

CHAPTER

29

**HYDRAULIC
POWER**



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AIRCRAFT MAINTENANCE MANUAL**

**CHAPTER 29
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29-EFFECTIVE PAGES			29-00-00 (cont)			29-11-00		
1 thru 11	SEP 05/2018		608	May 05/2017		201	Jan 05/2015	
12	BLANK		609	May 05/2017		202	Sep 05/2017	
29-CONTENTS			610	BLANK		203	Sep 05/2017	
1	Jan 05/2015		29-00-00			204	Sep 05/2017	
2	Sep 05/2017		901	Jan 05/2015		205	May 05/2017	
3	Jul 25/2018		902	Jan 05/2015		206	May 05/2017	
4	Jan 05/2018		903	Jan 05/2015		207	Sep 05/2017	
5	May 05/2016		904	Jan 05/2015		208	Sep 05/2017	
6	Sep 05/2017		905	May 05/2016		209	Sep 05/2017	
7	May 05/2016		906	May 05/2016		210	May 05/2017	
8	Sep 05/2016		907	Sep 05/2017		211	Sep 05/2017	
9	Sep 05/2017		908	Jan 05/2015		212	Sep 05/2017	
10	Sep 05/2017		909	Sep 05/2017		213	Sep 05/2017	
11	Jan 05/2015		910	Sep 05/2017		214	Sep 05/2017	
12	Sep 05/2017		911	Sep 05/2017		215	Sep 05/2017	
13	Jan 05/2017		912	Sep 05/2017		216	Sep 05/2017	
14	Jan 05/2017		913	Sep 05/2017		217	Sep 05/2017	
15	Sep 05/2017		914	Sep 05/2017		218	Sep 05/2017	
16	Jan 05/2017		915	Sep 05/2017		219	May 05/2017	
17	Jan 05/2018		916	Sep 05/2017		220	May 05/2017	
18	Jan 05/2017		917	Sep 05/2017		221	May 05/2017	
19	Sep 05/2017		918	Sep 05/2017		222	Sep 05/2017	
20	Jan 05/2017		919	Sep 05/2017		223	Sep 05/2017	
21	Jan 05/2017		920	Sep 05/2017		224	Sep 05/2017	
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29-00-00			922	Sep 05/2017		226	Sep 05/2017	
201	Sep 05/2015		923	Sep 05/2017		227	Sep 05/2017	
202	Sep 05/2017		924	Sep 05/2017		228	Sep 05/2017	
29-00-00			925	Sep 05/2017		229	Sep 05/2017	
601	May 05/2017		926	Sep 05/2017		230	Sep 05/2017	
602	May 05/2017		927	Sep 05/2017		231	Sep 05/2017	
603	Sep 05/2017		928	Sep 05/2017		232	Sep 05/2017	
604	Sep 05/2017		929	Sep 05/2017		233	Sep 05/2017	
605	May 05/2018		930	Sep 05/2017		234	Jul 25/2018	
606	Sep 05/2017					235	Jul 25/2018	
607	May 05/2017					236	Jul 25/2018	

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29-11-00 (cont)			29-11-00 (cont)			29-11-00 (cont)		
237	Jul 25/2018		522	Jul 25/2018		558	Jan 05/2018	
238	Jul 25/2018		523	Jul 25/2018		559	Jan 05/2018	
239	Jul 25/2018		524	Jul 25/2018		560	Jan 05/2018	
240	Jul 25/2018		525	Jul 25/2018		561	Jan 05/2018	
241	Jul 25/2018		526	Jul 25/2018		562	BLANK	
242	Jul 25/2018		527	Jul 25/2018		29-11-00		
243	Jul 25/2018		528	Jul 25/2018		601	Sep 05/2017	
244	Jul 25/2018		529	Jan 05/2018		602	Sep 05/2017	
245	Jul 25/2018		530	Jan 05/2018		603	Sep 05/2017	
246	Jul 25/2018		531	Jan 05/2018		604	Sep 05/2017	
247	Jul 25/2018		532	Jan 05/2018		605	May 05/2017	
248	Jul 25/2018		533	Jan 05/2018		606	May 05/2017	
249	Jul 25/2018		534	Jan 05/2018		607	May 05/2017	
250	BLANK		535	Jan 05/2018		608	May 05/2017	
29-11-00			536	Jan 05/2018		609	May 05/2017	
501	May 05/2015		537	Jan 05/2018		610	May 05/2017	
502	Sep 05/2017		538	Jan 05/2018		611	Sep 05/2017	
503	Sep 05/2017		539	Jan 05/2018		612	Sep 05/2017	
504	May 05/2017		540	Jan 05/2018		613	Sep 05/2017	
505	May 05/2017		541	Jan 05/2018		614	Sep 05/2017	
506	May 05/2016		542	Jan 05/2018		615	Sep 05/2017	
507	Jan 05/2015		543	Jan 05/2018		616	Sep 05/2017	
508	Sep 05/2017		544	Jan 05/2018		617	Sep 05/2017	
509	Jan 05/2015		545	Jan 05/2018		618	Sep 05/2017	
510	Sep 05/2017		546	Jan 05/2018		619	Sep 05/2017	
511	Sep 05/2017		547	Jan 05/2018		620	Sep 05/2017	
512	Jan 05/2015		548	Jan 05/2018		621	Sep 05/2017	
513	Sep 05/2017		549	Jan 05/2018		622	Sep 05/2017	
514	Sep 05/2017		550	Jan 05/2018		623	Sep 05/2017	
515	Sep 05/2017		551	Jan 05/2018		624	Sep 05/2017	
516	Sep 05/2017		552	Jan 05/2018		625	Sep 05/2017	
517	Jul 25/2018		553	Jan 05/2018		626	Sep 05/2017	
518	Jul 25/2018		554	Jan 05/2018		627	Sep 05/2017	
519	Jul 25/2018		555	Jan 05/2018		628	Sep 05/2017	
520	Jul 25/2018		556	Jan 05/2018		629	Sep 05/2017	
521	Jul 25/2018		557	Jan 05/2018		630	Sep 05/2017	

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29-11-00 (cont)			29-11-01 (cont)			29-11-06		
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632	Sep 05/2017		411	Jan 05/2018		402	May 05/2017	
633	Sep 05/2017		412	BLANK		403	May 05/2017	
634	Sep 05/2017		29-11-02			404	May 05/2017	
635	Sep 05/2017		401	Sep 05/2017		405	May 05/2016	
636	Sep 05/2017		402	May 05/2016		406	Sep 05/2017	
637	Sep 05/2017		403	Jan 05/2015		407	Sep 05/2017	
638	Sep 05/2017		404	May 05/2017		408	Sep 05/2017	
639	Sep 05/2017		405	Jan 05/2015		409	May 05/2017	
640	Sep 05/2017		406	May 05/2017		410	May 05/2017	
641	Sep 05/2017		407	May 05/2018		411	Sep 05/2017	
642	Sep 05/2017		408	Jan 05/2018		412	Sep 05/2017	
643	Sep 05/2017		409	Jan 05/2018		413	Sep 05/2017	
644	Sep 05/2017		410	Jan 05/2018		414	Sep 05/2017	
645	Sep 05/2017		411	Jan 05/2018		415	Sep 05/2017	
646	Sep 05/2017		412	BLANK		416	May 05/2017	
647	Sep 05/2017		29-11-05 Config 2			417	May 05/2017	
648	Sep 05/2017		401	May 05/2017		418	Sep 05/2017	
649	Sep 05/2017		402	Sep 05/2017		419	Sep 05/2017	
650	May 05/2018		403	May 05/2018		420	Sep 05/2017	
651	Sep 05/2017		404	May 05/2018		29-11-07		
652	Sep 05/2017		405	Sep 05/2017		401	May 05/2017	
653	Sep 05/2017		406	May 05/2017		402	Sep 05/2017	
654	Sep 05/2017		407	Jan 05/2016		403	May 05/2017	
655	Sep 05/2017		408	May 05/2018		404	May 05/2017	
656	Sep 05/2017		409	Jan 05/2016		405	May 05/2017	
29-11-01			410	Jan 05/2018		406	May 05/2017	
401	May 05/2015		411	Jan 05/2018		407	Sep 05/2017	
402	Sep 05/2017		412	Jan 05/2018		408	Sep 05/2017	
403	Sep 05/2017		413	Jan 05/2018		409	Sep 05/2017	
404	Jan 05/2015		414	Jan 05/2018		410	BLANK	
405	Jan 05/2015		415	Jan 05/2018		29-11-10		
406	May 05/2018		416	Jan 05/2018		401	May 05/2015	
407	Jan 05/2018		417	Sep 05/2017		402	Jul 25/2018	
408	Jan 05/2018		418	BLANK		403	Jan 05/2015	
409	Jan 05/2018					404	Jan 05/2015	

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29-11-10 (cont)			29-11-11 (cont)			29-11-15 (cont)		
405	Jan 05/2015		414	BLANK		407	May 05/2017	
406	May 05/2017		29-11-12			408	BLANK	
407	May 05/2017		401	Sep 05/2016		29-11-16		
408	May 05/2017		402	Sep 05/2017		401	Sep 05/2017	
409	May 05/2017		403	Sep 05/2017		402	Sep 05/2017	
410	Jan 05/2015		404	May 05/2017		403	May 05/2017	
411	May 05/2017		405	Jul 25/2018		404	May 05/2017	
412	May 05/2017		406	May 05/2017		405	May 05/2017	
413	May 05/2017		407	May 05/2017		406	May 05/2017	
414	May 05/2017		408	May 05/2017		407	May 05/2017	
415	May 05/2017		409	Sep 05/2016		408	Jan 05/2015	
416	May 05/2018		410	Sep 05/2016		409	Jan 05/2015	
417	Jul 25/2018		411	May 05/2017		410	BLANK	
418	Jan 05/2015		412	Sep 05/2017		29-11-17		
419	Jan 05/2015		413	Sep 05/2017		401	Sep 05/2017	
420	May 05/2016		414	Sep 05/2017		402	Sep 05/2017	
421	Sep 05/2017		29-11-14			403	May 05/2017	
422	Sep 05/2017		401	Sep 05/2017		404	May 05/2017	
423	Sep 05/2017		402	Jul 25/2018		405	Jan 05/2015	
424	Sep 05/2017		403	Sep 05/2017		406	Jan 05/2015	
425	Sep 05/2017		404	May 05/2017		29-11-18		
426	BLANK		405	Jul 25/2018		401	Sep 05/2017	
29-11-11			406	May 05/2017		402	Sep 05/2017	
401	Sep 05/2017		407	May 05/2017		403	May 05/2017	
402	Sep 05/2017		408	May 05/2018		404	May 05/2017	
403	Sep 05/2017		409	May 05/2015		405	Jan 05/2015	
404	May 05/2017		410	May 05/2015		406	Jan 05/2015	
405	Jan 05/2015		411	May 05/2015		29-11-19		
406	Jan 05/2015		412	BLANK		401	Jan 05/2015	
407	May 05/2017		29-11-15			402	Sep 05/2017	
408	Jul 25/2018		401	Sep 05/2017		403	May 05/2017	
409	Jan 05/2015		402	Sep 05/2017		404	May 05/2017	
410	Sep 05/2017		403	May 05/2017		405	Sep 05/2017	
411	Sep 05/2017		404	May 05/2017		406	Jan 05/2015	
412	Sep 05/2017		405	May 05/2018				
413	Jan 05/2015		406	May 05/2017				

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29-11-20			29-11-20 (cont)			29-11-22 (cont)		
401	Sep 05/2017		437	Sep 05/2017		407	Sep 05/2017	
402	Jan 05/2015		438	Sep 05/2017		408	Sep 05/2017	
403	Jan 05/2015		439	Sep 05/2017		409	Sep 05/2017	
404	Sep 05/2017		440	Sep 05/2017		410	BLANK	
405	Jan 05/2015		441	May 05/2018		29-11-23		
406	May 05/2017		442	Sep 05/2017		401	Sep 05/2017	
407	May 05/2017		443	Sep 05/2017		402	Sep 05/2017	
408	May 05/2017		444	Sep 05/2017		403	May 05/2017	
409	May 05/2017		445	Sep 05/2017		404	May 05/2017	
410	May 05/2017		446	Sep 05/2017		405	May 05/2017	
411	May 05/2017		447	Sep 05/2017		406	May 05/2016	
412	May 05/2017		448	Sep 05/2017		407	Sep 05/2017	
413	May 05/2017		29-11-21			408	Jan 05/2015	
414	May 05/2017		401	Sep 05/2017		29-11-24		
415	May 05/2017		402	Sep 05/2017		401	Sep 05/2017	
416	May 05/2018		403	Sep 05/2017		402	Sep 05/2017	
417	May 05/2016		404	Sep 05/2017		403	May 05/2017	
418	Sep 05/2017		405	Sep 05/2017		404	May 05/2017	
419	Sep 05/2017		406	Sep 05/2017		405	May 05/2017	
420	Sep 05/2017		407	Sep 05/2017		406	May 05/2016	
421	Sep 05/2017		408	Sep 05/2017		407	Sep 05/2017	
422	Sep 05/2017		409	Sep 05/2017		408	BLANK	
423	Sep 05/2017		410	Sep 05/2017		29-11-25		
424	Sep 05/2017		411	Sep 05/2017		401	Sep 05/2017	
425	Sep 05/2017		412	May 05/2018		402	Jan 05/2015	
426	Sep 05/2017		413	Sep 05/2017		403	May 05/2017	
427	Sep 05/2017		414	Sep 05/2017		404	May 05/2017	
428	Sep 05/2017		415	Sep 05/2017		405	May 05/2016	
429	Sep 05/2017		416	Sep 05/2017		406	May 05/2015	
430	Sep 05/2017		29-11-22			407	Sep 05/2017	
431	Sep 05/2017		401	Sep 05/2017		408	Sep 05/2017	
432	Sep 05/2017		402	Sep 05/2017		409	Sep 05/2017	
433	Sep 05/2017		403	Sep 05/2017		410	May 05/2015	
434	Sep 05/2017		404	Sep 05/2017		411	Sep 05/2017	
435	Sep 05/2017		405	Sep 05/2017		412	May 05/2016	
436	Sep 05/2017		406	Sep 05/2017		413	Jan 05/2015	

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29-11-25 (cont)			29-11-30 (cont)			29-11-40 (cont)		
414	Sep 05/2017		409	Sep 05/2017		416	Sep 05/2017	
415	Jan 05/2015		410	Jan 05/2015		417	Sep 05/2017	
416	Jan 05/2015		29-11-31			418	BLANK	
29-11-26			401	Sep 05/2017		29-11-41		
401	Sep 05/2017		402	May 05/2015		401	Jan 05/2015	
402	Sep 05/2017		403	Sep 05/2017		402	Sep 05/2017	
403	May 05/2017		404	May 05/2017		403	Sep 05/2017	
404	May 05/2017		405	May 05/2018		404	Sep 05/2017	
405	May 05/2016		406	Jan 05/2015		405	Sep 05/2017	
406	Sep 05/2017		407	Jan 05/2015		406	May 05/2017	
407	Sep 05/2017		408	Sep 05/2017		407	May 05/2017	
408	Sep 05/2017		29-11-32			408	May 05/2017	
409	Sep 05/2017		401	Sep 05/2017		409	May 05/2017	
410	Sep 05/2017		402	Sep 05/2017		410	May 05/2018	
411	Sep 05/2017		403	May 05/2017		411	May 05/2016	
412	Sep 05/2017		404	May 05/2017		412	May 05/2015	
413	Sep 05/2017		405	May 05/2018		413	May 05/2015	
414	Sep 05/2017		406	Jan 05/2015		414	May 05/2015	
29-11-28			407	Sep 05/2017		415	May 05/2015	
401	Sep 05/2017		408	Sep 05/2017		416	Sep 05/2017	
402	Sep 05/2017		29-11-40			29-11-42		
403	May 05/2017		401	Jan 05/2015		401	May 05/2015	
404	May 05/2017		402	Sep 05/2017		402	Sep 05/2017	
405	Jan 05/2018		403	Sep 05/2017		403	Sep 05/2017	
406	Sep 05/2017		404	Sep 05/2017		404	Sep 05/2017	
407	Sep 05/2017		405	Sep 05/2017		405	Sep 05/2017	
408	BLANK		406	Sep 05/2017		406	Jan 05/2015	
29-11-30			407	Sep 05/2017		407	May 05/2017	
401	Sep 05/2017		408	Sep 05/2017		408	May 05/2017	
402	Jan 05/2015		409	Sep 05/2017		409	May 05/2017	
403	Jan 05/2015		410	Sep 05/2017		410	May 05/2017	
404	May 05/2017		411	May 05/2018		411	May 05/2017	
405	May 05/2017		412	Sep 05/2017		412	May 05/2018	
406	May 05/2017		413	Sep 05/2017		413	May 05/2017	
407	May 05/2018		414	Sep 05/2017		414	May 05/2015	
408	May 05/2017		415	Sep 05/2017		415	May 05/2015	

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29-11-42 (cont)			29-11-44 (cont)			29-11-55 (cont)		
416	Jan 05/2015		408	Jan 05/2015		406	May 05/2017	
417	Jan 05/2015		409	Jan 05/2015		407	Sep 05/2017	
418	Sep 05/2017		410	Sep 05/2017		408	May 05/2018	
419	Sep 05/2017		411	Jan 05/2015		409	Jan 05/2018	
420	BLANK		412	BLANK		410	Jan 05/2018	
29-11-43			29-11-45			411	Sep 05/2017	
401	May 05/2015		401	Sep 05/2017		412	Jan 05/2018	
402	May 05/2016		402	Sep 05/2017		413	Sep 05/2017	
403	Sep 05/2015		403	Sep 05/2017		414	BLANK	
404	Sep 05/2017		404	May 05/2017		29-11-55		
405	Sep 05/2017		405	May 05/2017		601	May 05/2017	
406	Sep 05/2015		406	May 05/2016		602	May 05/2017	
407	May 05/2017		407	May 05/2015		603	Sep 05/2017	
408	May 05/2017		408	May 05/2015		604	May 05/2017	
409	May 05/2017		409	Sep 05/2017		605	May 05/2017	
410	May 05/2017		410	BLANK		606	May 05/2017	
411	May 05/2017		29-11-50			607	Sep 05/2017	
412	May 05/2018		201	Jan 05/2015		608	BLANK	
413	May 05/2017		202	Sep 05/2017		29-11-60		
414	May 05/2017		203	May 05/2018		401	Sep 05/2017	
415	May 05/2016		204	May 05/2018		402	Sep 05/2017	
416	May 05/2016		29-11-50			403	May 05/2017	
417	May 05/2016		401	May 05/2015		404	May 05/2017	
418	May 05/2016		402	Jan 05/2015		405	May 05/2018	
419	May 05/2016		403	Sep 05/2017		406	May 05/2017	
420	May 05/2016		404	May 05/2017		407	Sep 05/2017	
421	Sep 05/2017		405	Sep 05/2017		408	Sep 05/2017	
422	BLANK		406	May 05/2015		409	Sep 05/2017	
29-11-44			407	Jan 05/2015		410	Sep 05/2017	
401	Sep 05/2017		408	BLANK		29-11-60		
402	Sep 05/2017		29-11-55			601	May 05/2018	
403	Sep 05/2017		401	May 05/2015		602	May 05/2015	
404	May 05/2017		402	May 05/2015		603	May 05/2018	
405	May 05/2017		403	May 05/2015		604	Sep 05/2017	
406	May 05/2017		404	May 05/2015		605	Sep 05/2017	
407	May 05/2017		405	May 05/2017		606	Jan 05/2015	

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29-11-60 (cont)			29-11-73 (cont)			29-18-02 (cont)		
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608	May 05/2017		407	Sep 05/2017		408	BLANK	
609	May 05/2017		408	Jan 05/2017		29-18-03		
610	May 05/2018		29-11-74			401	Jan 05/2015	
611	May 05/2017		401	Sep 05/2017		402	Jan 05/2015	
612	Sep 05/2017		402	Sep 05/2017		403	Sep 05/2017	
613	Sep 05/2017		403	Sep 05/2017		404	Sep 05/2017	
614	BLANK		404	Sep 05/2017		405	May 05/2016	
29-11-70			405	Sep 05/2017		406	Jan 05/2015	
401	Sep 05/2017		406	Jan 05/2018		407	Sep 05/2017	
402	Sep 05/2017		407	Sep 05/2017		408	BLANK	
403	Sep 05/2017		408	Jan 05/2017		29-18-06		
404	Sep 05/2017		29-11-80			401	Jan 05/2015	
405	Jan 05/2018		401	Jan 05/2015		402	Jan 05/2015	
406	Sep 05/2017		402	Sep 05/2017		403	Sep 05/2017	
407	Sep 05/2017		403	Jan 05/2015		404	Sep 05/2017	
408	BLANK		404	BLANK		405	Jan 05/2015	
29-11-72 Config 2			29-11-80			406	Jan 05/2015	
401	Sep 05/2017		501	Jan 05/2015		29-21-00		
402	Sep 05/2017		502	Jan 05/2015		201	Jan 05/2016	
403	Sep 05/2017		503	Jan 05/2015		202	Jan 05/2016	
404	Sep 05/2017		504	Jan 05/2015		203	Jan 05/2016	
405	Sep 05/2017		29-18-01			204	Sep 05/2017	
406	Sep 05/2017		401	May 05/2016		205	Sep 05/2017	
407	Sep 05/2017		402	May 05/2016		206	Sep 05/2017	
408	Sep 05/2017		403	Sep 05/2017		207	Sep 05/2017	
409	Sep 05/2017		404	May 05/2016		208	Sep 05/2017	
410	Sep 05/2017		405	Sep 05/2017		209	Sep 05/2017	
411	Sep 05/2017		406	Sep 05/2017		210	Sep 05/2017	
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29-11-73			401	May 05/2015		212	Sep 05/2017	
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402	Sep 05/2017		403	Sep 05/2017		214	Sep 05/2017	
403	Sep 05/2017		404	Sep 05/2017		215	Sep 05/2017	
404	Sep 05/2017		405	May 05/2016		216	BLANK	
405	Sep 05/2017		406	Sep 05/2017				

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506	Sep 05/2017		542	Jan 05/2018		603	Sep 05/2017	
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510	Sep 05/2017		403	Sep 05/2017		402	Sep 05/2017	
511	Sep 05/2017		404	Sep 05/2017		403	Sep 05/2017	
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413	Sep 05/2017		405	May 05/2017		410	BLANK	
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TASK 29-00-00-910-801

1. Airworthiness Limitation Precautions

A. General

- (1) Critical Design Configuration Control Limitations (CDCCLs)
 - (a) All occurrences of CDCCLs found in this chapter of the AMM are identified by this note after each applicable CDCCL design feature:
 - 1) NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).
 - (b) Design features that are identified as CDCCLs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. These design features are a means of identifying certain design configuration features intended to preclude a fuel tank ignition source for the operational life of the airplane. CDCCLs are mandatory and cannot be changed or deleted without the approval of the FAA Oversight Office that is responsible for the airplane model Type Certificate. A critical fuel tank ignition source prevention feature may exist in the fuel system and its related installation or in systems that, if a failure condition were to develop, could interact with the fuel system in such a way that an unsafe condition would develop without this limitation. Strict adherence to configuration, methods, techniques, and practices as prescribed is required to ensure the CDCCL is complied with. Any use of parts, methods, techniques or practices not contained in the applicable CDCCL must be approved by the FAA Oversight Office that is responsible for the airplane model Type Certificate.
- (2) Airworthiness Limitation Instructions (ALIs)
 - (a) All occurrences of fuel tank system ALIs found in this chapter of the AMM are identified by this note after each applicable ALI inspection feature:
 - 1) NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).
 - (b) Inspection features that are ALIs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. These ALIs identify inspection features related to fuel tank ignition source prevention which must be done to maintain the design level of safety for the operational life of the airplane. These inspection features are mandatory and cannot be changed or deleted without the approval of the FAA Oversight Office that is responsible for the airplane model Type Certificate. Strict adherence to methods, techniques and practices as prescribed is required to ensure the ALI is complied with. Any use of methods, techniques or practices not contained in these ALIs must be approved by the FAA Oversight Office that is responsible for the airplane model Type Certificate.

B. Location Zones

Zone	Area
100	Lower Half of Fuselage
200	Upper Half of Fuselage
300	Empennage and Body Section 48
400	Powerplants and Nacelle Struts

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Zone	Area

500	Left Wing

600	Right Wing

C. Critical Design Configuration Control Limitations (CDCCLs)

SUBTASK 29-00-00-910-001



OBEY THE MANUFACTURER'S PROCEDURES WHEN YOU DO MAINTENANCE THAT HAS AN EFFECT ON A CDCCL. IF YOU DO NOT OBEY THE PROCEDURES, IT CAN INCREASE THE RISK OF A SOURCE OF FUEL TANK IGNITION, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR IF THERE IS A FIRE OR EXPLOSION.

- (1) Make sure you follow the procedures for items identified as CDCCLs.

D. Airworthiness Limitation Instructions (ALIs)

SUBTASK 29-00-00-910-002



OBEY THE MANUFACTURER'S PROCEDURES WHEN YOU DO ANY MAINTENANCE THAT MAY AFFECT AN ALI. IF YOU DO NOT FOLLOW THE PROCEDURES, IT CAN INCREASE THE RISK OF A FUEL TANK IGNITION SOURCE.

- (1) Make sure you follow the procedures for the items identified as ALIs.

————— **END OF TASK** —————

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HYDRAULIC POWER - INSPECTION/CHECK

1. General

- A. This procedure has one task. This task does a check of the hydraulic fluid.
- B. The conditions in which the hydraulic system operates can affect the service life of the hydraulic fluid. You make a decision to take a sample of the hydraulic fluid for analysis if you think is it necessary from your service experience. Remove one fluid sample from the hydraulic reservoir. Then, make an analysis of the fluid properties using the table found in the task below. If one of the fluid properties is more than the limit, replace a sufficient quantity of the fluid until the property is less than the limit. You must make a decision about the quantity of fluid you replace.
- C. A polyethylene bottle (500ml), STD-1104 or a sample bottle with lid, STD-119 can be used to collect the hydraulic fluid.

TASK 29-00-00-200-801

2. Hydraulic Fluid Check

A. General

- (1) If the polyethylene bottle (500ml), STD-1104 or the sample bottle with lid, STD-119 which will hold the fluid samples were not prepared before this check, you must do the steps in this procedure to clean the them. If you do not do this, it is possible the fluid samples will not be correct. You must get one fluid sample from each hydraulic reservoir.

NOTE: The glass bottle is shown as an alternate choice because low quality polyethylene containers can allow organic contaminants to pass into the oil sample and affect the test results. Polyethylene containers made from high grade PE, especially those obtained from the hydraulic fluid supplier, are acceptable for use.

B. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-119	Bottle and Lid - 1 pt (473 cc), glass, sample
STD-1104	Bottle - HDPE Polyethylene, Capacity 500ml, with LDPE Polyethylene Internal Plug and Self Seal Polypropylene Screw Cap
STD-1106	Bag - Polyethylene, Capacity 1 Pint Polyethylene Bottle with Cap

D. Consumable Materials

Reference	Description	Specification
B00047	Acid - Technical Grade, Nitric (61%-68.2% Purity)	A-A-59105

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Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
B00541	Cleaner - General Purpose Household Detergent	
G01061	Water - Distilled	

E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

F. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

G. Prepare for the Check

SUBTASK 29-00-00-110-001

- (1) If it is necessary to prepare the polyethylene bottle (500ml), STD-1104 and for this check, do these steps:

NOTE: Use these steps to clean the cap for the polyethylene bottle (500ml), STD-1104.

- (a) Clean the polyethylene bottle (500ml), STD-1104 fully in a solution of general purpose household detergent cleaner, B00541 and hot water.
- (b) Flush the polyethylene bottle (500ml), STD-1104 two times in hot potable water that does not have minerals.
- (c) Flush the polyethylene bottle (500ml), STD-1104 two times in distilled water, G01061.
- (d) Drain the distilled water, G01061 from the polyethylene bottle (500ml), STD-1104.
- (e) Dry the polyethylene bottle (500ml), STD-1104 in the air of a laminar flow bench in a clean room.

NOTE: If the laminar flow bench is not available, put the polyethylene bottle (500ml), STD-1104 in a clean dry room, with the top in a down position. Keep all persons from the room until the polyethylene bottle (500ml), STD-1104 is dry and you put a cap on it.

- (f) After the polyethylene bottle (500ml), STD-1104 is dry, install a cap on the bottle.
- (g) Put the polyethylene bottle (500ml), STD-1104 in a new polyethylene bag (1 pint), STD-1106.
- (h) Seal the polyethylene bag (1 pint), STD-1106 with a knot or tape.
- (i) Identify the polyethylene bag (1 pint), STD-1106.

SUBTASK 29-00-00-110-002

- (2) If it is necessary to prepare the sample bottle with lid, STD-119 for this check, do these steps:

NOTE: Do not use these steps to clean the cap for the sample bottle with lid, STD-119. To clean the cap, use the steps for cleaning a polyethylene bottle.

- (a) Flush the sample bottle with lid, STD-119 in a solution which has 20% by volume of acid, B00047.

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- (b) Flush the sample bottle with lid, STD-119 two times in hot potable water that does not have minerals.
- (c) Flush the sample bottle with lid, STD-119 two times in distilled water, G01061.
- (d) Flush the sample bottle with lid, STD-119 with clean alcohol, B00130 which was put through a filter.
- (e) Dry the sample bottle with lid, STD-119 in the air of a laminar flow bench in a clean room.
NOTE: If the laminar flow bench is not available, put the sample bottle with lid, STD-119 in a clean dry room, with the top in a down position. Keep all persons from the room until the sample bottle with lid, STD-119 is dry and you put a cap on it.
- (f) After the sample bottle with lid, STD-119 is dry, install a cap on the sample bottle with lid, STD-119.
- (g) Put the bottle in a new polyethylene bag (1 pint), STD-1106.
- (h) Seal the polyethylene bag (1 pint), STD-1106 with a knot or tape.
- (i) Identify the polyethylene bag (1 pint), STD-1106.

SUBTASK 29-00-00-040-001



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-00-00-010-001

- (4) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-00-00-010-002

- (5) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-00-00-480-001



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

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SUBTASK 29-00-00-480-002



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (7) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-00-00-860-004

- (8) For the hydraulic system from which you will remove a sample of hydraulic fluid, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-00-00-860-001

- (9) Operate all the flight controls, 6 to 8 times, to let the fluid flow through all the systems.

NOTE: You must get the sample in less than one hour after you stop the hydraulic system.

SUBTASK 29-00-00-860-002

- (10) For the hydraulic system from which you will remove the sample, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

H. Hydraulic Fluid Check

SUBTASK 29-00-00-020-001

- (1) Remove the cap from the outlet of the sample valve on the reservoir (Figure 601).

SUBTASK 29-00-00-680-001

- (2) Open the sample valve on the applicable reservoir to supply a smooth flow of fluid.

SUBTASK 29-00-00-680-002

- (3) Drain a minimum of one pint of hydraulic fluid before you get a sample.

SUBTASK 29-00-00-020-002

- (4) Remove the cap from the polyethylene bottle (500ml), STD-1104 or the sample bottle with lid, STD-119.

SUBTASK 29-00-00-680-003

- (5) Do these steps to fill the polyethylene bottle (500ml), STD-1104 or the sample bottle with lid, STD-119 .

(a) Put the bottle in the fluid flow but do not touch the sample valve.

(b) When the bottle is full, remove the it from the fluid flow.

NOTE: Do not close the sample valve while the bottle is in the fluid flow. This can loosen the contamination which can get into the sample.

(c) Put the cap on the bottle.

SUBTASK 29-00-00-860-003

- (6) Close the sample valve.

SUBTASK 29-00-00-420-002

- (7) Install the cap on the outlet of the sample valve.

SUBTASK 29-00-00-420-003

- (8) Safety the bleed screw, on the sample valve, with a lockwire.

SUBTASK 29-00-00-930-001

- (9) Identify the bottle with this data:

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- (a) Airplane model
- (b) Airplane number
- (c) Hydraulic system number
- (d) Date
- (e) Location.

NOTE: After you remove a fluid sample from the hydraulic reservoir, you can make an analysis of the fluid properties which show below (Table 601). If one of the fluid properties is more than the limit, replace a sufficient quantity of the fluid until the property is less than the limit. You must make a decision about the quantity of fluid you replace.

Table 601/29-00-00-993-803 Hydraulic Fluid, BMS 3-11, Property Limits

FLUID PROPERTIES	IN-SERVICE FLUID LIMITS	TEST PROCEDURE
Visual	Must be transparent. No phase separation or precipitation. All colors are satisfactory	Visual
Specific Gravity 77°F	0.970 - 1.066	ASTM D1217 or ASTM D4052
Percent of Water By Weight	0.8 max.	ASTM D6304 or Infrared
Neutralization No. mg KOH/gm	1.5 max.	ASTM D974 or ASTM D664 ^{*[1]}
Viscosity, cs at 100°F	6.0 to 12.5	ASTM D445
Organic Contamination	Not Found by Test	Supplier Test ^{*[2]} ^{*[3]}
Elemental Contamination ^{*[3]} ^{*[4]}		A Procedure with the Precision that Follows:
Calcium Potassium Sodium Chlorine Sulfur	50 ppm max. 50 ppm max. 50 ppm max. 200 ppm max. 500 ppm max.	± 4 ppm ± 2 ppm ± 3 ppm ± 20 ppm ±10ppm ^{*[5]}
Particulate Contamination	NAS 1638, Class 9 ^{*[6]}	SAE AS 598
Particle Size Range (Microns)	Maximum number of Particles Allowed	
5 to 15 15 to 25 25 to 50 50 to 100 OVER 100	128,000 22,800 4,050 720 128	

^{*[1]} When using ASTM D664 titrate to an endpoint of pH 11.0.

^{*[2]} If you think that there is contamination, then speak to your hydraulic fluid supplier for the test procedure.

^{*[3]} For routine hydraulic fluid analysis, it is not necessary to test for organic or elemental contaminants.

^{*[4]} Contamination is a quantity that is more than that in the base stock or the group of items which you add. Compare the data from the fluid analysis with the limits put on the new fluid.

^{*[5]} The precision of ± 10 ppm is applicable to total values in the range from 0 to 1000 ppm. In the range from 1000 to 3000 ppm, the precision will decrease to ± 50 ppm with some equipment.

^{*[6]} These are the maximum contamination limits based on a 100 milliliter sample size.

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SUBTASK 29-00-00-610-001

- (10) Do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-00-00-080-001



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (11) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801

SUBTASK 29-00-00-410-001

- (12) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-00-00-410-002

- (13) For the right hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-00-00-440-001

- (14) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

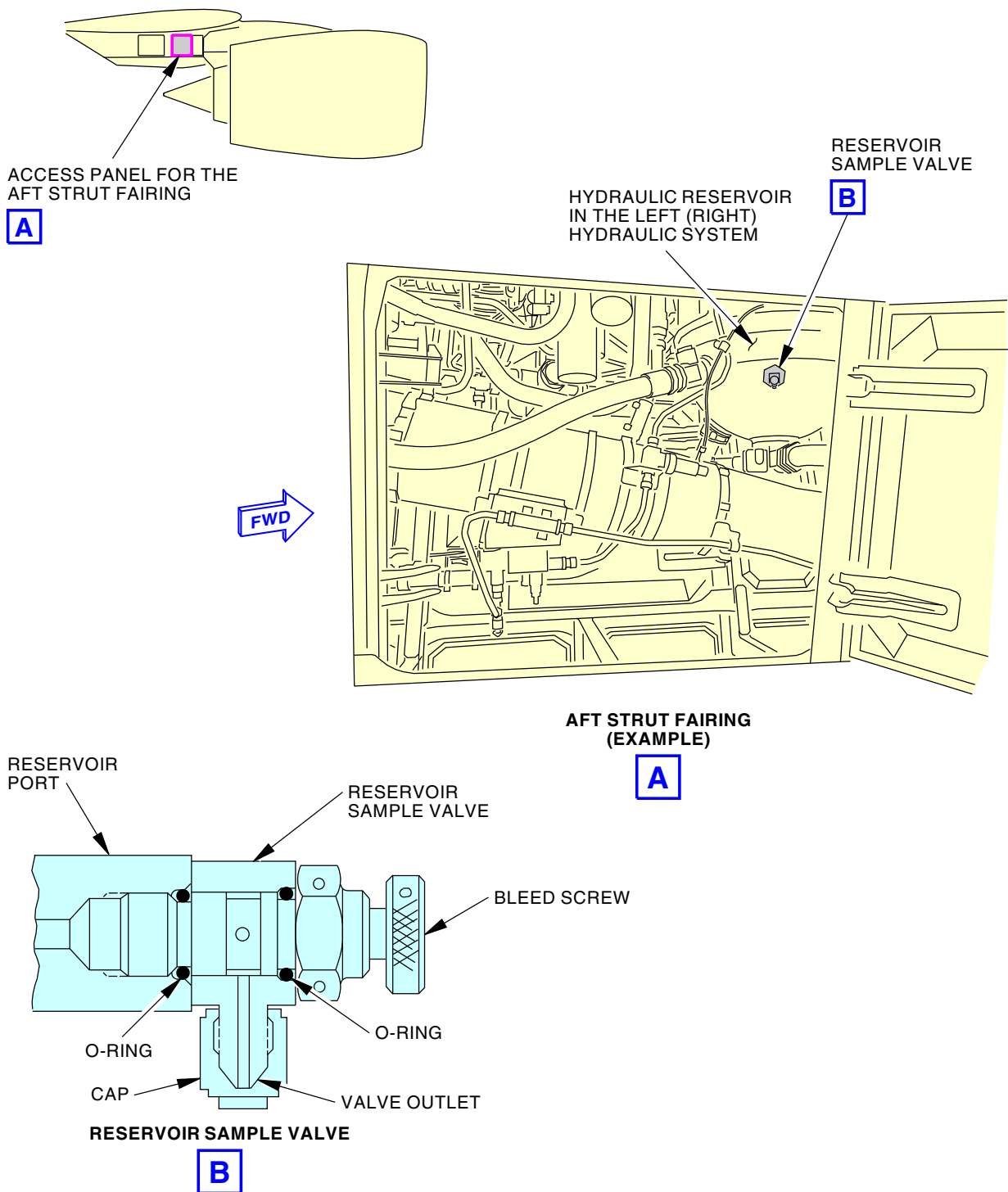
————— **END OF TASK** —————

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E37253 S0006415737_V2

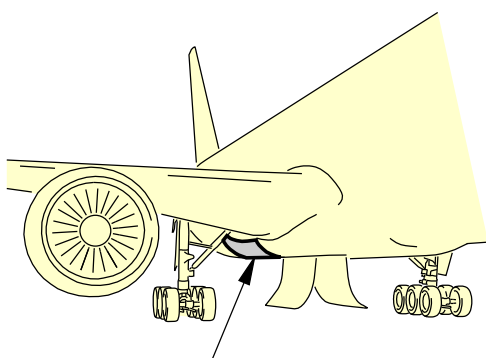
Reservoir Sample Valve
Figure 601/29-00-00-990-801 (Sheet 1 of 3)

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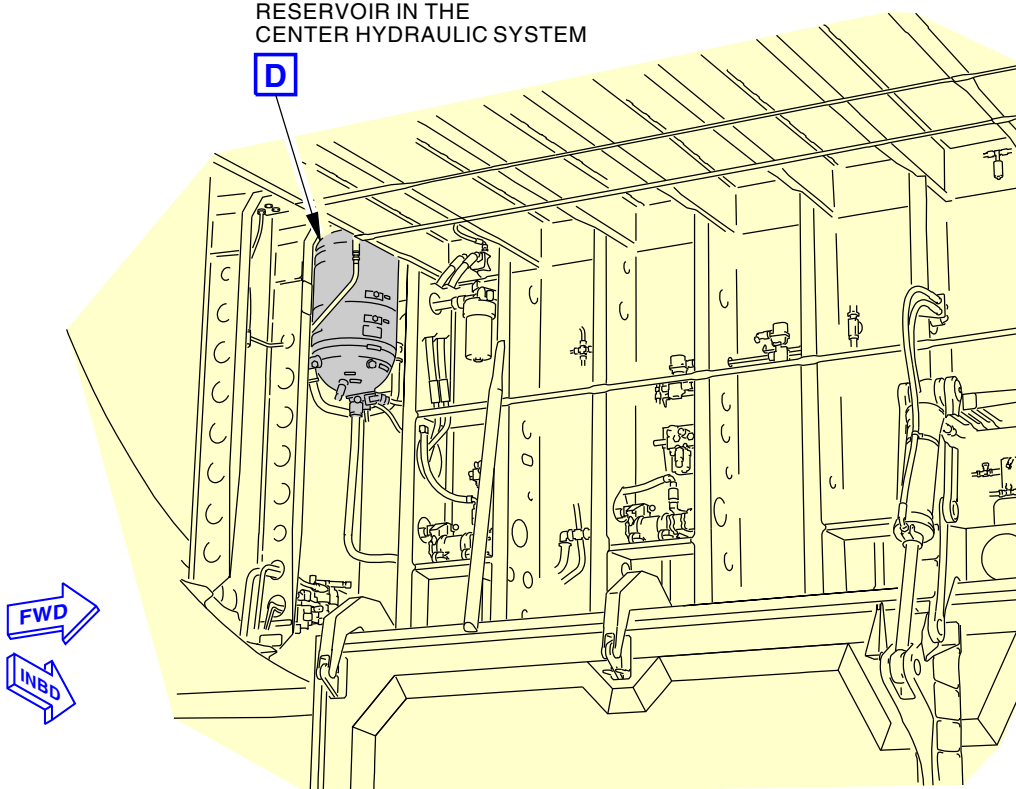


RIGHT WHEEL WELL

C

RESERVOIR IN THE
CENTER HYDRAULIC SYSTEM

D



RIGHT WHEEL WELL

C

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Reservoir Sample Valve
Figure 601/29-00-00-990-801 (Sheet 2 of 3)

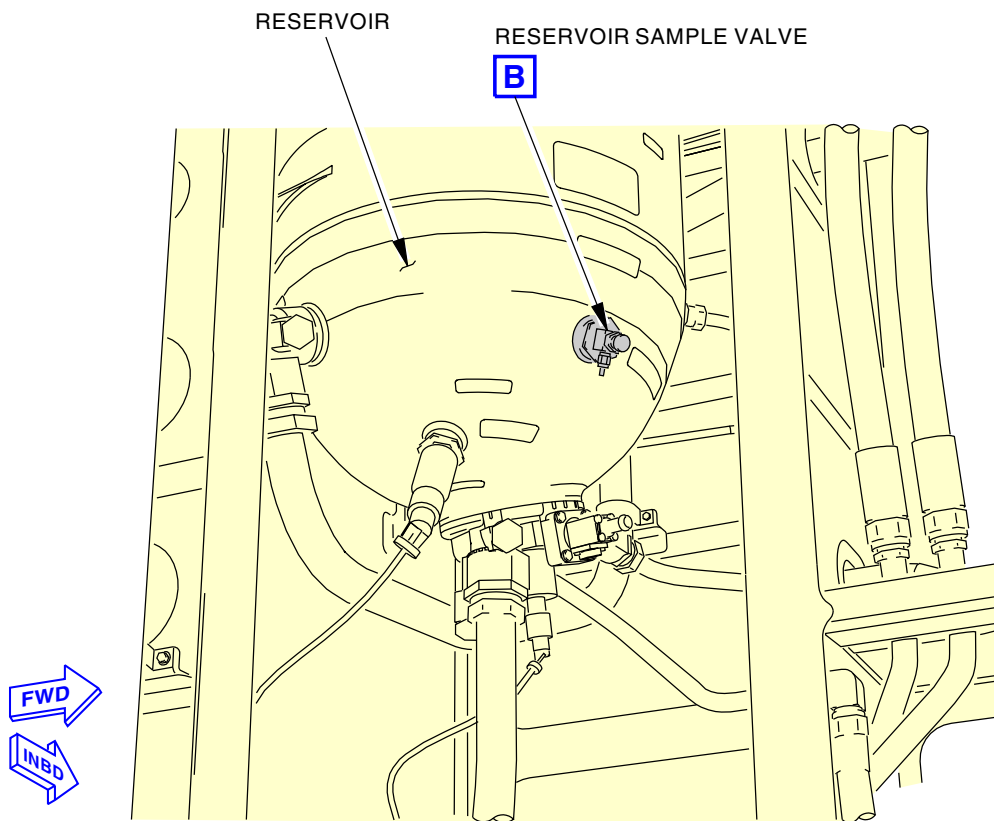
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RESERVOIR IN THE CENTER HYDRAULIC SYSTEM

D

E37258 S0006415739_V2

Reservoir Sample Valve
Figure 601/29-00-00-990-801 (Sheet 3 of 3)

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HYDRAULIC 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 hydraulic power system:
 - (1) MMEL 29-11-1 (DDG) Preparation - Engine Driven Pump (EDP) Depressurization Function Inoperative
 - (2) MMEL 29-11-1 (DDG) Restoration - Engine Driven Pump (EDP) Depressurization Function Inoperative
 - (3) MMEL 29-11-2 (DDG) Preparation - Center System Primary Alternating Current Motor Pumps (ACMP) Inoperative
 - (4) MMEL 29-11-2 (DDG) Restoration - Center System Primary Alternating Current Motor Pumps (ACMP) Inoperative
 - (5) MMEL 29-11-3 (DDG) Preparation - Center System Demand Air-Driven Pumps (ADP) Inoperative
 - (6) MMEL 29-11-3 (DDG) Restoration - Center System Demand Air-Driven Pumps (ADP) Inoperative
 - (7) MMEL 29-11-5 (DDG) Preparation - Hydraulic Interface Module (HYDIM) Cards Inoperative
 - (8) MMEL 29-11-5 (DDG) Restoration - Hydraulic Interface Module (HYDIM) Cards Inoperative
 - (9) MMEL 29-11-6 (DDG) Preparation - Center Hydraulic Isolation System Inoperative
 - (10) MMEL 29-11-6 (DDG) Restoration - Center Hydraulic Isolation System Inoperative
 - (11) MMEL 29-31-2 (DDG) Preparation - Pump Low Pressure Indications Inoperative
 - (12) MMEL 29-31-2 (DDG) Restoration - Pump Low Pressure Indications Inoperative
 - (13) MMEL 29-32-1 (DDG) Preparation - Pump Temperature Indications Inoperative
 - (14) MMEL 29-32-1 (DDG) Restoration - Pump Temperature Indications Inoperative
 - (15) MMEL 29-33-1 (DDG) Preparation - Hydraulic Fluid Quantity Indications (Flight Deck) Inoperative
 - (16) MMEL 29-33-1 (DDG) Restoration - Hydraulic Fluid Quantity Indications (Flight Deck) Inoperative

TASK 29-00-00-040-808

2. MMEL 29-11-1 (DDG) Preparation - Engine Driven Pump (EDP) Depressurization Function Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Engine Driven Pump (EDP) Depressurization Function Inoperative.
- (2) EICAS Status Messages
 - (a) None

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B. Location Zones

Zone	Area

211	Flight Compartment, Left

212	Flight Compartment, Right

C. Deactivate the Engine Driven Pump (EDP) Depressurization Function

SUBTASK 29-00-00-040-018

- (1) Put a DEPRESS FUNCTION INOP placard on the associated Hydraulic Panel (P5) PRIMARY L or R ENG switch.

————— END OF TASK —————

TASK 29-00-00-440-809

3. MMEL 29-11-1 (DDG) Restoration - Engine Driven Pump (EDP) Depressurization Function Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Engine Driven Pump (EDP) Depressurization Function Inoperative.
- (2) EICAS Status Messages
 - (a) None

B. Location Zones

Zone	Area

211	Flight Compartment, Left

212	Flight Compartment, Right

C. Reactivate the Engine Driven Pump Depressurization Function

SUBTASK 29-00-00-440-006

- (1) Remove the DEPRESS FUNCTION INOP placard from the associated Hydraulic Panel (P5) PRIMARY L or R ENG switch.

————— END OF TASK —————

TASK 29-00-00-040-801

4. MMEL 29-11-2 (DDG) Preparation - Center System Primary Alternating Current Motor Pumps (ACMP) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Center System Primary Alternating Current Motor Pumps (ACMP) Inoperative.
- (2) EICAS Status Messages
 - (a) HYD PUMP PRI C1
 - (b) HYD PUMP PRI C2

B. Location Zones

Zone	Area

211	Flight Compartment, Left

212	Flight Compartment, Right

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C. Deactivate the Inoperative Center System Alternating Current Motor Pump (ACMP)

SUBTASK 29-00-00-040-003

- (1) If the inoperative pump is the ACMP C1, do these steps:
 - (a) Set the pump switch, on the hydraulic control panel, to OFF:
 - 1) HYDRAULIC PRIMARY ELEC C1
 - (b) Open this circuit breaker and install safety lock:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	28	C29607	C1 HYD PUMP CTRL

NOTE: The open circuit breaker will cause the status message HYD ISLN VALVE to show on the EICAS display. The status message will clear when the circuit breaker is closed.

- (c) Disconnect connector D10008P on the P100 power panel-left.
 - 1) Cap and stow the electrical connector D10008P.
 - 2) Install a cap on the panel jack receptacle.
- (d) Remove the safety lock and close this circuit breaker:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	28	C29607	C1 HYD PUMP CTRL

SUBTASK 29-00-00-040-012

- (2) If the inoperative pump is the ACMP C2, do these steps:
 - (a) Set the pump switch, on the hydraulic control panel, to OFF:
 - 1) HYDRAULIC PRIMARY ELEC C2
 - (b) Open this circuit breaker and install safety lock:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	5	C29608	C2-HYD PUMP CTRL

————— END OF TASK —————

TASK 29-00-00-440-801

5. MMEL 29-11-2 (DDG) Restoration - Center System Primary Alternating Current Motor Pumps (ACMP) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Center System Primary Alternating Current Motor Pumps (ACMP) Inoperative.

B. Location Zones

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

C. Reactivate the Inoperative Center System Alternating Current Motor Pump (ACMP)

SUBTASK 29-00-00-440-002

- (1) If the inoperative pump is the ACMP C1, do this step:

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- (a) Remove the cap from the J8 electrical connector D10008P, on the P100 Power Panel.
- (b) Remove the cap from the receptacle on the P100 Power Panel.
- (c) Connect the J8 electrical connector D10008P to the P100 Power Panel.
- (d) Remove the safety lock and close this circuit breaker:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
M	28	C29607	C1 HYD PUMP CTRL

SUBTASK 29-00-00-440-003

- (2) If the inoperative pump is the ACMP C2, do this step:
 - (a) Remove the safety lock and close this circuit breaker:

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	5	C29608	C2-HYD PUMP CTRL

SUBTASK 29-00-00-810-001

- (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 29-00-00-810-007

- (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 chapter).
 - (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 29-00-00-810-008

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

————— END OF TASK —————

TASK 29-00-00-040-807

6. MMEL 29-11-3 (DDG) Preparation - Center System Demand Air-Driven Pumps (ADP) Inoperative

A. General

- (1) This procedure has maintenance task for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG). This task prepares the airplane for flight with an inoperative Center System Demand Air Driven Pump (ADP).
- (2) This task also prepares the airplane for flight with an inoperative ADP Auto Function.
- (3) EICAS Status Messages
 - (a) HYD PUMP DEM C1
 - (b) HYD PUMP DEM C2

B. References

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

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Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

C. Location Zones

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

D. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

E. Confirm the HYDRAULIC DEMAND AIR C1 and C2 selector positions (ON and OFF), at the Hydraulic Panel (P5), operate normally.

SUBTASK 29-00-00-860-032

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

SUBTASK 29-00-00-860-033

(2) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-00-00-710-003

(3) If the EICAS Status messages HYD PUMP DEM C1 and HYD PUMP DEM C2 are shown, do the following test for each ADP system separately:

- (a) Set the associated HYDRAULIC DEMAND AIR C1 or C2 selector to ON position.
 - 1) Confirm that the associated EICAS Status message HYD PUMP DEM C1 or HYD PUMP DEM C2 no longer shows to determine if the associated ADP is operative.
 - 2) Do these steps if the associated EICAS Status message HYD PUMP DEM C1 or HYD PUMP DEM C2 still shows:

NOTE: The associated ADP is inoperative.

- a) Advise operations that the associated ADP is inoperative.
 - b) Do the procedure (see below) to confirm that the inoperative ADP is not running when selected OFF..
 - c) Do the procedure (see below) to confirm that the remaining ADP heater operates normally.
- (b) Set the associated HYDRAULIC DEMAND AIR C1 or C2 selector to OFF position at the Hydraulic Panel (P5).
 - 1) Confirm that the associated EICAS Status message HYD PUMP DEM C1 or HYD PUMP DEM C2 is now shown.
 - (c) Advise dispatch the associated ADP Auto function is inoperative.
 - (d) Attach an AUTO INOP tag to the associated HYDRAULIC DEMAND AIR C1 or C2 selector, at the Hydraulic Panel (P5).

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F. Confirm the inoperative ADP is not running when selected OFF.

SUBTASK 29-00-00-860-034

- (1) Make sure these selectors/push-button switches for the four center system hydraulic pumps are selected OFF, at the Hydraulic Panel (P5):
 - (a) HYDRAULIC DEMAND AIR C1 selector
 - (b) HYDRAULIC DEMAND AIR C2 selector
 - (c) HYDRAULIC PRIMARY ELEC C1 push-button switch
 - (d) HYDRAULIC PRIMARY ELEC C2 push-button switch

SUBTASK 29-00-00-860-035

- (2) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

NOTE: It is not necessary to depressurize the reservoir.

SUBTASK 29-00-00-860-036

- (3) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-00-00-710-004

- (4) Do these steps to confirm the inoperative ADP is not running when selected OFF:
 - (a) To show the Hydraulic maintenance page on a multi-function display, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - 1) Confirm that the DEMAND PUMP PRESS shows less than 100 psig and DEMAND PUMP RUN=NO for the inoperative ADP.
 - 2) If the inoperative ADP is not running, do the procedure (see below) to confirm the remaining ADP heater operates normally.
 - (b) If the inoperative ADP is running, do these steps to disconnect the inoperative ADP so it does not run:
 - 1) If the C1 ADP is inoperative,
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>
D	4	C29609	C HYD AIR PUMP 1

- 2) If the C2 ADP is inoperative,
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>
D	5	C29606	HYD AIR PUMP 2

- 3) Get access to the right/left systems card files (P84/P85) in the main equipment center.
 - a) If the C1 ADP is inoperative, set the power switch on front of right systems card file (P84) for the HYDIM CR to OFF.
 - b) If the C2 ADP is inoperative, set the power switch on front of left systems card file (P85) for the HYDIM CL to OFF.

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MAKE SURE THAT THE ADP ACCESS DOOR IS FULLY OPEN OR FULLY CLOSED WHEN YOU MOVE THE TRAILING EDGE FLAPS. THE FLAPS CAN HIT THE DOOR IF IT IS NOT FULLY OPEN OR CLOSED. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- 4) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.
- 5) To get access to the Logic Speed Control Unit (LSCU) for the inoperative ADP, open this access panel:

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

197JL	Air Driven Pump (ADP) Access Door

- a) If the C1 ADP is inoperative, disconnect, cap and stow the electrical connector (DM29306A) from LSCU, also cap the LSCU receptacle.
- b) If the C2 ADP is inoperative, disconnect, cap and stow the electrical connector (DM29321A) from LSCU, also cap the LSCU receptacle.
- 6) Get access to the right/left systems card files (P84/P85) in the main equipment center.
 - a) If the C1 ADP is inoperative, set the power switch on front of right systems card file (P84) for the HYDIM CR to ON.
 - b) If the C2 ADP is inoperative, set the power switch on front of left systems card file (P85) for the HYDIM CL to ON.
- 7) If the C1 ADP is inoperative,
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>
D	4	C29609	C HYD AIR PUMP 1

- 8) If the C2 ADP is inoperative,
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>
D	5	C29606	HYD AIR PUMP 2

- 9) Confirm that the inoperative ADP is not running:
 - a) To show the Hydraulic maintenance page on a multi-function display, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - b) Confirm that the DEMAND PUMP PRESS shows less than 100 psig and DEMAND PUMP RUN=NO for the inoperative ADP.
 - c) If the inoperative ADP continues to run, do not dispatch the airplane.
- 10) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door
- 11) Remove the DO-NOT-OPERATE tag on the flap lever on the P10 panel.



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G. Confirm the remaining ADP heater operates normally.

NOTE: The EICAS status message HYD PUMP DEM C1 or HYD PUMP DEM C2 would show if the ADP heater was inoperative. An ADP heater failure can result in ADP icing condition which can prevent the associated ADP from operating in AUTO. The ADP heater faults are linked to the ADP Auto function item. The EICAS status message HYD PUMP DEM C1 or HYD PUMP DEM C1 is inhibited (not displayed) if the ADP heater fault is set (overcurrent or control power interface faults) and the associated ADP is selected ON and the pump is pressurized.

SUBTASK 29-00-00-210-007

- (1) Confirm that the EICAS status message HYD PUMP DEM C1 or HYD PUMP DEM C2 is not displayed for the associated remaining ADP heater.

SUBTASK 29-00-00-890-001

- (2) Advise operations the status of the remaining ADP heater.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-00-00-860-039

- (1) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-00-00-860-040

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

————— END OF TASK —————

TASK 29-00-00-440-802

7. MMEL 29-11-3 (DDG) Restoration - Center System Demand Air-Driven Pumps (ADP) Inoperative

A. General

- (1) This procedure has a maintenance task for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG).
- (2) This task puts the airplane back to its usual condition after operation with the Center System Demand Air-Driven Pumps (ADP) Inoperative.

B. Location Zones

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

C. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. Reactivate the Inoperative Center System Demand Air-Driven Pump (ADP)

SUBTASK 29-00-00-420-004

- (1) If the air-driven pump (ADP) logic speed control unit (LSCU) is disconnected, do these steps to connect the Logic Speed Control Unit (LSCU):
 - (a) If the inoperative pump is the ADP C1, do this step:
Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1

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- (b) If the inoperative pump is the ADP C2, do this step:

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>
D	5	C29606	HYD AIR PUMP 2

- (c) Get access to the right/left systems card files (P84/P85) in the main equipment center.
- 1) If the inoperative pump is the ADP C1, set the power switch on front of right systems card file (P84) for the HYDIM CR to OFF.
 - 2) If the inoperative pump is the ADP C2, set the power switch on front of left systems card file (P85) for the HYDIM CL to OFF.



CAUTION

MAKE SURE THAT THE ADP ACCESS DOOR IS FULLY OPEN OR FULLY CLOSED WHEN YOU MOVE THE TRAILING EDGE FLAPS. THE FLAPS CAN HIT THE DOOR IF IT IS NOT FULLY OPEN OR CLOSED. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- 3) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.
- (d) To get access to the Logic Speed Control Unit (LSCU), open this access panel:

Number Name/Location

197JL Air Driven Pump (ADP) Access Door

- 1) If the inoperative pump is the ADP C1, do these steps:
 - a) Remove the cap from the electrical connector (DM29306A).
 - b) Remove the cap from the LSCU receptacle.
 - c) Connect the electrical connector (DM29306A) to the LSCU.
 - 2) If the inoperative pump is the ADP C2, do these steps:
 - a) Remove the cap from the electrical connector (DM29321A).
 - b) Remove the cap from the LSCU receptacle.
 - c) Connect the electrical connector (DM29321A) to the LSCU.
- (e) Get access to the right/left systems card files (P84/P85) in the main equipment center.
- 1) If the inoperative pump is the ADP C1, set the power switch on front of right systems card file (P84) for the HYDIM CR to ON.
 - 2) If the inoperative pump is the ADP C2, set the power switch on front of left systems card file (P85) for the HYDIM CL to ON.
- (f) If the inoperative pump is the ADP C1, do this step:
- 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>
D	4	C29609	C HYD AIR PUMP 1

- (g) If the inoperative pump is the ADP C2, do this step:

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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>
D	5	C29606	HYD AIR PUMP 2

- (h) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

- (i) Remove the DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-00-00-810-002

- (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 29-00-00-810-009

- (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 chapter).
(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 29-00-00-810-010

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

————— **END OF TASK** —————

TASK 29-00-00-040-803

8. MMEEL 29-11-5 (DDG) Preparation - Hydraulic Interface Module (HYDIM) Cards Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with one Hydraulic Interface Module (HYDIM) Card Inoperative.
(2) EICAS Status Messages
(a) HYDIM CARD HCR
(b) HYDIM CARD HCL
(c) HYDIM CARD HL
(d) HYDIM CARD HR

B. References

<u>Reference</u>	<u>Title</u>
29-11-50-000-801	Hydraulic Interface Module (HYDIM) Cards Removal (P/B 401)
29-11-50-400-801	Hydraulic Interface Module (HYDIM) Cards Installation (P/B 401)

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

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D. Move the Defective HYDIM Card to the HCR Position

SUBTASK 29-00-00-900-001

- (1) Do these steps to change the positions of the defective HYDIM card and the card at the HCR position.
 - (a) Remove the HYDIM card from the HCR card position, A4, in the right systems card file, P84. To remove it, do this task: Hydraulic Interface Module (HYDIM) Cards Removal, TASK 29-11-50-000-801.
 - (b) Remove the HYDIM card which is defective.
 - (c) Install the serviceable card, from the HCR card position, in the position of the defective card.
 - (d) Install the defective card in the HCR card position, A4, in the right systems card file. To install it, do this task: Hydraulic Interface Module (HYDIM) Cards Installation, TASK 29-11-50-400-801.

NOTE: The power switch for HYDIM card HCR should remain off after installing the defective HYDIM card in the HCR position.

NOTE: Following the MAT test of the HYDIM cards, only the HYDIM CARD HCR status message should be displayed.

————— END OF TASK —————

TASK 29-00-00-440-803

9. MMEL 29-11-5 (DDG) Restoration - Hydraulic Interface Module (HYDIM) Cards Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Hydraulic Interface Module (HYDIM) Cards Inoperative.

B. References

Reference	Title
29-11-50-000-801	Hydraulic Interface Module (HYDIM) Cards Removal (P/B 401)
29-11-50-400-801	Hydraulic Interface Module (HYDIM) Cards 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. Replace the Defective HYDIM Card

SUBTASK 29-00-00-900-002

- (1) Replace the defective HYDIM card in the HCR card position, A4, in the right systems card file, P84,

These are the tasks:

- Hydraulic Interface Module (HYDIM) Cards Removal, TASK 29-11-50-000-801
- Hydraulic Interface Module (HYDIM) Cards Installation, TASK 29-11-50-400-801

————— END OF TASK —————

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TASK 29-00-00-040-804

10. MMEL 29-11-6 (DDG) Preparation - Center Hydraulic Isolation System Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Center Hydraulic Isolation System Inoperative.
- (2) EICAS Status Messages
 - (a) HYD ISLN VALVE

B. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Deactivate the Isolation Valves for the Center Hydraulic Isolation System in the Open Position

SUBTASK 29-00-00-480-003



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-00-00-480-004



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-00-00-860-005

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

Left Power Management Panel, P110

Row	Col	Number	Name
M	28	C29607	C1 HYD PUMP CTRL

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SUBTASK 29-00-00-860-006

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	10	C29610	NOSE GEAR ISLN VALVE

SUBTASK 29-00-00-040-010

- (5) Do these steps for the reserve isolation valve (Figure 901):
- (a) Disconnect the electrical connector DV29302 from the valve.
 - (b) Install a cap on the electrical connector, on the wire bundle, to prevent contamination.
 - (c) Install a cap on the electrical receptacle, on the valve, to prevent contamination.
 - (d) Attach the wire bundle, for the valve, to the adjacent wire bundle to hold it away from the valve.
 - (e) Move the valve position indicator, on the valve, to put the valve in the open position.
 - (f) Install a lockwire to hold the valve position indicator in the open position.

SUBTASK 29-00-00-040-019

- (6) Do these steps for the nose gear isolation valve (Figure 901):
- (a) Disconnect the electrical connector DV29303 from the valve.
 - (b) Install a cap on the electrical connector, on the wire bundle, to prevent contamination.
 - (c) Install a cap on the electrical receptacle, on the valve, to prevent contamination.
 - (d) Attach the wire bundle, for the valve, to the adjacent wire bundle to hold it away from the valve.
 - (e) Move the valve position indicator, on the valve, to put the valve in the open position.
 - (f) Install a lockwire to hold the valve position indicator in the open position.

SUBTASK 29-00-00-860-007

- (7) 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>
M	28	C29607	C1 HYD PUMP CTRL

SUBTASK 29-00-00-080-002



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

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SUBTASK 29-00-00-080-003



WARNING

DO NOT REMOVE THE DOWNLOCK PINS UNLESS ALL MAINTENANCE AND SERVICING OF THE AIRPLANE IS COMPLETE. THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT IF THE DOWNLOCK PINS ARE NOT INSTALLED.

- (9) If all maintenance on the airplane is finished, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

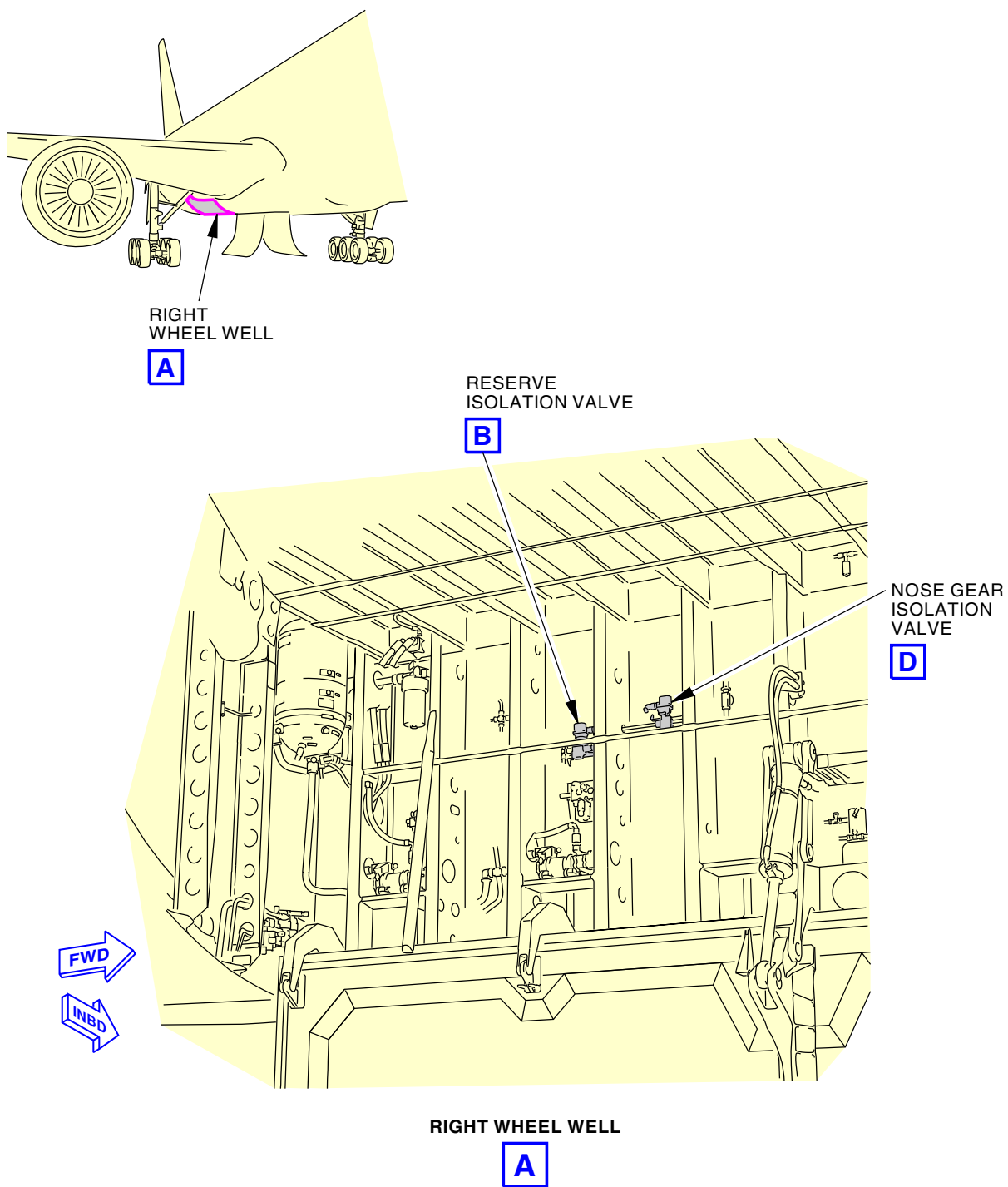
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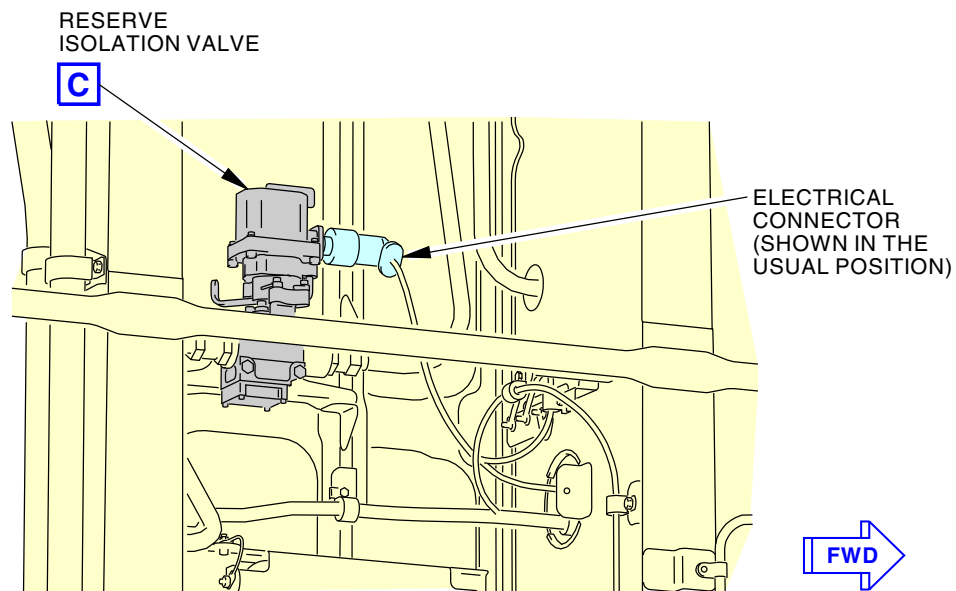
**Center Hydraulic Isolation System Valves Deactivation
Figure 901/29-00-00-990-802 (Sheet 1 of 4)**

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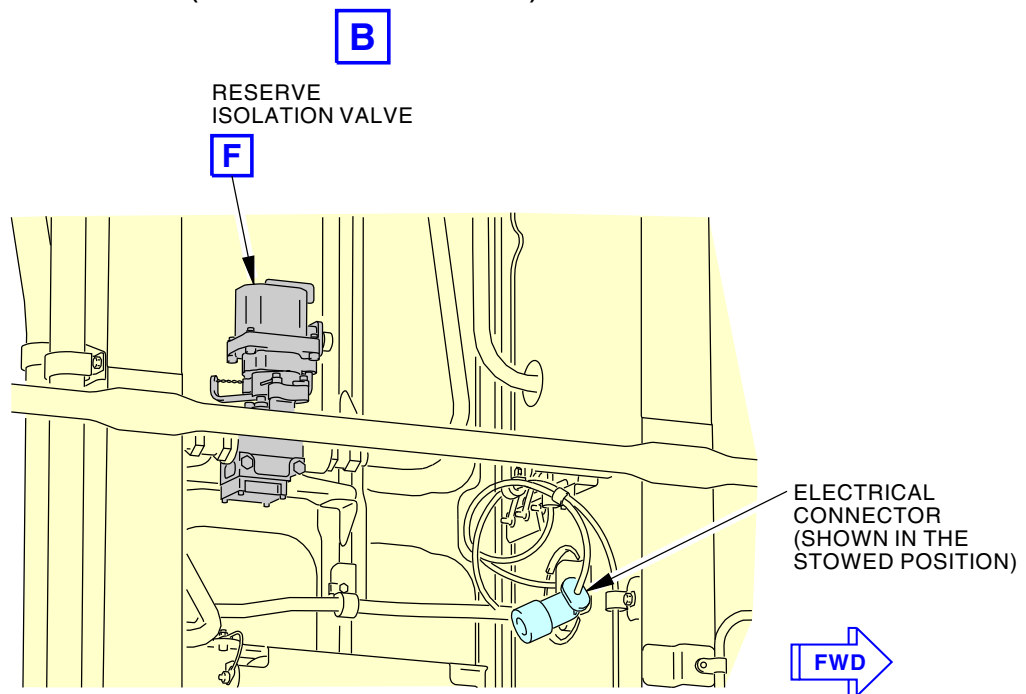
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**RESERVE ISOLATION VALVE
(ACTIVATED CONFIGURATION)**



**RESERVE ISOLATION VALVE
(DEACTIVATED CONFIGURATION)**

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**Center Hydraulic Isolation System Valves Deactivation
Figure 901/29-00-00-990-802 (Sheet 2 of 4)**

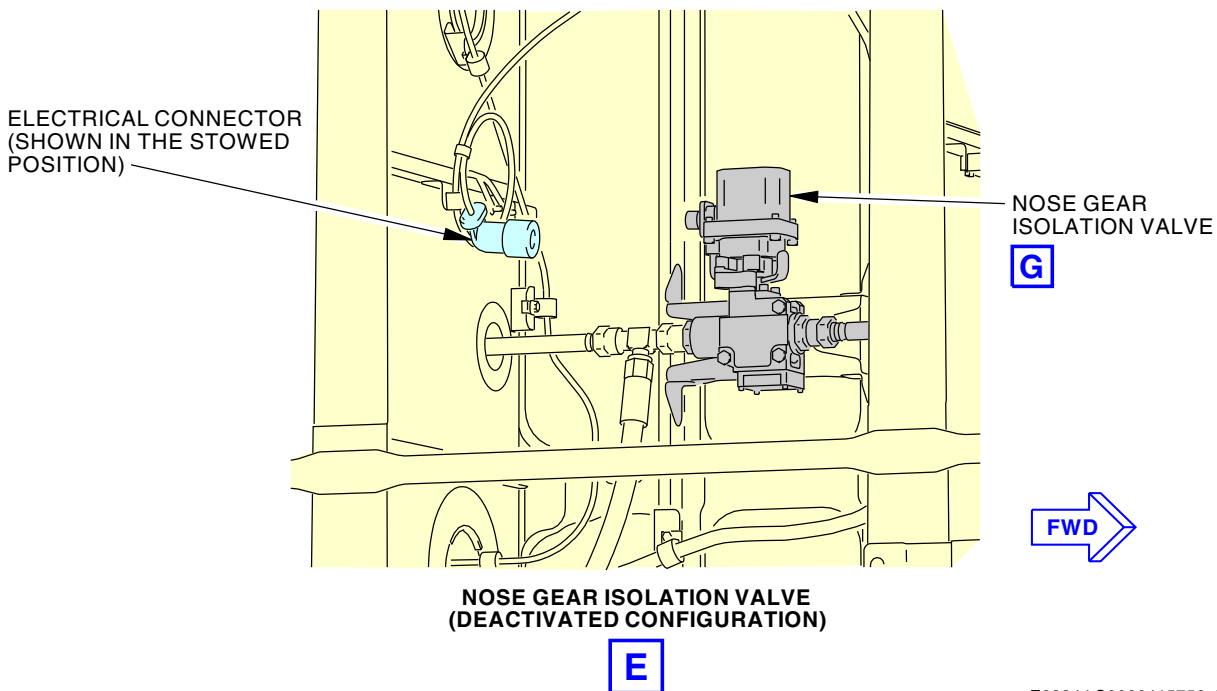
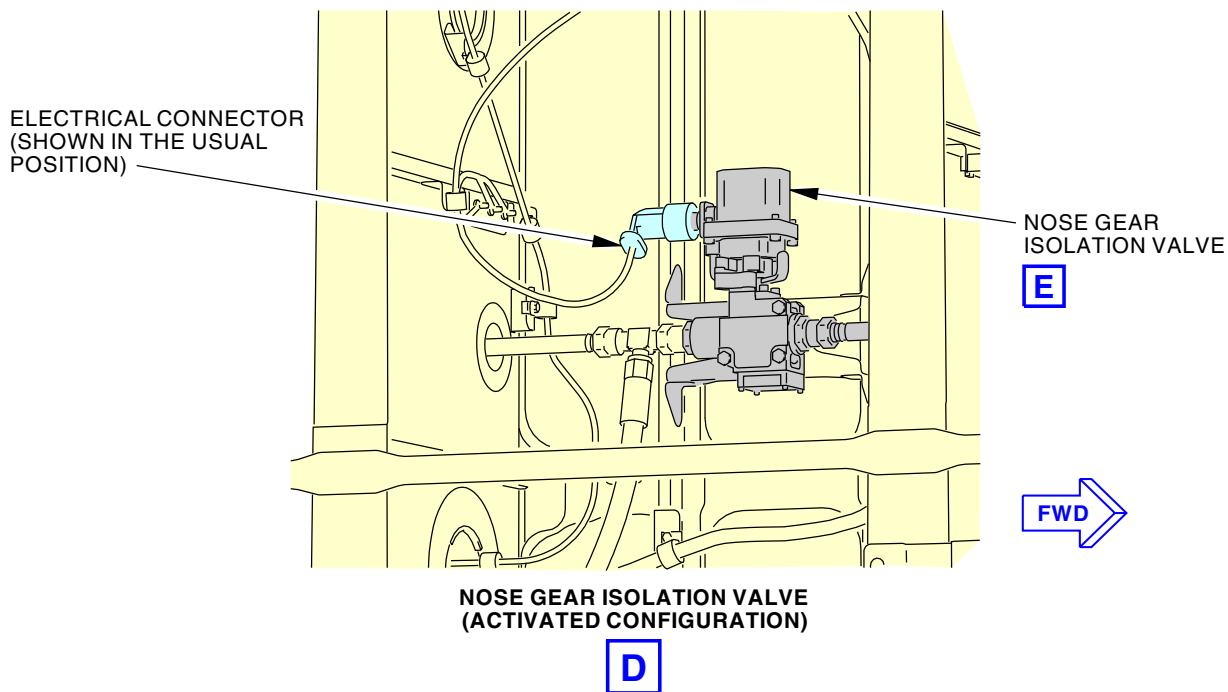
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**Center Hydraulic Isolation System Valves Deactivation
Figure 901/29-00-00-990-802 (Sheet 3 of 4)**

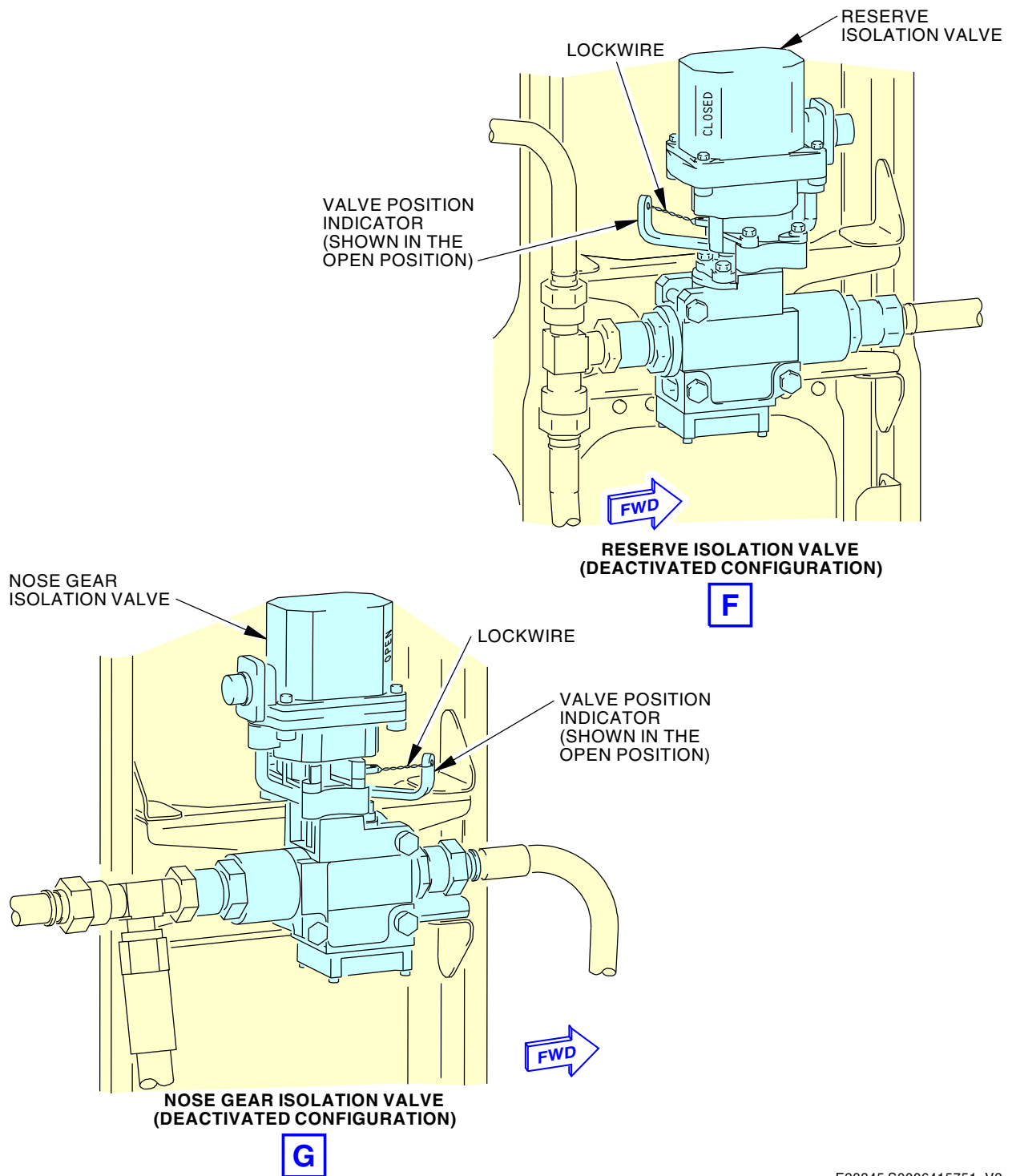
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**Center Hydraulic Isolation System Valves Deactivation
Figure 901/29-00-00-990-802 (Sheet 4 of 4)**

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TASK 29-00-00-440-804

11. **MMEL 29-11-6 (DDG) Restoration - Center Hydraulic Isolation System Inoperative**

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Center Hydraulic Isolation System Inoperative.

B. References

Reference	Title
29-11-00-710-805	Center Hydraulic Isolation System - Operational Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Reactivate the Isolation Valves for the Center Hydraulic Isolation Valves

SUBTASK 29-00-00-480-005



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-00-00-480-006



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-00-00-860-008

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

Left Power Management Panel, P110

Row	Col	Number	Name
M	28	C29607	C1 HYD PUMP CTRL

SUBTASK 29-00-00-440-004

- (4) Do these steps for the reserve isolation valve (Figure 901):
- Remove the lockwire from the valve position indicator on the valve.
 - Remove the wire bundle, for the valve, from the adjacent wire bundle to which it is attached for storage.
 - Remove the cap from the electrical connector DV29302 on the wire bundle.

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- (d) Remove the cap from the electrical receptacle on the valve.
- (e) Connect the electrical connector DV29302 to the valve.

SUBTASK 29-00-00-440-007

- (5) Do these steps for the nose gear isolation valve (Figure 901):
 - (a) Remove the lockwire from the valve position indicator on the valve.
 - (b) Remove the wire bundle, for the valve, from the adjacent wire bundle to which it is attached for storage.
 - (c) Remove the cap from the electrical connector DV29303 on the wire bundle.
 - (d) Remove the cap from the electrical receptacle on the valve.
 - (e) Connect the electrical connector DV29303 to the valve.

SUBTASK 29-00-00-860-009

- (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>
M	28	C29607	C1 HYD PUMP CTRL

SUBTASK 29-00-00-860-010

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

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	10	C29610	NOSE GEAR ISLN VALVE

SUBTASK 29-00-00-710-001

- (8) Do this task: Center Hydraulic Isolation System - Operational Test, TASK 29-11-00-710-805.

SUBTASK 29-00-00-810-003

- (9) 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 29-00-00-810-011

- (10) 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 chapter).
 - (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 29-00-00-810-012

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

SUBTASK 29-00-00-080-004

 WARNING	OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (12) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

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SUBTASK 29-00-00-080-005



WARNING

DO NOT REMOVE THE DOWNLOCK PINS UNLESS ALL MAINTENANCE AND SERVICING OF THE AIRPLANE IS COMPLETE. THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT IF THE DOWNLOCK PINS ARE NOT INSTALLED.

- (13) If all maintenance on the airplane is finished, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

————— END OF TASK —————

TASK 29-00-00-440-805

12. MMEL 29-31-2 (DDG) Preparation - Pump Low Pressure Indications Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Pump Low Pressure Indications Inoperative.
- (2) EICAS Status Messages
- (a) HYD PRESS IND DEM C1
 - (b) HYD PRESS IND DEM C2
 - (c) HYD PRESS IND DEM L
 - (d) HYD PRESS IND DEM R
 - (e) HYD PRESS IND PRI C1
 - (f) HYD PRESS IND PRI C2
 - (g) HYD PRESS IND PRI L
 - (h) HYD PRESS IND PRI R

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-41-000-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-42-000-801	Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-43-000-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-31-02-000-801	Left and Right System Alternating Current Motor Pump (ACMP) Pressure Transducer Removal (P/B 401)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
71-00-00-800-805-H01	Engine Automatic Start (P/B 201)
71-00-00-800-836-H00	Dry Motor (P/B 201)

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Reference	Title
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
211	Flight Compartment, Left
212	Flight Compartment, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

E. Make Sure that the Related Pump Operates Satisfactorily

SUBTASK 29-00-00-860-011

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

SUBTASK 29-00-00-860-012

(2) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-00-00-860-013

(3) If you will operate an air-driven pump (ADP), do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-00-00-860-014

(4) If you will operate an engine-driven pump (EDP), do one of these alternative tasks:

(a) Do this task: Dry Motor, TASK 71-00-00-800-836-H00.

(b) Do this task: Engine Automatic Start, TASK 71-00-00-800-805-H01.

SUBTASK 29-00-00-860-015

(5) Do these steps for the applicable pump:



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

(a) Set only the applicable pump switch, on the hydraulic control panel, to ON:

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- 1) HYDRAULIC PRIMARY L ENG
- 2) HYDRAULIC PRIMARY R ENG
- 3) HYDRAULIC PRIMARY ELEC C1
- 4) HYDRAULIC PRIMARY ELEC C2
- 5) HYDRAULIC DEMAND L ELEC
- 6) HYDRAULIC DEMAND R ELEC
- 7) HYDRAULIC DEMAND AIR C1
- 8) HYDRAULIC DEMAND AIR C2

SUBTASK 29-00-00-210-001

- (6) If you operate an alternating current motor pump (ACMP), do this step:
- (a) Make sure the HYDRAULIC SYSTEM PRESS (L, C, or R) indication on the EICAS display, for the applicable hydraulic system, shows 2700 to 3200 psi. (18600 to 22100 KPa)

SUBTASK 29-00-00-210-004

- (7) If you operate an engine-driven pump (EDP) or an air-driven pump (ADP), do this step:
- (a) Make sure the HYDRAULIC SYSTEM PRESS (L, C, or R) indication on the EICAS display, for the applicable hydraulic system, shows 2900 to 3200 psi (20000 to 22100 KPa).

SUBTASK 29-00-00-750-001

- (8) If the associated pump status message shows instead of the pump pressure indication status message, then do these steps:
- (a) If the associated system pressure remained normal in the previous step, then do a check for these pressure readings:
 - 1) Intermittent readings or a blank pump pressure reading.
NOTE: If the pump pressure is less than 0 psi or greater than 4000 psi (27600 KPa), then the pump pressure indication status message will show and the pump pressure readout on the EICAS hydraulic maintenance page will be blanked.
 - 2) For EDP or ADP: 0 to 2800 psi (0 to 19300 KPa), or 3250 to 4000 psi (22400 to 27600 KPa).
 - 3) For ACMP: 0 to 2600 psi (0 to 17900 KPa), or 3250 to 4000 psi (22400 to 27600 KPa)
 - (b) If the pump pressure does not indicate the transducer is malfunctioning and the pump status message shows, then do not dispatch the airplane using this MMEL item.
 - (c) If the test shows that the transducer is malfunctioning, then do the steps to de-activate the transducer.
NOTE: Before you de-activate the transducer, do the steps to turn off the hydraulic power, shut down the engine and to depressurize the pneumatic system. These steps follow.

SUBTASK 29-00-00-860-016

- (9) Set the applicable pump switch, on the hydraulic control panel, to OFF.

SUBTASK 29-00-00-860-017

- (10) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

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SUBTASK 29-00-00-210-002

- (11) Make sure the HYDRAULIC SYSTEM PRESS (L, C, or R) indication on the EICAS display, for the applicable hydraulic system, shows 0 to 200 psi (0 to 1380 KPa).

SUBTASK 29-00-00-860-018

- (12) If you operated an engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

SUBTASK 29-00-00-860-019

- (13) If you supplied pneumatic power, do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

F. De-activate The Pump Pressure Indication Transducer

SUBTASK 29-00-00-040-013

- (1) For a primary left or right, or demand left or right pump pressure transducer, do these steps to deactivate the transducer:

- (a) Deactivate the associated engine thrust reverser for ground maintenance. To do this, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (b) Open the applicable aft strut fairing door:

Primary Left (EDP), open this access panel:

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

434CL	Left Forward Access Door, Left Strut Aft Fairing

Primary Right (EDP), open this access panel:

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

444CL	Left Forward Access Door, Right Strut Aft Fairing

Demand Left (ACMP) , open this access panel:

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

434CR	Right Forward Access Door, Left Strut Aft Fairing

Demand Right (ACMP), open this access panel:

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

444CR	Right Forward Access Door, Right Strut Aft Fairing

- (c) Locate the electrical connector for the pump pressure transducer.

NOTE: The transducers are located in the associated engine aft strut fairing behind the strut fairing door.

- (d) Disconnect, cap, and stow the connector and wiring for the transducer. Use these references to identify the transducer, connector, and wiring:

- 1) Primary Left (EDP) - DM29108 - (TASK 29-11-42-000-801)
- 2) Primary Right (EDP) - DM29208 - (TASK 29-11-42-000-801)
- 3) Demand Left (EDP) - DM29109 - (TASK 29-31-02-000-801)
- 4) Demand Right (EDP) - DM29209 - (TASK 29-31-02-000-801)

- (e) Close the applicable aft strut fairing door:

Primary Left (EDP), close this access panel:

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

434CL	Left Forward Access Door, Left Strut Aft Fairing

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Primary Right (EDP), close this access panel:

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

444CL	Left Forward Access Door, Right Strut Aft Fairing

Demand Left (ACMP), close this access panel:

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

434CR	Right Forward Access Door, Left Strut Aft Fairing

Demand Right (ACMP) , close this access panel:

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

444CR	Right Forward Access Door, Right Strut Aft Fairing

- (f) Re-activate the associated engine thrust reverser after ground maintenance. To do this, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-00-00-040-014

- (2) For a primary C1 or C2 pump pressure transducer, do these steps to deactivate the transducer:
- (a) Make sure that the landing gear downlock pins are installed. To do this, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.
 - (b) Install the landing gear door safety pins. To do this, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.
 - (c) Locate the electrical connector for the pump pressure transducer.
NOTE: The transducers are located on the inboard wall of the right wheel well.
 - (d) Disconnect, cap, and stow the connector and wiring for the transducer. Use these references to identify the transducer, connector, and wiring:
 - 1) Primary C1 (ACMP) - DM29312 - (TASK 29-11-41-000-801)
 - 2) Primary C2 (ACMP) - DM29317 - (TASK 29-11-41-000-801)
 - (e) If you are finished with maintenance in the landing gear area, then remove the landing gear door safety pins. To do this, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-00-00-040-015

- (3) For a demand C1 or C2 pump pressure transducer, do these steps to deactivate the transducer:
- (a) Open this access door:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle
 - (b) Locate the electrical connector for the pump pressure transducer.
NOTE: The transducers are located in the wing to body fairing on the aft left side behind the door.
 - (c) Disconnect, cap, and stow the connector and wiring for the transducer. Use these references to identify the transducer, connector, and wiring:
 - 1) Demand C1 (ADP) - DM29318 - (TASK 29-11-43-000-801)
 - 2) Demand C2 (ADP) - DM29316 - (TASK 29-11-43-000-801)

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- (d) Close this access door:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

- (e) If you are finished with maintenance in the landing gear area, then remove the landing gear door safety pins. To do this, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-00-00-860-029

- (4) Make sure that all operative HYDIM card power switches are ON.

NOTE: The associated pump EICAS alerting and status messages will continue to show, even though the pump is operating normally. Additionally, the pump pressure readout on the EICAS hydraulic maintenance page will be blank and pump pressure indications status message will show after you disconnect the transducer.

————— **END OF TASK** —————

TASK 29-00-00-440-806

13. M MEL 29-31-2 (DDG) Restoration - Pump Low Pressure Indications Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Pump Low Pressure Indications Inoperative.

B. Location Zones

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

C. Correct the Inoperative Pump Low Pressure Indications

SUBTASK 29-00-00-810-004

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

SUBTASK 29-00-00-810-013

- (2) Go to the Fault Code Index in the FIM and find the fault code (the first two digits of the fault code are the FIM chapter).
(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 29-00-00-810-014

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

————— **END OF TASK** —————

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TASK 29-00-00-040-805

14. MMEL 29-32-1 (DDG) Preparation - Pump Temperature Indications Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Pump Temperature Indications Inoperative.
- (2) EICAS Status Messages
 - (a) HYD TEMP IND DEM C1
 - (b) HYD TEMP IND DEM C2
 - (c) HYD TEMP IND DEM L
 - (d) HYD TEMP IND DEM R
 - (e) HYD TEMP IND PRI C1
 - (f) HYD TEMP IND PRI C2
 - (g) HYD TEMP IND PRI L
 - (h) HYD TEMP IND PRI R

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
71-00-00-800-805-H01	Engine Automatic Start (P/B 201)
71-00-00-800-836-H00	Dry Motor (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

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

D. Make Sure that the Related Hydraulic Pump Operates Satisfactorily

SUBTASK 29-00-00-860-020

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

SUBTASK 29-00-00-860-021

- (2) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-00-00-860-022

- (3) If you will operate an air-driven pump (ADP), do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-00-00-860-023

- (4) If you will operate an engine-driven pump (EDP), do one of these alternative tasks:
 - (a) Do this task: Dry Motor, TASK 71-00-00-800-836-H00.
 - (b) Do this task: Engine Automatic Start, TASK 71-00-00-800-805-H01.

SUBTASK 29-00-00-860-024

- (5) Do these steps for the applicable pump:

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

- (a) Set only the applicable pump switch, on the hydraulic control panel, to ON:
- 1) HYDRAULIC PRIMARY L ENG
 - 2) HYDRAULIC PRIMARY R ENG
 - 3) HYDRAULIC PRIMARY ELEC C1
 - 4) HYDRAULIC PRIMARY ELEC C2
 - 5) HYDRAULIC DEMAND L ELEC
 - 6) HYDRAULIC DEMAND R ELEC
 - 7) HYDRAULIC DEMAND AIR C1
 - 8) HYDRAULIC DEMAND AIR C2

SUBTASK 29-00-00-210-005

- (6) If you operate an alternating current motor pump (ACMP), do this step:
- (a) Make sure the applicable HYDRAULIC PRIMARY PRESS or the HYDRAULIC DEMAND PUMP PRESS indication on the EICAS display, for the applicable hydraulic system, shows 2700 to 3200 psi.

SUBTASK 29-00-00-210-006

- (7) If you operate an engine-driven pump (EDP) or an air-driven pump (ADP), do this step:
- (a) Make sure the applicable HYDRAULIC PRIMARY PRESS or the HYDRAULIC DEMAND PUMP PRESS indication on the EICAS display, for the applicable hydraulic system, shows 2900 to 3200 psi.

SUBTASK 29-00-00-860-025

- (8) Set the applicable pump switch, on the hydraulic control panel, to the desired setting (ON, AUTO, OFF).

SUBTASK 29-00-00-940-001

- (9) If further maintenance makes it necessary to turn the pump OFF and depressurize the hydraulic system, do these tasks:
- (a) Set the applicable pump switch, on the hydraulic control panel, to OFF.
 - (b) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.
 - (c) Make sure the applicable HYDRAULIC PRIMARY PRESS or the HYDRAULIC DEMAND PUMP PRESS indication, on the EICAS display shows 0 to 200 psi.
 - (d) If you supplied pneumatic power, do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801

SUBTASK 29-00-00-860-027

- (10) If you operated an engine, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

———— **END OF TASK** ————

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TASK 29-00-00-440-807

15. MMEL 29-32-1 (DDG) Restoration - Pump Temperature Indications Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Pump Temperature Indications Inoperative.

B. Location Zones

Zone	Area

211	Flight Compartment, Left
212	Flight Compartment, Right

C. Correct the Inoperative Pump Temperature Indications

SUBTASK 29-00-00-810-005

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

SUBTASK 29-00-00-810-015

- (2) Go to the Fault Code Index in the FIM and find the fault code (the first two digits of the fault code are the FIM chapter).
 - (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 29-00-00-810-016

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

————— END OF TASK —————

TASK 29-00-00-040-806

16. MMEL 29-33-1 (DDG) Preparation - Hydraulic Fluid Quantity Indications Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Hydraulic Fluid Quantity Indications Inoperative.

B. References

Reference	Title

12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)

C. Location Zones

Zone	Area

211	Flight Compartment, Left
212	Flight Compartment, Right

D. Make Sure that the System Reservoir Quantity Level is Satisfactory

SUBTASK 29-00-00-610-002

- (1) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

NOTE: If the reservoir quantity gage, at the ground service bay operates, do only the steps necessary to do a fluid level check at the ground service bay. If the reservoir quantity gage does not operate, do only the steps necessary to do a fluid level check at the hydraulic reservoir.

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SUBTASK 29-00-00-040-011

- (2) If the hydraulic quantity indicating system for the center system does not operate, do this task:
MMEL 29-11-6 (DDG) Preparation - Center Hydraulic Isolation System Inoperative,
TASK 29-00-00-040-804.

————— END OF TASK —————

TASK 29-00-00-440-808

17. MMEL 29-33-1 (DDG) Restoration - Hydraulic Fluid Quantity Indications Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Hydraulic Fluid Quantity Indications Inoperative.

B. Location Zones

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

C. Correct the Inoperative Hydraulic Fluid Quantity Indications

SUBTASK 29-00-00-440-005

- (1) If the quantity indicating system for the center hydraulic system did not operate, do this task:
MMEL 29-11-6 (DDG) Restoration - Center Hydraulic Isolation System Inoperative,
TASK 29-00-00-440-804.

SUBTASK 29-00-00-810-006

- (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 29-00-00-810-017

- (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 chapter).
 - (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 29-00-00-810-018

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

————— END OF TASK —————

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MAIN (LEFT, RIGHT, AND CENTER) HYDRAULIC SYSTEMS - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Main Hydraulic System Pressurization
 - (a) This task gives the alternative tasks you can use to pressurize the main hydraulic system.
 - (2) Main hydraulic system Pressurization with a portable hydraulic service cart
 - (3) Main hydraulic system pressurization with an alternating current motor pump (ACMP)
 - (4) Left or right hydraulic system pressurization with an engine-driven pump (EDP)
 - (5) Center hydraulic system pressurization with an air-driven pump (ADP)
 - (6) Main hydraulic systems reservoirs pressurization with an external air source
 - (7) Main hydraulic system and reservoir depressurization
 - (a) This task stops the hydraulic pumps or the portable hydraulic cart and removes the pressure which stays in the hydraulic lines. This procedure also removes the air pressure from the hydraulic reservoir.
 - (8) Main hydraulic system air bleed
 - (a) This task removes excess air in the hydraulic system when large portions of the hydraulic system have been opened.
 - (9) Main hydraulic system power removal
 - (a) This task stops the hydraulic pumps or the portable hydraulic cart when the hydraulic pressure is not necessary. This procedure does not remove the pressure which stays in the system after the hydraulic pressure sources stop.
 - (10) Main hydraulic system flushing
 - (a) This task flushes the hydraulic system after you replace a defective hydraulic pump.
 - (11) Main hydraulic system fluid replacement.
 - (12) Main and nose and landing gear hydraulic lines and fitting inspection.
 - (13) Hydraulic fluid transfer between the right and center hydraulic reservoir.
- C. The sequence in which you pressurize or remove the pressure from the hydraulic systems can cause fluid to move between the center and right systems. This can cause a high fluid level in one system and a low fluid level in the other system.
- D. If you set the parking brake in one of the conditions below, and then release the brake with only the center system pressurized, the fluid can move to the center system:
 - (1) The right and center systems pressurized
 - (2) Only the right system pressurized
 - (3) No hydraulic system pressurized.
- E. If you set the parking brake with only the center system pressurized, and then release the brake in one of the conditions below, the fluid can move to the right system:
 - (1) The right and center systems pressurized
 - (2) Only the right system pressurized
 - (3) No hydraulic system pressurized.

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- F. To keep the movement of the fluid between the right and center hydraulic systems to a minimum, the conditions which follow are important:
- (1) Pressurize the right hydraulic system first.
 - (2) Remove the pressure from the right hydraulic system last.

TASK 29-11-00-860-801

2. Main Hydraulic System Pressurization

A. Procedure

SUBTASK 29-11-00-860-085

- (1) Do one of these tasks to pressurize the applicable main hydraulic system:
 - (a) Do this task: Main Hydraulic System Pressurization with a Portable Hydraulic Cart, TASK 29-11-00-860-802.
 - (b) Do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803.
 - (c) Do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.
 - (d) Do this task: Center Hydraulic System Pressurization with an Air-Driven Pump (ADP), TASK 29-11-00-860-805.

————— END OF TASK —————

TASK 29-11-00-860-802

3. Main Hydraulic System Pressurization with a Portable Hydraulic Cart

(Figure 201)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For 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-1796	Portable Hydraulic Cart, System Test, Capable of 3000 PSI and a minimum flow of 50 GPM. Part #: 5830 SERIES Supplier: 59603 Part #: 58300BJ Supplier: 59603 Part #: 9780-0327 Supplier: 05172 Part #: 9780-0398 Supplier: 05172 Part #: HPPE503K-S4 Supplier: 6T605 Part #: HT2000-1-E/1-S Supplier: H6394 Part #: HT2000-1-F-S Supplier: H6394 Part #: HT50-E-F-D Supplier: H6394 Part #: PH50D Supplier: 10000 Part #: TMH3000 Supplier: L1238

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C. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

E. Procedure

SUBTASK 29-11-00-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-001

- (2) For the left hydraulic system, do this step:
 - (a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-010-002

- (3) For the right hydraulic system, do this step:
 - (a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-010-003

- (4) For the center hydraulic system, do this step:
 - (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-860-001

- (5) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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SUBTASK 29-11-00-480-001

- (6) For the applicable hydraulic system, connect the pressure and return hoses, from the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to the ground service pressure and return disconnects on the airplane.

SUBTASK 29-11-00-860-002

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

SUBTASK 29-11-00-040-002



WARNING

KEEP PERSONS AND EQUIPMENT CLEAR OF THE SPOILERS. WITH ELECTRICAL AND HYDRAULIC POWER AVAILABLE, IF YOU REMOVE THE ELECTRICAL POWER, MOVE THE THRUST LEVERS, OR PUT THE AIR/GROUND SYSTEM IN THE AIR MODE, THIS CAN CAUSE ACCIDENTAL MOVEMENT OF THE SPOILERS. THE ACCIDENTAL SPOILER MOVEMENT CAN CAUSE INJURY TO PERSONS.

- (8) If persons or equipment will be in the area of the spoilers, do this task: Spoiler Deactivation, TASK 27-61-00-040-801.

SUBTASK 29-11-00-860-003



WARNING

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



CAUTION

WHEN YOU PRESSURIZE THE MAIN HYDRAULIC SYSTEMS, CAREFULLY MONITOR THE HYDRAULIC INDICATION SYSTEMS IN THE FLIGHT COMPARTMENT TO MAKE SURE THE SYSTEMS OPERATE SATISFACTORILY. IF THE HYDRAULIC FLUID BECOMES TOO HOT, STOP OPERATION OF THE SYSTEM.



CAUTION

MAKE SURE YOU DO NOT PRESSURIZE THE HYDRAULIC SYSTEM WHEN THE RETURN LINES ARE BLOCKED. THIS CAN CAUSE TOO MUCH PRESSURE IN THE HYDRAULIC RETURN SYSTEM BECAUSE OF INTERNAL LEAKAGE. WHEN YOU REMOVE HYDRAULIC LINES OR COMPONENTS, PUT DO-NOT-OPERATE TAGS ON THE HYDRAULIC PUMP SWITCHES AND IDENTIFY THE LINES OR COMPONENTS WHICH YOU REMOVED.

- (9) Operate the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796 to pressurize the applicable hydraulic system to 3000 psi.

————— **END OF TASK** —————

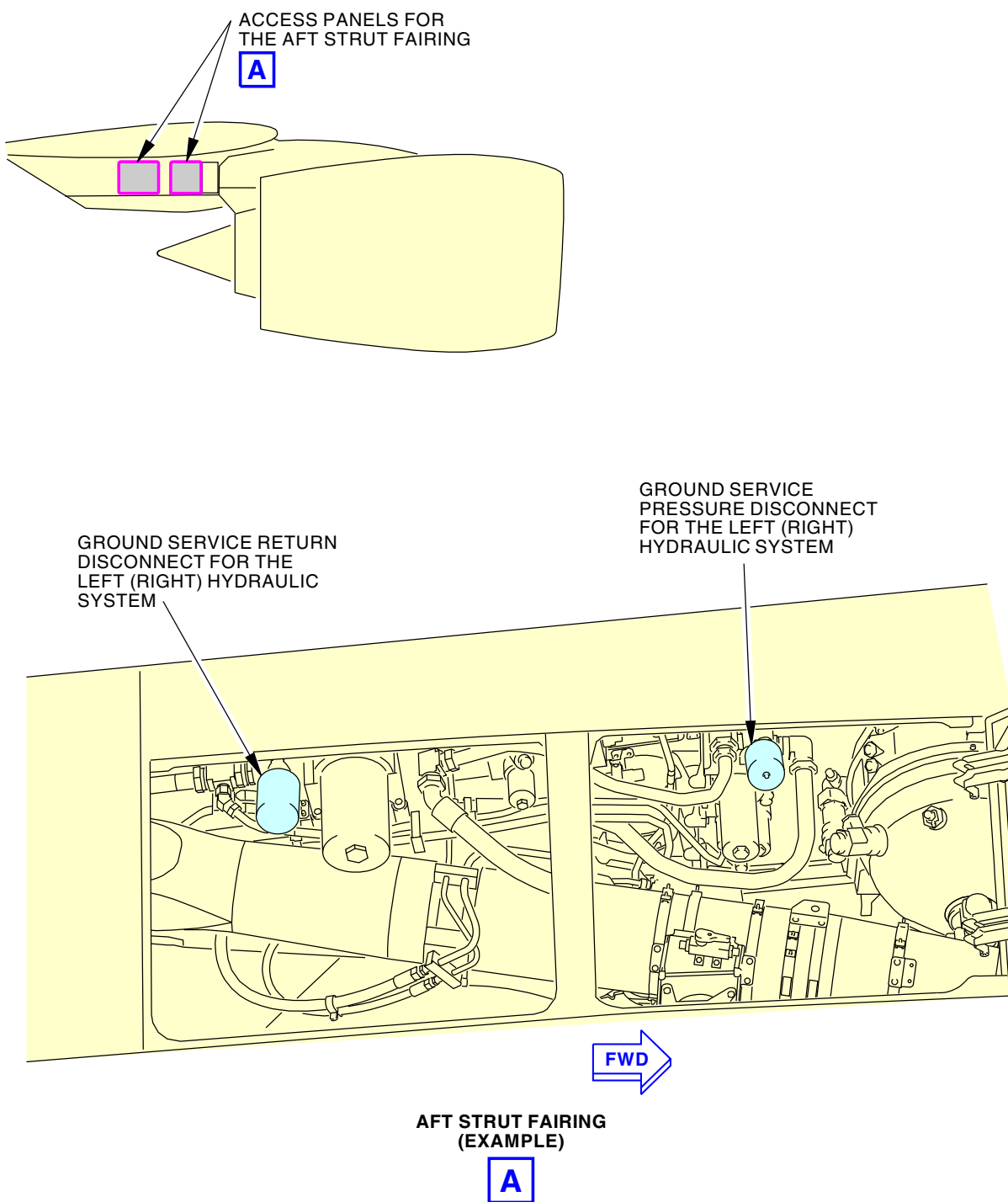
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Hydraulic Ground Service Connections
Figure 201/29-11-00-990-801 (Sheet 1 of 2)

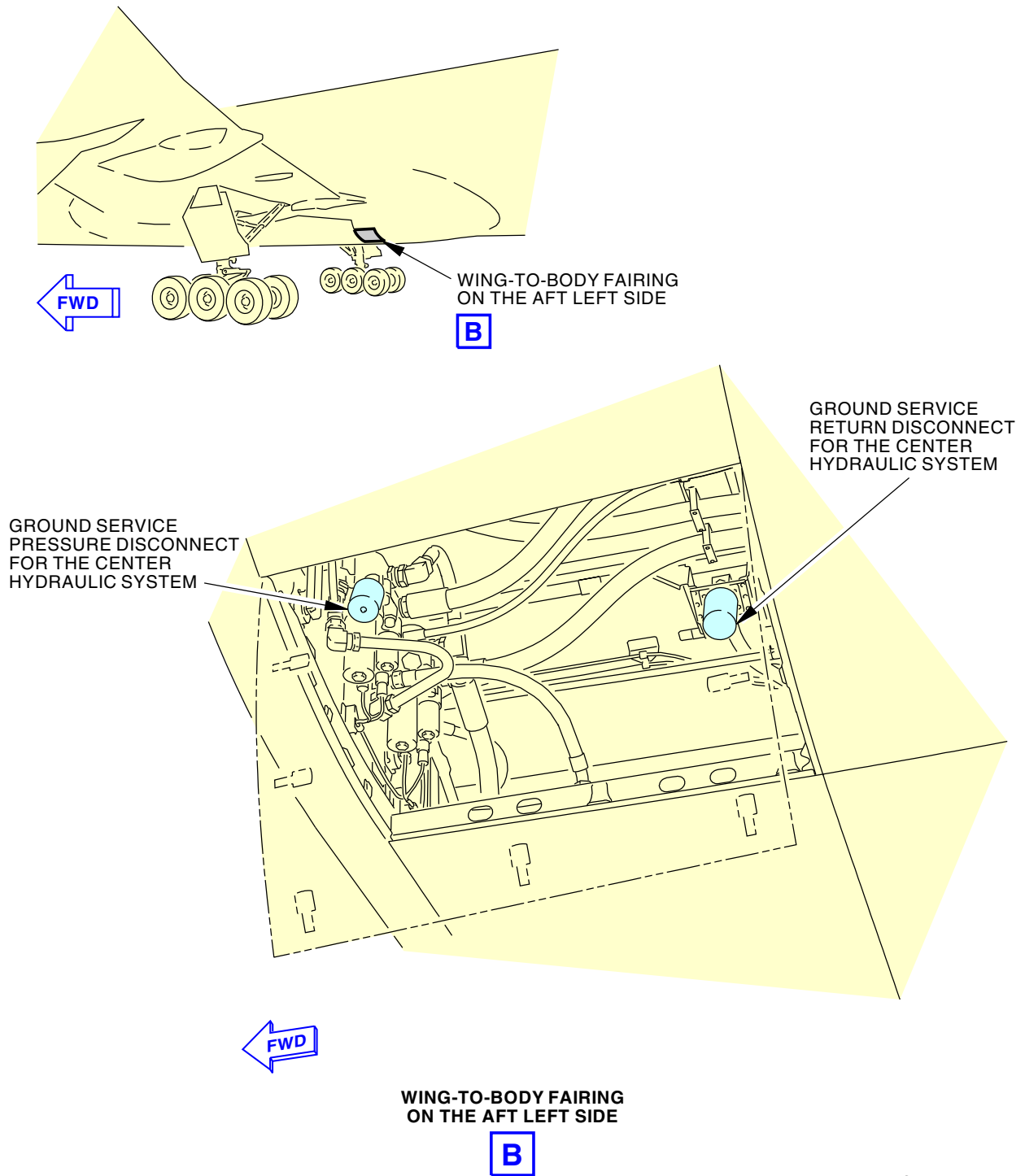
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Hydraulic Ground Service Connections
Figure 201/29-11-00-990-801 (Sheet 2 of 2)

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TASK 29-11-00-860-803

4. Main Hydraulic System Pressurization with an Alternating Current Motor Pump (Figure 202)

A. 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)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

B. Location Zones

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

C. Procedure

SUBTASK 29-11-00-860-004

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

SUBTASK 29-11-00-210-001

- (2) For the left or right hydraulic system, do this step:
- (a) Make sure that there is not less than 5000 lb (2268 kg) of fuel in the left or right main tank.

NOTE: The heat exchangers in the hydraulic system use the fuel to remove the heat from the hydraulic fluid.

SUBTASK 29-11-00-210-002

- (3) For the center hydraulic system, do this step:
- (a) Make sure there is not less than 7303 lb (3313 kg) of fuel in the right main tank.
- NOTE:** The heat exchangers in the hydraulic system use the fuel to remove the heat from the hydraulic fluid.

SUBTASK 29-11-00-860-005

 CAUTION	DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE PUMP TEMPERATURE INDICATION IS MORE THAN 105 °C OR BLANK OR AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (4) If the applicable fuel tank contains less than the specified minimum amount of fuel, obey these limits:
- (a) Stop the operation of the hydraulic pump if one of these conditions occur:
- 1) The temperature indication for the hydraulic pump, on the EICAS display, becomes more than 105 °C
 - 2) The fault light for the hydraulic pump comes on.
 - 3) The EICAS overheat message is true and the temperature indication for the hydraulic pump, on the EICAS display, is blank.
- (b) Do not operate the hydraulic pump more than 10 minutes.

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- (c) After the operation of the hydraulic pump, let the temperature of the hydraulic pump decrease for 20 minutes with the hydraulic pump off before you operate it again.

SUBTASK 29-11-00-860-006

- (5) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-860-001

- (6) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-00-860-007

- (7) For each hydraulic system that you will pressurize, make sure the applicable HYDRAULIC RESERVOIR PRESS (L, C, R) indication on the EICAS display shows NORM.

NOTE: It is important that you pressurize the reservoir, if you will operate a hydraulically powered system. The reservoir pressure will make sure there is a sufficient supply of hydraulic fluid to the hydraulic pump at high flow rates.

It is not important that you pressurize the reservoir, if you will operate a hydraulic pump only to do a check that it will pressurize the system.

- (a) If the EICAS display does not show NORM, do one of these optional procedures to pressurize the reservoir:
- 1) Do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.
 - 2) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-00-040-003



KEEP PERSONS AND EQUIPMENT CLEAR OF THE SPOILERS. WITH ELECTRICAL AND HYDRAULIC POWER AVAILABLE, IF YOU REMOVE THE ELECTRICAL POWER, MOVE THE THRUST LEVERS, OR PUT THE AIR/GROUND SYSTEM IN THE AIR MODE, THIS CAN CAUSE ACCIDENTAL MOVEMENT OF THE SPOILERS. THE ACCIDENTAL SPOILER MOVEMENT CAN CAUSE INJURY TO PERSONS.

- (8) If persons or equipment will be in the area of the spoilers, do this task: Spoiler Deactivation, TASK 27-61-00-040-801.

SUBTASK 29-11-00-860-008



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



WHEN YOU PRESSURIZE THE MAIN HYDRAULIC SYSTEMS, CAREFULLY MONITOR THE HYDRAULIC INDICATION SYSTEMS IN THE FLIGHT COMPARTMENT TO MAKE SURE THE SYSTEMS OPERATE SATISFACTORILY. IF THE HYDRAULIC FLUID BECOMES TOO HOT, STOP OPERATION OF THE SYSTEM.

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(CAUTION PRECEDES)



MAKE SURE YOU DO NOT PRESSURIZE THE HYDRAULIC SYSTEM WHEN THE RETURN LINES ARE BLOCKED. THIS CAN CAUSE TOO MUCH PRESSURE IN THE HYDRAULIC RETURN SYSTEM BECAUSE OF INTERNAL LEAKAGE. WHEN YOU REMOVE HYDRAULIC LINES OR COMPONENTS, PUT DO-NOT-OPERATE TAGS ON THE HYDRAULIC PUMP SWITCHES AND IDENTIFY THE LINES OR COMPONENTS WHICH YOU REMOVED.

- (9) For the left (right) hydraulic system, turn the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel, to the ON position.

SUBTASK 29-11-00-860-009

- (10) For the center hydraulic system, push one or all of these switches, on the hydraulic control panel, to the ON position:
- (a) HYDRAULIC PRIMARY C1 ELEC
 - (b) HYDRAULIC PRIMARY C2 ELEC

SUBTASK 29-11-00-210-003

- (11) Make sure the applicable HYDRAULIC SYSTEM PRESS (L, C, or R) indication, on the EICAS display, shows 2700 to 3200 psi.

———— **END OF TASK** ————

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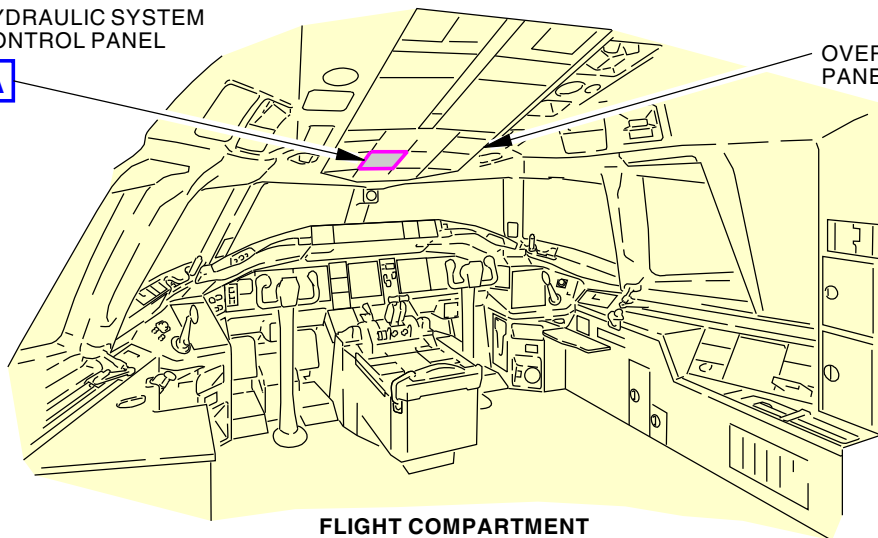
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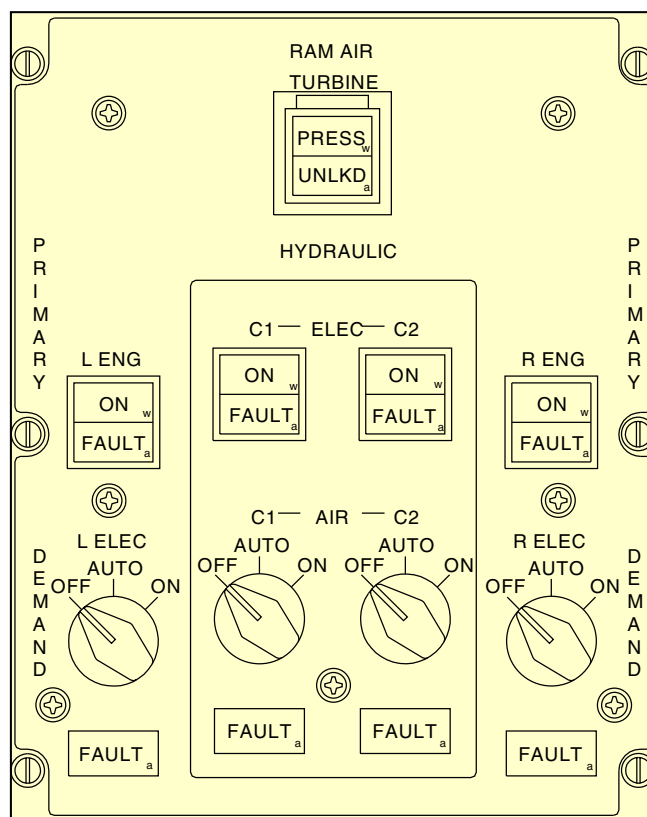
HYDRAULIC SYSTEM
CONTROL PANEL

A

OVERHEAD
PANEL, P5



FLIGHT COMPARTMENT



HYDRAULIC SYSTEM CONTROL PANEL

A

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Hydraulic System Control Panel
Figure 202/29-11-00-990-802

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TASK 29-11-00-860-804

5. Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP)

(Figure 202)

A. 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)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-805-H01	Engine Automatic Start (P/B 201)
71-00-00-800-836-H00	Dry Motor (P/B 201)

B. Location Zones

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

C. Procedure

SUBTASK 29-11-00-860-010

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

SUBTASK 29-11-00-210-004

- (2) Make sure that there is not less than 5000 lb (2268 kg) of fuel in the left (right) main tank.

NOTE: The heat exchangers in the hydraulic system use the fuel to remove the heat from the hydraulic fluid.

SUBTASK 29-11-00-860-011



CAUTION

DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE PUMP TEMPERATURE INDICATION 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.

- (3) If the left (right) main fuel tank contains less than the specified minimum amount of fuel, obey these limits:
 - (a) Stop the operation of the hydraulic pump if one of these conditions occur:
 - 1) The temperature indication for the hydraulic pump, on the EICAS display, becomes more than 105 °C
 - 2) The fault light for the hydraulic pump comes on.
 - (b) Do not operate the hydraulic pump more than 10 minutes.
 - (c) After the operation of the hydraulic pump, let the temperature of the hydraulic pump decrease for 20 minutes with the hydraulic pump off.

SUBTASK 29-11-00-860-012

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-610-001

- (5) For the left (right) hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

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SUBTASK 29-11-00-040-004



KEEP PERSONS AND EQUIPMENT CLEAR OF THE SPOILERS. WITH ELECTRICAL AND HYDRAULIC POWER AVAILABLE, IF YOU REMOVE THE ELECTRICAL POWER, MOVE THE THRUST LEVERS, OR PUT THE AIR/GROUND SYSTEM IN THE AIR MODE, THIS CAN CAUSE ACCIDENTAL MOVEMENT OF THE SPOILERS. THE ACCIDENTAL SPOILER MOVEMENT CAN CAUSE INJURY TO PERSONS.

- (6) If persons or equipment will be in the area of the spoilers, do this task: Spoiler Deactivation, TASK 27-61-00-040-801.

SUBTASK 29-11-00-860-013



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



WHEN YOU PRESSURIZE THE MAIN HYDRAULIC SYSTEMS, CAREFULLY MONITOR THE HYDRAULIC INDICATION SYSTEMS IN THE FLIGHT COMPARTMENT TO MAKE SURE THE SYSTEMS OPERATE SATISFACTORILY. IF THE HYDRAULIC FLUID BECOMES TOO HOT, STOP OPERATION OF THE SYSTEM.



MAKE SURE YOU DO NOT PRESSURIZE THE HYDRAULIC SYSTEM WHEN THE RETURN LINES ARE BLOCKED. THIS CAN CAUSE TOO MUCH PRESSURE IN THE HYDRAULIC RETURN SYSTEM BECAUSE OF INTERNAL LEAKAGE. WHEN YOU REMOVE HYDRAULIC LINES OR COMPONENTS, PUT DO-NOT-OPERATE TAGS ON THE HYDRAULIC PUMP SWITCHES AND IDENTIFY THE LINES OR COMPONENTS WHICH YOU REMOVED.

- (7) Push the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, to the ON position.

SUBTASK 29-11-00-860-014

- (8) For the left (right) engine, do one of these alternative tasks:
- (a) Do this task: Dry Motor, TASK 71-00-00-800-836-H00.
 - (b) Do this task: Engine Automatic Start, TASK 71-00-00-800-805-H01.

SUBTASK 29-11-00-210-005

- (9) Make sure the applicable HYDRAULIC SYSTEM PRESS (L or R) indication, on the EICAS display, shows 2900 to 3200 psi.

————— END OF TASK —————

TASK 29-11-00-860-805

6. Center Hydraulic System Pressurization with an Air-Driven Pump (ADP)

(Figure 202)

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)

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(Continued)

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-61-00-040-801	Spoiler Deactivation (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

B. Location Zones

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

C. Procedure

SUBTASK 29-11-00-860-015

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

SUBTASK 29-11-00-860-016



CAUTION

DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE PUMP TEMPERATURE INDICATION 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.

- (2) Obey these limits while you operate an air-driven pump (ADP):
- (a) Stop the operation of the hydraulic pump if one of these conditions occur:
 - 1) The temperature indication for the hydraulic pump, on the EICAS display, becomes more than 105 °C
 - 2) The fault light for the hydraulic pump comes on.
 - (b) Do not operate the hydraulic pump more than 10 minutes.
 - (c) After the operation of the hydraulic pump, let the temperature of the hydraulic pump decrease for 20 minutes with the hydraulic pump off before you operate it again.

SUBTASK 29-11-00-860-017

(3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-610-002

(4) For the reservoir in the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-00-860-018

(5) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-00-040-005



WARNING

KEEP PERSONS AND EQUIPMENT CLEAR OF THE SPOILERS. WITH ELECTRICAL AND HYDRAULIC POWER AVAILABLE, IF YOU REMOVE THE ELECTRICAL POWER, MOVE THE THRUST LEVERS, OR PUT THE AIR/GROUND SYSTEM IN THE AIR MODE, THIS CAN CAUSE ACCIDENTAL MOVEMENT OF THE SPOILERS. THE ACCIDENTAL SPOILER MOVEMENT CAN CAUSE INJURY TO PERSONS.

(6) If persons or equipment will be in the area of the spoilers, do this task: Spoiler Deactivation, TASK 27-61-00-040-801.

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SUBTASK 29-11-00-860-019



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



WHEN YOU PRESSURIZE THE MAIN HYDRAULIC SYSTEMS, CAREFULLY MONITOR THE HYDRAULIC INDICATION SYSTEMS IN THE FLIGHT COMPARTMENT TO MAKE SURE THE SYSTEMS OPERATE SATISFACTORILY. IF THE HYDRAULIC FLUID BECOMES TOO HOT, STOP OPERATION OF THE SYSTEM.



MAKE SURE YOU DO NOT PRESSURIZE THE HYDRAULIC SYSTEM WHEN THE RETURN LINES ARE BLOCKED. THIS CAN CAUSE TOO MUCH PRESSURE IN THE HYDRAULIC RETURN SYSTEM BECAUSE OF INTERNAL LEAKAGE. WHEN YOU REMOVE HYDRAULIC LINES OR COMPONENTS, PUT DO-NOT-OPERATE TAGS ON THE HYDRAULIC PUMP SWITCHES AND IDENTIFY THE LINES OR COMPONENTS WHICH YOU REMOVED.

- (7) If you will operate an air-driven pump (ADP) only to do a check that it will pressurize the system, do these steps:
- Turn the HYDRAULIC DEMAND AIR C1 or C2 switch, on the hydraulic control panel, to the ON position.
 - Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS display, shows 2900 to 3200 psi.

SUBTASK 29-11-00-860-020

- (8) If you will operate an air-driven pump (ADP) to supply high flow rates in the center system, do these steps:
- NOTE: This procedure will operate the air-driven pump (ADP) as a demand pump. This will let the center system operate for a longer time before the air-driven pump (ADP) becomes too hot.
- Push these switches, on the hydraulic control panel, to the ON position:
 - HYDRAULIC PRIMARY C1 ELEC
 - HYDRAULIC PRIMARY C2 ELEC
 - Turn the HYDRAULIC DEMAND AIR C1 or C2 switch, on the hydraulic control panel, to the AUTO position.
 - Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS display, shows 2700 to 3200 psi.

————— END OF TASK —————

TASK 29-11-00-860-806

7. Main Hydraulic System Reservoirs Pressurization with an External Air Source

(Figure 203)

A. General

- The airplane pneumatic system usually pressurizes the reservoirs when pneumatic pressure is available. This procedure pressurizes the reservoirs with an external air source.

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B. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1091	Gauge - Air Pressure, 0-100 PSIG (0-690 KPa)

D. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	29-11-25-01-050	ARO ALL
4	Packing	29-11-25-01-045	ARO ALL
6	Packing	29-11-26-01-051	ARO ALL
8	Packing	29-11-26-01-053	ARO ALL

F. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

G. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

H. Prepare for the Main Hydraulic System Reservoirs Pressurization with an External Air Source

SUBTASK 29-11-00-040-006



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-11-00-010-004

- (2) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-010-005

- (3) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-002



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-010-006



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

I. Main Hydraulic System Reservoirs Pressurization with an External Air Source

SUBTASK 29-11-00-020-007

- (1) When a pressure gage installed on the reservoir pressurization module is used to indicate hydraulic reservoir pressure, do these steps:

NOTE: The pressure gage on the external air source that indicates regulated pressure can be used as an alternative.

- (a) For the left or right hydraulic system:
 - 1) Remove the plug [3] from the test port on the reservoir pressurization module.
 - 2) Remove the plug [1] from the gage port on the reservoir pressurization module.
- (b) For the center hydraulic system:
 - 1) Remove the plug [7] from the test port on the reservoir pressurization module.
 - 2) Remove the plug [5] from the gage port on the reservoir pressurization module.
- (c) Install the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 in the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-020-008

- (2) When the pressure gage on the external air source is used to indicate hydraulic reservoir pressure, do these steps:

NOTE: A pressure gage installed on the reservoir pressurization module gage port can be used as an alternative.

- (a) For the left or right hydraulic system:

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- 1) Remove the plug [3] from the test port on the reservoir pressurization module.
- (b) For the center hydraulic system:
 - 1) Remove the plug [7] from the test port on the reservoir pressurization module.

SUBTASK 29-11-00-480-003

- (3) Connect the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to the test port on the reservoir pressurization module.

SUBTASK 29-11-00-860-021

- (4) Adjust the pressure of the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 until the air pressure gage shows 50-55 psi.

NOTE: Do not supply more than 75 psi at the test port on the reservoir pressurization module.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-860-022

- (1) Adjust the pressure of the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 until the air pressure gage on the external air source shows zero.

SUBTASK 29-11-00-080-001

- (2) Remove the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 from the test port of the reservoir pressurization module.

SUBTASK 29-11-00-420-008

- (3) If a pressure gage installed on the reservoir pressurization gage was used to indicate hydraulic reservoir pressure, do these steps:
 - (a) For the left or right hydraulic system, do these steps:
 - 1) Remove the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 from the gage port on the reservoir pressurization module.
 - 2) Apply MCS 352B fluid, D00054 to the new packing [4] and packing [2].
 - 3) Install the packing [4] on the plug [3].
 - 4) Install the packing [2] on the plug [1].
 - 5) Install the plug [3] and packing [4] in the test port on the reservoir pressurization module.
 - 6) Install the plug [1] and packing [2] in the gage port on the reservoir pressurization module.
 - (b) For the center hydraulic system, do these steps:
 - 1) Apply MCS 352B fluid, D00054 to the new packing [8] and packing [6].
 - 2) Install the packing [8] on the plug [7].
 - 3) Install the packing [6] on the plug [5].
 - 4) Install the plug [7] and the packing [8] in the test port on the reservoir pressurization module.
 - 5) Install the plug [5] and the packing [6] in the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-420-010

- (4) If the pressure gage on the external air source was used to indicate hydraulic reservoir pressure, do these steps:
 - (a) For the left or right hydraulic system, do these steps:
 - 1) Apply MCS 352B fluid, D00054 to the new packing [4].

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- 2) Install the packing [4] on the plug [3].
- 3) Install the plug [3] and packing [4] in the test port on the reservoir pressurization module.
- (b) For the center hydraulic system, do these steps:
 - 1) Apply MCS 352B fluid, D00054 to the new packing [8].
 - 2) Install the packing [8] on the plug [7].
 - 3) Install the plug [7] and the packing [8] in the test port on the reservoir pressurization module.

SUBTASK 29-11-00-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801

SUBTASK 29-11-00-410-002

- (6) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-410-003

- (7) For the right hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-001

- (8) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

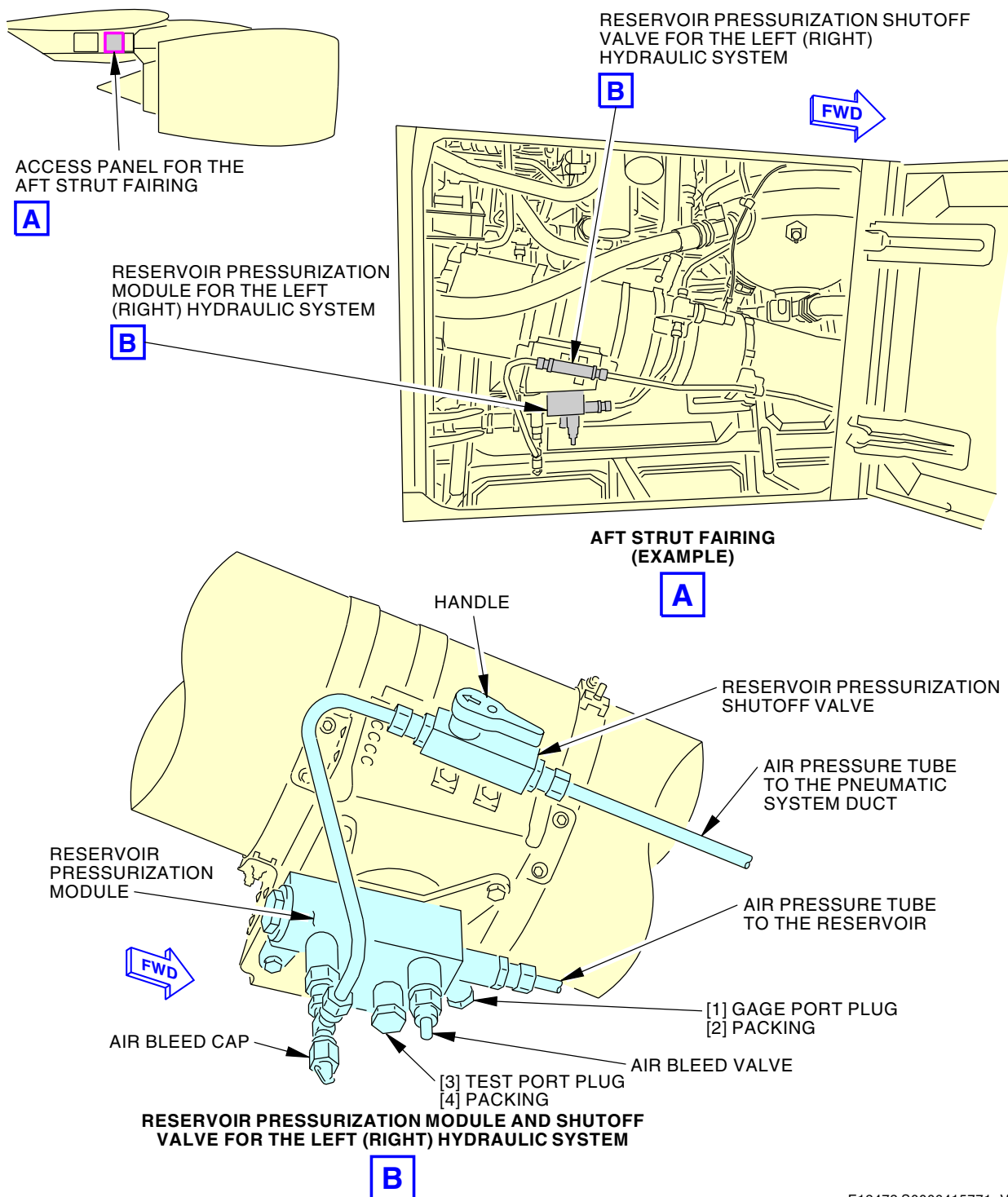
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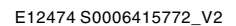
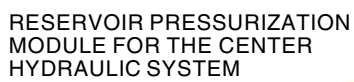
**Reservoir Pressurization Module and Shutoff Valve
Figure 203/29-11-00-990-803 (Sheet 1 of 3)**

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Reservoir Pressurization Module and Shutoff Valve
Figure 203/29-11-00-990-803 (Sheet 2 of 3)

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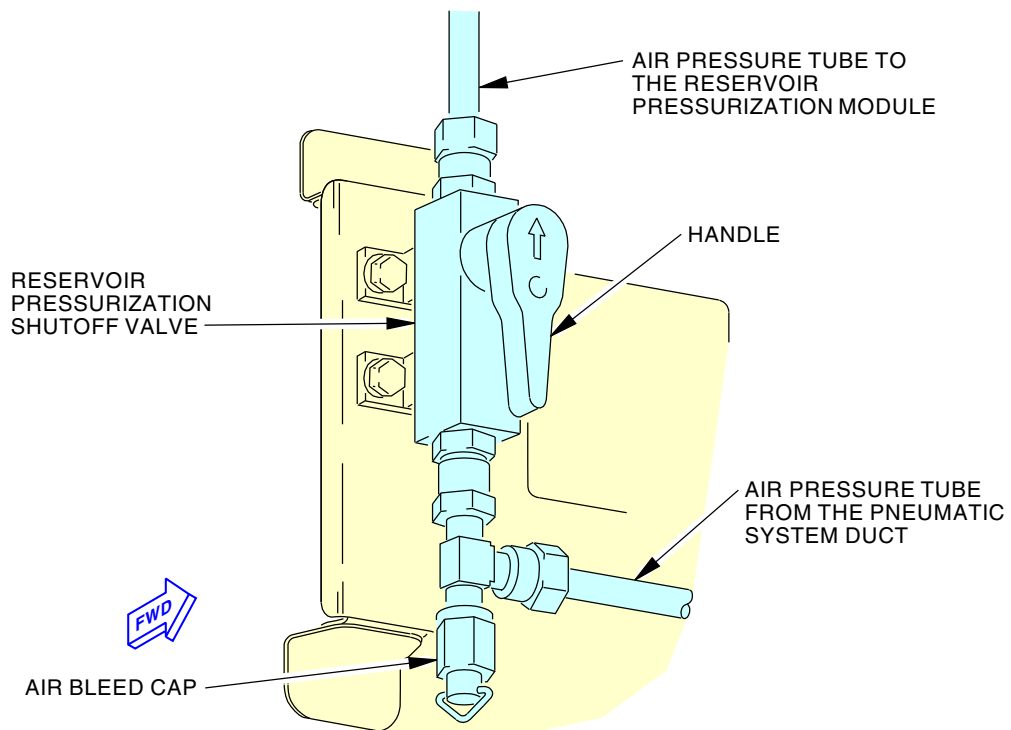
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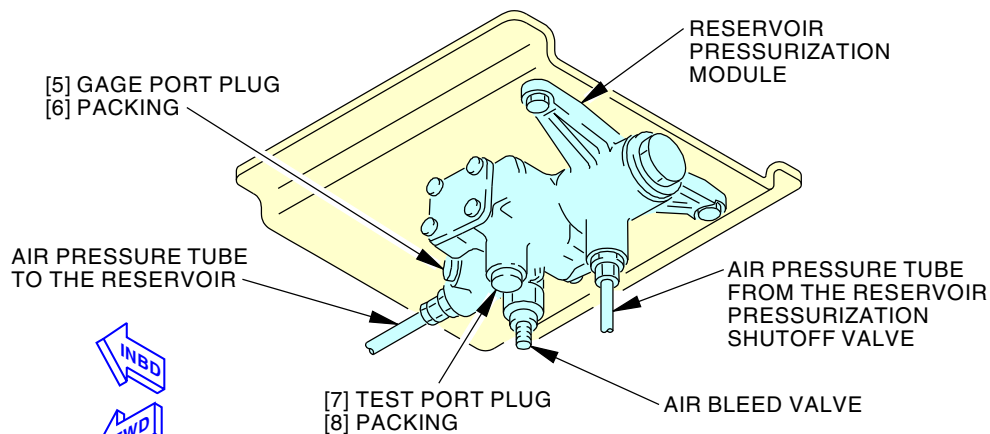


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RESERVOIR PRESSURIZATION SHUTOFF VALVE
FOR THE CENTER HYDRAULIC SYSTEM

E



RESERVOIR PRESSURIZATION MODULE
FOR THE CENTER HYDRAULIC SYSTEM

F

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Reservoir Pressurization Module and Shutoff Valve
Figure 203/29-11-00-990-803 (Sheet 3 of 3)

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TASK 29-11-00-860-807

8. Main Hydraulic System and the Reservoir Depressurization

A. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (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-1796	Portable Hydraulic Cart, System Test, Capable of 3000 PSI and a minimum flow of 50 GPM. Part #: 5830 SERIES Supplier: 59603 Part #: 58300BJ Supplier: 59603 Part #: 9780-0327 Supplier: 05172 Part #: 9780-0398 Supplier: 05172 Part #: HPPE503K-S4 Supplier: 6T605 Part #: HT2000-1-E/1-S Supplier: H6394 Part #: HT2000-1-F-S Supplier: H6394 Part #: HT50-E-F-D Supplier: H6394 Part #: PH50D Supplier: 10000 Part #: TMH3000 Supplier: L1238
SPL-1798	Pin - Locking, Valve, Hydraulic Reservoir Pressurization Shutoff Part #: A29002-6 Supplier: 81205
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

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E. Main Hydraulic System Depressurization

SUBTASK 29-11-00-210-109



MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure that both engines are off.

NOTE: Engine Driven Pumps are operational any time the engines are on.

SUBTASK 29-11-00-210-110

- (2) Make sure that the APU is not on.

SUBTASK 29-11-00-860-023

- (3) Set all the switches for the hydraulic pumps, on the hydraulic control panel, to the OFF position (Figure 202).

SUBTASK 29-11-00-860-024

- (4) 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>
L	19	C29604	R HYD PUMP CTRL
M	28	C29607	C1 HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	4	C29605	L HYD PUMP CTRL
L	5	C29608	C2-HYD PUMP CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-00-860-025

- (5) If you used the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to pressurize the system, do this step:
- (a) Set the pressure of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to zero.
- (b) Install DO NOT OPERATE tag, STD-858 on the external hydraulic supply.

SUBTASK 29-11-00-860-026

- (6) Make sure that these switches on the maintenance panel, P61, are in the NORM position:
- (a) FLT CONTROL HYD POWER TAIL L, C, and R
- (b) FLT CONTROL HYD POWER WING L, C, and R.

SUBTASK 29-11-00-860-027

- (7) Do one of these steps to remove the remaining pressure from the hydraulic system:
- (a) Let the internal leakage decrease the pressure in the hydraulic system to zero.

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- (b) For the right or center hydraulic system, operate the pitch trim with the alternate pitch trim lever to decrease the pressure in the system to zero.
- (c) For the left hydraulic system, turn the control wheel more than 10 degrees (to operate spoilers No. 4 and No. 11) to decrease the pressure in the system to zero.

SUBTASK 29-11-00-860-028

- (8) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-210-006

- (9) Make sure that the applicable HYDRAULIC SYSTEM PRESS (L, C, or R) indication on the EICAS display shows a pressure close to zero.

NOTE: There will be a pressure indication greater than zero until the applicable hydraulic system reservoir is depressurized.

SUBTASK 29-11-00-080-003

- (10) If you used the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to pressurize the system, do these steps:
 - (a) Disconnect the pressure and return hoses, of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the ground service pressure and return disconnects on the airplane (Figure 201).
 - (b) Install caps on the ground service pressure and return disconnects on the airplane.
 - (c) Install DO NOT OPERATE tags, STD-858 on the ground service disconnects to prevent connection of the external hydraulic supply lines to the airplane.
 - (d) For the reservoir in the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-00-860-029

- (11) Do these steps to remove the pressure from the brake system:
 - (a) Make sure that the tires have chocks installed around them (CHOCK INSTALLATION, PAGEBLOCK 10-11-05/201).
 - (b) Release the parking brake.
 - (c) Fully push the captain's brake pedals twelve times to remove the pressure from the brake accumulator.

F. Main Hydraulic System Reservoir Depressurization

NOTE: If you will loosen a hydraulic connection or open the hydraulic system, you must remove the pressure from the hydraulic reservoir.

SUBTASK 29-11-00-860-257



MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure that the pneumatic system is depressurized, Depressurize the Pneumatic System, TASK 36-00-00-860-801.

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SUBTASK 29-11-00-040-007



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-007

- (3) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-010-008

- (4) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-004



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-010-009



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-11-00-860-030

- (7) For the applicable hydraulic system, do these steps:

- Hold the handle of the shutoff valve for reservoir pressurization in the closed position (Figure 203).
- Put the reservoir pressurization shutoff valve locking pin, SPL-1798, into the handle of the shutoff valve.

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SUBTASK 29-11-00-480-005



WARNING

PUT A RAG AROUND THE AIR BLEED VALVE ON THE RESERVOIR PRESSURIZATION MODULE TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (8) Put a rag around the air bleed valve on the reservoir pressurization module to catch a spray of hydraulic fluid from the air bleed valve.

SUBTASK 29-11-00-860-031

- (9) Open the air bleed valve on the reservoir pressurization module to remove the pressure from the reservoir.

SUBTASK 29-11-00-860-032

- (10) Close the air bleed valve when you can not hear the flow of air from the air bleed valve.

G. Main Hydraulic System and Reservoir Depressurization - Tryout

NOTE: This tryout is to make sure that the main hydraulic system and the main hydraulic system reservoir are in a zero energy state.

SUBTASK 29-11-00-860-258

- (1) Do these steps to make sure that the main hydraulic system and main hydraulic system reservoir are depressurized:
 - (a) For the Left and Right hydraulic systems, put the L and R ELEC DEMAND pump switches, P5 panel, to the ON position.
 - 1) Make sure that the L and R ACMP HYD DEMAND pumps do not come on.

NOTE: An observer must be in voice contact with an operator in the flight deck at all times to complete this step.
 - (b) For the Center hydraulic system, put the C1 and C2 ELEC pump switches, P5 panel, to the ON position.
 - 1) Make sure that the C1 and C2 ACMP pumps do not come on.

NOTE: An observer must be in voice contact with an operator in the flight deck at all times to complete this step.
 - (c) For the Center hydraulic system, put the C1 and C2 AIR pump switches, P5 panel, to the ON position.
 - 1) Make sure that the C1 and C2 AIR DEMAND pumps do not come on.

NOTE: An observer must be in voice contact with an operator in the flight deck at all times to complete this step.
 - (d) Make sure that the applicable HYDRAULIC SYSTEM PRESS (L, C, or R) indication on the EICAS display shows a pressure close to zero.
 - (e) Put these switches to the OFF position and install DO NOT OPERATE tags, STD-858:
 - 1) L and R ELEC DEMAND pump switches
 - 2) C1 and C2 ELEC pump switches
 - 3) C1 and C2 AIR pump switches

SUBTASK 29-11-00-860-259

- (2) Do these steps to make sure that the main hydraulic system reservoir is depressurized:

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- (a) Put a rag around the air bleed valve on the reservoir pressurization module.
- (b) Open the air bleed valve on the reservoir pressurization module.
 - 1) Make sure that there is no air or noise coming from the bleed valve.
- (c) Close the air bleed valve on the reservoir pressurization module.

SUBTASK 29-11-00-860-260

- (3) Operate the control wheel, column, and rudder pedals.
 - (a) Make sure that no flight control surfaces move.

H. When the Main Hydraulic System and Reservoir Depressurization is Not Necessary, Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-080-004

- (1) For the applicable hydraulic system, do these steps:
 - (a) Remove the reservoir pressurization shutoff valve locking pin, SPL-1798, from the handle of the shutoff valve for reservoir pressurization.



CAUTION

MAKE SURE THE SHUTOFF VALVE FOR RESERVOIR PRESSURIZATION MOVES TO THE OPEN POSITION. THE PNEUMATIC SYSTEM CAN NOT PRESSURIZE THE RESERVOIR WITH THE SHUTOFF VALVE IN THE CLOSED POSITION.

- (b) Make sure the handle of the shutoff valve for reservoir pressurization moves to the open position.

SUBTASK 29-11-00-410-004



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801

SUBTASK 29-11-00-410-006

- (3) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-410-007

- (4) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-002

- (5) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

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SUBTASK 29-11-00-860-033

- (6) 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>
L	19	C29604	R HYD PUMP CTRL
M	28	C29607	C1 HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	4	C29605	L HYD PUMP CTRL
L	5	C29608	C2-HYD PUMP CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-00-860-261

- (7) Remove the DO NOT OPERATE tag, STD-858 from these switches:

- (a) L and R ELEC DEMAND pump switches
- (b) C1 and C2 ELEC pump switches
- (c) C1 and C2 AIR pump switches

SUBTASK 29-11-00-860-262

- (8) Remove the DO NOT OPERATE tag, STD-858 from the ground service disconnects on the airplane.

SUBTASK 29-11-00-860-263

- (9) Remove the DO NOT OPERATE tag, STD-858 from the external hydraulic supply.

————— END OF TASK —————

TASK 29-11-00-860-809

9. Main Hydraulic System - Air Bleed - Left, Center and Right

A. General

- (1) This task is used to bleed air from the left, center and right hydraulic systems, when large amounts of the system have been opened and air introduced into the system.
- (2) When you remove and replace a hydraulic component or tubing, take care to minimize the loss of hydraulic fluid and the subsequent entry of air into the hydraulic system.
- (3) Many component and system maintenance tasks have specific bleeding requirements that are included in their respective installation tasks. Make sure that you do all the required component or system bleed tasks before you use this procedure.

When large portions of the system are affected, the following general procedure may be used to bleed the flight control portions of the hydraulic system. If the landing gear system has significant air trapped in its tubing, then the affected gear will need to be cycled to fully bleed the system. These procedures are contained in LANDING GEAR NORMAL EXTENSION AND RETRACTION SYSTEMS, SUBJECT 32-30-01.

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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)
32-30-01	LANDING GEAR NORMAL EXTENSION AND RETRACTION SYSTEMS

C. Air Bleed the Hydraulic System, Left, Center and Right

SUBTASK 29-11-00-840-002

- (1) Prepare to do the Air Bleed Procedure:
 - (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
 - (b) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.
 - (c) Use a Ground Service Hydraulic Cart to pressurize the Left, Center or Right Hydraulic Systems as follows: do this task: Main Hydraulic System Pressurization with a Portable Hydraulic Cart, TASK 29-11-00-860-802
 - 1) Left and Right Hydraulics systems; connect to the ground service disconnect unless the EDP pressure hose or EDP have been serviced, in which case connect to the EDP (Engine Driven Pump) PRESSURE hose.
 - 2) Center Hydraulic System, connect to the ACMP1 ground service disconnect.

SUBTASK 29-11-00-870-002

- (2) Air Bleed the System:
 - (a) Operate the flight controls in the sequence shown below for each hydraulic system being bled:
 - 1) Elevators - 10 cycles
 - 2) Rudder - 3 cycles
 - 3) Lateral - 6 cycles
 - 4) Elevators - 20 cycles

SUBTASK 29-11-00-840-003

- (3) Remove Hydraulic Power, Depressurize the Hydraulic systems and Disconnect the Ground Service Hydraulic Cart:
 - (a) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
 - (b) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-00-790-027

- (4) Pressurize the Left, Center and Right Hydraulic Systems, Perform an Operational Test and Check for Leakage
 - (a) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) Operate the flight controls, elevators, rudder, and lateral.
 - (c) Check for leakage in all disturbed systems.

SUBTASK 29-11-00-840-004

- (5) Restore to Usual Condition:
 - (a) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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- (b) Do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.
- (c) Close all access panels and doors.

———— **END OF TASK** ————

TASK 29-11-00-860-808

10. Main Hydraulic System Power Removal

A. General

- (1) This procedure stops the hydraulic power sources in the main hydraulic systems. This procedure does not remove the pressure which stays in the hydraulic system after the hydraulic power sources stop. If you will loosen the hydraulic connections or open the hydraulic system, you must, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (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
COM-1796	Portable Hydraulic Cart, System Test, Capable of 3000 PSI and a minimum flow of 50 GPM. Part #: 5830 SERIES Supplier: 59603 Part #: 58300BJ Supplier: 59603 Part #: 9780-0327 Supplier: 05172 Part #: 9780-0398 Supplier: 05172 Part #: HPPE503K-S4 Supplier: 6T605 Part #: HT2000-1-E/1-S Supplier: H6394 Part #: HT2000-1-F-S Supplier: H6394 Part #: HT50-E-F-D Supplier: H6394 Part #: PH50D Supplier: 10000 Part #: TMH3000 Supplier: L1238
SPL-1798	Pin - Locking, Valve, Hydraulic Reservoir Pressurization Shutoff Part #: A29002-6 Supplier: 81205

D. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left
211	Flight Compartment, Left
212	Flight Compartment, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

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E. Access Panels

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

F. Hydraulic System Power Removal from a Portable Hydraulic Cart.

SUBTASK 29-11-00-860-034

- (1) Adjust the pressure of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796 to zero.

SUBTASK 29-11-00-080-005

- (2) Disconnect the pressure and return hoses, of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the ground service pressure and return disconnects on the airplane. (Figure 201)

SUBTASK 29-11-00-420-002

- (3) Install caps on the ground service pressure and return disconnects on the airplane.

SUBTASK 29-11-00-080-006

- (4) For the applicable hydraulic system, do these steps: (Figure 203)
 - (a) Remove the reservoir pressurization shutoff valve locking pin, SPL-1798 from the handle of the shutoff valve for reservoir pressurization. (Figure 203)



CAUTION

MAKE SURE THE SHUTOFF VALVE FOR RESERVOIR PRESSURIZATION MOVES TO THE OPEN POSITION. THE PNEUMATIC SYSTEM CAN NOT PRESSURIZE THE RESERVOIR WITH THE SHUTOFF VALVE IN THE CLOSED POSITION.

- (b) Make sure the handle of the shutoff valve for reservoir pressurization moves to the open position.

SUBTASK 29-11-00-610-003

- (5) For the reservoir in the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-00-410-008

- (6) For the center hydraulic system, close this access panel:

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-410-009

- (7) For the left hydraulic system, close these access panels:

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing

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SUBTASK 29-11-00-410-010

- (8) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-003

- (9) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

G. Hydraulic System Power Removal from an Alternating Current Motor Pump (ACMP).

SUBTASK 29-11-00-860-036

- (1) For the left (right) hydraulic system, turn the HYDRAULICS DEMAND L (R) ELEC switch, on the hydraulic control panel, to the OFF position. (Figure 201)

SUBTASK 29-11-00-860-037

- (2) For the center hydraulic system, push these, switches on the hydraulic control panel, to the OFF position:
- (a) HYDRAULIC PRIMARY C1 ELEC
 - (b) HYDRAULIC PRIMARY C2 ELEC

H. Left or Right Hydraulic System Power Removal from an Engine-Driven Pump (EDP).

SUBTASK 29-11-00-860-039

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

I. Center Hydraulic System Power Removal from an Air-Driven Pump (ADP).

SUBTASK 29-11-00-860-040

- (1) Turn the HYDRAULIC DEMAND AIR C1 and C2 switches, on the hydraulic control panel, to the OFF position. (Figure 202)

SUBTASK 29-11-00-860-041

- (2) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

————— END OF TASK —————

TASK 29-11-00-170-801

11. Main Hydraulic System Flushing

A. General

- (1) This procedure flushes the hydraulic system after you replace a defective hydraulic pump.
- (2) If the airplane experiences repeated failures of a pump at one location, there may be debris in the case drain line, case drain hose or case drain hose quick-disconnect that cannot be flushed by accomplishing this procedure. Careful examination, cleaning, or replacement of the case drain hose or quick-disconnect may be required.
- (3) If metal contamination from a damaged pump is found when you flush the hydraulic system, then it is recommended to do these steps:

NOTE: Operator experience shows that a new filter can become plugged by debris that remains in the hydraulic system after a mechanical failure. A plugged filter can cause hydraulic fluid to bypass the filter element and allow debris to circulate in the system. Debris that bypasses the filter can cause a premature failure of a new hydraulic pump.

- (a) Replace the case drain filter element again, at the first scheduled maintenance opportunity following one week of normal operation.

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- (b) Replace all the filter elements in the system at the first scheduled maintenance opportunity following two months of normal operation.
- (4) If the contamination of the hydraulic fluid is from a chemical source, replace the fluid and the filter elements.

B. References

Reference	Title
29-11-05-000-801-002	Engine-Driven Pump (EDP) Removal (P/B 401)
29-11-05-400-801-002	Engine-Driven Pump (EDP) Installation (P/B 401)
29-11-11-000-801	Air-Driven Pump (ADP) Pump Removal (P/B 401)
29-11-11-400-801	Air-Driven Pump (ADP) Pump Installation (P/B 401)
29-11-40-000-801	Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-40-400-801	Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
29-11-41-000-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-41-400-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
29-11-42-000-801	Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-42-400-801	Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
29-11-43-000-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-43-400-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
29-11-44-000-801	Left and Right System Return Filter Module and Components Removal (P/B 401)
29-11-44-400-801	Left and Right System Return Filter Module and Components Installation (P/B 401)
29-11-45-000-801	Center System Return Filter Module and Components Removal (P/B 401)
29-11-45-400-801	Center System Return Filter Module and Components Installation (P/B 401)

C. Location Zones

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

D. Procedure

SUBTASK 29-11-00-860-043

- (1) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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SUBTASK 29-11-00-960-001

- (2) Do one of these tasks to replace the pressure and case drain filter elements in the filter module which has a relation to the defective pump:

NOTE: Do only the steps necessary to replace the filter elements in these tasks.

- (a) These are the tasks:

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-40-000-801,

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-40-400-801.

- (b) These are the tasks:

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-41-000-801,

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-41-400-801.

- (c) These are the tasks:

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-42-000-801,

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-42-400-801.

- (d) These are the tasks:

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-43-000-801,

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-43-400-801.

SUBTASK 29-11-00-960-002

- (3) Do one of these tasks to replace the filter element, in the return filter module, in the hydraulic system which has a relation to the defective pump:

NOTE: Do only the steps necessary to replace the filter element in these tasks.

- (a) Examine the differential pressure indicator on each return filter module:

NOTE: There is one return filter module in each of the three main hydraulic systems.

- (b) If the differential pressure indicator is activated (extended), do one of these tasks to replace the related filter.

- 1) These are the tasks:

Left and Right System Return Filter Module and Components Removal, TASK 29-11-44-000-801,

Left and Right System Return Filter Module and Components Installation, TASK 29-11-44-400-801.

- 2) These are the tasks:

Center System Return Filter Module and Components Removal, TASK 29-11-45-000-801,

Center System Return Filter Module and Components Installation, TASK 29-11-45-400-801.

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SUBTASK 29-11-00-860-044

- (4) To pressurize the applicable hydraulic system with the pump which you replaced, do one of these applicable tasks:
- (a) Do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803.
 - (b) Do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.
 - (c) Do this task: Center Hydraulic System Pressurization with an Air-Driven Pump (ADP), TASK 29-11-00-860-805.

SUBTASK 29-11-00-860-045

- (5) Operate all the systems which operate with hydraulic pressure (but not the landing gear) not less than six times at a fast rate.

SUBTASK 29-11-00-860-046

- (6) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-00-960-003

- (7) Do one of these tasks to replace the pressure and case drain filter elements in the filter module which has a relation to the defective pump:

NOTE: Do only the steps necessary to replace the filter elements in these tasks.

- (a) These are the tasks:

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-40-000-801,

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-40-400-801.

- (b) These are the tasks:

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-41-000-801,

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-41-400-801.

- (c) These are the tasks:

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-42-000-801,

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-42-400-801.

- (d) These are the tasks:

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-43-000-801,

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-43-400-801.

SUBTASK 29-11-00-160-001

- (8) If the defective pump is an EDP or an ADP, do these steps:
- (a) Remove, clean, and install the check valves at the pressure and case drain ports of the pump:

NOTE: If a check valve does not operate, replace it.

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- 1) For the engine-driven pump (EDP),
These are the tasks: Engine-Driven Pump (EDP) Removal,
TASK 29-11-05-000-801-002, Engine-Driven Pump (EDP) Installation,
TASK 29-11-05-400-801-002
- 2) For the air-driven pump (EDP),
These are the tasks: Air-Driven Pump (ADP) Pump Removal,
TASK 29-11-11-000-801, Air-Driven Pump (ADP) Pump Installation,
TASK 29-11-11-400-801

SUBTASK 29-11-00-960-004

- (9) If the check valve, in the filter module which has a relation to the defective pump, does not operate correctly, do one of these applicable steps:

NOTE: If a check valve does not open, the related pump will not pressurize the hydraulic system. If a check valve does not close, the FAULT light for the pump will not come on when the pump switch is in the OFF position and the system is pressurized with a different pump.

- (a) These are the tasks:

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-40-000-801,

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-40-400-801.

- (b) These are the tasks:

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-41-000-801,

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-41-400-801.

- (c) These are the tasks:

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-42-000-801,

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-42-400-801.

- (d) These are the tasks:

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-43-000-801,

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-43-400-801.

————— **END OF TASK** —————

TASK 29-11-00-170-802

12. **Main Hydraulic Systems Fluid Replacement**

A. **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)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

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Reference	Title
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
29-11-02-400-801	Center System Alternating Current Motor Pump (ACMP) Installation (P/B 401)
29-11-05-000-801-002	Engine-Driven Pump (EDP) Removal (P/B 401)
29-11-05-400-801-002	Engine-Driven Pump (EDP) Installation (P/B 401)
29-11-11-000-801	Air-Driven Pump (ADP) Pump Removal (P/B 401)
29-11-11-400-801	Air-Driven Pump (ADP) Pump Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-21-11-000-803	Nose Landing Gear Torsion Link Disconnection/Electrical Harness Storage (P/B 201)
32-21-11-400-803	Nose Landing Gear Torsion Link Connection (P/B 201)
32-30-01-720-802	Nose and Main Landing Gear Extension and Retraction Systems - Functional Test (Airplane on the Jacks) (P/B 501)
32-41-00-870-801	Alternate Hydraulic Brake System - Bleeding (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)
78-31-00-860-818-H00	Thrust Reverser Operation - Retract (Selection) (P/B 201)
78-31-00-860-819-H00	Thrust Reverser Operation - Extend (Selection) (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-1796	Portable Hydraulic Cart, System Test, Capable of 3000 PSI and a minimum flow of 50 GPM. Part #: 5830 SERIES Supplier: 59603 Part #: 58300BJ Supplier: 59603 Part #: 9780-0327 Supplier: 05172 Part #: 9780-0398 Supplier: 05172 Part #: HPPE503K-S4 Supplier: 6T605 Part #: HT2000-1-E/1-S Supplier: H6394 Part #: HT2000-1-F-S Supplier: H6394 Part #: HT50-E-F-D Supplier: H6394 Part #: PH50D Supplier: 10000 Part #: TMH3000 Supplier: L1238

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

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Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Prepare for the Main Hydraulic Systems Fluid Replacement

SUBTASK 29-11-00-860-047

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

SUBTASK 29-11-00-860-048

- (2) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-00-010-011

- (3) Do these steps to open the left thrust reverser on GE engines:



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.

- (a) For the left or right hydraulic system, do these tasks in this sequence to safely open the left thrust reverser:
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) To open the left fan cowl panel, do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.
- (d) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (e) To open the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00.

SUBTASK 29-11-00-480-006



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-007



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-11-00-860-086

- (6) For the center hydraulic system, do this task: Nose Landing Gear Torsion Link Disconnection/Electrical Harness Storage, TASK 32-21-11-000-803.

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E. Center Hydraulic System Fluid Replacement

NOTE: The center hydraulic system contains a total of approximately 89 gallons (337 liters) of hydraulic fluid. This procedure replaces approximately 60% of the total fluid in the system.

SUBTASK 29-11-00-480-008

- (1) Do these steps to connect a 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to the center hydraulic system:
 - (a) Disconnect the supply and pressure hoses from the air-driven pump (ADP) C1 (Air-Driven Pump (ADP) Pump Removal, TASK 29-11-11-000-801).
 - (b) Connect a drain hose to the ADP supply hose.
 - (c) Put the end of the drain hose in a container to collect the used hydraulic fluid.
 - (d) Connect the pressure hose of a 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to the ADP pressure hose.

SUBTASK 29-11-00-860-049

- (2) Set the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to pressurize the center hydraulic system to 3000 psi, with a flow rate of 10 to 20 gpm.

SUBTASK 29-11-00-860-050

- (3) Operate the speed brake lever to move the spoilers through 10 full cycles.

NOTE: Because you pressurize the hydraulic systems one at a time in this procedure, not all flight control surfaces will move.

SUBTASK 29-11-00-860-051

- (4) Operate the control wheel to move the ailerons through 6 full cycles.

SUBTASK 29-11-00-860-052

- (5) Make sure the stabilizer is at the 0 position.

SUBTASK 29-11-00-860-053

- (6) Operate the alternate pitch trim levers to move the stabilizer from position 0 to position 8.

SUBTASK 29-11-00-860-054

- (7) After the stabilizer stops, operate the alternate pitch trim levers to move the stabilizer from position 8 to position 0.

SUBTASK 29-11-00-860-055

- (8) Operate the rudder pedals to move the rudder through 5 full cycles.

NOTE: One cycle is the movement of the rudder from the full left position to the full right position.

SUBTASK 29-11-00-860-056

- (9) Operate the control column to move the elevators through 10 full up/down cycles.

SUBTASK 29-11-00-860-057

- (10) Make sure the flaps are in the position 0.

SUBTASK 29-11-00-860-058

- (11) Operate the flap control lever to move the flaps/slats from position 0 to position 5.

SUBTASK 29-11-00-860-059

- (12) After the flap/slats stop, operate the flap control lever to move the flaps/slats from position 5 to position 0.

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SUBTASK 29-11-00-860-060

- (13) To operate the landing gear through one full up/down cycle, do this task: Nose and Main Landing Gear Extension and Retraction Systems - Functional Test (Airplane on the Jacks), TASK 32-30-01-720-802.

SUBTASK 29-11-00-860-061

- (14) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-00-080-007

- (15) Do these steps to remove the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the center hydraulic system.
- (a) Disconnect the pressure hose of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the ADP pressure hose.
 - (b) Disconnect the drain hose from the ADP supply hose.
 - (c) Connect the supply and pressure hoses to the ADP C1 (Air-Driven Pump (ADP) Pump Installation, TASK 29-11-11-400-801).
 - (d) To pressurize the center hydraulic system with the ADP C1, do this task: Center Hydraulic System Pressurization with an Air-Driven Pump (ADP), TASK 29-11-00-860-805.
 - (e) Make sure there are no leaks at the supply and pressure hose connections to the ADP C1.
 - (f) For the center hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

F. Left Hydraulic System Fluid Replacement

NOTE: The left hydraulic system contains a total of approximately 41 gallons (155 liters) of hydraulic fluid. This procedure replaces approximately 90% of the total fluid in the system.

SUBTASK 29-11-00-480-009

- (1) Do these steps to connect a 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to the left hydraulic system:
- (a) Disconnect the supply and pressure hoses from the left engine-driven (EDP), do this task: Engine-Driven Pump (EDP) Removal, TASK 29-11-05-000-801-002.
 - (b) Connect a drain hose to the left EDP supply hose.
 - (c) Put the end of the drain hose in a container to collect the used hydraulic fluid.
 - (d) Connect the pressure hose of a 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to the left EDP pressure hose.

SUBTASK 29-11-00-860-062

- (2) Set the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to pressurize the left hydraulic system to 3000 psi, with a flow rate of 10 to 20 gpm.

SUBTASK 29-11-00-860-063

- (3) Operate the speed brake lever to move the spoilers through 12 full cycles.

NOTE: Because you pressurize the hydraulic systems one at a time in this procedure, not all flight control surfaces will move.

SUBTASK 29-11-00-860-064

- (4) Operate the control wheel to move the ailerons through 10 full cycles.

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SUBTASK 29-11-00-860-065

- (5) Operate the rudder pedals to move the rudder through 10 full cycles.

NOTE: One cycle is the movement of the rudder from the full left position to the full right position.

SUBTASK 29-11-00-860-066

- (6) Operate the control column to move the elevators through 15 full up/down cycles.

SUBTASK 29-11-00-860-067

- (7) For the left hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-00-080-008

- (8) Do these steps to remove the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the left hydraulic system.
- (a) Disconnect the pressure hose of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the left EDP pressure hose.
 - (b) Disconnect the drain hose from the left EDP supply hose.
 - (c) Connect the supply and pressure hoses to the left EDP (TASK 29-11-05-400-801-002).
 - (d) To pressurize the left hydraulic system with the EDP, do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.
 - (e) Make sure there are no leaks at the supply and pressure hose connections to the left EDP.
 - (f) For the left hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-11-00-410-011



DO ALL 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.

- (9) Do these tasks in this sequence to safely close the left thrust reverser:
- (a) To close the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
 - (b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (c) To close the left fan cowl panel, do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 29-11-00-860-068

- (10) For the left hydraulic system, do this task: Main Hydraulic System Pressurization with a Portable Hydraulic Cart, TASK 29-11-00-860-802.

SUBTASK 29-11-00-860-069

- (11) Operate the left thrust reverser through 4 full cycles

These are the tasks:

Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-860-819-H00,

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Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-860-818-H00.

NOTE: Use the power method to operate the thrust reverser.

SUBTASK 29-11-00-860-070

- (12) For the left hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

G. Right Hydraulic System Fluid Replacement

NOTE: The right hydraulic system contains a total of approximately 42 gallons (159 liters) of hydraulic fluid. This procedure replaces approximately 80% of the total fluid in the system.

SUBTASK 29-11-00-480-010

- (1) Do these steps to connect a 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to the right hydraulic system:
- (a) Disconnect the supply and pressure hoses from the right engine-driven (EDP), do this task: Engine-Driven Pump (EDP) Removal, TASK 29-11-05-000-801-002.
 - (b) Connect a drain hose to the right EDP supply hose.
 - (c) Put the end of the drain hose in a container to collect the used hydraulic fluid.
 - (d) Connect the pressure hose of a 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to the right EDP pressure hose.

SUBTASK 29-11-00-860-071

- (2) Set the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, to pressurize the right hydraulic system to 3000 psi, with a flow rate of 10 to 20 gpm.

SUBTASK 29-11-00-860-072

- (3) Operate the speed brake lever to move the spoilers through 12 full cycles.

NOTE: Because you pressurize the hydraulic systems one at a time in this procedure, not all flight control surfaces will move.

SUBTASK 29-11-00-860-073

- (4) Operate the control wheel to move the flaperons through 8 full cycles.

SUBTASK 29-11-00-860-074

- (5) Make sure the stabilizer is at the 0 position.

SUBTASK 29-11-00-860-075

- (6) Operate the alternate pitch trim levers to move the stabilizer from position 0 to position 8.

SUBTASK 29-11-00-860-076

- (7) After the stabilizer stops, operate the alternate pitch trim levers to move the stabilizer from position 8 to position 0.

SUBTASK 29-11-00-860-077

- (8) Operate the control column to move the elevators through 10 full up/down cycles.

SUBTASK 29-11-00-860-078

- (9) Operate the rudder pedals to move the rudder through 10 full cycles.

NOTE: One cycle is the movement of the rudder from the full left position to the full right position.

SUBTASK 29-11-00-870-001

- (10) Do this task: Alternate Hydraulic Brake System - Bleeding, TASK 32-41-00-870-801.

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SUBTASK 29-11-00-860-079

- (11) For the right hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-00-080-009

- (12) Do these steps to remove the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the right hydraulic system.
- (a) Disconnect the pressure hose of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, from the right EDP pressure hose.
 - (b) Disconnect the drain hose from the right EDP supply hose.
 - (c) Connect the supply and pressure hoses to the right EDP (TASK 29-11-02-400-801).
 - (d) To pressurize the right hydraulic system with the EDP, do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.
 - (e) Make sure there are no leaks at the supply and pressure hose connections to the right EDP.
 - (f) For the right hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808

SUBTASK 29-11-00-410-013



WARNING

DO ALL 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 this sequence to safely close the left thrust reverser:
- (a) To close the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
 - (b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (c) To close the left fan cowl panel, do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 29-11-00-860-080

- (14) For the right hydraulic system, do this task: Main Hydraulic System Pressurization with a Portable Hydraulic Cart, TASK 29-11-00-860-802.

SUBTASK 29-11-00-860-081

- (15) Operate the right thrust reverser through 4 full cycles.

These are the tasks:

Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-860-819-H00,

Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-860-818-H00.

NOTE: Use the power method to operate the thrust reverser.

SUBTASK 29-11-00-860-082

- (16) For the right hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-860-083

- (1) For the center hydraulic system, do this task: Nose Landing Gear Torsion Link Connection, TASK 32-21-11-400-803.

SUBTASK 29-11-00-610-004

- (2) For each hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-00-080-010



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801

————— END OF TASK —————

TASK 29-11-00-210-801

13. Main and Nose Landing Gear Hydraulic Lines and Fittings Inspection

A. References

Reference	Title
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-00-40-860-801	Landing Gear Ground Door Release System Operation (Close the Doors) (P/B 201)
32-00-40-860-802	Landing Gear Ground Door Release System Operation (Open the Doors) (P/B 201)

B. Location Zones

Zone	Area
113	Nose Landing Gear Wheel Well, Left
114	Nose Landing Gear Wheel Well, Right
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right

C. Procedure

SUBTASK 29-11-00-480-051

- (1) Make sure the landing gear downlock pins are installed on the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 29-11-00-010-053



USE THE CORRECT PROCEDURE TO OPEN THE DOORS. THE DOORS OPEN AND CLOSE QUICKLY. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Open the landing gear doors, do this task: Landing Gear Ground Door Release System Operation (Open the Doors), TASK 32-00-40-860-802.

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SUBTASK 29-11-00-210-108

- (3) Do a general visual inspection of the hydraulic lines and fittings in the nose and main landing gear areas.

SUBTASK 29-11-00-410-042



WARNING

USE THE CORRECT PROCEDURE TO OPEN OR CLOSE THE DOORS. THE DOORS OPEN AND CLOSE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (4) Close the landing gear doors, do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

SUBTASK 29-11-00-080-036

- (5) If all maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

————— END OF TASK —————

TASK 29-11-00-600-801

14. Hydraulic Fluid Transfer between the Right and Center Hydraulic Reservoir

A. General

- (1) The 777 hydraulic system is capable of transferring a small quantity of hydraulic fluid between the right and center hydraulic reservoir. This procedure can be used to transfer 0.33 gallons (1.25 liters) of hydraulic fluid from the airplane brake system through the return line of the applicable hydraulic system.

B. Hydraulic Fluid Transfer from the Right to the Center Hydraulic Reservoir

SUBTASK 29-11-00-610-011

- (1) Do these steps to transfer hydraulic fluid from the right hydraulic reservoir to the center hydraulic reservoir:
 - (a) For the right and center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) Set the parking brake.
 - (c) For the right hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
 - (d) Release the parking brake.

C. Hydraulic Fluid Transfer from the Center to the Right Hydraulic Reservoir

SUBTASK 29-11-00-610-012

- (1) Do these steps to transfer hydraulic fluid from the center hydraulic reservoir to the right hydraulic reservoir:
 - (a) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) Set the parking brake.
 - (c) For the right hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (d) Release the parking brake.

————— END OF TASK —————

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TASK 29-11-00-170-804

15. Main Hydraulic Filter and Flushing Requirements

(Table 201)

A. References

Reference	Title
29-00-00 P/B 601	HYDRAULIC POWER - INSPECTION/CHECK
29-11-00 P/B 601	MAIN (LEFT, RIGHT, AND CENTER) HYDRAULIC SYSTEMS - INSPECTION/CHECK
29-11-40 P/B 401	LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION
29-11-41 P/B 401	CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION
29-11-42 P/B 401	ENGINE-DRIVEN PUMP (EDP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION
29-11-43 P/B 401	AIR-DRIVEN PUMP (ADP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION
29-11-44 P/B 401	LEFT AND RIGHT SYSTEM RETURN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION
29-11-45 P/B 401	CENTER SYSTEM RETURN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

B. Procedure

SUBTASK 29-11-00-170-002

- (1) Use this table to determine the hydraulic system flushing and filter requirements.

Table 201/29-11-00-993-817

HYDRAULIC SYSTEM FLUSHING AND FILTER REPLACEMENT REQUIREMENTS		
CONDITION NO.	CONDITION	REQUIREMENTS
1.	Hydraulic Pump Failure - Non dirt generating (shaft seal, depressurization function or erratic operation).	1. Flushing not required. 2. Check Pressure and Case Drain pressure differential indicators (MAIN (LEFT, RIGHT, AND CENTER) HYDRAULIC SYSTEMS - INSPECTION/CHECK, PAGEBLOCK 29-11-00/601). 3. Return Filter element replacement not required.

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Table 201/29-11-00-993-817 (Continued)

HYDRAULIC SYSTEM FLUSHING AND FILTER REPLACEMENT REQUIREMENTS		
CONDITION NO.	CONDITION	REQUIREMENTS
2.	Pump Failure - Dirt generating.	1. Flush pump case drain and pressure line. Check in-line check valves. In-line check valves in the case drain and pressure lines at the EDP/ADP pumps are easily blocked by dirt generating pump. 2. Replace both Pressure and Case Filter elements (LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-40/401, CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-41/401, ENGINE-DRIVEN PUMP (EDP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-42/401, AIR-DRIVEN PUMP (ADP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-43/401).
		3. Check Return Filter pressure differential indicator and by-pass indicator (MAIN (LEFT, RIGHT, AND CENTER) HYDRAULIC SYSTEMS - INSPECTION/CHECK, PAGEBLOCK 29-11-00/601).
3.	Pump Overheat - Resulting from loss of hydraulic fluid or operating with the left or right EDP supply shut-off valve closed. CAUTION: If the pump is operated for any length of time with the EDP shut-off valve closed. Pump replacement will be required. CAUTION: Observe requirements of Condition 2. if there is evidence of Dirt Generation.	1. Take Fluid sample (HYDRAULIC POWER - INSPECTION/CHECK, PAGEBLOCK 29-00-00/601). 2. Replace Pressure and Case Drain Filter elements ((LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-40/401, CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-41/401, ENGINE-DRIVEN PUMP (EDP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-42/401, AIR-DRIVEN PUMP (ADP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-43/401). NOTE: System Flush may be required following Fluid Sample results.

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Table 201/29-11-00-993-817 (Continued)

HYDRAULIC SYSTEM FLUSHING AND FILTER REPLACEMENT REQUIREMENTS		
CONDITION NO.	CONDITION	REQUIREMENTS
4.	EDP operation with the supply shut-off valve closed. (Any length of time).	1. Replace Engine Driven Pump. 2. Replace Pressure and Case Drain Filter elements. ((LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-40/401, CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-41/401, ENGINE-DRIVEN PUMP (EDP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-42/401, AIR-DRIVEN PUMP (ADP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-43/401). 3. If evidence of dirt generation is present flush case drain line and perform Condition No. 2.
		CAUTION: In-line check valves in the case drain and pressure lines at the EDP/ADP pumps are easily blocked by dirt generating pump.
5.	Return Filter module pressure differential indicator actuates coincidental with dirt generating pump failure. Caution: If the filter by-pass indicator also shows, some hydraulic fluid flowed back to the reservoir and did not go through the return filter. It is necessary to make sure there is no contamination of the hydraulic fluid in the reservoir (AMM 29-00-00-6).	1. Replace return filter element (LEFT AND RIGHT SYSTEM RETURN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-44/401, CENTER SYSTEM RETURN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-45/401) 2. Flush applicable system as required. 3. Replace Pressure and Case Drain Filter elements of the failed pump ((LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-40/401, CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-41/401, ENGINE-DRIVEN PUMP (EDP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-42/401, AIR-DRIVEN PUMP (ADP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-43/401).
6.	Pressure filter rupture or collapse. No pump failure.	1. No flushing required. 2. Replace pressure module filter elements.

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Table 201/29-11-00-993-817 (Continued)

HYDRAULIC SYSTEM FLUSHING AND FILTER REPLACEMENT REQUIREMENTS		
CONDITION NO.	CONDITION	REQUIREMENTS
7.	System broken into for component replacement or general repair.	1. No flushing required.
8.	Excessive acid content in the hydraulic fluid.	1. No flushing required. 2. Drain and replenish with new fluid as required to attain acceptable acidity.

———— **END OF TASK** ————

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MAIN (LEFT, RIGHT, AND CENTER) HYDRAULIC SYSTEMS - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) An operational test of the engine-driven pump (EDP).
 - (2) A functional test of the air-driven pump (ADP) assembly.
 - (3) An operational test of the alternating current motor pumps (ACMP) in the center system.
 - (4) An operational test of the alternating current motor pump (ACMP) in the left and right systems.
 - (5) An operational test for the hydraulic interface module (HYDIM).
 - (6) An operational test of the center hydraulic isolation system.
 - (7) A system test of the center hydraulic isolation system.
 - (8) A system test of the supply shutoff valve for the engine-driven pump (EDP).
 - (9) A system test of the hydraulic reservoir pressurization system.
 - (10) A functional test of the air-driven pump (ADP) 1 and 2 heaters.
 - (11) An operational test of the Ground Fault Protection System for the ACMP.

TASK 29-11-00-710-801

2. Engine-Driven Pump (EDP) - Operational Test

(Figure 501)

A. General

- (1) The left and right hydraulic systems each have one engine-driven pump (EDP). You can use this procedure to do a test of the EDP in the left or the right hydraulic system.

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)
71-00-00-800-836-H00	Dry Motor (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 29-11-00-860-087

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

SUBTASK 29-11-00-610-005

- (2) 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 29-11-00-860-088

- (3) Make sure these switches, on the hydraulic control panel, are in the OFF position:

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- (a) HYDRAULIC PRIMARY L (R) ENG
- (b) HYDRAULIC DEMAND L (R) ELEC

SUBTASK 29-11-00-210-007

- (4) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel, is on.

SUBTASK 29-11-00-210-008

- (5) Make sure the FAULT light on the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, is on.

SUBTASK 29-11-00-860-089

- (6) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-210-009

- (7) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, shows to 0 to 200 psi.

SUBTASK 29-11-00-210-010

- (8) Make sure the HYDRAULIC PRIMARY PUMP PRESS L (R) indication, on the EICAS maintenance page, shows to 0 to 200 psi.

SUBTASK 29-11-00-860-090

- (9) Make sure the engine fire switch handle, for the applicable engine, on the aft aisle stand panel, P8, is in the down and locked position.

SUBTASK 29-11-00-210-011

- (10) Make sure the HYDRAULIC PRIMARY PUMP S/O VLV (L or R) indication, on the EICAS maintenance page, shows OPEN.

E. Engine-Driven Pump (EDP) - Operational Test

SUBTASK 29-11-00-970-001

- (1) Make a record of the HYDRAULIC PRIMARY PUMP TEMP L (R) indication, on the EICAS maintenance page.

NOTE: Write this indication as Value No. 1.

SUBTASK 29-11-00-860-091

- (2) Do this task: Dry Motor, TASK 71-00-00-800-836-H00.

SUBTASK 29-11-00-860-092



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.

- (3) Push the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, to the ON position.

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SUBTASK 29-11-00-210-012

- (4) Make sure the FAULT light on the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, goes off.

SUBTASK 29-11-00-210-013

- (5) Make sure the HYDRAULIC PRIMARY PUMP PRESS L (R) indication, on the EICAS maintenance page, is 2900 to 3200 psi.

SUBTASK 29-11-00-970-002

- (6) Make sure the HYDRAULIC PRIMARY PUMP TEMP L (R) indication, on the EICAS maintenance page, shows higher than the indication you wrote as Value No. 1.

SUBTASK 29-11-00-210-014

- (7) Make sure the HYDRAULIC SYSTEM PRESS L (R) indication, on the EICAS maintenance page, is 2900 to 3200 psi.

SUBTASK 29-11-00-860-093

- (8) Push the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, to the OFF position.

SUBTASK 29-11-00-210-015

- (9) Make sure the FAULT light on the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, comes on.

SUBTASK 29-11-00-860-094

- (10) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 29-11-00-210-016

- (11) Make sure the HYDRAULIC PRIMARY PUMP PRESS L (R) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

SUBTASK 29-11-00-210-017

- (12) Make sure the HYDRAULIC SYSTEM PRESS L (R) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

SUBTASK 29-11-00-860-095

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

————— **END OF TASK** —————

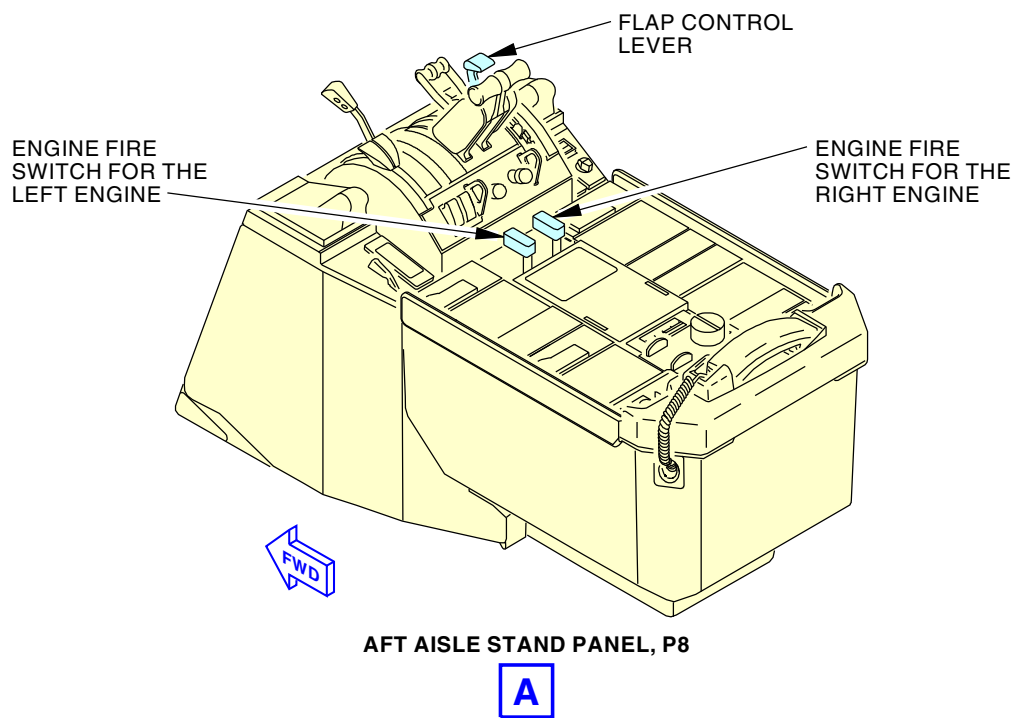
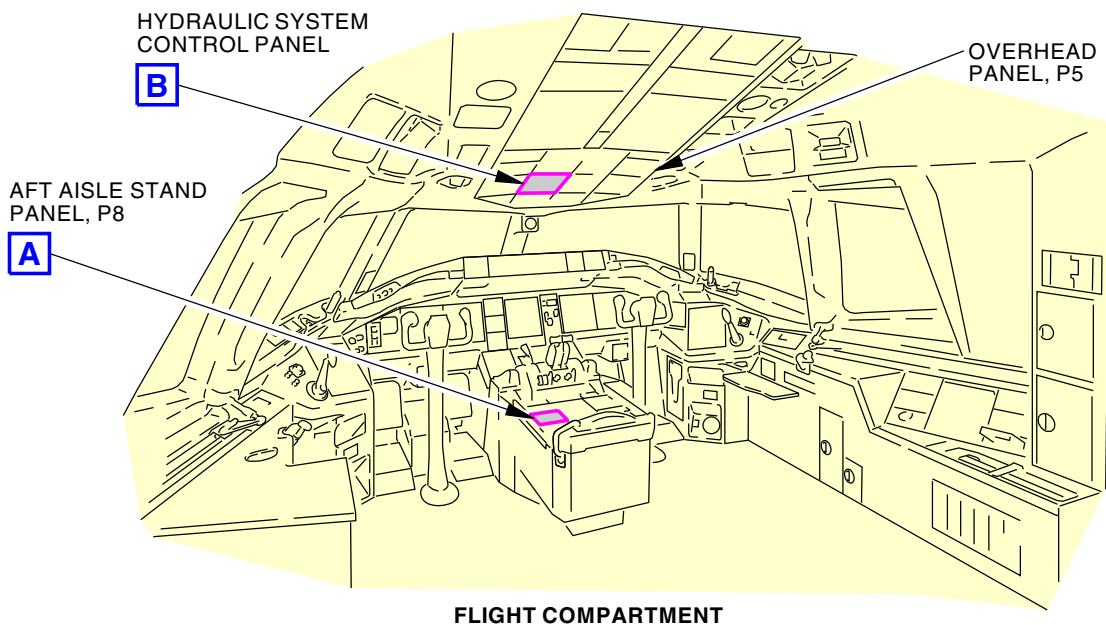
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Flight Compartment Panels
Figure 501/29-11-00-990-804 (Sheet 1 of 2)

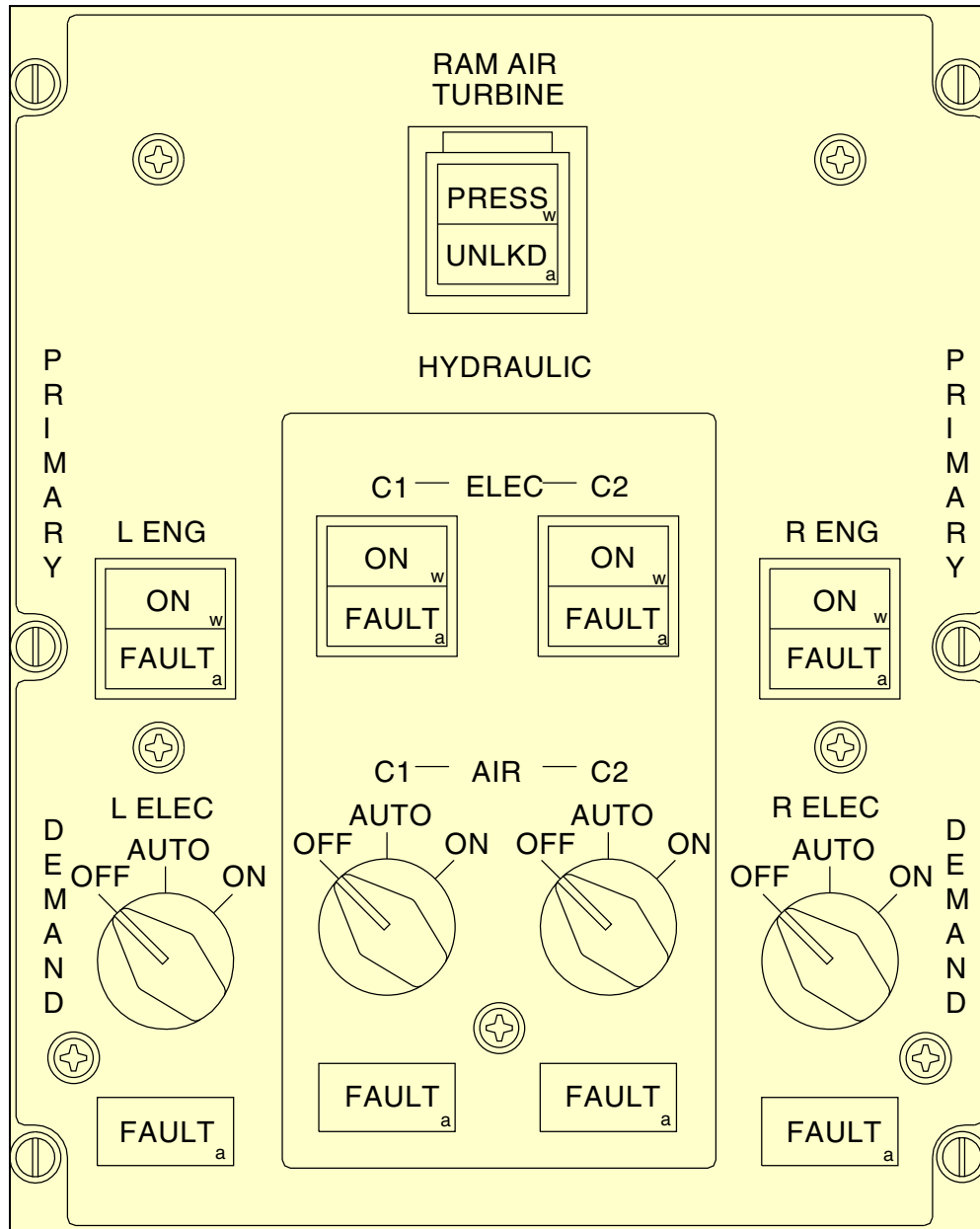
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HYDRAULIC SYSTEM CONTROL PANEL

B

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Flight Compartment Panels
Figure 501/29-11-00-990-804 (Sheet 2 of 2)

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TASK 29-11-00-710-802

3. Air-Driven Pump (ADP) Assembly - Functional Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This test makes sure that the air-driven pump (ADP) C1 or C2 and the related indications operates correctly. This includes a test of the overspeed protection, the secondary speed control, the reserve power, the AUTO/ON control, and the pressure and temperature indications. This test also resets an ADP C1 or C2 overspeed condition.
- (2) There are two air-driven pump (ADP) assemblies in the center system. They are referred to as the ADP C1 and ADP C2. The same sequence of steps is used for the ADP C1 or the ADP C2
- (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.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-13-05-610-801	Add Oil to the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) (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)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (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. Prepare for the Test

SUBTASK 29-11-00-860-096

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

SUBTASK 29-11-00-610-006

- (2) 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 29-11-00-610-007

- (3) To make sure the turbine gearbox assembly, on the air-driven pump (ADP) assembly C1 (C2), is full of lubricating oil, do this task: Add Oil to the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA), TASK 12-13-05-610-801.

SUBTASK 29-11-00-860-097

- (4) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

NOTE: Use an engine or the ground service cart to pressurize the pneumatic system. The APU does not provide the air flow necessary for the ADP test.

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E. Air-Driven Pump (ADP) C1 (C2) Ground Test on the Maintenance Access Terminal (MAT)

NOTE: This procedure does a test of the automatic functions of the ADP and the related logic speed control unit (LSCU).

SUBTASK 29-11-00-710-001

- (1) Use a maintenance access terminal (MAT) to do the functional test of the air-driven pump (ADP) C1 (C2):
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) OPERATIONAL TEST
 - 6) Air-Driven Pump (ADP) (C1, C2)
 - 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, refer to the applicable maintenance message index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

F. Air-Driven Pump (ADP) C1 (C2) Functional Test for the ON Mode.

NOTE: This procedure makes sure the ADP C1 (C2) operates correctly with the ADP switch in the ON position. This procedure also makes sure the ADP C1 (C2) pressure and temperature indication operate.

SUBTASK 29-11-00-860-098

- (1) Make sure these switches on the hydraulic control panel are in the OFF position:
 - (a) HYDRAULIC DEMAND AIR C1
 - (b) HYDRAULIC DEMAND AIR C2
 - (c) HYDRAULIC PRIMARY ELEC C1
 - (d) HYDRAULIC PRIMARY ELEC C2

SUBTASK 29-11-00-210-018

- (2) Make sure the FAULT lights below the HYDRAULIC DEMAND AIR C1 and C2 switches, on the hydraulic control panel, are on.

SUBTASK 29-11-00-210-019

- (3) Make sure the FAULT lights on the HYDRAULIC PRIMARY ELEC C1 AND C2 switches, on the hydraulic control panel, are on.

SUBTASK 29-11-00-860-099

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

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SUBTASK 29-11-00-970-003

- (5) Make a record of the HYDRAULIC DEMAND PUMP TEMP C1 (C2) indication, on the EICAS maintenance page.

NOTE: Write this indication as Value No. 1.

SUBTASK 29-11-00-860-100



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.

- (6) Set the HYDRAULIC DEMAND AIR C1 (C2) switch to the ON position.

SUBTASK 29-11-00-210-020

- (7) Make sure the FAULT light below the HYDRAULIC DEMAND AIR C1 (C2) switch, on the hydraulic control panel, goes off.

SUBTASK 29-11-00-860-101

- (8) Operate the air-driven pump C1 (C2) for approximately one minute.

SUBTASK 29-11-00-210-021

- (9) Make sure the HYDRAULIC DEMAND PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, is 2900 to 3200 psi.

SUBTASK 29-11-00-970-004

- (10) Make sure the HYDRAULIC DEMAND PUMP TEMP C1 (C2) indication, on the EICAS maintenance page, shows higher than the indication you wrote as Value No. 1.

SUBTASK 29-11-00-210-022

- (11) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, is 2900 to 3200 psi.

SUBTASK 29-11-00-860-102

- (12) Set the HYDRAULIC DEMAND AIR C1 (C2) switch to the OFF position.

SUBTASK 29-11-00-210-023

- (13) Make sure the FAULT light below the HYDRAULIC DEMAND AIR C1 (C2) switch, on the hydraulic control panel, comes on.

SUBTASK 29-11-00-860-103

- (14) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 29-11-00-210-024

- (15) Make sure the HYDRAULIC DEMAND PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

SUBTASK 29-11-00-210-025

- (16) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

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G. Air-Driven Pump C1 and C2 Functional Test for the Manual Mode

NOTE: This procedure makes sure that the ADP C1 and C2 do not operate at the same time when the two ADP switches are in the ON position.

SUBTASK 29-11-00-860-104

- (1) Set the HYDRAULIC DEMAND AIR C1 switch, on the hydraulic control panel, to the ON position.

SUBTASK 29-11-00-860-165

- (2) Set the HYDRAULIC DEMAND AIR C2 switch, on the hydraulic control panel, to the ON position.

SUBTASK 29-11-00-210-026

- (3) Make sure the HYDRAULIC DEMAND PUMP PRESS C1 indication, on the EICAS maintenance page, shows 2900 to 3200 psi.

SUBTASK 29-11-00-210-027

- (4) Make sure the HYDRAULIC DEMAND PUMP PRESS C2 indication, on the EICAS maintenance page, shows 0 to 200 psi.

SUBTASK 29-11-00-210-028

- (5) Make sure the FAULT light below the HYDRAULIC DEMAND AIR C1 switch, on the hydraulic control panel, goes off.

SUBTASK 29-11-00-210-029

- (6) Make sure the FAULT light below the HYDRAULIC DEMAND AIR C2 switch, on the hydraulic control panel, is on.

NOTE: This FAULT light will possibly go off for 2 seconds and then come on again.

SUBTASK 29-11-00-860-105

- (7) Set the HYDRAULIC DEMAND AIR C1 and C2 switches, on the hydraulic control panel, to the OFF position.

SUBTASK 29-11-00-210-030

- (8) Make sure the HYDRAULIC DEMAND PUMP PRESS C1 indication, on the EICAS maintenance page, shows 0 to 200 psi.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-860-106

- (1) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

————— END OF TASK —————

TASK 29-11-00-710-803

4. Center System Alternating Current Motor Pumps (ACMP) - Operational Test

(Figure 501)

A. General

- (1) This test makes sure that the alternating current motor pumps (ACMP) C1 or C2 and the related indications operate correctly. This includes a test of the pressure and temperature indications.
- (2) There are two alternating current motor pumps (ACMP) in the center system. They are referred to as the ACMP C1 and ACMP C2. You can use this procedure to do a test of the ACMP C1 or ACMP C2

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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)

C. Location Zones

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

D. Procedure

SUBTASK 29-11-00-860-166

- (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 29-11-00-860-107

- (2) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the off position .

SUBTASK 29-11-00-860-108

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

SUBTASK 29-11-00-610-008

- (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 29-11-00-860-109

- (5) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-210-031

- (6) Make sure HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, is 0 to 200 psi.

SUBTASK 29-11-00-210-032

- (7) Make sure the FAULT light on the HYDRAULIC PRIMARY ELEC C1 (C2) switch, on the hydraulic control panel, is on.

SUBTASK 29-11-00-970-005

- (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 29-11-00-860-110



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.

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(WARNING PRECEDES)



DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION ON EICAS IS MORE THAN 105 °C OR BLANK 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.

SUBTASK 29-11-00-210-033

- (10) Make sure the HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 29-11-00-860-167

- (11) Let the hydraulic pump operate for at least one minute, before you do the step which follows.

SUBTASK 29-11-00-970-006

- (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 29-11-00-210-034

- (13) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 29-11-00-210-035

- (14) Make sure the FAULT light on the HYDRAULIC PRIMARY ELEC C1 (C2) switch, on the hydraulic control panel, goes off.

SUBTASK 29-11-00-860-111

- (15) Push the HYDRAULIC PRIMARY ELEC C1 (C2) switch to the OFF position.

SUBTASK 29-11-00-210-036

- (16) Make sure the FAULT light on the HYDRAULIC PRIMARY ELEC C1 (C2) switch, on the hydraulic control panel, comes on.

SUBTASK 29-11-00-860-112

- (17) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 29-11-00-210-037

- (18) Make sure the HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

SUBTASK 29-11-00-860-168

- (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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TASK 29-11-00-730-801

5. Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test

A. General

- (1) This test makes sure that the alternating current motor pumps (ACMP) and the related indications, in the left and right hydraulic systems, operate correctly. This includes a test of the pressure and temperature indications.
- (2) The left and right hydraulic systems each have one alternating current motor pump (ACMP). You can use this procedure to do a test of the ACMP in the left or the right hydraulic system.

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)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Prepare for the Test

SUBTASK 29-11-00-860-113

- (1) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the off position (Figure 501).

SUBTASK 29-11-00-860-114

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

SUBTASK 29-11-00-610-009

- (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 29-11-00-860-115

- (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 29-11-00-210-038

- (1) Make sure HYDRAULIC PRIMARY PUMP PRESS left (right) indication, on the EICAS maintenance page, is 0 to 200 psi.

SUBTASK 29-11-00-210-039

- (2) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel, is on (Figure 501).

SUBTASK 29-11-00-970-007

- (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.

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SUBTASK 29-11-00-860-116



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 BLANK 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 29-11-00-210-040

- (5) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 29-11-00-860-169

- (6) Let the hydraulic pump operate for at least one minute, before you do the step which follows.

SUBTASK 29-11-00-970-008

- (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 29-11-00-210-041

- (8) Make sure the HYDRAULIC SYSTEM PRESS L (R) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 29-11-00-210-042

- (9) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel, goes off.

SUBTASK 29-11-00-860-117

- (10) Set the HYDRAULIC DEMAND L (R) ELEC switch to the OFF position.

SUBTASK 29-11-00-210-043

- (11) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel, comes on.

SUBTASK 29-11-00-860-118

- (12) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 29-11-00-210-044

- (13) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

SUBTASK 29-11-00-860-207



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.

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(WARNING PRECEDES)



DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION ON EICAS IS MORE THAN 105 °C OR BLANK 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 29-11-00-710-005

- (15) Make sure the HYDRAULIC DEMAND PUMP PRESS L (R) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 29-11-00-860-208

- (16) Set the HYDRAULIC DEMAND L (R) ELEC switch to the OFF position.

SUBTASK 29-11-00-860-209

- (17) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

SUBTASK 29-11-00-210-077

- (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 29-11-00-710-804

6. Hydraulic Interface Module (HYDIM) - Operational Test

A. General

- (1) The hydraulic interface module (HYDIM) has four circuit cards. The circuit card, L, is in the left system and the circuit card, R, is in the right system. The circuit cards, CL and CR, are in the center system.
- (2) This test makes sure the HYDIM card for each hydraulic system operates correctly.
- (3) The same sequence of steps is used for the HYDIM cards L, CL, CR, and R.
- (4) 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
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 29-11-00-860-119

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

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SUBTASK 29-11-00-710-002

- (2) Use a maintenance access terminal (MAT) to do the LRU replacement test of the HYDIM cards L, R, CL, and CR.
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) LRU REPLACEMENT TEST
 - 6) HYDIM (L, CL, CR, R)
 - 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

————— END OF TASK —————

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TASK 29-11-00-710-805

7. Center Hydraulic Isolation System - Operational Test

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This test makes sure that the center hydraulic isolation system (CHIS) control and indication functions operate correctly. The nose gear isolation and reserve isolation valves will close and then open. The command to inhibit the slat operation will be sent to each flap slat electronic unit (FSEU) in sequence.
- (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
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 29-11-00-860-120

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

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SUBTASK 29-11-00-710-003

- (2) Use a maintenance access terminal (MAT) to do the operational test of the center hydraulic isolation system.
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) OPERATIONAL TEST
 - 6) Center Hydraulic Isolation 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

————— END OF TASK —————

TASK 29-11-00-730-802

8. Center Hydraulic Isolation System - System Test

A. General

- (1) 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
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-12-01-680-801	Hydraulic Reservoir Fluid Level Lowering or Draining (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)
32-21-11-000-803	Nose Landing Gear Torsion Link Disconnection/Electrical Harness Storage (P/B 201)
32-21-11-400-803	Nose Landing Gear Torsion Link Connection (P/B 201)
34-11-00-780-801	Static and Total Air Pressure System - Pressurization (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Tools/Equipment

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

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Reference	Description
COM-1579	Analyzer - Databus, Datatrak Models 600, 650, 650H Part #: DT-600 Supplier: 0Z3C6 Opt Part #: 01-1405-00 Supplier: 41364 Opt Part #: 01-1406-00 Supplier: 41364 Opt Part #: 01-1407-00 Supplier: 41364 Opt Part #: 100-600-001 Supplier: 41364 Opt Part #: 100-650-001 Supplier: 41364 Opt Part #: 100-655-001 Supplier: 41364
COM-1914	Test Set - Air Data Model FLMTS (Flight Line Maintenance) Part #: 18910920000 Supplier: 89944 Part #: ADTS405F Supplier: U0427 Part #: ADTS530 Supplier: U0427 Part #: ADTS552F Supplier: U0427 Part #: D60340MK Supplier: K1474 Part #: DPS1000 Supplier: 21844 Part #: DPS350 Supplier: 21844 Part #: DPS450 Supplier: 21844 Part #: MODEL 6300 Supplier: ORDZ5 Part #: MPS34C Supplier: 48RQ2 Part #: MPS43B Supplier: A0197 Part #: MPS45 Supplier: 48RQ2 Part #: MPS49 Supplier: 48RQ2 Opt Part #: 01-0987-00 Supplier: 41364 Opt Part #: 18910480000 Supplier: 89944 Opt Part #: ADTS505 Supplier: U0427 Opt Part #: D60302 Supplier: K1474 Opt Part #: D60340 Supplier: K1474 Opt Part #: D60383 Supplier: K1474 Opt Part #: DPS500 Supplier: 21844 Opt Part #: MPS31C Supplier: 48RQ2 Opt Part #: MPS43 Supplier: A0197
COM-1916	Adapter - Pitot Test (Typically included in Air Data Accessory Kit) Part #: 509767 Supplier: 53949 Part #: 884EH Supplier: 59885 Part #: 884EH-3 Supplier: 59885 Part #: CSA77700HT-3 Supplier: 3BSK6 Part #: P77796HT-3 Supplier: 38002
SPL-1499	Pin - Lock, NLG Towing Lever Part #: A09003-2 Supplier: 81205 Opt Part #: A09003-1 Supplier: 81205

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
144	Main Landing Gear Wheel Well, Right
212	Flight Compartment, Right

E. Procedure

SUBTASK 29-11-00-860-121

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

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SUBTASK 29-11-00-710-004

- (2) Use a maintenance access terminal (MAT) to do the operational test of the center hydraulic isolation system.
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) OPERATIONAL TEST
 - 6) Center Hydraulic Isolation 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

SUBTASK 29-11-00-860-122

- (3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-610-010

- (4) For the center system reservoir, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-00-210-045

- (5) Make sure the HYDRAULIC NOSE GR ISLN: VALVE POS indication, on the EICAS maintenance page, shows NORM.

SUBTASK 29-11-00-860-256

- (6) Use one of the two methods that follow to simulate airspeed:
 - (a) To simulate airspeed with an air data model test set, COM-1914, do these steps:
 - 1) Prepare to pressurize the left pitot system (Static and Total Air Pressure System - Pressurization, TASK 34-11-00-780-801).
 - 2) Make sure the ADIRU switch on the overhead panel, P5, is ON.



CAUTION

MAKE SURE THAT THE PRESSURE IN THE ADM IS NOT TOO HIGH. PRESSURE THAT IS MORE THAN 39.865 INCHES HG WILL CAUSE DAMAGE TO THE ADM.

- 3) Operate the air data test set to apply a pitot pressure equivalent to 70 knots.
 - (b) To simulate airspeed with an databus analyzer, COM-1579, do these steps:
 - 1) Set the ADIRU switch, on the overhead panel, P5, to the OFF position.

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- 2) Disconnect one of these electrical connectors on the Data Bus Panel - L (Flight Controls), P112:

NOTE: The Data Bus Panel - L, P112, is on the left side of the main equipment center, on the outboard side of the nose wheel well.

- a) Connector DB34106 on the ARINC 629 coupler B34106 at the location E1.
b) Connector DB34105 on the ARINC 629 coupler B34105 at the location E6.
- 3) Connect the databus analyzer, COM-1579 to the ARINC 629 coupler B34105 or B34106.
- 4) Do this step to send a signal that the airspeed is more than 60 knots:
- a) Set the databus analyzer, COM-1579 to transmit this ARINC 629 wordstring on the left flight controls bus with this data:

Table 501/29-11-00-993-825

TI	05.0 (ms)				
TG	16				
SG	32				
LABEL	FED				
CID	0				
WORD 1	(HEXM)	X	0	0	0
WORD 2	(HEXM)	0	4	6	0
WORD 3	(HEXM)	0	0	0	0
WORD 4	(HEXM)	0	0	0	0
WORD 5	(HEXM)	0	0	1	9
WORD 6	(HEXM)	0	0	1	9
WORD 7	(HEXM)	0	0	0	0
WORD 8	(HEXM)	0	0	0	0
WORD 9	(HEXM)	0	0	0	0
WORD 10	(HEXM)	0	0	0	0
WORD 11	(HEXM)	0	0	0	0
WORD 12	(HEXM)	0	0	0	0
WORD 13	(HEXM)	0	0	0	0
WORD 14	(HEXM)	X	X	X	X

NOTE:

- 1) Label FED, ADIRU ADR PRESS and TEMPPARAMETERS.
2) Word 1 Bits 10-0 are the ParameterValidity Bits, all must equal 0.
3) Word 1 Bits 15-12 are the freshnesscounter.
4) Word 2 is the Computed Airspeed (CAS)set to 70 knots.
5) Words 5-6 is the Altitude (ALT) setto 100 feet.
6) Word 14 compute the Cyclic RedundancyCheck (CRC).
7) Word 1 and 14, X can be any numberincluding 0.

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- 5) Set the databus analyzer, COM-1579 to transmit the ADIRU Healthy, ARINC 629, wordstring on the left flight controls bus with this data:

Table 502/29-11-00-993-826

TI	05.0 (ms)				
TG	16				
SG	32				
LABEL	FE8				
CID	0				
WORD 1	(HEXM)	0	0	0	0
WORD 2	(HEXM)	X	0	0	0
WORD 3	(HEXM)	0	0	0	0
WORD 4	(HEXM)	0	0	0	0
WORD 5	(HEXM)	0	0	0	0
WORD 6	(HEXM)	0	0	0	0
WORD 7	(HEXM)	0	3	8	0
WORD 8	(HEXM)	0	0	0	0
WORD 9	(HEXM)	0	0	0	0
WORD 10	(HEXM)	0	0	0	0
WORD 11	(HEXM)	0	0	0	0
WORD 12	(HEXM)	0	0	0	0
WORD 13	(HEXM)	0	0	0	0
WORD 14	(HEXM)	X	X	X	X

NOTE:

- 1) Label FE8, ADIRU SYSTEM STATUS WORDSTRING.
- 2) Word 1 System Status Word.
- 3) Word 2 Parameter Validity Word - Freshness Counter Bits 15-12.
- 4) Word 14 compute the Cyclic RedundancyCheck (CRC).
- 5) Word 2 and 14, X can be any number including 0.

SUBTASK 29-11-00-860-126

- (7) Set the FLT CONTROL HYD POWER C WING and TAIL switches, on the overhead maintenance panel, P61, to the SHUTOFF position.
- (a) Make sure the related VALVE CLOSED lights on the overhead maintenance panel, P61, come on.

SUBTASK 29-11-00-860-127

- (8) Push the HYDRAULIC PRIMARY ELEC C1 and C2 switches, on the hydraulic control panel, to the ON position (Figure 501).
- (a) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, shows 2700 to 3200 psi.

SUBTASK 29-11-00-860-128

- (9) Do these steps to make sure the slats will operate in the primary mode:

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- (a) Move the flap control lever, on the control stand, from the UP position to the 1-unit position (Figure 501).
 - 1) Make sure the slats move, in the primary mode, to a position that agrees with the flap control lever.
- (b) Move the flap control lever, on the control stand, from the 1-unit position to the UP position.
 - 1) Make sure the slats move, in the primary mode, to a position that agrees with the flap control lever.

SUBTASK 29-11-00-860-129

- (10) Push the HYDRAULIC PRIMARY ELEC C1 switch, on the hydraulic control panel, to the OFF position (Figure 501).

SUBTASK 29-11-00-680-001

- (11) To lower the fluid level in the center reservoir to 0.37, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

SUBTASK 29-11-00-210-046

- (12) Make sure these EICAS advisory messages show:
 - (a) HYD QTY LOW C
 - (b) RESERVE BRAKES/STRG

SUBTASK 29-11-00-210-047

- (13) Make sure the HYDRAULIC NOSE GR ISLN: VALVE POS indication, on the EICAS maintenance page, shows ISLN.

SUBTASK 29-11-00-210-048

- (14) Make sure the HYDRAULIC RESERVE ISLN: VALVE POS indication, on the EICAS maintenance page, shows ISLN.

SUBTASK 29-11-00-210-049

- (15) Make sure the valve position indicator, on the nose gear isolation valve, is in the closed position (Figure 502).

SUBTASK 29-11-00-210-050

- (16) Make sure the valve position indicator, on the reserve isolation valve, is in the closed position (Figure 502).

SUBTASK 29-11-00-790-001

- (17) Do these steps to make sure that the nose gear isolation valve does not have a leak:
 - (a) Do this task: Nose Landing Gear Torsion Link Disconnection/Electrical Harness Storage, TASK 32-21-11-000-803.
 - (b) Remove the NLG towing lever pin, SPL-1499, for the towing lever from the metering valve for nose wheel steering.
 - (c) Make a record of the position of the nose landing gear.

NOTE: On the nose landing gear, the graduated scales on the steering collar and the arrows on the lower support plate show the angular position of the wheels.
 - (d) Push the HYDRAULIC PRIMARY ELEC C1 switch on the hydraulic control panel to the ON position (Figure 501).
 - 1) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, shows 2700 to 3200 psi.

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WARNING

KEEP PERSONS AND EQUIPMENT CLEAR OF THE NOSE AND MAIN LANDING GEAR WHEELS AND TIRES. THESE COMPONENTS CAN MOVE WHEN YOU OPERATE THE STEERING TILLER. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (e) Turn the Captain's or First Officer's steering tiller clockwise or counterclockwise to its stop and hold it there for at least 5 minutes.
 - 1) Make sure the nose gear steering does not turn the nose gear more than 4 degrees.
- NOTE: When you move the steering tiller, the main gear steering will move the aft axle of each main landing gear.
- (f) Release the Captain's or First Officer's steering tiller.



WARNING

ONLY USE THE CORRECT PIN FOR THE AIRPLANE MODEL. IF YOU USE AN INCORRECT PIN, THE HYDRAULIC STEERING CAN OPERATE. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (g) Install the NLG towing lever pin, SPL-1499, for the towing lever from the metering valve for nose wheel steering.
- (h) Do this task: Nose Landing Gear Torsion Link Connection, TASK 32-21-11-400-803.
- (i) Push the HYDRAULIC PRIMARY ELEC C2 switch on the hydraulic control panel to the OFF position (Figure 501).
- NOTE: The nose gear isolation valve will open when the pressure in the center system becomes less than 1200 psi for more than 30 seconds. This valve will close again when the pressure in the center system becomes more than 1200 psi.

SUBTASK 29-11-00-860-130

- (18) Set the FLT CONTROL HYD POWER C WING and TAIL switches, on the overhead maintenance panel, P61, to the NORM position.
 - (a) Make sure the related VALVE CLOSED lights on the overhead maintenance panel, P61, go off.

SUBTASK 29-11-00-860-131

- (19) Let the internal leakage, in the center hydraulic system, decrease the hydraulic system pressure to 0-80 psi.

SUBTASK 29-11-00-860-132

- (20) Set the FLT CONTROL HYD POWER C WING and TAIL switches, on the overhead maintenance panel, P61, to the SHUTOFF position.
 - (a) Make sure the related VALVE CLOSED lights on the overhead maintenance panel, P61, come on.

SUBTASK 29-11-00-790-002

- (21) Do these steps to make sure the reserve isolation valve does not have a leak:
 - (a) Monitor the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, for at least 2 minutes.
 - 1) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, does not increase more than 20 psi.

SUBTASK 29-11-00-860-133

- (22) Push the HYDRAULIC PRIMARY ELEC C2 switch on the hydraulic control panel to the ON position.

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SUBTASK 29-11-00-860-134

- (23) Push the HYDRAULIC PRIMARY ELEC C1 switch on the hydraulic control panel to the OFF position.

SUBTASK 29-11-00-860-264

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

Right Power Panel, P200

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

ARO 011-999

B	1	C27300	SLATS ELEC MOT PWR

ARO 001-010

B	3	C27300	SLATS ELEC MOT PWR

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SUBTASK 29-11-00-860-135

- (25) Move the flap control lever, on the control stand, from the UP position to the 1-unit position (Figure 501).
- (a) Make sure the EICAS message, SLATS DRIVE, shows on the EICAS display.
- (b) Make sure the slats do not move.

SUBTASK 29-11-00-860-136

- (26) Move the flap control lever, on the control stand, from the 1-unit position to the UP position.

SUBTASK 29-11-00-860-267

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

Right Power Panel, P200

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

ARO 011-999

B	1	C27300	SLATS ELEC MOT PWR

ARO 001-010

B	3	C27300	SLATS ELEC MOT PWR

ARO ALL

SUBTASK 29-11-00-780-001

- (28) If you use the air data model test set, COM-1914 to simulate airspeed, do this step:



CAUTION

MAKE SURE THAT THE PRESSURE IN THE ADM IS NOT TOO HIGH. PRESSURE THAT IS MORE THAN 39.865 INCHES HG WILL CAUSE DAMAGE TO THE ADM.

- (a) Operate the air data test set to apply a pitot pressure equivalent to 50 knots.

SUBTASK 29-11-00-860-249

- (29) If you use the databus analyzer, COM-1579 to simulate airspeed, do this step:
- (a) Do this step to send a signal that the airspeed is less than 60 knots:
- 1) Set the databus analyzer, COM-1579 to transmit this ARINC 629 wordstring on the left flight controls bus with this data:

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Table 503/29-11-00-993-827

TI	05.0 (ms)				
TG	16				
SG	32				
LABEL	FED				
CID	0				
WORD 1	(HEXM)	X	0	0	0
WORD 2	(HEXM)	0	3	2	0
WORD 3	(HEXM)	0	0	0	0
WORD 4	(HEXM)	0	0	0	0
WORD 5	(HEXM)	0	0	1	9
WORD 6	(HEXM)	0	0	1	9
WORD 7	(HEXM)	0	0	0	0
WORD 8	(HEXM)	0	0	0	0
WORD 9	(HEXM)	0	0	0	0
WORD 10	(HEXM)	0	0	0	0
WORD 11	(HEXM)	0	0	0	0
WORD 12	(HEXM)	0	0	0	0
WORD 13	(HEXM)	0	0	0	0
WORD 14	(HEXM)	X	X	X	X

NOTE:

- 1) Label FED, ADIRU ADR PRESS and TEMPPARAMETERS.
- 2) Word 1 Bits 10-0 are the ParameterValidity Bits, all must equal 0.
- 3) Word 1 Bits 15-12 are the freshnesscounter.
- 4) Word 2 is the Computed Airspeed (CAS)set to 50 knots.
- 5) Words 5-6 is the Altitude (ALT) setto 100 feet.
- 6) Word 14 compute the Cyclic RedundancyCheck (CRC).
- 7) Word 1 and 14, X can be any numberincluding 0.

SUBTASK 29-11-00-210-051

- (30) Make sure the HYDRAULIC NOSE GR ISLN: VALVE POS indication, on the EICAS maintenance page, shows NORM.

SUBTASK 29-11-00-210-052

- (31) Make sure the valve position indicator, on the nose gear isolation valve, is in the open position (Figure 502).

SUBTASK 29-11-00-780-002

- (32) If you use the air data model test set, COM-1914 to simulate airspeed, do this step:



MAKE SURE THAT THE PRESSURE IN THE ADM IS NOT TOO HIGH. PRESSURE THAT IS MORE THAN 39.865 INCHES HG WILL CAUSE DAMAGE TO THE ADM.

- (a) Operate the air data test set to apply a pitot pressure equivalent to 70 knots.

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SUBTASK 29-11-00-860-251

- (33) If you use the databus analyzer, COM-1579 to simulate airspeed, do this step:
- (a) Do this step to send a signal that the airspeed is more than 60 knots:
- 1) Set the databus analyzer, COM-1579 to transmit this ARINC 629 wordstring on the left flight controls bus with this data:

Table 504/29-11-00-993-828

TI	05.0 (ms)				
TG	16				
SG	32				
LABEL	FED				
CID	0				
WORD 1	(HEXM)	X	0	0	0
WORD 2	(HEXM)	0	4	6	0
WORD 3	(HEXM)	0	0	0	0
WORD 4	(HEXM)	0	0	0	0
WORD 5	(HEXM)	0	0	1	9
WORD 6	(HEXM)	0	0	1	9
WORD 7	(HEXM)	0	0	0	0
WORD 8	(HEXM)	0	0	0	0
WORD 9	(HEXM)	0	0	0	0
WORD 10	(HEXM)	0	0	0	0
WORD 11	(HEXM)	0	0	0	0
WORD 12	(HEXM)	0	0	0	0
WORD 13	(HEXM)	0	0	0	0
WORD 14	(HEXM)	X	X	X	X

NOTE:

- 1) Label FED, ADIRU ADR PRESS and TEMPPARAMETERS.
- 2) Word 1 Bits 10-0 are the ParameterValidity Bits, all must equal 0.
- 3) Word 1 Bits 15-12 are the freshnesscounter.
- 4) Word 2 is the Computed Airspeed (CAS)set to 70 knots.
- 5) Words 5-6 is the Altitude (ALT) setto 100 feet.
- 6) Word 14 compute the Cyclic RedundancyCheck (CRC).
- 7) Word 1 and 14, X can be any numberincluding 0.

SUBTASK 29-11-00-210-053

- (34) Make sure these EICAS advisory messages show:
- (a) HYD QTY LOW C
- (b) RESERVE BRAKES/STRG

SUBTASK 29-11-00-210-054

- (35) Make sure the HYDRAULIC NOSE GR ISLN; VALVE POS indication, on the EICAS maintenance page, shows ISLN.

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SUBTASK 29-11-00-860-175

- (36) Set the FLT CONTROL HYD POWER C WING and TAIL switches, on the overhead maintenance panel, P61, to the NORM position.
- (a) Make sure the related VALVE CLOSED lights on the overhead maintenance panel, P61, go off.

SUBTASK 29-11-00-860-139

- (37) Push the HYDRAULIC PRIMARY ELEC C2 switch, on the hydraulic control panel, to the OFF position (Figure 501).

SUBTASK 29-11-00-860-140

- (38) Let the internal leakage, in the center hydraulic system, decrease the hydraulic system pressure.

SUBTASK 29-11-00-210-055

- (39) Make sure this condition occurs in less than 32 seconds after the pressure in the center system decreases to 1200 psi:
- (a) The HYDRAULIC NOSE GR ISLN; VALVE POS indication, on the EICAS maintenance page, shows NORM.

SUBTASK 29-11-00-780-003

- (40) If you use the air data model test set, COM-1914 to simulate airspeed, do this step:



MAKE SURE THAT THE PRESSURE IN THE ADM IS NOT TOO HIGH. PRESSURE THAT IS MORE THAN 39.865 INCHES HG WILL CAUSE DAMAGE TO THE ADM.

- (a) Operate the air data test set to apply a pitot pressure equivalent to 50 knots.

SUBTASK 29-11-00-860-253

- (41) If you use the databus analyzer, COM-1579 to simulate airspeed, do this step:
- (a) Do these steps to send a signal that the airspeed is less than 60 knots:
- NOTE:** The nose gear isolation valve will stay in the open position.
- 1) Set the databus analyzer, COM-1579 to transmit this ARINC 629 wordstring on the left flight controls bus with this data:

Table 505/29-11-00-993-829

TI	05.0 (ms)				
TG	16				
SG	32				
LABEL	FED				
CID	0				
WORD 1	(HEXM)	X	0	0	0
WORD 2	(HEXM)	0	3	2	0
WORD 3	(HEXM)	0	0	0	0
WORD 4	(HEXM)	0	0	0	0
WORD 5	(HEXM)	0	0	1	9
WORD 6	(HEXM)	0	0	1	9

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Table 505/29-11-00-993-829 (Continued)

WORD 7	(HEXM)	0	0	0	0
WORD 8	(HEXM)	0	0	0	0
WORD 9	(HEXM)	0	0	0	0
WORD 10	(HEXM)	0	0	0	0
WORD 11	(HEXM)	0	0	0	0
WORD 12	(HEXM)	0	0	0	0
WORD 13	(HEXM)	0	0	0	0
WORD 14	(HEXM)	X	X	X	X

NOTE:

- 1) Label FED, ADIRU ADR PRESS and TEMPPARAMETERS.
- 2) Word 1 Bits 10-0 are the ParameterValidity Bits, all must equal 0.
- 3) Word 1 Bits 15-12 are the freshnesscounter.
- 4) Word 2 is the Computed Airspeed (CAS)set to 50 knots.
- 5) Words 5-6 is the Altitude (ALT) setto 100 feet.
- 6) Word 14 compute the Cyclic RedundancyCheck (CRC).
- 7) Word 1 and 14, X can be any numberincluding 0.

SUBTASK 29-11-00-720-001

- (42) Monitor the HYDRAULIC RESERVOIR QTY C and the RESERVE ISLN: VALVE POS indications on the EICAS maintenance page while you do these steps:
 - (a) To slowly fill the reservoir in the center hydraulic system until the HYDRAULIC RESERVOIR QTY C indication shows 1.00, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.
 - (b) Make sure HYDRAULIC RESERVE ISLN: VALVE POS indication, on the EICAS maintenance page, changes from ISLN to NORM in less than 6 seconds after the HYDRAULIC RESERVOIR QTY C indication becomes 0.71.

SUBTASK 29-11-00-210-056

- (43) Make sure these EICAS advisory messages do not show:
 - (a) HYD QTY LOW C
 - (b) RESERVE BRAKES/STRG

SUBTASK 29-11-00-210-057

- (44) Make sure the HYDRAULIC NOSE GR ISLN: VALVE POS indication, on the EICAS maintenance page, shows NORM.

SUBTASK 29-11-00-210-058

- (45) Make sure the HYDRAULIC RESERVE ISLN: VALVE POS indication, on the EICAS maintenance page, shows NORM.

SUBTASK 29-11-00-720-002

- (46) Do these steps to make sure the slats will operate in the primary mode:
 - (a) Push these switches, on the hydraulic control panel, to the ON position (Figure 501):
 - 1) HYDRAULIC PRIMARY ELEC C1
 - 2) HYDRAULIC PRIMARY ELEC C2
 - (b) Move the flap control lever, on the control stand, from the UP position to the 1-unit position (Figure 501).

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- 1) Make sure the slats move, in the primary mode, to a position that agrees with the flap control lever.
 - (c) Move the flap control lever, on the control stand, from the 1-unit position to the UP position.
 - 1) Make sure the slats move, in the primary mode, to a position that agrees with the flap control lever.
 - (d) Push these switches, on the hydraulic control panel, to the OFF position:
 - 1) HYDRAULIC PRIMARY ELEC C1
 - 2) HYDRAULIC PRIMARY ELEC C2
- SUBTASK 29-11-00-080-035
- (47) If you use the air data model test set, COM-1914 to simulate airspeed, do these steps to remove the air data model test set, COM-1914:



CAUTION

DO NOT DISCONNECT THE PITOT SYSTEM TEST ADAPTER WHEN THE PITOT-STATIC SYSTEM IS NOT AT AMBIENT PRESSURE. DAMAGE TO THE AIR DATA MODULES CAN OCCUR IF THE SYSTEM IS NOT AT AMBIENT PRESSURE.

- (a) Disconnect the air data model test set, COM-1914 from the pitot test adapter, COM-1916.
- (b) Remove the pitot test adapter, COM-1916 from the pitot probe.
- (c) Remove the safety tags and close these circuit breakers:

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	CBC7-C	PITOT ADM

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	CBC7-R	PITOT ADM

- (d) 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>
H	6	C30424	PH C PITOT PROBE HTR L
M	25	C30624	PROBE/VANE HTR CTRL L

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C30423	PH C PITOT PROBE HTR R
G	26	C30425	PH C PITOT PROBE HTR C
L	10	C30623	PROBE/VANE HTR CTRL R
L	11	C30625	PITOT PROBE HTR C CTRL

SUBTASK 29-11-00-080-011

- (48) If you use the databus analyzer, COM-1579 to simulate airspeed, do these steps to remove the databus analyzer, COM-1579:
- (a) Disconnect the databus analyzer, COM-1579 from the ARINC 629 coupler B34105 or B34106.

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- (b) Install the electrical connector on the ARINC 629 coupler B34105 or B34106, on the Data Bus Panel - L (Flight Controls), P112:

NOTE: The Data Bus Panel - L, P112, is on the left side of the main equipment center, on the outboard side of the nose wheel well.

- 1) Connector DB34106 on the ARINC 629 coupler B34106 at the location E1.
- 2) Connector DB34105 on the ARINC 629 coupler B34105 at the location E6.

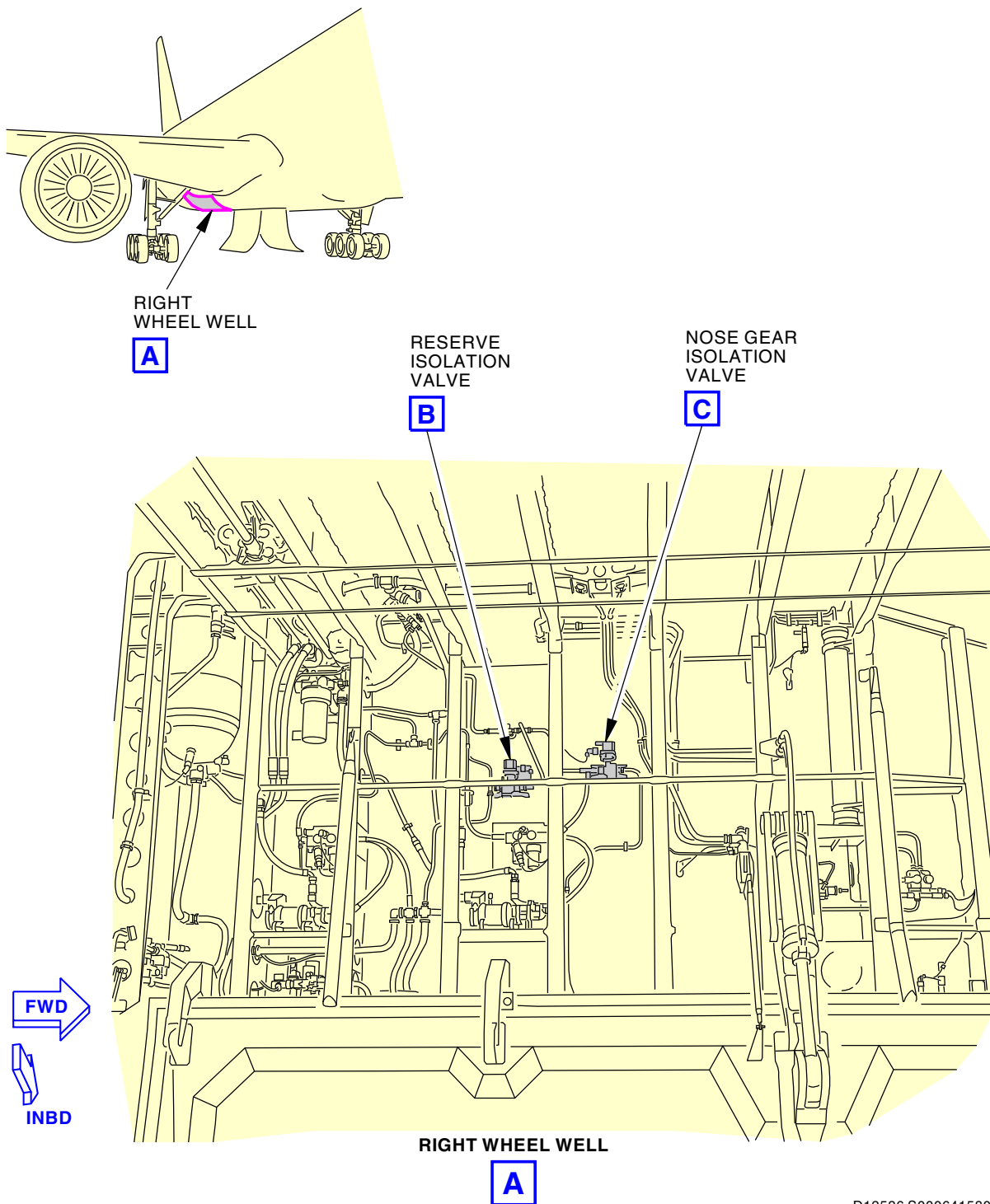
———— **END OF TASK** ————

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D12536 S0006415800_V2

**Center Hydraulic Isolation System Valves
Figure 502/29-11-00-990-805 (Sheet 1 of 2)**

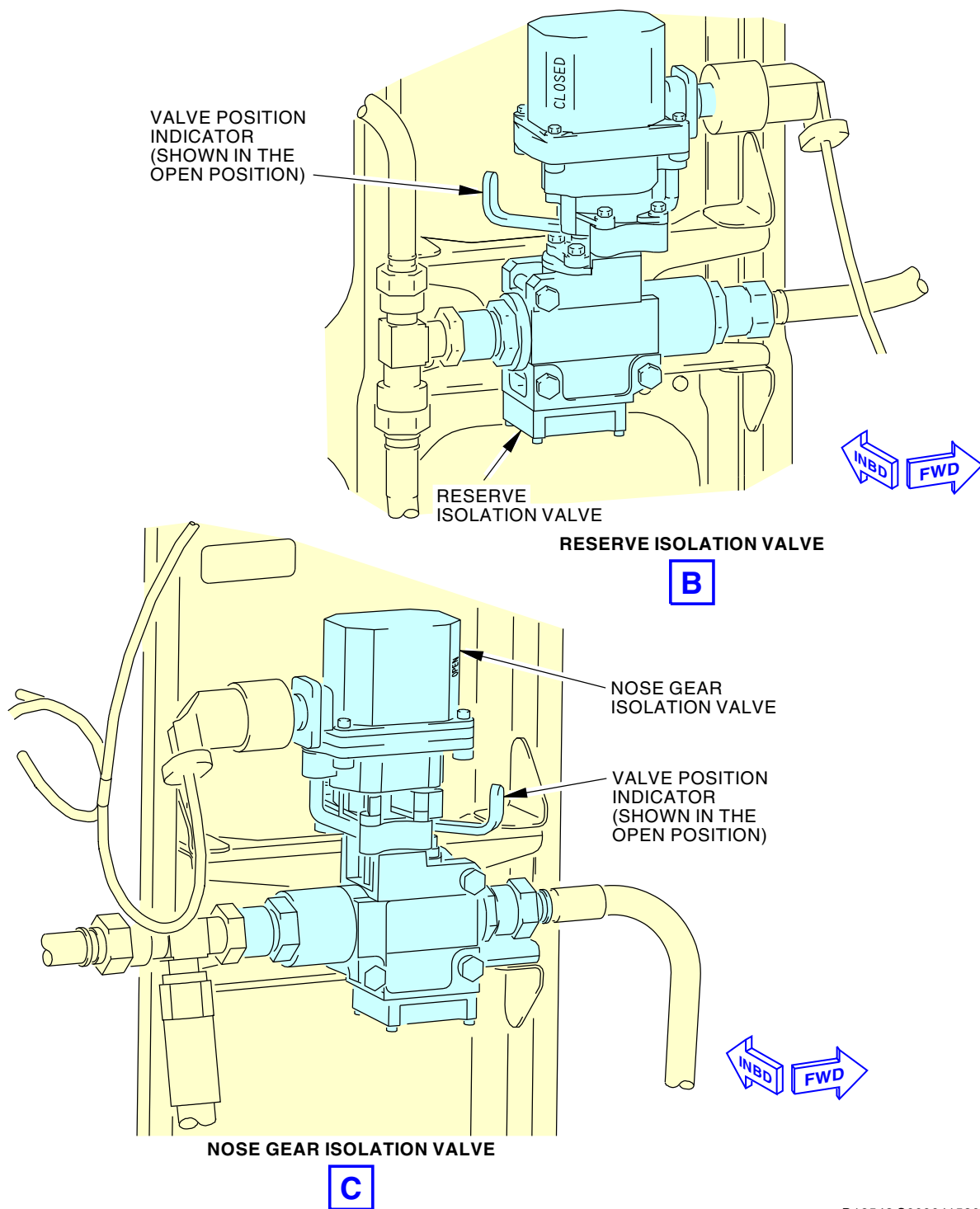
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D12543 S0006415801_V2

Center Hydraulic Isolation System Valves
Figure 502/29-11-00-990-805 (Sheet 2 of 2)

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TASK 29-11-00-710-806

9. Engine-Driven Pump (EDP) Supply Shutoff Valve - System Test

A. General

- (1) This test makes sure that the supply shutoff valve, for the engine-driven pump (EDP), and the related circuit operates correctly. This test also makes sure that the circuit for the depressurization valve, for the engine-driven pump (EDP), operates correctly.
- (2) You can use this procedure to do a test of the supply shutoff valve, for the engine-driven pump (EDP), in the left or the right hydraulic system.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (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)
71-00-00-800-835-H00	Engine Start (Selection) (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)
FIM 24-23 TASK 802	IDG Fire Switch Has Been Pulled - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

E. Prepare for the Test

SUBTASK 29-11-00-860-142

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

SUBTASK 29-11-00-860-143

- (2) For the left hydraulic system, do these steps:
 - (a) 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
B	4	C76601	L ENG FUEL VALVE

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	1	C36611	AIR SPLY L PRI
C	2	C36613	AIR SPLY L BACKUP
L	2	C26633	FIRE EXT L ENG BTL 1
L	4	C26635	FIRE EXT L ENG BTL 2

SUBTASK 29-11-00-860-144

- (3) For the right hydraulic system, do these steps:
- (a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	19	C28002	R ENGINE FUEL SPAR VALVE
B	19	C76600	R ENG FUEL VALVE

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	12	C36612	AIR SPLY R PRI
P	13	C36614	AIR SPLY R BACKUP

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	1	C26632	FIRE EXT R ENG BTL 1
L	3	C26634	FIRE EXT R ENG BTL 2

SUBTASK 29-11-00-010-016



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.

- (4) Do these tasks in this sequence to safely open the left thrust reverser:
- (a) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (b) To open the left fan cowl panel, do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) To open the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00.

SUBTASK 29-11-00-010-018

- (5) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

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SUBTASK 29-11-00-010-019

- (6) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

F. Engine-Driven Pump (EDP) Supply Shutoff Valve - System Test

SUBTASK 29-11-00-860-145

- (1) Make sure the engine fire switch handle, for the left (right) engine, on the aft aisle stand panel, P8, is in the down and locked position (Figure 501).

SUBTASK 29-11-00-860-146

- (2) Push the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, to the ON position (Figure 501).

NOTE: The FAULT light, on the HYDRAULIC PRIMARY L (R) ENG switch, will stay on during this test because the pump is not operating.

SUBTASK 29-11-00-860-147

- (3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-210-059

- (4) Make sure the HYDRAULIC PRIMARY PUMP S/O VLV L (R) indication, on the EICAS maintenance page, shows OPEN.

SUBTASK 29-11-00-210-060

- (5) Make sure the position indicator on the supply shutoff valve, for the left (right) engine-driven pump, is in the open position (Figure 503).

SUBTASK 29-11-00-860-148

 WARNING	DO NOT TURN THE ENGINE FIRE SWITCH HANDLE. IF YOU TURN THE ENGINE FIRE SWITCH HANDLE, THIS CAN RELEASE THE CONTENTS OF THE FIRE EXTINGUISHER BOTTLES AND CAN CAUSE DAMAGE TO THE ENGINE.

- (6) Push the manual override switch and pull out the left (right) engine fire switch handle, on the aft aisle stand panel, P8 (Figure 501).

SUBTASK 29-11-00-210-061

- (7) Make sure the HYDRAULIC PRIMARY PUMP S/O VLV L (R) indication, on the EICAS maintenance page, shows CLOSED.

SUBTASK 29-11-00-210-078

- (8) Make sure the position indicator on the supply shutoff valve, for the left (right) engine driven pump, is in the closed position (Figure 503).

SUBTASK 29-11-00-860-149

- (9) Push down the left (right) engine fire switch handle on the aft aisle stand panel, P8, to the down and locked position (Figure 501).

SUBTASK 29-11-00-210-063

- (10) Make sure the HYDRAULIC PRIMARY PUMP S/O VLV L (R) indication, on the EICAS maintenance page, shows OPEN.

SUBTASK 29-11-00-210-064

- (11) Make sure the position indicator on the supply shutoff valve, for the left (right) engine driven pump, is in the open position (Figure 503).

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SUBTASK 29-11-00-860-150

- (12) Push the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, to the OFF position (Figure 501).

NOTE: The FAULT light, on the HYDRAULIC PRIMARY L (R) ENG switch, will stay on.

SUBTASK 29-11-00-840-005

- (13) Make sure that these maintenance messages show in the EXISTING FAULTS on the MAT:
- (a) For the left supply shutoff valve: 24-31531 Engine Fire Switch L is Pulled.
 - (b) For the right supply shutoff valve: 24-31532 Engine Fire Switch R is Pulled.

SUBTASK 29-11-00-840-006

- (14) To clear the maintenance messages 24-31532 and 24-31531, do these steps:
- (a) Push the L GEN CTRL switch on the P5 panel two times.
 - (b) Push the R GEN CTRL switch on the P5 panel two times.
 - (c) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
 - (d) If the MAT shows NOT ACTIVE for the maintenance message while the engine operates, then you have cleared the messages.
 - (e) If the MAT continues to show ACTIVE or LATCHED for the maintenance message while the engine operates, do this task: FIM 24-23 TASK 802.

SUBTASK 29-11-00-710-007

- (15) Do this task: Engine-Driven Pump (EDP) - Operational Test, TASK 29-11-00-710-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-860-151

- (1) For the left hydraulic system, do these steps:
- (a) 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
B	4	C76601	L ENG FUEL VALVE

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	1	C36611	AIR SPLY L PRI
C	2	C36613	AIR SPLY L BACKUP
L	2	C26633	FIRE EXT L ENG BTL 1
L	4	C26635	FIRE EXT L ENG BTL 2

SUBTASK 29-11-00-860-152

- (2) For the right hydraulic system, do these steps:
- (a) 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	19	C28002	R ENGINE FUEL SPAR VALVE
B	19	C76600	R ENG FUEL VALVE

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Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
P	12	C36612	AIR SPLY R PRI
P	13	C36614	AIR SPLY R BACKUP

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	1	C26632	FIRE EXT R ENG BTL 1
L	3	C26634	FIRE EXT R ENG BTL 2

SUBTASK 29-11-00-410-015

- (3) For the left hydraulic system, do this step:

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-410-016

- (4) For the right hydraulic system, do this step:

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-410-017



DO ALL 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.

- (5) Do these tasks in this sequence to safely close the left thrust reverser:
- (a) To close the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
 - (b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (c) To close the left fan cowl panel, do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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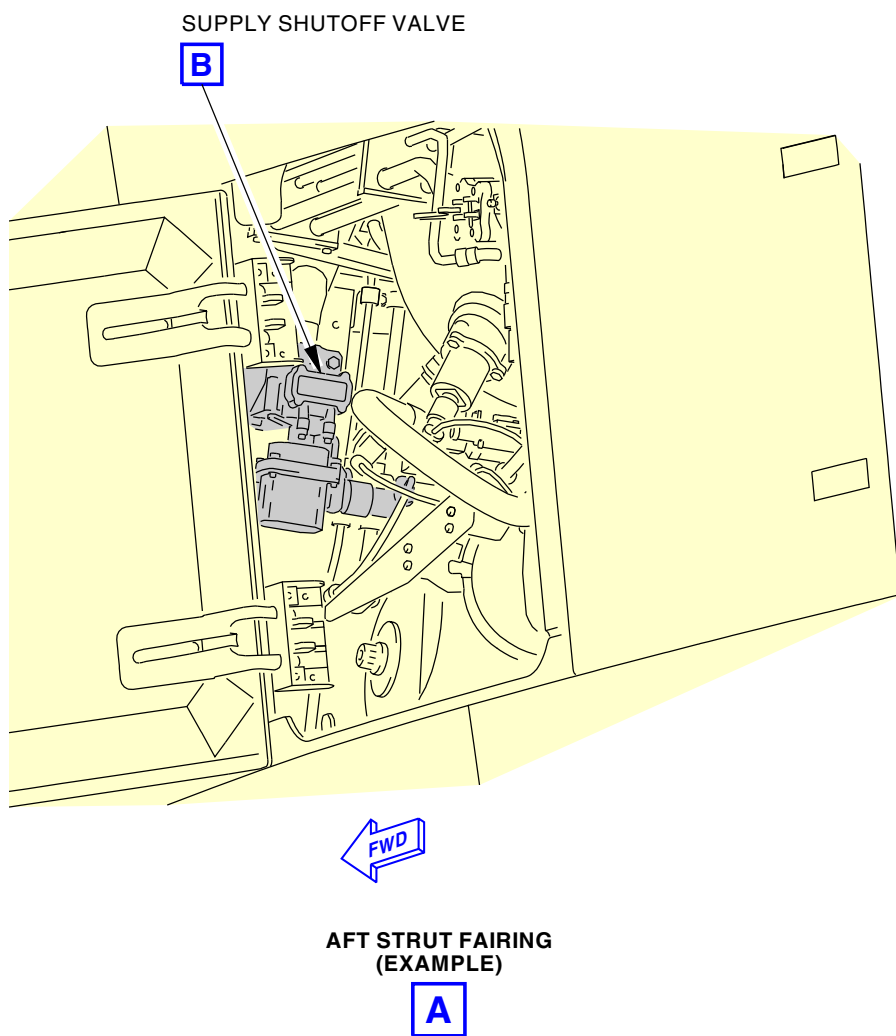
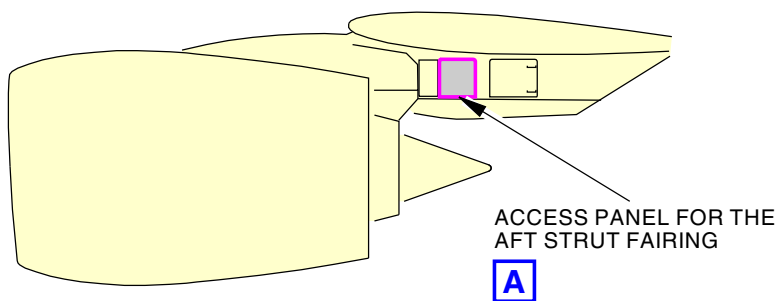
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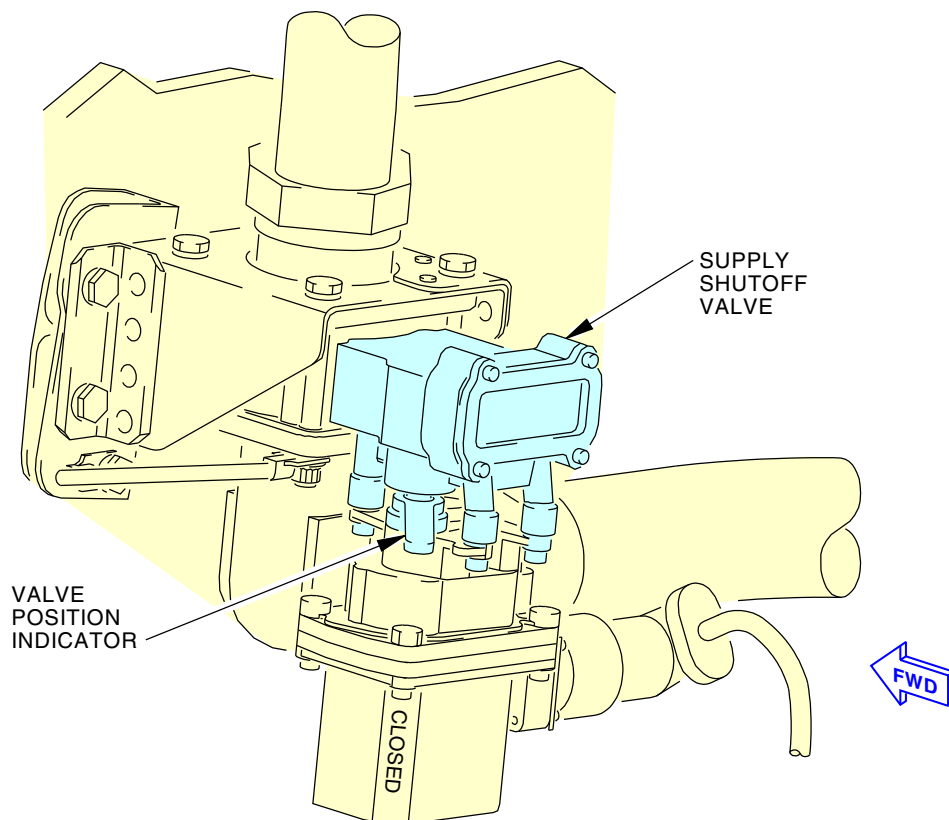
Engine-Driven Pump (EDP) Supply Shutoff Valve
Figure 503/29-11-00-990-806 (Sheet 1 of 2)

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SUPPLY SHUTOFF VALVE

B

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Engine-Driven Pump (EDP) Supply Shutoff Valve
Figure 503/29-11-00-990-806 (Sheet 2 of 2)

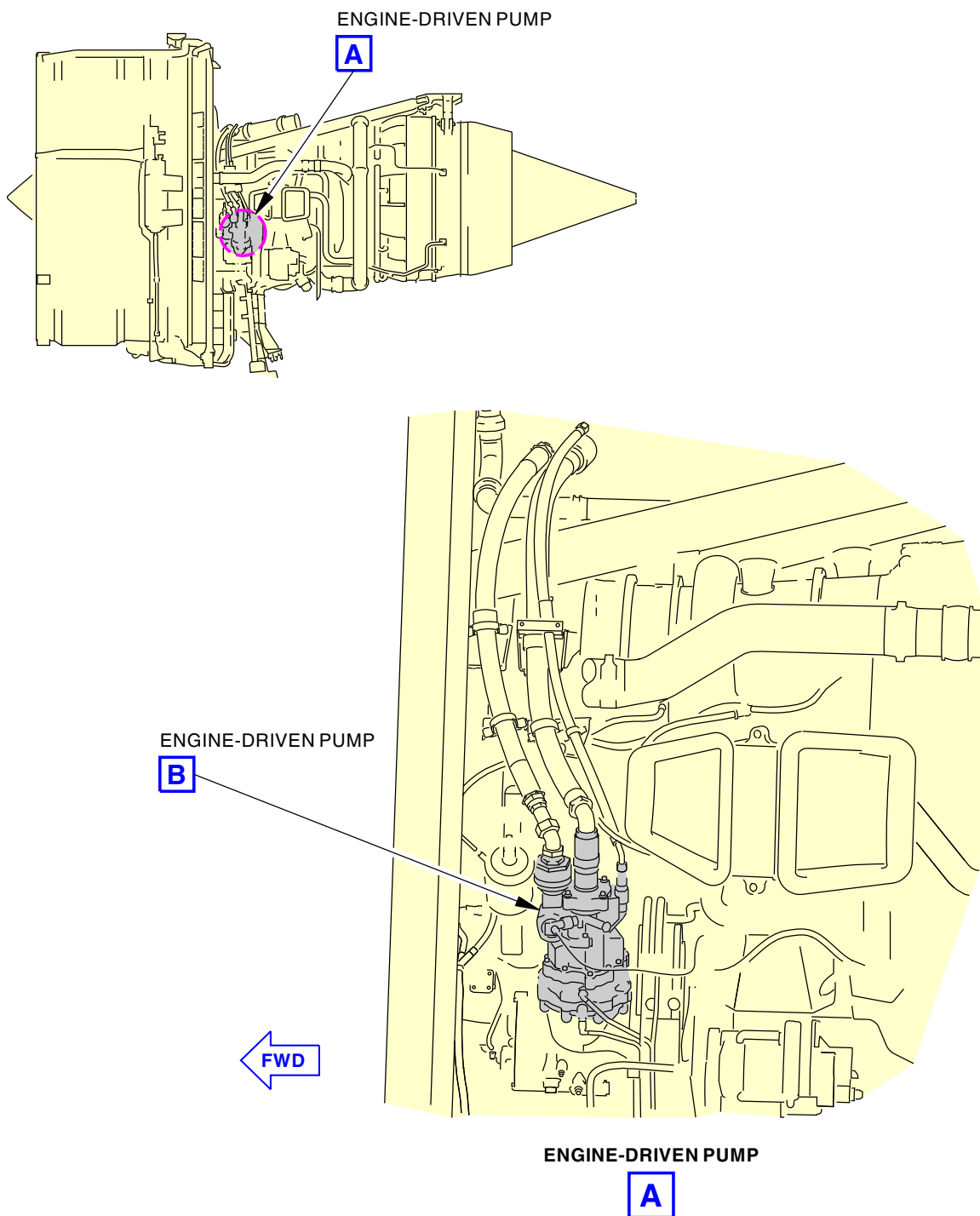
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D12516 S0006415806_V2

Engine-Driven Pump (EDP)
Figure 504/29-11-00-990-820

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TASK 29-11-00-730-803

10. Hydraulic Reservoir Pressurization System - System Test

(Figure 505)

A. General

- (1) You can use this procedure to do a test of the reservoir pressurization system in the left, right, or center hydraulic system.
- (2) This test makes sure that the reservoir pressurization system and the related pressure indication system operate correctly.

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)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1091	Gauge - Air Pressure, 0-100 PSIG (0-690 KPa)

D. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	29-11-25-01-050	ARO ALL
4	Packing	29-11-25-01-045	ARO ALL
6	Packing	29-11-26-01-051	ARO ALL
8	Packing	29-11-26-01-053	ARO ALL

F. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

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(Continued)

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

G. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

H. Procedure

SUBTASK 29-11-00-860-153

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

SUBTASK 29-11-00-040-010



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-020

- (3) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-010-021

- (4) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-013



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-014



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

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SUBTASK 29-11-00-210-065

- (7) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-00-860-154

- (8) For the applicable hydraulic system, make sure the handle of the shutoff valve for reservoir pressurization is in the open position.

SUBTASK 29-11-00-860-155

- (9) To pressurize the pneumatic system to 45-55 psi, with a ground air source, do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-00-790-003

- (10) Use Snoop Leak Detector compound, G00091 to do a check for air leaks from these components between the pneumatic system duct and the reservoir:

NOTE: There must be no air leakage from these components. This does not include the air bleed caps. The air bleed caps continuously bleed air from the air pressure tubes to remove moisture.

- (a) Air pressure tubes
- (b) Reservoir pressurization shutoff valve
- (c) Reservoir pressurization module.

SUBTASK 29-11-00-860-156

- (11) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-00-490-001



WARNING

PUT A RAG AROUND THE AIR BLEED VALVE ON THE RESERVOIR PRESSURIZATION MODULE TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (12) Put a rag around the air bleed valve on the reservoir pressurization module to catch a spray of hydraulic fluid from the air bleed valve.

SUBTASK 29-11-00-860-157

- (13) Open the air bleed valve on the reservoir pressurization module to remove the pressure from the reservoir.

SUBTASK 29-11-00-210-066

- (14) Make sure you can hear the flow of air from the air bleed valve.

SUBTASK 29-11-00-860-158

- (15) Close the air bleed valve when you can not hear the flow of air from the air bleed valve.

SUBTASK 29-11-00-860-159

- (16) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-210-067

- (17) Make sure the HYDRAULIC (L, C, or R) RESERVOIR PRESS indication, on the EICAS maintenance page, shows LOW for the applicable hydraulic system.

SUBTASK 29-11-00-020-004

- (18) For the left or right hydraulic system, do these steps:

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- (a) Remove the plug [3] from the test port on the reservoir pressurization module.
- (b) Remove the plug [1] from the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-020-005

- (19) For the center hydraulic system, do these steps:
 - (a) Remove the plug [7] from the test port on the reservoir pressurization module.
 - (b) Remove the plug [5] from the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-480-015

- (20) Connect the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to the test port on the reservoir pressurization module.

SUBTASK 29-11-00-480-016

- (21) Install the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 in the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-860-160

- (22) Slowly increase the pressure of the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to pressurize the reservoir to 35-39 psi.

SUBTASK 29-11-00-210-068

- (23) Make sure the HYDRAULIC (L, C, or R) RESERVOIR PRESS indication, on the EICAS maintenance page, shows NORM for the applicable hydraulic system.

SUBTASK 29-11-00-860-161



DO NOT PRESSURIZE THE RESERVOIR TO MORE THAN 100 PSI. TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE HYDRAULIC RESERVOIR.

- (24) Slowly increase the pressure of the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 source until you can hear the flow of air from the pressure relief valve on the applicable hydraulic reservoir.

SUBTASK 29-11-00-210-069

- (25) Make sure the pressure is 85-95 psi when the pressure relief valve on the applicable hydraulic reservoir opens.

NOTE: You can hear the air flow from the pressure relief valve when it opens.

SUBTASK 29-11-00-860-162

- (26) Decrease the pressure of the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to zero.

SUBTASK 29-11-00-480-017



PUT A RAG AROUND THE AIR BLEED VALVE ON THE RESERVOIR PRESSURIZATION MODULE TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (27) Put a rag around the air bleed valve on the reservoir pressurization module to catch a spray of hydraulic fluid from the valve.

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SUBTASK 29-11-00-860-163

- (28) Open the air bleed valve on the reservoir pressurization module to remove the pressure from the reservoir.

SUBTASK 29-11-00-860-164

- (29) Close the air bleed valve when you can not hear the flow of air from the air bleed valve.

SUBTASK 29-11-00-080-014

- (30) Disconnect the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to the test port on the reservoir pressurization module.

SUBTASK 29-11-00-420-004

- (31) For the left or right hydraulic system, do these steps:
- (a) Apply MCS 352B fluid, D00054 to the new packing [4].
 - (b) Install the packing [4] on the plug [3].
 - (c) Install the plug [3] and packing [4] in the test port on the reservoir pressurization module.

SUBTASK 29-11-00-420-005

- (32) For the center hydraulic system, do these steps:
- (a) Apply MCS 352B fluid, D00054 to the new packing [8].
 - (b) Install the packing [8] on the plug [7].
 - (c) Install the plug [7] and the packing [8] in the test port on the reservoir pressurization module.

SUBTASK 29-11-00-860-170

- (33) To pressurize the pneumatic system to 45-55 psi, with a ground air source, do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-00-860-171

- (34) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

NOTE: The check valves in the reservoir pressurization module will hold the pressure in the reservoir.

SUBTASK 29-11-00-860-172

- (35) Let the air in the reservoir become cool for 30 minutes.

SUBTASK 29-11-00-970-009

- (36) Make a record of the pressure which shows on the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 in the gage port on the reservoir pressurization module.
- (a) Make sure the pressure which shows on the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 is more than 25 psi.

SUBTASK 29-11-00-970-010

- (37) After 10 minutes, from the time that you made a record of the pressure shown on the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 do this step:
- (a) Make sure the pressure which shows on the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 did not decrease more than 2 psi.



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SUBTASK 29-11-00-480-018



WARNING

PUT A RAG AROUND THE AIR BLEED VALVE ON THE RESERVOIR PRESSURIZATION MODULE TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (38) Put a rag around the air bleed valve on the reservoir pressurization module to catch a spray of hydraulic fluid from the valve.

SUBTASK 29-11-00-860-173

- (39) Open the air bleed valve on the reservoir pressurization module to remove the pressure from the reservoir.

SUBTASK 29-11-00-860-174

- (40) Close the air bleed valve when you can not hear the flow of air from the air bleed valve.

SUBTASK 29-11-00-080-012

- (41) Remove the pressure gauge (0-100 PSIG) (0-690 KPa), STD-1091 from the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-420-006

- (42) For the left or right hydraulic system, do these steps:
- (a) Apply MCS 352B fluid, D00054 to the new packing [2].
 - (b) Install the packing [2] on the plug [1].
 - (c) Install the plug [1] and packing [2] in the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-420-007

- (43) For the center hydraulic system, do these steps:
- (a) Apply MCS 352B fluid, D00054 to the new packing [6].
 - (b) Install the packing [6] on the plug [5].
 - (c) Install the plug [5] and the packing [6] in the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-860-176

- (44) To pressurize the pneumatic system to 45-55 psi, with a ground air source, do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-00-790-004

- (45) Use Snoop Leak Detector compound, G00091 to do a check for air leaks at the plugs in the test port and the gage port on the reservoir pressurization module.

SUBTASK 29-11-00-860-177

- (46) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

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SUBTASK 29-11-00-080-013



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (47) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801

SUBTASK 29-11-00-410-019

- (48) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-410-020

- (49) For the right hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-007

- (50) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

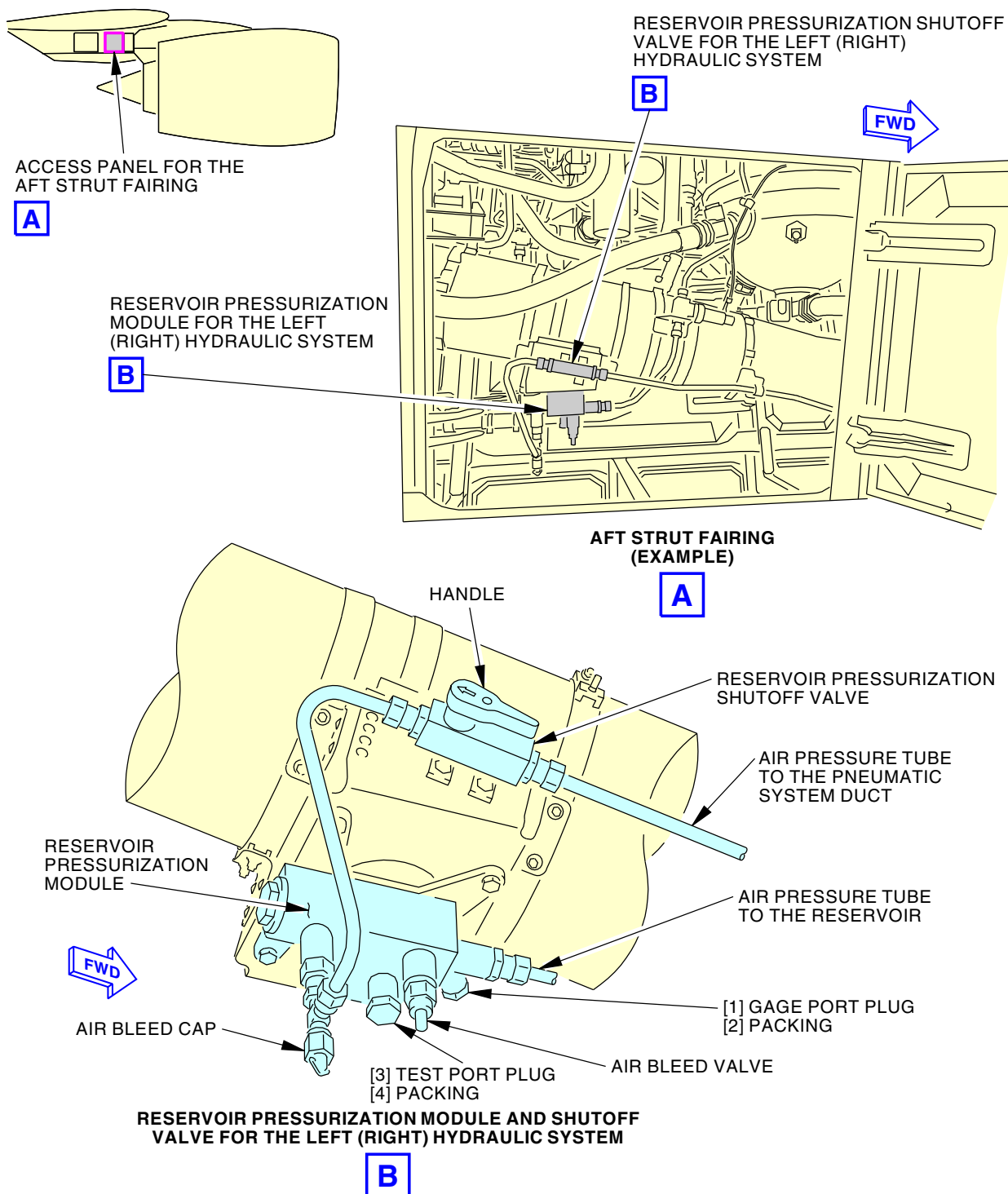
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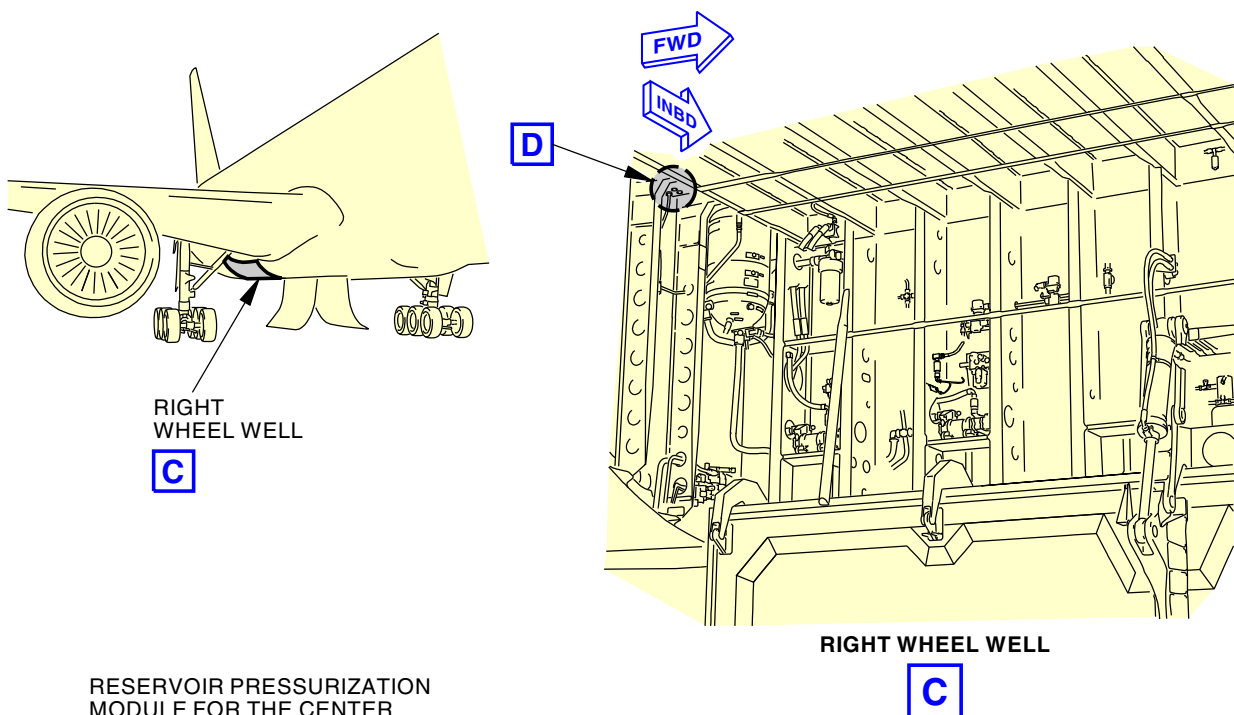
Reservoir Pressurization Module and Shutoff Valve
Figure 505/29-11-00-990-808 (Sheet 1 of 3)

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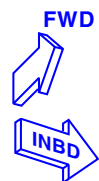
RESERVOIR PRESSURIZATION
MODULE FOR THE CENTER
HYDRAULIC SYSTEM

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RESERVOIR
PRESSURIZATION
SHUTOFF VALVE
FOR THE CENTER
HYDRAULIC SYSTEM

E

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**Reservoir Pressurization Module and Shutoff Valve
Figure 505/29-11-00-990-808 (Sheet 2 of 3)**

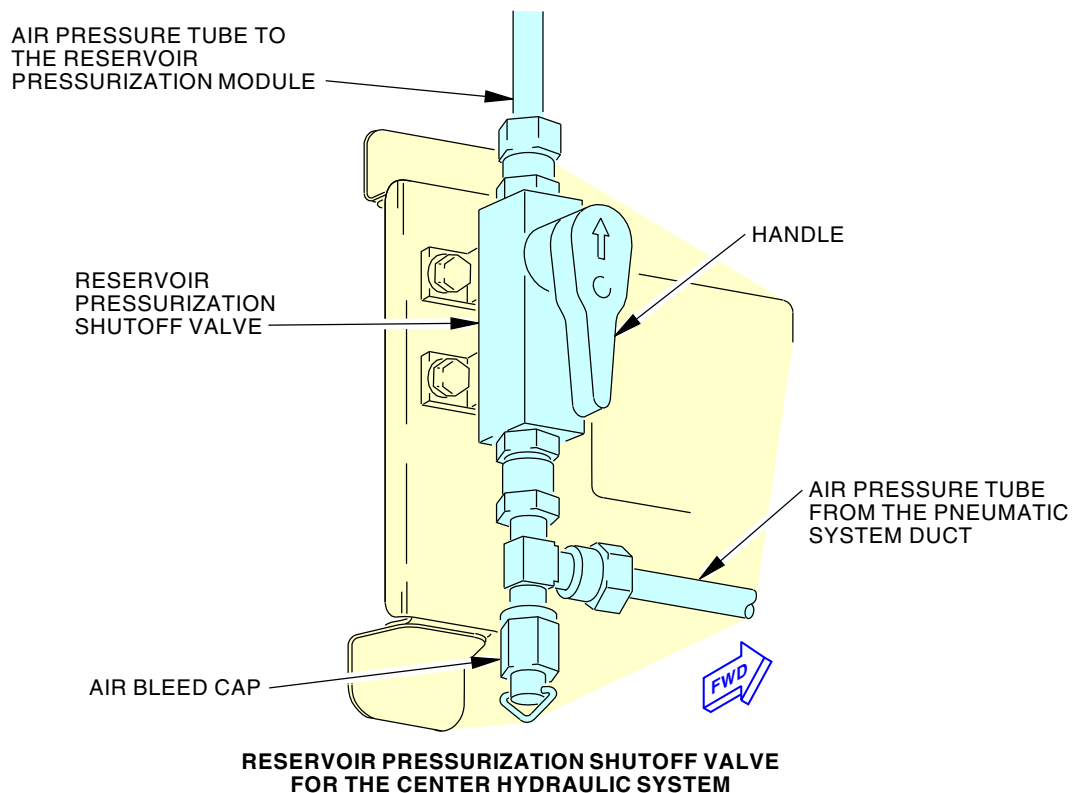
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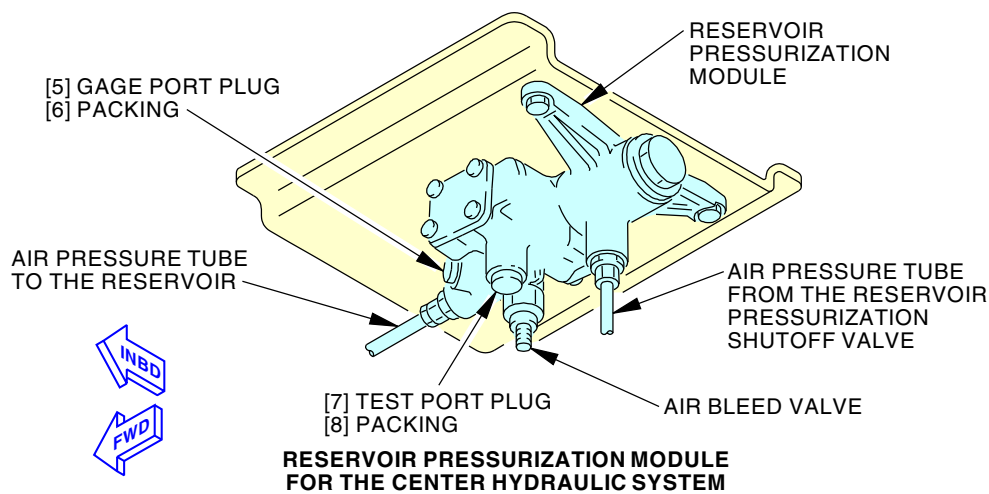
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**Reservoir Pressurization Module and Shutoff Valve
Figure 505/29-11-00-990-808 (Sheet 3 of 3)**

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TASK 29-11-00-700-801

11. Air-Driven Pump (ADP) C1 and C2 Heater - Functional Test

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Use this system test for airplanes with the maintenance access terminal (MAT) ground test; Heaters (RAT Generator, ADP C1, and ADP C2).
- (2) This test makes sure that the ADP C1 and C2 heaters operate correctly.
- (3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal (MAT), do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

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

C. Location Zones

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

D. Prepare for the Test

SUBTASK 29-11-00-840-001

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

E. Air-Driven Pump (ADP) C1 (C2) Ground Test on the Maintenance Access Terminal (MAT)

NOTE: This test makes sure that the RAT generator and Air Driven Pump heaters operate correctly.

SUBTASK 29-11-00-710-006

- (1) Use a maintenance access terminal (MAT) to do the operational test of the air-driven pump (ADP) C1 (C2) heaters:
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) OPERATIONAL TEST
 - 6) Heaters (RAT Generator, ADP C1, and ADP C2)
 - 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.

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- (d) If FAILED shows, refer to the applicable maintenance message index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

————— END OF TASK —————

TASK 29-11-00-710-807

12. Ground Fault Protection for the Alternating Current Motor Pumps (ACMP) C1 or C2 - Operational Test

(Figure 501)

A. General

- (1) This test makes sure that the ground fault protection in the alternating current motor pumps (ACMP) C1 or C2 operate correctly.
- (2) There are two ground fault protection for the alternating current motor pumps (ACMP) in the center system. They are referred to as the ACMP C1 and ACMP C2. You can use this procedure to do a test of the ACMP C1 or ACMP C2

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)

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-4309	GFCI Tester - AC Hydraulic Pump Part #: J24014-24 Supplier: 81205 Opt Part #: J24014-1 Supplier: 81205

D. Location Zones

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

E. Prepare fo the Test

SUBTASK 29-11-00-860-217

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

Left Power Management Panel, P110

Row	Col	Number	Name
M	28	C29607	C1 HYD PUMP CTRL

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

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SUBTASK 29-11-00-860-218

- (2) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the OFF position.

SUBTASK 29-11-00-860-219

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

SUBTASK 29-11-00-610-013

- (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 29-11-00-860-220

- (5) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-030-001

- (6) Disconnect the connector DM29304A (DM29311A) from M29304 (M29311), C1 (C2) ACMP.

SUBTASK 29-11-00-210-081

- (7) Make sure that the shipside connector pin D is still connected to the ground. You can check this connection in two ways;
 - (a) Check that pin D is connected to the airplane structure.
 - (b) Measure the resistance in pin D. The resistance should read less than 2 ohms.

SUBTASK 29-11-00-480-040

- (8) Connect the connector DM29304A (DM29311A) to the GFCI Tester, SPL-4309.

SUBTASK 29-11-00-860-221

- (9) 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>
M	28	C29607	C1 HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	5	C29608	C2-HYD PUMP CTRL

F. Ground Fault Protection System for the Alternating Current Motor Pumps (ACMP) C1 or C2 - Operational Test

SUBTASK 29-11-00-860-222



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 BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (1) Set the PRIMARY pump ELEC C1 (C2) switch to the ON position, P5 overhead panel.

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SUBTASK 29-11-00-860-223

- (2) Set the ground fault trip box switch to the "FAULT" position.

SUBTASK 29-11-00-210-082

- (3) Make sure that the following maintenance messages appear on the EICAS Status page;
- (a) HYD PUMP PRI C1 (C2) status message
 - (b) HYD PRESS PRI C1 (C2) advisory message
 - (c) HYD PRESS SYS C (C2) caution level message

SUBTASK 29-11-00-210-083

- (4) Make sure that the maintenance message 29-17022 HYD PRI C1 GND FAULT (29-17023 HYD PRI C2 GND FAULT) appear on the MAT.

SUBTASK 29-11-00-210-084

- (5) Make sure that the following maintenance messages do not appear on the MAT;
- (a) 29-12015 - HYD ELMS P110 C1 FAULT (29-12010 - HYD ELMS P210 C2 FAULT)
 - (b) 29-17006 - CONTACTOR M29303 FAULT (29-17008 - CONTACTOR M29308 FAULT)
 - (c) 29-10550 - C ELEC PUMP 1 PRESS FAULT (29-10570 - C ELEC PUMP 2 PRESS FAULT)
 - (d) 29-17010 - HYD ACMP C1 FUNCTION FAULT (29-17009 - HYD ACMP C2 FUNCTION FAULT)

SUBTASK 29-11-00-860-224

- (6) Set the PRIMARY pump ELEC C1 (C2) switch to the OFF position, P5 overhead panel.

SUBTASK 29-11-00-860-225

- (7) 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>
M	28	C29607	C1 HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	5	C29608	C2-HYD PUMP CTRL

SUBTASK 29-11-00-080-025

- (8) Disconnect the connector DM29304A (DM29311A) from the GFCI Tester, SPL-4309.

SUBTASK 29-11-00-430-001

- (9) Connect the connector DM29304A (DM29311A) to M29304 (M29311), C1 (C2) ACMP.

SUBTASK 29-11-00-860-226

- (10) 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>
M	28	C29607	C1 HYD PUMP CTRL

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Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	5	C29608	C2-HYD PUMP CTRL

SUBTASK 29-11-00-860-227



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 BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (11) Set the PRIMARY pump ELEC C1 (C2) switch to the ON position, P5 overhead panel.

SUBTASK 29-11-00-210-085

- (12) Wait for 30 seconds, then make sure that the hydraulic primary pump C1 (C2) pressure is below 200 psi.

SUBTASK 29-11-00-210-086

- (13) Make sure that the following maintenance messages appear on the EICAS Status page;
- (a) HYD PUMP PRI C1 (C2) status message
 - (b) HYD PRESS PRI C1 (C2) advisory message
 - (c) HYD PRESS SYS C caution level message

SUBTASK 29-11-00-210-087

- (14) Make sure that the maintenance message 29-17022 HYD PRI C1 GND FAULT (29-17023 HYD PRI C2 GND FAULT) appear on the MAT.

SUBTASK 29-11-00-210-088

- (15) Make sure that the following maintenance messages do not appear on the MAT;
- (a) 29-12015 - HYD ELMS P110 C1 FAULT (29-12010 - HYD ELMS P210 C2 FAULT)
 - (b) 29-17006 - CONTACTOR M29303 FAULT (29-17008 - CONTACTOR M29308 FAULT)
 - (c) 29-10550 - C ELEC PUMP 1 PRESS FAULT (29-10570 - C ELEC PUMP 2 PRESS FAULT)
 - (d) 29-17010 - HYD ACMP C1 FUNCTION FAULT (29-17009 - HYD ACMP C2 FUNCTION FAULT)

SUBTASK 29-11-00-860-228

- (16) Set the PRIMARY pump ELEC C1 (C2) switch to the OFF position, P5 overhead panel.

SUBTASK 29-11-00-210-090

- (17) Make sure there are no leaks in the C1 (C2) ACMP pressure and case drain lines.

SUBTASK 29-11-00-210-089

- (18) Make sure the FAULT light below the HYDRAULIC PRIMARY C1 (C2) ELEC switch, on the hydraulic control panel comes on.

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SUBTASK 29-11-00-210-091

- (19) Make sure the HYDRAULIC PRIMARY PUMP C1 (C2) indication, on the EICAS maintenance page shows 0 to 200 psi.

SUBTASK 29-11-00-860-229

- (20) 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 —————

TASK 29-11-00-710-808

13. Ground Fault Protection for the Alternating Current Motor Pumps (ACMP) Left or Right - Operational Test

(Figure 501)

A. General

- (1) This test makes sure that the ground fault protection in the alternating current motor pumps (ACMP) Left or Right operate correctly.
- (2) The left and right hydraulic systems each have one alternating current motor pump (ACMP). You can use this procedure to do a ground fault protection test of the ACMP in the left or the right hydraulic system.

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. 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-4309	GFCI Tester - AC Hydraulic Pump Part #: J24014-24 Supplier: 81205 Opt Part #: J24014-1 Supplier: 81205

D. Location Zones

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

E. Prepare for the Test

SUBTASK 29-11-00-860-230

- (1) 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>
L	19	C29604	R HYD PUMP CTRL

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Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	4	C29605	L HYD PUMP CTRL

SUBTASK 29-11-00-860-231

- (2) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the OFF position.

SUBTASK 29-11-00-860-232

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

SUBTASK 29-11-00-610-014

- (4) 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 29-11-00-860-233

- (5) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-030-002

- (6) Disconnect the connector DM29104A (DM29204A) from M29104 (M29204), L (R) ACMP.

SUBTASK 29-11-00-210-092

- (7) Make sure that the shipside connector pin D is still connected to the ground. You can check this connection in two ways;
- (a) Check that pin D is connected to the airplane structure.
 - (b) Measure the resistance in pin D. The resistance should read less than 2 ohms.

SUBTASK 29-11-00-480-041

- (8) Connect the connector DM29104A (DM29204A) to the GFCI Tester, SPL-4309.

SUBTASK 29-11-00-860-234

- (9) 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>
L	19	C29604	R HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	4	C29605	L HYD PUMP CTRL

F. Ground Fault Protection System for the Alternating Current Motor Pumps (ACMP) Left or Right - Operational Test

SUBTASK 29-11-00-860-235



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.

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(WARNING PRECEDES)



DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (1) Set the DEMAND pump L (R) ELEC switch to the ON position, P5 overhead panel.

SUBTASK 29-11-00-860-236

- (2) Set the ground fault trip box switch to the "FAULT" position.

SUBTASK 29-11-00-210-093

- (3) Make sure that the following maintenance messages appear on the EICAS Status page;
- (a) HYD PUMP DEM L (R) status message
 - (b) HYD PRESS DEM L (R) advisory message
 - (c) HYD PRESS SYS L (R) caution level message

SUBTASK 29-11-00-210-094

- (4) Make sure that the maintenance message 29-17020 HYD DEM L GND FAULT (29-17021 HYD DEM R GND FAULT) appear on the MAT.

SUBTASK 29-11-00-210-095

- (5) Make sure that the following maintenance messages do not appear on the MAT;
- (a) 29-12000 - HYD ELMS P210 LEFT FAULT (29-12005 - HYD ELMS P210 RIGHT FAULT)
 - (b) 29-17007 - CONTACTOR M29103 FAULT (29-17005 - CONTACTOR M29203 FAULT)
 - (c) 29-10620 - L ELEC PUMP PRESS FAULT (29-10710 - R ELEC PUMP PRESS FAULT)
 - (d) 29-17012 - HYD ACMP L FUNCTION FAULT (29-17011 - HYD ACMP R FUNCTION FAULT)

SUBTASK 29-11-00-860-237

- (6) Set the DEMAND pump L (R) ELEC to the OFF position, P5 overhead panel.

SUBTASK 29-11-00-860-238

- (7) 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>
L	19	C29604	R HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	4	C29605	L HYD PUMP CTRL

SUBTASK 29-11-00-080-026

- (8) Disconnect the connector DM29104A (DM29204A) from the GFCI Tester, SPL-4309.

SUBTASK 29-11-00-430-002

- (9) Connect the connector DM29104A (DM29204A) to M29104 (M29204), L (R) ACMP.

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SUBTASK 29-11-00-860-239

- (10) 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>
L	19	C29604	R HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	4	C29605	L HYD PUMP CTRL

SUBTASK 29-11-00-860-240



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 BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (11) Set the DEMAND pump L (R) ELEC to the ON position, P5 overhead panel.

SUBTASK 29-11-00-210-096

- (12) Wait for 30 seconds, then make sure that the hydraulic demand pump L (R) pressure is below 200 psi.

SUBTASK 29-11-00-210-097

- (13) Make sure that the following maintenance messages appear on the EICAS Status page;
- (a) HYD PUMP DEM L (R) status message
 - (b) HYD PRESS DEM L (R) advisory message
 - (c) HYD PRESS SYS L (R) caution level message

SUBTASK 29-11-00-210-098

- (14) Make sure that the maintenance message 29-17020 HYD DEM L GND FAULT (29-17021 HYD DEM R GND FAULT) appear on the MAT.

SUBTASK 29-11-00-210-099

- (15) Make sure that the following maintenance messages do not appear on the MAT;
- (a) 29-12000 - HYD ELMS P210 L FAULT (29-12005 - HYD ELMS P210 RIGHT FAULT)
 - (b) 29-17007 - CONTACTOR M29103 FAULT (29-17005 - CONTACTOR M29203 FAULT)
 - (c) 29-10620 - L ELEC PUMP PRESS FAULT (29-10710 - R ELEC PUMP PRESS FAULT)
 - (d) 29-17012 - HYD ACMP L FUNCTION FAULT (29-17011 - HYD ACMP R FUNCTION FAULT)

SUBTASK 29-11-00-860-241

- (16) Set the DEMAND pump L (R) ELEC to the OFF position, P5 overhead panel.

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SUBTASK 29-11-00-210-100

- (17) Make sure there are no leaks in the L (R) ACMP pressure and case drain lines.

SUBTASK 29-11-00-210-101

- (18) Make sure the FAULT light below the HYDRAULIC DEMAND L (R) ELEC switch, on the hydraulic control panel comes on.

SUBTASK 29-11-00-210-102

- (19) Make sure the HYDRAULIC DEMAND PUMP L (R) indication, on the EICAS maintenance page shows 0 to 200 psi.

————— END OF TASK —————

TASK 29-11-00-730-805

14. Ground Fault Protection for the Alternating Current Motor Pumps (ACMP) C1 or C2 - System Test

A. General

- (1) This test makes sure that the ground fault protection for the alternating current motor pumps (ACMP) in the hydraulic systems reset correctly. There are two alternating current motor pumps (ACMP) in the center system. They are referred to as the ACMP C1 and ACMP C2. You can use this procedure to do a test of the ACMP C1 or ACMP C2.
- (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
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Procedure

SUBTASK 29-11-00-860-215

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

SUBTASK 29-11-00-730-003

- (2) Use a maintenance access terminal (MAT) to do a system test of the ground fault protection for the C1 (C2) ACMP.
- (a) Make these selections on the MAT:
- 1) LINE MAINTENANCE
 - 2) GROUND TESTS
 - 3) 29 Hydraulic System
 - 4) SYSTEM TEST
 - 5) HYD PRI C1 (C2) GROUND FAULT RESET
- (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.

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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 BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (d) Set the PRIMARY pump ELEC C1 (C2) switch to the ON position, P5 overhead panel.
- (e) Make sure that hydraulic advisory, status or maintenance messages does not appear on the EICAS or MAT.
- (f) Set the PRIMARY pump ELEC C1 (C2) switch to the OFF position, P5 overhead panel.
- (g) If failed shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

————— END OF TASK —————

TASK 29-11-00-730-806

15. Ground Fault Protection for the Alternating Current Motor Pumps (ACMP) Left or Right - System Test

A. General

- (1) This test makes sure that the ground fault protection for the alternating current motor pumps (ACMP) in the hydraulic systems reset correctly. The left and right hydraulic systems each have one alternating current motor pump (ACMP). You can use this procedure to do a test of the ACMP in the left or the right hydraulic system.
- (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
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Procedure

SUBTASK 29-11-00-860-216

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

SUBTASK 29-11-00-730-004

- (2) Use a maintenance access terminal (MAT) to do a system test of the ground fault protection for the L (R) ACMP.
 - (a) Make these selections on the MAT:
 - 1) LINE MAINTENANCE
 - 2) GROUND TESTS

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- 3) 29 Hydraulic System
 - 4) SYSTEM TEST
 - 5) HYD DEM L (R) GROUND FAULT RESET
- (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.



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 BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (d) Set the DEMAND pump L (R) ELEC switch to the ON position, P5 overhead panel.
- (e) Make sure that hydraulic advisory, status or maintenance messages does not appear on the EICAS or MAT.
- (f) Set the DEMAND pump L (R) ELEC switch to the OFF position, P5 overhead panel.
- (g) If failed shows, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

————— **END OF TASK** —————

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MAIN (LEFT, RIGHT, AND CENTER) HYDRAULIC SYSTEMS - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Differential Pressure Indicators of the alternating current motor pumps (ACMPs) for the Pressure and Case Drain Filters Inspection/Check
 - (2) Differential Pressure Indicators of the engine driven pumps (EDPs) for the Pressure and Case Drain Filters Inspection/Check
 - (3) Differential Pressure Indicators of the air driven pumps (ADPs) for the Pressure and Case Drain Filters Inspection/Check
 - (4) Differential Pressure Indicators of the Air Driven Pumps (ADPs) for the Turbine Gearbox Assembly (TGA) Oil Filter
 - (5) Differential Pressure Indicators for the Bypass Relief Valve and the Filter Element on the Return Filter Modules Inspection/Check
 - (6) Filter Elements of the Alternating Current Motor Pumps (ACMPs) Pressure and Case Drain Filter Modules Inspection/Check
 - (7) Filter Elements of the Engine Driven Pumps (EDPs) Pressure and Case Drain Filter Modules Inspection/Check
 - (8) Filter Elements of the Air Driven Pumps (ADPs) Pressure and Case Drain Filter Modules Inspection/Check
 - (9) Filter Elements of the Return Filter Modules Inspection/Check
 - (10) Filter Elements of the Air Driven Pumps (ADPs) Turbine Gearbox Assembly (TGA) Inspection/Check
 - (11) Main Hydraulic Systems External Leakage Check
 - (12) Main Hydraulic Systems Gross Internal Leakage Check
 - (13) Main and Nose Landing Gear Wheel Assemblies Hydraulic Leakage Check

TASK 29-11-00-200-801

2. Differential Pressure Indicators of the Alternating Current Motor Pumps (ACMPs) for the Pressure and Case Drain Filters Inspection/Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
29-11-40-000-801	Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-40-400-801	Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
29-11-41-000-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)

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(Continued)

Reference	Title
29-11-41-400-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

D. Procedure

SUBTASK 29-11-00-040-011



WARNING DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-022

- (2) Open these access panels:

Number	Name/Location
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-019



WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

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SUBTASK 29-11-00-480-020



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-070

- (5) Examine the differential pressure indicators for the pressure and case drain filters on the filter modules for the ACMPs.
- (a) Make sure the red indicator button on each differential pressure indicator does not show.
- (b) If the red indicator button shows, do one of these tasks to replace the related filter element:

NOTE: Do only the steps necessary to replace the filter element in these tasks:

- 1) These are the tasks:

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-40-000-801,

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-40-400-801.

- 2) These are the tasks:

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-41-000-801,

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-41-400-801.

- (c) If the red indicator button shows, set the red indicator button on the applicable differential pressure indicator.
- (d) If you can not set the red indicator button, do one of these tasks to replace the differential pressure indicator:

NOTE: Do only the steps necessary to replace the differential pressure indicator in these tasks:

- 1) These are the tasks:

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-40-000-801,

Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-40-400-801.

- 2) These are the tasks:

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-41-000-801,

Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-41-400-801.

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SUBTASK 29-11-00-080-015



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-021

(7) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-008

(8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

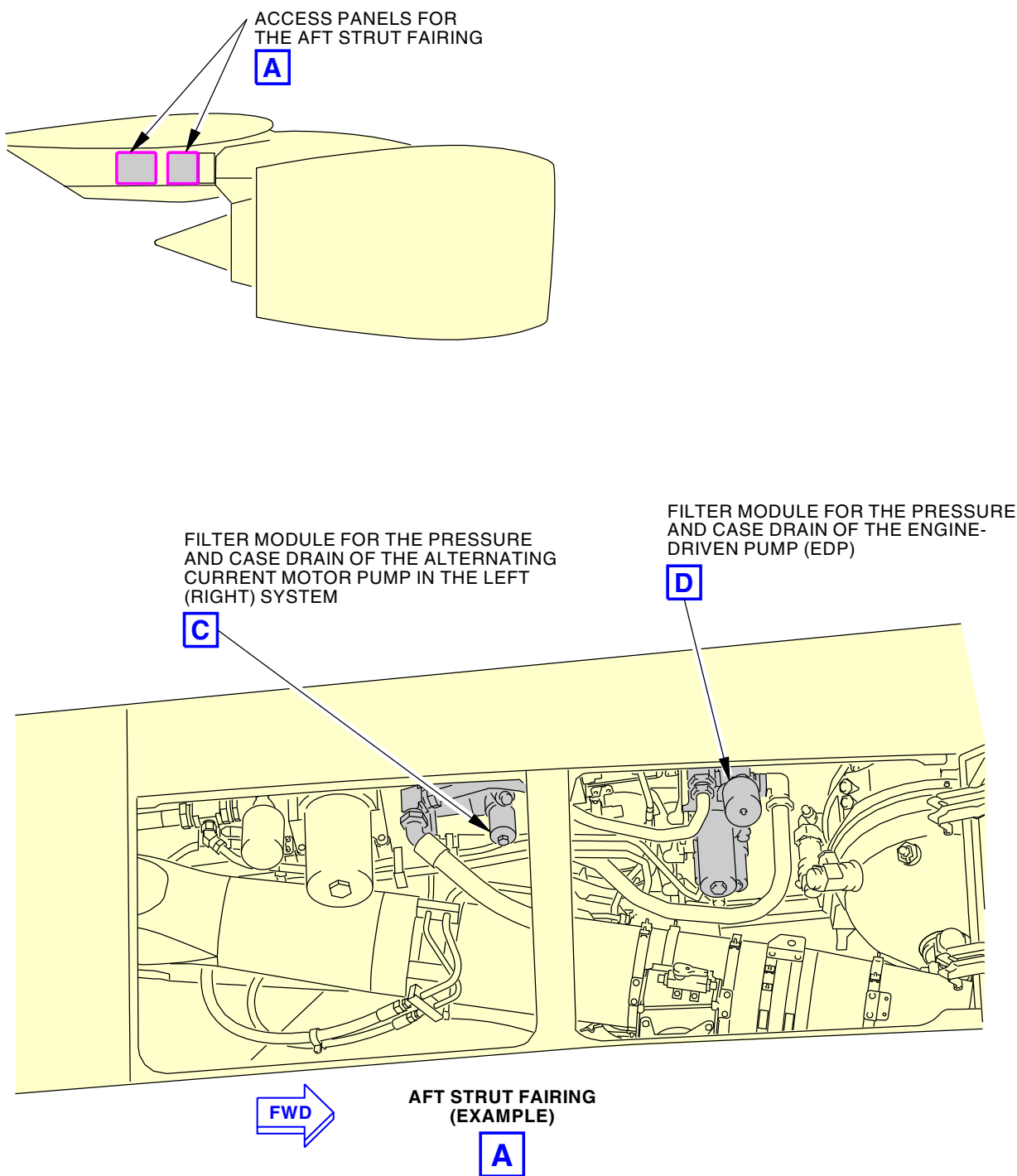
————— **END OF TASK** —————

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ARO ALL

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E22047 S0006415829_V2

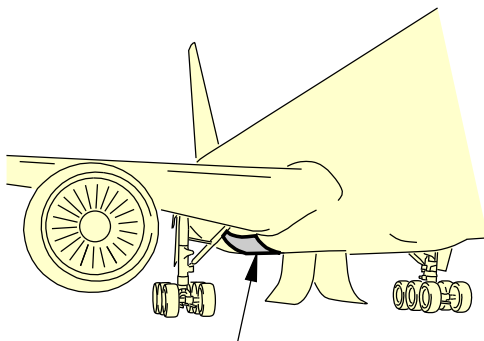
**Pressure and Case Drain Filter Modules Inspection
Figure 601/29-11-00-990-809 (Sheet 1 of 6)**

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RIGHT
WHEEL WELL

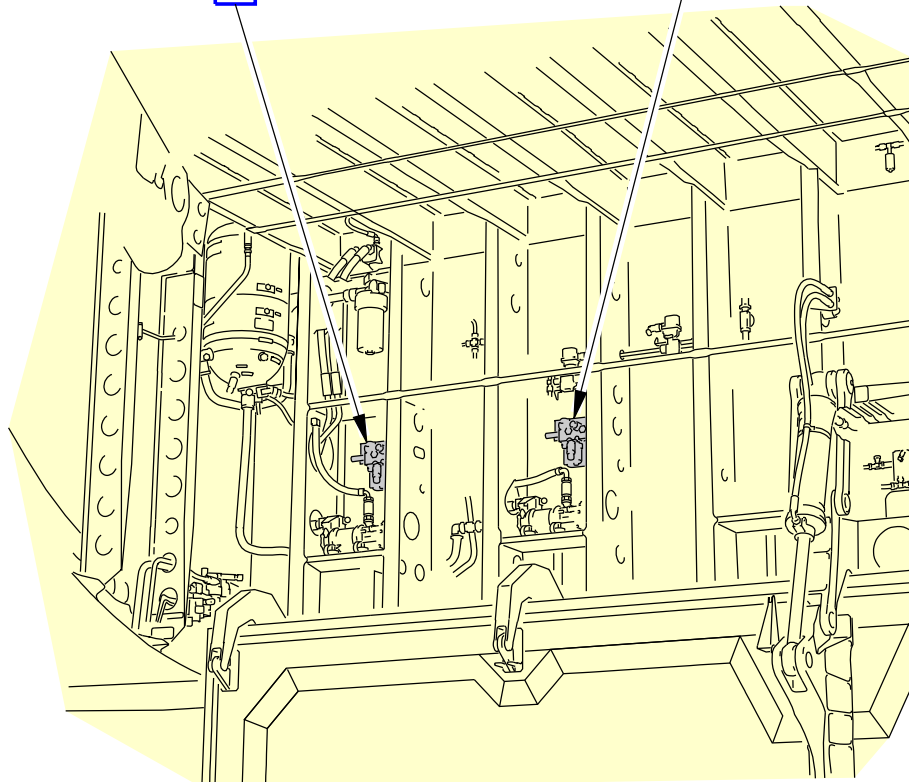
B

FILTER MODULE FOR THE
PRESSURE AND CASE DRAIN OF
THE ALTERNATING CURRENT
MOTOR PUMP (ACMP) C2

C

FILTER MODULE FOR THE
PRESSURE AND CASE DRAIN OF
THE ALTERNATING CURRENT
MOTOR PUMP (ACMP) C1

C



RIGHT WHEEL WELL

B



E22050 S0006415830_V2

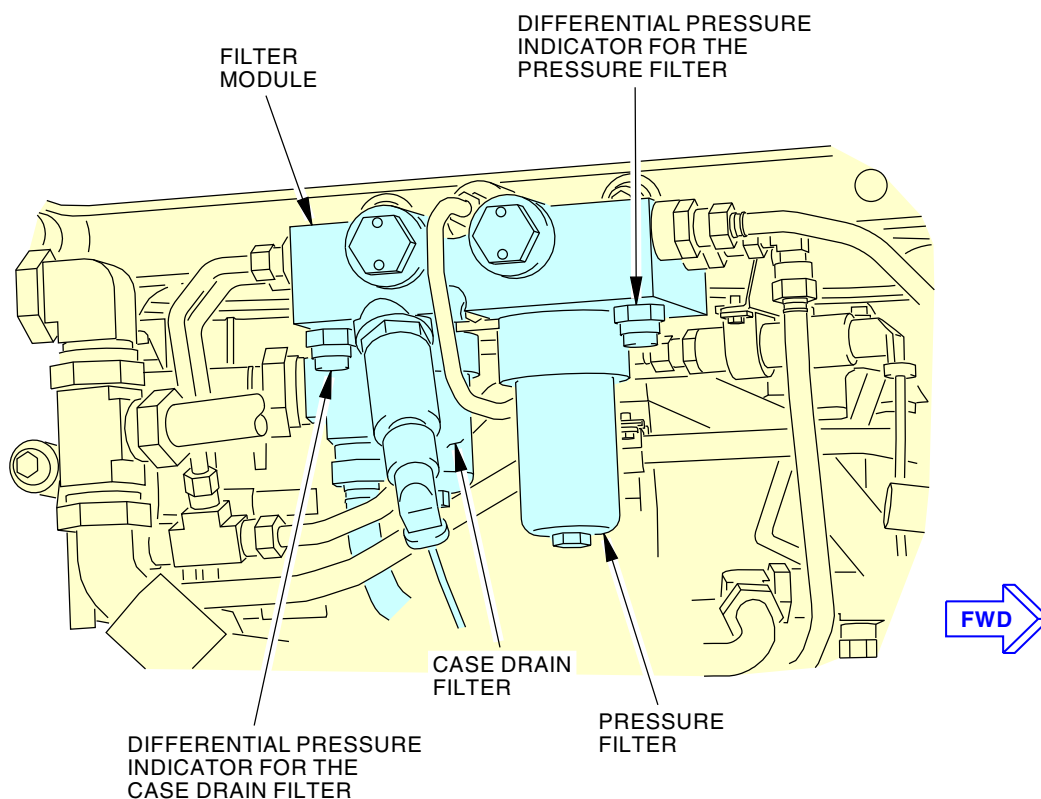
**Pressure and Case Drain Filter Modules Inspection
Figure 601/29-11-00-990-809 (Sheet 2 of 6)**

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**FILTER MODULE FOR AN ACMP
(LEFT/RIGHT SYSTEM IS SHOWN, CENTER SYSTEM IS EQUIVALENT)**

C

E22078 S0006415831_V2

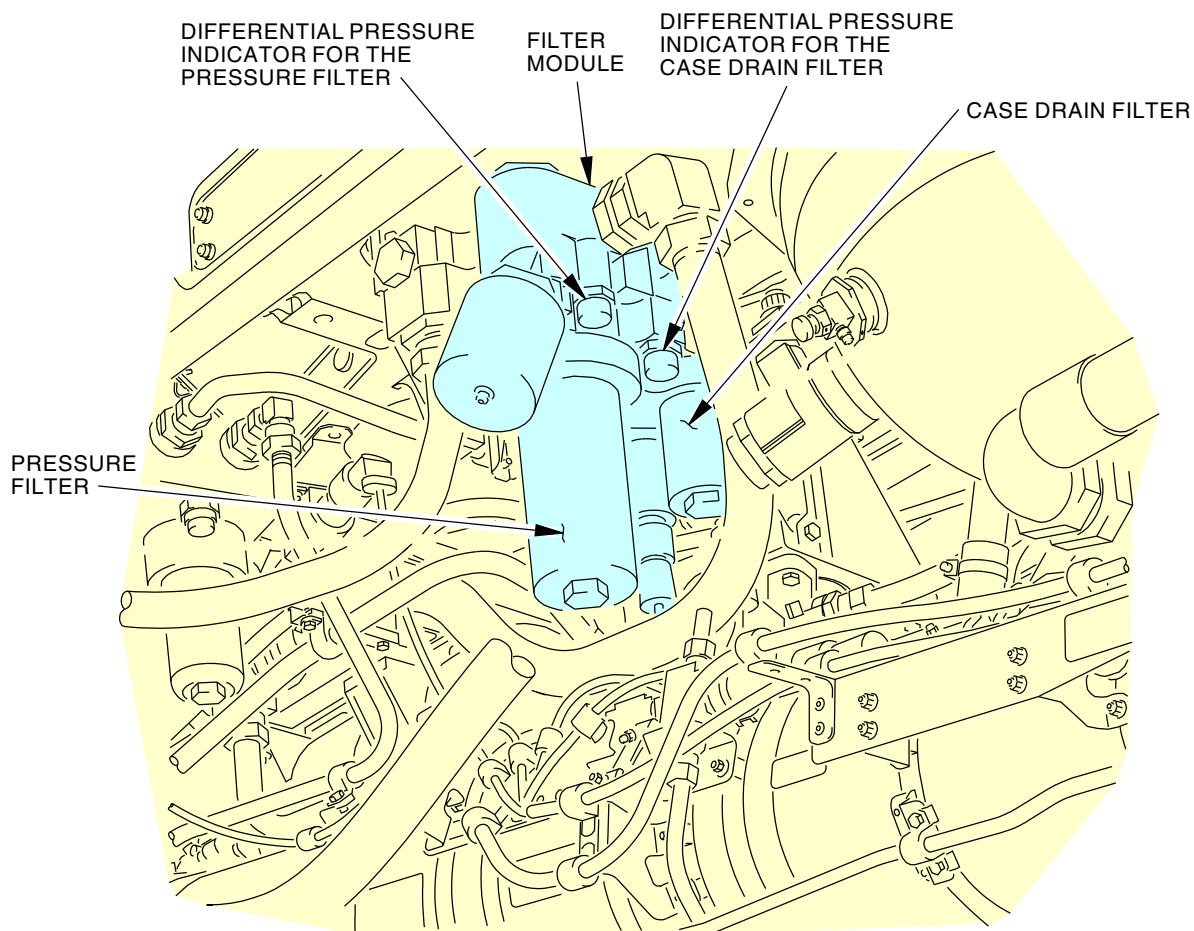
**Pressure and Case Drain Filter Modules Inspection
Figure 601/29-11-00-990-809 (Sheet 3 of 6)**

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**FILTER MODULE FOR AN EDP
(EXAMPLE)**



E22094 S0006415832_V2

**Pressure and Case Drain Filter Modules Inspection
Figure 601/29-11-00-990-809 (Sheet 4 of 6)**

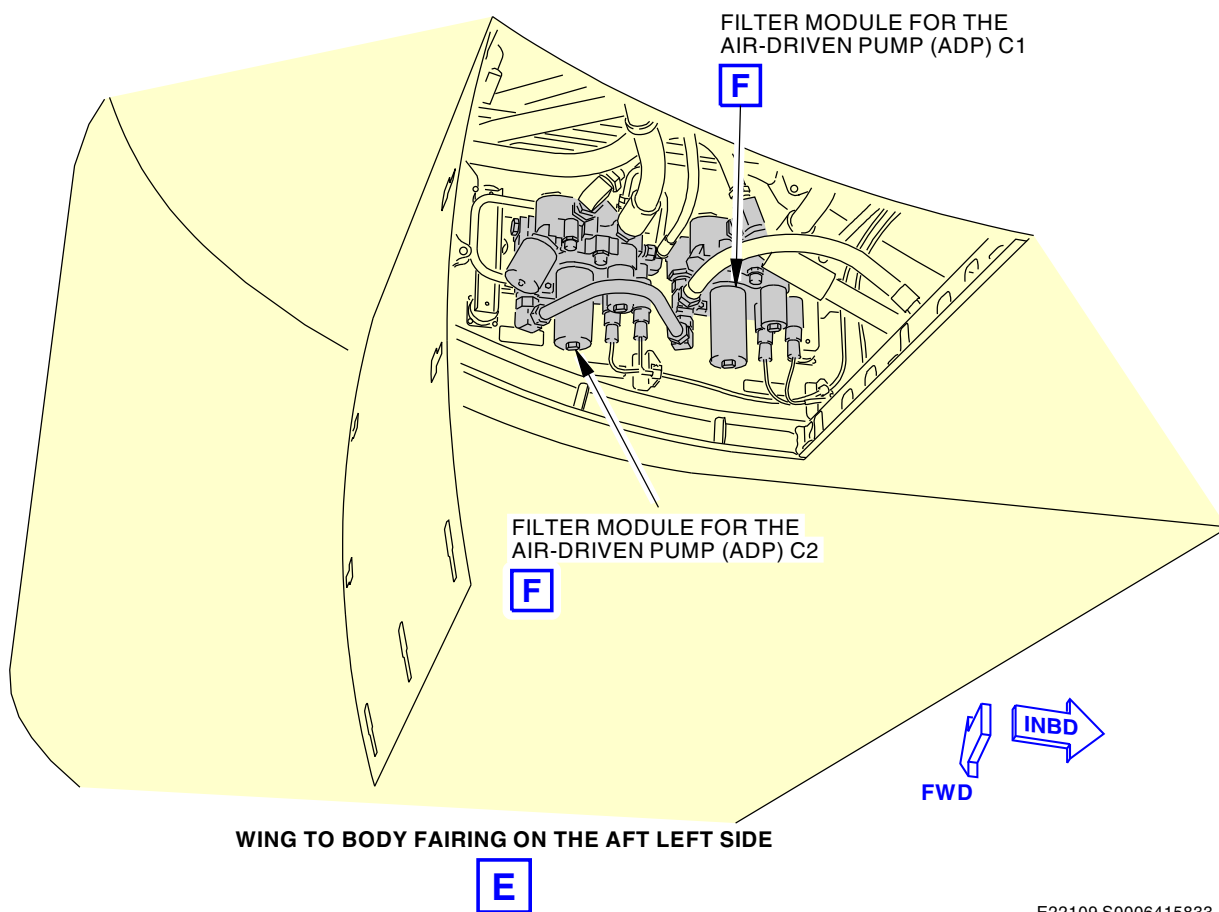
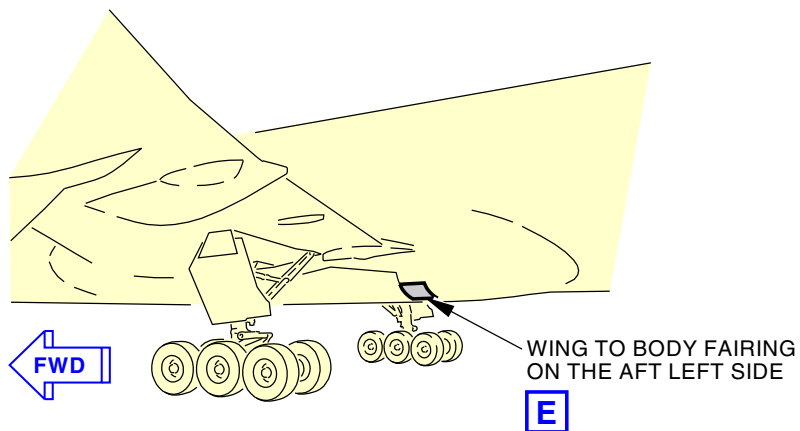
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E22109 S0006415833_V2

Pressure and Case Drain Filter Modules Inspection
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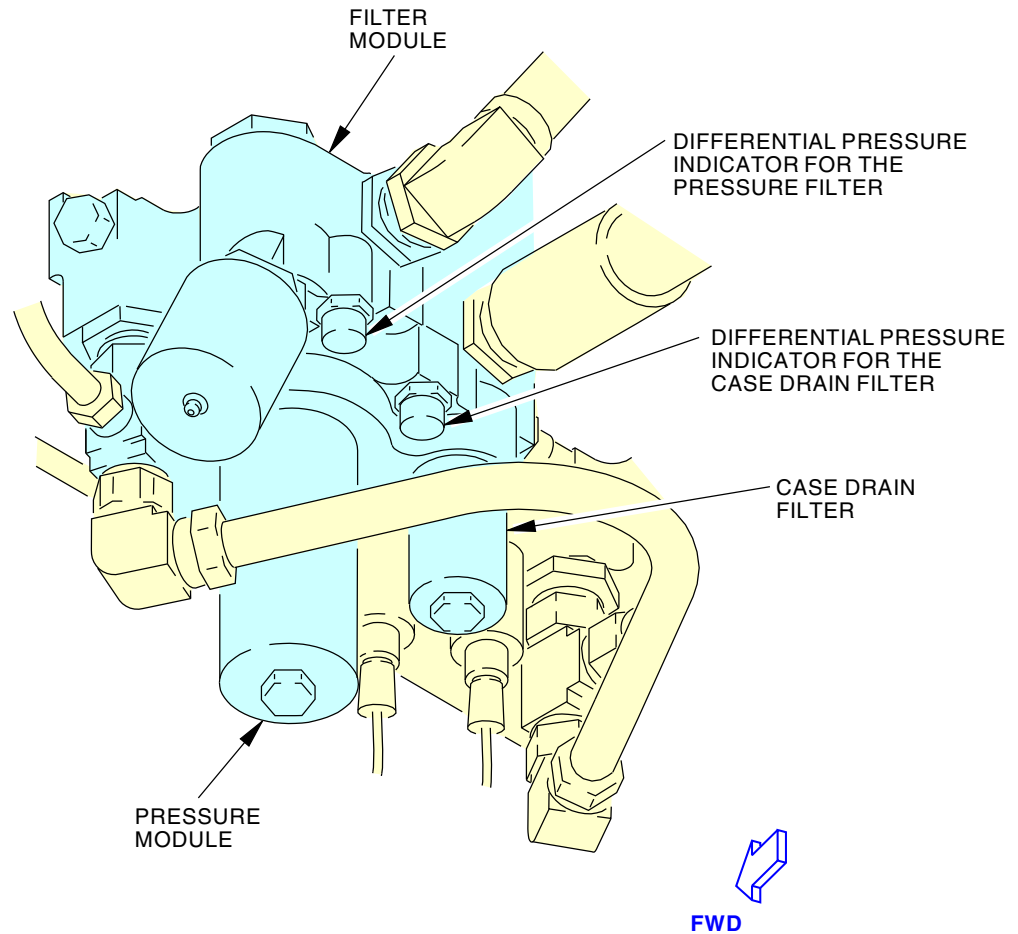
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FILTER MODULE FOR AN ADP
(EXAMPLE)



E22223 S0006415834_V2

Pressure and Case Drain Filter Modules Inspection
Figure 601/29-11-00-990-809 (Sheet 6 of 6)

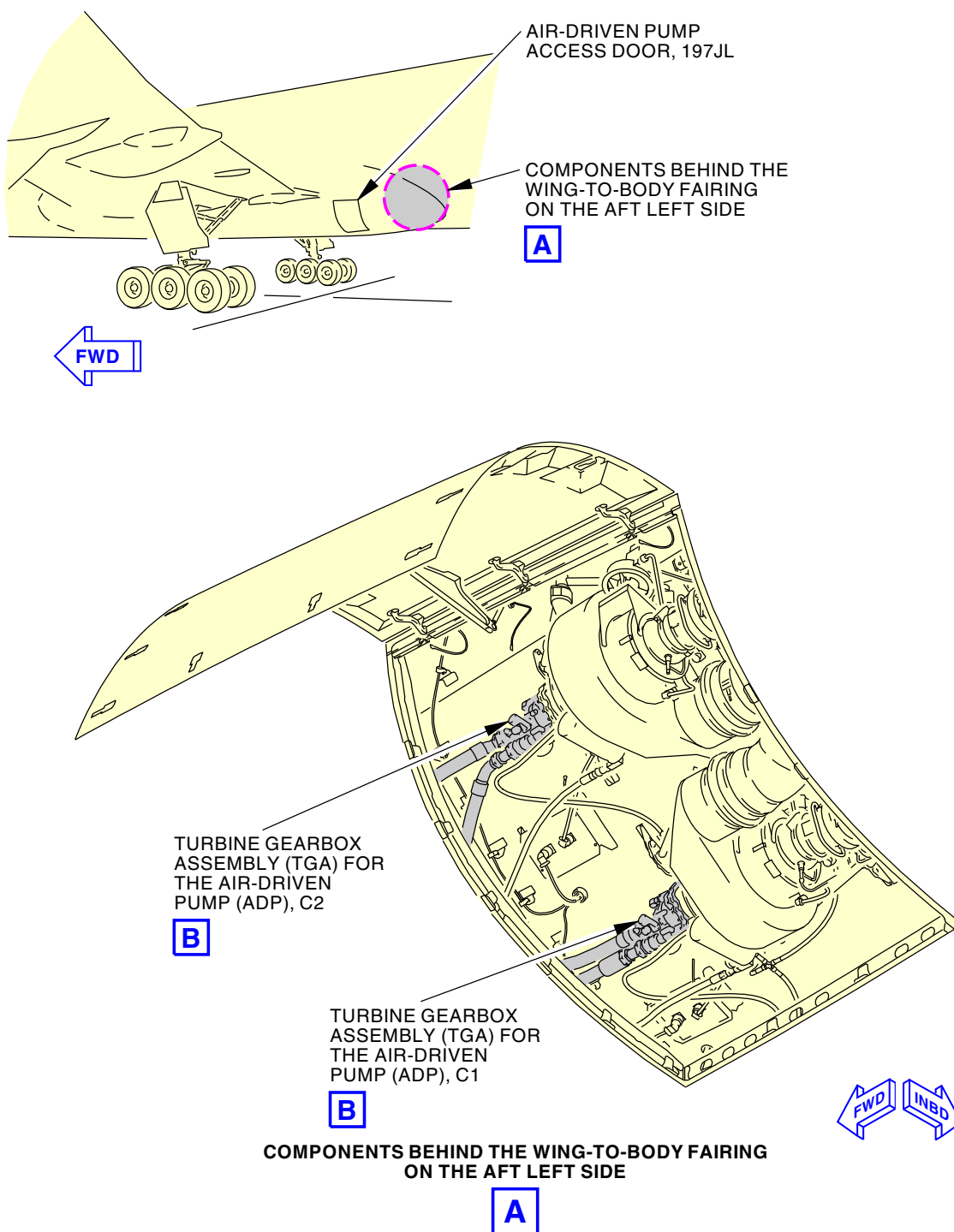
EFFECTIVITY
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H96933 S0006415835_V2

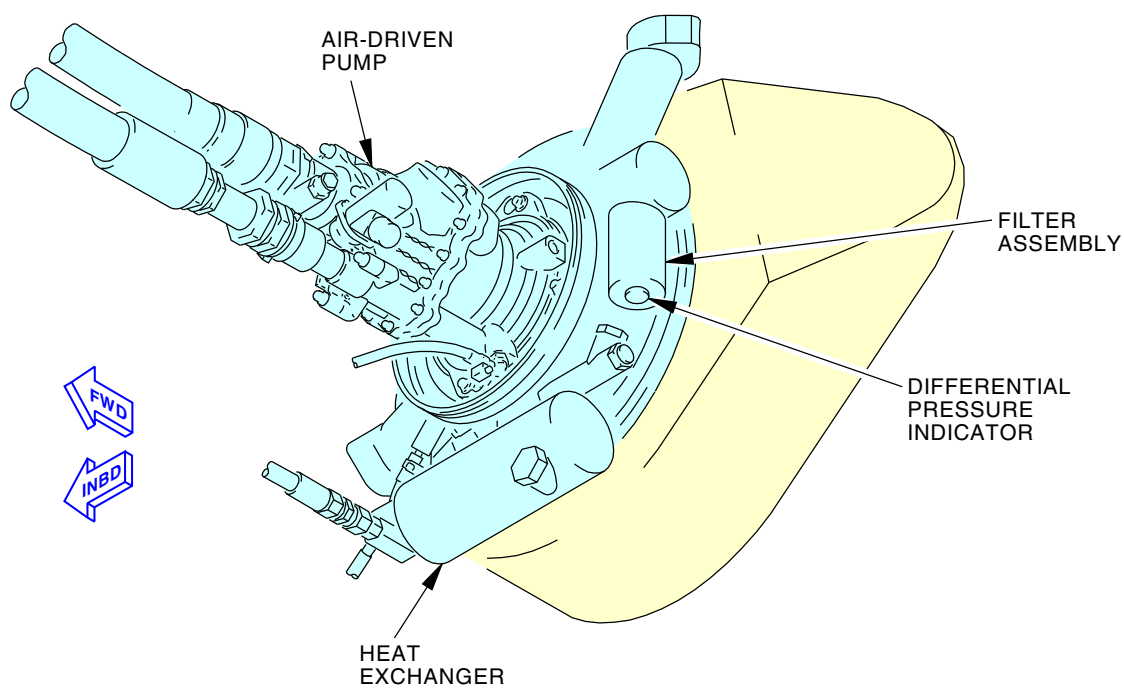
Turbine Gearbox Assembly (TGA) Oil Filter Inspection
Figure 602/29-11-00-990-822 (Sheet 1 of 2)

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**TURBINE GEARBOX ASSEMBLY (TGA)
(EXAMPLE)**

B

H96935 S0006415836_V2

**Turbine Gearbox Assembly (TGA) Oil Filter Inspection
Figure 602/29-11-00-990-822 (Sheet 2 of 2)**

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TASK 29-11-00-200-807

3. Differential Pressure Indicators of the Engine Driven Pumps (EDPs) for the Pressure and Case Drain Filters Inspection/Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-42-000-801	Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-42-400-801	Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

D. Procedure

SUBTASK 29-11-00-040-016



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-034

- (2) Open these access panels:

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

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SUBTASK 29-11-00-480-034



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-035



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-075

- (5) Examine the differential pressure indicators for the pressure and case drain filters on the filter modules for the EDPs.
- (a) Make sure the red indicator button on each differential pressure indicator does not show.
- (b) If the red indicator button shows, do one of these tasks to replace the related filter element:

NOTE: Do only the steps necessary to replace the filter element in these tasks:

- 1) These are the tasks:

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-42-000-801,

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-42-400-801.

- (c) If the red indicator button shows, set the red indicator button on the applicable differential pressure indicator.
- (d) If you can not set the red indicator button, do one of these tasks to replace the differential pressure indicator:

NOTE: Do only the steps necessary to replace the differential pressure indicator in these tasks:

- 1) These are the tasks:

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-42-000-801,

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-42-400-801.

SUBTASK 29-11-00-080-021



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

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SUBTASK 29-11-00-410-031

- (7) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-013

- (8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-00-200-808

4. Differential Pressure Indicators of the Air Driven Pumps (ADPs) for the Pressure and Case Drain Filters Inspection/Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
29-11-43-000-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-43-400-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

D. Procedure

SUBTASK 29-11-00-040-017



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-11-00-010-035

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-480-036



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-037



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-076

- (5) Examine the differential pressure indicators for the pressure and case drain filters on the filter modules for the ADPs.
- (a) Make sure the red indicator button on each differential pressure indicator does not show.
- (b) If the red indicator button shows, do one of these tasks to replace the related filter element:

NOTE: Do only the steps necessary to replace the filter element in these tasks:

- 1) These are the tasks:

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-43-000-801,

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-43-400-801.

- (c) If the red indicator button shows, set the red indicator button on the applicable differential pressure indicator.
- (d) If you can not set the red indicator button, do one of these tasks to replace the differential pressure indicator:

NOTE: Do only the steps necessary to replace the differential pressure indicator in these tasks:

- 1) These are the tasks:

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-43-000-801,

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-43-400-801.

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SUBTASK 29-11-00-080-022



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-032

(7)

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-440-014

(8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-00-200-809

5. Differential Pressure Indicators of the Air Driven Pumps (ADPs) for the Turbine Gearbox Assembly (TGA) Oil Filter Inspection/Check

(Figure 602)

A. References

<u>Reference</u>	<u>Title</u>
29-11-19-000-801	Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal (P/B 401)
29-11-19-400-801	Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

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D. Procedure

SUBTASK 29-11-00-040-018



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-036

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-480-038



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-039



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-079

- (5) Examine the differential pressure indicators for the Turbine Gearbox Assembly (TGA) Oil Filters for the ADPs.
 - (a) Make sure the differential pressure indicator red indicator button on the bottom of the oil filter does not show.
 - (b) If the red indicator button shows, do one of these tasks to replace the oil filter element:
NOTE: Do only the steps necessary to replace the filter element in these tasks:
 - 1) These are the tasks:
Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal, TASK 29-11-19-000-801,
Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation, TASK 29-11-19-400-801.
 - (c) If the red indicator button shows, set the red indicator button on the oil filter differential pressure indicator.

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- (d) If you can not set the red indicator button, do one of these tasks to replace the differential pressure indicator:

NOTE: Do only the steps necessary to replace the differential pressure indicator in these tasks:

- 1) These are the tasks:

Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal, TASK 29-11-19-000-801,

Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation, TASK 29-11-19-400-801.

SUBTASK 29-11-00-080-023



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-033

- (7)

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-440-015

- (8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-00-200-802

6. Differential Pressure Indicators for the Bypass Relief Valve and the Filter Element on the Return Filter Modules Inspection/Check

(Figure 603)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
29-11-44-000-801	Left and Right System Return Filter Module and Components Removal (P/B 401)
29-11-44-400-801	Left and Right System Return Filter Module and Components Installation (P/B 401)
29-11-45-000-801	Center System Return Filter Module and Components Removal (P/B 401)
29-11-45-400-801	Center System Return Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

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Reference	Title
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

D. Procedure

SUBTASK 29-11-00-040-012



WARNING DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-023

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-010-024

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-021



WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

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SUBTASK 29-11-00-480-022



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-071

- (6) Examine the differential pressure indicators, for the bypass relief valve and the return filter, on each return filter module:

NOTE: There is one return filter module in each of the three main hydraulic systems.

- (a) If only the red indicator button on the differential pressure indicator for the return filter shows or if the red indicator buttons on the differential pressure indicators for the return filter and the bypass relief valve show, do one of these tasks to replace the related filter element:

NOTE: Do only the steps necessary to replace the filter element in these tasks.

- 1) These are the tasks:

Left and Right System Return Filter Module and Components Removal,
TASK 29-11-44-000-801,

Left and Right System Return Filter Module and Components Installation,
TASK 29-11-44-400-801.

- 2) These are the tasks:

Center System Return Filter Module and Components Removal,
TASK 29-11-45-000-801,

Center System Return Filter Module and Components Installation,
TASK 29-11-45-400-801.

- (b) If only the red indicator button for the bypass relief valve shows, do one of these tasks to replace the filter element and the differential pressure indicator for the return filter:

NOTE: Do only the steps necessary to replace the filter element and the differential pressure indicator in these tasks.

- 1) These are the tasks:

Left and Right System Return Filter Module and Components Removal,
TASK 29-11-44-000-801,

Left and Right System Return Filter Module and Components Installation,
TASK 29-11-44-400-801.

- 2) These are the tasks:

Center System Return Filter Module and Components Removal,
TASK 29-11-45-000-801,

Center System Return Filter Module and Components Installation,
TASK 29-11-45-400-801.

- (c) Set all the red indicator buttons which showed.

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- (d) If a red indicator button will not set, do one of these tasks to replace the related differential pressure indicator or bypass relief valve:

NOTE: Do only the steps necessary to replace the differential pressure indicator or bypass relief valve in these tasks.

- 1) These are the tasks:

Left and Right System Return Filter Module and Components Removal,
TASK 29-11-44-000-801,

Left and Right System Return Filter Module and Components Installation,
TASK 29-11-44-400-801.

- 2) These are the tasks:

Center System Return Filter Module and Components Removal,
TASK 29-11-45-000-801,

Center System Return Filter Module and Components Installation,
TASK 29-11-45-400-801.

SUBTASK 29-11-00-080-016



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (7) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-022

- (8) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-410-023

- (9) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-009

- (10) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

———— **END OF TASK** ————

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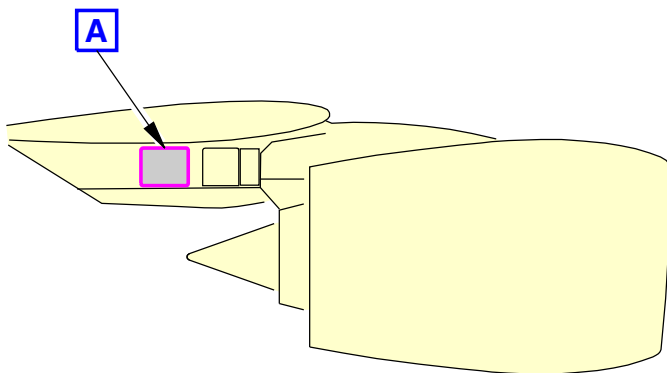
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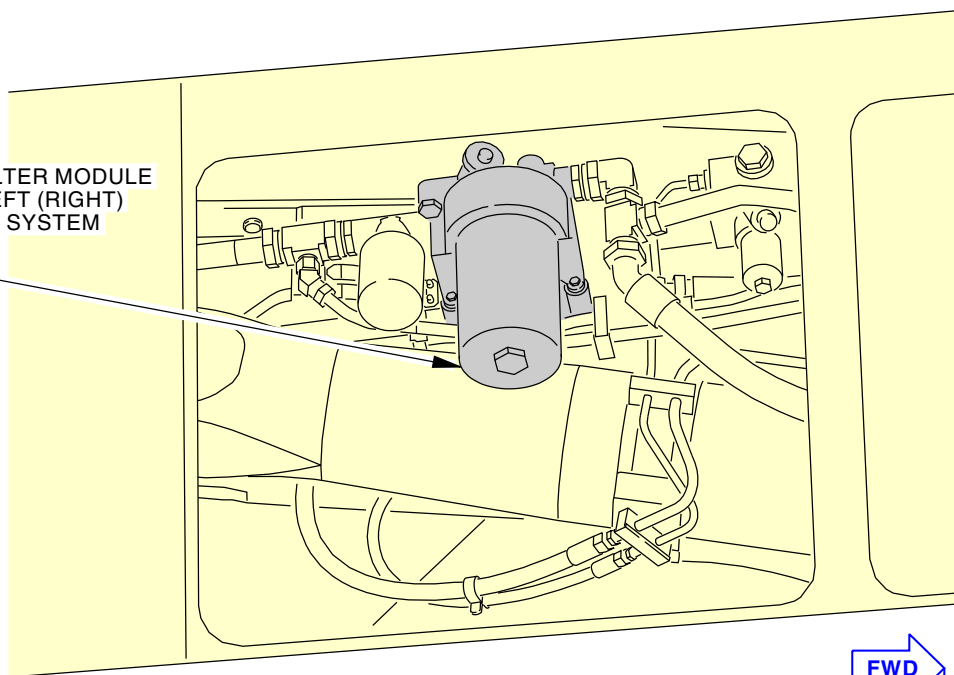
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AFT ACCESS PANEL FOR
THE AFT STRUT FAIRING



RETURN FILTER MODULE
FOR THE LEFT (RIGHT)
HYDRAULIC SYSTEM

B



**AFT STRUT FAIRING
(EXAMPLE)**

A

E22112 S0006415841_V2

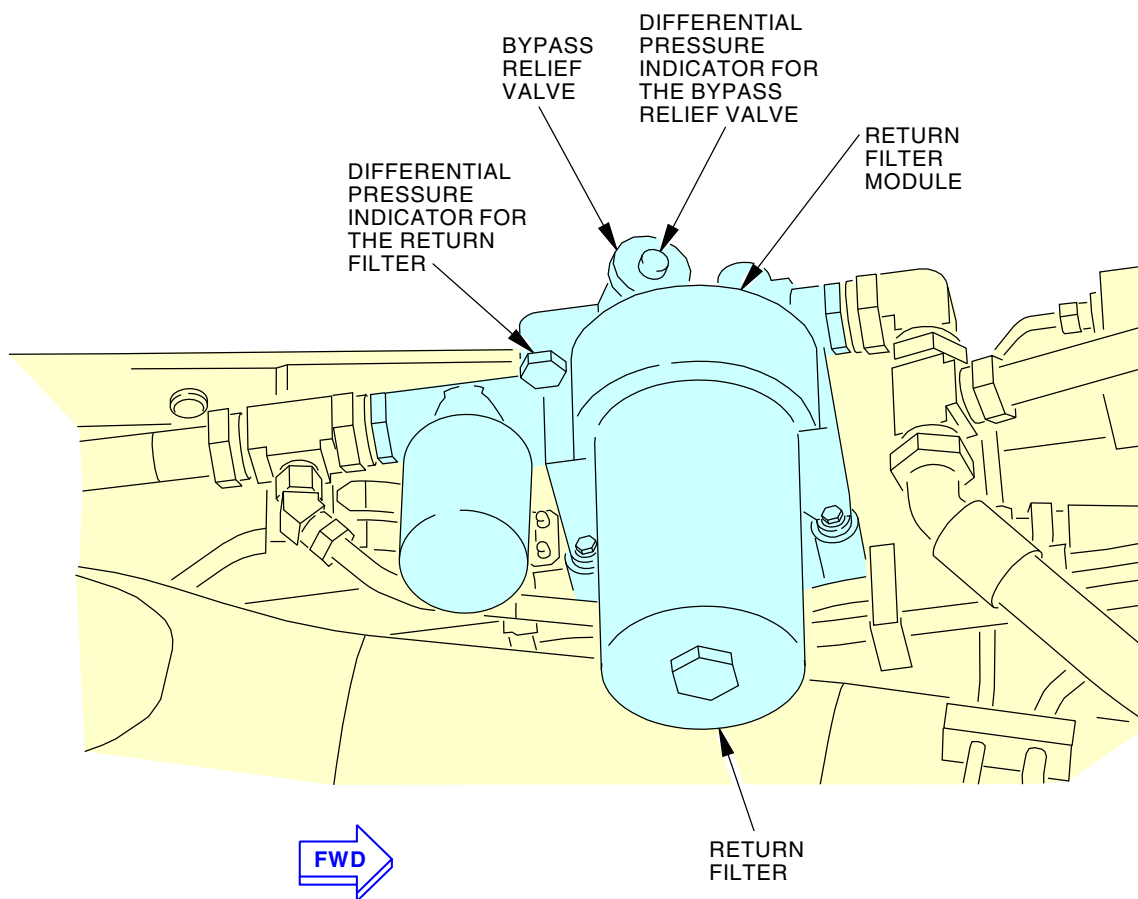
Return Filter Modules Inspection
Figure 603/29-11-00-990-810 (Sheet 1 of 3)

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**RETURN FILTER MODULE FOR THE
LEFT (RIGHT) HYDRAULIC SYSTEM**

B

E22118 S0006415842_V2

Return Filter Modules Inspection
Figure 603/29-11-00-990-810 (Sheet 2 of 3)

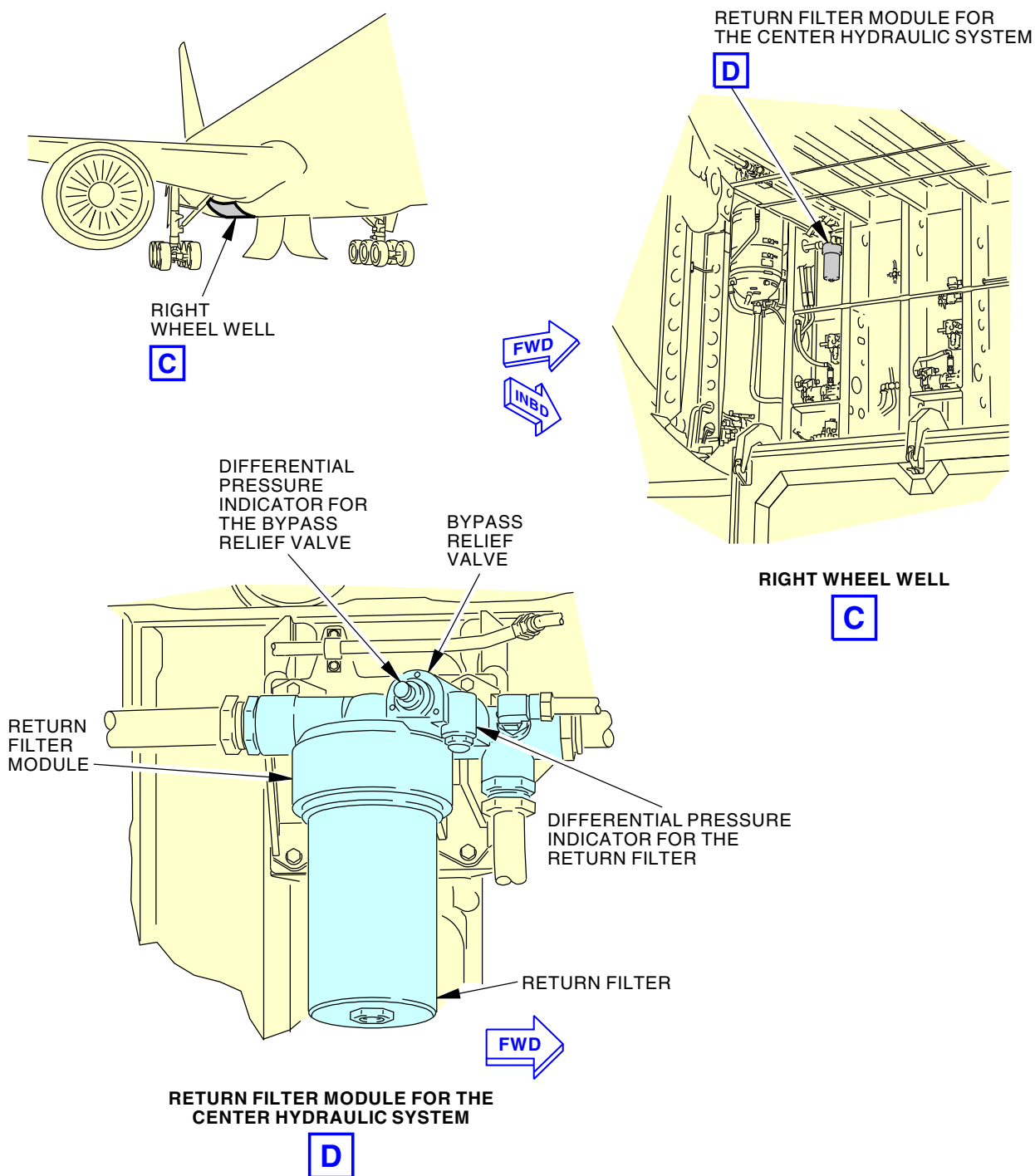
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E22142 S0006415843_V2

**Return Filter Modules Inspection
Figure 603/29-11-00-990-810 (Sheet 3 of 3)**

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TASK 29-11-00-200-803

7. Filter Elements of the Alternating Current Motor Pumps (ACMPs) Pressure and Case Drain Filter Modules Inspection/Check

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-40-000-801	Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-40-400-801	Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
29-11-41-000-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-41-400-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

D. Procedure

SUBTASK 29-11-00-040-013



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-11-00-010-025

- (2) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-023



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-024



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-072

- (5) Do these steps to examine each filter element:

NOTE: There are pressure and case drain filters for the ACMPs in each (Left, Center, Right) system.

- (a) Do these tasks to remove the filter element from the filter module:

NOTE: Do only the steps necessary to remove the filter element in these tasks.

- 1) Do this task: Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-40-000-801.
 - 2) Do this task: Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-41-000-801.
- (b) Examine each filter element to make sure it is not filled with unwanted material and it does not have damage.
- (c) If the filter element is not serviceable, discard the filter element.
- (d) Do these tasks to install a new or serviceable filter element in the filter module:

NOTE: Do only the steps necessary to install the filter element in these tasks.

- 1) Do this task: Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-40-400-801.
- 2) Do this task: Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-41-400-801.

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SUBTASK 29-11-00-080-017



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-024

- (7) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-010

- (8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-00-200-810

8. Filter Elements of the Engine Driven Pumps (EDPs) Pressure and Case Drain Filter Modules Inspection/Check

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
29-11-42-000-801	Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-42-400-801	Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

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D. Procedure

SUBTASK 29-11-00-040-020



WARNING

YOU MUST DEACTIVATE THE ENGINE AND THRUST REVERSER BEFORE YOU DO WORK ON OR AROUND THE THRUST REVERSER. IF YOU DO NOT, THE ENGINE OR THRUST REVERSER CAN OPERATE ACCIDENTALLY AND CAUSE INJURY AND/OR DAMAGE.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-047

- (2) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-042



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-043



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-103

- (5) Do these steps to examine each filter element:

NOTE: There are pressure and case drain filters for the EDPs in the left and right systems.

- (a) Do this task to remove the filter element from the filter module:

NOTE: Do only the steps necessary to remove the filter element in this task.

- 1) Do this task: Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-42-000-801.
- (b) Examine each filter element to make sure it is not filled with unwanted material and it does not have damage.
- (c) If the filter element is not serviceable, discard the filter element.
- (d) Do this task to install a new or serviceable filter element in the filter module:

NOTE: Do only the steps necessary to install the filter element in this task.

- 1) Do this task: Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-42-400-801.

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SUBTASK 29-11-00-080-027



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-035

(7) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-440-016

(8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-00-200-811

9. Filter Elements of the Air Driven Pumps (ADPs) Pressure and Case Drain Filter Modules

Inspection/Check

A. References

<u>Reference</u>	<u>Title</u>
29-11-43-000-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-43-400-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
197	Aft Wing-to-Body Fairings, Left

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

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D. Procedure

SUBTASK 29-11-00-040-021



YOU MUST DEACTIVATE THE ENGINE AND THRUST REVERSER BEFORE YOU DO WORK ON OR AROUND THE THRUST REVERSER. IF YOU DO NOT, THE ENGINE OR THRUST REVERSER CAN OPERATE ACCIDENTALLY AND CAUSE INJURY AND/OR DAMAGE.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-048

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-480-044



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-045



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-104

- (5) Do this task to examine each filter element:

NOTE: There are pressure and case drain filters for the ADPs in the center system.

- (a) Do this task to remove the filter element from the filter module:

NOTE: Do only the steps necessary to remove the filter element in this task.

- 1) Do this task: Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-43-000-801.
- (b) Examine each filter element to make sure it is not filled with unwanted material and it does not have damage.
- (c) If the filter element is not serviceable, discard the filter element.
- (d) Do this task to install a new or serviceable filter element in the filter module:

NOTE: Do only the steps necessary to install the filter element in this task.

- 1) Do this task: Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-43-400-801.

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SUBTASK 29-11-00-080-028



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-036

(7) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-440-017

(8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

TASK 29-11-00-200-811-006

10. Filter Elements of the Air Driven Pumps (ADPs) Pressure and Case Drain Filter Modules Inspection/Check - 300ER

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
29-11-43-000-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
29-11-43-400-801	Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
197	Aft Wing-to-Body Fairings, Left

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

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D. Procedure

SUBTASK 29-11-00-040-028



WARNING

YOU MUST DEACTIVATE THE ENGINE AND THRUST REVERSER BEFORE YOU DO WORK ON OR AROUND THE THRUST REVERSER. IF YOU DO NOT, THE ENGINE OR THRUST REVERSER CAN OPERATE ACCIDENTALLY AND CAUSE INJURY AND/OR DAMAGE.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-060

- (2) Open this access panel:

Number

Name/Location

197DL

Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-480-062



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-063



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-116

- (5) Do this task to examine each filter element:

NOTE: There are pressure and case drain filters for the ADPs in the center system.

- (a) Do this task to remove the filter element from the filter module:

NOTE: Do only the steps necessary to remove the filter element in this task.

- 1) Do this task: Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal, TASK 29-11-43-000-801.
- (b) Examine each filter element to make sure it is not filled with unwanted material and it does not have damage.
- (c) If the filter element is not serviceable, discard the filter element.
- (d) Do this task to install a new or serviceable filter element in the filter module:

NOTE: Do only the steps necessary to install the filter element in this task.

- 1) Do this task: Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation, TASK 29-11-43-400-801.

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SUBTASK 29-11-00-080-042



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-048

- (7) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-440-025

- (8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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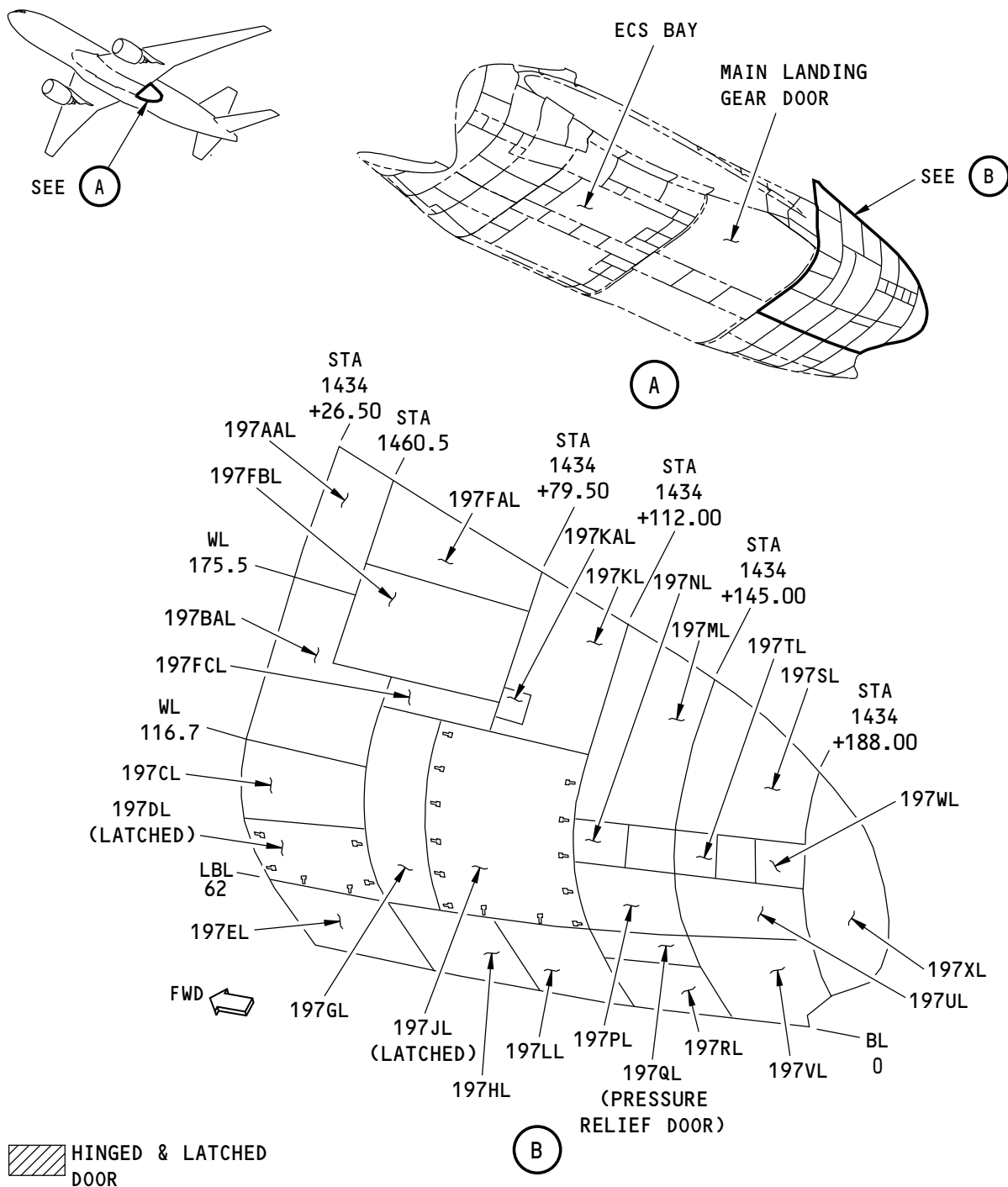
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SUB-MAJOR ZONE 190 - AFT WING TO BODY FAIRINGS - LEFT SIDE (777-300)
Figure 604/29-11-00-990-830

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TASK 29-11-00-200-812

11. Filter Elements of the Return Filter Modules Inspection/Check

(Figure 603)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-44-000-801	Left and Right System Return Filter Module and Components Removal (P/B 401)
29-11-44-400-801	Left and Right System Return Filter Module and Components Installation (P/B 401)
29-11-45-000-801	Center System Return Filter Module and Components Removal (P/B 401)
29-11-45-400-801	Center System Return Filter Module and Components Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

D. Procedure

SUBTASK 29-11-00-040-022



YOU MUST DEACTIVATE THE ENGINE AND THRUST REVERSER BEFORE YOU DO WORK ON OR AROUND THE THRUST REVERSER. IF YOU DO NOT, THE ENGINE OR THRUST REVERSER CAN OPERATE ACCIDENTALLY AND CAUSE INJURY AND/OR DAMAGE.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-049

- (2) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

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SUBTASK 29-11-00-480-046



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-047



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-105

- (5) Do these steps to examine each filter element:

NOTE: There is a return filter in each (Left, Center, Right) system.

- (a) Do these applicable tasks to remove the filter element from the filter module:

NOTE: Do only the steps necessary to remove the filter element in these tasks.

- 1) Do this task: Left and Right System Return Filter Module and Components Removal, TASK 29-11-44-000-801.
 - 2) Do this task: Center System Return Filter Module and Components Removal, TASK 29-11-45-000-801.
- (b) Examine each filter element to make sure it is not filled with unwanted material and it does not have damage.
- (c) If the filter element is not serviceable, discard the filter element.
- (d) Do these tasks to install a new or serviceable filter element in the filter module:
- NOTE: Do only the steps necessary to install the filter element in these tasks.
- 1) Do this task: Left and Right System Return Filter Module and Components Installation, TASK 29-11-44-400-801.
 - 2) Do this task: Center System Return Filter Module and Components Installation, TASK 29-11-45-400-801.

SUBTASK 29-11-00-080-029



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-037

- (7) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

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SUBTASK 29-11-00-440-018

- (8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-00-200-813

12. Filter Elements of the Air Driven Pumps (ADPs) Turbine Gearbox Assembly (TGA) Inspection/Check

A. References

Reference	Title
29-11-19-000-801	Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal (P/B 401)
29-11-19-400-801	Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

D. Procedure

SUBTASK 29-11-00-020-012

 WARNING	YOU MUST DEACTIVATE THE ENGINE AND THRUST REVERSER BEFORE YOU DO WORK ON OR AROUND THE THRUST REVERSER. IF YOU DO NOT, THE ENGINE OR THRUST REVERSER CAN OPERATE ACCIDENTALLY AND CAUSE INJURY AND/OR DAMAGE.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-010-050

- (2) Open this access panel:

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

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SUBTASK 29-11-00-480-048



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-049



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-210-106

- (5) Do this task to examine each filter element:
- (a) Do this task to remove the filter element from the filter module:
 - 1) Do this task: Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal, TASK 29-11-19-000-801.
 - (b) Examine each filter element to make sure it is not filled with unwanted material and it does not have damage.
 - (c) If the filter element is not serviceable, discard the filter element.
 - (d) Do this task to install a new or serviceable filter element in the filter module:
 - 1) Do this task: Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation, TASK 29-11-19-400-801.

SUBTASK 29-11-00-410-038

- (6) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

SUBTASK 29-11-00-440-019

- (7) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-11-00-080-031



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-080-032

- (9) Remove the downlock pins from the nose and main landing gears, if it is not necessary, do this task: (Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801).

————— END OF TASK —————

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TASK 29-11-00-200-814

13. Filter Elements of the Hydraulic Reservoir Pressurization Modules - Inspection/Check

A. General

(1) This task has these procedures:

- (a) An inspection of the left and right system hydraulic reservoir pressurization module filters
- (b) An inspection of the center system hydraulic reservoir pressurization module filter.

B. References

Reference	Title
20-30-80-910-801	General Cleaning of Metal (Series 80) (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-25-000-802	Filter Element Removal (P/B 401)
29-11-25-400-802	Filter Element Installation (P/B 401)
29-11-26-000-802	Filter Element Removal (P/B 401)
29-11-26-400-802	Filter Element Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B01000	Solvent - General Cleaning Of Metal	

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

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F. Prepare for the Inspection/Check

SUBTASK 29-11-00-860-244



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) To do the deactivation procedure for the thrust reverser (forward thrust position) for ground maintenance, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-480-050



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

- (2) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-860-245



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-010-051

- (4) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-010-052

- (5) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-860-246

- (6) For the applicable (left, right or center) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

G. Filter Element Inspection/Check

SUBTASK 29-11-00-210-107

- (1) Do this task to examine each filter element:
 - (a) Do this task to remove the filter element from left or right system reservoir pressurization module:
 - 1) Do this task: Filter Element Removal, TASK 29-11-25-000-802.

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- (b) Do this task to remove the filter element from the center system reservoir pressurization module:
 - 1) Do this task: Filter Element Removal, TASK 29-11-26-000-802.
- (c) Examine the filter element to make sure it is not filled with unwanted material and it does not have damage.
 - 1) Clean the filter element with Series 80 solvent, B01000 (TASK 20-30-80-910-801) and then fully dry it.
 - 2) If the filter element is not serviceable, discard the filter element.
- (d) Examine the filter cap for damage.
 - 1) If the filter cap has damage, replace the filter cap.
- (e) Do this task to install a new or serviceable filter element in the left or right system reservoir pressurization module:
 - 1) Do this task: Filter Element Installation, TASK 29-11-25-400-802.
- (f) Do this task to install a new or serviceable filter element in the center system reservoir pressurization module:
 - 1) Do this task: Filter Element Installation, TASK 29-11-26-400-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-410-039

- (1) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-00-410-040

- (2) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-860-247

- (3) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-11-00-080-033



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-080-034

- (5) Remove the downlock pins from the nose and main landing gears, if it is not necessary, do this task: (Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801).

————— **END OF TASK** —————

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TASK 29-11-00-200-804

14. Main Hydraulic Systems External Leakage Check

A. General

- (1) This procedure gives the external leakage limits which are permitted for normal operation and for dispatch of the airplane to avoid a delay. An external leakage rate which is not more than these limits will not have a bad effect on the component or system operation. You must make an analysis of each of the leakage rates to make a decision on the maximum total leakage rate that the average length of flight will permit.
- (2) These conditions are important when you do a leakage check for the various components:
 - (a) The seal at the B-nut tube connections is made by metal-to-metal surfaces. If a leak will not stop when you tighten the B-nut to the correct torque, the joint is defective and must be repaired.
 - (b) Supply hydraulic pressure to the component while you measure the leakage.
 - (c) If it is possible, operate the actuators to see if the leakage changes during the travel.
 - (d) Make sure the leak is not a type which will increase to a much higher rate with time. Use the type of leak and the length of time the component is pressurized to make this decision.
 - (e) Make sure all the reservoirs are full before each flight.
 - (f) After each flight, do a check of the components which have a leak.
 - (g) If hydraulic fluid collects in the area of the leak, it must not cause damage to the airplane structure or equipment.

NOTE: When titanium is exposed to Skydrol hydraulic fluid, BMS3-11, and temperatures above 270°F (132°C) hydrogen embrittlement of the titanium can occur.

B. References

Reference	Title
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
27-51-00-860-804	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-805	Retract the Trailing Edge Flaps (P/B 201)
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)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
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)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-45-07-700-802	Main Landing Gear Brake Fast Check (Wheel Installed on the Airplane) (P/B 601)
51-03-04-100-801	Empennage Drainage Cleaning (P/B 701)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)

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(Continued)

Reference	Title
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
113	Nose Landing Gear Wheel Well, Left
114	Nose Landing Gear Wheel Well, Right
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
197	Aft Wing-to-Body Fairings, Left
198	Aft Wing-to-Body Fairings, Right
410	PowerPlant, Left
420	PowerPlant, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle
197JL	Air Driven Pump (ADP) Access Door
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DL	Left Aft Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DL	Left Aft Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

E. Do a Check of the Hydraulic System External Leakage on Each Engine

NOTE: (Table 601)

SUBTASK 29-11-00-010-027



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 panel, do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.
- (e) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00.

SUBTASK 29-11-00-790-005

- (2) Examine the hydraulic line connections, the hydraulic fittings, and the hydraulic components on the engine for signs of hydraulic fluid leakage.

SUBTASK 29-11-00-790-006

- (3) If there are signs of hydraulic fluid leakage, do these steps to isolate the leak source:
 - (a) For the applicable hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) Compare the leak rate of the component with the external leakage limits (Table 601).
 - (c) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.
 - (d) If the leak rate is more than the external leakage limits (Table 601), repair the cause of the leak.
 - (e) For the area of the leak, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

Table 601/29-11-00-993-812 Hydraulic System External Leakage Limits

COMPONENTS	NORMAL OPERATION LIMITS ^{*[1]}	DISPATCH LIMITS TO AVOID DELAY ^{*[2]}
Hydraulic Pumps ^{*[3]} (ADP/EDP)	5 Drops per Minute	10 drops per Minute
Hydraulic Pumps ^{*[3]} (ACMP)	1 Drop per 10 Minutes	1 drop per 10 Minutes
Hydraulic Pumps ^{*[3]} (ACMP P/N S270T201)	5 Drops per Minute	10 drops per Minute
RAT Pump	1 Drop per Minute (Static)	1 Drop per Minute (Static)
Hydraulic Motors	5 Drops per Minute	10 Drops per Minute
Dynamic Seals (Swivel Glands, Actuator Rod End Seals, Vent or Weep Hole etc. Does not apply to Pumps or Motors)	8 Drops per Minute (Stopped or in Operation)	30 Drops per Minute (Stopped or in Operation)
Static Seals (Parting Seals, etc. Does not apply to Pumps or Motors)	1 Drop per 10 Minutes	1 Drop per 10 Minutes
B-Nuts,Tubing,Hoses	No Leakage	No Leakage
Landing Gear Brake Assemblies	No Leakage	Refer to Main Landing Gear Brake Fast Check (Wheel Installed on the Airplane), TASK 32-45-07-700-802 for brake examination and leakage limit details.

^{*[1]} The total leakage in each system must not be more than 100 drops per minute or 0.10 gallons per hour. But, the total leakage from the components that are part of the reserve brakes and steering system must not be more than 10 drops per minute or 0.01 gallons per hour.

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- *[2] Each system must not have more than two leaks which are larger than the normal operation limits in this table. The airplane must not have more than four leaks which are larger than the normal operation limits in this table. Total leakage for each system must not be more than 100 drops per minute or 0.10 gallons per hour. But, the total leakage from the components that are part of the reserve brakes and steering system must not be more than 10 drops per minute or 0.01 gallons per hour. It is recommended that components with more than normal leakage be checked either before or after each flight.
- *[3] Operate the pumps while you do a check of the leakage rate. One of the center system pumps can be deactivated for dispatch as contained in the Minimum Equipment List (MEL) and the Dispatch Deviation Guide (DDG) procedures.

SUBTASK 29-11-00-410-025



DO ALL 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 this 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.
 - (b) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
 - (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.

F. Do a Check of the Hydraulic System External Leakage in All Areas Except the Engine .

NOTE: (Table 601)

SUBTASK 29-11-00-040-015



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-00-040-019



OPERATING THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (2) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-00-010-029

- (3) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle
197JL	Air Driven Pump (ADP) Access Door
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle
434CL	Left Forward Access Door, Left Strut Aft Fairing

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<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DL	Left Aft Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DL	Left Aft Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-480-025



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-480-026



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-00-860-178

- (6) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-11-00-860-179



WARNING

MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE FLAPS, SLATS, FLAPERONS AND AILERONS. THESE SURFACES WILL MOVE AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 29-11-00-790-007

- (8) Examine the hydraulic line connections, the hydraulic fittings, and the hydraulic components for signs of hydraulic fluid leakage, in these areas:
- (a) Hydraulic bay in the aft strut fairing
 - (b) Wing rear spar
 - (c) Left and right main wheel wells
 - (d) Nose wheel well
 - (e) Wing to body fairing - left side
 - (f) Wing to body fairing - right side

SUBTASK 29-11-00-790-008

- (9) Examine the external drains on the vertical and horizontal stabilizers for signs of hydraulic fluid leakage (TASK 51-03-04-100-801).

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SUBTASK 29-11-00-790-009

- (10) If there are signs of hydraulic fluid leakage, do these steps to isolate the leak source:
- (a) For the applicable hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) Compare the leak rate of the component with the external leakage limits (Table 601).
 - (c) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.
 - (d) If the leak rate is more than the external leakage limits (Table 601), repair the cause of the leak.
 - (e) To remove the hydraulic fluid from the area of the leak, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-00-860-180



MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE FLAPS, SLATS, FLAPERONS AND AILERONS. THESE SURFACES WILL MOVE AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (11) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 29-11-00-860-181

- (12) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

SUBTASK 29-11-00-080-018



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (13) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-00-410-028

- (14) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle
197JL	Air Driven Pump (ADP) Access Door
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DL	Left Aft Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DL	Left Aft Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-00-080-024

- (15) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

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SUBTASK 29-11-00-440-012

- (16) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

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TASK 29-11-00-200-805

15. Main Hydraulic Systems Gross Internal Leakage Check

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task does a check of the total (gross) flow of the internal leakage for each main hydraulic system. This task has two alternative procedures to do a gross internal leakage check. You can use each of these procedures to do a gross internal leakage check of the left, right, or center hydraulic systems.
 - (a) For one procedure, you must operate an alternating current motor pump (ACMP) in the applicable hydraulic system. For the other procedure, you must use a portable hydraulic cart and a flowmeter.
 - (b) The procedure which uses the ACMP is the easier task of the two procedures, but it is the least accurate. More time is necessary to do the procedure which uses the hydraulic service cart and a flowmeter, but this procedure can give a more accurate result.
 - (c) The usual procedure is to first do the gross internal leakage check with the ACMP. If this procedure shows that the gross internal leakage flow is possibly above 6.5 gpm, then you do the procedure with the portable hydraulic cart and a flowmeter to make sure the flow is above 6.5 gpm.
- (2) The maximum approved internal leakage for each hydraulic system is the certification limit of 8.0 gpm at a system pressure of 3000 psi. The maximum maintenance limit for each hydraulic system is 6.5 gpm at a system pressure of 3000 psi. If the internal leakage is more than the maintenance limit, it is recommended that you repair or replace components to decrease the internal leakage below 6.5 gpm. The maintenance limit gives a tolerance which permits the internal leakage to increase (before a subsequent internal leakage check) and not become more than the certification limit of 8.0 gpm.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-802	Main Hydraulic System Pressurization with a Portable Hydraulic Cart (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

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

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Reference	Description
COM-1786	Flowmeter - Leakage Check, Hydraulic System Internal Part #: 410DME-10AR Supplier: 06659 Part #: 410DME-10AR-M Supplier: 06659 Part #: A215-UNIV-3K Supplier: 6T605 Part #: HTT01 Supplier: H6394
COM-1796	Portable Hydraulic Cart, System Test, Capable of 3000 PSI and a minimum flow of 50 GPM. Part #: 5830 SERIES Supplier: 59603 Part #: 58300BJ Supplier: 59603 Part #: 9780-0327 Supplier: 05172 Part #: 9780-0398 Supplier: 05172 Part #: HPPE503K-S4 Supplier: 6T605 Part #: HT2000-1-E/1-S Supplier: H6394 Part #: HT2000-1-F-S Supplier: H6394 Part #: HT50-E-F-D Supplier: H6394 Part #: PH50D Supplier: 10000 Part #: TMH3000 Supplier: L1238

D. Location Zones

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

E. Prepare for the Check

SUBTASK 29-11-00-860-182

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

SUBTASK 29-11-00-860-183

- (2) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-00-860-184

- (3) Make sure the control column, the control wheel, and the rudder pedals are in the center position.

SUBTASK 29-11-00-480-027



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-010-030



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-11-00-860-185

- (6) Make sure the landing gear control lever, on the forward center panel, P2, is the DN position.

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SUBTASK 29-11-00-860-186

- (7) Make sure the speedbrake lever, on the control stand, is in the DOWN position.

SUBTASK 29-11-00-860-187

- (8) Make sure the six FLT CONTROL HYD POWER switches, on the maintenance panel, P61, are in the NORM position.

SUBTASK 29-11-00-860-188

- (9) Do these steps to cause the landing gear selector/bypass valves to move to the off position:

NOTE: This is the position of the valves when the auto off function is engaged.

- (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	23	C78605	L ENG T/R CTRL

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
N	12	C78604	R ENG T/R CTRL

F. Main Hydraulic Systems Gross Internal Leakage Check with an Alternating Current Motor Pump (ACMP)

SUBTASK 29-11-00-860-193



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 BLANK OR AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

- (1) For the applicable hydraulic system, set this switch on the hydraulic control panel to the ON position:

NOTE: All other hydraulic pump switches, on the hydraulic control panel, must be in the OFF position.

- (a) For the left hydraulic system:
- 1) HYDRAULIC DEMAND L ELEC
- (b) For the center hydraulic system, one of these switches:
- 1) HYDRAULIC PRIMARY ELEC C1
 - 2) HYDRAULIC PRIMARY ELEC C2

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- (c) For the right hydraulic system:
 - 1) HYDRAULIC DEMAND R ELEC

SUBTASK 29-11-00-860-194

- (2) Operate the alternating current motor pump (ACMP) for one minute to let the hydraulic pressure become stable.

SUBTASK 29-11-00-970-011

- (3) Make a record of this hydraulic pressure indication, which shows on the EICAS maintenance page, for the applicable ACMP:
 - (a) For the left hydraulic system:
 - 1) HYDRAULIC L DEMAND PUMP: PRESS
 - (b) For the center hydraulic system:
 - 1) HYDRAULIC C1 or C2 PRIMARY PUMP: PRESS
 - (c) For the right hydraulic system:
 - 1) HYDRAULIC R DEMAND PUMP: PRESS

SUBTASK 29-11-00-970-014

- (4) Look at the graph of ACMP output pressure versus internal leakage flow range (Figure 605).

NOTE: The maximum output pressure value usable on the graph of ACMP Output Pressure versus Internal Leakage is 3100 psi. For EICAS maintenance page pressure readings between 3100 and 3215 psi, the leakage check is considered acceptable and no further action is necessary.

- (a) If the upper limit of the internal leakage flow range is less than the maintenance limit of 6.5 gpm, you do not need to do the Main Hydraulic Systems Gross Internal Leakage Check with A Portable Hydraulic Cart and Flowmeter.
- (b) If the upper limit of the internal leakage flow range is more than the maintenance limit of 6.5 gpm (but the lower limit is not), do this procedure which follows in this task:

NOTE: The procedure which follows gives a more accurate measurement of internal leakage flow. It is possible this procedure will show that the internal leakage flow is not above the maintenance limit.

- 1) Main Hydraulic System Gross Internal Leakage Check with a Portable Hydraulic Cart and a Flowmeter.
- (c) If the lower limit of the internal leakage flow range is also more than the maintenance limit of 6.5 gpm, it is recommended that you repair or replace components to decrease the flow below 6.5 gpm.

NOTE: The maintenance limit gives a tolerance which permits the internal leakage to increase (before a subsequent internal leakage check) and not become more than the certification limit of 8.0 gpm.

SUBTASK 29-11-00-860-195

- (5) Set all of the hydraulic pump switches, on the hydraulic control panel, to the OFF position.

G. Main Hydraulic Systems Gross Internal Leakage Check with a Portable Hydraulic Cart and a Flowmeter

SUBTASK 29-11-00-480-028

- (1) Install the hydraulic system internal leakage check flowmeter, COM-1786 between the pressure hose of the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796 and the ground service pressure disconnect on the airplane.

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SUBTASK 29-11-00-860-189



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 FLIGHT CONTROLS OR OTHER SYSTEM WHICH USES HYDRAULIC POWER, DURING THIS PROCEDURE. THE OPERATION OF A HYDRAULICALLY POWERED SYSTEM WILL INCREASE THE HYDRAULIC FLOW RATE. A HIGH FLOW RATE CAN CAUSE DAMAGE TO THE FLOWMETER.

- (2) To pressurize the applicable hydraulic system to 2950-3050 psi, do this task: Main Hydraulic System Pressurization with a Portable Hydraulic Cart, TASK 29-11-00-860-802

SUBTASK 29-11-00-970-012

- (3) After one minute, make a record of the internal leakage flow which shows on the hydraulic system internal leakage check flowmeter, COM-1786.

SUBTASK 29-11-00-970-013

- (4) Make sure the internal leakage is more than 0.75 gpm, but is less than the maintenance limit of 6.5 gpm.

NOTE: The check for a minimum of 0.75 gpm is only to make sure the flowmeter is operating.

- (a) If the internal leakage is more than the maintenance limit, it is recommended that you repair or replace components to decrease the flow below 6.5 gpm.

NOTE: The maintenance limit gives a tolerance which permits the internal leakage to increase (before a subsequent internal leakage check) and not become more than the certification limit of 8.0 gpm.

SUBTASK 29-11-00-860-190

- (5) To remove the 3000 PSI, 50 GPM system test portable hydraulic cart, COM-1796, and the hydraulic system internal leakage check flowmeter, COM-1786, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-860-191

- (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	23	C78605	L ENG T/R CTRL

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
N	12	C78604	R ENG T/R CTRL

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SUBTASK 29-11-00-080-019



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

———— **END OF TASK** ————

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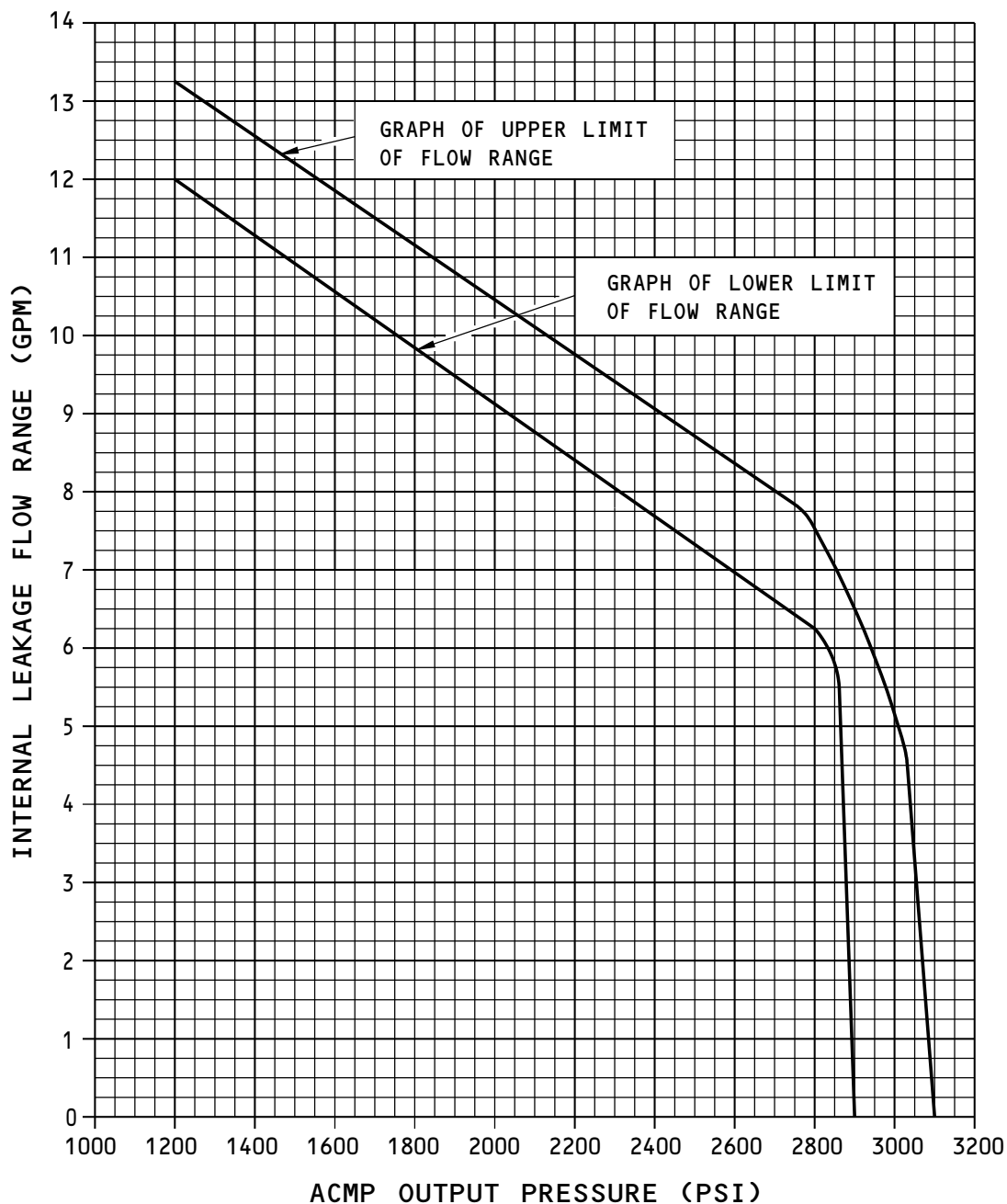
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NOTE: THE DIFFERENCE BETWEEN THE TWO GRAPHS OF THE INTERNAL LEAKAGE FLOW AT A GIVEN OUTPUT PRESSURE IS THE FLOW RANGE. THE FLOW RANGE INCLUDES THE DIFFERENCES IN OUTPUT BETWEEN DIFFERENT PUMPS PLUS THE TOLERANCE OF THE PRESSURE INDICATING SYSTEM.

E65144 S0006415851_V1

Internal Leakage Flow Range Versus ACMP Output Pressure
Figure 605/29-11-00-990-811

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TASK 29-11-00-790-801

16. Main and Nose Landing Gear Installation Hydraulic Leakage Check

A. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
113	Nose Landing Gear Wheel Well, Left
114	Nose Landing Gear Wheel Well, Right
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right

C. Procedure

SUBTASK 29-11-00-480-032



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-00-790-026

- (2) Examine the hydraulic line connections, the hydraulic fittings, and the hydraulic components for signs of hydraulic fluid leakage, in these areas:
 - (a) Main landing gear installation
 - (b) Nose landing gear installation.

D. Put the Airplane in its Usual Condition

SUBTASK 29-11-00-080-020



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— END OF TASK —————

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LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/ INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the left and right system alternating current motor pump (referred to as the pump [25] in this procedure)
 - (2) An installation of the pump [25].
- B. The left and right hydraulic systems each have one pump [25]. You can use this procedure to remove and install each of the pump [25].
- C. If you replace a pump [25] because of mechanical failure, you must flush the applicable hydraulic system, (TASK 29-11-00-170-801).

TASK 29-11-01-000-801

2. Left and Right System Alternating Current Motor Pump (ACMP) Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. **Location Zones**

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. **Access Panels**

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434DL	Left Aft Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444DL	Left Aft Access Door, Right Strut Aft Fairing

D. **Prepare for the Removal**

SUBTASK 29-11-01-860-001

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

Left Power Management Panel, P110

Row	Col	Number	Name
L	19	C29604	R HYD PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
L	4	C29605	L HYD PUMP CTRL

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SUBTASK 29-11-01-040-001



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-01-020-001

- (3) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434DL	Left Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-01-020-002

- (4) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444DL	Left Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-01-860-002

- (5) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Left and Right System Alternating Current Motor Pump (ACMP) Removal

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SUBTASK 29-11-01-000-001

- (1) Do the steps that follow:
- (a) Remove the lockwire from the electrical connectors [8] and [35].
 - (b) Disconnect the electrical connectors [8] and [35] from the alternating current motor pump [25].
 - (c) Install a cap on the electrical connectors [8] and [35] to prevent contamination.

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SUBTASK 29-11-01-020-005

- (2) Disconnect the self-sealing fitting [7] of the supply hose [6] from the pump [25].

NOTE: Loosen the self-sealing fitting [7] with a wrench on the removal flats of the self-sealing fitting [7] closest to the union [22] and a wrench on the removal flats on the union [22]. Disconnect the self-sealing fitting [7] by hand.

SUBTASK 29-11-01-020-006

- (3) Disconnect the case drain hose [3] and the pressure hose [4] from the pump [25].

SUBTASK 29-11-01-020-007

- (4) Install caps on the self-sealing fitting [7], the case drain hose [3], and the pressure hose [4] to prevent contamination.

SUBTASK 29-11-01-030-001

- (5) Remove the bolt [12], washer [13], washer [14], washer [16] and nut [17] which hold the aft jumper assembly [15] to the frame support assembly for the hydraulic equipment [10].

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- (a) Remove the aft jumper assembly [15].

SUBTASK 29-11-01-030-002

- (6) Remove the nut [28], screw [27], washer [26], washer [29], and support bracket [30] which hold the forward jumper assembly [15] to the support assembly for the ACMP [11].

SUBTASK 29-11-01-030-003

- (7) Move the ACMP temperature sensor wiring [31] away from the pump [25].

SUBTASK 29-11-01-020-009

- (8) Remove the bolts [1] which hold the support assembly [11] for the pump [25] to the frame support assembly [10] for the hydraulic equipment.

NOTE: While you remove the bolts [1], the frame support assembly [11] and the pump [25] will move down. When the frame support [11] moves down, the brackets [9] will engage the frame support assembly [10]. The brackets [9] will hold the assembly of the frame support assembly [11] and the pump [25] in its position until you remove it.

SUBTASK 29-11-01-020-010

- (9) Lift the frame support assembly [11] and the pump [25] sufficiently to remove their weight from the brackets [9].

SUBTASK 29-11-01-020-011

- (10) Move the frame support assembly [11] and the pump [25] aft until the brackets [9] disengage from the frame support assembly [10].

SUBTASK 29-11-01-020-012

- (11) Carefully lower the frame support assembly [11] and the pump [25].

SUBTASK 29-11-01-020-013

- (12) Move the frame support assembly [11] and the pump [25] between the structure of the aft strut fairing and the diagonal brace [5].

SUBTASK 29-11-01-020-014

- (13) Remove the frame support assembly [11] and the pump [25] through the aft access opening in the aft strut fairing.

SUBTASK 29-11-01-030-004

- (14) Do the steps which follow to remove the pump [25] from the frame support assembly [11]:
- (a) Remove the screws [27] which attach the pump [25] to the frame support assembly [11].
NOTE: The screw [27] at the location of the forward jumper assembly [15] attach point has been previously removed.
 - (b) Remove the support assembly [11] from the pump [25].
 - (c) Remove the aft jumper assembly [15] from the pump [25].

SUBTASK 29-11-01-020-016

- (15) If it is necessary to keep components for installation on the replacement pump [25], do these steps:
- (a) Remove the union [22] and the reducer [18] and reducer [20] from the ports on the pump [25].
 - (b) Install caps on the open ports of the pump [25] to prevent contamination.

————— **END OF TASK** —————

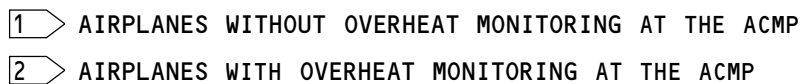
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ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details

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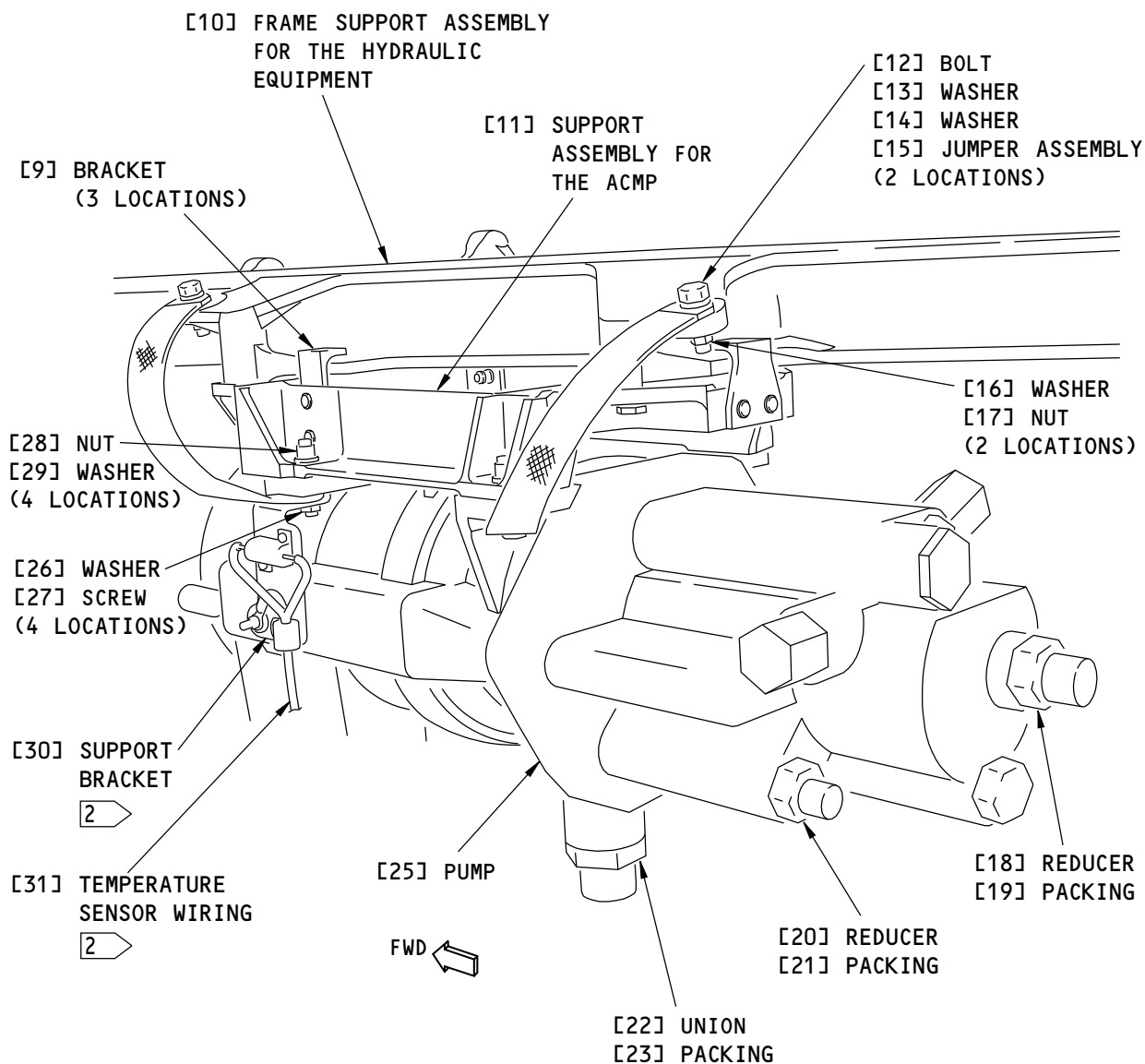
Alternating Current Motor Pump (ACMP) Installation

Figure 401/29-11-01-990-803 (Sheet 1 of 2)

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ALTERNATING CURRENT MOTOR PUMP (ACMP)

B

2 AIRPLANES WITH OVERHEAT MONITORING AT THE ACMP

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**Alternating Current Motor Pump (ACMP) Installation
Figure 401/29-11-01-990-803 (Sheet 2 of 2)**

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TASK 29-11-01-400-801

3. Left and Right System Alternating Current Motor Pump (ACMP) Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (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)
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	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.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2572	Wrench - Strap, Electrical Connector (for p/n's BT-BS-609/610 max dia 2.50"/1.50" with max part torque 200 in-lb; TG70 max dia 3.00" with max part torque 150 in-lb; BT-BS-611/ 618BSS max dia 4.00" with max part torque 200 in-lb) Part #: BT-BS-609 Supplier: 11851 Part #: BT-BS-610 Supplier: 11851 Part #: BT-BS-611 Supplier: 11851 Part #: BT-BS-618BSS Supplier: 11851 Part #: TG70 Supplier: 06324

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV

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(Continued)

Reference	Description	Specification
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
19	Packing	29-11-02-25A-020	ARO ALL
21	Packing	29-11-02-25A-025	ARO ALL
23	Packing	29-11-02-25A-030	ARO ALL
25	Pump	29-11-02-25A-040	ARO ALL

E. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

F. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434DL	Left Aft Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444DL	Left Aft Access Door, Right Strut Aft Fairing

G. Left and Right System Alternating Current Motor Pump (ACMP) Installation

SUBTASK 29-11-01-420-001

- (1) If it is necessary to install components on the replacement alternating current motor pump [25], do these steps:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [19], [packing [21], and packing [23] and to the threads on the union [22] and the reducer [18] and pump [25].
 - (b) Remove the caps from the ports on the pump [25].
 - (c) Install the packing [23] on the union [22].
 - (d) Install the packing [19] on the reducer [18].
 - (e) Install the packing [21] on the reducer [20].
 - (f) Install the union [22] and the reducer [18] and reducer [20] in the ports of the pump [25].

SUBTASK 29-11-01-420-012

- (2) Do the steps which follow to install the support assembly [11] on the pump [25]:
 - (a) Put the support assembly [11] on the pump [25].
 - (b) Install the screws [27], washers [26], washers [29], aft jumper assembly [15], and nuts [28](SWPM 20-20-00) except at the location where the forward jumper assembly [15] is installed.

NOTE: The forward jumper assembly [15] will be installed when the pump is in its installed position.

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SUBTASK 29-11-01-420-003

- (3) Move the support assembly [11] and the pump [25] through the aft access opening in the aft strut fairing.

SUBTASK 29-11-01-420-004

- (4) Carefully move the support assembly [11] and the pump [25] between the structure of the aft strut fairing and the diagonal brace [5].

SUBTASK 29-11-01-420-005

- (5) Move the support assembly [11] and the pump [25] up to the frame support assembly [10] for the hydraulic equipment.

SUBTASK 29-11-01-420-006

- (6) Move support assembly [11] and the pump [25] forward until the brackets [9] engage the frame support assembly [10].

NOTE: The brackets [9] will hold the support assembly [11] and the pump [25] in position while you install the bolts [1].

SUBTASK 29-11-01-420-007

- (7) Install the bolts [1] and washers [2] which attach the support assembly [11] for the pump [25] to the frame support assembly [10] for the hydraulic equipment.

SUBTASK 29-11-01-430-002

- (8) Install the bolt [12], washer [13], washer [14], washer [16] and nut [17] to attach the aft jumper assembly [15] to the frame support assembly [10] for the hydraulic equipment (SWPM 20-20-00).

SUBTASK 29-11-01-430-001

- (9) Install the nut [28], screw [27], washer [26], washer [29], and support bracket [30] with the temperature sensor wiring [31] to attach the forward jumper assembly [15] to the support assembly for the ACMP [11] (SWPM 20-20-00).
 - (a) With the intrinsically safe approved bonding meter, COM-1550, make sure that the maximum resistance between the jumper assembly [15] and the frame support assembly [10] is 0.00025 ohms (SWPM 20-20-00).

SUBTASK 29-11-01-420-009

- (10) Remove the caps from the self-sealing fitting [7], case drain hose [3] and pressure hose [4].

SUBTASK 29-11-01-420-010

- (11) Connect the case drain hose [3] and the pressure hose [4] to the pump [25].
 - (a) Tighten the B-nut on the case drain hose [3] to 170 ± 9 in-lb (19 ± 1 N·m).
 - (b) Tighten the B-nut on the pressure hose [4] to 500 ± 25 in-lb (56 ± 3 N·m).

SUBTASK 29-11-01-420-011

- (12) Connect the self-sealing fitting [7] of the supply hose [6] to the pump [25].
 - (a) Torque the self-sealing fitting [7] of the supply hose [6] to 450 ± 23 in-lb (51 ± 3 N·m).

SUBTASK 29-11-01-000-003

- (13) Do the steps that follow:
 - (a) Remove the caps from the electrical connectors [8] and [35].
 - (b) Connect the electrical connectors [8] and [35] to the alternating current motor pump [25].
 - 1) Make sure that the electrical connectors are correctly installed (SWPM 20-60-06).

NOTE: Correct installation of the electrical connectors is important to prevent moisture and contamination.

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- (c) Use the strap wrench, COM-2572 to tighten the electrical connectors [8] and [35] to 83 pound-inches (9.378 newton-meters).
- (d) Safety the electrical connector [8] with a lockwire. To safety, do this task: Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801.

SUBTASK 29-11-01-870-001

- (14) Do the steps which follow to bleed the air from the pump [25]:
 - (a) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.



WARNING

PUT A RAG AROUND THE CASE DRAIN PORT ON THE ACMP TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (b) Put a rag around the case drain hose [3] at the port on the pump [25] to catch a spray of hydraulic fluid.
- (c) Slowly loosen the case drain hose [3] at the reducer [20] to bleed the air from the pump [25].
- (d) After you bleed the air, tighten the B-nut on the case drain hose [3] to 170 $\pm$ 9 in-lb (19 $\pm$ 1 N·m).

H. Left and Right System Alternating Current Motor Pump (ACMP) Installation Test

SUBTASK 29-11-01-860-003

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

SUBTASK 29-11-01-860-004

- (2) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-01-610-001

- (3) For the applicable (left or right) system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-01-860-005

- (4) 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>
L	19	C29604	R HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	4	C29605	L HYD PUMP CTRL

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SUBTASK 29-11-01-860-006



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

- (5) Set the applicable HYDRAULIC DEMAND (L or R) ELEC switch on the hydraulic control panel to ON.

SUBTASK 29-11-01-790-001

- (6) Make sure there are no leaks at the hydraulic hose connections to the pump [25].

SUBTASK 29-11-01-210-001

- (7) Make sure the applicable HYDRAULIC SYSTEM PRESS (L or R) indication, on the EICAS maintenance page, is 2800 to 3200 psi.

SUBTASK 29-11-01-210-002

- (8) Make sure the FAULT light in the applicable HYDRAULIC DEMAND (L or R) ELEC switch goes off.

SUBTASK 29-11-01-860-007

- (9) Set the applicable HYDRAULIC DEMAND (L or R) ELEC switch, on the hydraulic control panel, to OFF.

SUBTASK 29-11-01-210-003

- (10) Make sure the FAULT light in the applicable HYDRAULIC DEMAND (L or R) ELEC switch comes on.

SUBTASK 29-11-01-210-005

- (11) Make sure the applicable HYDRAULIC SYSTEM TEMP (L or R) indication, on the EICAS maintenance page shows.

SUBTASK 29-11-01-210-004

- (12) Make sure the applicable HYDRAULIC SYSTEM PRESS (L or R) indication, on the EICAS maintenance page, is 0 to 200 psi.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-01-170-001

- (1) If you replaced an pump [25] because of mechanical failure, for the applicable (left or right) hydraulic system, (TASK 29-11-00-170-801).

SUBTASK 29-11-01-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) To clean all hydraulic fluid from the installation area, (TASK 12-25-01-100-801).

SUBTASK 29-11-01-410-001

- (3) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434DL	Left Aft Access Door, Left Strut Aft Fairing

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SUBTASK 29-11-01-410-002

- (4) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444DL	Left Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-01-440-001

- (5) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

———— **END OF TASK** ————

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CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the center system alternating current motor pump (referred to as the pump [15] in this procedure)
- (2) An installation of the pump [15].

B. There are two pumps [15] in the center hydraulic system. You can use this procedure to remove and install each of the pumps [15].

C. If you replace a pump [15] because of mechanical failure, you must flush the applicable hydraulic system (TASK 29-11-00-170-801).

TASK 29-11-02-000-801

2. Center System Alternating Current Motor Pump (ACMP) Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-02-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-02-010-001



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-02-860-001

- (3) For the center system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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SUBTASK 29-11-02-860-002

- (4) 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>
M	28	C29607	C1 HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	5	C29608	C2-HYD PUMP CTRL

D. Center System Alternating Current Motor Pump (ACMP) Removal

SUBTASK 29-11-02-210-008

- (1) Examine the connector pins when you disconnect the connector from the pump.

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SUBTASK 29-11-02-020-012

- (2) Do the steps that follow:
- (a) Remove the lockwire from the electrical connectors [16] and [35].
 - (b) Disconnect the electrical connectors [16] and [35] from the alternating current motor pump [15] (referred to as the pump [15] in this procedure).
 - (c) Install a cap on the electrical connectors [16] and [35] to prevent contamination.

ARO ALL

SUBTASK 29-11-02-020-003

- (3) Disconnect the supply hose [2] from the pump [15] by turning the self-sealing fitting [3] and disconnecting it from the union [4].

SUBTASK 29-11-02-020-004

- (4) Disconnect the case drain hose [8] and the pressure hose [9] from the pump [15].

SUBTASK 29-11-02-020-005

- (5) Install caps on the self-sealing fitting [3], the case drain hose [8], and the pressure hose [9] to prevent contamination.

SUBTASK 29-11-02-020-006

- (6) Remove the nut [17] from the stud [18] on each of the isolators [20].

SUBTASK 29-11-02-020-007

- (7) Remove the jumper assemblies [21] from the stud [18] from each of the outboard isolators [20].

SUBTASK 29-11-02-020-008

- (8) Lift the pump [15] above the studs [18] on the isolators [20] and remove the pump [15].

SUBTASK 29-11-02-020-009

- (9) If it is necessary to keep components for installation on the replacement pump [15], do this step:
- (a) Remove the union [4] and the reducer [6] and reducer [10] from the ports on the pump [15].

SUBTASK 29-11-02-020-010

- (10) Install caps on the ports of the pump [15] to prevent contamination.

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SUBTASK 29-11-02-210-001

- (11) Examine each of the isolators [20] for damage.

SUBTASK 29-11-02-020-011

- (12) If you find one or more of the isolators [20] have damage, do these steps:
- (a) Remove the bolts [12] from the isolator [20].
 - (b) Remove the isolator [20] from the keel beam [14].

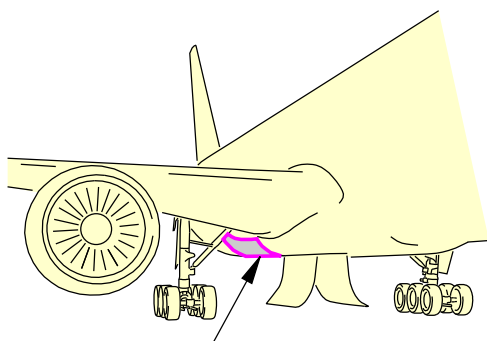
———— **END OF TASK** ————

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RIGHT
WHEEL WELL

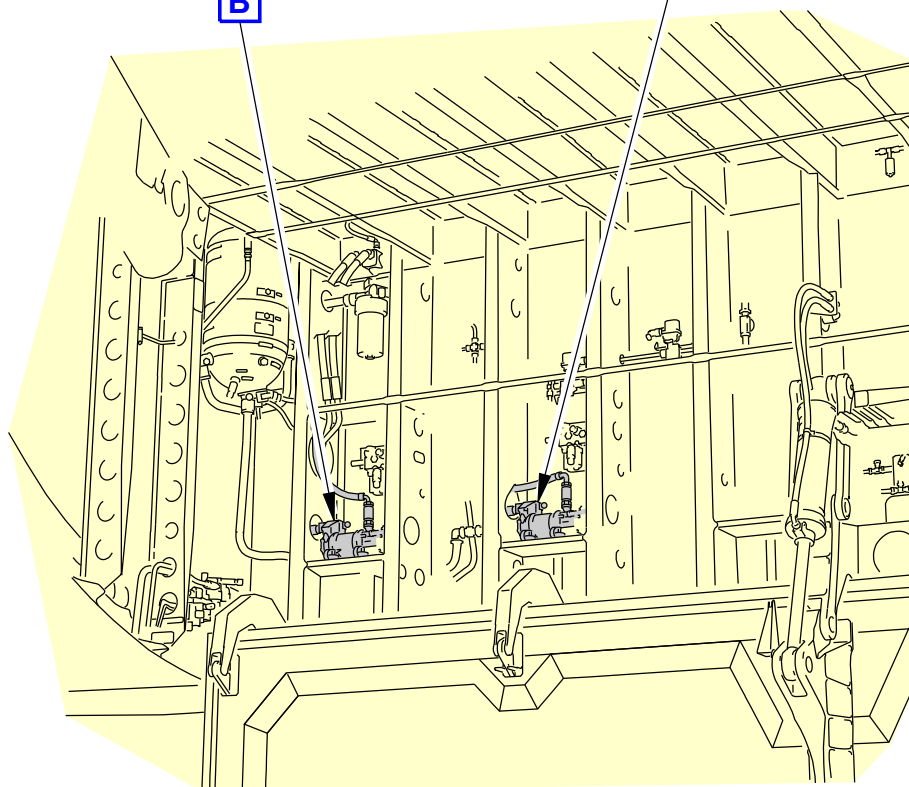
A

ALTERNATING CURRENT
MOTOR PUMP (ACMP) C2

B

ALTERNATING CURRENT
MOTOR PUMP (ACMP) C1

B



RIGHT WHEEL WELL

A



D06627 S0006415869_V2

**Alternating Current Motor Pump (ACMP) Installation
Figure 401/29-11-02-990-801 (Sheet 1 of 3)**

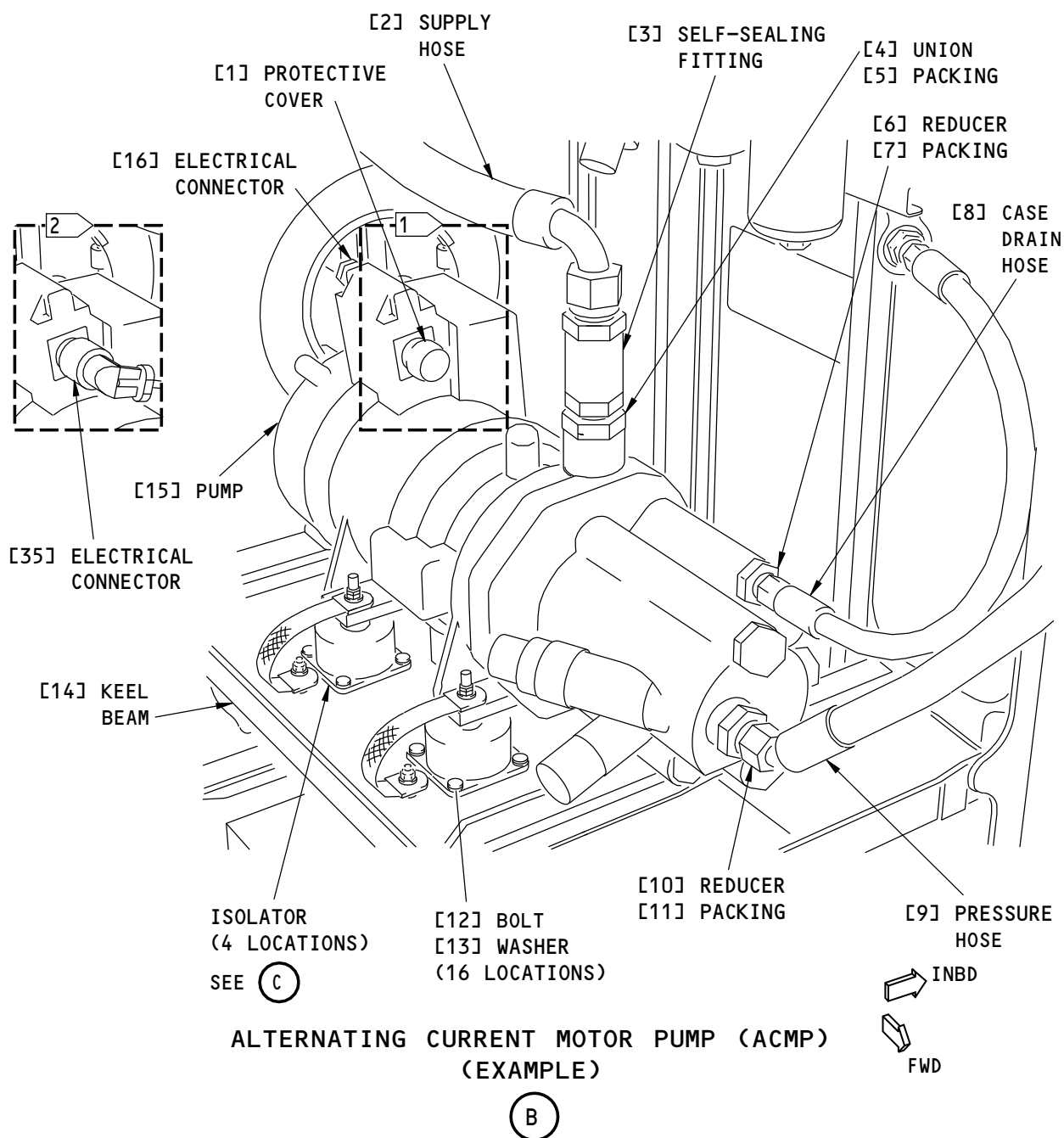
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- 1** AIRPLANES WITHOUT OVERHEAT MONITORING AT THE ACMP
- 2** AIRPLANES WITH OVERHEAT MONITORING AT THE ACMP

D06638 S0006415871_V1

**Alternating Current Motor Pump (ACMP) Installation
Figure 401/29-11-02-990-801 (Sheet 2 of 3)**

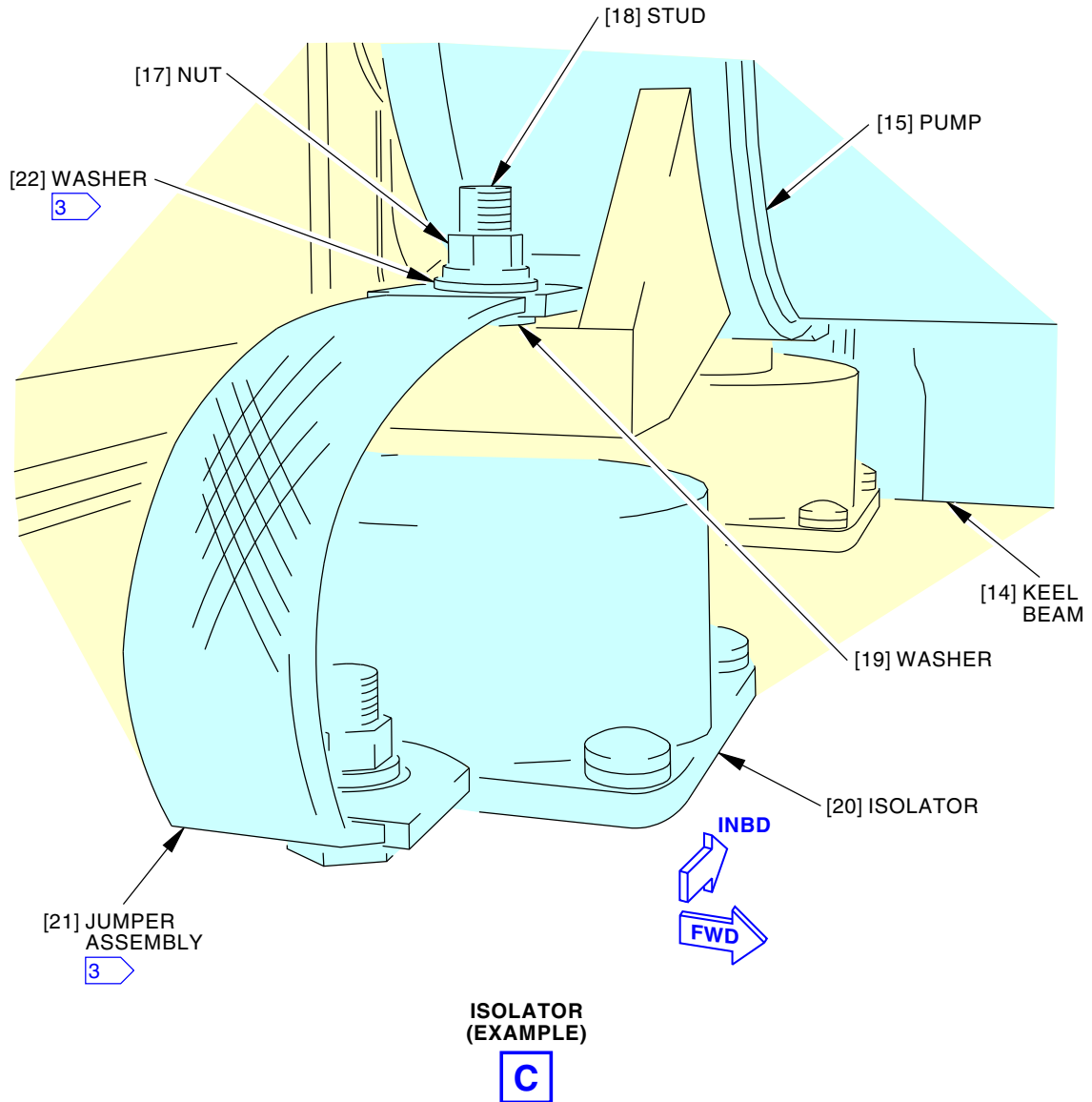
EFFECTIVITY
ARO ALL; AIRPLANES WITH HEAVYWEIGHT
VICKERS ACMP'S

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3 THESE COMPONENTS ARE INSTALLED AT THE TWO OUTBOARD ISOLATORS ONLY

L98755 S0006415874_V2

Alternating Current Motor Pump (ACMP) Installation
Figure 401/29-11-02-990-801 (Sheet 3 of 3)

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TASK 29-11-02-400-801

3. Center System Alternating Current Motor Pump (ACMP) Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (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)
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
SWPM 20-20-00	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.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2572	Wrench - Strap, Electrical Connector (for p/n's BT-BS-609/610 max dia 2.50"/1.50" with max part torque 200 in-lb; TG70 max dia 3.00" with max part torque 150 in-lb; BT-BS-611/ 618BSS max dia 4.00" with max part torque 200 in-lb) Part #: BT-BS-609 Supplier: 11851 Part #: BT-BS-610 Supplier: 11851 Part #: BT-BS-611 Supplier: 11851 Part #: BT-BS-618BSS Supplier: 11851 Part #: TG70 Supplier: 06324

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV

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(Continued)

Reference	Description	Specification
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Packing	29-11-02-25A-030	ARO ALL
7	Packing	29-11-02-25A-025	ARO ALL
11	Packing	29-11-02-25A-020	ARO ALL
15	Pump	29-11-02-25A-040	ARO ALL

E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

F. Center System Alternating Current Motor Pump (ACMP) Installation

SUBTASK 29-11-02-420-001

- (1) If you removed one or more of the isolators [20], do these steps:

NOTE: All isolators [20] must always have the same part numbers. If you replace one or more of the isolators [20], make sure that they all have the same part number.

- (a) Put the isolator [20] on the keel beam [14].
- (b) Install the bolt [12] and the washers [13] to attach the isolator [20] to the keel beam [14].

NOTE: The countersink on each washers [13] must be against the head of each bolts [12].

SUBTASK 29-11-02-420-002

- (2) If it is necessary to install components on the replacement alternating current motor pump [15] (referred to as the pump [15] in this procedure), do these steps:

- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [5], packing [7], and packing [11] and to the threads on the union [4]] and the reducer [6] and reducer [10].
- (b) Remove the caps from the ports on the pump [15].
- (c) Install the packing [5] on the union [4].
- (d) Install the packing [7] on the reducer [6].
- (e) Install the packing [11] on the reducer [10].
- (f) Install the union [4], the reducer [6] and the reducer [10] in the ports of the pump [15].
 - 1) Tighten the union [4] to 450 $\pm$ 23 in-lb (51 $\pm$ 3 N·m).
 - 2) Tighten the reducer [6] to 280 $\pm$ 14 in-lb (32 $\pm$ 2 N·m).
 - 3) Tighten the reducer [10] to 360 $\pm$ 18 in-lb (41 $\pm$ 2 N·m).

SUBTASK 29-11-02-420-003

- (3) Put the pump [15] on the studs [18] of the isolators [20].

SUBTASK 29-11-02-420-004

- (4) At each outboard isolator [20], do these steps:

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- (a) Install the washers [19], jumper assembly [21], washers [22] and nuts [17] (SWPM 20-20-00).
- (b) Tighten the nuts [17] to 65-90 pound-inches (7.344-10.169 newton-meters).
- (c) With the intrinsically safe approved bonding meter, COM-1550, make sure that the maximum resistance between the pump [15] and the keel beam [14] is 0.001 ohms (SWPM 20-20-00).
- (d) After the resistance check, seal the studs [18] and attaching hardware for the jumper assembly [21] per (SWPM 20-20-00, paragraph 3. D).

SUBTASK 29-11-02-420-005

- (5) At each inboard isolator [20], do these steps:
 - (a) Install the washers [19] and the nuts [17] on the stud [18] of the isolator [20].
 - (b) Tighten the nuts [17] to 65-70 pound-inches (7.344-7.909 newton-meters).

SUBTASK 29-11-02-420-006

- (6) Remove the caps from the self-sealing fitting [3], case drain hose [8] and pressure hose [9].

SUBTASK 29-11-02-420-007

- (7) Connect the case drain hose [8] and pressure hose [9] to the pump [15].
 - (a) Tighten the B-nut on the case drain hose [8] to 170 $\pm$ 9 in-lb (19 $\pm$ 1 N·m).
 - (b) Tighten the B-nut on the pressure hose [9] to 500 $\pm$ 25 in-lb (56 $\pm$ 3 N·m).

SUBTASK 29-11-02-420-008

- (8) Connect the self-sealing fitting [3] of the supply hose [2] to the union [4] on the pump [15].
 - (a) Torque the self-sealing fitting [3] of the supply hose [2] to 450 $\pm$ 23 in-lb (51 $\pm$ 3 N·m).

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SUBTASK 29-11-02-020-015

- (9) Do the steps that follow:
 - (a) Remove the cap from the electrical connectors [16] and [35].
 - (b) Connect the electrical connectors [16] and [35] from the alternating current motor pump [15] (referred to as the pump [15] in this procedure).
 - 1) Make sure that the electrical connectors are correctly installed (SWPM 20-60-06).
NOTE: Correct installation of the electrical connectors is important to prevent moisture and contamination.
 - (c) Use a strap wrench, COM-2572 to tighten the electrical connector [16] and [35] to 83 pound-inches (9.378 newton-meters).

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- (d) Safety the electrical connector [16] with a lockwire. To safety, do this task: Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801.

SUBTASK 29-11-02-870-001

- (10) Do the steps which follow to bleed the air from the pump [15]:
 - (a) For the center system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

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WARNING

PUT A RAG AROUND THE CASE DRAIN PORT ON THE ACMP TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (b) Put a rag around the case drain hose [8] at the port on the pump [15] to catch a spray of hydraulic fluid.
- (c) Slowly loosen the case drain hose [8] at the reducer [6] to bleed the air from the pump [15].
- (d) After you bleed the air, tighten the B-nut on the case drain hose [8] to 170 ±9 in-lb (19 ±1 N·m).

G. Center System Alternating Current Motor Pump (ACMP) Installation Test

SUBTASK 29-11-02-860-003

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

SUBTASK 29-11-02-860-004

- (2) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-02-210-002

- (3) For the center system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-02-860-005

- (4) 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>
M	28	C29607	C1 HYD PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	5	C29608	C2-HYD PUMP CTRL

SUBTASK 29-11-02-860-006



WARNING

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

- (5) Set the applicable HYDRAULIC PRIMARY ELEC (C1 or C2) switch on the hydraulic control panel to ON.

SUBTASK 29-11-02-790-001

- (6) Make sure there are no leaks at the hydraulic hose connections to the pump [15].

SUBTASK 29-11-02-210-003

- (7) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, is 2800 to 3200 psi.

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SUBTASK 29-11-02-210-004

- (8) Make sure the FAULT light in the applicable HYDRAULIC PRIMARY ELEC (C1 or C2) switch goes off.

SUBTASK 29-11-02-860-007

- (9) Push the applicable HYDRAULIC PRIMARY ELEC (C1 or C2) switch on the hydraulic control panel to OFF.

SUBTASK 29-11-02-210-005

- (10) Make sure the FAULT light in the applicable HYDRAULIC PRIMARY ELEC (C1 or C2) switch comes on.

SUBTASK 29-11-02-210-006

- (11) Make sure the HYDRAULIC SYSTEM PRESS C indication, on the EICAS maintenance page, is 0 to 200 psi.

SUBTASK 29-11-02-210-007

- (12) Make sure the a HYDRAULIC SYSTEM TEMP C1 (C2) indication, on the EICAS maintenance page shows.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-02-170-001

- (1) If you replace an pump [15] because of mechanical failure, do this task: Main Hydraulic System Flushing, TASK 29-11-00-170-801.

SUBTASK 29-11-02-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) To clean all hydraulic fluid from the installation area, (TASK 12-25-01-100-801).

SUBTASK 29-11-02-410-001



OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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ENGINE-DRIVEN PUMP (EDP) - REMOVAL/INSTALLATION

1. General

- A. This procedure contains two tasks. The first task removes the engine-driven pump (EDP). The second task installs the engine-driven pump.
- B. The engine-driven pump (EDP) is the same as the hydraulic pump on the air-driven pump (ADP) assembly. This procedure is applicable to the hydraulic pump on the engine. For the procedures for the hydraulic pump on the air-driven pump (ADP) assembly, refer to ADP Pump (TASK 29-11-11-000-801).
- C. If an engine-driven pump (EDP) operates for more than 5 minutes without hydraulic fluid, you must replace the EDP because this will usually cause damage to the EDP.
- D. If you replace an engine-driven pump because of mechanical failure, do this task: Main Hydraulic System Flushing, TASK 29-11-00-170-801.

TASK 29-11-05-000-801-002

2. Engine-Driven Pump (EDP) Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
71-00-00-700-822-H00	Test No. 21 - High-Power Leak Check (P/B 501)
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)
79-00-00-200-804-H01	Engine Oil System (DMS) (Scheduled Maintenance Task) Inspection (P/B 601)
79-00-00-200-805-H01	Engine Oil System (Lube and Scavenge Pump Screens and Magnetic Plugs) Inspection (P/B 601)

B. **Tools/Equipment**

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. **Consumable Materials**

Reference	Description	Specification
D50072 [C02-023]	Oil - Engine Lubricating	MIL-PRF-23699

D. **Location Zones**

Zone	Area
410	PowerPlant, Left
420	PowerPlant, Right

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E. Procedure

SUBTASK 29-11-05-860-001-002

- (1) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-05-860-002-002

- (2) For the left hydraulic system, 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>
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-05-860-009-002

- (3) For the right hydraulic system, 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>
L	3	C29600	R D-PRESS VLV SPLY

SUBTASK 29-11-05-010-001-002



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.

- (4) Do these tasks in this sequence to safely open the left thrust reverser:
- (a) To deactivate the leading edge slats in the retracted position, do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (b) To open the left fan cowl panel, do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00.

SUBTASK 29-11-05-030-001-002

- (5) Disconnect the electrical connector [10] from the (Figure 401) pump assembly [30].

SUBTASK 29-11-05-020-001-002

- (6) Install a cap on the electrical connector [10] to prevent contamination.

SUBTASK 29-11-05-480-001-002

- (7) Hold a oil resistant container 1 gal, (4 l), STD-1058 below the pump assy [30] to catch the hydraulic fluid, if it drains from the hydraulic connections.

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SUBTASK 29-11-05-030-002-002



BE CAREFUL WHEN YOU DISCONNECT THE SUPPLY HOSE TO PREVENT KINKS AND A CLOSED HOSE. DO NOT PUT THE HOSE INTO COILS. A CLOSED HOSE CAN CAUSE FAILURE OF THE ENGINE-DRIVEN PUMP.

- (8) Disconnect the check valve [12] of the pressure hose [1] from the adapter [16] on the pump assy [30].

NOTE: Do not disconnect the hydraulic hoses [1], [2], and [3] from the check valves [5] and [12] or the self-sealing fitting [4]. If you disconnect these hoses, hydraulic fluid can drain from the hoses.

SUBTASK 29-11-05-020-002-002

- (9) Disconnect the self-sealing fitting [4] of the supply hose [2] from the adapter [17] on the pump assy [30].

SUBTASK 29-11-05-020-003-002

- (10) Disconnect the check valve [5] of the case drain hose [3] from the adapter [21] on the pump assy [30].

SUBTASK 29-11-05-020-004-002

- (11) Disconnect the seal drain tube [8] from the reducer [26] on the pump assy [30].

SUBTASK 29-11-05-020-005-002

- (12) Install caps on the fittings on the ends of the hydraulic hoses [1], [2], and [3] and the seal drain tube [8] to prevent contamination.

SUBTASK 29-11-05-020-006-002



DO NOT LET THE HYDRAULIC FLUID GET IN THE GEARBOX OIL. VERY SMALL QUANTITIES OF THIS FLUID CAN CHEMICALLY CHANGE THE OIL. THIS CAN CAUSE DAMAGE TO THE GEARBOX.

- (13) Do these steps to remove the pump assy [30] from the engine gearbox [6]:

- (a) Loosen the nut [9], which attach the pump assy [30] to the engine gearbox [6], approximately three turns.

NOTE: It is not necessary to remove the nut [9] to remove the pump assy [30]. But if you do remove a nut [9], after three turns, lightly hit the shell of the nut [9] to release the self-lock property of the nut [9]. This will make it easier to remove the nut [9].



GET SUFFICIENT AID FROM PERSONS AND EQUIPMENT TO HOLD THE COMPONENT DURING REMOVAL AND INSTALLATION. THIS COMPONENT WEIGHS APPROXIMATELY 35 LBS (15.9 KG). THIS WILL PREVENT INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Support the weight of the pump assy [30] with your hands while you do these steps:
- 1) Turn the pump assy [30] clockwise until the nuts [9] can go through the larger ends of the slots on the pump assy [30].
 - 2) Pull the pump assy [30] away from the engine gearbox [6] in the direction which is parallel to the axis of the pump assy [30].

NOTE: The coupling shaft [27] will usually stay in the pump assembly [30].

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INSTALL THE END OF THE COUPLING SHAFT THAT HAS THE RETAINING RING INTO THE PUMP ASSEMBLY. INCORRECT INSTALLATION OF THE COUPLING SHAFT WILL CAUSE OIL LEAKAGE, AND DAMAGE TO THE ENGINE.

- (c) If the coupling shaft [27] stays in the engine gearbox [6], do these steps:
 - 1) Pull the coupling shaft [27] from the engine gearbox [6].
 - 2) Install the coupling shaft [27] in the pump assembly [30].
- (d) If the coupling shaft is not easily removed, it can be installed backwards.
 - 1) Do the procedure that follows if the shaft is stuck in the gearbox pad:
 - a) Remove the hydraulic pump support assembly from the AGB casing with the procedure that follows:
 - <1> Remove the six bolts and the washers that attach the pump support to the AGB.
 - <2> Install jackscrews in the three jacking holes adjacent to the bolt holes.
 - <3> Remove the pump support with the jackscrews.



MAKE SURE THE OLD INNER BEARING RACE IS REMOVED FROM THE GEARBOX BEFORE INSTALLATION.

- <4> Remove and discard the preformed packing.
- <5> Cover all the bare part surfaces and AGB openings where you do not work on parts.
- b) Install the new hydraulic pump support assembly to the AGB casing as follows:
 - <1> Apply engine lubricating oil, D50072 [C02-023] to the new preformed packing P/N J221P164 (05-360, 72-64-00).
 - <2> Install the new preformed packing in the pump support.
 - <3> Install new preformed packings on the transfer tube (05-550, 72-64-00 and 05-570, 72-64-00) P/Ns J221P012 and J221P110.



USE BEARING COMPONENTS WITH THE SAME SERIAL NUMBER. BEARING COMPONENTS USED WITH DIFFERENT SERIAL NUMBERS CAN CAUSE BEARING FAILURE.

- c) Install the roller bearing outer race in the AGB casing as follows:
 - <1> If necessary, apply heat with a heat gun to the AGB casing where the roller bearing outer race for the bevel gearshaft is installed.

NOTE: Do not increase the temperature over 150°F (65.6°C).
 - <2> Align the bolt hole of the roller bearing outer race with the bolt hole in the AGB casing.
 - <3> Install the roller bearing outer race in the AGB casing.
 - <4> Apply engine lubricating oil, D50072 [C02-023] to threads of the bolt.
 - <5> Attach the roller bearing outer race to the AGB casing with the nut.
 - <6> Tighten the nut to 55-70 lb in (6.3–7.9 N m).

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YOU MUST BE CAREFUL WHEN THE INNER RACE OF THE BEARING IS INSTALLED TO THE OUTER RACE. DAMAGE TO THE BEARING CAN OCCUR.

- <7> Apply engine lubricating oil, D50072 [C02-023] to the roller bearing outer race in the AGB casing.
- <8> Align the bolt holes in the pump support with the bolt holes in the AGB casing.
- <9> Align the roller bearing inner race on the bevel gearshaft with the outer race in the AGB casing.
- <10> Install the pump support on the AGB casing.
- <11> Attach the pump support to the AGB casing with bolts and washers.
- <12> Make sure the gears turn without resistance.
- <13> Tighten the bolts to 100–130 lb in (11.3–14.7 N m).
- d) After the spare hydraulic pump is assembled, do the steps that follow:
 - <1> Do a high power leak check for 20 minutes IAW (TASK 71-00-00-700-822-H00).

NOTE: No leaks at the sealing surface between the hydraulic pump assembly and AGB are permitted.
 - <2> Check MDS and DMS IAW (Engine Oil System (DMS) (Scheduled Maintenance Task) Inspection, TASK 79-00-00-200-804-H01) and (Engine Oil System (Lube and Scavenge Pump Screens and Magnetic Plugs) Inspection, TASK 79-00-00-200-805-H01).
 - <3> If you find unwanted material, send it out for metallurgical analysis.
 - <4> Do step <3> again in or less than 5 cycles after return to revenue service.
 - <5> Monitor oil consumption.

SUBTASK 29-11-05-020-007-002

- (14) Remove the adapter [16] from the pressure port on the pump assy [30].

SUBTASK 29-11-05-020-008-002

- (15) Remove the adapter [17] from the supply port on the pump assy [30].

SUBTASK 29-11-05-020-009-002

- (16) Remove the adapter [21] from the case drain port of the pump assy [30].

SUBTASK 29-11-05-020-010-002

- (17) Remove the reducer [26] from the seal drain port on the pump assy [30].

SUBTASK 29-11-05-020-011-002

- (18) Install caps on the ports on the pump assy [30] to prevent contamination.

———— **END OF TASK** ————

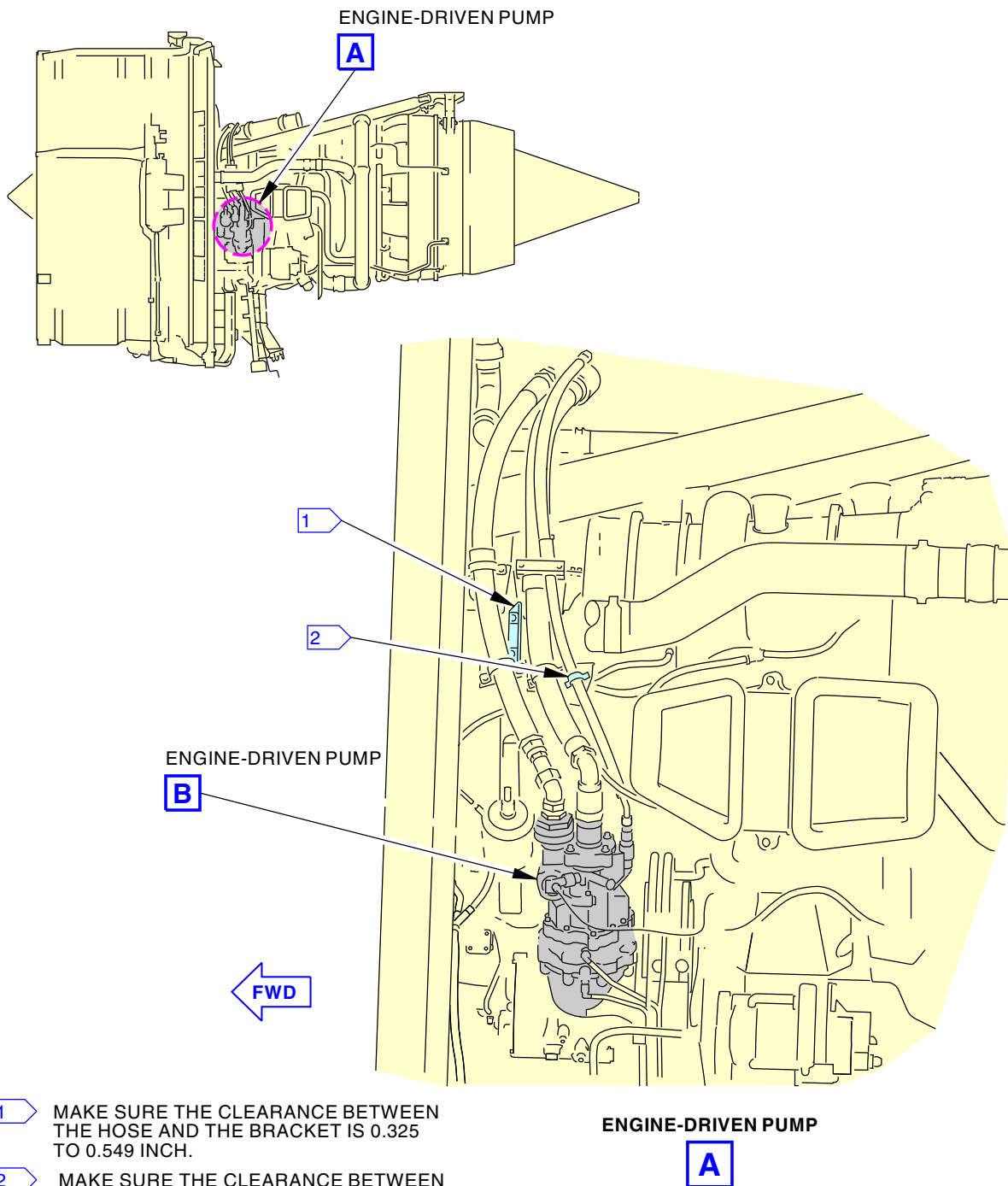
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- 1 MAKE SURE THE CLEARANCE BETWEEN THE HOSE AND THE BRACKET IS 0.325 TO 0.549 INCH.
- 2 MAKE SURE THE CLEARANCE BETWEEN THE SUPPLY HOSE AND THE SUPPORT BRACKET IS A MINIMUM OF 0.28 INCH.

ENGINE-DRIVEN PUMP

C33209 S0006415915_V2

Engine-Driven Pump (EDP) Installation
Figure 401/29-11-05-990-801-002 (Sheet 1 of 4)

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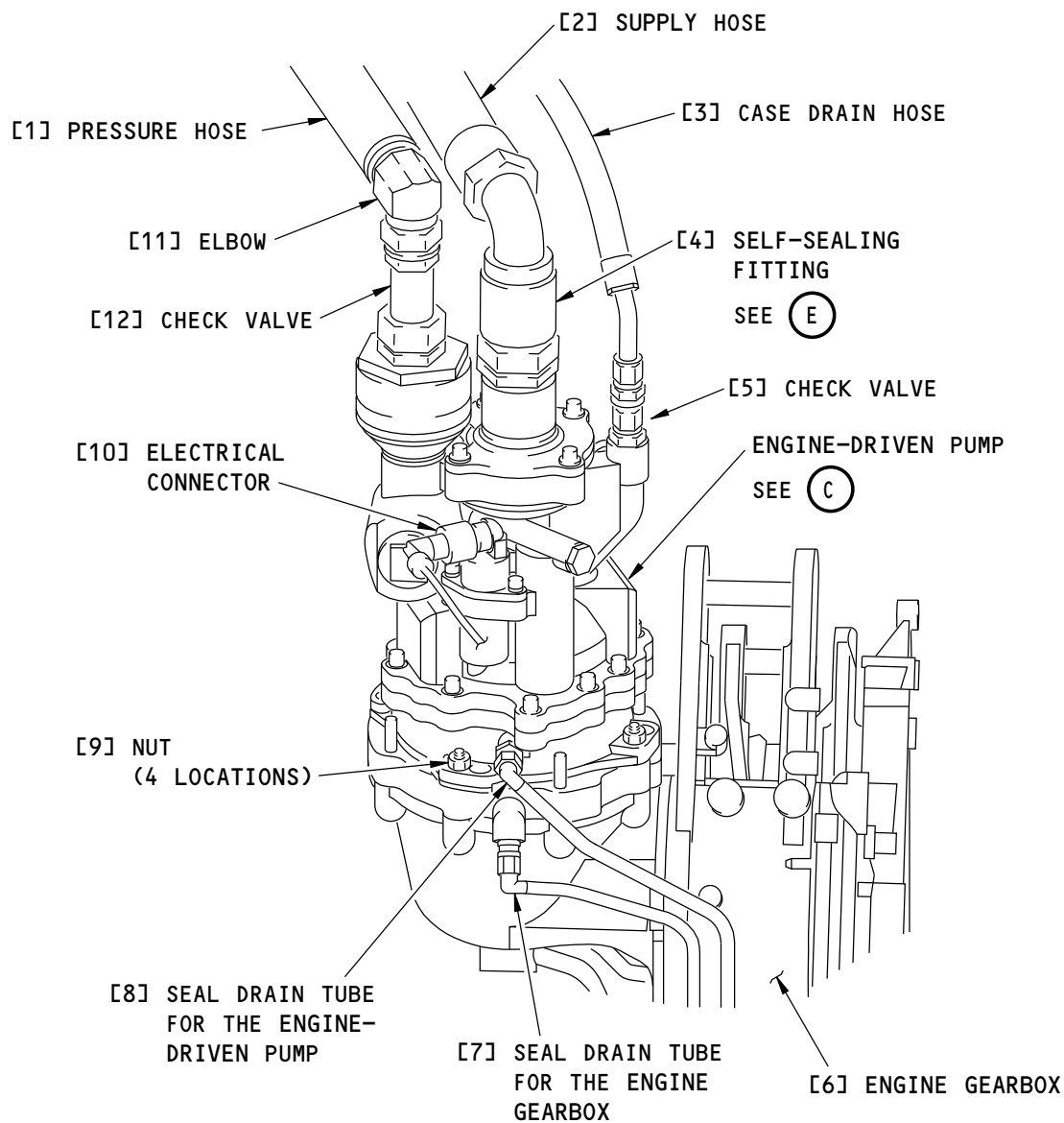
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ENGINE-DRIVEN PUMP

(B)

C58776 S0006415916_V2

**Engine-Driven Pump (EDP) Installation
Figure 401/29-11-05-990-801-002 (Sheet 2 of 4)**

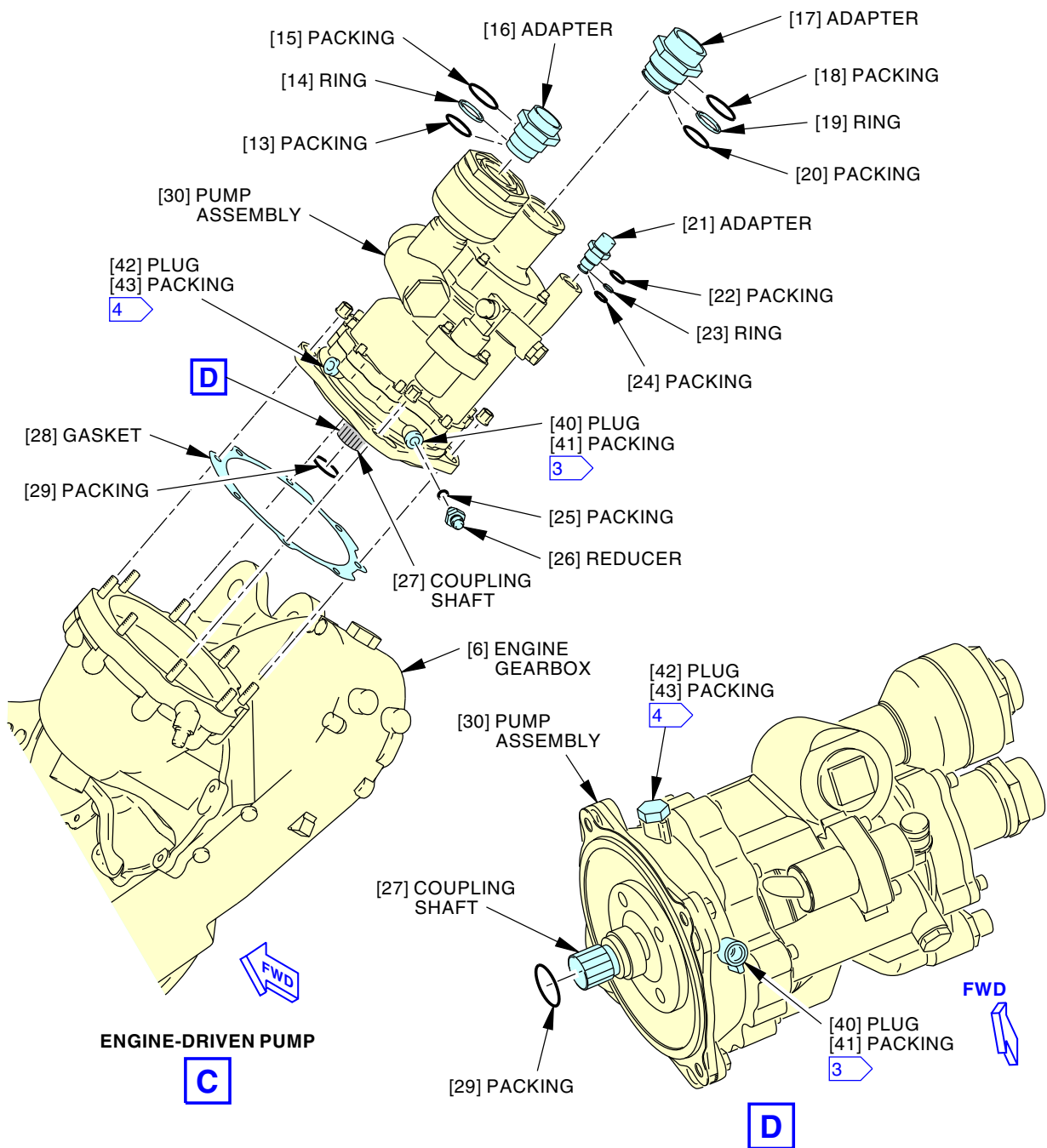
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- [3] REMOVE SHIPPING PLUG AND PACKING TO CONNECT REDUCER TO EDP PORT.
[4] DO NOT REMOVE SHIPPING PLUG AND PACKING FROM THIS EDP PORT.

C34193 S0006415918_V3

Engine-Driven Pump (EDP) Installation
Figure 401/29-11-05-990-801-002 (Sheet 3 of 4)

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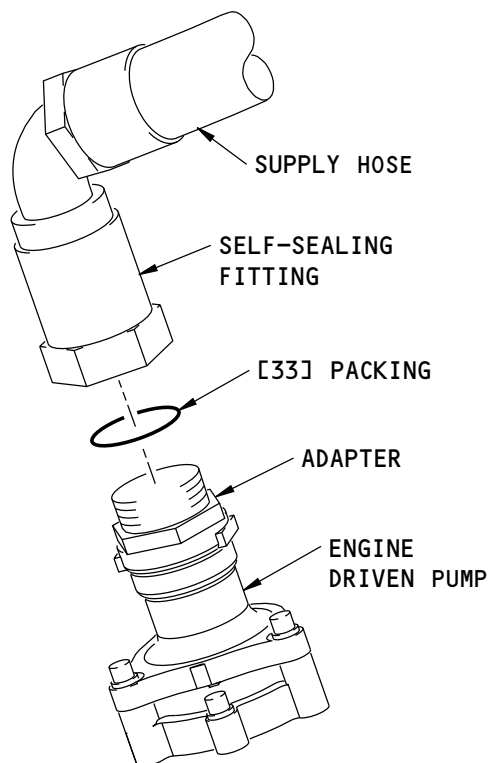
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SELF-SEALING FITTING
(EXAMPLE)

E

1997030 S0000389888_V1

Engine-Driven Pump (EDP) Installation
Figure 401/29-11-05-990-801-002 (Sheet 4 of 4)

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TASK 29-11-05-400-801-002

3. Engine-Driven Pump (EDP) Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-09-400-801	Flareless Tubing Assembly Installation (P/B 401)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (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)
71-00-00-800-837-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)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D00554 [C02-021]	Oil - Jet Engine Lubricating Oil	MIL-PRF-6081, Grade 1010
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Packing	29-11-05-02B-015	ARO ALL
14	Ring	29-11-05-02B-020	ARO ALL
15	Packing	29-11-05-02B-010	ARO ALL
18	Packing	29-11-05-02B-030	ARO ALL
19	Ring	29-11-05-02B-040	ARO ALL
20	Packing	29-11-05-02B-035	ARO ALL
22	Packing	29-11-05-02B-050	ARO ALL
23	Ring	29-11-05-02B-060	ARO ALL
24	Packing	29-11-05-02B-055	ARO ALL
25	Packing	29-11-05-02B-070	ARO ALL
28	Gasket	29-11-05-02B-080	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
29	Packing	29-11-05-02B-085	ARO ALL
30	Pump assembly	29-11-05-02B-090	ARO ALL
33	Packing	29-11-52-02B-110	ARO ALL
		29-11-52-02B-115	ARO ALL

D. Location Zones

Zone	Area
410	PowerPlant, Left
420	PowerPlant, Right

E. Engine-Driven Pump (EDP) Installation

SUBTASK 29-11-05-640-001-002

- (1) Lubricate the components which follow with hydraulic fluid, D50269 or hydraulic fluid, D00153:

NOTE: 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. After installation, make sure the O-ring/pre-formed packing is seated correctly in the groove of the spline and is free of damage.

- (a) packing [13], packing [15], packing [18], packing [20], packing [22], packing [24], packing [25], and packing [33].
- (b) ring [14], ring [19] and ring [23].
- (c) The threads on the adapter [16], adapter [17], adapter [21], reducer [26].

SUBTASK 29-11-05-420-001-002

- (2) Install the packing [13], packing [15], and ring [14] on the adapter [16]. (Figure 401)

SUBTASK 29-11-05-420-002-002

- (3) Install the packing [18], packing [20], and ring [19] on the adapter [17].

SUBTASK 29-11-05-420-003-002

- (4) Install the packing [22], packing [24], and ring [23] on the adapter [21].

SUBTASK 29-11-05-420-004-002

- (5) Install the packing [25] on the reducer [26].

SUBTASK 29-11-05-420-143

- (6) Replace the new packing [33] on the self-sealing fitting [4].

SUBTASK 29-11-05-420-005-002

- (7) Remove the caps from the ports on the pump assembly [30].

SUBTASK 29-11-05-020-012-002

- (8) If there is a shipping plug in the seal drain port on the pump assembly [30], remove the shipping plug [40] and the packing [41].

NOTE: A new pump assembly [30] is equipped with two shipping plugs installed in two drain ports. You will need to remove the shipping plug [40] and packing [41] from the seal drain port to permit connection of the reducer [26] to the pump assembly [30]. You do not need to remove the shipping plug [42] and packing [43] from the other drain port.

- (a) Make sure the shipping plug [42] and packing [43] are installed in the other drain port on the pump assembly [30].

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- (9) Install the new hydraulic pump support assembly to the Accessory Gear Box (AGB) casing as follows:
- (a) Apply C02-023 engine oil to the new preformed packing.
 - (b) Install the new preformed packing in the pump support.
 - (c) Install new preformed packings on the transfer tube.



KEEP THE INNER RACE AND THE OUTER RACE OF THE BEARING HOUSING TOGETHER. THE OUTER RACE AND THE INNER RACE OF THE ROLLER BEARING HOUSING HAVE THE SAME SERIAL NUMBER. DAMAGE TO EQUIPMENT CAN OCCUR IF THE INNER AND THE OUTER RACE DO NOT HAVE THE SAME SERIAL NUMBER.

- (d) Install the roller bearing outer race in the AGB casing as follows:



KEEP THE TEMPERATURE LESS THAN THE SPECIFIED LIMIT. HEAT CAN CAUSE DAMAGE TO EQUIPMENT.

- 1) If necessary, apply heat, with a heat gun to the AGB casing where the roller bearing outer race for the bevel gearshaft is installed.
 - a) Make sure the temperature of the surrounding area is not more than 150°F (66°C).
- 2) Align the bolt hole of the roller bearing outer race with the bolt hole in the AGB casing.
 - a) Install the roller bearing outer race in the AGB casing.
- 3) Apply C02-023 engine oil to the threads of the bolt.
 - a) Attach the roller bearing outer race to the AGB casing with the nut.
- 4) Tighten the nut to 55 in-lb (6.2 N·m) to 70 in-lb (7.9 N·m).



MAKE SURE THAT THE SPLIT INNER RACE OF THE BEARING STAYS WITH THE OUTER RACE. IF YOU INSTALL THE BEARING INCORRECTLY, DAMAGE TO THE BEARING WILL OCCUR.

- (e) Apply C02-023 engine oil to the roller bearing outer race in the AGB casing.
- (f) Align the bolt holes in the pump support with the bolt holes in the AGB casing.
 - 1) Align the roller bearing inner race on the bevel gearshaft with the outer race in the AGB casing.
 - 2) Install the pump support on the AGB casing.
- (g) Attach the pump support to the AGB casing with bolts and washers.
- (h) Make sure the gears turn without resistance.
- (i) Tighten the bolts to 100 in-lb (11.3 N·m) to 130 in-lb (14.7 N·m).

SUBTASK 29-11-05-420-006-002

- (10) Install the adapter [17] in the supply port of the pump assembly [30].

SUBTASK 29-11-05-420-007-002

- (11) Tighten the adapter [17] from 855 in-lb (97 N·m) to 945 in-lb (107 N·m).

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SUBTASK 29-11-05-420-008-002

- (12) Install the adapter [16] in the pressure port of the pump assembly [30].

SUBTASK 29-11-05-420-009-002

- (13) Tighten the adapter [16] to from 855 in-lb (97 N·m) to 945 in-lb (107 N·m).

SUBTASK 29-11-05-420-010-002

- (14) Install the adapter [21] in the case drain port of the pump assembly [30].

SUBTASK 29-11-05-420-011-002

- (15) Tighten the adapter [21] from 266 in-lb (30 N·m) to 294 in-lb (33 N·m).

SUBTASK 29-11-05-420-012-002

- (16) Install the reducer [26] in the seal drain port of the pump assembly [30].

SUBTASK 29-11-05-420-023-002

- (17) Tighten the reducer [26] from 105 in-lb (12 N·m) to 115 in-lb (13 N·m).

SUBTASK 29-11-05-640-002-002

- (18) Lubricate the packing [29] with oil, D00554 [C02-021].

SUBTASK 29-11-05-210-050-002



INSTALL THE END OF THE DRIVE SHAFT THAT HAS THE RETAINING RING INTO THE PUMP ASSEMBLY. INCORRECT INSTALLATION OF THE DRIVE SHAFT WILL CAUSE OIL LEAKAGE, AND DAMAGE TO THE ENGINE.

- (19) Make sure that the drive shaft [27] has been installed correctly in the pump assembly [30].

NOTE: It is possible for the drive shaft to be installed incorrectly. This can cause oil loss and subsequent engine and pump damage.

SUBTASK 29-11-05-420-013-002



MAKE SURE YOU INSTALL THE PACKING IN THE SPLINE GROOVE ON THE DRIVE SHAFT OF THE ENGINE-DRIVEN PUMP. THE PACKING PREVENTS LEAKAGE OF OIL FROM THE ENGINE GEARBOX. A LOSS OF ENGINE OIL CAN AFFECT ENGINE OPERATION AND CAUSE AN IN FLIGHT SHUTDOWN.

- (20) Install new packing [29] in the packing groove on the drive shaft [27] of the pump assembly [30].
- (a) Do not put grease on the drive shaft [27] of the pump assembly [30], the engine oil lubricates the drive shaft spline.

SUBTASK 29-11-05-210-001-002

- (21) Make sure the seal drain opening on the engine gearbox [6], adjacent to the pump assembly [30], is clear.

SUBTASK 29-11-05-210-002-002

- (22) Make sure the seal drain tube [8] for the pump assembly [30] and the seal drain tube [7] for the engine gearbox [6] are clear.

SUBTASK 29-11-05-140-001-002

- (23) If it is necessary, remove a blockage from the seal drain tube [8] for the pump assembly [30] and the seal drain tube [7] for the engine gearbox [6].

SUBTASK 29-11-05-160-001-002

- (24) Make sure the mating surfaces of the pump assembly [30] and the engine gearbox [6] are clean.

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SUBTASK 29-11-05-210-003-002

- (25) Make sure the gasket [28] is in good condition.

SUBTASK 29-11-05-420-014-002

- (26) If it is necessary, install a new gasket [28] on the engine gearbox [6].

SUBTASK 29-11-05-420-015-002



MAKE SURE YOU DO NOT DAMAGE THE PACKING WHEN YOU INSTALL THE ENGINE-DRIVEN PUMP. A DAMAGED PACKING CAN CAUSE A LOSS OF ENGINE OIL, WHICH CAN AFFECT ENGINE OPERATION AND CAUSE AN IN FLIGHT SHUTDOWN.

- (27) Put the pump assembly [30] on the engine gearbox [6] and carefully engage the drive shaft [27] with the engine gearbox [6].

SUBTASK 29-11-05-420-016-002

- (28) Turn the pump assembly [30] to let the nut [9] go through the larger ends of the slots on the pump assembly [30].

SUBTASK 29-11-05-420-017-002

- (29) Turn the pump assembly [30] counterclockwise until the small ends of the slots in the pump assembly [30] are tightly against the studs on the engine gearbox [6].

SUBTASK 29-11-05-420-018-002

- (30) Tighten the nut [9] from 260 in-lb (29 N·m) to 320 in-lb (36 N·m).

SUBTASK 29-11-05-420-019-002



DO A CHECK OF THE SUPPLY HOSE TO MAKE SURE IT DOES NOT HAVE KINKS AND IT IS NOT CLOSED. DAMAGE TO THE SUPPLY HOSE IS NOT EASY TO FIND BECAUSE OF THE SHEATH WHICH IS AROUND THE SUPPLY HOSE. A SUPPLY HOSE WHICH HAS KINKS OR IS CLOSED CAN CAUSE FAILURE OF THE ENGINE-DRIVEN PUMP. MAKE SURE YOU TIGHTEN THE SELF-SEALING FITTING ON THE SUPPLY HOSE CORRECTLY. A SELF-SEALING FITTING, WHICH DOES NOT HAVE SUFFICIENT TORQUE, CAN LIMIT THE FLOW OF HYDRAULIC FLUID.

- (31) Do the steps which follow to connect the hydraulic hoses [1], [2], and [3] to the pump assembly [30]:
- (a) Remove the caps from the fittings on the ends of the hydraulic hoses [1], [2], and [3] and the seal drain tube [8].



MAKE SURE THAT THE HYDRAULIC HOSES DO NOT RUB ON THE ADJACENT ENGINE COMPONENTS. IF THE HOSES RUB ON THE ENGINE COMPONENTS, THE DAMAGE CAN CAUSE LEAKAGE OF HYDRAULIC FLUID.

- (b) Put each hydraulic hose [1], [2], [3] in a position which gives the maximum clearance between these hoses and the adjacent engine components; do this task: Flareless Tubing Assembly Installation, TASK 20-10-09-400-801
- 1) Make sure the clearance between the hydraulic hose [1] and the bracket is 0.325 in. (8 mm) to 0.549 in. (14 mm).
 - 2) Make sure the clearance between the hydraulic hose [2] is a minimum of 0.280 in. (7 mm).
- (c) Hold the hydraulic hoses [1], [2], and [3] in this position until you tighten the hose fittings.

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(d) Install the self-sealing fitting [4] of the supply hose [2] to the adapter [17].

1) Tighten the self-sealing fitting [4] to 900 ±45 in-lb (102 ±5 N·m).

(e) Install the check valve [5] of the case drain hose [3] to the adapter [21].

1) Tighten the check valve [5] to 280 ±14 in-lb (32 ±2 N·m).

(f) Install the check valve [12] of the pressure hose [1] to the adapter [16].

1) Tighten the check valve [12] to 1600 ±80 in-lb (181 ±9 N·m).

NOTE: Use a backup wrench on the adapter [16] and tighten the check valve [12] with a different wrench.

SUBTASK 29-11-05-420-020-002

(32) Connect the seal drain tube [8] to the reducer [26] on the pump assembly [30].

SUBTASK 29-11-05-420-021-002

(33) Remove the cap from the electrical connector [10].

SUBTASK 29-11-05-420-022-002

(34) Connect the electrical connector [10] to the pump assembly [30].

SUBTASK 29-11-05-870-001-002

(35) Do the steps which follow to bleed the air from the pump assembly [30]:

(a) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.



PUT A RAG AROUND THE CASE DRAIN PORT ON THE ENGINE-DRIVEN PUMP TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

(b) Put a rag around the case drain hose [3] at the port on the pump assembly [30] to catch a spray of hydraulic fluid.

(c) Slowly loosen the check valve [5] at the adapter [21] to bleed the air from the pump assembly [30].

(d) After you bleed the air, tighten the check valve [5] to 280 ±14 in-lb (32 ±2 N·m).

SUBTASK 29-11-05-610-004-002

(36) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-05-860-010-002

(37) For the left hydraulic system, 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>
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-05-860-003-002

(38) For the right hydraulic system, 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>
L	3	C29600	R D-PRESS VLV SPLY

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SUBTASK 29-11-05-110-001-002



CAUTION

QUICKLY CLEAN ALL HYDRAULIC FLUID FROM THE GEARBOX SURFACES. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE ENGINE GEARBOX HOUSING.

- (39) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-05-170-002-002

- (40) If you replace the pump assembly [30] because of mechanical failure, do this task: Main Hydraulic System Flushing, TASK 29-11-00-170-801.

F. Engine-Driven Pump (EDP) Installation Test

SUBTASK 29-11-05-710-001-002

- (1) Do the test(s) listed in the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

SUBTASK 29-11-05-210-004-002

- (2) Make sure the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, is in the ON position.

SUBTASK 29-11-05-840-001-002

- (3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-05-210-005-002

- (4) Make sure the L (R) HYDRAULIC SYSTEM PRESS indication on the EICAS maintenance display is 2900 to 3200 psi.

SUBTASK 29-11-05-790-001-002

- (5) Make sure there are no leaks at the hydraulic hose connections to the pump assembly [30].

SUBTASK 29-11-05-860-005-002

- (6) Push the HYDRAULIC PRIMARY L (R) ENG switch to the OFF position.

SUBTASK 29-11-05-860-006-002

- (7) Let the hydraulic system pressure decrease.

SUBTASK 29-11-05-210-006-002

- (8) Make sure the FAULT indicator light, for the applicable pump assembly [30], comes on.

SUBTASK 29-11-05-860-007-002

- (9) Push the HYDRAULIC PRIMARY L (R) ENG switch to the ON position.

SUBTASK 29-11-05-210-007-002

- (10) Make sure the L (R) HYDRAULIC SYSTEM PRESS indication, on the EICAS maintenance display, is 2900 to 3200 psi.

SUBTASK 29-11-05-210-008-002

- (11) Make sure the FAULT indicator light, for the pump assembly [30], goes off.

SUBTASK 29-11-05-860-084-002

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

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-05-410-001-002



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 this sequence to safely close the left thrust reverser:
 - (a) For the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
 - (b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (c) For the left fan cowl panel, do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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HYDRAULIC SYSTEM CHECK VALVES (HOSE-MOUNTED) - REMOVAL/INSTALLATION

1. **General**

A. This procedure is for the removal and installation of the following check valves::

- (1) The engine-driven pump check valves.
- (2) The air-driven pump check valves.
- (3) The hydraulic line check valves.

TASK 29-11-06-000-802

2. **Engine-Driven Pump (EDP) Hose-Mounted Check Valve Removal**

Figure 401

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. Location Zones

Zone	Area
410	PowerPlant, Left
420	PowerPlant, Right

D. Prepare for the Removal

SUBTASK 29-11-06-860-010

- (1) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-06-860-011

- (2) For the left engine-driven pump (EDP), open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-06-860-012

- (3) For the right engine-driven pump (EDP), open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
L	3	C29600	R D-PRESS VLV SPLY

SUBTASK 29-11-06-010-003

- (4) To open the fan cowl panels, do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.

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E. Engine-Driven Pump(EDP) Hose-Mounted Check Valve Removal

SUBTASK 29-11-06-480-001

- (1) Hold a oil resistant container 1 gal, (4 l), STD-1058 below the engine-driven pump to catch the hydraulic fluid, if it drains from the hydraulic connections.

SUBTASK 29-11-06-020-023

- (2) Use a back-up wrench to hold the pump adapter[18] in its position.
 - (a) Remove the check valve [4] from the elbow [14].
 - (b) Put a cap on the elbow [14] to prevent contamination.

SUBTASK 29-11-06-020-010

- (3) Use a back-up wrench to hold the pump adapter [18] in its position.
 - (a) Disconnect the check valve [4] from the pump adapter [18].
 - (b) Put a cap on the pump adapter [18] to prevent contamination.

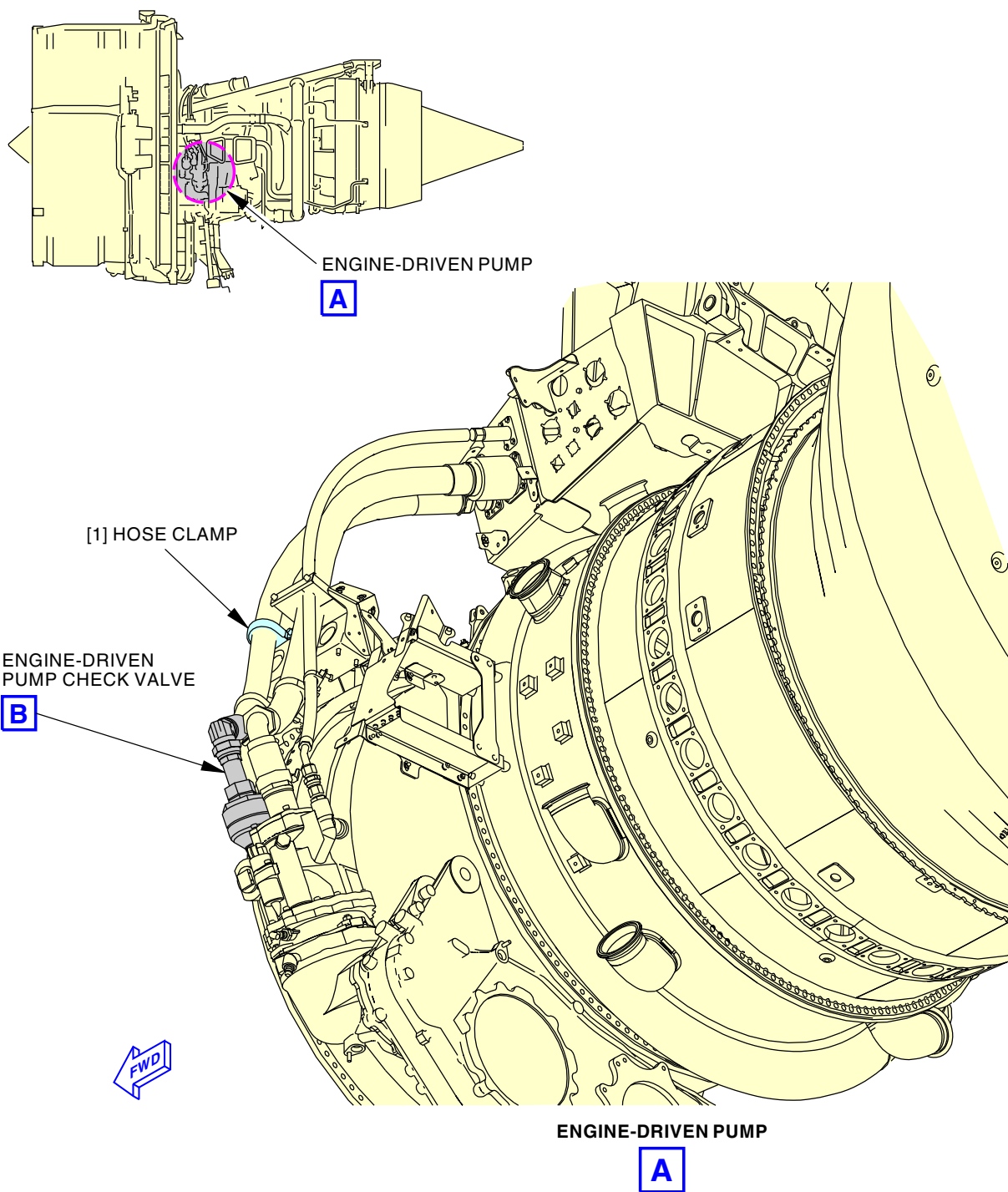
————— **END OF TASK** —————

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Engine-Driven Pump (EDP) Hose-Mounted Check Valve Installation
Figure 401/29-11-06-990-803 (Sheet 1 of 2)

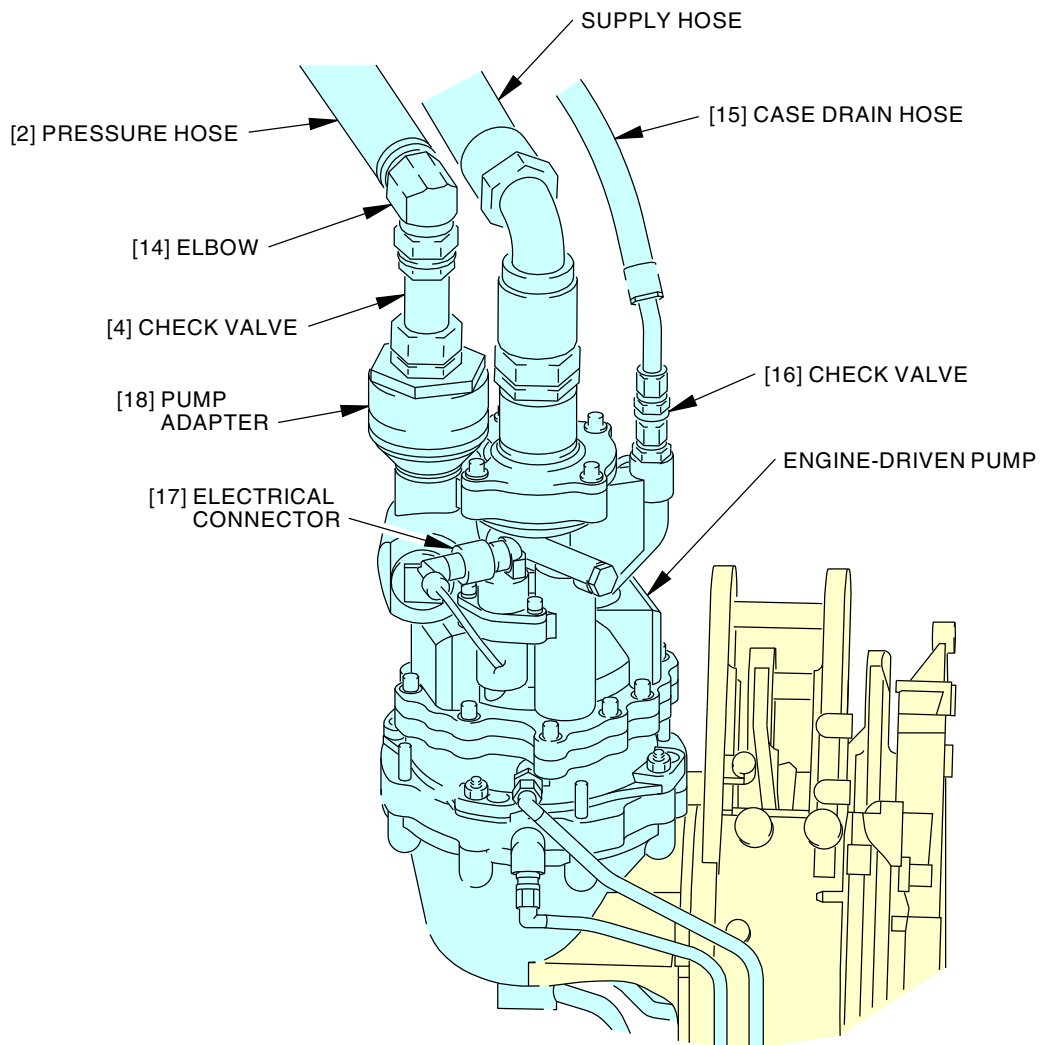
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**ENGINE-DRIVEN PUMP CHECK VALVE
(EXAMPLE)**

B

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**Engine-Driven Pump (EDP) Hose-Mounted Check Valve Installation
Figure 401/29-11-06-990-803 (Sheet 2 of 2)**

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TASK 29-11-06-400-801

3. Engine-Driven Pump (EDP) Hose-Mounted Check Valve Installation

Figure 401

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
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)

B. Location Zones

Zone	Area
410	PowerPlant, Left
420	PowerPlant, Right

C. Prepare for the Installation

SUBTASK 29-11-06-860-013

- (1) Make sure that this circuit breaker is open:

Left Power Management Panel, P110

Row	Col	Number	Name
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-06-860-014

- (2) Make sure that this circuit breaker is open:

Right Power Management Panel, P210

Row	Col	Number	Name
L	3	C29600	R D-PRESS VLV SPLY

D. Engine-Driven Pump (EDP) Hose-Mounted Check Valve Installation

SUBTASK 29-11-06-420-022

- (1) Do the following steps to install the check valve [4] on the pump adapter [18]:
- Remove the cap from the pump adapter [18].
 - Install the check valve [4] on the pump adapter [18].
 - Use a back-up wrench to prevent damage to the engine-driven pump.
 - Tighten the check valve [4] to 1600 ±80 in-lb (181 ±9 N·m).

SUBTASK 29-11-06-420-023

- (2) Do the following steps to install the check valve [4] on the elbow [14]:
- Remove the cap from the elbow [14].
 - Install the check valve [4] on the elbow [14].
 - Use a back-up wrench to prevent damage to the engine-driven pump.
 - Tighten the check valve [4] to 1600 ±80 in-lb (181 ±9 N·m).

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SUBTASK 29-11-06-610-001

- (3) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-06-870-001

- (4) Do the steps which follow to bleed the air from the engine-driven pump:
- (a) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.



CAUTION

CLEAN THE PARTS IF HYDRAULIC FLUID GETS ON THEM. IF THE HYDRAULIC FLUID STAYS ON THE PARTS, IT CAN CAUSE CORROSION.

- (b) Put a rag around the case drain hose [15] at the port on the engine-driven pump to catch a spray of hydraulic fluid.
- (c) Slowly loosen the check valve [16] on the case drain hose [15] to bleed the air from the engine-driven pump.
- (d) After you bleed the air, tighten the check valve [16] to 266 in-lb (30 N·m) to 294 in-lb (33 N·m).

SUBTASK 29-11-06-860-015

- (5) For the left engine-driven pump (EDP), remove safety tag and close this circuit breaker:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-06-860-016

- (6) For the right engine driven pump (EDP), 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>
L	3	C29600	R D-PRESS VLV SPLY

SUBTASK 29-11-06-110-001



CAUTION

CLEAN THE PARTS IF HYDRAULIC FLUID GETS ON THEM. IF THE HYDRAULIC FLUID STAYS ON THE PARTS, IT CAN CAUSE CORROSION.

- (7) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801 .

E. Engine-Driven Pump (EDP) Installation Test

SUBTASK 29-11-06-710-003

- (1) Do the test(s) listed in the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

SUBTASK 29-11-06-860-017

- (2) Make sure the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, is in the ON position.

SUBTASK 29-11-06-860-018

- (3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

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SUBTASK 29-11-06-210-003

- (4) Make sure the L (R) HYDRAULIC SYSTEM PRESS indication on the EICAS maintenance display is 2900 to 3200 psi.

SUBTASK 29-11-06-790-001

- (5) Make sure there are no leaks at the hydraulic hose connections to the engine-driven pump.

SUBTASK 29-11-06-860-020

- (6) Push the HYDRAULIC PRIMARY L (R) ENG switch to the OFF position.

SUBTASK 29-11-06-860-021

- (7) Let the hydraulic system pressure decrease.

SUBTASK 29-11-06-210-004

- (8) Make sure the FAULT indicator light, for the applicable engine-driven pump, comes on.

SUBTASK 29-11-06-860-022

- (9) Push the HYDRAULIC PRIMARY L (R) ENG switch to the ON position.

SUBTASK 29-11-06-210-005

- (10) Make sure the L (R) HYDRAULIC SYSTEM PRESS indication, on the EICAS maintenance display, is 2900 to 3200 psi.

SUBTASK 29-11-06-210-006

- (11) Make sure the FAULT indicator light, for the engine-driven pump, goes off.

SUBTASK 29-11-06-860-050

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

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-06-410-002

- (1) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

————— END OF TASK —————

TASK 29-11-06-000-803

4. Air-Driven Pump (ADP) Hose-Mounted Check Valve Removal

Figure 402

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. Prepare for the Removal

SUBTASK 29-11-06-860-024

- (1) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

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SUBTASK 29-11-06-860-025

- (2) For the center system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-06-860-026

- (3) 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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-06-040-001



MAKE SURE THAT THE ADP ACCESS DOOR IS FULLY OPEN OR FULLY CLOSED WHEN YOU MOVE THE TRAILING EDGE FLAPS. THE FLAPS CAN HIT THE DOOR IF IT IS NOT FULLY OPEN OR CLOSED. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (4) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-06-010-004

- (5) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

E. Air-Driven Pump (ADP) Hose-Mounted Check Valve Removal

SUBTASK 29-11-06-480-003

- (1) Hold a oil resistant container 1 gal, (4 l), STD-1058 below the air-driven pump to catch the hydraulic fluid, if it drains from the hydraulic connections.

SUBTASK 29-11-06-020-019

- (2) Remove the hose clamps.

SUBTASK 29-11-06-020-021

- (3) Use a back-up wrench to hold the pump adapter [3] in its position.
- (a) Disconnect the pressure hose [1] from the check valve [2].
 - (b) Put a cap on the pressure hose [1] to prevent contamination.

SUBTASK 29-11-06-020-024

- (4) Use a back-up wrench to hold the pump adapter [3] in its position.
- (a) Disconnect the check valve [2] from the pump adapter [3].
 - (b) Put a cap on the pressure hose [1] to prevent contamination.

————— **END OF TASK** —————

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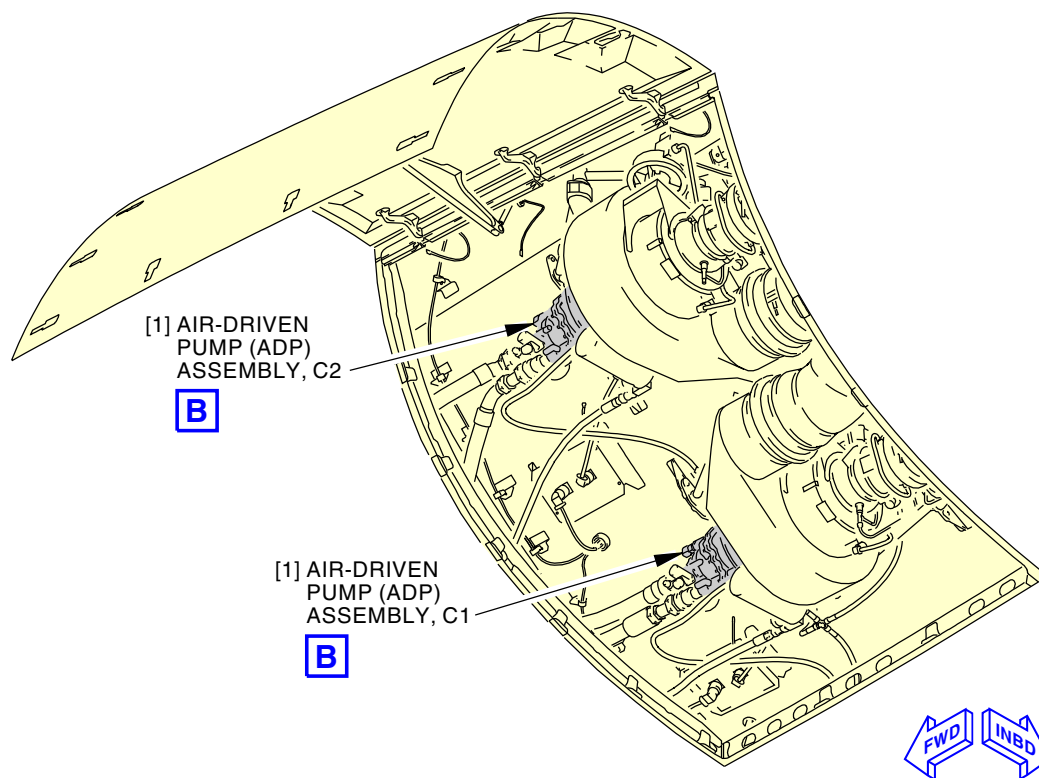
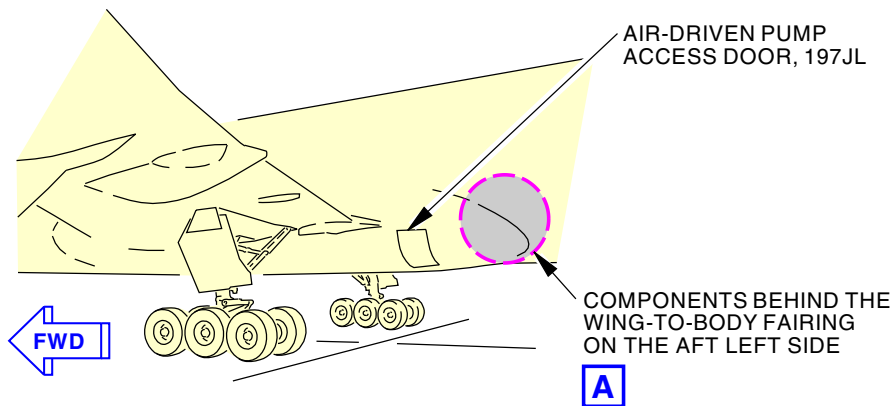
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COMPONENTS BEHIND THE WING-TO-BODY FAIRING
ON THE AFT LEFT SIDE

A

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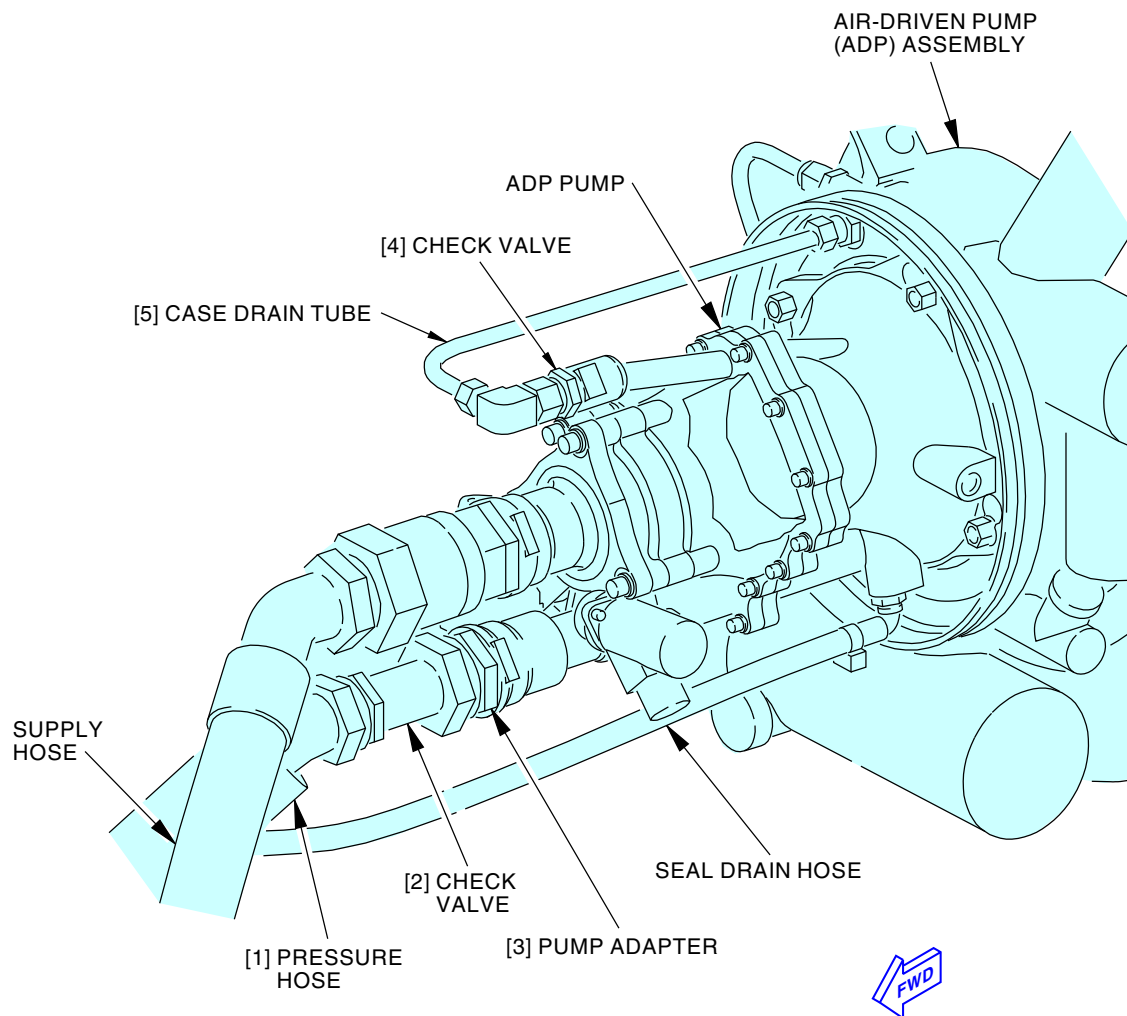
Air-Driven Pump (ADP) Hose-Mounted Check Valve Installation
Figure 402/29-11-06-990-806 (Sheet 1 of 2)

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**AIR-DRIVEN PUMP (ADP) ASSEMBLY
(EXAMPLE)**

B

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Air-Driven Pump (ADP) Hose-Mounted Check Valve Installation
Figure 402/29-11-06-990-806 (Sheet 2 of 2)

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TASK 29-11-06-400-802

5. Air-Driven Pump (ADP) Hose-Mounted Check Valve Installation

Figure 402

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
45-10-00-740-819	How to Do a Ground Test (P/B 201)

B. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

C. Prepare for the Installation

SUBTASK 29-11-06-860-027

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

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-06-040-002



CAUTION MAKE SURE THAT THE ADP ACCESS DOOR IS FULLY OPEN OR FULLY CLOSED WHEN YOU MOVE THE TRAILING EDGE FLAPS. THE FLAPS CAN HIT THE DOOR IF IT IS NOT FULLY OPEN OR CLOSED. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (2) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-06-010-005

- (3) Make sure that this access panel is open:

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. Air-Driven Pump (ADP) Hose-Mounted Check Valve Installation

SUBTASK 29-11-06-420-020

- (1) Do the following steps to install the check valve [2] on the pump adapter [3]:
- Remove the cap from the pump adapter [3].
 - Install the check valve [2] on the pump adapter [3].
 - Use a back-up wrench to prevent damage to the air-driven pump.
 - Tighten the check valve [2] to 1600 ±80 in-lb (181 ±9 N·m).

SUBTASK 29-11-06-420-019

- (2) Do the following steps to Install the pressure hose [1] on the check valve [2]:
- Remove the cap from the pressure hose [1].

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- (b) Connect the pressure hose [1] to the check valve [2].
- (c) Use a back-up wrench to prevent damage to the air-driven pump.
- (d) Tighten the pressure hose [1] to 1520 in-lb (172 N·m) to 1680 in-lb (190 N·m).

SUBTASK 29-11-06-420-021

- (3) Install the hose clamps.

SUBTASK 29-11-06-870-002

- (4) Do the steps which follow to bleed the air from the air-driven pump:
 - (a) For the center system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.



CAUTION

CLEAN THE PARTS IF HYDRAULIC FLUID GETS ON THEM. IF THE HYDRAULIC FLUID STAYS ON THE PARTS, IT CAN CAUSE CORROSION.

- (b) Put a rag around the case drain tube [5] at the port on the air-driven pump to catch a spray of hydraulic fluid.
- (c) Slowly loosen the check valve [4] on the case drain tube [5] to bleed the air from the air-driven pump.
- (d) After you bleed the air, tighten the check valve [4] to 280 ±14 in-lb (32 ±2 N·m).

SUBTASK 29-11-06-610-002

- (5) For the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-06-110-002



CAUTION

CLEAN THE PARTS IF HYDRAULIC FLUID GETS ON THEM. IF THE HYDRAULIC FLUID STAYS ON THE PARTS, IT CAN CAUSE CORROSION.

- (6) Clean all hydraulic fluid from the installation area (TASK 12-25-01-100-801).

E. Air-Driven Pump (ADP) Pump Installation Test

SUBTASK 29-11-06-860-029

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

SUBTASK 29-11-06-860-030

- (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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-06-710-001

- (3) Use a maintenance access terminal (MAT) (TASK 45-10-00-740-819) to do an operational test of the applicable air-driven pump (ADP) (C1 or C2).

NOTE: Use an engine or the ground service cart to pressurize the pneumatic system. The APU does not provide the air flow necessary for the ADP test.

- (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE

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- 2) LINE MAINTENANCE
- 3) GROUND TESTS
- 4) 29 Hydraulic Power
- 5) OPERATIONAL TEST
- 6) Make a selection on the MAT of one of the applicable operational tests which follow:
 - a) Air Driven Pump (ADP) (C1)
 - b) Air Driven Pump (ADP) (C2)
- 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.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-06-410-003

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-06-080-001

- (2) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

————— **END OF TASK** —————

TASK 29-11-06-000-804

6. Hydraulic Line Hose-Mounted Check Valve Removal

Figure 403

A. References

<u>Reference</u>	<u>Title</u>
10-11-05 P/B 201	CHOCK INSTALLATION
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-00-40-860-802	Landing Gear Ground Door Release System Operation (Open the Doors) (P/B 201)

B. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-6907	Container - Hydraulic Fluid Resistant, 15 Gallon (57 Liter)

C. Location Zones

<u>Zone</u>	<u>Area</u>
143	Main Landing Gear Wheel Well, Left

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(Continued)

Zone Area

211 Flight Compartment, Left

D. Prepare for the Removal

SUBTASK 29-11-06-860-036

- (1) Make sure the control lever for the landing gear is in the DN position.

SUBTASK 29-11-06-860-037

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

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

SUBTASK 29-11-06-860-038

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-06-480-004



WARNING

MAKE CERTAIN LANDING GEAR DOWNLOCK PINS ARE INSTALLED TO PREVENT INADVERTENT RETRACTION OF LANDING GEAR, AND POSSIBLE INJURY TO PERSONNEL.

- (4) If the downlock pins are not installed in all the landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-06-480-005

- (5) Install the chocks around the tires of the main landing gear (CHOCK INSTALLATION, PAGEBLOCK 10-11-05/201).

SUBTASK 29-11-06-860-039

- (6) Do this task: Landing Gear Ground Door Release System Operation (Open the Doors), TASK 32-00-40-860-802.

SUBTASK 29-11-06-480-006



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-06-860-040

- (8) To prevent too much hydraulic fluid leakage, do these steps:
 - (a) Set the C FLT CONTROL HYD POWER TAIL switch, on the overhead panel P61, to the SHUTOFF position.
 - (b) Make sure the amber VALVE CLOSED light below the switch comes on.

E. Hydraulic Line Hose-Mounted Check Valve Removal

SUBTASK 29-11-06-480-007

- (1) Put a 15 gallon (57 liter) hydraulic fluid resistant container, STD-6907 in a position below the check valve [4] to catch the hydraulic fluid.

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SUBTASK 29-11-06-480-008

- (2) Use a back-up wrench to hold the swivel tee [18] in its position.
 - (a) Disconnect the check valve [4] from the swivel tee [18].

SUBTASK 29-11-06-480-009

- (3) Use a back-up wrench to hold the flareless tee [19] in its position.
 - (a) Disconnect the check valve [4] from the flareless tee [19].
 - (b) Put a cap on the flareless tee [19].
 - (c) Put a cap on the swivel tee [18].

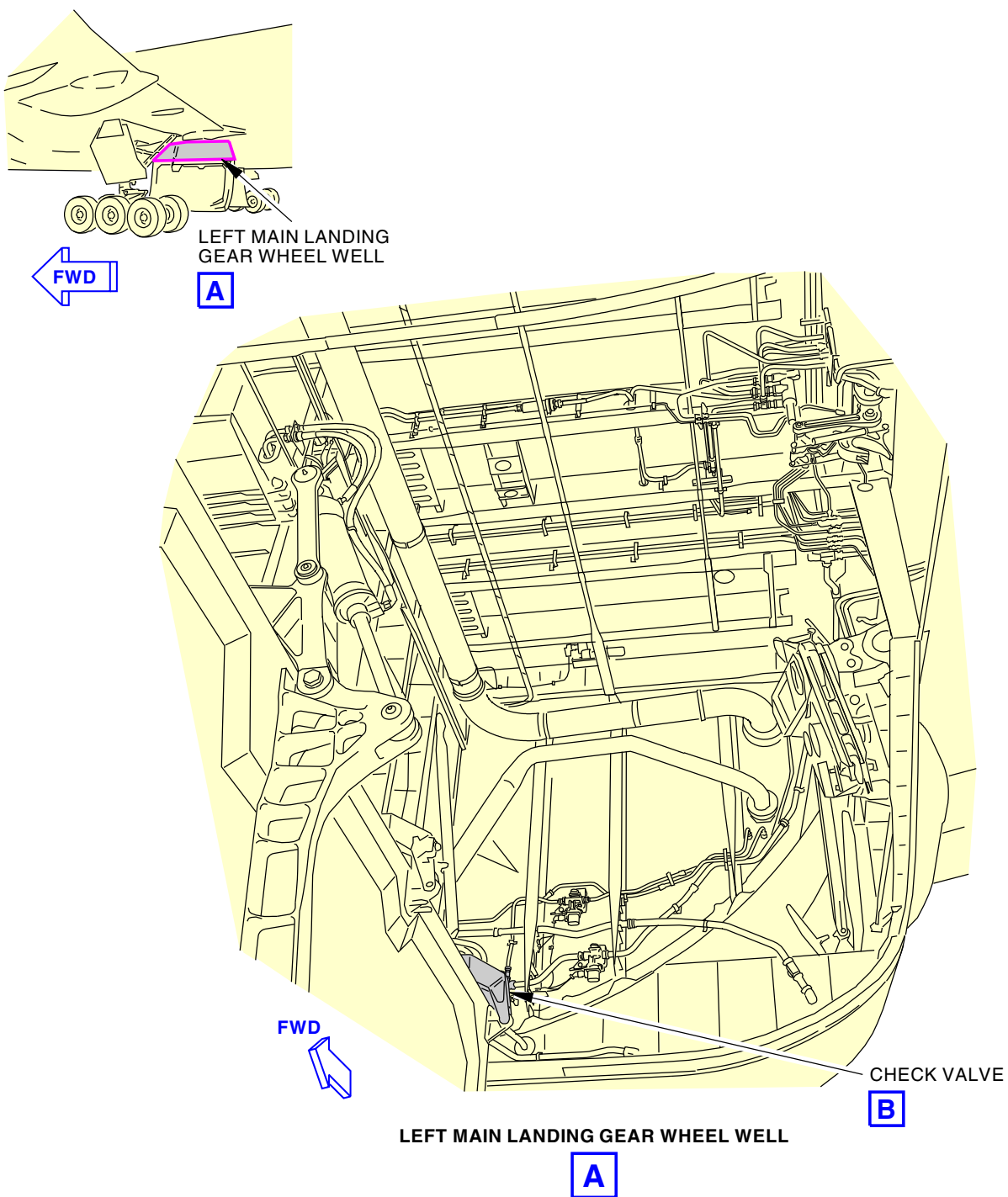
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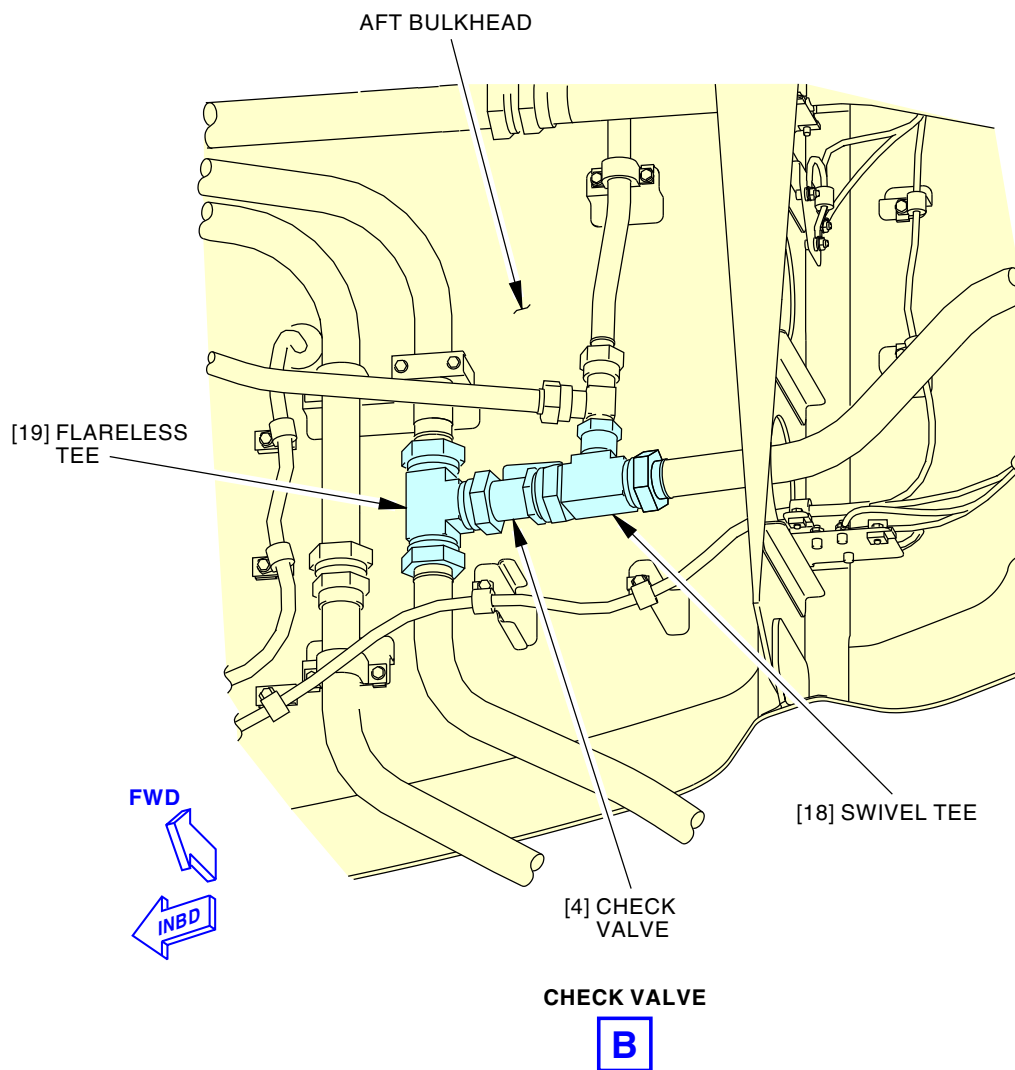
**Hose-Mounted Check Valve Installation
Figure 403/29-11-06-990-807 (Sheet 1 of 2)**

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Hose-Mounted Check Valve Installation
Figure 403/29-11-06-990-807 (Sheet 2 of 2)

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TASK 29-11-06-400-803

7. Hydraulic Line Hose-Mounted Check Valve Installation

Figure 403

A. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
32-00-15 P/B 201	LANDING GEAR DOOR SAFETY PINS - MAINTENANCE PRACTICES
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-30 P/B 201	LANDING GEAR DOWNLOCK PINS - MAINTENANCE PRACTICES
32-00-40 P/B 201	LANDING GEAR GROUND DOOR RELEASE SYSTEM - MAINTENANCE PRACTICES
32-00-40-860-801	Landing Gear Ground Door Release System Operation (Close the Doors) (P/B 201)

B. Location Zones

Zone	Area
143	Main Landing Gear Wheel Well, Left
211	Flight Compartment, Left

C. Prepare for the Installation

SUBTASK 29-11-06-860-041

- (1) Make sure the control lever for the landing gear is in the DN position.

SUBTASK 29-11-06-860-042

- (2) Make sure that these circuit breakers are open and have 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 29-11-06-860-043



WARNING

MAKE CERTAIN LANDING GEAR DOWNLOCK PINS ARE INSTALLED TO PREVENT INADVERTENT RETRACTION OF LANDING GEAR, AND POSSIBLE INJURY TO PERSONNEL.

- (3) Make sure that the downlock pins are installed in all the landing gear (LANDING GEAR DOWNLOCK PINS - MAINTENANCE PRACTICES, PAGEBLOCK 32-00-30/201).

SUBTASK 29-11-06-860-044

- (4) Make sure that the chocks are installed around the tires of the main landing gear (CHOCK INSTALLATION, PAGEBLOCK 10-11-05/201).

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SUBTASK 29-11-06-860-045

- (5) Make sure that the landing gear doors are open (LANDING GEAR GROUND DOOR RELEASE SYSTEM - MAINTENANCE PRACTICES, PAGEBLOCK 32-00-40/201).

SUBTASK 29-11-06-860-046



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Make sure that the landing gear door safety pins are installed (LANDING GEAR DOOR SAFETY PINS - MAINTENANCE PRACTICES, PAGEBLOCK 32-00-15/201).

D. Hydraulic Line Hose-Mounted Check Valve Installation

SUBTASK 29-11-06-420-024

- (1) Do the following steps to install the check valve [4] on the swivel tee [18]:
 - (a) Remove the cap from the swivel tee [18].
 - (b) Remove the cap from the flareless tee [19].
 - (c) Install the check valve [4] on the swivel tee [18].
 - (d) Use a back-up wrench to prevent damage to the swivel tee [18].
 - (e) Tighten the check valve [4] to 1600 ±80 in-lb (181 ±9 N·m).

SUBTASK 29-11-06-420-025

- (2) Do the following steps to install the check valve [4] on the flareless tee [19]:
 - (a) Install the check valve [4] on the flareless tee [19].
 - (b) Use a back-up wrench to prevent damage to the flareless tee [19].
 - (c) Tighten the check valve [4] to 1600 ±80 in-lb (181 ±9 N·m).

SUBTASK 29-11-06-160-001



CLEAN THE PARTS IF HYDRAULIC FLUID GETS ON THEM. IF THE HYDRAULIC FLUID STAYS ON THE PARTS, IT CAN CAUSE CORROSION.

- (3) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

E. Hydraulic Line Hose-Mounted Check Valve Post-Installation Test

SUBTASK 29-11-06-860-047

- (1) Set the C FLT CONTROL HYD POWER TAIL switch, on the overhead panel P61, to the NORM position.
 - (a) Make sure the VALVE CLOSED light below the switch goes off.

SUBTASK 29-11-06-610-003

- (2) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-06-710-002

- (3) Operate the control wheel through 4 full cycles.

SUBTASK 29-11-06-790-002

- (4) Make sure that there are no hydraulic fluid leaks at the check valve [4].

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SUBTASK 29-11-06-610-004

- (5) For the center hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808

SUBTASK 29-11-06-610-005

- (6) For the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-06-020-027



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-06-410-004

- (2) Do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

SUBTASK 29-11-06-860-048

- (3) 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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HYDRAULIC SYSTEM CHECK VALVES (FIREWALL-MOUNTED) - REMOVAL/INSTALLATION

1. General

- A. This procedure is for the removal and installation of the firewall-mounted check valves.

TASK 29-11-07-000-801

2. Firewall-Mounted Check Valve Removal

Figure 401

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-6907	Container - Hydraulic Fluid Resistant, 15 Gallon (57 Liter)

C. Location Zones

Zone	Area
410	PowerPlant, Left
420	PowerPlant, Right

D. Prepare for the Removal

SUBTASK 29-11-07-860-016

- (1) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-07-860-017

- (2) For the left engine-driven pump (EDP), open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-07-860-018

- (3) For the right engine-driven pump (EDP), open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
L	3	C29600	R D-PRESS VLV SPLY

SUBTASK 29-11-07-010-001

- (4) To open the fan cowl panels, do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.

E. Firewall-Mounted Check Valve Removal

SUBTASK 29-11-07-020-002

- (1) Remove the hose clamp [1] and the spray blanket at the strut assembly.

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SUBTASK 29-11-07-020-005



CAUTION

HOLD THE TUBES WHEN YOU LOOSEN, OR TIGHTEN THE CONNECTORS. THIS WILL MAKE SURE THAT THE TUBES CANNOT TWIST. IF THE TUBES TWIST, DAMAGE CAN OCCUR.

- (2) Disconnect the pressure hose [2] from the check valve [10].
 - (a) Put a 15 gallon (57 liter) hydraulic fluid resistant container, STD-6907 in a position below the check valve [10] to catch the hydraulic fluid.
 - (b) Push against the poppet in the check valve [10] to drain the hydraulic fluid.
 - (c) Put a cap on the pressure hose [2].

SUBTASK 29-11-07-020-008



CAUTION

HOLD THE TUBES WHEN YOU LOOSEN, OR TIGHTEN THE CONNECTORS. THIS WILL MAKE SURE THAT THE TUBES CANNOT TWIST. IF THE TUBES TWIST, DAMAGE CAN OCCUR.

- (3) Disconnect the strut tube [12] from the check valve [10].

SUBTASK 29-11-07-020-006

- (4) Remove the fasteners [13] that attach the check valve [10] to the strut [11].

SUBTASK 29-11-07-020-007

- (5) Remove the check valve [10] from the strut [11].

SUBTASK 29-11-07-420-008

- (6) Put a cap on the strut tube [12].

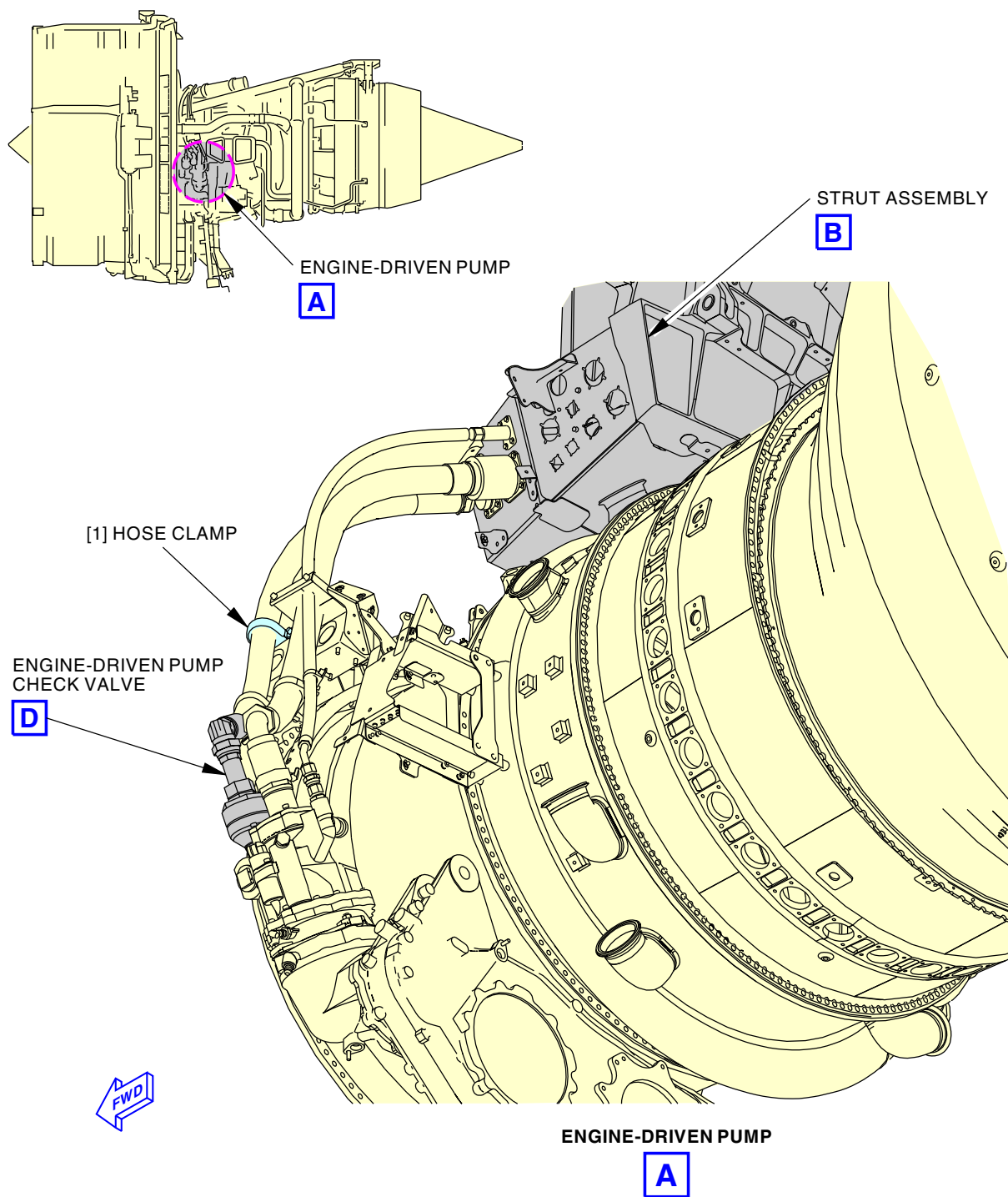
————— END OF TASK —————

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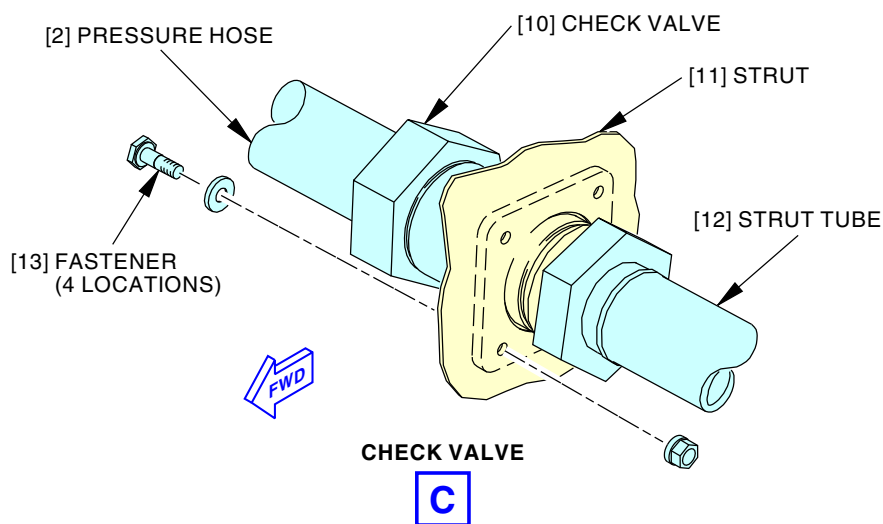
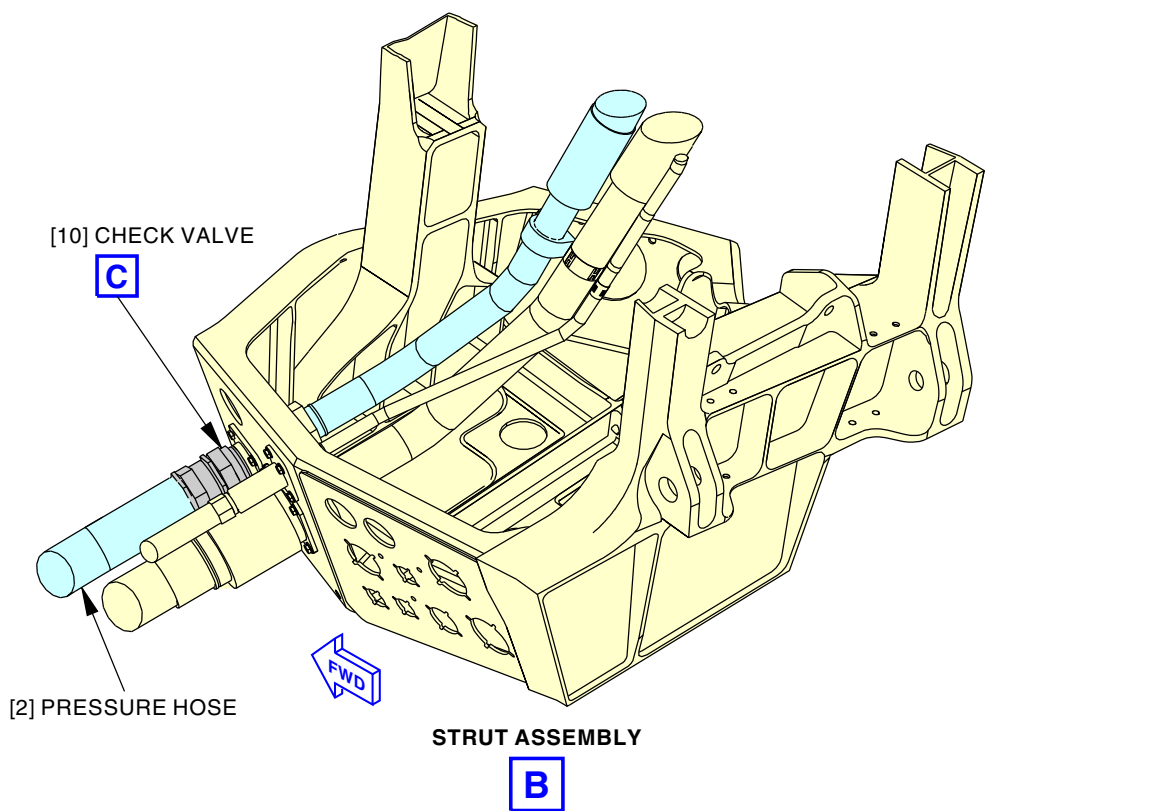
**Firewall-Mounted Check Valve Installation
Figure 401/29-11-07-990-803 (Sheet 1 of 3)**

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**Firewall-Mounted Check Valve Installation
Figure 401/29-11-07-990-803 (Sheet 2 of 3)**

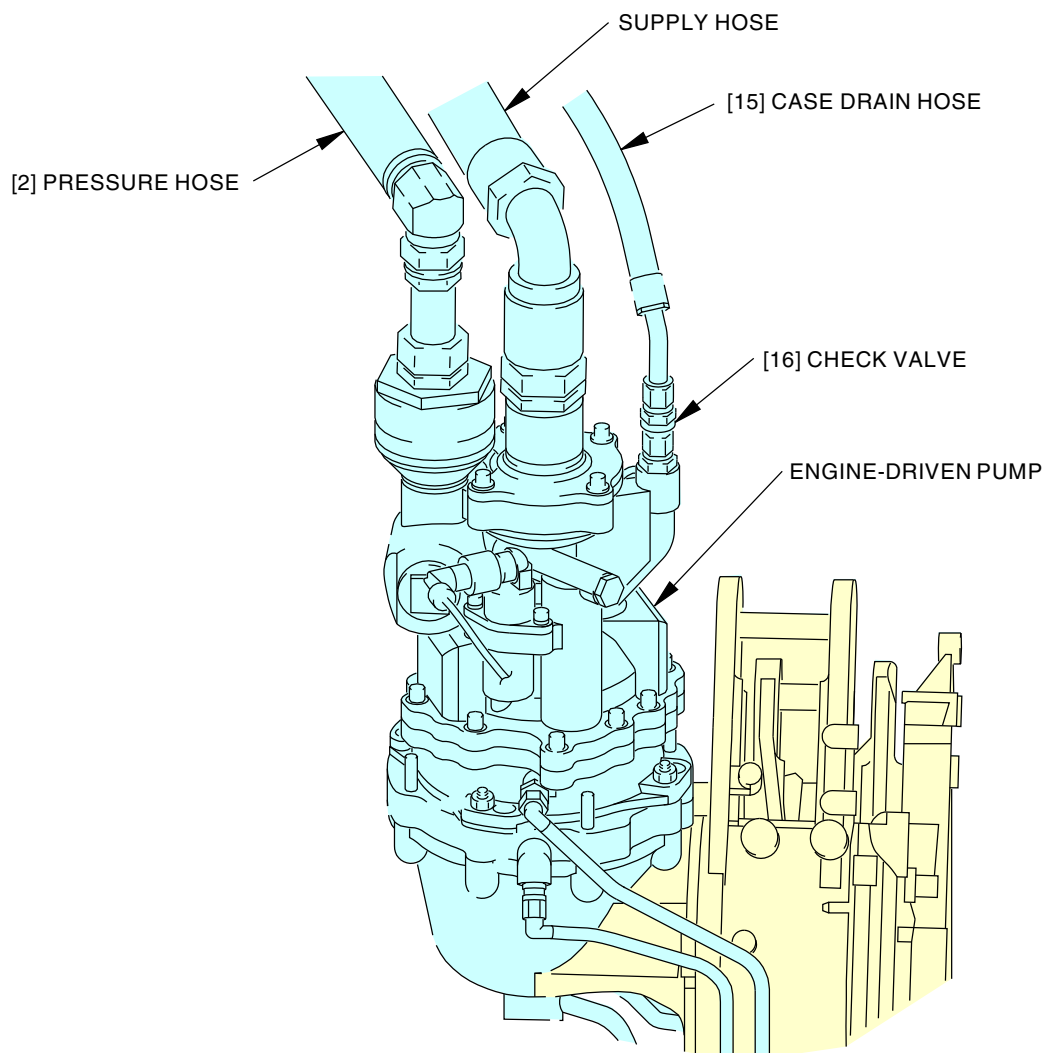
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**ENGINE-DRIVEN PUMP CHECK VALVE
(EXAMPLE)**

D

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**Firewall-Mounted Check Valve Installation
Figure 401/29-11-07-990-803 (Sheet 3 of 3)**

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TASK 29-11-07-400-801

3. Firewall-Mounted Check Valve Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-700-802-H01	Test No. 2 - Dry Motor leak Check (P/B 501)
71-00-00-700-804-H01	Test No. 5 - Idle Leak Check (P/B 501)
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)

B. Location Zones

Zone	Area
410	PowerPlant, Left
420	PowerPlant, Right

C. Prepare for the Installation

SUBTASK 29-11-07-860-001

- (1) Make sure that this circuit breaker is open:

Left Power Management Panel, P110

Row	Col	Number	Name
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-07-860-002

- (2) Make sure that this circuit breaker is open:

Right Power Management Panel, P210

Row	Col	Number	Name
L	3	C29600	R D-PRESS VLV SPLY

D. Firewall-Mounted Check Valve Installation

SUBTASK 29-11-07-020-009

- (1) Remove the cap from the strut tube [12].

SUBTASK 29-11-07-420-001

- (2) Install the check valve [10] on the strut [11].

- (a) Install the fasteners [13].

SUBTASK 29-11-07-420-007

- (3) Do the following steps to connect the strut tube [12] to the check valve [10]:

- (a) Connect the strut tube [12] to the check valve [10].

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CAUTION

HOLD THE TUBES WHEN YOU LOOSEN, OR TIGHTEN THE CONNECTORS. THIS WILL MAKE SURE THAT THE TUBES CANNOT TWIST. IF THE TUBES TWIST, DAMAGE CAN OCCUR.

- (b) Tighten the B-nut on the strut tube [12] to 1600 ±80 in-lb (181 ±9 N·m).

SUBTASK 29-11-07-420-002

- (4) Do the following steps to connect the pressure hose [2] to the check valve [10]:
- (a) Remove the cap from the pressure hose [2].
 - (b) Connect the pressure hose [2] to the check valve [10].



CAUTION

HOLD THE TUBES WHEN YOU LOOSEN, OR TIGHTEN THE CONNECTORS. THIS WILL MAKE SURE THAT THE TUBES CANNOT TWIST. IF THE TUBES TWIST, DAMAGE CAN OCCUR.

- (c) Tighten the B-nut on the pressure hose [2] to 1600 ±80 in-lb (181 ±9 N·m).

SUBTASK 29-11-07-610-001

- (5) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-07-870-001

- (6) Do the steps which follow to bleed the air from the engine-driven pump:
- (a) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.



CAUTION

CLEAN THE PARTS IF HYDRAULIC FLUID GETS ON THEM. IF THE HYDRAULIC FLUID STAYS ON THE PARTS, IT CAN CAUSE CORROSION.

- (b) Put a rag around the case drain hose [15] at the port on the engine-driven pump to catch a spray of hydraulic fluid.
- (c) Slowly loosen the check valve [16] on the case drain hose [15] to bleed the air from the engine-driven pump.
- (d) After you bleed the air, tighten the check valve [16] to 280 ±14 in-lb (32 ±2 N·m).

SUBTASK 29-11-07-860-003

- (7) For the left engine-driven pump (EDP), remove safety tag and close this circuit breaker:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	20	C29601	L D-PRESS VLV SPLY

SUBTASK 29-11-07-860-004

- (8) For the right engine driven pump (EDP), 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>
L	3	C29600	R D-PRESS VLV SPLY

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SUBTASK 29-11-07-110-001



CAUTION

CLEAN THE PARTS IF HYDRAULIC FLUID GETS ON THEM. IF THE HYDRAULIC FLUID STAYS ON THE PARTS, IT CAN CAUSE CORROSION.

- (9) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

E. Engine-Driven Pump (EDP) Installation Test

SUBTASK 29-11-07-700-001

- (1) For the left (right) engine:
- (a) Do this task: Test No. 2 - Dry Motor leak Check, TASK 71-00-00-700-802-H01.
 - (b) Do this task: Test No. 5 - Idle Leak Check, TASK 71-00-00-700-804-H01.

SUBTASK 29-11-07-860-005

- (2) Make sure the HYDRAULIC PRIMARY L (R) ENG switch, on the hydraulic control panel, is in the ON position.

SUBTASK 29-11-07-860-006

- (3) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-07-210-001

- (4) Make sure the L (R) HYDRAULIC SYSTEM PRESS indication on the EICAS maintenance display is 2900 to 3200 psi.

SUBTASK 29-11-07-790-001

- (5) Make sure that there are no leaks at pressure hose [2] and strut tube [12] connections to the check valve [10].

SUBTASK 29-11-07-860-010

- (6) Push the HYDRAULIC PRIMARY L (R) ENG switch to the OFF position.

SUBTASK 29-11-07-860-011

- (7) Let the hydraulic system pressure decrease.

SUBTASK 29-11-07-210-002

- (8) Make sure the FAULT indicator light, for the applicable engine-driven pump, comes on.

SUBTASK 29-11-07-860-012

- (9) Push the HYDRAULIC PRIMARY L (R) ENG switch to the ON position.

SUBTASK 29-11-07-210-003

- (10) Make sure the L (R) HYDRAULIC SYSTEM PRESS indication, on the EICAS maintenance display, is 2900 to 3200 psi.

SUBTASK 29-11-07-210-004

- (11) Make sure the FAULT indicator light, for the engine-driven pump, goes off.

SUBTASK 29-11-07-860-021

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

SUBTASK 29-11-07-420-006

- (13) Install the spray blanket at the strut assembly.
- (a) Install the hose clamp [1].

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-07-410-001

(1) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.

———— **END OF TASK** ————

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AIR-DRIVEN PUMP (ADP) ASSEMBLY - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the air-driven pump (ADP) assembly
 - (2) An installation of the air-driven pump (ADP) assembly.
- B. The air-driven pump (ADP) assembly includes the air driven unit (ADU) and the hydraulic pump. The hydraulic pump is referred to as the ADP pump. The air-driven unit (ADU) includes the turbine gearbox assembly (TGA) and the modulating shutoff valve (MSOV). This procedure removes and installs the air-driven pump (ADP) assembly in one piece.
- (1) For information on the ADP pump:
These are the tasks:
Air-Driven Pump (ADP) Pump Removal, TASK 29-11-11-000-801,
Air-Driven Pump (ADP) Pump Installation, TASK 29-11-11-400-801.
 - (2) For information on the modulating shutoff valve:
These are the tasks:
Air-Driven Pump (ADP) Modulating Shutoff Valve (MSOV) Removal, TASK 29-11-14-000-801,
Air-Driven Pump (ADP) Modulating Shutoff Valve (MSOV) Installation, TASK 29-11-14-400-801.
 - (3) For information on the turbine gearbox assembly (TGA):
These are the tasks:
Turbine Gearbox Assembly (TGA) Removal, TASK 29-11-12-000-801,
Turbine Gearbox Assembly (TGA) Installation, TASK 29-11-12-400-801.
- C. There are two air-driven pump (ADP) assemblies in the aft left wing-to-body fairing. The upper ADP assembly is referred to as the ADP assembly C2. The lower ADP is referred to as the ADP assembly C1. You can use this procedure to remove and install each of these ADP assemblies.

TASK 29-11-10-000-801

2. Air-Driven Pump (ADP) Assembly Removal

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-16-000-801	Air-Driven Pump (ADP) Inlet Duct Removal (P/B 401)
29-11-17-000-801	Air-Driven Pump (ADP) Exhaust Duct Removal (P/B 401)
36-00-00-860-801	Depressurize the Pneumatic System (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.

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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-1576	Positioner - Load, Engine Accessories, 250LB Capacity (GE and PW engines)
SPL-1802	Adapter - Hoist, Air Driven Pump Part #: J29003-93 Supplier: 81205 Opt Part #: J29003-85 Supplier: 81205

C. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

D. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

E. Prepare for the Removal

SUBTASK 29-11-10-860-001

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

Right Power Management Panel, P210

Row	Col	Number	Name
A	7	C29401	ADP 1 HTR PWR
A	8	C29402	ADP 2 HTR PWR
G	10	C29623	ADP 1 HTR CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-10-860-002

- (2) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-10-860-003

- (3) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-10-040-001



OPERATING THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (4) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-10-010-001

- (5) Open this access panel:

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

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F. Air-Driven Pump (ADP) Assembly Removal

SUBTASK 29-11-10-020-001

- (1) For the applicable air-driven pump (ADP) assembly (C1 or C2) [4] (Figure 401) (referred to in this procedure as the ADP assembly), do this task: Air-Driven Pump (ADP) Inlet Duct Removal, TASK 29-11-16-000-801.

SUBTASK 29-11-10-020-002

- (2) If you will remove the ADP assembly C1 [4], do this task: Air-Driven Pump (ADP) Exhaust Duct Removal, TASK 29-11-17-000-801.

SUBTASK 29-11-10-020-003

- (3) If you will remove the ADP assembly C2 [4], do these steps to disconnect the exhaust duct [11]:
 - (a) Remove the clamps [13] which attach the flexible hose [12] to the ADP assembly C2 [4] and to the exhaust duct [11].
 - (b) Move the flexible hose [12] on the ADP assembly C2 [4] away from the exhaust duct [11].

SUBTASK 29-11-10-020-004

- (4) Disconnect the electrical connectors [2], [6], and [14] from the ADP assembly [4].

SUBTASK 29-11-10-020-012

- (5) Disconnect the electrical connector [48].
 - (a) Remove the (2) flange retention screws and washers from connector bracket.
NOTE: Backshell and bracket are one assembly and should not be disassembled.

SUBTASK 29-11-10-480-001

- (6) Install caps on the electrical connectors [2], [6], [14] and [48] to prevent contamination and damage.

SUBTASK 29-11-10-020-005

- (7) Remove the nuts [35], [40], and [44] from the bonding jumpers [33], [38], and [42].

SUBTASK 29-11-10-020-006

- (8) Remove the bonding jumpers [33], [38], and [42] from the studs on the ADP assembly [4].

SUBTASK 29-11-10-020-007

- (9) Do these steps to disconnect the hydraulic hoses from the ADP pump [23]:
 - (a) Disconnect the self-sealing fitting [20] of the supply hose [19] from the adapter [21] on the ADP pump [23].
NOTE: Do not disconnect the supply hose [19] from the self-sealing fitting [20]. If you disconnect the supply hose [19] from the self-sealing fitting [20], fluid can drain from the supply hose [19].
 - (b) Disconnect the check valve [28] of the pressure hose [29] from the adapter [27] on the ADP pump [23].
NOTE: Do not disconnect the pressure hose [29] from the check valve [28]. If you disconnect the pressure hose [29] from the check valve [28], fluid can drain from the pressure hose [29].
 - (c) Disconnect the check valve [16] of the case drain hose [17] from the union [15] on the inboard end of the heat exchanger [18].
 - (d) Loosen the clamp [25] on the seal drain hose [26].
 - (e) Disconnect the seal drain hose [26] from the elbow [24] on the ADP pump [23].
 - (f) Loosen the clamp [5] on the drain hose [1] for the turbine gearbox.

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- (g) Disconnect the drain hose [1] from the drain outlet on the turbine gearbox.
- (h) Install caps on the open ports of the ADP pump [23] to prevent contamination.
- (i) Install caps on these components to prevent contamination:
 - 1) The self-sealing fitting [20] of the supply hose [19].
 - 2) The check valve [28] of the pressure hose [29].
 - 3) The check valve [16] of case drain hose [17].
 - 4) The seal drain hose [26] for the ADP pump [23].
 - 5) The drain hose [1] for the turbine gearbox.

SUBTASK 29-11-10-480-002

- (10) Do these steps to attach the air driven pump hoist adapter, SPL-1802, [73] (Figure 402) to the ADP assembly [4]:
 - (a) Install the 250LB capacity, load positioner (GE and PW engines), SPL-1576, [65] on the arm of the hoist, SPL-1556, [61].
 - (b) Install the air driven pump hoist adapter, SPL-1802, [73] on the 250LB capacity, load positioner (GE and PW engines), SPL-1576, [65].
 - (c) Loosen the knob [75] on the forward support assembly [76] to make the band [66] larger.
 - (d) Remove the ball lock pin [67].
 - (e) Remove the forward support assembly [76] from the platform assembly [74].
 - (f) Loosen the knurled nut [70] on the aft support assembly [71].
 - (g) Pull the pin assembly [69] out until the ends of the pins are aligned with the surface of the aft support assembly [71].
 - (h) Move the hoist, SPL-1556, [61] below the ADP assembly [4] which you will remove.
 - (i) Operate the hoist, SPL-1556, [61] to lift the air driven pump hoist adapter, SPL-1802, [73] to engage with the ADP assembly [4].
 - 1) Use the 250LB capacity, load positioner (GE and PW engines), SPL-1576, [65] to move the air driven pump hoist adapter, SPL-1802, [73] in a horizontal plane, until the aft support assembly [71] engages with the air turbine housing [63] immediately aft of the bracket [62].
 - (j) Turn the coupling nut [68] on the air driven pump hoist adapter, SPL-1802, [73] to align the pin assembly [69] with the holes in the bracket [62].
 - (k) Tighten the knurled nut [70] on the aft support assembly [71] to engage the pin assembly [69] with the holes in the bracket [62].
 - (l) Put the band [66] of the forward support assembly [76] over the ADP pump [23].
 - (m) Move the forward support assembly [76] aft to engage the platform assembly [74].
 - (n) Engage the band [66] with the ring on the ADP assembly [4] near the base of the ADP pump [23].
 - (o) Install the ball lock pin [67] to attach the forward support assembly [76] to the platform assembly [74].
 - (p) Turn the knob [75] on the forward support assembly [76] to tighten the band [66] around the ring on the ADP assembly [4].

SUBTASK 29-11-10-020-008

- (11) Remove the bolts [30], (Figure 401) which attach the ADP assembly [4] to the three isolator mounts [32] on the mount assembly [3].

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SUBTASK 29-11-10-020-009

- (12) To remove the ADP assembly C1 [4], lower it from the wing-to-body fairing with the hoist, SPL-1556.

SUBTASK 29-11-10-020-010

- (13) To remove the ADP assembly C2 [4], do these steps until it is clear of the wing-to-body fairing:
- (a) Lower the ADP assembly C2 [4] with the hoist, SPL-1556, a small distance.
 - (b) Turn the coupling nut [68] (Figure 402), on the air driven pump hoist adapter, SPL-1802, to turn the ADP assembly C2 [4] counterclockwise (when you look at it from the aft end).

SUBTASK 29-11-10-020-011

- (14) For the ADP assembly C2 [4] (Figure 401) remove the flexible hose [12] from the outlet on the exhaust collector [9].

————— **END OF TASK** —————

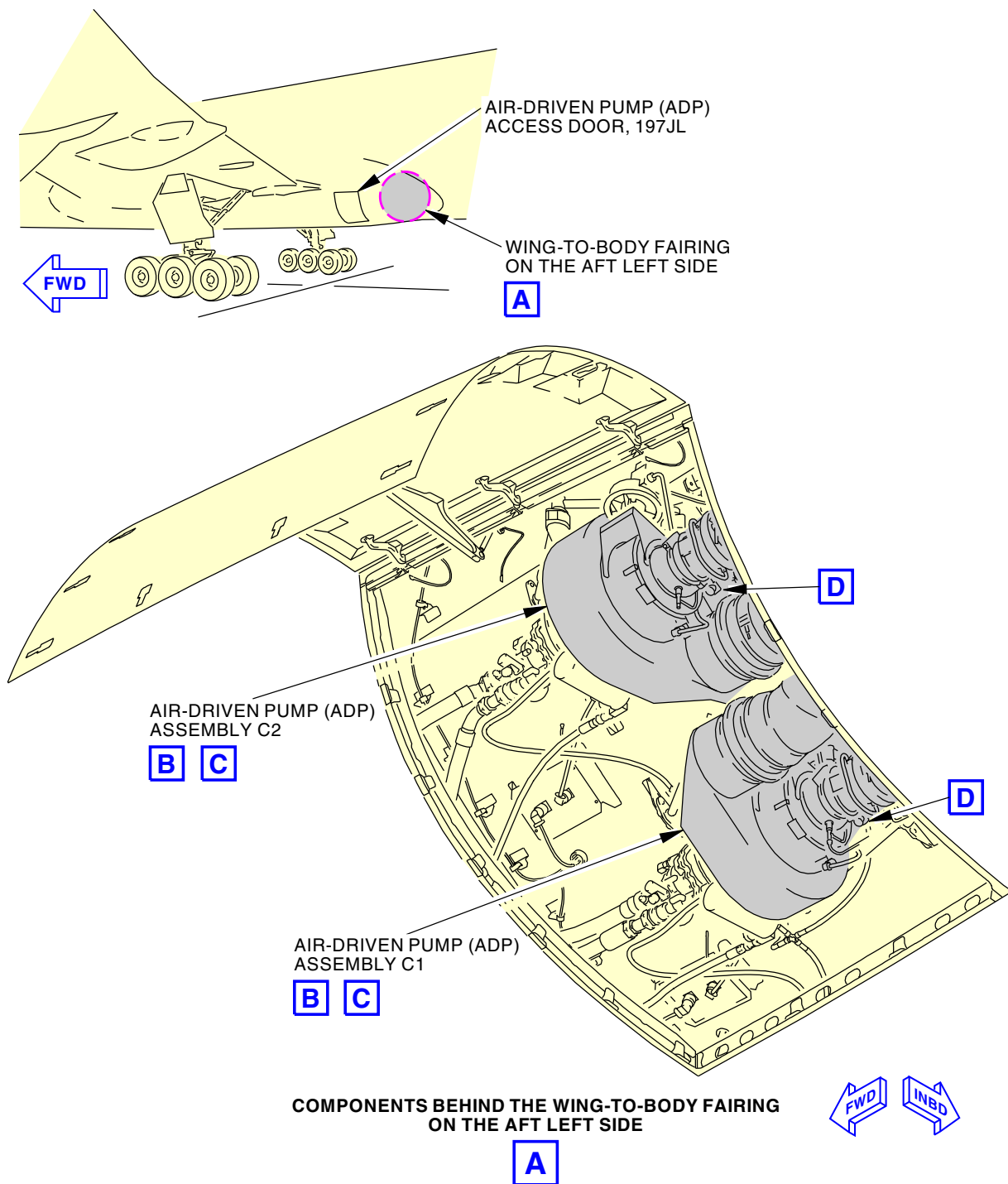
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C16375 S0006415949_V2

**Air-Driven Pump (ADP) Assembly Installation
Figure 401/29-11-10-990-801 (Sheet 1 of 7)**

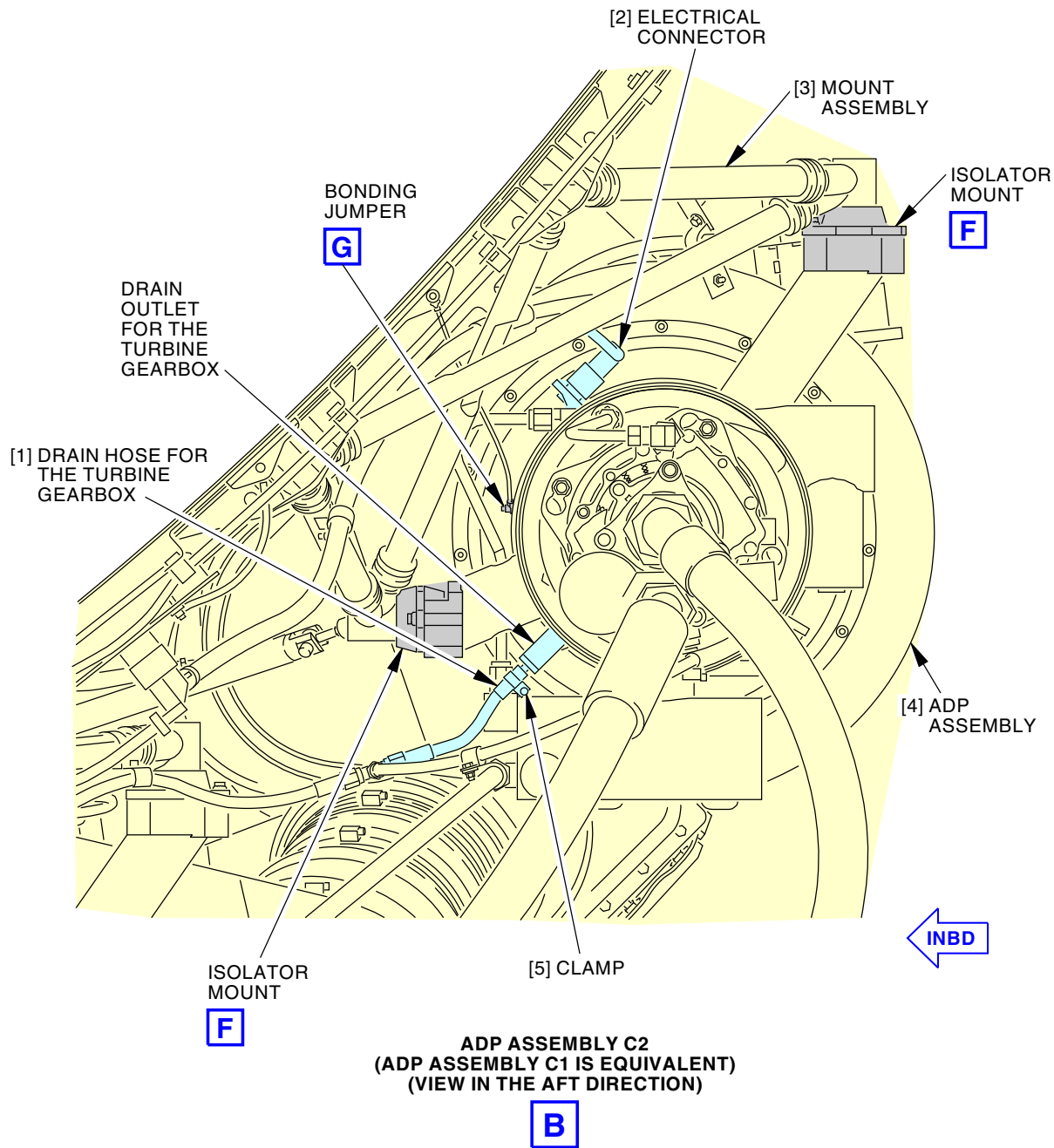
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C17306 S0006415950_V2

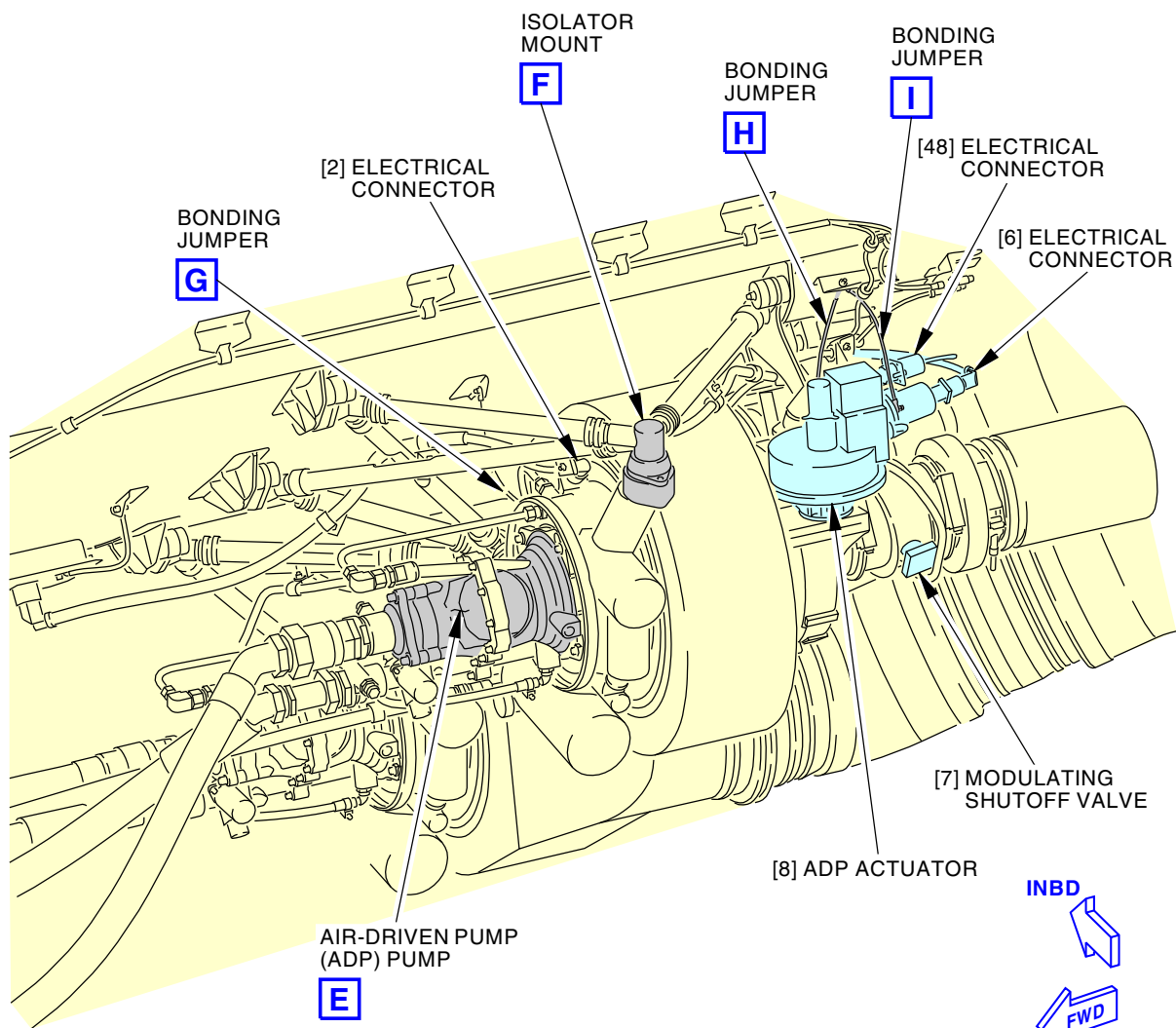
**Air-Driven Pump (ADP) Assembly Installation
Figure 401/29-11-10-990-801 (Sheet 2 of 7)**

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**AIR-DRIVEN PUMP (ADP) ASSEMBLY C2
(AIR-DRIVEN PUMP (ADP) ASSEMBLY C1 IS EQUIVALENT)**

[C]

E42873 S0006415951_V2

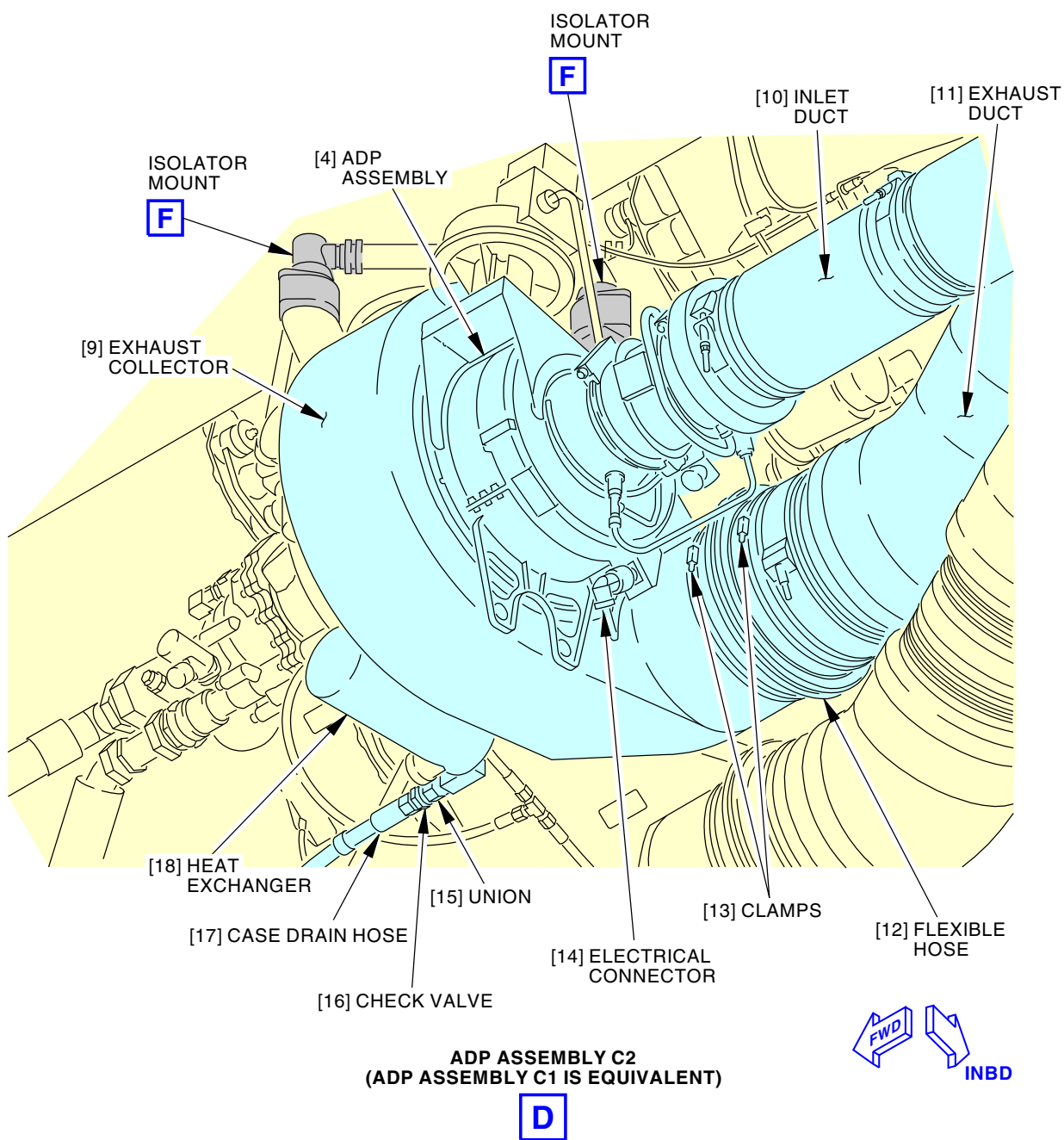
**Air-Driven Pump (ADP) Assembly Installation
Figure 401/29-11-10-990-801 (Sheet 3 of 7)**

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E42875 S0006415952_V2

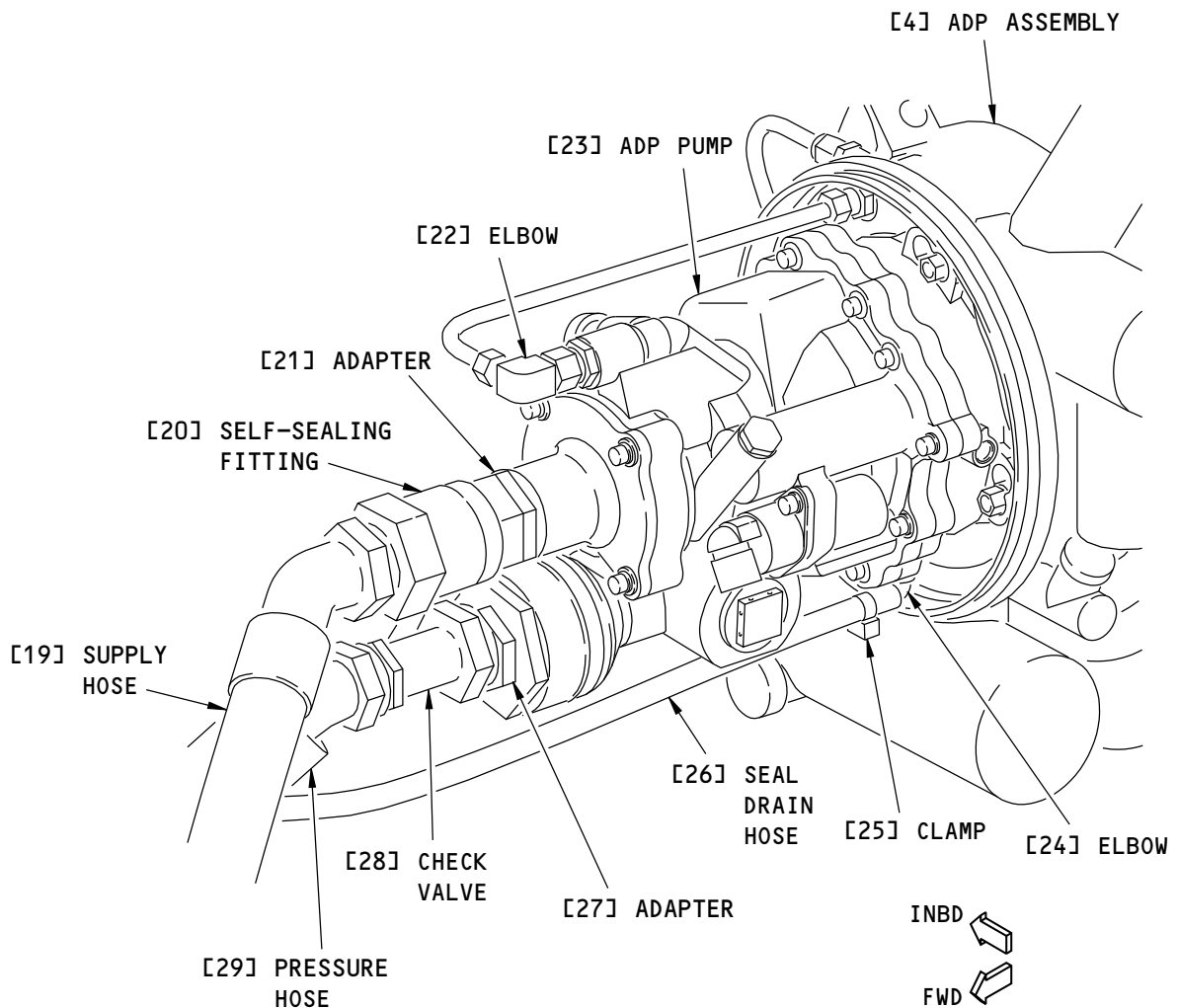
**Air-Driven Pump (ADP) Assembly Installation
Figure 401/29-11-10-990-801 (Sheet 4 of 7)**

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**AIR-DRIVEN PUMP (ADP) PUMP
(EXAMPLE)**

E

E42876 S0006415954_V1

**Air-Driven Pump (ADP) Assembly Installation
Figure 401/29-11-10-990-801 (Sheet 5 of 7)**

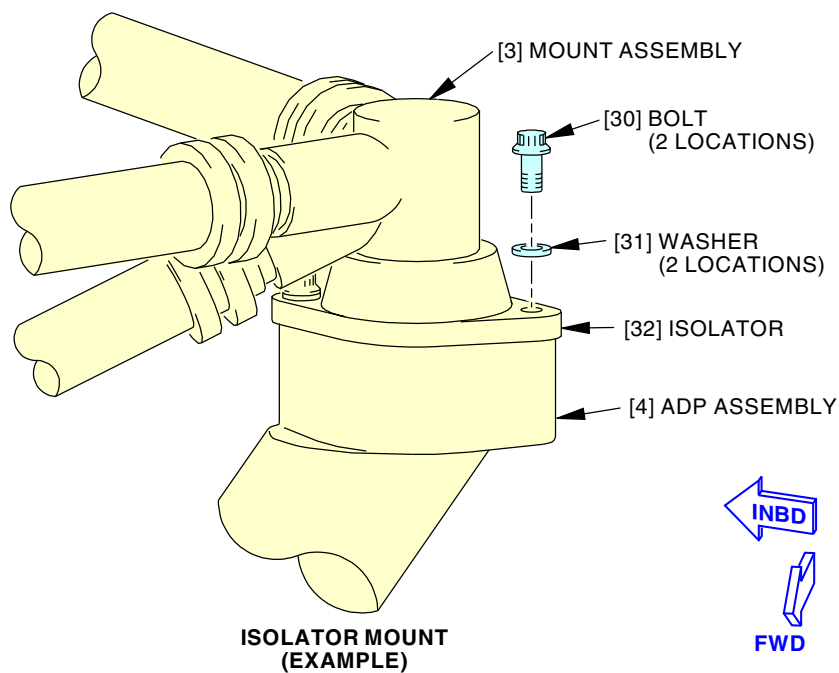
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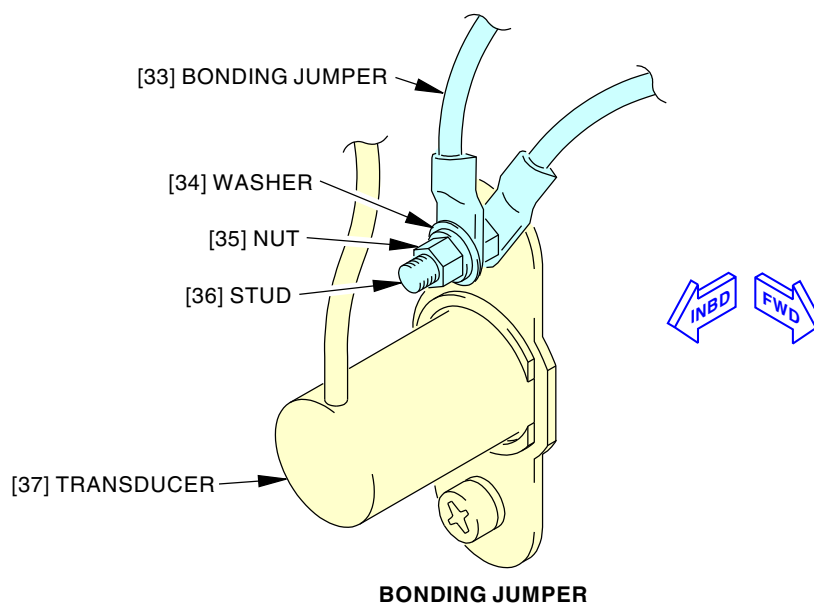
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F



G

E43840 S0006415955_V2

**Air-Driven Pump (ADP) Assembly Installation
Figure 401/29-11-10-990-801 (Sheet 6 of 7)**

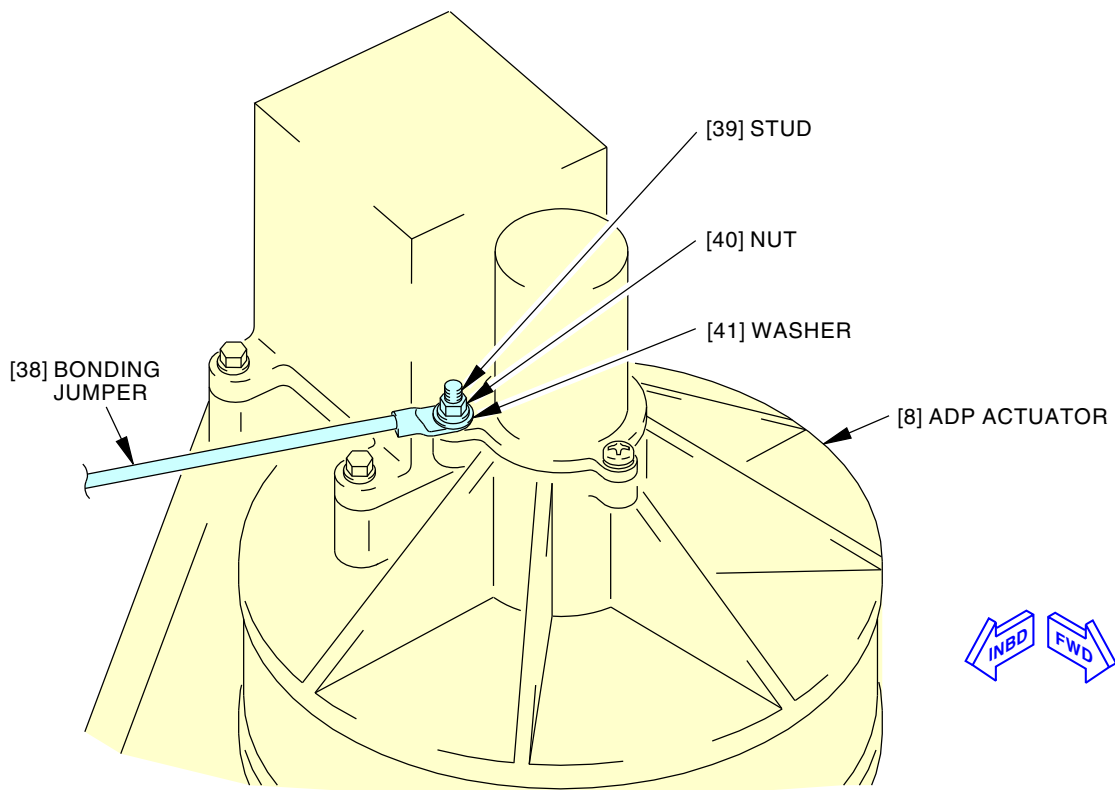
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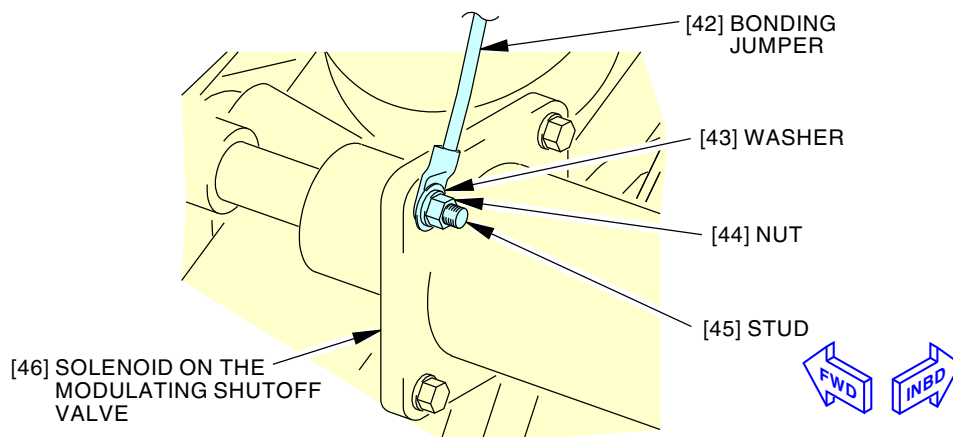
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BONDING JUMPER

H



BONDING JUMPER

I

E43838 S0006415956_V2

Air-Driven Pump (ADP) Assembly Installation
Figure 401/29-11-10-990-801 (Sheet 7 of 7)

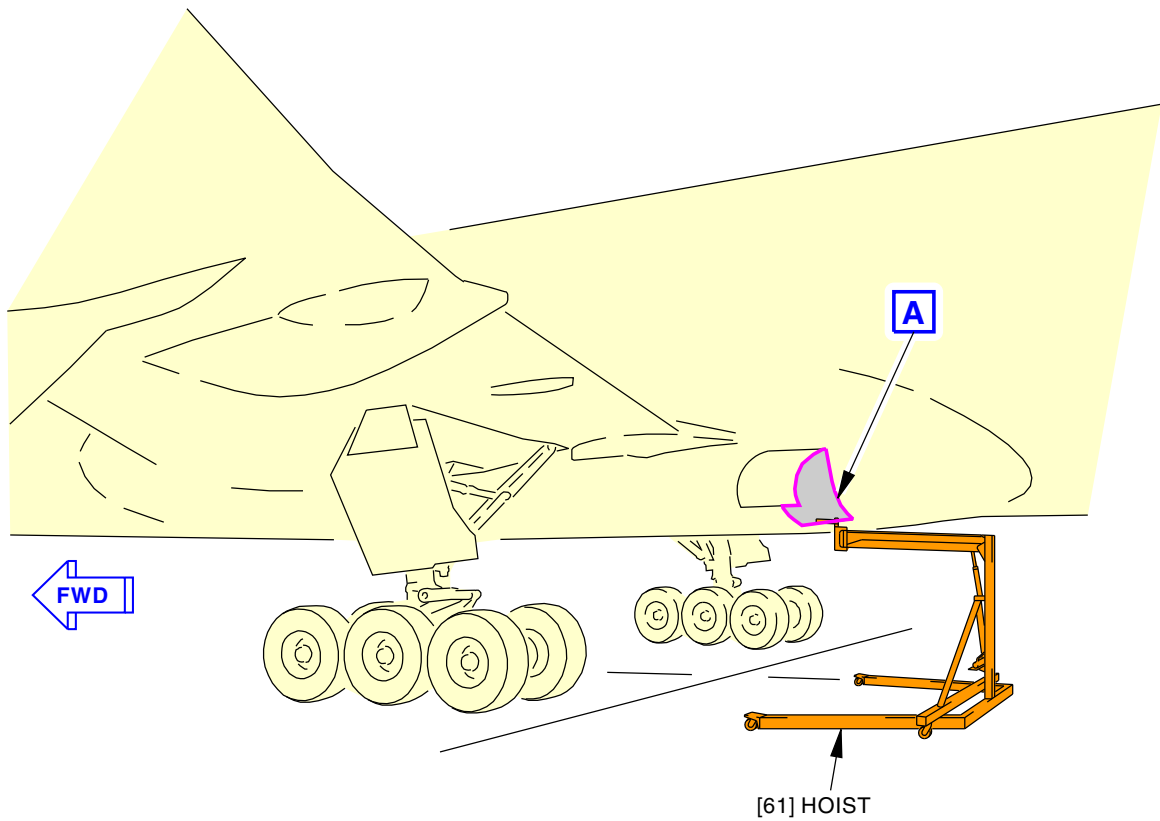
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E44019 S0006415957_V2

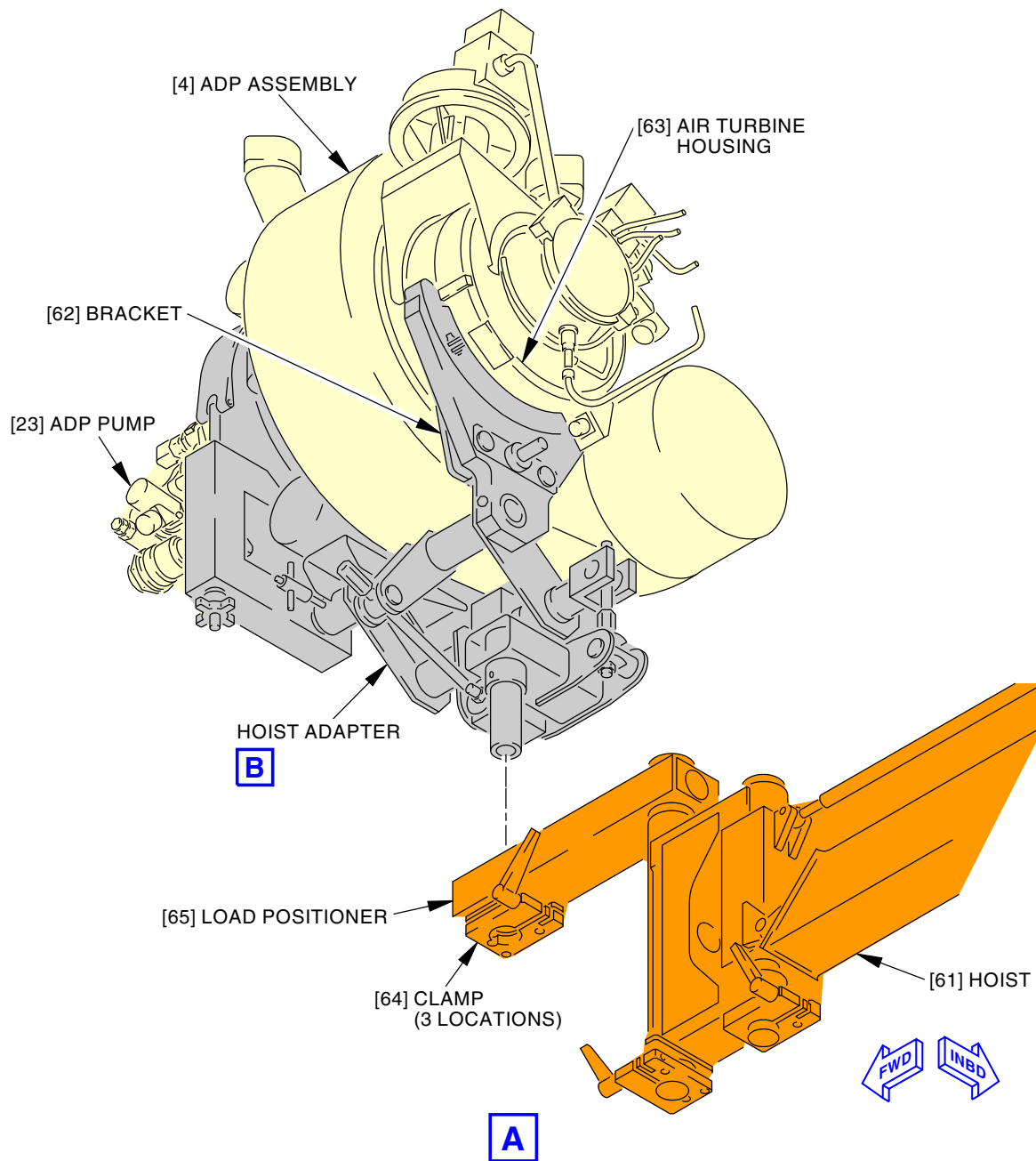
Air-Driven Pump (ADP) Hoist Adapter
Figure 402/29-11-10-990-802 (Sheet 1 of 3)

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E44020 S0006415958_V2

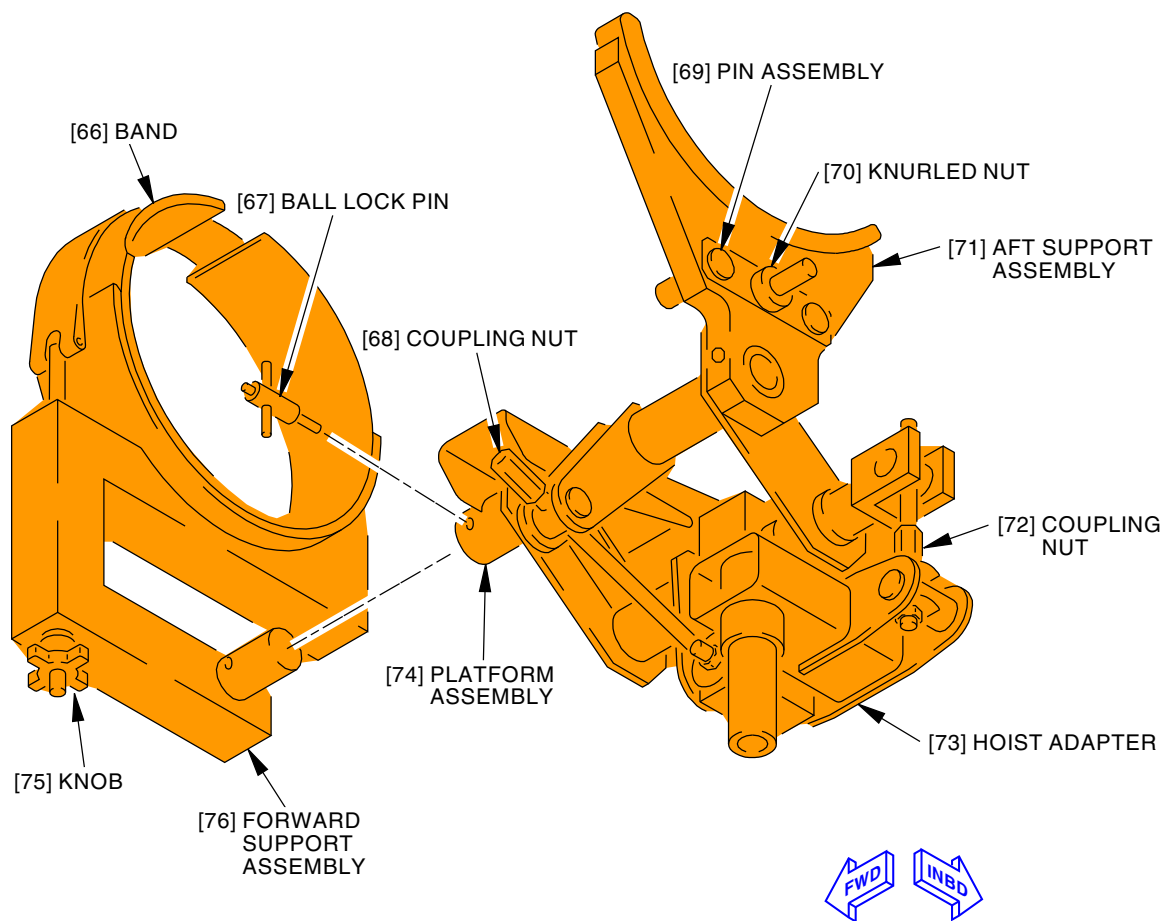
**Air-Driven Pump (ADP) Hoist Adapter
Figure 402/29-11-10-990-802 (Sheet 2 of 3)**

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HOIST ADAPTER

B

E44021 S0006415959_V2

Air-Driven Pump (ADP) Hoist Adapter
Figure 402/29-11-10-990-802 (Sheet 3 of 3)

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TASK 29-11-10-400-801

3. Air-Driven Pump (ADP) Assembly Installation

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has an installation test for the air-driven pump (ADP) assembly. This test makes sure the air-driven pump (ADP) (C1) or (C2) and the related indication operates correctly. This includes a test of the overspeed protection, the secondary speed control, the reserve power, the AUTO/ON control, and the pressure and temperature indications. This test also resets on ADP C1 or C2 overspeed condition.
- (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
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-13-05-610-801	Add Oil to the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-16-400-801	Air-Driven Pump (ADP) Inlet Duct Installation (P/B 401)
29-11-17-400-801	Air-Driven Pump (ADP) Exhaust Duct Installation (P/B 401)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
SPL-1556	Hoist - Boom, General, 400 Pound Maximum Capacity Part #: A20001-152 Supplier: 81205 Opt Part #: A20001-82 Supplier: 81205

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(Continued)

Reference	Description
SPL-1576	Positioner - Load, Engine Accessories, 250LB Capacity (GE and PW engines)
SPL-1802	Adapter - Hoist, Air Driven Pump Part #: J29003-93 Supplier: 81205 Opt Part #: J29003-85 Supplier: 81205

D. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

E. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

F. Prepare for Installation

SUBTASK 29-11-10-210-001

- (1) Make sure the exhaust collector [9] (Figure 403) is in the correct position for the location (upper or lower) in which you will install the air-driven pump (ADP) assembly [4] (referred to in this procedure as the ADP assembly).

NOTE: The upper ADP assembly is referred to as the ADP assembly C2. The lower ADP assembly is referred to as the ADP assembly C1.

SUBTASK 29-11-10-820-001

- (2) If the exhaust collector [9] is not in the correct position, do these steps to adjust its position:
 - (a) Loosen the 15 nuts [92] on the clamp ring [91] which is on the forward side of the exhaust collector [9].
 - (b) Loosen the 10 nuts [94] on the clamp ring [100] which is on the aft side of the exhaust collector [9].
 - (c) Remove the bolts [98] from the bracket [96].
 - (d) Remove the bracket [96] and the spacer [97].
 - (e) Turn the exhaust collector [9] until it is in the correct position for the location (upper or lower) in which you will install the ADP assembly [4].
 - 1) On the aft side of the exhaust collector [9], align the semicircular notch in the clamp ring [100] with the 1/4 inch hole in the inlet housing.
 - (f) Tighten the 15 nuts [92] on the clamp ring [91], which is on the forward side of the exhaust collector [9], to 25 in-lb (3 N·m) to 30 in-lb (3 N·m).
 - (g) Tighten the 10 nuts [98] on the clamp ring [100], which is on the aft side of the exhaust collector [9], to 25 in-lb (3 N·m) to 30 in-lb (3 N·m).
 - (h) Do these steps to install the bracket [96].
 - 1) Hold the spacer [97] and the bracket [96] in position.
 - 2) Install the bolts [98] and the washers [99].
 - 3) Tighten the bolts [98] to 25 in-lb (3 N·m) to 30 in-lb (3 N·m).

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G. Air-Driven Pump (ADP) Assembly Installation

SUBTASK 29-11-10-480-003

- (1) Do these steps to attach the air driven pump hoist adapter, SPL-1802, [73] (Figure 402) to the ADP assembly [4]:
 - (a) Install the 250LB capacity, load positioner (GE and PW engines), SPL-1576, [65] on the arm of the hoist, SPL-1556 [61].
 - (b) Install the air driven pump hoist adapter, SPL-1802, [73] on the 250LB capacity, load positioner (GE and PW engines), SPL-1576 [65].
 - (c) Loosen the knob [75] on the forward support assembly [76] to make the band [66] larger.
 - (d) Remove the ball lock pin [67].
 - (e) Remove the forward support assembly [76] from the platform assembly [74].
 - (f) Loosen the knurled nut [70] on the aft support assembly [71].
 - (g) Pull the pin assembly [69] out until the ends of the pins are aligned with the surface of the aft support assembly [71].
 - (h) Put the ADP assembly [4] on the air driven pump hoist adapter, SPL-1802, [73].
 - 1) Engage the aft support assembly [71] of the air driven pump hoist adapter, SPL-1802, [73] with the air turbine housing [63] immediately aft of the bracket [62].
 - (i) Align the holes in the bracket [62], on the ADP assembly [4], with the pin assembly [69], on the air driven pump hoist adapter, SPL-1802, [73].
 - (j) Tighten the knurled nut [70] on the aft support assembly [71] to engage the pin assembly [69] with the holes in the bracket [62].
 - (k) Put the band [66] of the forward support assembly [76] over the ADP pump [23].
 - (l) Move the forward support assembly [76] aft to engage the platform assembly [74].
 - (m) Engage the band [66] with the ring on the ADP assembly [4] near the base of the ADP pump [23].
 - (n) Install the ball lock pin [67] to attach the forward support assembly [76] to the platform assembly [74].
 - (o) Turn the knob [75] on the forward support assembly [76] to tighten the band [66] around the ring on the ADP assembly [4].

SUBTASK 29-11-10-420-001

- (2) For the ADP assembly C2 [4] (Figure 401), put the flexible hose [12] on the outlet of the exhaust collector [9].

SUBTASK 29-11-10-420-002

- (3) Do these steps to move the ADP assembly [4] into its position on the mount assembly [3]:
 - (a) For the ADP assembly C2 [4], turn the coupling nut [68] (Figure 402) on the air driven pump hoist adapter, SPL-1802, [73] to set the exhaust outlet opening in the exhaust collector [9] (Figure 401) at approximately the 2 O'clock position (when you look at it from the aft end).
 - (b) For the ADP assembly C1 [4], turn the coupling nut [68] (Figure 402) on the air driven pump hoist adapter, SPL-1802, [73] to set the exhaust outlet opening in the exhaust collector [9] (Figure 401) at approximately the 9 O'clock position (when you look at it from the aft end).
 - (c) Lift the ADP assembly [4] into the wing-to-body fairing with the hoist, SPL-1556 [61] (Figure 402).

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- (d) When the ADP assembly C2 [4] is near the wing-to-body fairing, do these steps until it is in the mounting position:
 - 1) Turn the coupling nut [68] on the air driven pump hoist adapter, SPL-1802, [73] to turn the ADP assembly C2 [4] clockwise (when you look at it from the aft end).
 - 2) Lift the ADP assembly C2 [4] with the hoist, SPL-1556, [61] a small distance.
- (e) Do these steps to align the ADP assembly [4] (Figure 401) with the mount assembly [3]:
 - 1) Use the 250LB capacity, load positioner (GE and PW engines), SPL-1576, [65] (Figure 402) to move the ADP assembly [4] in a horizontal plane.
 - 2) Use the coupling nut [72] on the air driven pump hoist adapter, SPL-1802, [73] to turn the ADP assembly [4] clockwise or counterclockwise (when you look at it from the aft end).
 - 3) Use the coupling nut [68] on the air driven pump hoist adapter, SPL-1802, [73] to turn the ADP assembly [4] clockwise or counterclockwise (when you look at it from the outboard side).

SUBTASK 29-11-10-420-003

- (4) Install the bolts [30] (Figure 401) and the washers [31] to attach the ADP assembly [4] to the three isolator mounts [32] on the mount assembly [3].

SUBTASK 29-11-10-480-004

- (5) Do these steps to remove the air driven pump hoist adapter, SPL-1802, [73] (Figure 402) from the ADP assembly [4]:
 - (a) Loosen the knob [75] on the forward support assembly [76] to make the band [66] larger.
 - (b) Remove the ball lock pin [67].
 - (c) Remove the forward support assembly [76] from the platform assembly [74].
 - (d) Loosen the knurled nut [70] on the aft support assembly [71].
 - (e) Pull the pin assembly [69] out until the ends of the pins are aligned with the surface of the aft support assembly [71].
 - (f) Operate the hoist, SPL-1556 [61] to lower the air driven pump hoist adapter, SPL-1802 [73] away from the ADP assembly [4].
 - (g) Move the hoist, SPL-1556, [61] away from the airplane.

SUBTASK 29-11-10-420-004

- (6) Remove the caps from these components:
 - (a) The ports on the ADP pump [23] (Figure 401).
 - (b) The self-sealing fitting [20] of the supply hose [19].
 - (c) The check valve [28] of the pressure hose [29].
 - (d) The check valve [16] of case drain hose [17].
 - (e) The seal drain hose [26] for the ADP pump [23].
 - (f) The drain hose [1] for the turbine gearbox.

SUBTASK 29-11-10-420-005

- (7) Do these steps to connect the hydraulic hoses to the ADP pump [23]:

NOTE: Clamps must be installed at the crossover point between the supply hose [19] and the pressure hose [29] in order to maintain proper clearance between the hoses, and side of body structure.



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- (a) Connect the self-sealing fitting [20] of the supply hose [19] to the adapter [21] on the ADP pump [23].
 - 1) Tighten the self-sealing fitting [20] to 900 ± 45 in-lb (102 ± 5 N·m).
- (b) Connect the check valve [28] of the pressure hose [29] to the adapter [27] on the ADP pump [23].
 - 1) Tighten the check valve [28] to 1600 ± 80 in-lb (181 ± 9 N·m).
- (c) Connect the check valve [16] of the case drain hose [17] to the union [15] on the inboard end of the heat exchanger [18].
 - 1) Tighten the check valve [16] to 280 ± 14 in-lb (32 ± 2 N·m).
- (d) Do these steps to install the drain hose [1] on the turbine gearbox:
 - 1) Put the clamp [5] on the drain hose [1] for the turbine gearbox.
 - 2) Connect the drain hose [1] to the drain outlet on the turbine gearbox.
 - 3) Tighten the clamp [5] on the drain hose [1].
- (e) Do these steps to install the seal drain hose [26] on the ADP pump [23]:
 - 1) Put the clamp [25] on the seal drain hose [26] for the ADP pump [23].
 - 2) Connect the seal drain hose [26] to the elbow [24] on the ADP pump [23].
 - 3) Tighten the clamp [25] on the seal drain hose [26].
- (f) Make sure the seal drain hose [26] for the ADP pump [23] and the drain hose [1] for the turbine gearbox are in a position which has these properties:
 - 1) Each hose will let the fluid drain down to the drain outlet in the wing to body fairing.
 - 2) Each hose has a minimum clearance of 0.25 inches from all structure, brackets, and the components of the ADP assembly [4].
 - 3) Each hose has a minimum clearance of 2 inches from all the electrical wire bundles.

SUBTASK 29-11-10-420-006

- (8) Remove the caps from the electrical connectors [2], [6], [14] and [48].

SUBTASK 29-11-10-420-007

- (9) Connect the electrical connectors [2], [6], and [14] to the ADP assembly [4].

SUBTASK 29-11-10-420-012

- (10) Connect the electrical connector [48].
 - (a) Install (2) flange retention screws and washers into connector bracket.

SUBTASK 29-11-10-420-008

- (11) Do these steps to install the bonding jumpers [33], [38], and [42] (SWPM 20-20-00).
 - (a) Put the bonding jumper [33], [38], or [42] on the stud [36], [39], or [45] on the ADP assembly [4].
 - (b) Install the washer [34], [41], or [43] and the nut [35], [40], or [44] on the stud [36], [39], or [45] on the ADP assembly [4].
 - (c) With the intrinsically safe approved bonding meter, COM-1550, make sure the resistance across each bonding jumper [33], [38], or [42] is not more than 0.008 ohms (SWPM 20-20-00).
 - (d) If the resistance is more than 0.008 ohms, do one of these steps to clean the mating surfaces between the bonding jumper [33], [38], or [42] and the ADP assembly [4] or the bracket on the airplane structure:

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- 1) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
- 2) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.
- 3) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.

SUBTASK 29-11-10-420-009

- (12) For the ADP assembly C2, do these steps to connect the exhaust duct [11]:
 - (a) Move the flexible hose [12], on the outlet of the exhaust collector [9], to engage the exhaust duct [11].
 - (b) Install the clamps [13] to attach the flexible hose [12] to the ADP assembly C2 [4] and to the exhaust duct [11].

SUBTASK 29-11-10-420-010

- (13) For the ADP assembly C1, do this task: Air-Driven Pump (ADP) Exhaust Duct Installation, TASK 29-11-17-400-801.

SUBTASK 29-11-10-420-011

- (14) For the applicable ADP Assembly (C1 or C2), do this task: Air-Driven Pump (ADP) Inlet Duct Installation, TASK 29-11-16-400-801.

SUBTASK 29-11-10-870-001

- (15) Do these steps to bleed the air from the ADP pump [23]:
 - (a) For the reservoir in the center hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.



PUT A RAG AROUND THE ELBOW ON THE ADP PUMP TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (b) Put a rag around the elbow [22] at the case drain port on the ADP pump [23], to catch a spray of hydraulic fluid.
- (c) Slowly loosen the elbow [22] at the case drain port on the ADP pump [23], to bleed the air from the ADP pump [23].
- (d) After you bleed the air, tighten the elbow [22] to 266 in-lb (30 N·m) to 294 in-lb (33 N·m).

SUBTASK 29-11-10-110-001



QUICKLY CLEAN ALL HYDRAULIC FLUID FROM THE SURFACES OF THE ADP ASSEMBLY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE ADP ASSEMBLY.

- (16) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-10-610-001

- (17) For the reservoir in the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-10-610-002

- (18) Do this task: Add Oil to the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA), TASK 12-13-05-610-801.

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H. Air-Driven Pump (ADP) Assembly Installation Test

NOTE: The same sequence of steps is used for the air-driven pump C1 or C2.

SUBTASK 29-11-10-710-001

(1) Installation Test

- (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
- (b) 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>
A	7	C29401	ADP 1 HTR PWR
A	8	C29402	ADP 2 HTR PWR
G	10	C29623	ADP 1 HTR CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

- (c) Use a maintenance access terminal (MAT) to do the operational test of the air-driven pump (ADP) (C1, C2):

NOTE: Use an engine or the ground service cart to pressurize the pneumatic system.
The APU does not provide the air flow necessary for the ADP test.

- 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 29 Hydraulic System
 - e) OPERATIONAL TEST
 - f) Air driven pump (ADP) (C1, C2)
 - 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-10-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

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SUBTASK 29-11-10-080-001

- (2) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

———— **END OF TASK** ————

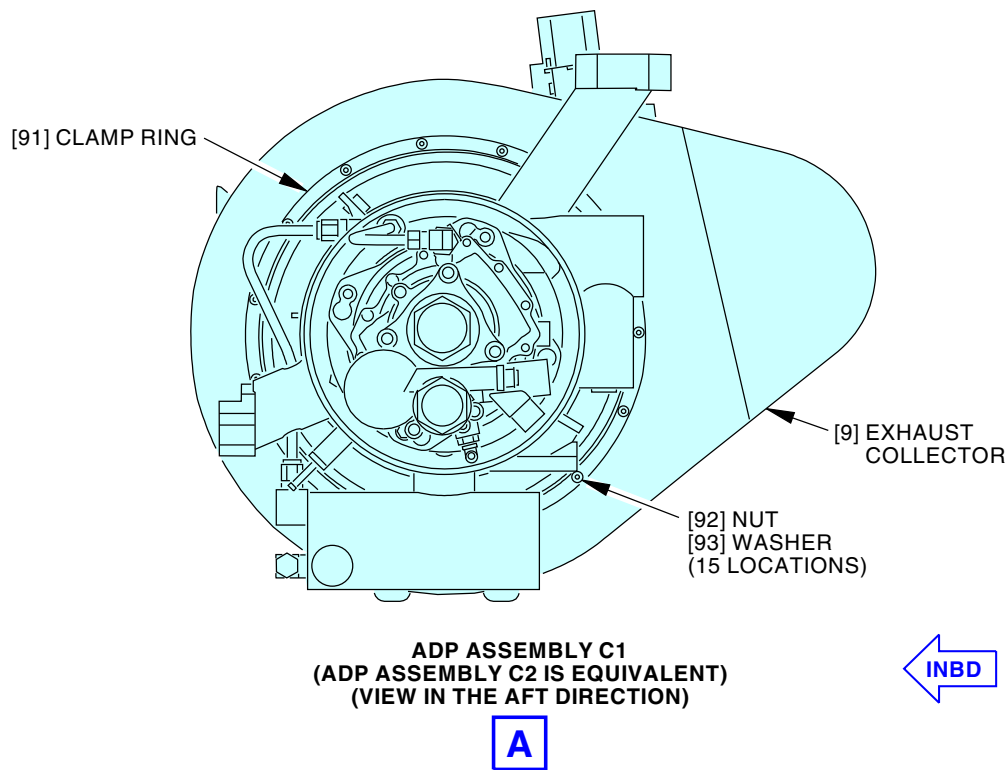
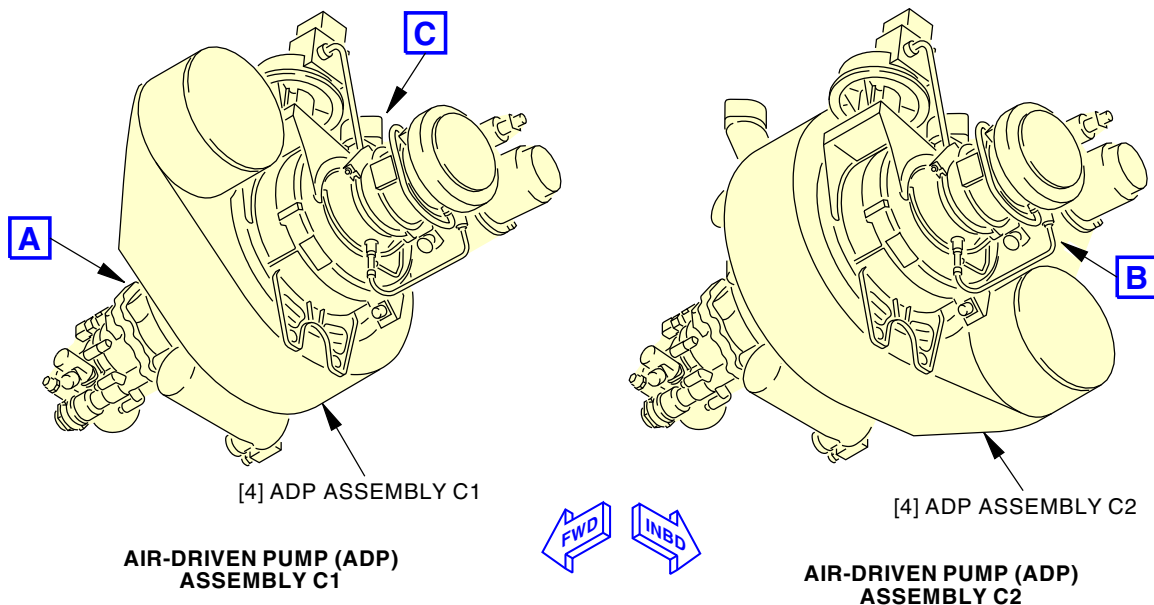
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E44210 S0006415961_V2

**Air-Driven Pump (ADP) Assembly Exhaust Collector
Figure 403/29-11-10-990-803 (Sheet 1 of 2)**

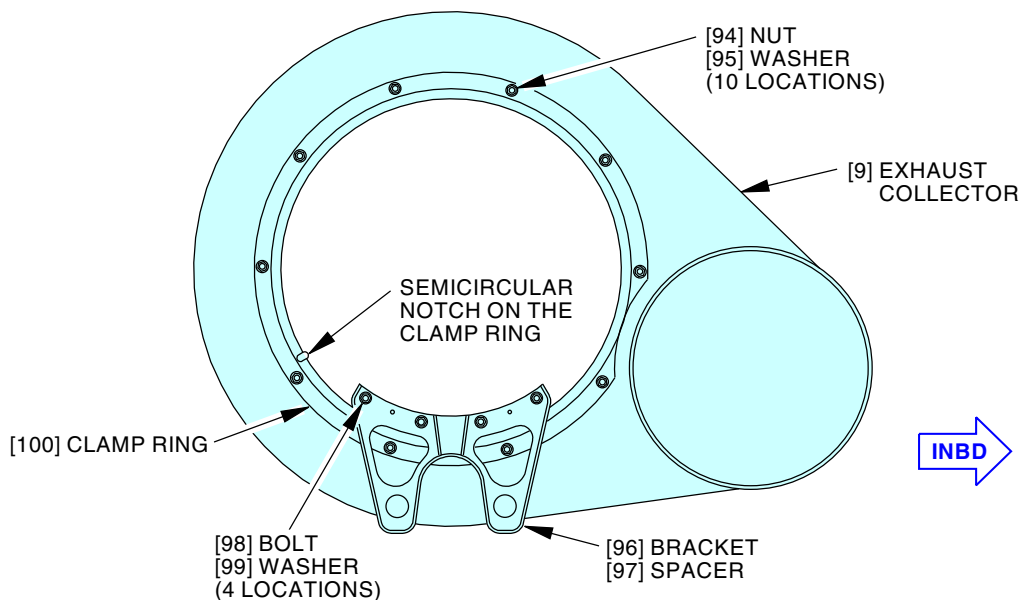
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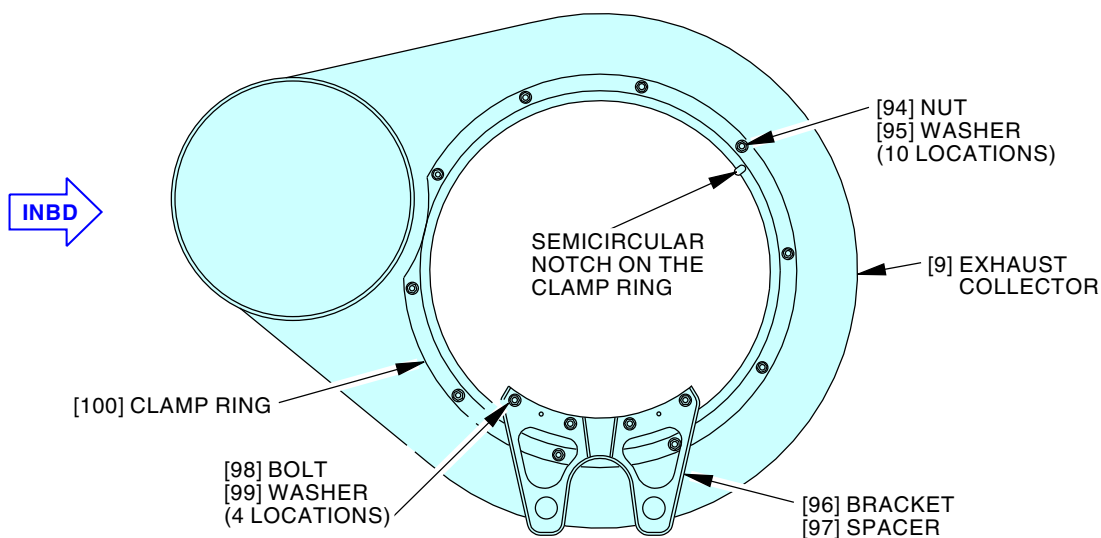
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**ADP ASSEMBLY C2
(VIEW IN THE FORWARD DIRECTION)**

B



**ADP ASSEMBLY C1
(VIEW IN THE FORWARD DIRECTION)**

C

E44212 S0006415962_V2

**Air-Driven Pump (ADP) Assembly Exhaust Collector
Figure 403/29-11-10-990-803 (Sheet 2 of 2)**

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AIR-DRIVEN PUMP (ADP) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the pump on the air-driven pump (ADP)
 - (2) An installation of the pump on the ADP.
- B. There are two air-driven pump (ADP) assemblies in the aft left wing-to-body fairing. The hydraulic pump on each of the ADP assemblies is the same as the engine-driven pump on each engine. You can use this procedure to remove and install the hydraulic pump on each of the ADP assemblies. For the procedure for the engine-driven pump on the engines, refer to Engine-Driven Pump (TASK 29-11-05-000-801-002).
- C. If you replace an ADP pump because of mechanical failure, flush the center hydraulic system, do this task: Main Hydraulic System Flushing, TASK 29-11-00-170-801.

TASK 29-11-11-000-801

2. Air-Driven Pump (ADP) Pump Removal

(Figure 401)

A. **References**

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)

B. **Location Zones**

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. **Access Panels**

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. **Prepare for the Removal**

SUBTASK 29-11-11-860-001

- (1) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-11-860-002

- (2) For the center system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-11-860-003

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

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

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SUBTASK 29-11-11-040-001



CAUTION

OPERATING THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (4) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-11-010-001

- (5) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

E. Air-Driven Pump (ADP) Pump Removal

SUBTASK 29-11-11-020-001

- (1) Do the steps which follow to disconnect the hydraulic hoses from the pump assembly [28]:
- (a) Disconnect the self-sealing fitting [13] of the supply hose [12] from the adapter [33] on the pump assembly [28].
NOTE: Do not disconnect the supply hose [12] from the self-sealing fitting [13]. If you disconnect the supply hose [12] from the self-sealing fitting [13], fluid can drain from the supply hose [12].
 - (b) Disconnect the check valve [10] of the pressure hose [11] from the adapter [32] on the pump assembly [28].
NOTE: Do not disconnect the pressure hose [11] from the check valve [10]. If you disconnect the pressure hose [11] from the check valve [10], fluid can drain from the pressure hose [11].
 - (c) Disconnect the elbow [5] of the tube assembly [6] from the adapter [17] on the pump assembly [28].
 - (d) Disconnect the tube assembly [6] from the air-driven pump (ADP) assembly [1] and remove the tube assembly [6].
 - (e) Loosen the clamp [8] on the seal drain hose [9].
 - (f) Disconnect the seal drain hose [9] from the elbow [25] on the pump assembly [28].
 - (g) Install caps on these components to prevent contamination:
 - 1) Self-sealing fitting [13] on the supply hose [12]
 - 2) Check valve [10] on the pressure hose [11]
 - 3) Seal drain hose [9].

SUBTASK 29-11-11-020-002



CAUTION

DO NOT LET THE HYDRAULIC FLUID GET IN THE GEARBOX OIL. VERY SMALL QUANTITIES OF THIS FLUID CAN CHEMICALLY CHANGE THE OIL. THIS CAN CAUSE DAMAGE TO THE GEARBOX.

- (2) Do these steps to remove the pump assembly [28] from the air-driven pump (ADP) assembly [1]:

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- (a) Loosen the nuts [7], which attach the pump assembly [28] to the air-driven pump (ADP) assembly [1], approximately three turns.

NOTE: It is not necessary to remove the nuts [7] to remove the pump assembly [28]. But if you do remove a nut [7], after three turns, lightly hit the shell of the nut [7] to release the self-lock property of the nut [7]. This will make it easier to remove the nut [7].

- (b) Support the weight of the pump assembly [28] with your hands while you do these steps:

- 1) Turn the pump assembly [28] clockwise (when you look at the forward end of the pump) until the nuts [7] can go through the larger ends of the slots on the pump assembly [28].
- 2) Remove the pump assembly [28] from the air-driven pump (ADP) assembly [1].
- 3) Pull the pump assembly [28] away from the air-driven pump (ADP) assembly [1] in the direction which is parallel to the axis of the pump assembly [28].

NOTE: The drive shaft [22] will usually stay in the pump assembly [28]. The coupling [34] will usually stay in the air-driven pump (ADP) assembly [1].

- (c) If the drive shaft [22] stays in the air-driven pump (ADP) assembly [1], do these steps:

- 1) Pull the drive shaft [22] from the air-driven pump (ADP) assembly [1].
- 2) Install the drive shaft [22] in the pump assembly [28].

- (d) If the coupling [34] stays on the drive shaft [22] of the pump assembly [28], do these steps:

- 1) Remove the coupling [34] from the drive shaft [22] of the pump assembly [28].
- 2) Make sure the retainer [35] is on the coupling [34].
- 3) Make sure the coupling [34] has no cracks or other damage.
- 4) Install the coupling [34] in the air-driven pump (ADP) assembly [1].

- (e) Remove and discard o-ring [23].

SUBTASK 29-11-11-020-003

- (3) If it is necessary to keep components for installation on the replacement pump assembly [28], do these steps:

- (a) Remove the adapter [17], the adapter [32], and the adapter [33] from the ports of the pump assembly [28].
- (b) Remove and discard the o-ring [18], the o-ring [20], the o-ring [31], the o-ring [29], the o-ring [14], and the o-ring [16].
- (c) Remove the Backup Ring [19], the Backup Ring [30], and the Backup Ring [15].
- (d) Remove the elbow [25] and the nut [26] from the seal drain port on the pump assembly [28].
- (e) Remove and discard the o-ring [27].
- (f) Remove the cover [21].

SUBTASK 29-11-11-020-004

- (4) Install caps on the ports of the pump assembly [28] to prevent contamination.

————— **END OF TASK** —————

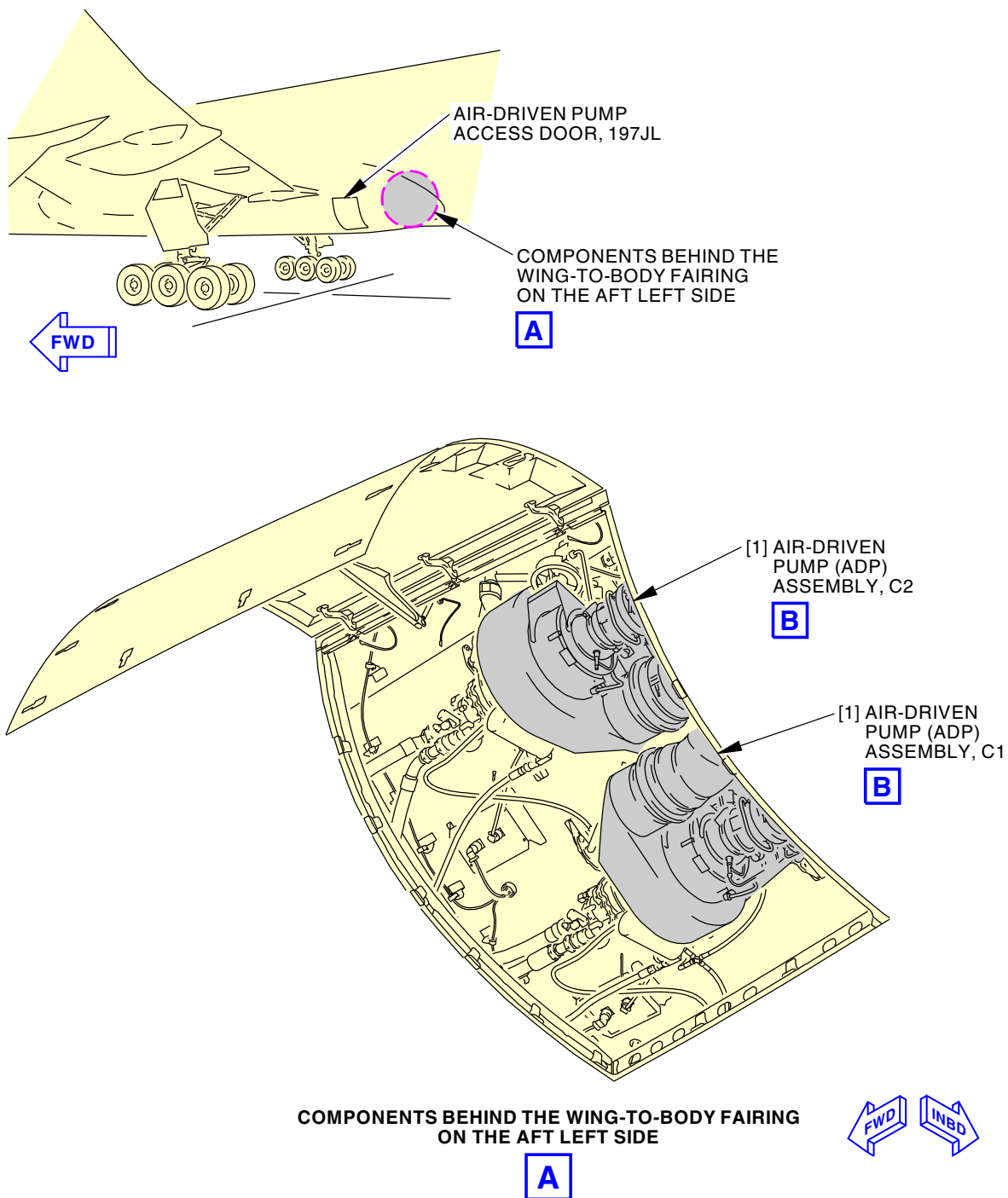
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C19100 S0006415966_V2

**Air-Driven Pump (ADP) Installation
Figure 401/29-11-11-990-801 (Sheet 1 of 4)**

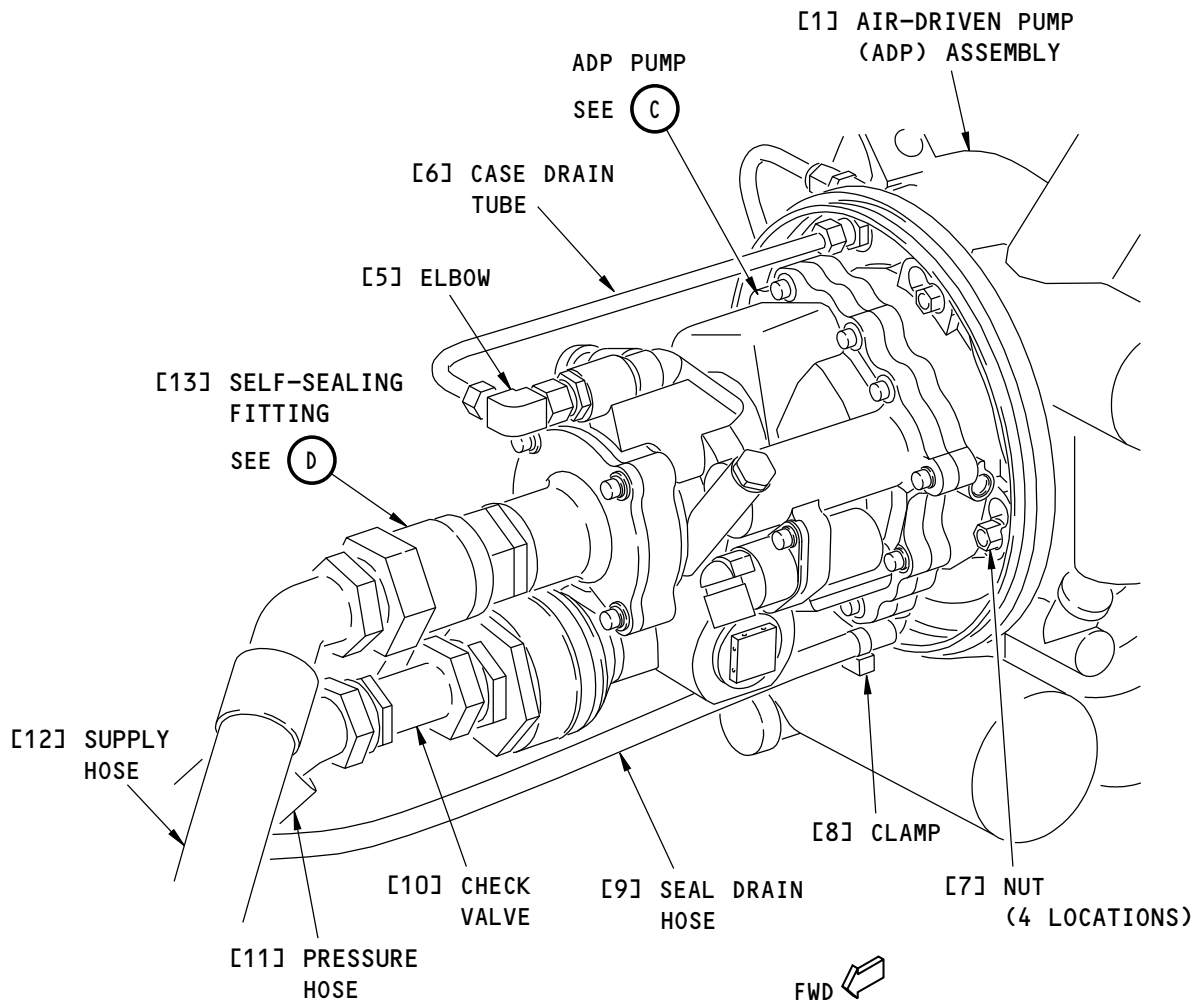
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**AIR-DRIVEN PUMP (ADP) ASSEMBLY
(EXAMPLE)**

(B)

2159421 S0000474043_V1

**Air-Driven Pump (ADP) Installation
Figure 401/29-11-11-990-801 (Sheet 2 of 4)**

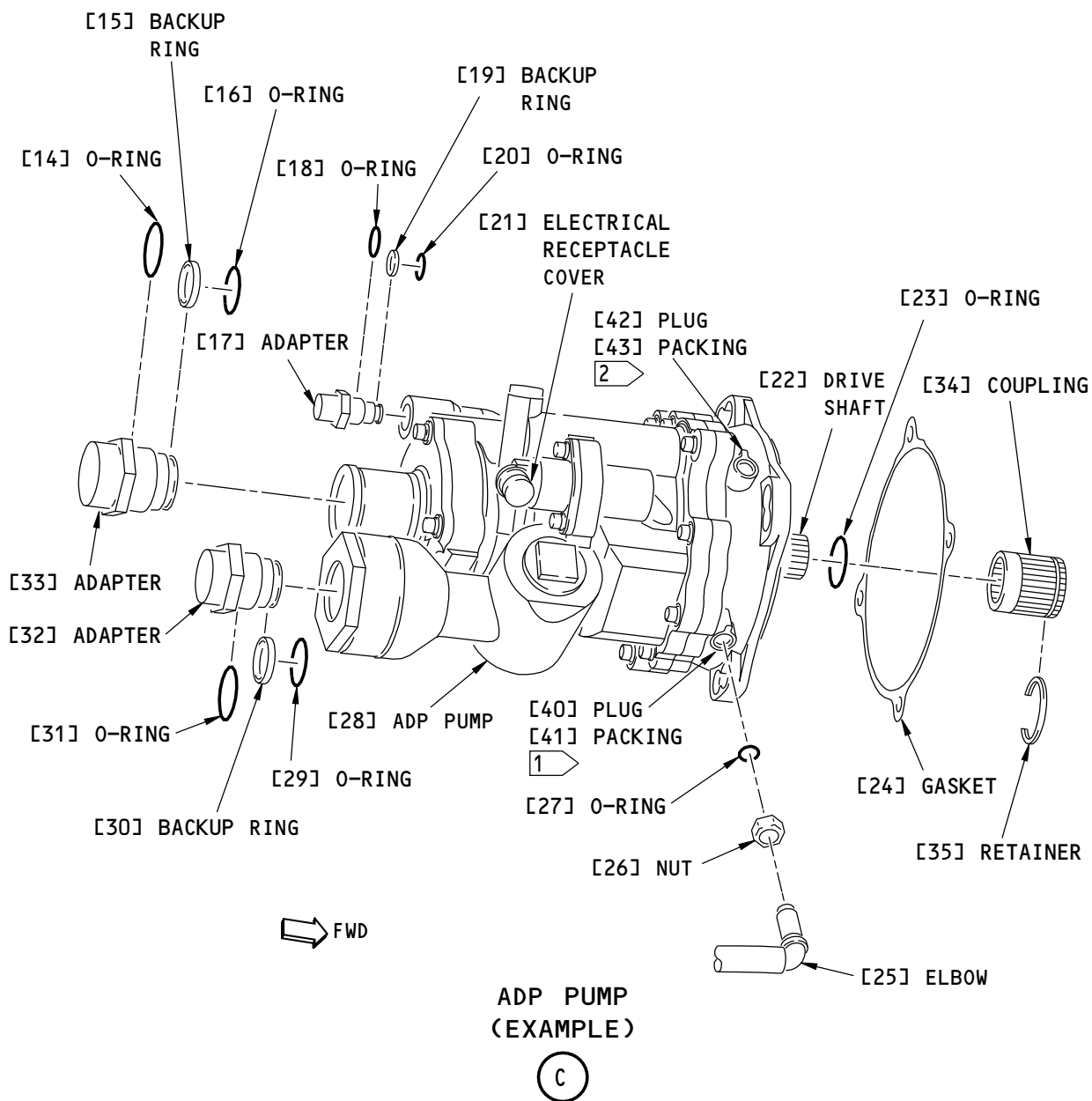
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- 1 REMOVE SHIPPING PLUG AND PACKING TO CONNECT ELBOW TO ADP PORT.
- 2 DO NOT REMOVE SHIPPING PLUG AND PACKING FROM THIS ADP PORT.

C19109 S0006415969_V2

**Air-Driven Pump (ADP) Installation
Figure 401/29-11-11-990-801 (Sheet 3 of 4)**

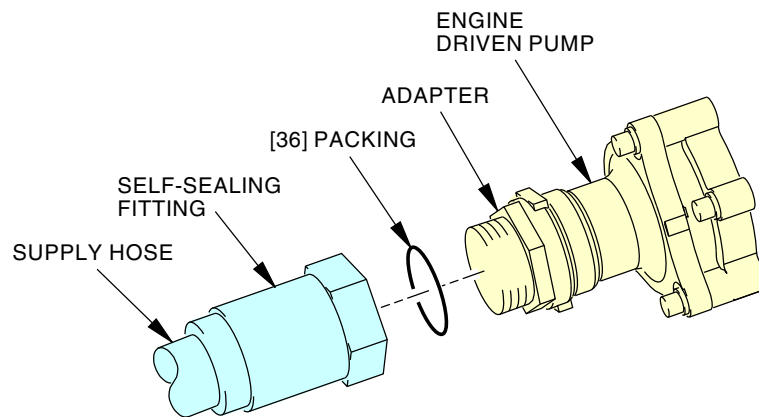
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SELF-SEALING FITTING
(EXAMPLE)



2159218 S0000474017_V2

Air-Driven Pump (ADP) Installation
Figure 401/29-11-11-990-801 (Sheet 4 of 4)

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TASK 29-11-11-400-801

3. Air-Driven Pump (ADP) Pump Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
45-10-00-740-819	How to Do a Ground Test (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
14	O-ring	29-11-10-01B-230	ARO ALL
15	Backup Ring	29-11-10-01B-235	ARO ALL
16	O-ring	29-11-10-01B-225	ARO ALL
18	O-ring	29-11-10-01B-210	ARO ALL
19	Backup Ring	29-11-10-01B-215	ARO ALL
20	O-ring	29-11-10-01B-205	ARO ALL
23	O-ring	29-11-10-01B-197	ARO ALL
24	Gasket	29-11-10-01B-198	ARO ALL
27	O-ring	29-11-10-01B-263	ARO ALL
28	Pump assembly	29-11-10-01B-190	ARO ALL
		29-11-10-01B-195	ARO ALL
		29-11-10-01B-275	ARO ALL
		29-11-10-01B-277	ARO ALL
29	O-ring	29-11-10-01B-245	ARO ALL
30	Backup Ring	29-11-10-01B-255	ARO ALL
31	O-ring	29-11-10-01B-250	ARO ALL
36	Packing	29-11-43-05-210	ARO ALL
		29-11-43-05-255	ARO ALL

D. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

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E. Access Panels

Number	Name/Location

197JL	Air Driven Pump (ADP) Access Door

F. Air-Driven Pump (ADP) Pump Installation

SUBTASK 29-11-11-420-001

- (1) If it is necessary to install the components on the replacement pump assembly [28], do these steps:

- (a) Install the cover [21] on the electrical connector on the pump assembly [28].

NOTE: This cover [21] is not connected when you use the pump assembly [28] on the air-driven pump (ADP) assembly [1]. The cover [21] is connected only when you use the pump assembly [28] on an engine.

- (b) Do these steps to install the hydraulic fittings in the ports of the pump assembly [28]:

- 1) Lubricate the components which follow, with MCS 352B fluid, D00054
 - a) o-ring [14], o-ring [16], o-ring [18], o-ring [20], o-ring [27], o-ring [29], and o-ring [31].
 - b) Backup Ring [15], Backup Ring [19], and Backup Ring [30].
 - c) Threads on the adapter [17], adapter [32], and adapter [33] and on the elbow [25].
- 2) Install the new o-ring [18], the new o-ring [20] and the Backup Ring [19] on the adapter [17].
- 3) Install the new o-ring [29], the new o-ring [31] and the Backup Ring [30] on the adapter [32].
- 4) Install the new o-ring [14], the new o-ring [16] and the Backup Ring [15] on the adapter [33].
- 5) Install the new o-ring [27] and the new nut [26] on the elbow [25].
- 6) Remove the caps from the ports on the pump assembly [28].
- 7) If there is a shipping plug in the seal drain port on the pump assembly [28], remove the shipping plug [40] and the packing [41].

NOTE: A new pump assembly [28] is equipped with two shipping plugs installed in two drain ports. You will need to remove the shipping plug [40] and packing [41] from the seal drain port to permit connection of the elbow [25] to the pump assembly [28]. You do not need to remove the shipping plug [42] and packing [43] from the other drain port.

 - a) Make sure the shipping plug [42] and packing [43] are installed in the other drain port on the pump assembly [28].
- 8) Install the adapter [33] in the supply port on the pump assembly [28].
- 9) Tighten the adapter [33] to 855-945 pound-inches.
- 10) Install the adapter [32] in the pressure port on the pump assembly [28].
- 11) Tighten the adapter [32] to 855-945 pound-inches.
- 12) Install the adapter [17] in the case drain on the pump assembly [28].
- 13) Tighten the adapter [17] to 266-294 pound-inches.
- 14) Make sure the seal drain opening on the air-driven pump (ADP) assembly [1] is clear.

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- a) If it is necessary, clean the seal drain opening, in the air-driven pump (ADP) assembly [1], and the seal drain hose.
- 15) Install the elbow [25] and the nut [26] at the seal drain port on the pump assembly [28].
- 16) Align the elbow [25] with the center line of the pump assembly [28] while you tighten the nut [26] to 105-115 pound-inches.

SUBTASK 29-11-11-640-001

- (2) Lubricate the new o-ring [23] with oil, D00068.

SUBTASK 29-11-11-420-002



CAUTION

MAKE SURE YOU INSTALL THE PACKING IN THE SPLINE GROOVE ON THE DRIVE SHAFT OF THE PUMP. THE PACKING PREVENTS LEAKAGE OF OIL FROM THE GEARBOX OF THE AIR-DRIVEN PUMP (ADP) ASSEMBLY.

- (3) Install the new o-ring [23] in the spline groove on the drive shaft [22] of the pump assembly [28].

NOTE: Do not put grease on the drive shaft [22] of the pump assembly [28], the oil in the turbine gearbox assembly lubricates the drive shaft spline.

SUBTASK 29-11-11-160-001

- (4) Make sure the seal drain port on the pump assembly [28] is clear.
 - a) If it is necessary, clean the seal drain port in the pump assembly [28], and the seal drain hose [9].

SUBTASK 29-11-11-420-003

- (5) Make sure the gasket [24] is in good condition.
 - a) If it is necessary, install a new gasket [24] on the air-driven pump (ADP) assembly [1].

SUBTASK 29-11-11-210-001

- (6) Make sure the coupling [34] is in its position in the air-driven pump (ADP) assembly [1].

NOTE: If the coupling [34] is not there, the air-driven pump (ADP) assembly [1] will not operate the pump assembly [28].

SUBTASK 29-11-11-420-004

- (7) Put the pump assembly [28] on the air-driven pump (ADP) assembly [1] and carefully engage the drive shaft [22] with the coupling [34] on the ADP [1].

NOTE: Before you put the pump assembly [28] on the air-driven pump (ADP) assembly [1], put the pump assembly [28] in the correct position to align the ports on the pump assembly [28] with the hydraulic hoses (Figure 401).

SUBTASK 29-11-11-420-005

- (8) Turn the pump assembly [28] to let the nuts [7] go through the larger ends of the slots on the pump assembly [28].

SUBTASK 29-11-11-420-006

- (9) Turn the pump assembly [28] counterclockwise (when you look at the forward end of the pump) until the small ends of the slots on the pump assembly [28] are tightly against the studs on the air-driven pump (ADP) assembly [1].

SUBTASK 29-11-11-420-007

- (10) Tighten the nut [7] to 260-320 pound-inches.

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SUBTASK 29-11-11-420-008

- (11) Do these steps to attach the hydraulic hoses to the pump assembly [28]:

NOTE: Clamps must be installed at the crossover point between the supply hose [12] and the pressure hose [11] in order to maintain proper clearance between the hoses and side of body structure.

- (a) Remove the caps from these components:
 - 1) Self-sealing fitting [13] on the supply hose [12]
 - 2) Check valve [10] on the pressure hose [11]
 - 3) Seal drain hose [9].
- (b) Connect the check valve [10] of the pressure hose [11] to the adapter [32] on the pump assembly [28].
- (c) Tighten the check valve [10] to 1520-1680 pound-inches.
- (d) Connect the tube assembly [6] to the air-driven pump (ADP) assembly [1].
- (e) Connect the elbow [5] of the tube assembly [6] to the adapter [17] on the pump assembly [28].
- (f) Tighten the elbow [5] to 266-294 pound-inches.
- (g) Replace the packing [36] on the self-sealing fitting [13].
 - 1) Lubricate the new packing [36] with MCS 352B fluid, D00054.
- (h) Connect the self-sealing fitting [13] of the supply hose [12] to the adapter [33] on the pump assembly [28].
 - (i) Tighten the self-sealing fitting [13] to 855-945 pound-inches.
 - (j) Put the clamp [8] on the seal drain hose [9].
- (k) Connect the seal drain hose [9] to the elbow [25] on the pump assembly [28].
- (l) Tighten the clamp [8] on the seal drain hose [9].

SUBTASK 29-11-11-870-001

- (12) Do the steps which follow to bleed the air from the pump assembly [28]:

- (a) For the center system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.



PUT A RAG AROUND THE CASE DRAIN TUBE [6] AT THE PUMP [28] TO CATCH A SPRAY OF HYDRAULIC FLUID. A SPRAY OF HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF THE HYDRAULIC FLUID TOUCHES YOUR SKIN, FLUSH THE SKIN WITH WATER. IF THE HYDRAULIC FLUID TOUCHES YOUR EYES, FLUSH THE EYES WITH WATER AND GET MEDICAL AID.

- (b) Put a rag around the tube assembly [6] at the port on the pump assembly [28] to catch a spray of hydraulic fluid.
- (c) Slowly loosen the elbow [5] on the tube assembly [6] to bleed the air from the pump assembly [28].
- (d) After you bleed the air, tighten the elbow [5] to 266-294 pound-inches.

SUBTASK 29-11-11-610-001

- (13) For the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

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SUBTASK 29-11-11-110-001



CAUTION

QUICKLY CLEAN ALL HYDRAULIC FLUID FROM THE SURFACES OF THE AIR-DRIVEN PUMP (ADP) ASSEMBLY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIR-DRIVEN PUMP (ADP) ASSEMBLY.

- (14) Clean all hydraulic fluid from the installation area (TASK 12-25-01-100-801).

SUBTASK 29-11-11-170-001

- (15) If you replaced the pump assembly [28] because of mechanical failure, do this task: Main Hydraulic System Flushing, TASK 29-11-00-170-801.

G. Air-Driven Pump (ADP) Pump Installation Test

SUBTASK 29-11-11-860-004

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

SUBTASK 29-11-11-860-005

- (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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-11-710-001

- (3) Use a maintenance access terminal (MAT) (TASK 45-10-00-740-819) to do an operational test of the applicable air-driven pump (ADP) (C1 or C2).

NOTE: Use an engine or the ground service cart to pressurize the pneumatic system. The APU does not provide the air flow necessary for the ADP test.

- (a) Make these selections on the MAT:
- 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic Power
 - 5) OPERATIONAL TEST
 - 6) Make a selection on the MAT of one of the applicable operational tests which follow:
 - a) Air Driven Pump (ADP) (C1)
 - b) Air Driven Pump (ADP) (C2)
 - 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.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-11-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-11-080-001

- (2) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

———— **END OF TASK** ————

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TURBINE GEARBOX ASSEMBLY (TGA) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the turbine gearbox assembly (TGA)
 - (2) An installation of the TGA.
- B. There are two air-driven pump (ADP) assemblies in the aft left wing-to-body fairing. The lower ADP assembly is referred to as the ADP assembly C1. The upper ADP assembly is referred to as the ADP assembly C2. You can use this procedure to remove and install the TGA on each of the ADP assemblies.
- C. The air-driven pump (ADP) assembly includes the air drive unit (ADU) and the hydraulic pump. The hydraulic pump is also referred to as the ADP or simply the pump. The air-drive unit (ADU) includes the turbine gearbox assembly (TGA), the modulating shutoff valve (MSOV), and the ADP heater.
- D. The ADP assembly must be removed from the airplane to remove the TGA. The ADP heater, the MSOV, and the pump are then removed from the TGA to separate it from the rest of the ADP assembly.

TASK 29-11-12-000-801

2. Turbine Gearbox Assembly (TGA) Removal

A. References

Reference	Title
29-11-10-000-801	Air-Driven Pump (ADP) Assembly Removal (P/B 401)
29-11-18-000-801	Air-Driven Pump (ADP) Heater Removal (P/B 401)

B. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. Prepare for the Removal

SUBTASK 29-11-12-020-001

- (1) Remove the applicable ADP assembly. To remove it, do this task: Air-Driven Pump (ADP) Assembly Removal, TASK 29-11-10-000-801.

D. Remove the Modulating Shutoff Valve (MSOV)

Figure 401

SUBTASK 29-11-12-020-002

- (1) Remove the ADP heater. To remove it, do this task: Air-Driven Pump (ADP) Heater Removal, TASK 29-11-18-000-801.

SUBTASK 29-11-12-020-003

- (2) Disconnect the heater cartridge from the TGA servo valve.
 - (a) Remove the screw [23] and the washer [24].

SUBTASK 29-11-12-020-004

- (3) Disconnect the heater cartridge from the secondary manifold.
 - (a) Remove the screw [25] and the washer [26].

SUBTASK 29-11-12-020-005

- (4) Do these steps to disconnect the air tubes from the Valve [11].
 - (a) Disconnect the air tube [5] from the Valve [11].

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- (b) Disconnect the air tube [6] from the union [4] on the air tube [3].
 - 1) Remove the bolt [20] and the nut [22] from the from the clamp [21].
- (c) Disconnect the air tube [10] from the Valve [11] and the TGA.

SUBTASK 29-11-12-020-006

- (5) Disconnect the coupling [12] which holds the Valve [11] and the noise isolator [8] to the TGA.
 - (a) Remove the Valve [11] and the noise isolator [8] from the TGA.
 - (b) Remove the Packing [9] from the recess in the Valve [11].
 - (c) Remove the Packing [13] from the recess in the TGA.
 - (d) Install caps on all the open tubes and the tubes which you removed, to prevent contamination.
 - (e) Install caps on the open ports of the Air Turbine Gearbox from which you disconnected tubes, to prevent contamination.

E. Remove the Air-Driven Pump (ADP) from the TGA

Figure 402

SUBTASK 29-11-12-020-008



DO NOT LET HYDRAULIC FLUID LEAKAGE COLLECT. IF YOU DO NOT MAKE THE AREA CLEAN, DAMAGE CAN OCCUR FROM THE HYDRAULIC FLUID.

- (1) Do these steps to remove the Pump assembly [28] from the TGA:
 - NOTE: Even a small quantity of hydraulic fluid can contaminate the gearbox oil and cause damage to the gearbox.
 - (a) Loosen the nut [7], which attach the Pump assembly [28] to the TGA, approximately three turns.
 - NOTE: It is not necessary to remove the nuts to remove the pump. If you do remove a nut, after three turns, lightly hit the shell of the nut to release the self-lock property of the nut. This will make it easier to remove the nut.
 - (b) Support the weight of the Pump assembly [28] with your hands while you do these steps:
 - 1) Turn the Pump assembly [28] clockwise (when you look at the forward end of the pump) until the nuts [7] can go through the larger ends of the slots on the Pump assembly [28].
 - 2) Pull the Pump assembly [28] away from the TGA until the drive shaft [22] is disengaged from the coupling [34].
 - NOTE: The drive shaft will usually stay in the pump. The coupling will usually stay in the TGA.
 - (c) If the drive shaft stays in the TGA, do these steps:
 - 1) Pull the drive shaft [22] from the TGA.
 - 2) Install the drive shaft [22] in the Pump assembly [28].
 - (d) If the coupling stays on the drive shaft, do these steps:
 - 1) Remove the coupling [34] from the drive shaft [22].
 - 2) Make sure the retainer [35] is on the coupling [34].
 - 3) Make sure the coupling [34] has no cracks or other damage.

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- 4) Install the coupling [34] in the TGA.
- (e) Remove and discard the O-ring [23].

———— **END OF TASK** ————

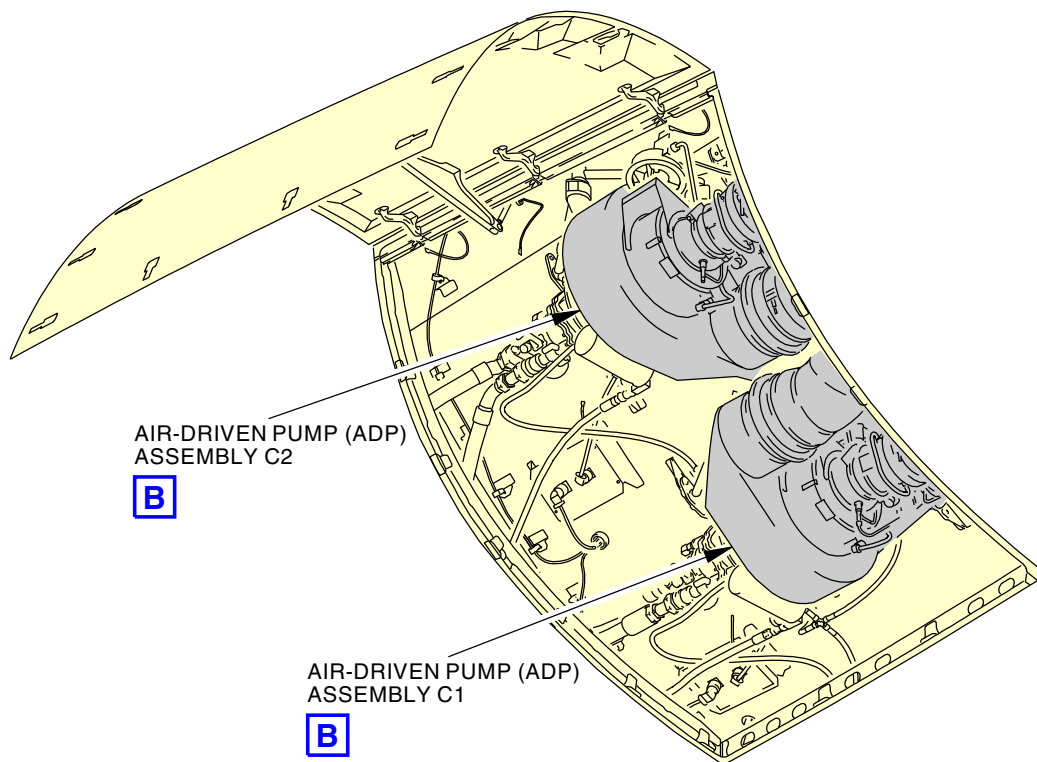
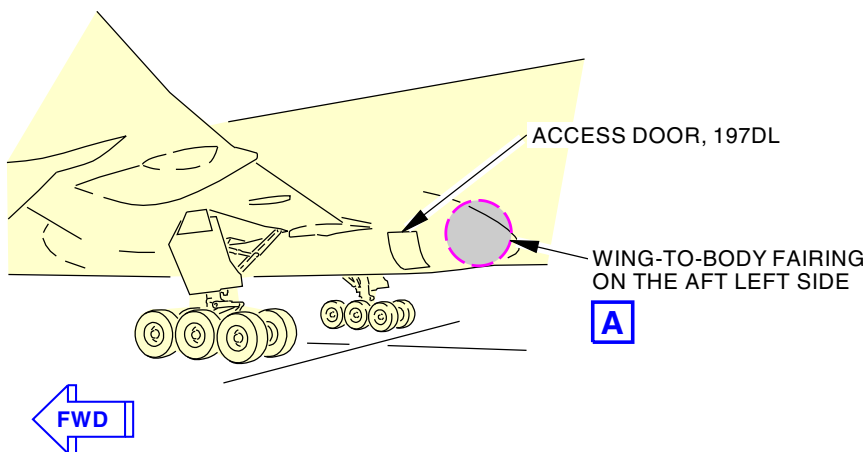
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**COMPONENTS BEHIND THE WING-TO-BODY FAIRING
ON THE AFT LEFT SIDE**



C17193 S0006415975_V2

Turbine Gearbox Assembly (TGA) Installation Figure 401/29-11-12-990-801 (Sheet 1 of 4)

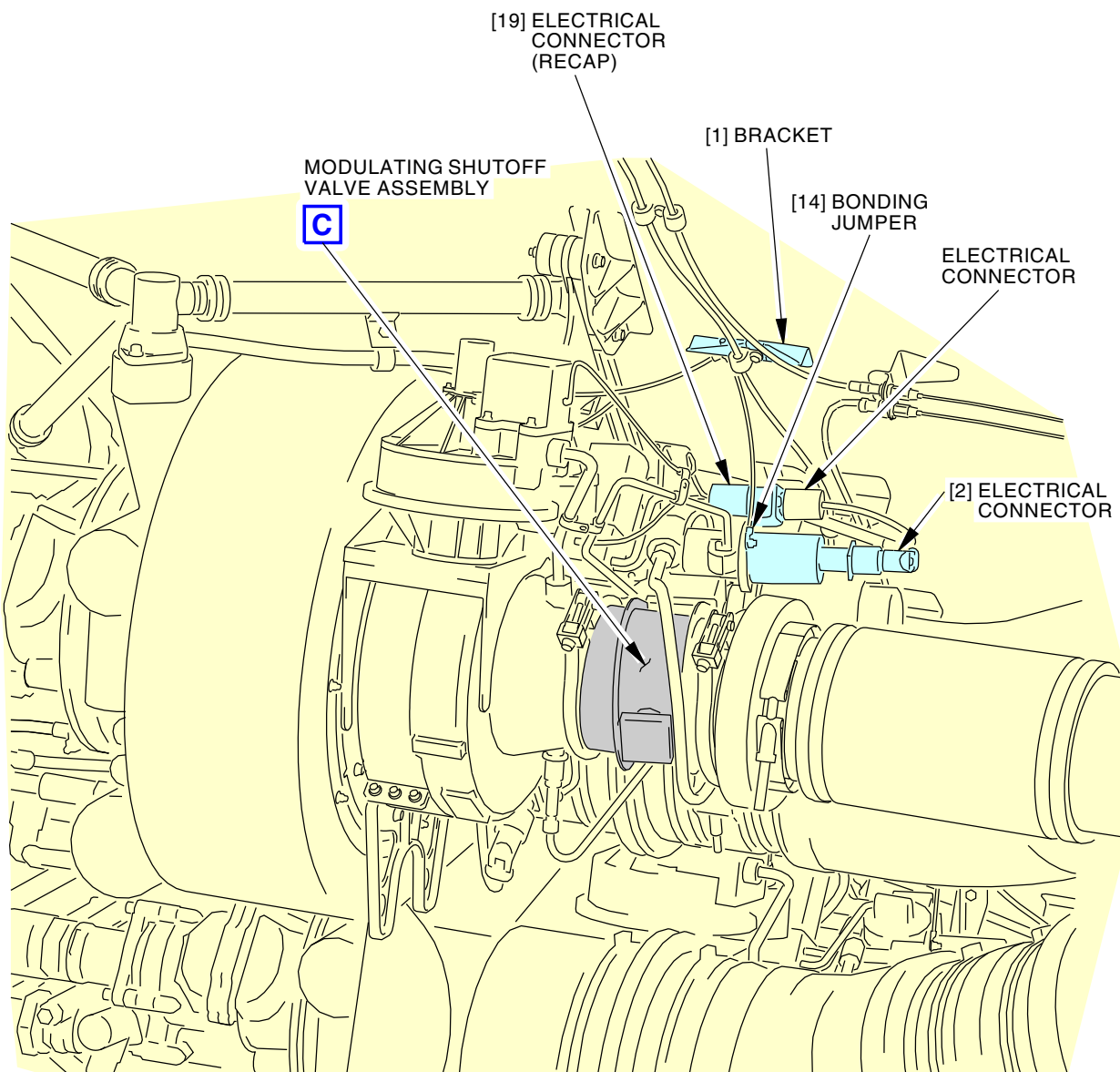
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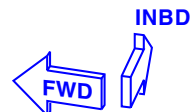
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**AIR-DRIVEN PUMP (ADP) ASSEMBLY C2
(AIR-DRIVEN PUMP (ADP) ASSEMBLY C1 IS EQUIVALENT)**

B



C18690 S0006415976_V4

**Turbine Gearbox Assembly (TGA) Installation
Figure 401/29-11-12-990-801 (Sheet 2 of 4)**

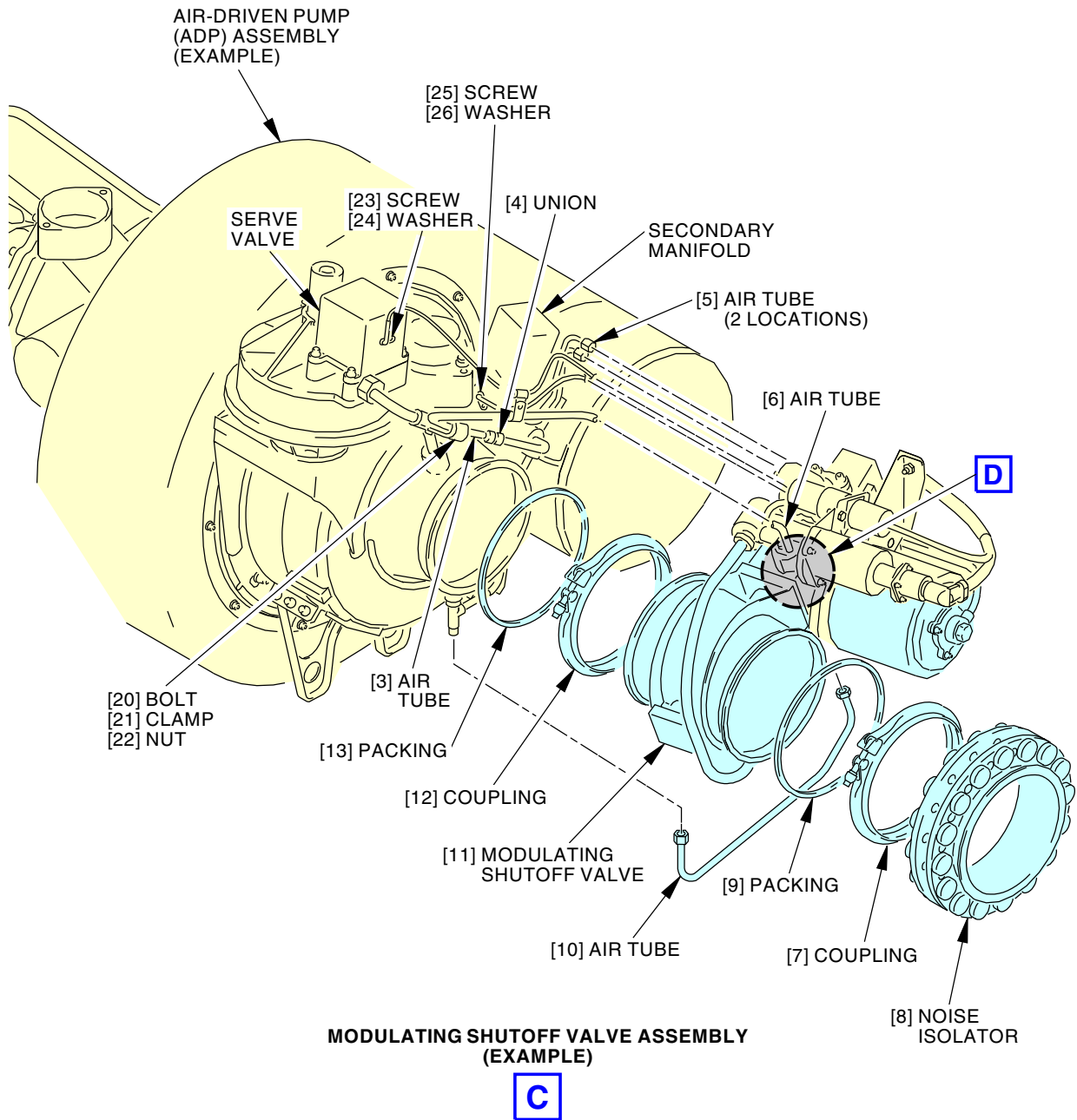
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E44940 S0006415977_V4

Turbine Gearbox Assembly (TGA) Installation
Figure 401/29-11-12-990-801 (Sheet 3 of 4)

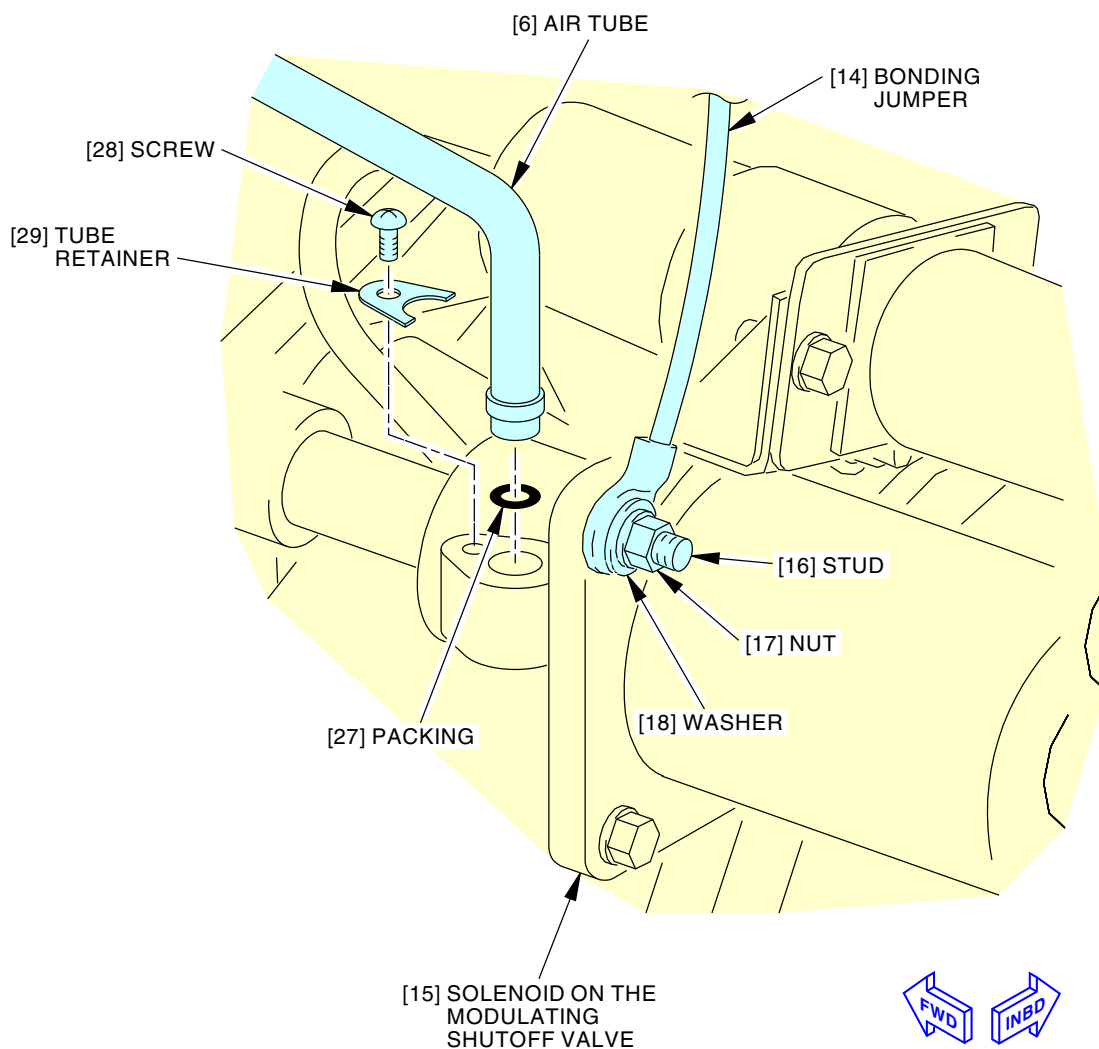
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D

E50135 S0006415978_V3

Turbine Gearbox Assembly (TGA) Installation
Figure 401/29-11-12-990-801 (Sheet 4 of 4)

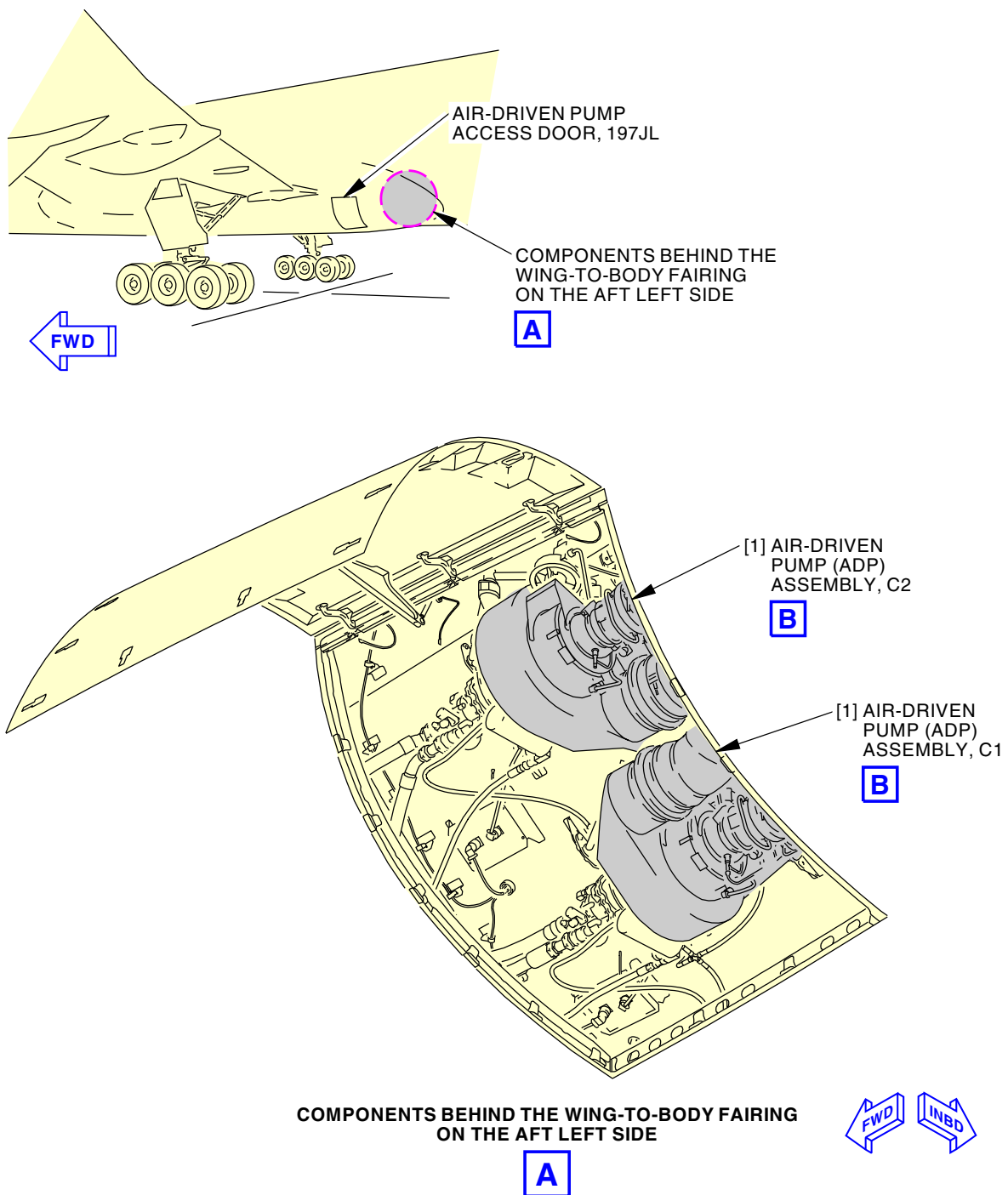
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C19100 S0006415966_V2

Turbine Gearbox Assembly (TGA) Installation Figure 402/29-11-12-990-802 (Sheet 1 of 3)

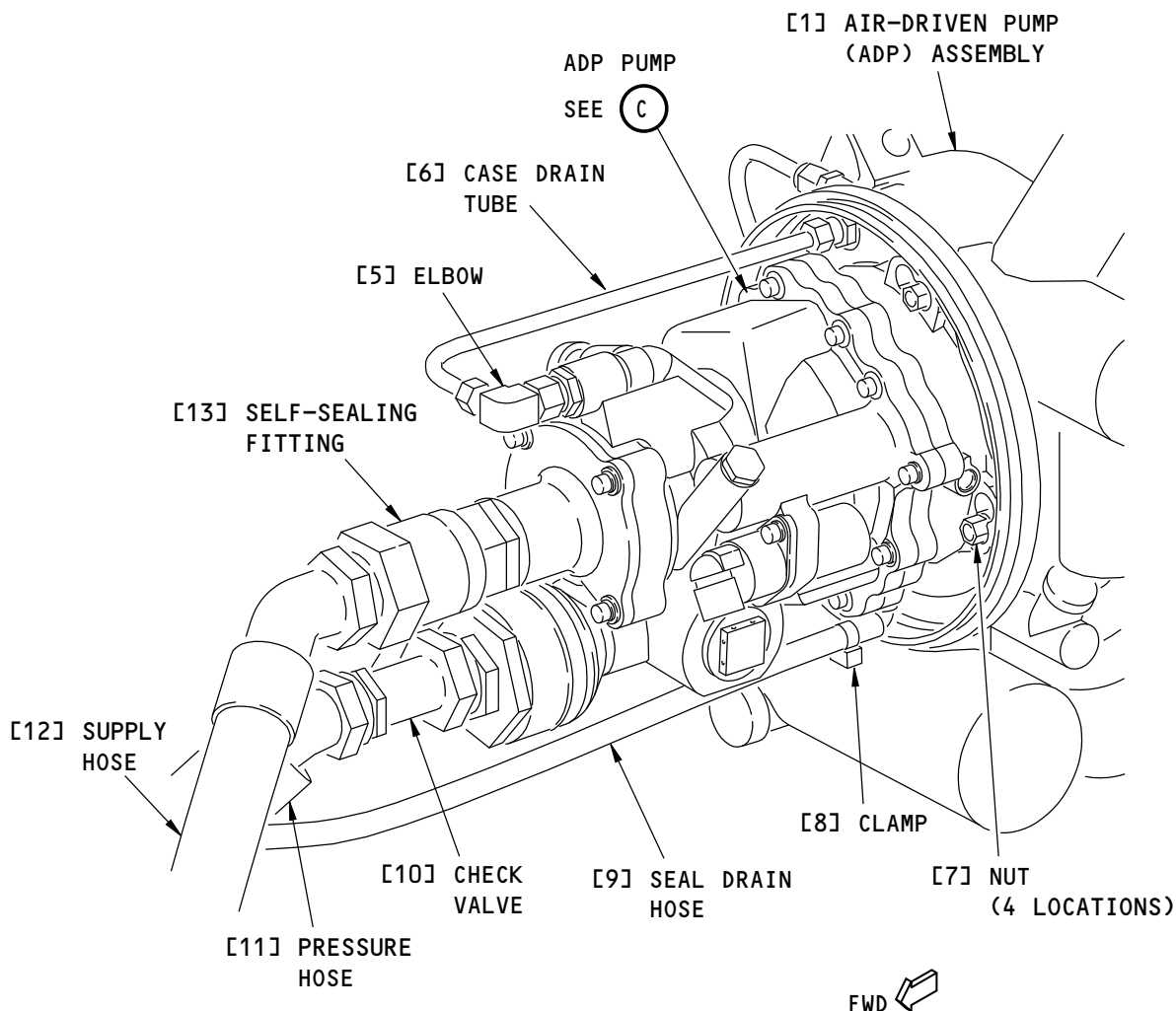
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**AIR-DRIVEN PUMP (ADP) ASSEMBLY
(EXAMPLE)**

(B)

D06524 S0006415967_V1

**Turbine Gearbox Assembly (TGA) Installation
Figure 402/29-11-12-990-802 (Sheet 2 of 3)**

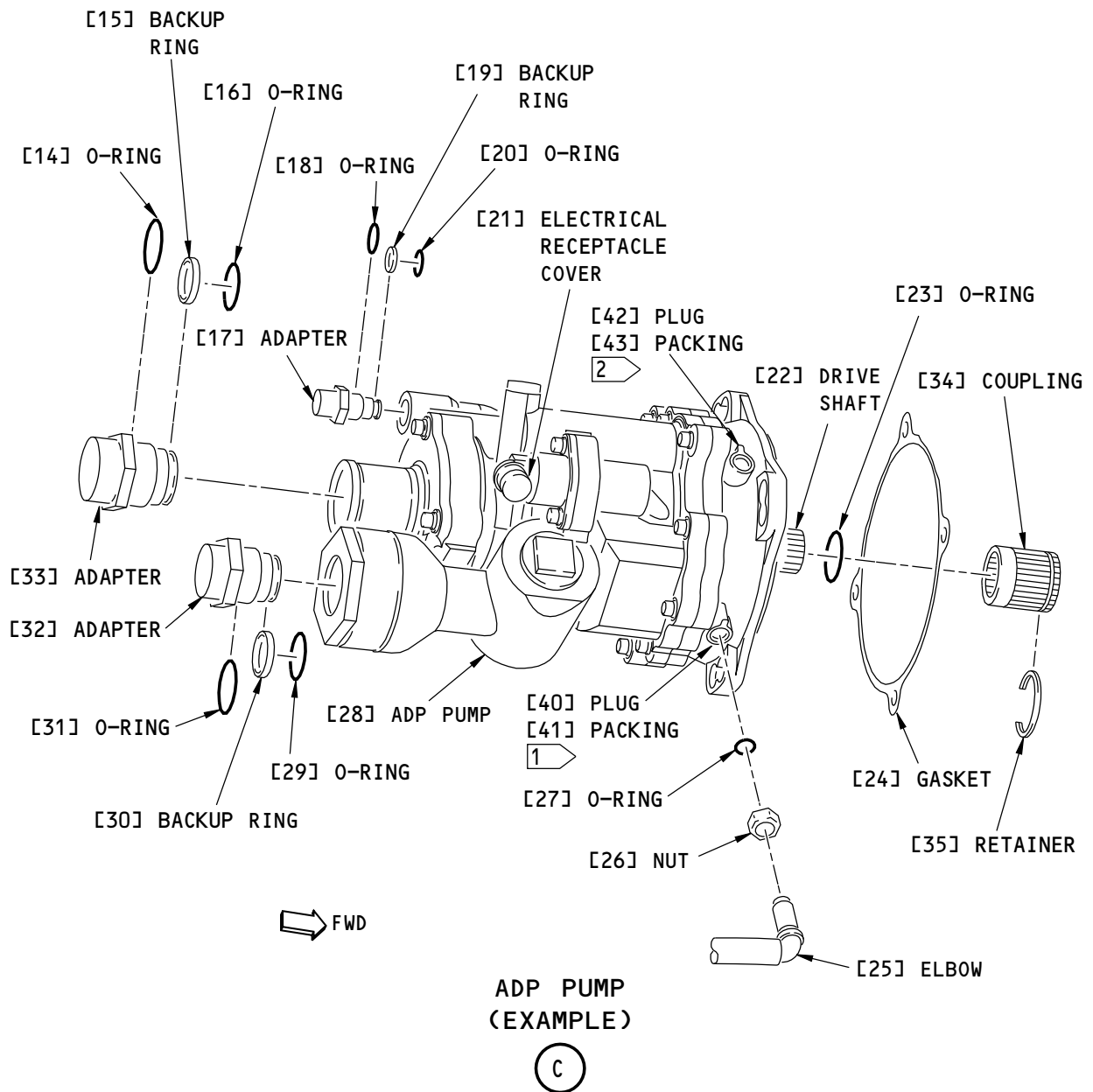
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- 1 REMOVE SHIPPING PLUG AND PACKING TO CONNECT ELBOW TO ADP PORT.
- 2 DO NOT REMOVE SHIPPING PLUG AND PACKING FROM THIS ADP PORT.

C19109 S0006415969_V2

**Turbine Gearbox Assembly (TGA) Installation
Figure 402/29-11-12-990-802 (Sheet 3 of 3)**

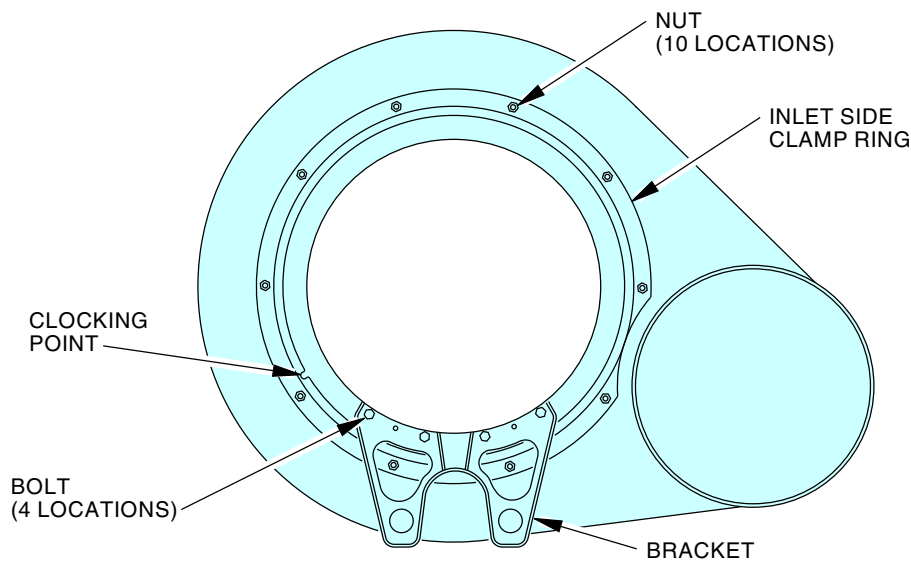
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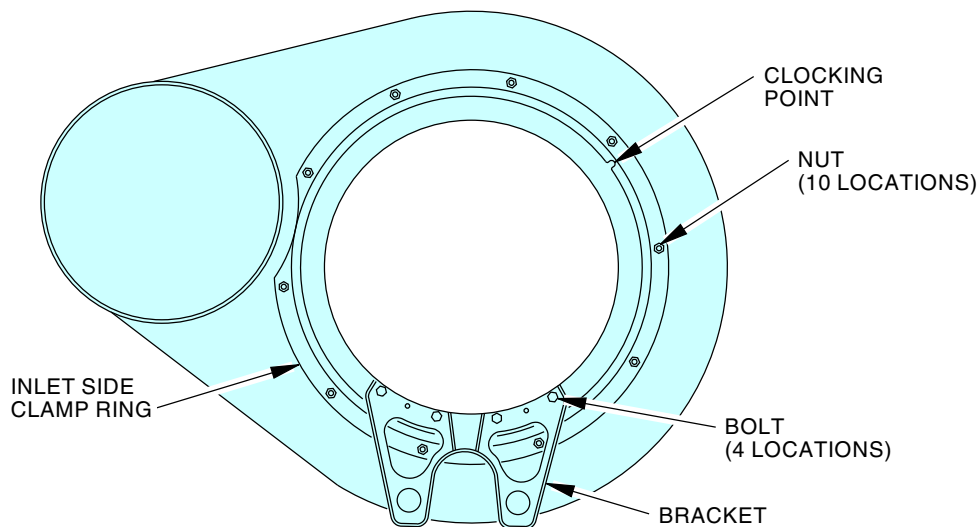
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**EXHAUST COLLECTOR INSTALLATION
FOR THE UPPER ADU POSITION C2
(INLET SIDE IS SHOWN, PUMP SIDE IS EQUIVALENT)**



**EXHAUST COLLECTOR INSTALLATION
FOR THE LOWER ADU POSITION C1**

W49118 S0000125076_V2

Turbine Gearbox Assembly (TGA) Installation
Figure 403/29-11-12-990-803

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TASK 29-11-12-400-801

3. Turbine Gearbox Assembly (TGA) Installation

A. References

Reference	Title
29-11-10-400-801	Air-Driven Pump (ADP) Assembly Installation (P/B 401)
29-11-18-400-801	Air-Driven Pump (ADP) Heater Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)

C. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

D. Prepare for the Installation

SUBTASK 29-11-12-420-001

- (1) If necessary, do these steps to clock the TGA exhaust collector: Figure 403
 - (a) Loosen the 15 nuts on the pump side clamp ring.
 - (b) Loosen the 10 nuts on the inlet side clamp ring.
 - (c) Remove the 4 bolts that hold the bracket to the TGA.
 - (d) Turn the exhaust collector to the correct position for the applicable ADU installation (C1 or C2).

NOTE: The notch in the exhaust collector will be aligned with a hole in the TGA housing when the exhaust collector is in the correct position.
 - (e) Tighten the 25 fasteners that hold the clamp rings to 25-30 in-lb.
 - (f) Reinstall the 4 bolts that hold the bracket to the TGA.
 - (g) Tighten the 4 bolts to 25-30 in-lb.

E. Install the Air-Driven Pump (ADP)

Figure 402

SUBTASK 29-11-12-640-001

- (1) Lubricate the new O-ring [23] with oil, D00068.

SUBTASK 29-11-12-420-002



MAKE SURE THAT YOU DO NOT CAUSE DAMAGE TO THE NEW PACKING WHEN YOU INSTALL IT.

- (2) Install the new O-ring [23] in the spline groove on the drive shaft [22] of the Pump assembly [28].

NOTE: Do not put grease on the drive shaft of the pump, the oil in the turbine gearbox assembly lubricates the drive shaft spline. The O-ring must be properly installed to prevent leakage of oil from the TGA.

SUBTASK 29-11-12-210-001

- (3) Make sure the seal drain port on the Pump assembly [28] is clear.

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- (a) If necessary, clean the seal drain port in the Pump assembly [28], and the seal drain hose [9].

SUBTASK 29-11-12-210-002

- (4) Make sure the Gasket [24] is in good condition.
 - (a) If it is necessary, install a new Gasket [24] on the TGA.

SUBTASK 29-11-12-210-003

- (5) Make sure the coupling [34] is in its position in the TGA.
NOTE: If the coupling is not installed, the TGA cannot operate the pump.

SUBTASK 29-11-12-420-003

- (6) Put the Pump assembly [28] on the TGA and carefully engage the drive shaft [22] with the coupling [34].
NOTE: Before you put the pump on the TGA, put it in the correct position to align the ports on the pump with the hydraulic hoses Figure 402.
 - (a) Turn the Pump assembly [28] to let the nuts [7] go through the larger ends of the slots on the Pump assembly [28].
 - (b) Turn the Pump assembly [28] counterclockwise (when you look at the forward end of the pump) until the small ends of the slots on the Pump assembly [28] are tightly against the studs on the TGA.
 - (c) Tighten the nuts [7] to 260-320 pound-inches.

F. Install the Modulating Shutoff Valve (MSOV)

Figure 401

SUBTASK 29-11-12-420-004

- (1) Do these steps to install the MSOV on the TGA.
 - (a) Put the Packing [13] in the recess in the TGA.
 - (b) Put the Packing [9] in the recess in the Valve [11].
 - (c) Put the Valve [11] and the noise isolator [8] in their position on the TGA.
 - (d) Turn the Valve [11] to align the key on the Valve [11] with the keyway on the TGA.
 - (e) Install the coupling [12] to hold the valve to the TGA.

SUBTASK 29-11-12-420-006

- (2) Do these steps to connect the air tubes to the Valve [11]:
 - (a) Remove protective caps from the tubes of the Air Turbine Gearbox.
 - (b) Remove the caps from the ports of the Air Turbine Gearbox.
 - (c) Connect the air tube [5] to the Valve [11].
 - (d) Connect the air tube [6] to the union [4] on the air tube [3].
 - 1) Install the bolt [20], the clamp [21] and the nut [22].
 - (e) Connect the air tube [10] to the TGA and to the Valve [11].

SUBTASK 29-11-12-420-007

- (3) Connect the heater cartridge to the TGA servo valve.
 - (a) Put the heater cartridge in its position.
 - (b) Install the screw [23] and the washer [24].

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SUBTASK 29-11-12-420-008

- (4) Connect the heater cartridge to the secondary manifold.
 - (a) Put the heater cartridge in its position.
 - (b) Install the screw [25] and the washer [26].

SUBTASK 29-11-12-420-009

- (5) Install the ADP heater. To install it, do this task: Air-Driven Pump (ADP) Heater Installation, TASK 29-11-18-400-801.

SUBTASK 29-11-12-420-010

- (6) Install the ADP assembly. To install it, do this task: Air-Driven Pump (ADP) Assembly Installation, TASK 29-11-10-400-801

———— **END OF TASK** ————

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AIR-DRIVEN PUMP (ADP) MODULATING SHUTOFF VALVE (MSOV) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the modulating shutoff valve (MSOV) for the air-driven pump (ADP) (referred to as the shutoff valve in this procedure)
 - (2) An installation of the shutoff valve.
- B. There is one shutoff valve on each air-driven pump (ADP) assembly. There are two air-driven pump (ADP) assemblies in the aft left wing-to-body fairing. You can use this procedure to remove and install the shutoff valve on each of these ADP assemblies.

TASK 29-11-14-000-801

2. Air-Driven Pump (ADP) Modulating Shutoff Valve (MSOV) Removal

(Figure 401)

A. References

Reference	Title
29-11-18-000-801	Air-Driven Pump (ADP) Heater Removal (P/B 401)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. Prepare for the Removal

SUBTASK 29-11-14-860-001

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

Right Power Management Panel, P210

Row	Col	Number	Name
A	7	C29401	ADP 1 HTR PWR
A	8	C29402	ADP 2 HTR PWR
G	10	C29623	ADP 1 HTR CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-14-860-002

- (2) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

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SUBTASK 29-11-14-040-001



CAUTION

DO NOT OPERATE THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN. THIS CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (3) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-14-010-001

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

E. Air-Driven Pump (ADP) Modulating Shutoff Valve (MSOV) Removal

SUBTASK 29-11-14-020-012

- (1) Remove the ADP heater. To remove it, do this task: Air-Driven Pump (ADP) Heater Removal, TASK 29-11-18-000-801.

SUBTASK 29-11-14-020-001

- (2) Disconnect electrical connector [2] and electrical connector [19] from the valve [11].

- (a) Remove the (2) flange retention screws and washers from connector bracket.

NOTE: Backshell and bracket are one assembly and should not be disassembled.

SUBTASK 29-11-14-020-002

- (3) Install a cap on electrical connector [2] and electrical connector [19] to prevent contamination and damage.

SUBTASK 29-11-14-020-010

- (4) Disconnect the heater cartridge from the servo valve.

- (a) Remove the screw [23] and the washer [24].

SUBTASK 29-11-14-020-011

- (5) Disconnect the heater cartridge from the secondary manifold.

- (a) Remove the screw [25] and the washer [26].

SUBTASK 29-11-14-020-003

- (6) Do these steps to disconnect the bonding jumper [14]:

- (a) Remove the nut [17] which attaches the bonding jumper [14] to the stud [16] on the solenoid [15] of the valve [11].

- (b) Remove the bonding jumper [14] from the stud [16] on the solenoid [15] of the valve [11].

SUBTASK 29-11-14-020-004

- (7) Do these steps to disconnect the air tubes from the valve [11].

- (a) Disconnect the air tube [5] from the valve [11].

- (b) Disconnect the air tube [6] from the valve [11] and the union [4] on the air tube [3].

- 1) Remove the bolt [20] and the nut [22] from the clamp [21].

- 2) Remove and discard the packing between the air tube [6] and the valve [11].

- (c) Disconnect the air tube [10] from the valve [11] and the air-driven pump (ADP) assembly.

SUBTASK 29-11-14-020-005

- (8) Disconnect the coupling [12] which holds the valve [11] to the air-driven pump (ADP) assembly.

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SUBTASK 29-11-14-020-006

- (9) Disconnect the coupling [7] which holds the valve [11] to the noise isolator assembly [8].

SUBTASK 29-11-14-020-007

- (10) Remove the valve [11] from the air-driven pump (ADP) assembly.

SUBTASK 29-11-14-020-008

- (11) Remove the packing [13] from the recess in the air-driven pump (ADP) assembly.

SUBTASK 29-11-14-020-009

- (12) Remove the packing [9] from the recess in the valve [11].

————— **END OF TASK** —————

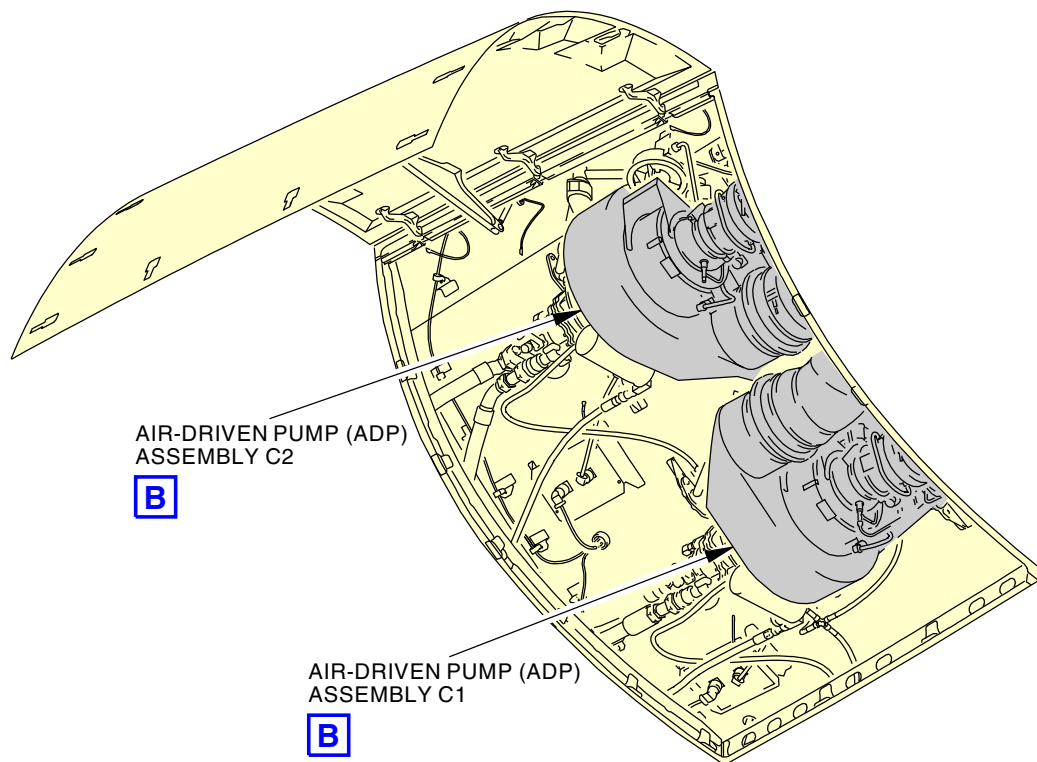
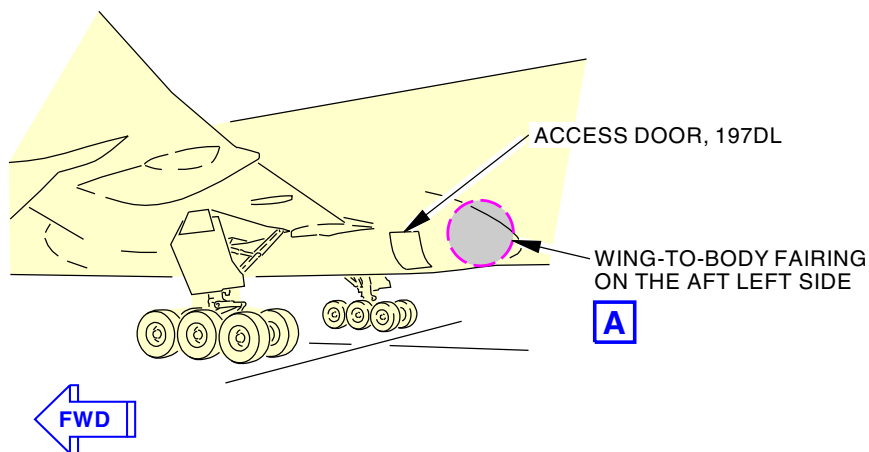
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**COMPONENTS BEHIND THE WING-TO-BODY FAIRING
ON THE AFT LEFT SIDE**

A



C17193 S0006415975_V2

Air Drive Unit (ADU) Modulating Shutoff Valve Installation Figure 401/29-11-14-990-801 (Sheet 1 of 4)

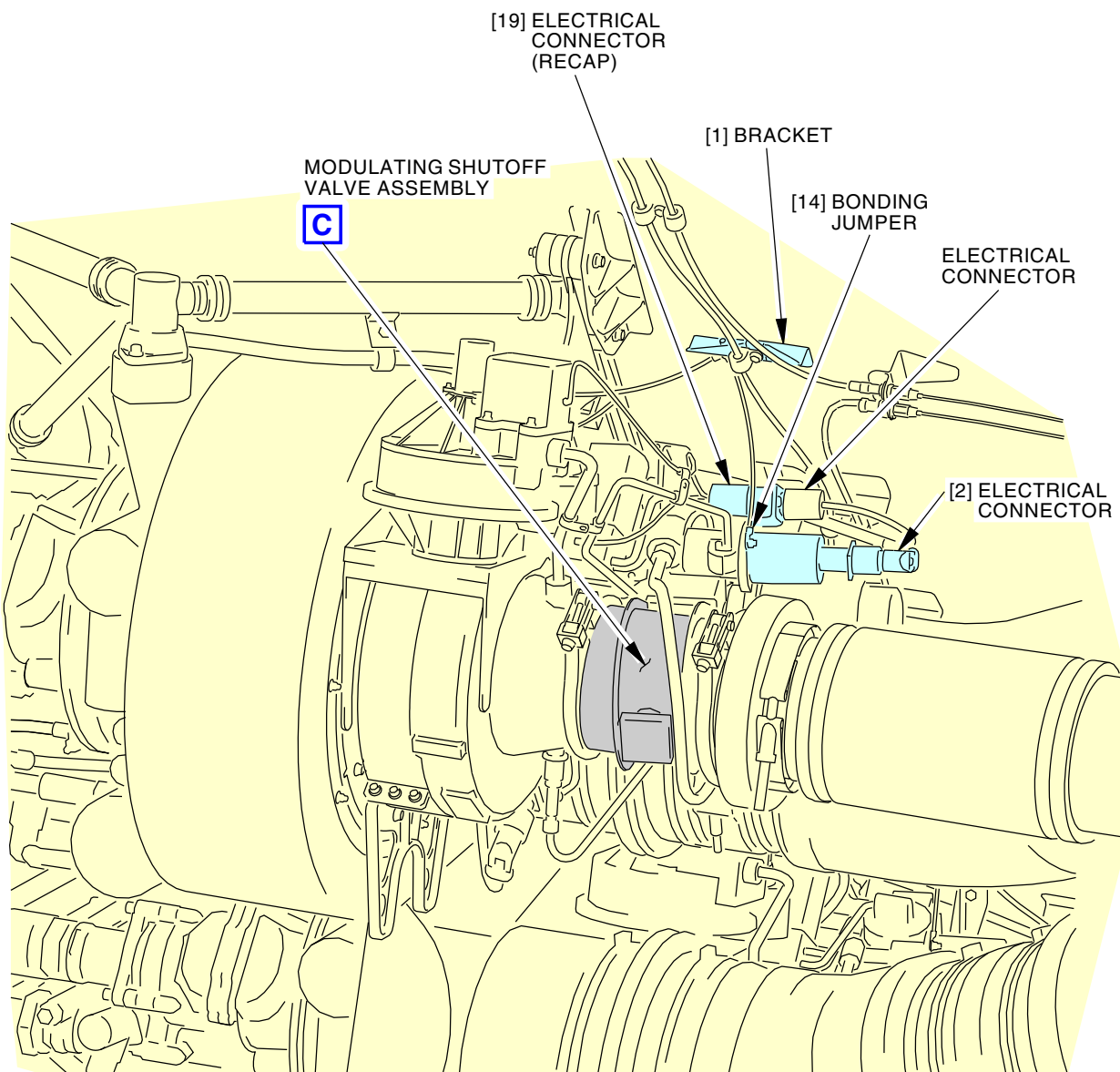
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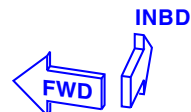
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**AIR-DRIVEN PUMP (ADP) ASSEMBLY C2
(AIR-DRIVEN PUMP (ADP) ASSEMBLY C1 IS EQUIVALENT)**

B



C18690 S0006415976_V4

**Air Drive Unit (ADU) Modulating Shutoff Valve Installation
Figure 401/29-11-14-990-801 (Sheet 2 of 4)**

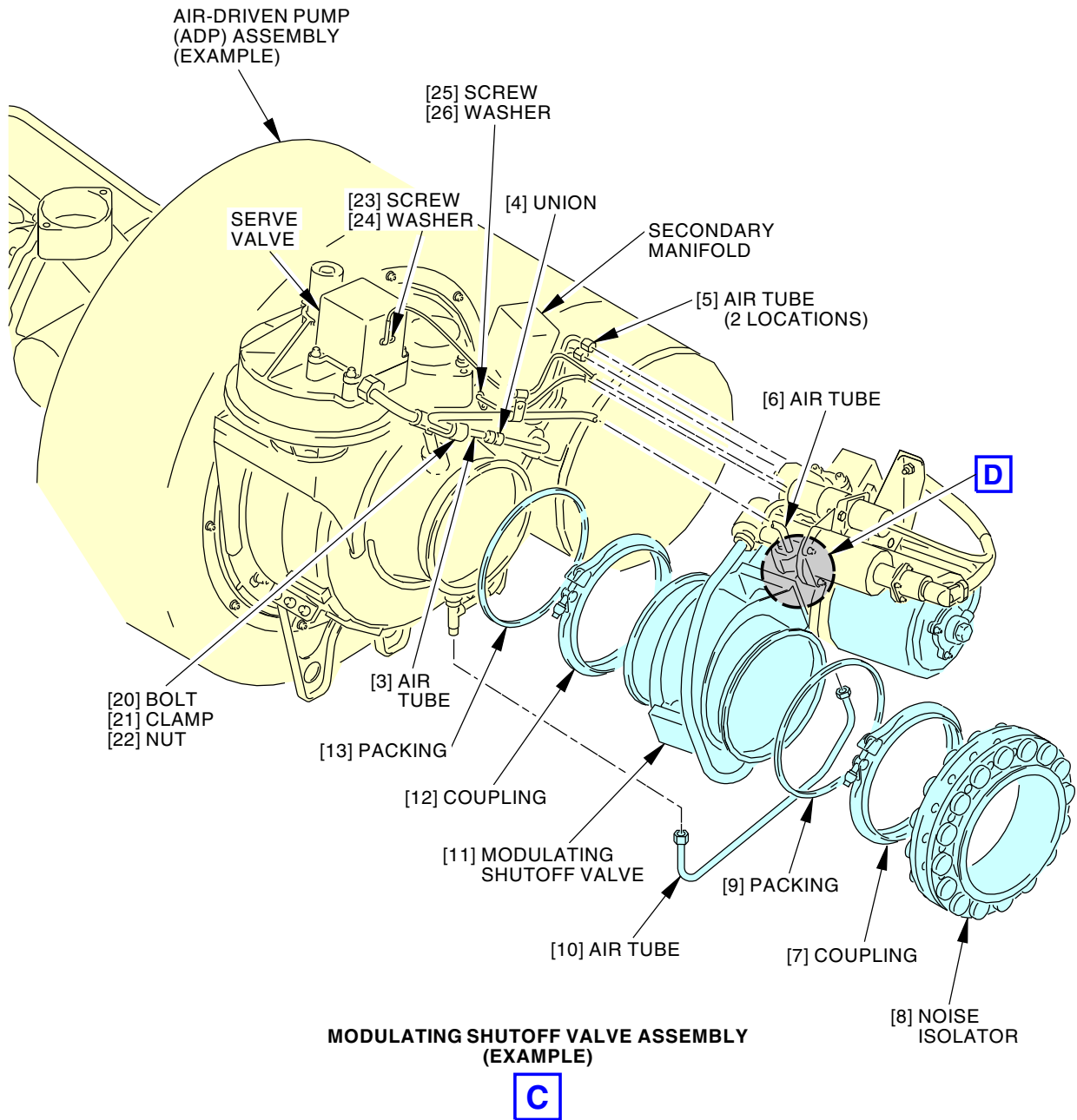
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E44940 S0006415977_V4

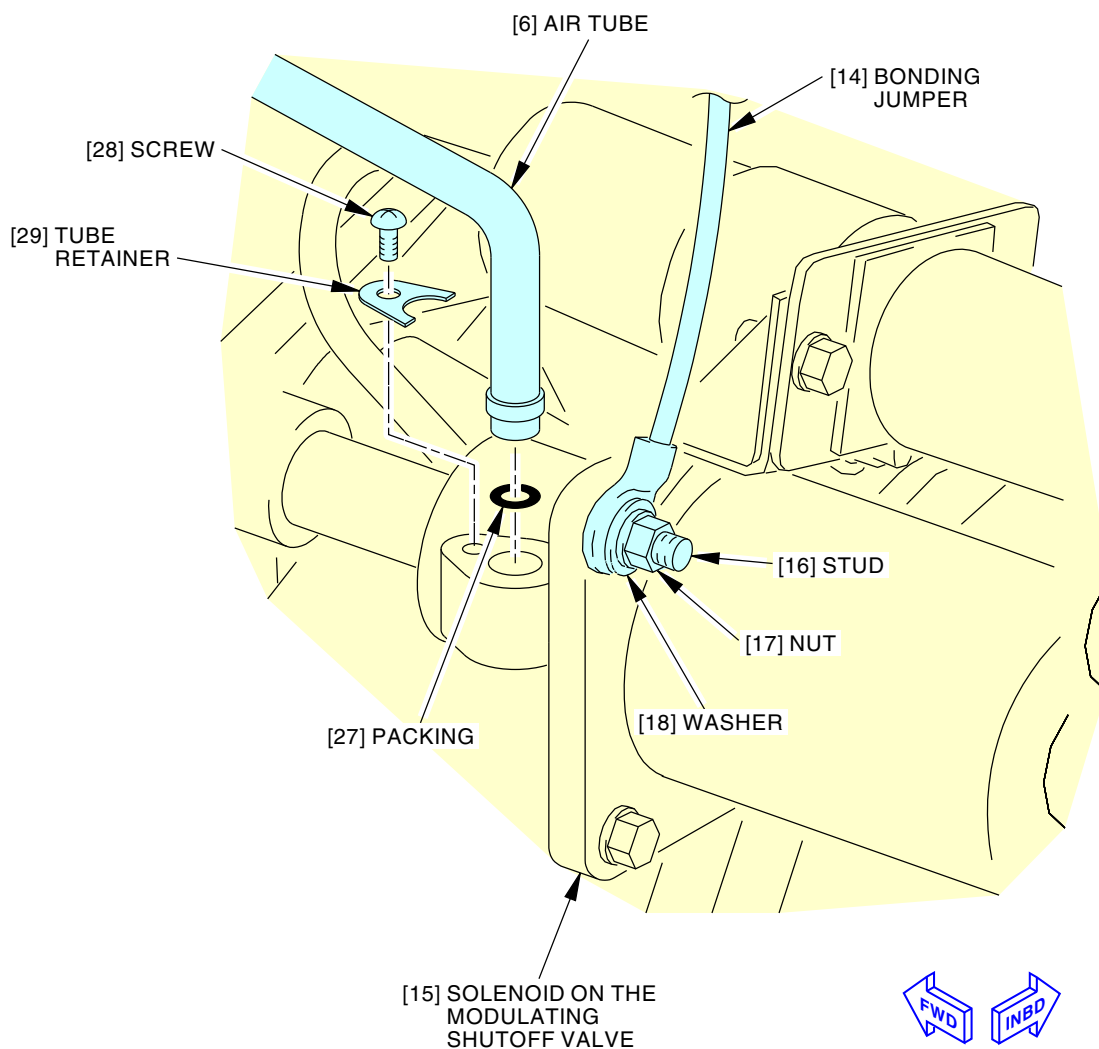
**Air Drive Unit (ADU) Modulating Shutoff Valve Installation
Figure 401/29-11-14-990-801 (Sheet 3 of 4)**

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D

E50135 S0006415978_V3

**Air Drive Unit (ADU) Modulating Shutoff Valve Installation
Figure 401/29-11-14-990-801 (Sheet 4 of 4)**

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TASK 29-11-14-400-801

3. Air-Driven Pump (ADP) Modulating Shutoff Valve (MSOV) Installation

(Figure 401)

A. General

- (1) This task has an installation test for the air-driven pump (ADP) assembly. This test makes sure the air-driven pump (ADP) assembly (C1) or (C2) and the related indication operates correctly. This includes a test of the overspeed protection, the secondary speed control, the reserve power, the AUTO/ON control, and the pressure and temperature indications. This test also resets an ADP C1 or C2 overspeed condition.
- (2) A maintenance access terminal is necessary for the installation test 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
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-18-400-801	Air-Driven Pump (ADP) Heater Installation (P/B 401)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Packing	29-11-10-50-035	ARO ALL
11	Valve	29-11-14-01-050	ARO ALL
12	Coupling	29-11-10-50-120	ARO ALL
13	Packing	29-11-10-50-125	ARO ALL

E. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

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F. Access Panels

Number	Name/Location

197JL	Air Driven Pump (ADP) Access Door

G. Air-Driven Pump (ADP) Modulating Shutoff Valve (MSOV) Installation

SUBTASK 29-11-14-420-001

- (1) Put the packing [13] in the recess in the air-driven pump (ADP) assembly.

SUBTASK 29-11-14-420-002

- (2) Put the packing [9] in the recess in the valve [11].

SUBTASK 29-11-14-420-003

- (3) Put the valve [11] in its position between the air-driven pump (ADP) assembly and the noise isolator assembly [8].

SUBTASK 29-11-14-420-004

- (4) Turn the valve [11] to align the key on the valve [11] with the keyway on the air-driven pump (ADP) assembly.

SUBTASK 29-11-14-420-005

- (5) Install the coupling [12].

NOTE: This will hold the valve [11] to the air-driven (ADP) pump assembly.

SUBTASK 29-11-14-420-006

- (6) Install the coupling [7].

NOTE: This will hold the valve [11] to the noise isolator assembly [8].

SUBTASK 29-11-14-420-007

- (7) Do these steps to connect the air tubes to the valve [11]:

- (a) Connect the air tubes [5] to the valve [11].
- (b) Connect the union [4] on the air tube [3].
- (c) Connect the air tube [6] to the valve [11] with screw [28] and tube retainer [29].
 - 1) Install the new packing [27] between the air tube [6] and the valve [11].

NOTE: You can use water to lubricate the new packing.
 - 2) Install the bolt [20], clamp [21], and nut [22].
- (d) Connect the air tube [10] to the air-driven pump (ADP) and the valve [11].

SUBTASK 29-11-14-420-011

- (8) Connect the heater cartridge to the servo valve.

- (a) Put the heater cartridge in its position.
- (b) Install the screw [23] and the washer [24].

SUBTASK 29-11-14-420-012

- (9) Connect the heater cartridge to the secondary manifold.

- (a) Put the heater cartridge in its position.
- (b) Install the screw [25] and the washer [26].

SUBTASK 29-11-14-420-008

- (10) Remove the cap from electrical connector [2] and electrical connector [19].

SUBTASK 29-11-14-420-009

- (11) Connect electrical connector [2] and electrical connector [19] to the valve [11].

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- (a) Install (2) flange retention screws and washers into connector bracket.

SUBTASK 29-11-14-420-010

- (12) Do these steps to install the bonding jumper [14] (SWPM 20-20-00).
 - (a) Put the bonding jumper [14] on the stud [16] on the solenoid [15] of the valve [11].
 - (b) Install the washer [18] and the nut [17] on the stud [16] on the solenoid [15] of the valve [11].
 - (c) With the intrinsically safe approved bonding meter, COM-1550, make sure the resistance across the bonding jumper [14] is not more than 0.008 ohms. (SWPM 20-20-00).
 - (d) If the resistance is more than 0.008 ohms, do one of these steps to clean the mating surfaces between the bonding jumper [14] and the solenoid [15] of the valve [11] or the bracket [1] on the airplane structure:
 - 1) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
 - 2) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.
 - 3) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.

SUBTASK 29-11-14-410-001

- (13) Install the ADP heater. To install it, do this task: Air-Driven Pump (ADP) Heater Installation, TASK 29-11-18-400-801.

H. Air-Driven Pump (ADP) Modulating Shutoff Valve (MSOV) Installation Test

NOTE: The same sequence of steps is used for the air-driven pump (ADP) assembly C1 or C2.

SUBTASK 29-11-14-710-001

- (1) Installation Test
 - (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.
 - (b) 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>
A	7	C29401	ADP 1 HTR PWR
A	8	C29402	ADP 2 HTR PWR
G	10	C29623	ADP 1 HTR CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

- (c) Use a maintenance access terminal (MAT) to do the operational test of the air-driven pump (ADP) assembly (C1, C2):

NOTE: Use an engine or the ground service cart to pressurize the pneumatic system.
The APU does not provide the air flow necessary for the ADP test.

- 1) Make these selections on the MAT:
 - a) ONBOARD MAINTENANCE
 - b) LINE MAINTENANCE
 - c) GROUND TESTS
 - d) 29 Hydraulic Power

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- e) OPERATIONAL TESTS
- f) Air Driven Pump (ADP) (C1, C2)
- 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-14-860-003

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-14-080-001

- (2) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

———— **END OF TASK** ————

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AIR-DRIVEN PUMP (ADP) LOGIC SPEED CONTROL UNIT (LSCU) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the air-driven pump (ADP) logic speed control unit (LSCU) (referred to as the unit [3] in this procedure)
 - (2) An installation of the unit [3].
- B. There is one unit [3] for each of the two ADPs in the center hydraulic system. You can use this procedure to remove and install each of the units [3].

TASK 29-11-15-000-801

2. Air-Driven Pump (ADP) Logic Speed Control Unit (LSCU) Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. Location Zones

<u>Zone</u>	<u>Area</u>
197	Aft Wing-to-Body Fairings, Left

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

C. Prepare for the Removal

SUBTASK 29-11-15-860-001

- (1) 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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-15-860-002

- (2) For the logic speed control unit (LSCU) [3] (referred to as the unit [3] in this procedure) for the air-driven pump (ADP) C1 [2], do this step:
- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM C.R. card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-11-15-860-003

- (3) For the unit [3] for the ADP C2 [1], do this step:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C.L. card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-11-15-040-001



CAUTION

OPERATING THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (4) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-15-010-001

- (5) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

D. Air-Driven Pump (ADP) Logic Speed Control Unit (LSCU) Removal

SUBTASK 29-11-15-020-001

- (1) Disconnect the electrical connectors [9] and [10] from the unit [3].

SUBTASK 29-11-15-020-002

- (2) Remove the nut [4] and the bonding jumper [6] from the grounding stud [8].

SUBTASK 29-11-15-020-003

- (3) Hold the unit [3] in its position.

SUBTASK 29-11-15-020-004

- (4) Remove the bolts [11] which attach the unit [3] to the brackets [7].

SUBTASK 29-11-15-020-005

- (5) Remove the unit [3] from the brackets [7].

————— **END OF TASK** —————

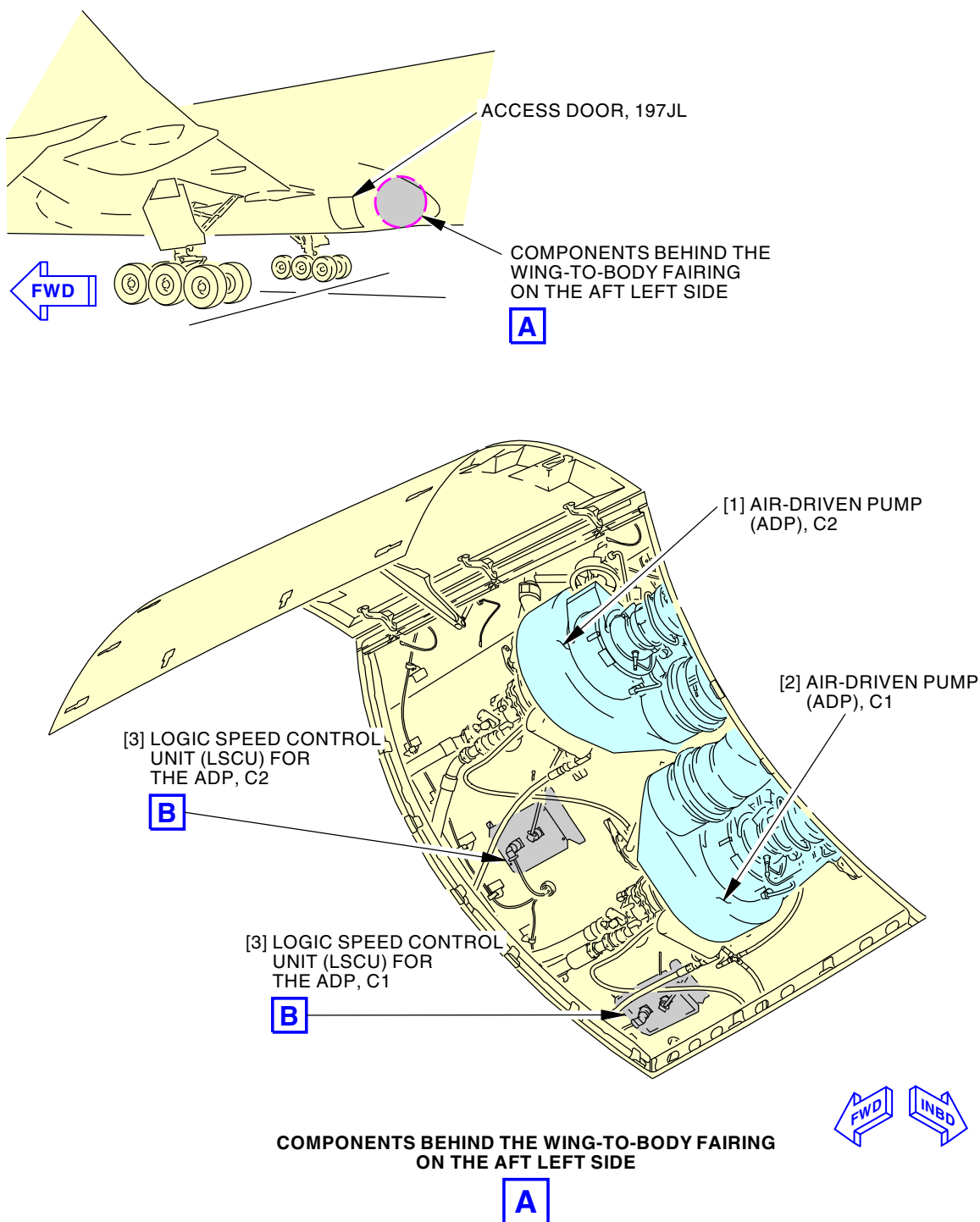
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C17205 S0006415983_V2

Logic Speed Control Unit (LSCU) Installation
Figure 401/29-11-15-990-801 (Sheet 1 of 2)

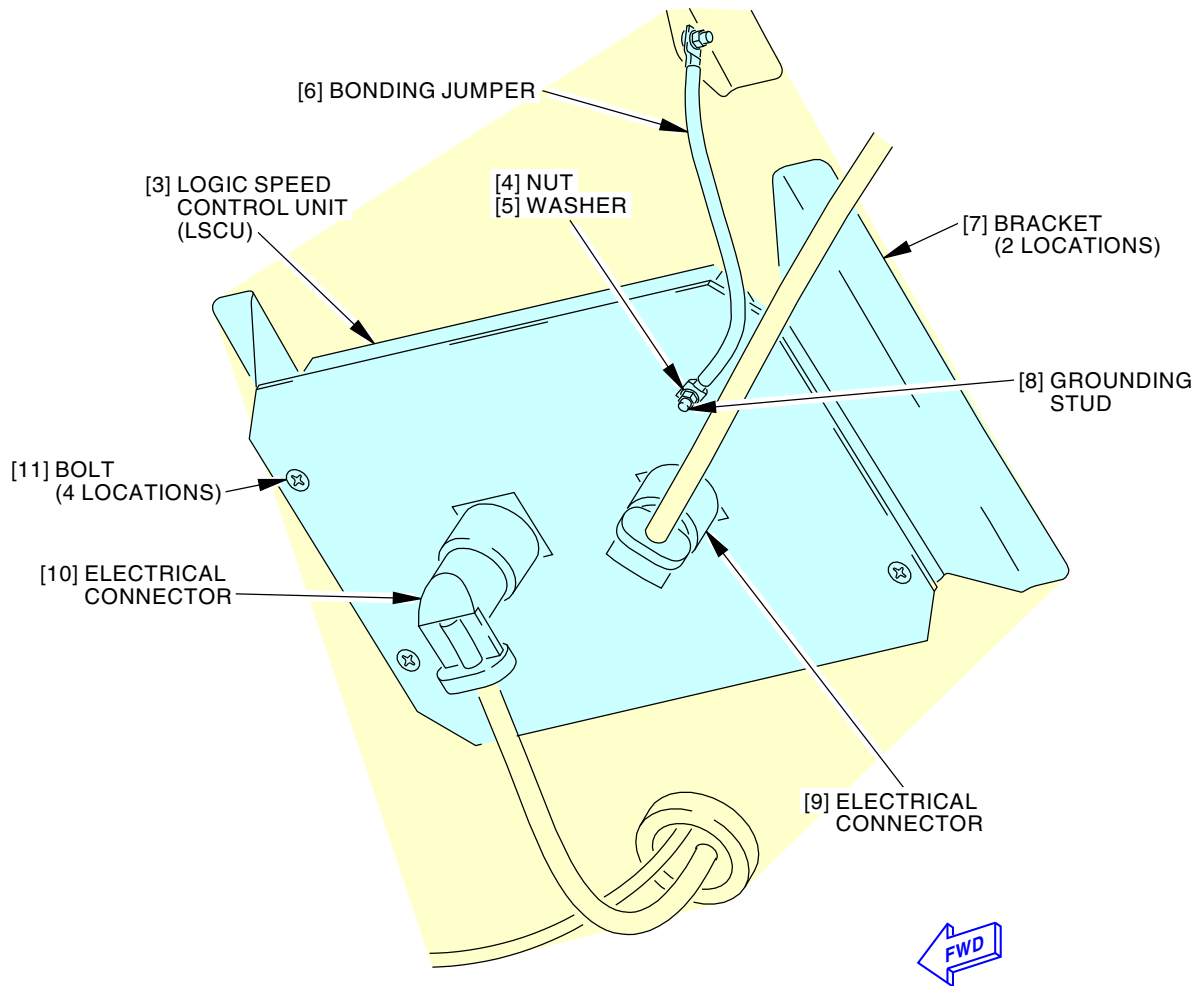
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LOGIC SPEED CONTROL UNIT (LSCU)
(EXAMPLE)

B

C18887 S0006415984_V2

Logic Speed Control Unit (LSCU) Installation
Figure 401/29-11-15-990-801 (Sheet 2 of 2)

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TASK 29-11-15-400-801

3. Air-Driven Pump (ADP) Logic Speed Control Unit (LSCU) Installation (Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) 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
24-22-00-860-805	Supply Electrical Power (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Unit	29-11-15-01-030	ARO ALL

E. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

F. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

G. Air-Driven Pump (ADP) Logic Speed Control Unit (LSCU) Installation

SUBTASK 29-11-15-420-001

- (1) Hold the logic speed control unit (LSCU) [3] (referred to as the unit [3] in this procedure) on the brackets [7].

SUBTASK 29-11-15-420-002

- (2) Install the bolts [11] to attach the unit [3] to the brackets [7].

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SUBTASK 29-11-15-420-003

- (3) Install the bonding jumper [6], the washer [5], and the nut [4] on the grounding stud [8] (SWPM 20-20-00).
 - (a) With the intrinsically safe approved bonding meter, COM-1550, make sure the maximum resistance across the bonding jumper [6] is 0.008 ohms (SWPM 20-20-00).

SUBTASK 29-11-15-420-004

- (4) Connect the electrical connectors [9] and [10] to the unit [3].

SUBTASK 29-11-15-410-001

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-15-080-001

- (6) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

H. Air-Driven Pump (ADP) Logic Speed Control Unit (LSCU) Installation Test

SUBTASK 29-11-15-860-004

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

SUBTASK 29-11-15-860-005

- (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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-15-860-006

- (3) For the unit [3] for the air-driven pump (ADP) C1 [2], do this step:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM C.R. card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-11-15-860-007

- (4) For the unit [3] for the air-driven pump (ADP) C2 [1], do this step:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C.L. card to the On position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-15-710-001

- (5) Use a maintenance access terminal (MAT) to do an operational test of the applicable unit [3].

NOTE: Use an engine or the ground service cart to pressurize the pneumatic system. The APU does not provide the air flow necessary for the ADP test.

 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic Power
 - 5) OPERATIONAL TEST

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- 6) Make a selection on the MAT of one of the applicable operational tests which follow:
 - a) Air Driven Pump (ADP) (C1, C2)
- 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

———— **END OF TASK** ————

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AIR-DRIVEN PUMP (ADP) INLET DUCT - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the air-driven pump (ADP) inlet duct (referred to as the duct assy in this procedure) and the adjacent pneumatic duct.
 - (2) An installation of the duct assy and the adjacent pneumatic duct.
- B. There are two air-driven pumps in the wing-to-body fairing on the aft left side. You can use this procedure to remove and install the short piece of the duct assy which is adjacent to each air-driven pump. The removal of the short piece of the duct assy will give access to some components of the air-driven pump.

TASK 29-11-16-000-801

2. Air-Driven Pump (ADP) Inlet Duct Removal

(Figure 401)

A. **General**

- (1) This procedure will give all of the data necessary to remove and install a duct section. Do only the steps that are necessary to remove the applicable section of the duct.

B. **References**

Reference	Title
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)

C. **Location Zones**

Zone	Area
197	Aft Wing-to-Body Fairings, Left

D. **Access Panels**

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

E. **Prepare for the Removal**

SUBTASK 29-11-16-860-001

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

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-16-040-001



OPERATING THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (2) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

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SUBTASK 29-11-16-010-001

(3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-16-860-002

 WARNING	YOU MUST RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT HIGH PRESSURE AIR IN THE PNEUMATIC DUCTS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

F. Air-Driven Pump (ADP) Inlet Duct Removal

NOTE: The steps that follow include all of the information that is necessary to remove all of the duct sections. You do not have to do all of the steps.

SUBTASK 29-11-16-020-004

- (1) Do these steps to remove the air-driven pump (ADP) inlet duct (referred to as the duct assembly [2] in this procedure):
 - (a) Remove the coupling [3] which attaches the duct assembly [2] to the adjacent pneumatic duct [5].
 - (b) Remove the coupling [1] which attaches the duct assembly [2] to the noise isolator [4].
 - (c) Remove the duct assembly [2].

SUBTASK 29-11-16-020-005

- (2) Do these steps to remove the pneumatic duct [5]:
 - (a) Remove the bolts [9], washers [10], and backing plates [8] from the pressure seal [6].
 - (b) Remove the bolts [11], washers [12] and nuts [13] for the duct support links [7].
 - (c) Remove the couplings [14].
 - (d) Remove the pneumatic duct [5].
 - (e) Remove the pressure seal [6] and keep for installation.

SUBTASK 29-11-16-410-002

- (3) Install covers on the openings in the duct to keep out unwanted objects.

————— **END OF TASK** —————

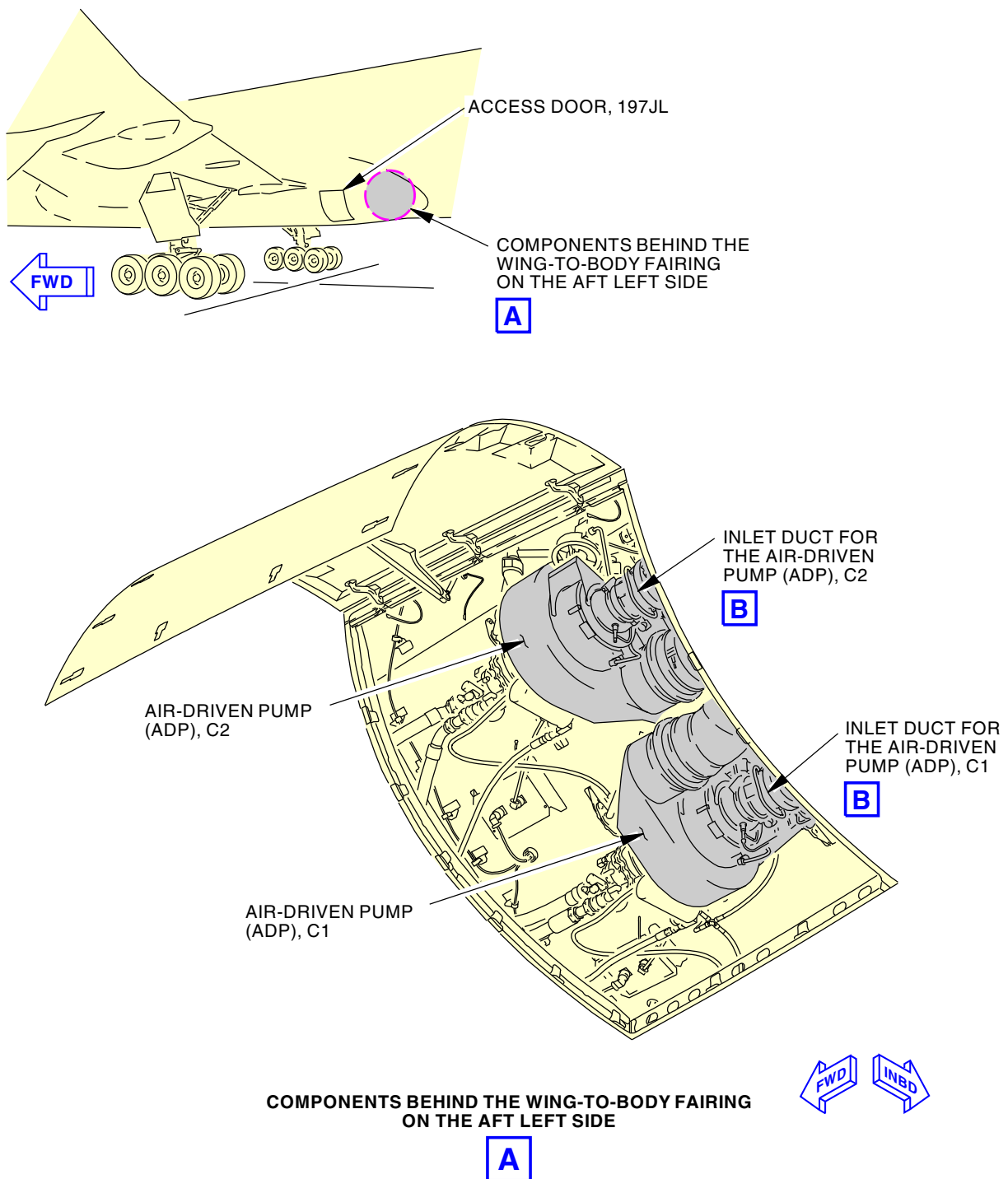
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C17213 S0006415989_V2

Air-Driven Pump (ADP) Inlet Duct
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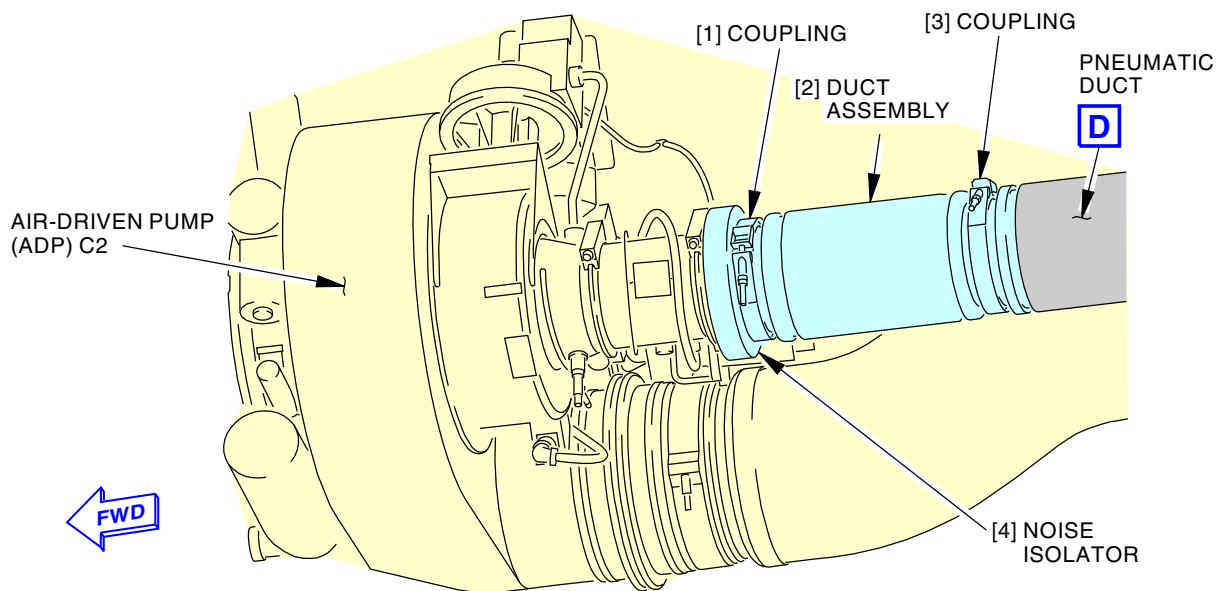
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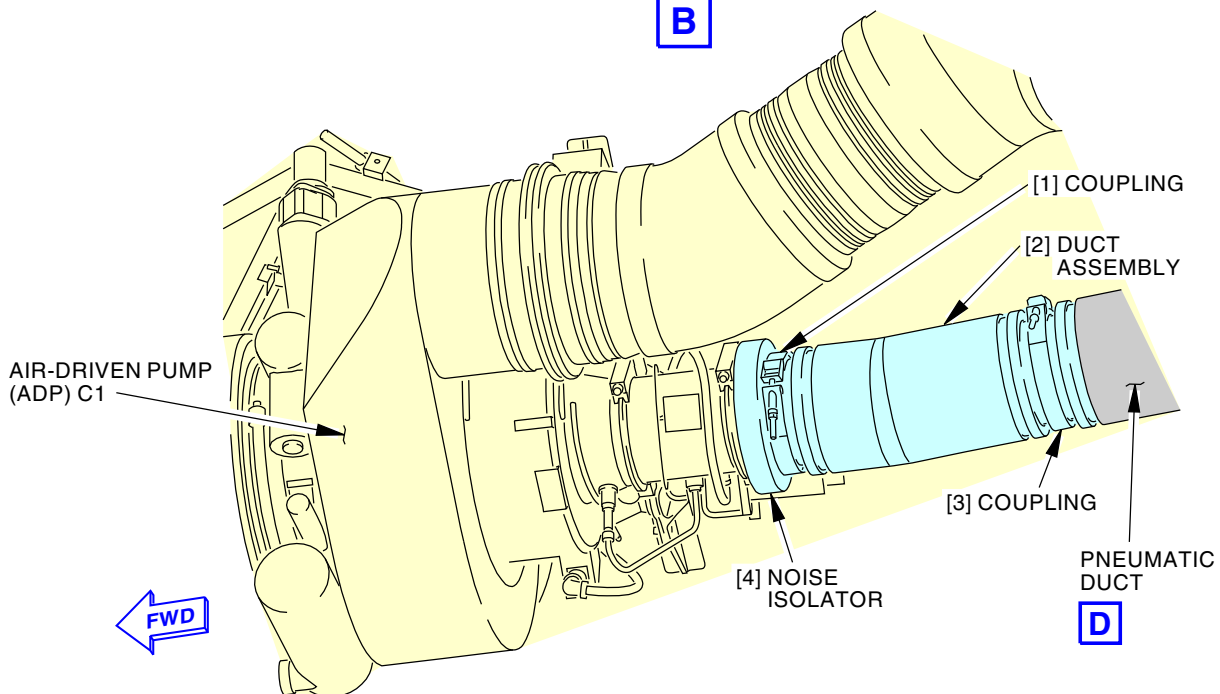
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INLET DUCT FOR THE AIR-DRIVEN PUMP (ADP) C2

B



INLET DUCT FOR THE AIR-DRIVEN PUMP (ADP) C1

C

C18727 S0006415990_V4

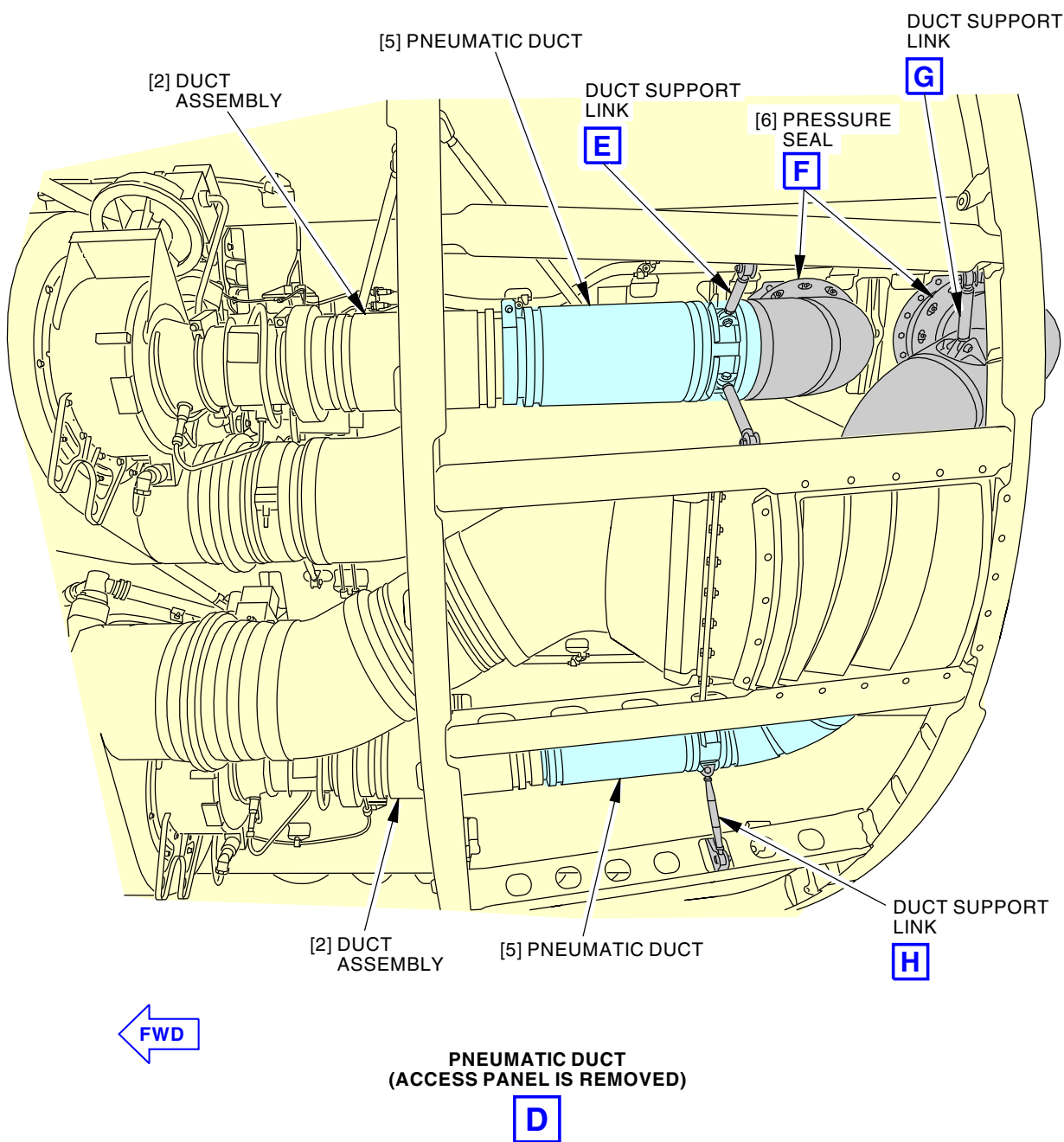
Air-Driven Pump (ADP) Inlet Duct
Figure 401/29-11-16-990-801 (Sheet 2 of 5)

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2157002 S0000472482_V3

**Air-Driven Pump (ADP) Inlet Duct
Figure 401/29-11-16-990-801 (Sheet 3 of 5)**

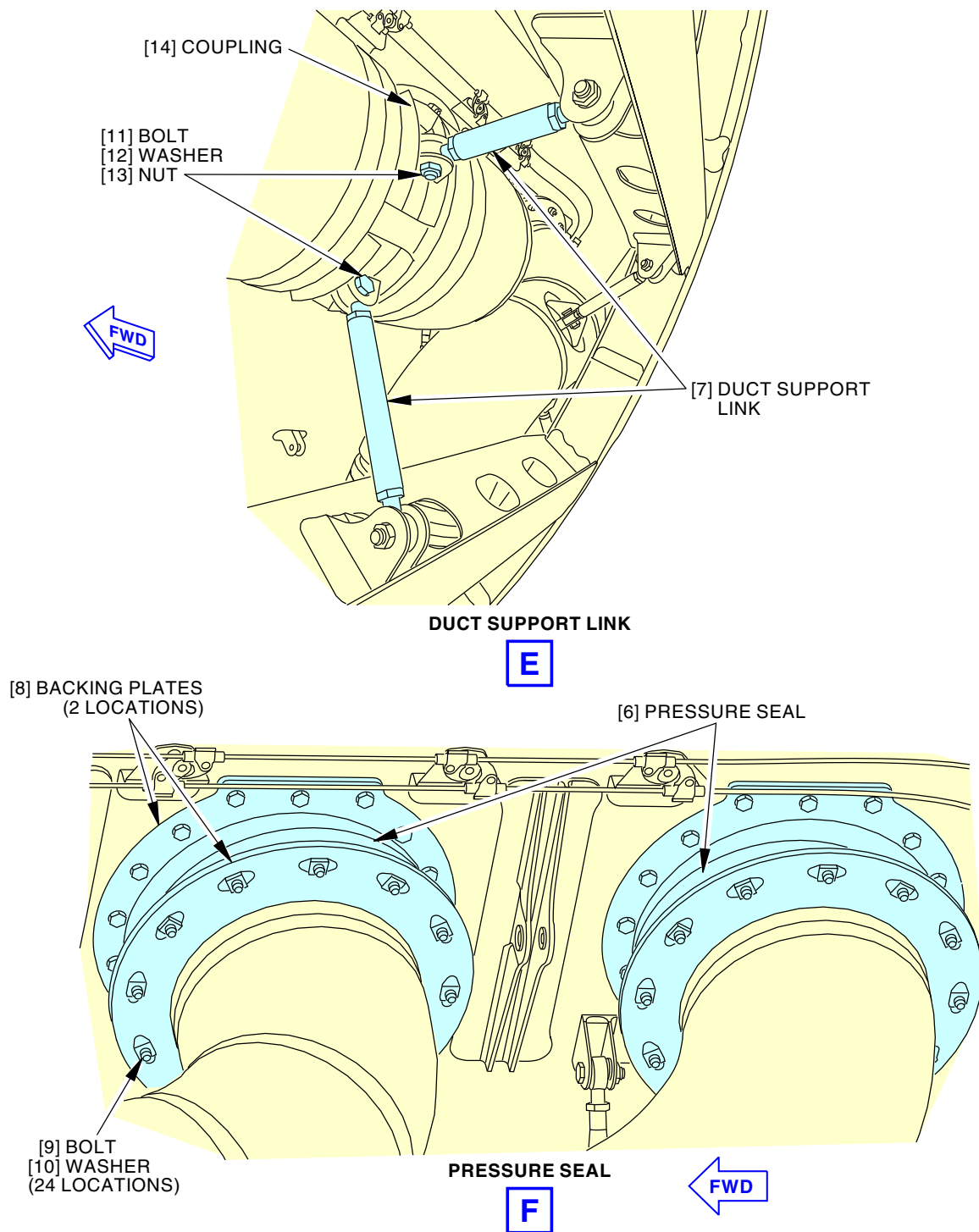
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2157867 S0000472483_V2

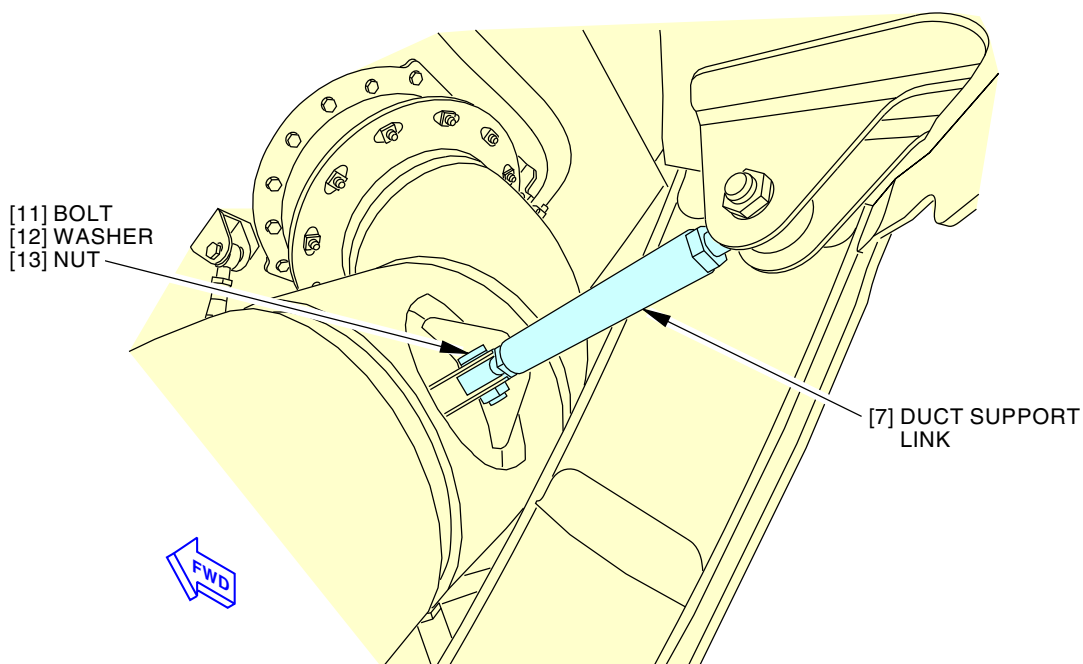
**Air-Driven Pump (ADP) Inlet Duct
Figure 401/29-11-16-990-801 (Sheet 4 of 5)**

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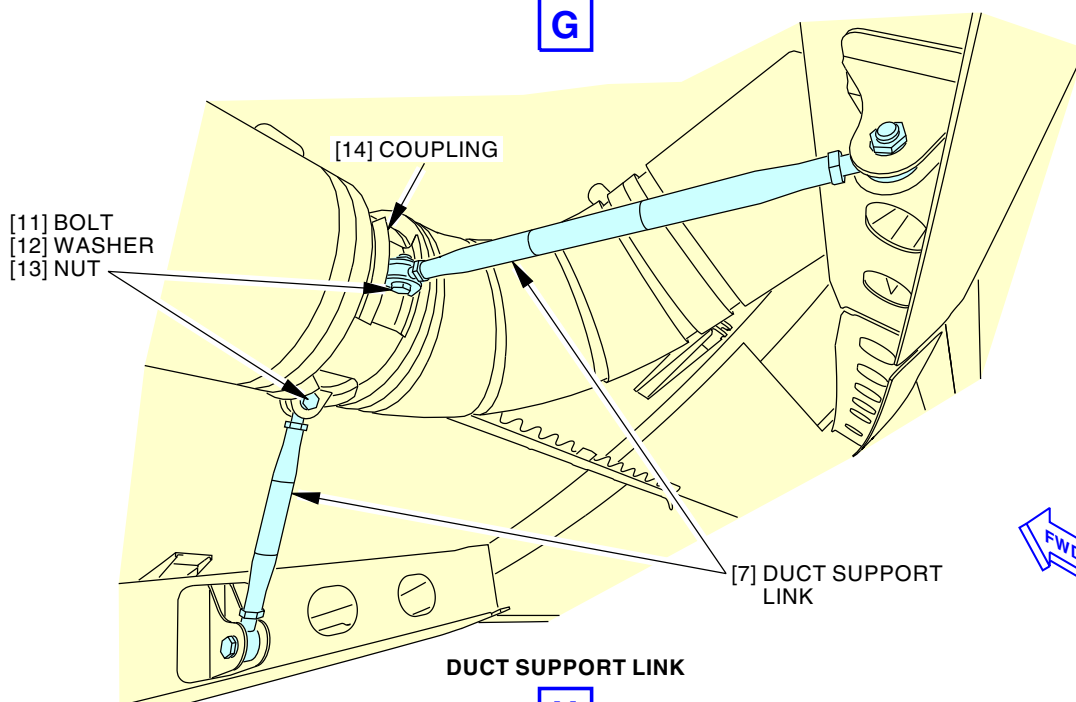
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DUCT SUPPORT LINK

G



DUCT SUPPORT LINK

H

2157876 S0000473586_V3

**Air-Driven Pump (ADP) Inlet Duct
Figure 401/29-11-16-990-801 (Sheet 5 of 5)**

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TASK 29-11-16-400-801

3. Air-Driven Pump (ADP) Inlet Duct Installation

(Figure 401)

A. References

Reference	Title
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

B. Consumable Materials

Reference	Description	Specification
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Duct assembly	29-11-16-03-485	ARO ALL
		29-11-16-03-490	ARO ALL
5	Pneumatic duct	29-11-16-03-475	ARO ALL
		29-11-16-03-480	ARO ALL

D. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

E. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

F. Air-Driven Pump (ADP) Inlet Duct Installation

NOTE: Do only the steps that are necessary to install the section of the duct that was removed.

SUBTASK 29-11-16-020-006

- (1) Remove the covers from the duct.

SUBTASK 29-11-16-420-005

- (2) Do these steps to install the pneumatic duct [5]:
 - (a) Install the pressure seal [6] on the pneumatic duct [5].
 - (b) Loosely install the pneumatic duct [5].
 - (c) Install the couplings [14] and tighten to a torque of 15 ±5 in-lb (2 ±1 N·m).
 - (d) Install the bolts [11], washers [12], and nuts [13] for the duct support links [7].
 - (e) Install the bolts [9], washers [10], and nuts [8] for the pressure seal [6].

SUBTASK 29-11-16-420-001

- (3) Do these steps to install the air-driven pump (ADP) inlet duct (referred to as the duct assembly [2] in this procedure):
 - (a) Hold the duct assembly [2] between the noise isolator [4] and the adjacent pneumatic duct [5].
 - (b) For the duct assembly [2] on the ADP C1, do this step:
 - 1) Turn the duct assembly [2] until its flanges are parallel to the flanges on the noise isolator [4] and on the adjacent pneumatic duct.

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- (c) Install the coupling [1] and coupling [3] at each end of the duct assembly [2].
- (d) Tighten the coupling [1] and coupling [3] to 50-60 pound-inches.

G. Air-Driven Pump (ADP) Inlet Duct Installation Test

SUBTASK 29-11-16-860-003

- (1) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-16-790-002

- (2) Apply Snoop Leak Detector compound, G00091 at each end of the duct assembly [2] or pneumatic duct [5].

SUBTASK 29-11-16-790-001

- (3) Do a check for air leakage at each end of the duct assembly [2] or the pneumatic duct [5].
 - (a) Small air leaks are satisfactory.
 - (b) Repair large air leaks.

NOTE: A large air leak is one that you can feel with your hand at a distance of 12 inches or more from the leak point on the inlet duct.

SUBTASK 29-11-16-860-004

- (4) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-16-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-16-080-001

- (2) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

SUBTASK 29-11-16-860-005

- (3) 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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

————— END OF TASK —————

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AIR-DRIVEN PUMP (ADP) EXHAUST DUCT - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the air-driven pump (ADP) exhaust duct (referred to as the duct assembly [1] in this procedure).
- (2) An installation of the duct assembly [1].

B. There are two air-driven pumps (ADPs) in the wing-to-body fairing on the aft left side. The ADP C2 is above the ADP C1. This procedure removes and installs the short piece of the exhaust duct which attaches to the ADP C1. The removal of this short piece of the exhaust duct will give access to some components of the ADP. Because of its location, the one-piece exhaust duct for the ADP C2 does not have this short piece which you can remove for access. Thus, this procedure is for the exhaust duct on the ADP C1 only.

TASK 29-11-17-000-801

2. Air-Driven Pump (ADP) Exhaust Duct Removal

(Figure 401)

A. References

Reference	Title
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. Prepare for the Removal

SUBTASK 29-11-17-860-001

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

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-17-040-001



OPERATING THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (2) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-17-010-001

- (3) Open this access panel:

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

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SUBTASK 29-11-17-860-002

- (4) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

E. Air-Driven Pump (ADP) Exhaust Duct Removal

SUBTASK 29-11-17-020-001

- (1) Remove the clamps [5] from the hose [6].

SUBTASK 29-11-17-020-002

- (2) Remove the clamps [2] from the sleeve [4].

SUBTASK 29-11-17-020-003

- (3) Move the hose [6] on the air-driven pump C1 away from the duct assembly [1].

SUBTASK 29-11-17-020-004

- (4) Remove the duct assembly [1] from the sleeve [4] and the adjacent exhaust duct [3].

————— **END OF TASK** —————

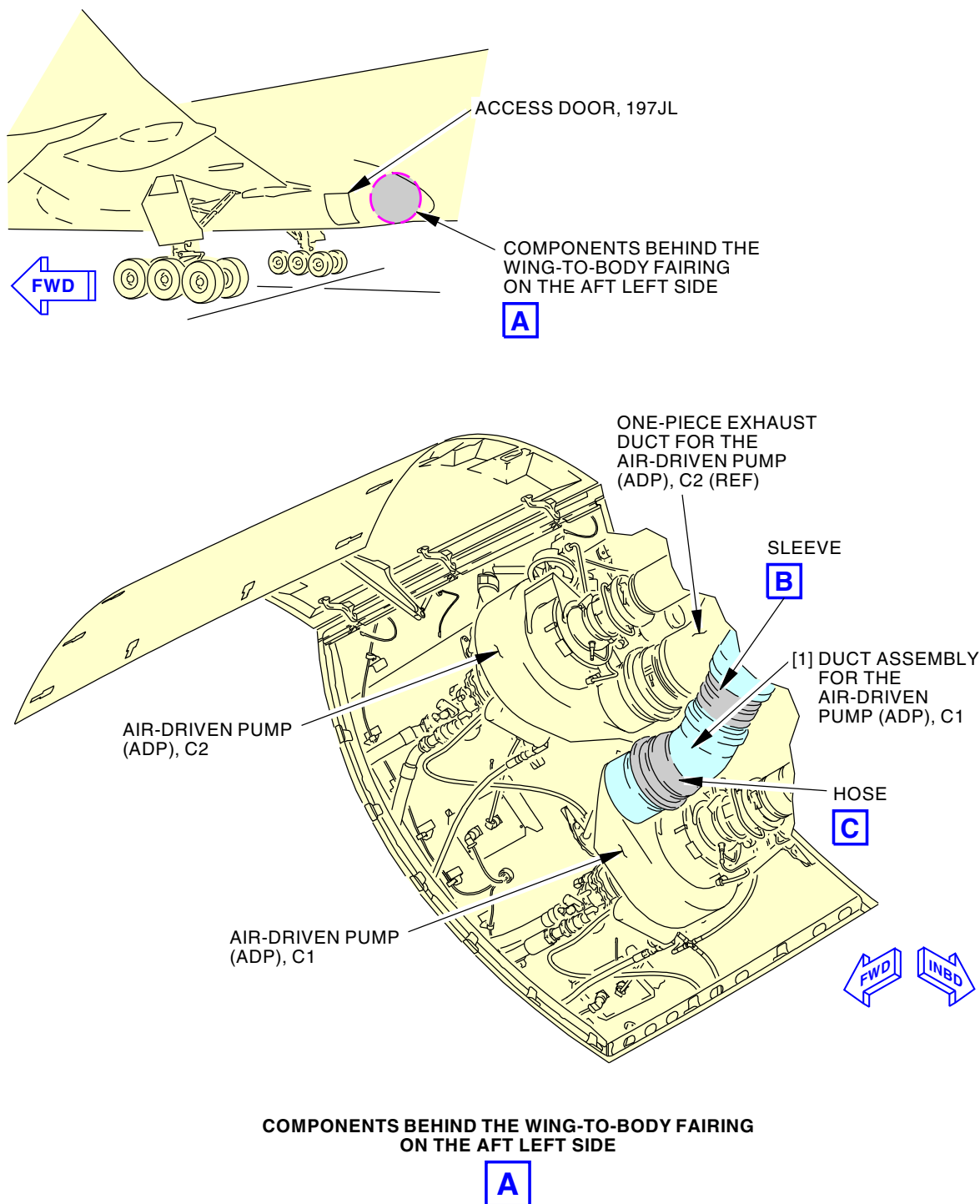
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C17218 S0006415995_V2

Air-Driven Pump (ADP) Exhaust Duct Installation
Figure 401/29-11-17-990-801 (Sheet 1 of 2)

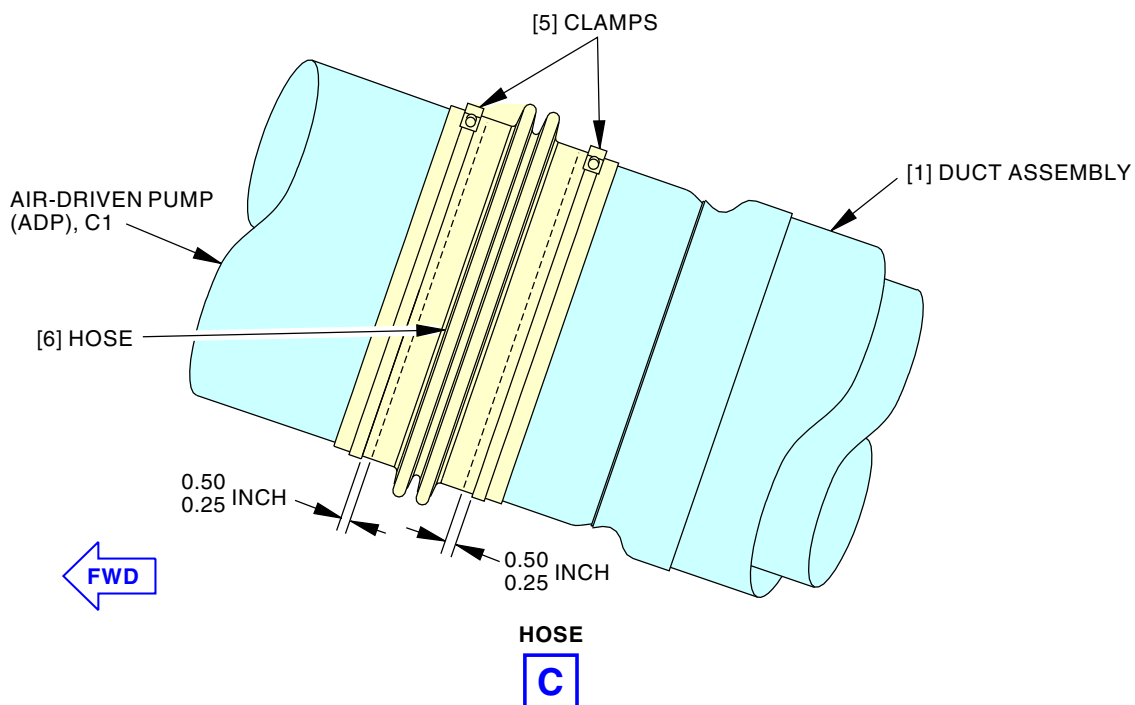
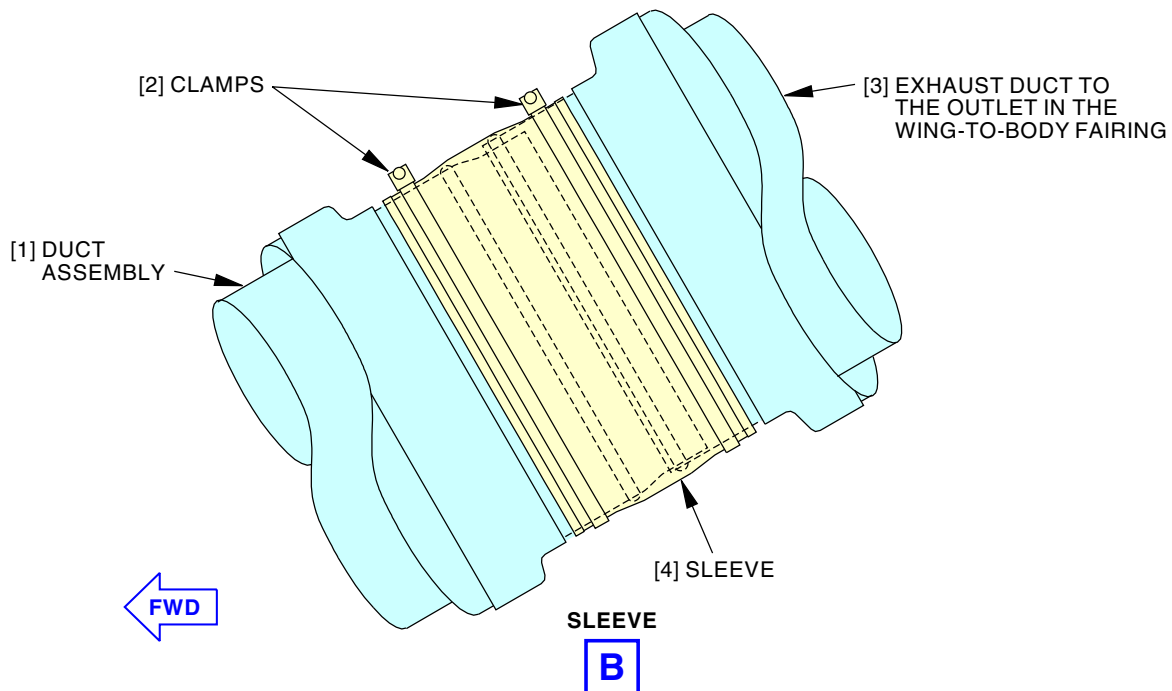
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**Air-Driven Pump (ADP) Exhaust Duct Installation
Figure 401/29-11-17-990-801 (Sheet 2 of 2)**

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TASK 29-11-17-400-801

3. **Air-Driven Pump (ADP) Exhaust Duct Installation**

(Figure 401)

A. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Duct assembly	29-11-17-01-075	ARO ALL

B. **Location Zones**

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. **Access Panels**

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. **Air-Driven Pump (ADP) Exhaust Duct Installation**

SUBTASK 29-11-17-420-001

(1) Put the sleeve [4] on the adjacent exhaust duct [3].

SUBTASK 29-11-17-420-002

(2) Put the hose [6] on the outlet of the air-driven pump C1.

SUBTASK 29-11-17-420-003

(3) Install the air-driven pump (ADP) exhaust duct (referred to as the duct assembly [1] in this procedure) into the sleeve [4] and the adjacent exhaust duct [3].

SUBTASK 29-11-17-420-004

(4) Turn the duct assembly [1] to align it with the outlet on the air-driven pump C1.

SUBTASK 29-11-17-420-005

(5) Move the hose [6] to engage the duct assembly [1].

SUBTASK 29-11-17-420-006

(6) Install the clamps [2] on the sleeve [4].

SUBTASK 29-11-17-420-007

(7) Tighten the clamps [2] to 10-20 pound-inches.

SUBTASK 29-11-17-420-008

(8) Install the clamps [5] on the hose [6].

SUBTASK 29-11-17-420-009

(9) Tighten the clamps [5] to 10-20 pound-inches.

E. **Put the Airplane Back to Its Usual Condition**

SUBTASK 29-11-17-410-001

(1) Close this access panel:

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-17-080-001

(2) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

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SUBTASK 29-11-17-860-003

- (3) 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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

———— **END OF TASK** ————

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AIR-DRIVEN PUMP (ADP) HEATER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the heater for the air-driven pump (ADP)
 - (2) An installation of the heater.
- B. There is one heater on each air-driven pump (ADP) assembly. There are two air-driven pump (ADP) assemblies in the aft left wing-to-body fairing. You can use this procedure to remove and install the heater on each of these ADP assemblies.
- C. Each Heater Assembly incorporates two cartridge heaters and two conformal heaters, which are connected to a single connector.

TASK 29-11-18-000-801

2. Air-Driven Pump (ADP) Heater Removal

(Figure 401)

A. **References**

Reference	Title
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)

B. **Location Zones**

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. **Access Panels**

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. **Prepare for Removal**

SUBTASK 29-11-18-840-001

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

Right Power Management Panel, P210

Row	Col	Number	Name
A	7	C29401	ADP 1 HTR PWR
A	8	C29402	ADP 2 HTR PWR
G	10	C29623	ADP 1 HTR CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-18-840-002

- (2) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

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SUBTASK 29-11-18-040-001



CAUTION

OPERATING THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (3) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-18-010-001

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

E. Air Driven Pump (ADP) Heater Assembly Removal

SUBTASK 29-11-18-020-001

- (1) Remove the clamp [2] that holds the heater wire to the modulating shutoff valve (MSOV).
 - (a) Remove the bolt [1] and the nut [3].

SUBTASK 29-11-18-020-002

- (2) Carefully cut the tie cords that hold the conformal heater for the solenoid [8] and the conformal heater for the flex duct [7].

NOTE: Observe the tie cord routing to help with the installation.

SUBTASK 29-11-18-020-003

- (3) Remove the tie cords.

SUBTASK 29-11-18-020-004

- (4) Remove the screw [9] and the washer [10] that hold the cartridge heater of the heater assembly [6] to the servovalve.

SUBTASK 29-11-18-020-005

- (5) Remove the screw [4] and the washer [5] that hold the cartridge heater of the heater assembly [6] to the secondary manifold.

SUBTASK 29-11-18-020-006

- (6) Disconnect the electrical connector from the MSOV.

SUBTASK 29-11-18-480-001

- (7) Install a cap on the electrical connector.

SUBTASK 29-11-18-020-007

- (8) Remove the heater assembly [6] (two conformal heaters [7] and [8], and the two cartridge heaters).

————— END OF TASK —————

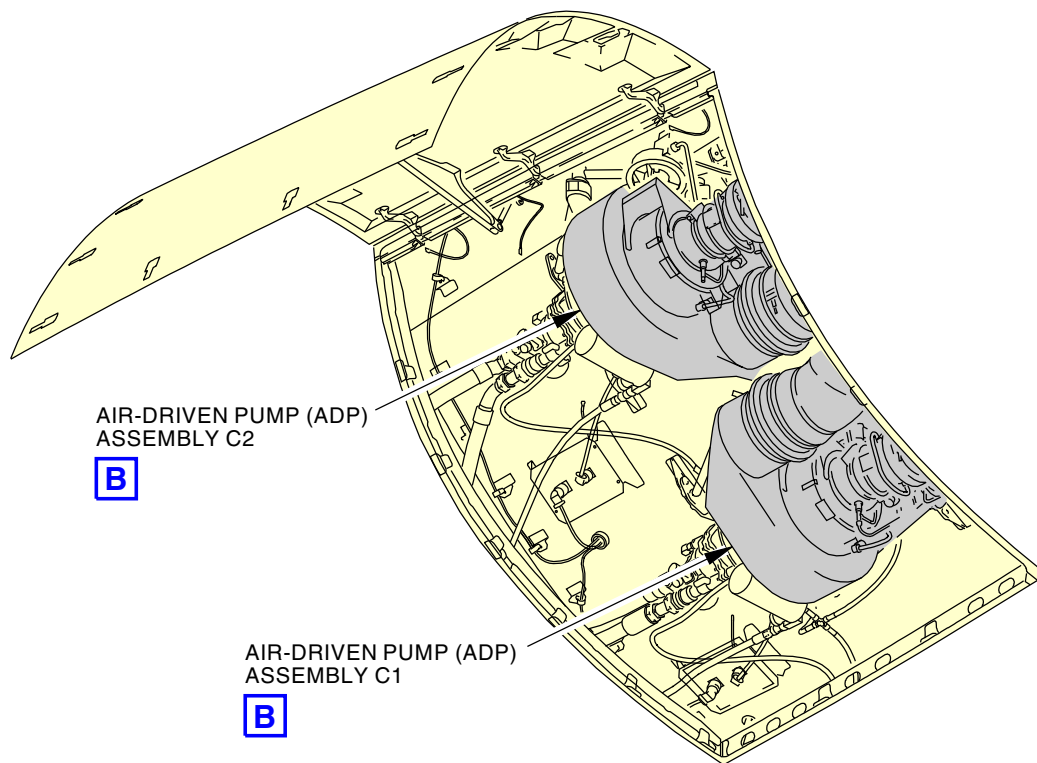
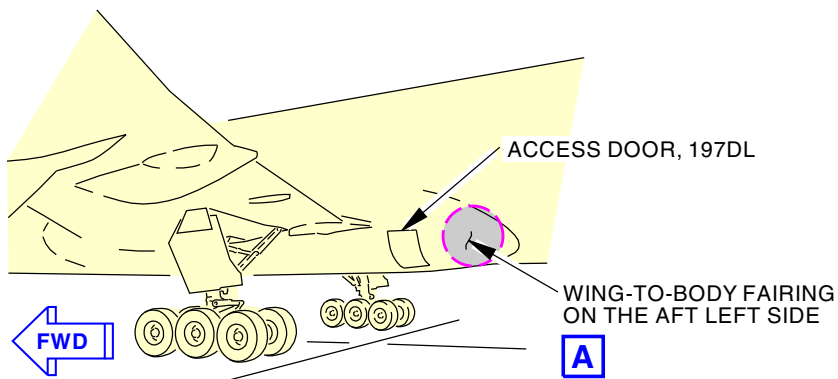
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**COMPONENTS BEHIND THE WING-TO-BODY FAIRING
ON THE AFT LEFT SIDE**

A



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**Air-Driven Unit (ADU) Heater Installation
Figure 401/29-11-18-990-801 (Sheet 1 of 2)**

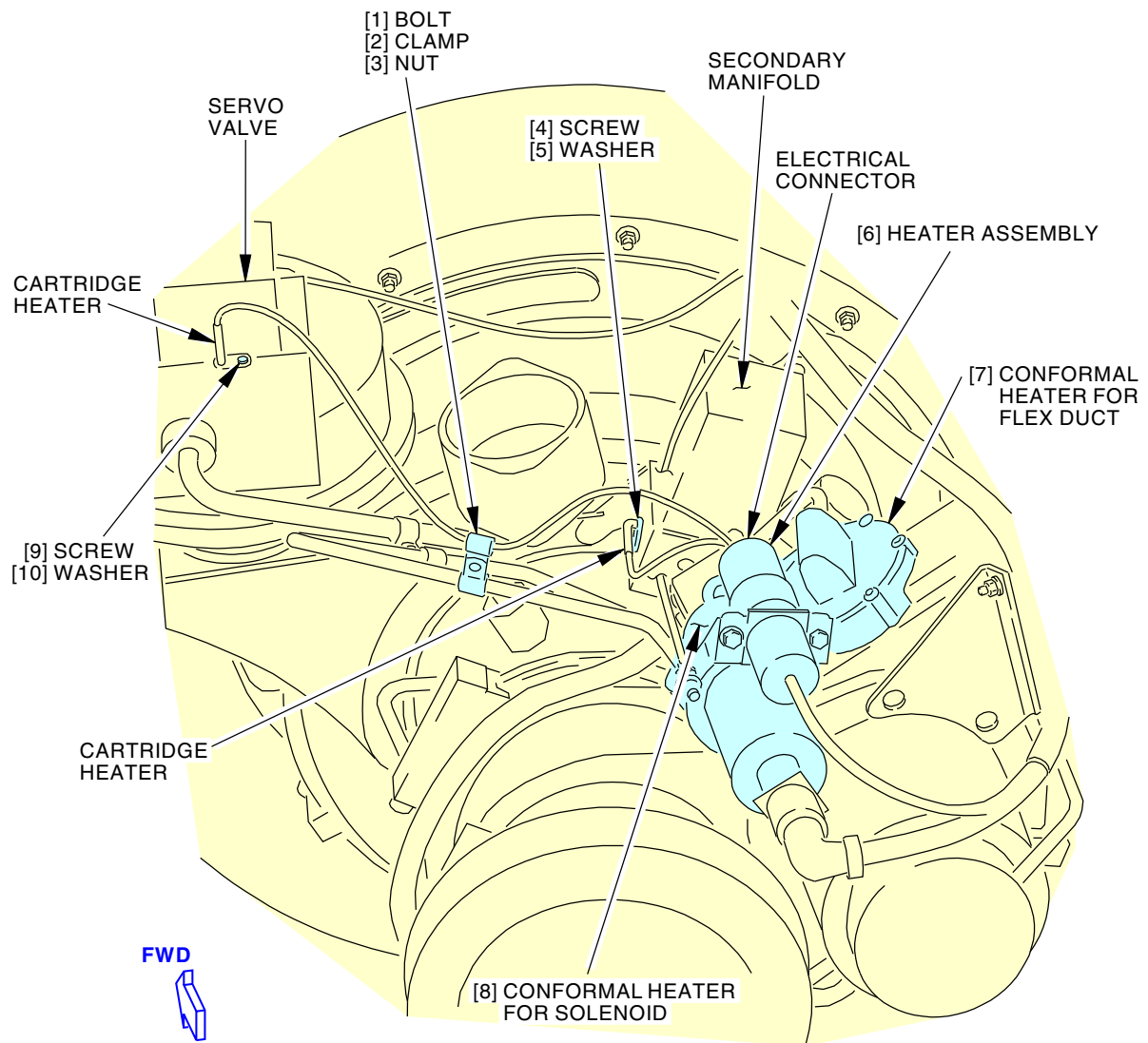
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**AIR-DRIVEN PUMP (ADP) ASSEMBLY
(EXAMPLE)**

B

F42706 S0006416002_V2

**Air-Driven Unit (ADU) Heater Installation
Figure 401/29-11-18-990-801 (Sheet 2 of 2)**

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TASK 29-11-18-400-801

3. Air-Driven Pump (ADP) Heater Installation

(Figure 401)

A. References

Reference	Title
29-11-00-700-801	Air-Driven Pump (ADP) C1 and C2 Heater - Functional Test (P/B 501)

B. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. Air-Driven Pump (ADP) Heater Assembly Installation

SUBTASK 29-11-18-420-001

- (1) Install the conformal heaters [7] and [8] for the solenoid and the flex duct.

SUBTASK 29-11-18-420-002

- (2) Use tie cords to hold the 2 conformal heaters [7] and [8] to their mating surfaces on the modulating shutoff valve (MSOV). (SWPM 20-00-11, Table 15 - Pull Cord).

NOTE: Each tie cord is to pass through the existing tube in the conformal heater twice and around the mating MSOV twice.

SUBTASK 29-11-18-420-003

- (3) Tie the ends of the tie cords to each other.
- (a) Cut off the excess tie wrap material.
 - (b) Safety the knot with a layer of fast drying acrylic sealant.

SUBTASK 29-11-18-420-004

- (4) Install the cartridge heater for the secondary manifold.
- (a) Put the cartridge heater in its position.
 - (b) Install the screw [4] and the washer [5].

SUBTASK 29-11-18-420-005

- (5) Install the cartridge heater for the servovalve.
- (a) Put the cartridge heater in its position.
 - (b) Install the screw [9] and the washer [10].

SUBTASK 29-11-18-080-001

- (6) Remove the cap on the electrical connector.

SUBTASK 29-11-18-420-006

- (7) Connect the electrical connector of the heater assembly [7] to the MSOV.

SUBTASK 29-11-18-720-001

- (8) Do this task: Air-Driven Pump (ADP) C1 and C2 Heater - Functional Test, TASK 29-11-00-700-801.

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E. Put the Airplane Back to its Usual Condition

SUBTASK 29-11-18-840-003

- (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>
A	7	C29401	ADP 1 HTR PWR
A	8	C29402	ADP 2 HTR PWR
G	10	C29623	ADP 1 HTR CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-18-410-001

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-18-080-002

- (3) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

———— **END OF TASK** ————

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AIR-DRIVEN PUMP (ADP) TURBINE GEARBOX ASSEMBLY (TGA) FILTER ELEMENT - REMOVAL/ INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the filter element for the turbine gearbox assembly (TGA) on the air-driven pump (ADP) assembly.
 - (2) An installation of the filter element for the turbine gearbox assembly (TGA) on the air-driven pump (ADP) assembly.
- B. There are two air-driven pump (ADP) assemblies in the aft left wing-to-body fairing. Each ADP assembly has a turbine gearbox assembly (TGA) oil filter. This procedure can be used to remove and install the filter element on each of the ADP assemblies.

TASK 29-11-19-000-801

2. Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

C. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

D. Prepare for the Removal

SUBTASK 29-11-19-860-001

- (1) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-19-860-002

- (2) For the center system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-19-860-003

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

Standby Power Management Panel, P310

Row	Col	Number	Name
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

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SUBTASK 29-11-19-040-001



MAKE SURE THAT THE ADP ACCESS DOOR IS FULLY OPEN OR FULLY CLOSED WHEN YOU MOVE THE TRAILING EDGE FLAPS. THE FLAPS CAN HIT THE DOOR IF IT IS NOT FULLY OPEN OR CLOSED. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (4) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 29-11-19-010-001

- (5) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

E. Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal

SUBTASK 29-11-19-020-001

- (1) Do these steps to remove the element [3] from the ADP filter assembly [1].
- (a) Remove the housing [8] from the filter assembly [1].
 - (b) Remove the element [3] from the filter assembly [1].
 - (c) Remove the packing [2] and the packing [4] from the element [3].
 - (d) Remove the packing [7] from the housing [8].

————— **END OF TASK** —————

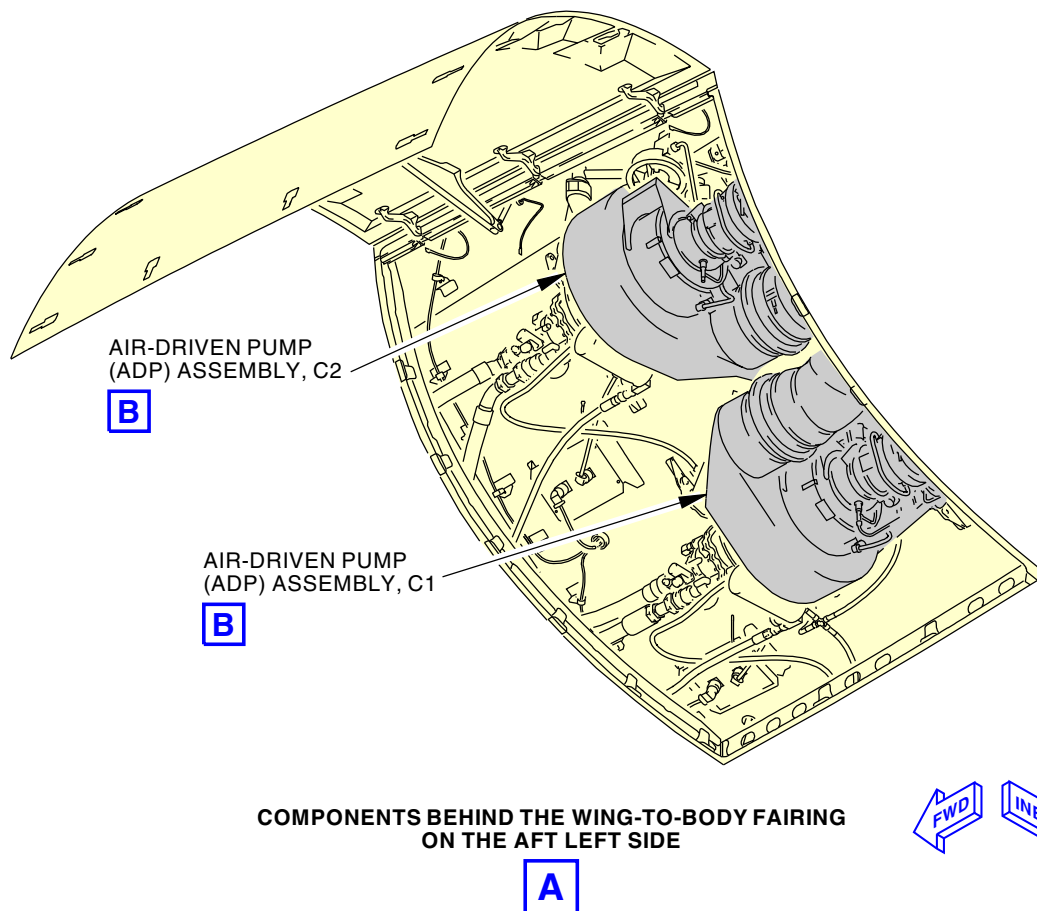
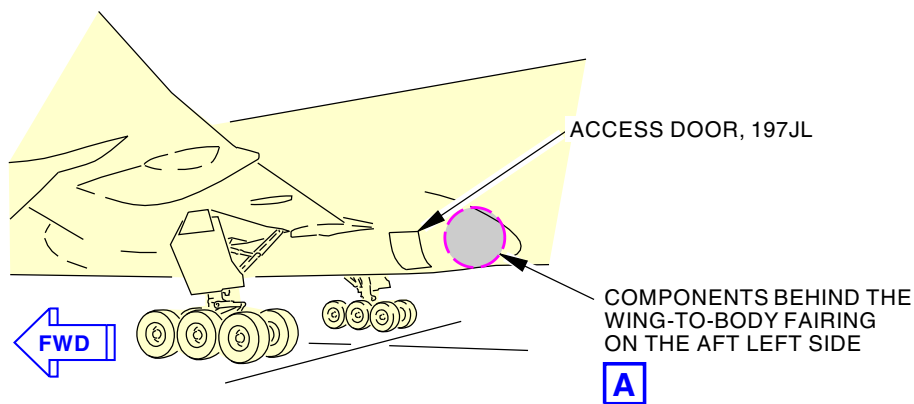
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**Air-Driven Pump (ADP) Assembly Filter Element Installation
Figure 401/29-11-19-990-801 (Sheet 1 of 2)**

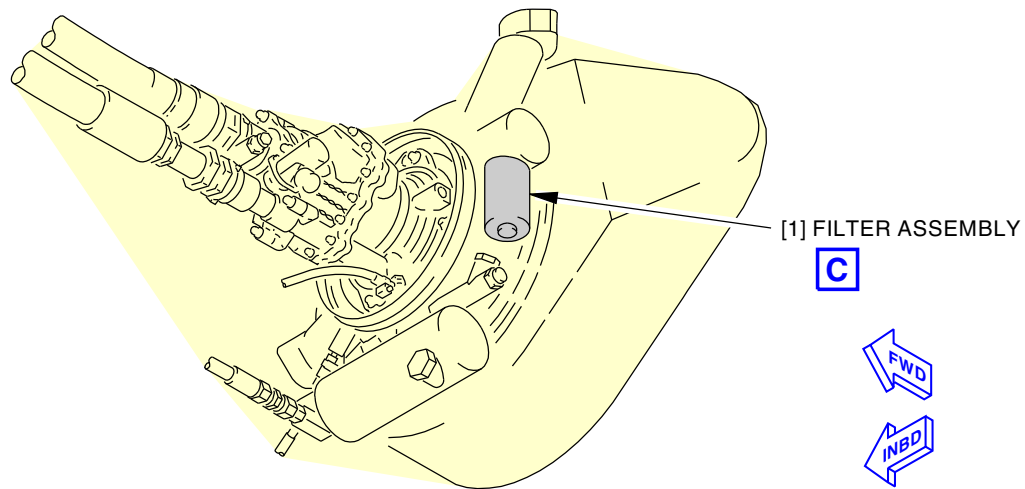
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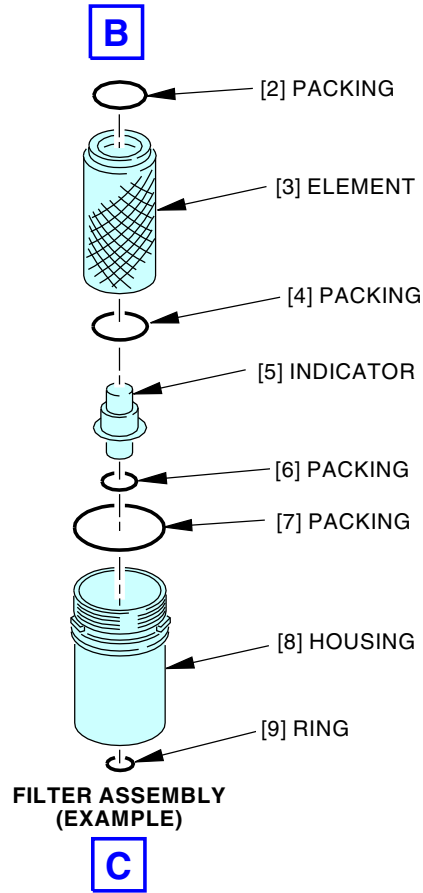
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**AIR-DRIVEN PUMP (ADP) ASSEMBLY
(EXAMPLE)**



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Air-Driven Pump (ADP) Assembly Filter Element Installation
Figure 401/29-11-19-990-801 (Sheet 2 of 2)

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TASK 29-11-19-400-801

3. Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation (Figure 401)

A. References

Reference	Title
12-13-05-610-801	Add Oil to the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) (P/B 301)
29-11-00-860-805	Center Hydraulic System Pressurization with an Air-Driven Pump (ADP) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	29-11-10-50-310	ARO ALL
3	Element	29-11-10-50-305	ARO ALL
4	Packing	29-11-10-50-310	ARO ALL
7	Packing	29-11-10-50-330	ARO ALL

D. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

E. Access Panels

Number	Name/Location
197JL	Air Driven Pump (ADP) Access Door

F. Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation

SUBTASK 29-11-19-420-001

- (1) Do these steps to install the element [3] into the ADP filter assembly [1].
 - (a) Clean the housing [8].
 - (b) Apply oil, D00068 to the new packing [7].
 - (c) Install the new packing [7] on the housing [8].
 - (d) If the indicator [5] shows a differential pressure indication, then turn the housing [8] until the indicator [5] points up and press the indicator [5] to reset the indication.

NOTE: The filter housing must be removed and turned before you can reset the differential pressure indicator.
 - (e) Install the new packing [2] and the new packing [4] on the element [3].
 - (f) Install the element [3] and the housing [8] on the filter assembly [1].
 - (g) Tighten the housing [8] to 18-20 pound-inches (2.033-2.259 N-m).

SUBTASK 29-11-19-610-001

- (2) Add oil to the turbine gearbox assembly. To add oil, do this task: Add Oil to the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA), TASK 12-13-05-610-801.

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G. Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation Test

SUBTASK 29-11-19-860-004

- (1) 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>
D	4	C29609	C HYD AIR PUMP 1
D	5	C29606	HYD AIR PUMP 2

SUBTASK 29-11-19-710-001

- (2) Operate the ADP pump to pressurize the center hydraulic system. To operate it, do this task:
Center Hydraulic System Pressurization with an Air-Driven Pump (ADP),
TASK 29-11-00-860-805.

NOTE: Pressurize the system with the ADP (C1 or C2) that has the new filter element.

SUBTASK 29-11-19-790-001

- (3) Make sure there are no oil leaks at the filter assembly [1] connections.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-19-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197JL	Air Driven Pump (ADP) Access Door

SUBTASK 29-11-19-860-005

- (2) Remove the DO-NOT-OPERATE tag from the flap lever on the P10 panel.

————— **END OF TASK** —————

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LEFT AND RIGHT SYSTEM RESERVOIR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A left system reservoir removal
 - (2) A left system reservoir installation
 - (3) A right system reservoir removal
 - (4) A right system reservoir installation.

TASK 29-11-20-000-801

2. Left System Reservoir Removal

(Figure 401)

A. 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)
29-11-22-000-801	Reservoir Drain Valve Removal (P/B 401)
29-11-23-000-801	Reservoir Sample Valve Removal (P/B 401)
29-32-01-000-801	Reservoir Temperature Transducer Removal (P/B 401)
29-33-02-000-801	Reservoir Quantity Transmitter Removal (P/B 401)
54-52-04-000-801	Aft Fairing Removal (P/B 401)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut

C. Prepare for the Removal

SUBTASK 29-11-20-860-001

- (1) For the left hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-20-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) For the left engine, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-20-010-001

- (3) For the left engine strut, do this task: Aft Fairing Removal, TASK 54-52-04-000-801.

SUBTASK 29-11-20-860-002

- (4) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-11-20-680-001

- (5) To drain the fluid from the left system reservoir assembly [49], do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

D. Left System Reservoir Removal

SUBTASK 29-11-20-020-001

- (1) Do these steps to remove the tubes along the left side of the left system reservoir assembly [49] (referred to as the reservoir assy in this procedure):
- (a) Disconnect each end of the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18].
 - (b) Remove the screw [3], screw [8], screw [26] and screw [30] at the bracket assembly [100] and the bracket assembly [108] on the left side of the reservoir assembly [49].
 - (c) Remove the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18].
 - (d) Remove these components from the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18].
 - 1) The aft clamp block assembly which has these components:
 - a) block [33]
 - b) block [34]
 - c) block [35]
 - d) channels [29]
 - e) spacer [28]
 - f) spacer [32].
 - 2) The forward clamp block assembly which has these components:
 - a) block [11]
 - b) block [12]
 - c) block [13]
 - d) channels [7]
 - e) spacer [5]
 - f) spacer [10].
 - (e) Install caps on all the open tubes and the tubes which you removed, to prevent contamination.
 - (f) Install caps on the open ports of the hydraulic components from which you disconnected the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18], to prevent contamination.

SUBTASK 29-11-20-020-002

- (2) Disconnect the electrical connector [6] from the reservoir temperature transducer.

SUBTASK 29-11-20-020-003

- (3) Disconnect the electrical connector [25] from the reservoir quantity transmitter.

SUBTASK 29-11-20-020-004

- (4) Install caps on the electrical connectors [6] and [25] to prevent contamination or damage.

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SUBTASK 29-11-20-020-005

- (5) Install caps on the reservoir quantity transmitter and the reservoir temperature transducer, to prevent contamination or damage.

SUBTASK 29-11-20-020-006

- (6) Disconnect these hoses from the reservoir assembly [49]:
 - (a) Hose [24] for the supply of the alternating current motor pump (ACMP)
 - (b) Hose [38] for the supply of the engine-driven pump (EDP)
 - (c) Hose [39] for the fluid return.

SUBTASK 29-11-20-020-007

- (7) Do these steps to remove the tube assembly [20]:
 - (a) Disconnect the tube assembly [20] from the valve [19].
 - (b) Remove the clamp [22] from the coupling [21] on the tube assembly [20].
 - (c) Disconnect the coupling [21] from the tube [23].
 - (d) Remove the tube assembly [20] with the coupling [21].

SUBTASK 29-11-20-020-008

- (8) Do these steps to remove the tube assembly [40] and the jumper assembly [50]:
 - (a) Remove the screws [42] from the clamp [41].
 - (b) Remove the clamp [41] from the tube assembly [40].
 - (c) Remove the screw [56] which attaches the jumper assembly [50] to the reservoir assembly [49].
 - (d) Remove the screw [60] which attaches the jumper assembly [50] to the reservoir pressure switch [51].
 - (e) Disconnect the elbow [61] on the tube assembly [40] from the reservoir assembly [49].
 - (f) Disconnect the tube assembly [40] from the T-fitting [52].
 - (g) Remove these components together as an assembly:
 - 1) elbow [61]
 - 2) tube assembly [40]
 - 3) jumper assembly [50]
 - 4) clamp [64]
 - 5) clamp [68]
 - 6) screw [65]
 - 7) washers [66]
 - 8) nut [67].

SUBTASK 29-11-20-020-009

- (9) Do these steps to remove the valve [19]:
 - (a) Remove the bolt [69] from the clamp [63] which holds the valve [19].
 - (b) Remove the valve [19] from the reservoir assembly [49].

SUBTASK 29-11-20-020-010

- (10) Install caps on the open ports of the reservoir assembly [49] to prevent contamination.

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SUBTASK 29-11-20-020-011

- (11) Install caps on the tube assy [23], tube assembly [40], and the hoses [24], [38] and [39], to prevent contamination.

SUBTASK 29-11-20-020-012

- (12) Hold the reservoir assembly [49] with your hands while you do these steps to disconnect it from the brackets [81], [97] and [106] on the nacelle support fittings:
- (a) Remove the bolt [80] at the bracket [81] on the inboard nacelle support fitting.
 - (b) Remove the bolt [94] at the bracket [97] on the outboard nacelle support fitting.
 - (c) Remove the bolt [114] at the bracket [106] on the outboard nacelle support fitting.

SUBTASK 29-11-20-020-013

- (13) Do these steps to remove the bracket assembly [44], bracket assembly [73], bracket assembly [100], and bracket assembly [108] from the reservoir assembly [49].
- (a) Remove the bolts [71] and bolts [91] which attach the bracket assembly [73] to the reservoir assembly [49].
 - 1) Remove the bracket assembly [73] and the shim [89] from the reservoir assembly [49].
 - (b) Remove the bolts [92] and bolts [103] which attach the bracket assembly [100] to the reservoir assembly [49].
 - 1) Remove the bracket assembly [100] and the shim [101] from the reservoir assembly [49].
 - (c) Remove the bolts [110] and bolts [112] which attach the bracket assembly [108] to the reservoir assembly [49].
 - 1) Remove the bracket assembly [108] and the shim [109] shim [] from the reservoir assembly [49].
 - (d) Remove the bolts [45] which attach the bracket assembly [44] to the reservoir assembly [49].
 - 1) Remove the bracket assembly [44] from the reservoir assembly [49].

SUBTASK 29-11-20-020-014

- (14) Do these steps to remove the reservoir assembly [49] from the aft strut:



BE CAREFUL WHEN YOU TURN THE RESERVOIR SO THAT THE REMAINING FLUID IN THE RESERVOIR DOES NOT FLOW ON YOU. HYDRAULIC FLUID, BMS 3-11, CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (a) Turn the reservoir assembly [49] (around its vertical axis) to find the best position in which to remove it between the outboard nacelle support fitting and the diagonal brace.
- (b) Turn the reservoir assembly [49] (around its horizontal axis) to move the bottom of the reservoir assembly [49] outboard between the outboard nacelle support fitting and the diagonal brace.
- (c) Continue to turn the reservoir assembly [49] while you move it outboard, until it is in a horizontal position as it comes out of the aft strut.

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SUBTASK 29-11-20-020-015

- (15) If it is necessary to keep components for installation on the replacement reservoir assembly [49], do these steps:
- (a) Do this task: Reservoir Drain Valve Removal, TASK 29-11-22-000-801.
 - (b) Do this task: Reservoir Sample Valve Removal, TASK 29-11-23-000-801.
 - (c) Do this task: Reservoir Temperature Transducer Removal, TASK 29-32-01-000-801.
 - (d) Do this task: Reservoir Quantity Transmitter Removal, TASK 29-33-02-000-801.
 - (e) Install caps on the open ports on the reservoir assembly [49] to prevent contamination.

————— **END OF TASK** —————

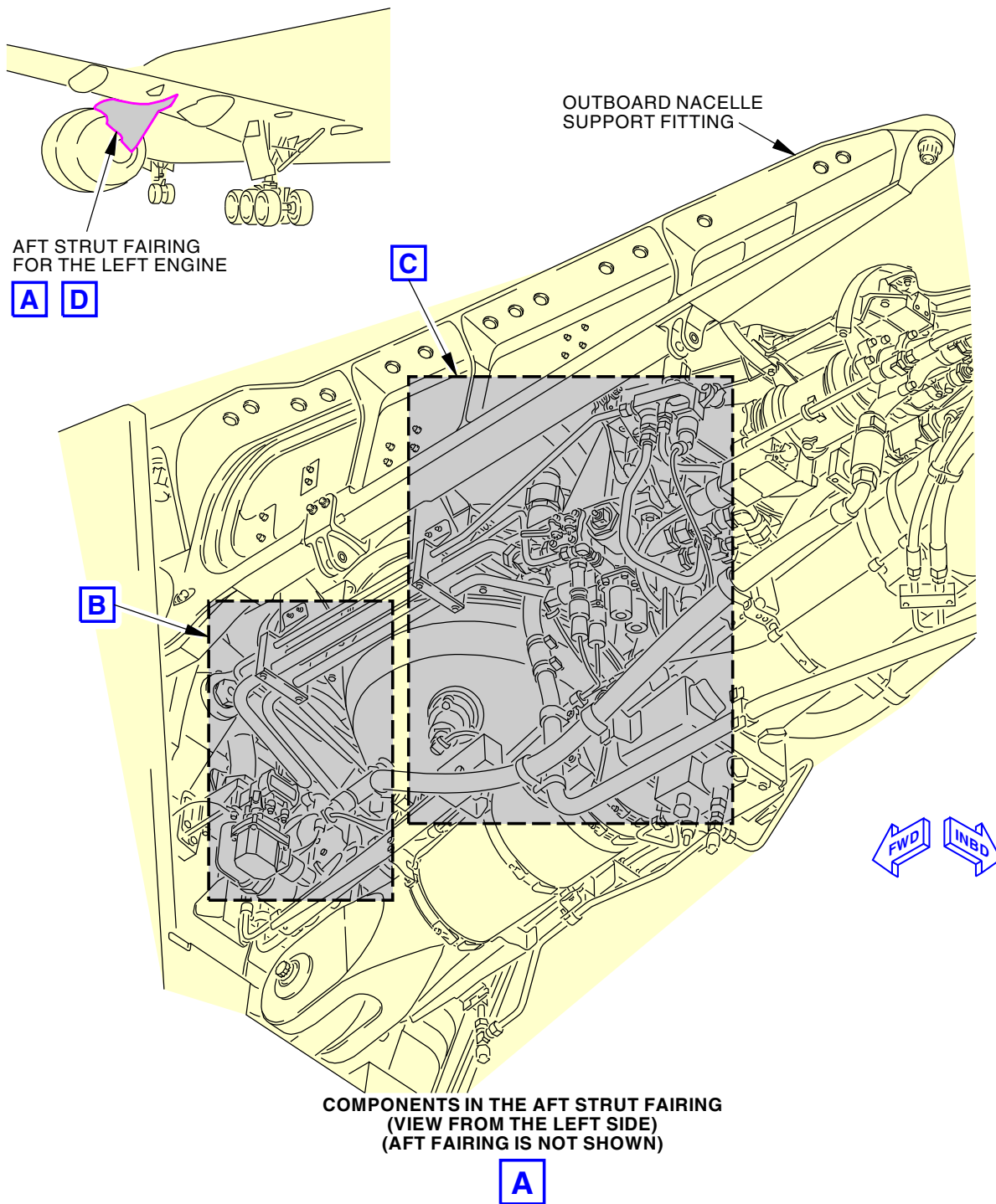
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Left System Reservoir Installation
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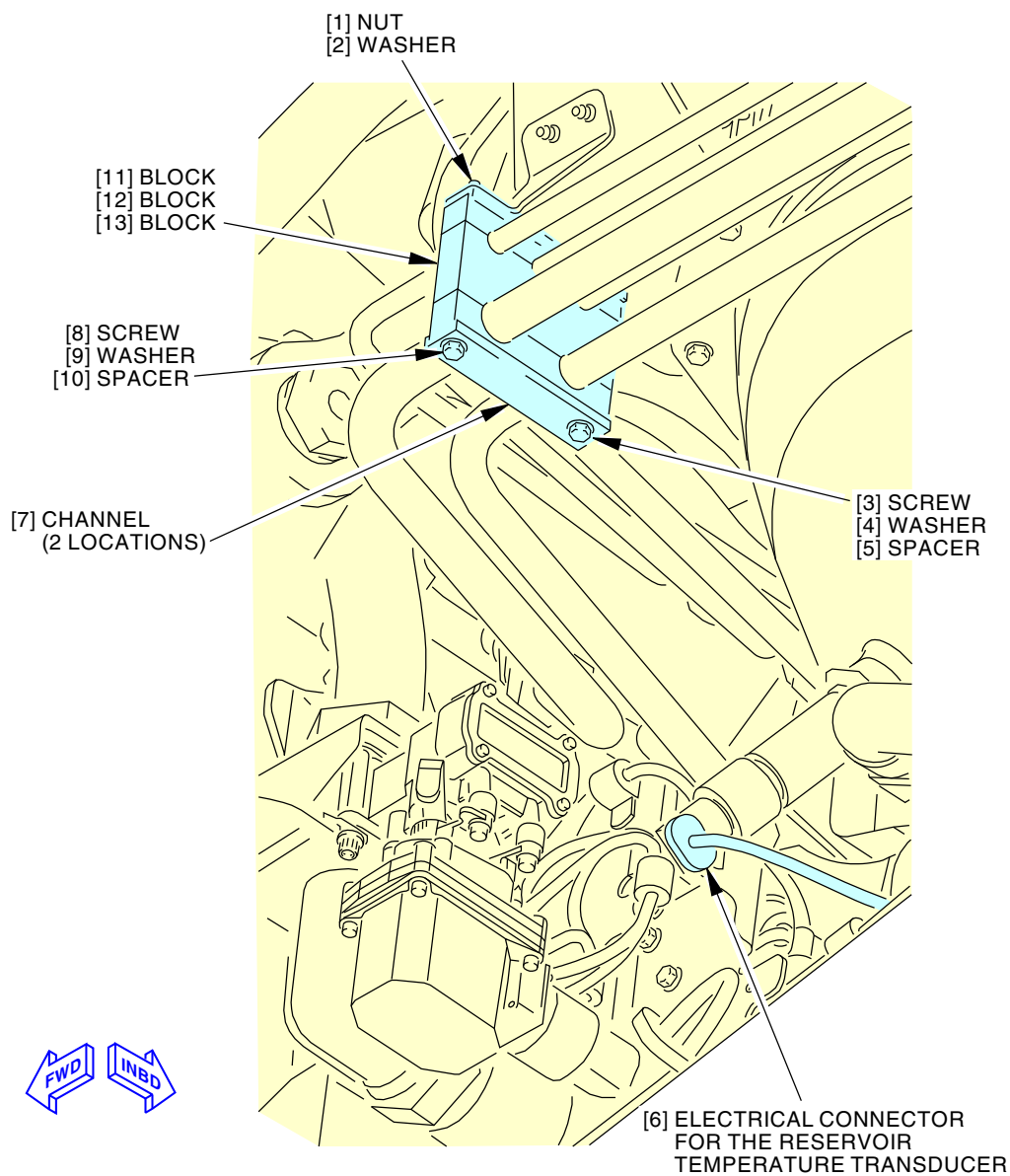
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**Left System Reservoir Installation
Figure 401/29-11-20-990-801 (Sheet 2 of 10)**

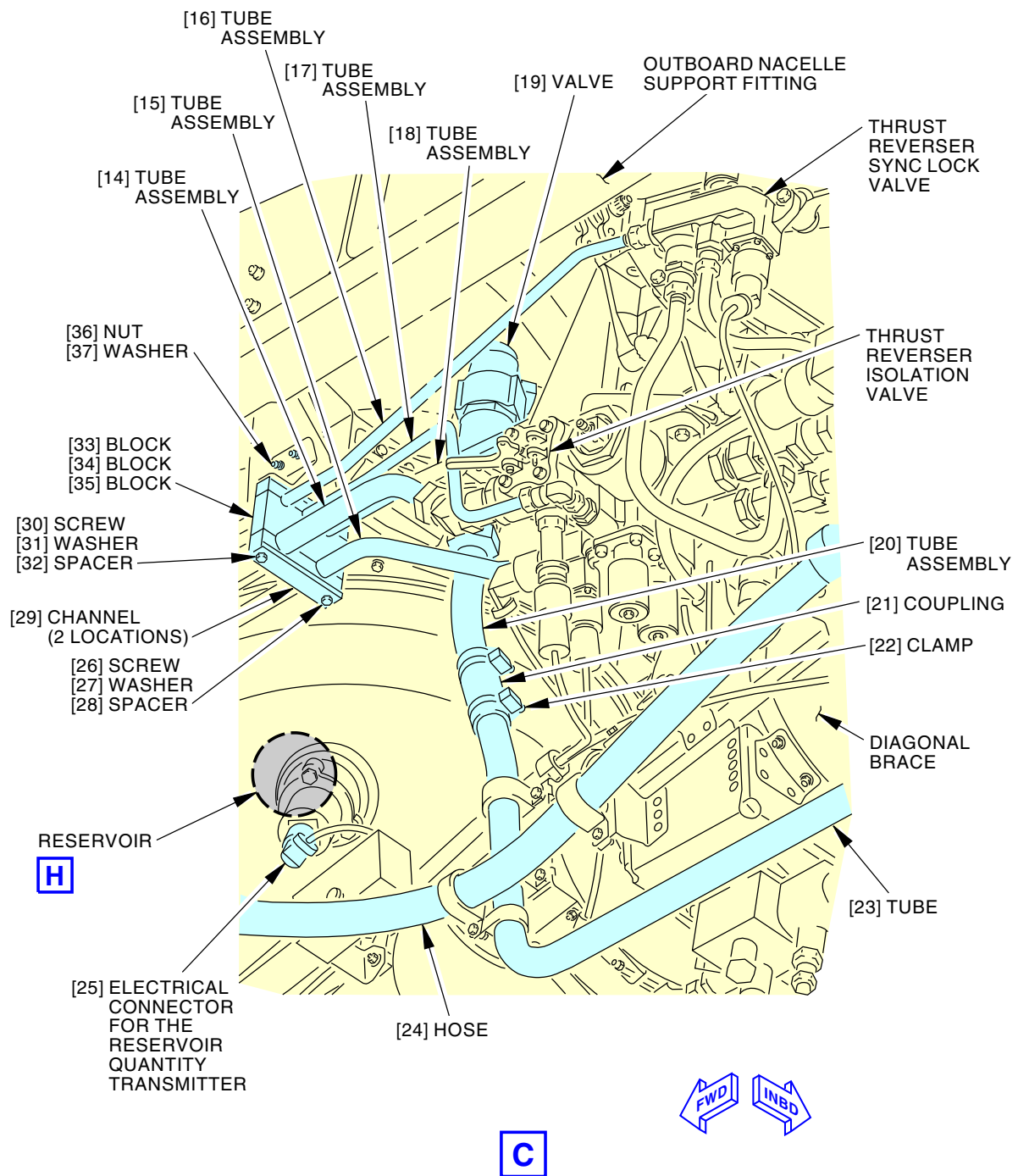
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Left System Reservoir Installation
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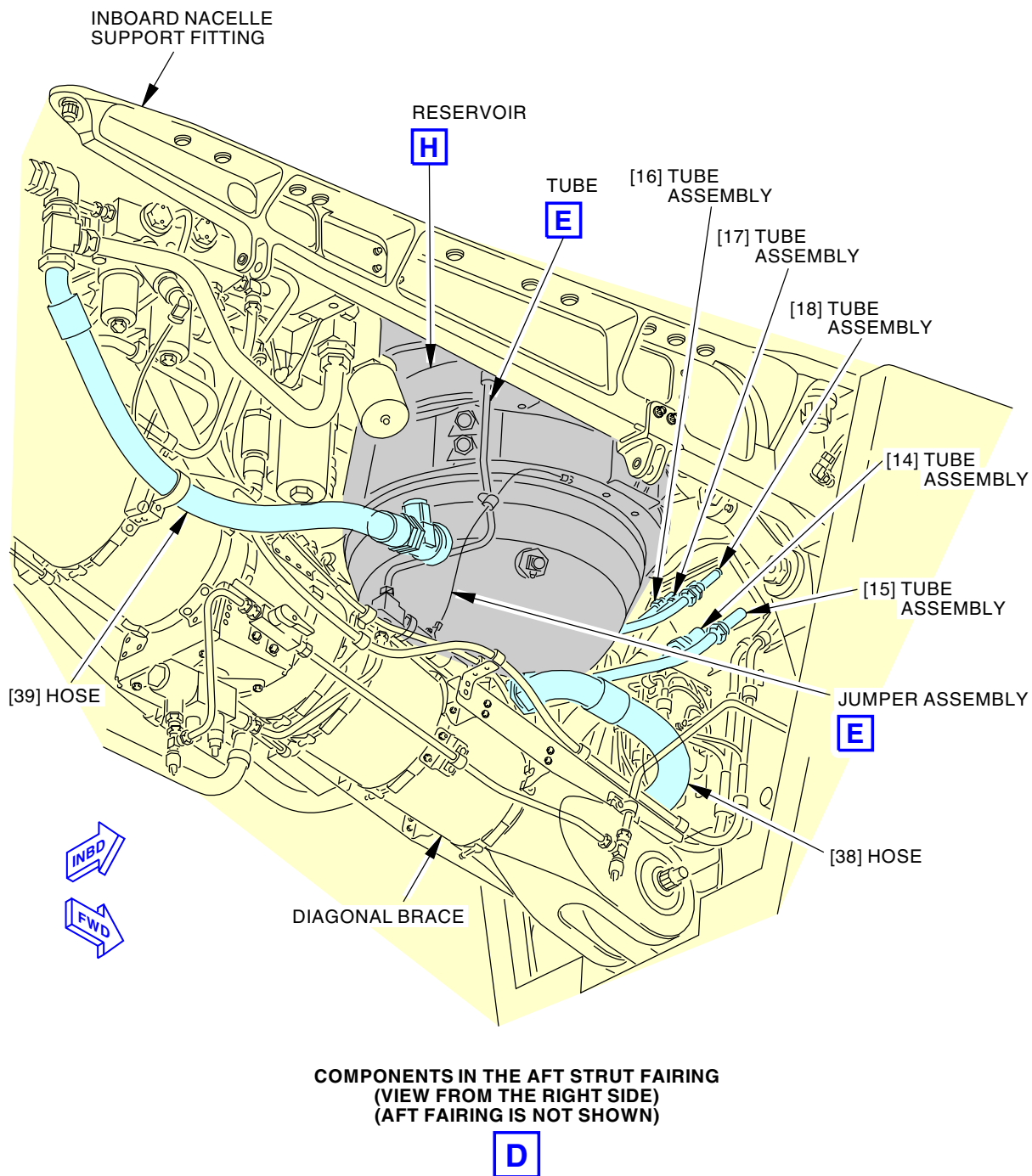
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**Left System Reservoir Installation
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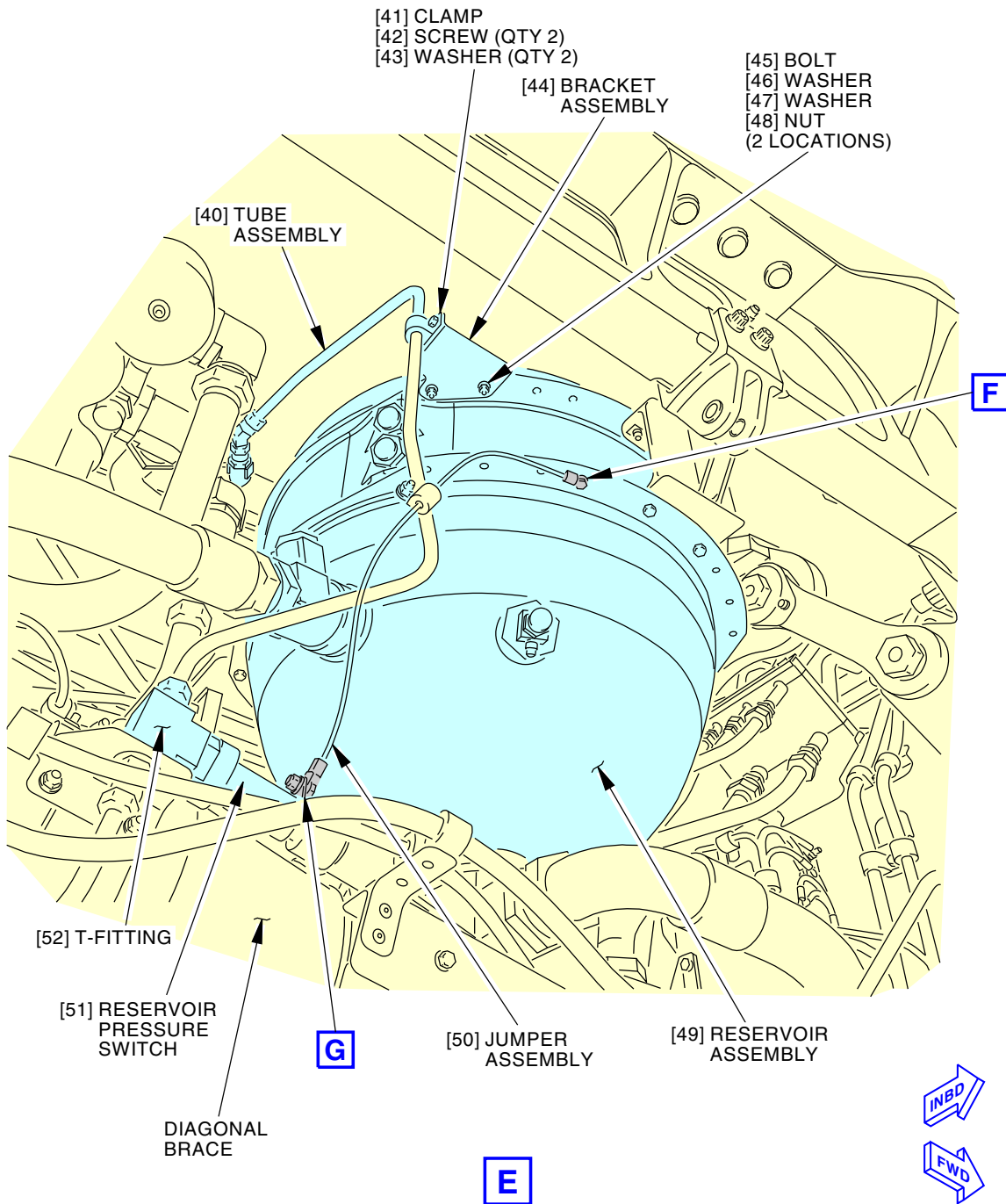
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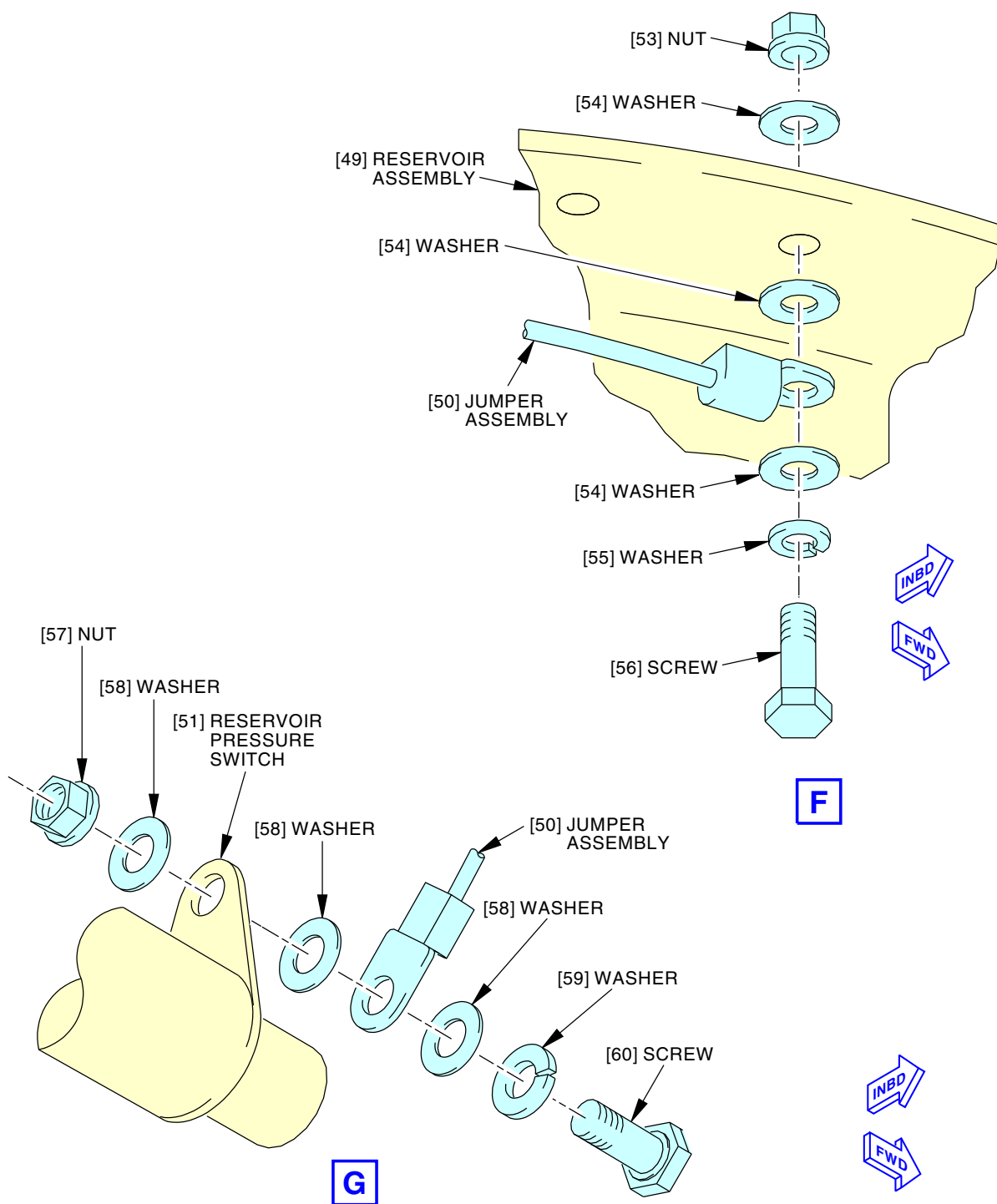
**Left System Reservoir Installation
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**Left System Reservoir Installation
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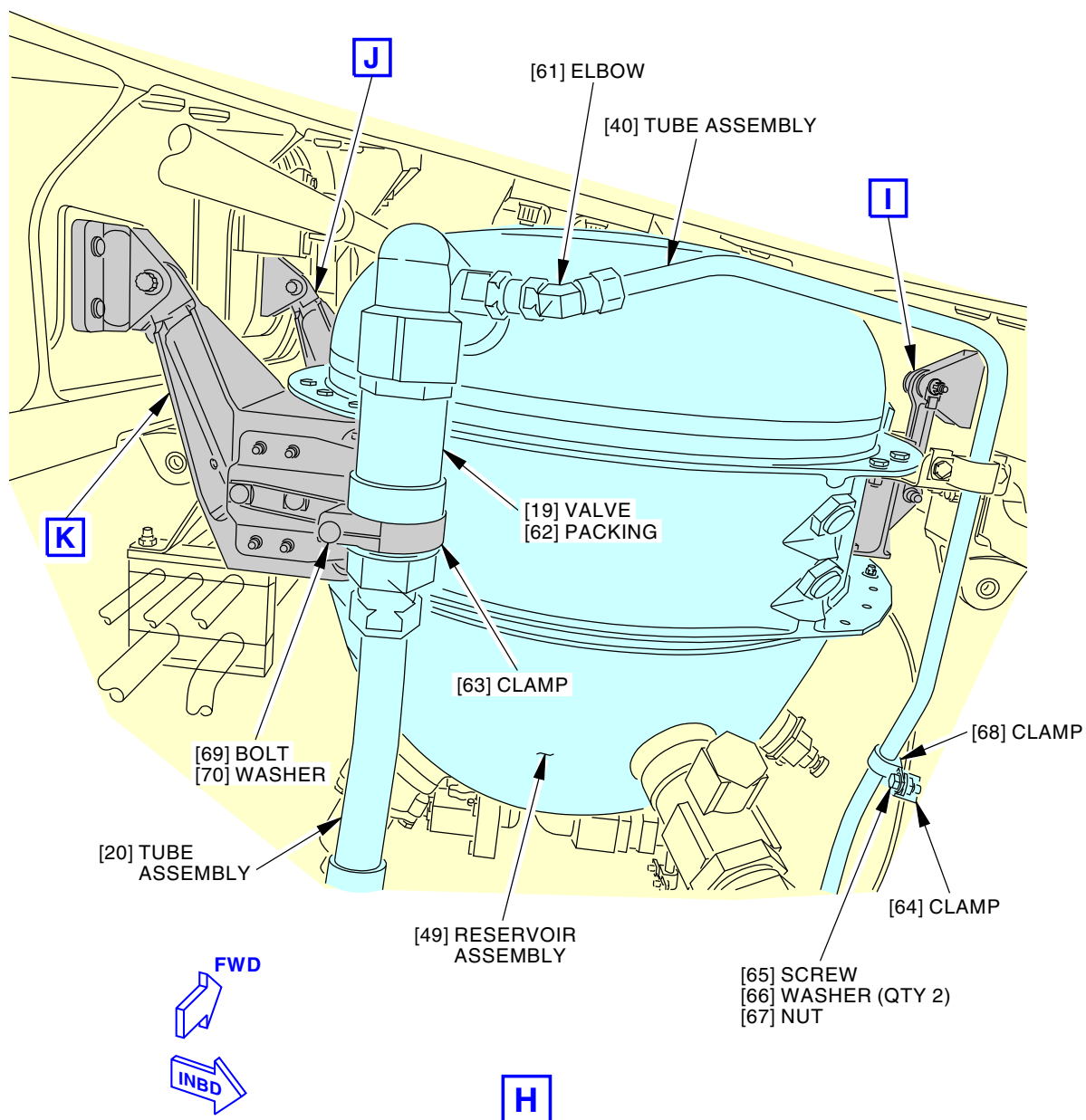
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**Left System Reservoir Installation
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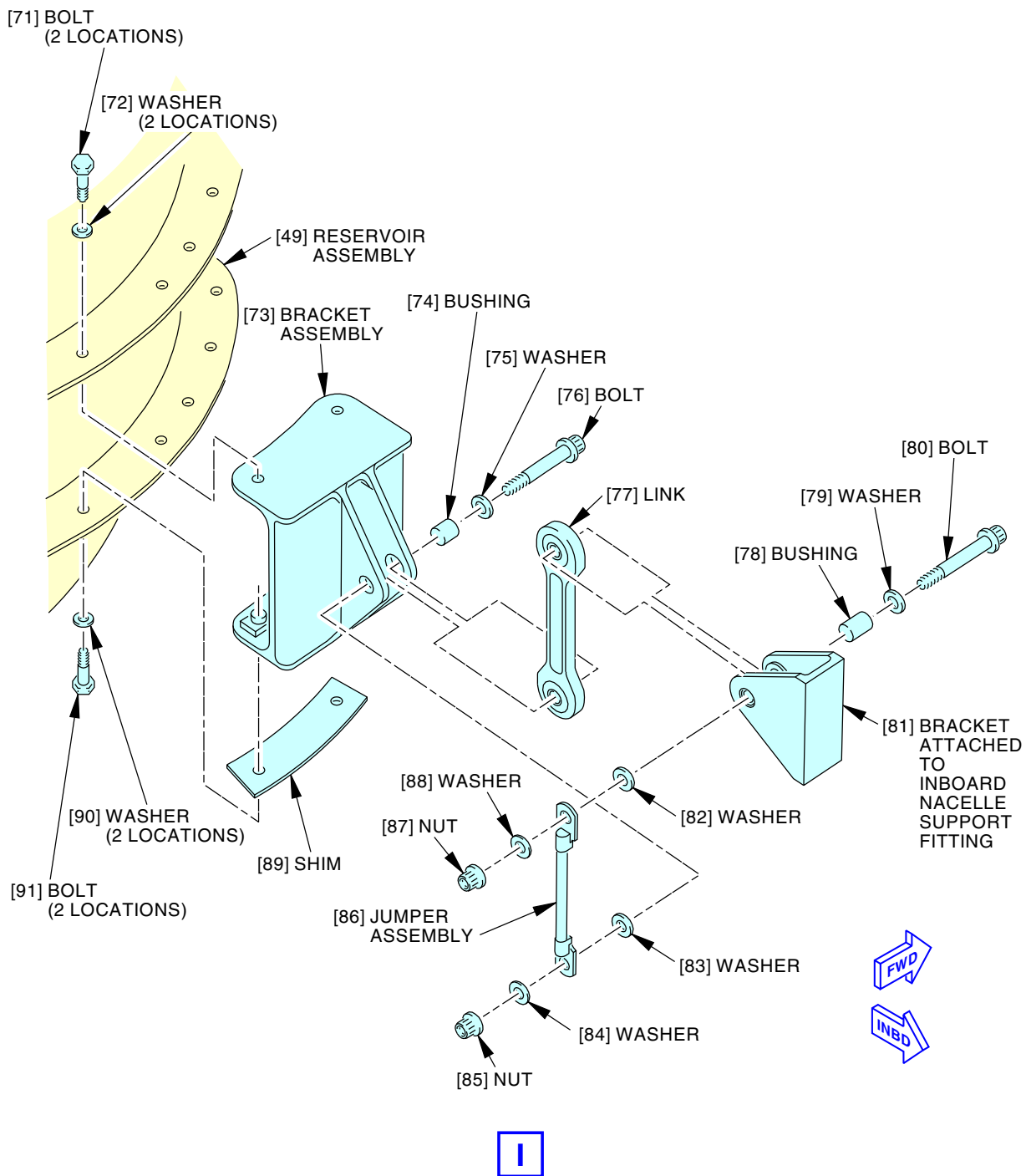
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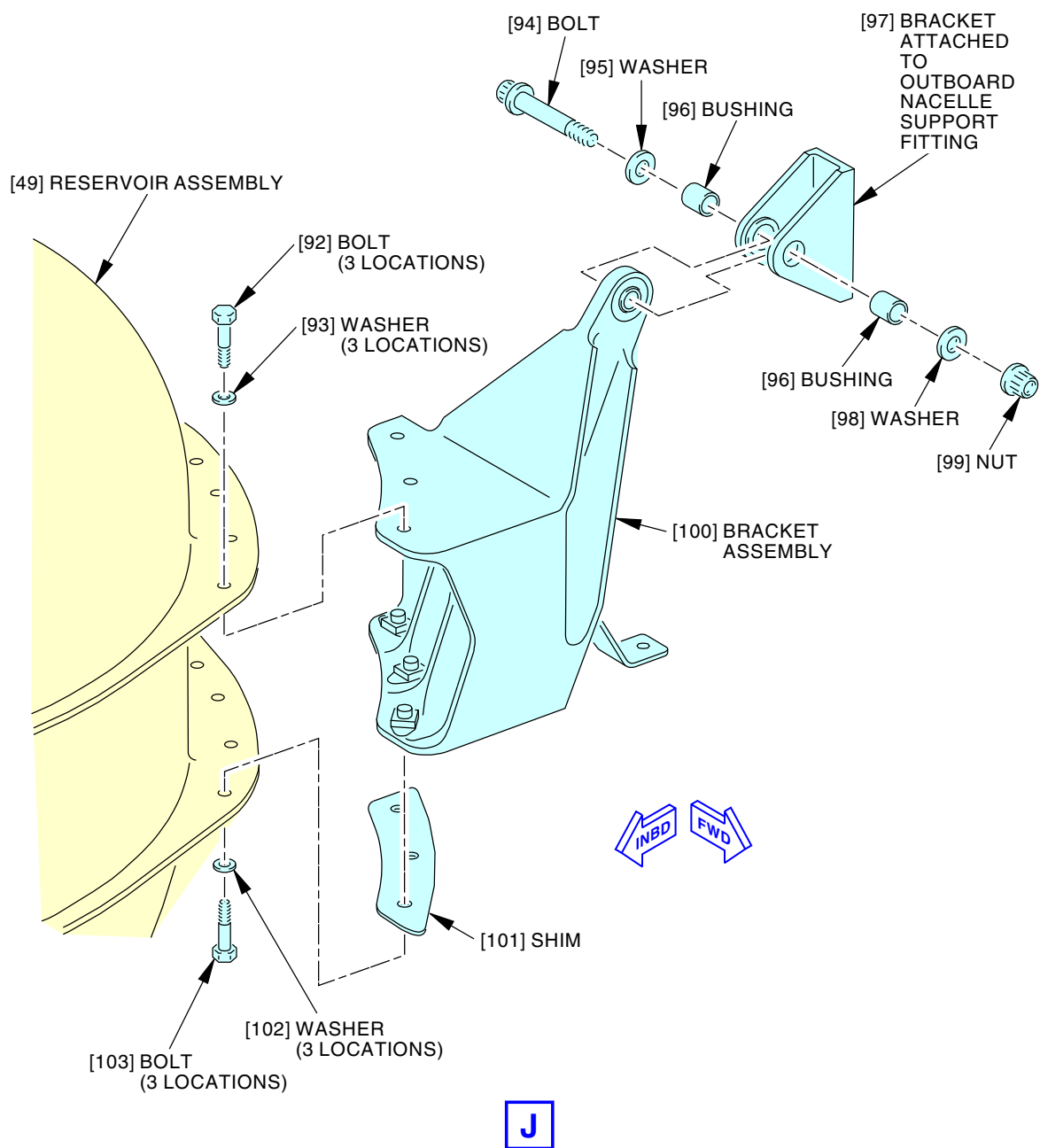
Left System Reservoir Installation
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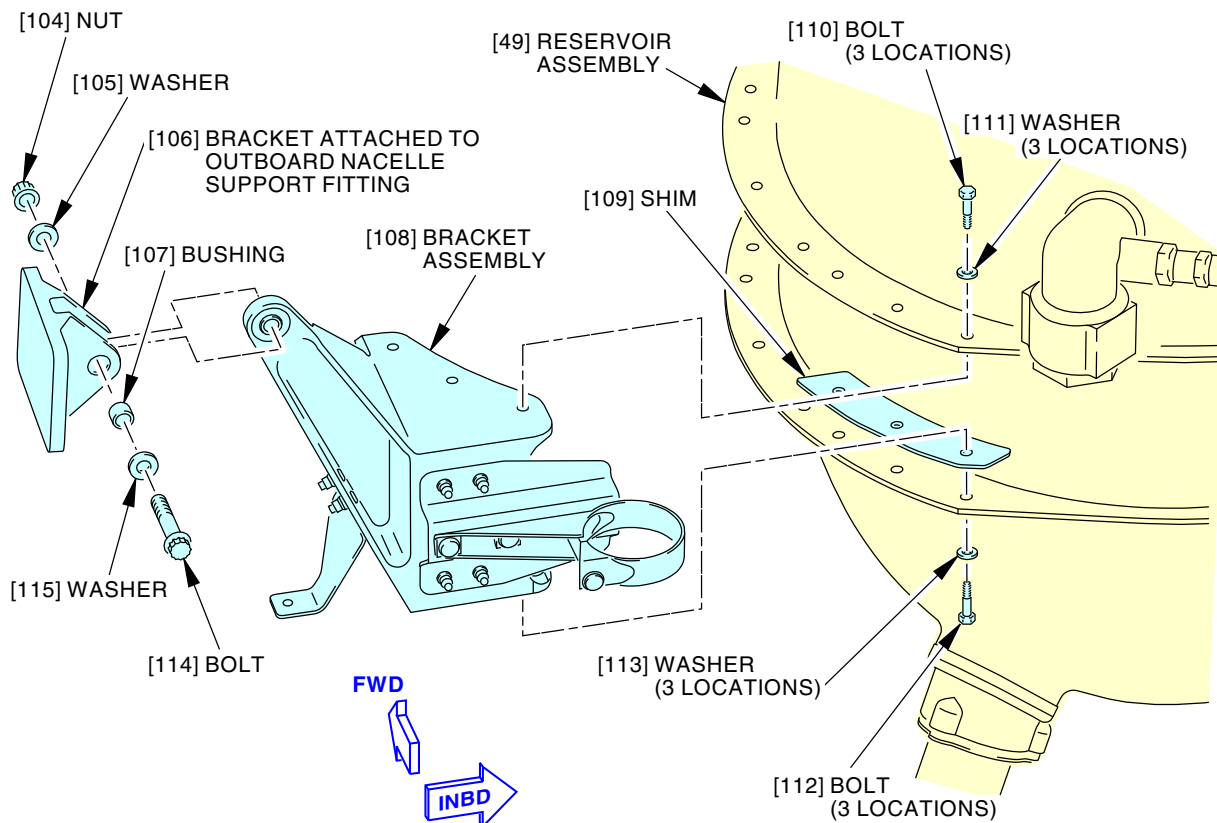
**Left System Reservoir Installation
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**Left System Reservoir Installation
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TASK 29-11-20-400-801

3. Left System Reservoir Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
29-11-00-860-804	Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
29-11-22-400-801	Reservoir Drain Valve Installation (P/B 401)
29-11-23-400-801	Reservoir Sample Valve Installation (P/B 401)
29-32-01-400-801	Reservoir Temperature Transducer Installation (P/B 401)
29-33-02-400-801	Reservoir Quantity Transmitter Installation (P/B 401)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
54-52-04-400-801	Aft Fairing Installation (P/B 401)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-710-821-H00	Thrust Reverser - Operational Test (Engine Not In Operation) (P/B 501)
SWPM 20-20-00	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.

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
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	

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Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
49	Reservoir assembly	29-11-20-01-075 29-11-20-04-195	ARO ALL ARO ALL
62	Packing	29-11-24-01-025	ARO ALL

E. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut

F. Left System Reservoir Installation

SUBTASK 29-11-20-120-001

- (1) Prepare the mating surfaces of the left system reservoir assembly [49] (referred to as the reservoir assembly [49] in this procedure) and the bracket assembly [73] for an electrical bond (SWPM 20-20-00).

NOTE: The maximum resistance across this electrical bond is 0.0025 ohms.

SUBTASK 29-11-20-120-002

- (2) Prepare the mating surfaces of the jumper assy [86] and the bracket [81] for an electrical bond (SWPM 20-20-00).

NOTE: The maximum resistance across this electrical bond is 0.0025 ohms.

SUBTASK 29-11-20-420-001

- (3) If it is necessary to install the components on the replacement reservoir assembly [49], do these steps:
 - (a) Remove the caps from the ports on the reservoir assembly [49].
 - (b) Do this task: Reservoir Drain Valve Installation, TASK 29-11-22-400-801.
 - (c) Do this task: Reservoir Sample Valve Installation, TASK 29-11-23-400-801.
 - (d) Do this task: Reservoir Temperature Transducer Installation, TASK 29-32-01-400-801.
 - (e) Do this task: Reservoir Quantity Transmitter Installation, TASK 29-33-02-400-801.

SUBTASK 29-11-20-420-002

- (4) Do these steps to move the reservoir assembly [49] into the aft strut:

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BE CAREFUL WHEN YOU TURN THE RESERVOIR SO THAT THE REMAINING FLUID IN THE RESERVOIR DOES NOT FLOW ON YOU. HYDRAULIC FLUID, BMS 3-11, CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (a) Turn the reservoir assembly [49] (around its vertical axis) to find the best position in which to move it between the outboard nacelle support fitting and the diagonal brace.
- (b) Hold the reservoir assembly [49] in a horizontal position while you move the top of the reservoir assembly [49] between the outboard nacelle support fitting and the diagonal brace.
- (c) Turn the reservoir assembly [49] (around its horizontal axis) to lower the bottom while you move the top of the reservoir assembly [49] up into the aft strut.
- (d) Continue to move the reservoir assembly [49] between the outboard nacelle support fitting and the diagonal brace until it is in a vertical position in the aft strut.

SUBTASK 29-11-20-420-003

- (5) Do these steps to install the bracket assembly [44], bracket assembly [73], bracket assembly [100], and bracket assembly [108] on the reservoir assembly [49]:
 - (a) Put the bracket assembly [44] on the reservoir assembly [49].
 - 1) Install the bolts [45], washers [46], washers [47], and nuts [48] that attach the bracket assembly [44] to the reservoir assembly [49].
 - (b) Put the bracket assembly [73] on the reservoir assembly [49].
 - 1) If it is necessary, install the shim [89] between the reservoir assembly [49] and the bracket assembly [73].

NOTE: The maximum clearance between the reservoir assembly [49] and the bracket assembly [73] is 0.010 inch.

 - a) If you remove the laminations from the shim [89] apply primer, C00259 to the shim [89].
 - 2) Install the bolts [71], bolts [91], washers [72], and washers [90] that attach the bracket assembly [73] to the reservoir assembly [49].
 - (c) Put the bracket assembly [100] on the reservoir assembly [49].
 - 1) If it is necessary, install the shim [101] between the reservoir assembly [49] and the bracket assembly [100].

NOTE: The maximum clearance between the reservoir assembly [49] and the bracket assembly [100] is 0.010 inch.

 - a) If you remove the laminations from the shim [101], apply primer, C00259 to the shim [101].
 - 2) Install the bolts [92], bolts [103], washers [93] and washers [102] that attach the bracket assembly [100] to the reservoir assembly [49].
 - (d) Put the bracket assembly [108] on the reservoir assembly [49].



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- 1) If it is necessary, install the shim [109] between the reservoir assembly [49] and the bracket assembly [108].

NOTE: The maximum clearance between the reservoir assembly [49] and the bracket assembly [108] is 0.010 inch.

- a) If you remove the laminations from the shim [109], apply primer, C00259 to the shim [109].
- 2) Install the bolts [110], bolts [112], washers [111] and washers [113] that attach the bracket assembly [108] to the reservoir assembly [49].

SUBTASK 29-11-20-420-004

- (6) Do these steps to connect the reservoir assembly [49] to the brackets [81], [97] and [106] on the nacelle support fittings:
 - (a) Install these components to attach the bracket assembly [108] on the reservoir assembly [49] to the bracket [106] on the outboard nacelle support fitting:
 - 1) bolt [114]
 - 2) washer [105]
 - 3) washer [115]
 - 4) bushing [107]
 - 5) nut [104].
 - (b) Install these components to attach the bracket assembly [100] on the reservoir assembly [49] to the bracket [97] on the outboard nacelle support fitting:
 - 1) bolt [94]
 - 2) washer [95]
 - 3) washer [98]
 - 4) bushings [96]
 - 5) nut [99].
 - (c) Install these components to attach the link [77] and the bonding jumper [86] on the reservoir assembly [49] to the bracket [81] on the inboard nacelle support fitting.
 - 1) bolt [80]
 - 2) washer [79]
 - 3) washer [82]
 - 4) washer [88]
 - 5) bushing [78]
 - 6) nut [87].

SUBTASK 29-11-20-420-005

- (7) Remove the caps from the tube [23], tube assembly [40], and hoses [24], [38], and [39].

SUBTASK 29-11-20-420-006

- (8) Remove the caps from the ports on the reservoir assembly [49].

SUBTASK 29-11-20-420-007

- (9) Do these steps to install the valve [19]:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [62] and to the threads on the valve [19].
 - (b) Install the new packing [62] on the valve [19].

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- (c) Install the valve [19] in the port on the reservoir assembly [49].
- (d) Install the bolt [69] and the washer [70] in the clamp [63].

SUBTASK 29-11-20-420-008

- (10) Do these steps to install the assembly of the tube assembly [40] and the jumper assembly [50]:

NOTE: This assembly has these parts; elbow [61], tube assembly [40], jumper assembly [50], clamp [64], clamp [68], screw [65], washers [66], and nut [67].

- (a) Connect the elbow [61] on the tube assembly [40] to the reservoir assembly [49].
- (b) Connect the end of the elbow [61] to the T-fitting [52].
- (c) Install the clamp [41] on the tube assembly [40].
- (d) Install the screw [42] and washers [43] that attach the clamp [41] to the reservoir assembly [49].
- (e) Prepare the mating surfaces of the jumper assembly [50], the flange on the reservoir assembly [49], and the reservoir pressure switch [51] for an electrical bond (SWPM 20-20-00).
- (f) Install the screw [56], washers [54], washer [55], and nut [53] to attach the jumper assembly [50] to the flange on the reservoir assembly [49].
- (g) Install the screw [60], washers [58], washer [59], and nut [57] that attach the jumper assembly [50] to the reservoir pressure switch [51].
- (h) With the intrinsically safe approved bonding meter, COM-1550, make sure the maximum resistance between the flange on the reservoir assembly [49] and the reservoir pressure switch [51] is 0.008 ohms (SWPM 20-20-00).

SUBTASK 29-11-20-420-009

- (11) Do these steps to install the tube assembly [20]:

- (a) Remove the cap from the tube assy [23].
- (b) Push the coupling [21] (with the tube assembly [20] attached) on the tube assy [23].
- (c) Connect the tube assembly [20] to the valve [19].
- (d) Install the clamp [22] on the coupling [21].

SUBTASK 29-11-20-420-010

- (12) Remove the caps from the hoses [24], [38] and [39].

SUBTASK 29-11-20-020-016

- (13) Connect the hose [24], hose [38] and hose [39] to the reservoir assembly [49]:

- (a) Tighten the B-nut on the hose [24] for the supply of the alternating current motor pump (ACMP) to a torque of 450 $\pm$ 23 in-lb (51 $\pm$ 3 N·m).
- (b) Tighten the B-nut on the hose [38] for the supply of the engine-driven pump (EDP) to a torque of 900 $\pm$ 45 in-lb (102 $\pm$ 5 N·m).
- (c) Tighten the B-nut on the hose [39] for the fluid return to a torque of 750 in-lb (85 N·m).

SUBTASK 29-11-20-420-011

- (14) Remove the caps from the reservoir temperature transducer and the reservoir quantity transmitter.

SUBTASK 29-11-20-420-012

- (15) Remove the caps from the electrical connectors [6] and [25] for the reservoir temperature transducer and the reservoir quantity transmitter.

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SUBTASK 29-11-20-420-013

- (16) Connect the electrical connector [6] to the reservoir temperature transducer.

SUBTASK 29-11-20-420-014

- (17) Connect the electrical connector [25] to the reservoir quantity transmitter.

SUBTASK 29-11-20-420-015

- (18) Do these steps to install the tubes along the left side of the reservoir assembly [49]:
- Remove the caps from the ports of the hydraulic components and the tubes from which you removed the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18].
 - Remove the caps from the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18].
 - Assemble these components on the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18]:
 - The aft clamp block assembly which has these components:
 - block [33]
 - block [34]
 - block [35]
 - channels [29]
 - The forward clamp block assembly which has these components:
 - block [11]
 - block [12]
 - block [13]
 - channels [7]
 - While you hold the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18] in their position in the aft strut fairing, do these steps:

NOTE: Do not tighten the screw [3], screw [8], screw [26] and screw [30] until you connect the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18].

- Install these components at the outboard end of the forward clamp block assembly:
 - screw [8]
 - spacer [10]
 - washer [2]
 - washer [9]
 - nut [1].
- Install these components at the inboard end of the forward clamp block assembly:
 - screw [3]
 - spacer [5]
 - washer [4].
- Install these components at the outboard end of the aft clamp block assembly:
 - screw [30]

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- b) spacer [32]
- c) washer [31]
- d) washer [37]
- e) nut [36].
- 4) Install these components at the inboard end of the aft clamp block assembly:
 - a) screw [26]
 - b) spacer [28]
 - c) washer [27].
- (e) Connect each end of the tube assembly [14], tube assembly [15], tube assembly [16], tube assembly [17] and tube assembly [18].
- (f) Tighten the screw [3], screw [8], screw [26] and screw [30].

G. Left System Reservoir Installation Test

SUBTASK 29-11-20-860-003

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

SUBTASK 29-11-20-860-004

- (2) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-20-610-001

- (3) For the reservoir assembly [49] in the left hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

- (a) While you fill the reservoir assembly [49], do these steps:

- 1) Monitor the reservoir quantity gage at the ground service bay.
- 2) Make sure the indication, on the reservoir quantity gage, increases while you fill the reservoir.

SUBTASK 29-11-20-860-005

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-20-210-001

- (5) Make sure the HYDRAULIC RESERVOIR TEMP L indication, on the EICAS maintenance page, shows a value for the hydraulic fluid temperature.

NOTE: It is not necessary to do a check of the precision of the
HYDRAULIC RESERVOIR TEMP L value which shows.

SUBTASK 29-11-20-860-006

- (6) For the reservoir assembly [49] in the left hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-20-790-001

- (7) Make sure there is no hydraulic fluid leakage at the hydraulic tube and hose connections on the reservoir assembly [49].

SUBTASK 29-11-20-790-002

- (8) Make sure there is no hydraulic fluid leakage at these components on the reservoir assembly [49]:
 - (a) Sight glasses

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- (b) Sample valve
- (c) Drain valve
- (d) Temperature transducer
- (e) Quantity transmitter.

SUBTASK 29-11-20-790-003

- (9) Make sure there is no air leakage at the valve [19] or at each end of the tube assembly [40].

SUBTASK 29-11-20-860-007

- (10) For the left hydraulic system, do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.

SUBTASK 29-11-20-790-004

- (11) Make sure there is no hydraulic fluid leakage at each end of the tube assembly [18] for the case drain of the engine-driven pump.

SUBTASK 29-11-20-860-008

- (12) For the left hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-11-20-440-001

- (13) For the left engine, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-11-20-790-005

- (14) For the left engine, do this task: Thrust Reverser - Operational Test (Engine Not In Operation), TASK 78-31-00-710-821-H00.
 - (a) Operate the thrust reverser a minimum of three full cycles.
 - (b) Make sure there is no hydraulic fluid leakage at each end of the tube assembly [14], tube assembly [15], tube assembly [16], and tube assembly [17].

SUBTASK 29-11-20-040-002

 WARNING	DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (15) For the left engine, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-20-110-001

 CAUTION	QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-20-410-001

- (2) For the left engine strut, do this task: Aft Fairing Installation, TASK 54-52-04-400-801.

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SUBTASK 29-11-20-440-002

- (3) For the left engine, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-11-20-860-009

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

————— END OF TASK —————

TASK 29-11-20-000-802

4. Right System Reservoir Removal

(Figure 402)

A. 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)
29-11-22-000-801	Reservoir Drain Valve Removal (P/B 401)
29-11-23-000-801	Reservoir Sample Valve Removal (P/B 401)
29-32-01-000-801	Reservoir Temperature Transducer Removal (P/B 401)
29-33-02-000-801	Reservoir Quantity Transmitter Removal (P/B 401)
54-52-04-000-801	Aft Fairing Removal (P/B 401)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
444	Aft Strut Fairing - Right Nacelle Strut

C. Prepare for the Removal

SUBTASK 29-11-20-860-010

- (1) For the right hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-20-040-003



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) For the right engine, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-20-010-002

- (3) For the right engine strut, do this task: Aft Fairing Removal, TASK 54-52-04-000-801.

SUBTASK 29-11-20-860-011

- (4) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

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SUBTASK 29-11-20-680-002

- (5) To drain the fluid from the right system reservoir assembly [170], do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

D. Right System Reservoir Removal

SUBTASK 29-11-20-020-017

- (1) Do these steps to remove the tubes along the left side of the right system reservoir assembly [170] (referred to as the reservoir assy in this procedure):
- (a) Disconnect each end of tube assembly [142], tube assembly [143], tube assembly [144], and tube assembly [146].
 - (b) Remove the screw [134], screw [139], screw [154], and screw [158] at the bracket [241] and the bracket [244] on the left side of the reservoir assembly [170].
 - (c) Remove the tube assembly [142], tube assembly [143], tube assembly [144], and tube assembly [146].
 - (d) Remove these components from the tube assembly [142], tube assembly [143], tube assembly [144], and tube assembly [146].
 - 1) The aft clamp block assembly which has these components:
 - a) block [161]
 - b) block [162]
 - c) block [163]
 - d) channels [157]
 - e) spacer [156]
 - f) spacer [160].
 - 2) The forward clamp block assembly which has these components:
 - a) block [131]
 - b) block [132]
 - c) block [133]
 - d) channels [138]
 - e) spacer [136]
 - f) spacer [141]
 - (e) Install caps on all the open tubes and the tubes which you removed, to prevent contamination.
 - (f) Install caps on the open ports of the hydraulic components from which you disconnected the tube assembly [142], tube assembly [143], tube assembly [144], and tube assembly [146], to prevent contamination.

SUBTASK 29-11-20-020-018

- (2) Disconnect the electrical connector [137] from the reservoir temperature transducer.

SUBTASK 29-11-20-020-019

- (3) Disconnect the electrical connector [153] from the reservoir quantity transmitter.

SUBTASK 29-11-20-020-020

- (4) Install caps on the electrical connectors [137] and [153] to prevent contamination or damage.

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SUBTASK 29-11-20-020-021

- (5) Install caps on the reservoir quantity transmitter and the reservoir temperature transducer, to prevent contamination or damage.

SUBTASK 29-11-20-020-022

- (6) Disconnect these hoses from the reservoir assembly [170]:
 - (a) Hose [152] for the supply of the alternating current motor pump (ACMP)
 - (b) Hose [164] for the supply of the engine-driven pump (EDP)
 - (c) Hose [165] for the fluid return.

SUBTASK 29-11-20-020-023

- (7) Do these steps to remove the tube assembly [148]:
 - (a) Disconnect the tube assembly [148] from the valve [147].
 - (b) Remove the clamp [150] from the coupling [149] on the tube assembly [148].
 - (c) Disconnect the coupling [149] from the tube [151].
 - (d) Remove the tube assembly [148] with the coupling [149].

SUBTASK 29-11-20-020-024

- (8) Do these steps to remove the tube assembly [166] and the jumper assembly [171]:
 - (a) Remove the screws [168] from the clamp [167].
 - (b) Remove the clamp [167] from the tube assembly [166].
 - (c) Remove the screw [177] which attaches the jumper assembly [171] to the reservoir assembly [170].
 - (d) Remove the screw [181] which attaches the to the jumper assembly [171] to the reservoir pressure switch [172].
 - (e) Disconnect the elbow [182] on the tube assembly [166] from the reservoir assembly [170].
 - (f) Disconnect the tube assembly [166] from the T-fitting [173].
 - (g) Remove these components together:
 - 1) elbow [182]
 - 2) tube assembly [166]
 - 3) jumper assembly [171]
 - 4) clamp [185]
 - 5) clamp [189]
 - 6) screw [186]
 - 7) washers [187]
 - 8) nut [188].

SUBTASK 29-11-20-020-025

- (9) Do these steps to remove the valve [147]:
 - (a) Remove the bolt [190] from the clamp [184] which holds the valve [147].
 - (b) Remove the valve [147] from the reservoir assembly [170].

SUBTASK 29-11-20-020-026

- (10) Install caps on the open ports of the reservoir assembly [170] to prevent contamination.

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SUBTASK 29-11-20-020-027

- (11) Install caps on the tube [151] and tube assembly [166] and the hoses [152], [164] and [165], to prevent contamination.

SUBTASK 29-11-20-020-028

- (12) Hold the reservoir assembly [170] with your hands while you do these steps to disconnect it from the brackets [212], [213] and [229] on the nacelle support fittings:
- (a) Remove the bolt [192] at the bracket [212] on the inboard nacelle support fitting.
 - (b) Remove the bolt [216] at the bracket [213] on the outboard nacelle support fitting.
 - (c) Remove the bolt [230] at the bracket [229] on the outboard nacelle support fitting.

SUBTASK 29-11-20-020-029

- (13) Do these steps to remove the bracket assembly [199], bracket assembly [222], bracket assembly [233], bracket [241], and bracket [244] from the reservoir assembly [170]:
- (a) Remove the bolts [202] and bolts [203] which attach the bracket assembly [199] to the reservoir assembly [170].
 - 1) Remove the bracket assembly [199] and the shim [200] from the reservoir assembly [170].
 - (b) Remove the bolts [218] and bolts [219] which attach the bracket assembly [222] to the reservoir assembly [170].
 - 1) Remove the bracket assembly [222] and the shim [221] from the reservoir assembly [170].
 - (c) Remove the bolts [225] and bolts [236] which attach the bracket assembly [233] to the reservoir assembly [170].
 - 1) Remove the bracket assembly [233] and the shim [234] from the reservoir assembly [170].
 - (d) Remove the bolts [238] and bolts [240] which attach the bracket [241] to the reservoir assembly [170].
 - 1) Remove the bracket [241] from the reservoir assembly [170].
 - (e) Remove the bolts [242] and bolts [246] which attach the bracket [244] to the reservoir assembly [170].
 - 1) Remove the bracket [244] from the reservoir assembly [170].

SUBTASK 29-11-20-020-030

- (14) Do these steps to remove the reservoir assembly [170] from the aft strut:



WARNING

BE CAREFUL WHEN YOU TURN THE RESERVOIR SO THAT THE REMAINING FLUID IN THE RESERVOIR DOES NOT FLOW ON YOU. HYDRAULIC FLUID, BMS 3-11, CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (a) Turn the reservoir assembly [170] (around its vertical axis) to find the best position in which to remove it between the outboard nacelle support fitting and the diagonal brace.
- (b) Turn the reservoir assembly [170] (around its horizontal axis) to move the bottom of the reservoir assembly [170] outboard between the outboard nacelle support fitting and the diagonal brace.

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- (c) Continue to turn the reservoir assembly [170] while you move it outboard, until it is in a horizontal position as it comes out of the aft strut.

SUBTASK 29-11-20-020-031

- (15) If it is necessary to keep components for installation on the replacement reservoir assembly [170], do these steps:
 - (a) Do this task: Reservoir Drain Valve Removal, TASK 29-11-22-000-801.
 - (b) Do this task: Reservoir Sample Valve Removal, TASK 29-11-23-000-801.
 - (c) Do this task: Reservoir Temperature Transducer Removal, TASK 29-32-01-000-801.
 - (d) Do this task: Reservoir Quantity Transmitter Removal, TASK 29-33-02-000-801.
 - (e) Install caps on the open ports on the reservoir assembly [170] to prevent contamination.

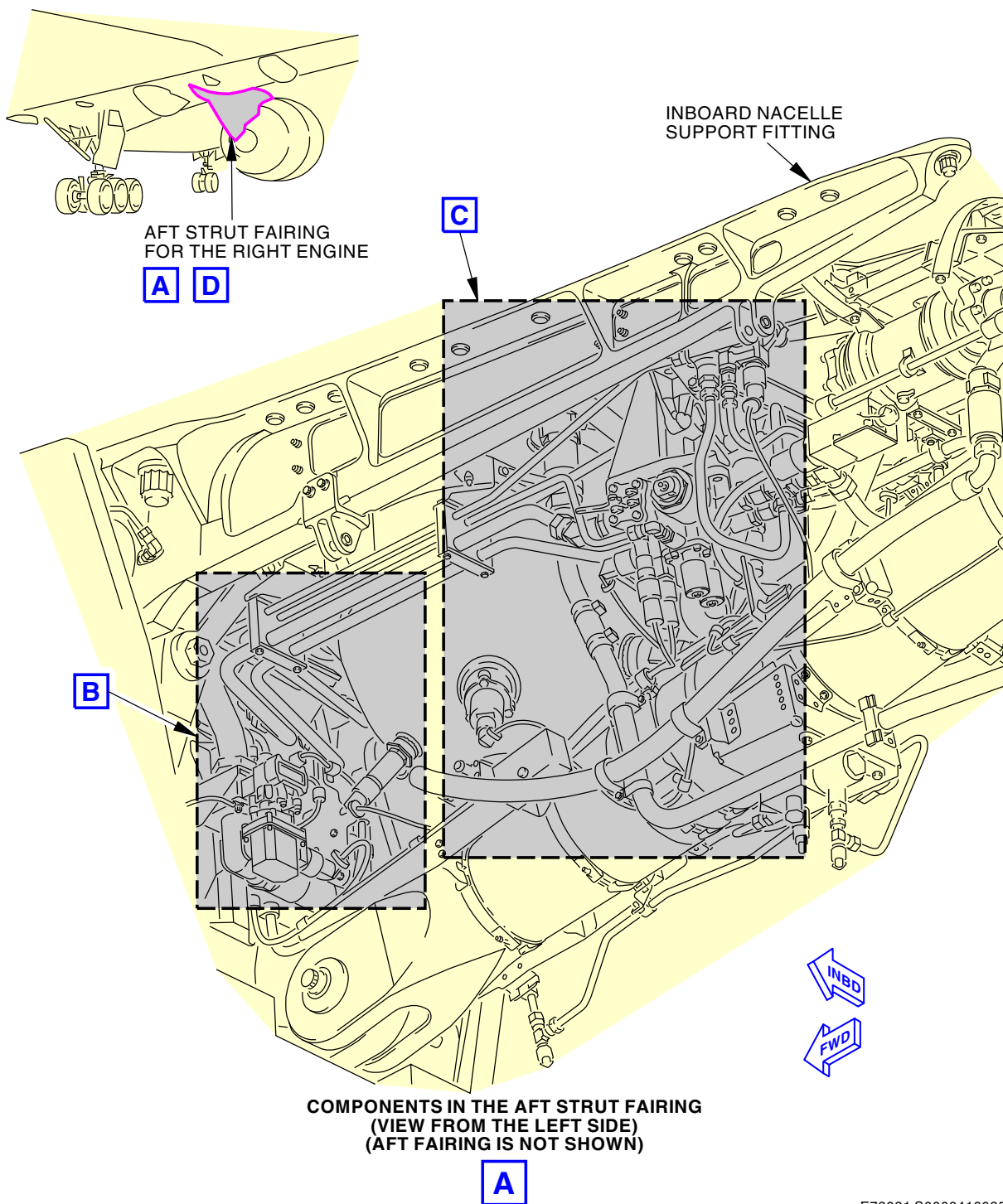
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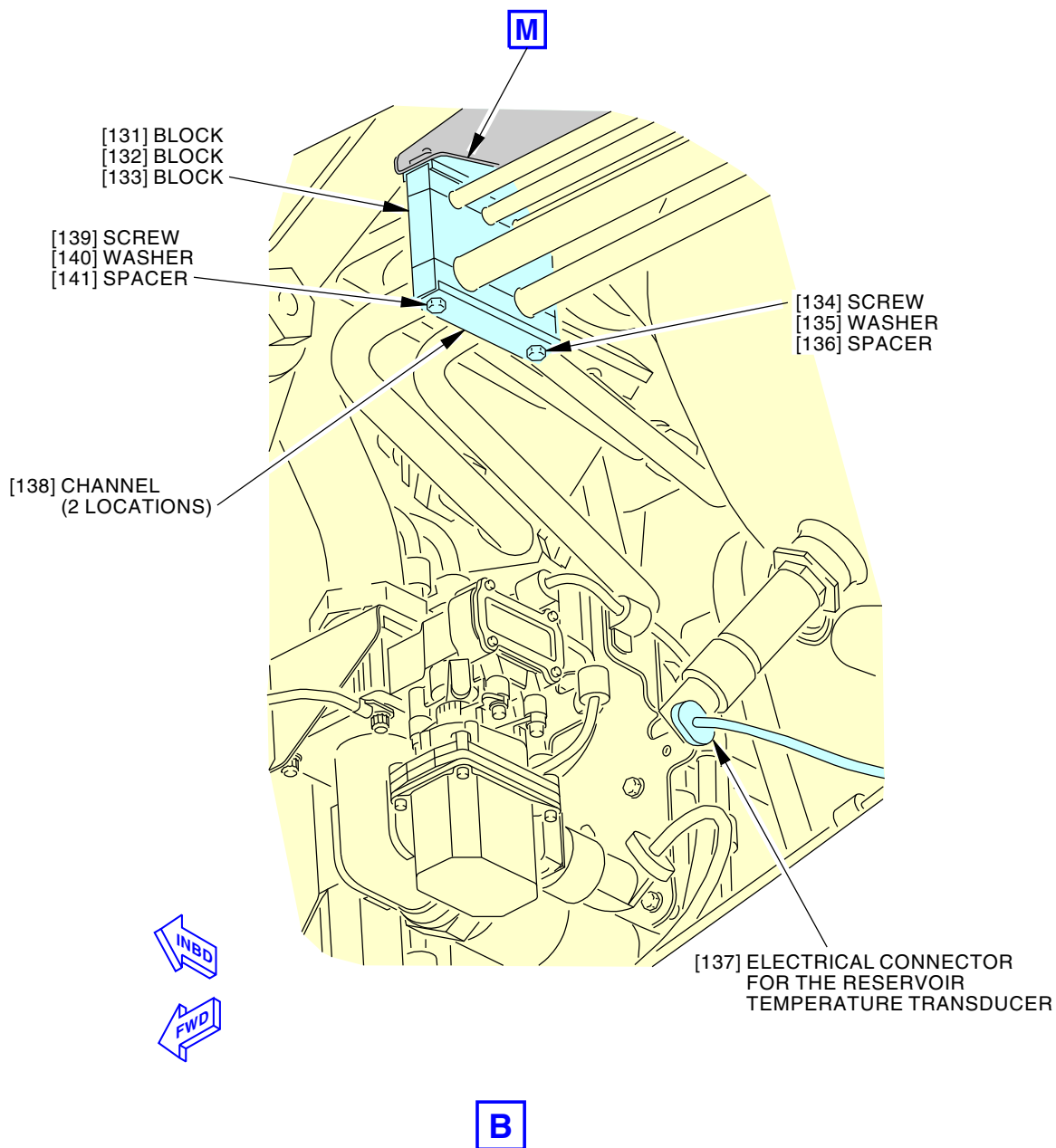
**Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 1 of 12)**

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E72172 S0006416026_V2

**Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 2 of 12)**

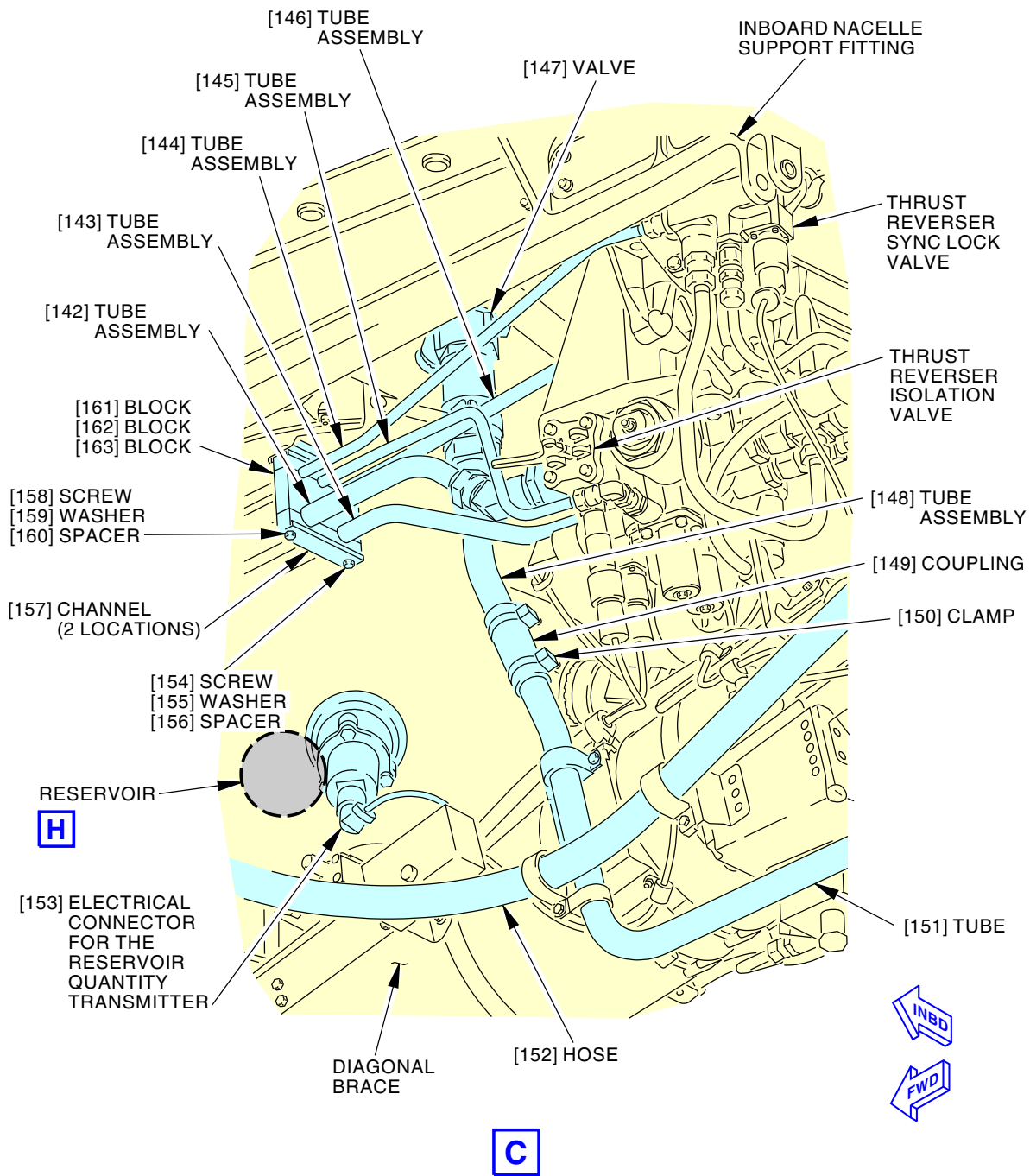
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E72193 S0006416027_V2

Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 3 of 12)

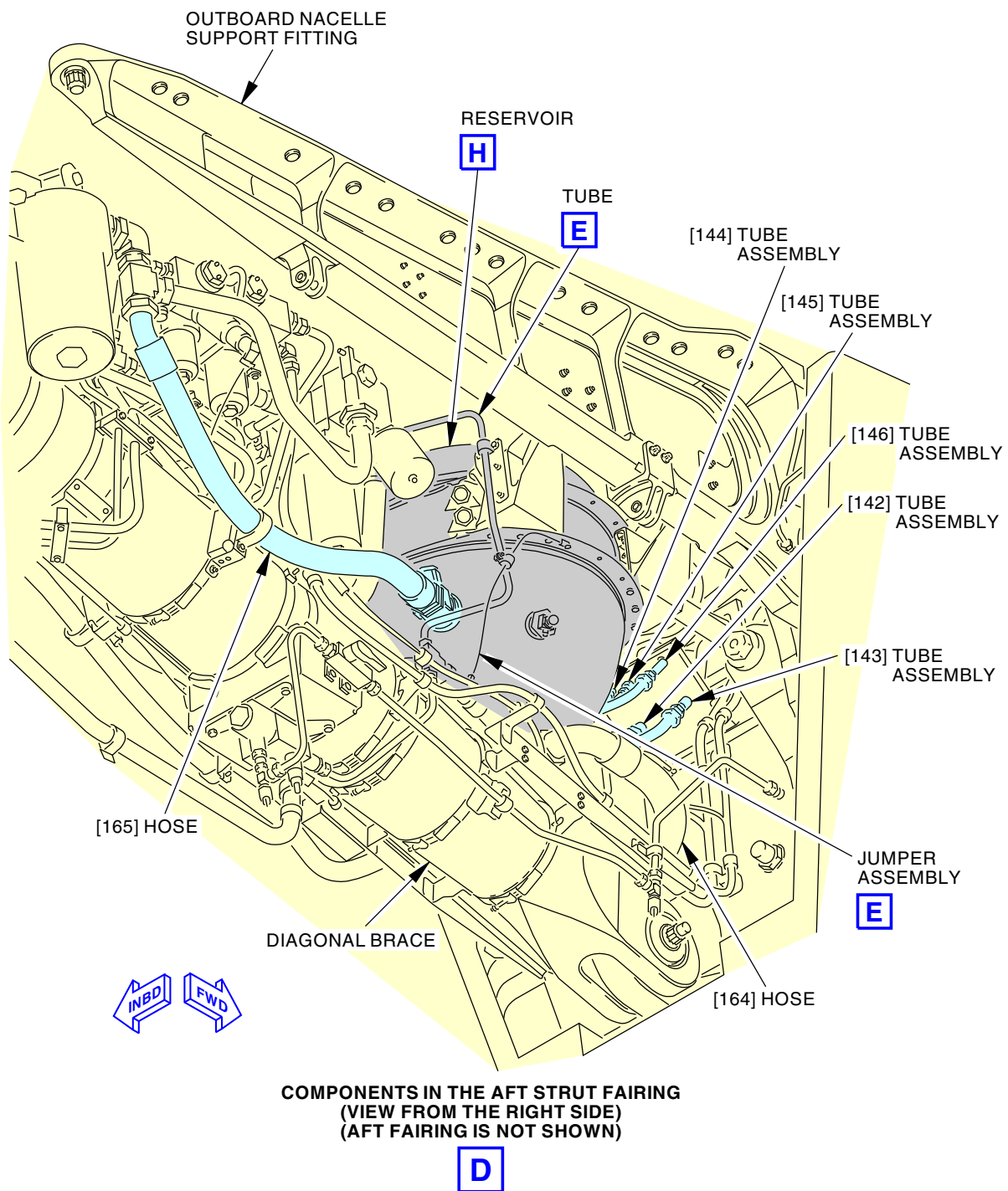
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**Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 4 of 12)**

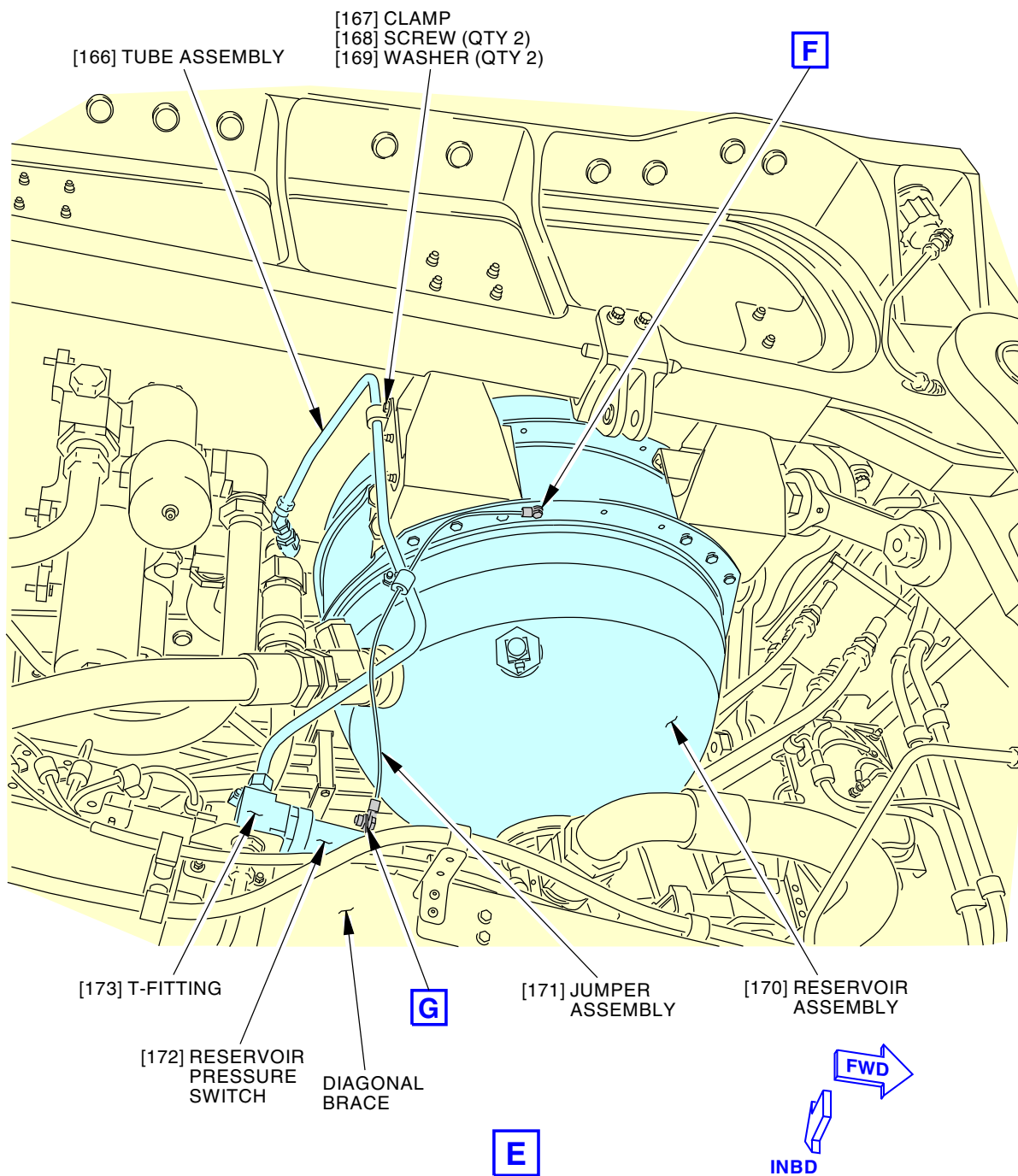
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**Right System Reservoir Installation
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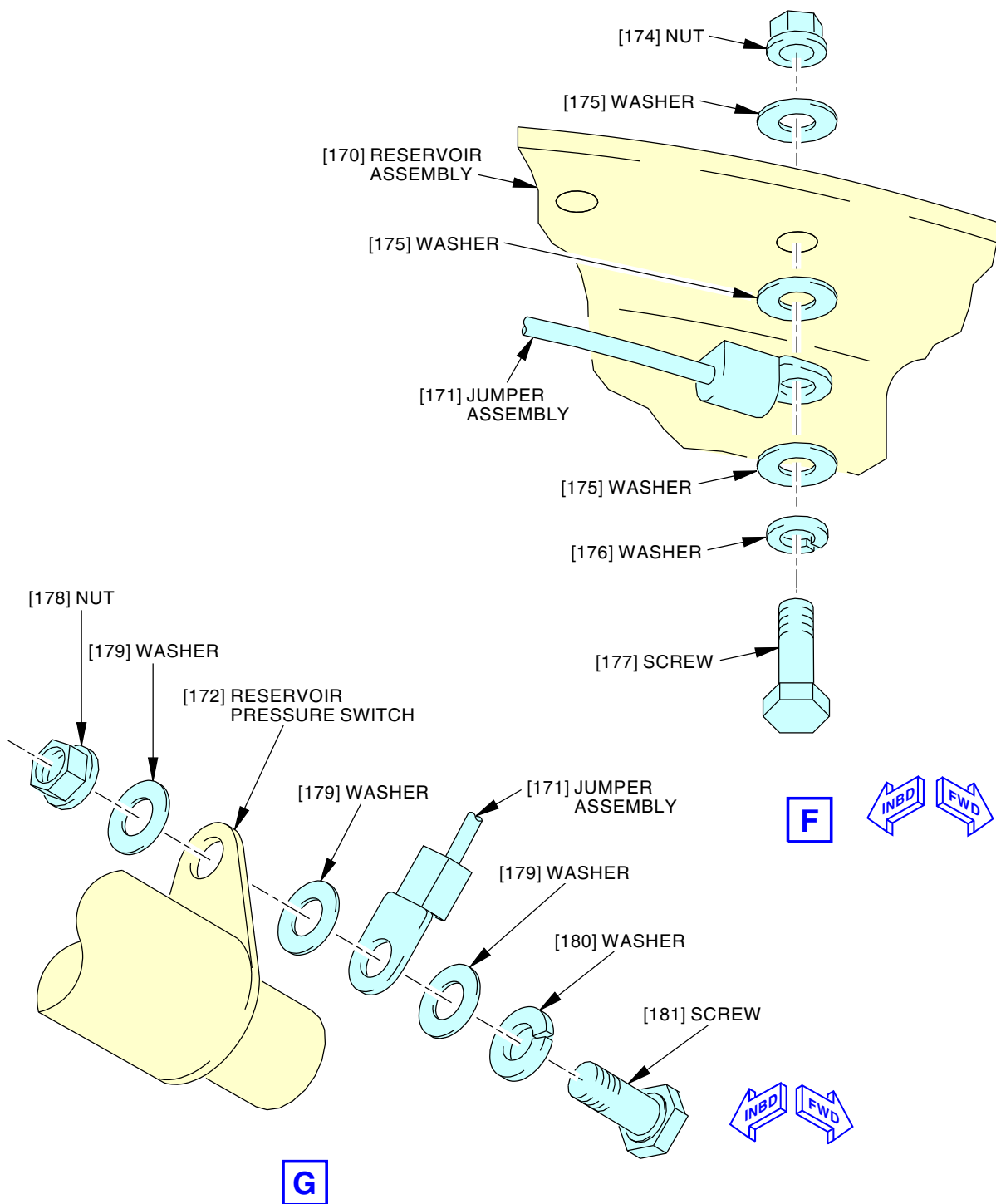
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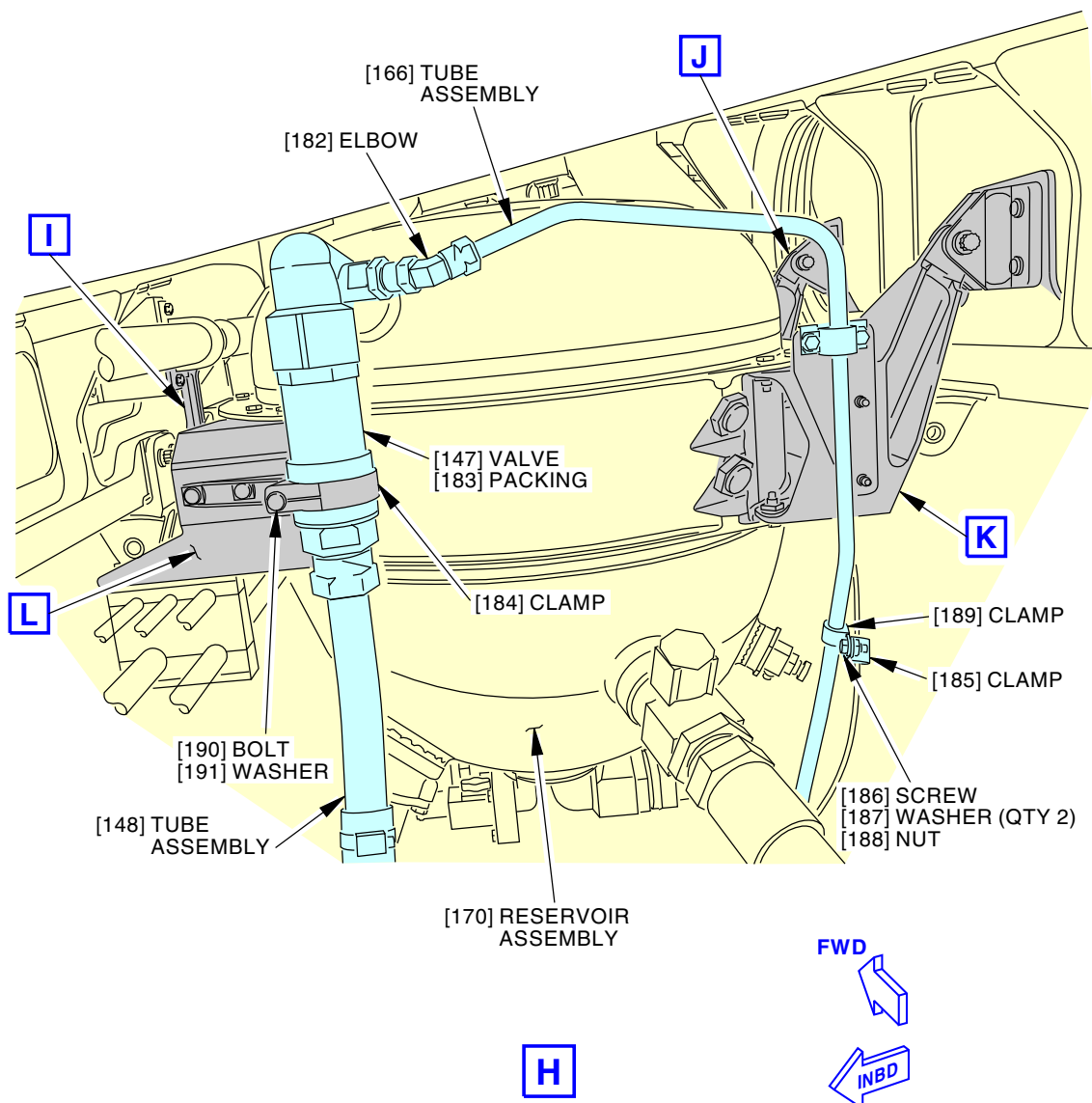
**Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 6 of 12)**

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E73272 S0006416031_V2

**Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 7 of 12)**

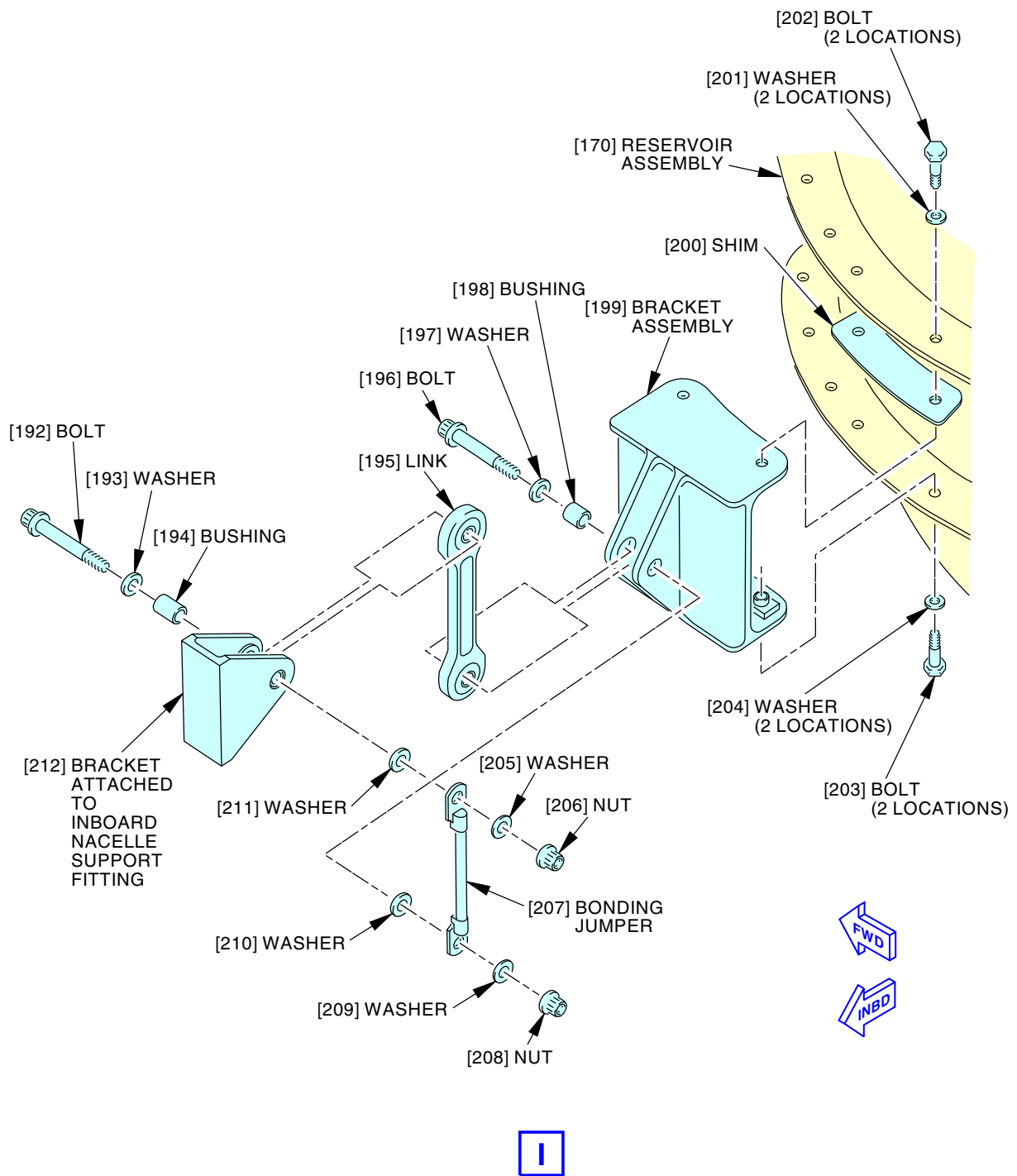
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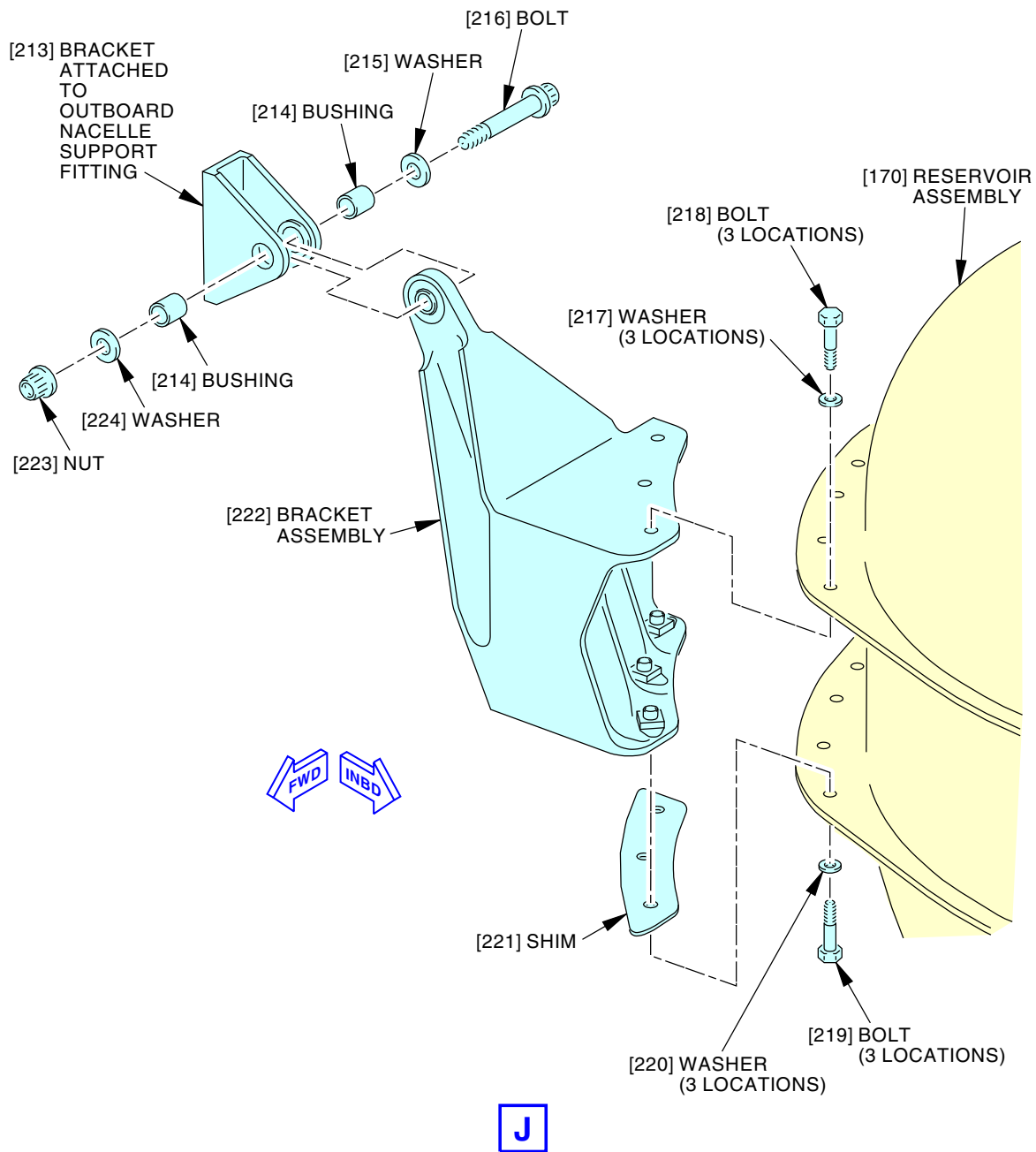
Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 8 of 12)

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E73752 S0006416033_V2

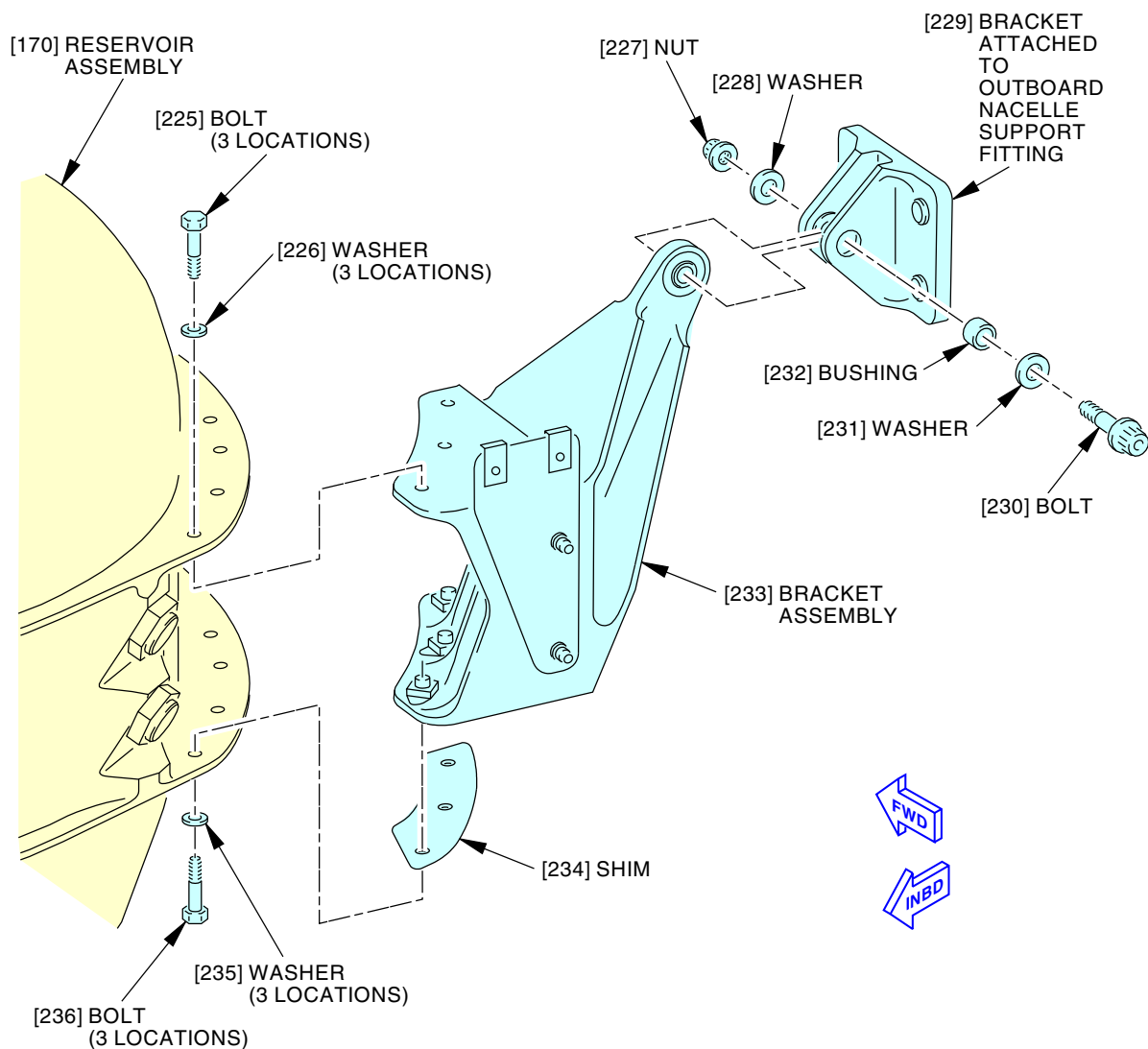
**Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 9 of 12)**

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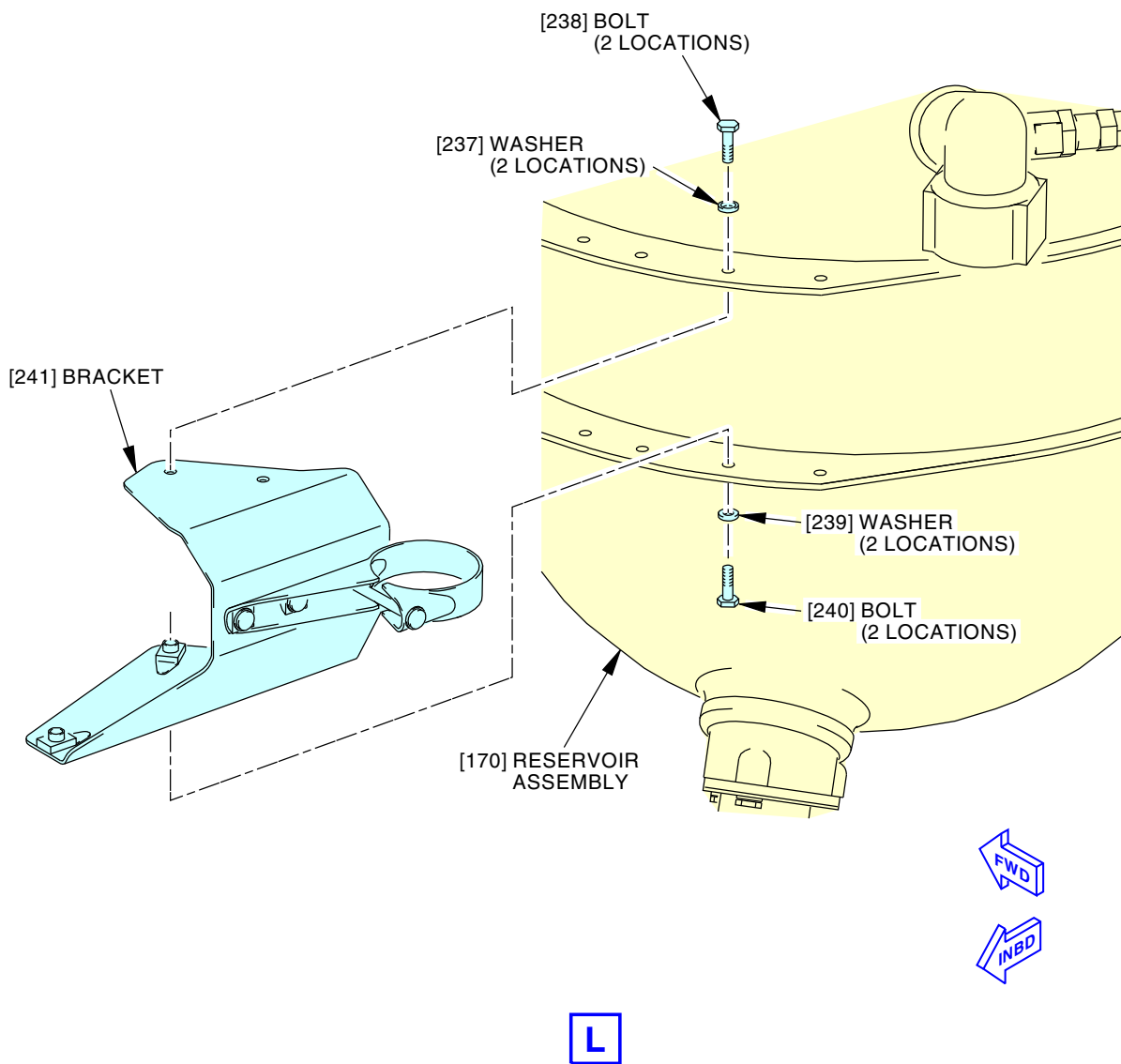
**Right System Reservoir Installation
Figure 402/29-11-20-990-802 (Sheet 10 of 12)**

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E74038 S0006416035_V2

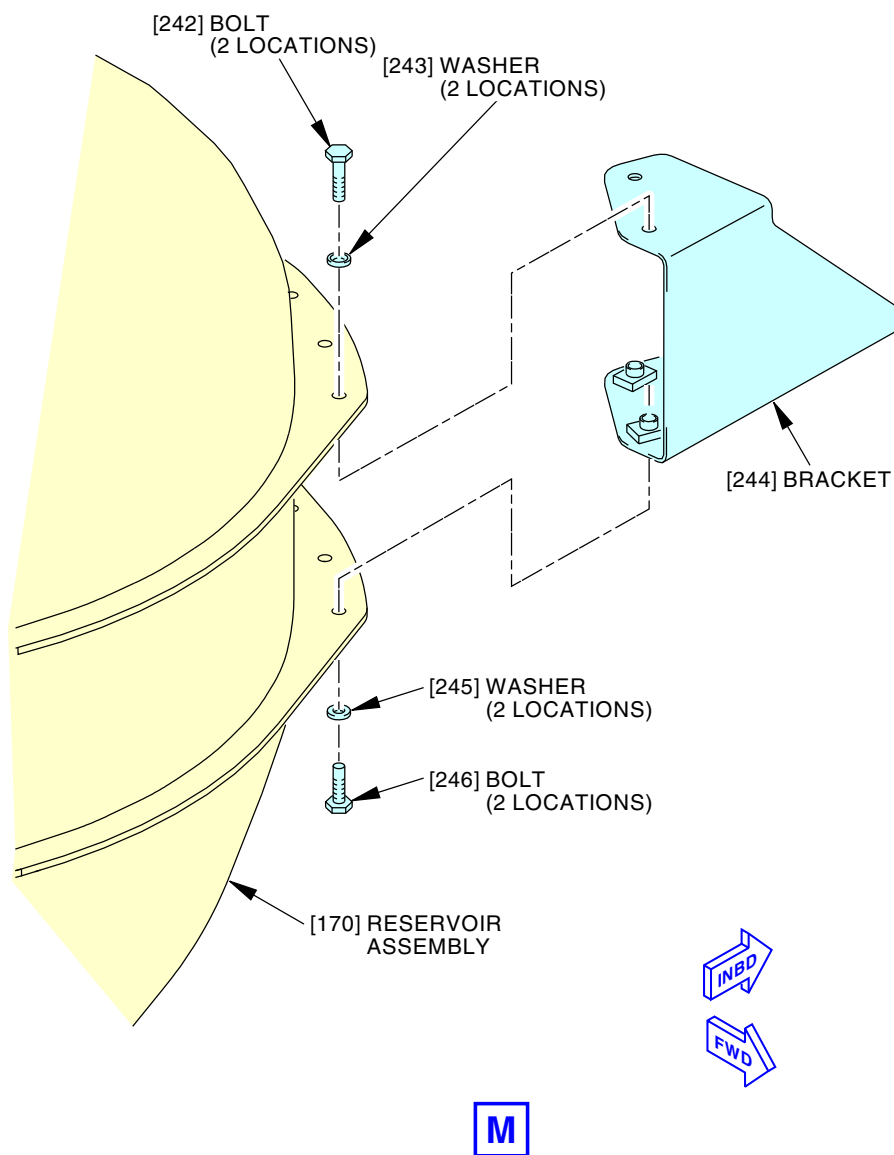
Right System Reservoir Installation
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E74095 S0006416036_V2

**Right System Reservoir Installation
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TASK 29-11-20-400-802

5. Right System Reservoir Installation

(Figure 402)

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-804	Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
29-11-22-400-801	Reservoir Drain Valve Installation (P/B 401)
29-11-23-400-801	Reservoir Sample Valve Installation (P/B 401)
29-32-01-400-801	Reservoir Temperature Transducer Installation (P/B 401)
29-33-02-400-801	Reservoir Quantity Transmitter Installation (P/B 401)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
54-52-04-400-801	Aft Fairing Installation (P/B 401)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-710-821-H00	Thrust Reverser - Operational Test (Engine Not In Operation) (P/B 501)
SWPM 20-20-00	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.

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
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	

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Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
170	Reservoir assembly	29-11-20-01-080 29-11-20-04-195	ARO ALL ARO ALL
183	Packing	29-11-24-01-025	ARO ALL

E. Location Zones

Zone	Area
444	Aft Strut Fairing - Right Nacelle Strut

F. Right System Reservoir Installation

SUBTASK 29-11-20-120-003

- (1) Prepare the mating surfaces of the right system reservoir assembly [170] (referred to as the reservoir assembly [170] in this procedure) and the bracket assembly [199] for an electrical bond (SWPM 20-20-00).

NOTE: The maximum resistance across this electrical bond is 0.0025 ohms.

SUBTASK 29-11-20-120-004

- (2) Prepare the mating surfaces of the jumper [207] and the bracket [212] for an electrical bond (SWPM 20-20-00).

NOTE: The maximum resistance across this electrical bond is 0.0025 ohms.

SUBTASK 29-11-20-420-016

- (3) If it is necessary to install the components on the replacement reservoir assembly [170], do these steps:
 - (a) Remove the caps from the ports on the reservoir assembly [170].
 - (b) Do this task: Reservoir Drain Valve Installation, TASK 29-11-22-400-801.
 - (c) Do this task: Reservoir Sample Valve Installation, TASK 29-11-23-400-801.
 - (d) Do this task: Reservoir Temperature Transducer Installation, TASK 29-32-01-400-801.
 - (e) Do this task: Reservoir Quantity Transmitter Installation, TASK 29-33-02-400-801.

SUBTASK 29-11-20-420-017

- (4) Do these steps to move the reservoir assembly [170] into the aft strut:

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BE CAREFUL WHEN YOU TURN THE RESERVOIR SO THAT THE REMAINING FLUID IN THE RESERVOIR DOES NOT FLOW ON YOU. HYDRAULIC FLUID, BMS 3-11, CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (a) Turn the reservoir assembly [170] (around its vertical axis) to find the best position in which to move it between the outboard nacelle support fitting and the diagonal brace.
- (b) Hold the reservoir assembly [170] in a horizontal position while you move the top of the reservoir assembly [170] between the outboard nacelle support fitting and the diagonal brace.
- (c) Turn the reservoir assembly [170] (around its horizontal axis) to lower the bottom while you move the top of the reservoir assembly [170] up into the aft strut.
- (d) Continue to move the reservoir assembly [170] between the outboard nacelle support fitting and the diagonal brace until it is in a vertical position in the aft strut.

SUBTASK 29-11-20-420-018

- (5) Do these steps to install the bracket assembly [199], bracket assembly [222], bracket assembly [233], bracket [241] and bracket [244] on the reservoir assembly [170]:
 - (a) Put the bracket [244] on the reservoir assembly [170].
 - 1) Install the bolts [242], bolts [246], washers [243], and washers [245] that attach the bracket [244] to the reservoir assembly [170].
 - (b) Put the bracket [241] on the reservoir assembly [170].
 - 1) Install the bolts [238], bolts [240], washers [237], and washers [239] that attach the bracket [241] to the reservoir assembly [170].
 - (c) Put the bracket assembly [233] on the reservoir assembly [170].
 - 1) If it is necessary, install the shim [234] between the reservoir assembly [170] and the bracket assembly [233].

NOTE: The maximum clearance between the reservoir assembly [170] and the bracket assembly [233] is 0.010 inch.

 - a) If you remove the laminations from the shim [234] apply primer, C00259 to the shim [234].
 - 2) Install the bolts [225], bolts [236], washers [226], and washers [235] that attach the bracket assembly [233] to the reservoir assembly [170].
 - (d) Put the bracket assembly [222] on the reservoir assembly [170].
 - 1) If it is necessary, install the shim [221] between the bracket assembly [222] and the reservoir assembly [170].

NOTE: The maximum clearance between the reservoir assembly [170] and the bracket assembly [222] is 0.010 inch.

 - a) If you remove the laminations from the shim [221], apply primer, C00259 to the shim [221].
 - 2) Install the bolts [218], bolts [219], washers [217] and washers [220] to attach the bracket assembly [222] to the reservoir assembly [170].
 - (e) Put the bracket assembly [199] on the reservoir assembly [170].

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- 1) If it is necessary, install the shim [200] between the reservoir assembly [170] and the bracket assembly [199].

NOTE: The maximum clearance between the reservoir assembly [170] and the bracket assembly [199] is 0.010 inch.

- a) If you remove the laminations from the shim [200], apply primer, C00259 to the shim [200].

SUBTASK 29-11-20-420-019

- (6) Do these steps to connect the reservoir assembly [170] to the brackets [212], [213] and [229] on the nacelle support fittings:

- (a) Install these components to attach the bracket assembly [222] on the reservoir assembly [170] to the bracket [213] on the outboard nacelle support fitting:

- 1) bolt [216]
- 2) washer [215]
- 3) washer [224]
- 4) bushings [214]
- 5) nut [223].

- (b) Install these components to attach the bracket assembly [233] on the reservoir assembly [170] to the bracket [229] on the outboard nacelle support fitting:

- 1) bolt [230]
- 2) washer [231]
- 3) washer [228]
- 4) bushing [232]
- 5) nut [227].

- (c) Install these components to attach the link [195] and the bonding jumper [207] on the reservoir assembly [170] to the bracket [212] on the inboard nacelle support fitting:

- 1) bolt [192]
- 2) washer [193]
- 3) washer [205]
- 4) washer [211]
- 5) bushing [194]
- 6) nut [206].

SUBTASK 29-11-20-420-020

- (7) Remove the caps from the tube [151], tube assembly [166], and the hoses [152], [164] and [165].

SUBTASK 29-11-20-420-021

- (8) Remove the caps from the ports on the reservoir assembly [170].

SUBTASK 29-11-20-420-022

- (9) Do these steps to install the valve [147]:

- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [183] and to the threads on the reservoir pressure relief valve [147] (referred to as the valve [147] in this procedure).

- (b) Install the new packing [183] on the valve [147].

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- (c) Install the valve [147] in the port on the reservoir assembly [170].
- (d) Install the bolt [190] and the washer [191] in the clamp [184].

SUBTASK 29-11-20-420-023

- (10) Do these steps to install the assembly of the tube assembly [166] and the jumper assembly [171]:

NOTE: This assembly has these parts; tube assembly [166], elbow [182], jumper assembly [171], clamp [185], clamp [189], screw [186], washers [187], and nut [188].

- (a) Connect the elbow [182] on the tube assembly [166] to the reservoir assembly [170].
- (b) Connect the end of the tube assembly [166] to the T-fitting [173].
- (c) Install the clamp [167] on the tube assembly [166].
- (d) Install the screws [168] and washers [169] that attach the clamp [167] to the reservoir assembly [170].
- (e) Prepare the mating surfaces of the jumper assembly [171], the flange on the reservoir assembly [170], and the reservoir pressure switch [172] for an electrical bond (SWPM 20-20-00).
- (f) Install the screw [177], washers [175], washer [176] and the nut [174] that attach the jumper assembly [171] to the flange on the reservoir assembly [170].
- (g) Install the screw [181], washers [179], washer [180], and nut [178] that attach the jumper assembly [171] to the reservoir pressure switch [172].
- (h) With the intrinsically safe approved bonding meter, COM-1550, make sure the maximum resistance between the flange on the reservoir assembly [170] and the reservoir pressure switch [172] is 0.008 ohms (SWPM 20-20-00).

SUBTASK 29-11-20-420-024

- (11) Do these steps to install the tube assembly [148]:
 - (a) Remove the cap from the tube [151].
 - (b) Push the coupling [149] (with the tube assembly [148] attached) on the tube [151].
 - (c) Connect the tube assembly [148] to the valve [147].
 - (d) Install the clamp [150] on the coupling [149].

SUBTASK 29-11-20-010-003

- (12) Remove the caps from the hoses [152], [164] and [165].

SUBTASK 29-11-20-020-032

- (13) Connect the hose [152], hose [164] and hose [165] to the reservoir assembly [170]:
 - (a) Tighten the B-nut on the hose [152] for the supply of the alternating current motor pump (ACMP) to a torque of 450 $\pm$ 23 in-lb (51 $\pm$ 3 N·m).
 - (b) Tighten the B-nut on the hose [164] for the supply of the engine-driven pump (EDP) to a torque of 900 $\pm$ 45 in-lb (102 $\pm$ 5 N·m).
 - (c) Tighten the B-nut on the hose [165] for the fluid return to a torque of 750 in-lb (85 N·m).

SUBTASK 29-11-20-420-025

- (14) Remove the caps from the reservoir temperature transducer and the reservoir quantity transmitter.

SUBTASK 29-11-20-420-026

- (15) Remove the caps from the electrical connectors [137] and [153] for the reservoir temperature transducer and the reservoir quantity transmitter.

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SUBTASK 29-11-20-420-027

- (16) Connect the electrical connector [137] to the reservoir temperature transducer.

SUBTASK 29-11-20-420-028

- (17) Connect the electrical connector [153] to the reservoir quantity transmitter.

SUBTASK 29-11-20-420-029

- (18) Do these steps to install the tubes along the left side of the reservoir assembly [170]:
- Remove the caps from the ports of the hydraulic components and the tubes from which you removed the tube assembly [142], tube assembly [143], tube assembly [144], tube assembly [145], and tube assembly [146].
 - Remove the caps from the tube assembly [142], tube assembly [143], tube assembly [144], tube assembly [145], and tube assembly [146].
 - Assemble these components on the tube assembly [142], tube assembly [143], tube assembly [144], tube assembly [145], and tube assembly [146]:
 - The aft clamp block assembly which has these components:
 - block [161]
 - block [162]
 - block [163]
 - channels [157]
 - The forward clamp block assembly which has these components:
 - block [131]
 - block [132]
 - block [133]
 - channels [138]
 - While you hold the tube assembly [142], tube assembly [143], tube assembly [144], tube assembly [145], and tube assembly [146] in their position in the aft strut fairing, do these steps:

NOTE: Do not tighten the screw [134], screw [139], screw [154], and screw [158] until you connect the tube assembly [142], tube assembly [143], tube assembly [144], tube assembly [145], and tube assembly [146].

- Install these components at the inboard end of the forward clamp block assembly:
 - screw [139]
 - spacer [141]
 - washer [140].
- Install these components at the outboard end of the forward clamp block assembly:
 - screw [134]
 - spacer [136]
 - washer [135].
- Install these components at the inboard end of the aft clamp block assembly:
 - screw [158]
 - spacer [160]
 - washer [159].

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- 4) Install these components at the outboard end of the aft clamp block assembly:
 - a) screw [154]
 - b) spacer [156]
 - c) washer [155].
- (e) Connect each end of the tube assembly [142], tube assembly [143], tube assembly [144], tube assembly [145], and tube assembly [146].
- (f) Tighten the screw [134], screw [139], screw [154], and screw [158].

G. Right System Reservoir Installation Test

SUBTASK 29-11-20-860-012

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

SUBTASK 29-11-20-860-013

- (2) On the front of the right systems card file, P85, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-20-610-002

- (3) For the reservoir assembly [170] in the right hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.
 - (a) While you fill the reservoir assembly [170], do these steps:
 - 1) Monitor the reservoir quantity gage at the ground service bay.
 - 2) Make sure the indication, on the reservoir quantity gage, increases while you fill the reservoir assembly [170].

SUBTASK 29-11-20-860-014

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-20-210-002

- (5) Make sure the HYDRAULIC RESERVOIR TEMP R indication, on the EICAS maintenance page, shows a value for the hydraulic fluid temperature.

NOTE: It is not necessary to do a check of the precision of the
HYDRAULIC RESERVOIR TEMP R value which shows.

SUBTASK 29-11-20-860-015

- (6) For the reservoir assembly [170] in the Right hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-20-790-006

- (7) Make sure there is no hydraulic fluid leakage at the hydraulic tube and hose connections on the reservoir assembly [170].

SUBTASK 29-11-20-790-007

- (8) Make sure there is no hydraulic fluid leakage at these components on the reservoir assembly [170]:
 - (a) Sight glasses
 - (b) Sample valve
 - (c) Drain valve
 - (d) Temperature transducer
 - (e) Quantity transmitter.

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SUBTASK 29-11-20-790-008

- (9) Make sure there is no air leakage at the valve [147] or at each end of the tube assembly [148].

SUBTASK 29-11-20-860-016

- (10) For the right hydraulic system, do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.

SUBTASK 29-11-20-790-009

- (11) Make sure there is no hydraulic fluid leakage at each end of the tube assembly [146] for the case drain of the engine-driven pump.

SUBTASK 29-11-20-860-017

- (12) For the right hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-11-20-440-003

- (13) For the right engine, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-11-20-790-010

- (14) For the right engine, do this task: Thrust Reverser - Operational Test (Engine Not In Operation), TASK 78-31-00-710-821-H00.
- (a) Operate the thrust reverser a minimum of three full cycles.
- (b) Make sure there is no hydraulic fluid leakage at each end of the tube assembly [142], tube assembly [143], tube assembly [144], and tube assembly [145].

SUBTASK 29-11-20-040-004



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (15) For the right engine, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-20-110-002



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-20-410-002

- (2) For the right engine strut, do this task: Aft Fairing Installation, TASK 54-52-04-400-801.

SUBTASK 29-11-20-440-004

- (3) For the right engine, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

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CENTER SYSTEM RESERVOIR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the center system reservoir
 - (2) An installation of the center system reservoir.

TASK 29-11-21-000-801

2. Center System Reservoir Removal

(Figure 401)

A. 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)
29-11-22-000-801	Reservoir Drain Valve Removal (P/B 401)
29-11-23-000-801	Reservoir Sample Valve Removal (P/B 401)
29-11-24-000-801	Reservoir Pressure Relief Valve Removal (P/B 401)
29-32-01-000-801	Reservoir Temperature Transducer Removal (P/B 401)
29-33-02-000-801	Reservoir Quantity Transmitter Removal (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-21-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-21-010-001



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-21-860-001

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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SUBTASK 29-11-21-860-002

- (4) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-21-680-001

- (5) To drain the fluid from the reservoir assembly [25], do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

D. Center System Reservoir Removal

SUBTASK 29-11-21-020-001

- (1) Disconnect the electrical connector [38] from the reservoir temperature transducer [39].

SUBTASK 29-11-21-020-002

- (2) Disconnect the electrical connector [35] from the reservoir quantity transmitter [32].

SUBTASK 29-11-21-020-003

- (3) Install caps on the electrical connectors [35] and [38] to prevent contamination or damage.

SUBTASK 29-11-21-020-004

- (4) Install caps on the reservoir temperature transducer [39] and the reservoir quantity transmitter [32] to prevent contamination or damage.

SUBTASK 29-11-21-020-005

- (5) Remove the nut [48] and washer [49] to disconnect the bonding jumper [50] from the reservoir assembly [25].

SUBTASK 29-11-21-020-013

- (6) Remove the tube assembly [18].

SUBTASK 29-11-21-020-014

- (7) Do these steps to remove the tube assembly [1], tube assembly [15], and union [17] together:
 - (a) Remove the screws [12] from the clamp [14].
 - (b) Remove the clamp [14] from the tube assembly [15].
 - (c) Disconnect the tube assembly [15] from the reservoir assembly [25].
 - (d) Disconnect the tube assembly [1] from the return filter module [4].
 - (e) Remove the tube assembly [1], tube assembly [15], and union [17] as an assembly.

SUBTASK 29-11-21-020-015

- (8) Do these steps to remove the tube assembly [10]:
 - (a) Remove the screws [8] from the clamp [7].
 - (b) Remove the clamp [7] from the tube assembly [10].
 - (c) Remove the tube assembly [10].

SUBTASK 29-11-21-020-016

- (9) Do these steps to remove the tube assembly [3]:
 - (a) Remove the screws [5] from the clamp [2].
 - (b) Remove the clamp [2] from the tube assembly [3].
 - (c) Remove the tube assembly [3].

SUBTASK 29-11-21-020-017

- (10) Do these steps to remove the tube assembly [19]:
 - (a) Remove the screws [22] from the clamps [24].

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- (b) Remove the clamps [24] from the tube assembly [19].
- (c) Loosen the clamp [21] on the tube [20].
- (d) Disconnect the tube assembly [19] from the reservoir assembly [25].
- (e) Remove the tube assembly [19] from the tube [20].

SUBTASK 29-11-21-020-006

- (11) Disconnect these tubes from the reservoir assembly [25]:
 - (a) Tube assy [44]
 - (b) Tube assy [16]
 - (c) Tube assy [11]

SUBTASK 29-11-21-020-007

- (12) Install caps on the openings in the reservoir assembly [25] and on the tube assembly [3], tube assy [16], tube assembly [10], tube assy [11], tube assembly [18], tube assembly [15], tube assembly [19], and tube [44] to prevent contamination.

SUBTASK 29-11-21-020-008

- (13) Hold the reservoir assembly [25] while you do these steps to disconnect it from the aft bulkhead of the right wheel well:
 - (a) Remove the bolt [53] from the bracket [57] at the top attachment of the reservoir assembly [25].
 - (b) Remove the bolt [68] from the bracket [67] at the bottom inboard attachment of the reservoir assembly [25].
 - (c) Remove the bolt [62] from the bracket [64] at the bottom outboard attachment of the reservoir assembly [25].
 - (d) Remove the bushing [58] from the bracket [64] at the bottom outboard attachment of the reservoir assembly [25].

SUBTASK 29-11-21-020-009

- (14) Remove the reservoir assembly [25] from the aft bulkhead of the right wheel well.

SUBTASK 29-11-21-020-010

- (15) If it is necessary, to keep the components for installation on the replacement reservoir, do these steps:
 - (a) To remove the reservoir drain valve [42], do this task: Reservoir Drain Valve Removal, TASK 29-11-22-000-801.
 - (b) To remove the reservoir sample valve [43], do this task: Reservoir Sample Valve Removal, TASK 29-11-23-000-801.
 - (c) To remove the reservoir pressure relief valve [47], do this task: Reservoir Pressure Relief Valve Removal, TASK 29-11-24-000-801.
 - (d) To remove the reservoir temperature transducer [39], do this task: Reservoir Temperature Transducer Removal, TASK 29-32-01-000-801.
 - (e) To remove the reservoir quantity transmitter [32], do this task: Reservoir Quantity Transmitter Removal, TASK 29-33-02-000-801.

SUBTASK 29-11-21-020-011

- (16) If it is necessary, remove the union [26] and packing [27], union [28] and packing [29], union [33] and packing [34], union [36] and packing [37], union [40] and packing [41], and union [45] and packing [46] from the reservoir assembly [25].

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SUBTASK 29-11-21-020-012

- (17) Install caps on the ports in the reservoir assembly [25] to prevent contamination.

————— **END OF TASK** —————

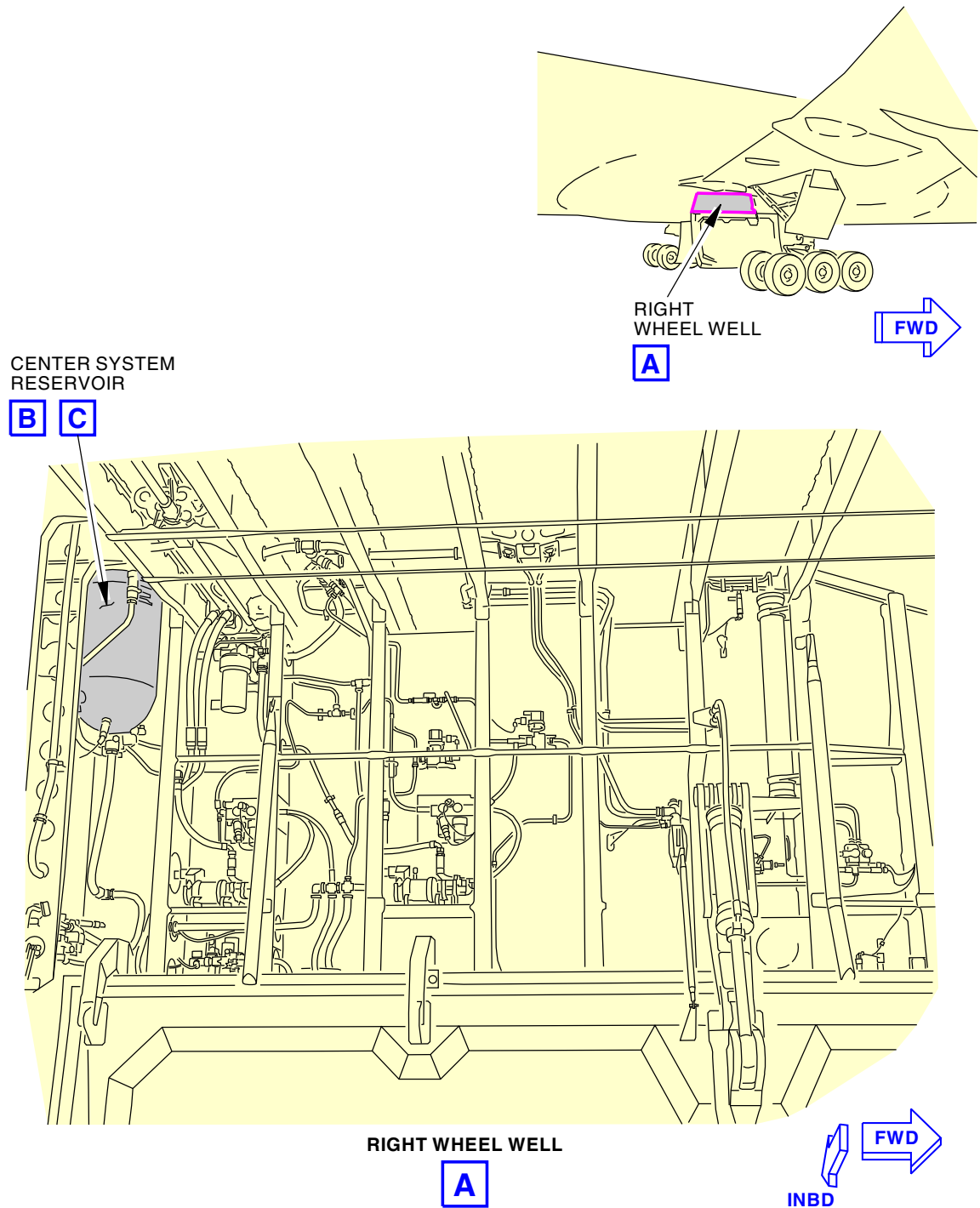
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C76198 S0006416041_V2

Center System Reservoir Installation
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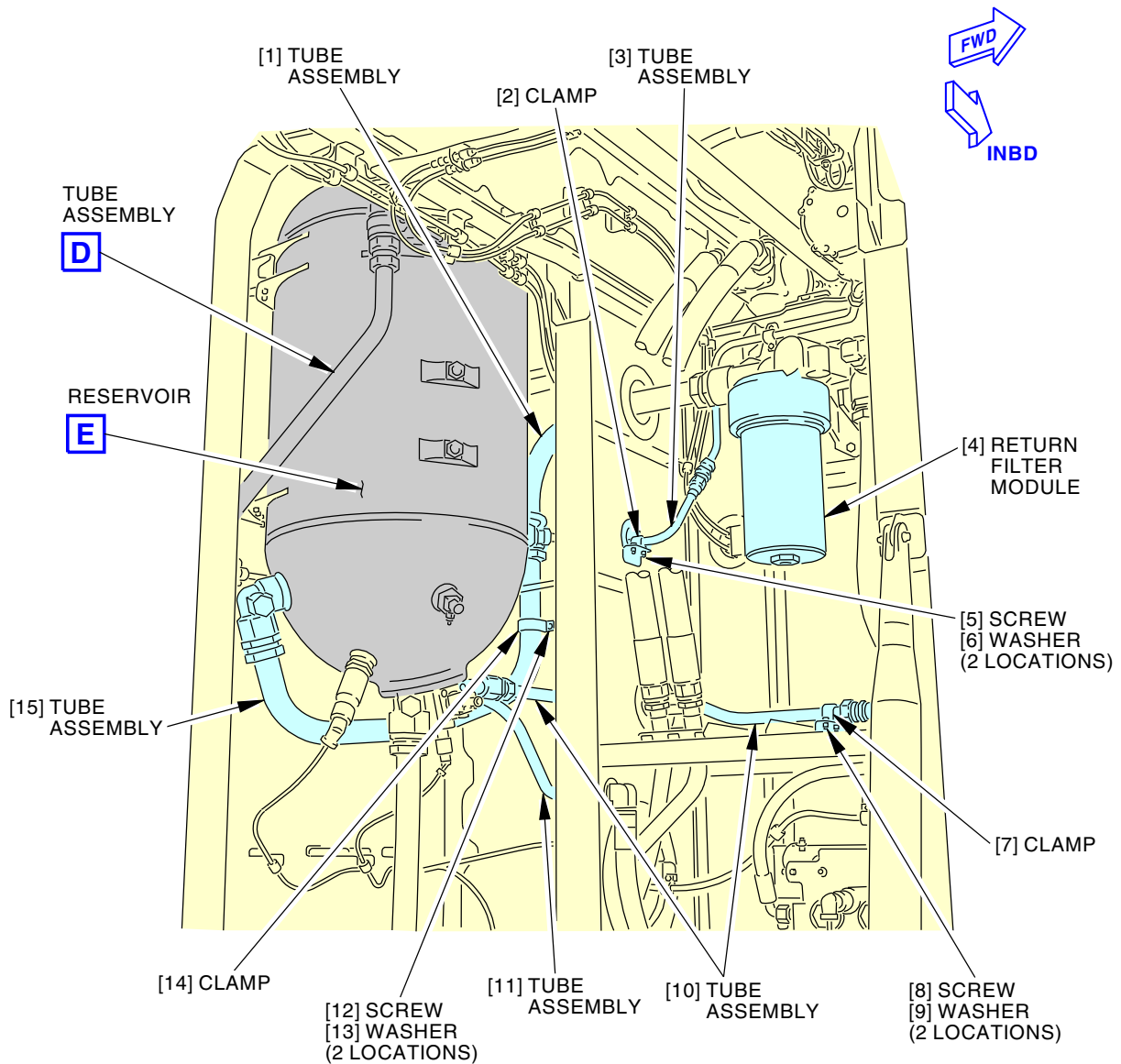
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CENTER SYSTEM RESERVOIR

[B]

C76216 S0006416042_V2

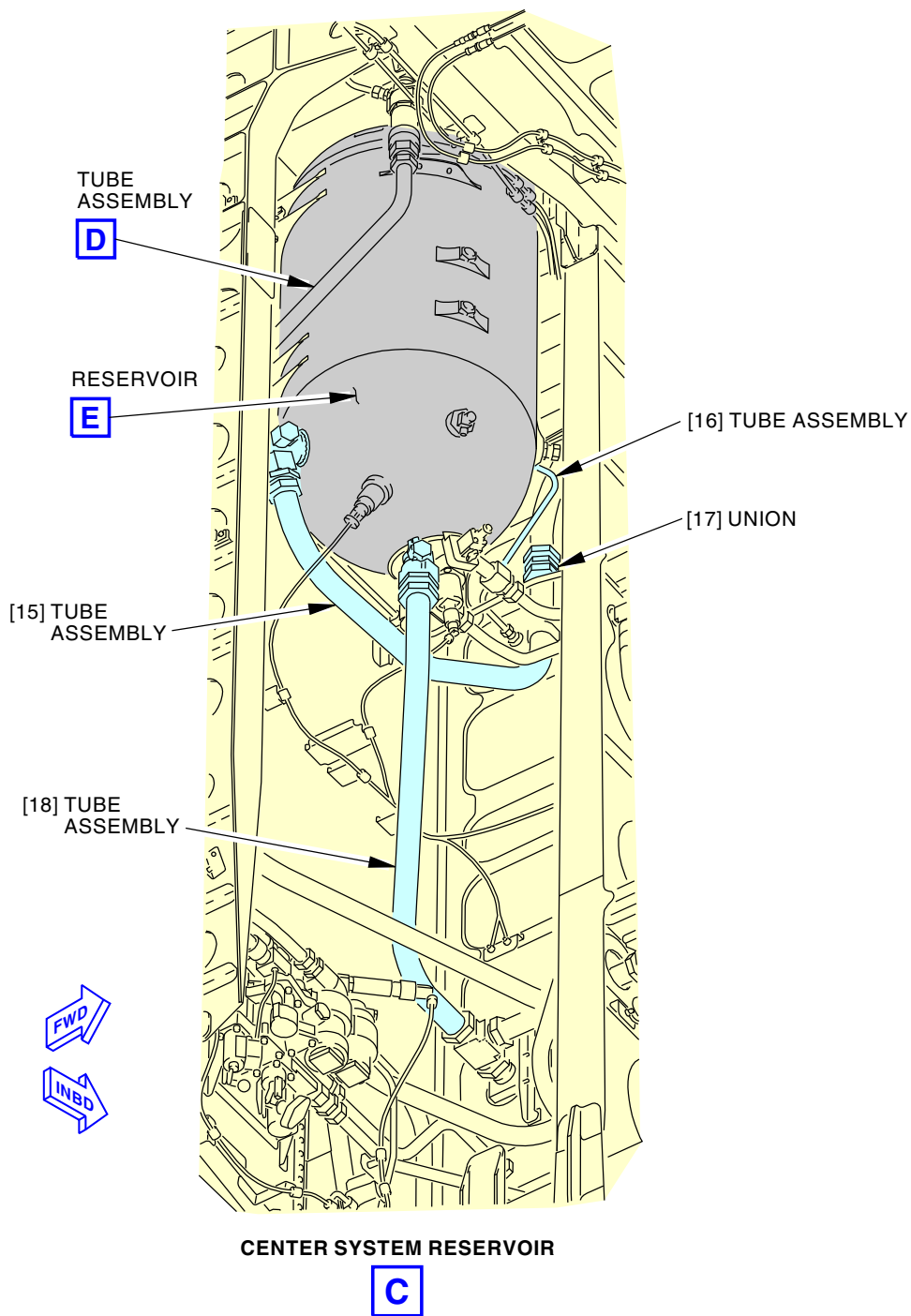
Center System Reservoir Installation
Figure 401/29-11-21-990-801 (Sheet 2 of 7)

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C76407 S0006416043_V2

**Center System Reservoir Installation
Figure 401/29-11-21-990-801 (Sheet 3 of 7)**

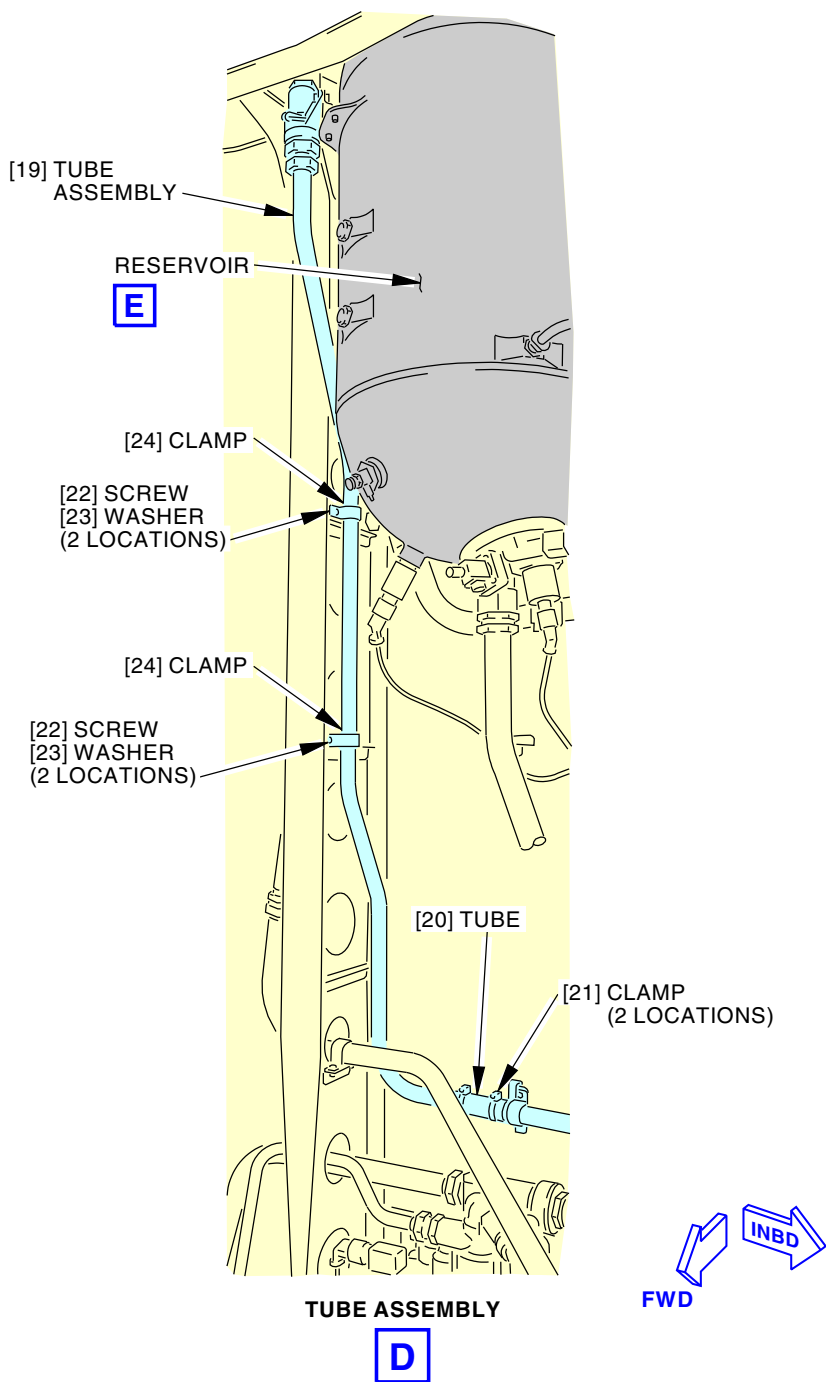
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C78387 S0006416044_V2

**Center System Reservoir Installation
Figure 401/29-11-21-990-801 (Sheet 4 of 7)**

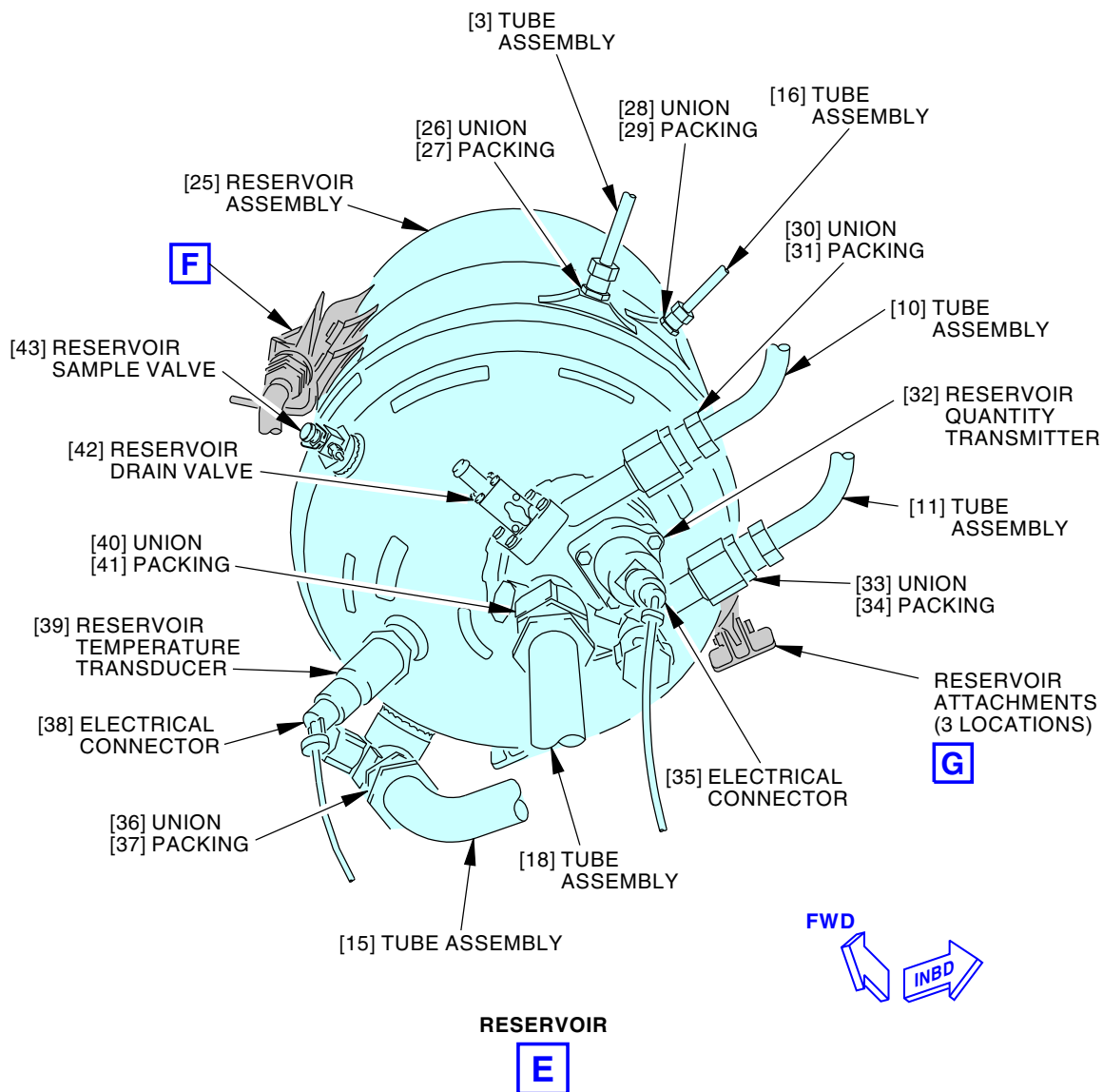
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E75900 S0006416045_V2

Center System Reservoir Installation
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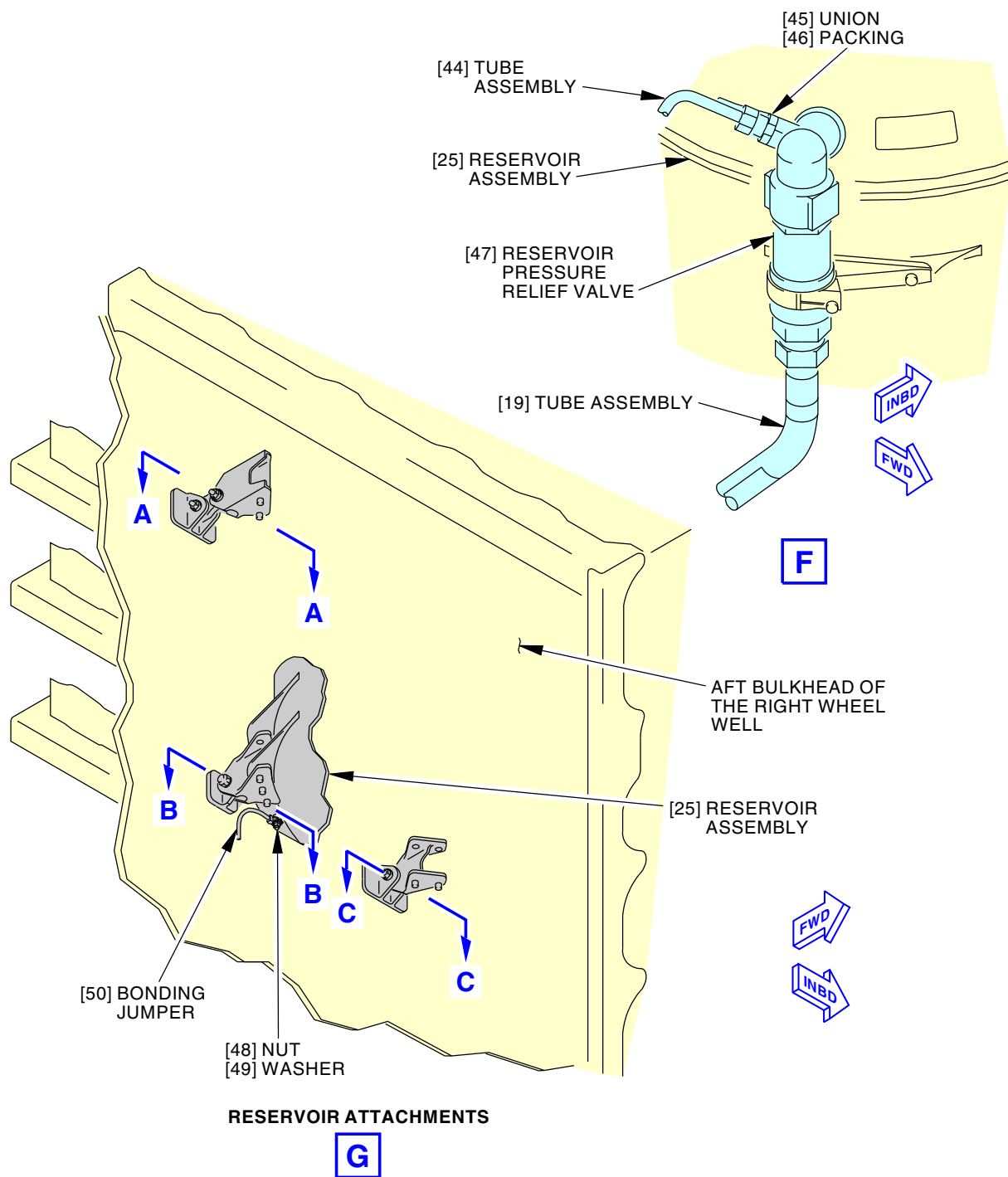
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E75901 S0006416046_V2

**Center System Reservoir Installation
Figure 401/29-11-21-990-801 (Sheet 6 of 7)**

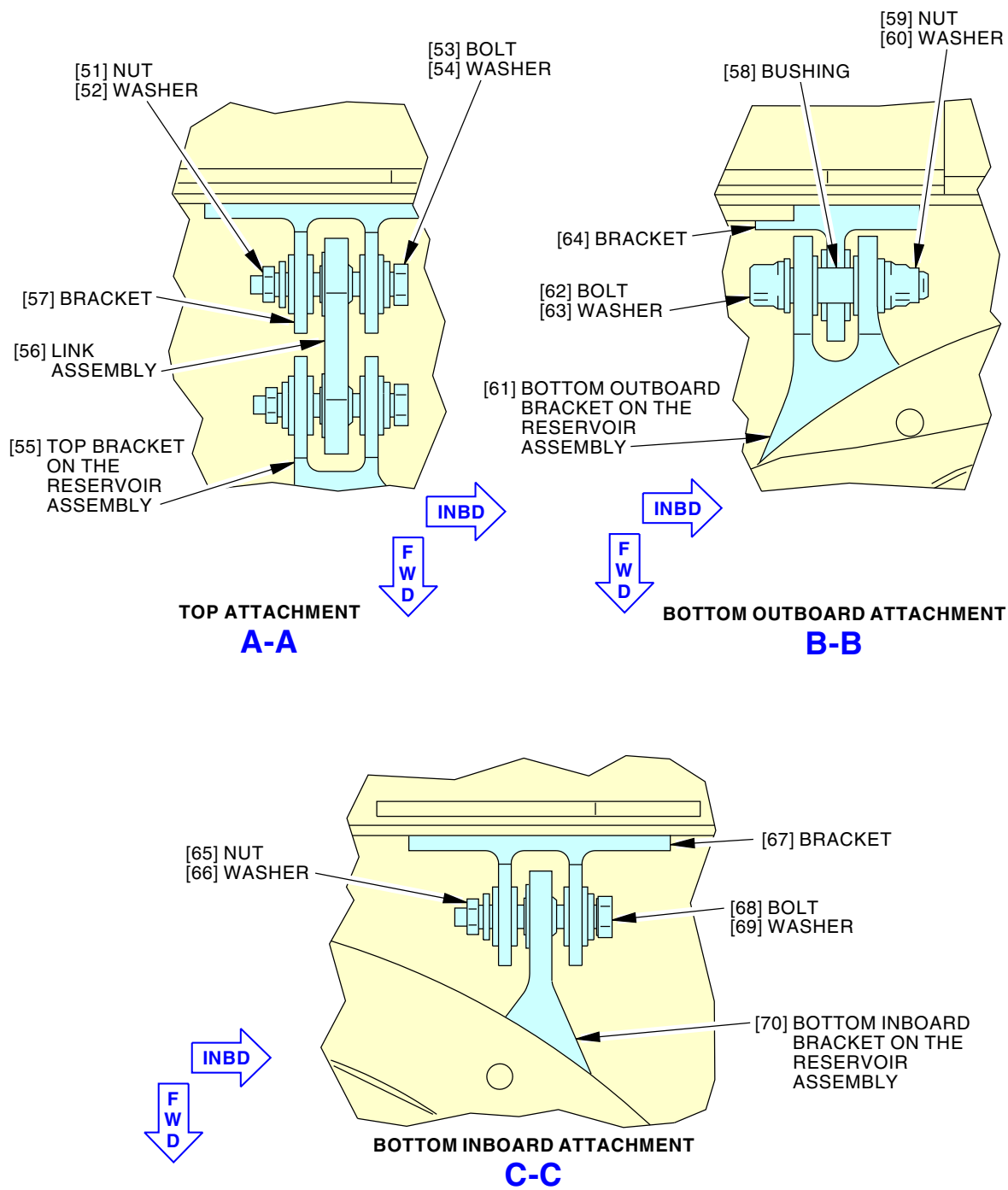
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E78205 S0006416047_V2

Center System Reservoir Installation
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TASK 29-11-21-400-801

3. Center System Reservoir Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-22-400-801	Reservoir Drain Valve Installation (P/B 401)
29-11-23-400-801	Reservoir Sample Valve Installation (P/B 401)
29-11-24-400-801	Reservoir Pressure Relief Valve Installation (P/B 401)
29-32-01-400-801	Reservoir Temperature Transducer Installation (P/B 401)
29-33-02-400-801	Reservoir Quantity Transmitter Installation (P/B 401)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
SWPM 20-20-00	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.

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
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
25	Reservoir assembly	29-11-21-05-055	ARO ALL
27	Packing	29-11-21-01-170	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
29	Packing	29-11-21-01-165	ARO ALL
31	Packing	29-11-21-01-180	ARO ALL
34	Packing	29-11-21-01-180	ARO ALL
37	Packing	29-11-21-01-190	ARO ALL
41	Packing	29-11-21-01-190	ARO ALL
46	Packing	29-11-24-05-045	ARO ALL

E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

F. Center System Reservoir Installation

SUBTASK 29-11-21-420-001

- (1) If it is necessary to install the union [26] and packing [27], union [28] and packing [29], union [30] and packing [31], union [33] and packing [34], union [36] and packing [37], union [40] and packing [41], and union [45] and packing [46] in the ports of the packing [46], do these steps:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [27], packing [29], packing [34], packing [37], packing [41], packing [46], and to the threads of union [26], union [28], union [30], union [33], union [36], union [40], and union [45].
 - (b) Install the new packing [27] on union [26], new packing [29] on union [28], new packing [31] on union [30], new packing [34] on union [33], new packing [37] on union [36], new packing [41] on union [40], and new packing [46] on union [45].
 - (c) Remove the caps from the ports on the reservoir assembly [25].
 - (d) Install the new packing [27] and union [26], new packing [29] and union [28], new packing [31] and union [30], new packing [34] and union [33], new packing [37] and union [36], new packing [41] and union [40], and new packing [46] and union [45] in the ports on the reservoir assembly [25].

SUBTASK 29-11-21-420-002

- (2) If it is necessary to install the components on the replacement reservoir assembly [25], do these steps:
 - (a) Remove the caps from the ports on the reservoir assembly [25].
 - (b) Install the components which follow:
 - 1) For the reservoir drain valve [42], do this task: Reservoir Drain Valve Installation, TASK 29-11-22-400-801.
 - 2) For the reservoir sample valve [43], do this task: Reservoir Sample Valve Installation, TASK 29-11-23-400-801.
 - 3) For the reservoir pressure relief valve [47], do this task: Reservoir Pressure Relief Valve Installation, TASK 29-11-24-400-801.
 - 4) For the reservoir temperature transducer [39], do this task: Reservoir Temperature Transducer Installation, TASK 29-32-01-400-801.
 - 5) For the reservoir quantity transmitter [32], do this task: Reservoir Quantity Transmitter Installation, TASK 29-33-02-400-801.

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SUBTASK 29-11-21-420-003

- (3) Hold the reservoir assembly [25] in its position on the aft bulkhead of the right wheel well while you do these steps:
- (a) Align the holes in the link assembly [56] and the bracket [57] at the top attachment.
 - (b) Install the bolt [53], washer [54], washer [52], and nut [51] at the top attachment.
 - (c) Align the holes in the bottom outboard bracket [61] and the bottom inboard bracket [70] with the holes in the related brackets [64] and [67].
 - (d) Install the bolt [62], washer [63], bushing [58], washer [60], and the nut [59] at the bottom outboard attachment.
 - (e) Install the bolt [68], washer [69], washer [66] and nut [65] at the bottom inboard attachment.

SUBTASK 29-11-21-020-018

- (4) Remove the caps from the openings in the reservoir assembly [25] and from the tube assembly [3], tube assy [16], tube assembly [10], tube assy [11], tube assembly [18], tube assembly [15], tube assembly [19], and tube assy [44].

SUBTASK 29-11-21-420-004

- (5) Connect these tubes to the reservoir assembly [25]:
- (a) Tube assembly [44]
 - (b) Tube assembly [16]
 - (c) Tube assembly [11]

SUBTASK 29-11-21-420-009

- (6) Do these steps to install the tube assembly [19]:
- (a) Push the end of the tube assembly [19] into the tube [20].
 - (b) Connect the tube assembly [19] to the reservoir assembly [25].
 - (c) Tighten the clamp [21] on the tube [20].
 - (d) Install the clamps [24] on the tube assembly [19].
 - (e) Install the screws [22] and the washers [23] to hold the clamps [24] on the structure of the wheel well.

SUBTASK 29-11-21-420-010

- (7) Do these steps to install the tube assembly [3]:
- (a) Connect the tube assembly [3] to the reservoir assembly [25] and the adjacent tube.
 - (b) Install the clamp [2] on the tube assembly [3].
 - (c) Install the screws [5] and the washers [6] to hold the clamp [2] on the structure of the wheel well.

SUBTASK 29-11-21-420-011

- (8) Do these steps to install the tube assembly [10]:
- (a) Connect the tube assembly [10].
 - (b) Install the clamp [7] on the tube assembly [10].
 - (c) Install the screws [8] and the washers [9] to hold the clamp [7] on the structure of the wheel well.

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SUBTASK 29-11-21-420-012

- (9) Do these steps to install the assembly of the tube assembly [1], the union [17], and the tube assembly [15]:
 - (a) Connect the tube assembly [15] to the reservoir assembly [25].
 - (b) Connect the tube assembly [1] to the return filter module [4].
 - (c) Install the clamp [14] on the tube assembly [15].
 - (d) Install the screws [12] and the washers [13] to hold the clamp [14] on the structure of the wheel well.

SUBTASK 29-11-21-420-013

- (10) Connect the tube assembly [18].

SUBTASK 29-11-21-420-005

- (11) Remove the caps from the electrical connectors [35] and [38].

SUBTASK 29-11-21-420-006

- (12) Connect the electrical connector [38] to the reservoir temperature transducer [39].

SUBTASK 29-11-21-420-007

- (13) Connect the electrical connector [35] to the reservoir quantity transmitter [32].

SUBTASK 29-11-21-420-008

- (14) Install the bonding jumper [50], washer [49], and nut [48] on the reservoir assembly [25], adjacent to the bottom outboard bracket [61] (SWPM 20-20-00).
 - (a) With the intrinsically safe approved bonding meter, COM-1550, make sure the maximum resistance across the bonding jumper [50], between the reservoir assembly [25] and the adjacent structure is 0.0025 ohms (SWPM 20-20-00).

G. Center System Reservoir Installation Test

SUBTASK 29-11-21-860-003

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

SUBTASK 29-11-21-860-004

- (2) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-21-610-001

- (3) For the reservoir assembly [25] in the center hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.
 - (a) While you fill the reservoir assembly [25], do these steps:
 - 1) Monitor the reservoir quantity gage at the ground service bay.
 - 2) Make sure the indication on the reservoir quantity gage increases while you fill the reservoir.

SUBTASK 29-11-21-860-005

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-21-210-001

- (5) Make sure the HYDRAULIC RESERVOIR TEMP C indication on the EICAS maintenance page shows a value for the hydraulic fluid temperature.

NOTE: It is not necessary to do a check of the precision of the HYDRAULIC RESERVOIR TEMP C value which shows.

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SUBTASK 29-11-21-860-006

- (6) For the center hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-21-790-001

- (7) Make sure there are no leaks of hydraulic fluid at the hydraulic tube connections to the reservoir assembly [25].

SUBTASK 29-11-21-790-002

- (8) Make sure there are no leaks of hydraulic fluid at these components on the reservoir assembly [25]:
- (a) Reservoir drain valve [42]
 - (b) Reservoir sample valve [43]
 - (c) Reservoir temperature transducer [39].
 - (d) Reservoir quantity transmitter [32].

SUBTASK 29-11-21-790-003

- (9) Make sure there are no air leaks at the pressure relief valve [47] or at tube assembly [44].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-21-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, (TASK 12-25-01-100-801).

SUBTASK 29-11-21-410-001



OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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RESERVOIR DRAIN VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir drain valve
 - (2) An installation of the reservoir drain valve.
- B. There is one reservoir drain valve on the reservoir in each main hydraulic system. You can use this procedure to remove and install each reservoir drain valve (the reservoir drain valves are called valves [3] in this procedure).

TASK 29-11-22-000-801

2. Reservoir Drain Valve Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

E. Prepare for the Removal

SUBTASK 29-11-22-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-11-22-010-001

- (2) For the left hydraulic system, open this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-22-010-002

- (3) For the right hydraulic system, open this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-22-480-002



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-22-010-003



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-11-22-860-001

- (6) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-22-480-001

- (7) Attach a hose to the valve [3] and put the other end of the hose into a oil resistant container (5 gal)(19 Liter), STD-1055 for the hydraulic fluid.

SUBTASK 29-11-22-680-001

- (8) Open the valve [3] to drain the hydraulic fluid into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 29-11-22-080-001

- (9) After you drain the fluid from the reservoir, remove the hose from the valve [3].

F. Reservoir Drain Valve Removal

SUBTASK 29-11-22-020-001

- (1) Remove the bolts [1] and washers [2] which hold the valve [3] to the reservoir.

SUBTASK 29-11-22-020-002

- (2) Remove the valve [3].

SUBTASK 29-11-22-020-004

- (3) Remove and discard the packing [4] from the valve [3].

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SUBTASK 29-11-22-020-003

- (4) Install a cap on the opening in the reservoir to prevent contamination.

———— **END OF TASK** ————

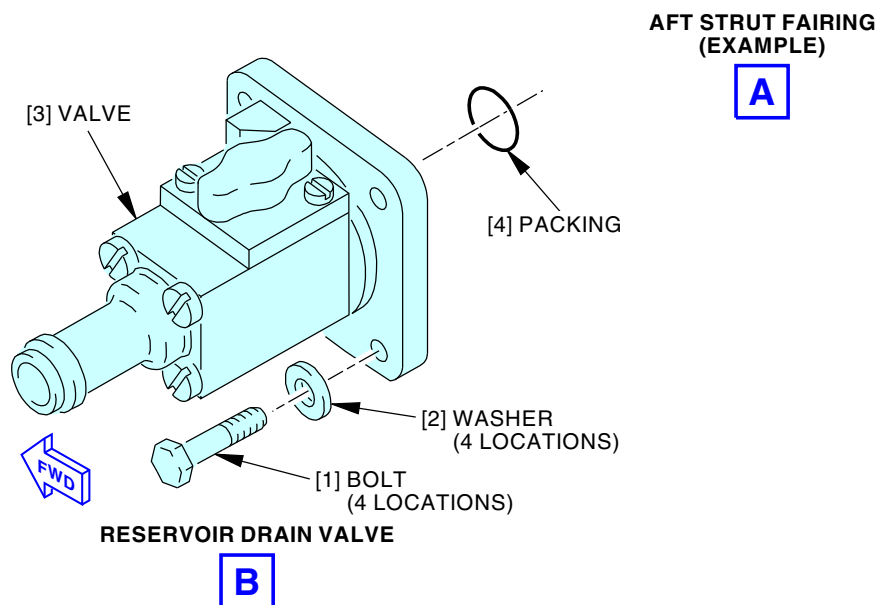
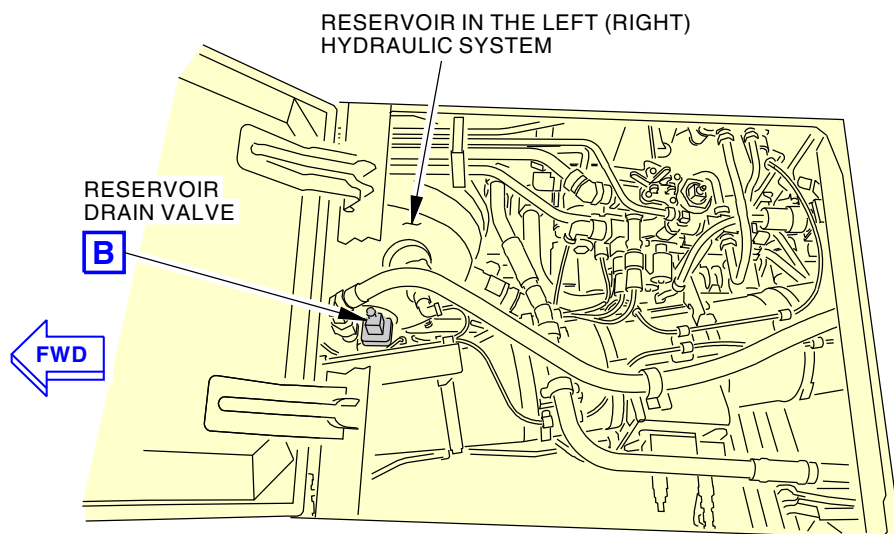
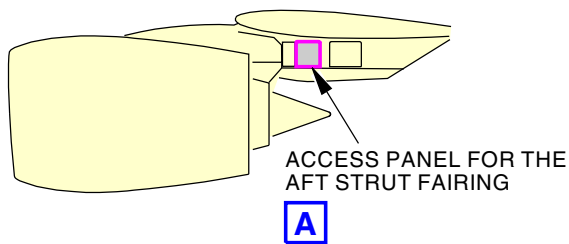
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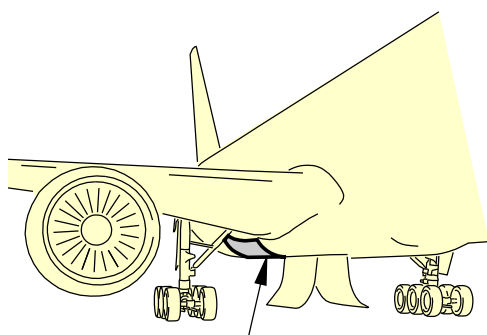
**Reservoir Drain Valve Installation
Figure 401/29-11-22-990-801 (Sheet 1 of 3)**

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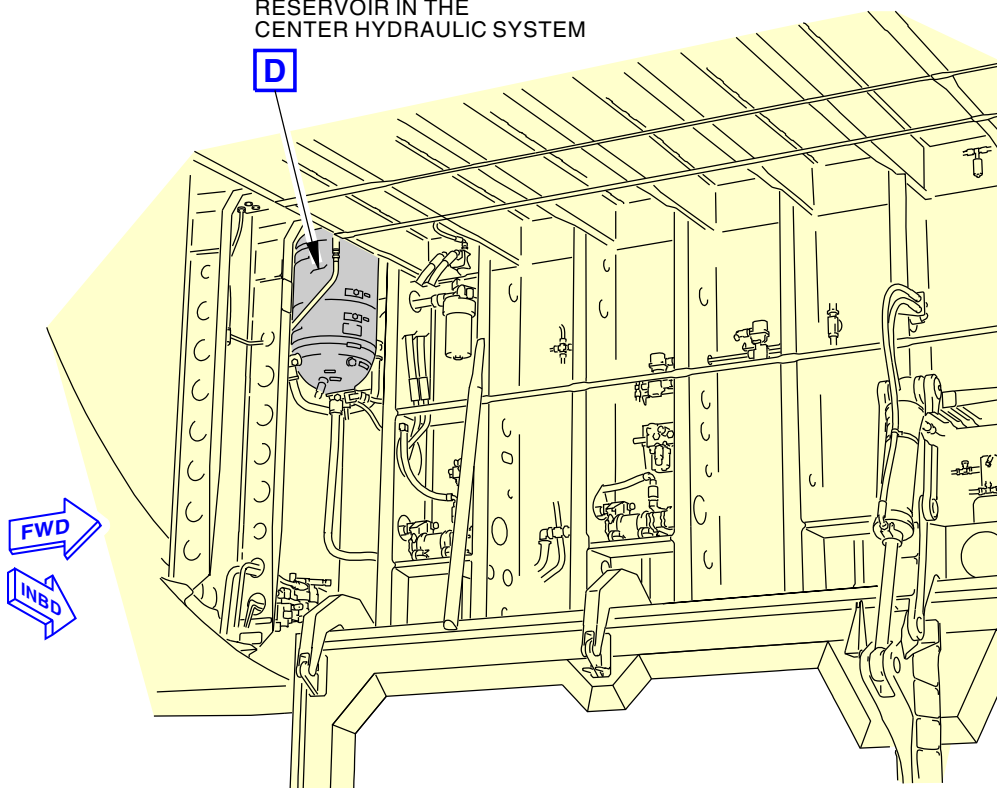


RIGHT WHEEL WELL

C

RESERVOIR IN THE
CENTER HYDRAULIC SYSTEM

D



RIGHT WHEEL WELL

C

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**Reservoir Drain Valve Installation
Figure 401/29-11-22-990-801 (Sheet 2 of 3)**

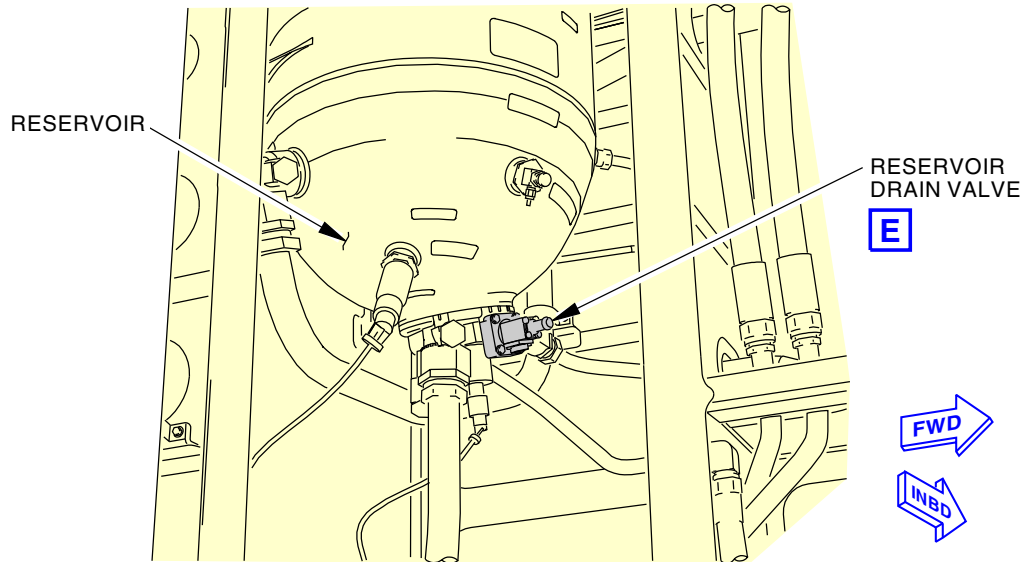
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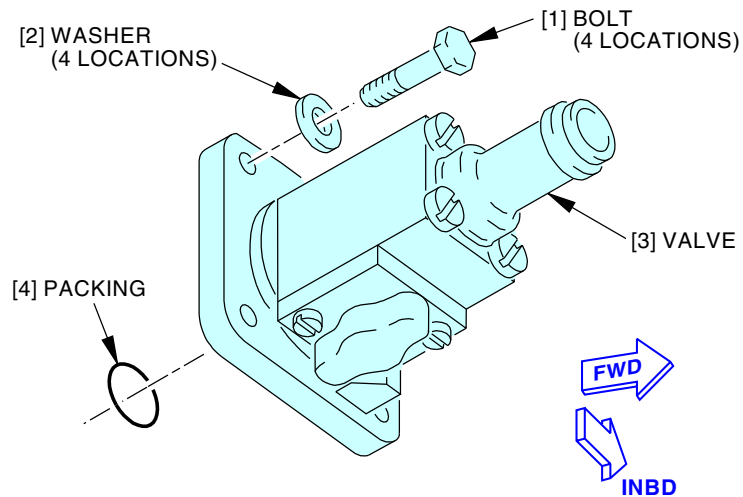
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RESERVOIR IN THE CENTER HYDRAULIC SYSTEM

D



RESERVOIR DRAIN VALVE

E

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Reservoir Drain Valve Installation
Figure 401/29-11-22-990-801 (Sheet 3 of 3)

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TASK 29-11-22-400-801

3. Reservoir Drain Valve Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Valve	29-11-22-01-015	ARO ALL
		29-11-22-05-015	ARO ALL
4	Packing	29-11-22-01-020	ARO ALL
		29-11-22-05-020	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

F. Reservoir Drain Valve Installation

SUBTASK 29-11-22-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [4].

SUBTASK 29-11-22-420-001

- (2) Install the new packing [4] in the groove in the flange of the valve [3].

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SUBTASK 29-11-22-420-002

- (3) Remove the cap from the opening in the reservoir.

SUBTASK 29-11-22-420-003

- (4) Hold the valve [3] in its position on the reservoir.

SUBTASK 29-11-22-420-004

- (5) Install the bolts [1] and washers [2] that attach the valve [3] to the reservoir.

SUBTASK 29-11-22-420-005

- (6) Tighten the bolts [1] to 26-30 pound-inches.

SUBTASK 29-11-22-420-006

- (7) Safety the bolts [1] with a lockwire.

SUBTASK 29-11-22-860-002

- (8) Close the valve [3].

SUBTASK 29-11-22-420-007

- (9) Safety the reservoir drain valve [3] in the closed position with a lockwire.

G. Reservoir Drain Valve Installation Test

SUBTASK 29-11-22-610-001

- (1) For the applicable hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-11-22-860-003

- (2) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-22-790-001

- (3) Make sure there is no hydraulic fluid leakage at the valve [3].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-22-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-22-410-003



OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-22-410-001

- (3) For the left hydraulic system, close this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

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SUBTASK 29-11-22-410-002

- (4) For the right hydraulic system, close this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-22-440-001

- (5) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

———— **END OF TASK** ————

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RESERVOIR SAMPLE VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir sample valve
 - (2) An installation of the reservoir sample valve.
- B. There is one reservoir sample valve on the reservoir in each main hydraulic system. You can use this procedure to remove and install each reservoir sample valve (the reservoir sample valve called valves [1] in this procedure).

TASK 29-11-23-000-801

2. Reservoir Sample Valve Removal

(Figure 401)

A. 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)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-11-23-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-11-23-010-001

- (2) For the left hydraulic system, open these applicable access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

and .

SUBTASK 29-11-23-010-002

- (3) For the right hydraulic system, open these applicable access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

and .

SUBTASK 29-11-23-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-23-010-003



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-11-23-860-001

- (6) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-23-680-001

- (7) To drain the fluid from the applicable reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

E. Reservoir Sample Valve Removal

SUBTASK 29-11-23-020-001

- (1) Remove the valve [1] from the reservoir port.

SUBTASK 29-11-23-020-002

- (2) Install a cap on the opening on the reservoir to prevent contamination.

SUBTASK 29-11-23-020-003

- (3) Remove and discard the packing [3] from the valve [1].

————— **END OF TASK** —————

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ARO ALL

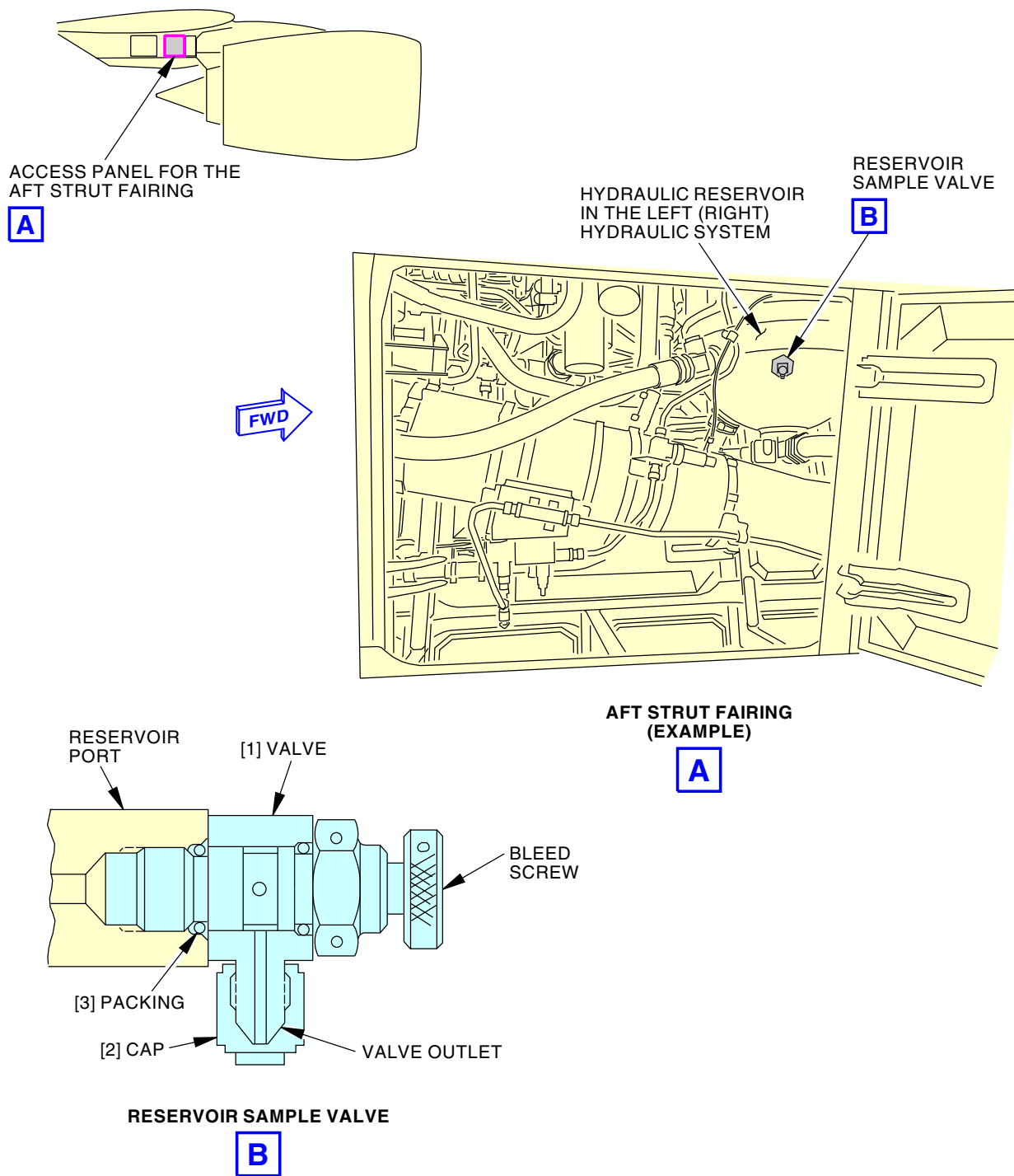
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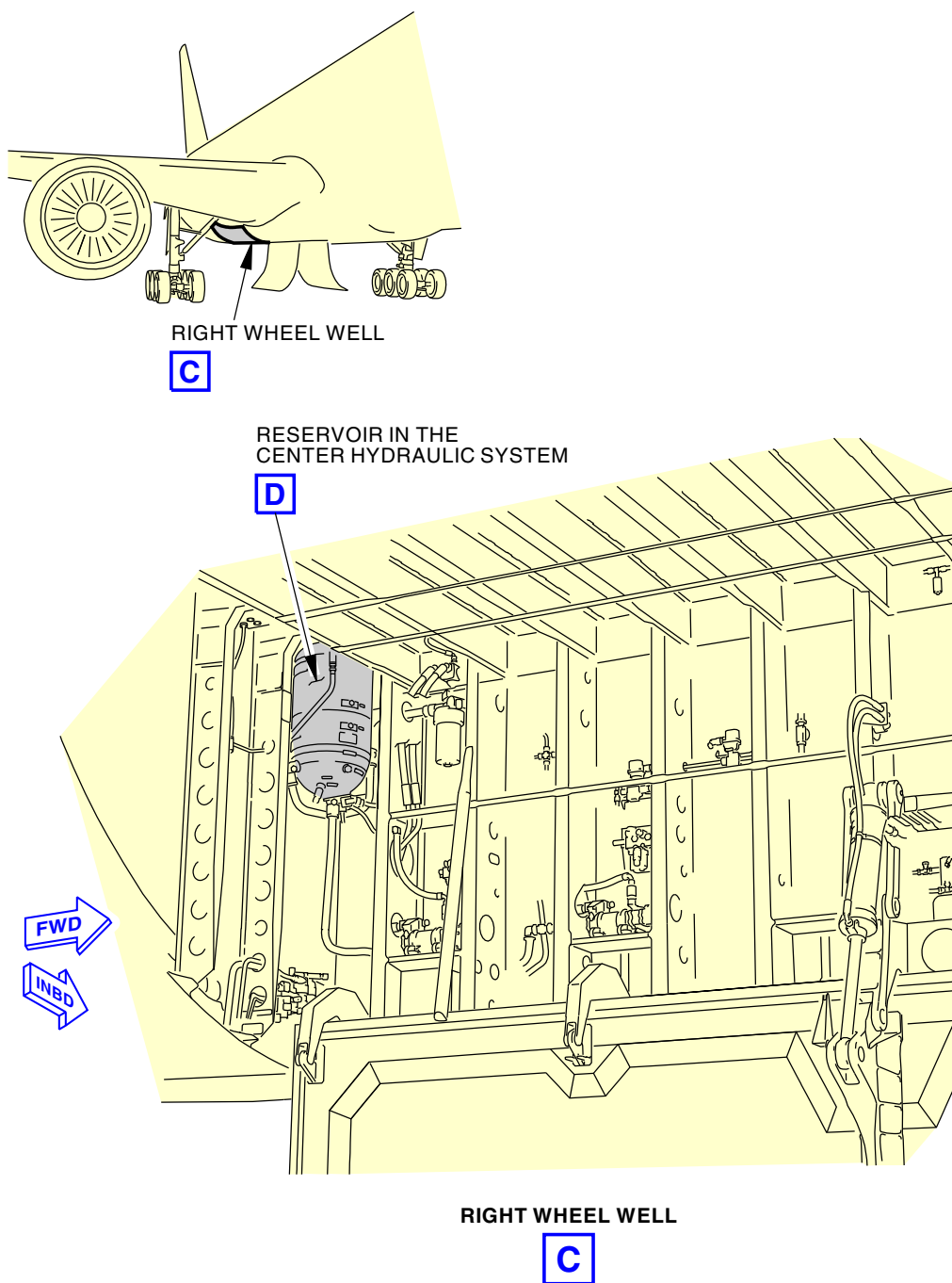
Reservoir Sample Valve
Figure 401/29-11-23-990-801 (Sheet 1 of 3)

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Reservoir Sample Valve
Figure 401/29-11-23-990-801 (Sheet 2 of 3)

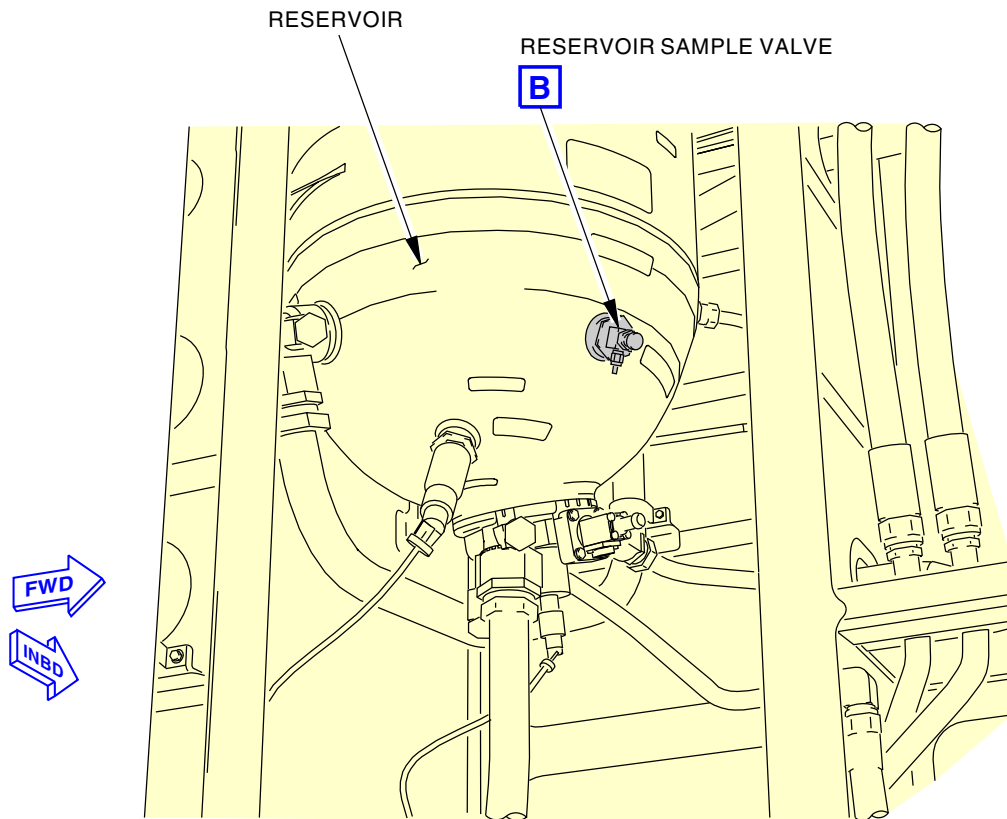
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RESERVOIR IN THE CENTER HYDRAULIC SYSTEM

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Reservoir Sample Valve
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TASK 29-11-23-400-801

3. Reservoir Sample Valve Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve	29-11-23-01-020	ARO ALL
		29-11-23-05-010	ARO ALL
3	Packing	29-11-23-01-025	ARO ALL
		29-11-23-05-015	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

F. Reservoir Sample Valve Installation

SUBTASK 29-11-23-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [3].

SUBTASK 29-11-23-420-001

- (2) Install a new packing [3] on the valve [1].

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SUBTASK 29-11-23-420-002

- (3) Remove the cap from the opening in the reservoir.

SUBTASK 29-11-23-420-003

- (4) Install the valve [1] on the reservoir.

NOTE: The outlet of the valve [1] must point down.

SUBTASK 29-11-23-860-002

- (5) Put the valve [1] in the closed position.

SUBTASK 29-11-23-860-003

- (6) Safety the valve [1] in the closed position with a lockwire.

SUBTASK 29-11-23-420-004

- (7) Install a cap assembly [2] on the outlet of the valve [1].

G. Reservoir Sample Valve Installation Test

SUBTASK 29-11-23-610-001

- (1) For the applicable hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-11-23-860-004

- (2) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-23-790-001

- (3) Make sure there is no hydraulic fluid leakage at the valve [1].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-23-410-003



OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-23-410-001

- (2) For the left hydraulic system, close these applicable access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
and .	

SUBTASK 29-11-23-410-002

- (3) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
and .	

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SUBTASK 29-11-23-440-001

- (4) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

———— **END OF TASK** ————

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RESERVOIR PRESSURE RELIEF VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir pressure relief valve (referred to as the valve [1] in this procedure)
 - (2) An installation of the relief valve.
- B. There is one relief valve on the reservoir in each main hydraulic system. You can use this procedure to remove and install each of the relief valves.

TASK 29-11-24-000-801

2. Reservoir Pressure Relief Valve Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-11-24-040-001



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, to do the deactivation procedure for the thrust reverser (forward thrust position), do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-24-010-001

- (2) For the left hydraulic system, open this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

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SUBTASK 29-11-24-010-002

- (3) For the right hydraulic system, open this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-24-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 29-11-24-010-003



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 29-11-24-860-001

- (6) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Reservoir Pressure Relief Valve Removal

SUBTASK 29-11-24-020-001

- (1) Disconnect the pressure relief tube [4] from the reservoir pressure relief valve [1] (referred to as the valve [1] in this procedure).

SUBTASK 29-11-24-020-002

- (2) Install a cap on the pressure relief tube [4] to prevent contamination.

SUBTASK 29-11-24-020-003

- (3) Remove the bolt [5] from the clamp [3] which holds the valve [1].

SUBTASK 29-11-24-020-004

- (4) Remove the valve [1] from the pressure relief port on the reservoir.

SUBTASK 29-11-24-020-005

- (5) Install a cap on the pressure relief port on the reservoir to prevent contamination.

SUBTASK 29-11-24-020-006

- (6) Remove and discard the packing [2] from the valve [1].

————— END OF TASK —————

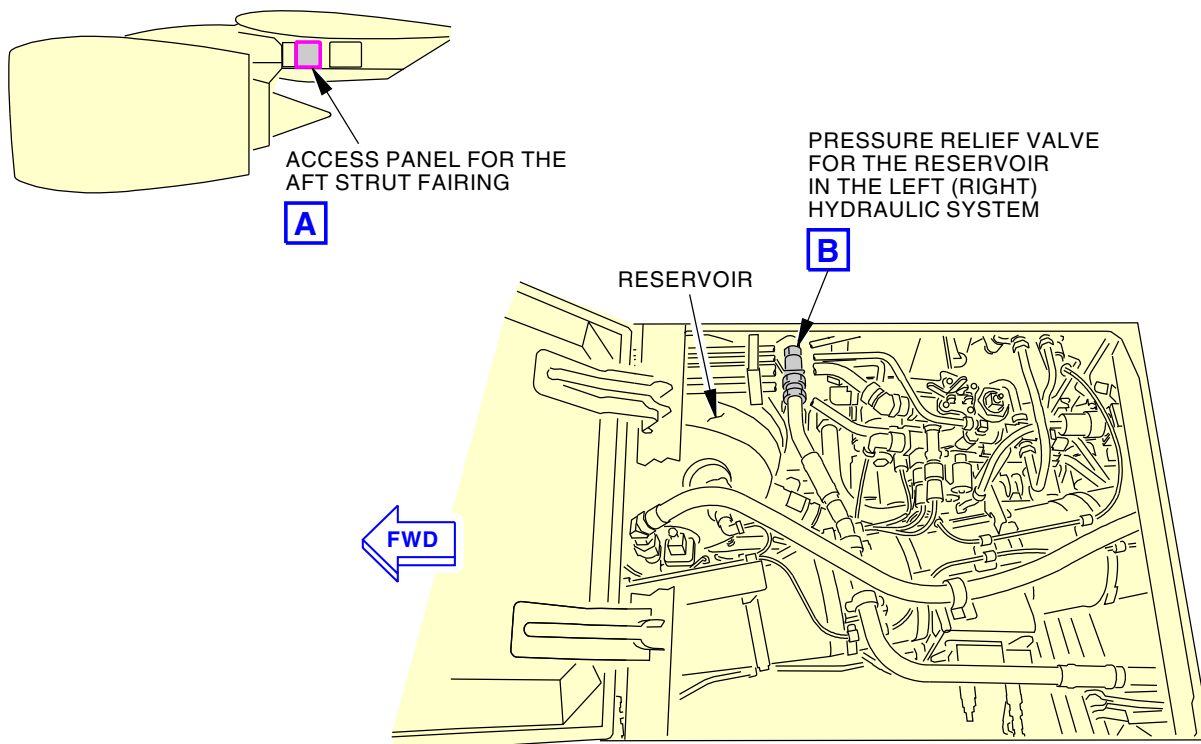
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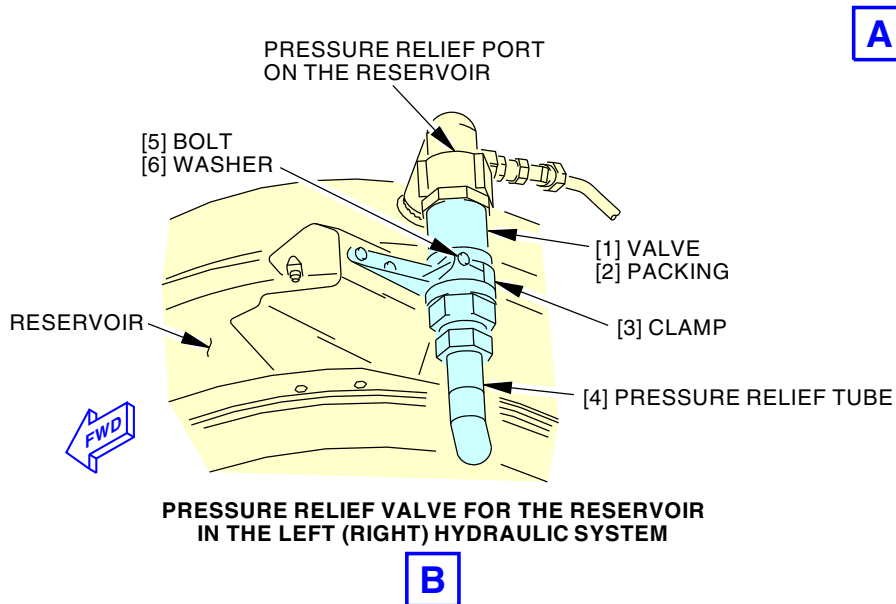
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AFT STRUT FAIRING (EXAMPLE)



C59352 S0006416066_V2

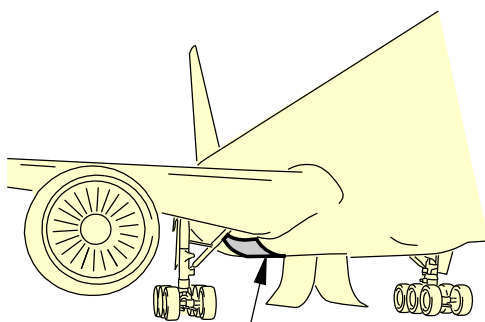
Reservoir Pressure Relief Valve
Figure 401/29-11-24-990-801 (Sheet 1 of 3)

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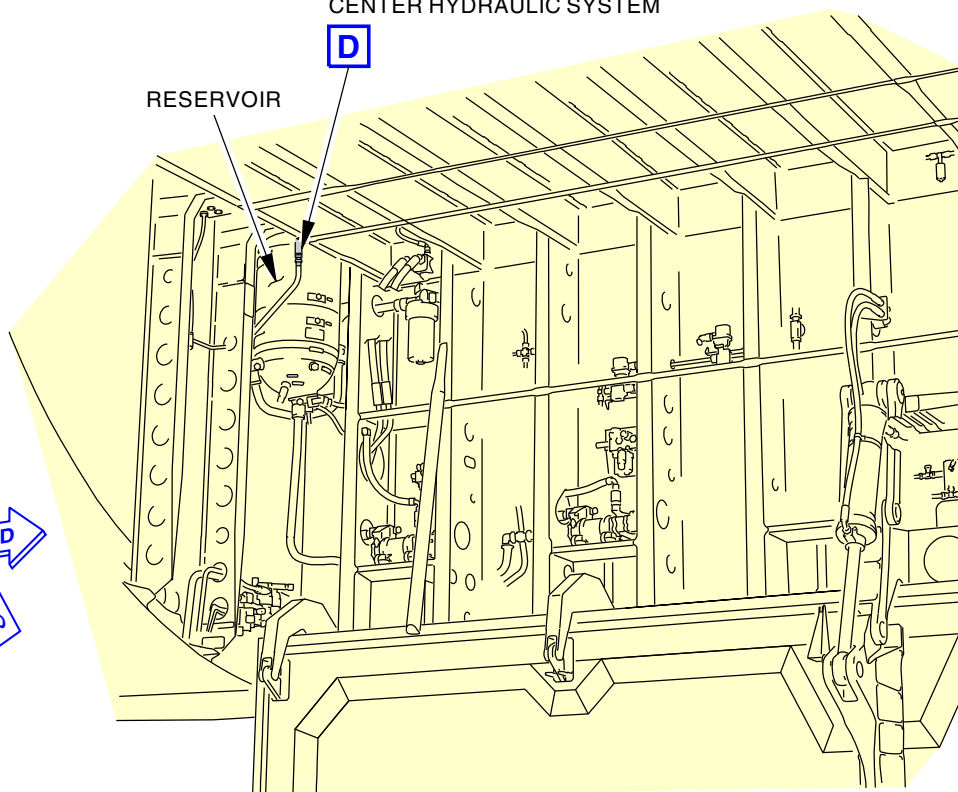
RIGHT WHEEL WELL

C

PRESSURE RELIEF VALVE
FOR THE RESERVOIR IN THE
CENTER HYDRAULIC SYSTEM

D

RESERVOIR



RIGHT WHEEL WELL

C

C59367 S0006416067_V2

**Reservoir Pressure Relief Valve
Figure 401/29-11-24-990-801 (Sheet 2 of 3)**

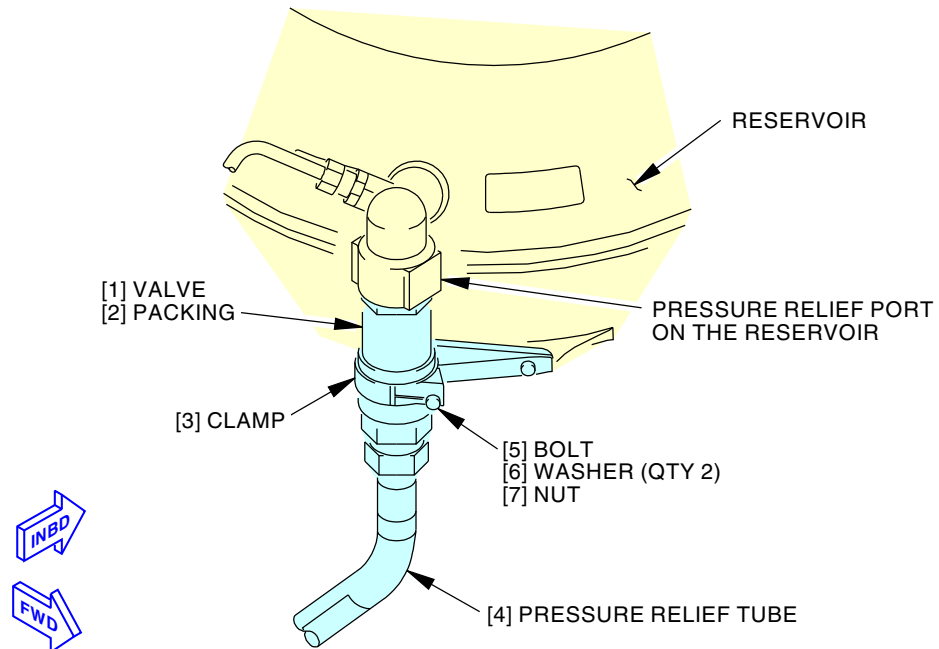
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**PRESSURE RELIEF VALVE FOR THE RESERVOIR
IN THE CENTER HYDRAULIC SYSTEM**

D

C59368 S0006416068_V2

Reservoir Pressure Relief Valve
Figure 401/29-11-24-990-801 (Sheet 3 of 3)

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TASK 29-11-24-400-801

3. Reservoir Pressure Relief Valve Installation

(Figure 401)

A. References

Reference	Title
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve	29-11-24-01-020	ARO ALL
		29-11-24-05-050	ARO ALL
2	Packing	29-11-24-01-025	ARO ALL
		29-11-24-05-055	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

F. Reservoir Pressure Relief Valve Installation

SUBTASK 29-11-24-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [2] and to the threads on the reservoir pressure relief valve [1] (referred to as the valve [1] in this procedure).

SUBTASK 29-11-24-420-001

- (2) Install the packing [2] on the valve [1].

SUBTASK 29-11-24-420-002

- (3) Remove the cap from the pressure relief port on the reservoir.

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SUBTASK 29-11-24-420-003

- (4) Install the valve [1] in the pressure relief port on the reservoir.

SUBTASK 29-11-24-420-004

- (5) For the left or right system, do the step which follows:
 - (a) Install the bolt [5] and washer [6] in the clamp [3].

SUBTASK 29-11-24-420-005

- (6) For the center system, do the step which follows:
 - (a) Install the bolt [5], washer [6], and nut [7] in the clamp [3].

SUBTASK 29-11-24-420-006

- (7) Remove the cap from the pressure relief tube [4].

SUBTASK 29-11-24-420-007

- (8) Install the pressure relief tube [4] on the valve [1].

G. Reservoir Pressure Relief Valve Installation Test

SUBTASK 29-11-24-860-002

- (1) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-24-790-001

- (2) Make sure there is no leakage of air at the connection of the valve [1] to the pressure relief port on the reservoir.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-24-410-003



OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-11-24-410-001

- (2) For the left hydraulic system, close this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-24-410-002

- (3) For the right hydraulic system, close this applicable access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-24-440-001

- (4) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

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LEFT AND RIGHT SYSTEM RESERVOIR PRESSURIZATION MODULE AND COMPONENTS - REMOVAL/ INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A removal of the left and right system reservoir pressurization module
 - (2) An installation of the left and right system reservoir pressurization module.
 - (3) A removal of the filter element from the reservoir pressurization module.
 - (4) An installation of the filter element in the reservoir pressurization module.
 - (5) A removal of the check valves in the reservoir pressurization module.
 - (6) An installation of the check valves in the reservoir pressurization module.
 - (7) A removal of the bleed valve in the reservoir pressurization module.
 - (8) An installation of the bleed valve in the reservoir pressurization module.

TASK 29-11-25-000-801

2. Left and Right System Reservoir Pressurization Module Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-11-25-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) To do the deactivation procedure for the thrust reverser (forward thrust position), do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-11-25-010-001

- (2) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-25-010-002

- (3) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-860-001

- (4) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Left and Right System Reservoir Pressurization Module Removal

SUBTASK 29-11-25-020-001

- (1) Disconnect the pneumatic supply tube [1] from the reservoir pressurization module assembly [3] (referred to as the module assembly [3] in this procedure) in the left or right system.

SUBTASK 29-11-25-020-002

- (2) Disconnect the reservoir pressure tube [6] from the module assembly [3].

SUBTASK 29-11-25-020-003

- (3) Remove the bolts [4] and washers [5].

SUBTASK 29-11-25-020-004

- (4) Remove the module assembly [3].

SUBTASK 29-11-25-020-005

- (5) If it is necessary, do this step:
(a) Remove the adapter [14], union [7], plug [9], and plug [11] from the module assembly [3].

SUBTASK 29-11-25-020-006

- (6) Install caps on the reservoir pressure tube [6] and the pneumatic supply tube [1] to prevent contamination.

SUBTASK 29-11-25-020-007

- (7) Install caps on the open ports of the module assembly [3] to prevent contamination.

————— **END OF TASK** —————

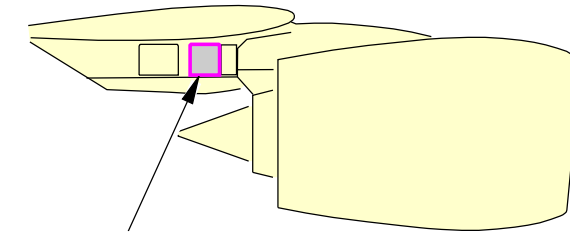
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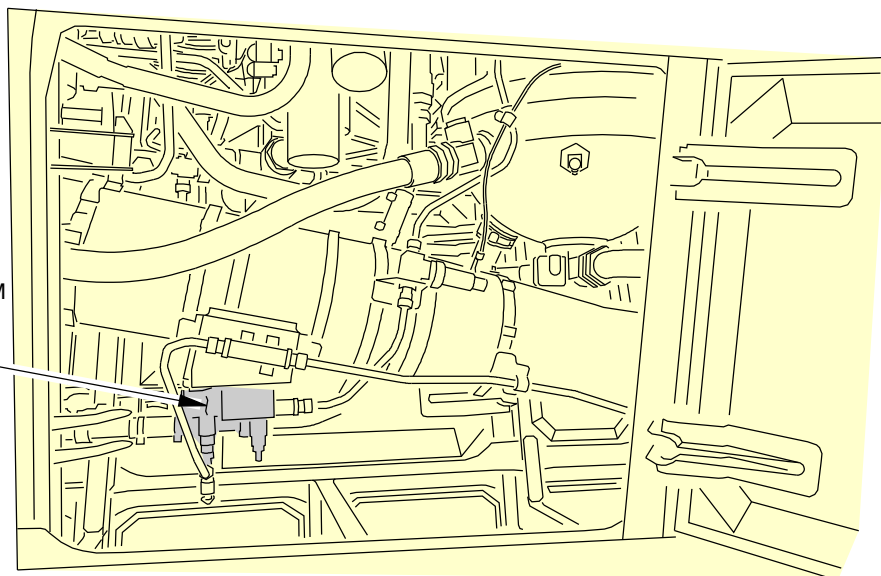


ACCESS PANEL FOR THE
AFT STRUT FAIRING

A

RESERVOIR
PRESSURIZATION
MODULE FOR THE
LEFT (RIGHT)
HYDRAULIC SYSTEM

B



AFT STRUT FAIRING
(EXAMPLE)

A



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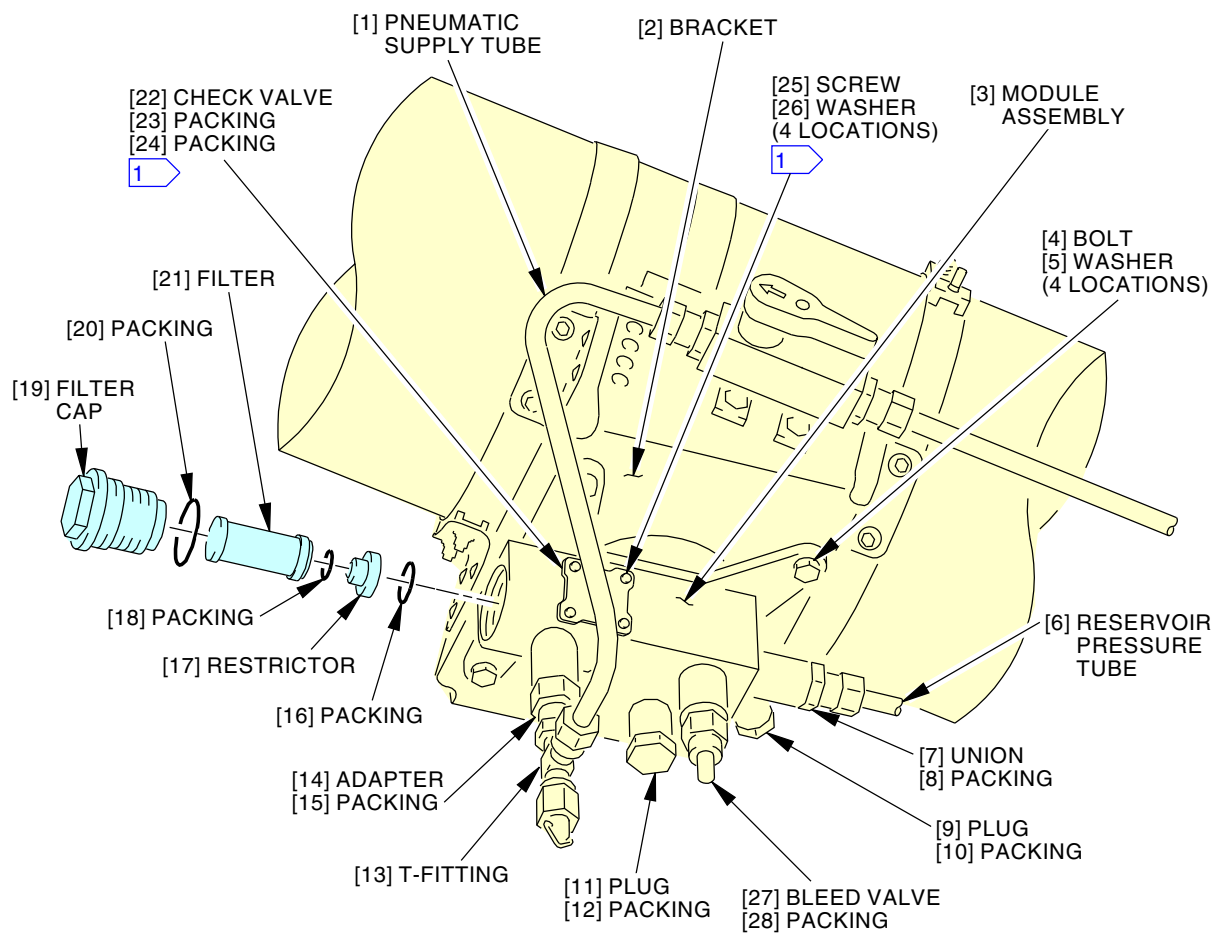
Reservoir Pressurization Module Installation
Figure 401/29-11-25-990-801 (Sheet 1 of 2)

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RESERVOIR PRESSURIZATION MODULE

B



1 CHECK VALVE INSTALLATION ON OPPOSITE SIDE OF MODULE IS EQUIVALENT

C92828 S0006416074_V4

**Reservoir Pressurization Module Installation
Figure 401/29-11-25-990-801 (Sheet 2 of 2)**

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TASK 29-11-25-400-801

3. Left and Right System Reservoir Pressurization Module Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Module assembly	29-11-25-01-055	ARO ALL
8	Packing	29-11-25-01-045	ARO ALL
10	Packing	29-11-25-01-050	ARO ALL
12	Packing	29-11-25-01-045	ARO ALL
15	Packing	29-11-25-01-045	ARO ALL

D. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

F. Left and Right System Reservoir Pressurization Module Installation

SUBTASK 29-11-25-640-001

(1) If it is necessary, do these steps:

- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [8], packing [10], packing [12], packing [15], and to the threads of the adapter [14], union [7], plug [9], and plug [11].

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- (b) Install the new packing [15] on adapter [14].
- (c) Install the new packing [8] on union [7].
- (d) Install the new packing [10] on plug [9].
- (e) Install the new packing [12] on plug [11].
- (f) If shipping plugs are in the ports of the module, remove them.
- (g) Install the adapter [14], union [7], plug [9], and plug [11] in the ports on the module assembly [3].

SUBTASK 29-11-25-420-001

- (2) Hold the module assembly [3] in its position on bracket [2].

SUBTASK 29-11-25-420-002

- (3) Install the bolts [4] and washers [5] that attach the module assembly [3] to the bracket [2].

NOTE: Install each of the washers [5] with the countersink against the head of the bolts [4].

SUBTASK 29-11-25-420-003

- (4) Remove the caps from the pneumatic supply tube [1], the reservoir pressure tube [6], and the ports of the module assembly [3].

SUBTASK 29-11-25-420-004

- (5) Connect the pneumatic supply tube [1] to the module assembly [3].

SUBTASK 29-11-25-420-005

- (6) Connect the reservoir pressure tube [6] to the module assembly [3].

G. Left and Right System Reservoir Pressurization Module Installation Test

SUBTASK 29-11-25-080-001

- (1) For the applicable (left or right) hydraulic system, remove the lock pin from the handle of the shutoff valve for reservoir pressurization (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [3].

SUBTASK 29-11-25-860-002

- (2) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-25-860-003

- (3) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-25-790-001

- (4) Make sure there is no leakage of air at the reservoir pressure tube [6] and the pneumatic supply tube [1] connections to the module assembly [3].

SUBTASK 29-11-25-860-004

- (5) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-25-410-001

- (1) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

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SUBTASK 29-11-25-410-002

- (2) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-440-001

- (3) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

TASK 29-11-25-000-802

4. Filter Element Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-11-25-040-002



WARNING

DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) To do the deactivation procedure for the thrust reverser (forward thrust position) for ground maintenance, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-25-010-003

- (2) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

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(Continued)

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

434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-25-010-004

(3) For the right hydraulic system, open these access panels:

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

444CL	Left Forward Access Door, Right Strut Aft Fairing

444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-860-005

(4) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Filter Element Removal

SUBTASK 29-11-25-020-008

(1) Remove the filter cap [19] from the reservoir pressurization module assembly [3].

SUBTASK 29-11-25-020-009

(2) Remove the filter [21] and restrictor [17] from the module assembly [3].

————— END OF TASK —————

TASK 29-11-25-400-802

5. Filter Element Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-30-80-910-801	General Cleaning of Metal (Series 80) (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
A00386	Adhesive - Silicone RTV, Non-Corrosive, Sealant Primer	MIL-A-46146
B01000	Solvent - General Cleaning Of Metal	
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
16	Packing	29-11-25-01-090	ARO ALL
18	Packing	29-11-25-01-080	ARO ALL
20	Packing	29-11-25-01-070	ARO ALL
21	Filter	29-11-25-01-075	ARO ALL

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D. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

F. Filter Element Installation

SUBTASK 29-11-25-160-001

- (1) Remove the remaining sealant from the filter cap [19] and the adjacent surface of the module assembly [3].

SUBTASK 29-11-25-160-002

- (2) Clean the hole in the module assembly [3] for the filter [21].

SUBTASK 29-11-25-110-001

- (3) Clean the filter [21] with Series 80 solvent, B01000 (TASK 20-30-80-910-801) and then fully dry it.

SUBTASK 29-11-25-640-002

- (4) Apply MCS 352B fluid, D00054 to the new packing [16], packing [18], packing [20], and to the threads on the filter cap [19].

SUBTASK 29-11-25-420-006

- (5) Assemble the filter [21], packing [16], packing [18], packing [20], and the restrictor [17].

SUBTASK 29-11-25-420-007

- (6) Install the filter [21] and the restrictor [17] into the module assembly [3].

SUBTASK 29-11-25-420-008

- (7) Install the filter cap [19] on the module assembly [3].

SUBTASK 29-11-25-420-009

- (8) Tighten the filter cap [19] to 75-95 pound-inches.

G. Filter Element Installation Test

SUBTASK 29-11-25-080-002

- (1) Remove the lock pin from the handle of the shutoff valve for reservoir pressurization, in the left or right hydraulic system, as applicable, (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [3].

SUBTASK 29-11-25-860-006

- (2) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-25-860-007

- (3) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-25-790-002

- (4) Make sure there is no leakage of air at the filter cap [19] on the module assembly [3].

SUBTASK 29-11-25-860-008

- (5) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-25-420-010

- (1) Safety the filter cap [19] with a lockwire.

SUBTASK 29-11-25-390-001

- (2) Apply a bead of adhesive, A00386 to the joint between the filter cap [19] and the module assembly [3].

SUBTASK 29-11-25-410-003

- (3) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-25-410-004

- (4) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-440-002

- (5) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-25-000-803

6. Check Valve Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

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D. Prepare for the Removal

SUBTASK 29-11-25-040-003



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) To do the deactivation procedure for the thrust reverser (forward thrust position) for ground maintenance, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-25-010-005

- (2) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-25-010-006

- (3) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-864-001

- (4) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Remove the Check Valve

SUBTASK 29-11-25-020-010

- (1) Remove the screws [25] and washers [26] from the check valve [22].

SUBTASK 29-11-25-020-011

- (2) Remove the check valve [22] from the module assembly [3].

SUBTASK 29-11-25-020-012

- (3) Remove and discard the packing [23] and packing [24].

————— END OF TASK —————

TASK 29-11-25-400-803

7. Check Valve Installation

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

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B. Consumable Materials

Reference	Description	Specification
A00386	Adhesive - Silicone RTV, Non-Corrosive, Sealant Primer	MIL-A-46146
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00633	Grease - Aircraft General Purpose	BMS3-33
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50380	LEAK TEC - 16-OX, THIN FILM BUBBLE TESTING SOLUTIONS	MIL-PRF-25567

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	Check valve	29-11-25-01-110	ARO ALL
23	Packing	29-11-25-01-115	ARO ALL
24	Packing	29-11-25-01-120	ARO ALL

D. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

F. Procedure

SUBTASK 29-11-25-640-003

(1) Apply MCS 352B fluid, D00054 to the packing [23] and packing [24].

SUBTASK 29-11-25-420-011

(2) Install the packing [23] and packing [24] on the check valve [22].

SUBTASK 29-11-25-420-012

(3) Install the check valve [22] in the module assembly [3].

SUBTASK 29-11-25-640-004

(4) Apply grease, D00633 to the threads of the screws [25] and install the screws [25] and washers [26].

SUBTASK 29-11-25-430-001

(5) Tighten the screws [25] to 20-25 pound-inches (2.3-2.8 N-m).

SUBTASK 29-11-25-790-003

(6) Apply Leak Tec 16-OX (leak detection compound), G50380 to the check valve [22].

SUBTASK 29-11-25-863-001

(7) Remove the lock pin from the handle of the shutoff valve for reservoir pressurization, in the left or right hydraulic system, as applicable, (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [3].

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SUBTASK 29-11-25-863-002

- (8) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-25-863-003

- (9) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-25-790-004

- (10) Make sure there is no leakage of air at the check valve [22].

SUBTASK 29-11-25-864-002

- (11) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-25-430-002

- (12) Install a MS20995NC32 lockwire, G50347 on the screws [25].

SUBTASK 29-11-25-390-002

- (13) Apply adhesive, A00386 to the screws [25] and to the joint between the check valve [22] and the module assembly [3].

G. Put the Airplane Back to its Usual Condition.

SUBTASK 29-11-25-410-005

- (1) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-25-410-006

- (2) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-440-003

- (3) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

TASK 29-11-25-000-804

8. Bleed Valve Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

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C. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-11-25-040-004



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) To do the deactivation procedure for the thrust reverser (forward thrust position) for ground maintenance, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-25-010-007

- (2) For the left hydraulic system, open these access panels:

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-25-010-008

- (3) For the right hydraulic system, open these access panels:

Number	Name/Location
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-864-003

- (4) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Remove the Bleed Valve

SUBTASK 29-11-25-020-013



WARNING

IF THE BLEED VALVE WILL NOT MOVE TO THE OPEN POSITION, YOU MUST REMOVE THE BLEED VALVE VERY SLOWLY. THIS WILL DECREASE THE AIR PRESSURE IN THE RESERVOIR SAFELY. IF YOU REMOVE THE BLEED VALVE QUICKLY, THE PRESSURE IN THE RESERVOIR WILL RELEASE SUDDENLY AND CAUSE A SPRAY OF HYDRAULIC FLUID. THIS CAN CAUSE INJURIES TO PERSONNEL.

- (1) Remove the bleed valve [27] from the module assembly [3].

SUBTASK 29-11-25-020-014

- (2) Remove the packing [28] from the bleed valve [27].

— END OF TASK —

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TASK 29-11-25-400-804

9. Bleed Valve Installation

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
A00386	Adhesive - Silicone RTV, Non-Corrosive, Sealant Primer	MIL-A-46146
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00633	Grease - Aircraft General Purpose	BMS3-33
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50380	LEAK TEC - 16-OX, THIN FILM BUBBLE TESTING SOLUTIONS	MIL-PRF-25567

C. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

E. Procedure

SUBTASK 29-11-25-640-005

(1) Apply MCS 352B fluid, D00054 to the packing [28].

SUBTASK 29-11-25-420-013

(2) Install the packing [28] on the bleed valve [27].

SUBTASK 29-11-25-640-006

(3) Apply grease, D00633 to the threads of the bleed valve [27].

SUBTASK 29-11-25-420-014

(4) Install the bleed valve [27] in the module assembly [3].

SUBTASK 29-11-25-430-003

(5) Tighten the bleed valve [27] to 50-65 pound-inches (5.6-7.3 N-m).

SUBTASK 29-11-25-790-005

(6) Apply Leak Tec 16-OX (leak detection compound), G50380 to the bleed valve [27].

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SUBTASK 29-11-25-863-004

- (7) Remove the lock pin from the handle of the shutoff valve for reservoir pressurization, in the left or right hydraulic system, as applicable, (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [3].

SUBTASK 29-11-25-863-005

- (8) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-25-863-006

- (9) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-25-790-006

- (10) Make sure there is no leakage of air at the bleed valve [27].

SUBTASK 29-11-25-864-004

- (11) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-25-430-004

- (12) Install a MS20995NC32 lockwire, G50347 on the bleed valve [27].

SUBTASK 29-11-25-390-003

- (13) Apply adhesive, A00386 to the joint between the bleed valve [27] and the module assembly [3].

F. Put the Airplane Back to its Usual Condition.

SUBTASK 29-11-25-410-007

- (1) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-25-410-008

- (2) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-25-440-004

- (3) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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CENTER SYSTEM RESERVOIR PRESSURIZATION MODULE AND COMPONENTS - REMOVAL/ INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A removal of the reservoir pressurization module for the center system.
 - (2) An installation of the reservoir pressurization module for the center system.
 - (3) A removal of the filter element from the reservoir pressurization module.
 - (4) An installation of the filter element in the reservoir pressurization module.
 - (5) A removal of the check valves in the reservoir pressurization module.
 - (6) An installation of the check valves in the reservoir pressurization module.
 - (7) A removal of the bleed valve in the reservoir pressurization module.
 - (8) An installation of the bleed valve in the reservoir pressurization module.

TASK 29-11-26-000-801

2. Center System Reservoir Pressurization Module and Components Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-26-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-26-480-002



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

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SUBTASK 29-11-26-860-001

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

D. Center System Reservoir Pressurization Module Removal

SUBTASK 29-11-26-020-001

- (1) Disconnect the pneumatic supply tube [12] from the reservoir pressurization module (referred to as the module assembly [1] in this procedure).

SUBTASK 29-11-26-020-002

- (2) Disconnect the reservoir pressure tube [15] from the module assembly [1].

SUBTASK 29-11-26-020-003

- (3) Remove the bolts [2] which attach the module assembly [1].

SUBTASK 29-11-26-020-004

- (4) Remove the module assembly [1].

SUBTASK 29-11-26-020-005

- (5) Remove the adapter [10] and the packing [11] from the module assembly [1].

SUBTASK 29-11-26-020-006

- (6) Remove the union [16] and the packing [17] from the module assembly [1].

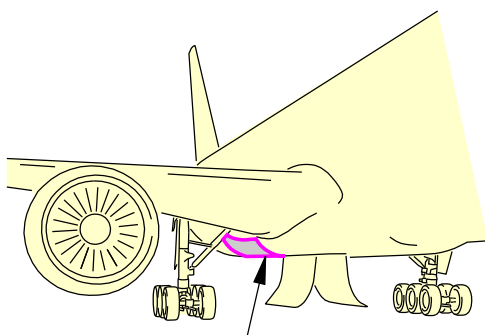
————— **END OF TASK** —————

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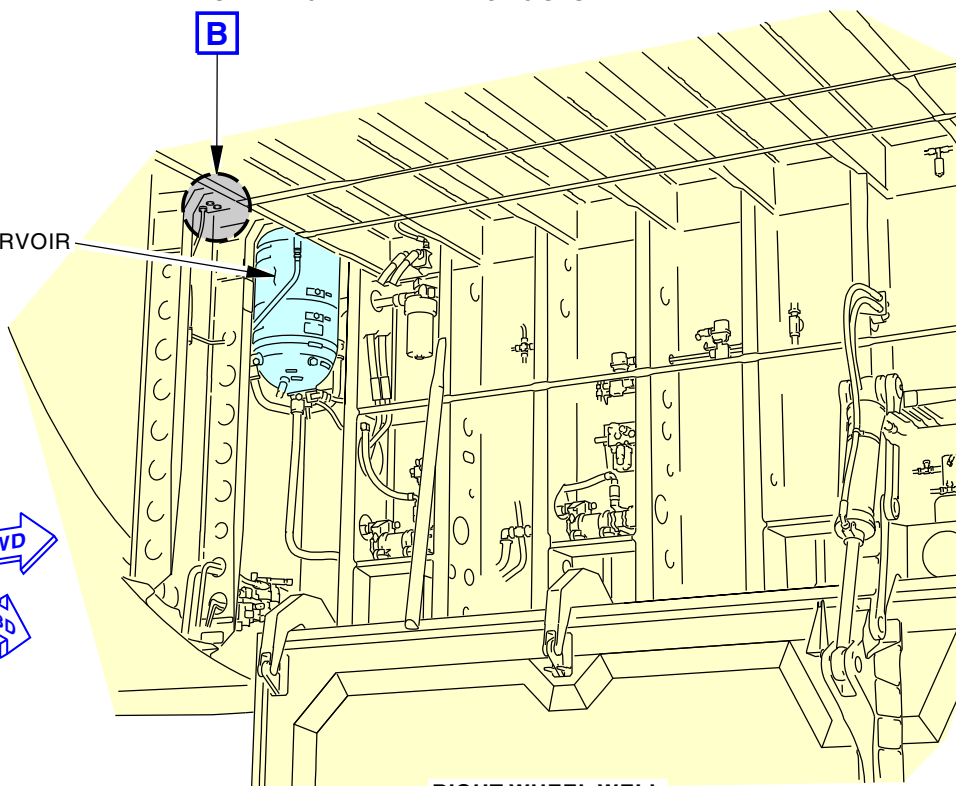
RIGHT WHEEL WELL

A

RESERVOIR PRESSURIZATION MODULE
FOR THE CENTER HYDRAULIC SYSTEM

B

RESERVOIR



RIGHT WHEEL WELL

A

C60055 S0006416081_V2

**Reservoir Pressurization Module Installation
Figure 401/29-11-26-990-801 (Sheet 1 of 2)**

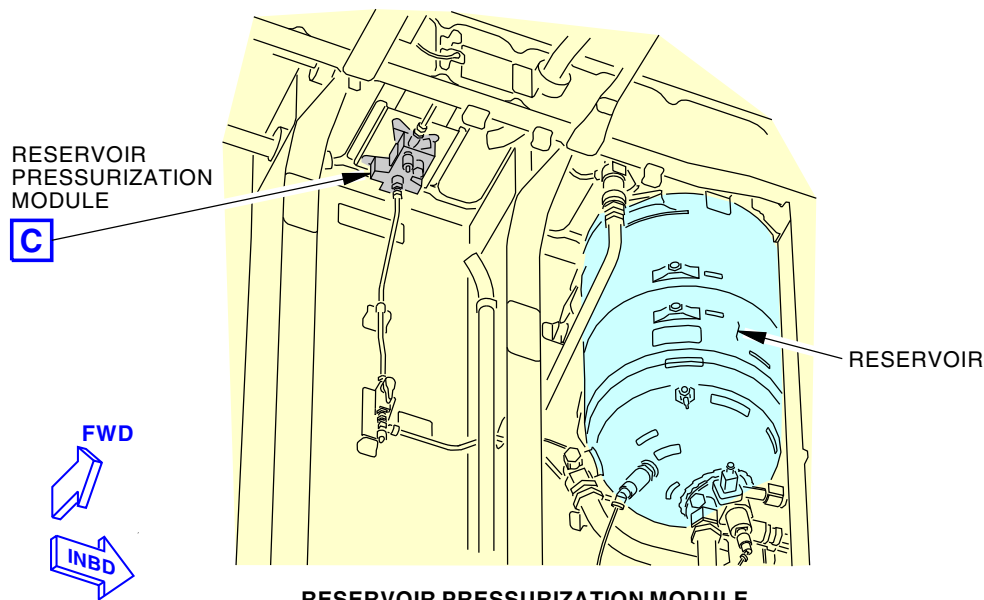
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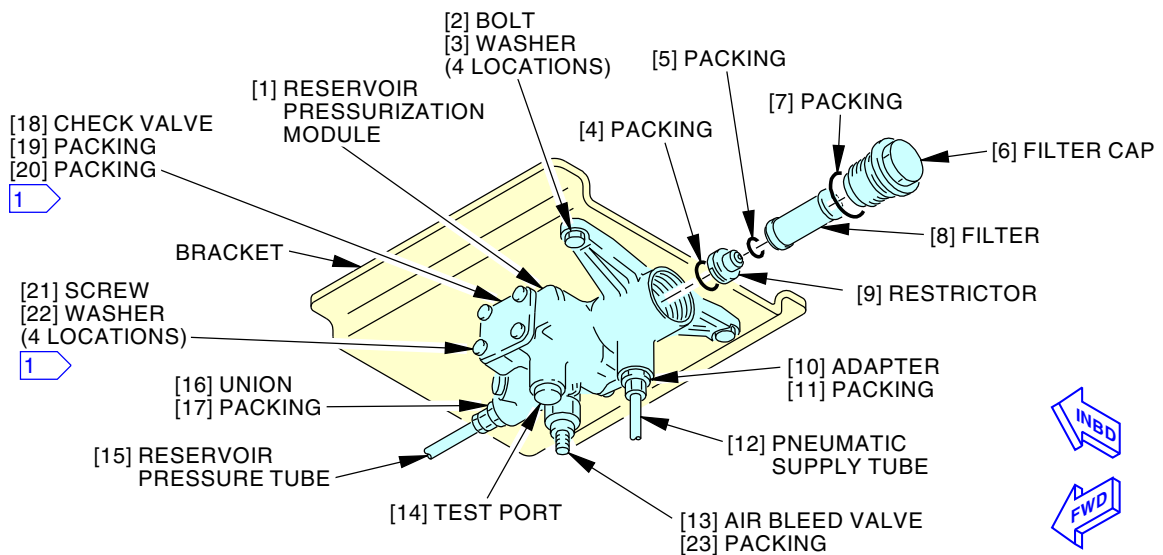
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**RESERVOIR PRESSURIZATION MODULE
FOR THE CENTER HYDRAULIC SYSTEM**

B



RESERVOIR PRESSURIZATION MODULE

C

1 CHECK VALVE
INSTALLATION ON
OPPOSITE SIDE OF
MODULE IS EQUIVALENT

C60179 S0006416082_V3

**Reservoir Pressurization Module Installation
Figure 401/29-11-26-990-801 (Sheet 2 of 2)**

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TASK 29-11-26-400-801

3. Center System Reservoir Pressurization Module Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Module assembly	29-11-25-01-010	ARO ALL
		29-11-25-01-055	ARO ALL
		29-11-26-01-020	ARO ALL
		29-11-26-01-055	ARO ALL
11	Packing	29-11-25-01-045	ARO ALL
		29-11-26-01-053	ARO ALL
17	Packing	29-11-25-01-045	ARO ALL
		29-11-26-01-053	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

E. Center System Reservoir Pressurization Module Installation

SUBTASK 29-11-26-110-001

- (1) Remove all contamination from the mating surfaces of the bracket and the reservoir pressurization module (referred to as the module assembly [1] in this procedure).

SUBTASK 29-11-26-640-001

- (2) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [11] and packing [17] and the threads of the adapter [10] and the union [16].

SUBTASK 29-11-26-420-001

- (3) Install the new packing [11] on the adapter [10].

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SUBTASK 29-11-26-420-002

- (4) Install the new packing [17] on the union [16].

SUBTASK 29-11-26-420-003

- (5) Install the adapter [10] and the union [16] in the ports on the module assembly [1].

SUBTASK 29-11-26-420-004

- (6) Put the module assembly [1] on the bracket.

SUBTASK 29-11-26-420-005

- (7) Install the bolts [2] and the washers [3] that attach the module assembly [1] to the bracket.

NOTE: Install each washers [3] with the countersink against the head of the bolts [2].

SUBTASK 29-11-26-420-006

- (8) Connect the pneumatic supply tube [12] to the module assembly [1].

SUBTASK 29-11-26-420-007

- (9) Connect the reservoir pressure tube [15] to the module assembly [1].

F. Center System Reservoir Pressurization Module Installation Test

SUBTASK 29-11-26-080-001

- (1) Remove the lock pin from the handle of the shutoff valve for reservoir pressurization (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [1].

SUBTASK 29-11-26-860-002

- (2) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-26-860-003

- (3) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-26-790-001

- (4) Make sure there is no leakage of air at the reservoir pressure tube [15] and the pneumatic supply tube [12] connections to the module assembly [1].

SUBTASK 29-11-26-860-004

- (5) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-26-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

TASK 29-11-26-000-802

4. Filter Element Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

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A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-26-480-003



WARNING

MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-26-480-004



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-26-860-008

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

D. Filter Element Removal

SUBTASK 29-11-26-020-007

- (1) Remove the filter cap [6] from the reservoir pressurization module (referred to as the module assembly [1] in this procedure).

SUBTASK 29-11-26-020-008

- (2) Remove the filter [8] and the restrictor [9] from the module assembly [1].

————— END OF TASK —————

TASK 29-11-26-400-802

5. Filter Element Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-30-80-910-801	General Cleaning of Metal (Series 80) (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

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Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

B. Consumable Materials

Reference	Description	Specification
A00386	Adhesive - Silicone RTV, Non-Corrosive, Sealant Primer	MIL-A-46146
B01000	Solvent - General Cleaning Of Metal	
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Packing	29-11-25-01-090	ARO ALL
		29-11-26-01-085	ARO ALL
5	Packing	29-11-25-01-080	ARO ALL
		29-11-26-01-075	ARO ALL
7	Packing	29-11-25-01-070	ARO ALL
		29-11-26-01-065	ARO ALL
8	Filter	29-11-25-01-075	ARO ALL
		29-11-26-01-070	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

E. Filter Element Installation

SUBTASK 29-11-26-160-001

- (1) Remove the remaining sealant from the filter cap [6] and the adjacent surface of the reservoir pressurization module (referred to as the module assembly [1] in this procedure).

SUBTASK 29-11-26-160-002

- (2) Clean the hole in the module assembly [1] for the filter [8].

SUBTASK 29-11-26-110-002

- (3) Clean the filter [8] with Series 80 solvent, B01000 (TASK 20-30-80-910-801), and fully dry the filter [8].

SUBTASK 29-11-26-640-002

- (4) Apply MCS 352B fluid, D00054, to the new packing [4], packing [5], and packing [7] and the threads on the filter cap [6].

SUBTASK 29-11-26-420-008

- (5) Assemble the filter [8], packing [4] and packing [5], and the restrictor [9].

SUBTASK 29-11-26-420-013

- (6) Install the new packing [7] on the filter cap [6].

SUBTASK 29-11-26-420-009

- (7) Install the filter [8]] and the restrictor [9] into the module assembly [1].

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SUBTASK 29-11-26-420-010

- (8) Install the filter cap [6] on the module assembly [1].

SUBTASK 29-11-26-420-011

- (9) Tighten the filter cap [6] to 75-95 pound-inches.

F. Filter Element Installation Test

SUBTASK 29-11-26-080-002

- (1) Remove the lock pin from the handle of the shutoff valve for reservoir pressurization, in the center hydraulic system (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [1].

SUBTASK 29-11-26-860-005

- (2) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-26-860-006

- (3) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-26-790-002

- (4) Make sure there is no leakage of air at the filter cap [6] on the module assembly [1].

SUBTASK 29-11-26-860-007

- (5) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-26-420-012

- (1) Safety the filter cap [6] with a lockwire.

SUBTASK 29-11-26-390-001

- (2) Apply a bead of adhesive, A00386, to the joint between the filter cap [6] and the module assembly [1].

SUBTASK 29-11-26-410-002



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— END OF TASK —————

TASK 29-11-26-000-803

6. Check Valve Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

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B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-26-490-001



WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 29-11-26-490-002



WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-26-864-001

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

D. Remove the Check Valve

SUBTASK 29-11-26-020-009

- (1) Remove the screws [21] and washers [22] from the check valve [18].

SUBTASK 29-11-26-020-010

- (2) Remove the check valve [18] from the module assembly [1].

SUBTASK 29-11-26-020-011

- (3) Remove and discard the packing [19] and packing [20].

————— END OF TASK —————

TASK 29-11-26-400-803

7. Check Valve Installation

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

B. Consumable Materials

Reference	Description	Specification
A00386	Adhesive - Silicone RTV, Non-Corrosive, Sealant Primer	MIL-A-46146

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Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00633	Grease - Aircraft General Purpose	BMS3-33
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50380	LEAK TEC - 16-OX, THIN FILM BUBBLE TESTING SOLUTIONS	MIL-PRF-25567

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
18	Check valve	29-11-25-01-110 29-11-26-01-100	ARO ALL ARO ALL
19	Packing	29-11-25-01-115 29-11-26-01-105	ARO ALL ARO ALL
20	Packing	29-11-25-01-120 29-11-26-01-110	ARO ALL ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

E. Procedure

SUBTASK 29-11-26-640-003

- (1) Apply MCS 352B fluid, D00054 to the packing [19] and packing [20].

SUBTASK 29-11-26-420-014

- (2) Install the packing [19] and packing [20] on the check valve [18].

SUBTASK 29-11-26-420-015

- (3) Install the check valve [18] in the module assembly [1].

SUBTASK 29-11-26-420-016

- (4) Apply grease, D00633 to the threads of the screws [21] and install the screws [21] and washers [22].

SUBTASK 29-11-26-430-001

- (5) Tighten the screws [21] to 20-25 pound-inches (2.3-2.8 N-m).

SUBTASK 29-11-26-790-003

- (6) Apply Leak Tec 16-OX (leak detection compound), G50380 to the check valve [18].

SUBTASK 29-11-26-863-001

- (7) Remove the lock pin from the handle of the shutoff valve for reservoir pressurization, in the center hydraulic system (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [1].

SUBTASK 29-11-26-863-002

- (8) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-26-863-003

- (9) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

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SUBTASK 29-11-26-790-004

- (10) Make sure there is no leakage of air at the check valve [18].

SUBTASK 29-11-26-864-002

- (11) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-26-430-002

- (12) Install a MS20995NC32 lockwire, G50347 on the screws [21].

SUBTASK 29-11-26-390-002

- (13) Apply adhesive, A00386 to the screws [21] and to the joint between the check valve [18] and the module assembly [1].

F. Put the Airplane Back to its Usual Condition

SUBTASK 29-11-26-090-001



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— END OF TASK —————

TASK 29-11-26-000-804

8. Bleed Valve Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-26-490-003



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

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SUBTASK 29-11-26-490-004



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-26-864-003

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

D. Remove the Bleed Valve

SUBTASK 29-11-26-020-012



WARNING

IF THE BLEED VALVE WILL NOT MOVE TO THE OPEN POSITION, YOU MUST REMOVE THE BLEED VALVE VERY SLOWLY. THIS WILL DECREASE THE AIR PRESSURE IN THE RESERVOIR SAFELY. IF YOU REMOVE THE BLEED VALVE QUICKLY, THE PRESSURE IN THE RESERVOIR WILL RELEASE SUDDENLY AND CAUSE A SPRAY OF HYDRAULIC FLUID. THIS CAN CAUSE INJURIES TO PERSONNEL.

- (1) Remove the bleed valve [13] from the module assembly [1].

SUBTASK 29-11-26-020-013

- (2) Remove the packing [23] from the bleed valve [13].

————— END OF TASK —————

TASK 29-11-26-400-804

9. Bleed Valve Installation

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

B. Consumable Materials

Reference	Description	Specification
A00386	Adhesive - Silicone RTV, Non-Corrosive, Sealant Primer	MIL-A-46146
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00633	Grease - Aircraft General Purpose	BMS3-33
G50347	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50380	LEAK TEC - 16-OX, THIN FILM BUBBLE TESTING SOLUTIONS	MIL-PRF-25567

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C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

D. Procedure

SUBTASK 29-11-26-640-004

- (1) Apply MCS 352B fluid, D00054 to the packing [23].

SUBTASK 29-11-26-420-017

- (2) Install the packing [23] on the bleed valve [13].

SUBTASK 29-11-26-640-005

- (3) Apply grease, D00633 to the threads of the bleed valve [13].

SUBTASK 29-11-26-420-018

- (4) Install the bleed valve [13] in the module assembly [1].

SUBTASK 29-11-26-430-003

- (5) Tighten the bleed valve [13] to 50-65 pound-inches (5.6-7.3 N-m).

SUBTASK 29-11-26-790-005

- (6) Apply Leak Tec 16-OX (leak detection compound), G50380 to the bleed valve [13].

SUBTASK 29-11-26-863-004

- (7) Remove the lock pin from the handle of the shutoff valve for reservoir pressurization, in the center hydraulic system (TASK 29-11-00-860-807).

NOTE: The shutoff valve is adjacent to the module assembly [1].

SUBTASK 29-11-26-863-005

- (8) Put the handle of the shutoff valve for reservoir pressurization in the open position.

SUBTASK 29-11-26-863-006

- (9) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-26-790-006

- (10) Make sure there is no leakage of air at the bleed valve [13].

SUBTASK 29-11-26-864-004

- (11) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-26-430-004

- (12) Install a MS20995NC32 lockwire, G50347 on the bleed valve [13].

SUBTASK 29-11-26-390-003

- (13) Apply adhesive, A00386 to the joint between the bleed valve [13] and the module assembly [1].

E. Put the Airplane Back to its Usual Condition

SUBTASK 29-11-26-090-002



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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RESERVOIR PRESSURIZATION SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir pressurization shutoff valve (referred to as the valve [4] or valve [10] in this procedure)
 - (2) An installation of the valve [4] or valve [10].
- B. There is one valve [4] or valve [10] for the reservoir pressurization in each hydraulic system. You can use this procedure to remove and install each valve [4] or valve [10].

TASK 29-11-28-000-801

2. Reservoir Pressurization Shutoff Valve Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-11-28-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-28-010-001

- (2) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

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SUBTASK 29-11-28-010-002

- (3) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-28-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center system, if the downlock pins are not installed for the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-28-010-003



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) For the center system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-11-28-860-001

- (6) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

SUBTASK 29-11-28-860-002

- (7) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Reservoir Pressurization Shutoff Valve Removal

SUBTASK 29-11-28-020-001

- (1) Disconnect the air outlet tube [1] and the air inlet tube [5] from the reservoir pressurization shutoff valve (referred to as the valve [4] or valve [10] in this procedure).

NOTE: For the center system, disconnect the T-fitting [9] on the air inlet tube [5] from the valve [10].

SUBTASK 29-11-28-020-002

- (2) Remove the bolts [6] or bolts [13] from the valve [4] or valve [10].

SUBTASK 29-11-28-020-003

- (3) Remove the valve [4] or valve [10] from the bracket [8].

SUBTASK 29-11-28-020-004

- (4) Install caps on the air outlet tube [1] and the air inlet tube [5] to prevent contamination.

SUBTASK 29-11-28-020-005

- (5) If it is necessary to keep components for installation on the replacement valve [4] or valve [10], do this step:
- (a) Remove the unions [2] or unions [11] and the packings [3] or packings [12] from each port on the valve [4] or valve [10]

SUBTASK 29-11-28-020-006

- (6) Install caps on the ports of the valve [4] or valve [10] to prevent contamination.

————— END OF TASK —————

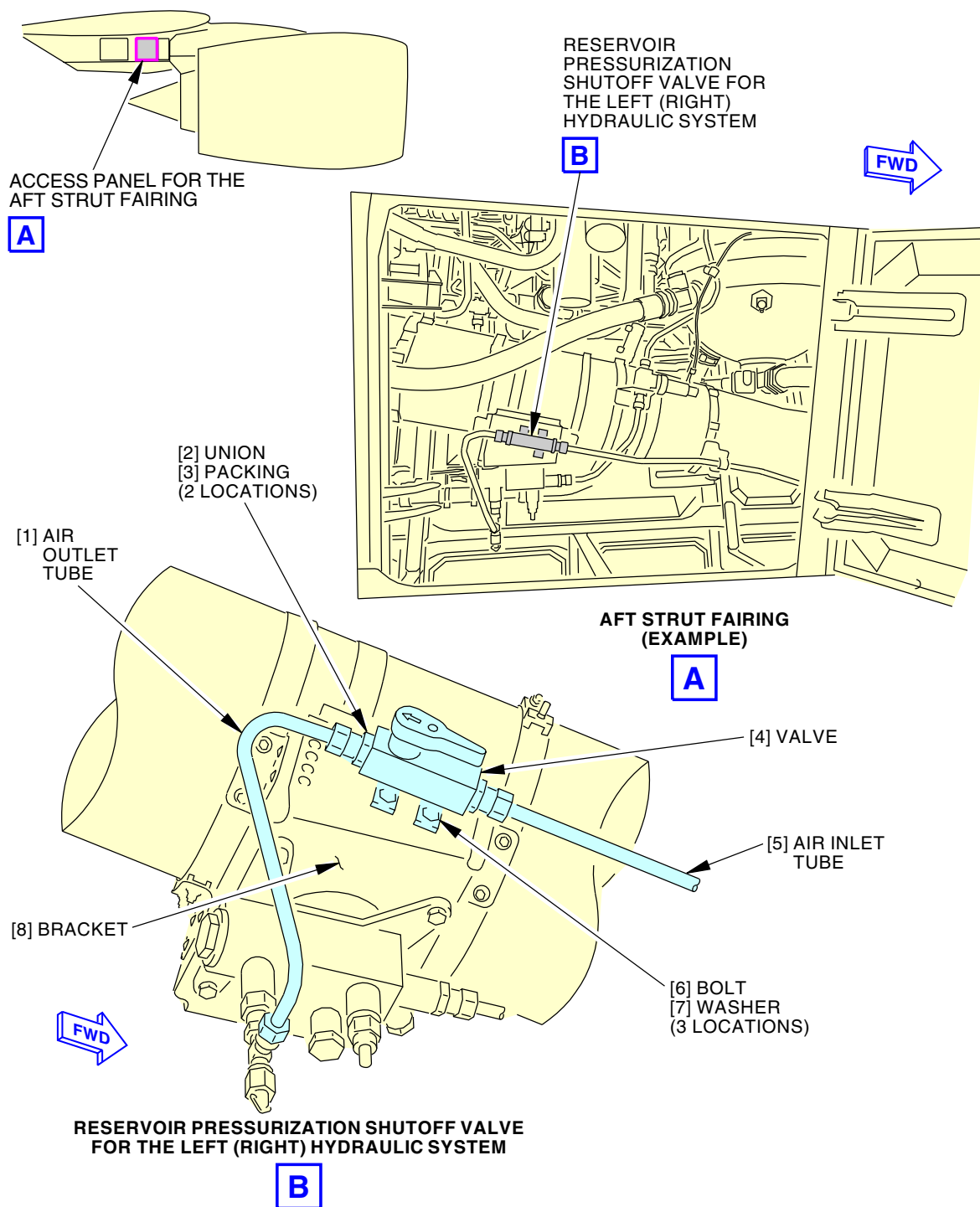
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Reservoir Pressurization Shutoff Valve Installation
Figure 401/29-11-28-990-801 (Sheet 1 of 2)

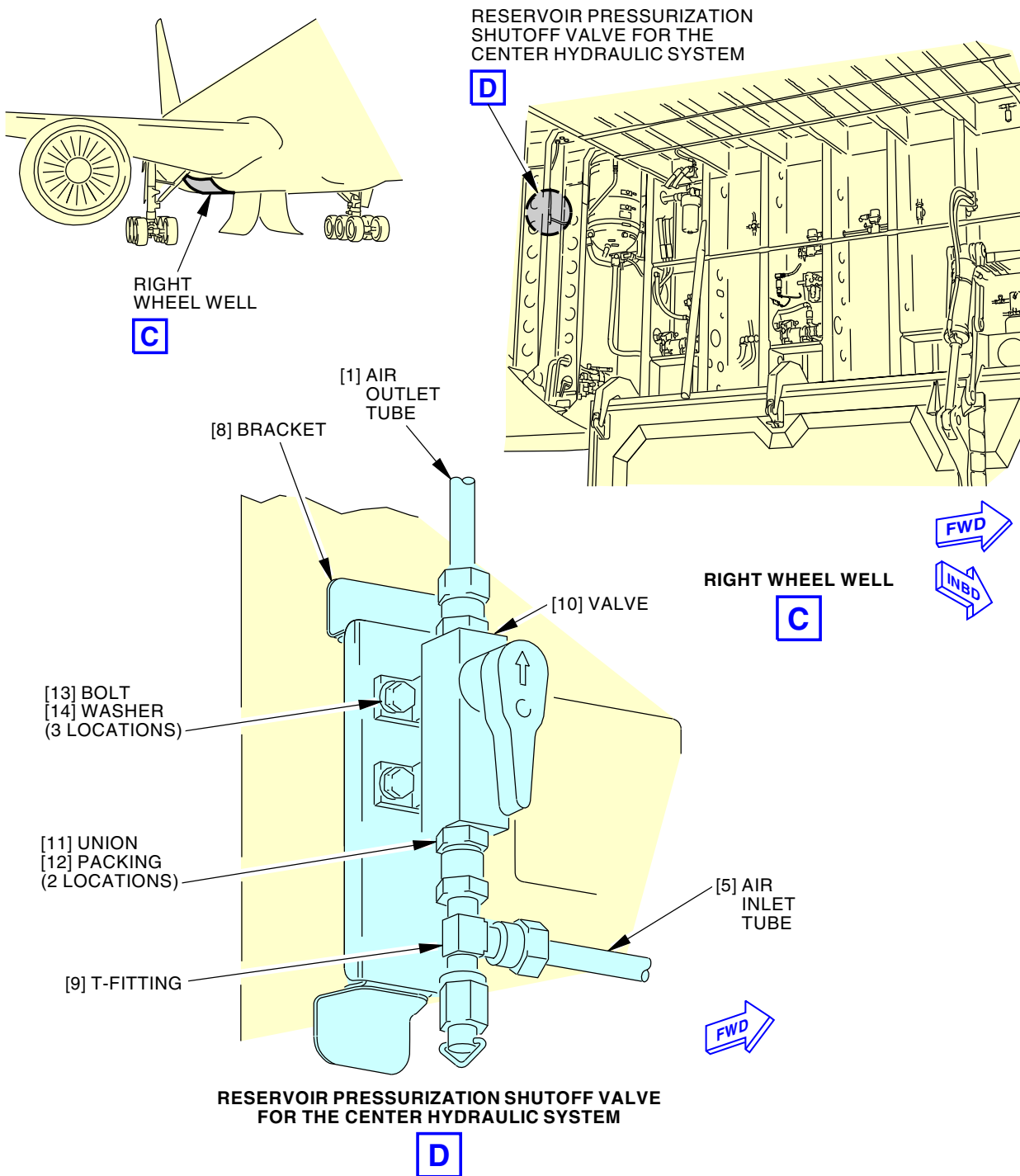
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Reservoir Pressurization Shutoff Valve Installation
Figure 401/29-11-28-990-801 (Sheet 2 of 2)

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TASK 29-11-28-400-801

3. Reservoir Pressurization Shutoff Valve Installation

(Figure 401)

A. References

Reference	Title
20-11-00-910-801	Standard Torque Values (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Packing	29-11-28-02-025	ARO ALL
4	Valve	29-11-28-02-030	ARO ALL
10	Valve	29-11-28-01-040	ARO ALL
12	Packing	29-11-28-01-035	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

E. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

F. Reservoir Pressurization Shutoff Valve Installation

SUBTASK 29-11-28-420-001

- (1) If it is necessary to install components on the replacement reservoir pressurization shutoff valve (referred to as the valve [4] or valve [10] in this procedure), do these steps:

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- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packings [3] or packings [12] and to the threads of the unions [2] or unions [11].
- (b) Install the new packings [3] or packings [12] on the unions [2] or unions [11].
- (c) Remove the caps from the ports of the valve [4] or valve [10].
- (d) Install the unions [2] or unions [11] in each port on the valve [4] or valve [10].

SUBTASK 29-11-28-420-002

- (2) Remove the caps from the air outlet tube [1] and the air inlet tube [5].

SUBTASK 29-11-28-390-001



USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.



DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (3) For the center hydraulic system, do this step:
 - (a) Apply a thin layer of Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the shank and the threads of the bolts [6] or bolts [13].

NOTE: You must install the bolts [6] or bolts [13] while the sealant is still wet.

SUBTASK 29-11-28-420-003

- (4) Hold the valve [4] or valve [10] on the bracket [8].

SUBTASK 29-11-28-420-004

- (5) Install the bolts [6] or bolts [13] and the washers [7] or washers [14] that attach the valve [4] or valve [10] to the bracket [8]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

NOTE: The countersink on each washer [7] or washer [14] must be against the head of each bolt [6] or bolt [13].

SUBTASK 29-11-28-420-005

- (6) Connect the air outlet tube [1] and the air inlet tube [5] to the valve [4] or valve [10].

NOTE: For the center system, connect the T-fitting [9] on the air inlet tube [5] to the valve [10].

G. Reservoir Pressurization Shutoff Valve Installation Test

SUBTASK 29-11-28-860-003

- (1) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-28-860-004

- (2) Put the handle on the valve [4] or valve [10] in the open position.

SUBTASK 29-11-28-790-001

- (3) Make sure there is no leakage of air at the connections for the air outlet tube [1] and the air inlet tube [5] on the valve [4] or valve [10].

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SUBTASK 29-11-28-860-005

- (4) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-28-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801

SUBTASK 29-11-28-410-002

- (2) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-28-410-003

- (3) For the right hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-28-440-001

- (4) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— END OF TASK —————

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ENGINE-DRIVEN PUMP (EDP) SUPPLY SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the engine-driven pump (EDP) supply shutoff valve (referred to as the valve assembly [13])
- (2) An installation of the engine-driven pump (EDP) supply shutoff valve.

TASK 29-11-30-000-801

2. Engine-Driven Pump (EDP) Supply Shutoff Valve Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

<u>Reference</u>	<u>Title</u>
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)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. **Location Zones**

<u>Zone</u>	<u>Area</u>
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. **Access Panels**

<u>Number</u>	<u>Name/Location</u>
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

D. **Prepare for the Removal**

SUBTASK 29-11-30-860-001

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

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C29603	LEFT EDP SUPPLY SHUTOFF VALVE
B	20	C29602	RIGHT EDP SUPPLY SHUTOFF VALVE

SUBTASK 29-11-30-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-11-30-010-001

- (3) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-30-010-002

- (4) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-30-860-002

- (5) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-30-680-001

- (6) To drain the fluid from the applicable reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

E. Engine-Driven Pump (EDP) Supply Shutoff Valve Removal

SUBTASK 29-11-30-020-001

- (1) Disconnect the electrical connector [16] from the valve assembly [13].

SUBTASK 29-11-30-020-002

- (2) Disconnect the hydraulic supply tube [15] from the bottom adapter [21] on the valve assembly [13].

SUBTASK 29-11-30-020-007

- (3) Install a cap on the hydraulic supply tube [15] to prevent contamination.

SUBTASK 29-11-30-020-008

- (4) Disconnect the hydraulic supply tube to the engine driven pump [6].

SUBTASK 29-11-30-020-009

- (5) Install a cap on the hydraulic supply tube [6].

SUBTASK 29-11-30-020-003

- (6) Remove the bolts [1], bolt [7], and bolt [9] which hold the valve assembly [13] to the top adapter [5] and bottom adapter [21].

SUBTASK 29-11-30-020-004

- (7) Remove the bottom adapter [21].

SUBTASK 29-11-30-020-005

- (8) Remove the valve assembly [13].

SUBTASK 29-11-30-020-010

- (9) Remove the adapter [5].

SUBTASK 29-11-30-020-006

- (10) Remove and discard the packing [14] from between the valve assembly [13] and the adapter [5].

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SUBTASK 29-11-30-020-011

- (11) Remove and discard the packing [14] from between the valve assembly [13] and the adapter [21].

————— **END OF TASK** —————

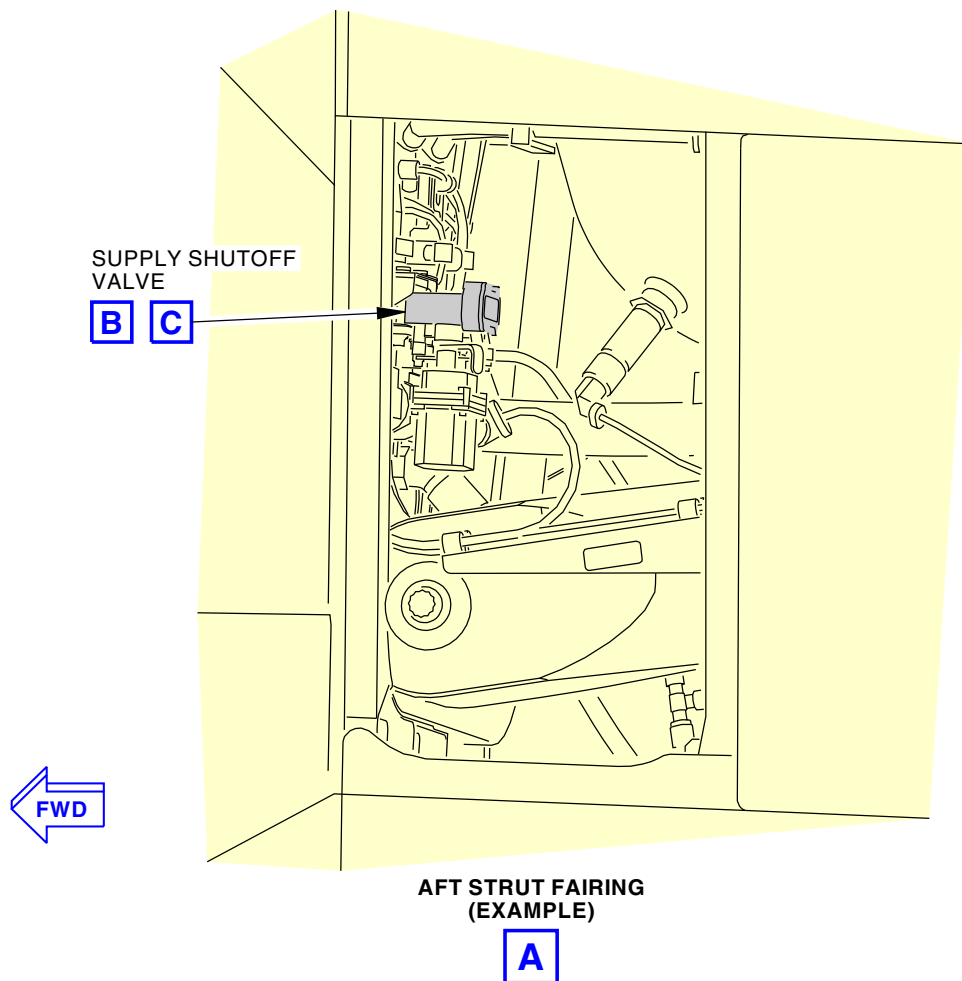
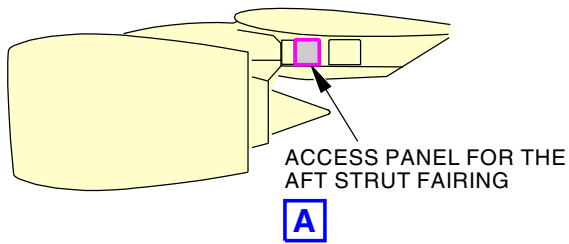
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Engine-Driven Pump (EDP) Supply Shutoff Valve
Figure 401/29-11-30-990-801 (Sheet 1 of 3)

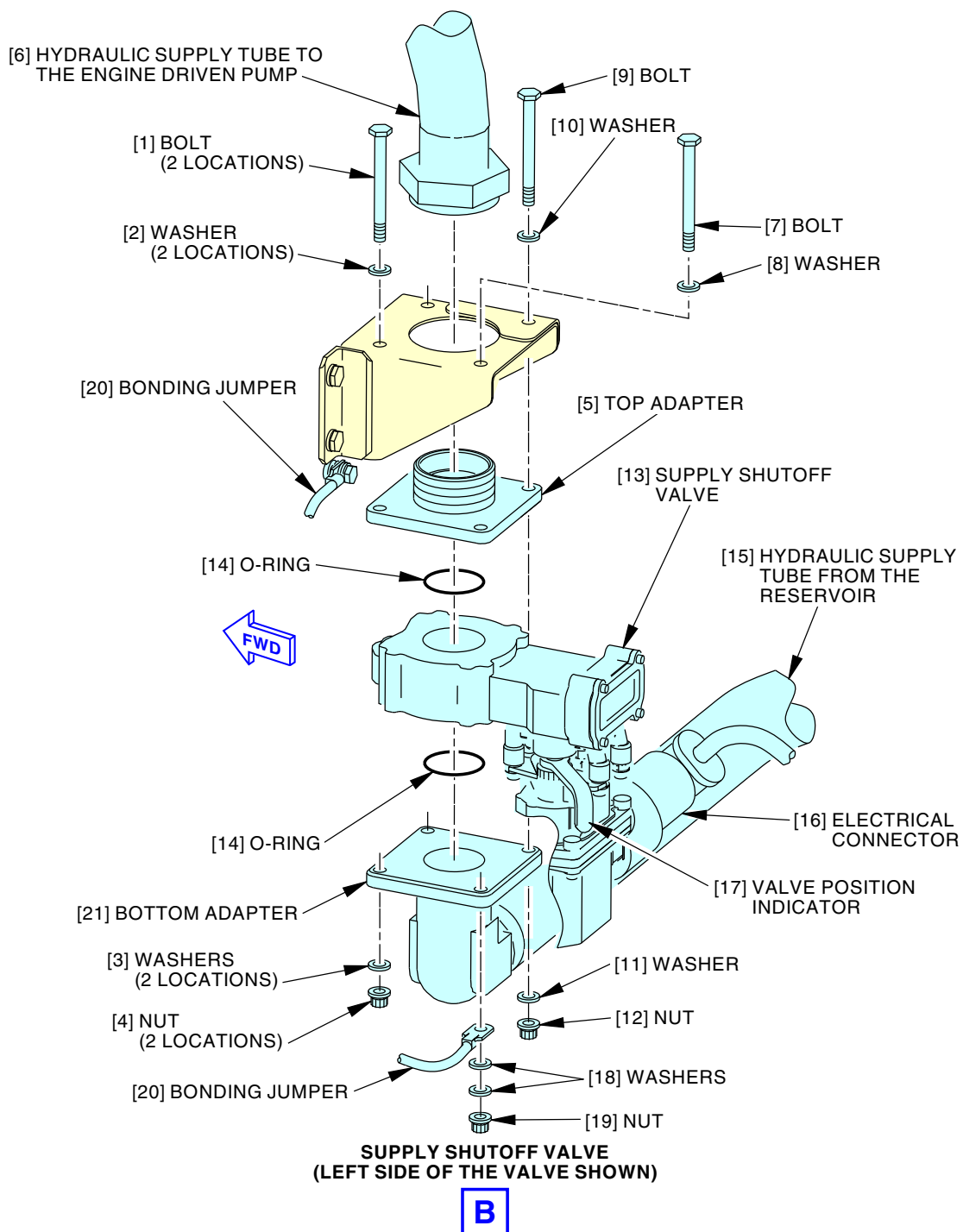
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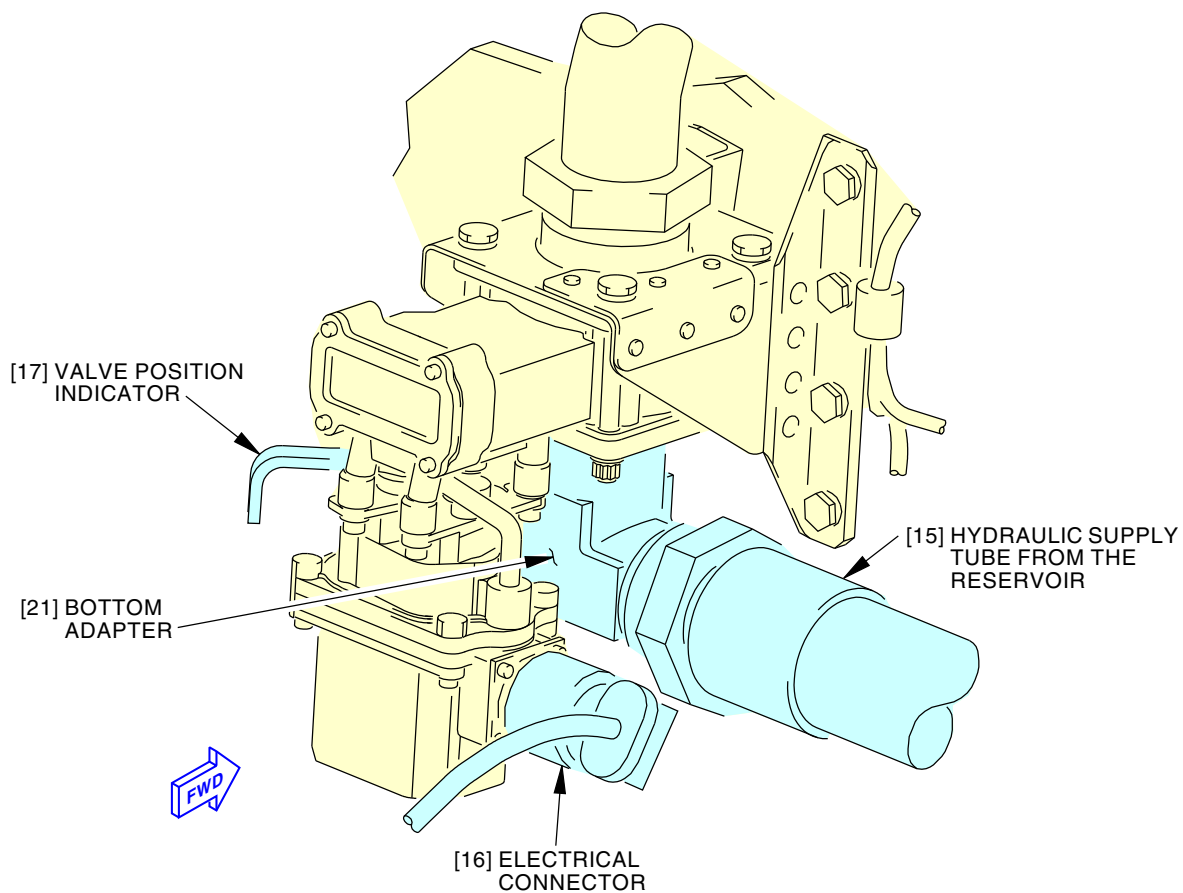
**Engine-Driven Pump (EDP) Supply Shutoff Valve
Figure 401/29-11-30-990-801 (Sheet 2 of 3)**

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**SUPPLY SHUTOFF VALVE
(RIGHT SIDE OF THE VALVE SHOWN)**

C

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Engine-Driven Pump (EDP) Supply Shutoff Valve
Figure 401/29-11-30-990-801 (Sheet 3 of 3)

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TASK 29-11-30-400-801

3. Engine-Driven Pump (EDP) Supply Shutoff Valve Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-710-806	Engine-Driven Pump (EDP) Supply Shutoff Valve - System Test (P/B 501)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	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.

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
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Valve assembly	29-11-30-02-030	ARO ALL
14	Packing	29-11-30-02-085	ARO ALL

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E. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

F. Access Panels

Number	Name/Location
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

G. Engine-Driven Pump (EDP) Supply Shutoff Valve Installation

SUBTASK 29-11-30-160-001

(1) Clean the mating surfaces of these components:

- (a) The top adapter [5]
- (b) The valve assembly [13]
- (c) The bottom adapter [21].

SUBTASK 29-11-30-420-001

(2) Remove the cap from the hydraulic supply tube [15].

SUBTASK 29-11-30-640-001

(3) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packings [14].

SUBTASK 29-11-30-420-002

(4) Install the new packings [14] in the grooves of the valve assembly [13].

SUBTASK 29-11-30-420-003

(5) Hold the bottom adapter [21] on the valve assembly [13].

SUBTASK 29-11-30-420-004

(6) Hold the bottom adapter [21] and the valve assembly [13] against the top adapter [5].

SUBTASK 29-11-30-420-005

(7) Install the bolts [1], washers [2], washers [3], and nuts [4].

SUBTASK 29-11-30-420-006

(8) Install the bolt [9], washer [10], washer [11], and nut [12].

SUBTASK 29-11-30-420-007

(9) Install the bolt [7], washer [8], washers [18], bonding jumper [20] and nut [19].

NOTE: One end of the bonding jumper [20] has a red band. Make sure you attach this end of the bonding jumper [20] to the valve assembly [13]. This end of the bonding jumper [20] has the tin plating.

SUBTASK 29-11-30-760-001

(10) Do a check of the electrical bonding between the valve assembly [13] and the adjacent structure with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the valve assembly [13] and the adjacent structure is 0.0025 ohms.

SUBTASK 29-11-30-420-008

(11) Connect the hydraulic supply tube [15] to the valve assembly [13].

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SUBTASK 29-11-30-420-009

- (12) Connect the electrical connector [16] to the valve assembly [13].

H. Engine-Driven Pump (EDP) Supply Shutoff Valve Installation Test

SUBTASK 29-11-30-860-003

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

SUBTASK 29-11-30-640-002

- (2) For the reservoir in the applicable hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-11-30-860-004

- (3) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-30-790-001

- (4) Make sure there is no leakage of hydraulic fluid at the valve assembly [13].

SUBTASK 29-11-30-860-005

- (5) 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>
B	5	C29603	LEFT EDP SUPPLY SHUTOFF VALVE
B	20	C29602	RIGHT EDP SUPPLY SHUTOFF VALVE

SUBTASK 29-11-30-710-001

- (6) Do this task: Engine-Driven Pump (EDP) Supply Shutoff Valve - System Test, TASK 29-11-00-710-806.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-30-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-30-410-001

- (2) For the left hydraulic system, do the steps which follow:

For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-30-410-002

- (3) For the right hydraulic system, do the steps which follow:

For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

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SUBTASK 29-11-30-440-001

- (4) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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RESERVE ISOLATION VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reserve isolation valve
 - (2) An installation of the reserve isolation valve.

TASK 29-11-31-000-801

2. Reserve Isolation Valve Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-31-480-001



WARNING

MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-31-010-001



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-31-860-001

- (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>
M	28	C29607	C1 HYD PUMP CTRL

SUBTASK 29-11-31-860-002

- (4) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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D. Reserve Isolation Valve Removal

SUBTASK 29-11-31-020-001

- (1) Disconnect the electrical connector [2] from the reserve isolation valve [6] (referred to as the valve [6] in this procedure).

SUBTASK 29-11-31-020-002

- (2) Disconnect the hydraulic pressure tubes [3] and [7] from the valve [6].

SUBTASK 29-11-31-020-003

- (3) Install caps on the hydraulic pressure tubes [3] and [7] to prevent contamination.

SUBTASK 29-11-31-020-004

- (4) Remove the bolts [4] that attach the valve [6].

SUBTASK 29-11-31-020-005

- (5) Remove the valve [6].

SUBTASK 29-11-31-020-006

- (6) Install caps on the ports on the valve [6] to prevent contamination.

————— **END OF TASK** —————

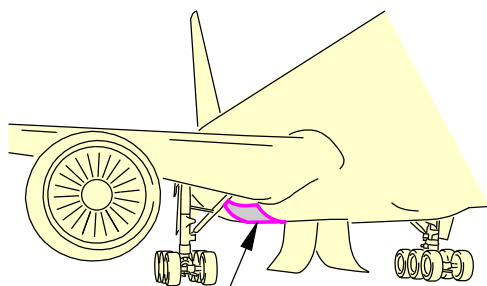
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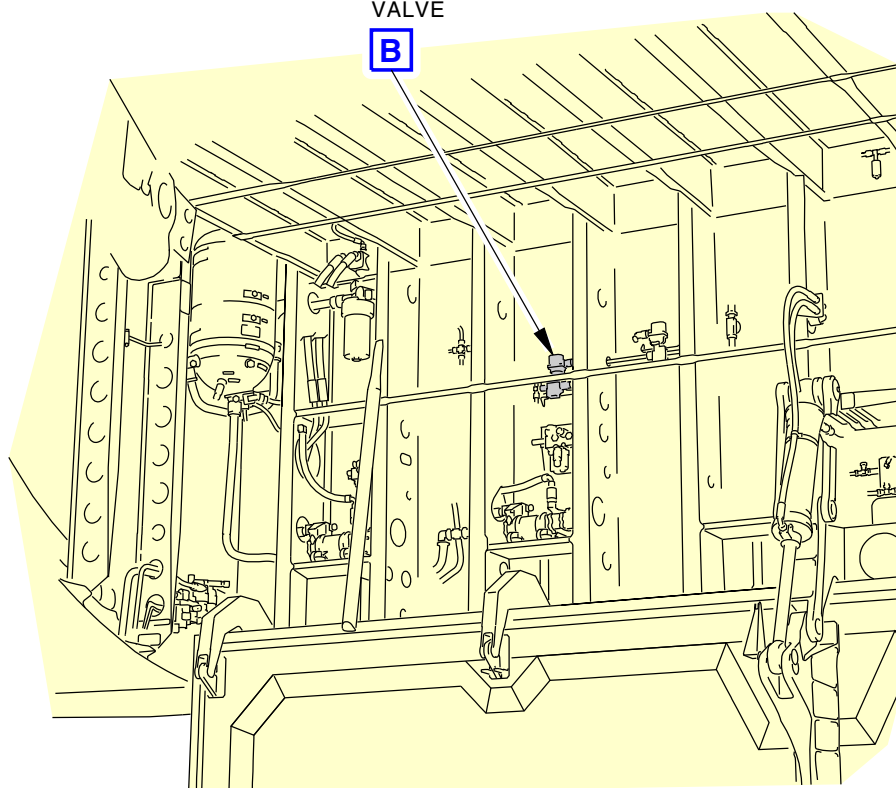


RIGHT
WHEEL WELL

A

RESERVE
ISOLATION
VALVE

B



RIGHT WHEEL WELL

A



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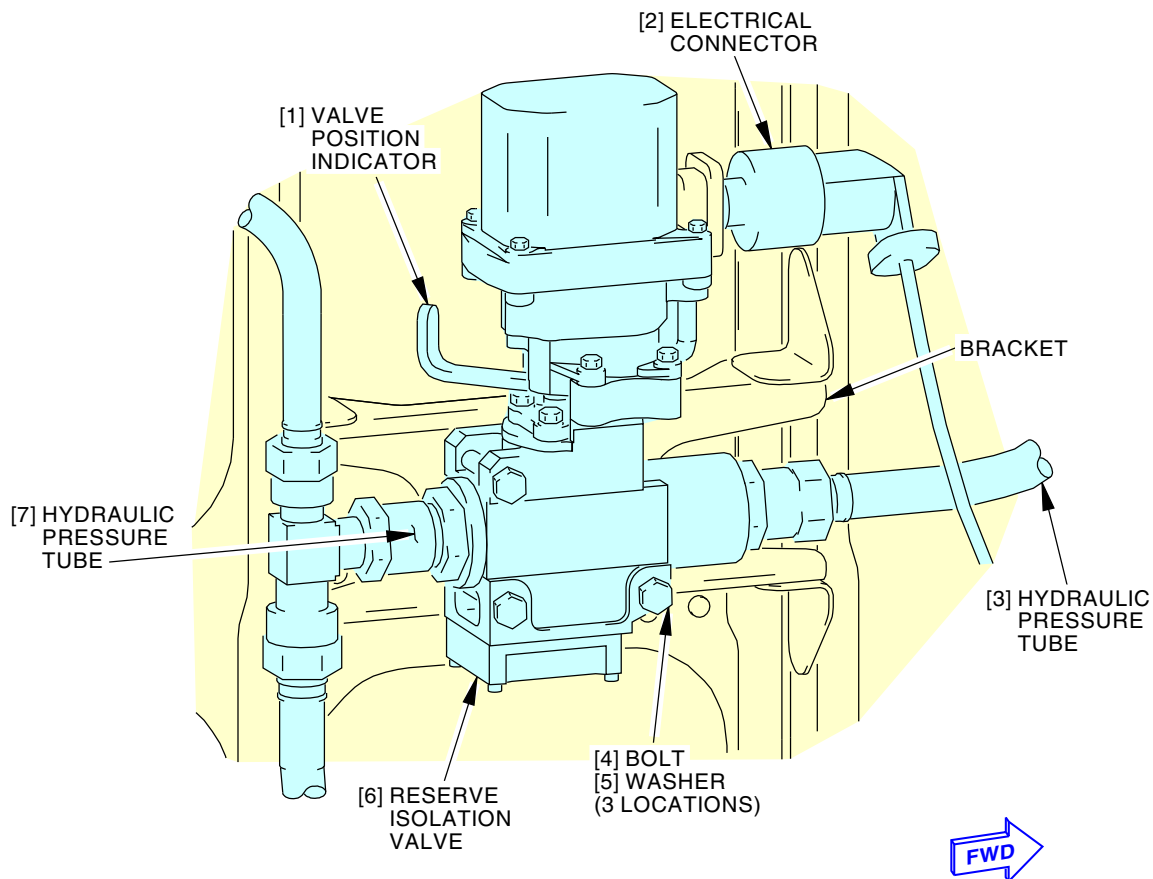
Reserve Isolation Valve Installation
Figure 401/29-11-31-990-801 (Sheet 1 of 2)

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RESERVE ISOLATION VALVE

B

C58267 S0006416103_V2

**Reserve Isolation Valve Installation
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TASK 29-11-31-400-801

3. Reserve Isolation Valve Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) 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
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Valve	29-11-31-01-010	ARO ALL

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F. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

G. Reserve Isolation Valve Installation

SUBTASK 29-11-31-140-001

- (1) Do one of the tasks which follow to clean the mating surfaces of the bracket and the reserve isolation valve [6] (referred to as the valve [6] in this procedure):
 - (a) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.
 - (b) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
 - (c) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.

SUBTASK 29-11-31-370-001

- (2) For the surfaces which you cleaned, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 29-11-31-390-001

- (3) Apply a thin layer of sealant, A00247 to the mating surfaces of the bracket and the valve [6].

SUBTASK 29-11-31-390-002

- (4) Apply a thin layer of sealant, A00247 to the shank and the threads of the bolts [4].

SUBTASK 29-11-31-420-001

- (5) Hold the valve [6] on the bracket.

SUBTASK 29-11-31-420-002

- (6) Install the bolts [4] and washers [5] that attach the valve [6] to the bracket.

NOTE: The countersink on each washer [5] must be against the head of each bolt [4].

SUBTASK 29-11-31-210-001

- (7) Make sure the sealant, A00247 comes out of the edges between the valve [6] and the bracket to make a continuous fillet seal.

SUBTASK 29-11-31-390-003

- (8) Remove the unwanted sealant, A00247 from the bolts [4], the valve [6], and the bracket.

SUBTASK 29-11-31-760-001

- (9) Do a check of the electrical bond between the valve [6] and the bracket with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the valve [6] and the bracket is 0.008 ohms.

SUBTASK 29-11-31-420-003

- (10) Remove the caps from the ports on the valve [6].

SUBTASK 29-11-31-420-004

- (11) Remove the caps from the hydraulic pressure tubes [3] and [7].

SUBTASK 29-11-31-420-005

- (12) Connect the hydraulic pressure tubes [3] and [7] to the valve [6].

SUBTASK 29-11-31-420-006

- (13) Connect the electrical connector [2] to the valve [6].

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H. Reserve Isolation Valve Installation Test

SUBTASK 29-11-31-860-003

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

SUBTASK 29-11-31-860-004

- (2) 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>
M	28	C29607	C1 HYD PUMP CTRL

SUBTASK 29-11-31-860-005

- (3) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-31-790-001

- (4) Make sure there are no leaks where the hydraulic pressure tubes [3] and [7] connect to the valve [6].

SUBTASK 29-11-31-860-006

- (5) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-11-31-740-001

- (6) Use a maintenance access terminal (MAT) to do the operational test of the center hydraulic isolation system (CHIS):
- (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) OPERATIONAL TEST
 - 6) Center Hydraulic Isolation 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA..
 - (e) To put the MAT back to its initial condition, make these selections:
 - 1) LINE MAINTENANCE
 - 2) EXIT MAINTENANCE

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-31-100-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-31-210-002

- (2) For the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-31-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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NOSE GEAR ISOLATION VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the nose gear isolation valve
 - (2) An installation of the nose gear isolation valve.

TASK 29-11-32-000-801

2. Nose Gear Isolation Valve Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-32-480-001



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-32-010-001



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-32-860-001

- (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>
L	10	C29610	NOSE GEAR ISLN VALVE

SUBTASK 29-11-32-860-002

- (4) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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D. Nose Gear Isolation Valve Removal

SUBTASK 29-11-32-020-001

- (1) Disconnect the electrical connector [8] from the nose gear isolation valve (referred to as the valve [1] in this procedure).

SUBTASK 29-11-32-020-002

- (2) Disconnect the hydraulic pressure tubes [5] and [6] from the valve [1].

SUBTASK 29-11-32-020-003

- (3) Install caps on the hydraulic lines to prevent contamination.

SUBTASK 29-11-32-020-004

- (4) Remove the bolts [3] that attach the valve [1].

SUBTASK 29-11-32-020-005

- (5) Remove the valve [1].

SUBTASK 29-11-32-020-006

- (6) Install caps on the ports on the valve [1] to prevent contamination.

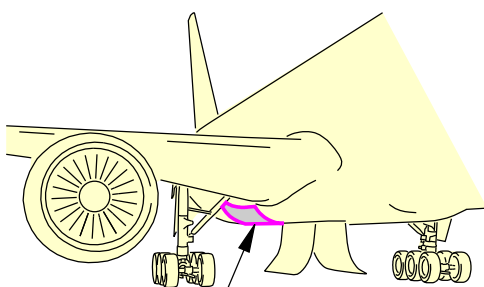
————— **END OF TASK** —————

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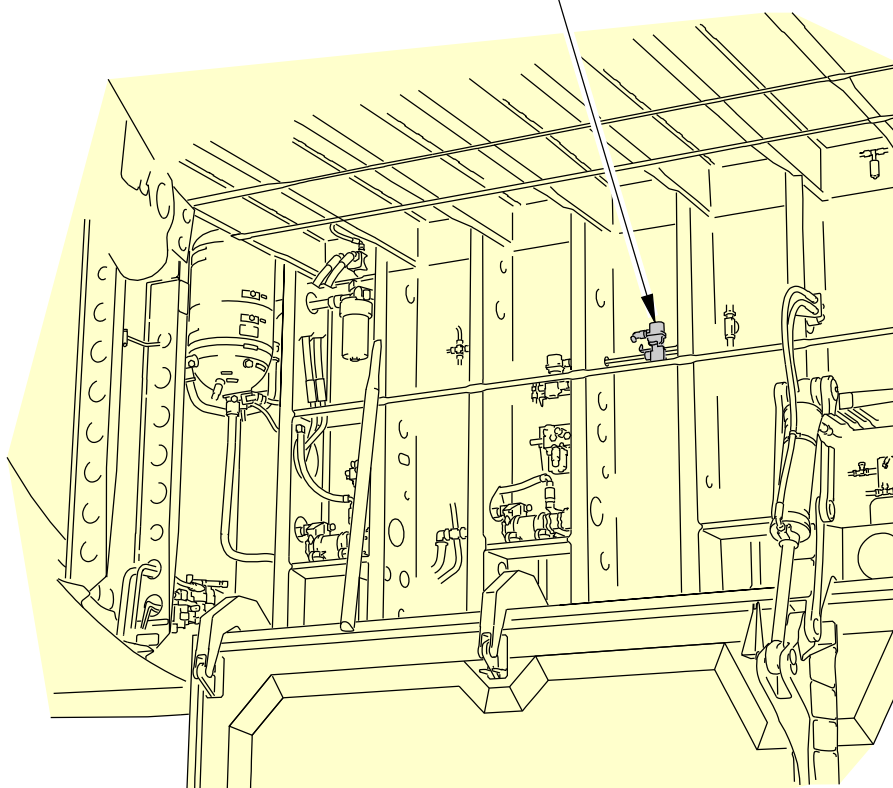


RIGHT
WHEEL WELL

A

NOSE GEAR
ISOLATION VALVE

B



RIGHT WHEEL WELL

A



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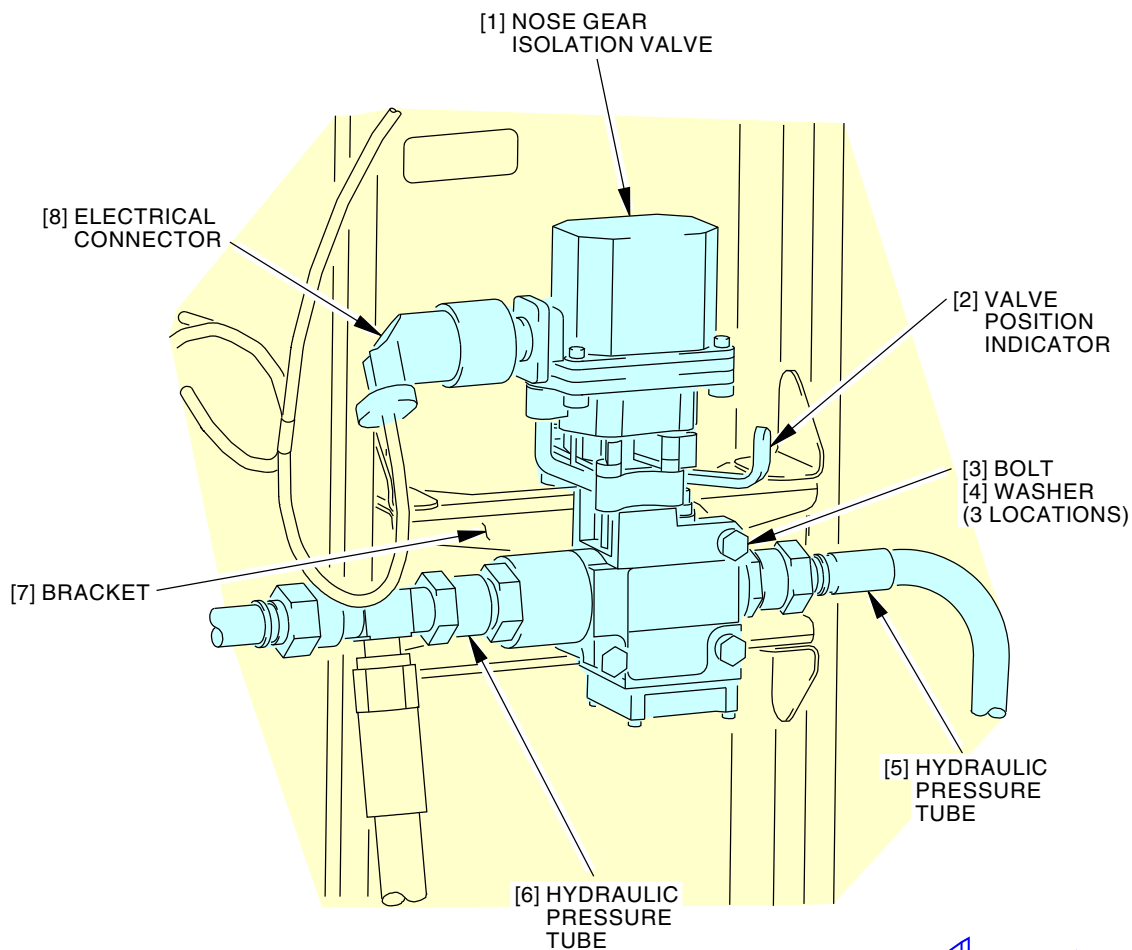
**Nose Gear Isolation Valve Installation
Figure 401/29-11-32-990-801 (Sheet 1 of 2)**

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NOSE GEAR ISOLATION VALVE

B

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**Nose Gear Isolation Valve Installation
Figure 401/29-11-32-990-801 (Sheet 2 of 2)**

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TASK 29-11-32-400-801

3. Nose Gear Isolation Valve Installation

(Figure 401)

A. General

- (1) 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
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve	29-11-32-01-015	ARO ALL

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F. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

G. Nose Gear Isolation Valve Installation

SUBTASK 29-11-32-140-001

- (1) Do one of the tasks which follow to clean the mating surfaces of the bracket [7] and the reserve isolation valve (referred to as the valve [1] in this procedure):
 - (a) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
 - (b) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.
 - (c) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.

SUBTASK 29-11-32-370-001

- (2) For the surfaces which you cleaned, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 29-11-32-390-001

- (3) Apply a thin layer of sealant, A00247 to the mating surfaces of the bracket [7] and the valve [1].

SUBTASK 29-11-32-390-002

- (4) Apply a thin layer of sealant, A00247 to the shank and the threads of the bolts [3].

SUBTASK 29-11-32-420-001

- (5) Hold the valve [1] on the bracket [7].

SUBTASK 29-11-32-420-002

- (6) Install the bolts [3] and the washers [4] that attach the valve [1] to the bracket [7].
NOTE: The countersink on each washer [4] must be against the head of each bolts [3].

SUBTASK 29-11-32-210-001

- (7) Make sure the sealant, A00247 comes out of the edges between the valve [1] and the bracket [7] to make a continuous fillet seal.

SUBTASK 29-11-32-390-003

- (8) Remove the unwanted sealant, A00247 from the bolts [3], the valve [1], and the bracket [7].

SUBTASK 29-11-32-760-001

- (9) Do a check of the electrical bond between the valve [1] and the bracket [7] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the valve [1] and the bracket [7] is 0.008 ohms.

SUBTASK 29-11-32-420-003

- (10) Remove the caps from the ports on the valve [1].

SUBTASK 29-11-32-420-004

- (11) Remove the caps from the hydraulic pressure tubes [5] and [6].

SUBTASK 29-11-32-420-005

- (12) Connect the hydraulic pressure tubes [5] and [6] to the valve [1].

SUBTASK 29-11-32-420-006

- (13) Connect the electrical connector [8] to the valve [1].

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H. Nose Gear Isolation Valve Installation Test

SUBTASK 29-11-32-860-003

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

SUBTASK 29-11-32-860-004

- (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	10	C29610	NOSE GEAR ISLN VALVE

SUBTASK 29-11-32-860-005

- (3) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-32-790-001

- (4) Make sure there are no leaks where the hydraulic pressure tubes [5] and [6] connect to the valve [1].

SUBTASK 29-11-32-860-006

- (5) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-11-32-740-001

- (6) Use a maintenance access terminal (MAT) to do the operational test of the center hydraulic isolation system (CHIS):
- (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) OPERATIONAL TEST
 - 6) Center Hydraulic Isolation 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA..

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-32-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

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SUBTASK 29-11-32-210-002

- (2) For the center system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-32-410-001



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE
DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the left and right system alternating current motor pump (ACMP) pressure and case drain filter module and components
- (2) An installation of the left and right system alternating current motor pump (ACMP) pressure and case drain filter module and components.

TASK 29-11-40-000-801

2. Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal

(Figure 401, Figure 402)

A. General

- (1) This task has the instructions for the removal of these components:
 - (a) The left and right system alternating current motor pump (ACMP) pressure and case drain filter module (referred to as the module assembly [25] in this procedure)
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Temperature transducer
- (2) Before you do one of the removals, do the steps to prepare for the removal. Then do the applicable removal.

B. References

Reference	Title
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-730-801	Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test (P/B 501)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-01 P/B 401	LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/INSTALLATION
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

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E. Prepare for the Removal

SUBTASK 29-11-40-860-001

- (1) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-40-860-002

- (2) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-11-40-040-001

 WARNING	DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-40-010-001

- (4) For the left hydraulic system, do the step which follows:
 - (a) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-40-010-002

- (5) For the right hydraulic system, do the step which follows:
 - (a) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-40-860-003

- (6) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

F. Filter Module Removal

SUBTASK 29-11-40-030-001

- (1) Disconnect the electrical connector [12] from the temperature transducer on the filter module (referred to as the module assembly [25] in this procedure).

SUBTASK 29-11-40-020-015

- (2) Install a cap on the electrical connector [12] to prevent contamination or damage.

SUBTASK 29-11-40-030-002

- (3) Put the electrical connector [12] in a position that is clear of the module assembly [25].

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SUBTASK 29-11-40-020-001

- (4) Disconnect the tube assembly [11] from the module assembly [25] and the pressure transducer [10] and remove it.

SUBTASK 29-11-40-020-002

- (5) Install a cap on the pressure transducer [10] to prevent contamination.

SUBTASK 29-11-40-030-003

- (6) Disconnect these hydraulic tubes from the module assembly [25]:
 - (a) Pressure inlet tube [9]
 - (b) Pressure outlet tube [8]
 - (c) Case drain inlet tube [2]
 - (d) Case drain outlet tube [1].

SUBTASK 29-11-40-030-004

- (7) Hold the module assembly [25] and remove the bolt [3] and bolts [5].

SUBTASK 29-11-40-020-003

- (8) Remove the module assembly [25].

SUBTASK 29-11-40-030-005

- (9) Install caps on the hydraulic tubes [1], [2], [8], and [9] to prevent contamination.

SUBTASK 29-11-40-020-004

- (10) If it is necessary to keep components for installation on the replacement module assembly [25], do these steps:
 - (a) Remove the union [23], the reducer [21], and reducer [26] from the ports of the module assembly [25].
 - (b) Do this procedure: Temperature Transducer Removal.
NOTE: This procedure follows in this task.

SUBTASK 29-11-40-030-006

- (11) Install caps on the open ports on the module assembly [25] to prevent contamination.

G. Filter Element Removal

SUBTASK 29-11-40-020-005

- (1) Do these steps to remove the element [40] for the case drain filter:
 - (a) Remove the case [39] for the case drain filter from the module assembly [25].
 - (b) Remove the element [40] for the case drain filter from the module assembly [25].
 - (c) Remove the packing [41] from the case [39].
 - (d) Remove the packing [42] from the element [40].

SUBTASK 29-11-40-210-002

- (2) Examine the element [40], the case [39], and the fluid in the case for metal contamination.



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- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test, TASK 29-11-00-730-801). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: (LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-01/401).

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.



CAUTION

FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).

SUBTASK 29-11-40-020-006

- (3) Do these steps to remove element [37] for the pressure filter:
- (a) Remove the case [38] for the pressure filter from the module assembly [25].
 - (b) Remove the element [37] for the pressure filter from the module assembly [25].
 - (c) Remove the packing [35], the ring [34], and the ring [36] from the case [38].
 - (d) Remove the packing [32] and the ring [33] from the element [37].

SUBTASK 29-11-40-210-003

- (4) Examine the element [37], the case [38], and the fluid in the case for metal contamination.

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- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test, TASK 29-11-00-730-801). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: (LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-01/401).

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.



FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).

H. Differential Pressure Indicator Removal

SUBTASK 29-11-40-020-007

- (1) Remove the indicator [30] or indicator [31] from the module assembly [25].

SUBTASK 29-11-40-020-008

- (2) Install a cap on the opening on the module assembly [25] to prevent contamination.

SUBTASK 29-11-40-020-009

- (3) Remove the packing [28] and packing [29] from the indicator [30] or indicator [31].

I. Temperature Transducer Removal

SUBTASK 29-11-40-020-010

- (1) Disconnect the electrical connector [12] from the transducer [43].

SUBTASK 29-11-40-020-016

- (2) Install a cap on the electrical connector [12] to prevent contamination or damage.

SUBTASK 29-11-40-020-011

- (3) Remove the transducer [43] from the module assembly [25].

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SUBTASK 29-11-40-020-012

(4) Install a cap on the opening on the module assembly [25] to prevent contamination.

SUBTASK 29-11-40-020-013

(5) Remove the packing [44] from the transducer [43].

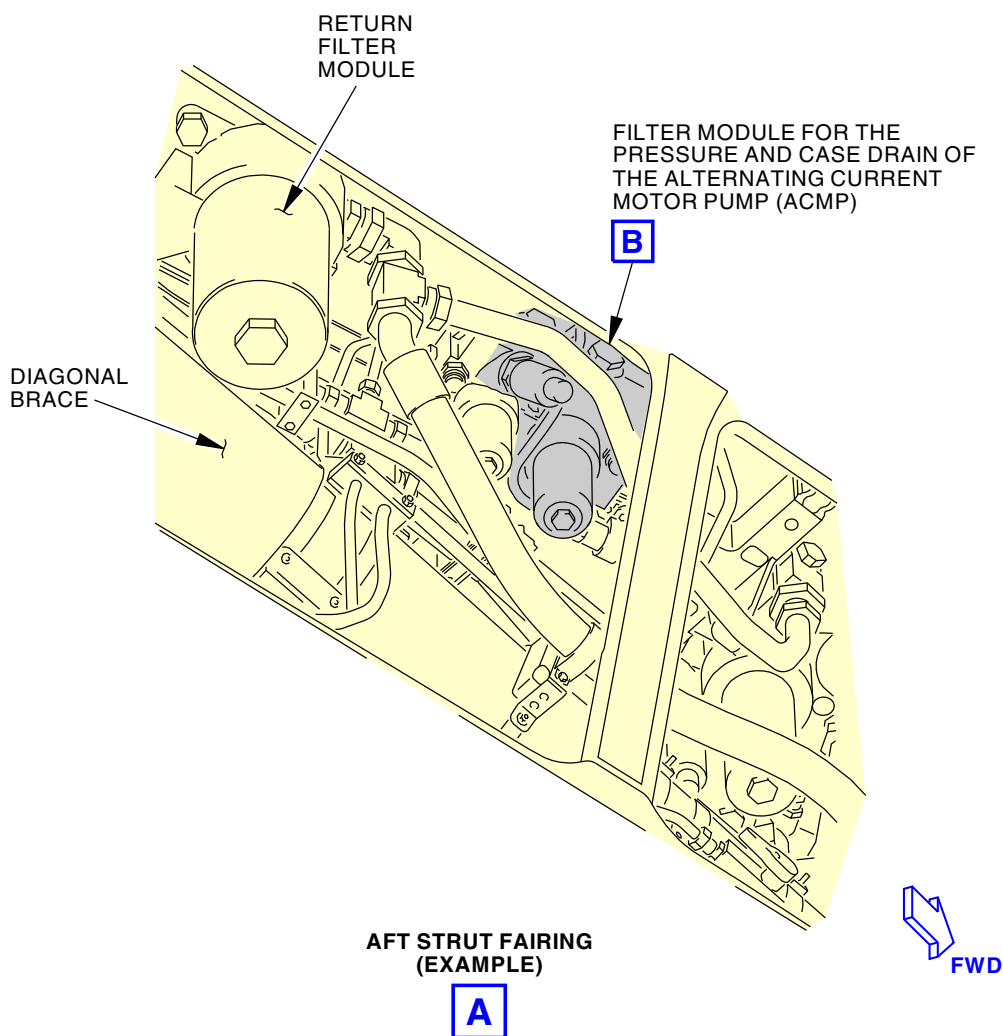
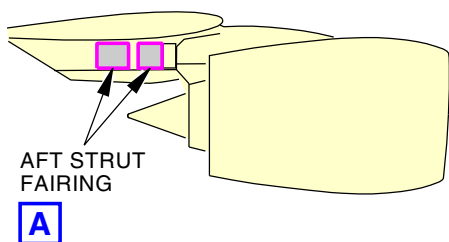
———— **END OF TASK** ————

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C90295 S0006416114_V2

ACMP Pressure and Case Drain Filter Module Installation
Figure 401/29-11-40-990-801 (Sheet 1 of 2)

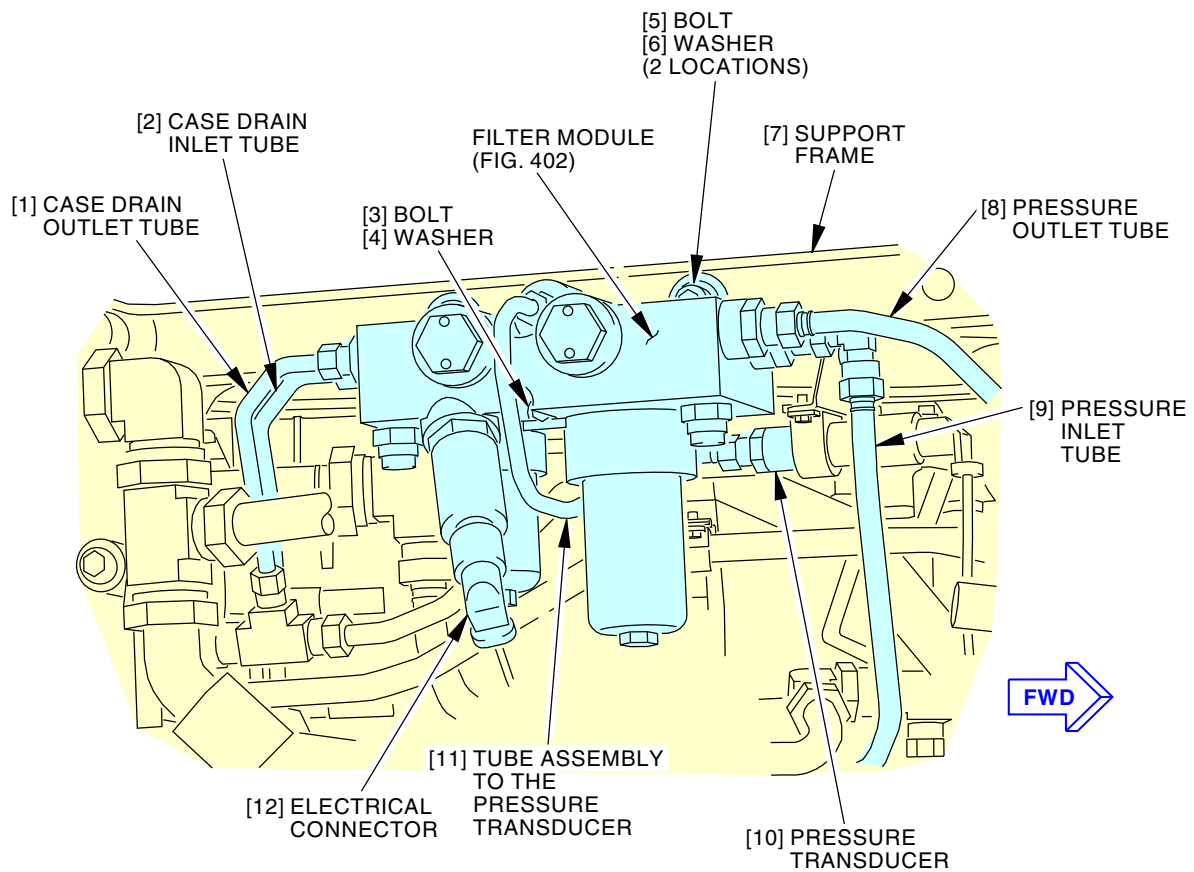
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FILTER MODULE

B

C90523 S0006416115_V2

**ACMP Pressure and Case Drain Filter Module Installation
Figure 401/29-11-40-990-801 (Sheet 2 of 2)**

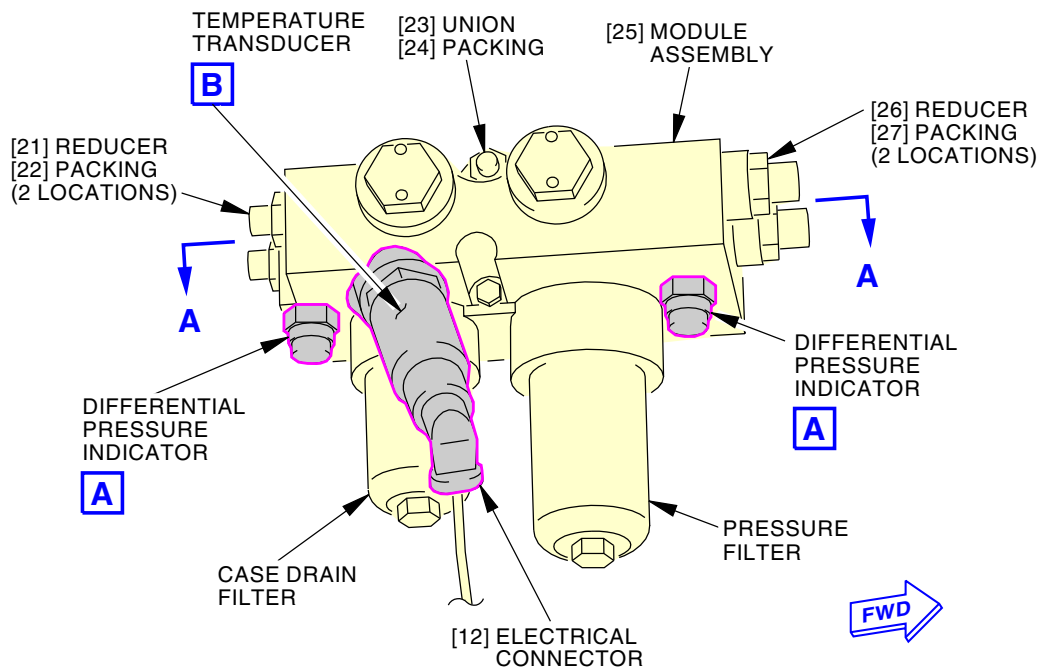
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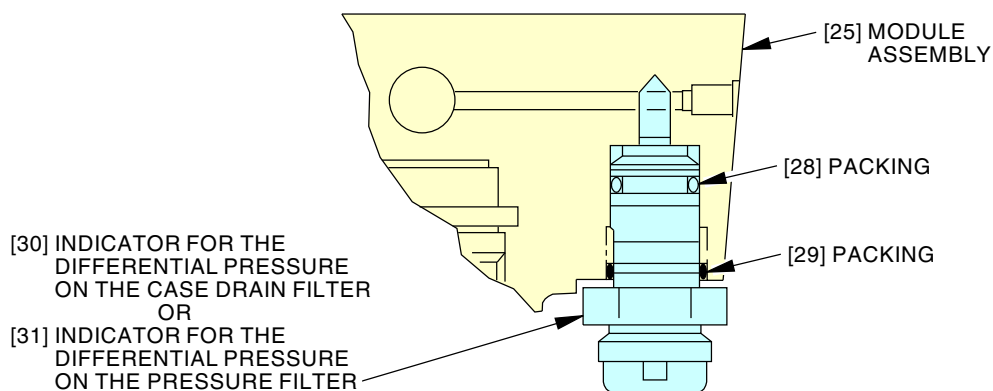
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FILTER MODULE



**DIFFERENTIAL PRESSURE INDICATOR
(EXAMPLE)**

A

C90703 S0006416116_V2

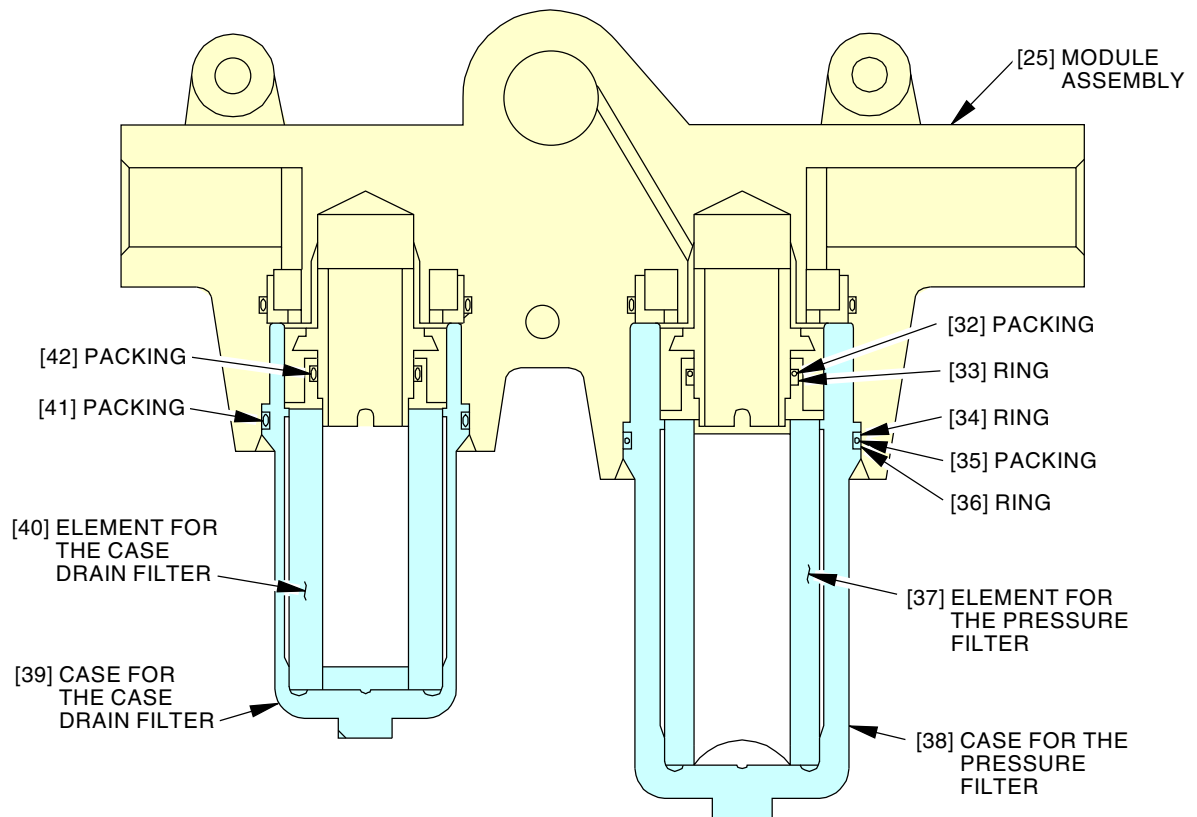
Filter Module Components
Figure 402/29-11-40-990-802 (Sheet 1 of 2)

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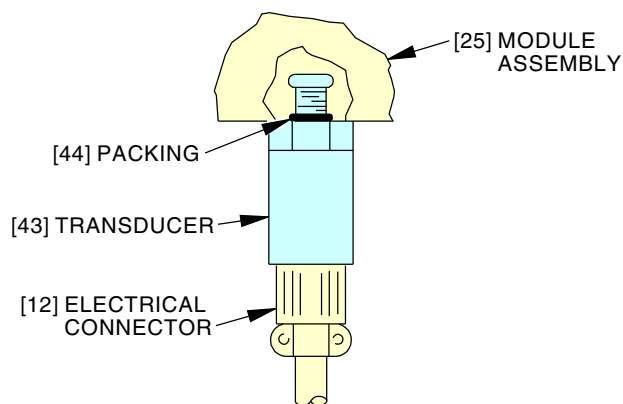
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PRESSURE AND CASE DRAIN FILTERS

A-A



TEMPERATURE TRANSDUCER

B

C90739 S0006416117_V2

**Filter Module Components
Figure 402/29-11-40-990-802 (Sheet 2 of 2)**

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TASK 29-11-40-400-801

3. Left and Right System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation

(Figure 401, Figure 402)

A. General

- (1) This task has the instructions for the installation of these components:
 - (a) Left and right system alternating current motor pump (ACMP) pressure and case drain filter module (referred to in this procedure as the module assembly [25])
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Temperature transducer
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-803	Main Hydraulic System Pressurization with an Alternating Current Motor Pump (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

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D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	BMS3-11 Type IV
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G02166	Lockwire - MS20995NC20, Monel - 0.020 Inch (0.508 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
22	Packing	29-11-40-10-010	ARO ALL
24	Packing	29-11-40-10-030	ARO ALL
25	Module assembly	29-11-75-10-385	ARO 001-004
		29-11-75-10A-710	ARO 005-010
		29-11-75-10B-710	ARO 011-015
27	Packing	29-11-40-10-020	ARO ALL
28	Packing	29-11-40-10-180	ARO ALL
29	Packing	29-11-40-10-185	ARO ALL
30	Indicator	29-11-40-10-155	ARO ALL
31	Indicator	29-11-40-10-140	ARO ALL
32	Packing	29-11-40-10-115	ARO ALL
35	Packing	29-11-40-10-130	ARO ALL
37	Element	29-11-40-10-110	ARO ALL
40	Element	29-11-40-10-065	ARO ALL
41	Packing	29-11-40-10-060	ARO ALL
42	Packing	29-11-40-10-067	ARO ALL
43	Transducer	29-11-40-10-035	ARO ALL
44	Packing	29-11-40-10-040	ARO ALL

F. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

G. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing

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(Continued)

Number	Name/Location

444CR	Right Forward Access Door, Right Strut Aft Fairing

444DR	Right Aft Access Door, Right Strut Aft Fairing

H. Filter Module Installation

SUBTASK 29-11-40-140-001

(1) Do one of these tasks to clean the mating surfaces of the support frame [7] and the module assembly [25]:

(a) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.

(b) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.

(c) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.

SUBTASK 29-11-40-370-001

(2) For the surfaces which you cleaned, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 29-11-40-420-001

(3) If it is necessary to install components on the replacement module assembly [25], do these steps:

(a) If plugs are installed in the ports for the hydraulic tubes and the temperature transducer, remove them.

(b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [22], new packing [24], new packing [27] and to the threads on the reducer [21], the reducer [26] and the union [23].

(c) Install the new packing [22] on the reducer [21].

(d) Install the new packing [24] on the union [23].

(e) Install the new packing [27] on the reducer [26].

(f) Install the reducer [21], reducer [26], and union [23] in the ports of the module assembly [25].

(g) Do this procedure: Temperature Transmitter Installation.

NOTE: This procedure follows in this task.

SUBTASK 29-11-40-390-001

(4) Apply a thin layer of sealant, A00247 to the mating surfaces of the support frame [7] and the module assembly [25].

SUBTASK 29-11-40-420-002

(5) If it is necessary, remove the caps from the ports on the module assembly [25].

SUBTASK 29-11-40-420-003

(6) Remove the caps from the hydraulic tubes [1], [2], [8], and [9].

SUBTASK 29-11-40-420-004

(7) Hold the module assembly [25] on the support frame [7].

SUBTASK 29-11-40-420-005

(8) Install the bolt [3], the bolts [5], the washer [4], and the washers [6] that attach the module assembly [25] to the support frame [7].

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SUBTASK 29-11-40-210-001

- (9) Make sure the sealant comes out of the edges between the module assembly [25] and the support frame [7] to make a continuous fillet seal.

SUBTASK 29-11-40-390-002

- (10) Remove the unwanted sealant from the module assembly [25] and the support frame [7].

SUBTASK 29-11-40-760-001

- (11) Measure resistance between the module assembly [25] and the support frame [7] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the module assembly [25] and the support frame [7] is 0.008 ohms.

SUBTASK 29-11-40-030-007

- (12) Connect these hydraulic tubes to the module assembly [25]:
 - (a) pressure inlet tube [9]
 - (b) pressure outlet tube [8]
 - (c) case drain inlet tube [2]
 - (d) case drain outlet tube [1]

SUBTASK 29-11-40-420-006

- (13) Remove the cap from the port on the pressure transducer [10].

SUBTASK 29-11-40-420-007

- (14) Connect the tube assembly [11] to the module assembly [25] and to the pressure transducer [10].

SUBTASK 29-11-40-420-021

- (15) Remove the cap from the electrical connector [12].

SUBTASK 29-11-40-420-008

- (16) Connect the electrical connector [12] to the transducer [43].

I. Filter Element Installation

SUBTASK 29-11-40-020-014

- (1) Do these steps to install the element [40] for the case drain filter:
 - (a) Clean the case [39] for the case drain filter.
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [41], new packing [42] and the threads on the case [39].
 - (c) Install the new packing [42] on the element [40].
 - (d) Install the new packing [41] on the case [39].
 - (e) Put the element [40] in the case [39].
 - (f) Install the element [40] and the case [39] on the module assembly [25].
 - (g) Tighten the case [39] to 270-300 pound-inches.
 - (h) Safety the case [39] with a MS20995C32 lockwire, G01048.

SUBTASK 29-11-40-420-009

- (2) Do these steps to install the element [37] for the pressure filter:
 - (a) Clean the case [38] for the pressure filter.

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- (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [32], the new packing [35], the ring [33], the ring [34], the ring [36], and the threads on the case [38].
- (c) Install the new packing [32] and the ring [33] on the element [37].
- (d) Install the new packing [35], the ring [34], and the ring [36] on the case [38].
- (e) Put the element [37] in the case [38].
- (f) Install the element [37] and the case [38] on the module assembly [25].
- (g) Tighten the case [38] to 270-300 pound-inches.
- (h) Safety the case [38] with a MS20995C32 lockwire, G01048.

J. Differential Pressure Indicator Installation

SUBTASK 29-11-40-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [28], the new packing [29], and the threads on the indicator [30] or the indicator [31].

SUBTASK 29-11-40-420-010

- (2) Install the new packing [28] and the new packing [29] on the indicator [30] or the indicator [31].

SUBTASK 29-11-40-420-011

- (3) Remove the cap from the opening on the module assembly [25].

SUBTASK 29-11-40-420-012

- (4) Install the indicator [30] or the indicator [31] on the module assembly [25].

SUBTASK 29-11-40-420-013

- (5) Tighten the indicator [30] or the indicator [31] to 160-175 pound-inches.

SUBTASK 29-11-40-420-014

- (6) Safety the indicator [30] or the indicator [31] with a MS20995C32 lockwire, G01048.

K. Temperature Transducer Installation

SUBTASK 29-11-40-640-002

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [44] and to the threads on the transducer [43].

SUBTASK 29-11-40-420-015

- (2) Install the new packing [44] on the transducer [43].

SUBTASK 29-11-40-420-016

- (3) Remove the cap from the port on the module assembly [25].

SUBTASK 29-11-40-420-017

- (4) Install the transducer [43] on the module assembly [25].

SUBTASK 29-11-40-420-018

- (5) Tighten the transducer [43] to 75-100 pound-inches.

SUBTASK 29-11-40-420-019

- (6) Safety the transducer [43] with a MS20995NC20 lockwire, G02166.

SUBTASK 29-11-40-420-022

- (7) Remove the cap from the electrical connector [12].

SUBTASK 29-11-40-420-020

- (8) Connect the electrical connector [12] to the transducer [43].

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L. Filter Module and Components Installation Test

SUBTASK 29-11-40-860-004

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

SUBTASK 29-11-40-860-005

- (2) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-40-860-006

- (3) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-11-40-970-001

- (4) If you removed an electrical connector from the transducer [43] in this procedure, do these steps:
 - (a) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - (b) Make a record of the HYDRAULIC DEMAND PUMP TEMP (L or R) indication, for the applicable ACMP.

SUBTASK 29-11-40-610-001

- (5) For the reservoir in the applicable (left or right) hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-40-860-007

- (6) For the reservoir in the applicable (left or right) hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-40-860-008

- (7) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803.

SUBTASK 29-11-40-790-001

- (8) Make sure there are no leaks at the hydraulic tube connections and at the components of the module assembly [25].

SUBTASK 29-11-40-970-002

- (9) If you removed an electrical connector from the transducer [43] in this procedure, do the steps which follow:
 - (a) Make sure the HYDRAULIC DEMAND PUMP TEMP (L or R) indication is higher than the indication before you pressurized the hydraulic system.

SUBTASK 29-11-40-860-009

- (10) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

M. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-40-860-010

- (1) If you can see the red indicator button on the indicator [30] or indicator [31], push the red indicator button until it aligns with the adjacent surface.

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SUBTASK 29-11-40-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) To remove the hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-40-010-003

- (3) For the left hydraulic system, do the step which follows:

- (a) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-40-010-004

- (4) For the right hydraulic system, do the step which follows:

- (a) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-40-440-001

- (5) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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**CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE AND CASE DRAIN
FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION**

1. General

A. This procedure has these tasks:

- (1) A removal of the center system alternating current motor pump (ACMP) pressure and case drain filter module (referred to as the module assembly [31] in this procedure) and components removal.
 - (2) An installation of the module assembly [31] and components.
- B. There are two ACMP module assemblies [31] in the center hydraulic system. You can use this procedure to remove and install each of the two ACMP module assemblies [31].

TASK 29-11-41-000-801

**2. Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module
and Components Removal**

(Figure 401, Figure 402)

A. General

- (1) This task has the instructions for the removal of these components:
 - (a) The center system alternating current motor pump (ACMP) pressure and case drain filter module (referred to as the module assembly [31] in this procedure)
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Temperature and pressure transducer
- (2) Before you do one of the removals, do the steps to prepare for the removal. Then do the applicable removal.

B. References

Reference	Title
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-710-803	Center System Alternating Current Motor Pumps (ACMP) - Operational Test (P/B 501)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-02 P/B 401	CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/INSTALLATION
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

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D. Prepare for the Removal

SUBTASK 29-11-41-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-41-010-001



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-41-860-001

- (3) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-41-860-008

- (4) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Filter Module Removal

SUBTASK 29-11-41-030-001

- (1) Disconnect the electrical connectors [1] and [10] from the transducer [11] and the transducer [2] on the module assembly [31].

SUBTASK 29-11-41-020-015

- (2) Install caps on the electrical connectors [1] and [10] to prevent contamination or damage.

SUBTASK 29-11-41-030-002

- (3) Put the electrical connectors [1] and [10] in a position that is clear of the module assembly [31].

SUBTASK 29-11-41-030-003

- (4) Disconnect these hydraulic tubes from the module assembly [31]:
 - (a) Pressure inlet tube [6]
 - (b) Pressure outlet tube [5]
 - (c) Case drain inlet tube [12]
 - (d) Case drain outlet tube [13].

SUBTASK 29-11-41-030-004

- (5) Hold the module assembly [31] and remove the bolts [3] and the bolt [8].

SUBTASK 29-11-41-020-001

- (6) Remove the module assembly [31].

SUBTASK 29-11-41-030-005

- (7) Install caps on the hydraulic tubes [5], [6], [12], and [13] to prevent contamination.

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SUBTASK 29-11-41-020-002

- (8) If it is necessary to keep components for installation on the replacement module assembly [31], do these steps:
- (a) Remove the union [32], the union [38], the reducer [34], and the reducer [36] from the ports of the module assembly [31].
 - (b) Do this procedure: Temperature and Pressure Transducers Removal.
- NOTE: This procedure follows in this task.

SUBTASK 29-11-41-030-006

- (9) Install caps on the open ports on the module assembly [31] to prevent contamination.

F. Filter Element Removal

SUBTASK 29-11-41-020-003

- (1) Do these steps to remove the element [52] for the case drain.
- (a) Remove the case [51] for the case drain filter from the module assembly [31].
 - (b) Remove the element [52] for the case drain filter from the module assembly [31].
 - (c) Remove the packing [53] from the case [51].
 - (d) Remove the packing [54] from the element [52].

SUBTASK 29-11-41-210-003

- (2) Examine the element [52], the case [51], and the fluid in the case for metal contamination.
- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Center System Alternating Current Motor Pumps (ACMP) - Operational Test, TASK 29-11-00-710-803). Examine the filter again at the scheduled filter change interval.
NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.
 - (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: (CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-02/401).
NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.
 - (c) Write down the results of the filter inspection and give them to the pump overhaul facility.
NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.

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FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).

SUBTASK 29-11-41-020-004

- (3) Do these steps to remove the element [49] for the pressure filter:
- (a) Remove the case [50] from the module assembly [31].
 - (b) Remove the element [49] from the module assembly [31].
 - (c) Remove the packing [47], the ring [46], and ring [48] from the case [50].
 - (d) Remove the packing [44] and the ring [45] from the element [49] for the pressure filter.

SUBTASK 29-11-41-210-004

- (4) Examine the element [49], the case [50], and the fluid in the case for metal contamination.
- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Center System Alternating Current Motor Pumps (ACMP) - Operational Test, TASK 29-11-00-710-803). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: (CENTER SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-02/401).

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.



FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).



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G. Differential Pressure Indicator Removal

SUBTASK 29-11-41-020-005

- (1) Remove the indicator [42] or indicator [43] for the differential pressure from the module assembly [31].

SUBTASK 29-11-41-020-006

- (2) Install a cap on the opening in the module assembly [31] to prevent contamination.

SUBTASK 29-11-41-020-007

- (3) Remove the packing [40] and the packing [41] from the indicator [42] or the indicator [43].

H. Pressure and Temperature Transducers Removal

SUBTASK 29-11-41-020-008

- (1) Disconnect the electrical connector [1] from the transducer [2] for pressure.

SUBTASK 29-11-41-020-009

- (2) Disconnect the electrical connector [10] from the transducer [11] for temperature.

SUBTASK 29-11-41-020-016

- (3) Install a cap on the electrical connector [1] or [10] to prevent contamination or damage.

SUBTASK 29-11-41-020-010

- (4) Remove the transducer [2] or the transducer [11] from the module assembly [31].

SUBTASK 29-11-41-020-011

- (5) Install a cap on the opening on the module assembly [31] to prevent contamination.

SUBTASK 29-11-41-020-012

- (6) Remove the packing [55] from the transducer [11].

SUBTASK 29-11-41-020-013

- (7) Remove the packing [56] from the transducer [2].

————— END OF TASK —————

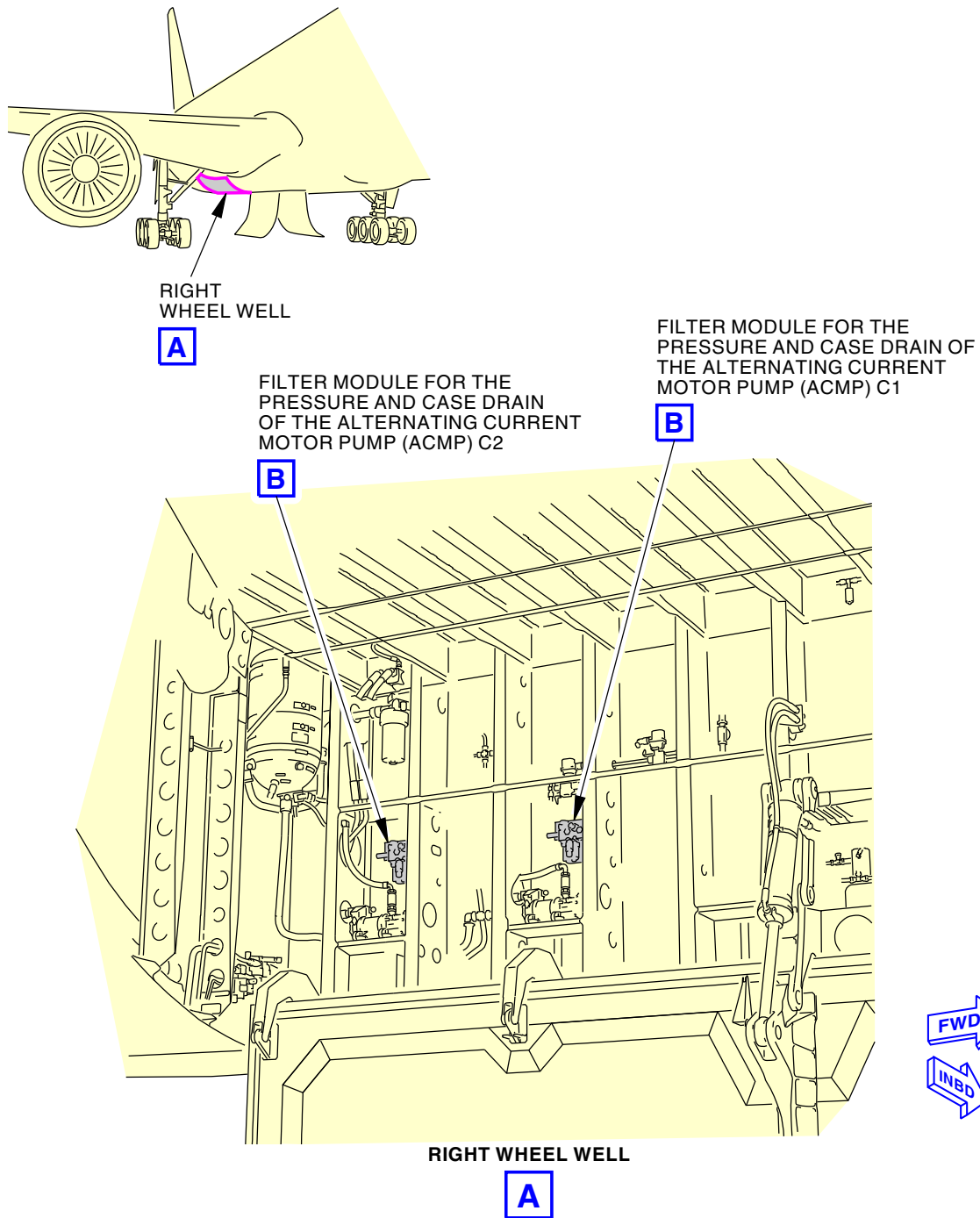
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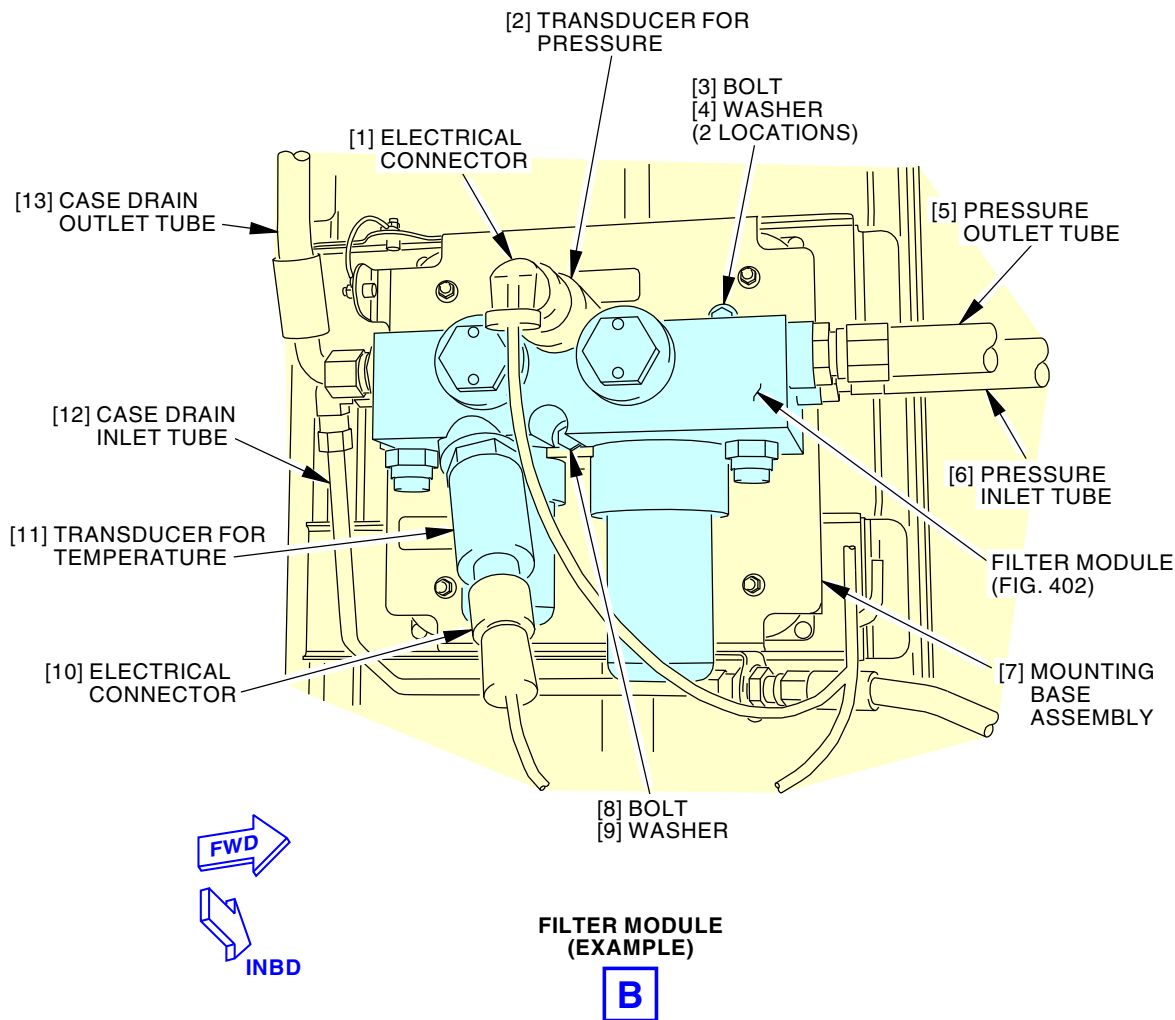
**ACMP Pressure and Case Drain Filter Module Installation
Figure 401/29-11-41-990-801 (Sheet 1 of 2)**

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**ACMP Pressure and Case Drain Filter Module Installation
Figure 401/29-11-41-990-801 (Sheet 2 of 2)**

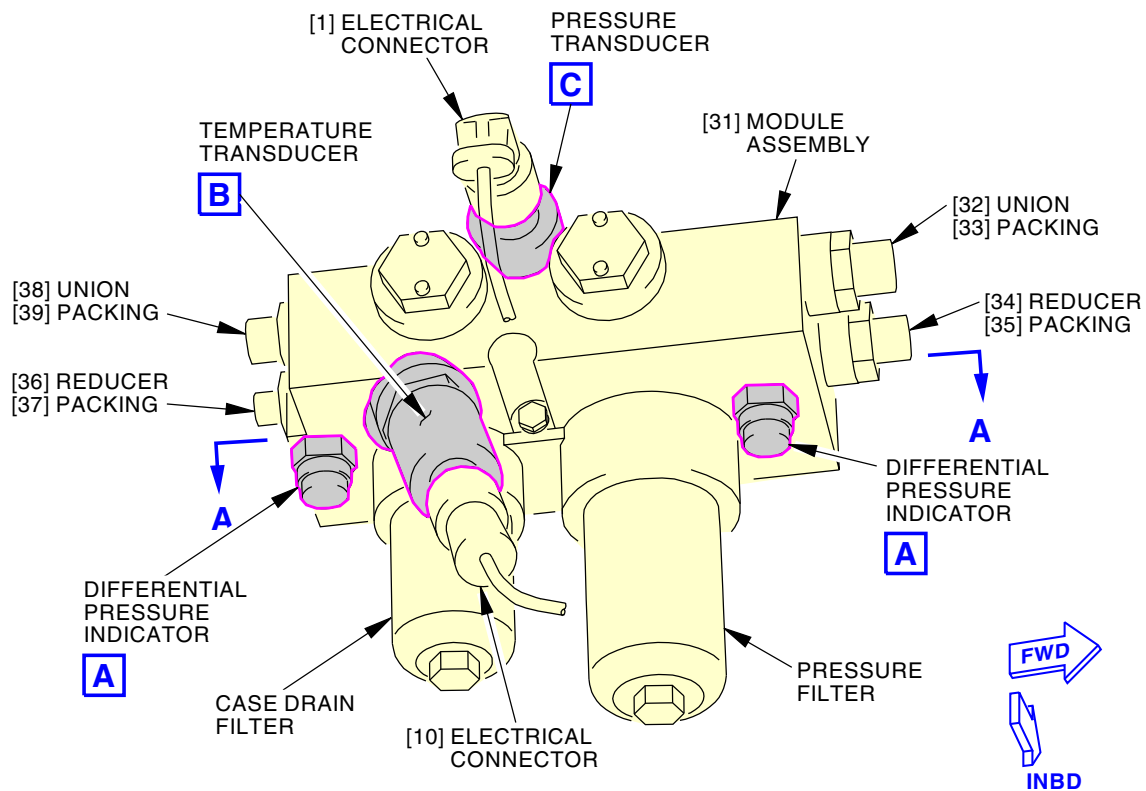
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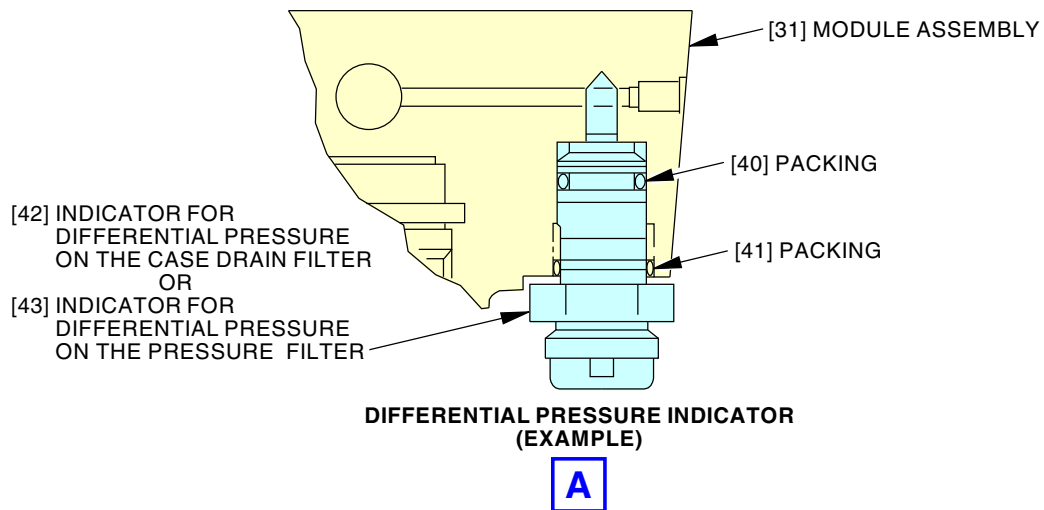
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CENTER SYSTEM ACMP FILTER MODULE



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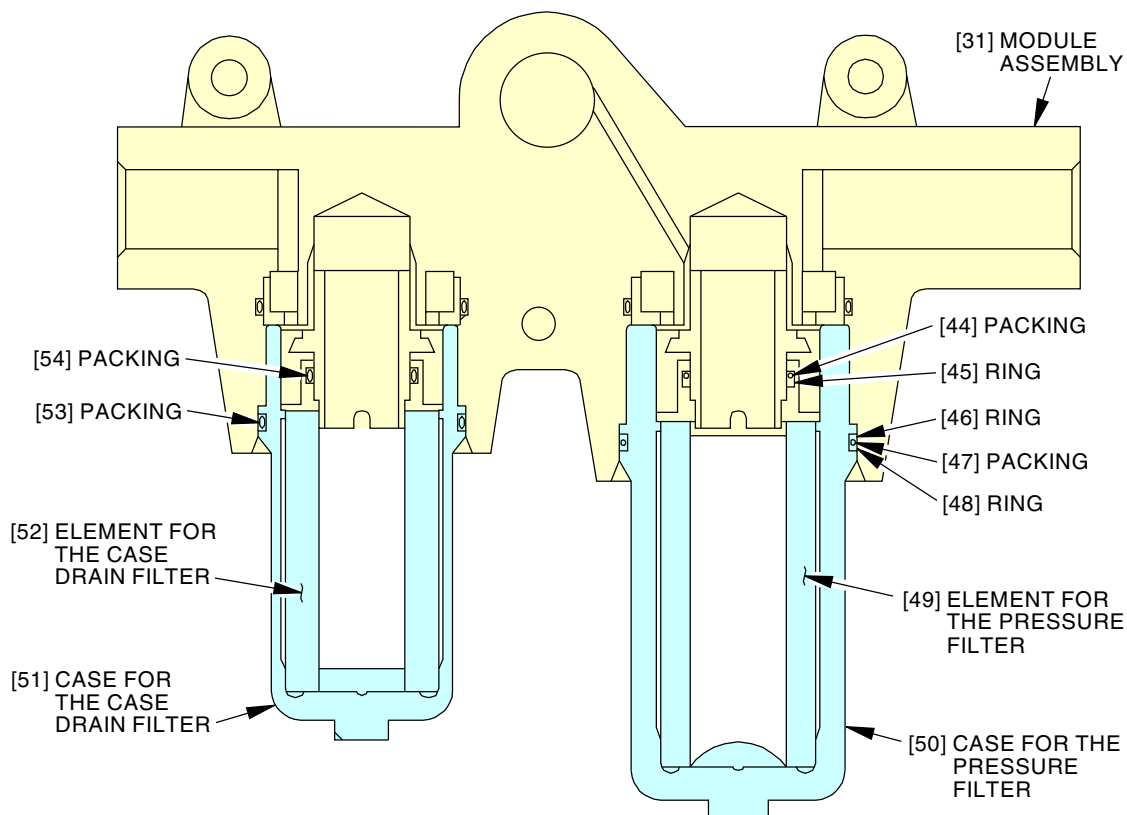
**Filter Module Components
Figure 402/29-11-41-990-802 (Sheet 1 of 2)**

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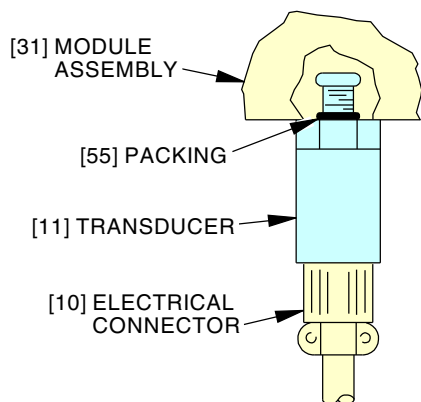
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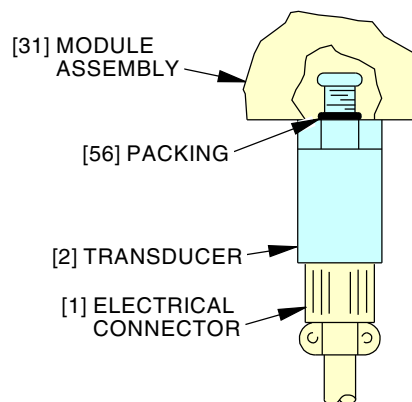
PRESSURE AND CASE DRAIN FILTERS

A-A



TEMPERATURE TRANSDUCER

B



PRESSURE TRANSDUCER

C

C91529 S0006416125_V2

**Filter Module Components
Figure 402/29-11-41-990-802 (Sheet 2 of 2)**

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TASK 29-11-41-400-801

3. Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Installation

(Figure 401, Figure 402)

A. General

- (1) This task has the instructions for the installation of these components:
 - (a) Center system alternating current motor pump (ACMP) pressure and case drain filter module (referred to in this procedure as the module assembly [31])
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Temperature and pressure transducer
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-803	Main Hydraulic System Pressurization with an Alternating Current Motor Pump (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

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D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Transducer	29-11-41-05-035	ARO ALL
11	Transducer	29-11-41-05-070	ARO ALL
31	Module assembly	29-11-41-01-040	ARO ALL
33	Packing	29-11-41-05-065	ARO ALL
35	Packing	29-11-41-05-065	ARO ALL
37	Packing	29-11-41-05-030	ARO ALL
39	Packing	29-11-41-05-030	ARO ALL
40	Packing	29-11-41-05-098	ARO ALL
		29-11-41-05-205	ARO ALL
41	Packing	29-11-41-05-097	ARO ALL
		29-11-41-05-200	ARO ALL
42	Indicator	29-11-41-05-175	ARO ALL
43	Indicator	29-11-41-05-085	ARO ALL
		29-11-41-05-235	ARO ALL
44	Packing	29-11-41-05-160	ARO ALL
47	Packing	29-11-41-05-166	ARO ALL
49	Element	29-11-41-05-155	ARO ALL
52	Element	29-11-41-05-110	ARO ALL
53	Packing	29-11-41-05-105	ARO ALL
54	Packing	29-11-41-05-112	ARO ALL
55	Packing	29-11-41-05-075	ARO ALL
56	Packing	29-11-41-05-045	ARO ALL

F. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

G. Filter Module Installation

SUBTASK 29-11-41-140-001

- (1) Do one of the tasks which follow to clean the mating surfaces of the mounting base assembly [7] and the module assembly [31]:

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- (a) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
- (b) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.
- (c) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.

SUBTASK 29-11-41-370-001

- (2) For the surfaces you cleaned, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 29-11-41-420-001

- (3) If it is necessary to install components on the replacement module assembly [31], do these steps:
 - (a) If plugs are installed in the ports for the hydraulic tubes [5], [6], [12], and [13], the transducer [11], and the transducer [2], remove the plugs.
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [33], new packing [35], new packing [37], new packing [39], and to the threads on the reducer [34], reducer [36], union [32], and union [38].
 - (c) Install the new packing [33] on the union [32].
 - (d) Install the new packing [35] on the reducer [34].
 - (e) Install the new packing [37] on the reducer [36].
 - (f) Install the new packing [39] on the union [38].
 - (g) Install the union [32], reducer [34], reducer [36], and union [38] in the ports of the module assembly [31].
 - (h) Do this procedure: Temperature and Pressure Transducer Installation.

NOTE: This procedure follows in this task.

SUBTASK 29-11-41-390-001

- (4) Apply a thin layer of sealant, A00247 to the mating surfaces of the mounting base assembly [7] and the module assembly [31].

SUBTASK 29-11-41-390-002

- (5) Apply a thin layer of sealant, A00247 to the shank and the threads of the bolts [3] and bolt [8].

SUBTASK 29-11-41-420-002

- (6) If caps are installed, remove the caps from the ports on the module assembly [31].

SUBTASK 29-11-41-420-003

- (7) Remove the caps from the hydraulic tubes [5], [6], [12], and [13].

SUBTASK 29-11-41-420-004

- (8) Hold the module assembly [31] on the mounting base assembly [7].

SUBTASK 29-11-41-420-005

- (9) Install the bolts [3], bolt [8], washers [4], and washer [9] that attach the module assembly [31] to the mounting base assembly [7].

NOTE: The countersink on the washers [4] and washer [9] must be against the head of the bolts [3] and bolt [8].

SUBTASK 29-11-41-210-001

- (10) Make sure the sealant, A00247 comes out of the edges between the module assembly [31] and the mounting base assembly [7] to make a continuous fillet seal.

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SUBTASK 29-11-41-390-003

- (11) Remove the unwanted sealant, A00247 from the module assembly [31] and the mounting base assembly [7].

SUBTASK 29-11-41-760-001

- (12) Do a check of the electrical bond between the module assembly [31] and the mounting base assembly [7] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the module assembly [31] and the mounting base assembly [7] is 0.008 ohms.

SUBTASK 29-11-41-030-007

- (13) Connect these hydraulic tubes to the module assembly [31]:
- (a) Pressure inlet tube [6]
 - (b) Pressure outlet tube [5]
 - (c) Case drain inlet tube [12]
 - (d) Case drain outlet tube [13].

SUBTASK 29-11-41-420-023

- (14) Remove the caps from the electrical connectors [1] and [10].

SUBTASK 29-11-41-420-006

- (15) Connect the electrical connector [10] to the transducer [11].

SUBTASK 29-11-41-420-007

- (16) Connect the electrical connector [1] to the transducer [2].

H. Filter Element Installation

SUBTASK 29-11-41-020-014

- (1) Do these steps to install the element [52] for the case drain filter:
- (a) Clean the case [51] for the case drain.
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [53], new packing [54], and to the threads on the case [51].
 - (c) Install the new packing [54] on the element [52].
 - (d) Install the new packing [53] on the case [51].
 - (e) Put the element [52] in the case [51].
 - (f) Install the element [52] and the case [51] on the module assembly [31].
 - (g) Tighten the case [51] to 270-300 pound-inches.
 - (h) Safety the case [51] with a lockwire.

SUBTASK 29-11-41-420-008

- (2) Do these steps to install the element [49] for the pressure filter:
- (a) Clean the case [50] for the pressure filter.
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [44], new packing [47], ring [45], ring [46], ring [48], and to the threads on the case [50].
 - (c) Install the new packing [44] and the ring [45] on the element [49].
 - (d) Install the new packing [47], ring [46], and ring [48] on the case [50].
 - (e) Put the element [49] in the case [50].
 - (f) Install the element [49] and the case [50] [50] on the module assembly [31].

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- (g) Tighten the case [50] to 270-300 pound-inches.
- (h) Safety the case [50] with a lockwire.

I. Differential Pressure Indicator Installation

SUBTASK 29-11-41-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [40] and new packing [41], and to the threads on the indicator [42] or indicator [43] for differential pressure.

SUBTASK 29-11-41-420-009

- (2) Install the new packing [40] and the new packing [41] on the indicator [42] or indicator [43].

SUBTASK 29-11-41-420-010

- (3) Remove the cap from the opening on the module assembly [31].

SUBTASK 29-11-41-420-011

- (4) Install the indicator [42] or indicator [43] on the module assembly [31].

SUBTASK 29-11-41-420-012

- (5) Tighten the indicator [42] or indicator [43] to 160-175 pound-inches.

SUBTASK 29-11-41-420-013

- (6) Safety the indicator [42] or indicator [43] with a lockwire.

J. Pressure and Temperature Transducers Installation

SUBTASK 29-11-41-640-002

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [55] or new packing [56] and to the threads on the transducer [11] for temperature or the transducer [2] for pressure.

SUBTASK 29-11-41-420-014

- (2) For the transducer [11] for temperature, do this step:
 - (a) Install the new packing [55] on the transducer [11].

SUBTASK 29-11-41-420-015

- (3) For the transducer [2] for pressure, do this step:
 - (a) Install the new packing [56] on the transducer [2].

SUBTASK 29-11-41-420-016

- (4) Remove the cap from the port on the module assembly [31].

SUBTASK 29-11-41-420-017

- (5) Install the transducer [11] or the transducer [2] on the module assembly [31].

SUBTASK 29-11-41-420-018

- (6) For the transducer [11], do this step:
 - (a) Tighten the transducer [11] to 450 ($\pm$ 45) pound-inches.

SUBTASK 29-11-41-420-019

- (7) For the transducer [2], do this step:
 - (a) Tighten the transducer [2] to 170 $\pm$ 17 in-lb (19 $\pm$ 2 N·m).

SUBTASK 29-11-41-420-020

- (8) Safety the transducer [11] or the transducer [2] with a lockwire.

SUBTASK 29-11-41-420-021

- (9) For the transducer [11], do this step:

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- (a) Remove the cap from the electrical connector [10].
- (b) Connect the electrical connector [10] to the transducer [11].

SUBTASK 29-11-41-420-022

- (10) For the transducer [2], do this step:
 - (a) Remove the cap from the electrical connector [1].
 - (b) Connect the electrical connector [1] to the transducer [2].

K. Filter Module and Components Installation Test

SUBTASK 29-11-41-860-002

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

SUBTASK 29-11-41-860-003

- (2) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-41-970-001

- (3) If you removed an electrical connector [1] or [10] from the transducer [11] or the transducer [2] in this procedure, do the steps which follow:
 - (a) Do this task: (Showing a Maintenance Page, TASK 31-61-00-800-804)
 - (b) Make a record of the HYDRAULIC PRIMARY PUMP TEMP (C1 or C2) indication, for the applicable ACMP.
 - (c) Make sure the HYDRAULIC PRIMARY PUMP PRESS (C1 or C2) indication, for the applicable ACMP, shows 0 to 200 psi.

SUBTASK 29-11-41-610-001

- (4) For the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-41-860-004

- (5) For the center hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-41-860-005

- (6) For the center hydraulic system, do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803.

NOTE: Use the ACMP (C1 or C2) which has a relation to the module assembly [31] on which you did the maintenance task.

SUBTASK 29-11-41-790-001

- (7) Make sure there are no leaks at the hydraulic tube connections and at the components of the module assembly [31].

SUBTASK 29-11-41-210-002

- (8) If you removed an electrical connector [1] or [11] from the transducer [11] or the transducer [2] in this procedure, do the steps which follow:
 - (a) Make sure the HYDRAULIC PRIMARY PUMP TEMP (C1 or C2) indication, for the applicable ACMP, is higher than the indication before you pressurized the hydraulic system.
 - (b) Make sure the HYDRAULIC PRIMARY PUMP PRESS (C1 or C2) indication, for the applicable ACMP, shows 2700 to 3200 psi.

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SUBTASK 29-11-41-860-006

- (9) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-41-860-007

- (1) If you can see the red indicator button on the indicator [42] or indicator [43] for differential pressure, push the red indicator button until it aligns with the adjacent surface.

SUBTASK 29-11-41-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) To clean the hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801

SUBTASK 29-11-41-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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ENGINE-DRIVEN PUMP (EDP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS -
REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks.

- (1) A removal of the engine-driven pump (EDP) pressure and case drain filter module and components
- (2) An installation of the engine-driven pump (EDP) case drain filter module and components.

TASK 29-11-42-000-801

2. Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Removal

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has the instructions for the removal of these components.
 - (a) Engine-driven pump pressure and case drain filter module (referred to in this procedure as the module assembly [4])
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Pressure transducer
 - (e) Temperature transducer
 - (f) Hydraulic ground service disconnect.
- (2) Before you do one of the removals, do the steps to prepare for the removal. Then do the applicable removal.

B. References

Reference	Title
12-12-01-680-801	Hydraulic Reservoir Fluid Level Lowering or Draining (P/B 301)
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-710-801	Engine-Driven Pump (EDP) - Operational Test (P/B 501)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-05 P/B 401 Config 2	ENGINE-DRIVEN PUMP (EDP) - REMOVAL/INSTALLATION
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

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(Continued)

Number	Name/Location

444CR	Right Forward Access Door, Right Strut Aft Fairing

E. Prepare for the Removal

SUBTASK 29-11-42-860-001

- (1) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-42-860-002

- (2) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-11-42-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-42-010-001

- (4) For the left hydraulic system, do the step which follows:
 - (a) For the left hydraulic system, open these access panels

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-42-010-002

- (5) For the right hydraulic system, do the step which follows:
 - (a) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-11-42-860-003

- (6) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807

F. Filter Module Removal

SUBTASK 29-11-42-680-001

- (1) To drain the hydraulic fluid from the applicable (left or right) system reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

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SUBTASK 29-11-42-030-001

- (2) Disconnect the electrical connectors [7] and [13] from the transducer [6] for temperature and the transducer [14] for pressure on the module assembly [4].

SUBTASK 29-11-42-020-018

- (3) Install caps on the electrical connectors [7] and [13] to prevent contamination or damage.

SUBTASK 29-11-42-030-002

- (4) Put the electrical connectors [7] and [13] in a position that is clear of the module assembly [4].

SUBTASK 29-11-42-020-020

- (5) Remove the tube assembly [2].

SUBTASK 29-11-42-030-003

- (6) Disconnect these hydraulic tubes from the module assembly [4].
 - (a) Pressure inlet tube [8]
 - (b) Pressure outlet tube [5]
 - (c) Case drain inlet tube [9]
 - (d) Case drain outlet tube [10].

SUBTASK 29-11-42-030-005

- (7) Install caps on the hydraulic tubes [2], [5], [8], [9], and [10] to prevent contamination.

SUBTASK 29-11-42-030-006

- (8) Install caps on the open ports on the module assembly [4] to prevent contamination.

SUBTASK 29-11-42-030-004

- (9) Hold the module assembly [4] and remove the bolt [11].

SUBTASK 29-11-42-020-001

- (10) Remove the module assembly [4] through the access opening on the right side of the aft strut fairing.

G. Filter Element Removal

SUBTASK 29-11-42-020-002

- (1) Do these steps to remove the case drain filter element (referred to as the element [38] in this procedure):
 - (a) Remove the bowl [40] from the module assembly [4].
 - (b) Remove the element [38] from the module assembly [4].
 - (c) Remove the packing [39] from the module assembly [4].
 - (d) Remove the packing [37] from the element [38].

SUBTASK 29-11-42-210-003

- (2) Examine the element [38], the bowl [40], and the fluid in the bowl for metal contamination.
 - (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Engine-Driven Pump (EDP) - Operational Test, TASK 29-11-00-710-801). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

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- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do these tasks: ENGINE-DRIVEN PUMP (EDP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-05/401 Config 2.

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.



CAUTION

FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).

SUBTASK 29-11-42-020-003

- (3) Do these steps to remove the pressure filter element (referred to as the element [46]):

- (a) Loosen the bowl [42].
(b) Lower the bowl [42] until it touches the diagonal brace.

NOTE: This gives access, above the top of the bowl [42], to the element [46].

- (c) Pull the element [46] down into the bowl [42] to release the element [46] from the module assembly [4].
(d) Remove the bowl [42] and the element [46].
(e) Remove the element [46] from the bowl [42].
(f) Remove the packing [44], the ring [43], and the ring [45] from the bowl [42].
(g) Remove the packing [49] and the ring [48] from the element [46].

SUBTASK 29-11-42-210-004

- (4) Examine the element [46], the bowl [42], and the fluid in the bowl for metal contamination.

- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Engine-Driven Pump (EDP) - Operational Test, TASK 29-11-00-710-801). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

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- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do these tasks: ENGINE-DRIVEN PUMP (EDP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-05/401 Config 2.

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.



CAUTION

FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).

H. Differential Pressure Indicator Removal

SUBTASK 29-11-42-020-004

- (1) Remove the differential pressure indicator (referred to as the indicator assembly [35] or indicator assembly [47] in this procedure) from the module assembly [4].

SUBTASK 29-11-42-020-005

- (2) Install a cap on the opening in the module assembly [4] to prevent contamination.

SUBTASK 29-11-42-020-006

- (3) For the indicator assembly [47] for the pressure filter, do the step which follows:
(a) Remove the packing [50] and the packing [51] from the indicator assembly [47].

SUBTASK 29-11-42-020-007

- (4) For the indicator assembly [35] for the case drain filter, do the step which follows:
(a) Remove the packing [33] and the packing [34] from the indicator assembly [35].

I. Pressure or Temperature Transducer Removal

SUBTASK 29-11-42-020-008

- (1) For the transducer [14] for pressure, disconnect the electrical connector [13].

SUBTASK 29-11-42-020-009

- (2) For the transducer [6] for temperature, disconnect the electrical connector [7].

SUBTASK 29-11-42-020-019

- (3) Install a cap on the electrical connector [7] or [13] to prevent damage or contamination.

SUBTASK 29-11-42-020-010

- (4) Remove the transducer [14] or the transducer [6] from the module assembly [4].

SUBTASK 29-11-42-020-011

- (5) Install a cap on the opening in the module assembly [4] to prevent contamination.

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SUBTASK 29-11-42-020-012

- (6) For the transducer [14], remove the packing [36].

SUBTASK 29-11-42-020-013

- (7) For the transducer [6], remove the packing [41].

J. Hydraulic Ground Service Disconnect Removal .

SUBTASK 29-11-42-020-014

- (1) Remove the hydraulic ground service disconnect (referred to as the coupling [31] in this procedure) from the module assembly [4].

SUBTASK 29-11-42-020-015

- (2) Install a cap on the opening in the module assembly [4] to prevent contamination.

SUBTASK 29-11-42-020-016

- (3) Remove the packing [32] from the coupling [31].

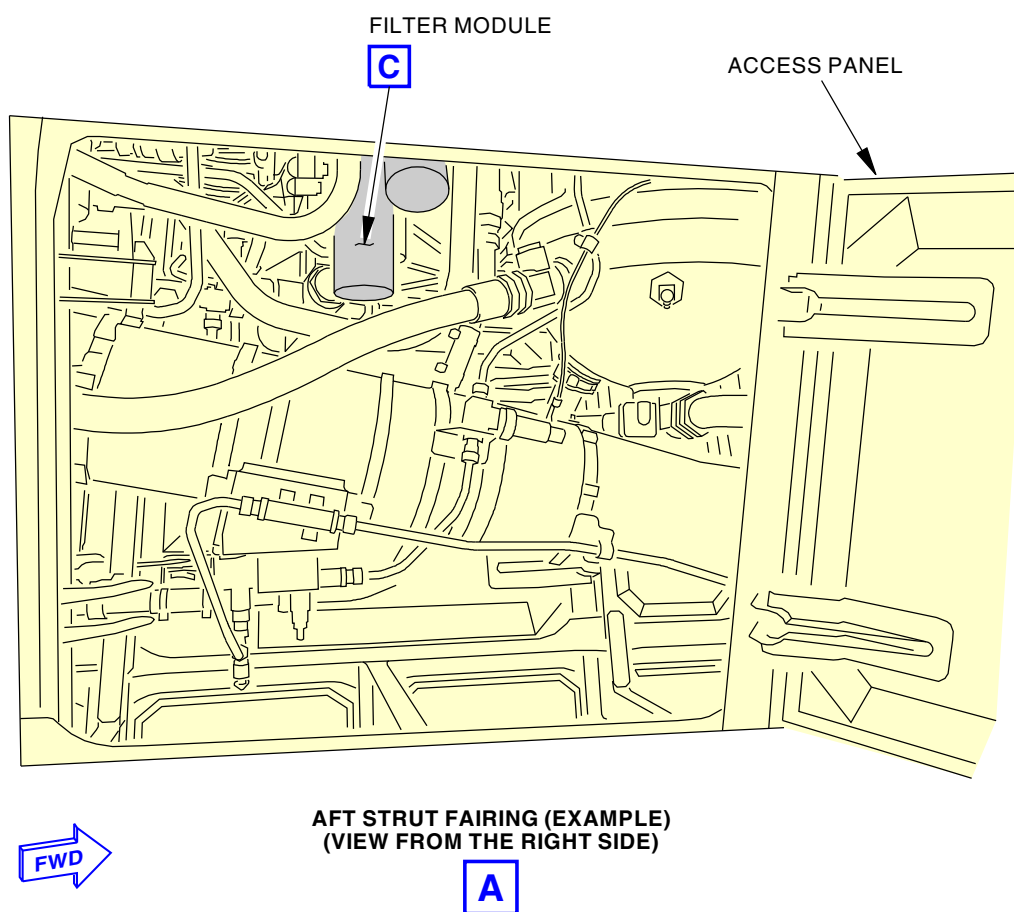
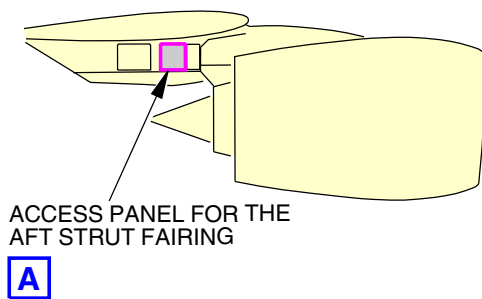
————— **END OF TASK** —————

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C83878 S0006416130_V2

Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module Installation
Figure 401/29-11-42-990-801 (Sheet 1 of 4)

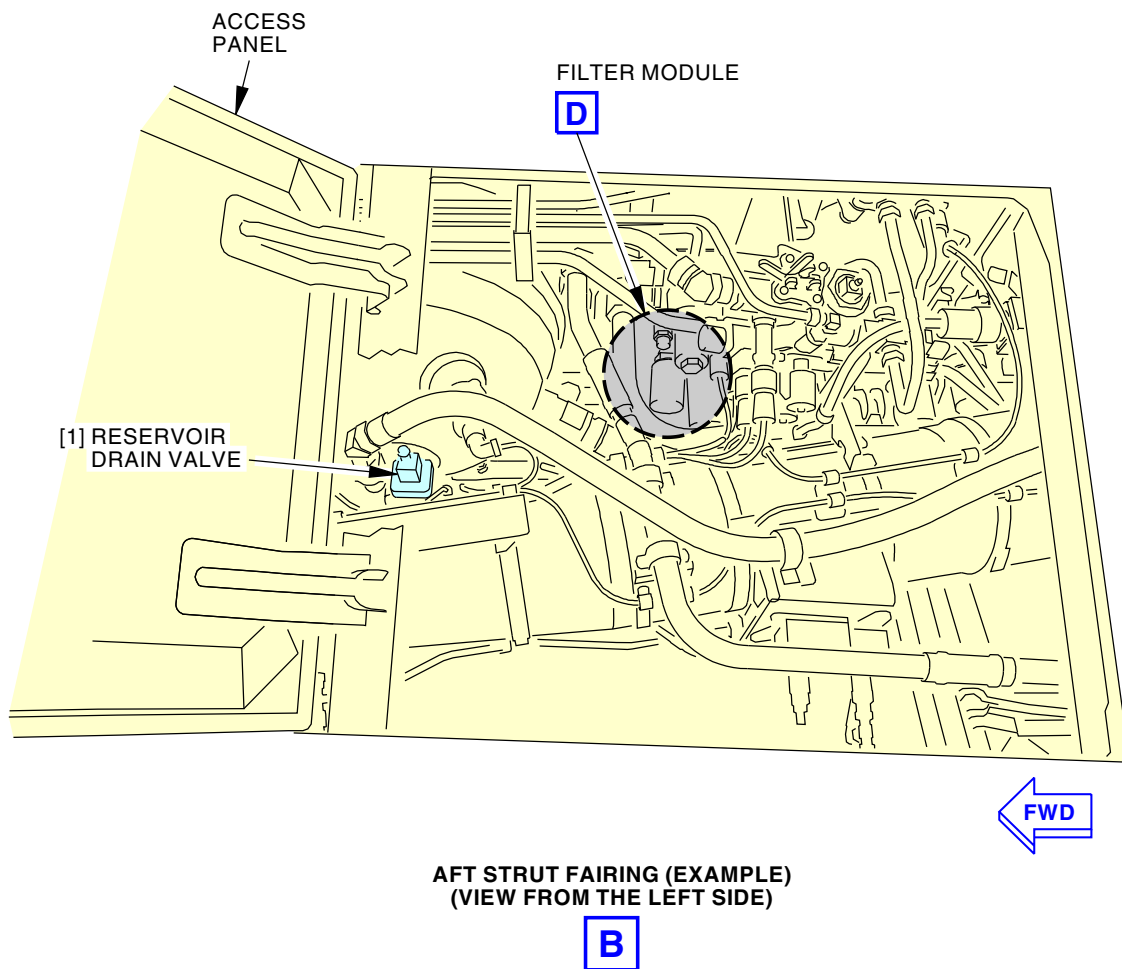
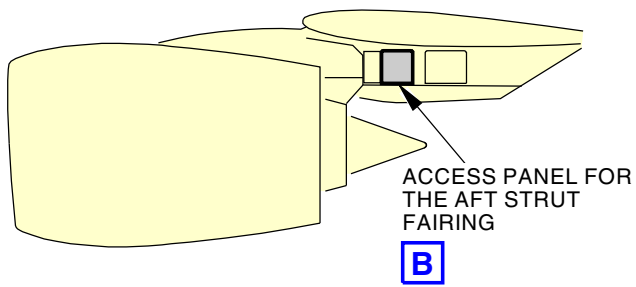
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AFT STRUT FAIRING (EXAMPLE)
(VIEW FROM THE LEFT SIDE)

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Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module Installation
Figure 401/29-11-42-990-801 (Sheet 2 of 4)

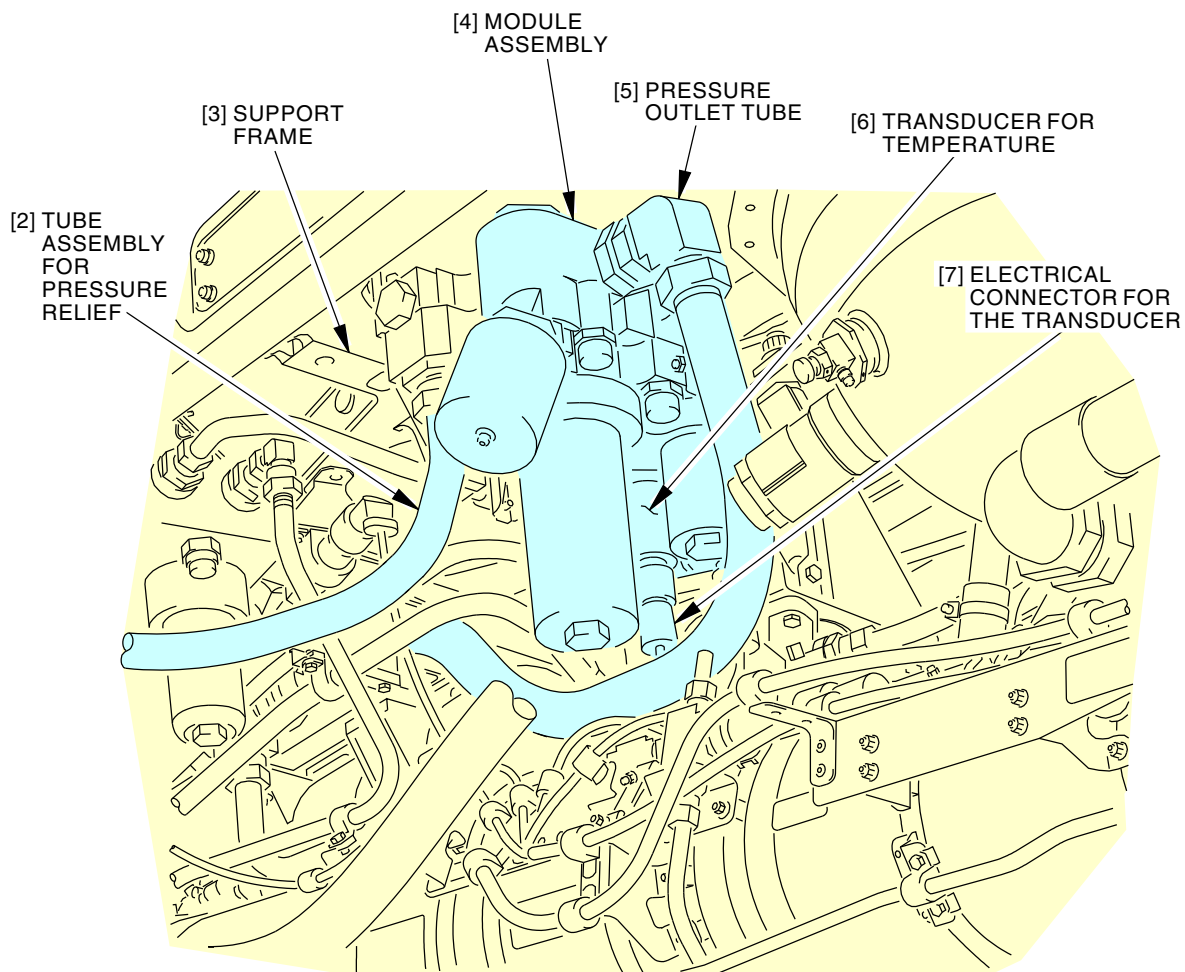
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FILTER MODULE
(VIEW FROM THE FORWARD RIGHT SIDE)



C84260 S0006416132_V3

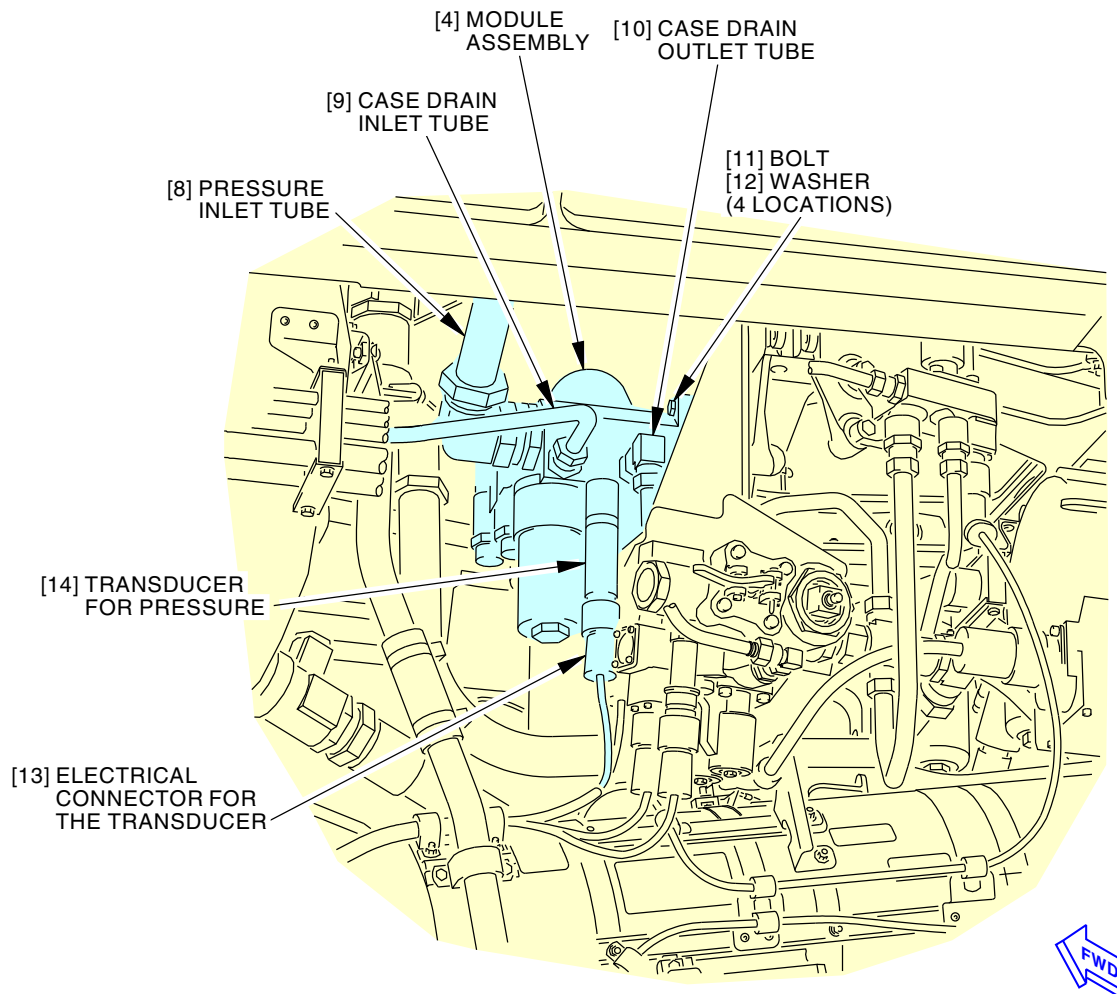
Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module Installation
Figure 401/29-11-42-990-801 (Sheet 3 of 4)

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**FILTER MODULE
(VIEW FROM THE FORWARD LEFT SIDE)**

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Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module Installation
Figure 401/29-11-42-990-801 (Sheet 4 of 4)

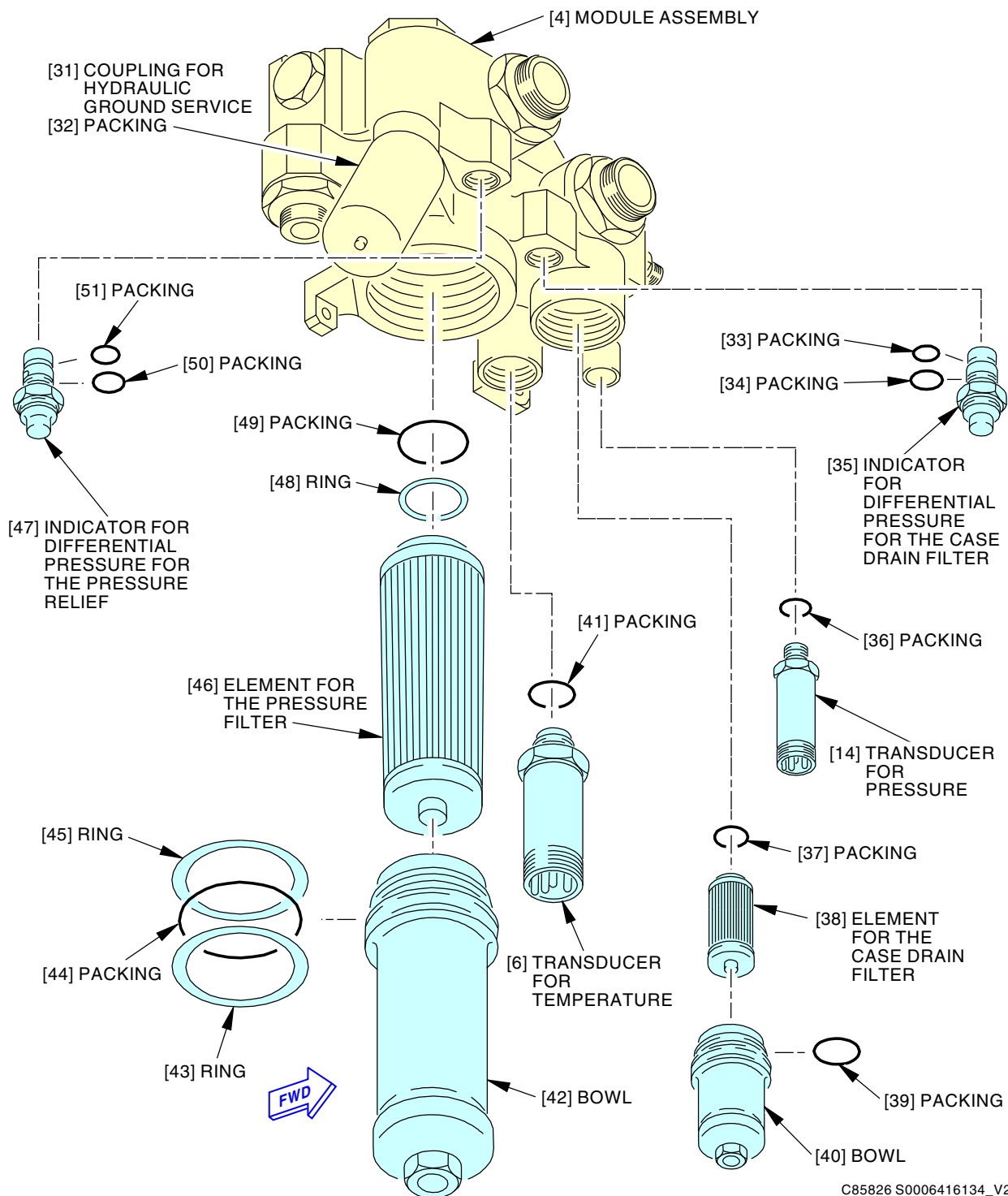
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**Filter Module and Components
Figure 402/29-11-42-990-802**

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TASK 29-11-42-400-801

3. Engine-Driven Pump (EDP) Pressure and Case Drain Filter Module and Components Installation (Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has the instructions for the installation of these components:
 - (a) Engine-driven pump pressure and case drain filter module (referred to in this procedure as the module assembly [4])
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Pressure transducer
 - (e) Temperature transducer
 - (f) Hydraulic ground service disconnect.
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-804	Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

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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

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Transducer	29-11-43-51-090	ARO ALL
14	Transducer	29-11-43-51-050	ARO ALL
32	Packing	29-11-42-01-010	ARO ALL
33	Packing	29-11-43-51-065	ARO ALL
34	Packing	29-11-43-51-070	ARO ALL
35	Indicator assembly	29-11-43-51-200	ARO ALL
36	Packing	29-11-43-51-055	ARO ALL
37	Packing	29-11-43-51-115	ARO ALL
38	Element	29-11-43-51-110	ARO ALL
39	Packing	29-11-43-51-105	ARO ALL
41	Packing	29-11-43-51-095	ARO ALL
44	Packing	29-11-43-51-175	ARO ALL
46	Element	29-11-43-51-185	ARO ALL
47	Indicator assembly	29-11-43-51-205	ARO ALL
49	Packing	29-11-43-51-190	ARO ALL
50	Packing	29-11-43-51-085	ARO ALL
51	Packing	29-11-43-51-080	ARO ALL

F. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

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G. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

H. Filter Module Installation

SUBTASK 29-11-42-140-001

- (1) Do one of these alternate tasks to clean the mating surfaces of the support frame [3] and the module assembly [4]:
 - (a) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
 - (b) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.
 - (c) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.

SUBTASK 29-11-42-370-001

- (2) For the surfaces which you cleaned, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 29-11-42-390-001

- (3) Apply a thin layer of sealant, A00247 to the mating surfaces of the support frame [3] and the module assembly [4].

SUBTASK 29-11-42-420-001

- (4) Remove the caps from the ports on the module assembly [4].

SUBTASK 29-11-42-420-002

- (5) Remove the caps from the hydraulic tubes [2], [5], [8], [9], and [10].

SUBTASK 29-11-42-420-003

- (6) Hold the module assembly [4] on the support frame [3].

SUBTASK 29-11-42-420-004

- (7) Install the bolt [11] and the washer [12] that attach the module assembly [4] to the support frame [3].

SUBTASK 29-11-42-210-001

- (8) Make sure the sealant, A00247 comes out of the edges between the module assembly [4] and the support frame [3] to make a continuous fillet seal.

SUBTASK 29-11-42-390-002

- (9) Remove the unwanted sealant, A00247 from the module assembly [4] and the support frame [3].

SUBTASK 29-11-42-760-001

- (10) Do a check of the electrical bond between the module assembly [4] and the support frame [3] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the module assembly [4] and the support frame [3] is 0.008 ohms.

SUBTASK 29-11-42-420-005

- (11) Connect these hydraulic tubes to the module assembly [4]:
 - (a) Pressure inlet tube [8]

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- (b) Pressure outlet tube [5]
- (c) Case drain inlet tube [9]
- (d) Case drain outlet tube [10].

SUBTASK 29-11-42-420-028

- (12) Install the tube assembly [2].

SUBTASK 29-11-42-420-026

- (13) Remove the caps from the electrical connectors [7] and [13].

SUBTASK 29-11-42-430-001

- (14) Install the electrical connector [13] on the transducer [14].

SUBTASK 29-11-42-420-006

- (15) Install the electrical connector [7] on the transducer [6].

SUBTASK 29-11-42-610-001

- (16) For the reservoir in the applicable (left or right) hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

I. Filter Element Installation

SUBTASK 29-11-42-020-017

- (1) Do these steps to install the element [38] for the case drain filter:
 - (a) Clean the bowl [40].
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [37] and new packing [39] and to the threads on the bowl [40].
 - (c) Install the new packing [37] on the element [38].
 - (d) Install the new packing [39] on the bowl [40].
 - (e) Put the element [38] in the bowl [40].
 - (f) Install the element [38] and the bowl [40] on the module assembly [4].
 - (g) Tighten the bowl [40] to 20-25 pound-feet.

SUBTASK 29-11-42-420-007

- (2) Do these steps to install the element [46] for the pressure filter:
 - (a) Clean the bowl [42].
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [44], the new packing [49], the ring [43], ring [45], ring [48], and to the threads on the bowl [42].
 - (c) Install the new packing [49] and the ring [48] on the element [46].
 - (d) Install the new packing [44], ring [43], and ring [45] on the bowl [42].
 - (e) Put the element [46] in the bowl [42].
 - (f) Install the element [46] and the bowl [42] on the module assembly [4].
 - (g) Install the bowl [42].
 - (h) Tighten the bowl [42] to 20-25 pound-feet.

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J. Differential Pressure Indicator Installation

SUBTASK 29-11-42-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [33] and new packing [34] or new packing [50] and new packing [51] and to the threads on the differential pressure indicator (referred to as the indicator assembly [35] or indicator assembly [47]).

SUBTASK 29-11-42-420-008

- (2) For the indicator assembly [47] for the pressure filter, do the step which follows:
 - (a) Install the new packing [50] and new packing [51] on the indicator assembly [47].

SUBTASK 29-11-42-420-009

- (3) For the indicator assembly [35] for the case drain filter, do the step which follows:
 - (a) Install the new packing [33] and new packing [34] on the indicator assembly [35].

SUBTASK 29-11-42-420-010

- (4) Remove the cap from the opening on the module assembly [4].

SUBTASK 29-11-42-420-011

- (5) Install the indicator assembly [35] or indicator assembly [47] on the module assembly [4].

SUBTASK 29-11-42-420-012

- (6) Tighten the indicator assembly [35] or indicator assembly [47] to 160-175 pound-inches.

SUBTASK 29-11-42-420-013

- (7) Safety the indicator assembly [35] or indicator assembly [47] with a lockwire.

K. Pressure or Temperature Transducer Installation

SUBTASK 29-11-42-420-014

- (1) For the transducer [14] for pressure, do the steps which follow:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [36] and to the threads on the transducer [14].
 - (b) Install the new packing [36] on the transducer [14].

SUBTASK 29-11-42-420-015

- (2) For the transducer [6] for temperature, do the steps which follow:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [41] and to the threads on the transducer [6].
 - (b) Install the new packing [41] on the transducer [6].

SUBTASK 29-11-42-420-016

- (3) Remove the cap from the opening in the module assembly [4].

SUBTASK 29-11-42-420-017

- (4) Install the transducer [14] or the transducer [6] on the module assembly [4].

SUBTASK 29-11-42-420-018

- (5) For the transducer [14], tighten it to 160-175 pound-inches.

SUBTASK 29-11-42-420-019

- (6) For the transducer [6], tighten it to 75-100 pound-inches.

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SUBTASK 29-11-42-760-002

- (7) Do a check of the electrical bond between the hexagonal fitting on the transducer [14] or the transducer [14] and the module assembly [4] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance is 0.005 ohms.

SUBTASK 29-11-42-420-027

- (8) Remove the cap from the electrical connector [7] or [13].

SUBTASK 29-11-42-420-020

- (9) For the transducer [14], connect the electrical connector [13].

SUBTASK 29-11-42-420-021

- (10) For the transducer [6], connect the electrical connector [7].

SUBTASK 29-11-42-420-022

- (11) Safety the transducer [14] or transducer [6] with a lockwire.

L. Hydraulic Ground Service Disconnect Installation

SUBTASK 29-11-42-640-003

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [32].

SUBTASK 29-11-42-420-023

- (2) Install the new packing [32] on the hydraulic ground service disconnect (referred to as the coupling [31] in this procedure).

SUBTASK 29-11-42-420-024

- (3) Install the coupling [31] on the module assembly [4].

SUBTASK 29-11-42-420-025

- (4) Safety the coupling [31] with a lockwire.

M. Filter Module and Components Installation Test

SUBTASK 29-11-42-860-004

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

SUBTASK 29-11-42-860-005

- (2) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-42-860-011

- (3) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-11-42-860-006

- (4) If you removed an electrical connector [7] or [13] from the transducer [6] or the transducer [14] in this procedure, do the steps which follow:
 - (a) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - (b) Make a record of the HYDRAULIC PRIMARY PUMP TEMP (L or R) indication, for the applicable EDP.

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- (c) Make sure the HYDRAULIC PRIMARY PUMP PRESS (L or R) indication, for the applicable EDP, shows 0 to 200 psi.

SUBTASK 29-11-42-860-007

- (5) For the reservoir in the applicable (left or right) hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-42-860-008

- (6) For the applicable (left or right) hydraulic system, do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.

SUBTASK 29-11-42-790-001

- (7) Make sure there are no leaks at the hydraulic tube connections and at the components of the module assembly [4].

SUBTASK 29-11-42-210-002

- (8) If you removed an electrical connector [7] or [13] from the transducer [6] or the transducer [14] in this procedure, do the steps which follow:
- (a) Make sure the HYDRAULIC PRIMARY PUMP TEMP (L or R) indication is higher than the indication before you pressurized the hydraulic system.
 - (b) Make sure the HYDRAULIC PRIMARY PUMP PRESS (L or R) indication, for the applicable EDP, shows 2900 to 3200 psi.

SUBTASK 29-11-42-860-009

- (9) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

N. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-42-860-010

- (1) If you can see the red indicator button, on the indicator assembly [35] or indicator assembly [47] for differential pressure, push the red indicator button until it aligns with the adjacent surface.

SUBTASK 29-11-42-160-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) Do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-42-410-001

- (3) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-11-42-410-002

- (4) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

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SUBTASK 29-11-42-440-001

- (5) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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AIR-DRIVEN PUMP (ADP) PRESSURE AND CASE DRAIN FILTER MODULE AND COMPONENTS -
REMOVAL/INSTALLATION

1. **General**

A. This procedure has these tasks:

- (1) A removal of the air-driven pump (ADP) pressure and case drain filter module (referred to as the filter assembly [8] or filter assembly [29] in this procedure) and components
- (2) An installation of the filter assembly [8] or filter assembly [29] and components.

TASK 29-11-43-000-801

2. **Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Removal**

(Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has the instructions for the removal of these components.
 - (a) Air-driven pump pressure and case drain filter module (referred to as the filter assembly [8] or filter assembly [29] in this procedure)
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Pressure transducer
 - (e) Temperature transducer
 - (f) Hydraulic ground service disconnect
 - (g) Pressure transducer and Ground service check valves
 - (h) Bypass check valve.
- (2) Before you do one of the removals, do the steps to prepare for the removal. Then do the applicable removal.

B. References

Reference	Title
29-11-00-170-801	Main Hydraulic System Flushing (P/B 201)
29-11-00-710-802	Air-Driven Pump (ADP) Assembly - Functional Test (P/B 501)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-11 P/B 401	AIR-DRIVEN PUMP (ADP) - REMOVAL/INSTALLATION

C. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

D. Access Panels

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

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E. Prepare for the Removal

SUBTASK 29-11-43-860-001

- (1) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-43-860-002

- (2) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-43-010-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

F. Filter Module Removal

SUBTASK 29-11-43-020-001

- (1) Disconnect the electrical connector [16] or [23] from the transducer [45] for pressure, on the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-002

- (2) Disconnect the electrical connector [18] or [24] from the transducer [47] for temperature on the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-026

- (3) Install caps on the electrical connectors [16] and [18] or [23] and [24] to prevent contamination or damage.

SUBTASK 29-11-43-860-003

- (4) Put the electrical connectors [16] and [18] or [23] and [24] in a position that is clear of the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-003

- (5) Disconnect these hydraulic connections from the filter assembly [8] or filter assembly [29]:
 - (a) The pressure relief tube [22].
 - (b) The pressure inlet hose [5] or pressure inlet hose [13].
 - (c) The pressure outlet tube [7].
 - (d) If filter assembly [8] is to be removed, disconnect these hydraulic connections:
 - 1) Pressure relief hose [17] and T-fitting [27].
 - 2) Pressure outlet hose [15] and T-fitting [12].
 - 3) Case drain inlet hose [14].
 - 4) Case drain outlet tube [9] and elbow [74].
 - (e) If filter assembly [29] is to be removed, disconnect these hydraulic connections:
 - 1) Case drain outlet tube [6] with T-fitting [72].
 - 2) Remove elbow [73] from the port of the drain outlet tube [6].
 - 3) Case drain inlet hose [19].
 - 4) Case drain outlet tube [32] or drain outlet tube [34].
 - 5) Elbow [3], elbow [70] from pressure relief tube port and if used elbow [33].

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- 6) T-fitting [28] from filter assembly [29]

SUBTASK 29-11-43-020-004

- (6) Hold the filter assembly [8] or filter assembly [29] and remove the bolts [1] or bolts [10].

SUBTASK 29-11-43-020-005

- (7) Remove the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-006

- (8) If it is necessary, do this step for the filter assembly [8] for the ADP C1:

- (a) Remove the plug [20] from the GRD P port on the filter assembly [8].

SUBTASK 29-11-43-020-007

- (9) If it is necessary, do this step for the filter assembly [29] for the ADP C2:

- (a) Do this procedure: Hydraulic Ground Service Disconnect Removal.

NOTE: This procedure follows in this task.

SUBTASK 29-11-43-020-008

- (10) Install caps on the hydraulic connections, which you disconnected, to prevent contamination:

SUBTASK 29-11-43-020-009

- (11) Install caps on the open ports on the filter assembly [8] or filter assembly [29] to prevent contamination.

G. Filter Element Removal

SUBTASK 29-11-43-020-010

- (1) Do these steps to remove the element [49] for the case drain filter:

- (a) Remove the bowl [51] from the filter assembly [8] or filter assembly [29].
- (b) Remove the element [49] from the filter assembly [8] or filter assembly [29].
- (c) Remove the packing [50] from the bowl [51].
- (d) Remove the packing [48] from the element [49].

SUBTASK 29-11-43-210-003

- (2) Examine the element [49], the bowl [51], and the fluid in the bowl for metal contamination.

- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Air-Driven Pump (ADP) Assembly - Functional Test, TASK 29-11-00-710-802). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: (AIR-DRIVEN PUMP (ADP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-11/401).

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

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- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.



FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).

SUBTASK 29-11-43-020-011

- (3) Do these steps to remove the element [59] for the pressure filter:
- (a) Remove the bowl [52] from the filter assembly [8] or filter assembly [29].
 - (b) Remove the element [59] from the filter assembly [8] or filter assembly [29].
 - (c) Remove the packing [54], the ring [53], and the ring [55] from the bowl [52].
 - (d) Remove the packing [61] and the ring [60] from the element [59].

SUBTASK 29-11-43-210-004

- (4) Examine the element [59], the bowl [52], and the fluid in the bowl for metal contamination.
- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (Air-Driven Pump (ADP) Assembly - Functional Test, TASK 29-11-00-710-802). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.
 - (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: (AIR-DRIVEN PUMP (ADP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-11/401).

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.

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FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Main Hydraulic System Flushing, TASK 29-11-00-170-801).

H. Differential Pressure Indicator Removal

SUBTASK 29-11-43-020-012

- (1) Remove the indicator assembly [43] or indicator assembly [56] from the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-013

- (2) Install a cap on the opening in the filter assembly [8] or filter assembly [29] to prevent contamination.

SUBTASK 29-11-43-020-014

- (3) For the indicator assembly [56] for the pressure filter, do the step which follows:
(a) Remove the packing [57] and the packing [58] from the indicator assembly [56].

SUBTASK 29-11-43-020-015

- (4) For the indicator assembly [43] for the case drain filter, do the step which follows:
(a) Remove the packing [41] and the packing [42] from the indicator assembly [43].

I. Pressure or Temperature Transducer Removal

SUBTASK 29-11-43-020-016

- (1) For the transducer [45] for pressure, disconnect the electrical connector [16] or [23].

SUBTASK 29-11-43-020-017

- (2) For the transducer [47] for temperature, disconnect the electrical connector [18] or [24].

SUBTASK 29-11-43-020-027

- (3) Install caps on the electrical connectors [16], [18], [23], or [24] to prevent contamination or damage.

SUBTASK 29-11-43-020-018

- (4) Remove the transducer [45] or the transducer [47] from the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-019

- (5) Install a cap on the opening in the filter assembly [8] or filter assembly [29] to prevent contamination.

SUBTASK 29-11-43-020-020

- (6) For the transducer [45], remove the packing [44].

SUBTASK 29-11-43-020-021

- (7) For the transducer [47], remove the packing [46].

J. Hydraulic Ground Service Disconnect Removal

NOTE: The hydraulic ground service disconnect (referred to as the coupling [25] in this procedure) is only on the filter assembly [29] for the ADP C2. This is the outboard filter assembly.

SUBTASK 29-11-43-020-022

- (1) Remove the coupling [25] from the filter assembly [29].

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SUBTASK 29-11-43-020-023

- (2) Install a cap on the opening in the filter assembly [29] to prevent contamination.

SUBTASK 29-11-43-020-024

- (3) Remove the packing [26] from the coupling [25].

K. Pressure Transducer or Ground Service Check Valve Removal

NOTE: The Pressure transducer check valve and the Ground service check valve are referred to as valve [30].

SUBTASK 29-11-43-020-028

- (1) Remove the valve [30] from the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-029

- (2) Install a cap on the opening in the filter assembly [8] or filter assembly [29] to prevent contamination.

SUBTASK 29-11-43-020-030

- (3) Remove the packing [69] and packing [63] and the rings [68] and rings [62] from the valve [30].

L. Bypass Check Valve Removal

SUBTASK 29-11-43-020-031

- (1) Remove the filter assembly [8] or filter assembly [29] from the bracket [4].

NOTE: The bypass check valve [30] is on the forward side of the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-032

- (2) Remove the bypass check valve [30] from the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-020-033

- (3) Install a cap on the opening in the filter assembly [8] or filter assembly [29] to prevent contamination.

SUBTASK 29-11-43-020-034

- (4) Remove the packing [67] and packing [65] and the backup rings [66] and backup rings [64] from the bypass check valves [31].

————— **END OF TASK** —————

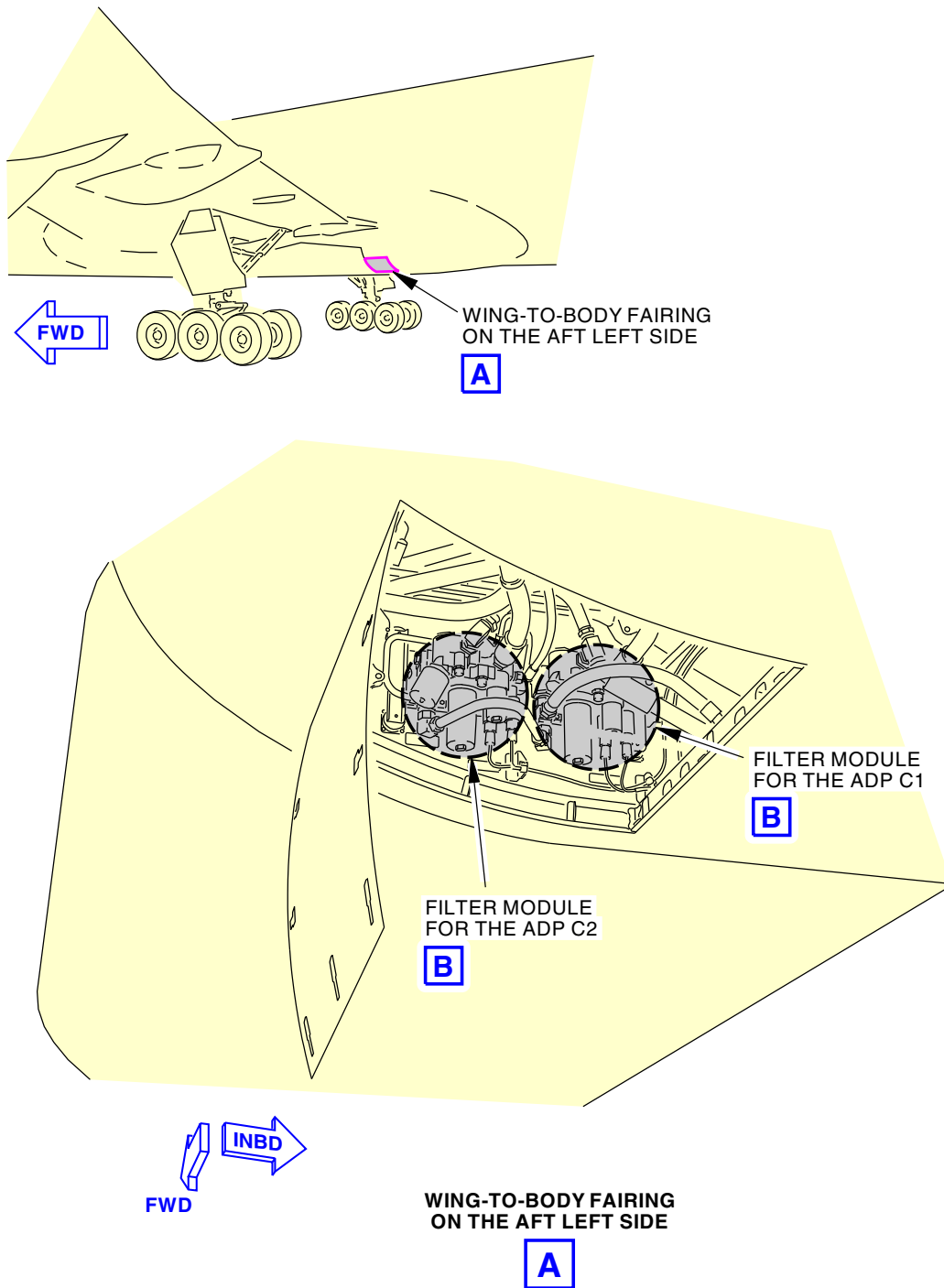
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C87219 S0006416139_V2

Air-Driven Pump (ADP) Pressure and Case Drain Filter Module Installation
Figure 401/29-11-43-990-801 (Sheet 1 of 3)

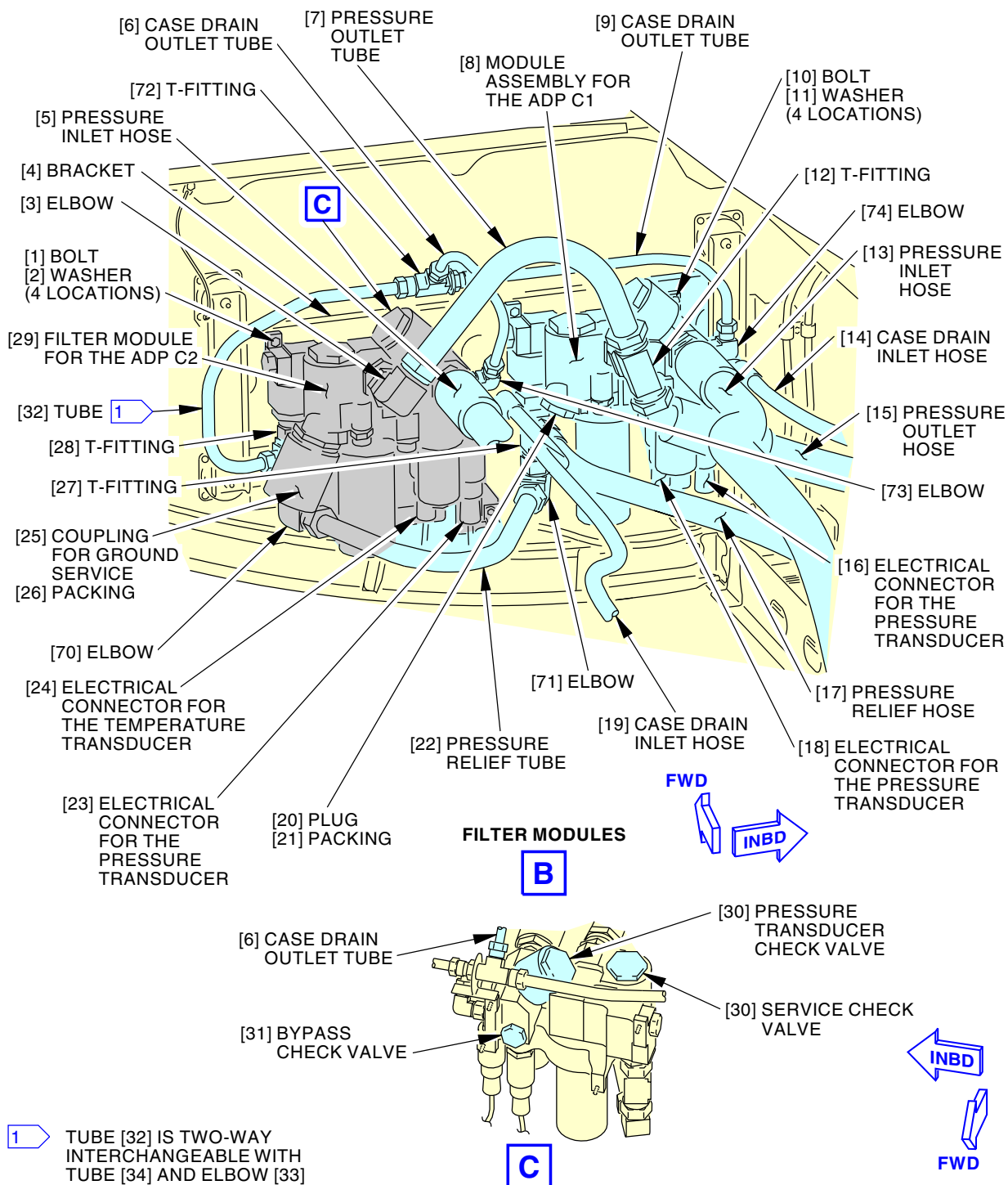
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C87222 S0006416140_V4

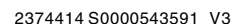
Air-Driven Pump (ADP) Pressure and Case Drain Filter Module Installation
Figure 401/29-11-43-990-801 (Sheet 2 of 3)

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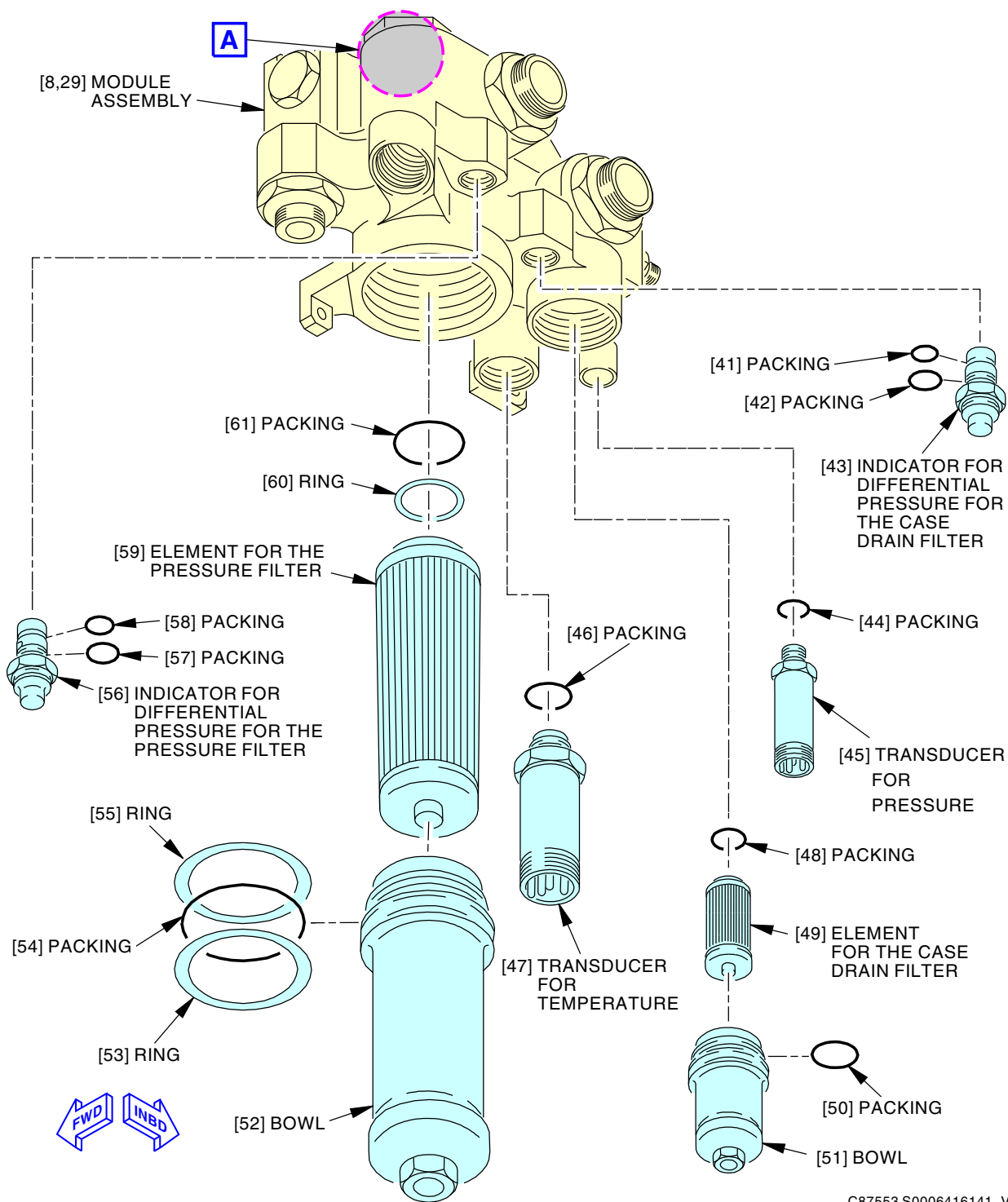
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Air-Driven Pump (ADP) Pressure and Case Drain Filter Module Installation
Figure 401/29-11-43-990-801 (Sheet 3 of 3)

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C87553 S0006416141_V2

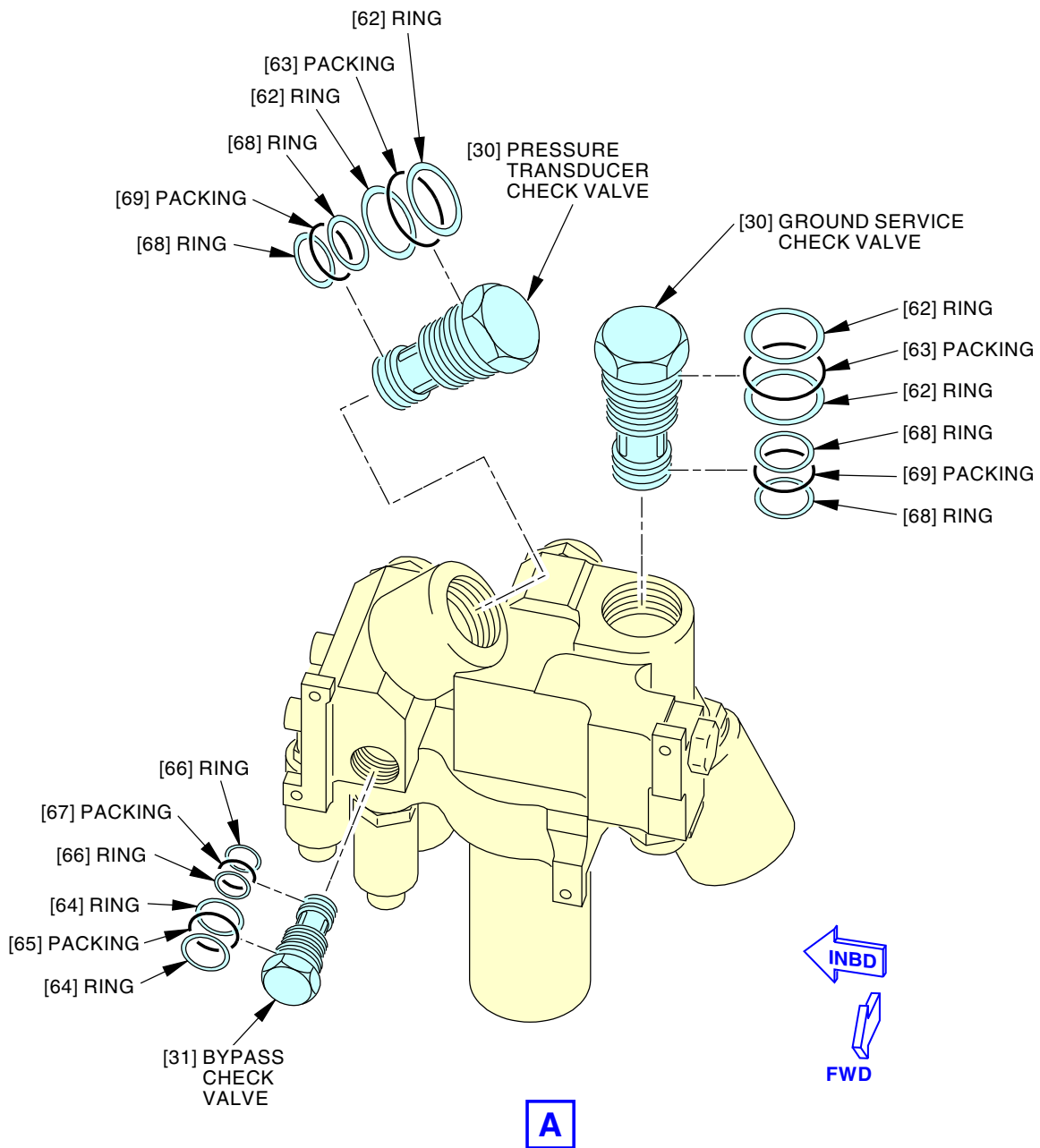
**Filter Module and Components
Figure 402/29-11-43-990-802 (Sheet 1 of 2)**

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G89973 S0006416142_V2

**Filter Module and Components
Figure 402/29-11-43-990-802 (Sheet 2 of 2)**

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TASK 29-11-43-400-801

3. Air-Driven Pump (ADP) Pressure and Case Drain Filter Module and Components Installation (Figure 401, Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has the instructions for the installation of these components:
 - (a) The air-driven pump (ADP) pressure and case drain filter module (referred to as the filter assembly [8] or filter assembly [29] in this procedure).
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Pressure transducer
 - (e) Temperature transducer
 - (f) Hydraulic ground service disconnect
 - (g) Pressure transducer and Ground service check valves
 - (h) Bypass check valve.
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-805	Center Hydraulic System Pressurization with an Air-Driven Pump (ADP) (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

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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

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Filter assembly	29-11-43-01-320	ARO ALL
20	Plug	29-11-43-01-310	ARO ALL
21	Packing	29-11-43-01-315	ARO ALL
26	Packing	29-11-43-05-190	ARO ALL
29	Filter assembly	29-11-43-01-051	ARO ALL
30	Valve	29-11-43-51-145	ARO ALL
31	Valve	29-11-43-51-120	ARO ALL
41	Packing	29-11-43-51-065	ARO ALL
42	Packing	29-11-43-51-070	ARO ALL
43	Indicator assembly	29-11-43-51-200	ARO ALL
44	Packing	29-11-43-51-055	ARO ALL
45	Transducer	29-11-43-51-050	ARO ALL
46	Packing	29-11-43-51-095	ARO ALL
47	Transducer	29-11-43-51-090	ARO ALL
48	Packing	29-11-43-51-115	ARO ALL
49	Element	29-11-43-51-110	ARO ALL
50	Packing	29-11-43-51-105	ARO ALL
51	Bowl	29-11-43-51-100	ARO ALL
52	Bowl	29-11-43-51-170	ARO ALL
53	Ring	29-11-43-51-180	ARO ALL
54	Packing	29-11-43-51-175	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
55	Ring	29-11-43-51-180	ARO ALL
56	Indicator assembly	29-11-43-51-205	ARO ALL
57	Packing	29-11-43-51-085	ARO ALL
58	Packing	29-11-43-51-080	ARO ALL
59	Element	29-11-43-51-185	ARO ALL
60	Ring	29-11-43-51-195	ARO ALL
61	Packing	29-11-43-51-190	ARO ALL
62	Ring	29-11-43-51-165	ARO ALL
63	Packing	29-11-43-51-160	ARO ALL
64	Ring	29-11-43-51-140	ARO ALL
65	Packing	29-11-43-51-135	ARO ALL
66	Ring	29-11-43-51-130	ARO ALL
67	Packing	29-11-43-51-125	ARO ALL
68	Ring	29-11-43-51-155	ARO ALL
69	Packing	29-11-43-51-150	ARO ALL

F. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

G. Access Panels

Number	Name/Location
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

H. Filter Module Installation

SUBTASK 29-11-43-420-001

- (1) If it is necessary, do these steps for the filter assembly [8] for the ADP C1:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [21] and to the threads of the plug [20].
 - (b) Install the new packing [21] on the plug [20].
 - (c) Install the plug [20] in the GRD P port on the filter assembly [8].

SUBTASK 29-11-43-420-002

- (2) If it is necessary, do this step for the filter assembly [29] for the ADP C2:
 - (a) Do this procedure: Hydraulic Ground Service Disconnect Installation.
NOTE: This procedure follows in this task.

SUBTASK 29-11-43-140-001

- (3) Do one of the tasks which follow to clean the mating surfaces of the bracket [4] and the filter assembly [8] or filter assembly [29]:
 - (a) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
 - (b) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.
 - (c) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.

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SUBTASK 29-11-43-370-001

- (4) For the surfaces that you cleaned, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 29-11-43-420-003

- (5) Remove the caps from the ports on the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-029

- (6) Remove the caps from the hydraulic fittings which you disconnected.

SUBTASK 29-11-43-390-001

- (7) Apply a thin layer of sealant, A00247 to the mating surfaces of the bracket [4] and the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-390-002

- (8) Apply a thin layer of sealant, A00247 to the shank and the threads of the bolts [1] or bolts [10].

SUBTASK 29-11-43-420-004

- (9) Hold the filter assembly [8] or filter assembly [29] on the bracket [4].

SUBTASK 29-11-43-420-030

- (10) Install the bolts [1] or bolts [10] and the washers [2] or washers [11] that attach the filter assembly [8] or filter assembly [29] to the bracket [4].

SUBTASK 29-11-43-210-001

- (11) Make sure the sealant comes out of the edges between the filter assembly [8] or filter assembly [29] and the bracket [4] to make a continuous fillet seal.

SUBTASK 29-11-43-390-003

- (12) Remove the unwanted sealant from the bolts [1] or bolts [10], the filter assembly [8] or filter assembly [29], and the bracket [4].

SUBTASK 29-11-43-760-001

- (13) Do a check of the electrical bond between the filter assembly [8] or filter assembly [29] and the bracket [4] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the filter assembly [8] or filter assembly [29] and the bracket [4] is 0.008 ohms.

SUBTASK 29-11-43-420-005

- (14) Connect these hydraulic connections to the filter assembly [8] or filter assembly [29].
- (a) If removed, connect these hydraulic connections to the filter assembly [29].
- 1) Install the elbow [3] into the filter assembly [29].
 - a) Tighten the B-nut on the elbow [3] to 1600 $\pm$ 80 in-lb (181 $\pm$ 9 N·m).
 - 2) Install the T-fitting [28] into the filter assembly [29].
 - a) Tighten the B-nut on the T-fitting [28] to 750 $\pm$ 38 in-lb (85 $\pm$ 5 N·m).
 - 3) Install the elbow [70] on the T-fitting [28].
 - a) Tighten the B-nut on the elbow [70] to 750 $\pm$ 38 in-lb (85 $\pm$ 5 N·m).
 - 4) If used, install the elbow [33] on the T-fitting [28].
 - a) Tighten the B-nut on the elbow [33] to 360 $\pm$ 18 in-lb (41 $\pm$ 2 N·m).
 - 5) Install the elbow [73] into the filter assembly [29].
 - a) Tighten the B-nut on the elbow [73] to 280 $\pm$ 14 in-lb (32 $\pm$ 2 N·m).
 - 6) Connect the case drain outlet tube [6] to the elbow [73].

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- a) Tighten the B-nut on the case drain outlet tube [6] to 280 ±14 in-lb (32 ±2 N·m).
- 7) Install the T-fitting [72] on the case drain outlet tube [6].
 - a) Tighten the B-nut on the case drain outlet tube [6] to 280 ±14 in-lb (32 ±2 N·m).
- 8) If used, connect the tube [34] to the elbow [33].
 - a) Tighten the B-nut on the tube [34] to 360 ±18 in-lb (41 ±2 N·m).
- 9) If used, connect the tube [34] to the T-fitting [72].
 - a) Tighten the B-nut on the tube [34] to 360 ±18 in-lb (41 ±2 N·m).
- 10) If used, connect the tube [32] to the T-fitting [28].
 - a) Tighten the B-nut on the tube [32] to 360 ±18 in-lb (41 ±2 N·m).
- 11) If used, connect the tube [32] to the T-fitting [72].
 - a) Tighten the B-nut on the tube [32] to 360 ±18 in-lb (41 ±2 N·m).
- 12) Connect the case drain inlet hose [19] to the filter assembly [29].
 - a) Tighten the B-nut on the case drain inlet hose [19] to 280 ±14 in-lb (32 ±2 N·m).
- 13) Connect the pressure inlet hose [5] to the filter assembly [29].
 - a) Tighten the B-nut on the pressure inlet hose [5] to 1600 ±80 in-lb (181 ±9 N·m).
- 14) Connect the pressure outlet tube [7] to the elbow [3].
 - a) Tighten the B-nut on the outlet tube [7] to 1600 ±80 in-lb (181 ±9 N·m).
- 15) Connect the pressure relief tube [22] to the elbow [70].
 - a) Tighten the B-nut on the pressure relief tube [70] to 750 ±38 in-lb (85 ±5 N·m).
- (b) If removed, connect these hydraulic connections to the filter assembly [8]:
 - 1) Install the T-fitting [12] into the filter assembly [8].
 - a) Tighten the B-nut on the T-fitting [12] to 1600 ±80 in-lb (181 ±9 N·m).
 - 2) Install the T-fitting [27] into the filter assembly [8].
 - a) Tighten the B-nut on the T-fitting [27] to 750 ±38 in-lb (85 ±5 N·m).
 - 3) Install the elbow [71] on the T-fitting [27].
 - a) Tighten the B-nut on the elbow [71] to 750 ±38 in-lb (85 ±5 N·m).
 - 4) Install the elbow [74] into the filter assembly [8].
 - a) Tighten the B-nut on the elbow [74] to 280 ±14 in-lb (32 ±2 N·m).
 - 5) Connect the case drain outlet tube [9] to the elbow [74].
 - a) Tighten the B-nut on the case drain outlet tube [9] to 280 ±14 in-lb (32 ±2 N·m).
 - 6) Connect the case drain outlet tube [9] to the T-fitting [72].
 - a) Tighten the B-nut on the case drain outlet tube [9] to 280 ±14 in-lb (32 ±2 N·m).
 - 7) Connect the pressure outlet tube [7] to the T-fitting [12].
 - a) Tighten the B-nut on the pressure outlet tube [7] to 1600 ±80 in-lb (181 ±9 N·m).

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- 8) Connect the case drain inlet hose [14] to the filter assembly [8].
 - a) Tighten the B-nut on the case drain inlet hose [14] to 280 $\pm$ 14 in-lb (32 $\pm$ 2 N·m).
- 9) Connect the pressure inlet hose [13] to the filter assembly [8].
 - a) Tighten the B-nut on the pressure inlet hose [13] to 1600 $\pm$ 80 in-lb (181 $\pm$ 9 N·m).
- 10) Connect the pressure outlet hose [15] to the T-fitting [12].
 - a) Tighten the B-nut on the pressure outlet hose [15] to 1600 $\pm$ 80 in-lb (181 $\pm$ 9 N·m).
- 11) Connect the pressure relief hose [17] to the T-fitting [27].
 - a) Tighten the B-nut on the pressure relief hose [17] to 750 $\pm$ 38 in-lb (85 $\pm$ 5 N·m).
- 12) Connect pressure relief tube [22] to the elbow [71].
 - a) Tighten the B-nut on the pressure relief tube [22] to 750 $\pm$ 38 in-lb (85 $\pm$ 5 N·m).

SUBTASK 29-11-43-420-027

- (15) Remove the caps from the electrical connectors [16] and [18] or [23] and [24].

SUBTASK 29-11-43-420-006

- (16) Connect the electrical connectors [16] and [23] to the transducer [45] for pressure on the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-007

- (17) Connect the electrical connectors [18] and [24] to the transducer [47] for temperature on the filter assembly [8] or filter assembly [29].

I. Filter Element Installation

SUBTASK 29-11-43-020-025

- (1) Do these steps to install the element [49] for the case drain filter :
 - (a) Clean the bowl [51].
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [48], new packing [50], and to the threads on the bowl [51].
 - (c) Install the new packing [48] on the element [49].
 - (d) Install the new packing [50] on the bowl [51].
 - (e) Put the element [49] in the bowl [51].
 - (f) Install the element [49] and the bowl [51] on the filter assembly [8] or filter assembly [29].
 - (g) Tighten the bowl [51] to 20-25 pound-feet.

SUBTASK 29-11-43-420-008

- (2) Do these steps to install the element [59] for the pressure filter:
 - (a) Clean the bowl [52].
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [54], the new packing [61], the ring [53], the ring [55], the ring [60], and to the threads on the bowl [52].
 - (c) Install the new packing [61] and the ring [60] on the element [59].
 - (d) Install the new packing [54], the ring [53], and the ring [55] on the bowl [52].
 - (e) Put the element [59] in the bowl [52].
 - (f) Install the element [59] and the bowl [52] on the filter assembly [8] or filter assembly [29].

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- (g) Tighten the bowl [52] to 20-25 pound-feet.

J. Differential Pressure Indicator Installation

SUBTASK 29-11-43-420-009

- (1) For the indicator assembly [56] for the pressure filter, do the step which follows:
- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [57], new packing [58], and to the threads on the indicator assembly [56] for differential pressure.
 - (b) Install the new packing [57] and new packing [58] on the indicator assembly [56].

SUBTASK 29-11-43-420-010

- (2) For the indicator assembly [43] for the case drain filter, do the step which follows:
- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [41] and new packing [42] and to the threads on the indicator assembly [43] for differential pressure.
 - (b) Install the new packing [41] and new packing [42] on the indicator assembly [43].

SUBTASK 29-11-43-420-011

- (3) Remove the cap from the opening on the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-012

- (4) Install the indicator assembly [43] or the indicator assembly [56] on the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-013

- (5) Tighten the indicator assembly [43] or the indicator assembly [56] to 160-175 pound-inches.

SUBTASK 29-11-43-420-014

- (6) Safety the indicator assembly [43] or the indicator assembly [56] with a lockwire.

K. Pressure or Temperature Transducer Installation

SUBTASK 29-11-43-420-015

- (1) For the transducer [45] for pressure, do the steps which follow:
- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [44] and to the threads on the transducer [45].
 - (b) Install the new packing [44] on the transducer [45].

SUBTASK 29-11-43-420-016

- (2) For the transducer [47] for temperature, do the steps which follow:
- (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [46] and to the threads on the transducer [47].
 - (b) Install the new packing [46] on the transducer [47].

SUBTASK 29-11-43-420-017

- (3) Remove the cap from the opening in the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-018

- (4) Install the transducer [45] or the transducer [47] on the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-019

- (5) For the transducer [45], tighten it to 160-175 pound-inches.

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SUBTASK 29-11-43-420-020

- (6) For the transducer [47], tighten it to 75-100 pound-inches.

SUBTASK 29-11-43-760-002

- (7) Do a check of the electrical bond between the hexagonal fitting on the transducer [45] or the transducer [47] and the filter assembly [8] or filter assembly [29] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance is 0.005 ohms.

SUBTASK 29-11-43-420-028

- (8) Remove the caps from the electrical connectors [16], [18], [23] or [24].

SUBTASK 29-11-43-420-021

- (9) For the transducer [45], connect the electrical connector [16] or [23].

SUBTASK 29-11-43-420-022

- (10) For the transducer [47], connect the electrical connector [18] or [24].

SUBTASK 29-11-43-420-023

- (11) Safety the transducer [45] or the transducer [47] with a lockwire.

L. Hydraulic Ground Service Disconnect Installation

NOTE: The hydraulic ground service disconnect (referred to as the coupling [25] in this procedure) is only on the filter assembly [29] for the ADP C2. This is the outboard filter module. The inboard filter assembly [8] has a plug in this port.

SUBTASK 29-11-43-640-003

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [26].

SUBTASK 29-11-43-420-024

- (2) Install the new packing [26] on the coupling [25].

SUBTASK 29-11-43-420-025

- (3) Install the coupling [25] on the filter assembly [29].

SUBTASK 29-11-43-420-026

- (4) Safety the coupling [25] with a lockwire.

M. Pressure Transducer or Ground Service Check Valve Installation

NOTE: The Pressure transducer check valve and the Ground service check valve are referred to as valve [30].

SUBTASK 29-11-43-640-004

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [69] and new packing [63].

SUBTASK 29-11-43-420-031

- (2) Install the new packing [69] and new packing [63] and backup rings [68] and backup rings [62] on the valve [30].

SUBTASK 29-11-43-080-001

- (3) Remove the cap from the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-032

- (4) Install the valve [30] in the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-033

- (5) Tighten the valve [30] to 125-150 pound-feet (169-203 newton-meters).

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N. Bypass Check Valve Installation

SUBTASK 29-11-43-640-005

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [65] and new packing [67].

SUBTASK 29-11-43-420-034

- (2) Install the new packing [65] and new packing [67] and backup rings [64] and backup rings [66] on the bypass check valve [31].

SUBTASK 29-11-43-080-002

- (3) Remove the cap from the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-035

- (4) Install the bypass check valve [31] in the filter assembly [8] or filter assembly [29].

SUBTASK 29-11-43-420-036

- (5) Tighten the bypass check valve [31] to 100-125 pound-feet (136-169 newton-meters).

O. Filter Module and Components Installation Test

SUBTASK 29-11-43-860-004

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

SUBTASK 29-11-43-860-005

- (2) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-11-43-860-006

- (3) If you removed an electrical connector [18] or [24] from the transducer [47] for temperature or the electrical connector [16] or [23] from the transducer [45] for pressure in this procedure, do the steps which follow:
 - (a) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 - (b) Make a record of the HYDRAULIC DEMAND PUMP TEMP (C1 or C2) indication, for the applicable ADP.
 - (c) Make sure the HYDRAULIC DEMAND PUMP PRESS (C1 or C2) indication, for the applicable EDP, shows 0 to 200 psi.

SUBTASK 29-11-43-610-001

- (4) For the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-43-860-007

- (5) For the center hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-43-860-008

- (6) Do this task: Center Hydraulic System Pressurization with an Air-Driven Pump (ADP), TASK 29-11-00-860-805.

NOTE: Use the ADP (C1 or C2) which has a relation to the filter assembly [8] or filter assembly [29] on which you did the maintenance task.

SUBTASK 29-11-43-790-001

- (7) Make sure there are no leaks at the hydraulic connections and at the components on the filter assembly [8] or filter assembly [29].

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SUBTASK 29-11-43-210-002

- (8) If you removed an electrical connector [18] or [24] from the transducer [47] or the electrical connector [16] or [23] from the transducer [45] in this procedure, do the steps which follow:
 - (a) Make sure the HYDRAULIC DEMAND PUMP TEMP (C1 or C2) indication is higher than the indication before you pressurized the hydraulic system.
 - (b) Make sure the HYDRAULIC DEMAND PUMP PRESS (C1 or C2) indication, for the applicable ADP, shows 2900 to 3200 psi.

SUBTASK 29-11-43-860-009

- (9) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

P. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-43-860-010

- (1) If you can see the red indicator button on the indicator assembly [43] or indicator assembly [56], push the red indicator button until it aligns with the adjacent surface.

SUBTASK 29-11-43-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) To remove the hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801

SUBTASK 29-11-43-410-001

- (3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
197DL	Air-Driven Pump (ADP) Filter Module Access Door and Escape Slide Inflation Bottle

————— END OF TASK —————

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LEFT AND RIGHT SYSTEM RETURN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the left and right system return filter module (referred to as the module assembly [5] in this procedure) and components
- (2) An installation of the module assembly [5] and components.

TASK 29-11-44-000-801

2. Left and Right System Return Filter Module and Components Removal

(Figure 401)

A. **General**

- (1) This task has the instructions for the removal of these components.
 - (a) Left and right system return filter module (referred to as the module assembly [5] in this procedure)
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Bypass relief valve
 - (e) Hydraulic ground service disconnect.
- (2) Before you do one of the removals, do the steps to prepare for the removal. Then do the applicable removal.

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)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. **Location Zones**

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. **Access Panels**

Number	Name/Location
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

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E. Prepare for the Removal

SUBTASK 29-11-44-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-11-44-010-001

- (2) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-44-010-002

- (3) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-44-860-001

- (4) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807

F. Return Filter Module Removal

SUBTASK 29-11-44-680-001

- (1) To drain the hydraulic fluid from the applicable (left or right) hydraulic reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

SUBTASK 29-11-44-020-001

- (2) Disconnect the T-fitting [2] from the aft port on the return filter module (referred to as the module assembly [5] in this procedure).

SUBTASK 29-11-44-020-002

- (3) Disconnect the elbow [8] from the forward port on the module assembly [5].

SUBTASK 29-11-44-020-003

- (4) Hold the module assembly [5] in its position and remove the bolts [12].

SUBTASK 29-11-44-020-004

- (5) Remove the module assembly [5] from the support frame [10].

SUBTASK 29-11-44-020-005

- (6) Install caps on the T-fitting [2] and the elbow [8] to prevent contamination.

SUBTASK 29-11-44-020-006

- (7) If it is necessary to keep components for installation on the replacement module assembly [5], do these steps:
 - (a) Remove the adapter [3] and the adapter [6] from the ports of the module assembly [5].
 - (b) Remove the packing [4] and the packing [7] from the adapter [3] and the adapter [6].
 - (c) Do this procedure: Hydraulic Ground Service Disconnect Removal.

NOTE: This procedure follows in this task.

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SUBTASK 29-11-44-020-007

- (8) Install caps on the ports on the module assembly [5] to prevent contamination.

G. Filter Element Removal

SUBTASK 29-11-44-020-008

- (1) Remove the case [20] from the module assembly [5].

SUBTASK 29-11-44-020-009

- (2) Remove the filter element (referred to as the element assembly [19] in this procedure) from the module assembly [5].

SUBTASK 29-11-44-020-010

- (3) Remove the packing [18] from the case [20].

SUBTASK 29-11-44-020-011

- (4) Remove the packing [17] from the element assembly [19].

H. Differential Pressure Indicator Removal

SUBTASK 29-11-44-020-012

- (1) Remove the differential pressure indicator (referred to as the indicator [27] in this procedure) from the module assembly [5].

SUBTASK 29-11-44-020-013

- (2) Install a cap on the opening on the module assembly [5] to prevent contamination.

SUBTASK 29-11-44-020-014

- (3) Remove the packing [25] and the packing [26] from the indicator [27].

I. Bypass Relief Valve Removal

SUBTASK 29-11-44-020-015

- (1) Remove the three screws [24] which attach the bypass relief valve (referred to as the valve assembly [23] in this procedure) to the module assembly [5].

SUBTASK 29-11-44-020-016

- (2) Remove the valve assembly [23] from the module assembly [5].

SUBTASK 29-11-44-020-017

- (3) Install a cap on the opening in the module assembly [5] to prevent contamination.

SUBTASK 29-11-44-020-018

- (4) Remove the packing [21] and the packing [22] from the valve assembly [23].

J. Hydraulic Ground Service Disconnect Removal

SUBTASK 29-11-44-020-019

- (1) Remove the hydraulic ground service disconnect (referred to as the coupling [14] in this procedure) from the module assembly [5].

SUBTASK 29-11-44-020-020

- (2) Install a cap on the opening in the module assembly [5] to prevent contamination.

SUBTASK 29-11-44-020-021

- (3) Remove the packing [15] from the coupling [14].

————— END OF TASK —————

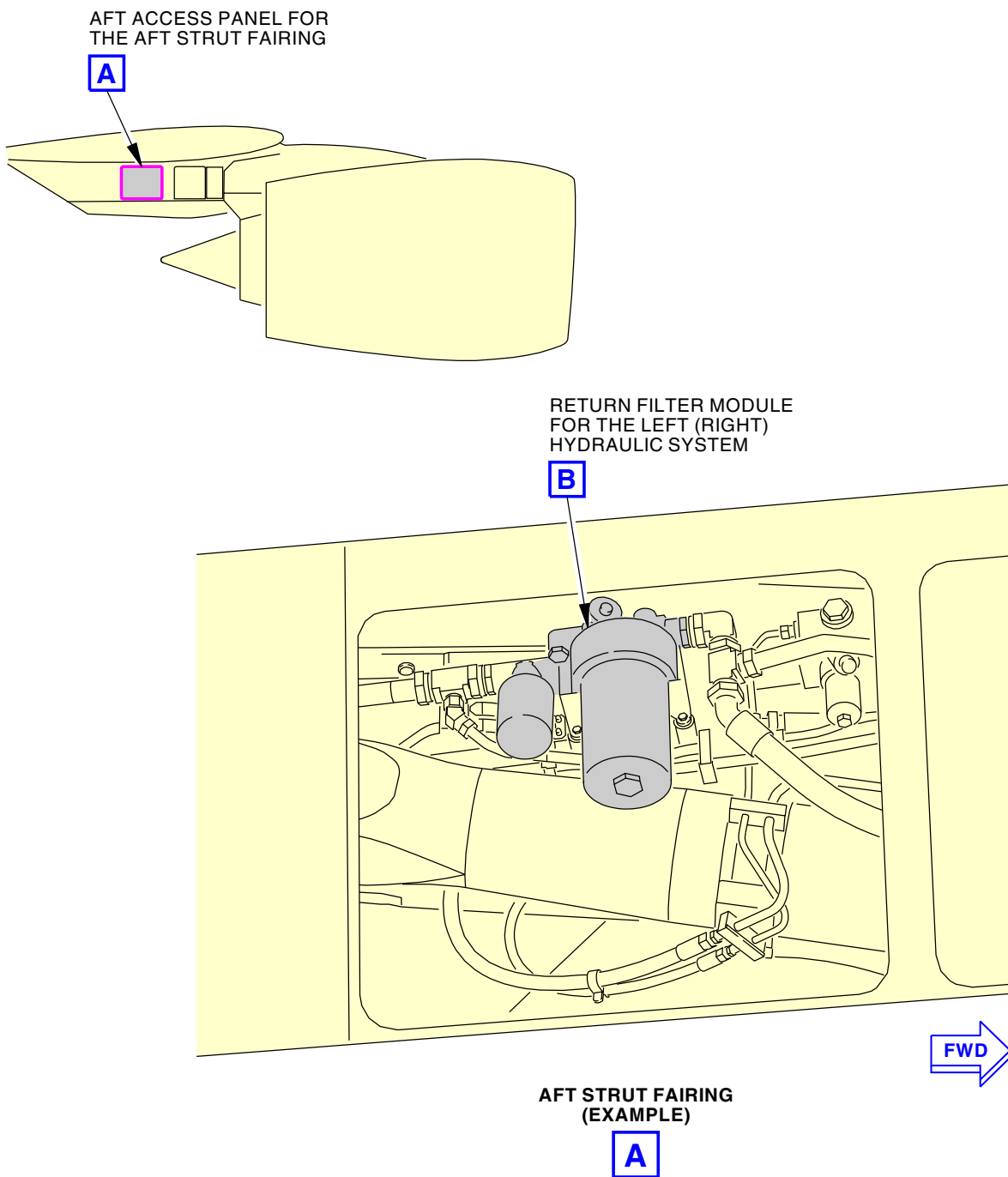
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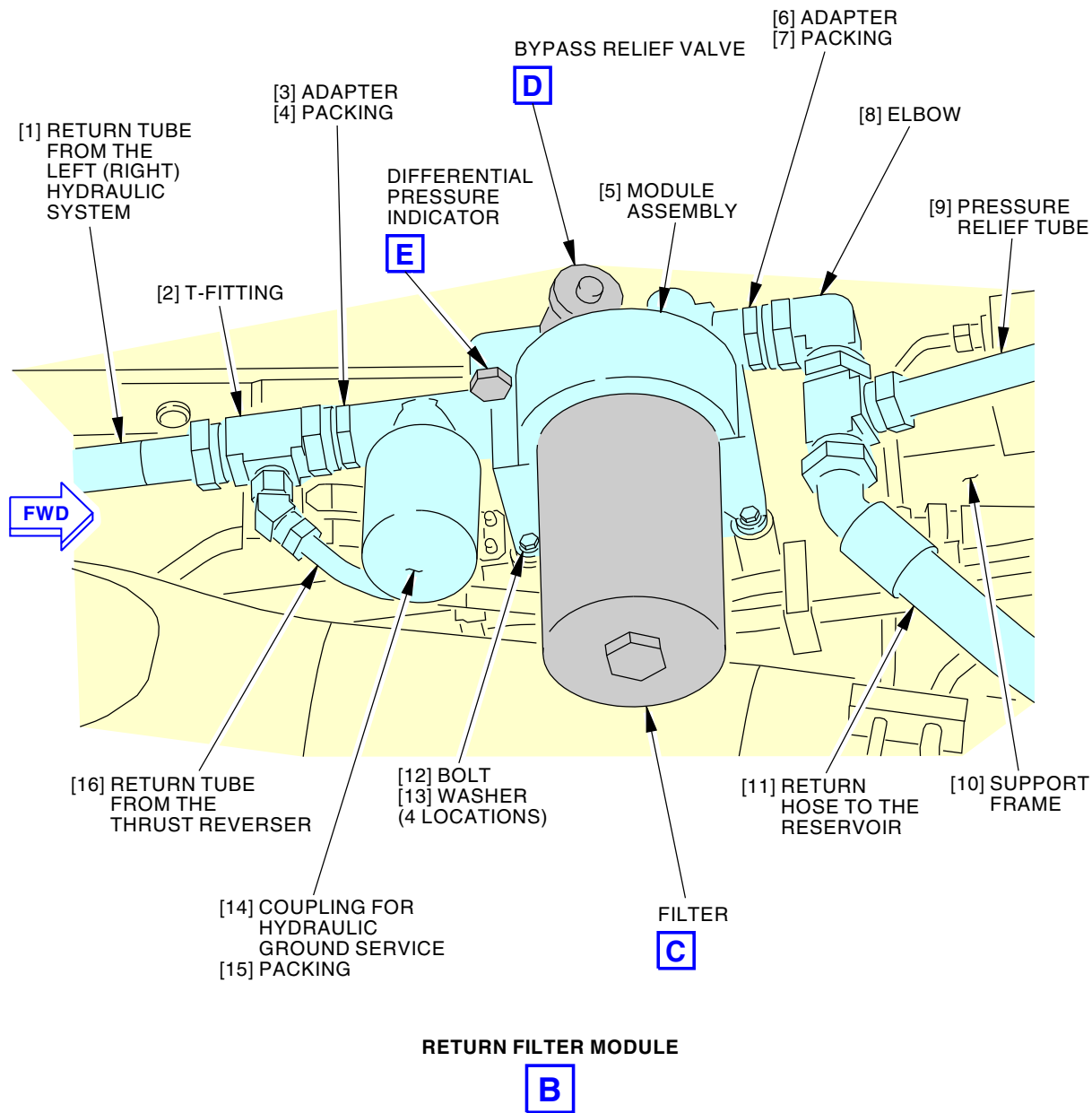
Return Filter Module Installation
Figure 401/29-11-44-990-801 (Sheet 1 of 3)

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**Return Filter Module Installation
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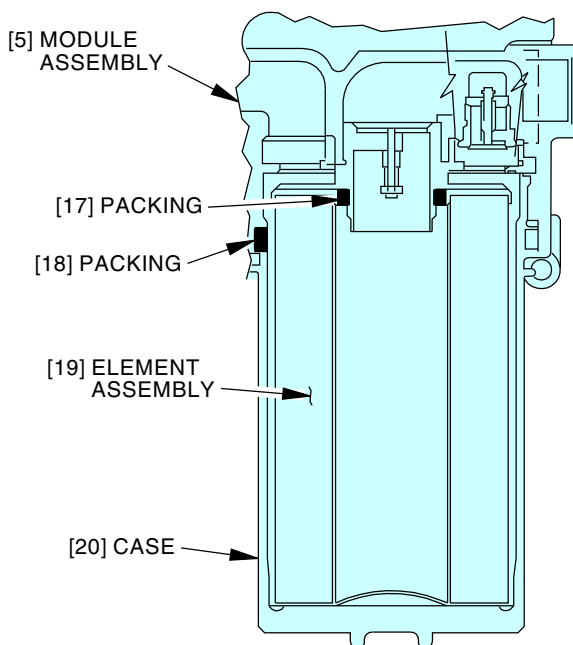
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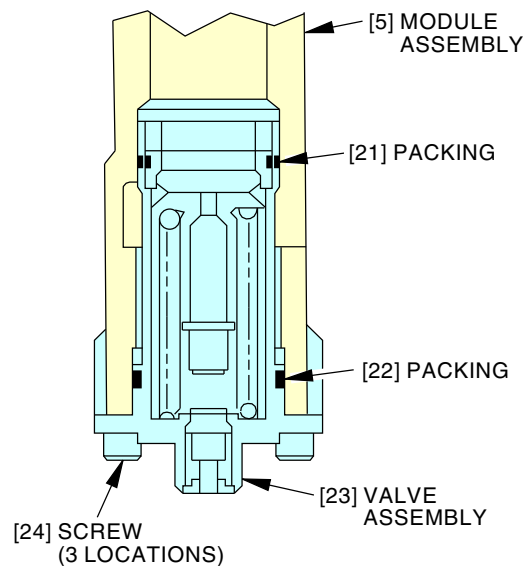
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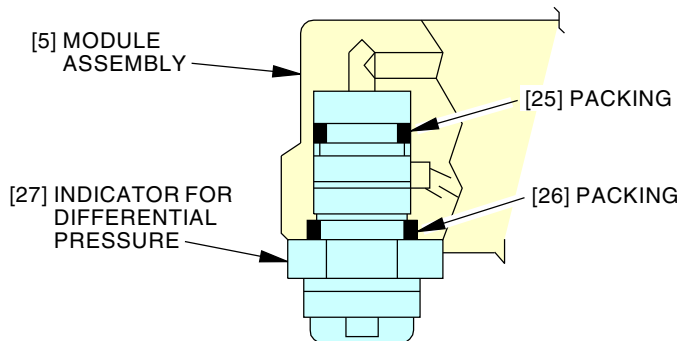
FILTER

C



BYPASS RELIEF VALVE

D



DIFFERENTIAL PRESSURE INDICATOR

E

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**Return Filter Module Installation
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TASK 29-11-44-400-801

3. Left and Right System Return Filter Module and Components Installation

(Figure 401)

A. General

- (1) This task has the instructions for the installation of these components:
 - (a) Left and right system return filter module (referred to in this procedure as the module assembly [5])
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Bypass relief valve
 - (e) Hydraulic ground service disconnect.
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Adapter	29-11-44-10-015	ARO ALL
4	Packing	29-11-44-10-020	ARO ALL
5	Module assembly	29-11-44-10-025	ARO ALL
6	Adapter	29-11-44-10-015	ARO ALL
7	Packing	29-11-44-10-020	ARO ALL
15	Packing	29-11-44-10-010	ARO ALL
17	Packing	29-11-44-10-066	ARO 001-015

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AMM Item	Description	AIPC Reference	AIPC Effectivity
18	Packing	29-11-44-10-055	ARO ALL
19	Element assembly	29-11-44-10-060	ARO ALL
20	Case	29-11-44-10-050	ARO ALL
21	Packing	29-11-44-10-195	ARO ALL
22	Packing	29-11-44-10-190	ARO ALL
23	Valve assembly	29-11-44-10-105	ARO ALL
25	Packing	29-11-44-10-040	ARO ALL
26	Packing	29-11-44-10-045	ARO ALL
27	Indicator	29-11-44-10-035	ARO ALL

E. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

F. Access Panels

Number	Name/Location
434DR	Right Aft Access Door, Left Strut Aft Fairing
444DR	Right Aft Access Door, Right Strut Aft Fairing

G. Return Filter Module Installation

SUBTASK 29-11-44-420-001

- (1) If it is necessary to install components on the replacement module assembly [5], do these steps:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [4], packing [7], and to the threads on the adapter [3] and adapter [6].
 - (b) Remove the caps from the ports on the module assembly [5].
 - (c) Install the new packing [4] and packing [7] on the adapter [3] and adapter [6].
 - (d) Install the adapter [3] and adapter [6] in the ports on the module assembly [5].
 - (e) Do this procedure: Hydraulic Ground Service Disconnect Installation.

NOTE: This procedure follows in this task.

SUBTASK 29-11-44-420-002

- (2) Remove the caps from the T-fitting [2] and the elbow [8].

SUBTASK 29-11-44-420-003

- (3) Hold the module assembly [5] on the support frame [10].

SUBTASK 29-11-44-420-004

- (4) Install the bolts [12] and the washers [13] that attach the module assembly [5] to the support frame [10].

SUBTASK 29-11-44-420-005

- (5) Connect the T-fitting [2] to the aft port on the module assembly [5].

SUBTASK 29-11-44-420-006

- (6) Connect the elbow [8] to the forward port on the module assembly [5].

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SUBTASK 29-11-44-610-001

- (7) For the reservoir in the applicable (left or right) hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

H. Filter Element Installation

SUBTASK 29-11-44-160-001

- (1) Clean the case [20].

SUBTASK 29-11-44-640-001

- (2) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [17], packing [18] and to the threads on the case [20].

SUBTASK 29-11-44-420-007

- (3) Install the new packing [18] on the case [20].

SUBTASK 29-11-44-420-008

- (4) Install the new packing [17] on the element assembly [19].

SUBTASK 29-11-44-420-009

- (5) Install the element assembly [19] and the case [20] on the module assembly [5].

SUBTASK 29-11-44-420-010

- (6) Tighten the case [20] to 420-480 pound-inches.

SUBTASK 29-11-44-420-011

- (7) Safety the case [20] with a lockwire.

I. Differential Pressure Indicator Installation

SUBTASK 29-11-44-640-002

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [25], packing [26], and to the threads on the differential pressure indicator (referred to as the indicator [27] in this procedure).

SUBTASK 29-11-44-420-012

- (2) Install the new packing [25] and packing [26] on the indicator [27].

SUBTASK 29-11-44-420-013

- (3) Remove the cap from the opening on the module assembly [5].

SUBTASK 29-11-44-420-014

- (4) Install the indicator [27] on the module assembly [5].

SUBTASK 29-11-44-420-015

- (5) Tighten the indicator [27] to 80-100 pound-inches.

SUBTASK 29-11-44-420-016

- (6) Safety the indicator [27] with a lockwire.

J. Bypass Relief Valve Installation

SUBTASK 29-11-44-640-003

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [21] and packing [22].

SUBTASK 29-11-44-420-017

- (2) Install the new packing [21] and packing [22] on the bypass relief valve (referred to as the valve assembly [23] in this procedure).

SUBTASK 29-11-44-420-018

- (3) Remove the cap from the opening in the module assembly [5].

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SUBTASK 29-11-44-420-019

- (4) Put the valve assembly [23] in the opening in the module assembly [5].

SUBTASK 29-11-44-420-020

- (5) Install the screws [24] that attach the valve assembly [23] to the module assembly [5].

SUBTASK 29-11-44-420-021

- (6) Tighten the screws [24] to 20-30 pound-inches.

K. Hydraulic Ground Service Disconnect Installation

SUBTASK 29-11-44-640-004

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [15].

SUBTASK 29-11-44-420-022

- (2) Install the new packing [15] on the hydraulic ground service disconnect (referred to as the coupling [14] in this procedure).

SUBTASK 29-11-44-420-023

- (3) Install the coupling [14] on the module assembly [5].

SUBTASK 29-11-44-420-024

- (4) Safety the coupling [14] with a lockwire.

L. Return Filter Module and Component Installation Test

SUBTASK 29-11-44-860-002

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

SUBTASK 29-11-44-860-006

- (2) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-44-860-003

- (3) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-44-790-001

- (4) Make sure there are no leaks at the ports or at the components of the module assembly [5].

SUBTASK 29-11-44-860-004

- (5) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

M. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-44-860-005

- (1) If you can see the red indicator button on the indicator [27] or on the valve assembly [23], push the red indicator button until it aligns with the adjacent surface.

SUBTASK 29-11-44-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

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SUBTASK 29-11-44-410-001

- (3) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434DR	Right Aft Access Door, Left Strut Aft Fairing

SUBTASK 29-11-44-410-002

- (4) For the right hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
444DR	Right Aft Access Door, Right Strut Aft Fairing

SUBTASK 29-11-44-440-001

- (5) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

———— **END OF TASK** ————

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CENTER SYSTEM RETURN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the center system return filter module (referred to as the module assembly [1] in this procedure) and components
- (2) An installation of the module assembly [1] and components.

TASK 29-11-45-000-801

2. Center System Return Filter Module and Components Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has the instructions for the removal of these components.
 - (a) Center system return filter module (referred to as the module assembly [1] in this procedure)
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Bypass relief valve
- (2) Before you do one of the removals, do the steps to prepare for the removal. Then do the applicable removal.

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)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

D. Prepare for the Removal

SUBTASK 29-11-45-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

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SUBTASK 29-11-45-010-001



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-45-860-001

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Return Filter Module Removal

SUBTASK 29-11-45-680-001

- (1) To drain the hydraulic fluid from the center system reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801

SUBTASK 29-11-45-020-001

- (2) Disconnect these hydraulic tubes from the return filter module (referred to as the module assembly [1] in this procedure):
 - (a) Return tube [2] to the hydraulic reservoir
 - (b) Elbow [5] on the return tube [6] from the heat exchanger
 - (c) Return tube [9] to the hydraulic ground service disconnect
 - (d) Return tube [7] from the return manifold.

SUBTASK 29-11-45-020-002

- (3) Hold the module assembly [1] and remove the bolts [10].

SUBTASK 29-11-45-020-003

- (4) Remove the module assembly [1] from the bracket [3].

SUBTASK 29-11-45-020-004

- (5) Install caps on the ports of the module assembly [1] to prevent contamination.

SUBTASK 29-11-45-020-005

- (6) Install caps on the hydraulic tubes to prevent contamination.

F. Filter Element Removal

SUBTASK 29-11-45-020-006

- (1) Remove the bowl [20] from the module assembly [1].

SUBTASK 29-11-45-020-007

- (2) Remove the filter element [19] from the module assembly [1].

SUBTASK 29-11-45-020-008

- (3) Remove the packing [21] from the bowl [20].

SUBTASK 29-11-45-020-009

- (4) Remove the packing [22] from the filter element [19].

G. Differential Pressure Indicator Removal

SUBTASK 29-11-45-020-010

- (1) Remove the differential pressure indicator (referred to as the indicator assembly [18] in this procedure) from the module assembly [1].

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SUBTASK 29-11-45-020-011

- (2) Install a cap on the opening on the module assembly [1] to prevent contamination.

SUBTASK 29-11-45-020-012

- (3) Remove the packing [16] and packing [17] from the indicator assembly [18].

H. Bypass Relief Valve Removal

SUBTASK 29-11-45-020-013

- (1) Remove the screws [13] which attach the bypass relief valve (referred to as the valve [12] in this procedure) to the module assembly [1].

SUBTASK 29-11-45-020-014

- (2) Remove the valve [12] from the module assembly [1].

SUBTASK 29-11-45-020-015

- (3) Install a cap on the opening in the module assembly [1] to prevent contamination.

SUBTASK 29-11-45-020-016

- (4) Remove the packing [14] and the packing [15] from the valve [12].

————— **END OF TASK** —————

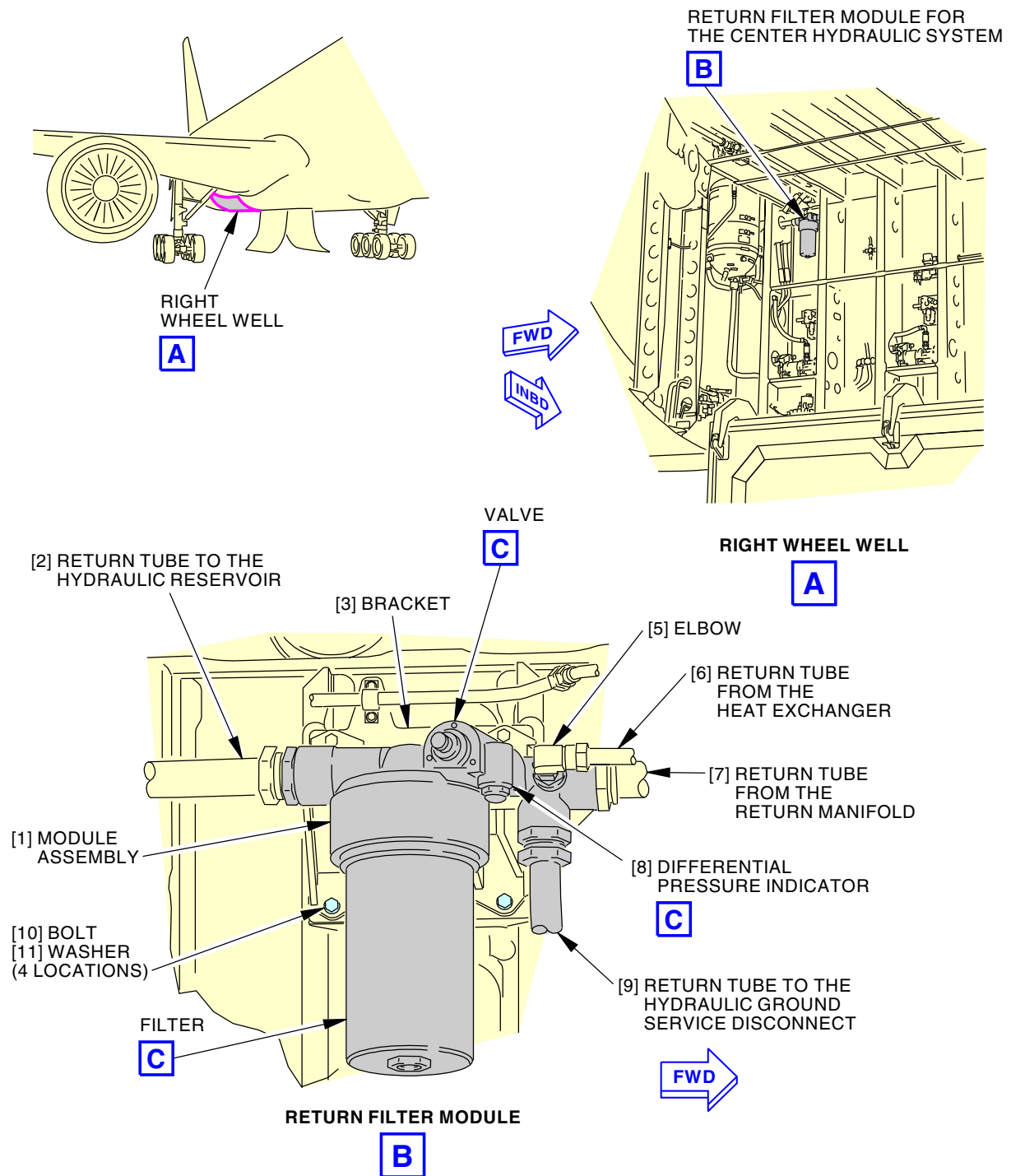
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C99067 S0006416154_V2

Return Filter Module Installation
Figure 401/29-11-45-990-801 (Sheet 1 of 2)

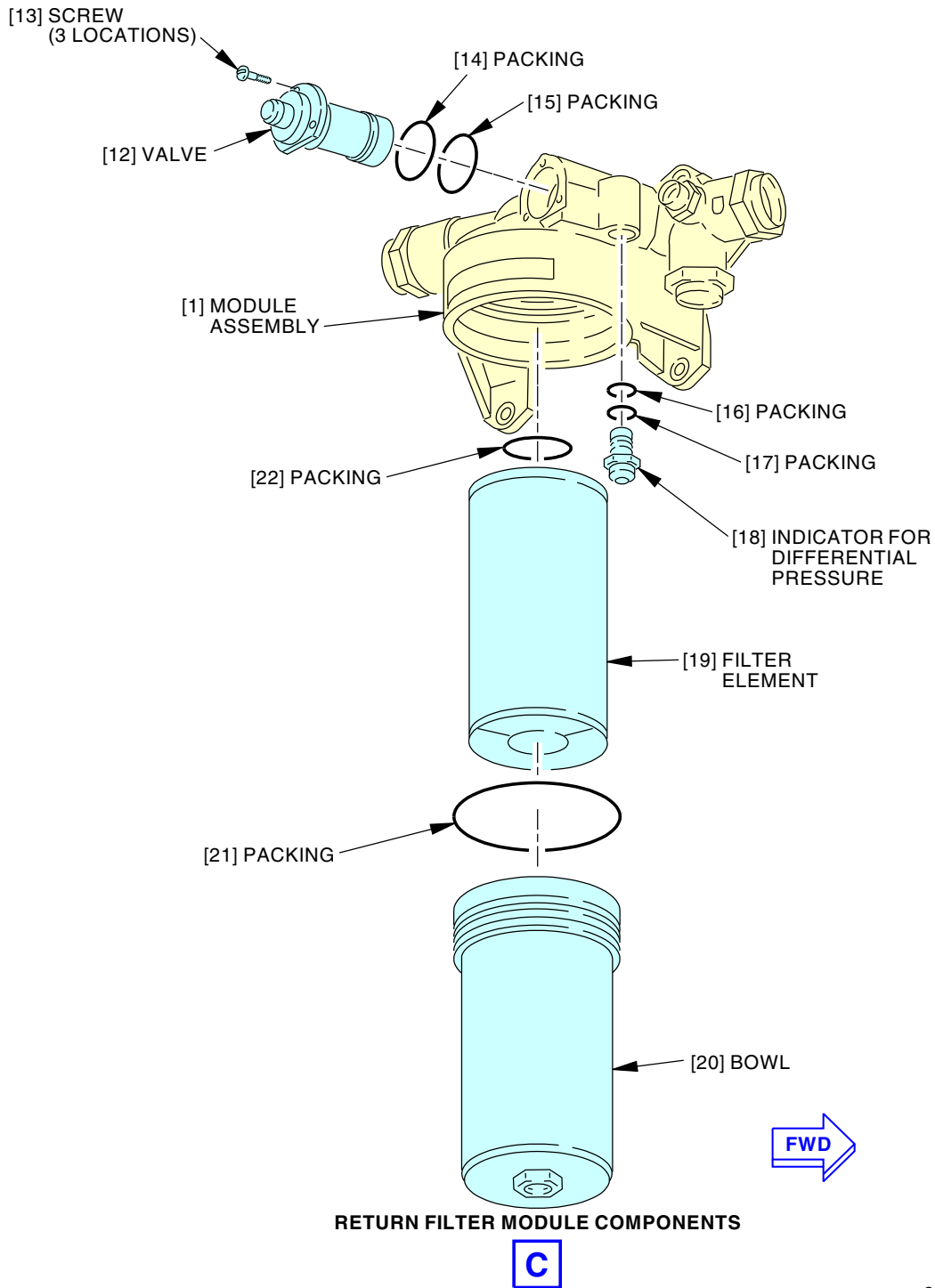
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C99321 S0006416155_V2

Return Filter Module Installation
Figure 401/29-11-45-990-801 (Sheet 2 of 2)

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TASK 29-11-45-400-801

3. Center System Return Filter Module and Components Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has the instructions for the installation of these components:
 - (a) Center system return filter module (referred to as the module assembly [1] in this procedure)
 - (b) Filter element
 - (c) Differential pressure indicator
 - (d) Bypass relief valve
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Module assembly	29-11-45-01-005	ARO ALL
12	Valve	29-11-45-01-067	ARO ALL
14	Packing	29-11-45-01-075	ARO ALL
15	Packing	29-11-45-01-070	ARO ALL
16	Packing	29-11-45-01-060	ARO ALL
17	Packing	29-11-45-01-055	ARO ALL
18	Indicator assembly	29-11-45-01-135	ARO ALL

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AMM Item	Description	AIPC Reference	AIPC Effectivity
19	Filter element	29-11-45-01-035	ARO ALL
20	Bowl	29-11-45-01-027	ARO ALL
21	Packing	29-11-45-01-030	ARO ALL
22	Packing	29-11-45-01-037	ARO ALL

E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

F. Return Filter Module Installation

SUBTASK 29-11-45-420-001

- (1) Remove the caps from the ports on the module assembly [1].

SUBTASK 29-11-45-420-002

- (2) Remove the caps from the hydraulic tubes.

SUBTASK 29-11-45-390-001

- (3) Apply a thin layer of sealant, A00247 to the shank and the threads of the bolts [10].

SUBTASK 29-11-45-420-003

- (4) Hold the module assembly [1] on the bracket [3].

SUBTASK 29-11-45-420-004

- (5) Install the bolts [10] and the washers [11] that attach the module assembly [1] to the bracket [3].

NOTE: The countersink on each washer [11] must be against the head of each bolt [10].

SUBTASK 29-11-45-420-005

- (6) Connect these hydraulic tubes to the unions in the ports of the module assembly [1]:

- (a) Return tube [2] to the hydraulic reservoir
- (b) Elbow [5] on the return tube [6] from the heat exchanger
- (c) Return tube [9] to the hydraulic ground service disconnect
- (d) Return tube [7] from the return manifold.

SUBTASK 29-11-45-610-001

- (7) For the center hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

G. Filter Element Installation

SUBTASK 29-11-45-160-001

- (1) Clean the bowl [20].

SUBTASK 29-11-45-640-001

- (2) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [21] and packing [22] and to the threads on the bowl [20].

SUBTASK 29-11-45-420-006

- (3) Install the new packing [21] on the bowl [20].

SUBTASK 29-11-45-420-007

- (4) Install the new packing [22] on the filter element [19].

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SUBTASK 29-11-45-420-008

- (5) Install the filter element [19] and the bowl [20] on the module assembly [1].

SUBTASK 29-11-45-420-009

- (6) Tighten the bowl [20] to 420-480 pound-inches.

SUBTASK 29-11-45-420-010

- (7) Safety the bowl [20] with a lockwire.

H. Differential Pressure Indicator Installation

SUBTASK 29-11-45-640-002

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [16] and packing [17] and to the threads on the differential pressure indicator (referred to as the indicator assembly [18] in this procedure).

SUBTASK 29-11-45-420-011

- (2) Install the new packing [16] and packing [17] on the indicator assembly [18].

SUBTASK 29-11-45-420-012

- (3) Remove the cap from the opening on the module assembly [1].

SUBTASK 29-11-45-420-013

- (4) Install the indicator assembly [18] on the module assembly [1].

SUBTASK 29-11-45-420-014

- (5) Tighten the indicator assembly [18] to 180-240 pound-inches.

SUBTASK 29-11-45-420-015

- (6) Safety the indicator assembly [18] with a lockwire.

I. Bypass Relief Valve Installation

SUBTASK 29-11-45-640-003

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [14] and packing [15].

SUBTASK 29-11-45-420-016

- (2) Install the new packing [14] and packing [15] on the bypass relief valve (referred to as the valve [12] in this procedure).

SUBTASK 29-11-45-420-017

- (3) Remove the cap from the opening in the module assembly [1].

SUBTASK 29-11-45-420-018

- (4) Put the valve [12] in the opening in the module assembly [1].

SUBTASK 29-11-45-420-019

- (5) Install the screws [13] that attach the valve [12] to the module assembly [1].

SUBTASK 29-11-45-420-020

- (6) Tighten the screws [13] to 60-70 pound-inches.

J. Return Filter Module and Components Installation Test

SUBTASK 29-11-45-860-002

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

SUBTASK 29-11-45-860-003

- (2) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

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SUBTASK 29-11-45-790-001

- (3) Make sure there are no leaks at the ports or at the components of the module assembly [1].

SUBTASK 29-11-45-860-004

- (4) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-45-860-005

- (1) If you can see the red indicator button on the indicator assembly [18] or on the valve [12], do this step:
 - (a) Push the red indicator button until it aligns with the adjacent surface.

SUBTASK 29-11-45-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (2) Do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-45-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

———— **END OF TASK** ————

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HYDRAULIC INTERFACE MODULE - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Software Configuration Check - Hydraulic Interface Module Card
- (2) Software Installation - Hydraulic Interface Module Card

TASK 29-11-50-700-801

2. Hydraulic Interface Module Software Configuration Check

A. General

- (1) The configuration check makes sure that the Hydraulic Interface Module (HYDIM) has the correct software installed.
- (2) The configuration check will show a failure if the operational program software (OPS) is not installed.
- (3) A maintenance access terminal (MAT) is necessary for this procedure. For instructions on how to use the MAT, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

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

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Configuration Check

SUBTASK 29-11-50-860-014

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

SUBTASK 29-11-50-750-001

- (2) Use a maintenance access terminal (MAT) to do a software configuration check on the HYDIM:

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

- (a) Make these selections on the MAT:

- 1) ONBOARD MAINTENANCE
- 2) LINE MAINTENANCE
- 3) SYSTEM CONFIGURATION
- 4) 29 Hydraulic System
- 5) CONTINUE

- (b) Find HYDIM on the display and make sure that the software part number is correct.

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

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

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- (d) If the part numbers are incorrect, do this task: Hydraulic Interface Module Software Installation, TASK 29-11-50-400-802

————— **END OF TASK** —————

TASK 29-11-50-400-802

3. Hydraulic Interface Module Software Installation

A. General

- (1) This procedure tells you how to install software in the Hydraulic Interface Module (HYDIM). The HYDIM must contain this piece of software:
 - (a) Operational Program Software (OPS).
- (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 HYDIM 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: Hydraulic Interface Module Software Configuration Check, TASK 29-11-50-700-801.
- (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 HYDIM, the load process first erases the old software and then installs the new software. If you install software directly to the HYDIM 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 HYDIM.

- (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)
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 29-11-50-860-013

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

SUBTASK 29-11-50-420-001

(2) Use a MAT to install software in the HYDIM:

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

- (a) If the software is on a disk, put the correct disk in the disk drive.
- (b) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) EXTENDED MAINTENANCE
 - 3) DATA LOAD
- (c) Make these selections to select the component that will receive the software:
 - 1) SELECT DESTINATION
 - 2) 29 Hydraulic System
 - 3) Hydraulic Interface Module (HYDIM) (L, CL, CR, or R)
 - 4) CONTINUE

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- (d) Make these selections to select the source of the software:
 - 1) SELECT SOURCE
 - 2) Select the source of the software (if Disk Drive is the only selection, it is automatically selected).
 - 3) Select the correct software part number from the display.
 - 4) CONTINUE
- (e) Select START to start the software installation.
- (f) When the software installation is completed, make sure the correct software part number shows on the display.
- (g) Select CONTINUE to remove the configuration display.

———— **END OF TASK** ————

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HYDRAULIC INTERFACE MODULE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) Hydraulic Interface Module (HYDIM) Cards Removal
 - (2) Hydraulic Interface Module (HYDIM) Cards Installation.
- B. The hydraulic interface module (HYDIM) has four circuit cards. There is one card in the left and right hydraulic systems and two cards in the center hydraulic system. The HYDIM L card for the left system and the HYDIM CL card for the center system are in the left systems card file, P85. The HYDIM CR card for the center system and the HYDIM R card for the right system are in the right systems card file, P84.
- C. The systems card files are on the outboard sides of the nose gear wheel well forward of the main equipment center.
- D. All of the HYDIM cards contain the same data and are interchangeable. A program pin in the card file makes each HYDIM card operate differently for each location. Because the HYDIM cards are interchangeable, it is possible a HYDIM card (with a failure in only one part of the card) will operate satisfactorily in a different location. But, when you move a card to a different location, it is possible it will not operate satisfactorily there, if it was moved for a failure before.

TASK 29-11-50-000-801

2. Hydraulic Interface Module (HYDIM) Cards Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
20-10-01-000-802	Printed Circuit Card Removal (P/B 401)
20-41-01-000-801	ESDS Handling for Printed Circuit Board Removal (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 the Removal**

SUBTASK 29-11-50-010-001

- (1) Open this access panel:

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

to get access to the systems cardfiles.

SUBTASK 29-11-50-860-001

- (2) Set the power switch for the applicable printed circuit assembly [1] to the OFF position.

NOTE: Use the power control decal on the front of the card file to find the appropriate switch.

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SUBTASK 29-11-50-860-002

- (3) For the HYDIM L card, 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>
L	20	C29601	L D-PRESS VLV SPLY

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C29603	LEFT EDP SUPPLY SHUTOFF VALVE
G	9	C32616	LDG GEAR RETR AUTO OFF

SUBTASK 29-11-50-860-003

- (4) For the HYDIM CL card, 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>
M	28	C29607	C1 HYD PUMP CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C29606	HYD AIR PUMP 2
K	7	C29618	RAT AUTO/MAN CTRL
L	10	C29610	NOSE GEAR ISLN VALVE

SUBTASK 29-11-50-860-004

- (5) For the HYDIM CR card, do these steps:
- (a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C29609	C HYD AIR PUMP 1

SUBTASK 29-11-50-860-005

- (6) For the HYDIM R card, do these steps:
- (a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	20	C29602	RIGHT EDP SUPPLY SHUTOFF VALVE
G	9	C32616	LDG GEAR RETR AUTO OFF

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Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	3	C29600	R D-PRESS VLV SPLY

E. Hydraulic Interface Module (HYDIM) Cards Removal

SUBTASK 29-11-50-910-001

 CAUTION	DO NOT TOUCH THE HYDIM CARD BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE HYDIM CARD.

- (1) Before you touch the printed circuit assembly [1], do this task: ESDS Handling for Printed Circuit Board Removal, TASK 20-41-01-000-801.

SUBTASK 29-11-50-010-002

- (2) Loosen the 4 quarter turn screws to open the front panel for the applicable systems cardfile.

SUBTASK 29-11-50-020-001

- (3) For the removal of the printed circuit assembly [1], do this task: Printed Circuit Card Removal, TASK 20-10-01-000-802.

————— **END OF TASK** —————

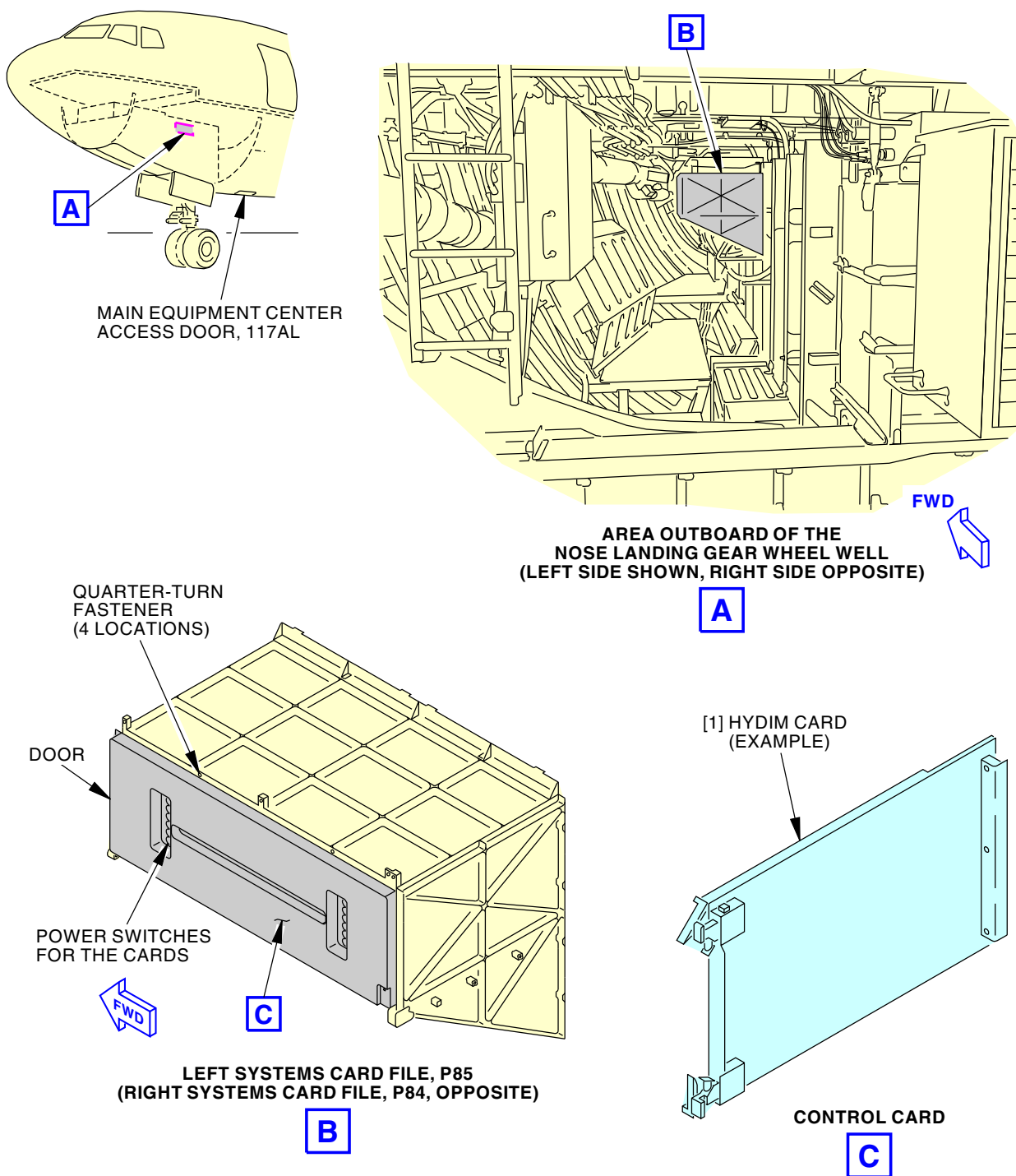
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Hydraulic Interface Module (HYDIM) Cards Installation
Figure 401/29-11-50-990-801

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TASK 29-11-50-400-801

3. Hydraulic Interface Module (HYDIM) Cards Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The circuit card has a locking mechanism on the end opposite the electrical connectors to prevent incorrect installation. The card file door has a marker that shows the correct orientation of the card installation.
- (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
20-10-01-400-802	Printed Circuit Card Installation (P/B 401)
20-41-01-400-801	ESDS Handling for Printed Circuit Board Installation (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-50-400-802	Hydraulic Interface Module Software Installation (P/B 201)
29-11-50-700-801	Hydraulic Interface Module Software Configuration Check (P/B 201)
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	Printed circuit assembly	29-11-50-01-005	ARO ALL
		29-11-50-02-005	ARO ALL

D. Location Zones

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

E. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

F. Hydraulic Interface Module (HYDIM) Cards Installation

SUBTASK 29-11-50-910-002



DO NOT TOUCH THE HYDIM CARD BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE HYDIM CARD.

- (1) Before you touch the printed circuit assembly [1], do this task: ESDS Handling for Printed Circuit Board Installation, TASK 20-41-01-400-801.

SUBTASK 29-11-50-400-001

- (2) To install the printed circuit assembly [1], do this task: Printed Circuit Card Installation, TASK 20-10-01-400-802.

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SUBTASK 29-11-50-410-002

- (3) Close the front panel for the applicable systems cardfile, and tighten the 4 quarter turn screws.

G. Hydraulic Interface Module (HYDIM) Cards Installation Test

SUBTASK 29-11-50-860-006

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

SUBTASK 29-11-50-860-012

- (2) Set the power switch for the applicable printed circuit assembly [1] to the ON position.

NOTE: Use the power control decal on the front of the card file to find the appropriate switch.

SUBTASK 29-11-50-860-007

- (3) For the HYDIM L card, 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>
L	20	C29601	L D-PRESS VLV SPLY

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C29603	LEFT EDP SUPPLY SHUTOFF VALVE
G	9	C32616	LDG GEAR RETR AUTO OFF

SUBTASK 29-11-50-860-008

- (4) For the HYDIM CL card, 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>
M	28	C29607	C1 HYD PUMP CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C29606	HYD AIR PUMP 2
K	7	C29618	RAT AUTO/MAN CTRL
L	10	C29610	NOSE GEAR ISLN VALVE

SUBTASK 29-11-50-860-009

- (5) For the HYDIM CR card, do these steps:
- (a) 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>
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	C29609	C HYD AIR PUMP 1

SUBTASK 29-11-50-860-010

- (6) For the HYDIM R card, do these steps:

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- (a) 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>
B	20	C29602	RIGHT EDP SUPPLY SHUTOFF VALVE
G	9	C32616	LDG GEAR RETR AUTO OFF

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	3	C29600	R D-PRESS VLV SPLY

SUBTASK 29-11-50-860-015

- (7) Do this task: Hydraulic Interface Module Software Configuration Check, TASK 29-11-50-700-801.

SUBTASK 29-11-50-470-001

- (8) Do this task: Hydraulic Interface Module Software Installation, TASK 29-11-50-400-802.

SUBTASK 29-11-50-740-001

- (9) Use a maintenance access terminal (MAT) to do an LRU replacement test of the applicable printed circuit assembly [1].
- (a) Make these selections on the MAT:
- 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) LRU REPLACEMENT TEST
 - 6) Make a selection on the MAT of one of the applicable LRU replacement tests which follow:
 - a) HYDIM (R, CR, CL, L)
 - 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, refer to the applicable Maintenance Message Index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-50-410-001

- (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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Bulkhead Fittings - Removal/ Installation

1. General

A. This procedure has these tasks:

- (1) A removal of a bulkhead fitting.
- (2) An installation of a bulkhead fitting.

TASK 29-11-55-000-801

2. Bulkhead Fitting - Removal

Figure 401

A. References

Reference	Title
27-51-00-860-804	Extend the Trailing Edge Flaps (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (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-12613	Tube Cutter Assy - small (0.500 IN. - 0.750 IN.) Part #: D12531-001 Supplier: 14798
SPL-12614	Tube Cutter Assy - small (0.250 IN. - 0.375 IN.) Part #: D12530-001 Supplier: 14798
SPL-12615	Tube Cutter Assy - Large (1.000 IN. - 1.500 IN.) Part #: D12532-001 Supplier: 14798
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

C. Location Zones

Zone	Area
530	Subzone 530 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
540	Subzone 540 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
550	Subzone 550 - Wing Trailing Edge - Aft of Rear Spar
560	Subzone 560 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon
630	Subzone 630 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
640	Subzone 640 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
650	Subzone 650 - Wing Trailing Edge - Aft of Rear Spar
660	Subzone 660 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon

D. Access Panels

Number	Name/Location
531AB	Access Door
533BB	Access Door
533EB	Access Door
533FB	Access Door
541AB	Access Door
541CB	Access Door

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Number	Name/Location

541HB	Access Door
541MB	Access Door
541PB	Access Door
544AB	Access Door
544CB	Access Door
544EB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
631AB	Access Door
633BB	Access Door
633CB	Access Door
633EB	Access Door
641AB	Access Door
641CB	Access Door
641HB	Access Door
641MB	Access Door
641PB	Access Door
644AB	Access Door
644CB	Access Door
644EB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

E. Prepare for Removal

SUBTASK 29-11-55-010-001

- (1) Do this task to get access to the applicable bulkhead fitting [1] on the aft spar:Extend the Trailing Edge Flaps, TASK 27-51-00-860-804

SUBTASK 29-11-55-040-001

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	17	C27631	FLAPS ELEC CTRL RLY PWR

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C27301	FLAPS ELEC MOT PWR

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C27632	FLAPS PRI DR CTRL 2

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
G	11	C27604	FLAPS PRI DR CTRL 1

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SUBTASK 29-11-55-010-002

- (3) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
531AB	Access Door
533BB	Access Door
533EB	Access Door
533FB	Access Door
541AB	Access Door
541CB	Access Door
541HB	Access Door
541MB	Access Door
541PB	Access Door
544AB	Access Door
544CB	Access Door
544EB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
631AB	Access Door
633BB	Access Door
633CB	Access Door
633EB	Access Door
641AB	Access Door
641CB	Access Door
641HB	Access Door
641MB	Access Door
641PB	Access Door
644AB	Access Door
644CB	Access Door
644EB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

SUBTASK 29-11-55-010-003

- (4) Do this task to enter the fuel tank: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

F. Removal

SUBTASK 29-11-55-020-001

- (1) Disconnect the hydraulic line attached to the bulkhead fitting [1] on the outside of the fuel tank.
- (a) Drain the hydraulic fluid into a suitable container.
- 1) An example of a suitable container is a 1 U.S.-gal (3.81 l) oil resistant container, STD-203.
- (b) Install a cap in the hydraulic line and bulkhead fitting [1] to prevent contamination.

SUBTASK 29-11-55-010-004

- (2) Do this task to enter the fuel tank: Purging and Fuel Tank Entry, TASK 28-11-00-010-801

SUBTASK 29-11-55-020-002

- (3) If necessary, remove any support clamps or blocks from the tube you will be removing.

SUBTASK 29-11-55-020-003

- (4) Cut the tube attached to the bulkhead fitting [1] using a tube cutter (small tube cutter, SPL-12614, small tube cutter, SPL-12613, or large tube cutter, SPL-12615).

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- (a) Make sure that the cut is in a straight section of tubing.

NOTE: This will make sure the fitting and swage tool will fit for installation.

SUBTASK 29-11-55-020-004

- (5) Use a suitable container to catch any hydraulic fluid that drains from the cut line.
 - (a) An example of a suitable container is a 1 U.S.-gal (3.81 l) oil resistant container, STD-203.

SUBTASK 29-11-55-020-005

- (6) Install a cap on the cut hydraulic line.

SUBTASK 29-11-55-020-006

- (7) Do these steps to remove the bulkhead fitting [1]:
 - (a) Remove the sealant from around the bulkhead fitting [1] and bolts [4].
 - (b) Remove the bolts [4], washers [5], washers [6], and nuts [7].
 - (c) Remove the bulkhead fitting [1] from the spar [2].
 - (d) Remove and discard the o-ring [3].

————— **END OF TASK** —————

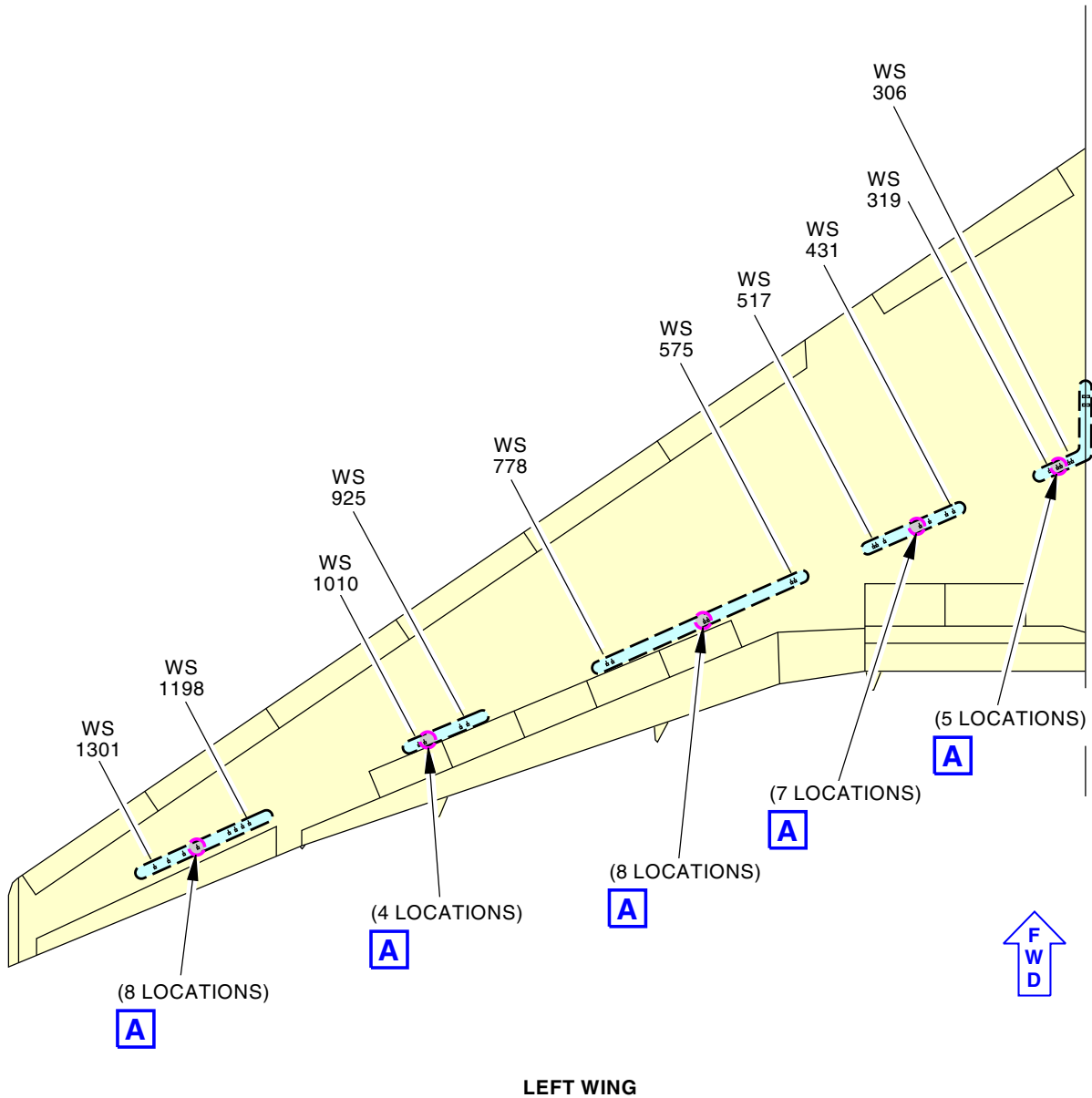
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Bulkhead Fittings Installation
Figure 401/29-11-55-990-801 (Sheet 1 of 3)

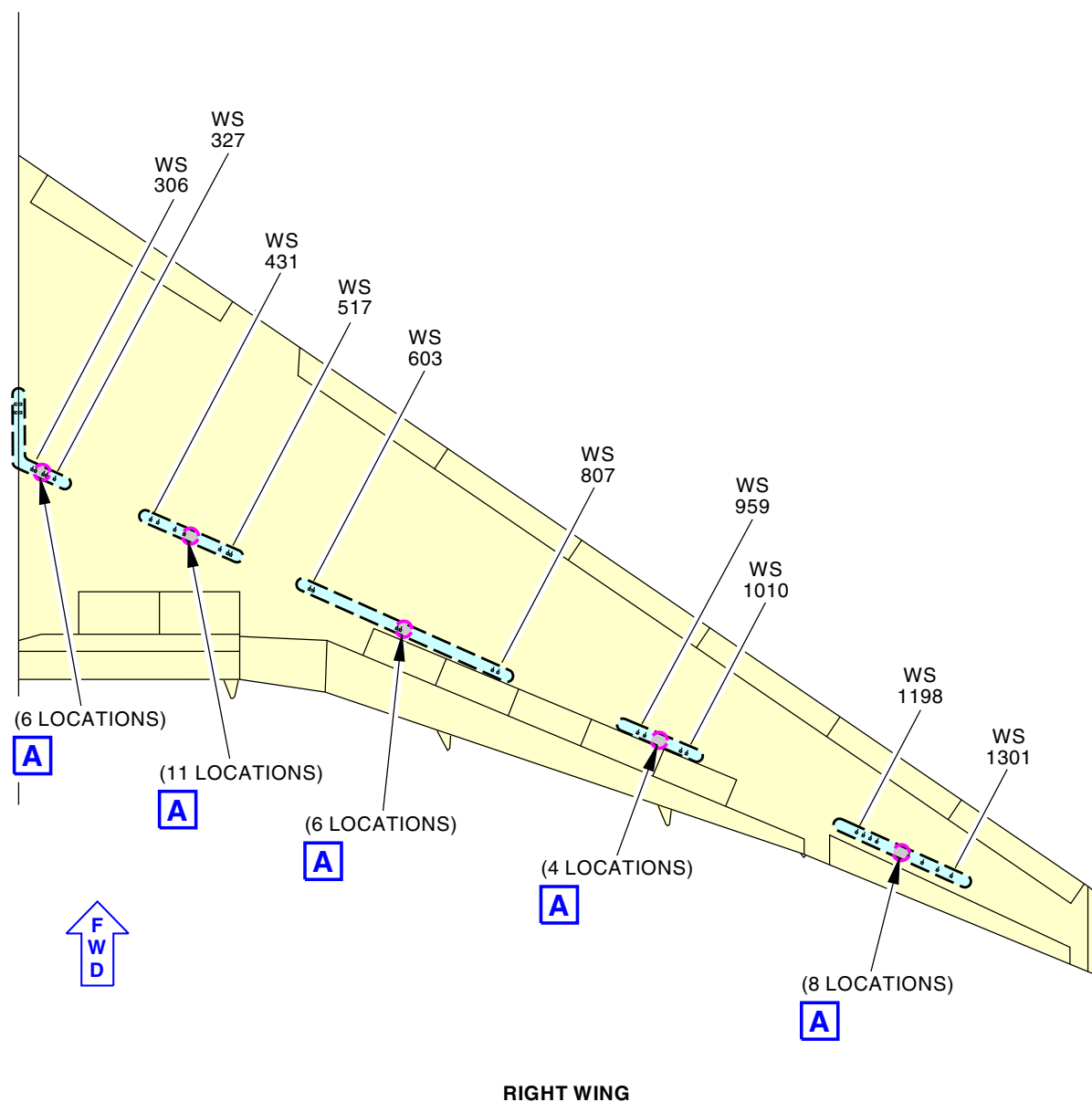
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Bulkhead Fittings Installation
Figure 401/29-11-55-990-801 (Sheet 2 of 3)

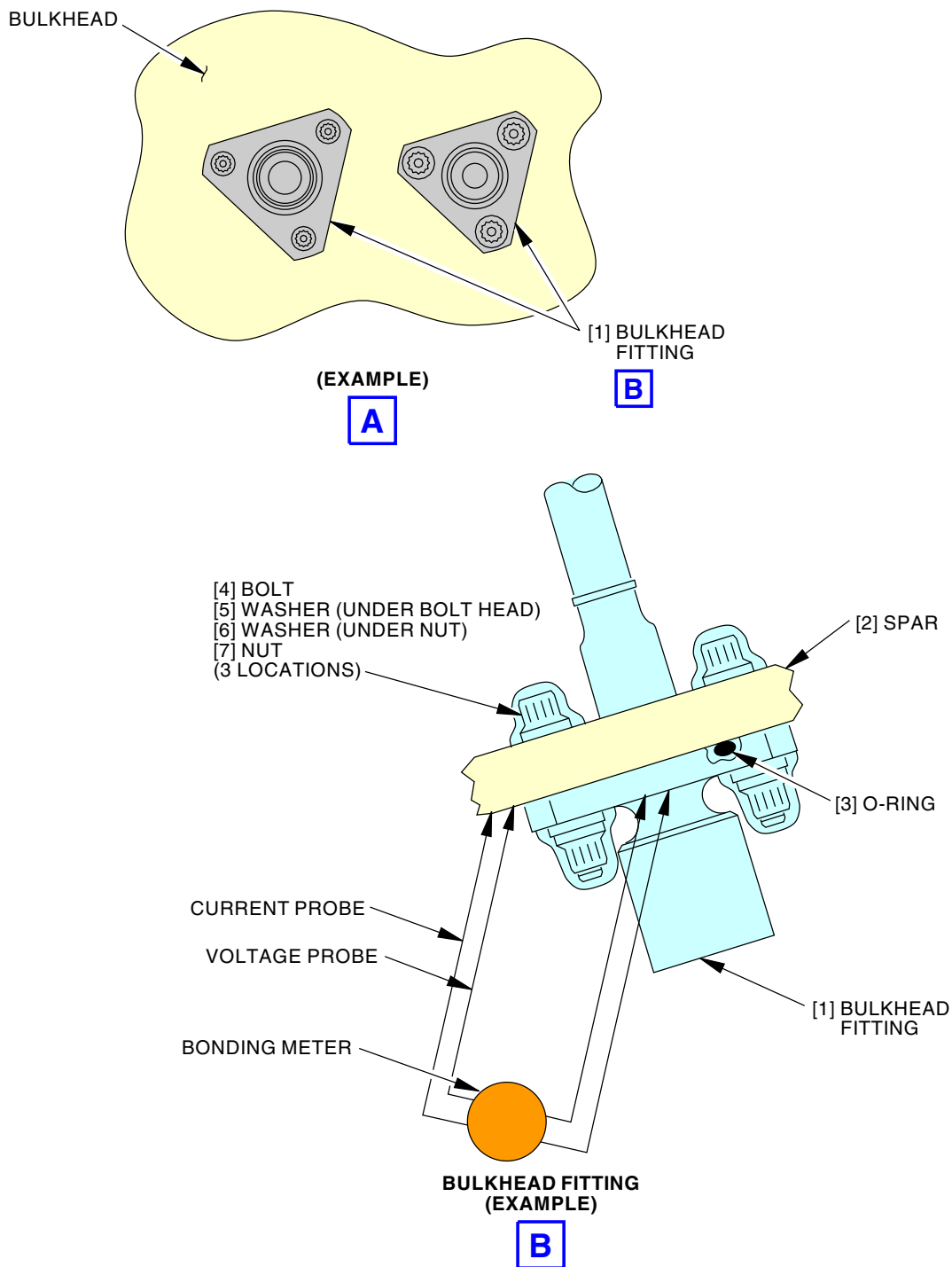
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**Bulkhead Fittings Installation
Figure 401/29-11-55-990-801 (Sheet 3 of 3)**

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TASK 29-11-55-400-801

3. Bulkhead Fitting - Installation

(Figure 401)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

B. References

Reference	Title
20-10-09-300-805	Titanium Hydraulic Tubing, 3000 psi - Roll swaging Harrison 53211 Sleeves and 53212 Unions using the Harrison 6777 Swage Machine. (P/B 801)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
29-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Consumable Materials

Reference	Description	Specification
A00436	Sealant - Fuel Tank	BMS5-45 (Supersedes BMS5-26)
A50155	Sealant - Fuel Tank	BMS5-45 Class C
B00065	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002 (Supersedes O-A-396)

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Reference	Description	Specification
C00862	Coating - Chemical Conversion - Bonderite M-CR 600 Aero (Formerly Alodine 600)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50481	Pad - Scotch Brite Type No. 7496, Fine To Medium (Light Green)	MIL-A-9962 Type II Grade B OR C

E. Location Zones

Zone	Area
530	Subzone 530 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
540	Subzone 540 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
550	Subzone 550 - Wing Trailing Edge - Aft of Rear Spar
560	Subzone 560 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon
630	Subzone 630 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
640	Subzone 640 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
650	Subzone 650 - Wing Trailing Edge - Aft of Rear Spar
660	Subzone 660 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon

F. Access Panels

Number	Name/Location
531AB	Access Door
533BB	Access Door
533EB	Access Door
533FB	Access Door
541AB	Access Door
541CB	Access Door
541HB	Access Door
541MB	Access Door
541PB	Access Door
544AB	Access Door
544CB	Access Door
544EB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
631AB	Access Door
633BB	Access Door
633CB	Access Door
633EB	Access Door
641AB	Access Door
641CB	Access Door
641HB	Access Door
641MB	Access Door
641PB	Access Door
644AB	Access Door
644CB	Access Door
644EB	Access Door

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Number	Name/Location

651DB	Inboard Fixed Trailing Edge Panel

652GB	Inboard Fixed Trailing Edge Panel

G. Prepare for Installation

SUBTASK 29-11-55-120-001

(1) Clean around the hole for the bulkhead fitting [1] with Scotch-Brite 7496 pad, G50481, abrasive pads.

(a) Remove all surface finishes, leaving a bright, aluminum bonding surface.

SUBTASK 29-11-55-120-002

(2) Clean the faying surface of the bulkhead fitting [1] with Scotch-Brite 7496 pad, G50481, abrasive pads.

SUBTASK 29-11-55-160-001

(3) Clean the area around the hole and the bulkhead fitting [1] with a cotton wiper, G00034, and alcohol, B00065.

H. Installation

SUBTASK 29-11-55-110-001

(1) Apply Bonderite M-CR 600 Aero coating, C00862, to all bare aluminum.

NOTE: The bulkhead fitting is titanium. Do not apply alodine to the bulkhead fitting.

SUBTASK 29-11-55-400-001

(2) Do these steps to install the bulkhead fitting [1].

(a) Install a new o-ring [3] on the bulkhead fitting [1].

(b) Apply a layer of sealant, A50155, to the mating surface of the bulkhead fitting [1].

(c) Install the bulkhead fitting [1] in the spar [2].

(d) Coat both sides of the washers [5] with sealant, A50155.

(e) Install the washers [5] onto the bolts [4].

(f) Apply a coating of sealant, A50155, to the shank and threads of the bolts [4].

(g) Install the bolts [4].

(h) Coat both sides of the washers [6] with sealant, A50155.

(i) Torque the bolts [4] to 100 ±3 in-lb (11 ±1 N·m).

(j) Apply a full-bodied (cap) fillet seal at the bulkhead fitting [1] to the tank wall interface inside and outside the fuel tank (TASK 51-31-01-390-804).

1) Use sealant, A00436, to apply the full-bodied (cap) fillet seal.

28-AWL-06: CDCCL

(k) Apply a fillet seal at the bulkhead fitting [1] to the tank wall interface outside the fuel tank.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on the Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

1) Use sealant, A00436, to apply the full-bodied (cap) fillet seal.

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SUBTASK 29-11-55-760-001



MAKE SURE THAT THE BONDING RESISTANCE IS LESS THAN THE LIMITS. THE RESISTANCE OF THE ELECTRICAL BOND IS VERY IMPORTANT IF LIGHTNING HITS THE AIRPLANE. AN EXPLOSION CAN OCCUR IF THE BONDING RESISTANCE IS NOT IN THE LIMITS DURING A LIGHTNING STRIKE.

28-AWL-06: CDCCL

- (3) For the bulkhead fitting [1], measure the electrical bonding resistance between the bulkhead fitting and the bulkhead (rear spar) (SWPM 20-20-00).

NOTE: CDCCL - Refer to this task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-06: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to this task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

SUBTASK 29-11-55-760-003

28-AWL-06: CDCCL

- (4) For the bulkhead fitting [1], measure the electrical bonding resistance between the hydraulic tube in the fuel tank and the bulkhead fitting in the fuel tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to this task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-06: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to this task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

SUBTASK 29-11-55-400-002

- (5) Do this task to reconnect the tube that was cut in the fuel tank: Titanium Hydraulic Tubing, 3000 psi - Roll swaging Harrison 53211 Sleeves and 53212 Unions using the Harrison 6777 Swage Machine., TASK 20-10-09-300-805.

SUBTASK 29-11-55-410-001

- (6) Install any clamps or blocks that were removed for access in the fuel tank.

SUBTASK 29-11-55-370-001

- (7) Reapply any finish removed during the process of reworking the faying surface.

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SUBTASK 29-11-55-410-002

- (8) Install any hydraulic lines that were removed for access.

I. Leak Check

SUBTASK 29-11-55-410-003

- (1) Do this task to close any access panels that were opened: Main Tank Access Door Installation, TASK 28-11-01-400-801.

NOTE: The fuel tank must be closed before power can be applied to the airplane.

SUBTASK 29-11-55-780-001



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

- (2) Do this task to pressurize the applicable hydraulic system: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-55-720-001

- (3) Operate the controls that are powered by the system containing the hydraulic line that has been repaired.

NOTE: Operating the controls helps to remove any air in the hydraulic system.

SUBTASK 29-11-55-860-001

- (4) Remove pressure from the applicable hydraulic system and reservoir (TASK 29-11-00-860-807

SUBTASK 29-11-55-010-005

- (5) Do this task to get access to the hydraulic line attached to the applicable bulkhead fitting [1]: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-55-940-001

- (6) Do this task to enter the fuel tank: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 29-11-55-790-001

- (7) Do a check of the union that was installed on the cut hydraulic line for leaks.

SUBTASK 29-11-55-790-002

- (8) Do a check of the applicable hydraulic lines that were previously removed for leaks.

SUBTASK 29-11-55-790-003

- (9) Repair all leaks.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-55-410-004

- (1) Do this step to close any panels that are still open:
 - (a) Make sure that these access panels are closed:

<u>Number</u>	<u>Name/Location</u>
531AB	Access Door
533BB	Access Door
533EB	Access Door
533FB	Access Door
541AB	Access Door

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<u>Number</u>	<u>Name/Location</u>
541CB	Access Door
541HB	Access Door
541MB	Access Door
541PB	Access Door
544AB	Access Door
544CB	Access Door
544EB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
631AB	Access Door
633BB	Access Door
633CB	Access Door
633EB	Access Door
641AB	Access Door
641CB	Access Door
641HB	Access Door
641MB	Access Door
641PB	Access Door
644AB	Access Door
644CB	Access Door
644EB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

———— **END OF TASK** ————

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Bulkhead Fittings - Inspection/ Check

1. General

A. This procedure has this task:

- (1) A bonding resistance check of the bulkhead fittings that penetrate the fuel tanks.

TASK 29-11-55-200-801

2. Bulkhead Fitting Bonding Resistance Check

Figure 601

A. **General**

- (1) This task does a bonding resistance check of the hydraulic line penetrations of the fuel tanks.

B. **References**

Reference	Title
27-51-00-860-804	Extend the Trailing Edge Flaps (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
29-11-55 P/B 401	Bulkhead Fittings - 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
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

D. **Location Zones**

Zone	Area
530	Subzone 530 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
540	Subzone 540 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
550	Subzone 550 - Wing Trailing Edge - Aft of Rear Spar
560	Subzone 560 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon
630	Subzone 630 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
640	Subzone 640 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
650	Subzone 650 - Wing Trailing Edge - Aft of Rear Spar
660	Subzone 660 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon

E. **Access Panels**

Number	Name/Location
531AB	Access Door
533BB	Access Door
533EB	Access Door
533FB	Access Door

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Number	Name/Location
541AB	Access Door
541CB	Access Door
541HB	Access Door
541MB	Access Door
541PB	Access Door
544AB	Access Door
544CB	Access Door
544EB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
631AB	Access Door
633BB	Access Door
633CB	Access Door
633EB	Access Door
641AB	Access Door
641CB	Access Door
641HB	Access Door
641MB	Access Door
641PB	Access Door
644AB	Access Door
644CB	Access Door
644EB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

F. Prepare for the Bonding Resistance Check

SUBTASK 29-11-55-010-006

- (1) Do this task to get access to the applicable bulkhead fitting [1] on the aft spar: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804

SUBTASK 29-11-55-040-002

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	17	C27631	FLAPS ELEC CTRL RLY PWR

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	2	C27301	FLAPS ELEC MOT PWR

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	9	C27632	FLAPS PRI DR CTRL 2

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Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
G	11	C27604	FLAPS PRI DR CTRL 1

SUBTASK 29-11-55-010-007

- (3) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
531AB	Access Door
533BB	Access Door
533EB	Access Door
533FB	Access Door
541AB	Access Door
541CB	Access Door
541HB	Access Door
541MB	Access Door
541PB	Access Door
544AB	Access Door
544CB	Access Door
544EB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
631AB	Access Door
633BB	Access Door
633CB	Access Door
633EB	Access Door
641AB	Access Door
641CB	Access Door
641HB	Access Door
641MB	Access Door
641PB	Access Door
644AB	Access Door
644CB	Access Door
644EB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

SUBTASK 29-11-55-010-008

- (4) Do this task to enter the fuel tank: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

G. Bonding Resistance Check

SUBTASK 29-11-55-200-001



MAKE SURE THAT THE BONDING RESISTANCE IS LESS THAN THE LIMITS. THE RESISTANCE OF THE ELECTRICAL BOND IS VERY IMPORTANT IF LIGHTNING HITS THE AIRPLANE. AN EXPLOSION CAN OCCUR IF THE BONDING RESISTANCE IS NOT IN THE LIMITS DURING A LIGHTNING STRIKE.

- (1) For bulkhead fitting [1], use an intrinsically safe approved bonding meter, COM-1550 to make sure the resistance between the bulkhead fitting and the bulkhead (rear spar) is 0.001 ohm (1 milliohm) or less.

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SUBTASK 29-11-55-200-002

- (2) If the bonding resistance for bulkhead fitting [1] is more than 0.001 ohm (1 milliohm), then rework the bonding surface per Bulkhead Fittings - Removal/ Installation, PAGEBLOCK 29-11-55/401 controlled by Critical Design Configuration Control Limitation (CDCCL) requirements.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-55-410-005

- (1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
531AB	Access Door
533BB	Access Door
533EB	Access Door
533FB	Access Door
541AB	Access Door
541CB	Access Door
541HB	Access Door
541MB	Access Door
541PB	Access Door
544AB	Access Door
544CB	Access Door
544EB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
631AB	Access Door
633BB	Access Door
633CB	Access Door
633EB	Access Door
641AB	Access Door
641CB	Access Door
641HB	Access Door
641MB	Access Door
641PB	Access Door
644AB	Access Door
644CB	Access Door
644EB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

————— END OF TASK —————

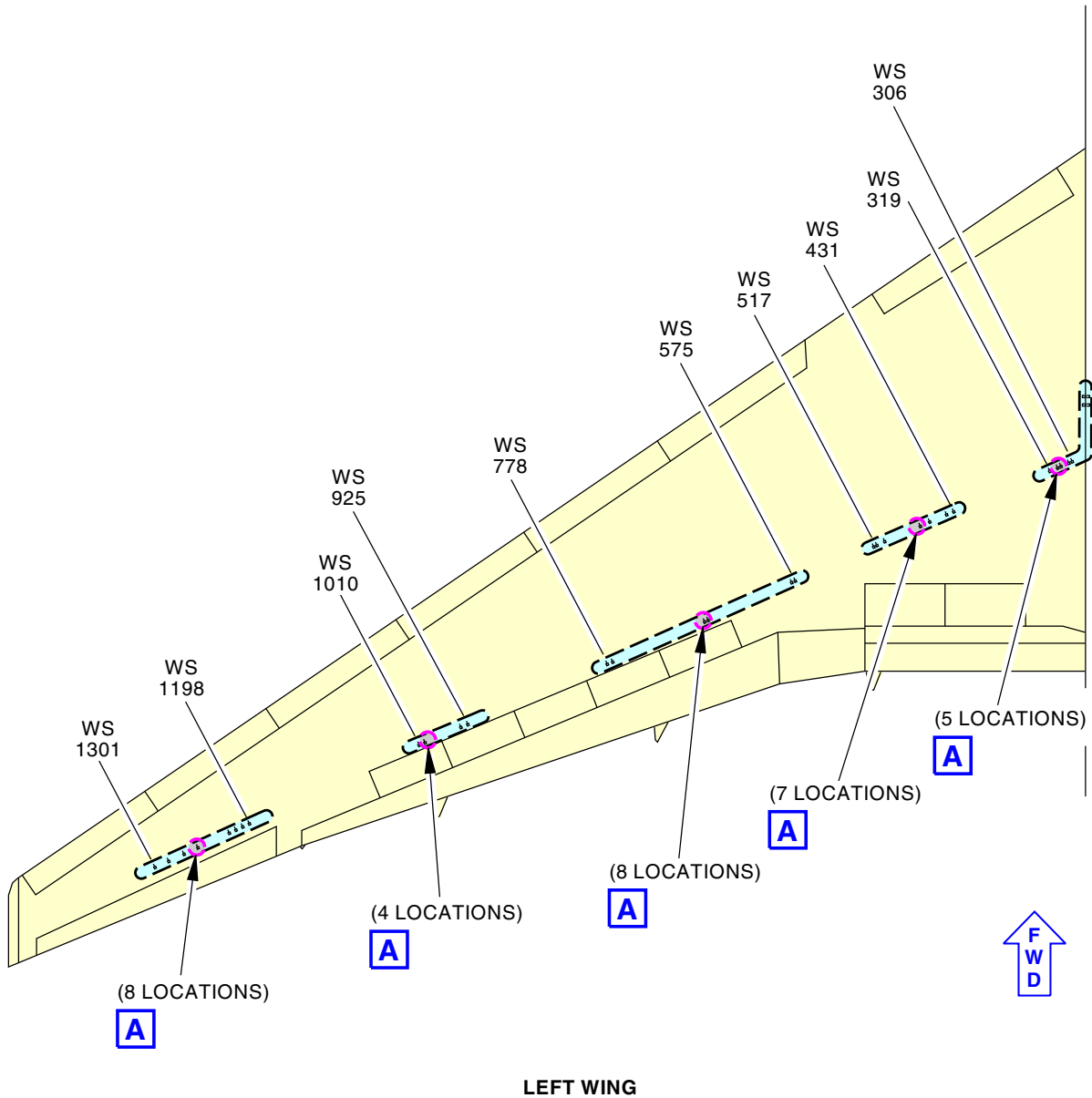
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Bulkhead Fittings Installation
Figure 601/29-11-55-990-802 (Sheet 1 of 3)

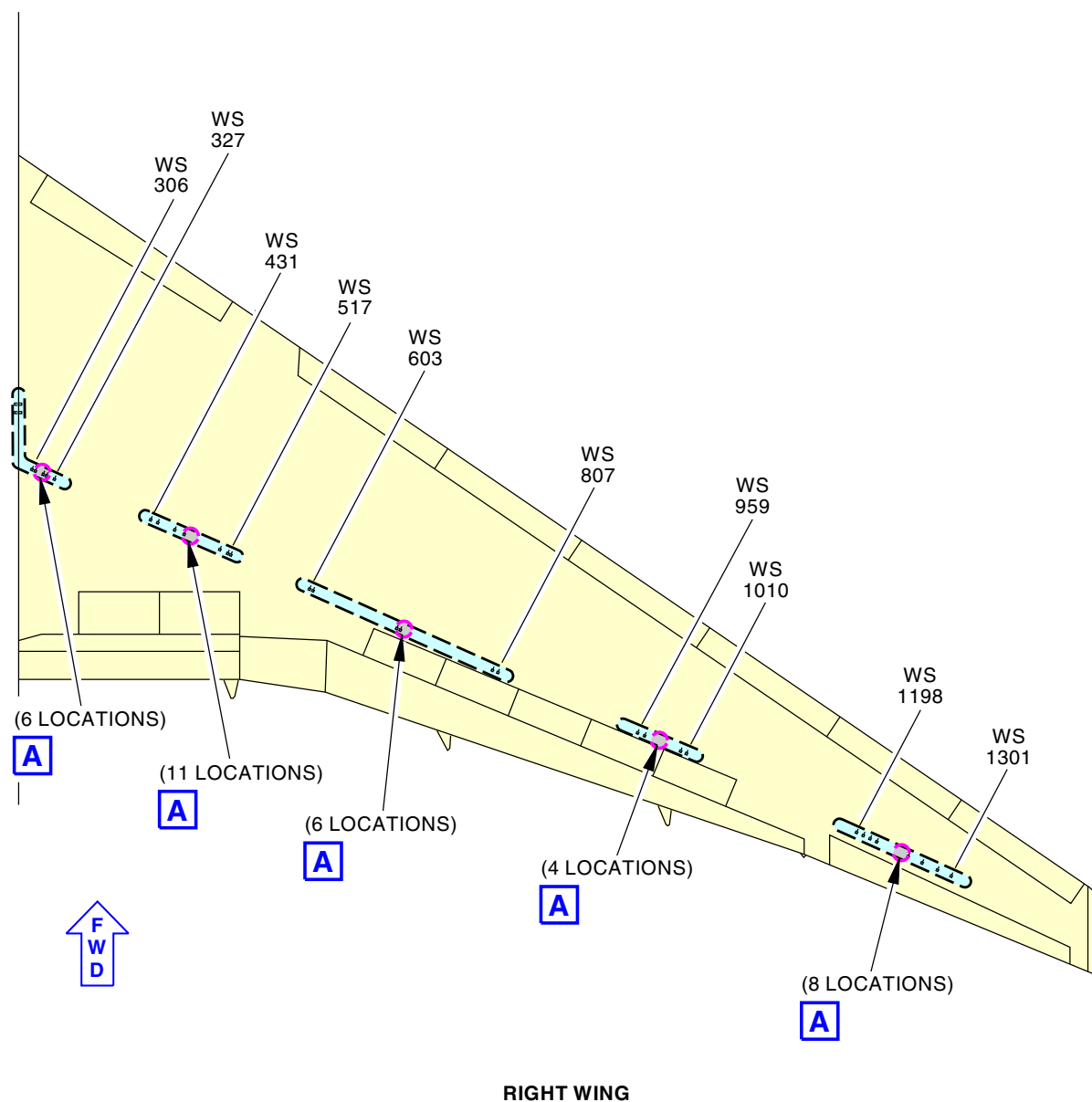
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Bulkhead Fittings Installation
Figure 601/29-11-55-990-802 (Sheet 2 of 3)

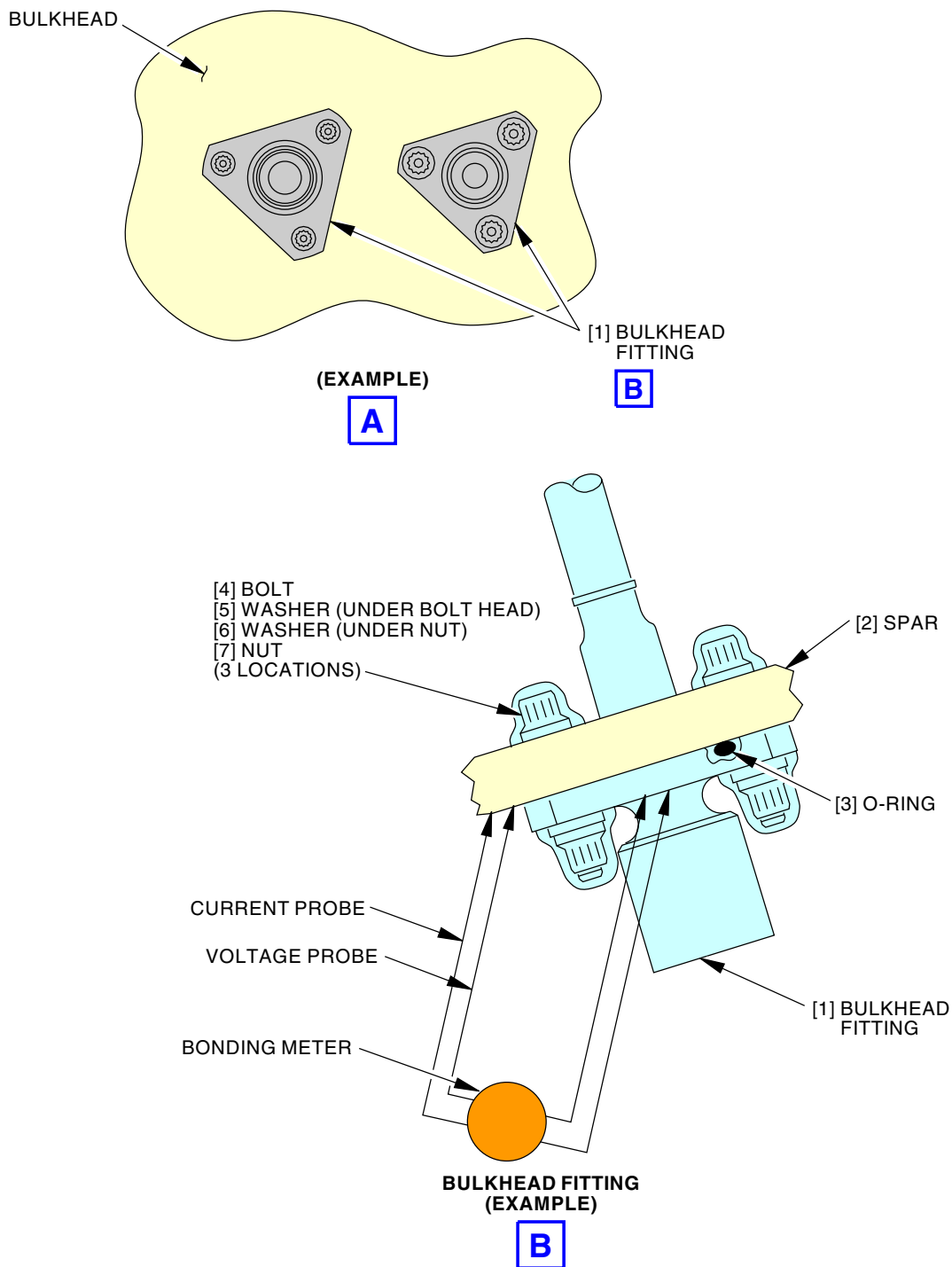
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**Bulkhead Fittings Installation
Figure 601/29-11-55-990-802 (Sheet 3 of 3)**

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HEAT EXCHANGER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the heat exchanger
 - (2) An installation of the heat exchanger.
- B. There is one heat exchanger in each main hydraulic system. The heat exchanger for the left hydraulic system is in the left wing. The heat exchangers for the center and the right hydraulic systems are in the right wing. You can use this procedure to remove and install each of the heat exchangers.

TASK 29-11-60-000-801

2. Heat Exchanger Removal

(Figure 401)

A. References

Reference	Title
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-09-400-804	Externally Swaged (Permaswage) Fittings Installation (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
533CB	Access Door
633CB	Access Door
633DB	Access Door

D. Prepare for the Removal

SUBTASK 29-11-60-860-001

- (1) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-60-650-001

- (2) To defuel the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

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SUBTASK 29-11-60-940-001



WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 29-11-60-010-001

- (4) For the heat exchanger in the left hydraulic system, open this access panel:

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

533CB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-010-002

- (5) For the heat exchanger in the center hydraulic system, open this access panel:

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

633DB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-010-003

- (6) For the heat exchanger in the right hydraulic system, open this access panel:

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

633CB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

E. Heat Exchanger Removal

SUBTASK 29-11-60-020-001

- (1) Remove the bolt [2], bolt [15], bolt [16], and bolt [24] which hold the heat exchanger [1].

SUBTASK 29-11-60-860-002

- (2) Move the bonding jumper [20] away from the heat exchanger [1].

SUBTASK 29-11-60-020-002

- (3) Cut the hydraulic tubes on the heat exchanger [1] (TASK 20-10-09-400-804).

SUBTASK 29-11-60-020-003

- (4) Remove the heat exchanger [1].

SUBTASK 29-11-60-020-004

- (5) If it is necessary, remove the bolts [7] which attach the supports [10] to the heat exchanger [1] (Views E and G).

SUBTASK 29-11-60-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (6) To remove the hydraulic fluid from the fuel tank, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

————— END OF TASK —————

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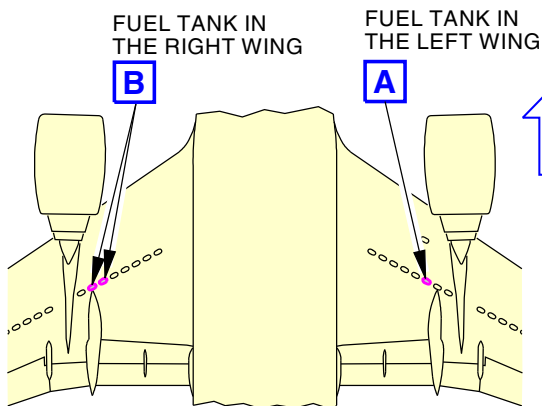
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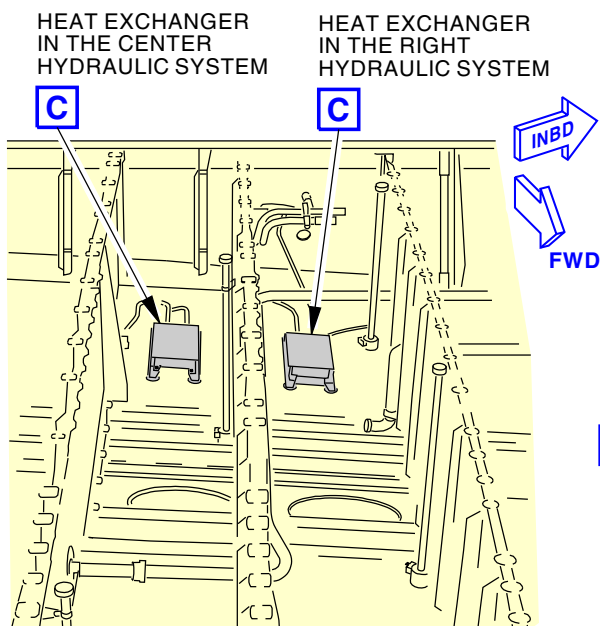
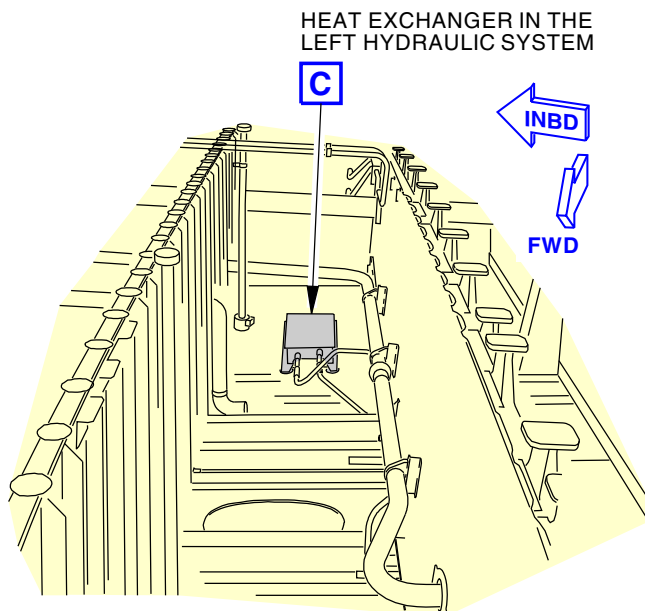
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(BOTTOM VIEW)

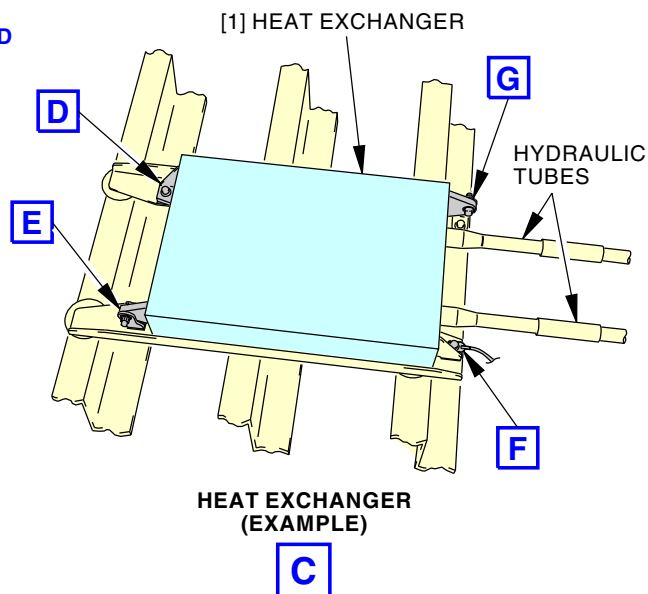


FUEL TANK IN THE RIGHT WING

B

FUEL TANK IN THE LEFT WING

A



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Heat Exchanger Installation
Figure 401/29-11-60-990-801 (Sheet 1 of 2)

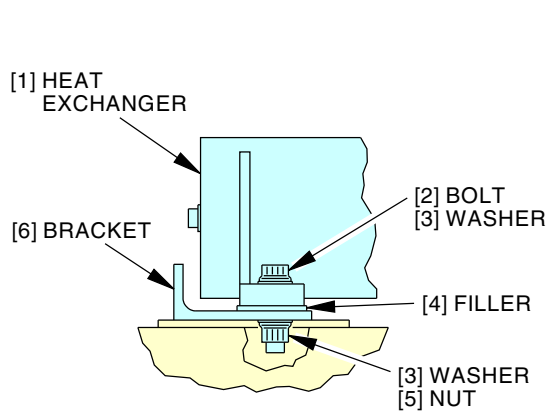
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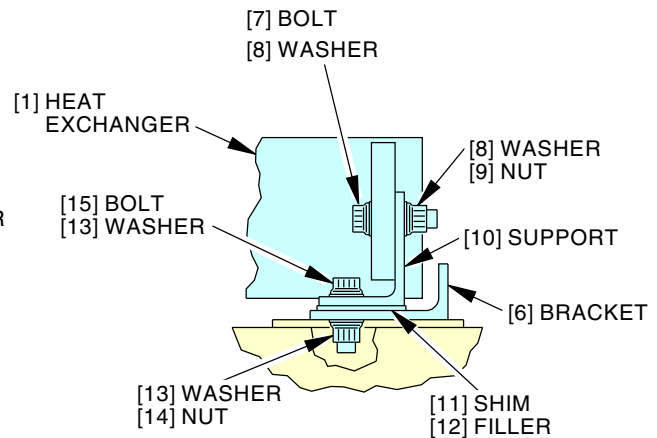
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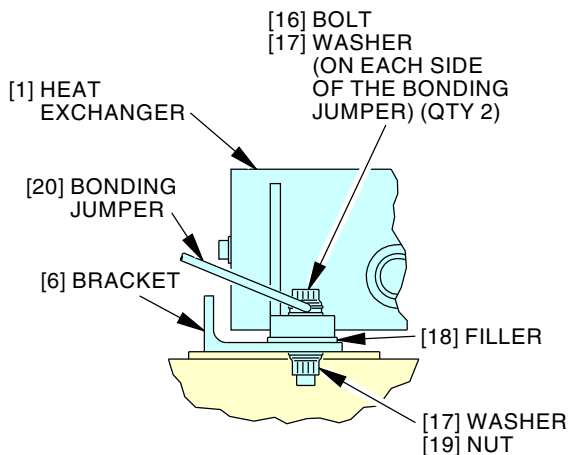
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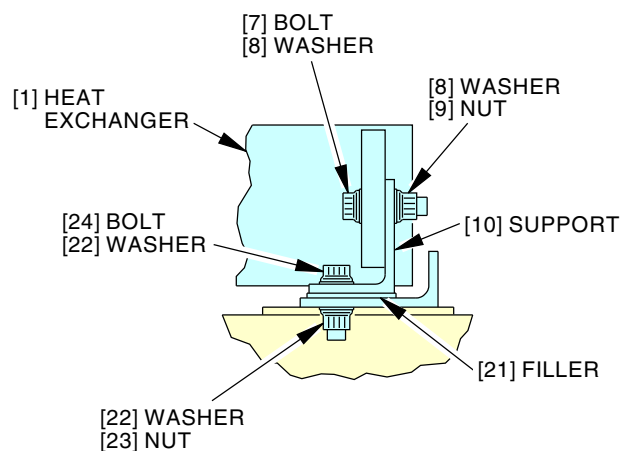
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E



F



G

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**Heat Exchanger Installation
Figure 401/29-11-60-990-801 (Sheet 2 of 2)**

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TASK 29-11-60-400-801

3. Heat Exchanger Installation

(Figure 401)

A. General

- (1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.
 - (a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-09-400-804	Externally Swaged (Permaswage) Fittings Installation (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
29-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
29-11-00-860-803	Main Hydraulic System Pressurization with an Alternating Current Motor Pump (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Heat exchanger	29-11-60-01-120	ARO ALL
4	Filler	29-11-60-01-115	ARO ALL
10	Support	29-11-60-01-090	ARO ALL

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AMM Item	Description	AIPC Reference	AIPC Effectivity
12	Filler	29-11-60-01-080	ARO ALL
18	Filler	29-11-60-01-115	ARO ALL
21	Filler	29-11-60-01-085	ARO ALL

E. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

F. Access Panels

Number	Name/Location
533CB	Access Door
633CB	Access Door
633DB	Access Door

G. Heat Exchanger Installation

SUBTASK 29-11-60-420-001

- (1) If it is necessary, install the bolts [7], washers [8], and nuts [9] to attach the supports [10] to the heat exchanger [1] (Views E and G).

SUBTASK 29-11-60-420-002

- (2) Put the filler [4], filler [12], filler [18], and filler [21] on the brackets [6] at the locations of the bolt holes.

SUBTASK 29-11-60-420-003

- (3) Put the shim [11] on the bracket [6] at one bolt hole location (View E).

SUBTASK 29-11-60-420-004

- (4) Put the heat exchanger [1] in its position on the filler [4], filler [12], filler [18], and filler [21] and the shim [11].

SUBTASK 29-11-60-820-001

- (5) Remove the laminations from the shim [11] or remove the shim [11] or the filler [12] to remove all clearance at each attachment of the heat exchanger [1].

SUBTASK 29-11-60-420-005

- (6) Install the bolt [16], washers [17], bonding jumper [20], and nut [19] (View F) (SWPM 20-20-00).

SUBTASK 29-11-60-210-001

28-AWL-06: CDCCL

- (7) Make sure the bonding jumper [20] is installed from the hydraulic heat exchanger to structure inside the tank.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

SUBTASK 29-11-60-420-006

- (8) Install the bolt [24], washers [22], and nut [23] (View G).

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SUBTASK 29-11-60-420-007

- (9) Install the bolt [2], washers [3], and nut [5] (View D).

SUBTASK 29-11-60-420-008

- (10) Install the bolt [15], washers [13], and nut [14] (View E).

SUBTASK 29-11-60-420-009

- (11) Connect the hydraulic tubes on the heat exchanger [1] to the hydraulic tubing in the wing with permaswage fittings (TASK 20-10-09-400-804).

SUBTASK 29-11-60-760-003

28-AWL-06: CDCCL

- (12) For the heat exchanger [1], measure the electrical bonding resistance across the bonding jumper [20] between the heat exchanger [1] and the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-06: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

SUBTASK 29-11-60-765-005

28-AWL-06: CDCCL

- (13) For the heat exchanger [1], measure the electrical bonding resistance between the heat exchanger [1] and each hydraulic tube (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

- (a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-06: CDCCL

- (b) Make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-06.

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SUBTASK 29-11-60-100-001



CAUTION

QUICKLY CLEAN THE FUEL TANK OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (14) To remove all the hydraulic fluid from the fuel tank, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

H. Heat Exchanger Installation Test

SUBTASK 29-11-60-010-004

- (1) For the heat exchanger in the left hydraulic system, install this access door:

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

533CB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 29-11-60-010-005

- (2) For the heat exchanger in the center hydraulic system, install this access door:

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

633DB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 29-11-60-010-006

- (3) For the heat exchanger in the right hydraulic system, install this access door:

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

633CB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 29-11-60-860-003

- (4) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-11-60-860-004



CAUTION

USUALLY, THE FUEL IN THE MAIN TANK MUST BE AT LEAST THE MINIMUM SPECIFIED AMOUNT TO KEEP THE HYDRAULIC FLUID COOL. BECAUSE THERE IS NO FUEL IN THE MAIN TANK, DO NOT OPERATE THE PUMP AFTER THE PUMP FAULT LIGHT COMES ON OR LONGER THAN NECESSARY TO DO THE LEAK CHECK. THIS CAN CAUSE THE HYDRAULIC FLUID TO BECOME TOO HOT.

- (5) For the applicable hydraulic system, do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803

NOTE: If it is necessary, you can use the engine-driven pump as an alternative to the ACMP, in the left or right hydraulic system.

SUBTASK 29-11-60-860-005

- (6) For the applicable hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

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SUBTASK 29-11-60-940-002



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (7) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 29-11-60-010-007

- (8) For the heat exchanger in the left hydraulic system, remove this access door:

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

533CB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-010-008

- (9) For the heat exchanger in the center hydraulic system, remove this access door:

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

633DB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-010-009

- (10) For the heat exchanger in the right hydraulic system, remove this access door:

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

633CB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-790-001

- (11) Make sure there is no leakage of hydraulic fluid at the hydraulic tube connections for the heat exchanger [1].

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-60-010-010

- (1) For the heat exchanger in the left hydraulic system, install this access door:

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

533CB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 29-11-60-010-011

- (2) For the heat exchanger in the center hydraulic system, install this access door:

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

633DB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 29-11-60-010-012

- (3) For the heat exchanger in the right hydraulic system, install this access door:

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

633CB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

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SUBTASK 29-11-60-610-001

- (4) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

————— **END OF TASK** —————

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HEAT EXCHANGER - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Heat Exchanger Hydraulic Tubes (Out of Tank) - Bonding Resistance Check
 - (2) Bonding Resistance Check of the Hydraulic Tubes for the Heat Exchanger.
 - (3) Leakage Check of the Heat Exchanger for the Hydraulic Fluid

TASK 29-11-60-200-801

2. Heat Exchanger Hydraulic Tubes (Out of Tank) - Bonding Resistance Check

Figure 601

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
29-11-55 P/B 401	Bulkhead Fittings - Removal/ Installation
SWPM 20-20-00	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.

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
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

E. Procedure

SUBTASK 29-11-60-010-018

- (1) Get access to the bulkhead fittings for the heat exchanger hydraulic tubes on the outside of the main tank on the rear spar (Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

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- (a) For the heat exchanger in the left hydraulic system, remove this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 552HB | Inboard Fixed Trailing Edge Panel |
- (b) For the heat exchanger in the center hydraulic system, remove this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 651DB | Inboard Fixed Trailing Edge Panel |
- (c) For the heat exchanger in the right hydraulic system, remove this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 652GB | Inboard Fixed Trailing Edge Panel |

SUBTASK 29-11-60-765-004

- (2) Use an electrical intrinsically safe approved bonding meter, COM-1550 to measure the bonding resistance between the bulkhead fitting and the structure (SWPM 20-20-00).
- (a) Make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.

SUBTASK 29-11-60-160-003

- (3) If the bonding resistance for the bulkhead fitting [1] is more than 0.001 ohm (1 milliohm), then rework the bonding surface per Bulkhead Fittings - Removal/ Installation, PAGEBLOCK 29-11-55/401 controlled by Critical Design Configuration Control Limitation (CDCCL) requirements.

SUBTASK 29-11-60-410-008

- (4) For the heat exchanger in the left hydraulic system, install this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 552HB | Inboard Fixed Trailing Edge Panel |

SUBTASK 29-11-60-410-009

- (5) For the heat exchanger in the center hydraulic system, install this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 651DB | Inboard Fixed Trailing Edge Panel |

SUBTASK 29-11-60-410-010

- (6) For the heat exchanger in the right hydraulic system, install this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 652GB | Inboard Fixed Trailing Edge Panel |

————— END OF TASK —————

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TASK 29-11-60-765-801

3. Bonding Resistance Check of the Hydraulic Tubes for the Heat Exchanger

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task does a bonding resistance check of the hydraulic tubes between the bulkhead fittings and the surface of the rear spar.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)

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Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
29-11-55 P/B 401	Bulkhead Fittings - Removal/ Installation
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

E. Access Panels

Number	Name/Location
533FB	Access Door
552HB	Inboard Fixed Trailing Edge Panel
633CB	Access Door
633EB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

F. Bonding Resistance Check in the Main Tank

SUBTASK 29-11-60-650-002

(1) To defuel the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 29-11-60-940-003



WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

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SUBTASK 29-11-60-010-013

- (3) For the heat exchanger in the left hydraulic system, remove this access door:

<u>Number</u>	<u>Name/Location</u>
533FB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-010-014

- (4) For the heat exchanger in the center hydraulic system, remove this access door:

<u>Number</u>	<u>Name/Location</u>
633EB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-010-015

- (5) For the heat exchanger in the right hydraulic system, remove this access door:

<u>Number</u>	<u>Name/Location</u>
633CB	Access Door

Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 29-11-60-765-001



MAKE SURE THAT THE BONDING RESISTANCE IS LESS THAN THE LIMITS. THE RESISTANCE OF THE ELECTRICAL BOND IS VERY IMPORTANT IF LIGHTNING HITS THE AIRPLANE. AN EXPLOSION CAN OCCUR IF THE BONDING RESISTANCE IS NOT IN THE LIMITS DURING A LIGHTNING STRIKE.

- (6) Use a intrinsically safe approved bonding meter, COM-1550, or intrinsically safe approved bonding meter, COM-1550, to do the checks of the bonding resistance in the main tanks for each heat exchanger as follows (SWPM 20-20-00):
- (a) Make sure the bonding resistance between each of the bulkhead fittings for the hydraulic tubes and the rear spar is 0.001 ohm (1 milliohm) or less.

SUBTASK 29-11-60-160-001

- (7) If the bonding resistance for the bulkhead fitting [1] is more than 0.001 ohm (1 milliohm), then rework the bonding surface per Bulkhead Fittings - Removal/ Installation, PAGEBLOCK 29-11-55/401 controlled by Critical Design Configuration Control Limitation (CDCCL) requirements.

SUBTASK 29-11-60-410-001

- (8) For the heat exchanger in the left hydraulic system, install this access door:

<u>Number</u>	<u>Name/Location</u>
533FB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 29-11-60-410-002

- (9) For the heat exchanger in the center hydraulic system, install this access door:

<u>Number</u>	<u>Name/Location</u>
633EB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

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SUBTASK 29-11-60-410-003

- (10) For the heat exchanger in the right hydraulic system, install this access door:

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

633CB	Access Door

Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

G. Bonding Resistance Check Out of the Main Tanks

SUBTASK 29-11-60-010-016

- (1) Get access to the bulkhead fittings for the hydraulic tubes for the heat exchanger out of the main tank on the rear spar.

- (a) For the heat exchanger in the left hydraulic system, remove this access panel:

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

552HB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

- (b) For the heat exchanger in the center hydraulic system, remove this access panel:

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

651DB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

- (c) For the heat exchanger in the right hydraulic system, remove this access panel:

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

652GB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

SUBTASK 29-11-60-765-002



MAKE SURE THAT THE BONDING RESISTANCE IS LESS THAN THE LIMITS. THE RESISTANCE OF THE ELECTRICAL BOND IS VERY IMPORTANT IF LIGHTNING HITS THE AIRPLANE. AN EXPLOSION CAN OCCUR IF THE BONDING RESISTANCE IS NOT IN THE LIMITS DURING A LIGHTNING STRIKE.

- (2) Use a intrinsically safe approved bonding meter, COM-1550, or intrinsically safe approved bonding meter, COM-1550, to do the checks of the bonding resistance out of the main tanks for each heat exchanger as follows (SWPM 20-20-00):

- (a) Make sure the bonding resistance between each of the bulkhead fittings for the hydraulic tubes and the rear spar is less than 0.001 ohm (1 milliohms).

SUBTASK 29-11-60-160-002

- (3) If the bonding resistance for bulkhead fitting [1] is more than 0.001 ohm (1 milliohms), then rework the bonding surface per Bulkhead Fittings - Removal/ Installation, PAGEBLOCK 29-11-55/401 controlled by Critical Design Configuration Control Limitation (CDCCL) requirements.

SUBTASK 29-11-60-410-004

- (4) For the heat exchanger in the left hydraulic system, install this access panel:

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

552HB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

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SUBTASK 29-11-60-410-005

- (5) For the heat exchanger in the center hydraulic system, install this access panel:

<u>Number</u>	<u>Name/Location</u>
651DB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

SUBTASK 29-11-60-410-006

- (6) For the heat exchanger in the right hydraulic system, install this access panel:

<u>Number</u>	<u>Name/Location</u>
652GB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

————— **END OF TASK** —————

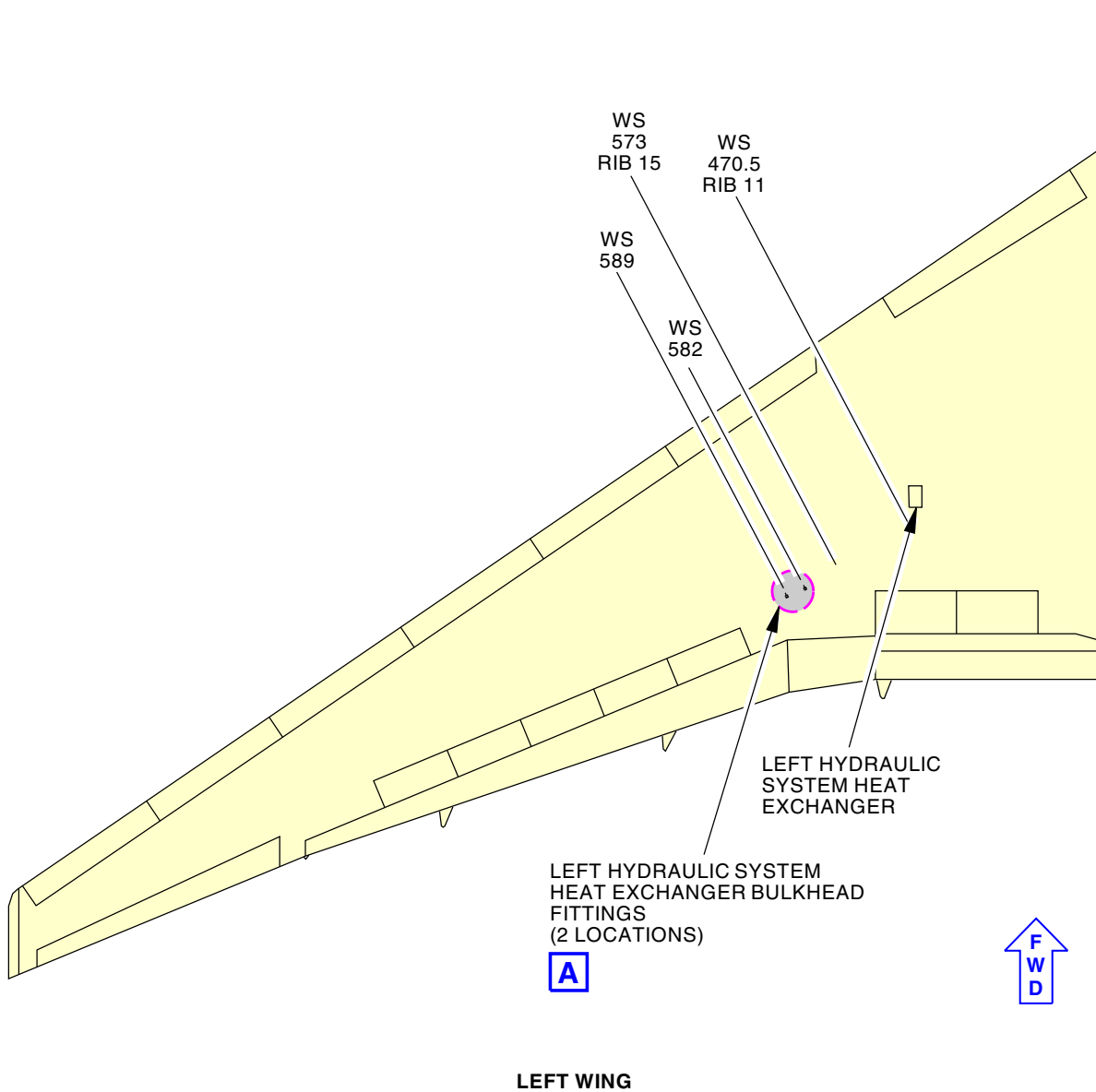
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Bulkhead Fittings Installation
Figure 601/29-11-60-990-803 (Sheet 1 of 3)

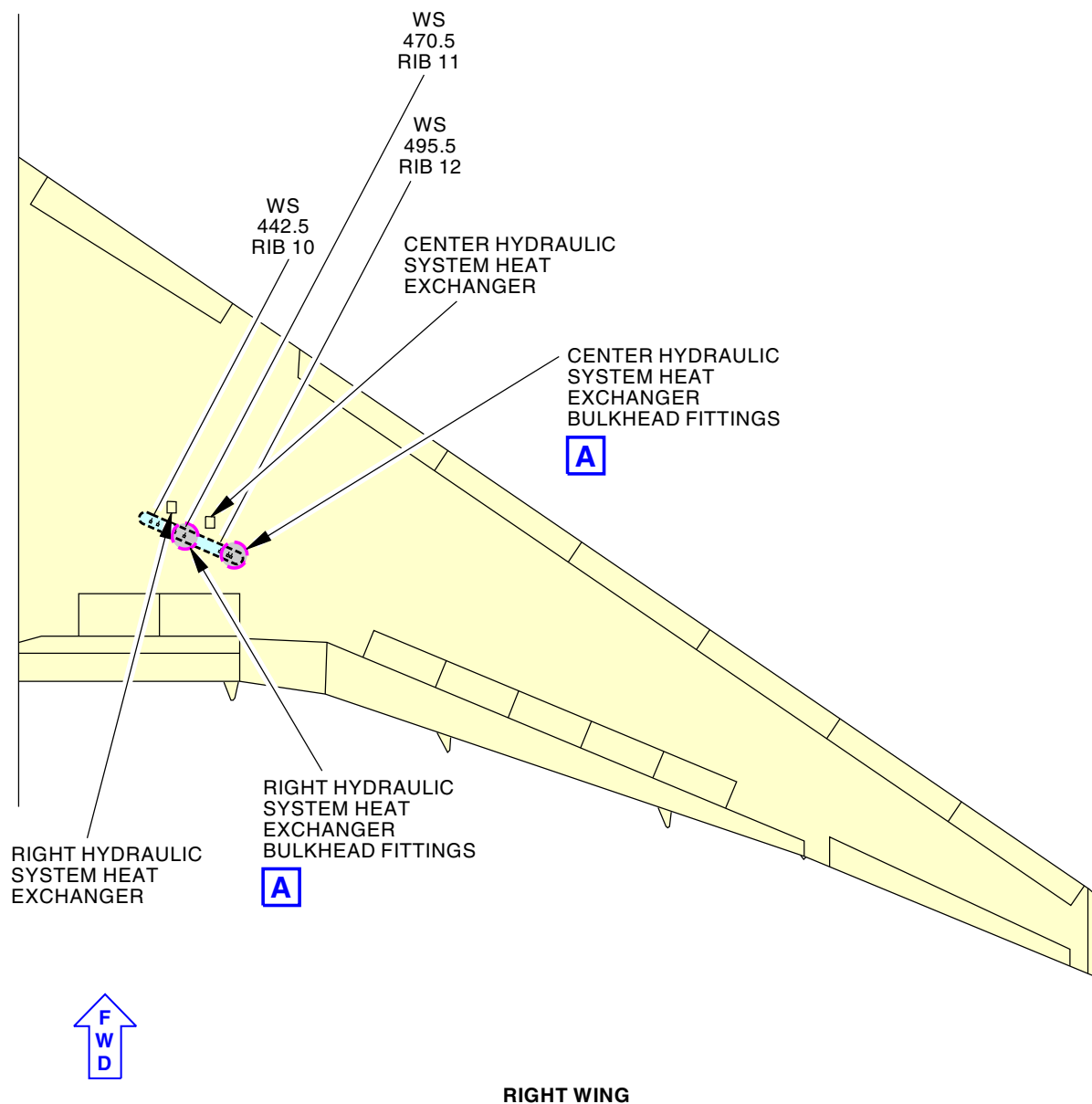
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Bulkhead Fittings Installation
Figure 601/29-11-60-990-803 (Sheet 2 of 3)

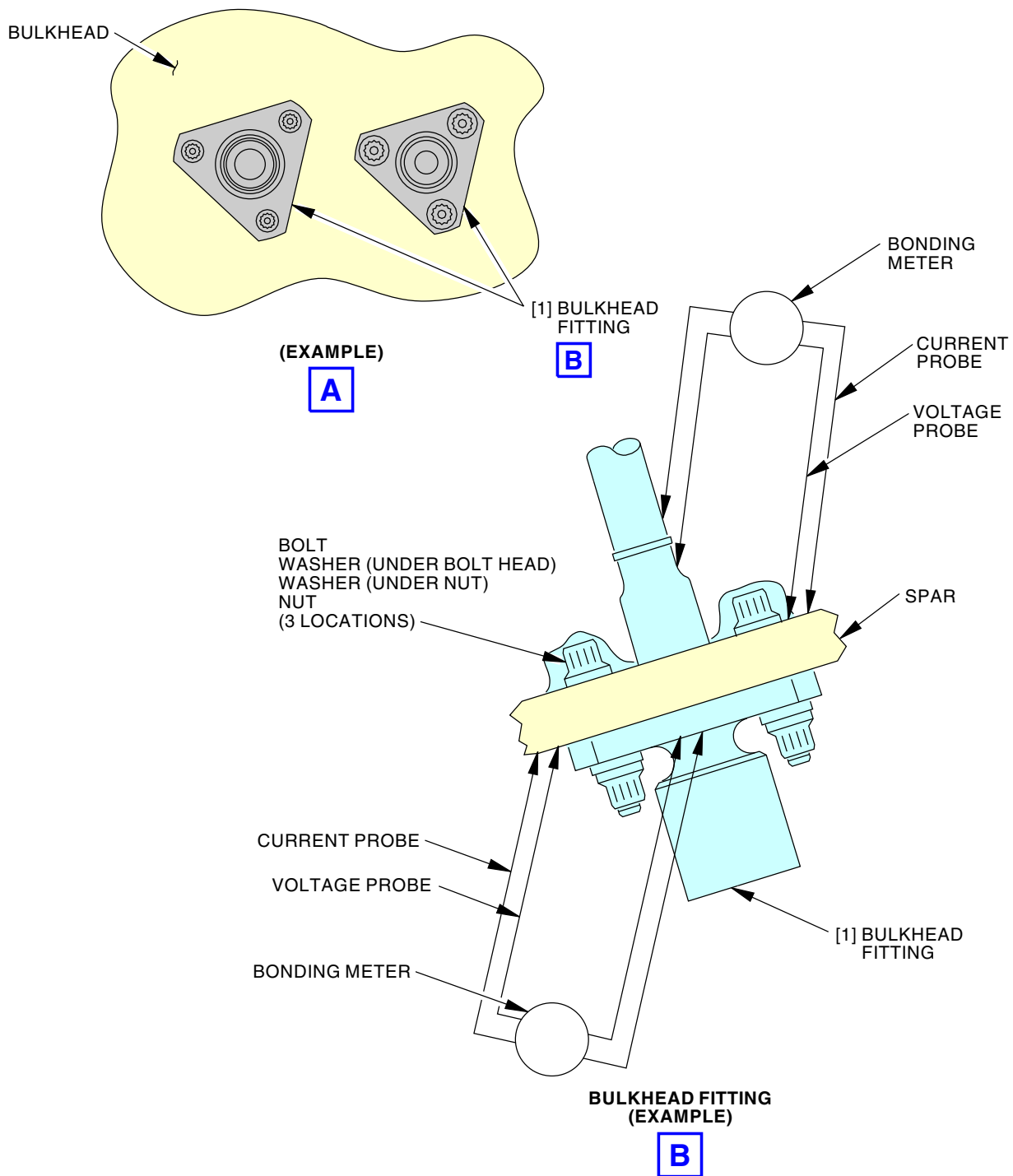
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**Bulkhead Fittings Installation
Figure 601/29-11-60-990-803 (Sheet 3 of 3)**

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TASK 29-11-60-790-801

4. Leakage Check of the Heat Exchanger for the Hydraulic Fluid

A. General

- (1) This procedure can be used to determine if there is a path for the hydraulic fluid to leak from the heat exchanger into the fuel tank. As an alternative method, a sample of fuel can be analyzed to determine if there is hydraulic fluid in the fuel.
- (2) This procedure contains a leakage check of the heat exchanger(s) for the hydraulic fluid. A dry air pressure source is used to pressurize the heat exchanger. It is necessary to get access to the tube connections of the heat exchangers as they enter and exit the applicable fuel tank.
- (3) There is one heat exchanger in each main hydraulic system. The heat exchanger for the left hydraulic system is in the left wing. The heat exchangers for the center and right hydraulic systems are in the right wing.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-55 P/B 401	Bulkhead Fittings - Removal/ Installation
29-11-60-000-801	Heat Exchanger Removal (P/B 401)
29-11-60-400-801	Heat Exchanger Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

E. Access Panels

Number	Name/Location
533CB	Access Door
552HB	Inboard Fixed Trailing Edge Panel

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Number	Name/Location

633CB	Access Door
633DB	Access Door
651DB	Inboard Fixed Trailing Edge Panel
652GB	Inboard Fixed Trailing Edge Panel

F. Preparation for the Leakage Check of the Heat Exchangers for the Hydraulic Fluid

SUBTASK 29-11-60-860-006

- (1) Remove the pressure from the hydraulic system. To remove the pressure, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-60-010-017

- (2) Get access to the bulkhead fittings on the rear spar for the hydraulic tubes to the heat exchangers:

- (a) For the heat exchanger in the left hydraulic system:

Open this access panel:

Number	Name/Location

533CB	Access Door

- (b) For the heat exchanger in the center hydraulic system:

Open this access panel:

Number	Name/Location

633DB	Access Door

- (c) For the heat exchanger in the right hydraulic system:

Open this access panel:

Number	Name/Location

633CB	Access Door

G. Leakage Check of the Heat Exchanger for the Hydraulic Fluid

SUBTASK 29-11-60-030-001

- (1) Disconnect the hydraulic tubes for the heat exchanger at the rear spar.

SUBTASK 29-11-60-680-001

- (2) Drain the hydraulic fluid from the hydraulic tubes of the applicable heat exchanger.

SUBTASK 29-11-60-750-001

- (3) Do a check of the hydraulic tubes to the heat exchanger for blockage as follows:

- (a) Use a source of low pressure dry air or nitrogen.
 - (b) Install an air pressure gage at the outlet port of the heat exchanger.
 - (c) Apply pressure with the dry air or nitrogen source through a shutoff valve at the inlet port to the heat exchanger.
 - (d) Make sure that the air pressure gage shows pressure.

SUBTASK 29-11-60-780-001

- (4) Pressurize the heat exchanger to 100 psi.

SUBTASK 29-11-60-780-002

- (5) Monitor the pressure gage to determine if a leak is present:

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- (a) If there is a decrease in pressure at the pressure gage, there is leakage in the applicable heat exchanger tubing.

SUBTASK 29-11-60-360-001

- (6) If you find leakage in the heat exchanger tubing, then do these tasks to replace the applicable heat exchanger Heat Exchanger Removal, TASK 29-11-60-000-801 and Heat Exchanger Installation, TASK 29-11-60-400-801.

SUBTASK 29-11-60-420-010

- (7) Connect the hydraulic tubes for the heat exchanger at the rear spar.

H. Bonding Resistance Check Out of the Main Tanks

SUBTASK 29-11-60-010-019

- (1) Get access to the bulkhead fittings for the hydraulic tubes for the heat exchanger out of the main tank on the rear spar.

- (a) For the heat exchanger in the left hydraulic system, remove this access panel:

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

552HB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

- (b) For the heat exchanger in the center hydraulic system, remove this access panel:

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

651DB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

- (c) For the heat exchanger in the right hydraulic system, remove this access panel:

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

652GB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

SUBTASK 29-11-60-700-001



MAKE SURE THAT THE BONDING RESISTANCE IS LESS THAN THE LIMITS. THE RESISTANCE OF THE ELECTRICAL BOND IS VERY IMPORTANT IF LIGHTNING HITS THE AIRPLANE. AN EXPLOSION CAN OCCUR IF THE BONDING RESISTANCE IS NOT IN THE LIMITS DURING A LIGHTNING STRIKE.

- (2) Use a intrinsically safe approved bonding meter, COM-1550, or intrinsically safe approved bonding meter, COM-1550, to do the checks of the bonding resistance out of the main tanks for each heat exchanger as follows (SWPM 20-20-00):
- (a) Make sure the bonding resistance between each of the bulkhead fittings for the hydraulic tubes and the rear spar is less than 0.001 ohm (1 milliohms).

SUBTASK 29-11-60-700-002

- (3) If the bonding resistance for the bulkhead fitting [1] is more than 0.001 ohm (1 milliohms), then rework the bonding surface per Bulkhead Fittings - Removal/ Installation, PAGEBLOCK 29-11-55/401 controlled by Critical Design Configuration Control Limitation (CDCCL) requirements.

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SUBTASK 29-11-60-410-011

- (4) For the heat exchanger in the left hydraulic system, install this access panel:

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

552HB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

SUBTASK 29-11-60-410-012

- (5) For the heat exchanger in the center hydraulic system, install this access panel:

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

651DB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

SUBTASK 29-11-60-410-013

- (6) For the heat exchanger in the right hydraulic system, install this access panel:

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

652GB	Inboard Fixed Trailing Edge Panel

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

I. Return of the Airplane to Its Usual Condition

SUBTASK 29-11-60-780-003

- (1) Pressurize the hydraulic system Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-60-790-002

- (2) Make sure that there is no indication of leakage at the bulkhead fittings at the rear spar for the applicable heat exchanger.

SUBTASK 29-11-60-410-007

- (3) Close these access panels that were opened to get access to the bulkhead fittings for the hydraulic tubes at the rear spar:

- (a) For the heat exchanger in the left hydraulic system:

Close this access panel:

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

533CB	Access Door

- (b) For the heat exchanger in the center hydraulic system:

Close this access panel:

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

633DB	Access Door

- (c) For the heat exchanger in the right hydraulic system:

Close this access panel:

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

633CB	Access Door

SUBTASK 29-11-60-611-001

- (4) Service the hydraulic system reservoir.

————— END OF TASK —————

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CENTER SYSTEM RETURN MANIFOLD - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the center system return manifold
- (2) An installation of the center system return manifold.

TASK 29-11-70-000-801

2. Center System Return Manifold Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Prepare for the Removal

SUBTASK 29-11-70-480-001



WARNING

MAKE SURE THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-11-70-010-001



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-11-70-860-001

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

D. Center System Return Manifold Removal

SUBTASK 29-11-70-020-001

- (1) Disconnect these components from the ports on the manifold assembly [10]:
 - (a) The hydraulic tubes [1], [4], [8], and [9]
 - (b) The T-fittings [5] and [11]
 - (c) The elbows [6] and [7].

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SUBTASK 29-11-70-020-002

- (2) Hold the manifold assembly [10].
 - (a) Remove the bolt [2], bolt [13], and bolts [14] which attach the manifold assembly [10] to the bracket [12].

SUBTASK 29-11-70-020-003

- (3) Remove the manifold assembly [10] from the bracket [12].

SUBTASK 29-11-70-020-004

- (4) Install caps on these components to prevent contamination:
 - (a) The open ports on the manifold assembly [10]
 - (b) The hydraulic tubes [1], [4], [8], and [9]
 - (c) The T-fittings [5] and [11]
 - (d) The elbows [6] and [7].

————— **END OF TASK** —————

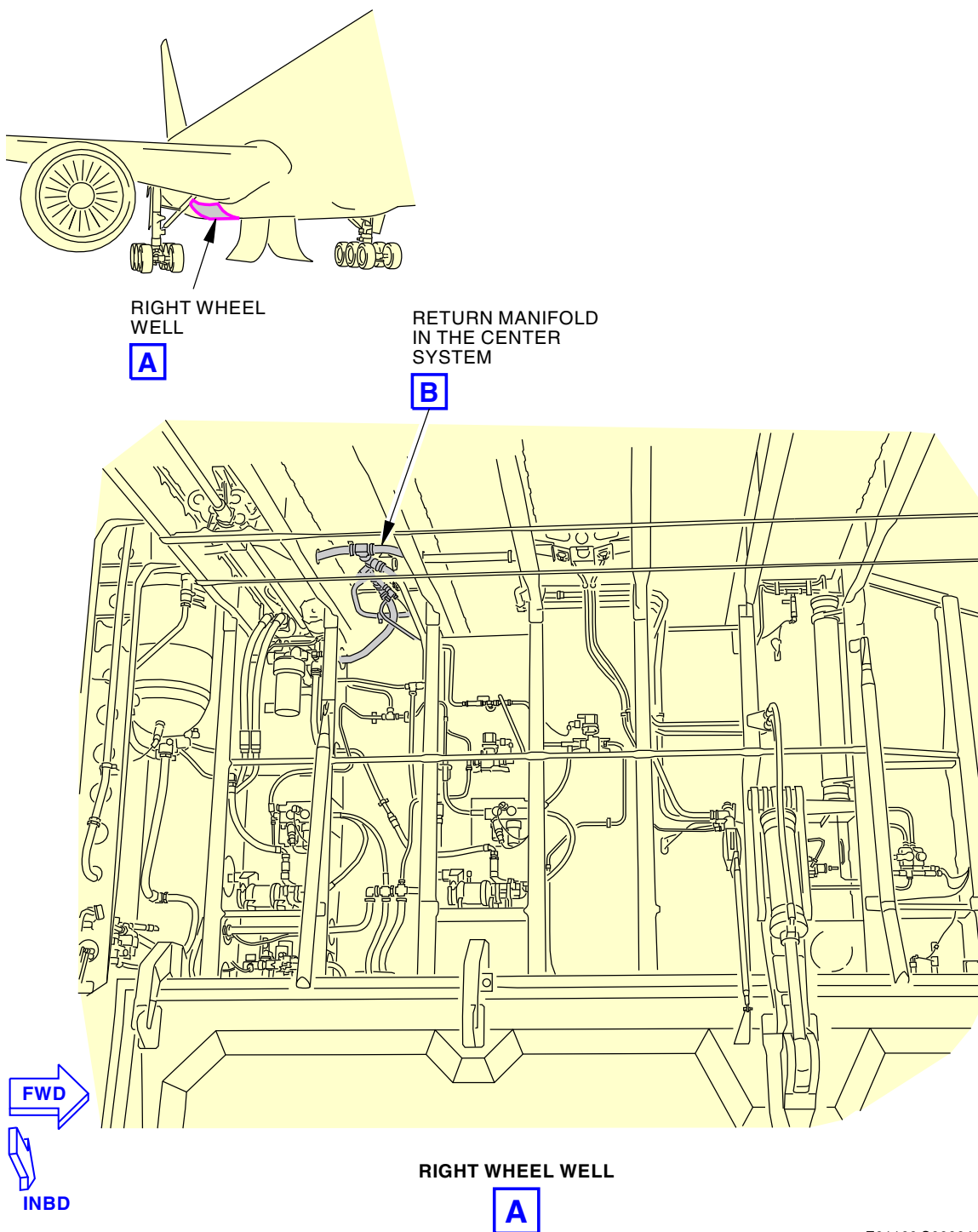
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Center System Return Manifold Installation
Figure 401/29-11-70-990-801 (Sheet 1 of 2)

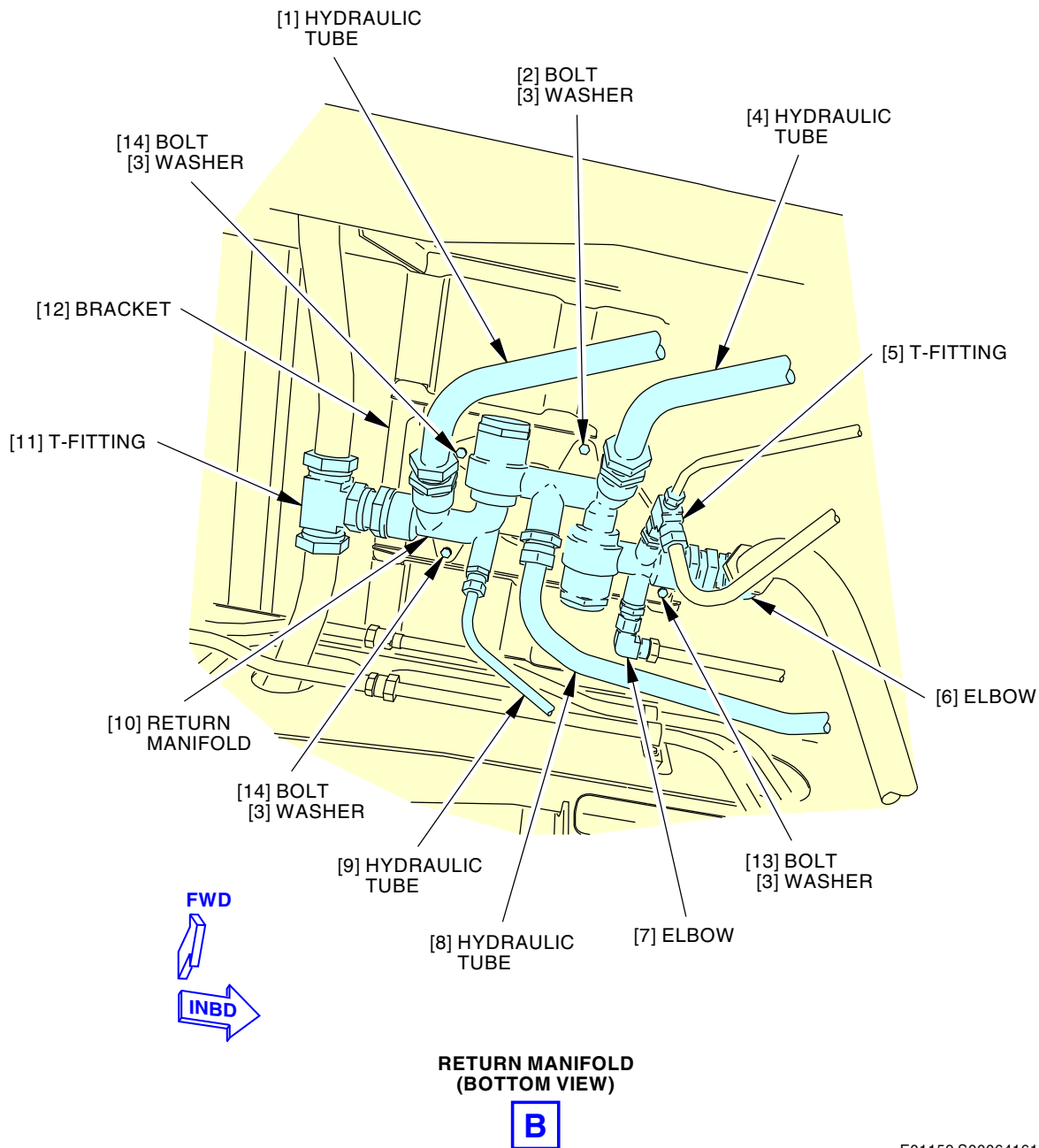
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Center System Return Manifold Installation
Figure 401/29-11-70-990-801 (Sheet 2 of 2)

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TASK 29-11-70-400-801

3. Center System Return Manifold Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-11-00-910-801	Standard Torque Values (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
10	Manifold assembly	29-11-70-01-005	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

E. Center System Return Manifold Installation

SUBTASK 29-11-70-160-001

- (1) Clean the mating surfaces of the manifold assembly [10] and the bracket [12].

SUBTASK 29-11-70-420-001

- (2) Remove the caps from these components:
- (a) The ports on the manifold assembly [10].
 - (b) The hydraulic tube [1], hydraulic tube [4], hydraulic tube [8], and hydraulic tube [9].
 - (c) The T-fitting [5] and T-fitting [11].
 - (d) The elbow [6] and elbow [7].

SUBTASK 29-11-70-390-001



WARNING

USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

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(WARNING PRECEDES)



DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (3) Apply a thin layer of Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the shank and the threads of the bolt [2], bolt [13], and bolts [14].

NOTE: You must install the bolt [2], bolt [13], and bolts [14] while the Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 is wet.

SUBTASK 29-11-70-420-002

- (4) Hold the manifold assembly [10] on the bracket [12].
- (a) Install the bolt [2], bolt [13], and bolts [14] and washers [3]. Refer to Standard Torque Values, TASK 20-11-00-910-801.
- NOTE: The countersink on the washers [3] must be against the head of each bolt [2], bolt [13], and bolts [14].

SUBTASK 29-11-70-420-003

- (5) Connect these components to the ports on the return manifold.
- (a) The hydraulic tube [1], hydraulic tube [4], hydraulic tube [8], and hydraulic tube [9].
- (b) The T-fitting [5] and T-fitting [11].
- (c) The elbow [6] and elbow [7].

F. Center System Return Manifold Installation Test

SUBTASK 29-11-70-860-002

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

SUBTASK 29-11-70-610-001

- (2) For the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-70-860-003

- (3) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-70-790-001

- (4) Make sure there are no leaks at the hydraulic tube connections to the manifold assembly [10].

SUBTASK 29-11-70-860-004

- (5) For the center hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-70-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To remove the hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-11-70-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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HYDRAULIC ACCUMULATOR - REMOVAL/INSTALLATION

1. General

- A. There are three hydraulic accumulators in the body section 48. The left, center and right hydraulic systems each have one hydraulic accumulator.
- B. This procedure has these tasks:
 - (1) A removal of the hydraulic accumulator.
 - (2) An installation of the hydraulic accumulator.
- C. You can use this procedure to remove and install each of the three hydraulic accumulators.

TASK 29-11-72-000-803-002

2. Hydraulic Accumulator Removal

(Figure 401)

A. **References**

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

B. **Location Zones**

Zone	Area
313	Stabilizer Torsion Box Compartment, Left
314	Stabilizer Torsion Box Compartment, Right

C. **Access Panels**

Number	Name/Location
313AL	Controls Bay Access Door

D. **Prepare for the Removal**

SUBTASK 29-11-72-860-017-002

- (1) For all the main hydraulic systems, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-72-860-018-002



YOU MUST PREVENT ALL POSSIBLE OPERATION OF THE HORIZONTAL STABILIZER WHEN YOU WORK ON OR NEAR IT. THE HORIZONTAL STABILIZER MOVES QUICKLY AND WITH FORCE. IF THE STABILIZER MOVES WHEN PERSONS ARE IN THE TORSION BOX COMPARTMENT OR NEAR THE STABILIZER, IT CAN CAUSE INJURY TO THEM.

- (2) To prevent the operation of the horizontal stabilizer, do these steps:
 - (a) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the SHUTOFF position.
 - (b) Make sure the amber VALVE CLOSED light below each switch comes on.

SUBTASK 29-11-72-010-003-002

- (3) Open this access panel to get access to the hydraulic accumulator:

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

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SUBTASK 29-11-72-860-019-002



WARNING

DO NOT ENTER THE COMPARTMENT WITHOUT FORCED AIR VENTILATION WHEN YOU SERVICE THE HYDRAULIC ACCUMULATORS. DO NOT RELEASE NITROGEN INTO THE COMPARTMENT WHEN SERVICING THE ACCUMULATORS. NITROGEN WILL DISPLACE AIR AND REDUCE THE OXYGEN LEVEL IN THE COMPARTMENT. A LACK OF OXYGEN CAN RESULT IN UNCONSCIOUSNESS OR DEATH. A SECOND MECHANIC WHO CAN OBSERVE THE WORK MUST BE LOCATED OUTSIDE THE COMPARTMENT WHEN NITROGEN IS BEING SERVICED IN A CLOSED COMPARTMENT.

- (4) Do these steps to remove the gas pressure from the applicable hydraulic accumulator [6], [18] or [20]:

- (a) Remove the cap [24] from the applicable charging valve [26].



WARNING

DO NOT LOOSEN THE BODY OF THE HYDRAULIC ACCUMULATOR CHARGING VALVE [26]. THE PRESSURE IN THE HYDRAULIC ACCUMULATORS CAN QUICKLY PUSH THE CHARGING VALVE [26] OFF THE MANIFOLD ASSEMBLY [28]. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Turn the outer nut [25] on the charging valve [26] one turn counterclockwise.

NOTE: This will release the gas pressure from the applicable hydraulic accumulator.

- (c) Make sure the applicable pressure gage on the service panel shows zero.
(d) Make sure you can not hear the flow of gas from the charging valve [26].

E. Hydraulic Accumulator Removal

SUBTASK 29-11-72-020-015-002

- (1) Disconnect the air pressure tube [7] or [19] from the applicable hydraulic accumulator: accumulator [6], accumulator [18], or accumulator [20].

SUBTASK 29-11-72-020-016-002

- (2) Disconnect the elbow [3], [14] or [23] on the hydraulic tube from the applicable hydraulic accumulator [6], [18] or [20].

SUBTASK 29-11-72-020-017-002

- (3) Loosen the two clamps [10] or [15] which hold the applicable hydraulic accumulator [6], [18] or [20].

SUBTASK 29-11-72-020-018-002

- (4) Remove the applicable hydraulic accumulator [6], [18] or [20] from the two clamps [10] or [15].

SUBTASK 29-11-72-020-019-002

- (5) Install caps on the air pressure tube [7] or [19] and the elbow [3], [14] or [23] to prevent contamination.

SUBTASK 29-11-72-020-020-002

- (6) If it is necessary to keep components for installation on the replacement hydraulic accumulator [6], [18] or [20], do this step:
(a) Remove the reducer [4] and [8] or [16] and [21] from the applicable hydraulic accumulator [6], [18] or [20].

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SUBTASK 29-11-72-020-021-002

- (7) Install caps on the open ports of the applicable hydraulic accumulator [6], [18] or [20].

———— **END OF TASK** ————

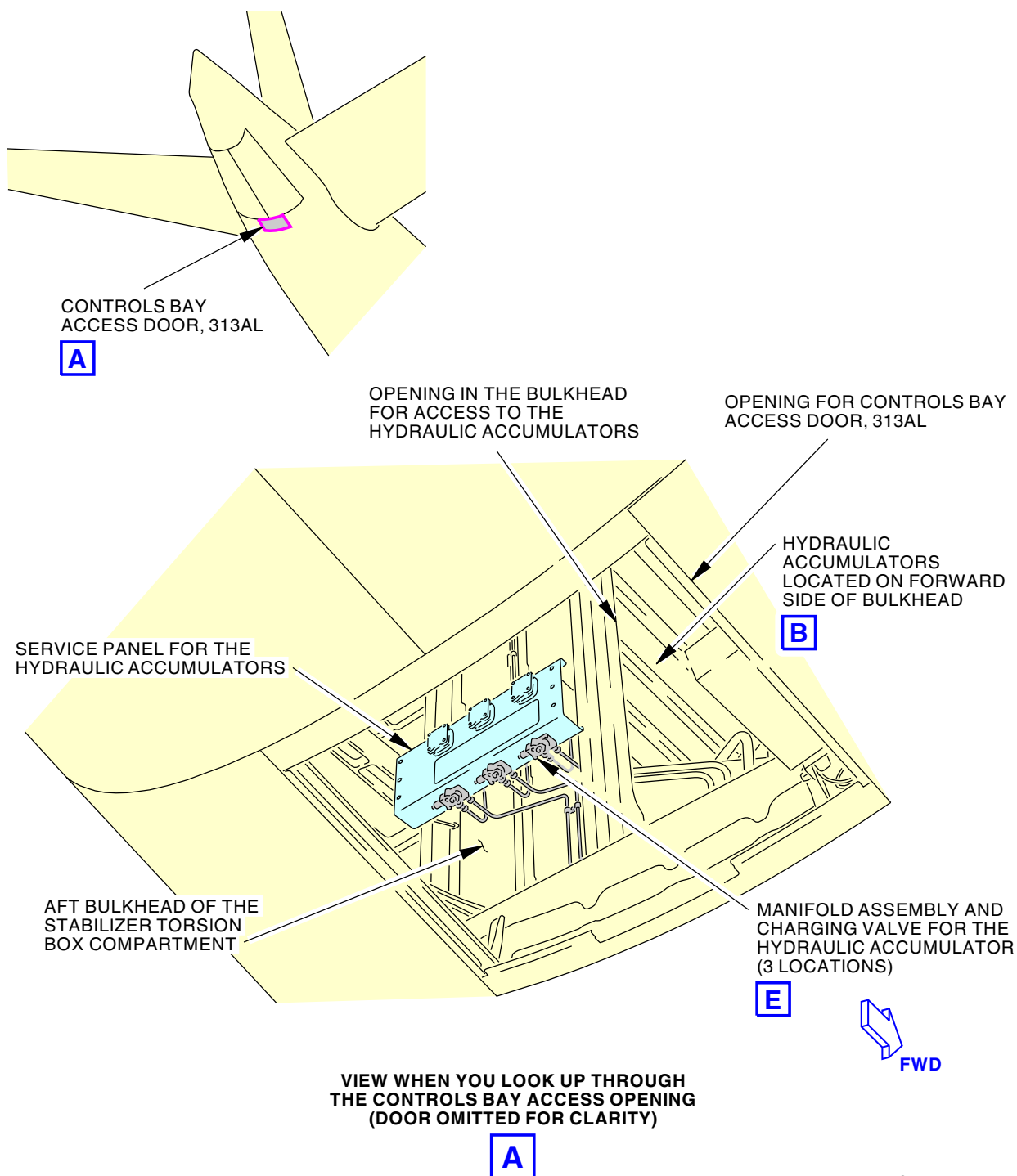
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**Hydraulic Accumulators Installation
Figure 401/29-11-72-990-803-002 (Sheet 1 of 5)**

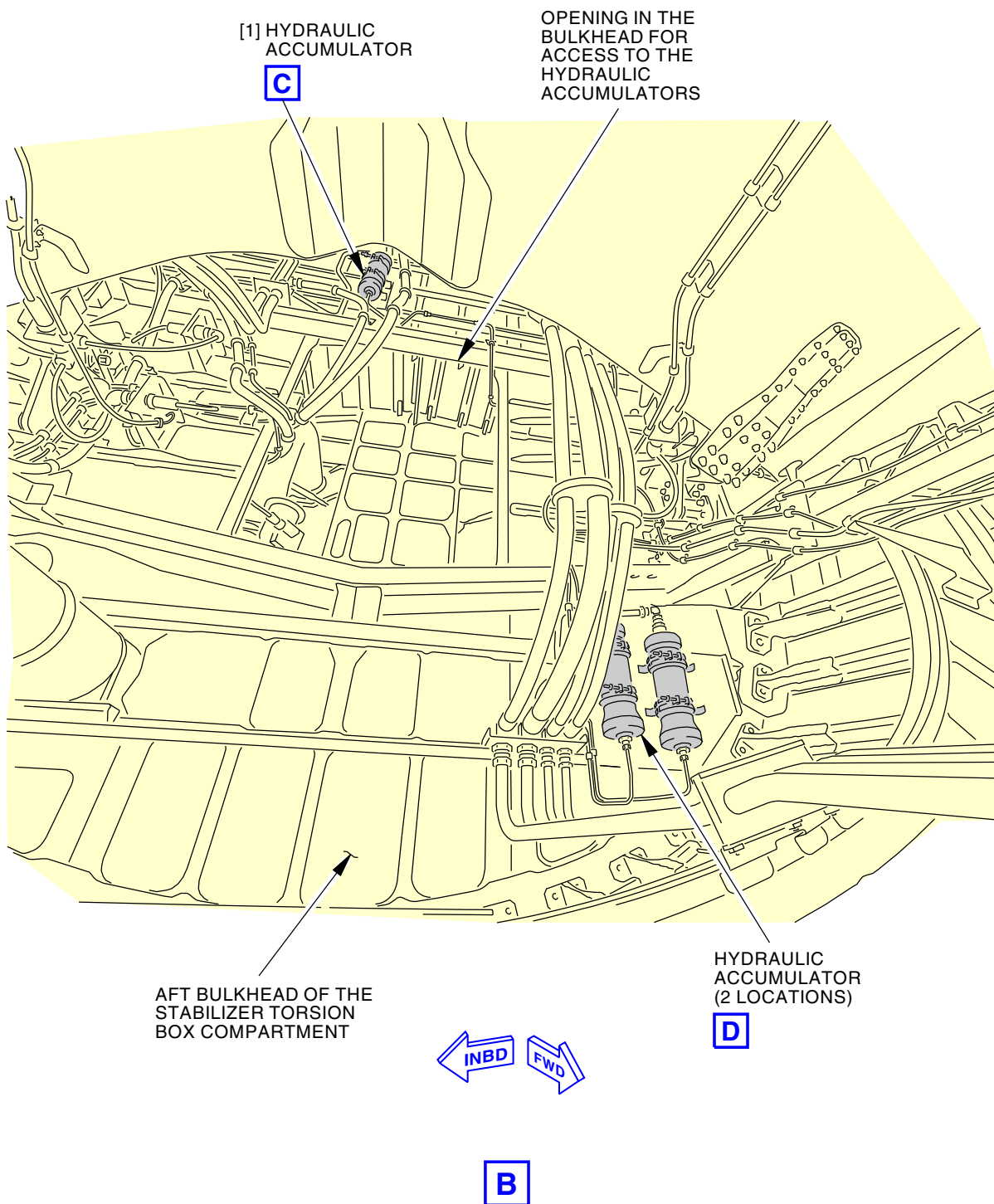
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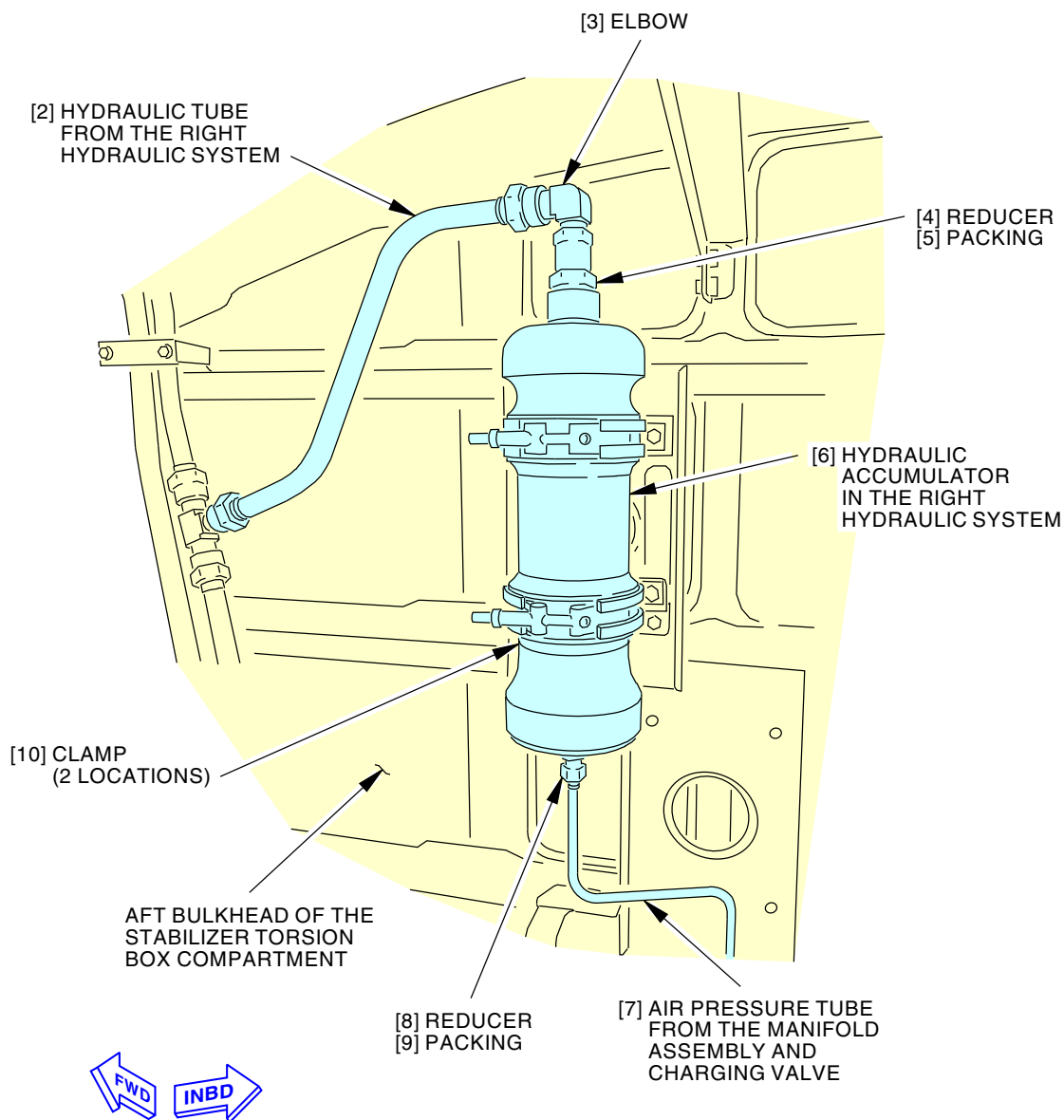
Hydraulic Accumulators Installation
Figure 401/29-11-72-990-803-002 (Sheet 2 of 5)

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**Hydraulic Accumulators Installation
Figure 401/29-11-72-990-803-002 (Sheet 3 of 5)**

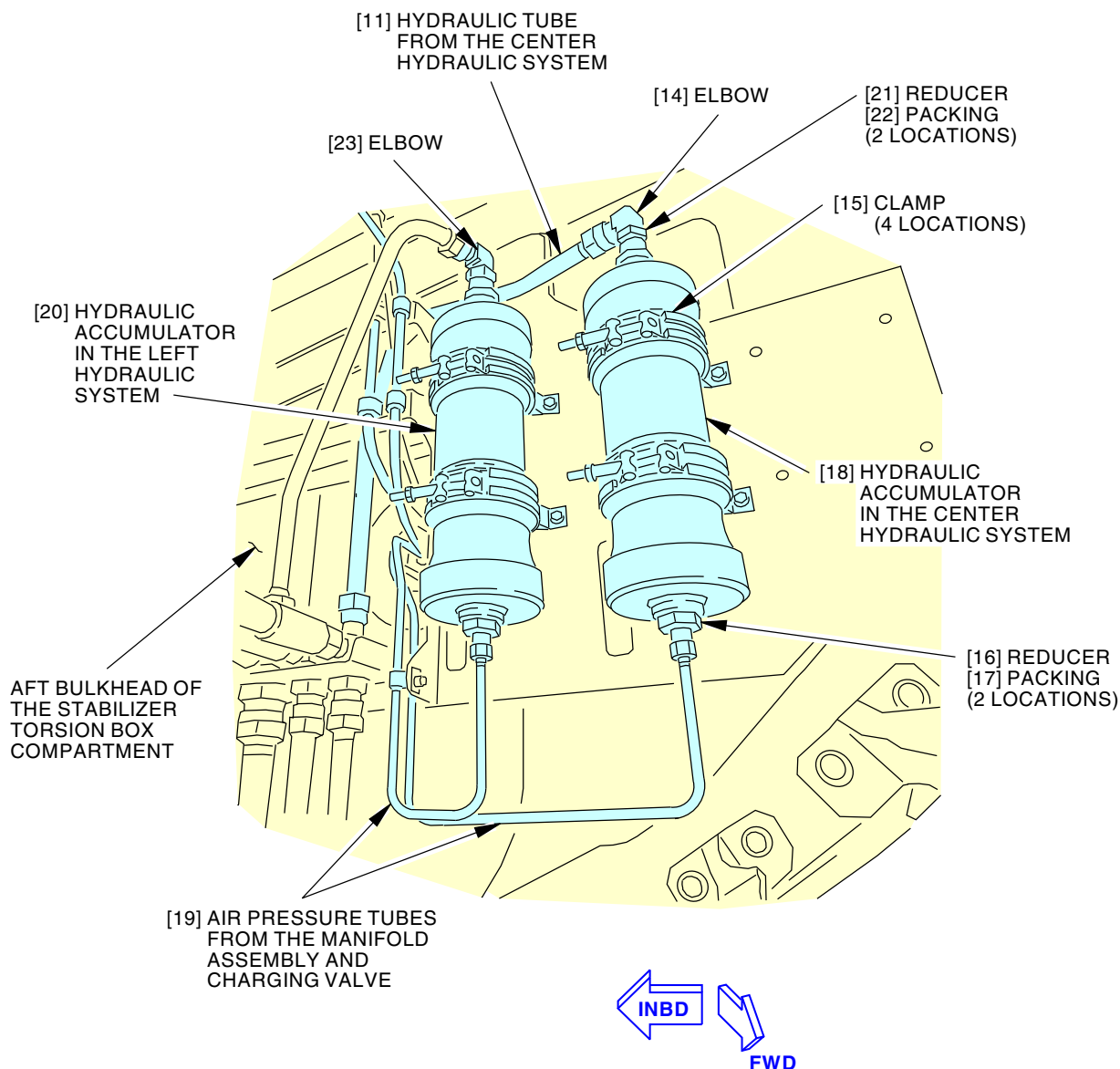
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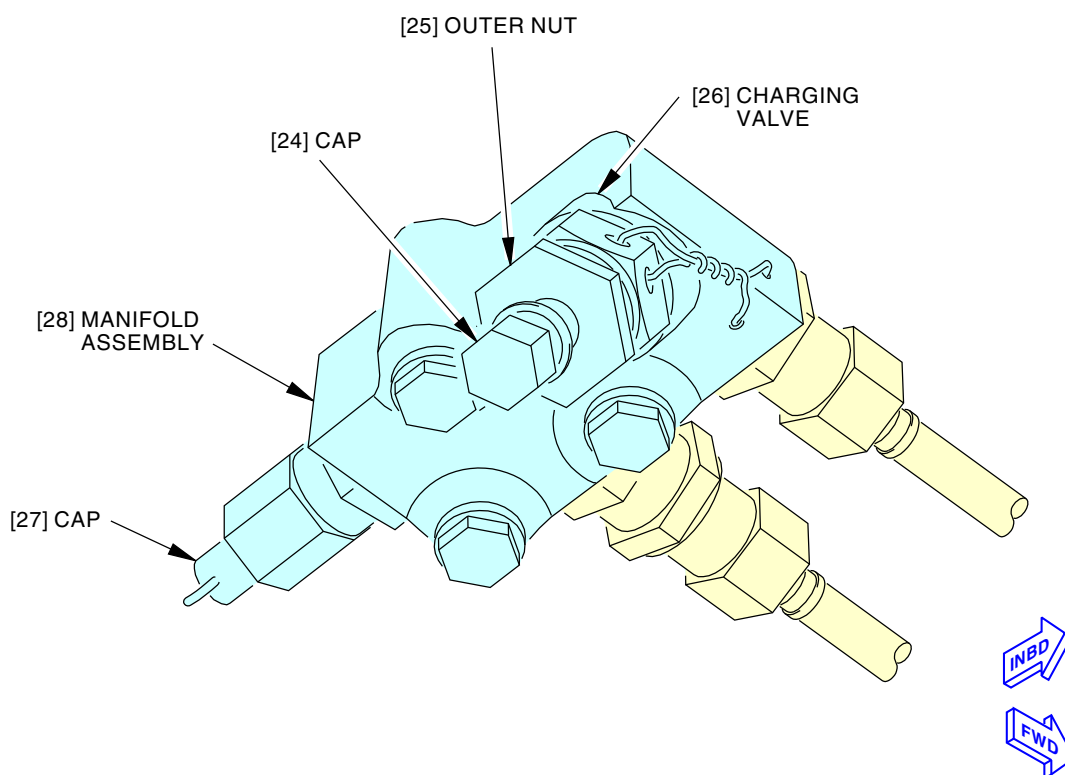
Hydraulic Accumulators Installation
Figure 401/29-11-72-990-803-002 (Sheet 4 of 5)

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Hydraulic Accumulators Installation
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TASK 29-11-72-400-803-002

3. Hydraulic Accumulator Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-15-10-610-802-002	Hydraulic Accumulator Servicing (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

C. Location Zones

Zone	Area
313	Stabilizer Torsion Box Compartment, Left
314	Stabilizer Torsion Box Compartment, Right

D. Access Panels

Number	Name/Location
313AL	Controls Bay Access Door

E. Hydraulic Accumulator Installation

SUBTASK 29-11-72-420-005-002

- (1) If it is necessary to install components on the replacement accumulator [6], accumulator [18], or accumulator [20] do these steps:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packings: packing [5], packing [9], packing [17] and packing [22].
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the threads on the reducers [4] and [8] or [16] and [21].
 - (c) Install the new packing [5] or [22] on the reducer [4] or [21].
 - (d) Install the new packing [9] or [17] on the reducer [8] or [16].
 - (e) Remove the caps from the ports on the applicable hydraulic accumulator [6], [18] or [20].
 - (f) Install the reducer [4] or [21] and reducer [8] or [16] in the ports of the applicable hydraulic accumulator [6], [18] or [20].

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SUBTASK 29-11-72-420-006-002

- (2) Remove the caps from the air pressure tube [7] or [19] and the elbow [3], [14] or [23].

SUBTASK 29-11-72-610-007-002

- (3) Fill the applicable hydraulic accumulator [6], [18] or [20] with hydraulic fluid, D50269 or hydraulic fluid, D00153 through the top port.

SUBTASK 29-11-72-410-015-002

- (4) Put the applicable hydraulic accumulator [6], [18] or [20] in the clamps [10] or [15].

SUBTASK 29-11-72-410-016-002

- (5) Loosely install the clamps [10] or [15] around the applicable hydraulic accumulator [6], [18] or [20].

SUBTASK 29-11-72-410-017-002

- (6) Turn the applicable hydraulic accumulator [6], [18] or [20] in the clamps [10] or [15] until you can easily see the nameplate.

SUBTASK 29-11-72-410-018-002

- (7) Connect the air pressure tube [7] or [19] to the applicable hydraulic accumulator [6], [18] or [20].

SUBTASK 29-11-72-410-019-002

- (8) Connect the elbow [3], [14] or [23], on the hydraulic tube, to the applicable hydraulic accumulator [6], [18] or [20].

SUBTASK 29-11-72-410-022

- (9) Tighten the clamps [10] or [15] to 60-90 pound-inches (6.78-10.17 Nm).

SUBTASK 29-11-72-110-003-002



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (10) To remove the hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

F. Hydraulic Accumulator Installation Test

SUBTASK 29-11-72-860-020-002



MAKE SURE THERE ARE NO PERSONS IN THE TORSION BOX COMPARTMENT OR NEAR THE HORIZONTAL STABILIZER BEFORE YOU OPERATE THE SWITCHES FOR THE FLIGHT CONTROL SHUTOFF VALVES. THE HORIZONTAL STABILIZER MOVES QUICKLY AND WITH FORCE. IF THE STABILIZER MOVES WHEN PERSONS ARE IN THE TORSION BOX COMPARTMENT OR NEAR THE STABILIZER, IT CAN CAUSE INJURY TO THEM.

- (1) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the NORM position.
 - (a) Make sure the amber VALVE CLOSED light below each switch goes off.

SUBTASK 29-11-72-610-008-002

- (2) For the applicable hydraulic system, do this task: Hydraulic Accumulator Servicing, TASK 12-15-10-610-802-002

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SUBTASK 29-11-72-860-021-002

- (3) For the applicable hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-72-860-022-002

- (4) For all main hydraulic systems, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-72-860-023-002



YOU MUST PREVENT ALL POSSIBLE OPERATION OF THE HORIZONTAL STABILIZER WHEN YOU WORK ON OR NEAR IT. THE HORIZONTAL STABILIZER MOVES QUICKLY AND WITH FORCE. IF THE STABILIZER MOVES WHEN PERSONS ARE IN THE TORSION BOX COMPARTMENT OR NEAR THE STABILIZER, IT CAN CAUSE INJURY TO THEM.

- (5) To prevent the operation of the horizontal stabilizer, do these steps:
- (a) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the SHUTOFF position.
 - (b) Make sure the amber VALVE CLOSED light below each switch comes on.

SUBTASK 29-11-72-790-005-002

- (6) Make sure there is no leak at the hydraulic tube [2] and [11], and the elbow [3], [14] or [23] at the connection to the hydraulic accumulator [6], [18] or [20].

SUBTASK 29-11-72-790-006-002

- (7) Use Snoop Leak Detector compound, G00091 to make sure there are no air leaks from the air pressure tube [7] or [19] at the connection to the applicable hydraulic accumulator [6], [18] or [20].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-72-410-021-002

- (1) Close this access panel:

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

SUBTASK 29-11-72-860-024-002

- (2) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the NORM position.

SUBTASK 29-11-72-210-003-002

- (3) Make sure the amber VALVE CLOSED light below each switch goes off.

SUBTASK 29-11-72-610-009-002

- (4) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

————— END OF TASK —————

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HYDRAULIC ACCUMULATOR PRESSURE GAGE - REMOVAL/INSTALLATION

1. General

- A. There are three pressure gages on the service panel, for the hydraulic accumulators, in body section 48. There is one gage for each main hydraulic system.
- B. This procedure has these tasks:
 - (1) A removal of the hydraulic accumulator pressure gage.
 - (2) An installation of the hydraulic accumulator pressure gage.
- C. You can use this procedure to remove and install each of the three hydraulic accumulator pressure gages.

TASK 29-11-73-000-801

2. Hydraulic Accumulator Pressure Gage Removal

(Figure 401)

A. **References**

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

B. **Location Zones**

Zone	Area
313	Stabilizer Torsion Box Compartment, Left
314	Stabilizer Torsion Box Compartment, Right

C. **Access Panels**

Number	Name/Location
313AL	Controls Bay Access Door

D. **Prepare for the Removal**

SUBTASK 29-11-73-860-001

- (1) For all the main hydraulic systems, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-73-860-002

 WARNING	YOU MUST PREVENT ALL POSSIBLE OPERATION OF THE HORIZONTAL STABILIZER WHEN YOU WORK ON OR NEAR IT. THE HORIZONTAL STABILIZER MOVES QUICKLY AND WITH FORCE. IF THE STABILIZER MOVES WHEN PERSONS ARE IN THE TORSION BOX COMPARTMENT OR NEAR THE STABILIZER, IT CAN CAUSE INJURY TO THEM.

- (2) To prevent the operation of the horizontal stabilizer, do these steps:
 - (a) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the SHUTOFF position.
 - (b) Make sure the amber VALVE CLOSED light below each switch comes on.

SUBTASK 29-11-73-010-001

- (3) Open this access panel to get access to the service panel for the hydraulic accumulator:

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

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SUBTASK 29-11-73-860-003



DO NOT ENTER THE COMPARTMENT WITHOUT FORCED AIR VENTILATION WHEN YOU SERVICE THE HYDRAULIC ACCUMULATORS. DO NOT RELEASE NITROGEN INTO THE COMPARTMENT WHEN SERVICING THE ACCUMULATORS. NITROGEN WILL DISPLACE AIR AND REDUCE THE OXYGEN LEVEL IN THE COMPARTMENT. A LACK OF OXYGEN CAN RESULT IN UNCONSCIOUSNESS OR DEATH. A SECOND MECHANIC WHO CAN OBSERVE THE WORK MUST BE LOCATED OUTSIDE THE COMPARTMENT WHEN NITROGEN IS BEING SERVICED IN A CLOSED COMPARTMENT.

- (4) Do these steps to remove the gas pressure from the applicable hydraulic accumulator.
- (a) Remove the cap [16] from the applicable charging valve [18].



DO NOT LOOSEN THE BODY OF THE HYDRAULIC ACCUMULATOR CHARGING VALVE [18]. THE PRESSURE IN THE HYDRAULIC ACCUMULATORS CAN QUICKLY PUSH THE CHARGING VALVE [18] OFF THE MANIFOLD ASSEMBLY [20]. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Turn the outer nut [17] on the charging valve [18] one turn counterclockwise.
- NOTE: This will release the gas pressure from the applicable hydraulic accumulator.
- (c) Make sure the applicable pressure gage on the service panel shows zero.
- (d) Make sure you can not hear the flow of gas from the charging valve [18].

E. Hydraulic Accumulator Pressure Gage Removal

SUBTASK 29-11-73-020-001

- (1) Disconnect the air pressure tube [1] from the hydraulic accumulator pressure gage (referred to as the pressure gage [6] in this procedure).

SUBTASK 29-11-73-020-002

- (2) Remove the nuts [15] behind the service panel [2].

SUBTASK 29-11-73-020-003

- (3) Remove the bolts [9] which attach the shield [8], flange [5], and flange [7] to the service panel [2].

SUBTASK 29-11-73-020-004

- (4) Remove the shield [8] and spacers [13].

SUBTASK 29-11-73-020-005

- (5) Remove the pressure gage [6], the flange [5], and the flange [7].

SUBTASK 29-11-73-020-006

- (6) Remove the flange [5] and the flange [7] from the pressure gage [6].

SUBTASK 29-11-73-020-007

- (7) If it is necessary to keep components for installation on the replacement pressure gage [6], do this step:
- (a) Remove the union [3] from the pressure gage [6].

SUBTASK 29-11-73-020-008

- (8) Install caps on the air pressure tube [1] and the open port on the pressure gage [6] to prevent contamination.

————— END OF TASK —————

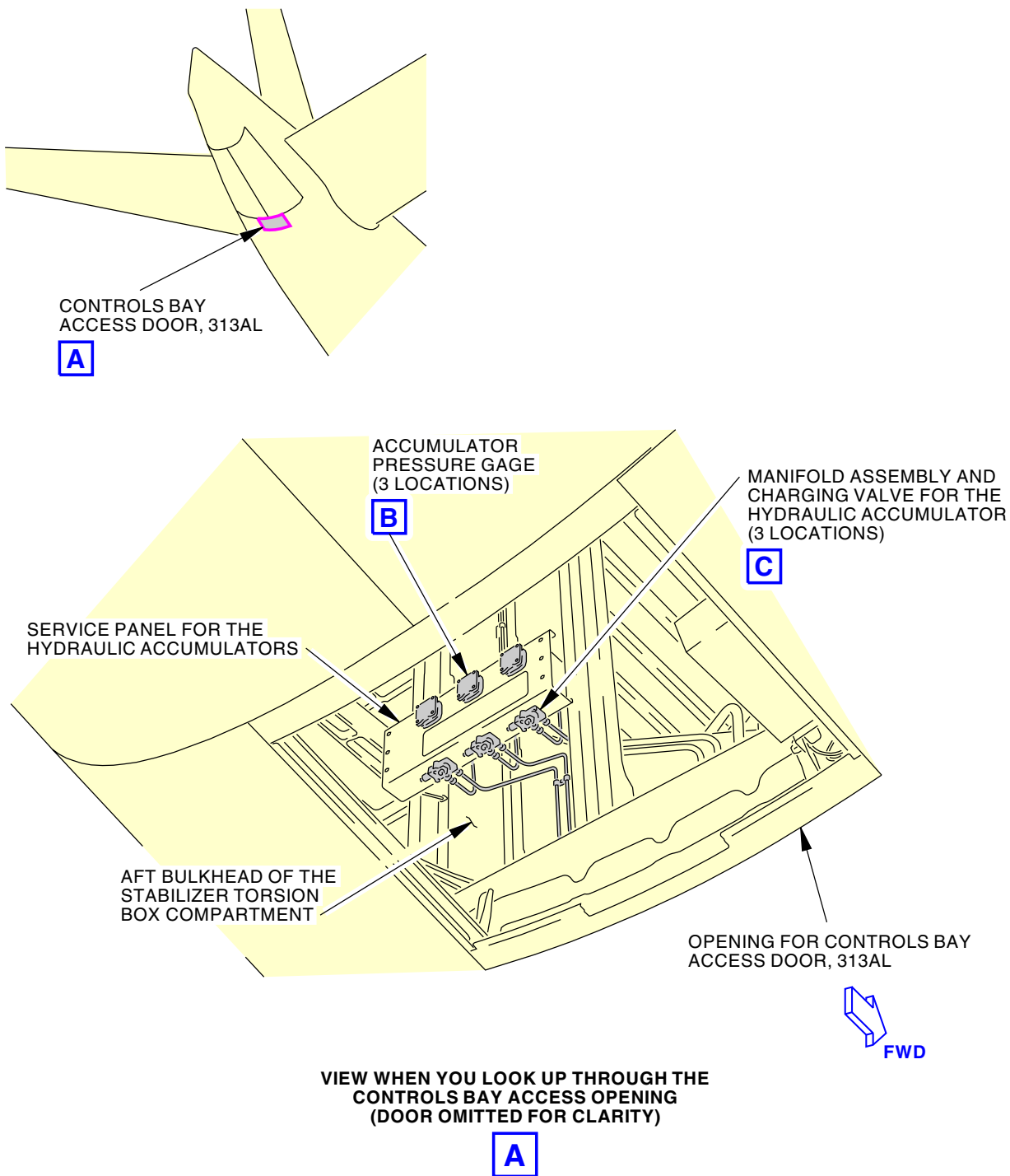
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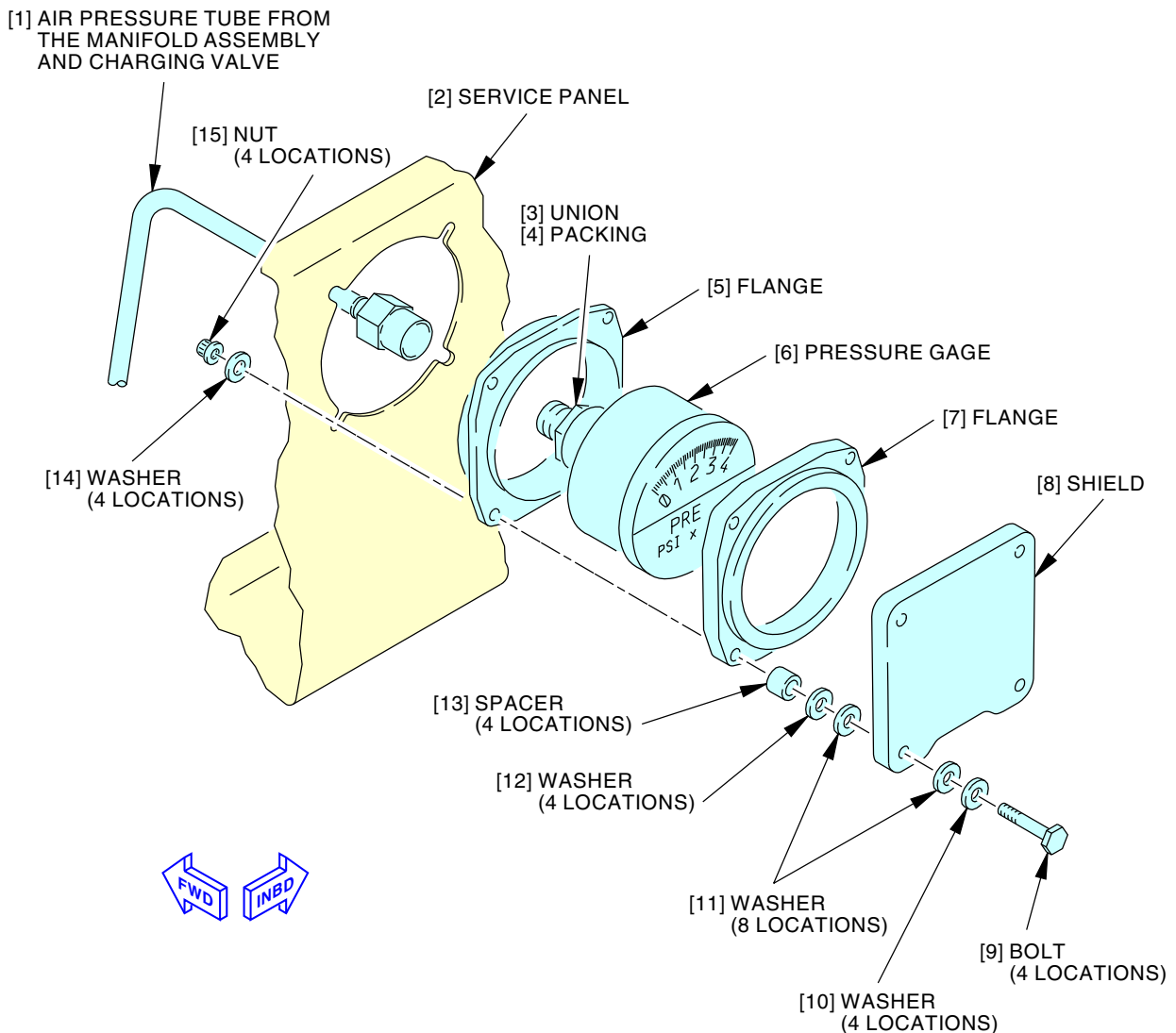
**Hydraulic Accumulator Pressure Gage Installation
Figure 401/29-11-73-990-801 (Sheet 1 of 3)**

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**Hydraulic Accumulator Pressure Gage Installation
Figure 401/29-11-73-990-801 (Sheet 2 of 3)**

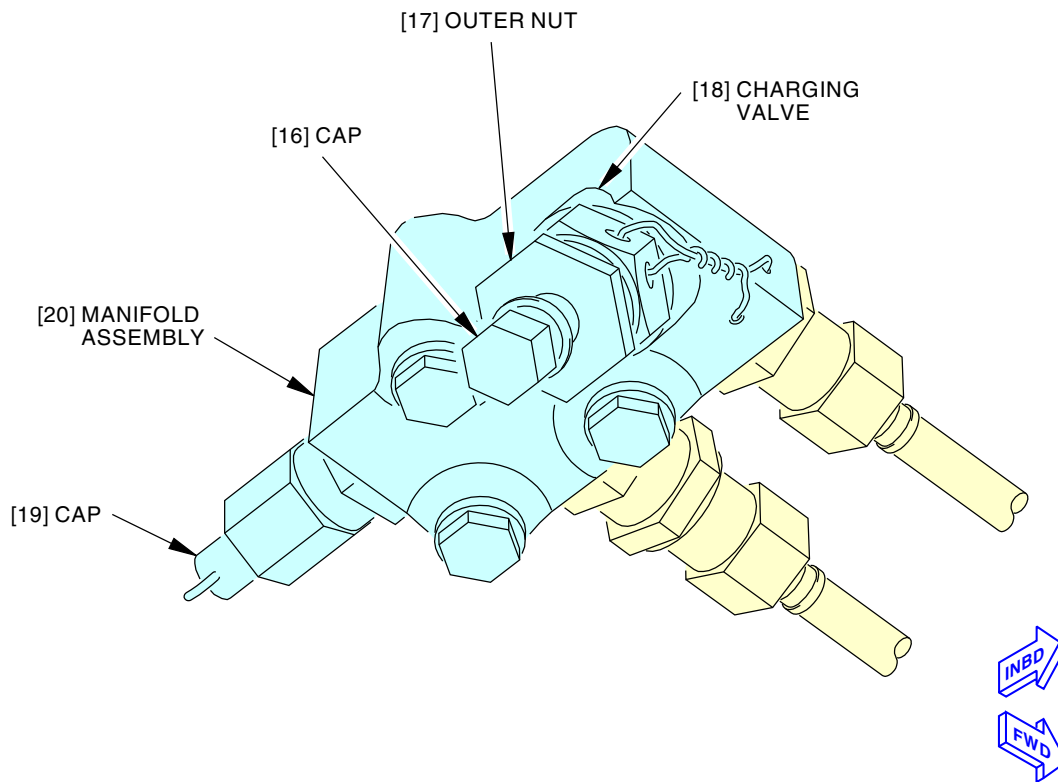
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Hydraulic Accumulator Pressure Gage Installation
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TASK 29-11-73-400-801

3. Hydraulic Accumulator Pressure Gage Installation

(Figure 401)

A. References

Reference	Title
12-15-10-610-802-002	Hydraulic Accumulator Servicing (P/B 301)
20-11-00-910-801	Standard Torque Values (P/B 201)

B. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Packing	29-11-71-30-095	ARO ALL
		29-11-73-01-055	ARO ALL
6	Pressure gage	29-11-71-30-085	ARO ALL
		29-11-73-01-045	ARO ALL

D. Location Zones

Zone	Area
313	Stabilizer Torsion Box Compartment, Left
314	Stabilizer Torsion Box Compartment, Right

E. Access Panels

Number	Name/Location
313AL	Controls Bay Access Door

F. Hydraulic Accumulator Pressure Gage Installation

SUBTASK 29-11-73-420-001

- (1) Remove the caps from the air pressure tube [1] and the port on the hydraulic accumulator pressure gage (referred to as the pressure gage [6] in this procedure).

SUBTASK 29-11-73-420-002

- (2) If it is necessary to install components on the replacement pressure gage [6], do these steps:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [4] and to the threads of the union [3].

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- (b) Install the new packing [4] on the union [3].
- (c) Install the union [3] in the port on the pressure gage [6].

SUBTASK 29-11-73-420-003

- (3) Put the flange [5] and the flange [7] on the pressure gage [6].

SUBTASK 29-11-73-420-004

- (4) Put the flange [5], flange [7], and the pressure gage [6] in the opening in the service panel [2].
 - (a) Turn the pressure gage [6] to the correct position.

SUBTASK 29-11-73-390-001



USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.



DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (5) Apply a layer of Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the shank and threads of the bolts [9].

SUBTASK 29-11-73-420-005

- (6) Hold the shield [8] against the flange [7] and install these components:

NOTE: Make sure you install the washers [11] against each surface of the shield [8].

- (a) Install the bolts [9], washers [10], washers [11], washers [12], spacers [13], washers [14], and nuts [15]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 29-11-73-420-006

- (7) Connect the air pressure tube [1] to the pressure gage [6].

SUBTASK 29-11-73-610-001

- (8) For the applicable hydraulic system, do this task: Hydraulic Accumulator Servicing, TASK 12-15-10-610-802-002

SUBTASK 29-11-73-790-001

- (9) Use Snoop Leak Detector compound, G00091 to make sure there are no air leaks from the air pressure tube [1] at the connection to the pressure gage [6].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-73-410-001

- (1) Close this access panel:

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

SUBTASK 29-11-73-860-004

- (2) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the NORM position.

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SUBTASK 29-11-73-210-001

- (3) Make sure the amber VALVE CLOSED light below each switch goes off.

————— **END OF TASK** —————

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HYDRAULIC ACCUMULATOR MANIFOLD ASSEMBLY AND CHARGING VALVE - REMOVAL/ INSTALLATION

1. General

- A. There are three manifold assemblies and charging valves on the service panel, for the hydraulic accumulators, in body section 48. There is one manifold assembly and charging valve for each main hydraulic system.
- B. This procedure has these tasks:
 - (1) A removal of the hydraulic accumulator manifold assembly and charging valve.
 - (2) An installation of the hydraulic accumulator manifold assembly and charging valve.
- C. You can use this procedure to remove and install each of the three manifold assemblies and charging valves.

TASK 29-11-74-000-801

2. Hydraulic Accumulator Manifold Assembly and Charging Valve Removal

(Figure 401)

A. **References**

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

B. **Location Zones**

Zone	Area
313	Stabilizer Torsion Box Compartment, Left
314	Stabilizer Torsion Box Compartment, Right

C. **Access Panels**

Number	Name/Location
313AL	Controls Bay Access Door

D. **Prepare for the Removal**

SUBTASK 29-11-74-860-001

- (1) For all the main hydraulic systems, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-11-74-860-002



YOU MUST PREVENT ALL POSSIBLE OPERATION OF THE HORIZONTAL STABILIZER WHEN YOU WORK ON OR NEAR IT. THE HORIZONTAL STABILIZER MOVES QUICKLY AND WITH FORCE. IF THE STABILIZER MOVES WHEN PERSONS ARE IN THE TORSION BOX COMPARTMENT OR NEAR THE STABILIZER, IT CAN CAUSE INJURY TO THEM.

- (2) To prevent the operation of the horizontal stabilizer, do these steps:
 - (a) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the SHUTOFF position.
 - (b) Make sure the amber VALVE CLOSED light below each switch comes on.

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SUBTASK 29-11-74-010-001

- (3) Open this access panel to get access to the service panel for the hydraulic accumulator.

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

SUBTASK 29-11-74-860-003



WARNING

DO NOT ENTER THE COMPARTMENT WITHOUT FORCED AIR VENTILATION WHEN YOU SERVICE THE HYDRAULIC ACCUMULATORS. DO NOT RELEASE NITROGEN INTO THE COMPARTMENT WHEN SERVICING THE ACCUMULATORS. NITROGEN WILL DISPLACE AIR AND REDUCE THE OXYGEN LEVEL IN THE COMPARTMENT. A LACK OF OXYGEN CAN RESULT IN UNCONSCIOUSNESS OR DEATH. A SECOND MECHANIC WHO CAN OBSERVE THE WORK MUST BE LOCATED OUTSIDE THE COMPARTMENT WHEN NITROGEN IS BEING SERVICED IN A CLOSED COMPARTMENT.

- (4) Do these steps to remove the gas pressure from the applicable hydraulic accumulator.
- (a) Remove the cap [3] from the applicable charging valve [5].



WARNING

DO NOT LOOSEN THE BODY OF THE HYDRAULIC ACCUMULATOR CHARGING VALVE [5]. THE PRESSURE IN THE HYDRAULIC ACCUMULATORS CAN QUICKLY PUSH THE CHARGING VALVE [5] OFF THE MANIFOLD ASSEMBLY [15]. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Turn the outer nut [4] on the charging valve [5] one turn counterclockwise.
- NOTE: This will release the gas pressure from the applicable hydraulic accumulator.
- (c) Make sure the applicable pressure gage on the service panel shows zero.
- (d) Make sure you can not hear the flow of gas from the charging valve [5].

E. Hydraulic Accumulator Manifold and Charging Valve Removal

SUBTASK 29-11-74-020-001

- (1) Do these steps if you will remove only the charging valve [5]:
- (a) Remove the charging valve [5] from the manifold assembly [15].
- (b) Remove the packing [16] from the charging valve [5].
- (c) Install a cap on the opening in the manifold assembly [15] to prevent contamination.

SUBTASK 29-11-74-020-002

- (2) Do these steps if you will remove the manifold assembly [15] with the charging valve [5] attached:
- (a) Disconnect the air pressure tube [8] and the air pressure tube [9] from the manifold assembly [15].
- (b) Hold the manifold assembly [15] while you remove the bolts [1].
- (c) Remove the manifold assembly [15] from the service panel for the hydraulic accumulators.
- (d) If it is necessary to keep components for installation on the replacement manifold assembly [15], do these steps:
- 1) Remove the union [6], the union [12], the cap [14], and the snubber [10] from the manifold assembly [15].

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- 2) Remove the packing [7] from the union [6].
 - 3) Remove the packing [11] from the snubber [10].
 - 4) Remove the packing [13] from the union [12].
- (e) Install caps on the air pressure tubes [8] and [9] and in the openings in the manifold assembly [15] to prevent contamination.

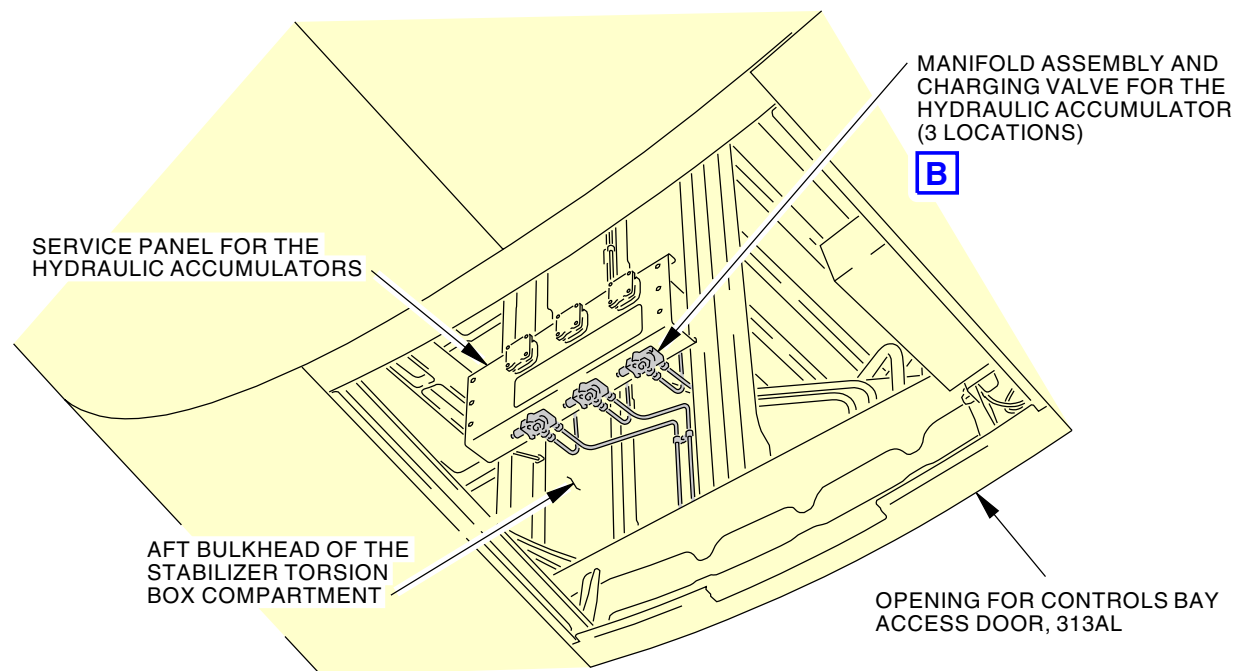
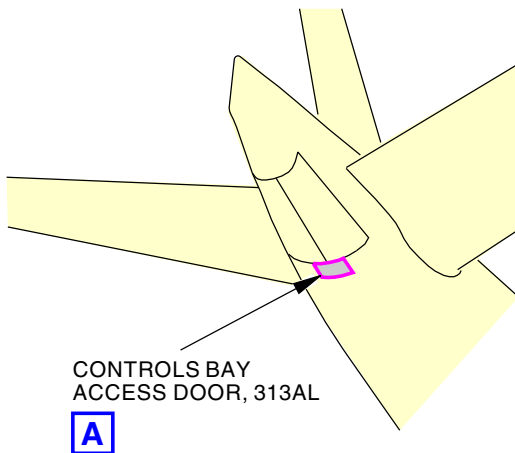
———— **END OF TASK** ————

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**VIEW WHEN YOU LOOK UP THROUGH THE
CONTROLS BAY ACCESS OPENING
(DOOR OMITTED FOR CLARITY)**

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**Hydraulic Accumulator Manifold Assembly and Charging Valve Installation
Figure 401/29-11-74-990-801 (Sheet 1 of 2)**

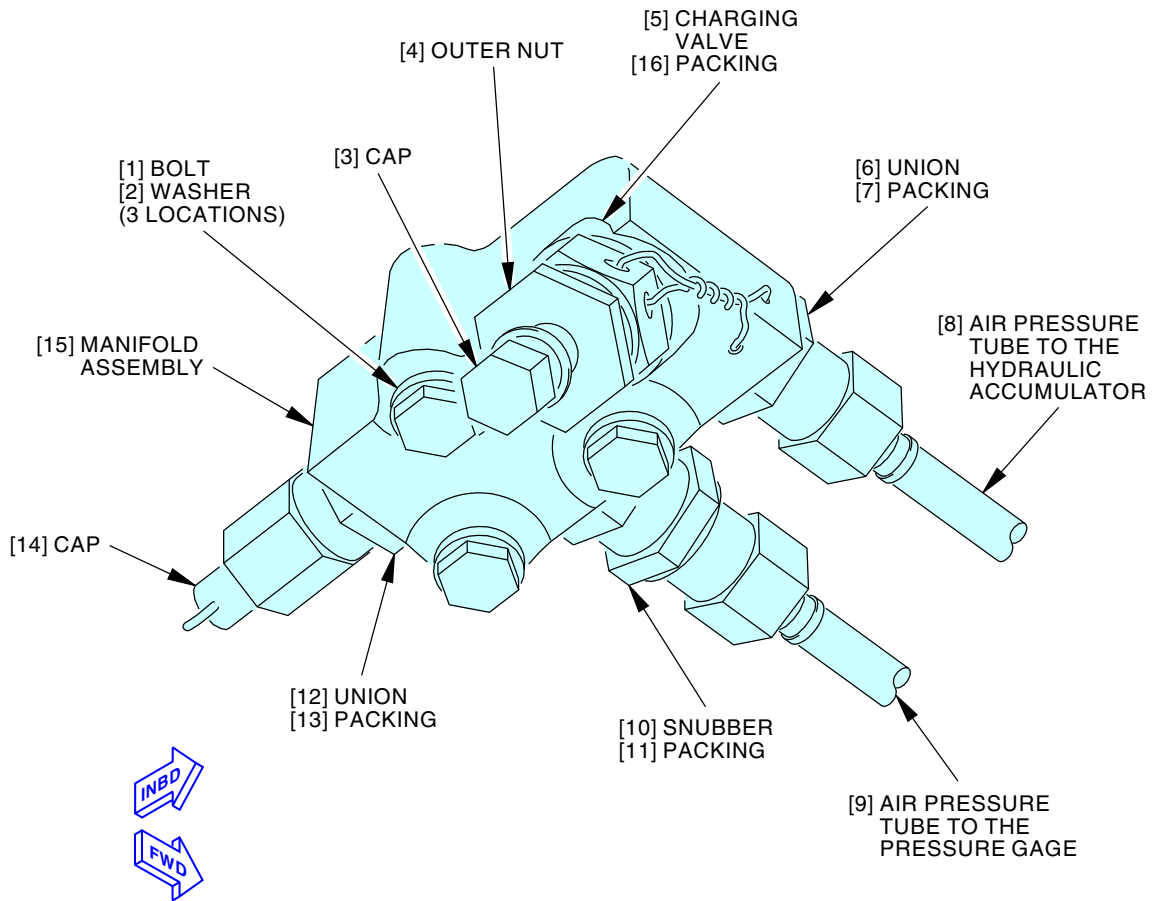
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Hydraulic Accumulator Manifold Assembly and Charging Valve Installation
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TASK 29-11-74-400-801

3. Hydraulic Accumulator Manifold Assembly and Charging Valve Installation

(Figure 401)

A. References

Reference	Title
12-15-10-610-802-002	Hydraulic Accumulator Servicing (P/B 301)
20-11-00-910-801	Standard Torque Values (P/B 201)

B. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Charging valve	29-11-74-01-020	ARO ALL
7	Packing	29-11-74-01-035	ARO ALL
11	Packing	29-11-74-01-045	ARO ALL
13	Packing	29-11-74-01-060	ARO ALL
15	Manifold assembly	29-11-74-01-065	ARO ALL
16	Packing	29-11-74-01-025	ARO ALL

D. Location Zones

Zone	Area
313	Stabilizer Torsion Box Compartment, Left
314	Stabilizer Torsion Box Compartment, Right

E. Access Panels

Number	Name/Location
313AL	Controls Bay Access Door

F. Hydraulic Accumulator Manifold and Charging Valve Installation

SUBTASK 29-11-74-420-001

- (1) Do these steps if you will install only the charging valve [5]:
 - (a) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [16] and to the threads of the charging valve [5].
 - (b) Install the packing [16] on the charging valve [5].

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- (c) Remove the cap from the opening in the manifold assembly [15].
- (d) Install the charging valve [5] on the manifold assembly [15].
- (e) Install the cap [3] on the charging valve [5].

SUBTASK 29-11-74-420-002



USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.



DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (2) Do these steps if you will install the manifold assembly [15] with the charging valve [5] attached:
 - (a) If it is necessary to install components on the replacement manifold assembly [15], do these steps:
 - 1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [7], the new packing [11], and the new packing [13].
 - 2) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the threads of the union [6], the union [12], and the snubber [10].
 - 3) Install the packing [13] on the union [12].
 - 4) Install the packing [11] on the snubber [10].
 - 5) Install the packing [7] on the union [6].
 - 6) Remove the caps from the openings in the manifold assembly [15].
 - 7) Install the union [6], the union [12], and the snubber [10] on the manifold assembly [15].
 - 8) Install the cap [14] on the union [12].
 - (b) Remove the caps from the air pressure tube [8] and air pressure tube [9].
 - (c) Apply a layer of Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the shank and threads of the bolts [1].
 - (d) Hold the manifold assembly [15] on the service panel for the hydraulic accumulators while you install the bolts [1] and the washers [2]. Refer to Standard Torque Values, TASK 20-11-00-910-801.
 - (e) Connect the air pressure tube [8] and the air pressure tube [9] to the manifold assembly [15].

SUBTASK 29-11-74-610-001

- (3) For the applicable hydraulic system, do this task: Hydraulic Accumulator Servicing, TASK 12-15-10-610-802-002

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SUBTASK 29-11-74-790-001

- (4) Use Snoop Leak Detector compound, G00091 to make sure there are no air leaks from the air pressure tube [8] or air pressure tube [9] at the connection to the manifold assembly [15].

SUBTASK 29-11-74-790-002

- (5) Use Snoop Leak Detector compound, G00091 to make sure there are no air leaks from the charging valve [5].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-74-410-001

- (1) Close this access panel:

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

SUBTASK 29-11-74-860-004

- (2) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the NORM position.

SUBTASK 29-11-74-210-001

- (3) Make sure the amber VALVE CLOSED light below each switch goes off.

————— **END OF TASK** —————

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HYDRAULIC/RAM AIR TURBINE MODULE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) Hydraulic/Ram Air Turbine Module Removal
 - (2) Hydraulic/Ram Air Turbine Module Installation

TASK 29-11-80-000-801

2. Hydraulic/Ram Air Turbine Removal

(Figure 401)

A. General

- (1) The HYDRAULIC/RAM AIR TURBINE module assembly [2] is found on the Pilot's Overhead Panel, P5.

B. References

Reference	Title
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. Procedure

SUBTASK 29-11-80-860-001

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

SUBTASK 29-11-80-020-001

- (2) Hold the HYDRAULIC/RAM AIR TURBINE module assembly [2] and turn the six quarter-turn fasteners [1] which hold the HYDRAULIC/RAM AIR TURBINE module assembly [2] to the Pilot's Overhead Panel, P5.

SUBTASK 29-11-80-020-002

- (3) Carefully lower the HYDRAULIC/RAM AIR TURBINE module assembly [2] out of the Pilot's Overhead Panel, P5 to get access to the electrical connectors.

SUBTASK 29-11-80-020-003

- (4) Disconnect the electrical connectors [3], [4] and [5].

SUBTASK 29-11-80-020-004

- (5) Remove the HYDRAULIC/RAM AIR TURBINE module assembly [2].

SUBTASK 29-11-80-020-005

- (6) Install protective caps on the electrical connectors [3], [4], [5] and on the module assembly [2] to prevent damage or contamination.

————— **END OF TASK** —————

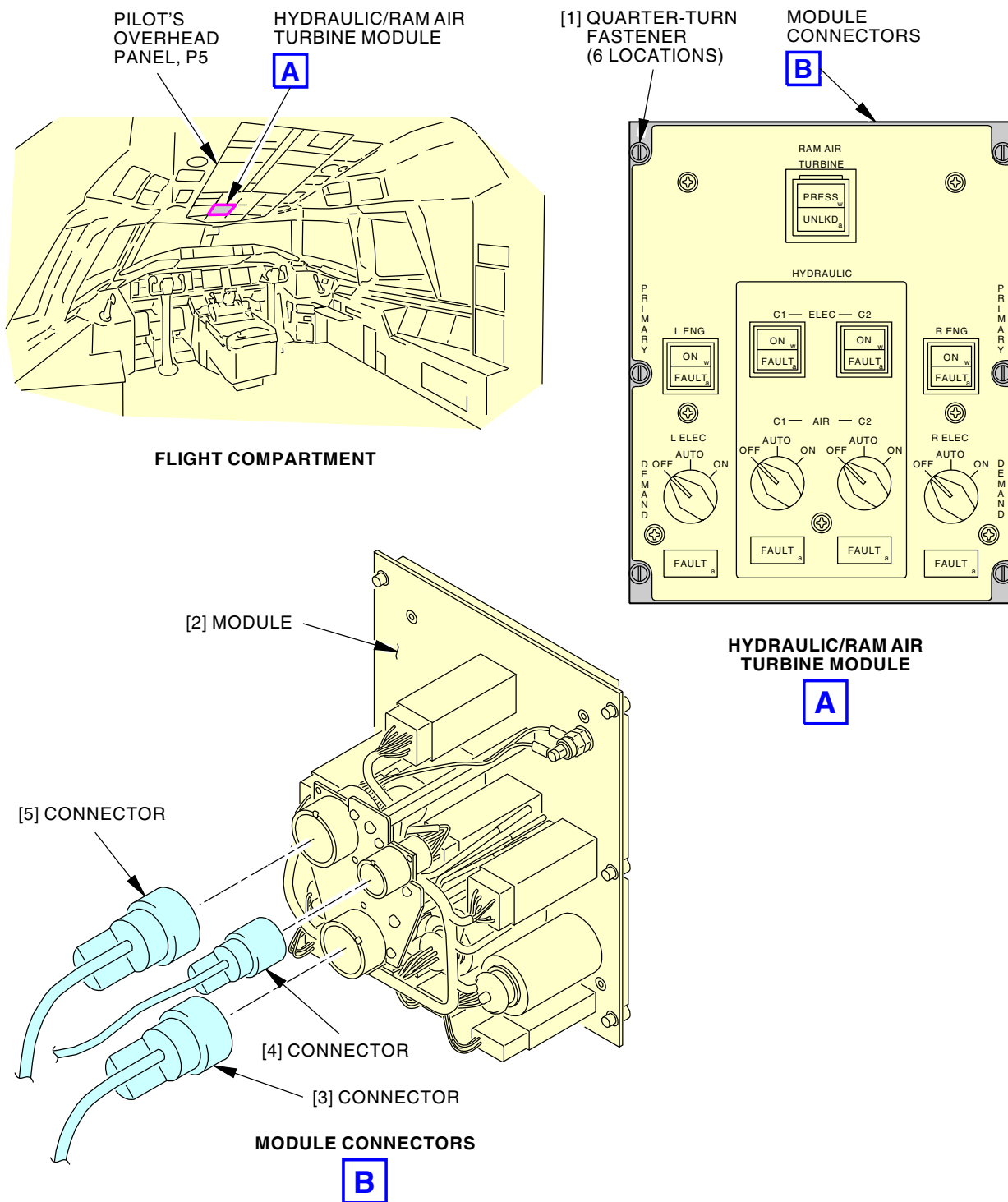
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Hydraulic/Ram Air Turbine Module Installation
Figure 401/29-11-80-990-801

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TASK 29-11-80-400-801

3. **Hydraulic/Ram Air Turbine Installation**

(Figure 401)

A. General

- (1) The HYDRAULIC/RAM AIR TURBINE module assembly [2] is found on the Pilot's Overhead Panel, P5.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-80-700-801	Hydraulic/Ram Air Turbine Module - Operational Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Module assembly	29-21-17-01-005	ARO ALL

D. Location Zones

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

E. Procedure

SUBTASK 29-11-80-420-001

- (1) Remove the protective caps from the electrical connectors [3], [4], [5] and the module assembly [2].

SUBTASK 29-11-80-410-001

- (2) Reconnect the electrical connectors [3], [4] and [5].

SUBTASK 29-11-80-410-002

- (3) Put the HYDRAULIC/RAM AIR TURBINE module assembly [2] into the Pilot's Overhead Panel, P5.

SUBTASK 29-11-80-410-003

- (4) Turn the six quarter-turn fasteners [1].

F. HYDRAULIC/RAM AIR TURBINE Module Assembly [2] Installation Test

SUBTASK 29-11-80-200-001

- (1) Make sure all the switches on the HYDRAULIC/RAM AIR TURBINE module assembly [2] are in the off position.

SUBTASK 29-11-80-860-002

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

SUBTASK 29-11-80-710-001

- (3) Do the operational test for the HYDRAULIC/RAM AIR TURBINE module assembly [2]. To do it, do this task: Hydraulic/Ram Air Turbine Module - Operational Test, TASK 29-11-80-700-801.

————— **END OF TASK** —————

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HYDRAULIC/RAM AIR TURBINE MODULE - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

- (1) An operational test of the Hydraulic/Ram Air Turbine Module.

NOTE: This is not a complete operational test of the components controlled by the Hydraulic/Ram Air Turbine module. To do a complete operational test of the components controlled by the module see the applicable system adjustment/test procedure.

- (2) The Hydraulic/Ram Air Turbine module will be referred to as the module in this procedure.

TASK 29-11-80-700-801

2. Hydraulic/Ram Air Turbine Module - Operational Test

A. General

- (1) This task has these operational tests:

- (a) An operational test of the PRIMARY L (R) ENG switch on the module.
- (b) An operational test of the DEMAND C1 (C2) AIR switch on the module.
- (c) An operational test of the PRIMARY C1 (C2) and DEMAND L (R) ELEC switches on the module.
- (d) An operational test of the RAM AIR TURBINE switch on the module.

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)
29-11-00-860-803	Main Hydraulic System Pressurization with an Alternating Current Motor Pump (P/B 201)
29-11-00-860-804	Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-805	Center Hydraulic System Pressurization with an Air-Driven Pump (ADP) (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (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)
36-00-00-860-801	Depressurize the Pneumatic System (P/B 201)
36-00-00-860-802	Pressurize the Pneumatic System (P/B 201)

C. Location Zones

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

D. Prepare for the Test

SUBTASK 29-11-80-860-003

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

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SUBTASK 29-11-80-860-004

- (2) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-80-610-001

- (3) To make sure the fluid level in the applicable (left, right, or center) system reservoir is satisfactory, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-11-80-860-005

- (4) Make sure these switches, on the hydraulic control panel, are in the off position:
- (a) HYDRAULIC PRIMARY L (R) ENG
 - (b) HYDRAULIC PRIMARY C1 (C2) ELEC
 - (c) HYDRAULIC DEMAND L (R) ELEC
 - (d) HYDRAULIC DEMAND C1 (C2) AIR
 - (e) RAM AIR TURBINE

SUBTASK 29-11-80-210-001

- (5) Make sure the Fault light for these switches, on the module, is on.
- (a) HYDRAULIC PRIMARY L (R) ENG
 - (b) HYDRAULIC PRIMARY C1 (C2) ELEC
 - (c) HYDRAULIC DEMAND L (R) ELEC
 - (d) HYDRAULIC DEMAND C1 (C2) AIR

SUBTASK 29-11-80-860-006

- (6) Make sure the engine fire switch handle, for each engine, on the aft aisle stand panel, P8, is in the down and locked position.

SUBTASK 29-11-80-860-007

- (7) Do this task: Pressurize the Pneumatic System, TASK 36-00-00-860-802.

SUBTASK 29-11-80-860-008

- (8) To show the maintenance page for the hydraulic system, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-11-80-860-009

- (9) To show the synoptic page for the hydraulic system, do this task: Showing a System Synoptic Page, TASK 31-61-00-800-816.

E. PRIMARY L (R) ENG switch - Operational Test

SUBTASK 29-11-80-210-002

- (1) Make sure the FAULT lights below the PRIMARY L (R) ENG switches, on the hydraulic control panel, are on.

SUBTASK 29-11-80-710-002

- (2) Pressurize the L (R) hydraulic systems with the engine driven pumps. To pressurize the systems, do this task: Left or Right Hydraulic System Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.

SUBTASK 29-11-80-210-003

- (3) Look at the synoptic page/maintenance page to make sure the engine driven pumps operate and pressurize the systems.

SUBTASK 29-11-80-210-004

- (4) Make sure the FAULT lights below the PRIMARY L (R) ENG switches, on the hydraulic control panel, go off.

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SUBTASK 29-11-80-860-010

- (5) Set the HYDRAULIC PRIMARY L (R) ENG switches to the OFF position.

SUBTASK 29-11-80-210-005

- (6) Make sure the FAULT lights below the PRIMARY L (R) ENG switches, on the hydraulic control panel, come on.

F. DEMAND C1 (C2) AIR switch - Operational Test

SUBTASK 29-11-80-210-006

- (1) Make sure the FAULT lights below the HYDRAULIC DEMAND AIR C1 and C2 switches, on the hydraulic control panel, are on.

SUBTASK 29-11-80-710-003

- (2) Pressurize the center hydraulic system with the air driven pumps. To pressurize the system, do this task: Center Hydraulic System Pressurization with an Air-Driven Pump (ADP), TASK 29-11-00-860-805.

SUBTASK 29-11-80-210-007

- (3) Make sure the FAULT light below the HYDRAULIC DEMAND AIR C1 (C2) switch, on the hydraulic control panel, goes off.

SUBTASK 29-11-80-210-008

- (4) Look at the synoptic page to make sure the hydraulic demand C1 (C2) air-driven pump operates and pressurizes the system.

SUBTASK 29-11-80-860-011

- (5) Set the HYDRAULIC DEMAND AIR C1 (C2) switch to the OFF position.

SUBTASK 29-11-80-210-009

- (6) Make sure the FAULT light below the HYDRAULIC DEMAND AIR C1 (C2) switch, on the hydraulic control panel, comes on.

SUBTASK 29-11-80-860-012

- (7) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

G. PRIMARY C1 (C2), DEMAND L (R) ELEC switches - Operational Test

SUBTASK 29-11-80-860-013

- (1) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the off position .

SUBTASK 29-11-80-210-010

- (2) Make sure the FAULT lights on the HYDRAULIC PRIMARY ELEC C1 (C2), DEMAND ELEC L (R) switches, on the hydraulic control panel, are on.

SUBTASK 29-11-80-710-004

- (3) Pressurize the center, left and right hydraulic systems with the alternating motor current pumps. To pressurize the system, do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803.

SUBTASK 29-11-80-210-011

- (4) Look at the synoptic page/maintenance page to make sure the hydraulic primary C1 (C2), and demand L (R) alternating current motor pumps operate and pressurizes the systems.

SUBTASK 29-11-80-210-012

- (5) Make sure the FAULT lights on the HYDRAULIC PRIMARY ELEC C1 (C2), DEMAND ELEC L (R) switches, on the hydraulic control panel, go off.

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SUBTASK 29-11-80-860-014

- (6) Push the HYDRAULIC PRIMARY ELEC C1 (C2) and DEMAND ELEC L (R) switches to the OFF position.

SUBTASK 29-11-80-210-013

- (7) Make sure the FAULT light on the HYDRAULIC PRIMARY ELEC C1 (C2) switch, on the hydraulic control panel, comes on.

SUBTASK 29-11-80-210-014

- (8) Make sure the FAULT lights on the HYDRAULIC PRIMARY ELEC C1 (C2), DEMAND ELEC L (R) switches, on the hydraulic control panel, come on.

H. RAM AIR TURBINE switch - Operational Test

SUBTASK 29-11-80-710-005

- (1) To extend the ram air turbine, do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-11-80-710-006

- (2) To retract the ram air turbine, do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

I. Put the Airplane Back to its Usual Condition

SUBTASK 29-11-80-860-015

- (1) Remove power from the hydraulic systems. To remove it, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-11-80-860-016

- (2) Do this task: Depressurize the Pneumatic System, TASK 36-00-00-860-801.

————— **END OF TASK** —————

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RESERVOIR FILL MANUAL PUMP - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir fill manual pump
 - (2) An installation of the reservoir fill manual pump.

TASK 29-18-01-000-801

2. Reservoir Fill Manual Pump Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

<u>Reference</u>	<u>Title</u>
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

B. **Location Zones**

<u>Zone</u>	<u>Area</u>
198	Aft Wing-to-Body Fairings, Right

C. **Access Panels**

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

D. **Reservoir Fill Manual Pump Removal**

SUBTASK 29-18-01-860-001

- (1) For all three hydraulic systems, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-18-01-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

SUBTASK 29-18-01-020-003

- (3) Disconnect the suction hose [7] from the reservoir manual fill pump [1] (referred to as the pump [1] in this procedure).

SUBTASK 29-18-01-020-004

- (4) Disconnect the outlet tube [8] from the pump [1].

SUBTASK 29-18-01-020-005

- (5) Install caps on the suction hose [7] and the outlet tube [8] to prevent contamination.

SUBTASK 29-18-01-020-006

- (6) Remove the bolts [13] which hold the pump [1] in the bracket [12].

SUBTASK 29-18-01-020-007

- (7) Remove the pump [1] from the bracket [12].

SUBTASK 29-18-01-020-011

- (8) Remove the elbow [16] from the union [2].

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SUBTASK 29-18-01-020-008

- (9) Remove the union [2] and packing [3] from the outlet port [9] on the pump [1].

SUBTASK 29-18-01-020-012

- (10) Remove the elbow [15] from the reducer [5].

SUBTASK 29-18-01-020-009

- (11) Remove the reducer [5] and packing [6] from the inlet port [4] on the pump [1].

———— END OF TASK ————

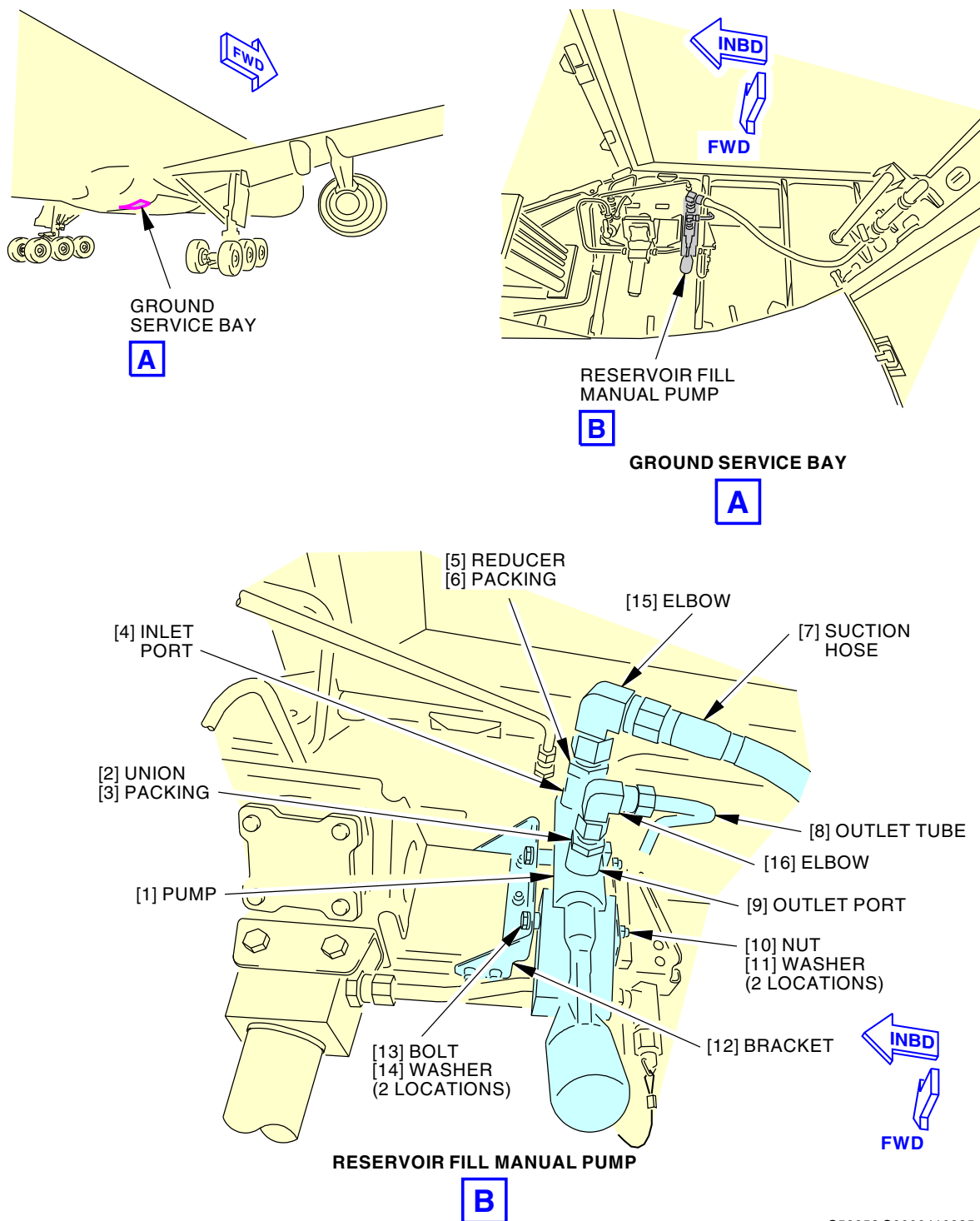
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Reservoir Fill Manual Pump Installation
Figure 401/29-18-01-990-801

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TASK 29-18-01-400-801

3. Reservoir Fill Manual Pump Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-12-01-610-803	Hydraulic Reservoir Filling - Manual Procedure (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Packing	29-18-01-01-015	ARO ALL
6	Packing	29-18-01-01-020	ARO ALL

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Access Panels

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

F. Reservoir Fill Manual Pump Installation

SUBTASK 29-18-01-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269 or hydraulic fluid, D00153 to the new packing [3] and packing [6] and to the threads on the packing [6] and the reducer [5].

SUBTASK 29-18-01-420-005

- (2) Install the new packing [3] and packing [6] on the union [2] and the reducer [5].

SUBTASK 29-18-01-420-006

- (3) Install the union [2] in the outlet port [8] on the reservoir fill manual pump [1] (referred to as the pump [1] in this procedure).

SUBTASK 29-18-01-420-007

- (4) Install the reducer [5] in the inlet port [4] on the pump [1].

SUBTASK 29-18-01-420-008

- (5) Hold the pump [1] in the bracket [12].

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SUBTASK 29-18-01-420-009

- (6) Install the bolts [13], washers [11], washers [14], and nut [10] that attach the pump [1] to the bracket [12].

SUBTASK 29-18-01-020-010

- (7) Remove the caps from the suction hose [7] and the outlet tube [8].

SUBTASK 29-18-01-420-010

- (8) Connect the outlet tube [8] to the pump [1].
 - (a) Install the elbow [16] on the union [2].
 - 1) Tighten the B-nut on the elbow [16] to 170 ± 9 in-lb (19 ± 1 N·m).
 - (b) Connect the outlet tube [8] to the elbow [16].
 - 1) Tighten the B-nut on the outlet tube [8] to 170 ± 9 in-lb (19 ± 1 N·m).

SUBTASK 29-18-01-420-011

- (9) Connect the suction hose [7] to the pump [1].
 - (a) Install the elbow [15] to the reducer [5].
 - 1) Tighten the B-nut on the elbow [15] to 360 ± 18 in-lb (41 ± 2 N·m).
 - (b) Connect the suction hose [7] to the elbow [15].
 - 1) Tighten the B-nut on the suction hose [7] to 360 ± 18 in-lb (41 ± 2 N·m).

G. Reservoir Fill Manual Pump Installation Test

SUBTASK 29-18-01-610-002

- (1) To add approximately one pint of hydraulic fluid to the reservoir in one of the hydraulic systems, do this task: Hydraulic Reservoir Filling - Manual Procedure, TASK 12-12-01-610-803.
 - (a) While you add hydraulic fluid to the reservoir, make sure the quantity of hydraulic fluid in the container decreases.

SUBTASK 29-18-01-790-002

- (2) Make sure there is no leakage of hydraulic fluid at the suction hose [7] and the outlet tube [8] connections on the pump [1].

SUBTASK 29-18-01-610-003

- (3) For the reservoir to which you added hydraulic fluid, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-18-01-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

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SUBTASK 29-18-01-410-002

(2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

————— **END OF TASK** —————

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RESERVOIR FILL SELECTOR VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the reservoir fill selector valve
- (2) An installation of the reservoir fill selector valve.

TASK 29-18-02-000-801

2. Reservoir Fill Selector Valve Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

<u>Reference</u>	<u>Title</u>
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
198	Aft Wing-to-Body Fairings, Right

C. Access Panels

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

D. Prepare for the Removal

SUBTASK 29-18-02-860-001

- (1) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L and the HYDIM C cards to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-18-02-860-002

- (2) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-18-02-860-003

- (3) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-18-02-010-001

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

E. Reservoir Fill Selector Valve Removal

SUBTASK 29-18-02-020-001

- (1) Disconnect the electrical connector [5] from the reservoir fill selector valve (referred to as the valve assembly [1] in this procedure).

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SUBTASK 29-18-02-020-002

- (2) Disconnect the inlet tube [9] from the valve assembly [1].

SUBTASK 29-18-02-020-003

- (3) Disconnect the three outlet tubes [6], [7], and [8] from the valve assembly [1].

SUBTASK 29-18-02-020-004

- (4) Install caps on the inlet tube [9] and the outlet tubes [6], [7] and [8] to prevent contamination.

SUBTASK 29-18-02-020-005

- (5) Remove the bolt [2], the bolt [13], and the bolt [17] which attach the valve assembly [1] to the bracket [16].

SUBTASK 29-18-02-020-006

- (6) Remove the valve assembly [1] from the bracket [16].

SUBTASK 29-18-02-020-007

- (7) Remove the valve [10] from the union [11] in the outlet port, for the center hydraulic system, on the valve assembly [1].

SUBTASK 29-18-02-020-008

- (8) Remove the union [11] from each port on the valve assembly [1].

————— **END OF TASK** —————

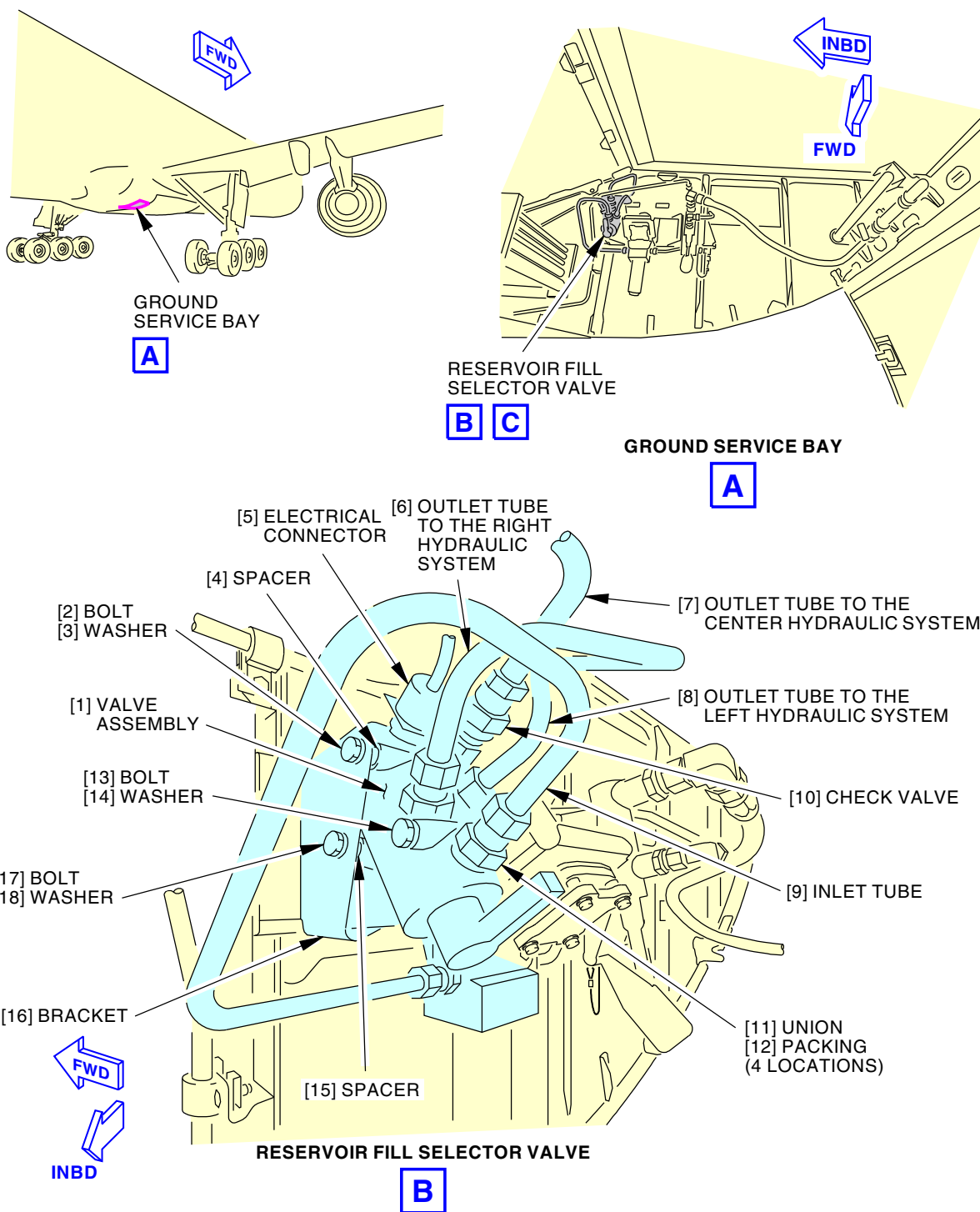
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Reservoir Fill Selector Valve Installation
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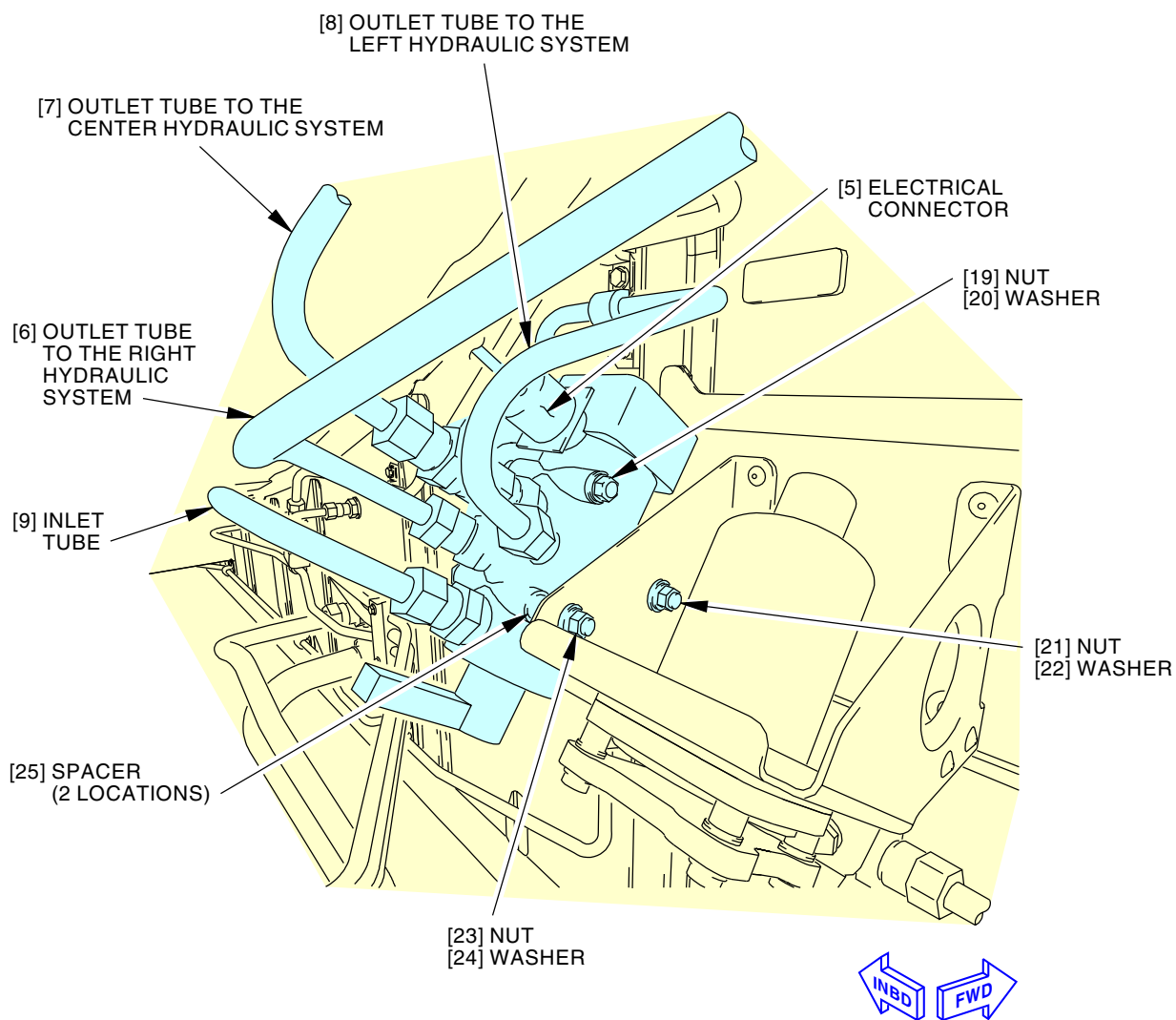
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RESERVOIR FILL SELECTOR VALVE

C

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Reservoir Fill Selector Valve Installation
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TASK 29-18-02-400-801

3. Reservoir Fill Selector Valve Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve assembly	29-18-00-05-170	ARO ALL
10	Valve	29-18-51-10-085	ARO ALL
12	Packing	29-18-02-01-010	ARO ALL

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Access Panels

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

F. Reservoir Fill Selector Valve Installation

SUBTASK 29-18-02-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packings [12] and the threads on the unions [11].

SUBTASK 29-18-02-420-001

- (2) Install the new packings [12] on the unions [11].

SUBTASK 29-18-02-420-002

- (3) Install the unions [11] in the ports on the reservoir fill selector valve (referred to as the valve assembly [1] in this procedure).

SUBTASK 29-18-02-420-003

- (4) Install the valve [10] on the unions [11] in the outlet port, for the center hydraulic system, on the valve assembly [1].

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SUBTASK 29-18-02-420-004

- (5) Hold the valve assembly [1] in the bracket [16].

SUBTASK 29-18-02-420-005

- (6) Install the bolt [2], bolt [13], bolt [17], the washer [3], washer [14], washer [18], washer [20], washer [22], washer [24], the spacer [4], spacer [15], spacers [25], the nut [19], nut [21], and nut [23] that attach the valve assembly [1] to the bracket [16].

SUBTASK 29-18-02-420-006

- (7) Remove the caps from the inlet tube [9] and outlet tubes [6], [7] and [8].

SUBTASK 29-18-02-420-007

- (8) Connect the outlet tubes [6], [7] and [8] to the valve assembly [1].

SUBTASK 29-18-02-420-008

- (9) Connect the inlet tube [9] to the valve assembly [1].

SUBTASK 29-18-02-420-009

- (10) Connect the electrical connector [5] to the valve assembly [1].

G. Reservoir Fill Selector Valve Installation Test

SUBTASK 29-18-02-860-004

- (1) On the front of the left systems card file, P85, put the applicable power switch for the HYDIM L and the HYDIM C cards to the ON position.

NOTE: The left systems card file, P85, is in the electrical/electronics compartment.

SUBTASK 29-18-02-860-005

- (2) On the front of the right systems card file, P84, put the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the electrical/electronics compartment.

SUBTASK 29-18-02-610-001

- (3) Do the steps which follow to add approximately one quart of hydraulic fluid to the reservoir in each hydraulic system:
 - (a) Do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.
 - (b) Make sure the quantity indication, on the reservoir quantity gage, increases for the system to which the valve handle points.

SUBTASK 29-18-02-790-001

- (4) Make sure there is no leakage of hydraulic fluid at the connections for the inlet tube [9] and outlet tubes [6], [7] and [8] on the valve assembly [1].

SUBTASK 29-18-02-610-002

- (5) For the reservoir in each hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-18-02-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

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SUBTASK 29-18-02-410-001

(2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

———— **END OF TASK** ————

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RESERVOIR FILL FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the reservoir fill filter module and components
- (2) An installation of the reservoir fill filter module and components.

TASK 29-18-03-000-801

2. Reservoir Fill Filter Module and Components Removal

(Figure 401)

A. **General**

- (1) This task has the instructions for the removal of these components:
 - (a) The reservoir fill filter module (referred to as the filter assembly [1] in this procedure)
 - (b) The element [9]
- (2) Before you do one of these removals, do the steps to prepare for the removal. Then do the applicable removal.

B. **References**

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)

C. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. **Access Panels**

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

E. **Prepare for the Removal**

SUBTASK 29-18-03-860-001

- (1) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-18-03-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

F. **Reservoir Fill Filter Module Removal**

SUBTASK 29-18-03-020-001

- (1) Disconnect the inlet tube [7] and the outlet tube [12] from the reservoir fill filter module (referred to as the filter assembly [1] in this procedure).

SUBTASK 29-18-03-020-002

- (2) Install caps on the inlet tube [7] and the outlet tube [12] to prevent contamination.

SUBTASK 29-18-03-020-003

- (3) Remove the bolts [2] which attach the filter assembly [1] to the bracket [6].

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SUBTASK 29-18-03-020-004

- (4) Remove the filter assembly [1] from the bracket [6].

SUBTASK 29-18-03-020-005

- (5) Remove the unions [10] and packings [11] from the ports on the filter assembly [1].

G. Filter Element Removal

SUBTASK 29-18-03-020-006

- (1) Remove the case [8] from the filter assembly [1].

SUBTASK 29-18-03-020-007

- (2) Remove the element [9] from the filter assembly [1].

SUBTASK 29-18-03-020-008

- (3) Remove the packing [17] and the retainer [16] and retainer [18] from the filter assembly [1].

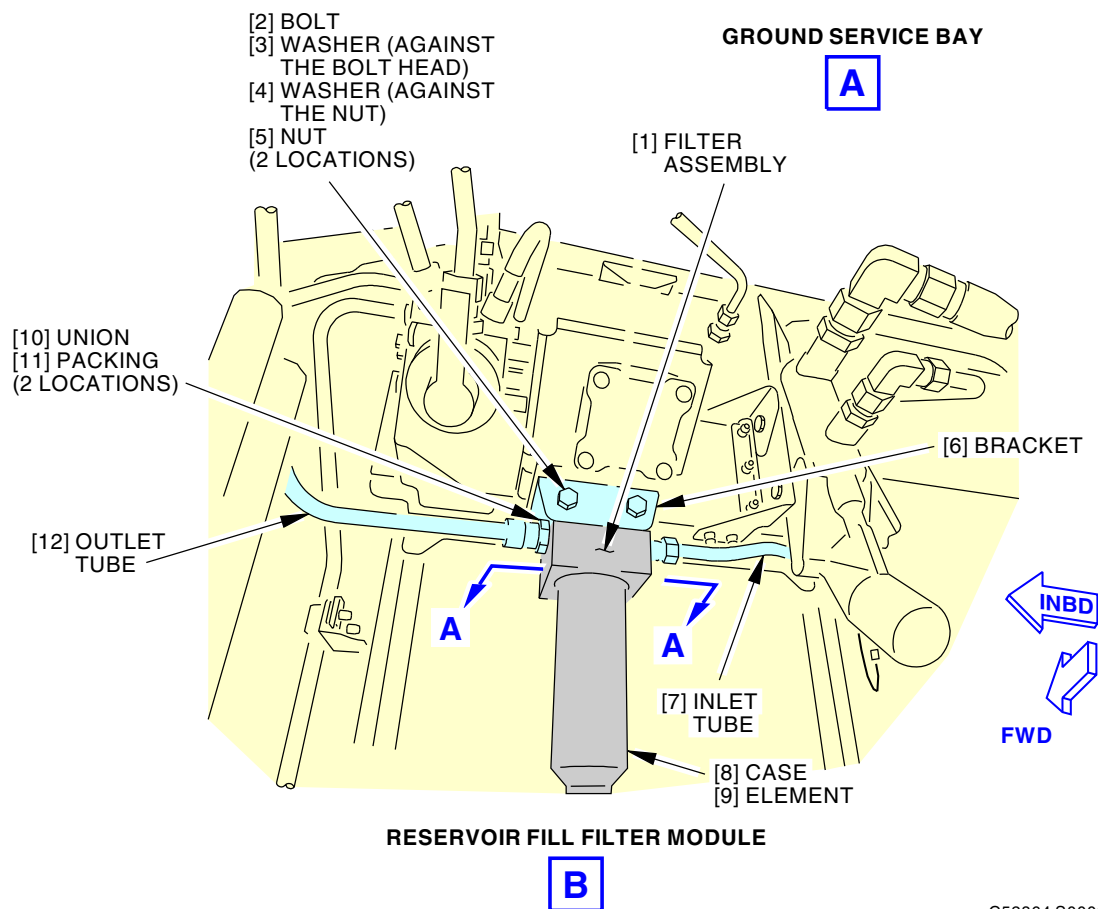
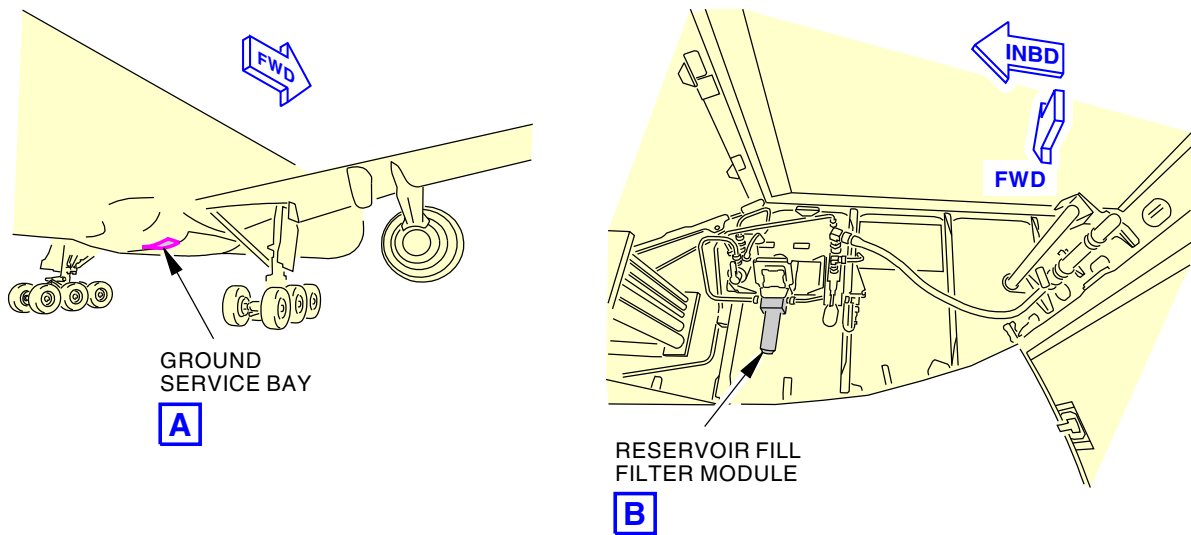
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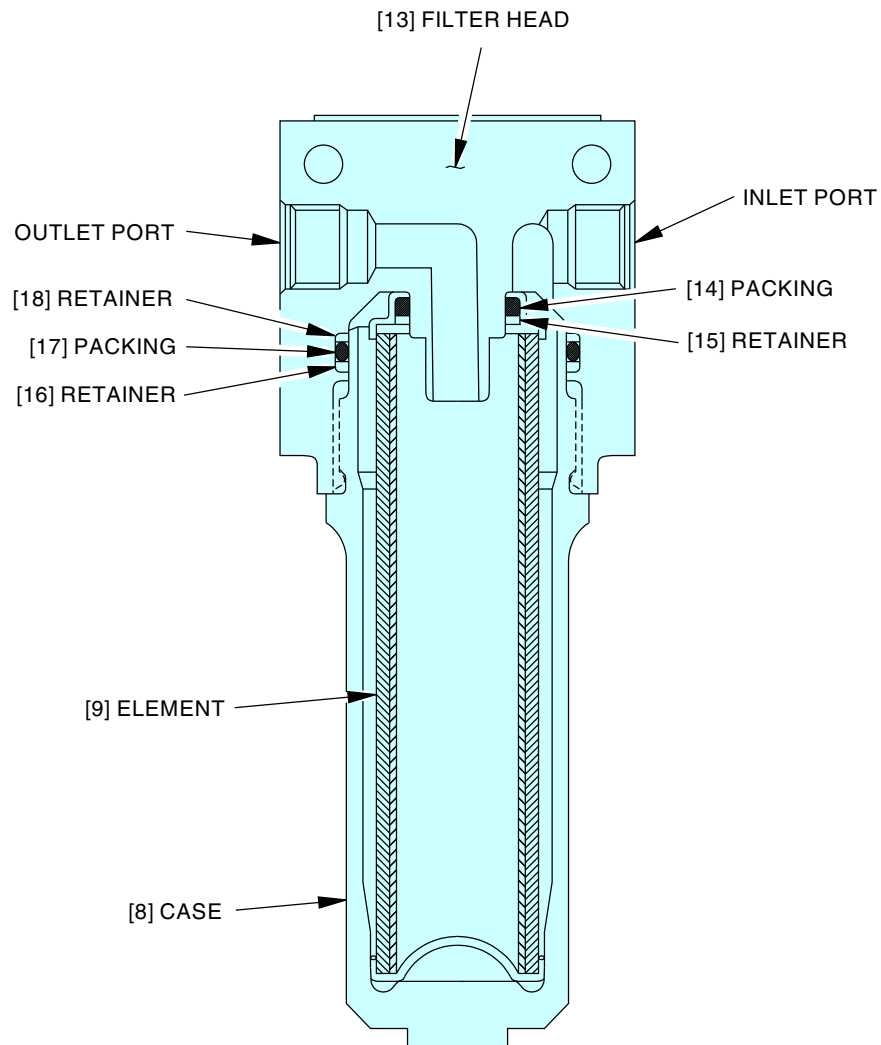


Reservoir Fill Filter Module Installation
Figure 401/29-18-03-990-801 (Sheet 1 of 2)

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FILTER CASE AND FILTER ELEMENT

A-A

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Reservoir Fill Filter Module Installation
Figure 401/29-18-03-990-801 (Sheet 2 of 2)

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TASK 29-18-03-400-801

3. Reservoir Fill Filter Module and Components Installation

(Figure 401)

A. General

- (1) This task has the instructions for the installation of these components:
 - (a) The reservoir fill filter module (referred to as the filter assembly [1] in this procedure)
 - (b) The element [9]
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-12-01-610-803	Hydraulic Reservoir Filling - Manual Procedure (P/B 301)
12-12-01-610-804	Hydraulic Reservoir Filling - Pressure Procedure (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Case	29-18-03-01-060	ARO ALL
		29-18-03-01-105	ARO ALL
9	Element	29-18-03-01-045	ARO ALL
		29-18-03-01-100	ARO ALL
11	Packing	29-18-03-01-010	ARO ALL
14	Packing	29-18-03-01-040	ARO ALL
		29-18-03-01-095	ARO ALL
		29-18-03-01-035	ARO ALL
15	Retainer	29-18-03-01-090	ARO ALL
		29-18-03-01-050	ARO ALL
16	Retainer	29-18-03-01-080	ARO ALL
		29-18-03-01-055	ARO ALL
17	Packing	29-18-03-01-085	ARO ALL

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E. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

F. Access Panels

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

G. Reservoir Fill Filter Module Installation

SUBTASK 29-18-03-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packings [11] and to the threads on the unions [10].

SUBTASK 29-18-03-420-001

- (2) Install the new packings [11] on the unions [10].

SUBTASK 29-18-03-420-002

- (3) Install the unions [10] in the ports on the filter assembly [1].

SUBTASK 29-18-03-420-003

- (4) Hold the filter assembly [1] on the bracket [6].

SUBTASK 29-18-03-420-004

- (5) Install the bolts [2], washers [3], washers [4], and nuts [5] that attach the filter assembly [1] to the bracket [6].

SUBTASK 29-18-03-420-005

- (6) Remove the caps from the inlet tube [7] and the outlet tube [12].

SUBTASK 29-18-03-420-006

- (7) Connect the inlet tube [7] and the outlet tube [12] to the filter assembly [1].

H. Filter Element Installation

SUBTASK 29-18-03-640-002

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the new packing [14] and packing [17] and to the retainer [15], retainer [16], and retainer [18].

SUBTASK 29-18-03-420-007

- (2) Install the new packing [17] and the retainer [16] and retainer [18] in the filter assembly [1].

SUBTASK 29-18-03-420-008

- (3) Install the new packing [14] and retainer [15] in the element [9].

SUBTASK 29-18-03-420-009

- (4) Install the element [9] in the filter assembly [1].

SUBTASK 29-18-03-160-001

- (5) Clean the case [8].

SUBTASK 29-18-03-420-010

- (6) Install the case [8] on the filter assembly [1].

SUBTASK 29-18-03-420-011

- (7) Tighten the case [8] to 75-100 pound-inches.

SUBTASK 29-18-03-420-012

- (8) Safety the case [8] with a lockwire.

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I. Reservoir Fill Filter Module and Components Installation Test

SUBTASK 29-18-03-610-001

- (1) Do one of these procedures to add approximately one half gallon to the reservoir in one hydraulic system:
 - (a) Do this task: Hydraulic Reservoir Filling - Manual Procedure, TASK 12-12-01-610-803.
 - (b) Do this task: Hydraulic Reservoir Filling - Pressure Procedure, TASK 12-12-01-610-804.

SUBTASK 29-18-03-790-001

- (2) Make sure there is no leakage of hydraulic fluid at the tube connections and at the case [8] on the filter assembly [1].

SUBTASK 29-18-03-610-002

- (3) For the reservoir in each hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 29-18-03-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-18-03-410-001

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

————— END OF TASK —————

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RESERVOIR QUANTITY GAGE - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir quantity gage
 - (2) An installation of the reservoir quantity gage.

TASK 29-18-06-000-801

2. Reservoir Quantity Gage Removal

(Figure 401)

A. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

B. **Access Panels**

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

C. **Prepare for the Removal**

SUBTASK 29-18-06-860-001

- (1) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L and the HYDIM C cards to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-18-06-860-002

- (2) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-18-06-010-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

D. **Reservoir Quantity Gage Removal**

SUBTASK 29-18-06-020-001

- (1) Disconnect the electrical connector [2] from the reservoir quantity gage [1] (referred to as the indicator [1] in this procedure).

SUBTASK 29-18-06-020-002

- (2) Remove the screws [9], washers [8], washers [10], spacers [7], and nuts [13] which attach the indicator [1], shield [5], and flange [4] to the bracket [3].

SUBTASK 29-18-06-020-003

- (3) Remove the indicator [1], shield [5], and flange [4] from the bracket [3].

SUBTASK 29-18-06-020-004

- (4) Remove the four screws [6] which attach the rear shell [12] of the flange [4] to the front shell [11].

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SUBTASK 29-18-06-020-005

- (5) Remove the front shell [11] and the rear shell [12] of the flange [4] from the indicator [1].

———— **END OF TASK** ————

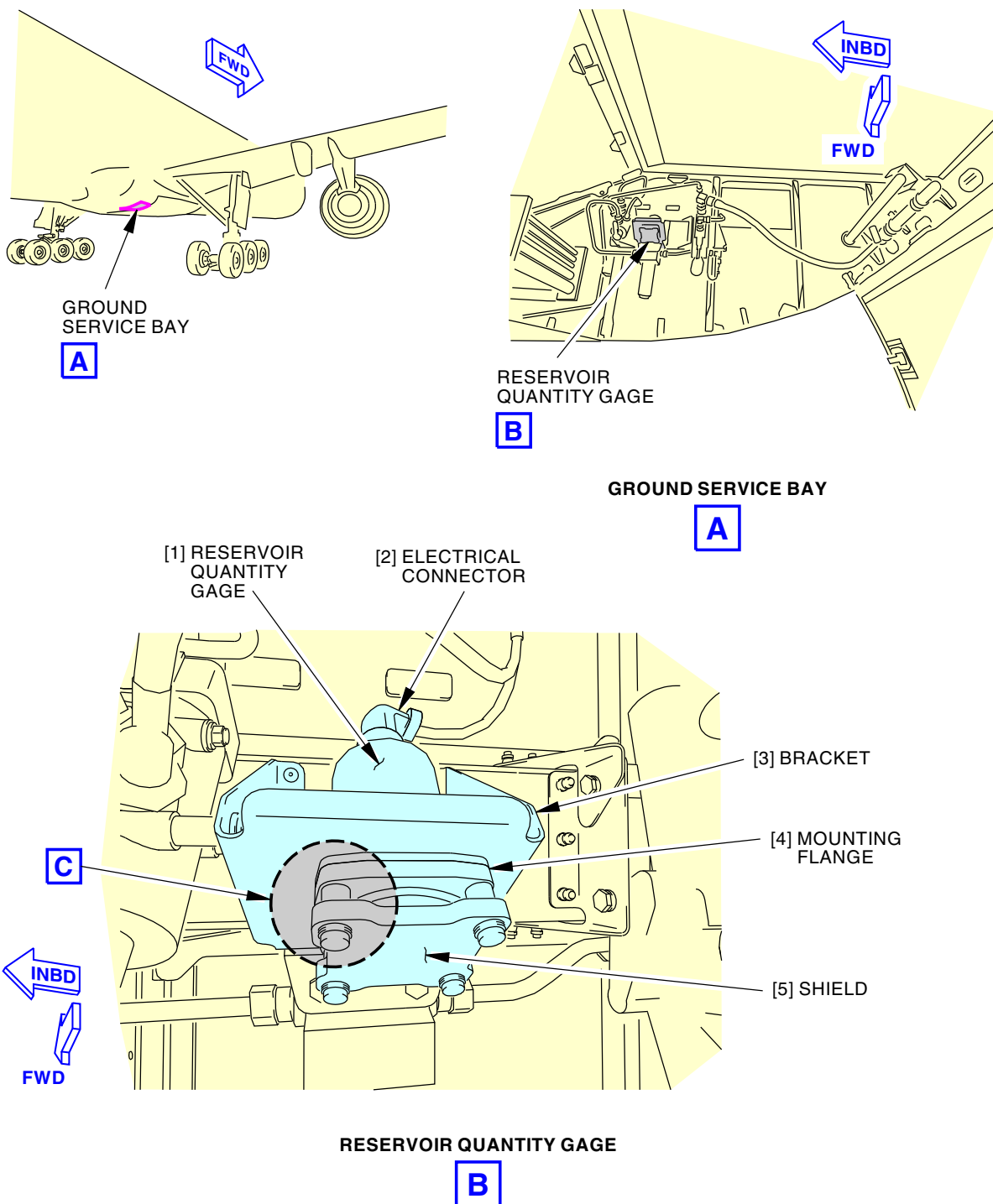
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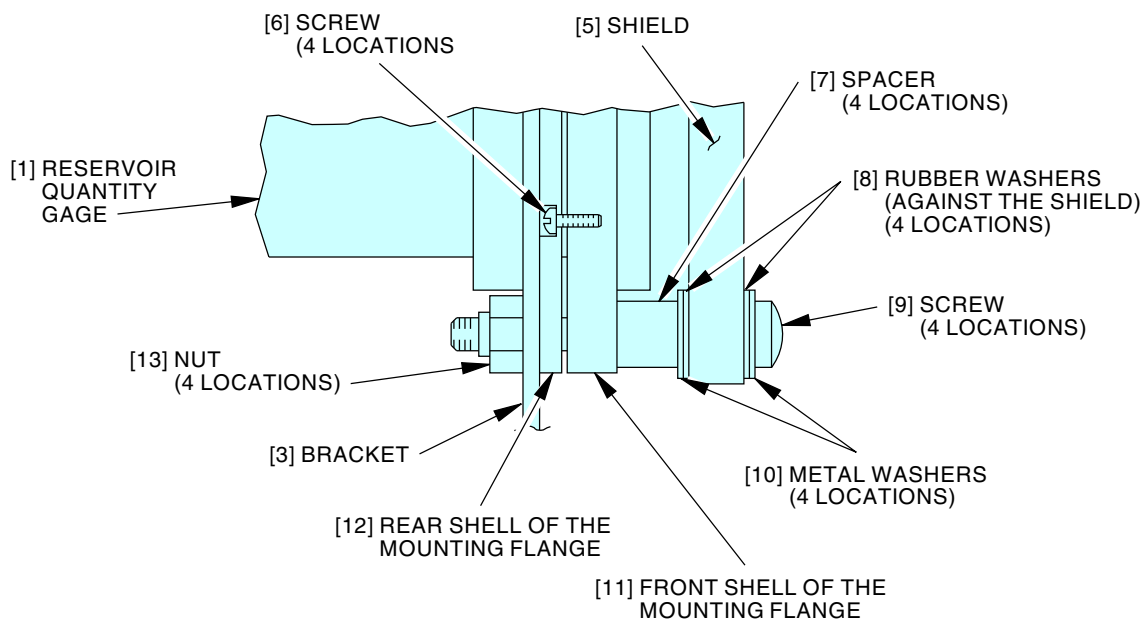
Reservoir Quantity Gage Installation
Figure 401/29-18-06-990-801 (Sheet 1 of 2)

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SHIELD AND MOUNTING FLANGE



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**Reservoir Quantity Gage Installation
Figure 401/29-18-06-990-801 (Sheet 2 of 2)**

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TASK 29-18-06-400-801

3. Reservoir Quantity Gage Installation

(Figure 401)

A. References

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

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Indicator	29-18-00-05-210	ARO ALL

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Access Panels

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

E. Reservoir Quantity Gage Installation

SUBTASK 29-18-06-420-001

- (1) Hold the front shell [11] and the rear shell [12] of the flange [4] on the reservoir quantity gage [1] (referred to as the indicator [1] in this procedure).

SUBTASK 29-18-06-420-002

- (2) Align the zero mark on the indicator [1] with the index mark on the front shell [11] of the flange [4].

SUBTASK 29-18-06-420-003

- (3) Install the four screws [6] that attach the front shell [11] of the flange [4] to the rear shell [12].

SUBTASK 29-18-06-420-004

- (4) Put the indicator [1] and the flange [4] in the bracket [3], with the zero mark at the bottom.

SUBTASK 29-18-06-420-005

- (5) Hold the shield [5] in its position and install the spacers [7], washers [8], washers [10], screws [9], and nuts [13].

SUBTASK 29-18-06-420-006

- (6) Connect the electrical connector [2] to the indicator [1].

F. Reservoir Quantity Gage Installation Test

SUBTASK 29-18-06-860-003

- (1) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L and the HYDIM C cards to the ON position.

NOTE: The left systems card file, P85, is in the
main equipment center.

SUBTASK 29-18-06-860-004

- (2) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

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SUBTASK 29-18-06-860-005

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

SUBTASK 29-18-06-860-006

- (4) Push the STAT button, on the display select panel, to show the EICAS status display on the multi-function display.

SUBTASK 29-18-06-860-007

- (5) Move the handle on the reservoir fill selector valve to the left, right, or center system.

SUBTASK 29-18-06-710-001

- (6) For the system to which you set the handle of the reservoir fill selector valve, do this step:
- (a) Make sure the quantity indication on the indicator [1] is approximately the same as that on the EICAS status display

SUBTASK 29-18-06-860-008

- (7) Move the handle on the reservoir fill selector valve to the OFF position.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-18-06-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

————— END OF TASK —————

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RAM AIR TURBINE (RAT) SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Ram Air Turbine (RAT) Deactivation
- (2) Ram Air Turbine (RAT) Reactivation
- (3) Ram Air Turbine (RAT) Extension
- (4) Ram Air Turbine (RAT) Retraction
- (5) Access to a Ram Air Turbine (RAT) That Will Not Extend

TASK 29-21-00-040-801

2. Ram Air Turbine (RAT) Deactivation

A. General

- (1) The automatic extension system for the ram air turbine (RAT) prevents the accidental extension of the RAT while the airplane is on the ground. But, some maintenance procedures can put the airplane in an unusual condition that can cause the accidental extension of the RAT. These procedures are:
 - (a) Procedures which lift the airplane on jacks.
 - (b) Procedures which put the air/ground system in the air mode.
 - (c) Procedures which do a simulation of airspeed or groundspeed.
- (2) If you will do one of these procedures, you must do the RAT deactivation to prevent its accidental extension.

B. References

Reference	Title
24-31-01-020-801	Disconnect Main Battery Power (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 29-21-00-860-201

- (1) If the Ram Air Turbine (RAT) is not extended, do this step to extend the RAT:
 - (a) Extend the RAT: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.
 - (b) Push the back of the RAT pump in the stow direction to lock the RAT pump

SUBTASK 29-21-00-210-053

- (2) Make sure that the RAT is fully extended and locked.

SUBTASK 29-21-00-210-054

- (3) Make sure that the RAT does not move.

SUBTASK 29-21-00-040-001

- (4) Do these steps to prevent the accidental deployment of the ram air turbine (RAT):

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- (a) 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	4	C29621	RAT AUTO/MANUAL CONTROL

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	6	C24619	ELMS RAT DEPLOY
K	7	C29618	RAT AUTO/MAN CTRL

SUBTASK 29-21-00-860-202

- (5) Make sure that the Center Hydraulic System has no power, Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-21-00-860-203

- (6) Make sure that the stow valve lever, on the Ground Checkout Module (GCM), is in the FLIGHT (down) position.

SUBTASK 29-21-00-210-055

- (7) On the RAM AIR TURBINE, P5 Panel, Make sure that the UNLKD light is on.

SUBTASK 29-21-00-210-056

- (8) On the EICAS status page, make sure that RAT UNLOCKED message shows.

SUBTASK 29-21-00-030-001

- (9) Do this task: Disconnect Main Battery Power, TASK 24-31-01-020-801

E. Ram Air Turbine (RAT) - Tryout

NOTE: This tryout is to make sure that the Ram Air Turbine is in a zero energy state.

SUBTASK 29-21-00-210-057

- (1) Make sure that the area around the RAT and RAT doors is clear of all personnel and equipment.

SUBTASK 29-21-00-210-058

- (2) Make sure that the stow valve lever, on the Ground Checkout Module (GCM), is in the FLIGHT (down) position.

SUBTASK 29-21-00-210-059

- (3) Make sure that the Center Hydraulic System has no power.

SUBTASK 29-21-00-210-060

- (4) Make sure that the RAT is fully extended.

SUBTASK 29-21-00-210-061

- (5) Make sure that the RAT does not move.

————— **END OF TASK** —————

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TASK 29-21-00-440-801

3. Ram Air Turbine (RAT) Reactivation

A. General

(1) This task puts the ram air turbine back to its usual condition after it has been deactivated.

B. References

Reference	Title
24-31-01-420-801	Restore Main Battery Power (P/B 201)

C. Location Zones

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

D. Procedure

SUBTASK 29-21-00-440-001

- (1) Do these steps to put the airplane back to its usual condition, when the ram air turbine (RAT) deactivation is not necessary:
- (a) Do this task: Restore Main Battery Power, TASK 24-31-01-420-801
- (b) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	4	C29621	RAT AUTO/MANUAL CONTROL

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

Row	Col	Number	Name
K	6	C24619	ELMS RAT DEPLOY
K	7	C29618	RAT AUTO/MAN CTRL

————— END OF TASK —————

TASK 29-21-00-860-801

4. Ram Air Turbine (RAT) Extension

(Figure 201)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (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.

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Reference	Description
SPL-1799	Cover - Protective, RAT Turbine Blade Part #: 2783292-1 Supplier: 70210

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 29-21-00-860-001

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

SUBTASK 29-21-00-480-001

- (2) Put ropes around the area below the RAT compartment door.

SUBTASK 29-21-00-210-001



WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Make sure there are no persons or equipment in the area below the RAT compartment door.

SUBTASK 29-21-00-860-002

- (4) Push the RAM AIR TURBINE switch/light on the overhead panel, P5, to extend the RAT.

NOTE: The RAT can move to the fully extended position in approximately 2 seconds. The RAT is extended when the blade lock disengages the hole in the turbine hub.

SUBTASK 29-21-00-860-180

- (5) If RAT does not extend when commanded, then stay away from the path of the RAT and the RAT compartment door.

NOTE: The RAT may be in an unsafe state and could extend unexpectedly.

SUBTASK 29-21-00-860-003

- (6) To prevent the retraction of the RAT while you do maintenance on it, do these steps:
- (a) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
D	13	C29619	RAT AUTO CONTROL

SUBTASK 29-21-00-480-002



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (7) Install RAT turbine blade protective cover, SPL-1799, on the RAT blades to prevent damage to the blades or injury to persons.

————— **END OF TASK** —————

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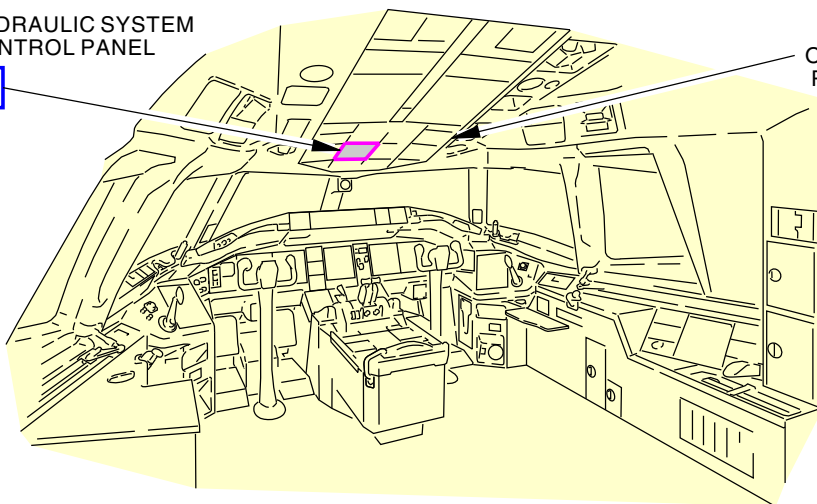


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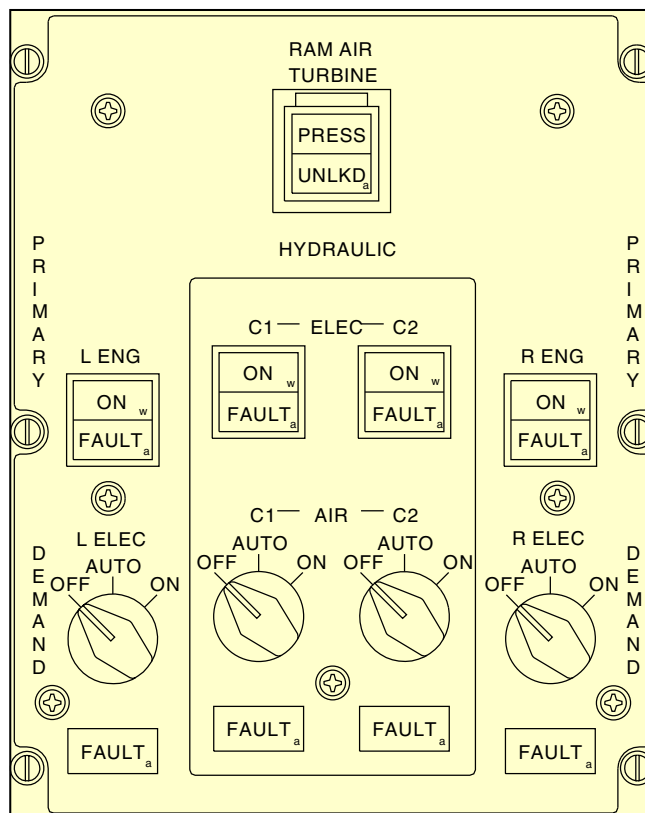
HYDRAULIC SYSTEM
CONTROL PANEL

A

OVERHEAD
PANEL, P5



FLIGHT COMPARTMENT



HYDRAULIC SYSTEM CONTROL PANEL

A

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Hydraulic System Control Panel
Figure 201/29-21-00-990-801

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TASK 29-21-00-860-802

5. Ram Air Turbine (RAT) Retraction

(Figure 202)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
29-21-00-990-806	Figure: Ram Air Turbine (RAT) (P/B 501)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

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

Reference	Description
SPL-1799	Cover - Protective, RAT Turbine Blade Part #: 2783292-1 Supplier: 70210

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 29-21-00-860-005

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

SUBTASK 29-21-00-480-003



WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-21-00-480-004



WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

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SUBTASK 29-21-00-210-050

- (4) Put ropes around the area below the RAT compartment door.

SUBTASK 29-21-00-480-041



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (5) Make sure there are no persons or equipment in the area below the RAT compartment door.

SUBTASK 29-21-00-860-006

- (6) Remove the safety tag and 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 29-21-00-210-002

- (7) Make sure the motoring valve lever, on the RAT checkout module, is in the flight (down) position and has a lockwire on it.

NOTE: The motoring valve lever is inboard of the stow valve lever. The motoring valve lever has an oval shape and a yellow color. The lockwire will help prevent the accidental movement of the motoring valve lever during the retraction of the RAT. The motoring valve lever is down when it is in the flight position.

SUBTASK 29-21-00-080-002



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (8) Remove the RAT turbine blade protective cover, SPL-1799, from the RAT blades.

SUBTASK 29-21-00-980-001

- (9) Manually turn the turbine hub to align the blades with the RAT strut.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blades. If the hole in the turbine hub does not align with the blade lock on the RAT strut, the RAT will stop during retraction. The RAT will stop approximately 15 degrees from the extended position.

- (a) Use a ladder to see the top of the RAT to make sure that the blade lock pin engages the hole in the turbine hub (Figure 29-21-00-990-806).

- 1) Move the blade as necessary to make sure that the lock pin seats in the hole.

SUBTASK 29-21-00-860-007

- (10) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-21-00-020-001

- (11) Remove the lockwire from the stow valve lever on the RAT checkout module.

NOTE: The stow valve lever is the one that has a T-handle on it. The stow valve lever is outboard of the motoring valve lever.

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SUBTASK 29-21-00-860-017

- (12) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

SUBTASK 29-21-00-860-008



MAKE SURE YOU OPERATE THE CORRECT VALVE LEVER ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE LEVER, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (13) Pull the T-handle and move the stow valve lever to the stow position.

NOTE: The stow position is the fully up position of the lever.

SUBTASK 29-21-00-860-009

- (14) Hold the stow valve lever in the stow position until the RAT door fully closes.

SUBTASK 29-21-00-980-002

- (15) If the RAT stops during retraction, do these steps:

NOTE: If the blade lock on the RAT strut does not engage the hole in the turbine hub, the RAT retraction will stop. The RAT retraction will stop, approximately 15 degrees from the extended position.

- (a) Move the stow valve lever to the stop position.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

- (b) Manually turn the turbine hub to align the blade lock with a hole in the turbine hub.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blade lock with a hole in the turbine hub.

- (c) Make sure the blade lock moves into its position suddenly, in the hole in the turbine hub.



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (d) Pull on one blade with your hand to make sure the turbine hub will not turn.
- (e) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (f) Make sure there are no persons or equipment in the area below the RAT compartment door.
- (g) Pull the T-handle and move the stow valve lever to the stow position.

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SUBTASK 29-21-00-860-010

- (16) After the door for the RAT compartment fully closes, move the stow valve lever to the stop (middle) position.

NOTE: If you put the stow valve lever in the flight (down) position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-210-003

- (17) Make sure the door for the RAT compartment is fully closed.

SUBTASK 29-21-00-860-018

- (18) Move the stow valve lever to the flight (down) position.

NOTE: If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-420-001

- (19) Safety the stow valve lever in the flight (down) position with a lockwire.

SUBTASK 29-21-00-210-004

- (20) Make sure the UNLOCKED light, on the RAM AIR TURBINE switch/light, on the overhead panel, P5, is off.

SUBTASK 29-21-00-210-005

- (21) Make sure the EICAS advisory message, RAT UNLOCKED, does not show on the EICAS display.

SUBTASK 29-21-00-210-006

- (22) Make sure the EICAS status message, RAT DEPLOY INOP, does not show on the EICAS display.

SUBTASK 29-21-00-860-011

- (23) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-21-00-210-007

- (24) Make sure the RAT PUMP: POS indication, on the EICAS maintenance display, shows STOWED.

SUBTASK 29-21-00-080-003



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (25) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-21-00-860-012

- (26) For the center hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-21-00-480-039

- (27) Remove ropes around the area below the RAT compartment door.

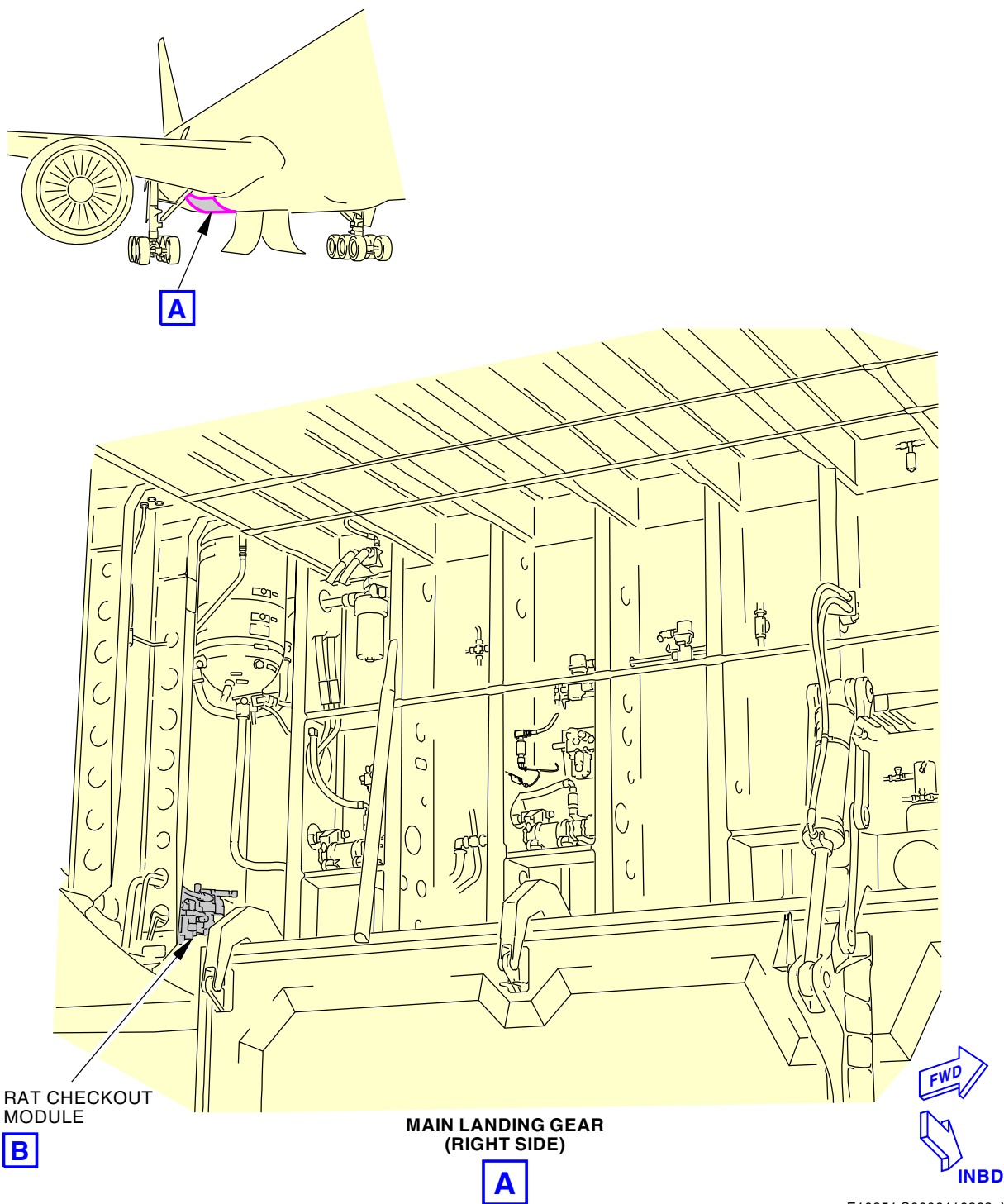
————— **END OF TASK** —————

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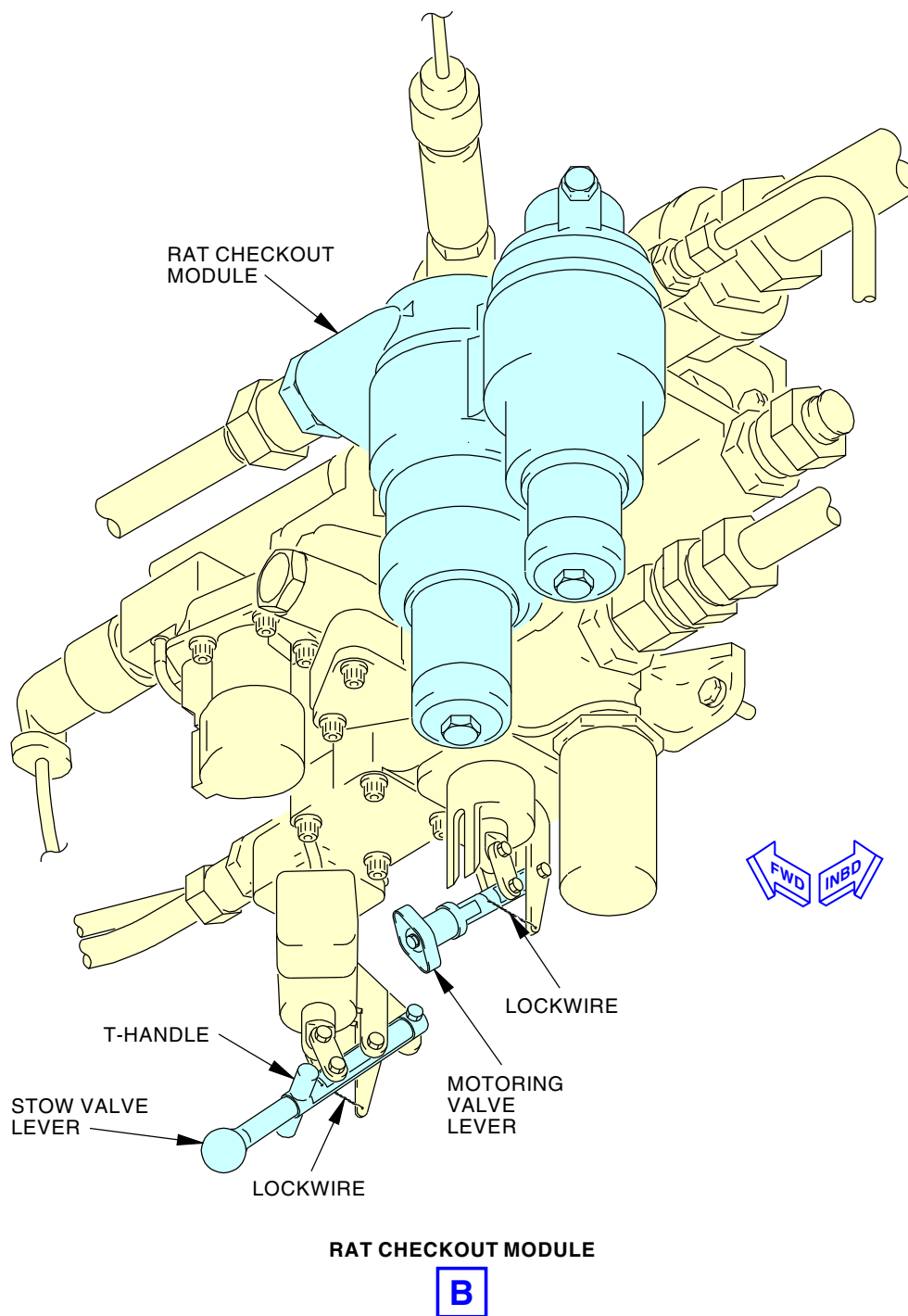
RAT Checkout Module
Figure 202/29-21-00-990-802 (Sheet 1 of 2)

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RAT Checkout Module
Figure 202/29-21-00-990-802 (Sheet 2 of 2)

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TASK 29-21-00-010-801

6. Access to a Ram Air Turbine (RAT) That Will Not Extend

(Figure 203)

A. General

- (1) This procedure has the instructions to get access to a ram air turbine (RAT) which is in the retracted position and will not extend.

B. References

Reference	Title
53-66-01-000-801	Aft Wing-To-Body Fairing Panel Removal (P/B 401)
53-66-01-400-801	Aft Wing-To-Body Fairing Panel Installation (P/B 401)

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Access Panels

Number	Name/Location
198JR	Aft Wing To Body Fairing Panel
198NR	Ram Air Turbine Access Panel

E. Get Access to the Ram Air Turbine (RAT)

SUBTASK 29-21-00-860-014

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	4	C29621	RAT AUTO/MANUAL CONTROL

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

Row	Col	Number	Name
K	6	C24619	ELMS RAT DEPLOY
K	7	C29618	RAT AUTO/MAN CTRL

SUBTASK 29-21-00-940-001

 WARNING	KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (2) Put ropes around the area below the RAT compartment door.

SUBTASK 29-21-00-010-001

- (3) Do one of these alternative steps to get access to a ram air turbine (RAT) which will not extend:

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- (a) To get access on the outboard side of the RAT, remove this access panel:

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

198NR	Ram Air Turbine Access Panel

Do this task: Aft Wing-To-Body Fairing Panel Removal, TASK 53-66-01-000-801.

NOTE: These two access panels are outboard and above the door [6] of the ram air turbine (RAT) compartment. After you remove these access panels, you can get access to the RAT in its retracted position.

- (b) To get access on the inboard side of the RAT, remove this access panel:

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

198JR	Aft Wing To Body Fairing Panel

Do this task: Aft Wing-To-Body Fairing Panel Removal, TASK 53-66-01-000-801.

NOTE: This access panel is inboard of the door [6] of the ram air turbine (RAT) compartment. After you remove this access panel, you can get access to the RAT in its retracted position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-00-410-001

- (1) Do the applicable steps which follow to install the access panels which you removed to get access to the RAT:

- (a) Close this access panel:

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

198NR	Ram Air Turbine Access Panel

Do this task: Aft Wing-To-Body Fairing Panel Installation, TASK 53-66-01-400-801.

- (b) Close this access panel:

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

198JR	Aft Wing To Body Fairing Panel

Do this task: Aft Wing-To-Body Fairing Panel Installation, TASK 53-66-01-400-801.

SUBTASK 29-21-00-860-015

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

APU Auxiliary Panel, P49

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C29621	RAT AUTO/MANUAL CONTROL

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	6	C24619	ELMS RAT DEPLOY
K	7	C29618	RAT AUTO/MAN CTRL

SUBTASK 29-21-00-860-016

- (3) If it is necessary, do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

————— END OF TASK —————

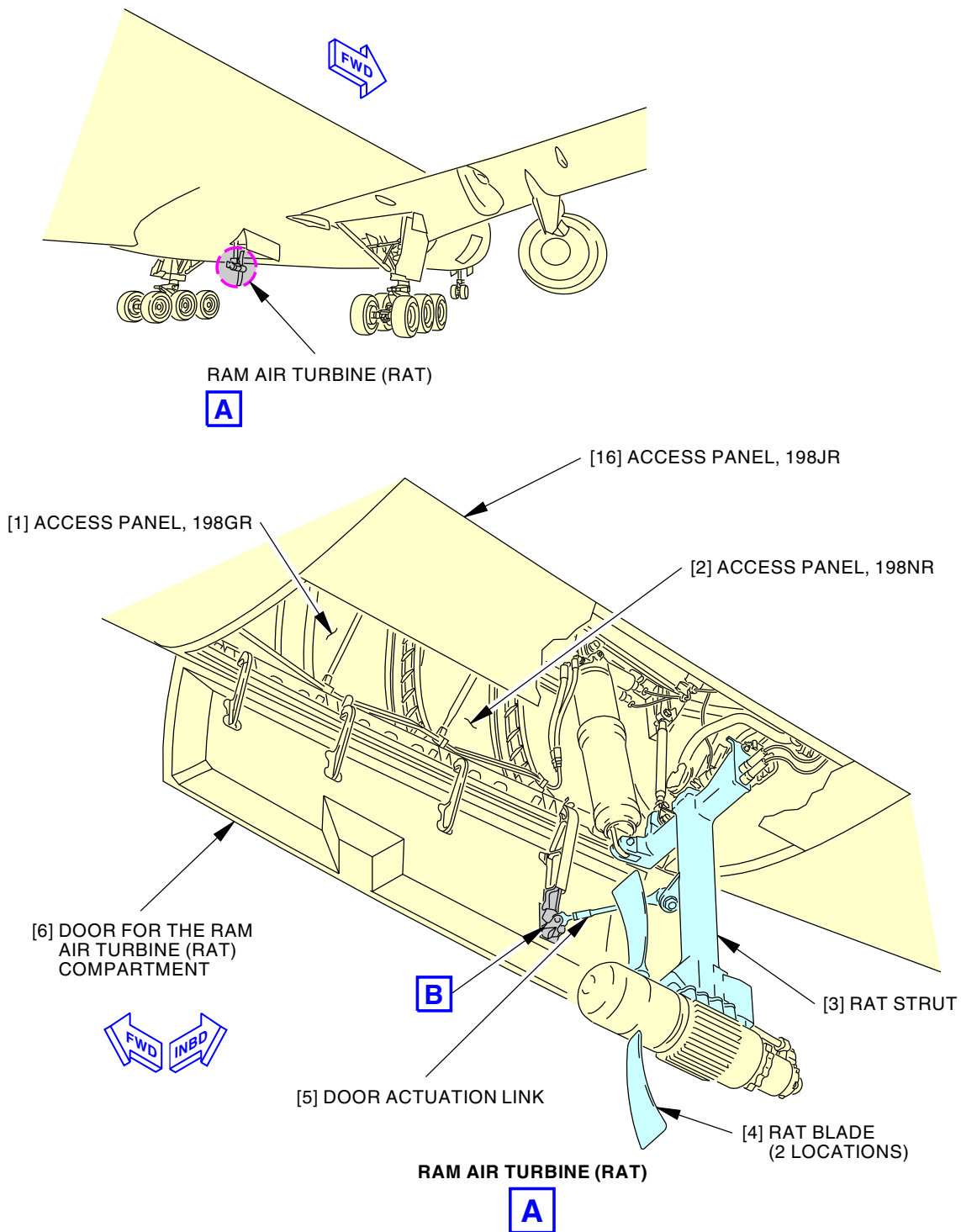
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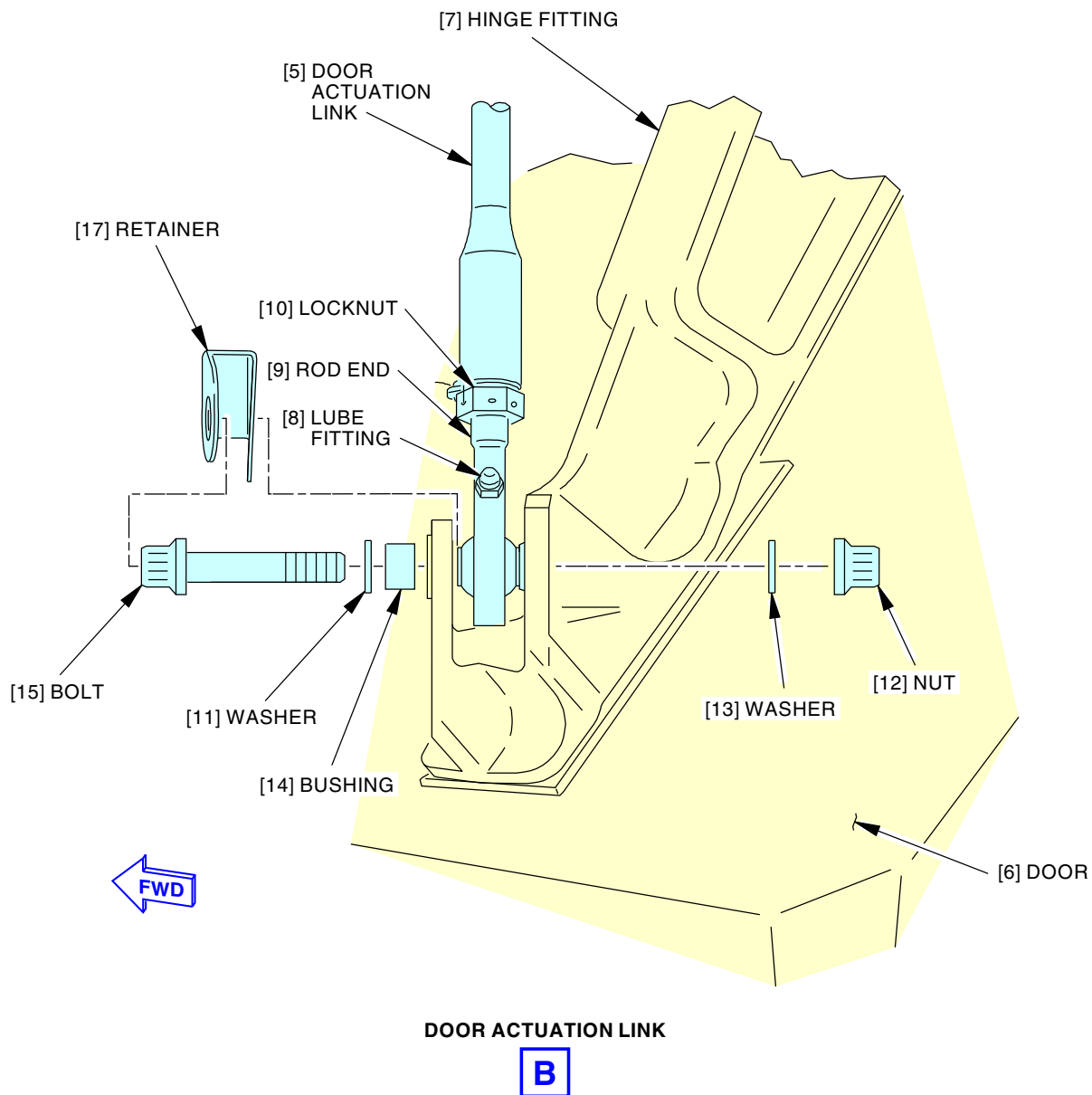
Ram Air Turbine (RAT)
Figure 203/29-21-00-990-803 (Sheet 1 of 2)

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**Ram Air Turbine (RAT)
Figure 203/29-21-00-990-803 (Sheet 2 of 2)**

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RAM AIR TURBINE (RAT) SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A system test of the manual deployment system for the ram air turbine (RAT) system
 - (2) A system test of the automatic deployment system for the ram air turbine (RAT) system
 - (3) A system test of the ram air turbine (RAT) generator heater
 - (4) A motoring test of the RAT system.

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TASK 29-21-00-730-802

2. Ram Air Turbine (RAT) Manual Deployment System - System Test

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

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

Reference	Description
SPL-1680	Protractor - Assembly, Control Column Part #: 4MIT65B80307-1 Supplier: 81205 Part #: A27021-29 Supplier: 81205 Part #: G76002-19 Supplier: 81205

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Prepare for the Test

SUBTASK 29-21-00-860-019

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

SUBTASK 29-21-00-860-020

- (2) Make sure the ADIRU switch on the overhead panel, P5, is in the OFF position.

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SUBTASK 29-21-00-480-005



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-21-00-480-006



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-21-00-480-007

- (5) Put ropes around the area below the RAT compartment door.

E. Ram Air Turbine (RAT) Manual Deployment System - System Test

SUBTASK 29-21-00-860-023

- (1) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-21-00-860-097

- (2) To pressurize the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-21-00-210-009

- (3) Make sure the RAT PUMP: POS indication, on the EICAS display, shows STOWED.

SUBTASK 29-21-00-210-010

- (4) Make sure that the stow valve lever, on the RAT checkout module, is in the flight position (Figure 501).

NOTE: The stow valve lever is the one that has a T-handle on it. The flight position is the fully down position of the stow valve lever.

SUBTASK 29-21-00-860-024

- (5) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.

SUBTASK 29-21-00-730-001



KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (6) Do these steps to make sure the RAT actuator solenoid, M29001, operates correctly:
- (a) 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>
K	6	C24619	ELMS RAT DEPLOY
K	7	C29618	RAT AUTO/MAN CTRL

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- (b) Make sure the EICAS message, RAT DEPLOY INOP, shows on the EICAS status display.
- (c) Make sure there are no persons or equipment in the area below the RAT compartment door.
- (d) Push the RAM AIR TURBINE switch/light on the overhead panel, P5, to extend the RAT (Figure 502).
- (e) Make sure the RAT moves to the extended position in 8 seconds or less.
NOTE: For this step, the RAT is extended when the blade lock disengages the hole in the turbine hub.
- (f) If RAT does not extend when commanded, then stay away from the path of the RAT and the RAT compartment door.

NOTE: RAT may be in an unsafe state and could extend unexpectedly.

SUBTASK 29-21-00-210-011

- (7) Make sure the UNLKD light on the RAM AIR TURBINE switch/light, on the P5 panel, is on.

SUBTASK 29-21-00-210-012

- (8) Make sure the EICAS message, RAT UNLOCKED, shows on the EICAS primary display.

SUBTASK 29-21-00-860-025

- (9) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-21-00-210-013

- (10) Make sure the RAT PUMP: POS indication, on the EICAS maintenance display, shows NOT STOWED.

SUBTASK 29-21-00-210-041

- (11) Do these steps to make sure the RAT door actuation link is not loose:
 - (a) Examine each end of the door actuation link to make sure that none of the nuts are loose.
 - (b) Try to move the bottom edge of the RAT compartment door inboard and outboard with your hands, while you monitor the door actuation link.
 - 1) Make sure the door actuation link is tightly attached to the RAT compartment door and to the RAT strut.

SUBTASK 29-21-00-980-003



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (12) Make sure you can manually turn the RAT turbine hub.

SUBTASK 29-21-00-480-008

- (13) If you will use a protractor to measure the angle of the RAT strut, do these steps (Figure 503):

NOTE: You can measure the length of the RAT actuator as an alternative to the protractor. The actuator length is measured between the centerlines of the attachment bolts at each end of the actuator.

- (a) Hold the control column assembly protractor, SPL-1680 against the aft side of the RAT strut.

NOTE: You can temporarily attach the protractor to the RAT strut with tape or plastic wire-tie straps.

- (b) Set the protractor to the zero position.

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SUBTASK 29-21-00-980-004



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (14) Manually turn the turbine hub to align the blades with the RAT strut.

NOTE: If the hole in the turbine hub does not align with the blade lock on the RAT strut, the RAT will stop during retraction. The RAT will stop approximately 15 degrees from the extended position.

SUBTASK 29-21-00-020-002

- (15) Remove the lockwire from the stow valve lever on the RAT checkout module (Figure 501).

NOTE: The stow valve lever is the one that has a T-handle on it. The stow valve lever is outboard of the motoring valve lever.

SUBTASK 29-21-00-860-082

- (16) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

SUBTASK 29-21-00-860-026

- (17) Do this step to retract the RAT until it is approximately 6 to 8 degrees (8 degrees is equivalent to an actuator length of 34.13 inches) from the fully extended position:



WARNING

MAKE SURE YOU OPERATE THE CORRECT VALVE LEVER ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE LEVER, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Pull the T-handle and move the stow valve lever from the stop position to the stow position in increments of approximately 0.5 seconds.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-860-027

- (18) Move the stow valve lever to the stop (middle) position.

SUBTASK 29-21-00-980-005



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (19) Manually turn the RAT turbine hub to make sure the blade lock does not engage the hole in the turbine hub (Figure 503):

- (a) Turn the turbine hub until the blades are 5 to 15 degrees counterclockwise from the position which aligns with the RAT strut (when you look at the RAT from the forward side).

NOTE: You can use the arrows on each side of the turbine hub and generator to help do this step.

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SUBTASK 29-21-00-860-083

- (20) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

SUBTASK 29-21-00-860-028

- (21) Do this step to retract the RAT until it is approximately 16 degrees (16 degrees is equivalent to an actuator length of 33.12 inches) from the fully extended position or until the RAT stops:



MAKE SURE YOU OPERATE THE CORRECT VALVE LEVER ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE LEVER, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



DO NOT RETRACT THE RAT MORE THAN 16 DEGREES (EQUIVALENT TO AN ACTUATOR LENGTH OF LESS THAN 33.12 INCHES) WHILE THE BLADES DO NOT ALIGN WITH THE RAT STRUT. IF THE RAT RETRACTS WHILE THE BLADES DO NOT ALIGN WITH THE RAT STRUT, THE BLADES CAN HIT THE AIRPLANE. THIS CAN CAUSE DAMAGE TO THE RAT BLADES AND THE AIRPLANE.

- (a) Pull the T-handle and move the stow valve lever from the stop position to the stow position in increments of approximately 0.5 seconds.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-210-014

- (22) Make sure the RAT stops before it is approximately 14 to 16 degrees (16 degrees is equivalent to an actuator length of 33.12 inches) from the fully extended position.

SUBTASK 29-21-00-860-029

- (23) Move the stow valve lever to the stop (middle) position.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-080-004

- (24) If you temporarily attached a protractor to the RAT strut (to measure the angle of the RAT strut), do this step (Figure 503):
- (a) Remove the control column assembly protractor, SPL-1680 from the aft side of the RAT strut.

SUBTASK 29-21-00-980-006

- (25) Manually turn the turbine hub to align the blade lock with a hole in the turbine hub.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blade lock with a hole in the turbine hub.

SUBTASK 29-21-00-210-015

- (26) Make sure the blade lock moves into its position suddenly, in the hole in the turbine hub.

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SUBTASK 29-21-00-980-007



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (27) Pull on the lower blade with your hand to make sure the blade lock holds the turbine hub in its position.

SUBTASK 29-21-00-860-084

- (28) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

SUBTASK 29-21-00-860-030

- (29) Pull the T-handle and move the stow valve lever to the stow (up) position.

SUBTASK 29-21-00-860-085

- (30) After the door for the RAT compartment fully closes, move the stow valve lever to the stop (middle) position.

NOTE: If you put the stow valve lever in the flight (down) position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-210-035

- (31) Make sure the RAT compartment door is fully closed.

SUBTASK 29-21-00-860-086



WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (32) Make sure there are no persons or equipment in the area below the RAT compartment door.

SUBTASK 29-21-00-860-031

- (33) Move the stow valve lever to the flight (down) position.

SUBTASK 29-21-00-210-016

- (34) Make sure the UNLKD light on the RAM AIR TURBINE switch/light, on the overhead panel, P5, is off (Figure 502).

SUBTASK 29-21-00-210-017

- (35) Make sure the EICAS advisory message, RAT UNLOCKED, does not show on the EICAS primary display.

SUBTASK 29-21-00-860-032

- (36) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-21-00-210-018

- (37) Make sure the RAT PUMP: POS indication, on the EICAS maintenance display, shows STOWED.

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SUBTASK 29-21-00-730-002



WARNING

KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (38) Do these steps to make sure the RAT actuator solenoid, M29002, operates correctly:

- (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>
K	7	C29618	RAT AUTO/MAN CTRL

- (b) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.
- (c) Make sure the EICAS message, RAT DEPLOY INOP, does not show on the EICAS status display.
- (d) 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	4	C29621	RAT AUTO/MANUAL CONTROL

- (e) Make sure there are no persons or equipment in the area below the RAT compartment door.
- (f) Push the RAM AIR TURBINE switch/light on the overhead panel, P5, to extend the RAT (Figure 502).
- (g) Make sure the RAT moves to the extended position in 8 seconds or less.
- NOTE: For this step, the RAT is extended when the blade lock disengages the hole in the turbine hub.
- (h) If RAT does not extend when commanded, then stay away from the path of the RAT and the RAT compartment door.

NOTE: RAT may be in an unsafe state and could extend unexpectedly.

SUBTASK 29-21-00-210-019

- (39) Make sure the UNLKD light on the RAM AIR TURBINE switch/light, on the P5 panel, is on.

SUBTASK 29-21-00-210-020

- (40) Make sure the EICAS message, RAT UNLOCKED, shows on the EICAS primary display.

SUBTASK 29-21-00-980-008



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (41) Manually turn the turbine hub to align the blades with the RAT strut.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blades. If the hole in the turbine hub does not align with the blade lock on the RAT strut, the RAT will stop during retraction. The RAT will stop approximately 15 degrees from the extended position.

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SUBTASK 29-21-00-860-087

- (42) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

SUBTASK 29-21-00-860-033



MAKE SURE YOU OPERATE THE CORRECT VALVE HANDLE ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE HANDLE, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (43) Pull the T-handle and move the stow valve lever to the stow (up) position.

SUBTASK 29-21-00-980-009

- (44) If the RAT stops during retraction, do these steps:

- (a) Move the stow valve lever to the stop position.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

- (b) Manually turn the turbine hub to align the blade lock with a hole in the turbine hub.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blade lock with a hole in the turbine hub.

- (c) Make sure the blade lock moves into its position suddenly, in the hole in the turbine hub.



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (d) Pull on the lower blade with your hand to make sure the blade lock holds the turbine hub in its position.

- (e) Pull the T-handle and move the stow valve lever to the stow (up) position.

SUBTASK 29-21-00-860-034

- (45) After the door for the RAT compartment fully closes, move the stow valve lever to the stop (middle) position.

NOTE: If you put the stow valve lever in the flight (down) position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-210-021

- (46) Make sure the RAT compartment door is fully closed.

SUBTASK 29-21-00-860-035

- (47) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.

SUBTASK 29-21-00-210-022

- (48) Make sure the EICAS message, RAT DEPLOY INOP, shows on the EICAS status display.

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SUBTASK 29-21-00-860-088



WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (49) Make sure there are no persons or equipment in the area below the RAT compartment door.

SUBTASK 29-21-00-860-036

- (50) Move the stow valve lever to the flight (down) position.

SUBTASK 29-21-00-210-040

- (51) Make sure the EICAS message, RAT DEPLOY INOP, does not show on the EICAS status display.

SUBTASK 29-21-00-860-037

- (52) For the center hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-21-00-860-038

- (53) 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	4	C29621	RAT AUTO/MANUAL CONTROL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	6	C24619	ELMS RAT DEPLOY

F. Put the Airplane Back to Its Usual Condition

NOTE: If you will immediately do the RAT motoring test or the RAT generator heater test, it is not necessary to do these steps to put the airplane back to its usual condition now.

SUBTASK 29-21-00-860-164

- (1) Safety the stow valve lever in the flight (down) position with a lockwire.

SUBTASK 29-21-00-860-165

- (2) Make sure the UNLKD light on the RAM AIR TURBINE switch/light, on the overhead panel, P5, is off (Figure 502).

SUBTASK 29-21-00-860-166

- (3) Make sure the EICAS advisory message, RAT UNLOCKED, does not show on the EICAS primary display.

SUBTASK 29-21-00-860-167

- (4) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.

SUBTASK 29-21-00-860-168

- (5) Make sure the EICAS message, RAT DEPLOY INOP, does not show on the EICAS status display.

SUBTASK 29-21-00-860-169

- (6) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

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SUBTASK 29-21-00-860-170

- (7) Make sure the RAT PUMP: POS indication, on the EICAS maintenance display, shows STOWED.

SUBTASK 29-21-00-410-002



OBHEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

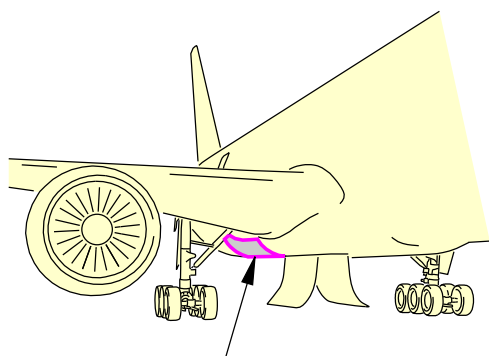
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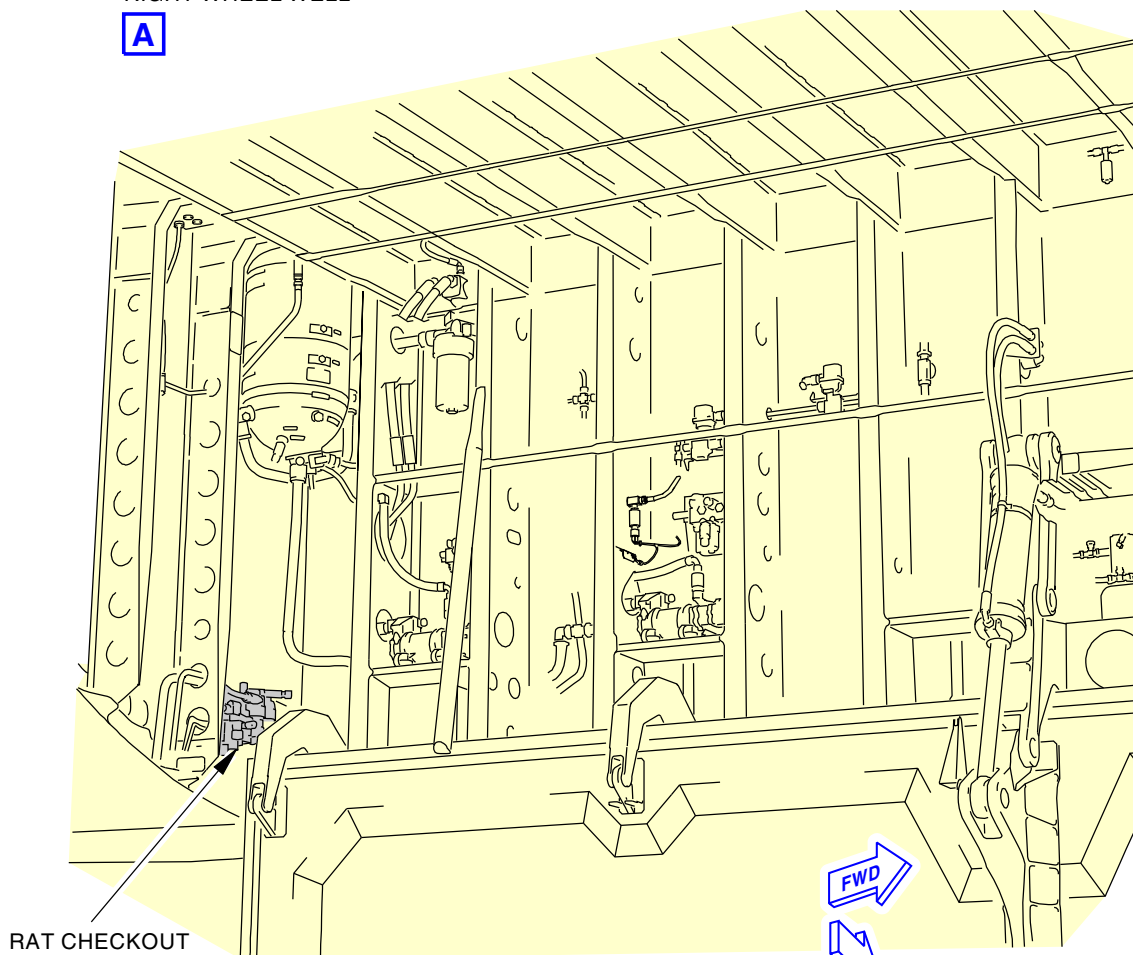
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RIGHT WHEEL WELL

A



RAT CHECKOUT
MODULE

B

RIGHT WHEEL WELL

A



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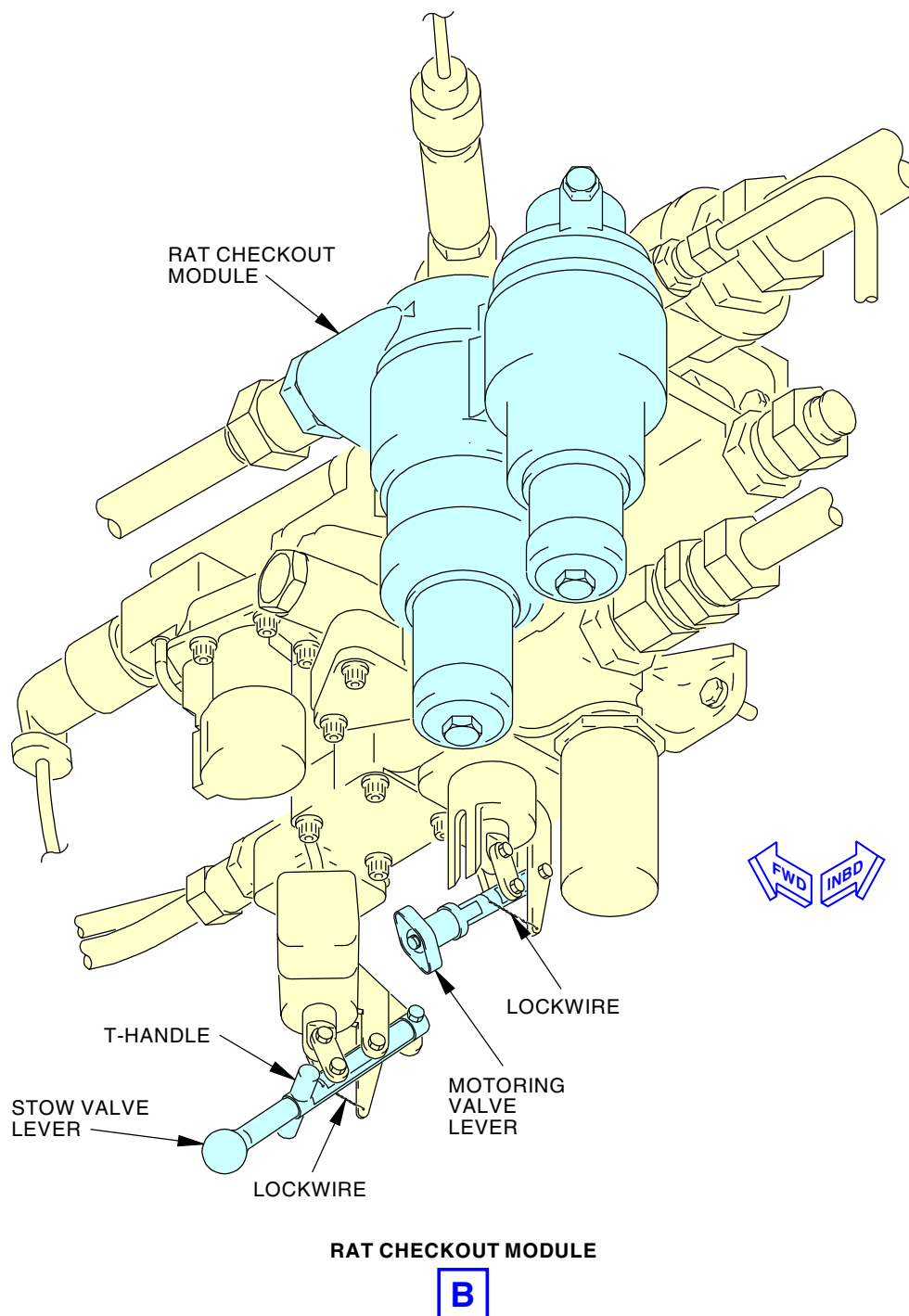
RAT Checkout Module
Figure 501/29-21-00-990-804 (Sheet 1 of 2)

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RAT Checkout Module
Figure 501/29-21-00-990-804 (Sheet 2 of 2)

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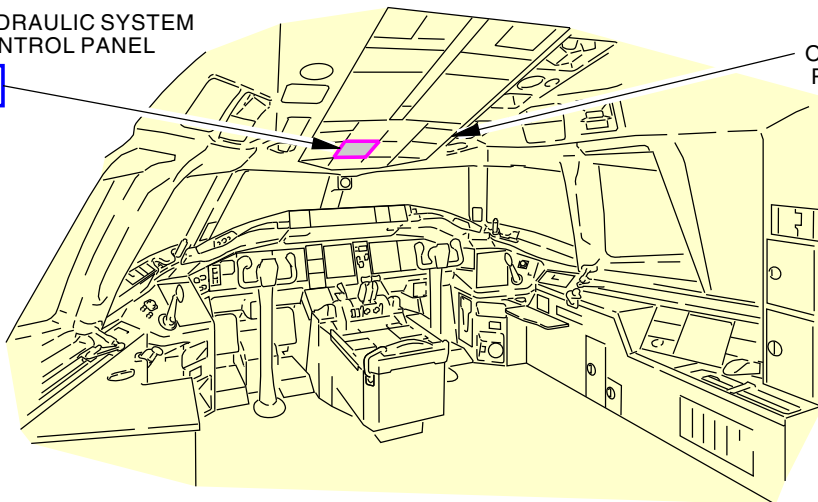


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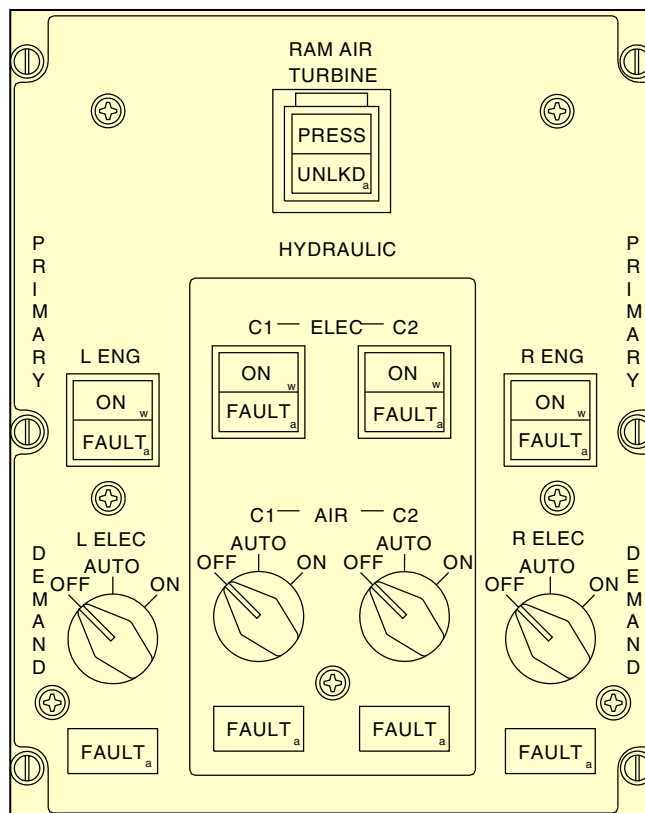
HYDRAULIC SYSTEM
CONTROL PANEL

A

OVERHEAD
PANEL, P5



FLIGHT COMPARTMENT



HYDRAULIC SYSTEM CONTROL PANEL

A

E32424 S0006416272_V3

Hydraulic System Control Panel
Figure 502/29-21-00-990-805

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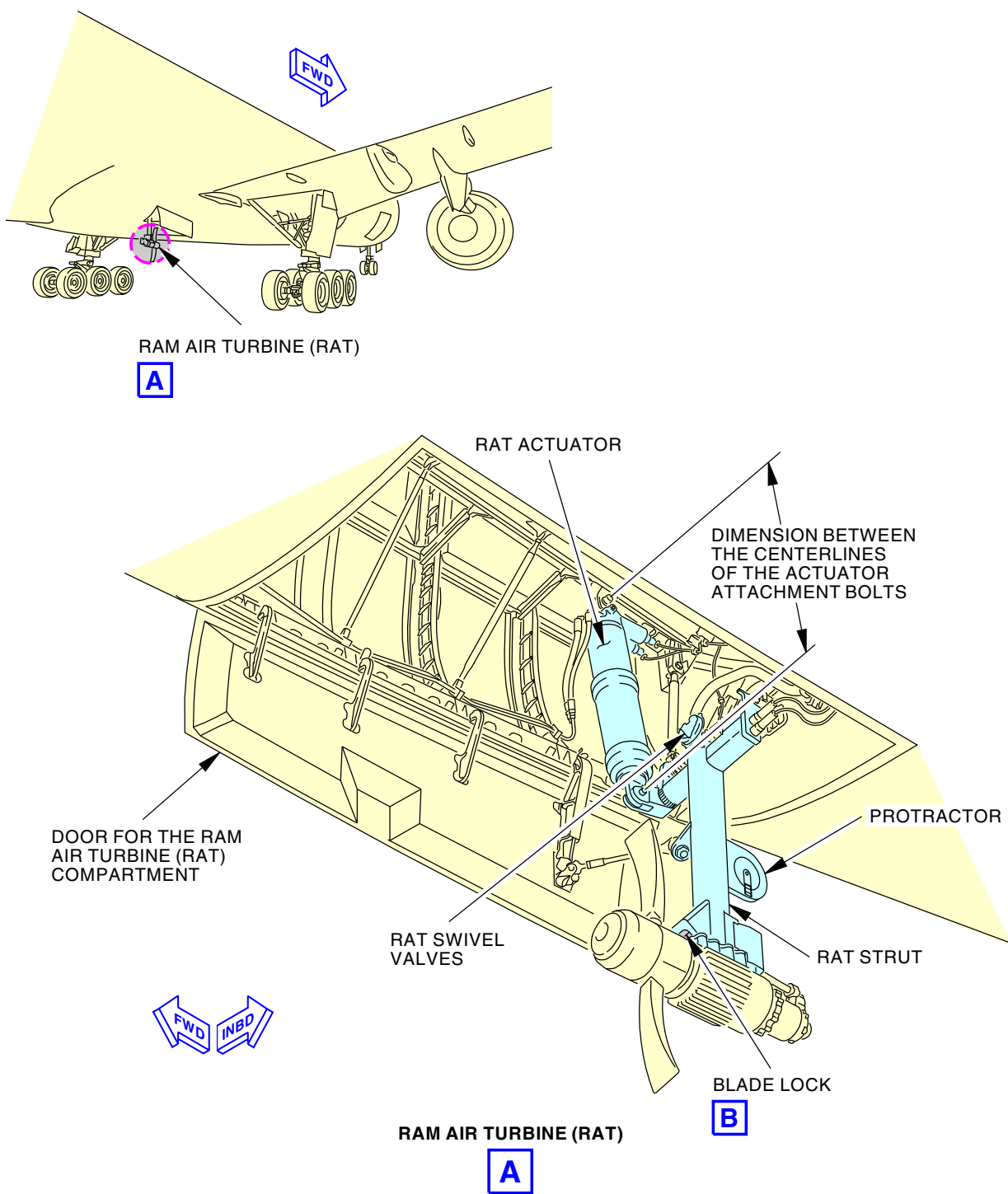
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E32433 S0006416273_V2

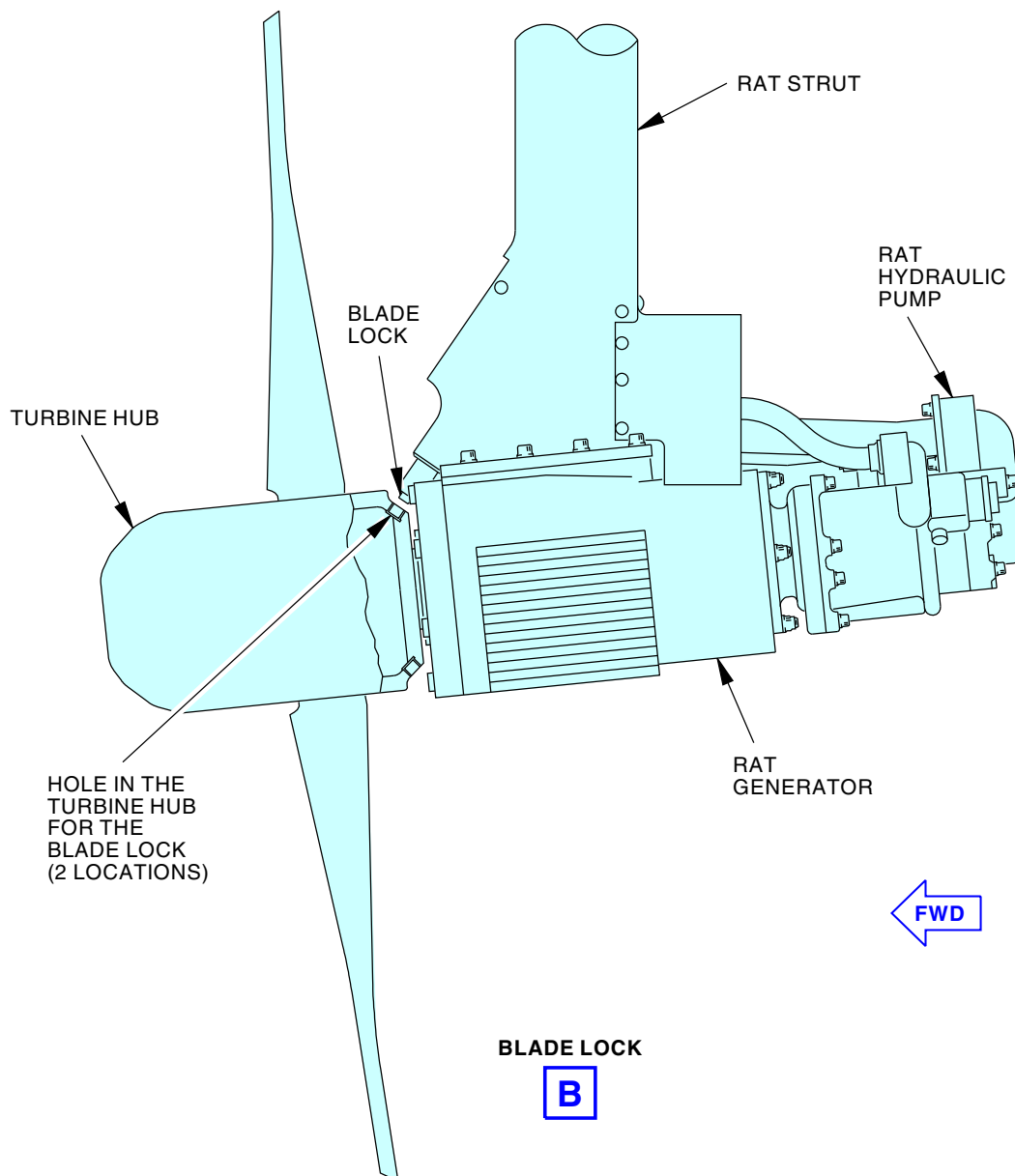
**Ram Air Turbine (RAT)
Figure 503/29-21-00-990-806 (Sheet 1 of 2)**

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Ram Air Turbine (RAT)
Figure 503/29-21-00-990-806 (Sheet 2 of 2)

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TASK 29-21-00-730-805

3. Ram Air Turbine (RAT) Automatic Deployment System - System Test

NOTE: This procedure is a scheduled maintenance task.

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)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-09-00-440-801	Air Mode Simulation - Restoration (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
34-11-01-200-801	Pitot Probe Inspection (P/B 601)
34-21-01-000-801	Air Data Inertial Reference Unit - Removal (P/B 401)
34-21-01-400-801	Air Data Inertial Reference Unit - Installation (P/B 401)
45-10-00-740-818	How to Find Active or Latched Maintenance Messages in One ATA System (P/B 201)
45-10-00-760-801	How to Use Input Monitoring (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)

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-1914	Test Set - Air Data Model FLMTS (Flight Line Maintenance) Part #: 18910920000 Supplier: 89944 Part #: ADTS405F Supplier: U0427 Part #: ADTS530 Supplier: U0427 Part #: ADTS552F Supplier: U0427 Part #: D60340MK Supplier: K1474 Part #: DPS1000 Supplier: 21844 Part #: DPS350 Supplier: 21844 Part #: DPS450 Supplier: 21844 Part #: MODEL 6300 Supplier: 0RDZ5 Part #: MPS34C Supplier: 48RQ2 Part #: MPS43B Supplier: A0197 Part #: MPS45 Supplier: 48RQ2 Part #: MPS49 Supplier: 48RQ2 Opt Part #: 01-0987-00 Supplier: 41364 Opt Part #: 18910480000 Supplier: 89944 Opt Part #: ADTS505 Supplier: U0427 Opt Part #: D60302 Supplier: K1474 Opt Part #: D60340 Supplier: K1474 Opt Part #: D60383 Supplier: K1474 Opt Part #: DPS500 Supplier: 21844 Opt Part #: MPS31C Supplier: 48RQ2 Opt Part #: MPS43 Supplier: A0197
COM-1916	Adapter - Pitot Test (Typically included in Air Data Accessory Kit) Part #: 509767 Supplier: 53949 Part #: 884EH Supplier: 59885 Part #: 884EH-3 Supplier: 59885 Part #: CSA77700HT-3 Supplier: 3BSK6 Part #: P77796HT-3 Supplier: 38002

C. Location Zones

Zone	Area
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door
521DB	Refueling Station Door

E. Prepare for the Test

SUBTASK 29-21-00-840-002

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

Standby Power Management Panel, P310

Row	Col	Number	Name
K	6	C24619	ELMS RAT DEPLOY

SUBTASK 29-21-00-860-129

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

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SUBTASK 29-21-00-840-003

- (3) Do these steps to make sure that the Autopilot/Flight Director System is off:
 - (a) Make sure that both F/D ON/OFF switches on the Mode Control Panel, P55, are in the OFF position.
 - (b) Make sure that both A/P switches on the Mode Control Panel, P55, are disengaged.

SUBTASK 29-21-00-860-130

- (4) Make sure the ADIRU switch on the overhead panel, P5, is in the ON position.

SUBTASK 29-21-00-210-044

- (5) Make sure that no Chapter 34, ADIRU faults are displayed in Existing Faults.
 - (a) For instruction on how to look at existing faults on the MAT, do this task: How to Find Active or Latched Maintenance Messages in One ATA System, TASK 45-10-00-740-818.
 - (b) If multiple faults exist that cause the status level message ADIRU to be displayed on EICAS, replace the ADIRU:
 - 1) Do these tasks: Air Data Inertial Reference Unit - Removal, TASK 34-21-01-000-801 and Air Data Inertial Reference Unit - Installation, TASK 34-21-01-400-801.

NOTE: It is not necessary to replace an ADIRU that has a fault or faults that result only in a maintenance memo on the maintenance access terminal.

SUBTASK 29-21-00-480-025



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-21-00-480-026



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-21-00-410-005

- (8) Make sure this access panel is closed:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 29-21-00-480-027

- (9) Put ropes around the area below the RAT compartment door.

SUBTASK 29-21-00-860-131



KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (10) Make sure there are no persons or equipment in the area below the RAT compartment door.

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SUBTASK 29-21-00-860-132

- (11) 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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
N	15	C52611	L FLT LOCK DR

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
N	8	C52610	R FLT LOCK DR

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
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

F. Ram Air Turbine (RAT) Automatic Deployment System - System Test

SUBTASK 29-21-00-840-005

- (1) 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>
G	5	C30405	PH B PITOT PROBE HTR L
H	6	C30424	PH C PITOT PROBE HTR L
M	25	C30624	PROBE/VANE HTR CTRL L

SUBTASK 29-21-00-840-006

- (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>
D	5	C30404	PH B PITOT PROBE HTR R
E	4	C30423	PH C PITOT PROBE HTR R
E	20	C30406	PH B PITOT PROBE HTR C
G	26	C30425	PH C PITOT PROBE HTR C
L	10	C30623	PROBE/VANE HTR CTRL R
L	11	C30625	PITOT PROBE HTR C CTRL

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SUBTASK 29-21-00-860-133

- (3) To pressurize the left and right hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

NOTE: The center hydraulic system is to remain depressurized.

SUBTASK 29-21-00-860-135

- (4) Make sure the BATTERY switch/light on the overhead panel, P5, is in the ON position.

SUBTASK 29-21-00-860-136

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

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	CBC7-C	PITOT ADM

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	CBC7-R	PITOT ADM

SUBTASK 29-21-00-170-001



CAUTION

MAKE SURE THAT YOU FLUSH THE PROBE ADAPTER WITH WATER BEFORE YOU ATTACH THE ADAPTER TO THE PROBE. DAMAGE TO THE PROBE OR THE ADAPTER CAN OCCUR.

- (6) Flush the pitot test adapter, COM-1916 with water.

NOTE: Use equal parts of water and ethylene glycol when the temperature is between 32 and -42 degrees Fahrenheit.

SUBTASK 29-21-00-480-036



CAUTION

MAKE SURE THAT THE PITOT PROBE HAS NO ADDED WEIGHT ON IT FROM THE TEST HOSE. THE PROBE CAN BEND OR TWIST OUT OF TOLERANCE.

- (7) Install the pitot test adapter, COM-1916 on the left pitot probe located at STA 201, WL 156.

SUBTASK 29-21-00-480-029

- (8) Connect the air data model test set, COM-1914 to the pitot test adapter, COM-1916.

SUBTASK 29-21-00-860-204

- (9) Do this step to put the left and right air/ground relay systems in the air mode:



WARNING

OBEY THE PROCEDURE THAT PUTS THE AIRPLANE IN THE AIR MODE. IF YOU DO THE PROCEDURE INCORRECTLY, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.
(b) Make sure that this circuit breaker is closed:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	7	C29618	RAT AUTO/MAN CTRL

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SUBTASK 29-21-00-730-009

- (10) Do these steps to make sure the RAT automatic deployment function, in the hydraulic interface module (HYDIM) card CL, operates correctly:

- (a) 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

- (b) Make sure that these circuit breakers are open:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	14	C28646	R FUEL JETT PUMP CTRL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	6	C24619	ELMS RAT DEPLOY

- (c) Remove power to the HYDIM CR card.

- 1) Open this access panel to get access to the hydraulic system cardfile:

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

- 2) Set the power switch on the P84 panel for the HYDIM CR card to the OFF position.

NOTE: Use the power control decal on the front of the card file to find the appropriate switch.



WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (d) Make sure there are no persons or equipment in the area below the RAT compartment door.

NOTE: The step which follows will cause the RAT to extend.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

- (e) To avoid jettison system faults being set, select the Left Jettison Nozzle Valve open prior to air speed greater than 100 knots. This inhibits the Jettison auto test and fuel scavenge operation.

NOTE: The Jettison auto test is designed to start after in air mode for greater than 10 minutes with airspeed greater than 100 knots.

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MAKE SURE THAT THE PRESSURE IN THE ADM IS NOT TOO HIGH. PRESSURE THAT IS MORE THAN 39.865 IN HG WILL CAUSE DAMAGE TO THE ADM.

- (f) Operate the air data model test set, COM-1914 to apply pressure between 25 and 27 mBars (0.74-0.80 in-Hg) greater than ambient pressure to the pitot system or equivalent to 110 knots.

NOTE: This pressure/airspeed must be applied at a rate such that full pressure/airspeed is achieved in no less than 10 seconds and no greater than 20 seconds. If it takes more than 20 seconds to achieve full pressure/airspeed, the ADIRU system may latch faults and cause the airspeed data to be incorrect. This will cause the RAT to not deploy. It may be helpful to set the higher pressure/airspeed value as the target because the tester will be more likely to pass through the lower value in the allotted time.

- (g) If the ambient pressure is not known, do these steps:
- 1) Use input monitoring on the MAT to determine the ambient pressure (TASK 45-10-00-760-801).
 - 2) Select "GENERAL INPUT" and 'ARINC 629.
 - 3) Use these parameters:
 - 4) FLIGHT CRITICAL BUS
BUS ID=L; LABEL=FED; CID=0; WORD RANGE FIRST=011, LAST=011.
 - 5) Type in the signal specification L/629/FC L/FED/0/11-11.
 - 6) Select: ENGINEERING THROUGH ALIASES,
Highlight item number 12 (mBars)
CONTINUE
RUN
- (h) Make sure the RAT moves to the extended position in 8 seconds or less after you complete the above step.
- NOTE:** The RAT should begin to deploy approximately 0.5 seconds after the simulated airspeed passes through 80 knots.
- NOTE:** For this step, the RAT is extended when the blade lock disengages the hole in the turbine hub.
- (i) If RAT does not extend when commanded, then stay away from the path of the RAT and the RAT compartment door.
- NOTE:** RAT may be in an unsafe state and could extend unexpectedly.
- (j) Put the test set back to ambient pressure or reduce airspeed to 0 knots.
- (k) 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

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SUBTASK 29-21-00-860-137

- (11) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-21-00-980-019



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (12) Manually turn the turbine hub to align the blades with the RAT strut.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blades. If the hole in the turbine hub does not align with the blade lock on the RAT strut, the RAT will stop during retraction. The RAT will stop approximately 15 degrees from the extended position.

SUBTASK 29-21-00-860-138

- (13) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

SUBTASK 29-21-00-860-139



WARNING

MAKE SURE YOU OPERATE THE CORRECT VALVE HANDLE ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE HANDLE, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (14) Pull the T-handle and move the stow valve lever to the stow (up) position.

SUBTASK 29-21-00-980-020

- (15) If the RAT stops during retraction, do these steps:

- (a) Move the stow valve lever to the stop position.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

- (b) Manually turn the turbine hub to align the blade lock with a hole in the turbine hub.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blade lock with a hole in the turbine hub.

- (c) Make sure the blade lock moves into its position suddenly, in the hole in the turbine hub.



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (d) Pull on the lower blade with your hand to make sure the blade lock holds the turbine hub in its position.
- (e) Pull the T-handle and move the stow valve lever to the stow (up) position.

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SUBTASK 29-21-00-860-140

- (16) After the door for the RAT compartment fully closes, move the stow valve lever to the stop (middle) position.

NOTE: If you put the stow valve lever in the flight (down) position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-210-045

- (17) Make sure the RAT compartment door is fully closed.

SUBTASK 29-21-00-860-141



KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (18) Make sure there are no persons or equipment in the area below the RAT compartment door.

SUBTASK 29-21-00-860-142

- (19) Move the stow valve lever to the flight (down) position.

NOTE: If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-860-171

- (20) Set the power switch on the P84 panel for the HYDIM CR card to the ON position.

NOTE: Use the power control decal on the front of the card file to find the appropriate switch.

SUBTASK 29-21-00-730-010

- (21) Do these steps to make sure the RAT automatic deployment function, in the hydraulic interface module (HYDIM) card CR, operates correctly:

- (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>
K	7	C29618	RAT AUTO/MAN CTRL

- (b) Remove power to the HYDIM CL card.

- 1) Set the power switch on the P85 panel for the HYDIM CL card to the OFF position.

NOTE: Use the power control decal on the front of the card file to find the appropriate switch.

NOTE: HYD Display will blank out following the removal of power from the HYDIM CL card.

- (c) Make sure the BATTERY switch/light on the overhead panel, P5, is in the ON position.
- (d) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

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WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (e) Make sure there are no persons or equipment in the area below the RAT compartment door.

NOTE: The step which follows will cause the RAT to extend.



CAUTION

MAKE SURE THAT THE PRESSURE IN THE ADM IS NOT TOO HIGH. PRESSURE THAT IS MORE THAN 39.865 IN HG WILL CAUSE DAMAGE TO THE ADM.

- (f) Operate the air data model test set, COM-1914 to apply pressure between 25 and 27 mBars (0.74-0.80 in-Hg) greater than ambient pressure to the pitot system or equivalent to 110 knots.

NOTE: This pressure/airspeed must be applied at a rate such that full pressure/airspeed is achieved in no less than 10 seconds and no greater than 20 seconds. If it takes more than 20 seconds to achieve full pressure/airspeed, the ADIRU system may latch faults and cause the airspeed data to be incorrect. This will cause the RAT to not deploy. It may be helpful to set the higher pressure/airspeed value as the target because the tester will be more likely to pass through the lower value in the allotted time.

- (g) Make sure the RAT moves to the extended position in 8 seconds or less after you complete the above step.

NOTE: The RAT should begin to deploy approximately 0.5 seconds after the simulated airspeed passes through 80 knots.

NOTE: For this step, the RAT is extended when the blade lock disengages the hole in the turbine hub.

- (h) If RAT does not extend when commanded, then stay away from the path of the RAT and the RAT compartment door.

NOTE: RAT may be in an unsafe state and could extend unexpectedly.

- (i) Put the test set back to ambient pressure or reduce airspeed to 0 knots.

SUBTASK 29-21-00-080-013



CAUTION

DO NOT DISCONNECT THE PITOT SYSTEM TEST ADAPTER WHEN THE PITOT-STATIC SYSTEM IS NOT AT AMBIENT PRESSURE. IF YOU DO, DAMAGE TO THE AIR DATA MODULES CAN OCCUR.

- (22) Disconnect the test set from the pitot test adapter, COM-1916.

SUBTASK 29-21-00-480-037

- (23) Remove the pitot test adapter, COM-1916 from the pitot probe.

SUBTASK 29-21-00-200-002

- (24) Examine the left pitot/static probe.

- (a) Do this task: Pitot Probe Inspection, TASK 34-11-01-200-801.

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SUBTASK 29-21-00-860-144

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

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	CBC7-C	PITOT ADM

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	CBC7-R	PITOT ADM

SUBTASK 29-21-00-840-007

- (26) 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>
G	5	C30405	PH B PITOT PROBE HTR L
M	25	C30624	PROBE/VANE HTR CTRL L

SUBTASK 29-21-00-840-008

- (27) 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>
D	5	C30404	PH B PITOT PROBE HTR R
E	20	C30406	PH B PITOT PROBE HTR C
L	10	C30623	PROBE/VANE HTR CTRL R
L	11	C30625	PITOT PROBE HTR C CTRL

SUBTASK 29-21-00-860-145

- (28) 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	7	C29618	RAT AUTO/MAN CTRL

SUBTASK 29-21-00-860-146

- (29) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-21-00-980-021



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (30) Manually turn the turbine hub to align the blades with the RAT strut.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blades. If the hole in the turbine hub does not align with the blade lock on the RAT strut, the RAT will stop during retraction. The RAT will stop approximately 15 degrees from the extended position.

SUBTASK 29-21-00-860-147

- (31) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

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SUBTASK 29-21-00-860-148



MAKE SURE YOU OPERATE THE CORRECT VALVE HANDLE ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE HANDLE, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (32) Pull the T-handle and move the stow valve lever to the stow (up) position.

SUBTASK 29-21-00-980-022

- (33) If the RAT stops during retraction, do these steps:

- (a) Move the stow valve lever to the stop position.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

- (b) Manually turn the turbine hub to align the blade lock with a hole in the turbine hub.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blade lock with a hole in the turbine hub.

- (c) Make sure the blade lock moves into its position suddenly, in the hole in the turbine hub.



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (d) Pull on the lower blade with your hand to make sure the blade lock holds the turbine hub in its position.

- (e) Pull the T-handle and move the stow valve lever to the stow (up) position.

SUBTASK 29-21-00-860-149

- (34) After the door for the RAT compartment fully closes, move the stow valve lever to the stop (middle) position.

NOTE: If you put the stow valve lever in the flight (down) position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

SUBTASK 29-21-00-210-046

- (35) Make sure the RAT compartment door is fully closed.

SUBTASK 29-21-00-860-150



KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (36) Make sure there are no persons or equipment in the area below the RAT compartment door.

SUBTASK 29-21-00-860-151

- (37) Move the stow valve lever to the flight (down) position.

NOTE: If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.



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SUBTASK 29-21-00-860-172

- (38) Set the power switch on the P85 panel for the HYDIM CL card to the ON position.

NOTE: Use the power control decal on the front of the card file to find the appropriate switch.

SUBTASK 29-21-00-860-152

- (39) For the left, right, and center hydraulic systems, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-21-00-860-153

- (40) Do this step to put the left and right air/ground relay systems in the ground mode:

(a) Do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

SUBTASK 29-21-00-730-011

- (41) Do these steps to make sure the RAT automatic deployment function, in the electrical load management system (ELMS), operates correctly:
- (a) Make sure the BATTERY switch/light on the overhead panel, P5, is in the ON position.
- (b) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	7	C29618	RAT AUTO/MAN CTRL

- (c) Make sure the EICAS message, RAT DEPLOY INOP, shows on the EICAS status display.
- (d) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
- (e) Make sure the PRI EXT PWR AC-V indication is between 110 and 120 volts on the EICAS maintenance display.
- (f) Make sure the SEC EXT PWR AC-V indication is between 110 and 120 volts on the EICAS maintenance display.
- (g) Do these steps to put the left and right air/ground relay systems in the air mode:
- 1) Do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.
 - 2) Close this circuit breaker:

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	13	C24643	MN BAT RLY CTRL

- (h) 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	6	C24619	ELMS RAT DEPLOY

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KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (i) Make sure there are no persons or equipment in the area below the RAT compartment door.

NOTE: The step which follows, will cause the RAT to extend.

- (j) At the same time, put the PRIMARY EXT PWR switch and the SECONDARY EXT PWR switch, on the overhead panel, P5, to the OFF position.
- 1) Make sure the AVAIL lights on the PRIMARY EXT PWR and the SECONDARY EXT PWR switch/lights, on the overhead panel, P5, are on.

- (k) Make sure the RAT moves to the extended position in 30 seconds or less after you complete the above step.

NOTE: For this step, the RAT is extended when the blade lock disengages the hole in the turbine hub.

- (l) If RAT does not extend when commanded, then stay away from the path of the RAT and the RAT compartment door.

NOTE: RAT may be in an unsafe state and could extend unexpectedly.

- (m) Set the PRIMARY EXT PWR and the SECONDARY EXT PWR switch/lights, on the overhead panel, P5, to the ON position.

- (n) 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>
D	13	C29619	RAT AUTO CONTROL

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	7	C29618	RAT AUTO/MAN CTRL

- (o) Do this step to put the left and right air/ground relay systems in the ground mode:

- 1) Do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

- (p) Make sure the PRI EXT PWR AC-V indication is between 110 and 120 volts on the EICAS maintenance display.

- (q) Make sure the SEC EXT PWR AC-V indication is between 110 and 120 volts on the EICAS maintenance display.

- (r) Put the APU Start Switch to the ON position for one second and then return it to the OFF position.

NOTE: Putting the APU Start Switch to the ON and OFF position resets the APU Autostart logic. This will prevent the APU inlet door from opening automatically when the APU INLET DOOR/FUEL SOV CTRL circuit breaker, C28650, is closed.

- (s) Do the restoration after the air mode simulation task. To do it, do this task: Air Mode Simulation - Restoration, TASK 32-09-00-440-801.

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- (t) Close the Left Jettison Nozzle Valve with the flight deck switch.

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- (u) 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>
L	22	C28645	L FUEL JETT PUMP CTRL
N	15	C52611	L FLT LOCK DR

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	13	C29619	RAT AUTO CONTROL

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	14	C28646	R FUEL JETT PUMP CTRL
N	8	C52610	R FLT LOCK DR

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	7	C29618	RAT AUTO/MAN CTRL
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

G. Put the Airplane Back to Its Usual Condition

NOTE: If you will immediately do the RAT motoring test or the RAT generator heater test, it is not necessary to do these steps to put the airplane back to its usual condition now.

SUBTASK 29-21-00-860-154

- (1) Do these steps to retract the RAT:
- (a) For center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (b) Manually turn the turbine hub to align the blades with the RAT strut.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blades. If the hole in the turbine hub does not align with the blade lock on the RAT strut, the RAT will stop during retraction. The RAT will stop approximately 15 degrees from the extended position.

- (c) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.

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MAKE SURE YOU OPERATE THE CORRECT VALVE LEVER ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE LEVER, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (d) Pull the T-handle and move the stow valve lever to the stow (up) position.
- (e) If the RAT stops during retraction, do these steps:
 - 1) Move the stow valve lever to the stop position.
NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.
 - 2) Manually turn the turbine hub to align the blade lock with a hole in the turbine hub.
NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blade lock with a hole in the turbine hub.
 - 3) Make sure the blade lock moves into its position suddenly, in the hole in the turbine hub.



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- 4) Pull on the lower blade with your hand to make sure the blade lock holds the turbine hub in its position.
- 5) Pull the T-handle and move the stow valve lever to the stow (up) position.
- (f) After the door for the RAT compartment fully closes, move the stow valve lever to the stop (middle) position.
NOTE: If you put the stow valve lever in the flight (down) position, before the RAT fully retracts, the RAT will move quickly back to the extended position.
- (g) Make sure the RAT compartment door is fully closed.



KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (h) Make sure there are no persons or equipment in the area below the RAT compartment door.
- (i) Move the stow valve lever to the flight (down) position.
NOTE: If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.
- (j) For the center hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
- (k) Safety the stow valve lever in the flight (down) position with a lockwire.
- (l) Make sure the UNLKD light on the RAM AIR TURBINE switch/light, on the overhead panel, P5, is off (Figure 502).



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- (m) Make sure the EICAS advisory message, RAT UNLOCKED, does not show on the EICAS primary display.
- (n) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.
- (o) Make sure the EICAS message, RAT DEPLOY INOP, does not show on the EICAS status display.
- (p) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
- (q) Make sure the RAT PUMP: POS indication, on the EICAS maintenance display, shows STOWED.

SUBTASK 29-21-00-810-001

- (2) Make sure the EICAS message, APU DC FUEL PUMP does not show on the EICAS status display.
 - (a) If necessary, do the steps that follow to extinguish the APU DC FUEL PUMP message:
 - 1) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.
 - 2) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
NOTE: If the task is performed when the aircraft is in side the hangar, put the APU CTRL Switch to the ON position for one second and then return it to the OFF position.
 - 3) Make sure the EICAS message, APU DC FUEL PUMP does not show.
 - 4) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

SUBTASK 29-21-00-860-200

- (3) 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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
H	6	C30424	PH C PITOT PROBE HTR L

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

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C30423	PH C PITOT PROBE HTR R
G	26	C30425	PH C PITOT PROBE HTR C

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
K	7	C29618	RAT AUTO/MAN CTRL

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SUBTASK 29-21-00-410-004



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

— END OF TASK —

TASK 29-21-00-730-803

4. Ram Air Turbine (RAT) Generator Heater - System Test

A. General

- (1) Use this system test for airplanes with the maintenance access terminal (MAT) test for the Heaters (RAT Generator, ADP C1, and ADP C2).
- (2) This test makes sure that the RAT generator heater operates correctly.
- (3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal (MAT), do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

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

C. Location Zones

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

D. Prepare for the Test

SUBTASK 29-21-00-840-001

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

E. RAT Generator Heater Ground Test on the Maintenance Access Terminal (MAT)

NOTE: This test makes sure that the RAT generator and Air Driven Pump heaters operate correctly.

SUBTASK 29-21-00-710-001

- (1) Use a maintenance access terminal (MAT) to do the operational test of the RAT generator heater.
 - (a) Make these selections on the MAT:
 - 1) ONBOARD MAINTENANCE
 - 2) LINE MAINTENANCE
 - 3) GROUND TESTS
 - 4) 29 Hydraulic System
 - 5) OPERATIONAL TEST
 - 6) Heaters (RAT Generator, ADP C1, and ADP C2)
 - 7) CONTINUE

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- (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, refer to the applicable maintenance message index in the FIM or select the maintenance message and select MAINTENANCE MESSAGE DATA.

END OF TASK

29-CMR-03

TASK 29-21-00-730-801

5. Ram Air Turbine (RAT) System - Motoring Test

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Two persons are necessary to do this motoring test. One person monitors the EICAS indications in the flight compartment. The second person operates the motoring valve lever in the right wheel well. It is necessary that each person can speak with the other person.

B. References

Reference	Title
21-00-00-800-804	Remove Conditioned Air Supplied by a Cooling Pack (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1801	Cage - Safety, Ram Air Turbine Part #: QAT102497 Supplier: 0AHE0 Opt Part #: IA2901-1 Supplier: 3D5B2

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

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E. Prepare for the Test

NOTE: If you do this test immediately after you did the RAT generator heater test or the RAT manual and automatic deployment systems test, it is not necessary to do these steps to prepare for the motoring test.

SUBTASK 29-21-00-860-062

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

SUBTASK 29-21-00-480-014



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-21-00-480-015



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-21-00-860-063



WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Make sure there are no persons or equipment in the area below the RAT compartment door and away from the RAT extension/retraction path.

SUBTASK 29-21-00-860-064

- (5) Push the RAM AIR TURBINE switch on the overhead panel, P5, to extend the RAT (Figure 502).

NOTE: The RAT can move to the fully extended position in approximately 2 seconds.

F. Ram Air Turbine (RAT) System - Motoring Test

SUBTASK 29-21-00-860-065

- (1) To prevent the retraction of the RAT while you do this motoring test, do these steps:
- (a) 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

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SUBTASK 29-21-00-980-014



DO NOT MOTOR THE RAM AIR TURBINE (RAT) IF IT IS NOT LOCKED IN THE EXTENDED POSITION. IF YOU MOTOR THE RAT WHILE IT IS NOT LOCKED, IT CAN MOVE IN THE RETRACTED DIRECTION. THIS MOVEMENT CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do these steps to make sure the RAT is locked in the extended position:



DO NOT TOUCH THE RAT GENERATOR IF IT IS HOT. THE RAT GENERATOR CAN BECOME HOT FROM THE OPERATION OF THE RAT GENERATOR HEATER. THE HOT SURFACE OF THE GENERATOR CAN BURN YOU.

- (a) Push forward on the RAT hydraulic pump to try to move the RAT strut in the retracted direction.
- (b) If the RAT strut moves more than one inch in the retracted direction, do this step:
- 1) Manually move the RAT strut forward and aft while it is at the fully extended position to help engage the actuator locks.

SUBTASK 29-21-00-080-006



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (3) If the protective covers are on the turbine blades remove them.

SUBTASK 29-21-00-480-035



DO NOT USE SAFETY SCREEN J29001-XX. DAMAGE TO EQUIPMENT OR INJURY TO PERSONNEL CAN OCCUR.

- (4) Install the ram air turbine safety cage, COM-1801 (preferred) or put a 20 foot (6 meter) diameter secured/roped-off area (alternate) below the RAT compartment door to prevent personnel entry.

SUBTASK 29-21-00-860-066

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

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	24	C22604	AFDC-C

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C27601	FSEU 1
M	9	C24632	STATIC INV POWER

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SUBTASK 29-21-00-860-067

- (6) Make sure the stow valve lever, on the RAT checkout module, is in the flight (down) position and has a lockwire on it.

NOTE: The stow valve lever is the one that has a T-handle on it. The stow valve lever is outboard of the motoring valve lever. The flight position is the fully down position of the stow valve lever. The lockwire will help prevent the accidental movement of the stow valve lever during the motoring test of the RAT.

SUBTASK 29-21-00-860-068

- (7) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-21-00-860-069

- (8) Pressurize the center hydraulic system with either a portable hydraulic cart or with either the C1 or C2 ADP.

NOTE: Do not use the ACMP to provide hydraulic pressure. The ACMP will not provide the required flow rate to complete this task.

- (a) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

NOTE: you can use the APU pneumatic air or the external air source if you pressurize the hydraulic system with the ADP.

SUBTASK 29-21-00-210-052

- (9) Make sure the PRESS light on the RAM AIR TURBINE switch/light, on the overhead panel, P5 is off.

SUBTASK 29-21-00-860-178

- (10) The packs must be turned OFF prior to RAT test procedure.
- (a) Do this task: Remove Conditioned Air Supplied by a Cooling Pack, TASK 21-00-00-800-804.

SUBTASK 29-21-00-020-005



MAKE SURE THAT THE RAM AIR TURBINE SAFETY CAGE, COM-1801 IS INSTALLED OR THERE IS A 20 FOOT (6 METER) DIAMETER AREA SECURED/ROPED-OFF AROUND THE RAT TO PREVENT PERSONNEL ENTRY BEFORE YOU MOTOR THE RAT. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (11) Remove the lockwire from the motoring valve lever on the RAT checkout module (Figure 501).

NOTE: The motoring valve lever is inboard of the stow valve lever. The motoring valve lever has an oval shape and a yellow color.

SUBTASK 29-21-00-860-096

- (12) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the motoring valve lever.

SUBTASK 29-21-00-860-070

- (13) Turn the motoring valve handle counterclockwise 90 degrees and move it to the motoring (up) position.

NOTE: You must hold the motoring valve lever in the motoring (up) position. A spring holds the motoring valve lever in the flight (down) position.

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SUBTASK 29-21-00-210-023

- (14) Monitor the HYDRAULIC RAT PUMP: RPM indication, on the EICAS maintenance page.
- (a) Make sure the HYDRAULIC RAT PUMP: RPM indication is not more than 5100 rpm.
 - (b) If the HYDRAULIC RAT PUMP: RPM indication becomes more than 5100 rpm, release the motoring valve lever to the flight (down) position.

SUBTASK 29-21-00-210-024

- (15) Make sure the HYDRAULIC RAT PUMP: RPM indication, on the EICAS maintenance page, shows 3920 to 4500 rpm.
- (a) If the HYDRAULIC RAT PUMP: RPM indication becomes more than 5100 rpm, release the motoring valve lever to the flight (down) position.

SUBTASK 29-21-00-210-025

- (16) Make sure the ELECTRICAL RAT GEN AC-V indication, on the EICAS electrical maintenance display, shows 108 to 127 volts.

NOTE: This indication will not show until approximately 10 seconds after the HYDRAULIC RAT PUMP: RPM indication becomes 3920 rpm.

SUBTASK 29-21-00-210-026

- (17) Make sure the ELECTRICAL RAT GEN FREQ indication, on the EICAS electrical maintenance display, shows 392 to 450 hertz.

NOTE: This indication will not show until approximately 10 seconds after the HYDRAULIC RAT PUMP: RPM indication becomes 3920 rpm.

SUBTASK 29-21-00-860-072

- (18) Set the PRIMARY EXT PWR switch/light, on the overhead panel, P5, to the OFF position.

SUBTASK 29-21-00-210-027

- (19) Make sure the AVAIL light on the PRIMARY EXT PWR switch/light, on the overhead panel, P5, is on.

SUBTASK 29-21-00-860-073

- (20) 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>
D	7	C24628	TRU C2 CTRL
M	7	C24638	BAT BUS PWR

SUBTASK 29-21-00-210-028

- (21) Make sure the ELECTRICAL RAT GEN AC-V indication, on the EICAS electrical maintenance display, shows 108 to 127 volts.

SUBTASK 29-21-00-210-029

- (22) Make sure the ELECTRICAL RAT GEN FREQ indication, on the EICAS electrical maintenance display, shows 392 to 450 hertz.

SUBTASK 29-21-00-860-074

- (23) 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>
D	7	C24628	TRU C2 CTRL
M	7	C24638	BAT BUS PWR

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SUBTASK 29-21-00-860-075

- (24) Set the PRIMARY EXT PWR switch/light, on the overhead panel, P5, to the ON position.

SUBTASK 29-21-00-210-030

- (25) Make sure the AVAIL light on the PRIMARY EXT PWR switch/light, on the overhead panel, P5, is off.

SUBTASK 29-21-00-860-076

- (26) Move the motoring valve lever to the flight (down) position. Turn the motoring valve lever clockwise 90 degrees.

NOTE: A spring holds the motoring valve lever in the flight (down) position.

SUBTASK 29-21-00-210-031

- (27) Make sure the spring moves the motoring valve lever to the flight (down) position.

SUBTASK 29-21-00-210-033



DO NOT TOUCH THE RAT GENERATOR AFTER YOU MOTOR THE RAT. THE OPERATION OF THE RAT GENERATOR CAN CAUSE THE GENERATOR TO BECOME HOT. THE HOT SURFACE OF THE GENERATOR CAN BURN YOU.

- (28) Make sure the RAT turbine blades and hub stop.

SUBTASK 29-21-00-420-003

- (29) Safety the motoring valve lever in the flight (down) position with a lockwire.

SUBTASK 29-21-00-080-012

- (30) Remove the ram air turbine safety cage, COM-1801, if it is installed around the RAT.

SUBTASK 29-21-00-790-001

- (31) Make sure there are no leaks at the RAT swivel valves or the hydraulic tube connections.

SUBTASK 29-21-00-790-002

- (32) Make sure the leakage from the RAT hydraulic pump is no more than five drops in three minutes when operating and no more than one drop per minute when stopped.

SUBTASK 29-21-00-210-049

- (33) Make sure there is no leakage from the RAT pump case. If the RAT pump case is found to be cracked, then it is recommended that the RAT pump and the ground control module be replaced at the same time.

NOTE: Service experience shows that a cracked RAT pump can be caused by blockage in the ground control module. Replacement of the ground control module can prevent a premature failure of the replacement RAT pump.

SUBTASK 29-21-00-860-077

- (34) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-00-860-078

- (1) Remove the safety tag and 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 29-21-00-860-079

- (2) Do these steps to retract the RAT:

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WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (a) Manually turn the turbine hub to align the blades with the RAT strut.

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blades. If the hole in the turbine hub does not align with the blade lock on the RAT strut, the RAT will stop during retraction. The RAT will stop approximately 15 degrees from the extended position.

- (b) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
- (c) Move into a position (at the aft end of the right main wheel well) in which you can look aft, below the wing-to body fairing, to see the RAT and put your right hand on the stow valve lever.



WARNING

MAKE SURE YOU OPERATE THE CORRECT VALVE HANDLE ON THE RAT CHECKOUT MODULE. IF YOU ACCIDENTALLY MOVE THE MOTORING VALVE HANDLE, YOU WILL MOTOR THE RAT HYDRAULIC PUMP. THE FAST MOVEMENT OF THE RAT TURBINE BLADES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (d) Pull the T-handle and move the stow valve lever to the stow (up) position.

NOTE: The stow valve lever is the one that has a T-handle on it. The stow valve lever is outboard of the motoring valve lever.

- (e) If the RAT stops during retraction, do these steps:

- 1) Move the stow valve lever to the stop position.

NOTE: The stop position is the middle position between the stow (up) and the flight (down) positions of the stow valve lever. If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

- 2) Manually turn the turbine hub to align the blade lock with a hole in the turbine hub (Figure 503).

NOTE: You can use the arrows on each side of the turbine hub and generator to help align the blade lock with a hole in the turbine hub.

- 3) Make sure the blade lock moves into its position suddenly, in the hole in the turbine hub.



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- 4) Pull on the lower blade with your hand to make sure the blade lock holds the turbine hub in its position.
- 5) Pull the T-handle and move the stow valve lever to the stow (up) position.

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- (f) After the door for the RAT compartment fully closes, move the stow valve lever to the stop (middle) position.

NOTE: If you put the stow valve lever in the flight (down) position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

- (g) Make sure the RAT compartment door is fully closed.
 (h) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.
 (i) Make sure the EICAS message, RAT DEPLOY INOP shows on the EICAS status display.



WARNING

KEEP PERSONS AND EQUIPMENT AWAY FROM THE PATH OF THE RAT AND THE RAT COMPARTMENT DOOR. THE RAT AND THE RAT COMPARTMENT DOOR MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (j) Make sure there are no persons or equipment in the area below the RAT compartment door.

- (k) Move the stow valve lever to the flight (down) position.

NOTE: If you put the stow valve lever in the flight position, before the RAT fully retracts, the RAT will move quickly back to the extended position.

- (l) For the center hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
 (m) Safety the stow valve lever in the flight (down) position with a lockwire.
 (n) Make sure the PRESS light on the RAM AIR TURBINE switch/light, on the overhead panel, P5 is off.
 (o) Make sure the UNLKD light on the RAM AIR TURBINE switch/light, on the overhead panel, P5, is off (Figure 502).
 (p) Make sure the EICAS advisory message, RAT UNLOCKED, does not show on the EICAS primary display.
 (q) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.
 (r) Make sure the EICAS message, RAT DEPLOY INOP, does not show on the EICAS status display.
 (s) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.
 (t) Make sure the RAT PUMP: POS indication, on the EICAS maintenance display, shows STOWED.

SUBTASK 29-21-00-860-080

- (3) 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	24	C22604	AFDC-C

Standby Power Management Panel, P310

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	3	C27601	FSEU 1
M	9	C24632	STATIC INV POWER

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SUBTASK 29-21-00-860-081

- (4) Push the STAT switch, on the display select panel for the EICAS, to show the EICAS status display.

SUBTASK 29-21-00-210-034

- (5) Make sure the EICAS message, RAT DEPLOY INOP, does not show on the EICAS status display.

SUBTASK 29-21-00-080-009



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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RAM AIR TURBINE (RAT) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the ram air turbine (RAT)
- (2) An installation of the ram air turbine (RAT).

TASK 29-21-01-000-801

2. Ram Air Turbine (RAT) Removal

NOTE: This procedure is a scheduled maintenance task.

A. 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)

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-1800	Equipment - Removal and Installation, Ram Air Turbine Part #: J29002-25 Supplier: 81205 Opt Part #: J29002-1 Supplier: 81205 Opt Part #: J29002-16 Supplier: 81205

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Prepare for the Removal

SUBTASK 29-21-01-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-01-860-002

- (2) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-21-01-680-001

- (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.

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E. Ram Air Turbine (RAT) Removal

SUBTASK 29-21-01-020-001



DO NOT TOUCH THE RAT GENERATOR IF IT IS HOT. THE RAT GENERATOR CAN BECOME HOT FROM THE OPERATION OF THE RAT GENERATOR HEATER. THE HOT SURFACE OF THE GENERATOR CAN BURN YOU.

- (1) Do these steps to disconnect the door actuation link [3] (Figure 401) (referred to as the link in this procedure) from the turbine assembly [2]:
 - (a) Remove the nut [62] and the washer [63] from the bolt [60].
 - (b) Remove the nut [10] and washer [11] that attaches the pin [12] on the link [3] to the turbine assembly [2].
 - (c) Remove the link [3] from the turbine assembly [2].
 - (d) Hold the link [3] to the RAT compartment door with tape or string, to keep it away from the removal path of the turbine assembly [2].

SUBTASK 29-21-01-020-002

- (2) Remove the bolt [8] which holds the RAT actuator [1] to the turbine assembly [2].

SUBTASK 29-21-01-020-003

- (3) Disconnect the electrical connectors [17] and [18] at the top of the turbine assembly [2].

SUBTASK 29-21-01-020-004

- (4) Install caps on the electrical connectors [17] and [18] to prevent contamination and damage.

SUBTASK 29-21-01-020-005

- (5) Remove the screw [21] to disconnect the bonding jumper [20] at the outboard end of the turbine assembly [2].

SUBTASK 29-21-01-020-006

- (6) Remove the screw [48] to disconnect the bonding jumper [47] at the inboard end of the turbine assembly [2].

SUBTASK 29-21-01-020-007

- (7) Do these steps to remove the assembly of the rod end [36] and rod end [45] together:
 - (a) Remove the bolt [34] which attaches the rod end [36] to the hydraulic swivel assembly [19], at the top of the turbine assembly [2].
 - (b) Remove the bolt [31] which attaches the rod end [45] to the bracket [23] on the aft bulkhead of the RAT compartment.
 - (c) Remove the assembly of the rod end [36] and screw [48] together.

SUBTASK 29-21-01-020-008



BE CAREFUL WHEN YOU DISCONNECT THE TUBES FROM THE RAT STRUT SO THAT THE REMAINING FLUID IN THE TUBES DOES NOT FLOW ON YOU. HYDRAULIC FLUID, BMS 3-11, CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (8) Disconnect the supply tube [13], the case drain tube [16], and the elbow [14] of the pressure tube [15] from the hydraulic swivel assembly [19] at the top of the turbine assembly [2].

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SUBTASK 29-21-01-020-009

- (9) Install caps on these components to prevent contamination:
- (a) The supply tube [13]
 - (b) The case drain tube [16]
 - (c) The elbow [14] on the pressure tube [15]
 - (d) The open ports in the hydraulic swivel assembly [19].

SUBTASK 29-21-01-480-001

- (10) Do these steps to install the ram air turbine equipment, SPL-1800, (Figure 402):
- (a) Install the bolt [72] (Figure 402), the washer [73] and the nut [74] to attach the hanger [77] to the bracket [23] (on the aft bulkhead of the RAT compartment).
 - 1) Tighten the bolt [72] and the nut [74] with your hand only, to prevent damage to the bracket [23].
 - (b) Put the sling assembly [79] around the turbine assembly [2], immediately below the connection point for the door actuation link [3] (Figure 401).
 - 1) Put the end of the sling assembly [79] (Figure 402), that has the D-ring, through the opposite end to make a loop around the turbine assembly [2].

SUBTASK 29-21-01-480-002

- (11) Do these steps to install the cable fishpole hoist, COM-1563:
- (a) Engage the hoist support fitting [75] with the keyhole slot in the hanger [77].
 - (b) Attach the hoist cable [76] to the D-ring [78] on the sling assembly [79].



BE CAREFUL WHEN YOU OPERATE THE CABLE FISHPOLE HOIST, COM-1563 SO THAT THE REMAINING FLUID IN THE RAT STRUT DOES NOT FLOW ON YOU. HYDRAULIC FLUID, BMS 3-11, CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (c) Operate the cable fishpole hoist, COM-1563, to hold the turbine assembly [2].

SUBTASK 29-21-01-020-010

- (12) While you hold the turbine assembly [2] with the cable fishpole hoist, COM-1563, do these steps to disconnect the turbine assembly [2] from the brackets [29] and [51] (Figure 401)(on the aft bulkhead of the RAT compartment).
- (a) At the outboard end of the turbine assembly [2], remove the bolt [28] at the bracket [29].
 - (b) At the inboard end of the turbine assembly [2], remove the bolt [50], washer [54], nut [52] and washer [53] at the bracket [51].
 - (c) Remove the washer [56], washer [57], and washer [58] if installed.

SUBTASK 29-21-01-020-011



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

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(WARNING PRECEDES)



WARNING

BE CAREFUL WHEN YOU MOVE THE RAT BECAUSE THE RAT WEIGHS APPROXIMATELY 150 POUNDS. INJURIES TO PERSONS CAN OCCUR.



CAUTION

DO NOT HOLD THE RAT BY THE TURBINE BLADES OR PUT THE RAT DOWN ON THE TURBINE BLADES. THE WEIGHT OF THE RAT CAN CAUSE DAMAGE TO THE TURBINE BLADES OR THE GOVERNOR MECHANISM.

- (13) Operate the cable fishpole hoist, COM-1563, to lower the ram air turbine (RAT) from the wing-to-body fairing.

———— **END OF TASK** ————

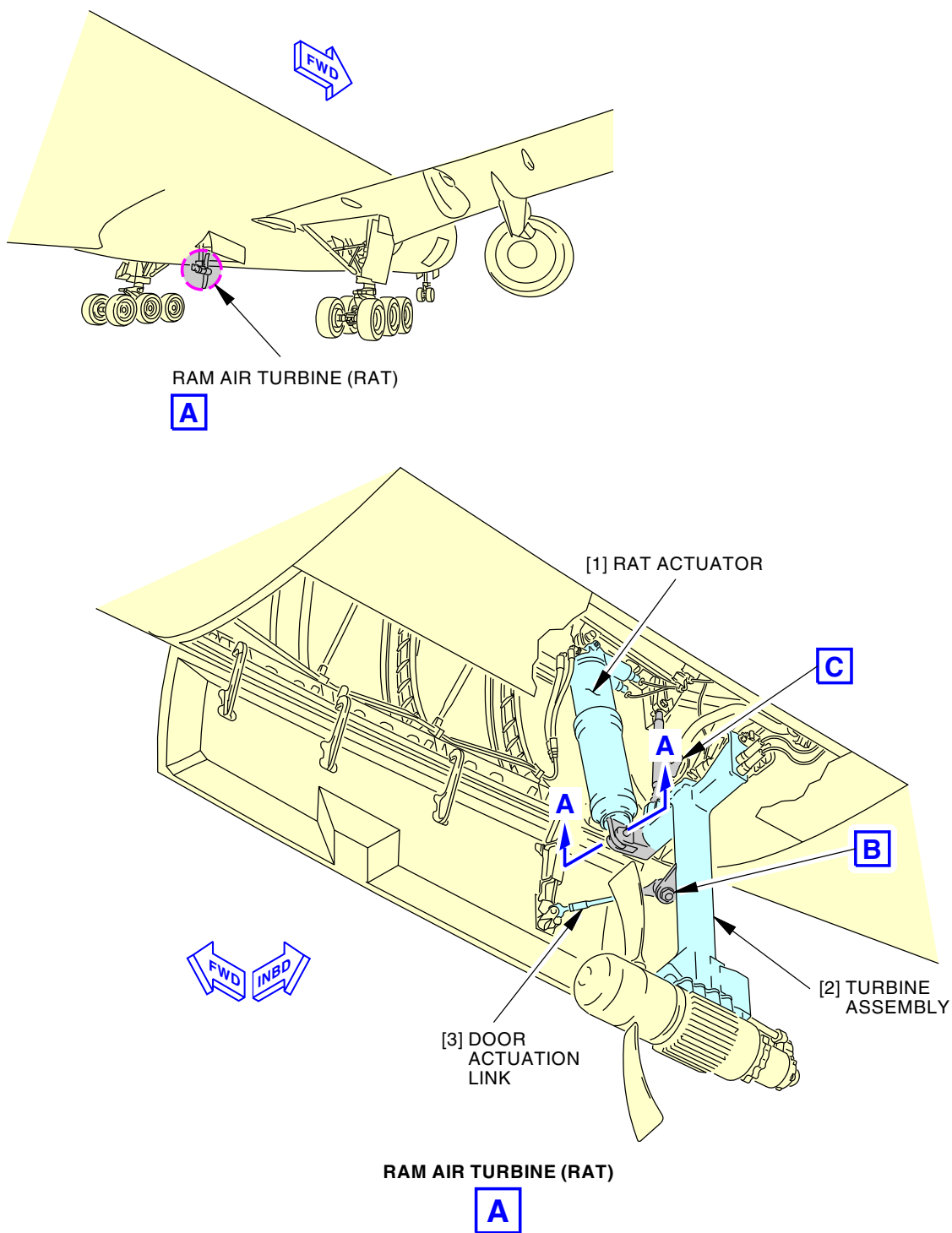
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Ram Air Turbine (RAT) Installation
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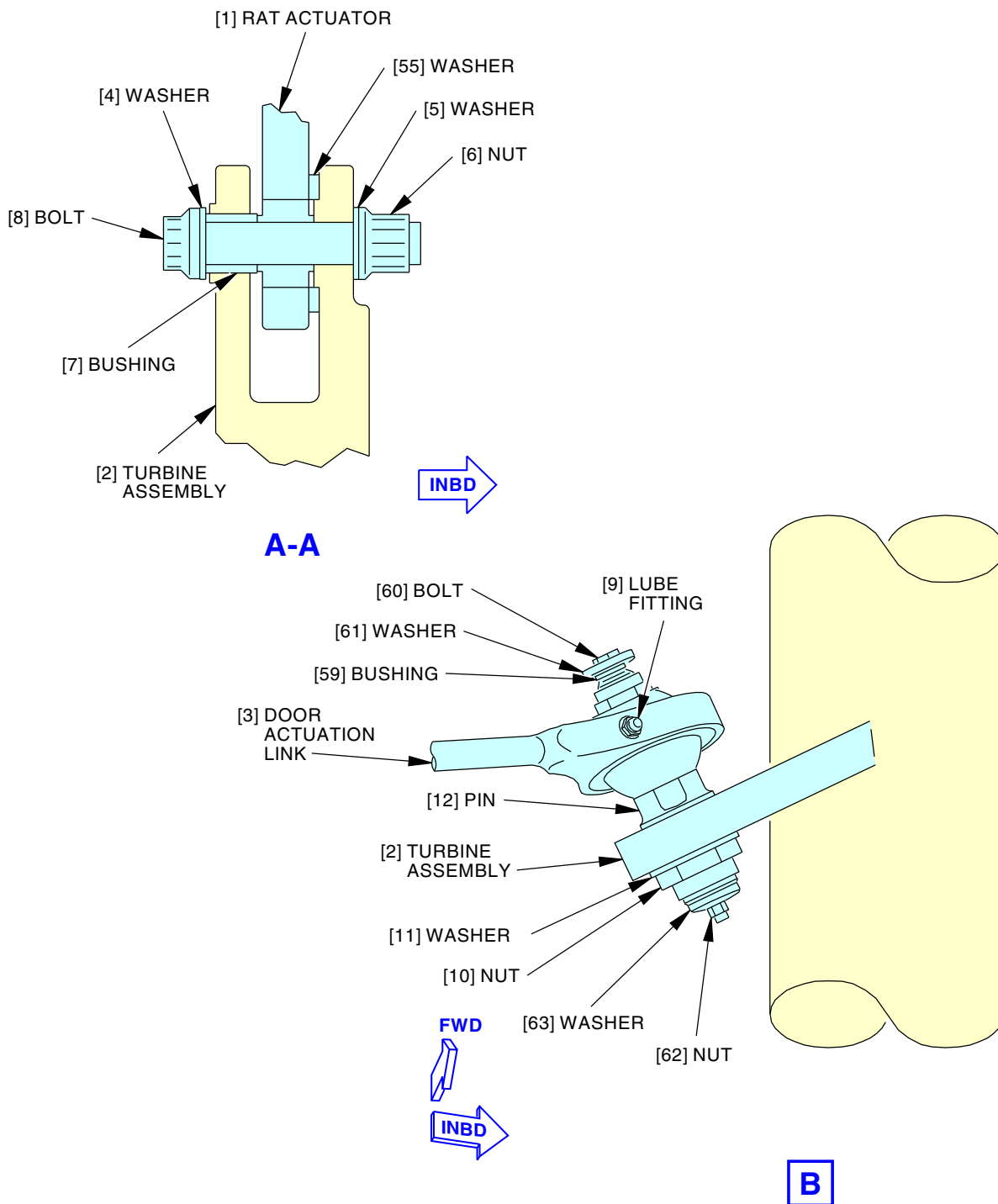
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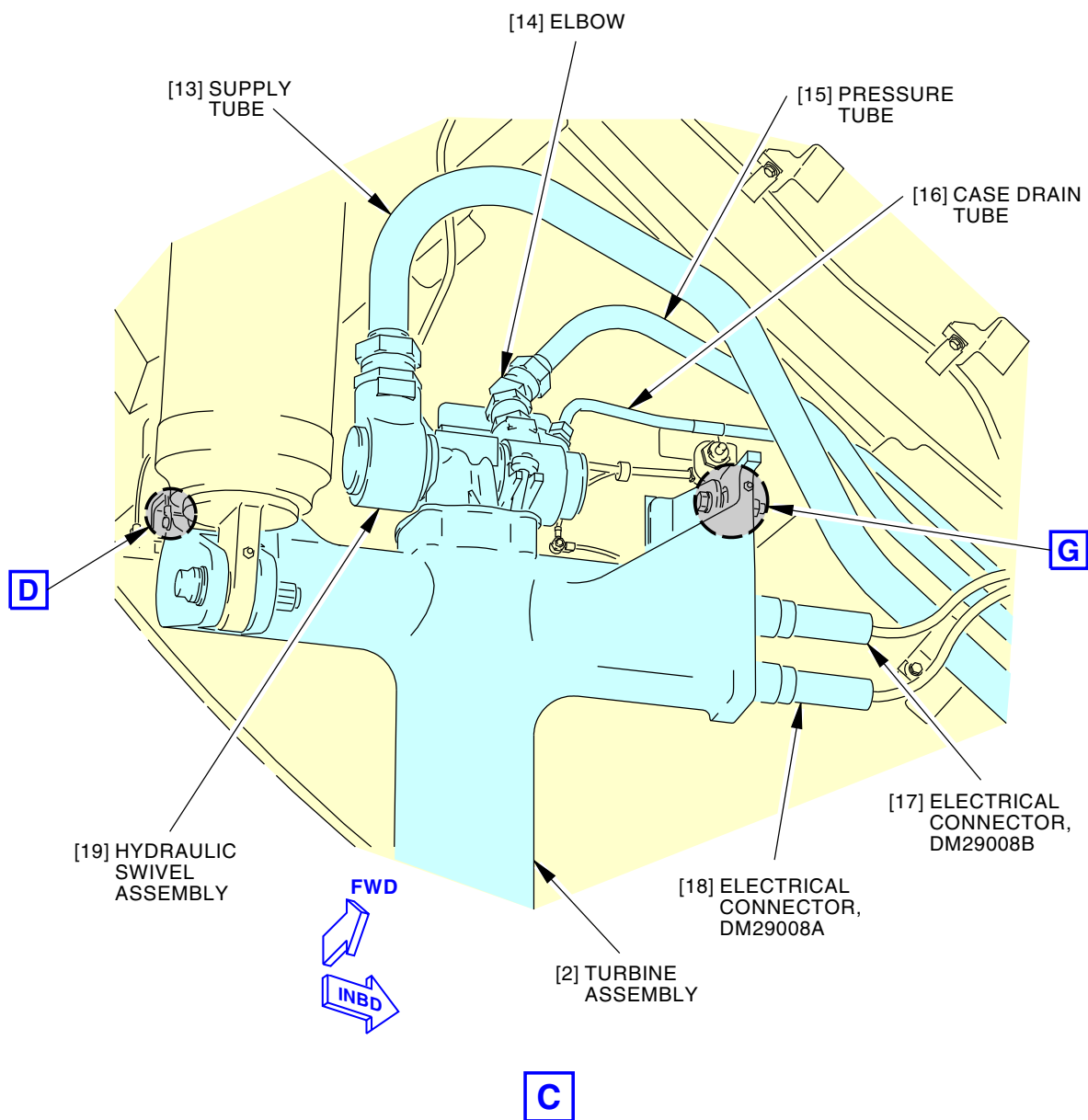
Ram Air Turbine (RAT) Installation
Figure 401/29-21-01-990-801 (Sheet 2 of 6)

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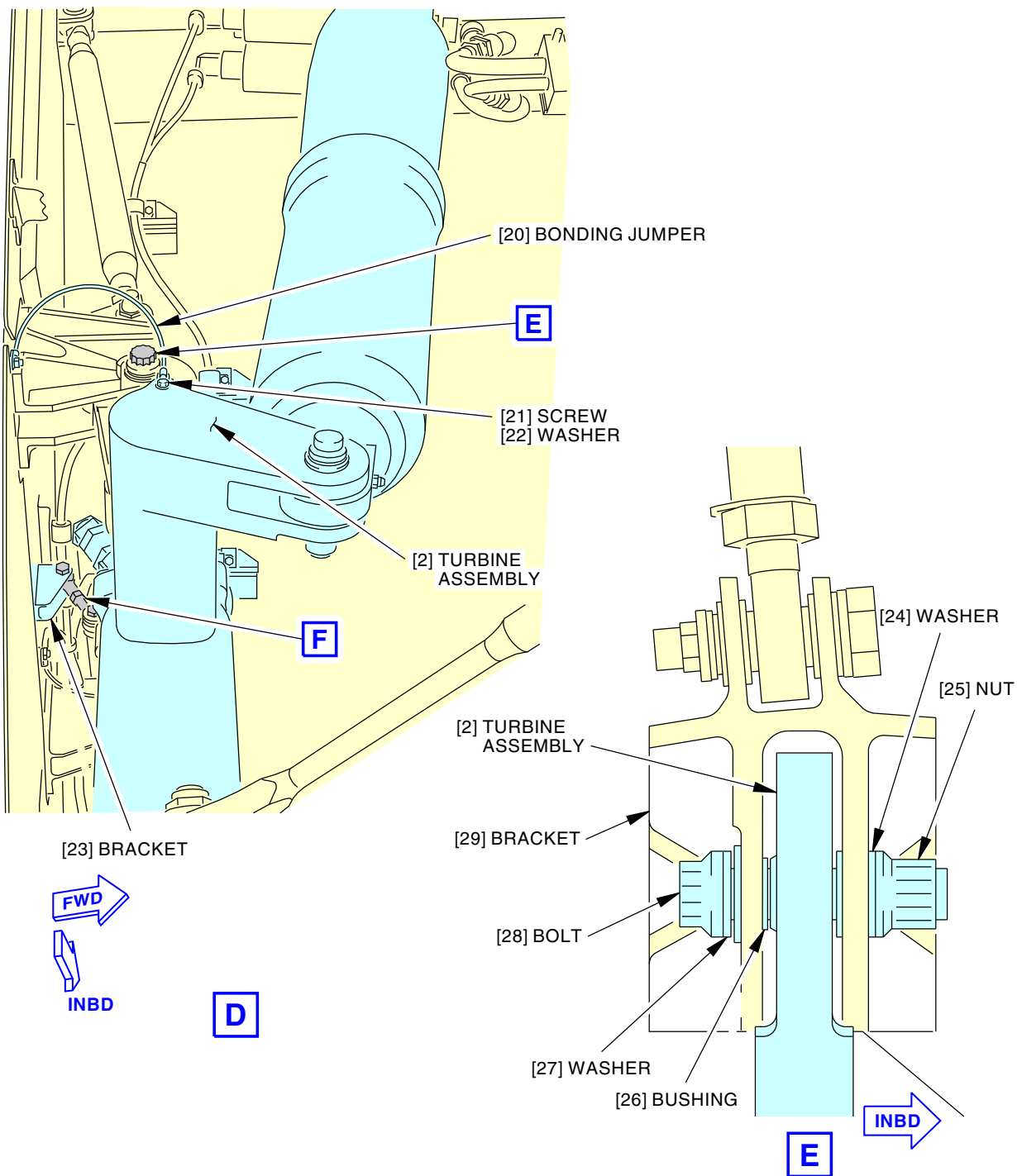
Ram Air Turbine (RAT) Installation
Figure 401/29-21-01-990-801 (Sheet 3 of 6)

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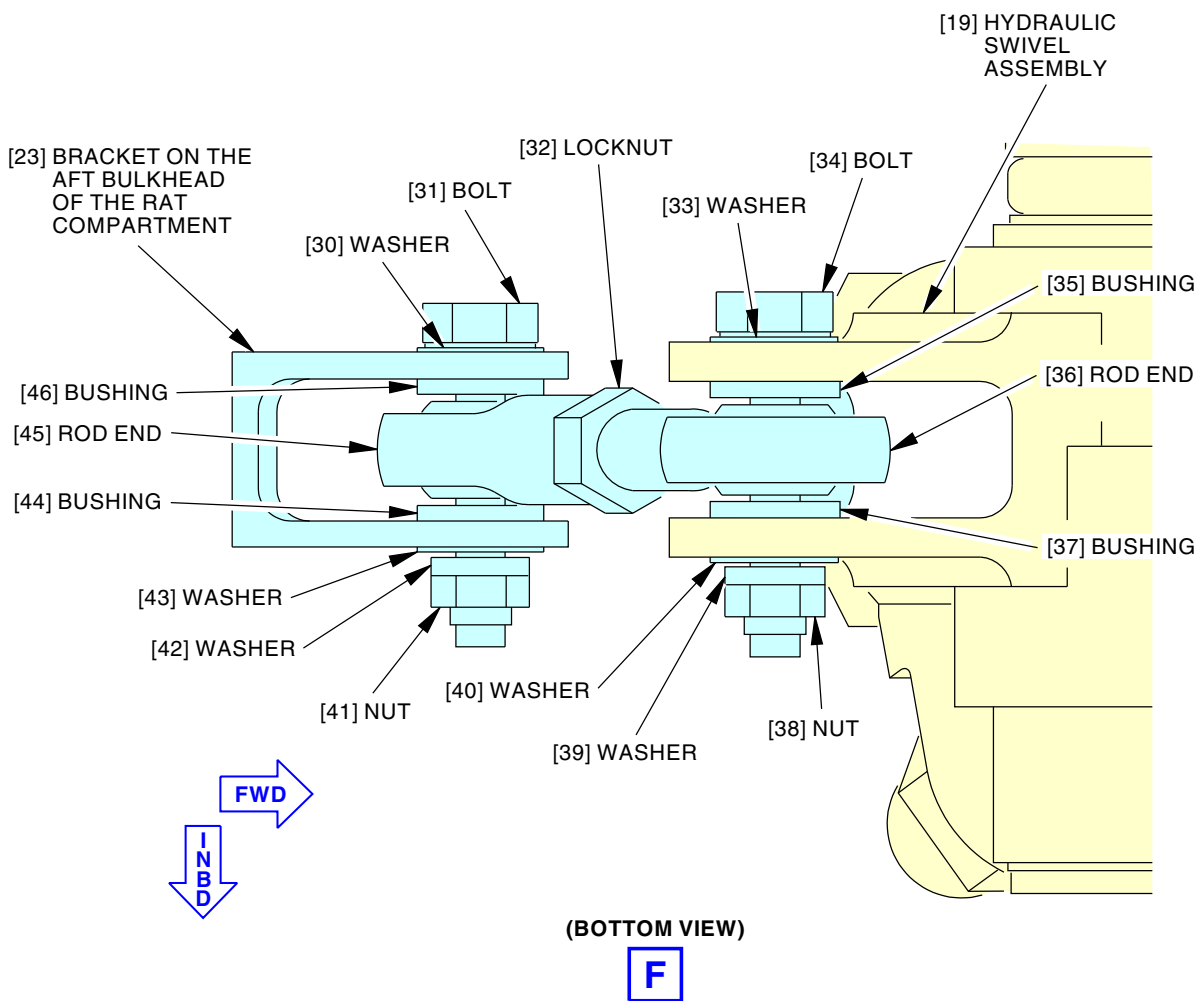
Ram Air Turbine (RAT) Installation
Figure 401/29-21-01-990-801 (Sheet 4 of 6)

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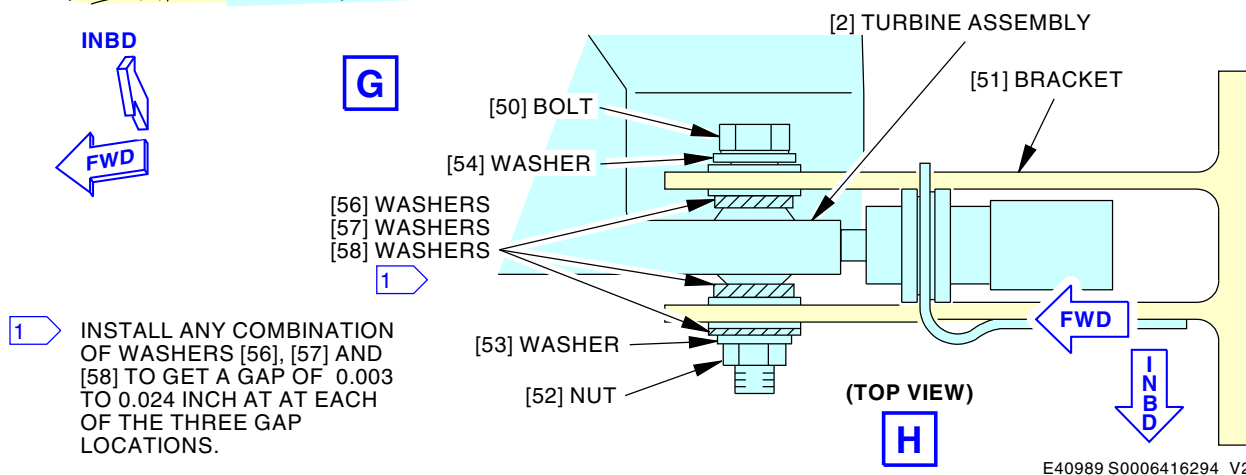
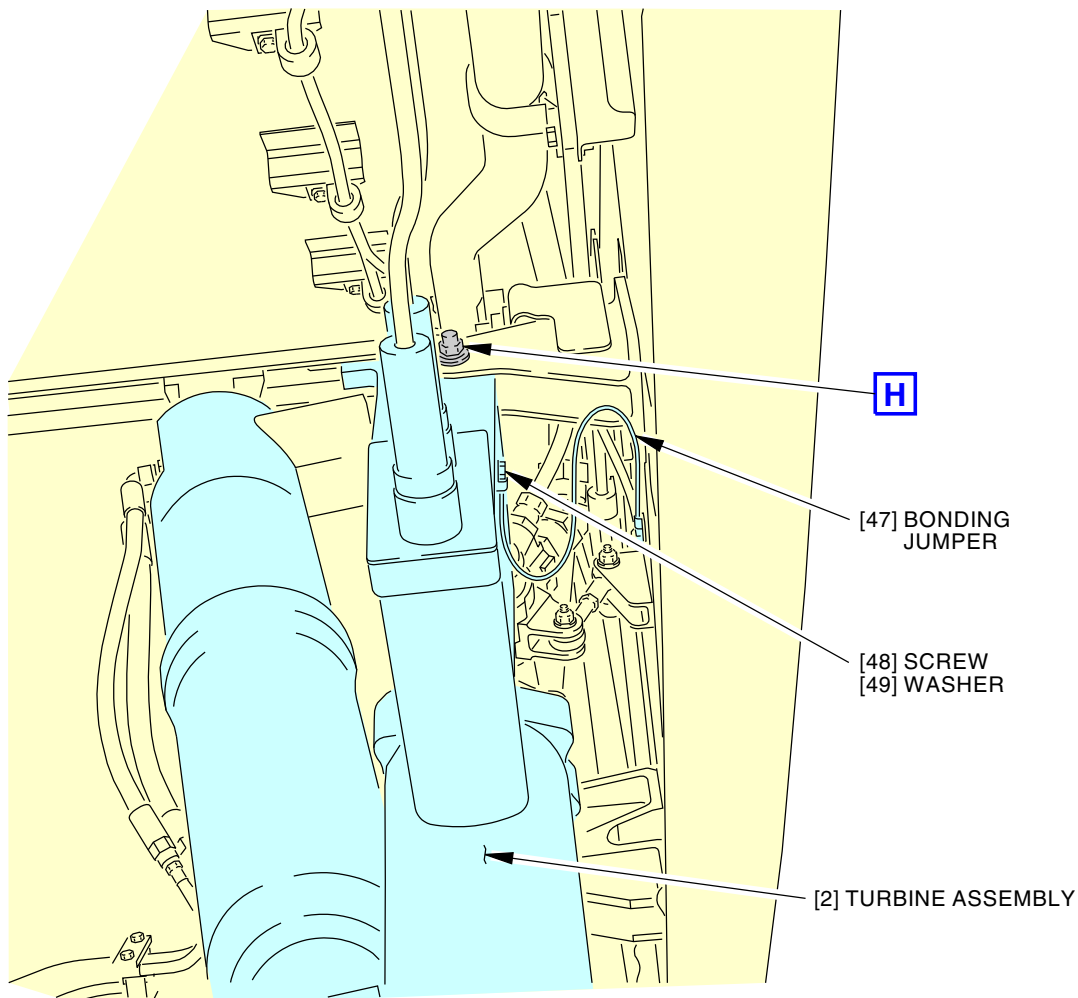
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**Ram Air Turbine (RAT) Installation
Figure 401/29-21-01-990-801 (Sheet 5 of 6)**

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Ram Air Turbine (RAT) Installation
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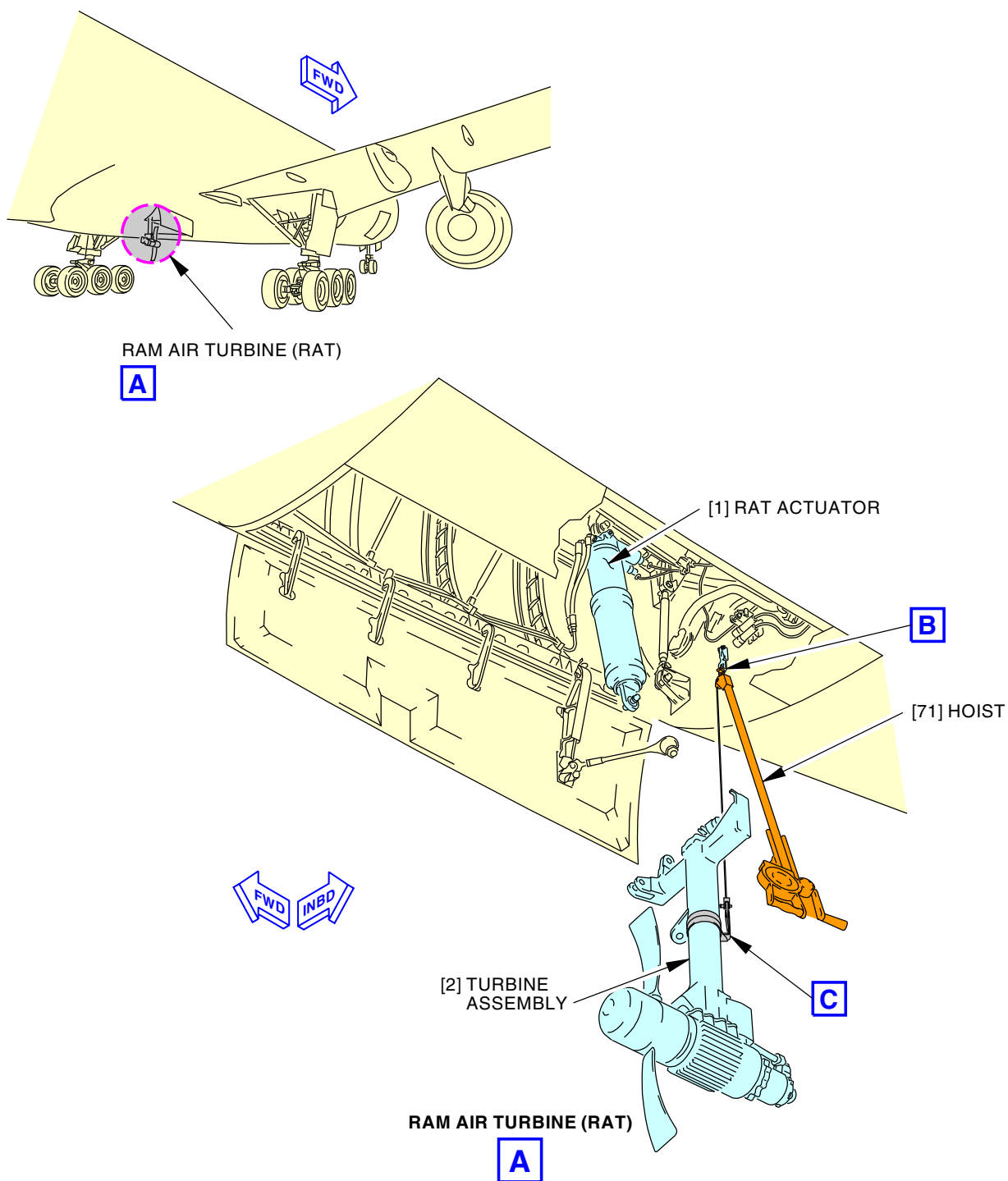
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Ram Air Turbine (RAT) Installation Equipment
Figure 402/29-21-01-990-802 (Sheet 1 of 2)

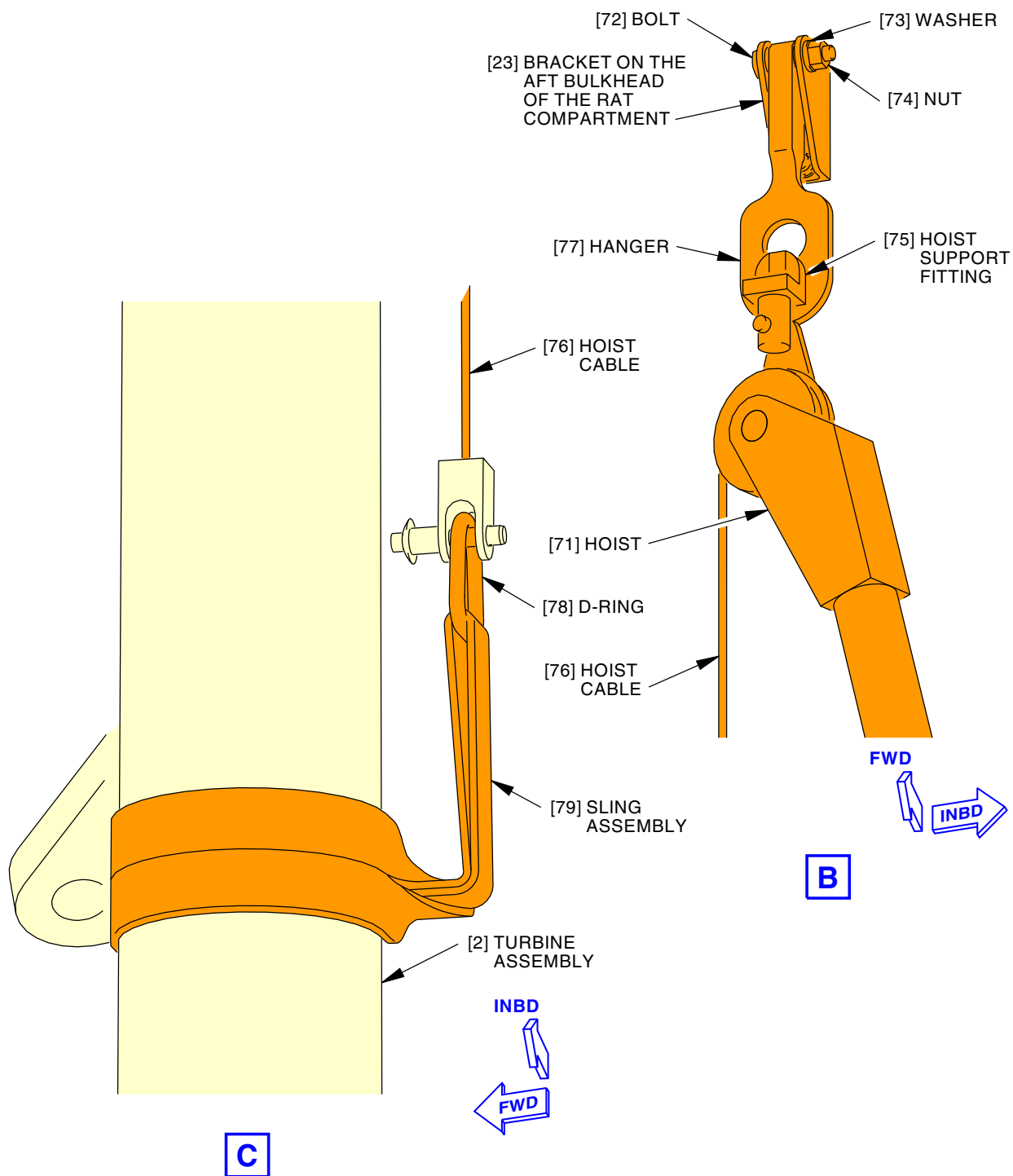
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Ram Air Turbine (RAT) Installation Equipment
Figure 402/29-21-01-990-802 (Sheet 2 of 2)

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TASK 29-21-01-400-801

3. Ram Air Turbine (RAT) Installation

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-21-30-640-801	Lubricate the Ram Air Turbine (RAT) Actuator (P/B 301)
12-21-30-640-802	Lubricate the Ram Air Turbine (RAT) Strut and Door Actuation Link (P/B 301)
20-11-00-910-801	Standard Torque Values (P/B 201)
29-21-00-730-801	Ram Air Turbine (RAT) System - Motoring Test (P/B 501)
29-21-00-730-802	Ram Air Turbine (RAT) Manual Deployment System - System Test (P/B 501)
29-21-00-730-803	Ram Air Turbine (RAT) Generator Heater - System Test (P/B 501)
29-21-00-730-805	Ram Air Turbine (RAT) Automatic Deployment System - System Test (P/B 501)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)
29-21-10-820-801	Ram Air Turbine (RAT) Door Actuation Link Adjustment (P/B 201)
SWPM 20-20-00	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.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-1563	Hoist - Fishpole (cable), minimum 500 lb capacity Part #: 10/3641 Supplier: K1425 Part #: PF51-003-1 Supplier: 1YRX6 Part #: PF51-009-1 Supplier: 1YRX6 Opt Part #: MINILIFT Supplier: K1425
SPL-1799	Cover - Protective, RAT Turbine Blade Part #: 2783292-1 Supplier: 70210
SPL-1800	Equipment - Removal and Installation, Ram Air Turbine Part #: J29002-25 Supplier: 81205 Opt Part #: J29002-1 Supplier: 81205 Opt Part #: J29002-16 Supplier: 81205

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C. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Ram Air Turbine (RAT) Installation

SUBTASK 29-21-01-480-005



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (1) If it is not installed, install the RAT turbine blade protective cover, SPL-1799, on the ram air turbine (RAT) blades.

SUBTASK 29-21-01-480-003

- (2) If it is not installed, do these steps to install the ram air turbine equipment, SPL-1800:
 - (a) Install the bolt [72] (Figure 402), the washer [73], and the nut [74] to attach the hanger [77] to the bracket [23] (on the aft bulkhead of the RAT compartment).
 - 1) Tighten the bolt [72] and the nut [74] with your hand only, to prevent damage the bracket [77].
 - (b) Put the sling assembly [79] around the turbine assembly [2], immediately below the connection point for the door actuation link [3] (Figure 401).
 - 1) Put the end of the sling assembly [79] (Figure 402), that has the D-ring, through the opposite end to make a loop around the turbine assembly [2].

SUBTASK 29-21-01-480-004

- (3) If it is not installed, do these steps to install the cable fishpole hoist, COM-1563 (Figure 402):
 - (a) Engage the hoist support fitting [75] with the keyhole slot in the hanger [77].
 - (b) Attach the hoist cable [76] to the D-ring [78] on the sling assembly [79].

SUBTASK 29-21-01-420-001



BE CAREFUL WHEN YOU MOVE THE RAT BECAUSE THE RAT WEIGHS APPROXIMATELY 150 POUNDS. INJURIES TO PERSONS CAN OCCUR.

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(WARNING PRECEDES)



CAUTION

DO NOT HOLD THE RAT BY THE TURBINE BLADES OR PUT THE RAT DOWN ON THE TURBINE BLADES. THE WEIGHT OF THE RAT CAN CAUSE DAMAGE TO THE TURBINE BLADES OR THE GOVERNOR MECHANISM.

- (4) Operate the cable fishpole hoist, COM-1563, to lift the turbine assembly [2] to the wing-to-body fairing.

SUBTASK 29-21-01-420-002

- (5) Align the holes at the top of the turbine assembly [2] with the holes in the brackets [29] and [51] (Figure 401).

SUBTASK 29-21-01-420-003

- (6) Do these steps to attach the turbine assembly [2] to the brackets [29] and [51]:
- (a) Lubricate the bushing [26] and the bushings in the brackets [29] and [51] with grease, D00013.
 - (b) At the outboard end of the turbine assembly [2], install the bolt [28], the washer [24], the washer [27], the bushing [26], and the nut [25].

NOTE: Install the washer [27] with the countersink against the head of the bolt [28].

- 1) Tighten the nut [25] to 1400 in-lb (158.18 N·m) - 1900 in-lb (214.67 N·m).
- (c) At the inboard end of the turbine assembly [2], install the bolt [50], the washer [54], the washer [53], and the nut [52].
 - 1) Make sure the countersink of the washer [53] is adjacent to the bolt [50] head.
 - 2) Measure the gap at the three locations shown in (Figure 401).
 - 3) Install any combination of washer [56], washer [57], and washer [58] to get a gap of 0.003 in. (0.076 mm) to 0.024 in. (0.610 mm) at each of the three gap locations (Figure 401).
 - 4) Tighten the nut [52] to 100 in-lb (11.30 N·m) - 150 in-lb (16.95 N·m).

SUBTASK 29-21-01-080-001

- (7) Do these steps to remove the cable fishpole hoist, COM-1563:
- (a) Disconnect the hoist cable [76] (Figure 402) from the D-ring [78] on the sling assembly [79].
 - (b) Disengage the hoist support fitting [75] from the keyhole slot in the hanger [77].

SUBTASK 29-21-01-080-002

- (8) Do these steps to remove the ram air turbine equipment, SPL-1800, from the turbine assembly [2].
- (a) Remove the bolt [72], the washer [73], and the nut [74] from the bracket [23] (on the aft bulkhead of the RAT compartment).
 - (b) Remove the hanger [77] from the bracket [23].
 - (c) Remove the sling assembly [79] from the turbine assembly [2].

SUBTASK 29-21-01-420-004

- (9) Remove the caps from these components:
- (a) The supply tube [13] (Figure 401)
 - (b) The case drain tube [16]
 - (c) The elbow [14] on the pressure tube [15]

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- (d) The ports in the hydraulic swivel assembly [19].

SUBTASK 29-21-01-420-005

- (10) Connect the supply tube [13], the case drain tube [16], and the elbow [14] of the pressure tube [15] to the hydraulic swivel assembly [19] at the top of the turbine assembly [2].

SUBTASK 29-21-01-420-006

- (11) Do these steps to install the assembly of the rod end [36] and the rod end [45] in one piece:
- (a) Examine the bracket [23] (on the aft bulkhead of the RAT compartment) to make sure that no damage occurred while you used the cable fishpole hoist, COM-1563.
 - (b) Lubricate the bushings [35], [37], [44] and [46] with grease, D00013.
 - (c) Hold the assembly of the rod end [36] and the rod end [45] in the mounting position.
 - (d) Install the bolt [34], the washer [33], the washer [39], the washer [40], and the nut [38] to attach the rod end [36] to the hydraulic swivel assembly [19], at the top of the turbine assembly [2].
 - (e) Install the bolt [31], the washer [30], the washer [42], the washer [43], and the nut [41] to attach the rod end [45] to the bracket [23] (on the aft bulkhead of the RAT compartment).
 - (f) Tighten the nut [38] and the nut [41] to 25 in-lb (2.82 N·m) to 35 in-lb (3.95 N·m).

SUBTASK 29-21-01-420-007

- (12) Do these steps to install the bonding jumpers [20] and [47] (SWPM 20-20-00).
- (a) Install the screw [21] and the washer [22] to attach the bonding jumper [20] at the outboard end of the turbine assembly [2].
 - (b) Install the screw [48] and the washer [49] to attach the bonding jumper [47] at the inboard end of the turbine assembly [2].
 - (c) With the intrinsically safe approved bonding meter, COM-1550, make sure the resistance across the each bonding jumper [20] or [47] (between the airplane structure and the turbine assembly [2]) is not more than 0.0023 ohms (SWPM 20-20-00).

SUBTASK 29-21-01-420-008

- (13) Remove the caps from the electrical connectors [17] and [18].

SUBTASK 29-21-01-420-009

- (14) Connect the electrical connectors [17] and [18] at the top of the turbine assembly [2].

SUBTASK 29-21-01-420-010

- (15) Do these steps to attach the RAT actuator [1] to the turbine assembly [2]:
- (a) Lubricate the bushing [7] with grease, D00013.
 - (b) Install the bolt [8], the washer [4], the washer [5], the washer [55], the bushing [7], and the nut [6].

SUBTASK 29-21-01-420-011

- (16) Do these steps to attach the door actuation link [3] (referred to as the link in this procedure) to the turbine assembly [2]:
- (a) Remove the tape or string which you used to hold the link [3] to the RAT compartment door.

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USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.



DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Fill the cavity in the pin [12] with Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913.
- (c) Put the pin [12] on the link [3] through the hole in the turbine assembly [2].
- (d) Install the washer [11] and the nut [10] on the pin [12].
- (e) Tighten the nut [10] to 700 in-lb (79 N·m) - 900 in-lb (102 N·m) above the run-on torque.
NOTE: Run-on torque is the torque that is required to turn the nut on the threads before any tension is put on the pin [12] of the door actuation link.
- (f) Make sure that the bushing [59], the washer [61], and the bolt [60] are in place on the pin [12].
- (g) Install the washer [63] and the nut [62] on the bolt [60].
- (h) Tighten the nut [62]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 29-21-01-610-001

- (17) For the reservoir in the center hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-21-01-820-001

- (18) Do this task: Ram Air Turbine (RAT) Door Actuation Link Adjustment, TASK 29-21-10-820-801.

SUBTASK 29-21-01-640-001

- (19) Do this task: Lubricate the Ram Air Turbine (RAT) Actuator, TASK 12-21-30-640-801.

SUBTASK 29-21-01-640-002

- (20) Do this task: Lubricate the Ram Air Turbine (RAT) Strut and Door Actuation Link, TASK 12-21-30-640-802.

F. Ram Air Turbine (RAT) Installation Test

SUBTASK 29-21-01-730-001

- (1) Do this task: Ram Air Turbine (RAT) Manual Deployment System - System Test, TASK 29-21-00-730-802.

SUBTASK 29-21-01-730-004

- (2) If the electrical connectors or wiring to the RAT actuator solenoids have been disconnected, do this task: Ram Air Turbine (RAT) Automatic Deployment System - System Test, TASK 29-21-00-730-805.

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SUBTASK 29-21-01-730-002

(3) Do this task: Ram Air Turbine (RAT) Generator Heater - System Test, TASK 29-21-00-730-803.

SUBTASK 29-21-01-730-003

(4) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

SUBTASK 29-21-01-860-003

(5) 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) - ADJUSTMENT/TEST

1. General

- A. This procedure has this task:
- (1) An adjustment of the ram air turbine (RAT).

TASK 29-21-01-820-801

2. Ram Air Turbine (RAT) - Adjustment

(Figure 501)

A. General

- (1) This procedure adjusts these components of the ram air turbine (RAT):
- (a) Blade index pin
 - (b) RAT blade index pin switch
 - (c) RAT strut angle switch.

B. References

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (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-1680	Protractor - Assembly, Control Column Part #: 4MIT65B80307-1 Supplier: 81205 Part #: A27021-29 Supplier: 81205 Part #: G76002-19 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
C00852	Compound - Antiseize, Molybdenum Disulfide-Petrolatum	MIL-PRF-83483
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)

E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

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F. Procedure

SUBTASK 29-21-01-860-006



DO NOT TOUCH THE RAT GENERATOR IF IT IS HOT. THE RAT GENERATOR CAN BECOME HOT FROM THE OPERATION OF THE RAT GENERATOR HEATER. THE HOT SURFACE OF THE GENERATOR CAN BURN YOU.

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-01-480-006

- (2) Hold the control column assembly protractor, SPL-1680 against the aft side of the RAT strut [2].

NOTE: You can temporarily attach the protractor to the RAT strut [2] with tape or plastic wire-tie straps.

SUBTASK 29-21-01-820-002

- (3) Set the protractor to the zero position.

SUBTASK 29-21-01-020-012

- (4) Do these steps to disconnect the door actuation link [3] from the RAT strut [2]:
- (a) Remove the nut [11] that attaches the pin [13] to the RAT strut [2].
 - (b) Remove the door actuation link [3] from the RAT strut [2].
 - (c) Hold the door actuation link [3] to the RAT compartment door with tape or string, to keep it away from the path of the RAT strut [2].

SUBTASK 29-21-01-020-013

- (5) Remove the bolt [9] which holds the RAT actuator [1] to the RAT strut [2].

SUBTASK 29-21-01-020-014

- (6) Disconnect the electrical connector [15], DM29008A, from the RAT strut [2].

SUBTASK 29-21-01-020-015

- (7) Remove the screws [36] from the switch cover [35].

SUBTASK 29-21-01-980-001

- (8) Do these steps to do a check that the adjustment of the blade index pin [33] is correct:



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (a) Do this step to make sure the blade index pin [33] does not align with one of the two holes in the turbine hub [24]:

- 1) Manually turn the turbine hub [24] until the hole in the turbine hub [24] is approximately 3 degrees (or one inch) from the blade index pin [25].

NOTE: You can use the arrows on each side of the turbine hub [24] and the generator [23] to help you do this step.

- (b) Push on the hydraulic pump [22] to manually move the RAT strut [2] forward until the surface B of the blade index pin [25] touches the surface A of the turbine hub [24]:

NOTE: The RAT strut [2] is in the correct position when the blade index pin [33] lightly touches the surface of the turbine hub [24]. In this position, the blade index pin [33] will make a clicking noise when it moves across the hole in the turbine hub [24], while you turn the turbine hub [24].

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- (c) Make a record of the angle which shows on the protractor when the surface B of the blade index pin [33] touches the surface A of the turbine hub [24].

NOTE: The adjustment of the blade index pin [33] is correct if this angle is 8 to 10 degrees.

- (d) Manually move the RAT strut [2] back to the extended position.

SUBTASK 29-21-01-820-003

- (9) If the angle shown on the protractor is not 8 to 10 degrees, do these steps to adjust the blade index pin [33]:

- (a) Hold the switch cam [32] with a wrench while you loosen the nut [27].
- (b) To extend or retract the blade index pin [33], turn it with a wrench while you hold the switch cam [32] with a wrench.
- (c) When the position of the blade index pin [33] is correct, do these steps:
- 1) Tighten the nut [27] to 114 to 126 pound-inches while you hold the switch cam [32] with a wrench.

NOTE: This torque must be added to the torque which is necessary to turn the nut [27] because of its self locking property.

SUBTASK 29-21-01-980-002

- (10) Do these steps to do a check of the adjustment of the blade index pin switch [26]:

- (a) Hold the switch actuator [17] on the RAT strut angle switch [18] down to open the switch.
- (b) Monitor the continuity between pins 10 and 11 on the electrical receptacle on the RAT strut [2].
- (c) Push on the hydraulic pump [22] to manually move the RAT strut [2] forward until there is continuity between pins 10 and 11 on the electrical receptacle.
- (d) Make a record of the angle which shows on the protractor.

NOTE: The adjustment of the blade index pin switch [26] is correct if this angle is 0.5 to 1.5 degrees more than the angle at which the blade index pin [33] touched the surface of the turbine hub [2].

- (e) Release the switch actuator [17] on the RAT strut angle switch [18].
- (f) Manually move the RAT strut [2] back to the extended position.

SUBTASK 29-21-01-820-004

- (11) If the angle at which the blade index pin switch [26] closes is not correct, do these steps until the adjustment of the blade index pin switch [26] is correct:

- (a) Loosen the screws [29] at the switch bracket [28].
- (b) Move the switch bracket [28] parallel to the switch cam [32].
- (c) Tighten the screws [29] to 30 to 32 pound-inches.

NOTE: This torque must be added to the torque which is necessary to turn the screws [29] because of their self locking property.

- (d) Do the steps, which do a check of the adjustment of the blade index pin switch [26], again.

SUBTASK 29-21-01-980-003

- (12) Do these steps to do a check of the adjustment of the RAT strut angle switch [18]:

- (a) Hold the switch actuator [34] on the blade index pin switch [26] down to open the switch.

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- (b) Monitor the continuity between pins 10 and 11 on the electrical receptacle on the RAT strut [2].
- (c) Push on the hydraulic pump [22] to manually move the RAT strut [2] forward until there is no continuity between pins 10 and 11 on the electrical receptacle.
- (d) Make a record of the angle which shows on the protractor.
NOTE: The adjustment of the RAT strut angle switch [18] is correct if the angle which shows on the protractor is 14 to 16 degrees.
- (e) Release the switch actuator [34] on the blade index pin switch [33].
- (f) Manually move the RAT strut [2] back to the extended position.

SUBTASK 29-21-01-820-005

- (13) If the RAT strut angle switch [18] does not open at 14 to 16 degrees, do these steps until the adjustment of the RAT strut angle switch [18] is correct:
 - (a) Loosen the screws [19] at the switch mounting plate [16].
 - (b) Move the switch mounting plate [16] to a position at which the RAT strut angle switch [18] will open when the RAT strut angle is 14 to 16 degrees.
 - (c) Tighten the screws [19] to 30-32 pound-inches.
NOTE: This torque must be added to the torque which is necessary to turn the screws [19] because of their self locking property.
 - (d) Do the steps, which do a check of the adjustment of the RAT strut angle switch [18], again.

SUBTASK 29-21-01-420-012

- (14) Do these steps to install the switch cover [35]:
 - (a) Apply compound, C00852 to the threads of the screws [36].
 - (b) Put the switch cover [35] on the RAT strut [2].
 - (c) Install the screws [36] and washer [37] that attach the switch cover [35] to the RAT strut [2].
 - (d) Tighten the screws [36] to 16-17 pound-inches.
NOTE: This torque must be added to the torque which is necessary to turn the screws [36] because of their self locking property.

SUBTASK 29-21-01-080-004

- (15) Remove the control column assembly protractor, SPL-1680 from the aft side of the RAT strut [2].

SUBTASK 29-21-01-420-013

- (16) Connect the electrical connector [15], DM29008A, to the electrical receptacle on the RAT strut [2].

SUBTASK 29-21-01-420-014

- (17) Do these steps to attach the RAT actuator [1] to the RAT strut [2]:
 - (a) Lubricate the bushing [8] with grease, D00013.
 - (b) Install the bolt [9], the washer [4], the washer [5], the washer [6], the bushing [8], and the nut [7].

SUBTASK 29-21-01-420-015

- (18) Do these steps to attach the door actuation link [3] to the RAT strut [2]:

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- (a) Remove the tape or string which you used to hold the door actuation link [3] to the RAT compartment door.
- (b) Put the pin [13] on the door actuation link [3] through the hole in the RAT strut [2].
- (c) Install the washer [12] and the bolt [9] on the pin [13].
- (d) Install the nut [11].
- (e) Tighten the nut [11] to 700-900 pound-inches.

SUBTASK 29-21-01-860-007

- (19) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

———— **END OF TASK** ————

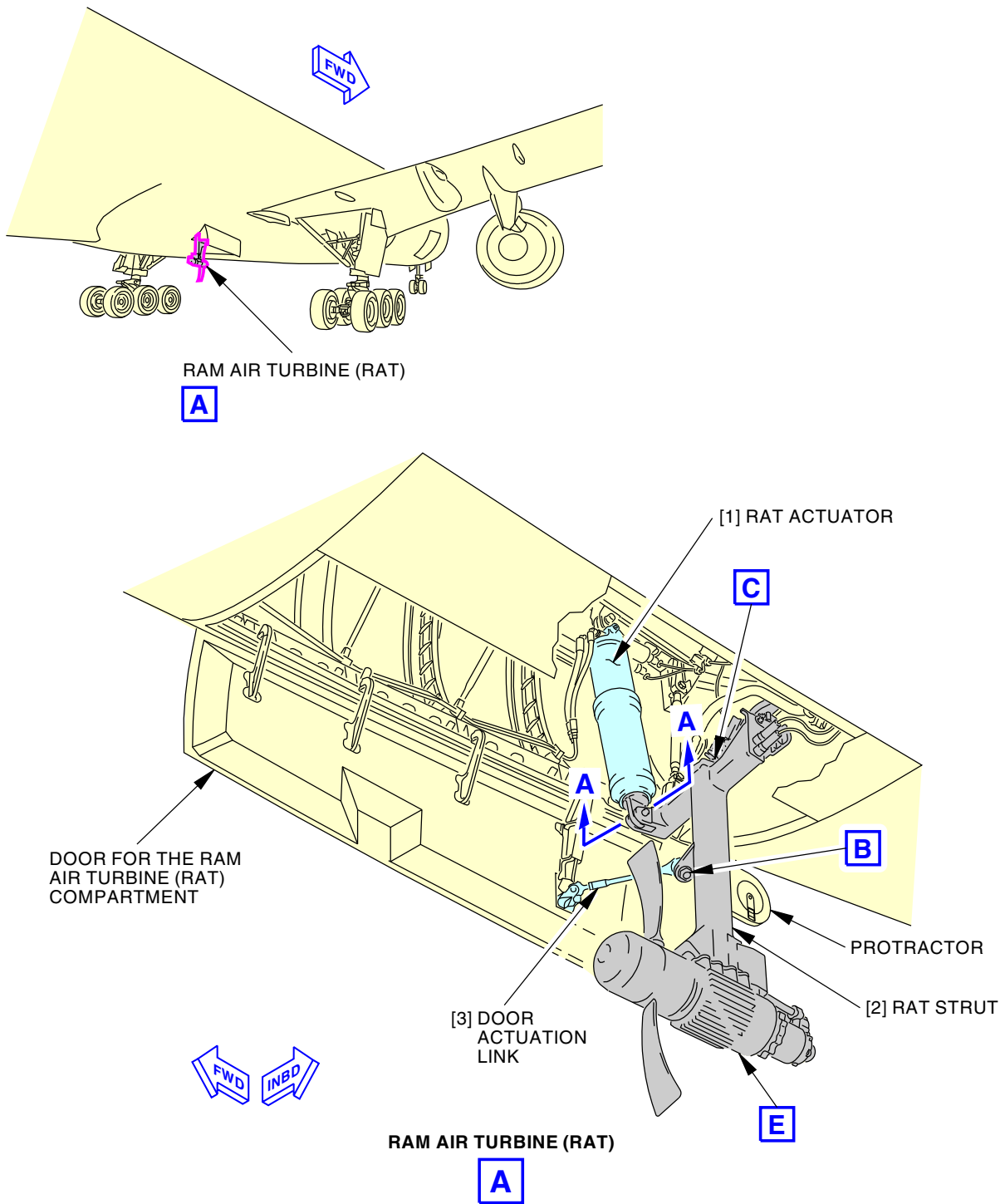
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Ram Air Turbine (RAT)
Figure 501/29-21-01-990-804 (Sheet 1 of 7)

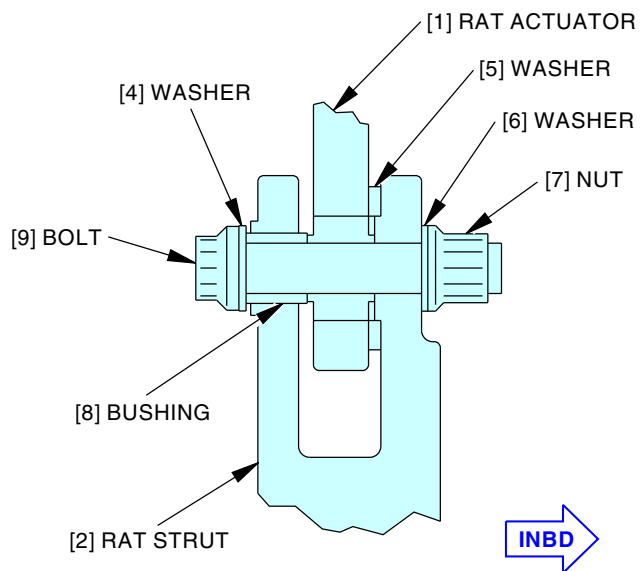
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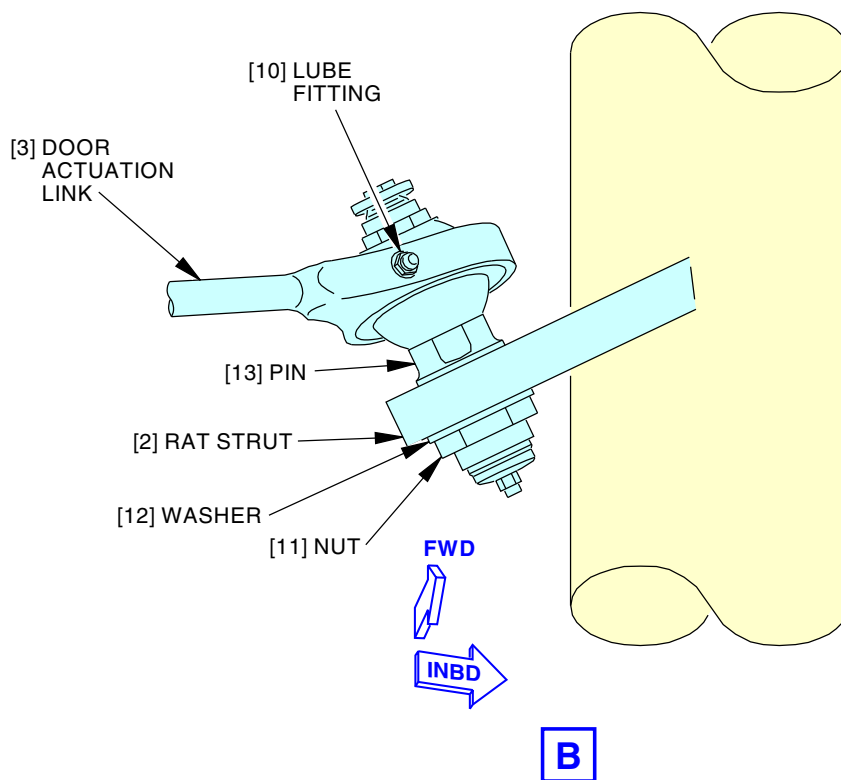
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A-A



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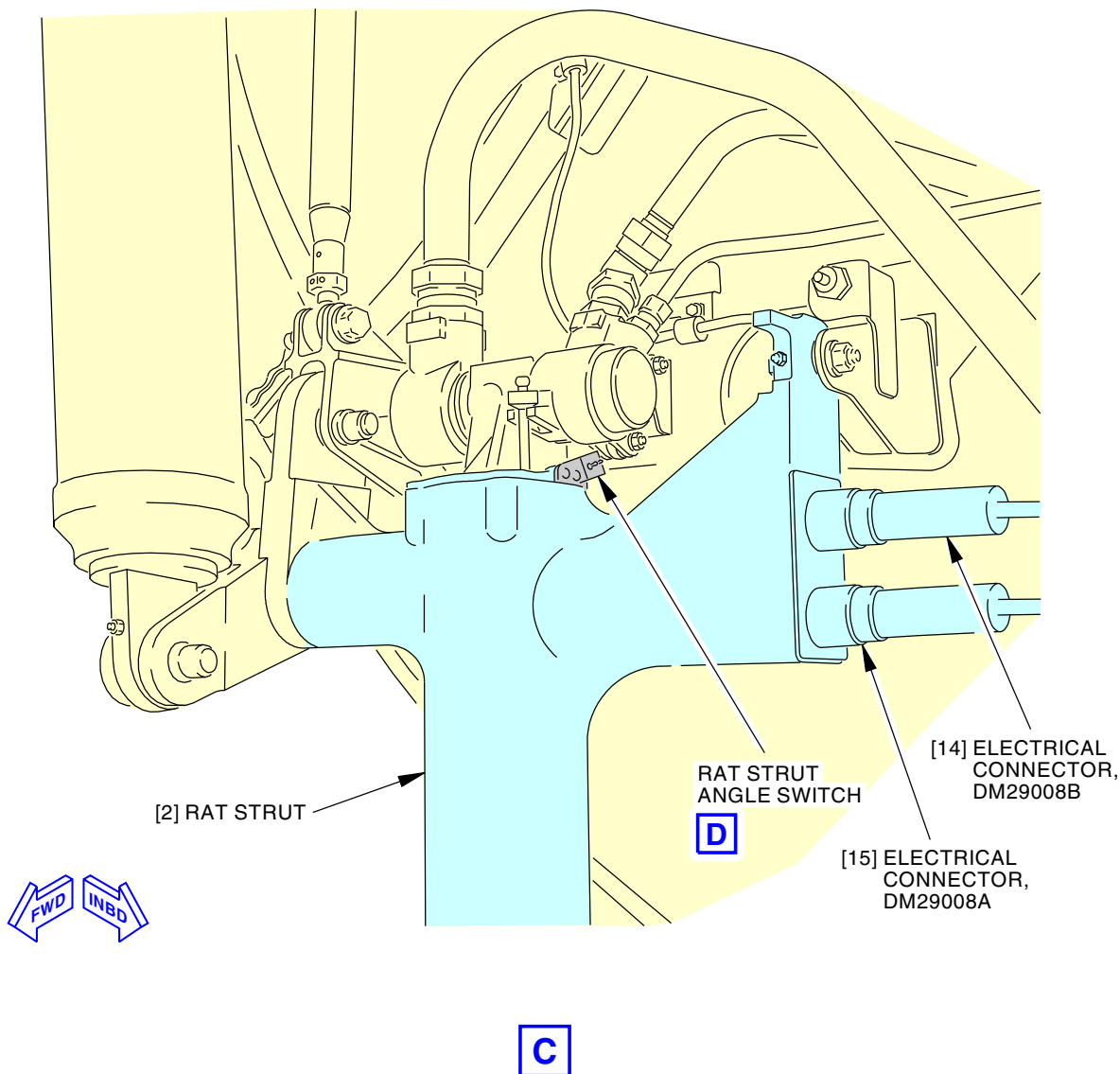
Ram Air Turbine (RAT)
Figure 501/29-21-01-990-804 (Sheet 2 of 7)

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Ram Air Turbine (RAT)
Figure 501/29-21-01-990-804 (Sheet 3 of 7)

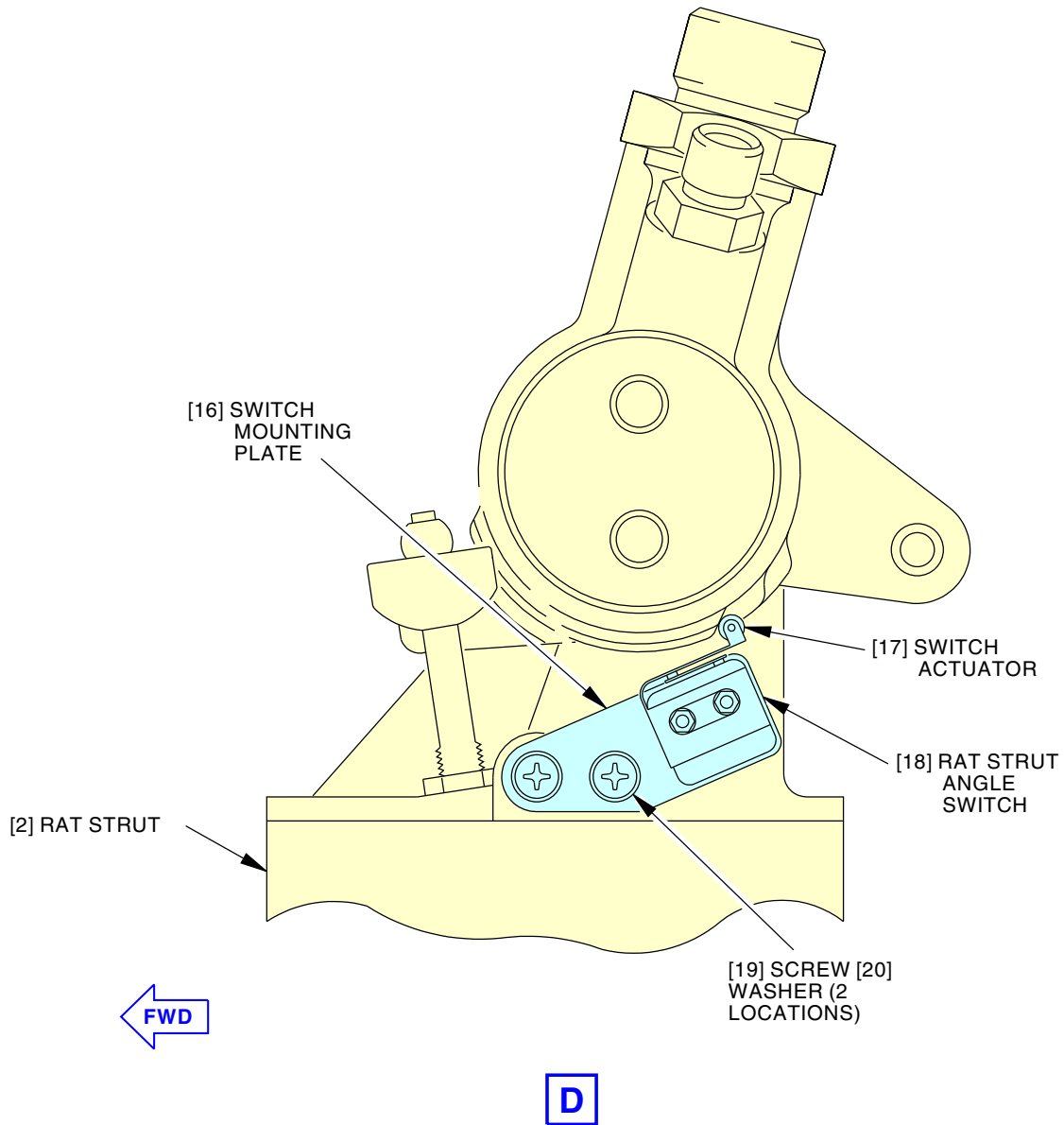
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Ram Air Turbine (RAT)
Figure 501/29-21-01-990-804 (Sheet 4 of 7)

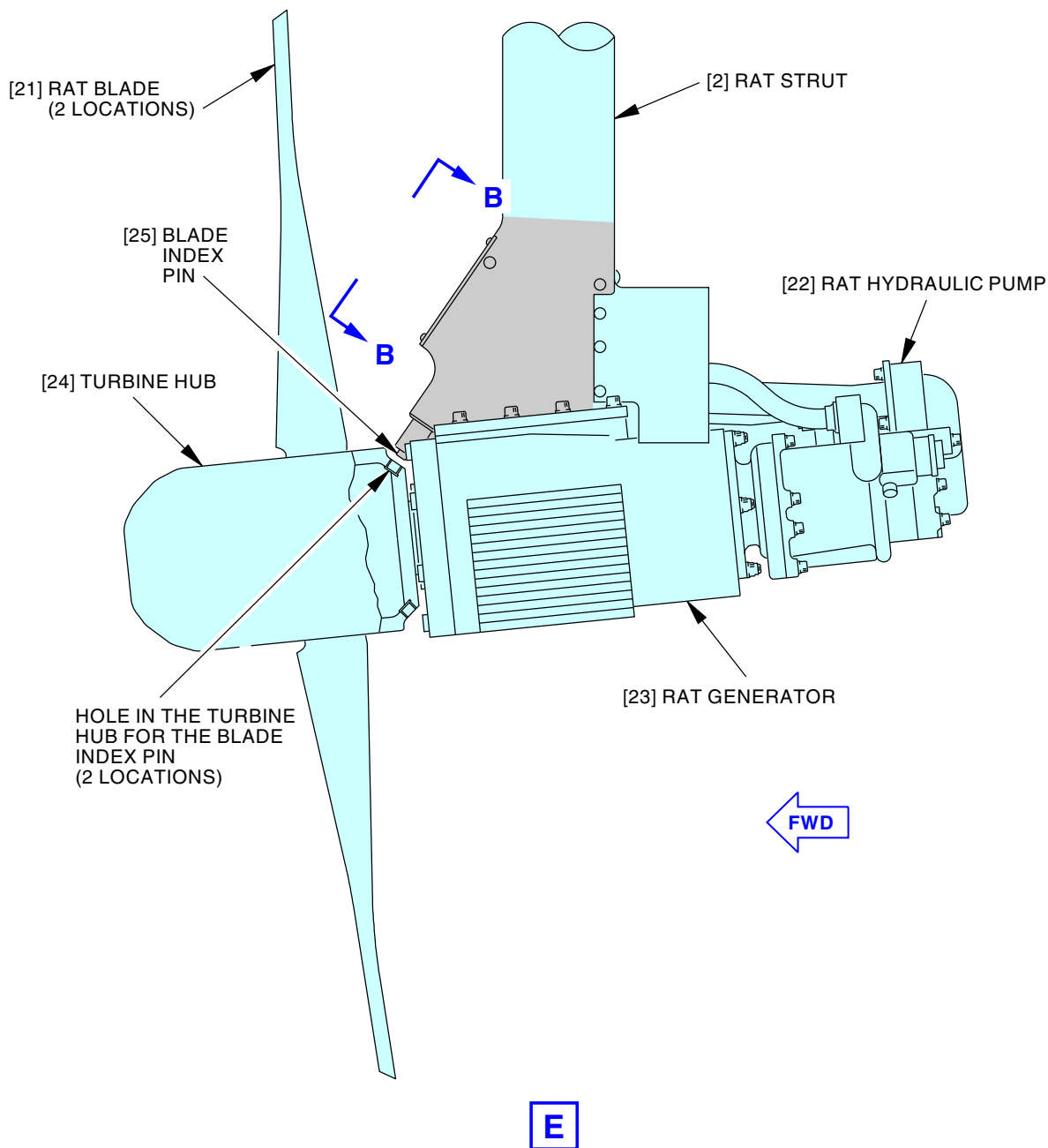
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**Ram Air Turbine (RAT)
Figure 501/29-21-01-990-804 (Sheet 5 of 7)**

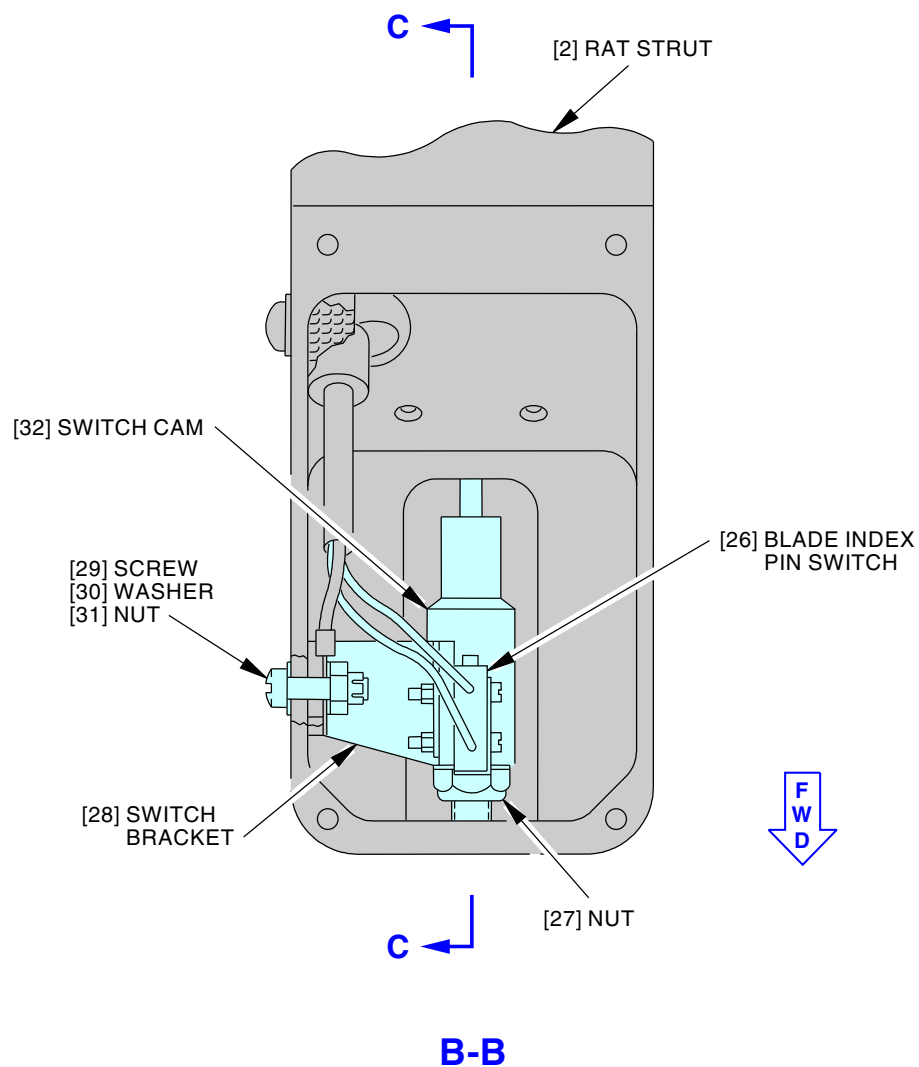
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Ram Air Turbine (RAT)
Figure 501/29-21-01-990-804 (Sheet 6 of 7)

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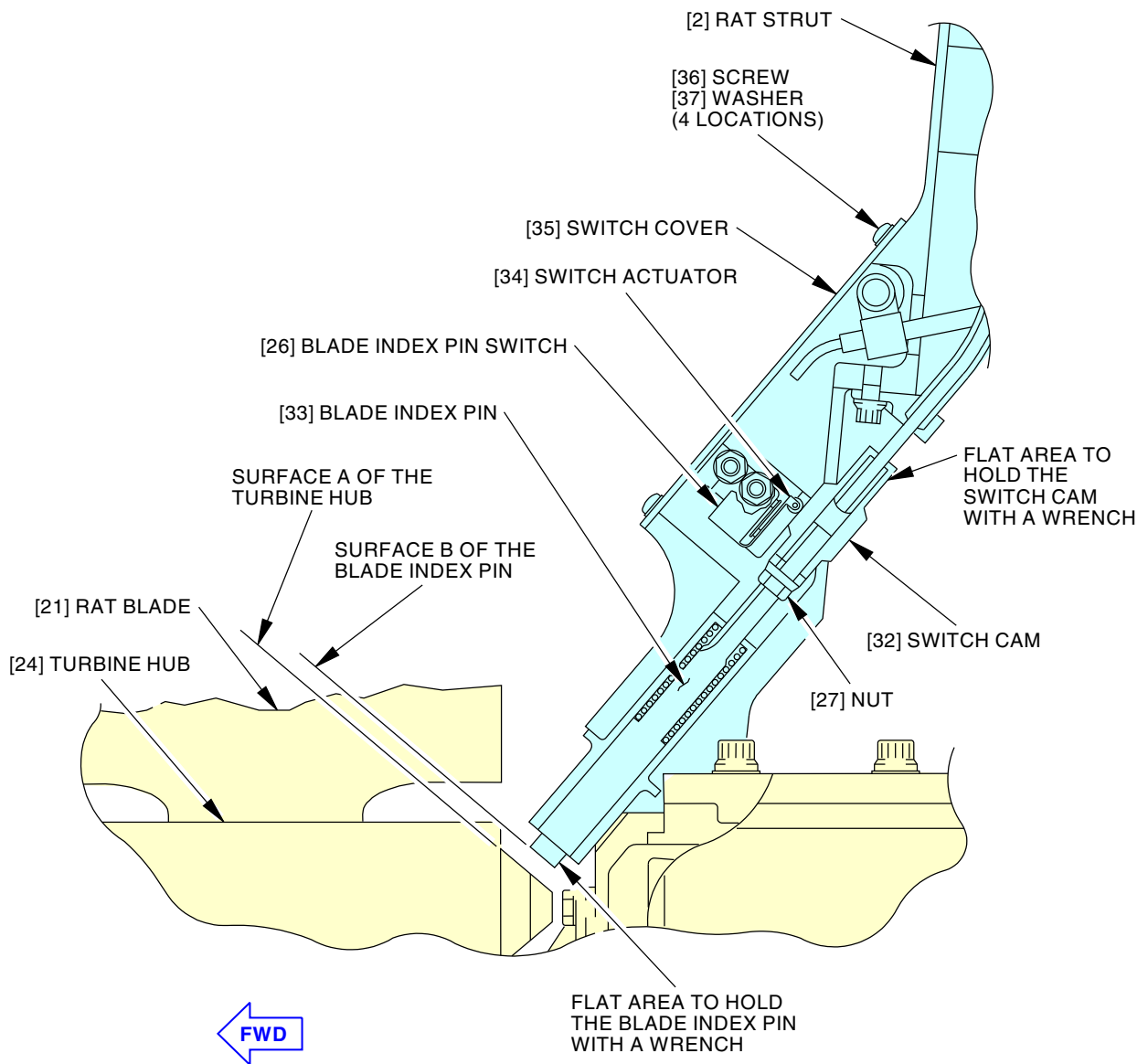
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C-C

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Ram Air Turbine (RAT)
Figure 501/29-21-01-990-804 (Sheet 7 of 7)

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RAM AIR TURBINE (RAT) - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has one task. This task is an inspection of the turbine blades on the ram air turbine (RAT).
- C. The ram air turbine is in the aft wing-to-body fairing on the right side.

TASK 29-21-01-200-801

2. Ram Air Turbine (RAT) Blades Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)

B. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

C. **Procedure**

SUBTASK 29-21-01-860-004

- (1) Do this task: (Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801)

SUBTASK 29-21-01-080-003



BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONS CAN OCCUR.

- (2) If the protective covers are on the turbine blades, remove them.

SUBTASK 29-21-01-210-001

- (3) Examine the leading edge of the turbine blades on the ram air turbine (RAT) for damage:

NOTE: Any damage to the RAT blade and pinion less than 0.010 in. (0.254 mm) depth and 1.0 in. (25.4 mm) length do not require repair.

- (a) Make sure there is no unrepaired damage, including nicks, dents, or scratches.
- (b) Make sure there are no more than 8 repaired nicks in each turbine blade.
- (c) Make sure the repaired nicks are at least 1.0 inch apart.
- (d) Make sure the turbine blades are not bent.

SUBTASK 29-21-01-210-002

- (4) Examine the surface of the turbine blades for damage:

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- (a) Make sure there is no unrepaired damage, including nicks, dents, scratches, or blemishes on the anodized surfaces.

NOTE: Residual surface polishing marks from the original manufacturing process are acceptable. Scratches or scored surfaces that do not show the aluminum base metal are acceptable.

NOTE: Any damage to the RAT blade and pinion less than 0.010 in. (0.254 mm) depth and 1.0 in. (25.4 mm) length do not require repair.

SUBTASK 29-21-01-350-001

- (5) Repair any damage off-aircraft per Vendor instructions:

SUBTASK 29-21-01-860-005

- (6) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

———— **END OF TASK** ————

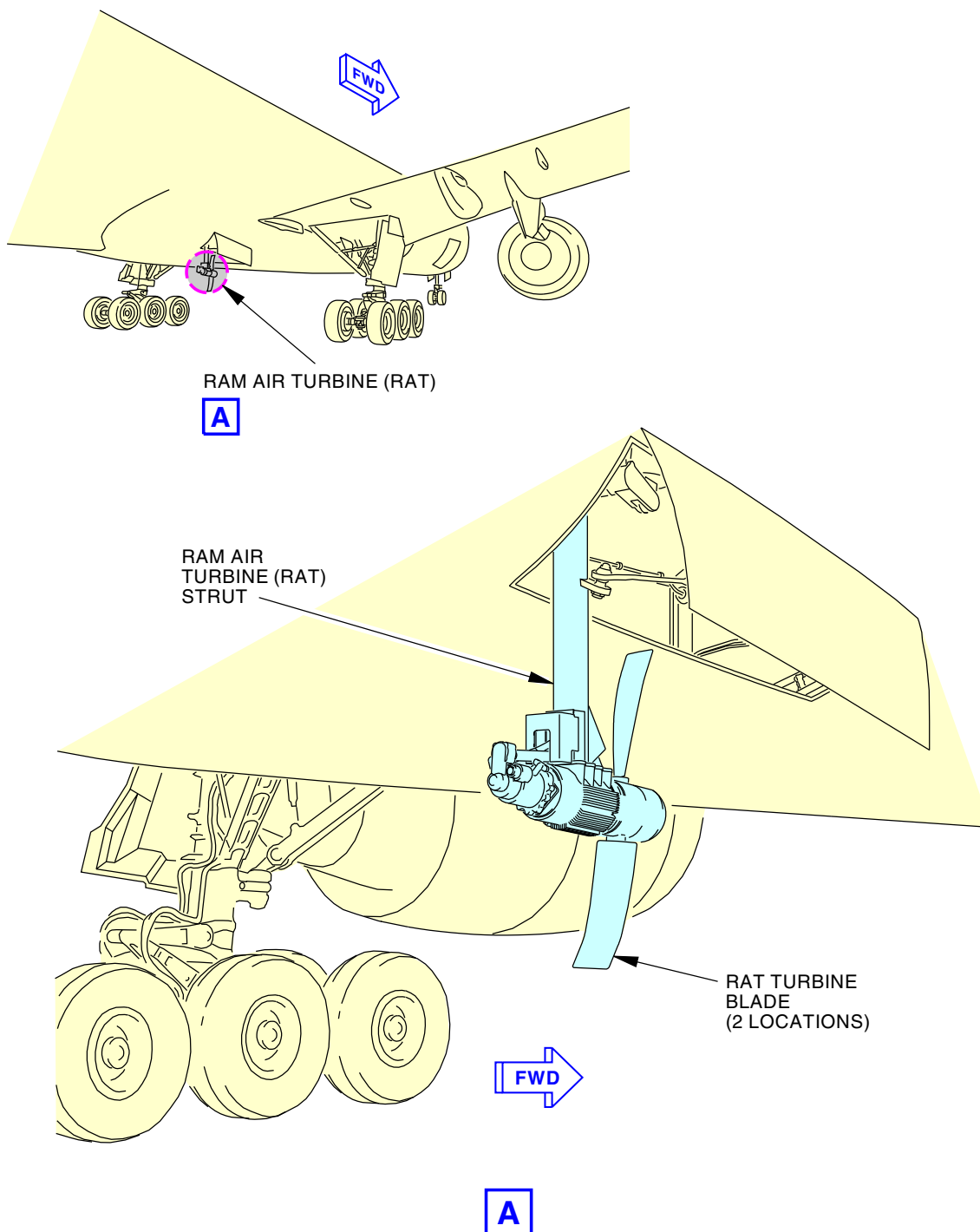
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Ram Air Turbine (RAT) Inspection
Figure 601/29-21-01-990-803

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RAM AIR TURBINE (RAT) PUMP - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the ram air turbine (RAT) pump.
- (2) An installation of the ram air turbine (RAT) pump.

TASK 29-21-02-000-801

2. Ram Air Turbine (RAT) Pump Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. 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)
29-21-00-730-801	Ram Air Turbine (RAT) System - Motoring Test (P/B 501)
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)
29-21-11 P/B 401	RAM AIR TURBINE (RAT) CHECKOUT MODULE AND COMPONENTS - REMOVAL/INSTALLATION

B. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Prepare for the Removal

SUBTASK 29-21-02-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-02-860-002

- (2) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-21-02-680-001

- (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.

E. Ram Air Turbine (RAT) Pump Removal

SUBTASK 29-21-02-020-001



WARNING

DO NOT TOUCH THE RAT GENERATOR IF IT IS HOT. THE RAT GENERATOR CAN BECOME HOT FROM THE OPERATION OF THE RAT GENERATOR HEATER. THE HOT SURFACE OF THE GENERATOR CAN BURN YOU.

- (1) Remove the sealant from the heads of the bolts [5], the bolts [9], and bolts [15].

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SUBTASK 29-21-02-020-002

- (2) Remove the sealant from the joints between the pump [1] and the flanges on the case drain tube [13], the pressure tube [11], and the supply tube [12].

SUBTASK 29-21-02-020-003

- (3) Remove the bolts [9] which attach the pressure tube [11] to the pump [1].

SUBTASK 29-21-02-020-004

- (4) Remove the bolts [5] which attach the supply tube [12] to the pump [1].

SUBTASK 29-21-02-020-005

- (5) Remove the bolts [15] which attach the case drain tube [13] to the pump [1].

SUBTASK 29-21-02-020-006

- (6) Remove the nuts [2] which attach the pump [1] to the RAT generator [14].

SUBTASK 29-21-02-480-001



DO NOT GET THE HYDRAULIC FLUID IN YOUR EYES OR ON YOUR SKIN. HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (7) Hold a oil resistant container 1 gal, (4 l), STD-1058 under the pump [1] to catch hydraulic fluid.

SUBTASK 29-21-02-020-007

- (8) Carefully pull the pump [1] straight away from the RAT generator [14] to disengage the hydraulic tubes and the shaft [19].

SUBTASK 29-21-02-020-008

- (9) Remove the spring [21] and the shaft [19].

SUBTASK 29-21-02-020-009

- (10) Remove the packing [17] from the RAT generator [14].

SUBTASK 29-21-02-020-010

- (11) Remove the packings [20] from the shaft [19].

SUBTASK 29-21-02-020-011

- (12) Remove the packing [18] from the case drain tube [13].

SUBTASK 29-21-02-020-012

- (13) Remove the packing [22] and the rings [23] from the supply tube [12].

SUBTASK 29-21-02-020-013

- (14) Remove the packing [6] and the rings [7] from the pressure tube [11].

SUBTASK 29-21-02-020-014

- (15) Install caps on these components to prevent contamination:
 - (a) The open ports on the pump [1]
 - (b) The pressure tube [11]
 - (c) The supply tube [12]
 - (d) The case drain tube [13].

SUBTASK 29-21-02-210-002

- (16) Pump Examination.

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- (a) Look for cracks on the housing.
- (b) If you see cracks, do these steps:
 - 1) Replace the checkout module: RAM AIR TURBINE (RAT) CHECKOUT MODULE AND COMPONENTS - REMOVAL/INSTALLATION, PAGEBLOCK 29-21-11/401.
 - 2) Replace the pump [1].
 - 3) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

———— **END OF TASK** ————

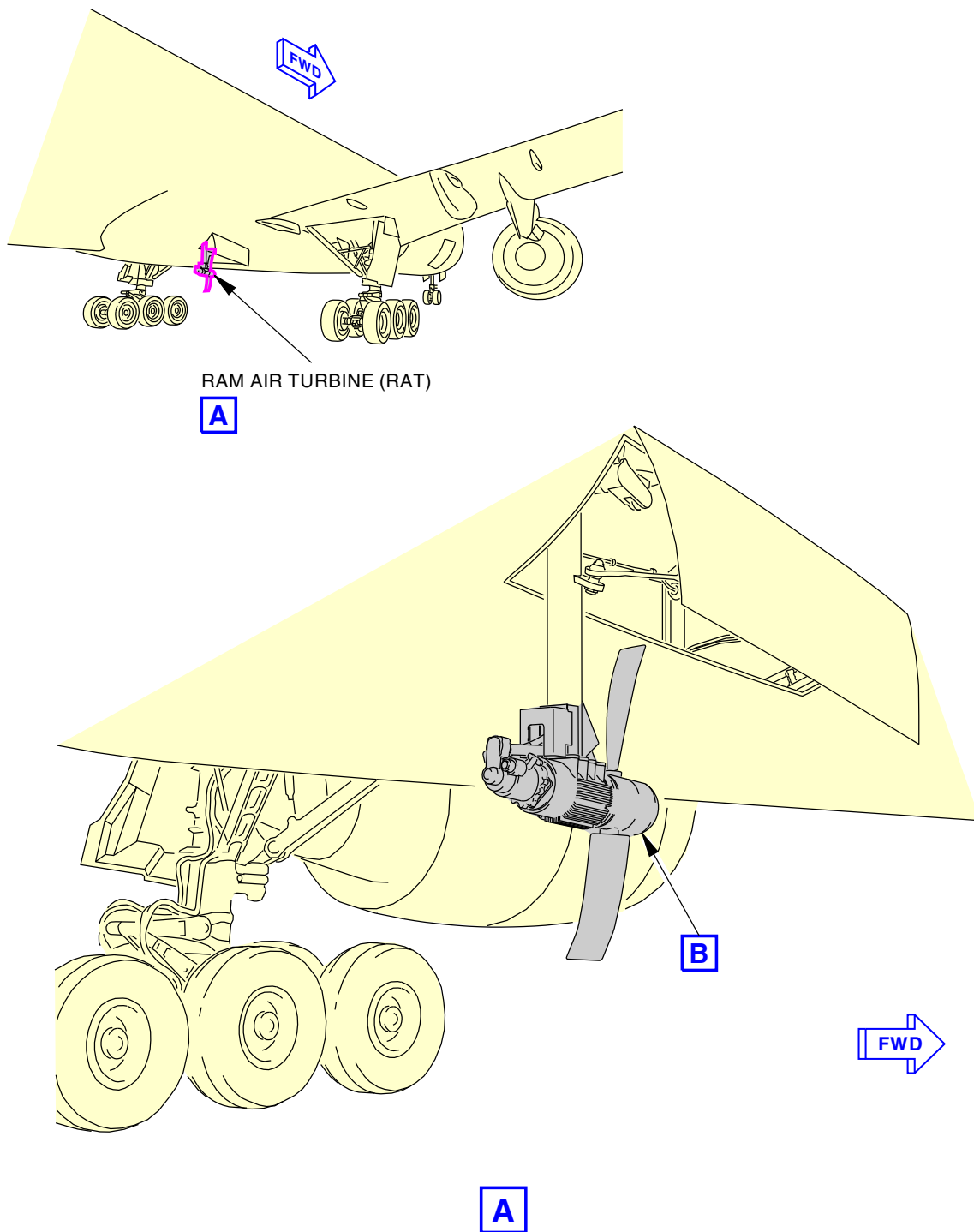
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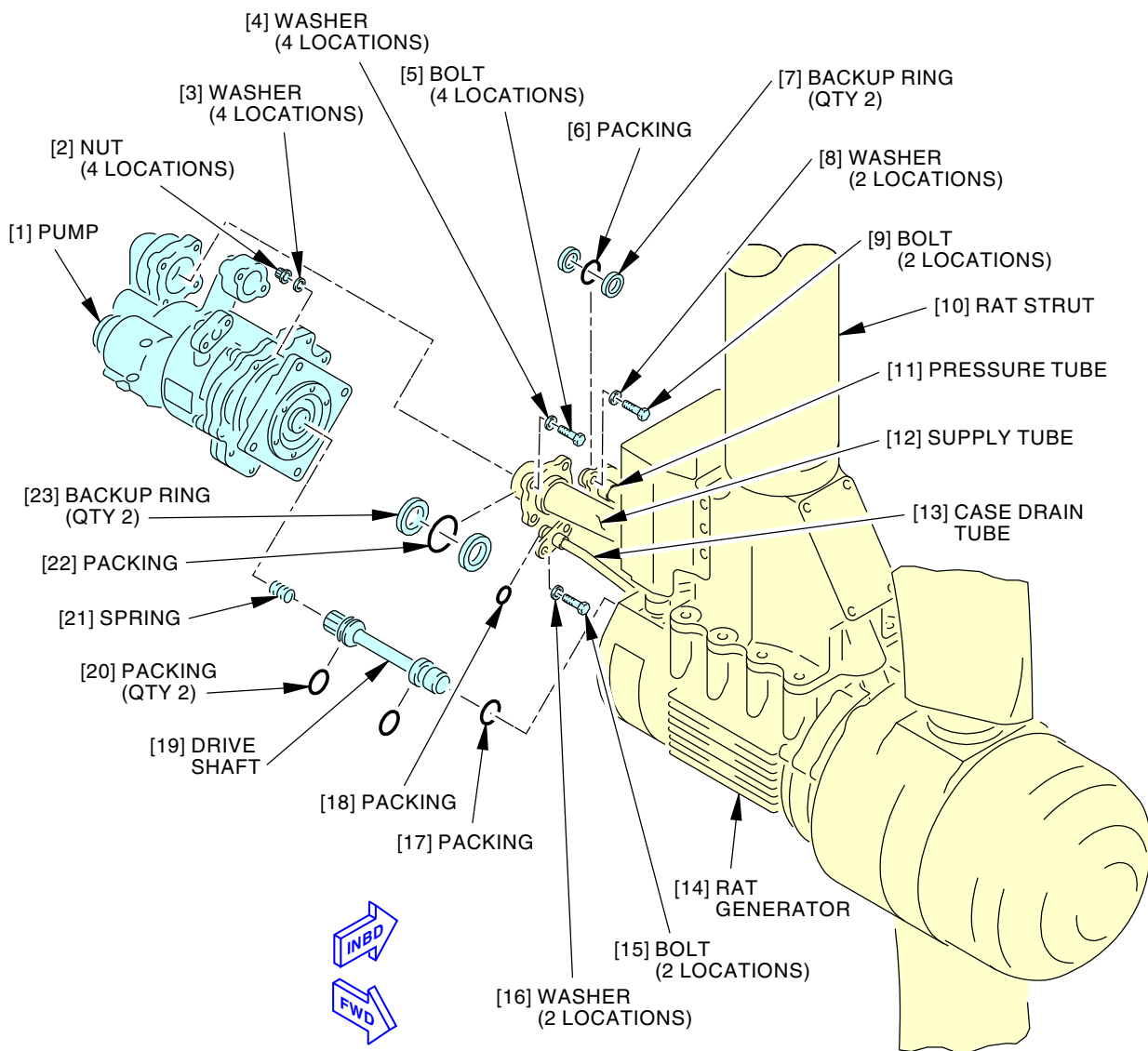
Ram Air Turbine (RAT) Pump Installation
Figure 401/29-21-02-990-801 (Sheet 1 of 2)

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**Ram Air Turbine (RAT) Pump Installation
Figure 401/29-21-02-990-801 (Sheet 2 of 2)**

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TASK 29-21-02-400-801

3. Ram Air Turbine (RAT) Pump Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. 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)

B. Consumable Materials

Reference	Description	Specification
A00386	Adhesive - Silicone RTV, Non-Corrosive, Sealant Primer	MIL-A-46146
C00852	Compound - Antiseize, Molybdenum Disulfide-Petrolatum	MIL-PRF-83483
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pump	29-21-02-05-120	ARO ALL
6	Packing	29-21-02-05-070	ARO ALL
7	Ring	29-21-02-05-060	ARO ALL
17	Packing	29-21-02-05-140	ARO ALL
18	Packing	29-21-02-05-050	ARO ALL
19	Shaft	29-21-02-05-130	ARO ALL
20	Packing	29-21-02-05-140	ARO ALL
21	Spring	29-21-02-05-150	ARO ALL
22	Packing	29-21-02-05-090	ARO ALL
23	Ring	29-21-02-05-080	ARO ALL

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Ram Air Turbine (RAT) Pump Installation

SUBTASK 29-21-02-420-001

- (1) Remove the caps from these components:
 - (a) The ports on the pump [1]
 - (b) The pressure tube [11]
 - (c) The supply tube [12]
 - (d) The case drain tube [13].

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SUBTASK 29-21-02-640-001

- (2) Apply MCS 352B fluid, D00054 to the packing [6], the packing [18], and packings [22].

SUBTASK 29-21-02-420-002

- (3) Install the packing [6] and the rings [7] on the pressure tube [11].

SUBTASK 29-21-02-420-003

- (4) Install the packing [22] and the rings [23] on the supply tube [12].

SUBTASK 29-21-02-420-004

- (5) Install the packing [18] on the case drain tube [13].

SUBTASK 29-21-02-640-002

- (6) Apply grease, D00013 to the packing [17] and the packing [20].

SUBTASK 29-21-02-420-005

- (7) Install the packing [17] in the governor shaft of the RAT generator [14].

SUBTASK 29-21-02-420-006

- (8) Install the packings [20] on the shaft [19].

SUBTASK 29-21-02-640-003

- (9) Apply grease, D00013 to the splines of the shaft [19].

SUBTASK 29-21-02-420-007

- (10) Install the shaft [19] in the RAT generator [14].

SUBTASK 29-21-02-420-008

- (11) Install the spring [21] in the end of the shaft [19].

SUBTASK 29-21-02-420-009

- (12) Engage the pump [1] with the shaft [19], the pressure tube [11], the supply tube [12], and the case drain tube [13].

SUBTASK 29-21-02-420-010

- (13) Move the pump [1] against the RAT generator [14].

SUBTASK 29-21-02-210-001

- (14) Make sure the flanges on the pressure tube [11], the supply tube [12], and the case drain tube [13] install correctly in the ports of the pump [1].

SUBTASK 29-21-02-640-004

- (15) Apply compound, C00852 to the threads of these components:
 - (a) The pump mounting studs on the RAT generator [14]
 - (b) The bolts [5], the bolts [9], and the bolts [15].

SUBTASK 29-21-02-420-011

- (16) Install the nuts [2] and the washers [3] that hold the pump [1] to the RAT generator [14].
 - (a) Tighten the nuts [2] to 228-252 pound-inches.

SUBTASK 29-21-02-420-012

- (17) Install the bolts [15] and the washers [16] to attach the case drain tube [13] to the pump [1].
 - (a) Tighten the bolts [15] to 49-53 pound-inches.

SUBTASK 29-21-02-420-013

- (18) Install the bolts [5] and the washers [4] to attach the supply tube [12] to the pump [1].
 - (a) Tighten the bolts [5] to 114-126 pound-inches.

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SUBTASK 29-21-02-420-014

- (19) Install the bolts [9] and the washers [8] to attach the pressure tube [11] to the pump [1].
(a) Tighten the bolts [9] to 114-126 pound-inches.

SUBTASK 29-21-02-390-001

- (20) Apply adhesive, A00386 around the heads of the bolts [5], the bolts [9], and the bolts [15].

SUBTASK 29-21-02-390-002

- (21) Apply adhesive, A00386 to the joints between the pump [1] and the flanges on the case drain tube [13], the pressure tube [11], and the supply tube [12].

F. Ram Air Turbine (RAT) Pump Installation Test

SUBTASK 29-21-02-610-001

- (1) For the reservoir in the center hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-21-02-720-001

- (2) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

SUBTASK 29-21-02-860-003

- (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) ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the ram air turbine (RAT) actuator.
- (2) An installation of the ram air turbine (RAT) actuator.
- (3) A removal of the ram air turbine (RAT) actuator solenoid.
- (4) An installation of the ram air turbine (RAT) actuator solenoid.

TASK 29-21-05-000-801

2. Ram Air Turbine (RAT) Actuator Removal

(Figure 401)

A. **References**

Reference	Title
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)

B. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

C. **Ram Air Turbine (RAT) Actuator Removal**

SUBTASK 29-21-05-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-05-860-002

- (2) Remove the pressure from the center hydraulic system and the reservoir, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-21-05-020-001

- (3) Disconnect the hydraulic hoses [2] and [8] from the actuator [7].

SUBTASK 29-21-05-020-002

- (4) Install caps on the hydraulic hoses [2] and [8] and the ports on the actuator [7], to prevent contamination.

SUBTASK 29-21-05-020-003

- (5) Disconnect the electrical connectors [4] and [5] from the actuator [7].

SUBTASK 29-21-05-020-004

- (6) Remove the bolt [20] which holds the actuator [7] to the RAT strut [1].

SUBTASK 29-21-05-020-005

- (7) Hold the actuator [7] in its position.

NOTE: The actuator [7] weighs approximately 48 pounds.

SUBTASK 29-21-05-020-006

- (8) Remove the bolt [14] which holds the actuator [7] to the support fitting [9].

SUBTASK 29-21-05-020-007

- (9) Remove the actuator [7].

————— **END OF TASK** —————

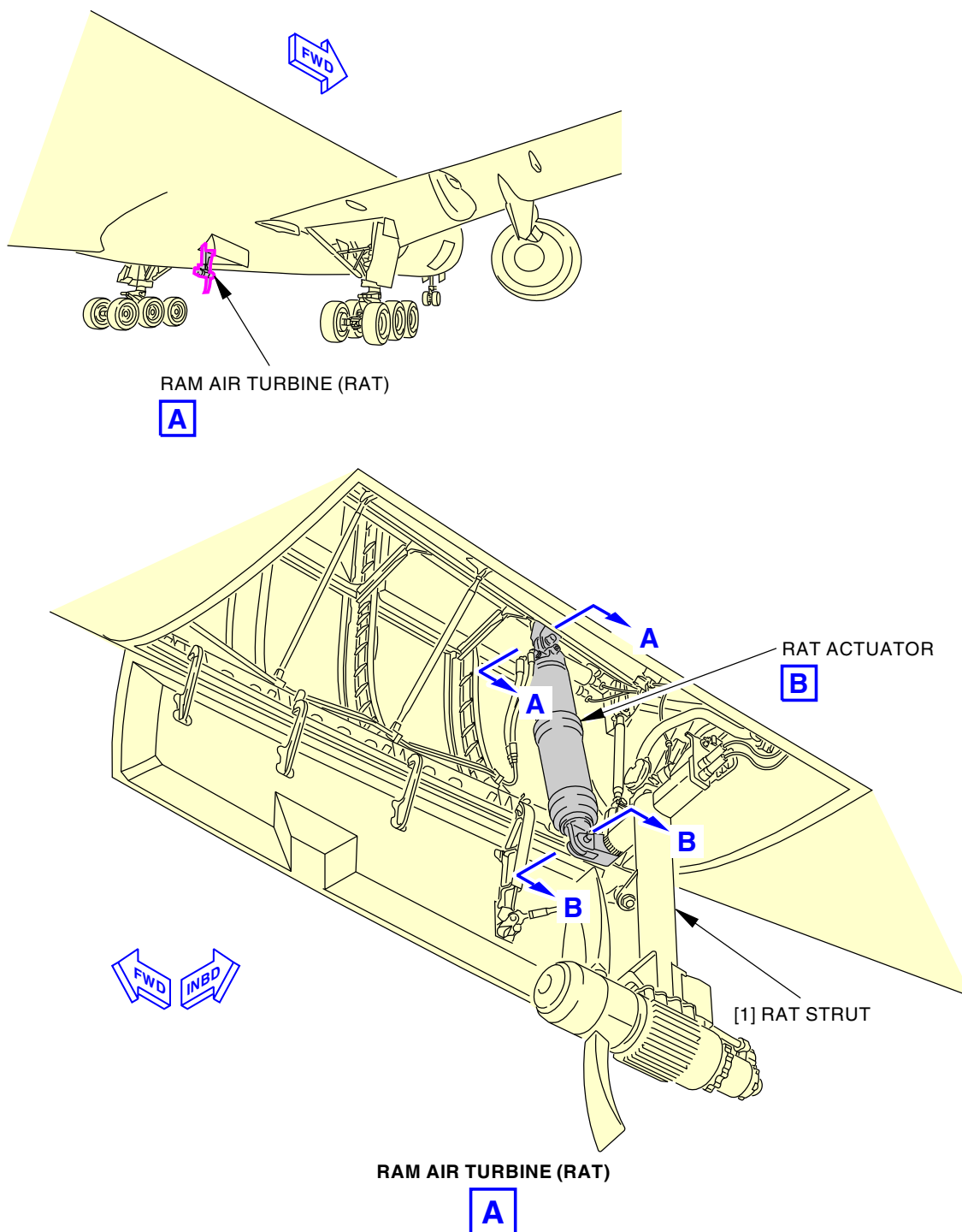
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Ram Air Turbine (RAT) Actuator Installation
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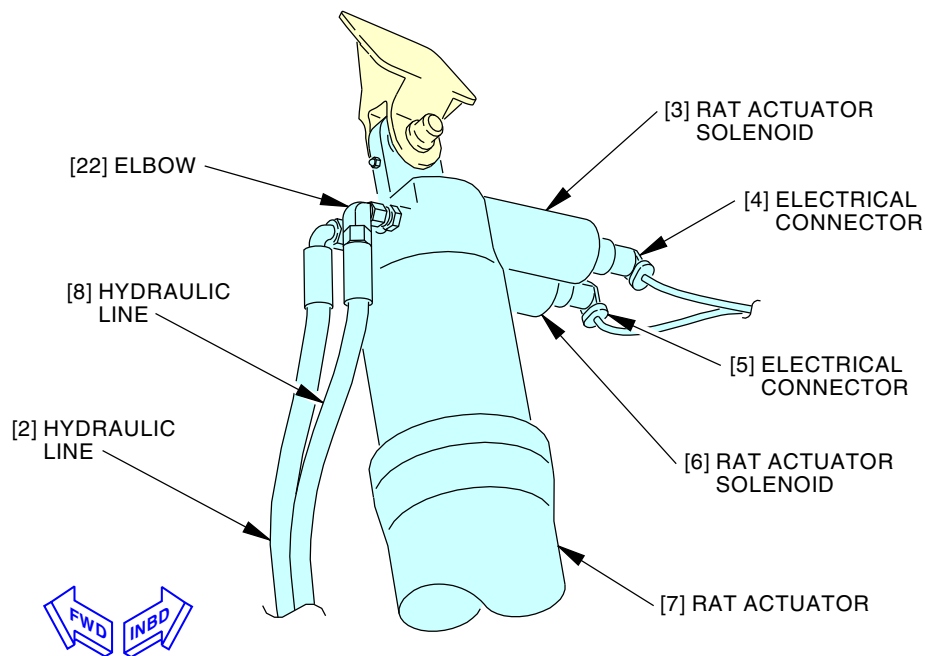
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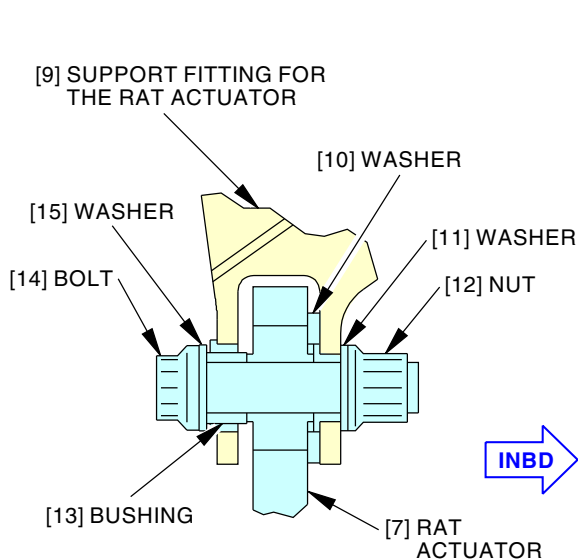
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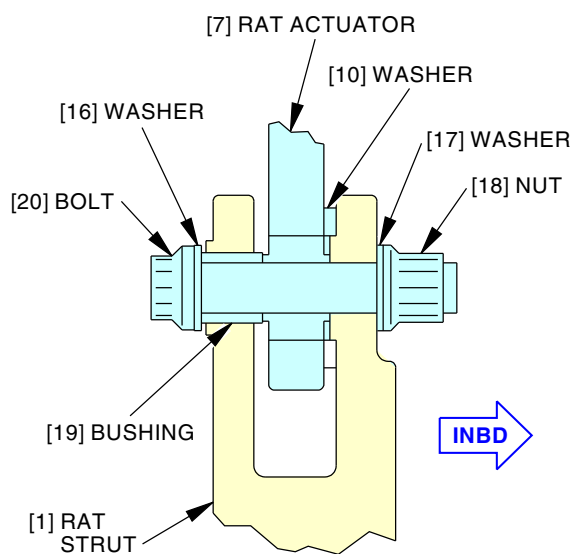


RAT ACTUATOR

B



A-A



B-B

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**Ram Air Turbine (RAT) Actuator Installation
Figure 401/29-21-05-990-801 (Sheet 2 of 2)**

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TASK 29-21-05-400-801

3. Ram Air Turbine (RAT) Actuator Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-21-30-640-801	Lubricate the Ram Air Turbine (RAT) Actuator (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
29-21-00-730-802	Ram Air Turbine (RAT) Manual Deployment System - System Test (P/B 501)
29-21-00-730-805	Ram Air Turbine (RAT) Automatic Deployment System - System Test (P/B 501)

B. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Actuator	29-21-05-05-010	ARO ALL

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Ram Air Turbine (RAT) Actuator Installation

SUBTASK 29-21-05-640-001

- (1) Lubricate the bushing [13] and the bushing [19] with grease, D00013.

SUBTASK 29-21-05-420-001

- (2) Hold the actuator [7] in its position in the support fitting [9].

SUBTASK 29-21-05-420-002

- (3) Install the bolt [14], the washer [15], the washer [10], the washer [11], the bushing [13], and the nut [12] that attach the actuator [7] to the support fitting [9].

SUBTASK 29-21-05-420-003

- (4) Align the end of the actuator [7] with the holes in the RAT strut [1].

SUBTASK 29-21-05-420-004

- (5) Install the bolt [20], the washer [10], the washer [16], the washer [17], the bushing [19], and the nut [18] that attach the actuator [7] to the RAT strut [1].

SUBTASK 29-21-05-420-005

- (6) Remove the caps from the hydraulic hose [2], hydraulic hose [8] and the ports on the actuator [7].

SUBTASK 29-21-05-420-006

- (7) Connect the hydraulic hose [2] and hydraulic hose [8] to the actuator [7].
(a) If it is not installed, install the elbow [22] on the hydraulic hose [8].

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- 1) Tighten the B-nut on the hydraulic hose [8] to 700 $\pm$ 35 in-lb (79 $\pm$ 4 N·m).
- (b) Connect the hydraulic hose [8] with installed elbow [22] to the actuator [7].
 - 1) Tighten the B-nut on the elbow [22] to 270 $\pm$ 14 in-lb (31 $\pm$ 2 N·m).
- (c) Connect the hydraulic hose [2] to the actuator [7].
 - 1) Tighten the B-nut on the hydraulic hose [2] to 280 $\pm$ 14 in-lb (32 $\pm$ 2 N·m).

SUBTASK 29-21-05-420-007

- (8) Connect the electrical connectors [4] and [5] to the actuator [7].

SUBTASK 29-21-05-640-002

- (9) To lubricate the bearings on the actuator [7] with grease, D00013 through the zerk fitting on each end of the actuator [7], do this task: Lubricate the Ram Air Turbine (RAT) Actuator, TASK 12-21-30-640-801.

F. Ram Air Turbine (RAT) Actuator Installation Test

SUBTASK 29-21-05-710-001

- (1) Do this task: Ram Air Turbine (RAT) Manual Deployment System - System Test, TASK 29-21-00-730-802.
 - (a) While you do this test, make sure there is no leakage of hydraulic fluid at the connections of the hydraulic hoses [2] and [8] to the actuator [7].

SUBTASK 29-21-05-730-001

- (2) Do this task: Ram Air Turbine (RAT) Automatic Deployment System - System Test, TASK 29-21-00-730-805.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-05-110-001



QUICKLY CLEAN THE AREA AROUND THE RAT ACTUATOR OF ALL HYDRAULIC FLUID. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) Clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-21-05-610-001

- (2) Do a check of the fluid level in the hydraulic reservoir in the center hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

————— END OF TASK —————

TASK 29-21-05-000-802

4. Ram Air Turbine (RAT) Actuator Solenoid Removal

(Figure 402)

A. References

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (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.

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Reference	Description
SPL-13942	Wrench - RAT Actuator Solenoid Part #: T3524-003 Supplier: 98391

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Ram Air Turbine (RAT) Actuator Solenoid Removal

SUBTASK 29-21-05-860-003

(1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-05-020-008

(2) To remove the solenoid [3], do these steps:

- (a) Disconnect the electrical connector [4] from the solenoid [3].
- (b) Use the wrench, SPL-13942 to remove the solenoid [3] from the RAT actuator [7].

SUBTASK 29-21-05-020-009

(3) To remove the solenoid [6], do these steps:

- (a) Disconnect the electrical connector [5] from the solenoid [6].
- (b) Use the wrench, SPL-13942 to remove the solenoid [6] from the RAT actuator [7].

SUBTASK 29-21-05-020-010

(4) Remove and discard the packing [21].

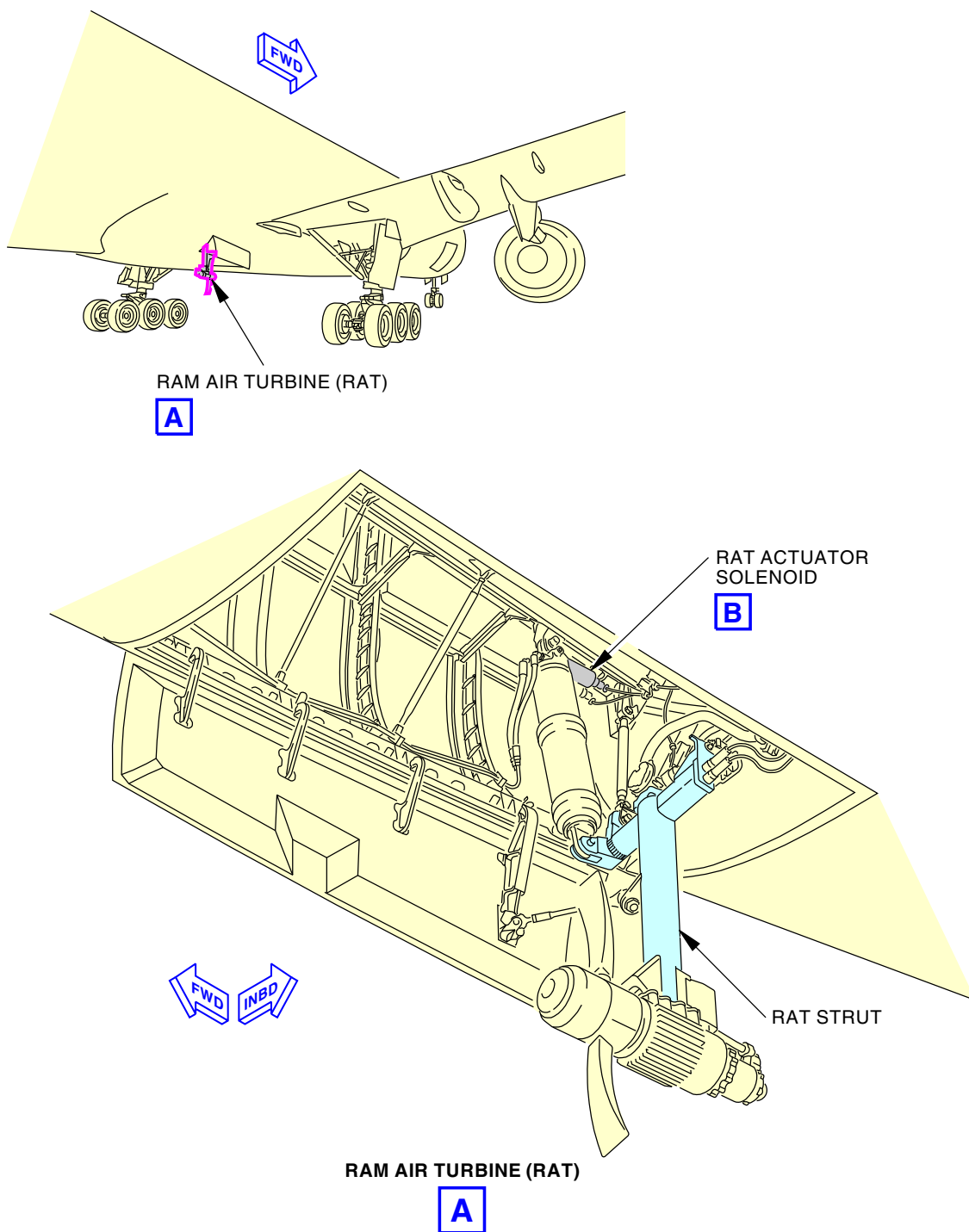
————— **END OF TASK** —————

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**Ram Air Turbine (RAT) Actuator Solenoid Installation
Figure 402/29-21-05-990-802 (Sheet 1 of 2)**

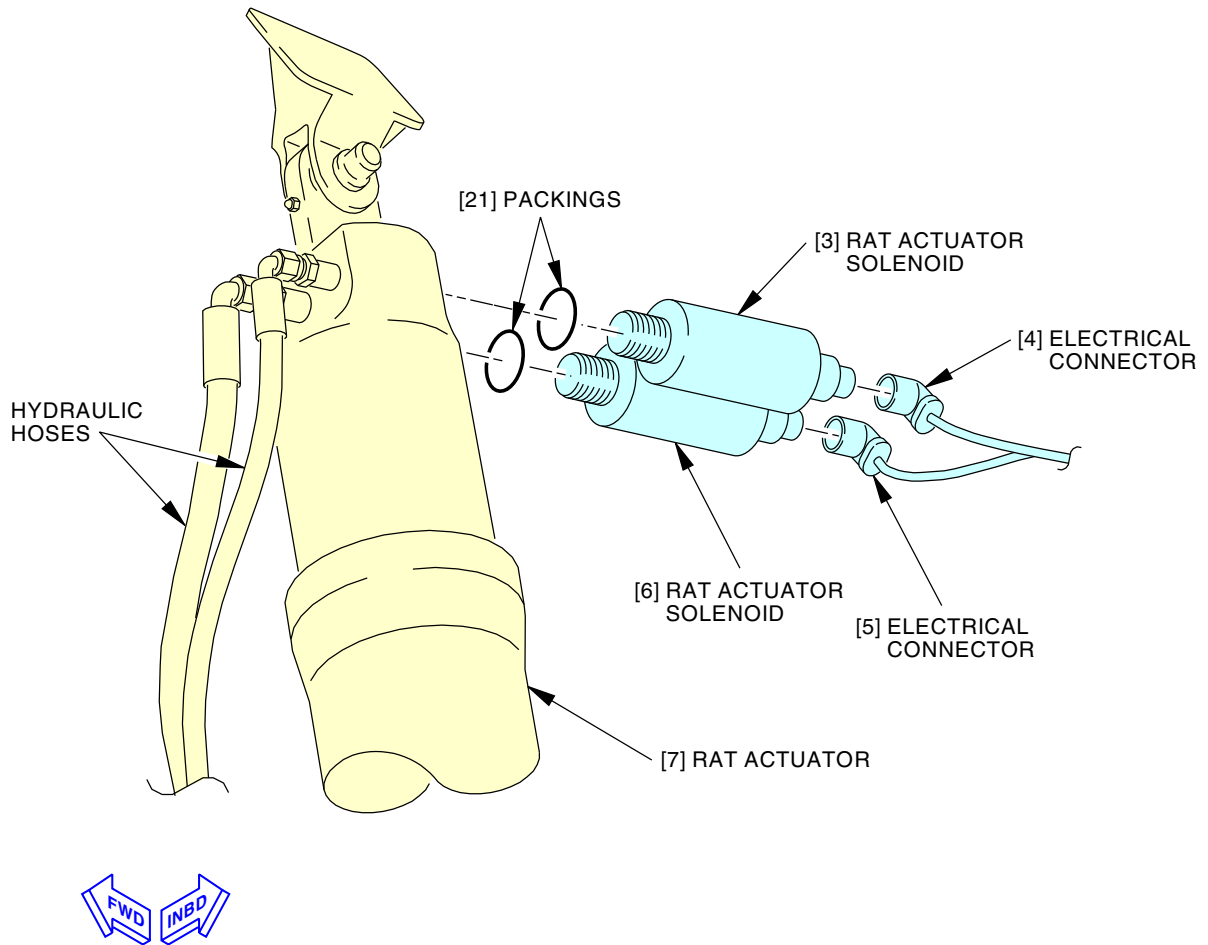
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RAT ACTUATOR SOLENOID

B

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Ram Air Turbine (RAT) Actuator Solenoid Installation
Figure 402/29-21-05-990-802 (Sheet 2 of 2)

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TASK 29-21-05-400-802

5. Ram Air Turbine (RAT) Actuator Solenoid Installation

(Figure 402)

A. References

Reference	Title
29-21-00-730-802	Ram Air Turbine (RAT) Manual Deployment System - System Test (P/B 501)
29-21-00-730-805	Ram Air Turbine (RAT) Automatic Deployment System - System Test (P/B 501)

B. Tools/Equipment

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

Reference	Description
SPL-13942	Wrench - RAT Actuator Solenoid Part #: T3524-003 Supplier: 98391

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Solenoid	29-21-05-05A-130	ARO ALL
6	Solenoid	29-21-05-05A-130	ARO ALL
21	Packing	29-21-05-05A-135	ARO ALL

E. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

F. Ram Air Turbine (RAT) Actuator Solenoid Installation

SUBTASK 29-21-05-640-003

- (1) Lubricate the packing [21] with MCS 352B fluid, D00054.

SUBTASK 29-21-05-420-009

- (2) To install the solenoid [3], do these steps:
- (a) Install the packing [21] on the solenoid [3].
 - (b) Install the solenoid [3] on the RAT actuator [7].
 - 1) Use the wrench, SPL-13942 to torque the solenoid [3] to 160-180 pound-inches (18-20 newton-meters).
 - (c) Connect the electrical connectors [4] to the solenoid [3].

SUBTASK 29-21-05-420-010

- (3) To install the solenoid [6], do these steps:
- (a) Install the packing [21] on the solenoid [6].
 - (b) Install the solenoid [6] on the RAT actuator [7].

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- 1) Use the wrench, SPL-13942 to torque the solenoid [6] to 160-180 pound-inches (18-20 newton-meters).
- (c) Connect the electrical connectors [5] to the solenoid [6].

G. Ram Air Turbine (RAT) Actuator Solenoid Installation Test

SUBTASK 29-21-05-710-002

- (1) Do this task: Ram Air Turbine (RAT) Manual Deployment System - System Test, TASK 29-21-00-730-802.

SUBTASK 29-21-05-730-002

- (2) Do this task: Ram Air Turbine (RAT) Automatic Deployment System - System Test, TASK 29-21-00-730-805.

———— **END OF TASK** ————

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RAM AIR TURBINE (RAT) COMPARTMENT DOOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the ram air turbine (RAT) compartment door
- (2) An installation of the ram air turbine (RAT) compartment door.

TASK 29-21-09-000-801

2. Ram Air Turbine (RAT) Compartment Door Removal

(Figure 401)

A. **References**

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)

B. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

C. **Procedure**

SUBTASK 29-21-09-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-09-020-001

- (2) Remove the bolt [42] that attaches the door actuation link [35] to the RAT compartment door (referred to as the door assembly [1] in this procedure).

SUBTASK 29-21-09-020-002

- (3) Remove the screw [24], the screw [29], and the screw [34] to disconnect the bonding jumpers [2], [3], and [4] from the door hinge fittings [6].

SUBTASK 29-21-09-020-003

- (4) Hold the door assembly [1] while you remove the bolts [14] and the bolt [19] at each hinge fitting [6].

SUBTASK 29-21-09-020-004

- (5) Remove the door assembly [1].

———— **END OF TASK** ————

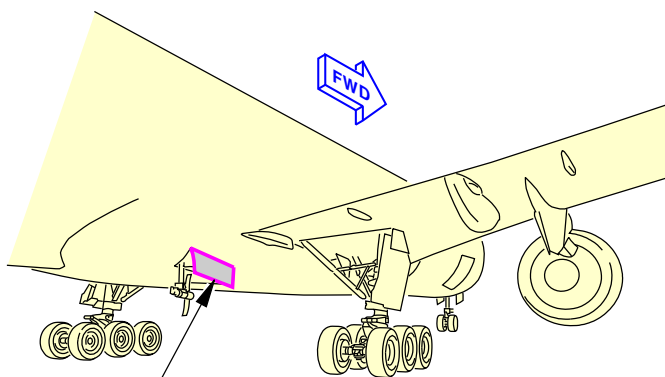
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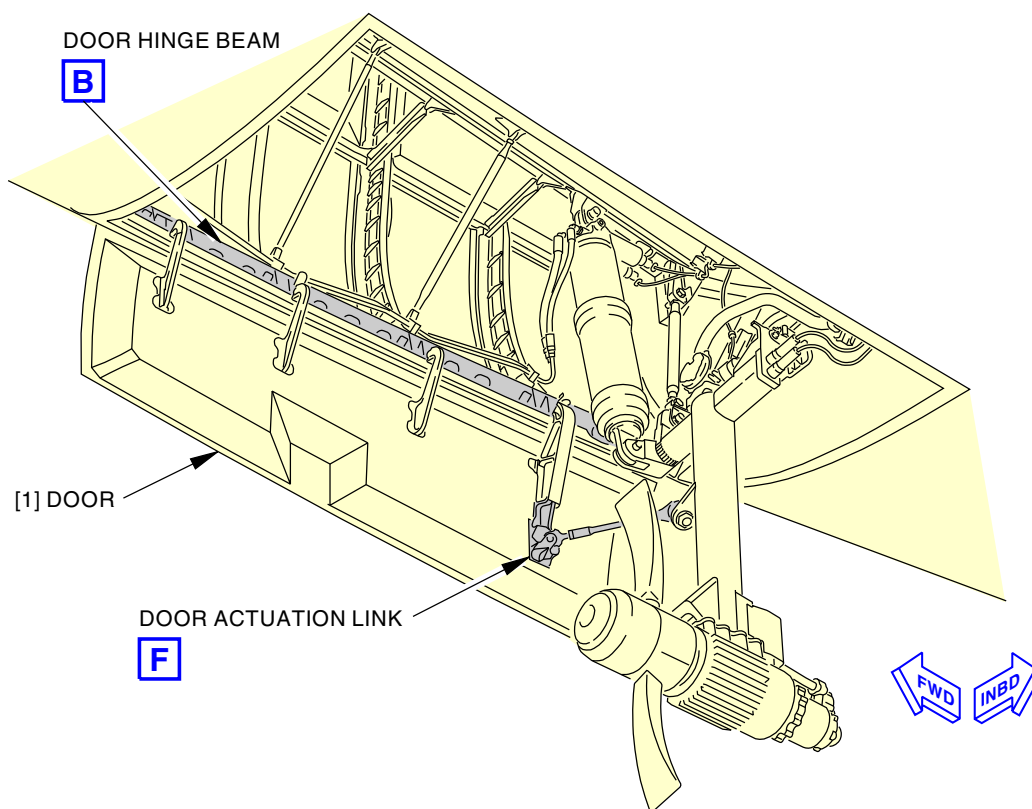
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DOOR FOR THE RAM
AIR TURBINE (RAT)
COMPARTMENT

A



DOOR HINGE BEAM

B

[1] DOOR

DOOR ACTUATION LINK

F

DOOR FOR THE RAT COMPARTMENT

A

E01032 S0006416325_V2

**Ram Air Turbine (RAT) Compartment Door Installation
Figure 401/29-21-09-990-801 (Sheet 1 of 5)**

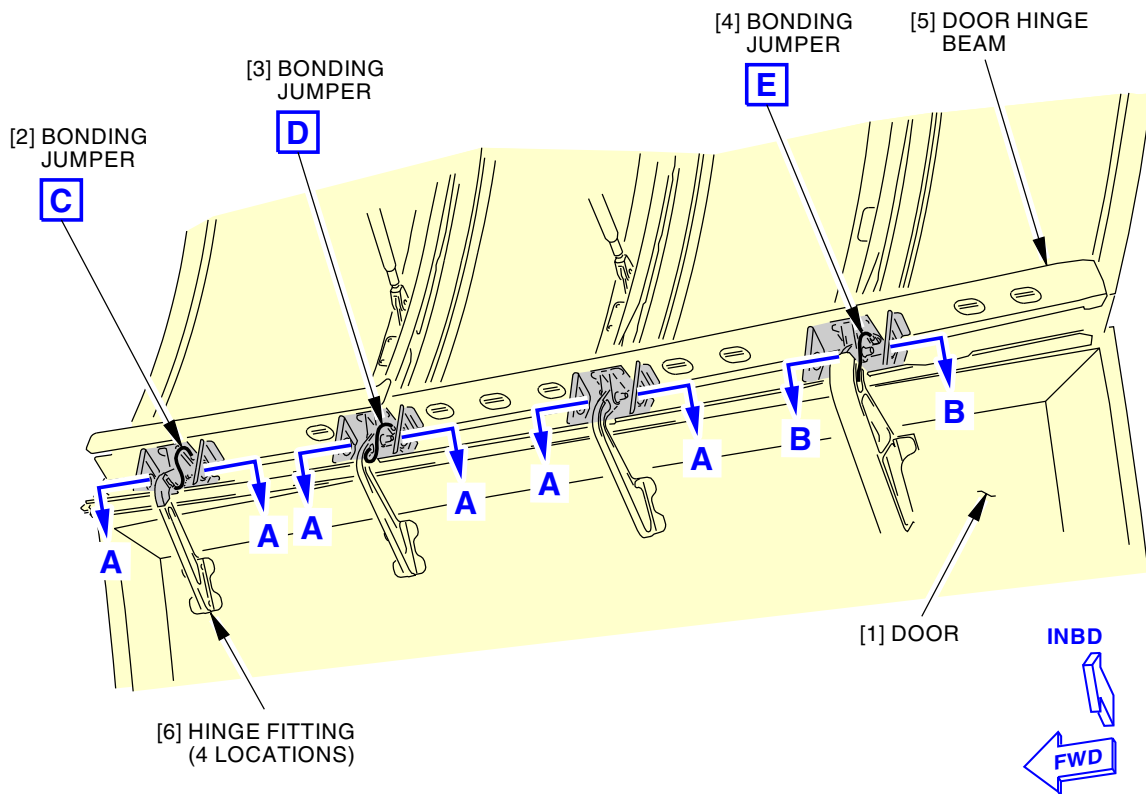
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DOOR HINGE BEAM

[B]

E01044 S0006416326_V2

Ram Air Turbine (RAT) Compartment Door Installation
Figure 401/29-21-09-990-801 (Sheet 2 of 5)

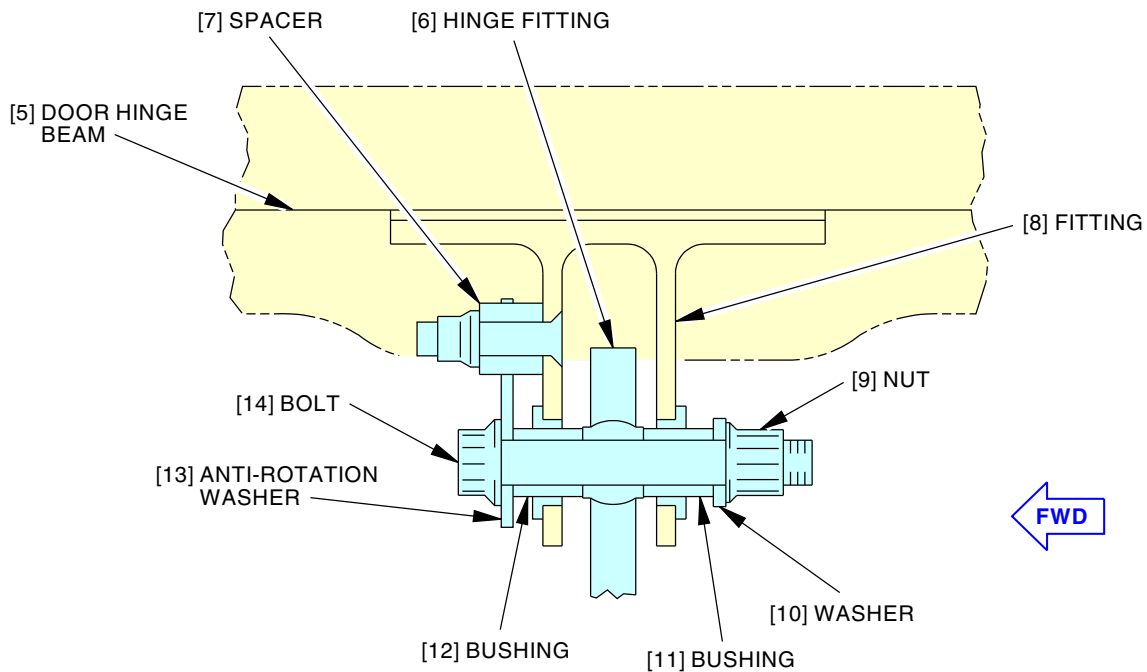
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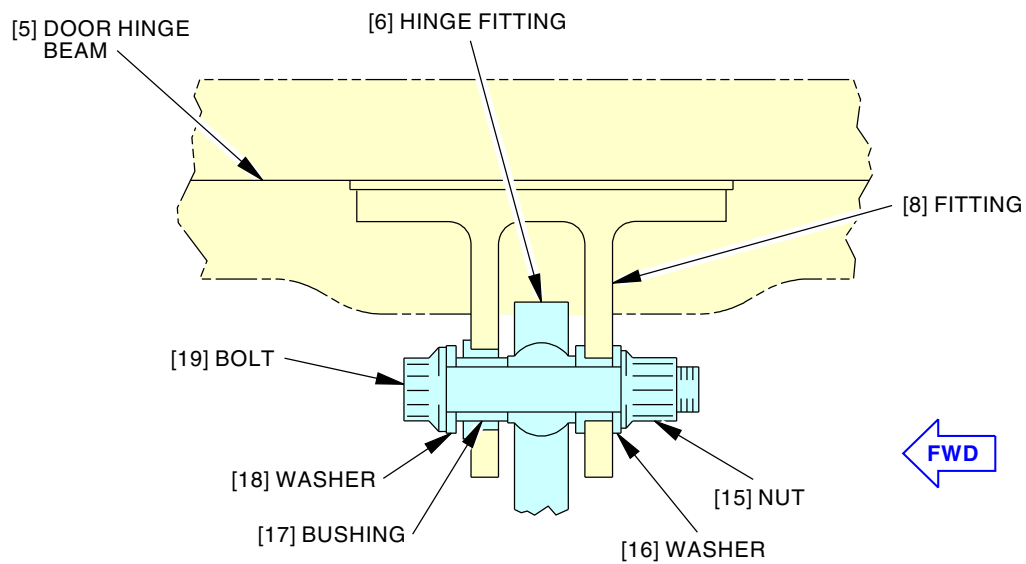
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A-A



B-B

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**Ram Air Turbine (RAT) Compartment Door Installation
Figure 401/29-21-09-990-801 (Sheet 3 of 5)**

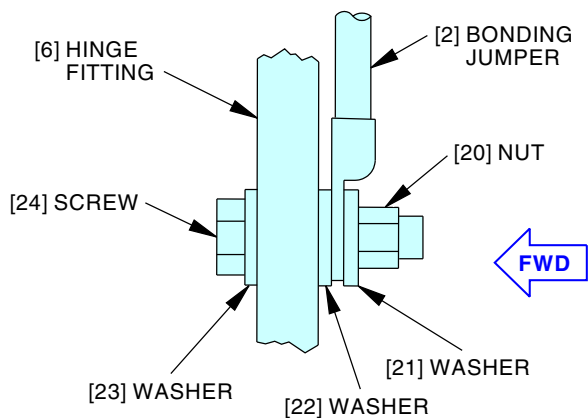
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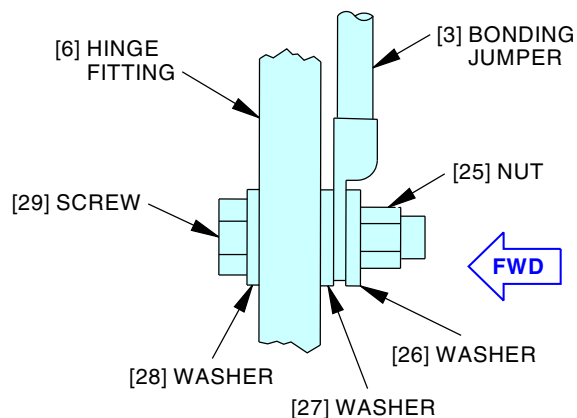
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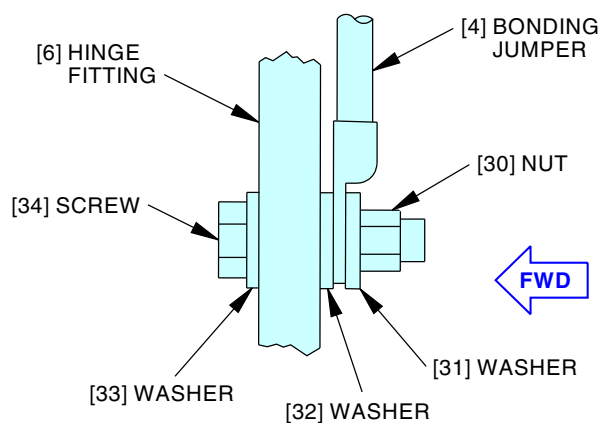
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C



D



E

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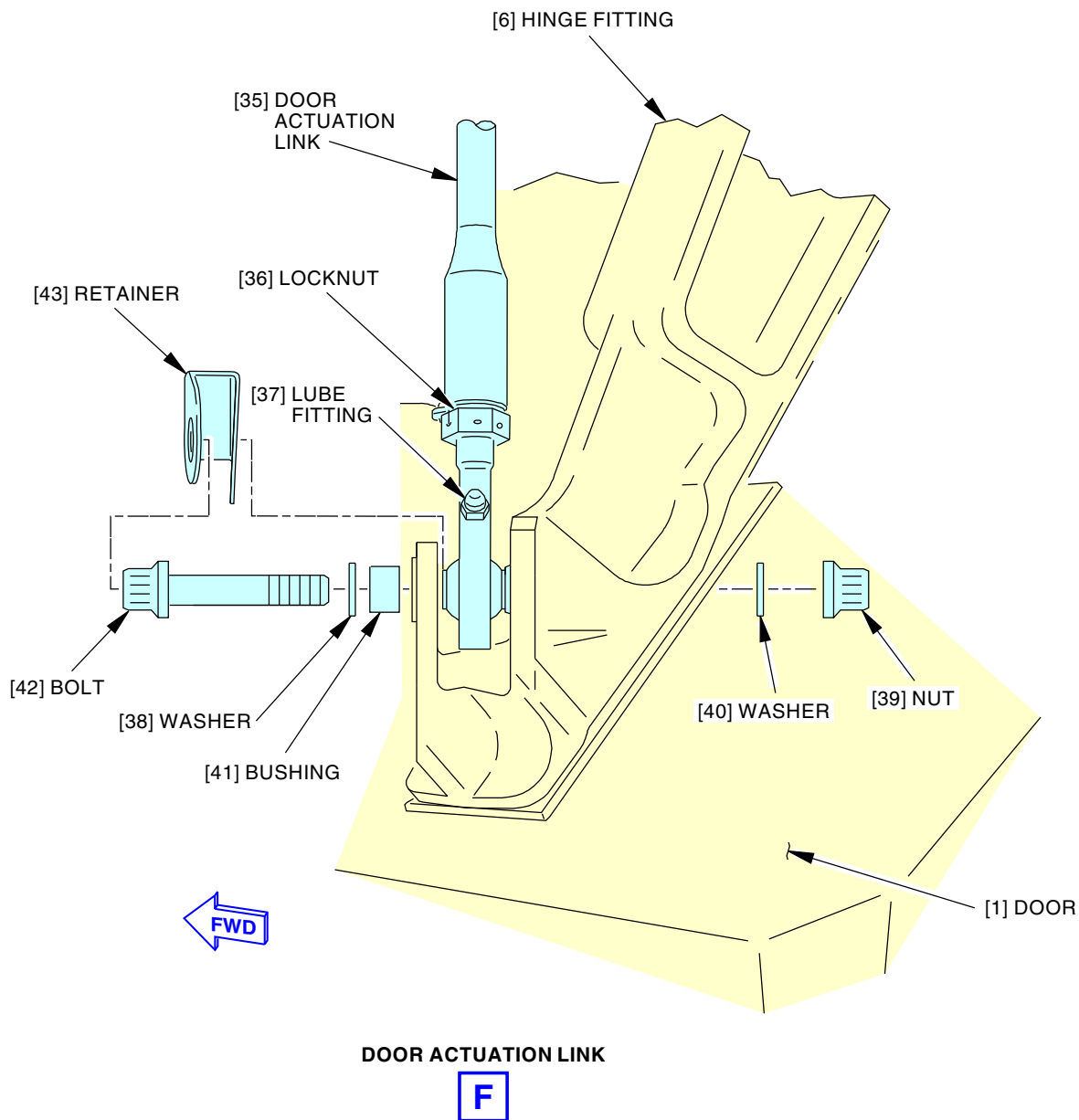
**Ram Air Turbine (RAT) Compartment Door Installation
Figure 401/29-21-09-990-801 (Sheet 4 of 5)**

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**Ram Air Turbine (RAT) Compartment Door Installation
Figure 401/29-21-09-990-801 (Sheet 5 of 5)**

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TASK 29-21-09-400-801

3. Ram Air Turbine (RAT) Compartment Door Installation

(Figure 401)

A. References

Reference	Title
29-21-10-820-801	Ram Air Turbine (RAT) Door Actuation Link Adjustment (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Door assembly	53-96-59-02-465	ARO ALL

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Ram Air Turbine (RAT) Compartment Door Installation

SUBTASK 29-21-09-420-001

- (1) Do these steps to attach the RAT compartment door (referred to as the door assembly [1] in this procedure) to the fittings [8] on the door hinge beam [5]:
 - (a) Apply the grease, D00633 to the outer diameter of the bolts [14] and the bolt [19] and to the inner diameter of the bushing [11], the bushing [12], and the bushing [17].
 - (b) Hold the door assembly [1] in its position while you install the fasteners at each hinge fitting [6].
 - (c) At the three forward hinge fittings [6], install the bolts [14], the washers [13], the washers [10], the bushings [11], the bushings [12], and the nuts [9].
NOTE: Make sure the washers [13] engages the spacer [7] on the fitting [8] on the door hinge beam [5].
 - (d) Tighten the nuts [9] to 65-100 pound-inches.
 - (e) At the aft hinge fitting [6], install the bolt [19], the washer [18], the washer [16], the bushing [17], and the nut [15].
 - (f) Tighten the nut [15] to 130-200 pound-inches.

SUBTASK 29-21-09-420-002

- (2) Do the steps which follow to attach the bonding jumpers [2], [3], and [4] to the door assembly [1] (SWPM 20-20-00):
 - (a) Install the screw [24], the washer [21], the washer [22], the washer [23], and the nut [20] to attach the bonding jumper [2] to the forward hinge fitting [6].
 - (b) Install the screw [29], the washer [26], the washer [27], the washer [28], and the nut [25] to attach the bonding jumper [3] to the second hinge fitting [6] from the forward end of the door assembly [1].

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- (c) Install the screw [34], the washer [31], the washer [32], the washer [33], and the nut [30] to attach the bonding jumper [4] to the aft hinge fitting [6].

SUBTASK 29-21-09-420-003

- (3) Do these steps to connect the door actuation link [35] to the door assembly [1]:
 - (a) Apply the grease, D00013 to the bolt [42] and to the bushing [41].
 - (b) Align the hole in the door actuation link [35] with the holes in the hinge fitting [6] on the door assembly [1].
 - (c) Install the bolt [42], the retainer [43], the washer [38], the washer [40], the bushing [41], and the nut [39].
 - (d) Tighten the nut [39] to 220-410 pound-inches.

SUBTASK 29-21-09-820-001

- (4) Do this task: Ram Air Turbine (RAT) Door Actuation Link Adjustment, TASK 29-21-10-820-801.

———— **END OF TASK** ————

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RAM AIR TURBINE (RAT) DOOR ACTUATION LINK - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) A removal of the ram air turbine (RAT) door actuation link (referred to as the link assembly [2] in this procedure)
- (2) An installation of the link assembly [2].
- (3) An adjustment of the link assembly [2].

TASK 29-21-10-000-801

2. Ram Air Turbine (RAT) Door Actuation Link Removal

(Figure 201)

A. **References**

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)

B. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

C. **Procedure**

SUBTASK 29-21-10-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-10-020-001

- (2) Remove the bolt [12] that attaches the door actuation link (referred to as the link assembly [2] in this procedure) to the RAT compartment door [3].

SUBTASK 29-21-10-020-002

- (3) Remove the nut [16] that connects the pin [14] on the link assembly [2] to the RAT strut [1].

SUBTASK 29-21-10-020-003

- (4) Remove the link assembly [2] from the RAT strut [1].

———— **END OF TASK** ————

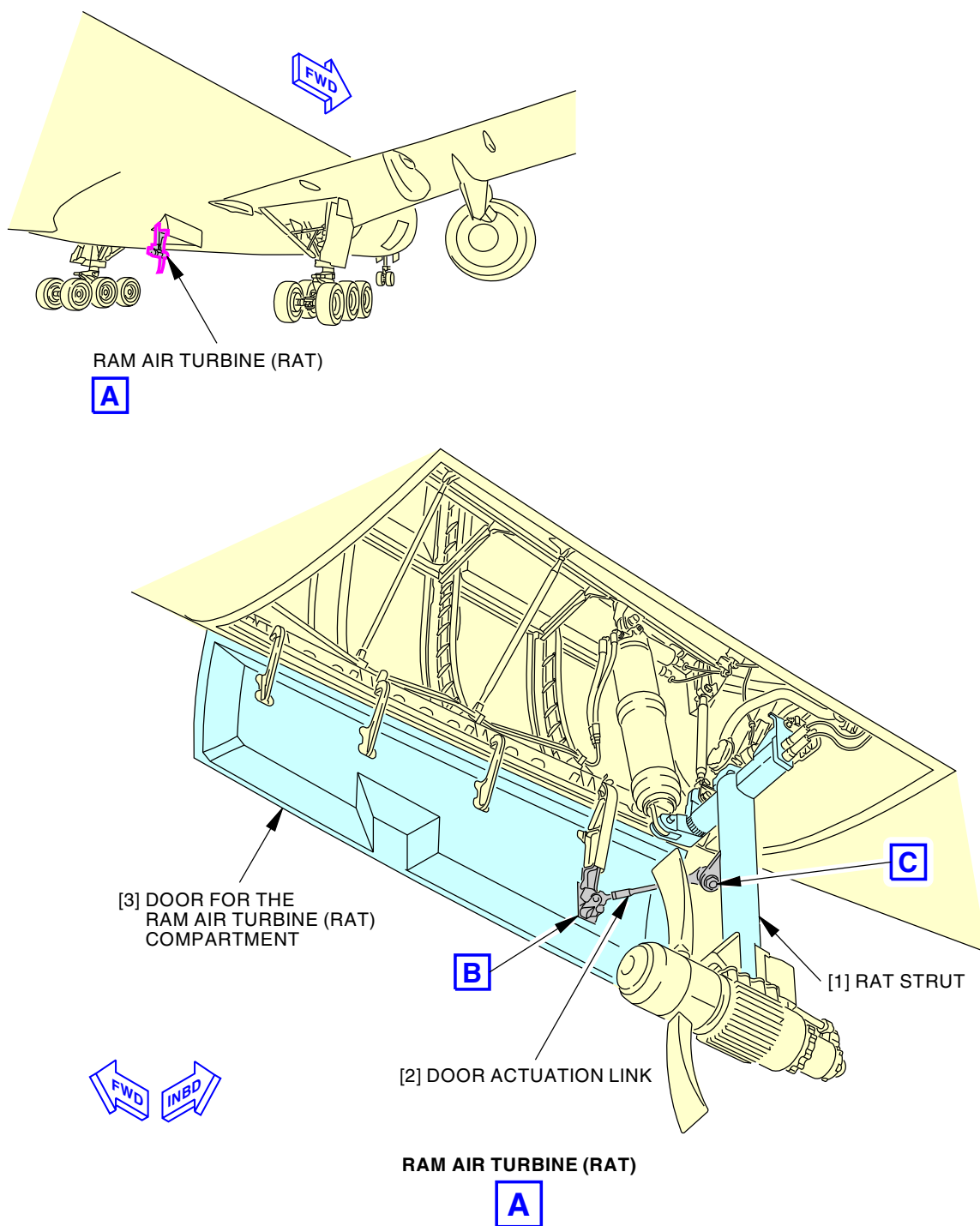
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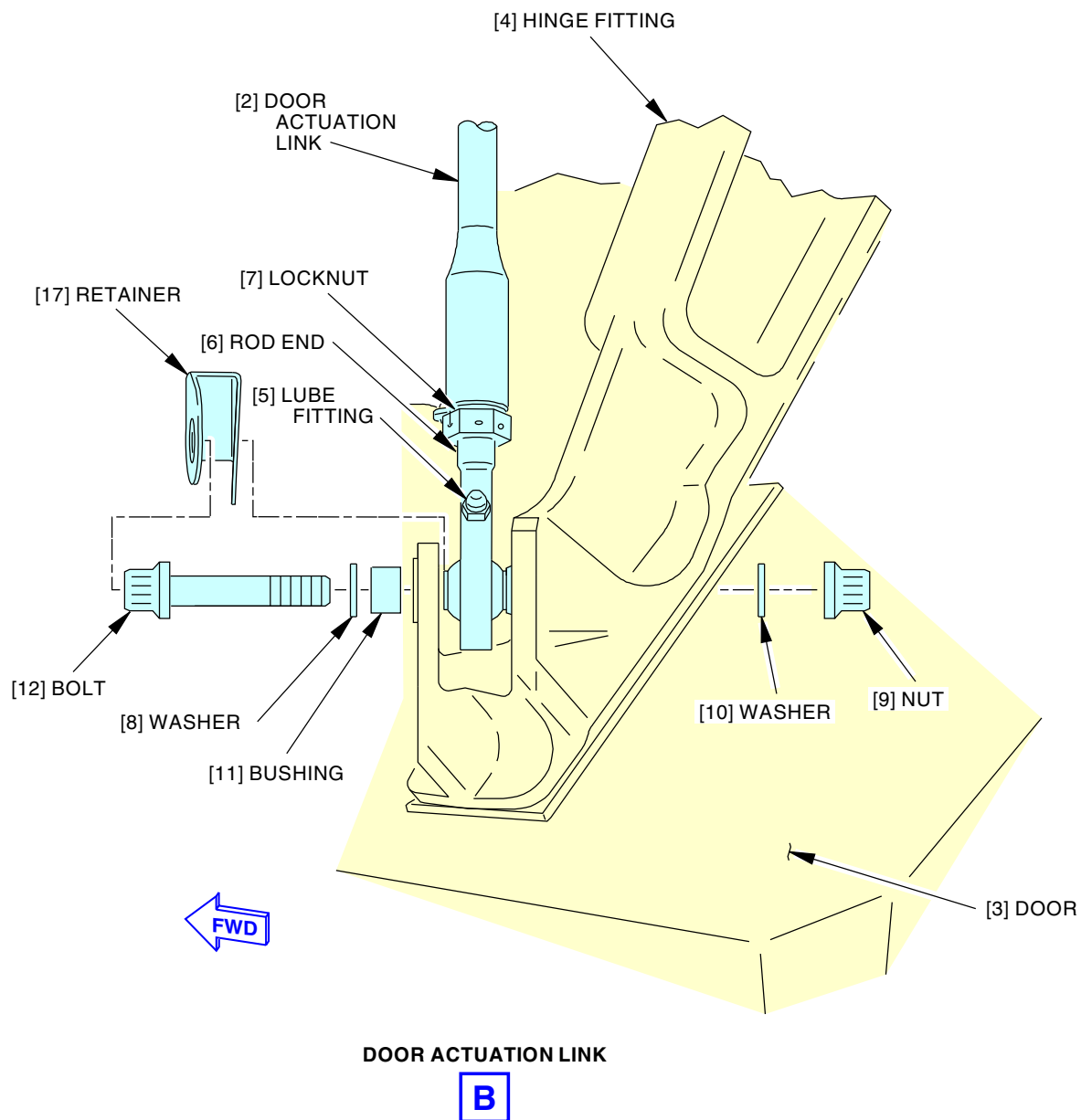
Ram Air Turbine (RAT) Door Actuation Link Installation
Figure 201/29-21-10-990-801 (Sheet 1 of 3)

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Ram Air Turbine (RAT) Door Actuation Link Installation
Figure 201/29-21-10-990-801 (Sheet 2 of 3)

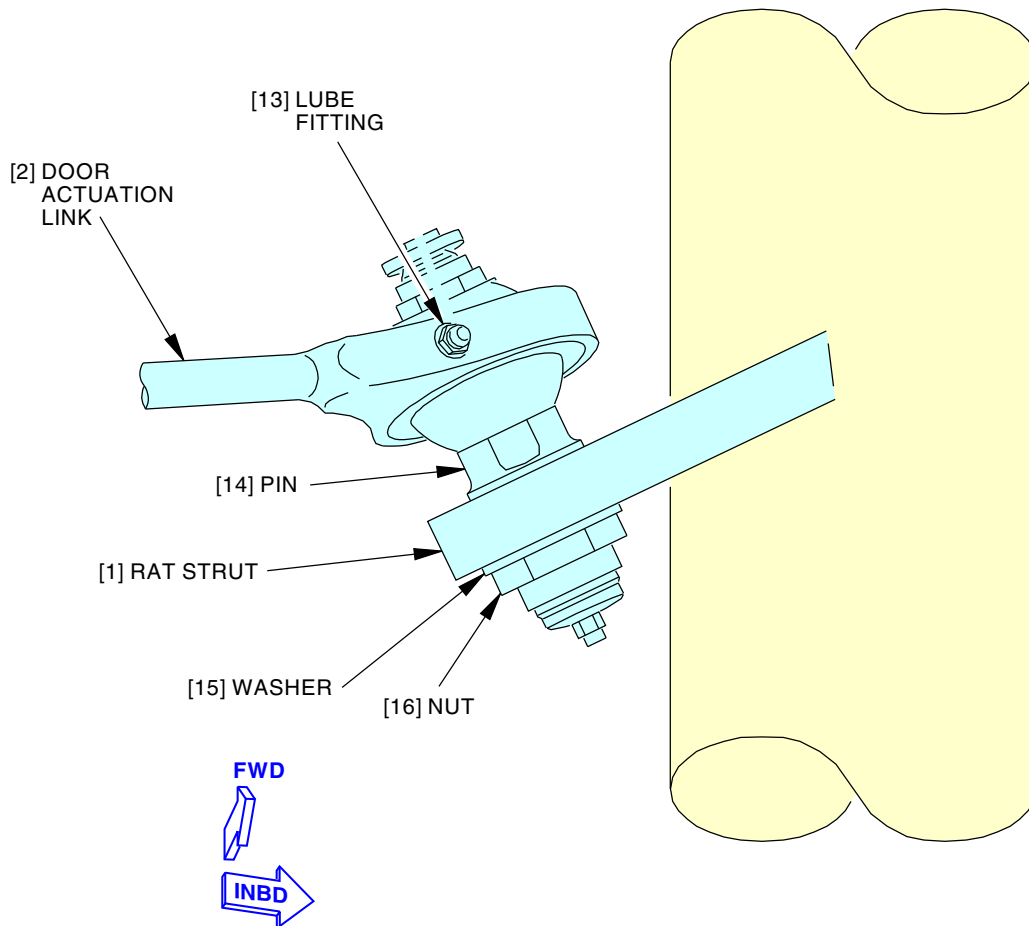
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Ram Air Turbine (RAT) Door Actuation Link Installation
Figure 201/29-21-10-990-801 (Sheet 3 of 3)

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TASK 29-21-10-400-801

3. Ram Air Turbine (RAT) Door Actuation Link Installation

(Figure 201)

A. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Link assembly	29-21-01-01-130	ARO ALL

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Procedure

SUBTASK 29-21-10-420-001

- (1) Do these steps to connect the door actuation link (referred to as the link assembly [2] in this procedure) to the RAT compartment door [3]:
 - (a) Apply the grease, D00013 to the bolt [12] and to the bushing [11].
 - (b) Align the hole in the link assembly [2] with the holes in the hinge fitting [4] on the RAT compartment door [3].
 - (c) Install the bolt [12], the retainer [17], the washer [8], the washer [10], the bushing [11], and the nut [9].
 - 1) Tighten the nut [9] to 220-410 pound-inches.

SUBTASK 29-21-10-820-001

- (2) Do this procedure: Ram Air Turbine (RAT) Door Actuation Link Adjustment.

NOTE: This procedure follows this task.

————— **END OF TASK** —————

TASK 29-21-10-820-801

4. Ram Air Turbine (RAT) Door Actuation Link Adjustment

(Figure 201)

A. References

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)

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C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Procedure

SUBTASK 29-21-10-860-002

- (1) If the ram air turbine (RAT) is not in the extended position, do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801

SUBTASK 29-21-10-020-004

- (2) If the door actuation link (referred to as the link assembly [2] in this procedure) is attached to the RAT strut [1], do these steps:
 - (a) Remove the nut [16] that attaches the pin [14] on the link assembly [2] to the RAT strut [1].
 - (b) Remove the link assembly [2] from the RAT strut [1].

SUBTASK 29-21-10-020-005

- (3) Loosen the locknut [7] on the rod end [6] on the link assembly [2].

SUBTASK 29-21-10-820-002

- (4) Turn the link assembly [2] until the distance between the centers of the holes at each end of the link assembly [2] is 14.20 (± 0.25)inches.

NOTE: Make sure the rod end [6] aligns with the opposite end of the link assembly [2].

SUBTASK 29-21-10-420-002

- (5) Tighten the locknut [7] by hand.

SUBTASK 29-21-10-420-003

- (6) Do these steps to connect the link assembly [2] to the RAT strut [1]:
 - (a) Put the pin [14], on the link assembly [2], through the hole in the RAT strut [1].
 - (b) Install the washer [15] and the nut [16] on the pin [14].
 - (c) Tighten the nut [16] to 700-900 pound-inches (79-102 Nm) above the run-on torque.
NOTE: Run-on torque is the torque that is required to turn the nut on the threads before any tension is put on the pin [14] of the link assembly.
 - (d) Lubricate the bearings on the link assembly [2], through the lube fittings [5] and [13], with grease, D00013.
 - (e) Remove the unwanted grease from the bearings on the link assembly [2].

SUBTASK 29-21-10-860-003

- (7) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

SUBTASK 29-21-10-220-001

- (8) Measure the mismatch between the RAT compartment door [3] (referred to as the door [3] in this procedure) and the adjacent panels of the wing-to-body fairing.

- (a) Make sure the mismatch is in the limit of ±0.040 inches.

NOTE: A mismatch of 0.070 inches is permitted in an area 8 inches aft and 8 inches inboard of the forward outboard corner of the RAT compartment door [3].

SUBTASK 29-21-10-820-005

- (9) Measure the gaps between the RAT compartment door [3] and the adjacent panels of the wing-to-body fairing.

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- (a) Make sure the panel gap is 0.14 ± 0.060 inches on the three sides of the door [3] without hinges.
- (b) Make sure the panel gap is 3.14 ± 0.060 inches on the side of the door [3] with hinges.
NOTE: This gap is measured to the next large panel, not the small panel that covers the hinges.

SUBTASK 29-21-10-820-003

- (10) If the mismatch is not in the limit, do these steps until the door [3] correctly aligns with the adjacent panels of the wing-to-body fairing:
 - (a) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.
 - (b) Do these steps to disconnect the link assembly [2] from the RAT strut [1]:
 - 1) Remove the nut [16] that connects the pin [14] on the link assembly [2] to the RAT strut [1].
 - 2) Remove the link assembly [2] from the RAT strut [1].
 - (c) Loosen the locknut [7] on the rod end [6].
 - (d) Turn the link assembly [2] 1/2 turn clockwise (when you look at the free end of the link assembly [2]) to make the link assembly [2] shorter.
 - (e) Tighten the locknut [7] by hand.
 - (f) Do these steps to connect the link assembly [2] to the RAT strut [1]:
 - 1) Put the pin [14] on the link assembly [2] through the hole in the RAT strut [1].
 - 2) Install the washer [15] and the nut [16] on the pin [14].
 - 3) Tighten the nut [16] to 700-900 pound-inches (79-102 Nm) above the run-on torque.
NOTE: Run-on torque is the torque that is required to turn the nut on the threads before any tension is put on the pin [14] of the link assembly.
 - (g) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.
 - (h) Measure the mismatch between the door [3] and the adjacent panels of the wing-to-body fairing.
 - (i) Make sure the mismatch is in the limit of ± 0.040 inches.
NOTE: A mismatch of 0.070 inches is permitted in an area 8 inches aft and 8 inches inboard of the forward inboard corner of the RAT compartment door [3].
 - (j) Make sure the panel gap is 0.14 ± 0.060 inches on the three sides of the door [3] without hinges.
 - (k) Make sure the panel gap is 3.14 ± 0.060 inches on the side of the door [3] with hinges.
NOTE: This gap is measured to the next large panel, not the small panel that covers the hinges.

SUBTASK 29-21-10-820-004

- (11) When the mismatch and gaps are in the limit, do these steps:
 - (a) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.
 - (b) Tighten the locknut [7] to 290-510 pound-inches.
 - (c) Safety the locknut [7] with a lockwire.

———— **END OF TASK** ————

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RAM AIR TURBINE (RAT) CHECKOUT MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the ram air turbine (RAT) checkout module and components.
- (2) An installation of the ram air turbine (RAT) checkout module and components.

TASK 29-21-11-000-801

2. Ram Air Turbine (RAT) Checkout Module and Components Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) This task has the instructions to remove these components:
 - (a) Ram air turbine (RAT) checkout Module
 - (b) Filter elements
 - (c) RAT pressure transducer
 - (d) Solenoid valve
 - (e) Bypass fuse
- (2) Before you do one of the removals, do the steps to prepare for the removal. Then do the applicable removal.

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)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. **Location Zones**

Zone	Area
144	Main Landing Gear Wheel Well, Right

D. **Prepare for the Removal**

SUBTASK 29-21-11-480-001



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

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SUBTASK 29-21-11-010-001



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-21-11-860-001

- (3) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card, to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-21-11-860-002

- (4) 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 29-21-11-860-003

- (5) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

E. Ram Air Turbine (RAT) Checkout Module Removal

SUBTASK 29-21-11-680-001

- (1) To drain the hydraulic fluid from the center system reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

SUBTASK 29-21-11-020-001

- (2) Disconnect these hydraulic tubes from the module [18]:
- (a) Supply tube [4] from the center system
 - (b) Case drain tube [5] from the RAT
 - (c) Pressure tube [6] to the center system
 - (d) Check valve [8] on the return tube [7] to the center system
 - (e) Supply tube [1] to the RAT
 - (f) Pressure tube [2] to the RAT
 - (g) Elbow [14] on the retract tube [13] to the RAT actuator
 - (h) Extend tube [12] to the RAT actuator.

SUBTASK 29-21-11-020-002

- (3) Install caps on the hydraulic tubes to prevent contamination.

SUBTASK 29-21-11-020-003

- (4) Disconnect the electrical connectors [3] and [15] from the module [18].

SUBTASK 29-21-11-020-004

- (5) Install caps on the electrical connectors [3] and [15] to prevent contamination.

SUBTASK 29-21-11-020-005

- (6) Remove the bolts [10] which attach the module [18] to the bracket [9].

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SUBTASK 29-21-11-020-006

- (7) Remove the module [18] from the bracket [9].

F. RAT Checkout Module Filter Elements Removal

SUBTASK 29-21-11-020-007

- (1) Do these steps to remove the element [20]:
 - (a) Remove the bowl [22] for the case drain from the module [18].
 - (b) Remove the element [20] for the case drain from the module [18].
 - (c) Remove the packing [21] from the bowl [22].
 - (d) Remove the packing [19] from the element [20].

SUBTASK 29-21-11-020-008

- (2) Do these steps to remove the element [25]:
 - (a) Remove the bowl [29] from the module [18].
 - (b) Remove the element [25] from the module [18].
 - (c) Remove the packing [27], the packing [26] and the packing [28] from the bowl [29].
 - (d) Remove the packing [23] and the packing [24] from the element [25].

G. Pressure Transducer Removal

SUBTASK 29-21-11-020-009

- (1) Disconnect the electrical connector [3] from the transducer [16].

SUBTASK 29-21-11-020-010

- (2) Remove the transducer [16] from the module [18].

SUBTASK 29-21-11-020-011

- (3) Install a cap on the opening on the module [18] to prevent contamination.

SUBTASK 29-21-11-020-012

- (4) Remove the packing [17] from the transducer [16].

H. Solenoid Valve Removal

SUBTASK 29-21-11-020-013

- (1) Remove the screws [41] from the valve [39].

SUBTASK 29-21-11-020-014

- (2) Remove the valve [39] from the module [18].

SUBTASK 29-21-11-020-015

- (3) Remove the plate [36] from the module [18].

SUBTASK 29-21-11-020-016

- (4) Remove the packing [37] from the valve [39].

I. Bypass Fuse Removal

SUBTASK 29-21-11-020-017

- (1) Remove the bolts [35] from the fuse assembly [33].

SUBTASK 29-21-11-020-018

- (2) Remove the fuse assembly [33] from the module [18].

SUBTASK 29-21-11-020-019

- (3) Install a cap on the opening in the module [18] to prevent contamination.

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SUBTASK 29-21-11-020-020

- (4) Remove the ring [30], the ring [32] and the packing [31] from the fuse assembly [33].

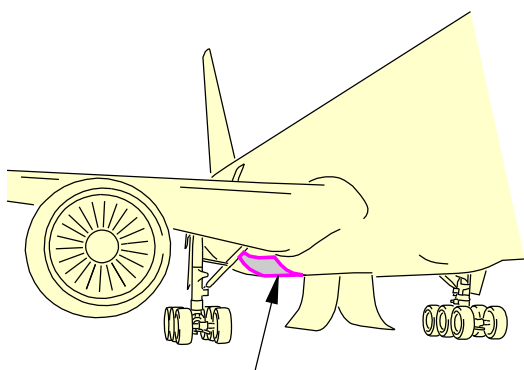
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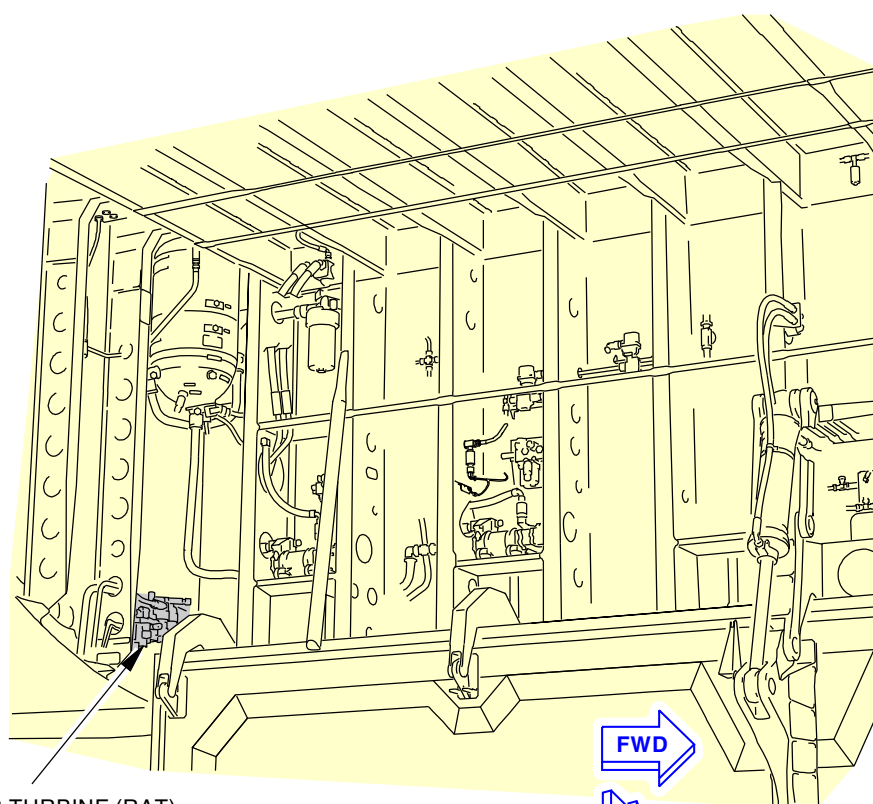
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RIGHT WHEEL WELL

A



RAM AIR TURBINE (RAT)
CHECKOUT MODULE

B

RIGHT WHEEL WELL

A

E10805 S0006416342_V2

**RAT Checkout Module Installation
Figure 401/29-21-11-990-801 (Sheet 1 of 3)**

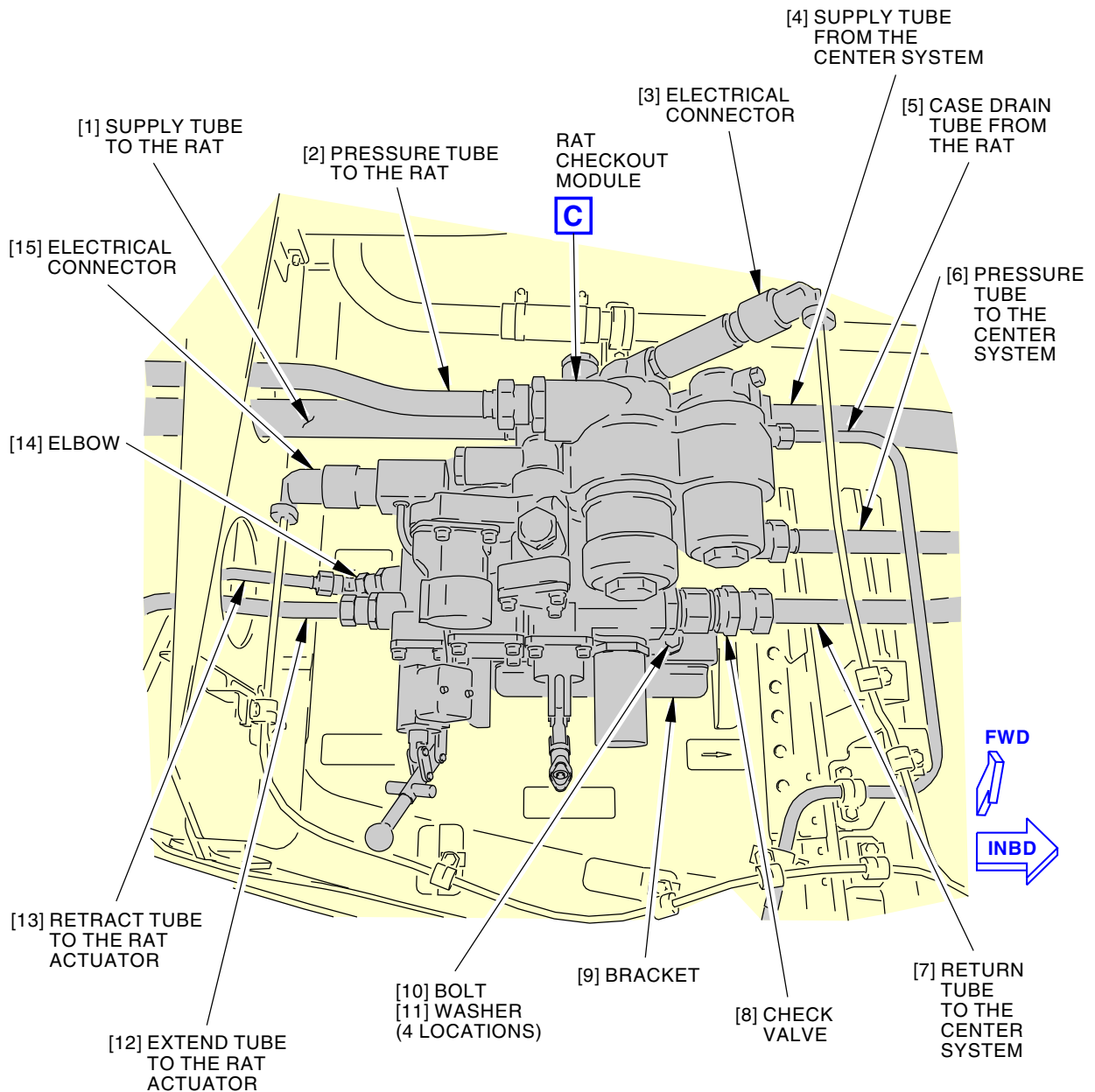
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RAT CHECKOUT MODULE

B

E10815 S0006416343_V2

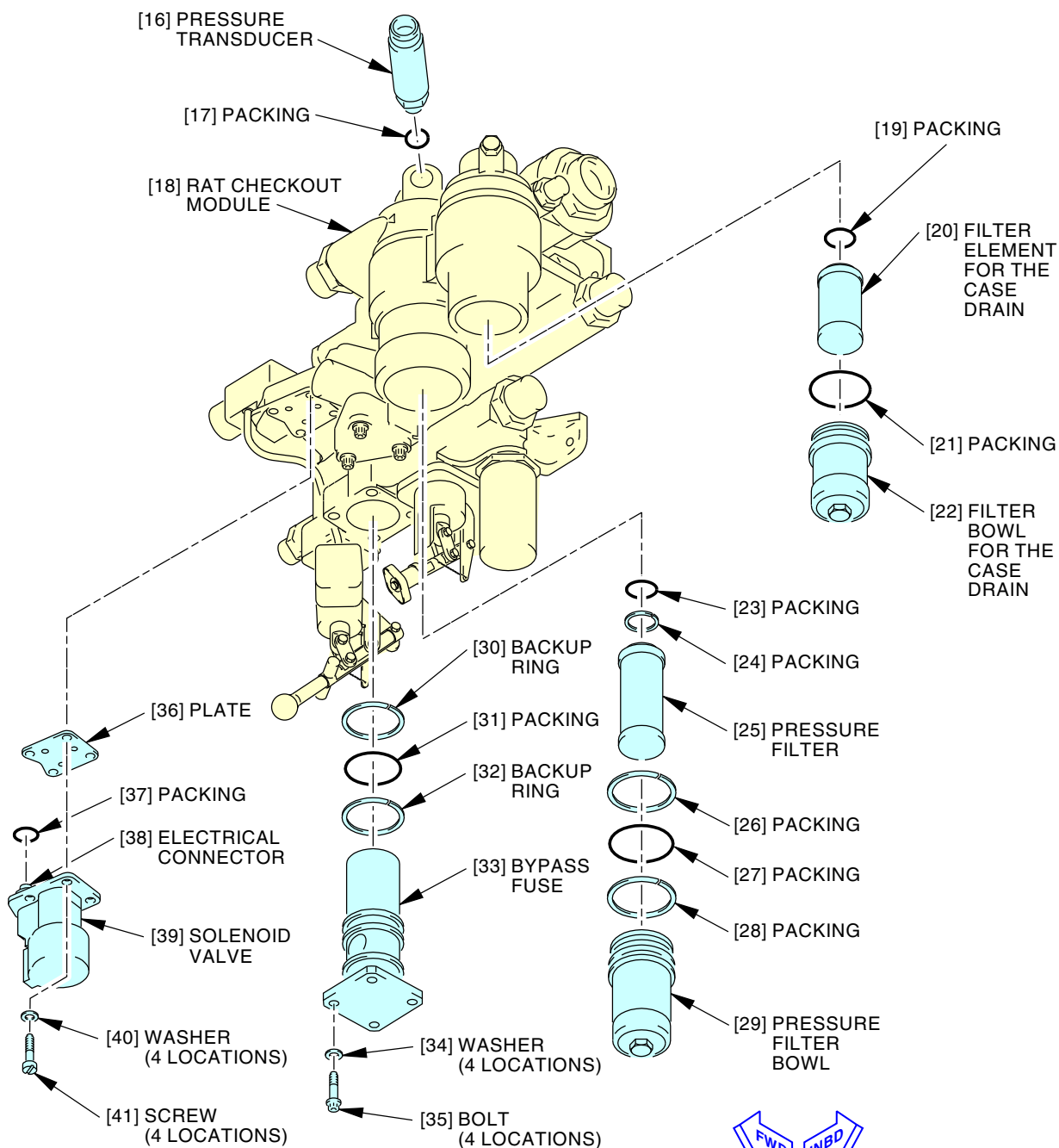
RAT Checkout Module Installation
Figure 401/29-21-11-990-801 (Sheet 2 of 3)

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RAT CHECKOUT MODULE

C

E10817 S0006416344_V2

RAT Checkout Module Installation
Figure 401/29-21-11-990-801 (Sheet 3 of 3)

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TASK 29-21-11-400-801

3. Ram Air Turbine (RAT) Checkout Module and Components Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has the instructions to install these components:
 - (a) Ram air turbine (RAT) checkout Module
 - (b) Filter elements
 - (c) RAT pressure transducer
 - (d) Solenoid valve
 - (e) Bypass fuse
- (2) After you do one or more of the installations, do the installation test. Then do the steps that put the airplane back to its usual condition.

B. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-10-22-120-802	Clean with a Rotary Abrasive Disk (P/B 701)
20-10-22-140-801	Clean Metal Surfaces with a Rotary Bonding Brush (P/B 701)
29-21-00-730-801	Ram Air Turbine (RAT) System - Motoring Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95

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Reference	Description	Specification
A00436	Sealant - Fuel Tank	BMS5-45 (Supersedes BMS5-26)
B00571	Coating - Clear Skydrol Resistant Topcoating	BAC5710 Type 41
C00852	Compound - Antiseize, Molybdenum Disulfide-Petrolatum	MIL-PRF-83483
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D00633	Grease - Aircraft General Purpose	BMS3-33
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
16	Transducer	29-21-11-01-050	ARO ALL
17	Packing	29-21-11-01-055	ARO ALL
18	Module	29-21-11-01-030	ARO ALL
19	Packing	29-21-11-01-075	ARO ALL
20	Element	29-21-11-01-070	ARO ALL
21	Packing	29-21-11-01-065	ARO ALL
22	Bowl	29-21-11-01-060	ARO ALL
23	Packing	29-21-11-01-105	ARO ALL
24	Packing	29-21-11-01-100	ARO ALL
25	Element	29-21-11-01-095	ARO ALL
26	Packing	29-21-11-01-085	ARO ALL
27	Packing	29-21-11-01-090	ARO ALL
28	Packing	29-21-11-01-085	ARO ALL
29	Bowl	29-21-11-01-080	ARO ALL
30	Ring	29-21-11-01-125	ARO ALL
31	Packing	29-21-11-01-130	ARO ALL
32	Ring	29-21-11-01-125	ARO ALL
33	Fuse assembly	29-21-11-01-110	ARO ALL
37	Packing	29-21-11-01-155	ARO ALL
39	Valve	29-21-11-01-145	ARO ALL
		29-21-11-01-147	ARO ALL

F. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

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G. Ram Air Turbine (RAT) Checkout Module Installation

SUBTASK 29-21-11-140-001

- (1) Do one of the tasks which follow, to clean the surfaces of the bracket [9] around each hole for the bolts [10]:
 - (a) Do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-22-120-801.
 - (b) Do this task: Clean Metal Surfaces with a Rotary Bonding Brush, TASK 20-10-22-140-801.
 - (c) Do this task: Clean with a Rotary Abrasive Disk, TASK 20-10-22-120-802.

SUBTASK 29-21-11-370-001

- (2) For the surfaces which you cleaned, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 29-21-11-160-001

- (3) Make sure the mating surface of the module [18] is clean.

SUBTASK 29-21-11-390-001

- (4) Apply a thin layer of sealant, A00247, to the shank and the threads of the bolts [10].

SUBTASK 29-21-11-420-002

- (5) Install the bolts [10] and the washers [11] to attach the module [18] to the bracket [9].

NOTE: Hold the module [18] on the bracket [9] while you install the bolts [10]. The countersink on each washer [11] must be against the head of each bolt [10].

SUBTASK 29-21-11-760-001

- (6) Do a check of the electrical bond between the module [18] and the bracket [9] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the module [18] and the bracket [9] is 0.008 ohms.

SUBTASK 29-21-11-390-002

- (7) Apply a filet of sealant, A00247, to the joint between the module [18] and the bracket [9].

SUBTASK 29-21-11-420-003

- (8) Remove the caps from the ports on the module [18].

SUBTASK 29-21-11-420-004

- (9) Remove the caps from the hydraulic tubes.

SUBTASK 29-21-11-420-005

- (10) Connect these components to the ports of the module [18]:
 - (a) Supply tube [4] from the center system
 - (b) Case drain tube [5] from the RAT
 - (c) Pressure tube [6] to the center system
 - (d) Check valve [8] on the return tube [7] to the center system
 - (e) Supply tube [1] to the RAT
 - (f) Pressure tube [2] to the RAT
 - (g) Elbow [14] on the retract tube [13] to the RAT actuator
 - (h) Extend tube [12] to the RAT actuator.

SUBTASK 29-21-11-420-006

- (11) Remove the caps from the electrical connectors [3] and [15].

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SUBTASK 29-21-11-420-007

- (12) Connect the electrical connectors [3] and [15] to the module [18].

SUBTASK 29-21-11-610-001

- (13) For the reservoir in the applicable hydraulic system, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

H. Filter Elements Installation

SUBTASK 29-21-11-420-008

- (1) Do these steps to install the element [20]:
 - (a) Clean the bowl [22] for the case drain.
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [19], the new packing [21] and to the threads on the bowl [22].
 - (c) Install the new packing [19] on the element [20].
 - (d) Install the new packing [21] on the bowl [22].
 - (e) Put the element [20] in the bowl [22].
 - (f) Install the element [20] and the bowl [22] on the module [18].
 - (g) Tighten the bowl [22] to 145-155 pound-inches.
 - (h) Safety the bowl [22] with a lockwire.

SUBTASK 29-21-11-420-009

- (2) Do these steps to install the element [25]:
 - (a) Clean the bowl [29].
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [23], the new packing [27], the packing [24], the packing [26], the packing [28] and to the threads on the bowl [29].
 - (c) Install the new packing [23] and the new packing [24] on the element [25].
 - (d) Install the new packing [27], the packing [26] and the packing [28] on the bowl [29].
 - (e) Put the element [25] in the bowl [29].
 - (f) Install the element [25] and the bowl [29] on the module [18].
 - (g) Tighten the bowl [29] to 145-155 pound-inches.
 - (h) Safety the bowl [29] with a lockwire.

I. Pressure Transducer Installation

SUBTASK 29-21-11-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [17] and to the threads on the transducer [16].

SUBTASK 29-21-11-420-010

- (2) Install the new packing [17] on the transducer [16].

SUBTASK 29-21-11-420-011

- (3) Remove the cap from the port on the module [18].

SUBTASK 29-21-11-420-012

- (4) Install the transducer [16] on the module [18].

SUBTASK 29-21-11-420-013

- (5) Tighten the transducer [16] to 162-178 pound-inches.

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SUBTASK 29-21-11-420-014

- (6) Safety the transducer [16] with a lockwire.

SUBTASK 29-21-11-420-015

- (7) Connect the electrical connector [3] to the transducer [16].

J. Solenoid Valve Installation

SUBTASK 29-21-11-640-002

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [37].

SUBTASK 29-21-11-420-016

- (2) Install the packing [37] on the valve [39].

SUBTASK 29-21-11-640-003

- (3) Apply a layer of grease, D00633, to the threads of the screws [41].

SUBTASK 29-21-11-420-017

- (4) Install the plate [36] on the valve [39].

SUBTASK 29-21-11-420-018

- (5) Put the valve [39] on the module [18] to engage the electrical connector [38] with the electrical connector in the module [18].

SUBTASK 29-21-11-420-020

- (6) Install the screws [41] and the washers [40] to attach the valve [39] to the module [18].

NOTE: Hold the valve [39] on the module [18].

SUBTASK 29-21-11-420-021

- (7) Tighten the screws [41] to 110-122 pound-inches more than the run-on torque.

NOTE: The run-on torque is the force necessary to turn a screw because of the self-locking property of the screw.

SUBTASK 29-21-11-420-022

- (8) Safety the screws [41] with a lockwire.

SUBTASK 29-21-11-390-003

- (9) Seal the external edges of the joints between the valve [39], the washers [40], and the screws [41] with sealant, A00436.

SUBTASK 29-21-11-370-002

- (10) After the sealant cures to a tack-free condition, apply coating, B00571, to the sealant.

K. Bypass Fuse Installation

SUBTASK 29-21-11-420-023

- (1) Remove the cap from the opening in the module [18].

SUBTASK 29-21-11-160-002

- (2) Remove all remaining sealant from the mating surface of the module [18].

SUBTASK 29-21-11-640-004

- (3) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [31], the ring [30] and the ring [32].

SUBTASK 29-21-11-420-024

- (4) Install the new packing [31], the ring [30] and the ring [32] on the fuse assembly [33].

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SUBTASK 29-21-11-640-005

- (5) Apply compound, C00852, to the threads of the bolts [35].

SUBTASK 29-21-11-420-026

- (6) Install the washers [34] and the bolts [35] to attach the fuse assembly [33] to the module [18].

NOTE: Hold the fuse assembly [33] on the module [18].

SUBTASK 29-21-11-420-027

- (7) Tighten the bolts [35] to 134-149 pound-inches more than the run-on torque.

NOTE: The run-on torque is the force necessary to turn a bolt because of the self-locking property of the bolt.

SUBTASK 29-21-11-420-028

- (8) Safety the bolts [35] with a lockwire.

SUBTASK 29-21-11-390-004

- (9) Seal the external edges of the joints between the module [18] and the fuse assembly [33] with sealant, A00436.

SUBTASK 29-21-11-390-005

- (10) Seal the external edges of the joints between fuse assembly [33], the washers [34], and the bolts [35] with sealant, A00436.

SUBTASK 29-21-11-370-003

- (11) After the sealant cures to a tack-free condition, apply coating, B00571, to the sealant.

L. Ram Air Turbine (RAT) Checkout Module and Components Installation Test

SUBTASK 29-21-11-860-004

- (1) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM CL card, to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-21-11-860-005

- (2) Remove the safety tag and 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 29-21-11-710-002

- (3) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

SUBTASK 29-21-11-790-001

- (4) Make sure there is no leakage of hydraulic fluid at the hydraulic tube connections or at the components on the checkout module.

M. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-11-110-001



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

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SUBTASK 29-21-11-410-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

———— **END OF TASK** ————

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RAM AIR TURBINE (RAT) CHECKOUT MODULE AND COMPONENTS - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has one task. This task is an inspection/check of the case drain filter in the checkout module for the ram air turbine (RAT).

TASK 29-21-11-200-801

2. Case Drain Filter Inspection/Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-21-00-730-801	Ram Air Turbine (RAT) System - Motoring Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	RAT checkout module	Not Specified	
2	O-ring	Not Specified	
3	Filter element	Not Specified	
4	O-ring	Not Specified	
5	Filter bowl	Not Specified	

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

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E. Prepare for the Inspection/Check

SUBTASK 29-21-11-480-002



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-21-11-010-002



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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

SUBTASK 29-21-11-860-006

- (3) For the center hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-21-11-020-021

- (4) Do these steps to remove the case drain filter element [3]:
 - (a) Remove the filter bowl [5] for the case drain from the RAT checkout module [1].
 - (b) Remove the filter element [3] for the case drain from the RAT checkout module [1].
 - (c) Remove and discard the o-ring [4] from the filter bowl [5].
 - (d) Remove and discard the o-ring [2] from the filter element [3].

F. Examine the Case Drain Filter

SUBTASK 29-21-11-210-001

- (1) Examine the filter element [3] to make sure that it is not clogged and that it does not have damage.
 - (a) If the filter element [3] is not serviceable, discard the filter element [3].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-11-420-029

- (1) Do these steps to install a new or a serviceable case drain filter element [3]:
 - (a) Clean the filter bowl [5] for the case drain.
 - (b) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new o-ring [2] and [4] and to the threads on the filter bowl [5].
 - (c) Install the new o-ring [2] on the filter element [3].
 - (d) Install the new o-ring [4] on the filter bowl [5].
 - (e) Put the filter element [3] in the filter bowl [5].
 - (f) Install the filter element [3] and the filter bowl [5] on the RAT checkout module [1].
 - (g) Tighten the filter bowl [5] to 145-155 pound-inches.
 - (h) Safety the filter bowl [5] with a lockwire.

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SUBTASK 29-21-11-710-003

- (2) Do this task: Ram Air Turbine (RAT) System - Motoring Test, TASK 29-21-00-730-801.

SUBTASK 29-21-11-790-002

- (3) Make sure there is no leakage of hydraulic fluid at the case drain filter bowl [5] on the RAT checkout module [1].

SUBTASK 29-21-11-110-002



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (4) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-21-11-410-002



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

———— **END OF TASK** ————

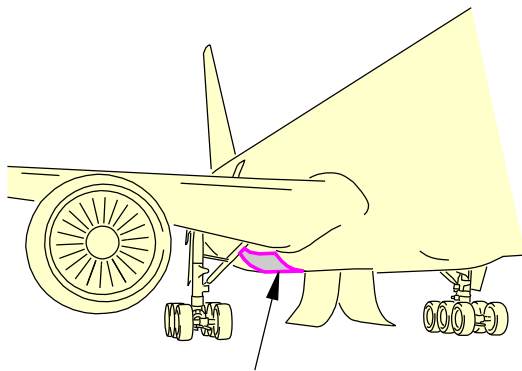
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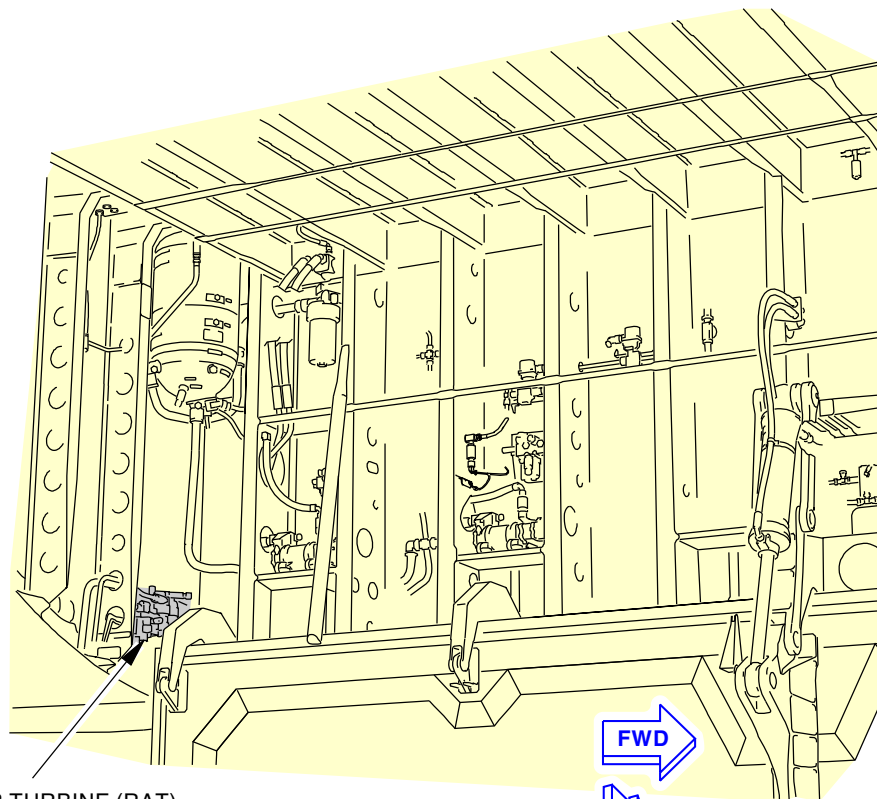
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RIGHT WHEEL WELL

A



RAM AIR TURBINE (RAT)
CHECKOUT MODULE

B

RIGHT WHEEL WELL

A

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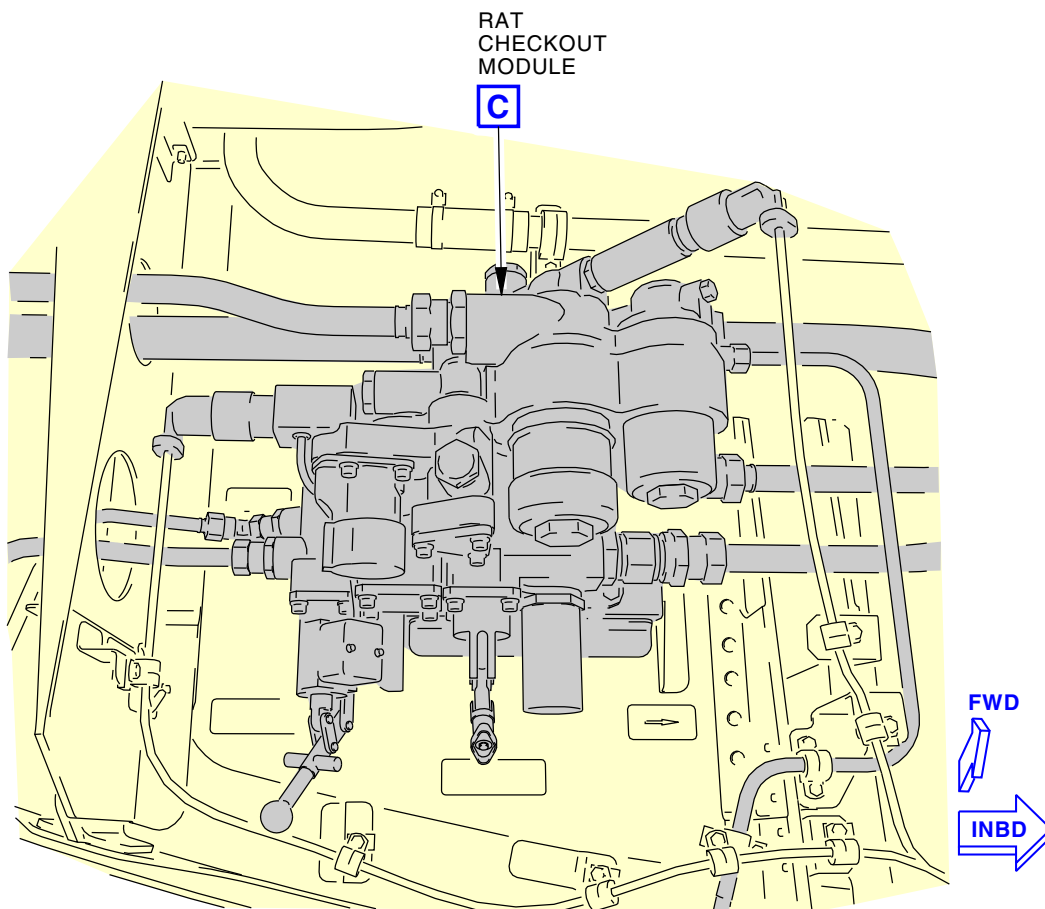
RAT Checkout Module Inspection
Figure 601/29-21-11-990-802 (Sheet 1 of 3)

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RAT CHECKOUT MODULE

B

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**RAT Checkout Module Inspection
Figure 601/29-21-11-990-802 (Sheet 2 of 3)**

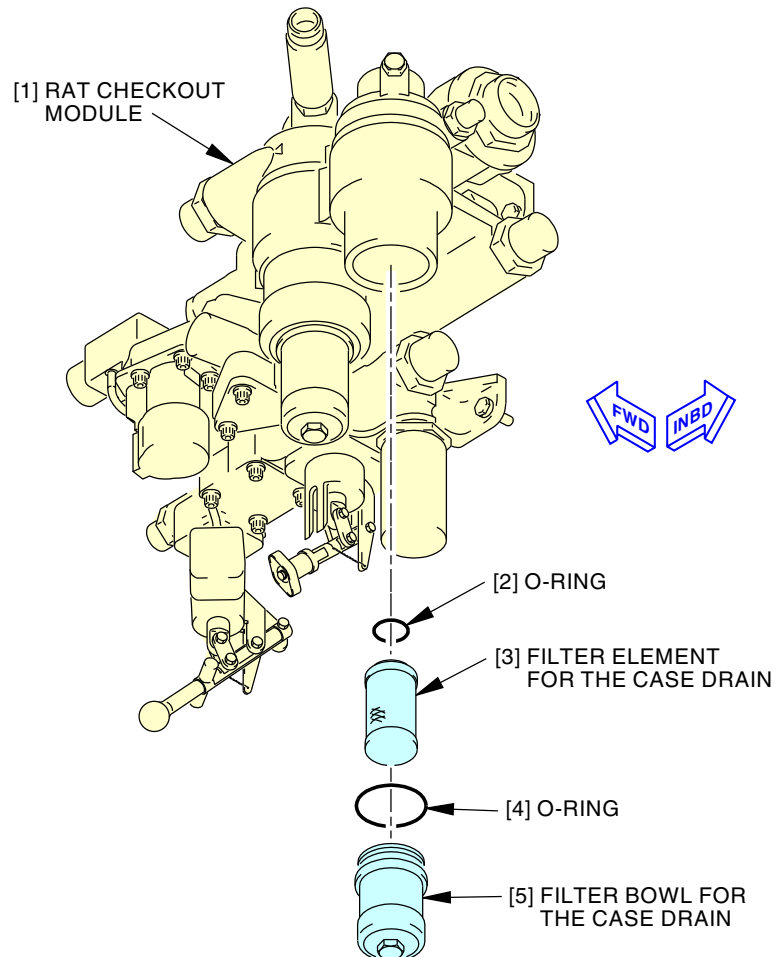
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RAT CHECKOUT MODULE

C

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RAT Checkout Module Inspection
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RAM AIR TURBINE (RAT) STOWED SWITCH - MAINTENANCE PRACTICES

1. General

- A. This procedure has the tasks which follow:
- (1) Ram Air Turbine (RAT) Stowed Switch Removal
 - (2) Ram Air Turbine (RAT) Stowed Switch Installation
 - (3) Ram Air Turbine (RAT) Stowed Switch Adjustment.

TASK 29-21-17-000-801

2. Ram Air Turbine (RAT) Stowed Switch Removal

(Figure 201)

A. **References**

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)

B. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

C. **Procedure**

SUBTASK 29-21-17-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-17-860-002

- (2) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM card CL to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-21-17-020-001

- (3) Cut the wires for the RAT stowed switch [3] (referred to as the switch in this procedure) near the switch [3].

SUBTASK 29-21-17-020-002

- (4) Remove the nut [8] from the switch [3].

SUBTASK 29-21-17-020-003

- (5) Remove the switch [3] from the bracket [6].

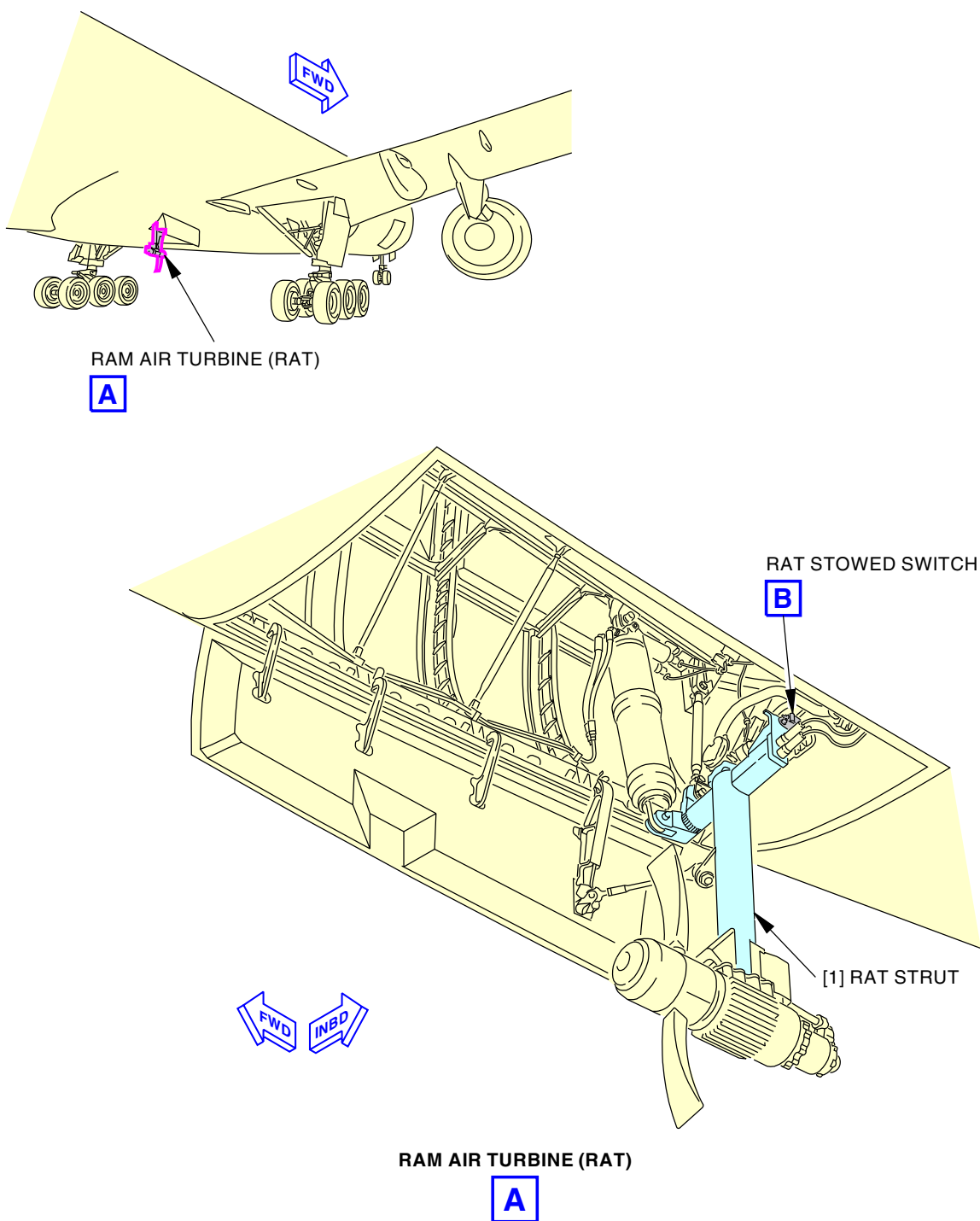
———— **END OF TASK** ————

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**Ram Air Turbine (RAT) Stowed Switch Installation
Figure 201/29-21-17-990-801 (Sheet 1 of 3)**

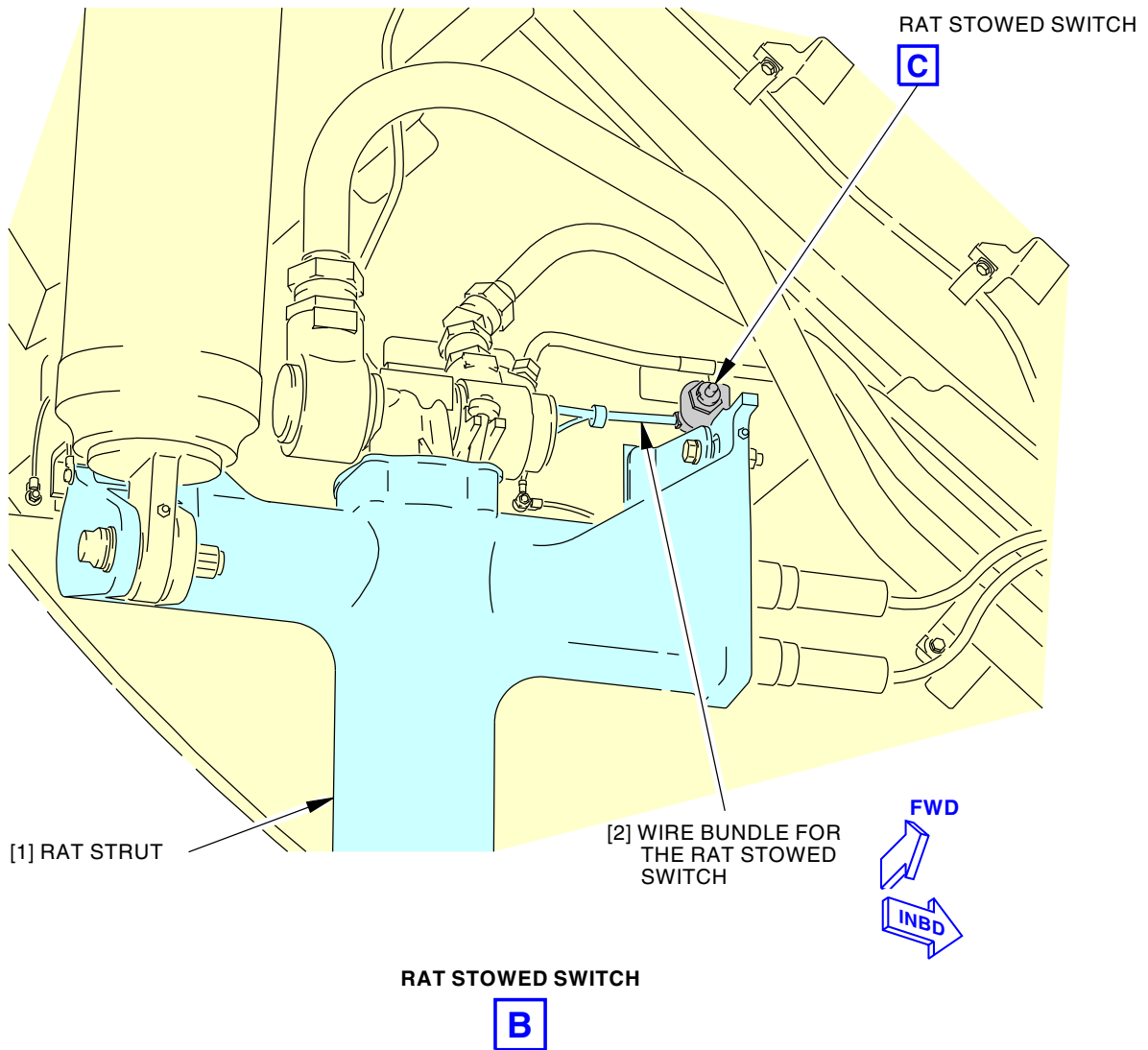
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Ram Air Turbine (RAT) Stowed Switch Installation
Figure 201/29-21-17-990-801 (Sheet 2 of 3)

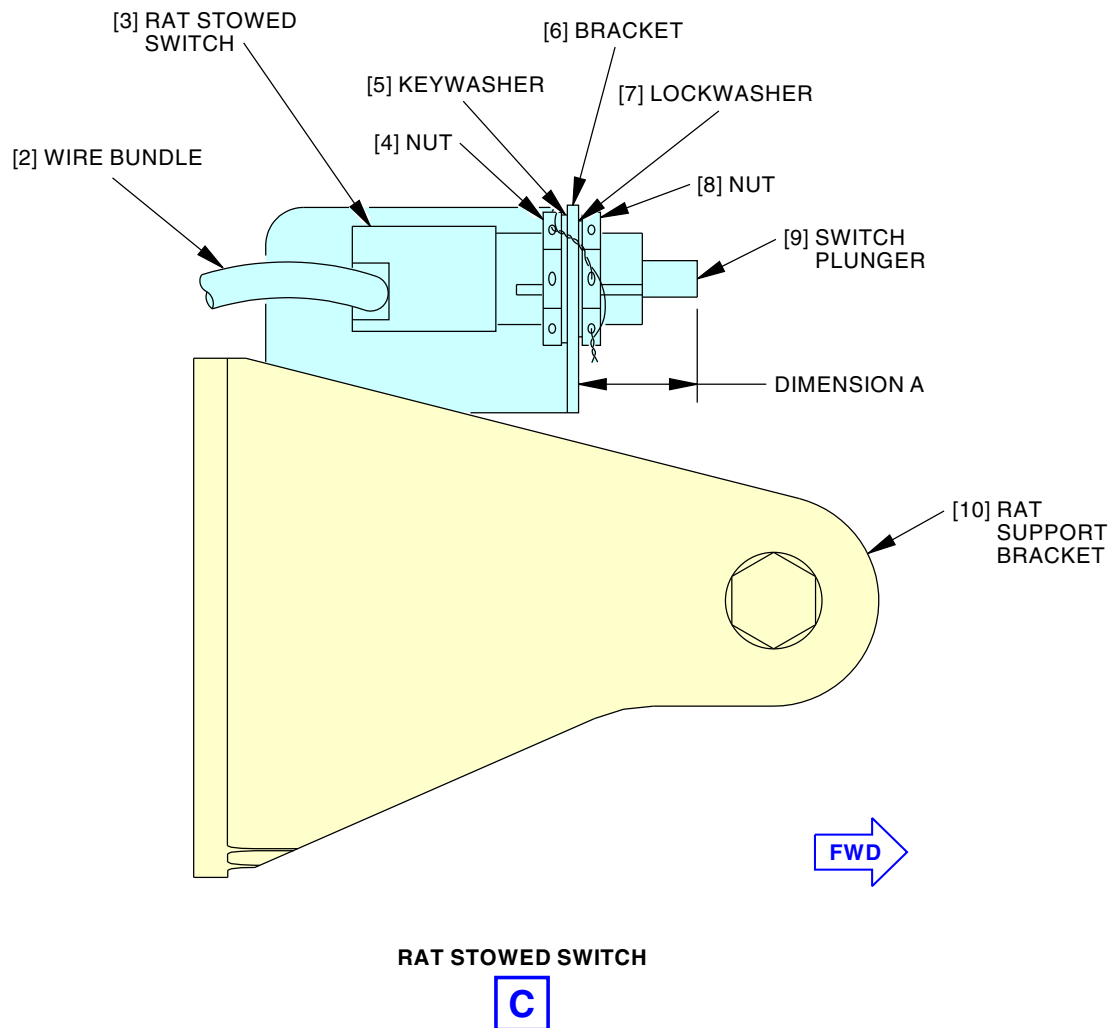
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Ram Air Turbine (RAT) Stowed Switch Installation
Figure 201/29-21-17-990-801 (Sheet 3 of 3)

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TASK 29-21-17-400-801

3. Ram Air Turbine (RAT) Stowed Switch Installation

(Figure 201)

A. References

Reference	Title
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)

B. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

C. Procedure

SUBTASK 29-21-17-420-001

- (1) Install the nut [4] and the key washer [5] on the ram air turbine (RAT) stowed switch [3] (referred to as the switch in this procedure).

SUBTASK 29-21-17-420-002

- (2) Hold the switch [3] in the bracket [6].

NOTE: Make sure the tab on the key washer [5] engages the hole in the bracket [6].

SUBTASK 29-21-17-420-003

- (3) Install the lockwasher [7] and the nut [8] on the switch [3].
 - (a) Tighten the nut [8] by hand.

SUBTASK 29-21-17-420-004

- (4) Connect the wires from the switch [3] to the wires in the wire bundle [2] with a splice.

SUBTASK 29-21-17-860-003

- (5) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM card CL to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-21-17-820-001

- (6) Do this task: Ram Air Turbine (RAT) Stowed Switch Adjustment, TASK 29-21-17-820-801.

NOTE: This task follows in this procedure.

SUBTASK 29-21-17-860-004

- (7) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

————— **END OF TASK** —————

TASK 29-21-17-820-801

4. Ram Air Turbine (RAT) Stowed Switch Adjustment

(Figure 201)

A. References

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (P/B 201)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)

B. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

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C. Procedure

SUBTASK 29-21-17-860-005

- (1) If the RAT is not in the extended position, do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-17-020-004

- (2) Loosen the nut [8] on the ram air turbine (RAT) stowed switch [3] (referred to as the switch in this procedure).

SUBTASK 29-21-17-820-002

- (3) Turn the nut [4] on the switch [3] to set the dimension A to 0.79-0.83 inches, View A-A (Figure 201).

SUBTASK 29-21-17-420-005

- (4) Tighten the nut [8] to 100-150 pound-inches.

NOTE: Make sure the tab on the key washer [5] engages the hole in the bracket [6] before you tighten the nut [8].

SUBTASK 29-21-17-420-006

- (5) Safety the nuts [4] and [8] with a lockwire.

SUBTASK 29-21-17-860-006

- (6) 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) BLADE INDEX PIN SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the Ram Air Turbine (RAT) Blade Index Pin Switch.
- (2) An installation of the Ram Air Turbine (RAT) Blade Index Pin Switch.

TASK 29-21-18-000-801

2. Ram Air Turbine (RAT) Blade Index Pin Switch Removal

Blade Index Pin Switch Installation/Figure 401

A. References

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (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-1680	Protractor - Assembly, Control Column Part #: 4MIT65B80307-1 Supplier: 81205 Part #: A27021-29 Supplier: 81205 Part #: G76002-19 Supplier: 81205

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Procedure

SUBTASK 29-21-18-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-18-480-001

- (2) Temporarily attach the control column assembly protractor, SPL-1680 to the aft side of the strut [2].

NOTE: You can attach the protractor to the strut [2] with tape or plastic wire-tie straps.

SUBTASK 29-21-18-820-001

- (3) Set the control column assembly protractor, SPL-1680 to the zero position.

SUBTASK 29-21-18-030-001

- (4) Do these steps to disconnect the door actuation link [3] from the RAT strut [2] (Figure 401):
 - (a) Remove the nut [10] and washer [11] from the pin [12] on the door actuation link [3].
 - (b) Remove the door actuation link [3] from the strut [2].
 - (c) Hold the door actuation link [3] to the RAT compartment door with tape or string, to keep it away from the path of the strut [2].

SUBTASK 29-21-18-030-002

- (5) Disconnect the RAT actuator [1] from the strut [2].
 - (a) Remove the nut [7] and washer [6] from the bolt [9].

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- (b) Remove the bolt [9], washer [4], bushing [8], and washer [5].

SUBTASK 29-21-18-030-003

- (6) Disconnect the electrical connector [13], DM29008A, from the strut [2].

SUBTASK 29-21-18-020-001

- (7) Remove the switch box cover [15].
- (a) Remove the screws [16] and washers [17] from the switch box cover [15].
- (b) Remove the switch box cover [15].

SUBTASK 29-21-18-020-002

- (8) Remove the screws [22], washers [23], washers [24] and nuts [25] that connect the bracket [26] to the strut [2].

SUBTASK 29-21-18-020-003

- (9) Do these steps to remove the switch [18] from the bracket [26].



CAUTION

DO NOT LET THE SCREWS TURN WHEN YOU TURN THE NUTS. IF THE SCREWS PUSH THE SWITCH AGAINST THE PLATE, YOU CAN CAUSE DAMAGE TO THE SWITCH.

- (a) Hold the screws [28]. Remove the nuts [31] and washers [30] from the screws [28].
- (b) Remove the screws [28] from the threaded plate [27].
- (c) Remove the washers [29], actuator [19], and threaded plate [27].
- (d) Break the adhesive bond between the switch [18] and the bracket [26]. Remove adhesive residue with a sharp blade or a fine file.

SUBTASK 29-21-18-930-001

- (10) Mark the leads [32] from the switch [18] as NC and C (normally closed and closed).

SUBTASK 29-21-18-020-004

- (11) Cut the leads [32] at the switch body.

SUBTASK 29-21-18-020-005

- (12) Remove the switch [18].

————— END OF TASK —————

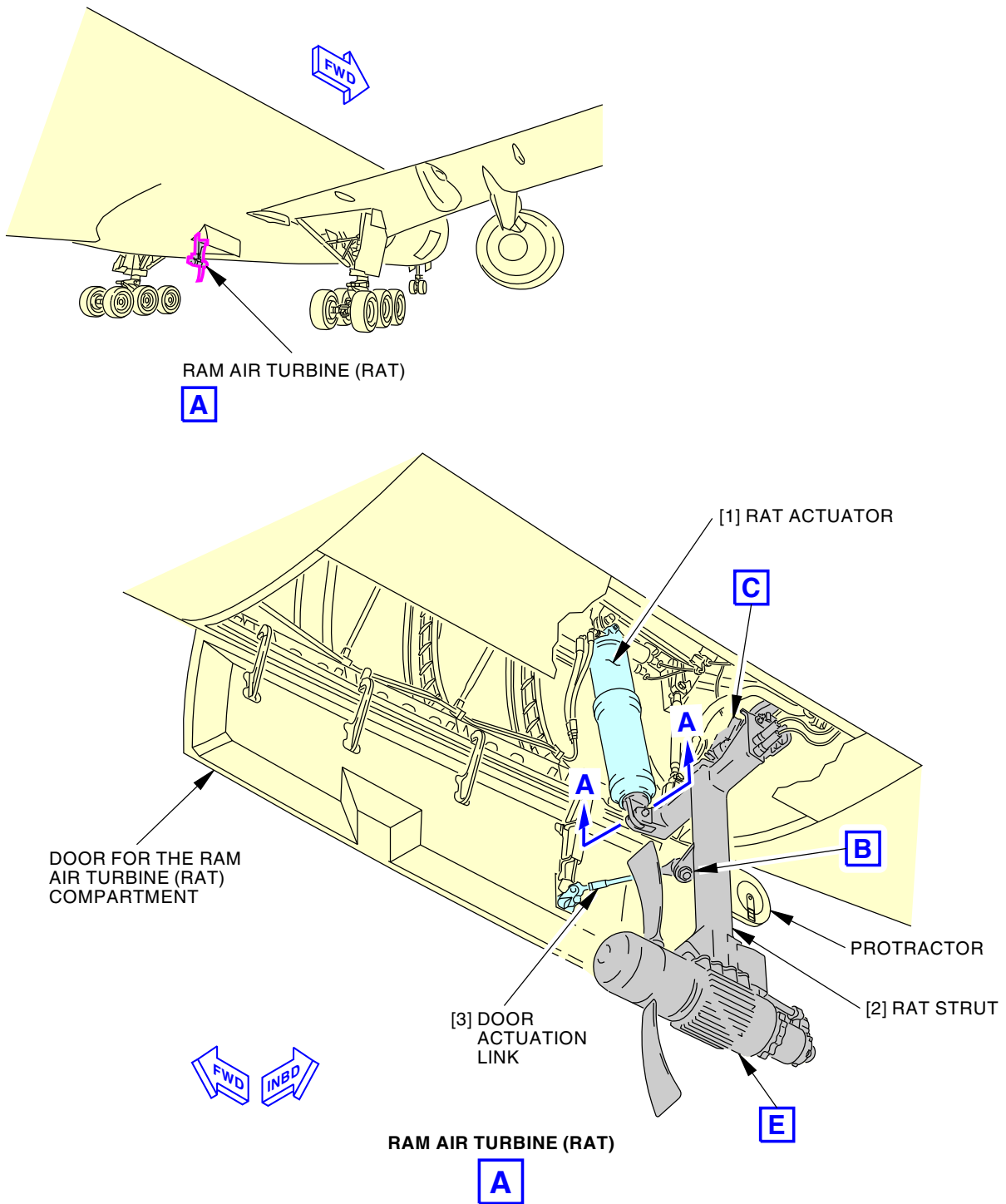
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Blade Index Pin Switch Installation
Figure 401/29-21-18-990-801 (Sheet 1 of 7)

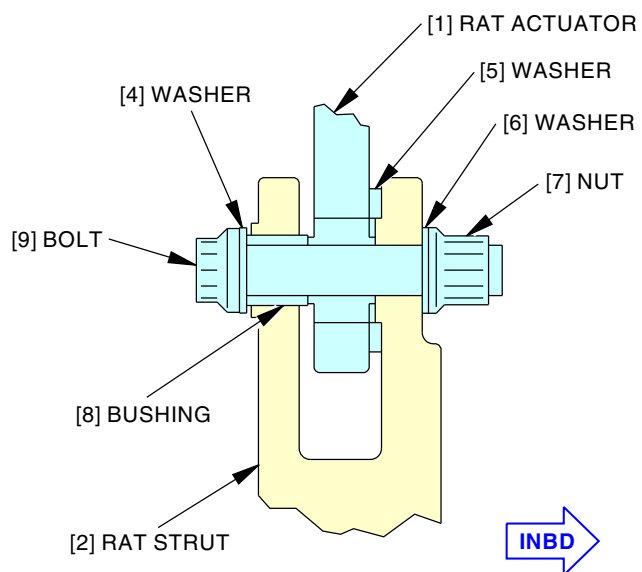
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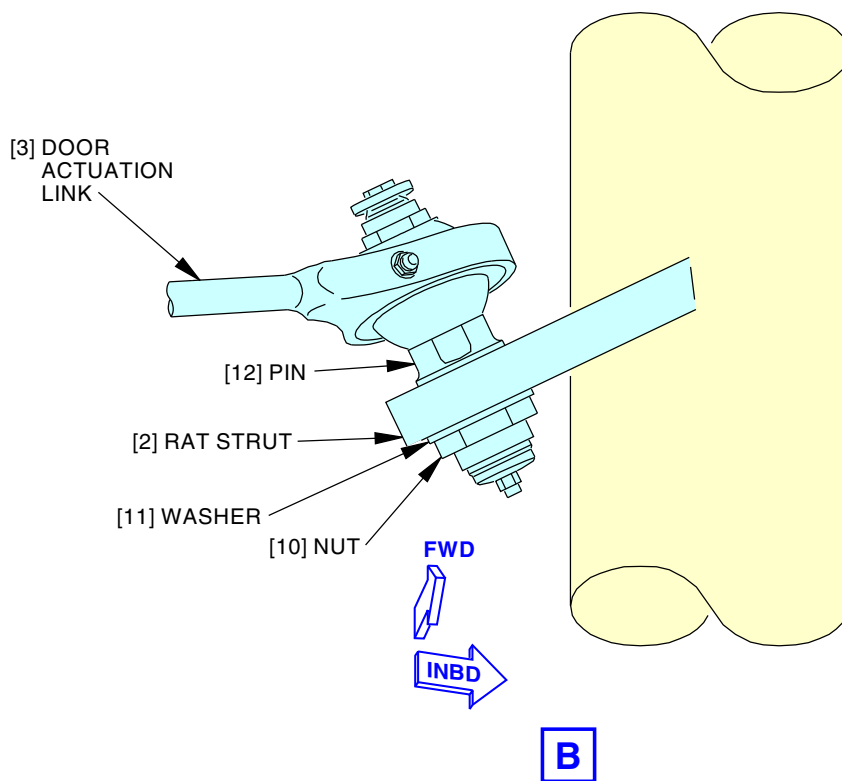
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A-A



1353292 S0000242086_V2

Blade Index Pin Switch Installation
Figure 401/29-21-18-990-801 (Sheet 2 of 7)

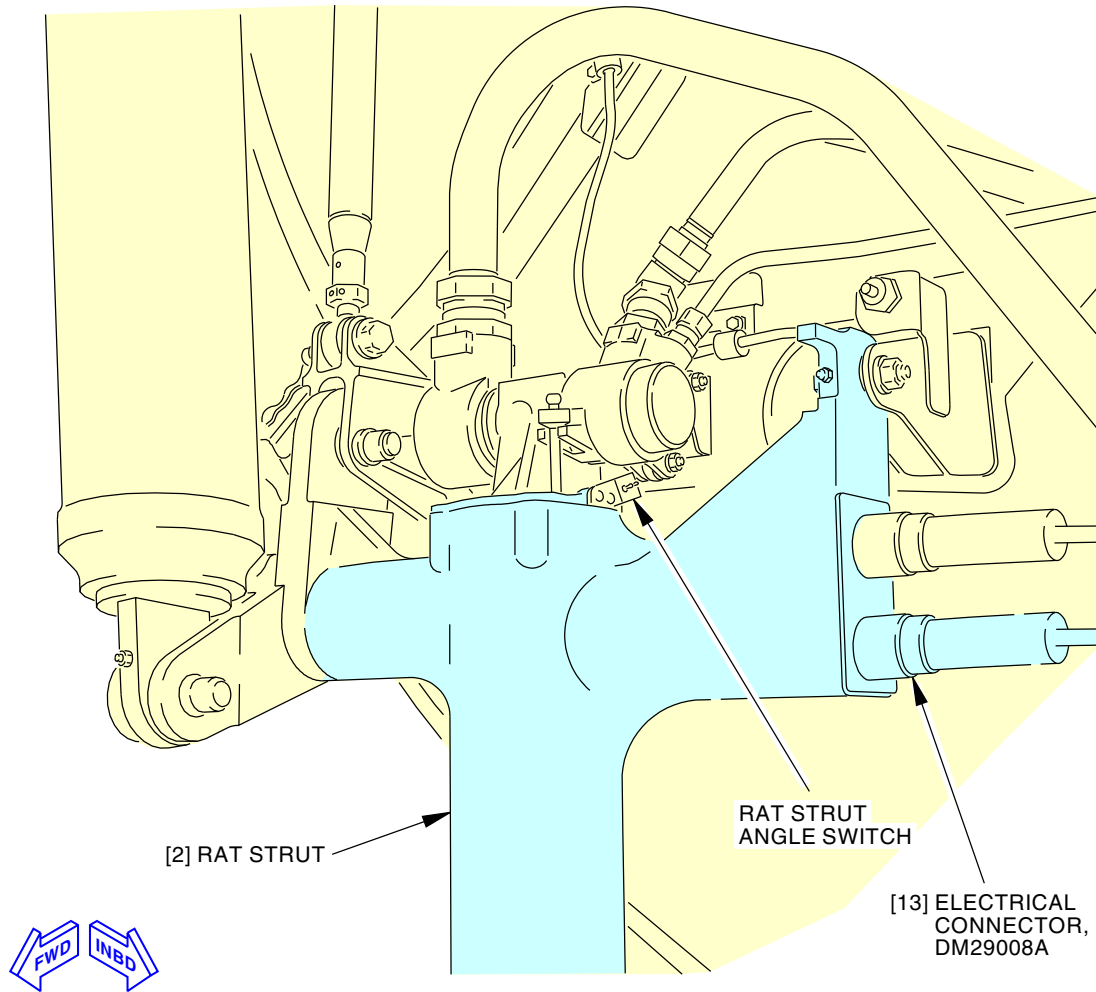
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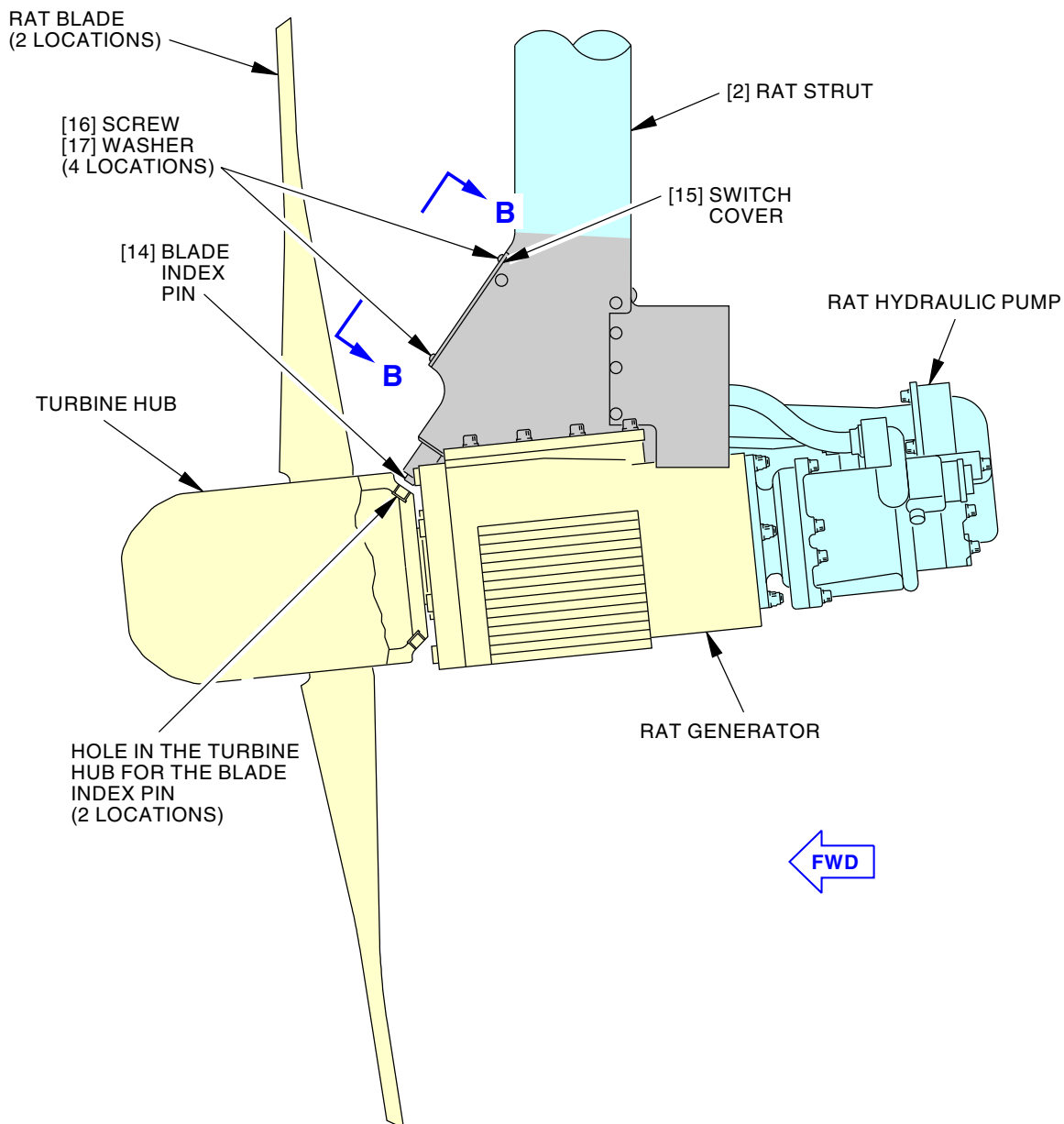
Blade Index Pin Switch Installation
Figure 401/29-21-18-990-801 (Sheet 3 of 7)

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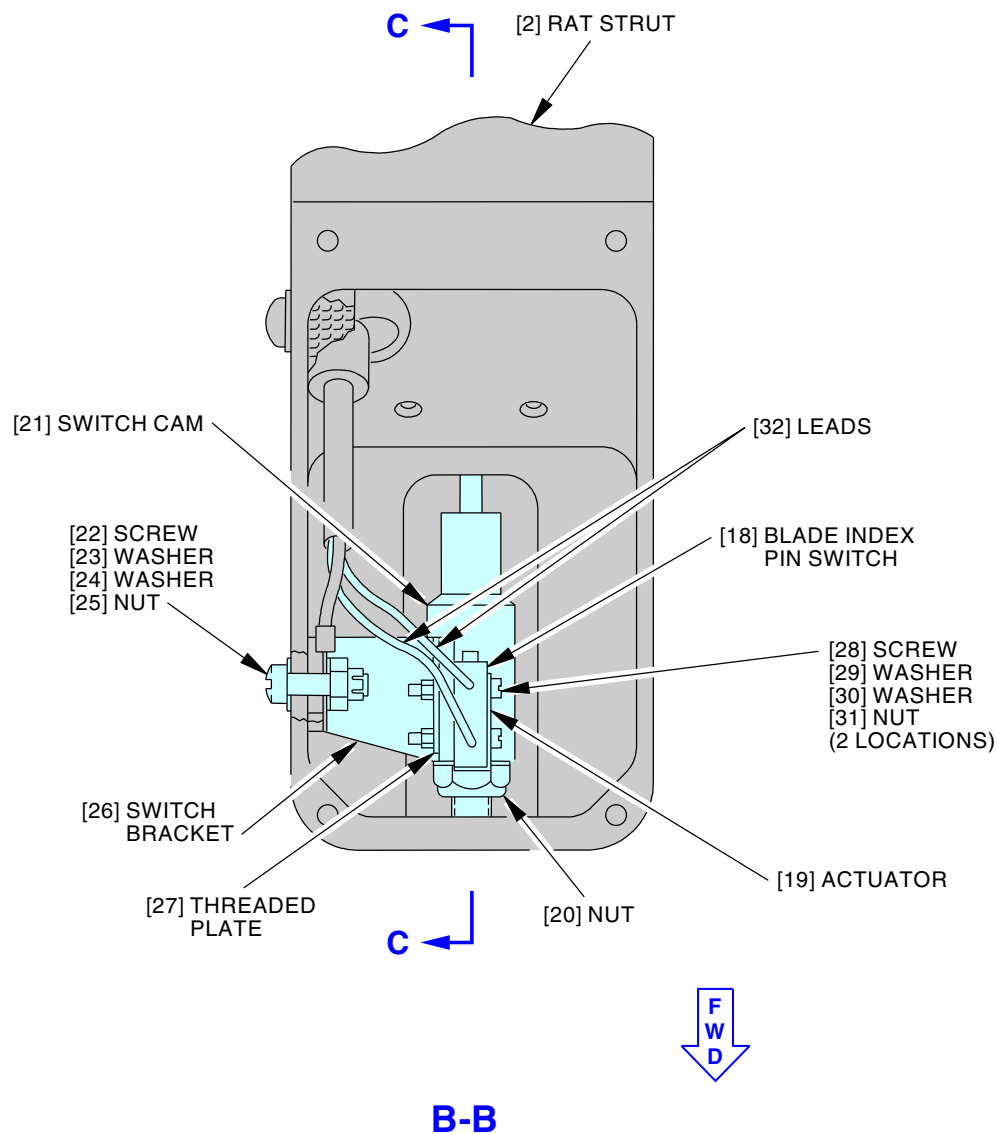
**Blade Index Pin Switch Installation
Figure 401/29-21-18-990-801 (Sheet 4 of 7)**

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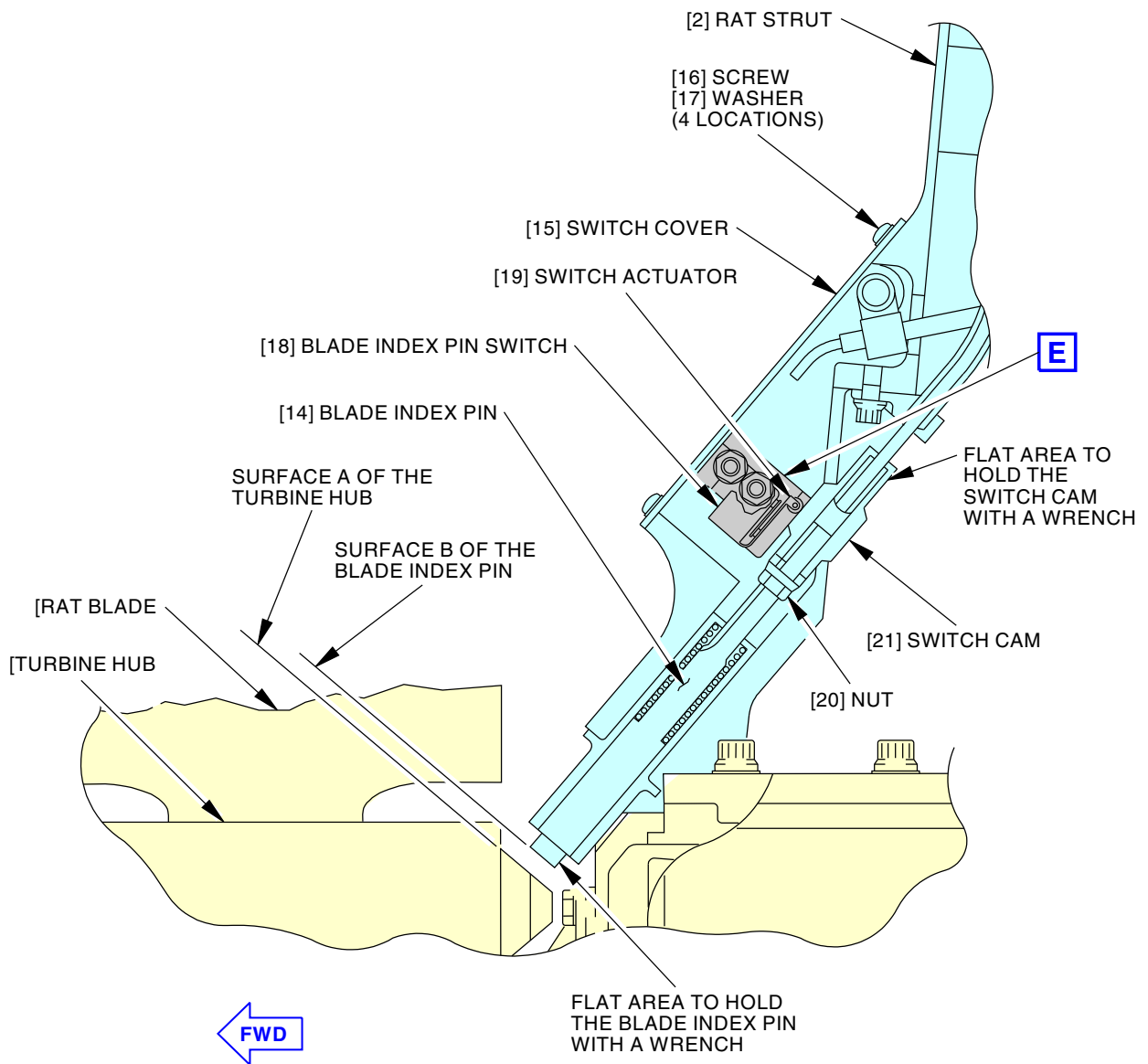
**Blade Index Pin Switch Installation
Figure 401/29-21-18-990-801 (Sheet 5 of 7)**

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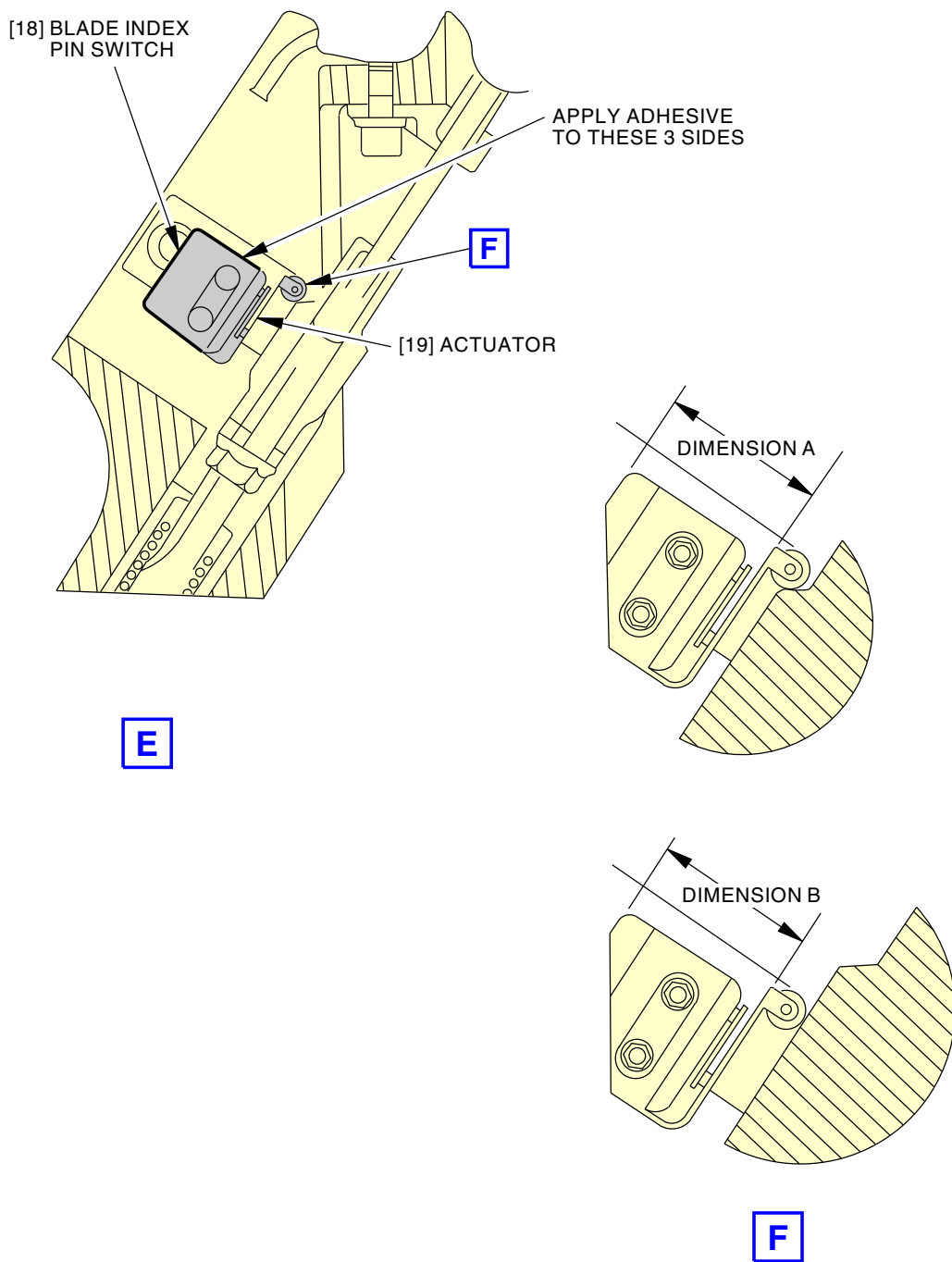
**Blade Index Pin Switch Installation
Figure 401/29-21-18-990-801 (Sheet 6 of 7)**

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1353780 S0000242091_V2

Blade Index Pin Switch Installation
Figure 401/29-21-18-990-801 (Sheet 7 of 7)

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TASK 29-21-18-400-801

3. Ram Air Turbine (RAT) Blade Index Pin Switch Installation

Figure 401

A. References

Reference	Title
29-21-00-730-802	Ram Air Turbine (RAT) Manual Deployment System - System Test (P/B 501)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)
SWPM 20-10-14	Installation of Shrinkable Sleeves
SWPM 20-30-12	Assembly of Splices

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-1680	Protractor - Assembly, Control Column Part #: 4MIT65B80307-1 Supplier: 81205 Part #: A27021-29 Supplier: 81205 Part #: G76002-19 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
A00253	Adhesive - Room Temperature Curing Two Part Epoxy	BMS5-109 Type II Class 2
A50051	Sealant - P/S 890 Class B Fuel Tank Sealant	SAE AMS-S-8802 Class B
A50152	Adhesive - Epoxy/Polyamide Two-Part Paste (Tyco Electronics - Raychem S1125)	
C00852	Compound - Antiseize, Molybdenum Disulfide-Petrolatum	MIL-PRF-83483
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Install the Blade Index Pin Switch

SUBTASK 29-21-18-840-001

(1) Prepare the wires.

- Cut the leads [32] at different locations so that the splice connections are not in the same area (Figure 401).
- Strip approximately 0.25 in. (0.64 cm) of insulation from the ends of the leads [32].
- Cut the leads of the new switch [18] so that there will be a maximum of 1.0 in. (2.5 cm) of excess wire when spliced. Cut the leads of the switch at different locations to match the leads [32].

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- (d) Strip approximately 0.25 in. (0.64 cm) of insulation from the leads from the NC and C poles of the new switch [18].

NOTE: The NO switch lead will be cut off at the switch body and sealed after the switch is spliced.

SUBTASK 29-21-18-902-001

- (2) Splice the wires.
 - (a) Install new heat-shrinkable sleeving over the wire leads.
 - (b) Install the M83519/1-1 or BACS13CT1N solder sleeves on each of the leads [32].
 - 1) Make sure the NC lead from the new switch is connected to the NC lead [32], and the C lead from the new switch is connected to the C lead [32].
 - 2) Make sure that the bare wire ends on the leads are engaged in the solder ring of the solder sleeves.
 - (c) Use a heat gun to splice the leads [32] with the leads from the new switch (SWPM 20-30-12).
 - (d) Apply adhesive paste, A50152 to the areas of the leads where the sleeving will end.
 - (e) Move the sleeving over the splice and shrink the sleeving (SWPM 20-10-14).

SUBTASK 29-21-18-901-001

- (3) Cut the NO lead at the body of the new switch [18].

SUBTASK 29-21-18-390-001

- (4) Apply P/S 890 Class B sealant, A50051 on and around the exposed wire to seal it. Allow the sealant to cure.

SUBTASK 29-21-18-420-001

- (5) Attach the actuator [19] and bracket [26] to the switch.
 - (a) Install the screws [28] and washers [29] into the actuator [19], switch [18], and threaded plate [27] finger tight. Do not torque the screws [28].
 - (b) Hold the screws [28] and install the washers [30] and nuts [31] finger tight. Do not torque the nuts [31].

SUBTASK 29-21-18-420-002

- (6) Install the bracket [26].
 - (a) Apply compound, C00852 on the threads of the screws [22].
 - (b) Install the screws [22], washers [23], washers [24], and nuts [25] finger tight.

F. Adjust the switch.

SUBTASK 29-21-18-710-001

- (1) Do these steps to do a check that the adjustment of the blade index pin [14] is correct.



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONNEL CAN OCCUR.

- (a) Do this step to make sure the blade index pin [14] does not align with one of the two holes in the turbine hub:



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- 1) Manually turn the turbine hub until the hole in the turbine hub is approximately 3 degrees (or 1 inch) from the blade index pin [14].

NOTE: You can use the arrows on each side of the turbine hub and the generator to help you do this step.



WARNING

DO NOT TOUCH THE RAT GENERATOR IF IT IS HOT. THE HOT SURFACE OF THE GENERATOR CAN BURN YOU.

- (b) Push on the hydraulic pump to manually move the strut [2] forward until the surface B of the blade index pin [14] touches the surface A of the turbine hub:

NOTE: The strut [2] is in the correct position when the blade index pin [14] lightly touches the surface of the turbine hub. In this position, the blade index pin [14] will make a clicking noise when it moves across the hole in the turbine hub, while you turn the turbine hub.

- (c) Make a record of the angle which shows on the protractor when the surface B of the blade index pin [14] touches the surface A of the turbine hub.

NOTE: The adjustment of the blade index pin [14] is correct if this angle is 8-10 degrees.

- (d) Manually move the strut [2] back to the extended position.

SUBTASK 29-21-18-820-002

- (2) If the angle shown on the control column assembly protractor, SPL-1680 was not 8-10 degrees, do these steps to adjust the blade index pin [14]:

- (a) Hold the switch cam [21] with a wrench while you loosen the nut [20].
- (b) To extend or retract the blade index pin [14], turn it with a wrench while you hold the switch cam [21] with a wrench.
- (c) When the position of the blade index pin [14] is correct, do this step:
 - 1) Tighten the nut [20] to 114-126 pound-inches (12.9-14.2 newton-meters) above the run-on torque while you hold the switch cam [21] with a wrench.

SUBTASK 29-21-18-820-003

- (3) Adjust the switch [18] and actuator [19].
 - (a) Hold the switch actuator on the RAT strut angle switch down to open the switch.
 - (b) Monitor the continuity between pins 10 and 11 on the electrical receptacle on the strut [2].
 - (c) Push on the hydraulic pump to manually move the strut [2] forward until the surface B of the blade index pin [14] touches the surface A of the turbine hub.
 - 1) Turn the turbine hub to align the RAT blades with the strut [2] (and the blade index pin with the slot in the turbine hub).
 - 2) Continue to push the strut [2] forward. Make sure that the switch [18] closes (there is continuity) at 0.5-1.5 degrees more than the recorded angle.
 - (d) Make sure the actuation range of the actuator [19] is correct.
 - 1) Manually rotate the strut [2] to the point that the switch [18] opens as the roller travels up the switch cam [21].
 - 2) Measure the distance from the top of the switch [18] body to the top of the actuator [19] and record the measurement as Dimension A.
 - 3) Manually rotate the strut [2] until the actuator [19] roller is on top of the cam.

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- 4) Measure the distance from the top of the switch body to the top of the actuator and record the measurement as Dimension B.
- 5) Subtract the Dimension B from the Dimension A. The difference must be 0.03-0.05 inch (0.76-1.27 mm).
- 6) If the measurement is not in this range, adjust the position of the switch [18] until you get the correct travel.

NOTE: Too little travel can result in accidental or intermittent actuation due to local vibration. Too much travel can bend or distort the arm of the actuator, and prevent the switch from returning to the open position.

- (e) Move the strut [2] back to the extended position.
- (f) Release the actuator on the RAT strut angle switch.



CAUTION DO NOT LET THE SCREWS TURN WHEN YOU TURN THE NUTS. IF THE SCREWS PUSH THE SWITCH AGAINST THE PLATE, YOU CAN CAUSE DAMAGE TO THE SWITCH.

- (g) Hold the screws [28] and tighten the nuts [31] to 1.3-1.5 pound-inches (0.15-0.17 newton-meters).
- (h) Tighten the nuts [25] to 30-32 pound-inches (3.4-3.6 newton-meters).

SUBTASK 29-21-18-710-002

- (4) Check the adjustment of the blade index pin switch [18]:
 - (a) Hold the switch actuator on the RAT strut angle switch down to open the switch.
 - (b) Monitor the continuity between pins 10 and 11 on the electrical receptacle on the strut [2].
 - (c) Push on the hydraulic pump to manually move the strut [2] forward until there is continuity between pins 10 and 11 on the electrical receptacle.
 - (d) Make a record of the angle which shows on the control column assembly protractor, SPL-1680.

NOTE: The adjustment of the blade index pin switch [18] is correct if this angle is 0.5 to 1.5 degrees more than the angle at which the blade index pin [14] touched the surface of the turbine hub.

 - (e) Release the actuator on the RAT strut angle switch.
 - (f) Manually move the strut [2] back to the extended position.

SUBTASK 29-21-18-390-002

- (5) Use adhesive, A00253 to seal the switch [18] to the bracket [26] along three joint edges. Make sure you do not get adhesive on the switch actuator. Let the adhesive cure.

G. Return the airplane to normal configuration.

SUBTASK 29-21-18-420-003

- (1) Do these steps to install the switch box cover [15]:
 - (a) Apply compound, C00852 to the threads of the screws [36].
 - (b) Put the switch box cover [15] on the strut [2].
 - (c) Install the screws [16] and washers [17] that attach the switch box cover [15] to the strut [2].
 - (d) Tighten the screws [36] to 16-17 pound-inches (1.8-1.9 newton-meters) above the run-on torque.

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SUBTASK 29-21-18-080-001

- (2) Remove the control column assembly protractor, SPL-1680 from the aft side of the strut [2].

SUBTASK 29-21-18-430-001

- (3) Connect the electrical connector [13], DM29008A, to the electrical receptacle on the strut [2].

SUBTASK 29-21-18-430-002

- (4) Do these steps to attach the RAT actuator [1] to the strut [2]:
- (a) Lubricate the bushing [8] with grease, D00013.
 - (b) Install the bolt [9], washer [4], washer [5], washer [6], bushing [8], and nut [7].

SUBTASK 29-21-18-430-003

- (5) Do these steps to attach the door actuation link [3] to the strut [2]:
- (a) Remove the tape or string that you used to hold the door actuation link [3] to the RAT compartment door.
 - (b) Put the pin [12] on the door actuation link [3] through the hole in the strut [2].
 - (c) Install the washer [11] on the pin [12].
 - (d) Install the nut [10].
 - (e) Tighten the nut [10] to 700-900 pound-inches (79-102 newton-meters)

SUBTASK 29-21-18-860-002

- (6) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

SUBTASK 29-21-18-710-003

- (7) Do this task: Ram Air Turbine (RAT) Manual Deployment System - System Test, TASK 29-21-00-730-802.

————— **END OF TASK** —————

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RAM AIR TURBINE (RAT) STRUT ANGLE SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the Ram Air Turbine (RAT) Strut Angle Switch.
- (2) An installation of the Ram Air Turbine (RAT) Strut Angle Switch.

B.

TASK 29-21-19-000-801

2. Ram Air Turbine (RAT) Strut Angle Switch Removal

Figure 401

A. References

Reference	Title
29-21-00-860-801	Ram Air Turbine (RAT) Extension (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-1680	Protractor - Assembly, Control Column Part #: 4MIT65B80307-1 Supplier: 81205 Part #: A27021-29 Supplier: 81205 Part #: G76002-19 Supplier: 81205

C. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Procedure

SUBTASK 29-21-19-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 29-21-19-480-001

- (2) Temporarily attach the control column assembly protractor, SPL-1680 to the aft side of the strut [2].

NOTE: You can attach the protractor to the strut [2] with tape or plastic wire-tie straps.

SUBTASK 29-21-19-820-001

- (3) Set the control column assembly protractor, SPL-1680 to the zero position.

SUBTASK 29-21-19-030-001

- (4) Do these steps to disconnect the door actuation link [3] from the strut [2]:
 - (a) Remove the nut [10] and washer [11] from the pin [12].
 - (b) Remove the door actuation link [3] from the strut [2].
 - (c) Hold the door actuation link [3] to the RAT compartment door with tape or string, to keep it away from the path of the strut [2].

SUBTASK 29-21-19-030-002

- (5) Disconnect the RAT actuator [1] from the strut [2].

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- (a) Remove the nut [7] and washer [6] from the bolt [9].
- (b) Remove the bolt [9], washer [4], bushing [8], and washer [5].

SUBTASK 29-21-19-030-003

- (6) Disconnect the electrical connector [13], DM29008A, from the strut [2].

SUBTASK 29-21-19-020-001

- (7) Remove the screws [22] and washers [23] to remove the mounting plate [14] from the strut [2].

SUBTASK 29-21-19-020-002

- (8) Do these steps to remove the switch [16] from the mounting plate [14].



CAUTION

DO NOT LET THE SCREWS TURN WHEN YOU TURN THE NUTS. IF THE SCREWS PUSH THE SWITCH AGAINST THE PLATE, YOU CAN CAUSE DAMAGE TO THE SWITCH.

- (a) Hold the screws [17]. Remove the nuts [21] and washers [20] from the screws.
- (b) Remove the screws [17] from the threaded plate [19].
- (c) Remove the washers [18], actuator [15], and threaded plate [19].
- (d) Break the adhesive bond between the switch [16] and the mounting plate [14]. Remove adhesive residue with a sharp blade or a fine file.

SUBTASK 29-21-19-930-001

- (9) Mark the leads from the switch [16] as NC and C (normally closed and closed).

SUBTASK 29-21-19-020-003

- (10) Cut the leads at the switch body.

SUBTASK 29-21-19-020-004

- (11) Remove the switch [16].

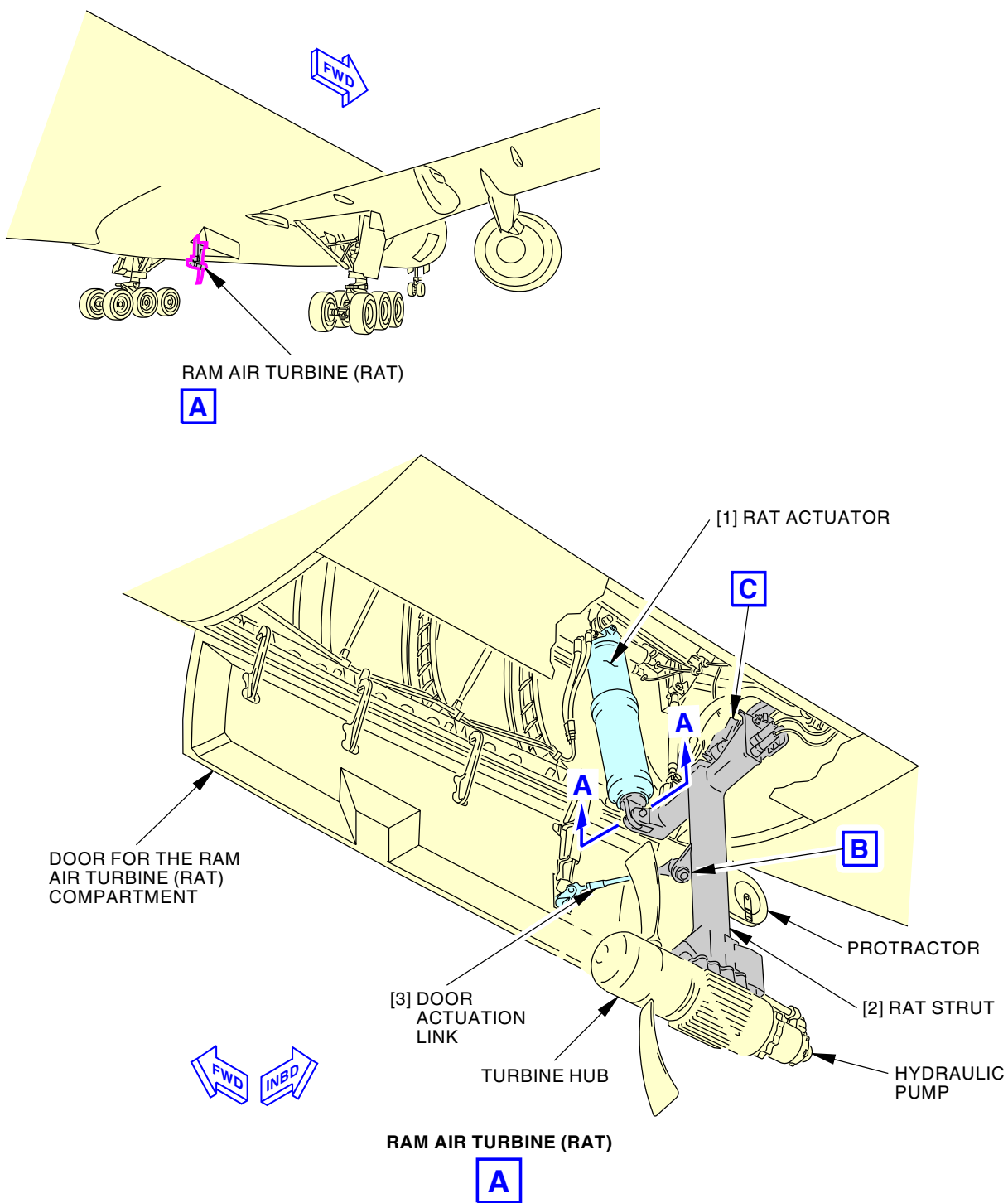
————— END OF TASK —————

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1353161 S0000242131_V2

**Strut Angle Switch Installation
Figure 401/29-21-19-990-801 (Sheet 1 of 5)**

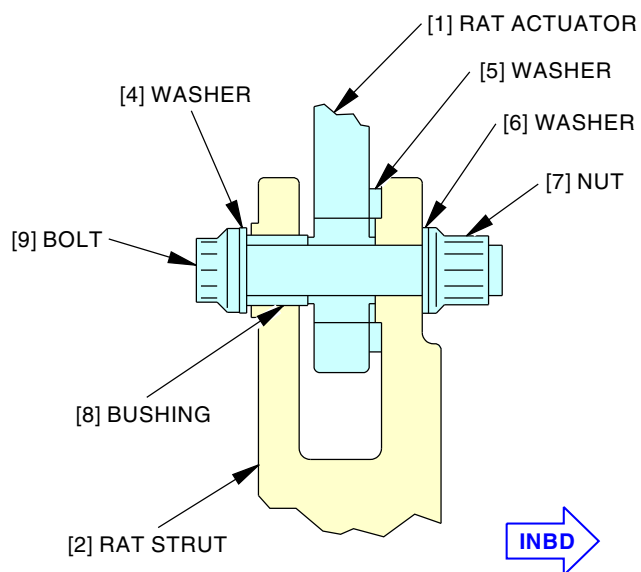
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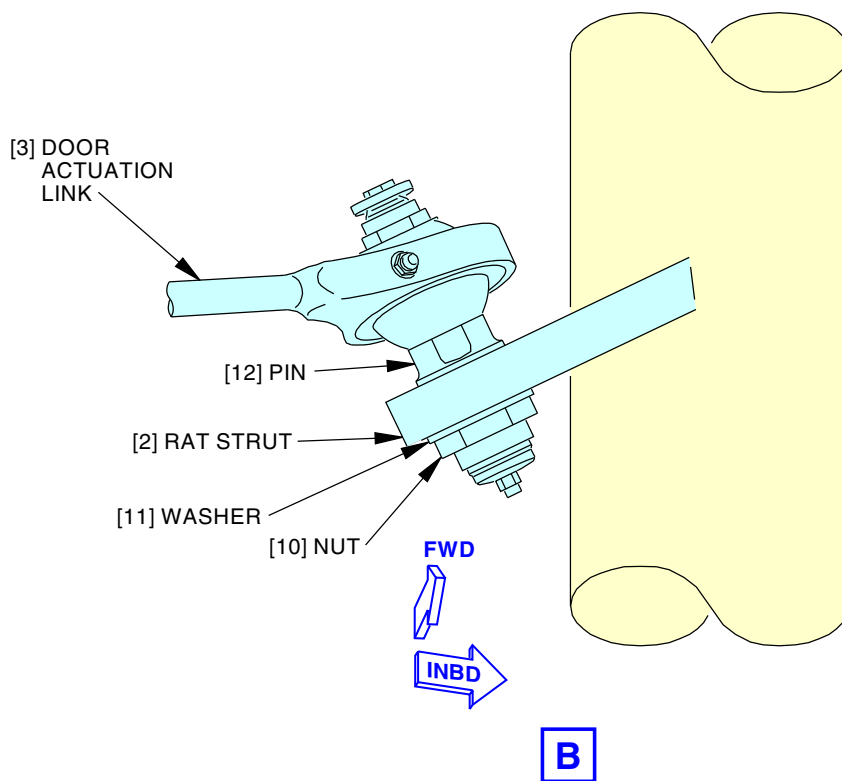
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A-A



1353163 S0000242132_V2

**Strut Angle Switch Installation
Figure 401/29-21-19-990-801 (Sheet 2 of 5)**

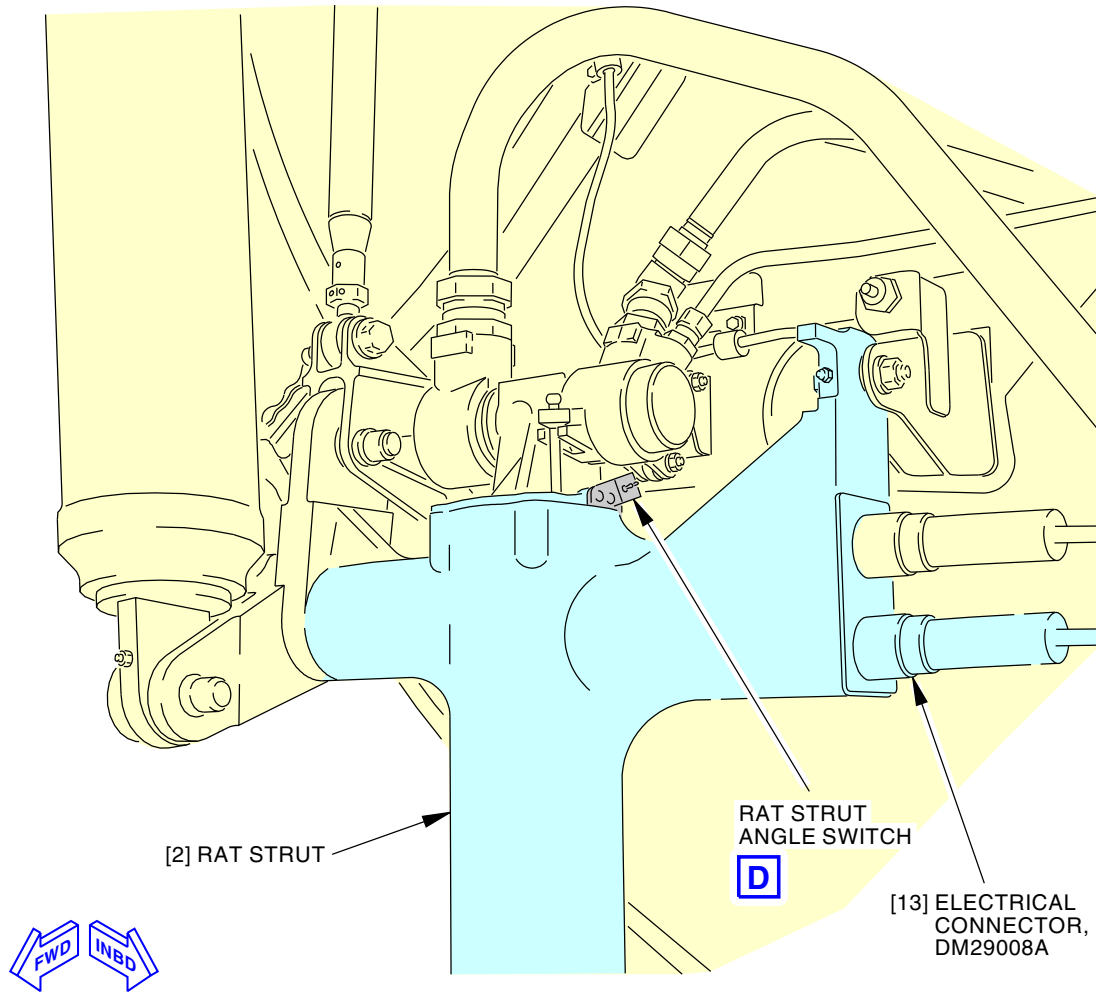
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1353166 S0000242134_V2

Strut Angle Switch Installation
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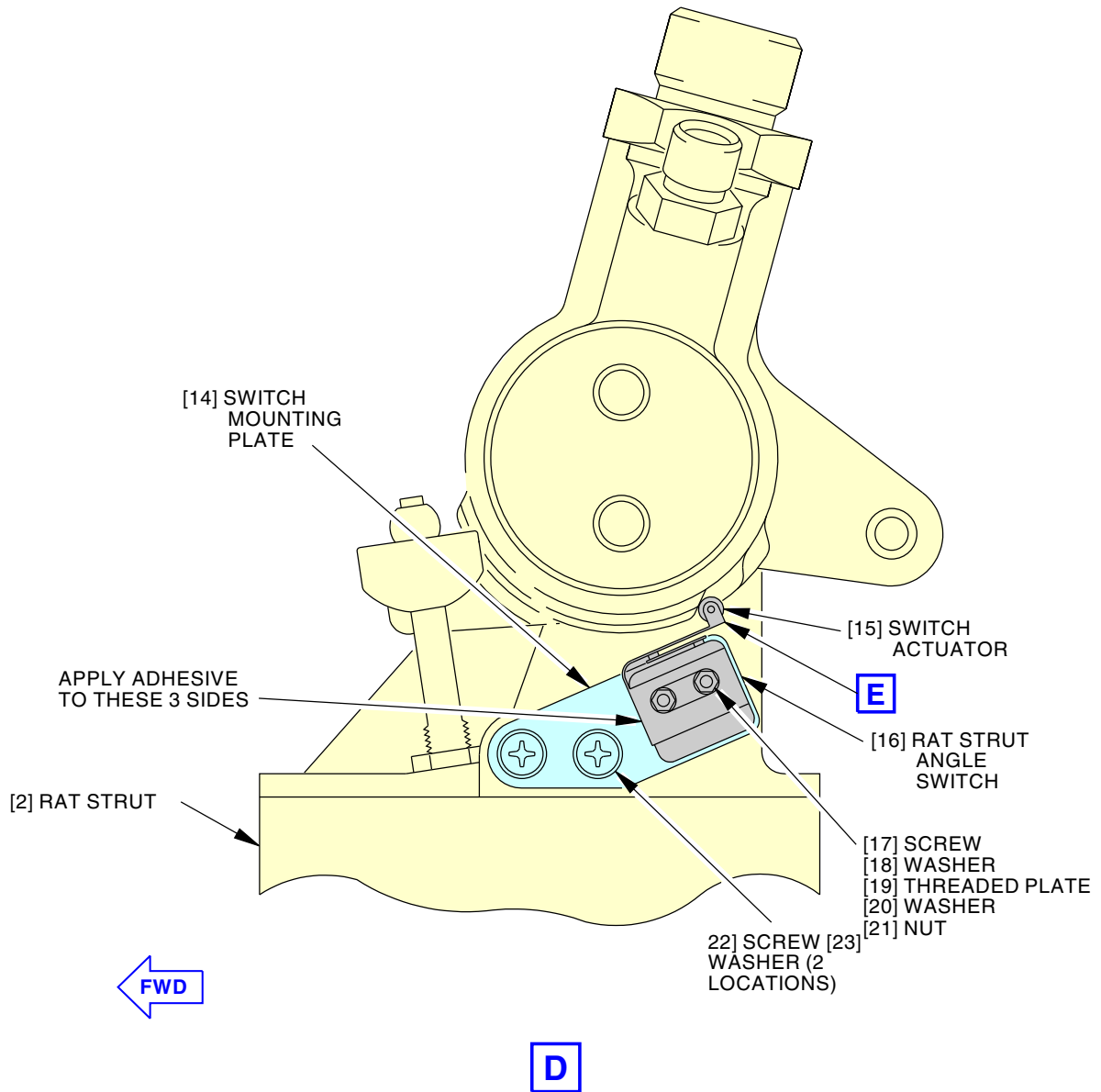
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1353175 S0000242135_V2

Strut Angle Switch Installation
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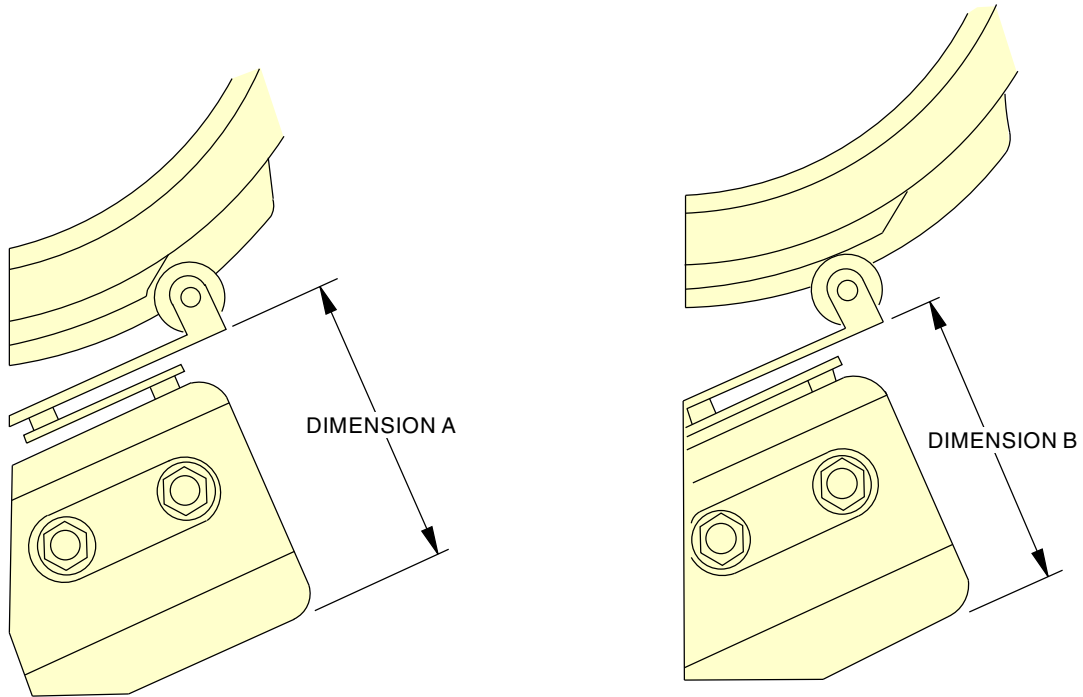
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Strut Angle Switch Installation
Figure 401/29-21-19-990-801 (Sheet 5 of 5)

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TASK 29-21-19-400-801

3. Ram Air Turbine (RAT) Strut Angle Switch Installation

Figure 401

A. References

Reference	Title
29-21-00-730-802	Ram Air Turbine (RAT) Manual Deployment System - System Test (P/B 501)
29-21-00-860-802	Ram Air Turbine (RAT) Retraction (P/B 201)
SWPM 20-10-14	Installation of Shrinkable Sleeves
SWPM 20-30-12	Assembly of Splices

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-1680	Protractor - Assembly, Control Column Part #: 4MIT65B80307-1 Supplier: 81205 Part #: A27021-29 Supplier: 81205 Part #: G76002-19 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
A00253	Adhesive - Room Temperature Curing Two Part Epoxy	BMS5-109 Type II Class 2
A50051	Sealant - P/S 890 Class B Fuel Tank Sealant	SAE AMS-S-8802 Class B
A50152	Adhesive - Epoxy/Polyamide Two-Part Paste (Tyco Electronics - Raychem S1125)	
C00852	Compound - Antiseize, Molybdenum Disulfide-Petrolatum	MIL-PRF-83483
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)

D. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

E. Install the Strut Angle Switch

SUBTASK 29-21-19-840-001

(1) Prepare the wires.

- Cut the leads at different locations so that the splice connections are not in the same area.
- Strip approximately 0.25 in. (0.64 cm) of insulation from the ends of the leads.
- Cut the leads of the new switch [16] so that there will be a maximum of 1.0 in. (2.5 cm) of excess wire when spliced. Cut the leads of the switch at different locations to match the leads you already cut.

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- (d) Strip approximately 0.25 in. (0.64 cm) of insulation from the leads from the NC and C poles of the new switch [16].

NOTE: The NO switch lead will be cut off at the switch body and sealed after the switch is spliced.

SUBTASK 29-21-19-902-001

- (2) Splice the wires.
 - (a) Install new heat-shrinkable sleeving over the wire leads.
 - (b) Install M83519/1-1 solder splicing sleeves on each of the leads.
 - (c) Make sure the NC lead from the new switch is connected to the NC lead [24], and the C lead from the new switch is connected to the C lead [24]. Splice the leads (SWPM 20-30-12).
 - (d) Apply adhesive paste, A50152 to the areas of the leads where the sleeving will end.
 - (e) Move the sleeving over the splice and shrink the sleeving (SWPM 20-10-14).

SUBTASK 29-21-19-901-001

- (3) Cut the NO lead at the body of the new switch [16].

SUBTASK 29-21-19-390-001

- (4) Apply P/S 890 Class B sealant, A50051 on and around the exposed wire to seal it. Allow the sealant to cure.

SUBTASK 29-21-19-430-001

- (5) Attach the actuator [15] and mounting plate [14] to the switch [16].
 - (a) Install the screws [17] and washers [18] into the actuator [15], switch [16], and threaded plate [19] finger tight. Do not torque the screws [17].
 - (b) Hold the screws [17] and install the nuts [21] and washers [20] finger tight. Do not torque the nuts [21].

SUBTASK 29-21-19-420-001

- (6) Install the mounting plate [14].
 - (a) Apply compound, C00852 on the threads of the screws [22].
 - (b) Install the screws [22], and washers [23] finger tight.

F. Adjust the switch.

SUBTASK 29-21-19-860-002



WARNING

BE CAREFUL WHEN YOU TOUCH THE RAT BLADES. BECAUSE THE EDGES OF THE RAT BLADES ARE SHARP, INJURIES TO PERSONNEL CAN OCCUR.

- (1) Manually turn the turbine hub until the hole in the turbine hub is approximately 3 degrees (or one inch) from the blade index pin.

NOTE: You can use the arrows on each side of the turbine hub and the generator to help you do this step.

SUBTASK 29-21-19-760-001

- (2) Monitor the continuity between pins 10 and 11 on the electrical receptacle on the strut [2].

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SUBTASK 29-21-19-860-003



WARNING

DO NOT TOUCH THE RAT GENERATOR IF IT IS HOT. THE HOT SURFACE OF THE GENERATOR CAN BURN YOU.

- (3) Push on the hydraulic pump to manually move the strut [2] forward until the control column assembly protractor, SPL-1680 reads 15 ± 1 degrees.

SUBTASK 29-21-19-820-002

- (4) Adjust the mounting plate [14] so that the switch [16] just opens (there is no continuity). Make a record of the actual angle.

SUBTASK 29-21-19-430-002

- (5) Tighten the screws [22] to 30-32 pound-inches (3.4-3.6 newton-meters).

SUBTASK 29-21-19-710-001

- (6) Make sure the actuation range of the actuator [15] is correct.
- (a) Push on the hydraulic pump to manually move the strut [2] forward to the point that the switch opens as the roller travels up the cam.
 - (b) Measure the distance from the top of the switch [16] body to the top of the actuator [15] and record the measurement as Dimension A.
 - (c) Move the strut [2] further forward until the actuator [15] roller is on top of the cam.
 - (d) Measure the distance from the top of the switch body to the top of the actuator and record the measurement as Dimension B.
 - (e) Subtract the Dimension B from Dimension A. The difference must be 0.03-0.05 inch (0.76-1.27 mm).
 - (f) If the measurement is not in this range, adjust the position of the switch [16] until you get the correct travel.

NOTE: Too little travel can result in accidental or intermittent actuation due to local vibration. Too much travel can bend or distort the arm of the actuator, and prevent the switch from returning to the open position.

- (g) If you loosened the screws [22], tighten the screws [22] to 30-32 pound-inches (3.4-3.6 newton-meters).



CAUTION

DO NOT LET THE SCREWS TURN WHEN YOU TURN THE NUTS. IF THE SCREWS PUSH THE SWITCH AGAINST THE PLATE, YOU CAN CAUSE DAMAGE TO THE SWITCH.

- (h) Hold the screws [17] and tighten the nuts [21] to 1.3-1.5 pound-inches (0.15-0.17 newton-meters).

SUBTASK 29-21-19-710-002

- (7) Check the adjustment of the switch.
- (a) Move the strut [2] back to the extended position.
 - (b) Make sure there is continuity between pins 10 and 11 on the electrical receptacle on the strut [2].
 - (c) Push on the hydraulic pump to manually move the strut [2] forward to the point that there is no continuity between the pins.

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- (d) Make sure the angle on the control column assembly protractor, SPL-1680 is 15 ± 1 degrees.

SUBTASK 29-21-19-390-002

- (8) Use adhesive, A00253 to seal the switch [16] to the mounting plate [14] along three joint edges. Make sure you do not get adhesive on the actuator. Let the adhesive cure.

G. Return the airplane to normal configuration.

SUBTASK 29-21-19-080-001

- (1) Remove the control column assembly protractor, SPL-1680 from the strut [2].

SUBTASK 29-21-19-430-003

- (2) Connect the electrical connector [13], DM29008A, to the electrical receptacle on the strut [2].

SUBTASK 29-21-19-430-004

- (3) Do these steps to attach the RAT actuator [1] to the strut [2]:
- (a) Lubricate the bushing [8] with grease, D00013.
 - (b) Install the bolt [9], washer [4], washer [5], washer [6], bushing [8], and nut [7].

SUBTASK 29-21-19-430-005

- (4) Do these steps to attach the door actuation link [3] to the strut [2]:
- (a) Remove the tape or string that you used to hold the door actuation link [3] to the RAT compartment door.
 - (b) Put the pin [12] on the door actuation link [3] through the hole in the strut [2].
 - (c) Install the washer [11] on the pin [12].
 - (d) Install the nut [10].
 - (e) Tighten the nut [10] to 700-900 pound-inches.

SUBTASK 29-21-19-860-004

- (5) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

SUBTASK 29-21-19-710-003

- (6) Do this task: Ram Air Turbine (RAT) Manual Deployment System - System Test, TASK 29-21-00-730-802.

———— **END OF TASK** ————

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HYDRAULIC SYSTEM PRESSURE TRANSDUCER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the hydraulic system pressure transducer.
- (2) An installation of the pressure transducer.

B. There is one pressure transducer in each main (left, right, and center) hydraulic system. You can use this procedure to remove and install each pressure transducer (referred to as the transducer [3] in this procedure).

TASK 29-31-01-000-801

2. Hydraulic System Pressure Transducer Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
54-52-07-000-801	Strut Trailing Edge Removal (P/B 401)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Transducer	29-31-01-01-065	ARO 001-017
		29-31-01-01-070	ARO ALL
		29-31-01-01-075	ARO ALL
		29-31-01-01B-010	ARO 016-999
		29-31-01-01B-015	ARO ALL
		29-31-01-01B-020	ARO ALL
8	Packing	29-31-01-05A-025	ARO ALL

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing

D. Access Panels

Number	Name/Location
552JB	Fixed Trailing Edge Panel
652JB	Fixed Trailing Edge Panel

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E. Prepare for the Removal

SUBTASK 29-31-01-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, to do the deactivation procedure for the thrust reverser (forward thrust position), do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00

SUBTASK 29-31-01-010-001

- (2) For the left or right hydraulic system, to remove the aft end of the applicable aft strut fairing, do this task: Strut Trailing Edge Removal, TASK 54-52-07-000-801.

SUBTASK 29-31-01-010-002

- (3) For the left hydraulic system, remove this access panel:

<u>Number</u>	<u>Name/Location</u>
552JB	Fixed Trailing Edge Panel

SUBTASK 29-31-01-010-003

- (4) For the right hydraulic system, remove this access panel:

<u>Number</u>	<u>Name/Location</u>
652JB	Fixed Trailing Edge Panel

SUBTASK 29-31-01-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) If the downlock pins are not installed on the main and nose landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-31-01-010-004



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR GROUND LOCKPINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 29-31-01-860-001

- (7) For the applicable hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 29-31-01-860-002

- (8) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-31-01-860-003

- (9) For the right hydraulic system, do the step which follows:
- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-31-01-860-004

- (10) For the center hydraulic system, do the step which follows:
- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM CR card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

F. Hydraulic System Pressure Transducer Removal

SUBTASK 29-31-01-020-001

- (1) Disconnect the electrical connector [4] from the transducer [3].

SUBTASK 29-31-01-020-002

- (2) For the left or right hydraulic system, do the steps which follow:
- (a) Remove the screws [6] and washers [7] from the clamp [2].
- (b) Remove the clamp [2] from the transducer [3].
- (c) Remove the transducer [3] from the T-fitting [1].

SUBTASK 29-31-01-020-003

- (3) For the center hydraulic system, do the steps which follow:
- (a) Remove the transducer [3] from the T-fitting [1].
- (b) Remove and discard the packing [8] from the transducer [3].

SUBTASK 29-31-01-020-004

- (4) Install a cap on the opening in the T-fitting [1] to prevent contamination.

————— **END OF TASK** —————

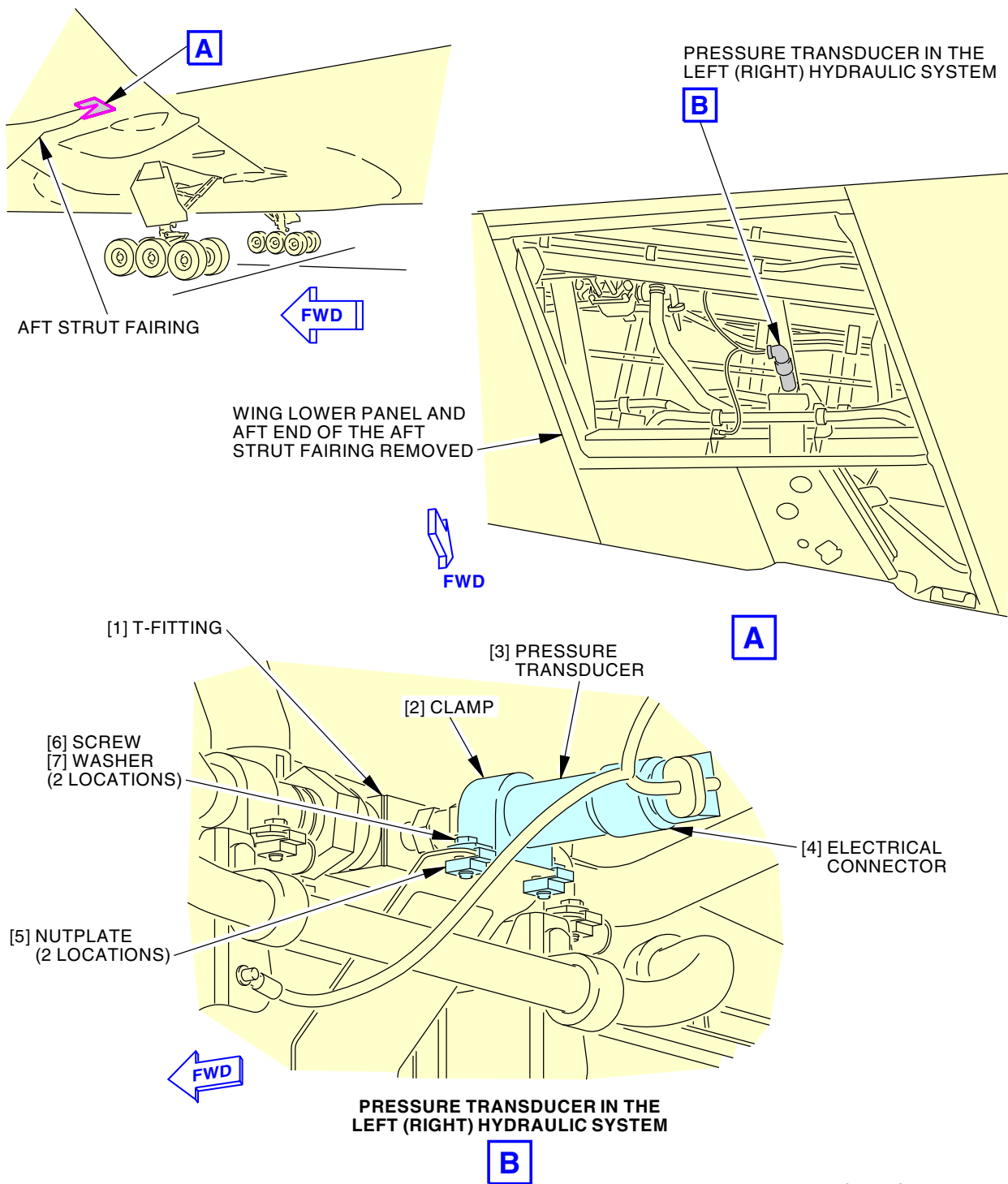
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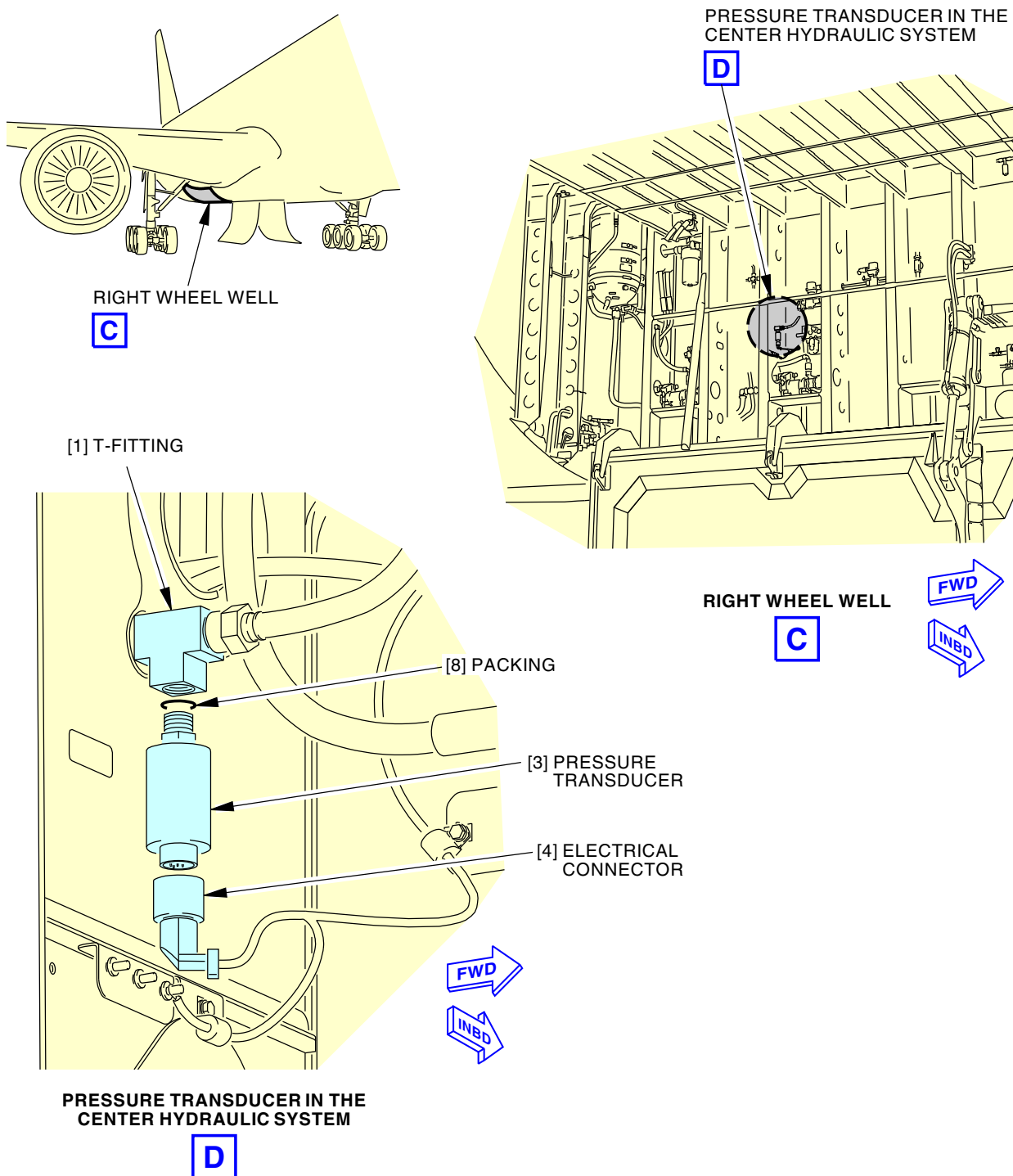
Hydraulic System Pressure Transducer Installation
Figure 401/29-31-01-990-801 (Sheet 1 of 2)

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**Hydraulic System Pressure Transducer Installation
Figure 401/29-31-01-990-801 (Sheet 2 of 2)**

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TASK 29-31-01-400-801

3. Hydraulic System Pressure Transducer Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
54-52-07-400-801	Strut Trailing Edge Installation (P/B 401)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Transducer	29-31-01-01-065	ARO 001-017
		29-31-01-01-070	ARO ALL
		29-31-01-01-075	ARO ALL
		29-31-01-01B-010	ARO 016-999
		29-31-01-01B-015	ARO ALL
		29-31-01-01B-020	ARO ALL
8	Packing	29-31-01-05A-025	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing

E. Access Panels

Number	Name/Location
552JB	Fixed Trailing Edge Panel
652JB	Fixed Trailing Edge Panel

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F. Hydraulic System Pressure Transducer Installation

SUBTASK 29-31-01-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the threads on the transducer [3].

SUBTASK 29-31-01-420-001

- (2) Remove the cap from the opening in the T-fitting [1].

SUBTASK 29-31-01-420-003

- (3) For the left or right hydraulic system, do the steps which follow:
 - (a) Install the transducer [3] on the T-fitting [1].
 - (b) Tighten the transducer [3] to a maximum of 270 $\pm$ 27 in-lb (31 $\pm$ 4 N·m).
 - (c) Install the clamp [2] on the transducer [3].
 - (d) Install the screws [6] and washers [7] on the clamp [2].

SUBTASK 29-31-01-420-004

- (4) For the center hydraulic system, do the steps which follow:
 - (a) Install the new packing [8] on the transducer [3]
 - (b) Install the transducer [3] on the T-fitting [1].
 - (c) Tighten the transducer [3] to a maximum of 270 $\pm$ 14 in-lb (31 $\pm$ 2 N·m).

SUBTASK 29-31-01-410-001

- (5) Connect the electrical connector [4] to the transducer [3].

G. Hydraulic System Pressure Transducer Installation Test

SUBTASK 29-31-01-860-005

- (1) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-31-01-860-006

- (2) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-31-01-860-007

- (3) For the center hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM CR card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-31-01-860-008

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

SUBTASK 29-31-01-610-001

- (5) For the applicable hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-31-01-860-009

- (6) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

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SUBTASK 29-31-01-210-001

- (7) Make sure the applicable HYDRAULIC SYSTEM PRESS (L, C, or R) indication, on the EICAS maintenance display, shows 0 to 200 psi.

SUBTASK 29-31-01-860-010

- (8) For the applicable hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-31-01-790-001

- (9) Make sure there is no leakage of hydraulic fluid at the transducer [3].

SUBTASK 29-31-01-210-002

- (10) Make sure the applicable HYDRAULIC SYSTEM PRESS (L, C, or R) indication, on the EICAS maintenance page, shows 2700 to 3200 psi.

SUBTASK 29-31-01-860-011

- (11) For the applicable hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-31-01-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-31-01-010-005

- (2) For the left hydraulic system, install this access panel:

<u>Number</u>	<u>Name/Location</u>
552JB	Fixed Trailing Edge Panel

SUBTASK 29-31-01-010-006

- (3) For the right hydraulic system, install this access panel:

<u>Number</u>	<u>Name/Location</u>
652JB	Fixed Trailing Edge Panel

SUBTASK 29-31-01-410-002

- (4) For the left or right hydraulic system, to install the aft end of the applicable aft strut fairing, do this task: Strut Trailing Edge Installation, TASK 54-52-07-400-801.

SUBTASK 29-31-01-440-001

- (5) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-31-01-410-003



OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

————— **END OF TASK** —————

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**LEFT AND RIGHT SYSTEM ALTERNATING CURRENT MOTOR PUMP (ACMP) PRESSURE TRANSDUCER
- REMOVAL/INSTALLATION**

1. General

A. This procedure has these tasks:

- (1) A removal of the left and right system alternating current motor pump (ACMP) pressure transducer (referred to as the transducer [2] in this procedure)
- (2) An installation of the transducer [2].
- (3) This procedure is applicable only to the transducers [2] for the ACMPs in the left and right hydraulic systems. The pressure transducers, for the ACMPs in the center system, are included in the procedure for the components of the ACMP pressure and case drain filter module.

TASK 29-31-02-000-801

2. Left and Right System Alternating Current Motor Pump (ACMP) Pressure Transducer Removal
(Figure 401)

A. General

- (1) The left and right system alternating current motor pump (ACMP) pressure transducer is referred to as the transducer [2] in this procedure.
- (2) The pressure transducers, for the ACMPs in the center system, are included in the procedure for the components of the ACMP pressure and case drain filter module (TASK 29-11-41-000-801).

B. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-41-000-801	Center System Alternating Current Motor Pump (ACMP) Pressure and Case Drain Filter Module and Components Removal (P/B 401)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

E. Prepare for the Removal

SUBTASK 29-31-02-860-001

- (1) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.

NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-31-02-860-002

- (2) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-31-02-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-31-02-010-001

- (4) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-31-02-010-002

- (5) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-31-02-860-003

- (6) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

F. Pressure Transducer Removal

SUBTASK 29-31-02-020-001

- (1) Remove the electrical connector [3] from the transducer [2].

SUBTASK 29-31-02-020-006

- (2) Install a cap on the electrical connector [3] to prevent contamination or damage.

SUBTASK 29-31-02-020-002

- (3) Loosen the bolts [5] which attach the clamp [4].

SUBTASK 29-31-02-020-003

- (4) Disconnect the pressure transducer tube [7] from the transducer [2].

SUBTASK 29-31-02-020-004

- (5) Remove the transducer [2] from the clamp [4].

SUBTASK 29-31-02-020-005

- (6) Install caps on the pressure transducer tube [7] and the transducer [2] to prevent contamination.

————— END OF TASK —————

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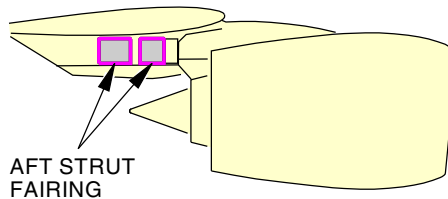
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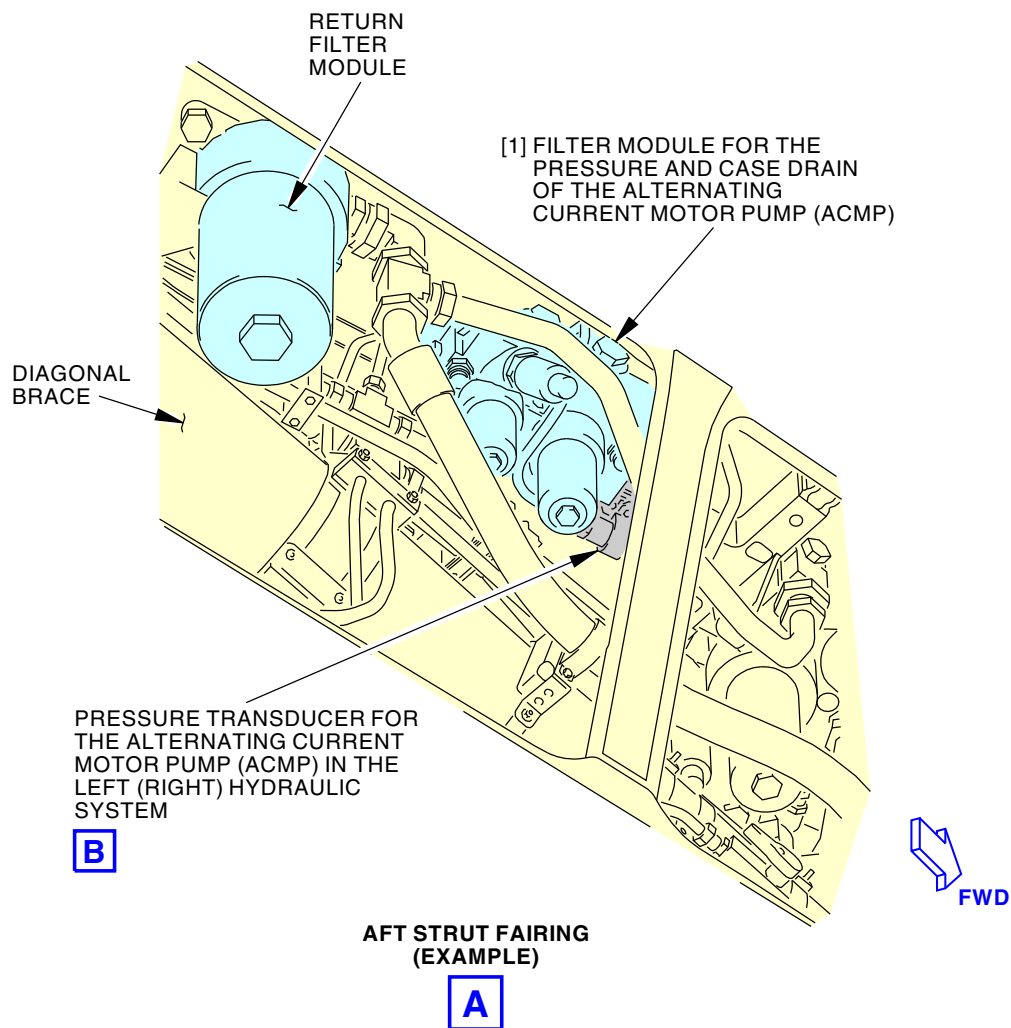
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AFT STRUT
FAIRING

A



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**Alternating Current Motor Pump (ACMP) Pressure Transducer Installation
Figure 401/29-31-02-990-801 (Sheet 1 of 2)**

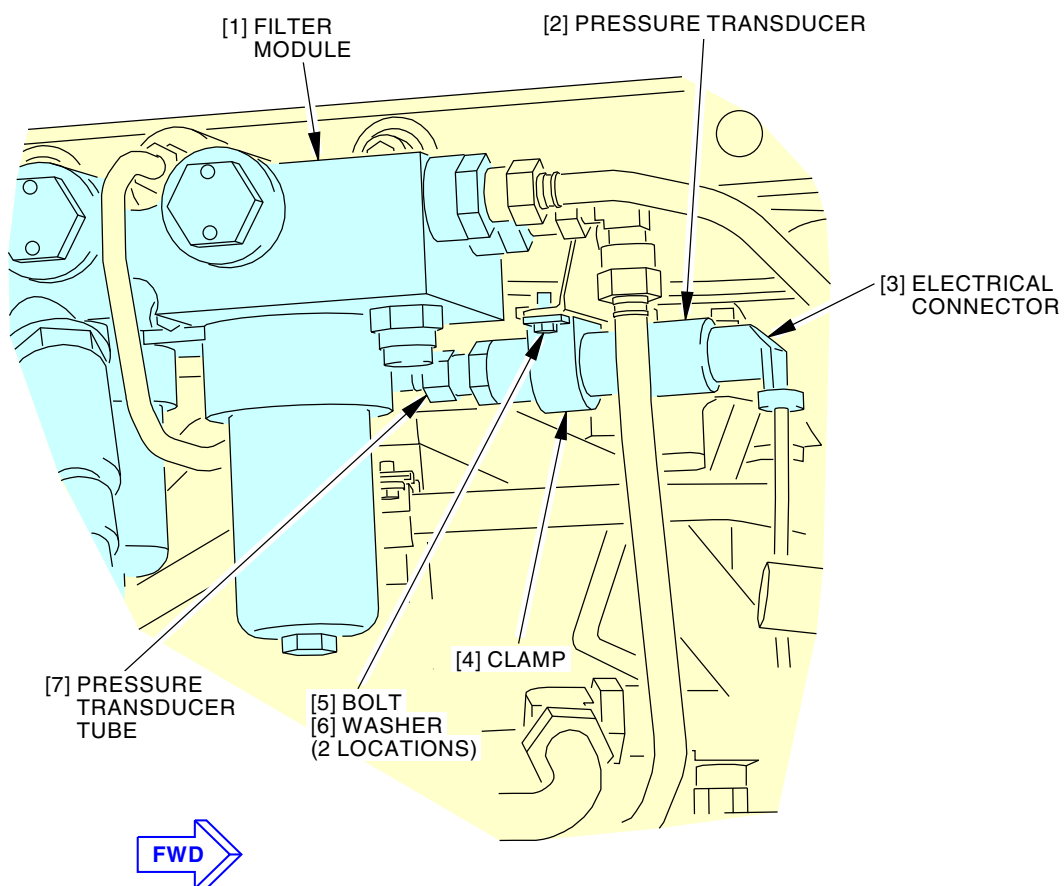
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**PRESSURE TRANSDUCER
(EXAMPLE)**

B

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Alternating Current Motor Pump (ACMP) Pressure Transducer Installation
Figure 401/29-31-02-990-801 (Sheet 2 of 2)

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TASK 29-31-02-400-801

3. Left and Right System Alternating Current Motor Pump (ACMP) Pressure Transducer Installation (Figure 401)

A. General

- (1) The left and right system alternating current motor pump (ACMP) pressure transducer is referred to as the transducer [2] in this procedure.

B. References

Reference	Title
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-803	Main Hydraulic System Pressurization with an Alternating Current Motor Pump (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
COM-1550	Bonding 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

D. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Transducer	29-31-01-06-010	ARO 005-999
		29-31-02-10-030	ARO 001-004

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AMM Item	Description	AIPC Reference	AIPC Effectivity
2 (cont.)		29-31-02-10-031	ARO 001-004

F. Location Zones

Zone	Area
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

G. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

H. Pressure Transducer Installation

SUBTASK 29-31-02-640-001

- (1) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153 to the threads on the transducer [2].

SUBTASK 29-31-02-420-007

- (2) Remove the caps from the pressure transducer tube [7] and the transducer [2].

SUBTASK 29-31-02-420-001

- (3) Put the transducer [2] in the clamp [4].

SUBTASK 29-31-02-420-008

- (4) Tighten the transducer [2] to a maximum of 270 ±14 in-lb (31 ±2 N·m).

SUBTASK 29-31-02-420-002

- (5) Connect the pressure transducer tube [7] to the transducer [2].

SUBTASK 29-31-02-420-003

- (6) Tighten the bolts [5] which attach the clamp [4].

SUBTASK 29-31-02-420-006

- (7) Remove the cap from the electrical connector [3].

SUBTASK 29-31-02-420-004

- (8) Connect the electrical connector [3] to the transducer [2].

SUBTASK 29-31-02-760-001

- (9) Do a check of the electrical bond between the transducer [2] and the filter module [1] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the transducer [2] and the filter module [1] is 0.008 ohms.

I. Pressure Transducer Installation Test

SUBTASK 29-31-02-860-004

- (1) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-31-02-860-005

- (2) For the right hydraulic system, do the step which follows:

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- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-31-02-860-006

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

SUBTASK 29-31-02-610-001

- (4) For the reservoir in the applicable (left or right) hydraulic system, do this task: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801.

SUBTASK 29-31-02-860-007

- (5) (TASK 31-61-00-800-804)

SUBTASK 29-31-02-210-001

- (6) Make sure the HYDRAULIC DEMAND PUMP PRESS (L or R) indication, on the EICAS maintenance page, shows 0 to 200 psi.

SUBTASK 29-31-02-860-008

- (7) For the applicable (left or right) hydraulic system, do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803.

SUBTASK 29-31-02-210-002

- (8) Make sure there is no leakage of hydraulic fluid at the transducer [2].

SUBTASK 29-31-02-210-003

- (9) Make sure the HYDRAULIC DEMAND PUMP PRESS (L or R) indication, on the EICAS maintenance page, shows 2700 to 3200 psi, for the applicable ACMP.

SUBTASK 29-31-02-860-009

- (10) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 29-31-02-110-001



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To clean all the hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-31-02-410-001

- (2) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-31-02-410-002

- (3) For the right hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-31-02-440-001

- (4) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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RESERVOIR PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir pressure switch (referred to in this procedure as the pressure switch)
 - (2) An installation of the pressure switch.
- B. There is one pressure switch in each main (left, right, and center) hydraulic system. You can use this procedure to remove and install each pressure switch.

TASK 29-31-03-000-801

2. Reservoir Pressure Switch Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-31-03-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-31-03-010-001

- (2) For the left hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

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SUBTASK 29-31-03-010-002

- (3) For the right hydraulic system, open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-31-03-480-001



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-31-03-010-003



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-31-03-860-001

- (6) For the applicable hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-31-03-860-002

- (7) For the left hydraulic system, do the step which follows:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.
- NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-31-03-860-003

- (8) For the right hydraulic system, do the step which follows:
- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.
- NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-31-03-860-004

- (9) For the center hydraulic system, do the step which follows:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the OFF position.
- NOTE: The left systems card file, P85, is in the main equipment center.

E. Reservoir Pressure Switch Removal

SUBTASK 29-31-03-020-001

- (1) Disconnect the electrical connector [9] from the reservoir pressure switch [2] (referred to as the switch [2] in this procedure).

SUBTASK 29-31-03-020-006

- (2) Install a cap on the electrical connector [9] to prevent damage or contamination.

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SUBTASK 29-31-03-020-002

- (3) For the left or right hydraulic system, do the step which follows:
- (a) Remove the screw [7] which attaches the bonding jumper [6] to the switch [2].

SUBTASK 29-31-03-020-003

- (4) Remove the switch [2] from the T-fitting [1].

SUBTASK 29-31-03-020-004

- (5) Install a cap on the opening in the T-fitting [1] to prevent contamination.

SUBTASK 29-31-03-020-005

- (6) Remove the packing [3] from the switch [2].

SUBTASK 29-31-03-020-007

- (7) Install caps on the open port and the electrical receptacle on the switch [2] to prevent contamination and damage.

————— **END OF TASK** —————

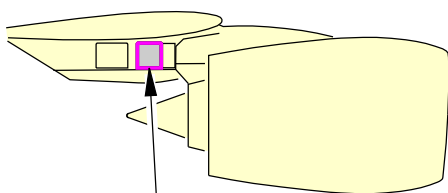
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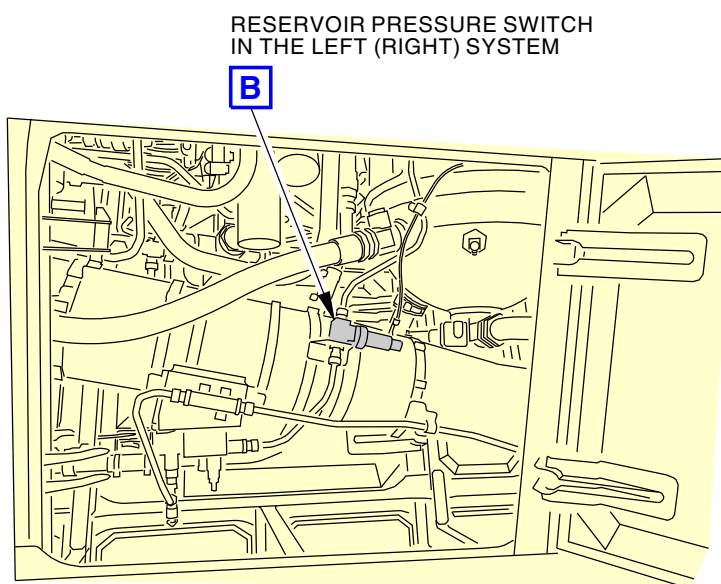
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ACCESS PANEL FOR THE
AFT STRUT FAIRING

A

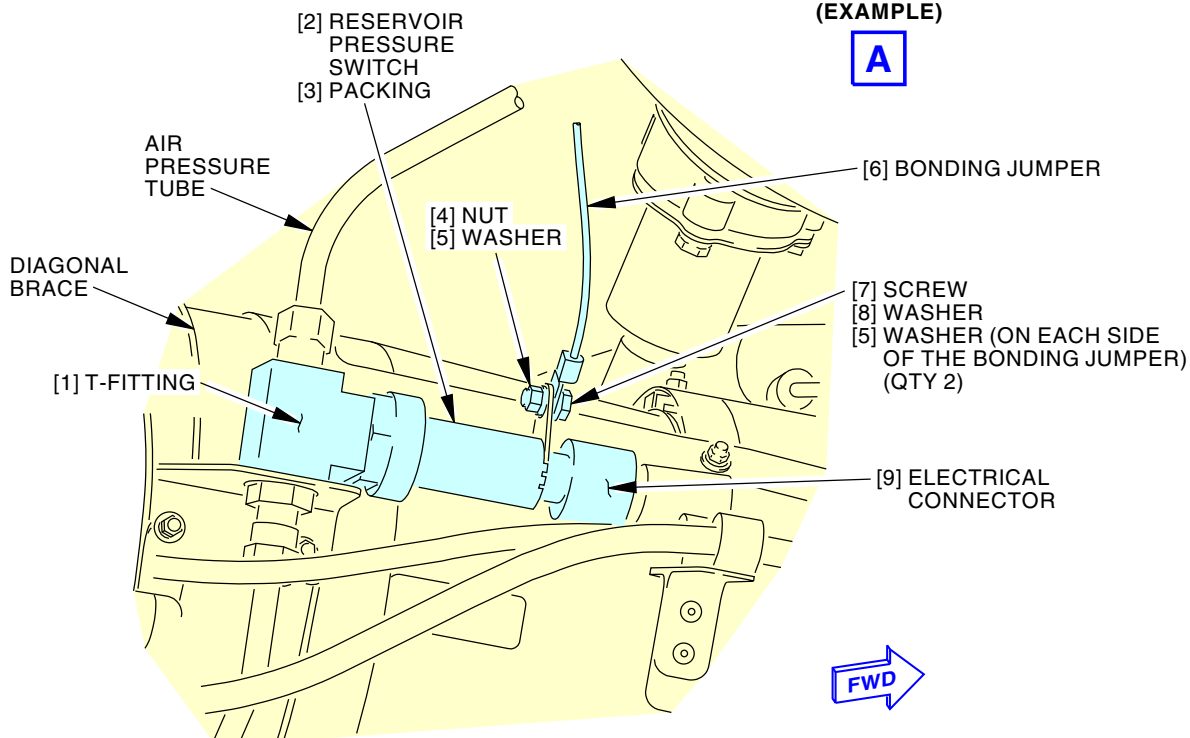


RESERVOIR PRESSURE SWITCH
IN THE LEFT (RIGHT) SYSTEM

B

AFT STRUT FAIRING
(EXAMPLE)

A



RESERVOIR PRESSURE SWITCH IN THE LEFT (RIGHT) SYSTEM

B

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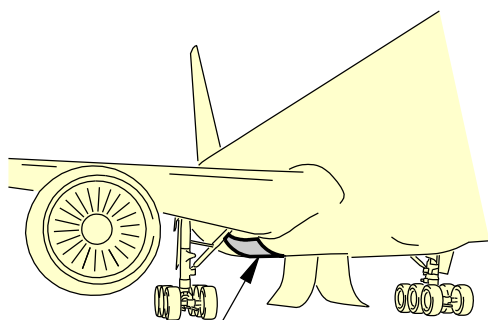
Reservoir Pressure Switch Installation
Figure 401/29-31-03-990-801 (Sheet 1 of 3)

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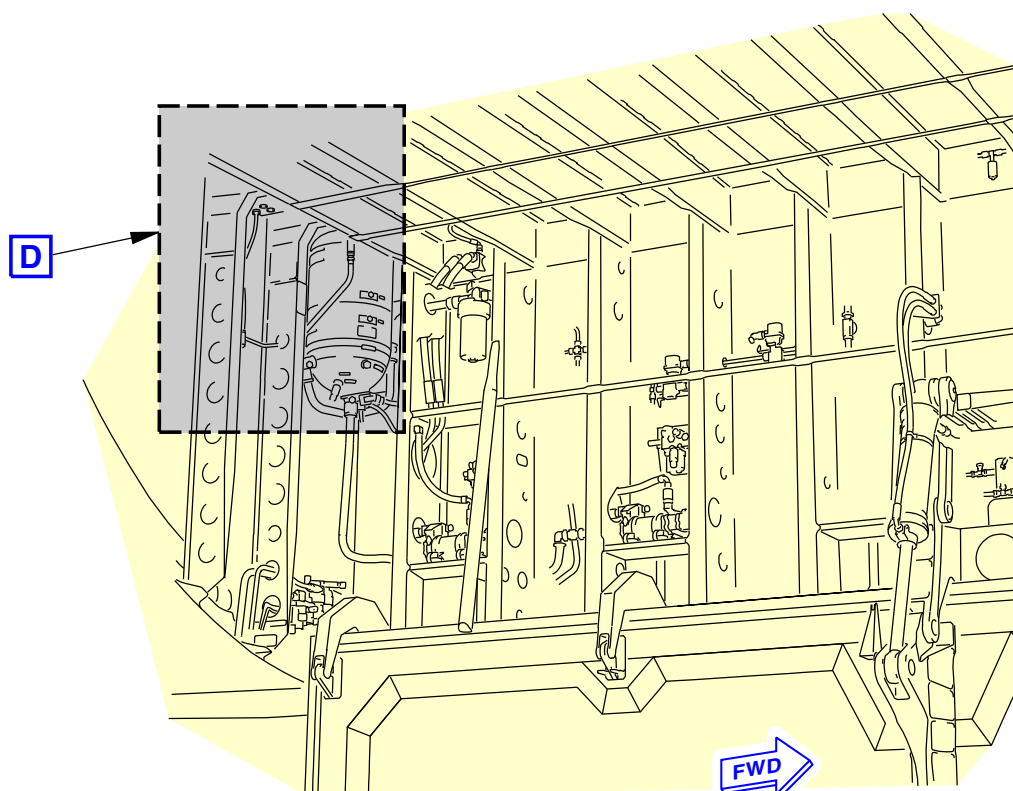
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RIGHT WHEEL WELL

C



D

RIGHT WHEEL WELL

C

FWD

INBD

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**Reservoir Pressure Switch Installation
Figure 401/29-31-03-990-801 (Sheet 2 of 3)**

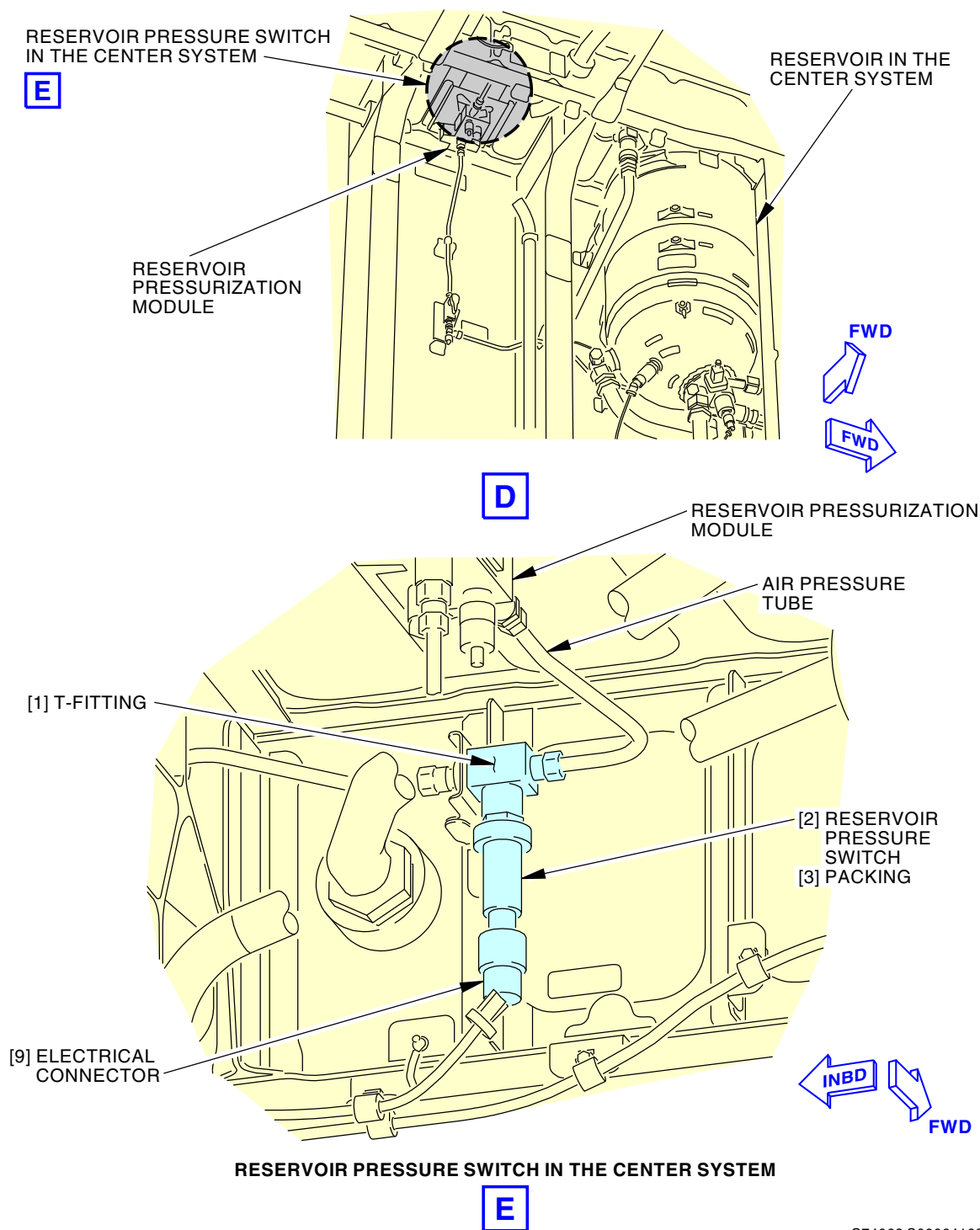
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C74068 S0006416377_V2

Reservoir Pressure Switch Installation
Figure 401/29-31-03-990-801 (Sheet 3 of 3)

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TASK 29-31-03-400-801

3. Reservoir Pressure Switch Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	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.

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
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Switch	29-31-03-01-050	ARO ALL
		29-31-03-10-125	ARO ALL
		29-31-03-15-130	ARO ALL
3	Packing	29-31-03-10-120	ARO ALL
		29-31-03-15-115	ARO ALL

E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

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(Continued)

Zone	Area

434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

F. Access Panels

Number	Name/Location

434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

G. Reservoir Pressure Switch Installation

SUBTASK 29-31-03-420-007

- (1) Remove the caps from the port and the electrical receptacle on the reservoir pressure switch [2] (referred to as the switch [2] in this procedure).

SUBTASK 29-31-03-640-001

- (2) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [3] and to the threads on the switch [2].

SUBTASK 29-31-03-420-001

- (3) Install the new packing [3] on the switch [2].

SUBTASK 29-31-03-420-002

- (4) Remove the cap from the opening in the T-fitting [1].

SUBTASK 29-31-03-420-003

- (5) Install the switch [2] on the T-fitting [1].

SUBTASK 29-31-03-420-004

- (6) Safety the switch [2] with a lockwire.

SUBTASK 29-31-03-420-005

- (7) For the left or right hydraulic system, do the step which follows:
 - (a) Attach the bonding jumper [6] to the switch [2] with the screw [7], washer [8], two washers [5] and nut [4] (SWPM 20-20-00).
 - 1) Make sure that the washers [5] are installed on each side of the bonding jumper [6].
 - (b) Measure the resistance between the flange on the hydraulic reservoir and the switch [2] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the flange on the hydraulic reservoir and the switch [2] is 0.008 ohms.

SUBTASK 29-31-03-420-008

- (8) Remove the cap from the electrical connector [9].

SUBTASK 29-31-03-420-006

- (9) Connect the electrical connector [9] to the switch [2].

H. Reservoir Pressure Switch Installation Test

SUBTASK 29-31-03-860-005

- (1) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-31-03-860-006

- (2) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-31-03-860-007

- (3) For the center hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-31-03-860-008

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

SUBTASK 29-31-03-860-009

- (5) For the applicable hydraulic system, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-31-03-790-001

- (6) Make sure there is no leakage of air at the switch [2].

SUBTASK 29-31-03-860-010

- (7) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-31-03-210-001

- (8) Make sure the HYDRAULIC RESERVOIR PRESS (L, C, or R) indication, for the applicable system, on the EICAS maintenance page shows NORM.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-31-03-410-003



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-31-03-410-001

- (2) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-31-03-410-002

- (3) For the right hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-31-03-440-001

- (4) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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HYDRAULIC FLUID TEMPERATURE INDICATING SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has these tasks:
- (1) A system test of the reservoir temperature indicating system in the left hydraulic system.
 - (2) A system test of the reservoir temperature indicating system in the right hydraulic system.
 - (3) A system test of the reservoir temperature indicating system in the center hydraulic system.
 - (4) A system test of the alternating current motor pump (ACMP) overheat detection system for the left, center and right hydraulic systems.
- B. This procedure does not do a test of the temperature indicating system for each hydraulic pump. The test of the temperature indicating system for each hydraulic pump is part of the operational test of that hydraulic pump.

TASK 29-32-00-730-801

2. Left Hydraulic System Reservoir Temperature Indicating System - System Test

A. General

- (1) This procedure does not do a test of the temperature indicating system for each hydraulic pump in the left system. The test of the temperature indicating system for each hydraulic pump is part of the operational test of that hydraulic pump. For the operational test of the hydraulic pumps in the left system, refer to these tasks:
- (a) Engine-driven pump (EDP) (TASK 29-11-00-710-801)
 - (b) Alternating current motor pump (ACMP) (TASK 29-11-00-730-801)

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)
29-11-00-710-801	Engine-Driven Pump (EDP) - Operational Test (P/B 501)
29-11-00-730-801	Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test (P/B 501)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
211	Flight Compartment, Left
212	Flight Compartment, Right
434	Aft Strut Fairing - Left Nacelle Strut

D. Access Panels

Number	Name/Location
434CL	Left Forward Access Door, Left Strut Aft Fairing

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E. Procedure

SUBTASK 29-32-00-860-001

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

SUBTASK 29-32-00-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-32-00-010-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-32-00-860-002

- (4) Do this task: (Showing a Maintenance Page, TASK 31-61-00-800-804)

SUBTASK 29-32-00-970-001

- (5) Make a record of the HYDRAULIC RESERVOIR TEMP L indication, which shows on the EICAS maintenance page.

NOTE: Refer to this indication as Value No. 1.

SUBTASK 29-32-00-860-003

- (6) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position (Figure 502).

NOTE: The left systems card file, P85, is in the main equipment center. Use the power control decal on the front of the card file to find the appropriate switch.

SUBTASK 29-32-00-020-001

- (7) Remove the electrical connector from the reservoir temperature transducer on the left system reservoir (Figure 501).

SUBTASK 29-32-00-860-004

- (8) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position (Figure 502).

SUBTASK 29-32-00-210-001

- (9) Make sure the HYDRAULIC RESERVOIR TEMP L indication, on the EICAS maintenance page, is blank.

SUBTASK 29-32-00-860-005

- (10) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position (Figure 502).

SUBTASK 29-32-00-420-001

- (11) Install the electrical connector on the reservoir temperature transducer on the left system reservoir (Figure 501).

SUBTASK 29-32-00-860-006

- (12) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position (Figure 502).

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SUBTASK 29-32-00-970-002

- (13) Make sure the HYDRAULIC RESERVOIR TEMP L indication, on the EICAS maintenance page, is the same (± 1 °C) as the Value No. 1.

SUBTASK 29-32-00-420-002

- (14) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-32-00-440-001

- (15) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-32-00-860-007

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

————— **END OF TASK** —————

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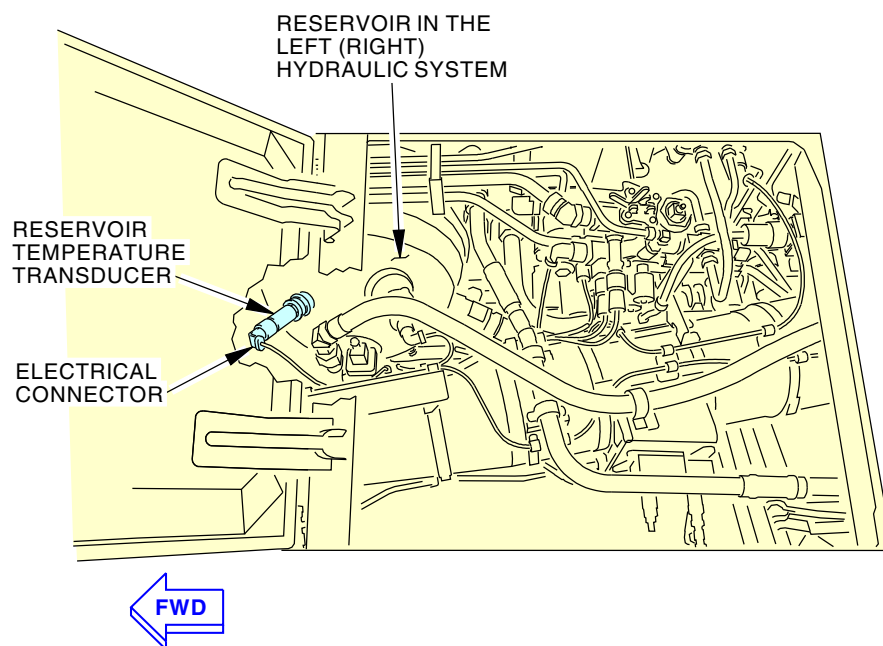
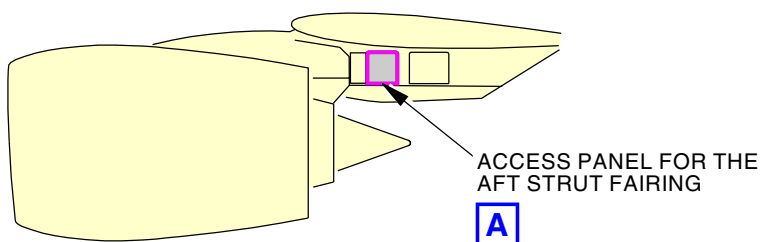
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AFT STRUT FAIRING
(EXAMPLE)

A

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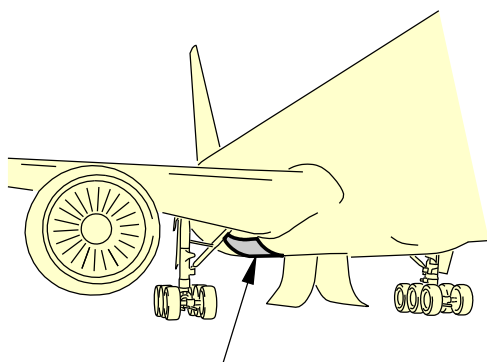
Reservoir Temperature Transducer
Figure 501/29-32-00-990-801 (Sheet 1 of 3)

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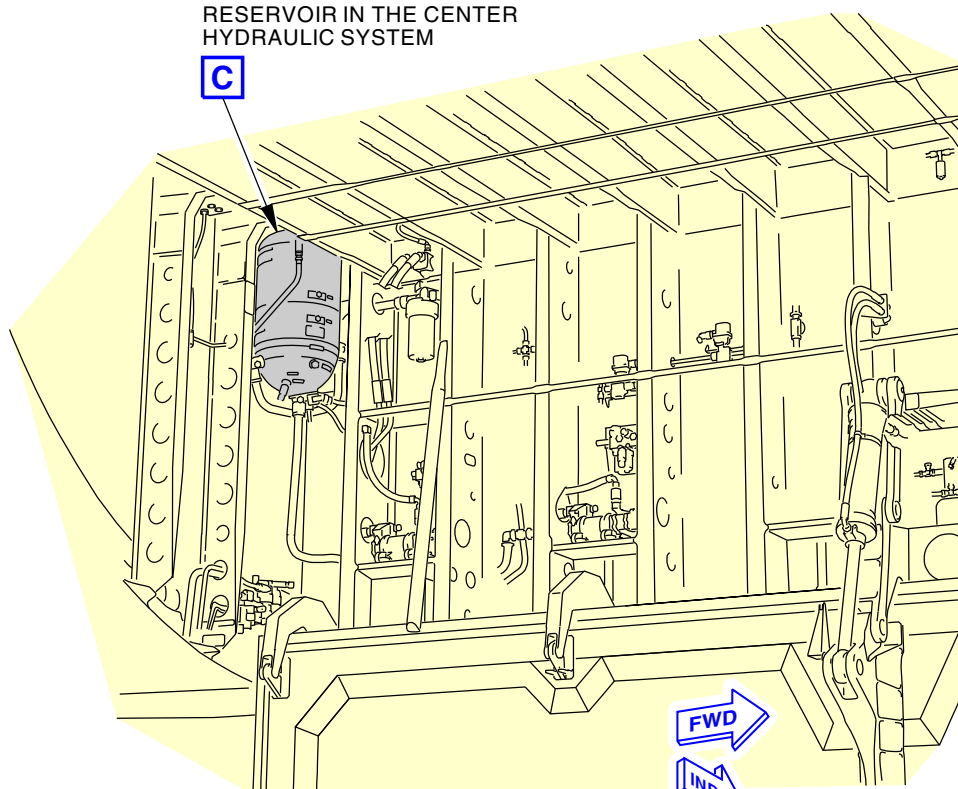


RIGHT WHEEL WELL

B

RESERVOIR IN THE CENTER
HYDRAULIC SYSTEM

C



RIGHT WHEEL WELL

B

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**Reservoir Temperature Transducer
Figure 501/29-32-00-990-801 (Sheet 2 of 3)**

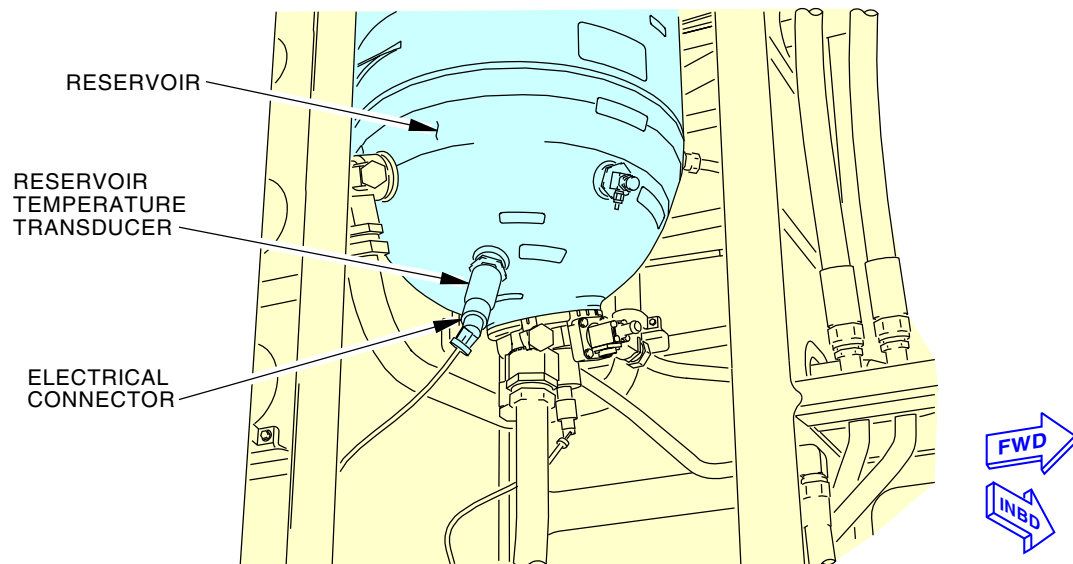
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RESERVOIR IN THE CENTER HYDRAULIC SYSTEM

C

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Reservoir Temperature Transducer
Figure 501/29-32-00-990-801 (Sheet 3 of 3)

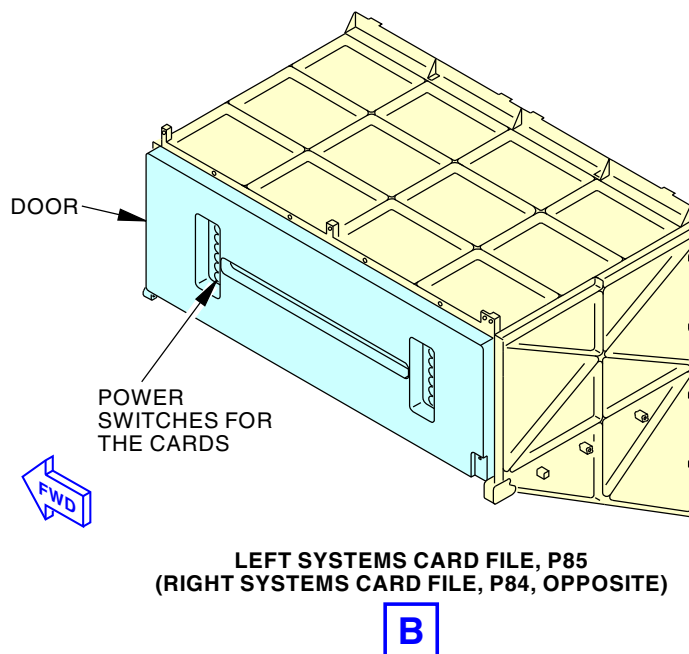
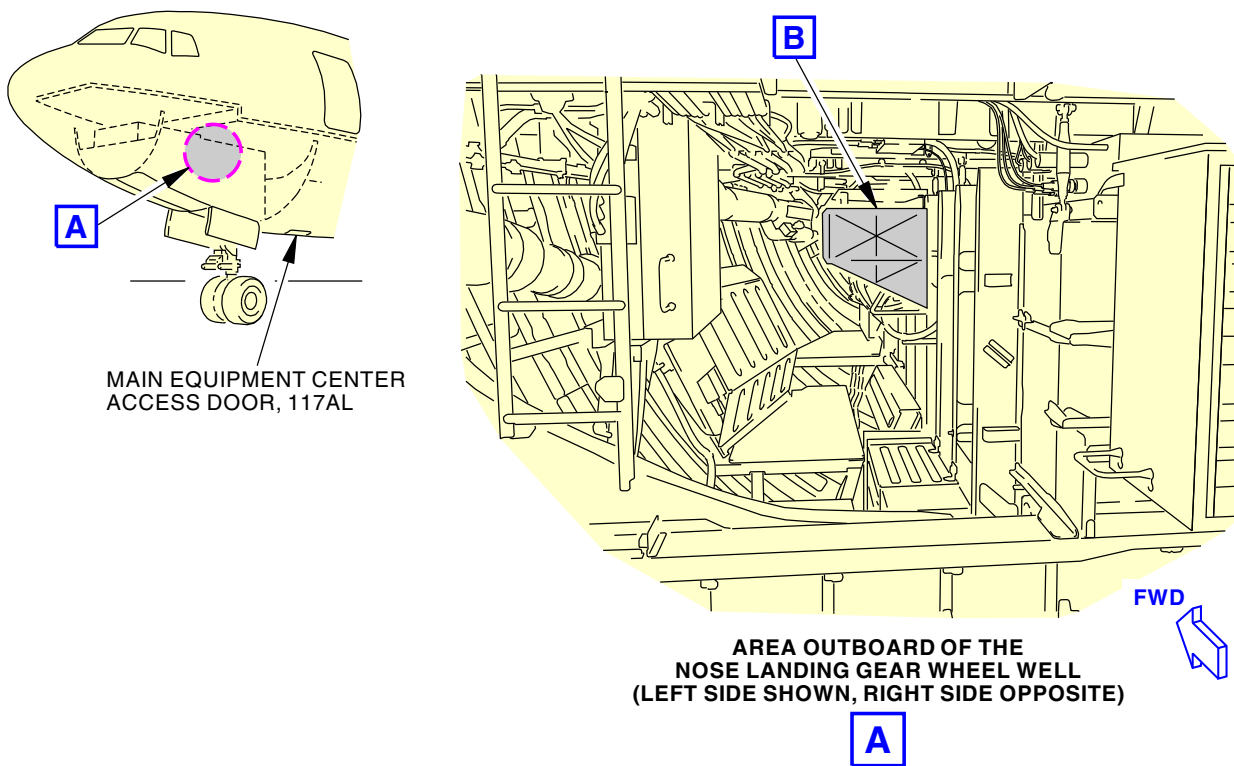
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Card File Power Switches
Figure 502/29-32-00-990-802

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TASK 29-32-00-730-802

3. Right Hydraulic System Reservoir Temperature Indicating System - System Test

A. General

- (1) This procedure does not do a test of the temperature indicating system for each hydraulic pump in the right system. The test of the temperature indicating system for each hydraulic pump is part of the operational test of that hydraulic pump. For the operational test of the hydraulic pumps in the right system, refer to these tasks:
- (a) Engine-driven pump (EDP) (TASK 29-11-00-710-801)
 - (b) Alternating current motor pump (ACMP) (TASK 29-11-00-730-801)

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)
29-11-00-710-801	Engine-Driven Pump (EDP) - Operational Test (P/B 501)
29-11-00-730-801	Left and Right System Alternating Current Motor Pumps (ACMP) - Operational Test (P/B 501)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
444	Aft Strut Fairing - Right Nacelle Strut

D. Access Panels

Number	Name/Location
444CL	Left Forward Access Door, Right Strut Aft Fairing

E. Procedure

SUBTASK 29-32-00-860-008

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

SUBTASK 29-32-00-040-002

 WARNING	DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-32-00-010-002

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

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SUBTASK 29-32-00-860-009

- (4) Do this task: (Showing a Maintenance Page, TASK 31-61-00-800-804)

SUBTASK 29-32-00-970-003

- (5) Make a record of the HYDRAULIC RESERVOIR TEMP R indication, which shows on the EICAS maintenance page.

NOTE: Refer to this indication as Value No. 2.

SUBTASK 29-32-00-860-010

- (6) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position (Figure 502).

NOTE: The right systems card file, P84, is in the main equipment center. Use the power control decal on the front of the card file to find the appropriate switch.

SUBTASK 29-32-00-020-002

- (7) Remove the electrical connector from the reservoir temperature transducer on the right system reservoir (Figure 501).

SUBTASK 29-32-00-860-011

- (8) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position (Figure 502).

SUBTASK 29-32-00-210-002

- (9) Make sure the HYDRAULIC RESERVOIR TEMP R indication, on the EICAS maintenance page, is blank.

SUBTASK 29-32-00-860-012

- (10) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position (Figure 502).

SUBTASK 29-32-00-420-003

- (11) Install the electrical connector on the reservoir temperature transducer on the right system reservoir (Figure 501).

SUBTASK 29-32-00-860-013

- (12) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position (Figure 502).

SUBTASK 29-32-00-970-004

- (13) Make sure the HYDRAULIC RESERVOIR TEMP R indication, on the EICAS maintenance page, is the same (± 1 °C) as the Value No. 2.

SUBTASK 29-32-00-410-001

- (14) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-32-00-440-002

- (15) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-32-00-860-014

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

————— **END OF TASK** —————

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TASK 29-32-00-730-803

4. Center Hydraulic System Reservoir Temperature Indicating System - System Test

A. General

- (1) This procedure does not do a test of the temperature indicating system for each hydraulic pump in the center system. The test of the temperature indicating system for each hydraulic pump is part of the operational test of that hydraulic pump. For the operational test of the hydraulic pumps in the center system, refer to these tasks:
 - (a) Air-driven pump (ADP) C1 or C2 (TASK 29-11-00-710-802)
 - (b) Alternating current motor pump (ACMP) C1 or C2 (TASK 29-11-00-710-803)

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-710-802	Air-Driven Pump (ADP) Assembly - Functional Test (P/B 501)
29-11-00-710-803	Center System Alternating Current Motor Pumps (ACMP) - Operational Test (P/B 501)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
144	Main Landing Gear Wheel Well, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 29-32-00-860-015

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

SUBTASK 29-32-00-480-001



WARNING

MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-32-00-010-003



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

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

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SUBTASK 29-32-00-210-003

- (4) (TASK 31-61-00-800-804)

SUBTASK 29-32-00-970-005

- (5) Make a record of the HYDRAULIC RESERVOIR TEMP C indication, which shows on the EICAS maintenance page.

NOTE: Refer to this indication as Value No. 3.

SUBTASK 29-32-00-860-016

- (6) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the OFF position (Figure 502).

NOTE: The left systems card file, P85, is in the main equipment center. Use the power control decal on the front of the card file to find the appropriate switch.

SUBTASK 29-32-00-020-003

- (7) Remove the electrical connector from the reservoir temperature transducer on the center system reservoir (Figure 501).

SUBTASK 29-32-00-860-017

- (8) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the ON position (Figure 502).

SUBTASK 29-32-00-210-004

- (9) Make sure the HYDRAULIC RESERVOIR TEMP C indication, on the EICAS maintenance page, is blank.

SUBTASK 29-32-00-860-018

- (10) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the OFF position (Figure 502).

SUBTASK 29-32-00-420-004

- (11) Install the electrical connector on the reservoir temperature transducer on the center system reservoir (Figure 501).

SUBTASK 29-32-00-860-019

- (12) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the ON position (Figure 502).

SUBTASK 29-32-00-970-006

- (13) Make sure the HYDRAULIC RESERVOIR TEMP C indication, on the EICAS maintenance page, is the same (± 1 °C) as the Value No. 3.

SUBTASK 29-32-00-410-002



OBEY THE REMOVAL PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (14) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

— END OF TASK —

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TASK 29-32-00-730-804

5. Left, Center and Right System Alternating Current Motor Pumps (ACMP) - Overheat Detection System Test

A. General

- (1) This test makes sure that the alternating current motor pumps (ACMP) and the indications related to the ACMP temperature switch and temperature transducer, in the left, right and center hydraulic systems, operate correctly.
- (2) The left and right hydraulic systems each have one alternating current motor pump (ACMP). The center hydraulic system has two ACMP's. You can use this procedure to do a test of each systems pump independently.

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)

C. Location Zones

Zone	Area
211	Flight Compartment, Left

D. Prepare for the Test

SUBTASK 29-32-00-860-021

- (1) Make sure all the PRIMARY and DEMAND hydraulic pump switches, on the hydraulic control panel, are in the off position (Figure 501).

SUBTASK 29-32-00-860-022

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

SUBTASK 29-32-00-610-001

- (3) To make sure the fluid level in the applicable (left, center 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 29-32-00-860-023

- (4) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

E. Left, Center and Right System Alternating Current Motor Pumps (ACMP) - Overheat Detection System Test

SUBTASK 29-32-00-210-005

- (1) Make sure applicable HYDRAULIC SYSTEM PRESS (L, C or R) indication, on the EICAS maintenance page, is 0 to 200 psi.

SUBTASK 29-32-00-210-006

- (2) Make sure the FAULT light below the applicable HYDRAULIC DEMAND L (R) or HYDRAULIC PRIMARY C1 (C2) ELEC switch, on the hydraulic control panel, is on.

SUBTASK 29-32-00-970-007

- (3) Make a record of the applicable HYDRAULIC DEMAND PUMP TEMP L (R) or HYDRAULIC PRIMARY PUMP TEMP C1 (C2) indication, on the EICAS maintenance page.

NOTE: Write this indication as Value No. 1.

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SUBTASK 29-32-00-860-024



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 BLANK 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 applicable HYDRAULIC DEMAND L (R) or HYDRAULIC PRIMARY C1 (C2) ELEC switch to the ON position.

SUBTASK 29-32-00-210-007

- (5) Make sure the applicable HYDRAULIC DEMAND PUMP PRESS L (R) or HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 29-32-00-760-001

- (6) Make sure the applicable messages do not show on the EICAS status page, for the applicable ACMP:
- (a) HYD TEMP IND DEM L and HYD PUMP DEM L
 - (b) HYD TEMP IND DEM R and HYD PUMP DEM R
 - (c) HYD TEMP IND PRI C1 and HYD PUMP PRI C1
 - (d) HYD TEMP IND PRI C2 and HYD PUMP PRI C2

SUBTASK 29-32-00-020-004

- (7) Remove the temperature switch connector from the applicable L, C or R ACMP:
- (a) DM29104B DEMAND pump ELEC L
 - (b) DM29204B DEMAND pump ELEC R
 - (c) DM29304B PRIMARY pump ELEC C1
 - (d) DM293114B PRIMARY pump ELEC C2

SUBTASK 29-32-00-760-002

- (8) Make sure the applicable message shows on the EICAS status page after 30 seconds:
- (a) HYD TEMP IND DEM L
 - (b) HYD TEMP IND DEM R
 - (c) HYD TEMP IND PRI C1
 - (d) HYD TEMP IND PRI C2

SUBTASK 29-32-00-800-001

- (9) Short pins 1, 2 & 3 together, inside the applicable connector.

SUBTASK 29-32-00-760-003

- (10) Make sure the applicable ACMP status message shows on the EICAS Status page:
- (a) HYD PUMP DEM L

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- (b) HYD PUMP DEM R
- (c) HYD PUMP PRI C1
- (d) HYD PUMP PRI C2

SUBTASK 29-32-00-800-002

- (11) Remove the short from pins 1,2 & 3 inside the applicable connector.

SUBTASK 29-32-00-760-004

- (12) Make sure the applicable message shows on the EICAS status page after 30 seconds:
- (a) HYD TEMP IND DEM L
 - (b) HYD TEMP IND DEM R
 - (c) HYD TEMP IND PRI C1
 - (d) HYD TEMP IND PRI C2

SUBTASK 29-32-00-760-005

- (13) Re-connect the temperature sensor switch connector.

SUBTASK 29-32-00-760-006

- (14) Make sure the applicable temperature sensor fault status message, does not show after 3 seconds:
- (a) HYD TEMP IND DEM L and HYD PUMP DEM L
 - (b) HYD TEMP IND DEM R and HYD PUMP DEM R
 - (c) HYD TEMP IND PRI C1 and HYD PUMP PRI C1
 - (d) HYD TEMP IND PRI C2 and HYD PUMP PRI C2

SUBTASK 29-32-00-970-008

- (15) Make sure the applicable HYDRAULIC DEMAND PUMP TEMP L (R) or HYDRAULIC PRIMARY TEMP C1 (C2) indication, on the EICAS maintenance page, shows higher than the indication recorded as Value No. 1.

NOTE: Make sure the applicable hydraulic pump operates for at least one minute before you record the temperature.

SUBTASK 29-32-00-210-008

- (16) Make sure the applicable HYDRAULIC SYSTEM PRESS L, C or R indication, on the EICAS maintenance page, is 2700 to 3200 psi.

SUBTASK 29-32-00-210-009

- (17) Make sure the FAULT light below the applicable HYDRAULIC DEMAND L (R) or HYDRAULIC PRIMARY C1 (C2) ELEC switch, on the hydraulic control panel, goes off.

SUBTASK 29-32-00-860-025

- (18) Set the applicable HYDRAULIC DEMAND L (R) or HYDRAULIC PRIMARY C1 (C2) ELEC switch to the OFF position.

SUBTASK 29-32-00-210-010

- (19) Make sure the FAULT light below the applicable HYDRAULIC DEMAND L (R) or HYDRAULIC PRIMARY C1 (C2) ELEC switch, on the hydraulic control panel, comes on.

SUBTASK 29-32-00-860-026

- (20) Let the internal leakage, in the hydraulic system, decrease the hydraulic pressure.

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SUBTASK 29-32-00-210-011

- (21) Make sure the applicable HYDRAULIC DEMAND PUMP PRESS L (R) or HYDRAULIC PRIMARY PUMP PRESS C1 (C2) indication, on the EICAS maintenance page, decreases to 0 to 200 psi.

———— **END OF TASK** ————

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RESERVOIR TEMPERATURE TRANSDUCER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) A removal of the reservoir temperature transducer
 - (2) An installation of the reservoir temperature transducer.
- B. There is one reservoir temperature transducer on the reservoir in each main hydraulic system. You can use this procedure to remove and install each reservoir temperature transducer (referred to as transducer [1] in this procedure).

TASK 29-32-01-000-801

2. Reservoir Temperature Transducer Removal

(Figure 401)

A. 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)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

C. Access Panels

Number	Name/Location
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

D. Prepare for the Removal

SUBTASK 29-32-01-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-32-01-010-001

- (2) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-32-01-010-002

- (3) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-32-01-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED IN ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-32-01-010-003



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-32-01-860-001

- (6) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-32-01-860-002

- (7) For the left hydraulic system, do the step which follows:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.
- NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-32-01-860-003

- (8) For the right hydraulic system, do the step which follows:
- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.
- NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-32-01-860-004

- (9) For the center hydraulic system, do the step which follows:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the OFF position.
- NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-32-01-680-001

- (10) To drain the fluid from the applicable reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

E. Reservoir Temperature Transducer Removal

SUBTASK 29-32-01-020-001

- (1) Disconnect the electrical connector [2] from the transducer [1].

SUBTASK 29-32-01-020-005

- (2) Install a cap on the electrical connector [2] to prevent contamination or damage.

SUBTASK 29-32-01-020-002

- (3) Remove the transducer [1] from the reservoir.

SUBTASK 29-32-01-020-003

- (4) Install a cap in the opening on the reservoir to prevent contamination.

SUBTASK 29-32-01-020-004

- (5) Remove and discard the packing [3] from the transducer [1].

————— **END OF TASK** —————

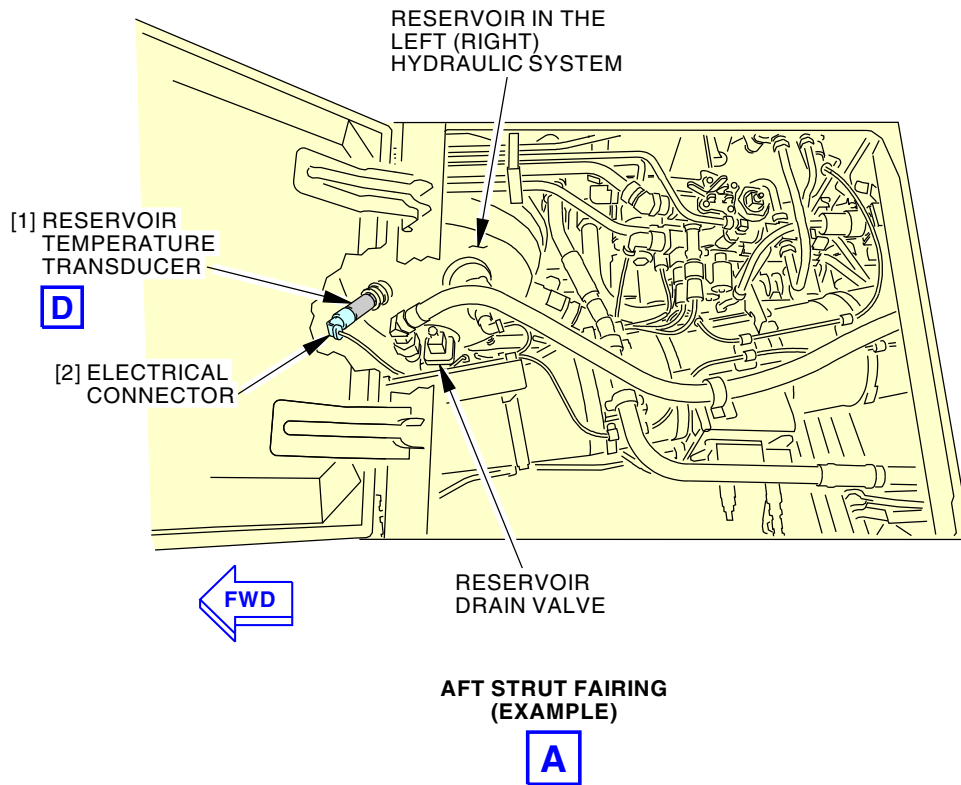
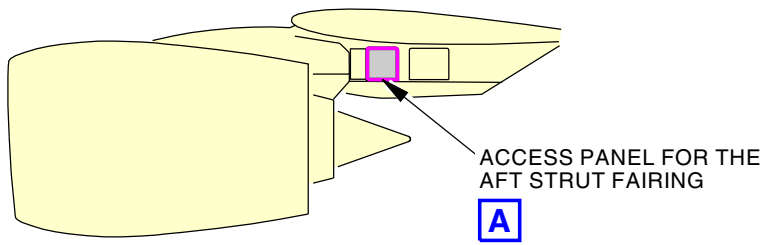
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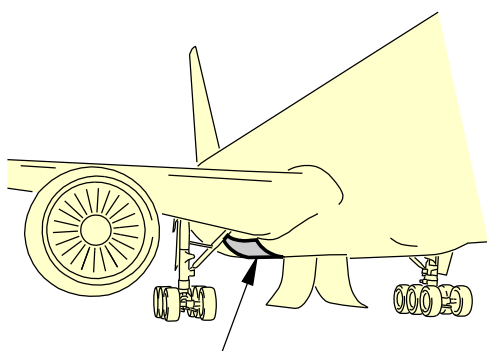
Reservoir Temperature Transducer Installation
Figure 401/29-32-01-990-801 (Sheet 1 of 3)

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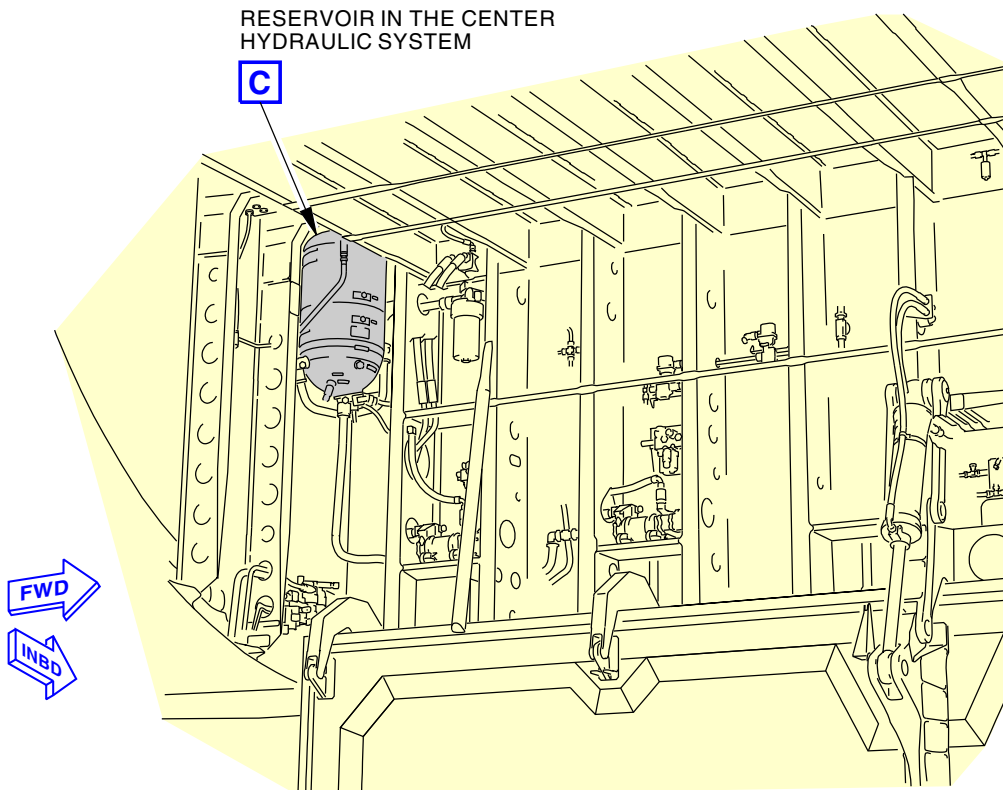


RIGHT WHEEL WELL

B

**RESERVOIR IN THE CENTER
HYDRAULIC SYSTEM**

C



RIGHT WHEEL WELL

B

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**Reservoir Temperature Transducer Installation
Figure 401/29-32-01-990-801 (Sheet 2 of 3)**

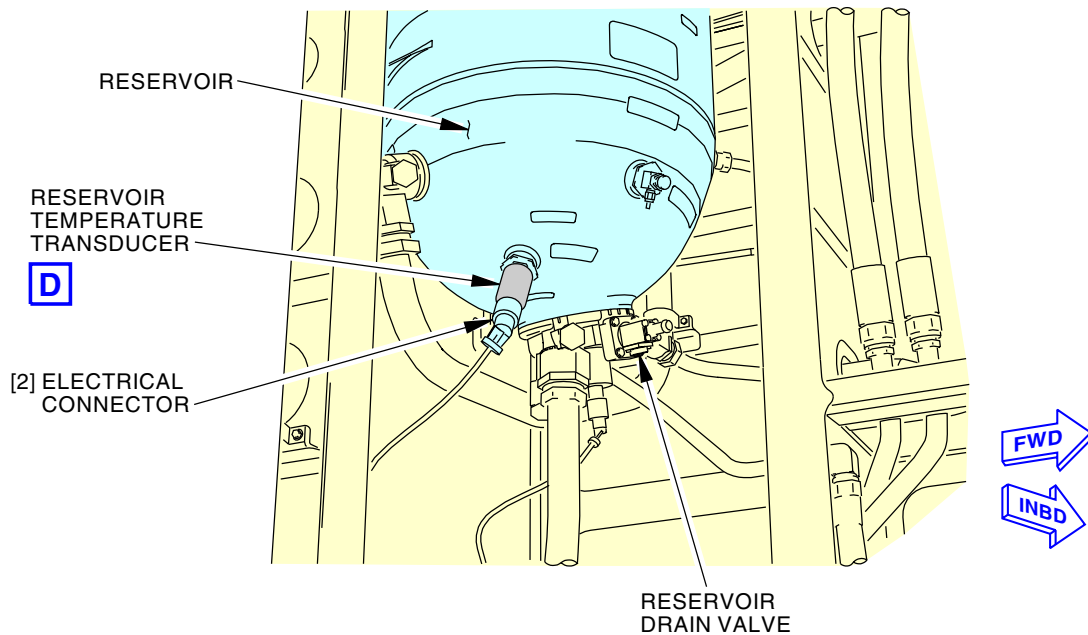
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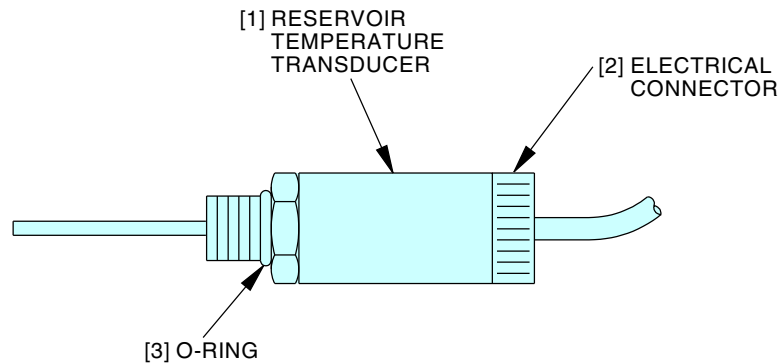
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RESERVOIR IN THE CENTER HYDRAULIC SYSTEM

C



**RESERVOIR TEMPERATURE TRANSDUCER
(EXAMPLE)**

D

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**Reservoir Temperature Transducer Installation
Figure 401/29-32-01-990-801 (Sheet 3 of 3)**

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TASK 29-32-01-400-801

3. Reservoir Temperature Transducer Installation

(Figure 401)

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-110-802	Clean Bare, Clad, or Plated Metal with Solvent (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	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.

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
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Transducer	29-32-01-01-020	ARO ALL
		29-32-01-05-010	ARO ALL
3	Packing	29-32-01-01-025	ARO ALL
		29-32-01-05-015	ARO ALL

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E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

F. Access Panels

Number	Name/Location
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

G. Reservoir Temperature Transducer Installation

SUBTASK 29-32-01-420-001

- (1) Remove the cap from the opening on the reservoir.

SUBTASK 29-32-01-110-001

- (2) Do the procedure which follows to clean the mating surfaces of the reservoir and the transducer [1]:
 - (a) Do this task: Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-22-110-802.

SUBTASK 29-32-01-640-001

- (3) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [3] and to the threads on the transducer [1].

SUBTASK 29-32-01-420-002

- (4) Install the new packing [3] on the transducer [1].

SUBTASK 29-32-01-420-003

- (5) Install the transducer [1] in its opening on the reservoir.

SUBTASK 29-32-01-420-005

- (6) Safety the transducer [1] with lockwire.

SUBTASK 29-32-01-760-001

- (7) Do a check of the electrical bonding between the reservoir and the transducer [1] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance across the electrical bond is 0.008 ohms.

SUBTASK 29-32-01-420-006

- (8) Remove the cap from the electrical connector [2].

SUBTASK 29-32-01-420-004

- (9) Install the electrical connector [2] on the transducer [1].

H. Reservoir Temperature Transducer Installation Test

SUBTASK 29-32-01-860-005

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

SUBTASK 29-32-01-860-006

- (2) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-32-01-860-007

- (3) For the right hydraulic system, do the step which follows:
- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-32-01-860-008

- (4) For the center hydraulic system, do the step which follows:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-32-01-610-001

- (5) For the applicable reservoir, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-32-01-860-009

- (6) For the applicable reservoir, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-32-01-790-001

- (7) Make sure there is no leakage of hydraulic fluid at the transducer [1].

SUBTASK 29-32-01-860-010

- (8) Do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

SUBTASK 29-32-01-210-001

- (9) Make sure the HYDRAULIC RESERVOIR TEMP (L, C, or R) indication, for the applicable system, on the EICAS maintenance display shows a value.

NOTE: It is not necessary to do a check of the precision of the
HYDRAULIC RESERVOIR TEMP (L, C, or R) value which shows.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-32-01-110-002



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To remove all hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-32-01-410-003



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

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SUBTASK 29-32-01-410-001

- (3) For the left hydraulic system, close this access panel:

<u>Number</u>	<u>Name/Location</u>
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-32-01-410-002

- (4) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-32-01-440-001

- (5) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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HYDRAULIC FLUID QUANTITY INDICATING SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has one task. This task is a system test of the hydraulic fluid quantity indicating system.
- B. This task makes sure that the reservoir fill selector valve and the reservoir quantity gage operate correctly. This task also makes sure that the quantity indications on the EICAS for LO (low), RF (refill), and OF (overfull) operate correctly.

TASK 29-33-00-730-801

2. Hydraulic Fluid Quantity Indicating System - System Test

A. **General**

- (1) This procedure is applicable to the left, right, and center hydraulic systems. Complete the procedure for one hydraulic system before you start the procedure for a different hydraulic system.

B. **References**

Reference	Title
12-12-01-610-804	Hydraulic Reservoir Filling - Pressure Procedure (P/B 301)
12-12-01-680-801	Hydraulic Reservoir Fluid Level Lowering or Draining (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)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. **Location Zones**

Zone	Area
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. **Access Panels**

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

E. **Prepare for the Test**

SUBTASK 29-33-00-860-001

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

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SUBTASK 29-33-00-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 29-33-00-010-001

- (3) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-33-00-010-002

- (4) For the right hydraulic system, do this step:

- (a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

and .

SUBTASK 29-33-00-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-33-00-010-004



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-33-00-010-003

- (7) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

SUBTASK 29-33-00-020-001

- (8) Disconnect the electrical connector from the temperature transducer on the reservoir in the applicable hydraulic system.

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F. Hydraulic Fluid Quantity Indicating System - System Test

SUBTASK 29-33-00-860-004

- (1) (TASK 31-61-00-800-804)

SUBTASK 29-33-00-680-001

- (2) Do these steps until the applicable HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page, shows 0.00 to 0.40:
- (a) Monitor the HYDRAULIC RESERVOIR QTY (L, C, or R) indication on the EICAS maintenance page.
 - (b) To slowly drain the fluid from the applicable reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

SUBTASK 29-33-00-210-001

- (3) Make sure the indication, LO, shows after the number in the applicable HYDRAULIC RESERVOIR QTY (L, C, or R) indication on the EICAS maintenance page.

SUBTASK 29-33-00-860-002

- (4) Set the handle of the reservoir fill selector valve to the position (LEFT, CTR, or RIGHT) for the applicable hydraulic system (Figure 501).

SUBTASK 29-33-00-210-002

- (5) Make sure the reservoir quantity gage shows approximately the same quantity as the HYDRAULIC RESERVOIR QTY (L, C, or R) indication on the EICAS maintenance page (Figure 501).

SUBTASK 29-33-00-610-001

- (6) Do these steps until the applicable HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page, shows 0.42 to 0.73:
- (a) Monitor the HYDRAULIC RESERVOIR QTY (L, C, or R) indication on the EICAS maintenance page.
 - (b) To slowly add fluid to the applicable reservoir, do this task: Hydraulic Reservoir Filling - Pressure Procedure, TASK 12-12-01-610-804.

SUBTASK 29-33-00-210-003

- (7) Make sure the indication, RF, shows after the number in the applicable HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page.

SUBTASK 29-33-00-210-008

- (8) Make sure the reservoir quantity gage shows approximately the same quantity as the HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page (Figure 501).

SUBTASK 29-33-00-610-002

- (9) Do these steps until the lower sight glass on the applicable reservoir changes from red to dark (Figure 502):

NOTE: When the sight glass is dark, the fluid level is above the sight glass.

- (a) Monitor the lower sight glass on the applicable reservoir.
- (b) To slowly add fluid to the applicable reservoir, do this task: Hydraulic Reservoir Filling - Pressure Procedure, TASK 12-12-01-610-804.

SUBTASK 29-33-00-210-004

- (10) Make sure the HYDRAULIC RESERVOIR QTY (L, C, or R) indication on the EICAS maintenance page shows 0.76 to 1.19.

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SUBTASK 29-33-00-210-009

- (11) Make sure the reservoir quantity gage shows approximately the same quantity as the HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page (Figure 501).

SUBTASK 29-33-00-610-003

- (12) Do these steps until the reservoir quantity gage shows at least 1.20:
 - (a) Monitor the reservoir quantity gage.
 - (b) To slowly add fluid to the applicable reservoir, do this task: Hydraulic Reservoir Filling - Pressure Procedure, TASK 12-12-01-610-804.

SUBTASK 29-33-00-210-005

- (13) Make sure the applicable HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page, shows at least 1.20.

SUBTASK 29-33-00-210-006

- (14) Make sure the indication, OF, shows after the number in the HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page.

SUBTASK 29-33-00-210-010

- (15) Make sure the upper sight glass on the applicable reservoir is dark.
NOTE: When the sight glass is dark, the fluid level is above the sight glass.

SUBTASK 29-33-00-610-004

- (16) Do these steps until the lower sight glass on the applicable reservoir changes from dark to red:
NOTE: When the sight glass is red, the fluid level is below the sight glass.
 - (a) Monitor the lower sight glass on the applicable reservoir.
 - (b) To slowly lower the fluid level in the applicable reservoir, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

SUBTASK 29-33-00-210-007

- (17) Make sure the HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page, shows 0.76 to 1.19.

SUBTASK 29-33-00-210-011

- (18) Make sure the reservoir quantity gage shows approximately the same quantity as the HYDRAULIC RESERVOIR QTY (L, C, or R) indication, on the EICAS maintenance page (Figure 501).

SUBTASK 29-33-00-610-005

- (19) Do one of these steps to set the reservoir fluid level at the F (full) mark on the reservoir quantity gage (Figure 501):
 - (a) If the reservoir fluid level is below the F (full) mark on the reservoir quantity gage, do this task: Hydraulic Reservoir Filling - Pressure Procedure, TASK 12-12-01-610-804.
 - (b) If the reservoir fluid level is above the F (full) mark on the reservoir quantity gage, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

SUBTASK 29-33-00-860-003

- (20) Set the handle of the reservoir fill selector valve to the OFF position (Figure 501).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-33-00-420-001

- (1) Connect the electrical connector to the temperature transducer on the reservoir in the applicable hydraulic system.

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SUBTASK 29-33-00-410-001

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

SUBTASK 29-33-00-410-002

- (3) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434CL	Left Forward Access Door, Left Strut Aft Fairing
434CR	Right Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-33-00-410-003

- (4) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444CL	Left Forward Access Door, Right Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-33-00-440-001

- (5) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

SUBTASK 29-33-00-410-004



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

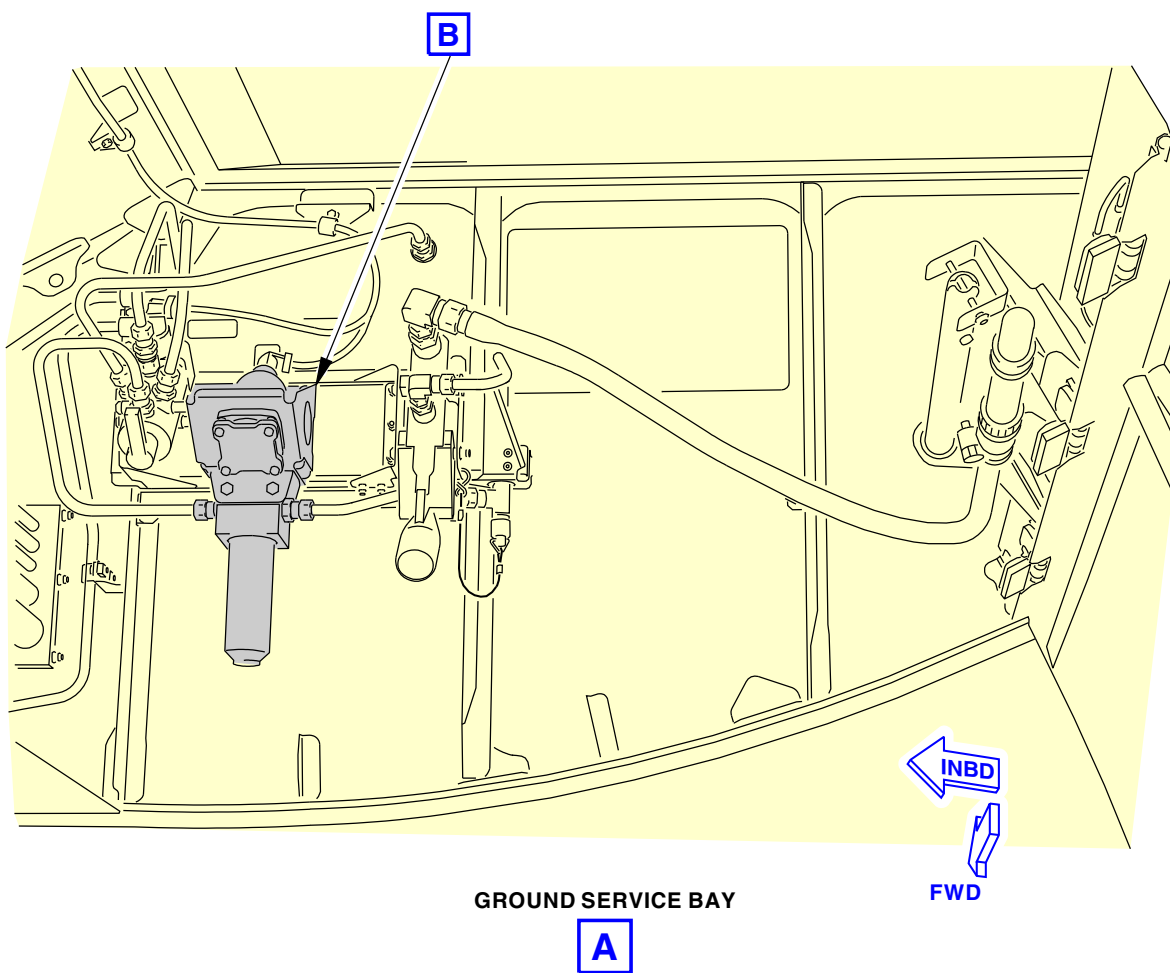
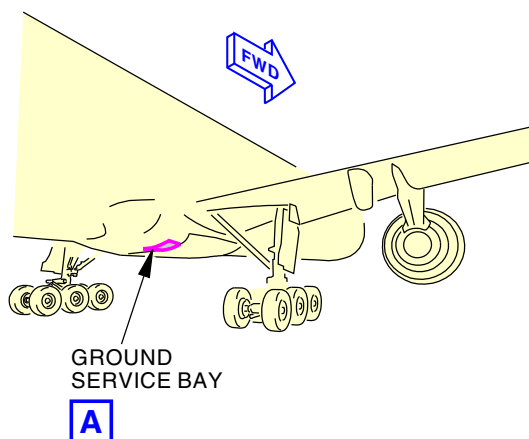
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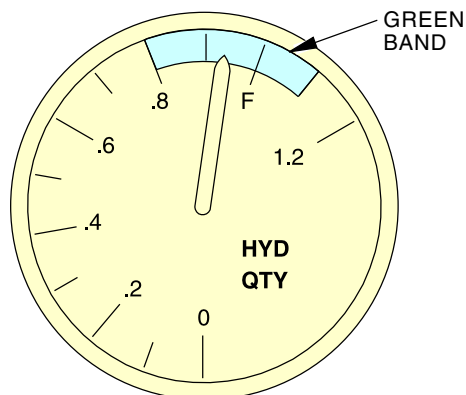
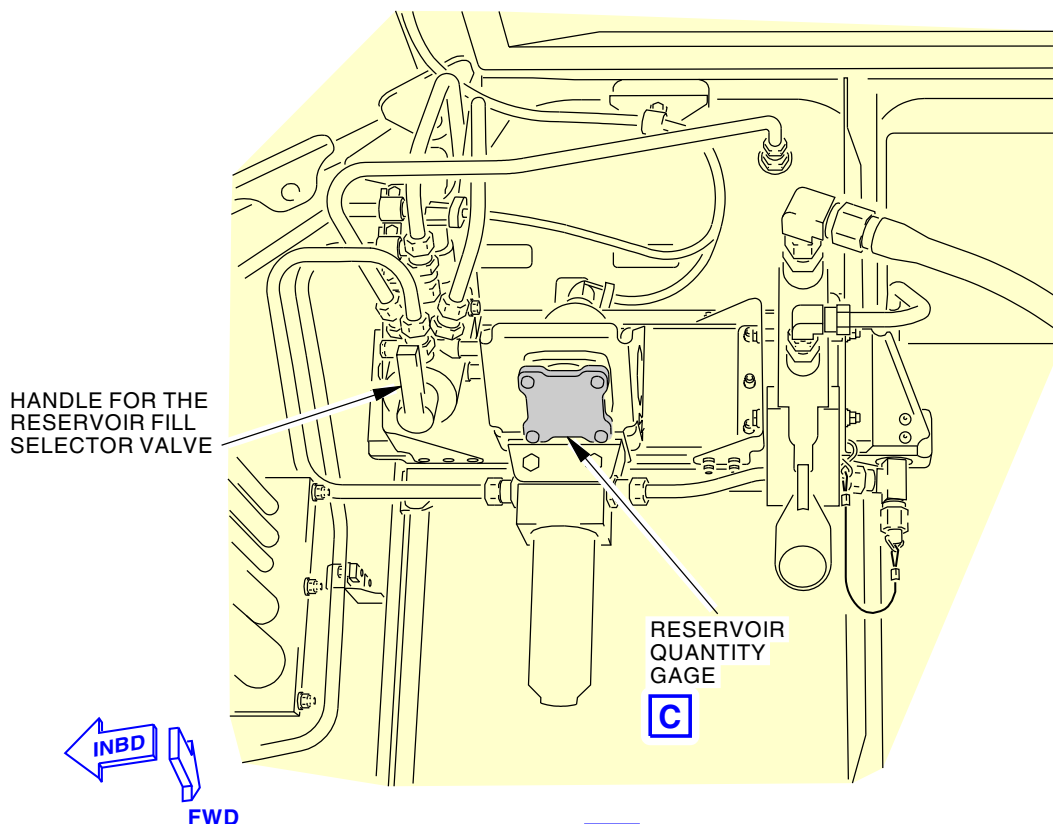
**Hydraulic Ground Service Bay
Figure 501/29-33-00-990-801 (Sheet 1 of 2)**

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RESERVOIR QUANTITY GAGE

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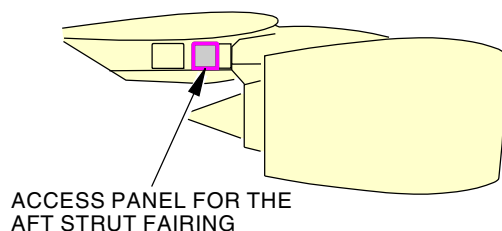
**Hydraulic Ground Service Bay
Figure 501/29-33-00-990-801 (Sheet 2 of 2)**

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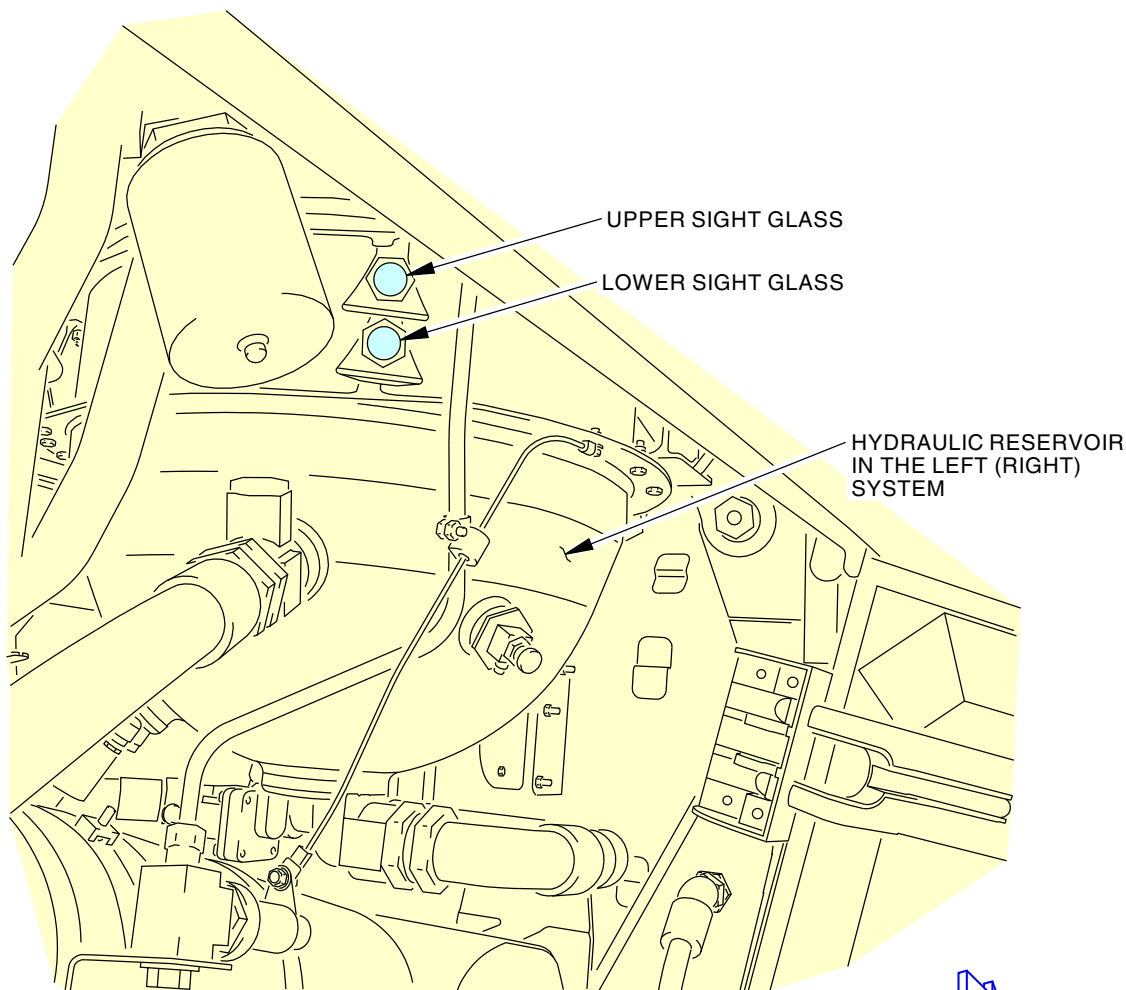
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A



**AFT STRUT FAIRING
(EXAMPLE)**

A



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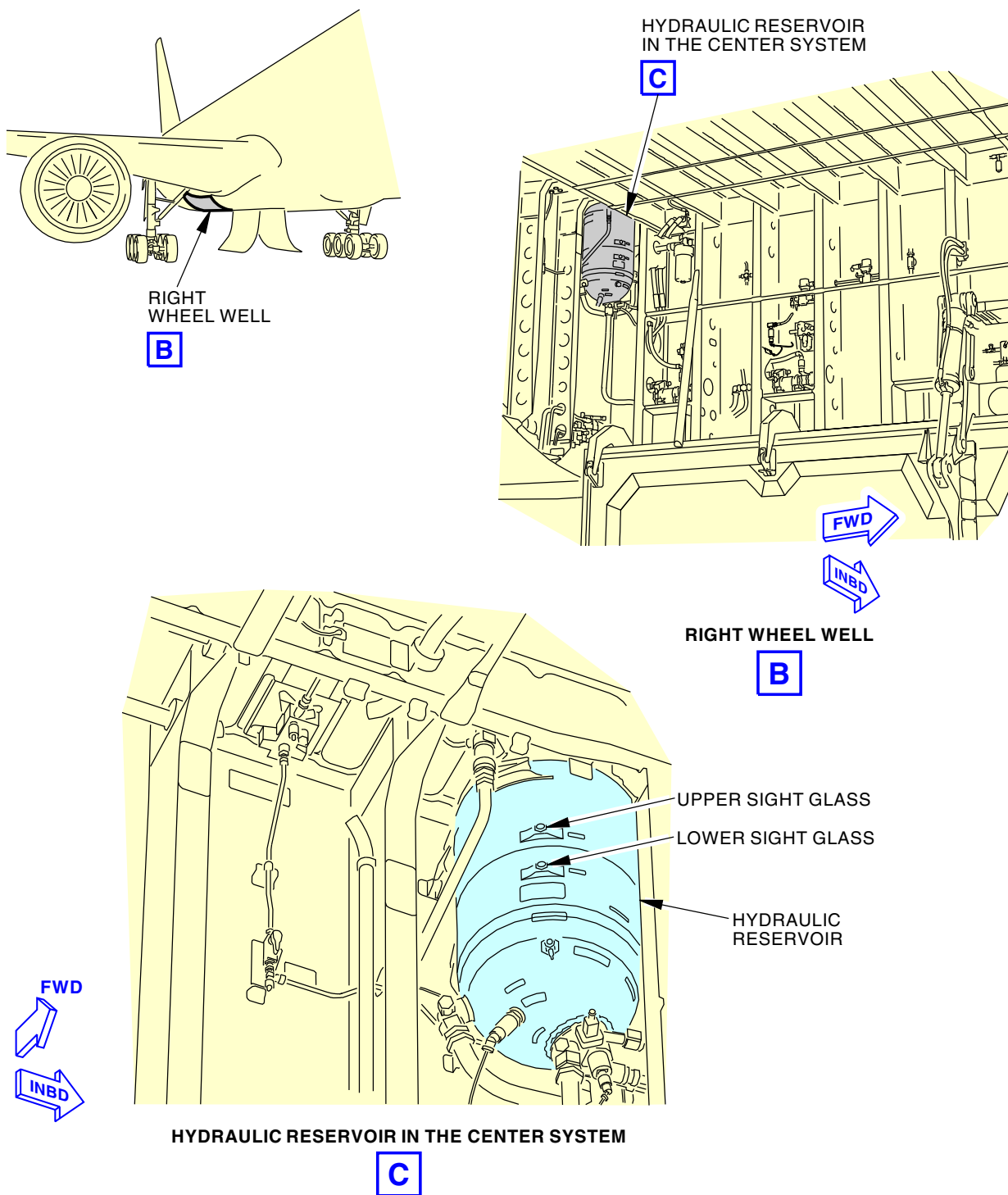
Hydraulic Reservoir Sight Glasses
Figure 502/29-33-00-990-802 (Sheet 1 of 2)

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Hydraulic Reservoir Sight Glasses
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RESERVOIR QUANTITY TRANSMITTER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the reservoir quantity transmitter
- (2) An installation of the reservoir quantity transmitter.

TASK 29-33-02-000-801

2. Reservoir Quantity Transmitter Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)
STD-1140	Hose - Flexible, 1/2 Inch ID, BMS 3-11 Resistant, 10 Foot

C. **Location Zones**

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

D. **Access Panels**

Number	Name/Location
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

E. **Prepare for the Removal**

SUBTASK 29-33-02-040-001



DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) For the left or right hydraulic system, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 29-33-02-010-001

- (2) For the left hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-33-02-010-002

- (3) For the right hydraulic system, open these access panels:

<u>Number</u>	<u>Name/Location</u>
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-33-02-480-001



MAKE SURE THE DOWNLOCK PINS ARE INSTALLED IN ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, if the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801

SUBTASK 29-33-02-010-003



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801

SUBTASK 29-33-02-860-009

- (6) Do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 29-33-02-860-001

- (7) For the left hydraulic system, do the step which follows:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the OFF position.
- NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-33-02-860-002

- (8) For the right hydraulic system, do the step which follows:
- (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the OFF position.
- NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-33-02-860-003

- (9) For the center hydraulic system, do the step which follows:
- (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the OFF position.
- NOTE: The left systems card file, P85, is in the main equipment center.

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SUBTASK 29-33-02-480-002



DO NOT GET HYDRAULIC FLUID IN YOUR EYES OR ON YOUR SKIN. HYDRAULIC FLUID CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU GET THE HYDRAULIC FLUID IN YOUR MOUTH, GET MEDICAL AID.

- (10) Push the ten foot hose (1/2 inch ID), STD-1140 on the outlet of the reservoir drain valve [2].

SUBTASK 29-33-02-480-003

- (11) Put the opposite end of the ten foot hose (1/2 inch ID), STD-1140 into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110 for the hydraulic fluid.

SUBTASK 29-33-02-680-001



DO NOT CLOSE THE RESERVOIR DRAIN VALVE [2] UNTIL YOU REPLACE THE RESERVOIR QUANTITY TRANSMITTER [3]. IF YOU CLOSE THE RESERVOIR DRAIN VALVE [2], THE FLUID CAN COLLECT IN THE RESERVOIR [1] AND FLOW ON YOU WHEN YOU REMOVE THE RESERVOIR QUANTITY TRANSMITTER [3].

- (12) Open the reservoir drain valve [2] to drain the hydraulic fluid into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110.

F. Reservoir Quantity Transmitter Removal

SUBTASK 29-33-02-020-001

- (1) Disconnect the electrical connector [4] from the transmitter [3].

SUBTASK 29-33-02-020-006

- (2) Install a cap on the electrical connector [4] to prevent contamination or damage.

SUBTASK 29-33-02-020-002

- (3) Remove the bolts [5] and washers [6] from the transmitter [3].

SUBTASK 29-33-02-020-003



BE CAREFUL WHEN YOU REMOVE THE TRANSMITTER [3]. IF YOU DO NOT DO THIS, YOU CAN CAUSE DAMAGE TO THE TRANSMITTER [3] OR THE HYDRAULIC RESERVOIR [1].

- (4) Remove the transmitter [3] from the reservoir [1].

SUBTASK 29-33-02-020-004

- (5) Install a cap in the opening on the reservoir [1] to prevent contamination.

SUBTASK 29-33-02-020-005

- (6) Remove the packing [7] from the transmitter [3].

————— **END OF TASK** —————

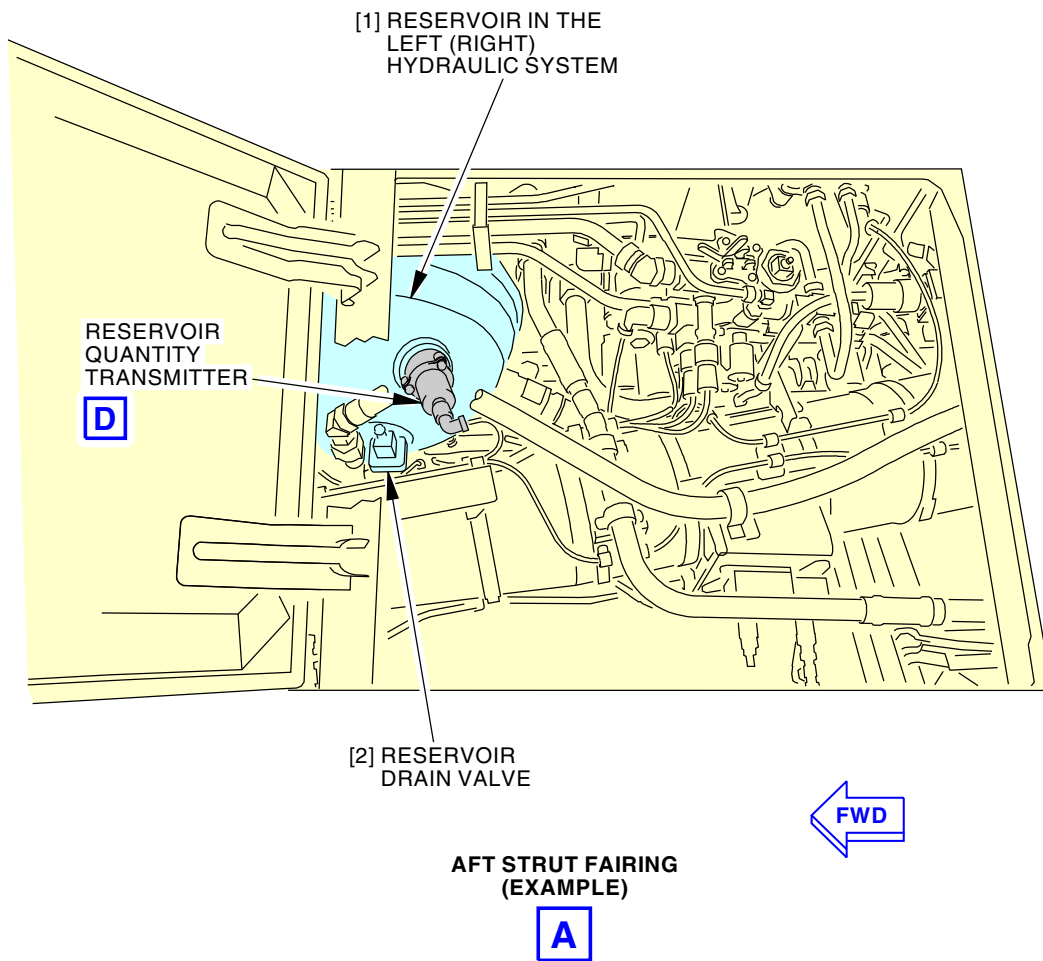
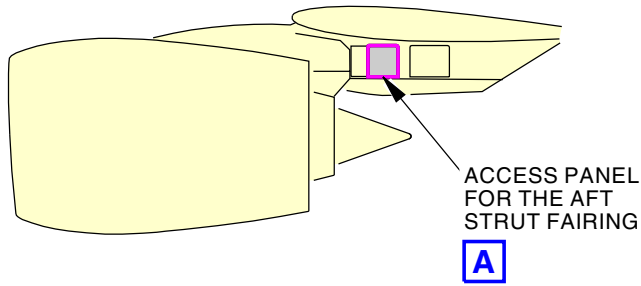
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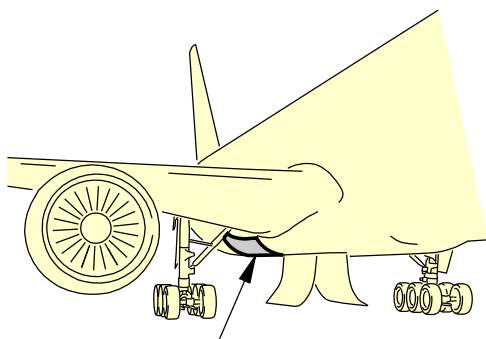
Reservoir Quantity Transmitter Installation
Figure 401/29-33-02-990-801 (Sheet 1 of 3)

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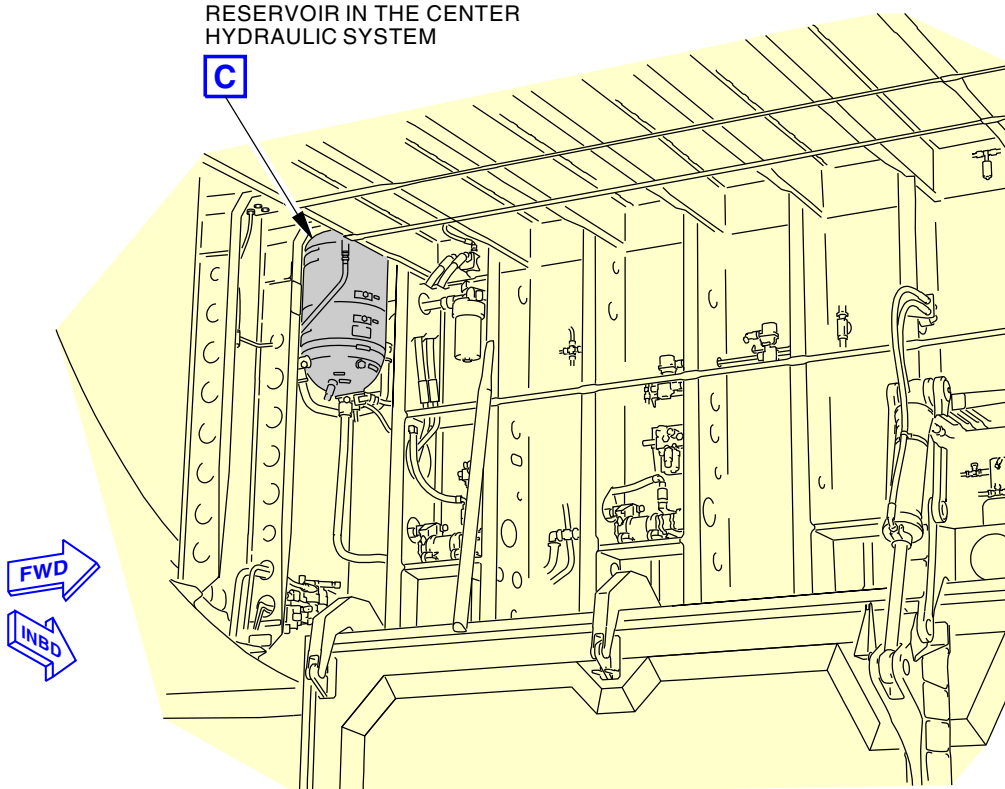


RIGHT WHEEL WELL

B

RESERVOIR IN THE CENTER
HYDRAULIC SYSTEM

C



RIGHT WHEEL WELL

B

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**Reservoir Quantity Transmitter Installation
Figure 401/29-33-02-990-801 (Sheet 2 of 3)**

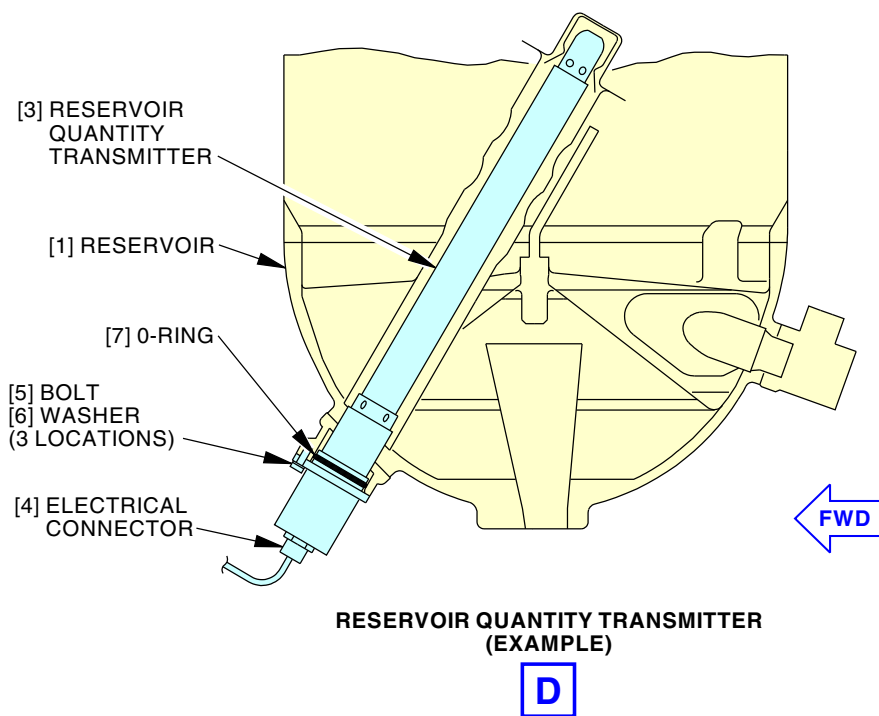
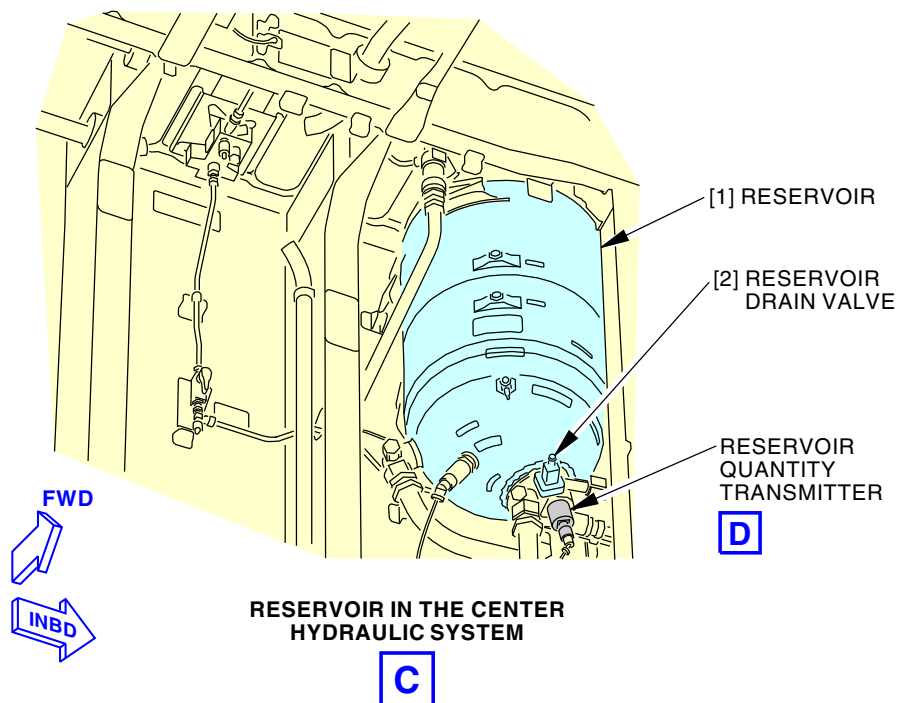
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**Reservoir Quantity Transmitter Installation
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TASK 29-33-02-400-801

3. Reservoir Quantity Transmitter Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-12-01-610-802	Hydraulic Reservoir Filling (P/B 301)
12-25-01-100-801	Clean (Wet Wash) the External Surfaces of the Airplane (P/B 301)
20-10-22-110-802	Clean Bare, Clad, or Plated Metal with Solvent (P/B 701)
24-22-00-860-805	Supply Electrical Power (P/B 201)
29-11-00-860-806	Main Hydraulic System Reservoirs Pressurization with an External Air Source (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	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.

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
STD-1140	Hose - Flexible, 1/2 Inch ID, BMS 3-11 Resistant, 10 Foot

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Transmitter	29-33-02-01-015	ARO ALL
		29-33-02-05-015	ARO ALL
7	Packing	29-33-02-01-020	ARO ALL

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AMM Item	Description	AIPC Reference	AIPC Effectivity
7 (cont.)		29-33-02-05-020	ARO ALL

E. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

F. Access Panels

Number	Name/Location
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

G. Reservoir Quantity Transmitter Installation

SUBTASK 29-33-02-420-001

- (1) Remove the cap from the opening on the reservoir [1].

SUBTASK 29-33-02-110-001

- (2) For the mating surfaces of the reservoir [1] and the transmitter [3], do this task: Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-22-110-802.

SUBTASK 29-33-02-640-001

- (3) Apply MCS 352B fluid, D00054, or hydraulic fluid, D50269, or hydraulic fluid, D00153, to the new packing [7].

SUBTASK 29-33-02-420-002

- (4) Install the new packing [7] on the transmitter [3].

SUBTASK 29-33-02-420-003



BE CAREFUL WHEN YOU INSTALL THE TRANSMITTER [3]. IF YOU ARE NOT CAREFUL, YOU CAN CAUSE DAMAGE TO THE TRANSMITTER [3] OR THE RESERVOIR [1].

- (5) Put the transmitter [3] into the opening in the reservoir [1].

SUBTASK 29-33-02-420-004

- (6) Install the bolts [5] and washers [6].

SUBTASK 29-33-02-420-005

- (7) Tighten the bolts [5] to 26 to 30 pound-inches.

SUBTASK 29-33-02-420-006

- (8) Safety the bolts [5] with a lockwire.

SUBTASK 29-33-02-760-001

- (9) Do a check of the electrical bond between the reservoir [1] and the transmitter [3] with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: The maximum resistance between the reservoir [1] and the transmitter [3] is 0.008 ohms.

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SUBTASK 29-33-02-420-009

- (10) Remove the cap from the electrical connector [4].

SUBTASK 29-33-02-420-007

- (11) Connect the electrical connector [4] to the transmitter [3].

SUBTASK 29-33-02-410-001

- (12) Close the reservoir drain valve [2] on the reservoir [1].

SUBTASK 29-33-02-080-001

- (13) Remove the ten foot hose (1/2 inch ID), STD-1140 from the reservoir drain valve [2].

SUBTASK 29-33-02-420-008

- (14) Safety the reservoir drain valve [2] with a lockwire.

H. Reservoir Quantity Transmitter Installation Test

SUBTASK 29-33-02-860-004

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

SUBTASK 29-33-02-860-005

- (2) For the left hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM L card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-33-02-860-006

- (3) For the right hydraulic system, do the step which follows:
 - (a) On the front of the right systems card file, P84, set the applicable power switch for the HYDIM R card to the ON position.

NOTE: The right systems card file, P84, is in the main equipment center.

SUBTASK 29-33-02-860-007

- (4) For the center hydraulic system, do the step which follows:
 - (a) On the front of the left systems card file, P85, set the applicable power switch for the HYDIM C card to the ON position.

NOTE: The left systems card file, P85, is in the main equipment center.

SUBTASK 29-33-02-610-001

- (5) For the applicable reservoir, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 29-33-02-210-001

- (6) Make sure the indicator for the reservoir quantity, in the ground service bay, shows a change when you add fluid to the applicable reservoir.

NOTE: It is not necessary to do a check of the precision of the quantity value which shows.

SUBTASK 29-33-02-860-008

- (7) For the applicable reservoir, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.

SUBTASK 29-33-02-790-001

- (8) Make sure there is no leakage of hydraulic fluid at the transmitter [3].

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-33-02-110-002



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (1) To remove all the hydraulic fluid from the installation area, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 29-33-02-410-002

- (2) For the left hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
434BL	Left Access Panel, Left Strut Aft Fairing
434CL	Left Forward Access Door, Left Strut Aft Fairing

SUBTASK 29-33-02-410-003

- (3) For the right hydraulic system, close these access panels:

<u>Number</u>	<u>Name/Location</u>
444BL	Left Access Panel, Right Strut Aft Fairing
444CL	Left Forward Access Door, Right Strut Aft Fairing

SUBTASK 29-33-02-410-004



OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) For the center hydraulic system, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 29-33-02-440-001

- (5) For the left or right hydraulic system, do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

————— **END OF TASK** —————

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