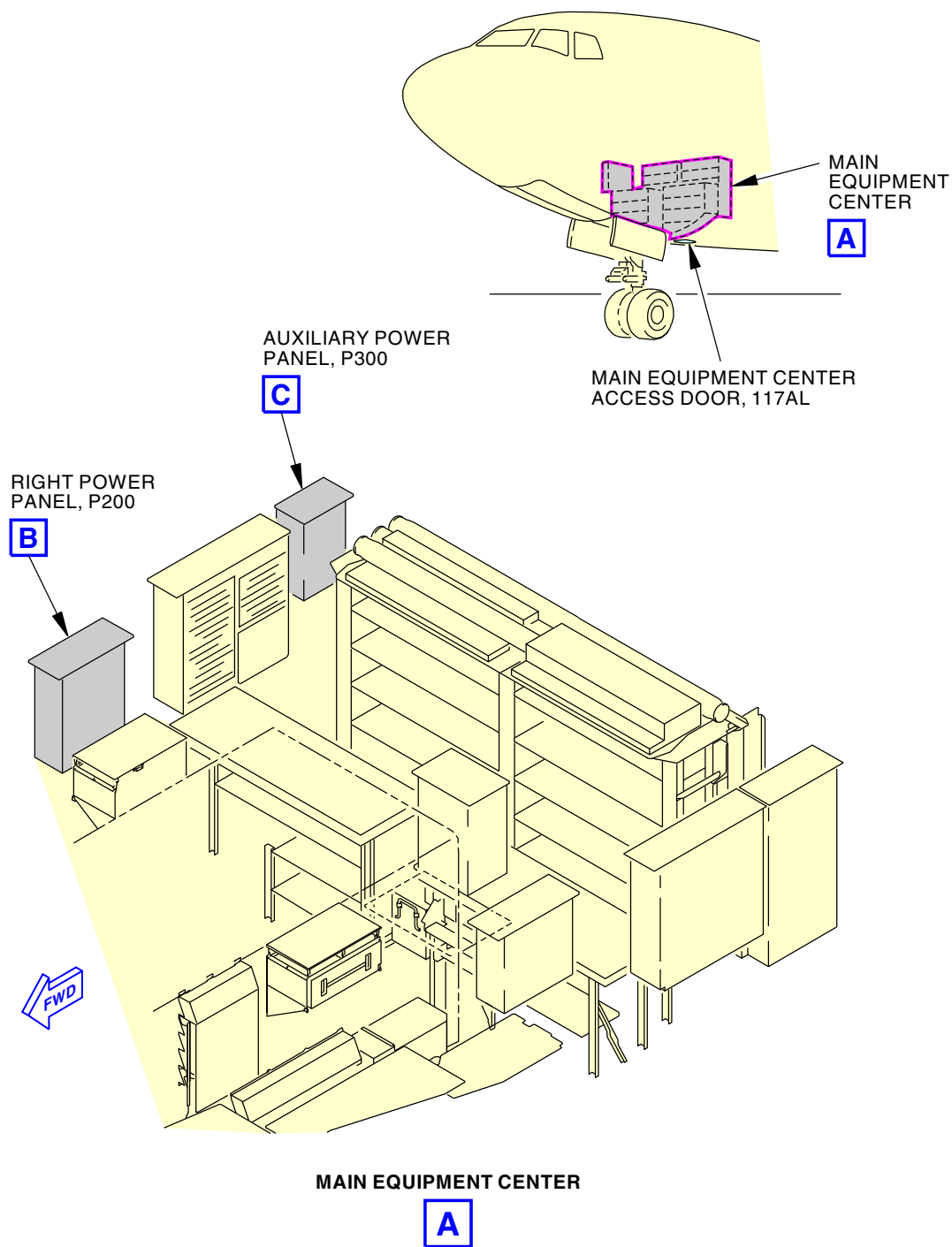
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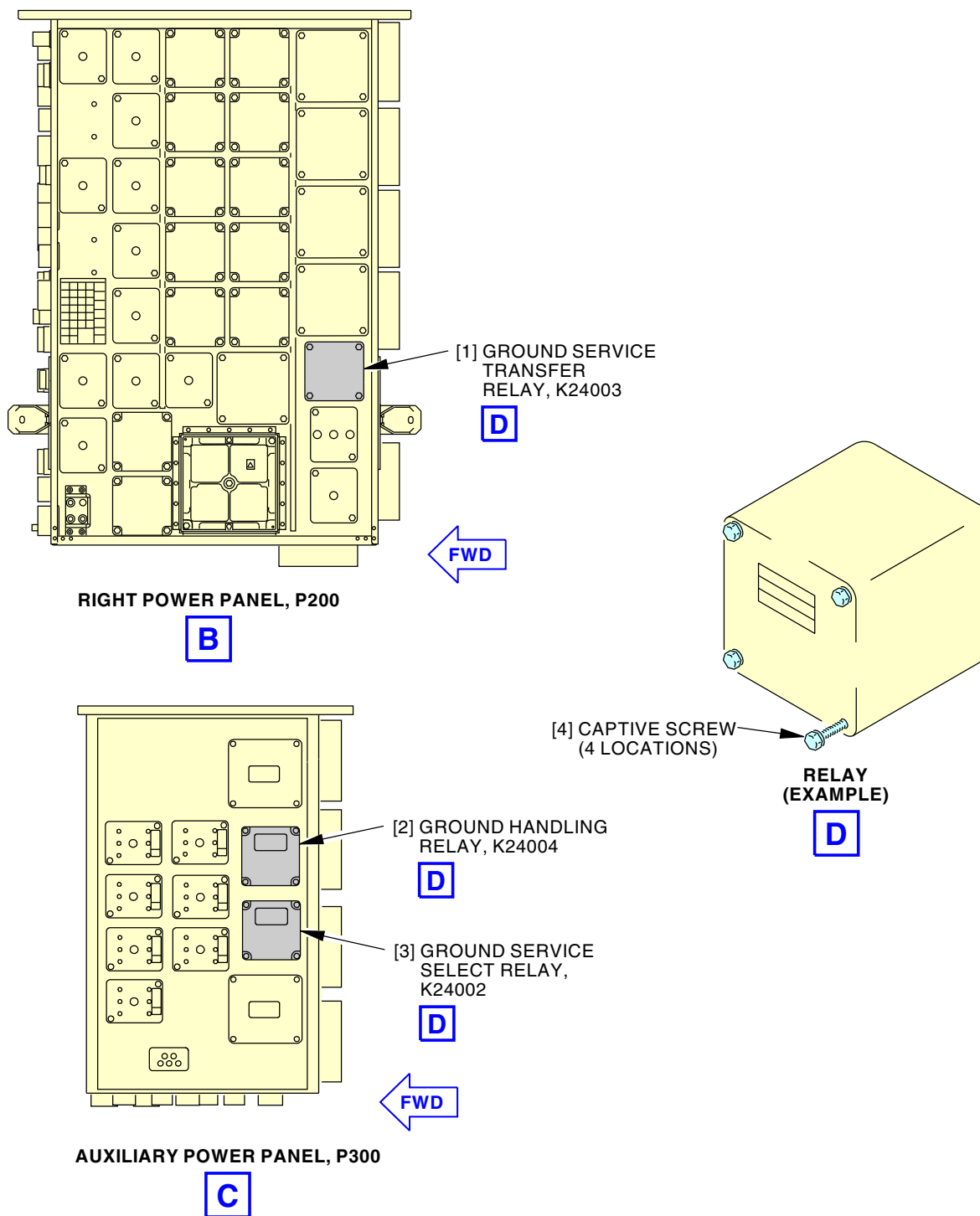
Ground Handling and Ground Service Relay Installation
Figure 401/24-22-05-990-802 (Sheet 1 of 3)

EFFECTIVITY
ARO ALL

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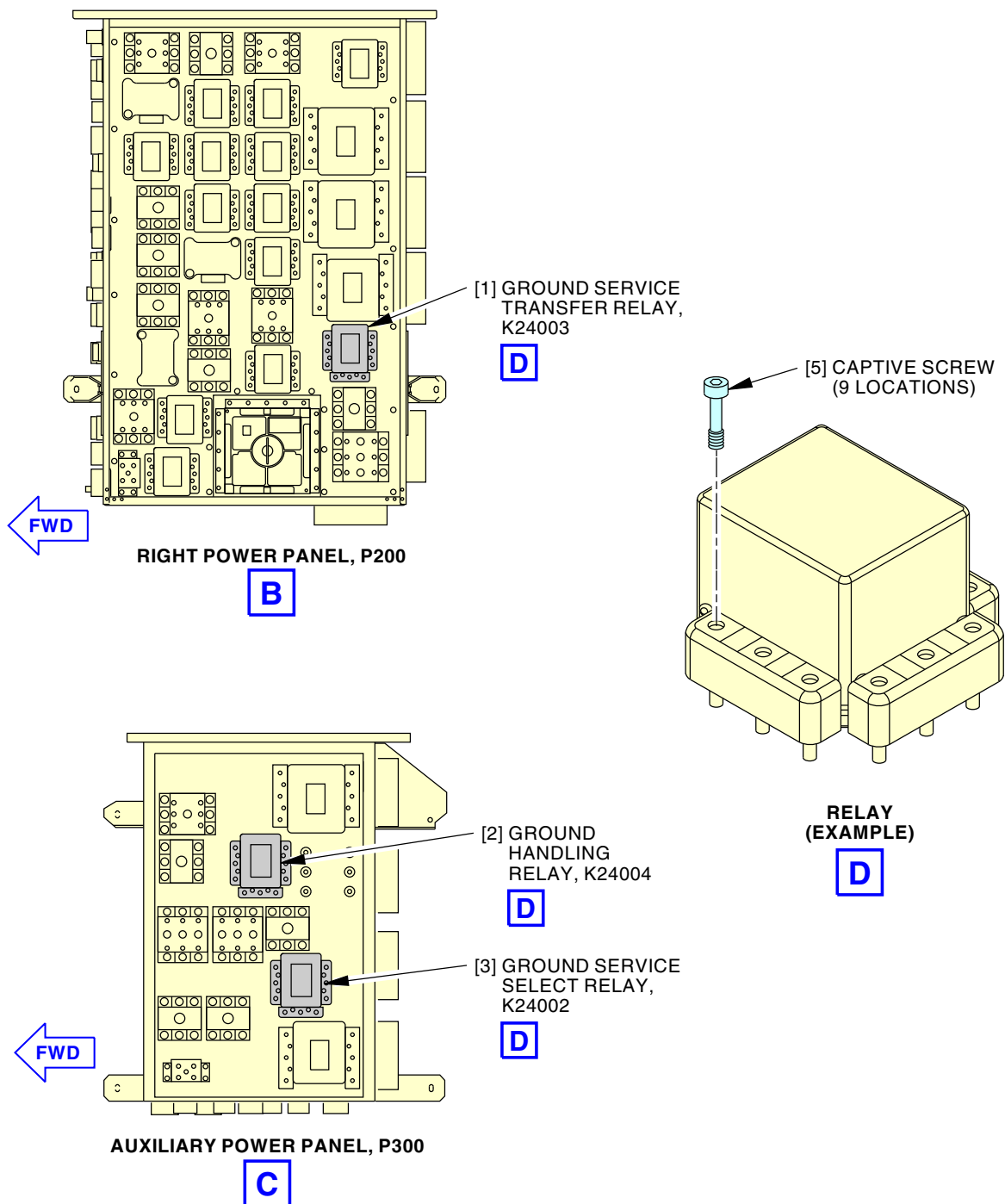
**Ground Handling and Ground Service Relay Installation
Figure 401/24-22-05-990-802 (Sheet 2 of 3)**

EFFECTIVITY
ARO 001-010

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**Ground Handling and Ground Service Relay Installation
Figure 401/24-22-05-990-802 (Sheet 3 of 3)**

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ARO 011-999

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TASK 24-22-05-400-801

3. Ground Handling and Ground Service Relay Installation

(Figure 401)

A. General



CAUTION DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (1) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Relay	24-09-01-76F-125	ARO 001-010
		24-09-01-77R-150	ARO 011-999
2	Relay	24-09-01-77L-115	ARO 001-010
		24-09-01-77S-090	ARO 011-999
3	Relay	24-09-01-77L-110	ARO 001-010
		24-09-01-77S-095	ARO 011-999

D. Location Zones

Zone	Area
118	Main Equipment Center, Right
212	Flight Compartment, Right

E. Installation

SUBTASK 24-22-05-410-001

- (1) Install the applicable relay to the power panel P200 or P300 as follows:

- (a) Put the applicable relay in the right position.
 - 1) Ground Service Transfer Relay [1]
 - 2) Ground Handling Relay [2]
 - 3) Ground Service Select Relay [3]

ARO 001-010

- (b) Install the four captive screws [4].

ARO 011-999

- (c) Install the captive screws [5].

ARO 001-010

- (d) Tighten the captive screws [4] to 15 in-lb (1.7 N·m).

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ARO 011-999

- (e) Torque the captive screws [5] between 28.8 in-lb (3.25 N·m) and 35.2 in-lb (3.98 N·m).

ARO ALL

- (f) Close the panel.

SUBTASK 24-22-05-860-002

- (2) Close these circuit breakers:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	9	C24684	L GCU/BPCU

Right Power Panel, P200

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

ARO 011-999

D	6	C24305	BPCU-AC

ARO 001-010

E	7	C24305	BPCU-AC

Standby Power Management Panel, P310

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

ARO ALL

B	10	C24649	BPCU DC

F. Installation Test

SUBTASK 24-22-05-740-001

- (1) Do these steps that follows for installation test:

- (a) For the ground handling relay:

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

NOTE: Supply the primary external power only.

- 2) Make sure the AVAIL light on the PRIMARY EXT PWR switch comes on.

- 3) Make sure the GND HDLG busses are in the ON position on the Electrical Maintenance Page 2/2.

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

- 5) Disconnect the primary external power (remove the plug from the airplane).

- 6) Make sure the GND HDLG busses indication are in the ON position on the Electrical Maintenance Page 2/2.

- (b) For the ground service transfer relay:

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

NOTE: Supply the primary external power only.

- 2) Make sure the AVAIL light on the PRIMARY EXT PWR switch comes on.

- 3) Select the GND SERVICE switch, on the P87 attendance panel, to the ON position.

- 4) Make sure the cabin lights are operational.

- 5) Select the PRIMARY EXT PWR switch to the ON position.

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- 6) Make sure the GND SVC indication are in the ON position on the Electrical Maintenance Page 2/2.
- (c) For the ground service select relay:
 - 1) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 2) Make sure the APU GEN switch, on the P5 panel, is in the ON position.
 - 3) Select the PRIMARY EXT PWR switch to make sure the AVAIL light comes on.
 - 4) Disconnect the primary external power (remove the plug from the airplane).
 - 5) Make sure the lights on the PRIMARY EXT PWR switches (ON and AVAIL) are off.
 - 6) Select the R BUS TIE switch, on the P5 panel, to the ISLN position.
 - 7) Select the GND SERVICE switch, on the P87 attendance panel, to the ON position.
 - 8) Make sure the GND SVC indication are in the ON position on the Electrical Maintenance Page 2/2.

———— **END OF TASK** ————

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BACKUP ELECTRICAL POWER - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Backup Generator Oil System Pressure Release
- (2) Backup Generator Oil System Static Leak Check.

TASK 24-25-00-600-801

2. Backup Generator Oil System Pressure Release

(Figure 201, Figure 202)

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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

B. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

C. Access Panels

Number	Name/Location
413BL	Oil Tank Access Door, Left Engine
415JB	Thrust Reverser Latch Panel, Left Engine
423BL	Oil Tank Access Door, Right Engine
425JB	Thrust Reverser Latch Panel, Right Engine

D. Procedure

SUBTASK 24-25-00-010-009

- (1) Open the applicable access panels:

Number	Name/Location
413BL	Oil Tank Access Door, Left Engine
415JB	Thrust Reverser Latch Panel, Left Engine
423BL	Oil Tank Access Door, Right Engine
425JB	Thrust Reverser Latch Panel, Right Engine

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SUBTASK 24-25-00-010-003



WARNING

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

- (2) Remove the dust cap from the backup generator overflow drain valve.

SUBTASK 24-25-00-610-001

- (3) Do these steps to release the oil pressure from the backup generator oil system:
- (a) Connect the overflow coupling which is on the service engine oil servicing cart, COM-1537 to the overflow hose.
 - (b) Put the free end of the overflow hose in a oil resistant container (5 gal)(19 Liter), STD-1055.



WARNING

WHEN YOU CONNECT THE OVERFLOW COUPLING TO THE OVERFLOW DRAIN VALVE, USE A RAG AROUND THE FITTINGS. THIS WILL PREVENT A SPRAY CAUSED BY PRESSURE IN THE BACKUP GENERATOR CASE. HOT OIL CAN BURN YOU.

- (c) Connect the overflow coupling and the overflow hose to the backup generator overflow drain valve.

NOTE: Some oil can come out of the drain hose when it is connected.

- (d) Permit the oil that drains from the overflow hose to flow into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (e) Keep the free end of the overflow hose below the level of the backup generator.
- (f) Disconnect the overflow coupling and the overflow hose from the overflow drain valve.

SUBTASK 24-25-00-410-002

- (4) Install the dust cap to the backup generator overflow drain valve.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-25-00-410-007

- (1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
413BL	Oil Tank Access Door, Left Engine
415JB	Thrust Reverser Latch Panel, Left Engine
423BL	Oil Tank Access Door, Right Engine
425JB	Thrust Reverser Latch Panel, Right Engine

————— **END OF TASK** —————

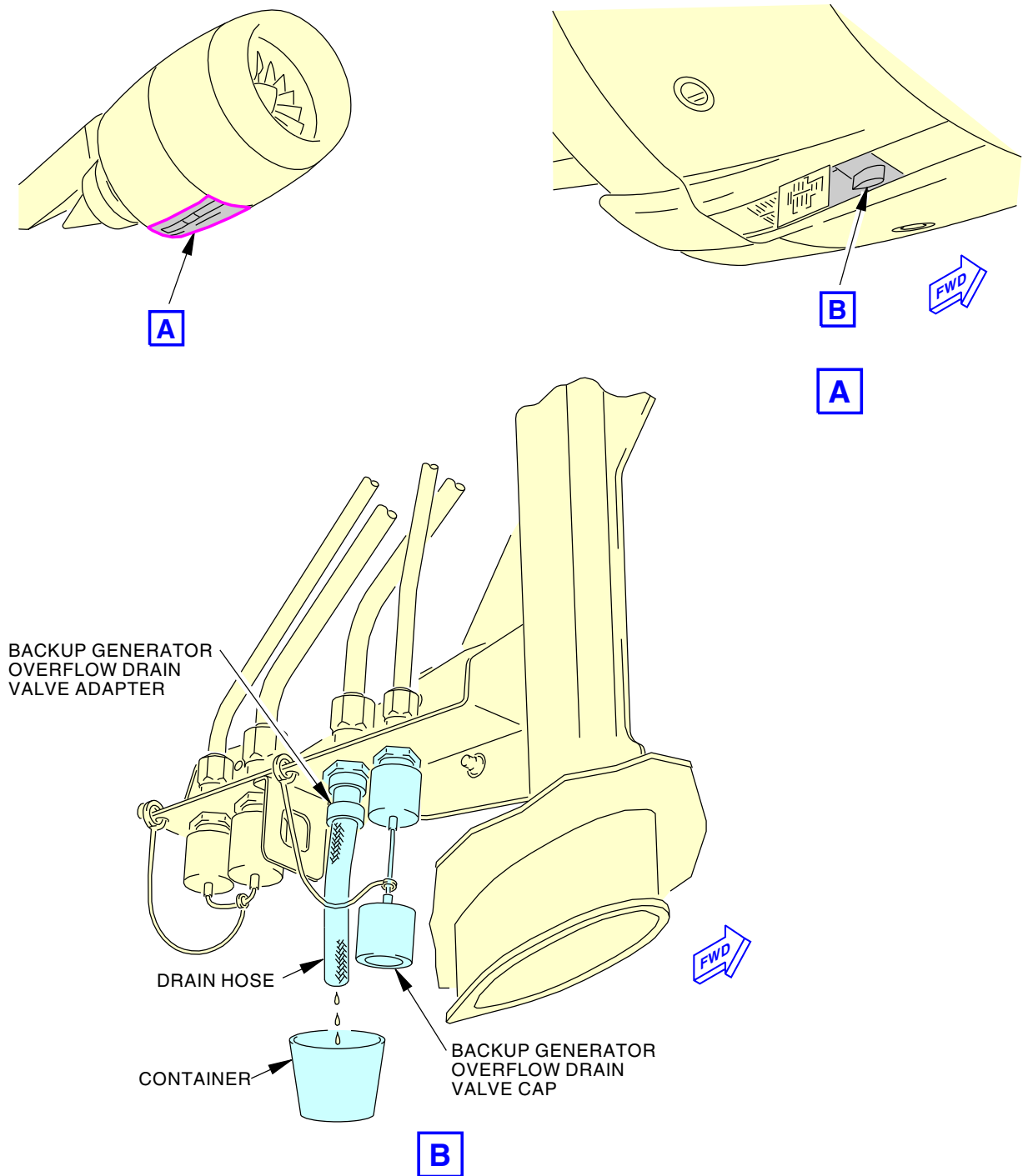
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ARO ALL

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BOEING
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Backup Generator Depressurization
Figure 201/24-25-00-990-803

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TASK 24-25-00-700-802

3. Backup Generator Oil System Static Leak Check

(Figure 201, Figure 202)

A. References

Reference	Title
12-13-07-600-801	Backup Generator Oil Fill (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Tools/Equipment

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

Reference	Description
COM-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
SPL-10937	Pressure Test Eqpt - Engine Generator (VSCF Installed) Part #: J24015-2 Supplier: 81205
STD-1082	Source - Air, Regulated, Dry Filtered, 0-50 PSIG

C. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

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E. Prepare for the Removal

SUBTASK 24-25-00-010-007



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

F. Procedure

SUBTASK 24-25-00-680-001

- (1) Do this task: Backup Generator Oil System Pressure Release, TASK 24-25-00-600-801.

SUBTASK 24-25-00-480-001

- (2) Use the Engine Generator Pressure Test Eqpt, SPL-10937 as shown in Figure 202.

SUBTASK 24-25-00-860-010

- (3) Set the shutoff valve, on the leak test equipment, to OFF.

SUBTASK 24-25-00-860-011

- (4) Turn off the regulator valve on the leak test equipment to prevent too much pressure in the backup generator case.

SUBTASK 24-25-00-860-012

- (5) Remove the cap from the backup generator pressure fill valve.

SUBTASK 24-25-00-860-013

- (6) Connect the fill coupling which is on the service engine oil servicing cart, COM-1537 and the leak test equipment to the backup generator pressure fill valve.

SUBTASK 24-25-00-860-014

- (7) Connect the other end of the leak test equipment to the 0-50 psig dry filtered regulated air source, STD-1082.

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SUBTASK 24-25-00-860-015



CAUTION

DO NOT APPLY MORE THAN 12 PSI. TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE BACKUP GENERATOR.

- (8) Turn the shutoff valve to ON and adjust the regulator to 10 psi.

SUBTASK 24-25-00-860-016

- (9) Turn the shutoff valve to OFF.

NOTE: The pressure will decrease a small quantity, then the pressure gauge will become stable at a constant value.

SUBTASK 24-25-00-860-017

- (10) If the pressure gauge continues to show smaller values, do these steps:
- (a) Visually examine the system for a leak.
 - (b) If the leak is from the drain mask, replace the backup generator.
 - (c) If the leak is from the external circuit, repair the leak or replace the heat exchanger.
 - (d) If you do not find a leak, do a leak check with a leak detector fluid or a soap solution.
 - (e) Do this task: Backup Generator Oil System Pressure Release, TASK 24-25-00-600-801.
 - (f) Do the leak check again.

SUBTASK 24-25-00-680-002

- (11) Do this task: Backup Generator Oil System Pressure Release, TASK 24-25-00-600-801.

SUBTASK 24-25-00-080-001

- (12) Disconnect the test equipment.

SUBTASK 24-25-00-610-002

- (13) Do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.
if it is necessary.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-25-00-410-004



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

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

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

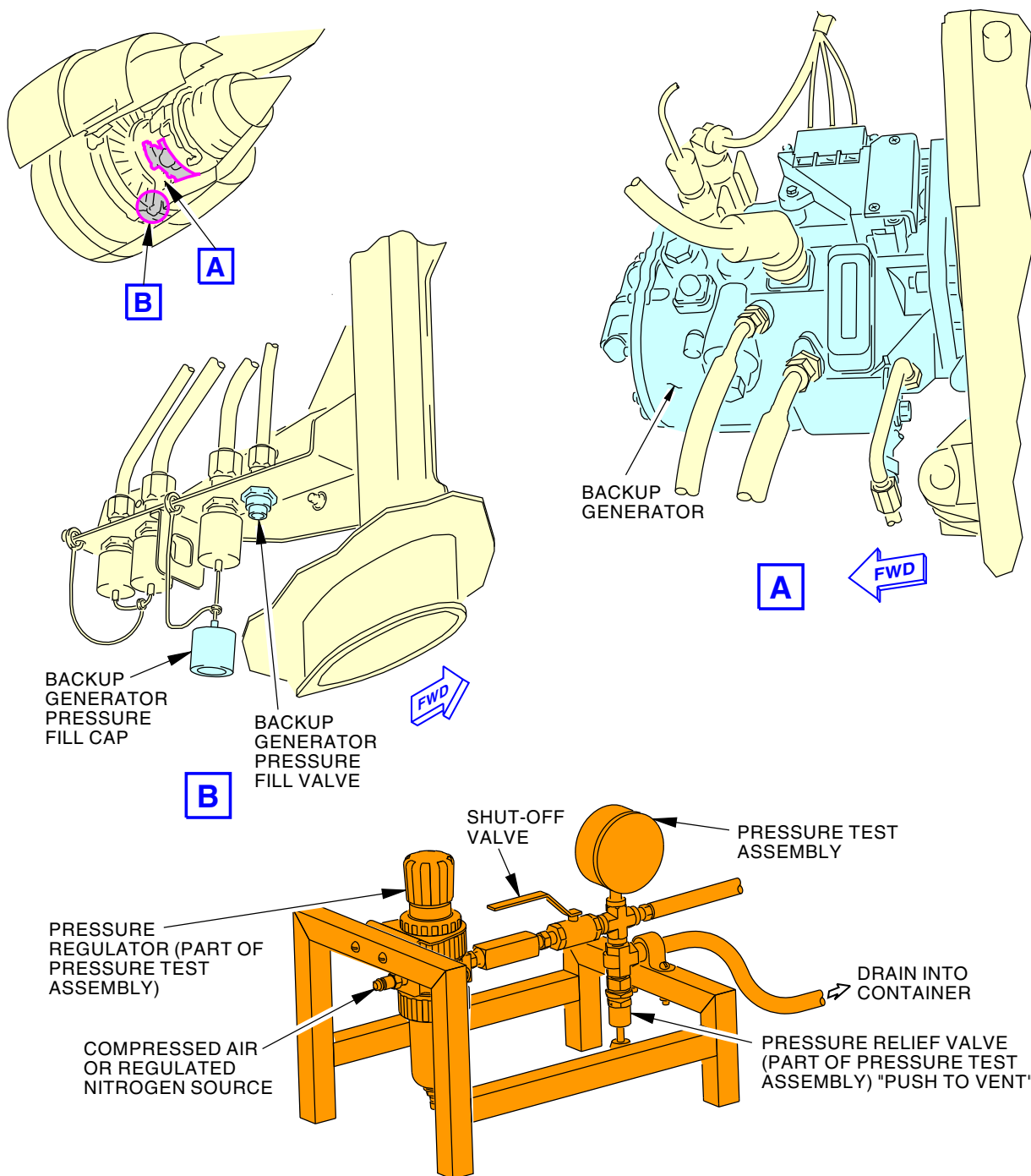
———— **END OF TASK** ————

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Backup Generator Static Leak Test
Figure 202/24-25-00-990-804

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BACKUP ELECTRICAL POWER - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
 - (1) An operational test of the backup electrical power.
- C. To do the operational test of the backup electrical power, you must either start an engine or, if the engine is already on, you can request a manually initiated engine start test through the CMC.

TASK 24-25-00-700-801

2. Backup Electrical Power - Operational Test

A. General

- (1) To do a manually initiated engine start test, you must select it on the CMC screen.
- (2) To do an automatically initiated engine start test, you must start one or both engines while the applicable BACKUP GEN switch(s) is in the latched position.
- (3) The operational test of the backup electrical power will do a test of these components.
 - (a) Backup Generator
 - (b) Backup Generator Converter
 - (c) Backup Generator Converter Supplemental Cooling Fan
 - (d) Left and Right Backup Generator Converter Circuit Breakers
 - (e) Left and Right Transfer Bus Breaker
- (4) Most of the switches and lights you use to do the operational test of the backup electrical power are on the P5 overhead panel. The other panels you use for the test are identified in the task.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Prepare for the Test

SUBTASK 24-25-00-860-001

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-25-00-710-001

- (2) Do the test of the indicator lights for the electrical system.
 - (a) Set the IND LTS switch to the TEST position.
 - (b) Make sure that all the indicator lights for the electrical system are on.
 - (c) Set the IND LTS switch to the BRT position.

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E. The Automatically Initiated Engine Start Test

SUBTASK 24-25-00-860-002

- (1) Make sure the oil level and the oil filter reads NORMAL for the backup generators.

SUBTASK 24-25-00-860-003

- (2) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 24-25-00-210-001

- (3) Make sure the L BACKUP GEN and R BACKUP GEN switches are in the latched position.
 - (a) Make sure the ON indicators on the L BACKUP GEN and R BACKUP GEN switches show.
 - (b) Make sure the OFF lights on the L BACKUP GEN and R BACKUP GEN switches are on.

SUBTASK 24-25-00-860-004

- (4) Start the applicable engine(s) for the components you want to test. To start the engine, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00
 - (a) Operate the engine(s) at idle speed for approximately 2 minutes.

SUBTASK 24-25-00-210-003

- (5) Make sure the OFF lights on the L BACKUP GEN and R BACKUP GEN switches go off.

SUBTASK 24-25-00-210-002

- (6) Make sure no EICAS status or advisory messages show for the Backup Electrical Power system.

F. The Manually Initiated Engine Start Test

SUBTASK 24-25-00-860-006

- (1) Select a manually initiated engine start test on the CMC screen.
 - (a) Make these selections on the maintenance access terminal (MAT):
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 24 BACK UP (VSCF) ELEC PWR SYSTEM
 - 5) OPE TEST
 - 6) ENG START TEST

SUBTASK 24-25-00-860-007

- (2) Select CONTINUE when the CMC pre condition screen displays a message.

SUBTASK 24-25-00-860-008

- (3) Make sure no EICAS status or advisory messages are displayed for the Backup Electrical Power System.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-25-00-860-009

- (1) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

————— END OF TASK —————

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BACKUP ELECTRICAL POWER - INSPECTION/CHECK

1. General

A. This procedure has one task:

- (1) An inspection of the backup electrical power system.

TASK 24-25-00-200-801

2. Backup Electrical Power Inspection

(Figure 601)

A. General

- (1) This procedure examines the backup electrical power system for damage.

B. References

Reference	Title
24-25-05-000-802-001	VSCF Oil Temperature Sensors Removal (P/B 401)
24-25-05-400-802-001	VSCF Oil Temperature Sensors Installation (P/B 401)
24-25-07-000-801	Oil/Oil Heat Exchanger Removal (P/B 401)
24-25-07-400-801	Oil/Oil Heat Exchanger Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

E. Backup Electrical Power System Inspection

SUBTASK 24-25-00-010-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

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- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

SUBTASK 24-25-00-210-004

- (2) Examine the VSCF oil temperature sensor and look for these signs:

- (a) Loose bolts on the temperature sensor

- 1) Tighten the bolts if it is loose (TASK 24-25-05-400-802-001).

- (b) Loose electrical connector.

- (c) Cracks in the mounting flange

- 1) These are the tasks: VSCF Oil Temperature Sensors Removal, TASK 24-25-05-000-802-001, VSCF Oil Temperature Sensors Installation, TASK 24-25-05-400-802-001.

- (d) Wear of the sensor with no cracks present is permitted.

SUBTASK 24-25-00-210-005

- (3) Examine the VSCF oil/oil heat exchanger and look for these signs:

- (a) Oil leaks

- 1) To replace the gaskets, These are the tasks: Oil/Oil Heat Exchanger Removal, TASK 24-25-07-000-801, Oil/Oil Heat Exchanger Installation, TASK 24-25-07-400-801.

- (b) Loose bolts on the heat exchanger

- 1) Tighten the bolts if it is loose (TASK 24-25-07-400-801).

- (c) Cracks in the mounting flange

- 1) Replace the VSCF oil/oil heat exchanger. These are the tasks: Oil/Oil Heat Exchanger Removal, TASK 24-25-07-000-801, Oil/Oil Heat Exchanger Installation, TASK 24-25-07-400-801.

- (d) Dents

- 1) Replace the VSCF oil/oil heat exchanger. These are the tasks:

Oil/Oil Heat Exchanger Removal, TASK 24-25-07-000-801, Oil/Oil Heat Exchanger Installation, TASK 24-25-07-400-801.

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-25-00-410-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

(a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

(b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

(c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

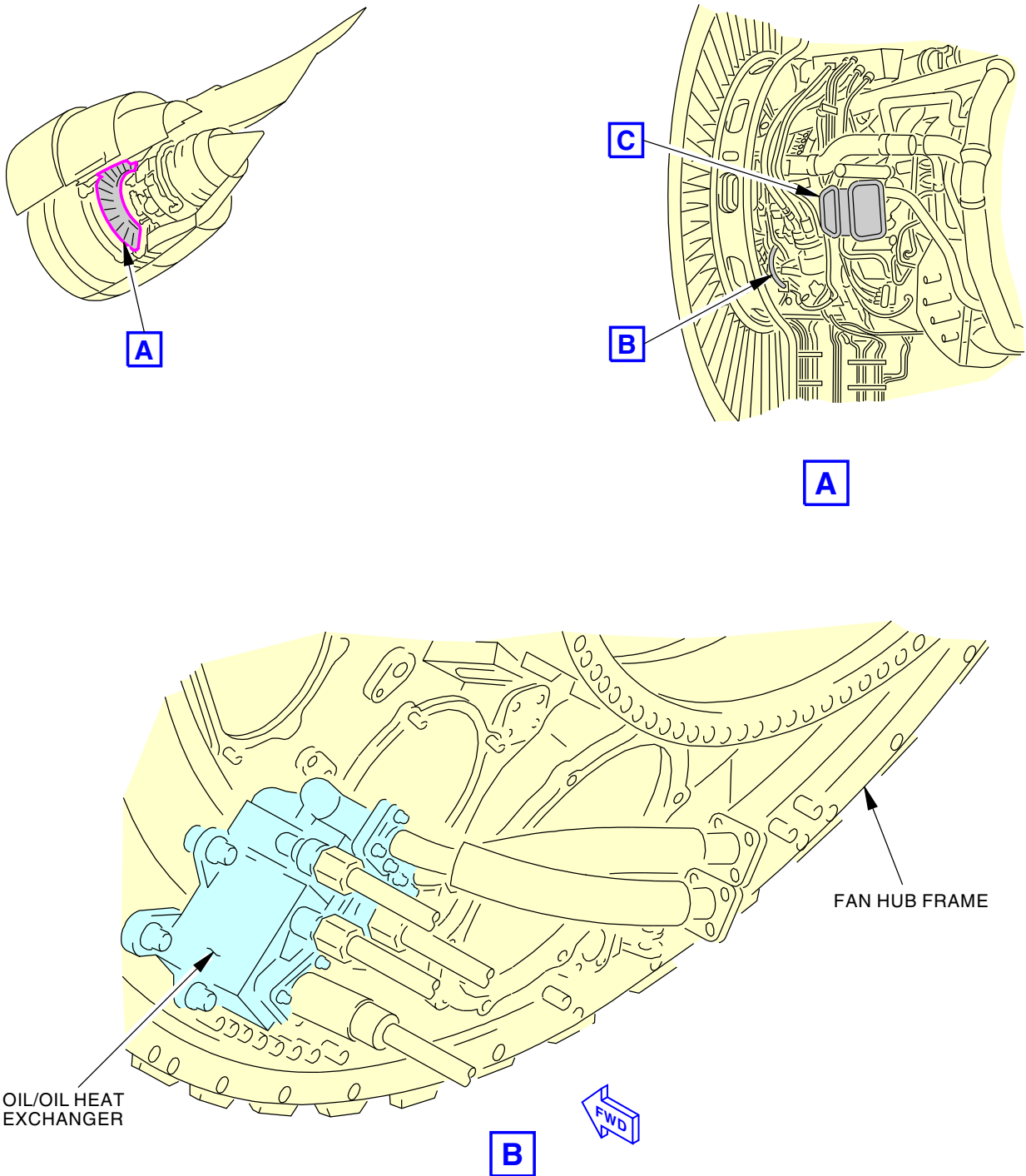
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Backup Electrical Power Inspection
Figure 601/24-25-00-990-802 (Sheet 1 of 2)

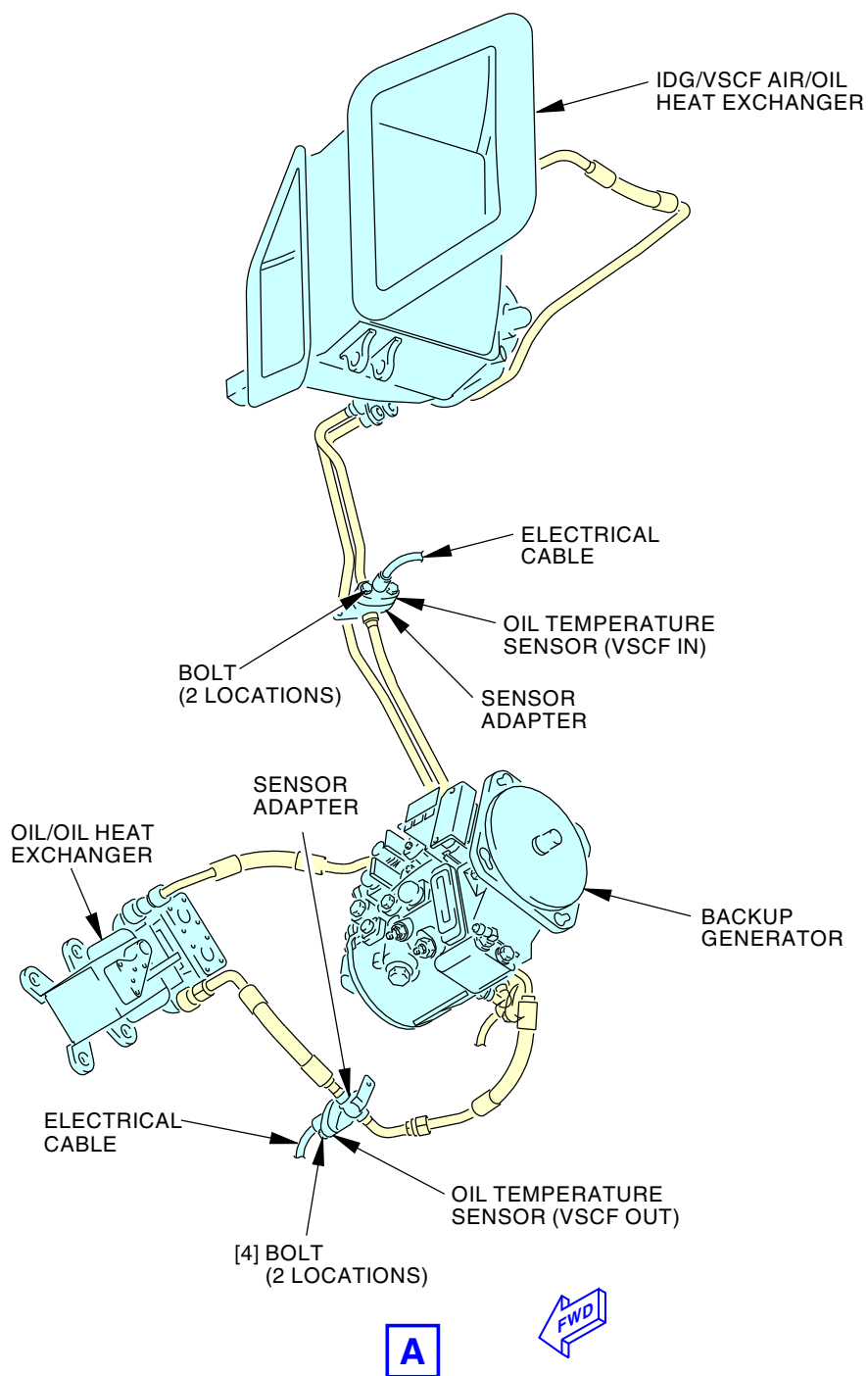
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Backup Electrical Power Inspection
Figure 601/24-25-00-990-802 (Sheet 2 of 2)

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BACKUP GENERATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Backup Generator Removal
 - (2) Backup Generator Installation.

TASK 24-25-01-000-804-001

2. Backup Generator Removal

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the removal of the backup generator. There is one backup generator on each engine. The backup generator is installed on the front side of the gearbox.

B. References

Reference	Title
24-25-02-200-801	Backup Generator Oil Filter Inspection Check (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
SPL-1556	Hoist - Boom, General, 400 Pound Maximum Capacity Part #: A20001-152 Supplier: 81205 Opt Part #: A20001-82 Supplier: 81205
SPL-1584	Adapter Assembly - Telescoping Hydraulic Part #: J20009-68 Supplier: 81205

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Reference	Description
SPL-1629	Adapter - Hoist, PW, GE, RR Engine VSCF Part #: J24001-50 Supplier: 81205
SPL-11069	Load Positioner - Engine Accessories, 250 lb Capacity Part #: J20002-59 Supplier: 81205 Opt Part #: J20002-43 Supplier: 81205 Opt Part #: J20002-44 Supplier: 81205
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	
G01505	Lockwire - Safety And Lock	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
16	O-ring	24-25-01-02B-525	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Prepare for the Removal

SUBTASK 24-25-01-010-004-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left fan cowl panels, do this task:
Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

SUBTASK 24-25-01-860-013-001

- (2) Make sure the engine does not operate (TASK 71-00-00-800-837-H00).

I. Backup Generator Removal

SUBTASK 24-25-01-020-043-001

- (1) Disconnect the harness connector [1].
- (a) Disconnect the harness connector [1] from the generator electrical connectors.
 - (b) Install the plastic caps on the generator connectors.

SUBTASK 24-25-01-020-044-001

- (2) Disconnect the phase leads [6].
- (a) Remove the two bolts [9] and the two washers [8].
 - (b) Remove the terminal block cover [10].
 - (c) Identify the phase leads (T-1, T-2, T-3) with some type of wire marker so they can be reconnected to the correct generator terminals during generator installation.
 - (d) Remove the terminal nut [7].
 - (e) For cam-lock terminal nut [7], remove as follows:
 - 1) Back off nut a minimum of 3 full turns.
 - 2) Tap the top of the nut with a hammer to unlock.

NOTE: It is preferred to tap the top of a socket that is fully seated on the nut.

NOTE: If you are unable to get access to the top of the nut with a hammer, the nut can be backed off completely while it is locked. The nut must be unlocked before it is reinstalled.
 - 3) The nut can be removed by hand after it is unlocked
 - (f) Disconnect the phase lead [6].
 - (g) Re-install the terminal nut [7] and tighten the nuts by hand.
 - (h) Re-install the terminal block cover [10].
 - 1) Put the terminal block cover [10] on the generator.
 - 2) Install the two washers [8] and the two bolts [9].
 - a) Tighten the two bolts [9] by hand.

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SUBTASK 24-25-01-020-045-001



WARNING

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

- (3) Remove the pressure from the generator case.
 - (a) Connect the overflow coupling which is on the engine oil servicing cart, COM-1537 to the overflow hose.
 - (b) Put the free end of the overflow hose in the oil resistant container (5 gal)(19 Liter), STD-1055.
 - (c) Connect the overflow coupling and overflow hose to the overflow drain valve.
 - (d) Disconnect the overflow coupling and overflow hose from the overflow drain valve.

SUBTASK 24-25-01-200-004

- (4) Do this task: Backup Generator Oil Filter Inspection Check, TASK 24-25-02-200-801.

SUBTASK 24-25-01-680-004-001

- (5) Drain the oil from the generator.
 - (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055 below the case drain plug.



CAUTION

USE TWO WRENCHES TO LOOSEN THE OVERTEMP DRAIN LINE. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

- (b) Disconnect the overtemp drain line [37].
- (c) Remove the lockwire, G01505 from the case drain plug.
- (d) Remove the o-ring [16] and case drain plug [12] from the backup generator. Discard the o-ring [16].
- (e) Let the oil drain from the backup generator.
- (f) Lubricate the new o-ring [16] with Royco HF-825 lubricant, D00657 (preferred), oil, D00071 or oil, D00068 and install it on the case drain plug [12], if you plan to re-use this back up generator.
- (g) Install and tighten the case drain plug [12] to a torque of 40 in-lb (5 N·m) - 45 in-lb (5 N·m).
- (h) Install a lockwire, G01505 on the case drain plug [12], if you plan to re-use this backup generator.

SUBTASK 24-25-01-020-046-001



CAUTION

USE TWO WRENCHES TO LOOSEN THE PRESSURE FILL AND THE OVERFLOW DRAIN LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

- (6) Disconnect the pressure fill line [14] and the overflow drain line [13] from their reducers.

NOTE: Be prepared to catch the remaining oil in an applicable container.

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SUBTASK 24-25-01-480-004-001

- (7) Install the shipping plugs in the pressure fill and overflow drain ports.

SUBTASK 24-25-01-020-047-001

- (8) Loosen the bolts [38] from the pressure fill and overflow drain lines.

SUBTASK 24-25-01-020-048-001



CAUTION

USE TWO WRENCHES TO LOOSEN THE OIL-IN AND OIL-OUT LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

- (9) Disconnect the oil-in line [2] and oil-out line [3] from the BUG as follows:

NOTE: The tube nut for oil-in line [2] stays with the check valve [21]. Turn the tube nut clockwise to remove the oil-in line [2].

- (a) Disconnect the oil-in line [2] and oil-out line [3] from the check valve [21] and the oil-out line union [20].

NOTE: Let the oil drain from the lines into the oil resistant container (5 gal)(19 Liter), STD-1055.

- (b) Install the plugs in the check valve [21] and the oil-out line union [20].

NOTE: The check valve [21] and the oil-out line union [20] will be re-used on the new generator.

SUBTASK 24-25-01-020-049-001



WARNING

BE CAREFUL WHEN YOU REMOVE THE BACKUP GENERATOR. BECAUSE THE BACKUP GENERATOR WEIGHS 35 POUNDS, INJURIES TO PERSONS CAN OCCUR.



CAUTION

YOU MUST BE CAREFUL DURING ROTATION AND REMOVAL OF THE BACKUP GENERATOR. ROTATE AND REMOVE THE GENERATOR SLOWLY, AND VISUALLY CONFIRM CLEARANCE BETWEEN TUBES AND GENERATOR HOUSING. A FAILURE TO FOLLOW THESE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE FUEL MANIFOLDS.

- (10) Remove the backup generator [4].

- (a) Loosen the generator stud nut [11] a minimum of three turns with a socket wrench.

NOTE: Use a 10 in. (25 cm) extension with a 12 point deep-socket for the upper-inboard stud nuts.



CAUTION

MAKE SURE THAT YOU REMOVE THE SOCKET BEFORE YOU TAP ON THE NUT. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO THE NUT-TO-WASHER WELD.

- (b) Remove the socket wrench and tap directly on the top surface of the nut to disengage the locking mechanism.

- (c) Continue to turn the nuts until there is a 0.5 in. (12.7 mm) clearance between the nut and the mounting-pad face.

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- (d) Temporarily place a pad, rag or shield around the forward inboard side of the generator housing.

NOTE: This will protect the adjacent engine fuel and air manifolds from the potential damage due to accidental contact from the generator during removal.

- (e) Pull the generator axially until the generator pilot is free of the mounting-pad pilot.
(f) Rotate the generator in a clockwise direction until the stud nut [11] line up with the large part of the keyholes in the generator mounting-flange.



DO NOT LET THE GENERATOR HANG ON THE INPUT SHAFT DURING THE REMOVAL. FAILURE TO HOLD THE GENERATOR CORRECTLY CAN CAUSE DAMAGE TO THE INPUT SEAL.



PACKING IS TIGHT ON BACKUP GENERATOR, PRY OFF THE BACKUP GENERATOR WITH A SOFT TOOL. DO NOT ROCK BACKUP GENERATOR OR DAMAGE WILL RESULT TO THE CARBON SEAL.

- (g) Pull the generator free of the mounting-pad.

SUBTASK 24-25-01-020-050-001



BE CAREFUL WHEN YOU REMOVE THE BACKUP GENERATOR. BECAUSE THE BACKUP GENERATOR WEIGHS 35 POUNDS, INJURIES TO PERSONS CAN OCCUR.



YOU MUST BE CAREFUL DURING ROTATION AND REMOVAL OF THE BACKUP GENERATOR. ROTATE AND REMOVE THE GENERATOR SLOWLY, AND VISUALLY CONFIRM CLEARANCE BETWEEN TUBES AND GENERATOR HOUSING. A FAILURE TO FOLLOW THESE STEPS CORRECTLY CAN CAUSE DAMAGE TO THE FUEL MANIFOLDS.

- (11) An alternate method to remove the backup generator [4] by using the optional VSCF hoist adapter, SPL-1629.
- (a) Attach the load positioner, SPL-11069 or the telescoping hydraulic adapter assembly, SPL-1584 to the hoist, SPL-1556, then attach to the VSCF hoist adapter, SPL-1629.
- (b) Attach the VSCF hoist adapter, SPL-1629 to the backup generator.
- (c) Loosen the generator stud nut [11] a minimum of three turns with a socket wrench.
- NOTE: Use a 10 in. (25 cm) extension with a 12 point deep-socket for the upper-inboard stud nuts.



MAKE SURE THAT YOU REMOVE THE SOCKET BEFORE YOU TAP ON THE NUT. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO THE NUT-TO-WASHER WELD.

- (d) Remove the socket wrench and tap directly on the top surface of the nut to disengage the locking mechanism.
- (e) Continue to turn the nuts until there is a 0.5 in. (12.7 mm) clearance between the nut and the mounting-pad face.

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- (f) Temporarily place a pad, rag or shield around the forward inboard side of the generator housing.

NOTE: This will protect the adjacent engine fuel and air manifolds from the potential damage due to accidental contact from the generator during removal.

- (g) While supporting the weight of the generator with the VSCF hoist adapter, SPL-1629, pull the generator axially until the generator pilot is free of the mounting-pad pilot.
- (h) Rotate the generator in a clockwise direction until the stud nuts [11] line up with the large part of the keyholes in the generator mounting-flange.



CAUTION

DO NOT LET THE GENERATOR HANG ON THE INPUT SHAFT DURING THE REMOVAL. FAILURE TO HOLD THE GENERATOR CORRECTLY CAN CAUSE DAMAGE TO THE INPUT SEAL.



CAUTION

PACKING IS TIGHT ON BACKUP GENERATOR, PRY OFF THE BACKUP GENERATOR WITH A SOFT TOOL. DO NOT ROCK BACKUP GENERATOR OR DAMAGE WILL RESULT TO THE CARBON SEAL.

- (i) While supporting the weight of the generator with the VSCF hoist adapter, SPL-1629, pull the generator free of the mounting-pad.
- (j) Remove the generator from the VSCF hoist adapter, SPL-1629.

SUBTASK 24-25-01-860-014-001

- (12) Put the generator on an applicable cart.

SUBTASK 24-25-01-020-051-001

- (13) If you plan to replace the backup generator with a new one, then do these steps:

- (a) Remove the terminal block adapter [29].
 - 1) Remove the screw [24].
 - 2) Remove the terminal block cover [25].
 - 3) Remove the terminal nut [26].
 - 4) Remove the terminal block screw [27] and washer [28].
 - 5) Remove the terminal block adapter [29].
- (b) Remove the check valve [21] and discard the o-ring [34].
- (c) Remove the oil-out line union [20] and discard the o-ring [33].
- (d) Remove the reducer [19] and discard the o-ring [17].
- (e) Remove the reducer [18] and discard the o-ring [15].
- (f) Loosen the backup nut [32].
- (g) Disconnect the overtemp drain elbow [23] with the retainer [30] and discard the o-ring [31].

SUBTASK 24-25-01-020-052-001

- (14) Remove and discard the o-ring [35] and o-ring [36] from the backup generator splined shaft and input mounting pad.

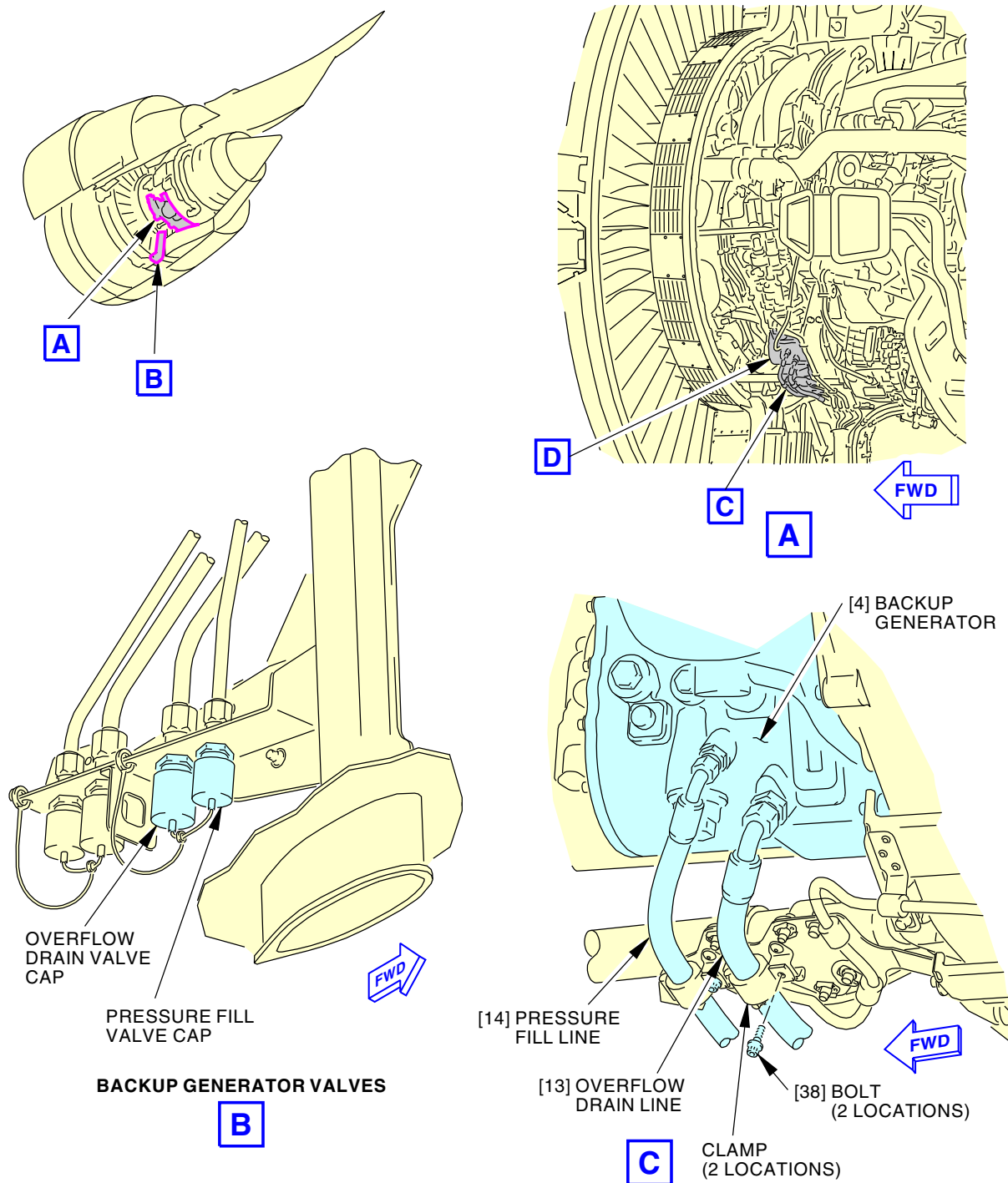
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K52510 S0006408284_V2

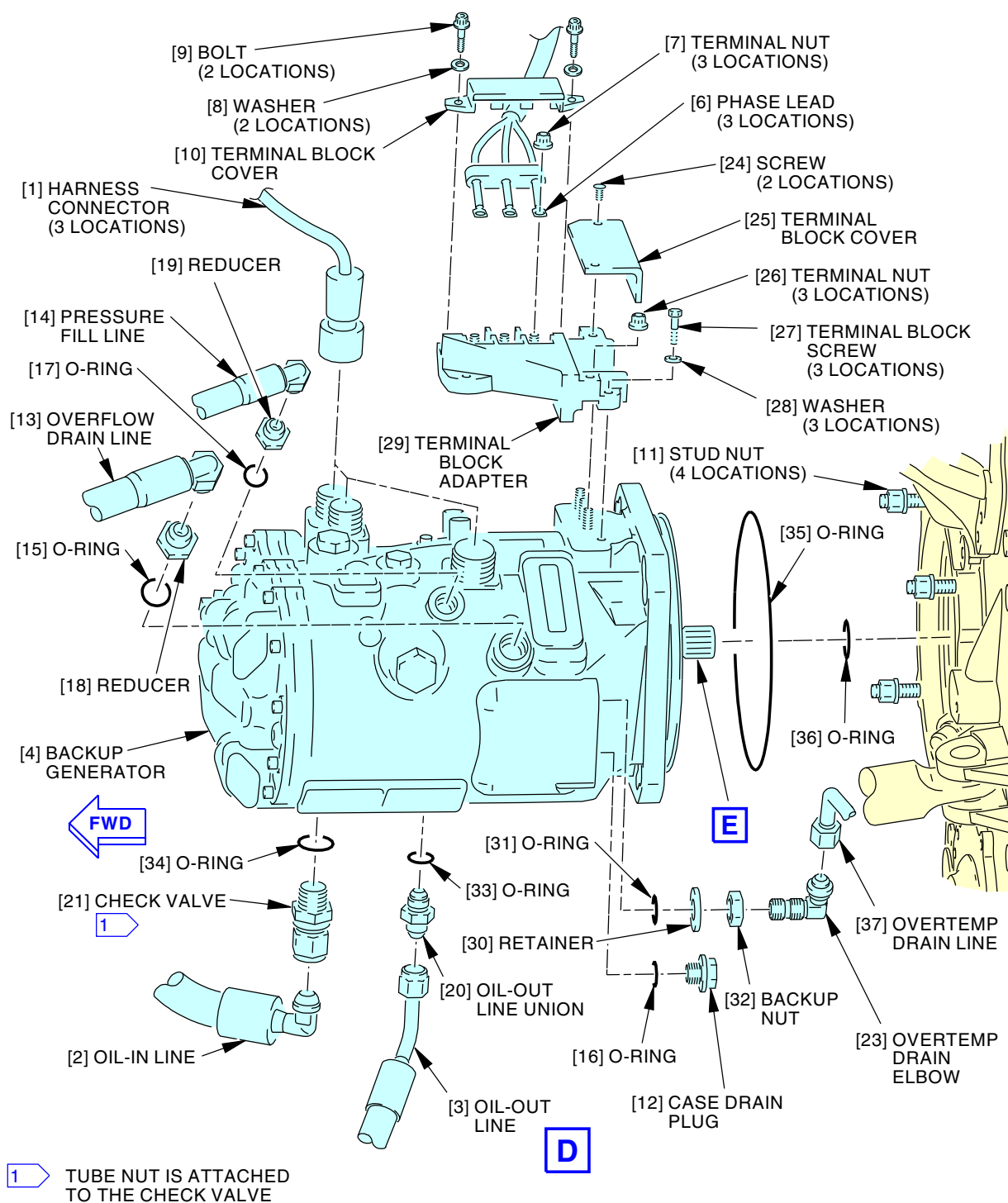
Backup Generator Installation
Figure 401/24-25-01-990-807-001 (Sheet 1 of 3)

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K52511 S0006408285_V4

Backup Generator Installation
Figure 401/24-25-01-990-807-001 (Sheet 2 of 3)

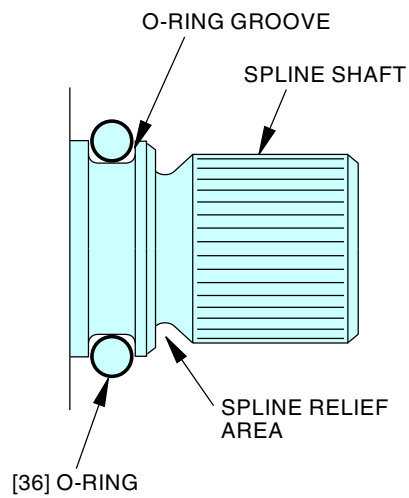
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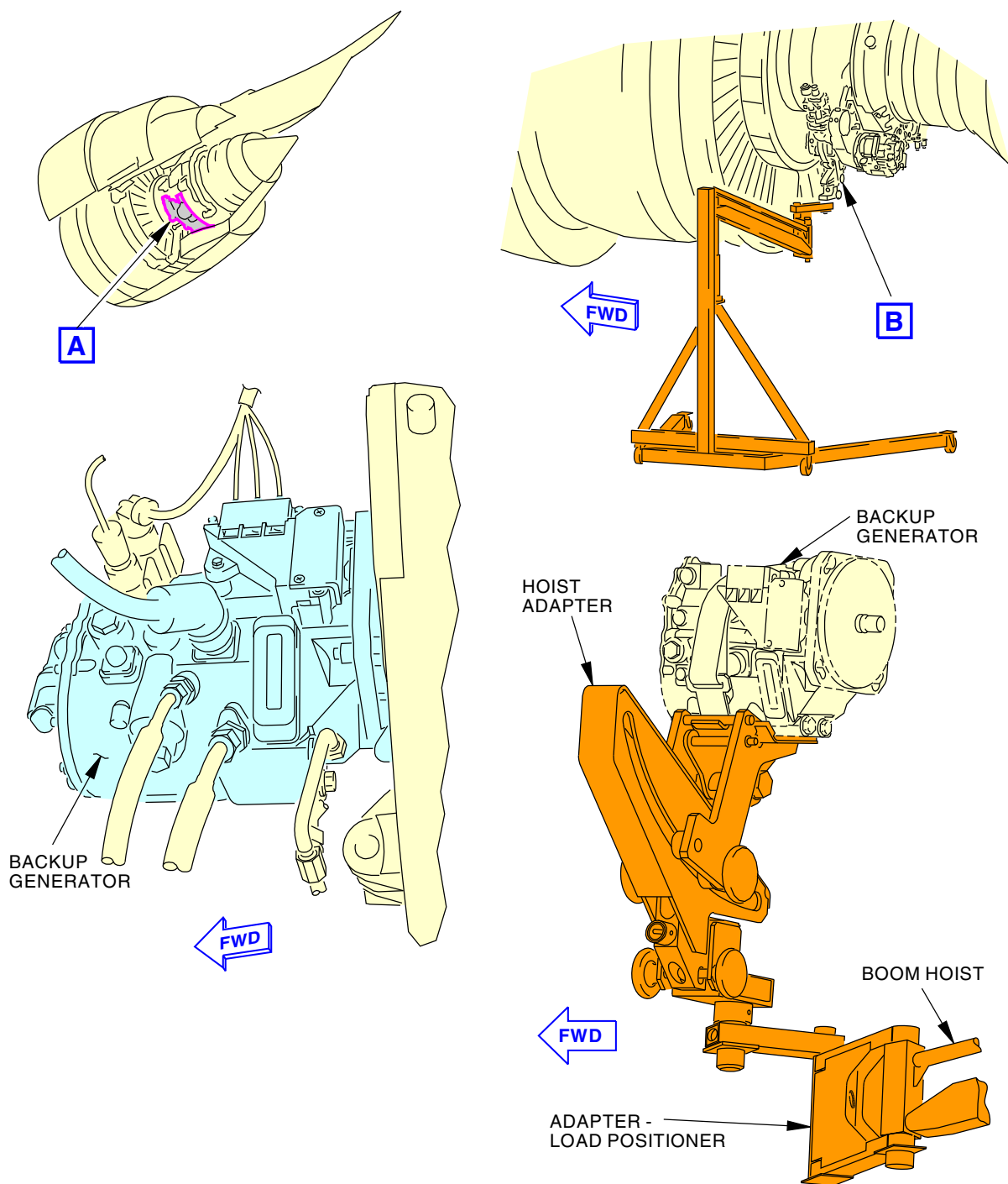
Backup Generator Installation
Figure 401/24-25-01-990-807-001 (Sheet 3 of 3)

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K52513 S0006408287_V3

Backup Generator Hoist Adapter Installation
Figure 402/24-25-01-990-808-001

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TASK 24-25-01-400-804-001

3. Backup Generator Installation

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the installation of the backup generator. There is one backup generator on each engine. The backup generator is installed on the front side of the gearbox.
- (2) As indicated in the Power Plant Test Reference Table, if an O-ring and/or a pre-formed packing is correctly installed and is checked by an independent second mechanic, the subsequent required Test No. 6 - Part-Power Leak Check, TASK 71-00-00-700-805-H01, can be considered optional.

NOTE: After installation, make sure the O-ring/pre-formed packing is seated correctly in the groove of the spline and is free of damage.

B. References

Reference	Title
12-13-07-200-801	Backup Generator Oil Level Check (P/B 301)
12-13-07-600-801	Backup Generator Oil Fill (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-700-805-H01	Test No. 6 - Part-Power Leak Check (P/B 501)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-1556	Hoist - Boom, General, 400 Pound Maximum Capacity Part #: A20001-152 Supplier: 81205 Opt Part #: A20001-82 Supplier: 81205
SPL-1584	Adapter Assembly - Telescoping Hydraulic Part #: J20009-68 Supplier: 81205
SPL-1629	Adapter - Hoist, PW, GE, RR Engine VSCF Part #: J24001-50 Supplier: 81205
SPL-11069	Load Positioner - Engine Accessories, 250 lb Capacity Part #: J20002-59 Supplier: 81205 Opt Part #: J20002-43 Supplier: 81205 Opt Part #: J20002-44 Supplier: 81205

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D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	
G01505	Lockwire - Safety And Lock	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Backup generator	24-25-01-02B-200	ARO ALL
15	O-ring	24-25-01-02B-070	ARO ALL
16	O-ring	24-25-01-02B-525	ARO ALL
17	O-ring	24-25-01-02B-080	ARO ALL
31	O-ring	24-25-01-02B-070	ARO ALL
33	O-ring	24-25-01-02B-070	ARO ALL
34	O-ring	24-25-01-02B-090	ARO ALL
35	O-ring	24-25-01-02B-197	ARO 014-999
		24-25-01-02B-230	ARO ALL
		24-25-01-02B-232	ARO ALL
36	O-ring	24-25-01-02B-195	ARO 014-999
		24-25-01-02B-220	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Prepare For Installation

SUBTASK 24-25-01-212-001



CAUTION

MAKE SURE THAT THE NUMBER OF TEETH ON THE BUG SHAFT AND ACCESSORY GEARBOX ARE THE SAME. DIFFERENT NUMBERS OF TEETH WILL CAUSE DAMAGE TO THE BUG SHAFT AND ACCESSORY GEARBOX.

- (1) Count the teeth on the backup generator shaft and accessory gearbox shaft to make sure they have the same number of teeth.

NOTE: There are two backup generator and accessory gearbox shaft configurations. Some backup generator and accessory gearbox shafts have 15 teeth and some backup generator and accessory gearbox shafts have 16 teeth.

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SUBTASK 24-25-01-210-004-001

- (2) Visually examine the gearbox mating surface and seal for signs of oil leakage prior to installing the generator. Repair leaks, if any are found.

I. Backup Generator Installation

SUBTASK 24-25-01-420-030-001

- (1) Install the o-ring [16] and case drain plug [12] to the backup generator.
 - (a) Lubricate the o-ring [16] with Royco HF-825 lubricant, D00657 (preferred), oil, D00071 or oil, D00068 and install it on the case drain plug.
 - (b) Install and tighten the case drain plug [12] to a torque of 40 in-lb (5 N·m) - 45 in-lb (5 N·m).
 - (c) Install a lockwire, G01505 on the case drain plug.

SUBTASK 24-25-01-420-031-001

- (2) Do these steps to install the terminal block adapter [29]:
 - (a) Attach the terminal block adapter [29] to the backup generator.
 - (b) Install the washer [28] and terminal block screw [27].
 - (c) Install the terminal nut [26].
 - (d) Tighten the terminal nuts [26] to a torque of 49 in-lb (6 N·m) - 53 in-lb (6 N·m).
 - (e) Attach the terminal block cover [25] to the terminal block adapter [29].
 - (f) Install the screws [24].
 - (g) Tighten the screws [24] to a torque of 6 in-lb (1 N·m) - 8 in-lb (1 N·m).

SUBTASK 24-25-01-420-032-001



BE CAREFUL WHEN YOU MOVE THE BACKUP GENERATOR. BECAUSE THE BACKUP GENERATOR WEIGHS 35 POUNDS, INJURIES TO PERSONS CAN OCCUR.



DO NOT LET THE GENERATOR TO HANG ON THE INPUT SHAFT DURING INSTALLATION. FAILURE TO HOLD THE GENERATOR CORRECTLY CAN CAUSE DAMAGE TO THE INPUT SEAL.

- (3) Install the backup generator [4].

NOTE: Move the generator shaft in a straight line to prevent damage to the generator input seal.



FOR THE INPUT DRIVE SHAFT LARGE O-RING [35] AND SMALL O-RING [36], M83485 HIGH THERMAL STABILITY (HTS) COMPATIBLE O-RINGS ARE RECOMMENDED WHEN USING HTS OIL. USE OF M83248 OR AS3209 NON-HTS COMPATIBLE O-RINGS WITH HTS OIL WILL RESULT IN LIFE REDUCING DEGRADATION OF THE O-RING. DEGRADATION OF THE SHAFT O-RINGS CAN RESULT IN LOSS OF ENGINE OIL.

- (a) Apply Royco HF-825 lubricant, D00657 to a new o-ring [35] and a o-ring [36].

NOTE: When you install the applicable o-ring, make sure that the o-ring is compatible with the engine oil type.

NOTE: Non-HTS or HTS compatible o-rings may be used with non-HTS oil.

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- (b) Install the o-ring [35] into its correct groove on the backup generator input mounting pad.
- (c) Install the o-ring [36] into its correct groove on the backup generator input splined shaft.



CAUTION

MAKE SURE YOU DO NOT DAMAGE THE SPLINED SHAFT O-RING WHEN YOU INSTALL THE BUG. A DAMAGED O-RING CAN CAUSE A LOSS OF ENGINE OIL, WHICH CAN AFFECT ENGINE OPERATION AND CAUSE AN IN-FLIGHT SHUTDOWN.

- (d) Put the generator on the mounting-pad and make sure that the studs and nuts go through the large part of the keyholes in the generator mounting-flange.
- (e) Turn the generator counterclockwise until the studs are against the ends of the keyholes slots in the generator flange.
- (f) Push the generator axially until the generator mounting-flange and the mounting-pad surface fits correctly.
- (g) Make sure you replace any nuts that show signs of shear failure where the nut is not fully attached to the washer. This will help prevent damage to the generator.
- (h) Do an inspection of the stud nuts [11] and replace all nuts that show indications of shear failure.
- (i) Install the stud nuts [11] and tighten to a torque of 260 in-lb (29 N·m) - 320 in-lb (36 N·m).

NOTE: Use a 10 in. (25 cm) extension with a 12 point deep-socket for the upper-inboard stud nuts.

SUBTASK 24-25-01-420-033-001



WARNING

BE CAREFUL WHEN YOU MOVE THE BACKUP GENERATOR. BECAUSE THE BACKUP GENERATOR WEIGHS 35 POUNDS, INJURIES TO PERSONS CAN OCCUR.



CAUTION

DO NOT LET THE GENERATOR TO HANG ON THE INPUT SHAFT DURING INSTALLATION. FAILURE TO ALIGN THE GENERATOR CORRECTLY CAN CAUSE DAMAGE TO THE INPUT SEAL.

- (4) Alternate installation of the backup generator [4] using the optional VSCF hoist adapter, SPL-1629.



CAUTION

MAKE SURE YOU USE THE CORRECT TOOLS AND PROCEDURES FOR THE BUG INSTALLATION. IF YOU DO NOT USE THE CORRECT TOOLS AND PROCEDURES, YOU MAY DAMAGE THE O-RING ON THE BUG SPLINED SHAFT. A DAMAGED O-RING CAN CAUSE A LOSS OF ENGINE OIL, WHICH CAN AFFECT ENGINE OPERATION AND CAUSE AN IN-FLIGHT SHUTDOWN.

- (a) Attach the load positioner, SPL-11069 or the telescoping hydraulic adapter assembly, SPL-1584 to the hoist, SPL-1556, then attach to the VSCF hoist adapter, SPL-1629.
- (b) Attach the backup generator to the VSCF hoist adapter, SPL-1629.

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FOR THE INPUT DRIVE SHAFT LARGE O-RING [35] AND SMALL O-RING [36], M83485 HIGH THERMAL STABILITY (HTS) COMPATIBLE O-RINGS ARE RECOMMENDED WHEN USING HTS OIL. USE OF M83248 OR AS3209 NON-HTS COMPATIBLE O-RINGS WITH HTS OIL WILL RESULT IN LIFE REDUCING DEGRADATION OF THE O-RING. DEGRADATION OF THE SHAFT O-RINGS CAN RESULT IN LOSS OF ENGINE OIL.

- (c) Apply Royco HF-825 lubricant, D00657 to a new o-ring [35] and a o-ring [36].

NOTE: When you install the applicable o-ring, make sure that the o-ring is compatible with the engine oil type.

NOTE: Low oil quantity is detectable via ENG OIL QTY EICAS message.

NOTE: Non-HTS or HTS compatible o-rings may be used with non-HTS oil.



MAKE SURE YOU DO NOT DAMAGE THE SPLINED SHAFT O-RING WHEN YOU INSTALL THE BUG. A DAMAGED O-RING CAN CAUSE A LOSS OF ENGINE OIL, WHICH CAN AFFECT ENGINE OPERATION AND CAUSE AN IN-FLIGHT SHUTDOWN.

- (d) Install the new o-ring [35] into its correct groove on the backup generator input mounting pad.
- (e) Install the new o-ring [36] into its correct groove on the backup generator input splined shaft.
- (f) Move the VSCF hoist adapter, SPL-1629 forward until the generator is on the mounting-pad and the keyholes in the generator mounting-flange are aligned with the mounting studs.
- NOTE: Move the generator shaft in a straight line to prevent damage to the generator input seal.
- (g) Make sure that the studs and nuts go through the large part of the keyholes in the generator mounting-flange.
- (h) Turn the generator counterclockwise until the studs are against the ends of the keyholes slots in the generator flange.
- (i) Push the generator axially until the generator mounting-flange and the mounting-pad surface fits correctly.
- (j) Make sure you replace any nuts that show signs of shear failure where the nut is not fully attached to the washer. This will help prevent damage to the generator.
- (k) Do an inspection of the stud nuts [11] and replace all nuts that show indications of shear failure.
- (l) Install the stud nuts [11] and tighten to a torque of 260 in-lb (29 N·m) - 320 in-lb (36 N·m).
- NOTE: Use a 10 in. (25 cm) extension with a 12 point deep-socket for the upper-inboard stud nuts.
- (m) Remove the VSCF hoist adapter, SPL-1629 from the backup generator.

SUBTASK 24-25-01-420-034-001

- (5) Install the phase leads [6].
- (a) Do these steps, if the terminal block cover is on the generator:
- 1) Loosen the bolts [9] and remove the terminal block cover [10].
 - 2) Remove the terminal nuts [7].

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DO NOT INSTALL ANY WASHERS EITHER UNDER OR OVER THE PHASE LEADS TERMINAL LUGS. THE PHASE LEADS TERMINAL LUGS MUST BE IN DIRECT CONTACT WITH THE GENERATOR TERMINAL LUGS. LOCALIZED RESISTANCE HEATING CAN OCCUR WHICH COULD CAUSE THE TERMINAL BLOCK TO BURN.

- (b) Install the phase leads [6] on the power terminal studs.
NOTE: Make sure that the correct phase lead is installed on each generator terminal.
- (c) Install the terminal nuts [7].
- (d) Tighten the terminal nuts [7] to a torque of 49 in-lb (6 N·m) - 53 in-lb (6 N·m).
- (e) Install the terminal block cover [10].



USE CARE WHEN WORKING AROUND THE GENERATOR TERMINAL BLOCK ADAPTER. DAMAGE TO THE TERMINAL BLOCK ADAPTER CAN OCCUR IF BOLTS ARE OVER-TORQUED OR THE ADAPTER IS STRUCK WITH A HARD OBJECT.

- (f) Install the washers [8] and bolts [9].
- (g) Tighten the bolts [9] to a torque of 40 in-lb (5 N·m) - 46 in-lb (5 N·m).

SUBTASK 24-25-01-020-053-001

- (6) If this is a new backup generator, then do these steps:
 - (a) Remove the shipping plugs from the generator.
 - (b) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00071 or oil, D00068 to the new o-ring [34].
 - (c) Install the o-ring [34] on the check valve [21].
 - (d) Install the check valve [21] and tighten to a torque of 240 in-lb (27 N·m) - 300 in-lb (34 N·m).
 - (e) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00071 or oil, D00068 to the new o-ring [33].
 - (f) Install the o-ring [33] on the oil-out line union [20].
 - (g) Install the oil-out line union [20] and tighten to a torque of 120 in-lb (14 N·m) - 180 in-lb (20 N·m).
 - (h) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00071 or oil, D00068 to the new o-ring [17].
 - (i) Install the o-ring [17] on the reducer [19].
 - (j) Install the reducer [19] and tighten to a torque of 60 in-lb (7 N·m) - 120 in-lb (14 N·m).
 - (k) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00071 or oil, D00068 to the o-ring [15].
 - (l) Install the o-ring [15] on the reducer [18].
 - (m) Install the reducer [18] and tighten to a torque of 120 in-lb (14 N·m) - 180 in-lb (20 N·m).
 - (n) Install the backup nut [32], retainer [30] and new o-ring [31] on the overtemp drain elbow [23].
 - (o) Install the overtemp drain elbow [23] and tighten the backup nut [32] to a torque of 120 in-lb (14 N·m) - 180 in-lb (20 N·m).



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SUBTASK 24-25-01-420-035-001



USE TWO WRENCHES TO TIGHTEN THE OVERTEMP DRAIN LINE. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTING. THIS CAN CAUSE DAMAGE TO THE GENERATOR BOSS.

- (7) Re-connect the overtemp drain line [37].
- (a) Tighten the overtemp drain line [37] to a torque of 260 in-lb (29 N·m) - 280 in-lb (32 N·m).
- NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.

SUBTASK 24-25-01-420-036-001



USE TWO WRENCHES TO TIGHTEN THE PRESSURE FILL AND OVERFLOW DRAIN LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR BOSSES.

- (8) Install the oil-in line [2] and oil-out lines [3].
- (a) Attach the oil-in line [2] and oil-out lines [3] to the check valve [21] and the oil-out line union [20].
- (b) Tighten the oil-in line [2] to a torque of 450 in-lb (51 N·m) - 550 in-lb (62 N·m).
- NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.
- (c) Tighten the oil-out line [3] to a torque of 270 in-lb (31 N·m) - 330 in-lb (37 N·m).
- NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.

SUBTASK 24-25-01-420-037-001



USE TWO WRENCHES TO TIGHTEN THE PRESSURE FILL AND OVERFLOW DRAIN LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR BOSSES.

- (9) Install the pressure fill line [14] and overflow drain lines [13].
- (a) Attach the pressure fill line [14] and overflow drain lines [13] to their reducers.
- (b) Tighten the pressure fill line to a torque of 260 in-lb (29 N·m) - 280 in-lb (32 N·m).
- NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.
- (c) Tighten the overflow drain line to a torque of 475 in-lb (54 N·m) - 525 in-lb (59 N·m).
- NOTE: The torque value for the line to fitting connection is more than the torque value for the fitting to generator connection. Be sure to use a backing wrench to prevent transfer of the higher torque to the generator.

SUBTASK 24-25-01-420-038-001

- (10) Install the bolts [38] which hold the pressure fill and overflow drain lines.

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SUBTASK 24-25-01-420-039-001

- (11) Install the harness connector [1].
 - (a) Remove the plastic caps from the electrical connectors.
 - (b) Connect the harness connectors [1] to the generator electrical connectors.



INSTALL THE BUG WIRE WITH SUFFICIENT TENSION TO KEEP IT AWAY FROM THE THRUST REVERSER. IF THE THRUST REVERSER RUBS THE BUG WIRE HARNESS, IT WILL CAUSE DAMAGE.

- 1) Pull the harness connector [1] until it is tight, and does not touch the thrust reverser.

SUBTASK 24-25-01-610-004-001

- (12) Do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.

SUBTASK 24-25-01-410-005-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (13) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
 - (a) Do this task:
Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) Do this task:
Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

J. Backup Generator Installation Test

SUBTASK 24-25-01-790-002-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

SUBTASK 24-25-01-860-015-001

- (2) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-25-01-860-016-001

- (3) Make sure that the ON light on the PRIMARY EXT PWR switch is on.

SUBTASK 24-25-01-710-005-001

- (4) Do the installation test of the backup generator.
 - (a) Push the MENU button on the Control Display Unit (CDU).
 - (b) Push the MAINT INFO DISPLAY button on the CDU.

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- (c) Push the ELECTRICAL SHOW DISPLAY button on the CDU.
- (d) Make sure there are data for the related main AC bus.
- (e) Make sure the oil level shows NORM for the related backup generator on the ELECTRICAL Maintenance Page.
NOTE: The oil level information will not be available until 5 minutes after there is power on the converter.
- (f) If the oil level shows "--", or SERVICE, do the check of the backup generator oil level (TASK 12-13-07-200-801).
- (g) Make sure the oil filter shows NORM for the related backup generator on the ELECTRICAL Maintenance Page.
- (h) If the oil filter shows "--" or BLOCKED, examine the oil filter differential pressure indicator (TASK 12-13-07-200-801).
- (i) Make sure the related BACKUP GEN switch on the P5 is in the latched (IN) position.
- (j) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
NOTE: The Engine Start Test will operate automatically and show all of the failures (if any) in 2 minutes or less.
- (k) Make sure there is no status, Engine Indication and Crew Alerting System (EICAS) advisory, or EICAS caution display show for the related Backup Generator.
- (l) Make sure there are no related maintenance messages on the Central Maintenance Computer (CMC).
- (m) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
- (n) Do this task: Backup Generator Oil Level Check, TASK 12-13-07-200-801.
- (o) Do a check for oil leakage.

———— **END OF TASK** ————

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BACKUP GENERATOR INPUT SHAFT - REPAIR

1. General

- A. This procedure is applicable to all 777 airplanes with Backup Generator 757066H (S281W401-20) or 762620E (S281W401-16), or later with the 1200 in-lb. input shaft.

TASK 24-25-01-960-801

2. Backup Generator Input Shaft Replacement (Shaft Shear)

(Figure 801 or Figure 802)

A. General

- (1) This procedure is intended to provide an alternative action to sending the backup generator to the shop for repair when the fault condition has been isolated to a nuisance input shaft shear.
- (2) This procedure is only intended for nuisance shaft shear events, if any other damage has occurred to the backup generator, it should be sent to a repair shop and replaced with a new one.

NOTE: If multiple shaft faults continue to occur, then replace the air starter valve (STARTER AIR VALVE - REMOVAL/INSTALLATION, PAGEBLOCK 80-11-02/401).

B. References

Reference	Title
24-25-01-000-804-001	Backup Generator Removal (P/B 401)
24-25-01-400-804-001	Backup Generator Installation (P/B 401)
24-25-02-000-803-002	Backup Generator Oil Filter Removal (P/B 401)
24-25-02-400-803-002	Backup Generator Oil Filter Installation (P/B 401)
80-11-02 P/B 401	STARTER AIR VALVE - REMOVAL/INSTALLATION

C. Tools/Equipment

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

Reference	Description
SPL-10939	Pressure Test Eqpt - Engine Generator (VSCF On Bench) Part #: J24015-3 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Retaining ring	24-25-01-02B-285	ARO ALL
3	Retaining ring	24-25-01-02B-310	ARO ALL
4	Input shaft	24-25-01-02B-315	ARO ALL
		24-25-01-02B-320	ARO ALL

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AMM Item	Description	AIPC Reference	AIPC Effectivity
5	O-ring	24-25-01-02B-220	ARO ALL
		24-25-01-02B-522	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Prepare for Replacement

SUBTASK 24-25-01-700-001

- (1) Do this check:
 - (a) Do a visual check of the backup generator differential pressure indicator (DPI), make sure it is not extended.
 - (b) Do this task: Backup Generator Oil Filter Removal, TASK 24-25-02-000-803-002.
 - (c) Do a visual check for metal particles on filter element or cover.
 - (d) If metal particles exist, send backup generator to repair shop and install new backup generator.
 - (e) If no metal particles exist, continue.
 - (f) Install a new filter element, do this task: Backup Generator Oil Filter Installation, TASK 24-25-02-400-803-002.

SUBTASK 24-25-01-020-054

- (2) Do this task: Backup Generator Removal, TASK 24-25-01-000-804-001.

SUBTASK 24-25-01-940-001

- (3) Put the backup generator on a suitable work surface.

H. Input Shaft Replacement

SUBTASK 24-25-01-020-057

- (1) Remove the seal assembly [8], use the steps that follow:
 - (a) Remove the three screws [7] that hold the seal assembly.
 - (b) Remove the stationary seal retainer.
 - (c) Use a right angle scribe to remove the seal assembly.

SUBTASK 24-25-01-020-055

- (2) Remove the input shaft [4], use the steps that follow:
 - (a) Use two sharp, small diameter scribes to remove the retaining ring [2].
 - (b) Discard the retaining ring [2].
 - (c) Pull out remaining half of the input shaft [4]. Use external ring pliers as necessary to hold the input shaft [4].
 - (d) If the input shaft [4] does not come out, use a scribe to carefully reposition the retaining ring [3] so it does not engage the retaining ring groove in the backup generator rotor shaft, then remove remaining portion of the input shaft [4].
 - (e) Discard the retaining ring [3], o-ring [5] and input shaft [4].

SUBTASK 24-25-01-020-056

- (3) Install the input shaft [4], use the steps that follow:

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CAUTION

FOR THE INPUT DRIVE SHAFT LARGE O-RING [5] AND SMALL O-RING [6], M83485 HIGH THERMAL STABILITY (HTS) COMPATIBLE O-RINGS ARE RECOMMENDED WHEN USING HTS OIL. USE OF M83248 OR AS3209 NON-HTS COMPATIBLE O-RINGS WITH HTS OIL WILL RESULT IN LIFE REDUCING DEGRADATION OF THE O-RING. DEGRADATION OF THE SHAFT O-RINGS CAN RESULT IN LOSS OF ENGINE OIL.

- (a) Lubricate the new o-ring [5] with Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071.
NOTE: Non-HTS or HTS compatible o-rings may be used with non-HTS oil.
- (b) Install a new o-ring [5] on the input shaft [4].
- (c) Position the new retaining ring [3] on the input shaft [4].
NOTE: The preferred method for installing the new retaining ring is to carefully spread the retaining ring (spir-o-lox type) and thread onto the input shaft at the shear section.
- (d) Position the new retaining ring [2] on the input shaft [4].
NOTE: The preferred method for installing the new retaining ring is to carefully spread the retaining ring (spir-o-lox type) and thread onto the input shaft at the shear section.
- (e) Install the input shaft [4] into the backup generator.
 - 1) Push down on the input shaft [4] until you feel it snap into place.
- (f) Install the new retaining ring [3] on the input shaft [4] until the ring bottoms.
- (g) Use two scribes to install the new retaining ring [2] in the groove on the backup generator rotor shaft.

SUBTASK 24-25-01-020-058

- (4) Install the seal assembly [8], use the steps that follow:



CAUTION

DO NOT HIT THE INSIDE DIAMETER OF THE SEAL AGAINST THE INPUT SHAFT. DAMAGE TO THE SEAL CAN OCCUR.

- (a) Install the seal assembly [8] and retainer over the input shaft [4] until it meets flush with the front cover.
- (b) Position seal assembly [8] so the holes line up with the holes in the generator housing.
- (c) Install the three screws [7] that hold the seal assembly [8].
 - 1) Tighten the screws to 20 in-lb (2.3 N·m) to 22 in-lb (2.5 N·m).

SUBTASK 24-25-01-210-001

- (5) Make sure the rotor can be spun freely by turning the input shaft [4] by hand.
NOTE: If the Backup Generator can not be spun freely by hand, the Backup Generator should be sent to the repair shop.

SUBTASK 24-25-01-780-001

- (6) Do a leak check of the backup generator as follows:
 - (a) Plug all ports on the backup generator except the overflow drain port.
 - (b) Do one of these steps to connect the test equipment to the backup generator:

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- 1) Connect a source of clean, filtered air or nitrogen, with a pressure gauge to the overflow drain port on the backup generator.
- 2) Connect the backup generator to the Engine Generator Pressure Test Eqpt, SPL-10939 as shown in Figure 801 or Figure 802.



CAUTION

DO NOT APPLY MORE THAN 25 PSI (2 KG/CM²) DURING THE LEAK CHECK. TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE BACKUP GENERATOR.

- (c) Pressurize the backup generator to 12 psi (83 kPa) and shut off air or nitrogen source.
- (d) Allow backup generator to remain pressurized for 10 minutes.
- (e) The pressure in the backup generator must be 11 psi (76 kPa) or greater after 10 minute period.

NOTE: If the Backup Generator pressure is not 11 psi (76 kPa) or greater, the Backup Generator should be sent to the repair shop.

- (f) Remove the test equipment from the backup generator.

SUBTASK 24-25-01-420-040

- (7) Do this task: Backup Generator Installation, TASK 24-25-01-400-804-001.

———— **END OF TASK** ————

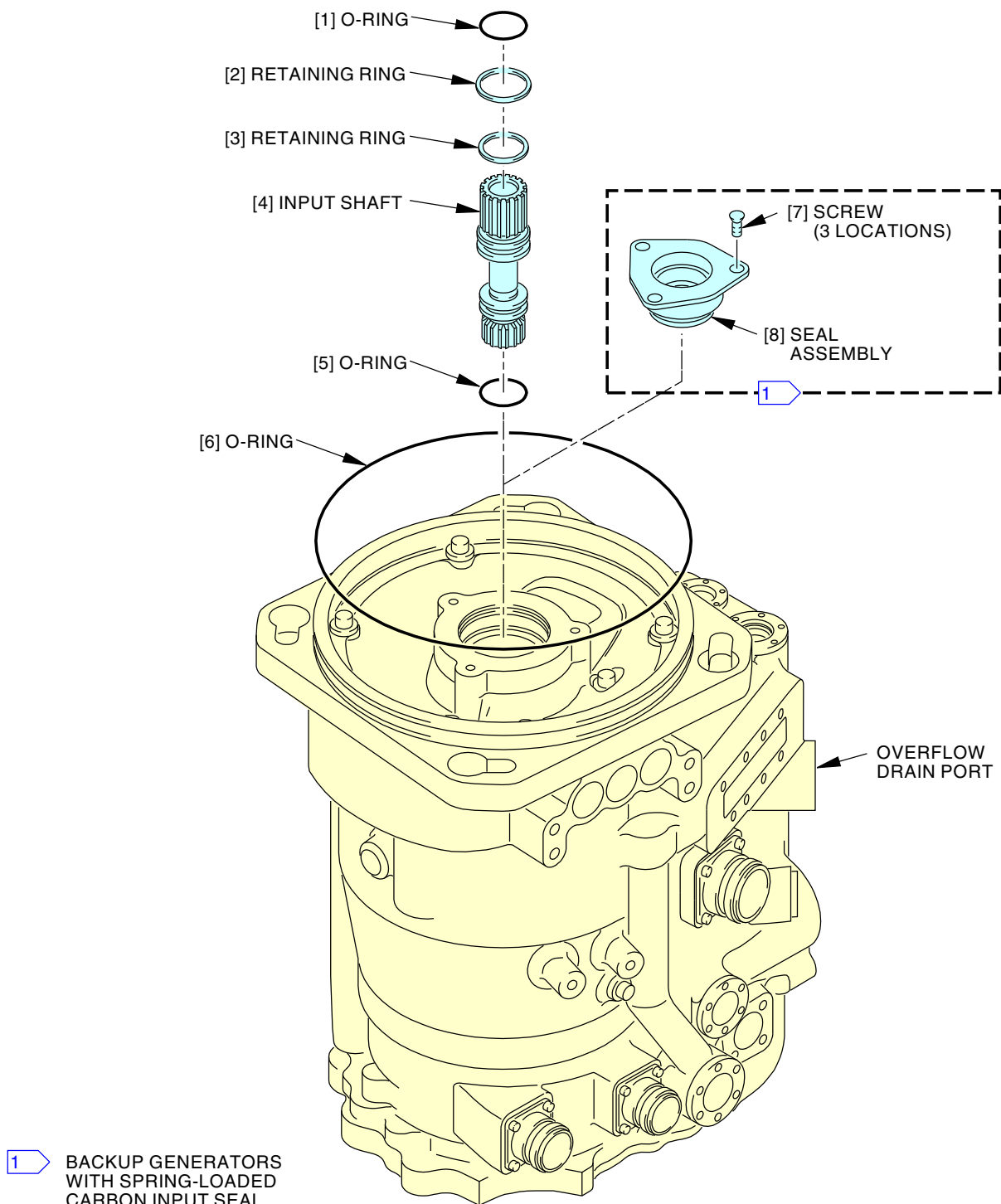
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**Backup Generator Input Shaft
Figure 801/24-25-01-990-809**

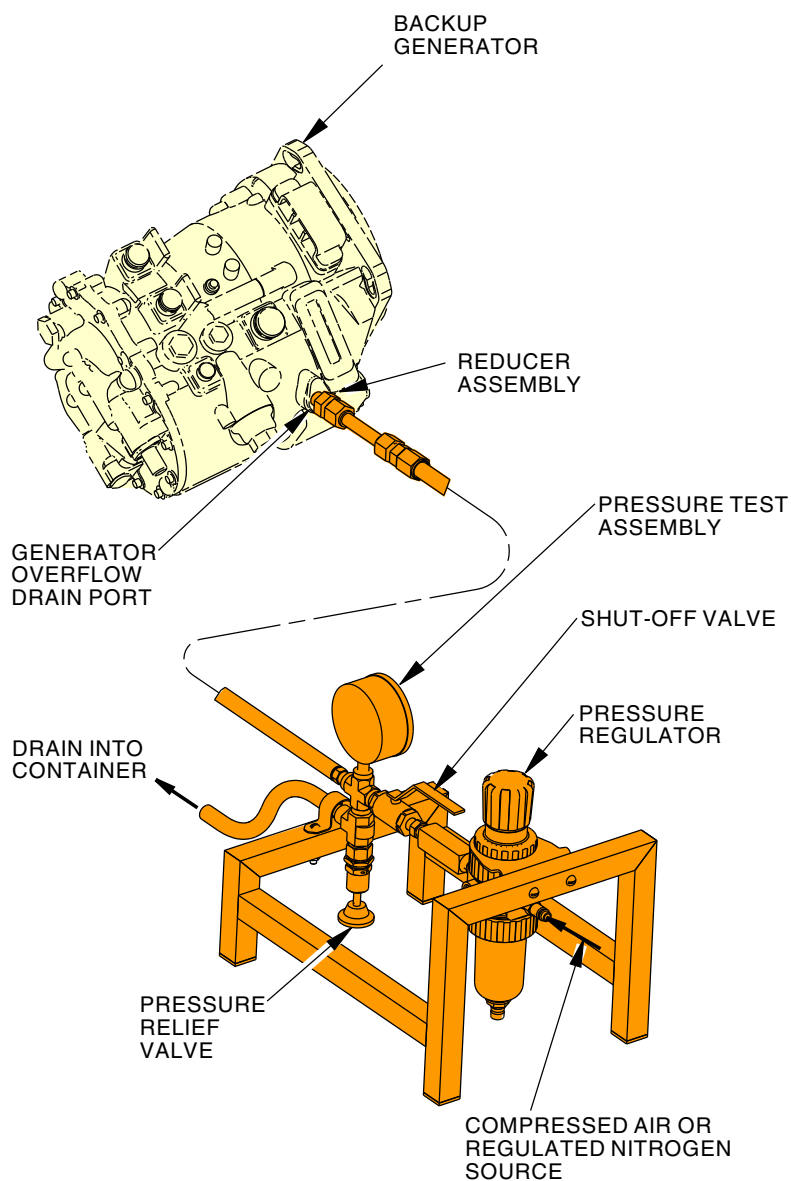
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Backup Generator Input Shaft Pressure Test
Figure 802/24-25-01-990-820

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TASK 24-25-01-960-802

3. Backup Generator Input Shaft Replacement (No Shaft Shear)

Figure 803 or Figure 804

A. General

- (1) This procedure provides an alternative action to sending the backup generator to the shop for input shaft replacement.
- (2) This procedure is only intended to replace a backup generator input shaft that has not failed.

B. References

Reference	Title
24-25-01-000-804-001	Backup Generator Removal (P/B 401)
24-25-01-400-804-001	Backup Generator 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
SPL-10939	Pressure Test Eqpt - Engine Generator (VSCF On Bench) Part #: J24015-3 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Retaining ring	24-25-01-02B-285	ARO ALL
3	Retaining ring	24-25-01-02B-310	ARO ALL
4	Input shaft	24-25-01-02B-315	ARO ALL
		24-25-01-02B-320	ARO ALL
5	O-ring	24-25-01-02B-220	ARO ALL
		24-25-01-02B-522	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Prepare for Replacement

SUBTASK 24-25-01-000-001

- (1) Do this task: Backup Generator Removal, TASK 24-25-01-000-804-001.

SUBTASK 24-25-01-940-002

- (2) Put the backup generator on a suitable work surface.

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H. Input Shaft Replacement

SUBTASK 24-25-01-000-002

- (1) Remove the seal assembly [8], use the steps that follow:
 - (a) Remove the three screws [7] that hold the seal assembly [8].
 - (b) Remove the stationary seal retainer.
 - (c) Use a right angle scribe to remove the seal assembly [8].

SUBTASK 24-25-01-000-003

- (2) Remove the input shaft [4], use the steps that follow:
 - (a) Use two sharp, small diameter scribes to remove the retaining ring [2].
 - (b) Remove the input shaft [4].
 - (c) If the input shaft [4] does not come out, use a scribe to carefully reposition the retaining ring [3] so it does not engage the retaining ring groove in the backup generator rotor shaft, then remove the input shaft [4].
 - (d) Discard the retaining ring [3], o-ring [5], and input shaft [4].

SUBTASK 24-25-01-430-001

- (3) Install the input shaft [4], use the steps that follow:



CAUTION

FOR THE INPUT DRIVE SHAFT LARGE O-RING [5] AND SMALL O-RING [6], M83485 HIGH THERMAL STABILITY (HTS) COMPATIBLE O-RINGS ARE RECOMMENDED WHEN USING HTS OIL. USE OF M83248 OR AS3209 NON-HTS COMPATIBLE O-RINGS WITH HTS OIL WILL RESULT IN LIFE REDUCING DEGRADATION OF THE O-RING. DEGRADATION OF THE SHAFT O-RINGS CAN RESULT IN LOSS OF ENGINE OIL.

- (a) Lubricate the new o-ring [5] with Royco HF-825 lubricant, D00657 (preferred), oil, D00068, or oil, D00071.
NOTE: Low oil quantity is detectable via ENG OIL QTY EICAS message.
NOTE: Non-HTS or HTS compatible o-rings may be used with non-HTS oil.
- (b) Install the new o-ring [5] on the input shaft [4].
- (c) Position the new retaining ring [3] on the input shaft [4].
NOTE: The preferred method for installing the new retaining ring is to carefully spread the retaining ring (spir-o-lox type) and thread onto the input shaft at the shear section.
- (d) Position the new retaining ring [2] on the input shaft [4].
NOTE: The preferred method for installing the new retaining ring is to carefully spread the retaining ring (spir-o-lox type) and thread onto the input shaft at the shear section.
- (e) Install the input shaft [4] in the backup generator.
 - 1) Push down the input shaft [4] until the you feel it snap into place.
- (f) Install the new retaining ring [3] on the input shaft [4] until the ring bottoms.
- (g) Use two scribes to install the new retaining ring [2] in the groove on the backup generator rotor shaft.

SUBTASK 24-25-01-430-002

- (4) Install the seal assembly [8], use the steps that follow:

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CAUTION

DO NOT HIT THE INSIDE DIAMETER OF THE SEAL AGAINST THE INPUT SHAFT. DAMAGE TO THE SEAL CAN OCCUR.

- (a) Install the seal assembly [8] and retainer over the input shaft [4] until it meets flush with the front cover.
- (b) Position the seal assembly [8] so that the holes line up with the holes in the generator housing.
- (c) Install the three screws [7] that hold the seal assembly [8].
 - 1) Tighten the screws to 20 in-lb (2.3 N·m) to 22 in-lb (2.5 N·m).

SUBTASK 24-25-01-200-001

- (5) Make sure the rotor can be spun freely by turning the input shaft [4] by hand.

NOTE: If the Backup Generator can not be spun freely by hand, the Backup Generator should be sent to the repair shop.

SUBTASK 24-25-01-200-002

- (6) Do a leak check of the backup generator as follows:
 - (a) Plug all ports on the backup generator except for the overflow drain port.
 - (b) Do one of the steps to connect the test equipment to the backup generator:
 - 1) Connect a source of clean, filtered air or nitrogen with a pressure gauge to the overflow drain port on the backup generator.
 - 2) Connect the backup generator to Engine Generator Pressure Test Eqpt, SPL-10939 as shown in Figure 803 or Figure 804.



CAUTION

DO NOT APPLY MORE THAN 25 PSI (2 KG/CM²) DURING THE LEAK CHECK. TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE BACKUP GENERATOR.

- (c) Pressurize the backup generator to 12 psi (83 kPa) and shut off air or nitrogen source.
- (d) Allow backup generator to remain pressurized for 10 minutes.
- (e) The pressure in the backup generator must be 11 psi (76 kPa) or greater after the 10 minute period.

NOTE: If the Backup Generator pressure is not 11 psi (76 kPa) or greater, the Backup Generator should be sent to the repair shop.

- (f) Remove the test equipment from the backup generator.

SUBTASK 24-25-01-420-052

- (7) Do this task: Backup Generator Installation, TASK 24-25-01-400-804-001..

————— **END OF TASK** —————

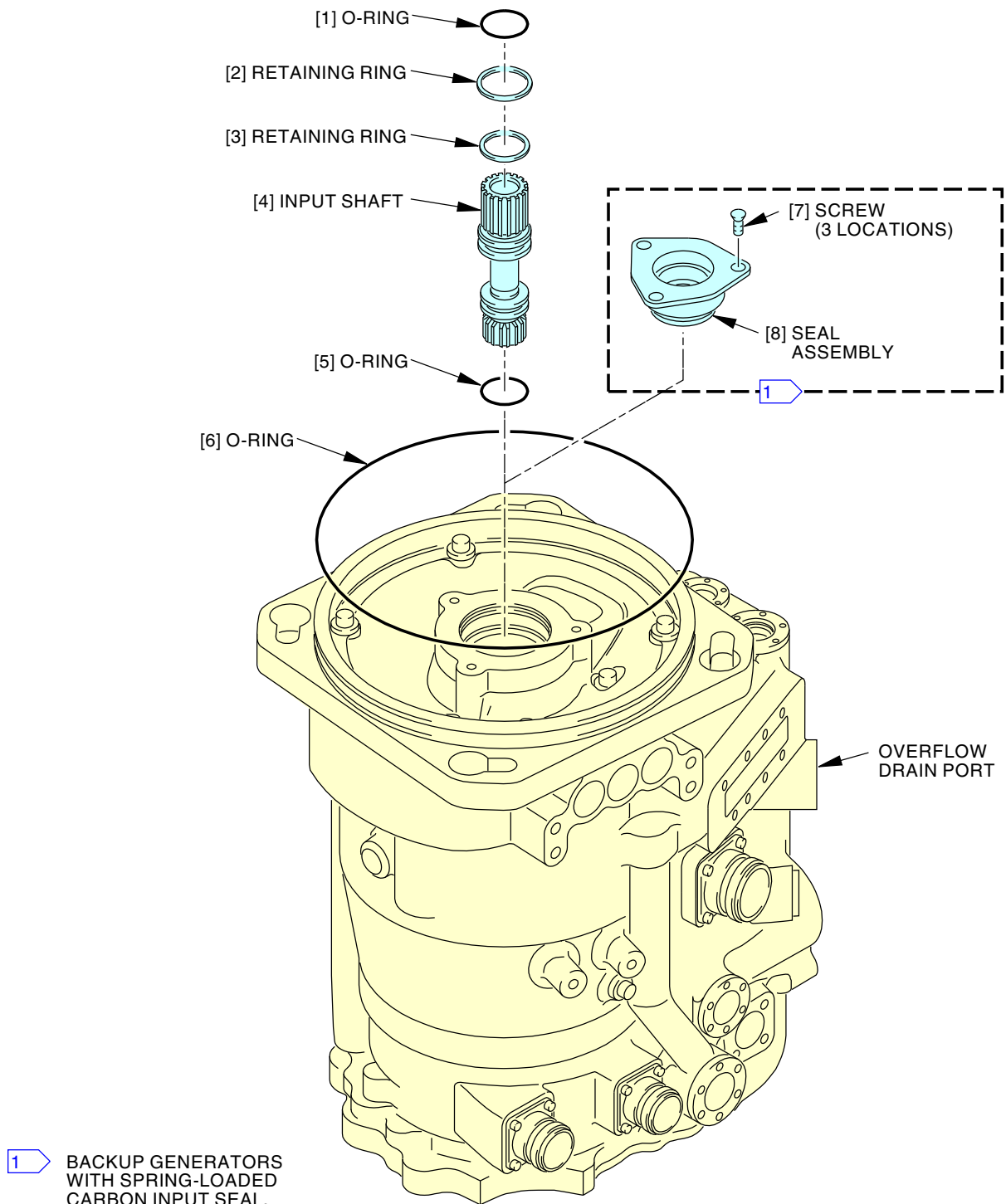
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**Backup Generator Input Shaft
Figure 803/24-25-01-990-819**

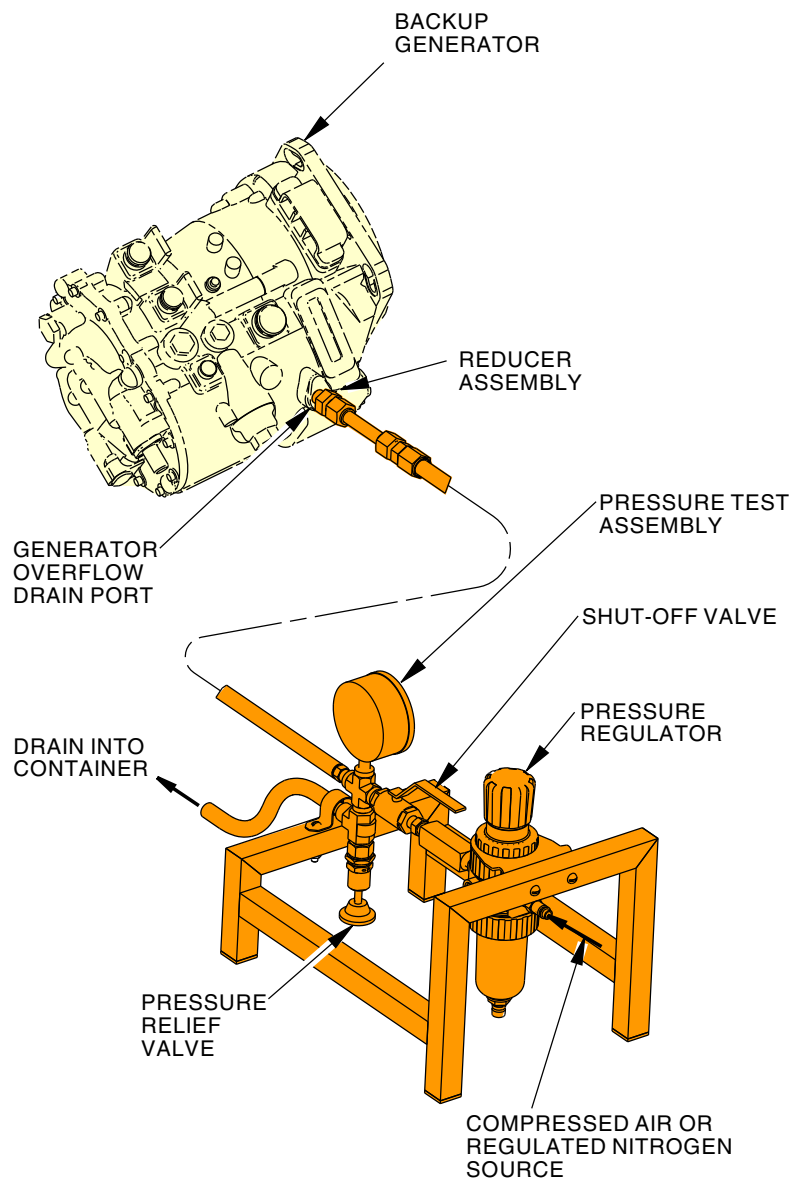
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Backup Generator Input Shaft Pressure Test
Figure 804/24-25-01-990-821

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BACKUP GENERATOR OIL FILTER - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
 - (1) Backup Generator Oil Filter Inspection Check

TASK 24-25-02-200-801

2. Backup Generator Oil Filter Inspection Check

A. General

- (1) You must remove the backup generator oil filter to do an inspection of the filter.

B. References

Reference	Title
24-11-04-000-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Removal (P/B 401)
24-11-04-400-802-002	IDG/Backup Generator Air/Oil Heat Exchanger Installation (P/B 401)
24-25-01-000-804-001	Backup Generator Removal (P/B 401)
24-25-01-400-804-001	Backup Generator Installation (P/B 401)
24-25-02-000-803-002	Backup Generator Oil Filter Removal (P/B 401)
24-25-02-400-803-002	Backup Generator Oil Filter Installation (P/B 401)
24-25-07-000-801	Oil/Oil Heat Exchanger Removal (P/B 401)
24-25-07-400-801	Oil/Oil Heat Exchanger Installation (P/B 401)

C. Consumable Materials

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

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Prepare for the Inspection

SUBTASK 24-25-02-020-008

- (1) Do this task: Backup Generator Oil Filter Removal, TASK 24-25-02-000-803-002.

F. Procedure

SUBTASK 24-25-02-210-001

- (1) Examine the filter element, filter cavity and filter cover as follows:

NOTE: A moderate number of scattered, small metallic flakes or small bits of epoxy and insulation are normal characteristics. Debris of this sort does not require backup generator removal.

- (a) If the filter element, filter cavity, or filter cover shows bright metal deposits that can be clearly specified as chunks or pieces caused by breakage, then replace the backup generator.

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These are the tasks:

Backup Generator Removal, TASK 24-25-01-000-804-001,

Backup Generator Installation, TASK 24-25-01-400-804-001.

- (b) If the filter element or the O-rings are damaged or show any indication of allowing contaminants to bypass the filter and enter the cooling system, then do these steps:

NOTE: An extended DPI indicates a blocked filter but does not provide an indication of filter bypass. Bypassing of oil into the cooling circuit is possible through a damaged filter element or a damaged filter o-ring.

- 1) Replace or flush the plumbing lines in the external oil cooling circuit with, oil, D00068 or oil, D00071.

NOTE: Remove the backup generator and the associated heat exchangers before flushing.

- 2) Replace the IDG/VSCF Air/Oil heat exchanger.

These are the tasks:

IDG/Backup Generator Air/Oil Heat Exchanger Removal,
TASK 24-11-04-000-802-002,

IDG/Backup Generator Air/Oil Heat Exchanger Installation,
TASK 24-11-04-400-802-002.

- 3) Replace the Oil/Oil heat exchanger.

These are the tasks:

Oil/Oil Heat Exchanger Removal, TASK 24-25-07-000-801,

Oil/Oil Heat Exchanger Installation, TASK 24-25-07-400-801.

- 4) Replace the backup generator.

These are the tasks:

Backup Generator Removal, TASK 24-25-01-000-804-001,

Backup Generator Installation, TASK 24-25-01-400-804-001.

NOTE: Return the contaminated filter element with the backup generator for shop analysis.

SUBTASK 24-25-02-420-001

- (2) Do this task: Backup Generator Oil Filter Installation, TASK 24-25-02-400-803-002.

————— **END OF TASK** —————

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BACKUP GENERATOR OIL FILTER - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Backup Generator Oil Filter Removal
 - (2) Backup Generator Oil Filter Installation.

TASK 24-25-02-000-803-002

2. Backup Generator Oil Filter Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure gives instructions to remove the backup generator oil filter.

B. References

Reference	Title
24-25-02-200-801	Backup Generator Oil Filter Inspection Check (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

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E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Prepare for the Removal

SUBTASK 24-25-02-010-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. Oil Filter Removal

SUBTASK 24-25-02-860-001

- (1) Do these steps to release the pressure from the backup generator:

- (a) Connect the overflow coupling which is on the service engine oil servicing cart, COM-1537 to the overflow hose.
- (b) Put the free end of the hose in the oil resistant container (5 gal)(19 Liter), STD-1055.



WHEN YOU CONNECT THE OVERFLOW COUPLING TO THE OVERFLOW DRAIN VALVE, USE A RAG AROUND THE FITTINGS. THIS WILL PREVENT A SPRAY CAUSED BY PRESSURE IN THE BACKUP GENERATOR CASE. HOT OIL CAN BURN YOU.

- (c) Connect the overflow coupling and overflow hose to the overflow drain valve.
NOTE: Some oil can come out of the drain hose when it is connected.
- (d) Permit the oil that drains from the hose to flow in the oil resistant container (5 gal)(19 Liter), STD-1055.
- (e) Disconnect the overflow coupling and overflow hose from the overflow drain valve.

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SUBTASK 24-25-02-020-003



USE TWO WRENCHES TO LOOSEN THE PRESSURE FILL AND THE OVERFLOW DRAIN LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

- (2) If it is necessary to get access to the filter cover, do these steps:
- NOTE: Use a container to catch the oil.
- (a) Disconnect the pressure fill line from the backup generator
 - (b) Disconnect the overflow drain line from the backup generator

SUBTASK 24-25-02-020-001



REMOVE THE FILTER COVER CAREFULLY. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION. HOT OIL CAN FLOW FROM THE SCAVENGE FILTER WHEN YOU REMOVE THE FILTER COVER. HOT OIL CAN BURN YOU.

- (3) Remove the filter cover [4]:
- (a) Put a oil resistant container (5 gal)(19 Liter), STD-1055 below the backup generator to collect oil from the filter cavity.
 - (b) Remove the filter cover [4].
 - (c) Drain the oil from the filter cavity into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - (d) Remove and discard the cover o-ring [1].

SUBTASK 24-25-02-020-002

- (4) Remove the filter element [3] from the filter cavity.
- (a) Examine the filter element, filter cavity and filter cover. Do this task: Backup Generator Oil Filter Inspection Check, TASK 24-25-02-200-801.
 - (b) Discard the filter element [3] and the filter o-ring [2].

————— **END OF TASK** —————

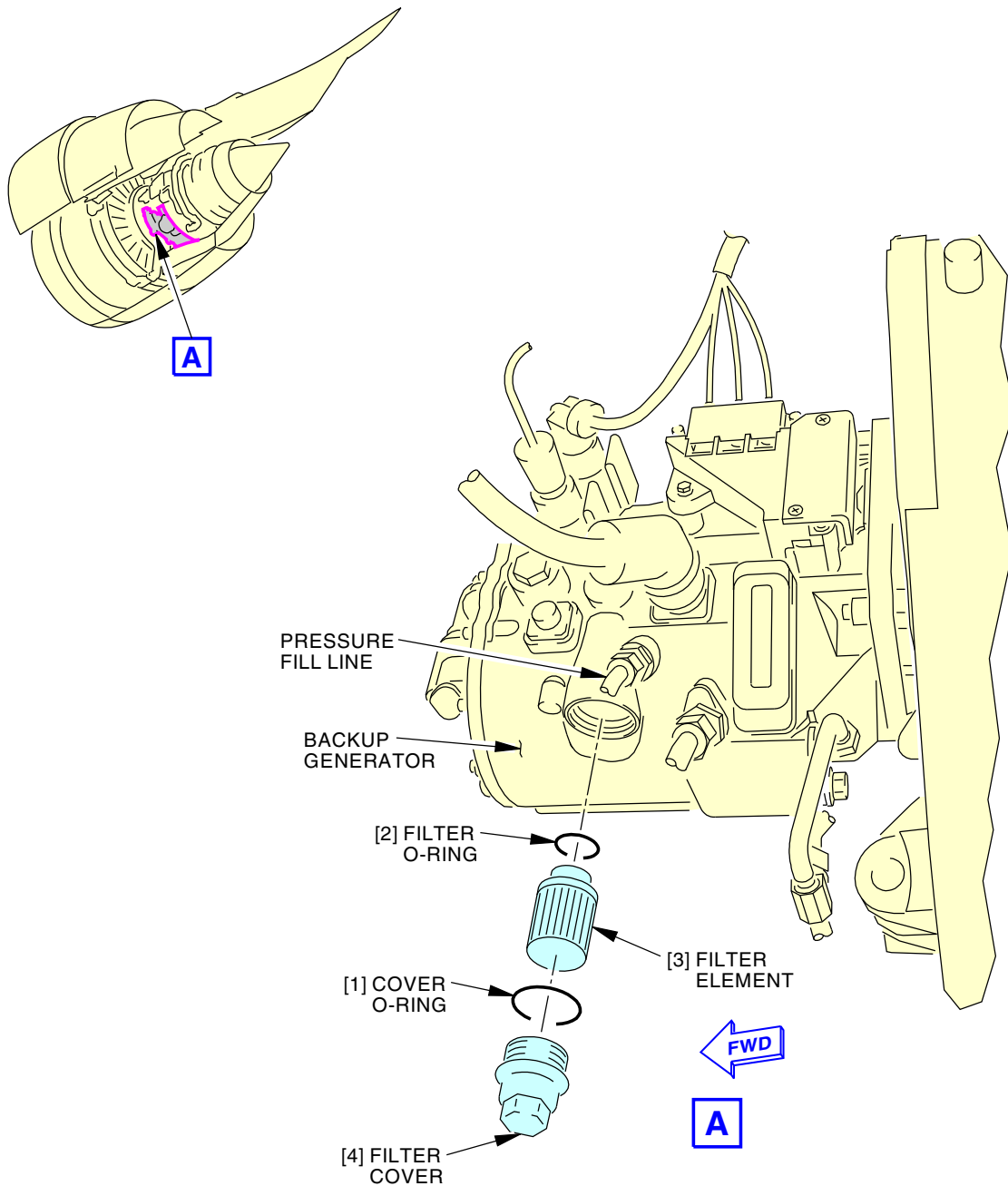
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Backup Generator Oil Filter Removal
Figure 401/24-25-02-990-801

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TASK 24-25-02-400-803-002

3. Backup Generator Oil Filter Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives instructions to install the backup generator oil filter.

B. References

Reference	Title
12-13-07-600-801	Backup Generator Oil Fill (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	
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	Cover o-ring	24-25-01-02B-370	ARO ALL
2	Filter o-ring	24-25-01-02B-465	ARO ALL

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

G. Oil Filter Installation

SUBTASK 24-25-02-420-002

- (1) Do these steps to install the filter element [3]:
- (a) Lubricate the new filter o-ring [2] with Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071.
 - (b) Install the new filter o-ring [2] on the filter element [3].

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- (c) Install the filter element [3] into the filter cavity until the o-ring makes a seal.

SUBTASK 24-25-02-420-003



CAUTION

MAKE SURE THE FILTER IS AGAINST THE BOTTOM OF THE FILTER CAVITY BEFORE YOU INSTALL THE FILTER COVER. DO NOT TIGHTEN THE FILTER COVER TO PUSH THE FILTER IN THE CAVITY. DAMAGE TO THE FILTER CAN OCCUR.

- (2) Do these steps to install the filter cover [4]:
- (a) Lubricate the new cover o-ring [1] with Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071.
 - (b) Install the new cover o-ring [1] on the filter cover [4].
 - (c) Install the filter cover [4] on the filter cavity.
 - (d) Tighten the filter cover [4] to 14 ± 1 ft-lb (19.0 ± 1.4 N·m).
 - (e) Install a MS20995C32 lockwire, G01048 on the filter cover [4].

SUBTASK 24-25-02-420-004



CAUTION

USE TWO WRENCHES TO TIGHTEN THE PRESSURE FILL AND OVERFLOW DRAIN LINES. IF THE TWO WRENCH PROCEDURE IS NOT FOLLOWED, TOO MUCH TORQUE WILL BE TRANSFERRED TO THE GENERATOR FITTINGS. THIS CAN CAUSE DAMAGE TO THE GENERATOR FITTINGS.

- (3) If the pressure fill line and overflow drain line are disconnected to get access to the filter cover, do these steps:
- (a) Connect the pressure fill line to the backup generator and tighten it to 270 ± 10 in-lb (31 ± 2 N·m).
 - (b) Connect the overflow drain line to the backup generator and tighten it to 500 ± 25 in-lb (56 ± 3 N·m).

SUBTASK 24-25-02-610-001

- (4) Do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.

H. Backup Generator Oil Filter Installation Test

SUBTASK 24-25-02-790-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-25-02-410-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
- Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

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(a) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

(b) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

(c) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

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VSCF OIL TEMPERATURE SENSORS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks

- (1) A removal of the VSCF oil temperature sensors.
- (2) An installation of the VSCF oil temperature sensors.

TASK 24-25-05-000-802-001

2. VSCF Oil Temperature Sensors Removal

(Figure 401)

A. **General**

- (1) This task gives instructions of the VSCF temperature sensors (referred to as oil temperature sensors) removal.

B. **References**

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)

D. **Location Zones**

Zone	Area
411	Engine, Left
421	Engine, Right

E. **Access Panels**

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. **Prepare for the Removal**

SUBTASK 24-25-05-010-003-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

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(c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

(e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. VSCF Oil Temperature Sensors Removal

SUBTASK 24-25-05-020-002-001



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

(1) Remove the oil temperature sensor [2].



USE TEFLON-JAWED PLIERS TO LOOSEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTORS COULD OCCUR.



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU DISCONNECT THEM. THE CONTAMINATION TO THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (a) Disconnect the electrical cable [3] from the oil temperature sensor [2] with the teflon-jawed pliers, STD-664.
- (b) Install protective covers on the electrical connection and the electrical cable connector.
- (c) Remove the bolts [4] that attach the oil temperature sensor [2] to the sensor adapter [1].
- (d) Remove the oil temperature sensor [2].
- (e) Install a protective cover on the oil temperature sensor [2].

————— **END OF TASK** —————

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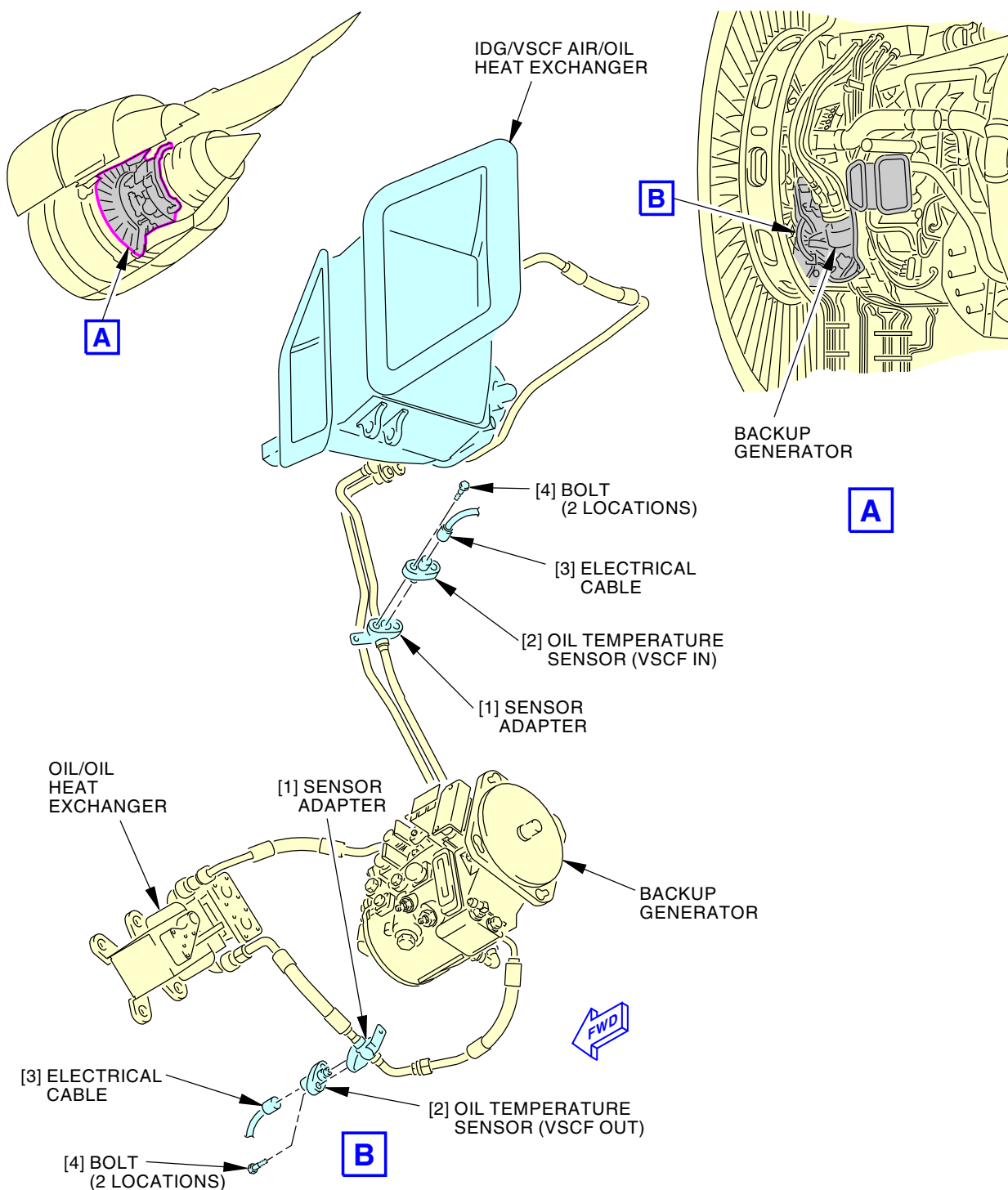
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Oil Temperature Sensors Installation
Figure 401/24-25-05-990-801-001

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TASK 24-25-05-400-802-001

3. VSCF Oil Temperature Sensors Installation

(Figure 401)

A. General

- (1) This task gives instructions of the VSCF temperature sensors (referred to as oil temperature sensors) installation.

B. References

Reference	Title
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)

D. Consumable Materials

Reference	Description	Specification
D00634 [C02-060]	Compound - Antiseize, Lithium-Based - Never-Seize Regular Grade	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Oil temperature sensor	79-34-01-02-015	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. VSCF Oil Temperature Sensors Installation

SUBTASK 24-25-05-420-004-001

- (1) Install the oil temperature sensor [2].
 - (a) Put Never-Seize Regular Grade compound, D00634 [C02-060] on the inside of the sensor adapter [1].
 - (b) Attach the oil temperature sensor [2] to the sensor adapter [1].
 - (c) Install the bolts [4] that attach the oil temperature sensor [2] to the sensor adapter [1].
 - 1) Tighten the bolts [4].
 - (d) Remove the protective covers from the electrical connection and the electrical cable connector.

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- (e) Tighten the connector with your hand.



CAUTION

USE TEFLON-JAWED PLIERS TO TIGHTEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTORS COULD OCCUR.



CAUTION

MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU CONNECT THEM. THE CONTAMINATION TO THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (f) Use teflon-jawed pliers, STD-664 to tighten the electrical cable connector.

I. VSCF Oil Temperature Sensors Installation Test

SUBTASK 24-25-05-710-002-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

J. Put the Airplane Back to its Usual Condition.

SUBTASK 24-25-05-410-002-001



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

Number

Name/Location

415AL

Left Thrust Reverser, Left Engine

425AL

Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

Number

Name/Location

413AL

Left Fan Cowl Panel, Left Engine

423AL

Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

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BACKUP GENERATOR OIL LEVEL SIGHTGLASS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Backup Generator Oil Level Sightglass Removal
- (2) Backup Generator Oil Level Sightglass Installation.

TASK 24-25-06-000-801

2. Backup Generator Oil Level Sightglass Removal

(Figure 401)

A. General

- (1) This procedure gives instructions to remove the backup generator oil level sightglass.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
G01505	Lockwire - Safety And Lock	NASM20995

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E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

G. Prepare for Removal

SUBTASK 24-25-06-010-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

H. Removal

SUBTASK 24-25-06-860-001

- (1) Do these steps to release the pressure from the backup generator:
- (a) Remove the cap from the overflow drain valve.

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BE CAREFUL WHEN YOU CONNECT THE ENGINE OIL SERVICING CART, COM-1537 TO THE OVERFLOW DRAIN VALVE, USE A RAG AROUND THE FITTING. THIS WILL PREVENT A SPRAY OF HOT OIL CAUSED BY PRESSURE IN THE BACKUP GENERATOR. HOT OIL CAN BURN YOU.

- (b) Connect the hose and the overflow coupling from the engine oil servicing cart, COM-1537 to the overflow drain valve.

NOTE: It is usual for some oil to drain.

- (c) Let the oil from the hose drain into an oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 24-25-06-020-001

- (2) Do these steps to drain the oil from the backup generator:
 - (a) Remove the case drain plug from the backup generator and let the oil flow into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - (b) Remove and discard the o-ring from the case drain plug.
 - (c) Lubricate new o-ring with oil, D00068 or oil, D00071 and install on the case drain plug.
 - (d) Install and tighten the case drain plug to a torque of 40 in-lb (5 N·m) -45 in-lb (5 N·m).
 - (e) Install a lockwire, G01505 on the case drain plug.

SUBTASK 24-25-06-020-002

- (3) Do these steps to remove the oil level sightglass:
 - (a) Put a oil resistant container (5 gal)(19 Liter), STD-1055 below the backup generator to collect oil.
 - (b) Remove the eight screws [6].
 - (c) Remove the plate [5].
 - (d) Remove the plate [4].
 - (e) Remove the gasket [3].
 - (f) Remove the glass [2].
 - (g) Remove the gasket [1].

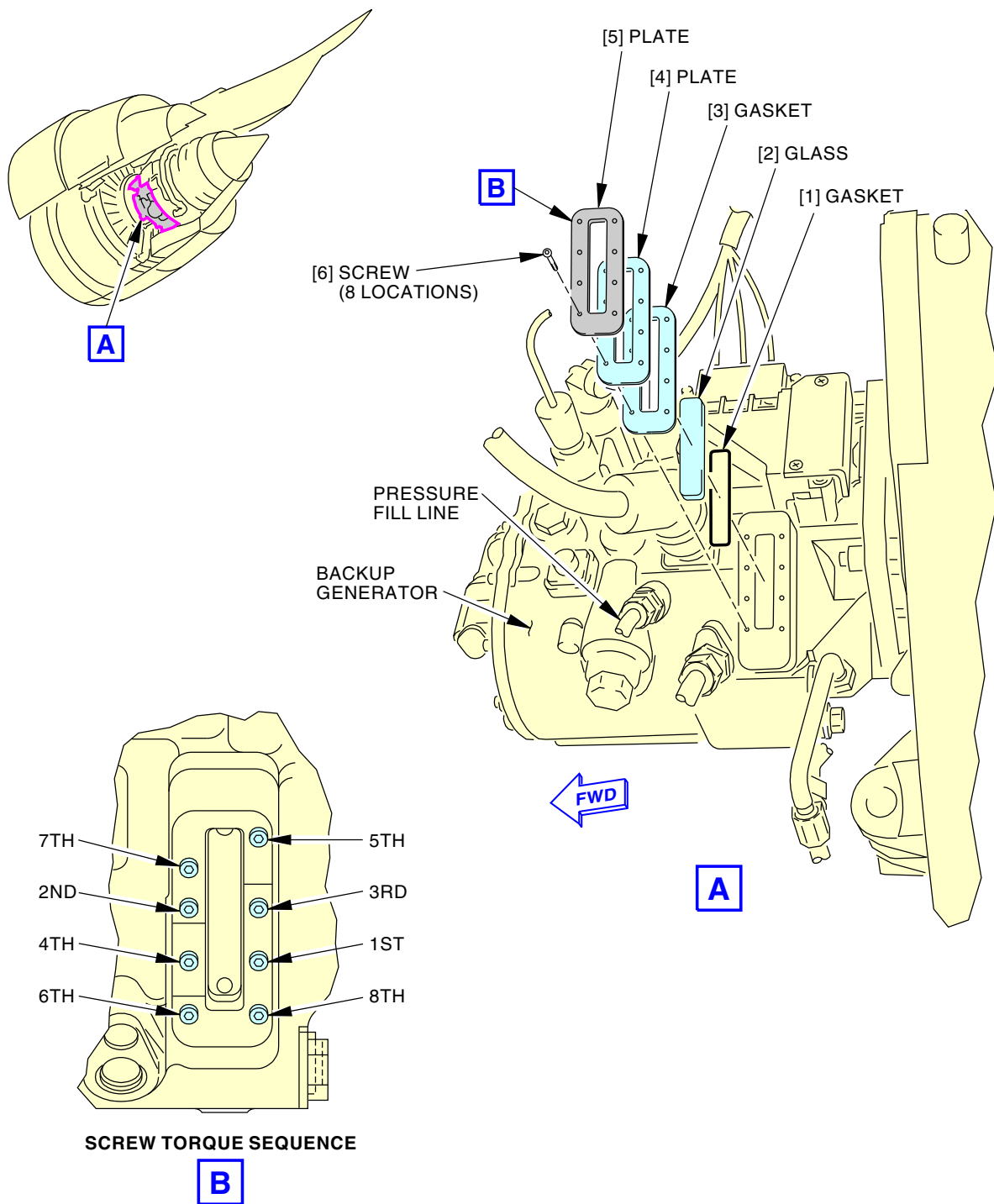
———— **END OF TASK** ————

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**Backup Generator Sightglass Installation
Figure 401/24-25-06-990-801**

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TASK 24-25-06-400-801

3. Backup Generator Oil Level Sightglass Installation

(Figure 401)

A. General

(1) This task gives instructions to install the backup generator oil level sightglass.

B. References

Reference	Title
12-13-07-600-801	Backup Generator Oil Fill (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Glass	24-25-01-02B-490	ARO ALL

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

F. Installation

SUBTASK 24-25-06-420-001

- (1) Do these steps to install the oil level sightglass:
- Install the gasket [1].
 - Install the glass [2].
 - Install the gasket [3].
 - Install the plate [4].
 - Install the plate [5].
 - Install the eight screws [6].
 - Tighten the screws [6] to 4 in-lb (0 N·m) - 5 in-lb (1 N·m) in the sequence shown on Figure 401.
 - Tighten the screws [6] again to 7.3 in-lb (1 N·m) - 8.1 in-lb (1 N·m) using the same sequence.

SUBTASK 24-25-06-610-001

- (2) Do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.

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G. Installation Test

SUBTASK 24-25-06-790-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-25-06-410-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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OIL/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION

1. **General**

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A removal of the oil/oil heat exchanger.
 - (2) An installation of the oil/oil heat exchanger.

TASK 24-25-07-000-801

2. **Oil/Oil Heat Exchanger Removal**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Do these steps to remove the VSCF oil/oil heat exchanger [1] (referred to as the heat exchanger):
 - (a) Disconnect the oil tube-hoses and oil flanges from the heat exchanger.
 - (b) Remove the oil pressure sensor [13] from the heat exchanger [1].
 - (c) Remove the heat exchanger [1] from the fan hub frame [17].

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
70-00-01-400-807-H01	Electrical Connector - Disconnect and Connect (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

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F. Prepare for the Removal

SUBTASK 24-25-07-010-001



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

G. Oil/Oil Heat Exchanger Removal

SUBTASK 24-25-07-020-001



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



USE TEFLON-JAWED PLIERS TO LOOSEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTORS COULD OCCUR.



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU DISCONNECT THEM. THE CONTAMINATION TO THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (1) Remove the oil/oil heat exchanger.



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU DISCONNECT THEM. THE CONTAMINATION OF THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.

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(CAUTION PRECEDES)



USE TEFLON-JAWED PLIERS TO LOOSEN THE ELECTRICAL CONNECTOR. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTORS COULD OCCUR.

- (a) Disconnect the electrical cable [5] from the oil pressure sensor [6] with the teflon-jawed pliers, STD-664 (TASK 70-00-01-400-807-H01).
- (b) Put an oil resistant container (5 gal)(19 Liter), STD-1055 under the heat exchanger.



DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE SHUTDOWN. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



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



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

- (c) Disconnect the reference pressure hose [4] from the heat exchanger [1].
- (d) Drain the engine oil into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (e) Disconnect the VSCF in tube-hose [3] from the heat exchanger [1].
- (f) Drain the oil into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (g) Disconnect the VSCF out tube-hose [2] from the heat exchanger [1].
- (h) Drain the oil into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (i) Remove the four bolts [11] that attach the flange bracket [18] of the lube out tube-hose [10] to the heat exchanger [1].
- (j) Pull the lube out tube-hose [10] away from the heat exchanger [1].
- (k) Drain the engine oil into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (l) Remove the gasket [12] from the LUBE OUT flange.
- (m) Examine the gasket [12] for damage (use the gasket for installation if not damaged).
- (n) Remove the four bolts [8] that attach the flange of the lube in tube-hose [9] to the heat exchanger [1].
- (o) Pull the lube in tube-hose [9] away from the heat exchanger [1].
- (p) Drain the engine oil into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (q) Remove the gasket [7] from the LUBE IN flange.
- (r) Examine the gasket [7] for damage (use the gasket for installation if not damaged).
- (s) Remove the three bolts [14] that attach the oil pressure sensor [13] to the heat exchanger [1] and remove the oil pressure sensor [13].
- (t) Remove the gasket seal [15] from the oil pressure sensor [13].

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- (u) Examine the gasket seal [15] for damage (use the gasket seal for installation if not damaged).
- (v) Remove the four bolts [16] that attach the heat exchanger to the fan hub frame [17] and remove the heat exchanger [1].
 - 1) Make sure the shock mount base does not fall down during the removal of the heat exchanger.
 - 2) Make sure to remove the grounding strap with the heat exchanger [1].
- (w) Install a protective cover on the oil pressure sensor pad on the heat exchanger [1].
- (x) Install a protective cover on the oil-pressure sensor mounting-flange.
- (y) Install protective covers on all tube-hoses, hoses, and fittings.

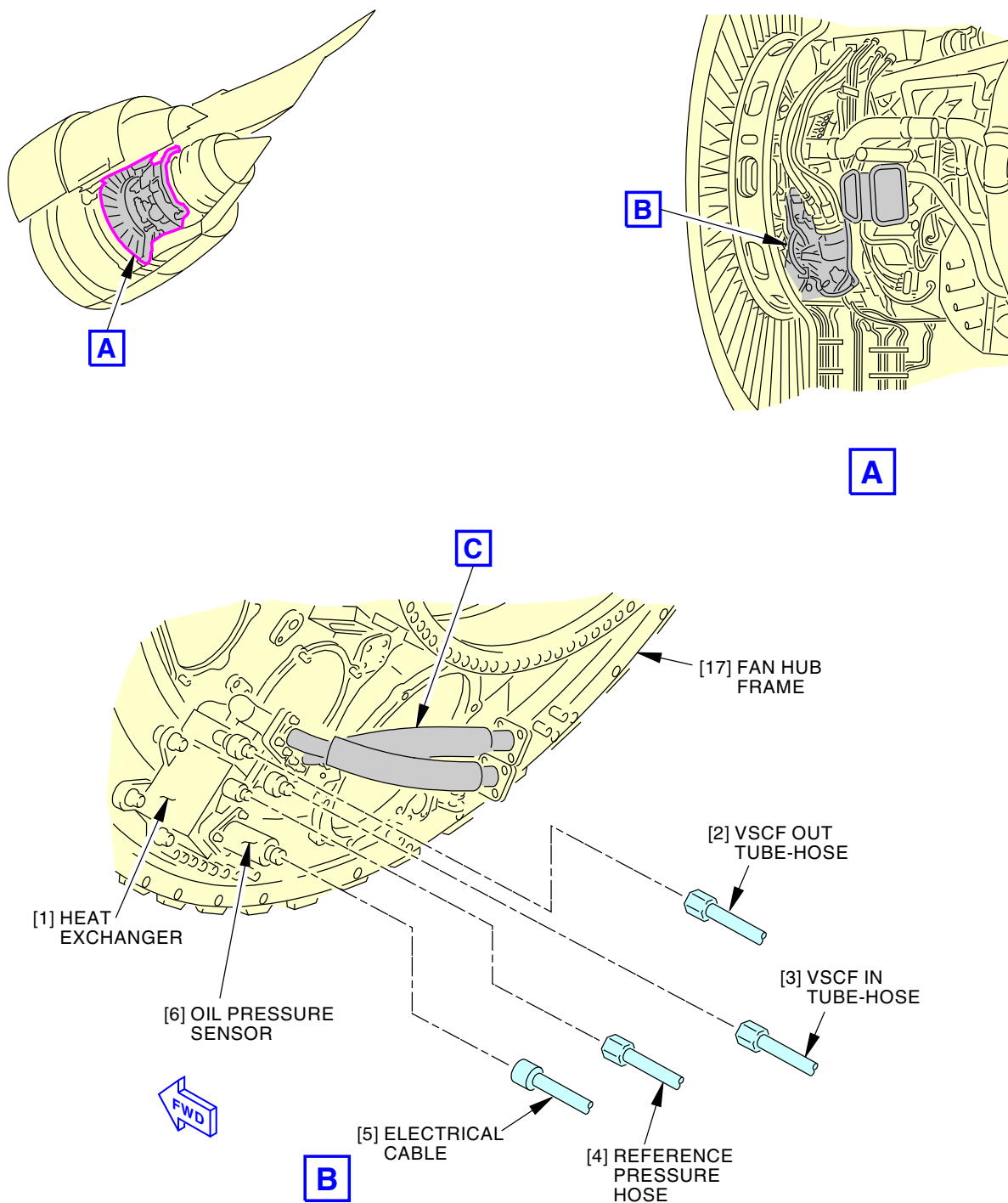
———— **END OF TASK** ————

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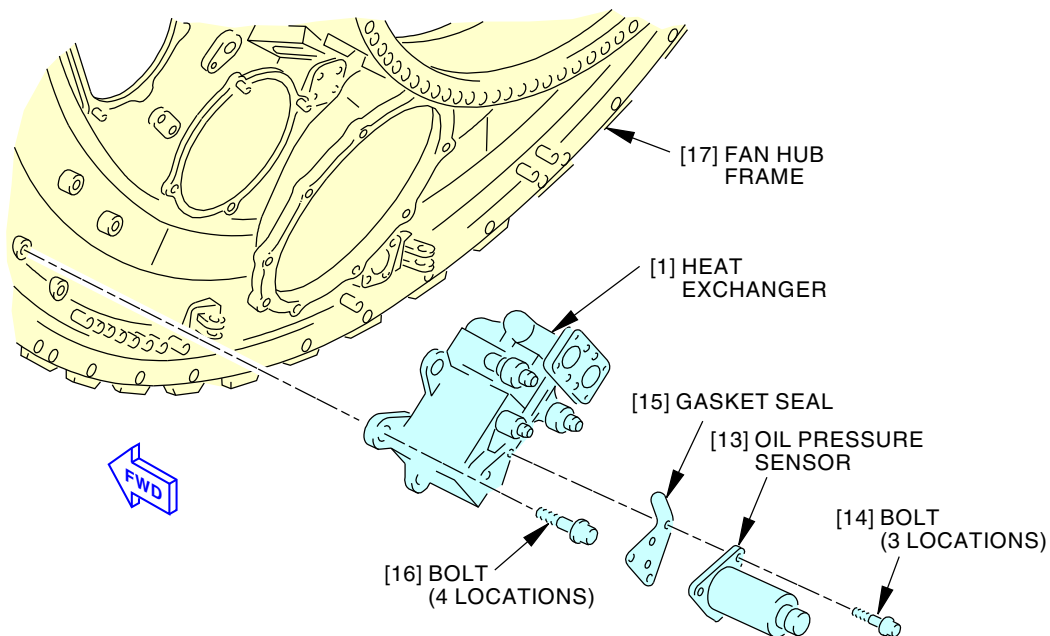
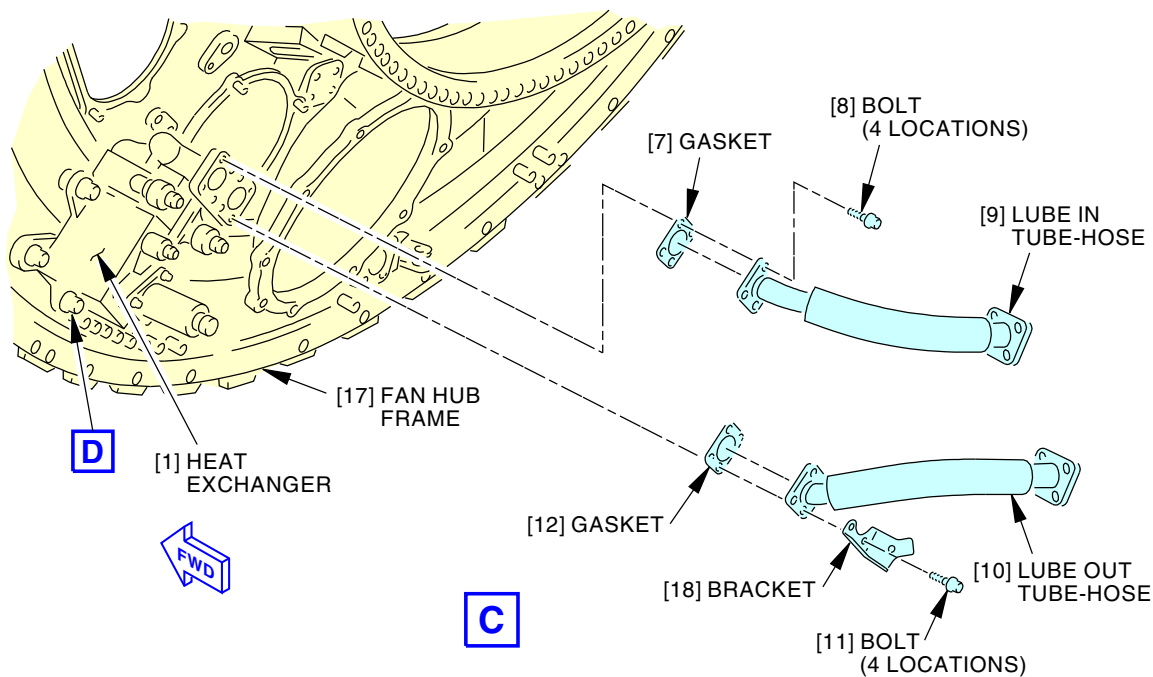
Oil/Oil Heat Exchanger Installation
Figure 401/24-25-07-990-801 (Sheet 1 of 2)

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**Oil/Oil Heat Exchanger Installation
Figure 401/24-25-07-990-801 (Sheet 2 of 2)**

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TASK 24-25-07-400-801

3. Oil/Oil Heat Exchanger Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) To install the VSCF oil/oil heat exchanger [1] (referred to as a heat exchanger), you must do these steps:
 - (a) Attach the heat exchanger [1] to the fan hub frame [17].
 - (b) Connect the oil tube-hoses and oil flanges to the heat exchanger.
 - (c) Attach the oil pressure sensor [13] to the heat exchanger [1].

B. References

Reference	Title
12-13-01-130-803-002	Engine Oil Replenishing (P/B 301)
12-13-07-600-801	Backup Generator Oil Fill (P/B 301)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
70-00-01-400-807-H01	Electrical Connector - Disconnect and Connect (P/B 201)
70-51-00-910-801-H01	Instruction for Torque (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)

D. Consumable Materials

Reference	Description	Specification
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Heat exchanger	79-21-02-02-020	ARO ALL
13	Oil pressure sensor	79-32-01-04-010	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

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H. Oil/Oil Heat Exchanger Installation

SUBTASK 24-25-07-010-002

- (1) Remove the protective covers from all tube-hoses, hoses, and fittings.

SUBTASK 24-25-07-420-001

- (2) Attach the heat exchanger [1] to the fan hub frame [17] as follows:
 - (a) Place the heat exchanger [1] on the fan hub frame [17] and install two bolts [16] through the top shock mounts of the heat exchanger [1] and turn the bolts [16] until the threads engage.
 - (b) Install the grounding-strap between the fan hub frame [17] and the left hand upper shock mount.
 - (c) Install a bolt [16] through the left hand upper shock mount and grounding-strap and into the fan hub frame [17] and turn the bolt [16] until the threads engage.
 - (d) Install a bolt [16] through the lower inner shock mount and into the fan hub frame [17].
NOTE: Make sure the shock mounts are installed correctly.
 - (e) Tighten the bolts [16] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

SUBTASK 24-25-07-420-003

- (3) Attach the flange of the lube out tube-hose [10] to the heat exchanger [1] as follows:
 - (a) Lubricate the gasket [12] with clean oil, oil, D00552 [C02-019].
 - (b) Install a bolt [11] through the flange of the lube out tube-hose [10] and the gasket [12] and into the heat exchanger [1].
 - (c) Turn the bolt [11] until the threads engage.
 - (d) Install a bolt [11] through the opposite hole in the flange of the lube out tube-hose [10] and the gasket [12] and into the heat exchanger [1].
 - (e) Turn the bolt [11] until the threads engage.
 - (f) Install the other two bolts [11] through the flange of the lube out tube-hose [10] and the gasket [12] and into the heat exchanger [1].
 - (g) Tighten the bolts [11] to 110 in-lb (12 N·m) 120 in-lb (14 N·m).

SUBTASK 24-25-07-420-002

- (4) Attach the flange of the lube in tube-hose [9] to the heat exchanger [1] as follows:
 - (a) Lubricate the gasket [7] with clean oil, oil, D00552 [C02-019].
 - (b) Install a bolt [8] through the flange of the lube in tube-hose [9] and the gasket [7] and into the heat exchanger [1].
 - (c) Turn the bolt [8] until the threads engage.
 - (d) Install a bolt [8] through the opposite hole in the flange of the lube in tube-hose [9] and the gasket [7] and into the heat exchanger [1].
 - (e) Turn the bolt [8] until the threads engage.
 - (f) Install the other two bolts [8] through the flange of the lube in tube-hose [9] and the gasket [7] and into the heat exchanger [1].
 - (g) Tighten the bolts [8] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

SUBTASK 24-25-07-420-004

- (5) Connect the backup generator VSCF out tube-hose [2] to the heat exchanger [1].
 - (a) Tighten the B-nut (TASK 70-51-00-910-801-H01).

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SUBTASK 24-25-07-420-005

- (6) Connect the backup generator VSCF in tube-hose [3] to the heat exchanger [1].
- (a) Tighten the B-nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-25-07-420-006

- (7) Connect the reference pressure hose [4] to the heat exchanger [1].
- (a) Tighten the B-nut (TASK 70-51-00-910-801-H01).

SUBTASK 24-25-07-410-001

- (8) Attach the oil pressure sensor [13] to the heat exchanger [1] as follows:
- (a) Remove the protective cover from the oil pressure sensor pad on the heat exchanger [1].
- (b) Remove the protective cover from the oil-pressure sensor mounting-flange.
- (c) Lubricate the gasket seal [15] with clean oil, oil, D00552 [C02-019].
- (d) Install the gasket seal [15] on the oil pressure sensor [13].
- (e) Install the oil pressure sensor [13] to the heat exchanger [1] and attach with three bolts [14].
- 1) Tighten the bolts [14] to 110 in-lb (12 N·m) - 120 in-lb (14 N·m).

SUBTASK 24-25-07-420-007



USE TEFLON-JAWED PLIERS TO TIGHTEN THE ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTORS COULD OCCUR.



MAKE SURE THE ELECTRICAL CONNECTORS ARE CLEAN WHEN YOU CONNECT THEM. THE CONTAMINATION TO THE ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (9) Connect the electrical cable [5] connector to the oil pressure sensor [6] (TASK 70-00-01-400-807-H01).
- (a) Tighten the connector with the teflon-jawed pliers, STD-664.

SUBTASK 24-25-07-610-001

- (10) Do this task: Engine Oil Replenishing, TASK 12-13-01-130-803-002.

SUBTASK 24-25-07-610-002

- (11) Do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.

I. Oil/Oil Heat Exchanger Installation Test

SUBTASK 24-25-07-790-001

- (1) Do the test listed on the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

J. Put the Airplane Back to its Usual Condition.

SUBTASK 24-25-07-410-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

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- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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BACKUP GENERATOR CONVERTER - MAINTENANCE PRACTICES

TASK 24-25-09-400-802

1. Backup Generator Converter Software Installation

A. General

- (1) This procedure tells you how to install software in the Backup Generator Converter (BEPS).
 - (a) The name of the software part loaded into a Backup Generator Converter follow:
BEPS Operational Program Software (OPS)
Using the name, the specific software part number for an aircraft can be identified in the Illustrated Parts Catalog (IPC).
- (2) A Maintenance Access Terminal (MAT) is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
- (3) If you do not know if the Backup Generator Converter needs new software, you can first do the software configuration check. It will save time if you only install software when the software is missing or the part number is incorrect. You can find the software configuration check in this task: Backup Generator Converter Installation, TASK 24-25-09-400-801.
- (4) You can use the Ground Support Equipment (GSE)-Laptop, maintenance device, SPL-5704, as an alternative to the Portable Maintenance Access Terminal (PMAT) in this task.
NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.
- (5) You can install the software from disks, the MAT hard drive or the PMAT hard drive (if available). It is recommended that you install software from the MAT or PMAT hard drive. To install new software on the MAT or PMAT hard drive, do this task: How to Add Software to the Hard Drive, TASK 45-10-00-860-812.
NOTE: When new software is installed in the Backup Generator Converter, the load process first erases the old software and then installs the new software. If you install software directly to the Backup Generator Converter from a faulty disk, the load process may erase the old software and then fail, so that no software is installed. If you install a faulty disk to the MAT or PMAT hard drive, the load may fail, but you will not erase the software from the Backup Generator Converter.
 - (a) It is recommended that you remove old software part numbers from the MAT or PMAT hard drive after new software is installed. To remove software from the hard drive, do this task: How to Remove Software from the Hard Drive, TASK 45-10-00-860-813.

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- (6) You can also install the software from the Onboard Network System (ONS) Mass Storage Device (MSD). To install new software on the ONS MSD, do this task: Mass Storage Device Software Part Installation, TASK 46-13-00-470-802.
 - (a) It is recommended that you remove old software part numbers from the ONS MSD after new software is installed. To remove software from the ONS MSD, do this task: Mass Storage Device Software Removal, TASK 46-13-00-070-801.

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- (7) The airplane must be on the ground with the engines off before you can install software.
- (8) To read about the conditions and times necessary for software installation, do this task: On-Airplane Software Installation, TASK 20-15-11-400-801.

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B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-25-09-400-801	Backup Generator Converter Installation (P/B 401)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-860-812	How to Add Software to the Hard Drive (P/B 201)
45-10-00-860-813	How to Remove Software from the Hard Drive (P/B 201)
46-13-00-070-801	Mass Storage Device Software Removal (P/B 201)
46-13-00-470-802	Mass Storage Device Software Part Installation (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

Zone	Area
212	Flight Compartment, Right

E. Procedure

SUBTASK 24-25-09-860-011

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

SUBTASK 24-25-09-420-003

- (2) Use a MAT to install software in the backup converter:

NOTE: Make sure you know the correct software part number for the backup converter before you select the software part number on the display. For the backup converter to be an approved installation, the correct software must be installed.

- (a) Set the GND TEST switch on the P61 panel to the ENABLE position.
- (b) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) EXTENDED MAINTENANCE
 - 3) DATA LOAD
- (c) Select SELECT DESTINATION and then do these steps:
 - 1) Select 24 BACKUP (VSCF) ELECTRICAL POWER SYSTEM (BEPS)
 - 2) Select BACKUP CONVERTER
 - 3) Select CONTINUE

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- (d) If the software is on a disk, put the correct disk in the disk drive.
- (e) Select SELECT SOURCE and then do these steps:
 - 1) Select the location of the software (if Disk Drive is the only selection, it is automatically selected).
 - 2) Select the correct software part number from the display.
 - 3) Select CONTINUE.
- (f) Select START to start the software installation.
- (g) When the software installation is completed, make sure the correct part number shows on the display.
- (h) Select CONTINUE to remove the configuration display.
- (i) Set the GND TEST switch on the P61 panel to the NORMAL position.

———— **END OF TASK** ————

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BACKUP GENERATOR CONVERTER - REMOVAL/INSTALLATION

1. **General**

A. This procedure has these tasks:

- (1) A removal of the backup generator converter
- (2) An installation of the backup generator converter.

TASK 24-25-09-000-801

2. **Backup Generator Converter Removal**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the removal of the backup generator converter. The backup generator converter is located on the E4-4 electrical/electronics equipment rack.

B. References

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

Zone	Area
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare for the Removal

SUBTASK 24-25-09-860-001

- (1) Make sure the engines are stopped. To stop it, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00

SUBTASK 24-25-09-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-25-09-860-002

- (3) Push the L BACKUP GEN and R BACKUP GEN switches on the P5 to the OFF (unlatched) position.
 - (a) Make sure the OFF light on the switches stay on.

SUBTASK 24-25-09-860-003

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
H	6	C24671	BACKUP CONVERTER CONTROL

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SUBTASK 24-25-09-860-004

- (5) Get access to the backup generator converter on the E4-4 rack.

F. Backup Generator Converter Removal

SUBTASK 24-25-09-860-005



DO NOT TOUCH THE BACKUP GENERATOR CONVERTER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE BACKUP GENERATOR CONVERTER.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-25-09-020-001

- (2) Disconnect the left and right ARINC connectors [1].

SUBTASK 24-25-09-020-002

- (3) Disconnect the left and right control connector [12].

SUBTASK 24-25-09-020-003

- (4) Do these steps to remove the output terminal wires:

NOTE: Make sure to mark the terminal wires for installation.

- (a) Remove the screws [3], washers [2] and the output terminal-block cover [4].
- (b) Remove the captive washer nuts [5].
- (c) Remove the 4 output terminal wires [6].

SUBTASK 24-25-09-020-004

- (5) Do these steps to remove the input terminal wires:

NOTE: Make sure to mark the terminal wires for installation.

- (a) Remove the screws [8], washers [9] and the input terminal-block covers [7].
- (b) Remove the captive washer nuts [10].
- (c) Remove the 6 input terminal wires [11].

SUBTASK 24-25-09-020-005

- (6) Remove the backup generator converter assembly [13]. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

NOTE: If cooling air is being supplied to the E/E boxes, temporarily install a cover over the cooling air opening. This step is done to stop the ground crew horn from sounding while ground maintenance is performed. Be sure to remove cover before you install backup converter.

————— END OF TASK —————

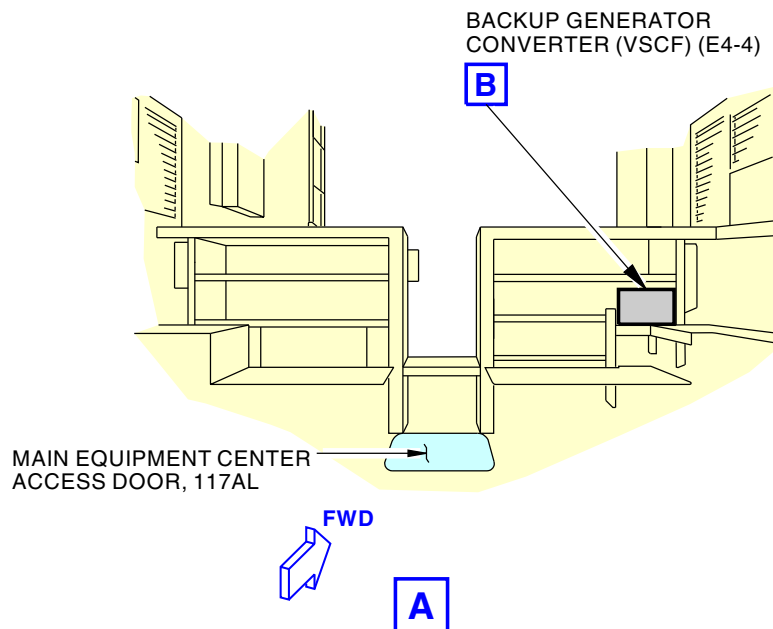
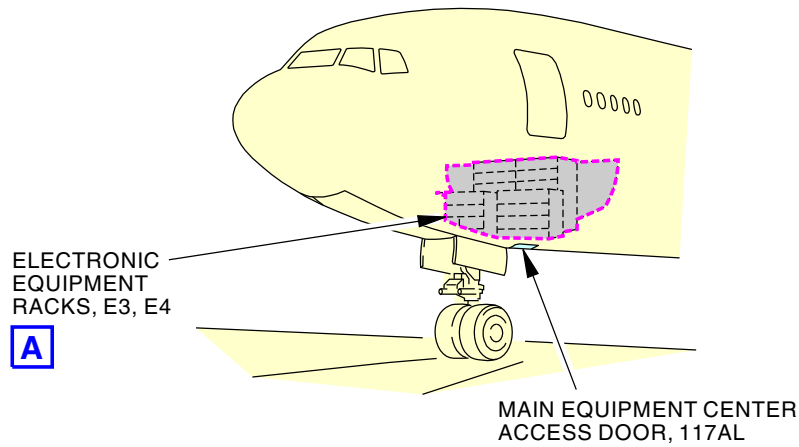
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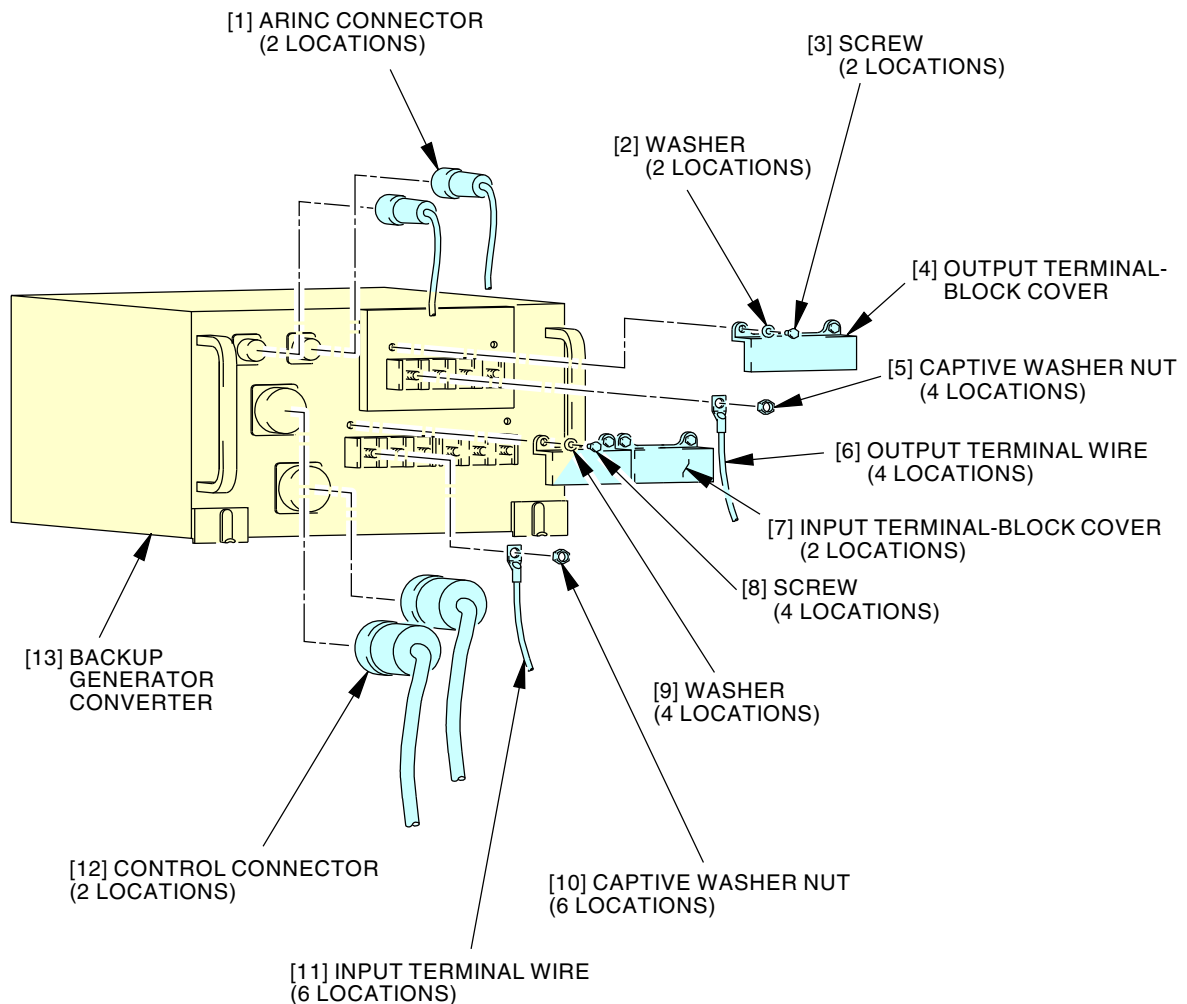
Backup Generator Converter (VSCF) Installation
Figure 401/24-25-09-990-802 (Sheet 1 of 2)

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**Backup Generator Converter (VSCF) Installation
Figure 401/24-25-09-990-802 (Sheet 2 of 2)**

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TASK 24-25-09-400-801

3. Backup Generator Converter Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the installation of the backup generator converter. The backup generator converter is located on the E4-4 electrical/electronics equipment rack.

B. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-25-09-400-802	Backup Generator Converter Software Installation (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-910-810	How to Operate the MAT in the Flight Compartment (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Converter assembly	24-25-09-01-010	ARO ALL
		25-71-91-50A-080	ARO ALL

D. Location Zones

Zone	Area
118	Main Equipment Center, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Backup Converter Installation

SUBTASK 24-25-09-860-006

 CAUTION	DO NOT TOUCH THE BACKUP GENERATOR CONVERTER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE BACKUP GENERATOR CONVERTER.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-25-09-420-001

- (2) Install the backup generator converter assembly [13]. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-25-09-420-002

- (3) Do these steps to connect the backup generator converter:
- Attach the 6 input terminal wires [11] to the terminal blocks.
 - Install the captive washer nuts [10] and tighten to a torque of 48 in-lb (5 N·m) - 53 in-lb (6 N·m).

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- (c) Attach the input terminal-block covers [7] to the backup generator converter.
- (d) Install the washers [9] and screws [8].
- (e) Tighten the screws [8] to 12 in-lb (1 N·m) - 14 in-lb (2 N·m).
- (f) Attach the 4 output terminal wires [6] to the terminal blocks.
- (g) Install the captive washer nuts [5] and tighten to a torque of 48 in-lb (5 N·m) - 53 in-lb (6 N·m).
- (h) Attach the output terminal-block cover [4] to the backup generator converter.
- (i) Install the washers [2] and screws [3].
- (j) Tighten the screws [3] to 12 in-lb (1 N·m) - 14 in-lb (2 N·m).
- (k) Connect the left and right control connectors [12].
- (l) Connect the left and right ARINC connectors [1].

SUBTASK 24-25-09-860-007

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
H	6	C24671	BACKUP CONVERTER CONTROL

SUBTASK 24-25-09-410-001

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

G. The Configuration Check of the Backup Converter

SUBTASK 24-25-09-750-002

- (1) The configuration check makes sure that the backup converter has the correct software.

SUBTASK 24-25-09-860-013

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

SUBTASK 24-25-09-860-014

- (3) Use a maintenance access terminal (MAT) to do a software configuration check of the backup converter:

NOTE: Make sure you know the correct software part number for the backup converter when you look at the software number on the display. For the backup converter to be an approved installation, the correct software part number must be installed.

- (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) SYSTEM CONFIGURATION
 - 4) 24 Backup (VSCF) Electric Power System (BEPS)
 - 5) CONTINUE
- (b) Find 24 Converter on the display and make sure that the software part number is correct.
- (c) Select GO BACK to remove the display.

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SUBTASK 24-25-09-860-015

- (4) If the software part number is correct, then do the Backup Converter Installation Test below.

SUBTASK 24-25-09-860-016

- (5) If the software part number is incorrect, do this task: Backup Generator Converter Software Installation, TASK 24-25-09-400-802.

H. Backup Converter Installation Test

SUBTASK 24-25-09-700-001

- (1) Do the control test of the backup converter, as follows:
- (a) Use a maintenance access terminal (MAT) to do the LRU replacement test of the backup converter. To operate the MAT, do this task: How to Operate the MAT in the Flight Compartment, TASK 45-10-00-910-810.
 - 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 24 Backup (VSCF) Electric Power System (BEPS)
 - e) LRU REPLACEMENT TEST
 - f) Backup Converter
 - g) CONTINUE
 - 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.
 - 5) To put the MAT back to its initial condition, make these selections:
 - a) LINE MAINTENANCE
 - b) EXIT MAINTENANCE

SUBTASK 24-25-09-710-002

- (2) Do the power test of the backup converter as follows:
- (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
 - (b) Make sure the STANDBY PWR switch on the P61 is in the AUTO position.
 - (c) Push the L BACKUP GEN and the R BACKUP GEN to the OFF (unlatched) position.
 - (d) Push the L BACKUP GEN and the R BACKUP GEN to the ON (latched) position.
 - (e) Use a maintenance access terminal (MAT) to do the operational test of the backup converter. To operate the MAT, do this task: How to Operate the MAT in the Flight Compartment, TASK 45-10-00-910-810.
 - 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE

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- c) GROUND TESTS
 - d) 24 Backup (VSCF) Electric Power System (BEPS)
 - e) OPERATIONAL TEST
 - f) Engine Start Test
 - g) CONTINUE
- 2) You will need to start the two engines per the instructions that show on the MAT. To start them, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
- NOTE: It is necessary to start two engines to do this test completely. Both engine do not need to be run at the same time.
- 3) Do the instructions that show on the MAT and then make these selections:
- a) CONTINUE
 - b) START TEST
- 4) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
- 5) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.
- 6) To put the MAT back to its initial condition, make these selections:
- a) LINE MAINTENANCE
 - b) EXIT MAINTENANCE
- (f) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

———— **END OF TASK** ————

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TRANSFER BUS AND CONVERTER CIRCUIT BREAKER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the circuit breaker.
- (2) An installation of the circuit breaker.
- (3) These circuit breakers are:
 - (a) The two Transfer Bus Breakers (TBBs), K24101 and K24201.
 - (b) The two Converter Circuit Breakers (CCBs), K24102 and K24202.

TASK 24-25-10-000-801

2. Transfer Bus and Converter Circuit Breaker Removal

(Figure 401)

A. General

- (1) The removal task is the same for all the breakers. The breakers are installed on the different panels.

B. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Breaker	24-09-01-75E-125	ARO 001-010
		24-09-01-76F-145	ARO 001-010
		24-09-01-77Q-145	ARO 011-999
		24-09-01-77R-165	ARO 011-999
2	Breaker	24-09-01-75E-120	ARO 001-010
		24-09-01-75E-125	ARO 001-010
		24-09-01-76F-140	ARO 001-010
		24-09-01-76F-145	ARO 001-010
		24-09-01-77Q-160	ARO 011-999
		24-09-01-77R-180	ARO 011-999

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

E. Prepare for the Removal

SUBTASK 24-25-10-860-004



REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

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SUBTASK 24-25-10-200-001

- (2) Make sure the hot bus warning lights for the applicable panel are off.

SUBTASK 24-25-10-010-001

- (3) Open the applicable panel to get access to the applicable breaker that you will remove as follows:
 - (a) In the P100, Left Power Panel:
 - 1) K24101, Left Transfer Bus Breaker [1]
 - 2) K24102, Left Converter Circuit Breaker [2]
 - (b) In the P200, Right Power Panel:
 - 1) K24201, Right Transfer Bus Breaker [1]
 - 2) K24202, Right Converter Circuit Breaker [2]

F. Circuit Breaker Removal

SUBTASK 24-25-10-020-001



DO NOT TOUCH THE CIRCUIT BREAKER. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE CIRCUIT BREAKER OR LET THE CIRCUIT BREAKER BECOME COOL. HIGH TEMPERATURE CAN BURN YOU.

- (1) Remove the applicable circuit breaker as follows:

ARO 001-010

- (a) Remove the four captive screws [3] that attach the applicable circuit breaker to the panel.

ARO 011-999

- (b) Remove the cap screws [4] that attach the applicable circuit breaker to the panel.

ARO ALL

- (c) Remove the applicable breaker [1] or breaker [2].

————— **END OF TASK** —————

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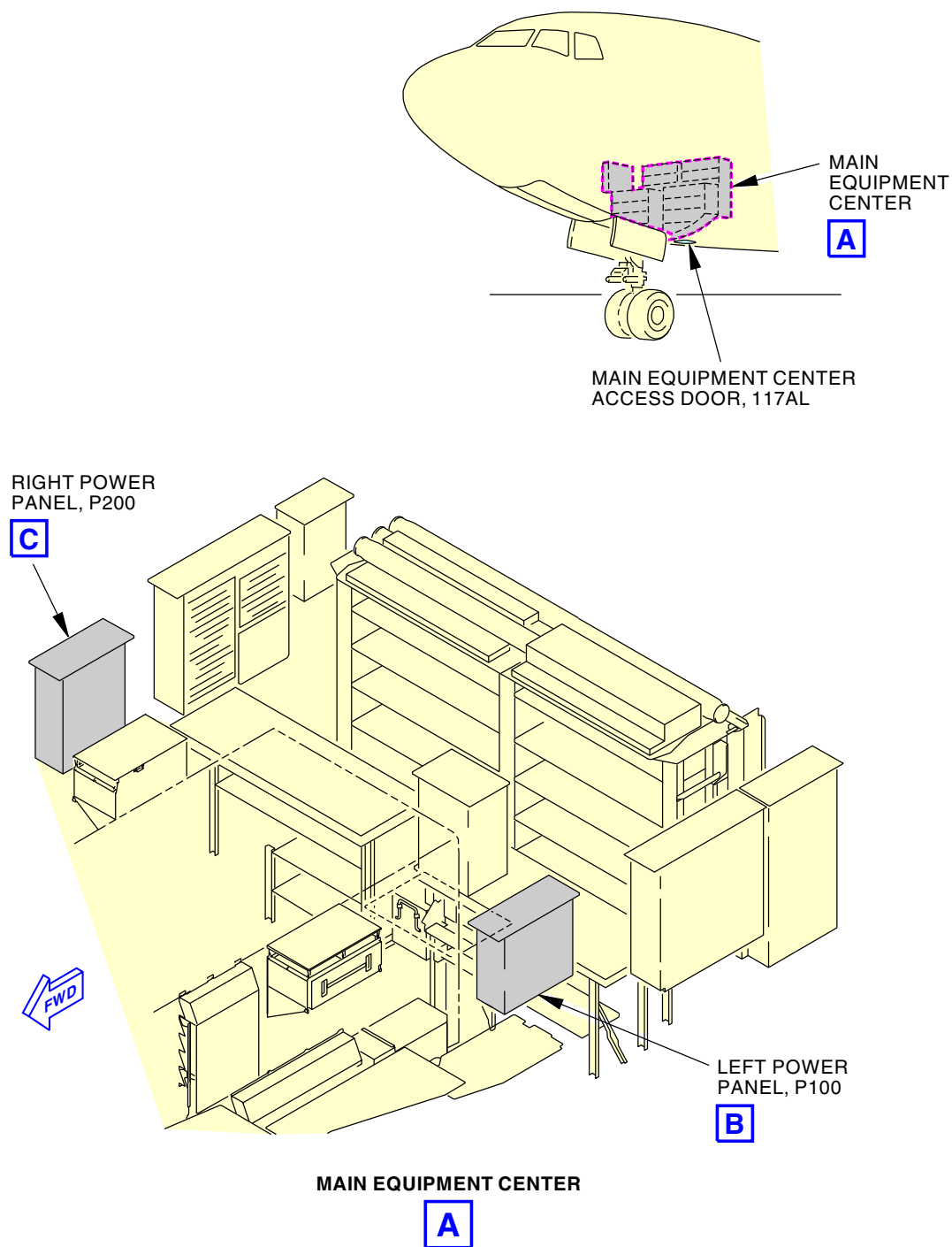
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Transfer Bus and Converter Circuit Breaker Installation
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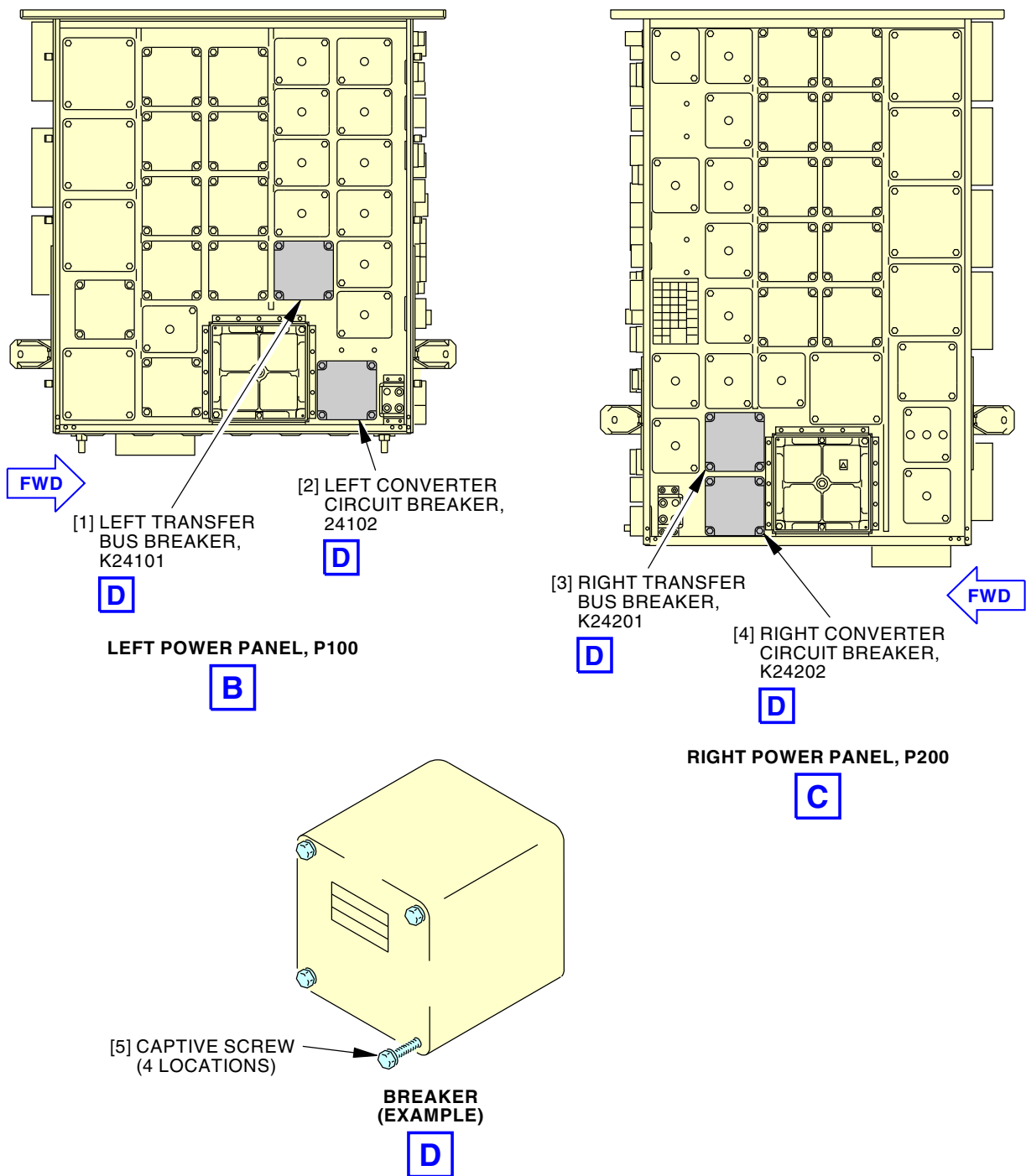
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**Transfer Bus and Converter Circuit Breaker Installation
Figure 401/24-25-10-990-802 (Sheet 2 of 3)**

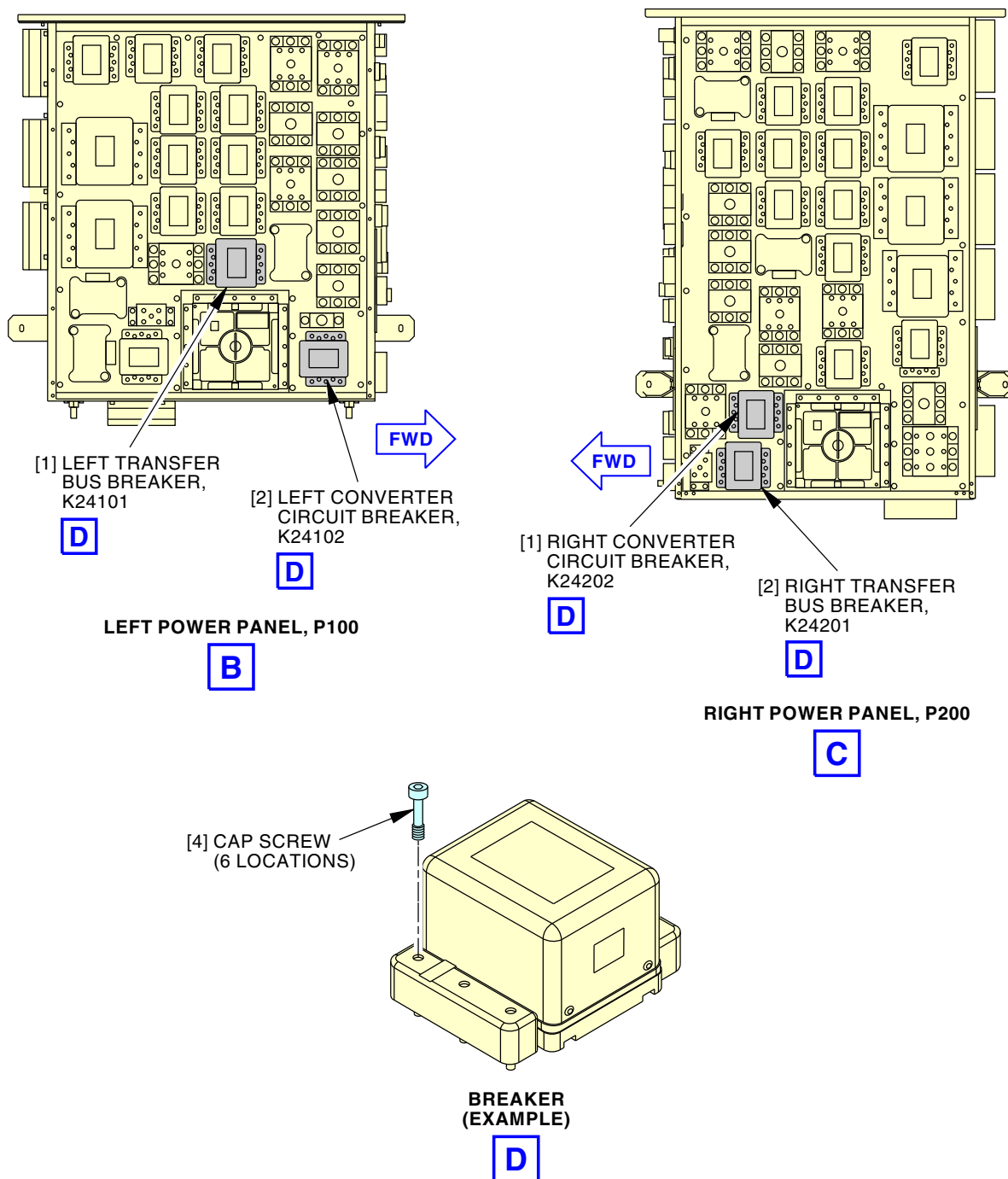
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**Transfer Bus and Converter Circuit Breaker Installation
Figure 401/24-25-10-990-802 (Sheet 3 of 3)**

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TASK 24-25-10-400-801

3. Transfer Bus and Converter Circuit Breaker Installation

(Figure 401)

A. General

- (1) The installation task is the same for all the breakers. The breakers are installed on the different panels.
- (2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-25-00-700-801	Backup Electrical Power - Operational Test (P/B 501)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Breaker	24-09-01-75E-125	ARO 001-010
		24-09-01-76F-145	ARO 001-010
		24-09-01-77Q-145	ARO 011-999
		24-09-01-77R-165	ARO 011-999
2	Breaker	24-09-01-75E-120	ARO 001-010
		24-09-01-75E-125	ARO 001-010
		24-09-01-76F-140	ARO 001-010
		24-09-01-76F-145	ARO 001-010
		24-09-01-77Q-160	ARO 011-999
		24-09-01-77R-180	ARO 011-999

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

E. Transfer Bus and Converter Circuit Breaker Installation

SUBTASK 24-25-10-420-001

- (1) Install the applicable circuit breaker as follows:
 - (a) Put the applicable circuit breaker [1] or breaker [2] in its position.

ARO 001-010

- (b) Install the four captive screws [3] that attach the applicable circuit breaker to the panel.

ARO 011-999

- (c) Install the cap screws [4] that attach the applicable circuit breaker to the panel.

ARO 001-010

- (d) Tighten the screws to 15 in-lb (2 N·m).

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- (e) Torque the screws between 28.8 in-lb (3.25 N·m) and 35.2 in-lb (3.98 N·m).

ARO ALL

- (f) Close the applicable panel.

F. Transfer Bus and Converter Circuit Breaker Installation Test

SUBTASK 24-25-10-710-001

- (1) Do this task: Backup Electrical Power - Operational Test, TASK 24-25-00-700-801.

———— **END OF TASK** ————

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CONVERTER SUPPLEMENTAL COOLING FAN - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the converter supplemental cooling fan.
- (2) An installation of the converter supplemental cooling fan.

TASK 24-25-13-000-801

2. Converter Supplemental Cooling Fan - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) This task is for the removal of the converter supplemental cooling fan. The converter supplemental cooling fan is located outboard of the electrical/electronics equipment rack, E4.

B. **References**

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. **Location Zones**

Zone	Area
118	Main Equipment Center, Right
212	Flight Compartment, Right

D. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door

E. **Prepare for the Removal**

SUBTASK 24-25-13-010-001

- (1) To get access to the supplemental cooling fan for the backup converter, do this step:

Open this access panel:

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 24-25-13-860-001

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

Standby Power Management Panel, P310

Row	Col	Number	Name
H	6	C24671	BACKUP CONVERTER CONTROL

SUBTASK 24-25-13-860-002



MAKE SURE YOU REMOVE ELECTRICAL POWER FROM THE AIRPLANE. IF YOU SUPPLY ELECTRICAL POWER TO THE ELECTRICAL/ELECTRONIC EQUIPMENT WHEN THE EQUIPMENT COOLING SYSTEM IS NOT IN OPERATION, THE ELECTRICAL/ELECTRONIC EQUIPMENT CAN BECOME TOO HOT. THIS CAN CAUSE DAMAGE TO THE ELECTRICAL/ELECTRONIC EQUIPMENT.

- (3) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

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F. Converter Supplemental Cooling Fan Removal

SUBTASK 24-25-13-020-001

- (1) Do the steps that follow to remove the fan from the duct assembly:
- (a) Disconnect the electrical connector [1] from the converter supplemental cooling fan.
 - (b) Remove the bolt [5], washers [6], and nut [7].
 - (c) Remove the bonding jumper [8].
 - (d) Remove the coupling [2] and coupling [4], which hold the fan to the duct assembly.
 - (e) Remove the fan [3].

———— **END OF TASK** ————

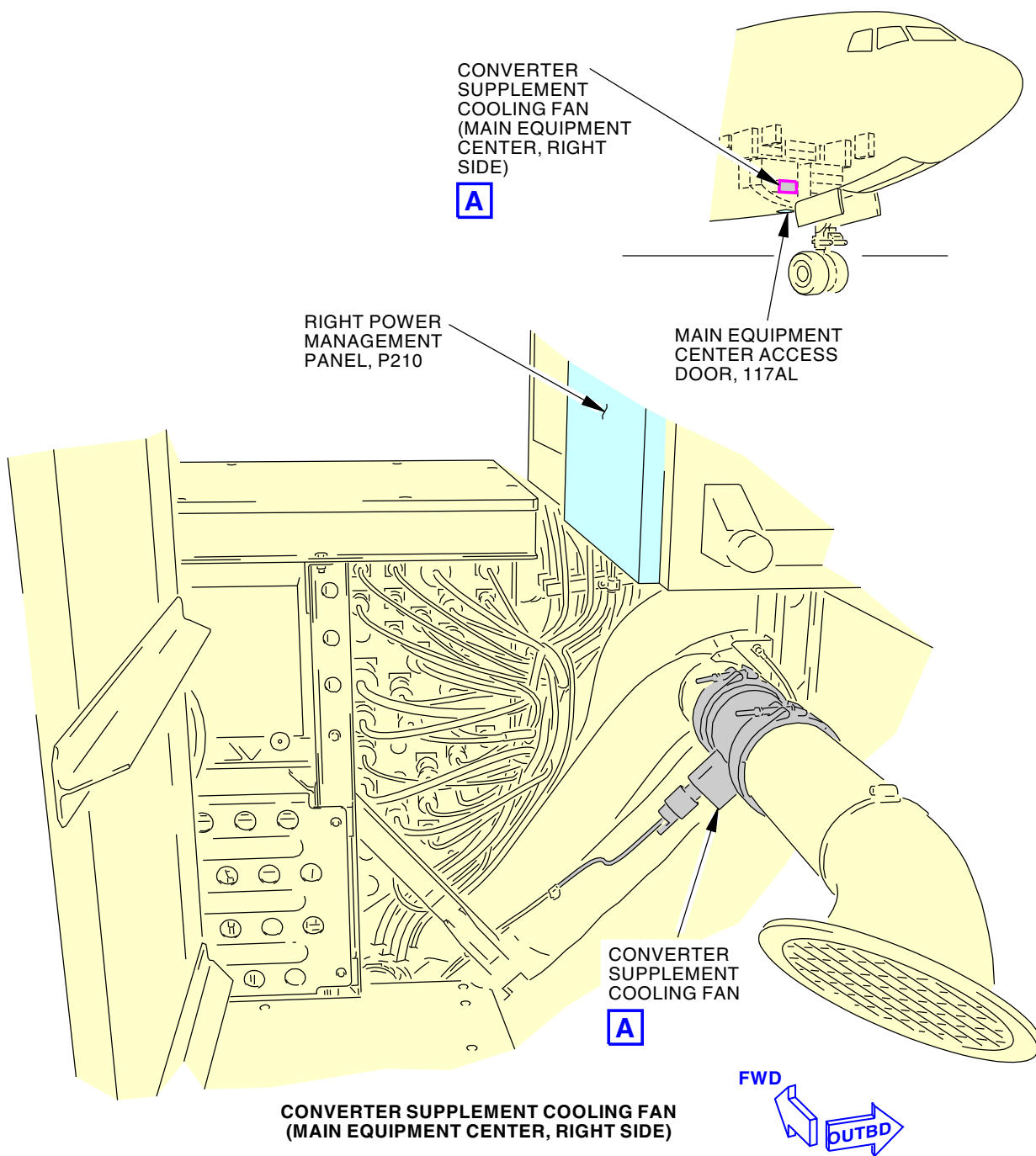
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Converter Supplement Cooling Fan Installation
Figure 401/24-25-13-990-802 (Sheet 1 of 2)

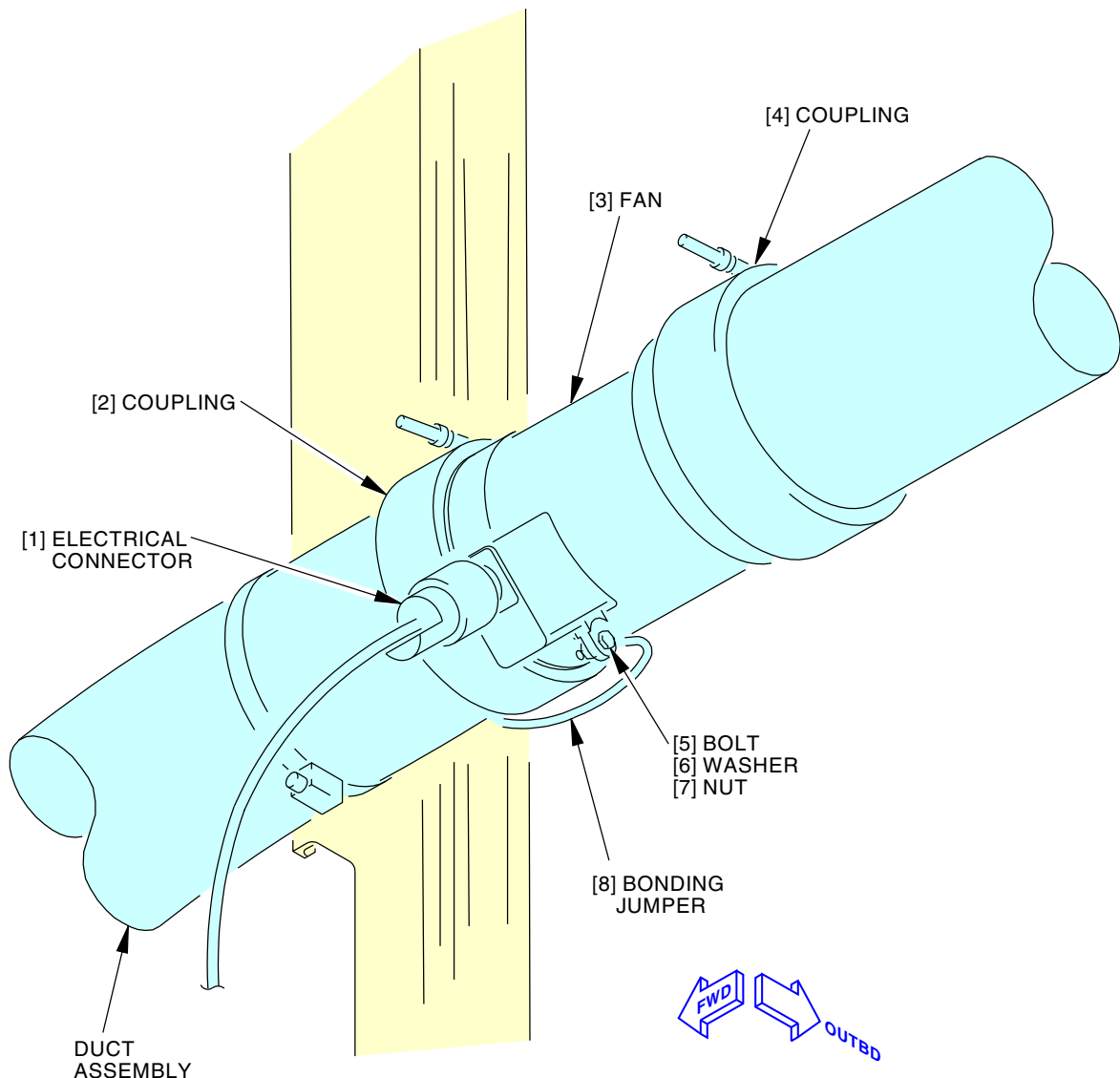
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CONVERTER SUPPLEMENT COOLING FAN

E04561 S0006408422_V2

Converter Supplement Cooling Fan Installation
Figure 401/24-25-13-990-802 (Sheet 2 of 2)

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TASK 24-25-13-400-801

3. Converter Supplemental Cooling Fan - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-25-00-700-801	Backup Electrical Power - Operational Test (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Fan	24-25-13-01-045	ARO ALL

C. Location Zones

Zone	Area
118	Main Equipment Center, Right
212	Flight Compartment, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Converter Supplemental Cooling Fan Installation

SUBTASK 24-25-13-410-001

- (1) Do the steps that follow to install the fan to the duct assembly.
 - (a) Install the coupling [2].
 - (b) Attach the fan [3] to the duct with the coupling [2].
 - (c) Install the coupling [4].
 - (d) Tighten the couplings to 45 in-lb (5 N·m)- 55 in-lb (6 N·m).
 - (e) Install the bonding jumper [8], bolt [5], washers [6], and nut [7].
 - (f) Measure the resistance for the bonding jumper.
 - 1) Make sure the maximum resistance is 0.0025 ohms (25 milliohms).
 - (g) Connect the electrical connector [1] to the converter supplemental cooling fan.

SUBTASK 24-25-13-860-006

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

Standby Power Management Panel, P310

Row	Col	Number	Name
H	6	C24671	BACKUP CONVERTER CONTROL

F. Converter Supplemental Cooling Fan Installation Test

SUBTASK 24-25-13-860-003

- (1) Do this task: Backup Electrical Power - Operational Test, TASK 24-25-00-700-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-25-13-860-004

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

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SUBTASK 24-25-13-860-005

(2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

———— **END OF TASK** ————

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BACKUP GENERATOR BLANKING PLATE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Backup Generator Blanking Plate Installation.
 - (2) Backup Generator Blanking Plate Removal

TASK 24-25-16-400-803

2. Backup Generator Blanking Plate Installation

A. General

- (1) This task is for the installation of the backup generator blanking plate.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-25-01-000-804-001	Backup Generator Removal (P/B 401)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-802-H01	Engine Operation Limits (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-11385	Dispatch Kit - VSCF Generator, GE Engine Part #: J24013-1 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D00657	Lubricant - Acryloid Synthetic Assembly Fluid and O-Ring Lubricant (Royco HF-825)	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
10	O-ring	24-25-01-02B-230	ARO ALL
		24-25-01-02B-232	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left

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(Continued)

Zone	Area
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Prepare for the Installation

SUBTASK 24-25-16-020-021

- (1) Do this task: Backup Generator Removal, TASK 24-25-01-000-804-001.

SUBTASK 24-25-16-020-022

- (2) To flush the oil from backup generator external oil cooling circuit, do these steps:
 - (a) Use regulated 30 psi (207 kPa) nitrogen gas source to flush oil from circuit.
 - (b) Attach hose from nitrogen gas source to the oil-out line fitting.
 - (c) Place 5 gal (19 l) oil resistant container under oil-in line to catch oil.

SUBTASK 24-25-16-860-005

- (3) Make sure the engine does not operate during the removal and installation of the backup generator blanking plate (TASK 71-00-00-800-837-H00).

I. Installation

SUBTASK 24-25-16-420-013

- (1) To install the backup generator blanking plate [1] GE engine, VSCF generator dispatch kit, SPL-11385, do these steps:

NOTE: It may be easier to install the phase leads before attaching the blanking plate to the gearbox.



MAKE SURE THAT YOU USE ONLY M83485 O-RING WHEN YOU USE HIGH THERMAL STABILITY (HTS) OIL CONFORMING TO MILSPEC-23699 IN THE ENGINE (EXAMPLE: BP/EASTMAN TURBO OIL 2197). USE OF OTHER O-RING STANDARDS (EXAMPLE: M83248 OR AS3209) WITH HTS OIL WILL RESULT IN REDUCED O-RING LIFE, ENGINE OIL LEAKAGE, AND POTENTIAL ENGINE SHUTDOWN.

- (a) Apply Royco HF-825 lubricant, D00657 (preferred), oil, D00068 or oil, D00071 to the new o-ring [10].
- (b) Install the new o-ring [10] into its correct groove on the backup generator blanking plate [1] input mounting pad.
- (c) Inspect the face seal on the GE engine, VSCF generator dispatch kit, SPL-11385, for damage and apply oil to the face seal [16].
- (d) Put the backup generator blanking plate [1] on the mounting-pad and make sure that the studs and stud nuts [8] go through the large part of the keyholes in the blanking plate-flange.
- (e) Turn the backup generator blanking plate [1] counterclockwise until the studs are against the ends of the keyholes slots in the flange.

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(f) Push the backup generator blanking plate [1] axially until the mounting-flange and the mounting-pad surface fits correctly.

(g) Tighten the stud nuts [8] to a torque of 260 in-lb (29 N·m) - 320 in-lb (36 N·m).

NOTE: Use a 10 in. (25 cm) extension with a 12 point deep-socket for the upper-inboard stud nuts.

SUBTASK 24-25-16-420-014

(2) To install the phase leads [3], do these steps:

(a) Loosen the bolts [5] on the terminal block cover [4].

(b) Move the phase leads [3] into position on the terminal block cover [4].

(c) Install the phase leads [3] on the exposed terminal studs of the terminal block cover [4].

(d) Close the terminal block cover [4].

(e) Tighten the bolts [5].

(f) Lockwire the bolts [5] (TASK 20-10-23-400-801).

SUBTASK 24-25-16-420-016



USE TWO WRENCHES TO TIGHTEN THE OVERTEMPERATURE DRAIN LINE. IF YOU USE ONE WRENCH, TOO MUCH TORQUE OCCURS AT THE GENERATOR FITTING. THIS CAN CAUSE DAMAGE TO THE BLANKING PLATE BOSS.

(3) To install the overtemp drain line [11], do these steps:

(a) Attach the overtemp drain line [11] to the overtemp drain union.

(b) Tighten the overtemp drain line to a torque of 260 in-lb (29 N·m) - 280 in-lb (32 N·m).

SUBTASK 24-25-16-420-017



USE TWO WRENCHES TO TIGHTEN THE OIL-IN AND OIL-OUT LINES. IF YOU USE ONE WRENCH, TOO MUCH TORQUE WILL OCCUR AT THE FITTINGS. THIS CAN CAUSE DAMAGE TO THE FITTINGS.

(4) To install the oil-in line [15] and oil-out line [14], do these steps:

(a) Attach the oil-in line [15] to the GE engine, VSCF generator dispatch kit, SPL-11385.

(b) Tighten the oil-in line [15] to a torque of 475 in-lb (54 N·m) - 525 in-lb (59 N·m).

(c) Attach the oil-out line [14] to the oil-out line union.

(d) Tighten the oil-out line [14] to a torque of 260 in-lb (29 N·m) - 280 in-lb (32 N·m).

SUBTASK 24-25-16-420-018



USE TWO WRENCHES TO TIGHTEN THE PRESSURE-FILL AND OVERFLOW DRAIN LINES. IF YOU USE ONE WRENCH, TOO MUCH TORQUE WILL OCCUR AT THE FITTINGS. THIS CAN CAUSE DAMAGE TO THE FITTINGS.

(5) To install the pressure fill line [13] and overflow drain line [12], do these steps:

(a) Attach the pressure fill line [13] to the pressure fill line reducer.

(b) Tighten the pressure fill line to a torque of 280 in-lb (32 N·m).

(c) Attach the overflow drain line [12] to the overflow drain line reducer.

(d) Tighten the overflow drain line to a torque of 475 in-lb (54 N·m) - 525 in-lb (59 N·m).



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SUBTASK 24-25-16-420-019

- (6) To install the electrical harness connectors [2], do these steps:
 - (a) Remove the plastic caps from the electrical harness connectors [2].
 - (b) Connect the electrical harness connectors [2] to the backup generator blanking plate [1].

J. Backup Generator Blanking Plate Installation Test

SUBTASK 24-25-16-410-005



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
 - (a) Do these tasks:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) Do these tasks:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 24-25-16-860-009

- (2) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
 - (a) Access the MFD engine maintenance page format display.
 - 1) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - (b) Let the engine become stable at the minimum idle for five minutes.
 - (c) Make sure the engine operates in the operation limits (TASK 71-00-00-800-802-H01).

SUBTASK 24-25-16-860-010

- (3) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 24-25-16-210-002

- (4) Do a visual check for oil leakage below the backup generator blanking plate [1] and drain mast location.

————— END OF TASK —————

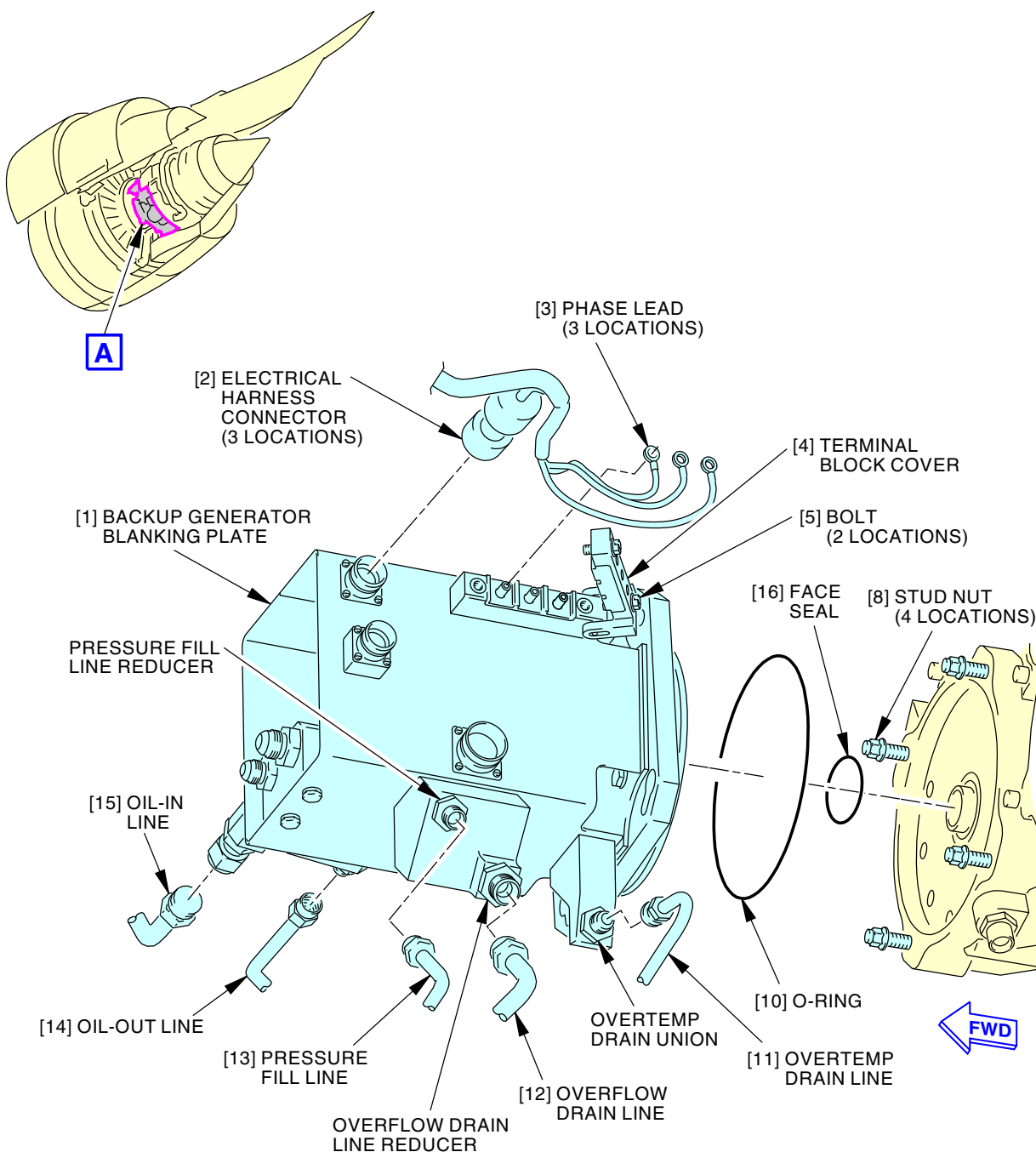
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**Backup Generator Blanking Plate Installation
Figure 401/24-25-16-990-803**

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TASK 24-25-16-000-803

3. Backup Generator Blanking Plate Removal

A. General

- (1) This task is for the removal of the backup generator blanking plate.

B. References

Reference	Title
20-10-23-000-801	Lockwire, Cotter Pins, and Lockrings - Removal (P/B 401)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-11385	Dispatch Kit - VSCF Generator, GE Engine Part #: J24013-1 Supplier: 81205

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

E. Prepare for the Removal

SUBTASK 24-25-16-860-006

- (1) Make sure the engine does not operate (TASK 71-00-00-800-837-H00).

SUBTASK 24-25-16-010-003

- (2) To open the left thrust reverser, do this task: (Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00).

F. Removal

SUBTASK 24-25-16-020-023

- (1) To disconnect the electrical harness connectors [2], do these steps:
- (a) Disconnect the electrical harness connectors [2] from the backup generator blanking plate [1].
 - (b) Install the plastic connector caps on the electrical harness connectors [2].

SUBTASK 24-25-16-020-024

- (2) To disconnect the phase leads [3], do these steps:
- (a) Remove the lockwire securing the bolts [5] (TASK 20-10-23-000-801).
 - (b) Loosen the bolts [5] on the terminal block cover [4].
 - (c) Open the terminal block cover [4].
 - (d) Remove the phase leads [3] from the terminal studs.
 - (e) Close the terminal block cover [4] and tighten the bolts [5].

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SUBTASK 24-25-16-020-025



CAUTION

USE TWO WRENCHES TO LOOSEN ALL OIL LINES. OBEY THE TWO-WRENCH PROCEDURE TO PREVENT TOO MUCH TORQUE ON THE FITTINGS. TOO MUCH TORQUE CAN CAUSE DAMAGE TO THE FITTINGS.

- (3) To disconnect the oil-in and oil-out lines from the blanking plate, do these steps:
- (a) Disconnect the oil-in line [15] from the GE engine, VSCF generator dispatch kit, SPL-11385.
 - (b) Disconnect the oil-out line [14] from the oil-out line union.
 - (c) Install shipping plug on the oil-out line union and the check valve [16].

SUBTASK 24-25-16-020-026



CAUTION

USE TWO WRENCHES TO LOOSEN ALL OIL LINES. OBEY THE TWO-WRENCH PROCEDURE TO PREVENT TOO MUCH TORQUE ON THE FITTINGS. TOO MUCH TORQUE CAN CAUSE DAMAGE TO THE FITTINGS.

- (4) Disconnect the pressure fill line [13] from the pressure fill line reducer.

SUBTASK 24-25-16-020-027



CAUTION

USE TWO WRENCHES TO LOOSEN ALL OIL LINES. OBEY THE TWO-WRENCH PROCEDURE TO PREVENT TOO MUCH TORQUE ON THE FITTINGS. TOO MUCH TORQUE CAN CAUSE DAMAGE TO THE FITTINGS.

- (5) Disconnect the overflow drain line [12] from the overflow drain line reducer.

SUBTASK 24-25-16-020-028



CAUTION

USE TWO WRENCHES TO LOOSEN ALL OIL LINES. OBEY THE TWO-WRENCH PROCEDURE TO PREVENT TOO MUCH TORQUE ON THE FITTINGS. TOO MUCH TORQUE CAN CAUSE DAMAGE TO THE FITTINGS.

- (6) Disconnect the overtemp drain line [11] from the overtemp drain union.

SUBTASK 24-25-16-020-029

- (7) To remove the backup generator blanking plate [1], do these steps:
- (a) Loosen the stud nuts [8] until there is a 0.5 in. (1.3 cm) clearance between the nut and the mounting-pad face.
NOTE: Use a 10 in. (25 cm) extension with a 12 point deep-socket for the upper-inboard stud nuts.
 - (b) Pull the backup generator blanking plate [1] axially until the pilot is free of the mounting-pad pilot.
 - (c) Rotate the backup generator blanking plate [1] in a clockwise direction until the stud nuts [8] line up with the large part of the keyholes in the mounting-flange.
 - (d) Pull the backup generator blanking plate [1] free of the mounting-pad.

———— **END OF TASK** ————

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DC/STANDBY POWER SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) DC/Standby Power System - Operational Test
 - (2) Main Battery Current Sensing System - Operational Test
 - (3) APU Battery Current Sensing System - Operational Test
 - (4) Main Battery Charge Capacity - System Test
 - (5) APU Battery Charge Capacity - System Test.
- C. The Ram Air Turbine (RAT) Generator is a source of standby power. To make sure the RAT operates correctly, do these tasks:
 - (1) Do this task: Ram Air Turbine (RAT) Manual Deployment System - System Test, TASK 29-21-00-730-802.
 - (2) Do this task: Ram Air Turbine (RAT) Generator Heater - System Test, TASK 29-21-00-730-803.
 - (3) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

TASK 24-30-00-700-801

2. DC/Standby Power System - Operational Test

A. **General**

- (1) The operational test performs this test:
 - (a) DC/Standby Power System Relays Test

B. **References**

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
31-61-00-800-816	Showing a System Synoptic Page (P/B 201)

C. **Location Zones**

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

D. **Prepare for the Operational Test**

SUBTASK 24-30-00-860-023

- (1) Put the BATTERY switch in the ON (latched) position.

SUBTASK 24-30-00-860-024

- (2) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

NOTE: Do the steps to apply primary external power to the 115V ac buses.

E. **DC/Standby Power System Relays Test**

SUBTASK 24-30-00-860-032

- (1) Get access to the electrical synoptic page. To get access, do this task: Showing a System Synoptic Page, TASK 31-61-00-800-816.
 - (a) Make sure the electrical synoptic page shows that the L XFR and R XFR buses are powered.

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SUBTASK 24-30-00-860-002

- (2) To start the DC/Standby Power System Relays Test, momentarily press and hold the STANDBY POWER switch in the BAT position. The STANDBY POWER switch is on the overhead maintenance panel, P61.

NOTE: The self test cannot be canceled after it is started. The test will take less than 10 seconds to complete. This test is completely automatic, and no interaction from maintenance personnel is necessary.

SUBTASK 24-30-00-860-003

- (3) Make sure the EICAS message, ELEC STANDBY SYS, does not show on the EICAS display.

————— **END OF TASK** —————

TASK 24-30-00-700-802

3. Main Battery Current Sensing System - Operational Test

A. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Main Battery Current Sensing Check

SUBTASK 24-30-00-860-004

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

NOTE: Do the steps to apply primary external power to the 115V ac buses.

- (a) Make sure the ON light on the PRIMARY EXT PWR switch is on.

SUBTASK 24-30-00-860-030

- (2) Make sure the STANDBY POWER switch on the P61 panel is in the AUTO position.

SUBTASK 24-30-00-860-031

- (3) Make sure the BATTERY switch on the P5 panel is set to the ON position.

SUBTASK 24-30-00-860-005

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

- (a) On the electrical system maintenance page, make sure the DC-V value for MAIN BAT is within 24 to 31.

NOTE: Use the captain's navigation display to view the electrical maintenance page.

SUBTASK 24-30-00-860-006

- (5) Push the PRIMARY EXT PWR switch on the P5 panel.

- (a) Make sure the AVAIL light in the switch comes on.
 - (b) Make sure the message MAIN BATTERY DISCH shows on the EICAS display.

SUBTASK 24-30-00-860-007

- (6) Wait for approximately 30 seconds after the message is displayed.

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SUBTASK 24-30-00-860-008

- (7) Push the PRIMARY EXT PWR switch on the P5 panel.
 - (a) Make sure the ON light on the switch comes on.
 - (b) On the electrical system maintenance page, make sure the DC-A value for MAIN BAT is 30 - 65 CHG during the charging mode.

————— END OF TASK —————

TASK 24-30-00-700-803

4. APU Battery Current Sensing System - Operational Test

A. References

Reference	Title
24-22-00-860-802	Supply Secondary External Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)

B. Location Zones

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

C. APU Battery Current Sensing Check

SUBTASK 24-30-00-860-009

- (1) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.

NOTE: Do the steps to apply secondary external power to the 115V ac buses.

SUBTASK 24-30-00-860-010

- (2) On the electrical system control panel, push the R BTB switch.
 - (a) Make sure the ISLN light in the R BTB switch comes on.

SUBTASK 24-30-00-860-021

- (3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - (a) On the electrical system maintenance page, make sure the DC-V value for APU BAT is between 24 to 31.

SUBTASK 24-30-00-860-022

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

NOTE: Do the steps to start the APU with the electric starter.

SUBTASK 24-30-00-860-025

- (5) On the electrical system control panel, push the R BTB switch.
 - (a) Make sure the AUTO indication in the R BTB switch shows.

SUBTASK 24-30-00-860-026

- (6) On the electrical system maintenance page, make sure the DC-A value for APU/BAT is between 30 - 65 CHG.

NOTE: During the charging-mode, the voltage will increase to 29 - 31 volts and current will drop to 10+/-2 amps.

D. Put the airplane back to its usual condition

————— END OF TASK —————

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TASK 24-30-00-700-804

5. Main Battery Charge Capacity - System Test

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) During this test, there is a potential for the fuel spar valve battery to discharge. This may cause the maintenance message (MM) 28-14003 to show. The fuel spar valve battery should recharge after the main battery is recharged. If the fuel spar valve battery does not recharge within an hour after the main battery is charged, then do the FIM troubleshooting as needed for the MM 28-14003.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-31-01-000-801	Main Battery Removal (P/B 401)
24-31-01-400-801	Main Battery Installation (P/B 401)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (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-6413	Charger/Tester- Battery Part #: RF80-K Supplier: 1WKR4
SPL-10209	Test Set - Test, Battery Discharge Part #: 374TS101-1 Supplier: 31467

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Main Battery Charge Capacity Check

SUBTASK 24-30-00-860-011

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-30-00-860-038

- (2) Save the AIMS fault history data if the external power is not supplied. To save it, do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

NOTE: The contents of the AIMS battery-backed memory will be erased when all 28 volts DC power is removed from the AIMS cabinet.

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SUBTASK 24-30-00-860-012

- (3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
- (a) On the electrical system maintenance page, make sure the DC-A value for MAIN BAT is 0+/-3.

NOTE: The battery should be fully charged before the capacity test. After the battery is fully charged, the DC-A value can show 0 +/-6 amps for approximately 5-10 minutes and decrease to 0 +/-3 amps.

SUBTASK 24-30-00-860-036



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-30-00-860-013

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR

SUBTASK 24-30-00-860-027

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	2	C24620	MN BAT CHARGER

SUBTASK 24-30-00-860-014

- (7) On the electrical system control panel, set the BATTERY switch to the OFF position.

SUBTASK 24-30-00-020-001

- (8) In the main equipment center, disconnect connector DM24013A from the main battery

NOTE: Connector DM24013A attaches the battery power feeder cables to the battery.

- (a) Turn the connector knob counterclockwise until the connector is free from the battery receptacle.

SUBTASK 24-30-00-020-002

- (9) Disconnect the control connector, DM24013B from the battery receptacle.

SUBTASK 24-30-00-750-005

- (10) If you use the battery discharge test set, SPL-10209, then do this charge capacity check of the main battery:

NOTE: This battery discharge test set, SPL-10209 also monitors the battery discharge voltage versus time.

- (a) Open circuit breaker CB1 on the battery discharge test set, SPL-10209.

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- (b) Connect the battery discharge test set, SPL-10209 to the battery and make these selections:

NOTE: The battery discharge test set is powered by the battery.

- 1) Close circuit breaker CB1 on the battery discharge test set, SPL-10209.
- 2) Set the battery AmpHour specification on the OBD to 47 AmpHour.
- 3) Set the number of cells of the battery on the OBD to 20.
- 4) Set the POWER SWITCH on the OBD to the ON position.
- 5) Wait for the DISCHARGE COMPLETE indicator to come on.

NOTE: The battery discharge will stop the battery discharge automatically.

- 6) Make sure the elapsed time display is 60 minutes or more.
- 7) Use the computer to make sure that the discharge curve from the data recorder is normal (see Figure 501).

NOTE: Follow the instructions from the tool manufacturer to get access to the data from the recorder.

- 8) If the elapse time is less than 60 minutes or the discharge curve is not normal (see Figure 501), then replace the main battery.
 - a) To replace the main battery, do these tasks: Main Battery Removal, TASK 24-31-01-000-801 and Main Battery Installation, TASK 24-31-01-400-801.

- (c) Set the POWER SWITCH to the OFF position.
- (d) Open circuit breaker CB1 on the battery discharge test set, SPL-10209.
- (e) Disconnect the battery discharge test set, SPL-10209 from the battery.

SUBTASK 24-30-00-750-004

- (11) If you use the Charger/tester- battery, COM-6413, then do this charge capacity check of the main battery:

NOTE: This Charger/tester- battery, COM-6413 does not monitor the battery discharge voltage versus time.

- (a) Connect the Charger/tester- battery, COM-6413 to the battery and make these selections:
 - 1) Use the SET DISCHARGE TIME thumb-wheel switches to set the discharge time to 01:00.
 - 2) Make the DISCHARGE MODE selection.
 - 3) Set the number of cells of the battery to 20.
 - 4) Set DISCHARGE CYCLE switch to SHORT.
 - 5) Use the SET CHARGE TIME thumb-wheel switches to set the charge time to 00:00.
 - 6) Set metering switch to AMPS.
 - 7) Use the AC POWER switch to turn on the test set.
 - 8) Push the CYCLE RESET switch to start the test.
 - 9) Turn the DISCHARGE CURRENT control knob to set 47 amps on the METERING display.
- (b) Make sure the ELAPSED DISCHARGE TIME shows 01:00.

NOTE: The battery passes the capacity check when the ELAPSED DISCHARGE TIME display shows 01:00. This indicates that the elapsed time of one hour is reached.

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- (c) Turn the METER switch to the voltage position.
- (d) Make sure that the battery voltage is more than 20 VDC.
 - 1) If the battery voltage is less than 20 VDC, replace the battery.
 - a) To replace the main battery, do these tasks: Main Battery Removal, TASK 24-31-01-000-801 and Main Battery Installation, TASK 24-31-01-400-801.
- (e) Disconnect the Charger/tester- battery, COM-6413 from the battery.

SUBTASK 24-30-00-420-001

- (12) Re-connect the power connector, DM24013A to the main battery
 - (a) Turn the connector knob clockwise until it is tight.
 - (b) Install the safety wire connector.

SUBTASK 24-30-00-420-002

- (13) Re-connect the control connector, DM24013B to the battery receptacle.

SUBTASK 24-30-00-860-041

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR

SUBTASK 24-30-00-860-045

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	2	C24620	MN BAT CHARGER

G. Main Battery Reconnection Test

SUBTASK 24-30-00-860-040

- (1) Load the pre-battery disconnection history data. To load it, do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

SUBTASK 24-30-00-710-001

- (2) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.

SUBTASK 24-30-00-860-044

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-30-00-860-042

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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SUBTASK 24-30-00-860-043

- (2) Remove electrical power if it is no longer needed, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

———— **END OF TASK** ————

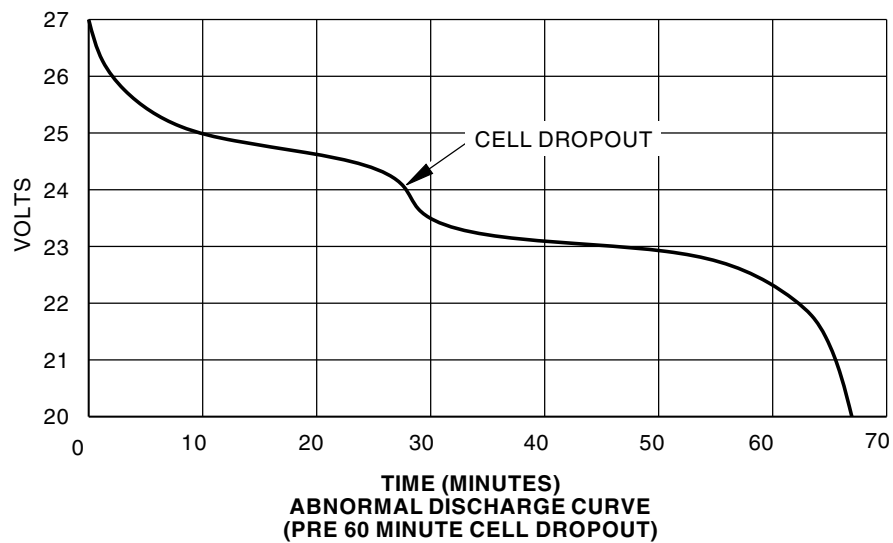
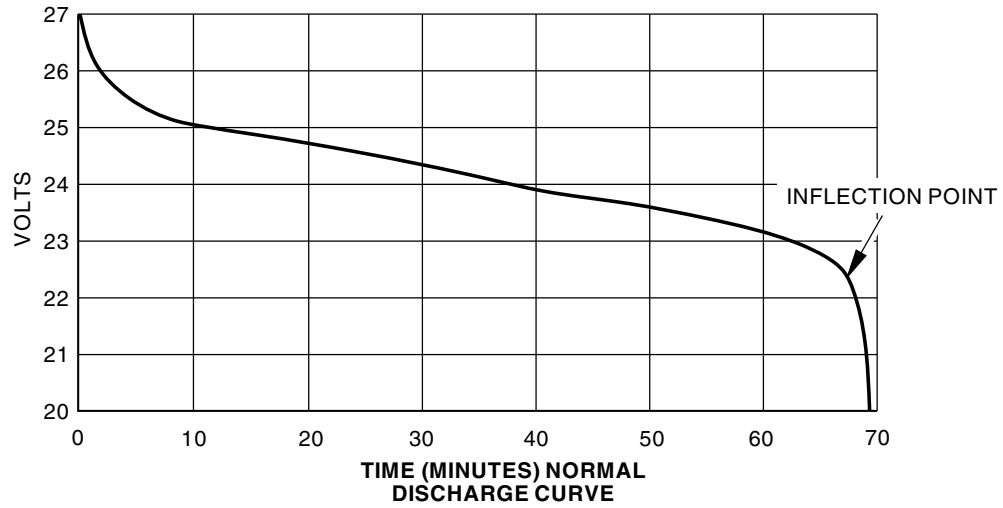
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Battery Voltage Output Discharge Curve
Figure 501/24-30-00-990-801

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TASK 24-30-00-700-805

6. APU Battery Charge Capacity - System Test

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-31-05-000-801	APU Battery Removal (P/B 401)
24-31-05-400-801	APU Battery Installation (P/B 401)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

B. Tools/Equipment

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

Reference	Description
COM-6413	Charger/Tester- Battery Part #: RF80-K Supplier: 1WKR4
SPL-10209	Test Set - Test, Battery Discharge Part #: 374TS101-1 Supplier: 31467

C. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Access Panels

Number	Name/Location
825	Bulk Cargo Door

E. APU Battery Charge Capacity Check

SUBTASK 24-30-00-860-015

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-30-00-860-016

- (2) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

- (a) Make sure the DC-A value below APU BAT is 0+/-3 amps on the electrical system maintenance page.

NOTE: The battery should be fully charged before the capacity test. After the battery is fully charged, the DC-A value can show 0 +/-6 amps for approximately 5-10 minutes and decrease to 0 +/-3 amps.

SUBTASK 24-30-00-860-017

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
K	12	C24301	APU BAT CHARGER PWR

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SUBTASK 24-30-00-860-018

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER

SUBTASK 24-30-00-020-003

- (5) Disconnect the power connector, DM24012A from the APU battery.
- (a) Turn the connector knob counterclockwise until the connector is free from the battery receptacle.

SUBTASK 24-30-00-020-004

- (6) Disconnect the control connector, DM24012B from the battery receptacle.

SUBTASK 24-30-00-750-006

- (7) If you use the battery discharge test set, SPL-10209, then do this charge capacity check of the APU battery:

NOTE: This battery discharge test set, SPL-10209 also monitors the battery discharge voltage versus time.

- (a) Open circuit breaker CB1 on the battery discharge test set, SPL-10209.
- (b) Connect the battery discharge test set, SPL-10209 to the battery and make these selections:

NOTE: The battery discharge test set is powered by the battery.

- 1) Close circuit breaker CB1 on the battery discharge test set, SPL-10209.
- 2) Set the battery AmpHour specification to 47 AmpHour.
- 3) Set the number of cells of the battery to 20.
- 4) Set the POWER SWITCH to the ON position.
- 5) Wait for the DISCHARGE COMPLETE indicator to come on.

NOTE: The battery discharge test set will stop the battery discharge automatically.

- 6) Make sure the elapsed time display is 60 minutes or more.
- 7) Use the computer to make sure that the discharge curve from the data recorder is normal (see Figure 501).

NOTE: Follow the instructions from the tool manufacturer to get access to the data from the recorder.

- 8) If the elapse time is less than 60 minutes or the discharge curve is not normal (see Figure 501), then replace the APU battery.
 - a) To replace the APU battery, do these tasks: APU Battery Removal, TASK 24-31-05-000-801 and APU Battery Installation, TASK 24-31-05-400-801.

- (c) Set the POWER SWITCH to the OFF position.
- (d) Open the circuit breaker CB1 on the battery discharge test set, SPL-10209.
- (e) Disconnect the battery discharge test set, SPL-10209 from the battery.

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SUBTASK 24-30-00-750-003

- (8) If you use the Charger/tester- battery, COM-6413, then do this charge capacity check of the APU battery:

NOTE: This Charger/tester- battery, COM-6413 does not monitor the battery discharge voltage versus time.

- (a) Connect the Charger/tester- battery, COM-6413 to the battery and make these selections:
- 1) Use the SET DISCHARGE TIME thumb-wheel switches to set the discharge time to 01:00.
 - 2) Make the DISCHARGE MODE selection.
 - 3) Set the number of cells of the battery to 20.
 - 4) Set DISCHARGE CYCLE switch to SHORT.
 - 5) Use the SET CHARGE TIME thumb-wheel switches to set the charge time to 00:00.
 - 6) Set metering switch to AMPS.
 - 7) Use the AC POWER switch to turn on the test set.
 - 8) Push the CYCLE RESET switch to start the test.
 - 9) Turn the DISCHARGE CURRENT control knob to set 47 amps on the METERING display.
- (b) Make sure the ELAPSED DISCHARGE TIME shows 01:00.

NOTE: The battery passes the capacity check when the ELAPSED DISCHARGE TIME display shows 01:00. This indicates that the elapsed time of one hour is reached.

- (c) Turn the METER switch to the voltage position.
- (d) Make sure that the battery voltage is more than 20 VDC.
- 1) If the battery voltage is less than 20 VDC, replace the battery.
 - a) To replace the APU battery, do these tasks: APU Battery Removal, TASK 24-31-05-000-801 and APU Battery Installation, TASK 24-31-05-400-801.
- (e) Disconnect the Charger/tester- battery, COM-6413 from the battery.

F. Put the Airplane Back To Its Usual Condition

SUBTASK 24-30-00-420-003

- (1) Re-connect the power connector, DM24012A to the APU battery
- (a) Turn the connector knob clockwise until it is tight.
 - (b) Install the safety wire connector.

SUBTASK 24-30-00-420-004

- (2) Re-connect the control connector, DM24012B to the battery receptacle.

SUBTASK 24-30-00-860-019

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	12	C24301	APU BAT CHARGER PWR

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SUBTASK 24-30-00-860-020

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER

SUBTASK 24-30-00-860-034

- (5) Make sure airplane has power for at least 90 minutes.

NOTE: It takes 90 minutes to fully charge the battery.

G. APU Battery Reconnection Test

SUBTASK 24-30-00-710-002

- (1) Do this task: APU Battery Current Sensing System - Operational Test, TASK 24-30-00-700-803.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-30-00-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

————— END OF TASK —————

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MAIN BATTERY - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) Disconnect Main Battery Power From The Airplane
 - (2) Restore Main Battery Power To The Airplane.
 - (3) Main Battery Connector Inspection

TASK 24-31-01-020-801

2. Disconnect Main Battery Power

(Figure 201)

A. General

- (1) This task disconnects Main Battery Power from the airplane. The Main Battery is located on a shelf between the E3 and E4 Equipment Racks in the Main Equipment Center.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare for Disconnection of Battery Power

SUBTASK 24-31-01-860-006

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-31-01-860-015

- (2) Save the AIMS fault history data if the external power is not supplied. To save it, do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

NOTE: The contents of the AIMS battery-backed memory will be erased when all 28 volts DC power is removed from the AIMS cabinet.

SUBTASK 24-31-01-010-002

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-31-01-860-020

- (4) On the electrical system control panel, set the BATTERY switch to the OFF position.

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SUBTASK 24-31-01-850-001



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-31-01-860-007

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR

SUBTASK 24-31-01-860-008

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	2	C24620	MN BAT CHARGER

F. Disconnection of Main Battery Power

SUBTASK 24-31-01-020-002

- (1) Do these steps to disconnect main battery power:
- (a) Disconnect the battery connector [1] from the main battery.
 - (b) Disconnect the electrical connector [3] from the main battery.

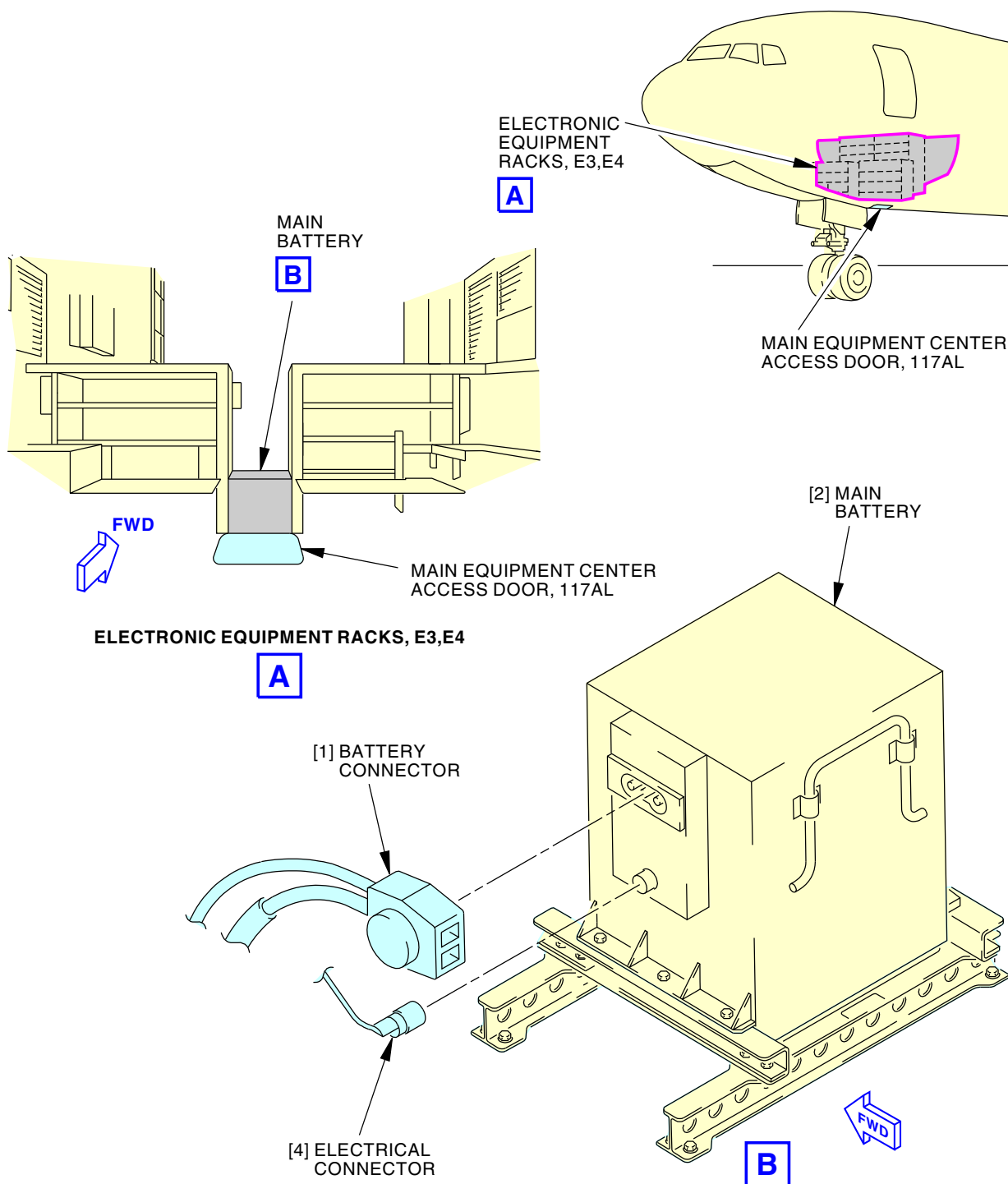
————— END OF TASK —————

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**Main Battery Connector Installation
Figure 201/24-31-01-990-803**

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TASK 24-31-01-420-801

3. Restore Main Battery Power

(Figure 201)

A. General

- (1) This task restores main battery power to the airplane.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Restore Main Battery Power

SUBTASK 24-31-01-420-002

- (1) Do these steps to restore main battery power:
- Reconnect the electrical connector [3] to the main battery.
 - Reconnect the battery connector [1] to the Main Battery.
 - Turn the knob on the connector clockwise with your hand until it is tight.
 - Use the double twist method to install the MS20995CY20 lockwire, G02479 from the main battery power connector knob to one of the connector bolts Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801.

SUBTASK 24-31-01-860-009

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

Standby Power Management Panel, P310

Row	Col	Number	Name
M	2	C24620	MN BAT CHARGER

SUBTASK 24-31-01-860-010

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
K	9	C24300	MN BAT CHARGER PWR

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G. Main Battery Reconnection Test

SUBTASK 24-31-01-860-016

- (1) Load the pre-battery disconnection history data. To load it, do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

SUBTASK 24-31-01-710-002

- (2) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.

SUBTASK 24-31-01-860-013

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-01-410-002

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-31-01-860-018

- (2) Remove electrical power if it is no longer needed, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

TASK 24-31-01-200-801

4. Main Battery Connector Inspection

(Figure 201, Figure 202)

A. References

<u>Reference</u>	<u>Title</u>
20-11-00 P/B 201	STANDARD TORQUE VALUES - MAINTENANCE PRACTICES
SWPM 20-30-11	Standard Wiring Practices Manual
SWPM 20-62-25	Standard Wiring Practices Manual

B. Tools/Equipment

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

<u>Reference</u>	<u>Description</u>
SPL-12292	Gage Tool - Battery Inspection Part #: J24016-1 Supplier: 81205

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Prepare for the Main Battery Connector Inspection

SUBTASK 24-31-01-020-003

- (1) Do this task: Disconnect Main Battery Power, TASK 24-31-01-020-801.

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E. Main Battery Connector Inspection

SUBTASK 24-31-01-200-004

- (1) Check the battery sensor connector, as follows:
 - (a) If one of the following conditions is found, repair or replace the connector.
 - 1) Corrosion or pitting of the contacts.
 - 2) Burn marks on the contacts.
 - 3) Bent or pushed back contacts.
 - 4) Damage or corrosion to the connector body.

SUBTASK 24-31-01-200-003

- (2) Check the battery power connector, as follows:
 - (a) Remove the two (2) bolts that hold the connector together.
 - (b) If one of the following conditions is found, replace the main battery connector (SWPM 20-62-25).
 - 1) Corrosion and pitting of the power contacts or terminal lug mating surfaces.
 - 2) Excessive free play or broken pins on the handwheel-worm assembly.
 - 3) Burn marks on the power contacts, terminal lug contact bar mating surfaces or terminal stud.
 - (c) FOR SPIRAL SPRING TYPE POWER CONTACTS;
 - 1) Put the 0.3700 end of the battery inspection gage tool, SPL-12292, in the first connector power contact.

NOTE: One end of the battery inspection gage tool, SPL-12292, has the marking "0.3700". The other end of the battery inspection gage tool, SPL-12292, has the marking "0.3850".

NOTE: The 0.3700 end of the battery inspection gage tool, SPL-12292, examines if the connector power contact is worn or is less than the correct diameter. The 0.3850 end of the battery inspection gage tool, SPL-12292, examines if the connector power contact is more than the correct diameter.
 - 2) Attach the force scale on the cable assembly.

NOTE: The force scale is part of the battery inspection gage tool, SPL-12292. The maximum weight of the force scale is 2 pounds with indications of 0.5 ounce.
 - 3) Hold the cover with the connector power contacts and force scale in the vertical position.
 - 4) Make sure that a force of 1 pound is necessary to remove the battery inspection gage tool, SPL-12292, from the first connector power contact.
 - a) If the force to remove the battery inspection gage tool, SPL-12292, from the first connector power contact is less than 1 pound, replace the battery connector.
 - 5) Do these steps again for the second connector power contact.
 - 6) Put the 0.3850 end of the battery inspection gage tool, SPL-12292, into the first connector power contact.
 - 7) Attach the force scale on the cable assembly.

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- 8) Hold the cover with the connector power contacts and force scale in the vertical position.
 - 9) Make sure that a force of more than 1 pound is necessary to remove the battery inspection gage tool, SPL-12292, from the first connector power contact.
 - a) If the force to remove the battery inspection gage tool, SPL-12292, from the connector power contact is less than 1 pound, replace the battery connector.
 - 10) Do these steps again for the second connector power contact.
- (d) FOR LONGITUDINAL SPRING TYPE POWER CONTACTS;
- 1) Put the 0.3700 end of the battery inspection gage tool, SPL-12292, in the first connector power contact.

NOTE: One end of the battery inspection gage tool, SPL-12292, has the marking "0.3700". The other end of the battery inspection gage tool, SPL-12292, has the marking "0.3850".

NOTE: The 0.3700 end of the battery inspection gage tool, SPL-12292, examines if the connector power contact is worn or is less than the correct diameter. You do not use the 0.3850 end of the battery inspection gage tool, SPL-12292, for power contacts of the longitudinal spring type.
 - 2) Attach the force scale on the cable assembly.

NOTE: The force scale is part of the battery inspection gage tool, SPL-12292. The maximum weight of the force scale is 2 pounds with indications of 0.5 ounce.
 - 3) Hold the cover with the connector power contacts and force scale in the vertical position.
 - 4) Make sure that a force of 1 pound is necessary to remove the battery inspection gage tool, SPL-12292, from the first connector power contact.
 - a) If the force to remove the battery inspection gage tool, SPL-12292, from the first connector power contact is less than 1 pound, replace the battery connector.
 - 5) Do these steps again for the second connector power contact.
- (e) Stow the force scale and battery inspection gage tool, SPL-12292.
- (f) Check the contact bar as follows:
- 1) If the contact bar is held on with a screw, make sure the screw is tight and the contact bar is tight.

NOTE: Use the standard torque values for the screw (STANDARD TORQUE VALUES - MAINTENANCE PRACTICES, PAGEBLOCK 20-11-00/201).
 - 2) If the contact bar is held with a rivet, make sure the contact bar can not be removed from the connector.

NOTE: The contact bar is loose on the connector.
- (g) If the terminal lug or stud is damaged, deformed, discolored or annealed, repair or replaced the terminal lug (SWPM 20-62-25).

NOTE: If the terminal lug is annealed, use a high temperature terminal lug to replace the lug (SWPM 20-30-11).

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- (h) Make sure the terminal nuts are tightened to a torque of 145 ± 10 in-lb (16.4 ± 1.1 N·m) (SWPM 20-62-25).

NOTE: Do not pull or move the wires after the terminal nut is tightened.

- (i) If the shipping plugs are installed, removed the shipping plugs.

NOTE: Wire type contacts have less contact surface.

- (j) Put the connector together and install the two (2) bolts (SWPM 20-62-25).

1) Tighten the bolts to a torque of 32 ± 2 in-lb (3.6 ± 0.2 N·m).

- (k) Make sure the wires are centered in the connector openings.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-01-420-003

- (1) Do this task: Restore Main Battery Power, TASK 24-31-01-420-801.

———— **END OF TASK** ————

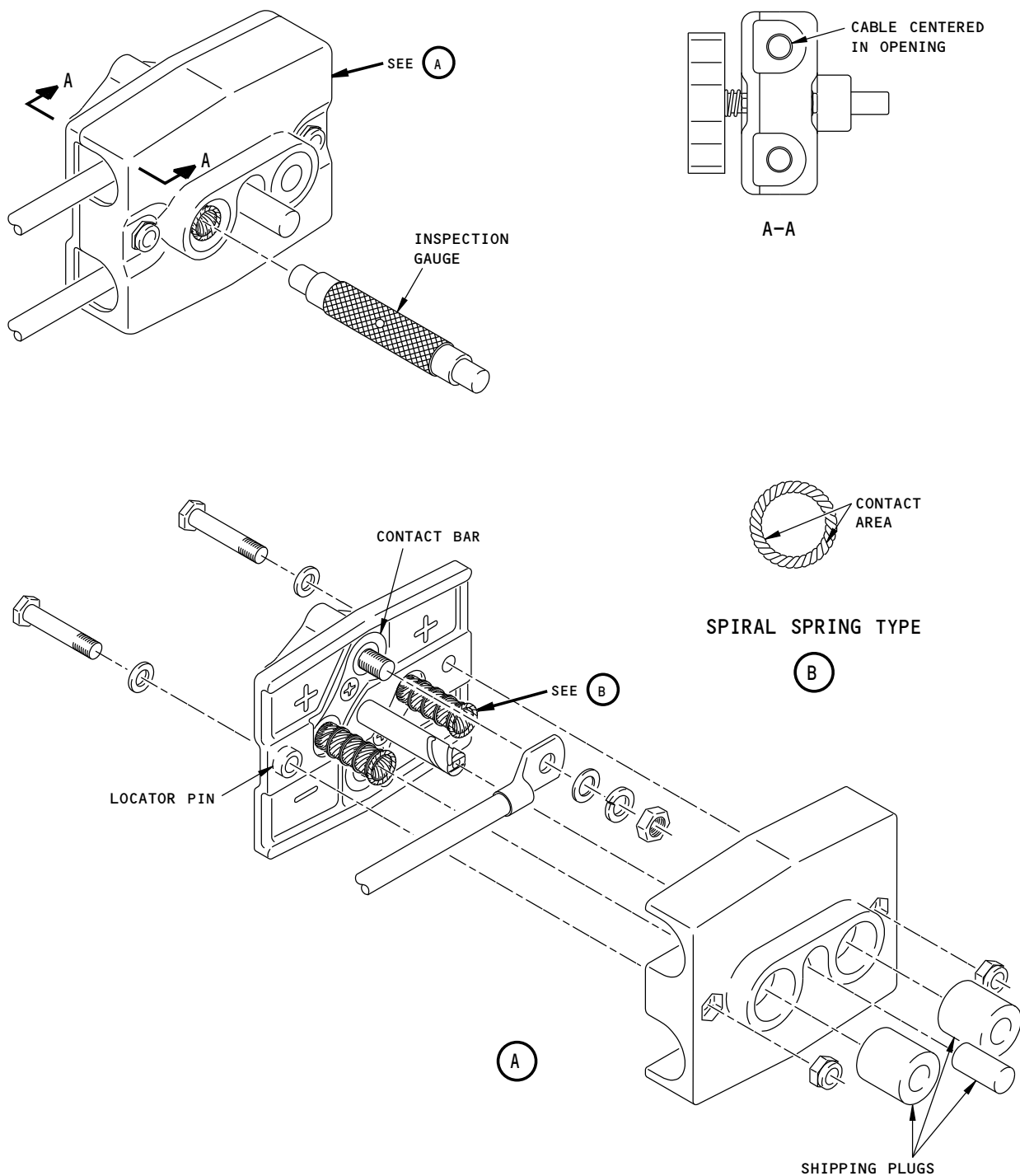
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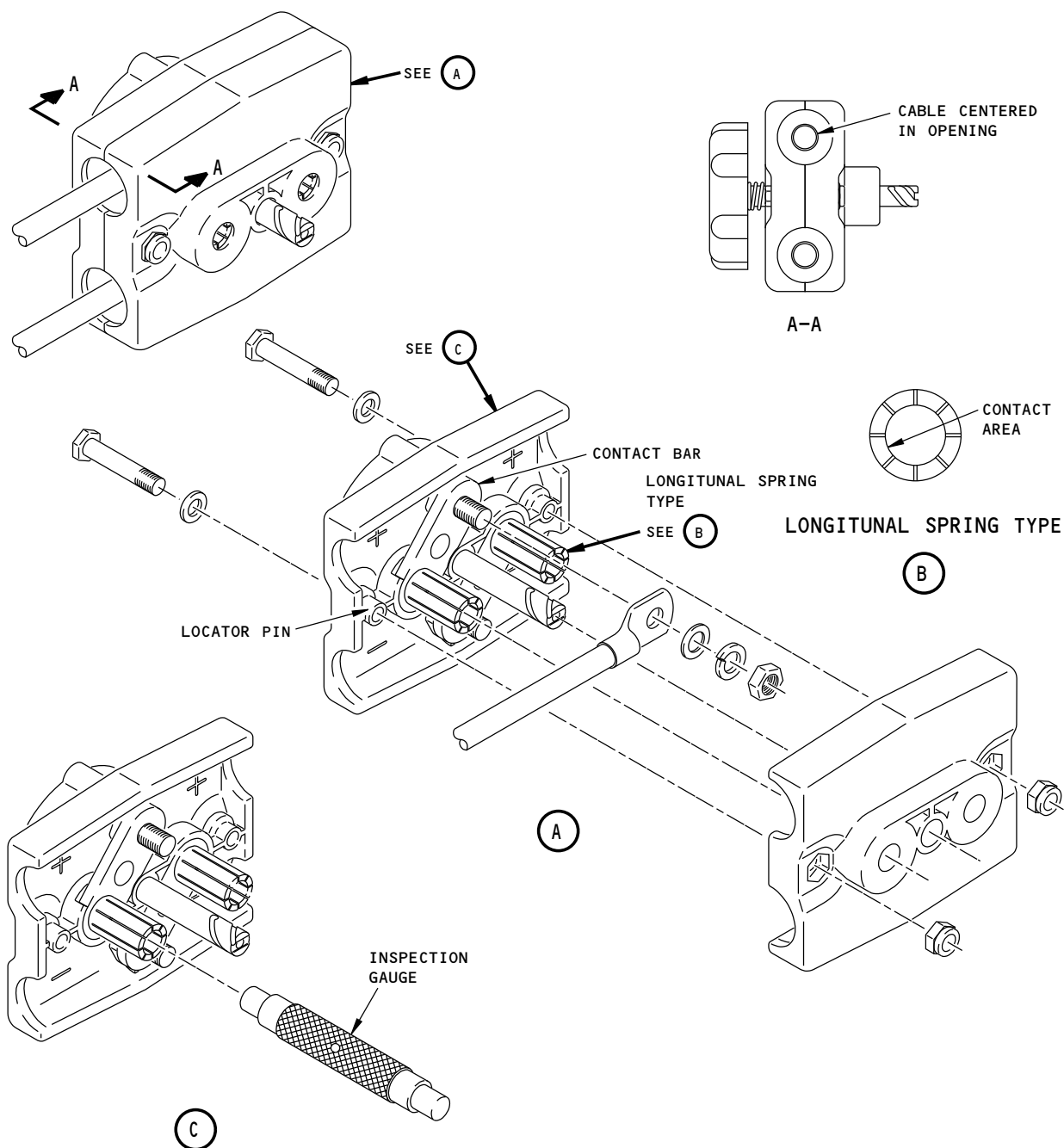
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**Battery Connector - Inspection/Check
Figure 202/24-31-01-990-804 (Sheet 1 of 2)**

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**Battery Connector - Inspection/Check
Figure 202/24-31-01-990-804 (Sheet 2 of 2)**

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MAIN BATTERY - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Main Battery Removal
- (2) Main Battery Installation.

TASK 24-31-01-000-801

2. Main Battery Removal

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the removal of the Main Battery. The Main Battery is located on a shelf between the E3 and E4 Equipment Racks in the Main Equipment Center.
- (2) During the main battery removal, the maintenance message (MM) 28-14003 can show. The fuel spar valve battery should recharge after the main battery is recharged. If the fuel spar valve battery does not recharge within an hour after the main battery is charged, then do the FIM troubleshooting as needed for the MM 28-14003.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (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-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
SPL-1573	Hoist - LRU, Main EE Bay (J20001-52 CE marked per EU Directive 2006/42/EC.) Part #: J20001-62 Supplier: 81205 Part #: J20001-63 Supplier: 81205 Opt Part #: J20001-60 Supplier: 81205
SPL-13356	Hoist - LRU, Main EE Bay (CE Marked per EU Directive 2006/42/EC.) Part #: J20001-62 Supplier: 81205 Part #: J20001-63 Supplier: 81205 Opt Part #: J20001-60 Supplier: 81205

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

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E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Prepare for the Removal

SUBTASK 24-31-01-860-005

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-31-01-860-014

- (2) Save the AIMS fault history data if the external power is not supplied. To save it, do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

NOTE: The contents of the AIMS battery-backed memory will be erased when all 28 volts DC power is removed from the AIMS cabinet.

SUBTASK 24-31-01-010-001

- (3) Open this access panel:

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 24-31-01-860-021

- (4) On the electrical system control panel, set the BATTERY switch to the OFF position.

SUBTASK 24-31-01-860-011



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

Row	Col	Number	Name
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-31-01-860-001

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
K	9	C24300	MN BAT CHARGER PWR

SUBTASK 24-31-01-860-002

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

Standby Power Management Panel, P310

Row	Col	Number	Name
M	2	C24620	MN BAT CHARGER

SUBTASK 24-31-01-860-023

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

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE

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Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C28003	APU FUEL S/O VALVE
A	19	C28002	R ENGINE FUEL SPAR VALVE

NOTE: Circuit breakers are opened to prevent complete discharge of fuel SPAR Valve Battery. This will avoid a recharge time of approximately 1 hour required if the fuels SPAR Valve Battery is drained.

G. Main Battery Removal

SUBTASK 24-31-01-020-001

- (1) Do these steps to remove the main battery:
 - (a) Remove the battery connector [1] from the main battery.
 - (b) Remove the electrical connector [4] from the main battery.
 - (c) Remove the screws [3] and washers [5] that hold the main battery.
 - (d) Attach the cable fishpole hoist, COM-1563 and the main EE bay LRU hoist, SPL-1573 or main EE bay LRU hoist, SPL-13356 to the main battery.



WHEN YOU HANG THE MAIN BATTERY FROM THE HOIST, YOU MUST STAY AWAY FROM THE AREA BELOW. DO NOT MOVE THE MAIN BATTERY ABOVE PERSONNEL DURING REMOVAL. THE BATTERY WEIGHS 106 POUNDS AND FAILURE OF THE HOIST CAN CAUSE INJURY TO PERSONNEL.

- (e) Remove the main battery [2].

————— **END OF TASK** —————

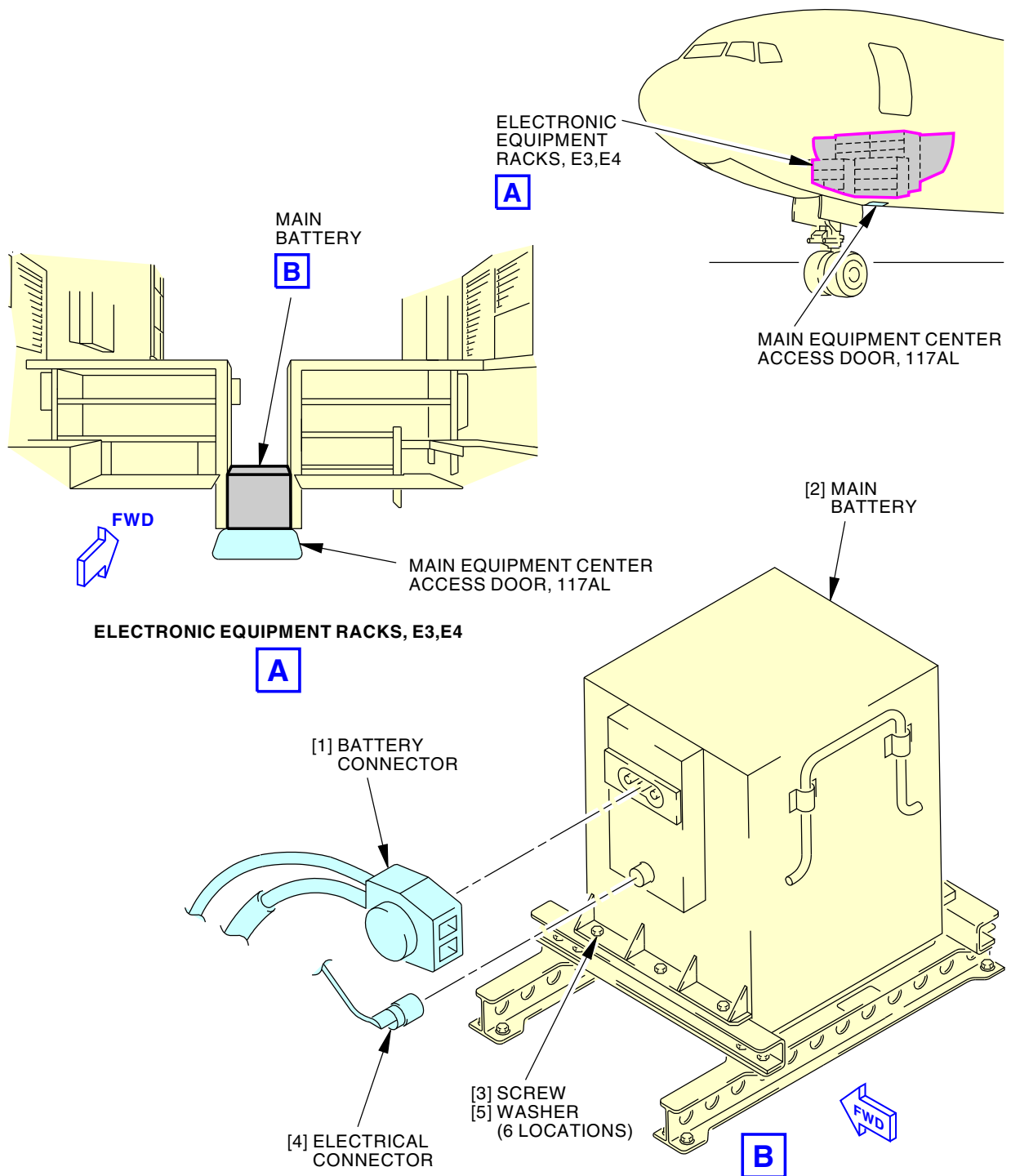
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Main Battery Installation
Figure 401/24-31-01-990-801

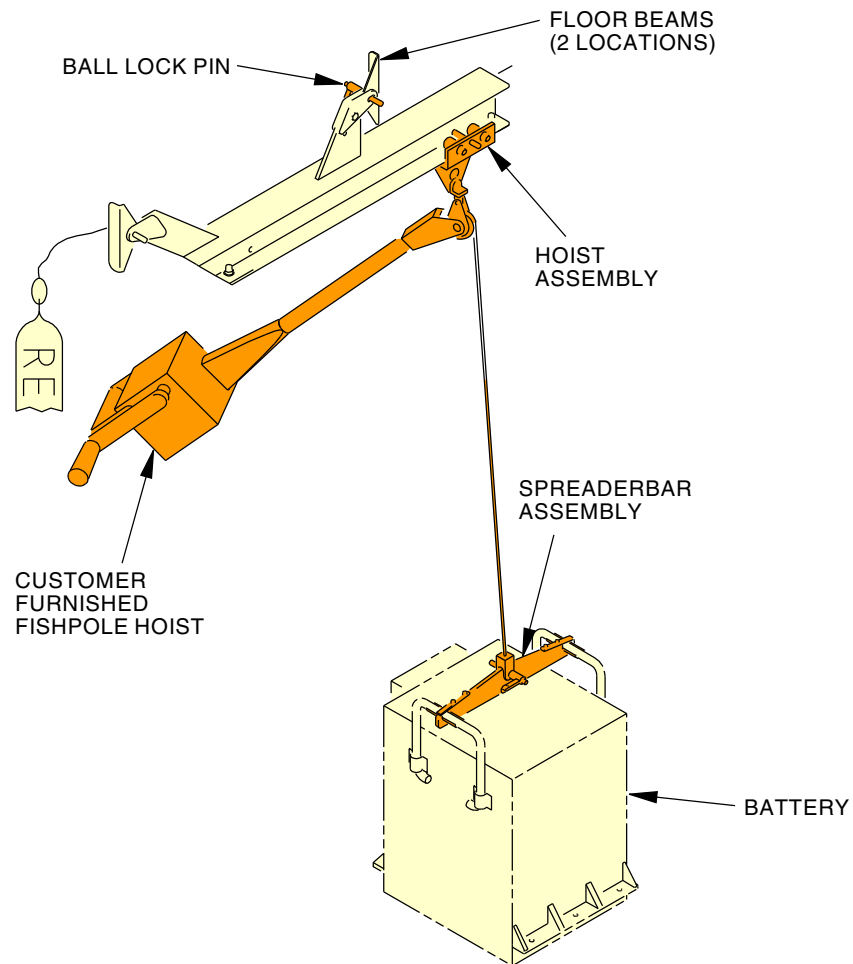
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Main Battery Hoist Equipment
Figure 402/24-31-01-990-802

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TASK 24-31-01-400-801

3. Main Battery Installation

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the installation of the main battery.
- (2) During the main battery installation, the maintenance message (MM) 28-14003 can show. The fuel spar valve battery should recharge after the main battery is recharged. If the fuel spar valve battery does not recharge within an hour after the main battery is charged, then do the FIM troubleshooting as needed for the MM 28-14003.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)
45-10-00-740-820	How to Backup and Replace the Fault Database (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-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
SPL-1573	Hoist - LRU, Main EE Bay (J20001-52 CE marked per EU Directive 2006/42/EC.) Part #: J20001-62 Supplier: 81205 Part #: J20001-63 Supplier: 81205 Opt Part #: J20001-60 Supplier: 81205
SPL-13356	Hoist - LRU, Main EE Bay (CE Marked per EU Directive 2006/42/EC.) Part #: J20001-62 Supplier: 81205 Part #: J20001-63 Supplier: 81205 Opt Part #: J20001-60 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Battery	24-31-01-01-010	ARO ALL

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F. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

G. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

H. Main Battery Installation

SUBTASK 24-31-01-420-001

- (1) Do these steps to install the main battery:

NOTE: The battery can be installed charged or discharged. Before you do the installation test, the battery needs to be fully charged. To fully charge the discharged battery, it can take up to 75 minutes.

- (a) Attach the main battery [2] to the cable fishpole hoist, COM-1563 and the main EE bay LRU hoist, SPL-1573 or main EE bay LRU hoist, SPL-13356.



WARNING

DO NOT GO BELOW THE BATTERY WHICH HANGS FROM THE BATTERY HOIST. DO NOT MOVE THE BATTERY SUCH THAT IT IS ABOVE YOUR HEAD DURING THE REMOVAL/INSTALLATION PROCEDURE. THE LINE THAT HOLDS THE BATTERY CAN BREAK AND CAUSE INJURY TO PERSONS.

- (b) Put the main battery [2] into position on the shelf between the E3 and E4 equipment racks.
- (c) Install the screws [3] and washers [5] that hold the main battery.
- (d) Attach the electrical connector [4] to the main battery.
- (e) Attach the battery connector [1] to the Main Battery.
- 1) Turn the knob on the connector clockwise with your hand until it is tight.
 - 2) Use the double twist method to install the MS20995CY20 lockwire, G02479 from the main battery power connector knob to one of the connector bolts (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801).

NOTE: MS20995CY20 lockwire is the alternative to MS20995CY20 lockwire, G02479.

SUBTASK 24-31-01-860-003

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

Standby Power Management Panel, P310

Row	Col	Number	Name
M	2	C24620	MN BAT CHARGER

SUBTASK 24-31-01-860-004

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
K	9	C24300	MN BAT CHARGER PWR

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I. Main Battery Installation Test

SUBTASK 24-31-01-860-017

- (1) Load the pre-battery removal history data. To load it, do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

SUBTASK 24-31-01-710-001

- (2) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.

NOTE: The main battery is considered fully charged when the battery current is 0 +/- 3 amps (either CHARGE or DISCHARGE) AND the battery voltage is 26.5 volts or more. The main battery current and voltage can be checked either on the Electrical Maintenance Page or the Electrical Synoptic display.

SUBTASK 24-31-01-860-012

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-31-01-860-024

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

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	C28001	L ENGINE FUEL SPAR VALVE
A	17	C28003	APU FUEL S/O VALVE
A	19	C28002	R ENGINE FUEL SPAR VALVE

SUBTASK 24-31-01-710-003

- (5) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 26 Fire Extinguishing System
 - 5) OPERATIONAL TEST
 - 6) Cargo Squibs
 - 7) CONTINUE
 - (b) Do the instructions that show on the MAT and then make these selections:
 - 1) CONTINUE
 - 2) START TEST
 - (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - (d) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.

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J. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-01-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-31-01-860-019

- (2) Remove electrical power if it is no longer needed, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— **END OF TASK** —————

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MAIN BATTERY CHARGER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the main battery charger
 - (2) An installation of the main battery charger.

TASK 24-31-02-000-801

2. Main Battery Charger Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the removal of the main battery charger. The main battery charger is located on E3-2 equipment rack in the main equipment center.

B. References

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare for the Removal

SUBTASK 24-31-02-010-001

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-31-02-860-001

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR

SUBTASK 24-31-02-860-002

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	2	C24620	MN BAT CHARGER

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F. Main Battery Charger Removal

SUBTASK 24-31-02-910-001



DO NOT TOUCH THE MAIN BATTERY CHARGER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE MAIN BATTERY CHARGER.

(1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-31-02-020-001

- (2) Do these steps to remove the main battery charger [1]:
- (a) Remove the electrical connector [2] from the main battery charger [1].
 - (b) Remove the screws [7] and the cover [3] from the terminal block on the main battery charger [1].
 - (c) Do these steps to remove the wires [11] from the terminal block:
 - 1) Remove the nut [6], lockwasher [5] and washer [4] from the terminal block.
 - 2) Disconnect the wire [11] from the terminal block.
 - 3) Remove the nut [8], lockwasher [9] and washer [10] from the terminal block.
 - 4) Disconnect the wire [11] from the terminal block.
 - (d) Remove the main battery charger [1]. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

————— **END OF TASK** —————

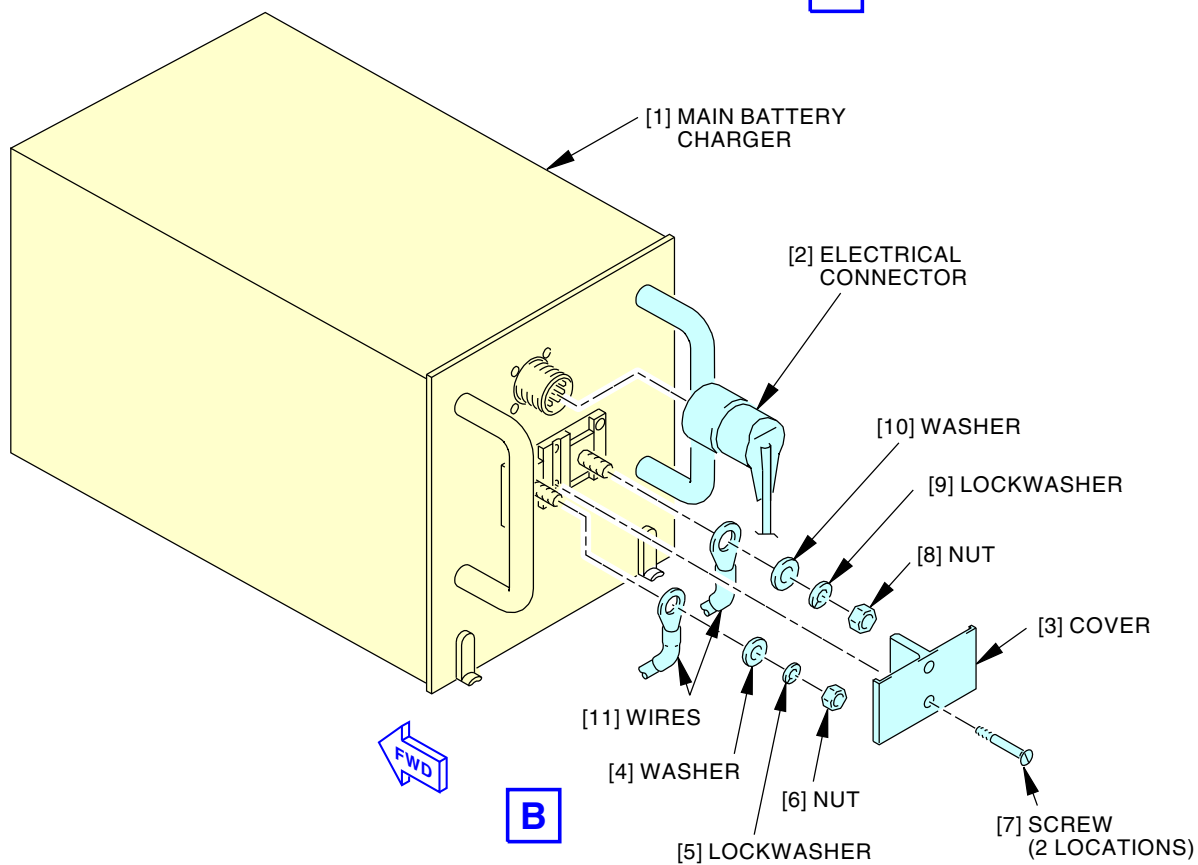
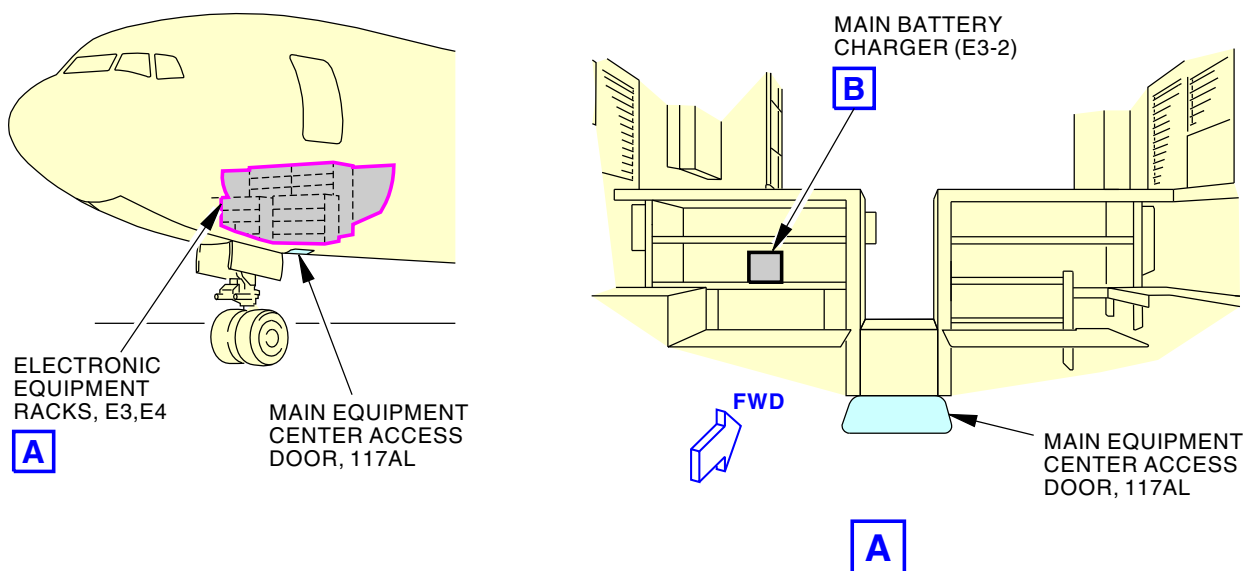
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Main Battery Charger Installation
Figure 401/24-31-02-990-801

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TASK 24-31-02-400-801

3. Main Battery Charger Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
20-41-01-400-803	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Main Battery Charger Installation

SUBTASK 24-31-02-910-002



CAUTION DO NOT TOUCH THE MAIN BATTERY CHARGER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE MAIN BATTERY CHARGER.

(1) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-41-01-400-803.

SUBTASK 24-31-02-420-001

(2) Install the main battery charger [1]. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-31-02-420-002

(3) Do these steps to connect the main battery charger:

- (a) Do these steps to reconnect the wires [11] to the terminal block:
 - 1) Connect the wires [11] to the terminal block on the main battery charger.
 - 2) Install the washer [10], lock washer [9] and nut [8].
 - 3) Tighten the nut on the positive terminal to 80-100 pound-inches (9.0-11.3 Newton meters).
 - 4) Install the washer [4], lock washer [5] and nut [6].
 - 5) Tighten the nut on the negative terminal to 80-100 pound-inches (9.0-11.3 Newton meters).
- (b) Attach the cover [3] to the terminal block.
- (c) Install the screw [7].
- (d) Connect the electrical connector [2] to the main battery charger.

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SUBTASK 24-31-02-860-004

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR

E. Main Battery Charger Installation Test

SUBTASK 24-31-02-860-005

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-31-02-860-006

- (2) Make sure these indications occur on the maintenance page:

- (a) For the MAIN/BAT; DC-V: 24 to 31

SUBTASK 24-31-02-860-007

- (3) Push the PRIMARY EXT PWR switch on the P5 panel to the AVAIL position.

- (a) Make sure the AVAIL light in the PRIMARY EXT PWR switch comes on.

SUBTASK 24-31-02-860-008

- (4) Make sure that you see one of two messages: the MAIN BATTERY DISC (EICAS ADVISORY) or the ELEC HOT BATTERY BUS (EICAS STATUS) messages.

SUBTASK 24-31-02-860-009

- (5) Wait for approximately 30 seconds after the message is displayed.

SUBTASK 24-31-02-860-010

- (6) Push the PRIMARY EXT PWR switch to the ON position.

- (a) Make sure the ON light in the switch comes on.

SUBTASK 24-31-02-860-003

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	2	C24620	MN BAT CHARGER

SUBTASK 24-31-02-860-011

- (8) Make sure these indications occur on the maintenance page:

NOTE: During the charge mode, the voltage will increase to 29 - 31 volts and current will drop to 8+/-4 amps.

- (a) For the MAIN/BAT; DC-A: 60+/-5CHG

SUBTASK 24-31-02-860-012

- (9) Make sure the BAT CHARGER MAIN message does not show on the EICAS display.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-02-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

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MAIN BATTERY CURRENT SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the main battery current sensor.
- (2) An installation of the main battery current sensor.

TASK 24-31-03-000-801

2. Main Battery Current Sensor Removal

(Figure 401)

A. **General**

- (1) This task is for the removal of the Main Battery Current Sensor. The Main Battery Current Sensor is located on a shelf between the E3 and E4 Equipment Rack in the Main Equipment Center.
- (2) You must remove the main battery to get access to the Main Battery Current Sensor.

B. **References**

Reference	Title
24-31-01-000-801	Main Battery Removal (P/B 401)

C. **Location Zones**

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door

E. **Prepare for the Removal**

SUBTASK 24-31-03-010-001

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-31-03-020-001

- (2) Do this task: Main Battery Removal, TASK 24-31-01-000-801.

SUBTASK 24-31-03-860-001

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR

SUBTASK 24-31-03-860-002

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	2	C24620	MN BAT CHARGER

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F. Main Battery Current Sensor Removal

SUBTASK 24-31-03-020-002

- (1) Do these steps to remove the main battery current sensor [4]:
 - (a) Remove the ground lead [1] from the battery connector [2].
 - (b) Remove the screw [5] that hold the ground lead.
 - (c) Move the ground lead [1] through the main battery current sensor [4].
 - (d) Remove the electrical connector [3], DM24037, from the Main Battery Current Sensor.
 - (e) Remove these parts that hold the main battery current sensor:
 - 1) nuts [9]
 - 2) washers [8]
 - 3) washers [7]
 - 4) bolts [6].
 - (f) Remove the main battery current sensor [4].

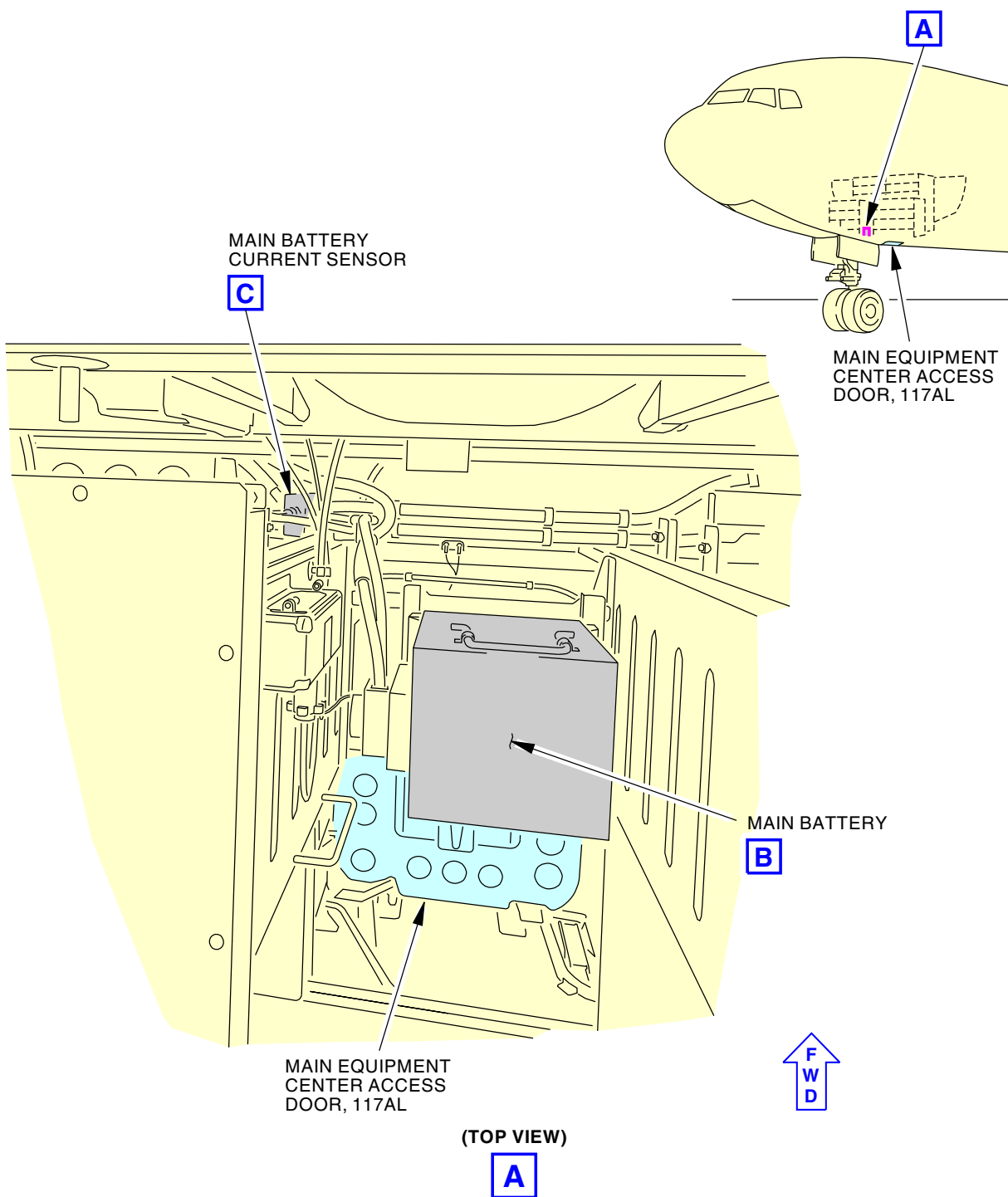
————— **END OF TASK** —————

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**Main Battery Current Sensor Installation
Figure 401/24-31-03-990-801 (Sheet 1 of 2)**

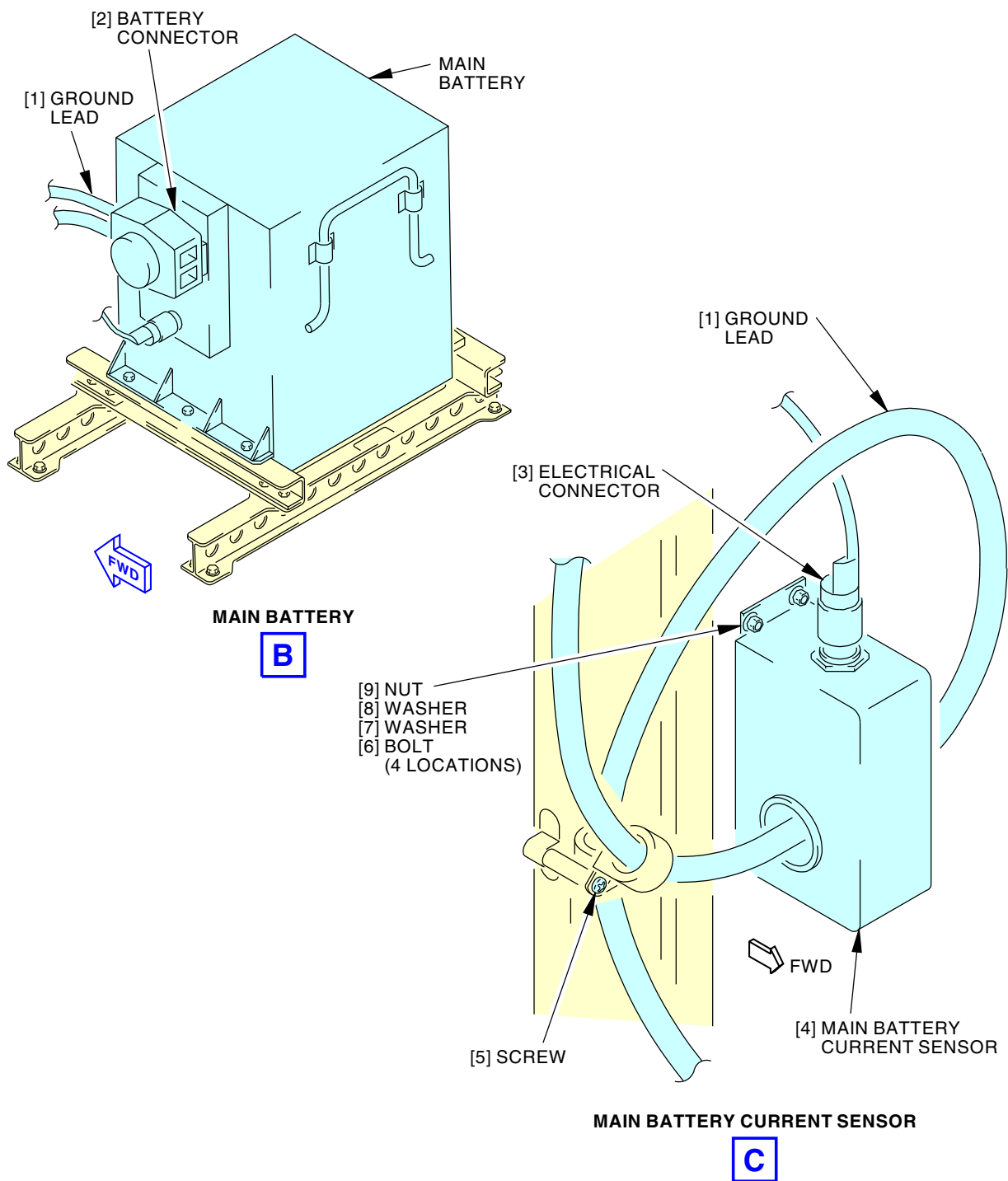
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**Main Battery Current Sensor Installation
Figure 401/24-31-03-990-801 (Sheet 2 of 2)**

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TASK 24-31-03-400-801

3. Main Battery Current Sensor Installation

(Figure 401)

A. General

- (1) This task is for the installation of the Main Battery Current Sensor. The Main Battery Current Sensor is located on a shelf between the E3 and E4 Equipment Rack in the Main Equipment Center.

B. References

Reference	Title
24-30-00-700-802	Main Battery Current Sensing System - Operational Test (P/B 501)
24-31-01-400-801	Main Battery Installation (P/B 401)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Main battery current sensor	24-31-03-01-010	ARO ALL

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Main Battery Current Sensor Installation

SUBTASK 24-31-03-420-001

- (1) Do these steps to install the main battery current sensor [4]:
 - (a) Attach the main battery current sensor [4] in position and install these parts that hold the current sensor.
 - 1) bolts [6]
 - 2) washers [7]
 - 3) washers [8]
 - 4) nuts [9].
 - (b) Move the ground lead [1] through the main battery current sensor.
 - (c) Install the screw [5] that hold the ground lead.



CAUTION

CONNECT EACH ELECTRICAL CONNECTOR TO THE BATTERY CONNECTION THAT HAS THE SAME POLARITY. IF THE POLARITIES DO NOT AGREE, DAMAGE TO THE BATTERY CAN OCCUR.

- (d) Connect the electrical connector [3], DM24037, to the main battery current sensor.
- (e) Connect the ground lead [1] to the battery connector [2].

SUBTASK 24-31-03-420-002

- (2) Do this task: Main Battery Installation, TASK 24-31-01-400-801.

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SUBTASK 24-31-03-860-003

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	2	C24620	MN BAT CHARGER

SUBTASK 24-31-03-860-004

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR

G. Main Battery Current Sensor Installation Test

SUBTASK 24-31-03-710-001

- (1) Do this task: Main Battery Current Sensing System - Operational Test, TASK 24-30-00-700-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-03-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

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APU BATTERY - MAINTENANCE PRATICES

1. General

A. This procedure has these tasks:

- (1) Disconnect APU Battery Power from the Airplane
- (2) Restore APU Battery Power to the Airplane.
- (3) APU Battery Connector Inspection

TASK 24-31-05-020-801

2. Disconnect APU Battery Power

(Figure 201)

A. General

- (1) This task disconnects the APU battery power. The APU battery is in the E10 equipment rack of the aft equipment center.

B. Location Zones

Zone	Area

162	Bulk Cargo Compartment, Right

C. Access Panels

Number	Name/Location

825	Bulk Cargo Door

D. Prepare for the Disconnection of APU Battery Power

SUBTASK 24-31-05-860-003

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name

K	12	C24301	APU BAT CHARGER PWR

Open this circuit breaker and install safety tag:

APU Auxiliary Panel, P49

Row	Col	Number	Name

A	1	C24622	APU BATTERY CHARGER

SUBTASK 24-31-05-010-002

- (2) Open this access panel:

Number	Name/Location

825	Bulk Cargo Door

E. Disconnection of APU Battery Power

SUBTASK 24-31-05-020-002

- (1) Do these steps to disconnect APU battery power:
 - (a) Disconnect the battery connector [1] from the APU battery.
 - (b) Disconnect the electrical connector [3] from the APU battery.

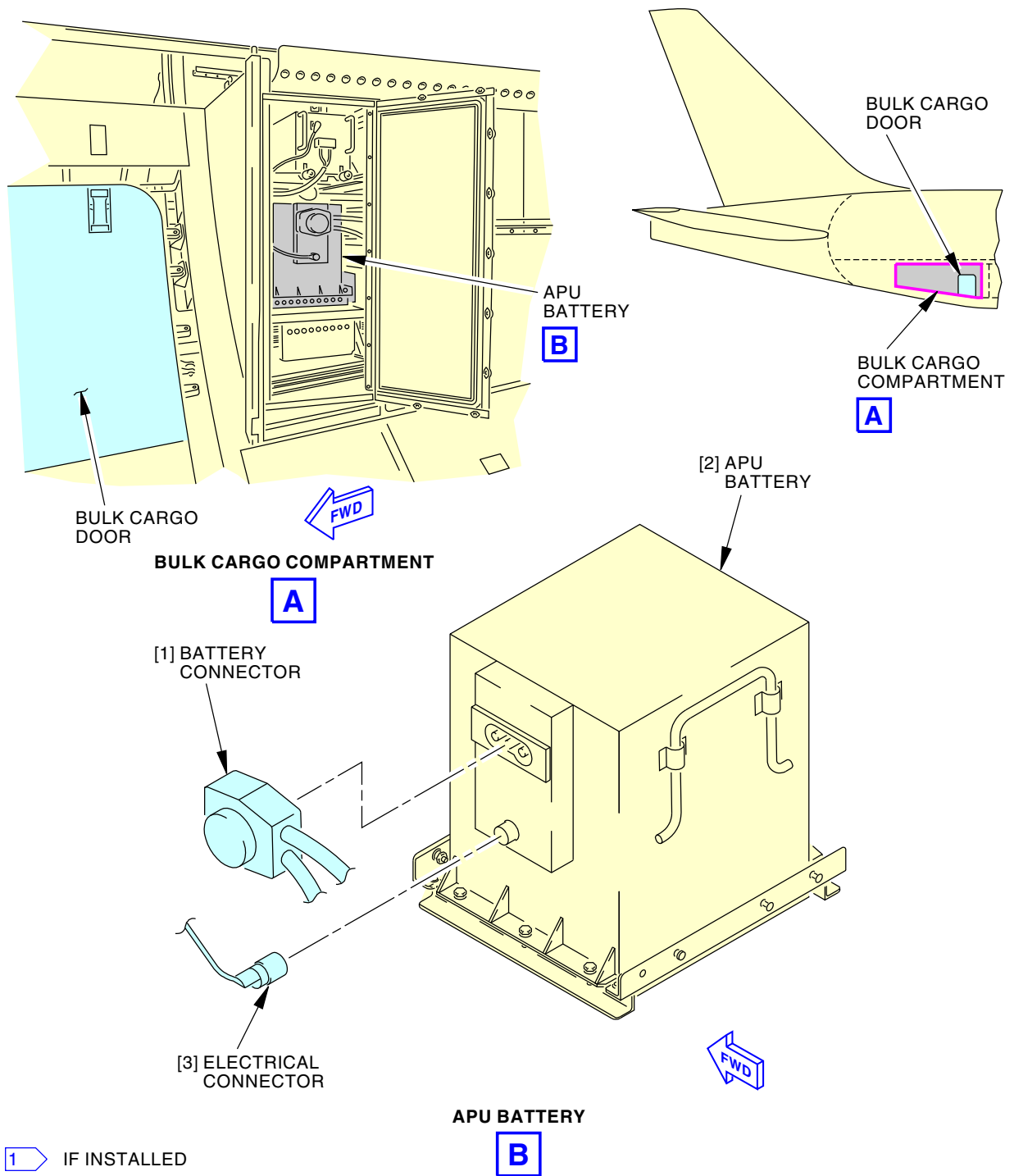
———— **END OF TASK** ————

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**APU Battery Connector Installation
Figure 201/24-31-05-990-803**

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TASK 24-31-05-420-801

3. Restore APU Battery Power

(Figure 201)

A. General

- (1) This task restores APU battery power to the airplane.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-30-00-700-803	APU Battery Current Sensing System - Operational Test (P/B 501)

C. Consumable Materials

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right

E. Access Panels

Number	Name/Location
825	Bulk Cargo Door

F. Restore Main Battery Power

SUBTASK 24-31-05-420-002

- (1) Do these steps to restore APU battery power:
- Reconnect the electrical connector [3] to the APU battery.
 - Reconnect the battery connector [1] to the APU Battery.
 - Turn the knob on the connector clockwise with your hand until it is tight.
 - Use the double twist method to install the MS20995CY20 lockwire, G02479 from the knob to one of the connector bolts Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801.

SUBTASK 24-31-05-860-005

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
K	12	C24301	APU BAT CHARGER PWR

Remove the safety tag and close this circuit breaker:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	1	C24622	APU BATTERY CHARGER

G. APU Battery Reconnection Test

SUBTASK 24-31-05-710-002

- (1) Do this task: APU Battery Current Sensing System - Operational Test, TASK 24-30-00-700-803.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-05-410-002

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

————— END OF TASK —————

TASK 24-31-05-200-801

4. APU Battery Connector Inspection

(Figure 201, Figure 202)

A. References

<u>Reference</u>	<u>Title</u>
20-11-00 P/B 201	STANDARD TORQUE VALUES - MAINTENANCE PRACTICES
SWPM 20-30-11	Standard Wiring Practices Manual
SWPM 20-62-25	Standard Wiring Practices Manual

B. Tools/Equipment

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

<u>Reference</u>	<u>Description</u>
SPL-12292	Gage Tool - Battery Inspection Part #: J24016-1 Supplier: 81205

C. Location Zones

<u>Zone</u>	<u>Area</u>
162	Bulk Cargo Compartment, Right

D. Prepare for the APU Battery Connector Inspection

SUBTASK 24-31-05-020-003

- (1) Do this task: Disconnect APU Battery Power, TASK 24-31-05-020-801.

E. APU Battery Connector Inspection

SUBTASK 24-31-05-200-003

- (1) Check the battery sensor connector, as follows:

- (a) If one of the following conditions is found, repair or replace the connector.
 - 1) Corrosion or pitting of the contacts.
 - 2) Burn marks on the contacts.
 - 3) Bent or pushed back contacts.
 - 4) Damage or corrosion to the connector body.

SUBTASK 24-31-05-200-004

- (2) Check the battery power connector, as follows:

- (a) Remove the two (2) bolts that hold the connector together.
- (b) If one of the following conditions is found, replace the main battery connector (SWPM 20-62-25).
 - 1) Corrosion and pitting of the power contacts or terminal lug mating surfaces.

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- 2) Excessive free play or broken pins on the handwheel-worm assembly.
- 3) Burn marks on the power contacts, terminal lug contact bar mating surfaces or terminal stud.

(c) FOR SPIRAL SPRING TYPE POWER CONTACTS;

- 1) Put the 0.3700 end of the battery inspection gage tool, SPL-12292, in the first connector power contact.

NOTE: One end of the battery inspection gage tool, SPL-12292, has the marking "0.3700". The other end of the battery inspection gage tool, SPL-12292, has the marking "0.3850".

NOTE: The 0.3700 end of the battery inspection gage tool, SPL-12292, examines if the connector power contact is worn or is less than the correct diameter. The 0.3850 end of the battery inspection gage tool, SPL-12292, examines if the connector power contact is more than the correct diameter.

- 2) Attach the force scale on the cable assembly.

NOTE: The force scale is part of the battery inspection gage tool, SPL-12292. The maximum weight of the force scale is 2 pounds with indications of 0.5 ounce.

- 3) Hold the cover with the connector power contacts and force scale in the vertical position.
- 4) Make sure that a force of 1 pound is necessary to remove the battery inspection gage tool, SPL-12292, from the first connector power contact.

- a) If the force to remove the battery inspection gage tool, SPL-12292, from the first connector power contact is less than 1 pound, replace the battery connector.

- 5) Do these steps again for the second connector power contact.

- 6) Put the 0.3850 end of the battery inspection gage tool, SPL-12292, into the first connector power contact.

- 7) Attach the force scale on the cable assembly.

- 8) Hold the cover with the connector power contacts and force scale in the vertical position.

- 9) Make sure that a force of more than 1 pound is necessary to remove the battery inspection gage tool, SPL-12292, from the first connector power contact.

- a) If the force to remove the battery inspection gage tool, SPL-12292, from the connector power contact is less than 1 pound, replace the battery connector.

- 10) Do these steps again for the second connector power contact.

(d) FOR LONGITUDINAL SPRING TYPE POWER CONTACTS;

- 1) Put the 0.3700 end of the battery inspection gage tool, SPL-12292, in the first connector power contact.

NOTE: One end of the battery inspection gage tool, SPL-12292, has the marking "0.3700". The other end of the battery inspection gage tool, SPL-12292, has the marking "0.3850".

NOTE: The 0.3700 end of the battery inspection gage tool, SPL-12292, examines if the connector power contact is worn or is less than the correct diameter. You do not use the 0.3850 end of the battery inspection gage tool, SPL-12292, for power contacts of the longitudinal spring type.

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- 2) Attach the force scale on the cable assembly.

NOTE: The force scale is part of the battery inspection gage tool, SPL-12292. The maximum weight of the force scale is 2 pounds with indications of 0.5 ounce.

- 3) Hold the cover with the connector power contacts and force scale in the vertical position.
- 4) Make sure that a force of 1 pound is necessary to remove the battery inspection gage tool, SPL-12292, from the first connector power contact.

- a) If the force to remove the battery inspection gage tool, SPL-12292, from the first connector power contact is less than 1 pound, replace the battery connector.

- 5) Do these steps again for the second connector power contact.

- (e) Stow the force scale and battery inspection gage tool, SPL-12292.

- (f) Check the contact bar as follows:

- 1) If the contact bar is held on with a screw, make sure the screw is tight and the contact bar is tight.

NOTE: Use the standard torque values for the screw (STANDARD TORQUE VALUES - MAINTENANCE PRACTICES, PAGEBLOCK 20-11-00/201).

- 2) If the contact bar is held with a rivet, make sure the contact bar can not be removed from the connector.

NOTE: The contact bar is loose on the connector.

- (g) If the terminal lug or stud is damaged, deformed, discolored or annealed, repair or replaced the terminal lug (SWPM 20-62-25).

NOTE: If the terminal lug is annealed, use a high temperature terminal lug to replace the lug (SWPM 20-30-11).

- (h) Make sure the terminal nuts are tightened to a torque of 145 ± 10 in-lb (16.4 ± 1.1 N·m) (SWPM 20-62-25).

NOTE: Do not pull or move the wires after the terminal nut is tightened.

- (i) If the shipping plugs are installed, removed the shipping plugs.

NOTE: Wire type contacts have less contact surface.

- (j) Put the connector together and install the two (2) bolts (SWPM 20-62-25).

- 1) Tighten the bolts to a torque of 32 ± 2 in-lb (3.6 ± 0.2 N·m).

- (k) Make sure the wires are centered in the connector openings.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-05-420-003

- (1) Do this task: Restore APU Battery Power, TASK 24-31-05-420-801.

————— END OF TASK —————

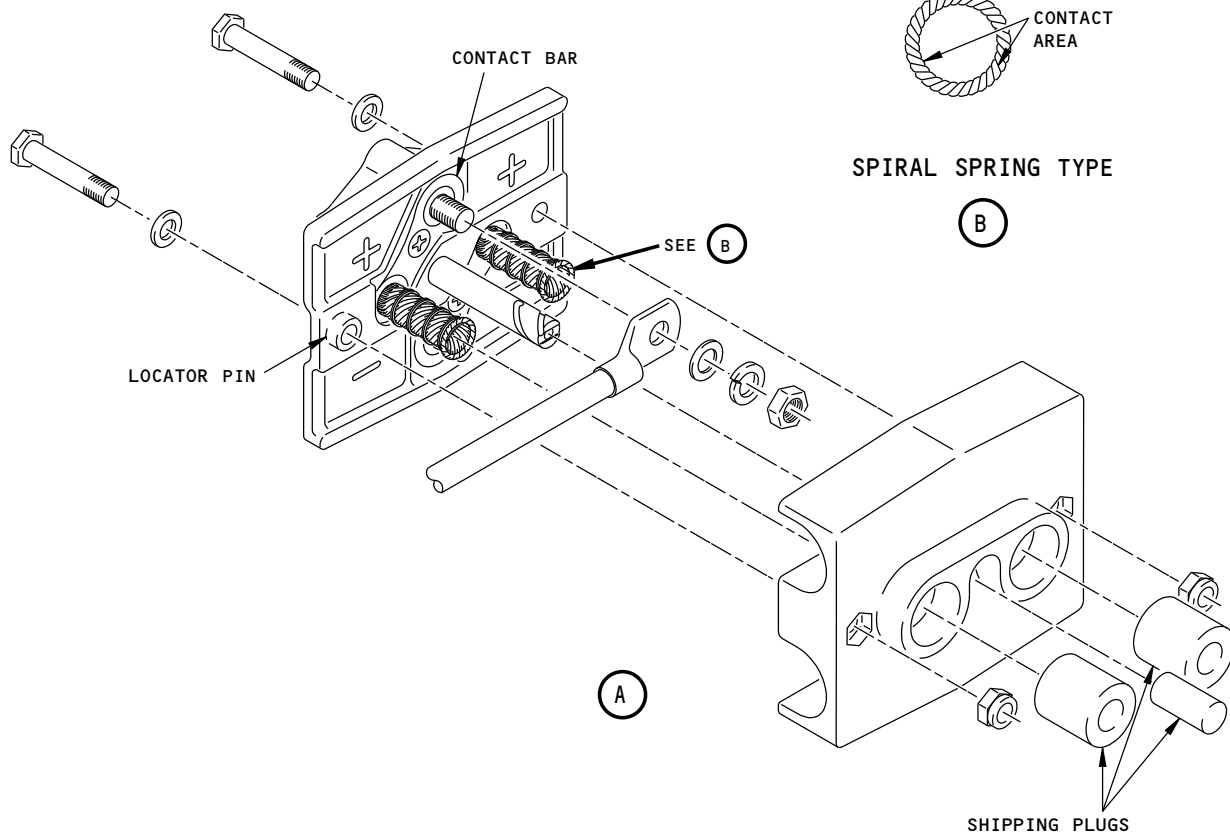
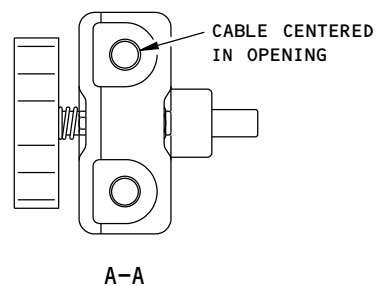
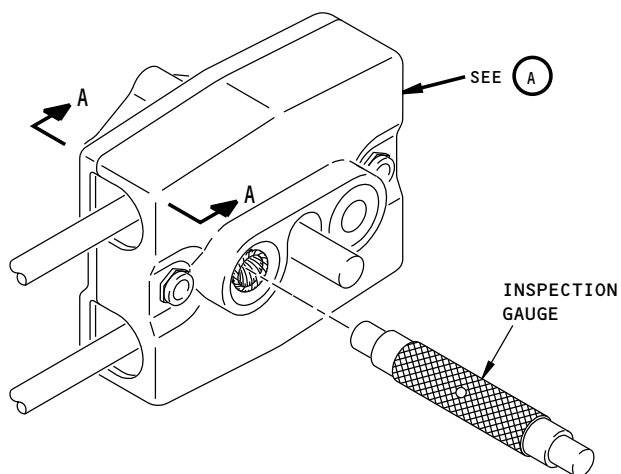
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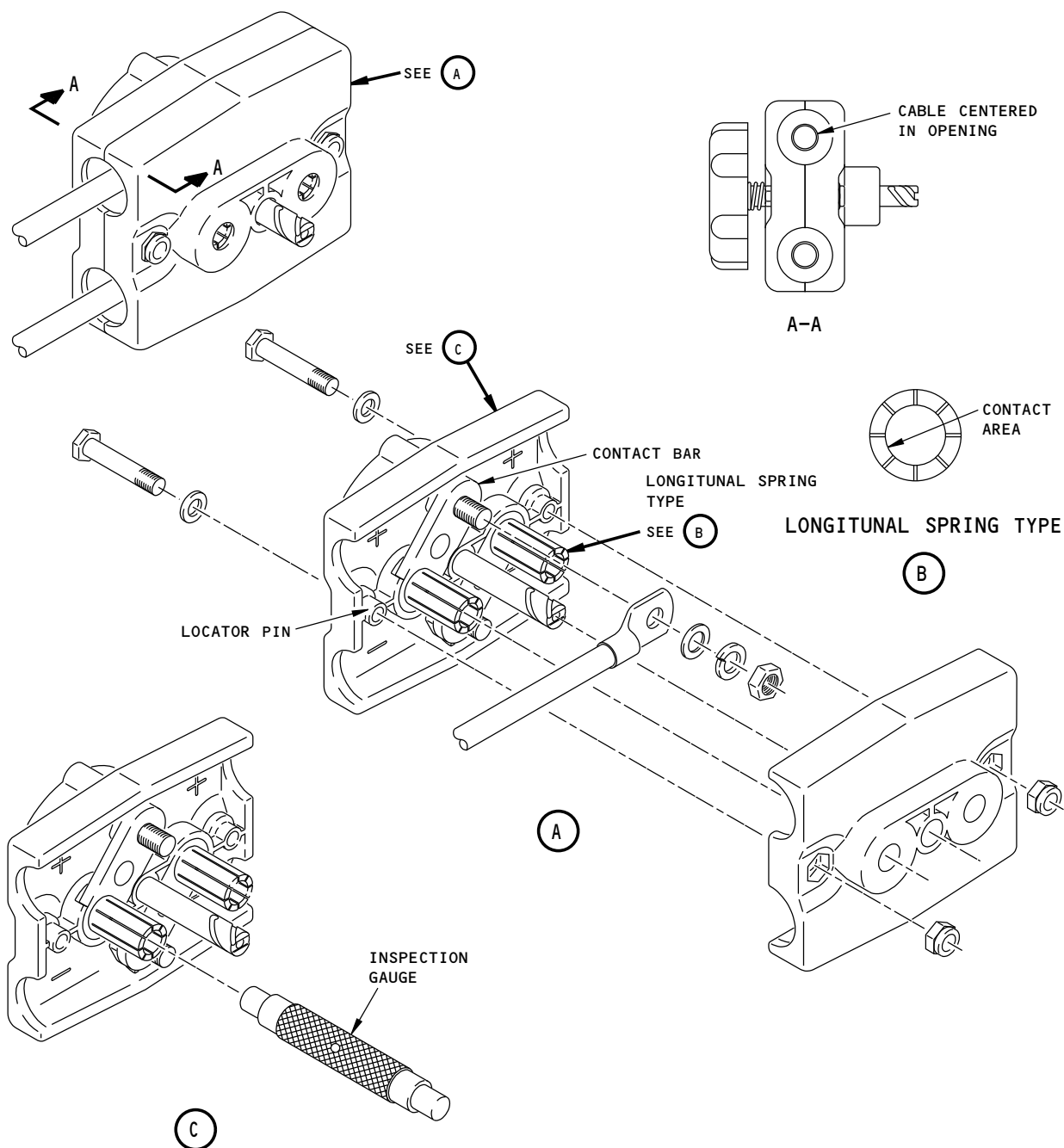
**Battery Connector - Inspection/Check
Figure 202/24-31-05-990-804 (Sheet 1 of 2)**

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**Battery Connector - Inspection/Check
Figure 202/24-31-05-990-804 (Sheet 2 of 2)**

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APU BATTERY - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU battery
- (2) An installation of the APU battery.

TASK 24-31-05-000-801

2. APU Battery Removal

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the removal of the APU Battery. The APU Battery is in the E10 equipment rack of the aft equipment center.

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-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
SPL-1630	Equipment - Hoist, APU Battery. Used with Customer Furnished Fishpole Hoist. Part #: J24005-1 Supplier: 81205

C. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right

D. Access Panels

Number	Name/Location
825	Bulk Cargo Door

E. Prepare for the Removal

SUBTASK 24-31-05-860-001

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	12	C24301	APU BAT CHARGER PWR

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SUBTASK 24-31-05-860-006

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER

SUBTASK 24-31-05-010-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

F. APU Battery Removal

SUBTASK 24-31-05-020-001

- (1) Do these steps to remove the APU battery:
- Remove the battery connector [1] from the APU battery [2].
 - Remove the electrical connector [5] from the APU battery [2].
 - If there is a retainer block [6] installed on each side of the E10-1 shelf, remove the two retainer blocks [6].
 - Loosen the captive screw [7] and slide out the E10-1 shelf.
 - Remove the screws [3] and washers [4] that attaches the APU battery [2] to the equipment rack shelf.
 - Set up the APU battery used with customer furnished fishpole hoist equipment, SPL-1630 on the airplane as follows:
 - Insert the top of the hoist beam assembly into the upper cargo tiedown fitting.
 - Insert the bottom of the hoist beam assembly into the lower cargo tiedown fitting.
 - Attach the spreader bar assembly to the APU Battery handles, then close the sliders located on the top of the spreader bar assembly to lock it in place.
 - Attach the cable fishpole hoist, COM-1563 to the APU battery used with customer furnished fishpole hoist equipment, SPL-1630 by attaching to the hoist beam assembly and the spreader bar assembly.



STAY AWAY FROM THE AREA BELOW THE APU BATTERY WHEN THE BATTERY IS HUNG FROM THE HOIST. DO NOT MOVE THE APU BATTERY ABOVE PERSONS DURING REMOVAL. THE BATTERY WEIGHS 106 POUNDS AND FAILURE OF THE HOIST CAN CAUSE INJURIES TO PERSONS.

- (h) Remove the APU battery [2].
- Use the cable fishpole hoist, COM-1563 to raise the APU battery [2] and pivot it clear of the battery tray.
 - Lower the APU battery [2] to the cargo deck.
 - Remove the slide collar pin from the hoist beam assembly slide collar and lower the adjust tube to the lower adjust stop.
 - Raise the APU battery [2] from the cargo deck and pivot it out of the cargo door opening.

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- 5) Lower the APU battery [2] to the ground.

———— **END OF TASK** ————

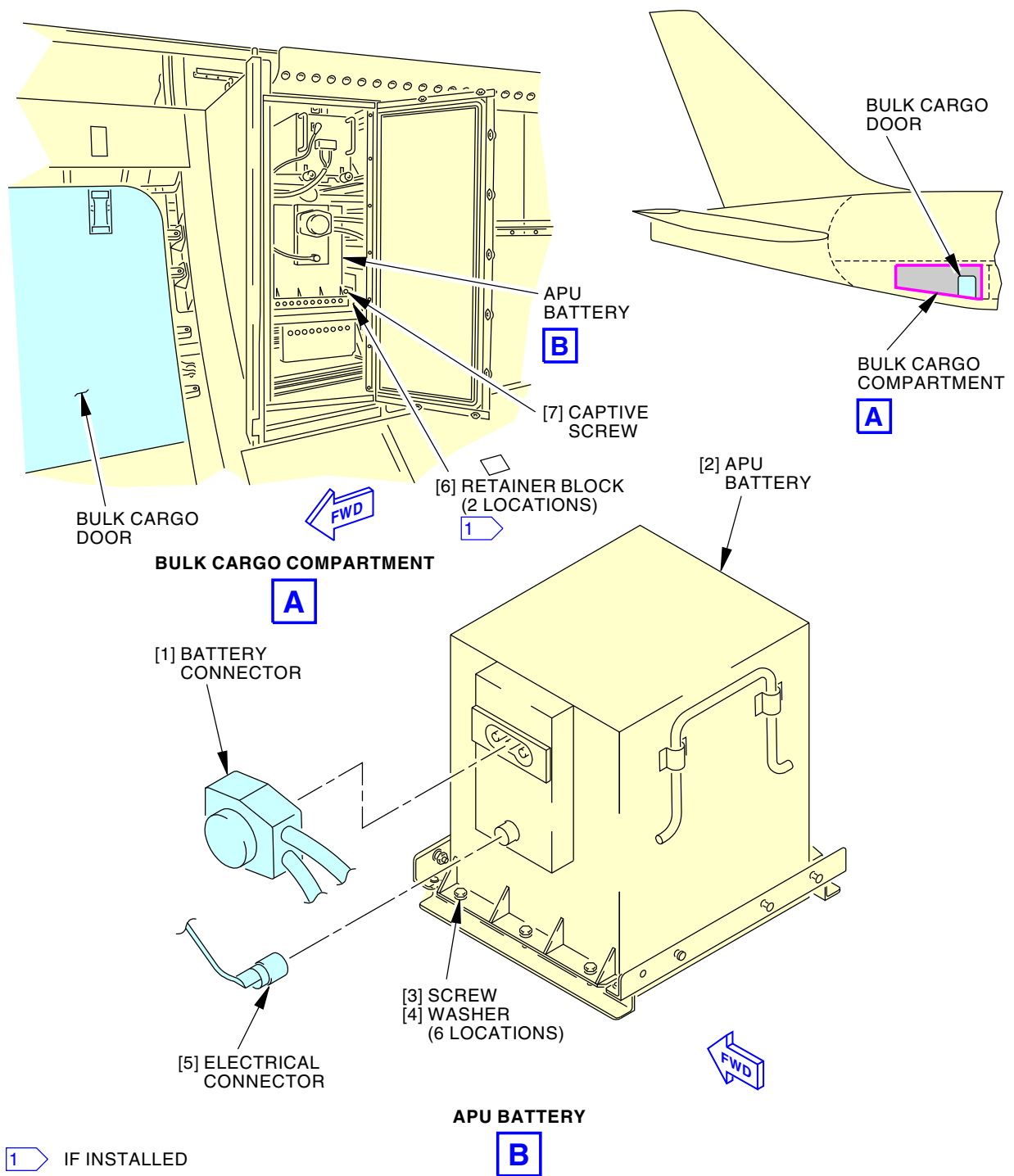
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**APU Battery Installation
Figure 401/24-31-05-990-801**

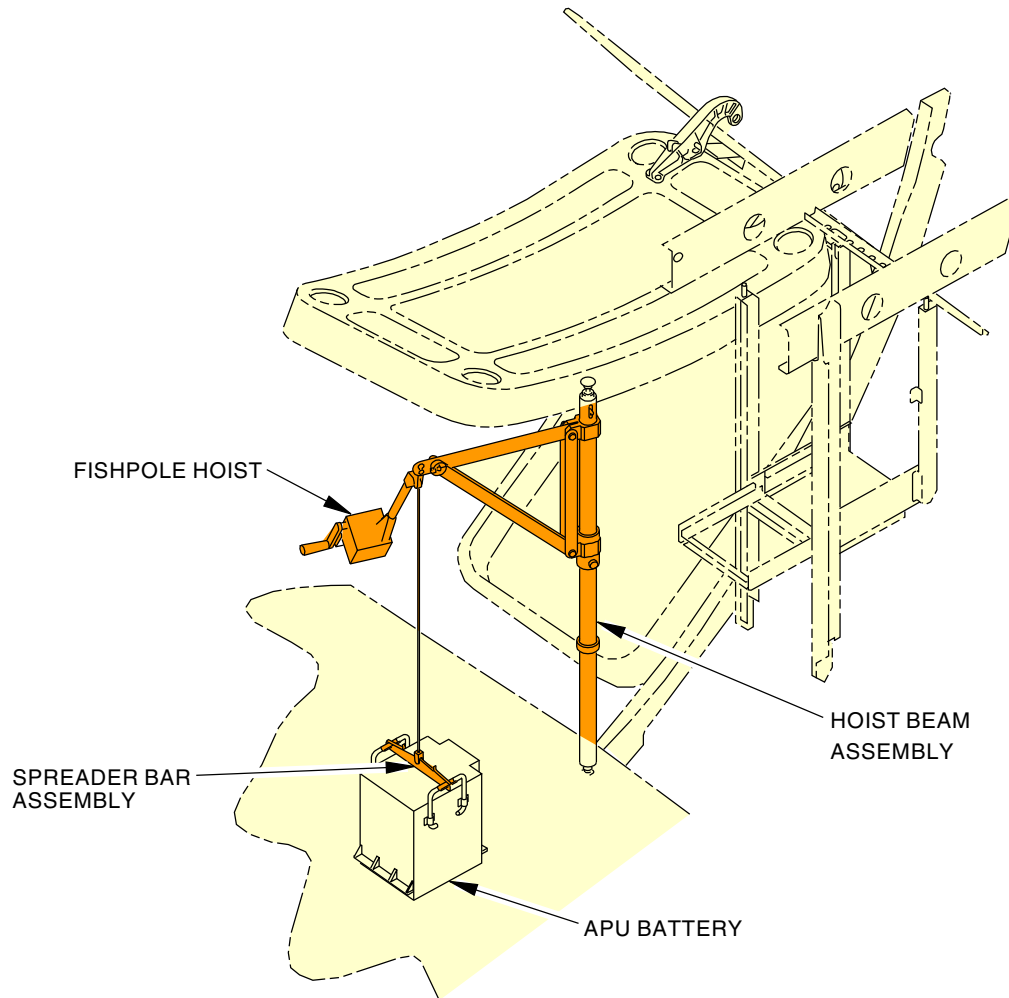
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E66203 S0006408463_V2

APU Battery Hoist Equipment
Figure 402/24-31-05-990-802

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TASK 24-31-05-400-801

3. APU Battery Installation

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task is for the installation of the APU battery.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-30-00-700-803	APU Battery Current Sensing System - Operational Test (P/B 501)

C. Tools/Equipment

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

Reference	Description
COM-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
SPL-1630	Equipment - Hoist, APU Battery. Used with Customer Furnished Fishpole Hoist. Part #: J24005-1 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

E. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right

F. Access Panels

Number	Name/Location
825	Bulk Cargo Door

G. APU Battery Installation

SUBTASK 24-31-05-420-001

(1) Do these steps to install the APU battery [2]:

NOTE: The battery can be installed charged or discharged. Before you do the installation test, the battery needs to be fully charged. To fully charge the discharged battery, it can take up to one hour.

(a) Set up the APU battery used with customer furnished fishpole hoist equipment, SPL-1630 on the airplane as follows:

- 1) Insert the top of the hoist beam assembly into the upper cargo tiedown fitting.
- 2) Insert the bottom of the hoist beam assembly into the lower cargo tiedown fitting.

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- 3) Remove the slide collar pin from the hoist beam assembly and lower the adjust tube to the lower adjust stop.
- 4) Attach the spreader bar assembly to the APU Battery handles, then close the sliders located on the top of the spreader bar assembly to lock it in place.
- (b) Attach the cable fishpole hoist, COM-1563 to the APU battery used with customer furnished fishpole hoist equipment, SPL-1630 by attaching to the hoist beam assembly and the spreader bar assembly.



WARNING

STAY AWAY FROM THE AREA BELOW THE APU BATTERY WHEN THE BATTERY IS HUNG FROM THE HOIST. DO NOT MOVE THE APU BATTERY ABOVE PERSONS DURING REMOVAL. THE BATTERY WEIGHS 106 POUNDS AND FAILURE OF THE HOIST CAN CAUSE INJURIES TO PERSONS.

- (c) Use the cable fishpole hoist, COM-1563 to raise the battery [2] and pivot it into the cargo door opening.
 - 1) Lower the APU battery [2] to the cargo deck.
 - 2) Raise the adjust tube to the upper adjust stop and install the slide collar pin into the hoist beam assembly slide collar.
 - 3) Raise the APU battery [2] from the cargo deck and put it into position on the E10-1 shelf.
- (d) Install the screws [3] and washers [4] that attaches the APU Battery to the shelf.
- (e) Slide the E10-1 shelf in and tighten the captive screws [7].
- (f) If the two retainer blocks [6] were removed, install the retainer block [6] to each side of the E10-1 shelf.
- (g) Attach electrical connector [5] to the APU battery [2].
- (h) Attach battery connector [1] to the APU battery [2].
 - 1) Turn the knob on the connector clockwise with your hand until it is tight.
 - 2) Use the double twist method to install MS20995CY20 lockwire, G02479 from the knob to one of the connector bolts (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801).

SUBTASK 24-31-05-860-002

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	12	C24301	APU BAT CHARGER PWR

SUBTASK 24-31-05-860-007

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER

H. APU Battery Installation Test

SUBTASK 24-31-05-710-001

- (1) Do this task: APU Battery Current Sensing System - Operational Test, TASK 24-30-00-700-803.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-05-410-001

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

————— **END OF TASK** —————

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APU BATTERY CHARGER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU battery charger
- (2) An installation of the APU battery charger.

TASK 24-31-06-000-801

2. APU Battery Charger Removal

(Figure 401)

A. **General**

- (1) This task is for the removal of the APU battery charger [1]. The APU battery charger [1] is on the E10 Equipment Rack.

B. **References**

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. **Location Zones**

Zone	Area
162	Bulk Cargo Compartment, Right

D. **Access Panels**

Number	Name/Location
825	Bulk Cargo Door

E. **Prepare for the Removal**

SUBTASK 24-31-06-860-001

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	12	C24301	APU BAT CHARGER PWR

SUBTASK 24-31-06-010-001

- (2) Open this access door:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

SUBTASK 24-31-06-860-002

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER

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F. APU Battery Charger Removal

SUBTASK 24-31-06-860-003



DO NOT TOUCH THE APU BATTERY CHARGER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE APU BATTERY CHARGER.

(1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-31-06-020-001

- (2) Do these steps to remove the APU battery charger [1]:
- (a) Remove the electrical connector [2] from the APU battery charger [1].
 - (b) Remove the screws [7] and the cover [3] from the terminal block on the APU battery charger [1].
 - (c) Do these steps to remove the wires [11] from the terminal block:
 - 1) Remove the nut [6], lockwasher [9], and washer [10] from the terminal block.
 - 2) Disconnect the wire [11] from the terminal block.
 - 3) Remove the nut [8], lockwasher [9] and washer [10] from the terminal block.
 - 4) Disconnect the wire [11] from the terminal block.
 - (d) Remove the APU battery charger [1]. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

———— **END OF TASK** ————

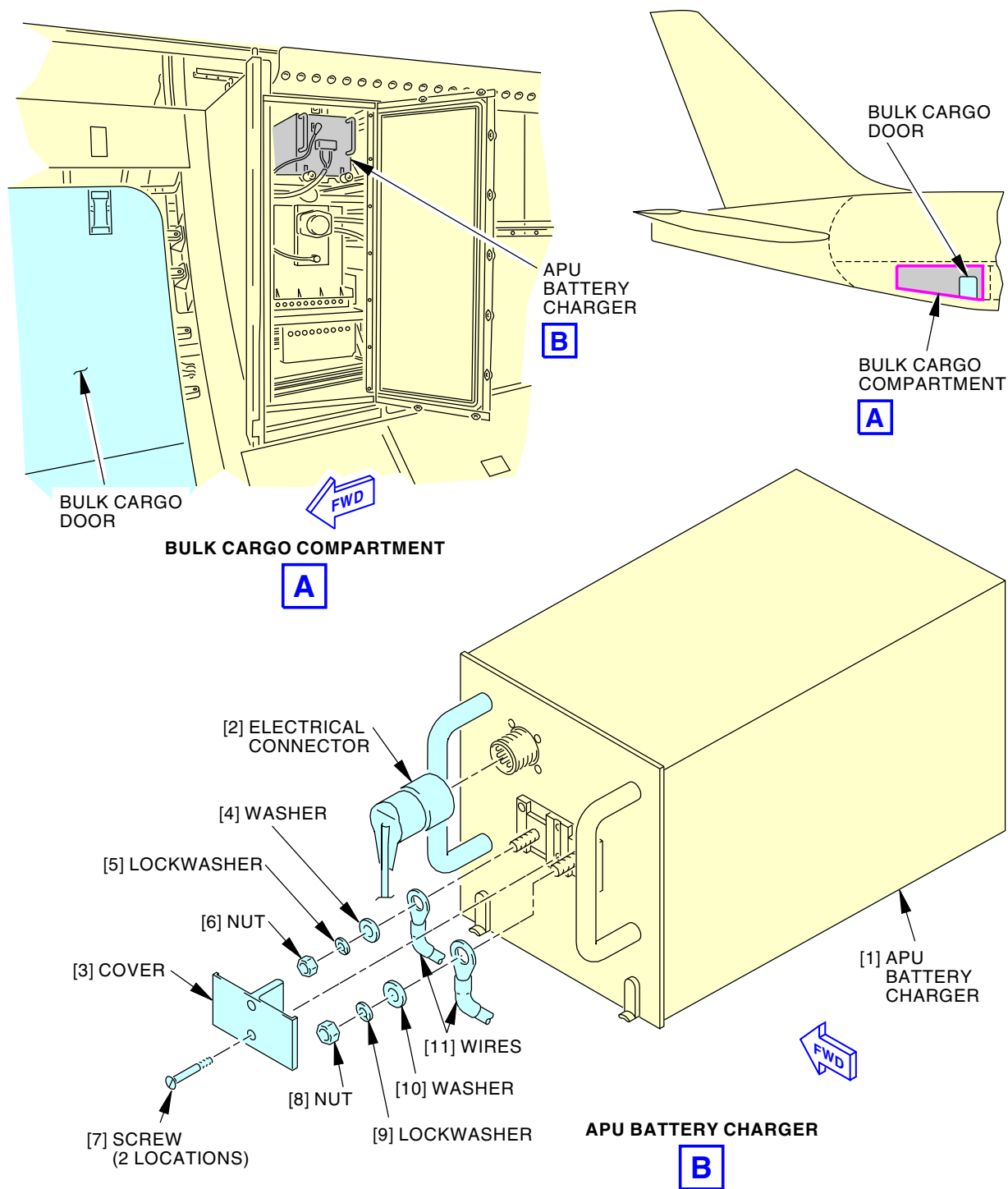
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APU Battery Charger Installation
Figure 401/24-31-06-990-801

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TASK 24-31-06-400-801

3. APU Battery Charger Installation

(Figure 401)

A. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

B. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right

C. Access Panels

Number	Name/Location
825	Bulk Cargo Door

D. APU Battery Charger Installation

SUBTASK 24-31-06-860-004



CAUTION DO NOT TOUCH THE APU BATTERY CHARGER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE APU BATTERY CHARGER.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-31-06-420-001

- (2) Install the APU battery charger [1]. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-31-06-420-002

- (3) Do these steps to connect the APU battery charger [1]:
- (a) Do these steps to reconnect the wires [11] to the terminal block:
 - 1) Connect the wires [11] to the terminal block on the APU battery charger [1].
 - 2) Install the washer [10], lockwasher [9], and nut [8].
 - 3) Tighten nut [8] on the positive terminal to a torque of approximately 90 ±10 in-lb (10 ±1 N·m).
 - 4) Install the washer [4], lockwasher [5], and nut [6].
 - 5) Tighten the nut [6] on the negative terminal to a torque of approximately 90 ±10 in-lb (10 ±1 N·m).
 - (b) Attach the cover [3] to the terminal block.
 - (c) Install the screws [7].
 - (d) Connect the electrical connector [2] to the APU battery charger [1].

E. APU Battery Charger Installation Test

SUBTASK 24-31-06-860-005

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

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SUBTASK 24-31-06-860-006

- (2) Push the PRIMARY EXT PWR switch on the P5 panel to the AVAIL position.
 - (a) Make sure the AVAIL light in the PRIMARY EXT PWR switch comes on.

SUBTASK 24-31-06-860-011

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER

SUBTASK 24-31-06-860-007

- (4) Push the PRIMARY EXT PWR switch to the ON position.
 - (a) Make sure the ON light in the switch comes on.
 - (b) Make sure the electrical maintenance page is displayed on the lower EICAS.

SUBTASK 24-31-06-860-012

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	12	C24301	APU BAT CHARGER PWR

SUBTASK 24-31-06-860-008

- (6) Make sure these indications occur on the maintenance page:

NOTE: During the charge mode, the voltage will increase to 29 - 31 volts and current will drop to 10+/-2 amps.

 - (a) For the APU/BAT (Table 401);

Table 401/24-31-06-993-802

VOLTAGE	AMPS
DC-V	24 to 31
DC-A	65+/-5

SUBTASK 24-31-06-860-009

- (7) Make sure the BAT CHARGER APU message does not show on the EICAS display.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-06-860-013

- (1) Remove electrical power if it is no longer needed, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-31-06-410-001

- (2) Close this access door:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

————— **END OF TASK** —————

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APU BATTERY CURRENT SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the APU battery current sensor
- (2) An installation of the APU battery current sensor.

TASK 24-31-07-000-801

2. APU Battery Current Sensor Removal

(Figure 401)

A. **General**

- (1) This task is for the removal of the APU battery current sensor. The APU battery current sensor is located on a shelf in the E9 equipment rack.

B. **Location Zones**

Zone	Area
162	Bulk Cargo Compartment, Right

C. **Access Panels**

Number	Name/Location
825	Bulk Cargo Door

D. **Prepare for the Removal**

SUBTASK 24-31-07-010-001

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

SUBTASK 24-31-07-860-001

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER
A	2	C24645	APU BATTERY VOLTAGE SENSE
A	3	C49602	APUC 2
A	4	C29621	RAT AUTO/MANUAL CONTROL

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	12	C24301	APU BAT CHARGER PWR

E. **APU Battery Current Sensor Removal**

SUBTASK 24-31-07-020-001

- (1) Do these steps to remove the APU battery current sensor [4]:
 - (a) Remove the battery connector [1] from the APU battery [2].
 - (b) Remove the ground lead [3] from the battery connector.
 - (c) Remove the screw [8] and clamp [9] that holds the ground lead [3].
 - (d) Remove the electrical connector [5], DM24038, from the APU battery current sensor [4].

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- (e) Remove the screws [7] and washers [6] which hold the APU battery current sensor [4].
- (f) Remove the APU battery current sensor [4] (slide up and off of ground lead).

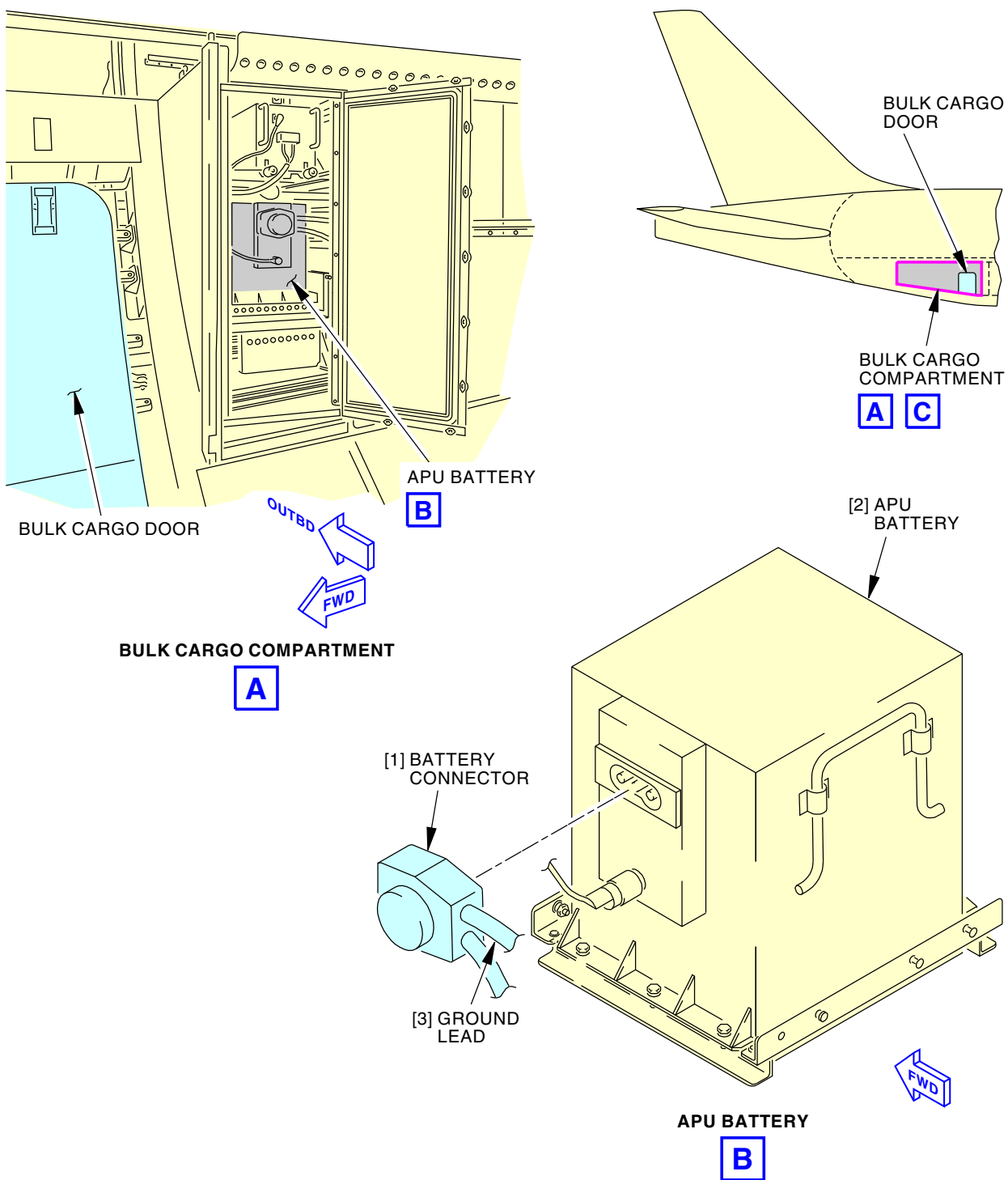
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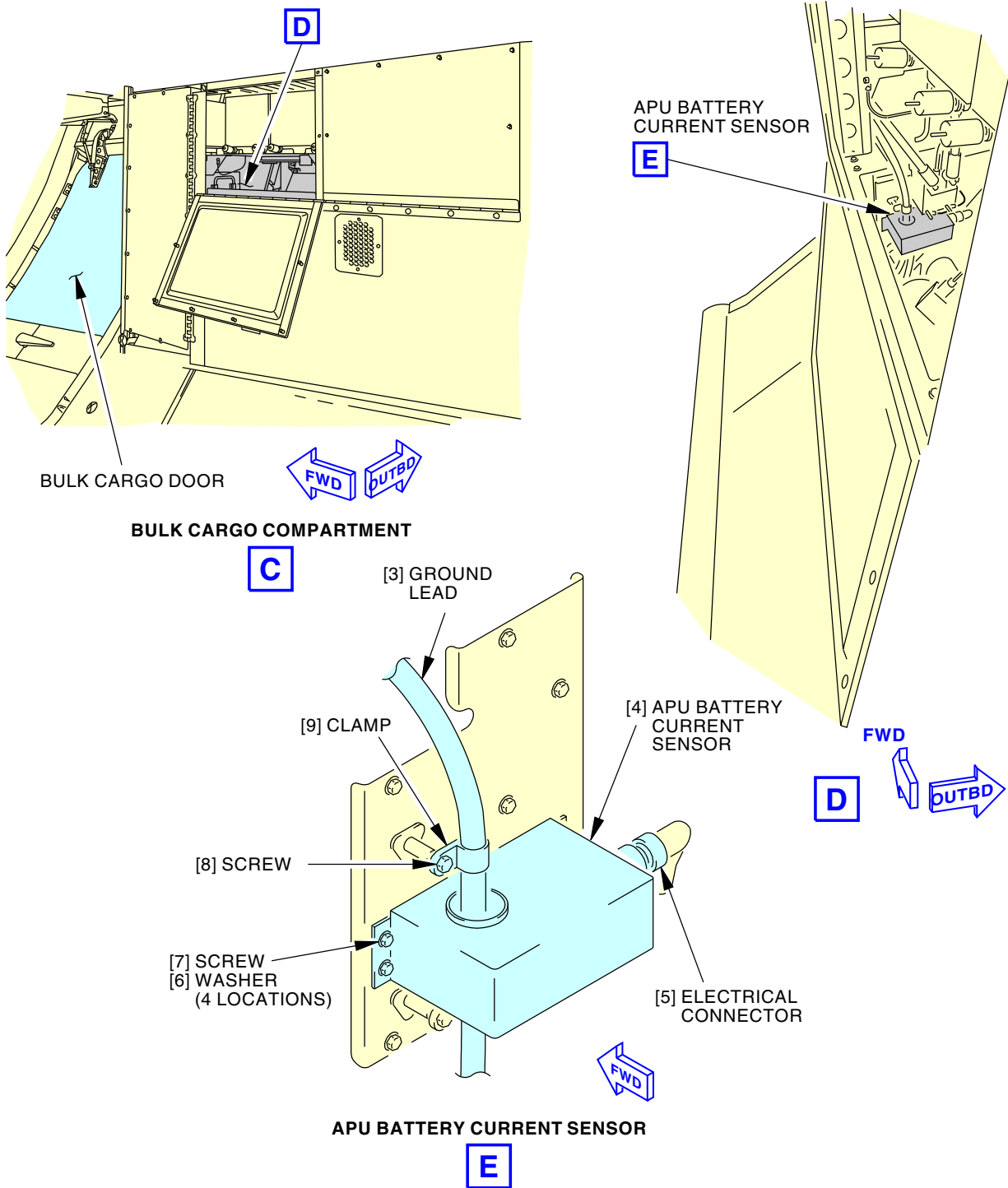
**APU Battery Current Sensor Installation
Figure 401/24-31-07-990-801 (Sheet 1 of 2)**

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**APU Battery Current Sensor Installation
Figure 401/24-31-07-990-801 (Sheet 2 of 2)**

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TASK 24-31-07-400-801

3. APU Battery Current Sensor Installation

(Figure 401)

A. General

- (1) This task is for the installation of the APU battery current sensor. The APU battery current sensor is located on a shelf in the E9 equipment rack.

B. References

Reference	Title
24-30-00-700-803	APU Battery Current Sensing System - Operational Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	APU battery current sensor	24-31-07-01-005	ARO ALL

D. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right

E. Access Panels

Number	Name/Location
825	Bulk Cargo Door

F. APU Battery Current Sensor Installation

SUBTASK 24-31-07-420-001

- (1) Do these steps to install the APU battery current sensor [4]:
- (a) Put the APU battery current sensor [4] in its position.
 - (b) Install the washers [6] and screws [7].
 - (c) Install the screw [8] and clamp [9] which hold the ground lead.
 - (d) Connect the electrical connector [5], DM24038, to the APU battery current sensor [4].
 - (e) Connect the ground lead [3] to the battery connector [1].
 - (f) Connect the battery connector [1] to the APU battery [2].

SUBTASK 24-31-07-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	1	C24622	APU BATTERY CHARGER
A	2	C24645	APU BATTERY VOLTAGE SENSE
A	3	C49602	APUC 2
A	4	C29621	RAT AUTO/MANUAL CONTROL

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
K	12	C24301	APU BAT CHARGER PWR

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G. APU Battery Current Sensor Installation Test

SUBTASK 24-31-07-710-001

- (1) Do this task: APU Battery Current Sensing System - Operational Test, TASK 24-30-00-700-803.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-07-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

————— **END OF TASK** —————

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APU CRANK CONTACTOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) APU Crank Contactor Removal
- (2) APU Crank Contactor Installation.

TASK 24-31-09-000-801

2. APU Crank Contactor Removal

(Figure 401)

A. **General**

- (1) This task is for the removal of the APU Crank Contactor. The APU crank contactor is installed in the E12-1.

B. **Location Zones**

Zone	Area
162	Bulk Cargo Compartment, Right

C. **Access Panels**

Number	Name/Location
825	Bulk Cargo Door

D. **Prepare for the Removal**

SUBTASK 24-31-09-860-001

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

Standby Power Management Panel, P310

Row	Col	Number	Name
K	8	C24652	APU CRK CTRL

SUBTASK 24-31-09-860-002

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	1	C24622	APU BATTERY CHARGER

SUBTASK 24-31-09-010-001

- (3) Open this access panel:

Number	Name/Location
825	Bulk Cargo Door

SUBTASK 24-31-09-860-010

- (4) Make sure ten minutes have gone by since the last APU start or APU shutdown.

NOTE: The time interval of ten minutes is necessary for the APU battery to discharge to less than 50 amps or less than 10V DC.

SUBTASK 24-31-09-020-001

- (5) Disconnect connector DM24012A from the APU battery.

SUBTASK 24-31-09-010-002

- (6) Open the access panel to get access to the APU crank contactor.

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E. APU Crank Contactor Removal

ARO ALL; AIRPLANES WITH IMPROVED APU CRANK CONTACTOR

SUBTASK 24-31-09-020-006

- (1) Remove the terminal wires [3] from the APU crank contactor:
 - (a) Loosen and remove the terminal nuts [5] and washers [4] from the terminal studs.
 - (b) Disconnect the terminal wires [3] from the terminal studs.

SUBTASK 24-31-09-020-007

- (2) Remove the wires [10] from the APU crank contactor:
 - (a) Loosen and remove the nuts [9] and washers [8] from the studs.
 - (b) Disconnect the wires [10] from the studs.

SUBTASK 24-31-09-020-008

- (3) Remove the APU crank contactor [15] from the E12 shelf:
 - (a) Loosen and remove the three screws [13], washers [1], and washer [14] with the APU crank contactor [15].

ARO ALL

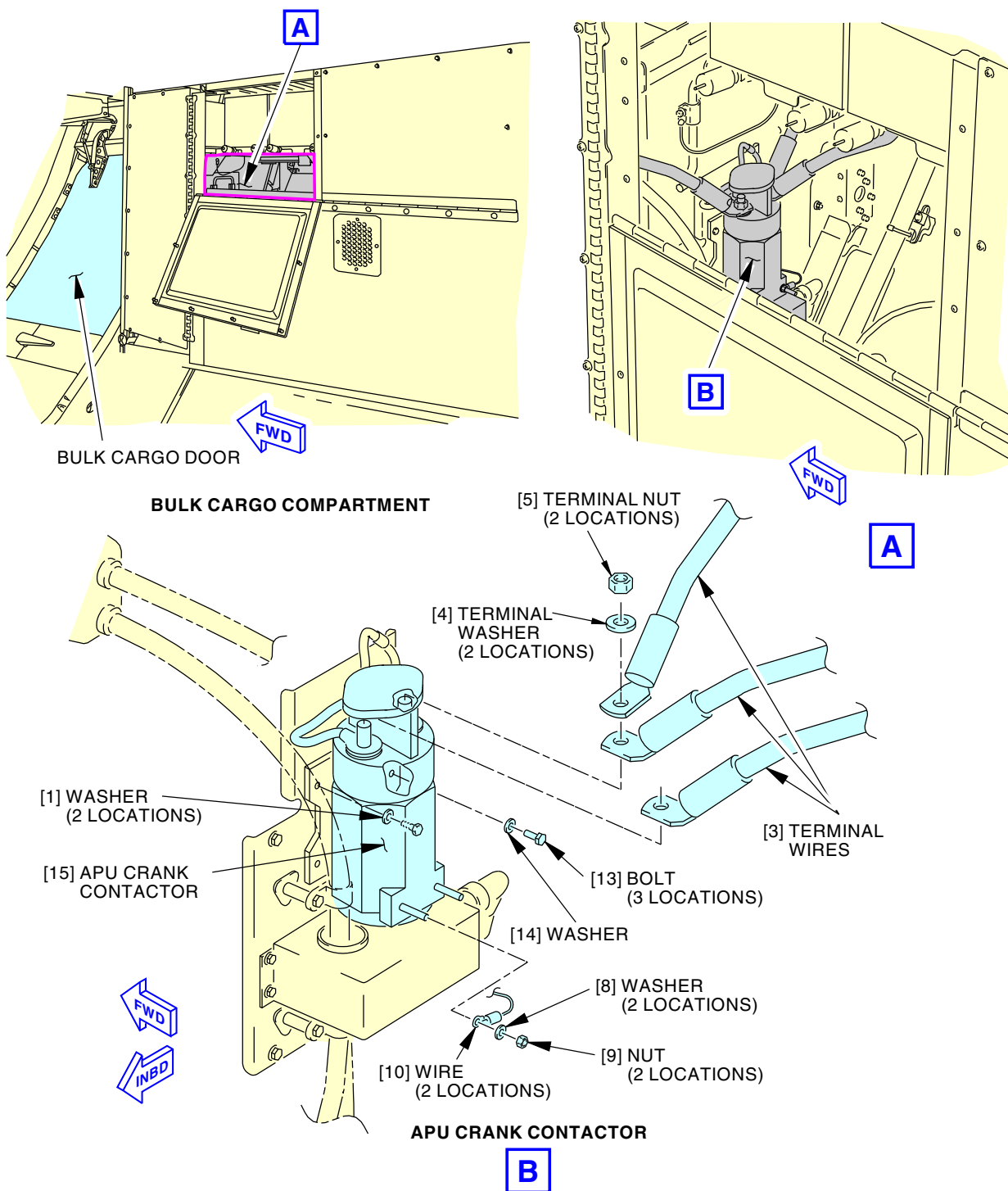
———— **END OF TASK** ————

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**APU Crank Contactor Installation
Figure 401/24-31-09-990-801**

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CRANK CONTACTOR

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TASK 24-31-09-400-801

3. APU Crank Contactor Installation

(Figure 401)

A. General

- (1) This task is for the installation of the APU crank contactor.

B. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
15	Contactor	24-31-09-01-105	ARO ALL

D. Location Zones

Zone	Area
162	Bulk Cargo Compartment, Right
825	Bulk Cargo Door

E. Access Panels

Number	Name/Location
825	Bulk Cargo Door

F. APU Crank Contactor Installation

SUBTASK 24-31-09-860-003

- (1) Make sure that this circuit breaker is open and has safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
K	8	C24652	APU CRK CTRL

SUBTASK 24-31-09-860-004

- (2) Make sure that this circuit breaker is open and has safety tag:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	1	C24622	APU BATTERY CHARGER

ARO ALL; AIRPLANES WITH IMPROVED APU CRANK CONTACTOR

SUBTASK 24-31-09-420-006

- (3) Install the APU crank contactor [15] to the E12 shelf:
- (a) Install the two washers [1], and screw [13] to the APU crank contactor [15].
 - (b) Install the washer [14] and screws [13] to the APU crank contactor [15].

SUBTASK 24-31-09-420-007

- (4) Install the wires [10] to the APU crank contactor [15]:
- (a) Connect the wires [10] to the studs.
 - (b) Install the washers [8] and nuts [9] on the studs.
 - (c) Tighten the nuts [9] to 23.0 in-lb (2.60 N·m) - 25.0 in-lb (2.82 N·m)

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ARO ALL; AIRPLANES WITH IMPROVED APU CRANK CONTACTOR (Continued)

SUBTASK 24-31-09-420-008

- (5) Install the terminal wires [3] to the APU crank contactor:
 - (a) Connect the terminal wires [3] to the terminal studs.
 - (b) Install the terminal washers [4] and nuts [5] on the terminal studs.
 - (c) Tighten the nuts [5] to 107.5 in-lb (12.1 N·m)-117.5 in-lb (13.3 N·m).

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SUBTASK 24-31-09-420-005

- (6) Install connector DM24012A (+ terminal) to the APU battery:

SUBTASK 24-31-09-410-002

- (7) Close the access panel.

SUBTASK 24-31-09-860-005

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER

SUBTASK 24-31-09-860-006

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	8	C24652	APU CRK CTRL

G. APU Crank Contactor Installation Test

SUBTASK 24-31-09-860-007

- (1) Start the APU. To start it, do this task: APU Starting and Operation, TASK 49-11-00-860-804.

SUBTASK 24-31-09-860-008

- (2) Make sure that the APU operates.

H. Put the Airplane Back to its Usual Condition

SUBTASK 24-31-09-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

SUBTASK 24-31-09-860-009

- (2) Stop the APU. To stop it, do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

————— END OF TASK —————

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TRANSFORMER RECTIFIER UNITS (TRU) (4) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the transformer rectifier unit (TRU)
- (2) An installation of the transformer rectifier unit (TRU).

B. The removal and installation procedures are the same for all of the units.

TASK 24-32-01-000-801

2. Transformer Rectifier Unit Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the removal of the TRU. There are 4 TRUs in the Electrical Power Generation System. The left TRU is located on the E1-1 Equipment Rack. The right TRU is located on the E2-2 Equipment Rack. There are two center TRUs. The TRU C1 is located on the E3-2 Equipment Rack. The TRU C2 is located on the E3-2 Equipment Rack.

B. References

<u>Reference</u>	<u>Title</u>
20-10-01-000-801	E/E Box Removal (P/B 401)

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

E. Prepare for the Removal

SUBTASK 24-32-01-010-001

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-32-01-860-001

- (2) Before you remove the Right TRU, do these steps:

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	1	C24666	DC BUS TIE R

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	1	C24302	TRU R

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ARO 001-010 (Continued)

(Continued)

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 011-999			
A	6	C24302	TRU R

ARO ALL

SUBTASK 24-32-01-860-002

- (3) Before you remove the Left TRU, do these steps:
- (a) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	28	C24629	DC BUS TIE L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C24303	TRU L

SUBTASK 24-32-01-860-003

- (4) Before you remove the TRU C1, do these steps:
- (a) Open these circuit breakers and install safety tags:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C24341	TRU C1

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	13	C24643	MN BAT RLY CTRL
M	16	C24667	CAPT INST ALTN

SUBTASK 24-32-01-860-004

- (5) Before you remove the TRU C2, do these steps:
- (a) Open these circuit breakers and install safety tags:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	5	C24654	F/O INST ALTN

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	3	C24340	TRU C2
ARO 011-999			
A	5	C24340	TRU C2

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F. Transformer Rectifier Unit (TRU) Removal

SUBTASK 24-32-01-020-001

- (1) Do these steps to disconnect the transformer rectifier unit:
 - (a) Remove the electrical connector [11] from the TRU.
 - (b) Do these steps to remove the wires [12] from the terminal block:
 - 1) Remove the screw [7] and washer [8] from the TRU and remove the terminal block cover [9].
 - 2) Remove the nut [1], lockwasher [2], washer [3] and remove the wire from the TRU terminal stud.
 - 3) Remove the nut [6], lockwasher [5], washer [4] and remove the wire from the TRU terminal stud.

SUBTASK 24-32-01-020-002

- (2) Remove the transformer rectifier unit [10]. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

————— **END OF TASK** —————

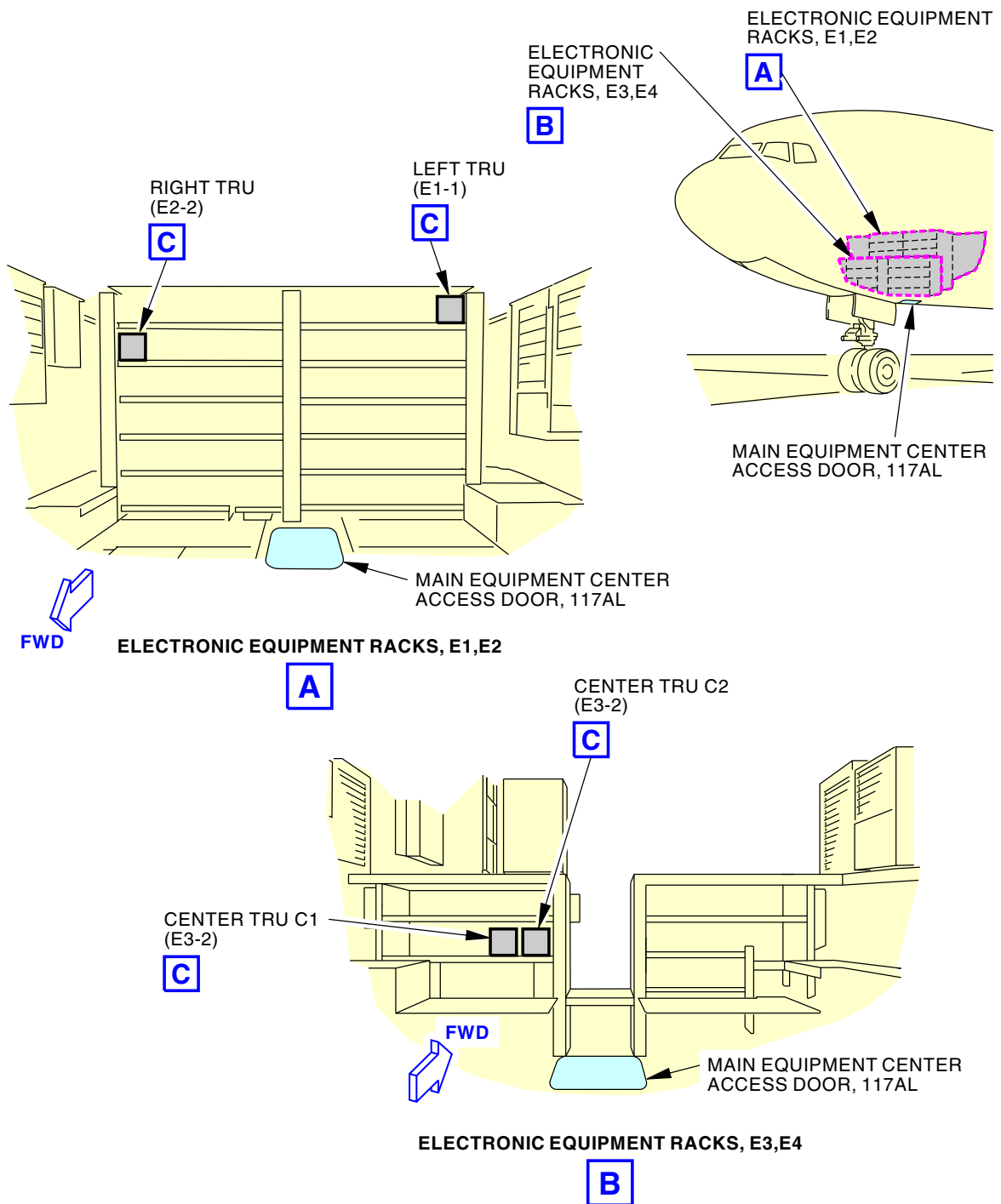
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Transformer Rectifier Units (TRU) Installation
Figure 401/24-32-01-990-801 (Sheet 1 of 2)

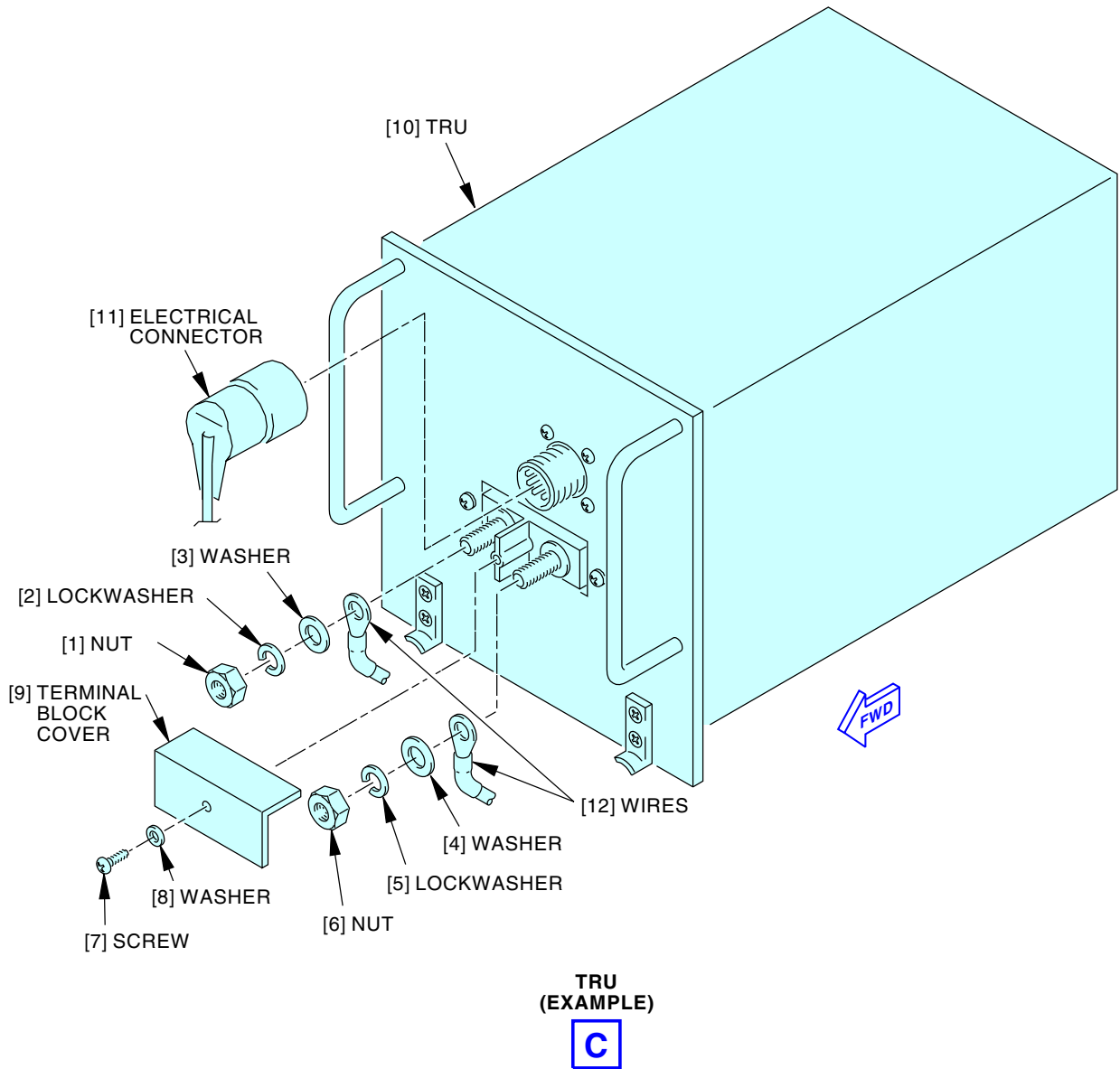
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Transformer Rectifier Units (TRU) Installation
Figure 401/24-32-01-990-801 (Sheet 2 of 2)

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TASK 24-32-01-400-801

3. Transformer Rectifier Unit Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the installation of the TRU. There are 4 TRUs in the Electrical Power Generation System. The left TRU is located on the E1-1 Equipment Rack. The right TRU is located on the E2-2 Equipment Rack. There are two center TRUs. The TRU C1 and TRU C2 are located on the E3-2 Equipment Rack.

B. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
10	Unit	24-32-01-01-009	ARO ALL

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Transformer Rectifier Unit (TRU) Installation

SUBTASK 24-32-01-420-001

- (1) Install the transformer rectifier unit [10]. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-32-01-420-002

- (2) Do these steps to connect the transformer rectifier unit:
- (a) Connect the wires [12] to the TRU terminal studs.
 - (b) Install the washer [3], lockwasher [2] and nut [1].
 - (c) Tighten the nut [1] to 135-145 inch-pounds (15.3-16.4 Newton meters).
 - (d) Install the washer [4], lockwasher [5] and nut [6].
 - (e) Tighten the nut [6] to 170-190 inch pounds (19.2-21.5 Newton meters).
 - (f) Install the terminal block cover [9] on the TRU.
 - (g) Install the washer [8] and screw [7].
 - (h) Connect the electrical connector [11] to the TRU.

SUBTASK 24-32-01-860-005

- (3) If you removed the Right TRU, do these steps:

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	1	C24666	DC BUS TIE R

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	1	C24302	TRU R
ARO 011-999			
A	6	C24302	TRU R

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SUBTASK 24-32-01-860-006

- (4) If you removed the Left TRU, do these steps:

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	28	C24629	DC BUS TIE L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C24303	TRU L

SUBTASK 24-32-01-860-007

- (5) If you removed the TRU C1, do these steps:

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

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C24341	TRU C1

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	13	C24643	MN BAT RLY CTRL
M	16	C24667	CAPT INST ALTN

SUBTASK 24-32-01-860-008

- (6) If you removed the TRU C2, do these steps:

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	5	C24654	F/O INST ALTN

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Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	3	C24340	TRU C2
ARO 011-999			
A	5	C24340	TRU C2

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SUBTASK 24-32-01-410-001

(7) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

G. Transformer Rectifier Unit (TRU) Installation Test

SUBTASK 24-32-01-700-001

(1) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.

———— **END OF TASK** ————

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CAPT - F/O BUS TIE RELAY - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the capt - f/o bus tie relay.
- (2) An installation of the capt - f/o bus tie relay.

TASK 24-32-08-000-801

2. Capt - F/O Bus Tie Relay Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Prepare for the Removal

SUBTASK 24-32-08-860-009

- (1) Do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

SUBTASK 24-32-08-860-001



REMOVE ELECTRICAL POWER BEFORE REPLACING BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES PRESENT CAN CAUSE INJURY TO PERSONS.

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-32-08-860-002

- (3) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to illuminate for 3 to 4 minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

SUBTASK 24-32-08-010-001

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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SUBTASK 24-32-08-860-010



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-32-08-860-007



CAUTION

DISCONNECTING MAIN BATTERY POWER WITH AC POWER NOT CONNECTED WILL RESULT IN THE CONTENTS OF THE AIMS BATTERY-BACKED MEMORY BEING ERASED.

- (6) Disconnect Main Aircraft Battery by removing battery connector and electrical connector.

E. Removal

SUBTASK 24-32-08-020-001



WARNING

DO NOT TOUCH THE RELAY. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE RELAY OR LET THE RELAY BECOME COOL. THE HIGH TEMPERATURE CAN BURN YOU.

- (1) Remove the square type relay, as follows:
- Open the P310 panel and remove the large horizontal insulating cover located at the bottom of the panel (above Row "M" circuit breakers).
 - Remove the four captive screws [2] that attach the relay to the panel.
 - Remove the relay [1].

SUBTASK 24-32-08-020-002



WARNING

DO NOT TOUCH THE RELAY. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE RELAY OR LET THE RELAY BECOME COOL. THE HIGH TEMPERATURE CAN BURN YOU.

- (2) Remove the canister type relay, as follows:
- Open the P310 panel and remove the large horizontal insulating cover located at the bottom of the panel (above Row "M" circuit breakers).
 - Remove the nuts [3] and lockwashers [4] and wires from the terminal studs.
NOTE: Place identification tags on wires before removing to help with installation.
 - Remove the electrical connector from the relay.
 - Remove the four screws [5] that attach the relay to the panel.
 - Remove the relay [1].

————— END OF TASK —————

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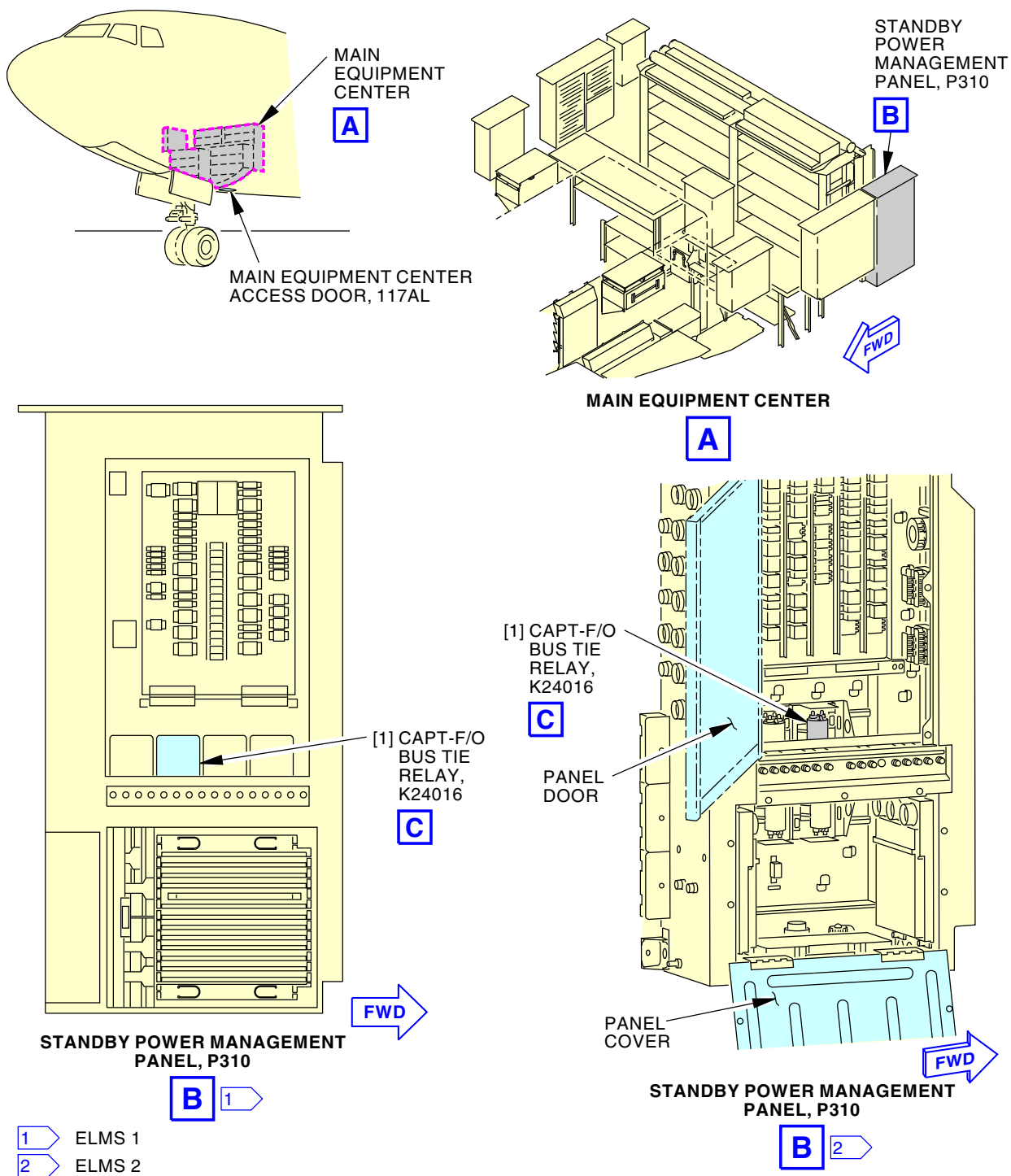
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Capt-F/O Bus Tie Relay Installation
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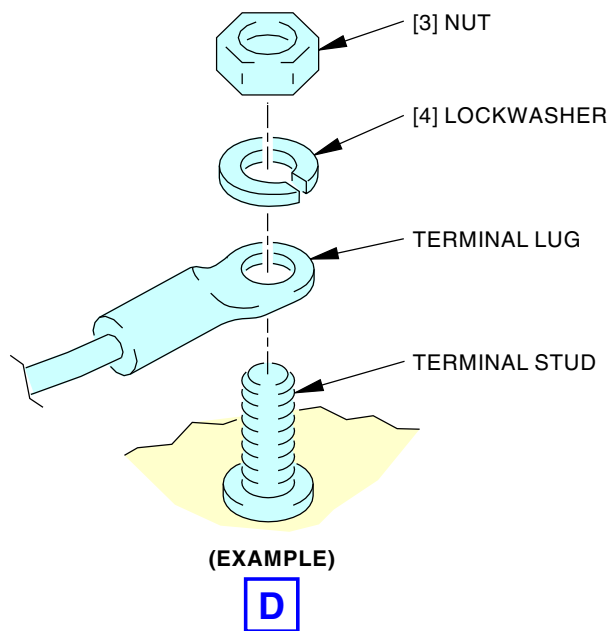
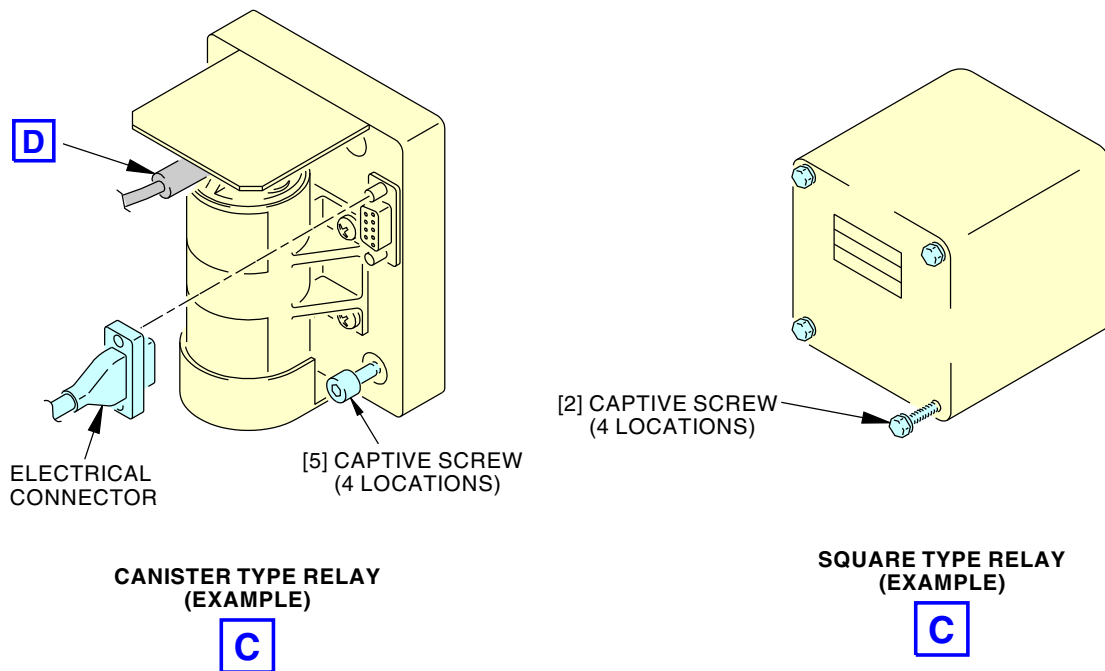
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AIRCRAFT MAINTENANCE MANUAL**



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**Capt-F/O Bus Tie Relay Installation
Figure 401/24-32-08-990-801 (Sheet 2 of 2)**

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TASK 24-32-08-400-801

3. Capt - F/O Bus Tie Relay Installation

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Installation

SUBTASK 24-32-08-420-001

- (1) Install the square type relay, as follows:
 - (a) Put the relay [1] in its position.
 - (b) Install the four captive screws [2] that attach the relay to the panel.
 - (c) Tighten the screws to 15 pound-inches.
 - (d) Reinstall the large horizontal insulating cover above the Row "M" circuit breakers and close the P310 panel.

SUBTASK 24-32-08-420-002

- (2) Install the canister type relay, as follows:
 - (a) Put the relay [1] in its position.
 - (b) Install the four screws [5] that attach the relay to the panel.
 - (c) Tighten the screws [5] to 35-43 pound-inches.
 - (d) Install the wire terminal lugs on the terminal studs.
 - (e) Install the nuts [3] and lockwashers [4] on the terminal studs.
 - (f) Tighten the nuts [3] to 31-37 pound-inches.
 - (g) Install the electrical connector on the relay.
 - (h) Reinstall the large horizontal insulating cover above the Row "M" circuit breakers and close the P310 panel.

SUBTASK 24-32-08-420-003

- (3) Re-connect the main aircraft battery connectors.

E. Installation Test

SUBTASK 24-32-08-710-002

- (1) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.

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SUBTASK 24-32-08-860-011

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-32-08-710-004

- (3) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:
- (a) Make these selections on the MAT:
- 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 26 Fire Extinguishing System
 - 5) OPERATIONAL TEST
 - 6) Cargo Squibs
 - 7) CONTINUE
- (b) Do the instructions that show on the MAT and then make these selections:
- 1) CONTINUE
 - 2) START TEST
- (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
- (d) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.

SUBTASK 24-32-08-710-003

- (4) Do these steps to make sure the FMCS has the appropriate thrust rating selected:
- (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
- (b) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the TEST position.
- (c) Make sure the EICAS message, ENG CONTROL L (R) does not show.
- (d) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the NORM position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-32-08-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

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TRU RELAY - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the TRU relay.
 - (2) An installation of the TRU relay.
 - (3) There are two TRU relays:
 - (a) TRU C1 relay, K24017
 - (b) TRU C2 relay, K24018
 - (4) The TRU relays are located on the Standby Power Management Panel, P310.

TASK 24-32-09-000-801

2. TRU Relay Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Prepare for Removal

SUBTASK 24-32-09-860-006

- (1) Do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

SUBTASK 24-32-09-860-007



WARNING

REMOVE ELECTRICAL POWER BEFORE REPLACING BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES PRESENT CAN CAUSE INJURY TO PERSONS.

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-32-09-860-008

- (3) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to illuminate for 3 to 4 minutes if the APU and BATTERY switch are both selected OFF in a quick sequence.

SUBTASK 24-32-09-010-002

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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SUBTASK 24-32-09-860-012



WARNING

MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-32-09-860-009



CAUTION

DISCONNECTING MAIN BATTERY POWER WITH AC POWER NOT CONNECTED WILL RESULT IN THE CONTENTS OF THE AIMS BATTERY-BACKED MEMORY BEING ERASED.

- (6) Remove the battery connector and electrical connector to disconnect main aircraft battery.

E. Removal

SUBTASK 24-32-09-020-001



CAUTION

DO NOT TOUCH THE RELAY. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE RELAY OR LET THE RELAY BECOMES COOL. THE HIGH TEMPERATURE CAN BURN YOU.

- (1) Do these steps to remove the relay:
- Remove the screw [8] to remove the top cover.
 - Identify the phase leads on the relay for the installation.
 - Remove the nut [3], washer [4] to remove the nine phase leads [5].
 - Remove the nut [9], washer [10] to remove the four phase leads [11].
 - Remove the four screws [6] and washers [7] that hold the relay.
 - Remove the relay [1] or relay [2].

————— **END OF TASK** —————

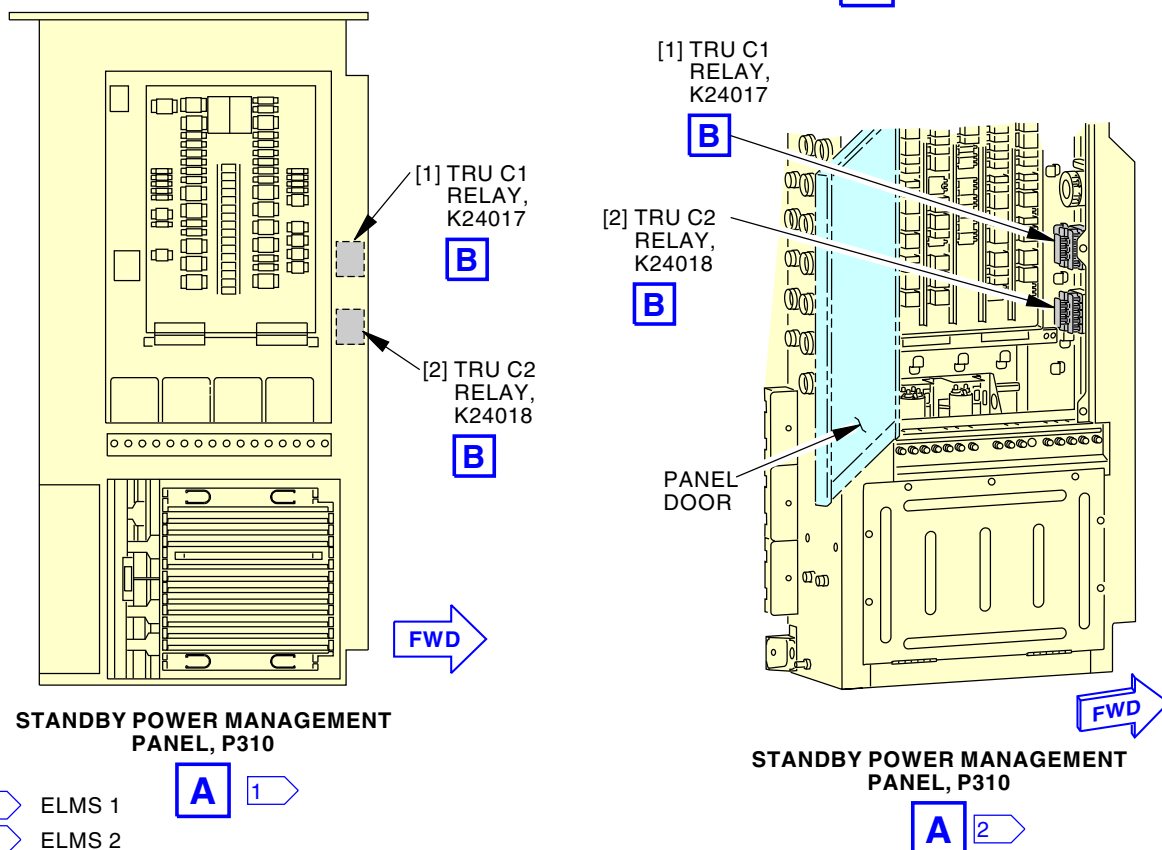
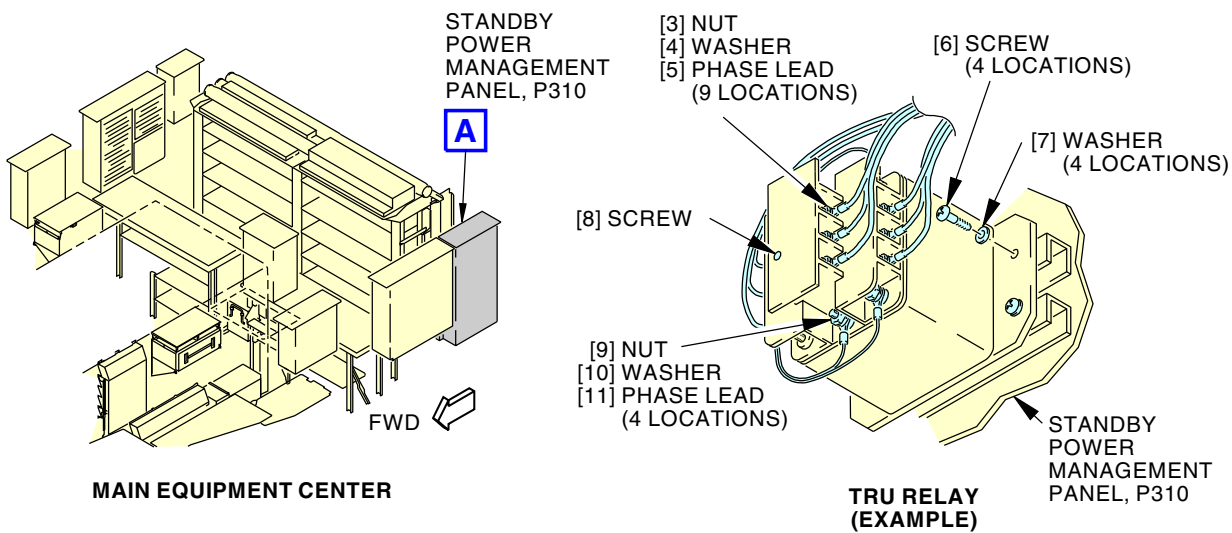
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TRU Relay Installation
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TASK 24-32-09-400-801

3. TRU Relay Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Installation

SUBTASK 24-32-09-420-001

- (1) Do these steps to install the relay:
 - (a) Put the relay [1] or relay [2] in the right position.
 - (b) Install the four washers [7] and screws [6] that hold the relay.



CAUTION

MAKE SURE YOU CONNECT THE PHASE LEADS TO THE RELAY CORRECTLY. A SYSTEM MALFUNCTION AND EQUIPMENT DAMAGE CAN OCCUR IF YOU DO NOT CONNECT THE PHASE LEADS CORRECTLY.

- (c) Connect all the phase leads to the terminals on the relay.
 - (d) Tighten the nine phase leads [5] with the washer [4] and nut [3].
 - (e) Tighten the four phase leads [11] with the washer [10] and nut [9].

E. Installation Test

SUBTASK 24-32-09-860-003

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

SUBTASK 24-32-09-700-001

- (2) Do these steps to test TRU relay:
 - (a) Set the STANDBY POWER switch, on the P61 panel, to the BAT position and release to the AUTO position.
 - (b) Stop for 20 seconds for the DC/Standby self check completed.
 - (c) Make sure that the message ELEC STANDBY SYS does not show on the EICAS.
 - (d) If there is a message for the TRU relay, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

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SUBTASK 24-32-09-860-011

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

- (4) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:
- (a) Make these selections on the MAT:
- 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 26 Fire Extinguishing System
 - 5) OPERATIONAL TEST
 - 6) Cargo Squibs
 - 7) CONTINUE
- (b) Do the instructions that show on the MAT and then make these selections:
- 1) CONTINUE
 - 2) START TEST
- (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
- (d) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.

SUBTASK 24-32-09-710-001

- (5) Do these steps to make sure the FMCS has the appropriate thrust rating selected:
- (a) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the TEST position.
 - (b) Make sure the EICAS message, ENG CONTROL L (R) does not show.
 - (c) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the NORM position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-32-09-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

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DC TIE RELAY - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the DC tie relay.
 - (2) An installation of the DC tie relay.

TASK 24-32-10-000-801

2. DC Tie Relay Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Prepare for the Removal

SUBTASK 24-32-10-860-001



WARNING

REMOVE ELECTRICAL POWER BEFORE REPLACING BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES PRESENT CAN CAUSE INJURY TO PERSONS.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-32-10-860-002

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

Left Power Management Panel, P110

Row	Col	Number	Name
P	28	C24629	DC BUS TIE L

Right Power Management Panel, P210

Row	Col	Number	Name
P	1	C24666	DC BUS TIE R

Standby Power Management Panel, P310

Row	Col	Number	Name
K	9	C24642	DC TIE CTRL

D. DC Tie Relay Removal

SUBTASK 24-32-10-020-001



WARNING

DO NOT TOUCH THE RELAY. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE RELAY OR LET THE RELAY BECOME COOL. THE HIGH TEMPERATURE CAN BURN YOU.

- (1) Remove the square type relay, as follows:

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- (a) Open the P210 panel and remove the four captive screws [4] that attach the relay to the panel.
- (b) Remove the relay [1].

SUBTASK 24-32-10-020-002



WARNING

DO NOT TOUCH THE RELAY. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE RELAY OR LET THE RELAY BECOME COOL. THE HIGH TEMPERATURE CAN BURN YOU.

- (2) Remove the canister type relay, as follows:
 - (a) Open the P210 panel and remove the nuts [5] and lockwashers [6] and wires from the terminal studs.

NOTE: Place identification tags on wires before removing to help with installation.
 - (b) Remove the electrical connector from the relay.
 - (c) Remove the four screws [7] that attach the relay to the panel.
 - (d) Remove the relay [1].

———— **END OF TASK** ————

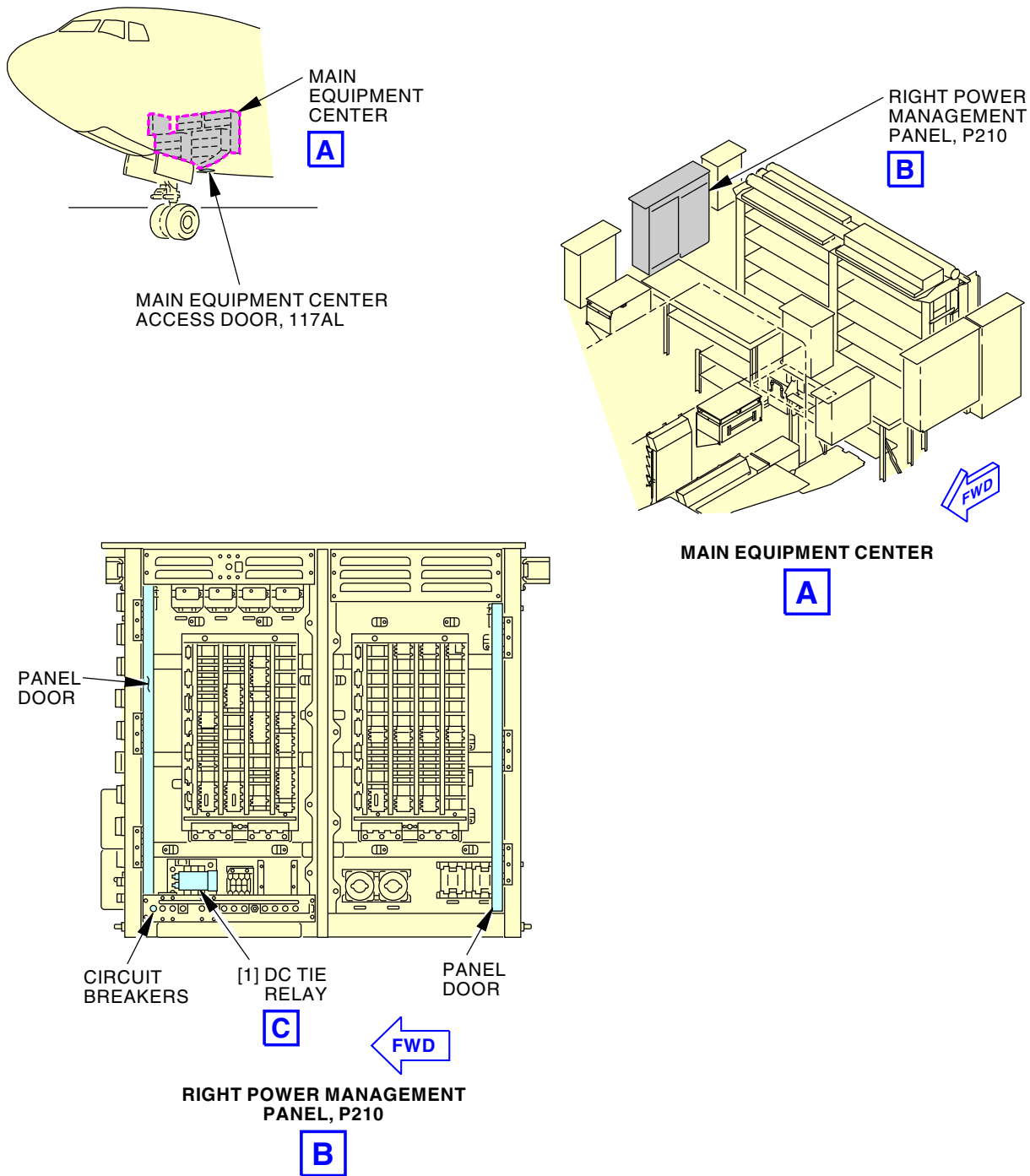
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DC Tie Relay Installation
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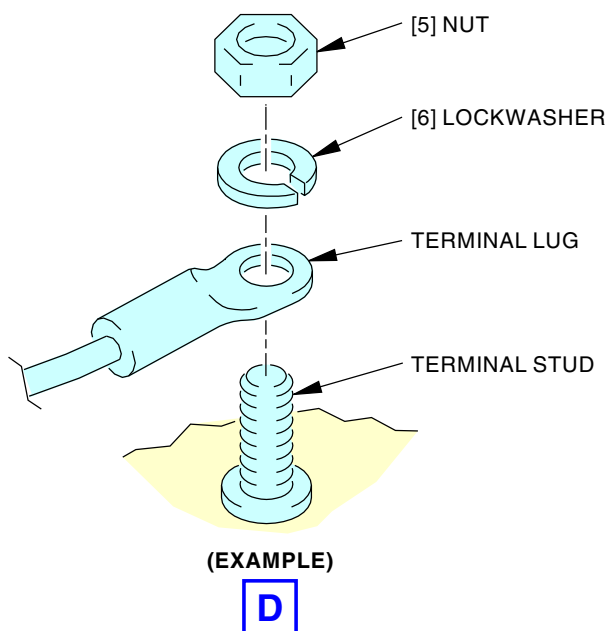
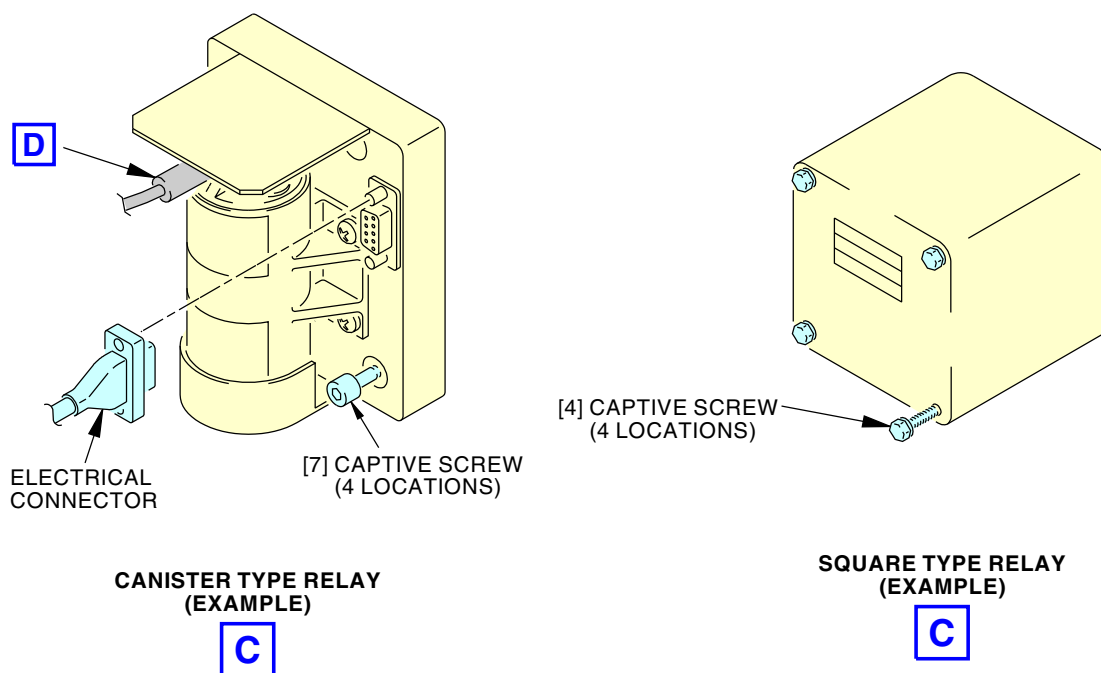
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**DC Tie Relay Installation
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TASK 24-32-10-400-801

3. DC Tie Relay Installation

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

C. DC Tie Relay Installation

SUBTASK 24-32-10-420-001

- (1) Install the square type relay, as follows:
- (a) Put the relay [1] in its position.
 - (b) Install the four captive screws [4] that attach the relay to the panel.
 - (c) Tighten the screws to 15 pound-inches.
 - (d) Close the P210 panel.

SUBTASK 24-32-10-420-002

- (2) Install the canister type relay, as follows:
- (a) Put the relay [1] in its position.
 - (b) Install the four screws [7] that attach the relay to the panel.
 - (c) Tighten the screws [7] to 35-43 pound-inches.
 - (d) Install the wire terminal lugs on the terminal studs.
 - (e) Install the nuts [5] and lockwashers [6] on the terminal studs.
 - (f) Tighten the nuts [5] to 31-37 pound-inches.
 - (g) Install the electrical connector on the relay.
 - (h) Close the P210 panel.

D. DC Tie Relay Installation Test

SUBTASK 24-32-10-860-003

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	28	C24629	DC BUS TIE L

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	1	C24666	DC BUS TIE R

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24642	DC TIE CTRL

SUBTASK 24-32-10-710-001

- (2) Do these steps to test the DC Tie relay installation:
- (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
 - (b) Make sure that the message ELEC STANDBY SYS does not show on the EICAS.
 - 1) If there is a maintenance message for the DC Bus Tie relay, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.
 - (c) Do the following steps to make sure the DC Bus Tie relay is operating correctly:
 - 1) Set the BATTERY switch, on the P5 panel, to the ON position.
 - 2) Open this circuit breaker and install safety tag:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C24303	TRU L

- 3) Make sure that the Lower Center Display, the Center CDU and the Captain's clock are powered.
- 4) Remove the safety tag and close this circuit breaker:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C24303	TRU L

SUBTASK 24-32-10-710-002

- (3) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.

SUBTASK 24-32-10-840-001

- (4) Put the airplane back to its usual condition.

————— END OF TASK —————

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RAM AIR TURBINE (RAT) GENERATOR AND GOVERNOR ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the RAT generator and governor assembly.

NOTE: The RAT generator and governor assembly is removed and installed as a single unit.
For disassembly of the generator and governor assembly, refer to the component maintenance manual for the RAT.

- (2) An installation of the RAT generator and governor assembly.

TASK 24-33-02-000-801

2. Ram Air Turbine (RAT) Generator and Governor Assembly Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) This task gives instructions to remove the RAT generator and governor together. These two units can be separated with a shop procedure if it is necessary.

B. **References**

Reference	Title
12-12-01-680-801	Hydraulic Reservoir Fluid Level Lowering or Draining (P/B 301)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)
29-21-02-000-801	Ram Air Turbine (RAT) Pump Removal (P/B 401)

C. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. **Prepare for the Removal**

SUBTASK 24-33-02-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 24-33-02-860-002

- (2) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 24-33-02-680-001

- (3) To drain the reservoir in the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

SUBTASK 24-33-02-680-002

- (4) To remove the RAT hydraulic pump, do this task: Ram Air Turbine (RAT) Pump Removal, TASK 29-21-02-000-801.

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E. RAT Generator and Governor Assembly Removal

SUBTASK 24-33-02-020-001



MAKE SURE YOU PUT BLADE COVERS ON THE GOVERNOR BLADES. IF YOU DO NOT PUT COVERS ON THE BLADES OF THE GOVERNOR, YOU CAN DAMAGE THE BLADES.

- (1) Put the blade covers on the governor blades.

SUBTASK 24-33-02-020-002

- (2) Remove the bolts [1] and washers [2] that hold the connector cover [3] to the strut [4].

SUBTASK 24-33-02-020-003

- (3) Remove the connector cover [3] from the strut [4].

SUBTASK 24-33-02-020-004

- (4) Disconnect the connector [5] and connector [6] from the generator.
 - (a) Put protective covers on the connectors.

SUBTASK 24-33-02-020-005



MAKE SURE YOU SUPPORT THE GENERATOR AND GOVERNOR ASSEMBLY BEFORE YOU REMOVE THE BOLTS THAT CONNECT THE ASSEMBLY TO THE STRUT. IF YOU DO NOT SUPPORT THE ASSEMBLY, THE ASSEMBLY WILL FALL. A FALLING ASSEMBLY CAN HURT YOU AND WILL DAMAGE THE ASSEMBLY.

- (5) Remove the eight bolts [7] and washers [8] that connect the generator [9] to the strut [4].

SUBTASK 24-33-02-020-006

- (6) Carefully lower the RAT generator [9] away from the strut [4].

————— **END OF TASK** —————

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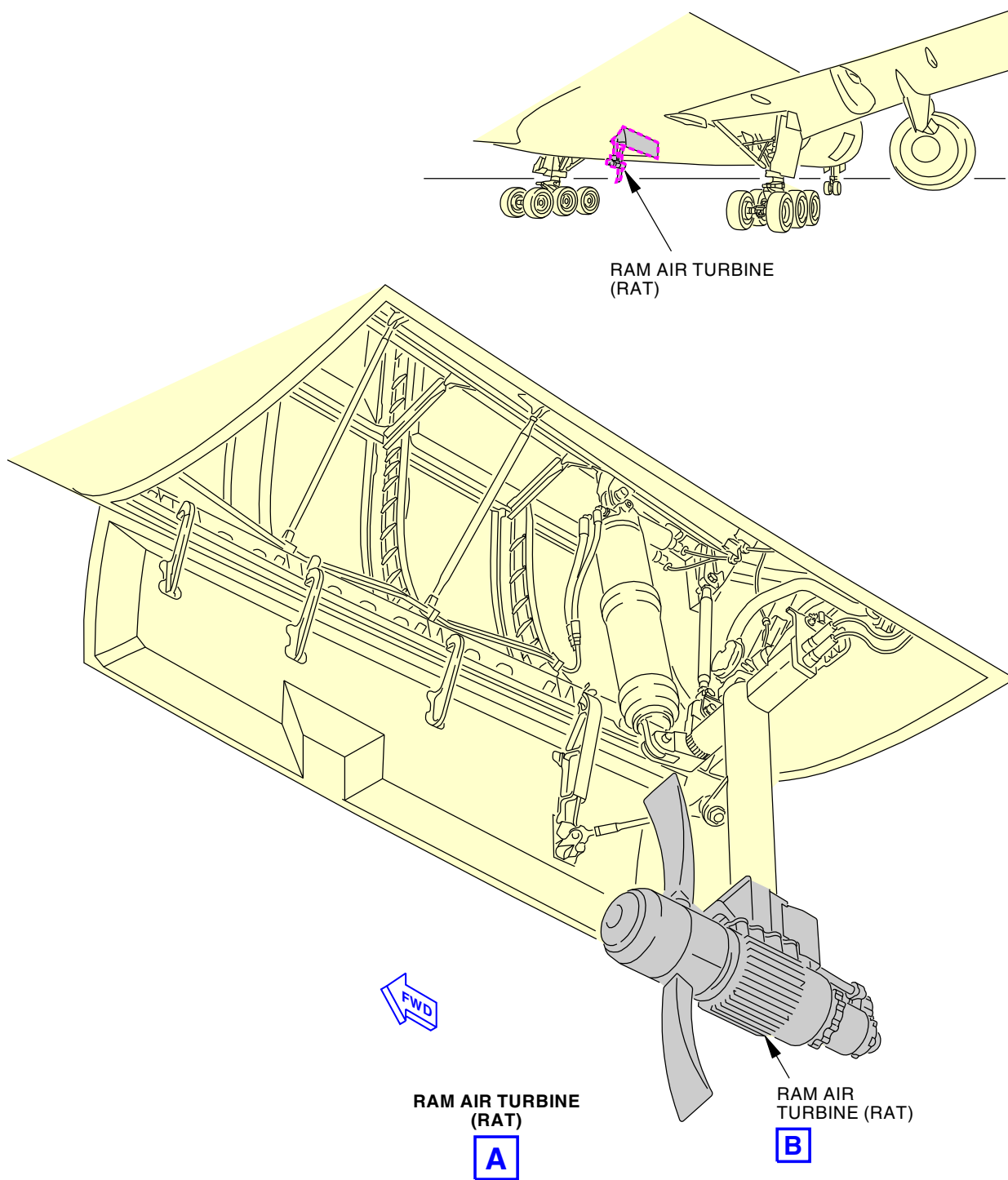
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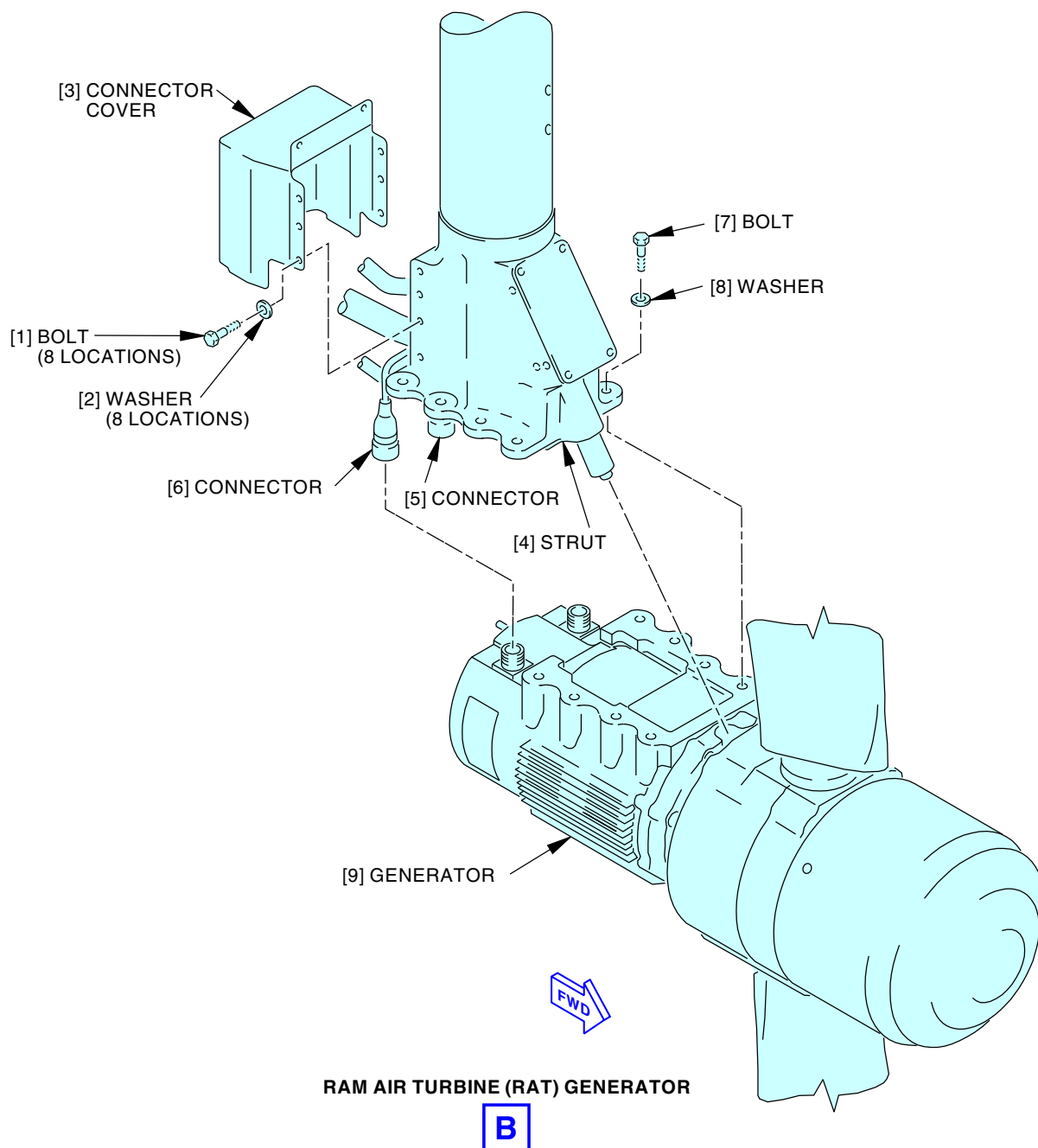
RAT Generator and Governor Assembly Installation
Figure 401/24-33-02-990-801 (Sheet 1 of 2)

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**RAT Generator and Governor Assembly Installation
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TASK 24-33-02-400-801

3. RAT Generator and Governor Assembly Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives instructions to install the RAT generator and governor together. The assembly of these two units is a procedure which must be done in the shop and is not included in this task.

B. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
29-21-00-730-801	Ram Air Turbine (RAT) System - Motoring Test (P/B 501)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)
29-21-02-400-801	Ram Air Turbine (RAT) Pump Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
C00852	Compound - Antiseize, Molybdenum Disulfide-Petrolatum	MIL-PRF-83483

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. RAT Generator and Governor Assembly Installation

SUBTASK 24-33-02-420-001

- (1) Apply compound, C00852 to the threads of the eight bolts [7].

SUBTASK 24-33-02-420-002



MAKE SURE YOU SUPPORT THE GENERATOR AND GOVERNOR ASSEMBLY WHEN YOU INSTALL THE BOLTS THAT CONNECT THE ASSEMBLY TO THE STRUT. IF YOU DO NOT SUPPORT THE ASSEMBLY, THE ASSEMBLY WILL FALL. A FALLING ASSEMBLY CAN HURT YOU AND WILL DAMAGE THE ASSEMBLY.

- (2) Install the generator [9].
 - (a) Install the eight bolts [7] and washers [8] through the flange of the strut [4] and into the generator [9].
 - (b) Tighten the bolts [7] to 228-252 pound-inches (26-28 N-m).

NOTE: These torque values do not include frictional torque or rundown resistance. Frictional torque values must be added to the specified torque.

SUBTASK 24-33-02-420-003

- (3) Remove the protective covers and attach the connector [5] and connector [6].

SUBTASK 24-33-02-420-004

- (4) Do these steps to install the connector cover [3]:
 - (a) Attach the connector cover [3] to the strut [4].
 - (b) Install the bolts [1] and washers [2].

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SUBTASK 24-33-02-680-003

- (5) To install the RAT pump, do this task: Ram Air Turbine (RAT) Pump Installation, TASK 29-21-02-400-801.

F. Ram Air Turbine (RAT) Pump Installation Test

SUBTASK 24-33-02-610-001

- (1) For the reservoir in the center hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 24-33-02-720-001

- (2) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

SUBTASK 24-33-02-860-003

- (3) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

————— **END OF TASK** —————

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RAM AIR TURBINE (RAT) GENERATOR CONTROL UNIT (GCU) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the GCU.
 - (2) An installation of the GCU.
 - (3) The installation task includes an operational test of the GCU.

TASK 24-33-03-000-801

2. RAT GCU Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the removal of the RAT GCU. The GCU is installed below the P310 panel in the lower forward E/E Equipment Bay.

B. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

D. GCU Removal

SUBTASK 24-33-03-040-001

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

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C29619	RAT AUTO CONTROL

SUBTASK 24-33-03-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-33-03-010-002

- (3) To remove the kick bracket [4], turn the fasteners [3] one quarter turn counterclockwise.

SUBTASK 24-33-03-020-001

- (4) Remove the two electrical connectors [5] from the GCU [6].

SUBTASK 24-33-03-020-002

- (5) Remove the four bolts [1] and washers [2].

SUBTASK 24-33-03-020-003

- (6) Remove the GCU [6].

———— **END OF TASK** ————

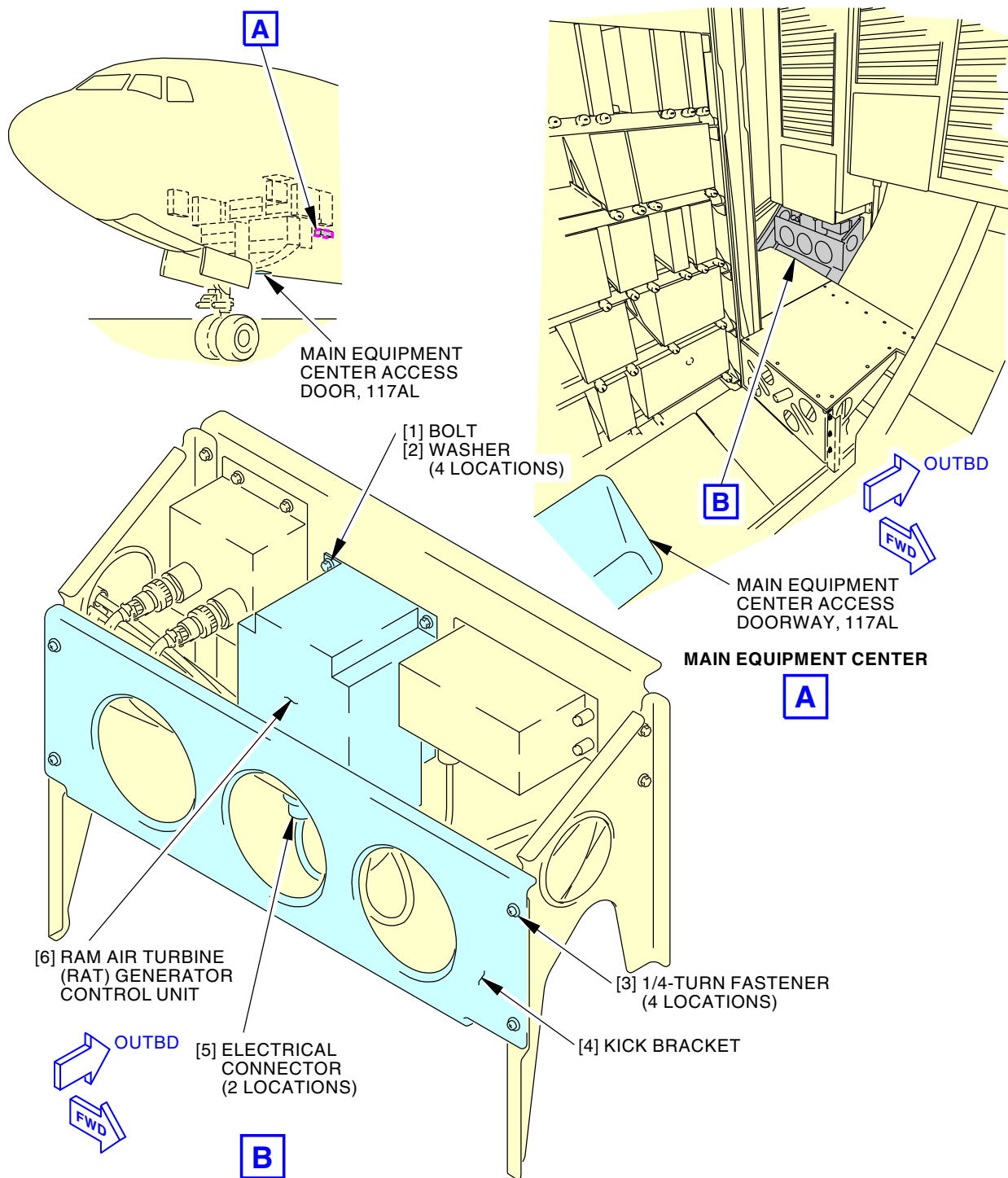
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Ram Air Turbine (RAT) Generator Control Unit Installation
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TASK 24-33-03-400-801

3. RAT GCU Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-21-00-730-801	Ram Air Turbine (RAT) System - Motoring Test (P/B 501)

B. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	GCU	29-21-02-01-005	ARO ALL

E. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

F. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

G. RAT GCU Installation

SUBTASK 24-33-03-040-002

(1) Make sure that this circuit breaker is open:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
D	13	C29619	RAT AUTO CONTROL

SUBTASK 24-33-03-420-001

(2) Put the GCU [6] into position and install the four bolts [1] and washers [2].

(a) Measure the resistance between the GCU [6] and the mounting structure with an intrinsically safe approved bonding meter, COM-1550.

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- 1) Make sure the resistance is not more than 0.0025 ohm.
- 2) If the resistance is more than 0.0025 ohm, clean the bonding surfaces between the GCU [6] and the mounting structure with the solvent, B00083.
- 3) Do a check of the resistance again.

SUBTASK 24-33-03-420-002

- (3) Connect the two connectors [5] to the GCU [6].

SUBTASK 24-33-03-410-001

- (4) Put the kick bracket [4] into position and turn the four fasteners [3] a quarter turn clockwise to engage them.

SUBTASK 24-33-03-440-001

- (5) Close this circuit breaker:

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C29619	RAT AUTO CONTROL

SUBTASK 24-33-03-410-002

- (6) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-33-03-710-001

- (7) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

————— **END OF TASK** —————

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STATIC INVERTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Static Inverter Removal
 - (2) Static Inverter Installation.

TASK 24-33-05-000-801

2. Static Inverter Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the removal of the Static Inverter. The Static Inverter is located on the E3-2 Equipment Rack.

B. References

<u>Reference</u>	<u>Title</u>
20-10-01-000-801	E/E Box Removal (P/B 401)

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

E. Prepare for the Removal

SUBTASK 24-33-05-010-001

- (1) Open this access door:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-33-05-860-001

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	9	C24632	STATIC INV POWER

F. Static Inverter Removal

SUBTASK 24-33-05-010-002

- (1) Remove the E3 rack protective cover.

SUBTASK 24-33-05-020-001

- (2) Do these steps to disconnect the static inverter [13]:
 - (a) Remove the electrical connector [11] from the static inverter [13].
 - (b) Remove the screw [7], lockwasher [8], and washer [9] at the four locations that hold the terminal block cover [10].
 - (c) Remove the terminal block cover [10].

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- (d) Put tags on the wires [12] to identify them for installation.
- (e) Remove the nut [1], lockwasher [2], and washer [3].
- (f) Remove the nut [6], lockwasher [5], and washer [4].
- (g) Remove the wires [12] from the terminals.

SUBTASK 24-33-05-020-002

- (3) Remove the static inverter [13]. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

———— **END OF TASK** ————

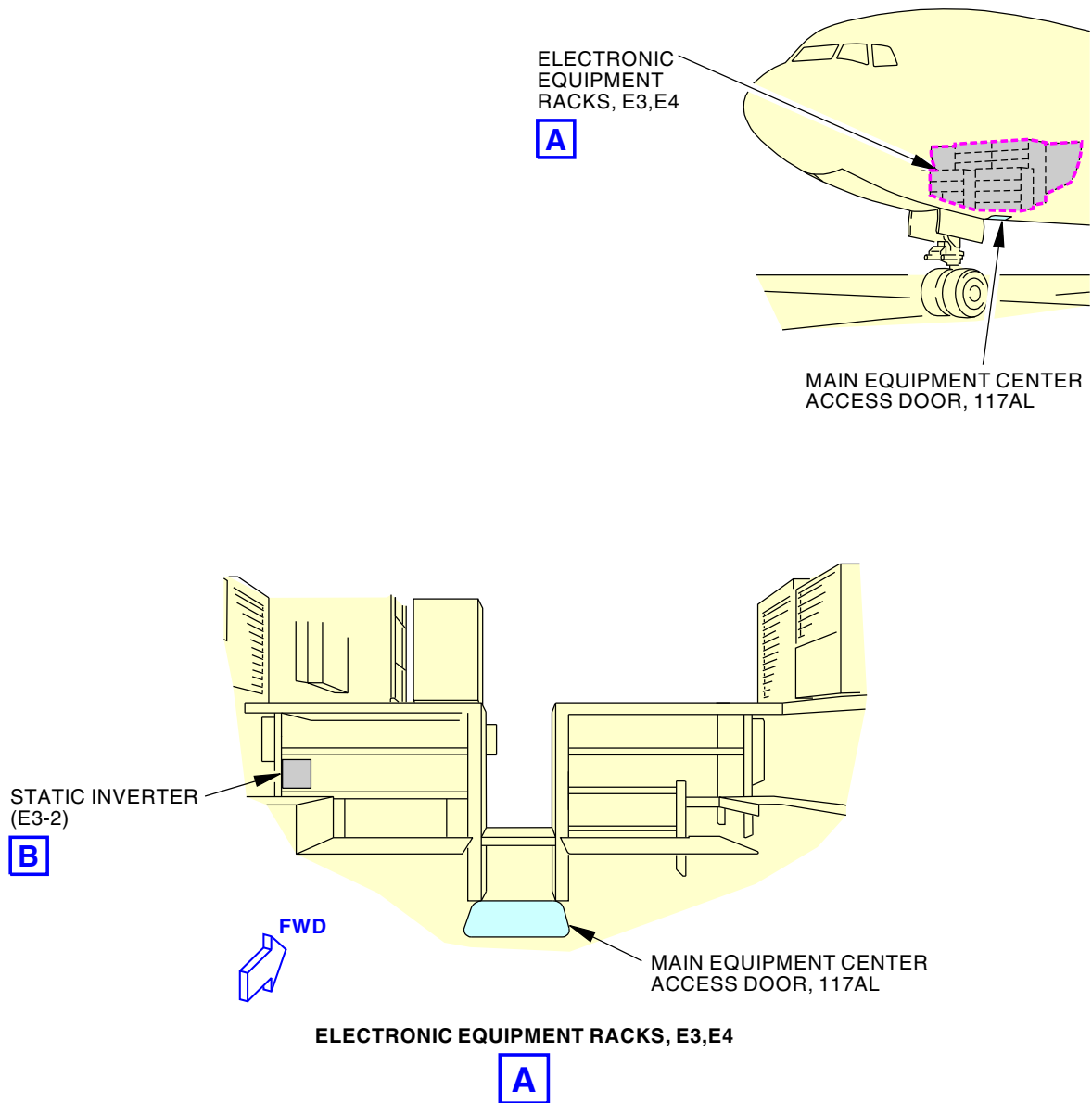
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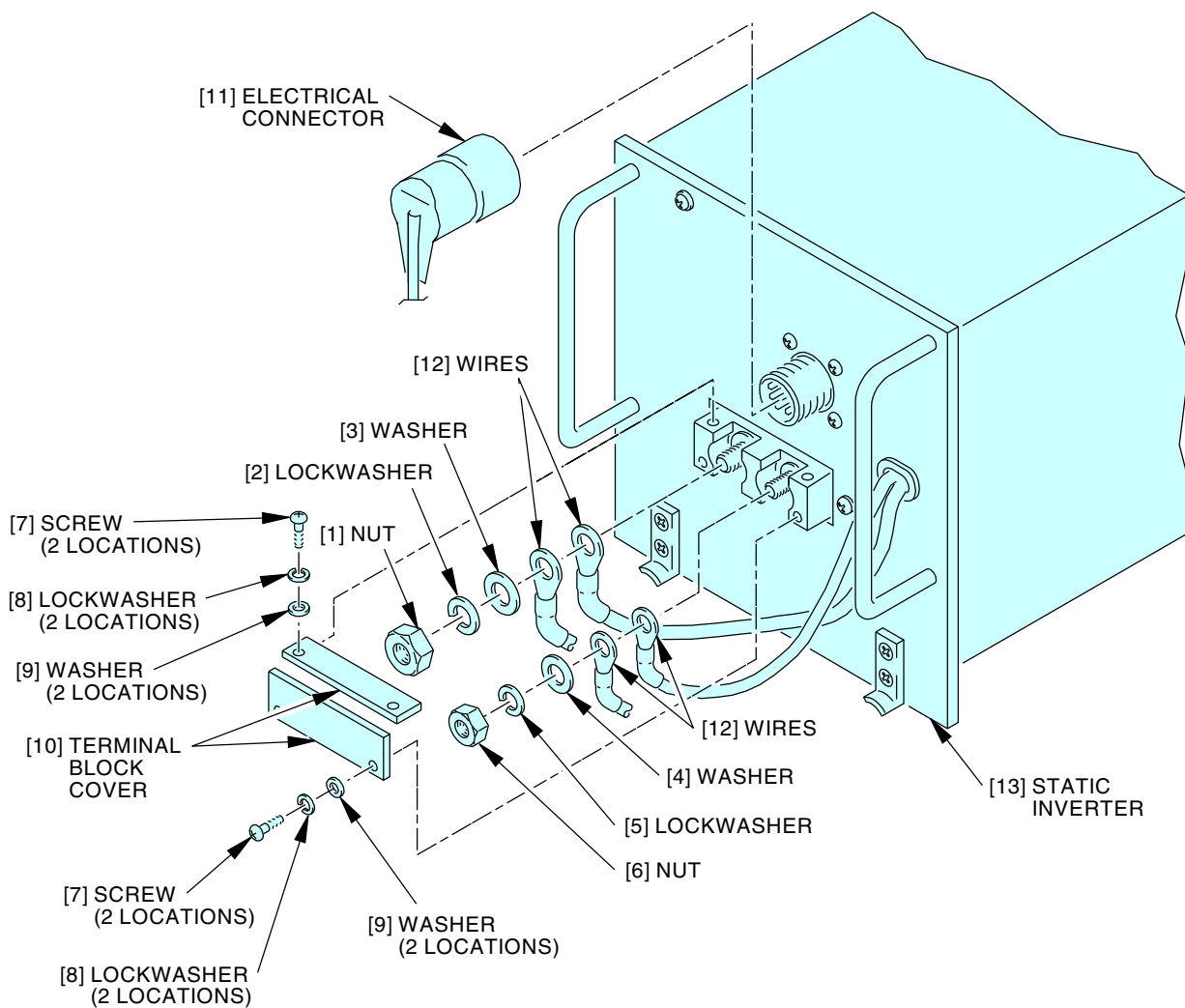
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TASK 24-33-05-400-801

3. Static Inverter Installation

Figure 401

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is the installation of the static inverter. The static inverter is located on the E3-2 equipment rack.

B. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
24-22-00-860-801	Supply Primary External Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Static Inverter Installation

SUBTASK 24-33-05-420-001

- (1) Install the static inverter [13]. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-33-05-420-002

- (2) Do these steps to connect the static inverter [13]:
 - (a) Put the wires [12] on the terminal lugs of the static inverter [13].
 - (b) Install the nut [1], lockwasher [2], and washer [3] and tighten the nut [1] to a torque of approximately 140 $\pm$ 5 in-lb (16 $\pm$ 1 N·m).
 - (c) Install the nut [6], lockwasher [5], and washer [4], and tighten the nut [6] to a torque of approximately 70 $\pm$ 5 in-lb (8 $\pm$ 1 N·m).
 - (d) Do these steps to install the terminal block cover [10]:
 - 1) Attach the terminal block cover [10], to the static inverter [13].
 - 2) Install the screw [7], lockwasher [8], and washer [9] at the four locations.
 - (e) Install the electrical connector [11] on the static inverter [13].

SUBTASK 24-33-05-410-002

- (3) Install the E3 rack protective cover.

F. Static Inverter Installation Test

SUBTASK 24-33-05-860-010

- (1) Make sure the airplane is in the ground mode and not in the air mode before you start this test.

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SUBTASK 24-33-05-860-013

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	9	C24639	AC STBY RLY CTRL

SUBTASK 24-33-05-860-004

- (3) Make sure these indications occur on the Electrical Maintenance Page (Table 401):

Table 401/24-33-05-993-802

CONNECTOR	INDICATION	POSITION
AC STDBY	115V	OFF
	28V	OFF

SUBTASK 24-33-05-860-005

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	9	C24632	STATIC INV POWER

SUBTASK 24-33-05-860-006

- (5) Make sure these indications occur on the Electrical Maintenance Page (Table 402):

Table 402/24-33-05-993-803

CONNECTOR	INDICATION	POSITION
AC STDBY	115V	ON
	28V	ON

SUBTASK 24-33-05-860-014

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	9	C24639	AC STBY RLY CTRL

SUBTASK 24-33-05-860-015

- (7) Push and hold the STANDBY POWER switch on the P61 panel to the BAT position for three seconds. Then, release the switch.

NOTE: The STANDBY POWER switch should be on AUTO.

SUBTASK 24-33-05-860-016

- (8) Make sure there are no EICAS maintenance messages related to the static inverter.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-33-05-410-001

- (1) Close this access door:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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SUBTASK 24-33-05-860-017

- (2) Remove electrical power is it is not necessary. Do this task: Supply Primary External Power, TASK 24-22-00-860-801 Supply Primary External Power, TASK 24-22-00-860-801

———— **END OF TASK** ————

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TOWING STATIC INVERTER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Towing Static Inverter Removal
- (2) Towing Static Inverter Installation.

TASK 24-33-06-000-801

2. Towing Static Inverter Removal

(Figure 401)

A. **General**

- (1) This task is the removal of the Towing Static Inverter. The Towing Static Inverter is located on the E3-2 Equipment Rack.

B. **References**

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. **Location Zones**

Zone	Area
117	Main Equipment Center, Left

D. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door

E. **Prepare for the Removal**

SUBTASK 24-33-06-860-001

- (1) Make sure there is no electrical power on the airplane.

SUBTASK 24-33-06-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-33-06-860-002

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	6	C24679	TOW BUS DISTR P310

F. **Towing Static Inverter Removal**

SUBTASK 24-33-06-010-002

- (1) Remove the E3 rack protective cover.

SUBTASK 24-33-06-020-001

- (2) Do these steps to disconnect the towing static inverter [13]:
 - (a) Remove the electrical connector [11] from the towing static inverter [13].

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- (b) Remove the screws [7], lockwashers [8], and washers [9] that hold the terminal lug covers [10].
- (c) Remove the terminal lug covers [10].
- (d) Put tags on the wires [12] to identify them for installation.
- (e) Remove the nut [1], lockwasher [2], and washer [3].
- (f) Remove the nut [6], lockwasher [5], and washer [4].
- (g) Remove the wires [12] from the terminals.

SUBTASK 24-33-06-480-001



DO NOT REMOVE THE TOWING STATIC INVERTER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE TOWING STATIC INVERTER.

- (3) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-33-06-020-002

- (4) Remove the towing static inverter [13]. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

————— **END OF TASK** —————

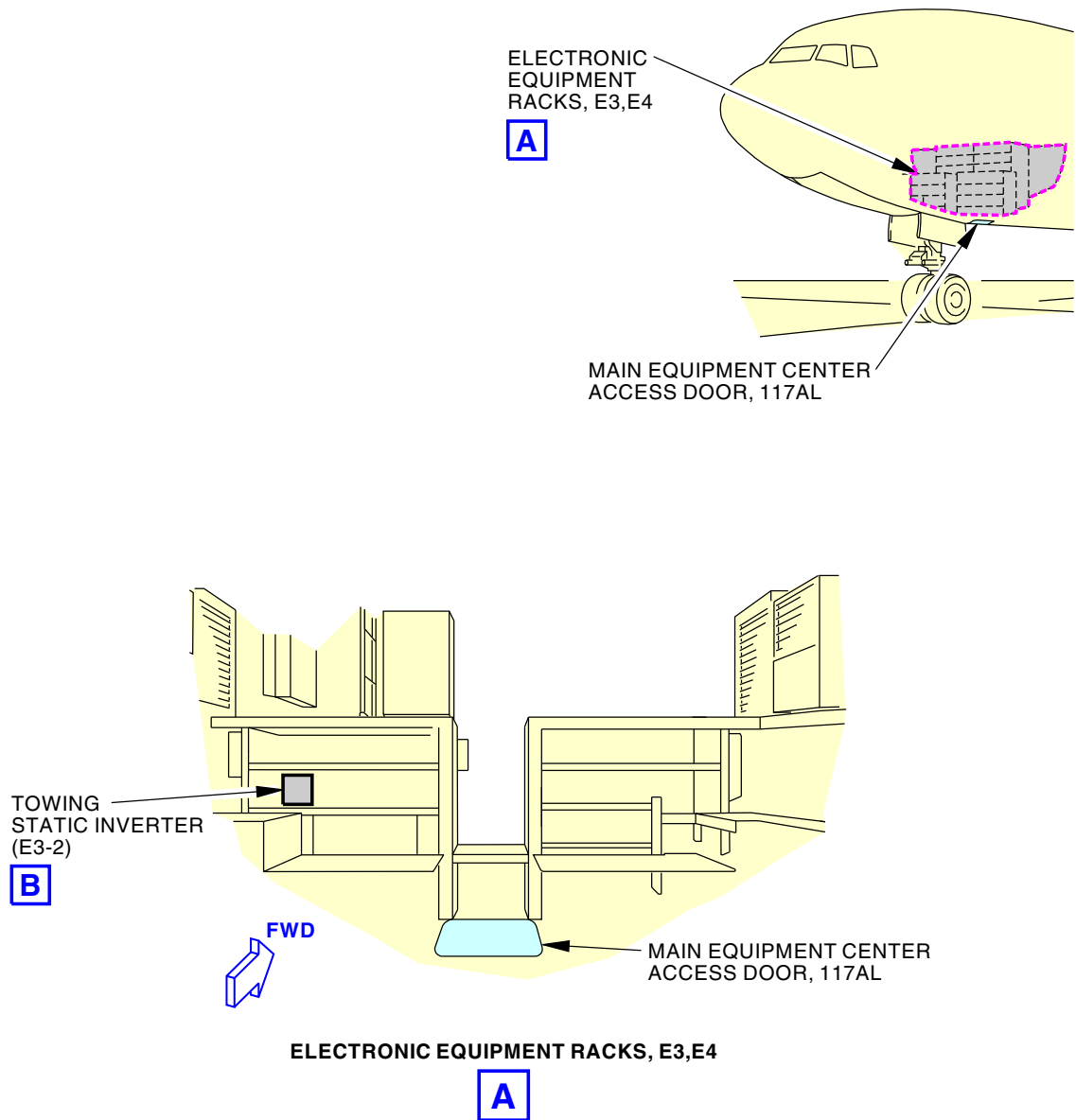
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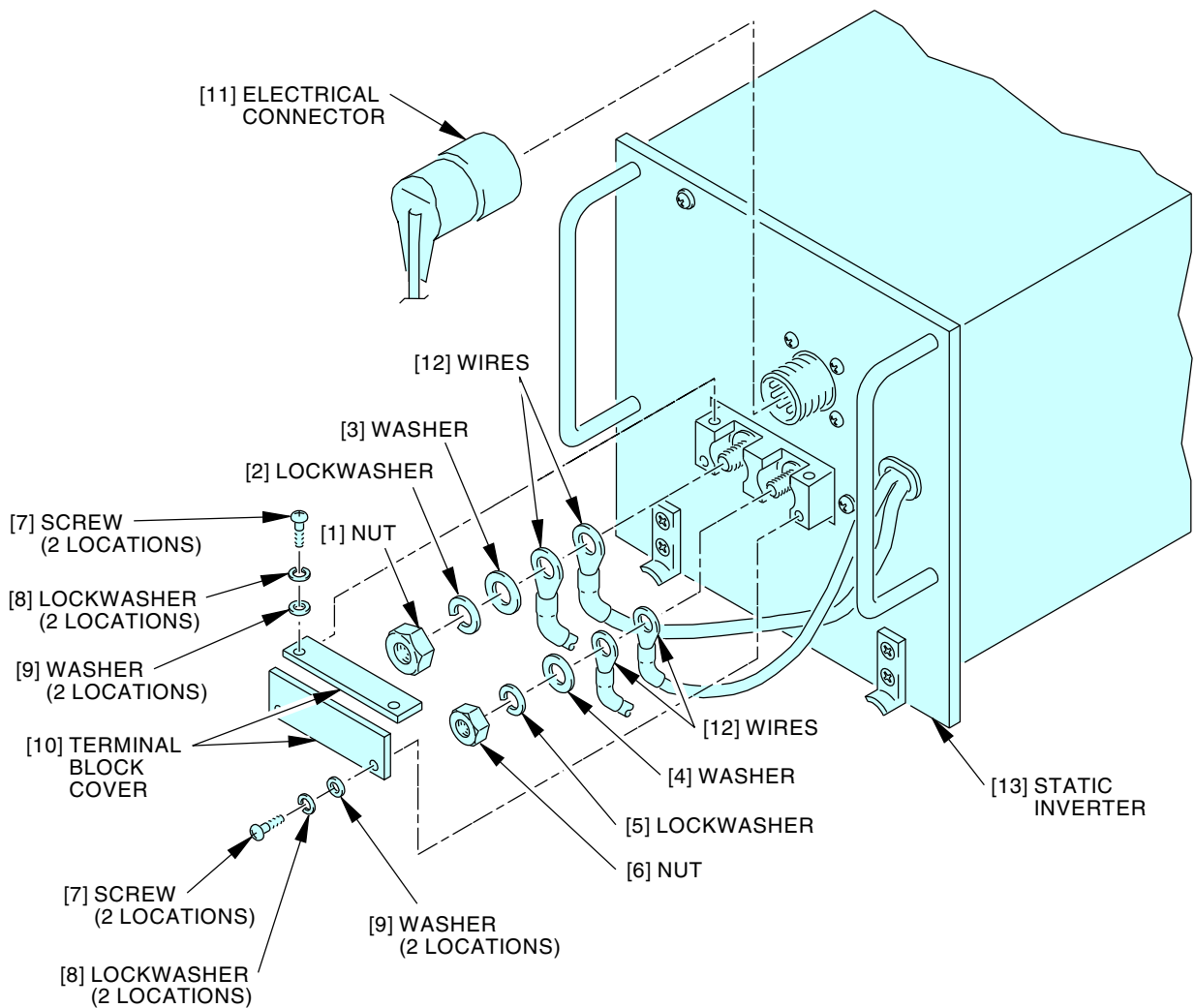
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TASK 24-33-06-400-801

3. Towing Static Inverter Installation

(Figure 401)

A. General

- (1) This task is the installation of the towing static inverter. The towing static inverter is located on the E3-2 equipment rack.

B. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
20-41-01-400-803	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Towing static inverter	24-33-05-01-005	ARO 001-011
		24-33-05-01-060	ARO 001-011
		24-33-05-01-310	ARO ALL

D. Location Zones

Zone	Area
117	Main Equipment Center, Left

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Towing Static Inverter Installation

SUBTASK 24-33-06-480-002



DO NOT INSTALL THE TOWING STATIC INVERTER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE STATIC INVERTER.

- (1) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-41-01-400-803.

SUBTASK 24-33-06-420-001

- (2) Install the towing static inverter [13]. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-33-06-420-002

- (3) Do these steps to connect the towing static inverter:
- Put the wires [12] on the terminal lugs of the towing static inverter [13].
 - Install the nut [1], lockwasher [2], and washer [3] and tighten the nut to a torque of 135-145 in.-lbs.
 - Install the nut [6], lockwasher [5], and washer [4] and tighten the nut to a torque of 65-75 in.-lbs.
 - Do these steps to install the terminal block covers [10]:
 - Attach the terminal block covers [10] to the static inverter.

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- 2) Install the screws [7], lockwashers [8], and washers [9].
- (e) Install the electrical connector [11] on the towing static inverter [13].

SUBTASK 24-33-06-410-001

- (4) Install the E3 rack protective cover.

SUBTASK 24-33-06-860-003

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	6	C24679	TOW BUS DISTR P310

G. Towing Static Inverter Installation Test

SUBTASK 24-33-06-860-004

- (1) Make sure there is no IDG, APU, primary or secondary external power being supplied to the airplane.

SUBTASK 24-33-06-860-005

- (2) Make sure the BATTERY switch on the P5 panel is in the OFF position.

SUBTASK 24-33-06-860-006

- (3) Set the TOWING POWER switch, on the ground test module assembly, P61, to the BAT position.

SUBTASK 24-33-06-860-007

- (4) Make sure the outboard flood light on the captain's panel, P7, is on.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-33-06-860-008

- (1) Set the TOWING POWER switch, on the ground test module assembly, P61, to the OFF position.

SUBTASK 24-33-06-410-002

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-33-06-860-009

- (3) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-33-06-860-010

- (4) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.

————— **END OF TASK** —————

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MAIN BATTERY, GROUND POWER BATTERY, AND BATTERY CAPTAIN ISOLATION RELAY - REMOVAL/
INSTALLATION

1. **General**

A. This procedure has these tasks:

- (1) A removal of the Main Battery or the Ground Power Battery or the Battery Captain (Bat-Capt) Isolation relays.
- (2) An installation of the Main Battery or the Ground Power Battery or the Bat-Capt Isolation relays.

B. These relays installed in Standby Management Panel P310 and are in the Standby Power-DC Control Removal/Installation task.

- (1) Main Battery Relay, K24006
- (2) Ground Power Battery Relay, K24019
- (3) Bat-Capt Isolation Relay, K24020

TASK 24-33-07-000-801

2. **Standby Power-DC Control Relay Removal**

(Figure 401)

A. **References**

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
45-10-00-740-820	How to Backup and Replace the Fault Database (P/B 201)

B. **Location Zones**

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

C. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door

D. **Prepare for Removal**

SUBTASK 24-33-07-860-004

- (1) Do this task: How to Backup and Replace the Fault Database, TASK 45-10-00-740-820.

SUBTASK 24-33-07-860-001



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-33-07-860-002

- (3) Set the BATTERY switch on the P5 panel to the OFF position.

NOTE: The generator control lights may continue to come on for 3 to 4 minutes if the APU and BATTERY switches are selected OFF in a quick sequence.

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SUBTASK 24-33-07-010-002

- (4) Open this access door:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-33-07-860-007



MAKE SURE THAT THE CIRCUIT BREAKERS IN THE SUBSEQUENT STEP ARE OPEN. IF THEY ARE CLOSED, THE FIRE EXTINGUISHER BOTTLES CAN RELEASE THEIR CONTENTS. THIS CAN CAUSE INJURIES TO PERSONNEL.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-33-07-020-002



DO NOT DISCONNECT THE MAIN BATTERY WHILE AC POWER IS NOT CONNECTED. IF YOU DISCONNECT AC POWER AND THE MAIN BATTERY, IT WILL ERASE THE BATTERY-BACKED MEMORY IN AIMS.

- (6) Remove the battery connector and electrical connector to disconnect main aircraft battery.

E. Removal

SUBTASK 24-33-07-020-003



DO NOT TOUCH THE RELAY. PUT ON GLOVES FOR HAND PROTECTION TO REMOVE THE RELAY OR LET THE RELAY BECOME COOL. THE HIGH TEMPERATURE CAN BURN YOU.

- (1) To remove the canister type relay, do the steps that follow:
- Open the P310 panel, and pull down the large insulating panel door cover [9] at the bottom of the panel (below Row "M" circuit breakers).
 - Remove the four captive screws [4] that attach the relay to the P310 panel.
 - Remove the electrical connector from Main Battery Relay [1], Bat-Capt Isolation Relay [2], and Ground Power Battery Relay [3].
 - Put an identification tag on the terminal lug wire to help with installation.
 - Remove the nut [5] and lockwasher [6] and disconnect the terminal lug from the terminal stud (View D).
 - Remove the applicable relay: Main Battery Relay [1], Bat-Capt Isolation Relay [2], or Ground Power Battery Relay [3].

————— END OF TASK —————

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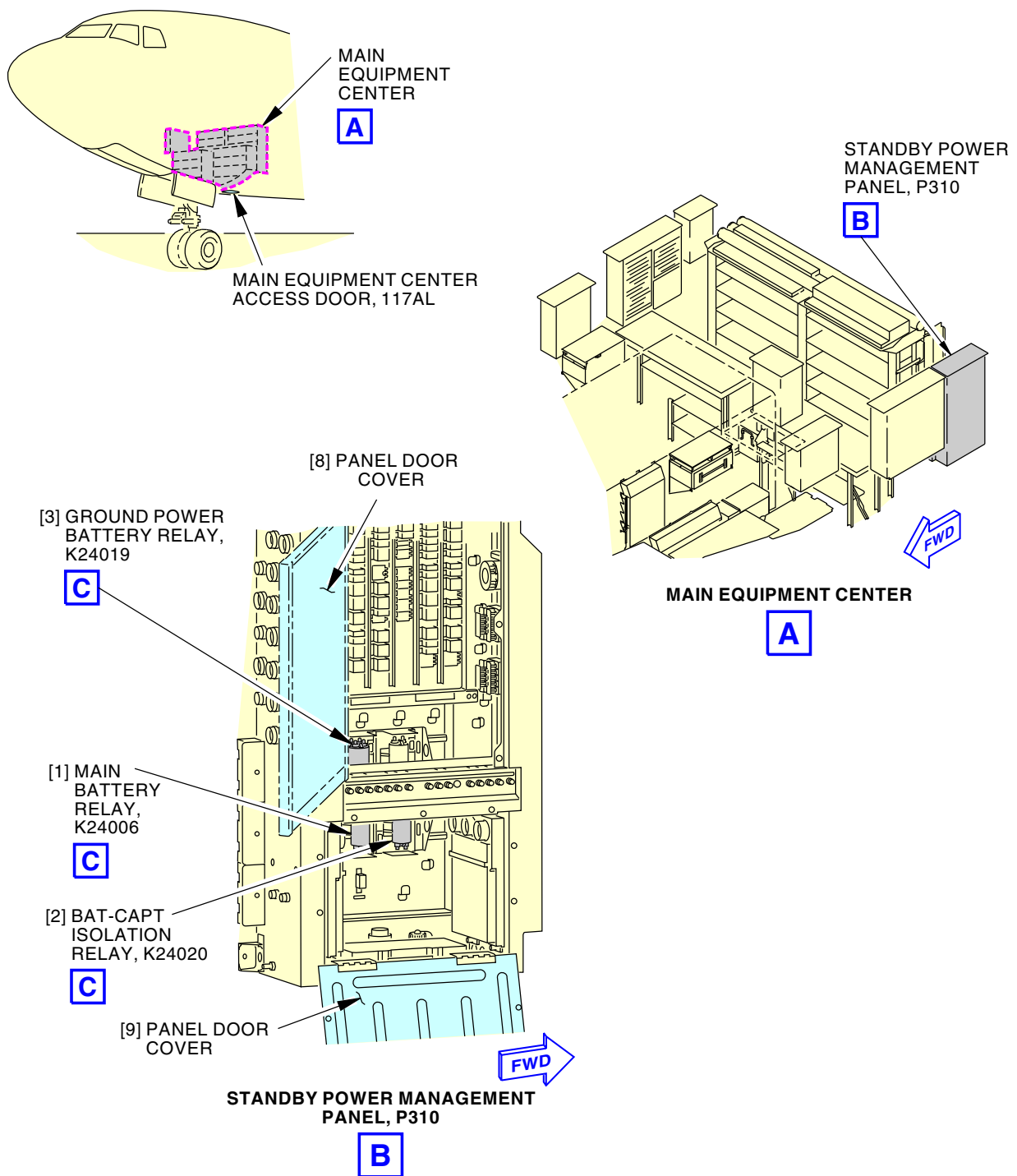
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N59233 S0006408542_V3

Main Battery, Gnd Pwr Battery, and Bat-Capt Isolation Relay Installation
Figure 401/24-33-07-990-801 (Sheet 1 of 2)

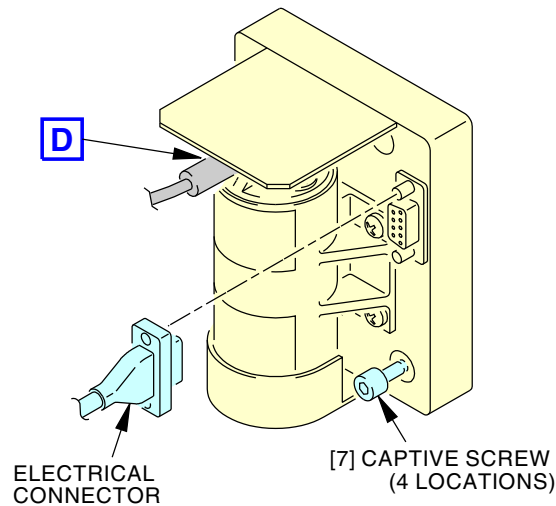
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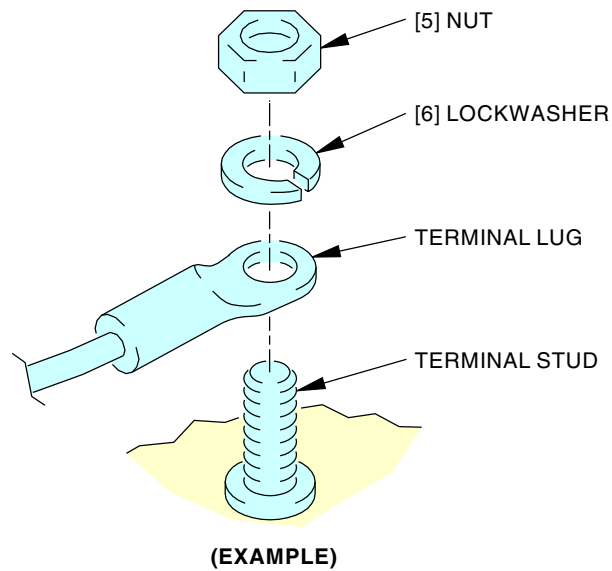
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**CANISTER TYPE RELAY
(EXAMPLE)**

[C]



[D]

2055498 S0000419550_V2

Main Battery, Gnd Pwr Battery, and Bat-Capt Isolation Relay Installation
Figure 401/24-33-07-990-801 (Sheet 2 of 2)

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TASK 24-33-07-400-801

3. Standby Power-DC Control Relay Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-30-00-700-801	DC/Standby Power System - Operational Test (P/B 501)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Installation

SUBTASK 24-33-07-420-002

- (1) To install the canister type relay, do the steps that follow:
 - (a) Put the applicable Main Battery Relay [1], Bat-Capt Isolation Relay [2], or Ground Power Battery Relay [3], in its position.
 - (b) Install the four captive screws [7] that attach the relay to the P310 panel.
 - (c) Tighten the four captive screws [7] to a torque of approximately 39 ±4 in-lb (4 ±1 N·m).
 - (d) Remove the identification tag from the terminal lug wire.
 - (e) Install the wire terminal lug on the terminal stud.
 - (f) Install the nut [5] and lockwasher [6] on the terminal stud.
 - (g) For the Main Battery Relay [1] and the Bat-Capt Isolation Relay [2], tighten the nut [5] to a torque of approximately 34 in-lb (4 N·m).
 - (h) For the Ground Power Battery Relay [3], tighten the nut [5] to a torque of approximately 25 in-lb (3 N·m) .
 - (i) Install the electrical connector on the Main Battery Relay [1], Bat-Capt Isolation Relay [2], or Ground Power Battery Relay [3].
 - (j) Reinstall the large insulating panel door cover [9] below the Row "M" circuit breakers, and close the P310 panel.

SUBTASK 24-33-07-420-003

- (2) Re-connect the battery connector and electrical connector to the main aircraft battery.

E. Installation Test

SUBTASK 24-33-07-710-003

- (1) Do this task: DC/Standby Power System - Operational Test, TASK 24-30-00-700-801.

SUBTASK 24-33-07-710-001

- (2) Do the steps that follow to do a test of the Main Battery Relay [1], and Bat-Capt Isolation Relay [2]:

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- (a) Set the STANDBY POWER switch on the P61 panel to the BAT position and release to the AUTO position.
- (b) Stop for 20 seconds for the DC/Standby Self Check to be completed.
- (c) Make sure the message ELEC STANDBY SYS does not show after 20 seconds, and let the EICAS display complete.
- (d) If there is a maintenance message for the main battery and Bat Capt isolation relay, refer to the applicable Maintenance Message Index in the FIM, or select the maintenance message and select MAINTENANCE MESSAGE DATA.

SUBTASK 24-33-07-710-002

- (3) Do the steps that follow to do a test of the ground power battery relay:
 - (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - (b) Set the BATTERY switch on the P5 panel to the ON position.
 - (c) Make sure the OFF lights on the L GEN CTRL and R GEN CTRL are on, located on the P5 panel.
 - (d) Set the BATTERY switch on the P5 panel to the OFF position.
 - (e) Make sure the OFF lights on the L GEN CTRL and R GEN CTRL are off.

SUBTASK 24-33-07-860-006

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C

SUBTASK 24-33-07-710-005

- (5) To erase EICAS MSGs related to Cargo Squib, use a maintenance access terminal (MAT) to do the operational test of the cargo squibs:
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 26 Fire Extinguishing System
 - 5) OPERATIONAL TEST
 - 6) Cargo Squibs
 - 7) CONTINUE
 - (b) Do the instructions that show on the MAT and then make these selections:
 - 1) CONTINUE
 - 2) START TEST
 - (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - (d) If FAILED shows, set the maintenance message and MAINTENANCE MESSAGE DATA. Refer to the applicable Maintenance Message Index in the FIM.

SUBTASK 24-33-07-710-004

- (6) Do these steps to make sure the FMCS has the applicable thrust rating selected:
 - (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

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- (b) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the TEST position.
- (c) Make sure the EICAS message, ENG CONTROL L (R) does not show.
- (d) Set the EEC MAINT L (R) ENG POWER switch on the P61 panel to the NORM position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-33-07-410-001

- (1) Close this access door:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

———— **END OF TASK** ————

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FLIGHT CONTROLS DC POWER - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Flight Controls DC Power Deactivation
- (2) Flight Controls DC Power Activation

TASK 24-35-00-040-801

2. Flight Controls DC Power - Deactivation

(Figure 201)

A. **General**

- (1) There are three Power Supply Assemblies (PSAs) in the Electrical Power Generation System. The left and center PSAs are located in the Main Equipment Center, on the E1-6 and E2-6 Equipment Shelves, respectively. The right PSA (PSA-R) is located on the E5-1 Equipment Shelf in the FWD Cargo Compartment.
- (2) There are three Flight Control (FCDC) Batteries in the Electrical Power Generation System. The left and center FCDC Batteries are located in the Main Equipment Center, on the E1-5 and E2-5 Equipment Shelves, respectively. The right FCDC Battery is located on the E5-2 Equipment Shelf in the FWD Cargo Compartment.
- (3) There are four Transformer Rectifier Units (TRUs) in the Electrical Power Generation System. The left TRU is located on the E1-1 Equipment Rack. The right TRU is located on the E2-2 Equipment Rack. There are two center TRUs. The TRU C1 is located on the E3-2 Equipment Rack. The TRU C2 is located on the E3-2 Equipment Rack.
- (4) This task removes electrical power from the Flight Controls DC Power System.

B. **References**

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. **Location Zones**

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door
825	Bulk Cargo Door

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F. Procedure

SUBTASK 24-35-00-860-019



MAKE SURE THAT THE AREA AROUND THE DOOR FOR THE MAIN LANDING GEAR IS CLEAR OF PERSONNEL, AND EQUIPMENT. THE DOORS CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE AREA AROUND THE THRUST REVERSERS. THE THRUST REVERSERS EXTEND AND RETRACT QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.



KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure clearance zones are established at the following areas of flight control surfaces:
 - (a) Ailerons
 - (b) Rudders
 - (c) Elevators
 - (d) Flaps
 - (e) Slats
 - (f) Spoilers
 - (g) Landing Gear
 - (h) Thrust Reversers
 - (i) Drive mechanisms

SUBTASK 24-35-00-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-35-00-010-002

- (3) Open these doors:

<u>Number</u>	<u>Name/Location</u>
821	Forward Large Cargo Door
825	Bulk Cargo Door

SUBTASK 24-35-00-860-010

- (4) Deactivate the PSAs:

- (a) Left PSA do these steps:
 - 1) On the front panel open this circuit breaker and attach a DO NOT OPERATE tag, STD-858:
 - a) CBD8 - LBAT INTLK

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	9	C24639	AC STBY RLY CTRL
M	4	C24675	L PSA BAT PWR
M	9	C24632	STATIC INV POWER

- (b) Center PSA do these steps:

- 1) On the front panel open this circuit breaker and attach a DO NOT OPERATE tag, STD-858:
 - a) CBD8 - C BAT INTLK
- 2) Open these circuit breakers and install safety tags:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

- (c) Right PSA do these steps:

- 1) On the front panel open this circuit breaker and attach a DO NOT OPERATE tag, STD-858:
 - a) CBD8 - R BAT INTLK
- 2) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

SUBTASK 24-35-00-860-011

- (5) Deactivate the TRUs:

- (a) Right TRU:

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	1	C24666	DC BUS TIE R

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	1	C24302	TRU R
ARO 011-999			
A	6	C24302	TRU R

ARO ALL

- (b) Left TRU:

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Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	28	C24629	DC BUS TIE L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C24303	TRU L

(c) C1 TRU:

Open these circuit breakers and install safety tags:

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C24341	TRU C1

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	13	C24643	MN BAT RLY CTRL
M	16	C24667	CAPT INST ALTN

(d) C2 TRU:

Open these circuit breakers and install safety tags:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	5	C24654	F/O INST ALTN

Right Power Panel, P200

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

ARO 001-010

A	3	C24340	TRU C2

ARO 011-999

A	5	C24340	TRU C2

ARO ALL

SUBTASK 24-35-00-860-012

(6) Deactivate the FCDC batteries:

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR
K	12	C24301	APU BAT CHARGER PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	8	C24652	APU CRK CTRL
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C
M	2	C24620	MN BAT CHARGER

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- (b) APU Auxiliary Panel (P49), Bulk Cargo Compartment:
- 1) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER
A	2	C24645	APU BATTERY VOLTAGE SENSE
A	3	C49602	APUC 2
A	4	C29621	RAT AUTO/MANUAL CONTROL

- (c) Disconnect the FCDC Battery connectors from the batteries and attach a DO NOT OPERATE tag, STD-858 to the connectors.
- 1) Left FCDC Battery (DM4102)
 - 2) Center FCDC Battery (DM24302)
 - 3) Right FCDC Battery (DM24202)

G. Flight Controls DC Power - Tryout

NOTE: This tryout is to make sure the Flight Controls DC Power System is in a zero energy state.

SUBTASK 24-35-00-860-013

- (1) Make sure that the battery connectors on the FCDC batteries are disconnected and have a DO NOT OPERATE tag, STD-858 attached.
 - (a) Left FCDC Battery (DM4102)
 - (b) Center FCDC Battery (DM24302)
 - (c) Right FCDC Battery (DM24202)

SUBTASK 24-35-00-860-014

- (2) Make sure that these circuit breakers are open and have safety tags:

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER
A	2	C24645	APU BATTERY VOLTAGE SENSE
A	3	C49602	APUC 2
A	4	C29621	RAT AUTO/MANUAL CONTROL

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR
K	12	C24301	APU BAT CHARGER PWR

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR
P	28	C24629	DC BUS TIE L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C24303	TRU L
E	4	C24341	TRU C1

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Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	1	C24666	DC BUS TIE R
P	3	C24672	R PSA TRU PWR
P	5	C24654	F/O INST ALTN

Right Power Panel, P200

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

ARO 001-010

A	1	C24302	TRU R
A	3	C24340	TRU C2

ARO 011-999

A	5	C24340	TRU C2
A	6	C24302	TRU R

Standby Power Management Panel, P310

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

ARO ALL

K	8	C24652	APU CRK CTRL
K	13	C24643	MN BAT RLY CTRL
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C
L	9	C24639	AC STBY RLY CTRL
M	2	C24620	MN BAT CHARGER
M	4	C24675	L PSA BAT PWR
M	5	C24676	C PSA BAT PWR
M	9	C24632	STATIC INV POWER
M	15	C24674	C PSA TRU PWR
M	16	C24667	CAPT INST ALTN

SUBTASK 24-35-00-780-001



MAKE SURE THAT THERE IS NO PRESSURE IN THE HYDRAULIC SYSTEM. PRESSURE IN THE HYDRAULIC SYSTEM CAN MOVE THE CONTROL SURFACES AND THE THRUST REVERSER. THEIR MOVEMENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Make sure that the hydraulic systems are not pressurized. If it is necessary, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 24-35-00-860-015



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (4) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-35-00-700-001

- (5) Make sure the electrical maintenance page shows no indication for the DC-V and DC-A for the following:
- (a) Power Supply Assemblies (PSAs)

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(b) Flight Control (FCDC) Batteries

————— **END OF TASK** —————

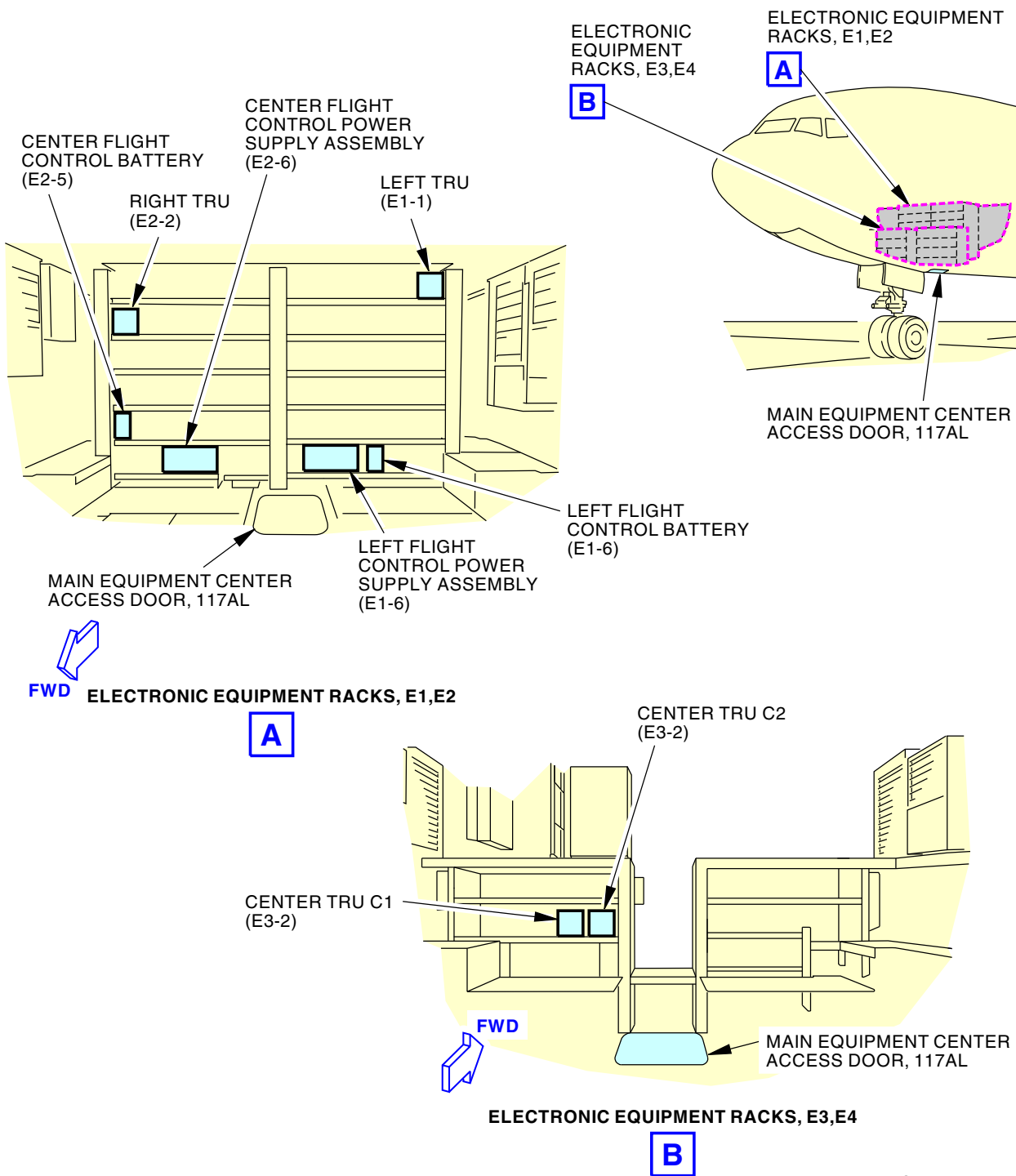
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2405520 S0000556627_V2

Flight Controls DC Power Component Locations
Figure 201/24-35-00-990-801 (Sheet 1 of 2)

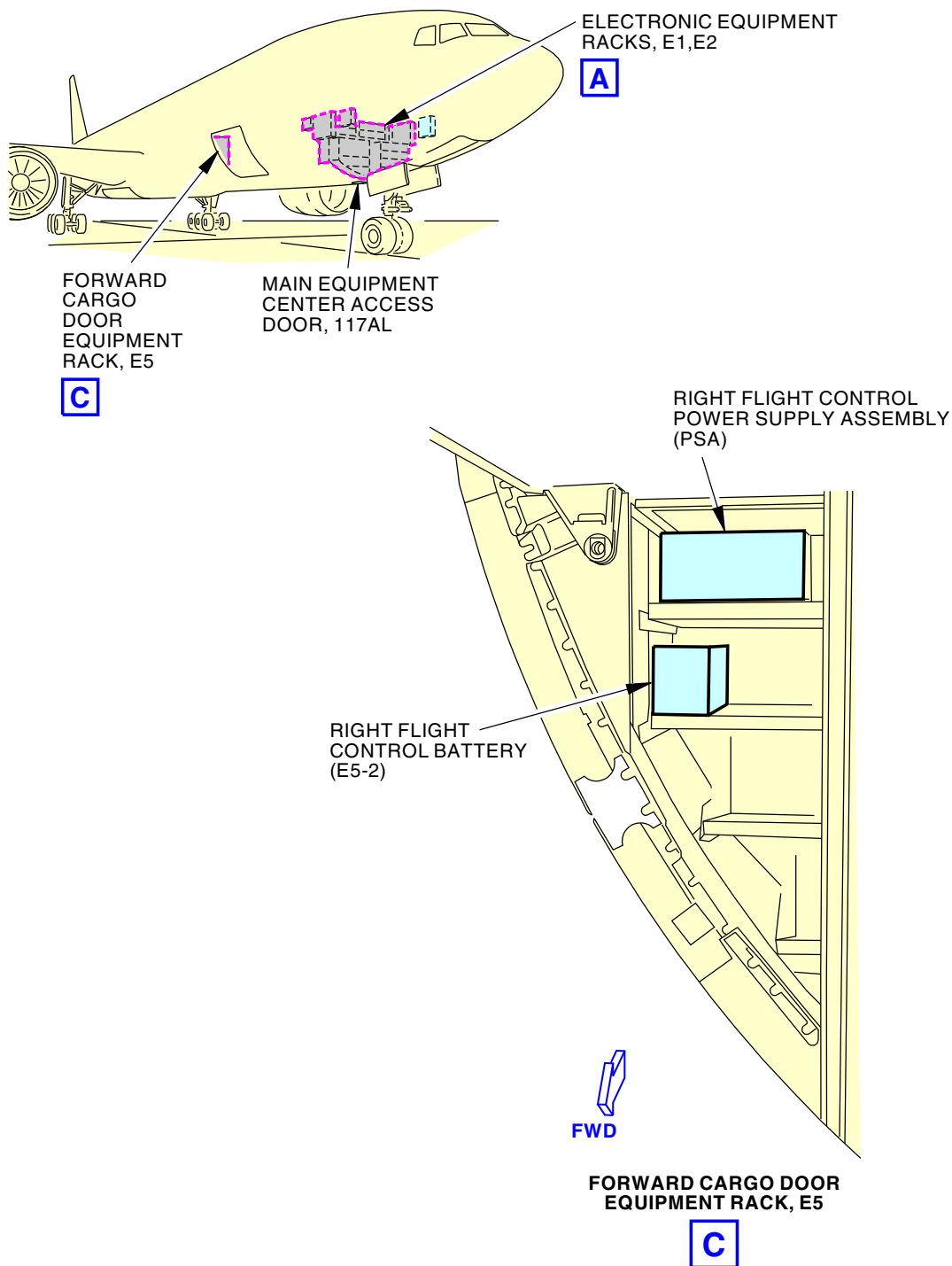
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2405539 S0000556629_V2

**Flight Controls DC Power Component Locations
Figure 201/24-35-00-990-801 (Sheet 2 of 2)**

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TASK 24-35-00-440-801

3. Flight Controls DC Power - Activation

(Figure 201)

A. General

- (1) This task adds electrical power to the Flight Controls DC Power System.

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door
825	Bulk Cargo Door

E. Procedure

SUBTASK 24-35-00-860-020



WARNING

MAKE SURE THAT THE AREA AROUND THE DOOR FOR THE MAIN LANDING GEAR IS CLEAR OF PERSONNEL, AND EQUIPMENT. THE DOORS CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.



WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE AREA AROUND THE THRUST REVERSERS. THE THRUST REVERSERS EXTEND AND RETRACT QUICKLY. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.



WARNING

KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES AND THE FLIGHT CONTROL DRIVE MECHANISMS. THESE COMPONENTS WILL MOVE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure clearance zones are established at the following areas of flight control surfaces:
- (a) Ailerons
 - (b) Rudders
 - (c) Elevators
 - (d) Flaps
 - (e) Slats
 - (f) Spoilers
 - (g) Landing Gear

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- (h) Thrust Reversers
- (i) Drive mechanisms

SUBTASK 24-35-00-860-016

- (2) Activate the FCDC batteries:
 - (a) Remove the DO NOT OPERATE tag, STD-858 from the battery connectors and re-connect the FCDC Battery connectors to the batteries.
 - 1) Left FCDC Battery (DM4102)
 - 2) Center FCDC Battery (DM24302)
 - 3) Right FCDC Battery (DM24202)
 - (b) APU Auxiliary Panel (P49), Bulk Cargo Compartment:
 - 1) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C24622	APU BATTERY CHARGER
A	2	C24645	APU BATTERY VOLTAGE SENSE
A	3	C49602	APUC 2
A	4	C29621	RAT AUTO/MANUAL CONTROL

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C24300	MN BAT CHARGER PWR
K	12	C24301	APU BAT CHARGER PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	8	C24652	APU CRK CTRL
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C
M	2	C24620	MN BAT CHARGER

SUBTASK 24-35-00-860-017

- (3) Activate the PSAs:
 - (a) Left PSA do these steps:
 - 1) On the front panel remove the DO NOT OPERATE tag, STD-858 and close this circuit breaker:
 - a) CBD8 - LBAT INTLK
 - 2) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	7	C26639	FIRE EXT CGO BTL 2A,2B & 2C
M	4	C24675	L PSA BAT PWR

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	9	C24632	STATIC INV POWER

(b) Center PSA do these steps:

- 1) On the front panel remove the DO NOT OPERATE tag, STD-858 and close this circuit breaker:
 - a) CBD8 - C BAT INTLK
- 2) Remove the safety tags and close these circuit breakers:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

(c) Right PSA do these steps::

- 1) On the front panel remove the DO NOT OPERATE tag, STD-858 and close this circuit breaker:
 - a) CBD8 - R BAT INTLK
- 2) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

SUBTASK 24-35-00-860-018

(4) Activate the TRUs:

(a) Right TRU:

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	1	C24666	DC BUS TIE R

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	1	C24302	TRU R
ARO 011-999			
A	6	C24302	TRU R

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(b) Left TRU:

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	28	C24629	DC BUS TIE L

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Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C24303	TRU L

(c) C1 TRU:

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

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C24341	TRU C1

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	13	C24643	MN BAT RLY CTRL
M	16	C24667	CAPT INST ALTN

(d) C2 TRU:

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	5	C24654	F/O INST ALTN

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 001-010			
A	3	C24340	TRU C2
ARO 011-999			
A	5	C24340	TRU C2

ARO ALL

SUBTASK 24-35-00-410-002

(5) Close these doors:

<u>Number</u>	<u>Name/Location</u>
821	Forward Large Cargo Door
825	Bulk Cargo Door

SUBTASK 24-35-00-410-003

(6) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

————— END OF TASK —————

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FLIGHT CONTROLS DC POWER - ADJUSTMENT/TEST

1. General

- A. This procedure has this task:
- (1) An operational test of the flight controls DC power.

TASK 24-35-00-700-801

2. Flight Controls DC Power - Operational Test

A. General

- (1) This task contains an operational test for the power supply assemblies and the FCDC batteries.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 24-35-00-860-001

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-35-00-860-002



MAKE SURE THAT THERE IS NO PRESSURE IN THE HYDRAULIC SYSTEM. PRESSURE IN THE HYDRAULIC SYSTEM CAN MOVE THE CONTROL SURFACES AND THE THRUST REVERSER. THEIR MOVEMENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (2) Make sure that the hydraulic systems are not pressurized. If it is necessary, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 24-35-00-710-001



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Do an operational test for the left FCDC power.
 - (a) Make sure the electrical maintenance page shows 19-33 DC-V and 4-21 DC-A for the left FBW.
 - (b) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
P	26	C24673	L PSA TRU PWR

- (c) Make sure the electrical maintenance page shows 19-33 DC-V and 4-21 DC-A for the left FBW.

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

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	8	CBD8-L	PFC BAT INTLK

- (e) Make sure the electrical maintenance page shows no indication for the DC-V and DC-A of the left FBW.
- (f) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR

- (g) Make sure the electrical maintenance page shows 19-33 DC-V and 4-19 DC-A for the left FBW.
- (h) Remove the safety tag and close this circuit breaker:

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	8	CBD8-L	PFC BAT INTLK

- (i) Make sure that there are no maintenance messages related to chapter 24 FCDC system for the left channel.

SUBTASK 24-35-00-710-002



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (4) Do an operational test for the right FCDC power.

- (a) Make sure the electrical maintenance page shows 19-33 DC-V and 4-18 DC-A for the right FBW.
- (b) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

- (c) Make sure the electrical maintenance page shows no indication for the DC-V and DC-A of the right FBW.
- (d) Open this circuit breaker and install safety tag:

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	8	CBD8-R	PFC BAT INTLK

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

- (f) Make sure the electrical maintenance page shows 19-33 DC-V and 4-19 DC-A for the right FBW.

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

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	8	CBD8-R	PFC BAT INTLK

- (h) Make sure that there are no maintenance messages related to chapter 24 FCDC system for the right channel.

SUBTASK 24-35-00-710-003



WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (5) Do an operational test for the center FCDC power.

- (a) Make sure the electrical maintenance page shows 19-33 DC-V and 4-27 DC-A for the center FBW.

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	15	C24674	C PSA TRU PWR

- (c) Make sure the electrical maintenance page shows no indication for the DC-V and DC-A of the center FBW.

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

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	8	CBD8-C	PFC BAT INTLK

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	15	C24674	C PSA TRU PWR

- (f) Make sure the electrical maintenance page shows 19-33 DC-V and 4-27 DC-A for the center FBW.

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

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	8	CBD8-C	PFC BAT INTLK

- (h) Make sure that there are no maintenance messages related to chapter 24 FCDC system for the center channel.

————— END OF TASK —————

TASK 24-35-00-700-802

3. Flight Controls Battery Charge Capacity - System Test

A. General

- (1) This task does a capacity test of the flight controls battery.

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B. References

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
20-10-01-400-801	E/E Box Installation (P/B 401)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

E. Prepare for the Operational Test

SUBTASK 24-35-00-860-003



WARNING

MAKE SURE THAT THERE IS NO PRESSURE IN THE HYDRAULIC SYSTEM. PRESSURE IN THE HYDRAULIC SYSTEM CAN MOVE THE CONTROL SURFACES AND THE THRUST REVERSER. THEIR MOVEMENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Make sure the hydraulic systems are not pressurized.
 - (a) If it is necessary to depressurize the hydraulic system, then do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 24-35-00-410-001

- (2) Open the applicable door to get access to the FC battery:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

SUBTASK 24-35-00-860-004



WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Before you remove the FC battery for testing, do the applicable steps:
 - (a) Open this circuit breaker on the PSA:
 - 1) CBD8 BAT INTLK
 - (b) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR

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Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	4	C24675	L PSA BAT PWR
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

SUBTASK 24-35-00-020-001

- (4) Remove the applicable FC battery from the equipment rack.
 - (a) Do this task: E/E Box Removal, TASK 20-10-01-000-801.

F. Flight Controls Battery Charge Capacity Check

SUBTASK 24-35-00-420-001

- (1) Connect the discharge unit to the applicable FC battery.

SUBTASK 24-35-00-760-001

- (2) Discharge the battery at 5 amps to an end voltage of 20 volts.
 - (a) Make sure the discharge time is more than 60 minutes.
 - (b) If the discharge time is less than 60 minutes, then replace the FC battery.

NOTE: Do not discard the FC battery. Refer to the vendor manual for possible repairs.

SUBTASK 24-35-00-020-002

- (3) Disconnect the discharge unit from the applicable FC battery.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-35-00-420-002

- (1) Install the applicable FC battery on the equipment rack.
 - (a) Do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-35-00-860-006

- (2) Close this circuit breaker on the PSA:
 - (a) CBD8 BAT INTLK

SUBTASK 24-35-00-860-007

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	4	C24675	L PSA BAT PWR

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

SUBTASK 24-35-00-860-008

- (4) Let the FC battery charge to the necessary level.
- (a) Approximately 5 hours is necessary to charge the FC battery to the level necessary for the usual operation of the airplane.

SUBTASK 24-35-00-860-009

- (5) Close these doors as applicable:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

———— **END OF TASK** ————

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POWER SUPPLY ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Power Supply Assembly Removal
- (2) Power Supply Assembly Installation

TASK 24-35-01-000-801

2. Power Supply Assembly Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) There are three Power Supply Assemblies (PSAs). The PSAs are located in the Main Equipment Center. The left PSA (PSA-L) is located on the E1-6 Equipment Shelf. The right PSA (PSA-R) is located on the E5-1 Equipment Shelf. The center PSA is located on the E2-6 Equipment Shelf.

B. **References**

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. **Location Zones**

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

E. **Prepare for the Removal**

SUBTASK 24-35-01-860-001

- (1) Make sure the engine does not operate. To stop the engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 24-35-01-860-008



MAKE SURE THAT THERE IS NO PRESSURE IN THE HYDRAULIC SYSTEM. PRESSURE IN THE HYDRAULIC SYSTEM CAN MOVE THE CONTROL SURFACES AND THE THRUST REVERSER. THEIR MOVEMENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (2) Make sure that the hydraulic systems are not pressurized. If it is necessary, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

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SUBTASK 24-35-01-010-001

- (3) Open the applicable doors:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

SUBTASK 24-35-01-860-002



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (4) Before you remove the PSA-L, do these steps:
- (a) Open this circuit breaker on the PSA:
 - 1) CBD8 BAT INTLK
 - (b) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	4	C24675	L PSA BAT PWR

SUBTASK 24-35-01-860-003



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (5) Before you remove the PSA-R, do these steps:
- (a) Open this circuit breaker on the PSA:
 - 1) CBD8 BAT INTLK
 - (b) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

SUBTASK 24-35-01-860-004



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (6) Before you remove the PSA-C, do these steps:
- (a) Open this circuit breaker on the PSA:
 - 1) CBD8 BAT INTLK

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

F. Power Supply Assembly Removal

SUBTASK 24-35-01-020-001

- (1) Remove the PSA [1] from the E/E equipment rack (TASK 20-10-01-000-801).

———— **END OF TASK** ————

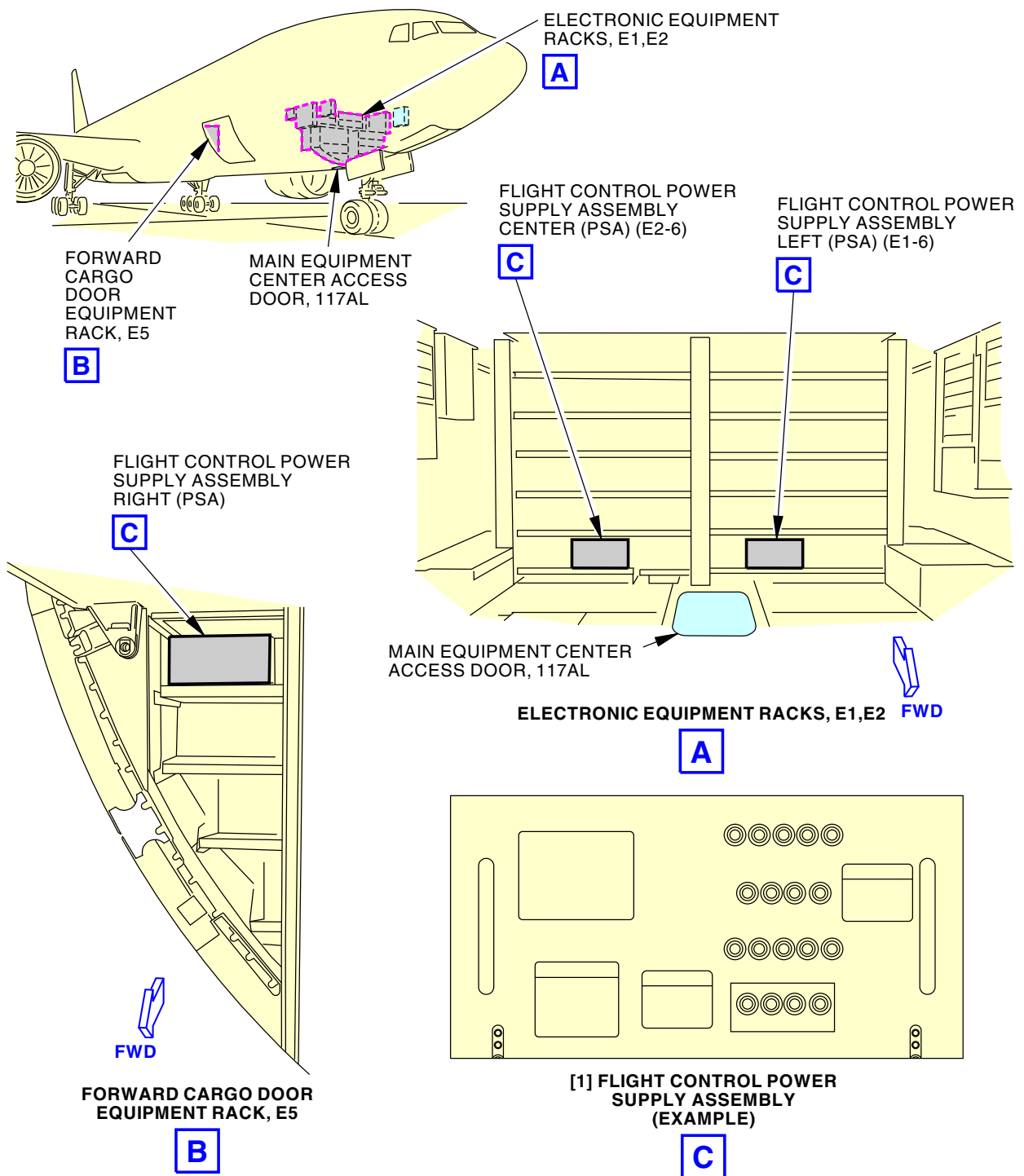
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Power Supply Assembly (PSA) Installation
Figure 401/24-35-01-990-801

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TASK 24-35-01-400-801

3. Power Supply Assembly Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
24-35-00-700-801	Flight Controls DC Power - Operational Test (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	PSA	24-35-01-01-010	ARO 001-010
		24-35-21-01-005	ARO ALL

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

E. Power Supply Assembly Installation

SUBTASK 24-35-01-420-001

- (1) Install the PSA [1] on the E/E equipment rack. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-35-01-860-005

- (2) If you installed the PSA-L, then do these steps:
- (a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
P	26	C24673	L PSA TRU PWR

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

Standby Power Management Panel, P310

Row	Col	Number	Name
M	4	C24675	L PSA BAT PWR

- (c) Close this circuit breaker on the PSA:

- 1) CBD8 BAT INTLK

SUBTASK 24-35-01-860-006

- (3) If you installed the PSA-R, then do these steps:

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

- (b) Close this circuit breaker on the PSA:

- 1) CBD8 BAT INTLK

SUBTASK 24-35-01-860-007

- (4) If you installed the PSA-C, then do these steps:

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

- (b) Close this circuit breaker on the PSA:

- 1) CBD8 BAT INTLK

F. Power Supply Assembly Installation Test

SUBTASK 24-35-01-710-001

- (1) Do this task: Flight Controls DC Power - Operational Test, TASK 24-35-00-700-801.

G. Put the Airplane Back to its Usual Condition

SUBTASK 24-35-01-410-001

- (1) Close the applicable access doors:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

————— **END OF TASK** —————

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FCDC BATTERIES - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) FCDC Batteries Removal
 - (2) FCDC Batteries Installation.

TASK 24-35-02-000-801

2. FCDC Batteries Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) There are three Flight Control (FC) Batteries. The FC Batteries are located in the Main Equipment Center. The left FC Battery is located on the E1-6 Equipment Shelf. The right FC Battery is located on the E5-2 Equipment Shelf. The center FC Battery is located on the E2-5 Equipment Shelf.

B. References

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

E. Prepare for the Removal

SUBTASK 24-35-02-860-007

 WARNING	MAKE SURE THAT THERE IS NO PRESSURE IN THE HYDRAULIC SYSTEM. PRESSURE IN THE HYDRAULIC SYSTEM CAN MOVE THE CONTROL SURFACES AND THE THRUST REVERSER. THEIR MOVEMENT CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Make sure that the hydraulic systems are not pressurized. If it is necessary, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 24-35-02-010-001

- (2) Open the applicable doors to get access to the FC batteries:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

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SUBTASK 24-35-02-860-001



WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(3) Before you remove the FC battery [1] for the PSA-L, do these steps:

- (a) Open this circuit breaker on the PSA:
 - 1) CBD8 BAT INTLK
- (b) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	26	C24673	L PSA TRU PWR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	4	C24675	L PSA BAT PWR

SUBTASK 24-35-02-860-002



WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(4) Before you remove the FC battery [1] for the PSA-R, do these steps:

- (a) Open this circuit breaker on the PSA:
 - 1) CBD8 BAT INTLK
- (b) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	3	C24672	R PSA TRU PWR

SUBTASK 24-35-02-860-003



WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE FLIGHT CONTROL SURFACES CAN MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(5) Before you remove the FC battery [1] for the PSA-C, do these steps:

- (a) Open this circuit breaker on the PSA:
 - 1) CBD8 BAT INTLK
- (b) Open these circuit breakers and install safety tags:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

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F. FCDC Batteries Removal

SUBTASK 24-35-02-020-001

- (1) Remove the FC battery [1] from the equipment rack. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

———— **END OF TASK** ————

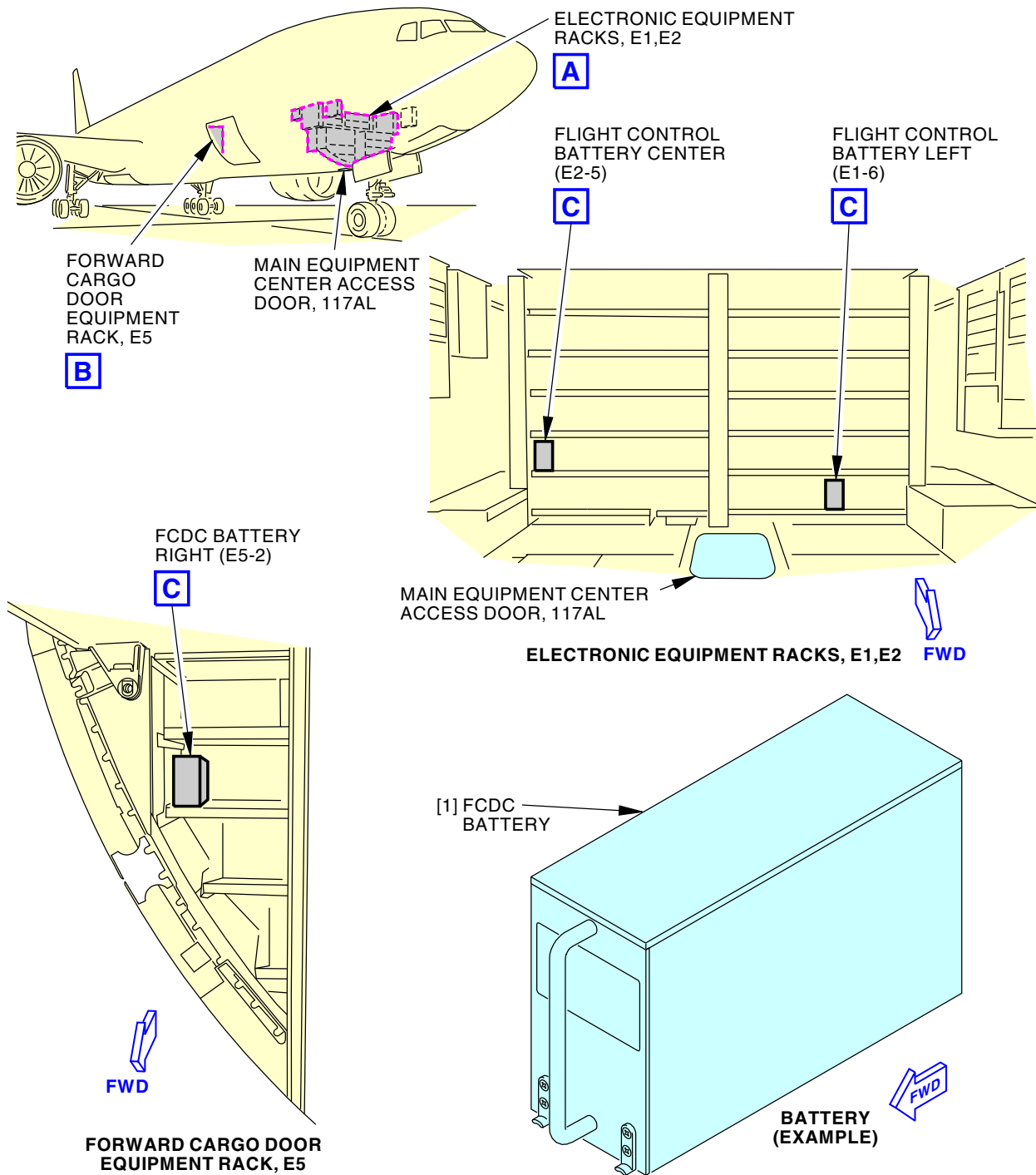
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FCDC Battery Installation
Figure 401/24-35-02-990-801

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TASK 24-35-02-400-801

3. FCDC Batteries Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
24-35-00-700-801	Flight Controls DC Power - Operational Test (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FC battery	24-35-01-01-075	ARO 001-010

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

E. FCDC Batteries Installation

SUBTASK 24-35-02-420-001

- (1) Install the FC battery [1] on the equipment rack. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-35-02-860-004

- (2) If you installed the FC battery [1] for the PSA-L, then do these steps:
- (a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
P	26	C24673	L PSA TRU PWR

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

Standby Power Management Panel, P310

Row	Col	Number	Name
M	4	C24675	L PSA BAT PWR

- (c) Close this circuit breaker on the PSA:
- 1) CBD8 BAT INTLK

SUBTASK 24-35-02-860-005

- (3) If you installed the FC battery [1] for the PSA-R, then do these steps:
- (a) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
P	3	C24672	R PSA TRU PWR

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(b) Close this circuit breaker on the PSA:

- 1) CBD8 BAT INTLK

SUBTASK 24-35-02-860-006

(4) If you installed the FC battery [1] for the PSA-C, then do these steps:

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	5	C24676	C PSA BAT PWR
M	15	C24674	C PSA TRU PWR

(b) Close this circuit breaker on the PSA:

- 1) CBD8 BAT INTLK

F. FCDC Batteries Installation Test

SUBTASK 24-35-02-710-001

(1) Do this task: Flight Controls DC Power - Operational Test, TASK 24-35-00-700-801.

G. Put the Airplane Back to its Usual Condition

SUBTASK 24-35-02-410-001

(1) Close these doors as applicable:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
821	Forward Large Cargo Door

————— END OF TASK —————

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AC EXTERNAL POWER - ADJUSTMENT/TEST

1. General

- A. This procedure has this task:
- (1) An operational test of the ac external power.

TASK 24-41-00-710-801

2. AC External Power - Operational Test

(Figure 501)

A. General

- (1) This operational test is to make sure the electrical interfaces of the AC External Power are connected correctly.

B. References

<u>Reference</u>	<u>Title</u>
20-41-00-910-801	Static Grounding (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-22-00-860-807	Remove Primary External Power (P/B 201)
24-22-00-860-808	Remove Secondary External Power (P/B 201)

C. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Access Panels

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

E. Procedure

SUBTASK 24-41-00-860-004

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-41-00-860-001

- (2) Do these steps to supply the primary external power to the 115V ac buses:

NOTE: The ground handling bus energizes automatically when the primary external power is supplied to the receptacle. The ground service bus is energized automatically when the primary external power is supplied to the right 115V ac bus.

- (a) Put the BATTERY switch in the ON position.
- (b) Put the STANDBY POWER switch in the BAT position.
- (c) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

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IF THE PRIMARY EXTERNAL POWER SUPPLY HAS AN EARTH GROUNDED NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRING OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE SEVERE INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (d) Make sure the primary external power supply operates correctly before you supply primary external power to the airplane.
- 1) If the ground return (neutral) circuit on the primary external power supply or the external power receptacle does not operate correctly, then, do this task: Static Grounding, TASK 20-41-00-910-801.



REMOVE THE ELECTRICAL POWER FROM THE PRIMARY EXTERNAL POWER CABLE BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (e) Install the power cable to the primary external power receptacle.
- NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.
- 1) Hold the cable with the electrical cable support.
- (f) Energize the primary external power cable.
- (g) Make sure these lights on the P30 panel are on:
- 1) The primary external power AC CONNECTED light
 - 2) The primary external power PWR NOT IN USE light.
- (h) Make sure the AVAIL light in the PRIMARY EXT PWR switch is on.
- (i) Set the L BUS TIE and R BUS TIE switches to the ISLN position.
- 1) Make sure the amber ISLN lights in the L BUS TIE and R BUS TIE switches are on.
- (j) Make sure these HOT BUS WARNING lights are on:
- 1) PRIMARY EXTERNAL POWER, on the right power panel, P200.
 - 2) GROUND HANDLING, on the auxiliary power panel, P300.
- (k) Push the GROUND SERVICE switch on the attendant's switch panel, P87.
- 1) Make sure the GROUND SERVICE light in the switch is on.
- (l) Make sure this HOT BUS WARNING light is on:
- 1) GROUND SERVICE, on the auxiliary power panel, P300.
- (m) Make sure the primary external power PWR NOT IN USE light is off.
- (n) Push the PRIMARY EXT PWR switch.
- 1) Make sure the ON light in the switch is on.
- (o) Set the L BUS TIE and R BUS TIE switches to the AUTO position.
- 1) Make sure the AUTO indicator shows in the L BUS TIE and R BUS TIE switches.
- (p) Make sure these HOT BUS WARNING lights are on:

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- 1) TIE BUS, on the left power panel, P100.
 - 2) TIE BUS, on the right power panel, P200.
 - 3) TIE BUS, on the auxiliary power panel, P300.
- (q) Set the R BUS TIE switch to the ISLN position.
- 1) Make sure the amber ISLN light in the switch is on.
- (r) Make sure this EICAS message shows:
- 1) ELEC AC BUS L
- (s) Set the R BUS TIE switch to the AUTO position.
- 1) Make sure the AUTO indicator in the switch shows.
- (t) Set the L BUS TIE switch to the ISLN position.
- 1) Make sure the amber ISLN light in the switch is on
- (u) Make sure this EICAS message shows:
- 1) ELEC AC BUS L
- (v) Do this task: Remove Primary External Power, TASK 24-22-00-860-807.
- NOTE:** You must remove primary electrical power to do the test for the secondary external power. If you are not going to do the test for secondary external power, you do not need to remove primary external power.

SUBTASK 24-41-00-860-002

- (3) Do these steps to supply the secondary external power to the 115V ac buses:

- (a) Put the BATTERY switch in the ON position.
- (b) Put the STANDBY POWER switch in the BAT position.



IF THE SECONDARY EXTERNAL POWER SUPPLY HAS AN EARTH GROUNDED NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRING OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE SEVERE INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (c) Make sure the secondary external power supply operates correctly before you supply secondary external power to the airplane.
- 1) If the ground return (neutral) circuit on the secondary external power supply or the secondary external power receptacle does not operate correctly, then, do this task: Static Grounding, TASK 20-41-00-910-801.



REMOVE THE ELECTRICAL POWER FROM THE SECONDARY EXTERNAL POWER CABLES BEFORE YOU CONNECT THE CABLES TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (d) Install the power cable to the secondary external power receptacle.

NOTE: Make sure that the receptacle contact area is clear of FOD before you connect the power cable.

- 1) Hold the cable with the electrical cable support.

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- (e) Energize the secondary external power cable.
- (f) Make sure these lights on the P30 panel are on:
 - 1) The secondary external power AC CONNECTED light
 - 2) The secondary external power PWR NOT IN USE light.
- (g) Make sure the AVAIL light in the SECONDARY EXT PWR switch is on.
- (h) Set the L BUS TIE and R BUS TIE switches to the ISLN position.
 - 1) Make sure the amber ISLN lights in the L BUS TIE and R BUS TIE switches are on.
- (i) Make sure this HOT BUS WARNING light is on:
 - 1) SECONDARY EXTERNAL POWER, on the auxiliary power panel, P300.
- (j) Put the SECONDARY EXT PWR switch in the ON position.
 - 1) Make sure the ON light in the switch is on.
- (k) Make sure this EICAS message shows:
 - 1) ELEC AC BUS L
 - 2) ELEC AC BUS R
- (l) Make sure these HOT BUS WARNING lights are on:
 - 1) TIE BUS, on the left power panel, P100.
 - 2) TIE BUS, on the right power panel, P200.
 - 3) TIE BUS, on the auxiliary power panel, P300.
- (m) Make sure the secondary external power NOT IN USE light is not on.
- (n) Set the L BUS TIE and R BUS TIE switches to the AUTO position.
- (o) Make sure these EICAS messages do not show:
 - 1) ELEC AC BUS L
 - 2) ELEC AC BUS R
- (p) Do this task: Remove Secondary External Power, TASK 24-22-00-860-808.
- (q) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-00-860-005

- (1) Set the STANDBY POWER switch to the AUTO position.

SUBTASK 24-41-00-860-006

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

————— **END OF TASK** —————

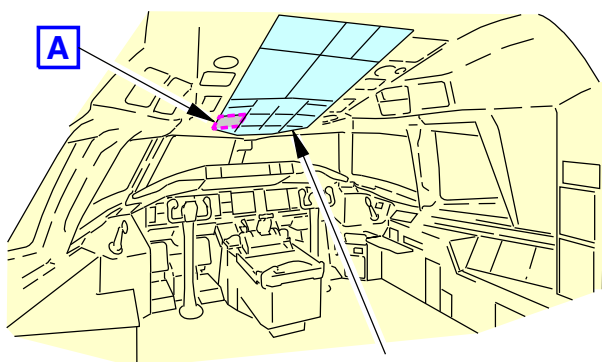
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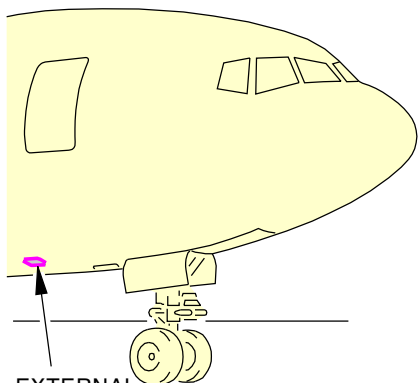
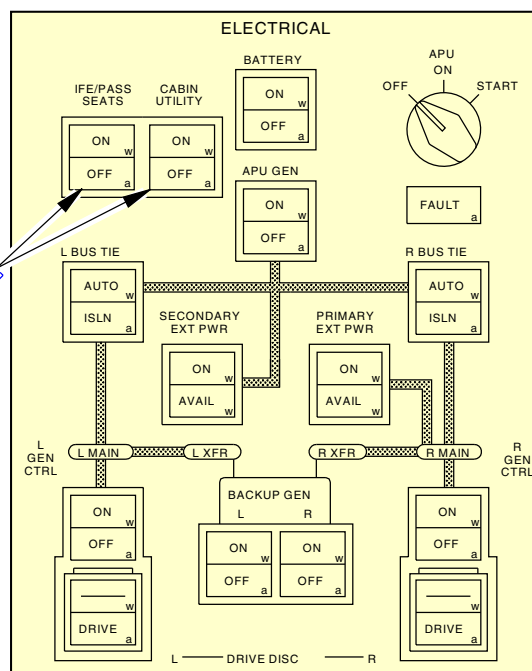
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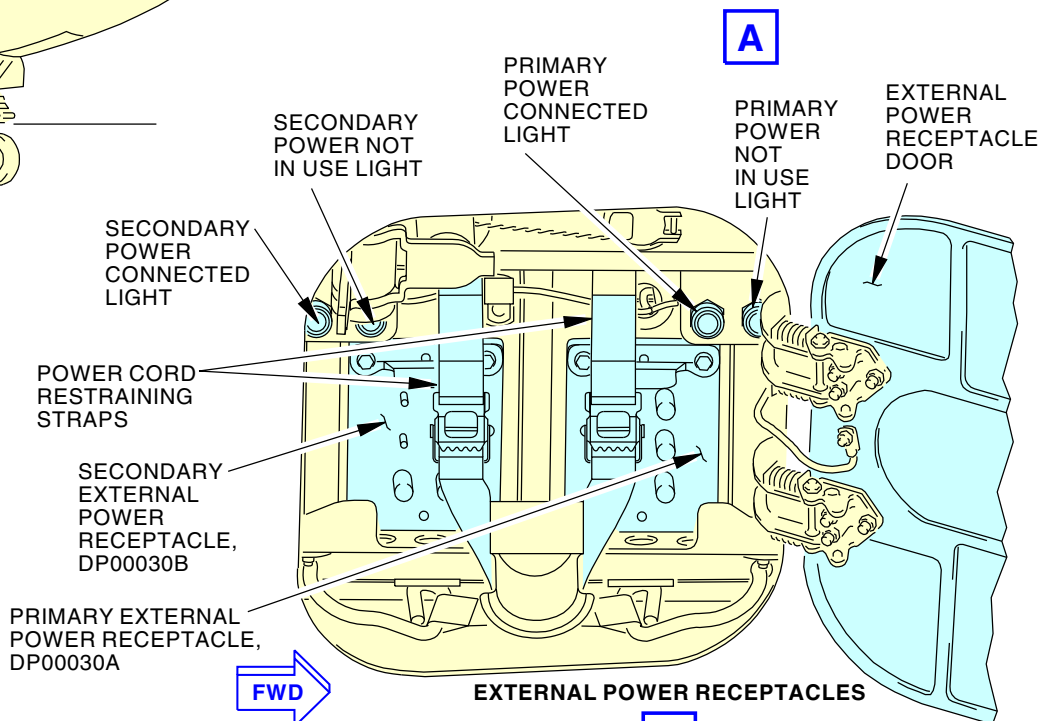


**OVERHEAD PANEL, P5
FLIGHT COMPARTMENT**



**EXTERNAL
GROUND
POWER
SUPPLY DOOR,
118AR**

B



1 IF INSTALLED

B

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**Electrical System/APU/External Power Receptacle Location
Figure 501/24-41-00-990-801**

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EXTERNAL POWER CONTACTOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) The removal of an external power contactor.
- (2) The installation of an external power contactor.
- (3) The tasks are for these external power contactors:
 - (a) The primary external power contactor, K24022, in the right power panel, P200.
 - (b) The secondary external power contactor, K24023, in the auxiliary power panel, P300.

TASK 24-41-01-000-801

2. External Power Contactor Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Prepare for the Removal

SUBTASK 24-41-01-860-005



REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-41-01-860-007



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (2) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P200 and P300.

D. External Power Contactor Removal

SUBTASK 24-41-01-020-001



WEAR GLOVES FOR HAND PROTECTION TO REMOVE THE CONTACTOR OR LET THE CONTACTOR BECOME COOL. THE HIGH TEMPERATURE OF THE CONTACTOR CAN BURN YOU.

- (1) Remove the applicable contactor, as follows:
 - (a) Open the applicable panel (P200 for Primary External Power contactor and P300 for Secondary External Power contactor).

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ARO 001-010

- (b) Remove the four captive screws [3] that attach the contactor to the applicable panel.

ARO 011-999

- (c) Remove the cap screws [4] that attach the contactor to the panel assembly.

ARO ALL

- (d) Remove the contactor.

———— **END OF TASK** ————

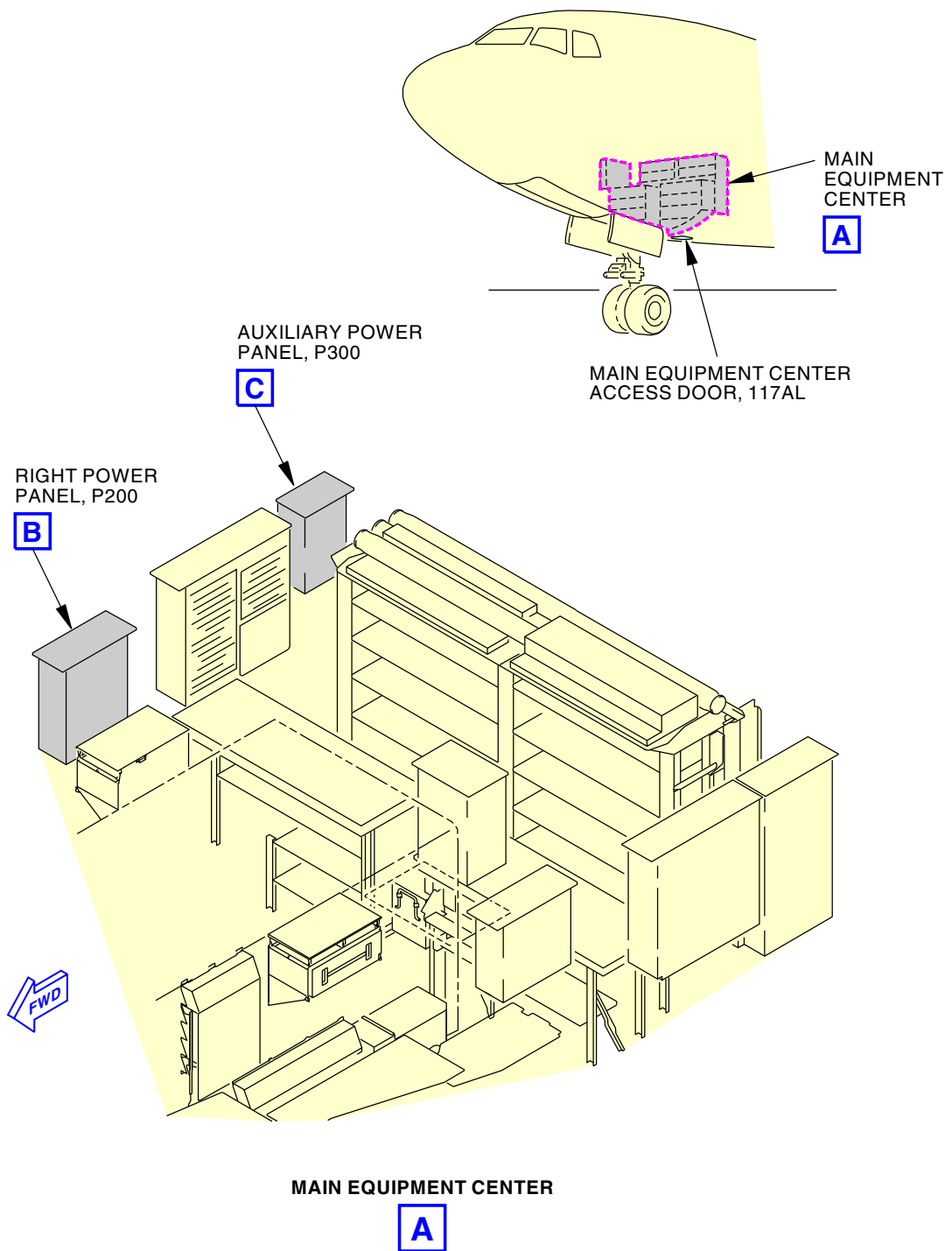
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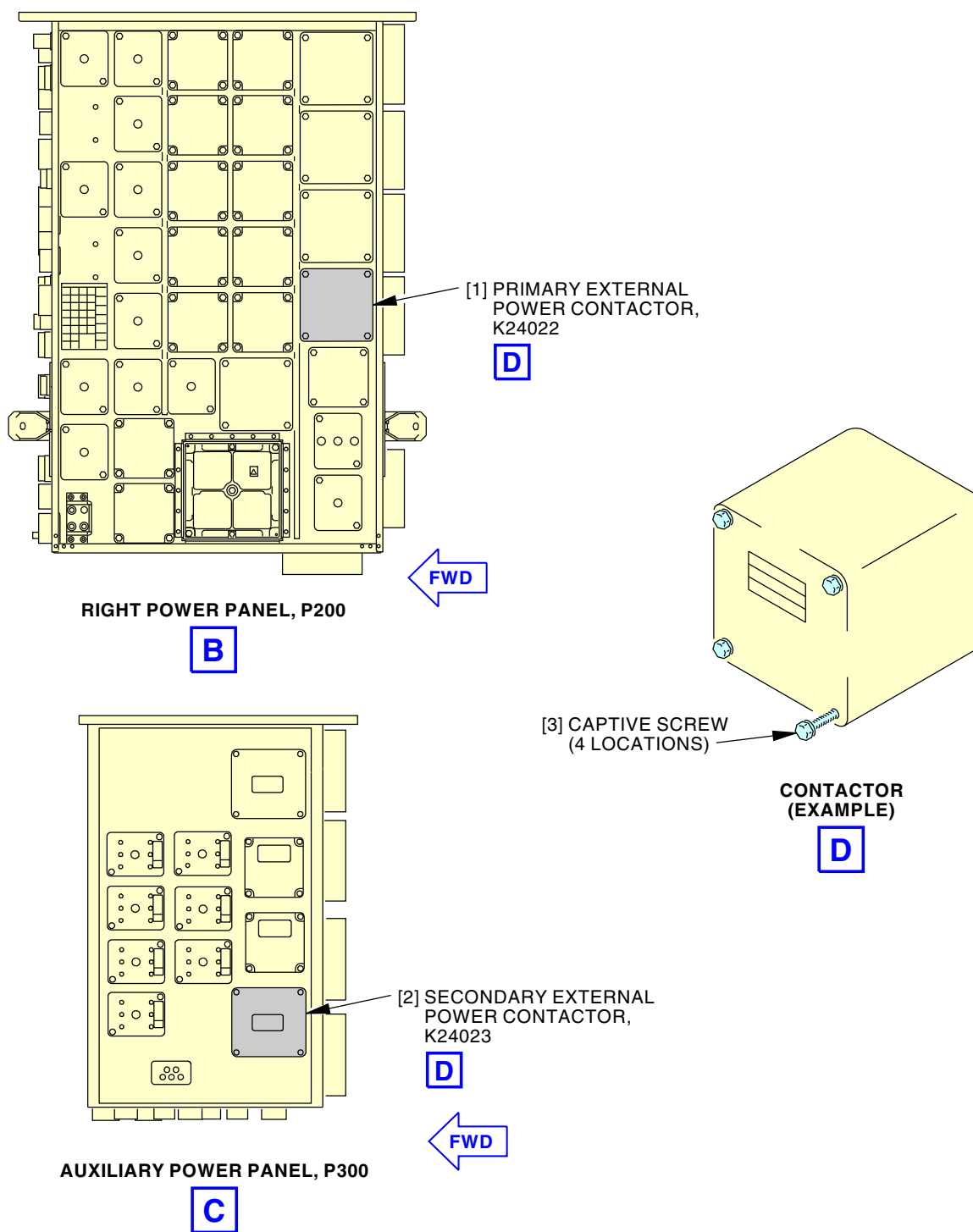
External Power Contactor Installation
Figure 401/24-41-01-990-801 (Sheet 1 of 3)

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**External Power Contactor Installation
Figure 401/24-41-01-990-801 (Sheet 2 of 3)**

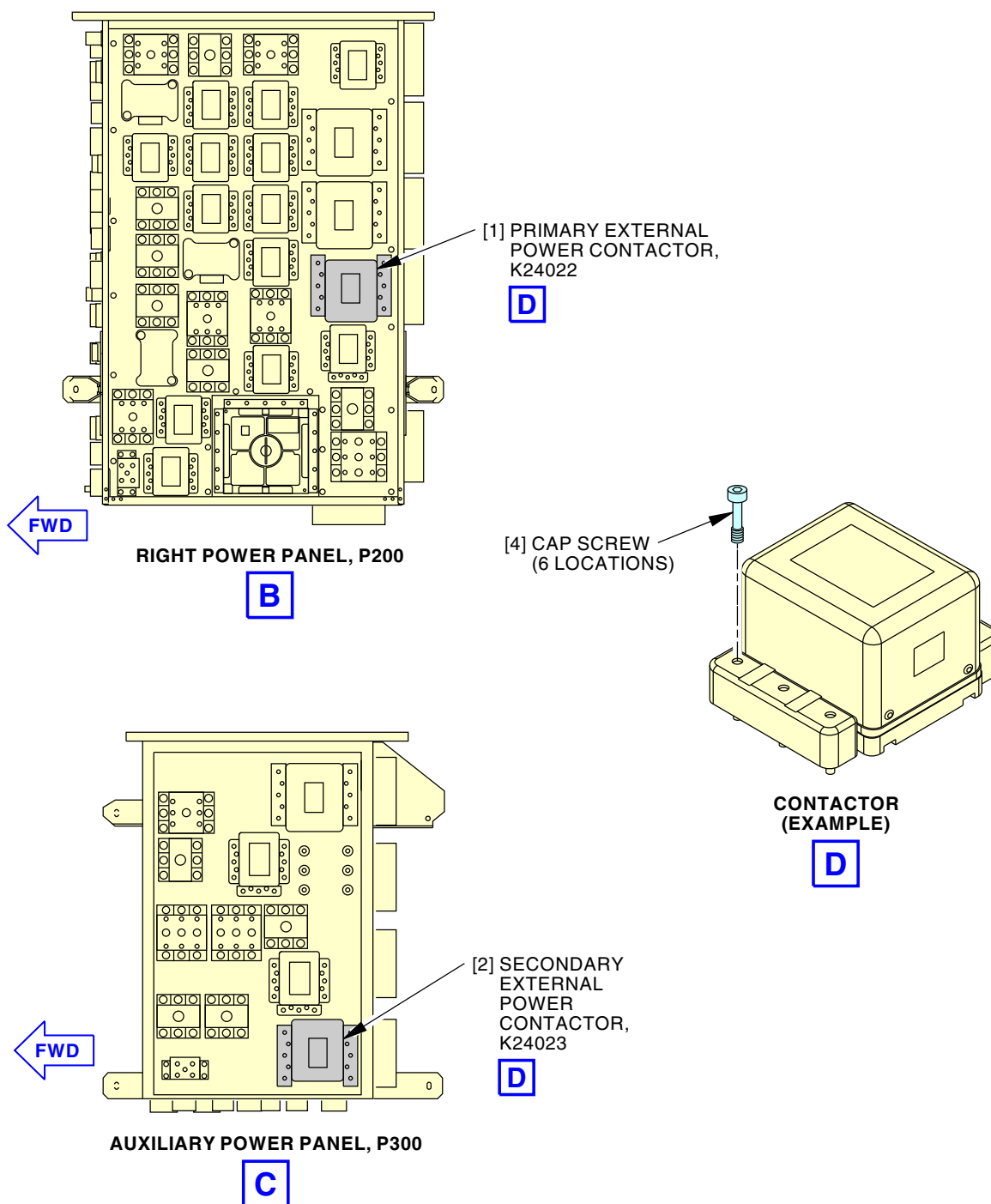
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**External Power Contactor Installation
Figure 401/24-41-01-990-801 (Sheet 3 of 3)**

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TASK 24-41-01-400-801

3. External Power Contactor Installation

(Figure 401)

A. General

 CAUTION	DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (1) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P200 and P300.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

D. External Power Contactor Installation

SUBTASK 24-41-01-420-001

- (1) Install the applicable contactor as follows:
 - (a) Put the Primary External Power Contactor, K24022 [1] or the Secondary External Power Contactor, K24023 [2] in the correct position in the appropriate power panel.

ARO 001-010

- (b) Install the four captive screws [3] that attach the contactor to the panel.

ARO 011-999

- (c) Install the cap screws [4] that attach the contactor to the panel.

ARO 001-010

- (d) Tighten the captive screws [3] to a torque of 15 pound-inches.

ARO 011-999

- (e) Torque the cap screws [4] between 28.8 in-lb (3.25 N·m) and 35.2 in-lb (3.98 N·m).

ARO ALL

- (f) Close the applicable panel.

E. External Power Contactor Installation Test

SUBTASK 24-41-01-860-002

- (1) Do the steps that follow for the installation test of the primary external power contactor:
 - (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
NOTE: Supply the primary external power only.
 - (b) Look at the Electrical Synoptic page to make sure the PRI EXT PWR light comes on.

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SUBTASK 24-41-01-860-006

- (2) Do the steps that follow for the installation test of the secondary external power contactor:
- (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
NOTE: Supply the secondary external power only.
 - (b) Look at the Electrical Synoptic page to make sure the SEC EXT PWR light comes on.

———— **END OF TASK** ————

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EXTERNAL POWER RECEPTACLE - INSPECTION/CHECK

1. General

- A. This procedure has these tasks:
 - (1) External Power Receptacle - Internal Visual Inspection.
 - (2) External Power Receptacle - External Visual Inspection.
 - (3) External Power Receptacle Pin Inspection.
 - (4) External Power Receptacle Neutral Pin to Nose Gear Grounding Stud Continuity Check.
- B. The external power receptacles (receptacle) may show worn areas and oxidation with usual use. The worn areas and the oxidation can cause an incorrect electrical connection between the plug and the receptacle.
- C. The visual inspection will make sure that the receptacle is in a good condition. In the visual inspection you will look for cracks in the receptacle case. You will make sure that the wires are in a good condition and connected correctly.
- D. The pin inspection uses a wear gage to do a GO-NO-GO test of the receptacle pins. The gage is made of a plug and a receptacle on a common shaft. The plug side of the gage is used to examine the pins on the receptacle. If you find worn pins, you will have to replace the receptacle. The receptacle side of the gage is used to examine the plug on the power cart. You must use the service procedure for the ground support equipment to do this test.
- E. You use a low resistance ohmmeter to measure the resistance between the neutral pins on the external power receptacles and grounding stud on the nose gear.

TASK 24-41-03-200-801

2. External Power Receptacle - Internal Visual Inspection

(Figure 601)

A. References

Reference	Title
53-01-01-000-801	Floor Panel Removal (P/B 401)
53-01-01-400-801	Floor Panel Installation (P/B 401)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

D. Prepare for the External Power Receptacles Visual Inspection

SUBTASK 24-41-03-860-001

- (1) Make sure there are no electrical power on the airplane.

SUBTASK 24-41-03-860-002

- (2) Disconnect all the electrical power cables from the external power receptacles.

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SUBTASK 24-41-03-860-003

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

SUBTASK 24-41-03-860-004



MAKE SURE YOU PUT A DO-NOT-OPERATE TAG ON THE EXTERNAL POWER RECEPTACLE TO PREVENT CONNECTION OF EXTERNAL POWER CABLES. INJURIES TO PERSONS CAN OCCUR IF YOU DO NOT OBEY THIS INSTRUCTION.

- (4) Attach a DO-NOT-OPERATE tag on the external power receptacle.

SUBTASK 24-41-03-010-001

- (5) You must remove the floor panel to get access to the back-side of the external power receptacles. To remove it, do this task: Floor Panel Removal, TASK 53-01-01-000-801.

SUBTASK 24-41-03-010-002

- (6) Remove the three nuts that hold the two conductor guards to the receptacle pan.

SUBTASK 24-41-03-010-003

- (7) Remove the insulator support from the two receptacles.

E. External Power Receptacle Visual Inspection

SUBTASK 24-41-03-210-002

- (1) Do these steps to examine the receptacles from the inner side of the airplane:
- (a) Look for discoloration of the receptacle studs and the wires caused by too much heat.
 - (b) Make sure that the wire connectors are assembled correctly.
NOTE: The wire terminal goes against the terminal block, then the washers and the nuts. Do not install the washers below the wire terminals.
 - (c) Look for loose nuts on the receptacle terminals.
 - 1) If you find loose nuts, do these steps to tighten them:
 - a) Tighten the four large nuts on the receptacle pins A, B, C and N to a torque of for 120-125 pound-inches.
 - b) Tighten the two small nuts on the receptacle pins E and F to a torque of 16-18 pound-inches.

F. Put the Airplane Back to Its Initial Condition

SUBTASK 24-41-03-410-004

- (1) Do these steps to install the applicable receptacle:
- (a) Install the insulator support to the two receptacles.
 - (b) Install the three nuts that hold the two conductor guards to the receptacle pan.
 - (c) Install the floor panel to the back-side of the external power receptacles. To install it, do this task: Floor Panel Installation, TASK 53-01-01-400-801.

SUBTASK 24-41-03-410-008

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

————— END OF TASK —————

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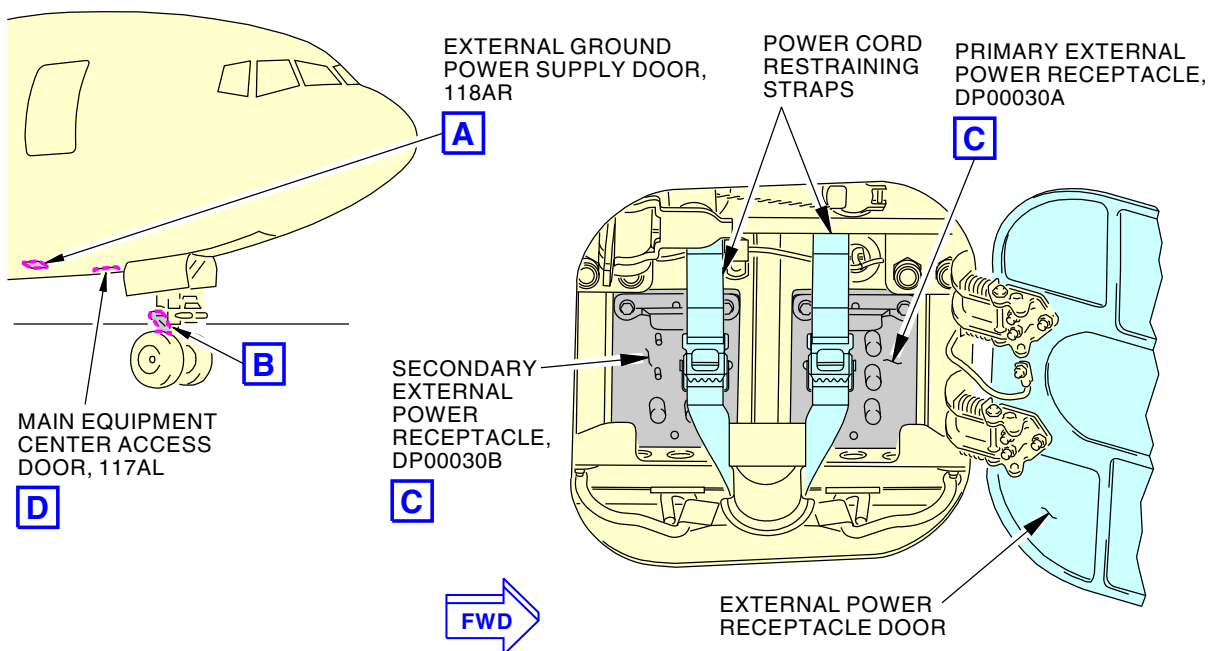
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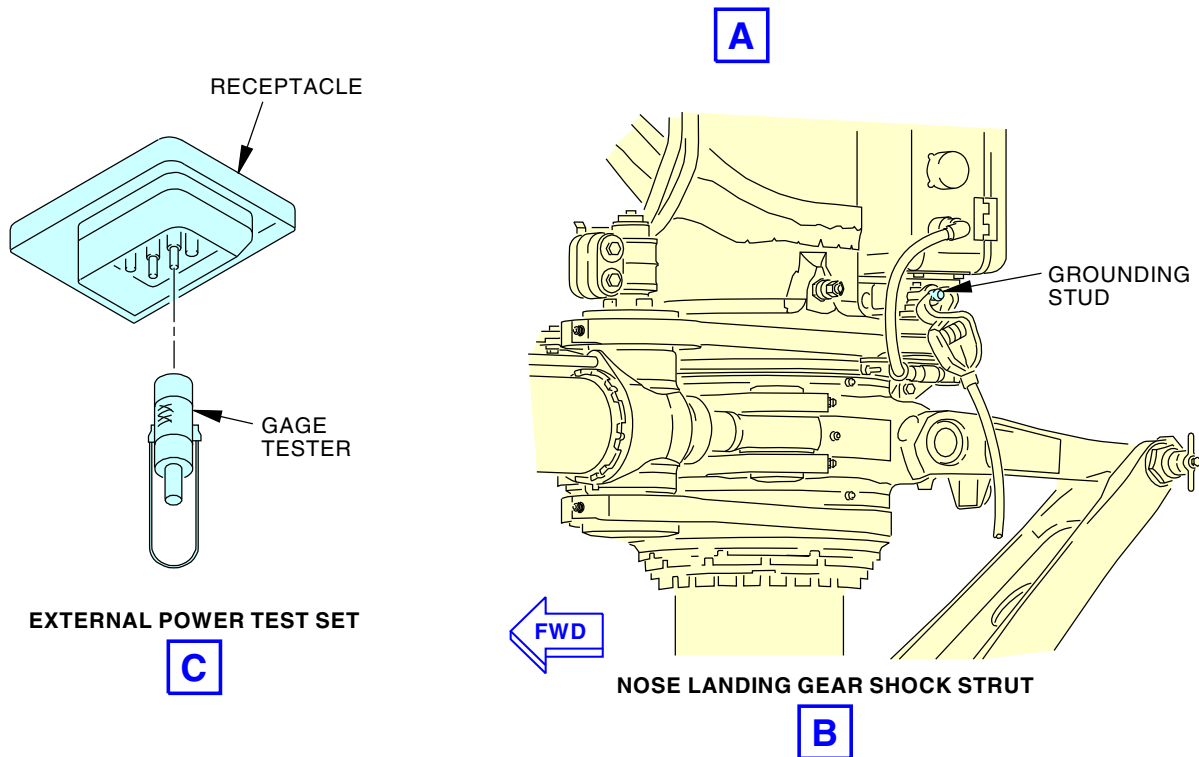
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EXTERNAL POWER RECEPTACLES



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**External Power Receptacle Inspection
Figure 601/24-41-03-990-801 (Sheet 1 of 2)**

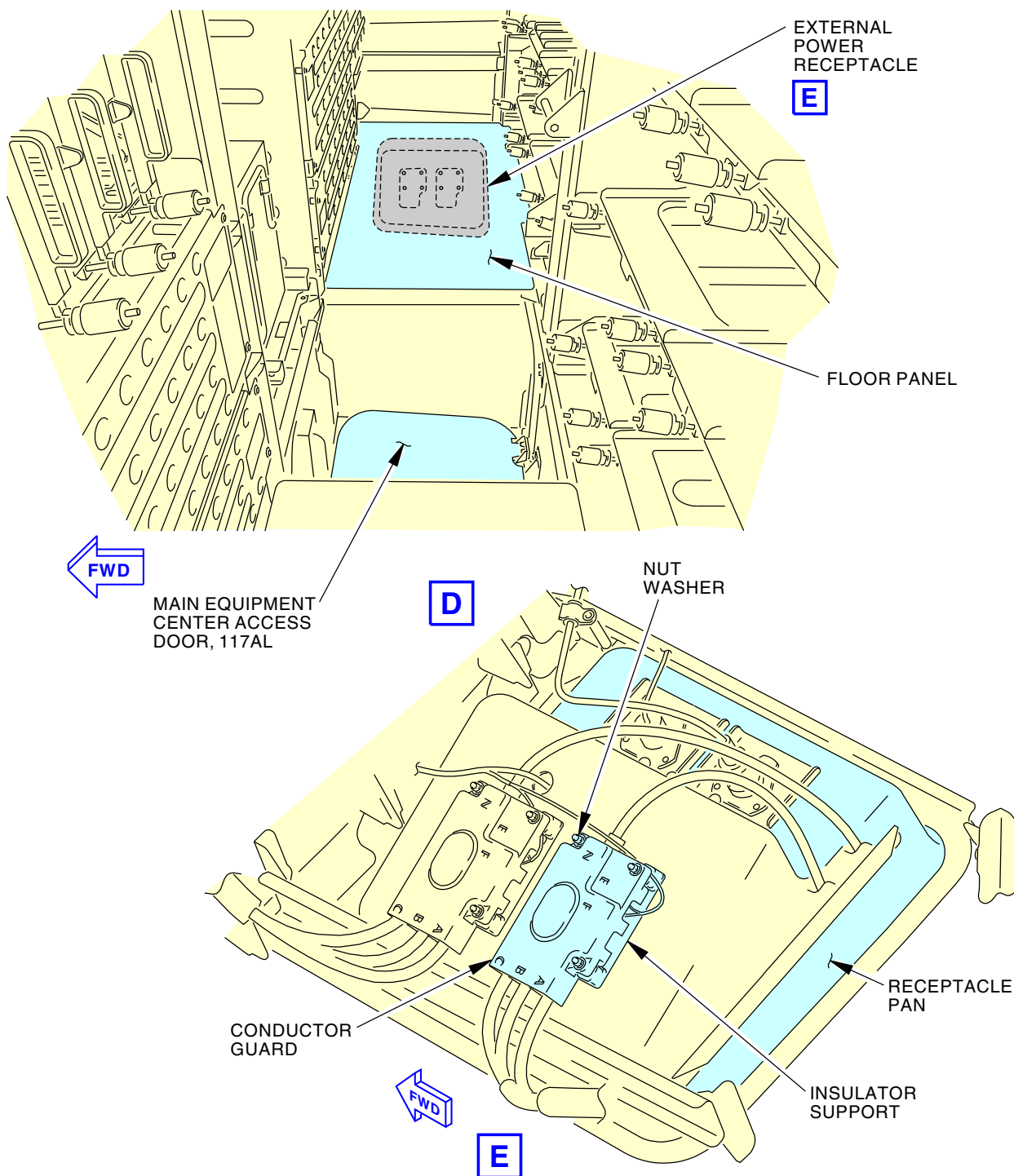
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External Power Receptacle Inspection
Figure 601/24-41-03-990-801 (Sheet 2 of 2)

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TASK 24-41-03-200-804

3. External Power Receptacle - External Visual Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

D. External Power Receptacle Pin Inspection

SUBTASK 24-41-03-860-006

- (1) Make sure there are no electrical power on the airplane. To remove it, do this task Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-41-03-010-004

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

SUBTASK 24-41-03-210-005

- (3) Do these steps to examine the receptacles from the outer side of the airplane:
- (a) Make sure the pins are not loose.
 - (b) Look for pins that are bent or have a crack.
 - (c) Look for damage or cracks on the base insulation.
 - (d) Look for discolored, burned, or pitted pins.

SUBTASK 24-41-03-410-006

- (4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

————— **END OF TASK** —————

TASK 24-41-03-200-802

4. External Power Receptacle Pin Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-41-04-000-801	External Power Receptacle Removal (P/B 401)

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(Continued)

Reference	Title
24-41-04-400-801	External Power Receptacle Installation (P/B 401)

B. Tools/Equipment

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

Reference	Description
SPL-1625	Wear Gage Set - Ground Power Plug and Receptacle Part #: F70284-1 Supplier: 81205

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
118AR	External Ground Power Supply Door

E. External Power Receptacle Pin Inspection

SUBTASK 24-41-03-860-005

- (1) Make sure there are no electrical power on the airplane. To remove it, do this task Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-41-03-010-005

- (2) Open this access panel:

Number	Name/Location
118AR	External Ground Power Supply Door

SUBTASK 24-41-03-220-001

- (3) Remove external power plug from receptacle, if it is installed.

SUBTASK 24-41-03-200-001

- (4) Inspect the external power receptacle pins for wear as follows:



CAUTION

DO NOT USE EXCESSIVE FORCE TO PUSH THE WEAR GAGE OVER THE PINS. THE GAGE IS A GO/NO GO GAGE AND SHOULD NOT FIT ON THE PIN. TOO MUCH FORCE WILL DAMAGE THE PIN AND/OR THE GAGE.

- (a) Try to slide the wear gage set, wear gage set, SPL-1625 over the external power receptacle pins.

NOTE: The F70284-1 is a gage set. Use the -2 on the four large pins A, B, C and N. Use the -3 on the two small pins E and F.

- (b) Make sure the gage does not slide over the pins. If the gage slides over the pins to within 0.50 in. (12.70 mm) of the face of the receptacle, replace the external power receptacle. These are the tasks:
 - External Power Receptacle Removal, TASK 24-41-04-000-801
 - External Power Receptacle Installation, TASK 24-41-04-400-801

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SUBTASK 24-41-03-410-007

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

————— END OF TASK —————

TASK 24-41-03-200-803

5. External Power Receptacle Neutral Pin to Nose Gear Grounding Stud Continuity Check

(Figure 601)

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.

<u>Reference</u>	<u>Description</u>
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

B. Location Zones

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

D. Procedure

SUBTASK 24-41-03-220-003

- (1) Prepare to do a check of the continuity between the receptacle neutral pins and the grounding stud.
- (a) Make sure there are no electrical power on the airplane.
- (b) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

SUBTASK 24-41-03-760-001

- (2) Do a continuity check between the receptacle neutral pins and the grounding stud.
- (a) Use a intrinsically safe approved bonding meter, COM-1550 to measure the resistance from the neutral pins on the receptacles to the nose gear grounding stud.
- (b) Make sure the resistance does not exceed 0.1 ohms.
- (c) If the resistance exceeds 0.1 ohms, do the steps that follow:

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- 1) Do this task: External Power Receptacle - Internal Visual Inspection, TASK 24-41-03-200-801.
 - 2) Do this task: External Power Receptacle Pin Inspection, TASK 24-41-03-200-802.
- (d) If the problem continues, examine and repair the wiring between the external power receptacle neutral pins and the associated ground stud.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-03-410-003

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
118AR	External Ground Power Supply Door

————— **END OF TASK** —————

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EXTERNAL POWER RECEPTACLE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the external power receptacle.
 - (2) An installation of the external power receptacle.
- B. You get access to the receptacles by opening the External Ground Power Supply Door.

TASK 24-41-04-000-801

2. External Power Receptacle Removal

(Figure 401, Figure 402)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
53-01-01-000-801	Floor Panel Removal (P/B 401)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
118AF	Forward MEC Floor Panel - External Power Receptacle
118AR	External Ground Power Supply Door

D. Prepare for the Removal

SUBTASK 24-41-04-860-001

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-41-04-020-001

- (2) Disconnect all the electrical power cables from the external power receptacle [7].

SUBTASK 24-41-04-010-001

- (3) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
118AR	External Ground Power Supply Door

SUBTASK 24-41-04-930-001



MAKE SURE YOU PUT A DO-NOT-OPERATE TAG ON THE EXTERNAL POWER RECEPTACLE TO PREVENT CONNECTION OF EXTERNAL POWER CABLES. INJURIES TO PERSONS CAN OCCUR IF YOU DO NOT OBEY THIS INSTRUCTION.

- (4) Attach a DO-NOT-OPERATE tag on the external power receptacle.

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SUBTASK 24-41-04-010-002

- (5) Remove this floor panel:

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

118AF	Forward MEC Floor Panel - External Power Receptacle

- (a) Refer to this task: (Floor Panel Removal, TASK 53-01-01-000-801).

NOTE: You get access to the back-side of the external power receptacles by removing the floor panel.

E. External Power Receptacle Removal

SUBTASK 24-41-04-020-002

- (1) Disconnect the electrical leads from the receptacle:

- Remove the nuts [21] and washers [2] to remove the foreign object debris FOD shield [23].
- Remove the washers [24], nuts [1], and washers [2] that attach the conductor guard [13] to the receptacle pan.
- Remove the conductor guard [13].
- Attach an identification tag to each lead.
- Remove the nuts [3], lockwashers [16] and washers [4] that attach the four large electrical leads to the receptacle studs.
- Remove the nuts [5], lockwashers [6] and washers [17] that attach the two small electrical leads to the receptacle studs.
- Disconnect the electrical leads from the studs.
- Remove the insulator support [15] from the receptacle pan.

SUBTASK 24-41-04-020-004

- (2) Remove the external power receptacle:

- Remove the nuts [11], washers [9], washers [10], screws [8], screw [12], screw [25] and bracket [14] that attach the receptacle to the receptacle pan.

NOTE: Two persons are necessary to do this step: One person on the inside of the airplane and one person on the outside of the airplane. If two persons are not available, it can be possible to apply tape to the heads of the screws to prevent them from falling out when the nuts are removed.

- Put a mark on the outer side of the receptacle pan to show the location of the screw [12].
 - Put a mark on the outer side of the receptacle pan to show the location of the screw [25].
- Remove the power cord restraining straps from the bracket [20].
 - Remove the four screws [18] and washers [19] that attach the bracket to the receptacle housing.
 - Remove the bracket [20] from the outside of the airplane.
 - Remove the external power receptacle [7] from the outer side of the airplane.

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SUBTASK 24-41-04-020-005

- (3) Remove the external power receptacle:

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| ARO ALL POST SB 777-24-0152 (Continued)

- (a) Remove the nuts [11], washers [9], washers [10], screws [27], screws [28], screws [29], screws [30], and guides [26] that attach the receptacle to the receptacle pan.

NOTE: Two persons are necessary to do this step: One person on the inside of the airplane and one person on the outside of the airplane. If two persons are not available, it can be possible to apply tape to the heads of the screws to prevent them from falling out when the nuts are removed.

- 1) Put a mark on the outer side of the receptacle pan to show the location of the four screws [27].

NOTE: When facing the P30 panel from outside of the airplane, the 2 upper screws on each connector guide [26] are the longest of the four screws.

- 2) Put a mark on the outer side of the receptacle pan to show the location of the screw [29].

NOTE: When facing the P30 panel from outside of the airplane, the lower forward screw on each connector guide is the shortest of the four.

- (b) Remove the external power receptacle [7] from the outer side of the airplane.

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———— **END OF TASK** ————

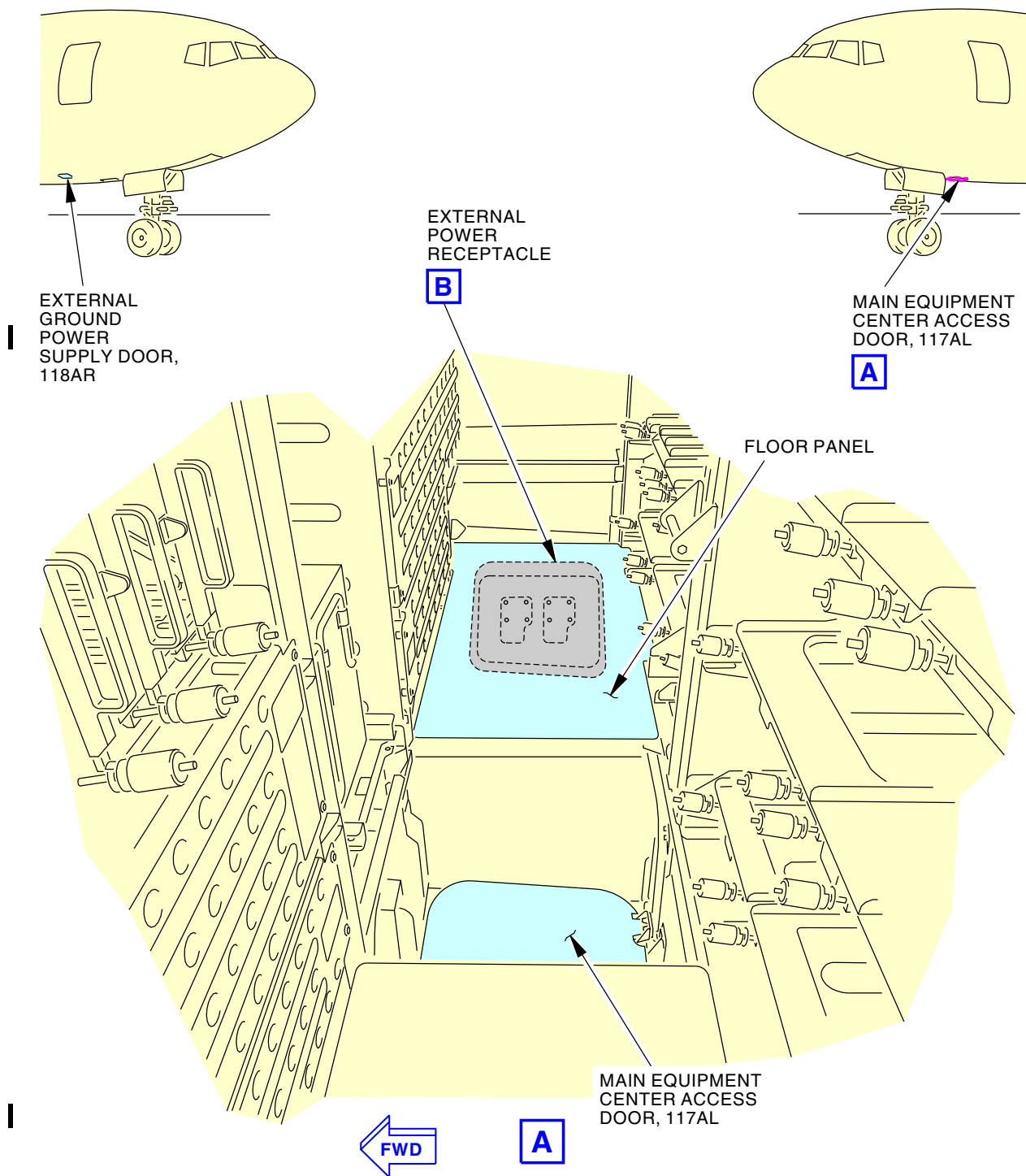
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**External Power Receptacle Installation
Figure 401/24-41-04-990-801 (Sheet 1 of 5)**

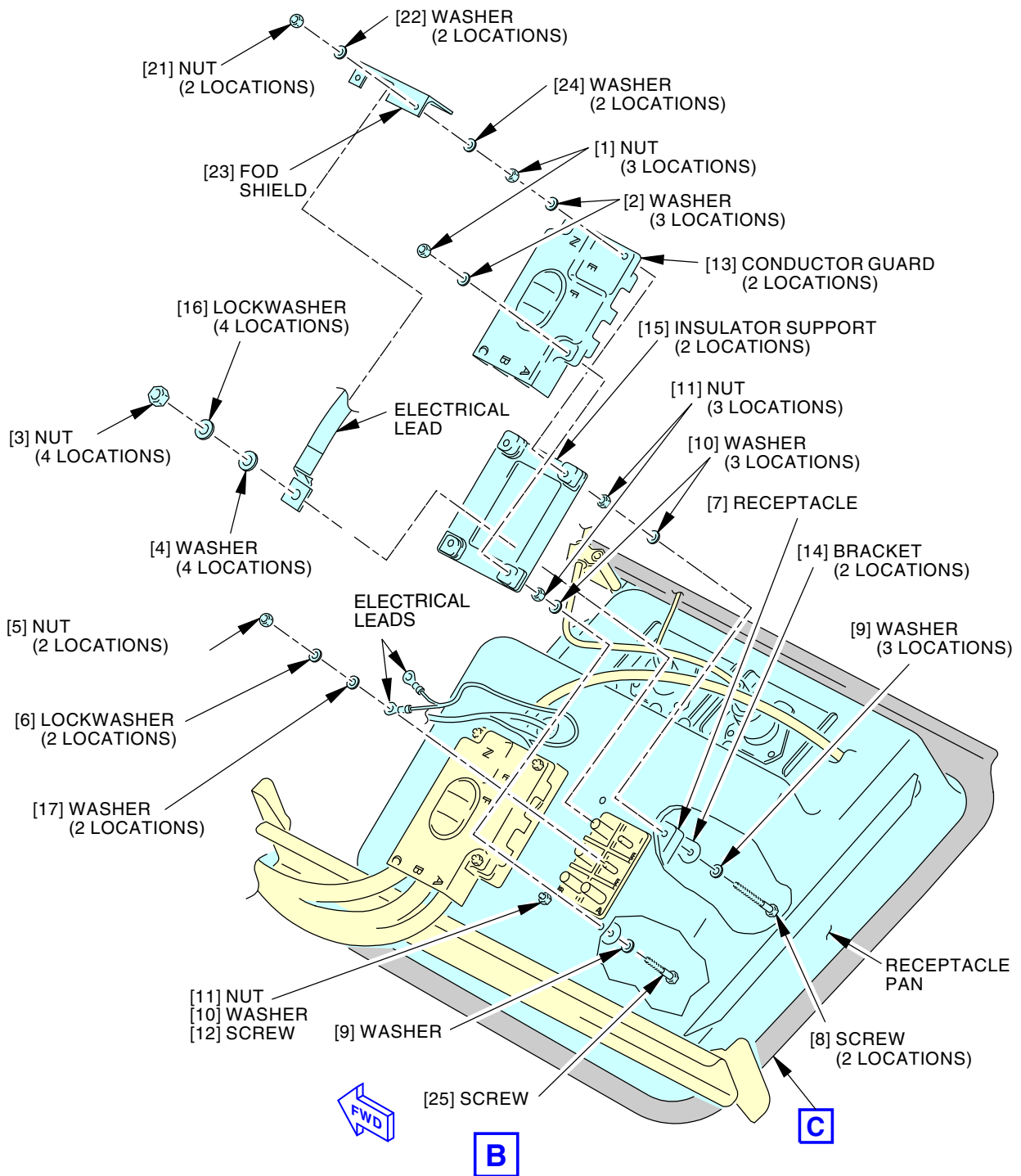
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1466847 S0000267286_V3

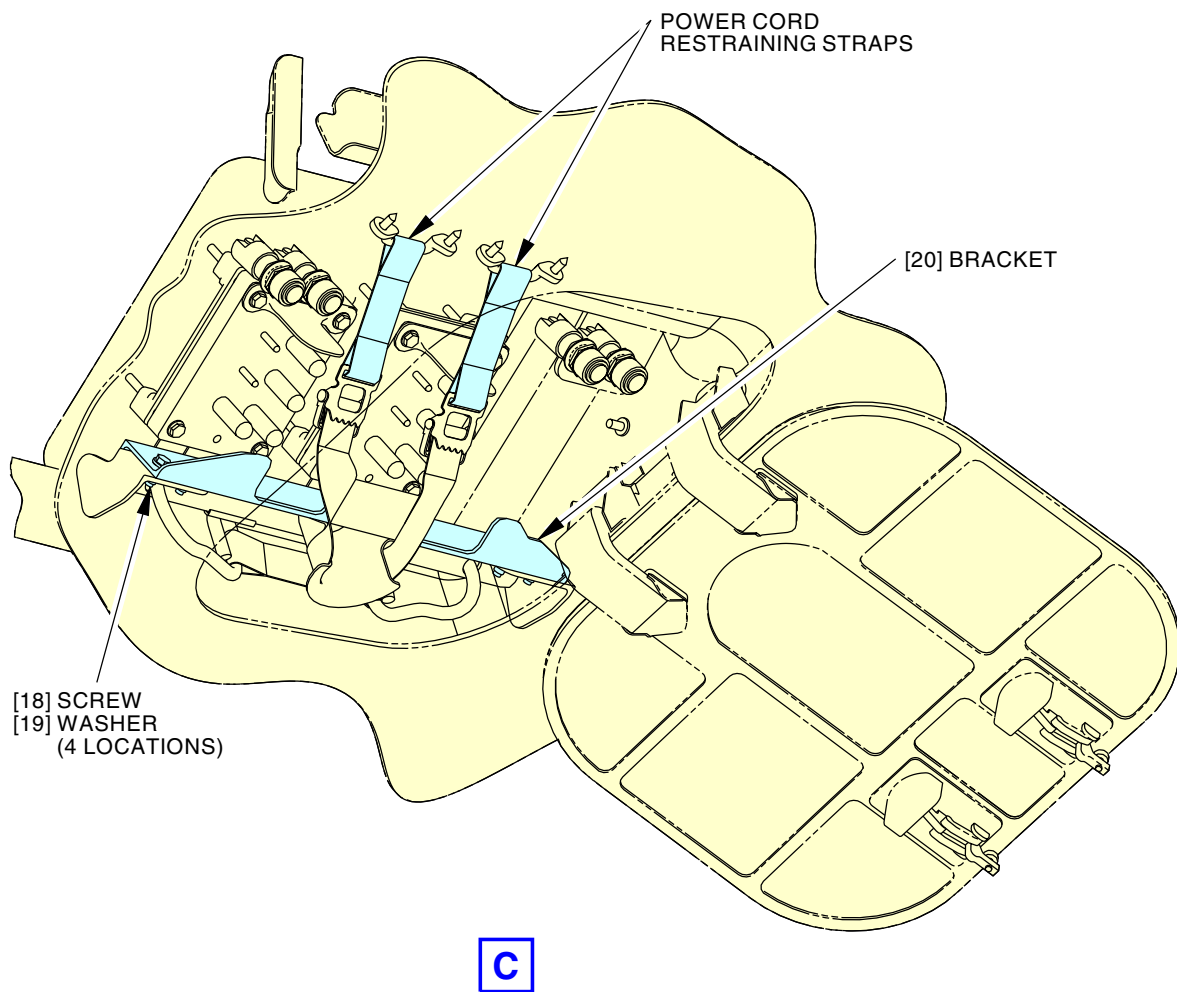
External Power Receptacle Installation
Figure 401/24-41-04-990-801 (Sheet 2 of 5)

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2572163 S0000617655_V1

External Power Receptacle Installation
Figure 401/24-41-04-990-801 (Sheet 3 of 5)

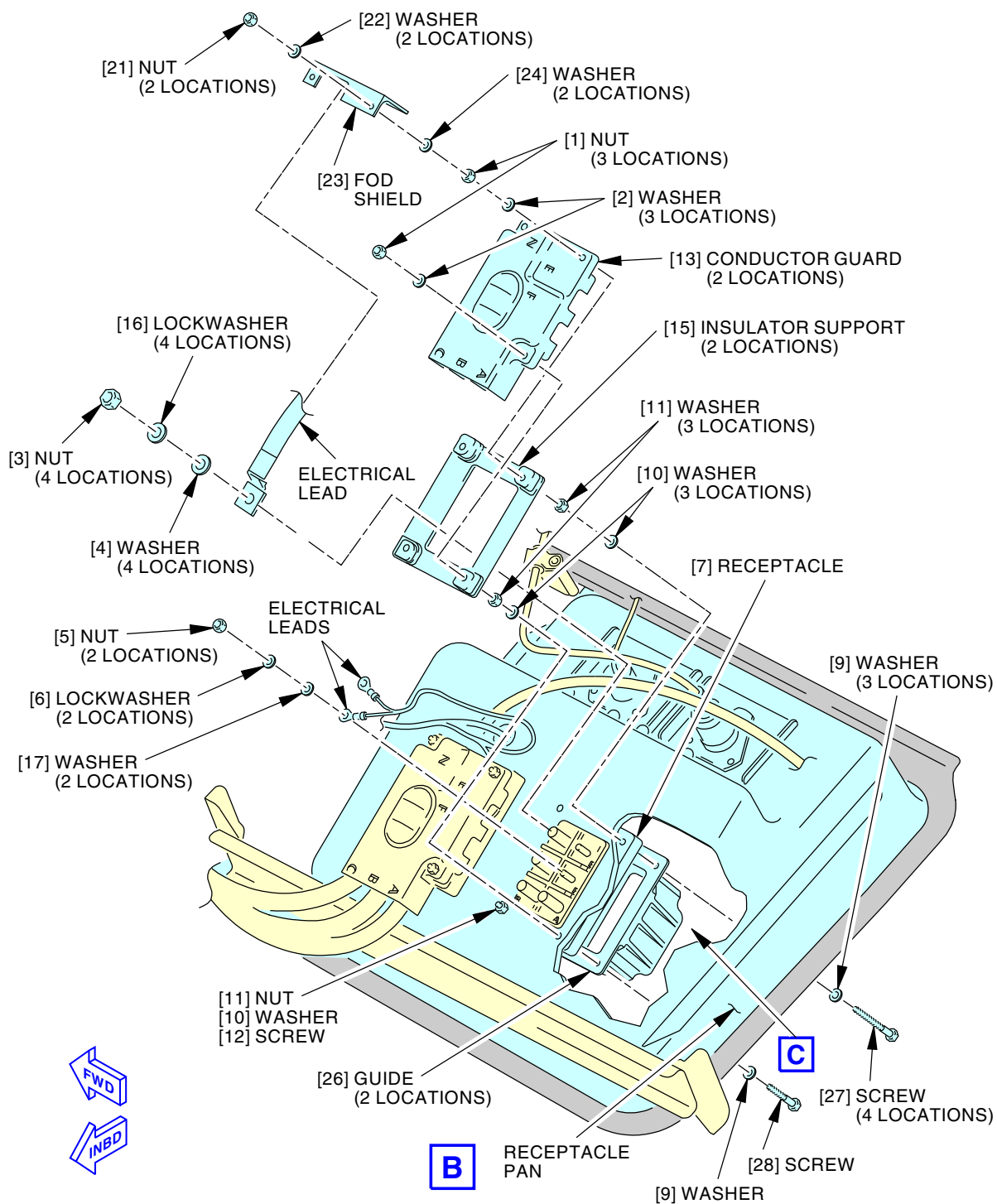
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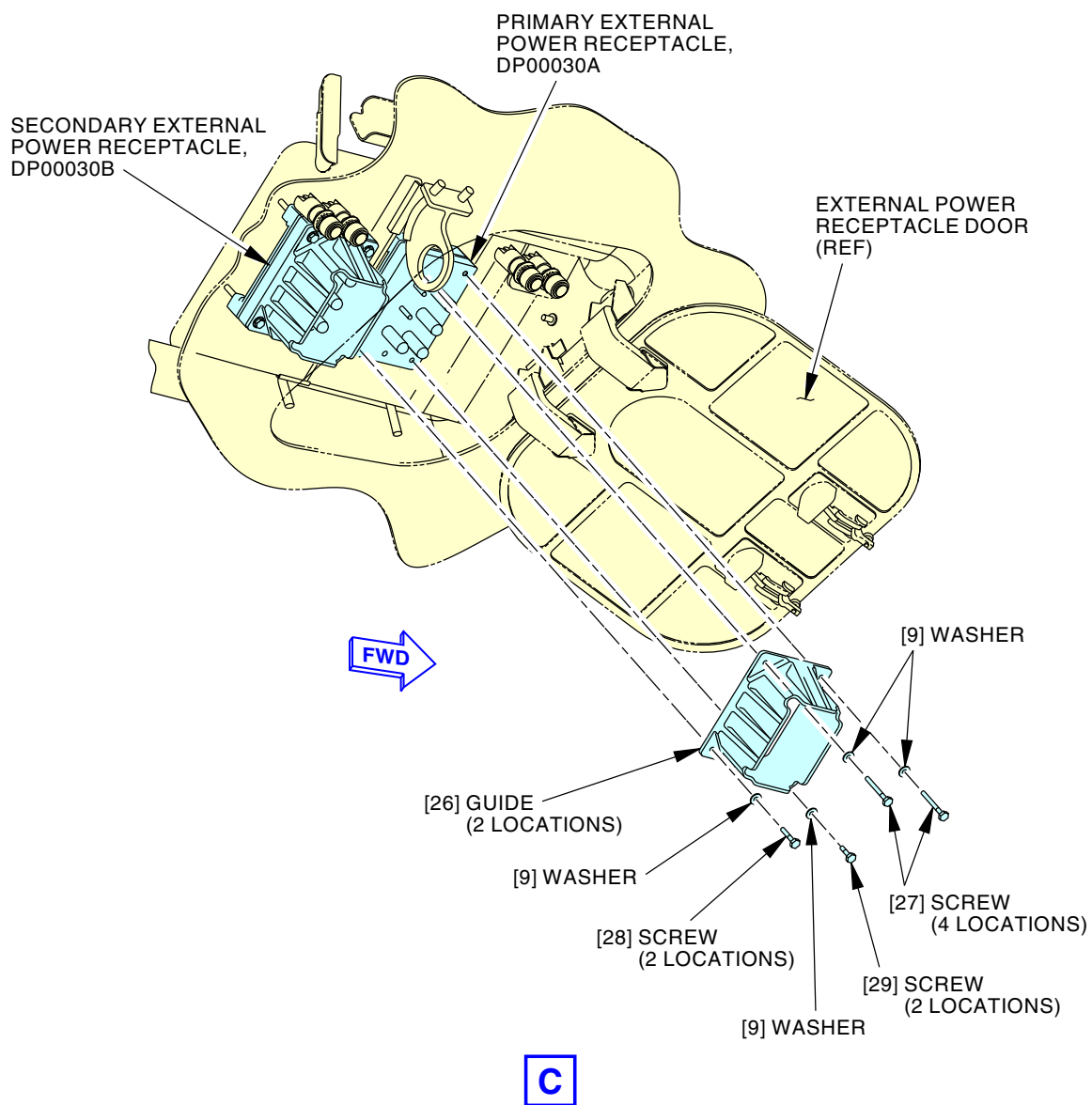
External Power Receptacle Installation
Figure 401/24-41-04-990-801 (Sheet 4 of 5)

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**External Power Receptacle Installation
Figure 401/24-41-04-990-801 (Sheet 5 of 5)**

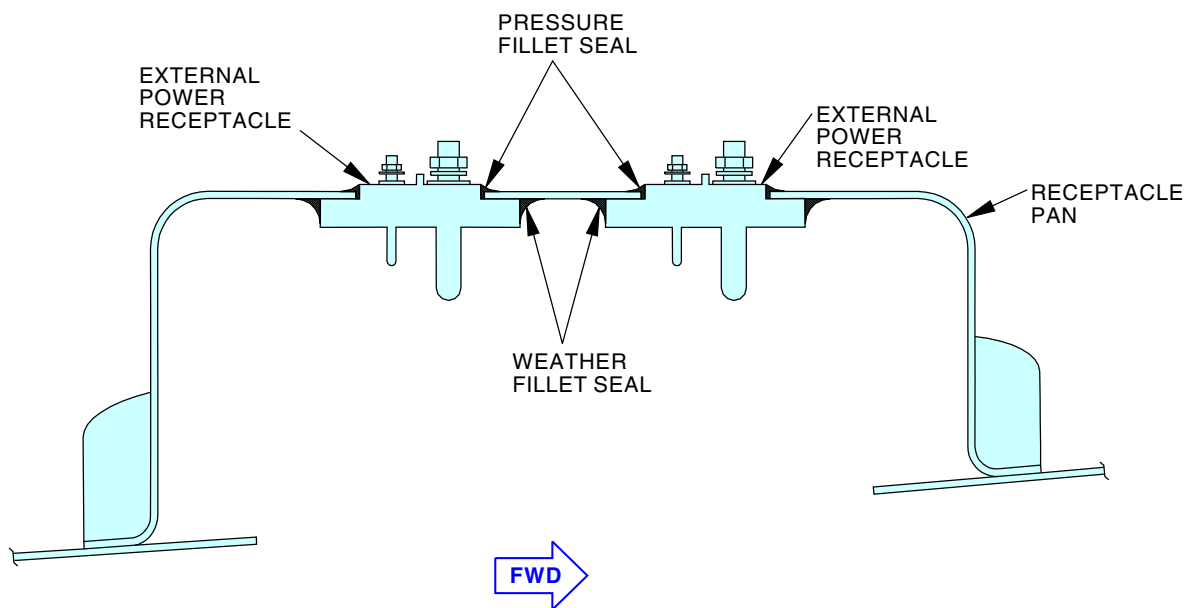
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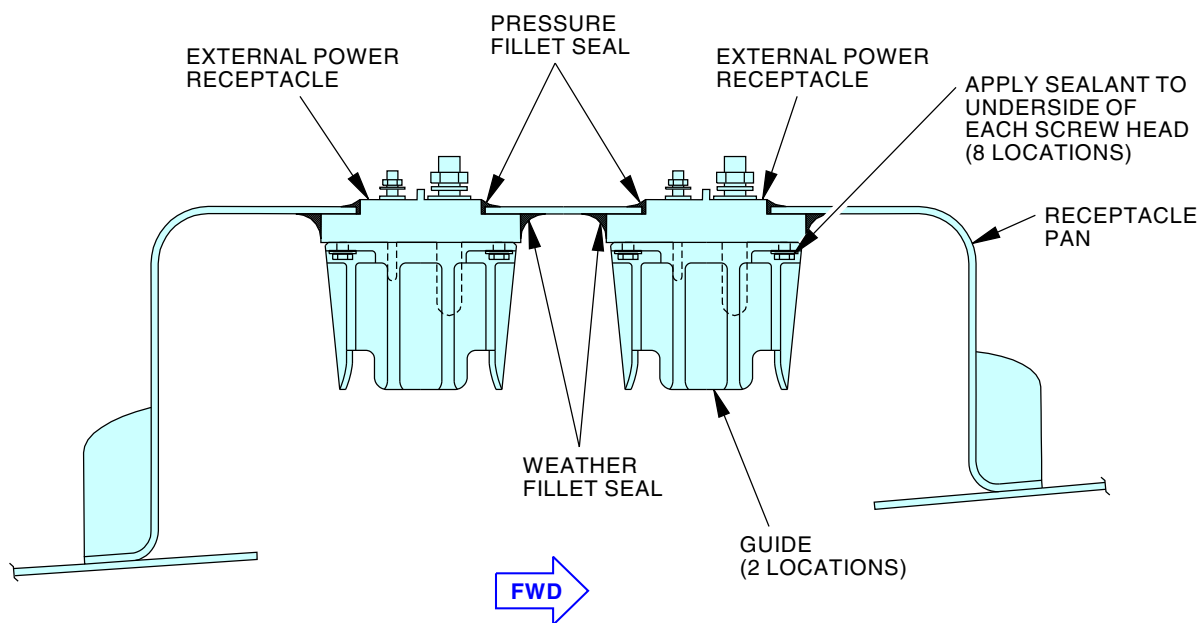
External Power Receptacle Sealant Requirements
Figure 402/24-41-04-990-802 (Sheet 1 of 2)

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**External Power Receptacle Sealant Requirements
Figure 402/24-41-04-990-802 (Sheet 2 of 2)**

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TASK 24-41-04-400-801

3. External Power Receptacle Installation

(Figure 401)

A. General

- (1) This task gives the steps to install the primary and secondary electrical receptacles into P30.
- Two persons are necessary to do this step: one person on the inside of the airplane and one person on the outside of the airplane. If two persons are not available, it can be possible to apply tape to the heads of the screws to prevent them from falling out when you install the nuts.

B. References

Reference	Title
20-30-01-910-801	Structure Adhesives, Cements, and Sealants (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-41-00-710-801	AC External Power - Operational Test (P/B 501)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Receptacle	24-41-04-01A-090	ARO ALL

E. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

F. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
118AF	Forward MEC Floor Panel - External Power Receptacle
118AR	External Ground Power Supply Door

G. External Power Receptacle Installation

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SUBTASK 24-41-04-420-001

- (1) Install the external power receptacle [7]:
- Put the external power receptacle [7] and the safety guide in their positions in the receptacle pan.
 - Apply sealant, A00247 to the surface of the receptacle that touches the receptacle pan, to make a pressure fillet seal.
 - Apply sealant, A00247 to the underside of the screws [8].

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ARO ALL PRE SB 777-24-0152 (Continued)

- (d) Install the washers [9], screws [8] through the receptacle [7], brackets [14] and the receptacle pan.

NOTE: If the screws [8] are not installed in the correct locations, the conductor guards [13] will not fit over the screws inside the airplane. Look at the figure to find the location of the screw [12].

- (e) Install the washers [10] and nuts [11] on the screws [8].

- (f) Apply sealant, A00247 to the underside of the screw [25].

- (g) Install the washer [9], screw [25] through the receptacle [7], bracket [14] and the receptacle pan.

NOTE: If the screw [25] is not installed in the correct locations, the conductor guard [13] will not fit over the screws inside the airplane. Look at the figure to find the location of the screw [12].

- (h) Install the washer [10] and nut [11] on the screw [25].

- (i) Apply sealant, A00247 to the underside of the screw [12].

- (j) Install the screw [12] and the washer [9] through the receptacle [7] and the receptacle pan.

- (k) Install the washer [10] and nut [11] on the screw [12].

- (l) Tighten the nut [11].

- (m) Apply sealant, A00247 to the edge of the receptacles and guides, to make a weather-resistant fillet seal.

ARO ALL POST SB 777-24-0152

SUBTASK 24-41-04-420-006

- (2) Install the external power receptacle [7]:

- (a) Put the external power receptacle [7] and the safety guide in their positions in the receptacle pan.

- (b) Apply sealant, A00247 to the surface of the receptacle that touches the receptacle pan, to make a pressure fillet seal.

- (c) Apply sealant, A00247 to the underside of the two guides [26], four screws [27], two screws [28] and two screws [29].

- (d) Install the washers [9], four screws [27], two screws [28] and two screws [29] through the guide [26], receptacle [7] and the receptacle pan.

NOTE: When facing the P30 panel from outside of the airplane, the 2 upper screws [27] on each connector guide [26] are the longest of the four screws.

When facing the P30 panel from outside of the airplane, the lower forward screw [29] on each connector guide is the shortest of the four.

- (e) Install washers [10] and nuts [11] on screws [27], screws [28] and screws [29].

Install the washer [9], screw [25] through the receptacle [7], bracket [14] and the receptacle pan.

- (f) Tighten the nut [11].

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ARO ALL POST SB 777-24-0152 (Continued)

- (g) Apply sealant, A00247 to the edge of the receptacle, to make a weather fillet seal (Structure Adhesives, Cements, and Sealants, TASK 20-30-01-910-801).

ARO ALL

SUBTASK 24-41-04-420-005

- (3) Install the insulator support [15] on the receptacle pan.

SUBTASK 24-41-04-420-002

- (4) Connect the electrical leads to the external power receptacle:



CAUTION

MAKE SURE YOU CONNECT THE CORRECT ELECTRICAL LEAD TO EACH RECEPTACLE STUD. AN INCORRECT INSTALLATION CAN CAUSE A MALFUNCTION OF THE CIRCUIT AND DAMAGE TO THE EQUIPMENT.

- (a) Install the leads on the receptacle studs of the external power receptacle.



CAUTION

DO NOT INSTALL THE WASHERS BELOW THE ELECTRICAL LEADS. THIS WILL CAUSE HEAT THAT CAN BURN THE RECEPTACLE STUDS.

- (b) Install the washer [4], lockwasher [16] and the nut [3] on the receptacle studs A, B, C and N.
- (c) Tighten the nuts to 122.5 ±2.5 in-lb (13.84 ±0.28 N·m).
- (d) Install the washers [17], lockwashers [6] and the nuts [5] on the receptacle studs E and F.
- (e) Tighten the nuts [5] to 21 ±1 in-lb (2.4 ±0.1 N·m).
- (f) Remove the identification tags.

SUBTASK 24-41-04-420-003

- (5) Install the conductor guard [13]:
 - (a) Put the conductor guard [13] in its position above the receptacle studs.
 - (b) Install the washers [2] and nuts [1] that attach the conductor guard [13] to the receptacle pan.
 - (c) Tighten the nuts [1].

SUBTASK 24-41-04-420-004

- (6) Install the FOD shield [23]:
 - (a) Put the washer [24] and FOD shield [23] in its position above the nut [1].
 - (b) Install the washers [22] and nuts [21] that attach the FOD shield [23] to the conductor guard [13].
 - (c) Tighten the nuts [21].

SUBTASK 24-41-04-410-002

- (7) Install this floor panel:

<u>Number</u>	<u>Name/Location</u>
118AF	Forward MEC Floor Panel - External Power Receptacle

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SUBTASK 24-41-04-410-001

(8) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door
118AR	External Ground Power Supply Door

SUBTASK 24-41-04-930-002

(9) Remove the DO-NOT-OPERATE tag on the external power receptacle.

H. External Power Receptacle Installation Test

SUBTASK 24-41-04-710-001

(1) Do this task: AC External Power - Operational Test, TASK 24-41-00-710-801.

I. Put The Airplane Back to Its Usual Condition

SUBTASK 24-41-04-860-003

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

————— END OF TASK —————

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BUS POWER CONTROL UNIT (BPCU) - MAINTENANCE PRACTICES

TASK 24-41-05-400-802

1. BPCU Software Installation

A. General

- (1) This procedure tells you how to install software in the Bus Power Control Unit (BPCU).
 - (a) The name of the software part loaded into an BPCU follow:
 - BPCU Operational Program Software (OPS)
 - (b) Using the name, the specific software part number for an aircraft can be identified in the Illustrated Parts Catalog (IPC).
- (2) The BPCU accepts software loading only when the airplane is on the ground and the two main AC buses are powered from Auxiliary Power Unit (APU) generator.
- (3) A Maintenance Access Terminal (MAT) is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
- (4) If you do not know if the BPCU needs new software, you can first do the software configuration check. It will save time if you only install software when the software is missing or the part number is incorrect. You can find the software configuration check in this task: BPCU Installation, TASK 24-41-05-400-801.
- (5) You can use the GSE-Laptop, maintenance device, SPL-5704, as an alternative to the Portable Maintenance Access Terminal (PMAT) in this task.

NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.

- (6) You can install the software from disks, the MAT hard drive or the PMAT hard drive (if available). It is recommended that you install software from the MAT or PMAT hard drive. To install new software on the MAT or PMAT hard drive, do this task: How to Add Software to the Hard Drive, TASK 45-10-00-860-812.

NOTE: When new software is installed in the BPCU, the load process first erases the old software and then installs the new software. If you install software directly to the BPCU from a faulty disk, the load process may erase the old software and then fail, so that no software is installed. If you install a faulty disk to the MAT or PMAT hard drive, the load may fail, but you will not erase the software from the BPCU.

- (a) It is recommended that you remove old software part numbers from the MAT or PMAT hard drive after new software is installed. To remove software from the hard drive, do this task: How to Remove Software from the Hard Drive, TASK 45-10-00-860-813.

ARO 014-999

- (7) You can also install the software from the Onboard Network System (ONS) Mass Storage Device (MSD). To install new software on the ONS MSD, do this task: Mass Storage Device Software Part Installation, TASK 46-13-00-470-802.
 - (a) It is recommended that you remove old software part numbers from the ONS MSD after new software is installed. To remove software from the ONS MSD, do this task: Mass Storage Device Software Removal, TASK 46-13-00-070-801.

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- (8) The airplane must be on the ground with the engines off before you can install software.

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- (9) To read about the conditions and times necessary for software installation, do this task:
On-Airplane Software Installation, TASK 20-15-11-400-801.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
24-22-00 P/B 201	AC GENERATION AND BUS CONTROL - MAINTENANCE PRACTICES
24-22-00-860-803	Supply APU Generator Power (P/B 201)
24-22-00-860-809	Remove APU Generator Power (P/B 201)
24-41-05-400-801	BPCU Installation (P/B 401)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-860-812	How to Add Software to the Hard Drive (P/B 201)
45-10-00-860-813	How to Remove Software from the Hard Drive (P/B 201)
46-13-00-070-801	Mass Storage Device Software Removal (P/B 201)
46-13-00-470-802	Mass Storage Device Software Part Installation (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

Zone	Area
212	Flight Compartment, Right

E. Procedure

SUBTASK 24-41-05-860-011

- (1) Do this task: Supply APU Generator Power, TASK 24-22-00-860-803.

SUBTASK 24-41-05-420-002

- (2) Use a MAT to install software in the BPCU:

NOTE: Make sure you know the correct software part number for the BPCU before you select the software part number on the display. For the BPCU to be an approved installation, the correct software must be installed.

- Make sure primary and secondary external power are available (PAGEBLOCK 24-22-00/201).
- Set the GND TEST switch on the P61 panel to the ENABLE position.
- Make these selections on the MAT:
 - ONBOARD MAINTENANCE

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- 2) EXTENDED MAINTENANCE
- 3) DATA LOAD
- (d) Select SELECT DESTINATION and then do these steps:
 - 1) Select 24 Main AC Electrical Power Generation System
 - 2) Select Bus Power Control Unit (BPCU)
 - 3) Select CONTINUE
- (e) If the software is on a disk, put the correct disk in the disk drive.
- (f) Select SELECT SOURCE and then do these steps:
 - 1) Select the location of the software (if Disk Drive is the only selection, it is automatically selected).
 - 2) Select the correct software part number from the display.
 - 3) Select CONTINUE.
- (g) Select START to start the software installation.
- (h) When the MAT software load bar has reached 100%, do the following steps:

NOTE: The following message will display:

WAIT FOR THE DESTINATION LRU TO START. IF YOU WAIT MORE THAN TWO MINUTES, SELECT STOP

- 1) After two minutes have elapsed, select STOP.

NOTE: The following message will display:

IF YOU SELECT STOP, THE DESTINATION LRU CANNOT OPERATE

- 2) Select STOP again.

NOTE: The following message will display:

THE DATA LOAD HAS STOPPED

- 3) Cycle the APU GEN CTRL switch on the P5 panel to the ON position.

NOTE: The BPCU will exit software installation mode after the switch is cycled.

- 4) Cycle the PRIMARY EXT PWR switch on the P5 panel to the OFF position.

NOTE: The AVAIL light will illuminate after the switch is cycled.

- a) Make sure the AVAIL light in the switch comes on.

- 5) Push the PRIMARY EXT PWR switch on the P5 panel to the ON position.

- a) Make sure the ON light in the switch comes on.

- 6) Cycle the SECONDARY EXT PWR switch on the P5 panel to the OFF position.

NOTE: The AVAIL light will illuminate after the switch is cycled.

- a) Make sure the AVAIL light in the switch comes on.

- 7) Push the SECONDARY EXT PWR switch on the P5 panel to the ON position.

- a) Make sure the ON light in the switch comes on.

- (i) Make these selections on the MAT:

- 1) EXIT MAINTENANCE
- 2) ONBOARD MAINTENANCE
- 3) LINE MAINTENANCE
- 4) SYSTEM CONFIGURATION

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- 5) 24 MAIN ELEC POWER SYSTEM
 - (j) Make sure the correct software part number shows on the display.
 - (k) Select CONTINUE to remove the configuration display.
 - (l) Set the GND TEST switch on the P61 panel to the NORMAL position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-05-860-012

- (1) Do this task: Remove APU Generator Power, TASK 24-22-00-860-809.

————— **END OF TASK** —————

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BUS POWER CONTROL UNIT (BPCU) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the BPCU.
 - (2) An installation of the BPCU.

TASK 24-41-05-000-801

2. BPCU Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The BPCU, M24002, is on the E1-1 equipment rack in the main equipment center.

B. References

Reference	Title
20-10-01-000-801	E/E Box Removal (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
27-61-00-040-801	Spoiler Deactivation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare for the removal

SUBTASK 24-41-05-040-001



DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do the deactivation procedure for the spoilers or move all persons and equipment away from the spoilers. To deactivate the spoilers, do this task: Spoiler Deactivation, TASK 27-61-00-040-801

SUBTASK 24-41-05-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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SUBTASK 24-41-05-860-003

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
J	9	C24684	L GCU/BPCU

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 011-999			
D	6	C24305	BPCU-AC

ARO 001-010			
E	7	C24305	BPCU-AC

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO ALL			
B	10	C24649	BPCU DC

SUBTASK 24-41-05-860-004

- (4) Make sure the BATTERY switch is in the OFF position.

SUBTASK 24-41-05-860-008

- (5) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

F. Bus Power Control Unit Removal

SUBTASK 24-41-05-910-001

 CAUTION	DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-41-05-020-001

- (2) Remove the BPCU [1] from the shelf. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

————— **END OF TASK** —————

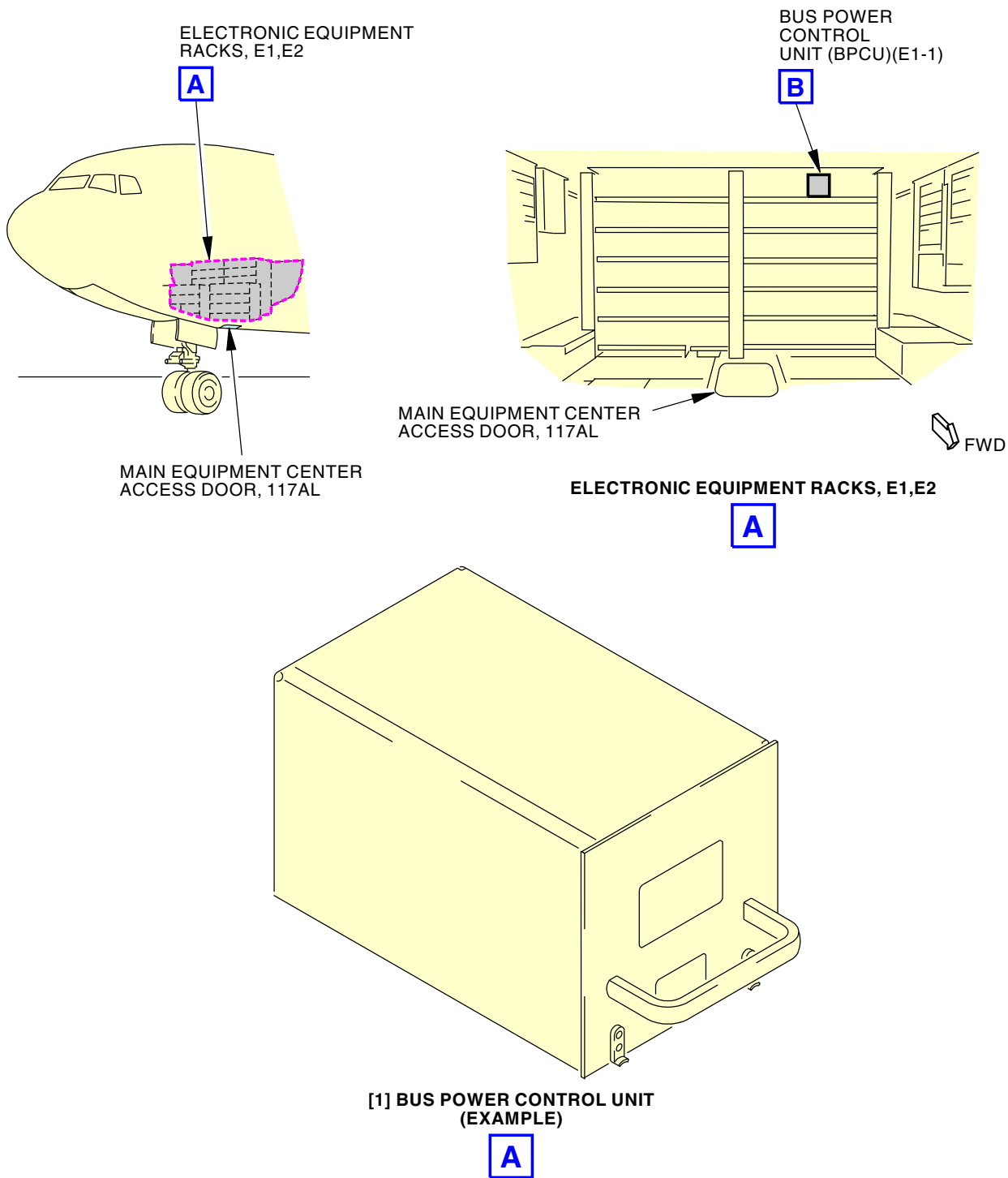
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Bus Power Control Unit (BPCU) Installation
Figure 401/24-41-05-990-801

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TASK 24-41-05-400-801

3. BPCU Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
20-41-01-400-803	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-41-05-400-802	BPCU Software Installation (P/B 201)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
45-10-00-910-810	How to Operate the MAT in the Flight Compartment (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	BPCU	24-41-05-01-009	ARO 001-010

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. BPCU Installation

SUBTASK 24-41-05-860-009

- (1) Make sure that these circuit breakers are open and have safety tags:

Right Power Management Panel, P210

Row	Col	Number	Name
J	9	C24684	L GCU/BPCU

Right Power Panel, P200

Row	Col	Number	Name
ARO 011-999			
D	6	C24305	BPCU-AC
ARO 001-010			
E	7	C24305	BPCU-AC

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ARO 001-010 (Continued)

Standby Power Management Panel, P310

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

ARO ALL

B	10	C24649	BPCU DC

SUBTASK 24-41-05-010-002

- (2) Open this access panel:

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

117AL	Main Equipment Center Access Door

SUBTASK 24-41-05-910-002



CAUTION

DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (3) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-41-01-400-803.

SUBTASK 24-41-05-420-001

- (4) Install the BPCU [1] to the E1-1 shelf. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-41-05-860-001

- (5) Close these circuit breakers:

Right Power Management Panel, P210

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

J	9	C24684	L GCU/BPCU

Right Power Panel, P200

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

ARO 011-999

D	6	C24305	BPCU-AC

ARO 001-010

E	7	C24305	BPCU-AC

Standby Power Management Panel, P310

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

ARO ALL

B	10	C24649	BPCU DC

SUBTASK 24-41-05-410-001

- (6) Close this access panel:

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

117AL	Main Equipment Center Access Door

F. BPCU Installation Test and Software Configuration Check

SUBTASK 24-41-05-860-002

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

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SUBTASK 24-41-05-860-005

(2) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.

SUBTASK 24-41-05-700-001

(3) Do a test of the BPCU, as follows:

- (a) Push the BATTERY switch to the ON position.
- (b) Make sure the AVAIL lights on the PRIMARY EXT PWR and SECONDARY EXT PWR switches come on.
- (c) Push the PRIMARY EXT PWR and SECONDARY EXT PWR switches.
- (d) Make sure the ON lights on the PRIMARY EXT PWR and SECONDARY EXT PWR switches come on.
- (e) Make sure the STANDBY POWER switch is in the AUTO position.
- (f) Use a maintenance access terminal (MAT) to do the LRU replacement test of the BPCU. To operate the MAT, do this task: How to Operate the MAT in the Flight Compartment, TASK 45-10-00-910-810.
 - 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 24 Main AC Electrical Power Generation System
 - e) LRU Replacement Test
 - f) Bus Power Control Unit
 - g) CONTINUE
 - 2) Do the instructions that show on the MAT and then make these selections:
 - a) CONTINUE
 - b) START TEST
 - 3) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - 4) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.
 - 5) To put the MAT back to its initial condition, make these selections:
 - a) LINE MAINTENANCE
 - b) EXIT MAINTENANCE

SUBTASK 24-41-05-860-006

(4) Check the software configuration of the BPCU as follows:

- (a) The configuration check makes sure that the BPCU has the correct software.
- (b) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

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- (c) Use a maintenance access terminal (MAT) to do a software configuration check of the BPCU:

NOTE: Make sure you know the correct software part number for the BPCU when you look at the software number on the display. For the BPCU to be an approved installation, the correct software part number must be installed.

- (d) Make these selections on the MAT:
- 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) SYSTEM CONFIGURATION
 - 4) 24 Main AC Electrical Power Generation System
 - 5) CONTINUE
- (e) Find 24 Bus Power Control Unit (BPCU) on the display and make sure that the software part number is correct.
- (f) Select GO BACK to remove the display.

SUBTASK 24-41-05-860-007

- (5) If the software part number is incorrect, do this task: BPCU Software Installation, TASK 24-41-05-400-802.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-05-440-001

- (1) Do the activation procedure for the spoilers if you did the deactivation procedure. To activate the spoilers, do this task: Spoiler Deactivation, TASK 27-61-00-040-801

SUBTASK 24-41-05-860-010

- (2) Push the PRIMARY EXT PWR and SECONDARY EXT PWR switches on the P5 overhead panel.
- (a) Make sure the AVAIL lights on the PRIMARY EXT PWR and SECONDARY EXT PWR switches come on and the ON lights go off.

———— **END OF TASK** ————

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ELECTRICAL LOAD CONTROL UNIT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the electrical load control units (ELCUs).
 - (2) An installation of the ELCUs.
 - (3) Installation tests of the ELCUs.
- B. The ELCUs are located inside the P100 and P200 electrical load management system (ELMS) panels.

TASK 24-51-05-000-801

2. ELCU Removal

(Figure 401)

A. **References**

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

B. **Location Zones**

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. **Access Panels**

Number	Name/Location
117AL	Main Equipment Center Access Door

D. **Prepare for the Removal**

SUBTASK 24-51-05-860-001



REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 24-51-05-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-51-05-860-027



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (3) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

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E. ELCU Removal

SUBTASK 24-51-05-020-001



WARNING

BE CAREFUL WHEN YOU TOUCH THE ELCU. WEAR GLOVES FOR HAND PROTECTION TO REMOVE THE ELCU, OR LET THE ELCU BECOME COOL. THE HIGH TEMPERATURE OF THE ELCU CAN BURN YOU.

- (1) Do these steps to remove the applicable ELCU [1]:
 - (a) Remove the protective cover from the applicable power panel.

ARO 001-010

- (b) Remove the four captive screws [2] that hold the unit to the panel.

ARO 011-999

- (c) Remove the cap screws [3] that hold the unit to the panel.

ARO ALL

- (d) Remove the applicable ELCU [1].

———— **END OF TASK** ————

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ARO ALL

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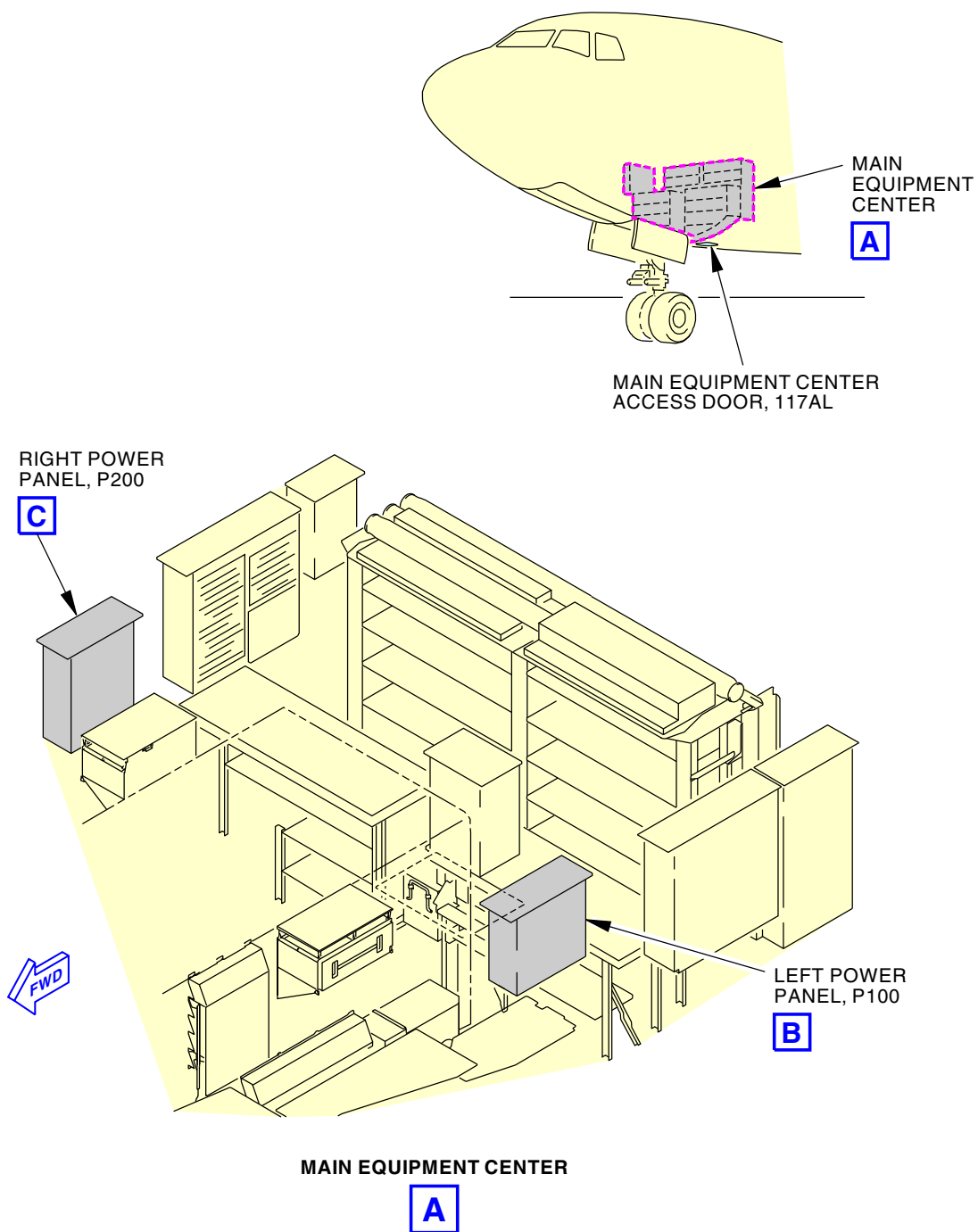
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E26619 S0006408597_V2

Electrical Load Control Unit (ELCU) Installation (Example)
Figure 401/24-51-05-990-801 (Sheet 1 of 3)

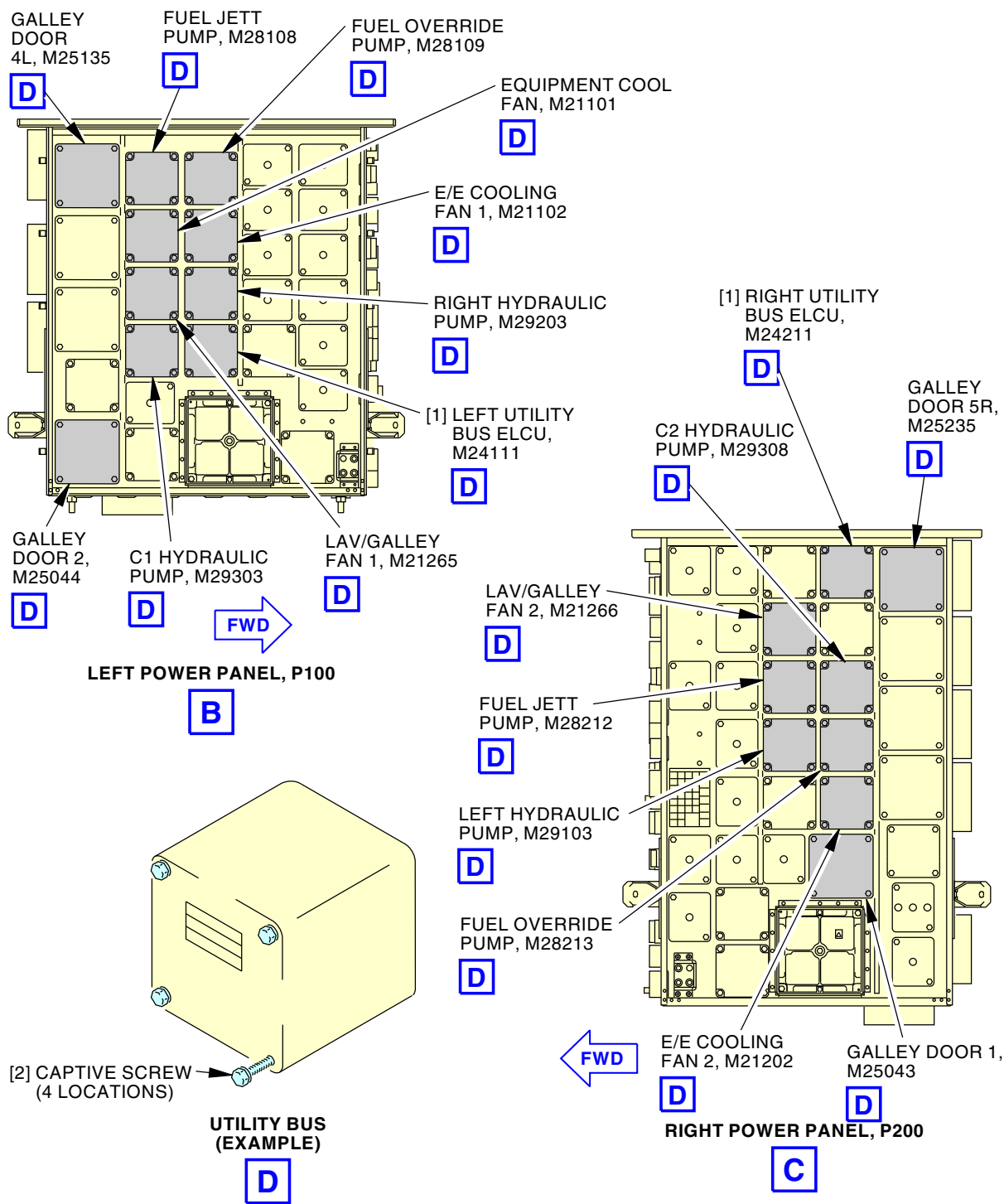
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M95981 S0006408599_V3

Electrical Load Control Unit (ELCU) Installation (Example)
Figure 401/24-51-05-990-801 (Sheet 2 of 3)

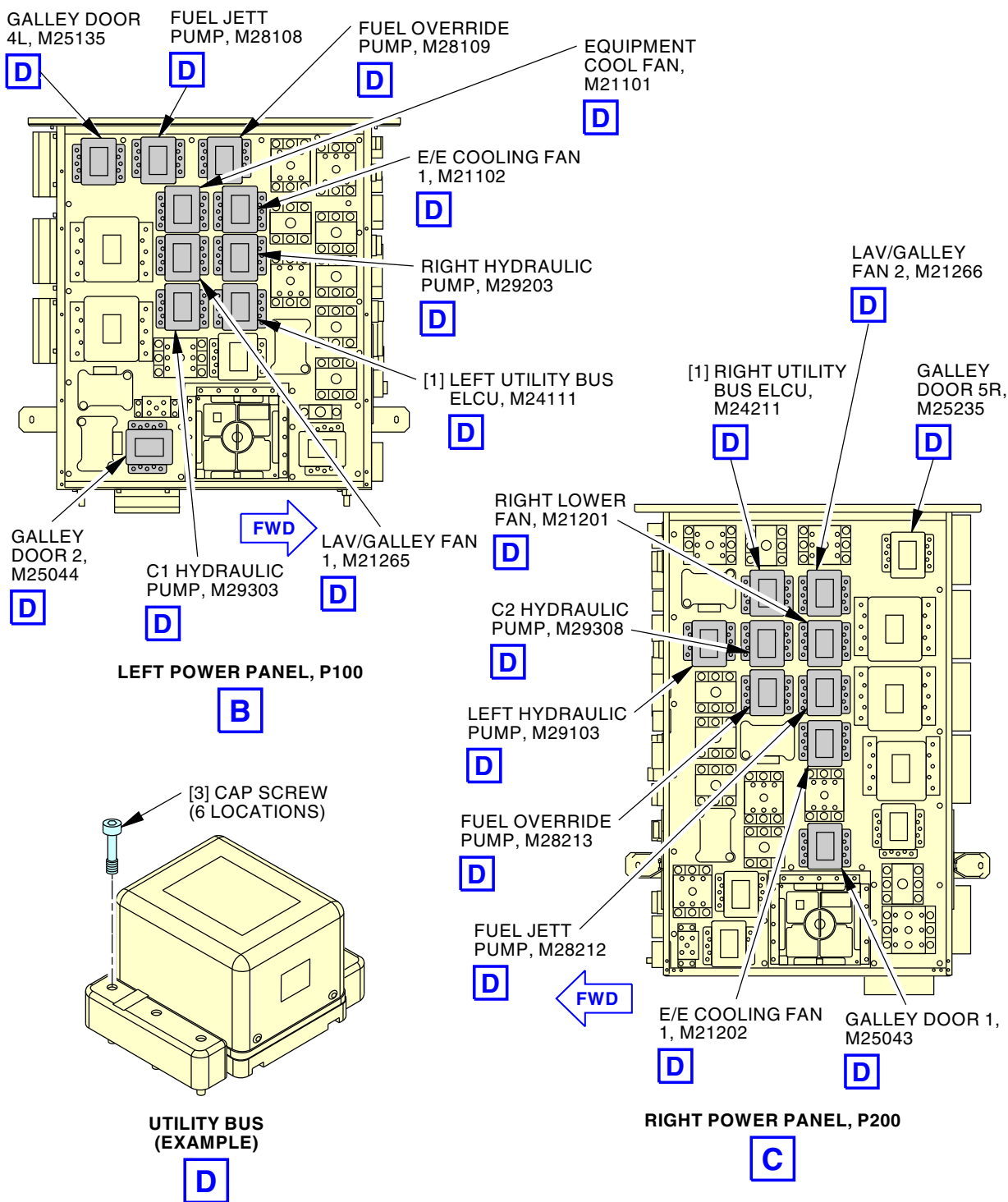
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2434831 S0000564432_V3

Electrical Load Control Unit (ELCU) Installation (Example)
Figure 401/24-51-05-990-801 (Sheet 3 of 3)

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TASK 24-51-05-400-801

3. ELCU Installation

(Figure 401)

A. General



DO NOT ACCIDENTALLY DISCONNECT THE POWER FEEDER CABLES FROM THE PANEL. A SYSTEM MALFUNCTION, AND DAMAGE TO THE PANEL CAN OCCUR.

- (1) Make sure that you do not disturb or accidentally disconnect the power feeder cables when you do the maintenance around the ELMS power panels P100, P200, and P300.

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. ELCU Installation

SUBTASK 24-51-05-420-001

- (1) Do these steps to install the applicable ELCU [1]:
- (a) Put the applicable ELCU [1] in the correct position.

ARO 001-010

- (b) Install the four captive screws [2] that attach the applicable ELCU [1] to the panel.

ARO 011-999

- (c) Install the cap screws [3] that attach the applicable ELCU [1] to the panel.

ARO 001-010

- (d) Tighten the captive screws [2] to a torque of 15 pound-inches.

ARO 011-999

- (e) Torque the cap screws [3] between 28.8 in-lb (3.25 N·m) and 35.2 in-lb (3.98 N·m).

ARO ALL

- (f) Close the applicable panel.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-51-05-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

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F. Do the ELCU Installation Test.

SUBTASK 24-51-05-710-005

- (1) After you complete the ELCU installation, do the applicable ELCU Installation Test from the list below:

NOTE: There are several different types of ELCUs, and each different type has its own unique Installation Test.

- (a) Do this task: Installation Test of ELCUs M24111, M24211, TASK 24-51-05-700-801.
- (b) Do this task: Installation test of ELCUs M21265, M21266, TASK 24-51-05-700-802.
- (c) Do this task: Installation Test of ELCUs M28109, M28213, TASK 24-51-05-700-807.
- (d) Do this task: Installation test of ELCUs M21102, M21202, TASK 24-51-05-700-803.
- (e) Do this task: Installation Test of ELCUs M25043, M25044, M25135, M25235, TASK 24-51-05-700-805.
- (f) Do this task: Installation Test of ELCUs M28108, M28212, TASK 24-51-05-700-806.
- (g) Do this task: Installation Test for ELCUs M29103, M29203, TASK 24-51-05-700-808.
- (h) Do this task: Operational Test for ELCUs M29303, M29308, TASK 24-51-05-710-801.
- (i) Do this task: Installation Test of ELCU M21101, TASK 24-51-05-700-804.

————— END OF TASK —————

TASK 24-51-05-700-801

4. Installation Test of ELCUs M24111, M24211

A. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)

B. Do these steps to do an installation test for the left or right utility bus ELCU (M24111, M24211).

SUBTASK 24-51-05-710-002

- (1) Do these steps to test the left utility bus ELCU (M24111):
- (a) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.
 - (b) Select the Electrical Maintenance Page 2/2 on the multi-function display (MFD).
 - (c) Make sure the left UTIL is ON.
 - (d) Select the L BUS TIE switch, on the P5 panel, to the ISLN position.
 - (e) Look at the Electrical Maintenance Page 2/2 and make sure the left UTIL is OFF.
 - (f) Select the L BUS TIE switch, on the P5 panel, to the AUTO position.
 - (g) Make sure the left UTIL indication changes from the OFF position to the ON position within 60 seconds.

SUBTASK 24-51-05-710-006

- (2) Do these steps to test the right utility bus ELCU (M24211):
- (a) Make sure the BAT switch, on the P5 panel, is in the ON position.
 - (b) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802.
 - (c) Select the Electrical Maintenance Page 2/2 on the multi-function display (MFD).
 - (d) Make sure the right UTIL is ON.

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- (e) Select the R BUS TIE switch, on the P5 panel, to the ISLN position.
- (f) Look at the Electrical Maintenance Page 2/2 and make sure the right UTIL is OFF.
- (g) Select the R BUS TIE switch, on the P5 panel, to the AUTO position.
- (h) Make sure the right UTIL indication changes from the OFF position to the ON position within 60 seconds.

————— **END OF TASK** —————

TASK 24-51-05-700-810

5. Installation Test of ELCUs M21201

A. References

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

B. Do these steps to do an installation test for the right lower fan control ELCUs (M21201).

SUBTASK 24-51-05-710-007

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

SUBTASK 24-51-05-710-008

- (2) Use a maintenance access terminal (MAT) to do the System test of the Recirculation Fan System. To use the MAT, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808:
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 21 Cabin Temperature Control System
 - 5) SYSTEM TEST
 - 6) Recirculation Fan System
 - 7) CONTINUE
 - (b) Do the instructions that show on the MAT and then make these selections:
 - 1) CONTINUE
 - 2) START TEST
 - (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - (d) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

————— **END OF TASK** —————

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TASK 24-51-05-700-802

6. Installation test of ELCUs M21265, M21266

A. References

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

B. Do these steps to do an installation test for the left or right lavatory/galley vent fan control ELCUs (M21265, M21266).

SUBTASK 24-51-05-860-003

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

SUBTASK 24-51-05-740-001

(2) Use a maintenance access terminal (MAT) to do the System test of the Lavatory/Galley Ventilation Fans. To use the MAT, (TASK 45-10-00-740-808):

(a) Make these selections on the MAT:

- 1) ONBOARD MAINTENANCE
- 2) LINE MAINTENANCE
- 3) GROUND TESTS
- 4) 21 Environmental Control System
- 5) SYSTEM TEST
- 6) Lavatory/Galley Ventilation
- 7) CONTINUE

(b) Do the instructions that show on the MAT and then make these selections:

- 1) CONTINUE
- 2) START TEST

(c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.

(d) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

————— END OF TASK —————

TASK 24-51-05-700-803

7. Installation test of ELCUs M21102, M21202

A. References

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

B. Do these steps to do an installation test for the left or right equipment cooling supply fan ELCUs (M21102, M21202).

SUBTASK 24-51-05-860-004

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

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SUBTASK 24-51-05-740-002

- (2) Use a maintenance access terminal (MAT) to do the System test of the Equipment Cooling Supply Fans. To use the MAT, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 21 Environmental Control System
 - 5) SYSTEM TEST
 - 6) Equipment Cooling
 - 7) CONTINUE
 - (b) Do the instructions that show on the MAT and then make these selections:
 - 1) CONTINUE
 - 2) START TEST
 - (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
 - (d) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

————— END OF TASK —————

TASK 24-51-05-700-804

8. Installation Test of ELCU M21101

A. References

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

B. Do these steps to do an installation test for the equipment cooling vent fan ELCU (M21101).

SUBTASK 24-51-05-860-005

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

SUBTASK 24-51-05-740-003

- (2) Use a maintenance access terminal (MAT) to do the System Test of the Equipment Cooling Vent Fan. To use the MAT, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 21 Environmental Control System
 - 5) SYSTEM TEST
 - 6) Equipment Cooling

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- 7) CONTINUE
- (b) Do the instructions that show on the MAT and then make these selections:
 - 1) CONTINUE
 - 2) START TEST
- (c) When the test is completed, make sure that PASSED shows adjacent to TEST CONDITION on the MAT.
- (d) If FAILED shows, select the maintenance message and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

————— **END OF TASK** —————

TASK 24-51-05-700-805

9. Installation Test of ELCUs M25043, M25044, M25135, M25235

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)

B. Do these steps to do an installation test for the galley power ELCUs (M25043, 25044, 25135, 25235).

SUBTASK 24-51-05-860-006

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

SUBTASK 24-51-05-860-007

- (2) Make sure the circuit breakers for the ovens on the Galley Electrical Control Panel are closed.

SUBTASK 24-51-05-710-003

- (3) Do the test that follows on the galley associated with the ELCU you replaced.

NOTE: Only test one galley at a time.

NOTE: For additional information, refer to AMM 25-32-02.

- (a) Close the FAN circuit breaker on the oven control unit for the applicable oven being tested.
- (b) Put the temperature selector switch in the lowest temperature position.
- (c) Set the timer to ten minute.
- (d) Put the ON/OFF switch in the ON position.
 - 1) Make sure the POWER light for the oven comes on.
 - 2) Make sure the heat element in the oven compartment operates.
- (e) Set the timer to zero.
 - 1) Make sure the HOLD light comes on.
- (f) Put the ON/OFF switch in the OFF position.
 - 1) Make sure the POWER light for the oven goes off.

————— **END OF TASK** —————

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TASK 24-51-05-700-806

10. Installation Test of ELCUs M28108, M28212

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

B. Access Panels

Number	Name/Location
521DB	Refueling Station Door

C. Do these steps to do an installation test for the left or right fuel jettison pump ELCUs (M28108, M28212).

SUBTASK 24-51-05-720-001

(1) Do a test of the fuel pump(s):

(a) To do an operational test for one pump, do these steps:

- 1) Make sure there is a minimum of 15,000 LB (7000 KGS) in the applicable main fuel tank.

NOTE: This fuel quantity is necessary to prevent dry operation of the fuel pumps after the pumps are drained.

- a) Refuel the fuel tanks, if it is necessary (TASK 12-11-01-650-801).
- 2) Make sure that the FUEL JETTISON L(R) NOZZLE valve switch-lights, on the Fuel Jettison Panel (P5 Overhead Panel), are in the closed position.



WARNING

DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- 3) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).
- 4) Open this access door to get access to the integrated refuel panel (IRP), P28: (TASK 06-44-00-800-802).

Number	Name/Location
521DB	Refueling Station Door



WARNING

MAKE SURE THAT THERE IS NO PRESSURE IN THE REFUEL/JETTISON MANIFOLD. IF THERE IS PRESSURE IN THE MANIFOLD, A FUEL LEAKAGE CAN OCCUR. FUEL IS DANGEROUS TO PERSONNEL AND EQUIPMENT.

- 5) If the refuel/jettison manifold has been pressurized in the last 30 to 60 minutes, do these steps before you continue:
 - a) To remove pressure from the refuel/jettison manifold:
 - <1> Put the REFUEL VALVE CONTROL switches for the left, right and center fuel tanks to the OPEN position.

NOTE: This step will remove pressure from the refuel/jettison manifold.

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- <2> Wait approximately 1 minute to remove the pressure in the manifold.
- <3> Put the refuel valve control switches to the CLOSE position.
- 6) If the refuel/jettison manifold has not been pressurized in the last 30 to 60 minutes, then continue to the next step.
- 7) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the OPEN position.
- 8) Push the JETTISON ARM switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ARMED position.
- 9) Listen at the rear spar to make sure the applicable jettison fuel pump operates.
- 10) Make sure the applicable EICAS status message does not show on the EICAS display for the applicable pump:
 - a) FUEL JETT PUMP L
 - b) FUEL JETT PUMP R
- 11) Push the JETTISON ARM switch-light to the off position.
- 12) Listen at the rear spar to make sure the jettison fuel pump is off.
- 13) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the CLOSE position.

————— END OF TASK —————

TASK 24-51-05-700-807

11. Installation Test of ELCUs M28109, M28213

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-25-06-400-804	APU Fuel Shroud Drain Line - Installation (P/B 401)

B. Access Panels

Number	Name/Location
521DB	Refueling Station Door

C. Do these steps to do an installation test of the left and right center override fuel pump ELCUs (M28109, M28213).

SUBTASK 24-51-05-720-002

- (1) To do an operational test of one of the center pumps, do these steps:
 - (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door
 - (b) Make sure there is a minimum of 10,000 LB (5,000 KGS) in the center fuel tank.
NOTE: This fuel quantity is necessary to prevent dry operation of the fuel pumps after the pumps are drained.
 - 1) To refuel the fuel tank (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.
 - (c) Push the applicable fuel pump switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ON position.

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Table 401/24-51-05-993-801

CENTER TANK FUEL PUMPS	
PUMP	SWITCH-LIGHT
Left Center Fuel Pump	L CENTER PUMP
Right Center Fuel Pump	R CENTER PUMP

- (d) Make sure the applicable EICAS status message does not show on the EICAS display for the applicable pump:
 - 1) FUEL PUMP CENTER L
 - 2) FUEL PUMP CENTER R
- (e) Listen at the rear spar to make sure the applicable override/jettison fuel pump operates.
- (f) Make sure there are no fuel leaks at the applicable fuel pump, on the rear spar (Figure 401).
- (g) Let the pump run for 15 minutes and make sure there is no fuel leakage at the center dry bay drain mast, installed at the aft end of the main landing gear doors (TASK 28-25-06-400-804).
- (h) Push the applicable fuel pump switch-light to the off position.
- (i) Listen at the rear spar to make sure the applicable override/jettison fuel pump does not operate (Figure 401).
- (j) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

————— END OF TASK —————

TASK 24-51-05-700-808

12. Installation Test for ELCUs M29103, M29203

A. General

- (1) Do these steps to do an installation test of the left or right electric hydraulic pumps ELCUs (M29103, M29203).

B. References

<u>Reference</u>	<u>Title</u>
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 24-51-05-860-008

- (1) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the off position (Figure 401).

SUBTASK 24-51-05-860-009

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

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SUBTASK 24-51-05-610-001

- (3) To make sure the fluid level in the applicable (left or right) system reservoir is 0.42 to 1.19, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 24-51-05-860-010

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

E. Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test

SUBTASK 24-51-05-210-001

- (1) Make sure HYDRAULIC PRIMARY PUMP PRESS left (right) indication, on the EICAS maintenance page, is 0 to 200 psi.

SUBTASK 24-51-05-210-002

- (2) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control subpanel of the P5 Overhead Panel, comes on.

SUBTASK 24-51-05-970-001

- (3) Make a record of the HYDRAULIC DEMAND PUMP TEMP L (R) indication, on the EICAS maintenance page.

NOTE: Write this indication as Value No. 1.

SUBTASK 24-51-05-860-011



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



DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION ON EICAS IS MORE THAN 105 °C OR AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (4) Set the HYDRAULIC DEMAND L (R) ELEC switch to the ON position.

SUBTASK 24-51-05-210-003

- (5) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 24-51-05-860-012

- (6) Let the hydraulic pump operate for at least one minute, before you do the step which follows.

SUBTASK 24-51-05-970-002

- (7) Make sure the HYDRAULIC DEMAND PUMP TEMP L (R) indication, on the EICAS maintenance page, shows higher than the indication you wrote as Value No. 1.

SUBTASK 24-51-05-210-004

- (8) Make sure the HYDRAULIC SYSTEM PRESS L (R) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 24-51-05-210-005

- (9) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel, goes off.

SUBTASK 24-51-05-860-013

- (10) Set the HYDRAULIC DEMAND L (R) ELEC switch to the OFF position.

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SUBTASK 24-51-05-210-006

- (11) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel, comes on.

SUBTASK 24-51-05-860-014

- (12) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 24-51-05-210-007

- (13) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

SUBTASK 24-51-05-860-015



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



DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION ON EICAS IS MORE THAN 105 °C OR AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (14) Set the HYDRAULIC DEMAND L (R) ELEC switch to the AUTO position.

SUBTASK 24-51-05-710-004

- (15) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 24-51-05-860-016

- (16) Set the HYDRAULIC DEMAND L (R) ELEC switch to the OFF position.

SUBTASK 24-51-05-860-017

- (17) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 24-51-05-210-008

- (18) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

— END OF TASK —

TASK 24-51-05-710-801

13. Operational Test for ELCUs M29303, M29308

A. General

- (1) Do these steps to do an installation test of the center (C1 or C2) electric hydraulic pumps ELCUs (M29303, M29308).

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

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C. Location Zones

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

D. Prepare for the Test.

SUBTASK 24-51-05-860-018

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

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	23	C32608	LDG GEAR EXTD/RETR 2
G	10	C32607	LDG GEAR EXTD/RETR 1

SUBTASK 24-51-05-860-019

- (2) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the off position.

SUBTASK 24-51-05-860-020

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

SUBTASK 24-51-05-610-002

- (4) To make sure the fluid level in the center system reservoir is 0.42 to 1.19, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 24-51-05-860-021

- (5) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 24-51-05-210-009

- (6) Make sure HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, is 0 to 200 psi.

SUBTASK 24-51-05-210-010

- (7) Make sure the FAULT light on the HYDRAULIC PRIMARY ELEC C1 (C2) switch, on the hydraulic control panel, is on.

SUBTASK 24-51-05-970-003

- (8) Make a record of the HYDRAULIC PRIMARY PUMP TEMP C1 (C2) indication, on the EICAS maintenance page.

NOTE: Write this indication as Value No. 1.

SUBTASK 24-51-05-860-022



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



DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION ON EICAS IS MORE THAN 105 °C OR AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (9) Push the HYDRAULIC PRIMARY ELEC C1 (C2) switch to the ON position.

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SUBTASK 24-51-05-210-011

- (10) Make sure the HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 24-51-05-860-023

- (11) Let the hydraulic pump operate for at least one minute, before you do the step which follows.

SUBTASK 24-51-05-970-004

- (12) Make sure the HYDRAULIC PRIMARY PUMP TEMP C1 (C2) indication, on the EICAS maintenance page, shows higher than the indication you wrote as Value No. 1.

SUBTASK 24-51-05-210-012

- (13) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 24-51-05-210-013

- (14) Make sure the FAULT light on the HYDRAULIC PRIMARY ELEC C1 (C2) switch, on the hydraulic control panel, goes off.

SUBTASK 24-51-05-860-024

- (15) Push the HYDRAULIC PRIMARY ELEC C1 (C2) switch to the OFF position.

SUBTASK 24-51-05-210-014

- (16) Make sure the FAULT light on the HYDRAULIC PRIMARY ELEC C1 (C2) switch, on the hydraulic control panel, comes on.

SUBTASK 24-51-05-860-025

- (17) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 24-51-05-210-015

- (18) Make sure the HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

SUBTASK 24-51-05-860-026

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

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	23	C32608	LDG GEAR EXTD/RETR 2
G	10	C32607	LDG GEAR EXTD/RETR 1

————— **END OF TASK** —————

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MEDICAL FREQUENCY CONVERTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the medical frequency converter.
 - (2) An installation of the medical frequency converter.

TASK 24-51-21-000-801

2. Medical Frequency Converter Removal

A. **References**

<u>Reference</u>	<u>Title</u>
20-10-01-000-801	E/E Box Removal (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. **Location Zones**

<u>Zone</u>	<u>Area</u>
117	Main Equipment Center, Left
118	Main Equipment Center, Right

C. **Access Panels**

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

D. **Prepare for the removal**

SUBTASK 24-51-21-010-001

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

SUBTASK 24-51-21-860-001

- (2) Set the MEDICAL OUTLET PWR switch on the Medical Outlets Power Module, P61, to the OFF position.

SUBTASK 24-51-21-860-002

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	10	C25325	MED OUTLET FREQ CONV L

E. **Medical Frequency Converter Removal**

SUBTASK 24-51-21-910-001



DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803.

SUBTASK 24-51-21-860-003

- (2) Disconnect the Electrical Connector [2] from the front of applicable Medical Frequency Converter [1].

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SUBTASK 24-51-21-020-001

- (3) Remove the Medical Frequency Converter [1] from the shelf. To remove it, do this task: E/E Box Removal, TASK 20-10-01-000-801.

———— **END OF TASK** ————

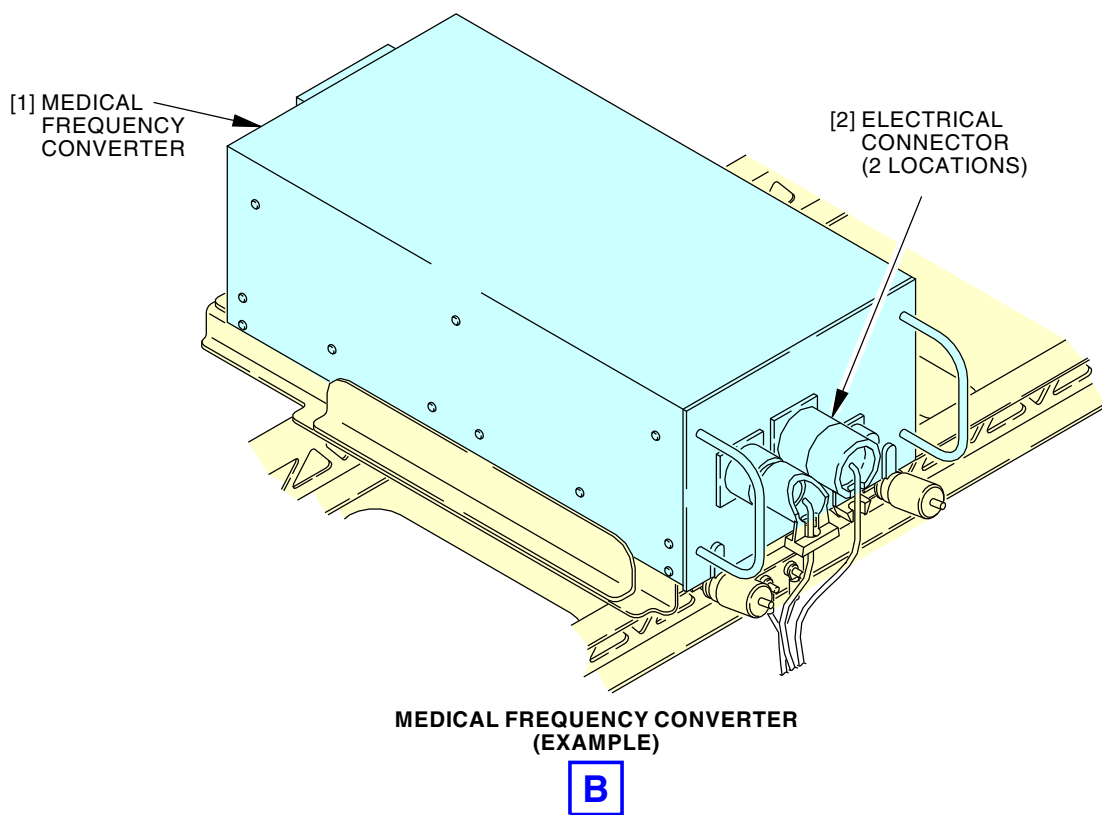
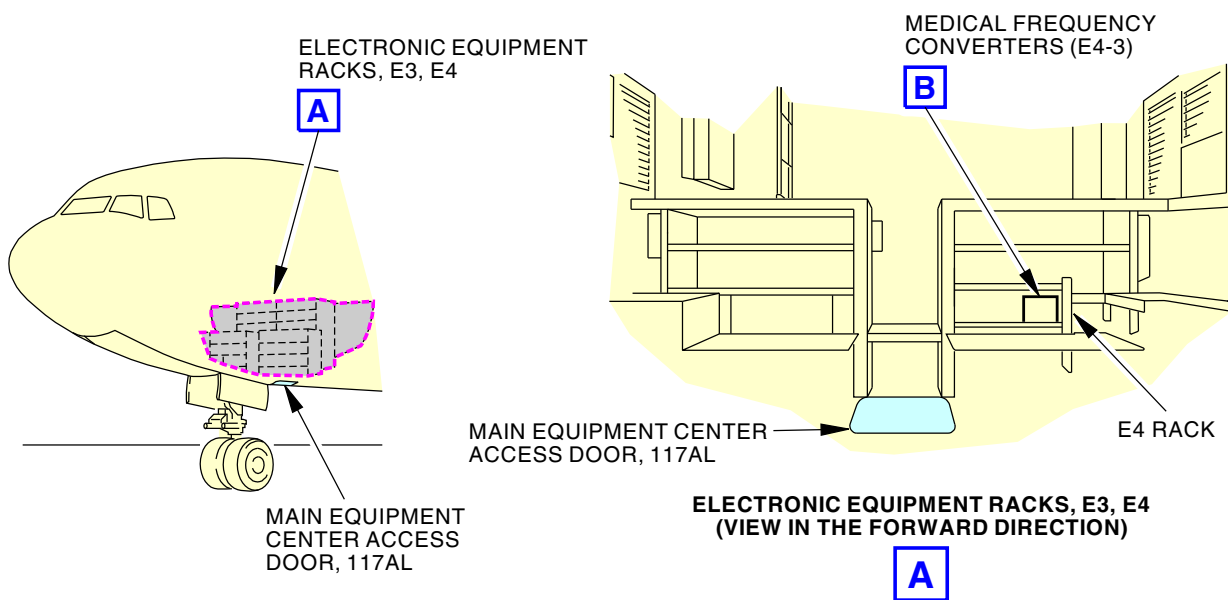
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**Medical Frequency Converter Installation
Figure 401/24-51-21-990-801**

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TASK 24-51-21-400-801

3. Medical Frequency Converter Installation

A. References

Reference	Title
20-10-01-400-801	E/E Box Installation (P/B 401)
20-41-01-400-803	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
WDM 25-29-21	Wiring Diagram Manual

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
212	Flight Compartment, Right

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Medical Frequency Converter Installation

SUBTASK 24-51-21-860-004

- (1) Make sure that this circuit breaker is open and has safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
K	10	C25325	MED OUTLET FREQ CONV L

SUBTASK 24-51-21-010-002

- (2) Open this access panel:

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 24-51-21-910-002



DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (3) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-41-01-400-803.

SUBTASK 24-51-21-420-001

- (4) Install the Medical Frequency Converter [1] to the E4-3 shelf. To install it, do this task: E/E Box Installation, TASK 20-10-01-400-801.

SUBTASK 24-51-21-860-005

- (5) Re-connect the Electrical Connector [2] to the Medical Frequency Converter [1].

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SUBTASK 24-51-21-860-006

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	10	C25325	MED OUTLET FREQ CONV L

SUBTASK 24-51-21-410-001

- (7) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

E. Installation Test

SUBTASK 24-51-21-860-007

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-51-21-700-001

- (2) Do this test for the medical frequency converter:
- Set the applicable MEDICAL OUTLET PWR switch on the Medical Outlets Power Module, P61, to the ON position (WDM 25-29-21).
 - Measure the voltage at the applicable medical outlet (WDM 25-29-21).
 - Make sure that the voltage at the applicable medical outlet is the same as the voltage in the WDM 25-29-21.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-51-21-860-008

- (1) Remove electrical power if it is no longer needed, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

————— END OF TASK —————

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GROUND HANDLING (TRU) - REMOVAL/INSTALLATION

1. **General**

A. This procedure has these tasks:

- (1) Ground Handling (TRU) Removal
- (2) Ground Handling (TRU) Installation

TASK 24-61-01-000-801

2. **Ground Handling (TRU) Removal**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is for the removal of the Ground Handling TRU. The Ground Handling TRU is located inside the Ground Service/Handling Power Panel P320.

B. References

Reference	Title
24-22-00-860-807	Remove Primary External Power (P/B 201)
24-22-00-860-808	Remove Secondary External Power (P/B 201)
24-22-00-860-809	Remove APU Generator Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare for the Removal

SUBTASK 24-61-01-010-001

- (1) Open this access panel:

Number	Name/Location
117AL	Main Equipment Center Access Door

SUBTASK 24-61-01-860-001

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
F	12	C24325	TRU GND HDLG

SUBTASK 24-61-01-860-006

- (3) Do this task: Remove Primary External Power, TASK 24-22-00-860-807.

SUBTASK 24-61-01-860-007

- (4) Do this task: Remove Secondary External Power, TASK 24-22-00-860-808.

SUBTASK 24-61-01-860-008

- (5) Do this task: Remove APU Generator Power, TASK 24-22-00-860-809.

NOTE: It is necessary to remove the external power cables from the aircraft to isolate power.

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SUBTASK 24-61-01-860-009

- (6) Remove 28Vac power source at the P320 panel.

F. Ground Handling (TRU) Removal

SUBTASK 24-61-01-020-001

- (1) Remove the terminal wires [1] from the ground handling TRU.
 - (a) Put identification tags on each terminal wires.
 - (b) Remove the terminal nuts [5] and terminal cover [4] from the ground handling TRU.
 - (c) Remove the terminal screws [3] and washers [2] from the ground handling TRU.
 - (d) Remove the terminal wires [1] from the ground handling relay.

SUBTASK 24-61-01-020-002

- (2) Remove the ground handling TRU [6].
 - (a) Remove the screw [7] and remove the ground handling TRU [6].

————— **END OF TASK** —————

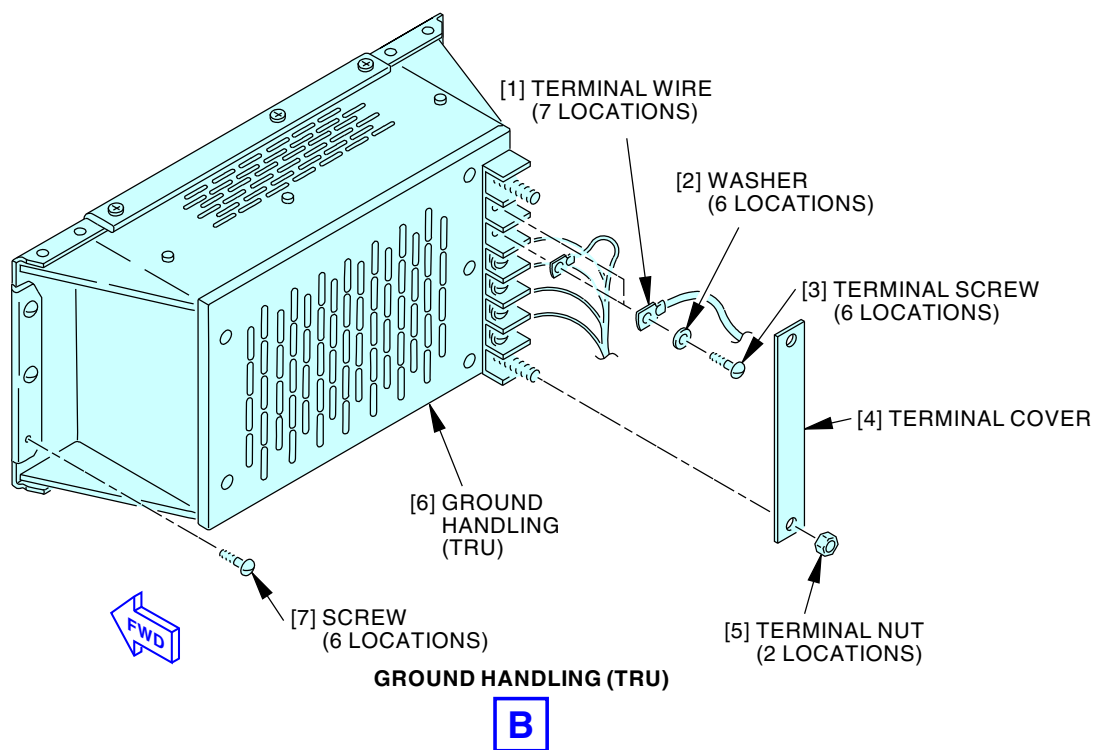
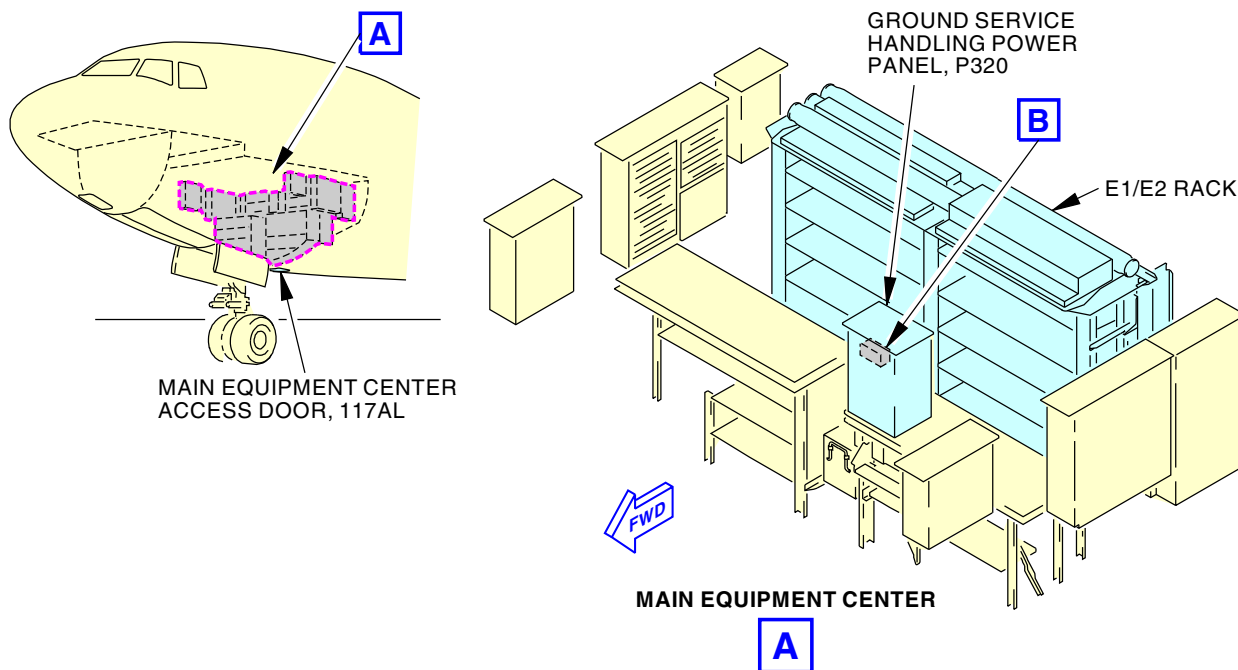
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Ground Handling (TRU) Installation
Figure 401/24-61-01-990-801

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TASK 24-61-01-400-801

3. Ground Handling (TRU) Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Ground Handling (TRU) Installation

SUBTASK 24-61-01-860-002

- (1) Make sure that this circuit breaker is open and has safety tag:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
F	12	C24325	TRU GND HDLG

SUBTASK 24-61-01-420-001

- (2) Do this step to install the ground handling TRU [6] on the Ground Service/Handling Power Panel, P320:

- (a) Put the ground handling TRU [6] on the P320 panel and install the screw [7].

SUBTASK 24-61-01-420-002

- (3) Install the terminal wires [1] to the ground handling TRU.
- (a) Install the terminal wires [1] to the ground handling TRU.
- (b) Install the terminal screws [3] and washers [2] to the ground handling TRU.
- (c) Install the terminal cover [4] with the terminal nuts [5] to the ground handling TRU.
- (d) Remove the identification tags from the terminal wires.

SUBTASK 24-61-01-860-003

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
F	12	C24325	TRU GND HDLG

E. Ground Handling (TRU) Installation Test

SUBTASK 24-61-01-860-004

- (1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 24-61-01-860-005

- (2) Make sure the MAT does not show any related maintenance messages to the ground handling TRU.

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-61-01-410-001

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117AL	Main Equipment Center Access Door

———— **END OF TASK** ————

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