

CHAPTER

12

SERVICING



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12-EFFECTIVE PAGES			12-11-01 (cont)			12-11-02 (cont)		
1 thru 9	SEP 05/2018		319	Sep 05/2017		304	Sep 05/2015	
10	BLANK		320	Sep 05/2017		305	Sep 05/2015	
12-CONTENTS			321	Sep 05/2017		306	Jan 05/2017	
1	Sep 05/2017		322	Sep 05/2017		307	Jan 05/2017	
2	Jul 25/2018		323	Sep 05/2017		308	Jul 25/2018	
3	Sep 05/2017		324	Sep 05/2017		309	Jul 25/2018	
4	Sep 05/2017		325	Sep 05/2017		310	Sep 05/2015	
5	Sep 05/2017		326	Sep 05/2017		12-12-01		
6	Sep 05/2017		327	Sep 05/2017		301	Jan 05/2015	
7	Sep 05/2017		328	Sep 05/2017		302	Jan 05/2015	
8	Sep 05/2017		329	Sep 05/2017		303	Sep 05/2017	
9	Jan 05/2018		330	Sep 05/2017		304	Sep 05/2017	
10	May 05/2018		331	Sep 05/2017		305	Sep 05/2017	
11	Jul 25/2018		332	Sep 05/2017		306	Sep 05/2017	
12	Sep 05/2017		333	Sep 05/2017		307	Sep 05/2017	
13	May 05/2017		334	Sep 05/2017		308	Sep 05/2017	
14	BLANK		335	Jan 05/2018		309	Sep 05/2017	
12-11-01			336	Jan 05/2018		310	Sep 05/2017	
301	Jan 05/2015		337	Jan 05/2018		311	Sep 05/2017	
302	Sep 05/2017		338	Sep 05/2017		312	Sep 05/2017	
303	Sep 05/2017		339	Sep 05/2017		313	Sep 05/2017	
304	Sep 05/2017		340	Sep 05/2017		314	Sep 05/2017	
305	Sep 05/2017		341	Sep 05/2017		315	Sep 05/2017	
306	Sep 05/2017		342	Sep 05/2017		316	Jul 25/2018	
307	Sep 05/2017		343	Sep 05/2017		317	Sep 05/2017	
308	Sep 05/2017		344	Sep 05/2017		318	Sep 05/2017	
309	Sep 05/2017		345	Sep 05/2017		319	Jul 25/2018	
310	Sep 05/2017		346	Sep 05/2017		320	Jul 25/2018	
311	Sep 05/2017		347	Sep 05/2017		321	Jul 25/2018	
312	Sep 05/2017		348	Sep 05/2017		322	Jul 25/2018	
313	Sep 05/2017		349	Sep 05/2017		323	Jul 25/2018	
314	Sep 05/2017		350	BLANK		324	Jul 25/2018	
315	Sep 05/2017		12-11-02			325	Jul 25/2018	
316	Sep 05/2017		301	Jan 05/2015		326	Jul 25/2018	
317	Sep 05/2017		302	Sep 05/2015				
318	Sep 05/2017		303	Sep 05/2015				

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12-12-02 Config 4			12-13-05			12-13-08 (cont)		
301	Jul 25/2018		301	Jul 25/2018		308	Sep 05/2017	
302	Jul 25/2018		302	Jul 25/2018		309	Sep 05/2017	
303	Jul 25/2018		303	Jul 25/2018		310	Sep 05/2017	
304	Jul 25/2018		304	Jan 05/2017		311	Sep 05/2017	
305	Jul 25/2018		305	Jan 05/2017		312	Sep 05/2017	
306	BLANK		306	BLANK		313	Sep 05/2017	
12-12-03			12-13-06			314	Sep 05/2017	
301	Sep 05/2017		301	May 05/2016		12-13-09		
302	Sep 05/2017		302	Jan 05/2018		301	Sep 05/2017	
303	Jan 05/2017		303	Sep 05/2017		302	Sep 05/2017	
304	BLANK		304	Sep 05/2017		303	Sep 05/2017	
12-13-01 Config 2			305	Sep 05/2017		304	Jan 05/2017	
301	May 05/2018		306	BLANK		305	Jan 05/2017	
302	May 05/2018		12-13-07			306	May 05/2016	
303	May 05/2018		301	Sep 05/2017		307	Sep 05/2017	
304	May 05/2018		302	Sep 05/2017		308	Sep 05/2017	
305	May 05/2018		303	Sep 05/2017		309	Sep 05/2017	
306	May 05/2018		304	Sep 05/2017		310	Jan 05/2017	
307	Sep 05/2017		305	May 05/2017		311	Jan 05/2017	
308	BLANK		306	Sep 05/2017		312	Jan 05/2017	
12-13-03			307	Sep 05/2017		313	Jan 05/2017	
301	Sep 05/2017		308	Sep 05/2017		314	Jan 05/2017	
302	Sep 05/2017		309	Sep 05/2017		315	Jan 05/2017	
303	Sep 05/2017		310	Jul 25/2018		316	Jan 05/2017	
304	Jul 25/2018		311	May 05/2017		317	Jan 05/2017	
305	Sep 05/2017		312	Sep 05/2017		318	BLANK	
306	Sep 05/2017		313	Sep 05/2017		12-14-01		
12-13-04			314	BLANK		301	Jul 25/2018	
301	May 05/2017		12-13-08			302	Jul 25/2018	
302	May 05/2017		301	Sep 05/2017		303	Jul 25/2018	
303	Jan 05/2017		302	Sep 05/2017		304	Jul 25/2018	
304	Sep 05/2017		303	Sep 05/2017		305	Jul 25/2018	C
305	May 05/2017		304	Sep 05/2017		306	Jul 25/2018	
306	Sep 05/2017		305	Sep 05/2017		307	Jan 05/2017	
			306	Sep 05/2017		308	Jul 25/2018	
			307	Sep 05/2017		309	Jan 05/2017	

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12-14-01 (cont)			12-15-02 Config 2 (cont)			12-15-04 (cont)		
310	Jul 25/2018		312	Jan 05/2018		306	Sep 05/2017	
311	Jul 25/2018		313	Jan 05/2018		307	Sep 05/2017	
312	Jul 25/2018		314	May 05/2018		308	Sep 05/2017	
313	Jul 25/2018		315	Jan 05/2018		12-15-08		
314	Jul 25/2018		316	Jan 05/2018		301	Sep 05/2017	
315	Jul 25/2018		317	Jan 05/2018		302	Sep 05/2017	
316	Jul 25/2018		318	Jan 05/2018		303	Jan 05/2018	
317	Sep 05/2017		319	Jan 05/2018		304	Jan 05/2018	
318	Sep 05/2017		R 320	Sep 05/2018		305	Jan 05/2018	
12-15-01			R 321	Sep 05/2018		306	Sep 05/2017	
301	Jul 25/2018		322	BLANK		307	Sep 05/2017	
302	Jul 25/2018		12-15-03			308	Sep 05/2017	
303	Jul 25/2018		301	Sep 05/2017		309	Sep 05/2017	
304	Jul 25/2018		302	Sep 05/2017		310	Sep 05/2017	
305	Sep 05/2017		303	May 05/2017		311	Sep 05/2017	
306	Sep 05/2017		304	May 05/2018		312	Sep 05/2017	
307	Sep 05/2017		305	May 05/2017		313	Sep 05/2017	
308	Sep 05/2017		306	Sep 05/2017		314	Sep 05/2017	
309	Jul 25/2018		307	Jul 25/2018		315	Sep 05/2017	
310	Jul 25/2018		308	Sep 05/2017		316	Sep 05/2017	
311	Jul 25/2018		309	Sep 05/2017		317	Sep 05/2017	
312	Jul 25/2018		310	Sep 05/2017		318	Jul 25/2018	
313	Jan 05/2018		311	Jul 25/2018		319	Sep 05/2017	
314	Jul 25/2018		312	Sep 05/2017		320	Jan 05/2018	
12-15-02 Config 2			313	Sep 05/2017		321	Sep 05/2017	
301	May 05/2015		314	Sep 05/2017		322	Sep 05/2017	
302	Sep 05/2017		315	May 05/2017		323	Sep 05/2017	
303	Sep 05/2017		316	Sep 05/2017		324	BLANK	
304	May 05/2017		317	Sep 05/2017		12-15-09		
305	Jan 05/2017		318	BLANK		301	Sep 05/2017	
306	Jan 05/2017		12-15-04			302	Sep 05/2017	
307	Sep 05/2016		301	Sep 05/2017		303	May 05/2017	
308	Jan 05/2017		302	Sep 05/2017		304	Sep 05/2017	
309	Jan 05/2017		303	Sep 05/2017		305	May 05/2017	
310	May 05/2017		304	Sep 05/2017		306	Sep 05/2017	
311	Jan 05/2018		305	Sep 05/2017		307	Sep 05/2017	

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12-15-09 (cont)			12-17-01 (cont)			12-21-05		
308	Sep 05/2017		303	Sep 05/2017		301	May 05/2017	
12-15-10 Config 2			304	Sep 05/2017		302	Jan 05/2018	
301	Sep 05/2017		305	May 05/2017		303	Sep 05/2017	
302	May 05/2017		306	BLANK		304	Sep 05/2017	
303	Jan 05/2017		12-21-00			305	Jan 05/2018	
304	May 05/2017		301	Sep 05/2017		306	May 05/2018	
305	Jan 05/2017		302	Sep 05/2017		307	Sep 05/2017	
306	May 05/2017		303	Sep 05/2017		308	BLANK	
R 307	Sep 05/2018		304	Sep 05/2017		12-21-06		
308	Sep 05/2017		305	Sep 05/2017		301	Jul 25/2018	
309	Sep 05/2017		306	Sep 05/2017		302	Jul 25/2018	
310	Jan 05/2015		307	Sep 05/2017		303	Sep 05/2017	
12-15-11			308	Sep 05/2017		304	Sep 05/2017	
301	May 05/2016		309	Sep 05/2017		305	Jan 05/2017	
302	Jan 05/2015		310	Sep 05/2017		306	Jan 05/2017	
12-16-02			311	Sep 05/2017		307	Jul 25/2018	
301	Sep 05/2017		312	BLANK		308	Jul 25/2018	
302	Sep 05/2017		12-21-04			309	Sep 05/2017	
303	Sep 05/2017		301	Jul 25/2018		310	Jan 05/2017	
304	Sep 05/2017		302	Jul 25/2018		311	Jan 05/2017	
305	Jul 25/2018		303	Sep 05/2017		312	BLANK	
306	Sep 05/2017		304	Sep 05/2017		12-21-07		
307	Sep 05/2017		305	Sep 05/2017		301	Sep 05/2017	
308	Sep 05/2017		306	Sep 05/2017		302	Sep 05/2017	
309	Sep 05/2017		307	May 05/2017		303	Sep 05/2017	
310	Sep 05/2017		308	Jan 05/2017		304	Sep 05/2017	
311	Sep 05/2017		309	Jan 05/2017		305	Jan 05/2017	
312	BLANK		310	Jul 25/2018		306	Sep 05/2017	
12-16-03			311	Jul 25/2018		307	Sep 05/2017	
301	Jan 05/2017		312	Sep 05/2017		308	Sep 05/2017	
302	Sep 05/2017		313	Sep 05/2017		309	Sep 05/2017	
303	Sep 05/2017		314	Sep 05/2017		310	Jan 05/2017	
304	BLANK		315	Sep 05/2017		311	Jan 05/2017	
12-17-01			316	Jan 05/2017		312	Sep 05/2017	
301	May 05/2017					313	Sep 05/2017	
302	Sep 05/2017					314	Sep 05/2017	

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12-21-07 (cont)			12-21-08 (cont)			12-21-09 (cont)		
315	Jan 05/2017		328	May 05/2016		303	Sep 05/2017	
316	Sep 05/2017		329	Jan 05/2017		304	Sep 05/2017	
317	Sep 05/2017		330	Jan 05/2017		305	Jan 05/2017	
318	Sep 05/2017		331	Jan 05/2017		306	Jan 05/2017	
319	Sep 05/2017		332	Jan 05/2017		307	Jul 25/2018	
320	Jan 05/2017		333	Jan 05/2018		308	May 05/2018	
321	Sep 05/2017		334	Jan 05/2018		309	Jan 05/2017	
322	BLANK		335	Sep 05/2017		310	Jan 05/2017	
12-21-08			336	Sep 05/2017		311	Jan 05/2017	
301	May 05/2016		337	Sep 05/2017		312	Jan 05/2017	
302	Jan 05/2018		338	Jan 05/2018		313	Sep 05/2017	
303	Jan 05/2018		339	Jan 05/2018		314	Sep 05/2017	
304	Jan 05/2018		340	Sep 05/2017		315	Sep 05/2017	
305	Jan 05/2017		341	Sep 05/2017		316	Sep 05/2017	
306	Jan 05/2017		342	Sep 05/2017		317	Sep 05/2017	
307	Jan 05/2018		343	Sep 05/2017		318	Sep 05/2017	
308	Jan 05/2017		344	Sep 05/2017		319	Sep 05/2017	
309	Jan 05/2018		345	Sep 05/2017		320	Sep 05/2017	
310	Jan 05/2017		346	Sep 05/2017		321	Sep 05/2017	
311	Jan 05/2016		347	Sep 05/2017		322	Sep 05/2017	
312	Jan 05/2018		348	Sep 05/2017		323	Jul 25/2018	
313	Jan 05/2018		349	Sep 05/2017		324	Jul 25/2018	
314	Sep 05/2017		350	Jul 25/2018		325	Sep 05/2017	
315	Sep 05/2017		351	Jan 05/2018		326	Sep 05/2017	
316	Jan 05/2018		352	Jan 05/2018		327	Sep 05/2017	
317	Jan 05/2017		353	Sep 05/2017		328	Jul 25/2018	
318	Jan 05/2017		354	Sep 05/2017		329	Sep 05/2017	
319	Jan 05/2017		355	Jul 25/2018		330	Jan 05/2018	
320	Jan 05/2018		356	Jan 05/2018		331	Sep 05/2017	
321	Jan 05/2017		357	Jan 05/2018		332	Sep 05/2017	
322	Jan 05/2017		358	Jan 05/2018		333	Sep 05/2017	
323	Sep 05/2017		359	Jan 05/2018		334	Sep 05/2017	
324	Sep 05/2017		360	BLANK		335	Sep 05/2017	
325	May 05/2016		12-21-09			336	Jul 25/2018	
326	May 05/2016		301	May 05/2017		337	Sep 05/2017	
327	May 05/2016		302	Sep 05/2017		338	Sep 05/2017	

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12-21-09 (cont)			12-21-09 (cont)			12-21-10 (cont)		
339	Sep 05/2017		375	Sep 05/2017		320	Sep 05/2017	
340	Sep 05/2017		376	Sep 05/2017		321	Sep 05/2017	
341	Sep 05/2017		377	Sep 05/2017		322	BLANK	
342	Sep 05/2017		378	Sep 05/2017		12-21-11 Config 2		
343	Sep 05/2017		379	Sep 05/2017		301	Sep 05/2017	
344	Sep 05/2017		380	Sep 05/2017		302	Sep 05/2017	
345	Sep 05/2017		381	Sep 05/2017		303	Sep 05/2017	
346	Sep 05/2017		382	Sep 05/2017		304	May 05/2017	
347	Sep 05/2017		383	Sep 05/2017		305	May 05/2017	
348	Sep 05/2017		384	Sep 05/2017		306	May 05/2017	
349	Sep 05/2017		385	Sep 05/2017		12-21-12		
350	Sep 05/2017		386	Sep 05/2017		301	Sep 05/2017	
351	Sep 05/2017		387	Sep 05/2017		302	Sep 05/2017	
352	Sep 05/2017		388	Sep 05/2017		303	Sep 05/2017	
353	Sep 05/2017		389	Sep 05/2017		304	May 05/2017	
354	Sep 05/2017		390	Sep 05/2017		305	May 05/2017	
355	Sep 05/2017		12-21-10			306	May 05/2017	
356	Sep 05/2017		301	May 05/2015		307	May 05/2017	
357	Sep 05/2017		302	Sep 05/2017		308	May 05/2017	
358	Sep 05/2017		303	Sep 05/2017		309	May 05/2017	
359	Sep 05/2017		304	Sep 05/2017		310	Sep 05/2017	
360	Sep 05/2017		305	May 05/2017		311	Sep 05/2017	
361	May 05/2018		306	May 05/2017		312	Sep 05/2017	
362	Sep 05/2017		307	May 05/2017		313	May 05/2017	
363	Sep 05/2017		308	May 05/2017		314	May 05/2017	
364	Sep 05/2017		309	May 05/2015		315	May 05/2017	
365	Sep 05/2017		310	Sep 05/2017		316	BLANK	
366	Sep 05/2017		311	Sep 05/2017		12-21-13		
367	Sep 05/2017		312	Sep 05/2017		301	Sep 05/2017	
368	May 05/2018		313	Sep 05/2017		302	Sep 05/2017	
369	Sep 05/2017		314	Sep 05/2017		303	Sep 05/2017	
370	Sep 05/2017		315	Sep 05/2017		304	May 05/2017	
371	Sep 05/2017		316	Sep 05/2017		305	May 05/2017	
372	Sep 05/2017		317	Sep 05/2017		306	BLANK	
373	Sep 05/2017		318	Sep 05/2017				
374	Sep 05/2017		319	Sep 05/2017				

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12-21-14 Config 2			12-21-14 Config 2 (cont)			12-21-21		
301	May 05/2015		337	Jan 05/2018		301	Sep 05/2017	
302	Sep 05/2017		338	Jan 05/2018		302	Sep 05/2017	
303	Sep 05/2017		339	Jan 05/2018		303	Sep 05/2017	
304	Sep 05/2017		340	Jan 05/2018		304	May 05/2017	
305	May 05/2017		341	Jan 05/2018		305	May 05/2017	
306	May 05/2017		342	Jan 05/2018		306	May 05/2017	
307	May 05/2017		343	Jan 05/2018		307	May 05/2017	
308	May 05/2017		344	Jan 05/2018		308	May 05/2017	
309	May 05/2017		345	Jan 05/2018		309	Sep 05/2017	
310	May 05/2017		346	BLANK		310	May 05/2017	
311	May 05/2017		12-21-15 Config 2			311	May 05/2017	
312	May 05/2017		301	May 05/2015		312	May 05/2017	
313	May 05/2017		302	Sep 05/2017		313	May 05/2017	
314	May 05/2017		303	Sep 05/2017		314	May 05/2017	
315	May 05/2017		304	May 05/2017		12-21-22		
316	Jan 05/2018		305	May 05/2017		301	May 05/2015	
317	Jan 05/2018		306	May 05/2017		302	May 05/2015	
318	Jan 05/2018		307	May 05/2017		303	Sep 05/2017	
319	Jan 05/2018		308	May 05/2017		304	Sep 05/2017	
320	Jan 05/2018		12-21-20			305	Sep 05/2017	
321	Jan 05/2018		301	Jan 05/2018		306	Sep 05/2017	
322	Jan 05/2018		302	Jan 05/2018		12-21-23		
323	Jan 05/2018		303	Jan 05/2018		301	Sep 05/2017	
324	Jan 05/2018		304	May 05/2017		302	May 05/2017	
325	Jan 05/2018		305	Jan 05/2018		12-21-24		
326	Jan 05/2018		306	May 05/2017		301	May 05/2018	
327	Jan 05/2018		307	May 05/2017		302	May 05/2018	
328	Jan 05/2018		308	May 05/2017		303	May 05/2018	
329	Jan 05/2018		309	Jan 05/2018		304	May 05/2018	
330	Jan 05/2018		310	Jan 05/2018		12-21-25		
331	Jan 05/2018		311	Jan 05/2018		301	May 05/2017	
332	Jan 05/2018		312	Jan 05/2018		302	Sep 05/2017	
333	Jan 05/2018		313	Jan 05/2018		303	Sep 05/2017	
334	Jan 05/2018		314	Jan 05/2018		304	BLANK	
335	Jan 05/2018							
336	Jan 05/2018							

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12-21-30			12-22-01 Config 2 (cont)			12-22-05 (cont)		
301	Sep 05/2017		306	Jul 25/2018		310	Sep 05/2017	
302	Sep 05/2017		307	Jul 25/2018		311	Sep 05/2017	
303	May 05/2017		308	Jul 25/2018		312	BLANK	
304	Sep 05/2017		309	Jul 25/2018		12-22-07		
305	Sep 05/2017		310	Jul 25/2018		301	May 05/2017	
306	Sep 05/2017		311	Jul 25/2018		302	Sep 05/2017	
307	May 05/2017		312	Jul 25/2018		303	Sep 05/2017	
308	Sep 05/2017		313	Jul 25/2018		304	Sep 05/2017	
309	Sep 05/2017		314	Jul 25/2018		305	Sep 05/2017	
310	Sep 05/2017		315	Jul 25/2018		306	Sep 05/2017	
12-21-31			316	Jul 25/2018		307	Sep 05/2017	
301	Sep 05/2017		317	Jul 25/2018		308	Sep 05/2017	
302	Jan 05/2015		318	Jul 25/2018		309	Sep 05/2017	
12-21-32			319	Jul 25/2018		310	Sep 05/2017	
301	May 05/2015		320	Jul 25/2018		311	Sep 05/2017	
302	Sep 05/2017		321	Jul 25/2018		312	Sep 05/2017	
303	Sep 05/2017		322	Jul 25/2018		313	Sep 05/2017	
304	May 05/2017		323	Jul 25/2018		314	Sep 05/2017	
305	Sep 05/2017		324	BLANK		12-22-09		
306	Sep 05/2017		12-22-04			301	May 05/2017	
12-21-33			301	Jul 25/2018		302	Sep 05/2017	
301	Sep 05/2017		302	Jul 25/2018		303	Sep 05/2017	
302	Sep 05/2017		303	Jul 25/2018		304	Sep 05/2017	
303	Sep 05/2017		304	Jan 05/2018		305	Sep 05/2017	
304	BLANK		305	Jul 25/2018		306	Sep 05/2017	
12-21-34			306	BLANK		12-23-01		
301	May 05/2015		12-22-05			301	May 05/2016	
302	May 05/2017		301	May 05/2017		302	Jan 05/2015	
303	May 05/2015		302	Sep 05/2017		12-25-01		
304	May 05/2017		303	Sep 05/2017		301	Sep 05/2017	
12-22-01 Config 2			304	May 05/2017		R 302	Sep 05/2018	
301	May 05/2017		305	May 05/2017		303	Jan 05/2017	
302	Jul 25/2018		306	May 05/2017		304	Sep 05/2017	
303	Jul 25/2018		307	Jan 05/2015		305	Sep 05/2017	
304	Jul 25/2018		308	Sep 05/2017		306	Sep 05/2017	
305	Jul 25/2018		309	May 05/2016		307	Sep 05/2017	

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308	Jul 25/2018		308	Sep 05/2017		321	Sep 05/2017	
309	Sep 05/2017		309	Sep 05/2017		322	Sep 05/2017	
310	Sep 05/2017		310	Sep 05/2017		323	Sep 05/2017	
311	Sep 05/2017		311	Sep 05/2017		324	Sep 05/2017	
312	Sep 05/2017		312	Sep 05/2017		325	Sep 05/2017	
313	Sep 05/2017		313	Sep 05/2017		326	Sep 05/2017	
314	Sep 05/2017		314	Sep 05/2017		327	Sep 05/2017	
315	Sep 05/2017		315	Sep 05/2017		328	Sep 05/2017	
316	Sep 05/2017		316	Sep 05/2017		329	Sep 05/2017	
317	Sep 05/2017		317	Sep 05/2017		330	Sep 05/2017	
318	Sep 05/2017		318	Sep 05/2017		331	Sep 05/2017	
319	Sep 05/2017		319	Sep 05/2017		332	Sep 05/2017	
320	Sep 05/2017		320	Sep 05/2017				
321	Sep 05/2017		321	May 05/2017				
322	Jul 25/2018		322	BLANK				
323	Sep 05/2017		12-33-02					
324	Sep 05/2017		301	Jan 05/2015				
325	Sep 05/2017		R 302	Sep 05/2018				
326	Sep 05/2017		303	Sep 05/2017				
327	Jul 25/2018		304	Sep 05/2017				
328	Jul 25/2018		305	Sep 05/2017				
329	Sep 05/2017		306	Sep 05/2017				
330	Sep 05/2017		307	Sep 05/2017				
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305	Sep 05/2017		318	Sep 05/2017				
306	Jan 05/2015		319	Sep 05/2017				
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A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

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CHAPTER 12
SERVICING

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FUEL TANK - PRESSURE REFUELING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks on pressure refueling:
 - (1) Precautions and Limits for the Refuel Operation
 - (2) Prepare the Airplane for a Refuel Operation
 - (3) Pressure Refueling
 - (4) Pressure Refueling - With a SET Fuel Quantity
 - (5) Pressure Refueling - With No SET Fuel Quantity
 - (6) Pressure Refueling - With Inoperative Refuel Valves
 - (7) Pressure Refueling - With An Inoperative Fuel Quantity Display
 - (8) Pressure Refueling - Without Electrical Power.

TASK 12-11-01-650-811

2. Precautions and Limits for the Refuel Operation

A. **General**

- (1) Obey all of the precautions in this task when you refuel the airplane.

B. **References**

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
28-21-00-750-801	Refuel Receptacle Adapter Check (P/B 601)
49-11-00-860-801	APU Emergency Shutdown (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

C. **Emergency Procedures**

SUBTASK 12-11-01-650-025

- (1) Obey all airport and operator provided fire protection, rescue and fuel spill emergency procedures. Emergency procedures include these subjects:
 - (a) Location of emergency fuel shutoff
 - (b) Airport fire department phone numbers
 - (c) Evacuation of airplane passengers
 - (d) Fuel spill containment and ignition source reduction
 - (e) Location and use of fire extinguishers
 - (f) Responsibilities of fuel servicing and airplane servicing personnel.

SUBTASK 12-11-01-650-026

- (2) Refuel the airplane in areas which allow the free movement of air, fire fighting equipment and other emergency equipment.

SUBTASK 12-11-01-650-027

- (3) Stop the refuel operation if any conditions change which could cause an unsafe condition for persons or equipment.

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D. Fuel Spills

SUBTASK 12-11-01-650-028

- (1) Each fuel spill event is different. Variables such as the size of the spill, weather conditions, equipment location, aircraft occupancy, emergency equipment and personnel available will determine the correct response to control the fire hazard.

SUBTASK 12-11-01-650-029

- (2) During a refuel operation, continuously monitor the airplane for fuel leaks and fuel spills at the wingtip.

SUBTASK 12-11-01-650-030



DO THESE STEPS IF YOU SPILL FUEL WHILE YOU REFUEL THE AIRPLANE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (3) If a fuel spill occurs, do these steps:
 - (a) Stop the fuel flow.
 - (b) Unload and shutdown the APU (TASK 49-11-00-860-805).
 - (c) Follow the fire department and operator provided fuel spill and fire protection emergency procedures.
 - (d) Find the cause of the fuel spill and correct it.
 - (e) Inspect enclosed areas to make sure they are free of fuel vapor.
 - (f) Do not start the refuel operation or start the APU again until the fire department or the person(s) in charge have given approval.

E. Passenger Precautions

SUBTASK 12-11-01-650-031



OBEY THESE PASSENGER PRECAUTIONS WHEN YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE PRECAUTIONS, INJURIES TO PERSONS CAN OCCUR.

- (1) Obey all airport and operator procedures if you refuel the airplane with passengers onboard.

SUBTASK 12-11-01-650-032

- (2) For each airplane type, a hazardous area must be identified for boarding or unloading passengers during a refuel operation. Barriers must be in place to stop passengers from entering this hazardous area.

F. Airplane System Precautions

SUBTASK 12-11-01-650-033



OBEY THESE AIRPLANE SYSTEM PRECAUTIONS WHEN YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE PRECAUTIONS, A FIRE OR AN EXPLOSION CAN OCCUR.

- (1) Do not operate these airplane systems during a refuel operation:
 - (a) HF communications system

SUBTASK 12-11-01-650-034

- (2) The SATCOM system can be operated during a refuel operation.

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SUBTASK 12-11-01-650-035

- (3) Obey these restrictions on maintenance tasks during a refuel operation:
- (a) Do not connect or disconnect the battery chargers, aircraft ground-power generators or other electrical ground-power components.
 - (b) Do not test the power equipment until after the refuel operation is complete.
 - (c) Do not fill or change oxygen bottles.
 - (d) Do not remove electrical power.
- NOTE: Damage to the refuel system components can occur.
- (e) Do not start refueling if a fire or engine overheat warning EICAS message is shown.
 - (f) Do not start refueling if any part of the landing gear is unusually hot.

SUBTASK 12-11-01-650-036



DO NOT OPERATE THE HYDRAULIC SYSTEMS UNLESS THE FUEL LEVEL IS HIGHER THAN THE HEAT EXCHANGERS. WITHOUT SUFFICIENT FUEL, THE HEAT EXCHANGER WILL BECOME TOO HOT. DAMAGE TO THE HYDRAULIC SYSTEM WILL OCCUR.

- (4) Do not operate a hydraulic system if the tank that contains the exchanger for that hydraulic system is empty.
- (a) Do not operate the left hydraulic system (placard controls) if the left main tank is defueled.
 - (b) Do not operate right or the center hydraulic system (placard controls) if the right main tank is empty.
 - (c) If the hydraulic exchangers are not below the top level of the fuel, the system becomes too hot.

SUBTASK 12-11-01-650-037

- (5) Make sure these components are in the closed position before you start the refuel operation:
- NOTE: Fuel spills, damage to the airplane or inability to close doors can occur if these components are not closed.
- (a) Wing pressure relief valves (two locations)
 - (b) Landing gear doors
 - (c) Make sure the wingtip vents are not blocked before you start the refuel operation.

SUBTASK 12-11-01-650-038



MAKE SURE THAT THE REFUEL ADAPTER IS CLEAN AND DOES NOT HAVE DAMAGE. IF THE REFUEL ADAPTER HAS DAMAGE, IT CAN CAUSE A FUEL LEAK.

- (6) Do an inspection of the refuel adapter before you connect the refuel nozzle:
- (a) Make sure there are no fuel leaks.
 - (b) Make sure the mating surfaces of the fuel hose and refuel receptacle adapter are clean and free from unwanted material.
 - (c) Make sure the slots and lugs on the adapter are not damaged.
 - (d) Use a wear gage to make sure the adapter is within operational limits (TASK 28-21-00-750-801).

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- (e) Make sure the refuel/defuel handle is in the refuel position.

SUBTASK 12-11-01-650-039

- (7) Make sure the landing gear wheel chocks do not touch the tires. The wheel chocks can wedge against the tire after you add fuel (PAGEBLOCK 10-11-05/201).

SUBTASK 12-11-01-650-040

- (8) A refuel operation with a main engine operating is an emergency procedure. Obey all airport- and operator-provided emergency procedures.

G. APU Operations During Refueling and Defueling - Limits and Precautions

SUBTASK 12-11-01-650-041

- (1) If the APU is operating during refueling, do these steps:



WARNING

OBEY THE PRECAUTIONS FOR APU OPERATION WHEN YOU OPERATE THE APU DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU OPERATE THE APU INCORRECTLY, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Obey the limits for the operation of the APU (TASK 49-11-00-860-804).
(b) You can start the APU during refueling if the start is an initial start or a restart after normal shutdown.
(c) You can shut down the APU (manual or automatic) during the refueling operation.
(d) If the low pressure indication light comes on for the APU DC fuel pump, immediately shut down the APU (TASK 49-11-00-860-805) so the pump will shut off.

NOTE: The switch for the APU DC fuel pump will not shut off the pump if the APU is operating.



WARNING

IF THERE IS A PROTECTIVE AUTOMATIC SHUTDOWN OF THE APU OR A FAILURE TO START CONDITION, DO NOT TRY TO START THE APU DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU TRY TO START THE APU, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (e) If there is a protective automatic shutdown or failure to start condition on the APU, do one of these two steps:
- 1) Complete the refueling before you try to start the APU again.
 - 2) Stop the refueling operation and disconnect the fuel hose(s) from the airplane fueling adapter(s) before you start the APU again.



WARNING

DO THESE STEPS IF AN APU FIRE OCCURS WHILE YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE STEPS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (f) If an APU fire occurs, do these steps in this sequence:
- 1) Stop the refueling operation.
 - 2) The APU should shut down automatically.
 - a) If it does not shut down automatically, do this task: APU Emergency Shutdown, TASK 49-11-00-860-801.
 - 3) Discharge the APU fire bottles (TASK 49-11-00-860-801).

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- 4) Notify persons on board the airplane and Airport Fire Services.



WARNING

DO THESE STEPS IF YOU SPILL FUEL WHILE YOU REFUEL THE AIRPLANE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (g) If fuel spillage occurs, do these steps:
- 1) Stop the refueling operation.
 - 2) Notify persons on board the airplane.
 - 3) Unload the APU and shut it down (TASK 49-11-00-860-805).
 - a) Do not start the APU until the spilled fuel is removed and there is no further risk of spilled fuel or vapors.



WARNING

MAKE SURE THAT FUELING VEHICLES ARE NOT PARKED IN THE EXHAUST FLOW OF THE ENGINES OF THIS AIRPLANE, OR ADJACENT AIRPLANES. THE HOT EXHAUST CAN CAUSE A FIRE OR EXPLOSION.

- (h) Make sure fueling vehicles are in a position that avoids any risk of coming in the path of the APU exhaust stream.

H. Airplane Separation Distance Limits

SUBTASK 12-11-01-650-042



WARNING

OBEY THESE SEPARATION DISTANCES DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU DO NOT OBEY THESE SEPARATION DISTANCES, A FIRE OR AN EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Maintain the separation distance given in Table 301:

Table 301/12-11-01-993-802

EQUIPMENT OR IGNITION SOURCES	REFUEL/DEFUEL SEPARATION DISTANCE ^{*[1]}
Adjacent aircraft engine and APU	50 ft (15 m)
Fuel service equipment - measured from engine or exhaust system	10 ft (3 m) from fuel vents
Ground Power Units	20 ft (6 m)
Aircraft servicing equipment measured from the engine or exhaust system	10 ft (3 m)
Electrical equipment that is likely to cause arcs or sparks	50 ft (15 m)
Photographic equipment	10 ft (3 m)
Battery powered equipment	10 ft (3 m) from fuel servicing equipment or fuel spills ^{*[2]}
Open flames, heat sources, lighted smoking material, and any other potential ignition sources	50 ft (15 m)
Electrical transmitting equipment	Reference Table 302

^{*[1]} The distance is measured from a point on the ground directly below the fuel vents or from fueling equipment.

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*[2] Does not apply to battery powered equipment approved (by an independent testing laboratory) for use in Class I Division 1 hazardous locations.

SUBTASK 12-11-01-650-043



WARNING OBEY THESE SEPARATION DISTANCES FOR THE ELECTRICAL SYSTEM DURING THE FUELING OF THE AIRPLANE. IF YOU DO NOT OBEY THIS PRECAUTION, A FIRE OR AN EXPLOSION CAN OCCUR.

(2) Maintain the separation distance given in Table 302:

Table 302/12-11-01-993-801

POWER (EIRP ^{*[1]} OF EQUIPMENT TRANSMITTING RADAR OR RADIO	REFUEL/DEFUEL SEPARATION DISTANCE ^{*[2]}
More than 100 watts (radio or radar)	200 ft (61 m)
25 to 100 watts (radio or radar)	50 ft (15 m)
Less than 25 watts ^{*[3]}	10 ft (3 m)

*[1] EIRP is Effective Isotropic Radiated Power in watts.

*[2] The distance is measured from a point on the ground directly below the fuel vents or from fueling equipment.

*[3] This category includes mobile phones, pagers, two-way radios, and similar wireless communication equipment. There are low power, intrinsically safe communication systems that are approved for use in hazardous locations. These devices can be used safely in areas that contain fuel vapor (UL 913 or equivalent standards).

I. Fuel Requirements

SUBTASK 12-11-01-650-044



WARNING OBEY THESE FUEL GRADE LIMITS. THE INCORRECT GRADE OF FUEL CAN CAUSE AN ENGINE FLAMEOUT, DECREASE ENGINE PERFORMANCE, OR CAUSE DAMAGE.

(1) Make sure the fuel source contains the correct fuel grade as specified by the AFM (Airplane Flight Manual).

SUBTASK 12-11-01-650-045



WARNING DO NOT USE WIDE-CUT FUEL WHEN IT IS NOT PERMITTED. A FLAMEOUT CAN OCCUR, AND ENGINE POWER CAN DECREASE SUDDENLY. INJURIES TO PERSONS AND DAMAGE TO THE AIRPLANE CAN OCCUR IF YOU USE AN INCORRECT FUEL.

(2) Do not use wide cut fuels.

NOTE: There is a placard on the refueling station that prevents the use of wide cut fuels. Wide cut fuel is fuel which satisfies ASTM D 6615, JET B or MIL-T-5624, JP-4. Wide cut fuel contains both kerosene and naphtha (gasoline) fractions. It is not certified for use on the Boeing 777 model of airplane.

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J. Fuel Servicing Equipment Precautions

SUBTASK 12-11-01-650-046



OBEY THESE SEPARATION DISTANCES DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU DO NOT OBEY THESE SEPARATION DISTANCES, A FIRE OR AN EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Obey all separation distance requirements (Table 301).

SUBTASK 12-11-01-650-047

- (2) Use only approved fuel servicing equipment in a serviceable condition.

SUBTASK 12-11-01-650-048

- (3) Do not disable deadman shutoff controls.

NOTE: Wire, rope or tools used to disable the deadman control can prevent the immediate shutoff of pressurized fuel. A disabled deadman control can cause a fuel spill hazard.

SUBTASK 12-11-01-650-049

- (4) When you position fuel servicing vehicles make sure the equipment:
 - (a) Has a clear exit path at all times.
 - (b) Does not interfere with access to the aircraft for rescue or fire protection.
 - (c) Does not obstruct the passenger evacuation routes.
 - (d) Does not obstruct the chute deployment areas.

K. Ground Equipment and Airplane Servicing Equipment Precautions

SUBTASK 12-11-01-650-050



OBEY THESE PRECAUTIONS FOR FUEL SERVICING EQUIPMENT WHEN YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE PRECAUTIONS, A FIRE OR AN EXPLOSION CAN OCCUR.

- (1) Obey all separation distance requirements (Table 301).

SUBTASK 12-11-01-650-051

- (2) Do not put ground equipment below the fuel system vents at the wingtips. The fuel tanks are vented through the wingtips vents. An explosive mixture of fuel vapor can exist at these locations.

SUBTASK 12-11-01-650-052

- (3) Added fuel weight will compress the landing gear shock struts and lower the airplane. Make sure all stands, ladders, vehicles, and equipment that can come in contact with the airplane are removed before the refuel operation starts.

L. Personnel Precautions

SUBTASK 12-11-01-650-053



OBEY THESE PERSONNEL PRECAUTIONS. IF YOU DO NOT OBEY THESE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Personnel that refuel the airplane must be trained in the safe operation of these systems and procedures:

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- (a) 777 fuel servicing operations
- (b) Fuel servicing equipment
- (c) Fuel spill prevention
- (d) Emergency controls
- (e) Emergency equipment
- (f) Emergency fuel spill and fire protection procedures
- (g) Fuel vapor hazard locations (wing tips, engine locations, and other hazard locations)

SUBTASK 12-11-01-650-054

- (2) At some airport locations, a fuel safety person may be added to oversee aircraft refueling operations.

M. Fueling Zone

SUBTASK 12-11-01-650-055

- (1) Refuel operations must only be done in airport approved areas. Fire protection, emergency rescue equipment and correct separation distances will be available in these areas.

SUBTASK 12-11-01-650-056

- (2) A fueling zone exists around the airplane at any time when an airplane is preparing for or during a refuel operation.

SUBTASK 12-11-01-650-057

- (3) Fire and rescue equipment, including approved fire extinguishers, must be available.

SUBTASK 12-11-01-650-058

- (4) Within the fueling zone, obey these requirements:
 - (a) Obey the equipment separation requirements (Table 301).
 - (b) Only authorized persons and vehicles are permitted.
 - (c) Passengers are not permitted.
 - (d) All personnel must assume that a refuel operation is in progress any time a fuel servicing vehicle is in the fueling zone.
 - (e) Limit maintenance activity on the airplane to work that does not increase the risk of igniting fuel vapor.
 - (f) All electrical equipment must be rated for the hazardous location zone where it will operate.
 - (g) Do not keep vehicle engines running unless necessary for aircraft maintenance or servicing.
 - (h) Metal wheels or studded tires are not permitted.
 - (i) Do not approach within 50 ft (15 m) of the airplane with these items:
 - 1) Open flames
 - 2) Heat sources
 - 3) Lighted smoking material
 - 4) Shoes with metal clips
 - 5) Other potential ignition sources.

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N. Adverse Weather Conditions Precautions

SUBTASK 12-11-01-650-059



WARNING

DO NOT REFUEL THE AIRPLANE WHEN YOU SEE LIGHTNING, OR THERE IS HIGH ATMOSPHERIC ELECTRICAL ACTIVITY. STOP THE REFUEL OPERATION IF YOU SEE LIGHTNING. DO NOT CONNECT A HEADSET. DO NOT TOUCH ELECTRICAL CONNECTIONS TO THE AIRPLANE. LIGHTNING STRIKES CAN CAUSE INJURIES TO PERSONNEL, A FIRE, OR AN EXPLOSION.

- (1) When thunderstorms or lightning are in the area, approximately a 10 mi (16 km) radius, do these steps:
 - (a) Contact the airport authority, air traffic control, or flight deck crew for guidance on the decision to continue or suspend fueling operations.
 - (b) Stop the refuel operation when fueling operations are suspended.
 - (c) Disconnect and remove any external headsets.
 - (d) Do not touch any electrical connections.

SUBTASK 12-11-01-650-060

- (2) Refueling operations must stop if strong wind conditions are present. Strong wind conditions can cause a build-up of static electricity. Large charges of static electricity can develop on support equipment while parked as a result of the movement of dust particles and air currents during strong wind conditions. Strong wind conditions can also cause the unwanted movement of items or equipment which can cause injury to persons or strike the airplane.

O. Refueling Precautions

SUBTASK 12-11-01-650-201



CAUTION

DO NOT OPERATE THE HYDRAULIC SYSTEMS UNLESS THE FUEL LEVEL IS HIGHER THAN THE HEAT EXCHANGERS. WITHOUT SUFFICIENT FUEL, THE HEAT EXCHANGER WILL BECOME TOO HOT. DAMAGE TO THE HYDRAULIC SYSTEM WILL OCCUR.

- (1) Do not operate a hydraulic system if the tank that contains the exchanger for that hydraulic system is empty.
 - (a) If the hydraulic exchangers are not below the top level of the fuel, the system becomes too hot.

SUBTASK 12-11-01-650-061



CAUTION

MAKE SURE THAT YOU PUT THE SAME QUANTITY OF FUEL INTO THE NO. 1 TANK AND THE NO. 2 TANK. IF THE FUEL QUANTITIES ARE DIFFERENT, THE AIRPLANE FLIGHT PROPERTIES WILL BE INCORRECT, AND DAMAGE TO THE WINGS CAN OCCUR.

- (2) Put approximately the same quantity of fuel in the left main tank and the right main tank.

SUBTASK 12-11-01-650-062

- (3) Obey all of the approved procedures and precautions during a refuel operation.

————— END OF TASK —————

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TASK 12-11-01-650-812

3. Prepare the Airplane for a Refuel Operation

A. References

Reference	Title
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

B. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-01-650-063

- (1) Read and obey the precautions for fuel servicing. To do this, do this task: Precautions and Limits for the Refuel Operation, TASK 12-11-01-650-811.

SUBTASK 12-11-01-860-038



DO NOT REMOVE ELECTRICAL POWER WHILE YOU REFUEL THE AIRPLANE. IF YOU REMOVE ELECTRICAL POWER, THE REFUELING VALVES WILL CLOSE AND CAN CAUSE DAMAGE TO EQUIPMENT.

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

NOTE: If you do not have 115-volt ac power, you can do the refuel operation with electrical power from the airplane battery.

SUBTASK 12-11-01-860-062

- (3) Make sure the airplane has a ground attitude of 0.7 degrees nose down pitch and 0.0 degree roll (+/- 2.0 degrees pitch and roll).

NOTE: A ground attitude of 0.7 degrees nose down pitch and 0.0 degrees roll permits you to put the maximum quantity of fuel in the tanks.

SUBTASK 12-11-01-680-001

- (4) Drain the water from the fuel tank sumps before you refuel the airplane. To do this, do this task: Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801

SUBTASK 12-11-01-860-039



DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Install a DO-NOT-OPERATE tag on the flap control lever (Figure 302).

SUBTASK 12-11-01-860-040

- (6) Make sure the onboard fuel load is in a valid fuel distribution configuration (equivalent to after a flight operation).
 - (a) If it is necessary, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

————— **END OF TASK** —————

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TASK 12-11-01-650-801

4. Pressure Refueling

A. General

(1) Refueling Station:

- (a) The refueling stations are installed in the leading edge, just outboard of each engine.
- (b) The left refueling station contains refuel adapters, bonding points, lights, an interphone jack, and an integrated refuel panel (IRP).
- (c) The right refueling station contains refuel adapters, bonding points, lights, and an interphone jack.
- (d) Aluminum foil markers installed on the refueling station door have refueling information and cautions.

(2) Surge Tank Overfill System:

- (a) There is a surge tank overfill system to catch fuel from the fuel tanks that are more than full and prevent fuel spills onto the ground. If the surge tank overfill system does not operate correctly and there is a fuel spill at the wing tip, stop the pressure refueling source immediately to keep the fire hazard to a minimum.

(3) Fuel loading limits:

NOTE: A STOP indication can show in a LOAD SELECT window on the IRP for a given tank. This means that the VSO has been exceeded by 100 gallons or more. The refueler should stop refueling. The STOP indication will remain until the quantity in the tank is reduced to the VSO level or below the VSO level for that tank.

NOTE: The FQPU can command the refuel valves to the closed position if there is a confirming or confirmed tank unit failure. The FQPU software will reduce the shutoff level up to 3.2% below VSO. If the FQPU commands early shutoff in one main tank, then there will be a fuel imbalance up to approximately 2200 lb (998 kg) between the left and right main fuel tanks.

- Tank Unit 10 Fault: Maint Message: 28-20060, 28-20061, 28-20108, 28-20109
- (163 Gallons Below VSO; or 1.7% Below VSO)
- Tank Unit 17 Fault: Maint Message: 28-20074, 28-20075, 28-20122, 28-20123
- (112 Gallons Below VSO; or 1.2% Below VSO)
- Tank Unit 18 Fault: Maint Message: 28-20076, 28-20077, 28-20124, 28-20125
- (165 Gallons Below VSO; or 1.7% Below VSO)
- Tank Unit 19 Fault: Maint Message: 28-20078, 28-20079, 28-20126, 28-20127
- (99 Gallons Below VSO; or 1.0% Below VSO)
- Other Failed Units can cause shutoff of 3.2% Below VSO

NOTE: The FQPU can command the refuel valves to the close position if there is failure of tank unit 10, 17, 18, or 19.

NOTE: For more information, refer to SDS 28-21-00.

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- (a) You can refuel all the tanks at the same time or in sequence.

NOTE: The usual procedure for refueling the center tank is to put fuel in the center tank if the left and right main tanks will be filled to capacity.

NOTE: For ground maintenance operations, you can refuel or defuel the left main, right main, or center fuel tanks in any order or to any quantity necessary to do maintenance.

- (b) Refuel the left and right main tanks with equal quantities of fuel.

(4) Airplane Attitude

- (a) The airplane must be within these limits for the fuel quantity indication to operate correctly:

- 1) Pitch = (-2.7 degrees to +1.3 degrees)
- 2) Roll = (-2.0 degrees to +2.0 degrees)

(5) Fuel Quantity Fluctuations:

- (a) If unfaulted tank unit anomalies cause fuel quantity fluctuations during the refuel procedure, do the steps that follow:

NOTE: The tank unit anomalies occur at a fuel load between 80,200 lb (36,378 kg) and 110,000 lb (49,895 kg). If temporarily stopping the refuel operation, stop below or above the limits to prevent this condition.

- 1) Close these access doors or move to a position where power is removed from the IRP:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door
621DB	Refueling Station Door

- 2) Wait two minutes.

NOTE: This will let the FQPU calculate the fuel quantity more accurately.

- (b) If there are fuel quantity fluctuations after refueling and the ADIRU is not available, do the steps that follow:

- 1) Wait four minutes after the EICAS message ADIRU "ALIGN" extinguishes.

NOTE: When the ADIRU is not available, wait for the ADIRU to align to let the FQPU calculate the fuel quantity more accurately.

B. Access Panels

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door
621DB	Refueling Station Door

C. To refuel the airplane, do one of the pressure refueling tasks that follow:

NOTE: If you make a decision not to do the recommended task, you must have an alternate procedure. Make sure the conditions during the fueling operation give sufficient protection to the persons and equipment used in the procedure. It is possible that local fire codes and standards make it necessary to use different procedures or more procedures than those defined in the subsequent tasks.

SUBTASK 12-11-01-650-011

- (1) Do this task: Pressure Refueling - With a SET Fuel Quantity, TASK 12-11-01-650-806.

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SUBTASK 12-11-01-650-012

(2) Do this task: Pressure Refueling - With No SET Fuel Quantity, TASK 12-11-01-650-807.

SUBTASK 12-11-01-650-013

(3) Do this task: Pressure Refueling - With Inoperative Refuel Valves, TASK 12-11-01-650-808.

SUBTASK 12-11-01-650-014

(4) Do this task: Pressure Refueling - With An Inoperative Fuel Quantity Display, TASK 12-11-01-650-809.

SUBTASK 12-11-01-650-017

(5) Do this task: Pressure Refueling - Without Electrical Power, TASK 12-11-01-650-810.

————— END OF TASK —————

TASK 12-11-01-650-806

5. Pressure Refueling - With a SET Fuel Quantity

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-41-00-760-801	Electrical Bonding (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
45-10-00-910-810	How to Operate the MAT in the Flight Compartment (P/B 201)
FIM 28-21 TASK 827	Overfill during refuel - Fault Isolation
FIM 28-21 TASK 828	Early Shutoff During Refueling - Fault Isolation

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

D. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-01-650-065

(1) Do this task: Prepare the Airplane for a Refuel Operation, TASK 12-11-01-650-812.

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E. Connect the Fueling Equipment

SUBTASK 12-11-01-420-025



OBEY THE APPLICABLE PRECAUTIONS WHEN YOU ATTACH THE BONDING CABLES. INSTALL THE BONDING CABLES AT AN APPROVED AIRPLANE GROUND CONNECTION TO MAKE SURE THAT THE ELECTRICAL BOND IS SUFFICIENT. IF THE FUEL SERVICE EQUIPMENT AND AIRPLANE DO NOT HAVE A SUFFICIENT ELECTRICAL BOND, A FIRE OR EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Connect a bonding cable from the fueling source to an approved electrical ground or bonding connection on the airplane (TASK 20-41-00-760-801).

NOTE: Static grounding of the airplane by positive grounding means is not necessary when performing pressure refueling or pressure defueling of the airplane. Electrical bonding between the airplane and the refueling vehicle is required.

SUBTASK 12-11-01-010-019

- (2) Open this access door installed on the left wing:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-010-020

- (3) Open this access door installed on the right wing, if it is necessary:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-480-002



MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do these steps to connect the fuel nozzle to the refuel receptacle:
 - (a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.
 - 1) Make sure that the screws and lugs are not loose or damaged.
 - (b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).
 - (c) Connect the refuel nozzle to the refuel receptacle.

F. Prepare the Integrated Refuel Panel (IRP)

SUBTASK 12-11-01-480-003

- (1) Make sure the applicable refuel access panel is open.

SUBTASK 12-11-01-010-022

- (2) Make sure the panel floodlights are on.

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SUBTASK 12-11-01-860-041

- (3) Make sure the fuel quantity displays are on.
- (a) The FUEL QTY displays will come on within 60 seconds after you open this access door:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|------------------------|
| 521DB | Refueling Station Door |
- (b) If the FUEL QTY display(s) does not show the fuel quantity, put the POWER switch on the IRP to the BATT position.
- (c) Make sure the FUEL QTY display(s) show the fuel quantity.
- (d) If one or more of the FUEL QTY displays continue to be off, do the Pressure Refueling - With A Inoperative Fuel Quantity Display procedure.
- 1) Make sure the total fuel legend "TF" shows on the TOTAL/BACKUP display.
- NOTE: This shows there is 28V DC at the IRP.
- 2) If the total fuel legend "TF" is not on or the refueling station door lights do not come on, do the Pressure Refueling - With Inoperative Refuel Valves procedure to open the refuel valves.

SUBTASK 12-11-01-650-066

- (4) Push the TEST IND switch to do a test of the fuel quantity indicators and the blue valve position lights.

SUBTASK 12-11-01-650-067

- (5) Make sure the correct test patterns (###.#) show on the FUEL QTY displays and the LOAD SEL displays of the integrated refuel panel.

NOTE: A checker-board pattern will show on the FUEL QTY display and the LOAD SEL Display for 2 seconds, the opposite pattern will show for 2 seconds, and then the displays will go off for 2 seconds. The test patterns will show one more time and then each FUEL QTY display and the LOAD SEL display will return to their usual condition.

SUBTASK 12-11-01-650-068

- (6) Make sure each blue valve position light comes on and then goes off.

G. Prepare the Fuel Sheet

SUBTASK 12-11-01-650-069

- (1) Use the operator-supplied fuel sheet to record the pre-uplift fuel quantity for each tank.

SUBTASK 12-11-01-650-070

- (2) Calculate the fuel to be uplifted converted to volume (if necessary).

SUBTASK 12-11-01-650-071

- (3) Record the uplift quantity on the fuel sheet (if necessary).

H. Set the Fuel Quantity

SUBTASK 12-11-01-650-072

- (1) Calculate the value that each refuel quantity indicator must show when the necessary quantity of fuel is in the tank.
- (2) Do one of these two procedures:
- (a) To set the fuel quantity for each fuel tank you are to refuel, do these steps:
- 1) At the LOAD SELECT QTY, set the thumbwheel switches to the necessary quantity of fuel.



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- 2) Push the LOAD SELECT SET switch for the applicable fuel tank for 1 second and release it.
- 3) Make sure the quantity input into the LOAD SELECT QTY shows on the LOAD SEL display for the applicable fuel tank.
 - a) If you make an error during the selection procedure, push the applicable LOAD SELECT SET switch to remove the value from the LOAD SEL display and do the procedure again.
- (b) To set the TOTAL fuel quantity that you are to refuel, do these steps:
 - 1) At the LOAD SELECT QTY, set the thumbwheel switches to the necessary quantity of fuel.
 - 2) Make sure the TOTAL/BACKUP display on the IRP is set to show the total fuel quantity.
 - 3) Push the LOAD SELECT SET switch for the total fuel indicator for 1 second and release it.
 - 4) Make sure the fuel quantity on the LOAD SELECT QTY shows on the LOAD SEL display for the TOTAL/BACKUP display.
 - a) If you make an error during the selection procedure, push the applicable LOAD SELECT SET switch to remove the value and do the procedure again.

I. Start the Refuel Operation

SUBTASK 12-11-01-650-073



MAKE SURE THE FUEL PRESSURE USED TO REFUEL THE AIRCRAFT IS NOT MORE THAN 55 PSI (379.2 KPA). IF THE PRESSURE IS MORE THAN 55 PSI (379.2 KPA), DAMAGE TO THE FUEL SYSTEM CAN OCCUR.

- (1) Do these steps to start the refuel operation:
 - (a) Activate the fuel shutoff control switch (deadman switch) to start the fuel flow.
 - (b) Put all the refuel valve switches to the OPEN position.

NOTE: The FQIS processor controls the start of refueling. The refuel valves will close automatically when:

- The fuel quantity equals the set fuel quantity
- The fuel tank is full
- The fuel spills into a surge tank.

If you put a refuel valve control switch to the CLOSE position during automatic refueling, the pressure refueling operation stops for that fuel tank.

NOTE: The FQPU can also command the refuel valves to the closed position if there is a confirming or confirmed tank unit failure. The FQPU software will reduce the shutoff level to 3.2% below VSO. If the FQPU commands early shutoff in one main tank, then there will be a fuel imbalance of approximately 2000 to 2200 LB (1000 to 1100 KG) between the left and right main fuel tank.

NOTE: Internal problems with the FQPU can also cause problems with refueling.

- 1) If one or more refuel valves does not open or if a valve closes unexpectedly during the refueling operation, do a check of the MAT for fault codes that show internal problems with the FQPU (TASK 45-10-00-910-810).

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- 2) If fueling is prevented because of an inoperative fueling valve, then do this task:
Pressure Refueling - With Inoperative Refuel Valves, TASK 12-11-01-650-808.
- (c) Make sure the applicable blue refuel valve lights come on.
- (d) Make sure the refuel pressure is between 35 and 55 psi.
- (e) Make sure the refuel valve indication lights are on (valves open).
- (f) Make sure the right and the left main tanks refuel at approximately the same rate.

SUBTASK 12-11-01-650-074

- (2) Monitor the fuel quantity on the FUEL QTY display, on the IRP.

SUBTASK 12-11-01-650-075

- (3) Push the TEST SYSTEM switch to do a refueling system test.

NOTE: It is not necessary to do a system test each time you refuel the airplane.

If you push the TEST SYSTEM switch during the refueling procedure, it causes the FQIS processor to test the pressure refueling system. The FQIS processor does a load select test, and a full tank shutoff test. After these tests are done, the refuel valves close in sequence. The refuel valves then open, and refueling continues.

SUBTASK 12-11-01-650-076

- (4) If it is necessary, do these steps to do an overfill test:

NOTE: It is not necessary to do this test for each refueling.

- (a) Apply fueling pressure.

NOTE: It is OK to use less than 55 psi for this test.

- (b) Push the OVERFILL TEST switch on the IRP, P28.

- (c) Make sure the refuel valve lights go off.

NOTE: This shows that the refuel valves are closed.

- (d) Set the OVERFILL RESET switch to the RESET position on the IRP, P28.

- (e) Set the OVERFILL RESET switch to the NORMAL position on the IRP, P28.

- (f) Make sure the refuel valve lights come on.

NOTE: This shows that the refuel valves are open.

J. Unexpected Shutoff of the Refuel Operation

NOTE: These steps are applicable only if the refuel operation stops unexpectedly before it is completed.

SUBTASK 12-11-01-650-077

- (1) If the message PUSH SET shows on the FUEL QTY display, the refuel operation will stop.
 - (a) Do the Pressure Refueling - With A Inoperative Fuel Quantity Display procedure to continue refueling the applicable fuel tank.

SUBTASK 12-11-01-650-078

- (2) If fueling stops when the fuel quantity in a tank is approximately 2100 $\pm$ 100 lb (953 $\pm$ 46 kg) less than the fuel quantity for a full tank, do this task: FIM 28-21 TASK 828.

NOTE: If there is a single confirming or confirmed tank unit failure, the FQPU software will command the refuel valves in the applicable tank to the closed position before volumetric shutoff (VSO). If the FQPU commands early shutoff in one main fuel tank, then there will be a fuel imbalance of approximately 2100 $\pm$ 100 lb (953 $\pm$ 46 kg) between the left and right main fuel tanks.



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SUBTASK 12-11-01-650-079

- (3) If the red OVERFILL IND light on the IRP comes on, refueling will stop. Do these steps:

NOTE: This condition shows there is fuel in the surge tank.

- (a) Set the refuel valve switches to the CLOSE position.
- (b) With the fuel gage or fuel measuring sticks, find out which fuel tank overfilled.
- (c) Remove fuel from the overfilled fuel tank until it shows the applicable maximum volume (TASK 28-26-00-650-802 or TASK 28-26-00-650-801).
 - 1) After you defuel the overfilled fuel tank, the surge tank will drain into the main fuel tank.
- (d) To reset the overfill system, open and close the RESET switch and switch guard.
- (e) During the next maintenance opportunity, correct the fault that caused the overfill (FIM 28-21 TASK 827).

K. Stop the Refuel Operation

SUBTASK 12-11-01-650-080

- (1) Put the applicable refuel valve switches to the CLOSE position for the fuel tanks with the correct quantity of fuel.

SUBTASK 12-11-01-650-081

- (2) Stop the fueling source.

SUBTASK 12-11-01-650-082

- (3) Release the deadman switch.

SUBTASK 12-11-01-650-083

- (4) Make sure all refuel valve lights are off, and all refuel valve switches are in the CLOSE position.

SUBTASK 12-11-01-860-042

- (5) If the power switch is in the BATT position, put the power switch to the NORMAL position.

SUBTASK 12-11-01-860-043

- (6) Make sure the onboard fuel load is in a valid pre-flight fuel distribution.

SUBTASK 12-11-01-650-084

- (7) Transfer fuel to balance the fuel load if it is necessary (TASK 28-26-00-650-802).

SUBTASK 12-11-01-650-085

- (8) Wait one minute to let the FQIS system become stable.

SUBTASK 12-11-01-650-086

- (9) Record the actual fuel quantities from the fuel quantity indicators.

SUBTASK 12-11-01-650-087

- (10) Record the actual fuel quantity from the fuel vehicle flow meter.

SUBTASK 12-11-01-650-088

- (11) Do the discrepancy check and make sure it is within limits.

NOTE: Refer to the operator's requirement.

SUBTASK 12-11-01-650-089

- (12) Complete the Fuel Sheet.

SUBTASK 12-11-01-650-090

- (13) Complete the Delivery Receipt if it is necessary.

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SUBTASK 12-11-01-650-091

- (14) Report any indicator lights that do not operate.

SUBTASK 12-11-01-650-092

- (15) Give a copy of the forms to the airline representative or flight crew.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 12-11-01-080-001

- (1) Disconnect the fueling nozzles.

SUBTASK 12-11-01-210-013

- (2) Make sure there is no fuel leakage at the refuel adapters.

SUBTASK 12-11-01-210-014

- (3) Make sure the receptacle adapter is not damaged.

SUBTASK 12-11-01-420-026

- (4) Close the left access door:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-420-027

- (5) If it is open, close the right access door:

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-860-045

- (6) Disconnect the bonding cable that you connected between the fueling source and the airplane (TASK 20-41-00-760-801).

SUBTASK 12-11-01-860-046

- (7) Do the operator-supplied procedures to remove the fuel vehicle.

SUBTASK 12-11-01-860-047

- (8) Remove the DO-NOT-OPERATE tag from the flap control lever (Figure 302).

SUBTASK 12-11-01-860-048

- (9) Remove electrical power if it is not necessary for other tasks (TASK 24-22-00-860-806).

————— END OF TASK —————

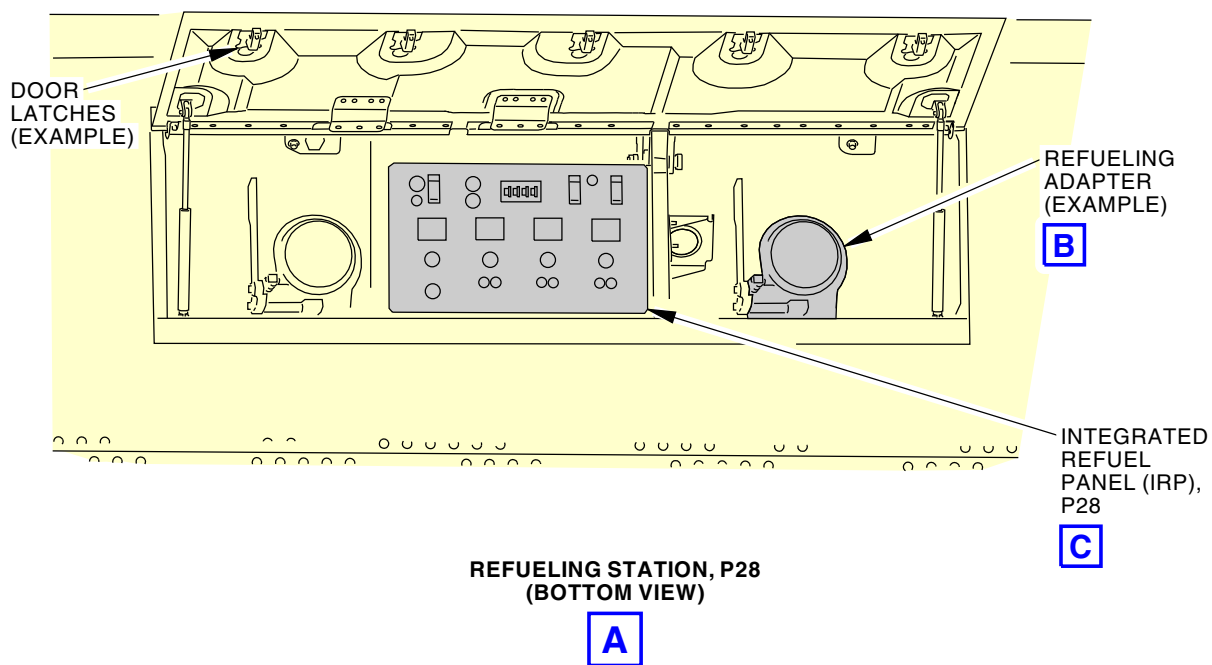
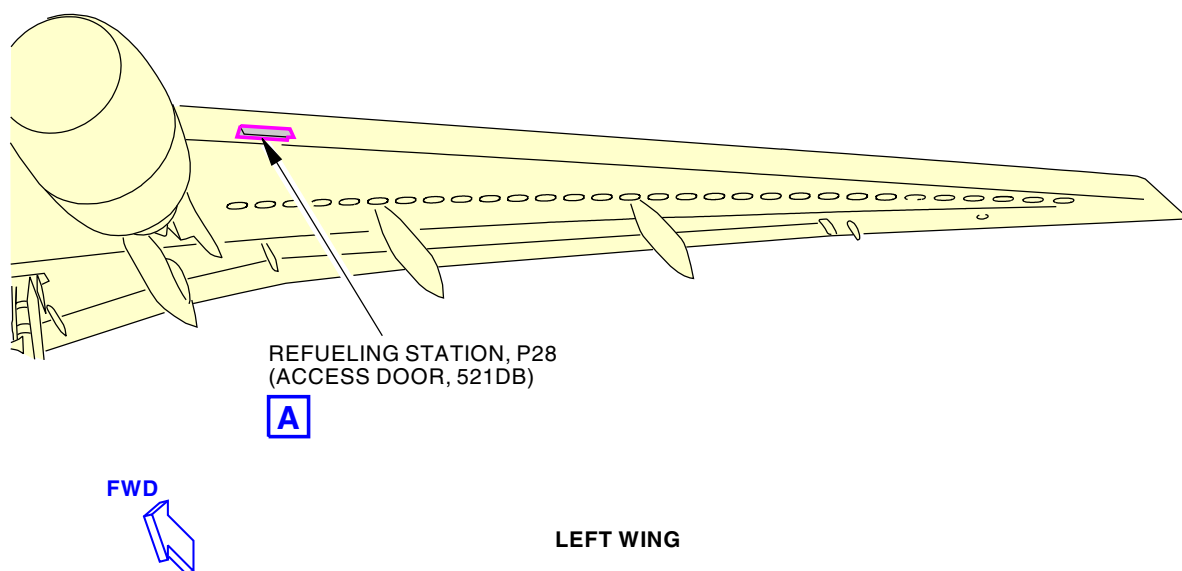
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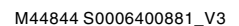
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Figure 301/12-11-01-990-801 (Sheet 1 of 4)

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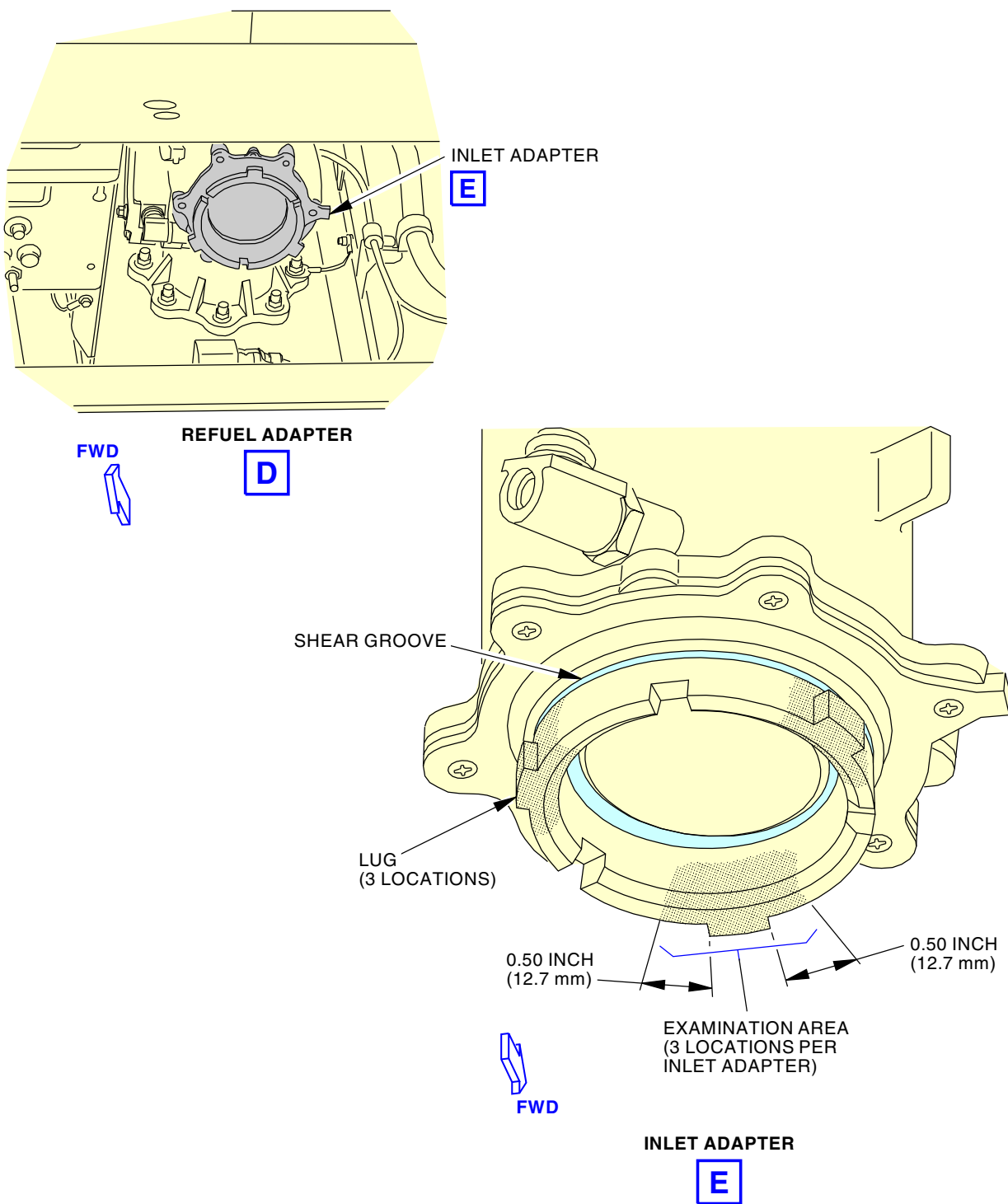
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Pressure Refueling
Figure 301/12-11-01-990-801 (Sheet 2 of 4)

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Pressure Refueling
Figure 301/12-11-01-990-801 (Sheet 3 of 4)

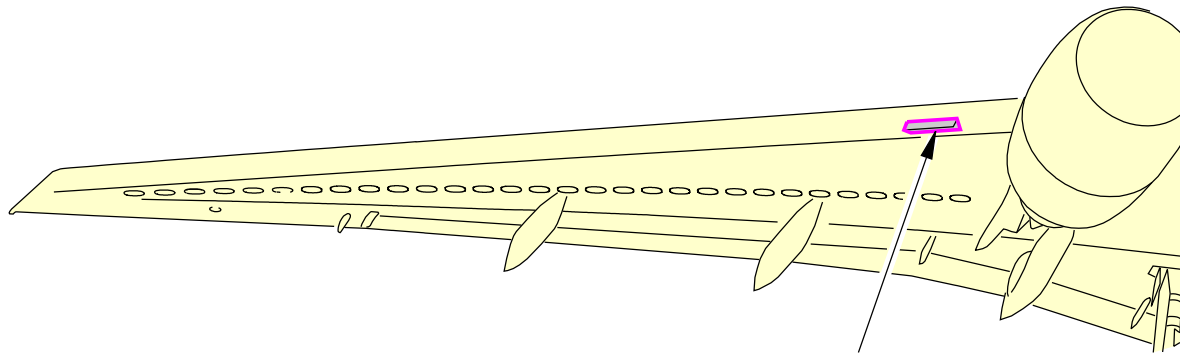
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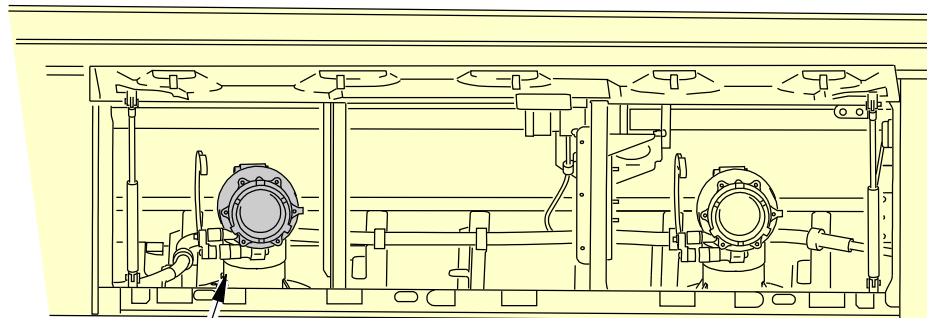


REFUELING STATION, P41
(ACCESS DOOR, 621DB)

F

RIGHT WING

FWD



REFUEL ADAPTER
(EXAMPLE)

D

REFUELING STATION, P41
(BOTTOM VIEW)

F



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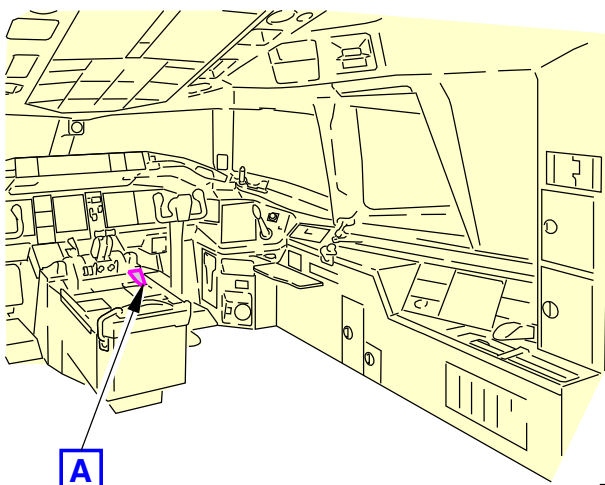
Pressure Refueling
Figure 301/12-11-01-990-801 (Sheet 4 of 4)

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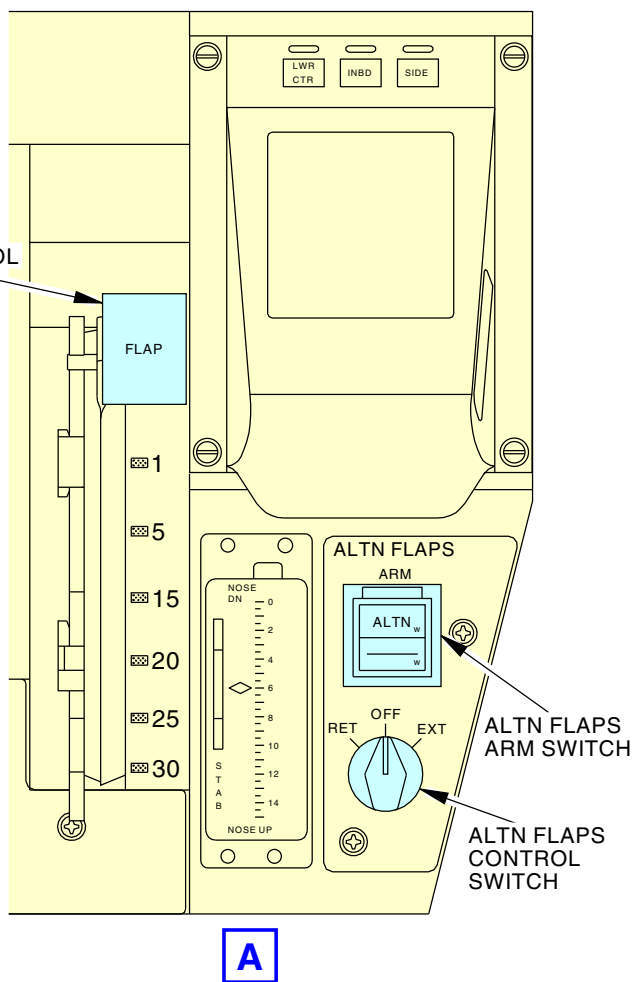
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FLIGHT COMPARTMENT

FLAP
CONTROL
LEVER



E50246 S0006400890_V2

**Leading Edge Slat System
Figure 302/12-11-01-990-802**

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TASK 12-11-01-650-807

6. Pressure Refueling - With No SET Fuel Quantity

(Figure 301, Figure 302)

A. General

- (1) This procedure does not set the fuel quantity to be put on the airplane. The automatic fuel shutoff control will close each refuel valve when the fuel tanks are full.

NOTE: The FQPU can also command the refuel valves to the closed position if there is a confirming or confirmed tank unit failure. The FQPU software will reduce the shutoff level to 3.2% below VSO.

- (2) To stop refueling at a specific fuel quantity shown on the FUEL QTY display, put the REFUEL VALVE CONTROL to the CLOSE position. The LOAD SEL display will be off.

NOTE: You do not have to open the refuel valves manually on the rear spar for this procedure.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-41-00-760-801	Electrical Bonding (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
45-10-00-910-810	How to Operate the MAT in the Flight Compartment (P/B 201)
FIM 28-21 TASK 827	Overfill during refuel - Fault Isolation
FIM 28-21 TASK 828	Early Shutoff During Refueling - Fault Isolation

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

E. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-01-860-050

- (1) Do this task: Prepare the Airplane for a Refuel Operation, TASK 12-11-01-650-812.

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F. Connect the Fueling Equipment

SUBTASK 12-11-01-860-051



OBEY THE APPLICABLE PRECAUTIONS WHEN YOU ATTACH THE BONDING CABLES. INSTALL THE BONDING CABLES AT AN APPROVED AIRPLANE GROUND CONNECTION TO MAKE SURE THAT THE ELECTRICAL BOND IS SUFFICIENT. IF THE FUEL SERVICE EQUIPMENT AND AIRPLANE DO NOT HAVE A SUFFICIENT ELECTRICAL BOND, A FIRE OR EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Connect a bonding cable from the fueling source to an approved electrical ground or bonding connection on the airplane (TASK 20-41-00-760-801).

NOTE: Static grounding of the airplane by positive grounding means is not necessary when performing pressure refueling or pressure defueling of the airplane. Electrical bonding between the airplane and the refueling vehicle is required.

SUBTASK 12-11-01-020-024

- (2) Open this access door installed on the left wing:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-020-025

- (3) Open this access door installed on the right wing, if it is necessary:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-860-053



MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do these steps to connect the fuel nozzle to the refuel receptacle:
 - (a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.
 - 1) Make sure that the screws and lugs are not loose or damaged.
 - (b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).
 - (c) Connect the refuel nozzle to the refuel receptacle.

G. Prepare the Integrated Refuel Panel (IRP)

SUBTASK 12-11-01-480-004

- (1) Make sure the applicable refuel access panel is open.

SUBTASK 12-11-01-020-027

- (2) Make sure the panel floodlights are on.

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SUBTASK 12-11-01-860-054

- (3) Make sure the fuel quantity displays are on.
- (a) The FUEL QTY displays will come on within 60 seconds after you open this access door:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|------------------------|
| 521DB | Refueling Station Door |
- (b) If the FUEL QTY display(s) does not show the fuel quantity, put the POWER switch on the IRP to the BATT position.
- (c) Make sure the FUEL QTY display(s) show the fuel quantity.
- (d) If one or more of the FUEL QTY displays continue to be off, do the Pressure Refueling - With A Inoperative Fuel Quantity Display procedure.
- 1) Make sure the total fuel legend "TF" shows on the TOTAL/BACKUP display.
- NOTE: This shows there is 28V DC at the IRP.
- 2) If the total fuel legend "TF" is not on or the refueling station door lights do not come on, then do this task: Pressure Refueling - With Inoperative Refuel Valves, TASK 12-11-01-650-808.

SUBTASK 12-11-01-650-093

- (4) Push the TEST IND switch to do a test of the fuel quantity indicators and the blue valve position lights.

SUBTASK 12-11-01-650-094

- (5) Make sure the correct test patterns (####.#) show on the FUEL QTY displays and the LOAD SEL displays of the integrated refuel panel.

NOTE: A checker-board pattern will show on the FUEL QTY display and the LOAD SEL Display for 2 seconds, the opposite pattern will show for 2 seconds, and then the displays will go off for 2 seconds. The test patterns will show one more time and then each FUEL QTY display and the LOAD SEL display will return to their usual condition.

SUBTASK 12-11-01-650-095

- (6) Make sure each blue valve position light comes on and then goes off.

H. Prepare the Fuel Sheet

SUBTASK 12-11-01-650-096

- (1) Use the operator-supplied fuel sheet to record the pre-uptake fuel quantity for each tank.

SUBTASK 12-11-01-650-097

- (2) Calculate the fuel to be uplifted converted to volume (if necessary).

SUBTASK 12-11-01-650-098

- (3) Record the uplift quantity on the fuel sheet (if necessary).

I. Start the Refuel Operation

SUBTASK 12-11-01-650-099



MAKE SURE THE FUEL PRESSURE USED TO REFUEL THE AIRCRAFT IS NOT MORE THAN 55 PSI (379.2 KPA). IF THE PRESSURE IS MORE THAN 55 PSI (379.2 KPA), DAMAGE TO THE FUEL SYSTEM CAN OCCUR.

- (1) Do these steps to start the refuel operation:
- (a) Activate the fuel shutoff control switch (deadman switch) to start the fuel flow.

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- (b) Put all the refuel valve switches to the OPEN position.

NOTE: The FQIS processor controls the start of refueling. The refuel valves will close automatically when:

- The fuel quantity equals the set fuel quantity
- The fuel tank is full
- The fuel spills into a surge tank.

If you put a refuel valve control switch to the CLOSE position during automatic refueling, the pressure refueling operation stops for that fuel tank.

NOTE: The FQPU can also command the refuel valves to the closed position if there is a confirming or confirmed tank unit failure. The FQPU software will reduce the shutoff level to 3.2% below VSO. If the FQPU commands early shutoff in one main tank, then there will be a fuel imbalance of approximately 2000 to 2200 LB (1000 to 1100 KG) between the left and right main fuel tank.

NOTE: Internal problems with the FQPU can also cause problems with refueling.

- 1) If one or more refuel valves does not open or if a valve closes unexpectedly during the refueling operation, do a check of the MAT for fault codes that show internal problems with the FQPU (TASK 45-10-00-910-810).
 - 2) If fueling is prevented because of an inoperative fueling valve, then do this task: Pressure Refueling - With Inoperative Refuel Valves, TASK 12-11-01-650-808.
- (c) Make sure the applicable blue refuel valve lights come on.
- 1) If the refuel valve lights do not stay on, then do this task: Pressure Refueling - With Inoperative Refuel Valves, TASK 12-11-01-650-808.
- (d) Make sure the refuel pressure is between 35 and 55 psi.
- (e) Make sure the refuel valve indication lights are on (valves open).
- (f) Make sure the right and the left main tanks refuel at approximately the same rate.

SUBTASK 12-11-01-650-100

- (2) Push the TEST SYSTEM switch to do a refueling system test.

NOTE: It is not necessary to do a system test each time you refuel the airplane. If you push the TEST SYSTEM switch during the refueling procedure, it causes the FQIS processor to test the pressure refueling system. The FQIS processor does a load select test, and a full tank shutoff test. After these tests are done, the refuel valves close in sequence. The refuel valves then open, and refueling continues.

SUBTASK 12-11-01-710-003

- (3) If it is necessary, do these steps to do an overfill test:

NOTE: It is not necessary to do this test for each refueling.

- (a) Apply fueling pressure.

NOTE: It is OK to use less than 55 psi for this test.

- (b) Push the OVERFILL TEST switch on the IRP, P28.
- (c) Make sure the refuel valve lights go off.

NOTE: This shows that the refuel valves are closed.

- (d) Set the OVERFILL RESET switch to the RESET position on the IRP, P28.
- (e) Set the OVERFILL RESET switch to the NORMAL position on the IRP, P28.

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- (f) Make sure the refuel valve lights come on.

NOTE: This shows that the refuel valves are open.

J. Early Shutoff of the Refuel Operation

NOTE: These steps are applicable only if the refuel operation stops unexpectedly before it is completed.

SUBTASK 12-11-01-650-101

- (1) If the message PUSH SET shows on the FUEL QTY display, the refuel operation will stop.
- (a) Do this task: Pressure Refueling - With An Inoperative Fuel Quantity Display, TASK 12-11-01-650-809.

SUBTASK 12-11-01-650-102

- (2) If fueling stops when the fuel quantity in a tank is approximately 2000 to 2200 LB (1000 to 1100 KG) less than the fuel quantity for a full tank, do this task: FIM 28-21 TASK 828.

NOTE: If there is a single confirming or confirmed tank unit failure, the FQPU software will command the refuel valves in the applicable tank to the closed position before volumetric shutoff (VSO). If the FQPU commands early shutoff in one main fuel tank, then there will be a fuel imbalance of approximately 2000 to 2200 LB (1000 to 1100 KG) between the left and right main fuel tanks.

SUBTASK 12-11-01-650-103

- (3) If the red OVERFILL IND light on the IRP comes on, refueling will stop. Do these steps:

NOTE: This condition shows there is fuel in the surge tank.

- (a) Set the refuel valve switches to the CLOSE position.
- (b) With the fuel gage or fuel measuring sticks, find out which fuel tank overfilled.
- (c) Remove fuel from the overfilled fuel tank until it shows the applicable maximum volume (TASK 28-26-00-650-802 or TASK 28-26-00-650-801).
- 1) After you defuel the overfilled fuel tank, the surge tank will drain into the main fuel tank.
- (d) To reset the overfill system, open and close the RESET switch and switch guard.
- (e) During the next maintenance opportunity, correct the fault that caused the overfill (FIM 28-21 TASK 827).

K. Stop the Refuel Operation

SUBTASK 12-11-01-650-104

- (1) Put the refuel valve switches to the CLOSE position when refueling is complete.

NOTE: The FQIS system will automatically close the refuel valve when the fuel quantity in a tank is the same as the set fuel quantity (or the fuel tank is full).

SUBTASK 12-11-01-650-105

- (2) Release the deadman switch.

SUBTASK 12-11-01-650-106

- (3) Make sure all refuel valve lights are off, and all refuel valve switches are in the CLOSE position.

SUBTASK 12-11-01-860-055

- (4) If the power switch is in the BATT position, put the power switch to the NORMAL position.

SUBTASK 12-11-01-860-056

- (5) Make sure the onboard fuel load is in a valid pre-flight fuel distribution.

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SUBTASK 12-11-01-860-057

- (6) Transfer fuel to balance the fuel load if it is necessary (TASK 28-26-00-650-802).

SUBTASK 12-11-01-860-058

- (7) Wait one minute to let the FQIS system become stable.

SUBTASK 12-11-01-650-107

- (8) Record the actual fuel quantities from the fuel quantity indicators.

SUBTASK 12-11-01-650-108

- (9) Record the actual fuel quantity from the fuel vehicle flow meter.

SUBTASK 12-11-01-650-109

- (10) Do the discrepancy check and make sure it is within limits.

NOTE: Refer to the operator's requirement.

SUBTASK 12-11-01-650-110

- (11) Complete the Fuel Sheet.

SUBTASK 12-11-01-650-111

- (12) Complete the Delivery Receipt if it is necessary.

SUBTASK 12-11-01-650-112

- (13) Report any indicator lights that do not operate.

SUBTASK 12-11-01-650-113

- (14) Give a copy of the forms to the airline representative or flight crew.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 12-11-01-090-001

- (1) Disconnect the fueling nozzles.

SUBTASK 12-11-01-210-015

- (2) Make sure there is no fuel leakage at the refuel adapters.

SUBTASK 12-11-01-210-016

- (3) Make sure the receptacle adapter is not damaged.

SUBTASK 12-11-01-410-013

- (4) Close the left access door:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-410-014

- (5) If it is open, close the right access door:

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-020-029

- (6) Disconnect the bonding cable that you connected between the fueling source and the airplane (TASK 20-41-00-760-801).

SUBTASK 12-11-01-860-059

- (7) Do the operator-supplied procedures to remove the fuel vehicle.

SUBTASK 12-11-01-860-060

- (8) Remove the DO-NOT-OPERATE tag from the flap control lever (Figure 302).

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SUBTASK 12-11-01-860-061

- (9) Remove electrical power if it is not necessary for other tasks (TASK 24-22-00-860-806).

END OF TASK

TASK 12-11-01-650-808

7. Pressure Refueling - With Inoperative Refuel Valves

(Figure 301, Figure 302, Figure 303)

A. General

- (1) This procedure lets the operator refuel one or more fuel tanks with inoperative refuel valves. You can operate the refuel valves manually on the rear spar.
- (2) There is no automatic refuel shutoff protection when the refuel valves are opened manually. If you put too much fuel into a fuel tank, fuel can spill into the surge tanks and possibly overboard.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-41-00-760-801	Electrical Bonding (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
27-51-00-740-802	Flap System Primary Control Test (P/B 501)
27-51-00-740-803	Flap System Secondary Control Test (P/B 501)
27-51-00-860-804	Extend the Trailing Edge Flaps (P/B 201)
28-00-00-040-802	MMEL 28-21-01-01 (DDG) Preparation - Refuel Valve(s) Inoperative (P/B 901)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - 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)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

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D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
551DB	Inboard Fixed Trailing Edge Panel
561CB	Midspan Fixed Trailing Edge Panel
621DB	Refueling Station Door
651DB	Inboard Fixed Trailing Edge Panel
661CB	Midspan Fixed Trailing Edge Panel

E. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-01-650-115

- (1) Do this task: Prepare the Airplane for a Refuel Operation, TASK 12-11-01-650-812.

F. Connect the Fueling Equipment

SUBTASK 12-11-01-420-028



WARNING

OBEY THE APPLICABLE PRECAUTIONS WHEN YOU ATTACH THE BONDING CABLES. INSTALL THE BONDING CABLES AT AN APPROVED AIRPLANE GROUND CONNECTION TO MAKE SURE THAT THE ELECTRICAL BOND IS SUFFICIENT. IF THE FUEL SERVICE EQUIPMENT AND AIRPLANE DO NOT HAVE A SUFFICIENT ELECTRICAL BOND, A FIRE OR EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Connect a bonding cable from the fueling source to an approved electrical ground or bonding connection on the airplane (TASK 20-41-00-760-801).

NOTE: Static grounding of the airplane by positive grounding means is not necessary when performing pressure refueling or pressure defueling of the airplane. Electrical bonding between the airplane and the refueling vehicle is required.

SUBTASK 12-11-01-010-023

- (2) Open this access door installed on the left wing:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-010-024

- (3) Open this access door installed on the right wing, if it is necessary:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-490-001



WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do these steps to connect the fuel nozzle to the refuel receptacle:
 - (a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.

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- 1) Make sure that the screws and lugs are not loose or damaged.
- (b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).
- (c) Connect the refuel nozzle to the refuel receptacle.

G. Refuel Operation

SUBTASK 12-11-01-210-011

- (1) Make sure the fuel quantity displays are on.
 - (a) The FUEL QTY displays will come on within 60 seconds after you open this access door:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door
 - (b) If the FUEL QTY display(s) does not show the fuel quantity, put the POWER switch on the IRP to the BATT position.
 - (c) Make sure the FUEL QTY display(s) show the fuel quantity.
 - (d) If one or more of the FUEL QTY displays continue to be off, do the Pressure Refueling - With A Inoperative Fuel Quantity Display procedure.
 - 1) Make sure the total fuel legend "TF" shows on the TOTAL/BACKUP display.

NOTE: This shows there is 28V DC at the IRP.

SUBTASK 12-11-01-700-001

- (2) Do this test to find the refuel valves that do not operate:
 - (a) Apply fueling pressure at the fueling source, squeeze the deadman so that fueling pressure is at the refuel receptacle.
 - (b) Make sure the fuel quantities in each tank remains constant.
 - (c) If the quantity does not remain constant, there is a refuel valve failed open, do this task: MMEL 28-21-01-01 (DDG) Preparation - Refuel Valve(s) Inoperative, TASK 28-00-00-040-802.
 - (d) Put each refuel valve control switch to the OPEN position.
 - (e) Make sure the applicable blue refuel valve lights come on and the fuel content quantity in each respective tank increases.

NOTE: The blue light shows that the refuel valve(s) in the applicable fuel tank are in the open position.

NOTE: If a refuel valve is in the failed condition, the blue light may not indicate the correct position of the refuel valve(s).
 - (f) Put the applicable refuel valve control switches to the CLOSED position.

NOTE: If you put a refuel valve control switch to the CLOSE position during refueling, the pressure refueling operation stops for that fuel tank.
 - (g) Make sure the applicable blue refuel valve lights go off and the fuel content quantity in each respective tank no longer increases.
 - (h) If the refuel valve light(s) do not go off or the fuel tank contents quantity continues to increase, a refuel valve is failed open; do this task: MMEL 28-21-01-01 (DDG) Preparation - Refuel Valve(s) Inoperative, TASK 28-00-00-040-802.

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CAUTION

THERE IS NO AUTOMATIC REFUEL SHUTOFF OR OVERFILL PROTECTION WHEN THE REFUEL VALVES ARE FAILED OPEN.

- (i) In order to fuel an airplane with a failed open refuel valve, care must be taken to avoid fuel spillage.
- (j) If possible, fill the tanks without the failed open refuel valve first, and fill the tank with the failed open refuel valve last.
NOTE: With the refuel valve in the failed open position, fueling can be stopped and started by operating the deadman.
- (k) Avoid filling past Volumetric Shutoff (VSO). If VSO is reached in the tank with the refuel valve failed open before the other tanks are filled to the appropriate level, fuel must be transferred from this tank before proceeding.
- (l) If the refuel valve light(s) do not come on, or the fuel content quantity does not increase, the refuel valve(s) have failed closed. In this case, continue to the next step.

SUBTASK 12-11-01-010-003

- (3) Do these steps to get access to the refuel valve control unit(s) (Figure 303):
 - (a) To get access to the refuel valve control units in the left main fuel tank, do these steps:
 - 1) Open this access panel to get access to the inboard refuel valve control unit in the left main fuel tank:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel
 - 2) Do one of these steps to access the outboard refuel valve control unit in the left main fuel tank:
 - a) Remove this access panel:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
561CB	Midspan Fixed Trailing Edge Panel
 - b) Extend the trailing edge flaps to 30 degrees. To extend the flaps for access, do the steps that follow:
 - c) Extend the trailing edge flaps to 30 degrees (TASK 27-51-00-860-804).
 - d) Deactivate the trailing edge flaps (TASK 27-51-00-040-801).
 - (b) To get access to the refuel valve control units in the right main fuel tank, do these steps:
 - 1) Open this access panel to get access to the inboard refuel valve control unit in the right main fuel tank:

<u>Number</u>	<u>Name/Location</u>
651DB	Inboard Fixed Trailing Edge Panel
 - 2) Do one of these steps to access the outboard refuel valve control unit in the right main fuel tank:
 - a) Remove this access panel:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
661CB	Midspan Fixed Trailing Edge Panel

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- b) Extend the trailing edge flaps to 30 degrees. To extend the flaps for access, do the steps that follow:
 - c) Extend the trailing edge flaps to 30 degrees (Extend the Trailing Edge Flaps, TASK 27-51-00-860-804).
 - d) Deactivate the trailing edge flaps (TASK 27-51-00-040-801).
- (c) To get access to the refuel valve control units in the center fuel tank, do these steps:
- 1) Make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-30-480-801).



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 12-11-01-980-001

- (4) Do these steps to open the refuel valve(s) manually (Figure 303):

NOTE: If the refuel manifold is pressurized in the last 30 minutes, the refuel valves will not open.

- (a) Do this step to remove pressure in the refuel manifold:

- 1) Put the LEFT, and RIGHT MAIN, or CENTER REFUEL VALVE CONTROL switches to the OPEN position.
- 2) Wait 1 minute to remove pressure in the refuel manifold.

NOTE: If all three INOP (Inoperative) refueling valve switches or INOP IRP, then wait 1-2 hours.

- (b) Make sure the fueling source is off.



DO NOT REMOVE THE RETAINER PLATE LOCKWIRE, SCREWS, OR THE RETAINER PLATE. FUEL LEAKAGE CAN OCCUR AND CAUSE DAMAGE.

- (c) Remove the lockwire from the override screw (knurled knob) only.
- (d) Turn the override screw (knurled knob) 10 to 13 turns in the counterclockwise direction.

NOTE: It can be necessary to use pliers to initially loosen the override screw.

NOTE: The resistance can increase as you turn the override screw (knurled knob).

NOTE: The refuel valve is not open until the override screw (knurled knob) is turned 10 to 13 turns. The refuel valve light indication may not be correct during manual opening of the valve. Do not use the refuel valve lights instead of counting the number of turns of the override screw (knurled knob).

SUBTASK 12-11-01-650-006



THERE IS NO AUTOMATIC REFUEL SHUTOFF OR OVERFILL PROTECTION WHEN THE REFUEL VALVES ARE OPENED MANUALLY.



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(CAUTION PRECEDES)



DO NOT MANUALLY USE THE REFUEL VALVES TO SLOW OR STOP THE REFUELING. IF YOU MANUALLY CLOSE THE REFUEL VALVES DURING FUELING, PRESSURE SURGES AND DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (5) Start the fueling source.

SUBTASK 12-11-01-650-007

- (6) Release the deadman switch on the fueling source to stop refueling when you get the correct quantity of fuel in the fuel tank.

SUBTASK 12-11-01-980-002

- (7) Do these steps to close the refuel valves manually:



TIGHTEN THE KNURLED KNOB BY HAND. IF YOU TIGHTEN THE KNURLED KNOB WITH TOOLS YOU CAN DAMAGE THE REFUEL VALVE CONTROL UNIT.

- (a) Turn the override screw (knurled knob) on the refuel valve control unit 10 to 13 turns in the clockwise direction until the override screw stops.

NOTE: The refuel valve is not closed until the override screw (knurled knob) is turned 10 to 13 turns.

- (b) Install lockwire to the override screw (knurled knob) (TASK 20-10-23-400-801).
(c) Remove temporary power if applied in the earlier step and re-connect the connectors to the valves.

NOTE: If necessary, temporarily mark the INOP refuel valve switches with a blue tape for the next refueler.

- (d) For the refuel valves in the left main fuel tank, do these steps:

- 1) For the inboard refuel valve (TASK 06-44-00-800-802);

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel

- 2) Do one of these steps to close access to the outboard refuel valve:

- a) Install this access panel:

<u>Number</u>	<u>Name/Location</u>
561CB	Midspan Fixed Trailing Edge Panel

(TASK 06-44-00-800-802).

- b) Reactivate the trailing edge flaps.

<1> Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

<2> Do a test of the trailing edge flaps.

<a> Do this task: Flap System Primary Control Test, TASK 27-51-00-740-802.

 Do this task: Flap System Secondary Control Test, TASK 27-51-00-740-803

- (e) For the refuel valves in the right main fuel tank, do these steps:

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- 1) For the inboard refuel valve (TASK 06-44-00-800-802);

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
651DB	Inboard Fixed Trailing Edge Panel

- 2) Do one of these steps to close access to the outboard refuel valve:

- a) Install this access panel:

(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
661CB	Midspan Fixed Trailing Edge Panel

- b) Reactivate the trailing edge flaps.

<1> Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

<2> Do a test of the trailing edge flaps. To do a test of the flaps, do these tests:

<3> Do this task: Flap System Primary Control Test, TASK 27-51-00-740-802.

<4> Do this task: Flap System Secondary Control Test, TASK 27-51-00-740-803.

- (f) For the center fuel tank, do this step:



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 12-11-01-020-013

- (8) Disconnect the fueling nozzles.

SUBTASK 12-11-01-020-019

- (9) Make sure there is no fuel leakage at the refuel adapters.

SUBTASK 12-11-01-410-005

- (10) Close this access door:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-410-006

- (11) Close this access door if it is open:

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-040-006

- (12) Remove the DO-NOT-OPERATE tag from the flap control lever (Figure 302).

————— **END OF TASK** —————

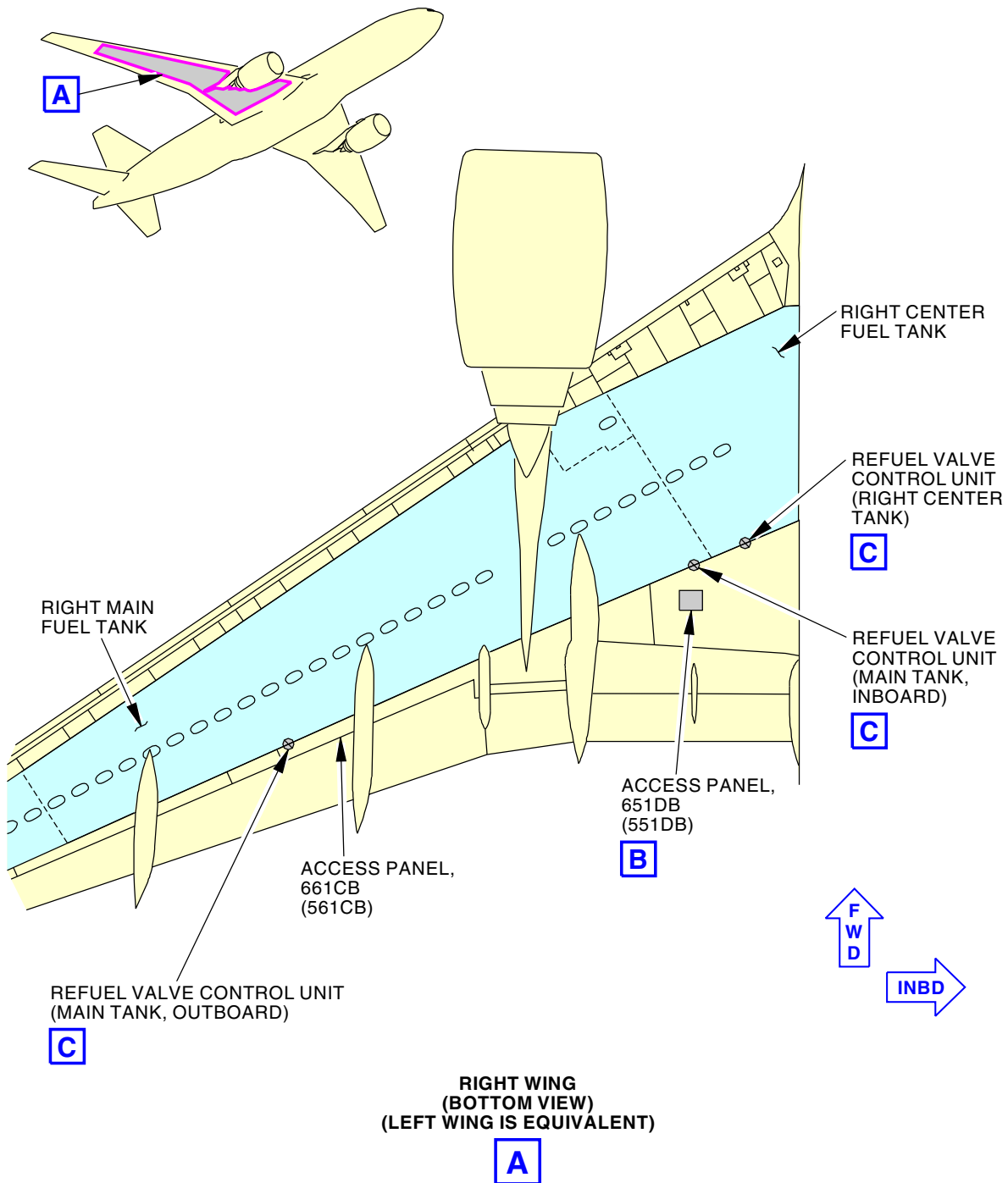
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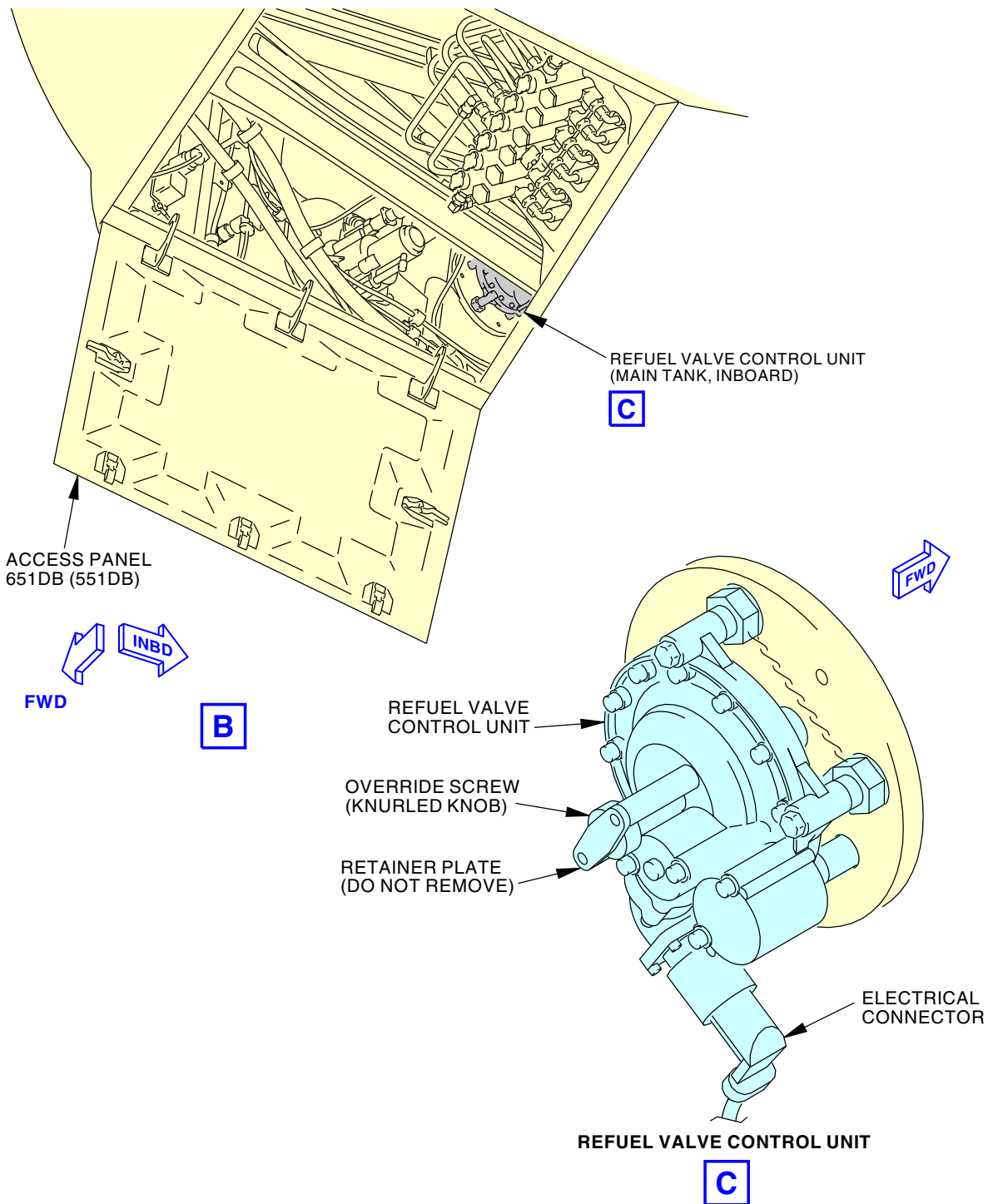
Refuel Valve Control Unit Servicing
Figure 303/12-11-01-990-803 (Sheet 1 of 2)

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**Refuel Valve Control Unit Servicing
Figure 303/12-11-01-990-803 (Sheet 2 of 2)**

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TASK 12-11-01-650-809

8. Pressure Refueling - With An Inoperative Fuel Quantity Display

(Figure 301)

A. General

- (1) This procedure lets the operator refuel one or more fuel tanks with a fuel quantity processor unit (FQPU) failure. The FUEL QTY display and the LOAD SEL display will be off for the fuel tanks with the failure. Only one refuel valve will open for the fuel tank with the failure. There is no volumetric shutoff (VSO) when the fuel quantity displays are off. To continue refueling, you can measure the fuel quantity with the fuel measuring sticks.

NOTE: If there is a failure during refueling, the message PUSH SET will show on the FUEL QTY display. Push the load select set switch to continue refueling. The FUEL QTY display and the LOAD SEL display will go off. One refuel valve will open in the applicable fuel tank.

NOTE: If the FUEL QTY display and the LOAD SEL display are off when the refuel panel door is opened the PUSH SET message will not show.

- (2) You do not have to open the refuel valves manually on the rear spar for this procedure.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-41-00-760-801	Electrical Bonding (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

E. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-01-650-117

- (1) Do this task: Prepare the Airplane for a Refuel Operation, TASK 12-11-01-650-812.

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F. Connect the Fueling Equipment

SUBTASK 12-11-01-420-030



WARNING

OBEY THE APPLICABLE PRECAUTIONS WHEN YOU ATTACH THE BONDING CABLES. INSTALL THE BONDING CABLES AT AN APPROVED AIRPLANE GROUND CONNECTION TO MAKE SURE THAT THE ELECTRICAL BOND IS SUFFICIENT. IF THE FUEL SERVICE EQUIPMENT AND AIRPLANE DO NOT HAVE A SUFFICIENT ELECTRICAL BOND, A FIRE OR EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Connect a bonding cable from the fueling source to an approved electrical ground or bonding connection on the airplane (TASK 20-41-00-760-801).

NOTE: Static grounding of the airplane by positive grounding means is not necessary when performing pressure refueling or pressure defueling of the airplane. Electrical bonding between the airplane and the refueling vehicle is required.

SUBTASK 12-11-01-010-026

- (2) Open this access door installed on the left wing:

(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-010-027

- (3) Open this access door installed on the right wing, if it is necessary:

(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-490-002



WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do these steps to connect the fuel nozzle to the refuel receptacle:
 - (a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.
 - 1) Make sure that the screws and lugs are not loose or damaged.
 - (b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).
 - (c) Connect the refuel nozzle to the refuel receptacle.

G. Refuel Operation

SUBTASK 12-11-01-210-008

- (1) Do these steps to make sure the FUEL QTY display does not operate:

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- (a) Wait 60 seconds after you open this access door to see if the FUEL QTY displays will come on:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

- 1) Make sure the total fuel legend "TF" shows on the TOTAL/BACKUP display.

NOTE: This shows there is 28V DC at the IRP.

- (b) If only one or two of the fuel quantity displays are off, set the TOTAL/BACKUP display to show the fuel quantity in the tank(s) with the inoperative display.
- 1) Push the switch on the TOTAL/BACKUP display the applicable number of times to display the quantity for the applicable tank.
- a) Each time you push the switch, a different tank quantity and identifier show on the TOTAL/BACKUP display.
- b) This is the sequence of identifiers:
- <1> TF = total fuel quantity
- <2> RM - right main tank quantity
- <3> CT - center tank quantity
- <4> LM - left main tank quantity
- (c) If none of the FUEL QTY displays show the fuel quantity, or if the TOTAL/BACKUP display does not operate as expected, put the POWER switch on the IRP to the BATT position.
- (d) Make sure the FUEL QTY display(s) show the fuel quantity.
- (e) If one or more of the FUEL QTY displays continue to be off, do these steps:
- 1) Do these steps to find the fuel quantity:
- a) Use the applicable Fuel Measuring Stick Manual (FMSM) to measure the fuel quantities in the applicable fuel tanks.
- 2) Use the fuel measuring sticks to add a known quantity of fuel.
- 3) Continue to the next step.

SUBTASK 12-11-01-650-008



WHEN THE FUEL QTY DISPLAY IS OFF, THE REFUEL SYSTEM FUNCTION FOR VOLUMETRIC SHUTOFF (VSO) IS OFF. IF YOU PUT TOO MUCH FUEL IN THE FUEL TANK, FUEL CAN SPILL INTO THE SURGE TANKS.

- (2) Start the fueling source.

NOTE: You close the refuel valves to stop fueling.

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SUBTASK 12-11-01-860-020



WHEN THE FUEL QTY DISPLAY IS OFF OR PUSH SET SHOWS, THE REFUEL SYSTEM FUNCTION FOR VOLUMETRIC SHUTOFF (VSO) IS OFF. IF YOU PUT TOO MUCH FUEL IN THE FUEL TANK, FUEL CAN SPILL INTO THE SURGE TANKS.

- (3) If the message PUSH SET shows on the fuel quantity display, push the SET switch to continue refueling.

NOTE: When the PUSH SET message shows the refuel valves will close for the applicable fuel tank. When you push the SET switch the refuel valves will open. You can monitor the fuel quantity with the fuel measuring sticks to continue refueling.

SUBTASK 12-11-01-650-009

- (4) Set the refuel valve control switch to OPEN for the applicable fuel tanks.

NOTE: If you put a refuel valve control switch to the CLOSE position during refueling, the pressure refueling operation stops for that fuel tank.

SUBTASK 12-11-01-210-009

- (5) Make sure the applicable blue refuel valve lights come on.

(a) If the refuel valve lights do not stay on, refer to the Pressure Refueling - With An Inoperative Refuel Valves procedure.

SUBTASK 12-11-01-650-010

- (6) Put the applicable refuel valve control switch, on the IRP, to the CLOSED position at the correct fuel quantity.

SUBTASK 12-11-01-020-015

- (7) Disconnect the fueling nozzles.

SUBTASK 12-11-01-020-020

- (8) Make sure there is no fuel leakage at the refuel adapters.

SUBTASK 12-11-01-860-016

- (9) If the battery power switch is in the BATT position, put the battery power switch to the NORMAL position.

SUBTASK 12-11-01-410-007

- (10) Close this access door:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-410-008

- (11) Close this access door if it is open:

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-040-008

- (12) Remove the DO-NOT-OPERATE tag from the flap control lever (Figure 302).

————— END OF TASK —————

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TASK 12-11-01-650-810

9. Pressure Refueling - Without Electrical Power

(Figure 301)

A. General

(1) This procedure lets the operator refuel one or more fuel tanks without electrical power.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-41-00-760-801	Electrical Bonding (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
27-51-00-740-802	Flap System Primary Control Test (P/B 501)
27-51-00-740-803	Flap System Secondary Control Test (P/B 501)
27-51-00-860-804	Extend the Trailing Edge Flaps (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - 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)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
551DB	Inboard Fixed Trailing Edge Panel
561CB	Midspan Fixed Trailing Edge Panel
621DB	Refueling Station Door
651DB	Inboard Fixed Trailing Edge Panel
661CB	Midspan Fixed Trailing Edge Panel

E. Prepare the Airplane for a Refuel Operation

SUBTASK 12-11-01-650-119

(1) Do this task: Prepare the Airplane for a Refuel Operation, TASK 12-11-01-650-812.

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F. Connect the Fueling Equipment

SUBTASK 12-11-01-420-032



WARNING

OBEY THE APPLICABLE PRECAUTIONS WHEN YOU ATTACH THE BONDING CABLES. INSTALL THE BONDING CABLES AT AN APPROVED AIRPLANE GROUND CONNECTION TO MAKE SURE THAT THE ELECTRICAL BOND IS SUFFICIENT. IF THE FUEL SERVICE EQUIPMENT AND AIRPLANE DO NOT HAVE A SUFFICIENT ELECTRICAL BOND, A FIRE OR EXPLOSION CAN OCCUR. A FIRE OR EXPLOSION CAN KILL OR CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Connect a bonding cable from the fueling source to an approved electrical ground or bonding connection on the airplane (TASK 20-41-00-760-801).

NOTE: Static grounding of the airplane by positive grounding means is not necessary when performing pressure refueling or pressure defueling of the airplane. Electrical bonding between the airplane and the refueling vehicle is required.

SUBTASK 12-11-01-010-029

- (2) Open this access door installed on the left wing:

(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-010-030

- (3) Open this access door installed on the right wing, if it is necessary:

(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-490-003



WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do these steps to connect the fuel nozzle to the refuel receptacle:
 - (a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.
 - 1) Make sure that the screws and lugs are not loose or damaged.
 - (b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).
 - (c) Connect the refuel nozzle to the refuel receptacle.

G. Refuel Procedure

SUBTASK 12-11-01-210-012

- (1) Do these steps to find the fuel quantity:
 - (a) Use the fuel measuring stick table to calculate the fuel measuring stick reading for the applicable fuel quantity.

SUBTASK 12-11-01-010-018

- (2) Do these steps to get access to the refuel valve control unit(s) (Figure 303):

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- (a) To get access to the refuel valve control units in the left main fuel tank, do these steps:
- 1) To get access to the inboard refuel valve control unit in the left main fuel tank, open this access panel:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel
 - 2) Do one of these steps to access the outboard refuel valve control unit in the left main fuel tank:
 - a) Remove this access panel:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
561CB	Midspan Fixed Trailing Edge Panel
 - b) Extend the trailing edge flaps to 30 degrees.
 - <1> Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.
 - <2> Deactivate the trailing edge flaps (TASK 27-51-00-040-801).
- (b) To get access to the refuel valve control units in the right main fuel tank, do these steps:
- 1) To get access to the inboard refuel valve control unit in the right main fuel tank, open this access panel:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
651DB	Inboard Fixed Trailing Edge Panel
 - 2) Do one of these steps to access the outboard refuel valve control unit in the right main fuel tank:
 - a) Remove this access panel:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
661CB	Midspan Fixed Trailing Edge Panel
 - b) Extend the trailing edge flaps to 30 degrees.
 - <1> Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.
 - <2> Deactivate the trailing edge flaps (TASK 27-51-00-040-801).
- (c) To get access to the refuel valve control units in the center fuel tank, do these steps:
- 1) Make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-30-480-801).



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY AND 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.

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SUBTASK 12-11-01-980-003

- (3) Do these steps to open the refuel valve(s) manually (Figure 303):

NOTE: The refuel valves will not open if the refuel manifold is pressurized. If the refuel manifold is pressurized, it usually can take 1 to 2 hours for the pressure to decrease by a sufficient quantity to open the valve(s).

- (a) Make sure the fueling source is off.



DO NOT REMOVE THE RETAINER PLATE LOCKWIRE, SCREWS, OR THE RETAINER PLATE. FUEL LEAKAGE CAN OCCUR AND CAUSE DAMAGE.

- (b) Remove the lockwire from the override screw (knurled knob) only.
- (c) Turn the override screw (knurled knob) 10 to 13 turns in the counterclockwise direction.
- NOTE:** It can be necessary to use pliers to initially loosen the override screw.
- NOTE:** The resistance can increase as you turn the override screw (knurled knob).
- NOTE:** The refuel valve is not open until the override screw (knurled knob) is turned 10 to 13 turns. The refuel valve light indication may not be correct during manual opening of the valve. Do not use the refuel valve lights instead of counting the number of turns of the override screw (knurled knob).

SUBTASK 12-11-01-860-025

- (4) Release the fuel measuring sticks on the applicable fuel tank.

NOTE: Let the stick fall freely and lift it slowly to lock on the float assembly.

SUBTASK 12-11-01-650-018



THERE IS NO AUTOMATIC REFUEL SHUTOFF OR OVERFILL PROTECTION WHEN THE REFUEL VALVES ARE OPENED MANUALLY.



DO NOT MANUALLY USE THE REFUEL VALVES TO SLOW OR STOP THE REFUELING. IF YOU MANUALLY CLOSE THE REFUEL VALVES DURING FUELING, PRESSURE SURGES AND DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (5) Start the fueling source.

SUBTASK 12-11-01-860-026

- (6) Use the fuel measuring sticks to monitor the fuel quantity.
- (a) Make sure you know the attitude of the airplane.
- (b) Use the fuel measuring stick procedure to calculate the fuel quantity.

SUBTASK 12-11-01-650-019

- (7) Put fuel in the tank until the fuel measuring sticks show the necessary quantity of fuel.

SUBTASK 12-11-01-650-020

- (8) Release the deadman switch on the fueling source to stop refueling when you get the correct quantity of fuel in the fuel tank.

SUBTASK 12-11-01-650-021

- (9) Permit the fuel level in the tank to become stable for five minutes.

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SUBTASK 12-11-01-650-022

- (10) Examine the fuel measuring sticks again.

SUBTASK 12-11-01-650-023

- (11) If the fuel measuring sticks show a fuel quantity less than the necessary quantity, continue the refuel operation.

SUBTASK 12-11-01-650-024

- (12) Continue to refuel the tank until the fuel measuring sticks show the necessary quantity after the five minute time.

SUBTASK 12-11-01-860-027

- (13) Lock the fuel measuring sticks in the retracted position.

SUBTASK 12-11-01-980-004

- (14) Do these steps to close the refuel valves manually:



CAUTION

TIGHTEN THE KNURLED KNOB BY HAND. IF YOU TIGHTEN THE KNURLED KNOB WITH TOOLS YOU CAN DAMAGE THE REFUEL VALVE CONTROL UNIT.

- (a) Turn the override screw (knurled knob) on the refuel valve control unit 10 to 13 turns in the clockwise direction until the override screw stops.
- (b) Install lockwire to the override screw (knurled knob) (TASK 20-10-23-400-801).
- (c) For the refuel valves in the left main fuel tank, do these steps:
- 1) Close this access panel for the inboard refuel valve:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel
 - 2) Do one of these steps to close access to the outboard refuel valve:
 - a) Install this access panel:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
561CB	Midspan Fixed Trailing Edge Panel
 - b) Reactivate the trailing edge flaps.
 - <1> Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.
 - <2> Do a test of the trailing edge flaps.
 - <a> Do this task: Flap System Primary Control Test, TASK 27-51-00-740-802.
 - Do this task: Flap System Secondary Control Test, TASK 27-51-00-740-803.
- (d) For the refuel valves in the right main fuel tank, do these steps:
- 1) Close this access panel for the inboard refuel valve:
(TASK 06-44-00-800-802)

<u>Number</u>	<u>Name/Location</u>
651DB	Inboard Fixed Trailing Edge Panel
 - 2) Do one of these steps to close access to the outboard refuel valve:

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- a) Install this access panel:
(TASK 06-44-00-800-802)
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-----------------------------------|
| 661CB | Midspan Fixed Trailing Edge Panel |
- b) Reactivate the trailing edge flaps.
- <1> Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.
- <2> Do a test of the trailing edge flaps.
- <a> Do this task: Flap System Primary Control Test, TASK 27-51-00-740-802.
- Do this task: Flap System Secondary Control Test, TASK 27-51-00-740-803.
- (e) For the center fuel tank, do this step:



OBEY THE INSTALLATION PROCEDURE FOR THE LANDING GEAR DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY AND 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 12-11-01-020-021

- (15) Disconnect the fueling nozzles.

SUBTASK 12-11-01-020-022

- (16) Make sure there is no fuel leakage at the refuel adapters.

SUBTASK 12-11-01-860-028

- (17) Make sure the battery power switch is in the NORMAL position.

SUBTASK 12-11-01-410-011

- (18) Close this access door:

<u>Number</u>	<u>Name/Location</u>
521DB	Refueling Station Door

SUBTASK 12-11-01-410-012

- (19) If it is open, close this access door:

<u>Number</u>	<u>Name/Location</u>
621DB	Refueling Station Door

SUBTASK 12-11-01-040-011

- (20) Remove the DO-NOT-OPERATE tag from the flap control lever (Figure 302).

————— **END OF TASK** —————

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FUEL SUMP - OPERATION

1. General

- A. If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps. To do a check for water at the fuel tank sump drain valves with fuel temperature below 32°F (0°C), do one of the subsequent steps to raise the temperature of the fuel:

(1) Refuel with warm fuel.

(2) If the ambient temperature is less than 32°F (0°C), move the airplane into a warm hangar.

- B. Water can be present in fuel as dissolved water, suspended free water, or settled free water. The main purpose of fuel tank sumping is to remove settled water that has collected in the tank sump. Removal of water can help keep microbial growth at the fuel water interface to a minimum.

NOTE: Fuel tank sumping should be based on operating environment and experience.

- C. There are two sump drain valves installed in the center fuel tank, one sump drain valve in each main fuel tank, and one sump drain valve in each surge tank. There are six sump drain valves in total, installed on the airplane.

- D. For the sump drain valves installed in the center and main fuel tanks:

(1) It is necessary to drain the fuel tank sumps regularly to remove water from the fuel tanks.

NOTE: There are L MAIN WATER, R MAIN WATER and CENTER TANK WATER messages that show on the fuel quantity maintenance page when the water detector finds water. These messages are for information only and should not be used to determine sumping frequency.

(2) Each fuel tank sump has a drain valve to let water drain from the tank. The fuel tank sumps should be drained before or after refueling, but not during refueling. During refueling, water mixes in the fuel. In cold weather the water can freeze and not let the sump drain valve open. For cold weather maintenance refer to (TASK 12-33-01-600-803).

(3) Examine each fuel sample independently for water, ice, or contamination.

(a) Fuel with no contamination and minimal suspended water is clear and bright. Jet fuel can have a range of colors from yellow (straw) color to no color. The words clear and bright are not a reference to the color of the fuel. Yellow fuel or fuel that has no color can be clear and bright as specified above.

(b) Settled water will usually show as a layer below the fuel. If more than 0.25 qt (0.2 l) of settled water is in a sample of 2 qt (2 l) or more, get more fuel samples until the samples contain less than 0.25 qt (0.2 l).

(c) Suspended water may show as small bubbles or ice crystals in the fuel.

NOTE: Suspended water eventually settles to the bottom of the tank. The settling rate varies, but is usually about one foot per hour. It can take several hours or more for suspended water to become drainable settled free water. It is not necessary to wait for suspended water to settle.

(d) If very cold fuel reserves mix with warm fuel from refueling, the fuel can look cloudy when sampling. The cloudiness will usually clear when the fuel warms.

NOTE: It is not necessary to wait for fuel to warm and cloudiness to clear. Cloudiness caused by mixing very cold and warm fuel or by mixing settled water, usually clears in less than 24 hours. Cloudiness that does not clear in less than 24 hours can show microbial growth or a filtering problem at the fuel source.

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- (e) If the water in the fuel has a brown color, a foul odor, or foreign particles are evident at the fuel water interface, then it is possible that there is microbial contamination. Refer to Detection Test for Microbial Growth, TASK 28-10-00-200-801.
 - (f) If fuel has a pink or a red color, refer to Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802.
 - (4) If one or two drops of food coloring that is water soluble is put into the container of fuel, then water in the fuel will be shown by a color.
 - (5) An excessive quantity of water drained from one tank before refueling can show a blocked water scavenge jet pump.
NOTE: An excessive quantity of water in a main tank is 2 qt (2 l) or more. An excessive quantity of water in the center tank is 6 qt (6 l) or more.
 - (6) If an excessive quantity of water is drained from a tank, do this task: Water Scavenge Jet Pump Check, TASK 28-22-13-200-801.
 - (a) If a blockage is found in the scavenge jet pump, follow the cleaning procedure in the same task to unblock.
 - (7) Make a maintenance record if an excessive quantity of water is found in a fuel tank.
- E. For the sump drain valves installed in the surge tanks:
- (1) These sump drain valves are installed to do a check for fuel in the surge tank before you remove the access door for entry. Fuel in the surge tank will drain into the main fuel tanks through the drain check valve in the each surge tank. If the main fuel tanks are full and there is fuel in the surge tank you can defuel the main tank to remove the fuel in the surge tank.
NOTE: The drain check valve installed in the surge tank will drain the fuel to a lower level than the sump drain valve.
- F. This procedure contains three tasks. The first task gives instructions to drain water from the fuel tank sumps in the main and center fuel tanks. The second task gives instructions to remove the primary poppet valve for the sump drain valves to defuel the main and center fuel tanks. The third task gives instructions to do a check for fuel in the surge tank.
- NOTE:** Removal of the primary poppet of the sump drain valve is recommended for maintenance that requires center or main fuel tank entry only.

TASK 12-11-02-680-801

2. Fuel Tank Sump Drain Valve - Water Removal/Sampling

(Figure 301)

A. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
28-10-00-200-801	Detection Test for Microbial Growth (P/B 201)
28-11-00-100-802	Clean the Fuel Tanks Contaminated with Red Dye (P/B 701)

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-1535	Equipment - Sampling, Fuel Part #: 100-0128-04 Supplier: 5N582 Part #: A12001-15 Supplier: 81205
STD-6646	Container - Fuel Resistant

C. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

E. Access Panels

Number	Name/Location
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

F. Drain the Main Fuel Tank Sumps

NOTE: The maximum quantity of water can be drained when the airplane is in a 0.7 degree nose down pitch and a 0.0 degree roll attitude and water is allowed to go to the bottom of the tank. It is not necessary for the airplane to be at this attitude.

SUBTASK 12-11-02-869-001

- (1) Turn the primary poppet 90 degrees with a flat blade screwdriver to unlock the sump drain valve.

SUBTASK 12-11-02-480-001

- (2) Put the top end of the fuel sampling fuel sampling equipment, COM-1535, against the bottom of the poppet valve on the sump drain valve.

SUBTASK 12-11-02-680-001

- (3) Drain each fuel tank sump.
 - (a) If the fuel sampling equipment, COM-1535, includes a plastic or glass container, drain the fuel from the sump into it or a fuel resistant container, STD-6646, until the fuel that drains contains less than 0.25 qt (0.2 l) of water in a sample of 2 qt (2 l) or more.
 - (b) If the fuel sampling equipment, COM-1535, does not include a plastic or glass container, drain the fuel from the sump into a fuel resistant container, STD-6646, until the fuel that drains contains less than 0.25 qt (0.2 l) of water in a sample of 2 qt (2 l) or more.

SUBTASK 12-11-02-080-001

- (4) Remove the fuel sampling receptacle to let the sump drain valve close.

SUBTASK 12-11-02-869-002

- (5) Make sure the sump drain valve closes without fuel leakage.

SUBTASK 12-11-02-869-003

- (6) Turn the primary poppet 90 degrees to lock the sump drain valve.

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SUBTASK 12-11-02-210-003

- (7) Do a visual inspection of the fuel in the container.
- (a) Make sure the fuel is clear and bright.
- NOTE: If warm fuel is mixed with cold fuel reserves the fuel may appear cloudy.
- (b) If you see red dye in the fuel, do this task: Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802
- (c) If you see other contamination, do these steps:
- 1) Clean the fuel sampling equipment with alcohol, B00130, and dry it completely.
 - 2) With a sterilized glass container, get another sample of fuel.
 - 3) Do this task: Detection Test for Microbial Growth, TASK 28-10-00-200-801.

G. Drain the Center Fuel Tank Sumps

NOTE: The maximum quantity of water can be drained when the airplane is in a 0.7 degree nose down pitch and a 0.0 degree roll attitude and water is allowed to go to the bottom of the tank. It is not necessary for the airplane to be at this attitude.

SUBTASK 12-11-02-010-001

- (1) To get access to the fuel drain, open the applicable access panel:
(TASK 06-41-00-800-801)

<u>Number</u>	<u>Name/Location</u>
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

SUBTASK 12-11-02-480-002

- (2) Put a fuel resistant container, STD-6646, below the drain line fitting on the sump drain valve.
- NOTE: Use the container only. The fuel sampling receptacle is not necessary.

SUBTASK 12-11-02-860-001

- (3) Hold the drain line near the poppet valve of the sump drain valve and push up to open the sump drain valve.

SUBTASK 12-11-02-680-002

- (4) Drain each fuel tank sump until the fuel that goes into the container contains less than 0.25 qt (0.2 l) of water in a sample of 2 qt (2 l) or more.

SUBTASK 12-11-02-860-002

- (5) Release the drain line to close the sump drain valve.

SUBTASK 12-11-02-210-005

- (6) Do a visual inspection of the fuel in the container.
- (a) Make sure the fuel is clear and bright.
- NOTE: If warm fuel is mixed with cold fuel reserves the fuel may appear cloudy.
- (b) If you see red dye in the fuel, do this task: Clean the Fuel Tanks Contaminated with Red Dye, TASK 28-11-00-100-802
- (c) If you see other contamination, do these steps:
- 1) Clean the fuel sampling equipment with alcohol, B00130, and dry it completely.
 - 2) With a sterilized glass container, get another sample of fuel.
 - 3) Do this task: Detection Test for Microbial Growth, TASK 28-10-00-200-801.

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SUBTASK 12-11-02-410-001

(7) Close the applicable access panel:

<u>Number</u>	<u>Name/Location</u>
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

———— **END OF TASK** ————

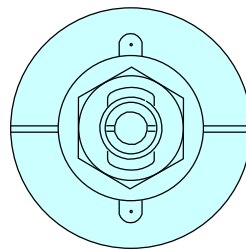
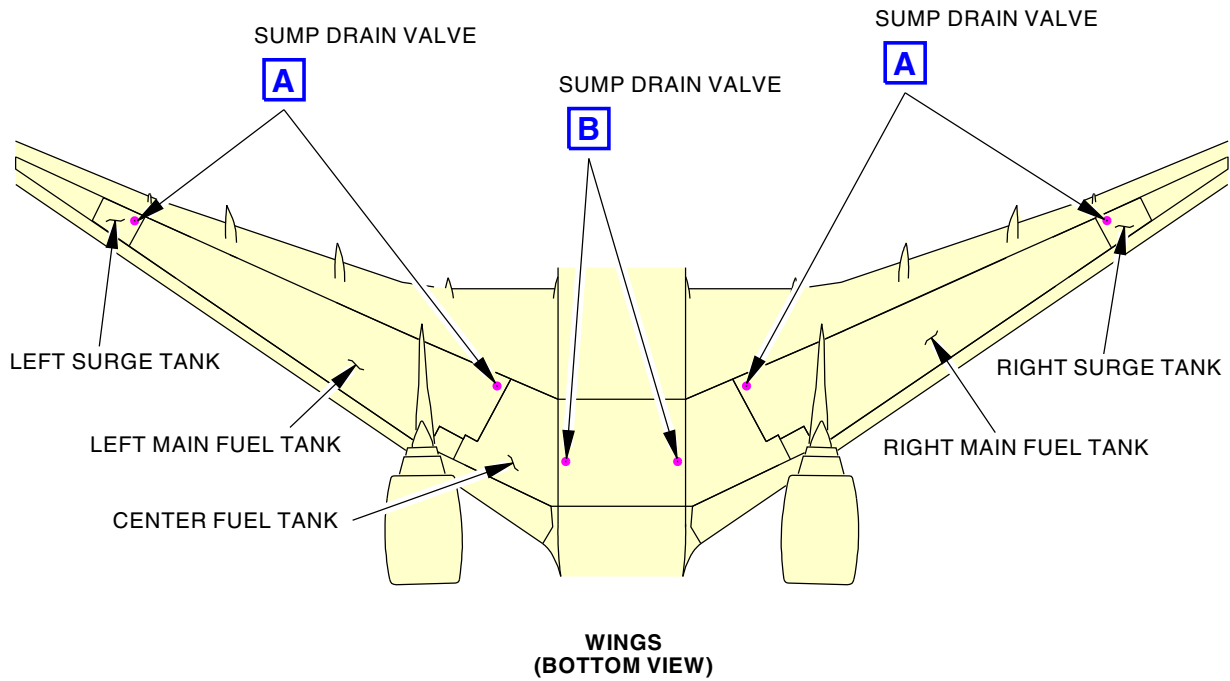
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VALVE FACE

A

J36044 S0000171527_V2

Fuel Sump Drain Valve Servicing
Figure 301/12-11-02-990-802 (Sheet 1 of 2)

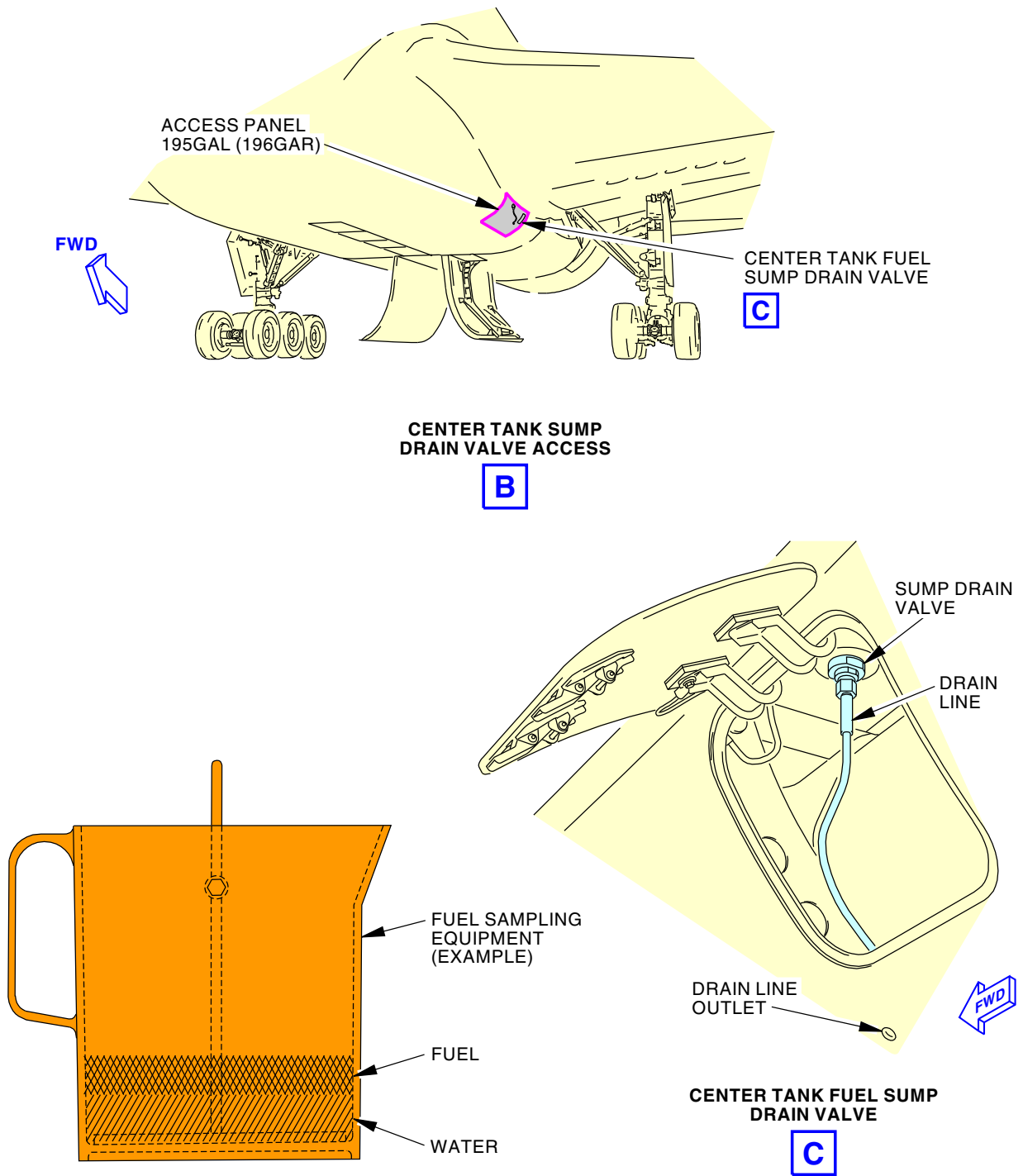
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Fuel Sump Drain Valve Servicing
Figure 301/12-11-02-990-802 (Sheet 2 of 2)

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TASK 12-11-02-650-801

3. Fuel Tank Sump Drain Valve - Tank Entry

(Figure 301)

A. General

- (1) This procedure is used to drain all fuel that remains in the fuel tank after defueling the fuel tank and before the Purging and Fuel Tank Entry procedure.

B. References

Reference	Title
28-11-06-000-801	Sump Drain Valve - Removal (P/B 401)
28-11-06-400-801	Sump Drain Valve - Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-1772	Drain Fitting, Fuel System Part #: J28013-1 Supplier: 81205
SPL-1773	Drain Hose, Center Fuel Tank Sump Valve Part #: J28012-13 Supplier: 81205 Opt Part #: J28012-1 Supplier: 81205

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

E. Access Panels

Number	Name/Location
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

F. Procedure

SUBTASK 12-11-02-586-004

- (1) Make sure the airplane has a ground attitude of 0.7 degree nose down pitch and 0.0 degree roll.

NOTE: A ground attitude of 0.7 degree nose down pitch and 0.0 degree roll lets you defuel all the fuel in the tanks.

SUBTASK 12-11-02-650-001

- (2) To drain the main fuel tank sumps, do these steps:
- (a) Install the sump drain drain fitting, SPL-1772, in the sump drain valve (for the main tanks).

NOTE: If it is necessary, install an extension hose and a shutoff valve to the sump drain tool. Close the shutoff valve on the sump drain hose before you install it.

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- (b) Open the shutoff valve on the sump drain hose.
- (c) Drain the fuel into a fuel container.
- (d) After you drain the fuel, close the shutoff valve.
- (e) Remove the extension hose or drain connection, if installed.
- (f) Remove the sump drain hose/adaptor.

SUBTASK 12-11-02-650-005

- (3) To drain the center fuel tank sumps, do these steps:

- (a) To get access to the drain line for the sump drain valve;

Open the applicable access panel:

<u>Number</u>	<u>Name/Location</u>
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

- (b) Disconnect the drain line at the poppet valve of the sum drain valve.
- (c) Do this task: Sump Drain Valve - Removal, TASK 28-11-06-000-801.
- (d) Install the adapter and coupling of the drain sump valve drain hose, SPL-1773 to the sump drain valve.
- (e) Connect the drain sump valve drain hose, SPL-1773 to the coupling.
- (f) Drain the fuel into an applicable container.
- (g) After you drain all the fuel, remove the drain sump valve drain hose, SPL-1773.
- (h) Remove the coupling and adapter.
- (i) Do this task: Sump Drain Valve - Installation, TASK 28-11-06-400-801.
- (j) Connect the drain line at the poppet valve of the sump drain line.
- (k) Close the applicable access panel:

<u>Number</u>	<u>Name/Location</u>
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

————— END OF TASK —————

TASK 12-11-02-650-802

4. Surge Tank Sump Drain Valve - Fuel Check

(Figure 301)

A. General

- (1) A sump drain valve is installed in the left and right surge tank. Each sump drain valve is installed to do a check for fuel in the surge tank before you remove the access door for entry. If the main fuel tanks are filled to capacity and there is fuel in the surge tank, fuel in the surge tank will drain into the main fuel tanks through the drain check valve in the each surge tank when the fuel level in the main tanks is lower during flight. You can also defuel the main tank to a lower level to move the fuel in the surge tank into the main fuel tank.

NOTE: The surge tank drain check valve will drain the fuel in the surge tank to a lower level than the sump drain valve in the surge tank.

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B. References

Reference	Title
28-26-00-650-801	Pressure Defueling (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-1535	Equipment - Sampling, Fuel Part #: 100-0128-04 Supplier: 5N582 Part #: A12001-15 Supplier: 81205

D. Location Zones

Zone	Area
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

E. Procedure

SUBTASK 12-11-02-210-002

- (1) Find the surge tank sump drain valves as shown in (Figure 301).

SUBTASK 12-11-02-480-003

- (2) Put the top end of the fuel sampling fuel sampling equipment, COM-1535, against the bottom of the poppet valve on the sump drain valve.

SUBTASK 12-11-02-680-003

- (3) Make sure there is no fuel (or water) in the surge tank.

SUBTASK 12-11-02-650-003

- (4) If there is fuel in the surge tank and the main fuel tank is full, defuel the applicable main fuel tank to lower the fuel in the surge tank.
 - (a) To defuel the applicable main tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 12-11-02-080-002

- (5) Remove the fuel sampling receptacle to let the sump drain valve close.

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS - SERVICING

1. General

- A. This procedure has these tasks:
- (1) Hydraulic reservoir fluid level check
 - (2) Hydraulic reservoir filling
 - (a) This task gives the alternative tasks you can use to fill the hydraulic reservoir.
 - (3) Hydraulic reservoir filling - manual procedure
 - (4) Hydraulic reservoir filling - pressure procedure
 - (5) Hydraulic reservoir fluid level lowering or draining.
- B. To get correct results when you do a check of the fluid level or fill the reservoirs, the airplane must be in these conditions:
- (1) The hydraulic system pressurized or not pressurized.
 - (2) The spoilers in the down position.
 - (3) For the center system:
 - (a) All the landing gear in the down position.
 - (b) All the landing gear doors in the closed position.

NOTE: This is not necessary, if you will use the sight glasses on the reservoir to do a fluid level check. The landing gear doors must be open to get access to the reservoir.
 - (4) For the left or right system:
 - (a) The thrust reversers retracted.
 - (5) For the right system:
 - (a) The parking brake accumulator pressurized by the right hydraulic system.
 - (b) The brake surge accumulator pressurized by the right hydraulic system.
- C. There are two sight glasses on the reservoir in each hydraulic system. When the fluid level is above a sight glass, the sight glass is dark. When the fluid level is below a sight glass, the sight glass shows a red dot. If the upper sight glass is dark, the fluid level is too high. If the lower sight glass shows a red dot, the fluid level is too low.

TASK 12-12-01-610-801

2. Hydraulic Reservoir Fluid Level Check

A. General

- (1) This task has three alternative procedures to do a check of the reservoir fluid level. These procedures are shown in the sequence of their precision. The most accurate procedure is shown first.
 - (a) Fluid level check on the EICAS display
 - 1) This procedure uses the hydraulic quantity indication, on the EICAS maintenance display, to do a check of the reservoir fluid level.
 - (b) Fluid level check at the ground service bay
 - 1) This procedure uses the reservoir quantity gage, at the ground service bay, to do a check of the reservoir fluid level.
 - (c) Fluid level check at the hydraulic reservoir.

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- 1) This procedure uses the two sight glasses, on each reservoir, to do a check of the reservoir fluid level.

B. References

Reference	Title
12-15-04-610-801	Check of the Brake Accumulator Precharge Pressure (P/B 301)
12-15-09-610-801	Check of the Brake Surge Accumulator Precharge Pressure (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)
29-11-00-860-801	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)
32-00-40-860-801	Landing Gear Ground Door Release System Operation (Close the Doors) (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)
78-31-00-860-818-H00	Thrust Reverser Operation - Retract (Selection) (P/B 201)

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, 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
434CR	Right Forward Access Door, Left Strut Aft Fairing
444CR	Right Forward Access Door, Right Strut Aft Fairing

E. Prepare for the Fluid Level Check

SUBTASK 12-12-01-860-001

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

SUBTASK 12-12-01-860-002

- (2) Make sure the spoilers are in the down position.

SUBTASK 12-12-01-860-003

- (3) For the left or right hydraulic system, do the step which follows:
 - (a) If the thrust reverser is not retracted, do this task: Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-860-818-H00.

SUBTASK 12-12-01-860-004

- (4) For the right hydraulic system, do these steps:

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- (a) To make sure the brake surge accumulator has the correct precharge, do this task: Check of the Brake Surge Accumulator Precharge Pressure, TASK 12-15-09-610-801.
- (b) To make sure the brake accumulator has the correct precharge, do this task: Check of the Brake Accumulator Precharge Pressure, TASK 12-15-04-610-801.
- (c) Do these steps to pressurize the brake and surge accumulators:
 - 1) To pressurize the right hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - 2) For the right hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

F. Fluid Level Check on the EICAS Display

SUBTASK 12-12-01-410-001

- (1) If the landing gear ground doors are in the open position do the following steps:



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.

- (a) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.
- (b) Do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

SUBTASK 12-12-01-860-005

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

SUBTASK 12-12-01-210-001

- (3) Make sure the OF, RF, or LO indication does not show on the EICAS maintenance page adjacent to the HYDRAULIC RESERVOIR QTY (L, C, R) indication.

NOTE: The OF (overfull) indication shows adjacent to a hydraulic quantity of 1.20 or more. The RF (refill) indication shows adjacent to a hydraulic quantity of 0.41 to 0.75. The LO (low) indication shows adjacent to a hydraulic quantity of 0.40 or less.

G. Fluid Level Check at the Ground Service Bay

(Figure 301)

SUBTASK 12-12-01-410-002

- (1) If the landing gear ground doors are in the open position do the following steps:



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.

- (a) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.
- (b) Do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

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SUBTASK 12-12-01-010-001

- (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 12-12-01-860-006

- (3) Set the handle of the reservoir fill selector valve to the position (LEFT, CTR, or RIGHT) for the applicable hydraulic system.

SUBTASK 12-12-01-210-002

- (4) Make sure the reservoir quantity gage shows in the green band.

SUBTASK 12-12-01-860-007

- (5) Set the handle of the reservoir fill selector valve to the OFF position.

SUBTASK 12-12-01-410-003

- (6) If it is not necessary to fill the reservoir or lower the fluid level in the reservoir, do this step:

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

H. Fluid Level Check at the Hydraulic Reservoir

(Figure 302)

SUBTASK 12-12-01-040-001



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.

SUBTASK 12-12-01-010-002

- (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 12-12-01-010-003

- (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 12-12-01-480-001



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, 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 12-12-01-010-004



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 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 12-12-01-210-003

- (6) Make sure the upper sight glass, on the applicable reservoir, is red.

NOTE: This shows that the fluid level is below the upper sight glass. The upper sight glass is at the overfull level.

SUBTASK 12-12-01-210-004

- (7) Make sure the lower sight glass, on the applicable reservoir, is dark.

NOTE: This shows that the fluid level is above the lower sight glass. The lower sight glass is at the refill level.

SUBTASK 12-12-01-410-004



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 AND DAMAGE TO EQUIPMENT.

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

SUBTASK 12-12-01-410-015

- (9) Do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

SUBTASK 12-12-01-410-005

- (10) 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 12-12-01-410-006

- (11) 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 12-12-01-440-001

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

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-12-01-610-001

- (1) If the fluid level in the reservoir is too low, do this task: Hydraulic Reservoir Filling, TASK 12-12-01-610-802.

SUBTASK 12-12-01-680-001

- (2) If the fluid level in the reservoir is too high, do this task: Hydraulic Reservoir Fluid Level Lowering or Draining, TASK 12-12-01-680-801.

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SUBTASK 12-12-01-860-008

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

———— **END OF TASK** ————

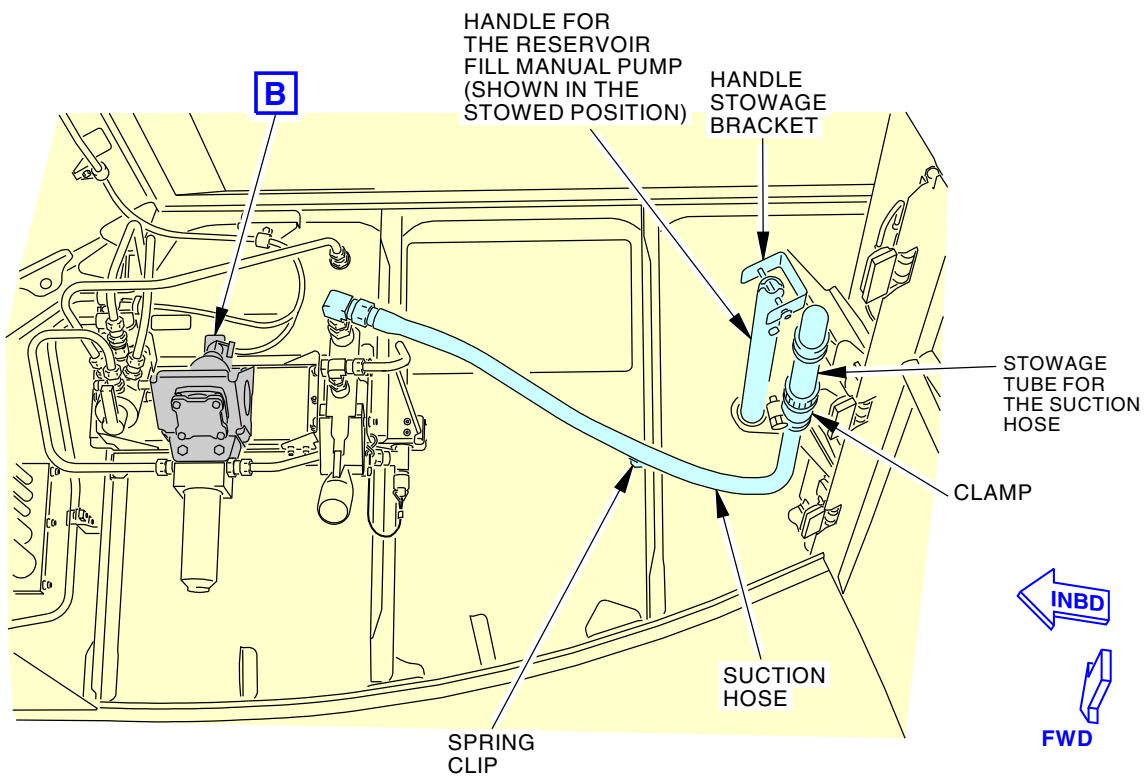
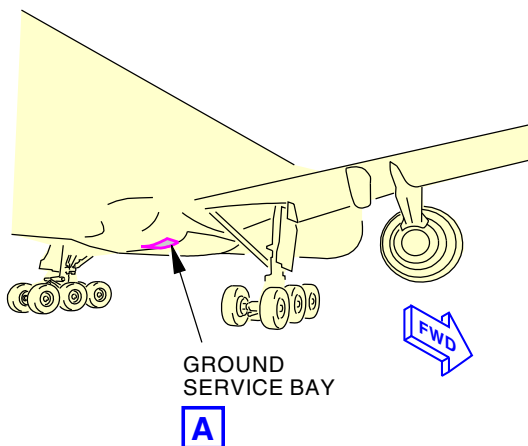
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GROUND SERVICE BAY

A

E15723 S0006401287_V2

Hydraulic Ground Service Bay
Figure 301/12-12-01-990-801 (Sheet 1 of 2)

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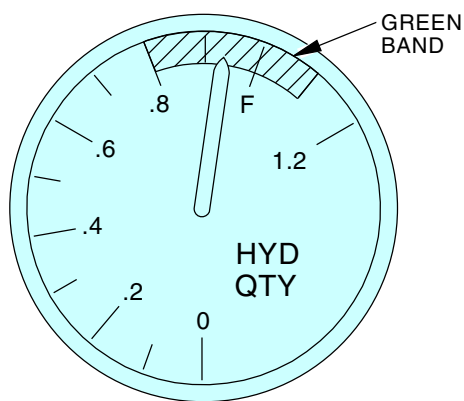
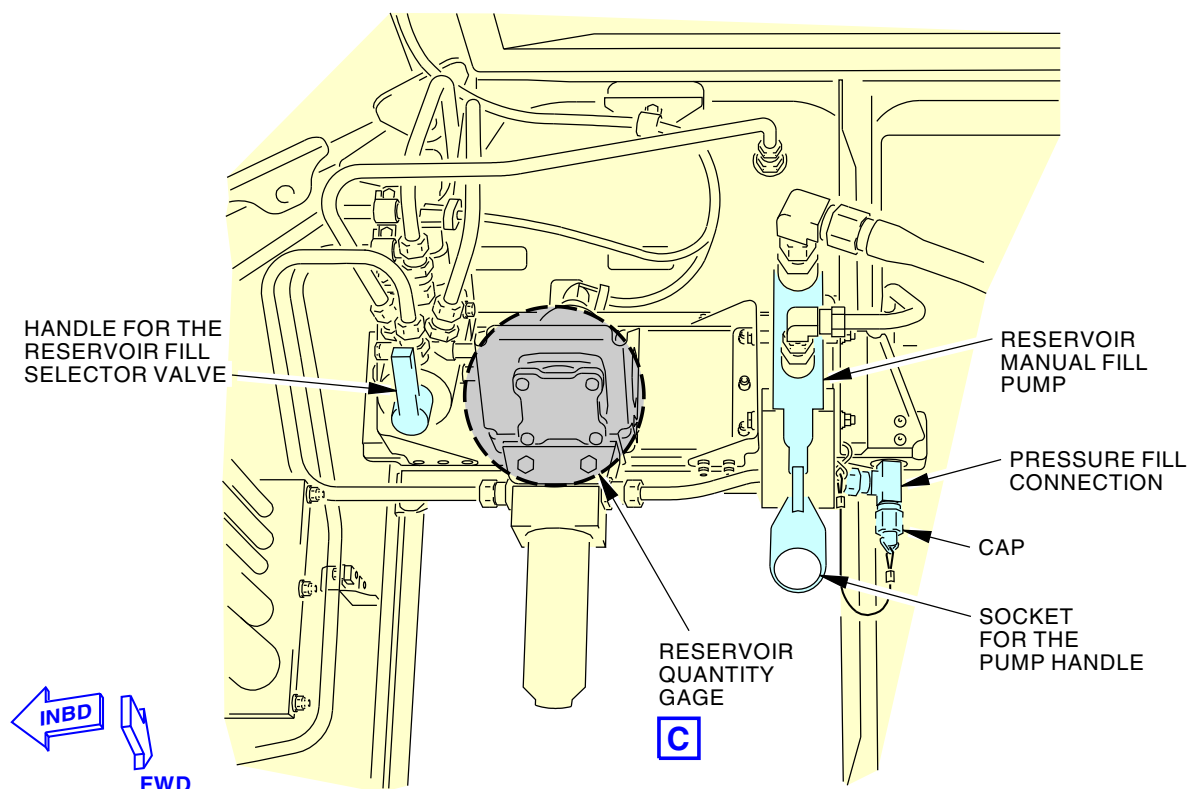
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RESERVOIR QUANTITY GAGE

E15736 S0006401288_V2

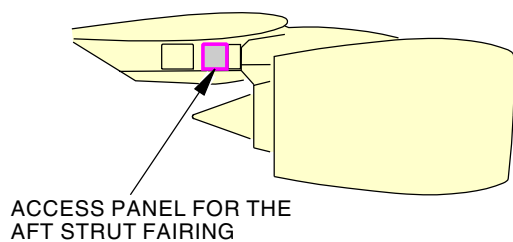
Hydraulic Ground Service Bay
Figure 301/12-12-01-990-801 (Sheet 2 of 2)

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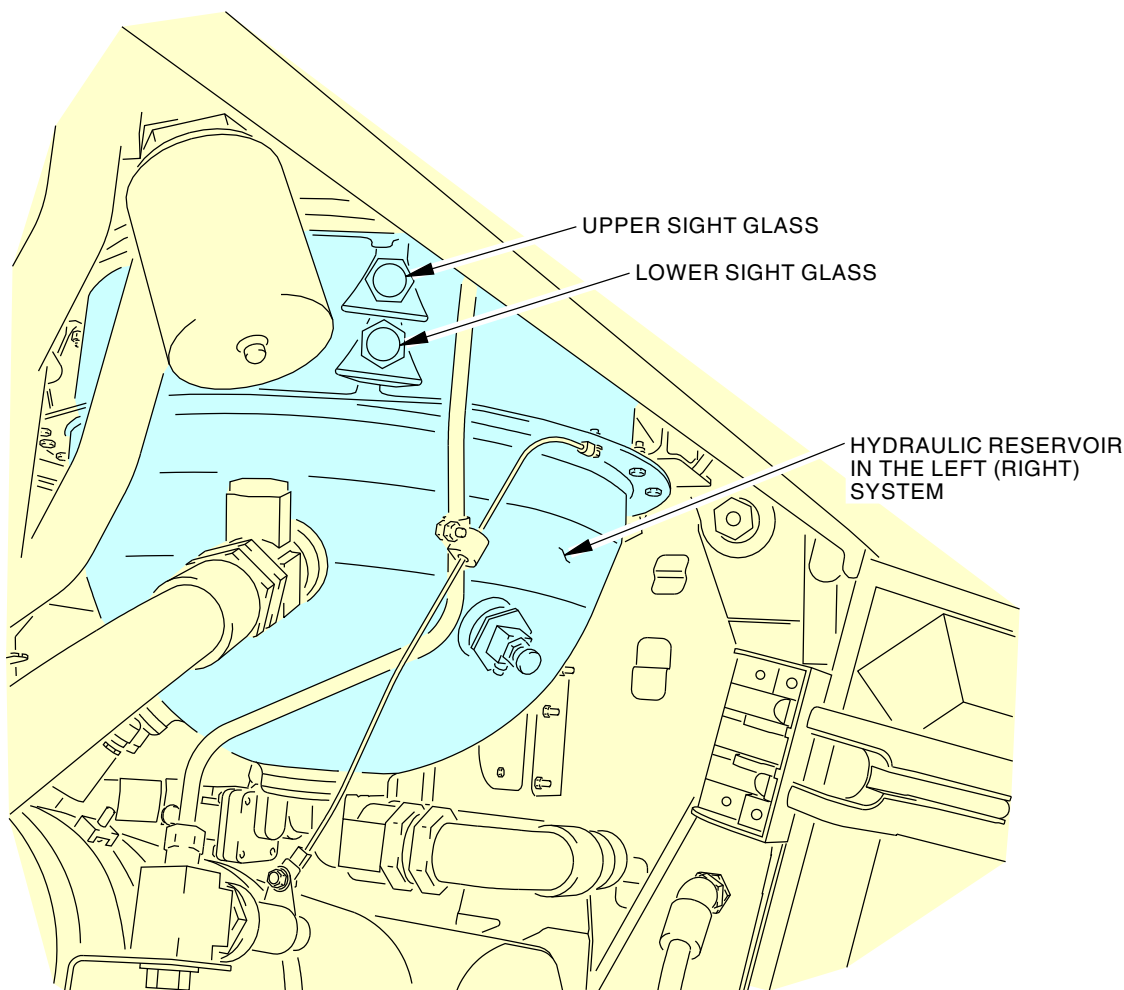
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**AFT STRUT FAIRING
(EXAMPLE)**

A



E15752 S0006401289_V3

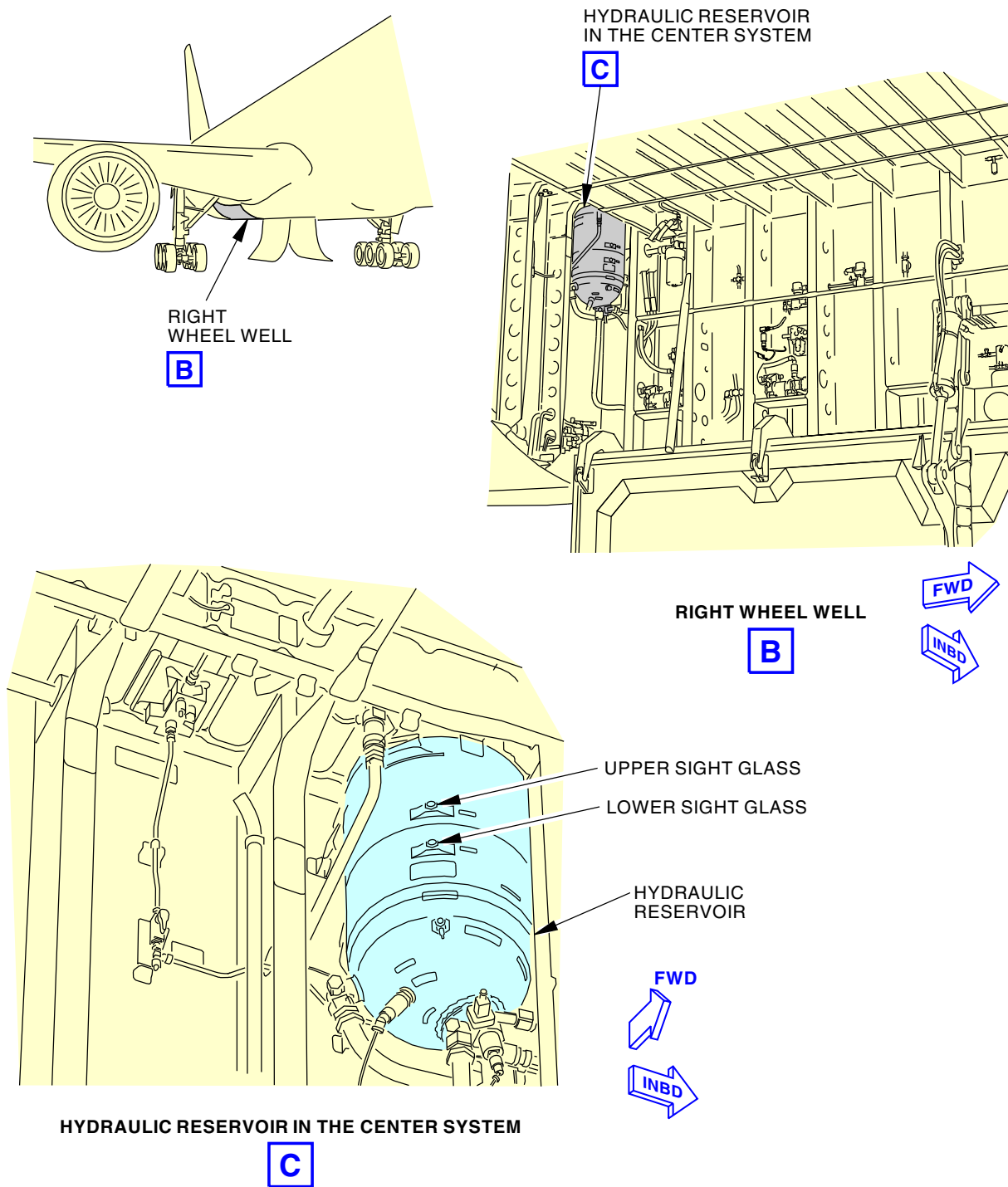
Hydraulic Reservoir Sight Glasses
Figure 302/12-12-01-990-802 (Sheet 1 of 2)

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Hydraulic Reservoir Sight Glasses
Figure 302/12-12-01-990-802 (Sheet 2 of 2)

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TASK 12-12-01-610-802

3. Hydraulic Reservoir Filling

A. Procedure

SUBTASK 12-12-01-610-004

- (1) Do one of these tasks to fill the reservoir in the applicable 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.

————— END OF TASK —————

TASK 12-12-01-610-803

4. Hydraulic Reservoir Filling - Manual Procedure

(Figure 301)

A. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
12-15-04-610-801	Check of the Brake Accumulator Precharge Pressure (P/B 301)
12-15-09-610-801	Check of the Brake Surge Accumulator Precharge Pressure (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)
29-11-00-860-801	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)
32-00-40-860-801	Landing Gear Ground Door Release System Operation (Close the Doors) (P/B 201)
78-31-00-860-818-H00	Thrust Reverser Operation - Retract (Selection) (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
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

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

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E. Prepare to Fill the Hydraulic Reservoir

SUBTASK 12-12-01-860-009

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

SUBTASK 12-12-01-860-027

- (2) Make sure the spoilers are in the down position.

SUBTASK 12-12-01-860-011

- (3) For the left or right hydraulic system, do the step which follows:
 - (a) If the thrust reverser is not retracted, do this task: Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-860-818-H00.

SUBTASK 12-12-01-860-028

- (4) Release the parking brake with the wheel chocks installed (CHOCK INSTALLATION, PAGEBLOCK 10-11-05/201).

NOTE: You can set the parking brake when you service the reservoir, but the reservoir quantity can change when the parking brake is released.

SUBTASK 12-12-01-860-012



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.

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

SUBTASK 12-12-01-410-016

- (6) Do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

SUBTASK 12-12-01-860-025

- (7) For the right hydraulic system, do these steps:
 - (a) To make sure the brake surge accumulator has the correct precharge, do this task: Check of the Brake Surge Accumulator Precharge Pressure, TASK 12-15-09-610-801.
 - (b) To make sure the brake accumulator has the correct precharge, do this task: Check of the Brake Accumulator Precharge Pressure, TASK 12-15-04-610-801Do these steps to pressurize the brake and brake surge accumulators:
 - 1) To pressurize the right hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - 2) For the right hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 12-12-01-010-005

- (8) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

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F. Hydraulic Reservoir Filling - Manual Procedure

SUBTASK 12-12-01-020-001



DO NOT GET HYDRAULIC FLUID IN YOUR EYES OR ON YOUR SKIN. THE 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.

- (1) Loosen the clamp which holds the suction hose in the stowage tube.

SUBTASK 12-12-01-020-002

- (2) Remove the suction hose from the stowage tube.

SUBTASK 12-12-01-020-003

- (3) Remove the suction hose from the spring clip.

SUBTASK 12-12-01-160-001



USE CLEAN HYDRAULIC FLUID AND CLEAN EQUIPMENT TO FILL THE HYDRAULIC SYSTEM RESERVOIR. IF YOU DO NOT DO THIS YOU CAN CAUSE CONTAMINATION OF THE HYDRAULIC SYSTEM.

- (4) Fully clean the suction hose before you put the hose in the container of hydraulic fluid, D00153.

NOTE: All currently qualified BMS 3-11, Type IV hydraulic fluids are interchangeable and intermixable in any proportion.

SUBTASK 12-12-01-020-008



USE CLEAN HYDRAULIC FLUID AND CLEAN EQUIPMENT TO FILL THE HYDRAULIC SYSTEM RESERVOIR. IF YOU DO NOT DO THIS, YOU CAN CAUSE CONTAMINATION OF THE HYDRAULIC SYSTEM.

- (5) Fully clean the suction hose before you put the hose in the container of hydraulic fluid, D00153.

NOTE: All currently qualified BMS 3-11, Type IV hydraulic fluids are interchangeable and intermixable in any proportion.

SUBTASK 12-12-01-860-013

- (6) Put the end of the suction hose in a container of hydraulic fluid, D50269 or hydraulic fluid, D00153.

SUBTASK 12-12-01-020-004

- (7) Do these steps to remove the handle of the reservoir fill manual pump (referred to as the pump in this procedure) from the stowage bracket.
- (a) Push the handle aft to compress the spring in the handle.
 - (b) Turn the handle to release it from the pin on the stowage bracket.
 - (c) Remove the handle from the stowage bracket.

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SUBTASK 12-12-01-420-001



DO NOT OPERATE THE PUMP WHILE THE HANDLE OF THE RESERVOIR FILL SELECTOR VALVE IS IN THE OFF POSITION. THIS CAN CAUSE TOO MUCH PRESSURE IN THE RESERVOIR FILL SYSTEM AND CAN CAUSE DAMAGE TO AIRPLANE EQUIPMENT.

- (8) Put the handle in the socket of the pump.

SUBTASK 12-12-01-610-002

- (9) For each hydraulic reservoir you will fill, do these steps:
- (a) Set the handle of the reservoir fill selector valve to the position (LEFT, CTR, or RIGHT) for the applicable hydraulic system.
 - (b) Operate the pump to add hydraulic fluid to the hydraulic reservoir.
 - 1) If the pump does not move the hydraulic fluid, do these steps to fill the pump with hydraulic fluid:
 - a) Remove the suction hose from the container of hydraulic fluid.
 - b) Put the suction hose in a small container of hydraulic fluid.
 - c) Hold the small container of hydraulic fluid at the same height as the pump.
 - d) Operate the pump to pull the hydraulic fluid into the pump.
 - e) Remove the suction hose from the small container of hydraulic fluid.
 - f) Put the end of the suction hose in the larger container of hydraulic fluid.



DO NOT FILL THE RESERVOIR TO MORE THAN THE FULL LEVEL. IF YOU PUT TOO MUCH FLUID IN THE RESERVOIR AND THERE IS A CHECK VALVE FAILURE, THE FLUID CAN GO INTO THE DUCTS OF THE PNEUMATIC SYSTEM AND THE AIR CONDITIONING PACKS. IF CONTAMINATION OF THE PNEUMATIC SYSTEM OCCURS MANY TIMES, IT CAN CAUSE DAMAGE TO THE TITANIUM DUCTS. IF YOU PUT TOO MUCH FLUID IN THE RESERVOIR, THE FLUID CAN FLOW OUT OF THE RESERVOIR VENT TUBE, THROUGH THE PRESSURE RELIEF VALVE.

- (c) Monitor the reservoir quantity gage while you fill the hydraulic reservoir.
- (d) Stop operating the pump when the reservoir quantity gage is at the F (full) mark.

SUBTASK 12-12-01-870-001

- (10) If you fill a hydraulic reservoir after the replacement of a component or when there is no fluid in the system, do these steps:
- (a) For the applicable hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) Operate all the flight control surfaces through three full cycles.
 - (c) If you replaced a component in the brake system, operate the brake pedals 10 times.
 - (d) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
 - (e) Do the steps to fill the hydraulic reservoir again.

SUBTASK 12-12-01-020-005

- (11) Remove the handle from the socket of the pump.

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SUBTASK 12-12-01-420-002

- (12) Do these steps to install the handle in the stowage bracket:
- (a) Put the handle in the stowage bracket.
 - (b) Push the handle aft, against the pin on the stowage bracket, to compress the spring in the handle.
 - (c) Turn the handle to engage the pin, on the stowage bracket, with the slot in the end of the handle.

SUBTASK 12-12-01-020-006

- (13) Remove the suction hose from the container of hydraulic fluid.

SUBTASK 12-12-01-680-002

- (14) Drain the hydraulic fluid from the suction hose.

SUBTASK 12-12-01-160-002

- (15) Fully clean all the hydraulic fluid from the suction hose, before you put the hose in the stowage tube.

SUBTASK 12-12-01-420-003

- (16) Put the suction hose in the spring clip.

SUBTASK 12-12-01-420-004

- (17) Put the suction hose in the stowage tube.

SUBTASK 12-12-01-420-005

- (18) Tighten the clamp, on the stowage tube, to hold the suction hose in the stowage tube.

SUBTASK 12-12-01-860-014

- (19) Set the handle of the reservoir fill selector valve to the OFF position.

SUBTASK 12-12-01-160-003



QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (20) To clean all the hydraulic fluid from the ground service bay, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 12-12-01-410-007

- (21) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

SUBTASK 12-12-01-860-015

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

————— **END OF TASK** —————

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TASK 12-12-01-610-804

5. Hydraulic Reservoir Filling - Pressure Procedure

(Figure 301)

A. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
12-15-04-610-801	Check of the Brake Accumulator Precharge Pressure (P/B 301)
12-15-09-610-801	Check of the Brake Surge Accumulator Precharge Pressure (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)
29-11-00-860-801	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)
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)
78-31-00-860-818-H00	Thrust Reverser Operation - Retract (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-1536	Cart - Service, Hydraulic System Part #: 06-5020-3600 Supplier: 59603 Part #: 06-5021-3600 Supplier: 59603 Part #: 06-5022-6600 Supplier: 59603 Part #: 06-5024-3610 Supplier: 59603 Part #: 06-5043-3600 Supplier: 59603 Part #: MODEL 160 Supplier: 94861 Part #: MODEL 170 Supplier: 94861 Part #: MODEL 400 Supplier: 94861 Part #: PF53467-1P Supplier: 94861 Part #: PF54115-6P Supplier: 94861 Part #: PF55451 Supplier: 94861 Opt Part #: WF160 Supplier: 94861

C. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type V)	BMS3-11 Type IV
D50269	Fluid - Hydraulic Fluid, Fire Resistant (Interchangeable And Intermixable With BMS 3-11 Type IV)	BMS3-11 Type V

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D. Access Panels

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

E. Prepare to Fill the Hydraulic Reservoir

SUBTASK 12-12-01-860-016

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

SUBTASK 12-12-01-860-017

- (2) Make sure the spoilers are in the down position.

SUBTASK 12-12-01-860-018

- (3) For the left or right hydraulic system, do this step:
- (a) If the thrust reverser is not retracted, do this task: Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-860-818-H00.

SUBTASK 12-12-01-860-029

- (4) Release the parking brake with the wheel chocks installed (CHOCK INSTALLATION, PAGEBLOCK 10-11-05/201).

NOTE: You can set the parking brake when you service the reservoir, but the reservoir quantity can change when the parking brake is released.

SUBTASK 12-12-01-860-019



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.

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

SUBTASK 12-12-01-410-017

- (6) Do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

SUBTASK 12-12-01-860-026

- (7) For the right hydraulic system, do these steps:
- (a) To make sure the brake surge accumulator has the correct precharge, do this task: Check of the Brake Surge Accumulator Precharge Pressure, TASK 12-15-09-610-801.
- (b) To make sure the brake accumulator has the correct precharge, do this task: Check of the Brake Accumulator Precharge Pressure, TASK 12-15-04-610-801
- (c) Do these steps to pressurize the brake and brake surge accumulators:
- 1) To pressurize the right hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
- 2) For the right hydraulic system, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 12-12-01-010-006

- (8) Open this access panel:

Number	Name/Location
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

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F. Hydraulic Reservoir Filling - Pressure Procedure

SUBTASK 12-12-01-020-010



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.



USE CLEAN HYDRAULIC FLUID AND CLEAN EQUIPMENT TO FILL THE HYDRAULIC SYSTEM RESERVOIR. IF YOU DO NOT DO THIS, YOU CAN CAUSE CONTAMINATION OF THE HYDRAULIC SYSTEM.

- (1) Remove the cap from the pressure fill connection, at the ground service bay for the hydraulic system.

NOTE: All currently qualified BMS 3-11, Type IV hydraulic fluids are interchangeable and intermixable in any proportion.

SUBTASK 12-12-01-480-002



DO NOT OPERATE THE HYDRAULIC SERVICE CART WHILE THE HANDLE OF THE RESERVOIR FILL SELECTOR VALVE IS IN THE OFF POSITION. THIS CAN CAUSE TOO MUCH PRESSURE IN THE RESERVOIR FILL SYSTEM AND CAN CAUSE DAMAGE TO AIRPLANE EQUIPMENT.

- (2) Connect the hydraulic system service cart, COM-1536, to the pressure fill connection.

SUBTASK 12-12-01-610-003

- (3) For each hydraulic reservoir you will fill, do these steps:
- (a) Set the handle of the reservoir fill selector valve to the position (LEFT, CTR, or RIGHT) for the applicable hydraulic system.



DO NOT FILL THE RESERVOIR TO MORE THAN THE FULL LEVEL. IF YOU PUT TOO MUCH FLUID IN THE RESERVOIR AND THERE IS A CHECK VALVE FAILURE, THE FLUID CAN GO INTO THE DUCTS OF THE PNEUMATIC SYSTEM AND THE AIR CONDITIONING PACKS. IF CONTAMINATION OF THE PNEUMATIC SYSTEM OCCURS MANY TIMES, IT CAN CAUSE DAMAGE TO THE TITANIUM DUCTS. IF YOU PUT TOO MUCH FLUID IN THE RESERVOIR, THE FLUID CAN FLOW OUT OF THE RESERVOIR VENT TUBE, THROUGH THE PRESSURE RELIEF VALVE.

- (b) Monitor the reservoir quantity gage while you fill the hydraulic reservoir.



USE A MAXIMUM OF 150 PSI WHEN YOU FILL THE RESERVOIR. TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE HYDRAULIC RESERVOIR.

- (c) Operate the hydraulic system service cart, COM-1536 to add hydraulic fluid, D50269 or hydraulic fluid, D00153, to the hydraulic reservoir.
- (d) Stop the hydraulic system service cart, COM-1536, when the reservoir quantity gage is at the F (full) mark.

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SUBTASK 12-12-01-870-002

- (4) If you fill a hydraulic reservoir after the replacement of a component or when there is no fluid in the system, do these steps:
- (a) For the applicable hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) operate all the flight control surfaces through three full cycles.
 - (c) If you replaced a component in the brake system, operate the brake pedals 10 times.
 - (d) If you replaced a landing gear component, hose or tubing, do these steps:
 - 1) Make sure the control lever for the landing gear is in the DN position.
 - 2) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.



MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- 3) 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.



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.

- 4) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
- 5) Move the control lever for the landing gear to the UP position.
- NOTE: You must push the LOCK OVRD button to do this.
- 6) Move the control lever for the landing gear to the DN position.



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.
- (e) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
- (f) Do the steps to fill the hydraulic reservoir again.

SUBTASK 12-12-01-080-001

- (5) Disconnect the hydraulic system service cart, COM-1536, from the pressure fill connection.

SUBTASK 12-12-01-420-006

- (6) Install the cap on the pressure fill connection.

SUBTASK 12-12-01-860-020

- (7) Set the handle of the reservoir fill selector valve to the OFF position.

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SUBTASK 12-12-01-160-004



CAUTION

QUICKLY CLEAN THE INSTALLATION AREA OF ALL HYDRAULIC FLUID. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE EQUIPMENT.

- (8) To clean all hydraulic fluid from the ground service bay, do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

SUBTASK 12-12-01-410-008

- (9) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

SUBTASK 12-12-01-860-021

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

— END OF TASK —

TASK 12-12-01-680-801

6. Hydraulic Reservoir Fluid Level Lowering or Draining

A. References

<u>Reference</u>	<u>Title</u>
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)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
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)
32-00-40-860-801	Landing Gear Ground Door Release System Operation (Close the Doors) (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

<u>Reference</u>	<u>Description</u>
STD-1140	Hose - Flexible, 1/2 Inch ID, BMS 3-11 Resistant, 10 Foot
STD-1158	Container - 20 Gallon (76 Liter)

C. Location Zones

<u>Zone</u>	<u>Area</u>
144	Main Landing Gear Wheel Well, Right
198	Aft Wing-to-Body Fairings, Right
434	Aft Strut Fairing - Left Nacelle Strut
444	Aft Strut Fairing - Right Nacelle Strut

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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
444CL	Left Forward Access Door, Right Strut Aft Fairing

E. Prepare for the Hydraulic Reservoir Fluid Level Lowering or Draining

SUBTASK 12-12-01-860-022

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

SUBTASK 12-12-01-040-002



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 12-12-01-010-007

- (3) 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

SUBTASK 12-12-01-010-008

- (4) 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

SUBTASK 12-12-01-480-003



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.

- (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 12-12-01-010-009



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 12-12-01-010-010

- (7) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

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SUBTASK 12-12-01-860-023

- (8) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

F. Hydraulic Reservoir Fluid Level Lowering or Draining

SUBTASK 12-12-01-480-004



WARNING

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.

- (1) Push the ten foot hose (1/2 inch ID), STD-1140 on the outlet of the reservoir drain valve (Figure 303).

SUBTASK 12-12-01-480-005

- (2) Put the opposite end of the ten foot hose (1/2 inch ID), STD-1140 into the 20 gallon (76 liter) container, STD-1158 for the hydraulic fluid.

SUBTASK 12-12-01-680-003

- (3) If you must lower the fluid level because it is too high, do these steps:
- (a) Monitor the reservoir quantity gage at the ground service bay while you drain fluid from the reservoir (Figure 301).
 - (b) Open the reservoir drain valve to drain the hydraulic fluid into the 20 gallon (76 liter) container, STD-1158 (Figure 303).
 - (c) Close the reservoir drain valve when the reservoir quantity gage is at the F (full) mark.

SUBTASK 12-12-01-680-004

- (4) If you must drain all of the fluid from the reservoir, do these steps:
- (a) If the applicable reservoir is not pressurized, do this task: Main Hydraulic System Reservoirs Pressurization with an External Air Source, TASK 29-11-00-860-806.
NOTE: It is not mandatory that you pressurize the reservoir, but it will make the hydraulic fluid drain faster. It will also prevent an air lock in the reservoir. If there is an air lock in the reservoir all of the fluid possibly will not drain out.
 - (b) Open the reservoir drain valve to drain the hydraulic fluid into the 20 gallon (76 liter) container, STD-1158.
 - (c) Close the reservoir drain valve when the flow of fluid from the hose stops.
 - (d) If you will loosen a hydraulic connection or open the hydraulic system, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.

SUBTASK 12-12-01-080-002

- (5) Remove the hose from the reservoir drain valve.

SUBTASK 12-12-01-420-007

- (6) Safety the handle on the reservoir drain valve with a lockwire.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-12-01-410-009

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
198DR	Hydraulic Ground Service Bay Access Door and Escape Slide Inflation Bottle

SUBTASK 12-12-01-410-010



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.

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

SUBTASK 12-12-01-410-018

- (3) Do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

SUBTASK 12-12-01-410-011

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

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

SUBTASK 12-12-01-410-012

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

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

SUBTASK 12-12-01-440-002

- (6) 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** —————

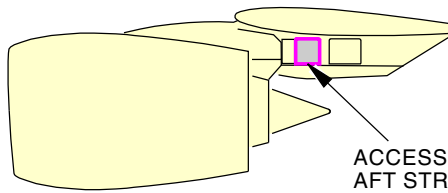
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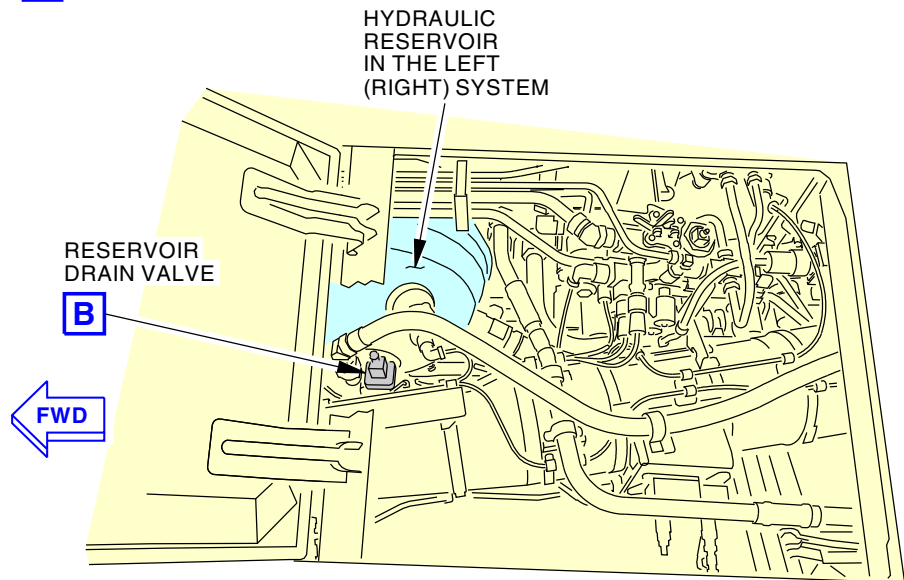
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ACCESS PANEL FOR THE
AFT STRUT FAIRING

A

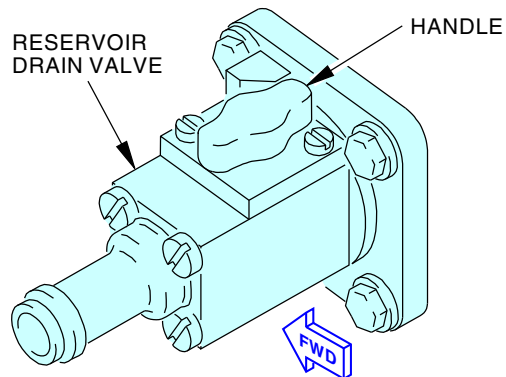


HYDRAULIC
RESERVOIR
IN THE LEFT
(RIGHT) SYSTEM

RESERVOIR
DRAIN VALVE

B

FWD



RESERVOIR
DRAIN VALVE

HANDLE

FWD

RESERVOIR DRAIN VALVE

B

AFT STRUT FAIRING
(EXAMPLE)

A

E15839 S0006401295_V2

Reservoir Drain Valve
Figure 303/12-12-01-990-803 (Sheet 1 of 3)

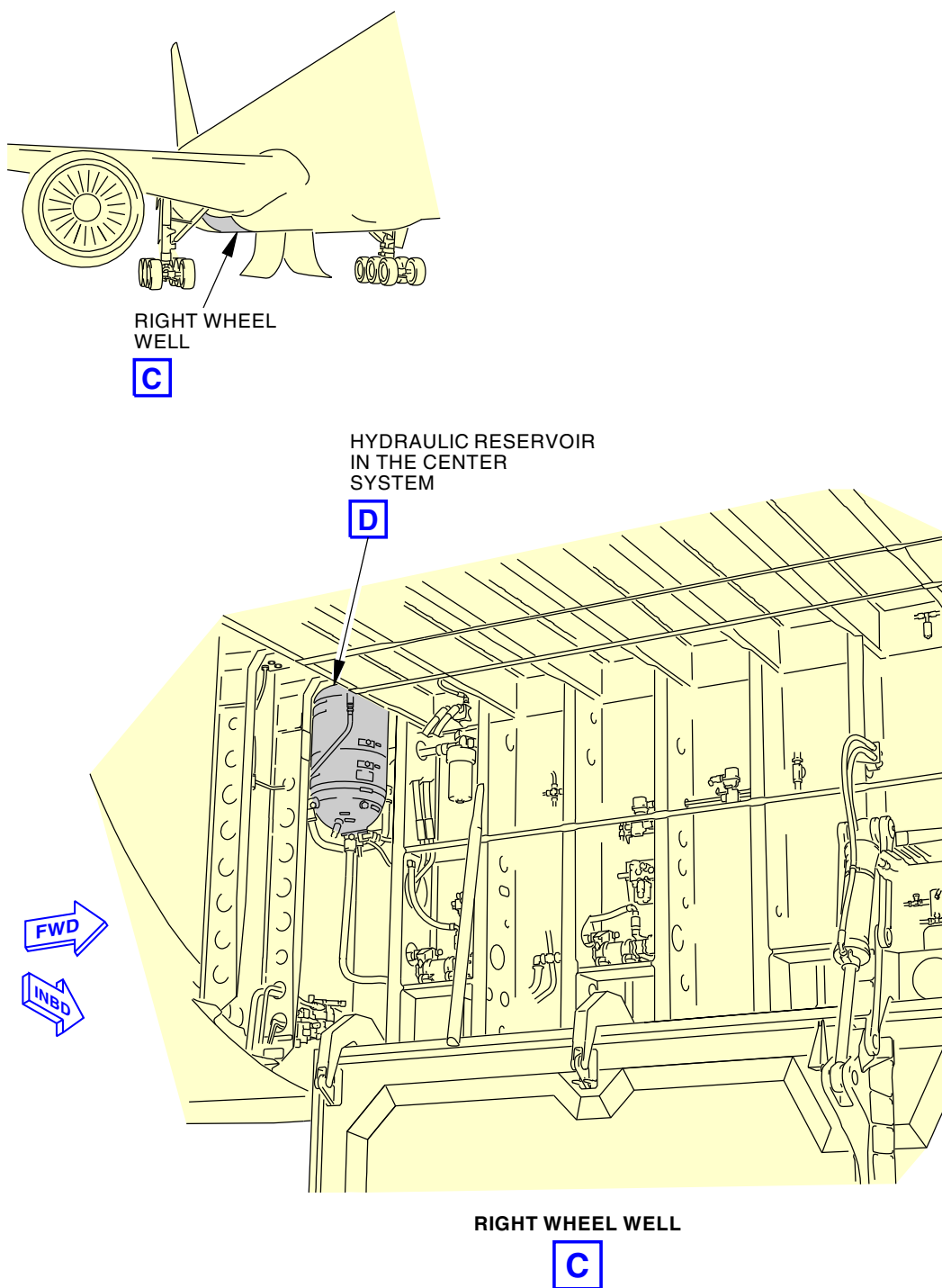
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E16011 S0006401296_V2

Reservoir Drain Valve
Figure 303/12-12-01-990-803 (Sheet 2 of 3)

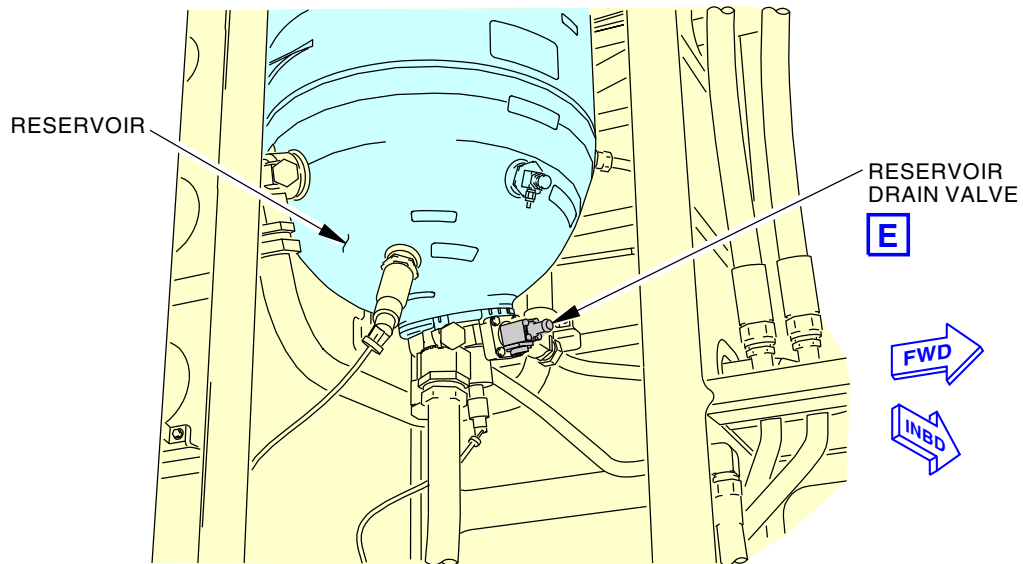
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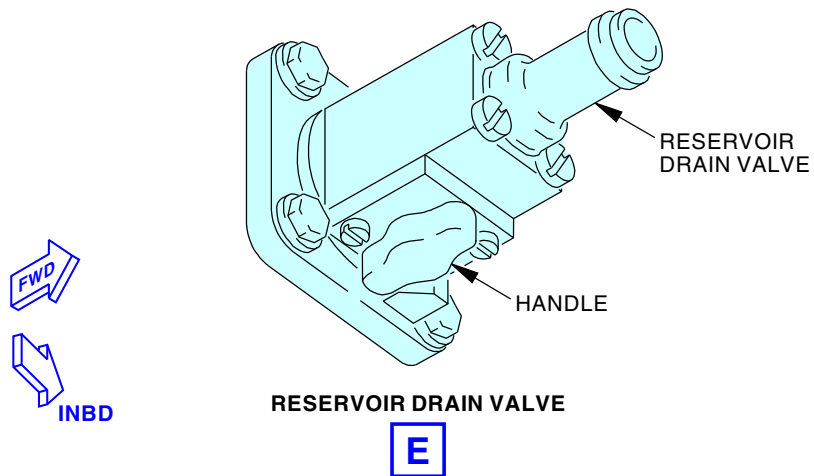
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HYDRAULIC RESERVOIR IN THE CENTER SYSTEM

D



RESERVOIR DRAIN VALVE

E16048 S0006401297_V2

Reservoir Drain Valve
Figure 303/12-12-01-990-803 (Sheet 3 of 3)

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POWER DOOR OPENING SYSTEM (PDOS) - SERVICING

1. General

A. This procedure has one task:

- (1) Fill the power door opening system (PDOS) pump (referred to as the PDOS pump) with oil.

TASK 12-12-02-610-803-004

2. Fill the PDOS Pump with Oil

(Figure 301)

A. **General**

- (1) The PDOS pump is installed on the brackets on the fan cowl support assembly. The fan cowl support assembly is on the forward side of the strut. You must remove the No. 1 forward fairing from the strut to get access to the PDOS pump.
- (2) You need to use the fall arrest lifeline procedure or other safety equipment to do this task.
- (3) After the oil servicing, you must do a bleed air check on the PDOS system.

B. **References**

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
54-52-00-910-804-001	Fall Arrest Lifeline Procedure (P/B 201)
70-41-00-910-803-H00	Lockwire Installation (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. **Consumable Materials**

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Packing	71-12-04-03C-070	ARO 001-004
		71-12-04-03C-125	ARO ALL

E. **Location Zones**

Zone	Area
431	Forward Strut Fairing - Left Nacelle Strut
441	Forward Strut Fairing - Right Nacelle Strut

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F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

G. Procedure

SUBTASK 12-12-02-490-002



WARNING

USE THE FALL ARREST LIFELINE PROCEDURE IF YOU DO NOT USE OTHER SAFETY EQUIPMENT. IF YOU USE THE SAFETY EQUIPMENT OR PROCEDURES INCORRECTLY, IT CAN CAUSE INJURY OR KILL YOU.

- (1) If you do not use other safety equipment, do the (strut-mounted) Fall Arrest Lifeline Procedure (TASK 54-52-00-910-804-001).

SUBTASK 12-12-02-010-007-004

- (2) Remove the applicable PDOS access door [3] from the forward fairing:
 - (a) Remove the 17 bolts [4] that attach the PDOS access door [3] to the strut fairing.
 - (b) Place the protective mat on the forward fairing.
 - (c) Remove the PDOS access door [3] and let the PDOS access door [3] hang with the lanyard.
 - 1) Make sure that you do not scratch the painted surface of the strut or fairing.

SUBTASK 12-12-02-610-007-004

- (3) Fill the PDOS pump [1] with oil, D00071 or oil, D00068:



CAUTION

MAKE SURE THE FAN COWL PANELS AND THRUST REVERSERS ARE CLOSED BEFORE YOU FILL THE PDOS PUMP OR AN OVERFILL CONDITION COULD OCCUR.

- (a) Make sure that the fan cowl panels and the thrust reversers are in the closed position before you fill the PDOS pump [1] with oil, D00071 or oil, D00068.
- (b) Remove the fill port dipstick [2] from the PDOS pump [1].
- (c) Clean the dipstick [2] with a clean dry cotton wiper, G00034.
- (d) Install the dipstick [2] into the PDOS pump [1] and then remove the dipstick [2] again.
- (e) Do a check of the oil level on the dipstick [2].
 - 1) If the oil level is low, fill the PDOS pump [1] with oil, D00071 or oil, D00068.



CAUTION

DO NOT OVERFILL THE PDOS PUMP, OTHERWISE, DAMAGE TO THE PDOS SYSTEM COULD OCCUR.

- 2) Fill the reservoir slowly during the fill process to prevent an overflow condition.

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- 3) Do a check regularly of the oil level of the dipstick [2].
- 4) If the oil level is met, install the dipstick [2] on the PDOS pump [1].
 - a) If necessary, install a new packing [5] on the dipstick [2].
 - b) Tighten the dipstick [2] to 60 in-lb (6.78 N·m) – 80 in-lb (9.04 N·m).
 - c) Install lockwire to the dipstick bolt head (TASK 70-41-00-910-803-H00).

H. Power Door Opening System Bleed Air Check

SUBTASK 12-12-02-010-009



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER(S). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR

- (1) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left and right fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

SUBTASK 12-12-02-870-008-004

- (2) If you disconnected connections in the PDOS system, do these steps to bleed air from the system:
 - (a) Cycle the thrust reversers a minimum of three times to bleed the air out of the thrust reverser PDOS system.
 - 1) Use the thrust reverser PDOS switches to cycle the thrust reversers.

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WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (b) Do these tasks in sequence to safely close the left and right thrust reversers on the applicable engine:

- 1) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine



CAUTION

MAKE SURE THAT THE THRUST REVERSERS ARE FULLY CLOSED BEFORE YOU CLOSE THE FAN COWL PANELS. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE FAN COWL PANELS AND THE THRUST REVERSER CAN OCCUR.

- (c) Cycle the fan cowl panels a minimum of two times to bleed the air out of the fan cowl PDOS system.

- 1) Use the fan cowl PDOS switches to cycle the fan cowl panels.

- (d) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (e) Do a visual check for leakage on the PDOS system.
(f) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
(g) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

I. Put the Airplane Back to Its Usual Condition.

SUBTASK 12-12-02-410-007-004

- (1) Install the applicable PDOS access door [3] to the forward fairing:
(a) Install the PDOS access door [3].
(b) Remove the protective mat from the forward fairing.
(c) Install the 17 bolts [4] that attach the PDOS access door [3] to the strut fairing.

SUBTASK 12-12-02-080-005-004

- (2) Remove the fall arrest equipment (TASK 54-52-00-910-804-001).

————— **END OF TASK** —————

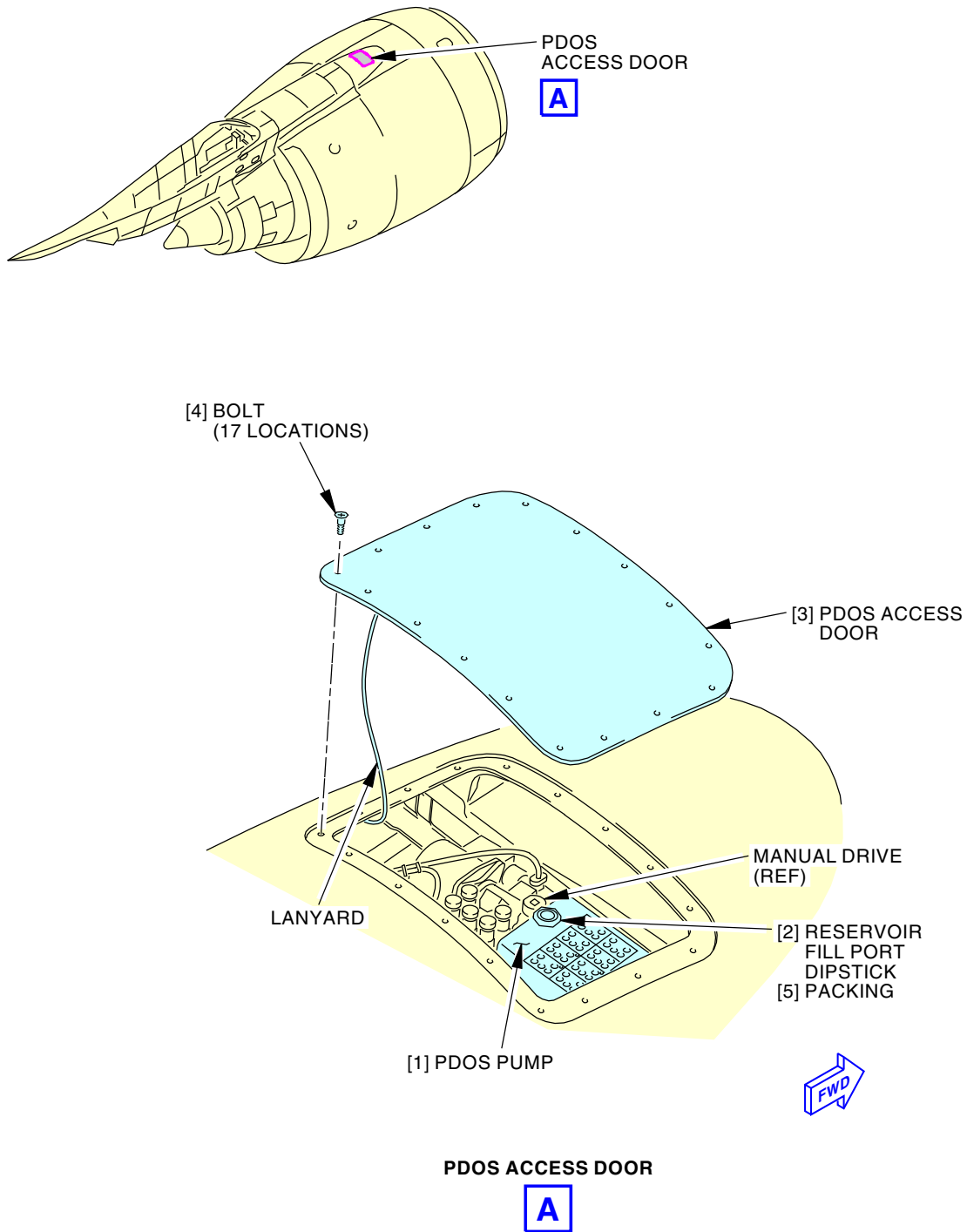
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N59038 S0006401310_V3

PDOS Pump Servicing
Figure 301/12-12-02-990-807-004

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NOSE RADOME SNUBBER - SERVICING

1. General

- A. This procedure has one task.
(1) Bleed the nose radome snubbers.

TASK 12-12-03-870-801

2. Bleed the Nose Radome Snubber

(Figure 301)

A. General

- (1) Use this procedure to service the top and the bottom nose radome snubbers.

B. References

Reference	Title
53-12-00 P/B 201	NOSE RADOME - MAINTENANCE PRACTICES
53-12-00-010-801	Open the Nose Radome (P/B 201)
53-12-00-410-802	Close the Nose Radome (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1159	Cart - Hydraulic Pressure Source, Fitted with Male Fitting Threaded 7/16-20 UNF-3A

D. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)

E. Location Zones

Zone	Area
111	Radome

F. Procedure

SUBTASK 12-12-03-010-001

- (1) Open the nose radome (TASK 53-12-00-010-801).

SUBTASK 12-12-03-840-001

- (2) Prepare the snubber as follows:
(a) Remove the fill plug and the gasket from the snubber.



WARNING

DO NOT USE MORE THAN 100 PSI WHEN YOU FILL THE SNUBBER WITH HYDRAULIC FLUID. TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE SNUBBER AND INJURY TO PERSONS.

- (b) Connect the hydraulic pressure source cart, STD-1159.

NOTE: The pressure source must have a male fitting which is threaded 7/16 20 UNF 3A.

- (c) Increase the hydraulic pressure to 95 ±5 psi (655 ±34 kPa).
(d) Fill the snubber with the hydraulic fluid, D00070, until the piston shaft is fully extended.

SUBTASK 12-12-03-870-001

- (3) Bleed the snubber while pressure is applied as follows:

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- (a) Loosen the two bleed plugs.
- (b) Move the nose radome from the fully open to the fully closed position three times to remove the air from the snubber.
- (c) Close the two bleed plugs.
- (d) Decrease the hydraulic pressure source to zero.
- (e) Lightly open one bleed plug and let the piston shaft retract 0.07 in. (1.78 mm).
NOTE: This permits the volume increase of fluid, D00070, due to temperature changes.
- (f) Tighten the bleed plug.

SUBTASK 12-12-03-860-001

- (4) Remove the hydraulic pressure source.

SUBTASK 12-12-03-420-001

- (5) Install the gasket and the fill plug in the snubber.

SUBTASK 12-12-03-870-002

- (6) Do the above steps again for the second nose radome snubber.

SUBTASK 12-12-03-820-001

- (7) Close and open the nose radome to make sure that the nose radome snubbers operate correctly (PAGEBLOCK 53-12-00/201).

SUBTASK 12-12-03-410-001

- (8) Close the nose radome (TASK 53-12-00-410-802).

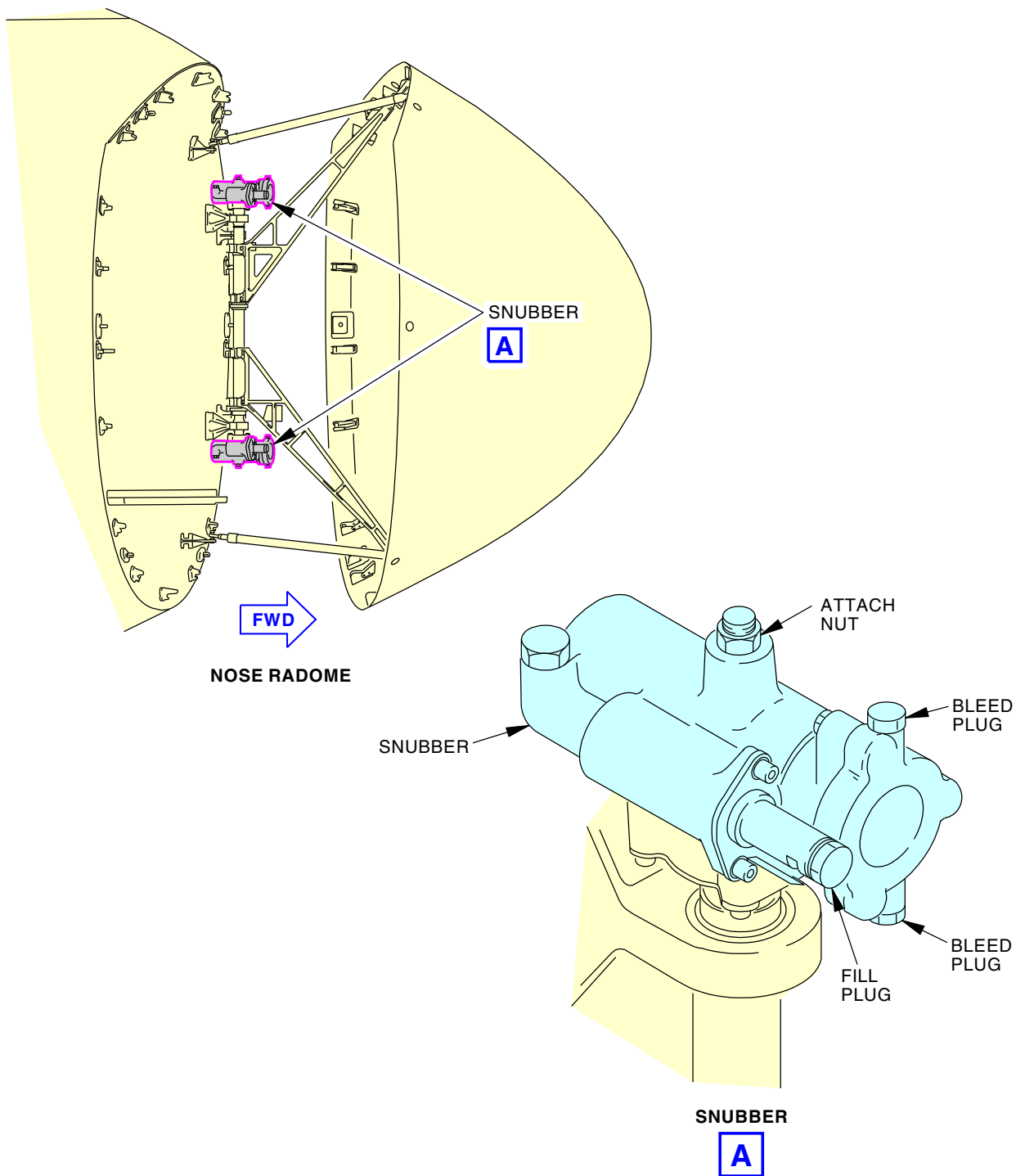
———— **END OF TASK** ————

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**Nose Radome Snubber Servicing
Figure 301/12-12-03-990-801**

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ENGINE - SERVICING (OIL REPLENISHING)

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure gives instructions to add oil to the engine oil tank.

TASK 12-13-01-130-803-002

2. Engine Oil Replenishing

(Figure 301)

A. General

- (1) This task is the replenishing procedure for the engine oil system.
- (2) The oil tank filler cap is at the top of the oil tank. The oil tank is on the left side of the fan case at approximately the 9:00 o'clock position.
- (3) You must open the oil tank access door on the left fan cowl panel to get access to the oil tank filler cap [3].

B. References

Reference	Title
71-11-04-000-802-H01	Open the Fan Cowl Panel (Power Method) (P/B 201)
71-11-04-400-802-H01	Close the Fan Cowl Panel (Power Method) (P/B 201)
79-00-00-200-807-H01	Engine Oil System (Fluids and Solids Contamination) Inspection (P/B 601)
79-11-00-200-801-H01	Oil Storage System Inspection (P/B 601)

C. Tools/Equipment

Reference	Description
STD-266	Detector Unit - Combustible Gas

D. Consumable Materials

Reference	Description	Specification
B00679 [C04-035]	Alcohol - Isopropyl	
D00519	Oil - Engine - Eastman Turbo Oil 2380	MIL-PRF-23699F-STD and UK spec DEF STAN 91-101/2
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
D00521	Oil - Engine - Mobil Jet Oil 254	MIL-PRF-23699F - HTS (High Thermal Stability)
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1
D50016	Oil - Engine - Eastman Turbo Oil 2197	MIL-PRF-23699F Class HTS (High Thermal Stability)
D50201	Lubricant - Aeroshell Turbine Oil 560	MIL-PRF-23699D, DERD 2499 Grade OX-27, OX-28, NATO O-156
D50311	Oil - Engine - Mobil Jet Oil 387	SAE AS5780, MIL-PRF-23699

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(Continued)

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Prepare for the Engine Oil Servicing (Normal Operation)

SUBTASK 12-13-01-610-028-002

- (1) Do the steps that follow to determine if engine oil servicing is necessary.

NOTE: Examine the engine oil quantity between 5 and 60 minutes after engine shutdown. If more than 60 minutes has passed since engine shutdown, you must dry motor the engine for 4 minutes before you examine the engine oil quantity. This will permit you to determine a more accurate engine oil quantity.

- (a) Determine if the airplane will fly for more or less than 6 flight hours on the next flight.

- (b) If the airplane will fly for 6 or more flight hours on the next flight:

- 1) Fully fill the engine oil tank with clean engine oil. Use the approved engine oil listed in SUBTASK 12-13-01-610-029-002 or GE90 SB 79-0001.

NOTE: Since full oil quantity is verified at the engine, this task does not require reference to the EICAS secondary engine display. However, at full capacity at least 21 qt (20 l) will be displayed on the EICAS.

- (c) If the airplane will fly for less than 6 flight hours on the next flight, then examine the oil quantity indicator on the multi-function display, secondary engine parameter display.

- 1) If the oil quantity indicator indicates that there is less than 18 qt (17 l) of oil in the engine, oil servicing is necessary.
 - 2) If the oil quantity indicator indicates that there is 18 qt (17 l) equal or more of oil in the engine, then oil servicing is not necessary.

SUBTASK 12-13-01-610-029-002



USE ONLY OIL APPROVED BY GE SERVICE BULLETIN 79-001. THERE ARE NO INCOMPATIBILITIES AMONG APPROVED BRANDS. HOWEVER, YOU SHOULD NOT MIX DIFFERENT OIL BRANDS INTERMITTENTLY. FLEET CHANGEOVER FROM ONE APPROVED BRAND TO ANOTHER APPROVED BRAND CAN BE DONE BY ADDITIONS OF THE NEW BRAND WHEN THE ENGINE IS SERVICED (TOPPING UP). IN CASES OF INADVERTENT MIXING OF NON-APPROVED OIL BRANDS, IT IS RECOMMENDED THAT THE ENTIRE LUBRICATION SYSTEM BE DRAINED, FLUSHED, AND SERVICED AGAIN WITH THE CORRECT OIL WITHOUT DELAY.

- (2) Use the approved engine oil listed below or GE90 SB 79-0001.

NOTE: This is the list of the approved oils from GE Service Bulletin 79-0001.

NOTE: It is recommended that the same oil is used every time that the engine oil system is filled. If there is no oil of the same kind available it is permitted to use one off the list below.

- (a) Aeroshell Turbine Oil 560, D50201
 - (b) Eastman Turbo Oil 2380, D00519
 - (c) Eastman Turbo Oil 2197, D50016
 - (d) Mobil Jet Oil II, D00520
 - (e) Mobil Jet Oil 254, D00521.

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- (f) oil, D00552 [C02-019]
- (g) Mobil Jet Oil 387, D50311

SUBTASK 12-13-01-610-034-002

- (3) To prevent the engine oil system contamination during oil servicing, refer to the steps that follow:
 - (a) Make sure that the oil service area is clean. If necessary, wipe all engine service fittings, oil tank scupper and oil cans with a clean cotton wiper, G00034, wet with alcohol, B00679 [C04-035], and blow dry with dry air or nitrogen to remove airborne contamination before oil servicing.



CAUTION

ENGINE OILS ARE HYGROSCOPIC AND CAN ABSORB WATER WHEN EXPOSED TO ATMOSPHERIC CONDITIONS. OIL SERVICING WITH OIL FILL CARTS, DIRTY OR OPEN OIL CANS SUBJECTED TO ATMOSPHERIC CONTAMINATION HAVE BEEN FOUND TO INTRODUCE OIL WITH LARGE AMOUNTS WATER AND AIRBORNE HARD PARTICLE CONTAMINATION INTO THE ENGINE AND ASSOCIATED EQUIPMENT OIL SYSTEMS. THIS CAN LEAD TO EARLY BEARING AND GEAR FAILURE.



CAUTION

OBJECTS DROPPED INTO THE OPEN PORTS OF THE SERVICE CART OR ENGINE OIL TANK CAN CAUSE DAMAGE AND FAILURE.

- (b) If oil cans are used for servicing, always service the engine with fresh oil from a sealed, clean and dry container, opened immediately prior to oil servicing.
- (c) If the oil service cart is used for oil servicing, do the steps that follow:
 - 1) The cart must be serviced per manufacturer recommendation.
 - 2) The cart service fittings and access ports must be covered when not in use to prevent contamination.
 - 3) All unused oil must be drained from the service cart when not in use.
 - 4) Wipe the service cart fill cover and surrounding area with a clean, lint-free cloth wet with alcohol, B00679 [C04-035], and blow dry with dry air or nitrogen to remove airborne contamination before opening to service the cart with oil.
 - 5) Always service the cart with fresh oil from a sealed, clean and dry container, opened immediately prior to servicing the engine oil tank.

SUBTASK 12-13-01-010-015-002

- (4) Open the oil tank access door on the left fan cowl panel.

SUBTASK 12-13-01-010-016-002



CAUTION

MAKE SURE THAT THE OIL TANK SCUPPER IS CLEAN. IF THE SCUPPER IS NOT CLEAN, IT CAN CAUSE CONTAMINATION OF THE OIL SYSTEM. THIS CAN CAUSE DAMAGE TO THE ENGINE.

- (5) Clean the oil tank scupper with a clean cotton wiper, G00034, before you remove the oil tank filler cap [3].

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SUBTASK 12-13-01-010-017-002



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY FIVE MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

DO NOT LET OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO EQUIPMENT.

(6) Open the oil tank filler cap [3]:

(a) Put the locking lever [2] on the oil tank filler cap [3] in the not locked position.

NOTE: The locking lever [2] will be vertical to the top of the oil tank filler cap [3] when it is not locked.

(b) Turn the lever on the oil tank filler cap [3] to the OPEN position.

(c) Pull the oil tank filler cap [3] straight up until the dipstick [4] is above the edge of the oil tank cap assembly.

NOTE: The dipstick [4] is attached to the bottom of the oil tank filler cap [3] and has a lanyard [5] that is attached to the inside of the manual gravity filling cap assembly [6].

NOTE: If the lanyard is broken or missing, replace the lanyard within 50 flight cycles. Refer to Oil Storage System Inspection, TASK 79-11-00-200-801-H01.

F. Engine Oil Servicing

SUBTASK 12-13-01-200-003-002



WARNING

FUEL IN ENGINE OIL CAN RESULT IN AN ENGINE FIRE. BEFORE YOU ADD OIL IN THE OIL TANK DURING SERVICING, MAKE SURE THE OIL IN TANK DOES NOT CONTAIN FUEL. IF YOU SMELL FUEL, REPLACE THE MAIN FUEL/OIL HEAT EXCHANGER (FUEL/OIL LUBE/SERVO COOLER) THEN FLUSH THE ENGINE OIL SYSTEM.

(1) When you open the oil tank filler cap, do a check for fuel in the oil with either of the methods that follow:

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- (a) Check for fuel vapors at the area of the fill port of the engine oil tank with a combustible gas detector unit, STD-266.
- (b) Check for the odor of fuel at the area of the fill port of the engine oil tank.
- (c) If there is fuel in the oil, do this task: Engine Oil System (Fluids and Solids Contamination) Inspection, TASK 79-00-00-200-807-H01.

SUBTASK 12-13-01-610-030-002



DO NOT USE OILS OF DIFFERENT TYPES OR BRAND NAMES THAT ARE NOT ON THE APPROVED LIST PER GE SERVICE BULLETIN 79-001. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE ENGINE.



IF YOU ACCIDENTALLY SERVICE THE ENGINE OIL TANK WITH A DIFFERENT TYPE OR NAME BRAND OIL THAT IS NOT ON THE APPROVED LIST, DO NOT OPERATE THE ENGINE UNTIL A COMPREHENSIVE EVALUATION OF THE EFFECTS ON THE OIL SYSTEM AND ENGINE IS DONE AND A CORRECTIVE ACTION IS COMPLETED.



DO NOT PUT AN OBJECT INTO THE OIL-TANK CAP SAMPLE-TUBE DURING OIL SERVICING. IF YOU DO NOT FOLLOW THIS CAUTION, IT CAN CAUSE BLOCKAGE AND EFFECT THE BACK-UP ANTI-LEAK OPERATION OF THE OIL-TANK CAP ASSEMBLY.

- (2) Fully fill the engine oil tank with clean engine oil, D00552 [C02-019], or Mobil Jet Oil II, D00520, up to the scupper base [8].

NOTE: The scupper base [8] is the same level as the bottom of the filler port neck.

NOTE: When you fill the engine oil tank, make sure you add the oil slowly. If you fill the tank too quickly, oil can spill over the side of the tank from the fill port [7], and may also incorrectly cause you to believe the tank is full.

SUBTASK 12-13-01-160-005-002

- (3) Do these steps to clean oil from the inner surface of the fan cowl if oil spills during oil servicing:
 - (a) Open the fan cowl panel (power method) (TASK 71-11-04-000-802-H01).
 - (b) Clean oil from the inner surface of the fan cowl.

NOTE: Reference Standard Overhaul Practices Manual (SOPM) 20-30-83 or 20-30-99 for suitable cleaning solvents.
 - (c) Close the fan cowl panel (power method) (TASK 71-11-04-400-802-H01).

SUBTASK 12-13-01-210-011-002

- (4) Do a visual check of the packing [1] on the oil tank filler cap [3] for damage.
 - (a) If you see damage, replace the packing [1].

SUBTASK 12-13-01-410-022-002

- (5) Do a visual check of the area around the oil tank filler cap [3] at the top of the oil tank for evidence of oil leakage from the oil tank filler cap [3].
 - (a) If you see evidence of oil leakage, replace the preformed packing [1] on the oil tank filler cap [3].

SUBTASK 12-13-01-410-023-002

- (6) Install the oil tank filler cap [3] into the manual gravity filling cap assembly [6].

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- (a) Align the oil tank filler cap [3] and dipstick [4] with the manual gravity filling cap assembly [6].
- (b) Carefully insert the dipstick [4] and cap straight into the oil tank filler cap [3].
NOTE: Make sure the lanyard [5] is not outside the manual gravity filling cap assembly [6].
- (c) Turn the locking lever [2] on the oil tank filler cap [3] clockwise to the closed position.
- (d) Put the locking lever [2] in the locked position.
NOTE: The locking lever [2] will be flat with the oil tank filler cap [3] when it is in the locked position.
- (e) Do a check of the oil tank filler cap [3] to make sure it is closed tightly and is locked.

G. Put the Airplane Back to its Usual Condition

SUBTASK 12-13-01-410-024-002

- (1) Close the oil tank access door on the left fan cowl panel.

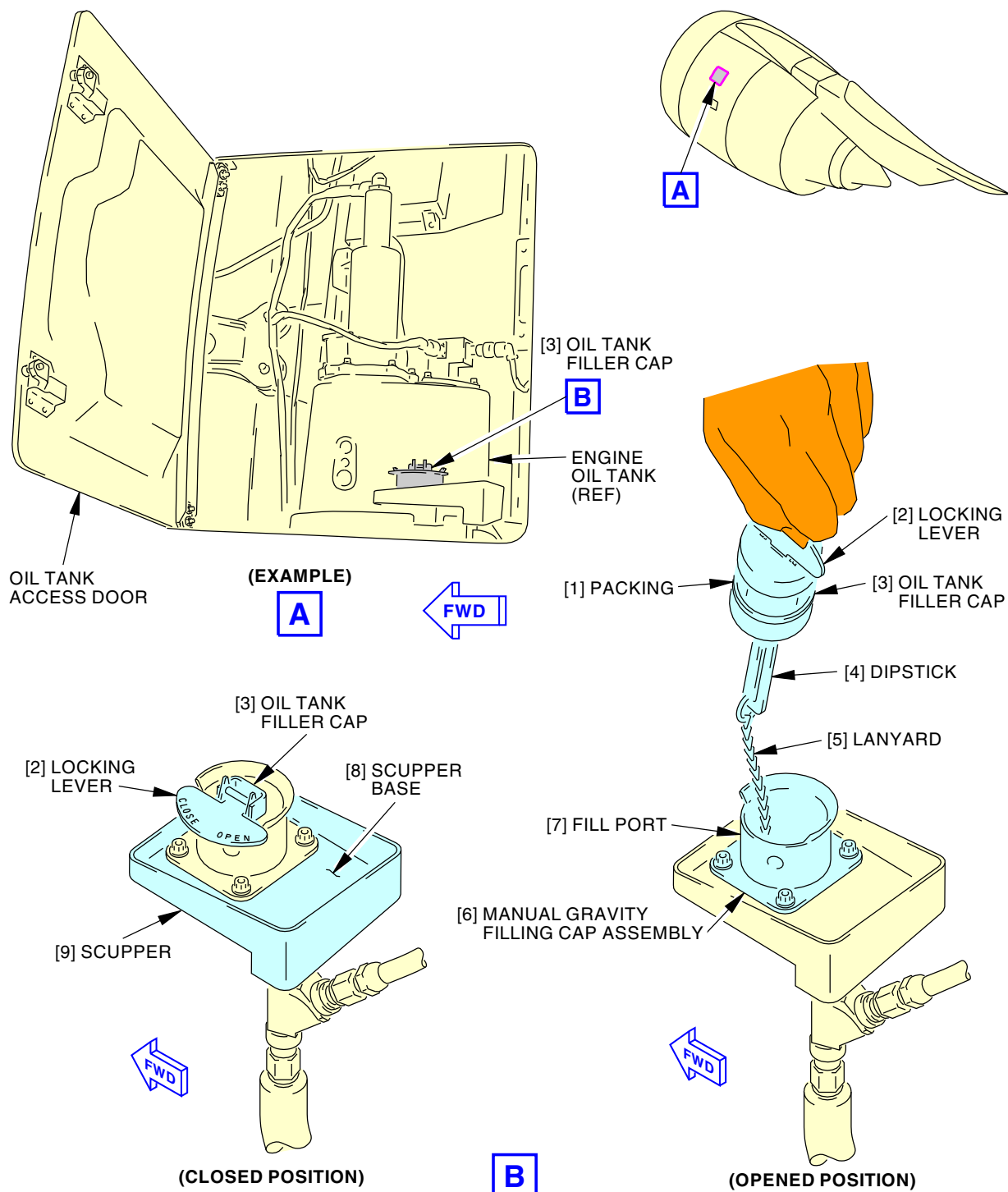
————— **END OF TASK** —————

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Engine Oil Replenishing
Figure 301/12-13-01-990-807-002

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INTEGRATED DRIVE GENERATOR OIL FILL - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
 - (1) IDG Oil Fill

TASK 12-13-03-600-802

2. IDG Oil Fill

(Figure 301)

A. General

- (1) When the overflow drain hose is connected to the overflow drain valve, use a short hose with its end hung vertically and open to the air. Do not bend the hose or let the end of the hose extend below the oil level in the container.
- (2) Approximately 1 quart of oil must drain from the overflow drain hose when you fill the IDG with oil. This will make sure the overflow valve adapter has put the IDG drain valve in the open position. If you fill the IDG without the drain valve open, you can overfill the IDG with oil. If you overfill the IDG with oil, the oil can overheat and cause damage to the IDG.
- (3) Do not do this task for a disconnected IDG. The operation of a defective IDG can cause damage to equipment.

B. References

Reference	Title
12-22-07-600-802	IDG Oil Change (P/B 301)

C. Tools/Equipment

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

Reference	Description
COM-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
B00679 [C04-035]	Alcohol - Isopropyl	
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3

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(Continued)

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
415JB	Thrust Reverser Latch Panel, Left Engine
425JB	Thrust Reverser Latch Panel, Right Engine

G. Prepare for the IDG Oil Fill

SUBTASK 12-13-03-010-008

- (1) Open the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
415JB	Thrust Reverser Latch Panel, Left Engine
425JB	Thrust Reverser Latch Panel, Right Engine

H. Procedure

SUBTASK 12-13-03-020-002



DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (1) Remove the dust caps from the overflow and pressure fill valve openings.

NOTE: If an overfill condition is observed and a fuel odor is present, the fuel / oil heat exchanger may be leaking fuel in to the generator oil circuit.

SUBTASK 12-13-03-860-004

- (2) Put the free end of the drain hose into an oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 12-13-03-480-004



WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE TO THE OVERFLOW DRAIN COUPLING, PUT A RAG AROUND THE FITTING. THE RAG WILL PREVENT THE OIL SPRAY CAUSED BY PRESSURE IN THE IDG CASE. HOT OIL CAN CAUSE INJURIES.

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(WARNING PRECEDES)



CAUTION

DO NOT DISCONNECT THE OIL OVERFLOW HOSE AND COUPLING FROM THE OVERFLOW DRAIN VALVE UNTIL YOU COMPLETE THE SERVICING AND THE OIL OVERFLOW DECREASES TO DROPS. IF THE HOSE AND COUPLING ARE DISCONNECTED FROM DRAIN VALVE BEFORE YOU COMPLETE THE SERVICING, THIS CAN CAUSE OIL OVERFILL CONDITION IN THE GENERATOR. AN OIL OVERFILL CONDITION CAN CAUSE DAMAGE TO THE GENERATOR DURING OPERATION.

- (3) Connect the adapter, OMP 2505-3 (overflow coupling) and the drain hose to the overflow drain valve.

NOTE: Some oil can come out of the overflow drain hose when it is connected.

SUBTASK 12-13-03-610-008

- (4) To prevent the IDG oil contamination during oil servicing, refer to the steps that follow:
- (a) Make sure that the oil service area is clean. If necessary, wipe all engine service fittings with a clean cotton wiper, G00034 wet with alcohol, B00679 [C04-035] and blow dry with dry air or nitrogen to remove airborne contamination before oil servicing.



CAUTION

ENGINE OILS ARE HYGROSCOPIC AND CAN ABSORB WATER WHEN EXPOSED TO ATMOSPHERIC CONDITIONS. OIL SERVICING WITH OIL FILL CARTS, DIRTY OR OPEN OIL CANS SUBJECTED TO ATMOSPHERIC CONTAMINATION HAVE BEEN FOUND TO INTRODUCE OIL WITH LARGE AMOUNTS OF WATER AND AIRBORNE HARD PARTICLE CONTAMINATION INTO THE ENGINE AND ASSOCIATED OIL SYSTEMS. THIS CAN LEAD TO EARLY BEARING AND GEAR FAILURE.



CAUTION

OBJECTS DROPPED INTO THE OPEN PORTS OF THE SERVICE CART OR ENGINE OIL TANK CAN CAUSE DAMAGE AND FAILURE.

- (b) If oil cans are used for servicing, always service the engine with new oil from a sealed, clean and dry container, opened immediately prior to oil servicing.
- (c) To prevent contamination in the oil service cart, do the steps that follow:
- 1) The cart must be serviced following the manufacturer recommendation.
 - 2) The cart service fittings and access ports must be covered when not in use to prevent contamination.
 - 3) All unused oil must be drained from the service cart when not in use.
 - 4) Wipe the service cart fill cover and adjacent area with a clean, lint-free cloth wet with alcohol, B00679 [C04-035] and blow dry with dry air or nitrogen to remove airborne contamination before you open to service the cart with oil.
 - 5) Always service the cart with new oil from a sealed, clean and dry container, opened immediately before you service the IDG.

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SUBTASK 12-13-03-480-005



DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (5) Connect the adapter, OMP 2506-3 (fill coupling) and the pressure fill hose from the service engine oil servicing cart, COM-1537 to the pressure fill valve.

SUBTASK 12-13-03-610-004



DO NOT FILL THE IDG TOO MUCH. MAKE SURE THE DRAIN LINE IS CONNECTED. ALL OF THE OIL MUST DRAIN OUT OF THE DRAIN LINE. DO NOT DISCONNECT THE DRAIN LINE UNTIL THE STREAM OF OIL DECREASES TO DROPS. TOO MUCH OIL CAN CAUSE A FAILURE OF THE IDG.

- (6) Fill the IDG with oil, D00068 or oil, D00071 to a maximum of 40 pounds per square inch.

NOTE: If you change the oil type or brand, contact the vendor, Hamilton Sundstrand for their list of approved oils.

NOTE: Be prepared to catch the oil in an applicable oil resistant container (5 gal)(19 Liter), STD-1055.

- (a) Fill the IDG with oil, D00068 or oil, D00071 until a minimum of 1.0 quart of oil comes out of the overflow drain hose.

SUBTASK 12-13-03-610-005



DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (7) If the airplane is parked for an extended period in cold weather conditions, temperature is below -40°F (-40°C), then do these steps:

- (a) Fill the IDG with oil, D00071 to a maximum of 40 pounds per square inch.

NOTE: If you change the oil type or brand, contact the vendor, Hamilton Sundstrand for their list of approved oils.

NOTE: Be prepared to catch the oil in an applicable oil resistant container (5 gal)(19 Liter), STD-1055.

- (b) If the oil in the IDG is different than the oil listed above or if you are unsure of the oil type, replace the IDG oil with oil, D00071. To replace the IDG oil, do this task: IDG Oil Change, TASK 12-22-07-600-802.
- (c) Fill the IDG with oil, D00071 until a minimum of 1.0 quart of oil comes out of the overflow drain hose.

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SUBTASK 12-13-03-080-003



CAUTION

DO NOT REMOVE THE OVERFLOW DRAIN HOSE FROM THE IDG UNTIL TWO MINUTES AFTER THE OIL FLOW HAS DECREASED TO DROPS. FAILURE TO DRAIN THE IDG CORRECTLY WILL CAUSE TOO MUCH OIL IN THE IDG. THIS CONDITION WILL CAUSE AN IMMEDIATE OVERHEAT CONDITION AND CAUSE DAMAGE TO THE IDG.

- (8) Remove the adapter, OMP 2506-3 and the pressure fill hose from the pressure fill valve.

SUBTASK 12-13-03-420-003

- (9) Install the dust cap on the pressure fill valve.

SUBTASK 12-13-03-860-006

- (10) Let the oil that comes out of the overflow drain hose decrease to a few drops a minute.

SUBTASK 12-13-03-080-004

- (11) Remove the adapter, OMP 2505-3 and the overflow drain hose from the overflow drain valve.

SUBTASK 12-13-03-420-004

- (12) Install the dust cap on the overflow drain valve.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-03-410-006

- (1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
415JB	Thrust Reverser Latch Panel, Left Engine
425JB	Thrust Reverser Latch Panel, Right Engine

————— END OF TASK —————

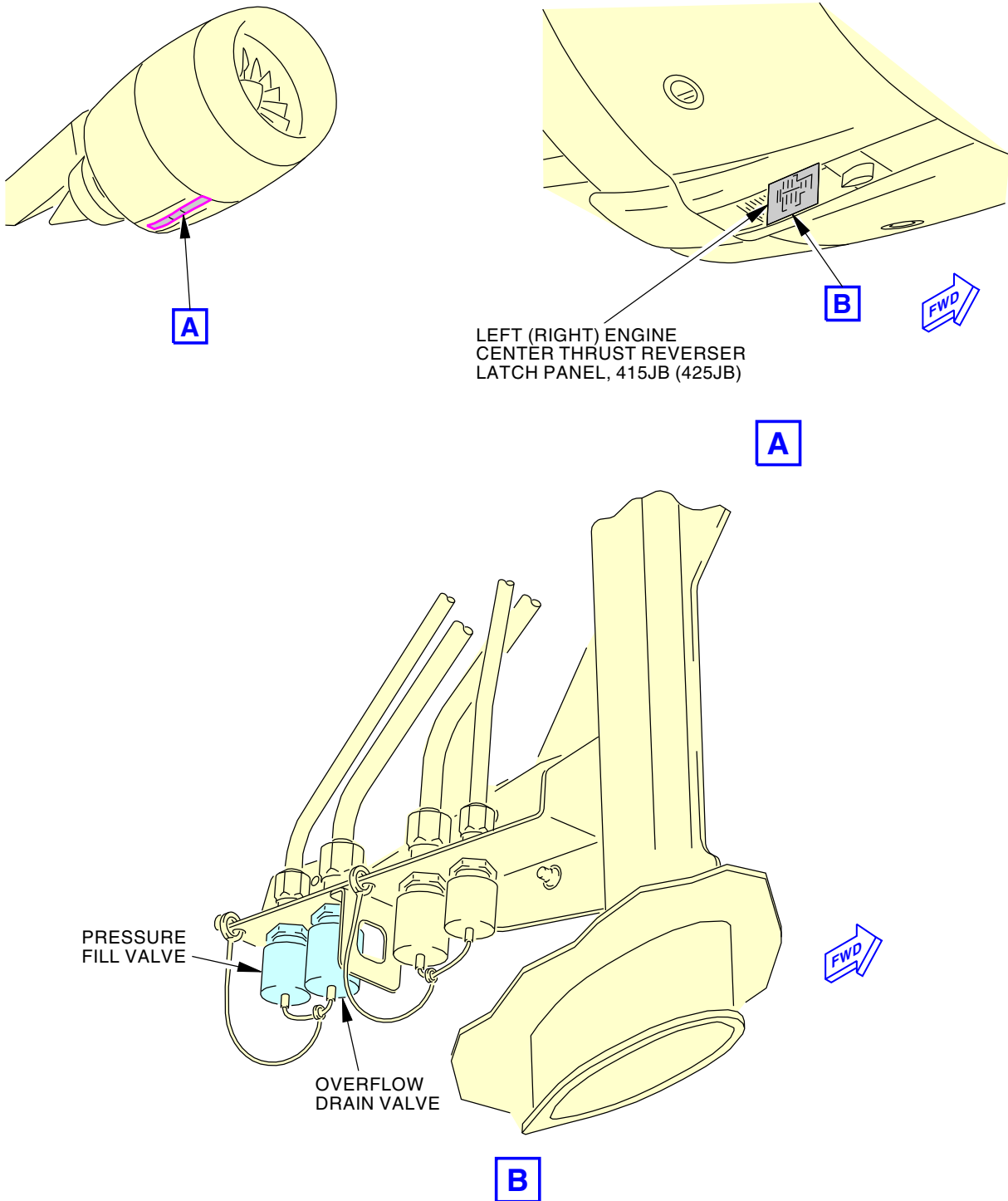
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Integrated Drive Generator Servicing
Figure 301/12-13-03-990-802

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AUXILIARY POWER UNIT REPLENISHING - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these task:
 - (1) APU oil level inspection
 - (2) APU oil replenishing.
- C. The auxiliary power unit is referred to as the APU.

TASK 12-13-04-200-801

2. APU Oil Level Inspection

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) There are 2 procedures to examine the APU oil level. The APU oil level can be examined on the EICAS status page or on the APU sight gage.

B. References

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

C. Location Zones

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

D. Access Panels

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

E. APU Oil Level Check - EICAS Status Page Procedure

NOTE: If EICAS is not available, the APU Oil Level Check - Sight Gage Procedure is an alternative.

SUBTASK 12-13-04-210-002

- (1) To examine the APU oil level on the EICAS status page, do these steps:
 - (a) If the APU selector on the P5 overhead panel is OFF, put the APU MAINT switch on the P61 overhead panel in the TEST position.

NOTE: The display indications will show after approximately 10 seconds.
 - (b) Push the STAT switch on the P55 display select panel.
 - (c) Look at OIL QTY display on the APU status page.
 - (d) If the OIL QTY display is less than 5, or if the EICAS STATUS message APU OIL QTY shows, do this task: APU Oil Replenishing, TASK 12-13-04-600-801.
 - (e) If the APU selector on the P5 overhead panel is OFF, put the APU MAINT switch on the P61 overhead panel in the NORM position.

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F. APU Oil Level Check - Sight Gage Procedure

NOTE: The APU Oil Level Check - Sight Gage Procedure is an alternative if EICAS is not available.

SUBTASK 12-13-04-010-001

(1) Do this task:

APU Access Doors (Open), TASK 49-11-02-010-801

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

SUBTASK 12-13-04-210-001

(2) To examine the oil level on the APU oil level sight gage [1], do these steps:

- (a) If the APU is operating, make sure the oil level is above the ADD line on the APU ON side of the oil level sight gage [1].
- (b) If the APU is shutdown, make sure the oil level is above the ADD line on the APU OFF side of the oil level sight gage [1].
- (c) If the oil level is below the ADD line, do this task: APU Oil Replenishing, TASK 12-13-04-600-801.

SUBTASK 12-13-04-410-001

(3) If the APU oil level is OK, then, do this task:

APU Access Doors (Close), TASK 49-11-02-410-801

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

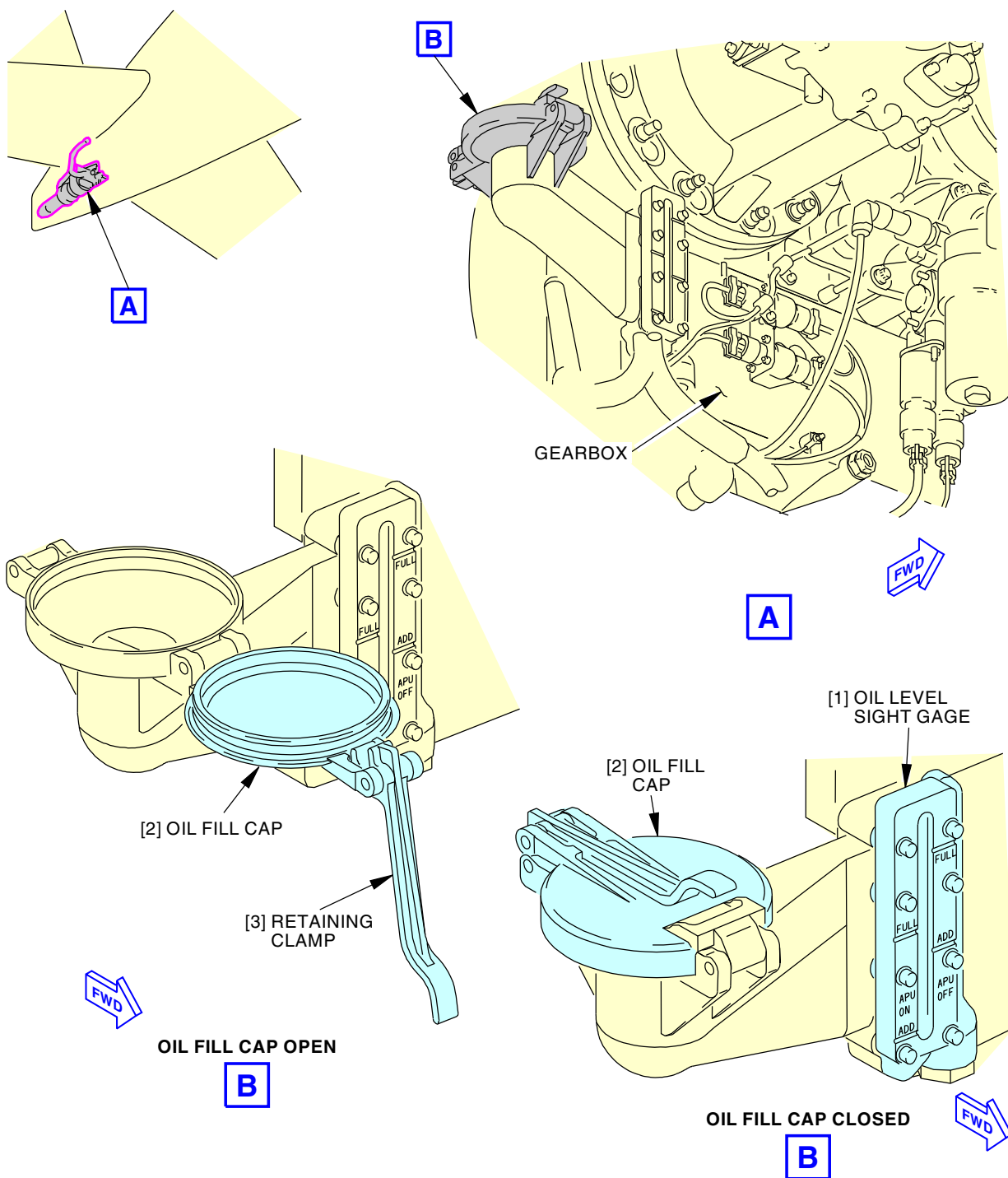
———— **END OF TASK** ————

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APU Oil Servicing
Figure 301/12-13-04-990-801

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TASK 12-13-04-600-801

3. APU Oil Replenishing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure is used to fill the oil in the APU to get the correct amount of oil necessary to operate the APU.
- (2) The oil reservoir is the gearbox housing and holds 8 qt (7.6 l). If the APU is new or if the air/oil cooler is replaced, 10 qt (9.5 l) of oil can be required.

NOTE: When the APU OFF side of the oil level sight gage [1] indicates FULL, the APU gearbox will contain 7.25 qt (6.86 l). This is also the maximum oil quantity that is displayed in EICAS.

- (3) It is recommended that you use Type 1 oil if the APU will be started in very cold conditions below -40°F (-40°C) or periodic in-flight starts (start sampling).

NOTE: For more information, see Honeywell Service Information Letter D201310000036 (Provide Operators with Information Regarding the Adverse Effects of Periodic In-flight Auxiliary Power Unit (APU) Starting on the GTCP331-500[B] APU Mid-Frame Thrust Bearing Life, When Combined with the Use of Type II Oils).

- (4) Use only these types and brands of oil:

NOTE: For additional information about approved oils for the APU, please refer to Honeywell SB 49-7933. This SB also contains information about approved oils that are no longer produced.

- (a) Synthetic Base Oil, Type I - MIL-PRF-7808 (-65°F (-54°C) - 130°F (54°C)):
 - 1) Eastman Turbo Oil 2389, D00637.
 - 2) Castrol 399.
- (b) Def Stan 91-94, Type I (-65°F (-54°C) - 130°F (54°C)):
 - 1) Aeroshell 390 oil, D00635.
 - 2) Castrol 325 oil, D00636.
- (c) Synthetic Base Oil, Type II - MIL-PRF-23699 (-40°F (-40°C) - 130°F (54°C)):
 - 1) Aeroshell Turbine Oil 500.
 - 2) Castrol Aero 5000.
 - 3) Eastman Turbo Oil 2380, D00519.
 - 4) Hatco 3211.
 - 5) Hatco 3611.
 - 6) Mobil Jet Oil II, D00520.
 - 7) Royco Turbine Oil 500.
- (d) Type II - MIL-PRF-23699 (Corrosion Inhibiting):
 - 1) Royco 899.
- (e) Type II, MIL-PRF-23699, (High Thermal Stability):
 - 1) Aeroshell Turbine Oil 560, D50201.
 - 2) Eastman Turbo Oil 2197, D50016.
 - 3) Mobil Jet Oil 254.

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- 4) Royco 560 Turbine Oil, D50202.
- (f) DOD-L-85734 and Def Stan 91-100, Type II (-40°F (-40°C) - 130°F (54°C)):
 - 1) Aeroshell 555 oil, D00513.
 - 2) Royco 555 oil, D50031.
- (5) The oil fill port is located on the top right side of the gearbox.

B. References

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

C. Consumable Materials

Reference	Description	Specification
D00513	Oil - Turbine - Aeroshell 555	
D00519	Oil - Engine - Eastman Turbo Oil 2380	MIL-PRF-23699F-STD and UK spec DEF STAN 91-101/2
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
D00635	Oil - Engine - Aeroshell 390	
D00636	Oil - Engine - Castrol 325	
D00637	Oil - Engine - Eastman Turbo Oil 2389	MIL-PRF-7808L grade 3
D50016	Oil - Engine - Eastman Turbo Oil 2197	MIL-PRF-23699F Class HTS (High Thermal Stability)
D50031	Oil - Turbine Engine, Type II (5 Centistokes) - Royco 555	
D50201	Lubricant - Aeroshell Turbine Oil 560	MIL-PRF-23699D, DERD 2499 Grade OX-27, OX-28, NATO O-156
D50202	Lubricant - Royco 560 Turbine Oil	MIL-PRF-23699F - HTS (High Thermal Stability)

D. Location Zones

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

E. Access Panels

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

F. Procedure

SUBTASK 12-13-04-860-001

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

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SUBTASK 12-13-04-600-001

- (2) Open these access panels:

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

- (3) Do the steps that follow to fill the APU oil:



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (a) Pull up on the retaining clamp [3] and disengage it from the oil fill cap [2].
(b) Open the oil fill cap [2].



CAUTION

DO NOT MIX TWO TYPES OF OIL WHEN YOU ADD THE OIL IN THE APU. IT IS PERMITTED TO MIX DIFFERENT BRANDS OF OIL WITH THE SAME TYPE OF OIL WHEN YOU ADD THE OIL IN THE APU. A MIXTURE OF TWO TYPES OF OIL IN THE APU CAN CAUSE DAMAGE TO THE APU.

- (c) Slowly add Mobil Jet Oil II, D00520 until the oil level is at the FULL line on the APU OFF side of the oil level sight gage [1].
(d) Close the oil fill cap [2].
(e) Engage the retaining clamp [3] on the oil fill cap [2] and push it down.

SUBTASK 12-13-04-860-002

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

SUBTASK 12-13-04-410-002

- (5) Do this task:

APU Access Doors (Close), TASK 49-11-02-410-801

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

————— **END OF TASK** —————

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AIR-DRIVEN PUMP (ADP) TURBINE GEARBOX ASSEMBLY (TGA) - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has one task. This task adds oil to the turbine gearbox assembly (TGA) on the air-driven pump (ADP).
- C. There are two air-driven pump assemblies in the wing to body fairing on the aft left side.

TASK 12-13-05-610-801

2. Add Oil to the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA)

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) The turbine gearbox assembly (TGA) is usually filled with lubricating oil, MIL-PRF-23699. For cold weather operation, the TGA possibly will contain lubricating oil, MIL-L-7808. For data on cold weather operation, refer to (Cold Weather Maintenance Procedure, TASK 12-33-01-600-803).

B. References

Reference	Title
12-33-01-600-803	Cold Weather Maintenance Procedure (P/B 301)
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)

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00109	Oil - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 (Supersedes MIL-L-7808)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	29-11-10-50-280	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

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G. Procedure

SUBTASK 12-13-05-860-001

- (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 12-13-05-040-001



DO NOT OPERATE THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN. IF YOU DO, IT CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (2) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 12-13-05-010-001

- (3) Open this access panel:

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

SUBTASK 12-13-05-212-001

- (4) If the indicator [4] shows a differential pressure indication, replace the ADP TGA Filter Element and reset the indicator [4], do these tasks:
- (a) Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal, TASK 29-11-19-000-801.
 - (b) Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation, TASK 29-11-19-400-801.

SUBTASK 12-13-05-210-001

- (5) Look in the sight glass [3] on the outboard side of the turbine gearbox assembly (TGA) on each air-driven pump (ADP) assembly.

NOTE: When the oil level is below the sight glass [3], you will see a reflective mirror (shiny) surface in the sight glass [3]. When the oil level is above the sight glass [3], you will see a surface in the sight glass [3] which is not shiny.

SUBTASK 12-13-05-610-001

- (6) If you see a reflective mirror (shiny) surface in the sight glass [3] on an ADP, do these steps to add oil to the TGA of the ADP:
- (a) Remove the plug [1] from the fill port on the TGA.



DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

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(CAUTION PRECEDES)



CAUTION

DO NOT USE LUBRICATING OIL, D00068, WHEN THE AIR TEMPERATURE ON THE GROUND IS LOWER THAN -40 °F. THE HIGH VISCOSITY OF THIS LUBRICATING OIL, AT TEMPERATURES LOWER THAN -40 °F, CAN CAUSE DAMAGE TO THE TGA.

- (b) Add oil, D00068, through the fill port on the TGA, until the oil level is at the top of the fill port.

NOTE: If the TGA contains lubricating oil, D00109, for cold weather operation, make sure you add the same oil. For data on cold weather maintenance (TASK 12-33-01-600-803).

- (c) Remove the packing [2] from the plug [1].
(d) Apply oil to the new packing [2] for the plug [1].
(e) Install the new packing [2] on the plug [1].
(f) Install the plug [1] in the fill port on the TGA.
 1) Torque the fill port plug [1] to 90 in-lb (10.2 N·m) to 95 in-lb (10.7 N·m).
(g) Safety the plug [1] with a lockwire.
(h) Remove all oil from the outer surface of the TGA with a rag.

SUBTASK 12-13-05-410-001

- (7) Close this access panel:

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

SUBTASK 12-13-05-080-001

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

SUBTASK 12-13-05-860-002

- (9) 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** —————

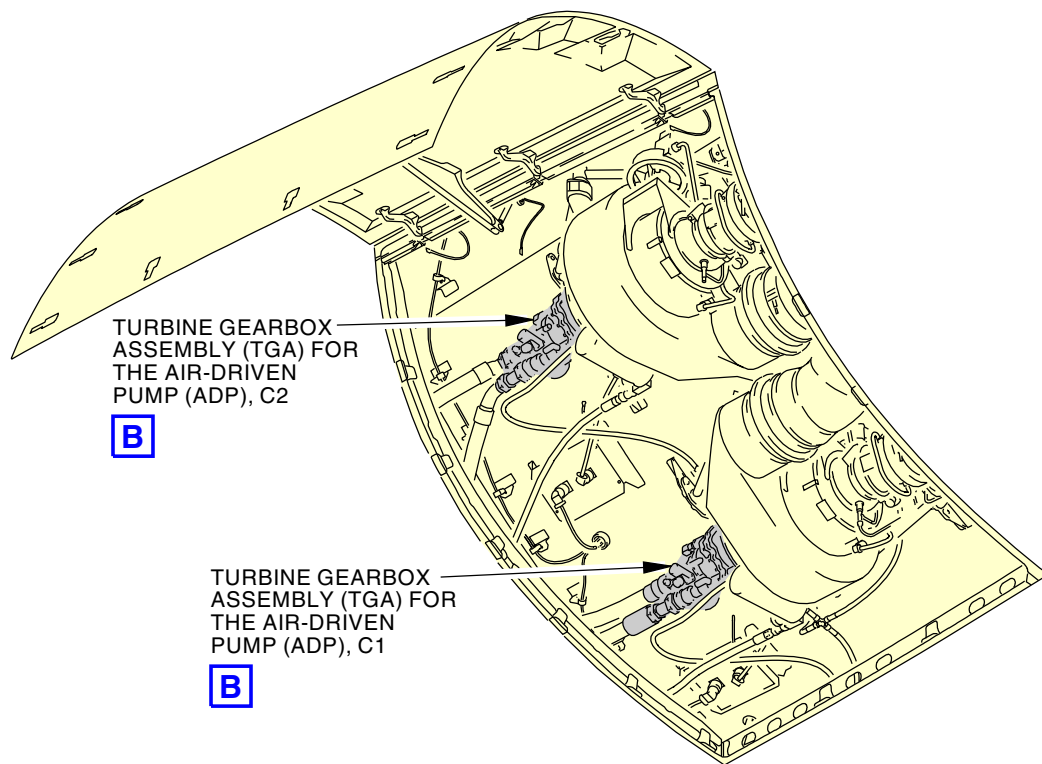
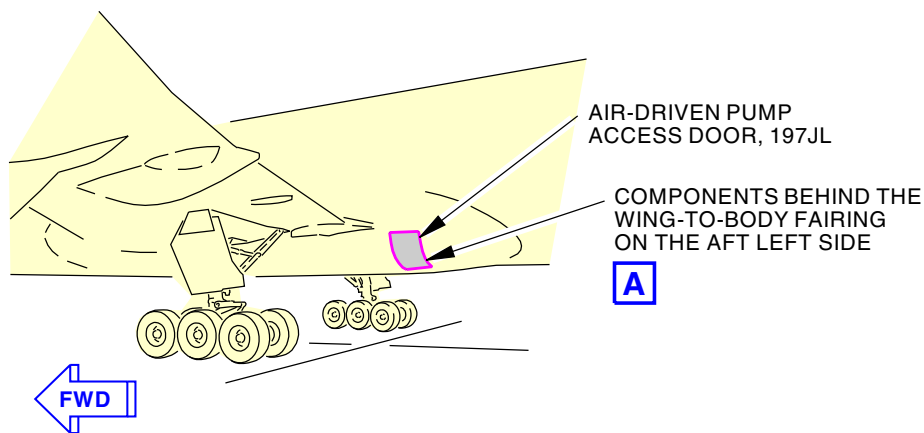
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**COMPONENTS BEHIND THE WING-TO-BODY FAIRING
ON THE AFT LEFT SIDE**

A



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**Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Servicing
Figure 301/12-13-05-990-801 (Sheet 1 of 2)**

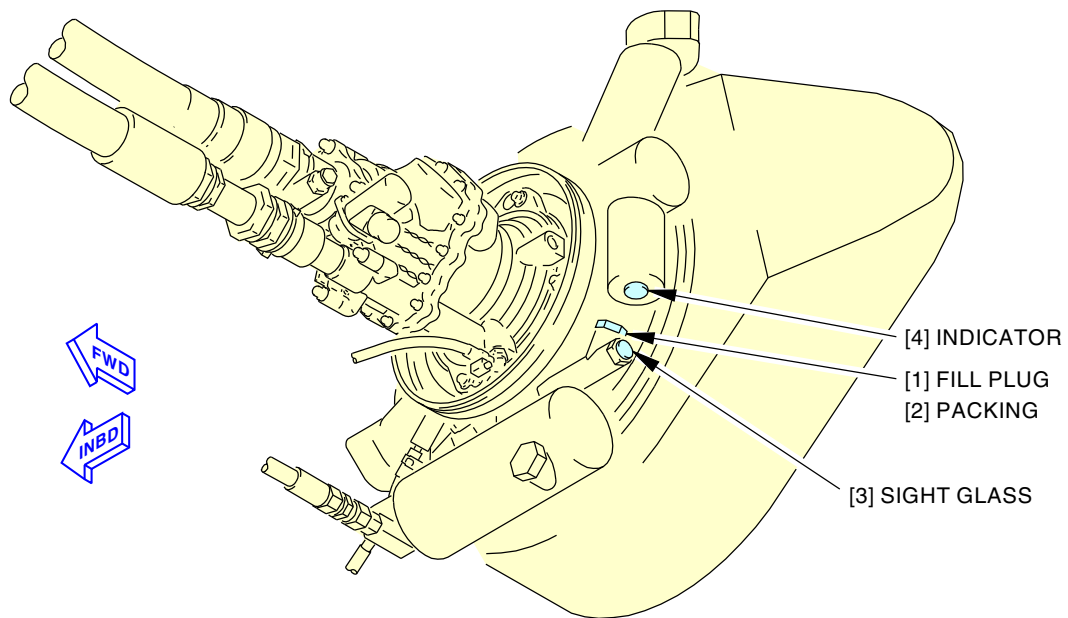
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TURBINE GEARBOX ASSEMBLY (TGA)
(EXAMPLE)

B

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Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Servicing
Figure 301/12-13-05-990-801 (Sheet 2 of 2)

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STABILIZER BALLSCREW ACTUATOR PRIMARY BRAKE - SERVICING

1. **General**

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
 - (1) Stabilizer Ballscrew Actuator Primary Brake Servicing.
- C. Refer to AMM 12-21-05/301, Stabilizer Ballscrew, Ballnut, and Gimbal - Servicing, for the procedure to lubricate the other parts of the stabilizer ballscrew actuator assembly.

TASK 12-13-06-600-801

2. **Stabilizer Ballscrew Actuator Primary Brake - Servicing**

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Use this procedure to fill the primary brake of the stabilizer ballscrew actuator with oil. It is never necessary to change the oil in the primary brake, only to keep it filled to the correct level.

B. References

Reference	Title
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2011	Ladder Equipment - Vertical Fin and Empennage Access Part #: J53001-1 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	27-41-13-11-423	ARO ALL

F. Location Zones

Zone	Area
311	Area Aft of Bulkhead, Left
312	Area Aft of Bulkhead, Right

G. Access Panels

Number	Name/Location
311BL	Service Access Door

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H. Procedure

SUBTASK 12-13-06-860-001



MAKE SURE CENTER AND RIGHT HYDRAULIC POWER IS NOT SUPPLIED. IF HYDRAULIC POWER IS SUPPLIED THE STABILIZER BALLSCREW ACTUATOR CAN MOVE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Make sure center and right hydraulic power is removed from the hydraulic systems and reservoirs, do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 12-13-06-010-001

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Service Access Door

SUBTASK 12-13-06-480-001

- (3) Install the ladder equipment, SPL-2011.

SUBTASK 12-13-06-020-001

- (4) Remove the plug [1], from the primary brake housing of the stabilizer ballscrew actuator.

SUBTASK 12-13-06-901-001

- (5) Remove the packing [2] and discard.

SUBTASK 12-13-06-610-001

- (6) Add fluid, D00070, if it is necessary, until the oil level is up to the bottom of the hole for the fill plug.

NOTE: It is only necessary to add fluid, D00070 at one of the two fill plugs.

SUBTASK 12-13-06-640-001

- (7) Lubricate the new packing [2] with fluid, D00070.

SUBTASK 12-13-06-420-001

- (8) Install the plug [1] and packing [2] in the fill port.

SUBTASK 12-13-06-420-002

- (9) Tighten the plug [1] to 110 in-lb (12 N·m) - 130 in-lb (15 N·m).

SUBTASK 12-13-06-080-001

- (10) Remove the ladder equipment, SPL-2011.

SUBTASK 12-13-06-410-001

- (11) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
311BL	Service Access Door

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Table 301/12-13-06-993-801

Stabilizer Ballscrew Actuator Servicing					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Primary brake for the stabilizer ballscrew actuator	fluid, D00070	MIL-PRF-5606 (Replaces MIL-H-5606)	Fill	2

————— **END OF TASK** —————

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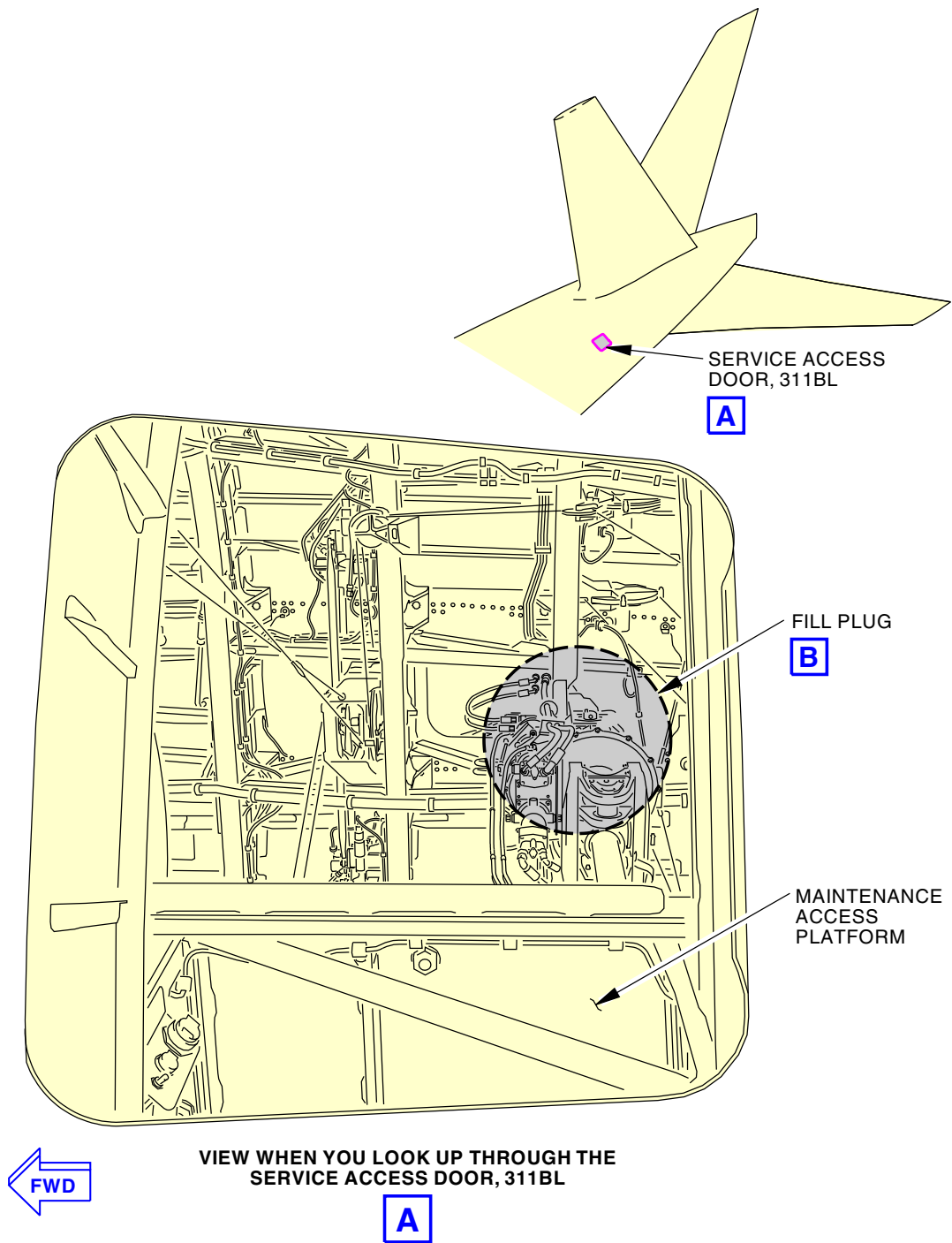
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Stabilizer Ballscrew Actuator - Servicing (Oil Replenishing)
Figure 301/12-13-06-990-801 (Sheet 1 of 2)

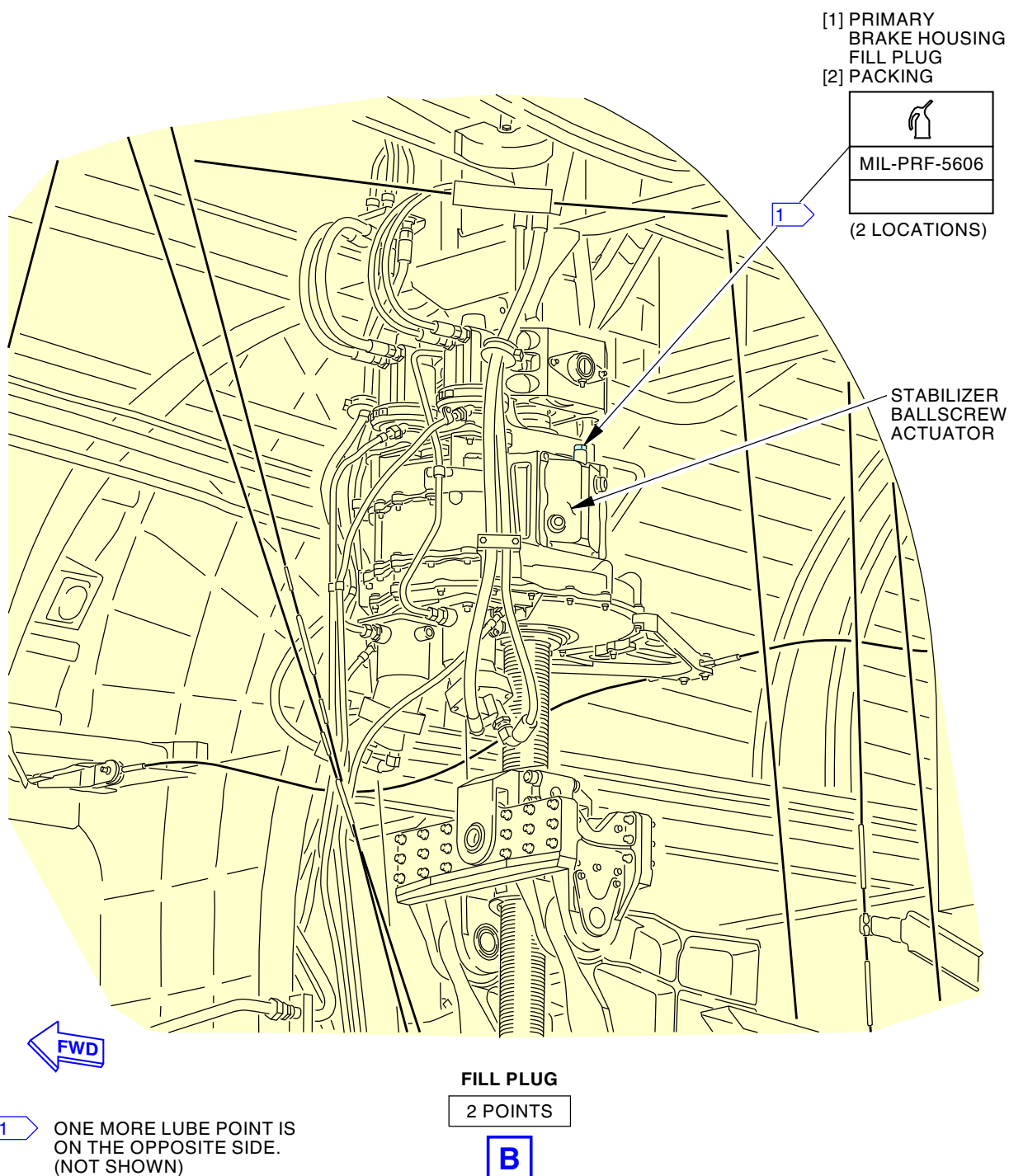
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Stabilizer Ballscrew Actuator - Servicing (Oil Replenishing)
Figure 301/12-13-06-990-801 (Sheet 2 of 2)

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BACKUP GENERATOR OIL REPLENISHING - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Backup Generator Oil Fill
 - (2) Backup Generator Oil Level Check
 - (3) Backup Generator Oil Filter Blocked Condition Check.

TASK 12-13-07-600-801

2. Backup Generator Oil Fill

(Figure 301, Figure 302)

A. General

- (1) This procedure gives instructions to fill the backup generator oil system.

B. Tools/Equipment

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

Reference	Description
COM-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)
STD-1404	Hose - Assembly

C. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

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E. Access Panels

Number	Name/Location
415JB	Thrust Reverser Latch Panel, Left Engine
425JB	Thrust Reverser Latch Panel, Right Engine

F. Procedure

SUBTASK 12-13-07-010-001

- (1) Open the applicable access panels:

Number	Name/Location
415JB	Thrust Reverser Latch Panel, Left Engine
425JB	Thrust Reverser Latch Panel, Right Engine

SUBTASK 12-13-07-010-002



DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (2) Open the dust caps from the overflow and pressure fill valves.

SUBTASK 12-13-07-860-001

- (3) Put the free end of the drain hose into an oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 12-13-07-480-001



BE CAREFUL WHEN YOU CONNECT THE OVERFLOW COUPLING TO THE OVERFLOW DRAIN VALVE, USE A RAG AROUND THE FITTING. THIS WILL PREVENT A SPRAY CAUSED BY PRESSURE IN THE BACKUP GENERATOR. HOT OIL CAN BURN YOU.



THE OIL OVERFLOW HOSE AND COUPLING MUST BE CONNECTED TO THE OIL OVERFLOW DRAIN VALVE TO RELEASE INTERNAL PRESSURE IN THE BACKUP GENERATOR. THE OVERFLOW HOSE AND COUPLING MUST REMAIN CONNECTED TO THE OVERFLOW DRAIN VALVE UNTIL SERVICING IS COMPLETED AND OIL OVERFLOW HAS SLOWED TO A FEW DROPS A MINUTE. FAILURE TO DO THIS CAN RESULT IN OVERFILLING WITH OIL, WHICH CAN CAUSE THE BACKUP GENERATOR TO BE DAMAGED DURING OPERATION.

- (4) Connect the overflow coupling and the hose, STD-1404 to the overflow drain valve.

SUBTASK 12-13-07-480-002



DO NOT MIX TYPES OR BRAND NAMES OF OIL IN THE BACKUP GENERATOR. INCORRECT OILS CAN CAUSE DAMAGE TO THE BACKUP GENERATOR.

- (5) To avoid the Backup Generator oil contamination during oil servicing, refer to the steps that follow:
- (a) Make sure the oil service area is clean. If necessary, wipe all engine service fittings with a clean cotton wiper, G00034 wet with isopropyl alcohol (C04-035) and blow dry with dry air or nitrogen to remove airborne contamination before oil servicing.

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ENGINE OILS ARE HYGROSCOPIC AND CAN ABSORB WATER WHEN EXPOSED TO ATMOSPHERIC CONDITIONS. OIL SERVICING WITH OIL FILL CARTS, DIRTY OR OPEN OIL CANS SUBJECTED TO ATMOSPHERIC CONTAMINATION HAVE BEEN FOUND TO INTRODUCE OIL WITH LARGE AMOUNTS WATER AND AIRBORNE HARD PARTICLE CONTAMINATION INTO THE ENGINE AND ASSOCIATED EQUIPMENT OIL SYSTEMS. THIS CAN LEAD TO EARLY BEARING AND GEAR FAILURE.



OBJECTS DROPPED INTO THE OPEN PORTS OF THE SERVICE CART OR ENGINE OIL TANK CAN CAUSE DAMAGE AND FAILURE.

- (b) To avoid contamination in the oil service cart, do the steps that follow:
- 1) Cart must be serviced by the manufacturer recommendation.
 - 2) The cart service fittings and access ports must be covered when not in use to prevent contamination.
 - 3) All unused oil must be drained from the service cart when not in use.
 - 4) Wipe the service cart fill cover and adjacent area with a clean, lint-free cloth wet with isopropyl alcohol (C04-035) and blow dry with dry air or nitrogen to remove airborne contamination before you open to service the cart with oil.
 - 5) Always service the cart with fresh oil from a sealed, clean and dry container, opened immediately before you service the backup generator.
- (6) Connect the fill coupling and pressure fill hose of the service engine oil servicing cart, COM-1537 to the pressure fill valve on the backup generator.

SUBTASK 12-13-07-610-002

- (7) Use the service engine oil servicing cart, COM-1537 to fill the backup generator with oil, D00068 or oil, D00071 at 5 to 15 pounds per square inch.

NOTE: If you change the oil type or brand, contact the vendor, Hamilton Sundstrand, for their list of approved oils.

- (a) Fill the backup generator with oil, D00068 or oil, D00071 until a minimum of 1.0 quart of oil comes out of the overflow hose.

SUBTASK 12-13-07-080-001



DO NOT REMOVE THE OIL OVERFLOW HOSE AND COUPLING FROM THE OVERFLOW DRAIN VALVE UNTIL SERVICING IS COMPLETED AND OIL OVERFLOW HAS SLOWED TO A FEW DROPS A MINUTE. FAILURE TO DO THIS CAN RESULT IN OVERFILLING WITH OIL, WHICH CAN CAUSE THE BACKUP GENERATOR TO BE DAMAGED DURING OPERATION.

- (8) Disconnect the service engine oil servicing cart, COM-1537 from the pressure fill valve on the backup generator.

SUBTASK 12-13-07-420-001

- (9) Install the dust cap on the pressure fill valve.

SUBTASK 12-13-07-080-002

- (10) Disconnect the overflow coupling and overflow hose from the overflow drain valve after oil drainage slows to a few drops a minute.

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SUBTASK 12-13-07-420-002

- (11) Install the dust cap on the overflow drain valve.

SUBTASK 12-13-07-420-003

- (12) Do this task: Backup Generator Oil Level Check, TASK 12-13-07-200-801.

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SUBTASK 12-13-07-410-001

- (13) Close the applicable access panels;

<u>Number</u>	<u>Name/Location</u>
415JB	Thrust Reverser Latch Panel, Left Engine
425JB	Thrust Reverser Latch Panel, Right Engine

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————— END OF TASK —————

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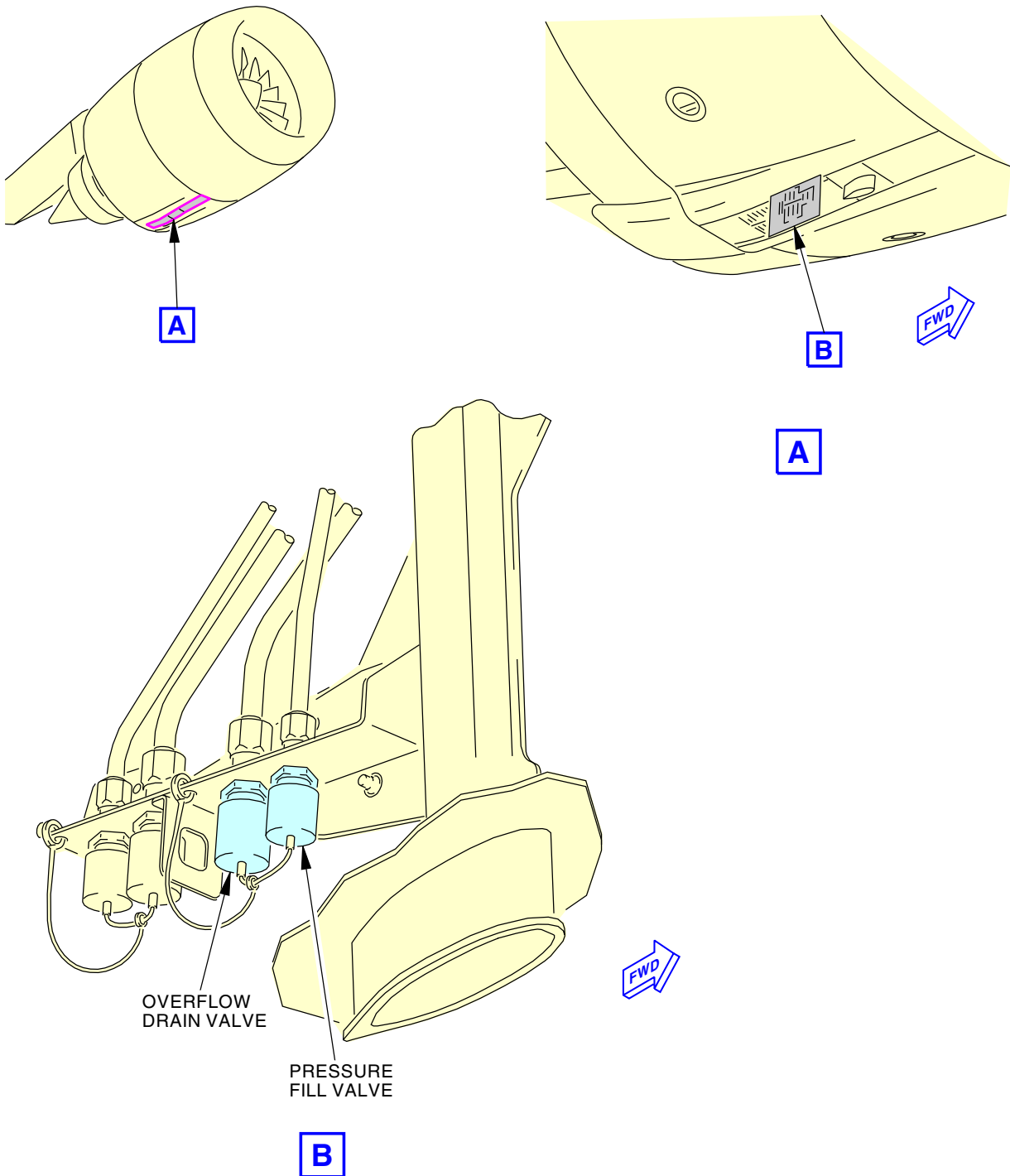
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Backup Generator Servicing
Figure 301/12-13-07-990-801

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TASK 12-13-07-200-801

3. Backup Generator Oil Level Check

(Figure 301, Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has these checks:
 - (a) Backup Generator Oil Level Check from the Multi-Function Display (MFD).
 - (b) Backup Generator Oil Level Check from the Sightglass.
- (2) You can do a check of the backup generator oil level from the MFD or the sightglass.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-25-00-700-802	Backup Generator Oil System Static Leak Check (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)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

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D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

G. Backup Generator Oil Level Check from the Multi Function Display (MFD)

SUBTASK 12-13-07-860-004

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

SUBTASK 12-13-07-860-005

- (2) Get access to the electrical maintenance page (TASK 31-61-00-800-804).

SUBTASK 12-13-07-860-006

- (3) Make sure the electrical maintenance page display NORMAL for the BACKUP GEN oil level.

SUBTASK 12-13-07-860-007



CAUTION

A SERVICE INDICATION ON THE ELECTRICAL MAINTENANCE PAGE MAY BE CAUSED BY AN OVERFILLED OR AN UNDERFILLED BACKUP GENERATOR. USE THE SIGHTGLASS TO FIND THE OIL LEVEL.

- (4) If the electrical maintenance page display SERVICE for the BACKUP GEN oil level, then do the check of the oil level from the sightglass.

H. Backup Generator Oil Level Check from the Sightglass

SUBTASK 12-13-07-010-003



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left fan cowl panels, do this task:
Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

SUBTASK 12-13-07-210-001

- (2) Do the oil level check of the backup generator.

- (a) Wait a minimum of 5 minutes after the engine is off before starting this task.
- (b) Clean the sight glass surface with a lint-free cotton wiper, G00034.
- (c) Examine the sight glass for the oil level.

SUBTASK 12-13-07-860-002

- (3) If the oil level is below the applicable oil level marks on the sight glass, do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.

NOTE: A leak may be responsible for a low oil level reading.

- (a) If frequent servicing is required, do this task: Backup Generator Oil System Static Leak Check, TASK 24-25-00-700-802.

SUBTASK 12-13-07-860-003

- (4) If the oil level is above the applicable oil level marks on the sight glass, do these steps:

- (a) Connect the overflow coupling which is on the service engine oil servicing cart, COM-1537 to the overflow hose.
- (b) Put the free end of the overflow hose into an oil resistant container (5 gal)(19 Liter), STD-1055.



WARNING

BE CAREFUL WHEN YOU CONNECT THE OVERFLOW COUPLING TO THE OVERFLOW DRAIN VALVE. USE A RAG AROUND THE FITTING. THIS WILL PREVENT A SPRAY CAUSED BY PRESSURE IN THE BACKUP GENERATOR. HOT OIL CAN BURN YOU.

- (c) Connect the overflow coupling and the overflow hose to the overflow drain valve.
 - 1) Permit the oil that drains from the overflow hose to flow into the oil resistant container (5 gal)(19 Liter), STD-1055.
- (d) Disconnect the overflow coupling and overflow hose from the overflow drain valve when the flow decreases to a few drops per minute.
- (e) Install the dust cap on the overflow drain valve.
- (f) Do this task: Backup Generator Oil Level Check.

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I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-07-410-002



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

(a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

(b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

(c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

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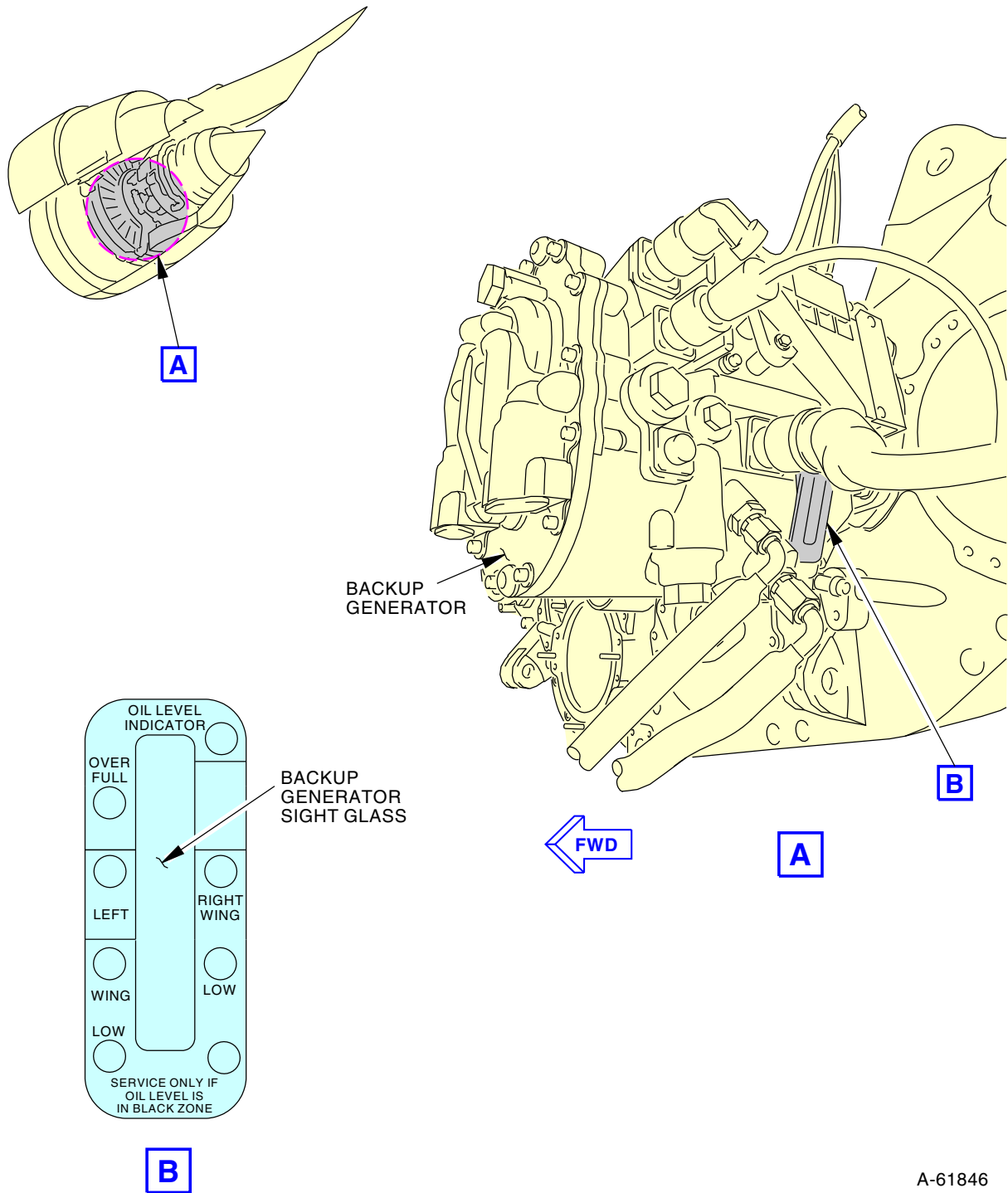
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Backup Generator Oil System Check
Figure 302/12-13-07-990-802

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TASK 12-13-07-200-802

4. Backup Generator Oil Filter Blocked Condition Check

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has these checks:
 - (a) Backup generator oil filter blocked condition check from the Multi Function Display (MFD).
 - (b) Backup generator oil filter blocked condition check at the backup generator.
- (2) You can do a check of the backup generator oil filter from the MFD or the backup generator.

B. References

Reference	Title
24-22-00-860-801	Supply Primary External Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (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 24-25 TASK 847	Backup Generator Oil Filter - Fault Isolation

C. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

E. Backup Generator Oil Filter Blocked Condition Check from the MFD

SUBTASK 12-13-07-860-010

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

SUBTASK 12-13-07-210-003

- (2) Do the check as follows:
 - (a) Get access to the electrical maintenance page (TASK 31-61-00-800-804).
 - (b) Make sure the electrical maintenance page display NORMAL for the associated backup generator.

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- (c) If the electrical maintenance page display "--" or BLOCKED for the associated backup generator, then do this task: FIM 24-25 TASK 847.

F. Backup Generator Oil Filter Blocked Condition Check at the Backup Generator

SUBTASK 12-13-07-010-004



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.



MAKE SURE THE FORWARD HOLD OPEN ROD IS ENGAGED WITH THE ENGINE RECEIVER BEFORE THE THRUST REVERSER IS FULLY OPENED. IF YOU DO NOT OBEY THIS INSTRUCTION, THE THRUST REVERSER CAN HIT THE LEADING EDGE SLATS AND CAUSE DAMAGE.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reverser, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

SUBTASK 12-13-07-210-004

- (2) Examine the differential pressure indicator.

- (a) Make sure the differential pressure indicator (red button) does not extend.

NOTE: When the DPI is set, an inspection must occur at an interval of 100 flight hours.

NOTE: After four consecutive 100 flight hour inspections without finding, the DPI inspection can be reverted back to the normal inspection interval.

- (b) If the differential pressure indicator (red button) is extended, then do this task:
FIM 24-25 TASK 847.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-13-07-410-003



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:

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- (a) Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

- (b) Do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— **END OF TASK** —————

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LEADING EDGE SLAT DRIVE SYSTEM OIL REPLENISHING - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A task to fill the power drive unit (PDU) and the electric motor for the leading edge slats with oil.
 - (2) A task to fill the no-back brake, offset gearboxes for the leading edge slats with oil.

TASK 12-13-08-610-801

2. Leading Edge Slat PDU and Electric Motor Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
06-30-00-800-806	Finding a Zone in Left Wing - Major Zone 500 (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)

B. **Consumable Materials**

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II

C. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
102	Packing	27-81-34-01-045	ARO ALL
105	Packing	27-81-31-05-170	ARO ALL

D. **Location Zones**

Zone	Area
511	Leading Edge to Front Spar - Inboard of Nacelle Strut - Left Wing

E. **Access Panels**

Number	Name/Location
511AB	Leading Edge PDU Panel

F. **Procedure**

SUBTASK 12-13-08-040-001

 WARNING	DO THE LEADING EDGE SLAT DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE SLAT SYSTEM. WITH THE SLATS ACTIVATED, THE SLATS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-13-08-010-001

- (2) On the lower surface of the strakelet of the left wing (TASK 06-30-00-800-806);

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Open this access panel:

<u>Number</u>	<u>Name/Location</u>
511AB	Leading Edge PDU Panel

SUBTASK 12-13-08-610-001

- (3) Do a check of the fluid level in the Power Drive Unit (PDU) [103] (Table 301):
- (a) Remove the plug [104] and packing [105] from the fill port.
 - 1) Discard the packing [105] that you removed.
 - (b) Make sure the fluid is at the level of the fill port.
 - (c) If the fluid is not at the level of the fill port, fill the PDU with fluid, D00070 to the level of the fill port.
 - (d) Lubricate the new packing [105] with fluid.
 - (e) Install the plug [104] and new packing [105] in the fill port.
 - (f) Tighten the plug [104] to 170-190 pound-inches.

SUBTASK 12-13-08-610-002

- (4) Do a check of the fluid level in the slat electric motor (Table 301):
- (a) Remove the plug [101] and packing [102] from the fill port.
 - 1) Discard the packing packing [102] that you removed.
 - (b) Make sure the fluid is at the level of the fill port.
 - (c) If the fluid is not at the level of the fill port, fill the electric motor with fluid, D00467 or fluid, D00070 to the level of the fill port.

NOTE: The electric motor is initially filled with fluid, D00467. You can add fluid, D00467 or fluid, D00070.
 - (d) Lubricate the new packing [102] with fluid.
 - (e) Install the plug [101] and new packing [102] in the fill port.
 - (f) Tighten the plug [101] to 160-190 pound-inches.
 - (g) Install lockwire on the plug [101].

SUBTASK 12-13-08-410-001

- (5) On the lower surface of the strakelet of the left wing (TASK 06-30-00-800-806);
Close this access panel:

<u>Number</u>	<u>Name/Location</u>
511AB	Leading Edge PDU Panel

SUBTASK 12-13-08-440-002

- (6) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

Table 301/12-13-08-993-803 Slat Power Drive Unit (PDU) and Electric Motor Servicing (Fig. 301)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Electric Motor	fluid, D00467 or fluid, D00070	BMS3-32 Type II or MIL-PRF- 5606 (Replaces MIL-H-5606)	Fill	1

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Table 301/12-13-08-993-803 Slat Power Drive Unit (PDU) and Electric Motor Servicing (Fig. 301)
(Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
2	Power Drive Unit	fluid, D00070	MIL-PRF-5606 (Replaces MIL-H-5606)	Fill	1

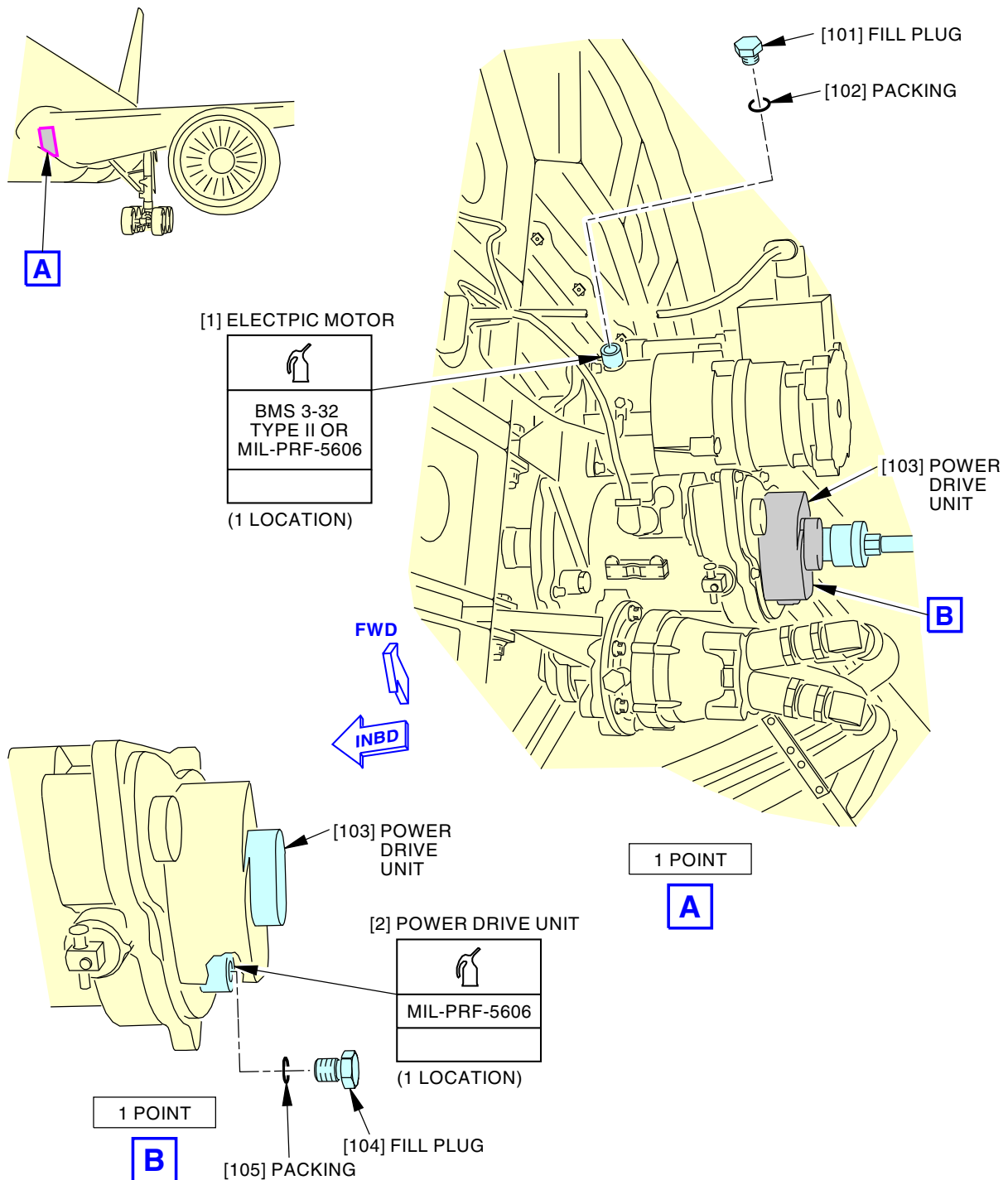
———— **END OF TASK** ————

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**Slat Power Drive Unit (PDU) and Electric Motor Servicing
Figure 301/12-13-08-990-801**

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TASK 12-13-08-610-802

3. Leading Edge No-Back Brake, Offset Gearbox Servicing

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-30-00-800-806	Finding a Zone in Left Wing - Major Zone 500 (P/B 201)
06-30-00-800-807	Finding a Zone in Right Wing - Major Zone 600 (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)
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. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
122	Packing	27-81-10-10-060	ARO ALL
124	Packing	27-81-17-10A-065	ARO ALL

D. Location Zones

Zone	Area
510	Subzone 510 - Wing Leading Edge - Forward of Front Spar
520	Subzone 520 - Wing Leading Edge - Forward of Front Spar
610	Subzone 610 - Wing Leading Edge - Forward of Front Spar
620	Subzone 620 - Wing Leading Edge - Forward of Front Spar

E. Access Panels

Number	Name/Location
511CB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel
521AAB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel
521BB	Outboard Fixed Leading Edge Panel
521EB	Outboard Fixed Leading Edge Panel
521GB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel
611CB	Inboard Fixed Leading Edge Panel

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(Continued)

Number	Name/Location
611MB	Inboard Fixed Leading Edge Panel
621AAB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel
621BB	Outboard Fixed Leading Edge Panel
621EB	Outboard Fixed Leading Edge Panel
621GB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel

F. Procedure

SUBTASK 12-13-08-040-002



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) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 12-13-08-040-003



WARNING

DO THE LEADING EDGE SLAT DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE SLAT SYSTEM. WITH THE SLATS ACTIVATED, THE SLATS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-13-08-010-002

- (3) Remove the applicable fixed leading edge panels from the lower surface of the wing:
 - (a) On the left wing (TASK 06-30-00-800-806):

- 1) For slat No. 1:

Remove these access panels:

Number	Name/Location
521AAB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel

- 2) For slat No. 2:

Remove these access panels:

Number	Name/Location
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel

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3) For slat No. 3:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel

4) For slat No. 4:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel

5) For slat No. 5:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
521GB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel

6) For slat No. 6:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
521BB	Outboard Fixed Leading Edge Panel
521EB	Outboard Fixed Leading Edge Panel

7) For slat No. 7:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
511CB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel

(b) On the right wing (TASK 06-30-00-800-807):

1) For slat No. 8:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
611CB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel

2) For slat No. 9:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
621BB	Outboard Fixed Leading Edge Panel
621EB	Outboard Fixed Leading Edge Panel

3) For slat No. 10:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
621GB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel

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- 4) For slat No. 11:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel

- 5) For slat No. 12:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel

- 6) For slat No. 13:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel

- 7) For slat No. 14:

Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
621AAB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel

SUBTASK 12-13-08-200-001



DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (4) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-13-08-610-003

- (5) Do a check of the fluid level in the inboard leading edge no-back brake, offset gearboxes (Table 302):

NOTE: The fluid level can be above the fill port when the offset gearbox is installed.

- (a) Remove the plug [121] and packing [122] from the fill port.
- (b) Make sure the fluid is at the level of the fill port.
- (c) If the fluid is not at the level of the fill port, fill the gearbox with fluid, D00070 to the level of the fill port.
- (d) Lubricate the new packing [122] with fluid.
- (e) Install the plug [121] and new packing [122] in the fill port.
- (f) Tighten the plug [121] to 100-110 pound-inches.

SUBTASK 12-13-08-610-004

- (6) Do a check of the fluid level in the outboard leading edge no-back brake, offset gearboxes (Table 302):

NOTE: The fluid level can be above the fill port when the offset gearbox is installed.

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- (a) Remove the plug [123] and packing [124] from the fill port.
- (b) Make sure the fluid is at the level of the fill port.
- (c) If the fluid is not at the level of the fill port, fill the gearbox with fluid, D00070 to the level of the fill port.
- (d) Lubricate the new packing [124] with fluid.
- (e) Install the plug [123] and new packing [124] in the fill port.
- (f) Tighten the plug [123] to 100-110 pound-inches.

SUBTASK 12-13-08-200-002



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (7) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-13-08-410-002

- (8) Install the applicable fixed leading edge panels on the lower surface of the wing:

- (a) On the left wing (TASK 06-30-00-800-806):

- 1) For slat No. 1:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
521AAB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel

- 2) For slat No. 2:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel

- 3) For slat No. 3:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel

- 4) For slat No. 4:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel

- 5) For slat No. 5:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
521GB	Outboard Fixed Leading Edge Panel

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(Continued)

<u>Number</u>	<u>Name/Location</u>
521JB	Outboard Fixed Leading Edge Panel

- 6) For slat No. 6:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
521BB	Outboard Fixed Leading Edge Panel
521EB	Outboard Fixed Leading Edge Panel

- 7) For slat No. 7:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
511CB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel

- (b) On the right wing (TASK 06-30-00-800-807):

- 1) For slat No. 8:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
611CB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel

- 2) For slat No. 9:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
621BB	Outboard Fixed Leading Edge Panel
621EB	Outboard Fixed Leading Edge Panel

- 3) For slat No. 10:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
621GB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel

- 4) For slat No. 11:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel

- 5) For slat No. 12:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel

- 6) For slat No. 13:

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Install these access panel:

<u>Number</u>	<u>Name/Location</u>
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel

7) For slat No. 14:

Install these access panel:

<u>Number</u>	<u>Name/Location</u>
621AAB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel

SUBTASK 12-13-08-440-003

(9) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-13-08-440-001

(10) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

Table 302/12-13-08-993-804 Leading Edge No-Back Brake, Offset Gearbox Servicing (Fig. 302)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations at both wings
1	Inboard Leading Edge No-Back Brake, Offset Gearbox	fluid, D00070	MIL-PRF-5606 (Replaces MIL-H-5606)	Fill	4
2	Outboard Leading Edge No-Back Brake, Offset Gearbox	fluid, D00070	MIL-PRF-5606 (Replaces MIL-H-5606)	Fill	22
3	Outboard Leading Edge No-Back Brake, Offset Position Sensor Gearbox	fluid, D00070	MIL-PRF-5606 (Replaces MIL-H-5606)	Fill	2

— END OF TASK —

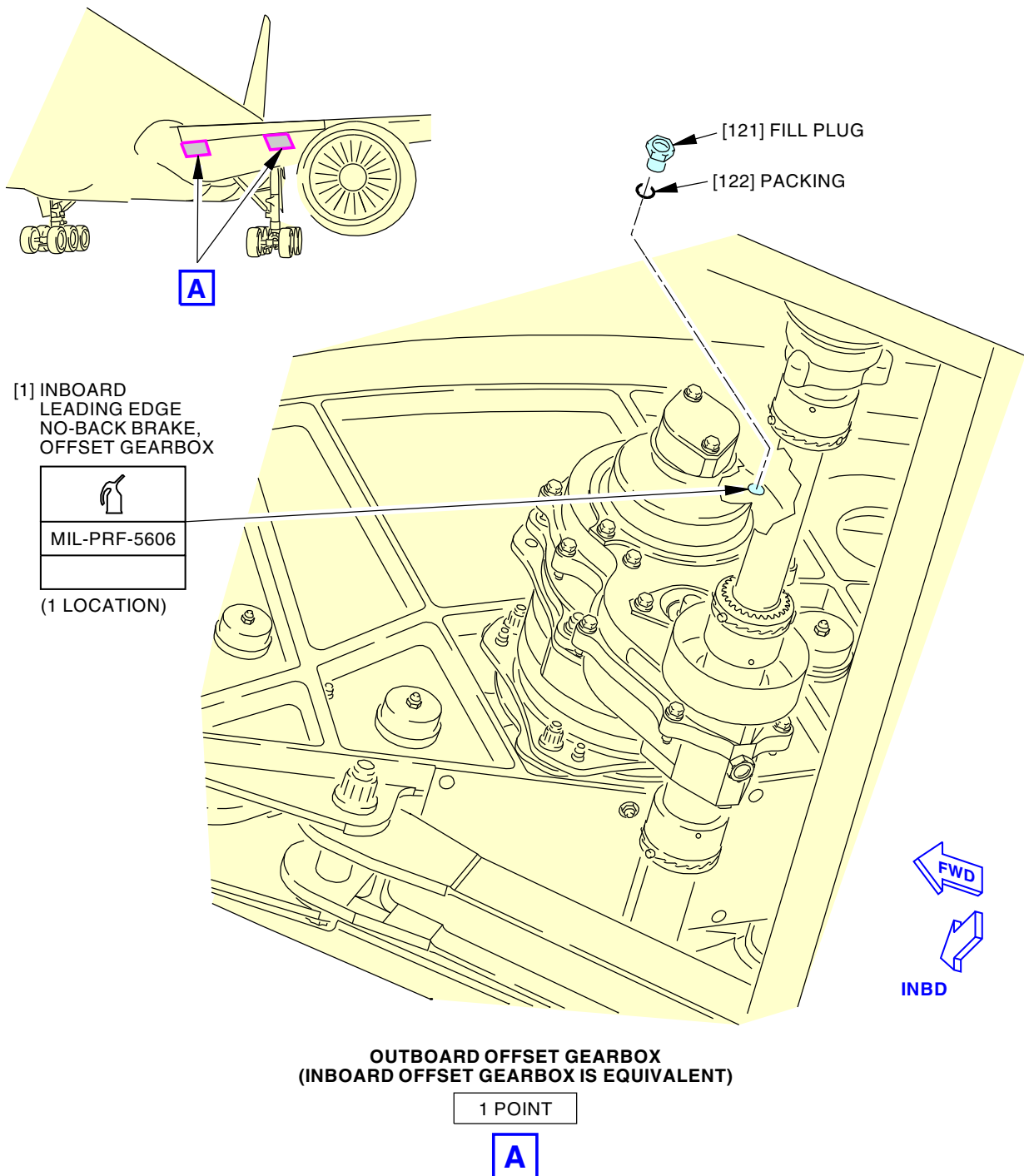
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Leading Edge No-Back Brake, Offset Gearbox Servicing
Figure 302/12-13-08-990-802 (Sheet 1 of 3)

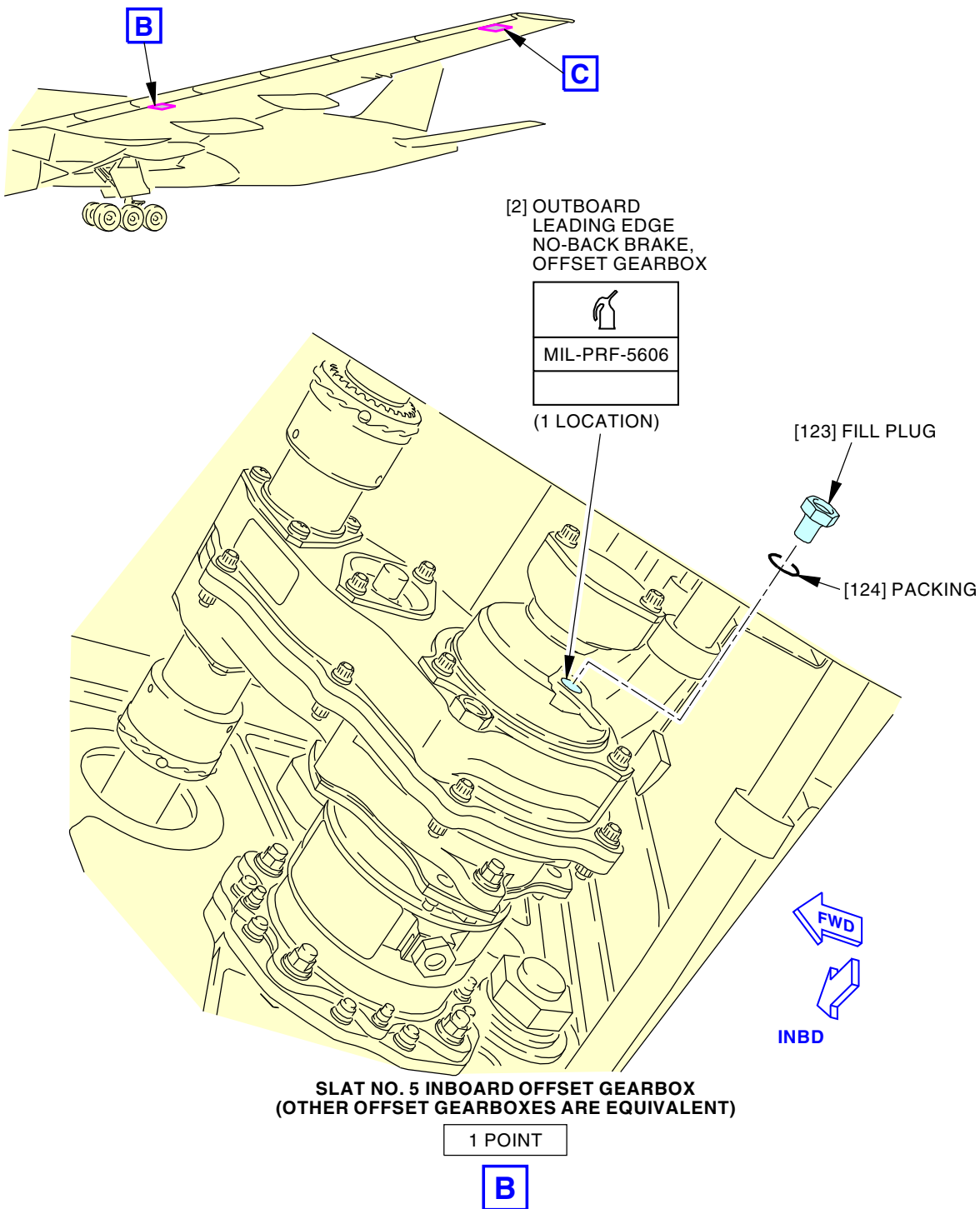
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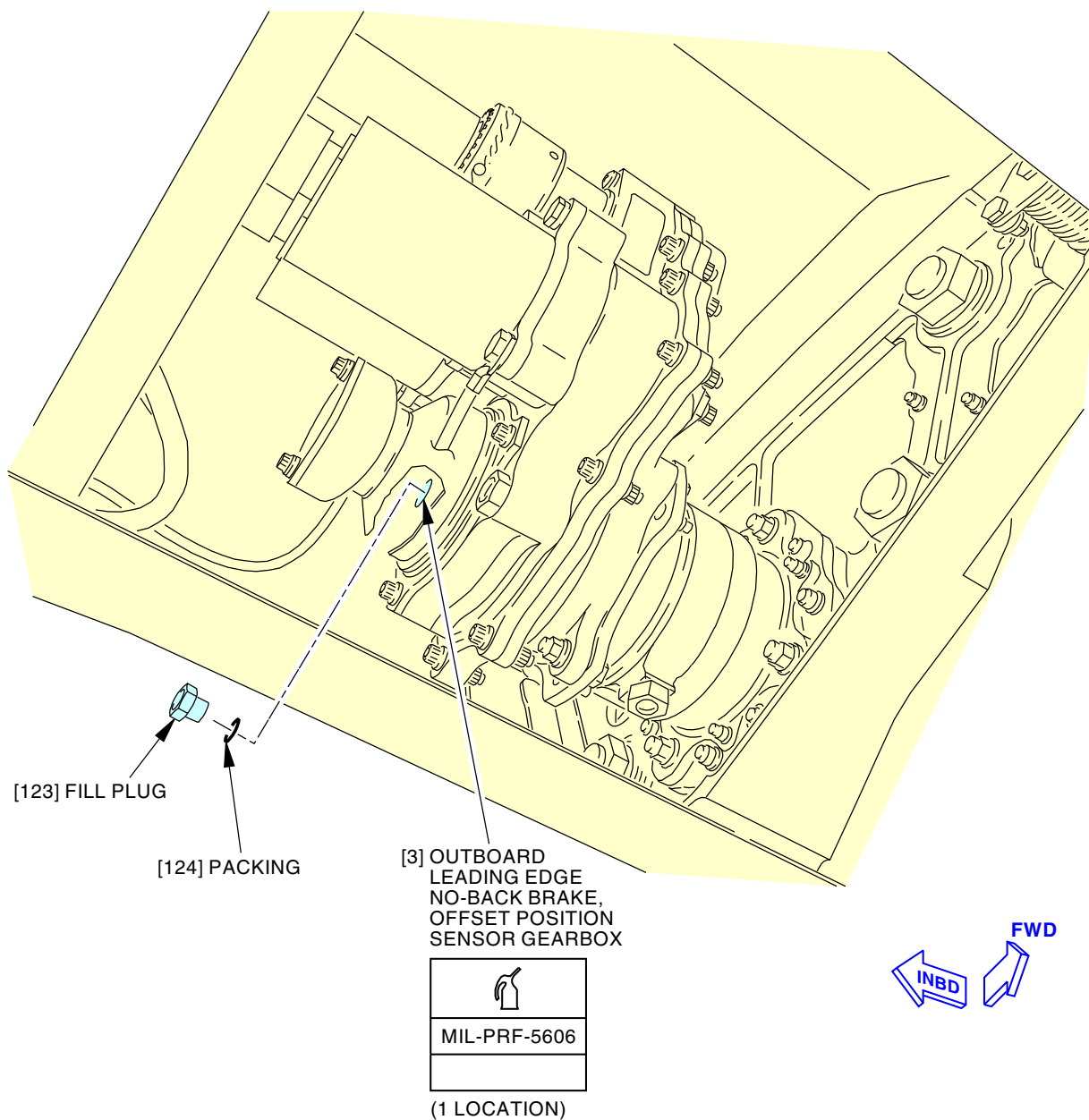
Leading Edge No-Back Brake, Offset Gearbox Servicing
Figure 302/12-13-08-990-802 (Sheet 2 of 3)

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**SLAT NO. 1 OUTBOARD OFFSET GEARBOX
(SLAT NO. 14 OUTBOARD OFFSET GEARBOX IS EQUIVALENT)**

1 POINT

C

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**Leading Edge No-Back Brake, Offset Gearbox Servicing
Figure 302/12-13-08-990-802 (Sheet 3 of 3)**

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TRAILING EDGE FLAP DRIVE SYSTEM - SERVICING (OIL REPLENISHING)

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
- (1) A task to fill the power drive unit (PDU) and the electric motor for the trailing edge flaps with oil.
 - (2) A task to fill the transmissions for the trailing edge flaps with oil.
 - (3) A task to fill the Ratchet No-Back Brake for the trailing edge flaps with oil.

TASK 12-13-09-610-801

2. Flap PDU and Electric Motor Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (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. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
102	Packing	27-51-34-01-030	ARO ALL
		27-81-34-01-045	ARO ALL
104	Packing	27-51-15-17-410	ARO ALL
		27-51-15-36-130	ARO 001-014
		27-51-31-10-020	ARO ALL

D. Location Zones

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

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E. Procedure

SUBTASK 12-13-09-480-001



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 on the main and nose landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 12-13-09-480-002



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR GROUND 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 12-13-09-040-001



WARNING

DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-13-09-610-001

- (4) Do a check of the fluid level in the Power Drive Unit (PDU) (Table 301):
 - (a) Remove the plug [103] and packing [104] from the fill port.
 - (b) Make sure the fluid is at the level of the fill port.
 - (c) If the fluid is not at the level of the fill port, fill the PDU with fluid, D00070 to the level of the fill port.
 - (d) Lubricate the new packing [104] with fluid.
 - (e) Install the plug [103] and new packing [104] in the fill port.
 - (f) Tighten the plug [103] to 110-130 pound-inches more than the run-on torque.
 - (g) Install lockwire on the plug [103].

SUBTASK 12-13-09-610-002

- (5) Do a check of the fluid level in the flap electric motor (Table 301):
 - (a) Remove the plug [101] and packing [102] from the fill port.
 - (b) Make sure the fluid is at the level of the fill port.
 - (c) If the fluid is not at the level of the fill port, fill the electric motor with fluid, D00467 or fluid, D00070 to the level of the fill port.

NOTE: The electric motor is initially filled with fluid, D00467. You can add fluid, D00467 or fluid, D00070.
 - (d) Lubricate the new packing [102] with fluid.
 - (e) Install the plug [101] and new packing [102] in the fill port.
 - (f) Tighten the plug [101] to 160-190 pound-inches.

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(g) Install lockwire on the plug [101].

SUBTASK 12-13-09-440-001

(6) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-13-09-080-001



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

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

Table 301/12-13-09-993-804 Flap Power Drive Unit and Electric Motor Servicing (Fig. 301)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Power Drive Unit	fluid, D00070	MIL-PRF-5606 (Replaces MIL-H-5606)	Fill	1
2	Flap Electric Motor	fluid, D00467 or fluid, D00070	BMS3-32 Type II or MIL-PRF-5606 (Replaces MIL-H-5606)	Fill	1

END OF TASK

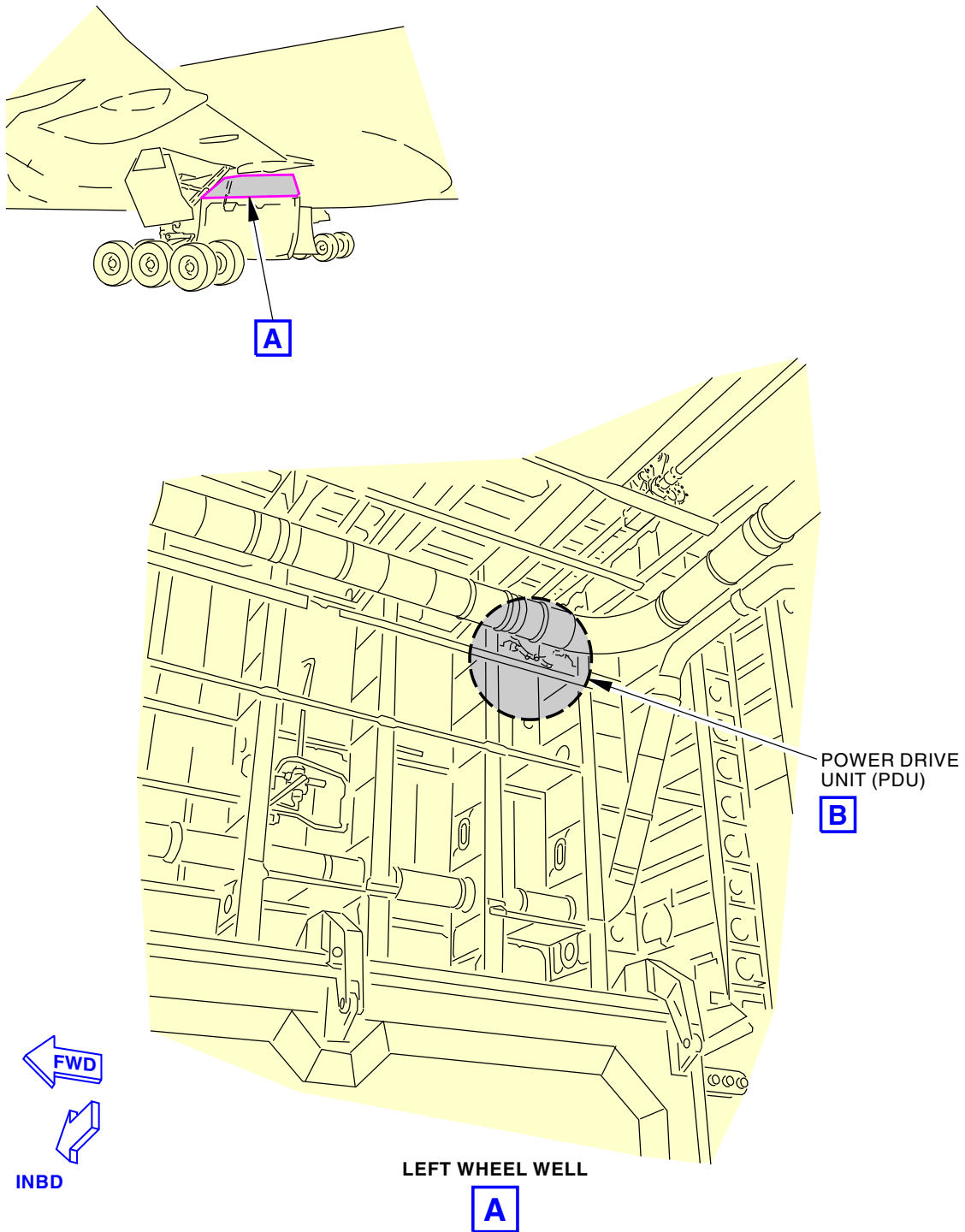
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Flap Power Drive Unit and Electric Motor Servicing
Figure 301/12-13-09-990-801 (Sheet 1 of 2)

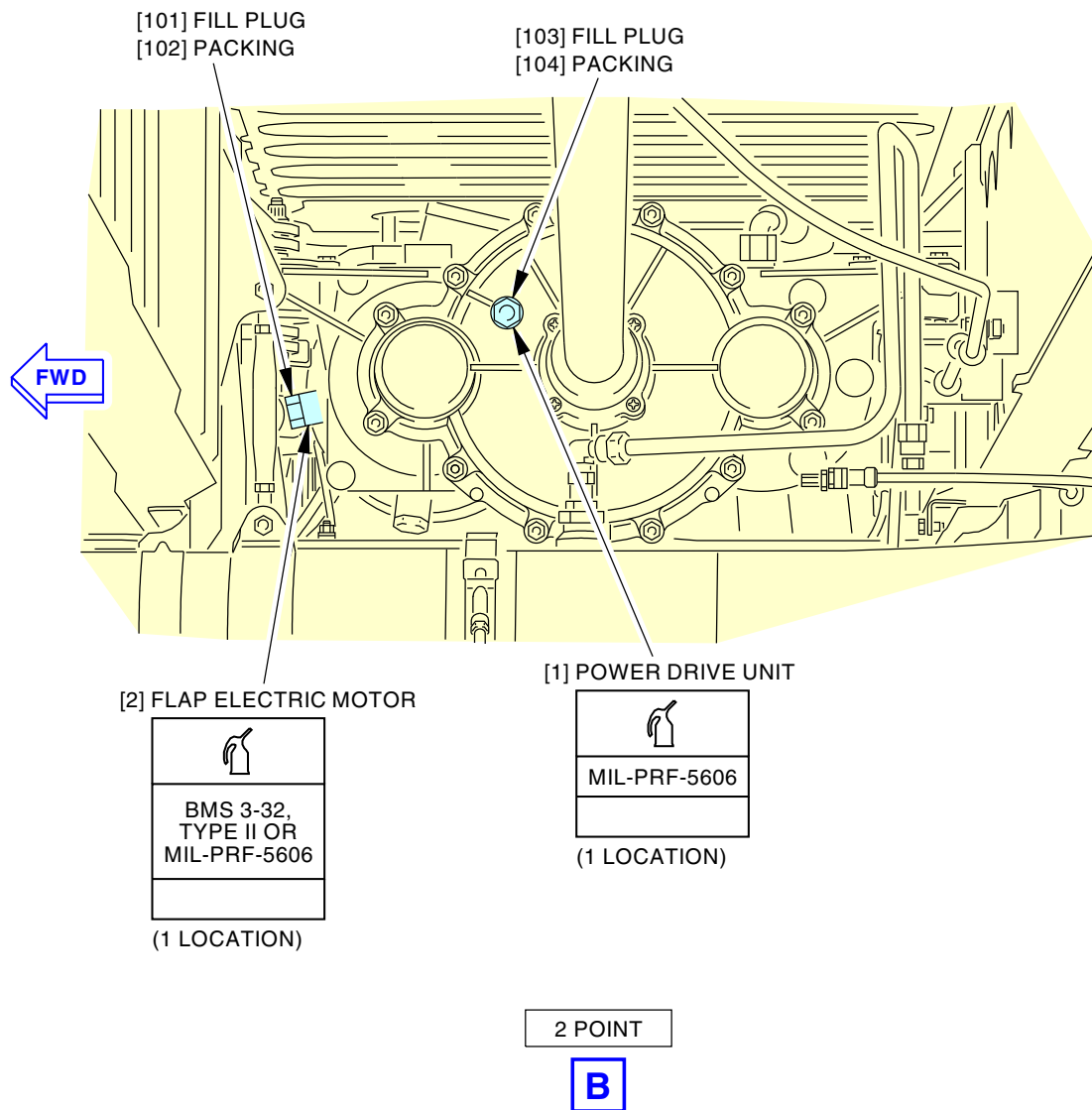
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Flap Power Drive Unit and Electric Motor Servicing
Figure 301/12-13-09-990-801 (Sheet 2 of 2)

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TASK 12-13-09-610-802

3. Flap Transmission Servicing

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task is applicable to all of the transmissions for the trailing edge flaps.

B. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
27-51-18 P/B 401	INBOARD FLAP FAIRINGS - REMOVAL/INSTALLATION
27-51-28 P/B 401	OUTBOARD FLAP FAIRINGS - REMOVAL/INSTALLATION
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. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00590	Fluid - Flap Drive System - Brayco 795	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
122	Packing	27-51-15-17-410	ARO ALL
		27-51-15-36-130	ARO 001-014
		27-51-25-70-070	ARO ALL
		27-51-25-73-070	ARO ALL

E. Location Zones

Zone	Area
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
571	Flap Support Fairing No. 4
573	Flap Support Fairing No. 3
576	Flap Support Fairing No. 2
577	Flap Support Fairing No. 1
671	Flap Support Fairing No. 5
673	Flap Support Fairing No. 6
676	Flap Support Fairing No. 7
677	Flap Support Fairing No. 8

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F. Procedure

SUBTASK 12-13-09-480-003



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 on the main and nose landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 12-13-09-480-004



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR GROUND 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 12-13-09-210-004



WARNING

MAKE SURE THE THRUST REVERSER COWLS ARE CLOSED WHEN YOU OPERATE THE FLAPS AND SLATS. THE SLATS CAN HIT THE THRUST REVERSER COWLS IF THEY ARE OPEN. THIS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Make sure the thrust reverser cowls are closed.

SUBTASK 12-13-09-210-001



CAUTION

MAKE SURE 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) Make sure the Air-Driven Pump (ADP) door is fully open or fully closed.

SUBTASK 12-13-09-860-001

- (5) Extend the trailing edge flaps to the 30-unit position. To extend the flaps, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 12-13-09-040-002



WARNING

DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-13-09-610-003

- (7) Do a check of the fluid level in the flap transmissions (Table 302):
 - (a) Remove the plug [121] and the packing [122] from the fill port.
 - (b) Make sure the fluid is at the level of the fill port.

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- (c) If the fluid is not at the level of the fill port, fill the transmission with Brayco 795 fluid, D00590 (preferred) or fluid, D00070 to the level of the fill port.

NOTE: The transmissions are initially filled with Brayco 795 fluid, D00590. The preferred fluid is Brayco 795 fluid, D00590. MIL-PRF-5606 fluid, D00070, can be used as an alternate. If Brayco 795 fluid, D00590, is not available, use no more than 17 fl-oz (500 ml) of fluid, D00070. You must fully drain and fill the transmission with Brayco 795 fluid, D00590, after more than 17 fl-oz (500 ml) of fluid, D00070, is added. If it is not possible to verify what quantity of the optional fluid, D00070, has been added previously, Brayco 795 fluid, D00590, must be used.

- (d) Lubricate the new packing [122] with fluid.
- (e) Install the plug [121] and the new packing [122] in the fill port.
- (f) Tighten the plug [121] to 110-130 pound-inches (12.4-14.7 newton-meters) more than the run-on torque.
- (g) Install lockwire on the plug [121].

SUBTASK 12-13-09-600-001

- (8) (OPTIONAL) Drain and refill the fluid level in the transmission (Table 302):

- (a) If necessary remove the applicable aft fairing for access to the transmission drain plug [123]: INBOARD FLAP FAIRINGS - REMOVAL/INSTALLATION, PAGEBLOCK 27-51-18/401, OUTBOARD FLAP FAIRINGS - REMOVAL/INSTALLATION, PAGEBLOCK 27-51-28/401

- (b) Remove the plug [121] and the packing [122] from the fill port.

- (c) Remove the plug [123] and the packing [122] from the drain port.

NOTE: Place a receptacle below the drain plug prior to removal to prevent spilling of the transmission fluid.

- (d) Lubricate the new packing [122] with fluid.

- (e) Install the plug [123] and the new packing [122] in the drain port.

- (f) Tighten the plug [123] to 110-130 pound-inches (12.4-14.7 newton-meters) more than the run-on torque.

- (g) Fill the transmission with Brayco 795 fluid, D00590 (preferred), or fluid, D00070 to the level of the fill port.

- (h) Lubricate the new packing [122] with fluid.

- (i) Install the plug [121] and the new packing [122] in the fill port.

- (j) Tighten the plug [121] to 110-130 pound-inches (12.4-14.7 newton-meters) more than the run-on torque.

- (k) Install lockwire on the fill plug [121] and the drain plug [123].

- (l) Install the aft fairings removed for access: INBOARD FLAP FAIRINGS - REMOVAL/INSTALLATION, PAGEBLOCK 27-51-18/401, OUTBOARD FLAP FAIRINGS - REMOVAL/INSTALLATION, PAGEBLOCK 27-51-28/401

SUBTASK 12-13-09-440-002

- (9) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-13-09-860-002

- (10) Retract the trailing edge flaps to the UP position. To retract the flaps, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

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SUBTASK 12-13-09-080-002



WARNING

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

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

Table 302/12-13-09-993-805 Flap Transmission Servicing (Fig. 302)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Transmission No. 1 (Transmission No. 8 is Equivalent)	BRAYCO 795	Fill	1
2	Transmission No. 2 (Transmission No. 7 is Equivalent)	BRAYCO 795	Fill	1
3	Transmission No. 3 (Transmission No. 6 is Equivalent)	BRAYCO 795	Fill	1
4	Transmission No. 4 (Transmission No. 5 is Equivalent)	BRAYCO 795	Fill	1

NOTE: The no-back brake is initially filled with Brayco 795 fluid, D00590. The preferred fluid is Brayco 795 fluid, D00590, but fluid, D00070 can also be used for topping off the no-back brakes, under the condition that the fluid, D00070 is drained and replaced with Brayco 795 fluid, D00590 at the next scheduled heavy maintenance check.

———— **END OF TASK** ————

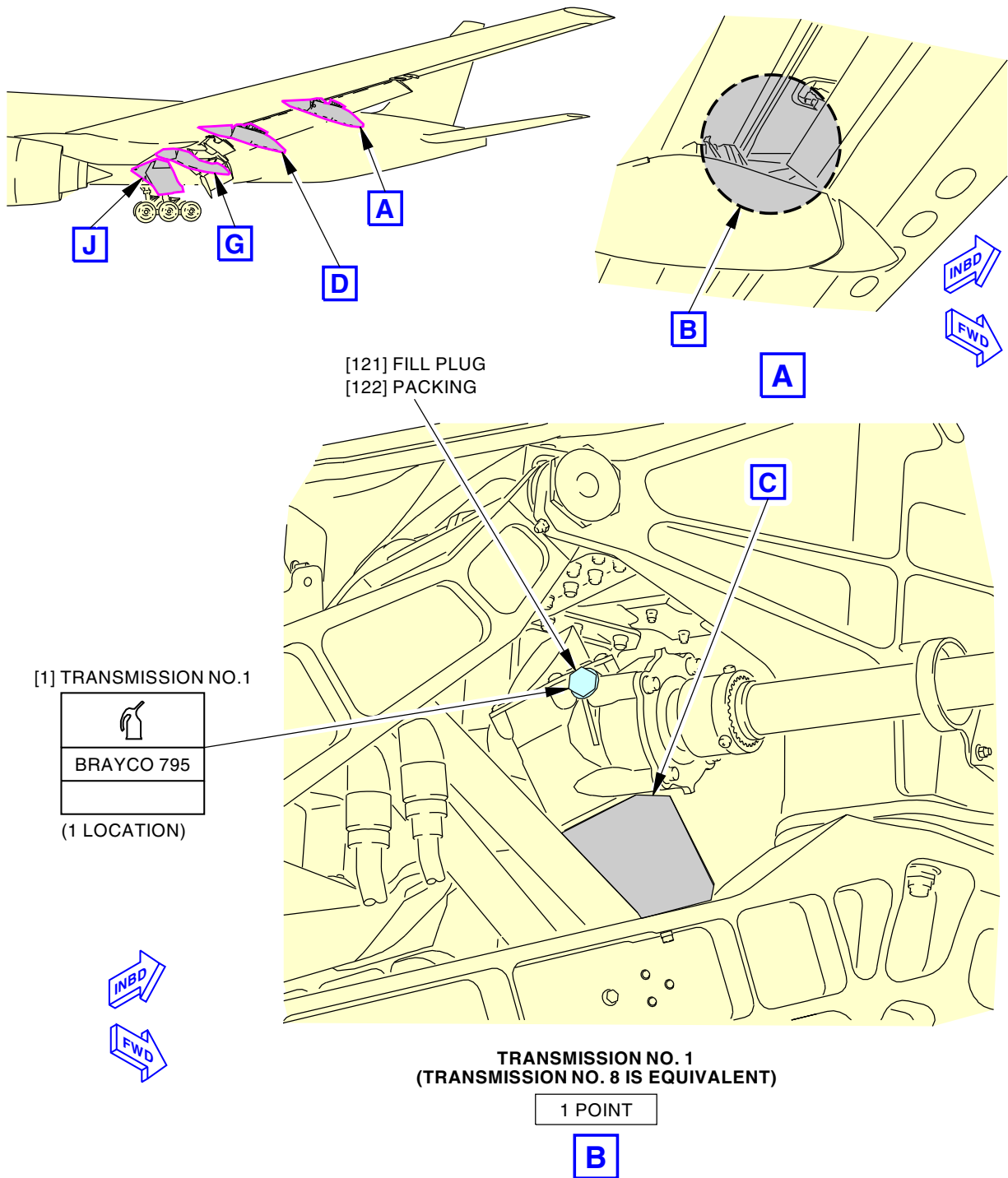
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E11073 S0006401431_V5

Flap Transmission Servicing
Figure 302/12-13-09-990-802 (Sheet 1 of 8)

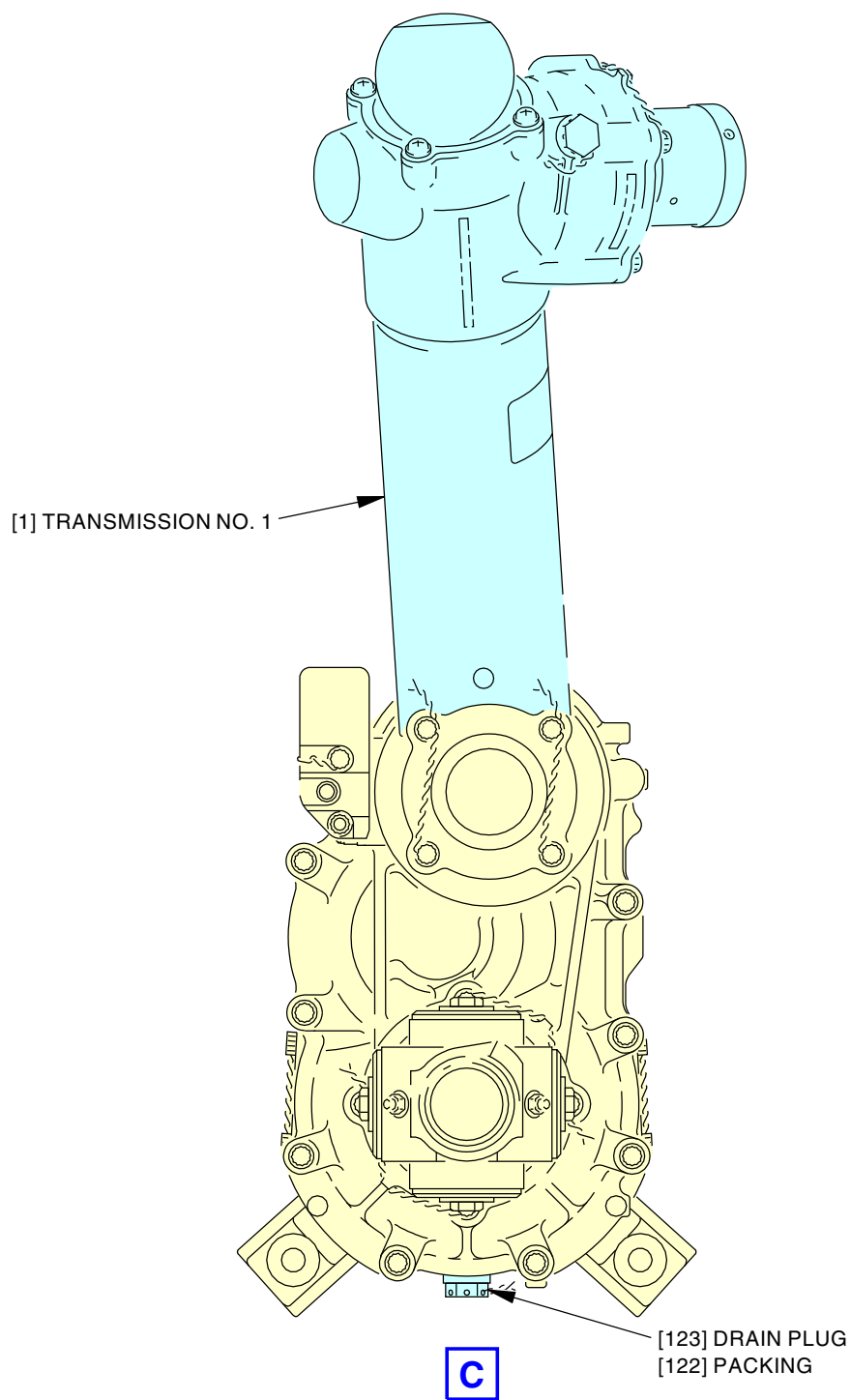
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2157899 S0000473080_V2

Flap Transmission Servicing
Figure 302/12-13-09-990-802 (Sheet 2 of 8)

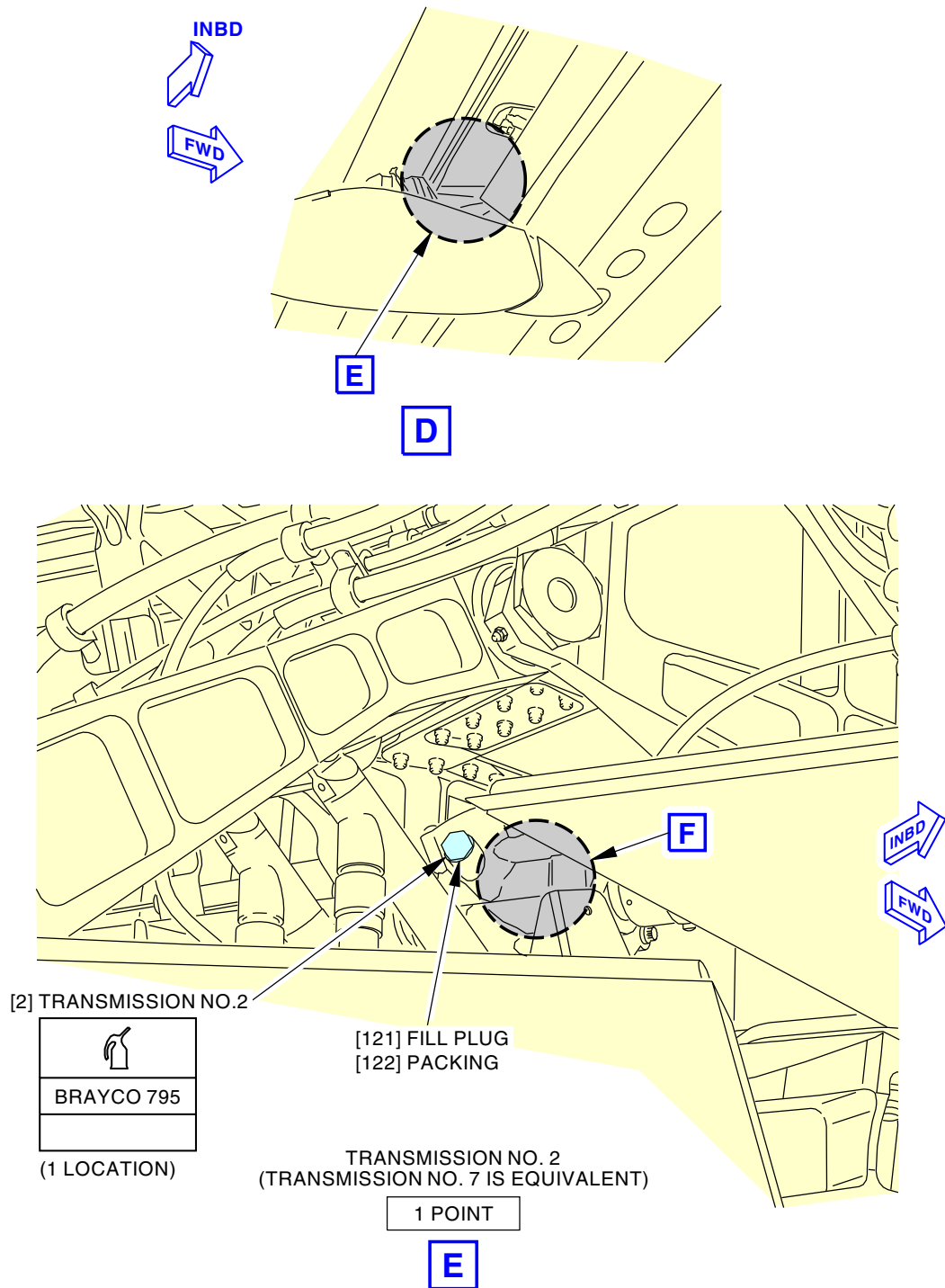
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E11090 S0006401432_V5

Flap Transmission Servicing
Figure 302/12-13-09-990-802 (Sheet 3 of 8)

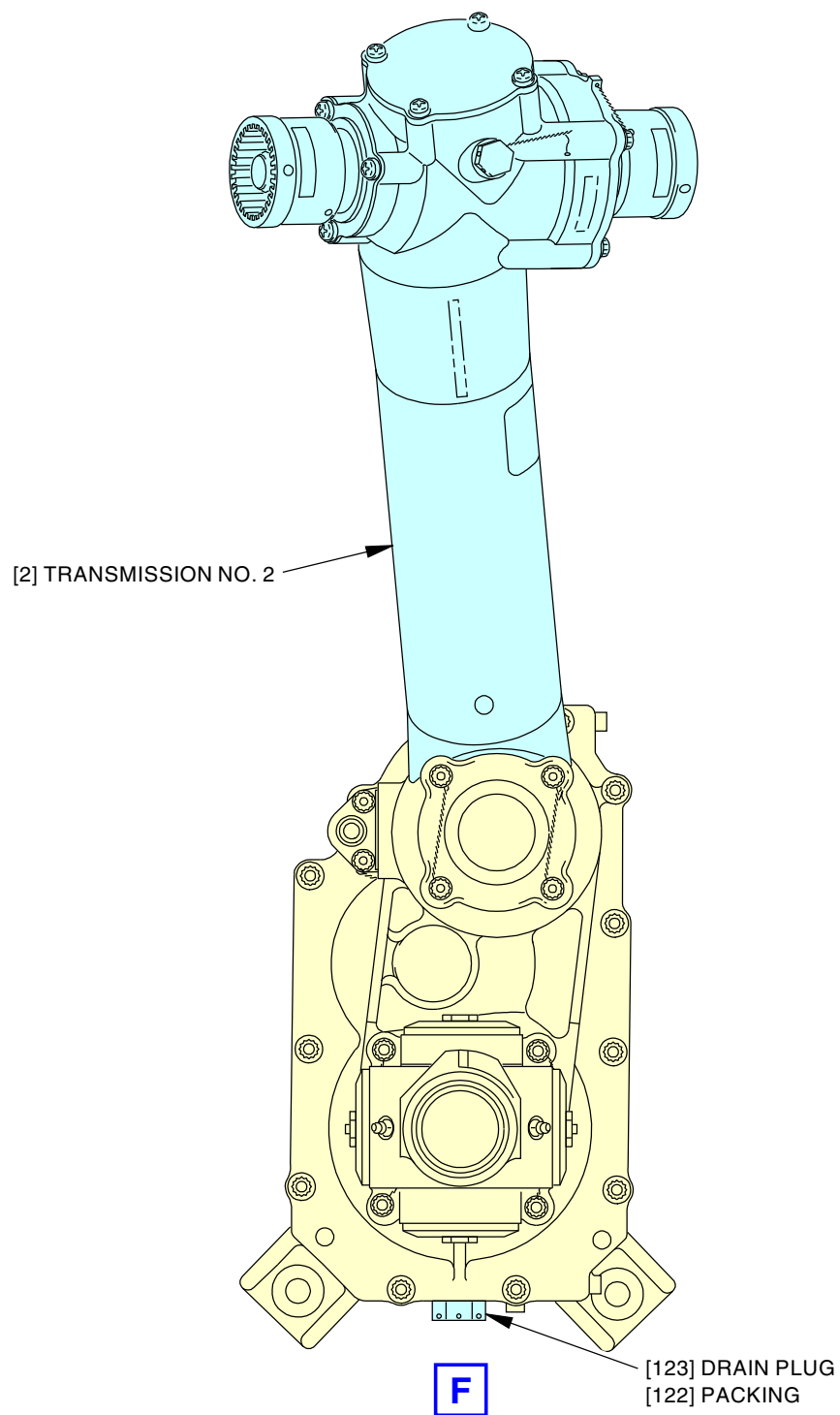
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2157963 S0000473082_V2

Flap Transmission Servicing
Figure 302/12-13-09-990-802 (Sheet 4 of 8)

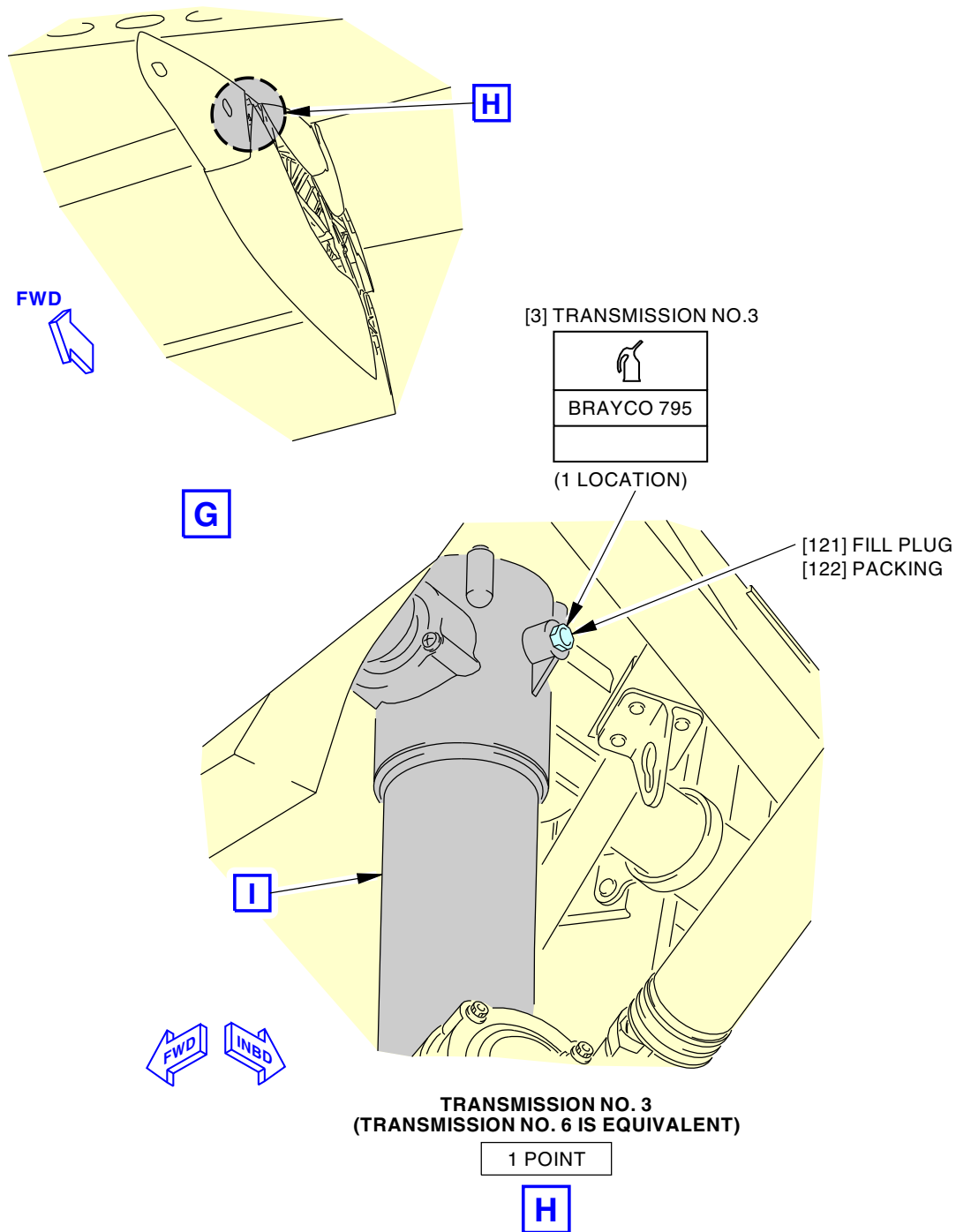
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E11107 S0006401433_V5

Flap Transmission Servicing
Figure 302/12-13-09-990-802 (Sheet 5 of 8)

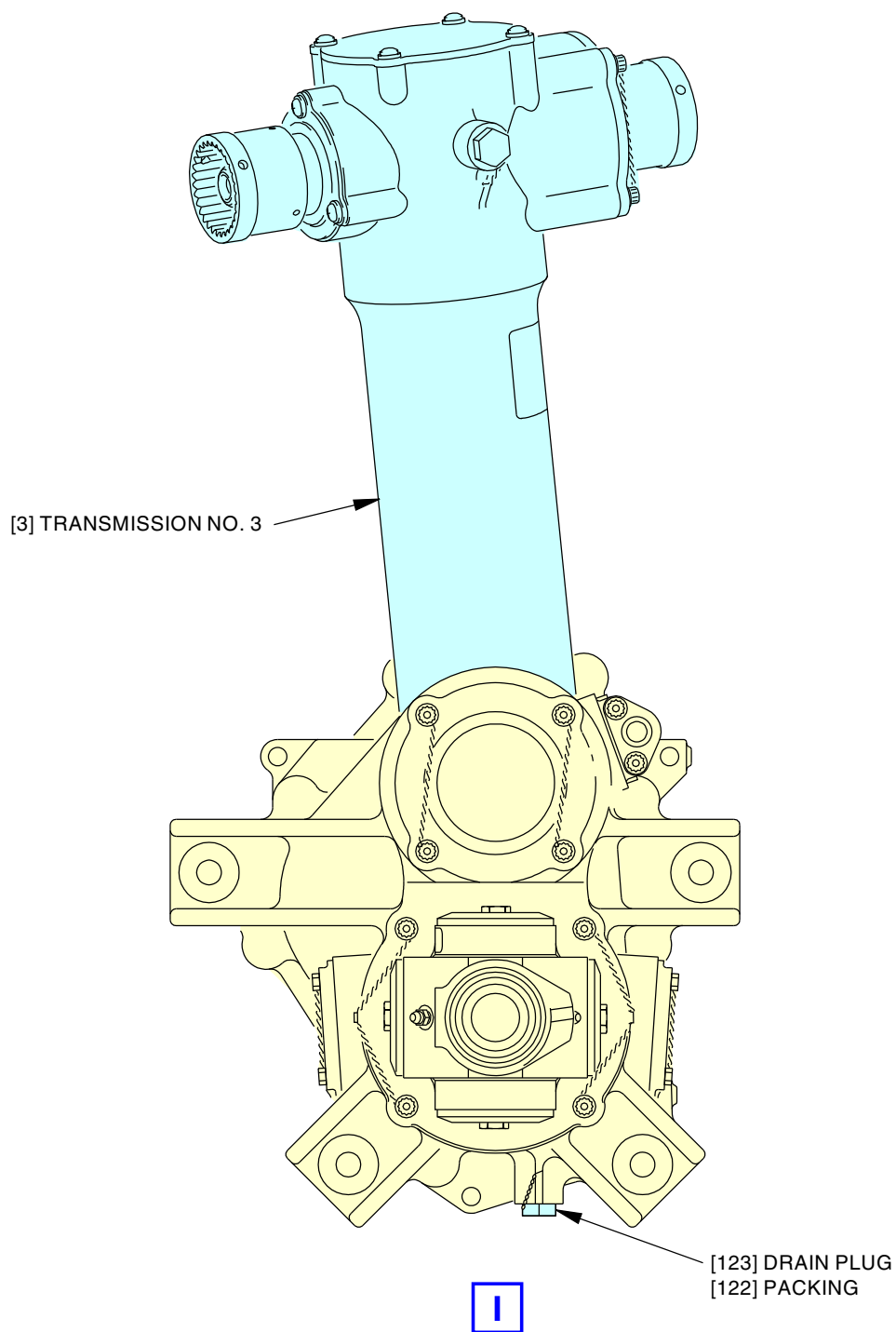
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2157969 S0000473084_V2

**Flap Transmission Servicing
Figure 302/12-13-09-990-802 (Sheet 6 of 8)**

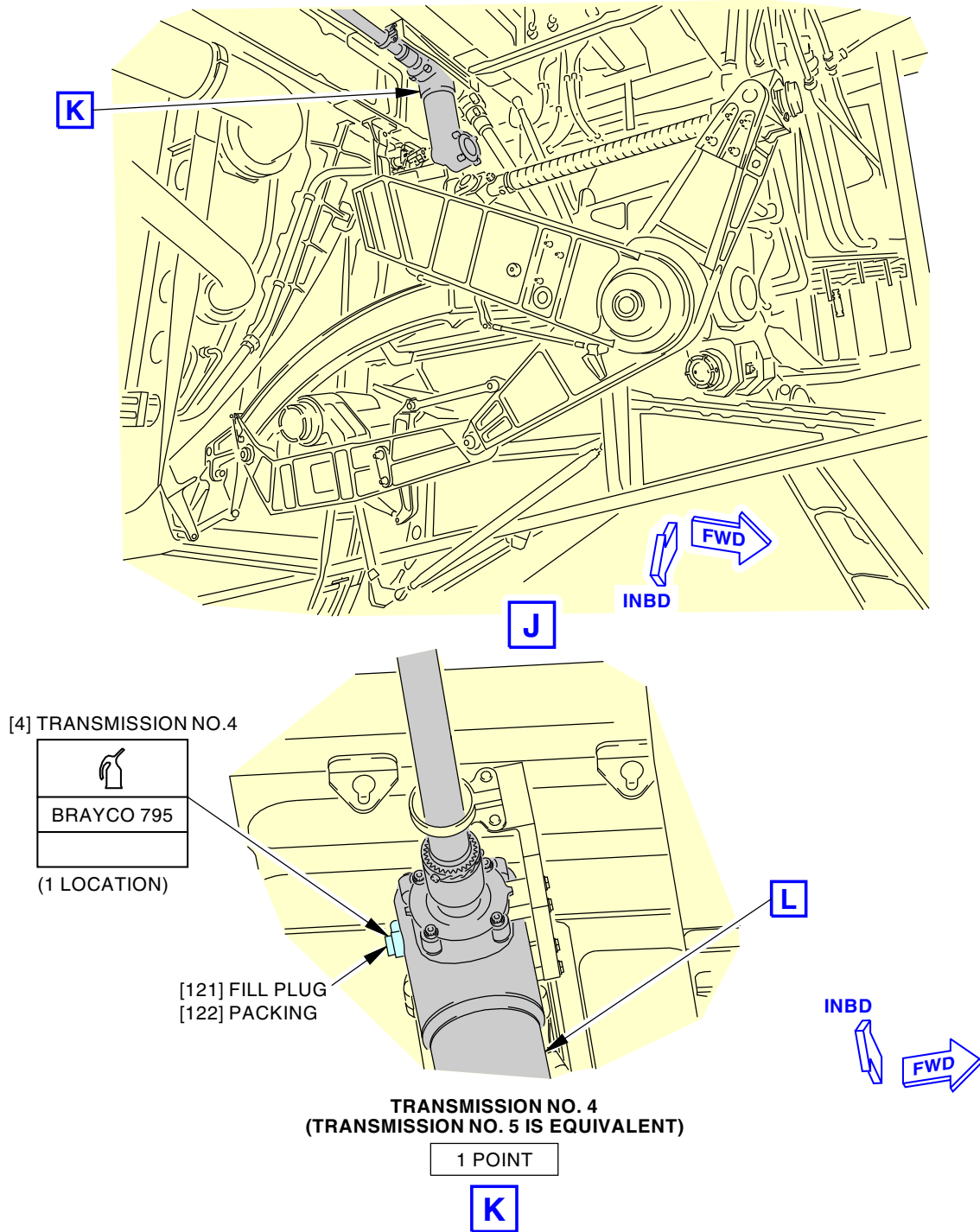
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E11122 S0006401434_V5

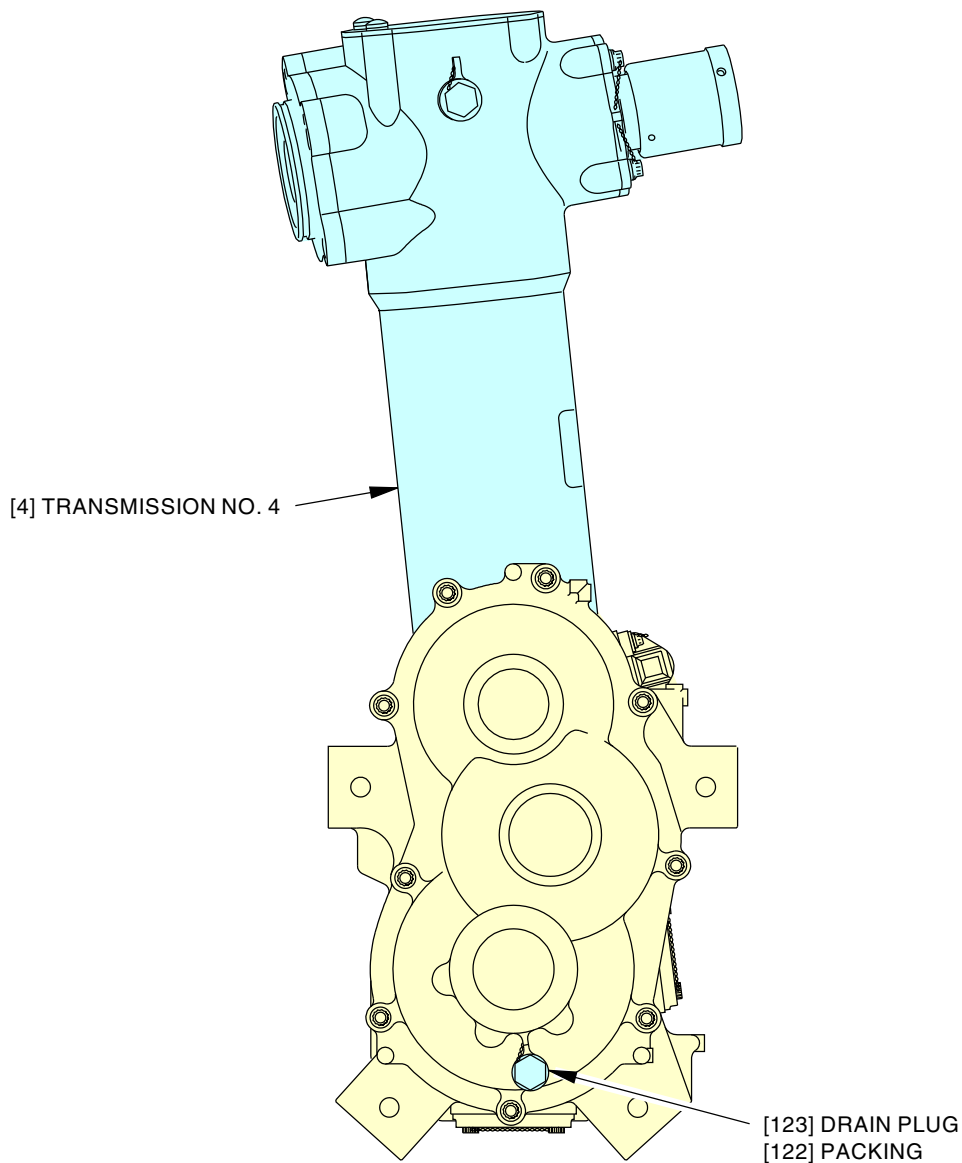
Flap Transmission Servicing
Figure 302/12-13-09-990-802 (Sheet 7 of 8)

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2157976 S0000473086_V2

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POTABLE WATER SYSTEM - SERVICING

1. General

- A. This procedure has these tasks:
- (1) Potable water tank drain
 - (2) Potable water tank fill
 - (a) This task has a procedure for the preselect fill.
 - (b) This task also has a procedure for the manual fill.

TASK 12-14-01-616-802

2. Potable Water System - Drain

(Figure 301)

A. **Location Zones**

Zone	Area
200	Upper Half of Fuselage

B. **Access Panels**

Number	Name/Location
122CR	Potable Water Drain Valve Door
154AR	Aft Potable Water Service Door

C. **Drain the Potable Water System**



WARNING

DRAIN, OR USE THE POTABLE WATER SYSTEM A MINIMUM OF ONE TIME EACH THREE DAYS. IF YOU DO NOT DRAIN, OR USE THE WATER SYSTEM FREQUENTLY, BACTERIA CAN GROW IN THE WATER. IF YOU DRINK WATER WITH BACTERIA IN IT, ILLNESS CAN OCCUR.

SUBTASK 12-14-01-860-116

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
B	12	C38311	WTR SYS ELECT PUMP 2
C	12	C38601	WTR SYS CTRL GND
E	7	C38615	WTR SYS ELECT VLV
G	12	C38310	WTR SYS ELECT PUMP 1

Right Power Management Panel, P210

Row	Col	Number	Name
L	9	C38614	DRAIN LINE VALVES
N	5	C38600	WTR SYS CTRL

SUBTASK 12-14-01-860-136

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

Left Power Management Panel, P110

Row	Col	Number	Name
A	8	C38401	LAV WTR HTR 1
B	8	C38403	LAV WTR HTR 2

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Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	7	C38407	LAV WTR HTR 7

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	24	C38406	LAV WTR HTR 6
D	25	C38404	LAV WTR HTR 5
D	26	C38402	LAV WTR HTR 4
D	27	C38400	LAV WTR HTR 3

ARO 001-005

SUBTASK 12-14-01-860-117

- (3) Turn the isolation/drain valve above the LH door 2 to the DRAIN position.

ARO ALL

SUBTASK 12-14-01-860-118

- (4) Make sure the shutoff valve for each lavatory and each wet galley is in the OPEN position.

- (a) Main Deck Lavatories:

- 1) Open the mirror cabinet door.

NOTE: The water shutoff valve is behind the mirror above the sink in the lavatory.

SUBTASK 12-14-01-860-166

- (5) Make sure that the drain valve for each lavatory is in the OPEN TO DRAIN position.

NOTE: The drain valve is found below the sink in the lavatory. Disabled, and some first class, lavatories have either one or two drain valves each.

- (a) For the self-close type drain valve, make sure that the lavatory drain valve is held open manually for about one and a half minutes when placing it in the OPEN TO DRAIN position.

SUBTASK 12-14-01-860-121

- (6) In the lavatory for the disabled, do these steps:

NOTE: There is a drain valve below the toilet flush valve in the lavatory.

- (a) Remove the toilet shroud as follows:

- 1) Turn the latch handles away from the toilet to open the toilet shroud.
- 2) Pull the bottom of the toilet shroud out.
- 3) Move the toilet shroud down until the top edge disengages from the trim strip on the lavatory wall.

- (b) Make sure that the drain valve for the toilet is in the OPEN TO DRAIN position.

SUBTASK 12-14-01-480-025

- (7) Connect a drain line to each of the drain ports:

- (a) Aft of the forward system drain panel (forward system drain).
- (b) Forward of the aft water service panel (aft system drain).
- (c) Aft of the aft water service panel (overflow/tank drain).

NOTE: The thread size for the nylon drain ports is 1/2-14 ANPT.

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SUBTASK 12-14-01-480-027

- (8) Connect the service panel fill port to the drain line.

SUBTASK 12-14-01-860-125

- (9) At the aft potable water service panel, do these steps:

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
154AR	Aft Potable Water Service Door

- (b) Make sure the preselect switch is in the OFF/RESET position.
(c) Make sure the TANK FILL VALVE handle is in the closed position.

NOTE: This will make sure the water pumps for the potable water system are operational.

SUBTASK 12-14-01-680-069

- (10) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
154AR	Aft Potable Water Service Door

SUBTASK 12-14-01-680-046

- (11) Pull the AFT SYSTEM DRAIN VALVE handle on the aft water service panel to open the manual drain and the manual system drain valves, and to start the water pumps.

NOTE: This drains the potable water tanks and the water system aft of the wings.

SUBTASK 12-14-01-680-047

- (12) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
122CR	Potable Water Drain Valve Door

- (13) Pull the handle on the forward system drain panel to open the forward drain valve.

NOTE: This will drain the water forward of the wings.

SUBTASK 12-14-01-860-127

- (14) Make sure the drain valve or faucet for each wet galley is in the ON position.

NOTE: The drain valve is found at the sink (if installed) in the wet galley.

SUBTASK 12-14-01-680-048

- (15) Open the drain valve to drain the water from each coffee maker or water boiler.

SUBTASK 12-14-01-680-049

- (16) Let the water drain from all of the drain ports and then wait for five minutes.

NOTE: This is to allow any residual water to drain.

SUBTASK 12-14-01-616-001

- (17) Push the guarded OVERRIDE switch on the Aft attendants switch panel to "ON" (starts one of the water pumps).

- (a) Wait for three minutes and then push the OVERRIDE switch to "OFF".

NOTE: The aft attendant's switch panel is located near the aft most cabin entry door.

NOTE: The pumps shutoff when the system indicates empty. The remaining water will drain by gravity. Starting the pump decreases the drain time.

- (18) Let the water drain from all of the drain ports.

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SUBTASK 12-14-01-860-130

- (19) Move the drain valve for each coffee maker or water boiler to the CLOSED position.

SUBTASK 12-14-01-860-131

- (20) Move the drain valve (if installed) or faucet for each wet galley to the CLOSED position.

ARO 001-005

SUBTASK 12-14-01-860-132

- (21) Turn the isolation/drain valve above LH door 2 to the OPEN position.

ARO ALL

SUBTASK 12-14-01-860-133



BEFORE YOU FILL THE WATER SYSTEM, MAKE SURE THAT THE LAVATORY DRAIN VALVES ARE CLOSED. THE LAVATORY DRAIN VALVE IS BELOW THE SINK. DISABLED AND SOME FIRST CLASS LAVATORIES HAVE A SECOND DRAIN VALVE BELOW THE TOILET FLUSH VALVE. IF THE DRAIN VALVE IS NOT CLOSED, THE WATER DRAIN LINE WILL FREEZE. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (22) Move the drain valve in each lavatory to the CLOSED position.

SUBTASK 12-14-01-860-134

- (23) In the lavatory for the disabled, do these steps:

- (a) Move the drain valve for the toilet to the CLOSED position.

NOTE: One drain valve is below the sink, and the other is below the toilet flush valve.

- (b) Install the toilet shroud as follows:

- 1) Engage the top edge of the toilet shroud with the trim strip of the lavatory wall.
- 2) Push the bottom edge of the toilet shroud in.
- 3) Turn the latch handles to engage the toilet shroud.

SUBTASK 12-14-01-860-159



DO NOT CLOSE THE FORWARD OR AFT SYSTEM DRAIN VALVES UNTIL A MINIMUM OF 5 MINUTES AFTER YOU CLOSE THE LAVATORY DRAIN VALVES. IF THE DRAIN LINES HAVE WATER IN THEM, THEY CAN FREEZE DURING FLIGHT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (24) Push the FWD SYSTEM DRAIN VALVE handle on the forward system drain panel to close the forward drain valve.

SUBTASK 12-14-01-860-160



DO NOT CLOSE THE FORWARD OR AFT SYSTEM DRAIN VALVES UNTIL A MINIMUM OF 5 MINUTES AFTER YOU CLOSE THE LAVATORY DRAIN VALVES. IF THE DRAIN LINES HAVE WATER IN THEM, THEY CAN FREEZE DURING FLIGHT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (25) Push the AFT SYSTEM DRAIN VALVE handle on the aft water service panel to close the manual drain valve and the manual system drain valve.

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SUBTASK 12-14-01-410-009

- (26) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
122CR	Potable Water Drain Valve Door
154AR	Aft Potable Water Service Door

SUBTASK 12-14-01-090-001

- (27) Disconnect the drain lines from the drain ports.

SUBTASK 12-14-01-860-135

- (28) If you do not fill the potable water tanks immediately after you drain the system, do these steps:

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C38311	WTR SYS ELECT PUMP 2
C	12	C38601	WTR SYS CTRL GND
G	12	C38310	WTR SYS ELECT PUMP 1

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
N	5	C38600	WTR SYS CTRL

SUBTASK 12-14-01-610-061

NOTE: During Cold Weather operation while the airplane is parked for extended periods of time, the following tasks should be performed.

- (29) Make sure that Subtask 12-14-01-860-135 is complete.

SUBTASK 12-14-01-610-062

- (30) Make sure that these circuit breakers are open:

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	7	C38615	WTR SYS ELECT VLV

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	9	C38614	DRAIN LINE VALVES

SUBTASK 12-14-01-610-063

- (31) Pull the TANK FILL VALVE control handle to the OPEN position and leave it in this OPEN position prior to Potable Water Tank Fill.

SUBTASK 12-14-01-610-050

- (32) To fill the potable water tanks, do these tasks:

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C38311	WTR SYS ELECT PUMP 2
C	12	C38601	WTR SYS CTRL GND

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Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	7	C38615	WTR SYS ELECT VLV
G	12	C38310	WTR SYS ELECT PUMP 1

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
N	5	C38600	WTR SYS CTRL

- (b) Fill the water tanks (TASK 12-14-01-600-810).
(c) 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>
A	8	C38401	LAV WTR HTR 1
B	8	C38403	LAV WTR HTR 2
D	7	C38407	LAV WTR HTR 7

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	24	C38406	LAV WTR HTR 6
D	25	C38404	LAV WTR HTR 5
D	26	C38402	LAV WTR HTR 4
D	27	C38400	LAV WTR HTR 3

———— **END OF TASK** ————

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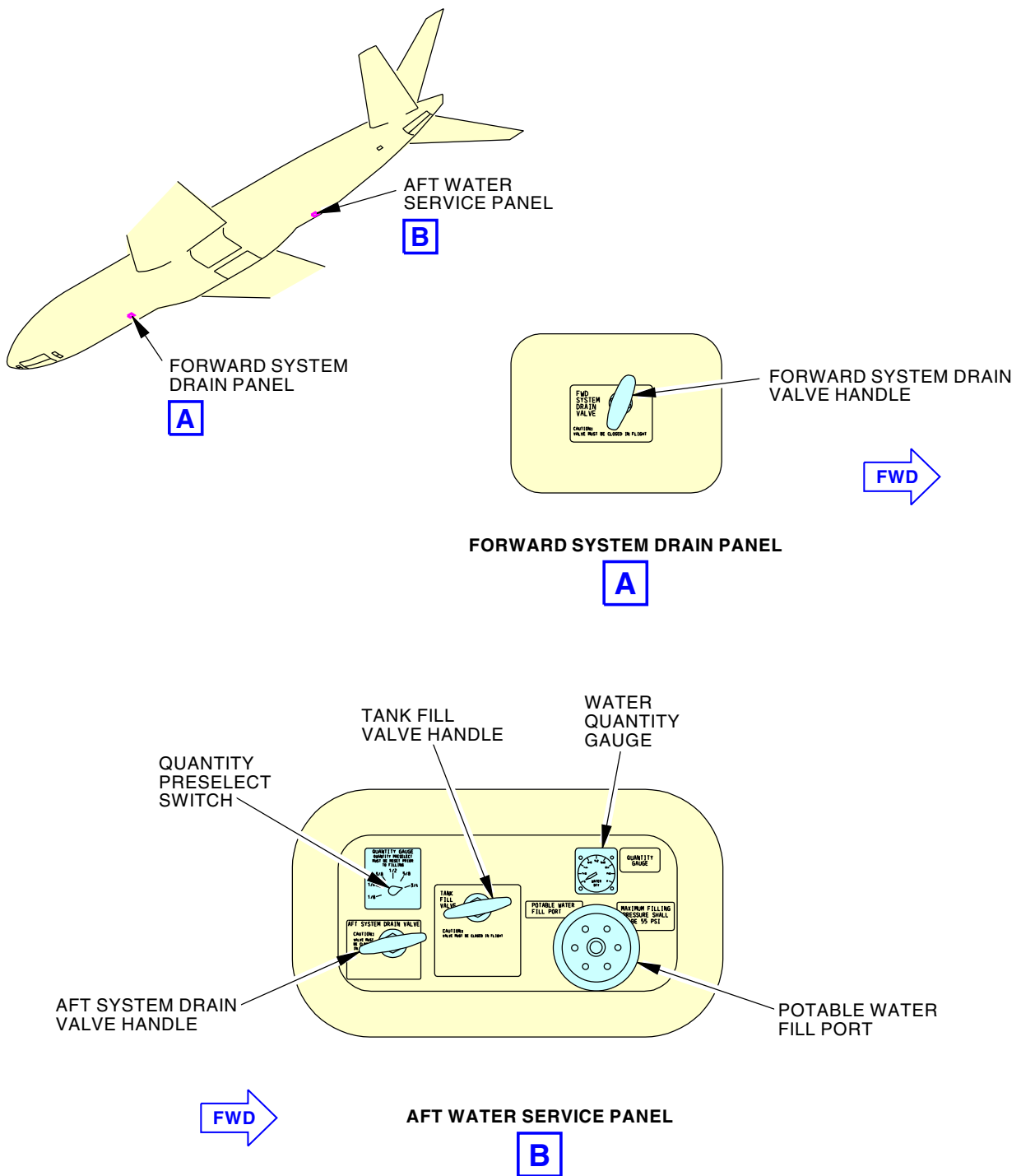
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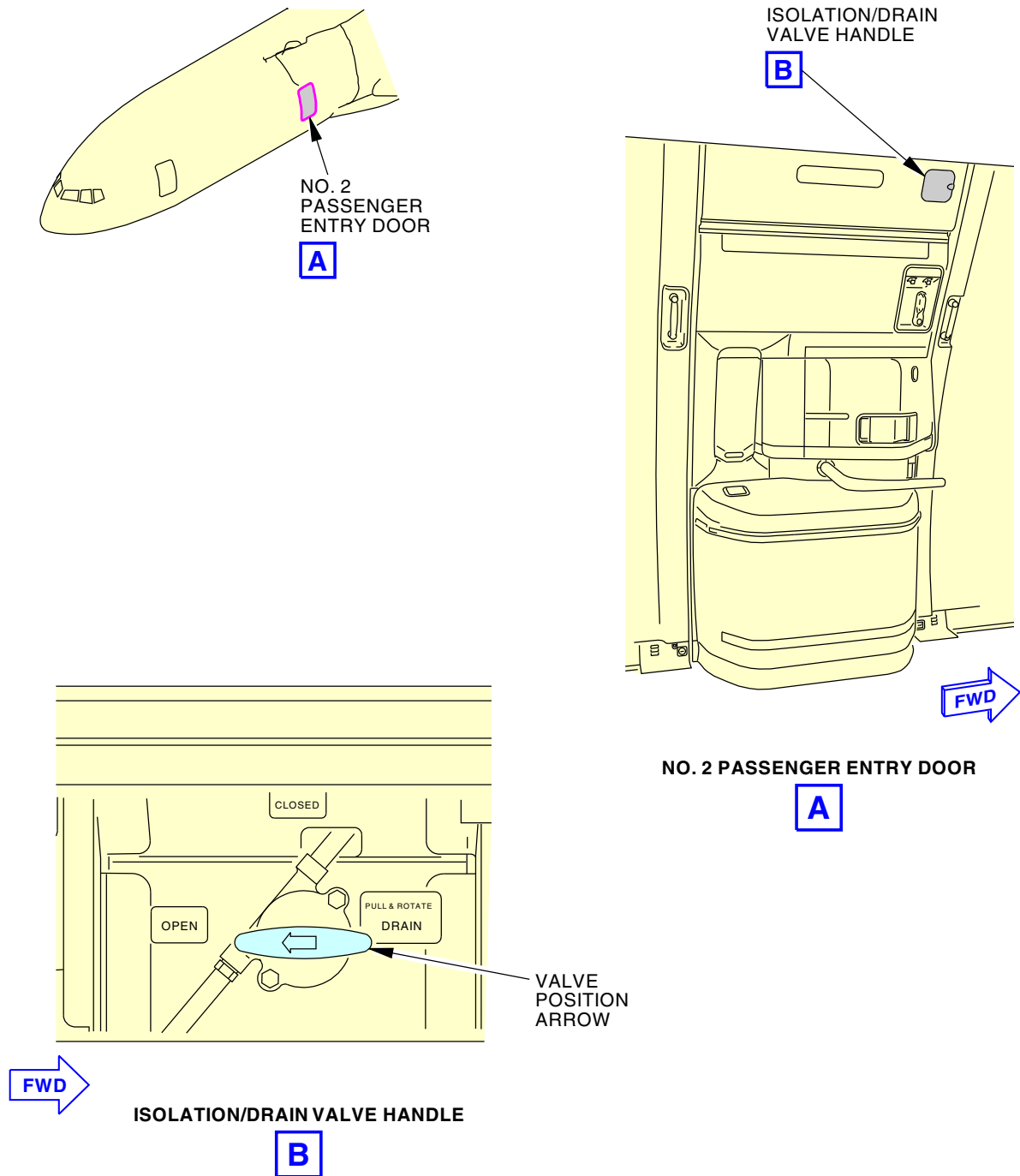
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Potable Water System Servicing
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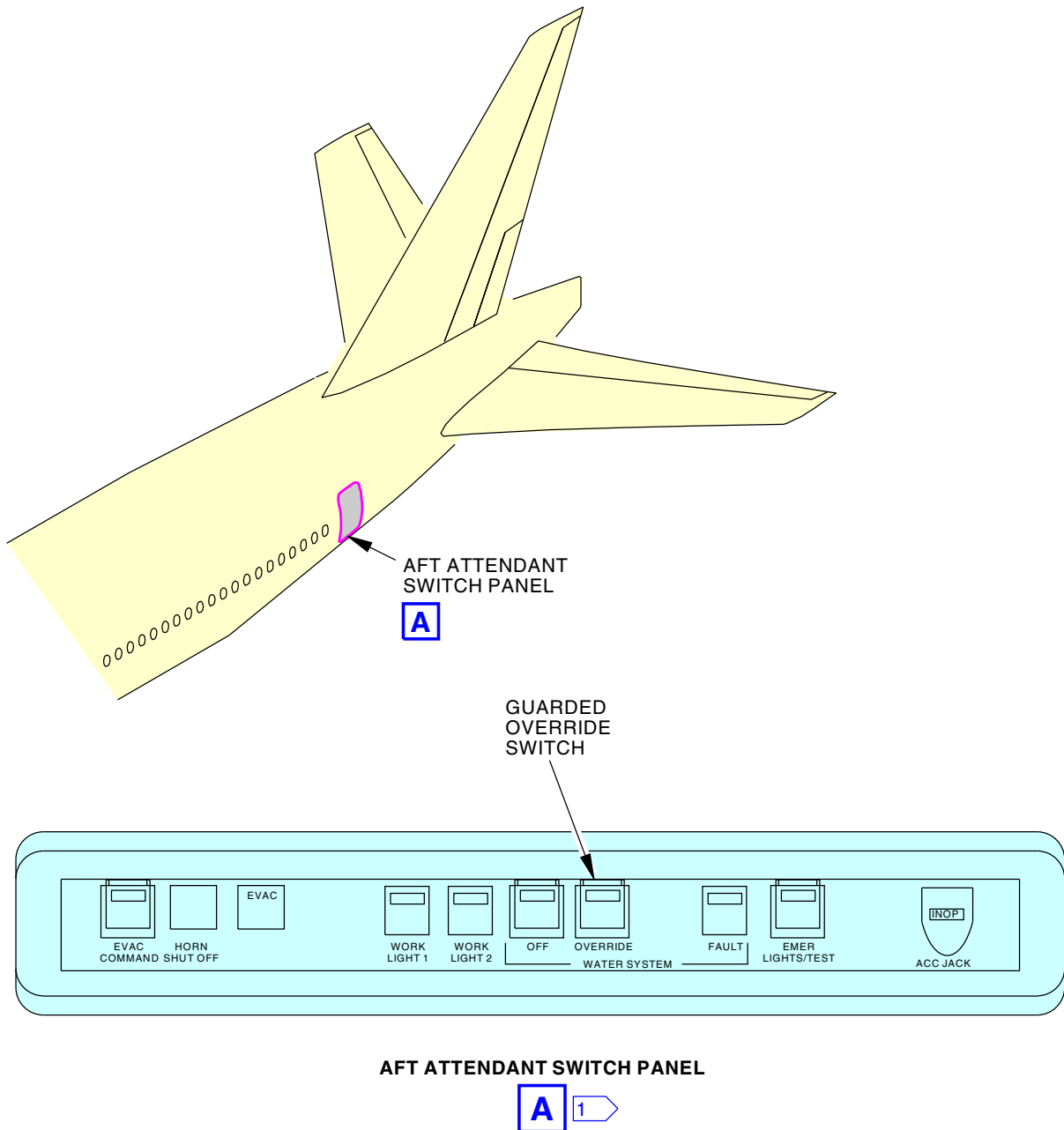
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1 EXACT LOCATION VARIES WITH CABIN INTERIOR OPTIONS. PANEL IS LOCATED NEAR THE AFT CABIN ENTRY DOOR.

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Potable Water System Servicing
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TASK 12-14-01-600-810

3. Potable Water Tank - Fill

(Figure 301, Figure 302)

A. References

Reference	Title
25-52-19-000-801	Bulk Cargo Compartment Aft End Wall Removal (P/B 401)
25-52-19-400-801	Bulk Cargo Compartment Aft End Wall Installation (P/B 401)

B. Tools/Equipment

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

Reference	Description
COM-1141	Equipment - Potable Water Servicing Part #: SPW-500PL Supplier: 32526 Part #: TWS-402 Supplier: 44185 Part #: WSP-900 Supplier: 6L481 Part #: WTM-900 Supplier: 6L481 Opt Part #: 2303 Supplier: 00365 Opt Part #: ACE-1520 Supplier: 6L481 Opt Part #: ACE-488-350 Supplier: 6L481 Opt Part #: ACE-499-350 Supplier: 6L481 Opt Part #: DEV-499 Supplier: 6L481

C. Access Panels

Number	Name/Location
122CR	Potable Water Drain Valve Door
154AR	Aft Potable Water Service Door
825	Bulk Cargo Door

D. Prepare to Fill the Water Tanks.

SUBTASK 12-14-01-210-001

- (1) If the potable water system was drained, do this step to make sure the potable water system is operable:

NOTE: This subtask restores the system electric functions following the potable water system drain maintenance procedure.

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

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
B	12	C38311	WTR SYS ELECT PUMP 2
C	12	C38601	WTR SYS CTRL GND
E	7	C38615	WTR SYS ELECT VLV
G	12	C38310	WTR SYS ELECT PUMP 1

Left Power Management Panel, P110

Row	Col	Number	Name
A	8	C38401	LAV WTR HTR 1
B	8	C38403	LAV WTR HTR 2

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(Continued)

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	7	C38407	LAV WTR HTR 7

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	24	C38406	LAV WTR HTR 6
D	25	C38404	LAV WTR HTR 5
D	26	C38402	LAV WTR HTR 4
D	27	C38400	LAV WTR HTR 3
L	9	C38614	DRAIN LINE VALVES
N	5	C38600	WTR SYS CTRL

- (b) Examine the lavatory drain valve(s) in each lavatory to make sure that all lavatory drain valves are closed.

E. Fill the Potable Water Tanks

SUBTASK 12-14-01-613-001



DRAIN, OR USE THE POTABLE WATER SYSTEM A MINIMUM OF ONE TIME EACH THREE DAYS. IF YOU DO NOT DRAIN, OR USE THE WATER SYSTEM FREQUENTLY, BACTERIA CAN GROW IN THE WATER. IF YOU DRINK WATER WITH BACTERIA IN IT, ILLNESS CAN OCCUR.



BEFORE YOU FILL THE WATER SYSTEM, MAKE SURE THAT THE LAVATORY DRAIN VALVES ARE CLOSED. THE LAVATORY DRAIN VALVE IS BELOW THE SINK. DISABLED AND SOME FIRST CLASS LAVATORIES HAVE A SECOND DRAIN VALVE BELOW THE TOILET FLUSH VALVE. IF THE DRAIN VALVE IS NOT CLOSED, THE WATER DRAIN LINE WILL FREEZE. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (1) The Boeing Company recommends a water pressure of 25 psi (172 kPa).
 - (a) Do not use a water pressure of more than 55 psi (379 kPa).

SUBTASK 12-14-01-600-002

- (2) Do these steps to fill the tanks using the Preselect method.

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
154AR	Aft Potable Water Service Door

- (b) Make sure there is no debris on the fill fitting. Clean the fill fitting, as necessary.
- (c) Connect the water supply hose, or the potable water servicing equipment, COM-1141, to the fill fitting at the Aft Potable Water Service Panel.
- (d) Make sure the AFT SYSTEM DRAIN VALVE control handle is in the closed position (in).
- (e) Pull the TANK FILL VALVE control handle to the OPEN position.

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- (f) Turn the preselect switch to the OFF / RESET position, then set the switch to the necessary quantity of potable water for the airplane.

NOTE: Putting the TANK FILL VALVE control handle to open mechanically positions the Fill/Overflow valve to the fill position, and provided the water tank quantity is less than the pre-select switch quantity, causes the aft preselect and tank vent valves to move to the fill position.

- (g) Start the water supply to the potable water tanks.
(h) Fill the potable water tanks until you see water flow from the overflow port.

NOTE: Water will flow out of the aft overflow / manual drain port when the water volume is the same as the preselect quantity, and the aft preselect and tank vent valves will move to the flight / normal position.

- (i) Turn the preselect switch to OFF / RESET.
(j) Shut off the water supply.
(k) Push the TANK FILL VALVE control handle to the CLOSED (in) position.
(l) Disconnect the supply hose from the AFT Potable Water Service Panel fill fitting.
(m) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
154AR	Aft Potable Water Service Door

F. Check the Lavatory Drain Valves.

SUBTASK 12-14-01-210-002

- (1) If the potable water system was drained before you filled the system, do these steps to make sure all the lavatory drain valves are closed:

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
122CR	Potable Water Drain Valve Door

- (b) Pull the handle on the Forward System Drain Panel to open the forward drain valve.
(c) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
154AR	Aft Potable Water Service Door

- (d) Pull the AFT SYSTEM DRAIN VALVE control handle on the Aft Potable Water Service Panel.

NOTE: This opens the manual drain valve (tank and distribution line drain) and the aft manual system drain valve.

NOTE: Water will drain from the tank drain port.

- (e) If water flows from the forward drain port or the aft system drain port, one or more of the lavatory drain valves are open, do the following:

- 1) Inspect all lavatories to determine if any additional drain valves are open.
- 2) For those lavatories that have open drain valves, do the following:
 - a) Close the lavatory water supply shut off valve.

NOTE: The water supply shut off valve is located behind the lavatory mirror or inside the cabinet, above and to the left of the lavatory sink.

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- b) With the lavatory drain valve still open, allow the water to drain from the lavatory.



DRAIN THE POTABLE WATER DRAIN LINES. IF THE POTABLE WATER DRAIN LINES HAVE WATER IN THEM, THEY CAN FREEZE DURING FLIGHT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- c) Observe the water draining at the drain port to determine when all water has finished draining.
- d) When the water flow stops, close the lavatory drain valve.
- e) Open the lavatory water supply shut off valve.
- 3) Wait 5 minutes, then do steps b) thru d) again to test for proper closure.
- 4) Repeat step e) if lavatory drain valve(s) are not closed.



DO NOT CLOSE THE FORWARD OR AFT SYSTEM DRAIN VALVES UNTIL A MINIMUM OF 5 MINUTES AFTER YOU CLOSE THE LAVATORY DRAIN VALVES. IF THE DRAIN LINES HAVE WATER IN THEM, THEY CAN FREEZE DURING FLIGHT. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (f) Push the FWD SYSTEM DRAIN VALVE handle to close the forward drain valve.
- (g) Push the AFT SYSTEM DRAIN VALVE control handle on the Aft Potable Water Service Panel.
- NOTE: This closes the manual drain valve (tank and distribution line drain) and the aft manual system drain valve.
- (h) Close these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|--------------------------------|
| 122CR | Potable Water Drain Valve Door |
| 154AR | Aft Potable Water Service Door |

G. Fill the Water Tanks - No Electrical Power - or Valve(s) Inoperative

NOTE: Both the motor actuated tank vent and preselect valves are equipped with a lever to provide for manual operation.

SUBTASK 12-14-01-860-138

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C38311	WTR SYS ELECT PUMP 2
C	12	C38601	WTR SYS CTRL GND
E	7	C38615	WTR SYS ELECT VLV
G	12	C38310	WTR SYS ELECT PUMP 1

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	9	C38614	DRAIN LINE VALVES
N	5	C38600	WTR SYS CTRL

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SUBTASK 12-14-01-010-007

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

SUBTASK 12-14-01-010-008

- (3) Do this task: Bulk Cargo Compartment Aft End Wall Removal, TASK 25-52-19-000-801.

SUBTASK 12-14-01-860-140

- (4) Move the tank vent valve manual lever to POS 1. This is the tank fill position.

SUBTASK 12-14-01-860-142

- (5) Move the Aft Preselect Valve to POS 1. This is the tank fill position.

SUBTASK 12-14-01-600-004

- (6) Do these steps to fill the tanks using the manual fill method.

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
154AR	Aft Potable Water Service Door

- (b) Make sure there is no debris on the fill fitting.
(c) Clean the fill fitting, as necessary.
(d) Connect the water supply hose, or the potable water servicing equipment, COM-1141, to the water fill fitting at the AFT Water Service Panel.
(e) Make sure the AFT SYSTEM DRAIN VALVE control handle is in the closed position (in).
(f) Move the TANK FILL VALVE control handle to the Open position (out).
(g) Start the water supply to the potable water tanks.
(h) Fill the potable water tanks until you see water flow from the overflow port.
(i) Move the TANK FILL VALVE control handle to the Closed position (in).
(j) Shut off the water supply and remove the supply hose from the Aft Water Service Panel fill fitting.
(k) Wait until the water stops draining from the service panel fill port.
(l) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
154AR	Aft Potable Water Service Door

SUBTASK 12-14-01-860-145

- (7) Move the tank vent valve manual lever to POS 2. This is the normal (flight) position.

SUBTASK 12-14-01-860-147

- (8) Move the Aft Preselect Valve to POS 2. This is the normal (flight) position.

SUBTASK 12-14-01-860-149

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

Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C38311	WTR SYS ELECT PUMP 2
C	12	C38601	WTR SYS CTRL GND
E	7	C38615	WTR SYS ELECT VLV

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Ground Service/Handling Power Panel, P320

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
G	12	C38310	WTR SYS ELECT PUMP 1

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
L	9	C38614	DRAIN LINE VALVES
N	5	C38600	WTR SYS CTRL

SUBTASK 12-14-01-410-010

(10) Do this task: Bulk Cargo Compartment Aft End Wall Installation, TASK 25-52-19-400-801.

SUBTASK 12-14-01-410-011

(11) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
825	Bulk Cargo Door

————— **END OF TASK** —————

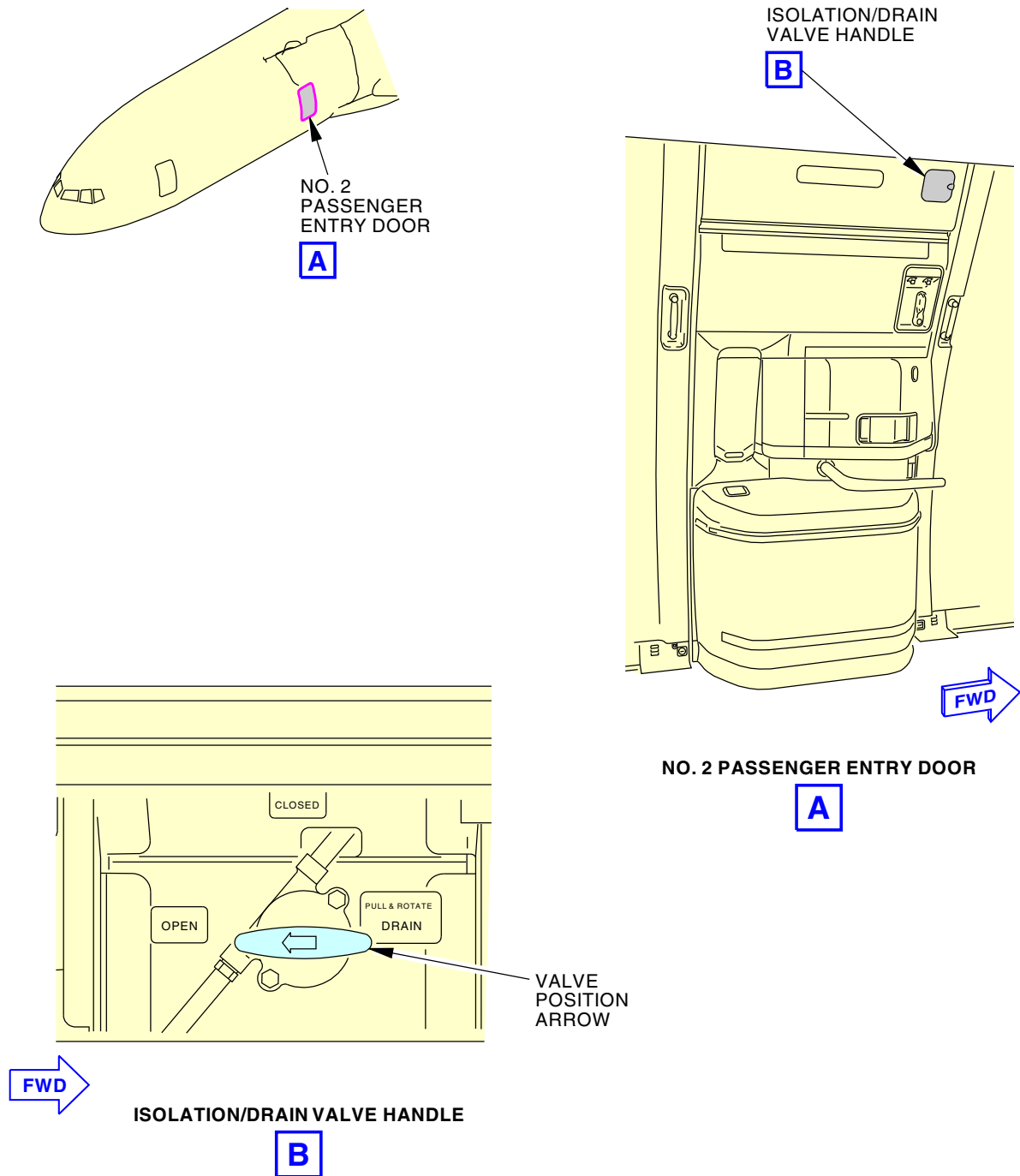
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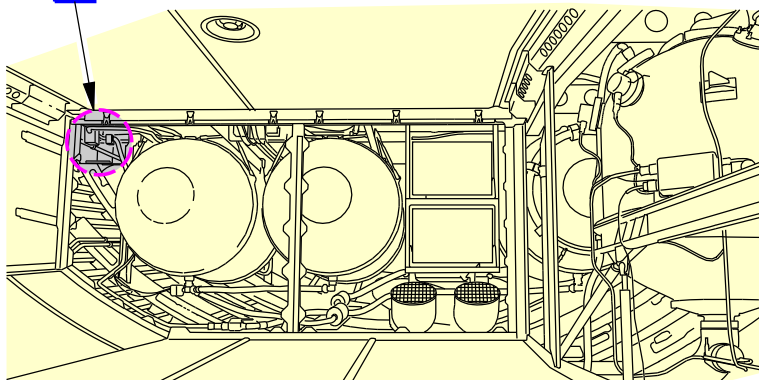
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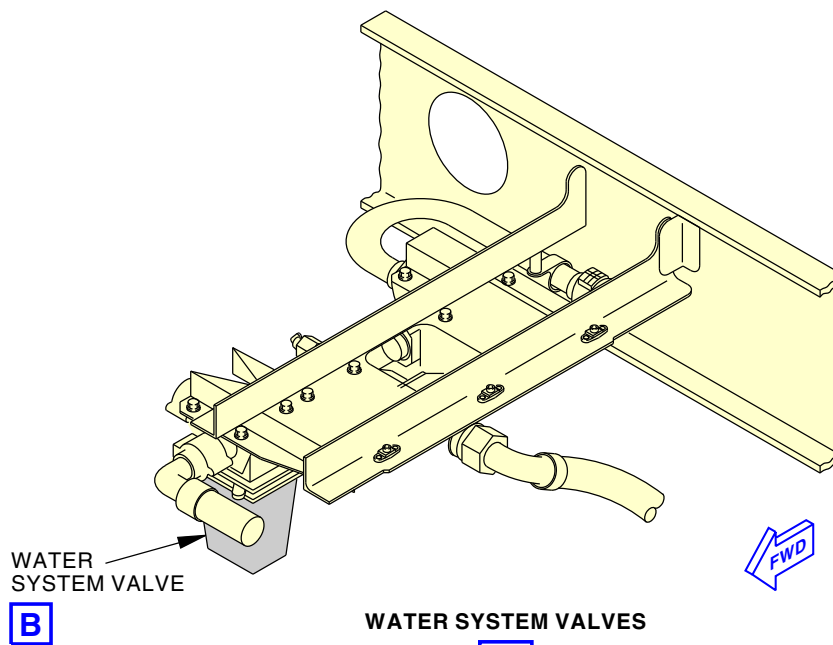
WATER SYSTEM
VALVES

A




FWD

**BULK CARGO COMPARTMENT
(END WALL PANELS NOT SHOWN)**



WATER
SYSTEM VALVE

WATER SYSTEM VALVES

A

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Figure 302/12-14-01-990-809 (Sheet 2 of 3)

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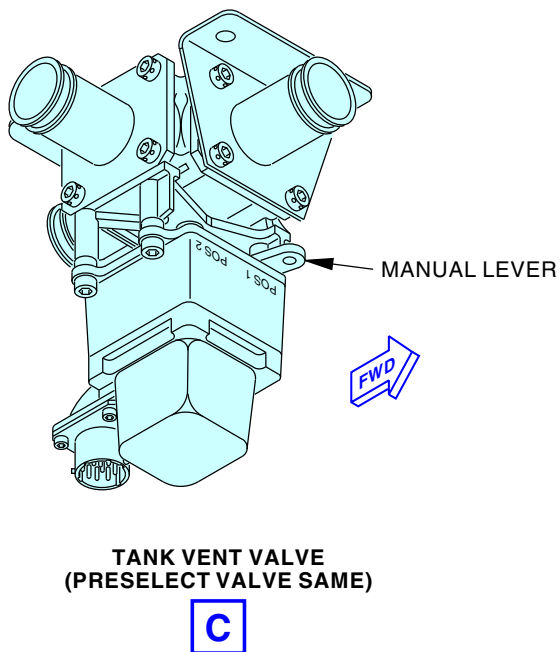
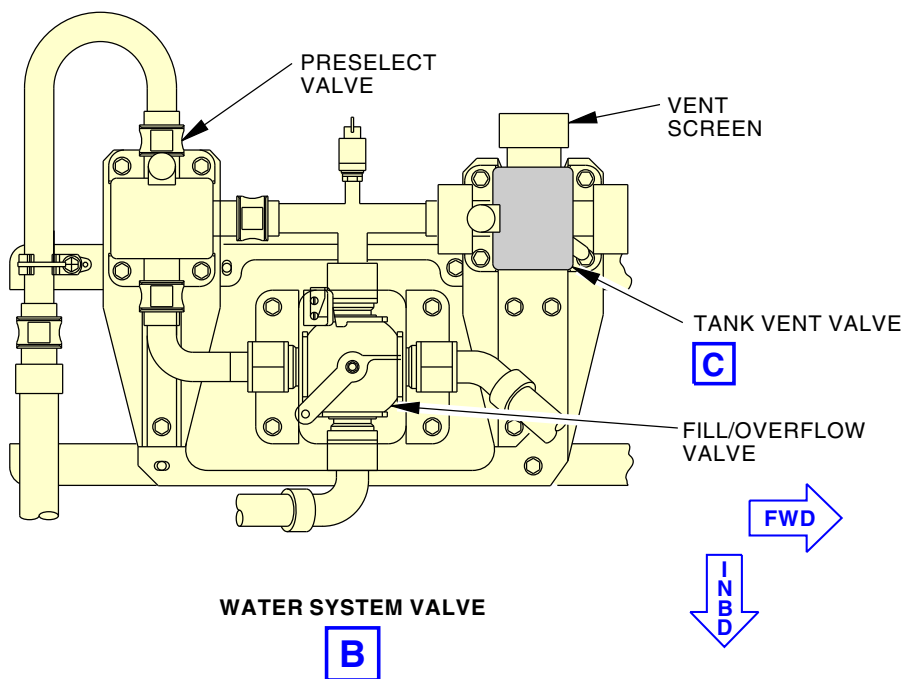
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MAIN LANDING GEAR SHOCK STRUT - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) An in-service check of the fluid levels for the shock strut.
 - (2) An in-service check to maintain the shock strut at the correct extension and pressure.
 - (3) To fully service the shock strut with fluid and nitrogen.
 - (4) To service the shock strut with nitrogen only.

TASK 12-15-01-610-809

2. Main Landing Gear Shock Strut Fluid Check

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure supplies instructions to check the level of the hydraulic fluid in the shock strut of the main landing gear.
 - (a) To do a check of the fluid level, you must measure the pressure and the extension of the shock strut twice, at two different shock strut extensions. The greater the difference in the shock strut extensions, the more accurate the fluid measurement will be.
 - 1) You can obtain the different shock strut extension one of two ways:
 - a) You can take the shock strut measurements at two different airplane weights, for example, before and after fueling the airplane, or,
 - b) If the airplane is on jacks, you can use floor jacks or the airplane jacks to compress or extend the shock struts.
 - 2) You should have a minimum difference of 2 in. (51 mm) between the two shock strut extensions to do the check.
 - 3) There are no maximum strut extension allowable difference measurements between the left hand and right hand struts.
 - 4) The extension and pressure measurements for both the left hand and right hand struts must lie within the respective strut servicing bands for proper operation.

B. References

Reference	Title
12-15-11-610-801	Landing Gear Shock Strut Fluids (P/B 301)
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
SPL-1526	Inflator - Strut, Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)

D. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D50022	Fluid - Landing Gear Shock Strut (Specifically For Preservation)	BMS3-32 Type I
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
731	Left Main Landing Gear
741	Right Main Landing Gear

F. Prepare to Check the Hydraulic Fluid Level in the Shock Strut

SUBTASK 12-15-01-420-017



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 12-15-01-420-018



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.

G. Examine the Fluid Level of the Shock Strut for the Main Landing Gear

NOTE: To do a check of the fluid level, you must measure the pressure and the extension of the shock strut twice, at different shock strut extensions.

SUBTASK 12-15-01-610-007

- (1) Check the hydraulic fluid level with the airplane at the first shock strut extension (Figure 301):
 - (a) Remove the cap [102] from the gas valve [103].
 - (b) Measure the pressure of the shock strut [101] with a pressure gauge (0-3000 PSIG), STD-1157
 - 1) Loosen the swivel nut [104] to release the gas from the shock strut [101].

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- (c) Measure the extension of the shock strut [101] (Dimension A, Figure 301).
- (d) Measure the surface temperature on the outer cylinder of the shock strut [101].
- (e) Compare the extension and pressure, that you measured, to the applicable temperature band on the servicing chart (Figure 302).
- (f) If the shock strut [101] pressure and the shock strut extension are not on the servicing curve on the servicing chart, do one of the steps that follow:
 - 1) If the extension and pressure you measured are above the servicing curve, deflate the shock strut [101] until they are on the servicing curve.
 - 2) If the extension and pressure you measured are below the servicing curve, use the landing gear strut inflator, SPL-1526 to inflate the shock strut [101] with nitrogen, G00018, until they are on the servicing curve (Figure 302).
 - a) If dry nitrogen is not available, you can use dry air as an alternative to inflate the shock strut [101].

Table 301/12-15-01-993-814 Main Landing Gear Shock Strut Servicing (Fig. 301)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Gas Valve	nitrogen, G00018	A-A-59503 Type I Grade B or MIL-PRF-27401 Type I Grade A	Charge	1
2	Shock Strut	fluid, D50022 ^{*[1]}	BMS3-32 Type I	Fill	1
		fluid, D00467 ^{*[1]}	BMS3-32 Type II		
		fluid, D00070 ^{*[1]}	MIL-PRF-5606 (Replaces MIL-H-5606)		

^{*[1]} For usage and alternative fluids, refer to Landing Gear Shock Strut Fluids, TASK 12-15-11-610-801

SUBTASK 12-15-01-610-008

- (2) Check the hydraulic fluid level with the airplane at the second shock strut extension (Figure 301):
 - (a) Measure the pressure and extension of the shock strut [101].
 - (b) Measure the surface temperature of the shock strut [101].
 - (c) Compare the extension and pressure, that you measured, to the applicable temperature band on the servicing chart.
 - (d) If the measured extension and pressure are not on the curve in the service chart, the fluid level is not correct, do this task: Main Landing Gear Shock Strut Servicing, TASK 12-15-01-610-810.
 - 1) If you cannot service the shock strut [101] immediately, you can add or remove nitrogen until the measured extension and pressure are on the service chart.

NOTE: If the level of fluid in the shock strut is very low, it is not possible to get the correct extension and pressure on the servicing chart. You must service the shock strut before you dispatch the aircraft.

SUBTASK 12-15-01-410-007

- (3) Tighten the gas valve [103]:
 - (a) Tighten the swivel nut [104] to 60 in-lb (6.8 N·m) - 84 in-lb (9.5 N·m).

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(b) Install the cap [102].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-01-020-019



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.

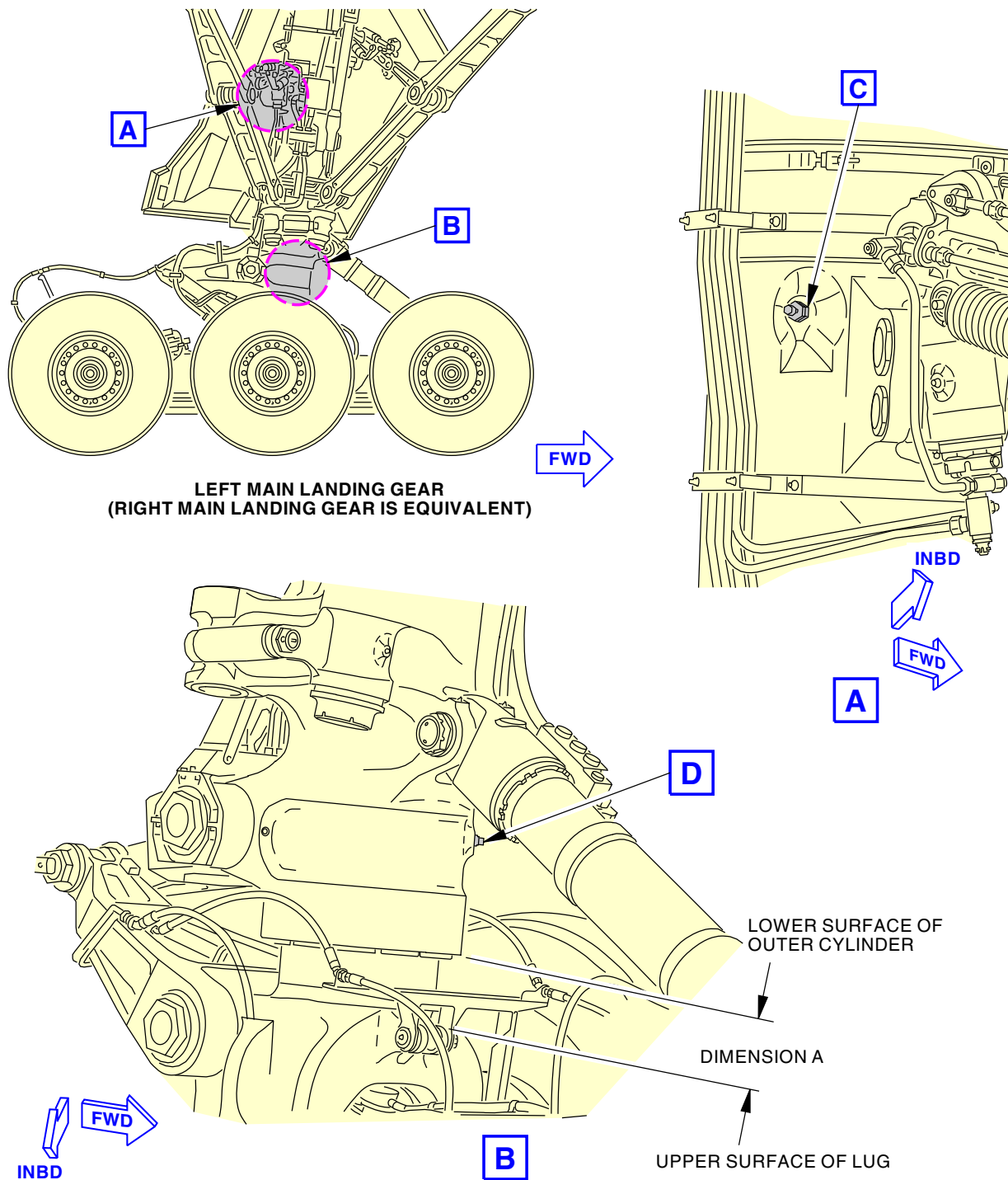
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**Main Landing Shock Strut Servicing
Figure 301/12-15-01-990-810 (Sheet 1 of 2)**

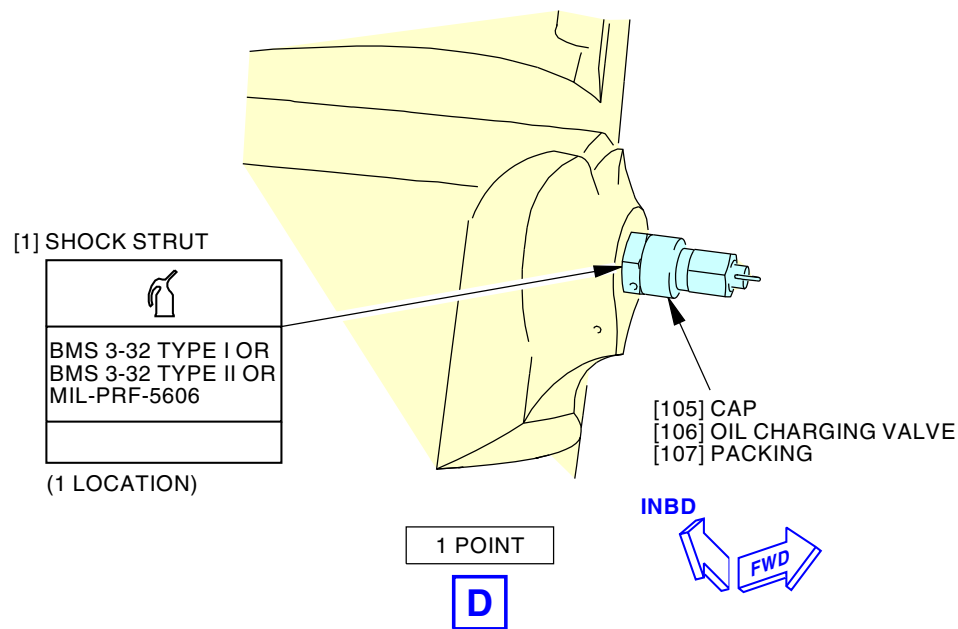
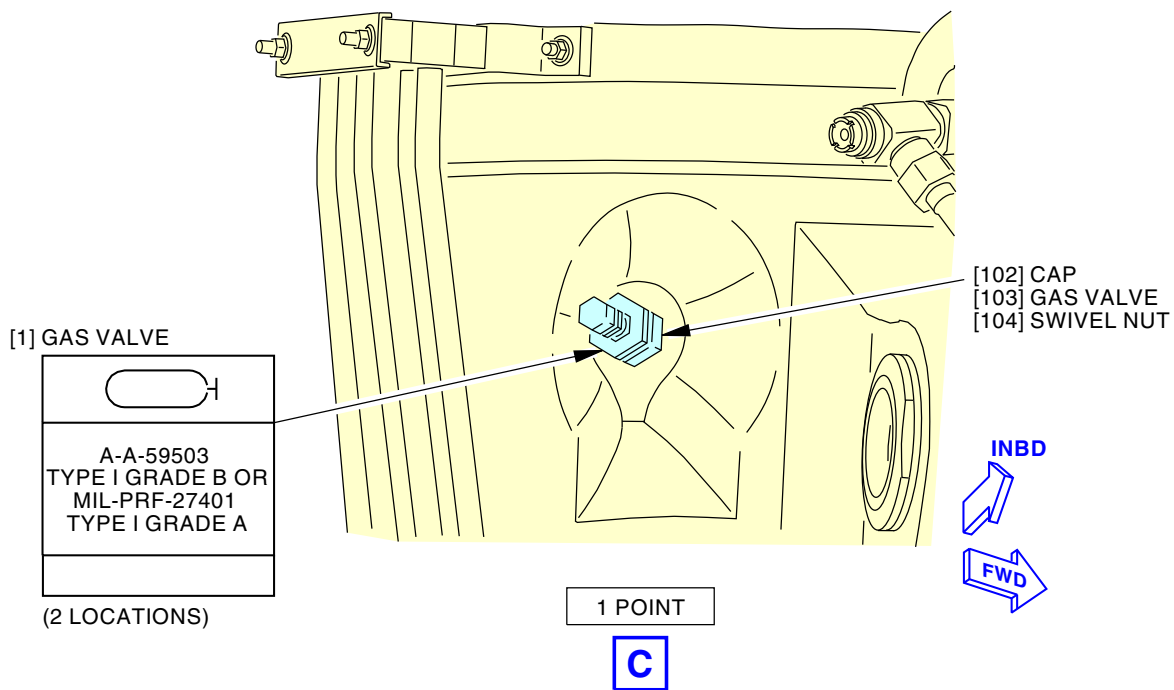
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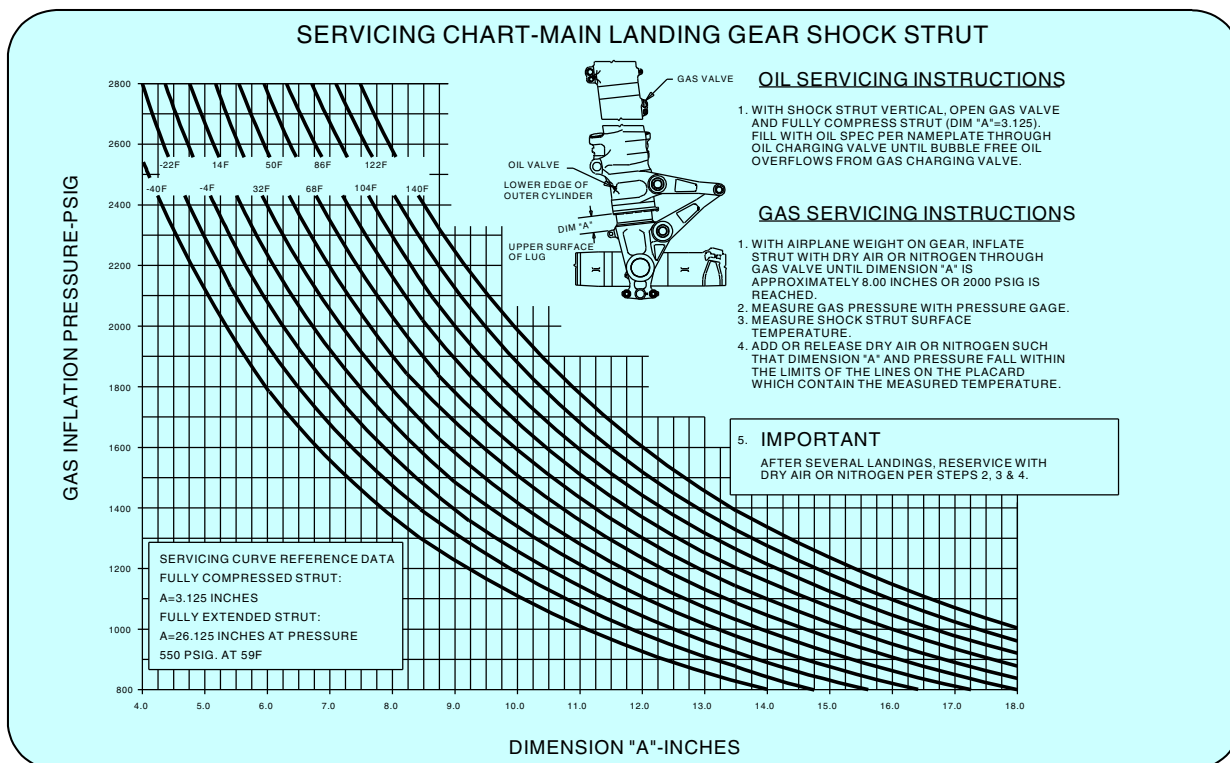
Main Landing Shock Strut Servicing
Figure 301/12-15-01-990-810 (Sheet 2 of 2)

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**Main Landing Gear Shock Strut - Servicing Chart
Figure 302/12-15-01-990-811 (Sheet 1 of 2)**

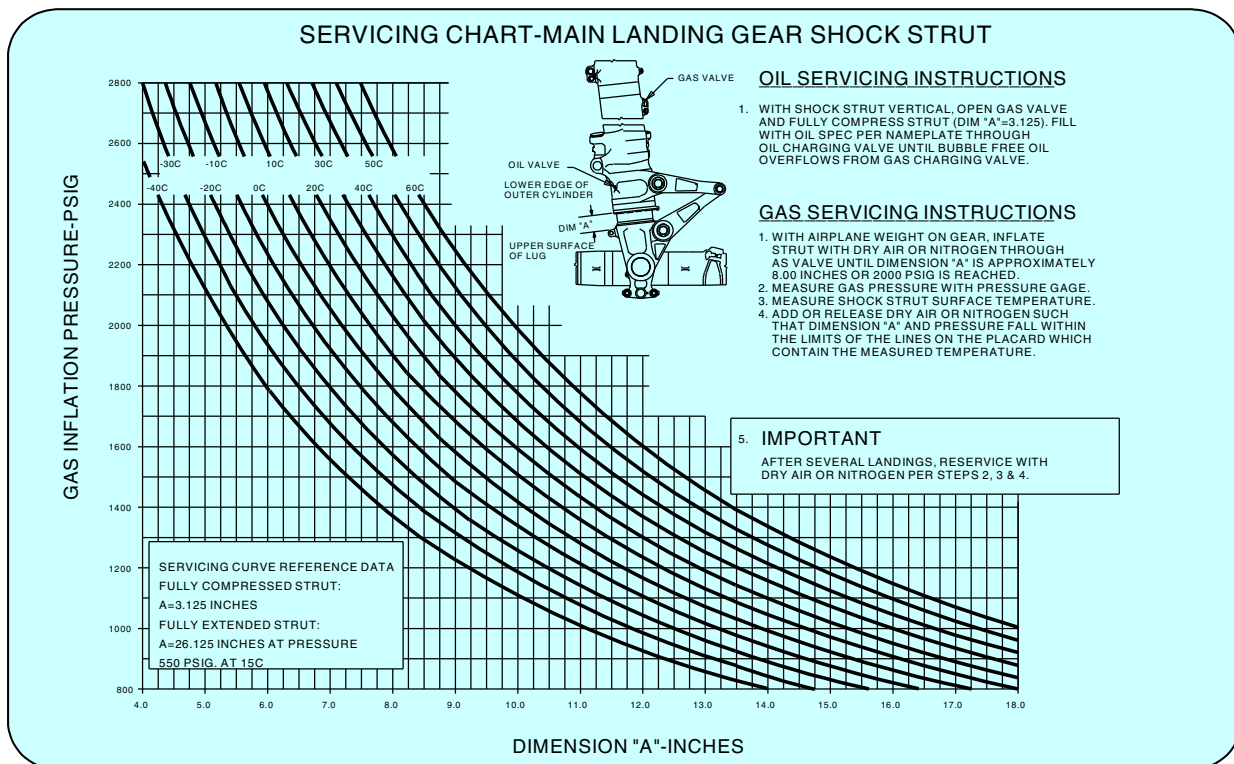
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Main Landing Gear Shock Strut - Servicing Chart
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TASK 12-15-01-610-810

3. Main Landing Gear Shock Strut Servicing

(Figure 302, Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure supplies instructions for the servicing of the shock strut of the main landing gear.

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)

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-1532	Cart - Servicing, Oil Part #: 8774B Supplier: 94861 Part #: 8844 Supplier: 94861 Part #: 8844B Supplier: 94861 Part #: PF53481-9P Supplier: 94861 Part #: PF54124-3P Supplier: 94861 Part #: PF55451-23 Supplier: 94861
SPL-1526	Inflator - Strut, Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
SPL-1829	Valve - Drain, Landing Gear Shock Strut Oil Part #: J32060-1 Supplier: 81205 Opt Part #: A32066-1 Supplier: 81205
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)
STD-1157	Gauge - Pressure, 0-3000 PSIG (0-20685 KPa)

D. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D50022	Fluid - Landing Gear Shock Strut (Specifically For Preservation)	BMS3-32 Type I
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
731	Left Main Landing Gear
741	Right Main Landing Gear

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F. Prepare for the Servicing of the Shock Strut

SUBTASK 12-15-01-420-019



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.

- (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 12-15-01-420-020



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.

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

SUBTASK 12-15-01-610-009

- (3) Deflate the shock strut [101] for the main landing gear:
 - (a) Remove the cap [102] from the gas valve [103].



WARNING

DO NOT REMOVE THE VALVE BODY UNTIL YOU DEFLATE THE SHOCK STRUT FULLY. THE AIR PRESSURE CAN BLOW THE VALVE BODY OUT AND CAUSE INJURIES TO PERSONNEL.

- (b) Loosen the swivel nut [104] on the gas valve [103] a maximum of two turns.
 - 1) Deflate the shock strut slowly to prevent the leakage of the fluid through the gas valve.

NOTE: Fluid in the shock strut will have bubbles when you release the pressure.

- (c) Loosen the swivel nut [104] fully when all of the pressure in the shock strut [101] is released.

NOTE: The shock strut is fully deflated when the dimension "A" is 3.125 in. (79.375 mm).

SUBTASK 12-15-01-610-010

- (4) If you need to drain the oil from the shock strut [101], do these steps:

NOTE: Draining of the oil is usually not necessary unless there are signs of contamination in the oil.

- (a) Remove the cap [105] from the oil charging valve [106].
- (b) Put a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, in a position to catch the shock strut fluid when the oil charging valve [106] is opened.
- (c) Install the drain equipment on the oil charging valve [106]:

NOTE: The tool, landing gear shock strut drain valve, SPL-1829, could also be used, but it will take much longer to drain the shock strut.

- 1) Cut a length of plastic tubing, long enough to reach the container on the floor.
- 2) Insert a small allen wrench in the end of the length of tubing, such that the long end of the allen wrench is flush with the end of the tube and the short end penetrates the wall of the tube.

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- 3) Install the tubing on the oil charging valve [106] such that the allen wrench goes into the oil charging valve [106] and holds it open to drain the hydraulic fluid.
- (d) Remove the drain equipment when you have removed all of the shock strut oil.

G. Service the Shock Strut

SUBTASK 12-15-01-610-011



USE ONLY THE TYPE OF FLUID THAT IS SPECIFIED IN THIS TASK TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

- (1) Fill the shock strut [101] with fluid, D50022, or fluid, D00467 (Table 301):
 - (a) Make sure the cap [105] for the oil charging valve [106] is removed.
 - (b) Attach the oil charging line from landing gear shock strut oil servicing cart, COM-1532, to the oil charging valve [106].
 - (c) Make sure the swivel nut [104] on the gas valve [103] is fully open.
 - (d) Attach a hose to the gas valve [103] with the end of the hose in a drain bucket.



CLEAN THE HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY IF THE FLUID FALLS ON THE TIRES. THE FLUID CAN CAUSE DETERIORATION OF THE TIRES.

- (e) Fill the shock strut [101] with fluid, D00467, or fluid, D50022, until the hydraulic fluid flows out of the gas valve [103] and into the drain bucket.
 - 1) Continue to fill the shock strut [101] until the hydraulic fluid which flows into the bucket is free of bubbles.
- (f) Remove the oil charging line.

SUBTASK 12-15-01-610-012

- (2) Do the steps that follow for the oil charging valve [106] (Figure 301):

- (a) Install the cap [105] on the oil charging valve [106].

NOTE: The packing is installed on the outside of the valve. This is to prevent leakage or loss of pressure. After servicing the MLG, prior to installing the cap, check the packing condition and replace if necessary to prevent leakage.

- (b) Tighten the cap [105].

SUBTASK 12-15-01-610-013

- (3) Remove the hose from the gas valve [103].

SUBTASK 12-15-01-610-014

- (4) Inflate the shock strut [101] for the main landing gear (Table 301):

- (a) Install the landing gear strut inflator, SPL-1526, on the gas valve [103].
- (b) Inflate the shock strut nitrogen, G00018, until the dimension A is approximately 8 in. (203 mm) or you reach 2000 psig (13,790 kPa).
 - 1) If dry nitrogen is not available, you can use dry air as an alternative to inflate the shock strut [101].
- (c) Use a pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
- (d) Measure the surface temperature of the shock strut [101].

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- (e) Inflate or deflate the shock strut [101] until the shock strut extension dimension "A", for the pressure and temperature measured, is on the applicable temperature band on the servicing chart.

NOTE: Dimension "A" and the pressure must be on the applicable temperature band for a correctly serviced shock strut.

SUBTASK 12-15-01-610-015

- (5) Remove the landing gear strut inflator, SPL-1526, from the gas valve [103].

SUBTASK 12-15-01-610-016

- (6) Tighten the gas valve [103]:
 - (a) Tighten the swivel nut [104] to 60 in-lb (6.8 N·m) – 84 in-lb (9.5 N·m).
 - (b) Install the cap [102].

SUBTASK 12-15-01-610-017

- (7) Return the airplane to service.

SUBTASK 12-15-01-610-018

- (8) Five to ten in-service landings after a complete oil and nitrogen servicing, do the steps that follow to check the pressure of the shock strut [101]:

NOTE: The shock strut fluid can absorb nitrogen after a complete servicing, reducing the shock strut dimension "A".

- (a) Check the pressure of the shock strut [101]:
 - 1) Remove the cap [102] from the gas valve [103].
 - 2) Use a pressure gauge (0-3000 PSIG), STD-1157, to measure the pressure of the shock strut [101].
 - 3) Measure the surface temperature of the shock strut [101].
 - 4) Make sure the pressure you measure is still correct for the extension and applicable temperature band of the shock strut [101] (Figure 302).
- (b) If the shock strut [101] does not have enough pressure, inflate the shock strut [101] for the main landing gear (Table 301):
 - 1) Install the landing gear strut inflator, SPL-1526, on the gas valve [103].
 - 2) Inflate the shock strut [101] with nitrogen, G00018, until the shock strut extension dimension "A", for the pressure and temperature measured, is on the applicable temperature band on the servicing chart (Figure 302).
- (c) Install the cap [102] on the gas valve [103].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-01-020-020



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.

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

————— **END OF TASK** —————

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TASK 12-15-01-901-801

4. Main Landing Gear Shock Strut Servicing - Nitrogen Only

A. General

- (1) This procedure supplies instructions for the servicing of the shock strut, with nitrogen (air), when the airplane weight is on the shock strut.

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)

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-1526	Inflator - Strut, Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
STD-1149	Gauge - Pressure, Dry Case, 0-2000 PSIG (0-13790 KPa), 1.0% of full scale accuracy

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
711	Nose Landing Gear

F. Prepare to Service the Shock Strut

SUBTASK 12-15-01-490-005



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.

- (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 12-15-01-490-006



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.

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

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SUBTASK 12-15-01-020-014

- (3) Remove the cap [102] from the gas valve [103].

G. Service the Shock Strut with Nitrogen

NOTE: If the level of fluid in the shock strut is very low, it is not possible to get the correct extension and pressure on the servicing chart. You must service the shock strut before you dispatch the aircraft.

NOTE: Use nitrogen, G00018, to inflate the shock strut. If dry nitrogen is not available, you can use dry air as an alternative.

SUBTASK 12-15-01-020-015

- (1) Use a pressure gauge (0-2000 PSIG), STD-1149, to measure the pressure at the gas valve [103].

SUBTASK 12-15-01-020-016

- (2) Measure the "A" dimension for the shock strut [101].

SUBTASK 12-15-01-020-017

- (3) Use a thermometer to measure the surface temperature on the outer cylinder of the shock strut [101].

SUBTASK 12-15-01-600-031

- (4) If the extension/pressure measurements are not within the limits for the appropriate temperature band, then do the steps that follow (Figure 302):
 - (a) Install the landing gear strut inflator, SPL-1526, on the gas valve [103].
 - (b) Add or release nitrogen, to the gas valve [103], until the extension/pressure measurement is within the appropriate temperature band.
 - (c) If you can not get the extension/pressure measurement within the appropriate temperature band then you must fully service the shock strut [101] with oil and nitrogen.
 - (d) Close the gas valve [103].

SUBTASK 12-15-01-020-018

- (5) Remove the landing gear strut inflator, SPL-1526.

SUBTASK 12-15-01-420-016

- (6) Do the steps that follow for the gas valve [103]:
 - (a) Tighten the swivel nut [104] to 60 in-lb (6.8 N·m) — 84 in-lb (9.5 N·m).
 - (b) Install the cap [102] on the gas valve [103].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-01-090-003



WARNING

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.

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

———— **END OF TASK** ————

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NOSE LANDING GEAR SHOCK STRUT - SERVICING

1. General

A. This procedure contains these tasks:

NOTE: Internal damage to the shock strut can occur as a result of centering cam engagement during ground operations if the DIM A is greater than allowed in the servicing chart.

(1) Nose Landing Gear Shock Strut Fluid Check.

This task measures the pressure and extension of the shock strut at two different aircraft weights. If both measured weights are in the servicing band then the shock strut fluid level is correct.

(2) Nose Landing Gear Shock Strut Check (in-service).

This task measures the shock strut pressures and extension to determine if the shock strut is serviced correctly.

(3) Nose Landing Gear Shock Strut Servicing.

This is a scheduled maintenance task.

This task performs the full servicing of the shock strut, deflate and drain. This task is done when adding nitrogen to the shock strut does not return the shock strut to the servicing band at two different airplane weights.

(4) Nose Landing Gear Shock Strut Servicing – Nitrogen Only.

This task is used when the fluid level has been determined to be correct but the strut pressure is low. Alternately, the shock strut pressure is low and there is no external evidence of leakage.

TASK 12-15-02-610-804-002

2. Nose Landing Gear Shock Strut Fluid Check

(Figure 301)

A. General

(1) This procedure supplies instructions to check the level of the hydraulic fluid in the shock strut of the nose landing gear.

(a) To do a check of the fluid level, you must measure the pressure and the extension of the shock strut twice, at two different shock strut extensions. The greater the difference in the shock strut extensions, the more accurate the fluid measurement will be. You can take the shock strut measurements at two different airplane weights, for example, before and after fueling the airplane

B. References

Reference	Title
12-15-11-610-801	Landing Gear Shock Strut Fluids (P/B 301)
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

Reference	Description
STD-1149	Gauge - Pressure, Dry Case, 0-2000 PSIG (0-13790 KPa), 1.0% of full scale accuracy

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D. Location Zones

Zone	Area
711	Nose Landing Gear

E. Prepare to Check the Hydraulic Fluid Level in the Shock Strut

SUBTASK 12-15-02-490-003-002



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 12-15-02-490-004-002



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.

F. Examine the Fluid Level of the Shock Strut for the Nose Landing Gear

NOTE: To do a check of the fluid level, you must measure the pressure and the extension of the shock strut twice, at different shock strut extensions.

SUBTASK 12-15-02-200-003-002

- (1) Check the hydraulic fluid level with the airplane at the first shock strut extension:
 - (a) Remove the cap from the lower gas valve [4] and use a pressure gauge (0-2000 PSIG), STD-1149, to measure the pressure of the shock strut.
 - 1) Loosen the swivel nut to release the gas from the shock strut.
 - (b) Measure the extension of the shock strut (Dimension "A", Figure 302).
 - (c) Compare the extension and pressure you measured with the servicing chart (Figure 302).
 - (d) If the shock strut pressure and the shock strut extension are not on the servicing curve on the servicing chart, do this task: Nose Landing Gear Shock Strut Servicing - Nitrogen Only, TASK 12-15-02-610-806-002.

SUBTASK 12-15-02-200-004-002

- (2) Check the hydraulic fluid level with the airplane at the second shock strut extension (Table 301):
 - (a) Measure the pressure, at the lower gas valve [4], and the extension of the shock strut.
 - (b) Compare the extension and pressure you measured with the servicing chart.
 - (c) If the measured extension and pressure are on the curve in the service chart, the fluid level is correct.
 - (d) If the measured extension and pressure are not on the curve in the service chart, the fluid level is not correct, do this task: Nose Landing Gear Shock Strut Servicing, TASK 12-15-02-610-805-002.

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- 1) If you cannot service the shock strut immediately, you can do this task: Nose Landing Gear Shock Strut Servicing - Nitrogen Only, TASK 12-15-02-610-806-002.

NOTE: If the level of fluid in the shock strut is very low, you will not be able to get the correct extension and pressure on the servicing chart; you will need to service the shock strut before you dispatch the airplane.

Table 301/12-15-02-993-809-002 Nose Landing Gear Shock Strut Servicing)

Item No.	Nomenclature	Fluid	Method of Application	Number of Locations
1	Gas Valve	A-A-59503 Type I, or MIL-P-27401 Type I	Charge	1
2	Shock Strut Fluid	BMS 3-32 Type I, II ^{*[1]}	Fill	1

*[1] For usage and alternative fluids, refer to Landing Gear Shock Strut Fluids, TASK 12-15-11-610-801

SUBTASK 12-15-02-420-009-002

- (3) Tighten the lower gas valve [4]:
- (a) Tighten the swivel to 76 in-lb (8.6 N·m) - 84 in-lb (9.5 N·m).
 - (b) Install the cap on the lower gas valve [4].

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-02-090-002-002

 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.

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

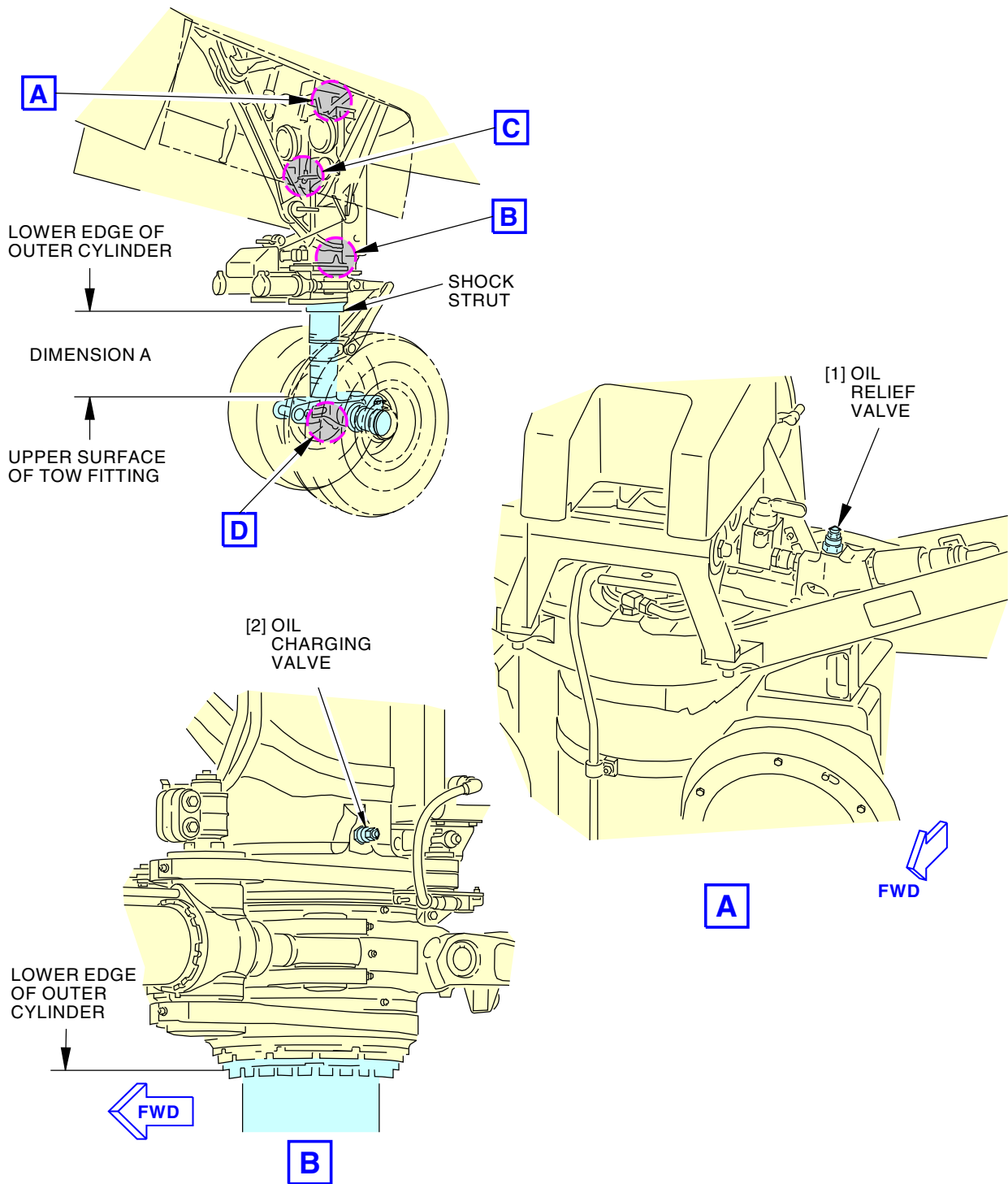
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**Nose Landing Gear Shock Strut Servicing
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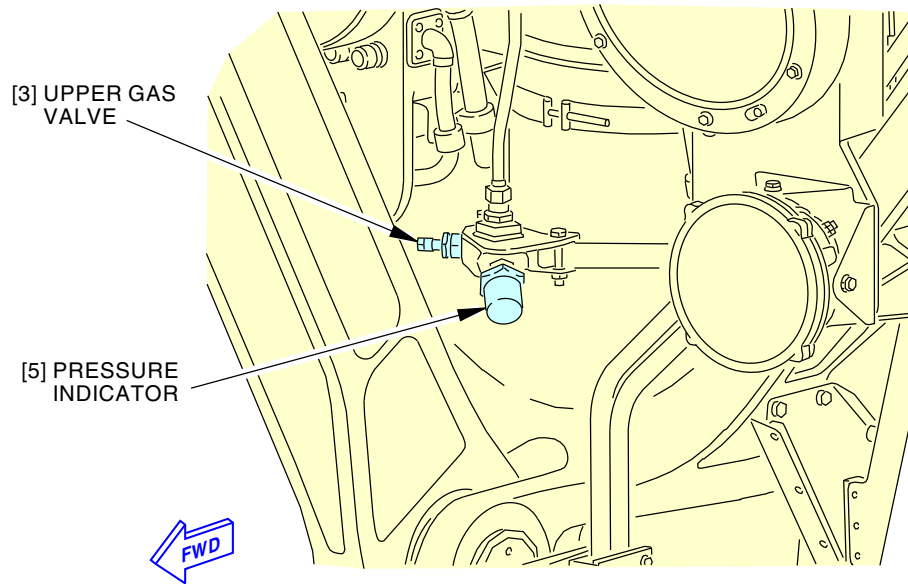
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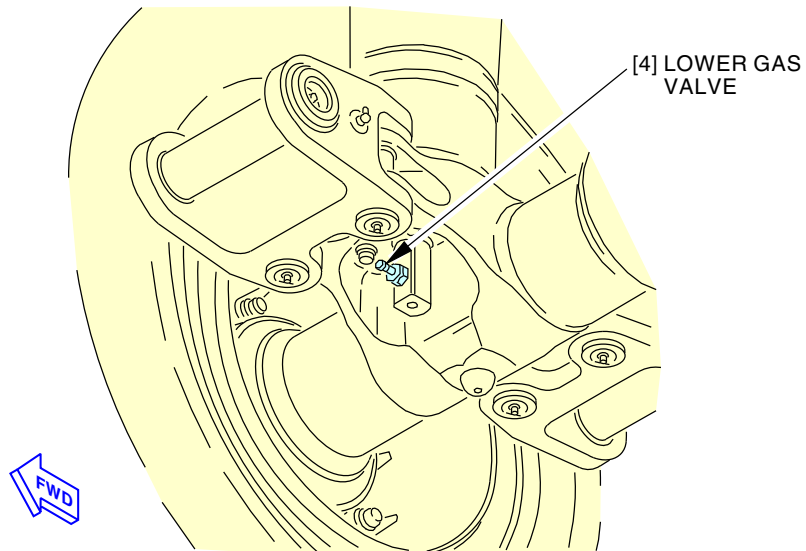
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Nose Landing Gear Shock Strut Servicing
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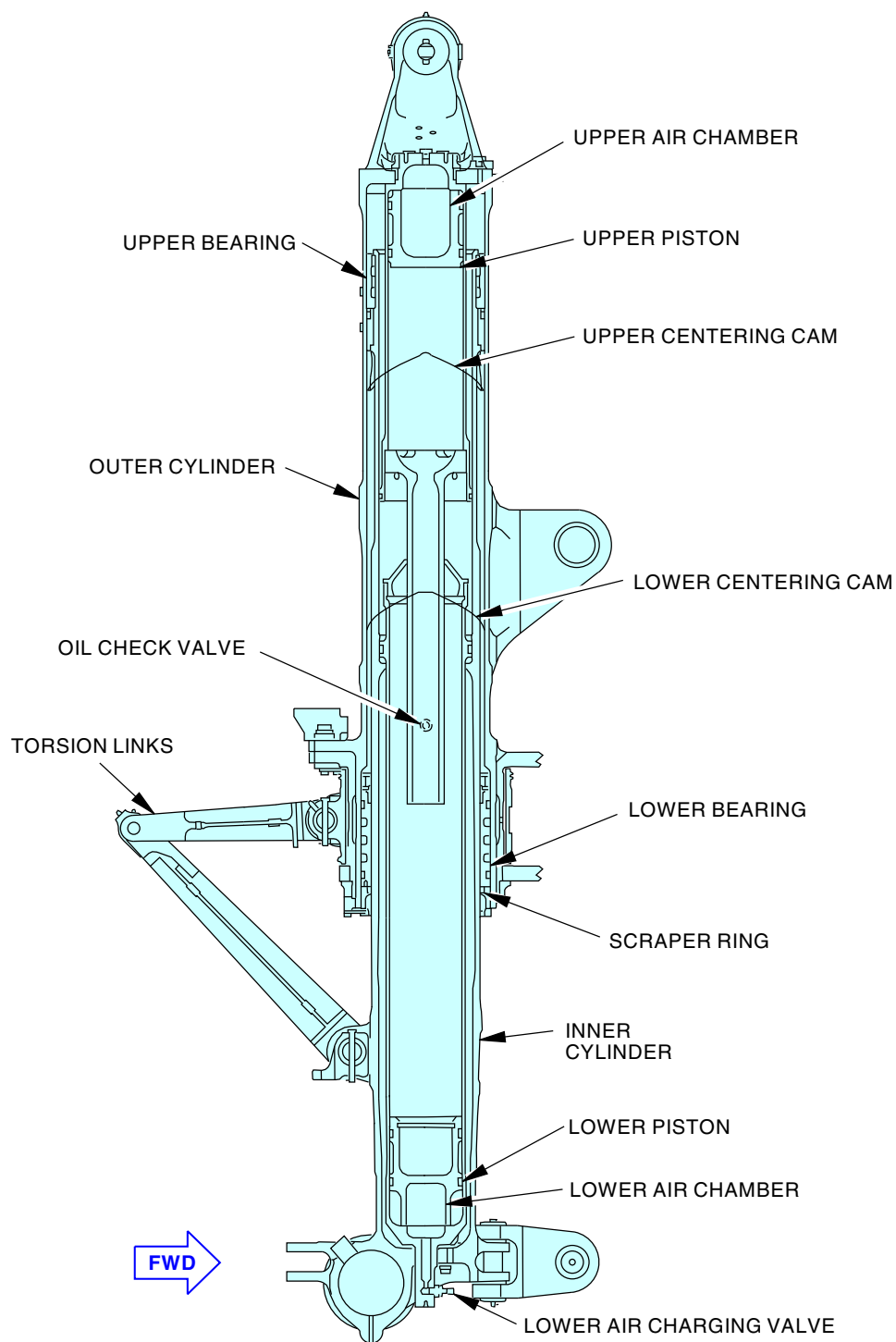
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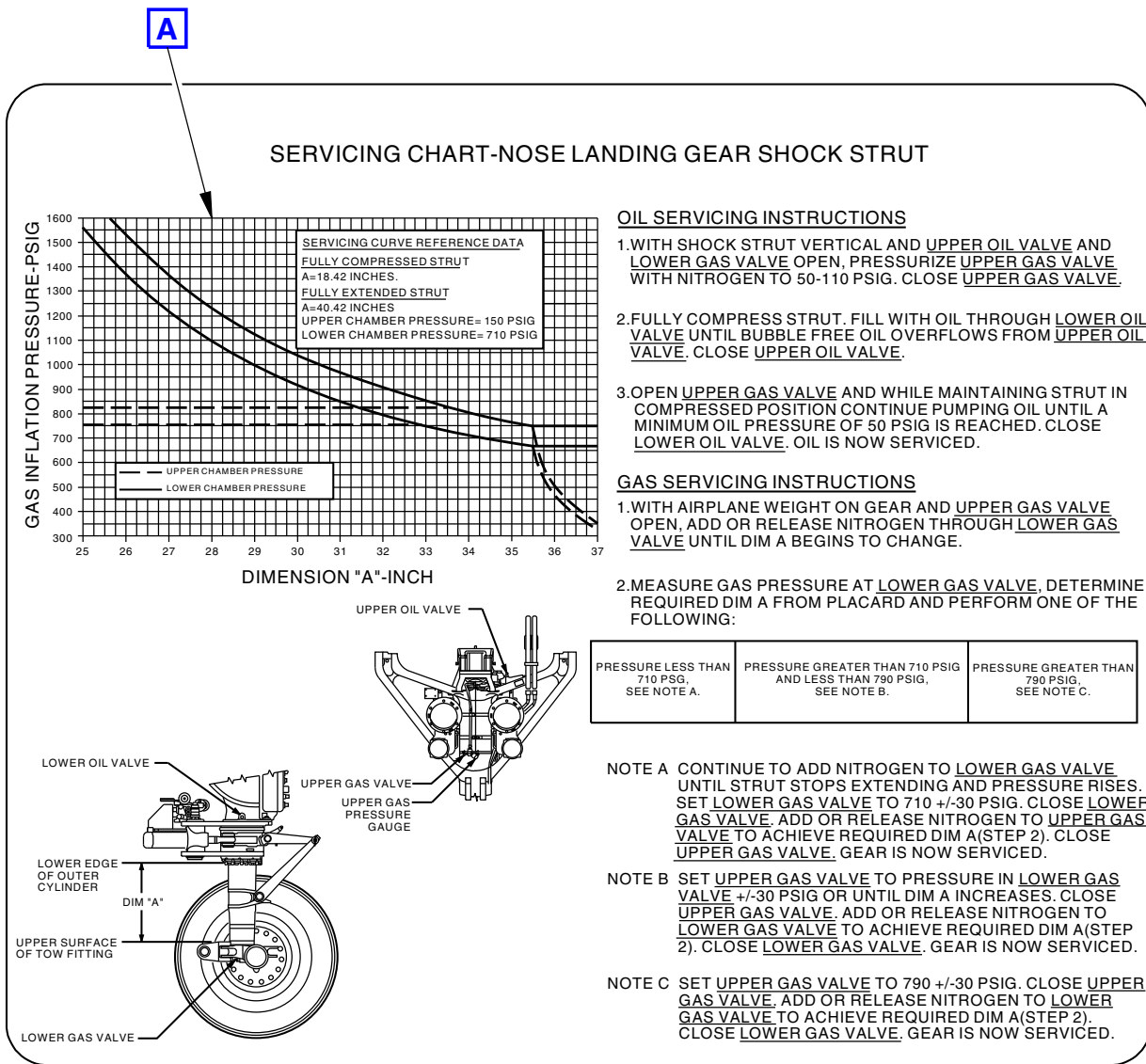
Nose Landing Gear Shock Strut Servicing
Figure 301/12-15-02-990-804-002 (Sheet 3 of 3)

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Nose Landing Gear Shock Strut - Servicing Chart
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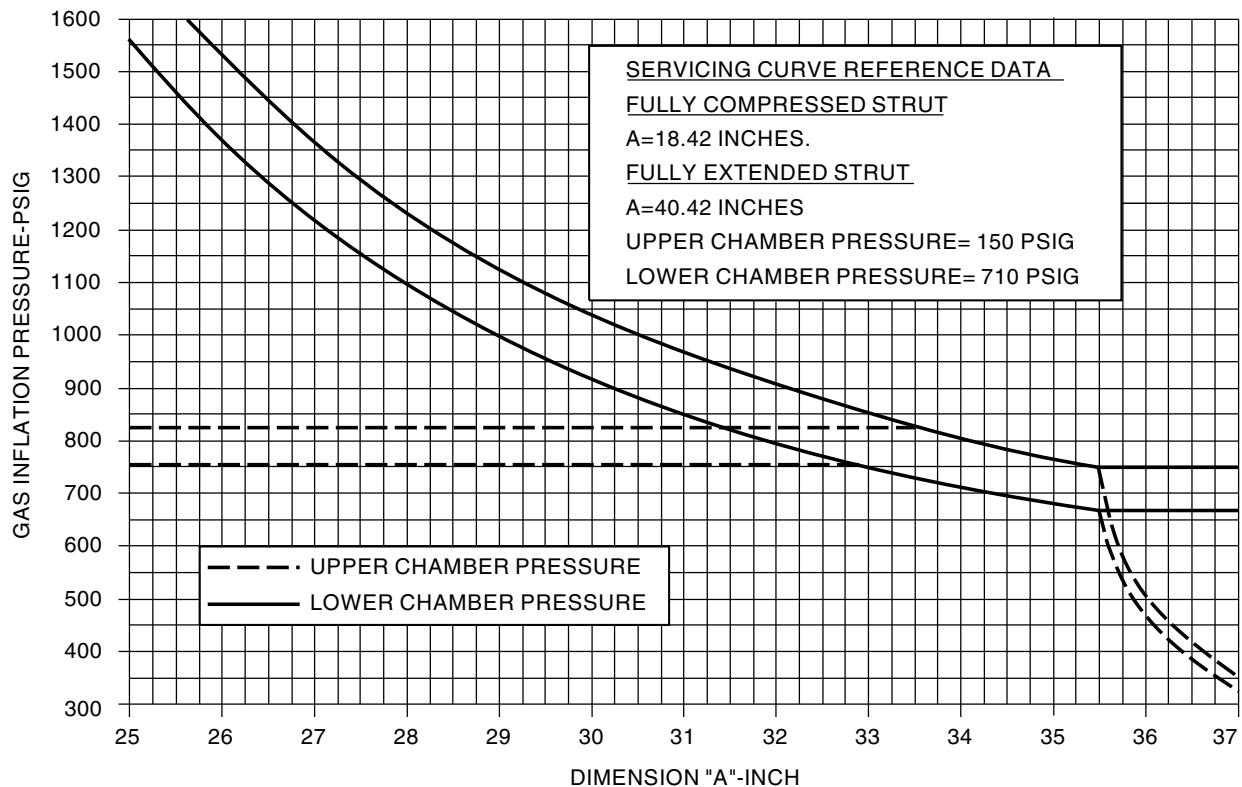
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Nose Landing Gear Shock Strut - Servicing Chart
Figure 302/12-15-02-990-805-002 (Sheet 2 of 3)

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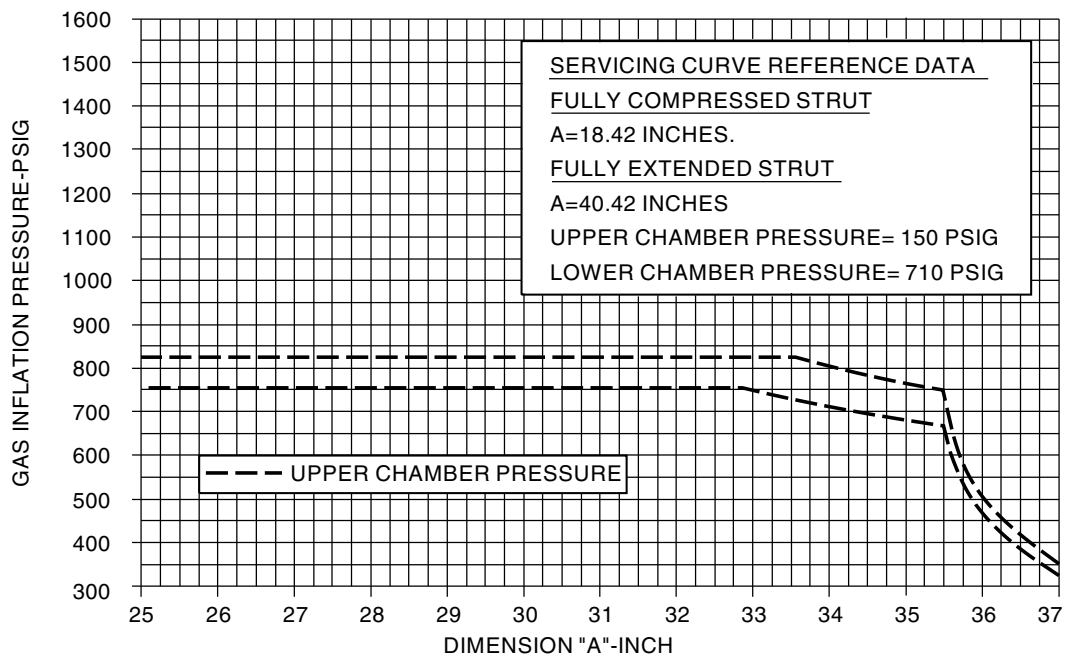
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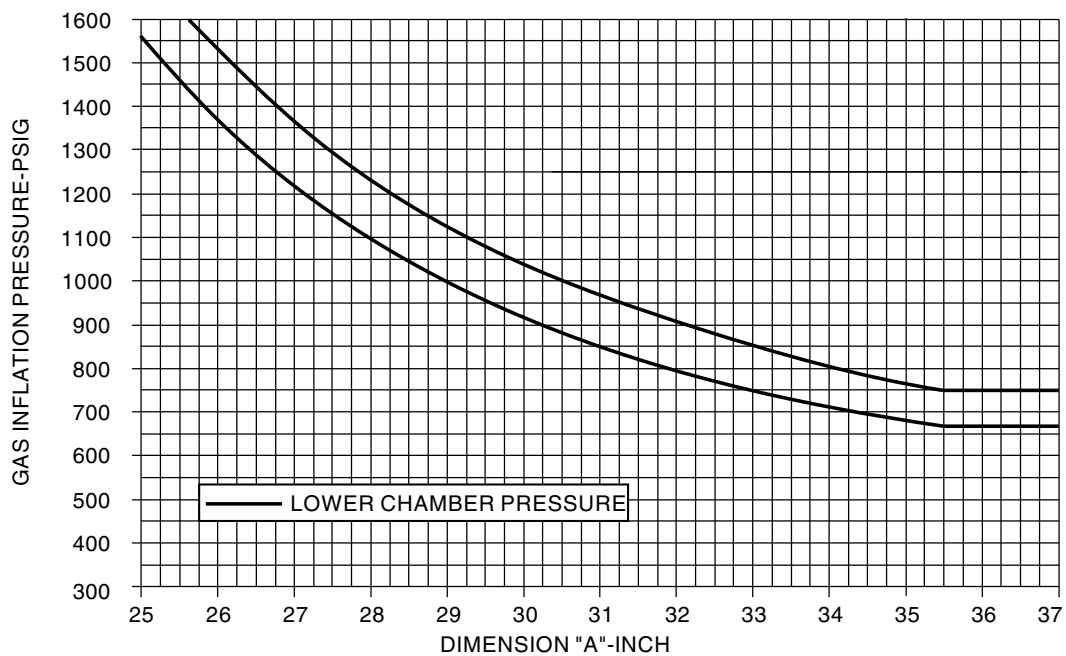
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A



A

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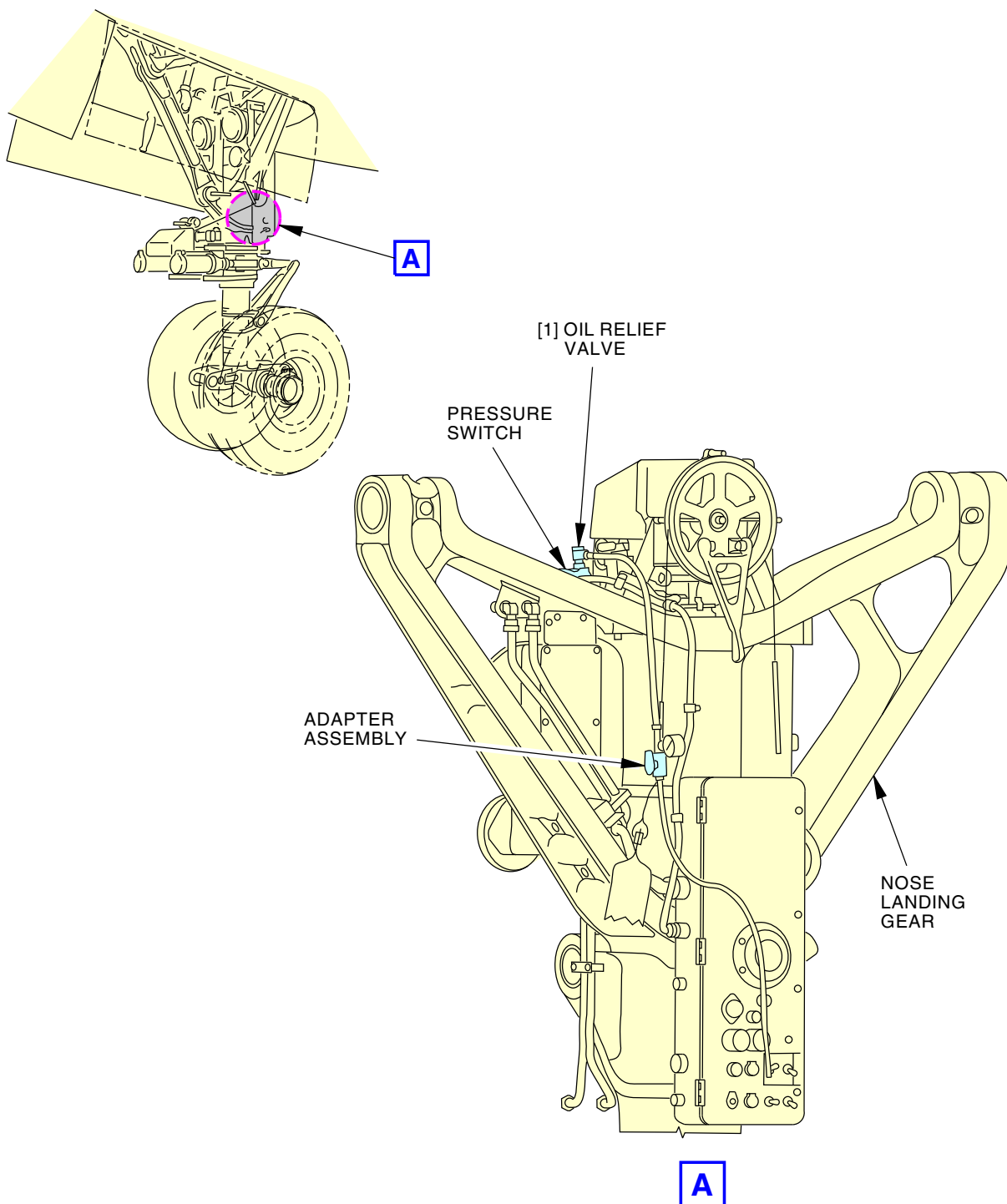
Nose Landing Gear Shock Strut - Servicing Chart
Figure 302/12-15-02-990-805-002 (Sheet 3 of 3)

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**Nose Landing Gear Shock Strut Servicing Adapter
Figure 303/12-15-02-990-806-002**

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TASK 12-15-02-610-809-002

3. Nose Landing Gear Shock Strut Check (In-Service)

(Figure 301)

A. General

- (1) This procedure supplies instructions to check and maintain the shock strut pressure and extension within the limits of the service band on the servicing chart.

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)

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-1526	Inflator - Strut, Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
STD-1149	Gauge - Pressure,Dry Case, 0-2000 PSIG (0-13790 KPa), 1.0% of full scale accuracy

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
711	Nose Landing Gear

F. Prepare to examine the shock strut

SUBTASK 12-15-02-490-001



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.

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SUBTASK 12-15-02-490-002



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.

G. Check the shock strut pressure and extension

NOTE: If the level of the fluid in the shock strut is very low, you will not be able to get the correct extension and pressure on the servicing chart; you will need to fully service the shock strut before you can dispatch the airplane.

NOTE: Use nitrogen, G00018 to inflate the shock strut. If dry nitrogen is not available, you can use dry air as an alternative.

SUBTASK 12-15-02-220-001

- (1) Do these steps to record the pressure for the upper and lower air chamber of the nose landing gear:
- Remove the cap from lower gas valve [4] and install a pressure gauge (0-2000 PSIG), STD-1149, to measure the pressure of the shock strut.
 - Loosen the swivel nut a maximum of two turns to release the gas from the shock strut.
 - Close the lower gas valve [4] and remove the pressure gauge (0-2000 PSIG), STD-1149.
 - Remove the cap from upper gas valve [3] and install a pressure gauge (0-2000 PSIG), STD-1149, to measure the pressure of the shock strut.
 - Loosen the swivel nut a maximum of two turns to release the gas from the shock strut.
 - Close the upper gas valve [3] and remove the pressure gauge (0-2000 PSIG), STD-1149.

SUBTASK 12-15-02-220-002

- (2) Measure and record the extension of the shock strut (Dimension "A", Figure 302).

SUBTASK 12-15-02-655-001

- (3) Use the servicing chart to determine if the recorded pressure for the upper and lower chambers are within the limits of the appropriate service band for the recorded "A" dimension.

NOTE: Examples. If dimension "A" is 36 in. (914 mm) and the lower chamber pressure is 710 psi (4895 kPa) and the upper chamber pressure is 500 psi (3447 kPa), the pressures are within the limits for the recorded dimension "A". If dimension "A" is 29.25 in. (742.95 mm) and the lower chamber pressure is 1050 psi (7239 kPa) and the upper chamber pressure is 790 psi (5447 kPa), the pressures are within the limits for the recorded dimension "A".

SUBTASK 12-15-02-212-001

- (4) If the upper and lower chamber pressures are correct for the recorded "A" dimension, the shock strut is serviced correctly, do the steps to "Put the Airplane Back to Its Usual Condition".

SUBTASK 12-15-02-212-002

- (5) If the upper and/or lower chamber pressure is not correct for the recorded "A" dimension, do the steps to "Maintain the correct shock strut pressure and extension".

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H. Maintain the correct shock strut pressure and extension

SUBTASK 12-15-02-614-002

- (1) If the recorded pressure for the lower air chamber is greater than 790 psi (5447 kPa), do these steps:
- (a) Install the landing gear strut inflator, SPL-1526, on the upper gas valve [3].
 - (b) Loosen the upper gas valve [3] swivel nut a maximum of two turns.
 - (c) Use the landing gear strut inflator, SPL-1526, on the upper gas valve [3], to set the upper chamber pressure to 790 psi (5447 kPa).
 - (d) Close the upper gas valve [3].
 - (e) Install the landing gear strut inflator, SPL-1526, on the lower gas valve [4].
 - (f) Loosen the lower gas valve [4] swivel nut a maximum of two turns.
 - (g) Add or release nitrogen, G00018, to the lower gas valve [4], until the extension/pressure measurement is within the limits of the upper chamber service band.
 - (h) Close the lower gas valve [4].

SUBTASK 12-15-02-614-001

- (2) If the recorded pressure for the lower air chamber is less than 710 psi (4895 kPa), do these steps:
- (a) Install the landing gear strut inflator, SPL-1526, on the lower gas valve [4].
 - (b) Loosen the lower gas valve [4] swivel nut a maximum of two turns.
 - (c) Use the landing gear strut inflator, SPL-1526, on the lower gas valve [4], to set the lower chamber pressure to 710 psi (4895 kPa).
 - (d) Close the lower gas valve [4].
 - (e) Install the landing gear strut inflator, SPL-1526, on the upper gas valve [3].
 - (f) Loosen the upper gas valve [3] swivel nut a maximum of two turns.
 - (g) Add or release nitrogen, G00018, to the upper gas valve [3], until the extension equals the recorded dimension "A".
 - (h) Close the upper gas valve [3].

SUBTASK 12-15-02-614-003

- (3) If the recorded pressure for the lower air chamber is greater than 710 psi (4895 kPa) and less than 790 psi (5447 kPa), do these steps:
- (a) Install the landing gear strut inflator, SPL-1526, on the upper gas valve [3].
 - (b) Loosen the upper gas valve [3] swivel nut a maximum of two turns.
 - (c) Use the landing gear strut inflator, SPL-1526, on the upper gas valve [3], to set the upper chamber pressure to the pressure recorded for the lower chamber.
 - (d) Close the upper gas valve [3].
 - (e) Install the landing gear strut inflator, SPL-1526, on the lower gas valve [4].
 - (f) Loosen the lower gas valve [4] swivel nut a maximum of two turns.
 - (g) Add or release nitrogen, G00018, to the lower gas valve [4], until the extension/pressure measurement is within the limits of the upper chamber service band.
 - (h) Close the lower gas valve [4].

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SUBTASK 12-15-02-610-008-002

- (4) If you can not get the correct extension and pressure you will need to do the task, Nose Landing Gear Shock Strut Servicing, TASK 12-15-02-610-805-002

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-02-430-002

- (1) Do these steps for the upper gas valve [3] and the lower gas valve [4]:
- (a) Tighten the swivel nut to 5 ft-lb (7 N·m) - 7 ft-lb (9 N·m).
 - (b) Install a cap on the valve.

SUBTASK 12-15-02-090-001



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.

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

————— **END OF TASK** —————

TASK 12-15-02-610-805-002

4. Nose Landing Gear Shock Strut Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure supplies instructions for the servicing of the shock strut of the nose landing gear with fluid and nitrogen.
- (2) The airplane weight must be on the nose landing gear to service the shock strut with fluid. The nitrogen can then be added to the shock strut with the airplane on the ground or on airplane jacks.

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)

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-1532	Cart - Servicing, Oil Part #: 8774B Supplier: 94861 Part #: 8844 Supplier: 94861 Part #: 8844B Supplier: 94861 Part #: PF53481-9P Supplier: 94861 Part #: PF54124-3P Supplier: 94861 Part #: PF55451-23 Supplier: 94861

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Reference	Description
SPL-1526	Inflator - Strut, Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
SPL-1829	Valve - Drain, Landing Gear Shock Strut Oil Part #: J32060-1 Supplier: 81205 Opt Part #: A32066-1 Supplier: 81205
SPL-10668	Adapter - NLG Strut Servicing Part #: J12007-1 Supplier: 81205
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D50022	Fluid - Landing Gear Shock Strut (Specifically For Preservation)	BMS3-32 Type I
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
711	Nose Landing Gear

F. Prepare to Do the Servicing of the Shock Strut

SUBTASK 12-15-02-490-005-002



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 12-15-02-490-006-002



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 12-15-02-020-008-002



WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA BELOW THE NOSE BEFORE YOU DEFLATE THE SHOCK STRUT. WHEN YOU DEFLATE THE SHOCK STRUT, THE NOSE CAN MOVE DOWN. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (3) Deflate the shock strut for the nose landing gear:
- (a) Remove the cap from the upper gas valve [3] on the shock strut.

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WARNING

DO NOT REMOVE THE VALVE BODY UNTIL YOU DEFLATE THE SHOCK STRUT FULLY. THE AIR PRESSURE CAN BLOW THE VALVE BODY OUT AND CAUSE INJURIES TO PERSONNEL.

- (b) Loosen the upper gas valve swivel nut a maximum of two turns.
- (c) Remove the cap from the lower gas valve [4] on the shock strut.



WARNING

DO NOT REMOVE THE VALVE BODY UNTIL YOU DEFLATE THE SHOCK STRUT FULLY. THE AIR PRESSURE CAN BLOW THE VALVE BODY OUT AND CAUSE INJURIES TO PERSONNEL.

- (d) Loosen the lower gas valve swivel nut a maximum of two turns.
- (e) Loosen the lower gas valve swivel nut fully when all of the pressure in the shock strut is released.

NOTE: The shock strut is fully deflated when the dimension "A" equals 18.42 in. (467.87 mm).

SUBTASK 12-15-02-680-002-002

- (4) If you need to drain the oil from the shock strut, do these steps:

NOTE: Draining of the oil is usually not necessary unless there are signs of contamination in the oil or the shock strut is over-serviced with oil (fully compressed "A" dimension greater than 18.57 in. (471.68 mm) with upper and lower chambers deflated).

- (a) Put a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, in a position to catch the shock strut fluid when the oil charging valve [2] is opened.
- (b) Install the drain equipment on the oil charging valve [2]:

NOTE: The tool, landing gear shock strut drain valve, SPL-1829, could also be used, but it will take much longer to drain the shock strut.

- 1) Cut a length of plastic tubing, long enough to reach the container on the floor.
- 2) Insert a small allen wrench in the end of the length of tubing, such that the long end of the allen wrench is flush with the end of the tube and the short end penetrates the wall of the tube.
- 3) Install the tubing on the oil charging valve [2] such that an allen wrench goes into the check valve and holds it open to drain the hydraulic fluid.
- (c) Open the oil relief valve [1].
- (d) When the flow of oil to the bucket stops, do these steps:

NOTE: The steps that follow will force the oil out of the inner cylinder. Four to five gallons will still remain in the inner cylinder after you complete these steps.

- 1) Install the landing gear strut inflator, SPL-1526, on the upper gas valve [3].
- 2) Inflate the upper air chamber with landing gear strut inflator, SPL-1526, until you have reached 50 psi (345 kPa) - 110 psi (758 kPa).

NOTE: This step is required to move the Upper Air Chamber to full bottom for removing remaining air in the piston cylinder.

NOTE: If dry nitrogen is not available, you can use dry air as an alternative.

- 3) Close the upper gas valve [3].
- 4) Remove the landing gear strut inflator, SPL-1526, from the upper gas valve [3].

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- 5) Install the landing gear strut inflator, SPL-1526, on the lower gas valve [4].
- 6) Slowly inflate the lower air chamber with nitrogen, G00018, until you have reached 50 psi (345 kPa) - 110 psi (758 kPa).

NOTE: If you inflate too quickly the oil may come out through the oil relief valve [1].

NOTE: If dry nitrogen is not available, you can use dry air as an alternative.

- 7) When the flow of oil to the bucket stops, then close the lower gas valve [4].
- 8) Remove the landing gear strut inflator, SPL-1526, from the lower gas valve [4].
- 9) Fully open the upper gas valve [3] and lower gas valve [4].

- (e) Remove the drain equipment.

G. Service the Shock Strut

SUBTASK 12-15-02-600-015-002



USE ONLY THE TYPE OF FLUID THAT IS SPECIFIED IN THIS TASK TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

- (1) Fill the shock strut with fluid, D00467, or fluid, D50022 (Table 301):
 - (a) Make sure the cap for the oil charging valve [2] is removed.
 - (b) Attach the oil charging line from landing gear shock strut oil servicing cart, COM-1532, to the oil charging valve [2].
 - (c) Make sure the swivel nut, for the lower gas valve [4], is fully open.
 - (d) Attach the NLG strut servicing adapter, SPL-10668, to the oil relief valve [1] with the end of the NLG strut servicing adapter, SPL-10668, in a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110 (Figure 303).
 - (e) Make sure the swivel nut, for the upper gas valve [3], is fully open.
 - (f) Install the landing gear strut inflator, SPL-1526, on the upper gas valve [3].
 - (g) Inflate the upper air chamber with nitrogen, G00018, until you have reached 50 psi (345 kPa) - 110 psi (758 kPa), this moves the upper piston to the bottom of the upper chamber.

NOTE: If dry nitrogen is not available, you can use dry air as an alternative.
 - (h) Close the upper gas valve [3].
 - (i) Remove the landing gear strut inflator, SPL-1526, from the upper gas valve [3].
 - (j) Install pressure gage to oil relief valve [1] (Figure 301).
 - (k) Remove the bolt from the oil relief valve [1].



CLEAN ALL THE LEAKED HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY. THE FLUID CAN CAUSE DAMAGE TO THE TIRES.

- (l) Fill the shock strut with fluid until the hydraulic fluid flows out of the oil relief valve [1] and into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110 (Table 301).
 - 1) Continue to fill the shock strut until the hydraulic fluid which flows into the 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110, is free of bubbles.
- (m) Open the upper gas valve [3].

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- 1) Make sure the swivel nut is fully open.
- (n) Close the valve on the NLG strut servicing adapter, SPL-10668.
NOTE: This will allow the pressure to be measured.
- (o) Continue to fill the shock strut with fluid until the hydraulic pressure is 50 psi (345 kPa) - 110 psi (758 kPa). Check the gauge that is mounted on the NLG strut servicing adapter, SPL-10668.
NOTE: The above step is required to insure that the upper and lower pistons are moved completely to the end of their chambers.
- (p) Stop the fluid application when the pressure gage, on the NLG strut servicing adapter, SPL-10668, shows the applied pressure.
 - 1) Make sure the shock strut stays compressed (A = 18.42 in. (467.87 mm)).
- (q) Remove the oil charging line.
- (r) Reinstall the cap on the oil charging valve.

SUBTASK 12-15-02-420-010-002

- (2) Do the steps that follow for the oil relief valve [1]:
 - (a) Ensure that the free end of the NLG strut servicing adapter, SPL-10668, is in a 5 gallon (19 liter) hydraulic fluid resistant container, STD-1110 (Figure 303).
 - (b) Momentarily open the valve on the NLG strut servicing adapter, SPL-10668, to remove the 50 psi (345 kPa) - 110 psi (758 kPa) of blocked oil pressure.
 - (c) Do not keep the valve open for longer than necessary to remove the blocked oil pressure. This can cause the level of hydraulic fluid to decrease.
 - (d) Tighten the oil relief valve [1] to 50 in-lb (5.6 N·m) - 70 in-lb (7.9 N·m).
 - (e) Remove the NLG strut servicing adapter, SPL-10668, from the oil relief valve [1].
 - (f) Install the bolt in the oil relief valve [1].

SUBTASK 12-15-02-600-016-002

- (3) Inflate the shock strut for the nose landing gear nitrogen, G00018 (Table 301):
 - (a) To inflate the shock strut with the airplane on the ground (airplane weight on shock strut), do the steps that follow:
NOTE: If dry nitrogen is not available, you can use dry air as an alternative.
 - 1) Install the landing gear strut inflator, SPL-1526, on the lower gas valve [4].
 - 2) Inflate the shock strut with nitrogen, G00018, until dimension "A" begins to increase (Figure 302).
 - 3) Do this task: Nose Landing Gear Shock Strut Servicing - Nitrogen Only, TASK 12-15-02-610-806-002.
 - (b) To inflate the shock strut with the airplane on jacks (shock strut fully extended, "A" = 40.42 in. (1026.67 mm)), do these steps (Figure 302):
NOTE: If dry nitrogen is not available, you can use dry air as an alternative.
 - 1) Install the landing gear strut inflator, SPL-1526, on the lower gas valve [4].
 - 2) Set the lower gas valve pressure to 710 psi (4895 kPa).
 - 3) Close the lower gas valve [4].
 - 4) Install the landing gear strut inflator, SPL-1526, on the upper gas valve [3].
 - 5) Set the upper gas valve pressure to 150 psi (1034 kPa).

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- 6) Close the upper gas valve [3].
- (c) Do the steps that follow for the upper gas valve [3] and lower gas valve [4]:
 - 1) Tighten the swivel nut to 7 ft-lb (9 N·m) - 5 ft-lb (7 N·m).
 - 2) Install the cap.

SUBTASK 12-15-02-090-003-002



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.

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

END OF TASK

TASK 12-15-02-610-806-002

5. Nose Landing Gear Shock Strut Servicing - Nitrogen Only

(Figure 301)

A. General

- (1) This procedure supplies instructions for the servicing of the shock strut, with nitrogen (air), when the airplane weight is on the shock strut.

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)

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-1526	Inflator - Strut, Landing Gear Part #: F70200-35 Supplier: 81205 Opt Part #: F70200-14 Supplier: 81205 Opt Part #: F70200-18 Supplier: 81205
STD-1149	Gauge - Pressure, Dry Case, 0-2000 PSIG (0-13790 KPa), 1.0% of full scale accuracy

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
711	Nose Landing Gear

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F. Prepare to Service the Shock Strut

SUBTASK 12-15-02-490-013-002



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 12-15-02-490-014-002



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 12-15-02-020-009-002

- (3) Remove the cap from the upper gas valve [3] and lower gas valve [4] on the shock strut.

G. Service the Shock Strut with Nitrogen

NOTE: If the level of the fluid in the shock strut is very low, you will not be able to get the correct extension and pressure on the servicing chart; you will need to fully service the shock strut before you can dispatch the airplane.

NOTE: Use nitrogen, G00018 to inflate the shock strut. If dry nitrogen is not available, you can use dry air as an alternative.

SUBTASK 12-15-02-020-010-002

- (1) Use a pressure gauge (0-2000 PSIG), STD-1149 to measure the pressure at the lower gas valve [4] of the shock strut.

SUBTASK 12-15-02-610-005

- (2) Open the lower gas valve [4].

SUBTASK 12-15-02-220-003

- (3) Refer to the service placard Figure 302 to determine Dimension "A" from the pressure measured, then record Dimension "A".

NOTE: Examples; if the pressure measured is 1000 psi, then dimension "A" would be 29.75 inches (approx), if the pressure measured is 500 psi, then demension "A" would be 36 inches (approx).

SUBTASK 12-15-02-600-017-002

- (4) If the pressure measured is greater than 790 psi, do the steps that follow:
 - (a) Install the landing gear strut inflator, SPL-1526 on the upper gas valve [3].
 - (b) Set the upper gas valve pressure to 790 $\pm$ 30 psi.
 - (c) Close the upper gas valve [3].
 - (d) Install the landing gear strut inflator, SPL-1526 on the lower gas valve [4].
 - (e) Add or release nitrogen, G00018, to the lower gas valve [4], until the extension equals the recorded dimension "A".
 - (f) Close the lower gas valve [4].

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SUBTASK 12-15-02-600-018-002

- (5) If the measured pressure is greater than 710 psi and less than 790 psi, do the steps that follow:
- (a) Install the landing gear strut inflator, SPL-1526 on the upper gas valve [3].
 - (b) Set the upper gas valve pressure to the pressure measured at the lower gas valve.
 - (c) Close the upper gas valve [3].
 - (d) Install the landing gear strut inflator, SPL-1526 on the lower gas valve [4].
 - (e) Add or release nitrogen, G00018, to the lower gas valve [4], until the extension equals the recorded dimension "A".
 - (f) Close the lower gas valve [4].

SUBTASK 12-15-02-600-019-002

- (6) If the measured pressure is less than 710 psi, do the steps that follow:
- (a) Install the landing gear strut inflator, SPL-1526 on the lower gas valve [4].
 - (b) Add nitrogen, G00018, to the lower gas valve [4], until the strut does not extend and the pressure starts to increase.
 - (c) Set the lower gas valve pressure to 710 $\pm$ 30 psi.
 - (d) Close the lower gas valve [4].
 - (e) Install the landing gear strut inflator, SPL-1526 on the upper gas valve [3].
 - (f) Add or release nitrogen, G00018, to the upper gas valve [3], until the extension/pressure measurement is on the servicing curve
 - (g) Close the upper gas valve [3].

SUBTASK 12-15-02-020-011-002

- (7) Remove the landing gear strut inflator, SPL-1526.

SUBTASK 12-15-02-420-011-002

- (8) Do the steps that follow for the upper gas valve [3] and lower gas valve [4]:
- (a) Tighten the swivel nut to 5 ft-lb (7 N·m) to 7 ft-lb (9 N·m).
 - (b) Install the cap.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-02-090-008-002



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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LANDING GEAR TIRE - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A check of all the tire pressures
 - (2) A check of all the tire pressures for HOT tires
 - (3) Servicing a tire which has an incorrect pressure.
 - (4) A check of the tire pressure indication system with a tire pressure gage.

TASK 12-15-03-780-801

2. Landing Gear Tire Pressure Check

(Figure 301, Figure 302, Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-1132	Gauge - Tire Pressure, 0-300 PSIG (0-2069 KPa), +/- 3 psig accuracy

C. **Location Zones**

Zone	Area
711	Nose Landing Gear
731	Left Main Landing Gear
741	Right Main Landing Gear

D. **Prepare for the Procedure**

SUBTASK 12-15-03-480-001



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.

E. **Procedure**

SUBTASK 12-15-03-600-001

- (1) Make sure the tires are cool before you measure the tire pressures.

NOTE: Let the tires cool for a minimum of two hours after the airplane has landed.

- (a) If the main landing gear tires and nose landing gear tires are too hot to check the tire pressures, and there is not enough time to allow the tires to cool before the airplane is dispatched, do this task: Landing Gear HOT Tire Pressure Check, TASK 12-15-03-780-802.

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SUBTASK 12-15-03-600-021



IF YOU USE A DIRECT READING GAGE TO MEASURE THE TIRE PRESSURES, MAKE SURE IT IS CORRECTLY CALIBRATED AND HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.

- (2) Use the Tire Pressure and Brake Temperature Monitoring System (TBMS) or the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the tire pressures.
 - (a) If installing a new wheel/tire assembly or replacing a TBMS tire pressure sensor, do this task: Tire Pressure Indication System Check, TASK 12-15-03-610-802.

NOTE: To use the TBMS, push the GEAR button on the display select panel. This will make the tire pressures show on the MFD. The display select panel and the MFD are on the flight deck. The display select panel is part of the P55 glareshield center panel and it is above the control lever for the landing gear.

SUBTASK 12-15-03-610-009

- (3) Make sure to use the same pressure in all the main landing gear tires, and the same pressure in all the nose landing gear tires.

SUBTASK 12-15-03-600-002

- (4) Use the tire pressure tables for the nose landing gear (Figure 302):

NOTE: The inflation pressures that are shown are for cold, loaded tires (for example, with the airplane resting on the tires). For unloaded tires, decrease the pressure by 5 psig (34 kPa).

- (a) For the applicable airplane maximum taxi weight, find the minimum service pressure.
- (b) For the tires in use, find the maximum service pressure.

SUBTASK 12-15-03-600-003

- (5) Use the tire pressure tables for the main landing gear (Figure 302):

NOTE: The inflation pressures that are shown are for cold, loaded tires (for example, with the airplane resting on the tires). For unloaded tires, decrease the pressure by 5 psig (34 kPa).

- (a) For the applicable airplane maximum taxi weight and tire, find the minimum service pressure.
- (b) For the tires in use, find the maximum service pressure.

SUBTASK 12-15-03-610-001

- (6) For these conditions, do this task: Landing Gear Tire Servicing, TASK 12-15-03-610-801.
 - (a) A tire pressure is less than the minimum service pressure.
 - (b) Two tires on the same axle have a pressure difference greater than or equal to 10 psig (69 kPa).
 - (c) The difference between the highest tire pressure on a truck and the lowest is greater than or equal to 10 psig (69 kPa).

————— END OF TASK —————

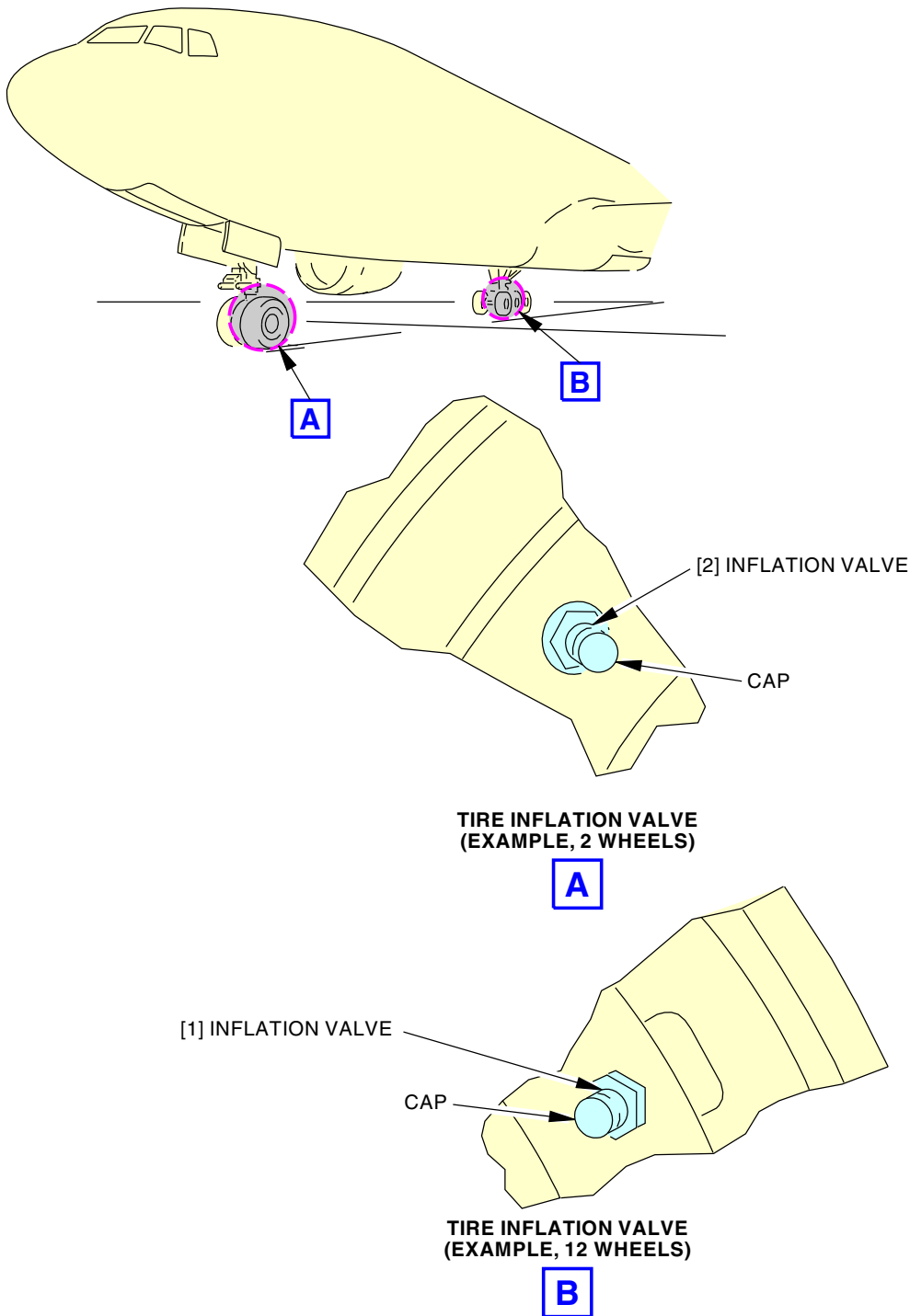
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Landing Gear Tire Servicing
Figure 301/12-15-03-990-805

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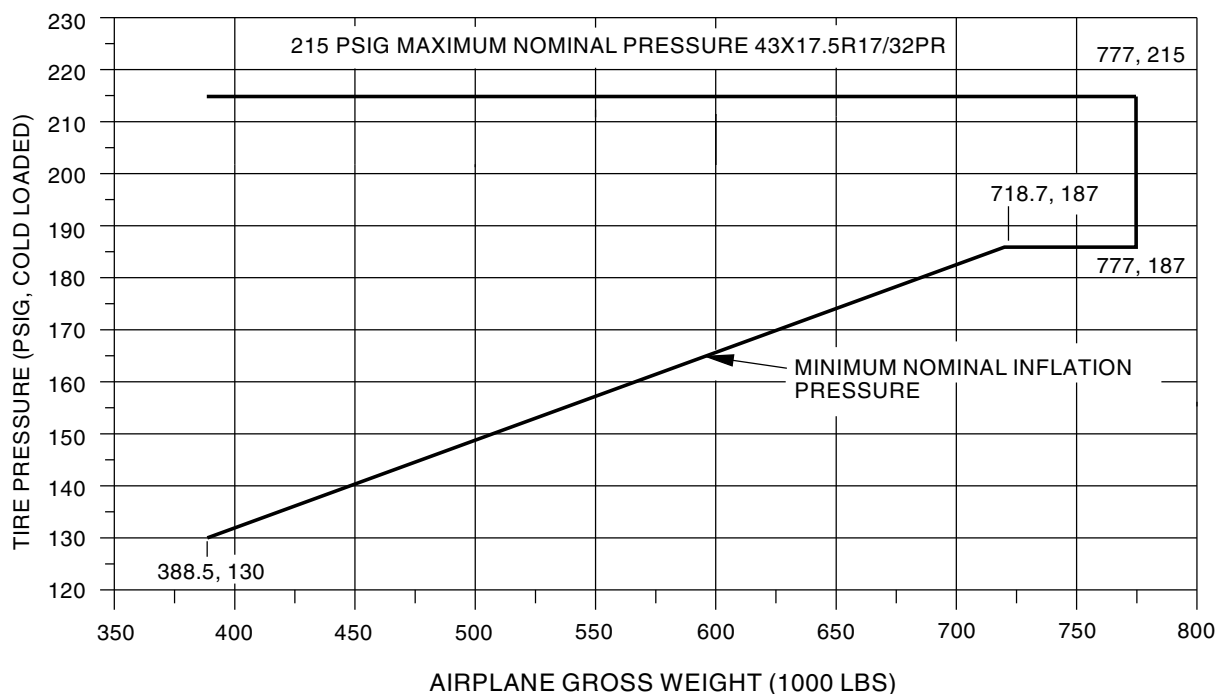
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NOSE LANDING GEAR 777-300ER

TABLE USAGE:

1. FOR THE APPLICABLE MAXIMUM TAXI WEIGHT, DETERMINE THE MINIMUM INFLATION PRESSURE.
2. DETERMINE THE MAXIMUM INFLATION PRESSURE FOR THE TIRE IN USE.
3. SELECT AN INFLATION PRESSURE BETWEEN THE MINIMUM AND THE MAXIMUM INFLATION PRESSURES.
4. INFLATE ALL NLG TIRES WITH NITROGEN TO THE SELECTED INFLATION PRESSURE ± 5 PSIG.

NOTE:

1. YOU MUST INFLATE THE TIRES ON THE SAME AXLE TO THE SAME PRESSURE.
2. THE INFLATION PRESSURES SHOWN ARE FOR COLD, LOADED TIRES (AIRPLANE WEIGHT ON THE TIRES). FOR UNLOADED TIRES REDUCE THE TARGET INFLATION PRESSURE BY 4 PERCENT.
3. FOR THE MAXIMUM TAXI WEIGHT, REFER TO THE AIRPLANE WEIGHT - CG CURVE IN THE WEIGHTS AND BALANCE MANUAL.

M63399 S0006401539_V5

Tire Pressure Limits
Figure 302/12-15-03-990-813 (Sheet 1 of 2)

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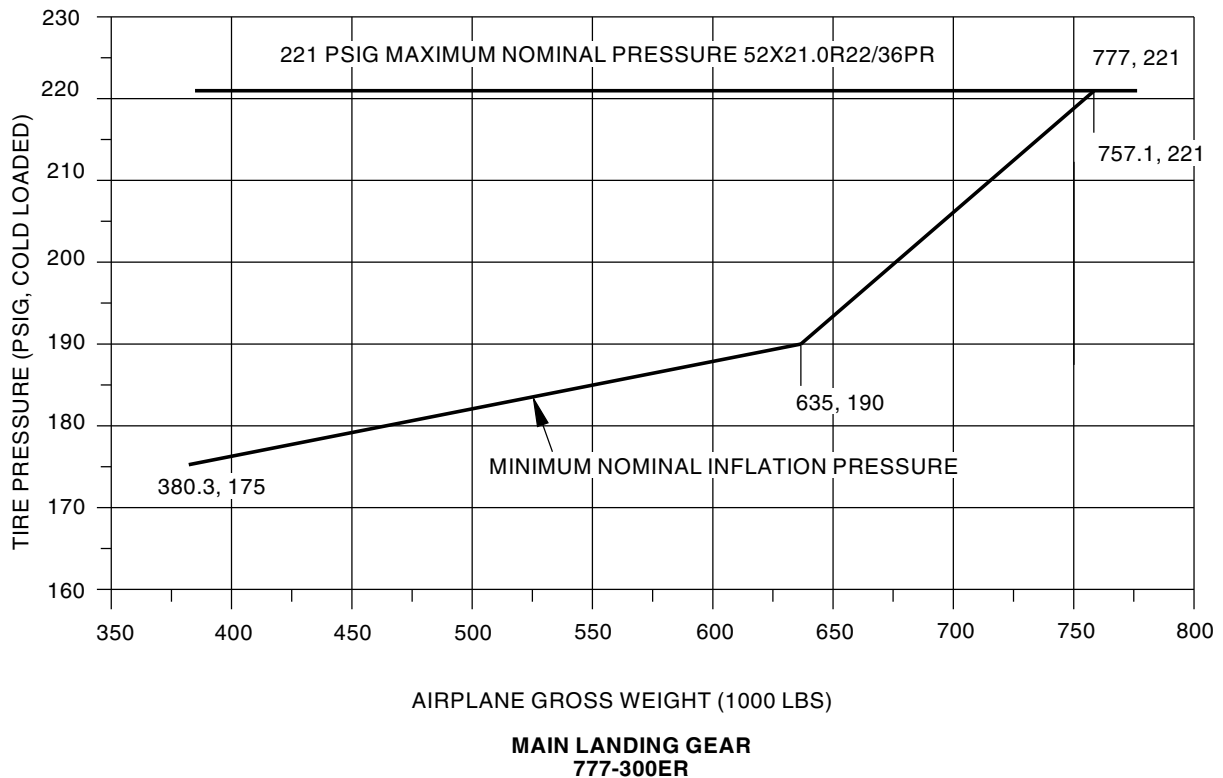


TABLE USAGE:

1. FOR THE APPLICABLE MAXIMUM TAXI WEIGHT, DETERMINE THE MINIMUM INFLATION PRESSURE.
2. DETERMINE THE MAXIMUM INFLATION PRESSURE FOR THE TIRE IN USE.
3. SELECT AN INFLATION PRESSURE BETWEEN THE MINIMUM AND THE MAXIMUM INFLATION PRESSURES.
4. INFLATE ALL MLG TIRES WITH NITROGEN TO THE SELECTED INFLATION PRESSURE ± 5 PSIG.

NOTE:

1. YOU MUST INFLATE THE TIRES ON THE SAME AXLE TO THE SAME PRESSURE.
2. THE INFLATION PRESSURES SHOWN ARE FOR COLD, LOADED TIRES (AIRPLANE WEIGHT ON THE TIRES). FOR UNLOADED TIRES REDUCE THE TARGET INFLATION PRESSURE BY 4 PERCENT.
3. FOR THE MAXIMUM TAXI WEIGHT, REFER TO THE AIRPLANE WEIGHT - CG CURVE IN THE WEIGHTS AND BALANCE MANUAL.

M63450 S0006401542_V4

**Tire Pressure Limits
Figure 302/12-15-03-990-813 (Sheet 2 of 2)**

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TASK 12-15-03-780-802

3. Landing Gear HOT Tire Pressure Check

A. General

- (1) The hot tire pressure check procedure is intended for occasional use only. Do not use the hot tire pressure check as a permanent alternative to the more accurate cold tire checks. The more accurate cold tire pressure check method must be used as frequently as possible to avoid possible tire service life problems such as tread losses and carcass ruptures.



WARNING

STAY AWAY FROM HOT WHEEL, BRAKE, OR TIRE COMPONENTS. IF YOU THINK THAT THESE COMPONENTS ARE HOT, DO THE PROCEDURE FOR HIGH-ENERGY STOP/HEAT DAMAGE. INJURIES TO PERSONNEL CAN OCCUR.

- (2) If the wheel, brake, or tire equipment is suspected of being overheated, do this task: High Energy Stop, TASK 05-51-14-210-801.
- (3) The intent of this task is to provide a method to check tire pressures prior to a two hour cool down of the tires, or for pressure checks subsequent to the required daily pressure check.
- (4) It is recommended that you check the tire pressure after you let the tires cool for a minimum of two hours since the airplane landed.
- (5) If it is not possible to wait the recommended two hours for the tires to cool down before the airplane is dispatched, you can use this task as an alternative inspection just prior to dispatch.



CAUTION

IF YOU USE A DIRECT READING GAGE TO MEASURE THE TIRE PRESSURES, MAKE SURE IT IS CORRECTLY CALIBRATED AND HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.

- (6) It is acceptable to use the Tire Pressure and Brake Temperature Monitoring System (TBMS) or the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the tire pressures.

B. References

Reference	Title
05-51-14-210-801	High Energy Stop (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-45-01-000-801	Main Landing Gear Wheel and Tire Assembly Removal (P/B 401)
32-45-01-400-801	Main Landing Gear Wheel and Tire Assembly Installation (P/B 401)
32-45-02 P/B 401	NOSE LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION
32-45-02-000-801	Nose Landing Gear Wheel and Tire Assembly Removal (P/B 401)
32-45-02-400-801	Nose Landing Gear Wheel and Tire Assembly Installation (P/B 401)

C. Tools/Equipment

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

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Reference	Description
SPL-1527	Inflator - Tire Part #: F70199-25 Supplier: 81205 Part #: F70199-52 Supplier: 81205
STD-1132	Gauge - Tire Pressure, 0-300 PSIG (0-2069 KPa), +/- 3 psig accuracy

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
711	Nose Landing Gear
731	Left Main Landing Gear
741	Right Main Landing Gear

F. Prepare for the Procedure

SUBTASK 12-15-03-480-002



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

- (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.

G. Procedure

SUBTASK 12-15-03-600-016

- (1) Make sure that all antiskid and autobrake system equipment is serviceable.

NOTE: If there are problems with the antiskid or autobrake systems, your average tire pressures can be higher than normal; this could cause you to over-inflate a suspected low pressure tire.

SUBTASK 12-15-03-600-017



CAUTION MAKE SURE THAT THE DIRECT READING GAGE IS CORRECTLY CALIBRATED. MAKE SURE THAT IT HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.



CAUTION DO NOT DEFLATE A HOT TIRE TO LOWER THE PRESSURE TO THE AVERAGE PRESSURE VALUE. PRESSURE SHOULD NEVER BE BLED FROM A HOT TIRE TO ACHIEVE A SPECIFIED VALUE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) If all of the tires can be assumed to be at approximately the same temperature, measure all of the main landing gear tire pressures and make a record of the values.
 - (a) You can use either the TBMS or the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the tire pressures.

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SUBTASK 12-15-03-600-018



DO NOT DEFLATE A HOT TIRE TO LOWER THE PRESSURE TO THE AVERAGE PRESSURE VALUE. PRESSURE SHOULD NEVER BE BLED FROM A HOT TIRE TO ACHIEVE A SPECIFIED VALUE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Use the tire pressure tables for the main landing gear and nose landing gear (use the tire pressures that are listed in the task for performing a tire pressure check) (Figure 302):
NOTE: The inflation pressures that are shown are for cold, loaded tires (for example, with the airplane resting on the tires). For unloaded tires, decrease the pressure by 5 psig (34 kPa).
 - (a) For the applicable airplane maximum taxi weight and tire, find the minimum service pressure.

SUBTASK 12-15-03-610-004

- (4) Make sure the all of the tire pressures are above the minimum "cold" specified pressures for the airplane's maximum taxi weight.

SUBTASK 12-15-03-610-005



DO NOT DEFLATE A HOT TIRE TO LOWER THE PRESSURE TO THE AVERAGE PRESSURE VALUE. PRESSURE SHOULD NEVER BE BLED FROM A HOT TIRE TO ACHIEVE A SPECIFIED VALUE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) If the pressure of one tire is low, calculate the average of the other eleven tires.

SUBTASK 12-15-03-610-006

- (6) If the pressure of the low tire is 5% - 10% less than the average pressure of the other eleven tires, do these steps:



USE A REGULATED PRESSURE SOURCE TO WHEN YOU SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Connect the tire inflator, SPL-1527, to the inflation valve [1] and inflate the tire with nitrogen, G00018, to the average value of the other eleven tires.
- (b) Remove the tire inflator, SPL-1527, from the inflation valve [1].

SUBTASK 12-15-03-610-007

- (7) If the pressure of the low tire is more than 10% below the average of the other tires, do these steps:
 - (a) Replace the wheel and tire assembly. These are the tasks:
 - Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-01-000-801
 - Main Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-01-400-801
 - 1) Send the wheel and tire assembly for an inspection to find the cause for the incorrect tire pressure.

SUBTASK 12-15-03-610-010

- (8) If the tire pressure of one tire is more than 20% below the average pressure of the other tires, do these steps:
 - (a) Replace the wheel and tire assembly. These are the tasks:

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- Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-01-000-801
- Main Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-01-400-801
- 1) Send the wheel and tire assembly for an inspection to find the cause for the incorrect tire pressure.

- (b) If the tire is on the forward or aft axle, then replace the wheel and tire assembly on the opposite side of the axle from the tire with the low pressure. These are the tasks:

NOTE: If the tire is on the center axle, then no replacement is necessary for the wheel and tire assembly on the opposite side.

- Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-01-000-801
- Main Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-01-400-801
- 1) Mark on the tire that it was on the same axle with a wheel and tire assembly that was replaced because of low tire pressure.
- 2) Send the wheel and tire assembly for an inspection to find the cause for the incorrect tire pressure.

SUBTASK 12-15-03-200-001



MAKE SURE THAT THE DIRECT READING GAGE IS CORRECTLY CALIBRATED. MAKE SURE THAT IT HAS AN APPROVED DIAL. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRES TO AN INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRES.

- (9) Use the pressure gage to measure the nose landing gear tire pressures.

SUBTASK 12-15-03-200-002

- (10) For the applicable airplane maximum taxi weight and tire, find the minimum nose tire service pressure (Fig. 302).

SUBTASK 12-15-03-200-003

- (11) Make sure that both of the nose gear tires are above the minimum "cold" specified pressures for the airplane's maximum taxi weight.

SUBTASK 12-15-03-200-004



DO NOT DEFLATE A HOT TIRE TO LOWER THE PRESSURE TO THE AVERAGE PRESSURE VALUE. PRESSURE SHOULD NEVER BE BLED FROM A HOT TIRE TO ACHIEVE A SPECIFIED VALUE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (12) If the pressure of one tire is 5% - 10% below the pressure of the other tire, do these steps:



USE A PRESSURE SOURCE WITH A REGULATOR TO INFLATE THE TIRES. A PRESSURE SOURCE WITHOUT A REGULATOR CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Connect the tire inflator, SPL-1527, to the inflation valve [1] and inflate the tire, with nitrogen, G00018, to the value of the other tire.
- (b) Remove the tire inflator, SPL-1527, from the inflation valve.

SUBTASK 12-15-03-200-005

- (13) If the pressure of the low tire is more than 10% below the pressure of the other tire, do these steps:



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- (a) Replace the tire and wheel assembly (NOSE LANDING GEAR WHEEL AND TIRE ASSEMBLY - REMOVAL/INSTALLATION, PAGEBLOCK 32-45-02/401).
 - 1) Send the tire and wheel assembly for an inspection to find the cause for the low tire pressure.

SUBTASK 12-15-03-200-006

- (14) If the pressure of the low tire is more than 20% below the pressure of the other tire, do these steps.
 - (a) Replace the wheel and tire assembly. These are the tasks:
 - Nose Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-02-000-801
 - Nose Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-02-400-801
 - 1) Send the wheel and tire assembly for an inspection to find the cause of the low tire pressure.
 - (b) Replace the wheel and tire installed on the opposite side of the axle. These are the tasks:
 - Nose Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-02-000-801
 - Nose Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-02-400-801
 - 1) Mark on the tire that it was on the same axle with a wheel and tire assembly that was replaced because of low tire pressure.
 - 2) Send the tire for inspection for damage.

————— END OF TASK —————

TASK 12-15-03-610-801

4. Landing Gear Tire Servicing

(Figure 301, Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) You can add air to the tire when nitrogen is not available, but the oxygen in the air that you add must not be more than 5 percent of the total tire volume.

B. References

Reference	Title
32-45-01-000-801	Main Landing Gear Wheel and Tire Assembly Removal (P/B 401)
32-45-01-400-801	Main Landing Gear Wheel and Tire Assembly Installation (P/B 401)
32-45-02-000-801	Nose Landing Gear Wheel and Tire Assembly Removal (P/B 401)
32-45-02-400-801	Nose Landing Gear Wheel and Tire Assembly Installation (P/B 401)

C. Tools/Equipment

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

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Reference	Description
SPL-1527	Inflator - Tire Part #: F70199-25 Supplier: 81205 Part #: F70199-52 Supplier: 81205
STD-1132	Gauge - Tire Pressure, 0-300 PSIG (0-2069 KPa), +/- 3 psig accuracy

D. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

E. Location Zones

Zone	Area
711	Nose Landing Gear
731	Left Main Landing Gear
741	Right Main Landing Gear

F. Procedure

SUBTASK 12-15-03-020-009

- (1) Do this task: Landing Gear Tire Pressure Check, TASK 12-15-03-780-801.

SUBTASK 12-15-03-020-010

- (2) Choose the inflation pressures to which you will inflate the nose and the main landing gear tires (Figure 302, Figure 303):

NOTE: The inflation pressures that are shown are for cold, loaded tires (for example, with the airplane resting on the tires). For unloaded tires, decrease the pressure by 5 psig (34 kPa).

- (a) For the applicable airplane maximum taxi weight, find the minimum service pressures for the main and nose landing gear tires.
- (b) For the tires in use, find the maximum service pressure.
- (c) Choose a service pressure between the minimum and the maximum service pressures.
- (d) Inflate all tires on the same landing gear to the service pressure you chose, +/- 5 psi (34 kPa).

SUBTASK 12-15-03-610-003



USE A DIRECT READING GAGE TO MEASURE THE TIRE PRESSURE WHEN YOU INFLATE THE TIRE. DO NOT USE THE TIRE PRESSURE INDICATION SYSTEM (TPIS) TO MEASURE THE TIRE PRESSURE WHEN YOU INFLATE THE TIRE. IF YOU USE TPIS WHEN YOU INFLATE THE TIRE, YOU MAY OVERINFLATE OR UNDERINFLATE THE TIRES. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO THE TIRE.

- (3) Do these steps for tires which have tire pressures below the correct pressure (Table 301):

NOTE: The inflation pressures that are shown are for cold, loaded tires (for example, with the airplane resting on the tires). For unloaded tires, decrease the pressure by 5 psig (34 kPa).

- (a) If the tire pressure is less than the correct pressure by 5% or less, do these steps:

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USE A REGULATED PRESSURE SOURCE TO WHEN YOU SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- 1) Connect the tire inflator, SPL-1527, to the inflation valve [1] and inflation valve [2], and inflate the tire with nitrogen, G00018, to the correct pressure.
 - 2) Remove the tire inflator, SPL-1527, from the inflation valve [1] and inflation valve [2].
- (b) If the tire pressure is between 5% - 10% less than the correct pressure, do these steps:



USE A REGULATED PRESSURE SOURCE TO WHEN YOU SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- 1) Connect the tire inflator, SPL-1527, to the inflation valve [1] and inflation valve [2] and inflate the tire with nitrogen, G00018, to the correct pressure.
- 2) Remove the tire inflator, SPL-1527, from the inflation valve [1] and inflation valve [2].
- 3) Measure the tire pressure with the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, again after 24 hours.



REPLACE TIRES THAT YOU MUST FILL MORE FREQUENTLY THAN OTHER TIRES. THESE TIRES SUDDENLY BREAK APART MORE FREQUENTLY THAN OTHER TIRES. THE TREAD OF THESE TIRES WEARS MORE QUICKLY. LOW PRESSURE CAUSES DAMAGE TO THESE TIRES. THEY CAN CAUSE DAMAGE TO OTHER EQUIPMENT.

- 4) If the tire pressure is more than 5% below the correct pressure again, do these steps to replace applicable wheel and tire assembly:
 - a) Replace the wheel and tire assembly installed on the main landing gear. These are the tasks:
 - Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-01-000-801
 - Main Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-01-400-801
 - b) Replace the wheel and tire assembly installed on the nose landing gear. These are the tasks:
 - Nose Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-02-000-801
 - Nose Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-02-400-801
 - c) Send the wheel and tire assembly for an inspection to find the cause for the incorrect tire pressure.
- (c) If the tire pressure is less than the correct tire pressure by more than 10%, do these steps to replace the applicable wheel and tire assembly:
- 1) If the wheel and tire assembly are installed on the main landing gear. These are the tasks:
 - Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-01-000-801



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- Main Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-01-400-801
- 2) If the wheel and tire assembly are installed on the nose landing gear. These are the tasks:
 - Nose Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-02-000-801
 - Nose Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-02-400-801
- 3) Send the wheel and tire assembly for an inspection to find the cause for the incorrect tire pressure.
- (d) If the tire pressure is less than the correct tire pressure by more than 20% and the wheel has turned with the airplane weight on it after the pressure had decreased, then do these steps:
 - 1) For a tire on the nose landing gear, replace the wheel and tire assembly and the wheel and tire assembly installed on the opposite side of that axle. These are the tasks:
 - Nose Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-02-000-801
 - Nose Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-02-400-801
 - 2) For a tire on the forward or aft axle of the main landing gear, replace the wheel and tire assembly and the wheel and tire assembly on the opposite side of that axle. These are the tasks:
 - Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-01-000-801
 - Main Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-01-400-801
 - 3) For a tire on the center axle of the main landing gear, replace the wheel and tire assembly. These are the tasks:
 - Main Landing Gear Wheel and Tire Assembly Removal, TASK 32-45-01-000-801
 - Main Landing Gear Wheel and Tire Assembly Installation, TASK 32-45-01-400-801

NOTE: No tire replacement is necessary for the wheel and tire assembly on the opposite side of the center axle.
- (e) Mark the reason for the tire removal on the tire to aid the inspectors when they examine the tire.
 - 1) For the tires which were on the same axle as a tire with low pressure, mark on the tire that they were on the same axle as a tire with low pressure.
- (f) Send the wheel and tire assembly for an inspection to find the cause for the incorrect tire pressure.

SUBTASK 12-15-03-020-008

- (4) Add nitrogen or air to a tire.

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YOU MUST INITIALLY INFLATE A TIRE WITH NITROGEN. IF YOU INITIALLY INFLATE THE TIRE WITH AIR, THEN THE HOT TIRE CAN MAKE DANGEROUS GASES. THESE GASES CAN MIX WITH THE OXYGEN IN THE TIRE. THIS CAN CAUSE THE TIRE EXPLOSION. A TIRE EXPLOSION CAN CAUSE DAMAGE TO EQUIPMENT AND INJURIES TO PERSONS.

- (a) Install the tire inflator, SPL-1527, to the inflation valve [1] and inflation valve [2].
- (b) If nitrogen is available, inflate the tire with nitrogen, G00018, to the correct pressure (TASK 12-15-03-780-801).
- (c) If nitrogen is not available, air can be used if the oxygen content in the tire is not more than 5% by volume.
 - 1) If refilling with air would result in an oxygen content of more than 5% by volume, deflate tire all the way and refill with nitrogen.
 - 2) Procedure 1 - Make a record of each of the air refill. Calculate the sum of all the air refill pressures and make sure the total is not more than 21 psi (145 kPa).
NOTE: One 21 psi (145 kPa) refill with air can be done before tire must be deflated and reinflated.
 - 3) Procedure 2 - Make a record of each of the air refill. Calculate the sum of all the air refill pressures and make sure the total is not more than the maximum given in Figure 302.
NOTE: Assume the tire is initially inflated to 165 psi with nitrogen. Refer to Figure 302, sum of all air refill pressures that can be added to tire is 30 psi (207 kPa). One 6 psi (41 kPa), one 14 psi (97 kPa), and two 5 psi (34 kPa) refills with air can be done before tire must be deflated and reinflated with nitrogen.

Table 301/12-15-03-993-806 Airplane Tire Servicing

Item No.	Nomenclature	Fluid	Specification	Method of Application	Number of Locations
1	Inflation Valve (main wheel)	nitrogen, G00018	A-A-59503 Type I Grade B or MIL-PRF-27401 Type I Grade A	Charge	12
2	Inflation Valve (nose wheel)	nitrogen, G00018	A-A-59503 Type I Grade B or MIL-PRF-27401 Type I Grade A	Charge	2

— END OF TASK —

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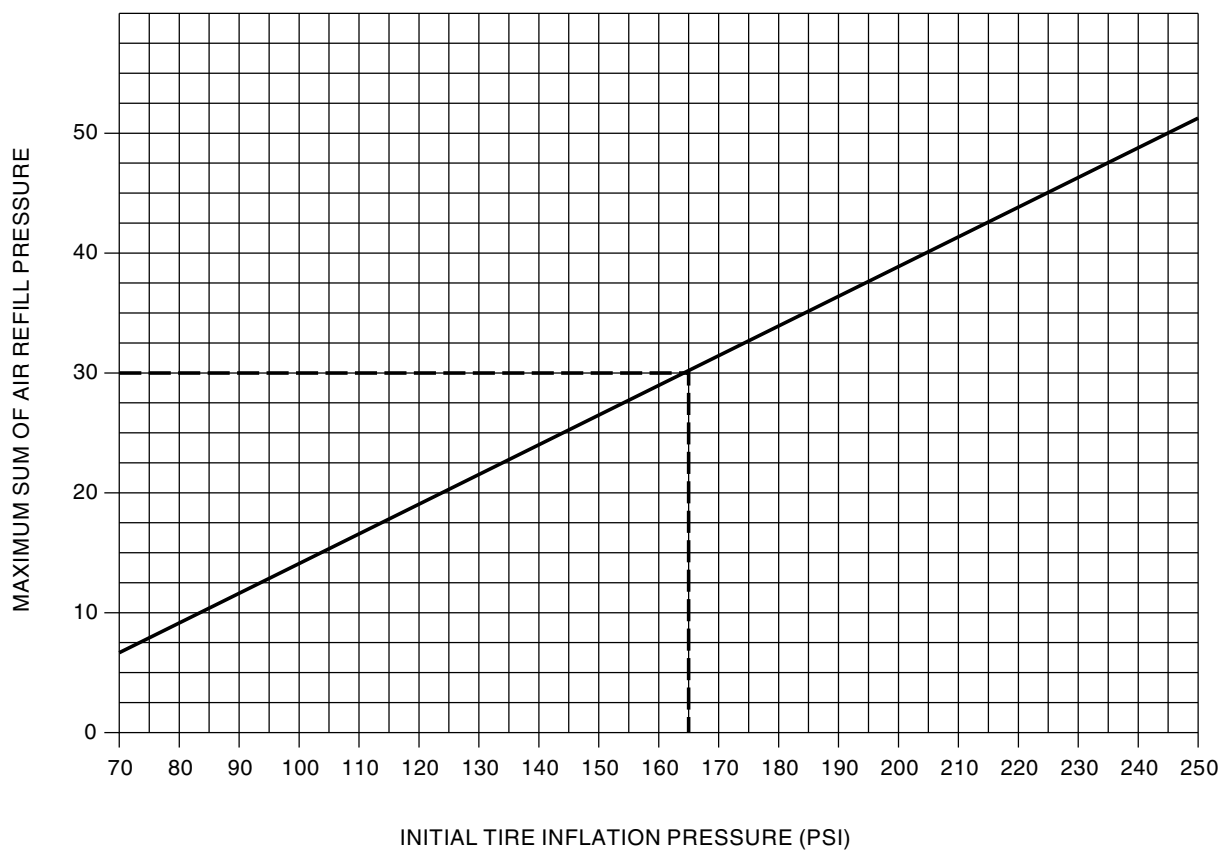
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Air Refill Pressure
Figure 303/12-15-03-990-814

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TASK 12-15-03-610-802

5. Tire Pressure Indication System Check

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives the steps to do a check of the tire pressure indication system. This task is necessary to make sure that the tire pressure indication system values are correct such that you can use them with confidence for the daily tire pressure check.

B. References

Reference	Title
32-49-00-710-801	Tire Pressure Indication System - Functional Check (P/B 501)

C. Tools/Equipment

Reference	Description
STD-1132	Gauge - Tire Pressure, 0-300 PSIG (0-2069 KPa), +/- 3 psig accuracy

D. Location Zones

Zone	Area
711	Nose Landing Gear
731	Left Main Landing Gear
741	Right Main Landing Gear

E. Procedure

SUBTASK 12-15-03-600-007

- (1) Make sure the tires are cool before you measure the tire pressures.
 - (a) Let the tires cool for a minimum of two hours after the airplane has landed.

SUBTASK 12-15-03-600-008

- (2) Use the tire pressure indication system to measure the tire pressures.

NOTE: To use the tire pressure indication system, push the GEAR button on the display select panel. This will make the tire pressures show on the Multi-Function Display (MFD). The display select panel and the multi-function display are on the flight deck. The display select panel is part of the P55 glareshield center panel and it is above the control lever for the landing gear.

- (a) Push the STAT button on the MFD select panel.
- (b) Make sure the TIRE PRESS SYS status message does not show on the Status page.

SUBTASK 12-15-03-600-009

- (3) Write down the tire pressure indication system indicated tire pressure for each tire.

SUBTASK 12-15-03-600-010

- (4) Use the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, to measure the tire pressures.
 - (a) Make sure the direct reading gage is correctly calibrated and has an approved dial.

NOTE: The gage must have an accuracy of ± 6 psi (41 kPa) for pressures of 100 psi (689 kPa) - 230 psi (1586 kPa).

SUBTASK 12-15-03-600-011

- (5) Compare the 0-300 psig (0-2069 kpa) tire pressure gauge, STD-1132, indicated tire pressure with tire pressure indication system indicated tire pressure:

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- (a) If the 0-300 psig (0-2069 kPa) tire pressure gauge, STD-1132, shows the tire pressure is more than ± 10 psi (69 kPa) different than the tire pressure indication system indicated pressure, do this task: Tire Pressure Indication System - Functional Check, TASK 32-49-00-710-801.
- (b) If the 0-300 psig (0-2069 kPa) tire pressure gauge, STD-1132, shows the tire pressure is in the range of ± 10 psi (69 kPa) of the tire pressure indication system indicated pressure, then the tire pressure indication system indicator for that tire is serviceable.

———— **END OF TASK** ————

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BRAKE ACCUMULATOR - SERVICING

1. General

- A. This procedure has these tasks:
 - (1) A check of the brake accumulator precharge pressure
 - (2) Servicing the brake accumulator if it has an incorrect precharge pressure.
- B. You must charge the brake accumulator with nitrogen.
- C. Use the charging instruction placard [6] adjacent to the brake accumulator pressure gage [2] to find the correct accumulator charge pressure for a given temperature (Figure 301).
- D. Use the brake accumulator pressure gage [2] adjacent to the brake accumulator for indication of accumulator pressure.

TASK 12-15-04-610-801

2. Check of the Brake Accumulator Precharge Pressure

(Figure 301)

A. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
24-22-00-860-805	Supply Electrical Power (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)
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)

B. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

C. Procedure

SUBTASK 12-15-04-860-001

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

SUBTASK 12-15-04-480-001



MAKE SURE THAT YOU INSTALL THE DOWNLOCK PINS ON ALL 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 12-15-04-010-001



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.

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

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SUBTASK 12-15-04-860-002

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

SUBTASK 12-15-04-480-002

- (5) Make sure the tires have chocks installed around them (PAGEBLOCK 10-11-05/201).

SUBTASK 12-15-04-860-003

- (6) Release the parking brake.

SUBTASK 12-15-04-860-005

- (7) Fully push the captain's brake pedals twelve times to bleed the fluid from the brake accumulator.

SUBTASK 12-15-04-860-004

- (8) Wait five minutes to allow accumulator gas to reach equilibrium.

SUBTASK 12-15-04-610-001

- (9) Do the steps that follow to do a check of the accumulator charge pressure:
- (a) Use the charging instruction placard [6] to find the correct accumulator pressure for the current ambient temperature of the airplane.
NOTE: The charging instruction placard [6] is located next to the brake accumulator pressure gage [2].
 - (b) Make sure the pressure that shows on the brake accumulator pressure gage [2] is within +/- 100 psig (689 kPa) of the pressure you obtained from the graph on the charging instruction placard [6].
 - (c) If the pressure shown on the brake accumulator pressure gage [2] is not in the correct range of the instructions placard pressure, do this task: Brake Accumulator Servicing, TASK 12-15-04-610-802.

D. Put the Airplane Back to its Usual Condition

SUBTASK 12-15-04-860-008

- (1) Apply the parking brake, if the chocks will be removed.
- (a) Remove the chocks from the tires.



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.



MAKE SURE THAT ALL PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA AROUND THE LANDING GEAR. IF THE LANDING GEAR MOVES, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

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

————— **END OF TASK** —————

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TASK 12-15-04-610-802

3. Brake Accumulator Servicing

(Figure 301)

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. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Cap	32-41-09-01-070	ARO ALL
		32-41-15-01-005	ARO ALL

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right

E. Procedure

SUBTASK 12-15-04-480-003



MAKE SURE THAT YOU INSTALL THE DOWNLOCK PINS 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 12-15-04-610-002

- (2) Do these steps to pressurize the brake accumulator:
 - (a) Remove the cap [3] from the brake accumulator charging valve [5].
 - (b) Attach a source of nitrogen, G00018, to the brake accumulator charging valve [5] (Table 301).



DO NOT LOOSEN THE BODY OF THE HYDRAULIC ACCUMULATOR CHARGING VALVE. THE PRESSURE IN THE HYDRAULIC ACCUMULATORS CAN QUICKLY PUSH THE CHARGING VALVE OFF THE MANIFOLD ASSEMBLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (c) Turn the outer swivel nut [4] of the brake accumulator charging valve [5] one turn counterclockwise.
- (d) Pressurize the brake accumulator to the correct pressure shown on the charging instruction placard [6] next to the brake accumulator pressure gage [2].
 - 1) Use the brake accumulator pressure gage [2] for indication of the brake accumulator pressure.

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- 2) If a large charge was required to service the brake accumulator (for example an additional charge in excess of 150 psi (1034 kPa)), wait five minutes to allow the accumulator gas temperature to reach equilibrium and to make sure the precharge pressure is maintained.
- (e) Turn the outer swivel nut [4] of the brake accumulator charging valve [5] clockwise until it is tight.

Table 301/12-15-04-993-802 Main Landing Gear Brake Accumulator Servicing (Fig. 301)

Item No.	Nomenclature	Fluid	Specification	Method of Application	Number of Locations
1	Gas Valve	nitrogen, G00018	A-A-59503 Type I Grade B or MIL-PRF-27401 Type I Grade A	Charge	1

SUBTASK 12-15-04-610-003

- (3) Do these steps to make sure the brake accumulator pressure does not decrease.
 - (a) Slowly push the captain's brake pedals fully to the stops.
 - (b) If the pressure shown on the brake accumulator pressure gage [2] decreases, do this task again.

SUBTASK 12-15-04-610-004

- (4) Disconnect the source of nitrogen, G00018, from the brake accumulator charging valve [5].

SUBTASK 12-15-04-610-005

- (5) Install the cap [3] on the brake accumulator charging valve [5] and tighten hand tight.

SUBTASK 12-15-04-790-001

- (6) If the brake accumulator pressure was less than the minimum service pressure before you serviced the accumulator, do the steps that follow:

NOTE: You can find the minimum pressure on the graph of ambient temperature and pressure on the charging instruction placard [6].

- (a) Use a soap solution to make sure there are no gas leaks from these components:
 - 1) The gas pressure tube connection to the brake accumulator.
 - 2) The joint in the gas pressure tube to the brake accumulator.
 - 3) The gas pressure tube connections to the manifold assembly [7].
 - 4) The gas pressure tube connections to the brake accumulator pressure gage [2].
 - 5) The brake accumulator pressure gage [2] (including gage face).
 - 6) The brake accumulator charging valve [5]/manifold assembly [7] interface.
 - 7) The pressure transducer [8]/manifold assembly [7] interface.

SUBTASK 12-15-04-860-006

- (7) Wait ten minutes to allow accumulator gas to reach equilibrium.

SUBTASK 12-15-04-860-007

- (8) Make sure the pressure that shows on the brake accumulator pressure gage [2] is within +/- 100 psig (689 kPa) of the pressure you obtained from the graph on the charging instruction placard [6].

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SUBTASK 12-15-04-410-001



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 AND DAMAGE TO EQUIPMENT.

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

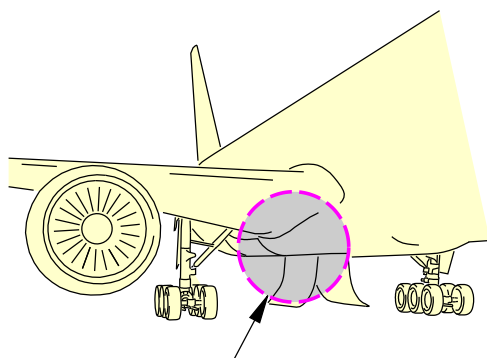
———— **END OF TASK** ————

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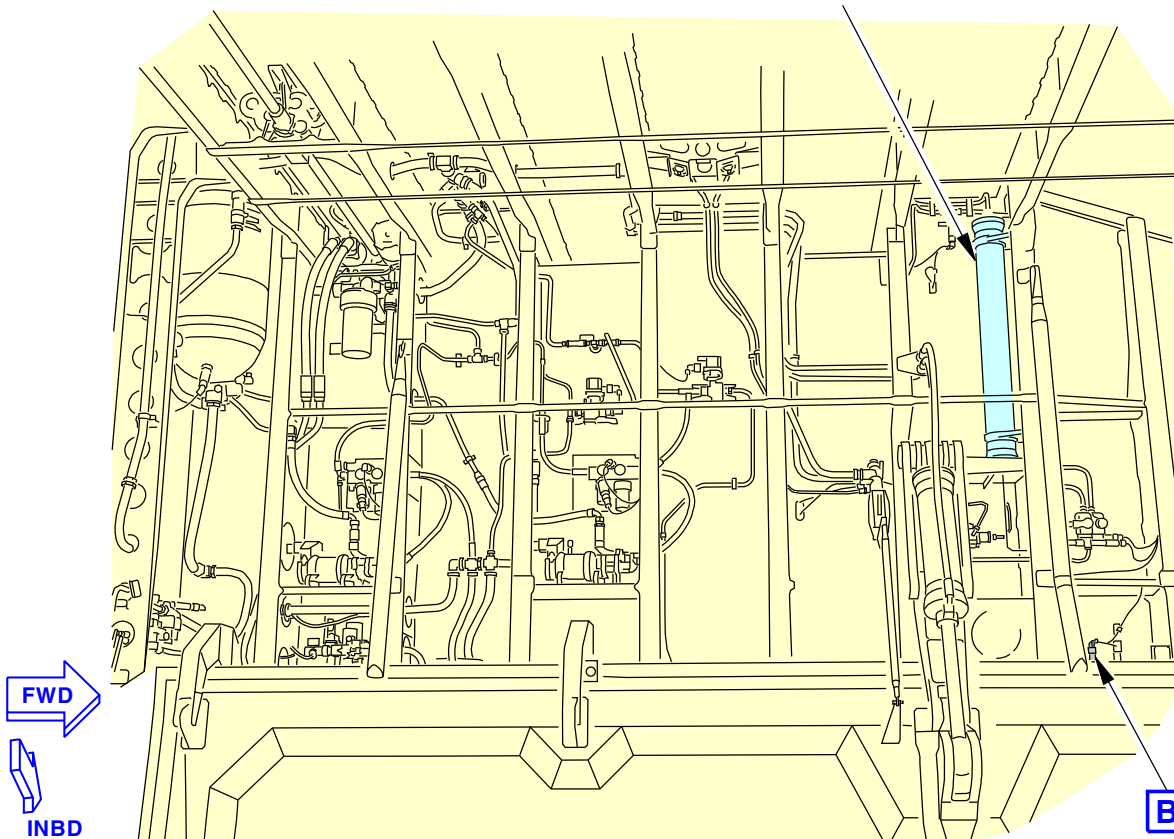
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RIGHT WHEEL WELL

A

BRAKE
ACCUMULATOR



RIGHT WHEEL WELL

A

B

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**Brake Accumulator Servicing
Figure 301/12-15-04-990-801 (Sheet 1 of 3)**

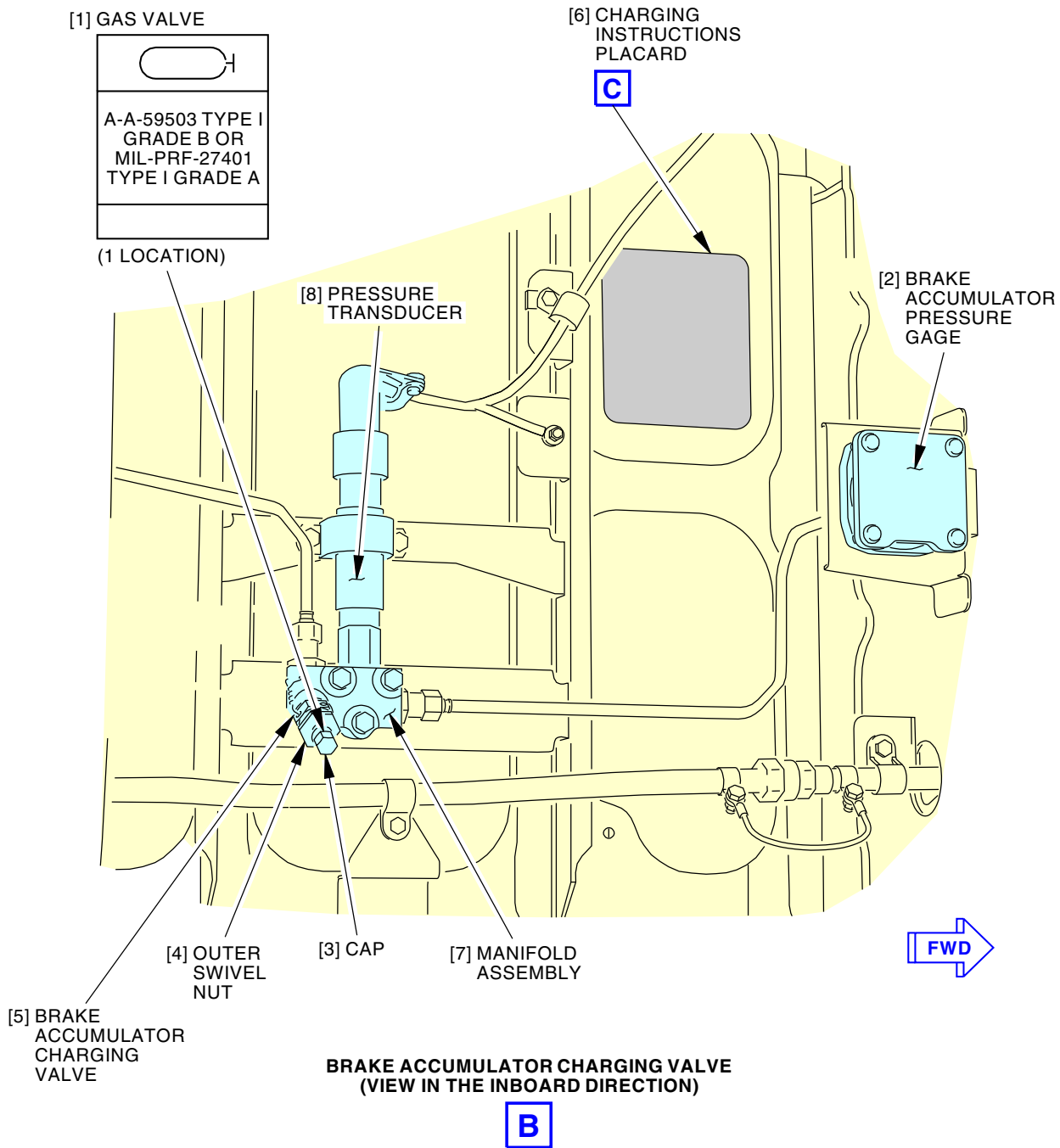
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Brake Accumulator Servicing
Figure 301/12-15-04-990-801 (Sheet 2 of 3)

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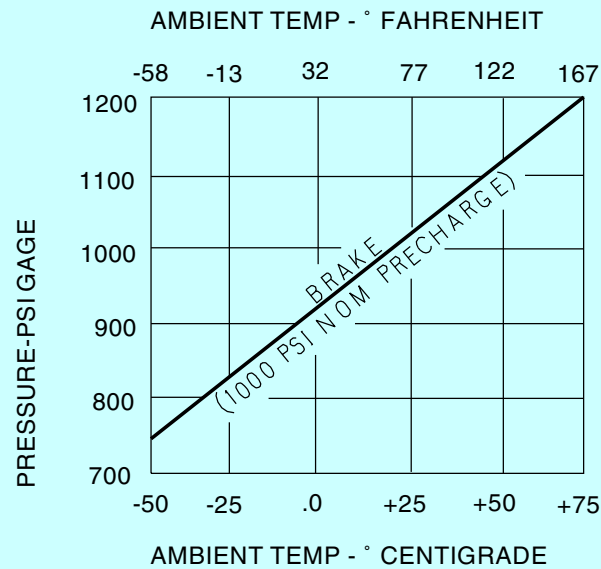
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CHARGING INSTRUCTIONS
HYDRAULIC ACCUMULATOR.
 WITH SYSTEM DEPRESSURIZED,
 CHARGE WITH DRY NITROGEN TO
 APPLICABLE PRESSURE PER CHART
 BELOW ± 100 PSI



CHARGING INSTRUCTIONS PLACARD



 FAHRENHEIT TEMPERATURES DO NOT SHOW ON THE ACTUAL PLACARD.

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Brake Accumulator Servicing
Figure 301/12-15-04-990-801 (Sheet 3 of 3)

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CREW OXYGEN SYSTEM - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Crew Oxygen Cylinder Servicing - Cylinder Replacement
 - (2) Crew Oxygen Cylinder Servicing - Remote Fill Panel
- C. The crew oxygen cylinders are installed in the main equipment center, above the forward wheel well.
 - (1) There are two methods for servicing the crew oxygen cylinders. The first method replaces the oxygen cylinders, and the second method refills the crew oxygen cylinders at the remote fill panel.
- D. The Kevlar composite and carbon fiber composite oxygen cylinders are a basic part to this airplane, however steel cylinders can be used too. The cylinder supports were designed to easily accommodate either a composite or steel cylinder (of the same volume). To convert from a Kevlar composite cylinder to a steel cylinder or a carbon fiber composite cylinder, minor adjustments are necessary to the aft cup and strap. No adjustment is needed to go from a carbon fiber composite cylinder to a steel cylinder.
- E. These are the Tasks to replenish the crew oxygen:
Crew Oxygen Cylinder Servicing - Cylinder Replacement, TASK 12-15-08-900-801, Crew Oxygen Cylinder Servicing - Remote Fill Panel, TASK 12-15-08-610-801.

TASK 12-15-08-900-801

2. Crew Oxygen Cylinder Servicing - Cylinder Replacement

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) This procedure replaces one crew oxygen cylinder. Do the procedure again for each cylinder that you must replace.
NOTE: For airplanes with two cylinders, it is recommended that cylinders with approximately the same pressure are installed.
- (3) The length of the Kevlar composite oxygen cylinder and the steel/carbon fiber composite oxygen cylinder is different. You must adjust the support structure to replace the oxygen cylinder with a cylinder of a different material or a cylinder of the same material but different size.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-11-00-910-801	Standard Torque Values (P/B 201)
20-41-00-910-801	Static Grounding (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
35-00-00-910-801	Oxygen System General Maintenance Practices (P/B 201)
35-11-00-710-802	Crew Oxygen Pressure Indication Test (P/B 501)

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C. Tools/Equipment

Reference	Description
STD-1131	Plug - Protective, Flareless Tube, 1/2-20 Thread

D. Consumable Materials

Reference	Description	Specification
D00386	Lubricant - Solid Film, Air Cured, Corrosion Inhibiting	MIL-L-23398 (NATO S-749)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567
G00624	Bag - Plastic, General Purpose	
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995
G50306	Compound - Leak Detection, Oxygen System	MIL-PRF-25567 (BAC5402)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Oxygen cylinder	35-11-51-01A-015	ARO 001-010
		35-11-51-01A-035	ARO 001-010
		35-11-51-01B-030	ARO 011-999

F. Location Zones

Zone	Area
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left
211	Flight Compartment, Left
212	Flight Compartment, Right

G. Prepare to Replace the Crew Oxygen Cylinder

SUBTASK 12-15-08-910-001



WARNING

MAKE SURE YOU OBEY ALL LOCAL SAFETY PROCEDURES BEFORE YOU DO WORK ON THE GASEOUS OXYGEN SYSTEM. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



WARNING

USE EXTREME CARE TO PREVENT OXYGEN SYSTEM OR ANY OF ITS COMPONENTS FROM BECOMING CONTAMINATED WITH GREASE OR OIL.

- (1) Read and obey the safety precautions and general instructions before you do the maintenance (TASK 35-00-00-910-801).

SUBTASK 12-15-08-860-001

- (2) Make sure that the airplane is electrically grounded (TASK 20-41-00-910-801).

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H. Remove the Crew Oxygen Cylinder

SUBTASK 12-15-08-860-004



DO NOT TIGHTEN THE SHUTOFF VALVE ON THE OXYGEN CYLINDER MORE THAN 25 POUND-INCHES. THIS CAN CAUSE DAMAGE TO THE SHUTOFF VALVE.

- (1) Close the shutoff valve [6] on the two oxygen cylinders [1] slowly.

SUBTASK 12-15-08-020-001

- (2) Disconnect the overboard discharge line [7] from the applicable crew oxygen cylinder [1].

NOTE: Some airplanes have more than one crew oxygen cylinder.

SUBTASK 12-15-08-020-002



LOOSEN THE CONNECTION SLOWLY. THE REMAINING OXYGEN CAN RELEASE WITH A LARGE FORCE, AND CAUSE THE TEMPERATURE TO INCREASE. HEAT AND OXYGEN CAN CAUSE A FIRE. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Loosen the B-nut [3] on the thermal compensator [2] slowly to bleed pressure from the lines.

SUBTASK 12-15-08-020-003

- (4) Disconnect the B-nut [3] on the thermal compensator [2] from the valve assembly.

SUBTASK 12-15-08-420-001



USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- (5) Install a Flareless Tube Plug, 1/2-20 Thread, STD-1131 on the open overboard discharge line [7].

NOTE: Oxygen clean fittings come from a sealed container with a label for use in the oxygen system. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

SUBTASK 12-15-08-420-028

- (6) To install the pressure cap assembly [15] when it is necessary, do the steps that follow:

NOTE: Oxygen clean fittings come from a sealed container with a label for installation in the oxygen system. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

- (a) Install the pressure cap assembly [15] on the external threads of the outlet port on the valve body.
- (b) Make sure to support the valve body with a 1 inch open end wrench.

NOTE: This will prevent damage to the boss seal between the valve assembly and cylinder.

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- (c) Apply a torque of 375 ± 25 in-lb (42 ± 3 N·m) to the pressure cap assembly with a crowfoot torque wrench (Figure 301 or Figure 302 or Figure 303).

SUBTASK 12-15-08-020-032

- (7) If the same oxygen cylinder will not be installed, remove the union [13] and packing [14] (Figure 301 or Figure 302 or Figure 303).
- (a) Keep the union [13] for installation in the replacement oxygen cylinder.

SUBTASK 12-15-08-420-013

- (8) Attach a plastic bag, G00624, on the open end of the thermal compensator [2] and the B-nut [3].

SUBTASK 12-15-08-020-004

- (9) Loosen the retaining nut [4].

SUBTASK 12-15-08-020-005

- (10) Disconnect the aft cup [11].

SUBTASK 12-15-08-020-006

- (11) Remove the applicable crew oxygen cylinder [1].

NOTE: Some airplanes have more than one crew oxygen cylinder.

I. Install the Crew Oxygen Cylinder

NOTE: For airplanes with two cylinders, it is recommended that cylinders with approximately the same pressure are installed.

SUBTASK 12-15-08-640-004

- (1) Apply the lubricant, D00386, or dry film lubricant approved by the airline, to the threads of the T-bolt of the support strap [8].

NOTE: Lubricate the T-bolt threads of the support strap [8] with an approved dry film lubricant (MIL-PRF-23398 or the equivalent) to prevent galling. There are field reports of damage of the aft cap and the strap assembly of the crew cylinder support. The damage occurs in the slot where the T-bolt of the support strap [8] engages the aft cup [11]. The damage is caused by galling of the nut and T-bolt. This causes a high torque condition which can cause damage to the aft cup and the support strap.

SUBTASK 12-15-08-210-020

- (2) Make sure that the hydrostatic test date obeys the regulations.

NOTE: The hydrostatic test date must be in the approved life limit. The life limit is set by national regulatory authorities, the cylinder manufacturer, and the airline.

NOTE: The hydrostatic test date is on the neck of the oxygen cylinder.

SUBTASK 12-15-08-210-002

- (3) Make sure that the crew oxygen cylinder [1] is serviceable.

SUBTASK 12-15-08-870-001



YOU MUST OPEN THE PRESSURE CAP SLOWLY, AND BLEED OFF THE REMAINING PRESSURE. IF YOU REMOVE THE CAP TOO QUICKLY THE CAP CAN BLOW OFF WITH A LARGE FORCE. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Slowly open the pressure cap to bleed off the gas.

NOTE: The pressure-type caps for the oxygen cylinders have metal valve-seats in the valve assembly. They are usually held to the crew oxygen cylinder [1] with chains. Do not cut or remove the chains.

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SUBTASK 12-15-08-010-001

- (5) Remove the pressure cap assembly [15].
 - (a) Make sure to support the valve body with a 1 inch open end wrench.

NOTE: This will prevent damage to the boss seal between the valve assembly and cylinder.
 - (b) Remove the pressure cap assembly [15] from the outlet port of the valve body and store on valve body.

SUBTASK 12-15-08-400-001

- (6) Install the union [13] and the packing [14].
 - (a) Tighten the union [13] from 125 in-lb (14 N·m) to 135 in-lb (15 N·m).

SUBTASK 12-15-08-020-007

- (7) Remove the Flareless Tube Plug, 1/2-20 Thread, STD-1131 from the overboard discharge line [7].

SUBTASK 12-15-08-020-015

- (8) Remove the plastic bag, G00624 from the thermal compensator [2] and the B-nut [3].

SUBTASK 12-15-08-210-003

- (9) Make sure that the fittings on the oxygen lines and ports are clean and serviceable.

SUBTASK 12-15-08-420-002

- (10) Put the crew oxygen cylinder [1] on the cylinder support structure.

SUBTASK 12-15-08-820-001

- (11) Do these steps to adjust the cylinder support structure to change to a longer or shorter oxygen cylinder.
 - (a) Move the aft cup [11] onto the forward or the aft pivot rod [12], if it is necessary.
 - (b) Remove the two bolts [9] from the support strap [8].
 - (c) Adjust the support strap [8] longer or shorter if it is necessary.
 - (d) Install the two bolts [9].

SUBTASK 12-15-08-410-001

- (12) Install the aft cup [11] and put the support strap [8] in its position.

SUBTASK 12-15-08-420-003

- (13) Tighten the retaining nut [4], do this task: Standard Torque Values, TASK 20-11-00-910-801.
 - (a) Make sure that the support strap [8] is tight.
 - (b) Make sure that the retaining nut [4] holds the crew oxygen cylinder [1] tight.

NOTE: This is prevent forward or aft movement of the oxygen cylinder.

SUBTASK 12-15-08-420-004

- (14) Connect the overboard discharge line [7] to the applicable oxygen cylinder [1].

NOTE: Some airplanes have more than one oxygen cylinder.

SUBTASK 12-15-08-420-005

- (15) Connect the thermal compensator [2] to the applicable crew oxygen cylinder [1].

NOTE: Some airplanes have more than one oxygen cylinder.

 - (a) Tighten the B-nut [3] to 420 ±20 in-lb (47 ±3 N·m).

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J. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-08-440-004

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

SUBTASK 12-15-08-440-002



WARNING

OPEN THE SHUTOFF VALVE SLOWLY. THE REMAINING OXYGEN CAN RELEASE WITH A LARGE FORCE WHICH CAN CAUSE A FIRE. THIS COULD CAUSE INJURY TO PERSONS AND DAMAGE TO THE AIRPLANE.

- (2) Slowly open the shutoff valve [6] fully on each crew oxygen cylinder [1].

NOTE: The shutoff valve will be fully open after approximately 6 turns in a counterclockwise direction.

NOTE: The lower cylinder can become warm if the top cylinder pressure is higher when you open the shutoff valves. Slowly open the shutoff valves. This will decrease the temperature of the lower cylinder when the top cylinder is at a higher pressure.

- (a) Close the shutoff valve [6] one fourth of a turn.
(b) Attach an inspection MS20995CY20 lockwire, G02479 to hold the valve in this position (TASK 20-10-23-400-801).

K. System Operational Check

SUBTASK 12-15-08-010-004

- (1) Get access to the crew oxygen mask regulator in the flight compartment (Figure 304).

SUBTASK 12-15-08-440-001

- (2) Examine the crew oxygen cylinder pressure in EICAS.

SUBTASK 12-15-08-210-021

- (3) Push down and hold the Reset/Test slide control on the stowage box to the TEST position.
(a) If the pressure decreases to 100 psig (689 kPa) or comes back slowly, make sure that the cylinder is fully open.
(b) Make sure that the flow indicator on the stowage box shows a yellow flow indication, and then a no flow indication (black).

SUBTASK 12-15-08-200-001

- (4) Continue to hold the Reset/Test slide control on the stowage box in the test position. Then, push and hold the Emergency/Test Selector Knob (red safety button) on the mask regulator to TEST for 10 seconds.
(a) Make sure that the Flow indicator shows a constant yellow flow indication.
(b) Make sure that you can hear the oxygen flow from the mask.
(c) Make sure that the crew oxygen pressure in EICAS does not decrease more than 100 psig (689 kPa).
(d) If the pressure decreases to 100 psig (689 kPa) or comes back slowly, make sure that the cylinder is fully open.

SUBTASK 12-15-08-210-022

- (5) Release the Emergency/Test Selector Knob (red safety button).
(a) Make sure that the flow indicator on the stowage box shows a zero flow indication (black).

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SUBTASK 12-15-08-040-001

- (6) Release the Reset/Test slide control on the stowage box.
- (a) Make sure that the yellow indicator does not show in the flow indicator.

SUBTASK 12-15-08-710-001

- (7) Do this task: Crew Oxygen Pressure Indication Test, TASK 35-11-00-710-802.

SUBTASK 12-15-08-280-006

- (8) Make sure that the installed cylinder is serviceable.

SUBTASK 12-15-08-790-001

- (9) Apply the leak detection compound, G50306, or Snoop Leak Detector compound, G00091, to all of the fittings and connections.
- (a) Look for bubbles to find all the leaks.
- (b) Remove the leak detection compound, G50306, or Snoop Leak Detector compound, G00091, with a clean cotton wiper, G00034, immediately after the check.
- (c) Make sure that the fitting and connections are dry.
- (d) If you find leaks, they must be repaired.

NOTE: Leaks in the oxygen system must not be permitted to continue.

———— **END OF TASK** ————

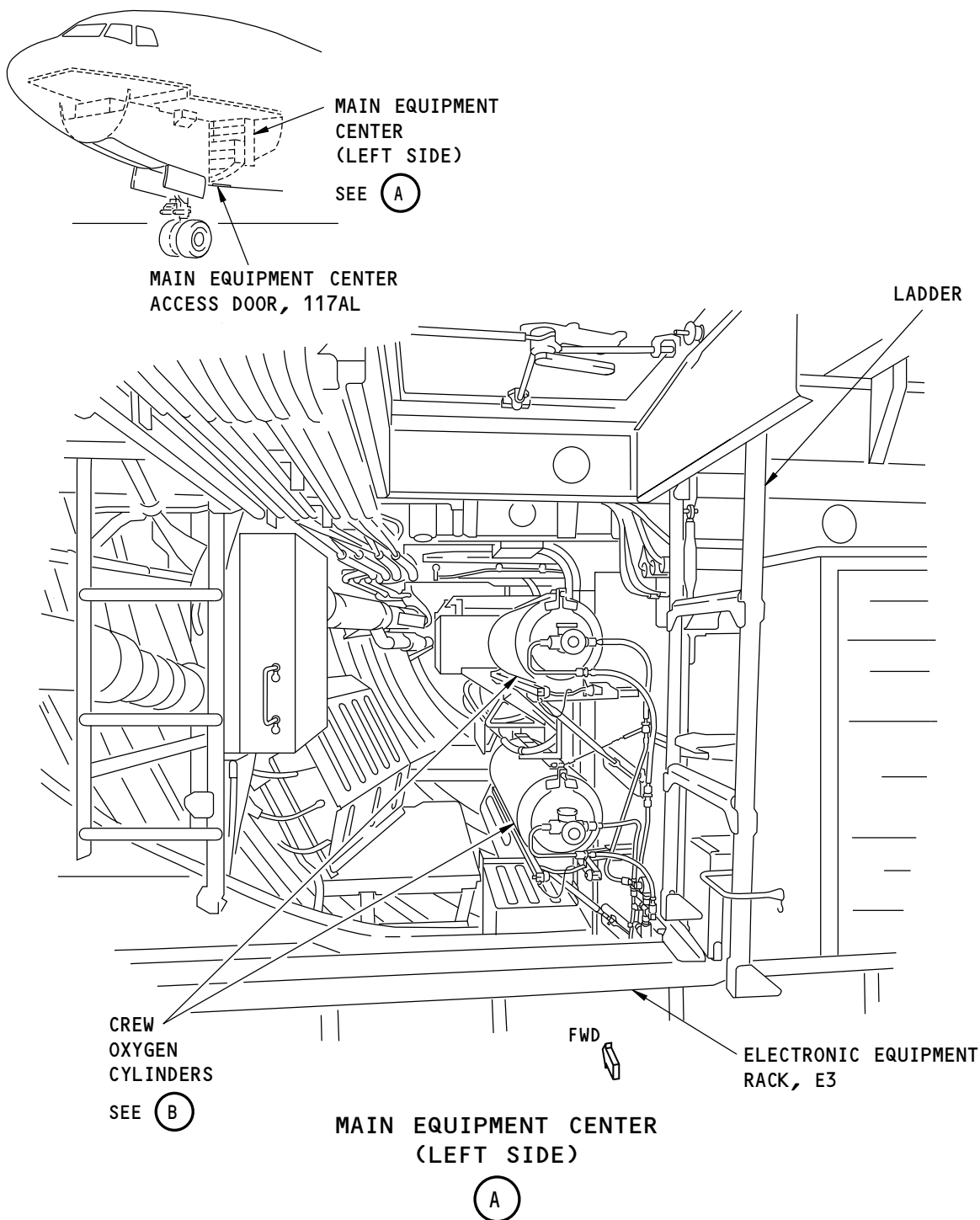
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G99873 S0006401599_V1

Crew Oxygen Servicing
Figure 301/12-15-08-990-801 (Sheet 1 of 5)

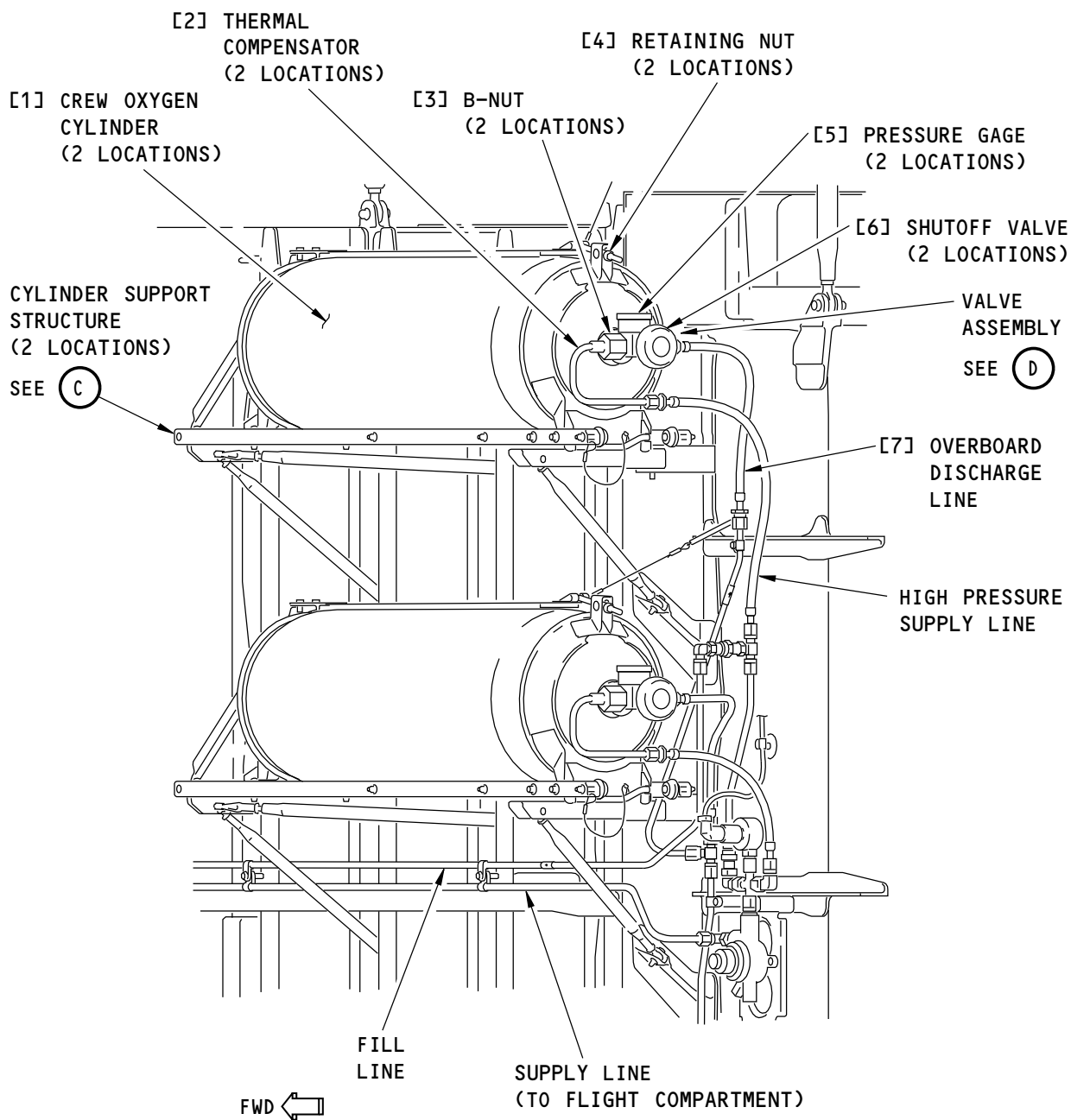
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CREW OXYGEN CYLINDERS

(B)

H27736 S0006401603_V2

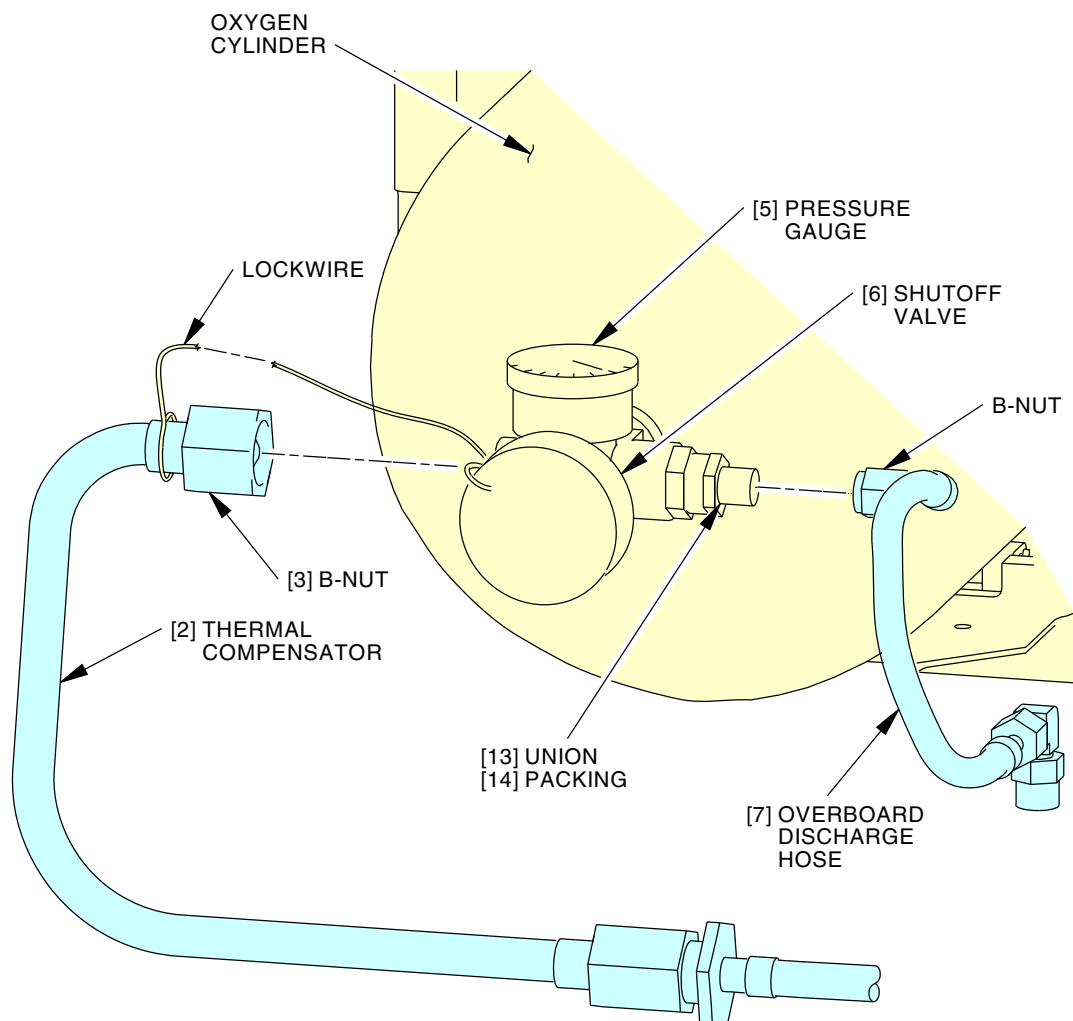
**Crew Oxygen Servicing
Figure 301/12-15-08-990-801 (Sheet 2 of 5)**

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**VALVE ASSEMBLY
(EXAMPLE)**

D

2018912 S0000399150_V3

Crew Oxygen Servicing
Figure 301/12-15-08-990-801 (Sheet 3 of 5)

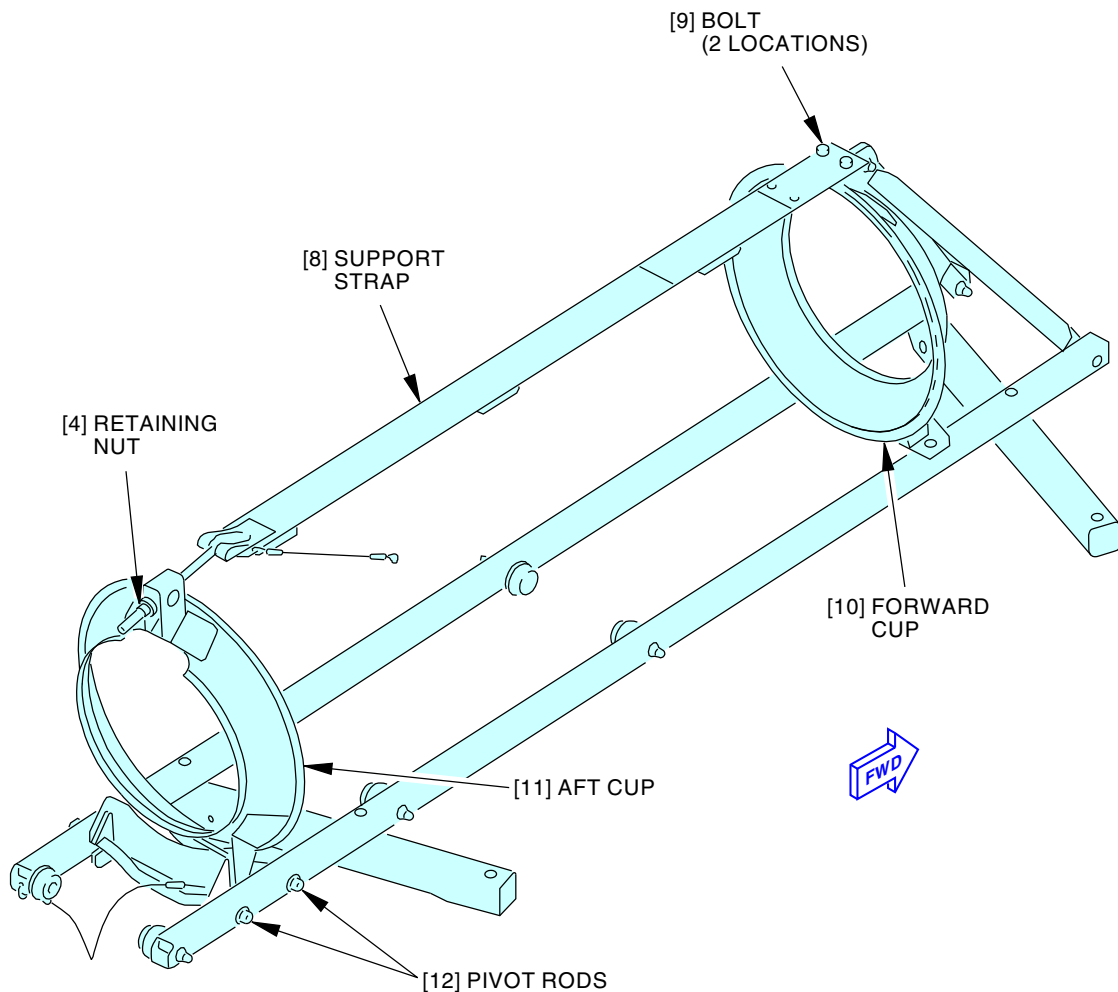
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CYLINDER SUPPORT STRUCTURE



C35722 S0006401605_V2

Crew Oxygen Servicing
Figure 301/12-15-08-990-801 (Sheet 4 of 5)

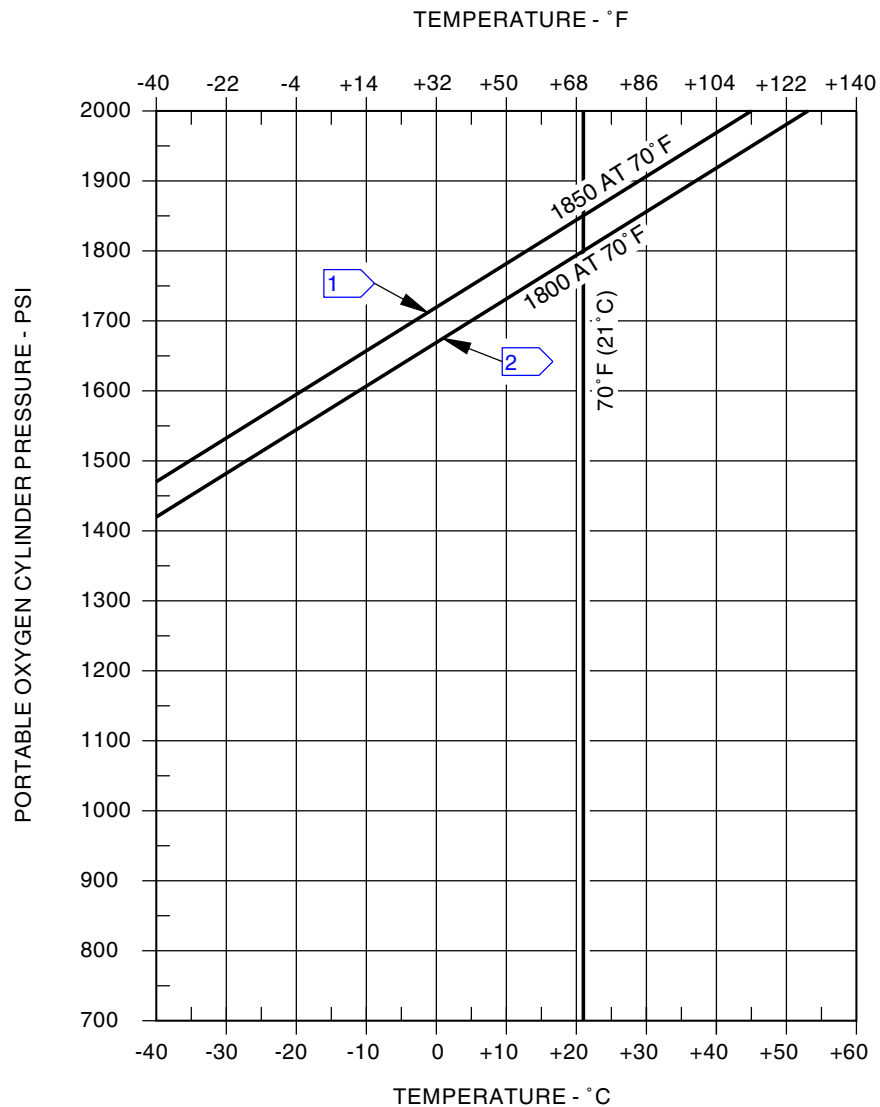
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NOTE:

MAXIMUM ALLOWABLE PRESSURE FOR FULLY SERVICED PORTABLE OXYGEN CYLINDER.

- 1 US DOT-SP-8162-1850 COMPOSITE CYLINDER OR US DOT-SP-10915-1850 (COMPOSITE)
- 2 US DOT-3AA-1800 (STEEL)

C73590 S0006401606_V2

Crew Oxygen Servicing
Figure 301/12-15-08-990-801 (Sheet 5 of 5)

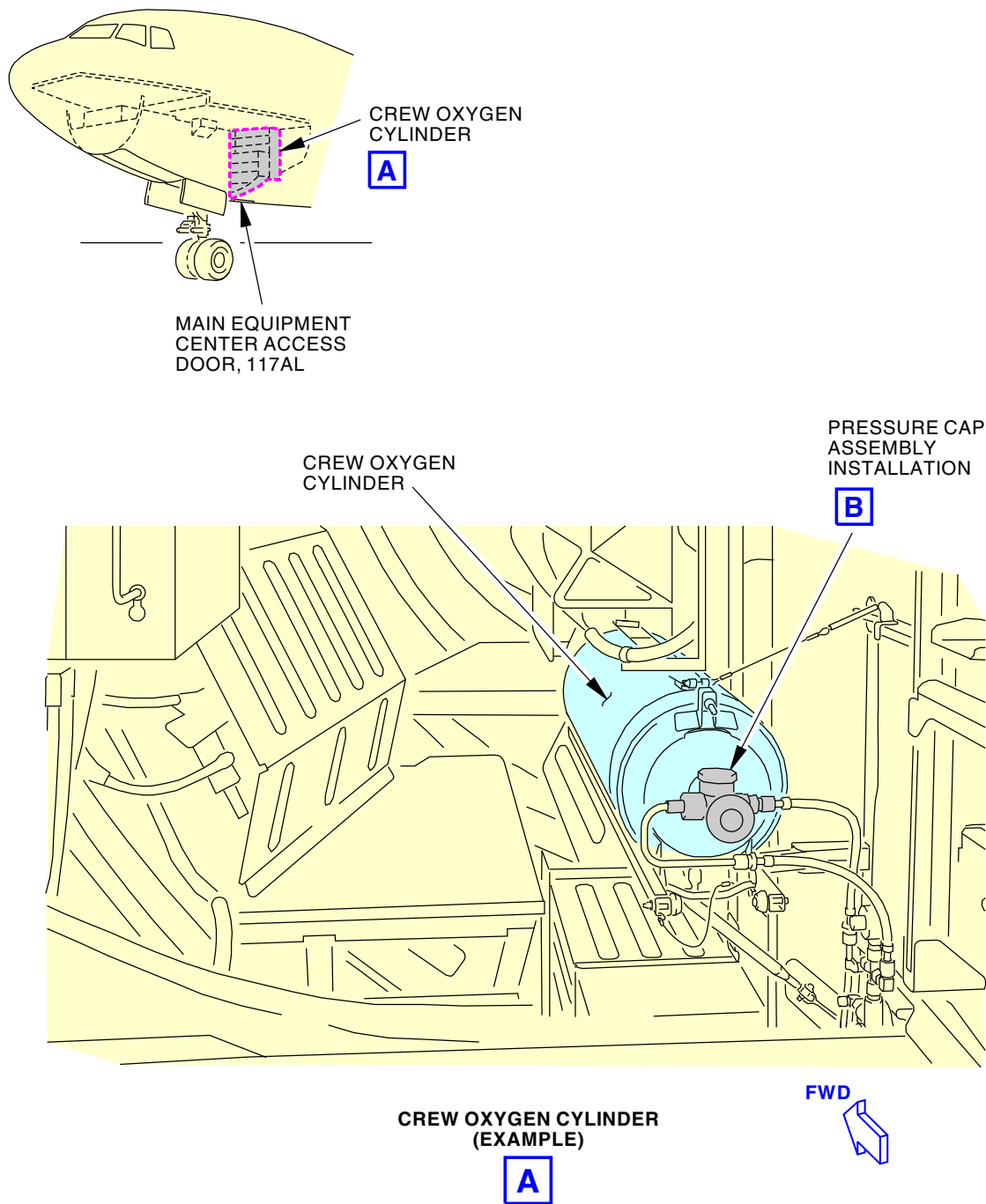
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2298151 S0000521510_V2

Pressure Cap Assembly Installation
Figure 302/12-15-08-990-815 (Sheet 1 of 2)

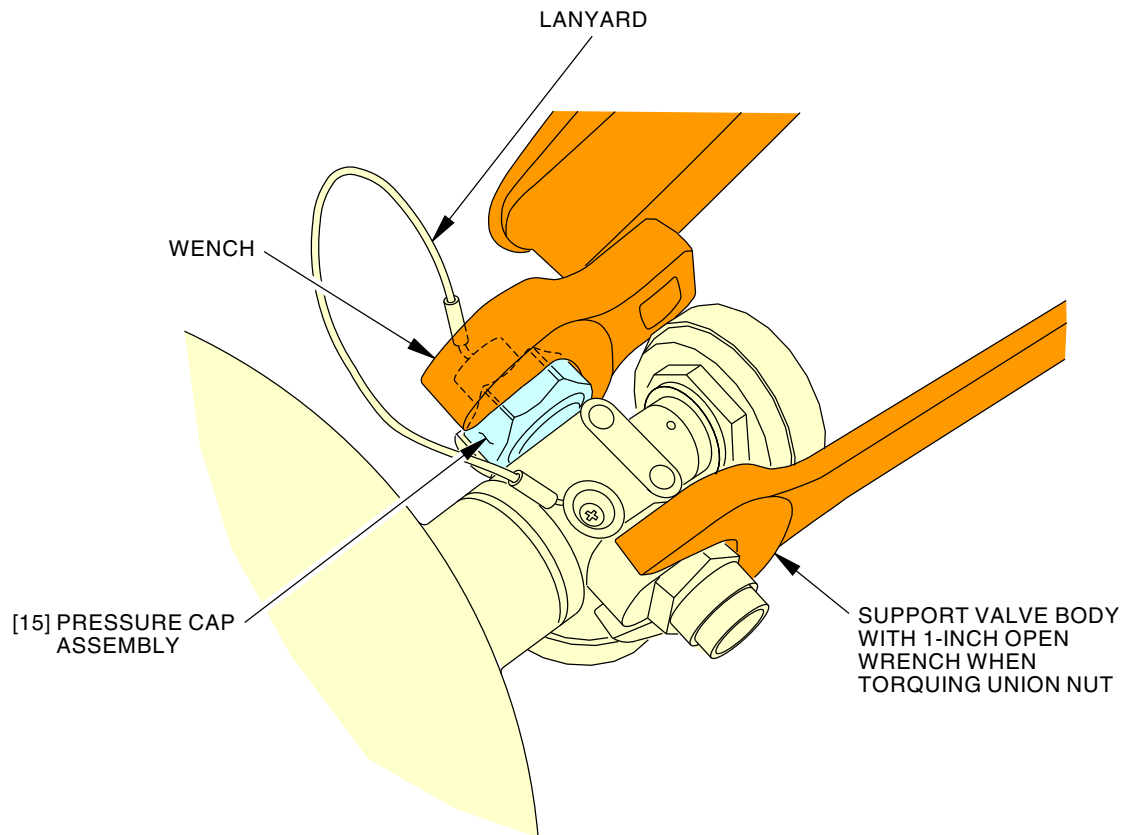
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**PRESSURE CAP INSTALLATION
(EXAMPLE)**

B

2298152 S0000521511_V5

**Pressure Cap Assembly Installation
Figure 302/12-15-08-990-815 (Sheet 2 of 2)**

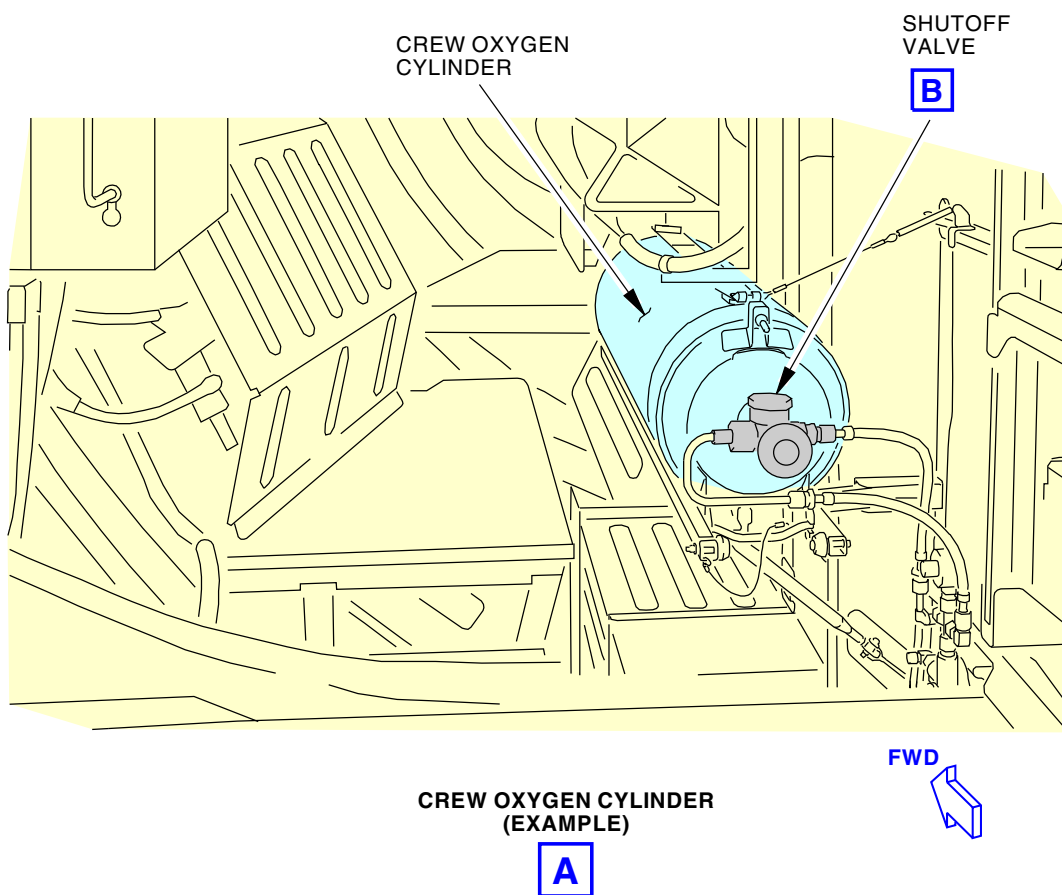
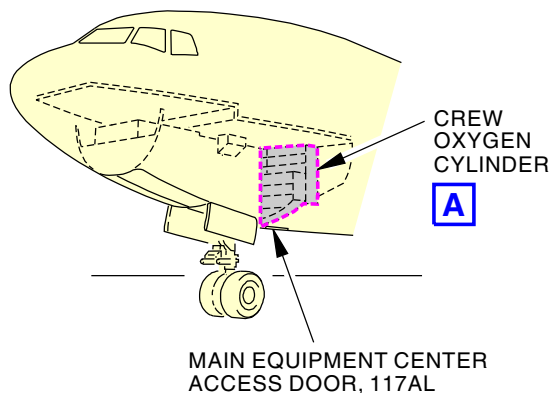
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2385496 S0000545797_V2

**Oxygen Valve Open/Closed Indicator
Figure 303/12-15-08-990-816 (Sheet 1 of 2)**

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ARO 011-999

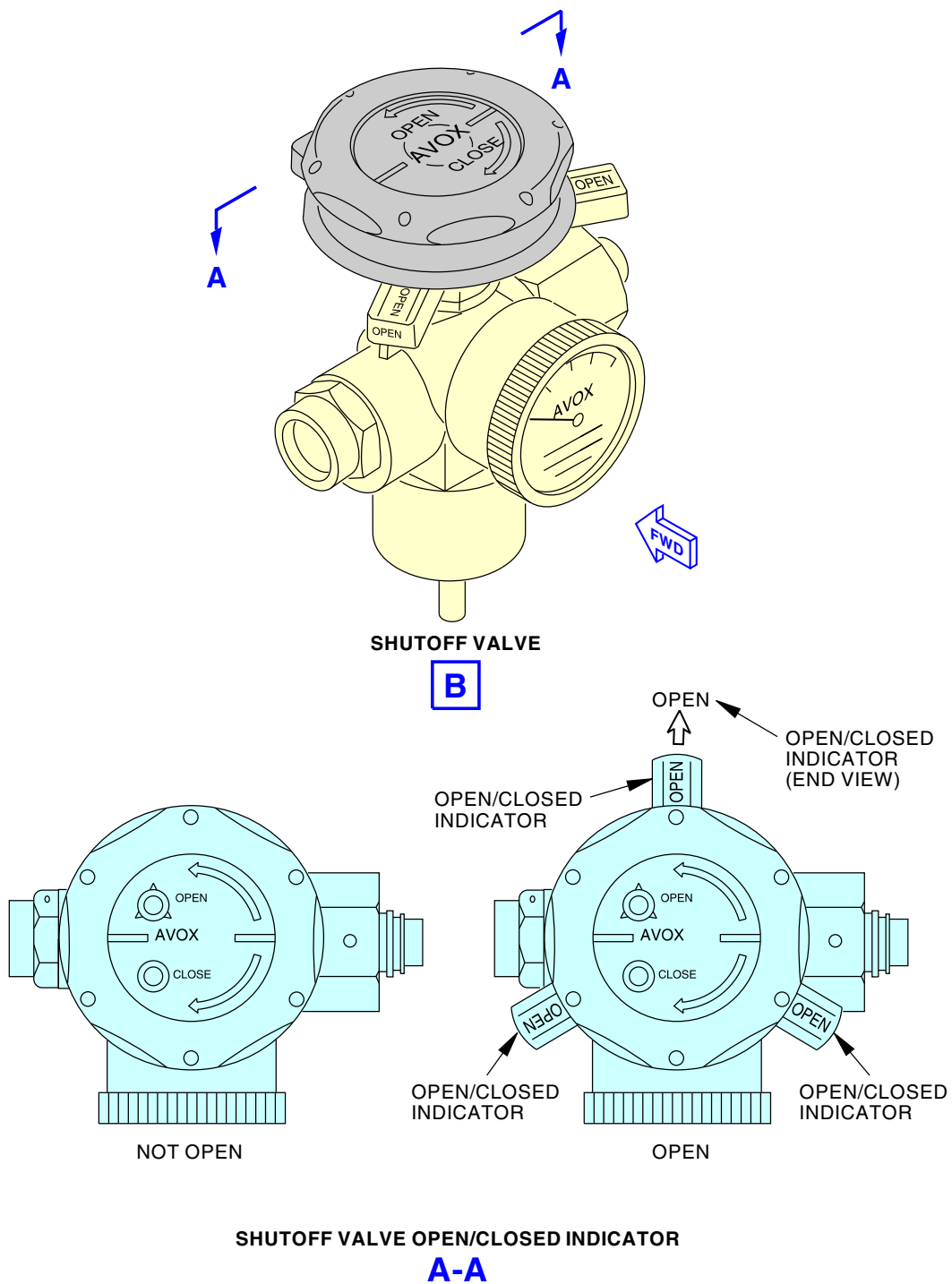
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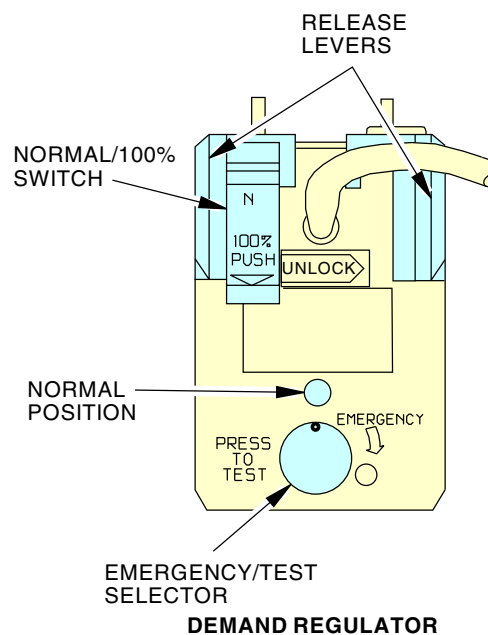
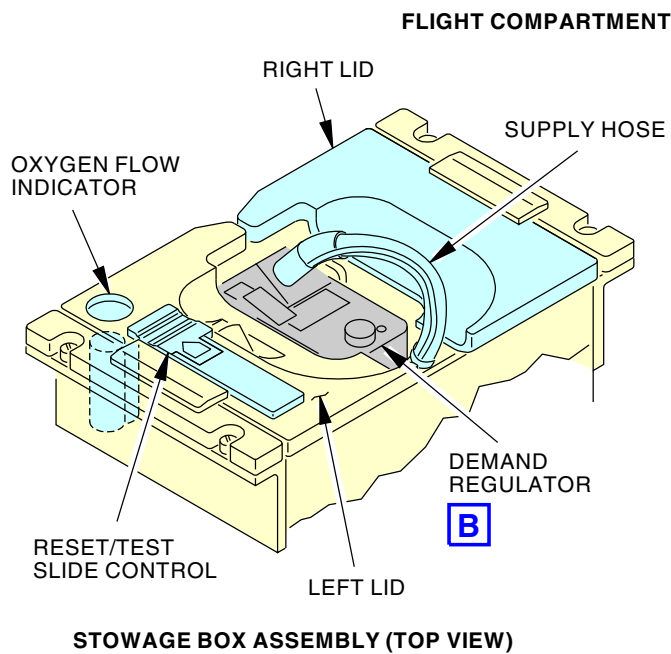
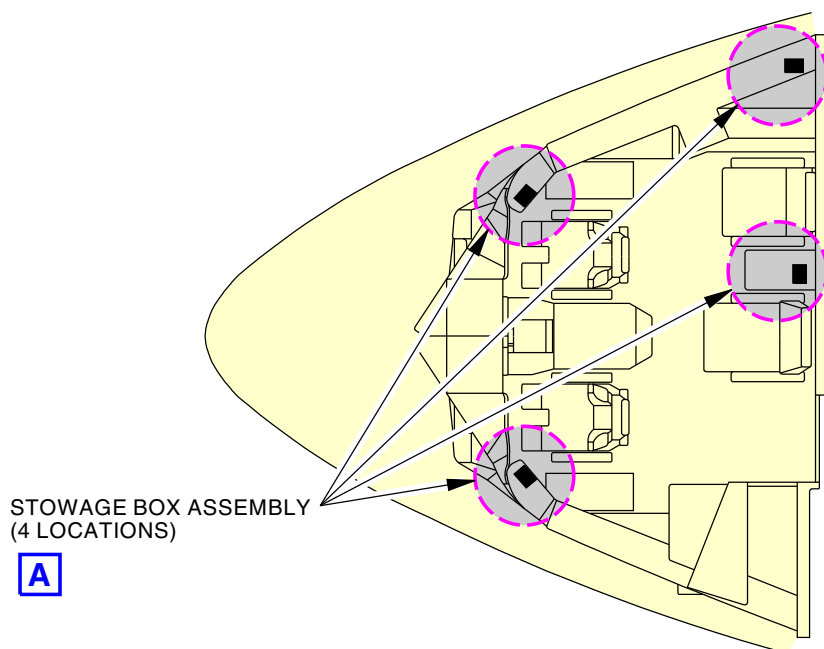
Oxygen Valve Open/Closed Indicator
Figure 303/12-15-08-990-816 (Sheet 2 of 2)

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J64422 S0000171845_V3

**Crew Oxygen System Operational Check
Figure 304/12-15-08-990-814**

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TASK 12-15-08-610-801

3. Crew Oxygen Cylinder Servicing - Remote Fill Panel

(Figure 305)

A. References

Reference	Title
35-00-00-420-801	Installation of Threaded Caps on Open Oxygen Lines (P/B 201)
35-00-00-910-801	Oxygen System General Maintenance Practices (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-1543	Cart - Oxygen Bottle (Less Bottles) Part #: 20-4505-7000 Supplier: 59603 Part #: 7090-011 Supplier: 00994 Part #: NBOT Supplier: D2029 Opt Part #: 7090-010 Supplier: 00994 Opt Part #: 9761-010 Supplier: 00994
STD-1130	Cap - Protective, Flareless Tube, 1/2-20 Thread
STD-1131	Plug - Protective, Flareless Tube, 1/2-20 Thread
STD-1441	Cart - Oxygen

C. Consumable Materials

Reference	Description	Specification
G00019	Oxygen - Aviator's Breathing, Liquid And Gas	MIL-PRF-27210 (Supersedes MIL-O-27210)

D. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
115	Area Outboard and Above Nose Landing Gear Wheel Well, Left

E. Procedure

SUBTASK 12-15-08-910-002



WARNING

MAKE SURE YOU OBEY ALL LOCAL SAFETY PROCEDURES BEFORE YOU DO WORK ON THE GASEOUS OXYGEN SYSTEM. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



WARNING

USE EXTREME CARE TO PREVENT OXYGEN SYSTEM OR ANY OF ITS COMPONENTS FROM BECOMING CONTAMINATED WITH GREASE OR OIL.

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(WARNING PRECEDES)



WARNING

DURING THE SERVICING PROCEDURES OF THE CREW OXYGEN SYSTEM, MAKE SURE THE AIRCRAFT AND OXYGEN CART IS CORRECTLY GROUNDED. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Read and obey the safety precautions and general instructions before you do the maintenance (TASK 35-00-00-910-801).

SUBTASK 12-15-08-212-001

- (2) Make sure the system pressure is not below 100 psi (689 kPa).

NOTE: If system pressure is below 100 psi (689 kPa) the oxygen cylinders should not be serviced at the remote fill panel. Service by replacing cylinders.

SUBTASK 12-15-08-610-001

- (3) Set the pressure compensator dial on the fill valve to the system pressure.

SUBTASK 12-15-08-610-002

- (4) Set the dial on the fill valve to the oxygen cylinder temperature.

SUBTASK 12-15-08-610-003

- (5) Set the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441) regulator to 100-150 psig.

SUBTASK 12-15-08-610-004

- (6) Temporarily open the shutoff valve on the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441) to remove gas from the fill line.

SUBTASK 12-15-08-420-011



WARNING

MAKE SURE YOUR HANDS, TOOLS, EQUIPMENT, AND CLOTHING USED IN THE WORK AREA DOES NOT HAVE DIRT, OIL, OR GREASE ON THEM. DO NOT LET THIS CONTAMINATION GO INTO THE OXYGEN SYSTEM. IF THIS CONTAMINATION MIXES WITH OXYGEN GAS, THEY CAN IGNITE. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (7) Install the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441) in the fill panel.

NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

SUBTASK 12-15-08-210-005



WARNING

MAKE SURE THAT YOU USE ONLY AVIATOR'S BREATHING OXYGEN IN THE AIRPLANE. UNSATISFACTORY QUALITY OXYGEN CAN CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL.

- (8) Make sure the oxygen cylinders on the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441) use oxygen, G00019 that is permitted for airplane use.

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SUBTASK 12-15-08-610-006

- (9) With the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441) regulator set at 100-150 psig, fully open the shutoff valve on the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441).

SUBTASK 12-15-08-610-007

- (10) Slowly increase the pressure on the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441) regulator.

SUBTASK 12-15-08-610-008

- (11) Keep the pressure at 200-250 psig above the lowest system pressure until the fill valve automatically shuts off.

SUBTASK 12-15-08-210-007

- (12) Make sure the oxygen cylinder pressure gage is not more than 1800 $\pm$ 50 psi at 70 °F (21 °C).

NOTE: See (Figure 305) for equivalent oxygen cylinder pressures for temperatures other than 70 °F (21 °C).

SUBTASK 12-15-08-610-009

- (13) Close the shutoff valve on the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441).

SUBTASK 12-15-08-610-010

- (14) Disconnect the oxygen cart, COM-1543 (or equivalent oxygen cart, STD-1441).

SUBTASK 12-15-08-610-011



USE ONLY OXYGEN-CLEAN COMPONENTS IN THE OXYGEN SYSTEM. IF YOU DO NOT USE OXYGEN-CLEAN COMPONENTS, A FIRE OR AN EXPLOSION CAN OCCUR. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS.

- (15) Install a Flareless Tube Cap, 1/2-20 Thread, STD-1130 or Flareless Tube Plug, 1/2-20 Thread, STD-1131 on the open line, Installation of Threaded Caps on Open Oxygen Lines, TASK 35-00-00-420-801

NOTE: Oxygen clean fittings come from a sealed package labeled for oxygen system installation. Make sure that you use only oxygen clean fittings. Some fittings used in the oxygen system are the same as fittings in other systems and are not oxygen clean. If it is necessary to clean parts, use the applicable oxygen procedures to clean the parts. This also applies to tube caps or plugs which must be as clean as the installation connections.

SUBTASK 12-15-08-410-002

- (16) Close and latch the servicing panel door.

SUBTASK 12-15-08-280-008

- (17) Make sure the crew oxygen cylinders have the minimum oxygen pressure necessary for dispatch (Figure 305 (Sheet 3)).

————— **END OF TASK** —————

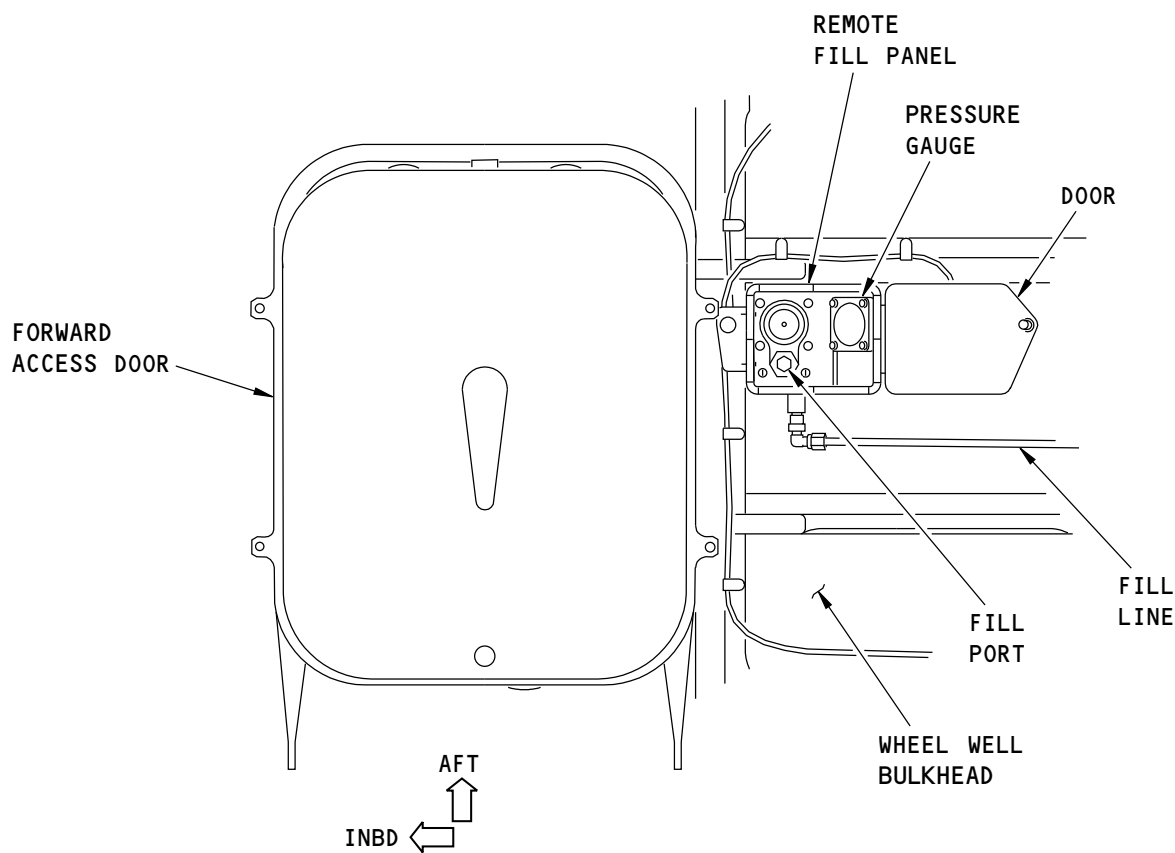
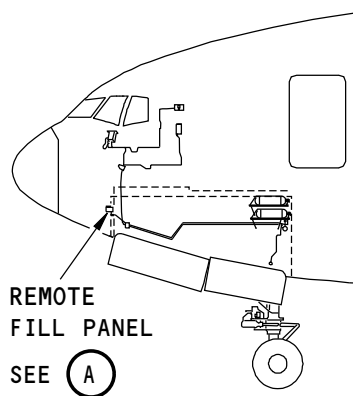
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REMOTE FILL PANEL

(A)

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**Remote Fill Panel Servicing
Figure 305/12-15-08-990-802 (Sheet 1 of 3)**

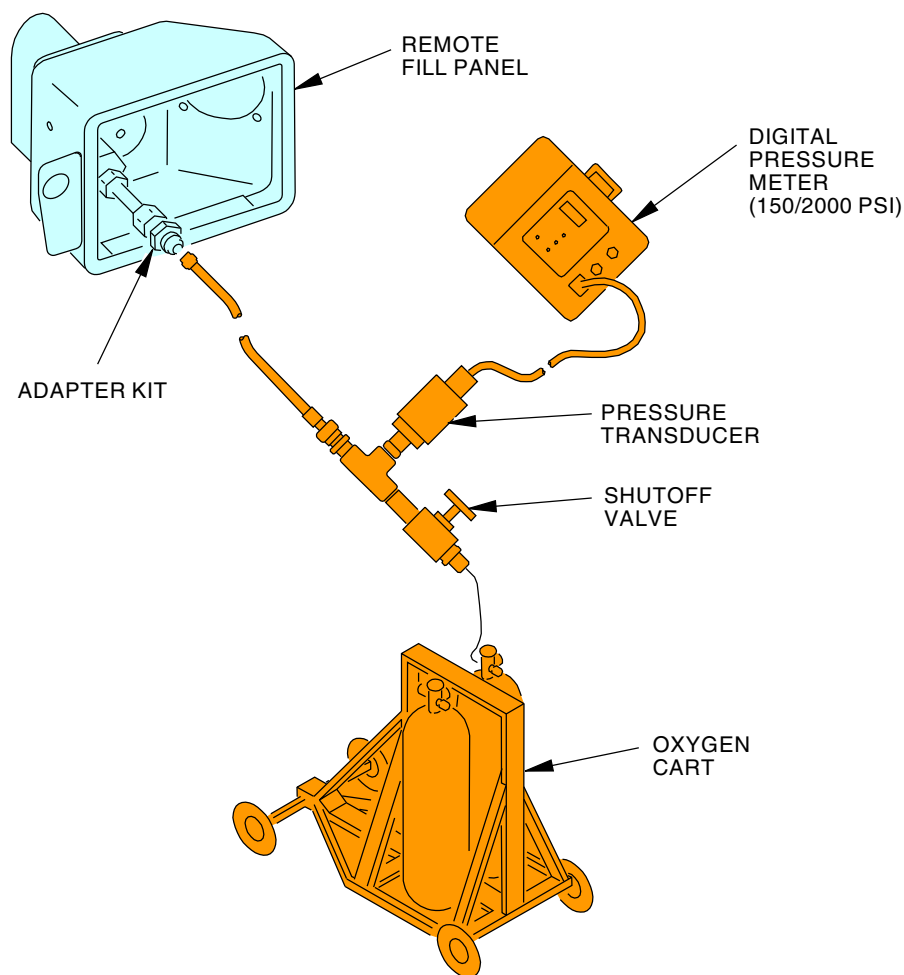
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OXYGEN CART INSTALLATION

E56523 S0006401610_V2

Remote Fill Panel Servicing
Figure 305/12-15-08-990-802 (Sheet 2 of 3)

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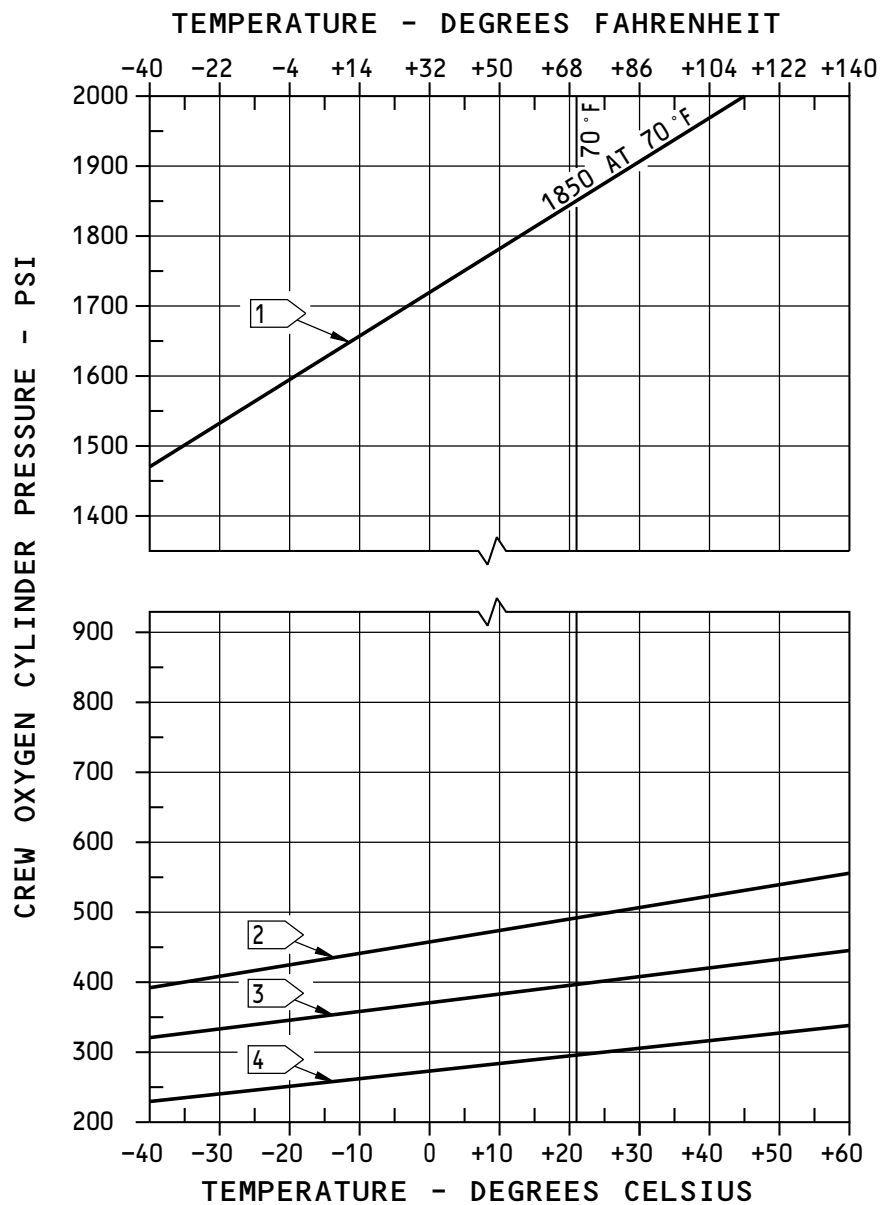
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- 1 MAXIMUM ALLOWABLE PRESSURE FOR FULLY SERVICED CREW OXYGEN CYLINDER
- 2 MINIMUM DISPATCH PRESSURE FOR 4 PERSON CREW
- 3 MINIMUM DISPATCH PRESSURE FOR 3 PERSON CREW
- 4 MINIMUM DISPATCH PRESSURE FOR 2 PERSON CREW

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Remote Fill Panel Servicing
Figure 305/12-15-08-990-802 (Sheet 3 of 3)

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BRAKE SURGE ACCUMULATOR - SERVICING

1. General

- A. This procedure has these tasks:
- (1) A check of the brake surge accumulator precharge pressure
 - (2) Servicing the brake surge accumulator if it has an incorrect precharge pressure.
 - (3) You must charge the brake surge accumulator with nitrogen.
- B. Use the charging instructions marker [105] adjacent to the brake surge accumulator pressure gage [103] to find the correct surge accumulator charge pressure for a given temperature (Figure 301).
- C. Use the brake surge accumulator pressure gage adjacent to the brake surge accumulator charging valve [102] for indication of accumulator pressure.

TASK 12-15-09-610-801

2. Check of the Brake Surge Accumulator Precharge Pressure

(Figure 301)

A. References

Reference	Title
10-11-05 P/B 201	CHOCK INSTALLATION
24-22-00-860-805	Supply Electrical Power (P/B 201)
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
551	Rear Spar to Landing Gear Support Beam - Left Wing

C. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

D. Procedure

SUBTASK 12-15-09-860-001

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

SUBTASK 12-15-09-480-001



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.

- (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.

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SUBTASK 12-15-09-010-001



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 Installation, TASK 32-00-15-480-801.

SUBTASK 12-15-09-860-002

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

SUBTASK 12-15-09-480-002

- (5) Make sure the tires have chocks installed around them (CHOCK INSTALLATION, PAGEBLOCK 10-11-05/201).

SUBTASK 12-15-09-860-003

- (6) Release the parking brake.

SUBTASK 12-15-09-860-004

- (7) Wait five minutes to allow the brake surge accumulator [107] gas to reach its equilibrium.

SUBTASK 12-15-09-010-002

- (8) To get access to the brake surge accumulator [107], open this access panel:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 12-15-09-610-006

- (9) Do the steps that follow to do a check of the brake surge accumulator [107] charge pressure:
- (a) Use the charging instructions marker [105] to find the correct surge accumulator pressure for the current ambient temperature of the airplane.
NOTE: The charging instructions marker [105] is located next to the brake surge accumulator pressure gage [103].
 - (b) Make sure the pressure that shows on the brake surge accumulator pressure gage [103] is within +/- 10 psig (69 kPa) of the pressure you obtained from the graph on the charging instructions marker [105].
 - (c) If the pressure shown on brake surge accumulator pressure gage [103] is not in the correct range of the instructions placard pressure, do this task: Brake Surge Accumulator Servicing, TASK 12-15-09-610-802.

SUBTASK 12-15-09-010-003

- (10) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel

————— END OF TASK —————

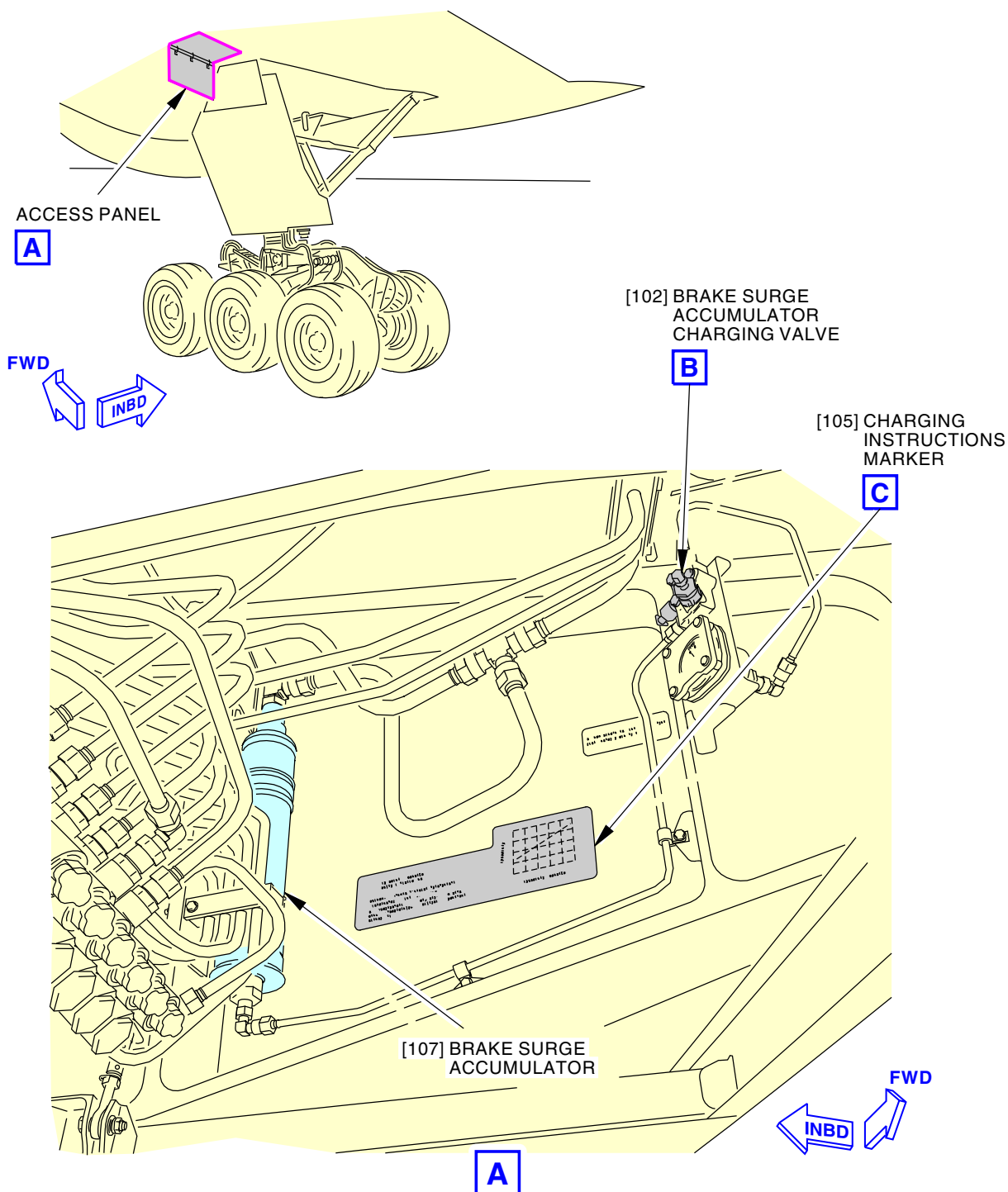
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Brake Surge Accumulator Servicing
Figure 301/12-15-09-990-801 (Sheet 1 of 3)

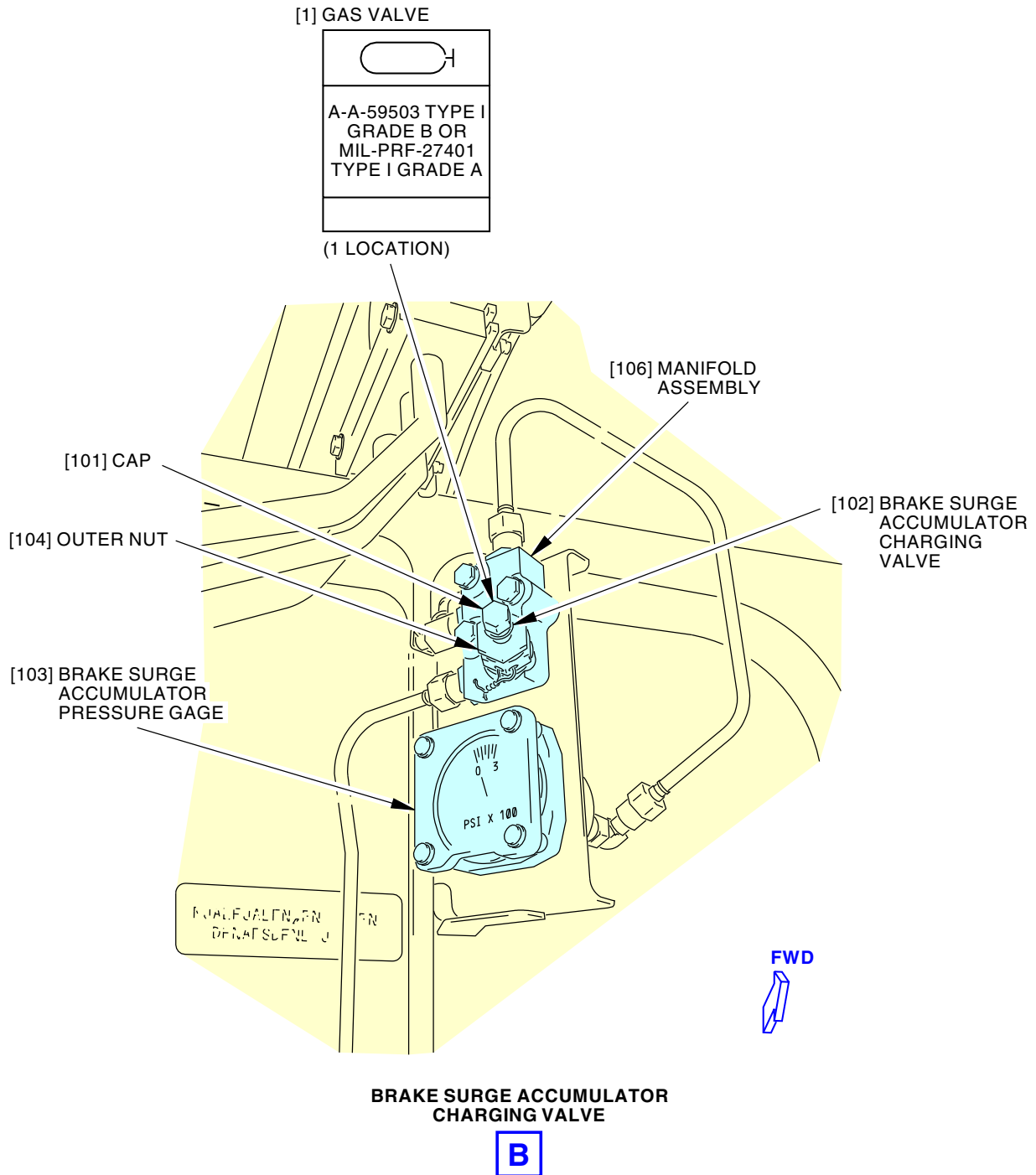
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Brake Surge Accumulator Servicing
Figure 301/12-15-09-990-801 (Sheet 2 of 3)

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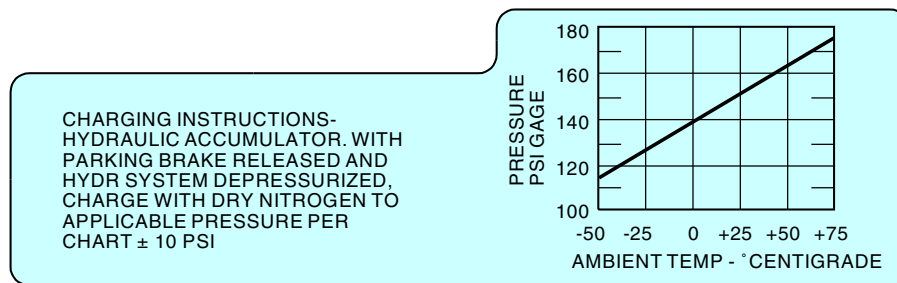
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[105] CHARGING INSTRUCTIONS MARKER

C

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Brake Surge Accumulator Servicing
Figure 301/12-15-09-990-801 (Sheet 3 of 3)

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TASK 12-15-09-610-802

3. **Brake Surge Accumulator Servicing**

(Figure 301)

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. Consumable Materials

Reference	Description	Specification
G00018	Nitrogen - Gaseous, Pressurizing, 99.5 Percent Pure	A-A-59503 Type I Grade B, MIL-PRF-27401 Type I Grade A

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
101	Cap	32-41-09-01-070	ARO ALL
		32-41-15-01-005	ARO ALL

D. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

F. Procedure

SUBTASK 12-15-09-480-003

 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 12-15-09-010-004

- (2) To get access to the brake surge accumulator [107], open this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 12-15-09-610-002

- (3) Do these steps to pressurize the brake surge accumulator [107]:
- (a) Remove the cap [101] from the brake surge accumulator charging valve [102].
 - (b) Attach a source of nitrogen, G00018, to the brake surge accumulator charging valve [102] (Table 301).

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WARNING

DO NOT LOOSEN THE BODY OF THE BRAKE-SURGE-ACCUMULATOR CHARGING-VALVE. THE PRESSURE IN THE BRAKE SURGE ACCUMULATOR CAN QUICKLY PUSH THE CHARGING VALVE OFF THE MANIFOLD. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (c) Turn the outer swivel nut [104] of the brake surge accumulator charging valve [102] one turn counterclockwise.
- (d) Pressurize the brake surge accumulator [107] to the correct pressure shown on the charging instructions marker [105] next to the brake surge accumulator pressure gage [103].

NOTE: Use the brake surge accumulator pressure gage for indication of the brake surge accumulator pressure.

NOTE: If a large charge was required to service the surge accumulator (for example, an additional charge in excess of 50 psi), wait five minutes to allow the accumulator gas temperature to reach equilibrium and to make sure the precharge pressure is maintained.

- (e) Turn the outer swivel nut [104] of the brake surge accumulator charging valve clockwise until it is tight.

Table 301/12-15-09-993-802 Main Landing Gear Brake Surge Accumulator Servicing (Fig. 301)

Item No.	Nomenclature	Fluid	Specification	Method of Application	Number of Locations
1	Gas Valve	nitrogen, G00018	A-A-59503 Type I Grade B or MIL-PRF-27401 Type I Grade A	Charge	1

SUBTASK 12-15-09-610-004

- (4) Disconnect the source of nitrogen, G00018, from the brake surge accumulator charging valve [102].

SUBTASK 12-15-09-610-005

- (5) Install the cap [101] on the brake surge accumulator charging valve [102] and tighten hand tight.

SUBTASK 12-15-09-790-001

- (6) If the brake surge accumulator [107] pressure was less than the minimum service pressure before you serviced the accumulator, do the steps that follow:

NOTE: You can find the minimum pressure on the graph of ambient temperature and pressure on the charging instructions marker [105].

- (a) Use a soap solution to make sure there are no gas leaks from these components:
 - 1) The gas pressure tube connection to the brake surge accumulator [107].
 - 2) The gas pressure tube connections to the manifold assembly [106].
 - 3) The gas pressure tube connections to the brake surge accumulator pressure gage [103].
 - 4) The brake surge accumulator charging valve [102]/manifold assembly [106] interface.

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SUBTASK 12-15-09-860-007

- (7) Wait ten minutes to allow accumulator gas to reach equilibrium.

SUBTASK 12-15-09-860-008

- (8) Make sure the pressure that shows on the brake surge accumulator pressure gage [103] is within +/- 10 psig (69 kPa) of the pressure you obtained from the charging instructions marker [105].

SUBTASK 12-15-09-010-005

- (9) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 12-15-09-410-001

 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.

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

———— **END OF TASK** ————

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HYDRAULIC ACCUMULATORS - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. There are three hydraulic accumulators in the body section 48. The right, center and left hydraulic systems each have one hydraulic accumulator.
- C. This procedure has these tasks:
 - (1) A check of the hydraulic accumulators precharge pressure.
 - (2) Servicing of the hydraulic accumulators if one has a low precharge pressure.

TASK 12-15-10-780-802-002

2. Check of the Hydraulic Accumulator Precharge Pressure

(Figure 301)

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)

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 Check

SUBTASK 12-15-10-860-007-002

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

SUBTASK 12-15-10-860-008-002

 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, YOU 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 12-15-10-010-003-002

- (3) To get access to the service panel for the hydraulic accumulators:

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Open this access panel:

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

E. Check of the Hydraulic Accumulator Precharge Pressure

SUBTASK 12-15-10-780-005-002

- (1) Do these steps to do a check of the hydraulic accumulator pressure for each hydraulic system:
 - (a) Find the correct charge pressure from the charging chart.
 - (b) Look at the pressure gage [1], pressure gage [2], or pressure gage [3] for the applicable hydraulic system on the service panel.
 - (c) Make sure the pressure which shows on each pressure gage [1], pressure gage [2], or pressure gage [3] is above the required charging zone.

SUBTASK 12-15-10-610-003-002

- (2) If the hydraulic accumulator pressure is not correct, do this task: Hydraulic Accumulator Servicing, TASK 12-15-10-610-802-002.

NOTE: This task follows in this procedure.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-10-410-003-002

- (1) Close this access panel:

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

SUBTASK 12-15-10-860-009-002

- (2) Set the three FLT CONTROL HYD POWER TAIL (L, C, and R) switches, on the overhead panel, P61, to the NORM position.

SUBTASK 12-15-10-210-003-002

- (3) Make sure the amber VALVE CLOSED light below each switch goes off.

——— **END OF TASK** ———

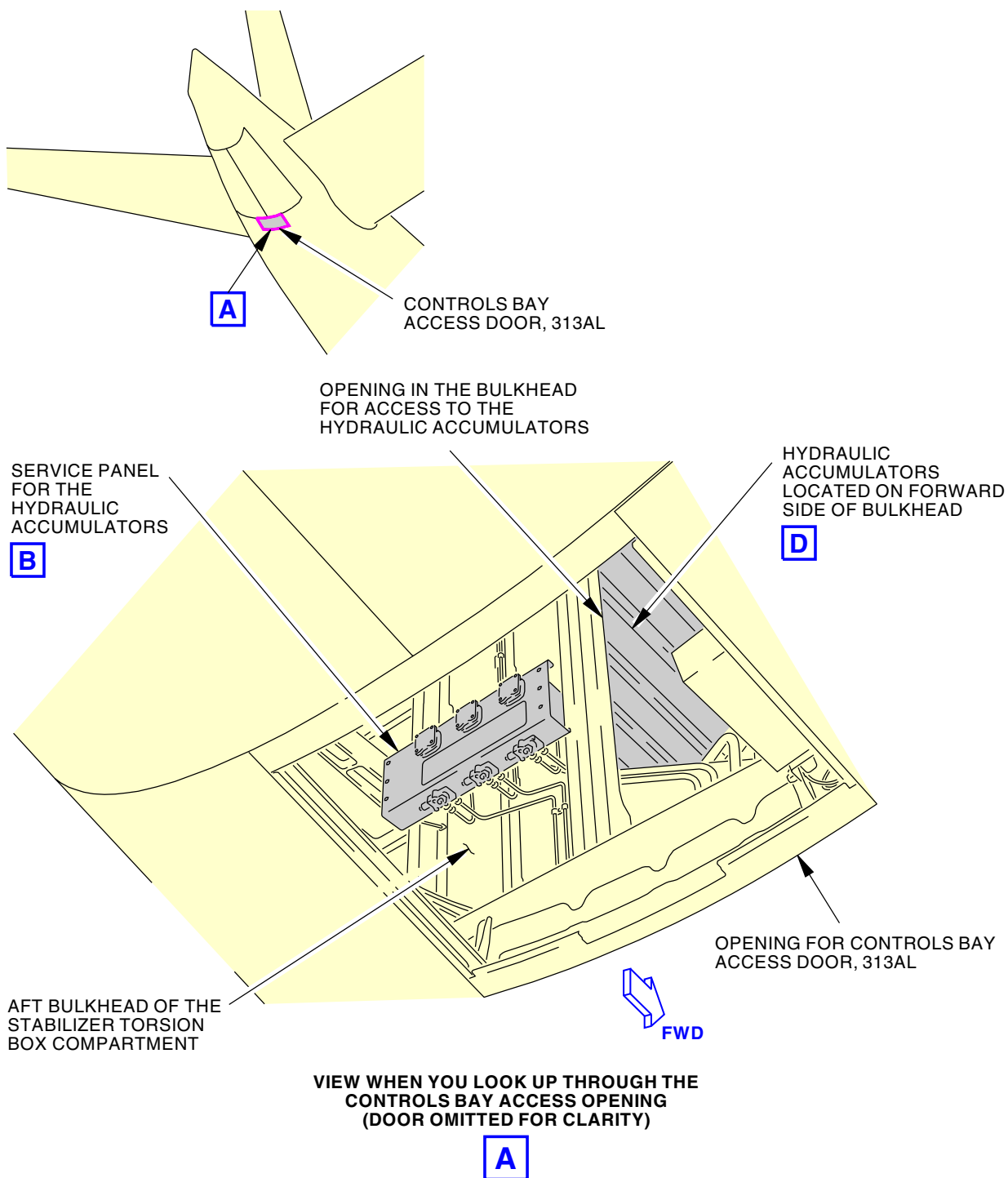
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**Hydraulic Accumulators Servicing
Figure 301/12-15-10-990-802-002 (Sheet 1 of 4)**

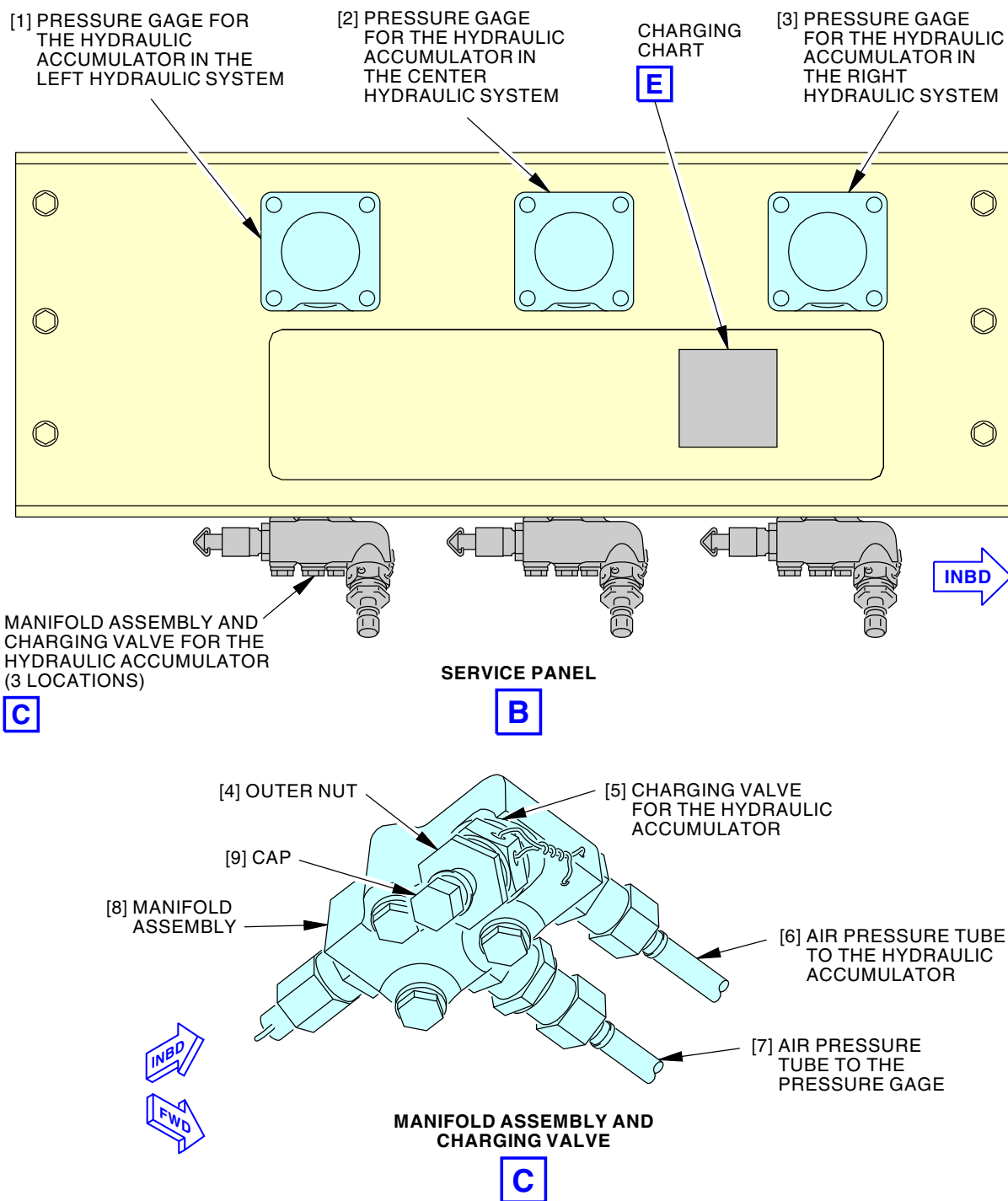
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Hydraulic Accumulators Servicing
Figure 301/12-15-10-990-802-002 (Sheet 2 of 4)

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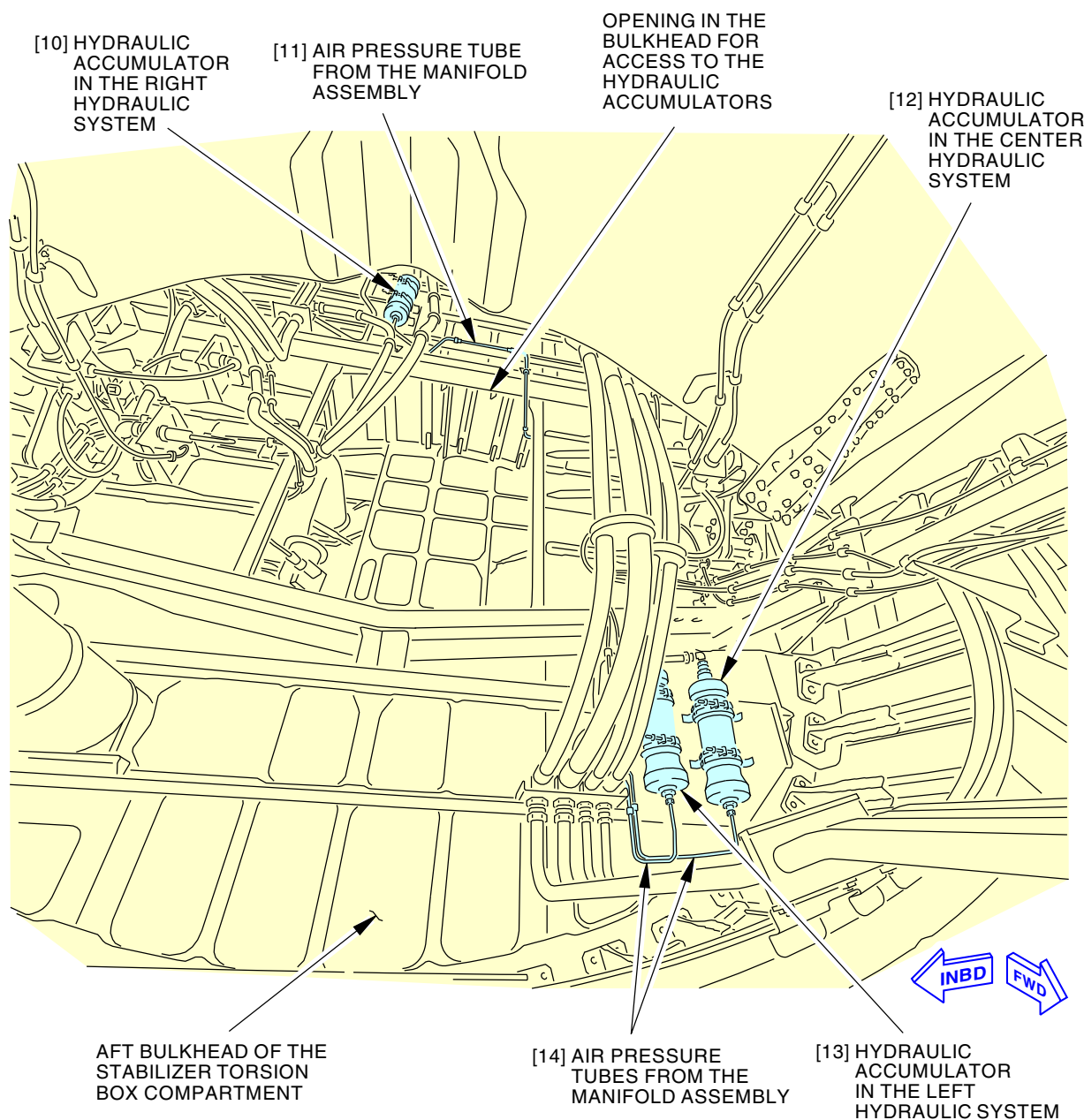
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Hydraulic Accumulators Servicing
Figure 301/12-15-10-990-802-002 (Sheet 3 of 4)

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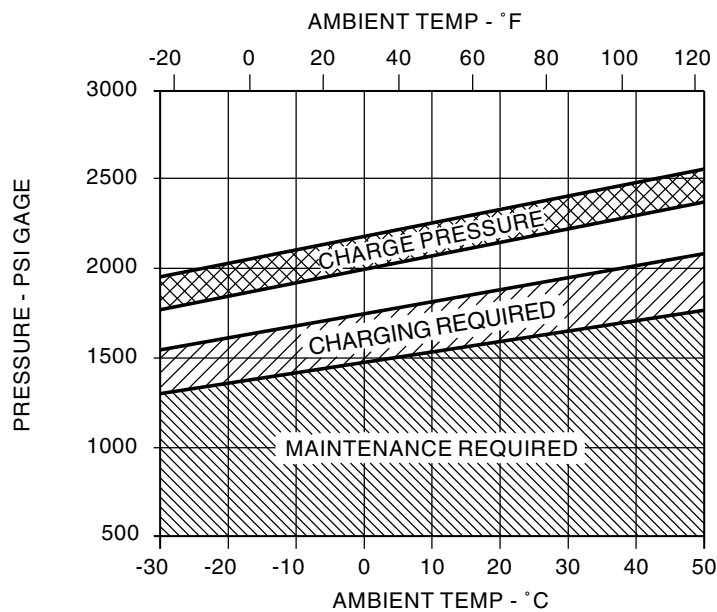
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CHARGING CHART

E

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Hydraulic Accumulators Servicing
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TASK 12-15-10-610-802-002

3. Hydraulic Accumulator Servicing

(Figure 301)

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)
29-11-72-000-803-002	Hydraulic Accumulator Removal (P/B 401)
29-11-72-400-803-002	Hydraulic Accumulator Installation (P/B 401)

B. Tools/Equipment

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

Reference	Description
COM-1538	Cart - Nitrogen Bottle Part #: 7046-011 Supplier: 00994 Part #: 8377 Supplier: 94861 Part #: 8932 Supplier: 94861 Part #: NBNT Supplier: D2029
COM-1548	Assembly - Hose End Includes a 35' Long Delivery Hose

C. Consumable Materials

Reference	Description	Specification
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

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. Prepare for the Servicing

SUBTASK 12-15-10-480-002-002

- (1) Connect the hose end assembly, COM-1548 to a nitrogen cart, COM-1538.
 - (a) Make sure that the regulator and vent valve of the hose end assembly, COM-1548 are closed prior to operating the nitrogen cart, COM-1538.

SUBTASK 12-15-10-860-010-002

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

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SUBTASK 12-15-10-860-011-002



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, YOU CAN CAUSE INJURY TO THEM.

- (3) To prevent the operation of the horizontal stabilizer, put the STAB CUTOUT switches on the control stand to the CUT OUT position.

SUBTASK 12-15-10-840-003-002

- (4) Set the three FLT CONTROL HYD POWER TAIL (L, C and R) and the three FLT CONTROL HYD POWER WING (L, C and R) switches on the overhead panel, P61, to the NORM position.

NOTE: These shutoff valves need to be open to perform this procedure to prevent pressure from increasing in the hydraulic systems.

- (a) Make sure the amber VALVE CLOSED light below each switch goes off.

SUBTASK 12-15-10-010-004-002

- (5) To get access to the service panel for the hydraulic accumulator [10], hydraulic accumulator [12], and hydraulic accumulator [13]:

Open this access panel:

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

G. Hydraulic Accumulator Servicing

SUBTASK 12-15-10-970-002-002

- (1) Find the correct target pressure from the graph of ambient temperature and pressure.

SUBTASK 12-15-10-610-004-002



DO NOT GO INTO THE COMPARTMENT WITHOUT FORCED-AIR-VENTILATION AND DO NOT RELEASE NITROGEN INTO THE COMPARTMENT WHEN YOU SERVICE THE HYDRAULIC ACCUMULATORS. NITROGEN WILL REPLACE AIR AND DECREASE THE OXYGEN LEVEL IN THE COMPARTMENT. KEEP OTHER PERSONNEL OUT OF THE COMPARTMENT WHEN YOU SERVICE THE ACCUMULATOR WITH THE NITROGEN IN A CLOSED COMPARTMENT. INJURY TO PERSONNEL CAN OCCUR WITH OXYGEN THAT IS NOT SUFFICIENT.

- (2) Do these steps for each hydraulic system for which you will pressurize the hydraulic accumulator [10], hydraulic accumulator [12], or hydraulic accumulator [13]:
 - (a) Remove the cap [9] from the applicable charging valve [5].
 - (b) Connect the hose end assembly, COM-1548 to the applicable charging valve [5].



DO NOT LOOSEN THE BODY OF THE HYDRAULIC ACCUMULATOR CHARGING VALVE. THE PRESSURE IN THE HYDRAULIC ACCUMULATORS CAN QUICKLY PUSH THE CHARGING VALVE OFF THE MANIFOLD ASSEMBLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (c) Turn the outer nut [4] on the charging valve [5] one turn counterclockwise.

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- (d) Pressurize the hydraulic accumulator [10], hydraulic accumulator [12], or hydraulic accumulator [13] until the applicable pressure gage [1], pressure gage [2], or pressure gage [3] shows the correct target pressure in the limit of 0 ± 100 psig (0 ± 689 kPa).

NOTE: A pressure gage for each hydraulic system is on the service panel for the hydraulic accumulators.

- (e) Turn the outer nut [4] on the charging valve [5] clockwise to tighten it.



WARNING

DO NOT RELEASE NITROGEN INTO THE COMPARTMENT WHEN DISCONNECTING THE NITROGEN CART FROM THE HYDRAULIC ACCUMULATORS. NITROGEN WILL DISPLACE AIR AND REDUCE THE OXYGEN LEVEL IN THE COMPARTMENT. A LACK OF OXYGEN CAN RESULT IN UNCONSCIOUSNESS OR DEATH.

- (f) Disconnect the hose end assembly, COM-1548, from the charging valve [5].
 (g) Install the cap [9] on the applicable charging valve [5].
 (h) Wait 10 minutes and make sure that each pressure gage shows a charge.

SUBTASK 12-15-10-780-006-002

- (3) If the hydraulic accumulator pressure was less than the 'charging required' pressure before you serviced the accumulator do these steps:

NOTE: You can find the 'charging required' pressure on the charging chart.

- (a) Use Snoop Leak Detector compound, G00091 to make sure there are no air leaks from these components:
- 1) Air pressure tube connections to the hydraulic accumulator [10], hydraulic accumulator [12], and hydraulic accumulator [13].
 - 2) Air pressure tube connections to the manifold assemblies [8].
 - 3) Air pressure tube connections to the pressure gage [1], pressure gage [2], and pressure gage [3].
 - 4) Joints in the air pressure tube [11] and air pressure tube [14].
 - 5) Charging valve [5].
 - 6) Pressure gages (including gage faces).
- (b) If no leaks are found, do these steps at the next maintenance opportunity.
- 1) Check the hydraulic accumulator precharge pressure.
 - 2) If the pressure is less than the "charging required" pressure, use Snoop Leak Detector compound, G00091 to check the accumulator components for leaks.
 - 3) If no leaks are found, replace the hydraulic accumulator.
 - a) These are the tasks:
 - Hydraulic Accumulator Removal, TASK 29-11-72-000-803-002
 - Hydraulic Accumulator Installation, TASK 29-11-72-400-803-002
- (c) If leaks are found, fix them.
- 1) Do the leak check again.

SUBTASK 12-15-10-780-007-002

- (4) After ten minutes, do this step:

- (a) Make sure the pressure which shows on each pressure gage [1], pressure gage [2], and pressure gage [3] is the same as the correct pressure.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-15-10-410-004-002

- (1) Close this access panel:

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

SUBTASK 12-15-10-840-004-002

- (2) Put the STAB CUTOUT switches on the control stand to the NORM position.

———— **END OF TASK** ————

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LANDING GEAR SHOCK STRUT FLUID - SERVICING

1. General

- A. This procedure contains a description of the fluids that are used to service the shock strut.

TASK 12-15-11-610-801

2. Landing Gear Shock Strut Fluids

A. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00106	Fluid - Hydraulic, Petroleum Base, For Preservation And Operation	MIL-PRF-6083 (NATO C-635)
D00510	Lubricant - Landing Gear Shock Strut Additive - Lubrizol 1395	

B. General

SUBTASK 12-15-11-610-001

- (1) All of the fluids that are listed here are compatible. Use any of these fluids to top off the strut even if the strut was originally filled with one of the other fluids.
- (2) It is not necessary to change the seals in the shock strut if you drained the strut and filled it with one of the other fluids.
- (3) It is recommended to use the pre-mixed fluid, BMS 3-32 Type I and Type II, if it is available. This is more convenient for the operator and will remove the possibility of error that can occur when the operator mixes the MIL-PRF-6083 or MIL-PRF-5606 with a lubricant.
- (4) Use BMS 3-32, Type I to fill the shock strut for the first time when new, or after overhaul. The Type I fluid contains a corrosion inhibitor.
- (5) Use BMS 3-32, Type I or Type II at the operator's discretion, for subsequent refills or to top off the strut. These two types of fluid are compatible.
- (6) If the BMS 3-32 is not available, You can use MIL-PRF-6083 or MIL-PRF-5606 without lubricants to top off the strut. Try not to do this too often because the lubricant that is already in the strut will become more diluted. This will make the fluid less effective.
- (7) The shock strut fluid must contain a lubricant to be effective in service. Lubrizol 1395 and methyl oleate are heavy duty lubricants. They are added to the fluid to reduce the wear on the parts of the shock strut that move.
- (8) If the BMS 3-32 is not available, and you need to fill an empty shock strut, it is recommended that you pre-mix the MIL-PRF-6083 or MIL-PRF-5606 with the lubricants before you add the fluid to the strut. If this is not possible, you can pre-mix 1 part lubricant with 10 parts (minimum) fluid before you add the lubricant into the shock strut.

C. Recommended (Pre-Mixed) Shock Strut Fluids

SUBTASK 12-15-11-610-002

- (1) BMS 3-32, Type I - This is MIL-H-6083 fluid pre-mixed with 1. 5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate.
- (2) BMS 3-32, Type II - This is MIL-PRF-5606 pre-mixed with 1. 5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate.

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D. Alternative (Not Pre-Mixed) Shock Strut Fluids

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- (1) MIL-PRF-6083 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for fluid, D00106 and mixed with 2.4 percent by volume of Lubrizol 1395 lubricant, D00510.

NOTE: Operators can choose to add 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate instead of 2.4 percent by volume of Lubrizol 1395.

- (2) MIL-PRF-5606 plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for fluid, D00070 and mixed with 2.4 percent by volume of Lubrizol 1395 lubricant, D00510.

NOTE: Operators can choose to add 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate instead of 2.4 percent by volume of Lubrizol 1395.

E. Shock Strut Fluid Precautions

SUBTASK 12-15-11-610-004

- (1) Do not add undiluted lubrizol directly into the shock strut. If you put undiluted lubrizol into a strut it will collect at the bottom and not mix correctly with the fluid. Undiluted lubrizol can cause the strut seals to expand and become soft, which will reduce the service life of the seals.
- (2) To add lubrizol directly into the shock strut, the lubrizol must be pre-mixed with shock strut fluid. You must mix 1 part of lubrizol with 10 parts (minimum) of shock strut fluid before you put the lubrizol into the shock strut.
- (3) When it is necessary to top off the shock strut with fluid. Do not add small quantities of hydraulic fluid without lubrizol many times. This can decrease the lubricity of the fluid in the strut which can cause damage to the strut.

————— **END OF TASK** —————

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FLIGHT COMPARTMENT WINDOWS - SERVICING

1. General

A. This procedure has these tasks:

- (1) No. 1 Windshield, No. 2, and No. 3, Glass Windows - Inner Surface Cleaning.
- (2) No. 1 Windshield, No. 2, and No. 3, Glass Windows - Outer Surface Cleaning
- (3) No. 2, and No. 3, Acrylic Windows - Inner Surface Cleaning
- (4) No. 2, and No. 3, Acrylic Windows - Outer Surface Cleaning

B. These procedures are to clean the dirt, lint, dust, and other materials, which bond to the window surfaces. If damage is apparent, refer to the FLIGHT COMPARTMENT WINDOWS - INSPECTION/CHECK, PAGEBLOCK 56-11-00/601

TASK 12-16-02-100-801

2. Flight Compartment Glass Window - Inner Surface Cleaning

A. Tools/Equipment

Reference	Description

STD-622	Pad - Protective

B. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
G01989	Soap - Castile (Vegetable Oil Based)	

C. Location Zones

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

D. Prepare to clean the Flight Compartment Windows

SUBTASK 12-16-02-020-001



WARNING

THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. IF THE WINDOW HEAT POWER IS ON, YOU CAN GET AN ELECTRICAL SHOCK WHEN YOU TOUCH THE WINDOW. THE SHOCK CAN CAUSE INJURY TO PERSONS.

- (1) Move these switches on the P5 pilots overhead panels to the OFF position and attach DO-NOT-OPERATE tags:
 - (a) Left side window heat,
 - (b) Left forward window heat,
 - (c) Right side window heat,
 - (d) Right forward window heat.

SUBTASK 12-16-02-860-001

- (2) Move these switches on the P61 overhead maintenance panel to the OFF position and attach DO-NOT-OPERATE tags:
 - (a) BACKUP WINDOW HEAT LEFT,
 - (b) BACKUP WINDOW HEAT RIGHT.

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SUBTASK 12-16-02-020-002

- (3) Make sure all of the WINDOW HEAT INOP lights are ON.

SUBTASK 12-16-02-020-006

- (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>
B	16	C30416	WDO HT 2R
C	16	C30418	WDO HT 3R
F	3	C30415	WDO HT BACKUP 1L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	2	C30301	WDO HTR 1L

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	11	C30417	WDO HT 2L
C	12	C30414	WDO HT BACKUP 1R
D	11	C30419	WDO HT 3L

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 005-999			
A	4	C30300	WDO HTR 1R
ARO 001-004			
B	4	C30300	WDO HTR 1R

ARO ALL

E. Procedure

SUBTASK 12-16-02-100-001

- (1) Clean the Inner Surface of the Glass Windows:
- (a) Use a moist chamois cloth, B00106, to apply the castile soap, G01989, solution to the inner surface of the window.



CAUTION

IF YOU OPEN THE NUMBER 2 WINDOW TO CLEAN ITS OUTER SURFACE, DO NOT CAUSE DAMAGE TO THE SEAL. A DAMAGED OR BROKEN SEAL CAN CAUSE AIR LEAKS DURING THE FLIGHT.

- (b) Carefully clean the window.
- 1) If you open the No. 2 window to clean outside, it is recommended to use a rubber protective pad, STD-622.
 - 2) Clean the windows with the minimum necessary pressure.
- (c) Remove the castile soap, G01989, solution from the windows with clean water.

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CAUTION

DO NOT RUB THE SURFACE WITH DRY CLOTH. THIS CAUSES SCRATCHES AND CAN CAUSE AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

- (d) Clean the window dry with a clean, moist chamois cloth, B00106.

F. Put the Airplane Back to its Usual Condition

SUBTASK 12-16-02-860-003

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	16	C30416	WDO HT 2R
C	16	C30418	WDO HT 3R
F	3	C30415	WDO HT BACKUP 1L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	2	C30301	WDO HTR 1L

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	11	C30417	WDO HT 2L
C	12	C30414	WDO HT BACKUP 1R
D	11	C30419	WDO HT 3L

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 005-999			
A	4	C30300	WDO HTR 1R

ARO 001-004

B	4	C30300	WDO HTR 1R

ARO ALL

SUBTASK 12-16-02-020-004

- (2) Move these switches on the P5 pilots overhead panels to the ON position and remove DO-NOT-OPERATE tags:
- (a) Left side window heat.
 - (b) Left forward window heat.
 - (c) Right side window heat.
 - (d) Right forward window heat.

SUBTASK 12-16-02-860-002

- (3) Make sure these switches on the P61 overhead maintenance panel are in the ON position and remove the DO-NOT-OPERATE tags:
- (a) BACKUP WINDOW HEAT LEFT,
 - (b) BACKUP WINDOW HEAT RIGHT.

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SUBTASK 12-16-02-020-005

- (4) Make sure all of the WINDOW HEAT INOP lights are OFF.

SUBTASK 12-16-02-700-001

- (5) Make sure MAT does not display BACKUP WINDOW HEAT message.

————— END OF TASK —————

TASK 12-16-02-100-802

3. Flight Compartment Glass Window - Outer Surface Cleaning

A. Tools/Equipment

Reference	Description
STD-622	Pad - Protective

B. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00130	Alcohol - Isopropyl	TT-I-735
G00834	Cloth - Lint-free Cotton	
G01989	Soap - Castile (Vegetable Oil Based)	
G02418	Water - De-ionized	

C. Location Zones

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

D. Prepare to Clean the outer Surface of the Glass Windows.

SUBTASK 12-16-02-020-007



WARNING

THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. THIS WILL HELP TO PREVENT ELECTRICAL SHOCK INJURY TO PERSONNEL.

- (1) Move these switches on the P5 pilots overhead panels to the OFF position:
 - (a) Left side window heat.
 - (b) Left forward window heat.
 - (c) Right side window heat.
 - (d) Right forward window heat.
- (2) Move these switches on the P61 overhead maintenance panel to the OFF position:
 - (a) BACKUP WINDOW HEAT LEFT.
 - (b) BACKUP WINDOW HEAT RIGHT.
- (3) Attach the DO-NOT-OPERATE tags to all of the switches.
- (4) Make sure that all of the WINDOW HEAT INOP lights are ON.

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E. Procedure

SUBTASK 12-16-02-100-002



DO NOT USE ABRASIVE CLEANERS, OR CLEANERS THAT CONTAIN FLUORIDES ON HYDROPHOBIC-COATED WINDOWS. THESE CLEANERS WILL REMOVE THE HYDROPHOBIC LAYER.

- (1) Clean the Outer Surface of the Glass Windows:



IF YOU OPEN THE NUMBER 2 WINDOW TO CLEAN ITS OUTER SURFACE, DO NOT CAUSE DAMAGE TO THE SEAL. A DAMAGED OR BROKEN SEAL CAN CAUSE AIR LEAKS DURING THE FLIGHT.

- (a) Use a moist chamois cloth, B00106 to apply the castile soap, G01989 solution to the outer surface of the window.
- (b) Carefully clean the window.
 - 1) If you open the No. 2 window to clean its outer surface, Boeing recommends to use a rubber protective pad, STD-622.
 - 2) Clean the windows with the minimum necessary pressure.
- (c) Remove the castile soap, G01989 solution from the windows with clean water.



DO NOT RUB THE SURFACE WITH DRY CLOTH. THIS CAUSES SCRATCHES AND CAN CAUSE AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

- (d) Clean the window dry with a clean, moist chamois cloth, B00106.
- (2) Hydrophobic coated No. 1 windshield:

NOTE: Hydrophobic coated windows are identified with the words HYDROPHOBIC COATED WINDSHIELD adjacent to the window part number.

 - (a) Use a lint-free cloth, G00834 to apply a 50/50 % solution of alcohol, B00130 and de-ionized water, G02418 to the outer surfaces of the windows.

NOTE: It is also permitted to clean the windows with castile soap, G01989, and clean water.

F. Put The Airplane Back to Its Usual Condition

SUBTASK 12-16-02-860-004

- (1) Move these switches on the P61 overhead maintenance panel to the ON position:
 - (a) BACKUP WINDOW HEAT LEFT.
 - (b) BACKUP WINDOW HEAT RIGHT.
- (2) Move these switches on the P5 pilots overhead panels to the ON position:
 - (a) Left side window heat
 - (b) Left forward window heat
 - (c) Right side window heat
 - (d) Right forward window heat
- (3) Remove the DO-NOT-OPERATE tags from all the switches.
- (4) Make sure that all of the WINDOW HEAT INOP lights are OFF.

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- (5) Make sure that MAT does not show the BACKUP WINDOW HEAT message.

————— **END OF TASK** —————

TASK 12-16-02-100-803

4. Flight Compartment Acrylic Window - Inner Surface Cleaning

A. Tools/Equipment

Reference	Description
STD-622	Pad - Protective

B. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00130	Alcohol - Isopropyl	TT-I-735
B50203	Polish - Plastic, Novus 1 Plastic Clean and Shine	
B50216	Cleaner - Permatex Plastic Cleaner (P/N 403D)	P-P-560
G01989	Soap - Castile (Vegetable Oil Based)	
G02418	Water - De-ionized	

C. Location Zones

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

D. Prepare to clean the Flight Compartment Windows

SUBTASK 12-16-02-020-008



WARNING

THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. THIS WILL HELP TO PREVENT ELECTRICAL SHOCK INJURY TO PERSONNEL.

- (1) Move these switches on the P5 pilots overhead panels to the OFF position:

- (a) Left side window heat
- (b) Left forward window heat
- (c) Right side window heat
- (d) Right forward window heat

SUBTASK 12-16-02-860-005

- (2) Move these switches on the P61 overhead maintenance panel to the OFF position:

- (a) BACKUP WINDOW HEAT LEFT,
- (b) BACKUP WINDOW HEAT RIGHT.

- (3) Attach the DO-NOT-OPERATE tags to all of the switches.

- (4) Make sure that all of the WINDOW HEAT INOP lights are ON.

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SUBTASK 12-16-02-020-009

- (5) 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>
B	16	C30416	WDO HT 2R
C	16	C30418	WDO HT 3R
F	3	C30415	WDO HT BACKUP 1L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	2	C30301	WDO HTR 1L

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	11	C30417	WDO HT 2L
C	12	C30414	WDO HT BACKUP 1R
D	11	C30419	WDO HT 3L

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 005-999			
A	4	C30300	WDO HTR 1R
ARO 001-004			
B	4	C30300	WDO HTR 1R

ARO ALL

E. Procedure

SUBTASK 12-16-02-100-003



IF YOU OPEN THE NUMBER 2 WINDOW TO CLEAN ITS OUTER SURFACE, DO NOT CAUSE DAMAGE TO THE SEAL. A DAMAGED OR BROKEN SEAL CAN CAUSE AIR LEAKS DURING THE FLIGHT.

- (1) Clean the Inner Surface of the Windows
- Use a moist chamois cloth, B00106, to apply castile soap, G01989, to the inner surface of the window.
 - Carefully clean the window.
 - If you open the No. 2 window to clean its outer surface, Boeing recommends to use a rubber protective pad, STD-622.
 - Do not use 50/50 mixture of alcohol, B00130, and de-ionized water, G02418, on acrylic windows.
 - Clean the windows dry with the minimum necessary pressure.
 - Remove the castile soap, G01989, solution from the windows with clean water.

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DO NOT RUB THE SURFACE WITH DRY CLOTH. THIS CAUSES SCRATCHES AND CAN CAUSE AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

- (d) Clean the window dry with a clean, moist chamois cloth, B00106.
- (e) For a cleaner and shinier finish of the No. 2 and No. 3 acrylic windows do as follows:
 - 1) Apply the Permatex plastic cleaner, B50216, or Novus 1 polish, B50203, on the clean window.
 - 2) Use a moist chamois cloth, B00106, to dry the windows clean.

F. Put The Airplane Back to Its Usual Condition

SUBTASK 12-16-02-860-006

- (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>
B	16	C30416	WDO HT 2R
C	16	C30418	WDO HT 3R
F	3	C30415	WDO HT BACKUP 1L

Left Power Panel, P100

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	2	C30301	WDO HTR 1L

Right Power Management Panel, P210

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	11	C30417	WDO HT 2L
C	12	C30414	WDO HT BACKUP 1R
D	11	C30419	WDO HT 3L

Right Power Panel, P200

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
ARO 005-999			
A	4	C30300	WDO HTR 1R
ARO 001-004			
B	4	C30300	WDO HTR 1R

ARO ALL

SUBTASK 12-16-02-020-010

- (2) Move these switches on the P5 pilots overhead panels to the ON position.
 - (a) Left side window heat.
 - (b) Left forward window heat.
 - (c) Right side window heat.
 - (d) Right forward window heat.

SUBTASK 12-16-02-020-011

- (3) Move these switches on the P61 overhead maintenance panel to the ON position:
 - (a) BACKUP WINDOW HEAT LEFT.

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- (b) BACKUP WINDOW HEAT RIGHT.
- (4) Remove the DO-NOT-OPERATE tags from all of the switches.
- SUBTASK 12-16-02-020-012
- (5) Make sure all of the WINDOW HEAT INOP lights are OFF.
- SUBTASK 12-16-02-700-002
- (6) Make sure MAT does not display BACKUP WINDOW HEAT message.

————— **END OF TASK** —————

TASK 12-16-02-100-804

5. Flight Compartment Acrylic Window - Outer Surface Cleaning

A. Tools/Equipment

Reference	Description
STD-622	Pad - Protective

B. Consumable Materials

Reference	Description	Specification
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00130	Alcohol - Isopropyl	TT-I-735
B50203	Polish - Plastic, Novus 1 Plastic Clean and Shine	
B50216	Cleaner - Permatex Plastic Cleaner (P/N 403D)	P-P-560
G01989	Soap - Castile (Vegetable Oil Based)	
G02418	Water - De-ionized	

C. Location Zones

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

D. Prepare to Clean the outer Surface of the Acrylic Windows.

SUBTASK 12-16-02-020-013



THE WINDOW HEAT SYSTEM POWER MUST BE OFF WHEN YOU CLEAN THE WINDOWS. THIS WILL HELP TO PREVENT ELECTRICAL SHOCK INJURY TO PERSONNEL.

- (1) Move these switches on the P5 pilots overhead panels to the OFF position:
- (a) Left side window heat.
 - (b) Left forward window heat.
 - (c) Right side window heat.
 - (d) Right forward window heat.

- (2) Attach the DO-NOT-OPERATE tags to all the switches.

SUBTASK 12-16-02-860-007

- (3) Move these switches on the P61 overhead maintenance panel to the OFF position:
- (a) BACKUP WINDOW HEAT LEFT.

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- (b) BACKUP WINDOW HEAT RIGHT.
- (4) Attach the DO-NOT-OPERATE tags to all of the switches.
- (5) Make sure that all of the WINDOW HEAT INOP lights are ON.

E. Procedure

SUBTASK 12-16-02-100-004



IF YOU OPEN THE NUMBER 2 WINDOW TO CLEAN ITS OUTER SURFACE, DO NOT CAUSE DAMAGE TO THE SEAL. A DAMAGED OR BROKEN SEAL CAN CAUSE AIR LEAKS DURING THE FLIGHT.

- (1) Clean the Outer Surface of the Acrylic Windows:
 - (a) Use a moist chamois cloth, B00106, to apply the castile soap, G01989, solution to the outer surface of the window.
 - (b) Carefully clean the window.
 - 1) If you open the No. 2 window to clean its outer surface, Boeing recommends to use a rubber protective pad, STD-622.
 - 2) Do not use 50/50 mixture of alcohol, B00130, and de-ionized water, G02418, on acrylic windows.
 - 3) Clean the windows with the minimum necessary pressure.
 - (c) Remove the castile soap, G01989, solution from the windows with clean water.



DO NOT RUB THE SURFACE WITH DRY CLOTH. THIS CAUSES SCRATCHES AND CAN CAUSE AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

- (d) Clean the window dry with a clean, moist chamois cloth, B00106.

SUBTASK 12-16-02-100-005

- (2) For a cleaner and shinier finish of the No. 2 and No. 3 acrylic windows do as follows:
 - (a) Apply the Permatex plastic cleaner, B50216, or Novus 1 polish, B50203, on the clean window.
 - (b) Use a moist chamois cloth, B00106, to dry the windows clean.

F. Put The Airplane Back to Its Usual Condition

SUBTASK 12-16-02-020-014

- (1) Move these switches on the P5 pilots overhead panels to the ON position.
 - (a) Left side window heat.
 - (b) Left forward window heat.
 - (c) Right side window heat.
 - (d) Right forward window heat.
- (2) Remove the DO-NOT-OPERATE tags.

SUBTASK 12-16-02-860-008

- (3) Move these switches on the P61 overhead maintenance panel to the ON position:
 - (a) BACKUP WINDOW HEAT LEFT.
 - (b) BACKUP WINDOW HEAT RIGHT.

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(4) Remove the DO-NOT-OPERATE tags.

SUBTASK 12-16-02-020-015

(5) Make sure all of the WINDOW HEAT INOP lights are OFF.

SUBTASK 12-16-02-700-003

(6) Make sure MAT does not display BACKUP WINDOW HEAT message.

———— **END OF TASK** ————

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PASSENGER COMPARTMENT WINDOWS - SERVICING

1. General

- A. This procedure has these tasks:
- (1) Clean the passenger windows.
 - (2) Apply wax to the windows.
 - (3) Clean the hardcoated polycarbonate dust covers.

TASK 12-16-03-100-801

2. Clean the Passenger Windows

A. References

Reference	Title
25-21-01-000-801	Sidewall Panel - Removal (P/B 401)
25-21-01-400-801	Sidewall Panel - Installation (P/B 401)
56-21-01-000-801	Passenger Compartment Window Removal (P/B 401)
56-21-01-400-801	Passenger Compartment Window Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00106	Cloth - Chamois Leather, Sheepskin, Oil Tanned	CS99-1970, KK-C-300
B00541	Cleaner - General Purpose Household Detergent	

C. Location Zones

Zone	Area
200	Upper Half of Fuselage

D. Prepare to Clean the Passenger Windows

SUBTASK 12-16-03-010-004

- (1) Do this task: Sidewall Panel - Removal, TASK 25-21-01-000-801.

SUBTASK 12-16-03-010-002

- (2) Do this task: Passenger Compartment Window Removal, TASK 56-21-01-000-801.

NOTE: You must remove the window assembly to clean between the outer and middle window panes.

E. Procedure

SUBTASK 12-16-03-100-001

- (1) Apply a solution of general purpose household detergent cleaner, B00541 and water with a chamois cloth, B00106 or the solvent, B00083 with a clean chamois cloth, B00106 to the outer and middle window panes.

SUBTASK 12-16-03-100-002

- (2) Clean the window panes with the minimum necessary pressure.

SUBTASK 12-16-03-170-001

- (3) Flush the window panes with clean water.

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SUBTASK 12-16-03-100-003



DO NOT RUB A DRY ACRYLIC WINDOW. YOU CAN EASILY MAKE SCRATCHES ON A DRY PANE. YOU CAN ALSO CREATE AN ELECTROSTATIC CHARGE. THE SCRATCHES WILL DECREASE THE VISUAL CAPACITY OF THE WINDOW. AN ELECTROSTATIC CHARGE CAN ATTRACT DUST PARTICLES TO THE WINDOW PANE.

- (4) Dry the window panes with a clean, moist chamois cloth, B00106.

SUBTASK 12-16-03-100-009

- (5) Do the steps that follow on the sidewall panel:
- (a) Open the window shade.
 - (b) Clean the non-structural inner pane in the sidewall panel.
 - (c) Close the window shade and clean the window shade if necessary.

F. Put the Airplane Back in its Usual Condition

SUBTASK 12-16-03-410-001

- (1) Install the window assembly, if you removed it, do this task: Passenger Compartment Window Installation, TASK 56-21-01-400-801.

SUBTASK 12-16-03-410-002

- (2) Install the sidewall panel, if you removed it, do this task: Sidewall Panel - Installation, TASK 25-21-01-400-801.

————— END OF TASK —————

TASK 12-16-03-390-801

3. Acrylic Passenger Compartment Window Waxing

A. General

- (1) Apply wax to acrylic windows only.

B. Consumable Materials

Reference	Description	Specification
B00703	Compound - Plastic Polish	P-P-560
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

C. Location Zones

Zone	Area
200	Upper Half of Fuselage

D. Procedure

SUBTASK 12-16-03-100-006

- (1) Make sure the window surfaces are clean.

SUBTASK 12-16-03-400-003

- (2) Put the wax compound, B00703 on a piece of cotton wiper, G00034.

SUBTASK 12-16-03-100-007

- (3) Use a cotton wiper, G00034 to apply a light layer of wax compound, B00703 on these surfaces:
- (a) Inner surface of the non-structural inner pane

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- (b) Outer surface of the outer window pane

SUBTASK 12-16-03-100-008

- (4) Polish the windows with a cotton wiper, G00034. Use the minimum necessary pressure.

————— END OF TASK —————

TASK 12-16-03-100-802

4. Hardcoated Polycarbonate Dust Covers - Cleaning

A. General

- (1) Clean the hardcoated polycarbonate dust covers.

B. Consumable Materials

Reference	Description	Specification
B50216	Cleaner - Permatex Plastic Cleaner (P/N 403D)	P-P-560
B50251	Cleaner - Miller-Stephenson MS-260 Safezone Cleaner For Plastic, Glass And Metal	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

C. Location Zones

Zone	Area
200	Upper Half of Fuselage

D. Procedure

SUBTASK 12-16-03-110-002

- (1) Apply the Permatex plastic cleaner, B50216 or MS-260 cleaner, B50251 with a clean cotton wiper, G00034 to the dust covers.
- (a) Lightly apply the cleaner on the surface of the dust covers.
- (b) Lightly remove the cleaner from the dust covers.
- (2) If necessary, do the steps in this procedure until the dust covers are thoroughly clean.
- (3) Examine the dust covers for cleanliness.
- (a) Make sure that the dust covers are clean and free of streaks, finger marks, and haze.

————— END OF TASK —————

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WASTE TANK - SERVICING

1. General

- A. This procedure has the instructions to service the waste tanks.
- B. After you drain each waste tank, you must flush each waste tank, then add a chemical precharge.

TASK 12-17-01-610-801

2. Waste Tank Servicing

(Figure 301)

A. **References**

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
12-14-01-600-810	Potable Water Tank - Fill (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
38-10-00-863-801	Potable Water System - Pressurization (P/B 201)
38-32-00-910-801	Standard Practices for Work with the Toilet Waste and Equipment (P/B 201)

B. **Tools/Equipment**

Reference	Description
STD-1142	Equipment - Waste System Servicing

C. **Consumable Materials**

Reference	Description	Specification
B00490	Chemical, Toilet Flushing Deodorant	AMS 1476B as qualified to D6-17487

D. **Location Zones**

Zone	Area
166	Area Aft of Bulk Cargo Compartment, Right

E. **Access Panels**

Number	Name/Location
163AL	Waste Tank Service Door

F. **Drain the Waste Tank**

SUBTASK 12-17-01-610-001

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

SUBTASK 12-17-01-910-001

- (2) Do this task: Standard Practices for Work with the Toilet Waste and Equipment, TASK 38-32-00-910-801.

SUBTASK 12-17-01-010-001

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
163AL	Waste Tank Service Door

SUBTASK 12-17-01-860-001

- (4) Open the cap on the drain valve assembly.

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SUBTASK 12-17-01-480-001

- (5) Connect the waste drain hose from the toilet service waste system servicing equipment, STD-1142 to the drain valve assembly.
 - (a) Make sure the toilet service line pressure does not exceed 8.8 psid (60.7 kPa).

SUBTASK 12-17-01-860-002

- (6) Push the PUSH-TO-OPEN lever on the drain valve assembly.

SUBTASK 12-17-01-680-003

- (7) Drain the waste tank.
 - (a) Pull a handle to open the waste drain ball valve.
 - 1) Feel the waste drain hose to make sure the liquid flows.
 - (b) Do this procedure for each of the three waste tanks.

G. Flush the Waste Tank

SUBTASK 12-17-01-860-003

- (1) Open the cap on the rinse fitting assembly.

NOTE: There is one handle and one adjacent rinse fitting assembly on the service panel for each waste tank.

SUBTASK 12-17-01-480-002

- (2) Connect a rinse water hose from the toilet service waste system servicing equipment, STD-1142 to the rinse fitting assembly.

- (a) Make sure that the water pressure is a minimum of 30 psig (207 kPa).

NOTE: The recommended pressure range is 30 psig (207 kPa) to 50 psig (345 kPa). If the water pressure is less than the minimum pressure, the waste tank will not get clean.

- (b) The maximum water pressure measured at the rinse nozzle is 80 psig (552 kPa).

SUBTASK 12-17-01-170-001

- (3) Flush the waste tank.
 - (a) Flush the waste tank with 10 gal (38 l) to 50 gal (189 l) of water.
 - 1) Feel the waste drain hose to make sure the liquid flows.
 - (b) Do this procedure for each of the three waste tanks.

SUBTASK 12-17-01-680-002

- (4) Make sure the liquid drains fully.

SUBTASK 12-17-01-860-004

- (5) At the service panel, push the handle to close the waste drain ball valve.

H. Add the precharge chemical to the waste tanks.

SUBTASK 12-17-01-610-002



MAKE SURE THAT YOU OBEY THE MANUFACTURER'S INSTRUCTIONS WHEN YOU USE THE CHEMICAL PRECHARGE. THE CHEMICAL PRECHARGE CONTAINS CORROSIVE, AND POISONOUS MATERIALS. OBEY THESE INSTRUCTIONS TO PREVENT INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.



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(WARNING PRECEDES)



DO NOT ADD THE CHEMICAL PRECHARGE TO THE WASTE TANKS IF YOU KEEP THE AIRPLANE WHERE IT IS VERY COLD. THE CHEMICAL PRECHARGE CAN FREEZE. THIS CAN CAUSE DAMAGE TO THE WASTE WATER SYSTEM.

- (1) Use Procedure I or Procedure II to add the precharge chemical, B00490.

SUBTASK 12-17-01-610-003

- (2) Procedure I - Add the precharge chemical, B00490 liquid through the rinse fitting assembly for each waste tank.
 - (a) Connect the precharge hose from the toilet service waste system servicing equipment, STD-1142 to the rinse fitting assembly.
 - (b) Put six gallons of the precharge chemical, B00490 into the waste tank.
 - (c) Disconnect the precharge hose from the rinse fitting assembly.
 - 1) Keep the rinse fitting assembly open for approximately one minute to permit the liquid to drain from the line.
 - (d) Close the cap on the rinse fitting assembly.
 - (e) Do this procedure for each of the waste tanks.

SUBTASK 12-17-01-610-004

- (3) Procedure II - Use one of the toilets in each of the three waste tank systems to add the precharge chemical, B00490.
 - (a) If it is necessary, do this task: Potable Water Tank - Fill, TASK 12-14-01-600-810.
 - (b) If it is necessary, do this task: Potable Water System - Pressurization, TASK 38-10-00-863-801.
 - (c) Get access to the passenger compartment (TASK 06-41-00-800-801).
 - (d) Put a quantity of the dry precharge chemical (per the manufacturer instructions) in one toilet for each waste tank.
 - (e) After you put the dry precharge chemical in the applicable toilets, operate the toilet 2 to 3 times.

NOTE: This will make sure the precharge is in the waste tank.

SUBTASK 12-17-01-080-001

- (4) Disconnect the waste drain hose from the drain valve assembly to the toilet service waste system servicing equipment, STD-1142.

SUBTASK 12-17-01-790-001



DO NOT LET THE LIQUID STAY IN THE LINES. FROZEN LIQUIDS CAN CAUSE DAMAGE TO THE WASTE SYSTEM.

- (5) Make sure there is no liquid leakage from the waste service panel.
- (6) Verify the presence of the sealing disc on the rinse fill cap.

SUBTASK 12-17-01-860-005

- (7) Close the cap for the drain valve assembly.

SUBTASK 12-17-01-160-001

- (8) Clean all the components and the door for the waste service panel.

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- (a) Dry all the components and the door for the waste service panel.

SUBTASK 12-17-01-410-001

- (9) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
163AL	Waste Tank Service Door

SUBTASK 12-17-01-710-001

- (10) Make sure all the toilets operate.

———— **END OF TASK** ————

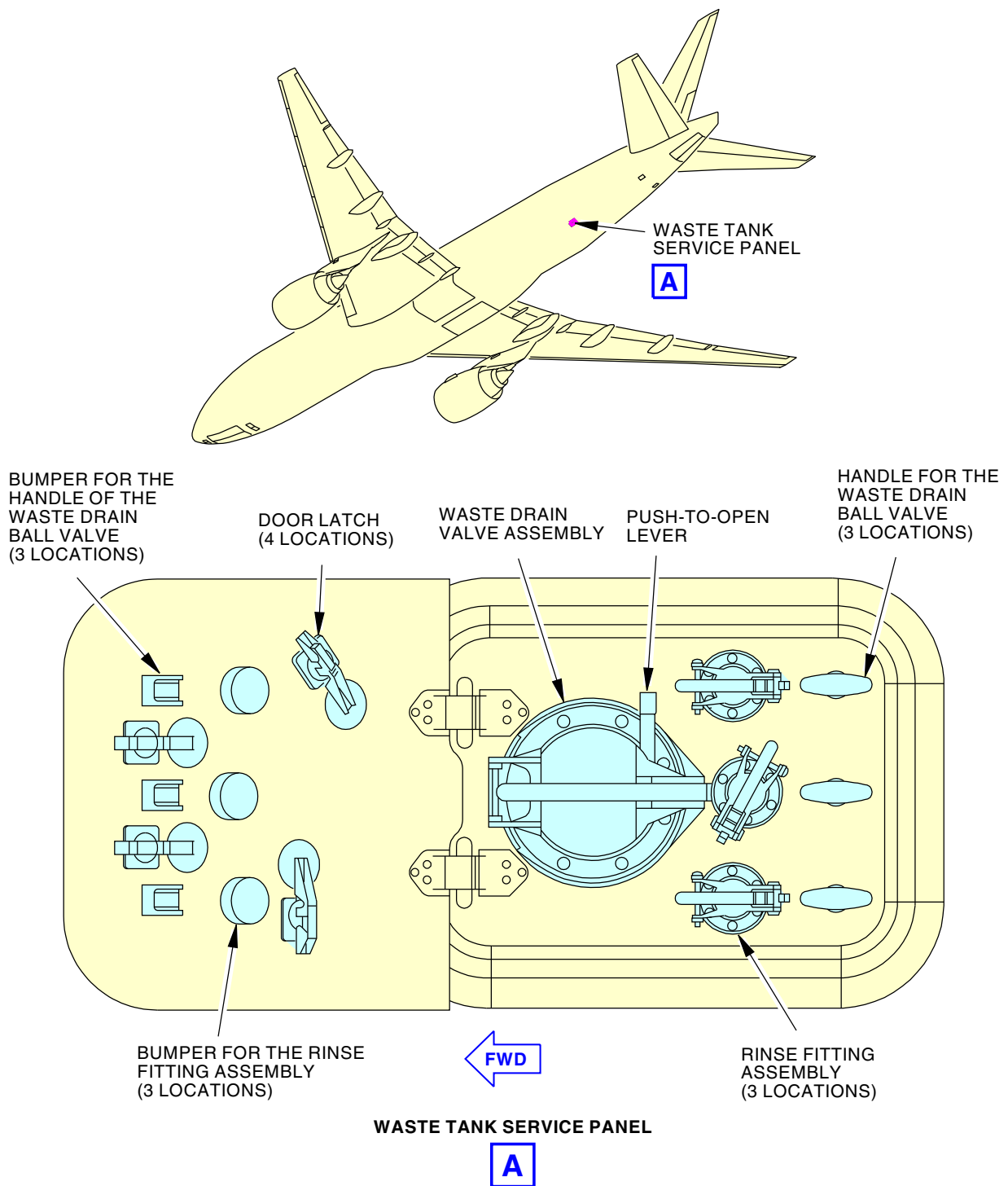
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**Waste Tank Servicing
Figure 301/12-17-01-990-801**

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AIRPLANE LUBRICATION - SERVICING

1. General

- A. This procedure contains these tasks:
- (1) General Instruction for Lubrication
 - (2) Intermixing or Purging of Greases
 - (3) Lubrication of Landing Gear During Cold Weather Operation

TASK 12-21-00-640-801

2. General Instructions for Lubrication

A. General

- (1) Description
 - (a) This section of the AMM gives the usual on-airplane lubrication procedures. Specific data about where to lubricate is given in the subsequent subjects of this section.
 - (b) There are other lubrication instructions in other ATA sections of the AMM about equipment removal and replacement.
- (2) General-Purpose Aviation Grease
 - (a) Boeing chooses the grease to use based on the specific application. Greases that meet the following specifications are considered general-purpose aviation grease for applications that operate in the -100°F (-73°C) to 250°F (121°C) range:
 - 1) grease, D00633.
 - 2) grease, D00013.
 - 3) grease, D00014.
 - (b) grease, D00633 is the preferred general-purpose aviation grease recommended by Boeing for applications exposed to temperatures of less than 250°F (121°C). It is recommended because it shows better wear, corrosion protection, and low temperature torque properties.
 - 1) grease, D00633 is satisfactory to be used:
 - a) When grease, D00013 was specified.
 - b) When grease, D00014 was specified AND grease, D00013 is given as an option
 - c) When grease, D00015 is specified for use in which the maximum service temperature is not more than 250°F (121°C).

NOTE: grease, D00015 has been obsolete and superseded by grease, D00633.
 - 2) grease, D00633 cannot be used where grease, D00014 or Royco 11MS grease, D00528 or grease, D50255 are the only greases specified because grease, D00633 was found not to be satisfactory in heavily loaded sliding applications.
 - 3) Greases that have been used before and approved by Boeing for the specific assembly are listed as flagnotes on the lubrication instructions for the specific assembly. If there is an application where only one grease must be used, it will be listed with the word "Only" after it.
- (3) Special Performance Greases.
 - (a) Special performance greases include:

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- 1) Royco 11MS grease, D00528.
 - 2) grease, D00016 (NATO G-354).
 - 3) grease, D00015.
 - 4) grease, D50255.
- (b) In some applications, a special purpose grease is necessary. Where only one grease is recommended for a specific application, it will be listed with the word "Only" after it.
- (4) Other Lubricants
- (a) fluid, D00467, Type II Landing Gear Shock Strut Fluid, Anti-Wear.
 - (b) fluid, D00070, Hydraulic Fluid, Petroleum base, Aircraft (NATO H-515).
 - (c) oil, D00091, Lubricating, General Purpose, Low Temperature (NATO O-142).
- (5) Lubrication Symbols.
- (a) Lubrication blocks are used to show the part or unit to be lubricated.
 - (b) Examples of Lubrication blocks used in the manual are shown in Lubrication Symbols (Figure 301 (Sheet 1)).
 - 1) If necessary, more data is given near the lubrication block to help you lubricate the airplane correctly. Each block shows this data:
 - a) The lubrication method.
 - b) The type of lubricant.
 - c) The access panel number is given above or below the lubrication block for points if it is not easy to find the area you must lubricate.
 - (c) More data on commonly used grease is available in SUMMARY OF MOST COMMONLY USED GREASES ON BOEING AIRPLANES, SL 20-006.

B. References

Reference	Title
SL 20-006	SUMMARY OF MOST COMMONLY USED GREASES ON BOEING AIRPLANES

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-4879	Coupler - Grease, Midget Part #: 314150 Supplier: OFKM1

D. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00014	Grease - Molybdenum Disulfide, Low & High Temperature	MIL-G-21164 (NATO G-353)
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS3-33)

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(Continued)

Reference	Description	Specification
D00016	Grease - Aircraft, General Purpose, Wide Temperature Range	MIL-PRF-81322
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00091	Oil - General Purpose, Low Temperature, Lubricating	MIL-PRF-7870 (NATO O-142)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D00528	Grease - Aircraft - Royco 11MS	
D00633	Grease - Aircraft General Purpose	BMS3-33
D50255	Grease - Aircraft And Instrument	MIL-PRF-32014
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50262	Wiper - Cleaning	BMS15-5

E. Lubrication Application Procedures and Cautions:

SUBTASK 12-21-00-640-001

- (1) Do these steps to prevent lubricant contamination:
 - (a) Put lubricant identification labels on all containers, guns, and dispensers.
 - (b) Keep lubricants in containers that have tight covers.
 - 1) Make sure that the container material will not absorb contamination.
 - (c) Do not let contamination get in the lubricant.
 - 1) Keep out dust and other contamination when the container is open.
 - 2) Keep the grease guns, brushes, and oil cans clean.

SUBTASK 12-21-00-640-002

- (2) Do these steps for correct lubrication:



CAUTION

DO NOT LET DIRT, METAL PARTICLES, AND OTHER UNWANTED MATERIAL GET IN THE LUBRICANT. CONTAMINATION IN THE LUBRICANT WILL CAUSE DAMAGE TO THE COMPONENT.

- (a) Remove dirt from the grease fittings before you attach the grease gun.

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DO NOT SET THE GUN TO A PRESSURE OF MORE THAN THE LIMIT GIVEN. TOO MUCH PRESSURE WILL CAUSE THE FITTING TO COME OUT AT A HIGH SPEED. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (b) Set the pressure at 100 psi (689 kPa) to 200 psi (1379 kPa) unless otherwise specified.

NOTE: This is usually sufficient to push out the used grease.

NOTE: Use of pneumatic or electric grease guns is not recommended unless the grease delivery pressure can be measured or controlled. Manually operated grease guns with maximum operating pressures of 4000 psi (27,579 kPa) or less are recommended. Use low input forces (approximately 10 lb (5 kg) or less) to operate the gun.

NOTE: The grease pressure delivered by a specific grease gun should be measured or estimated from the manufacturer's specifications.

- (c) Find all of the lubrication points that are identified in the specific maintenance task.

- 1) Use the specified lubricant.
- 2) Use a grease coupler, SPL-4879 for flush-type grease fittings.
- 3) Apply all lubricants lightly and smoothly.
- 4) Dispense grease into the grease fitting until the used grease is visually removed and only new grease comes out in one or more locations at the joint interface.

NOTE: This removes contamination along with the used grease.

- (d) After lubrication, remove the unwanted grease or lubricating fluid that is around the part or on other parts with a cotton wiper, G00034 or a wiper, G50262 to prevent contamination and damage to other surfaces.



LUBRICATE ONLY THE COMPONENTS THAT HAVE LUBRICATION FITTINGS. DO NOT LUBRICATE TEFLON BEARINGS AND BUSHINGS. LUBRICANTS CAUSE DAMAGE TO THE TEFLON, AND DECREASE THE LIFE OF THE BEARINGS.

- (e) Do not lubricate Teflon bearings and bushings.

NOTE: It is not necessary to lubricate these bearings.

- (f) If a grease fitting comes out, do these steps:

- 1) Look for blockage in the fitting or part.
- 2) If it is necessary, disassemble the part to remove the blockage.
- 3) Install a new fitting.

- (g) Be careful when you lubricate sealed-ball, or sealed-roller bearings that have a grease fitting.

- 1) Do not push the seal out with the grease.
- 2) Use a restrictor-type adapter to decrease the flow rate of the grease.
- 3) Stop the operation if the shape of the seal starts to change, or if the grease comes out of the bearing.

SUBTASK 12-21-00-640-018

- (3) If you find a plugged lubrication passage, do these steps:

- (a) Fill a hand-held grease gun with a warm mineral-based oil such as fluid, D00070.

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- (b) Flush the joint using a rapid pumping action.
- (c) Purge the oil with grease (TASK 12-21-00-640-802).
- (d) If the passage is still blocked or if the fitting becomes dislodged, do these steps:
 - 1) Disassemble the joint to remove the blockage.
 - 2) Install a new fitting.

SUBTASK 12-21-00-640-019

- (4) If desired, you may use a Grease Joint Rejuvenator to open clogged grease joints and fittings.

———— **END OF TASK** ————

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PAINT BRUSH	FILL TO LEVEL OF FILLER PORT	GREASE GUN	HAND	GREASE GUN	OIL GUN
	FILL	ZERK 		FLUSH 	
MIL-PRF-23827	MIL-CTR-5606	BMS 3-33	BMS 3-33	BMS 3-33	MIL-L-7870



METHOD OF APPLICATION
TYPE OF LUBRICANT

1

(SAMPLE SYMBOLS)

1 FLAG NOTES ARE TO PROVIDE ALTERNATE LUBRICANT AND ADDITIONAL INSTRUCTION

L00710 S0006401668_V6

Lubrication Symbols
Figure 301/12-21-00-990-801

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TASK 12-21-00-640-802

3. Intermixing or Purging of Greases

A. General

- (1) Boeing and grease manufacturers agree it is a best practice to limit intermixing of different types or brand-names of grease.
- (2) If you mix two different types or brand-names of greases, the performance and properties of the mixture may be degraded when compared with the performance and properties of the original, unmixed greases.
- (3) Use a different grease (alternative, optional, or brand-name) only after you remove the used grease as discussed below either by pumping or disassembly.
- (4) Purging
 - (a) Purging is the industry-recognized practice of replacing one grease with another. It is also the recommended procedure to be following in all lubrication tasks, even when not switching from one grease brand or type to another. It is used to ensure that as much of the used grease as possible or practical is removed from the assembly and is replaced by new grease.
 - 1) Purge the grease only when it is not possible or practical to disassemble to remove the used grease.
 - 2) The new grease can be the same type or a different type of grease if permitted for the application.
 - 3) Purging removes the contamination (wear debris, etc.) along with the used grease.
 - (b) Purging applies both to greasing with a new brand of grease and to usual greasing with the same grease.
 - (c) When an assembly is purged with a new brand of grease, a quantity of the previously used grease can continue to be in the assembly. The subsequent purging from the second and third lubrication operations with the new grease will decrease the remaining concentration of the previously used grease.

B. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50262	Wiper - Cleaning	BMS15-5

C. Procedure

SUBTASK 12-21-00-640-003

- (1) Make sure that the grease that you use is permitted by the specific AMM instructions and your local maintenance practices.

SUBTASK 12-21-00-640-004

- (2) Where surfaces are exposed or disassembly is a practical part of the lubrication procedure (e.g., wheel bearings), do these steps to replace the used grease:
 - (a) Remove all of the used grease from the bearing surfaces, and internal spaces of the mechanism with one of the following:
 - 1) cotton wiper, G00034.
 - 2) wiper, G50262.
 - (b) Lubricate the bearing surfaces with the new grease.

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SUBTASK 12-21-00-640-005

- (3) Where it is not possible or practical to disassemble the mechanism, do these steps to purge the used grease:
 - (a) Slowly put the new grease into each grease fitting
 - (b) Continue to add grease until all used grease is visually removed and only the new grease comes out.

————— END OF TASK —————

TASK 12-21-00-600-801

4. Lubrication of Landing Gear During Cold Weather Operation

A. General

- (1) This task provides maintenance instructions for the landing gear during cold weather operation. For the purposes of this task, cold weather is defined as the point where the temperature drops below 32°F (0°C).
- (2) Landing gear maintenance such as lubrication, shock strut servicing, and tire servicing are affected by cold weather operation. Proper maintenance procedures during cold weather operation for landing gear can help reduce degradation of the structural joints and ensure optimal shock strut performance. Lubrication is affected at lower temperatures due to increased viscosity of the grease and/or restricted (blocked) lubrication passages due to frozen moisture. Shock strut servicing and tire servicing are affected due to the reduced volume of air/nitrogen at lower temperatures. Special precautions, as described in this procedure, should be taken to ensure that the landing gear is properly maintained. Improperly maintained landing gear can potentially lead to excessive wear of bushings/joints, corrosion, heat damage, component fractures and reduced shock absorption capability.
- (3) Washing the landing gear should be avoided or reduced in frequency as much as possible. The practice of washing removes protective grease films in bearings and joints and accelerates corrosion and wear. When it is necessary to wash the gear for inspection purposes, it is recommended to re-grease the entire gear within approximately six hours to displace moisture and detergents.

B. References

Reference	Title
12-15-01-610-809	Main Landing Gear Shock Strut Fluid Check (P/B 301)
12-15-02-610-804-002	Nose Landing Gear Shock Strut Fluid Check (P/B 301)

C. Consumable Materials

Reference	Description	Specification
D00070	Fluid - Hydraulic, Petroleum Base	MIL-PRF-5606 (Replaces MIL-H-5606)
D00091	Oil - General Purpose, Low Temperature, Lubricating	MIL-PRF-7870 (NATO O-142)
D00467	Fluid - Landing Gear Shock Strut	BMS3-32 Type II
D00504	Grease - Petrolatum	VV-P-236

D. Landing Gear Structures Maintenance

SUBTASK 12-21-00-640-006

- (1) Where possible, perform scheduled lubrication at maintenance bases where the weather is above 32°F (0°C), or in a heated hangar.

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SUBTASK 12-21-00-640-007

- (2) If you will lubricate highly loaded MLG truck pivot joints, it is acceptable to “pre-grease” using oil prior to lubricating.

NOTE: This will help clear the lube paths and establish a protective film on the pins.

- (a) If Royco 11-MS grease is specified, use oil, D00091 or fluid, D00070 to pre-grease the joints.
- (b) Apply the oil until you see it coming out of the joints.
- (c) Purge the oil with grease (Intermixing or Purging of Greases, TASK 12-21-00-640-802).

SUBTASK 12-21-00-640-008

- (3) If necessary, use pressurized equipment to enable the grease to reach all surfaces of the joint.

NOTE: Attempting to grease a joint at higher pressures increases the risk of dislodging a lube fitting.

SUBTASK 12-21-00-640-009

- (4) Heat the landing gear structure using one of the methods below. The minimum time required to warm the structure is dependent on the surrounding temperature.

- (a) Blow hot air directly onto the structure
 - 1) Position the heater so that the warm air is directed to each zerk fitting and lubrication cavity prior to lubrication.
- (b) Blow hot air into an enclosure around the structure
 - 1) Use a tent-like enclosure (fabricated tent or parachute) made from heavy-duty material that is large enough to enclose the entire truck assembly.

NOTE: You can also use the cover for wheel/tire/brake protection during deicing/anti-icing or washing of the aircraft.

SUBTASK 12-21-00-640-010

- (5) Apply heat until the “touch temperature” of the steel landing gear structure (not the surrounding air temperature) has warmed above 32°F (0°C).

- (a) Use a thermocouple or infrared device to determine the temperature of the structure.

SUBTASK 12-21-00-640-011

- (6) Do not apply the heated air directly to the tires, as high temperatures can damage tires.

SUBTASK 12-21-00-640-012

- (7) Use one of the following heat sources to supply hot air directly to the structure or to the confined (tented) area surrounding the structure:
- (a) Space heaters (commercially available and can be used inside or outside hangars).
 - (b) Spencer Coldbuster Mark IV Flameless Heaters (can be used only outside or placed outside with ducting to direct hot air into the hangar/tented area).
 - (c) Herman-Nelson or Polar GSH-1 Heaters (placed outside with heat output directed into the hangar/tented area).
 - (d) Electric powered heaters (commercially available and may be used when the airplane is parked at the gate).
 - (e) Electric heat blankets connected to the airplane power.

SUBTASK 12-21-00-640-013

- (8) Continue to supply hot air to the area until the re-lubrication is completed.

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SUBTASK 12-21-00-640-014

- (9) To ensure that grease can flow freely, make sure that the grease gun itself is warmed to room temperature prior to grease application.
 - (a) Heat the grease gun and spare grease tube using a portable grease gun heater for approximately 15 minutes.

SUBTASK 12-21-00-640-015

- (10) If you find a plugged lubrication passage, do these steps:
 - (a) Fill a hand-held grease gun with a warm mineral-based oil such as fluid, D00070.
 - (b) Flush the joint using a rapid pumping action.
 - (c) Purge the oil with grease (Intermixing or Purging of Greases, TASK 12-21-00-640-802).
 - (d) If the passage is still blocked or if the fitting becomes dislodged, do these steps:
 - 1) Disassemble the joint to remove the blockage.
 - 2) Install a new fitting.

SUBTASK 12-21-00-640-016

- (11) If desired, you may use a Grease Joint Rejuvenator to open clogged grease joints and fittings.

E. Shock Strut Maintenance and Servicing

SUBTASK 12-21-00-640-017

- (1) During cold weather operation, some leakage of the shock strut fluid may occur. Minor leakage is acceptable.
 - (a) To prevent leakage during long layovers at temperatures below 0°F (-18°C), apply grease, D00504 to cover the gap between the gland nut and inner cylinder.

SUBTASK 12-21-00-880-002

- (2) For airplanes originating in a warm environment and terminating in a cold environment, do these steps:
 - (a) At the origin, over-inflate the shock struts by approximately 1 in. (25 mm).
 - (b) At the destination, perform a pressure/extension check (Main Landing Gear Shock Strut Fluid Check, TASK 12-15-01-610-809 or Nose Landing Gear Shock Strut Fluid Check, TASK 12-15-02-610-804-002).
 - 1) If you will use a two-point check, do these steps:
 - a) Make sure that the difference in ambient temperature at which the two measurements are made is not more than 20°F (-7°C).
 - b) Take the first measurement when the airplane is empty after arrival.
 - c) Take the second measurement when the airplane is fully loaded, at the same location as the first.
 - 2) If the strut is under-inflated, then service with nitrogen to bring the strut back onto the low end of the servicing band.

SUBTASK 12-21-00-710-001

- (3) For airplanes originating in a cold environment and terminating in a warm environment, do these steps:
 - (a) At the origin, perform a pressure/extension check (Main Landing Gear Shock Strut Fluid Check, TASK 12-15-01-610-809 or Nose Landing Gear Shock Strut Fluid Check, TASK 12-15-02-610-804-002).

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- 1) If the strut is under-inflated, then service with nitrogen to bring the strut back onto the low end of the servicing band.
- (b) At the destination, re-service the strut only if the airplane will remain in service in a warm environment.

NOTE: When the airplane arrives in the warmer location, the shock strut will appear slightly over-inflated. It is not recommended to re-service the strut if the airplane will soon return to a colder environment.

SUBTASK 12-21-00-210-001

- (4) Do these steps to ensure that the shock strut scraper functions properly:
 - (a) Wipe the chrome surface of the landing gear inner cylinder with fluid, D00467.
 - (b) Inspect the scraper ring and shock strut seals to make sure that there is no damage.

F. Parking and Tire Maintenance

SUBTASK 12-21-00-550-001

- (1) Do one of the following steps to park the airplane in an area where there is snow, ice, or slush:
 - (a) If possible, clear snow, ice, or slush from the areas directly under where the main and nose gear tires will be positioned, prior to parking the airplane.
 - (b) If the parking area is covered with packed snow or ice, park the airplane with the main gear tires on a thin layer of sand or a mat.

SUBTASK 12-21-00-880-003



DO NOT TRY TO MOVE THE AIRPLANE IF THE TIRES ARE FROZEN TO THE GROUND. MAKE SURE THAT THE WHEELS TURN WHEN YOU MOVE THE AIRPLANE. IF THE WHEELS DO NOT TURN, DAMAGE TO THE WHEELS AND THE AIRPLANE CAN OCCUR.

- (2) If wheel assemblies are frozen to the ramp, thaw ice around the tires with a ground heater, or soften ice by spraying a glycol mixture around the base of the tires.
 - (a) Make sure that the glycol or deicing fluid is not applied to the brake assemblies.

SUBTASK 12-21-00-610-001

- (3) For airplanes originating in a warm environment and terminating in a cold environment, do these steps:
 - (a) Service the tires to ensure that they have sufficient pressure, even if the airplane will fly to a warmer environment.

NOTE: It is better for the tires to be slightly over-inflated in a warmer environment than under-inflated in a colder environment.

SUBTASK 12-21-00-580-001

NOTE: If the airplane sits stationary in cold weather, the tires may develop flat spots. These flat spots are temporary and will go away when the tires are rolled. However, they may cause objectionable vibration during taxi or takeoff.

- (4) If desired, taxi the airplane to smooth out the flat spots.

————— **END OF TASK** —————

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ELEVATOR LUBRICATION - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Lubricate the Elevator Power Control Units (PCUs) - Use this procedure to lubricate the bearings at the attachment points of the PCUs.
 - (2) Lubricate the Elevator Hinges - Use this procedure to lubricate the bearings at the elevator hinge points.

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TASK 12-21-04-600-801

2. Elevator Power Control Units (PCUs) - Lubrication

(Figure 301 or Figure 302)

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)
29-11-00-860-807	Main Hydraulic System and the Reservoir Depressurization (P/B 201)
29-11-00-860-808	Main Hydraulic System Power Removal (P/B 201)
29-11-00-860-807	Main Hydraulic System and Reservoir Depressurization

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-1708	Pin Set, Elevator PCU Bypass Part #: J27019-1 Supplier: 81205
SPL-11197	Lock, Elevator Power Control Unit Part #: J27028-20 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
335	Left Horizontal Stabilizer - Rear Spar to Trailing Edge
336	Left Elevator
345	Right Horizontal Stabilizer - Rear Spar to Trailing Edge
346	Right Elevator

E. Access Panels

Number	Name/Location
335EXB	Horizontal Stabilizer Trailing Edge Panel

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(Continued)

Number	Name/Location

345EXB	Horizontal Stabilizer Lower Trailing Edge Panel

F. Prepare for the Procedure

SUBTASK 12-21-04-010-001

(1) Open the access panels in the lower surface of the stabilizer to get access to the PCUs.

(a) For the left elevator power control units, open this access panel:

Number	Name/Location

335EXB	Horizontal Stabilizer Trailing Edge Panel

(b) For the right elevator power control units, open this access panel:

Number	Name/Location

345EXB	Horizontal Stabilizer Lower Trailing Edge Panel

SUBTASK 12-21-04-840-001

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

SUBTASK 12-21-04-840-002



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.

(3) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-04-840-003

(4) Do one of these two procedures to move the elevators fully up and to install the elevator power control unit lock, SPL-11197:

(a) Procedure 1 - Move the elevator up manually:



MAKE SURE THAT THERE IS NO HIGH PRESSURE RESIDUAL TRAPPED IN THE HYDRAULIC SUPPLY LINES BETWEEN THE HYDRAULIC SOVS AND THE POWER CONTROL UNIT (PCUS) AFTER YOU CLOSE ALL HYDRAULIC SOVS. TRAPPED RESIDUAL PRESSURE CAN MOVE THE FLIGHT CONTROL SURFACES AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT DUE TO UN-COMMANDED MOVEMENT.

- 1) Depressurize the hydraulic system and reservoir. To depressurize them, do this task: AMM 29-11-00-860-807.
- 2) Move the control column several times to remove any remaining hydraulic pressure.
- 3) On the P61 panel, move the FLT CONTROL HYD VALVE POWER - TAIL switches to the SHUT OFF position.
- 4) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

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- a) A7, ELEV PCU LIB, LOB (On the left power supply assembly (PSA-L) in the E1-6 rack)
 - b) A7, ELEV PCU RIB, ROB (On the right power supply assembly (PSA-R) in the E5-1 rack)
 - c) A7, ELEV PCU LIB, LOB (On the center power supply assembly (PSA-C) in the E2-6 rack)
- 5) Operate the manual bypass valves on the two elevator PCUs.
- a) Install the elevator PCU bypass pin, SPL-1708, on the manual bypass valves (Figure 301 or Figure 302).
- 6) Push the trailing edge of the elevator up.
- NOTE:** The elevator will only move slowly because of the resistance in the PCUs.
- 7) Install the elevator power control unit lock, SPL-11197, on each of the elevator PCUs.
- 8) Remove the elevator PCU bypass pin, SPL-1708, from the manual bypass valves.



BEFORE YOU START THIS PROCEDURE, MAKE SURE THAT THERE IS NO LOCK INSTALLED ON ANY OF THE ELEVATOR PCUS. THE PCUS CAN BE DAMAGED IF HYDRAULIC POWER IS SUPPLIED WHEN THE LOCKS ARE INSTALLED ON THEM.

- (b) Procedure 2 - Move the elevator up with hydraulic power:
- 1) Make sure the PRIMARY FLIGHT COMPUTER switch (on the overhead panel, P5) is in the AUTO position.
 - 2) Move and hold the Captain's or the First Officer's control column full aft to put the elevators in the up position.
 - 3) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

- a) A7, ELEV PCU LIB, LOB (On the left power supply assembly (PSA-L) in the E1-6 rack)
- b) A7, ELEV PCU RIB, ROB (On the right power supply assembly (PSA-R) in the E5-1 rack)
- c) A7, ELEV PCU LIB, LOB (On the center power supply assembly (PSA-C) in the E2-6 rack)



REMOVING HYDRAULIC SYSTEM PRESSURE TO ALL THE PCU'S FOR A SINGLE ELEVATOR SURFACE MAY RESULT IN THAT SURFACE SLOWLY LOWERING. KEEP PERSONS AND EQUIPMENT CLEAR OF THE ELEVATOR SURFACE WHEN REMOVING ALL HYDRAULIC SYSTEM PRESSURE TO THE PCU'S OF THAT SURFACE. FAILURE TO OBEY THESE INSTRUCTIONS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

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(WARNING PRECEDES)



MAKE SURE THAT THERE IS NO HIGH PRESSURE RESIDUAL TRAPPED IN THE HYDRAULIC SUPPLY LINES BETWEEN THE HYDRAULIC SOVS AND THE POWER CONTROL UNIT (PCUS) AFTER YOU CLOSE ALL HYDRAULIC SOVS. TRAPPED RESIDUAL PRESSURE CAN MOVE THE FLIGHT CONTROL SURFACES AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT DUE TO UN-COMMANDED MOVEMENT.

- 4) Depressurize the hydraulic system and reservoir. To depressurize them, do this task: Main Hydraulic System and the Reservoir Depressurization, TASK 29-11-00-860-807.
- 5) Move the control column several times to remove any remaining hydraulic pressure.
- 6) Release the control column.
- 7) Make sure that there is no elevator movement.
- 8) On the P61 panel, move the FLT CONTROL HYD VALVE POWER - TAIL switches to the SHUT OFF position.



MAKE SURE THE CIRCUIT BREAKERS FOR THE PCUS ARE OPEN AND HYDRAULIC POWER FOR THE ELEVATOR PCUS IS REMOVED BEFORE YOU INSTALL THE SAFETY LOCKS. IF THE CIRCUIT BREAKERS FOR THE PCUS ARE CLOSED, THE ELEVATOR CAN FALL WHILE YOU INSTALL THE SAFETY LOCKS. IF HYDRAULIC POWER FOR THE PCUS IS ON, THE ELEVATOR CAN MOVE DOWN VERY FAST WHILE YOU INSTALL THE SAFETY LOCKS. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE EQUIPMENT.

- 9) Install the elevator power control unit lock, SPL-11197, on each of the elevator PCUs.

G. Procedure

SUBTASK 12-21-04-640-001

- (1) Put grease, D00633, in the fittings of the rod end bearing for the PCU and the reaction link (Table 301):

NOTE: Only these two bearings at the aft end of each PCU use lubricant. The bearings at the front of the PCU do not use lubricant. Also, for the PCU rod end, application of lubricant to only one of the two grease fittings is necessary.

NOTE: Rod end bearing lubrication requires that grease come out of the bearing between the bearing and the pin. If grease only comes out between the bearing and the rod end housing, the bearing is not properly lubricated.

- (a) Add grease, D00633, until clean grease, D00633 comes out of the bearings.

SUBTASK 12-21-04-640-002

- (2) Remove the excess grease, D00633 from around the bearings.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-04-860-001

- (1) Make sure that this circuit breaker is open and has safety tag:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

- (a) On the left power supply assembly (PSA-L) in the E1-6 rack:
- 1) A7, ELEV PCU LIB, LOB
- (b) On the right power supply assembly (PSA-R) in the E5-1 rack:
- 1) A7, ELEV PCU RIB, ROB
- (c) On the center power supply assembly (PSA-C) in the E2-6 rack:
- 1) A7, ELEV PCU LIB, LOB

SUBTASK 12-21-04-860-002

- (2) Make sure hydraulic power (TASK 29-11-00-860-808) is removed.

SUBTASK 12-21-04-080-001



MAKE SURE THE CIRCUIT BREAKERS FOR THE PCUS ARE OPEN AND HYDRAULIC POWER FOR THE ELEVATOR PCUS IS REMOVED. IF THE CIRCUIT BREAKERS FOR THE PCUS ARE CLOSED, THE ELEVATOR CAN FALL WHEN THE SAFETY LOCKS ARE REMOVED. IF HYDRAULIC POWER FOR THE PCUS IS ON, THE ELEVATOR CAN MOVE DOWN VERY FAST WHEN THE SAFETY LOCKS ARE REMOVED. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE EQUIPMENT.

- (3) Remove the elevator power control unit lock, SPL-11197, from the PCUs.
- (a) If the safety locks are caught (jammed) because the elevator has moved down, do the following:
- 1) Install the elevator PCU bypass pin, SPL-1708, on the manual bypass valves on the two elevator PCUs.
 - 2) Push the trailing edge of the elevator up and hold.
NOTE: The elevator will only move slowly because of the resistance in the units [10].
 - 3) Remove the elevator power control unit lock, SPL-11197.
 - 4) Remove the elevator PCU bypass pin, SPL-1708 from the manual bypass valves on the two elevator PCUs.
 - 5) Release lifting pressure on the elevator trailing edge.

SUBTASK 12-21-04-410-001

- (4) Install the access panels you removed:
- (a) For the left elevator power control units, install this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|---|
| 335EXB | Horizontal Stabilizer Trailing Edge Panel |
- (b) For the right elevator power control units, install this access panel:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|---|
| 345EXB | Horizontal Stabilizer Lower Trailing Edge Panel |

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SUBTASK 12-21-04-840-006

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

- (a) On the left power supply assembly (PSA-L) in the E1-6 rack:
1) A7, ELEV PCU LIB, LOB
- (b) On the right power supply assembly (PSA-R) in the E5-1 rack:
1) A7, ELEV PCU RIB, ROB
- (c) On the center power supply assembly (PSA-C) in the E2-6 rack:
1) A7, ELEV PCU LIB, LOB

SUBTASK 12-21-04-840-007

- (6) On the P61 panel, move the FLT CONTROL HYD POWER - TAIL switches to the NORM position.

Table 301/12-21-04-993-803 Elevator PCU Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Reaction Link (Aft End)	grease, D00633	BMS3-33	Zerk	1 each PCU
2	PCU Rod End	grease, D00633	BMS3-33	Zerk	1 each PCU

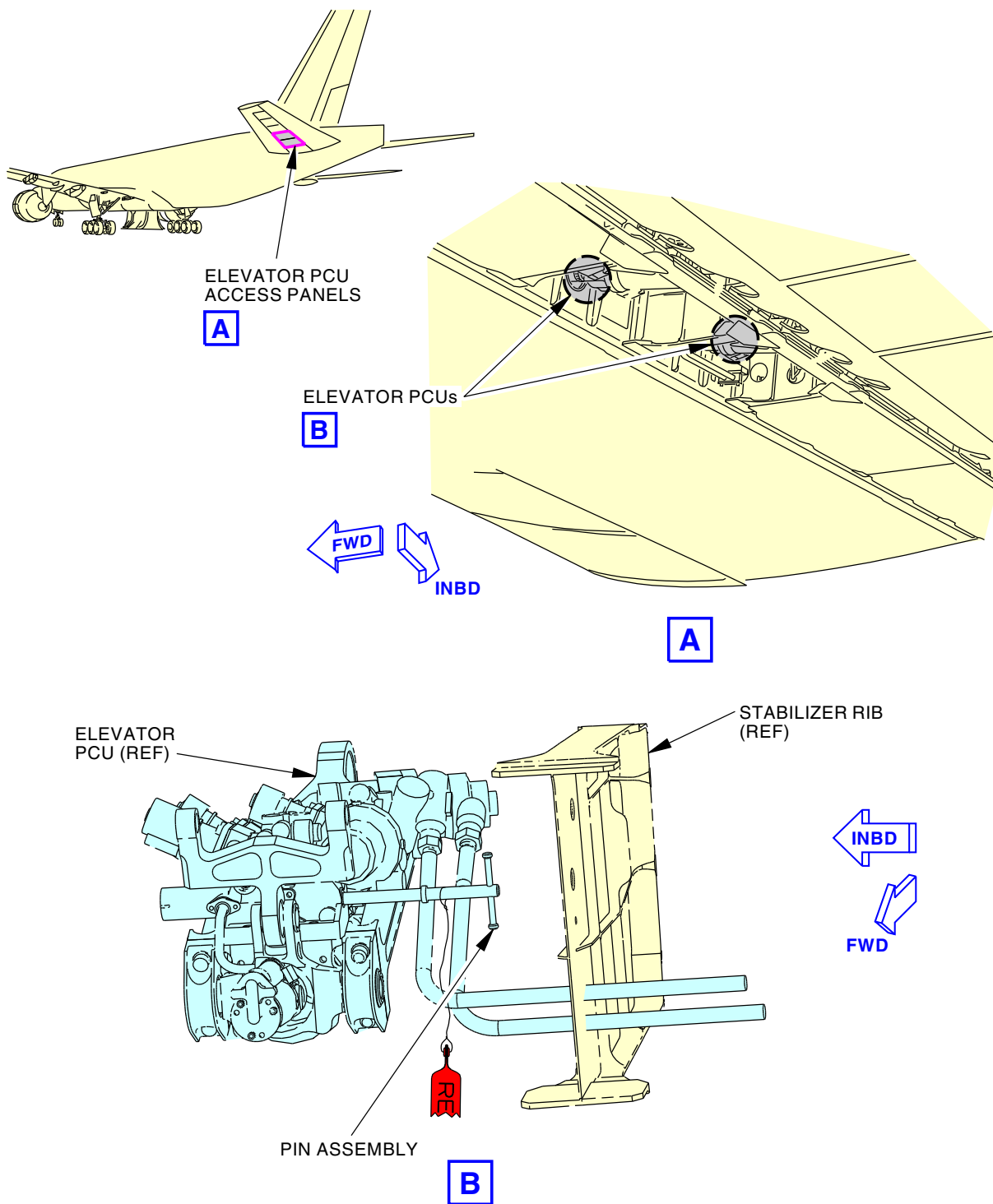
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U82819 S0000218953_V2

**Elevator PCU Bypass Pin Set
Figure 301/12-21-04-990-803**

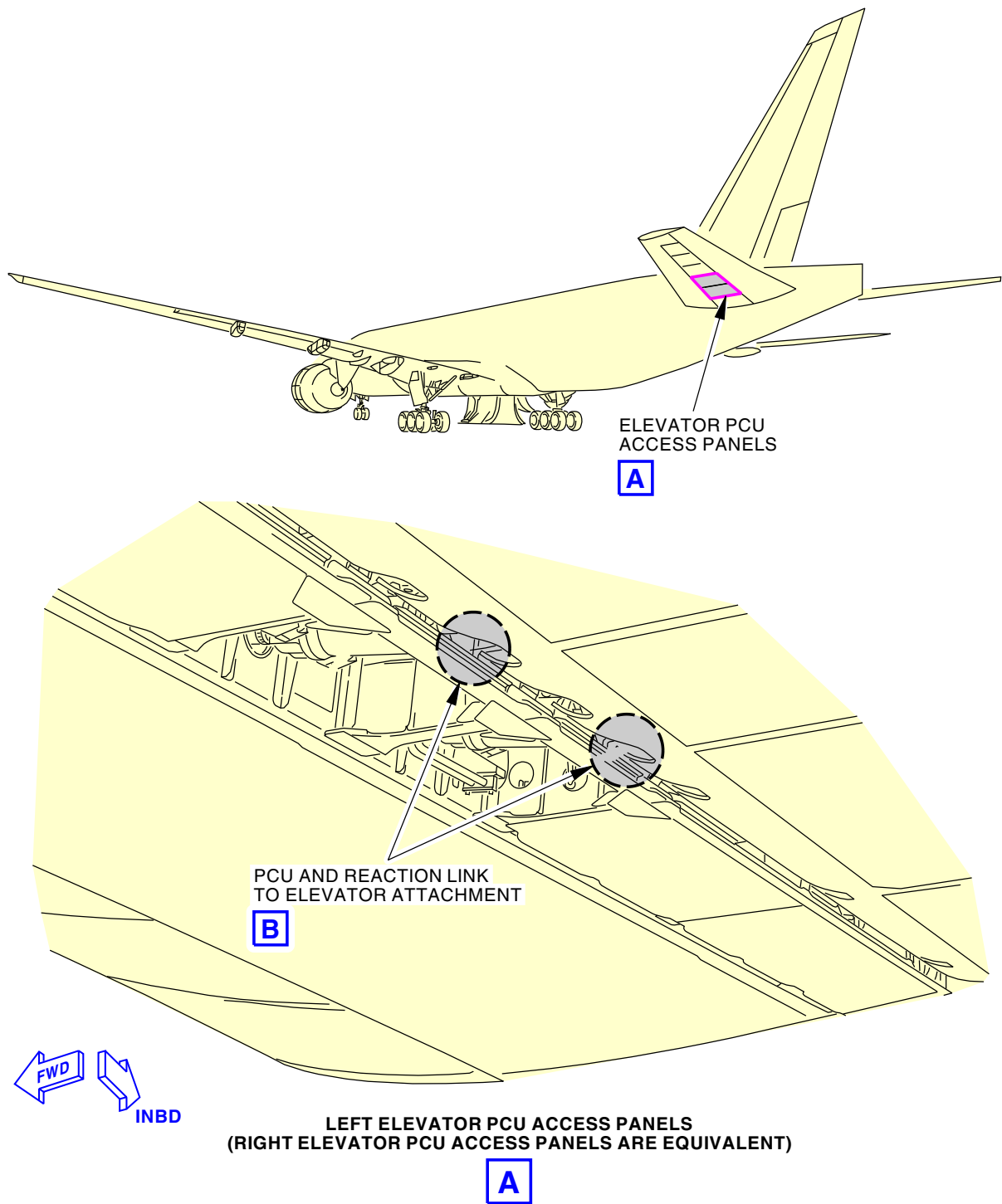
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E28700 S0006401678_V2

Elevator Power Control Unit (PCU) Servicing
Figure 302/12-21-04-990-801 (Sheet 1 of 2)

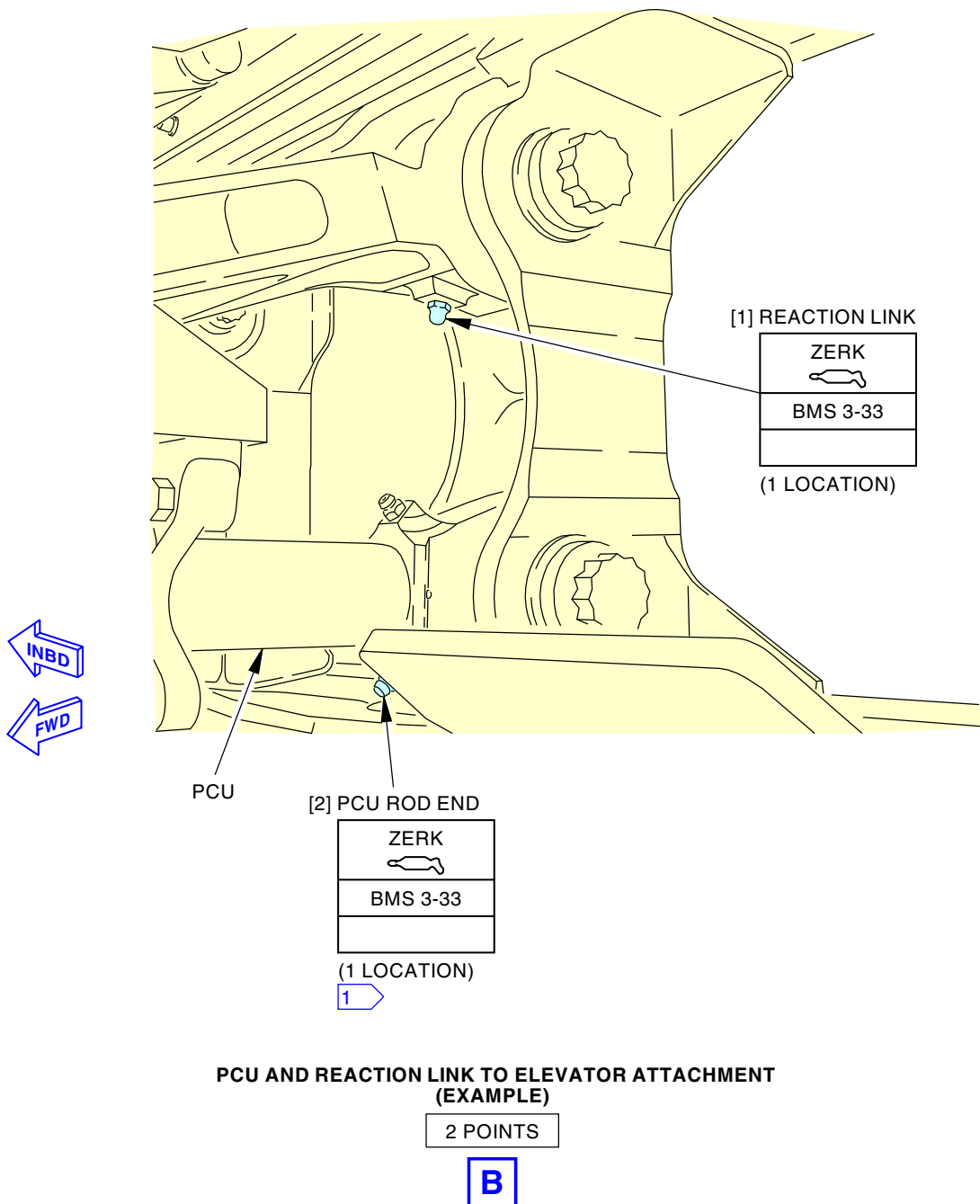
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1 LUBRICATE A MINIMUM OF ONE LUBE POINT ON THE PCU ROD END.

E28701 S0006401679_V4

**Elevator Power Control Unit (PCU) Servicing
Figure 302/12-21-04-990-801 (Sheet 2 of 2)**

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TASK 12-21-04-600-802

3. Lubricate the Elevator Hinges

(Figure 303)

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)

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-1708	Pin Set, Elevator PCU Bypass Part #: J27019-1 Supplier: 81205
SPL-11197	Lock, Elevator Power Control Unit Part #: J27028-20 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
335	Left Horizontal Stabilizer - Rear Spar to Trailing Edge
336	Left Elevator
345	Right Horizontal Stabilizer - Rear Spar to Trailing Edge
346	Right Elevator

E. Access Panels

Number	Name/Location
335EXB	Horizontal Stabilizer Trailing Edge Panel
335FBX	Horizontal Stabilizer Trailing Edge Seal
335QBX	Horizontal Stabilizer Trailing Edge Seal
335RBX	Horizontal Stabilizer Trailing edge Seal
335SBX	Horizontal Stabilizer Trailing Edge Seal
335TBX	Horizontal Stabilizer Trailing Edge Seal
335UBX	Horizontal Stabilizer Trailing Edge Seal
345EXB	Horizontal Stabilizer Lower Trailing Edge Panel
345FBX	Horizontal Stabilizer Trailing Edge Seal
345QBX	Horizontal Stabilizer Trailing Edge Seal
345RBX	Horizontal Stabilizer Trailing Edge Seal
345SBX	Horizontal Stabilizer Trailing Edge Seal
345TBX	Horizontal Stabilizer Trailing Edge Seal

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(Continued)

Number	Name/Location

345UBX	Horizontal Stabilizer Trailing Edge Seal

F. Prepare for the Procedure

SUBTASK 12-21-04-010-002

- (1) Open the access panels in the lower surface of the stabilizer to get access to the Elevator hinges:

- (a) For the left elevator power control units, open these access panels:

Number	Name/Location
335EXB	Horizontal Stabilizer Trailing Edge Panel
335FBX	Horizontal Stabilizer Trailing Edge Seal
335QBX	Horizontal Stabilizer Trailing Edge Seal
335RBX	Horizontal Stabilizer Trailing edge Seal
335SBX	Horizontal Stabilizer Trailing Edge Seal
335TBX	Horizontal Stabilizer Trailing Edge Seal
335UBX	Horizontal Stabilizer Trailing Edge Seal

- (b) For the right elevator power control units, open these access panels:

Number	Name/Location
345EXB	Horizontal Stabilizer Lower Trailing Edge Panel
345FBX	Horizontal Stabilizer Trailing Edge Seal
345QBX	Horizontal Stabilizer Trailing Edge Seal
345RBX	Horizontal Stabilizer Trailing Edge Seal
345SBX	Horizontal Stabilizer Trailing Edge Seal
345TBX	Horizontal Stabilizer Trailing Edge Seal
345UBX	Horizontal Stabilizer Trailing Edge Seal

SUBTASK 12-21-04-840-008

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

SUBTASK 12-21-04-840-009



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.

- (3) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-04-840-010

- (4) Do one of these two procedures to move the elevators fully up and to install the elevator power control unit lock, SPL-11197:

- (a) Procedure 1 - Move the elevator manually:

- 1) On the P61 panel, move the FLT CONTROL HYD VALVE POWER - TAIL switches to the SHUT OFF position.

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

- a) A7, ELEV PCU LIB, LOB (On the left power supply assembly (PSA-L) in the E1-6 rack)
 - b) A7, ELEV PCU RIB, ROB (On the right power supply assembly (PSA-R) in the E5-1 rack)
 - c) A7, ELEV PCU LIB, LOB (On the center power supply assembly (PSA-C) in the E2-6 rack)
- 3) Operate the manual bypass valves on the two elevator PCUs
- a) Install the elevator PCU bypass pin, SPL-1708, on the manual bypass valves.
- 4) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
- 5) Push the trailing edge of the elevator up.
- NOTE:** The elevator will only move slowly because of the resistance in the PCUs.
- 6) When the elevator is fully up, hold the elevator in its position and remove the elevator PCU bypass pin, SPL-1708, from the manual bypass valves.
- a) Install the elevator power control unit lock, SPL-11197, on each of the elevator PCUs.



CAUTION

BEFORE YOU USE THIS PROCEDURE, MAKE SURE THAT THERE IS NO LOCK INSTALLED ON ANY OF THE ELEVATOR PCU. THE PCUS CAN BE DAMAGED IF HYDRAULIC POWER IS SUPPLIED WHEN THE LOCKS ARE INSTALLED ON THEM.

- (b) Procedure 2 - Move the elevator with hydraulic power:

- 1) Make sure the PRIMARY FLIGHT COMPUTER switch (on the overhead panel, P5) is in the AUTO position.
- 2) Move and hold the Captain's or the First Officer's control column full aft to put the elevators in the up position.
- 3) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

- a) A7, ELEV PCU LIB, LOB (On the left power supply assembly (PSA-L) in the E1-6 rack)
 - b) A7, ELEV PCU RIB, ROB (On the right power supply assembly (PSA-R) in the E5-1 rack)
 - c) A7, ELEV PCU LIB, LOB (On the center power supply assembly (PSA-C) in the E2-6 rack)
- 4) On the P61 panel, move the FLT CONTROL HYD VALVE POWER - TAIL switches to the SHUT OFF position.
- 5) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
- 6) Release the control column.

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- 7) Make sure that there is no elevator movement.



WARNING

MAKE SURE THE CIRCUIT BREAKERS FOR THE PCUS ARE OPEN AND HYDRAULIC POWER FOR THE ELEVATOR PCUS IS REMOVED BEFORE YOU INSTALL THE SAFETY LOCKS. IF THE CIRCUIT BREAKERS FOR THE PCUS ARE CLOSED, THE ELEVATOR CAN FALL WHILE YOU INSTALL THE SAFETY LOCKS. IF HYDRAULIC POWER FOR THE PCUS IS ON, THE ELEVATOR CAN MOVE DOWN VERY FAST WHILE YOU INSTALL THE SAFETY LOCKS. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE EQUIPMENT.

- 8) Install the elevator power control unit lock, SPL-11197, on each of the elevator PCUs.

G. Procedure

SUBTASK 12-21-04-640-003

- (1) Put grease, D00633, in the fitting of the elevator hinge bearing:
 - (a) Add grease, D00633, until clean grease, D00633 comes out of the bearings.

SUBTASK 12-21-04-640-004

- (2) Remove the unwanted grease, D00633 from around the bearings.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-04-860-003

- (1) Make sure that this circuit breaker is open and has safety tag:

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

- (a) On the left power supply assembly (PSA-L) in the E1-6 rack:
 - 1) A7, ELEV PCU LIB, LOB
- (b) On the right power supply assembly (PSA-R) in the E5-1 rack:
 - 1) A7, ELEV PCU RIB, ROB
- (c) On the center power supply assembly (PSA-C) in the E2-6 rack:
 - 1) A7, ELEV PCU LIB, LOB

SUBTASK 12-21-04-860-004

- (2) Make sure hydraulic power (TASK 29-11-00-860-808) is removed.

SUBTASK 12-21-04-080-002



WARNING

MAKE SURE THE CIRCUIT BREAKERS FOR THE PCUS ARE OPEN AND HYDRAULIC POWER FOR THE ELEVATOR PCUS IS REMOVED. IF THE CIRCUIT BREAKERS FOR THE ELEVATOR PCUS ARE CLOSED, THE ELEVATOR CAN FALL WHEN THE SAFETY LOCKS ARE REMOVED. IF HYDRAULIC POWER FOR THE PCUS IS ON, THE ELEVATOR CAN MOVE DOWN VERY FAST WHEN THE SAFETY LOCKS ARE REMOVED. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE EQUIPMENT.

- (3) Remove the elevator power control unit lock, SPL-11197, from the elevator PCUs.

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- (a) If the safety locks are caught (jammed) because the elevator has moved down, do the following:
- 1) Install the elevator PCU bypass pin, SPL-1708, on the manual bypass valves on the two elevator PCUs.
 - 2) Push the trailing edge of the elevator up and hold.
NOTE: The elevator will only move slowly because of the resistance in the units [10].
 - 3) Remove the elevator power control unit lock, SPL-11197.
 - 4) Remove the elevator PCU bypass pin, SPL-1708 from the manual bypass valves on the two elevator PCUs.
 - 5) Release lifting pressure on the elevator trailing edge.

SUBTASK 12-21-04-410-002

- (4) Install the access panels you removed:
- (a) For the left elevator power control units, install these access panels:

<u>Number</u>	<u>Name/Location</u>
335EXB	Horizontal Stabilizer Trailing Edge Panel
335FBX	Horizontal Stabilizer Trailing Edge Seal
335QBX	Horizontal Stabilizer Trailing Edge Seal
335RBX	Horizontal Stabilizer Trailing edge Seal
335SBX	Horizontal Stabilizer Trailing Edge Seal
335TBX	Horizontal Stabilizer Trailing Edge Seal
335UBX	Horizontal Stabilizer Trailing Edge Seal

- (b) For the right elevator power control units, install these access panels:

<u>Number</u>	<u>Name/Location</u>
345EXB	Horizontal Stabilizer Lower Trailing Edge Panel
345FBX	Horizontal Stabilizer Trailing Edge Seal
345QBX	Horizontal Stabilizer Trailing Edge Seal
345RBX	Horizontal Stabilizer Trailing Edge Seal
345SBX	Horizontal Stabilizer Trailing Edge Seal
345TBX	Horizontal Stabilizer Trailing Edge Seal
345UBX	Horizontal Stabilizer Trailing Edge Seal

SUBTASK 12-21-04-840-013

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	27	C27609	ELEV PCU RIB(BLK)/ROB(BYP)

- (a) On the left power supply assembly (PSA-L) in the E1-6 rack:
- 1) A7, ELEV PCU LIB, LOB
- (b) On the right power supply assembly (PSA-R) in the E5-1 rack:
- 1) A7, ELEV PCU RIB, ROB
- (c) On the center power supply assembly (PSA-C) in the E2-6 rack:
- 1) A7, ELEV PCU LIB, LOB

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SUBTASK 12-21-04-840-014

- (6) On the P61 panel, move the FLT CONTROL HYD POWER - TAIL switches to the NORM position.

Table 302/12-21-04-993-804

Elevator Hinges					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Elevator Hinge Bearing	grease, D00633	BMS3-33	Zerk	9 each elevator

———— **END OF TASK** ————

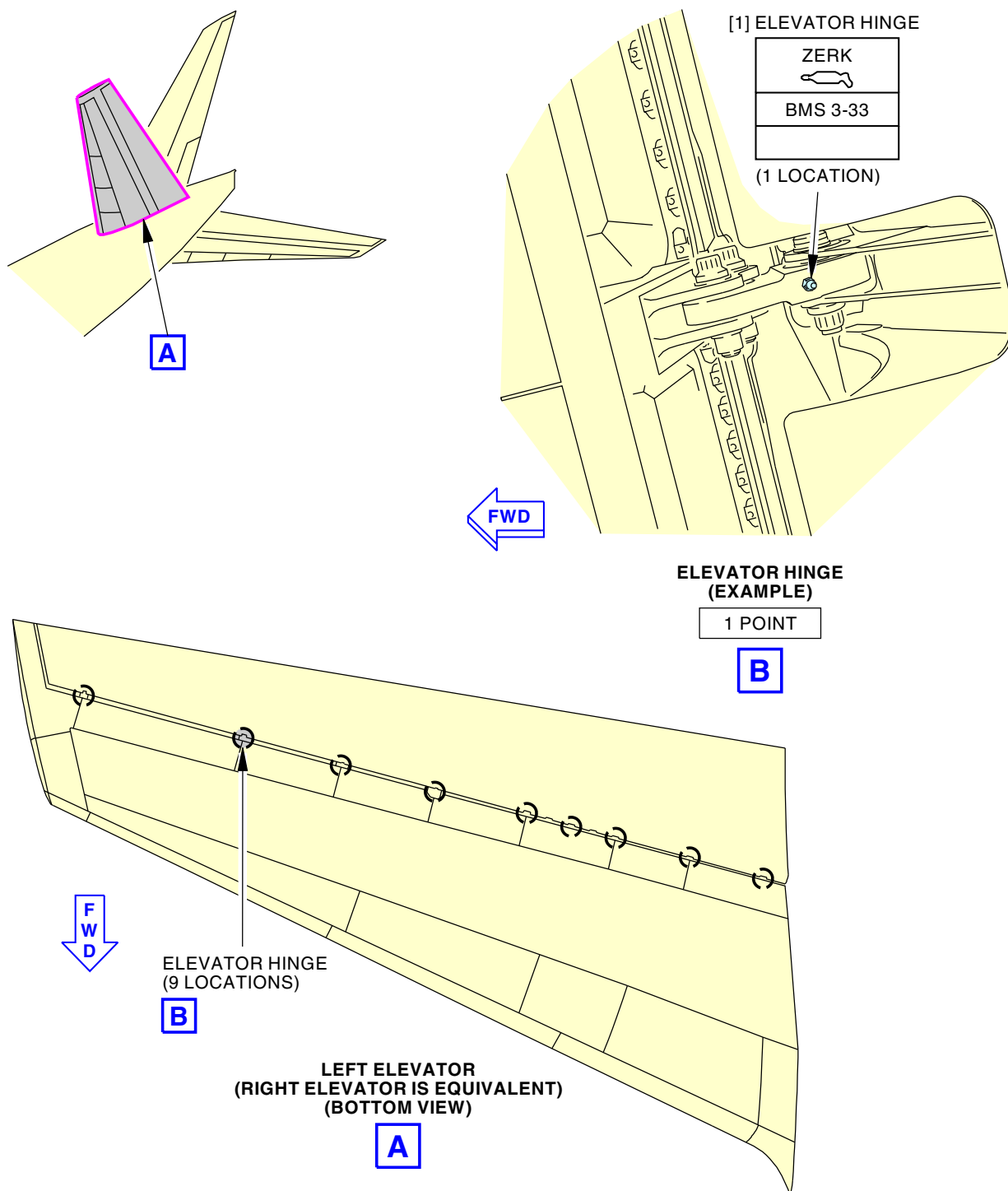
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Elevator Hinge Servicing
Figure 303/12-21-04-990-802

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HORIZONTAL STABILIZER BALLSCREW, BALLNUT AND GIMBAL - SERVICING

1. General

- A. This procedure contains scheduled maintenance tasks data.
- B. This procedure has these tasks:
- (1) Lubricate the Horizontal Stabilizer Ballscrew Assembly - Use this procedure to lubricate the ballscrew, ballnut, and gimbal of the stabilizer ballscrew actuator.
- NOTE: Refer to AMM 12-13-06/301, Stabilizer Ballscrew Actuator Primary Brake - Servicing, for the procedure to add oil to the primary brake of the stabilizer ballscrew actuator.

TASK 12-21-05-600-801

2. Horizontal Stabilizer Ballscrew Actuator Assembly - Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-41-13 P/B 401	STABILIZER TRIM ACTUATOR - REMOVAL/INSTALLATION
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. 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-2011	Ladder Equipment - Vertical Fin and Empennage Access Part #: J53001-1 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33
G50316	Cloth - Clean, Dry, Lint-free, White, Cotton	

D. Location Zones

Zone	Area
311	Area Aft of Bulkhead, Left
312	Area Aft of Bulkhead, Right

E. Access Panels

Number	Name/Location
311BL	Service Access Door

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F. Prepare for the Procedure

SUBTASK 12-21-05-840-001



MAKE SURE THAT CENTER AND RIGHT HYDRAULIC POWER IS NOT SUPPLIED. IF NOT, THE STABILIZER BALLSCREW ACTUATOR CAN MOVE. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 12-21-05-840-002

- (2) Put the three FLT CONTROL HYD VALVE POWER switches for the TAIL in the SHUT OFF position and attach DO-NOT-OPERATE tags.

SUBTASK 12-21-05-480-001

- (3) Attach DO-NOT-OPERATE tags on the ALTN PITCH and TRIM levers.

SUBTASK 12-21-05-840-003

- (4) On the control stand, put the Center and Right STAB CUT OFF switches in the CUT OUT position.

SUBTASK 12-21-05-860-002

- (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>
B	2	CBB2-C	STAB TRIM

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	2	CBB2-R	STAB TRIM

SUBTASK 12-21-05-010-003

- (6) Open this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Service Access Door

SUBTASK 12-21-05-480-002

- (7) Install the ladder equipment, SPL-2011.

G. Procedure

SUBTASK 12-21-05-600-001

- (1) Remove the old grease from the stabilizer ballscrew threads by wiping the screw with a clean, dry, non-abrasive cotton cloth, G50316, from top to bottom.

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SUBTASK 12-21-05-640-001



CAUTION

OBEY THE PRESSURE LIMITS. TOO MUCH PRESSURE WILL CAUSE DAMAGE TO EQUIPMENT.

- (2) Apply grease, D00633, slowly and smoothly in the two zerk fittings for the trunnion [1] at the lower gimbal of the stabilizer ballscrew actuator (Table 301).

NOTE: The maximum grease pressure limit is 5000 psi (34,474 kPa).

NOTE: The lower gimbal may have placards attached, which state "SERVICE WITH MIL-G-23827 GREASE ONLY". The following grease substitution note applies, even if these placards are present.

NOTE: You may use grease, D00013, as an acceptable alternative to grease, D00633, if you are currently using grease, D00013, in the horizontal stabilizer actuation system.

If you are currently using grease, D00633, in the horizontal stabilizer actuator assembly, you cannot use grease, D00013.

If you want to start using grease, D00633, in the horizontal stabilizer trim actuator assembly, you must completely flush the old grease, D00013, out of the system until the new grease comes out of the vent holes and bearings.

- (a) Add until clean grease, D00633, comes out of the bearings or between the lower gimbal assembly inner and outer plates.

NOTE: As long as any clean grease flows through the ballnut grease fitting, there is grease flow through the lower gimbal bearing space which is sufficient to lubricate the ballnut trunnion. Grease flow out between the lower gimbal assembly inner and outer plates is acceptable.

- (b) Remove any excess grease, D00633, from around the bearings or lower gimbal assembly plates.

Table 301/12-21-05-993-802 Stabilizer Ballscrew Actuator Assembly Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Trunnion	grease, D00633	BMS3-33	Zerk	2
2	Ballnut	grease, D00633	BMS3-33	Zerk	2
3	Ballscrew	grease, D00633	BMS3-33	Hand	1

SUBTASK 12-21-05-640-005

- (3) Use your hand to apply a thin layer of grease, D00633, to the threads of the ballscrew [3].

SUBTASK 12-21-05-440-009

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

Power Supply Assembly Center, M24301

Row	Col	Number	Name
B	2	CBB2-C	STAB TRIM

SUBTASK 12-21-05-440-001

- (5) Put the Center FLT CTRL HYD VALVE POWER switch for the TAIL in the NORM position and remove the DO-NOT-OPERATE tag.

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SUBTASK 12-21-05-440-002

- (6) On the control stand, put the Center STAB cutoff switch to the NORM position.

NOTE: Leave the Right STAB cutoff switch in the CUTOUT position. This will make the stabilizer ballscrew move more slowly while performing the following maintenance task.

SUBTASK 12-21-05-860-001



THE STABILIZER WILL MOVE DURING THIS PROCEDURE. IF YOU ARE NOT CAREFUL, INJURY TO PERSONS OR EQUIPMENT CAN OCCUR.

- (7) Pressurize the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-05-440-003

- (8) Move the stabilizer to the full APL Nose Down (stabilizer leading edge full up) position using the captain's control wheel trim switches.

SUBTASK 12-21-05-440-004

- (9) On the control stand, put the Center Stab cutoff switch in the CUTOUT position.

SUBTASK 12-21-05-640-006

- (10) Use your hand to apply a thin layer of grease, D00633, to the lower threads of the ballscrew [3] between the ballnut [2] and the lower endstop.

SUBTASK 12-21-05-440-005

- (11) On the control stand, put the Center Stab cutoff switch in the NORM position.

SUBTASK 12-21-05-440-006

- (12) Move the stabilizer to the full APL Nose Up (stabilizer leading edge full down) position using the captain's control wheel trim switches.

SUBTASK 12-21-05-440-007

- (13) On the control stand, put the Center Stab cutoff switch in the CUTOUT position.

SUBTASK 12-21-05-640-007

- (14) Use your hand to apply a thin layer of grease, D00633, to the upper threads of the ballscrew [3] between the ballnut [2] and the upper endstop.

SUBTASK 12-21-05-440-008

- (15) On the control stand, put the Center Stab cutoff switch in the NORM position.

SUBTASK 12-21-05-640-008



MAKE SURE THAT YOU STAY AWAY FROM THE STABILIZER AND BALLSCREW DURING THIS PROCEDURE. THE STABILIZER AND TRIM ACTUATOR MOVE DURING THIS PROCEDURE AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

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(WARNING PRECEDES)



CAUTION

OBEY THE PRESSURE LIMITS. TOO MUCH PRESSURE WILL CAUSE DAMAGE TO EQUIPMENT.

- (16) While the ballnut [2] moves from one endstop to the other endstop, add grease, D00633, slowly and smoothly to the ballnut [2] until fresh grease comes out from either the grease vent or the bottom seal (end opposite the zerk fitting).

NOTE: The maximum grease pressure limit is 5000 psi (34,474 kPa).

NOTE: Apply grease pressure slowly and continuously to the ballnut [2] while the ballnut moves to prevent excessive grease pressure flow past the return tube seals and ballscrew wiper seals.

NOTE: You may need to use a grease gun with a long, rigid extension to provide enough room between personnel and the rotating ballscrew and the moving stabilizer structure.

- (a) If fresh grease does not come out from either the grease vent or the bottom seal (end opposite the zerk fitting), remove and replace the stabilizer trim actuator (PAGEBLOCK 27-41-13/401).

SUBTASK 12-21-05-200-001

- (17) Inspect the grease that comes out of the ballnut [2] for signs of metallic debris, discolored water, rust, or other harmful particles. If any of these items are in the grease, remove and replace the stabilizer trim actuator (PAGEBLOCK 27-41-13/401).

SUBTASK 12-21-05-000-001

- (18) Remove unwanted grease from the ballnut [2].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-05-080-001

- (1) Remove the ladder equipment, SPL-2011.

SUBTASK 12-21-05-410-002

- (2) Close this access door:

<u>Number</u>	<u>Name/Location</u>
311BL	Service Access Door

SUBTASK 12-21-05-840-011

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

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	2	CBB2-R	STAB TRIM

SUBTASK 12-21-05-840-006

- (4) Put the three FLT CONTROL HYD VALVE POWER switches for the TAIL in the NORM position and remove the DO-NOT-OPERATE tags.

SUBTASK 12-21-05-840-007

- (5) Remove the DO-NOT-OPERATE tags on the ALTN PITCH and TRIM levers.

SUBTASK 12-21-05-840-008

- (6) On the control stand, put the Center and Right STAB CUT OFF switches in the NORM position.

————— END OF TASK —————

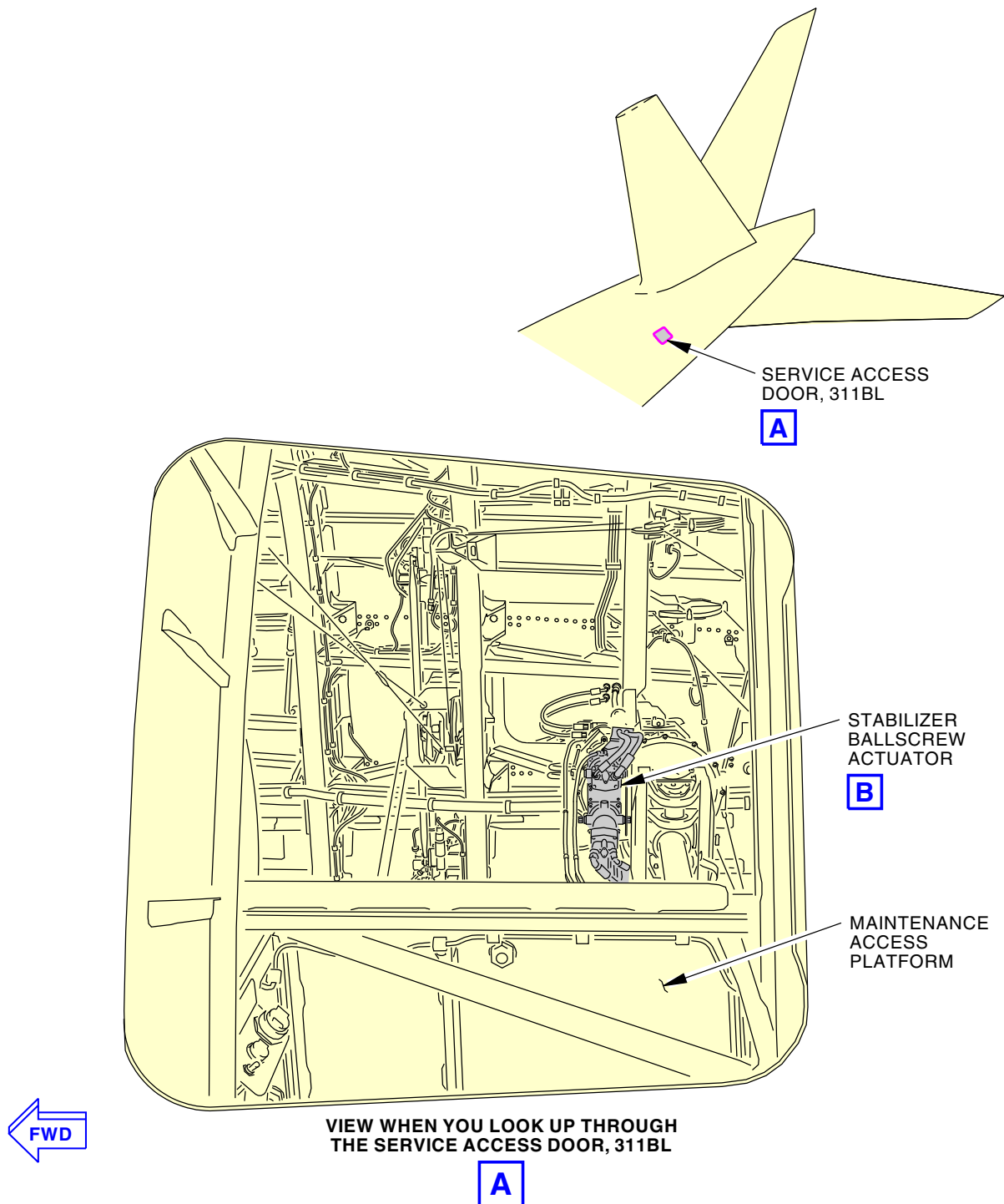
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Horizontal Stabilizer Ballscrew, Ballnut, and Gimbal - Servicing
Figure 301/12-21-05-990-801 (Sheet 1 of 2)

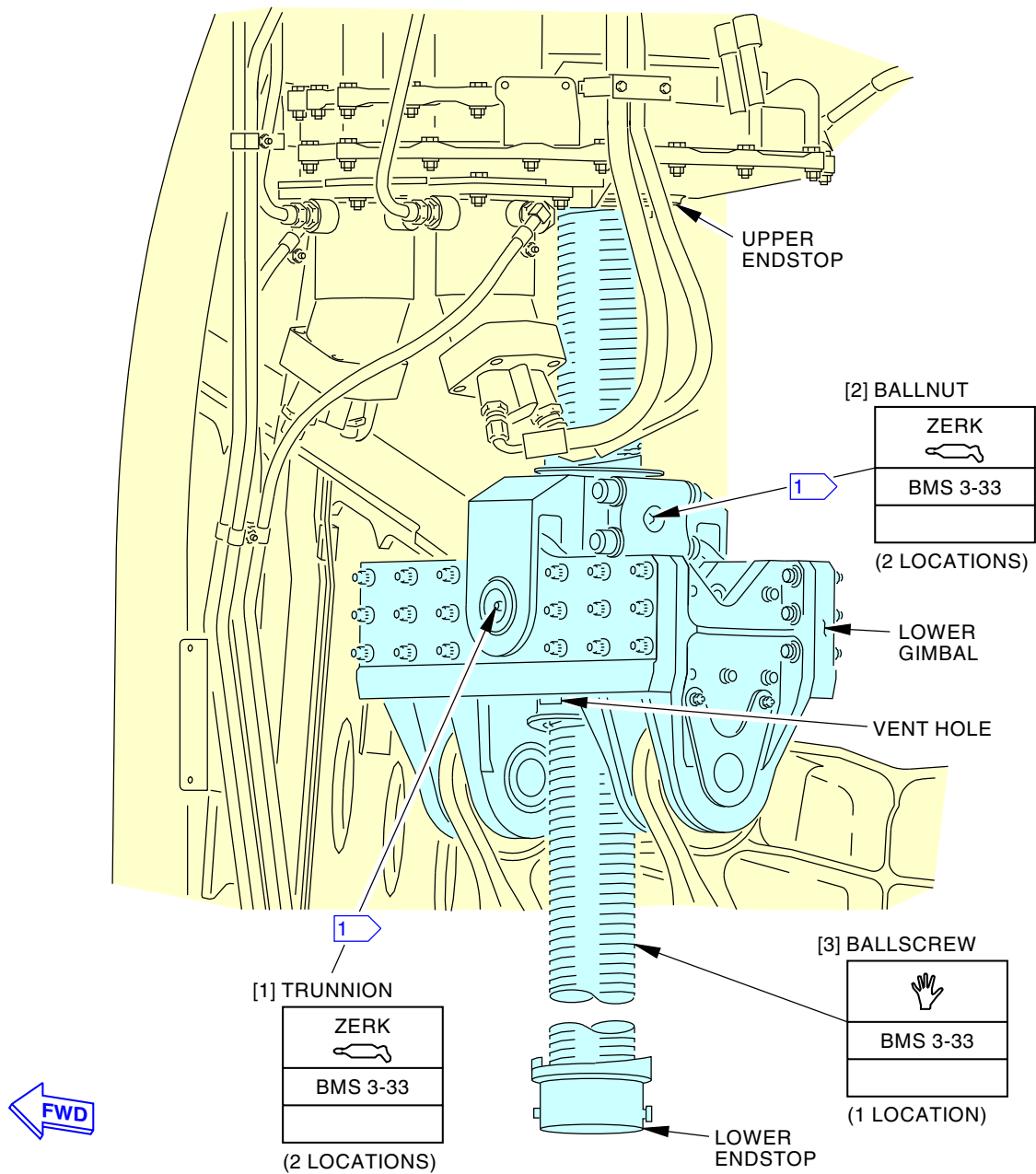
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STABILIZER BALLSCREW ACTUATOR

5 POINTS

1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

B

E25849 S0006401688_V3

Horizontal Stabilizer Ballscrew, Ballnut, and Gimbal - Servicing
Figure 301/12-21-05-990-801 (Sheet 2 of 2)

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RUDDER LUBRICATION - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Lubricate the Rudder Power Control Units (PCUs) - Use this procedure to lubricate the bearings at the attachment points of the PCUs.
 - (2) Lubricate the Rudder and Rudder Tab Hinges - Use this procedure to lubricate the bearings at the hinges for the rudder and rudder tab.

NOTE: If you will do this lubrication and the rudder tab bearing freeplay inspection at the same maintenance period, do the rudder tab bearing freeplay inspection Rudder Tab Bearings Freeplay - Inspection, TASK 27-21-11-200-804 before this lubrication.

27-CMR-07

TASK 12-21-06-600-801

2. Lubricate the Rudder Power Control Units (PCUs)

(Figure 301)

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)
29-11-00-860-808	Main Hydraulic System Power Removal (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-1499	Pin - Lock, NLG Towing Lever Part #: A09003-2 Supplier: 81205 Opt Part #: A09003-1 Supplier: 81205
SPL-1712	Lock, Rudder Power Control Unit Part #: J27028-21 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
324	Vertical Stabilizer - Rear Spar to Trailing Edge
325	Rudder

E. Access Panels

Number	Name/Location
324DXL	Vertical Stabilizer Trailing Edge Cover Panel
324PLX	Vertical Stabilizer Trailing Edge Seal

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F. Prepare for the Procedure

SUBTASK 12-21-06-840-009

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

SUBTASK 12-21-06-860-007

- (2) Move the towing lever, on the forward side of the nose landing gear, to the TOW position.
NOTE: This isolates the steering system for the nose landing gear from hydraulic power.
- (3) Install the NLG towing lever pin, NLG towing lever pin, SPL-1499, through the towing lever.
NOTE: You use the NLG towing lever pin, NLG towing lever pin, SPL-1499, to hold the towing lever in the TOW position.

SUBTASK 12-21-06-840-010

- (4) Put the three FLT CONTROL HYD VALVE POWER switches for the TAIL in the SHUTOFF position.

SUBTASK 12-21-06-840-011

- (5) Open these circuit breakers and attach DO-NOT-CLOSE tags:
 - (a) A9, RUD PCU (On the left power supply assembly (PSA-L) in the E1-6 rack)
 - (b) A9, RUD PCU (On the center power supply assembly (PSA-C) in the E2-6 rack)
 - (c) A9, RUD PCU (On the right power supply assembly (PSA-R) in the E5-1 rack)

SUBTASK 12-21-06-010-001

- (6) Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
324DXL	Vertical Stabilizer Trailing Edge Cover Panel
324PLX	Vertical Stabilizer Trailing Edge Seal

SUBTASK 12-21-06-840-001



WARNING

MAKE SURE THE CIRCUIT BREAKERS FOR RUDDER PCUS ARE OPEN AND HYDRAULIC POWER IS REMOVED. IF CIRCUIT BREAKERS FOR RUDDER PCUS ARE CLOSED AND SAFETY LOCKS ARE REMOVED, THE RUDDER WILL MOVE TO NEUTRAL POSITION. IF HYDRAULIC POWER IS ON AND SAFETY LOCKS ARE REMOVED, THE RUDDER WILL MOVE TO THE NEUTRAL POSITION QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (7) Install the rudder power control unit lock, SPL-1712:

NOTE: Verify hydraulic power is removed and the circuit breakers for the rudder PCUs are opened and tagged before you install the rudder power control unit lock, SPL-1712.

- (a) Push the rudder fully right and hold it there.
- (b) Install the rudder power control unit lock, SPL-1712 on the rudder PCUs.

NOTE: You must install the rudder power control unit lock, SPL-1712 on all three rudder PCUs.

- (c) Release the rudder.

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G. Procedure

SUBTASK 12-21-06-640-001

- (1) Put grease, D00633 in the fittings of the rod end bearing for the PCU and the reaction link (Table 301):

NOTE: Only the bearings at the aft end of each PCU use lubricant. The bearings at the front of the PCU do not use lubricant.

- (a) Add grease, D00633 until clean lubricant comes out of the bearings.

NOTE: Rod end bearing lubrication requires that grease come out of the bearing between the bearing and the pin. If grease only comes out between the bearing and the rod end housing, the bearing is not properly lubricated.

SUBTASK 12-21-06-160-001

- (2) Remove the excess grease, D00633 around the bearings.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-06-860-002

- (1) Make sure these circuit breakers are open and DO-NOT-CLOSE tags are attached:
 - (a) A9, RUD PCU (On the left power supply assembly (PSA-L) in the E1-6 rack)
 - (b) A9, RUD PCU (On the center power supply assembly (PSA-C) in the E2-6 rack)
 - (c) A9, RUD PCU (On the right power supply assembly (PSA-R) in the E5-1 rack)

SUBTASK 12-21-06-860-003

- (2) Make sure hydraulic power (TASK 29-11-00-860-808) is removed.

SUBTASK 12-21-06-840-002

- (3) Remove the NLG towing lever pin, SPL-1499, from the towing lever.

NOTE: You remove the NLG towing lever pin, SPL-1499, to release the towing lever from the TOW position.



MAKE SURE THE CIRCUIT BREAKERS FOR RUDDER PCUS ARE OPEN AND HYDRAULIC POWER IS REMOVED. IF CIRCUIT BREAKERS FOR RUDDER PCUS ARE CLOSED AND SAFETY LOCKS ARE REMOVED, THE RUDDER WILL MOVE TO NEUTRAL POSITION. IF HYDRAULIC POWER IS ON AND SAFETY LOCKS ARE REMOVED, THE RUDDER WILL MOVE TO THE NEUTRAL POSITION QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.



IF YOU CAN NOT REMOVE THE LOCK FROM THE RUDDER PCU, DO NOT SUPPLY PRESSURE TO THE HYDRAULIC SYSTEM TO REMOVE THE LOCK. THE RUDDER MIGHT MOVE AND CAUSE DAMAGE TO THE RUDDER PCU.

- (4) Remove the rudder power control unit lock, SPL-1712:
 - (a) Push the rudder fully right and hold it there.
 - (b) Remove the rudder power control unit lock, SPL-1712 from the rudder PCUs.

SUBTASK 12-21-06-410-001

- (5) Install the access panels:

<u>Number</u>	<u>Name/Location</u>
324DXL	Vertical Stabilizer Trailing Edge Cover Panel

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(Continued)

Number **Name/Location**

324PLX Vertical Stabilizer Trailing Edge Seal

SUBTASK 12-21-06-840-006

- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
- (a) On the left power supply assembly (PSA-L) in the E1-6 rack:
 - 1) A9, RUD PCU
 - (b) On the center power supply assembly (PSA-C) in the E2-6 rack:
 - 1) A9, RUD PCU
 - (c) On the right power supply assembly (PSA-R) in the E5-1 rack:
 - 1) A9, RUD PCU

SUBTASK 12-21-06-840-003

- (7) On the P61 panel, move the FLT CONTROL HYD POWER - TAIL switches to the NORM position.

Table 301/12-21-06-993-803 Rudder PCU Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Reaction Link Rod End	grease, D00633	BMS3-33	Zerk	3
2	PCU Rod End	grease, D00633	BMS3-33	Zerk	3

———— **END OF TASK** ————

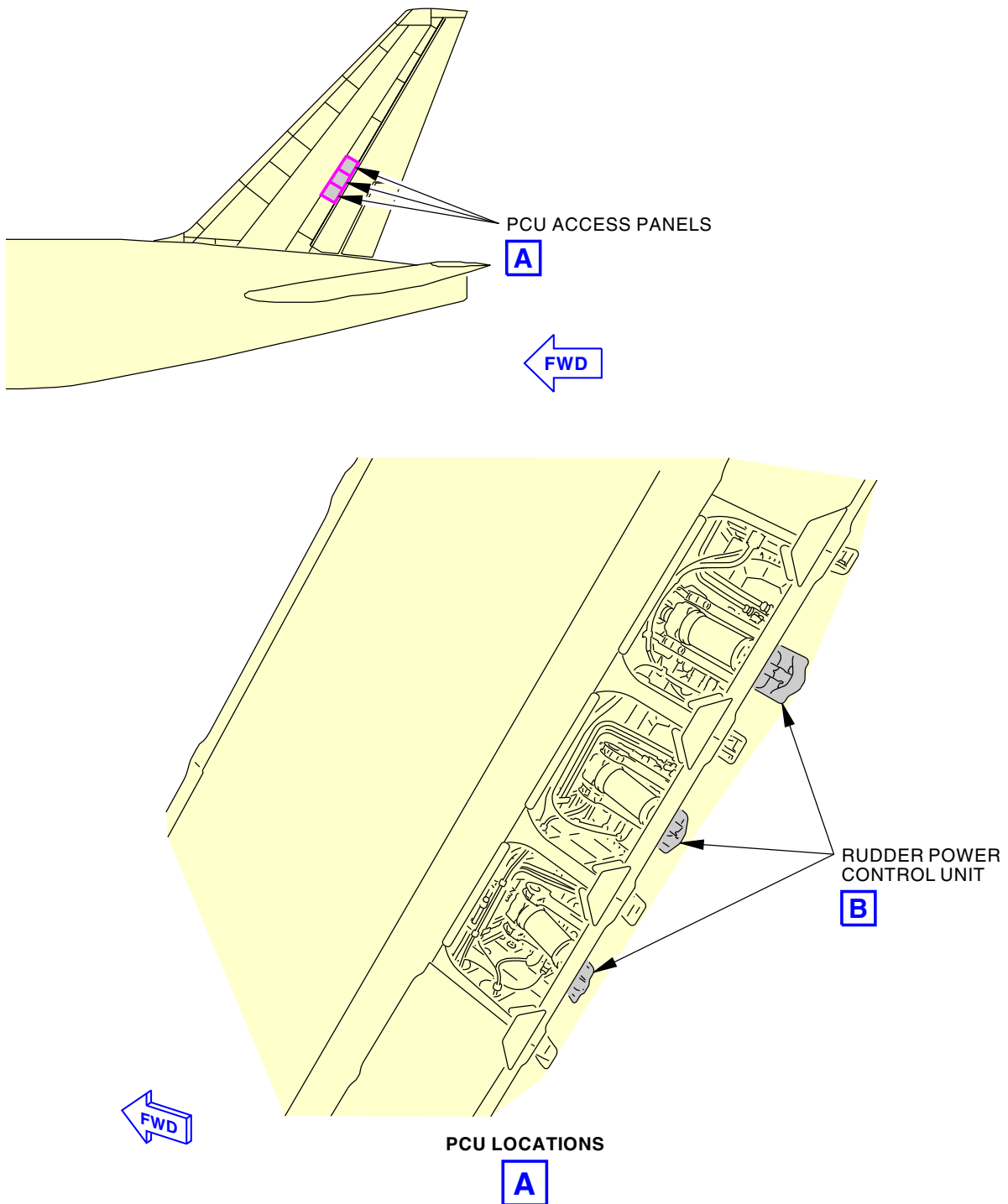
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E30235 S0006401693_V2

Rudder Power Control Unit (PCU) Servicing
Figure 301/12-21-06-990-801 (Sheet 1 of 2)

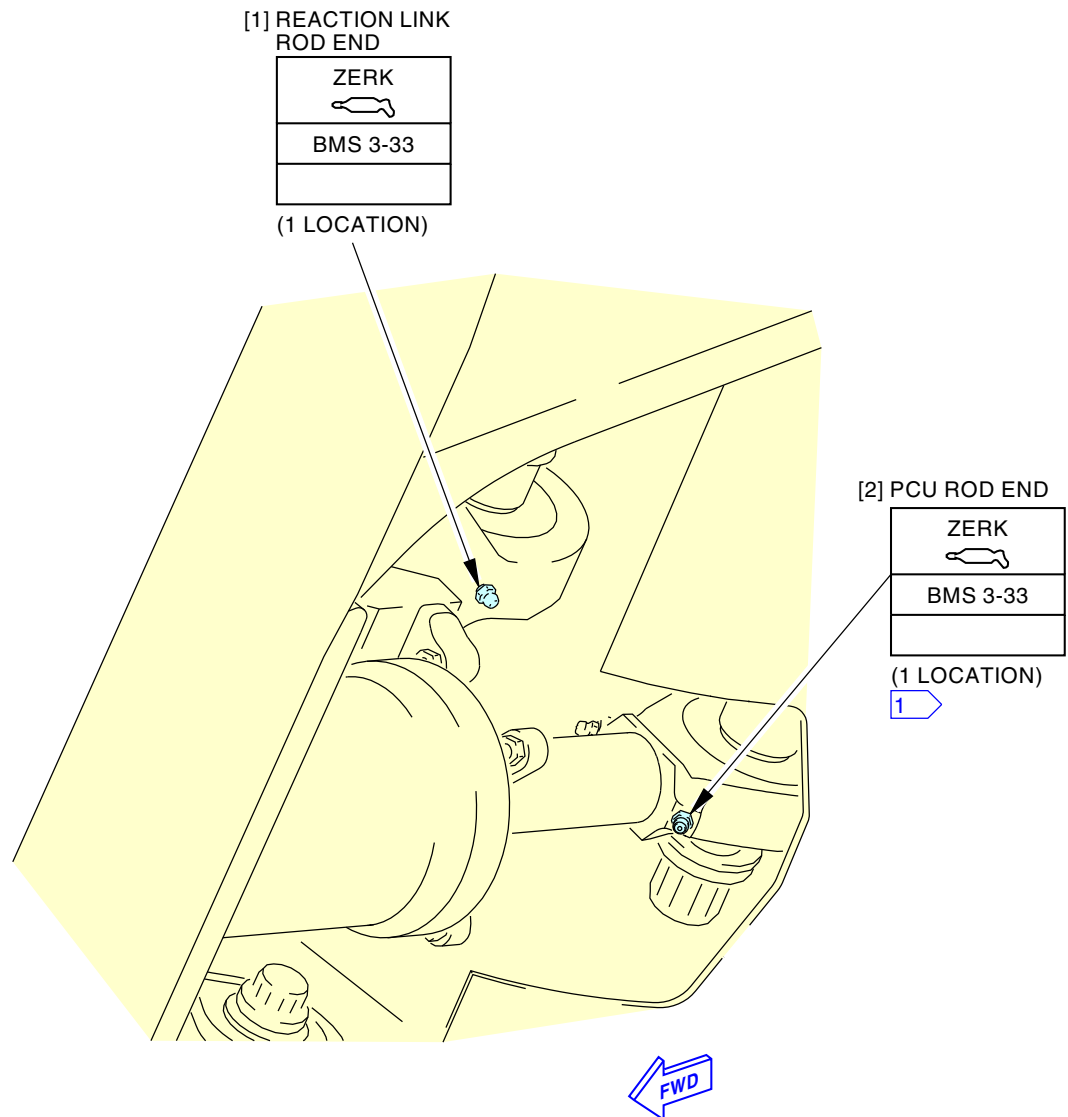
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RUDDER POWER CONTROL UNIT

2 POINTS

B

- 1** LUBRICATE A MINIMUM OF ONE LUBE POINT ON THE PCU ROD END.

E30238 S0006401694_V4

Rudder Power Control Unit (PCU) Servicing
Figure 301/12-21-06-990-801 (Sheet 2 of 2)

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27-CMR-07

TASK 12-21-06-600-802

3. Lubricate the Rudder and Rudder Tab Hinges

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
29-11-00-860-808	Main Hydraulic System Power Removal (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-1499	Pin - Lock, NLG Towing Lever Part #: A09003-2 Supplier: 81205 Opt Part #: A09003-1 Supplier: 81205
SPL-1712	Lock, Rudder Power Control Unit Part #: J27028-21 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
324	Vertical Stabilizer - Rear Spar to Trailing Edge
325	Rudder
326	Rudder Tab

E. Access Panels

Number	Name/Location
324DXL	Vertical Stabilizer Trailing Edge Cover Panel
324PLX	Vertical Stabilizer Trailing Edge Seal

F. Prepare for the Procedure

SUBTASK 12-21-06-840-012

- (1) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 12-21-06-860-006

- (2) Move the towing lever, on the forward side of the nose landing gear, to the TOW position.

NOTE: This isolates the steering system for the nose landing gear from hydraulic power.

- (3) Install the NLG towing lever pin, NLG towing lever pin, SPL-1499, through the towing lever.

NOTE: You use the NLG towing lever pin, NLG towing lever pin, SPL-1499, to hold the towing lever in the TOW position.

SUBTASK 12-21-06-840-013

- (4) Put the three FLT CONTROL HYD VALVE POWER switches for the TAIL in the SHUTOFF position.

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SUBTASK 12-21-06-840-014

- (5) Open these circuit breakers and attach DO-NOT-CLOSE tags:
- (a) A9, RUD PCU (On the left power supply assembly (PSA-L) in the E1-6 rack)
 - (b) A9, RUD PCU (On the center power supply assembly (PSA-C) in the E2-6 rack)
 - (c) A9, RUD PCU (On the right power supply assembly (PSA-R) in the E5-1 rack)

SUBTASK 12-21-06-010-002

- (6) Remove the panels that follow:

NOTE: If necessary, remove additional seals to access the hinge bearings.

- (a) Remove these access panels:

<u>Number</u>	<u>Name/Location</u>
324DXL	Vertical Stabilizer Trailing Edge Cover Panel
324PLX	Vertical Stabilizer Trailing Edge Seal

SUBTASK 12-21-06-840-015

- (7) Install the rudder power control unit lock, SPL-1712.

NOTE: Verify hydraulic power is removed and the circuit breakers for the rudder PCUs are opened and tagged before you install the rudder power control unit lock, SPL-1712.

- (a) Push the rudder fully right and hold it there.
- (b) Install the rudder power control unit lock, SPL-1712 on the rudder PCUs.

NOTE: You must install the rudder power control unit lock, SPL-1712 on all three rudder PCUs.

- (c) Release the rudder.

G. Procedure

SUBTASK 12-21-06-640-002

- (1) Put grease, D00633 in the fittings for the rudder hinge bearings (Table 302):
- (a) Add grease, D00633 until clean lubricant comes out of the bearings.
 - (b) Remove the excess grease, D00633 from around the bearings.

SUBTASK 12-21-06-640-003

- (2) Put grease, D00633 in the fittings for the hinge bearing for the rudder tab (Table 302):
- (a) Add grease, D00633 until clean lubricant comes out of the bearings.
 - (b) Remove the excess grease, D00633 from around the bearings.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-06-860-004

- (1) Make sure these circuit breakers are open and DO-NOT-CLOSE tags are attached:
- (a) A9, RUD PCU (On the left power supply assembly (PSA-L) in the E1-6 rack)
 - (b) A9, RUD PCU (On the center power supply assembly (PSA-C) in the E2-6 rack)
 - (c) A9, RUD PCU (On the right power supply assembly (PSA-R) in the E5-1 rack)

SUBTASK 12-21-06-860-005

- (2) Make sure hydraulic power (TASK 29-11-00-860-808) is removed.

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SUBTASK 12-21-06-840-008

- (3) Remove the NLG towing lever pin, SPL-1499, from the towing lever.

NOTE: You remove the NLG towing lever pin, SPL-1499, to release the towing lever from the TOW position.



WARNING

MAKE SURE THE CIRCUIT BREAKERS FOR RUDDER PCUS ARE OPEN AND HYDRAULIC POWER IS REMOVED. IF THE CIRCUIT BREAKERS FOR RUDDER PCUS ARE CLOSED, THE RUDDER WILL MOVE TO THE NEUTRAL POSITION WHEN THE SAFETY LOCKS ARE REMOVED. IF HYDRAULIC POWER IS ON, THE RUDDER WILL MOVE TO THE NEUTRAL POSITION VERY FAST WHEN THE SAFETY LOCKS ARE REMOVED. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.



CAUTION

IF YOU CAN NOT REMOVE THE LOCK FROM THE RUDDER PCU, DO NOT SUPPLY PRESSURE TO THE HYDRAULIC SYSTEM TO REMOVE THE LOCK. THE RUDDER MIGHT MOVE AND CAUSE DAMAGE TO THE RUDDER PCU.

- (4) Remove the rudder power control unit lock, SPL-1712 from the rudder PCUs.

NOTE: If the safety locks are caught because the rudder has moved toward neutral, move the rudder to the right to let you remove the rudder power control unit lock, SPL-1712.

SUBTASK 12-21-06-410-002

NOTE: If you remove additional seals to access the hinge bearing, install the seals.

- (5) Install the access panels:

<u>Number</u>	<u>Name/Location</u>
324DXL	Vertical Stabilizer Trailing Edge Cover Panel
324PLX	Vertical Stabilizer Trailing Edge Seal

SUBTASK 12-21-06-840-004

- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers:

- (a) On the left power supply assembly (PSA-L) in the E1-6 rack:
 - 1) A9, RUD PCU
- (b) On the center power supply assembly (PSA-C) in the E2-6 rack:
 - 1) A9, RUD PCU
- (c) On the right power supply assembly (PSA-R) in the E5-1 rack:
 - 1) A9, RUD PCU

SUBTASK 12-21-06-410-003

- (7) On the P61 panel, move the FLT CONTROL HYD POWER - TAIL switches to the NORM position.

Table 302/12-21-06-993-804 Rudder and Rudder Tab Hinges

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Rudder Hinge Bearing	grease, D00633	BMS3-33	Zerk	10
2	Rudder Tab Hinge Bearing	grease, D00633	BMS3-33	Zerk	5

————— END OF TASK —————

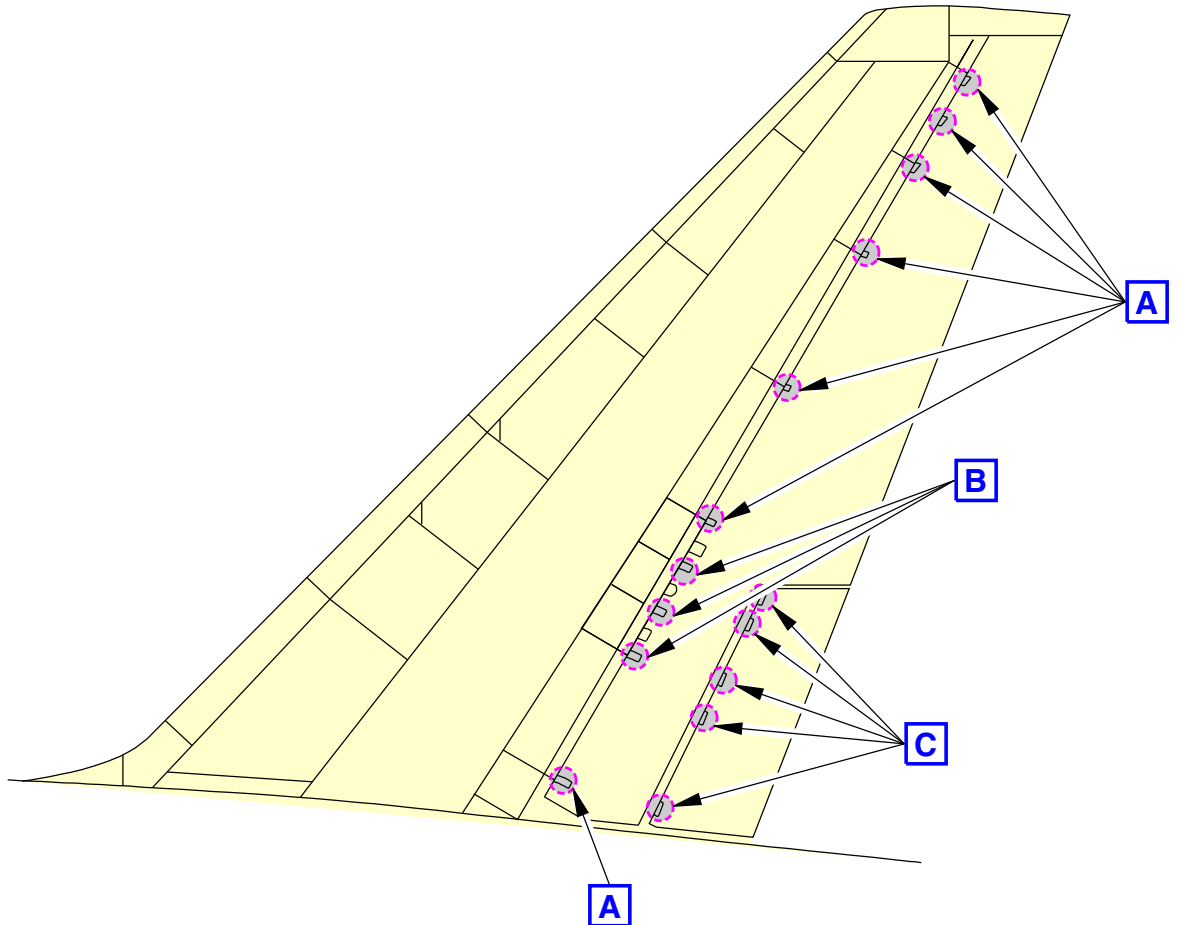
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VERTICAL STABILIZER

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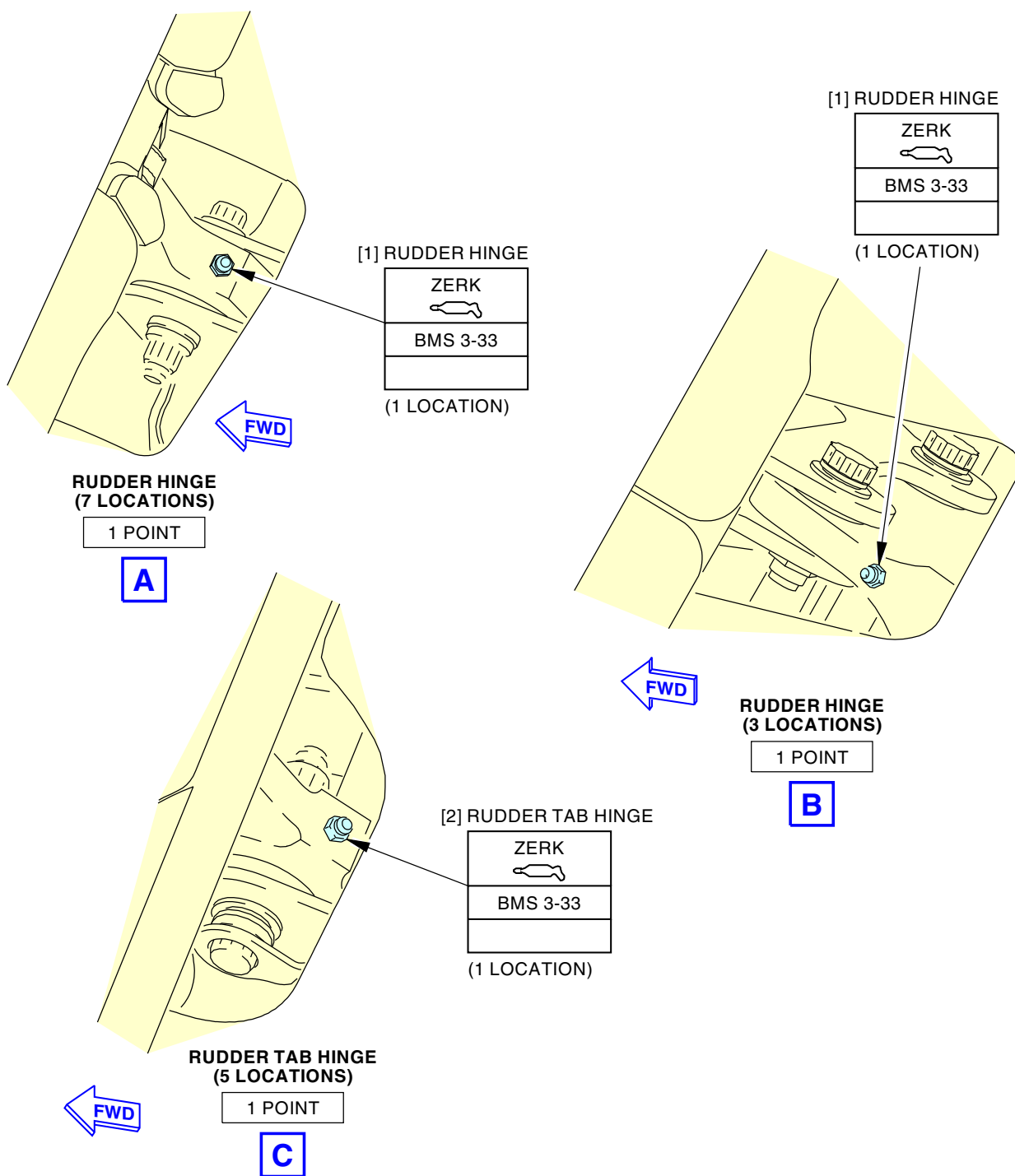
Rudder Servicing
Figure 302/12-21-06-990-802 (Sheet 1 of 2)

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AILERON AND FLAPERON LUBRICATION - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Lubricate the Aileron Power Control Units (PCUs) - Use this procedure to lubricate the bearings at the attachment points of the PCUs.
 - (2) Lubricate the Aileron Hinges - Use this procedure to lubricate the bearings at the aileron hinge points.
 - (3) Lubricate the Flaperon Power Control Units (PCUs) - Use this procedure to lubricate the bearings at the attachment points of the PCUs.
 - (4) Lubricate the Flaperon Hinges - Use this procedure to lubricate the bearings at the Flaperon hinge points.

TASK 12-21-07-600-801

2. Lubricate the Aileron Power Control Units (PCUs)

(Figure 301)

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)

B. **Consumable Materials**

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. **Location Zones**

Zone	Area
568	Left Wing Aileron
668	Right Wing Aileron

D. **Access Panels**

Number	Name/Location
561NB	Outboard Fixed Trailing Edge Panel
561PB	Outboard Fixed Trailing Edge Panel
661NB	Outboard Fixed Trailing Edge Panel
661PB	Outboard Fixed Trailing Edge Panel

E. **Prepare for the Procedure**

SUBTASK 12-21-07-860-001

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

SUBTASK 12-21-07-860-002

- (2) Put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the SHUT OFF position and attach DO-NOT-OPERATE tags.

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SUBTASK 12-21-07-860-003

- (3) 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>
K	25	C27611	AIL PCU LIB(BLK)/LOB(BYP)

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-C	AIL PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-L	AIL PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-R	AIL PCU

SUBTASK 12-21-07-010-001

- (4) Remove the fasteners for the hinged access panels for the PCUs.

NOTE: The access panel is forward of the aileron on the bottom of the wing.

- (a) On the left wing, open these access panels:

<u>Number</u>	<u>Name/Location</u>
561NB	Outboard Fixed Trailing Edge Panel
561PB	Outboard Fixed Trailing Edge Panel

- (b) On the right wing, open these access panels:

<u>Number</u>	<u>Name/Location</u>
661NB	Outboard Fixed Trailing Edge Panel
661PB	Outboard Fixed Trailing Edge Panel

F. Procedure

SUBTASK 12-21-07-640-001

- (1) Lubricate the aileron PCU rod ends [1] and the PCU reaction link [2].

NOTE: Only these two bearings at the aft end of each PCU use grease. The bearings at the front of the PCU do not use grease.

NOTE: Rod end bearing lubrication requires that grease come out of the bearing between the bearing and the pin. If grease only comes out between the bearing and the rod end housing, the bearing is not properly lubricated.

- (a) Add the grease, D00633 until clean grease, D00633 comes out of the bearings.

SUBTASK 12-21-07-160-001

- (2) Remove the unwanted grease from around the bearings.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-07-410-001

- (1) Close the access panels and install the fasteners.

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- (a) On the left wing, close these access panels:

<u>Number</u>	<u>Name/Location</u>
561NB	Outboard Fixed Trailing Edge Panel
561PB	Outboard Fixed Trailing Edge Panel

- (b) On the right wing, close these access panels:

<u>Number</u>	<u>Name/Location</u>
661NB	Outboard Fixed Trailing Edge Panel
661PB	Outboard Fixed Trailing Edge Panel

SUBTASK 12-21-07-860-004

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	25	C27611	AIL PCU LIB(BLK)/LOB(BYP)

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-C	AIL PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-L	AIL PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-R	AIL PCU

SUBTASK 12-21-07-860-005

- (3) Remove the DO-NOT-OPERATE tags and put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the NORM position.

SUBTASK 12-21-07-860-006

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

Table 301/12-21-07-993-802

Aileron PCU Lubrication					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Aileron PCU Rod End	grease, D00633	BMS3-33	Zerk	2 each PCU
2	PCU Reaction Link	grease, D00633	BMS3-33	Zerk	1 each PCU

————— **END OF TASK** —————

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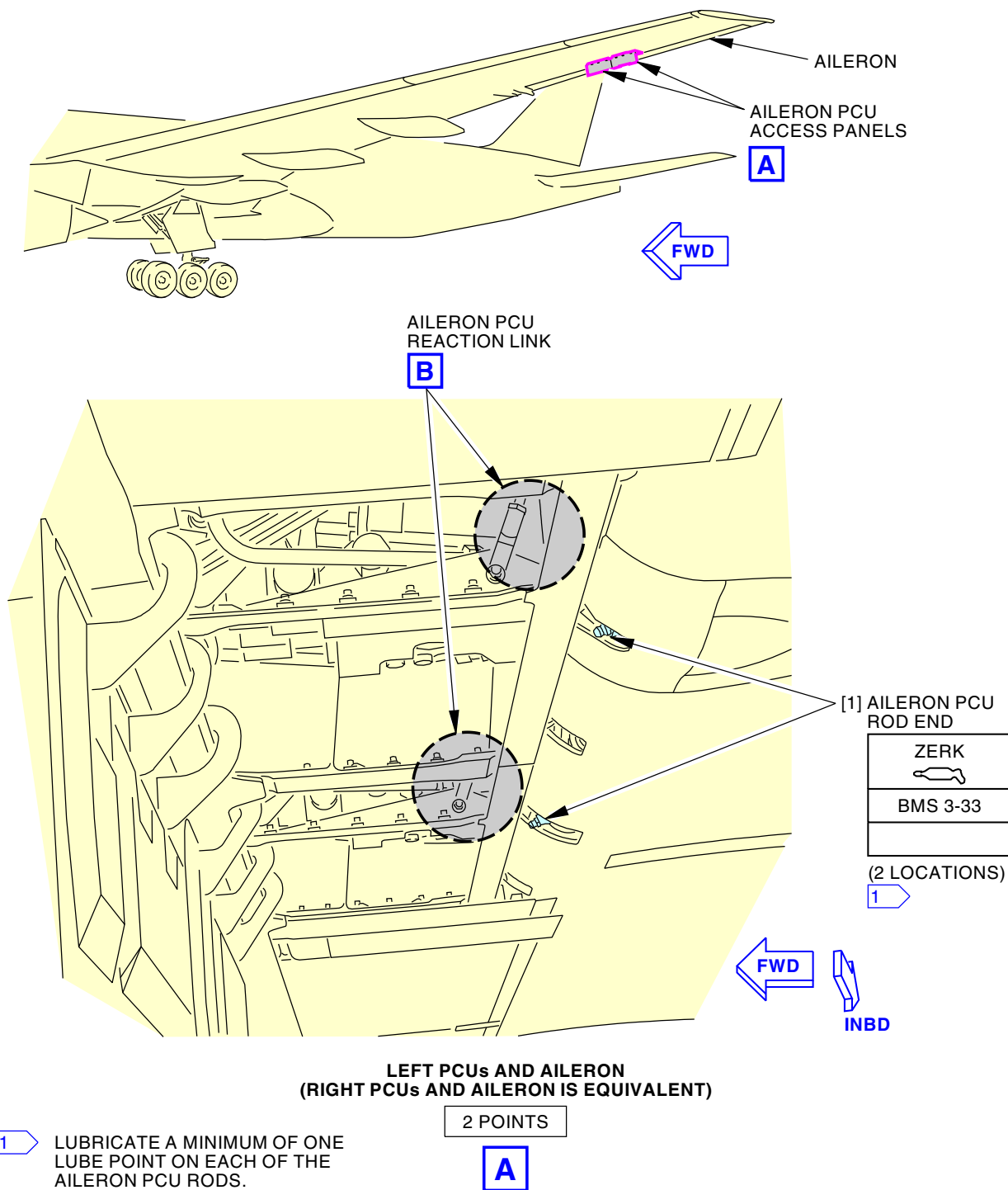
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Aileron Power Control Units (PCUs) Servicing
Figure 301/12-21-07-990-801 (Sheet 1 of 2)

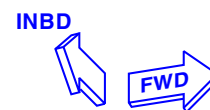
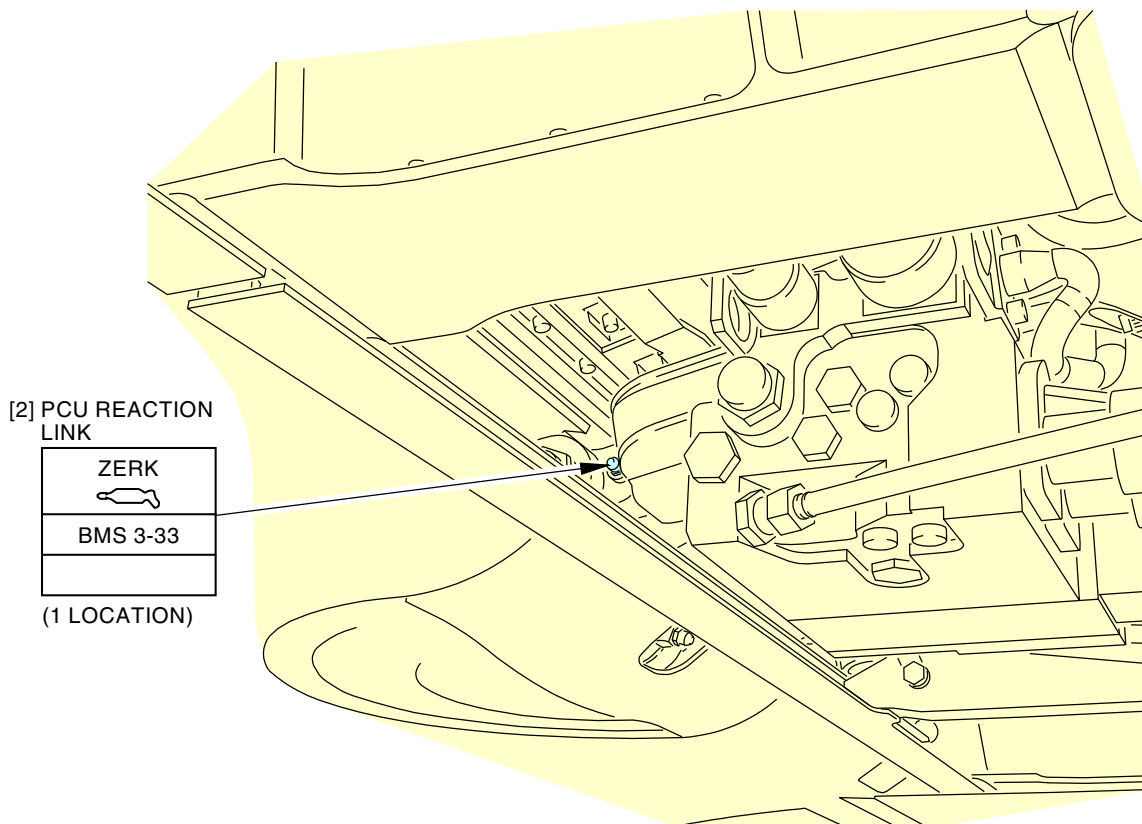
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**AILERON PCU REACTION LINK
(OUTBOARD LINK IS SHOWN, INBOARD
PCU REACTION LINK IS EQUIVALENT)**

1 POINT

B

E16003 S0006401704_V4

**Aileron Power Control Units (PCUs) Servicing
Figure 301/12-21-07-990-801 (Sheet 2 of 2)**

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TASK 12-21-07-600-802

3. Lubricate the Aileron Hinges

(Figure 302)

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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
568	Left Wing Aileron
668	Right Wing Aileron

D. Access Panels

Number	Name/Location
561KAB	Outboard Fixed Trailing Edge Seal
561MB	Outboard Fixed Trailing Edge Panel
561NB	Outboard Fixed Trailing Edge Panel
561PB	Outboard Fixed Trailing Edge Panel
561QAB	Outboard Fixed Trailing Edge Seal
561QBB	Hinge Rib Access Panel Door
561RAB	Outboard Fixed Trailing Edge Seal
661KAB	Outboard Fixed Trailing Edge Seal
661MB	Outboard Fixed Trailing Edge Panel
661NB	Outboard Fixed Trailing Edge Panel
661PB	Outboard Fixed Trailing Edge Panel
661QAB	Outboard Fixed Trailing Edge Seal
661QBB	Hinge Rib Access Panel Door
661RAB	Outboard Fixed Trailing Edge Seal

E. Prepare for the Procedure

SUBTASK 12-21-07-860-007

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

SUBTASK 12-21-07-860-008

- (2) Put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the SHUT OFF position and attach DO-NOT-OPERATE tags.

SUBTASK 12-21-07-860-009

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

Left Power Management Panel, P110

Row	Col	Number	Name
K	25	C27611	AIL PCU LIB(BLK)/LOB(BYP)

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Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-C	AIL PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-L	AIL PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-R	AIL PCU

SUBTASK 12-21-07-010-002

- (4) Remove the fasteners for the hinged access panels for the PCUs.

NOTE: The access panel is forward of the aileron on the bottom of the wing.

- (a) On the left wing, open these access panels:

<u>Number</u>	<u>Name/Location</u>
561KAB	Outboard Fixed Trailing Edge Seal
561MB	Outboard Fixed Trailing Edge Panel
561NB	Outboard Fixed Trailing Edge Panel
561PB	Outboard Fixed Trailing Edge Panel
561QAB	Outboard Fixed Trailing Edge Seal
561QBB	Hinge Rib Access Panel Door
561RAB	Outboard Fixed Trailing Edge Seal

- (b) On the right wing, open these access panels:

<u>Number</u>	<u>Name/Location</u>
661KAB	Outboard Fixed Trailing Edge Seal
661MB	Outboard Fixed Trailing Edge Panel
661NB	Outboard Fixed Trailing Edge Panel
661PB	Outboard Fixed Trailing Edge Panel
661QAB	Outboard Fixed Trailing Edge Seal
661QBB	Hinge Rib Access Panel Door
661RAB	Outboard Fixed Trailing Edge Seal

F. Procedure

SUBTASK 12-21-07-640-002

- (1) Lubricate the aileron hinge bearings.
- (a) Add the grease, D00633 until clean grease, D00633 comes out of the bearings.

SUBTASK 12-21-07-160-002

- (2) Remove the unwanted grease from around the bearings.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-07-410-002

- (1) Close the access panels and install the fasteners.

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- (a) On the left wing, close these access panels:

<u>Number</u>	<u>Name/Location</u>
561KAB	Outboard Fixed Trailing Edge Seal
561MB	Outboard Fixed Trailing Edge Panel
561NB	Outboard Fixed Trailing Edge Panel
561PB	Outboard Fixed Trailing Edge Panel
561QAB	Outboard Fixed Trailing Edge Seal
561QBB	Hinge Rib Access Panel Door
561RAB	Outboard Fixed Trailing Edge Seal

- (b) On the right wing, close these access panels:

<u>Number</u>	<u>Name/Location</u>
661KAB	Outboard Fixed Trailing Edge Seal
661MB	Outboard Fixed Trailing Edge Panel
661NB	Outboard Fixed Trailing Edge Panel
661PB	Outboard Fixed Trailing Edge Panel
661QAB	Outboard Fixed Trailing Edge Seal
661QBB	Hinge Rib Access Panel Door
661RAB	Outboard Fixed Trailing Edge Seal

SUBTASK 12-21-07-860-010

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	25	C27611	AIL PCU LIB(BLK)/LOB(BYP)

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-C	AIL PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-L	AIL PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	CBA3-R	AIL PCU

SUBTASK 12-21-07-860-011

- (3) Remove the DO-NOT-OPERATE tags and put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the NORM position.

SUBTASK 12-21-07-860-012

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

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Table 302/12-21-07-993-805

Aileron Hinges					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Aileron hinge bearing	grease, D00633	BMS3-33	Zerk	7 each aileron

———— **END OF TASK** ————

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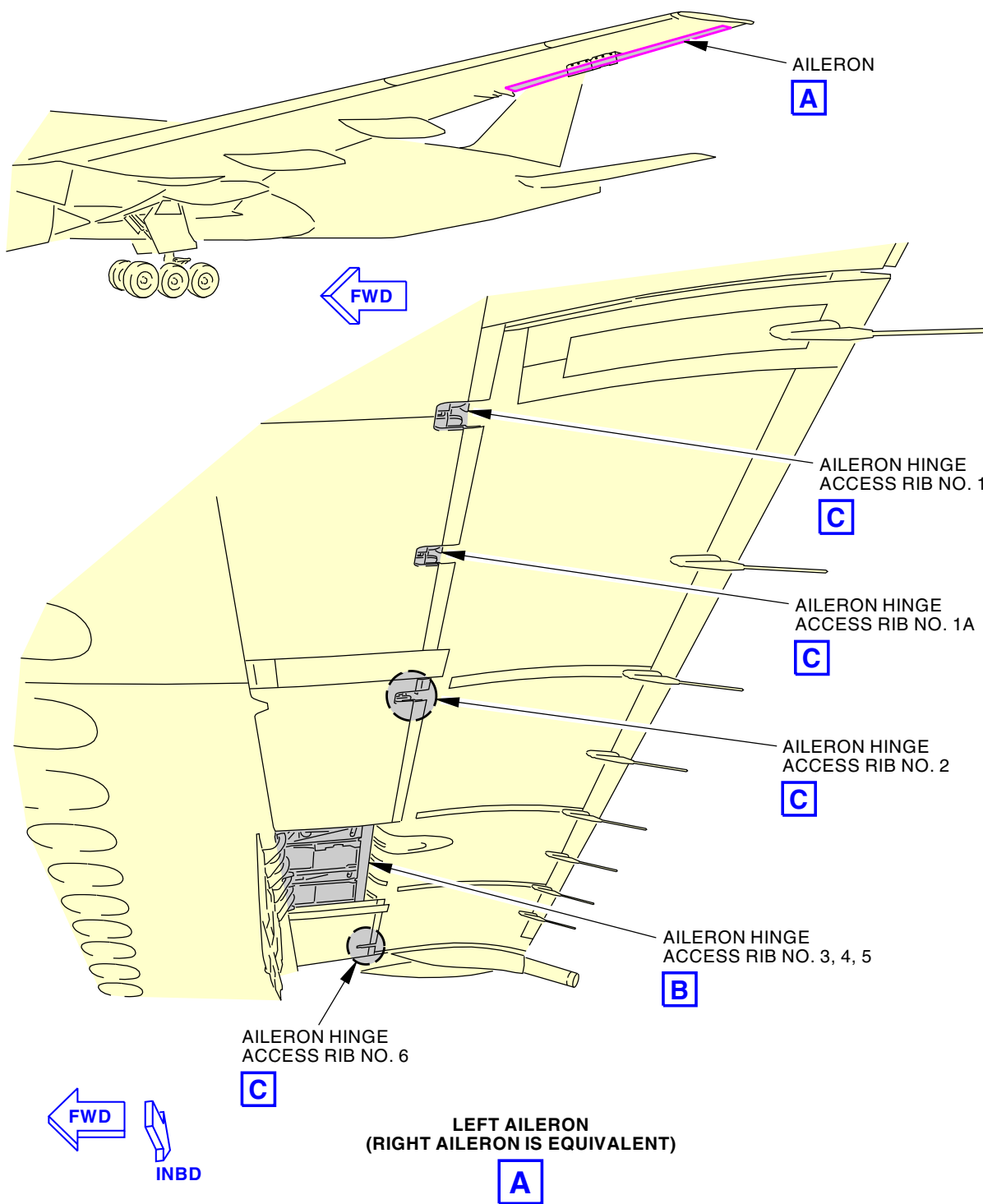
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Aileron Hinge Fitting Servicing
Figure 302/12-21-07-990-802 (Sheet 1 of 2)

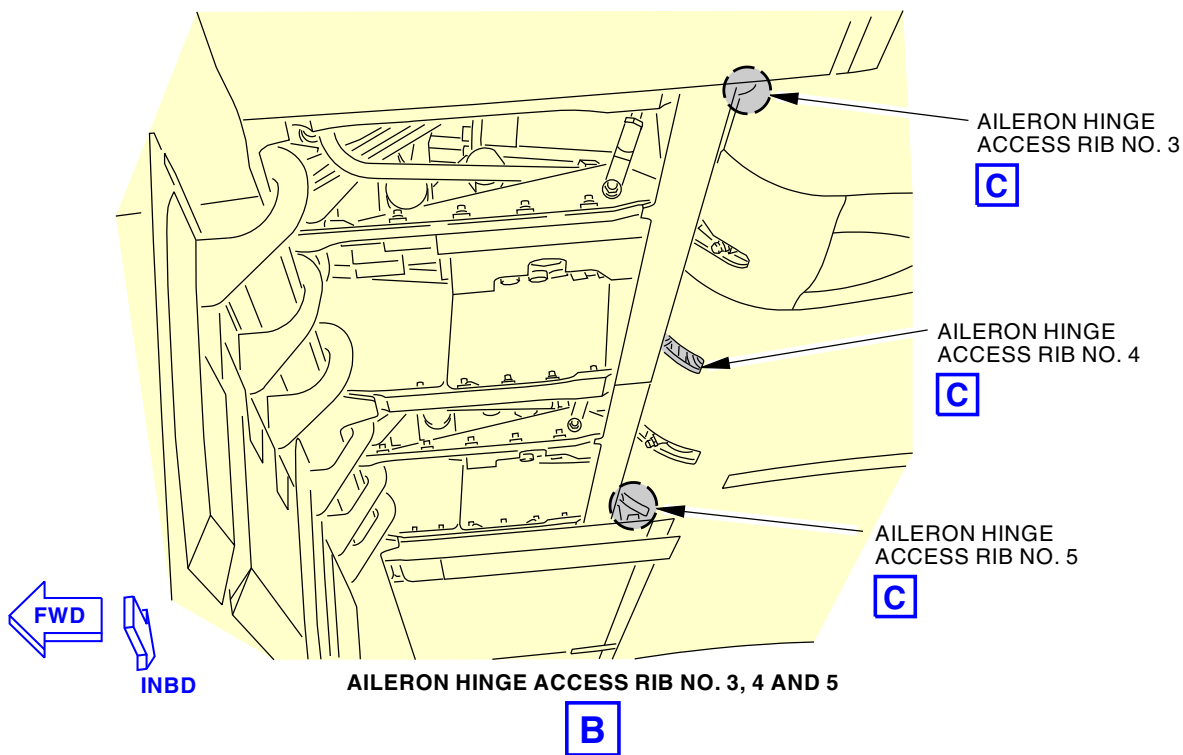
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[1] AILERON
HINGE FITTING

ZERK

BMS 3-33

(1 LOCATION)



**AILERON HINGE FITTING RIB NO. 3
(RIBS NO. 1, 1A, 2, 4, 5, 6 ARE EQUIVALENT)**

1 POINT

C

U83300 S0000218148_V3

**Aileron Hinge Fitting Servicing
Figure 302/12-21-07-990-802 (Sheet 2 of 2)**

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TASK 12-21-07-600-803

4. Lubricate the Flaperon Power Control Units (PCUs)

(Figure 303)

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)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
557	Left Wing Flaperon
574	Inboard Flaperon Support Fairing - Left Wing
575	Outboard Flaperon Support Fairing - Left Wing
657	Right Wing Flaperon
674	Inboard Flaperon Support Fairing - Right Wing
675	Outboard Flaperon Support Fairing - Right Wing

D. Prepare for the Procedure

SUBTASK 12-21-07-860-013

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

SUBTASK 12-21-07-860-014



WARNING

KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLAPERON. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR WHEN THIS SURFACE MOVES.

- (2) If the two flaperons are not extended, do these steps:
- (a) For the right hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
 - (b) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.
 - (c) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 12-21-07-860-015

- (3) Put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the SHUT OFF position and attach Do-NOT-OPERATE tags.

SUBTASK 12-21-07-040-001

- (4) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

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SUBTASK 12-21-07-860-016

- (5) 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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-C	FLPRN PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-L	FLPRN PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-R	FLPRN PCU

E. Procedure

SUBTASK 12-21-07-640-003

- (1) Lubricate the flaperon PCU rod ends [3] and PCU yoke assemblies [4].

NOTE: Rod end bearing lubrication requires that grease come out of the bearing between the bearing and the pin. If grease only comes out between the bearing and the rod end housing, the bearing is not properly lubricated.

- (a) Add grease, D00633 until clean grease, D00633 comes out of the bearings.

SUBTASK 12-21-07-160-003

- (2) Remove the unwanted grease from around the bearings.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-07-860-017

- (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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-C	FLPRN PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-L	FLPRN PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-R	FLPRN PCU

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SUBTASK 12-21-07-440-001

(2) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-07-860-018

(3) Remove the DO-NOT-OPERATE tags and put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the NORM position.

SUBTASK 12-21-07-860-027

(4) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-07-860-019

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

Table 303/12-21-07-993-804

Flaperon PCU Lubrication					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	PCU rod end	grease, D00633	BMS3-33	Zerk	1 each PCU
2	PCU yoke assembly	grease, D00633	BMS3-33	Zerk	2 each PCU

————— **END OF TASK** —————

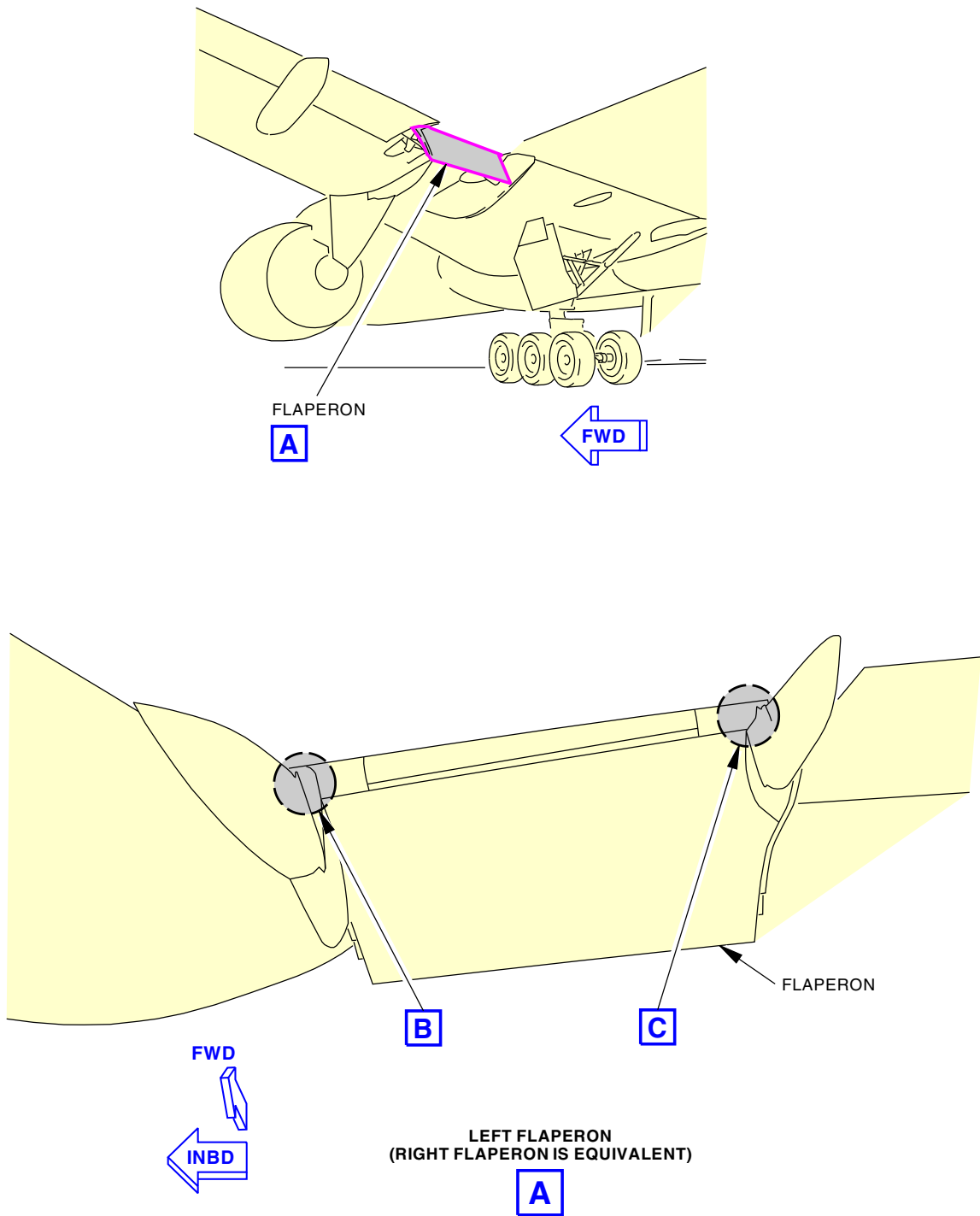
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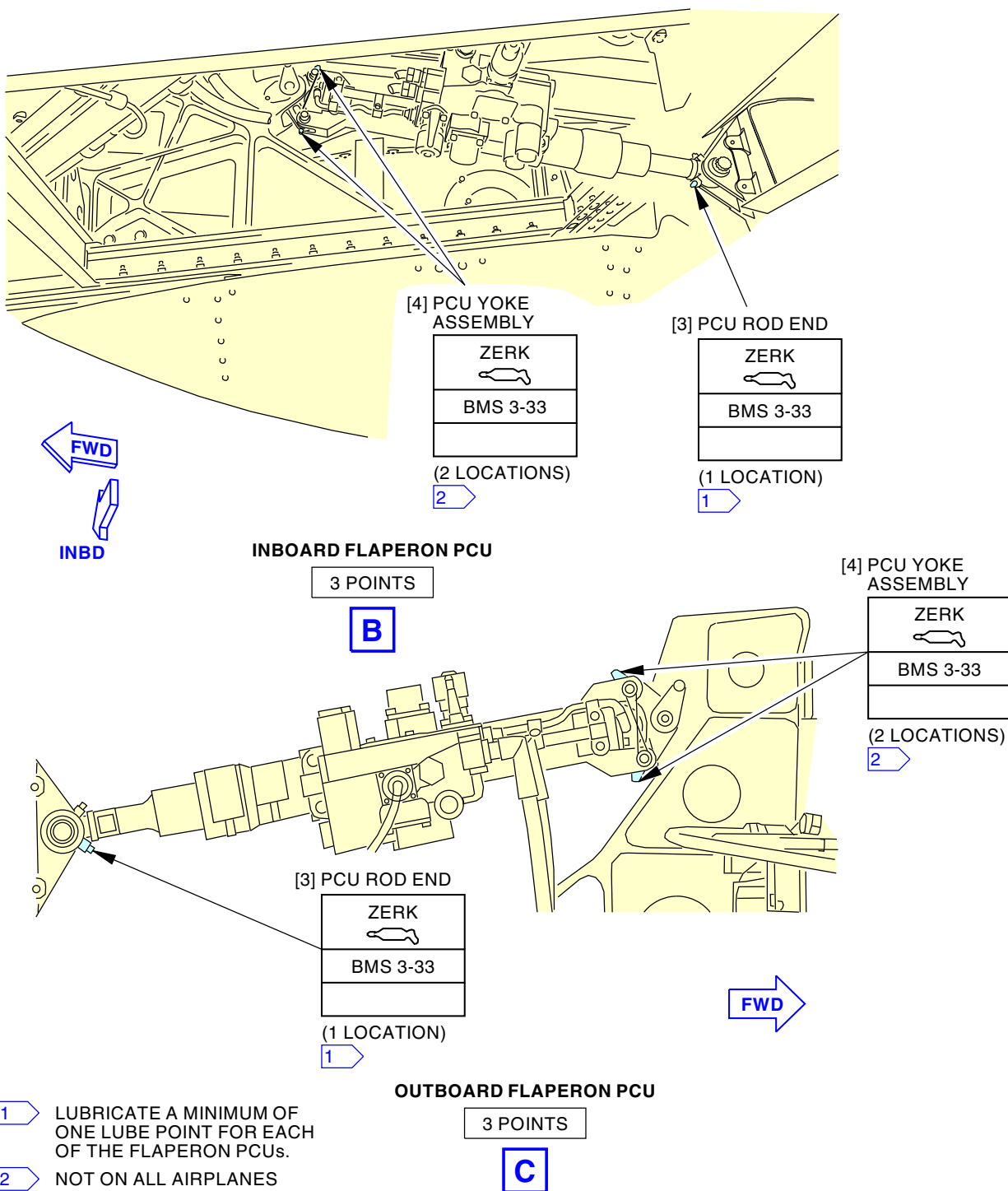
Flaperon Power Control Units (PCUs) Servicing
Figure 303/12-21-07-990-803 (Sheet 1 of 2)

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Flaperon Power Control Units (PCUs) Servicing
Figure 303/12-21-07-990-803 (Sheet 2 of 2)

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TASK 12-21-07-600-804

5. Lubricate the Flaperon Hinges

(Figure 304)

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)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
557	Left Wing Flaperon
574	Inboard Flaperon Support Fairing - Left Wing
575	Outboard Flaperon Support Fairing - Left Wing
657	Right Wing Flaperon
674	Inboard Flaperon Support Fairing - Right Wing
675	Outboard Flaperon Support Fairing - Right Wing

D. Prepare for the Procedure

SUBTASK 12-21-07-860-020

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

SUBTASK 12-21-07-860-021



WARNING

KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLAPERON. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR WHEN THIS SURFACE MOVES.

- (2) If the two flaperons are not extended, do these steps:
 - (a) Supply right-system hydraulic power (TASK 29-11-00-860-801).
 - (b) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.
 - (c) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 12-21-07-860-022

- (3) Put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the SHUT OFF position and attach Do-NOT-OPERATE tags.

SUBTASK 12-21-07-040-002

- (4) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

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SUBTASK 12-21-07-860-023

- (5) 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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-C	FLPRN PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-L	FLPRN PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-R	FLPRN PCU

E. Procedure

SUBTASK 12-21-07-640-004

- (1) Lubricate the flaperon hinge fittings [5].
(a) Add grease, D00633 until clean grease, D00633 comes out of the bearings.

SUBTASK 12-21-07-160-004

- (2) Remove the unwanted grease from around the bearings.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-07-860-024

- (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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-C	FLPRN PCU

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-L	FLPRN PCU

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	CBA5-R	FLPRN PCU

SUBTASK 12-21-07-440-002

- (2) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

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SUBTASK 12-21-07-860-025

- (3) Remove the DO-NOT-OPERATE tags and put the three FLT CONTROL HYD VALVE POWER switches for the WING on the overhead panel, P61, in the NORM position.

SUBTASK 12-21-07-860-026

- (4) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-07-862-001

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

Table 304/12-21-07-993-803

Flaperon Hinges					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Flaperon hinge fitting	grease, D00633	BMS3-33	Zerk	2 each flaperon

————— **END OF TASK** —————

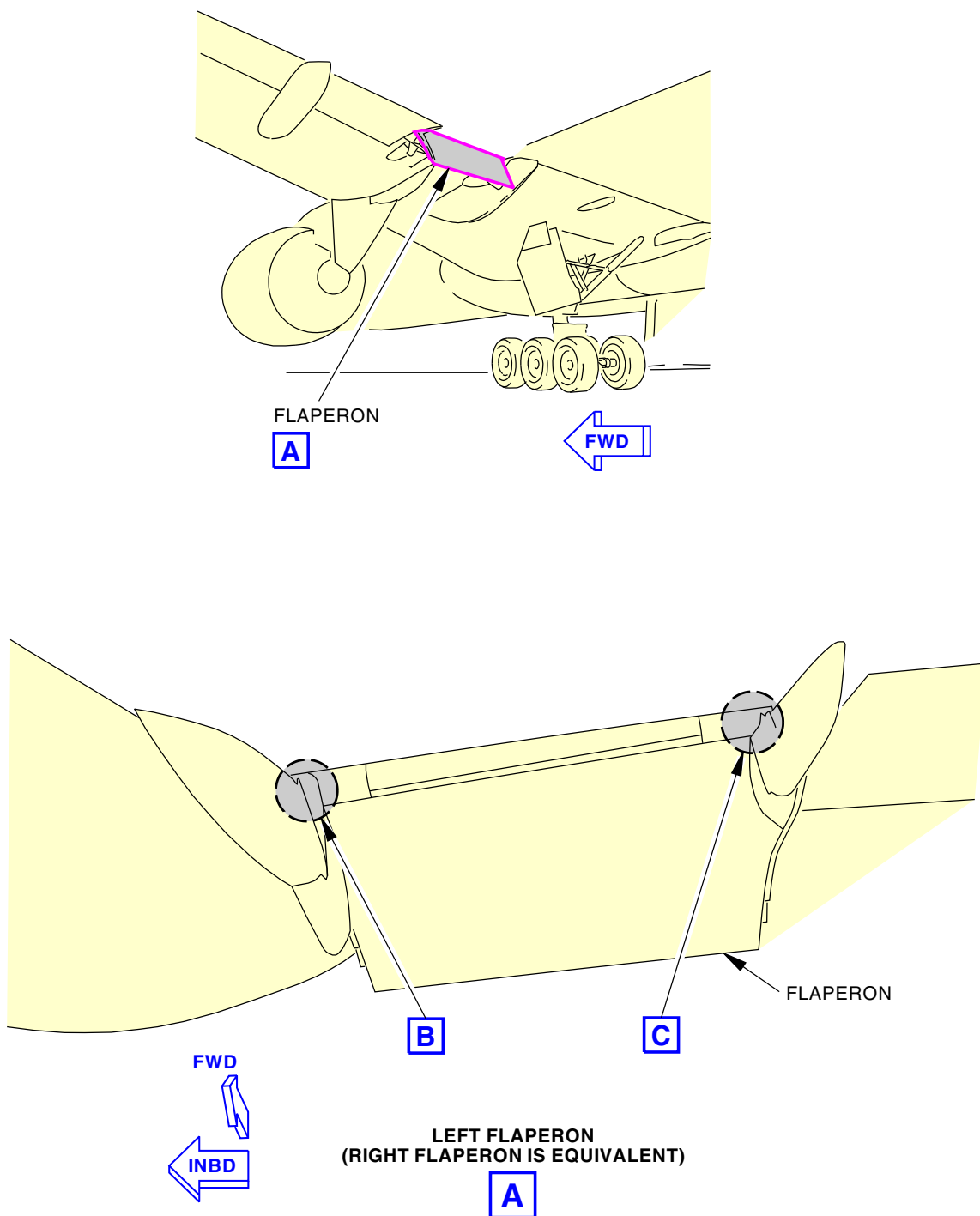
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Flaperon Hinge Fitting Servicing
Figure 304/12-21-07-990-804 (Sheet 1 of 2)

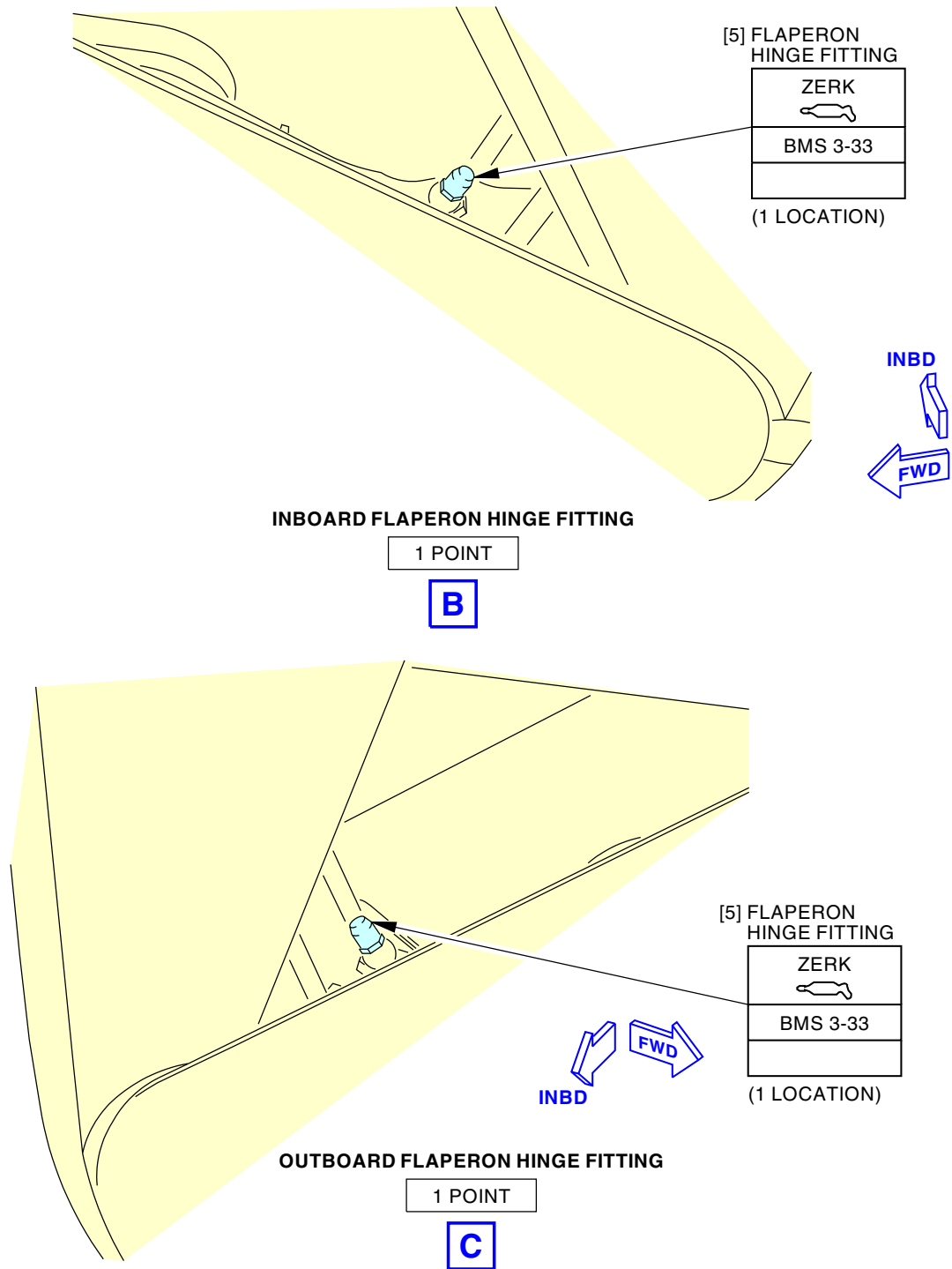
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Flaperon Hinge Fitting Servicing
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LEADING EDGE SLAT SYSTEM - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
- (1) A task to grease the torque tubes and torque tube supports inboard of the engines.
 - (2) A task to grease the torque tubes and torque tube supports outboard of the engines.
 - (3) A task to grease the torque tubes, torque tube supports and the pressure seals in the forward cargo compartment.
 - (4) A task to grease the main track rollers, auxiliary track rollers and pinion bearings for the inboard slats.
 - (5) A task to grease the main track rollers and pinion bearings for the outboard slats.
 - (6) A task to grease the bearings on the drive arm for the Krueger flap.
 - (7) A task to grease the main tracks for the inboard slats.
 - (8) A task to grease the main tracks for the outboard slats.

TASK 12-21-08-640-804

2. Inboard Leading Edge Torque Tube and Support Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is applicable to the torque tubes between the pressure seals and the driveline offset gearbox.

B. References

Reference	Title
06-30-00-800-806	Finding a Zone in Left Wing - Major Zone 500 (P/B 201)
06-30-00-800-807	Finding a Zone in Right Wing - Major Zone 600 (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)
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
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
101	Packing	27-81-38-02-015	ARO ALL

E. Location Zones

Zone	Area
510	Subzone 510 - Wing Leading Edge - Forward of Front Spar
610	Subzone 610 - Wing Leading Edge - Forward of Front Spar

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F. Access Panels

Number	Name/Location
511AB	Leading Edge PDU Panel
511CB	Inboard Fixed Leading Edge Panel
511GB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel
513AT	Krueger Slat Access Panel
611AB	Inboard Fixed Leading Edge Panel
611CB	Inboard Fixed Leading Edge Panel
611GB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel
613AT	Krueger Slat Access Panel

G. Procedure

SUBTASK 12-21-08-040-001



MAKE SURE THAT THRUST REVERSER IS DEACTIVATED. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 12-21-08-040-002



MAKE SURE THAT YOU DEACTIVATE THE LEADING-EDGE SLAT BEFORE YOU WORK ON THE SLAT SYSTEM. THE SLATS CAN MOVE QUICKLY WHEN YOU ACTIVATE THEM. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (2) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-21-08-010-001

- (3) Remove the fixed leading edge panels from the wing.
 - (a) Remove these access panels on the inboard end of the left wing:
(TASK 06-30-00-800-806)

<u>Number</u>	<u>Name/Location</u>
511AB	Leading Edge PDU Panel
511CB	Inboard Fixed Leading Edge Panel
511GB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel
513AT	Krueger Slat Access Panel

- (b) Remove these access panels on the inboard end of the right wing:
(TASK 06-30-00-800-807)

<u>Number</u>	<u>Name/Location</u>
611AB	Inboard Fixed Leading Edge Panel
611CB	Inboard Fixed Leading Edge Panel
611GB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel

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(Continued)

<u>Number</u>	<u>Name/Location</u>
613AT	Krueger Slat Access Panel

SUBTASK 12-21-08-200-012



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (4) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-640-001

- (5) Lubricate the torque tube couplings on the ends of the torque tubes with grease, D00633 (Table 301):
- For the torque tube on the inboard end of the inboard offset gearbox, move the seal tube [102]:
 - Remove the bolts [105], washers [104] and the plate [103] that hold the seal tube [102].
 - Move the seal tube [102] inboard to get access to the coupling on the torque tube.
 - Move the torque tube axially in the direction of the coupling you will grease.
 - Fill the coupling with grease, D00633 until clean grease comes out of one of the other lubrication holes.

NOTE: It is only necessary to put grease in one of the lubrication holes on each coupling.
 - Move the torque tube in the opposite direction until it stops.
 - Wipe the grease from around the coupling.
 - For the torque tube on the inboard end of the inboard offset gearbox, move the seal tube [102] to its usual position:
 - If it is necessary, install a new packing [101] on the seal tube [102].
 - Apply grease, D00633 to the packing [101] on the seal tube [102].
 - Move the seal tube [102] outboard to the offset gearbox.
 - Apply grease, D00633 to the bolts [105].
 - Put the plate [103] in its position and install the bolts [105] and washers [104].

SUBTASK 12-21-08-640-002

- (6) Lubricate the torque tube support with grease, D00633 (Table 301).

SUBTASK 12-21-08-200-013



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (7) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

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SUBTASK 12-21-08-010-002

(8) Install the fixed leading edge panels on the wing:

(a) Install these access panel on the inboard end of the left wing:

(TASK 06-30-00-800-806)

<u>Number</u>	<u>Name/Location</u>
511AB	Leading Edge PDU Panel
511CB	Inboard Fixed Leading Edge Panel
511GB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel
513AT	Krueger Slat Access Panel

(b) Install these access panel and on the inboard end of the right wing:

(TASK 06-30-00-800-807)

<u>Number</u>	<u>Name/Location</u>
611AB	Inboard Fixed Leading Edge Panel
611CB	Inboard Fixed Leading Edge Panel
611GB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel
613AT	Krueger Slat Access Panel

SUBTASK 12-21-08-440-001

(9) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-21-08-440-002

(10) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

Table 301/12-21-08-993-809 Inboard Leading Edge Torque Tube and Support Servicing (Fig. 301)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Pressure Seal Coupling	grease, D00633	BMS3-33	Flush	1
2	Side of Body Angle Gearbox Coupling	grease, D00633	BMS3-33	Flush	2
3	Power Drive Unit Coupling	grease, D00633	BMS3-33	Flush	2
4	Inboard Leading Edge No-Back Brake Offset Gearbox Coupling	grease, D00633	BMS3-33	Flush	2
5	Torque Tube Support	grease, D00633	BMS3-33	Zerk	1
6	Torque Tube Support Coupling	grease, D00633	BMS3-33	Flush	2
7	Driveline Offset Gearbox Coupling	grease, D00633	BMS3-33	Flush	2
8	Outboard No-Back Brake Offset Gearbox Coupling	grease, D00633	BMS3-33	Flush	2
9	Krueger Offset Gearbox Coupling	grease, D00633	BMS3-33	Flush	2
10	Krueger Rotary Actuator Coupling	grease, D00633	BMS3-33	Flush	1

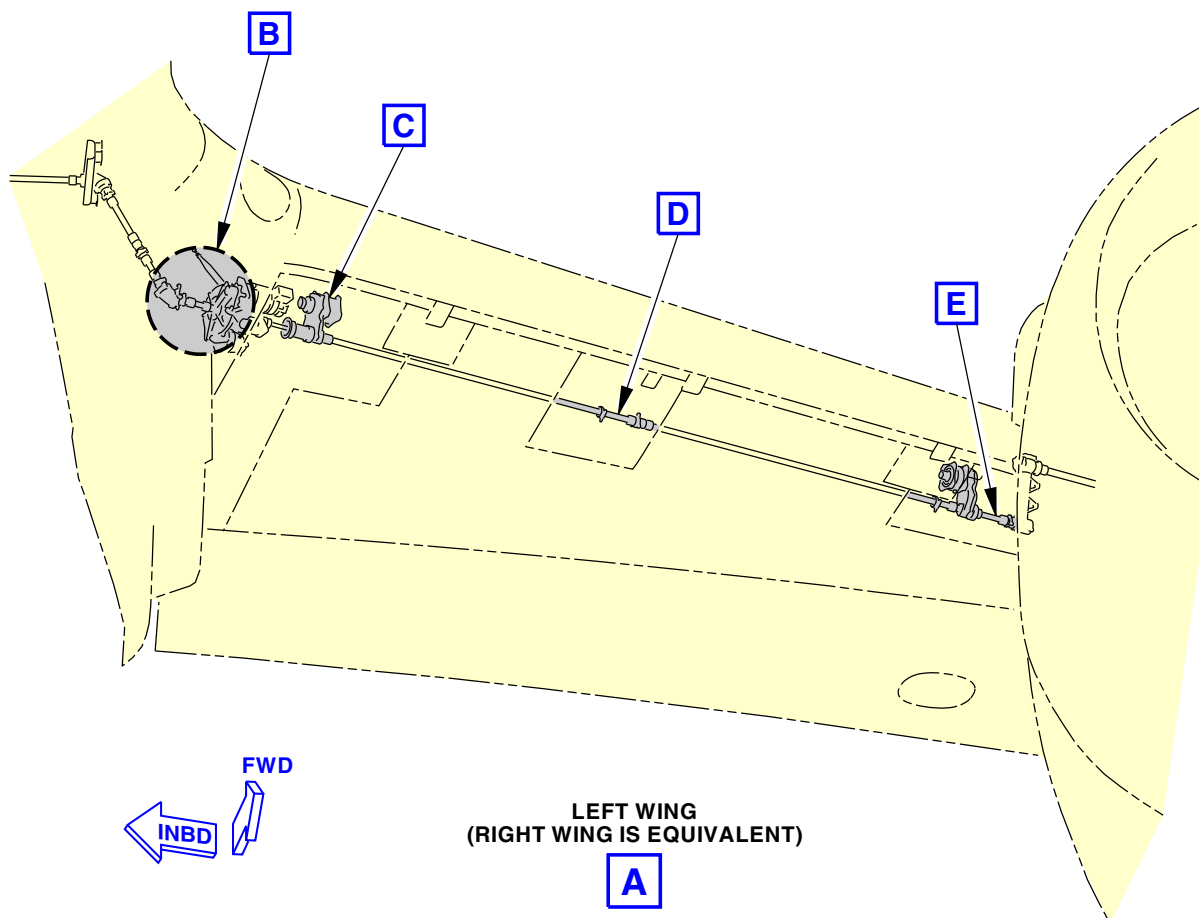
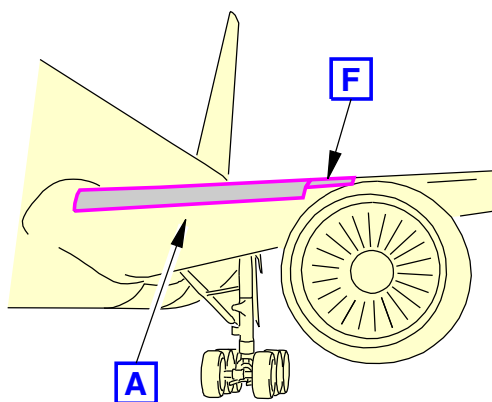
————— **END OF TASK** —————

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E11695 S0006401721_V2

**Inboard Leading Edge Torque Tube and Support Servicing
Figure 301/12-21-08-990-801 (Sheet 1 of 6)**

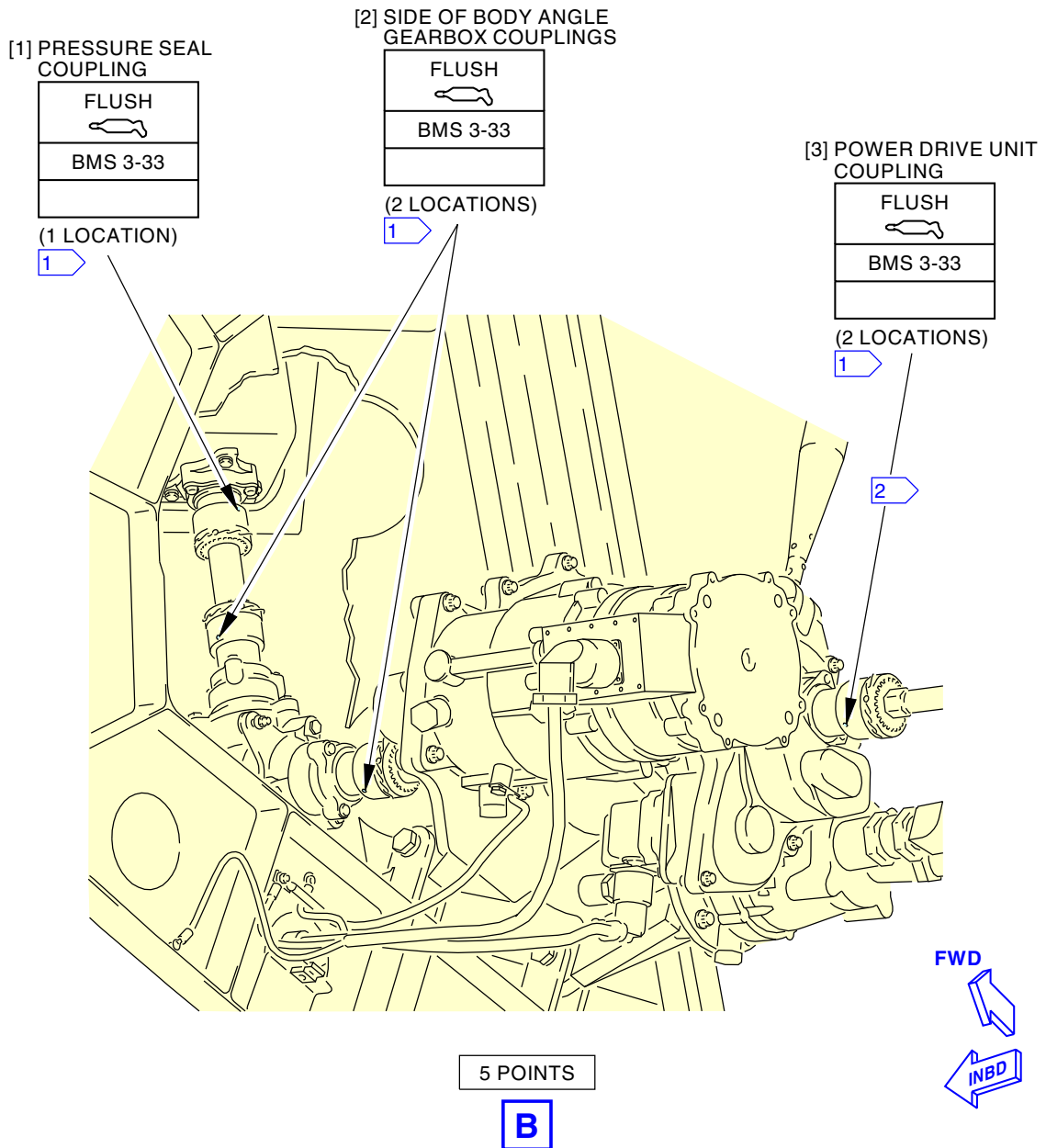
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- 1 LUBRICATE A MINIMUM OF ONE LUBE POINT ON EACH COUPLING UNTIL GREASE COMES OUT OF THE COUPLING.
- 2 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

E11696 S0006401722_V2

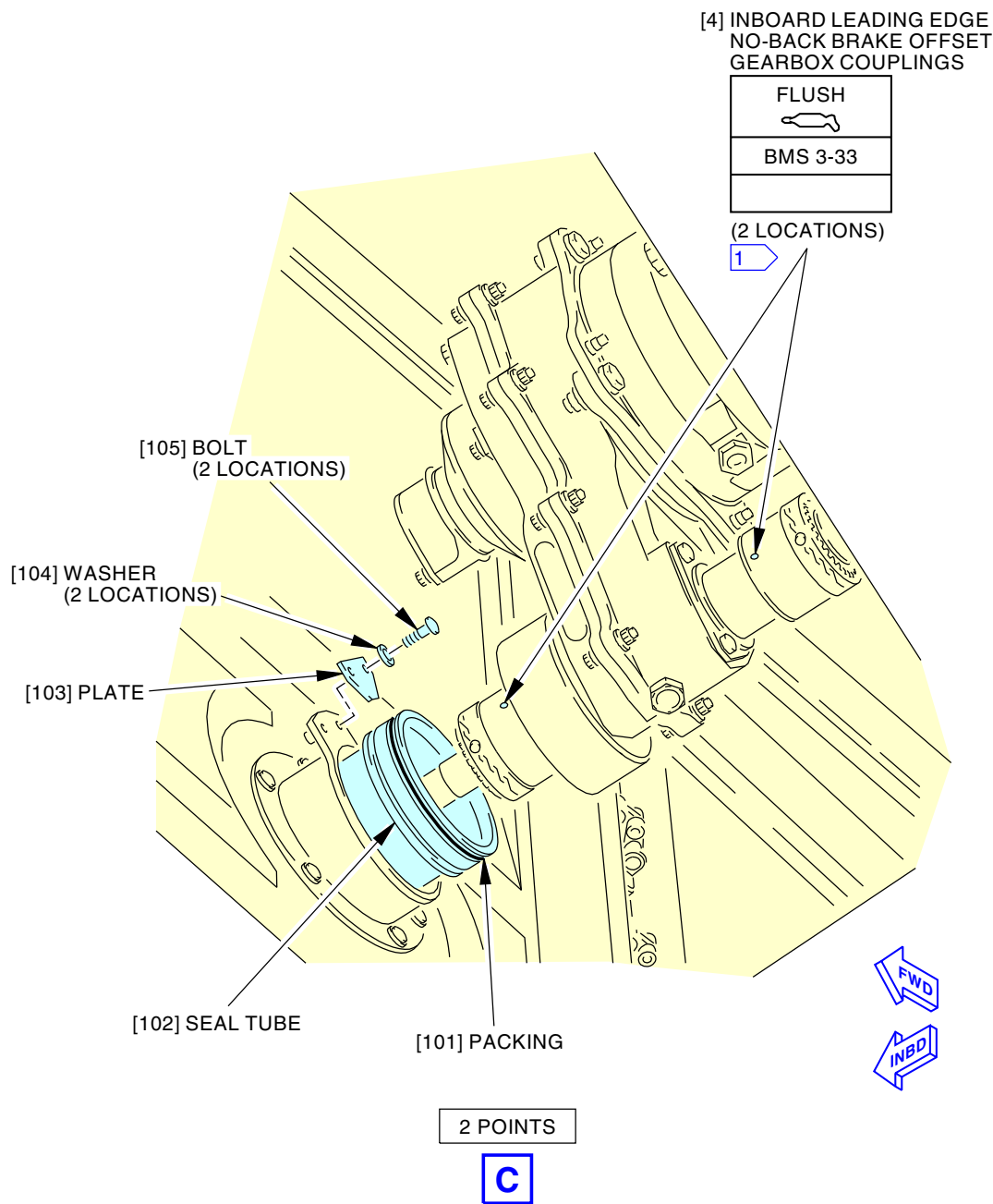
Inboard Leading Edge Torque Tube and Support Servicing
Figure 301/12-21-08-990-801 (Sheet 2 of 6)

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E11697 S0006401723_V3

**Inboard Leading Edge Torque Tube and Support Servicing
Figure 301/12-21-08-990-801 (Sheet 3 of 6)**

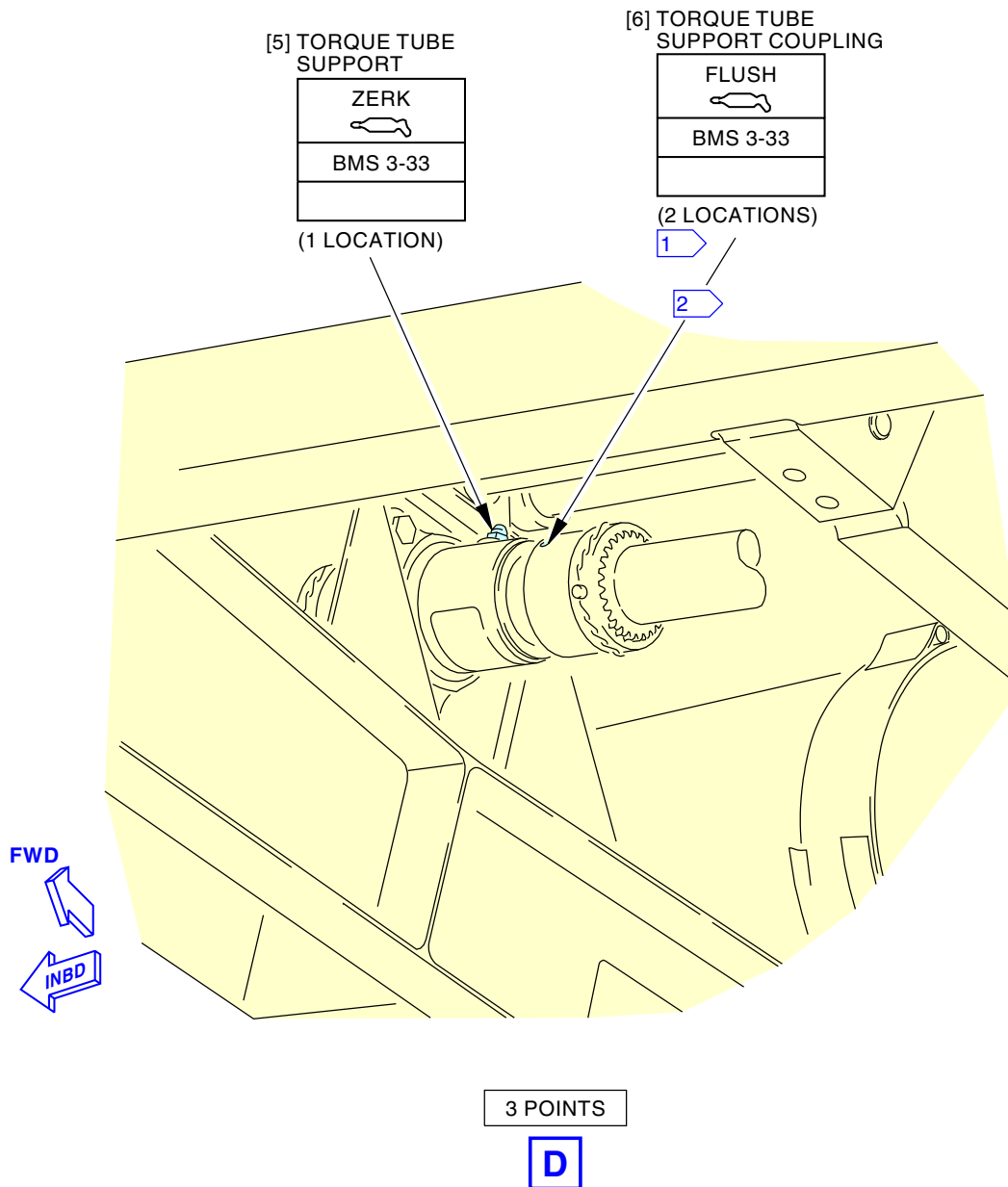
EFFECTIVITY
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E11698 S0006401724_V2

Inboard Leading Edge Torque Tube and Support Servicing
Figure 301/12-21-08-990-801 (Sheet 4 of 6)

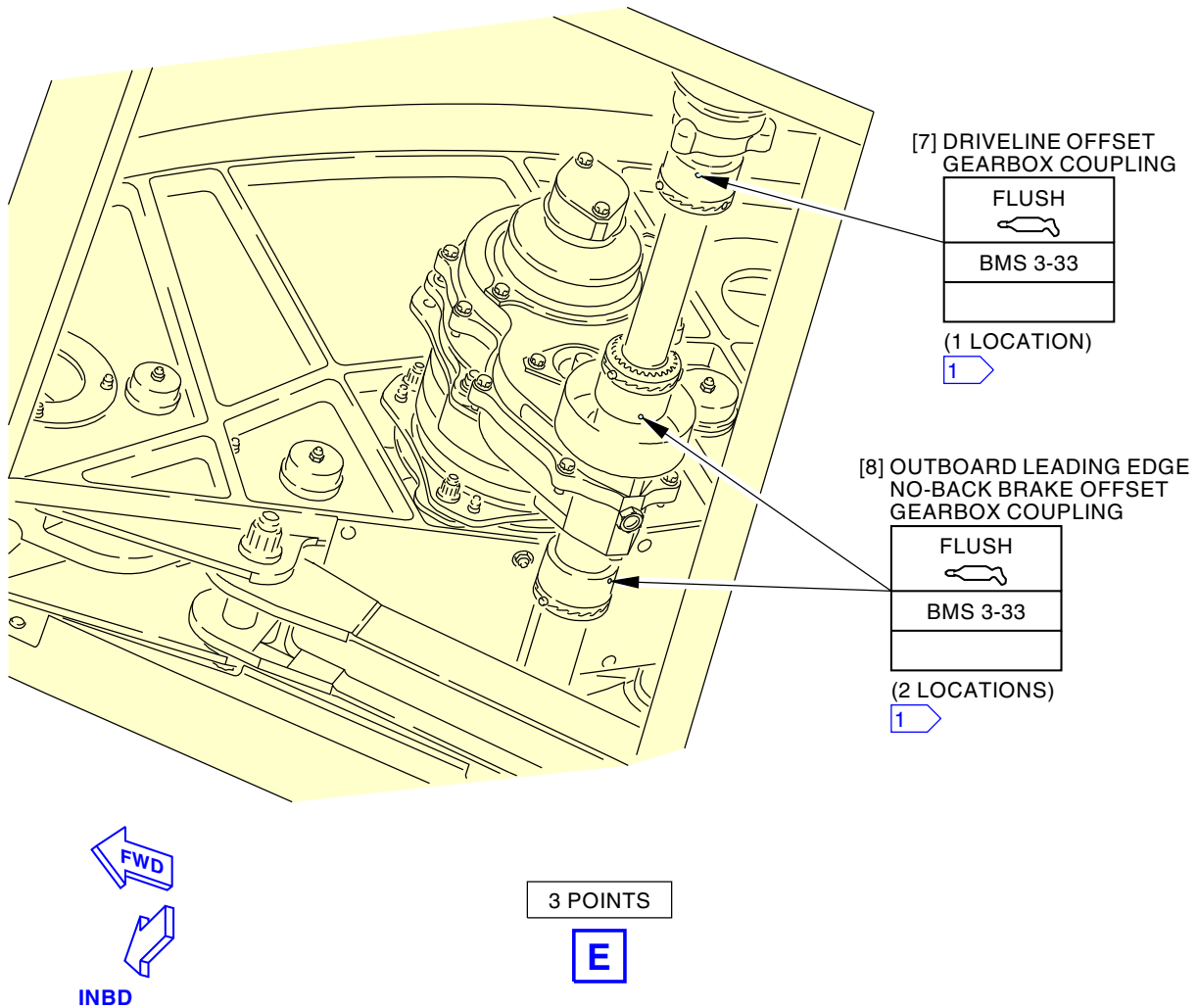
EFFECTIVITY
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E11699 S0006401725_V3

Inboard Leading Edge Torque Tube and Support Servicing
Figure 301/12-21-08-990-801 (Sheet 5 of 6)

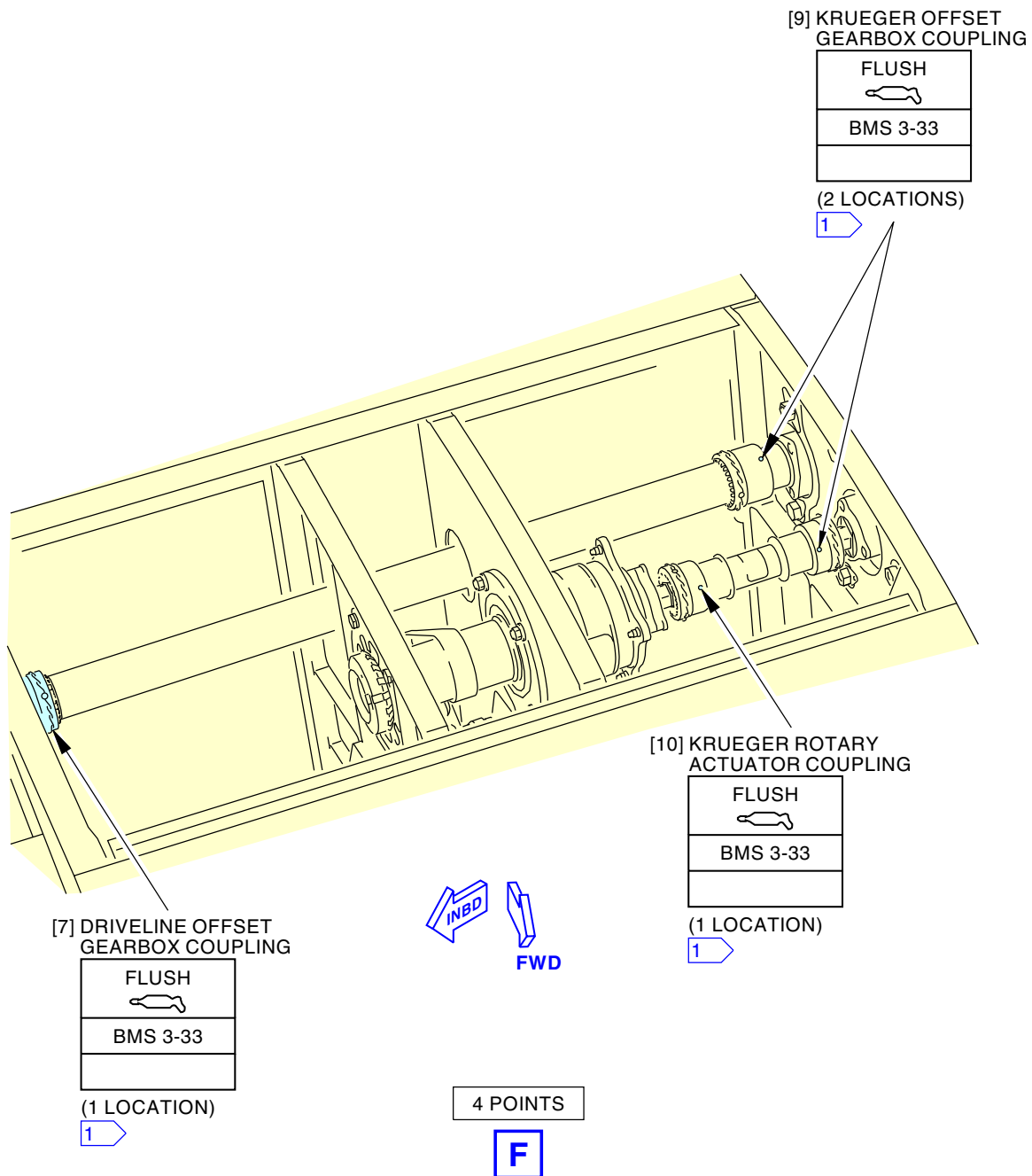
EFFECTIVITY
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E11701 S0006401726_V2

**Inboard Leading Edge Torque Tube and Support Servicing
Figure 301/12-21-08-990-801 (Sheet 6 of 6)**

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TASK 12-21-08-640-805

3. Outboard Leading Edge Torque Tube and Support Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task is applicable to the torque tubes outboard of the driveline offset gearbox.

B. References

Reference	Title
06-30-00-800-806	Finding a Zone in Left Wing - Major Zone 500 (P/B 201)
06-30-00-800-807	Finding a Zone in Right Wing - Major Zone 600 (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)
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
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
520	Subzone 520 - Wing Leading Edge - Forward of Front Spar
620	Subzone 620 - Wing Leading Edge - Forward of Front Spar

E. Access Panels

Number	Name/Location
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
521AAB	Outboard Fixed Leading Edge Panel
521AB	Wing Anti-Ice Valve Door
521ACB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel
521BB	Outboard Fixed Leading Edge Panel
521DB	Refueling Station Door
521EB	Outboard Fixed Leading Edge Panel
521FB	Outboard Fixed Leading Edge Panel
521GB	Outboard Fixed Leading Edge Panel
521HB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel
521KB	Outboard Fixed Leading Edge Panel
521LB	Outboard Fixed Leading Edge Panel
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel
521QB	Outboard Fixed Leading Edge Panel
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel

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Number	Name/Location
521UB	Outboard Fixed Leading Edge Panel
521VB	Outboard Fixed Leading Edge Panel
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel
521ZB	Outboard Fixed Leading Edge Panel
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel
621AAB	Outboard Fixed Leading Edge Panel
621AB	Wing Anti-Ice Valve Door
621ACB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel
621BB	Outboard Fixed Leading Edge Panel
621CAB	Outboard Fixed Leading Edge Panel
621DAB	Outboard Fixed Leading Edge Panel
621DB	Refueling Station Door
621EB	Outboard Fixed Leading Edge Panel
621FB	Outboard Fixed Leading Edge Panel
621GB	Outboard Fixed Leading Edge Panel
621HB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel
621KB	Outboard Fixed Leading Edge Panel
621LB	Outboard Fixed Leading Edge Panel
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel
621QB	Outboard Fixed Leading Edge Panel
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel
621UB	Outboard Fixed Leading Edge Panel
621VB	Outboard Fixed Leading Edge Panel
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel
621ZB	Outboard Fixed Leading Edge Panel

F. Procedure

SUBTASK 12-21-08-040-009



WARNING

MAKE SURE THAT THRUST REVERSER IS DEACTIVATED. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 12-21-08-040-010



WARNING

MAKE SURE THAT YOU DEACTIVATE THE LEADING-EDGE SLAT BEFORE YOU WORK ON THE SLAT SYSTEM. THE SLATS CAN MOVE QUICKLY WHEN YOU ACTIVATE THEM. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (2) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-21-08-010-005

- (3) Remove the fixed leading edge panels from the wing.
(a) Remove these access panels on the outboard end of the left wing:

(TASK 06-30-00-800-806)

<u>Number</u>	<u>Name/Location</u>
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
521AAB	Outboard Fixed Leading Edge Panel
521AB	Wing Anti-Ice Valve Door
521ACB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel
521BB	Outboard Fixed Leading Edge Panel
521DB	Refueling Station Door
521EB	Outboard Fixed Leading Edge Panel
521FB	Outboard Fixed Leading Edge Panel
521GB	Outboard Fixed Leading Edge Panel
521HB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel
521KB	Outboard Fixed Leading Edge Panel
521LB	Outboard Fixed Leading Edge Panel
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel
521QB	Outboard Fixed Leading Edge Panel
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel
521UB	Outboard Fixed Leading Edge Panel
521VB	Outboard Fixed Leading Edge Panel
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel
521ZB	Outboard Fixed Leading Edge Panel

- (b) Remove these access panels on the outboard end of the right wing:

(TASK 06-30-00-800-807)

<u>Number</u>	<u>Name/Location</u>
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel
621AAB	Outboard Fixed Leading Edge Panel
621AB	Wing Anti-Ice Valve Door
621ACB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel
621BB	Outboard Fixed Leading Edge Panel
621CAB	Outboard Fixed Leading Edge Panel

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(Continued)

<u>Number</u>	<u>Name/Location</u>
621DAB	Outboard Fixed Leading Edge Panel
621DB	Refueling Station Door
621EB	Outboard Fixed Leading Edge Panel
621FB	Outboard Fixed Leading Edge Panel
621GB	Outboard Fixed Leading Edge Panel
621HB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel
621KB	Outboard Fixed Leading Edge Panel
621LB	Outboard Fixed Leading Edge Panel
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel
621QB	Outboard Fixed Leading Edge Panel
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel
621UB	Outboard Fixed Leading Edge Panel
621VB	Outboard Fixed Leading Edge Panel
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel
621ZB	Outboard Fixed Leading Edge Panel

SUBTASK 12-21-08-200-003



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (4) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-640-009

- (5) Lubricate the torque tube couplings on the ends of the torque tubes with grease, D00633 (Table 302):
- (a) Move the torque tube axially in the direction of the coupling you will grease.
 - (b) Fill the coupling with grease, D00633 until clean grease comes out of one of the other lubrication holes.
NOTE: It is only necessary to put grease in one of the lubrication holes on each coupling.
 - (c) Move the torque tube in the opposite direction until it stops.
 - (d) Wipe the grease from around the coupling.

SUBTASK 12-21-08-640-010

- (6) Lubricate the torque tube supports with grease, D00633 (Table 302).

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SUBTASK 12-21-08-200-004



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (7) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-010-006

- (8) Install the fixed leading edge panels on the wing:
- (a) Install these access panel on the outboard end of the left wing:
(TASK 06-30-00-800-806)

<u>Number</u>	<u>Name/Location</u>
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
521AAB	Outboard Fixed Leading Edge Panel
521AB	Wing Anti-Ice Valve Door
521ACB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel
521BB	Outboard Fixed Leading Edge Panel
521DB	Refueling Station Door
521EB	Outboard Fixed Leading Edge Panel
521FB	Outboard Fixed Leading Edge Panel
521GB	Outboard Fixed Leading Edge Panel
521HB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel
521KB	Outboard Fixed Leading Edge Panel
521LB	Outboard Fixed Leading Edge Panel
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel
521QB	Outboard Fixed Leading Edge Panel
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel
521UB	Outboard Fixed Leading Edge Panel
521VB	Outboard Fixed Leading Edge Panel
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel
521ZB	Outboard Fixed Leading Edge Panel

- (b) Install these access panel on the outboard end of the right wing:
(TASK 06-30-00-800-807)

<u>Number</u>	<u>Name/Location</u>
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel
621AAB	Outboard Fixed Leading Edge Panel
621AB	Wing Anti-Ice Valve Door
621ACB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel
621BB	Outboard Fixed Leading Edge Panel

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<u>Number</u>	<u>Name/Location</u>
621CAB	Outboard Fixed Leading Edge Panel
621DAB	Outboard Fixed Leading Edge Panel
621DB	Refueling Station Door
621EB	Outboard Fixed Leading Edge Panel
621FB	Outboard Fixed Leading Edge Panel
621GB	Outboard Fixed Leading Edge Panel
621HB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel
621KB	Outboard Fixed Leading Edge Panel
621LB	Outboard Fixed Leading Edge Panel
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel
621QB	Outboard Fixed Leading Edge Panel
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel
621UB	Outboard Fixed Leading Edge Panel
621VB	Outboard Fixed Leading Edge Panel
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel
621ZB	Outboard Fixed Leading Edge Panel

SUBTASK 12-21-08-440-009

(9) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-21-08-440-010

(10) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

Table 302/12-21-08-993-810 Outboard Leading Edge Torque Tube and Support Servicing (Fig. 302)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Krueger Offset Gearbox Coupling	grease, D00633	BMS3-33	Flush	1
2	Torque Tube Support Coupling	grease, D00633	BMS3-33	Flush	16
3	Outboard Leading Edge Position Sensor Gearbox Coupling	grease, D00633	BMS3-33	Flush	1
4	Outboard Leading Edge No-Back Brake Offset Gearbox Coupling	grease, D00633	BMS3-33	Flush	22
5	Torque Tube Support	grease, D00633	BMS3-33	Zerk	8

———— **END OF TASK** ————

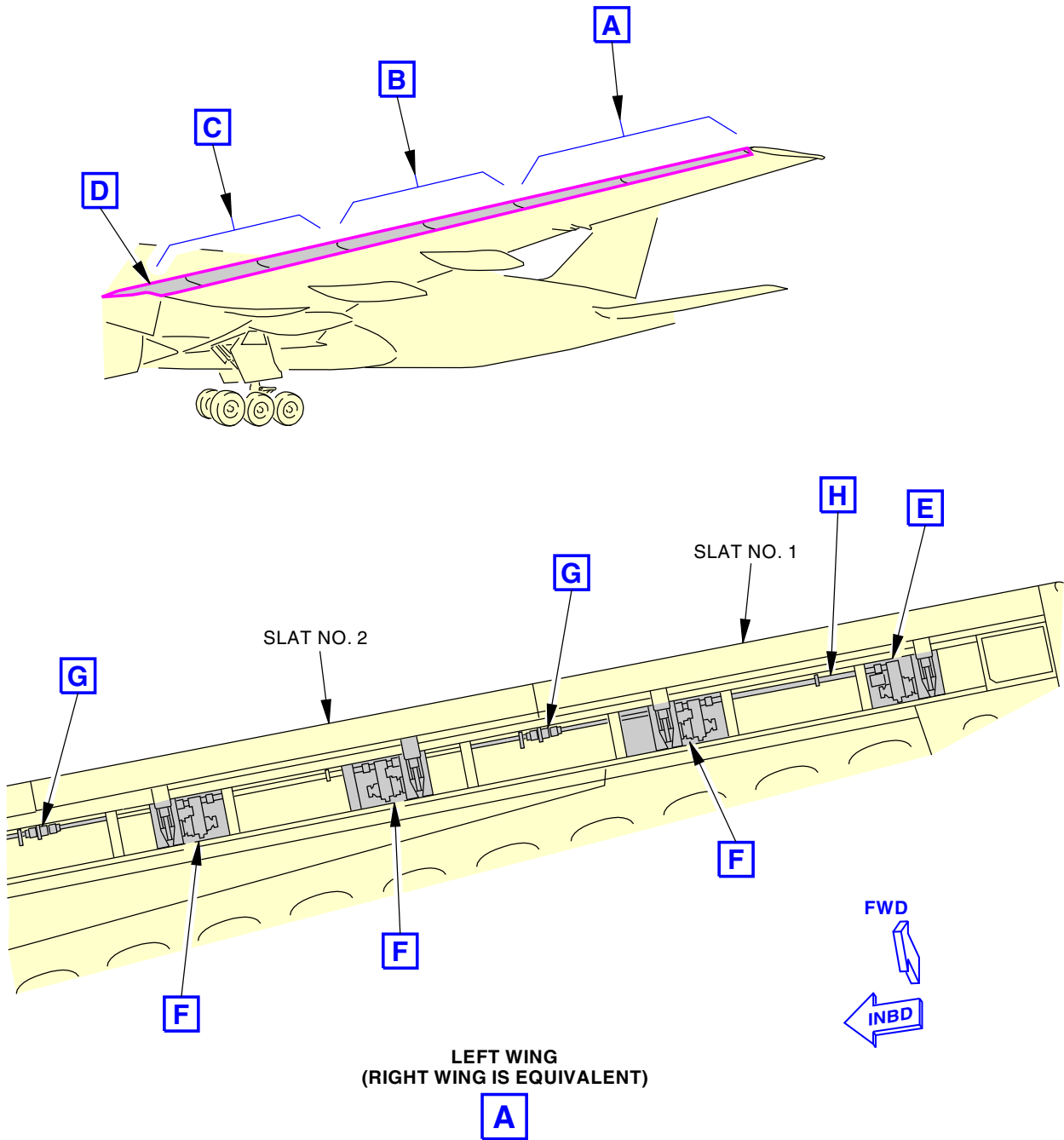
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1922229 S0000361126_V2

Outboard Leading Edge Torque Tube and Support Servicing
Figure 302/12-21-08-990-802 (Sheet 1 of 6)

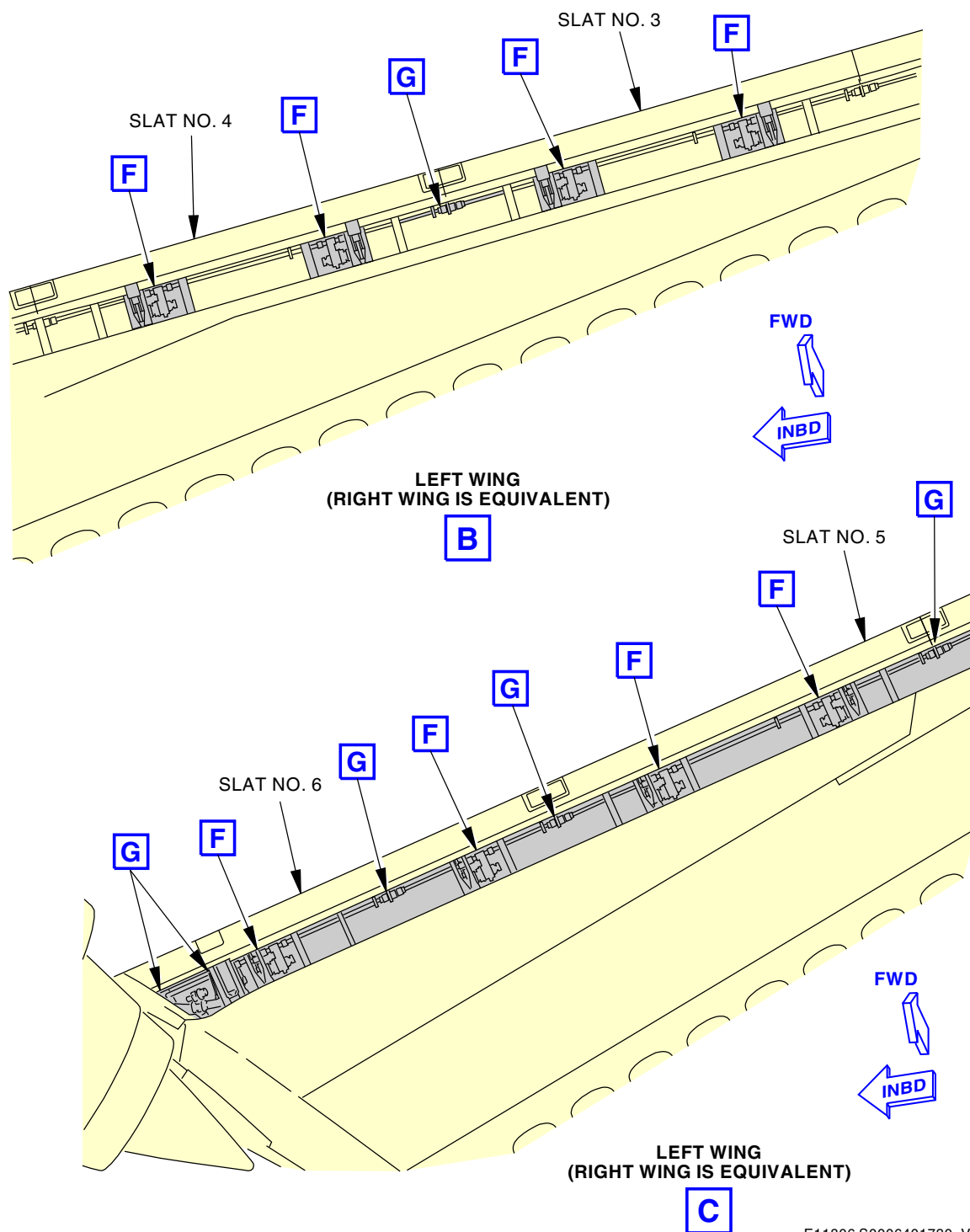
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E11806 S0006401730_V2

**Outboard Leading Edge Torque Tube and Support Servicing
Figure 302/12-21-08-990-802 (Sheet 2 of 6)**

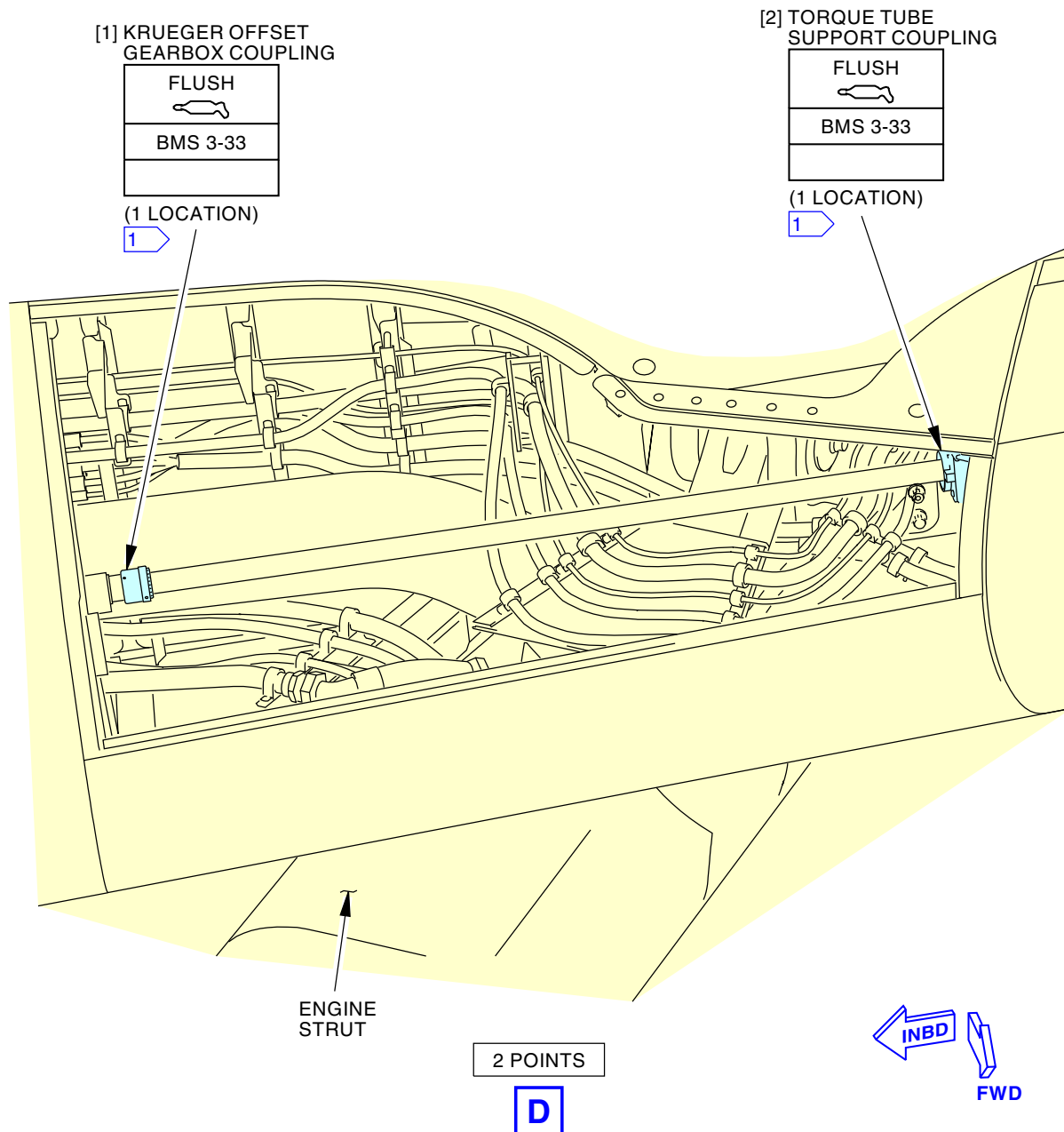
EFFECTIVITY
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1 LUBRICATE A MINIMUM OF ONE LUBE POINT ON EACH COUPLING UNTIL GREASE COMES OUT OF THE COUPLING.

E11809 S0006401731_V2

Outboard Leading Edge Torque Tube and Support Servicing Figure 302/12-21-08-990-802 (Sheet 3 of 6)

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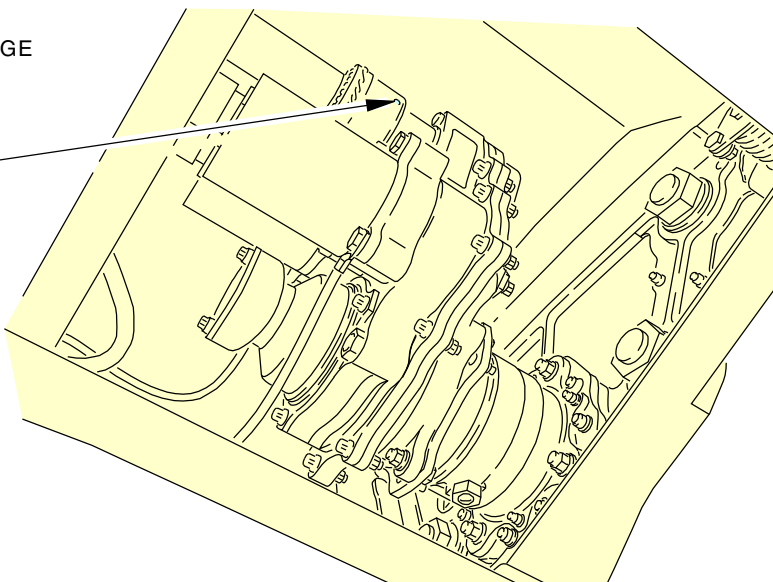
[3] OUTBOARD LEADING EDGE
POSITION SENSOR
GEARBOX COUPLING

FLUSH

BMS 3-33

(1 LOCATION)

1



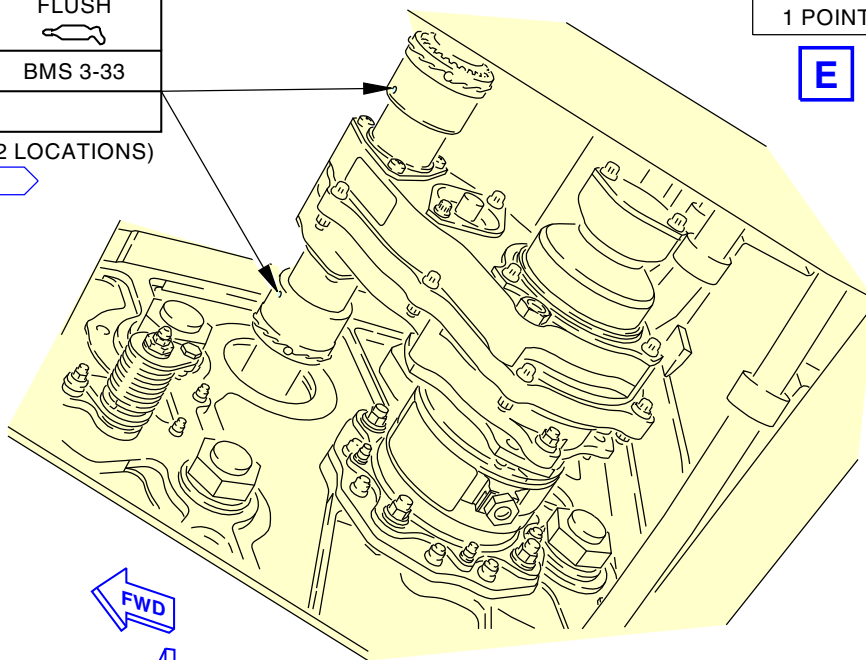
[4] OUTBOARD LEADING EDGE
NO-BACK BRAKE OFFSET
GEARBOX COUPLING

FLUSH

BMS 3-33

(2 LOCATIONS)

1



1 POINT

E



2 POINTS

F

G91675 S0006401733_V3

Outboard Leading Edge Torque Tube and Support Servicing
Figure 302/12-21-08-990-802 (Sheet 4 of 6)

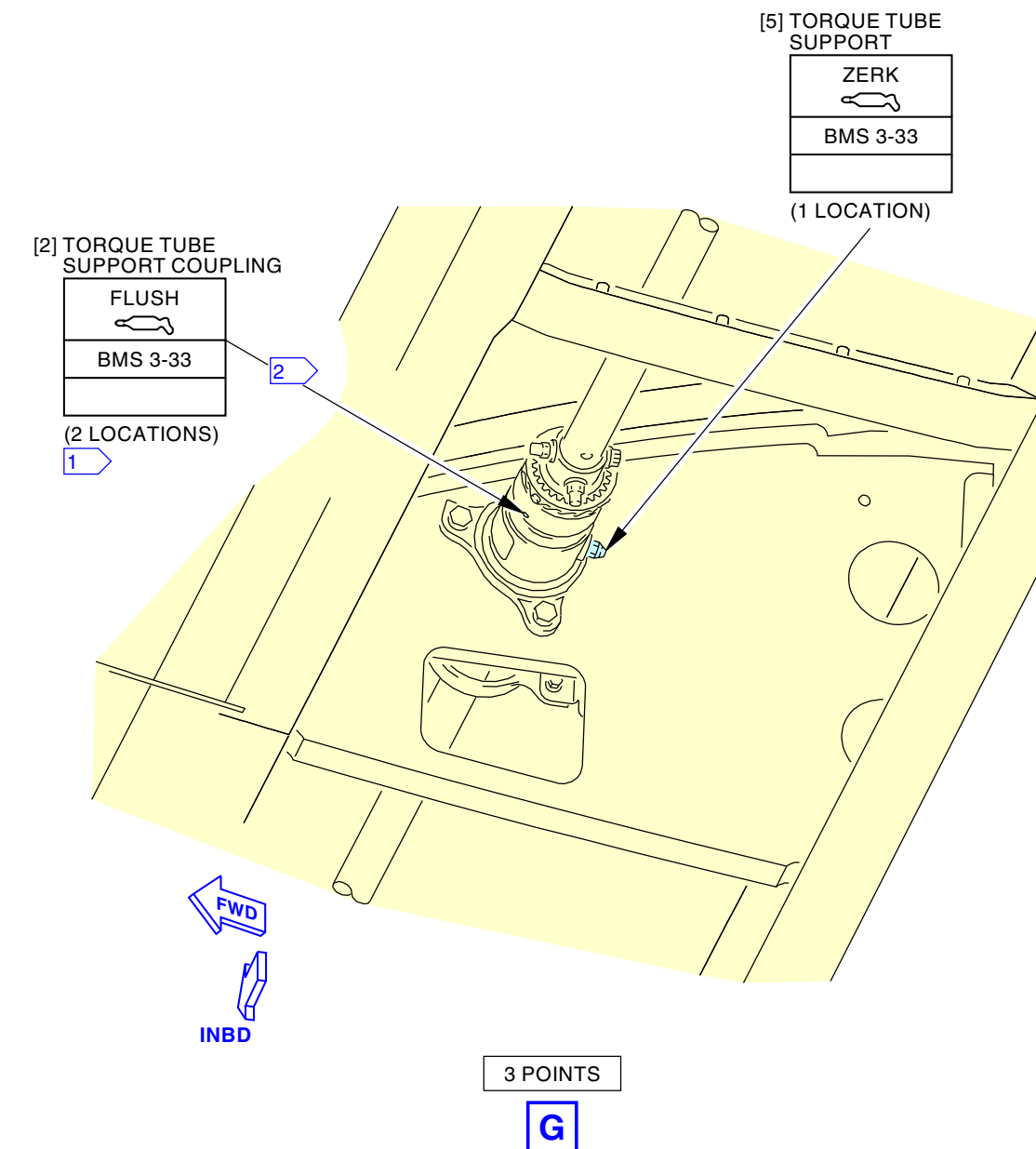
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[2] ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

E11812 S0006401734_V2

**Outboard Leading Edge Torque Tube and Support Servicing
Figure 302/12-21-08-990-802 (Sheet 5 of 6)**

EFFECTIVITY
ARO ALL

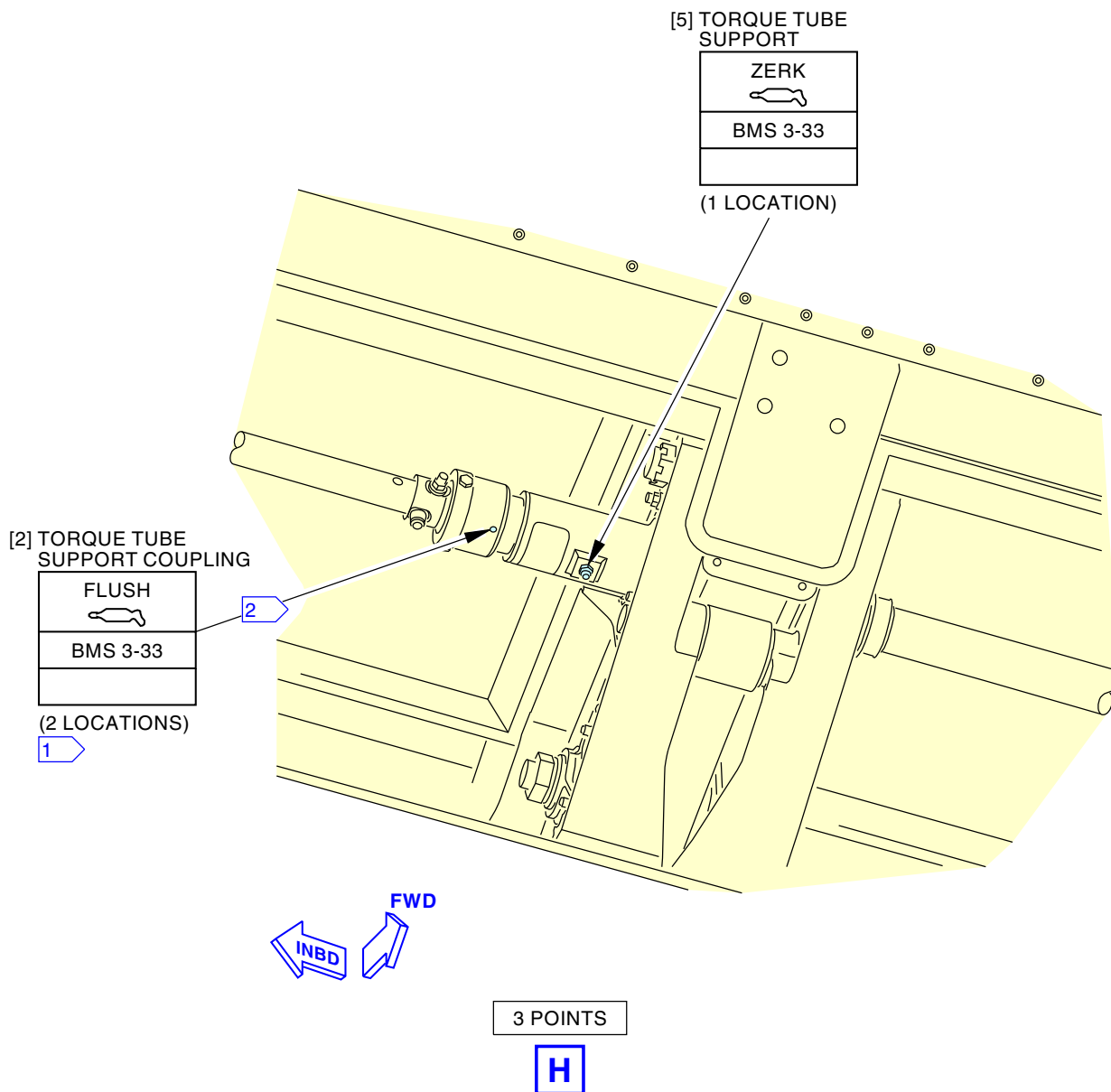
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2 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

1922232 S0000361130_V2

Outboard Leading Edge Torque Tube and Support Servicing
Figure 302/12-21-08-990-802 (Sheet 6 of 6)

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TASK 12-21-08-640-806-006

4. Cargo Compartment Torque Tube, Support and Pressure Seal Lubrication - 300ER

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task is applicable to the torque tubes in the aft end of the forward cargo compartment.

B. References

Reference	Title
25-52-06-000-801	Sidewall Liner Removal (P/B 401)
25-52-06-400-801	Sidewall Liner Installation (P/B 401)
25-52-09-000-801	Ceiling Liner Removal (P/B 401)
25-52-09-400-801	Ceiling Liner - Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
121	Forward Cargo Compartment, Left
122	Forward Cargo Compartment, Right

E. Procedure

SUBTASK 12-21-08-040-022



DO THE DEACTIVATION PROCEDURE FOR THE LEADING EDGE SLATS. THE SLATS RETRACT QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-21-08-010-025

- (2) Do this task: Sidewall Liner Removal, TASK 25-52-06-000-801, Figure 303, Figure 304, Figure 305.

SUBTASK 12-21-08-010-026

- (3) Do this task: Ceiling Liner Removal, TASK 25-52-09-000-801, Figure 306.

SUBTASK 12-21-08-640-034

- (4) Lubricate the torque tube couplings on the ends of the torque tubes with grease, D00633 (Table 303):
- (a) Use a long (6 feet) extender where necessary to complete the lubrication of torque tube couplings.
- NOTE:** Two persons may be necessary in areas where restricted access exist to complete the lubrication task. One person to locate the lube fitting and hold the adaptor and another person to operate the grease gun.
- NOTE:** Another alternative is to get access to the area for lubrication by removing the main cabin floor panel, or the local air return grille that covers the area above.
- (b) Move the torque tube axially in the direction of the coupling you will grease.

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ARO ALL

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- (c) Fill the coupling with grease, D00633 until clean grease comes out of one of the other lubrication holes.

NOTE: It is only necessary to put grease in one of the lubrication holes on each coupling.

- (d) Move the torque tube in the opposite direction until it stops.

- (e) Wipe the grease from around the coupling.

SUBTASK 12-21-08-640-035

- (5) Lubricate the torque tube supports with grease, D00633 (Table 303).

SUBTASK 12-21-08-640-036

- (6) Lubricate the pressure seals with grease, D00633 (Table 303).

NOTE: The pressure seals are installed in the aft end of the forward cargo compartment.

SUBTASK 12-21-08-410-020

- (7) Do this task: Ceiling Liner - Installation, TASK 25-52-09-400-801, Figure 306.

SUBTASK 12-21-08-410-021

- (8) Do this task: Sidewall Liner Installation, TASK 25-52-06-400-801, Figure 303, Figure 304, Figure 305.

SUBTASK 12-21-08-440-021

- (9) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

Table 303/12-21-08-993-822 Cargo Compartment Torque Tube, Support and Pressure Seal Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Torque Tube Support	grease, D00633	BMS3-33	Zerk	2
2	Torque Tube Support Coupling	grease, D00633	BMS3-33	Flush	4
3	Pressure Seal Coupling	grease, D00633	BMS3-33	Flush	2
4	Pressure Seal	grease, D00633	BMS3-33	Zerk	2
5	Floor Angle Gearbox Coupling	grease, D00633	BMS3-33	Flush	4

———— **END OF TASK** ————

EFFECTIVITY
ARO ALL

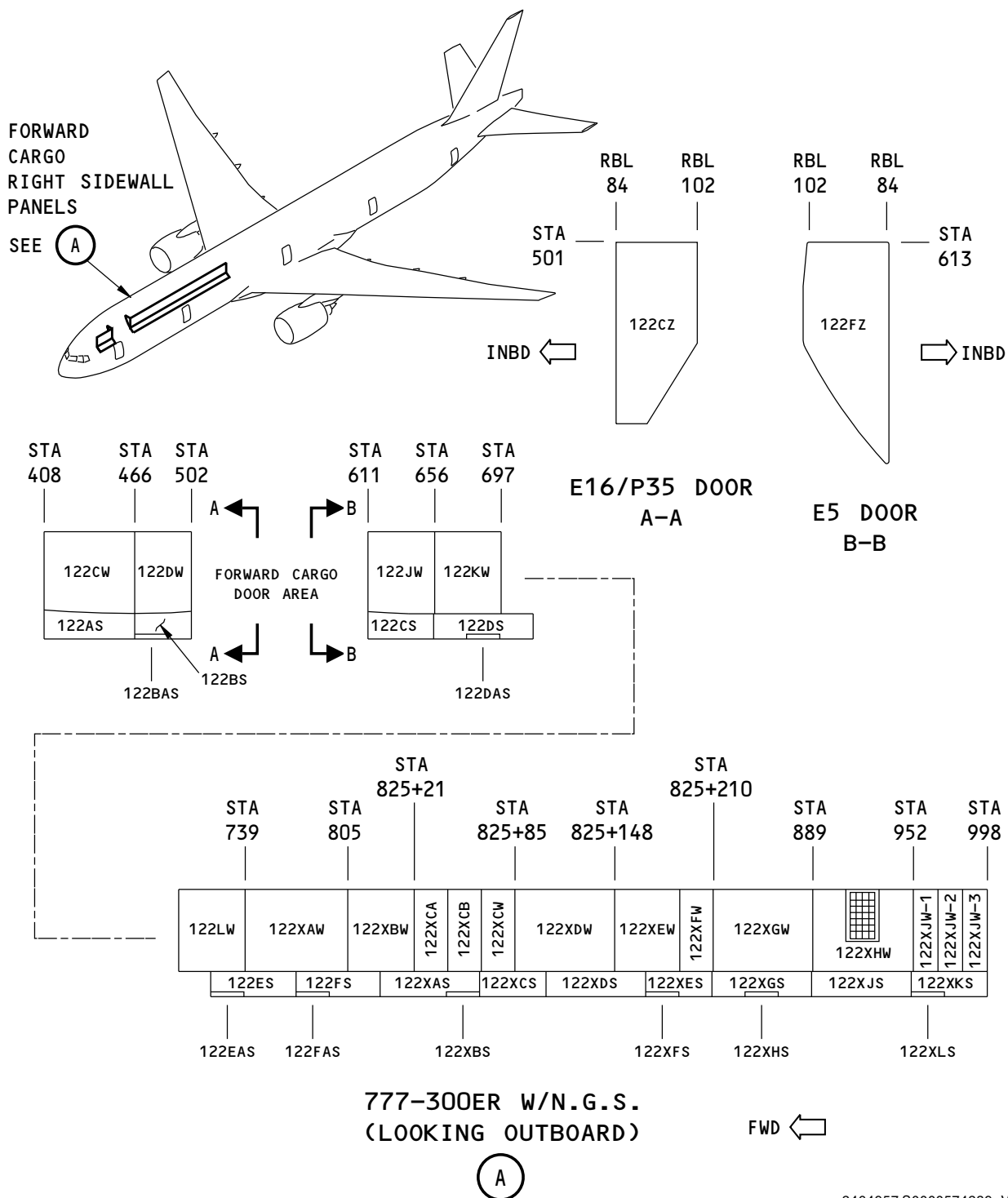
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2464957 S0000574239_V1

ZONE 122 FORWARD CARGO BAY SIDEWALL/BULKHEAD ACCESS PANELS W / NGS
Figure 303/12-21-08-990-830

EFFECTIVITY
ARO ALL

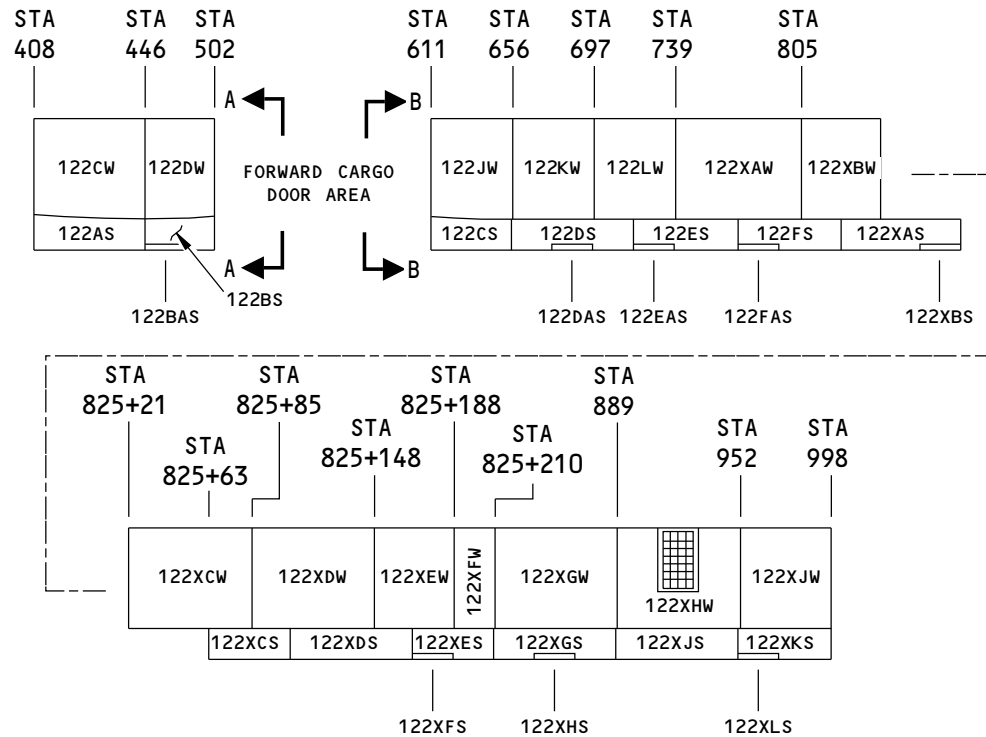
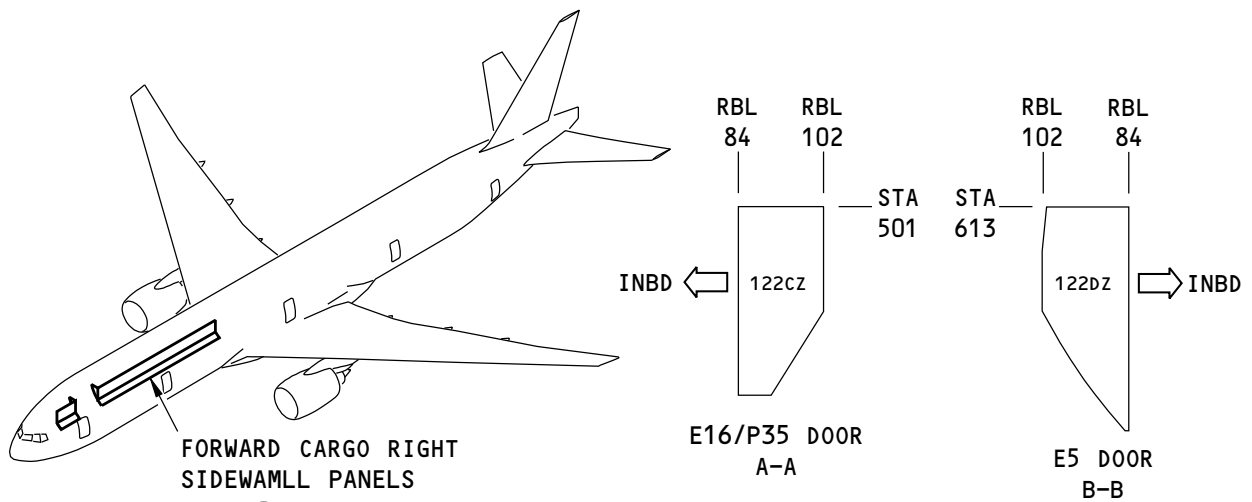
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777-300ER W/O N.G.S.
(LOOKING OUTBOARD)

(A)

FWD ←

2464958 S0000574240_V1

ZONE 122 FORWARD CARGO BAY SIDEWALL/BULKHEAD ACCESS PANELS W/O NGS
Figure 304/12-21-08-990-831

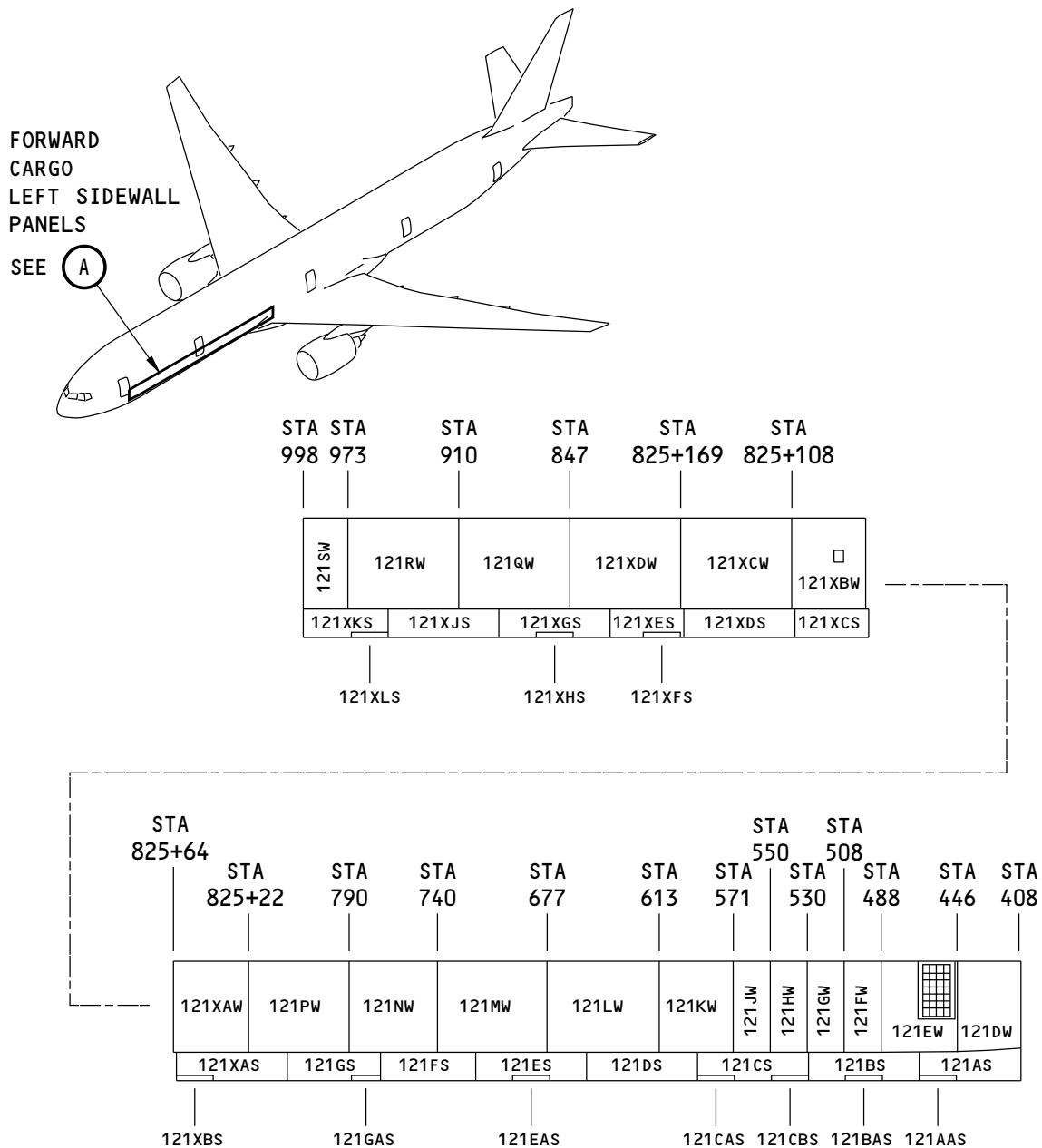
EFFECTIVITY
ARO ALL

12-21-08

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777-300ER
(LOOKING OUTBOARD) ➡ FWD

(A)

2464959 S0000574241_V1

ZONE 121 FORWARD CARGO BAY SIDEWALL/BULKHEAD ACCESS PANELS
Figure 305/12-21-08-990-832

EFFECTIVITY
ARO ALL

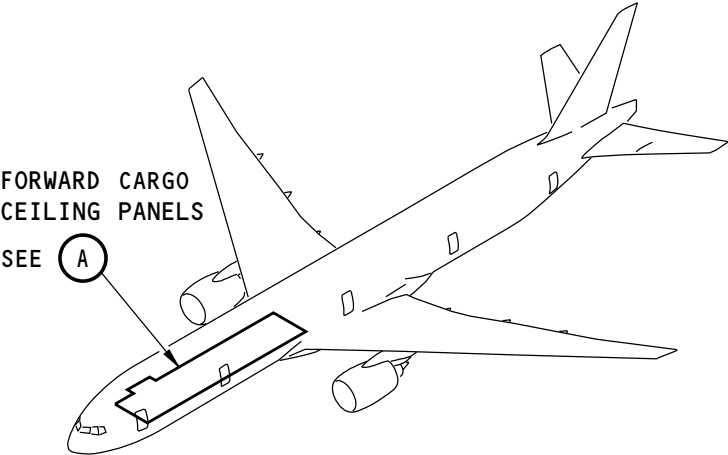
12-21-08

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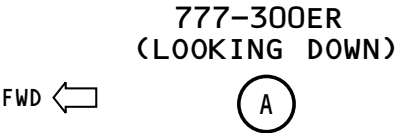
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STA 409	STA 508	STA 613	STA 697	STA 804	STA 825+84	STA 825+189	STA 909	STA 998
	122CC							
122AC	122BC	122DC	122EC	122XAC	122XBC	122XCC	122GC	
121AC	121CC	121EC	121GC	121XAC	121XCC	121XEC	121LC	
121BC	121DC	121FC	121HC	121XBC	121XDC	121XFC	121MC	



2464960 S0000574242_V1

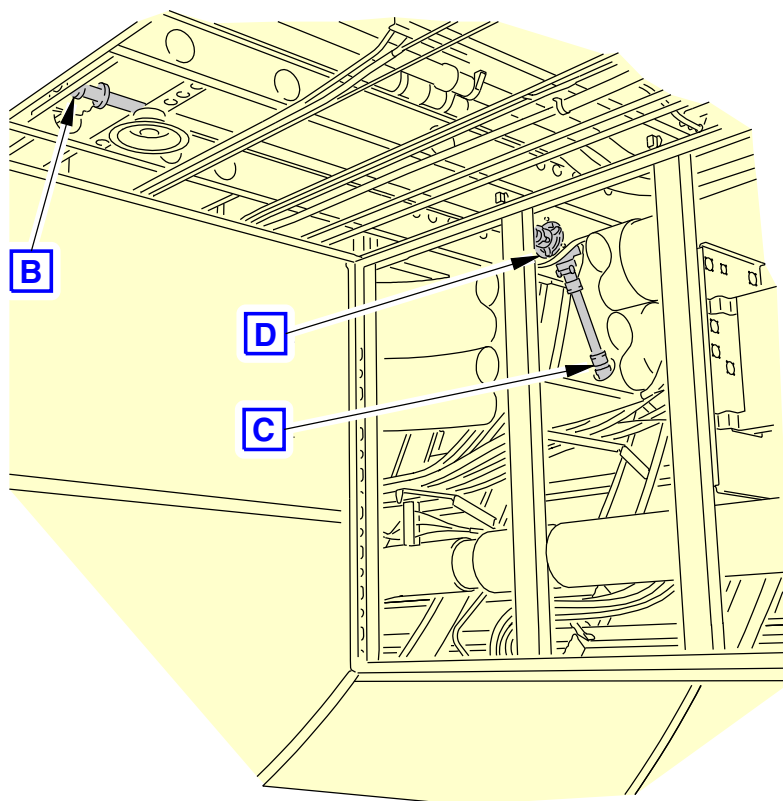
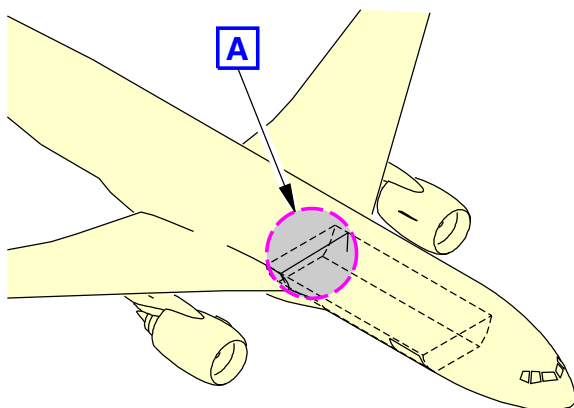
ZONE 121/122 AND 131/132 FORWARD CARGO BAY CEILING PANELS

Figure 306/12-21-08-990-833

EFFECTIVITY

ARO ALL

12-21-08



**LEFT SIDE OF THE CARGO COMPARTMENT
(RIGHT SIDE IS EQUIVALENT)**

A



E11814 S0006401737_V2

**Cargo Compartment Torque Tube, Support and Pressure Seal Servicing
Figure 307/12-21-08-990-829 (Sheet 1 of 4)**

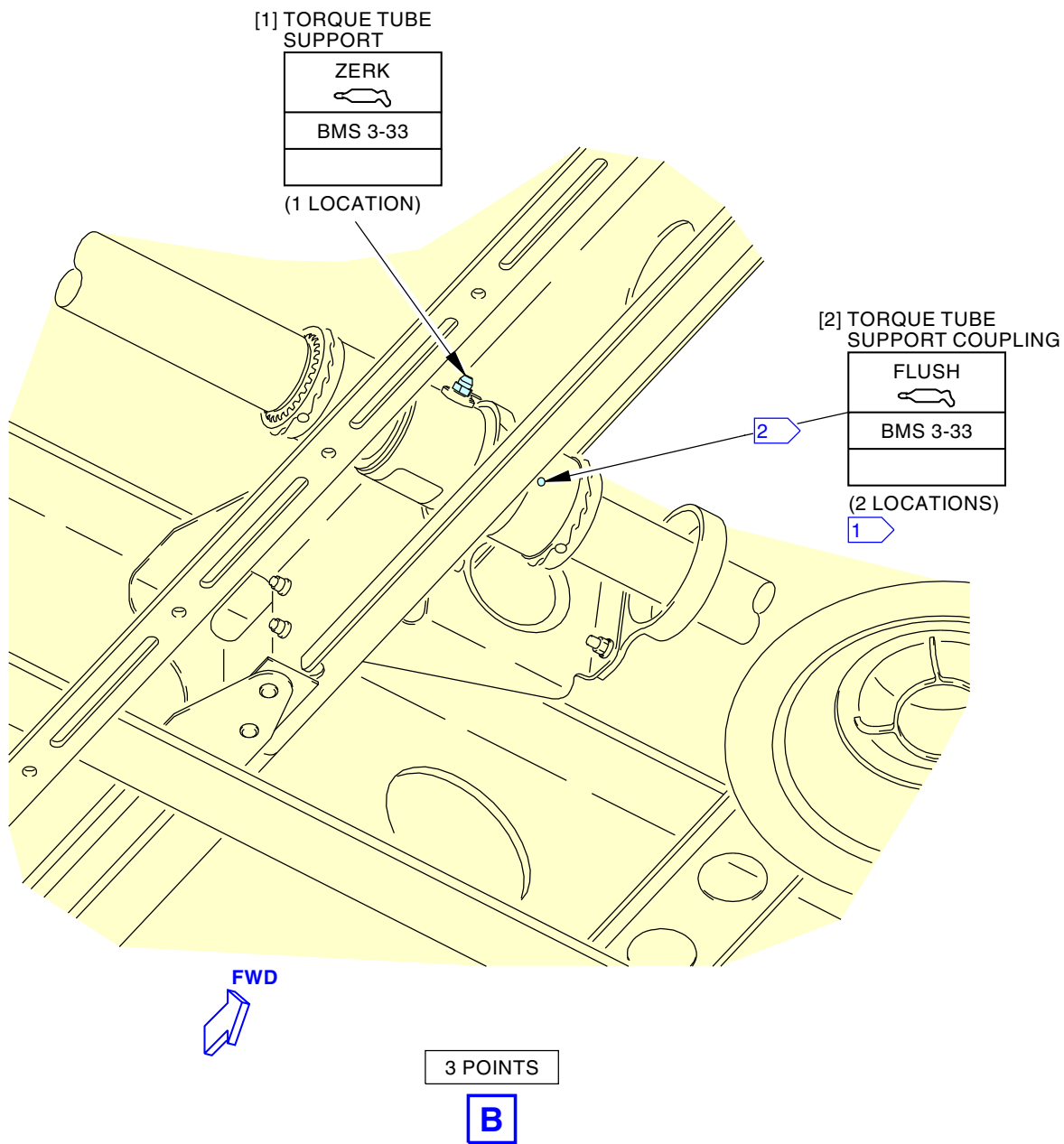
EFFECTIVITY
ARO ALL

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- 1 LUBRICATE A MINIMUM OF ONE LUBE POINT ON EACH COUPLING UNTIL GREASE COMES OUT OF THE COUPLING.
- 2 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

E11815 S0006401738_V2

Cargo Compartment Torque Tube, Support and Pressure Seal Servicing Figure 307/12-21-08-990-829 (Sheet 2 of 4)

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[3] PRESSURE SEAL
COUPLING

FLUSH 
BMS 3-33

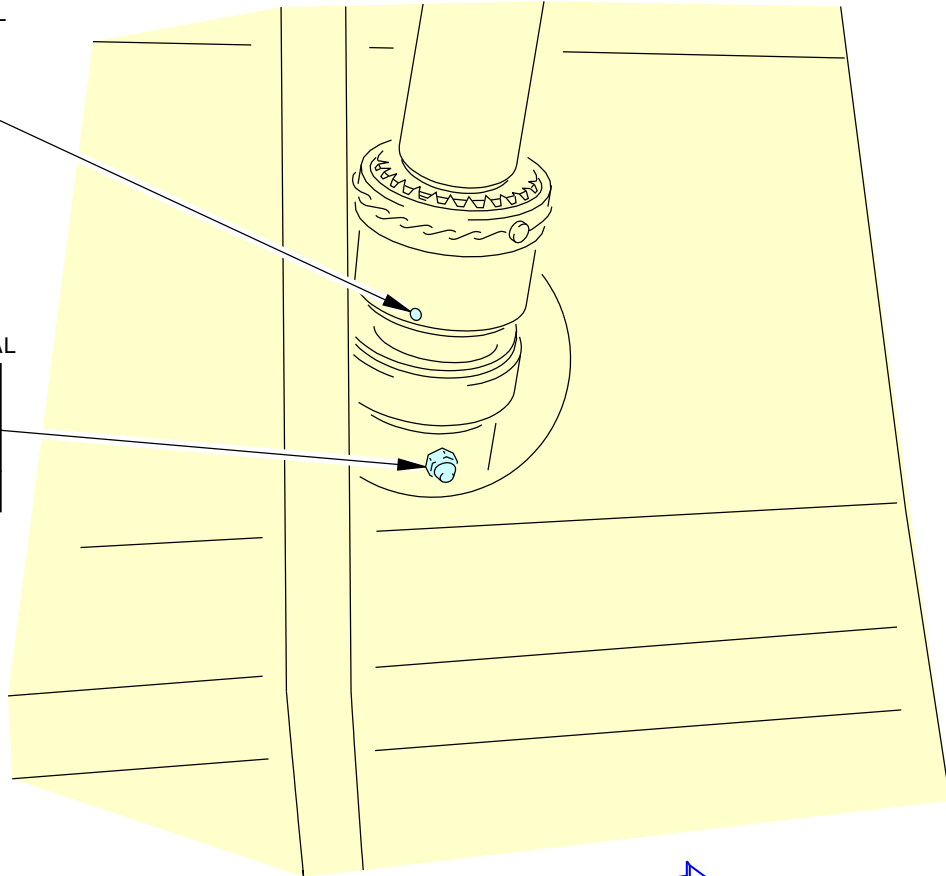
(1 LOCATION)

1

[4] PRESSURE SEAL

ZERK 
BMS 3-33

(1 LOCATION)



2 POINTS

C

E11844 S0006401739_V2

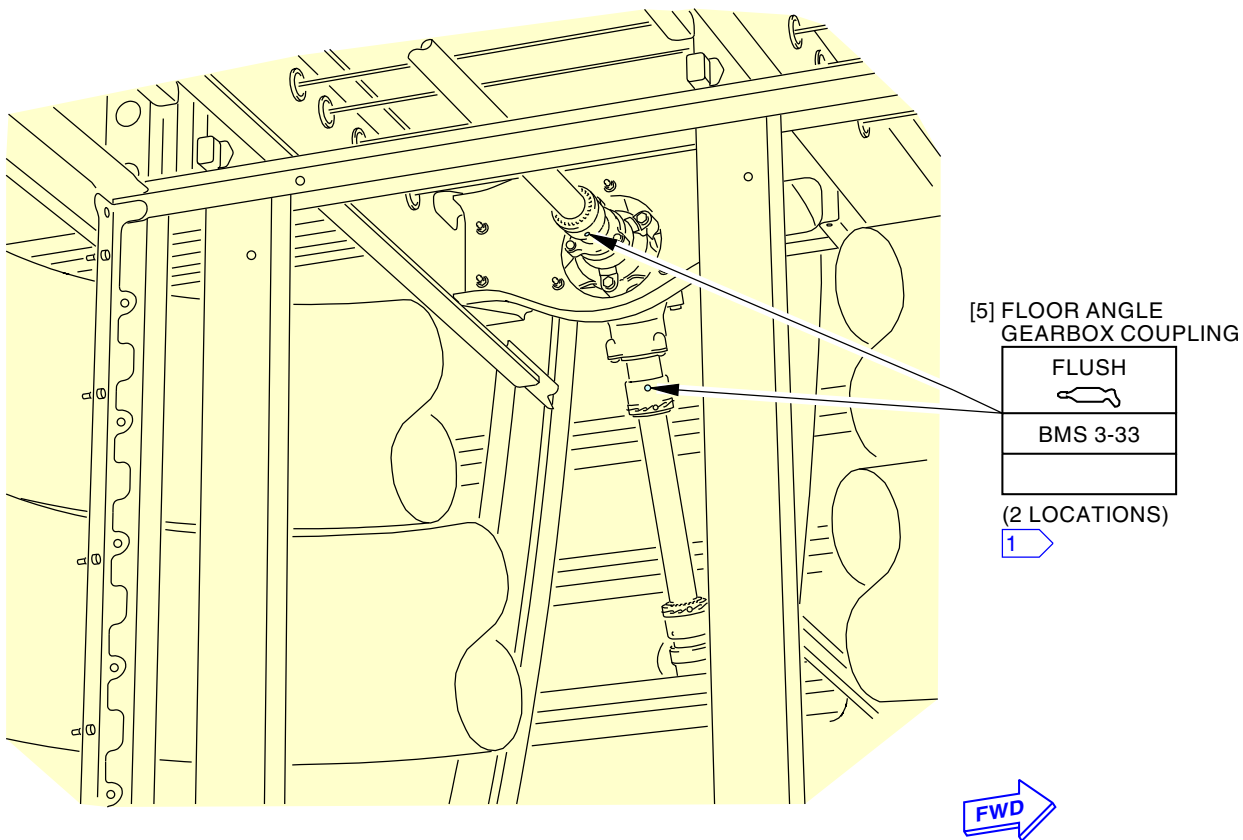
Cargo Compartment Torque Tube, Support and Pressure Seal Servicing
Figure 307/12-21-08-990-829 (Sheet 3 of 4)

EFFECTIVITY
ARO ALL

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**CARGO COMPARTMENT SIDE WALL
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)**

2 POINTS

D

E18189 S0006401740_V2

**Cargo Compartment Torque Tube, Support and Pressure Seal Servicing
Figure 307/12-21-08-990-829 (Sheet 4 of 4)**

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TASK 12-21-08-640-801

5. Inboard Slat Rollers and Pinion Bearing Lubrication

(Figure 308)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-30-00-800-806	Finding a Zone in Left Wing - Major Zone 500 (P/B 201)
06-30-00-800-807	Finding a Zone in Right Wing - Major Zone 600 (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)
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. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
510	Subzone 510 - Wing Leading Edge - Forward of Front Spar
610	Subzone 610 - Wing Leading Edge - Forward of Front Spar

D. Access Panels

Number	Name/Location
511CB	Inboard Fixed Leading Edge Panel
511EB	Inboard Fixed Leading Edge Panel
511GB	Inboard Fixed Leading Edge Panel
511JB	Inboard Fixed Leading Edge Panel
511LB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel
611CB	Inboard Fixed Leading Edge Panel
611EB	Inboard Fixed Leading Edge Panel
611GB	Inboard Fixed Leading Edge Panel
611JB	Inboard Fixed Leading Edge Panel
611LB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel

E. Procedure

SUBTASK 12-21-08-040-003



WARNING

MAKE SURE THAT THRUST REVERSER IS DEACTIVATED. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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SUBTASK 12-21-08-040-004



WARNING

MAKE SURE THAT YOU DEACTIVATE THE LEADING-EDGE SLAT BEFORE YOU WORK ON THE SLAT SYSTEM. THE SLATS CAN MOVE QUICKLY WHEN YOU ACTIVATE THEM. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (2) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-21-08-010-003

- (3) Remove these fixed leading edge panels from the lower surface of the wing.

- (a) Remove these access panels on the left wing:

(TASK 06-30-00-800-806)

<u>Number</u>	<u>Name/Location</u>
511CB	Inboard Fixed Leading Edge Panel
511EB	Inboard Fixed Leading Edge Panel
511GB	Inboard Fixed Leading Edge Panel
511JB	Inboard Fixed Leading Edge Panel
511LB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel

- (b) Remove these access panels on the right wing:

(TASK 06-30-00-800-807)

<u>Number</u>	<u>Name/Location</u>
611CB	Inboard Fixed Leading Edge Panel
611EB	Inboard Fixed Leading Edge Panel
611GB	Inboard Fixed Leading Edge Panel
611JB	Inboard Fixed Leading Edge Panel
611LB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel

SUBTASK 12-21-08-200-005



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (4) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-640-003

- (5) Lubricate the main track rollers with grease, D00633 (Table 304).

SUBTASK 12-21-08-640-004

- (6) Lubricate the auxiliary track rollers with grease, D00633 (Table 304).

SUBTASK 12-21-08-640-005

- (7) Lubricate the pinion bearings with grease, D00633 (Table 304).

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SUBTASK 12-21-08-200-006



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (8) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-410-001



CAUTION

MAKE SURE THAT YOU INSTALL THE SKIRT FAIRING ON THE PANEL FROM THE OUTER SIDE OF THE LEADING EDGE HOLE. IF NOT, DAMAGE TO THE ACCESS PANEL CAN OCCUR DURING THE EXTENSION OF THE LEADING EDGE SLAT.

- (9) Install these fixed leading edge panels on the lower surface of the wing:

- (a) Install these access panel on the left wing:

(TASK 06-30-00-800-806)

<u>Number</u>	<u>Name/Location</u>
511CB	Inboard Fixed Leading Edge Panel
511EB	Inboard Fixed Leading Edge Panel
511GB	Inboard Fixed Leading Edge Panel
511JB	Inboard Fixed Leading Edge Panel
511LB	Inboard Fixed Leading Edge Panel
511MB	Inboard Fixed Leading Edge Panel

- (b) Install these access panel on the right wing:

(TASK 06-30-00-800-807)

<u>Number</u>	<u>Name/Location</u>
611CB	Inboard Fixed Leading Edge Panel
611EB	Inboard Fixed Leading Edge Panel
611GB	Inboard Fixed Leading Edge Panel
611JB	Inboard Fixed Leading Edge Panel
611LB	Inboard Fixed Leading Edge Panel
611MB	Inboard Fixed Leading Edge Panel

SUBTASK 12-21-08-440-003

- (10) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-21-08-440-004

- (11) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

Table 304/12-21-08-993-812 Inboard Slat Rollers and Pinion Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Inboard Slat Main Track Roller	grease, D00633	BMS3-33	Zerk	8
2	Inboard Slat Pinion Bearing	grease, D00633	BMS3-33	Zerk	4
3	Auxiliary Track Roller	grease, D00633	BMS3-33	Zerk	3

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Table 304/12-21-08-993-812 Inboard Slat Rollers and Pinion Servicing (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
4	Center Main Track Roller	grease, D00633	BMS3-33	Zerk	4

———— **END OF TASK** ————

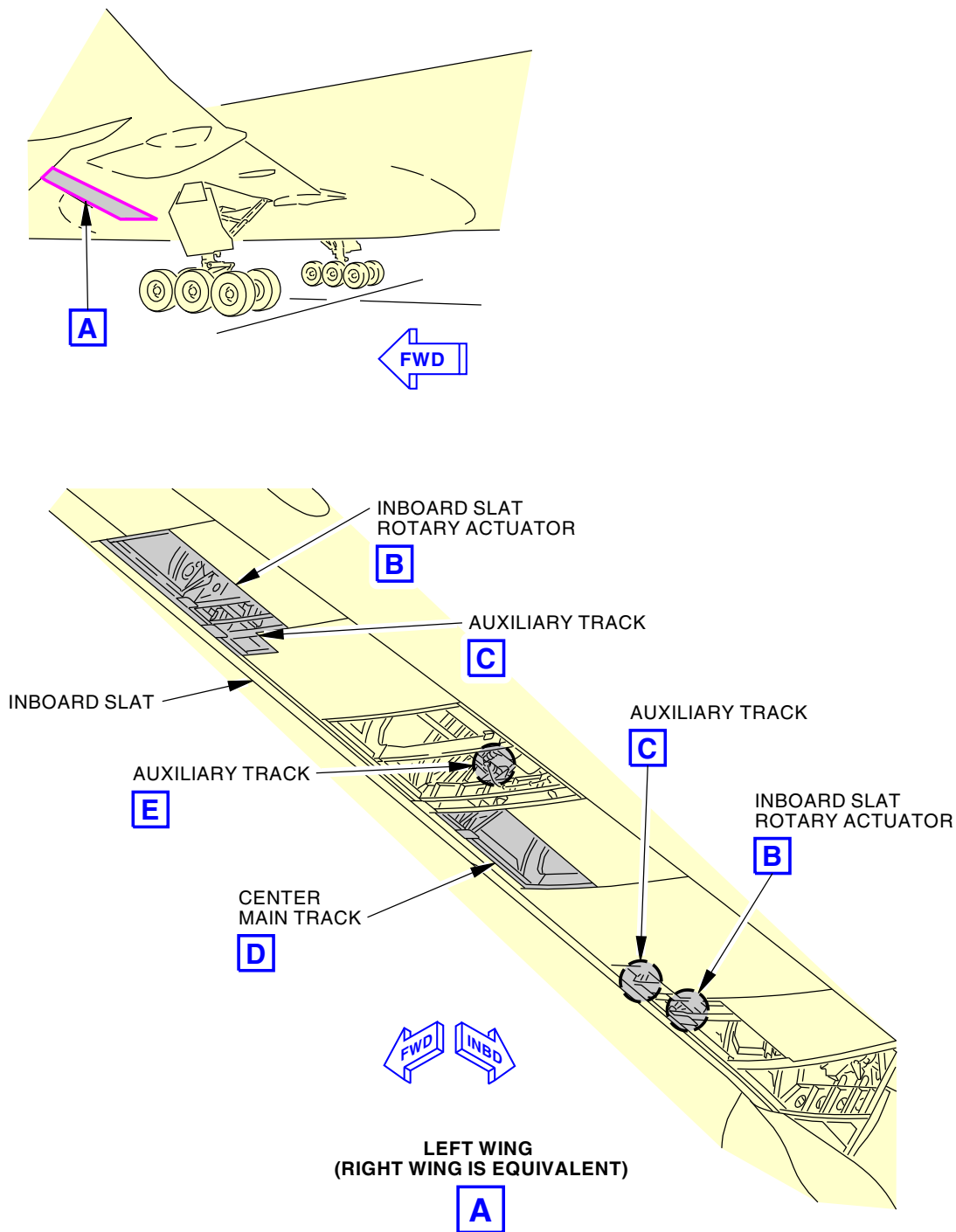
EFFECTIVITY
ARO ALL

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BOEING
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E11518 S0006401743_V2

Inboard Slat Rollers and Pinion Servicing
Figure 308/12-21-08-990-804 (Sheet 1 of 3)

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ARO ALL

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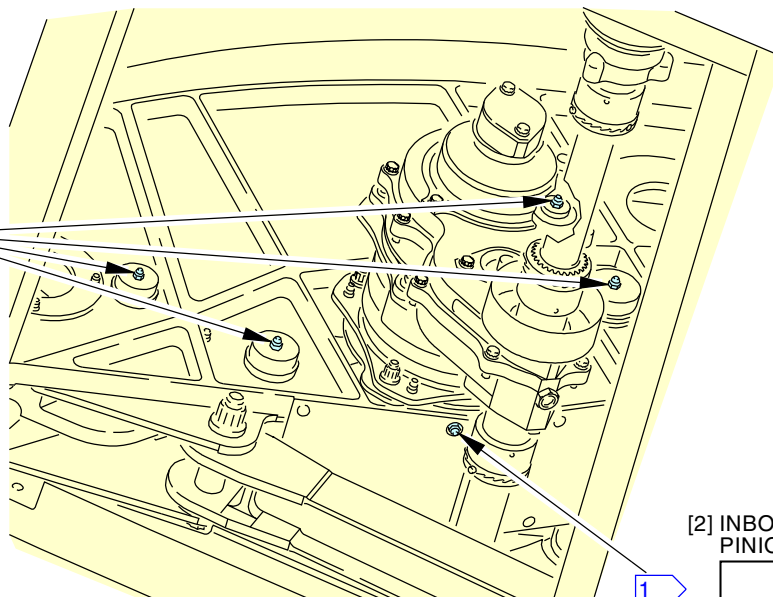
777-200/300 AIRCRAFT MAINTENANCE MANUAL

[1] INBOARD SLAT
MAIN TRACK
ROLLER

ZERK

BMS 3-33

(4 LOCATIONS)



**INBOARD SLAT ROTARY ACTUATOR
(OUTBOARD ROTARY ACTUATOR IS SHOWN,
INBOARD ROTARY ACTUATOR IS EQUIVALENT)**

6 POINTS

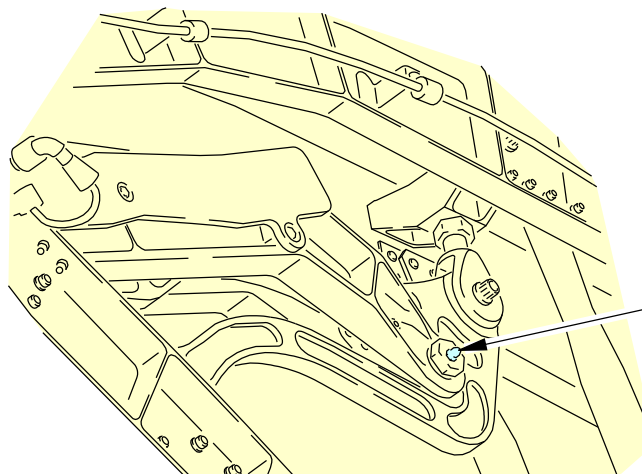
B

[2] INBOARD SLAT
PINION BEARING

ZERK

BMS 3-33

(2 LOCATIONS)



[3] AUXILIARY
TRACK ROLLER

ZERK

BMS 3-33

(1 LOCATION)



1

ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN)

1 POINT

C

E11529 S0006401744_V3

**Inboard Slat Rollers and Pinion Servicing
Figure 308/12-21-08-990-804 (Sheet 2 of 3)**

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ARO ALL

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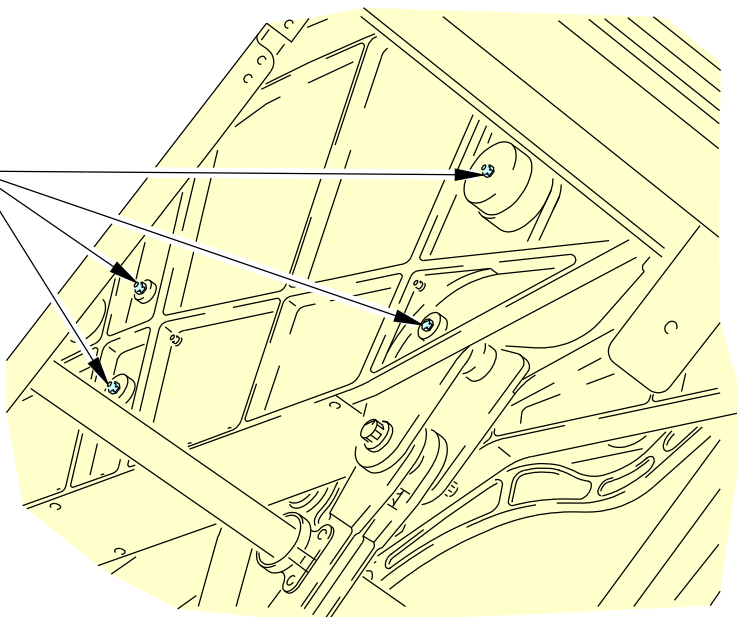
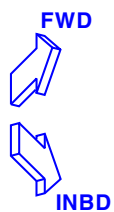
777-200/300 AIRCRAFT MAINTENANCE MANUAL

[4] CENTER MAIN
TRACK ROLLER

ZERK

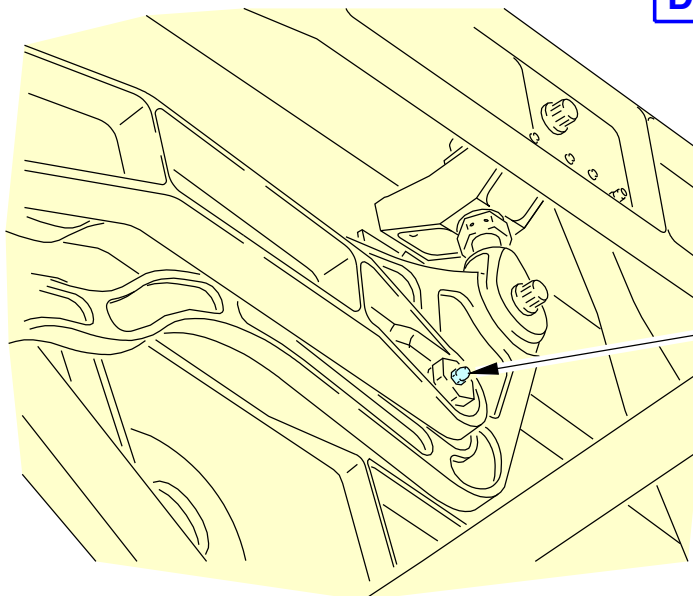
BMS 3-33

(4 LOCATIONS)



4 POINTS

D



[3] AUXILIARY TRACK
ROLLER

ZERK

BMS 3-33

(1 LOCATION)



1 POINT

E

E12268 S0006401745_V3

Inboard Slat Rollers and Pinion Servicing
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TASK 12-21-08-640-802

6. Outboard Slat Rollers and Pinion Bearing Lubrication

(Figure 309)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-30-00-800-806	Finding a Zone in Left Wing - Major Zone 500 (P/B 201)
06-30-00-800-807	Finding a Zone in Right Wing - Major Zone 600 (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)
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. 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. Location Zones

Zone	Area
520	Subzone 520 - Wing Leading Edge - Forward of Front Spar
620	Subzone 620 - Wing Leading Edge - Forward of Front Spar

D. Access Panels

Number	Name/Location
521AAB	Outboard Fixed Leading Edge Panel
521ACB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel
521BB	Outboard Fixed Leading Edge Panel
521EB	Outboard Fixed Leading Edge Panel
521GB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel
621AAB	Outboard Fixed Leading Edge Panel
621ACB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel
621BB	Outboard Fixed Leading Edge Panel
621DAB	Outboard Fixed Leading Edge Panel
621EB	Outboard Fixed Leading Edge Panel

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(Continued)

Number	Name/Location
621GB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel

E. Procedure

SUBTASK 12-21-08-040-005



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 12-21-08-040-006



DO THE LEADING EDGE SLAT DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE SLAT SYSTEM. WITH THE SLATS ACTIVATED, THE SLATS CAN MOVE QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-21-08-010-004

- (3) Remove the fixed leading edge panels from the wing:
 - (a) Remove these access panels on the outboard end of the left wing:
(TASK 06-30-00-800-806)

Number	Name/Location
521AAB	Outboard Fixed Leading Edge Panel
521ACB	Outboard Fixed Leading Edge Panel
521AFB	Outboard Fixed Leading Edge Panel
521BB	Outboard Fixed Leading Edge Panel
521EB	Outboard Fixed Leading Edge Panel
521GB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel

- (b) Remove these access panels on the outboard end of the right wing:
(TASK 06-30-00-800-807)

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<u>Number</u>	<u>Name/Location</u>
621AAB	Outboard Fixed Leading Edge Panel
621ACB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel
621BB	Outboard Fixed Leading Edge Panel
621DAB	Outboard Fixed Leading Edge Panel
621EB	Outboard Fixed Leading Edge Panel
621GB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel

SUBTASK 12-21-08-200-001



DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (4) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-640-006

- (5) Lubricate the main track rollers with grease, D00633 (preferred) or grease, D00013 (alternate) (Table 305).

SUBTASK 12-21-08-640-016

- (6) Lubricate the restoration seal linkages with grease, D00633 (preferred), or grease, D00013 (alternate), if there is a grease fitting installed on the bolt head (Table 305).

SUBTASK 12-21-08-640-007

- (7) Lubricate the pinion bearings with grease, D00633 (Table 305).

SUBTASK 12-21-08-200-002



DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (8) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-410-002

- (9) Install the fixed leading edge panels on the wing:
- (a) Install these access panel on the outboard end of the left wing:
(TASK 06-30-00-800-806)

<u>Number</u>	<u>Name/Location</u>
521AAB	Outboard Fixed Leading Edge Panel
521ACB	Outboard Fixed Leading Edge Panel

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(Continued)

<u>Number</u>	<u>Name/Location</u>
521AFB	Outboard Fixed Leading Edge Panel
521BB	Outboard Fixed Leading Edge Panel
521EB	Outboard Fixed Leading Edge Panel
521GB	Outboard Fixed Leading Edge Panel
521JB	Outboard Fixed Leading Edge Panel
521MB	Outboard Fixed Leading Edge Panel
521PB	Outboard Fixed Leading Edge Panel
521RB	Outboard Fixed Leading Edge Panel
521TB	Outboard Fixed Leading Edge Panel
521WB	Outboard Fixed Leading Edge Panel
521YB	Outboard Fixed Leading Edge Panel

- (b) Install these access panels on the outboard end of the right wing:

(TASK 06-30-00-800-807)

<u>Number</u>	<u>Name/Location</u>
621AAB	Outboard Fixed Leading Edge Panel
621ACB	Outboard Fixed Leading Edge Panel
621AFB	Outboard Fixed Leading Edge Panel
621BB	Outboard Fixed Leading Edge Panel
621DAB	Outboard Fixed Leading Edge Panel
621EB	Outboard Fixed Leading Edge Panel
621GB	Outboard Fixed Leading Edge Panel
621JB	Outboard Fixed Leading Edge Panel
621MB	Outboard Fixed Leading Edge Panel
621PB	Outboard Fixed Leading Edge Panel
621RB	Outboard Fixed Leading Edge Panel
621TB	Outboard Fixed Leading Edge Panel
621WB	Outboard Fixed Leading Edge Panel
621YB	Outboard Fixed Leading Edge Panel

SUBTASK 12-21-08-440-005

- (10) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-21-08-440-006

- (11) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

Table 305/12-21-08-993-813 Outboard Slat Rollers and Pinion Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Outboard Slat Pinion Bearing	grease, D00633	BMS3-33	Zerk	24
2	Outboard Slat Main Track Roller	grease, D00633 (preferred)	BMS3-33	Zerk	48

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Table 305/12-21-08-993-813 Outboard Slat Rollers and Pinion Servicing (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
		grease, D00013 (alternate)	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)		
3	Restoration Seal Linkage	grease, D00633 (preferred)	BMS3-33	Zerk	24
		grease, D00013 (alternate)	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)		

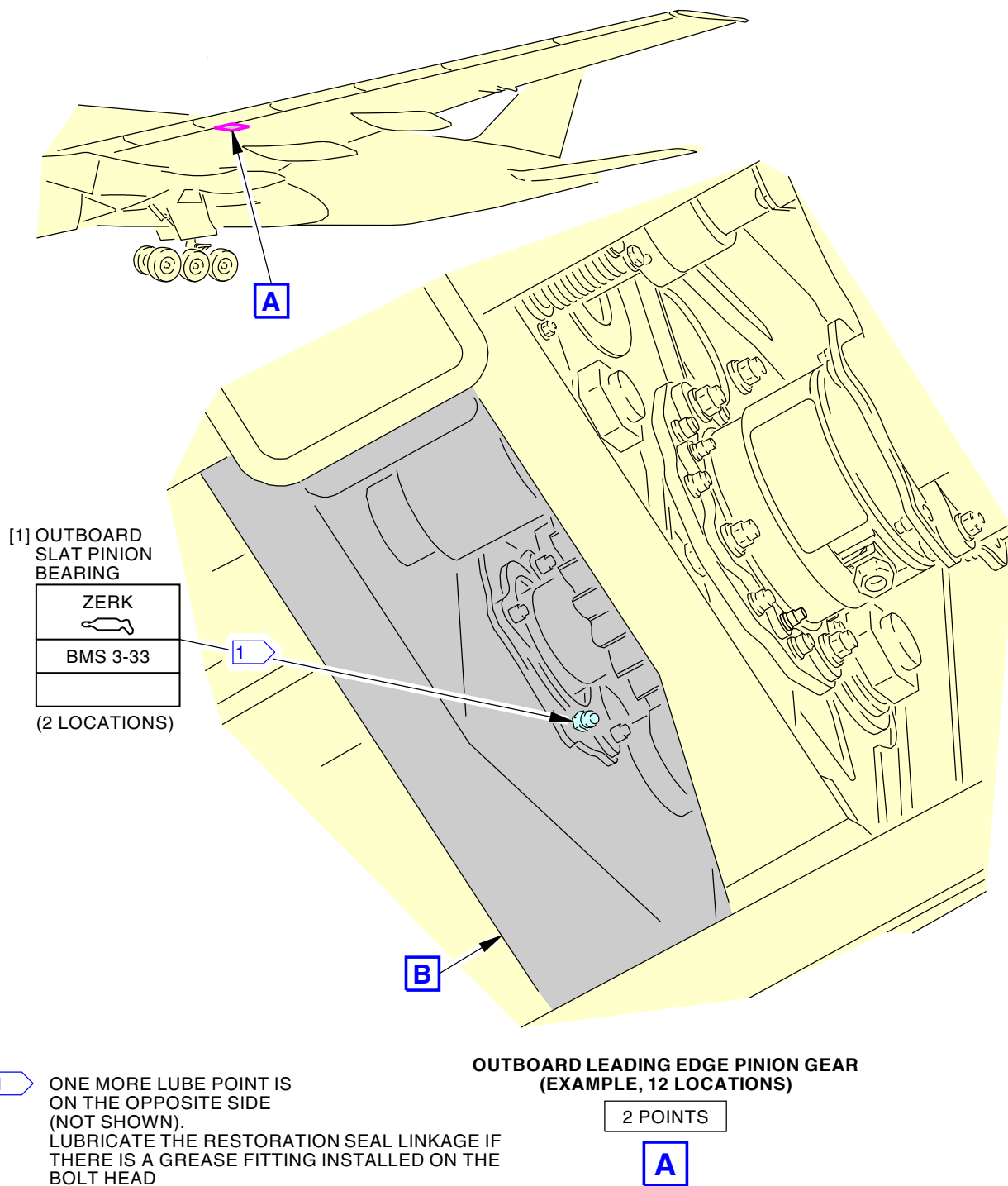
———— **END OF TASK** ————

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**Outboard Slat Rollers and Pinion Servicing
Figure 309/12-21-08-990-805 (Sheet 1 of 2)**

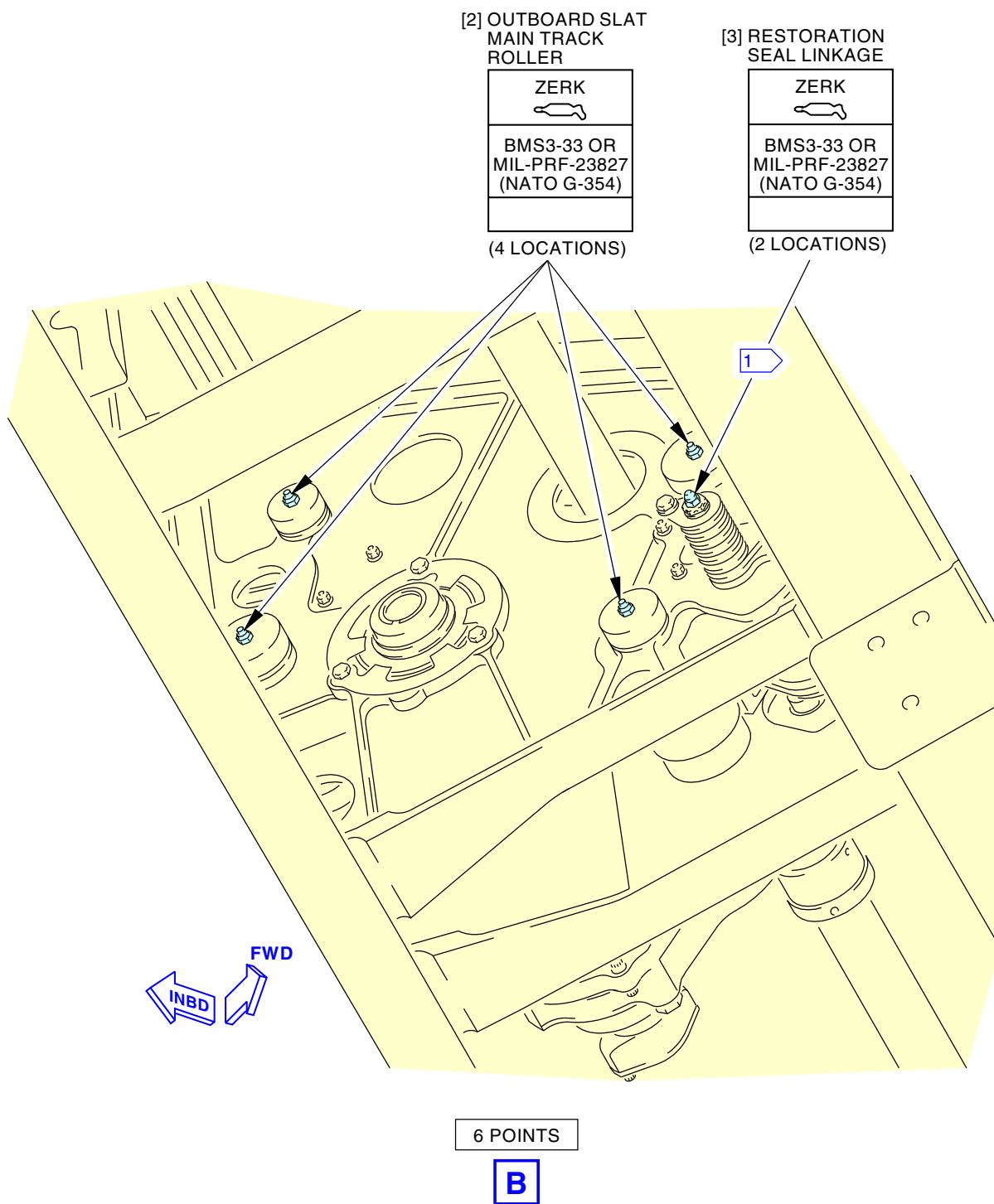
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Outboard Slat Rollers and Pinion Servicing
Figure 309/12-21-08-990-805 (Sheet 2 of 2)

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TASK 12-21-08-640-803

7. Krueger Flap Drive Arm Bearing Lubrication

(Figure 310)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-804	Extend the Leading Edge Slats (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (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. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
513	Krueger Seal Flap/Nacelle Gap Cover Area - Left Wing
613	Krueger Seal Flap/Nacelle Gap Cover Area - Right Wing

D. Procedure

SUBTASK 12-21-08-040-007



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 12-21-08-860-001

- (2) Extend the slats to the gapped position to get access to the lubrication fittings. To extend them, do this task: Extend the Leading Edge Slats, TASK 27-81-00-860-804.

SUBTASK 12-21-08-040-008



DO THE LEADING EDGE SLAT DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE SLAT SYSTEM. WITH THE SLATS ACTIVATED, THE SLATS CAN MOVE QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

SUBTASK 12-21-08-640-008

- (4) Lubricate the bearings for the Krueger flap drive arm with grease, D00633 (Table 306).

SUBTASK 12-21-08-440-007

- (5) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

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SUBTASK 12-21-08-860-002

(6) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

SUBTASK 12-21-08-440-008

(7) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

Table 306/12-21-08-993-814 Krueger Flap Drive Arm Bearing Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Krueger Drive Arm Bearing	grease, D00633	BMS3-33	Zerk	2

————— **END OF TASK** —————

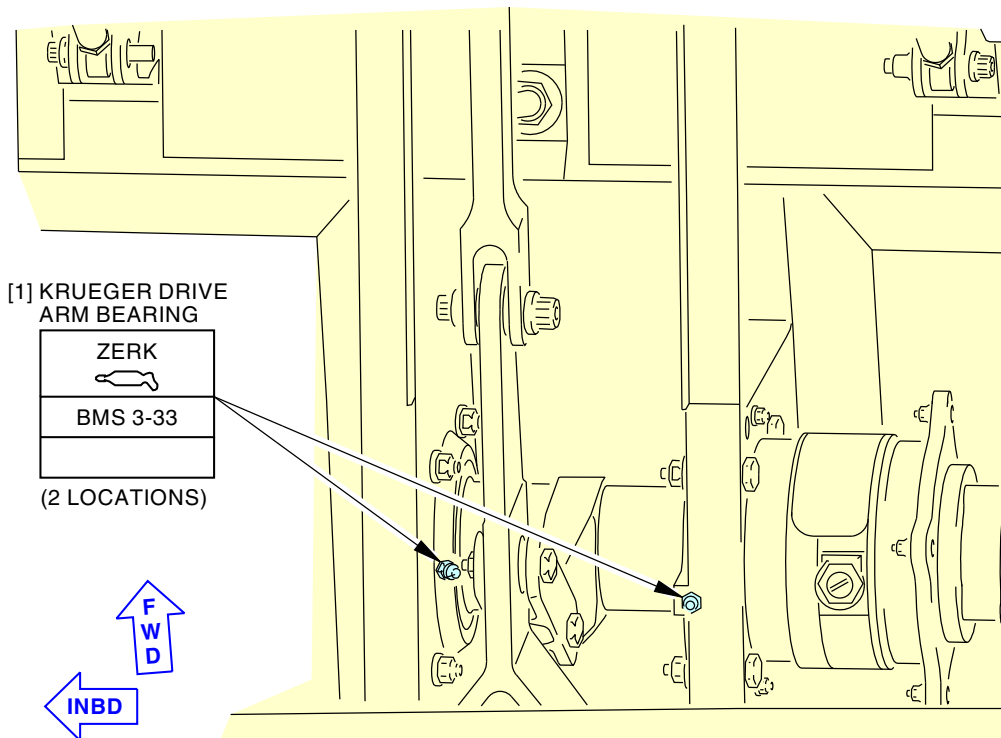
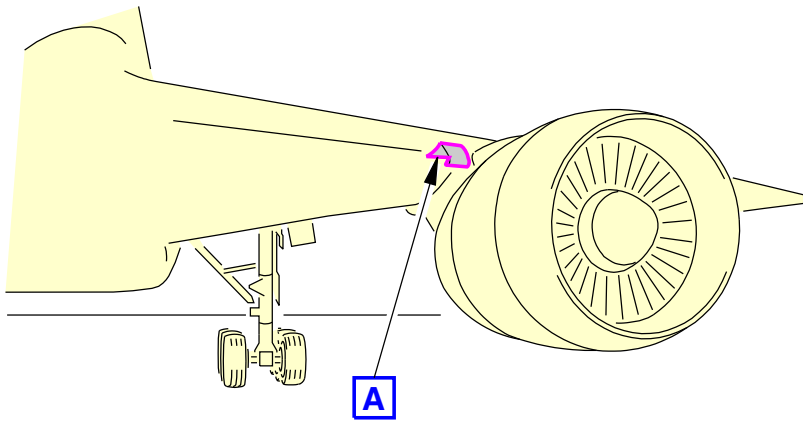
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**LEFT WING
(RIGHT WING IS EQUIVALENT)**

2 POINTS

A

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**Krueger Flap Drive Arm Bearing Servicing
Figure 310/12-21-08-990-806**

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TASK 12-21-08-640-807

8. Inboard Slat Main Track Lubrication

(Figure 311)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-81	LEADING EDGE SLAT SYSTEM
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-804	Extend the Leading Edge Slats (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
27-81-43-200-801	Slat Main Track Inspection (P/B 601)
51	STANDARD PRACTICES AND STRUCTURES
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)
SOPM 20-10-03	Shot Peening

B. Consumable Materials

Reference	Description	Specification
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
G50136	Compound - Corrosion Inhibiting, Non-drying Paste	BMS3-38

C. Location Zones

Zone	Area
510	Subzone 510 - Wing Leading Edge - Forward of Front Spar
610	Subzone 610 - Wing Leading Edge - Forward of Front Spar

D. Procedure

SUBTASK 12-21-08-040-012



WARNING

MAKE SURE THAT THRUST REVERSER IS DEACTIVATED. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 12-21-08-860-003

- (2) Extend the slats to the gapped position to get access to the main tracks. Do this task: TASK 27-81-00-860-804.

SUBTASK 12-21-08-040-013



WARNING

MAKE SURE THAT YOU DEACTIVATE THE LEADING-EDGE SLAT BEFORE YOU WORK ON THE SLAT SYSTEM. THE SLATS CAN MOVE QUICKLY WHEN YOU ACTIVATE THEM. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (3) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

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SUBTASK 12-21-08-200-011



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (4) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-210-001

- (5) Lubricate the top and bottom surfaces of the inboard slat main tracks with the steps that follow:

NOTE: Wear is a broad term that includes all the adverse effects of friction entailing the removal of material together with the loss of weight and changed dimensions.

- (a) If the inboard slat main track surfaces show signs of corrosion, then perform the following steps.

NOTE: Corrosion inspection practices of the track should be in accordance with CORROSION INSPECTIONS - MAINTENANCE PRACTICES, CHAPTER 51.

NOTE: Corrosion is the deterioration of a metal by chemical or electrochemical reaction with its environment. Any form of pitting with dark stains is also likely corrosion and not wear.

- 1) Solvent clean the debris, the corrosion products, and the residual grease from the main track lower and upper flange surfaces per the STANDARD PRACTICES AND STRUCTURES, CHAPTER 51, Interior and Exterior Finishes Procedure.

- 2) Abrade the track roller surfaces using a Scotch-Brite, Type A or Type S, very fine to fine pad, V76381 to expose pits on the track surfaces caused by corrosion.

NOTE: A pit is a small depression or cavity produced in a metal surface by corrosion. Pitting includes any single or multiple depressions or cavities produced by corrosion.

- a) Make sure to protect areas where the Cad-Ti plating is still intact (non roller surfaces) so that the abrasion process does not cause further damage.

- 3) Permit the main track surfaces to dry.

- 4) Perform a close, visual inspection on both the top and bottom surfaces of the track for pitting indications.

- (b) If no pitting or surface wear are found on the main track,

- 1) Lubricate the top and bottom surfaces of the inboard slat main tracks with corrosion inhibiting compound, C00528 (preferred) or corrosion inhibiting material, G50136 (alternate) (Table 307).

- (c) If pitting is found, do the steps that follow:

- 1) Examine the track for visible cracks using a 10X magnifying glasses.

- a) If cracks indications are found or suspected, do this task (TASK 27-81-43-200-801).

- b) If minor, localized pitting is found on the track roller surface and can be reworked without removing the track from the airplane then remove all corrosion and pitting by hand sanding using 50-150 grit abrasives.

NOTE: This is to ensure that there is no edge loading on the roller bearings while in flight.

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- <1> Remove the minimum amount of material to ensure complete corrosion removal and maintain a minimum 10:1 blend ratio in the FWD-AFT direction and a minimum 20:1 ratio in the INBD-OUTBD direction.
 - <2> Hand finish and prepare all sharp edges to meet the requirements of SOPM 20-10-03 in each reworked area with 300-400 grit abrasive and ensure that a surface smoothness of 125 Ra or better is achieved.
 - <3> Carry out flap peening, intensity 0.010A to 0.015A coverage 2.0, to each reworked area per SOPM 20-10-03 regardless of the amount of material removed.
 - <a> Make sure to do an Almen strip test prior to flap peening to ensure desired intensity is applied to the track surfaces.
 - <4> If the 20:1 blend ratio encroaches into the primer area of the track, then contact The Boeing Company.
- c) If significant corrosion and pitting is found on the track roller surfaces, which cannot be removed with the tracks on the airplane, then remove the track(s) per the B777 LEADING EDGE SLAT SYSTEM, SECTION 27-81 requirements and proceed to repair the damaged track(s) per applicable Component Maintenance Manual, as required.
- (d) If no cracks are found, all corrosion is removed, and the depth of any blend is not greater than 0.020 in. (0.51 mm), then continue.
- NOTE: For blends that exceed 0.020 in. (0.51 mm), contact The Boeing Company for further instruction.
- NOTE: Blends up to 0.020 in. (0.51 mm) deep, after clean up and corrosion removal, with smooth transition and/or no step are acceptable for continued service.
- 1) Lubricate the top and bottom surfaces of the inboard Slat Main Tracks with corrosion inhibiting compound, C00528 (preferred) or corrosion inhibiting material, G50136 (alternate) (Table 307).

SUBTASK 12-21-08-200-008



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (6) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-440-012

- (7) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-21-08-860-004

- (8) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

SUBTASK 12-21-08-440-013

- (9) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.



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Table 307/12-21-08-993-815 Inboard Slat Main Track Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Inboard Slat Main Track	compound, C00528 (preferred)	MIL-C-11796 CLASS III	Brush	3
		corrosion inhibiting material, G50136 (alternate)	BMS3-38		

———— **END OF TASK** ————

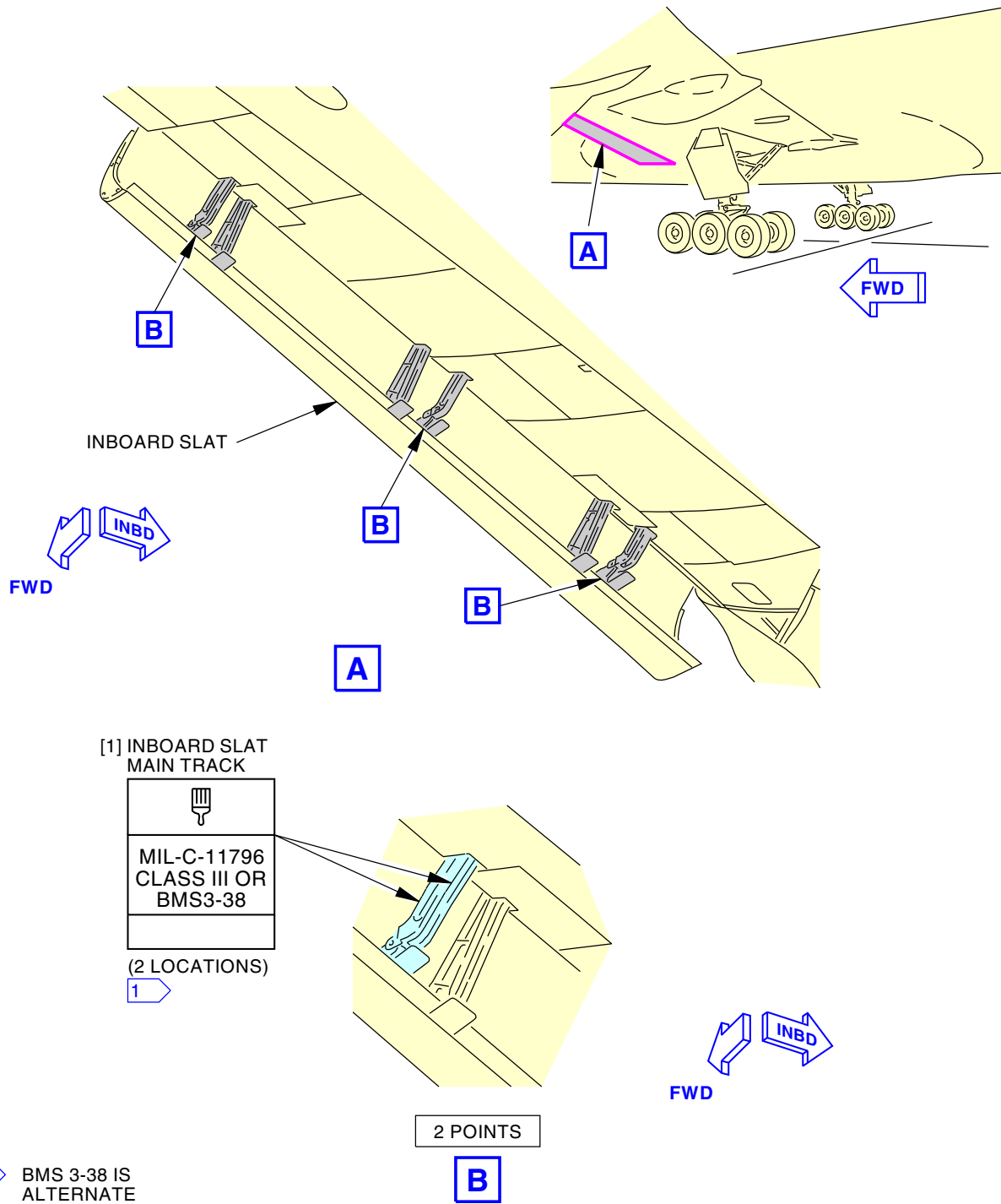
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Inboard Slat Main Track Servicing
Figure 311/12-21-08-990-807

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TASK 12-21-08-640-808

9. Outboard Slat Main Track Lubrication

(Figure 312)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-81	LEADING EDGE SLAT SYSTEM
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-804	Extend the Leading Edge Slats (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
27-81-43-200-801	Slat Main Track Inspection (P/B 601)
51	STANDARD PRACTICES AND STRUCTURES
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)
SOPM 20-10-03	Shot Peening

B. Consumable Materials

Reference	Description	Specification
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
G50136	Compound - Corrosion Inhibiting, Non-drying Paste	BMS3-38

C. Location Zones

Zone	Area
520	Subzone 520 - Wing Leading Edge - Forward of Front Spar
620	Subzone 620 - Wing Leading Edge - Forward of Front Spar

D. Procedure

SUBTASK 12-21-08-040-014



MAKE SURE THAT THRUST REVERSER IS DEACTIVATED. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

SUBTASK 12-21-08-860-005

- (2) Extend the slats to the gapped position to get access to the lubrication fittings. Do this task: TASK 27-81-00-860-804.

SUBTASK 12-21-08-040-015



MAKE SURE THAT YOU DEACTIVATE THE LEADING-EDGE SLAT BEFORE YOU WORK ON THE SLAT SYSTEM. THE SLATS CAN MOVE QUICKLY WHEN YOU ACTIVATE THEM. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (3) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

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SUBTASK 12-21-08-200-009



DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (4) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-210-002

- (5) Lubricate the top and bottom surfaces of the outboard slat main tracks with the steps that follow:

NOTE: Wear is a broad term that includes all the adverse effects of friction entailing the removal of material together with the loss of weight and changed dimensions.

- (a) If the outboard slat main track surfaces show signs of corrosion, then perform the following steps.

NOTE: Corrosion inspection practices of the track should be in accordance with CORROSION INSPECTIONS - MAINTENANCE PRACTICES, CHAPTER 51.

NOTE: Corrosion is the deterioration of a metal by chemical or electrochemical reaction with its environment. Any form of pitting with dark stains is also likely corrosion and not wear.

- 1) Solvent clean the debris, the corrosion products, and the residual grease from the main track lower and upper flange surfaces per the STANDARD PRACTICES AND STRUCTURES, CHAPTER 51, Interior and Exterior Finishes Procedure.
- 2) Abrade the track roller surfaces using a Scotch-Brite, Type A or Type S, very fine to fine pad, V76381 to expose pits on the track surfaces caused by corrosion.

NOTE: A pit is a small depression or cavity produced in a metal surface by corrosion. Pitting includes any single or multiple depressions or cavities produced by corrosion.

- a) Make sure to protect areas where the Cad-Ti plating is still intact (non roller surfaces) so that the abrasion process does not cause further damage.
- 3) Permit the main track surfaces to dry.
- 4) Perform a close, visual inspection on both the top and bottom surfaces of the track for pitting indications.
- (b) If no pitting or surface wear are found on the main track,
 - 1) Lubricate the top and bottom surfaces of the outboard slat main tracks with corrosion inhibiting compound, C00528 (preferred) or corrosion inhibiting material, G50136 (alternate) (Table 308).
- (c) If pitting is found, do the steps that follow:
 - 1) Examine the track for visible cracks using a 10X magnifying glasses.
 - a) If cracks indications are found or suspected, do this task (TASK 27-81-43-200-801).

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- b) If minor, localized pitting is found on the track roller surface and can be reworked without removing the track from the airplane then remove all corrosion and pitting by hand sanding using 50-150 grit abrasives.

NOTE: This is to ensure that there is no edge loading on the roller bearings while in flight.

- <1> Remove the minimum amount of material to ensure complete corrosion removal and maintain a minimum 10:1 blend ratio in the FWD-AFT direction and a minimum 20:1 ratio in the INBD-OUTBD direction.
- <2> Hand finish and prepare all sharp edges to meet the requirements of SOPM 20-10-03 in each reworked area with 300-400 grit abrasive and ensure that a surface smoothness of 125 Ra or better is achieved.
- <3> Carry out flap peening, intensity 0.010A to 0.015A coverage 2.0, to each reworked area per SOPM 20-10-03 regardless of the amount of material removed.
 - <a> Make sure to do an Almen strip test prior to flap peening to ensure desired intensity is applied to the track surfaces.
- <4> If the 20:1 blend ratio encroaches into the primer area of the track, then contact The Boeing Company.

- c) If significant corrosion and pitting is found on the track roller surfaces, which cannot be removed with the tracks on the airplane, then remove the track(s) per the B777 LEADING EDGE SLAT SYSTEM, SECTION 27-81 requirements and proceed to repair the damaged track(s) per applicable Component Maintenance Manual, as required.

- (d) If no cracks are found, all corrosion is removed, and the depth of any blend is not greater than 0.020 in. (0.51 mm), then continue.

NOTE: For blends that exceed 0.020 in. (0.51 mm), contact The Boeing Company for further instruction.

NOTE: Blends up to 0.020 in. (0.51 mm) deep, after clean up and corrosion removal, with smooth transition and/or no step are acceptable for continued service.

- 1) Lubricate the top and bottom surfaces of the outboard Slat Main Tracks with corrosion inhibiting compound, C00528 (preferred) or corrosion inhibiting material, G50136 (alternate) (Table 308).

SUBTASK 12-21-08-200-010



WARNING

DO NOT LET OBJECTS GET IN THE HOUSING ASSEMBLY OF THE SLAT TRACK. THIS WILL HELP PREVENT A PUNCTURE OF THE HOUSING ASSEMBLY THAT COULD CAUSE A FUEL LEAK. THE FUEL LEAK COULD CAUSE A FIRE AND POSSIBLE DEATH OR INJURY TO PERSONNEL.

- (6) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

SUBTASK 12-21-08-440-014

- (7) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-21-08-860-006

- (8) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

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SUBTASK 12-21-08-440-015

- (9) Do this task: Thrust Reverser Activation After Ground Maintenance,
TASK 78-31-00-440-805-H00.

Table 308/12-21-08-993-816 Outboard Slat Main Track Servicing

Item No.	Nomenclature	Lubricant	Lubricant	Method of Application	Number of Locations
1	Outboard Slat Main Track	compound, C00528 (preferred)	MIL-C-11796 CLASS III	Brush	12
		corrosion inhibiting material, G50136 (alternate)	BMS3-38		

————— **END OF TASK** —————

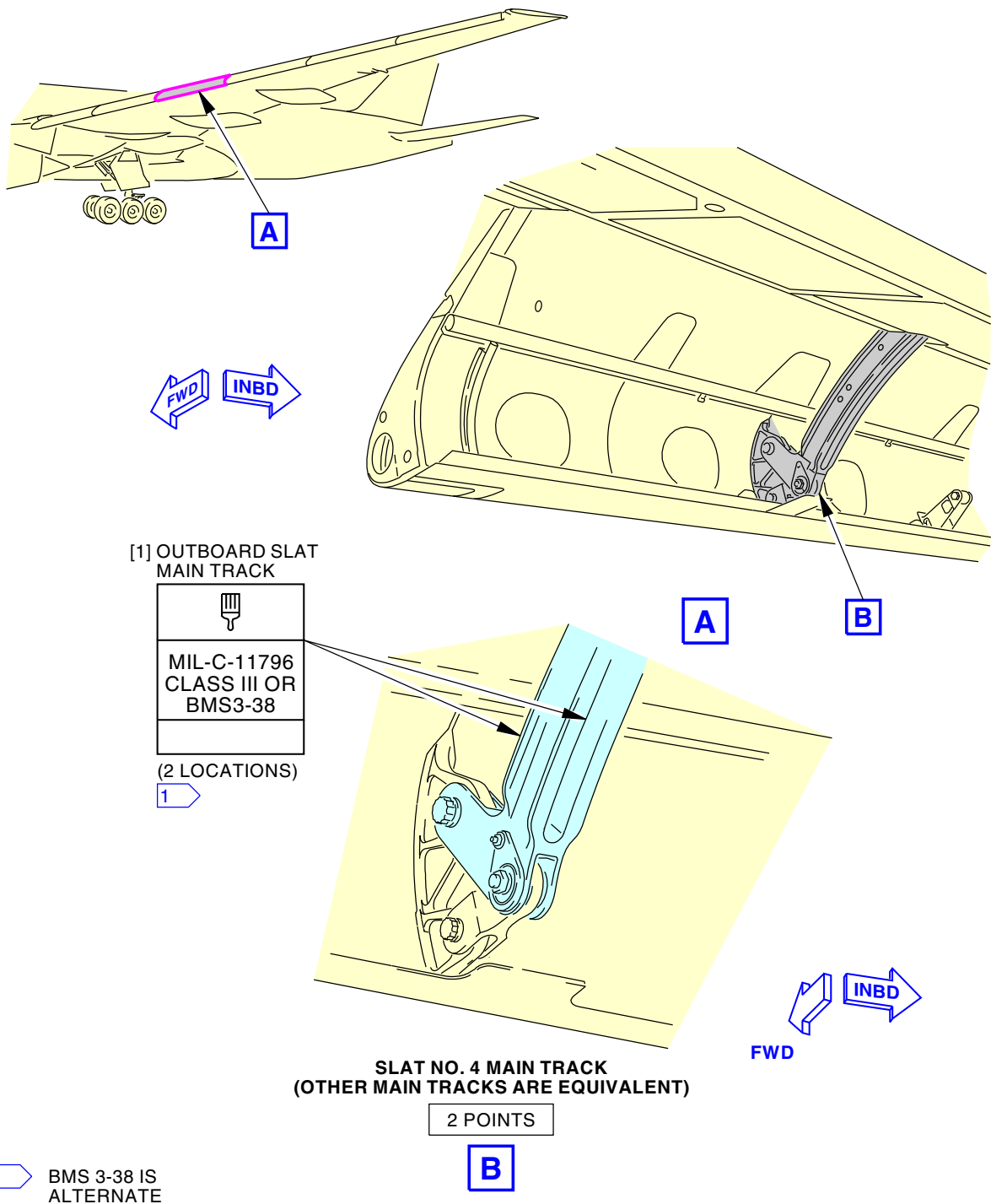
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Outboard Slat Main Track Servicing
Figure 312/12-21-08-990-808

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TRAILING EDGE FLAP SYSTEM - SERVICING

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks:

NOTE: After lubrication, make sure that surfaces and mechanisms are cleaned and free from grit and old soiled lubricant.

- (1) A task to lubricate the torque tubes and torque tube supports for the trailing edge flaps
- (2) A task to lubricate the inboard transmissions, ballscrews and gimbals for the inboard flaps
- (3) A task to lubricate the outboard transmissions, ballscrews and gimbals for the inboard flaps
- (4) A task to lubricate the inboard flap, inboard support mechanism
- (5) A task to lubricate the inboard flap, outboard support mechanism
- (6) A task to lubricate the aft flap rollers
- (7) A task to lubricate the outboard transmissions, ballscrews and gimbals for the outboard flaps
- (8) A task to lubricate the inboard transmissions, ballscrews and gimbals for the outboard flaps
- (9) A task to lubricate the outboard flap support mechanism for the outboard flaps
- (10) A task to lubricate the inboard flap support mechanism for the outboard flaps
- (11) A task to lubricate the outboard auxiliary support track and carriage for the outboard flaps
- (12) A task to lubricate the inboard auxiliary support track and carriage for the outboard flaps.
- (13) A task to lubricate the inboard and outboard RVT flap skew sensors.

TASK 12-21-09-640-801

2. Trailing Edge Torque Tube and Torque Tube Support Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
101	Packing	27-51-38-02-045	ARO ALL

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D. Location Zones

Zone	Area
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
550	Subzone 550 - Wing Trailing Edge - Aft of Rear Spar
560	Subzone 560 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon
650	Subzone 650 - Wing Trailing Edge - Aft of Rear Spar
660	Subzone 660 - Wing Trailing Edge - Aft of Rear Spar - Outboard of Flaperon

E. Prepare for the Lubrication

SUBTASK 12-21-09-480-001



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 on the main and nose landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 12-21-09-480-002



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR GROUND 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 12-21-09-860-001

- (3) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

F. Torque Tube and Torque Tube Support Lubrication

(Table 301)

SUBTASK 12-21-09-040-001



DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-001

- (2) Lubricate the torque tube couplings on each end of the torque tubes:
 - (a) For the second torque tubes inboard of the No. 2 and No. 7 transmissions, move the vapor seal tube [104] away from the torque tube support:
 - 1) Remove the screw [102] and bushing [103] that hold the vapor seal tube [104].
 - 2) Move the vapor seal tube [104] inboard to get access to the coupling on the torque tube.
 - (b) Manually move the torque tube axially in the direction of the coupling you will lubricate.

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- (c) Fill the coupling with grease, D00633 through a minimum of two of the three grease holes.

NOTE: Fill the coupling until clean grease comes out of curled end of the coupling or until grease comes out of the other grease holes.

- (d) Move the torque tube in the opposite direction until it stops.
- (e) Wipe the grease from around the coupling and the grease holes.
- (f) For the second torque tubes inboard of the No. 2 and No. 7 transmissions, move the vapor seal tube [104] to its usual position:
- 1) If it is necessary, install a new packing [101] on the torque tube support.
 - 2) Apply grease, D00633 to the packing [101] on the torque tube support.
 - 3) Move the vapor seal tube [104] outboard to the torque tube support.
 - 4) Install the bushing [103] and screw [102] to attach the vapor seal tube [104] to the torque tube support.

SUBTASK 12-21-09-640-002

- (3) Lubricate the torque tube supports with grease, D00633.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-001

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-002

- (2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-09-080-001



WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR GROUND 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.

Table 301/12-21-09-993-813 Trailing Edge Torque Tube and Torque Tube Support Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Transmission No. 1 Coupling (No. 8 Coupling Equivalent)	grease, D00633	BMS3-33	Flush	2
2	Torque Tube Support	grease, D00633	BMS3-33	Zerk	7
3	Torque Tube Support Coupling	grease, D00633	BMS3-33	Flush	20
4	Torque Tube Support Coupling	grease, D00633	BMS3-33	Flush	4
5	Transmission No. 2 Coupling (No. 7 Coupling Equivalent)	grease, D00633	BMS3-33	Flush	4
6	Vapor Seal Support	grease, D00633	BMS3-33	Zerk	1
7	Vapor Seal Support Coupling	grease, D00633	BMS3-33	Flush	4
8	Transmission No. 3 Coupling (No. 6 Coupling Equivalent)	grease, D00633	BMS3-33	Flush	4

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Table 301/12-21-09-993-813 Trailing Edge Torque Tube and Torque Tube Support Servicing (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
9	Rear Spar Angle Gearbox Coupling	grease, D00633	BMS3-33	Flush	4
10	Side of Body Angle Gearbox Coupling	grease, D00633	BMS3-33	Flush	4
11	Transmission No. 4 Coupling (No. 5 Coupling Equivalent)	grease, D00633	BMS3-33	Flush	4
12	Flap Position Sensor Gearbox Coupling	grease, D00633	BMS3-33	Flush	4
13	Flap Power Drive Unit Coupling	grease, D00633	BMS3-33	Flush	4

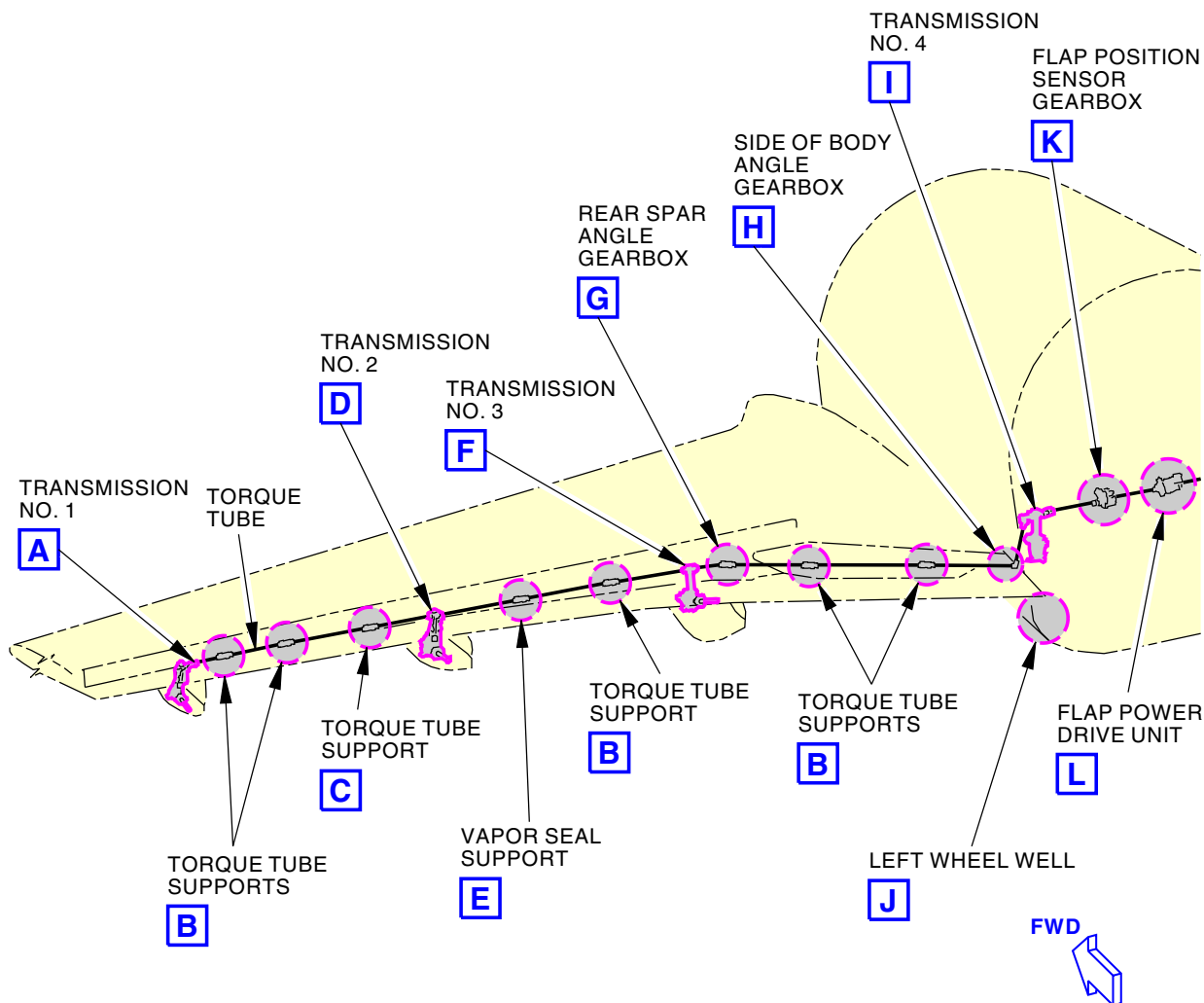
———— **END OF TASK** ————

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**LEFT WING
(RIGHT WING IS EQUIVALENT)**

1567008 S0000291290_V2

**Trailing Edge Torque Tube and Torque Tube Support Servicing
Figure 301/12-21-09-990-801 (Sheet 1 of 8)**

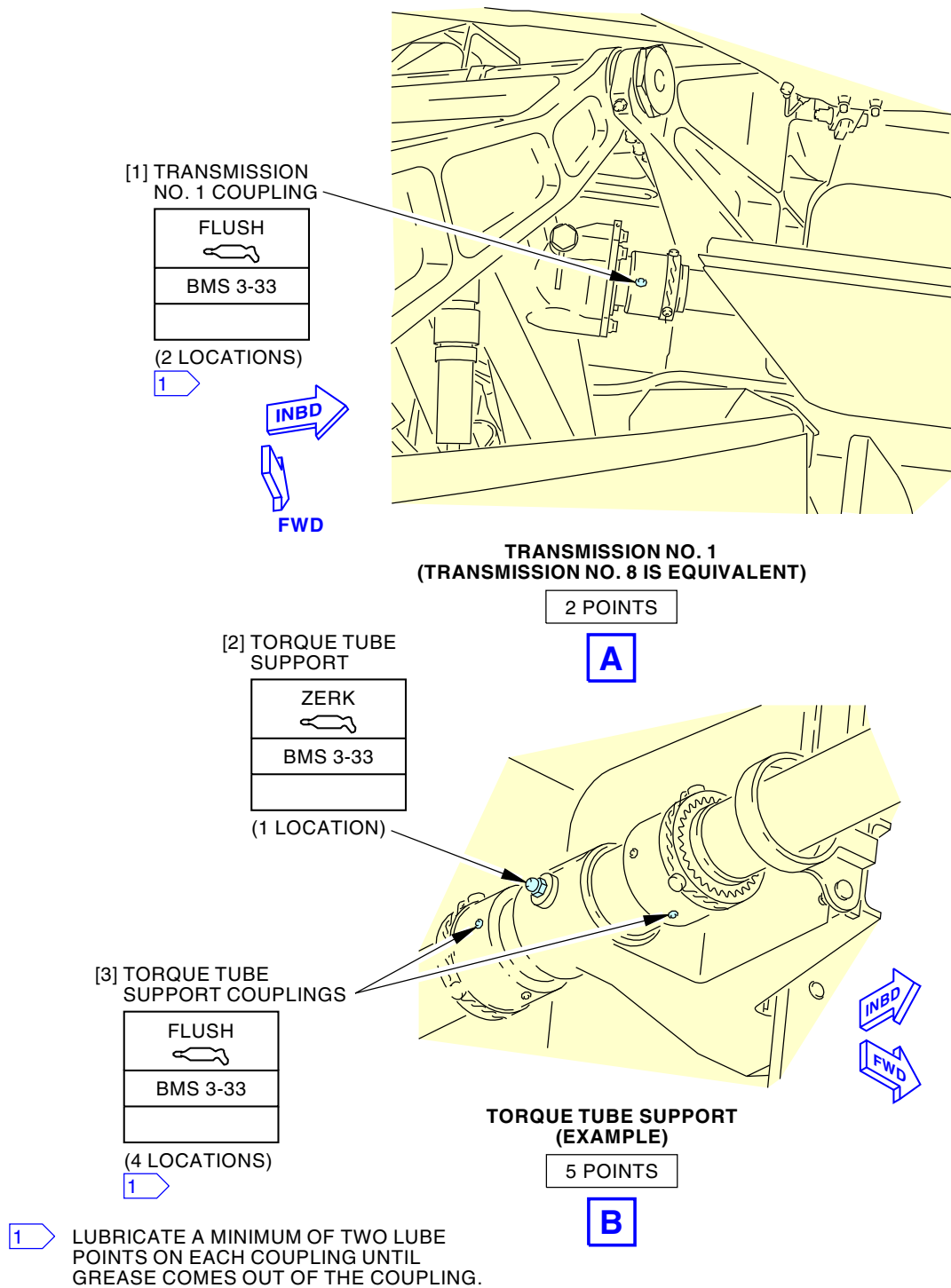
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E15729 S0006401766_V2

Trailing Edge Torque Tube and Torque Tube Support Servicing
Figure 301/12-21-09-990-801 (Sheet 2 of 8)

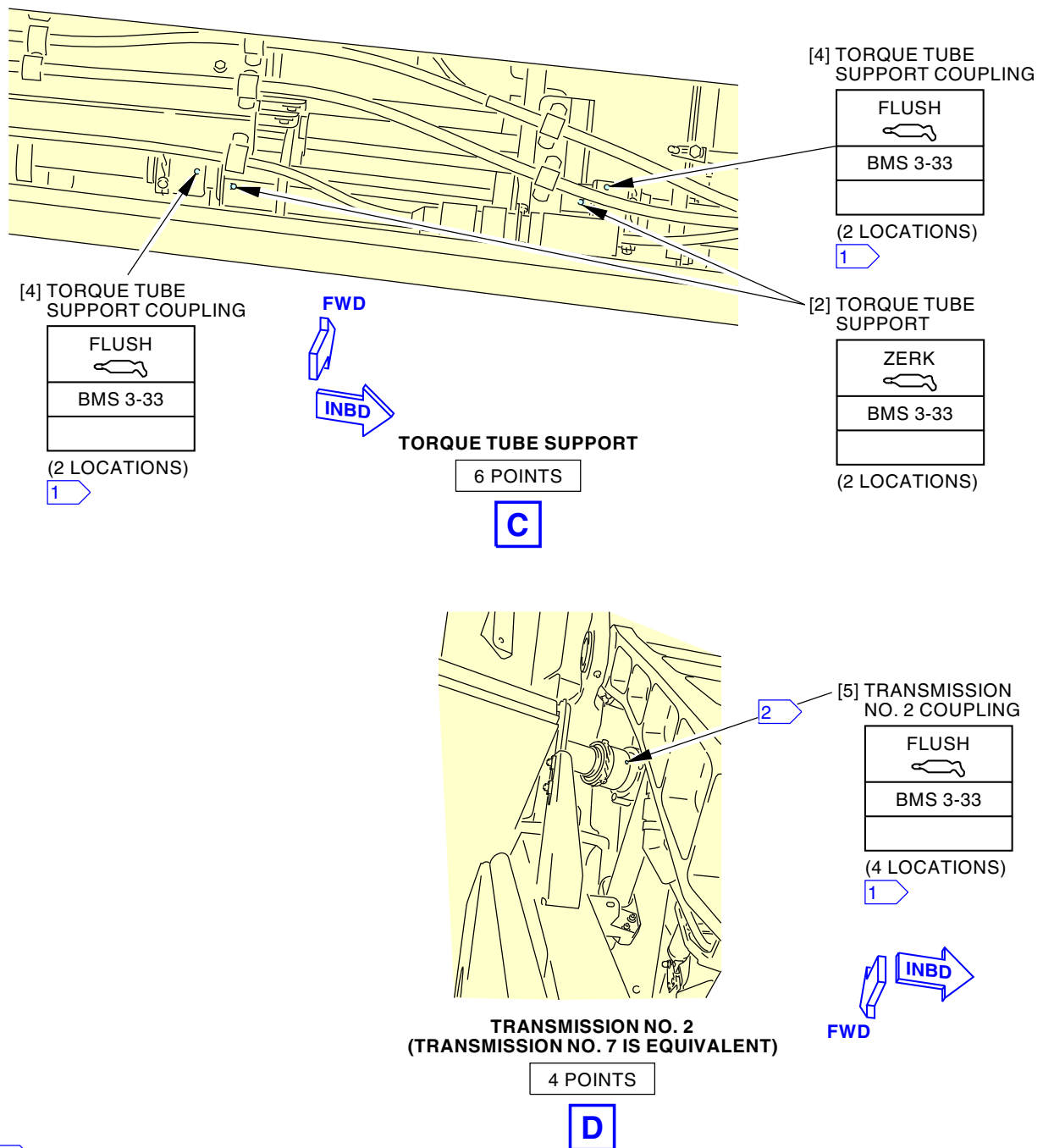
EFFECTIVITY
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1567024 S0000291291_V3

Trailing Edge Torque Tube and Torque Tube Support Servicing
Figure 301/12-21-09-990-801 (Sheet 3 of 8)

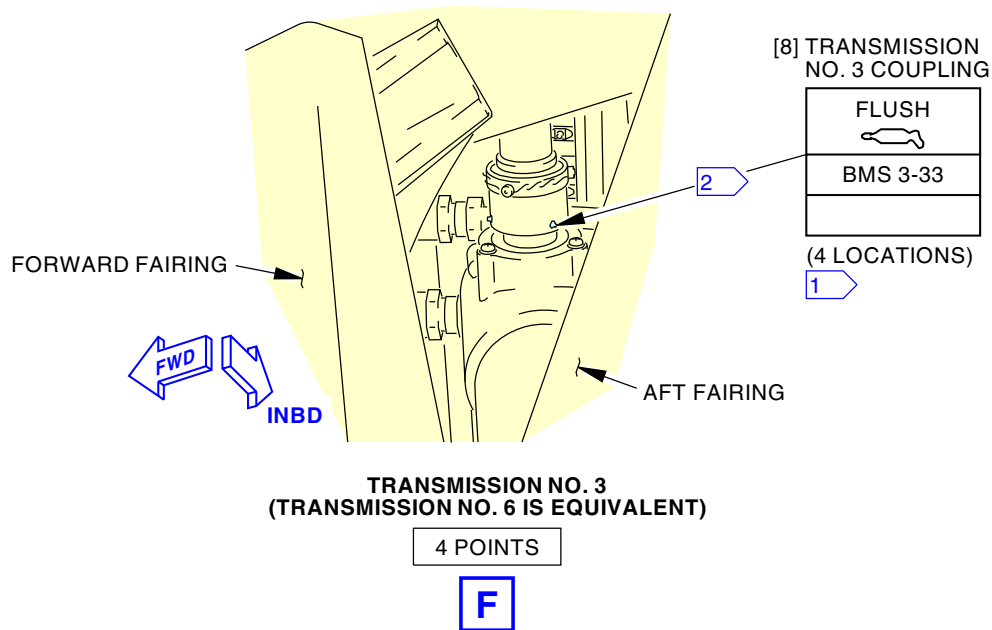
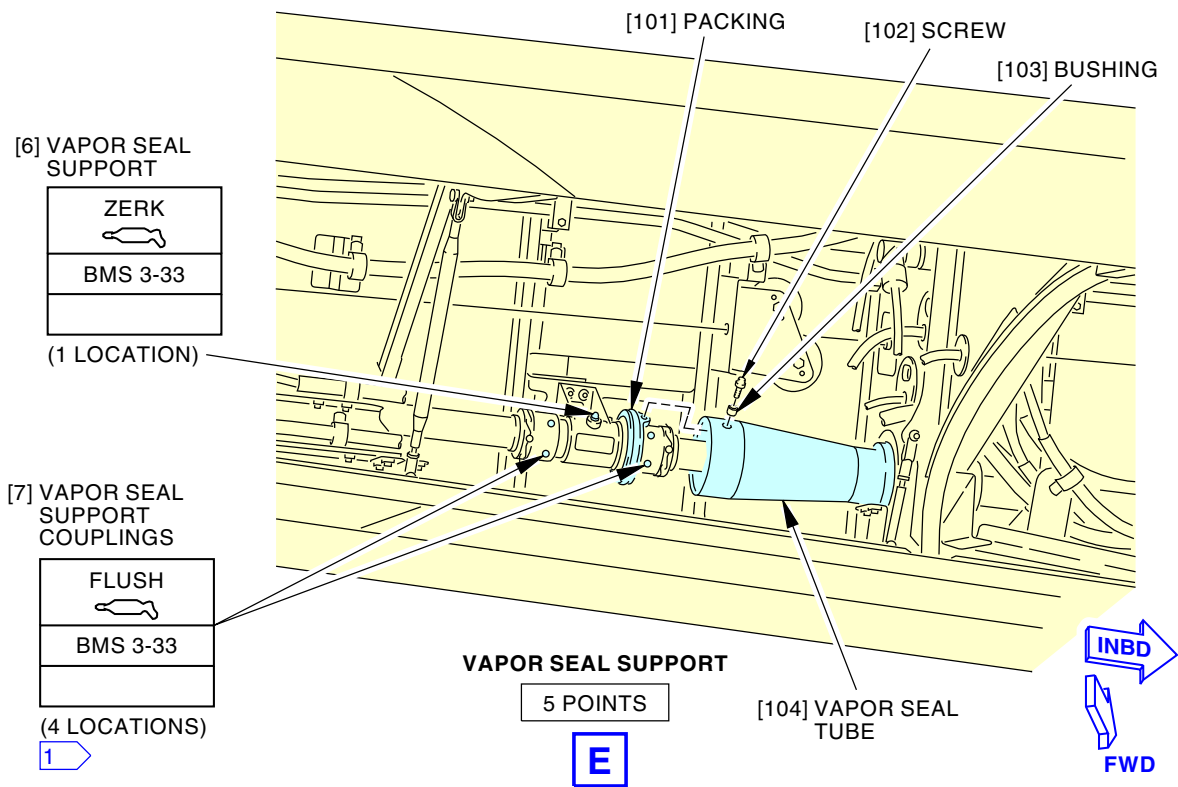
EFFECTIVITY
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E17473 S0006401768_V3

Trailing Edge Torque Tube and Torque Tube Support Servicing
Figure 301/12-21-09-990-801 (Sheet 4 of 8)

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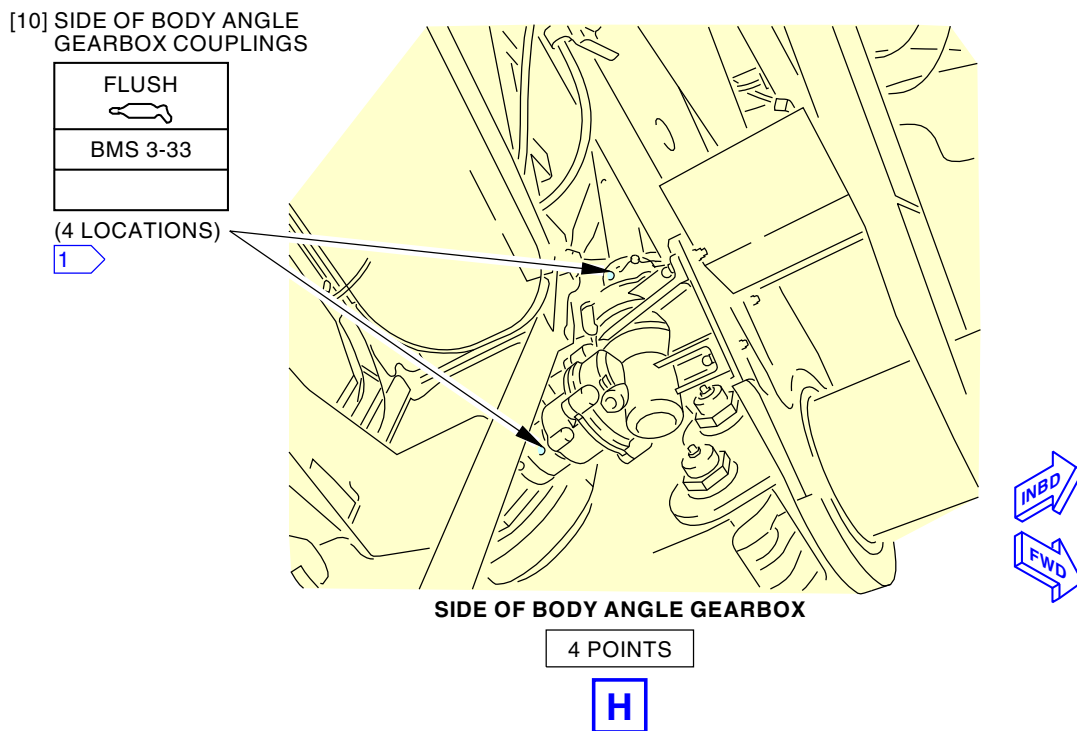
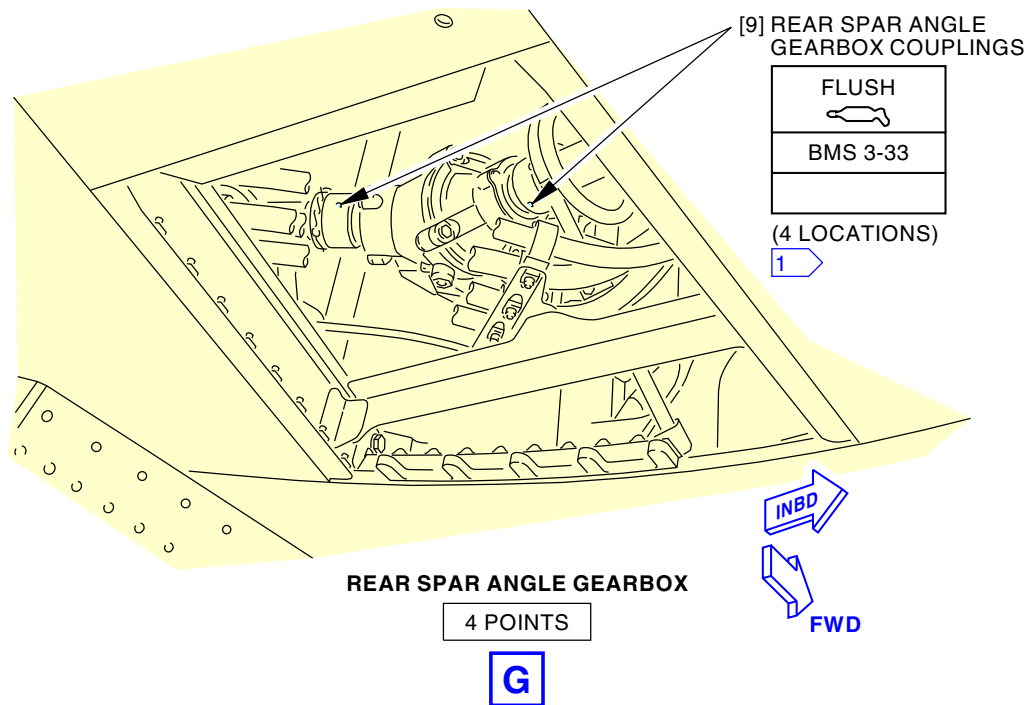
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E17482 S0006401769_V2

Trailing Edge Torque Tube and Torque Tube Support Servicing
Figure 301/12-21-09-990-801 (Sheet 5 of 8)

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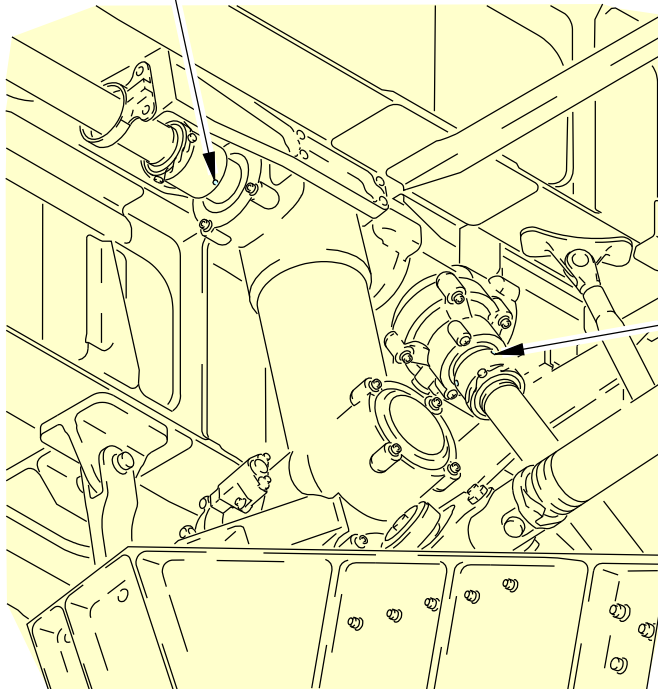
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[11] TRANSMISSION
NO. 4 COUPLING

FLUSH 
BMS 3-33

(4 LOCATIONS)

1



[11] TRANSMISSION
NO. 4 COUPLING

FLUSH 
BMS 3-33

(4 LOCATIONS)

1



TRANSMISSION NO. 4
(TRANSMISSION NO. 5 IS EQUIVALENT)

4 POINTS



E17926 S0006401770_V2

Trailing Edge Torque Tube and Torque Tube Support Servicing
Figure 301/12-21-09-990-801 (Sheet 6 of 8)

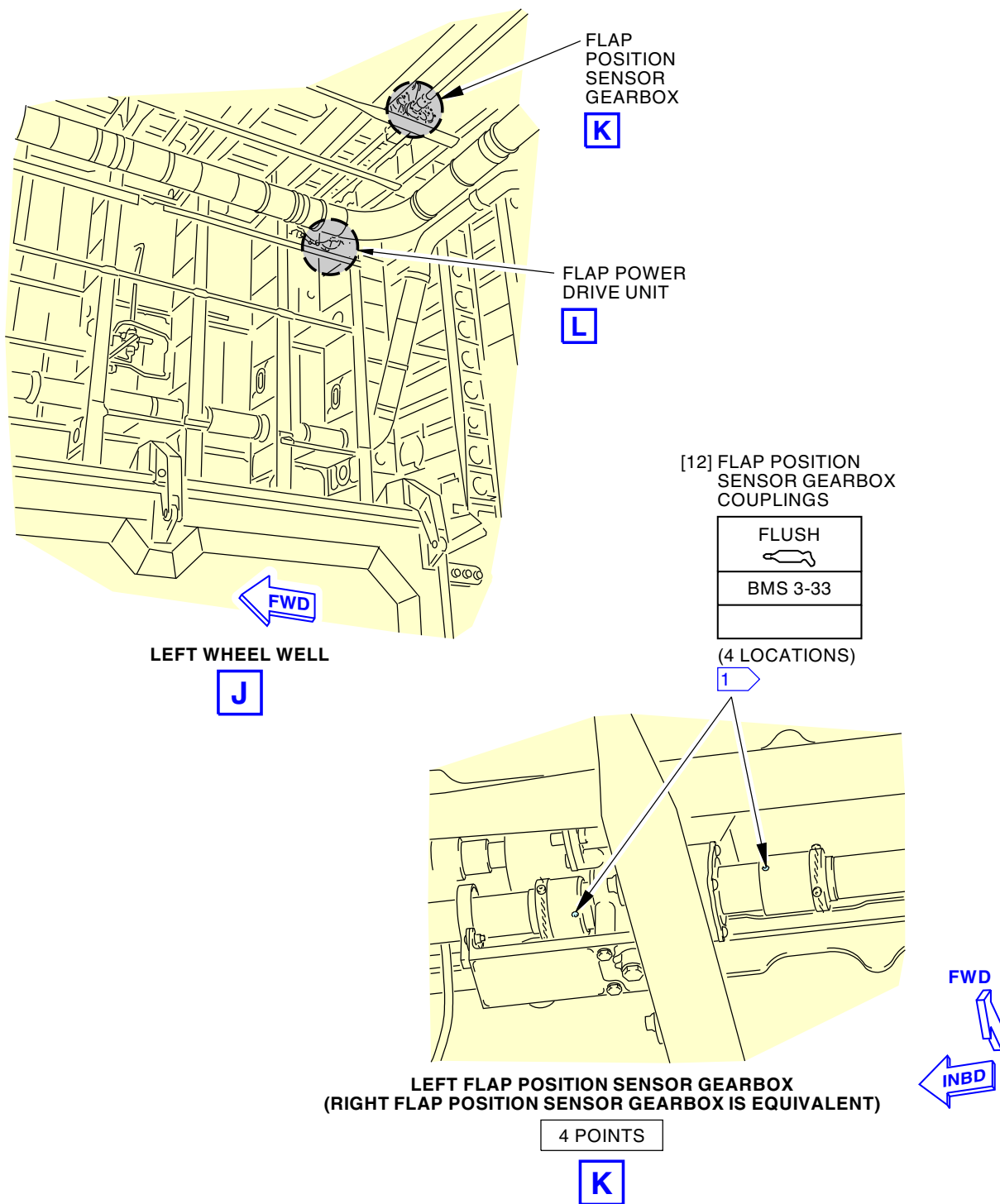
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E17967 S0006401771_V2

Trailing Edge Torque Tube and Torque Tube Support Servicing
Figure 301/12-21-09-990-801 (Sheet 7 of 8)

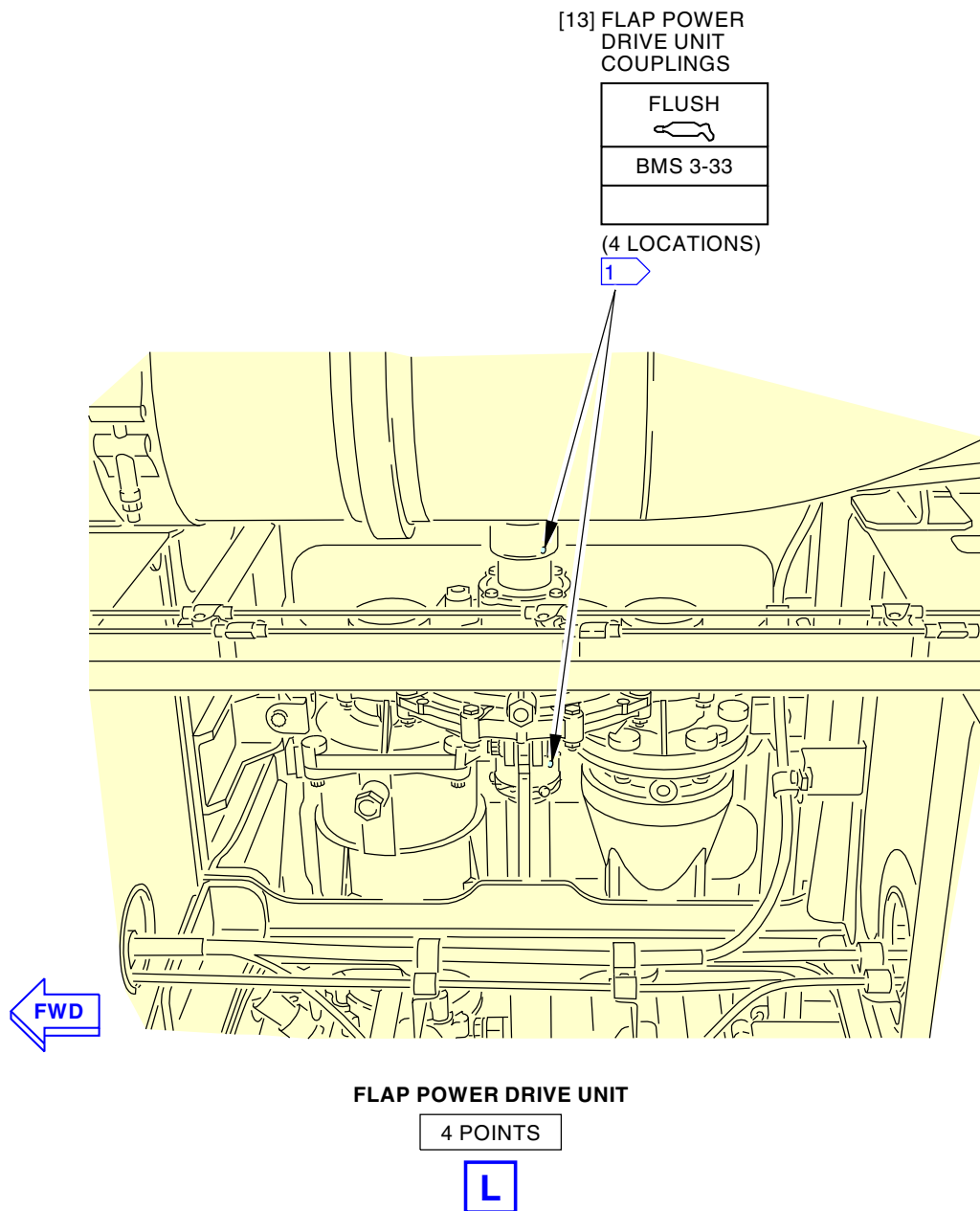
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E24630 S0006401772_V2

Trailing Edge Torque Tube and Torque Tube Support Servicing
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TASK 12-21-09-640-802

3. Inboard Flap Inboard Transmission, Ballscrew and Gimbal Lubrication (Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
571	Flap Support Fairing No. 4
671	Flap Support Fairing No. 5

D. Prepare for the Lubrication

SUBTASK 12-21-09-480-003



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 on the main and nose landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 12-21-09-480-004



OBEY THE INSTALLATION PROCEDURE FOR THE DOOR GROUND 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 12-21-09-860-003

- (3) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

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E. Inboard Flap Inboard Transmission, Ballscrew and Gimbal Lubrication

(Table 302)

SUBTASK 12-21-09-040-002



DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-003

- (2) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent.

The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-21-09-640-004

- (3) Lubricate the fittings on the top and bottom of the gimbal with grease, D00633.

NOTE: If the fitting will not accept grease, the lubrication path is possibly clogged. Too much grease pressure can cause damage to the gimbal bushing.

SUBTASK 12-21-09-640-005

- (4) Lubricate the fittings on the U-joint and yoke with grease, D00633.

SUBTASK 12-21-09-640-006

- (5) Lubricate the ballscrew:

- (a) Use a clean cloth to clean the ballscrew.

- (b) Apply a thin layer of grease, D00633 to the shaft of the ballscrew.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-002

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-004

- (2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-09-080-002



OBEY THE REMOVAL PROCEDURE FOR THE DOOR GROUND 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.

Table 302/12-21-09-993-814 Inboard Flap Inboard Transmission, Ballscrew and Gimbal Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	No. 4 U-Joint (No. 5 U-Joint Equivalent)	grease, D00633	BMS3-33	Zerk	2
2	No. 4 Yoke (No. 5 Yoke Equivalent)	grease, D00633	BMS3-33	Zerk	2
3	No. 4 Ballscrew (No. 5 Ballscrew Equivalent)	grease, D00633	BMS3-33	Brush	1

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**Table 302/12-21-09-993-814 Inboard Flap Inboard Transmission, Ballscrew and Gimbal Servicing
(Continued)**

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
4	No. 4 Ballscrew Nut (No. 5 Ballscrew Nut Equivalent)	grease, D00633	BMS3-33	Zerk	2
5	No. 4 Gimbal (No. 5 Gimbal Equivalent)	grease, D00633	BMS3-33	Zerk	2

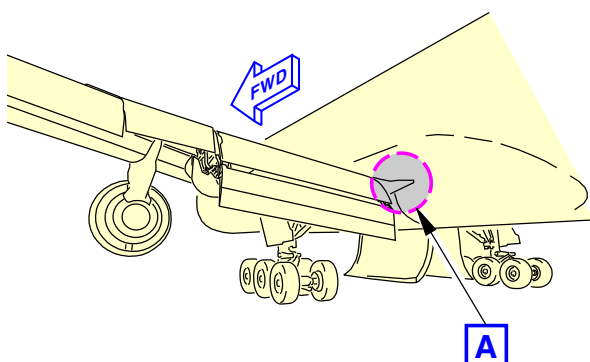
———— **END OF TASK** ————

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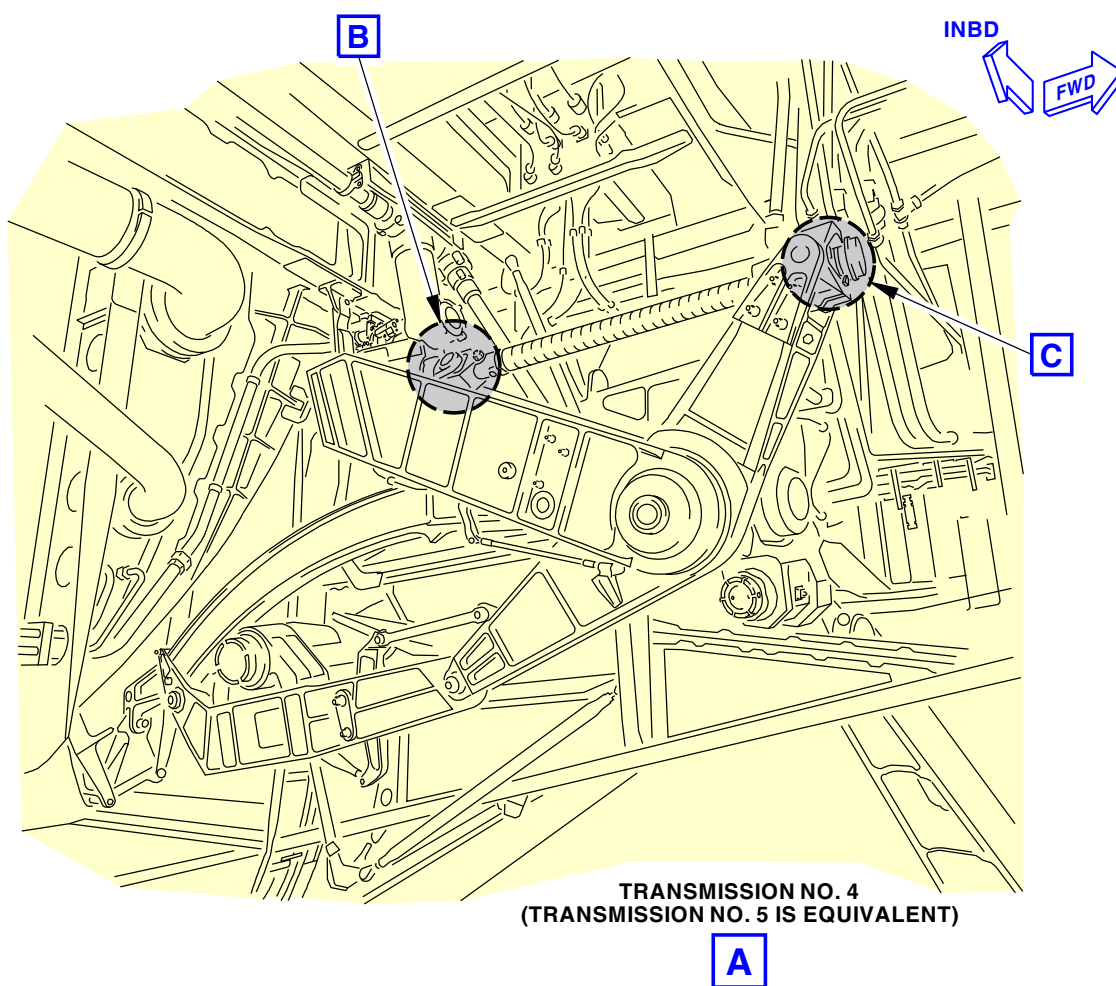
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LEFT WING
(RIGHT WING IS EQUIVALENT)



TRANSMISSION NO. 4
(TRANSMISSION NO. 5 IS EQUIVALENT)

E15741 S0006401775_V2

Inboard Flap Inboard Transmission, Ballscrew and Gimbal Servicing
Figure 302/12-21-09-990-802 (Sheet 1 of 2)

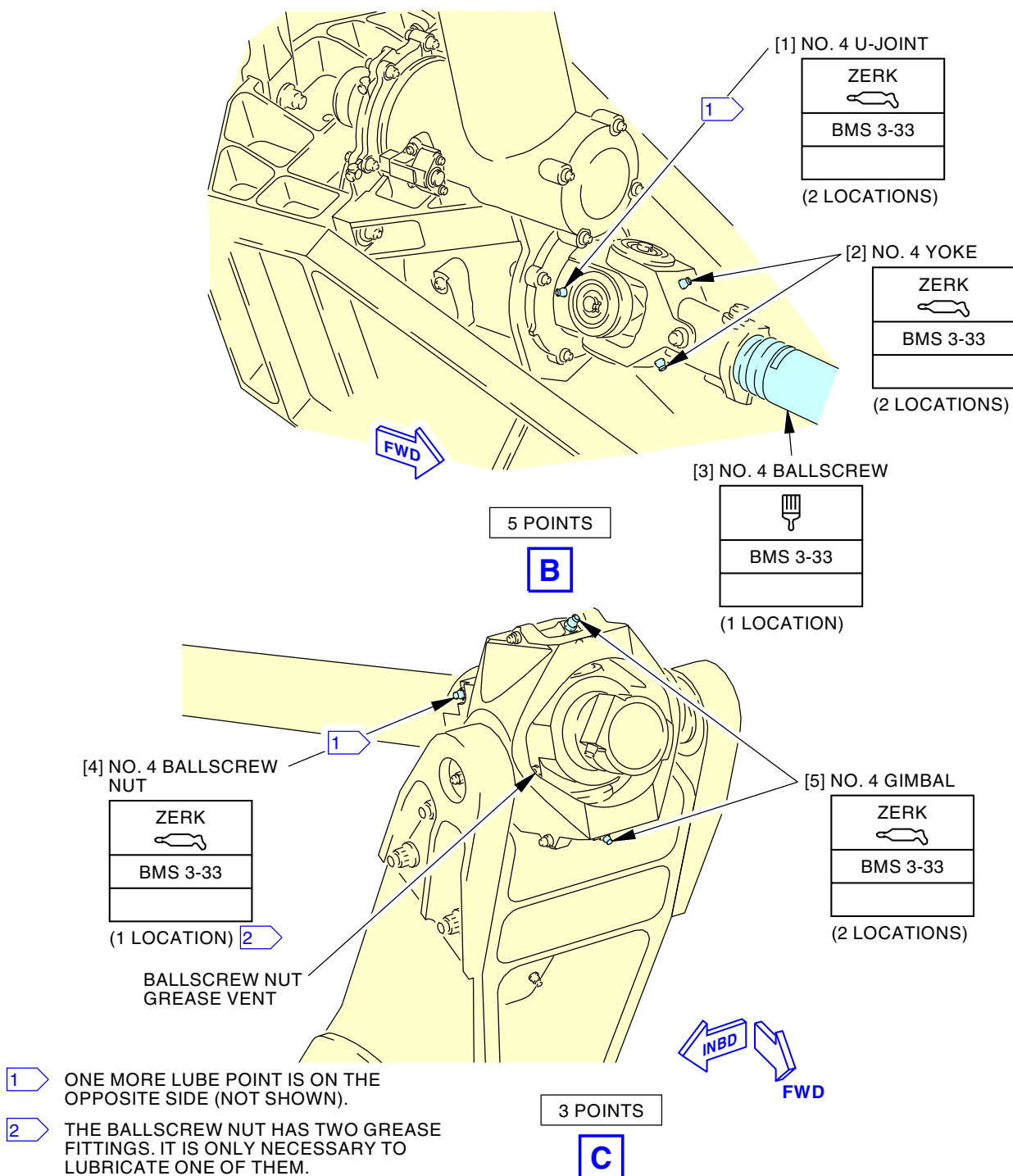
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E15830 S0006401776_V4

Inboard Flap Inboard Transmission, Ballscrew and Gimbal Servicing
Figure 302/12-21-09-990-802 (Sheet 2 of 2)

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TASK 12-21-09-640-807

4. Inboard Flap Outboard Transmission, Ballscrew and Gimbal Lubrication

(Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
573	Flap Support Fairing No. 3
673	Flap Support Fairing No. 6

D. Prepare for the Lubrication

SUBTASK 12-21-09-860-011

- (1) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

E. Inboard Flap Outboard Transmission, Ballscrew and Gimbal Lubrication

(Table 303)

SUBTASK 12-21-09-040-007



WARNING DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-013

- (2) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent.

The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-21-09-640-014

- (3) Lubricate the fittings on the top and bottom of the gimbal with grease, D00633.

NOTE: If the fitting will not accept grease, the lubrication path is possibly clogged. Too much grease pressure can cause damage to the gimbal bushing.

SUBTASK 12-21-09-640-015

- (4) Lubricate the fittings on the U-joint and yoke with grease, D00633.

SUBTASK 12-21-09-640-016

- (5) Lubricate the ballscrew:
 - (a) Use a clean cloth to clean the ballscrew.

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(b) Apply a thin layer of grease, D00633 to the shaft of the ballscrew.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-007

(1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-012

(2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

Table 303/12-21-09-993-815 Inboard Flap Outboard Transmission, Ballscrew and Gimbal Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	No. 3 Ballscrew Nut (No. 6 Ballscrew Nut Equivalent)	grease, D00633	BMS3-33	Zerk	1
2	No. 3 Gimbal (No. 6 Gimbal Equivalent)	grease, D00633	BMS3-33	Zerk	2
3	No. 3 U-Joint (No. 6 U-Joint Equivalent)	grease, D00633	BMS3-33	Zerk	2
4	No. 3 Ballscrew (No. 6 Ballscrew Equivalent)	grease, D00633	BMS3-33	Brush	1
5	No. 3 Yoke (No. 6 Yoke Equivalent)	grease, D00633	BMS3-33	Zerk	2

———— **END OF TASK** ————

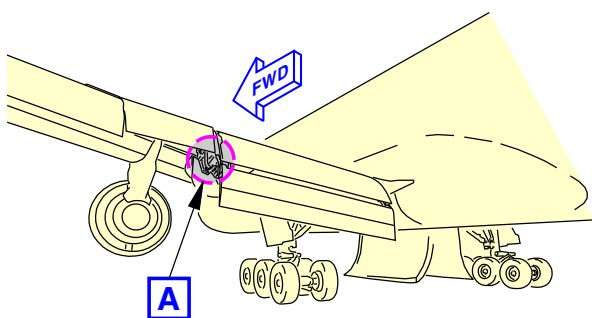
EFFECTIVITY
ARO ALL

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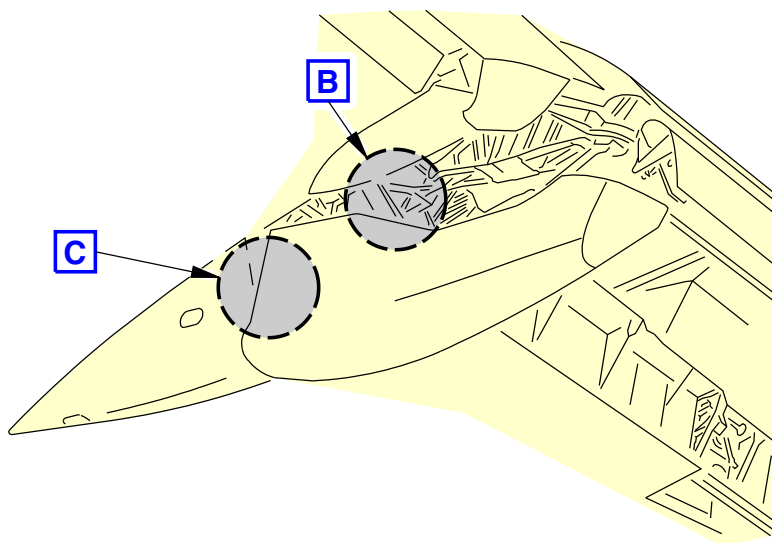
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LEFT WING
(RIGHT WING IS EQUIVALENT)



TRANSMISSION NO. 3
(TRANSMISSION NO. 6 IS EQUIVALENT)

A

E63499 S0006401779_V2

Inboard Flap Outboard Transmission, Ballscrew and Gimbal Servicing
Figure 303/12-21-09-990-803 (Sheet 1 of 3)

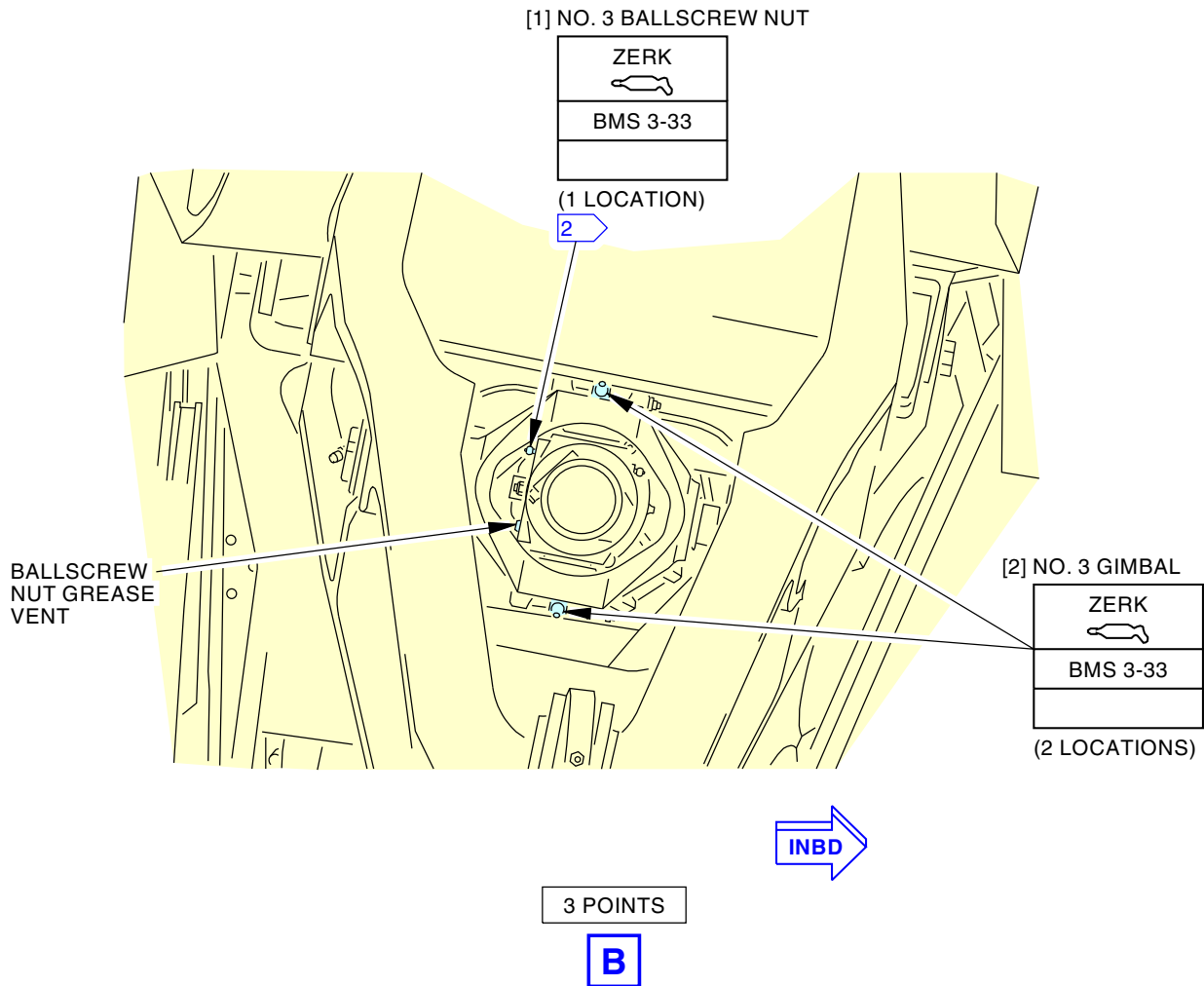
EFFECTIVITY
ARO ALL

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2 THE BALLSCREW NUT HAS TWO GREASE FITTINGS. IT IS ONLY NECESSARY TO LUBRICATE ONE OF THEM.

E15920 S0006401780_V3

Inboard Flap Outboard Transmission, Ballscrew and Gimbal Servicing
Figure 303/12-21-09-990-803 (Sheet 2 of 3)

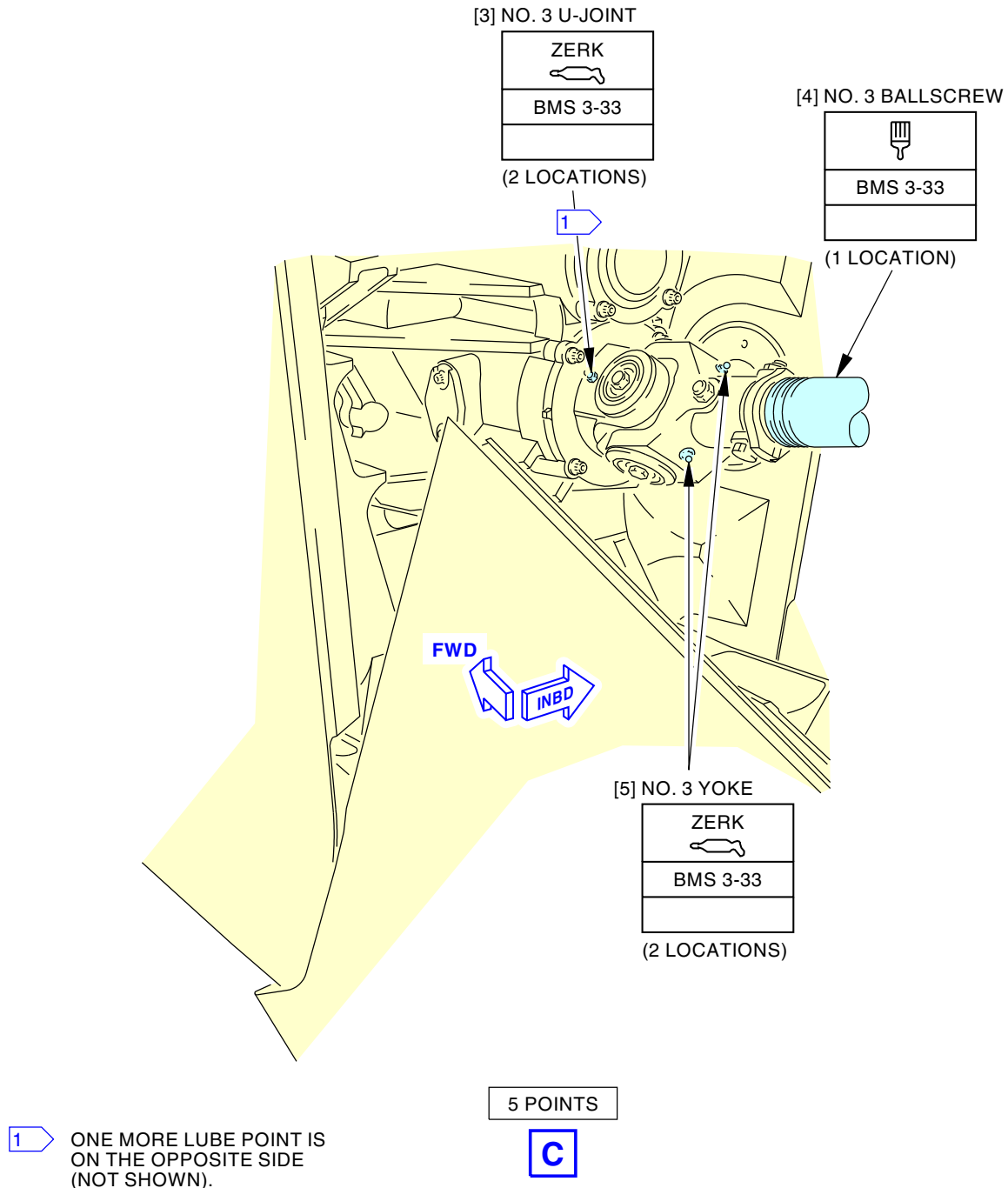
EFFECTIVITY
ARO ALL

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E15926 S0006401781_V2

Inboard Flap Outboard Transmission, Ballscrew and Gimbal Servicing
Figure 303/12-21-09-990-803 (Sheet 3 of 3)

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TASK 12-21-09-640-803

5. Inboard Flap, Inboard Support Mechanism Lubrication

(Figure 304)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
571	Flap Support Fairing No. 4
671	Flap Support Fairing No. 5

D. Prepare for the Lubrication

SUBTASK 12-21-09-480-009



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 on the main and nose landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 12-21-09-480-010



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 12-21-09-860-037

- (3) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

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E. Inboard Flap, Inboard Support Mechanism Lubrication (Table 304)

SUBTASK 12-21-09-040-013



DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-028

- (2) Lubricate the inboard flap inboard support mechanism with grease, D00633.

NOTE: The rod ends on the forward pushrod are fitted with two grease fittings. It is only necessary to lubricate the fitting which you can get access to.

NOTE: Rod end bearing lubrication requires that grease come out of the bearing between the bearing and the pin. If grease only comes out between the bearing and the rod end housing, the bearing is not properly lubricated.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-013

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-038

- (2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-09-080-005



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.

Table 304/12-21-09-993-825 Inboard Flap, Inboard Support Mechanism Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Gimbal Retainer	grease, D00633	BMS3-33	Zerk	2
2	Drive Arm Pivot	grease, D00633	BMS3-33	Zerk	1
3	Bellcrank	grease, D00633	BMS3-33	Zerk	3
4	Drive Arm Lower Fitting	grease, D00633	BMS3-33	Zerk	1
5	Carrier Beam	grease, D00633	BMS3-33	Zerk	1
6	Forward Pushrod	grease, D00633	BMS3-33	Flush	2
7	Drive Crank Support	grease, D00633	BMS3-33	Flush	1
8	Drive Crank Sleeve	grease, D00633	BMS3-33	Zerk	1
9	Upper Track Roller	grease, D00633	BMS3-33	Zerk	2
10	Lower Track Roller	grease, D00633	BMS3-33	Zerk	1

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Table 304/12-21-09-993-825 Inboard Flap, Inboard Support Mechanism Servicing (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
11	Track Support Fitting	grease, D00633	BMS3-33	Zerk	3

———— **END OF TASK** ————

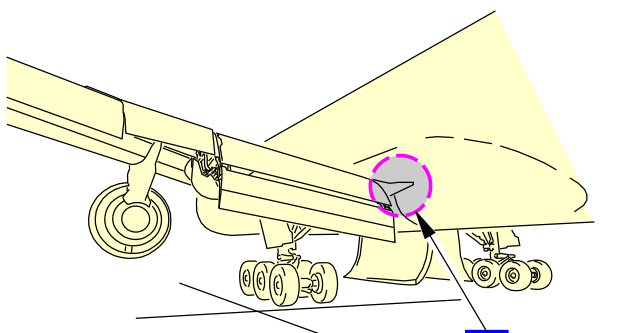
EFFECTIVITY
ARO ALL

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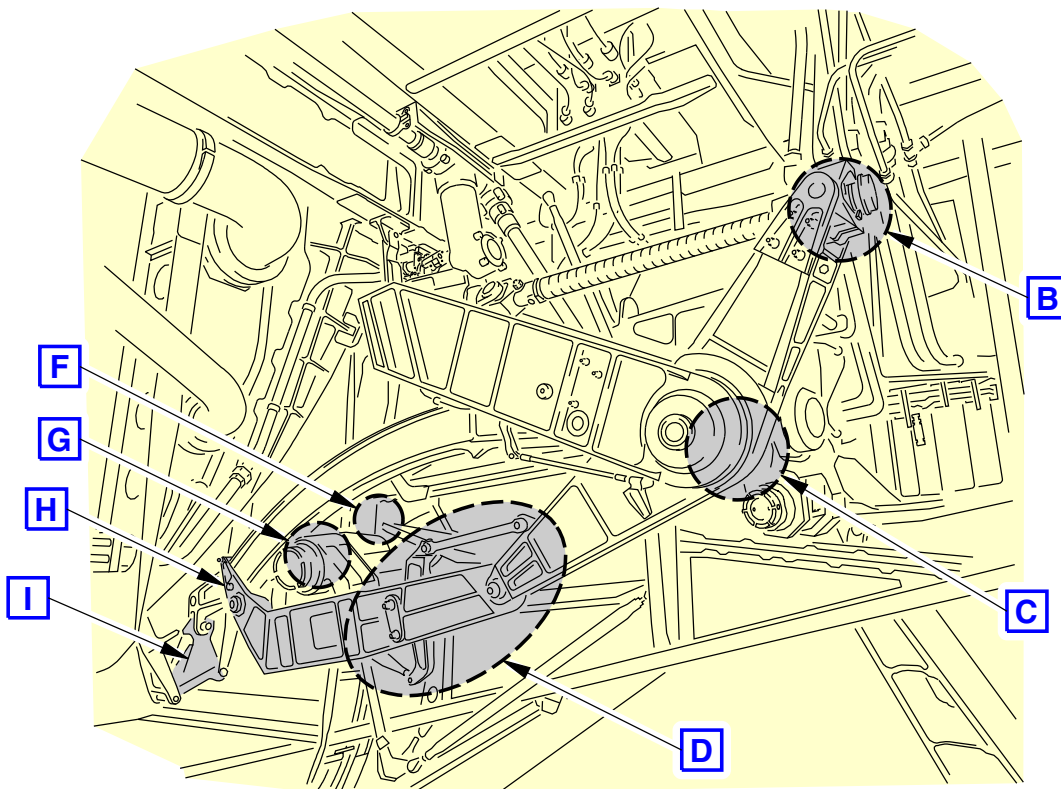
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A

LEFT WING
(RIGHT WING IS EQUIVALENT)



B

F

G

H

I

C

D

FLAP SUPPORT NO. 4
(FLAP SUPPORT NO. 5 IS EQUIVALENT)

A



E15927 S0006401784_V2

Inboard Flap, Inboard Support Mechanism Servicing
Figure 304/12-21-09-990-813 (Sheet 1 of 6)

EFFECTIVITY
ARO ALL

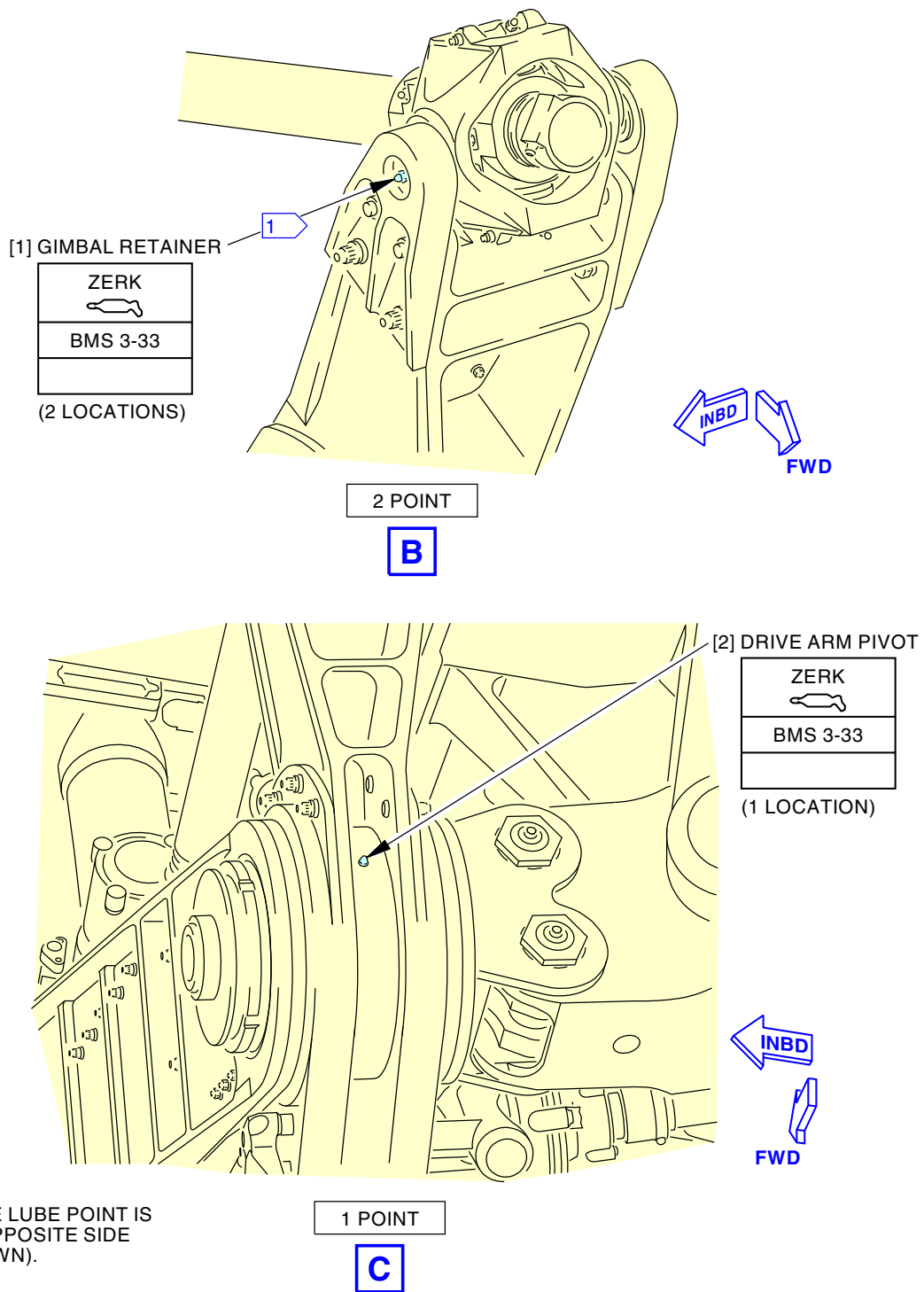
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E15928 S0006401785_V3

Inboard Flap, Inboard Support Mechanism Servicing
Figure 304/12-21-09-990-813 (Sheet 2 of 6)

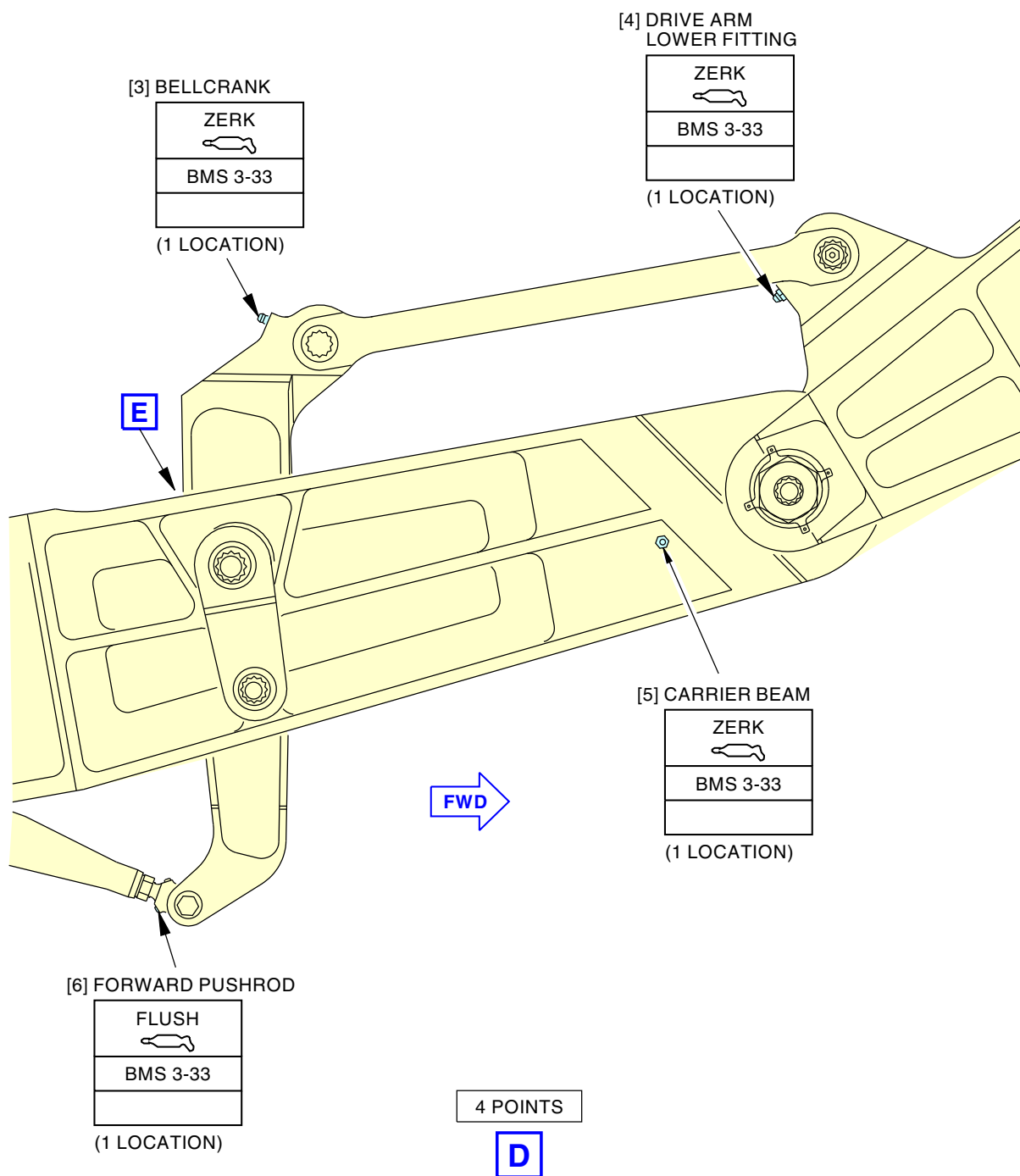
EFFECTIVITY
ARO ALL

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E16230 S0006401786_V3

Inboard Flap, Inboard Support Mechanism Servicing
Figure 304/12-21-09-990-813 (Sheet 3 of 6)

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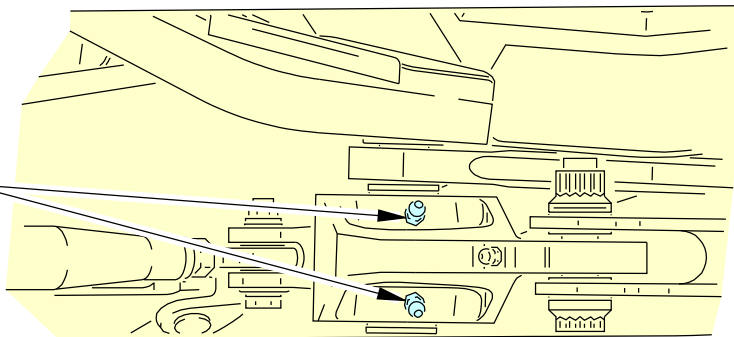
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[3] BELLCRANK

ZERK

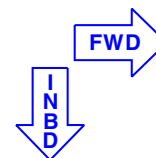
BMS 3-33

(2 LOCATIONS)



2 POINTS

E

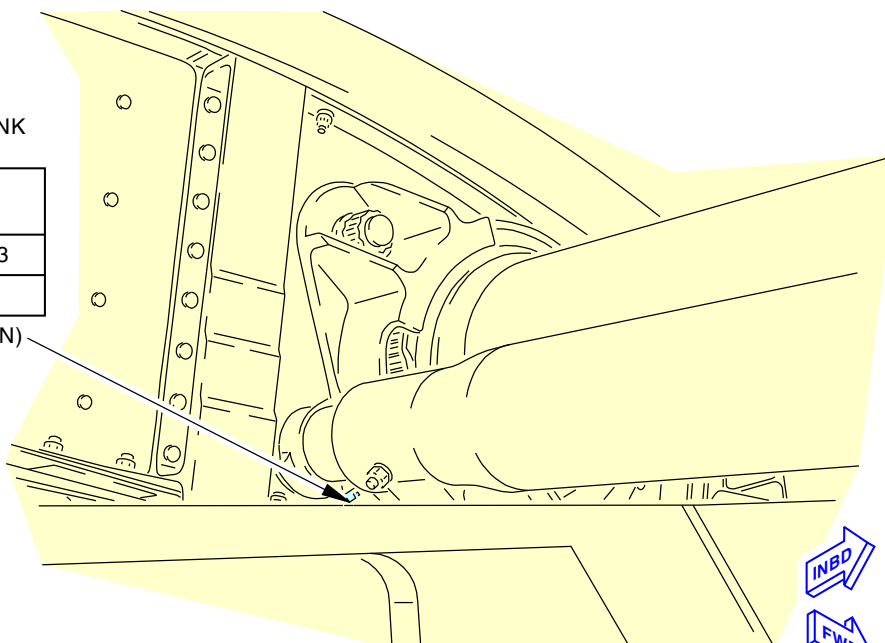


[7] DRIVE CRANK
SUPPORT

FLUSH

BMS 3-33

(1 LOCATION)



1 POINT

F



E16214 S0006401787_V2

Inboard Flap, Inboard Support Mechanism Servicing
Figure 304/12-21-09-990-813 (Sheet 4 of 6)

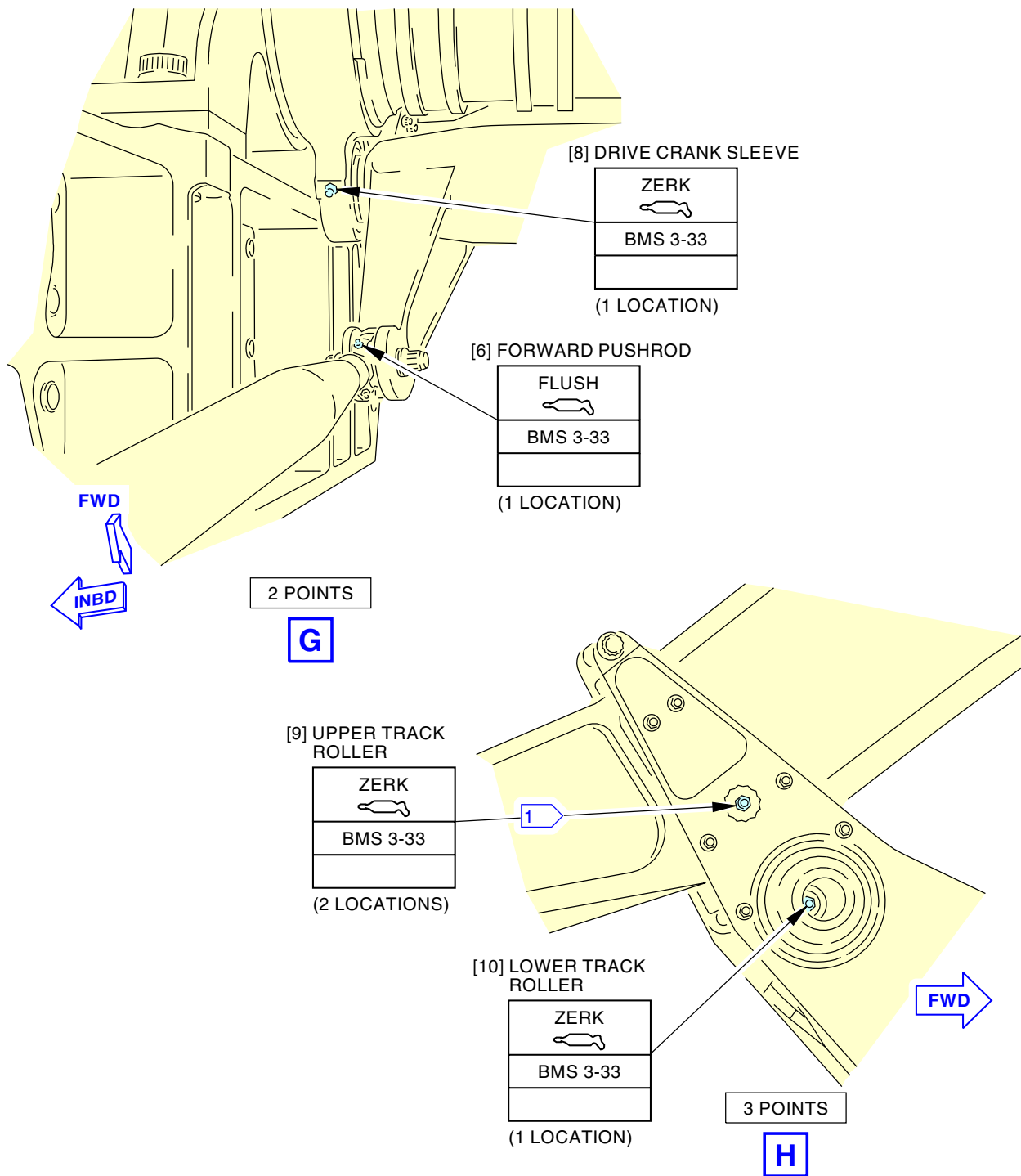
EFFECTIVITY
ARO ALL

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E16295 S0006401788_V3

**Inboard Flap, Inboard Support Mechanism Servicing
Figure 304/12-21-09-990-813 (Sheet 5 of 6)**

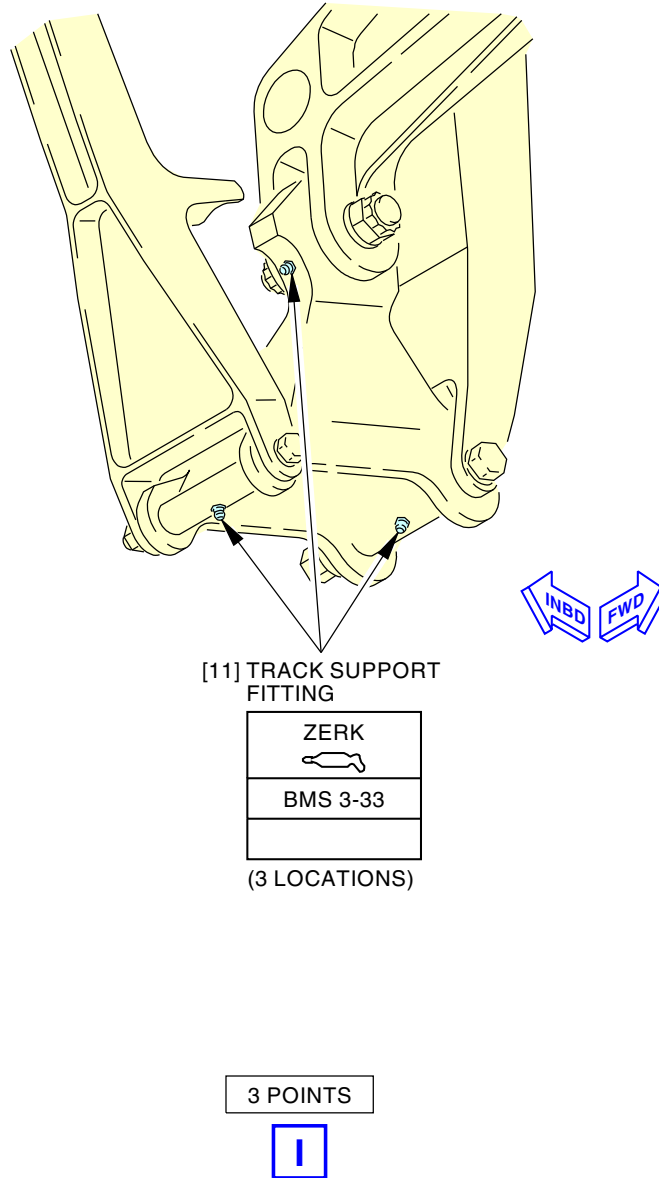
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ARO ALL

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E25689 S0006401789_V2

Inboard Flap, Inboard Support Mechanism Servicing
Figure 304/12-21-09-990-813 (Sheet 6 of 6)

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TASK 12-21-09-640-808

6. Inboard Flap, Outboard Support Mechanism Lubrication

(Figure 305)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
27-51-18-000-804	Outboard Flap Support Forward Fairing Removal (P/B 401)
27-51-18-400-804	Outboard Flap Support Forward Fairing Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
573	Flap Support Fairing No. 3
673	Flap Support Fairing No. 6

D. Prepare for the Lubrication

SUBTASK 12-21-09-010-001

- (1) Do this task: Remove either the Outboard Flap Support Forward Fairing Removal, TASK 27-51-18-000-804 or only the access door in the fairing 573BB or 673BB for access to lubrication points.

SUBTASK 12-21-09-860-013

- (2) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

E. Inboard Flap Outboard Support Mechanism Lubrication

(Table 305)

SUBTASK 12-21-09-040-008

 WARNING	DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-017

- (2) Lubricate the inboard flap, outboard support mechanism with grease, D00633.

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WARNING

DO NOT SET THE GUN TO A PRESSURE OF MORE THAN THE LIMIT GIVEN. TOO MUCH PRESSURE WILL CAUSE THE FITTING TO COME OUT AT A HIGH SPEED. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (a) Set the pressure at 100 psi (689 kPa) to 200 psi (1379 kPa) unless otherwise specified.

NOTE: This is usually sufficient to push out the used grease.

NOTE: When lube path are blocked, there is a tendency to apply too much grease pressure which can break the fay seal and split the lugs of the forward tension link.

SUBTASK 12-21-09-640-027

- (3) Lubricate the fairing support fittings with grease, D00633.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-008

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-028

- (2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-09-410-005

- (3) Do this task: Install either the Outboard Flap Support Forward Fairing Installation, TASK 27-51-18-400-804 or the access door in the fairing 573BB or 673BB previously removed for access to lubrication points.

Table 305/12-21-09-993-817 Inboard Flap, Outboard Support Mechanism Servicing (Fig. 305)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Forward Attach Point	grease, D00633	BMS3-33	Zerk	1
2	Actuator Support	grease, D00633	BMS3-33	Zerk	1
3	Aft Tension Beam Forward Fitting	grease, D00633	BMS3-33	Zerk	2
4	Forward Tension Link	grease, D00633	BMS3-33	Zerk	2
5	Aft Tension Beam Aft Fitting	grease, D00633	BMS3-33	Zerk	1
6	Compression Strut Aft Fitting	grease, D00633	BMS3-33	Zerk	2
7	Pivot Link	grease, D00633	BMS3-33	Zerk	2
8	Fairing Link	grease, D00633	BMS3-33	Zerk	2
9	Fairing Drive Link	grease, D00633	BMS3-33	Zerk	2
10	Forward Link	grease, D00633	BMS3-33	Zerk	1
11	Carrier Beam Rod Aft Fitting	grease, D00633	BMS3-33	Zerk	1
12	Bellcrank	grease, D00633	BMS3-33	Zerk	3
13	Aft Link	grease, D00633	BMS3-33	Zerk	1
14	Gimbal Fitting	grease, D00633	BMS3-33	Zerk	2
15	Carrier Beam Rod Forward Fitting	grease, D00633	BMS3-33	Zerk	1

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Table 305/12-21-09-993-817 Inboard Flap, Outboard Support Mechanism Servicing (Fig. 305)
(Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
16	Drive Arm Bottom Fitting	grease, D00633	BMS3-33	Zerk	1
17	Compression Strut Forward Fitting	grease, D00633	BMS3-33	Zerk	2
19	Drive Arm Top Fitting	grease, D00633	BMS3-33	Zerk	2
20	Drive Arm Center Fitting	grease, D00633	BMS3-33	Zerk	1
21	Fairing Support	grease, D00633	BMS3-33	Zerk	2

———— **END OF TASK** ————

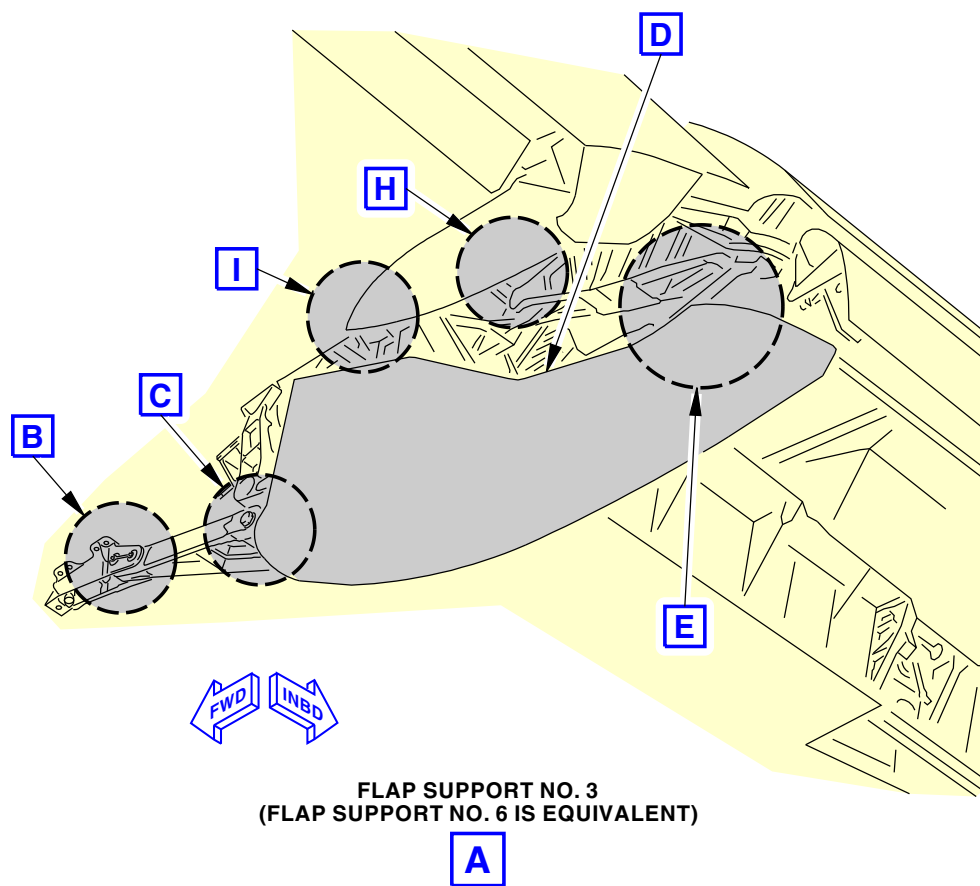
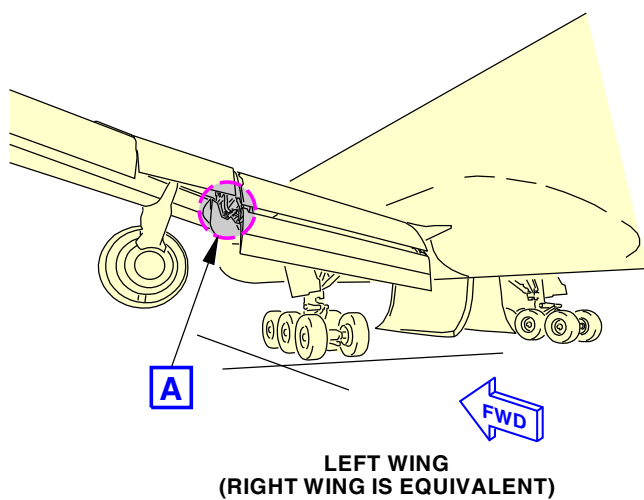
EFFECTIVITY
ARO ALL

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E16307 S0006401792_V2

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 1 of 8)

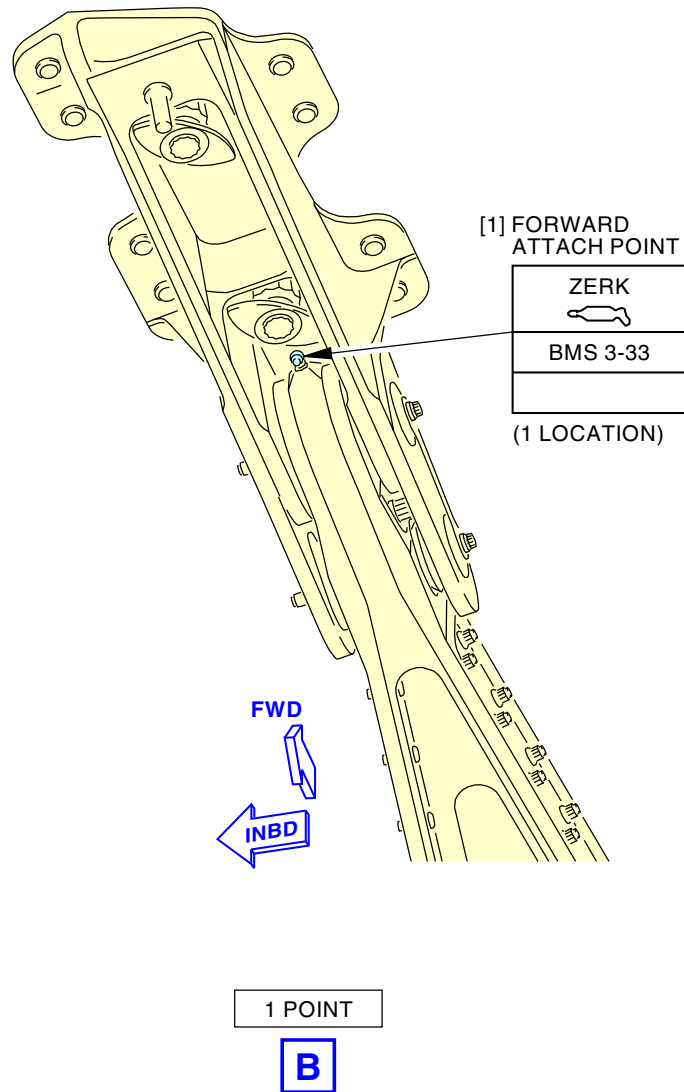
EFFECTIVITY
ARO ALL

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E16364 S0006401793_V3

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 2 of 8)

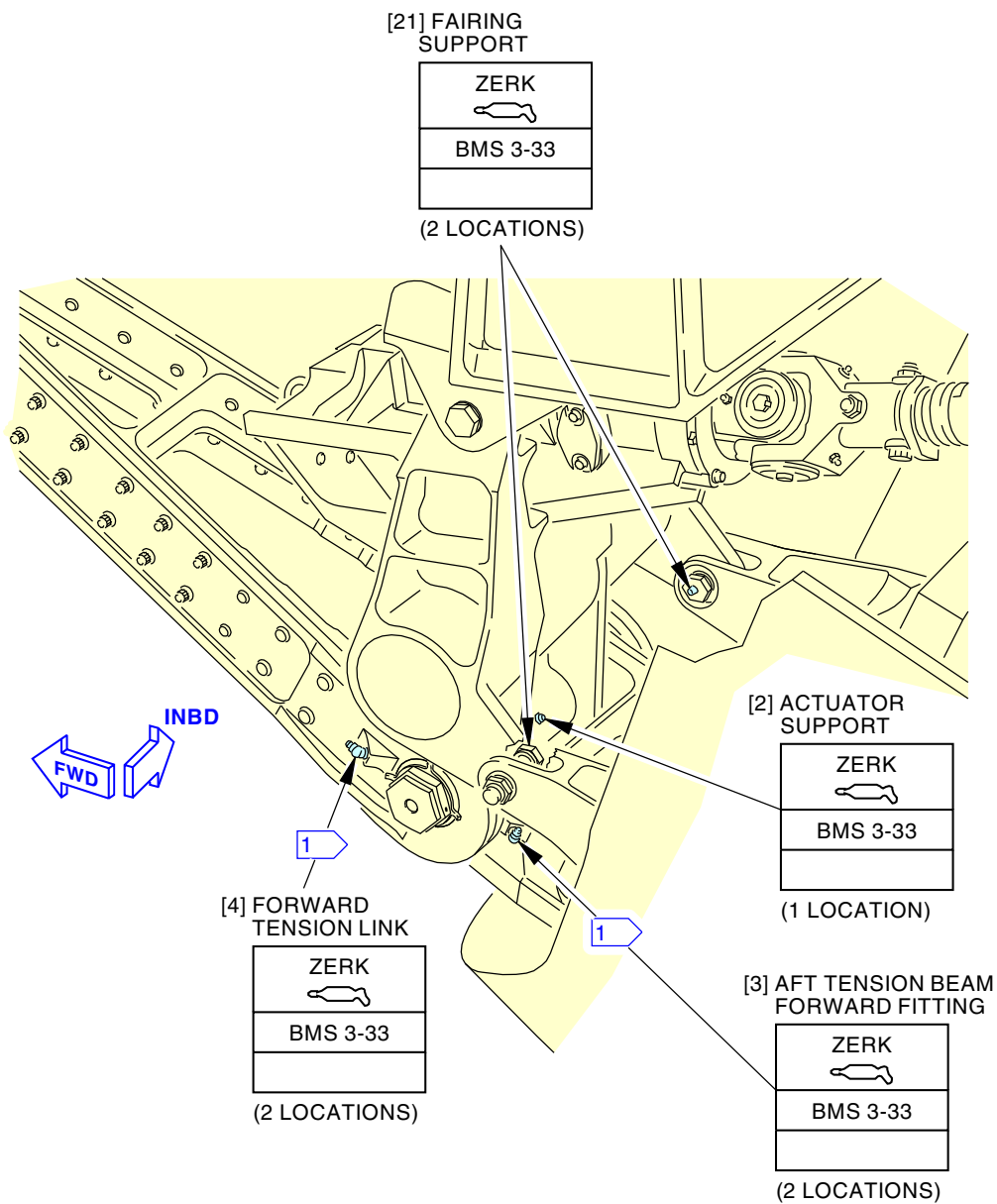
EFFECTIVITY
ARO ALL

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1 ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

L45239 S0006401795_V2

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 3 of 8)

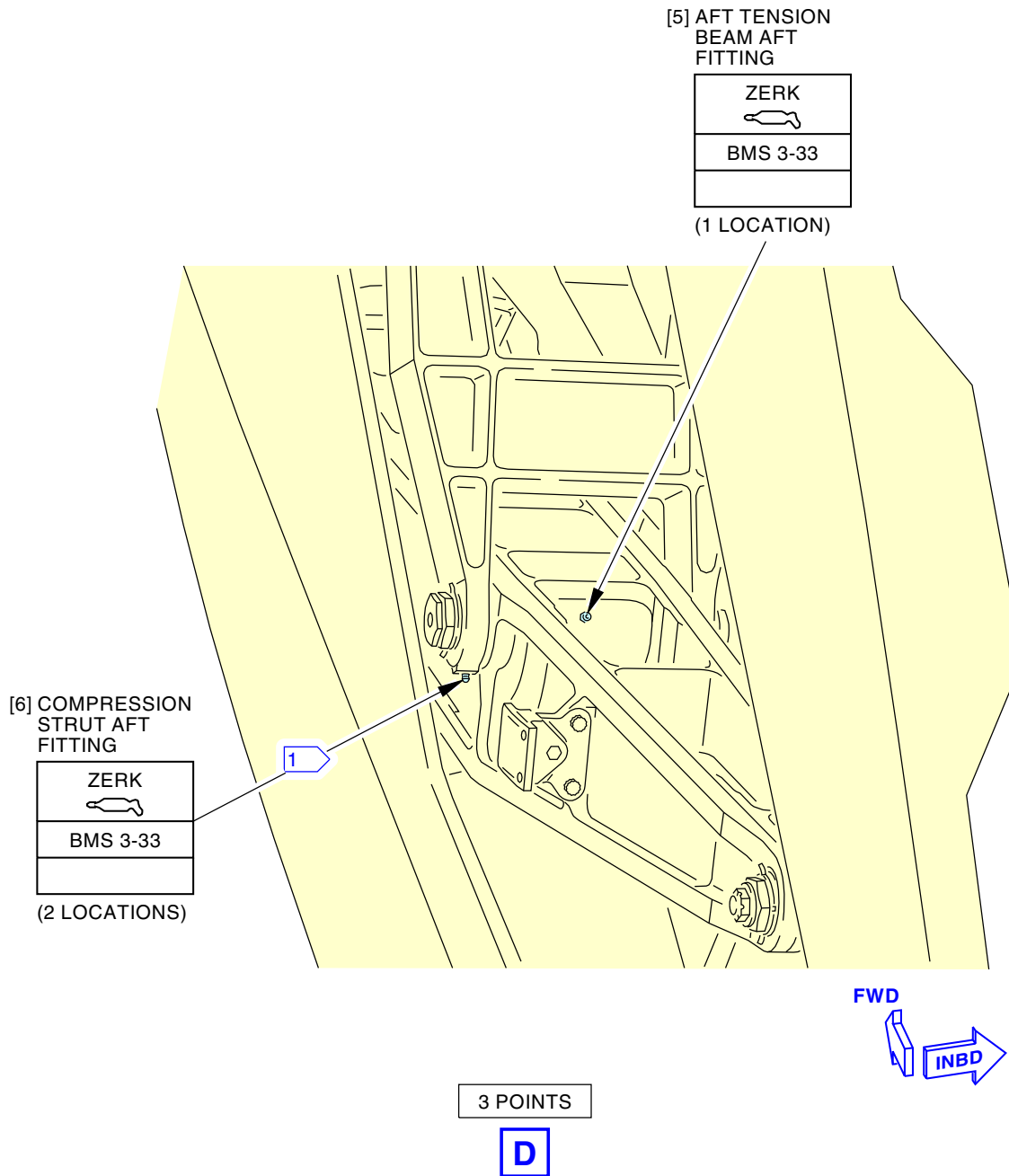
EFFECTIVITY
ARO ALL

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E16391 S0006401796_V2

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 4 of 8)

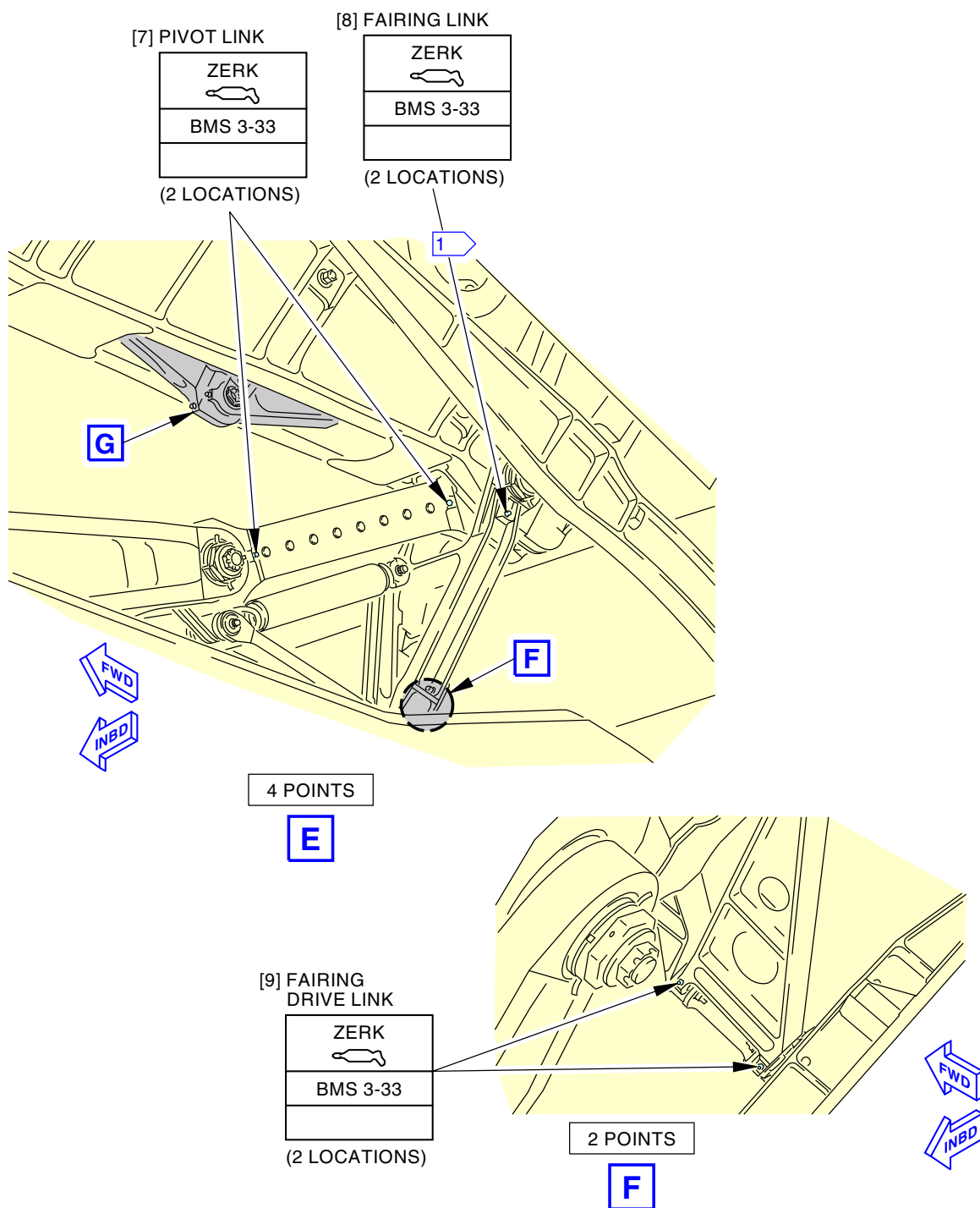
EFFECTIVITY
ARO ALL

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G78550 S0006401797_V2

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 5 of 8)

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ARO ALL

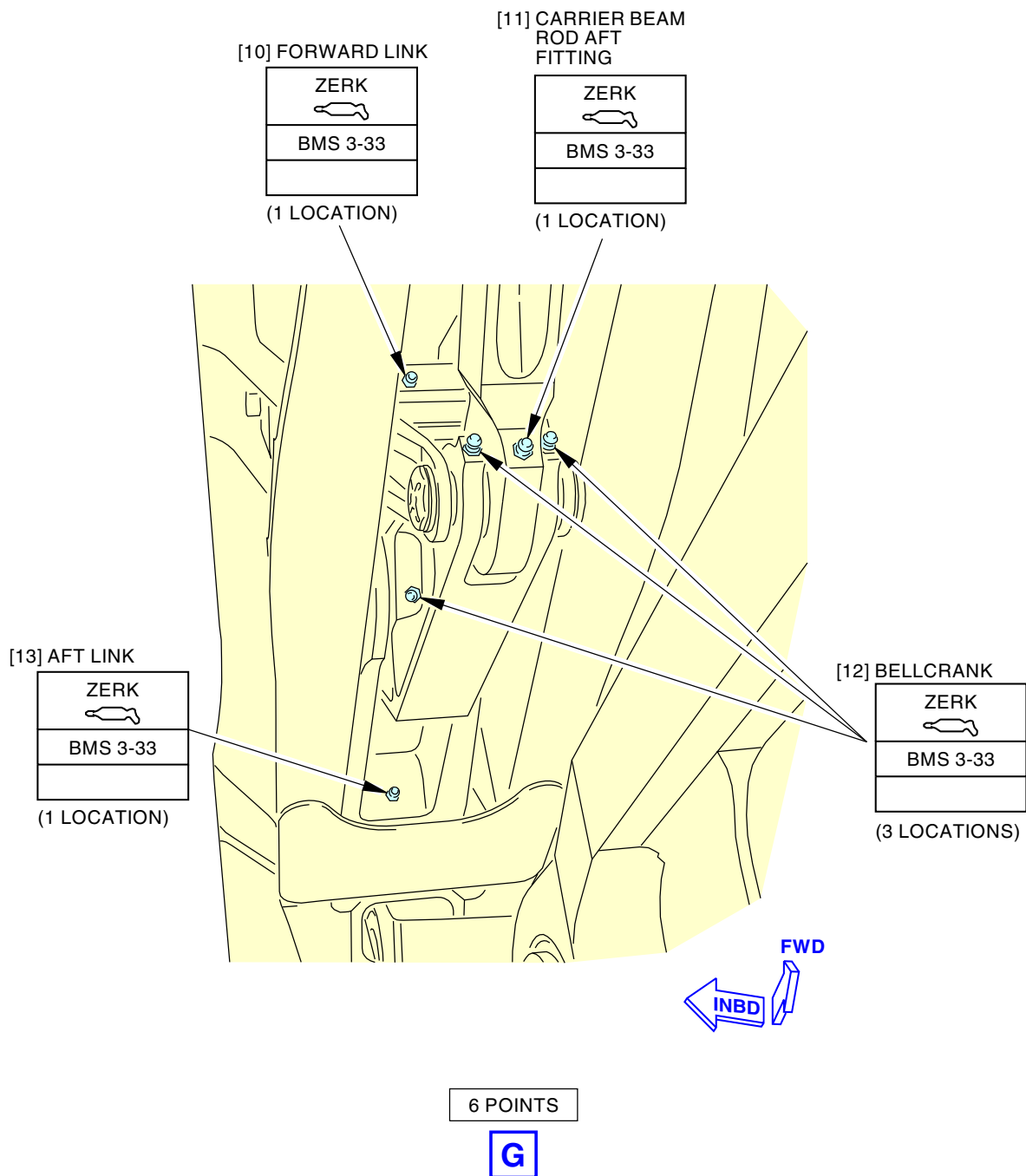
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E20807 S0006401798_V2

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 6 of 8)

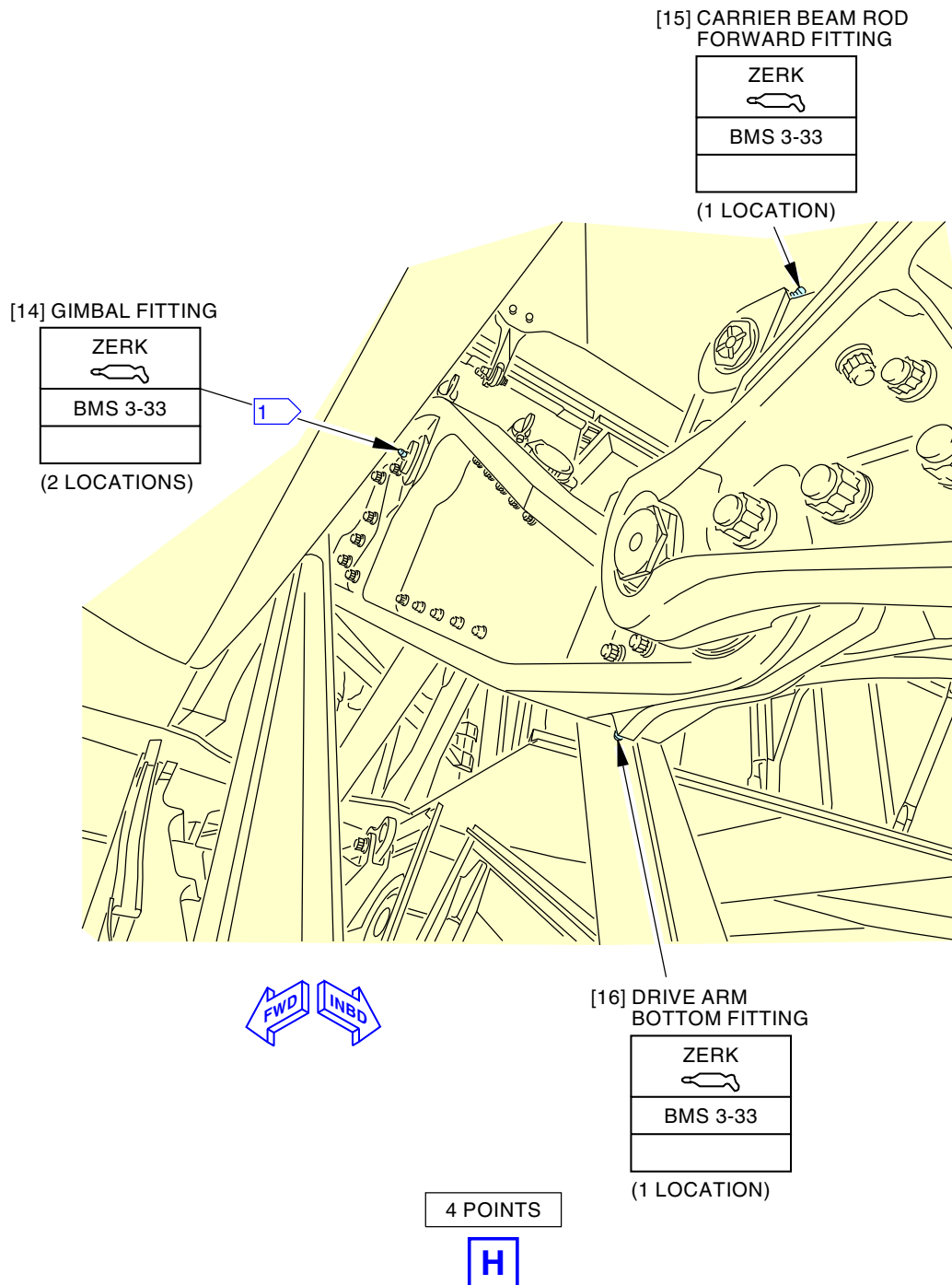
EFFECTIVITY
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E20842 S0006401799_V2

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 7 of 8)

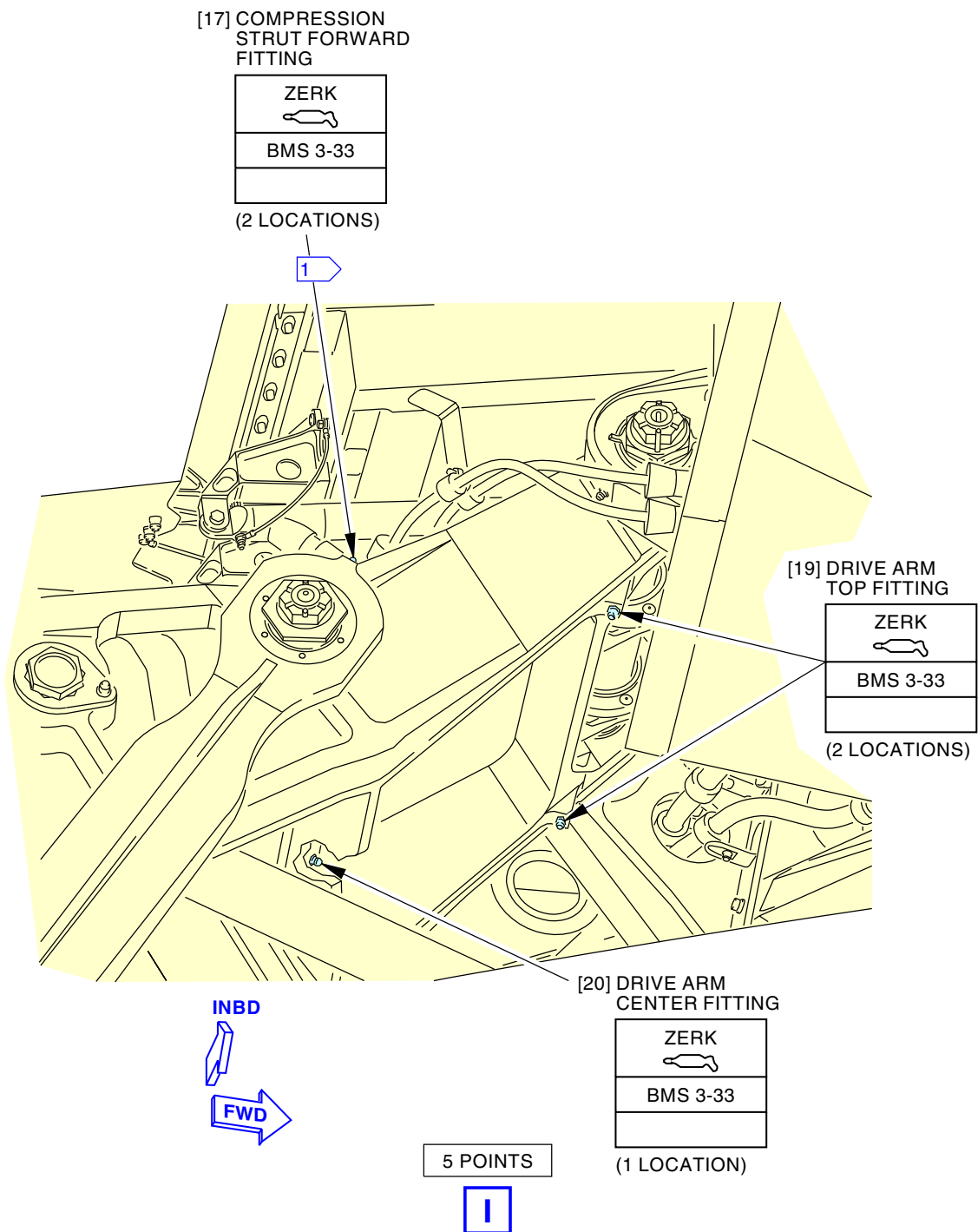
EFFECTIVITY
ARO ALL

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1664722 S0000304355_V2

Inboard Flap, Outboard Support Mechanism Servicing
Figure 305/12-21-09-990-805 (Sheet 8 of 8)

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TASK 12-21-09-640-809

7. Inboard Aft Flap Roller Lubrication

(Figure 306)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-10-22-110-802	Clean Bare, Clad, or Plated Metal with Solvent (P/B 701)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
571	Flap Support Fairing No. 4
572	Inboard Flap Center Track Fairing - Left Wing
573	Flap Support Fairing No. 3
671	Flap Support Fairing No. 5
672	Inboard Flap Center Track Fairing - Right Wing
673	Flap Support Fairing No. 6

D. Prepare for the Lubrication

SUBTASK 12-21-09-480-007



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 on the main and nose landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 12-21-09-480-008



WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR GROUND 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 12-21-09-860-014

- (3) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

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E. Inboard Aft Flap Roller Lubrication

(Table 306)

SUBTASK 12-21-09-040-009



DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-018

- (2) Lubricate the rollers for the aft flap with grease, D00633.

- (a) Make sure the rollers move freely and do not bind.

SUBTASK 12-21-09-640-031

- (3) Clean the upper and lower surface of the flap track after lubrication to remove unwanted grease (Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-22-110-802).

NOTE: Grease or oil on the flap track can attract dirt and debris. This causes the rollers to bind and damages the surface of the flap track.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-009

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-015

- (2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-09-080-004



OBEY THE REMOVAL PROCEDURE FOR THE DOOR GROUND 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.

Table 306/12-21-09-993-818 Inboard Aft Flap Roller Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Inboard Track Aft Roller	grease, D00633	BMS3-33	Flush	1
2	Inboard Track Forward Roller	grease, D00633	BMS3-33	Flush	1
3	Center Track Roller	grease, D00633	BMS3-33	Flush	1
4	Outboard Track Forward Roller	grease, D00633	BMS3-33	Flush	1
5	Outboard Track Aft Roller	grease, D00633	BMS3-33	Flush	1

— END OF TASK —

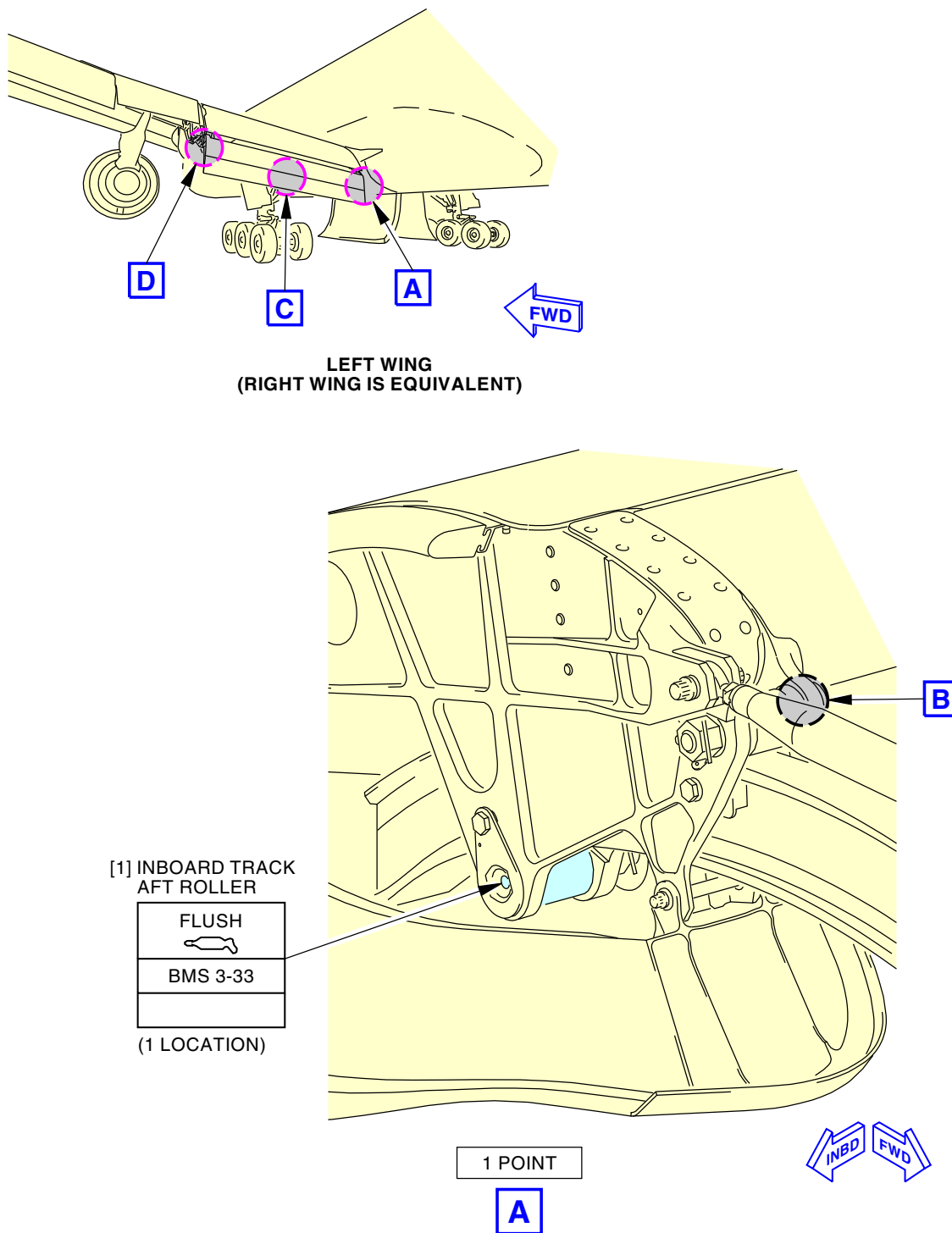
EFFECTIVITY
ARO ALL

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E21966 S0006401803_V2

Inboard Aft Flap Roller Servicing
Figure 306/12-21-09-990-806 (Sheet 1 of 3)

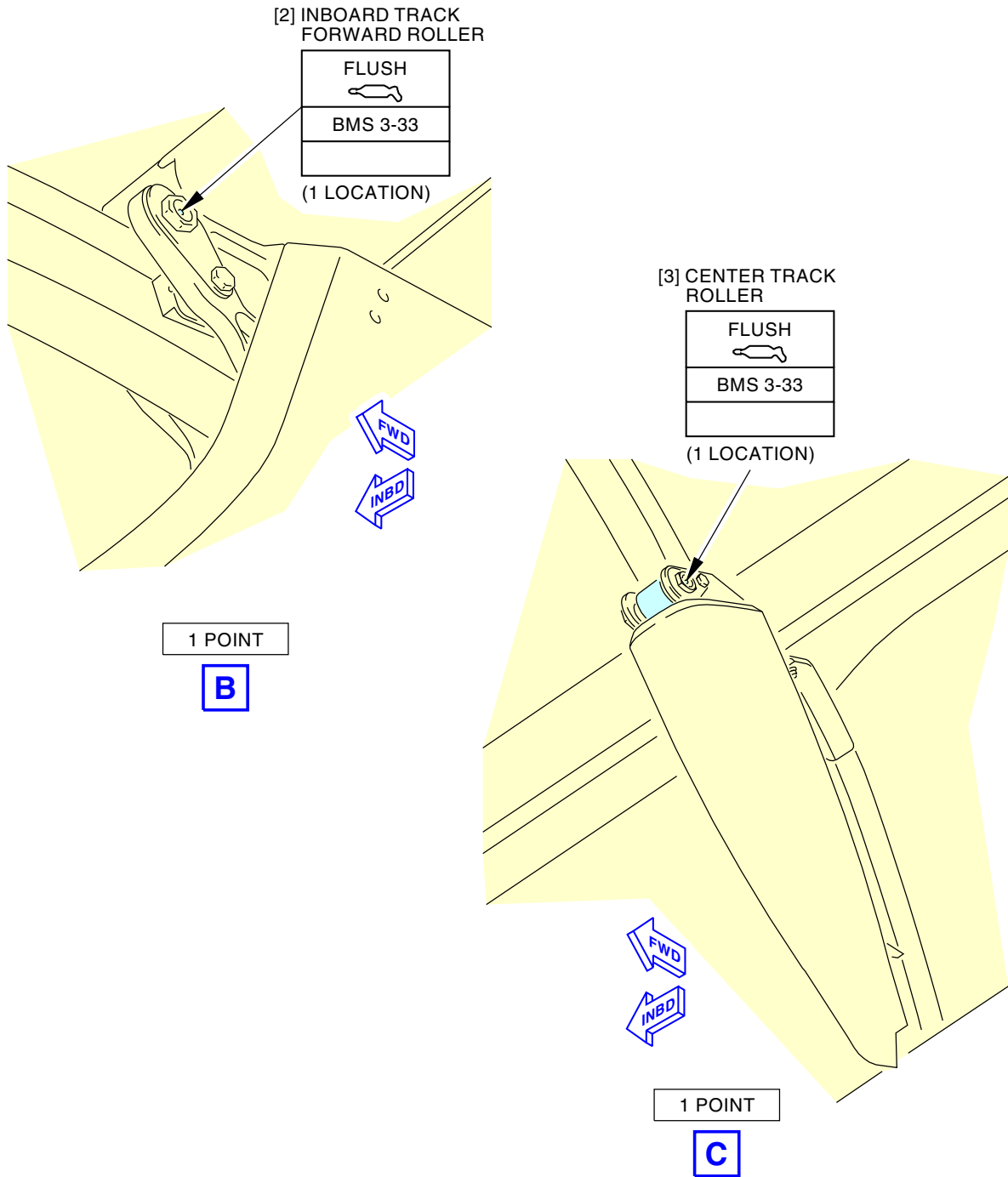
EFFECTIVITY
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E22021 S0006401804_V2

Inboard Aft Flap Roller Servicing
Figure 306/12-21-09-990-806 (Sheet 2 of 3)

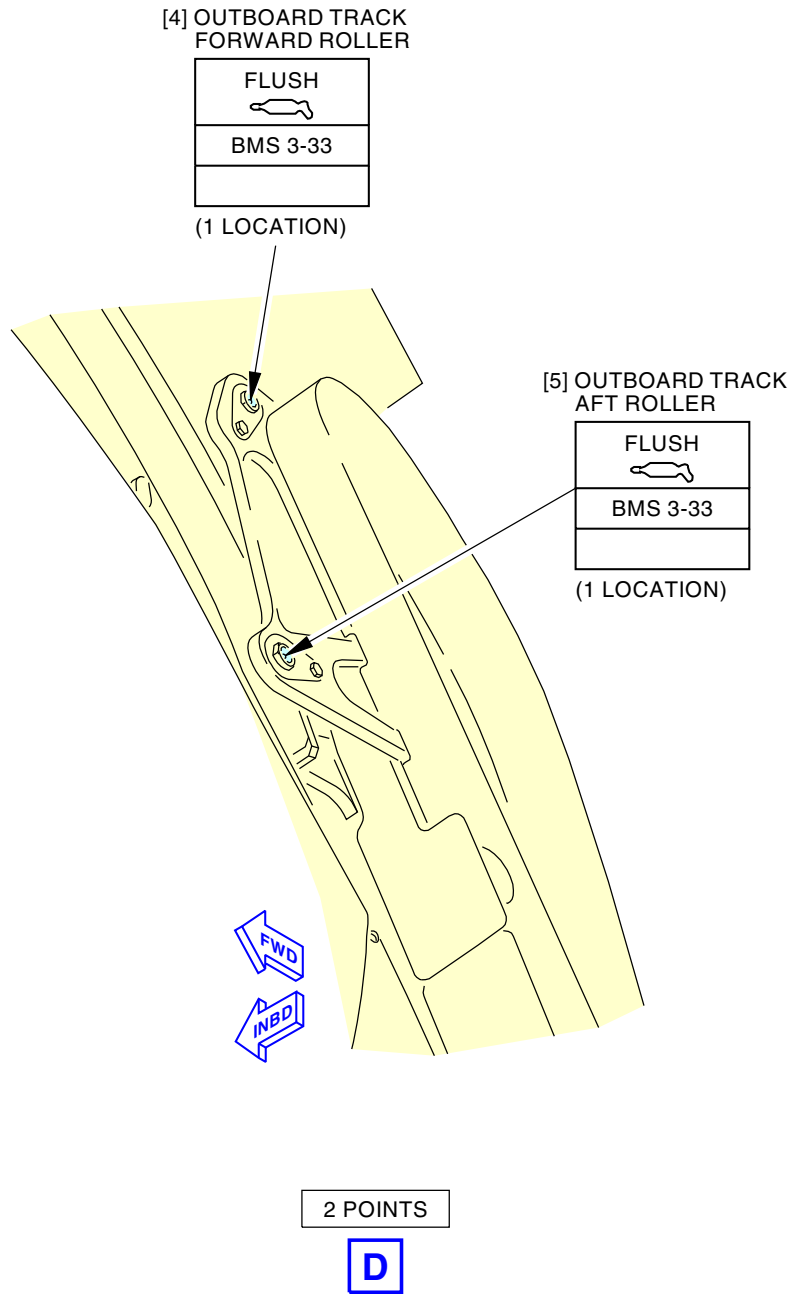
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E26405 S0006401805_V2

Inboard Aft Flap Roller Servicing
Figure 306/12-21-09-990-806 (Sheet 3 of 3)

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TASK 12-21-09-640-804

8. Outboard Flap Outboard Transmission, Ballscrew and Gimbal Lubrication

(Figure 307)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
27-51-00-980-801	Trailing Edge Flap System Manual Operation (P/B 201)
27-51-28-000-801	Outboard Flap Support Fairing Removal (P/B 401)
27-51-28-400-801	Outboard Flap Support Fairing Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
577	Flap Support Fairing No. 1
677	Flap Support Fairing No. 8

D. Prepare for the Lubrication

SUBTASK 12-21-09-860-007

- (1) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

E. Outboard Flap Outboard Transmission, Ballscrew and Gimbal Lubrication

(Table 307)

SUBTASK 12-21-09-040-004

 WARNING	DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-008

- (2) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent.

The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-21-09-640-009

- (3) Lubricate the fittings on the top and bottom of the gimbal with grease, D00633.

NOTE: If the fitting will not accept grease, the lubrication path is possibly clogged. Too much grease pressure can cause damage to the gimbal bushing.

SUBTASK 12-21-09-640-019

- (4) Lubricate the fittings on the U-joint and yoke on the ballscrew with grease, D00633.

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- (a) If additional access is needed in order to lubricate all four zerk fittings, do one of the following steps:
 - 1) Remove the applicable aft fairing (Outboard Flap Support Fairing Removal, TASK 27-51-28-000-801).
 - 2) Manually turn the torque tubes in order to gain access to the necessary zerk fitting(s) (Trailing Edge Flap System Manual Operation, TASK 27-51-00-980-801).
- (b) Lubricate the fittings on the U-joint and yoke on the ballscrew with grease, D00633.
- (c) If additional access was needed, do one of the following steps:
 - 1) Install the applicable aft fairing (Outboard Flap Support Fairing Installation, TASK 27-51-28-400-801).
 - 2) Manually turn the torque tubes back to their original position (Trailing Edge Flap System Manual Operation, TASK 27-51-00-980-801).

SUBTASK 12-21-09-640-010

- (5) Lubricate the ballscrew:
 - (a) Use a clean cloth to clean the ballscrew.
 - (b) Apply a thin layer of grease, D00633 to the shaft of the ballscrew.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-004

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-008

- (2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

Table 307/12-21-09-993-819 Outboard Flap Outboard Transmission, Ballscrew and Gimbal Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	No. 1 Yoke (No. 8 Yoke Equivalent)	grease, D00633	BMS3-33	Zerk	2
2	No. 1 U-Joint (No. 8 U-Joint Equivalent)	grease, D00633	BMS3-33	Zerk	2
3	No. 1 Gimbal (No. 8 Gimbal Equivalent)	grease, D00633	BMS3-33	Zerk	2
4	No. 1 Gimbal Plate (No. 8 Gimbal Equivalent)	grease, D00633	BMS3-33	Zerk	2
5	No. 1 Ballscrew Nut (No. 8 Ballscrew Nut Equivalent)	grease, D00633	BMS3-33	Zerk	2
6	No. 1 Ballscrew (No. 8 Ballscrew Equivalent)	grease, D00633	BMS3-33	Brush	1

————— **END OF TASK** —————

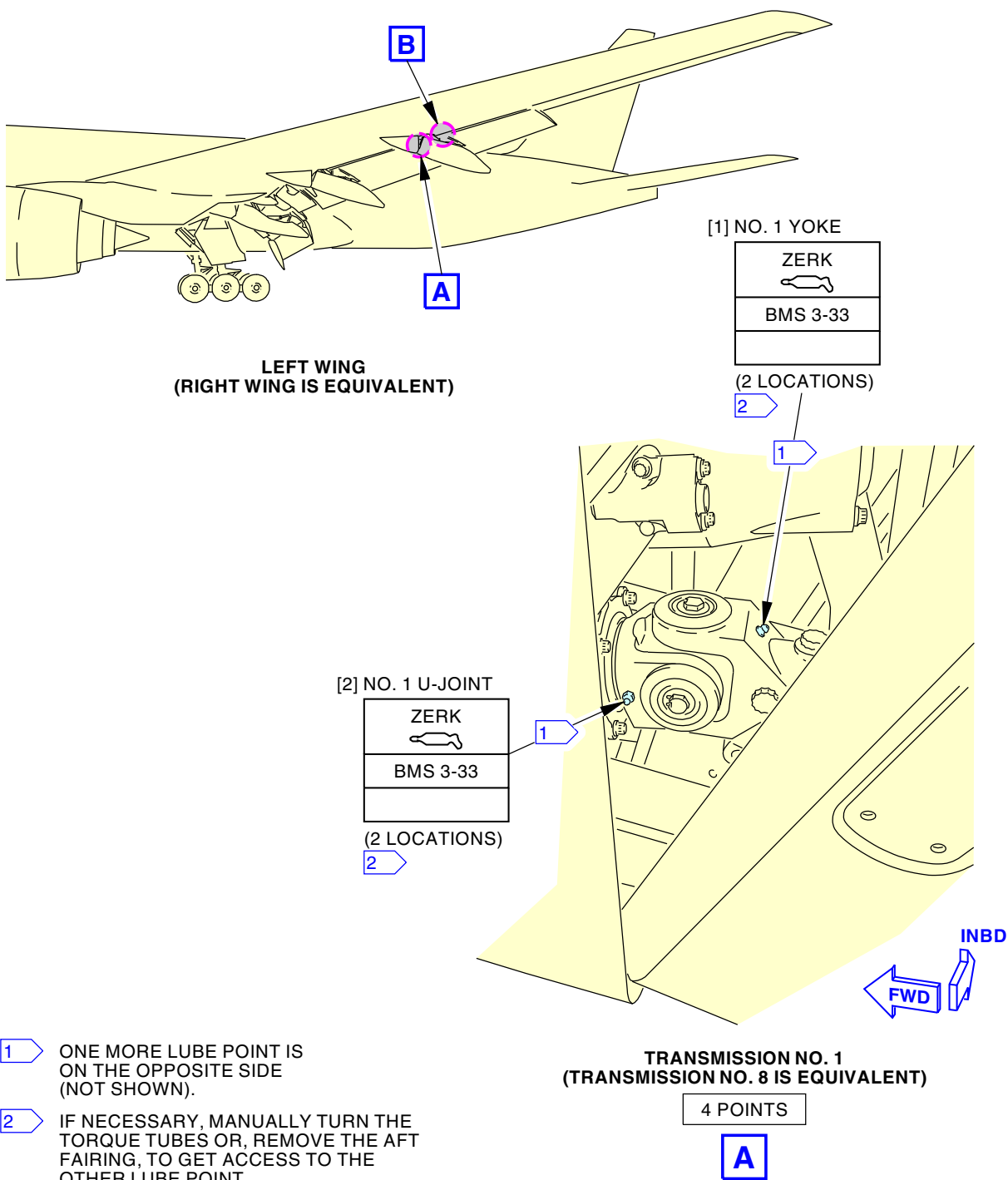
EFFECTIVITY
ARO ALL

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E22564 S0006401808_V3

Outboard Flap Outboard Transmission, Ballscrew and Gimbal Servicing
Figure 307/12-21-09-990-807 (Sheet 1 of 2)

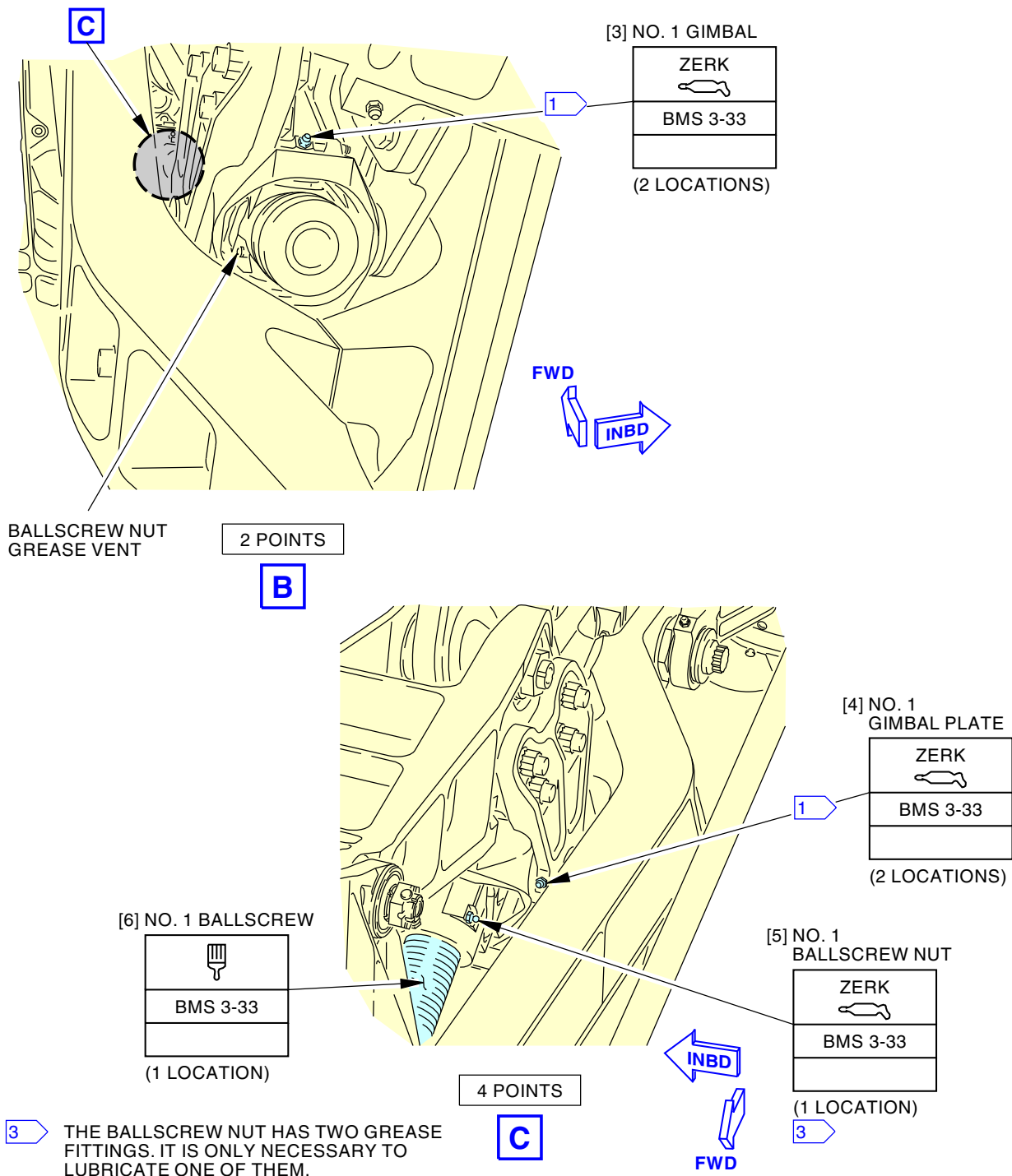
EFFECTIVITY
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E22565 S0006401809_V4

Outboard Flap Outboard Transmission, Ballscrew and Gimbal Servicing
Figure 307/12-21-09-990-807 (Sheet 2 of 2)

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TASK 12-21-09-640-810

9. Outboard Flap Inboard Transmission, Ballscrew and Gimbal Lubrication

(Figure 308)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
27-51-00-980-801	Trailing Edge Flap System Manual Operation (P/B 201)
27-51-28-000-801	Outboard Flap Support Fairing Removal (P/B 401)
27-51-28-400-801	Outboard Flap Support Fairing Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
576	Flap Support Fairing No. 2
676	Flap Support Fairing No. 7

D. Prepare for the Lubrication

SUBTASK 12-21-09-860-016

- (1) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

E. Outboard Flap Inboard Transmission, Ballscrew and Gimbal Lubrication

(Table 308)

SUBTASK 12-21-09-040-010

 WARNING	DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-640-020

- (2) Lubricate the ballscrew nut with grease, D00633.

NOTE: Put grease in the ballscrew nut until new grease comes out of the vent.

The ballscrew nut has two grease fittings. It is only necessary to lubricate one of them.

SUBTASK 12-21-09-640-021

- (3) Lubricate the fittings on the top and bottom of the gimbal with grease, D00633.

NOTE: If the fitting will not accept grease, the lubrication path is possibly clogged. Too much grease pressure can cause damage to the gimbal bushing.

SUBTASK 12-21-09-640-022

- (4) Lubricate the fittings on the U-joint and yoke on the ballscrew with grease, D00633.

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- (a) If additional access is needed in order to lubricate all four zerk fittings, do one of the following steps:
 - 1) Remove the applicable aft fairing (Outboard Flap Support Fairing Removal, TASK 27-51-28-000-801).
 - 2) Manually turn the torque tubes in order to gain access to the necessary zerk fitting(s) (Trailing Edge Flap System Manual Operation, TASK 27-51-00-980-801).
- (b) Lubricate the fittings on the U-joint and yoke on the ballscrew with grease, D00633.
- (c) If additional access was needed, do one of the following steps:
 - 1) Install the applicable aft fairing (Outboard Flap Support Fairing Installation, TASK 27-51-28-400-801).
 - 2) Manually turn the torque tubes back to their original position (Trailing Edge Flap System Manual Operation, TASK 27-51-00-980-801).

SUBTASK 12-21-09-640-023

- (5) Lubricate the ballscrew:
 - (a) Use a clean cloth to clean the ballscrew.
 - (b) Apply a thin layer of grease, D00633 to the shaft of the ballscrew.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-010

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-017

- (2) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

Table 308/12-21-09-993-820 Outboard Flap Inboard Transmission, Ballscrew and Gimbal Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	No. 2 Yoke (No. 7 Yoke Equivalent)	grease, D00633	BMS3-33	Zerk	2
2	No. 2 U-Joint (No. 7 U-Joint Equivalent)	grease, D00633	BMS3-33	Zerk	2
3	No. 2 Gimbal (No. 7 Gimbal Equivalent)	grease, D00633	BMS3-33	Zerk	2
4	No. 2 Gimbal Plate (No. 7 Gimbal Equivalent)	grease, D00633	BMS3-33	Zerk	2
5	No. 2 Ballscrew Nut (No. 7 Ballscrew Nut Equivalent)	grease, D00633	BMS3-33	Zerk	2
6	No. 2 Ballscrew (No. 7 Ballscrew Equivalent)	grease, D00633	BMS3-33	Brush	1

————— **END OF TASK** —————

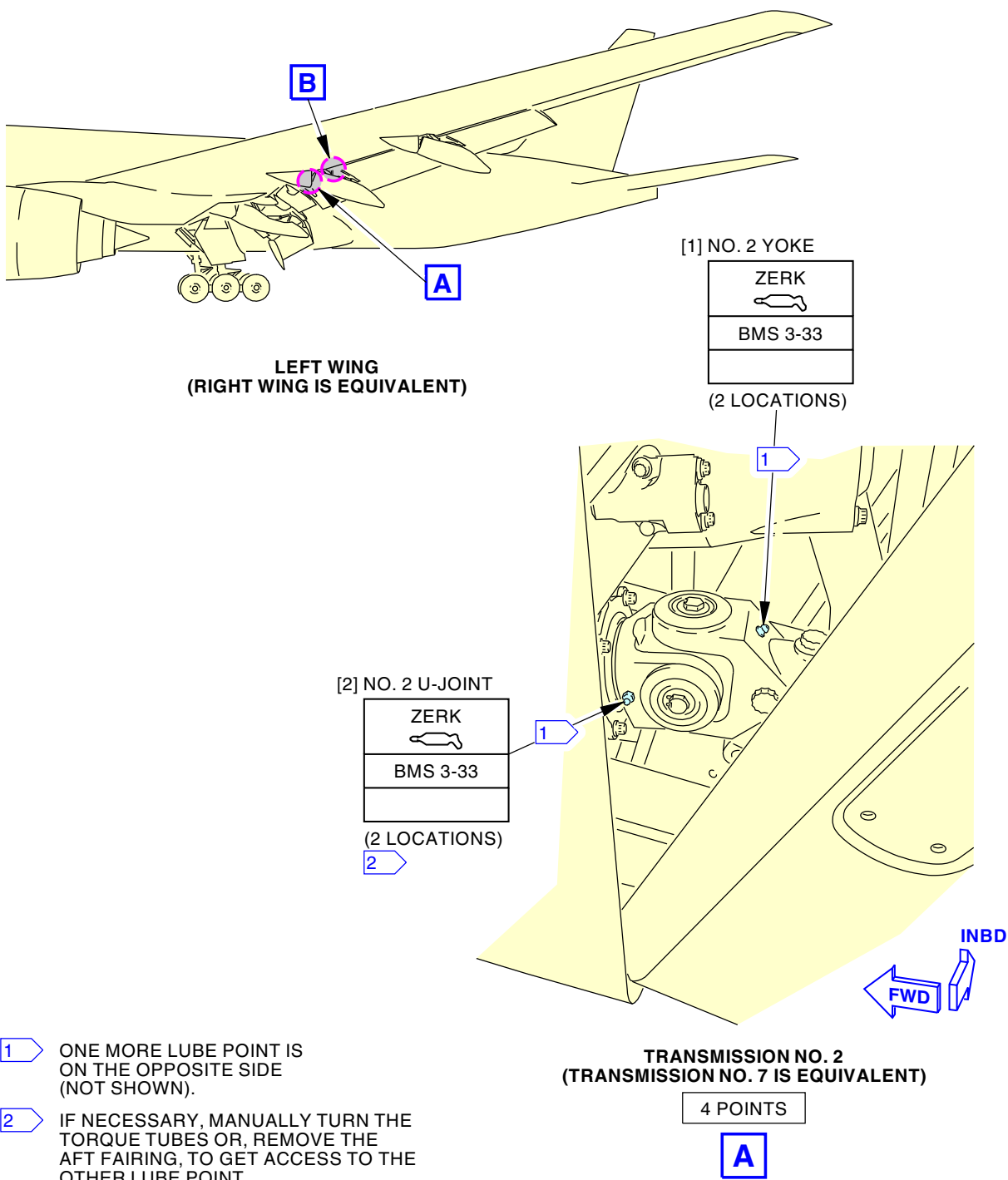
EFFECTIVITY
ARO ALL

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E63577 S0006401812_V3

Outboard Flap Inboard Transmission, Ballscrew and Gimbal Servicing
Figure 308/12-21-09-990-808 (Sheet 1 of 2)

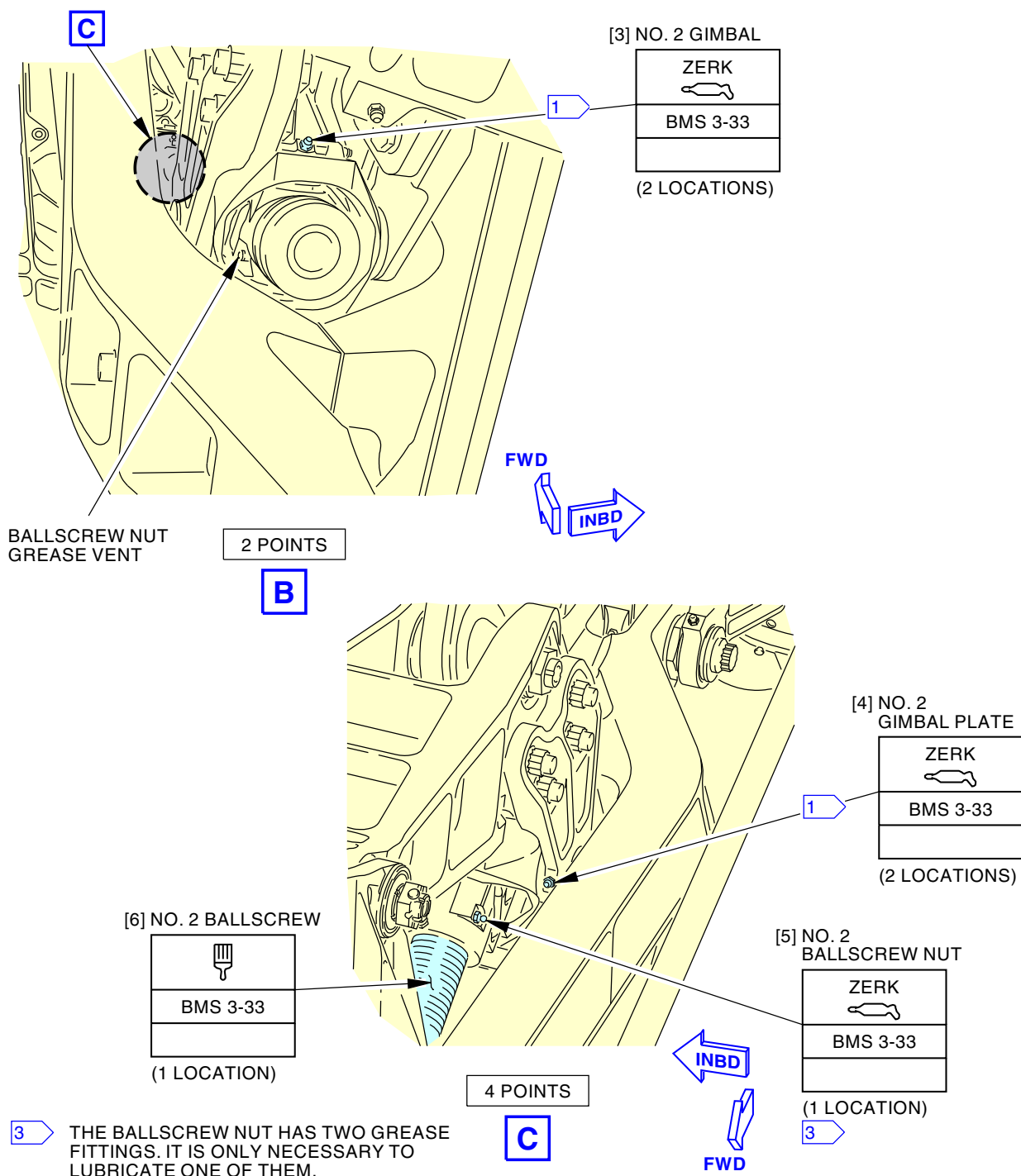
EFFECTIVITY
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E26424 S0006401813_V4

Outboard Flap Inboard Transmission, Ballscrew and Gimbal Servicing
Figure 308/12-21-09-990-808 (Sheet 2 of 2)

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ARO ALL

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TASK 12-21-09-640-805

10. Outboard Flap Outboard Support Mechanism Lubrication

(Figure 309)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
577	Flap Support Fairing No. 1
677	Flap Support Fairing No. 8

D. Access Panels

Number	Name/Location
577BB	Flap Support Fairing No. 1 Panel
677BB	Flap Support Fairing No. 8 Panel

E. Prepare for the Lubrication

SUBTASK 12-21-09-860-009

- (1) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

F. Outboard Flap Outboard Support Mechanism Lubrication

SUBTASK 12-21-09-040-005

 WARNING	DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-010-002

- (2) Remove the applicable access panels from the forward fairing:

<u>Number</u>	<u>Name/Location</u>
577BB	Flap Support Fairing No. 1 Panel
677BB	Flap Support Fairing No. 8 Panel

SUBTASK 12-21-09-640-011

- (3) Lubricate the outboard flap outboard support mechanism with grease, D00633.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-410-003

(1) Install the applicable access panels on the forward fairing:

<u>Number</u>	<u>Name/Location</u>
577BB	Flap Support Fairing No. 1 Panel
677BB	Flap Support Fairing No. 8 Panel

SUBTASK 12-21-09-440-005

(2) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-051

(3) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

Table 309/12-21-09-993-826 Outboard Flap, Outboard Support Mechanism Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Underwing Link	grease, D00633	BMS3-33	Zerk	2
2	Drive Arm	grease, D00633	BMS3-33	Zerk	1
3	Not Used	N/A	N/A	N/A	-
4	Carrier Beam	grease, D00633	BMS3-33	Zerk	1
5	Drive Link Upper Fitting	grease, D00633	BMS3-33	Flush	1
6	Pivot Link	grease, D00633	BMS3-33	Zerk	2
7	Support Link	grease, D00633	BMS3-33	Zerk	3
8	Drive Link Lower Fitting	grease, D00633	BMS3-33	Zerk	1
9	Adjustable Link	grease, D00633	BMS3-33	Flush	2
10	Forward Link	grease, D00633	BMS3-33	Zerk	4

————— END OF TASK —————

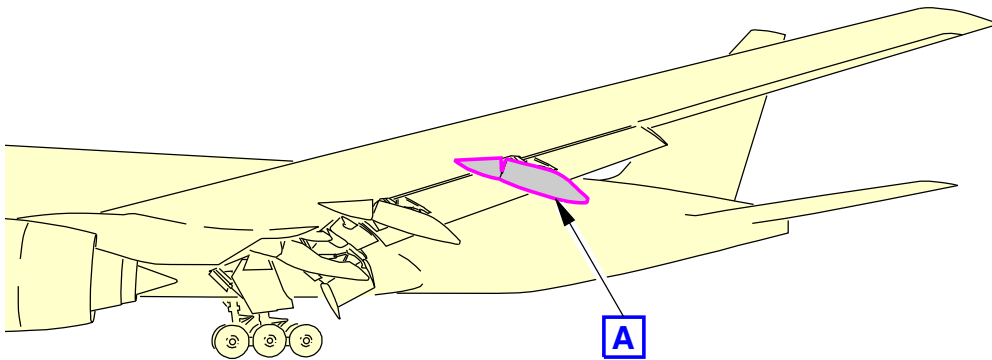
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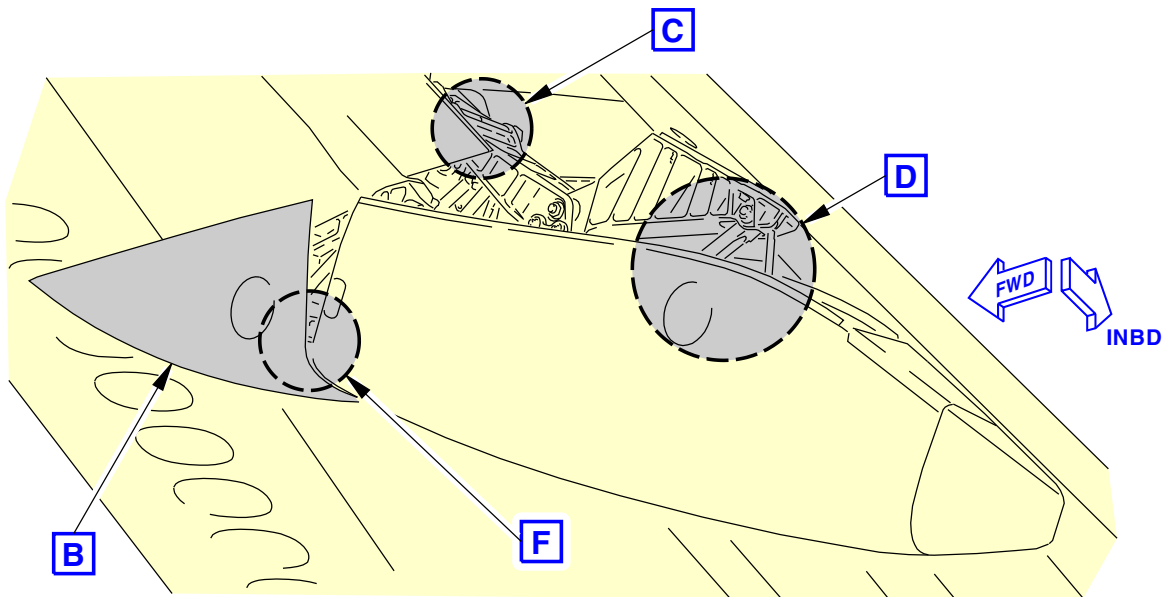
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**LEFT WING
(RIGHT WING IS EQUIVALENT)**



**FLAP SUPPORT NO. 1
(FLAP SUPPORT NO. 8 IS EQUIVALENT)**

A

E22903 S0006401816_V2

**Outboard Flap, Outboard Support Mechanism Servicing
Figure 309/12-21-09-990-809 (Sheet 1 of 5)**

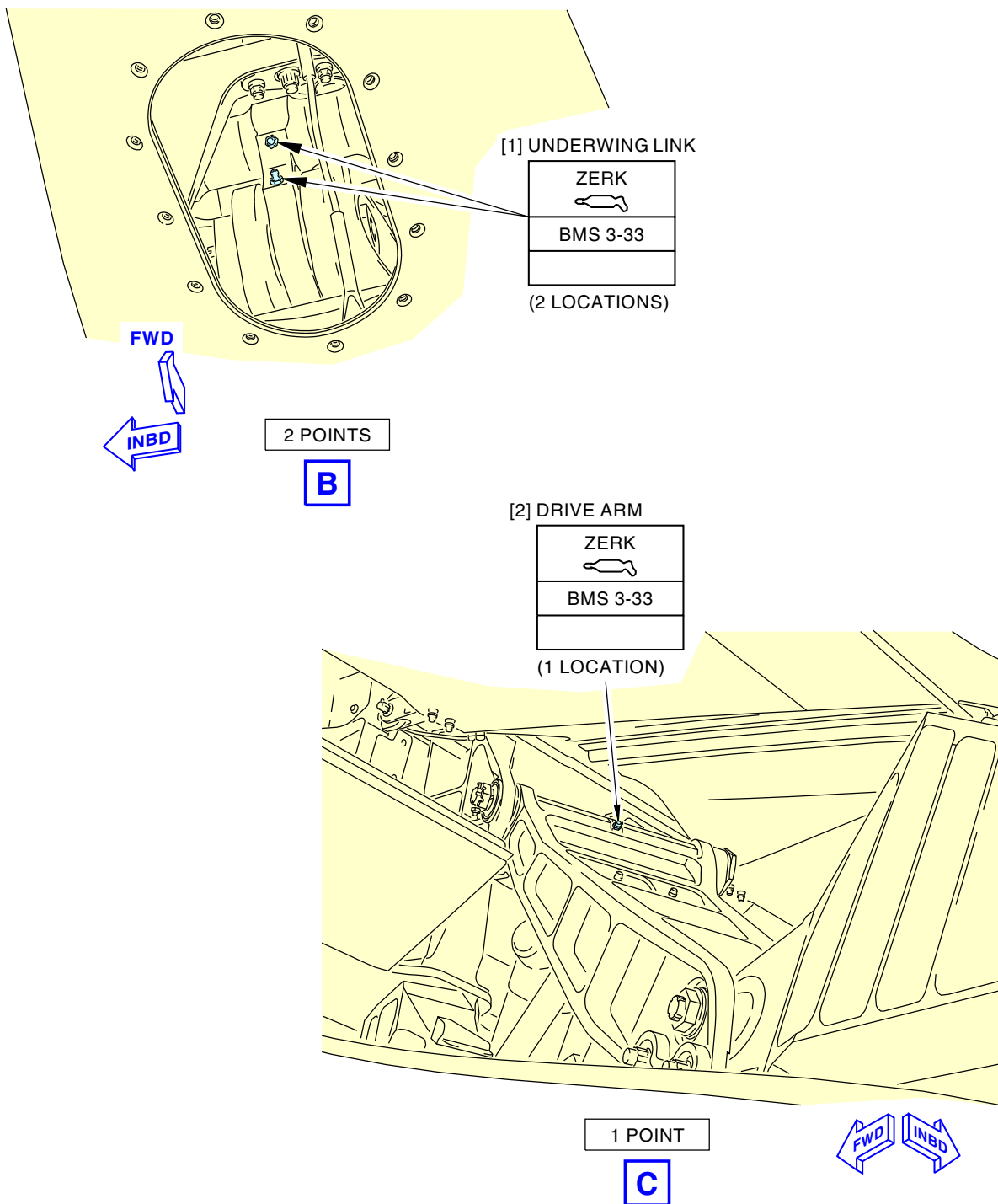
EFFECTIVITY
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J77015 S0000178616_V2

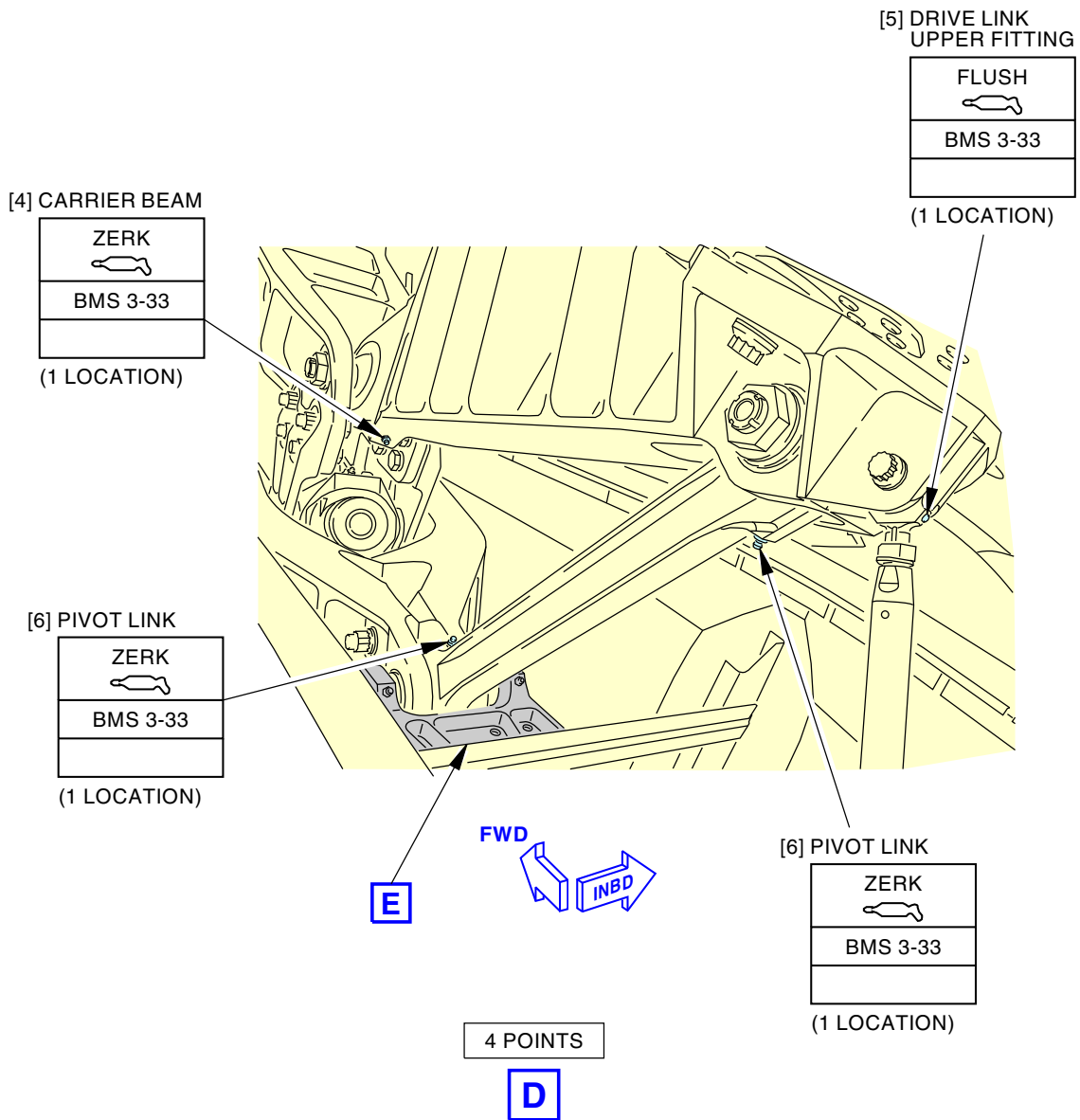
Outboard Flap, Outboard Support Mechanism Servicing
Figure 309/12-21-09-990-809 (Sheet 2 of 5)

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ARO ALL

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E22905 S0006401818_V2

**Outboard Flap, Outboard Support Mechanism Servicing
Figure 309/12-21-09-990-809 (Sheet 3 of 5)**

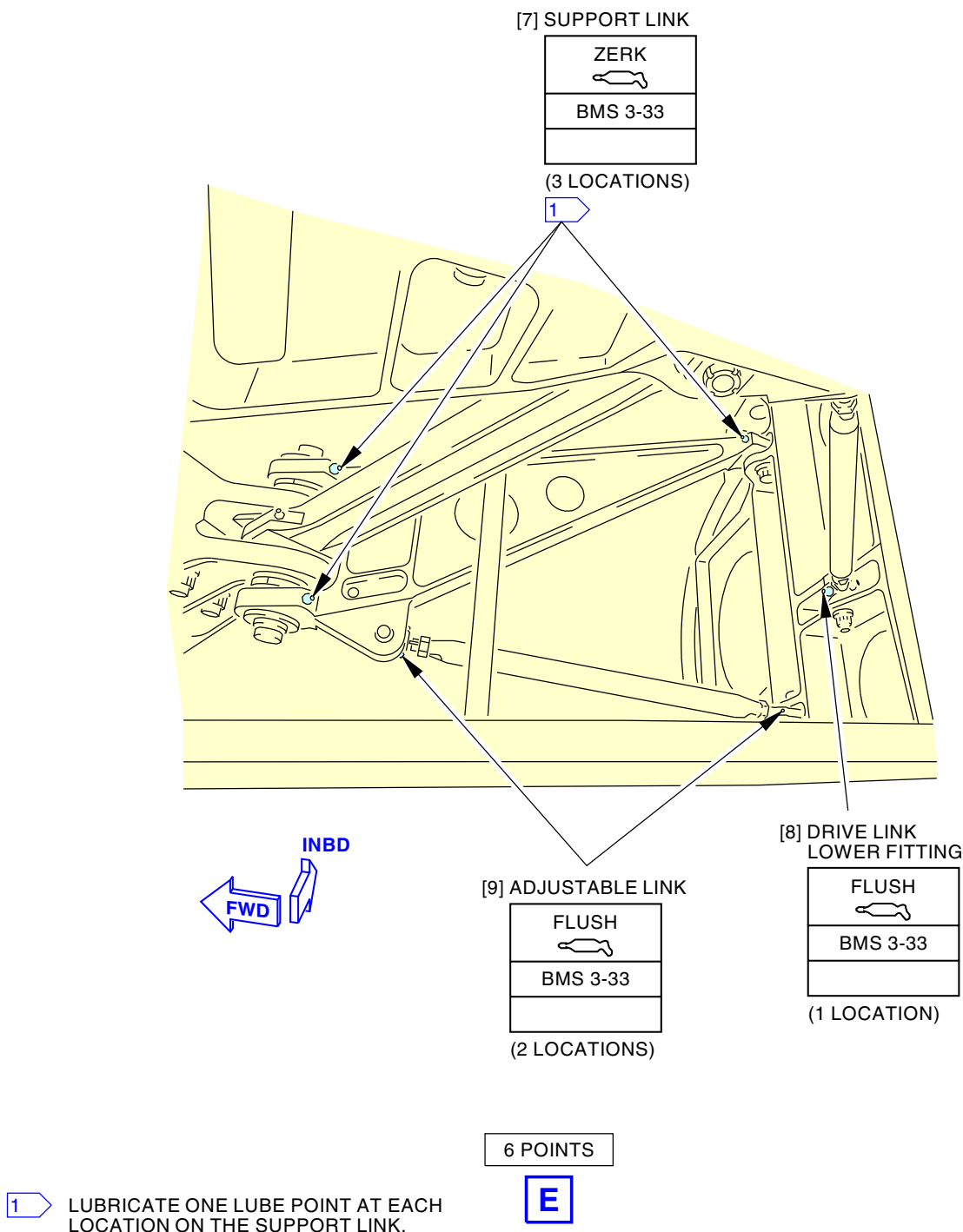
EFFECTIVITY
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E23539 S0006401819_V3

Outboard Flap, Outboard Support Mechanism Servicing
Figure 309/12-21-09-990-809 (Sheet 4 of 5)

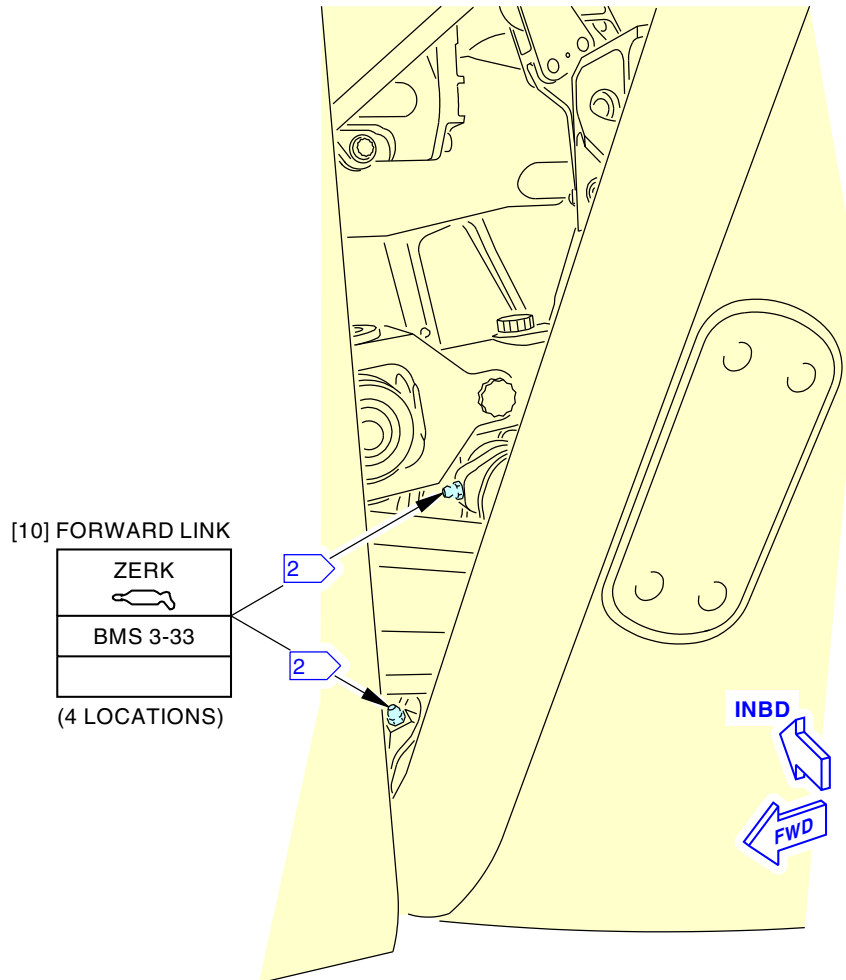
EFFECTIVITY
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4 POINTS

F

2 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

E23538 S0006401820_V2

Outboard Flap, Outboard Support Mechanism Servicing
Figure 309/12-21-09-990-809 (Sheet 5 of 5)

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TASK 12-21-09-640-811

11. Outboard Flap Inboard Support Mechanism Lubrication

(Figure 310)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
576	Flap Support Fairing No. 2
676	Flap Support Fairing No. 7

D. Access Panels

Number	Name/Location
576BB	Flap Support Fairing No. 2 Panel
676BB	Flap Support Fairing No. 7 Panel

E. Prepare for the Lubrication

SUBTASK 12-21-09-860-018

- (1) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

F. Outboard Flap Inboard Support Mechanism Lubrication

(Table 310)

SUBTASK 12-21-09-040-011

 WARNING	DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-09-010-003

- (2) Remove the applicable access panels from the forward fairing:

<u>Number</u>	<u>Name/Location</u>
576BB	Flap Support Fairing No. 2 Panel
676BB	Flap Support Fairing No. 7 Panel

SUBTASK 12-21-09-640-024

- (3) Lubricate the outboard flap inboard support mechanism with grease, D00633.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-410-004

(1) Install the applicable access panels on the forward fairing:

<u>Number</u>	<u>Name/Location</u>
576BB	Flap Support Fairing No. 2 Panel
676BB	Flap Support Fairing No. 7 Panel

SUBTASK 12-21-09-440-011

(2) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-052

(3) Retract the trailing edge flaps to the retracted position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

Table 310/12-21-09-993-827 Outboard Flap, Inboard Support Mechanism Servicing

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Underwing Link	grease, D00633	BMS3-33	Zerk	2
2	Drive Arm	grease, D00633	BMS3-33	Zerk	1
3	Not Used	N/A	N/A	N/A	-
4	Carrier Beam	grease, D00633	BMS3-33	Zerk	1
5	Drive Link	grease, D00633	BMS3-33	Flush	2
6	Pivot Link	grease, D00633	BMS3-33	Zerk	2
7	Support Link	grease, D00633	BMS3-33	Zerk	3
8	Adjustable Link	grease, D00633	BMS3-33	Flush	2
9	Forward Link	grease, D00633	BMS3-33	Zerk	4

————— **END OF TASK** —————

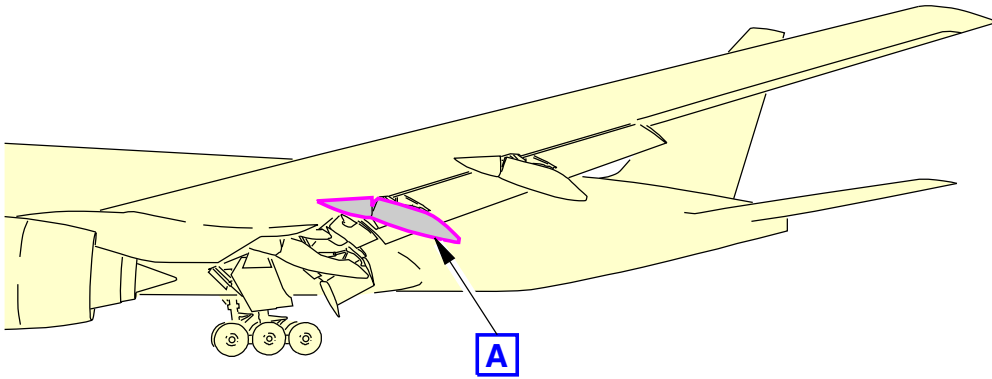
EFFECTIVITY
ARO ALL

12-21-09

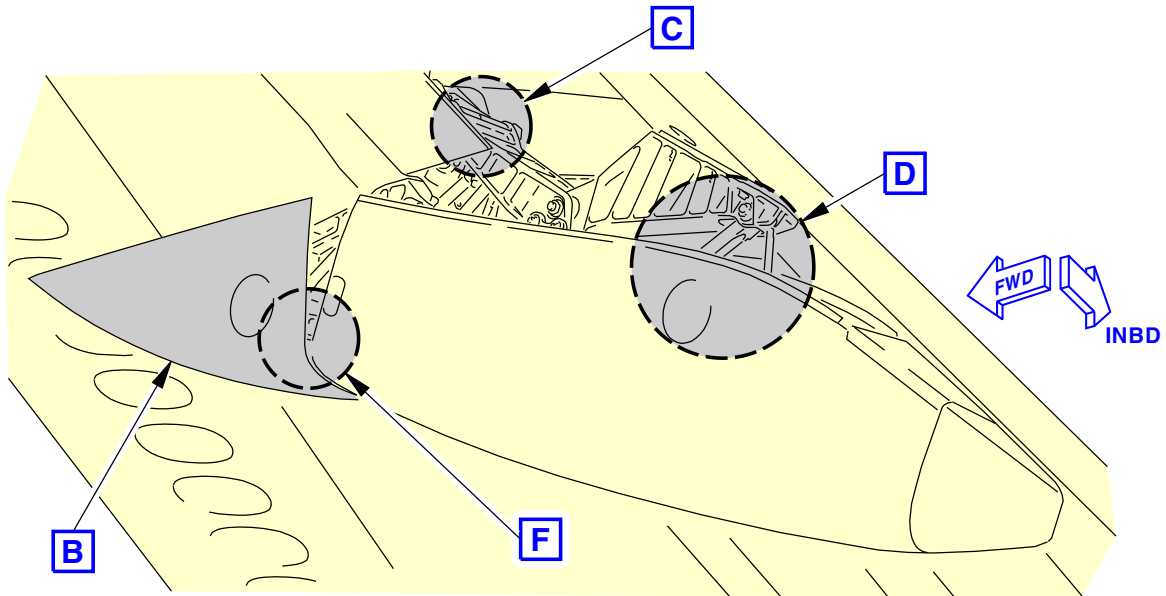
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**LEFT WING
(RIGHT WING IS EQUIVALENT)**



**FLAP SUPPORT NO. 2
(FLAP SUPPORT NO. 7 IS EQUIVALENT)**

A

E23200 S0006401823_V2

**Outboard Flap, Inboard Support Mechanism Servicing
Figure 310/12-21-09-990-810 (Sheet 1 of 5)**

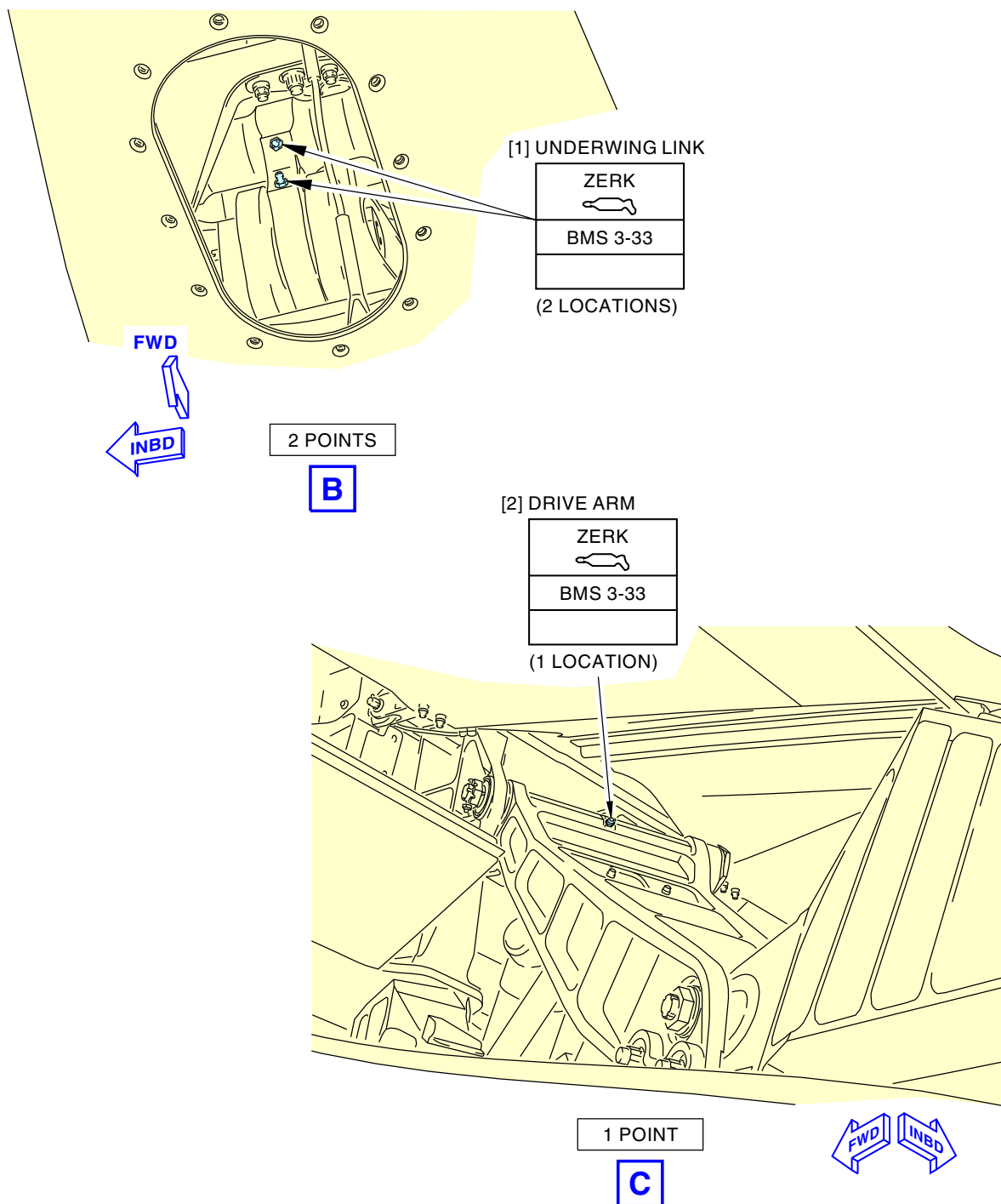
EFFECTIVITY
ARO ALL

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12-21-09

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J77122 S0000178596_V2

Outboard Flap, Inboard Support Mechanism Servicing
Figure 310/12-21-09-990-810 (Sheet 2 of 5)

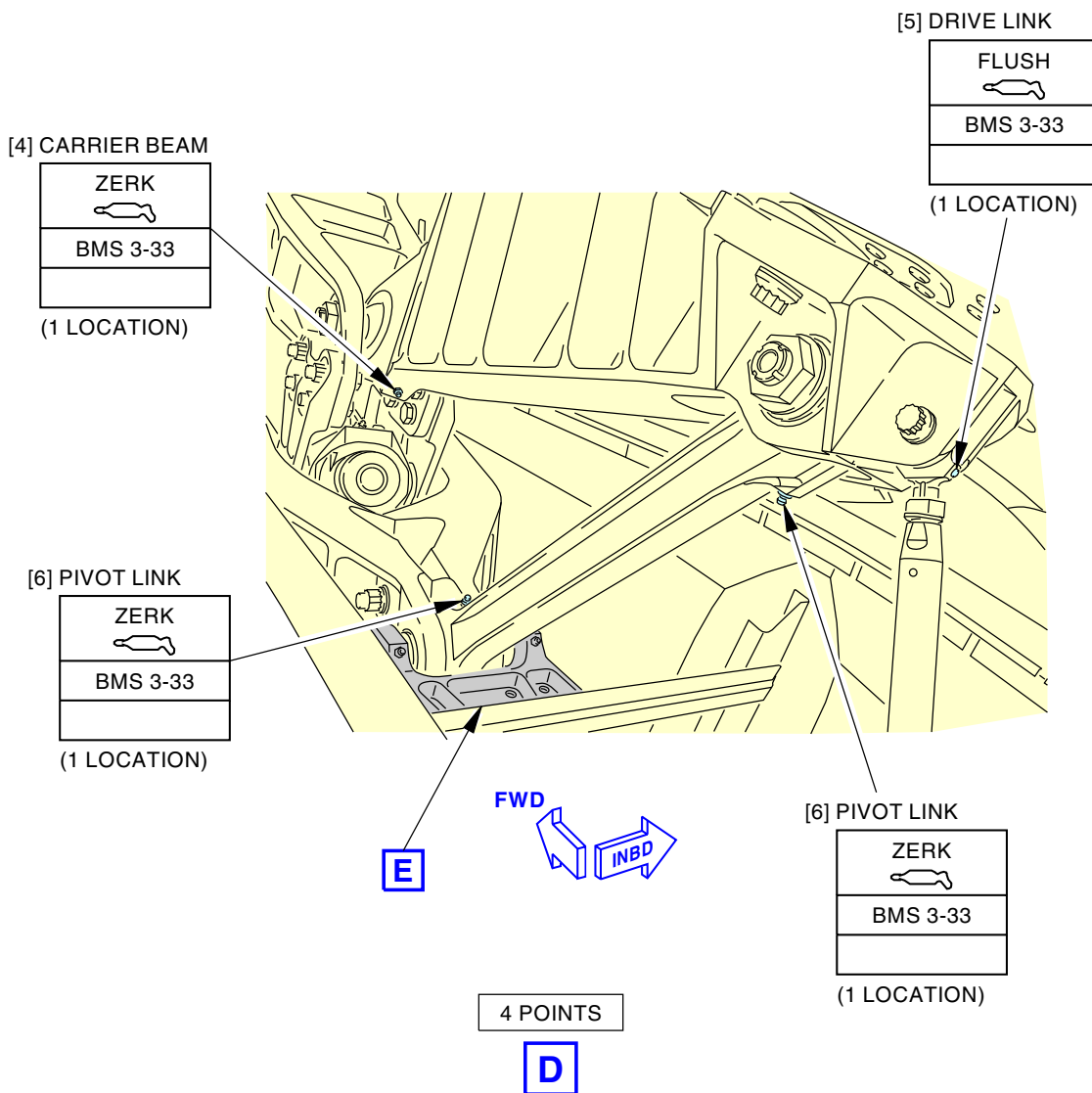
EFFECTIVITY
ARO ALL

12-21-09

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E23202 S0006401825_V2

**Outboard Flap, Inboard Support Mechanism Servicing
Figure 310/12-21-09-990-810 (Sheet 3 of 5)**

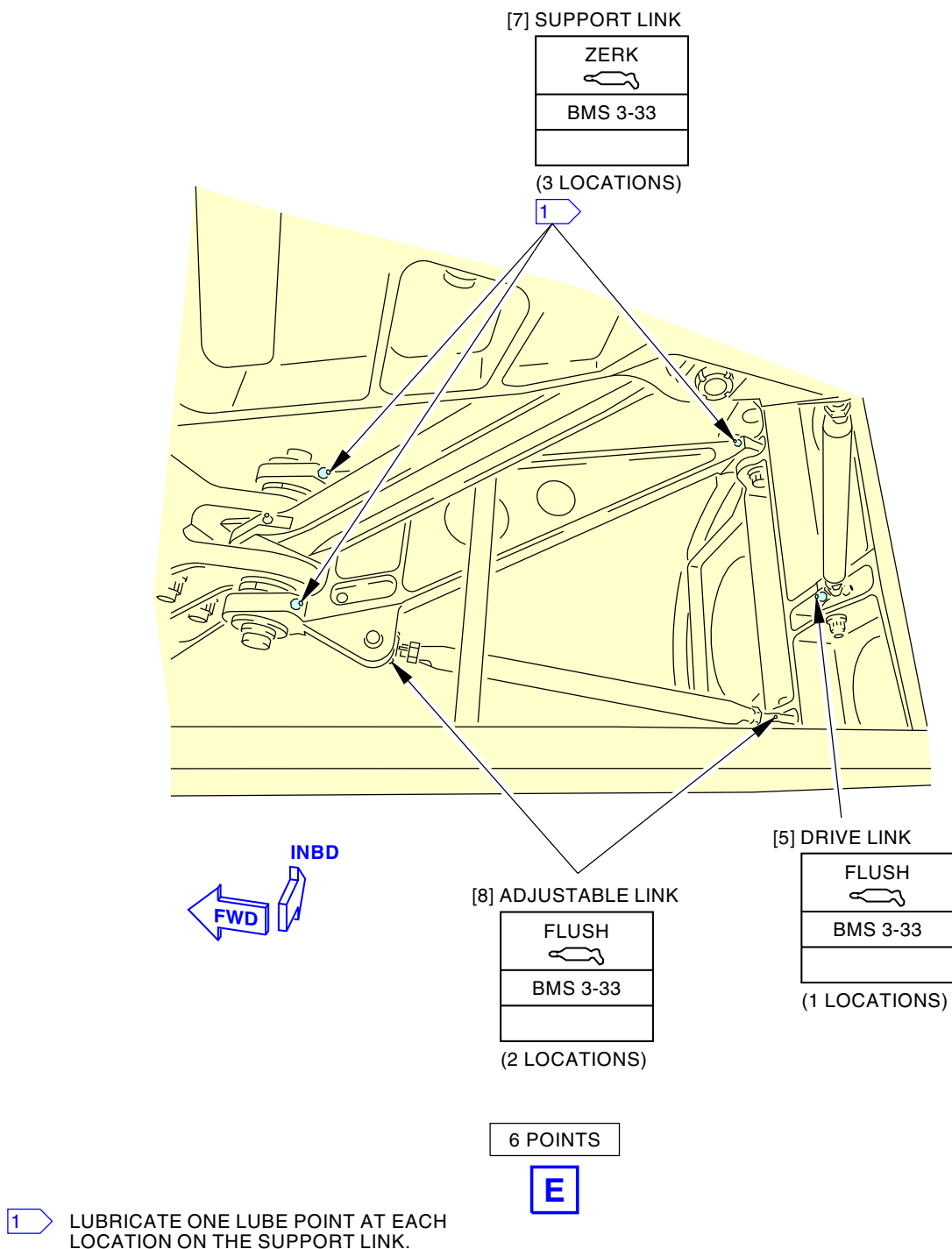
EFFECTIVITY
ARO ALL

12-21-09

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E23530 S0006401826_V3

Outboard Flap, Inboard Support Mechanism Servicing
Figure 310/12-21-09-990-810 (Sheet 4 of 5)

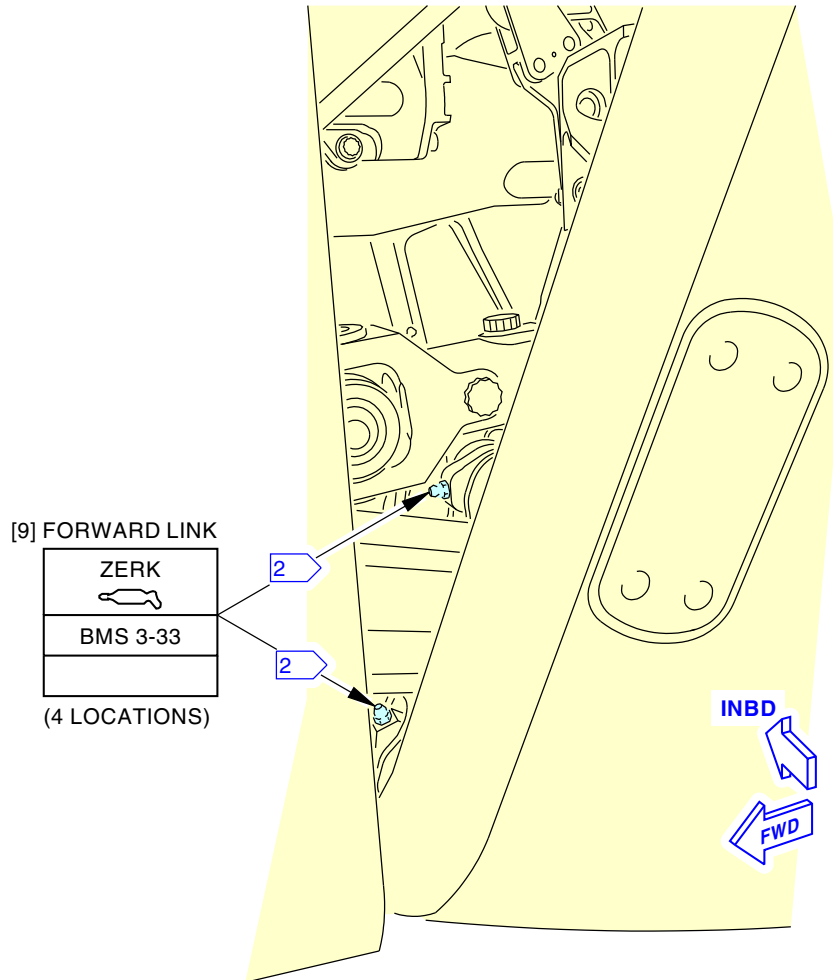
EFFECTIVITY
ARO ALL

12-21-09

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4 POINTS

F

2 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

E23516 S0006401827_V2

Outboard Flap, Inboard Support Mechanism Servicing
Figure 310/12-21-09-990-810 (Sheet 5 of 5)

EFFECTIVITY
ARO ALL

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TASK 12-21-09-640-806

12. Outboard Auxiliary Support Track and Carriage Lubrication

(Figure 311)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
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)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
578	Outboard Auxiliary Support Fairing - Left Wing
678	Outboard Auxiliary Support Fairing - Right Wing

D. Prepare for the Lubrication

SUBTASK 12-21-09-860-020

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

SUBTASK 12-21-09-210-003



WARNING

MAKE SURE THE THRUST REVERSER COWLS ARE CLOSED WHEN YOU OPERATE THE FLAPS AND SLATS. THE SLATS CAN HIT THE THRUST REVERSER COWLS IF THEY ARE OPEN. THIS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Make sure the thrust reverser cowls are closed.

SUBTASK 12-21-09-210-001



CAUTION

MAKE SURE 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) Make sure the Air-Driven Pump (ADP) door is fully open or fully closed.

EFFECTIVITY
ARO ALL

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SUBTASK 12-21-09-860-021



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.

- (4) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-09-860-022

- (5) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 12-21-09-860-023

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

SUBTASK 12-21-09-040-006



DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

E. Outboard Auxiliary Support Track and Carriage Lubrication

(Table 311)

SUBTASK 12-21-09-640-012

- (1) Lubricate the outboard auxiliary support track and carriage with grease, D00633.
- (a) Clean the upper and lower surface of the track and carriage after lubrication to remove the unwanted grease, D00633 (Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-22-110-802).

NOTE: Grease or oil on the Auxiliary Support tracks can attract dirt and debris. This causes the rollers to bind and damages the surface of the track.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-440-006

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-024



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.

- (2) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-09-860-025

- (3) Retract the trailing edge flaps to the UP position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

EFFECTIVITY
ARO ALL

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SUBTASK 12-21-09-860-026

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

Table 311/12-21-09-993-823 Outboard Auxiliary Support Track and Carriage Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Outboard Carriage	grease, D00633	BMS3-33	Zerk	2
2	Outboard Track	grease, D00633	BMS3-33	Zerk	2

———— **END OF TASK** ————

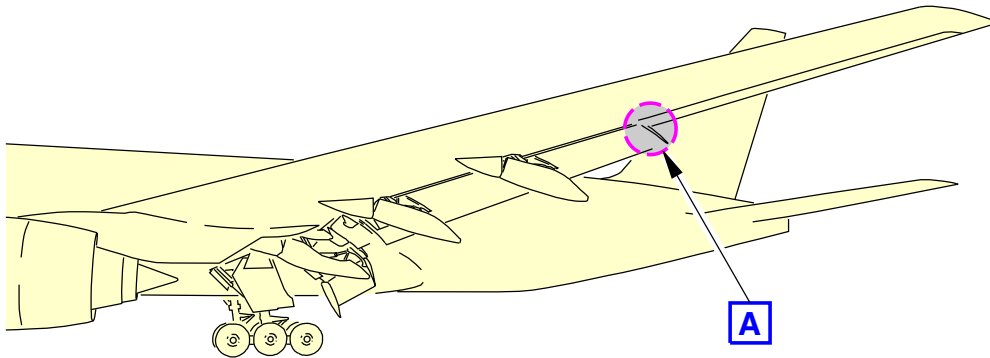
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ARO ALL

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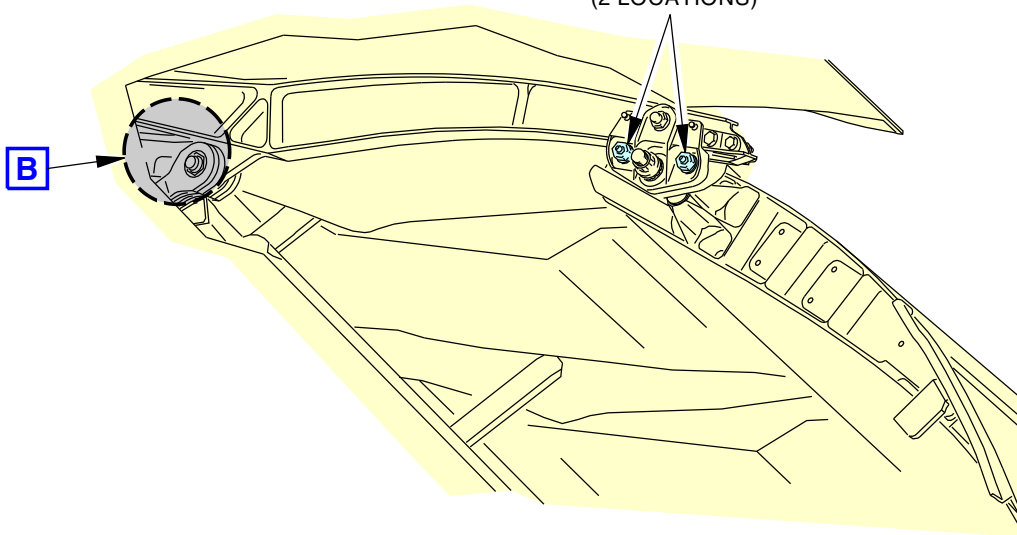
LEFT WING
(RIGHT WING IS EQUIVALENT)

[1] OUTBOARD CARRIAGE

ZERK

BMS 3-33

(2 LOCATIONS)



OUTBOARD AUXILIARY SUPPORT TRACK

2 POINTS

A

E23196 S0006401830_V2

Outboard Auxiliary Support Track and Carriage Servicing
Figure 311/12-21-09-990-811 (Sheet 1 of 2)

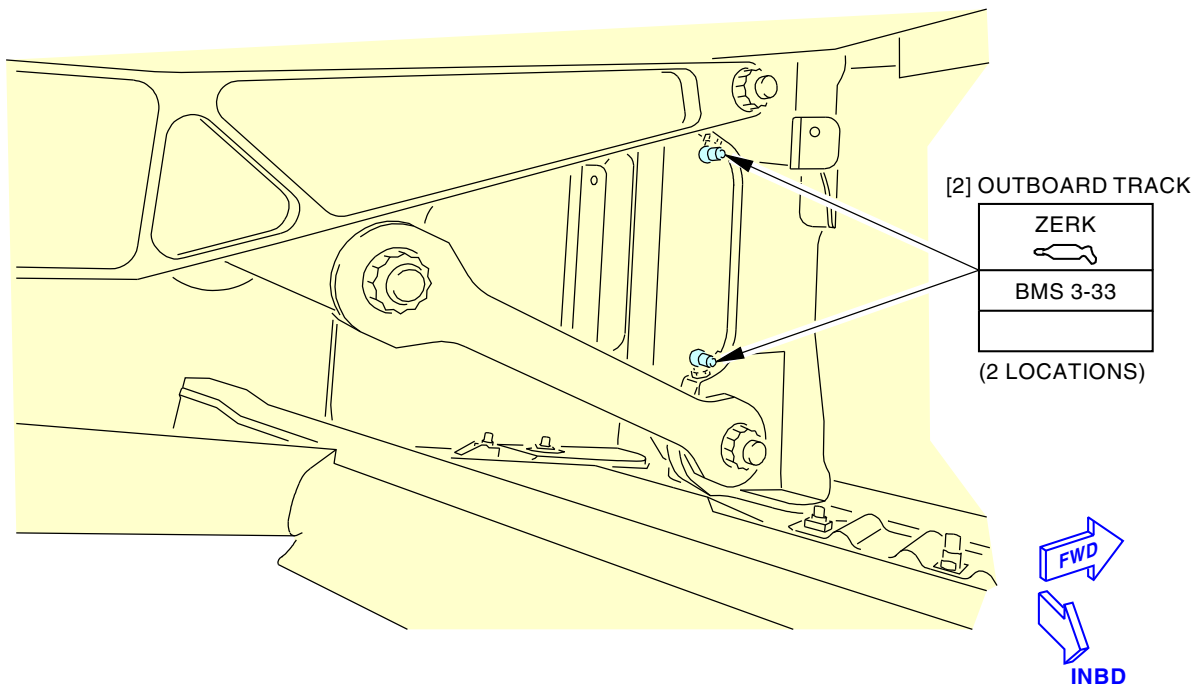
EFFECTIVITY
ARO ALL

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2 POINTS

B

E23198 S0006401831_V2

Outboard Auxiliary Support Track and Carriage Servicing
Figure 311/12-21-09-990-811 (Sheet 2 of 2)

EFFECTIVITY
ARO ALL

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TASK 12-21-09-640-812

13. Inboard Auxiliary Support Track and Carriage Lubrication

(Figure 312)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
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)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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)

B. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
567	Left Wing Outboard Flap
667	Right Wing Outboard Flap

D. Prepare for the Lubrication

SUBTASK 12-21-09-860-029

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

SUBTASK 12-21-09-210-005



WARNING

MAKE SURE THE THRUST REVERSER COWLS ARE CLOSED WHEN YOU OPERATE THE FLAPS AND SLATS. THE SLATS CAN HIT THE THRUST REVERSER COWLS IF THEY ARE OPEN. THIS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Make sure the thrust reverser cowls are closed.

SUBTASK 12-21-09-210-006



CAUTION

MAKE SURE 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) Make sure the Air-Driven Pump (ADP) door is fully open or fully closed.

EFFECTIVITY
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SUBTASK 12-21-09-860-030



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.

- (4) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-09-860-031

- (5) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 12-21-09-860-032

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

SUBTASK 12-21-09-040-012



DO THE TRAILING EDGE FLAP DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE FLAP SYSTEM. WITH THE FLAPS ACTIVATED, THE FLAPS CAN MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

E. Inboard Auxiliary Support Track and Carriage Lubrication

(Table 312)

SUBTASK 12-21-09-640-026

- (1) From above the flap, lubricate the inboard auxiliary support carriage with grease, D00633.
- (a) Clean the upper and lower surface of the track and carriage after lubrication to remove unwanted grease, D00633 (Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-22-110-802).

NOTE: Grease or oil on the Auxiliary Support tracks can attract dirt and debris. This causes the rollers to bind and damages the surface of the track.

SUBTASK 12-21-09-640-025

- (2) Lubricate the inboard auxiliary support track with grease, D00633.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-09-860-033

- (1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-034



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.

- (2) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

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SUBTASK 12-21-09-860-035

- (3) Retract the trailing edge flaps to the UP position. To retract them, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-09-860-036

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

Table 312/12-21-09-993-824 Inboard Auxiliary Support Track and Carriage Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Inboard Carriage	grease, D00633	BMS3-33	Zerk	2
2	Inboard Track	grease, D00633	BMS3-33	Zerk	2

————— **END OF TASK** —————

EFFECTIVITY
ARO ALL

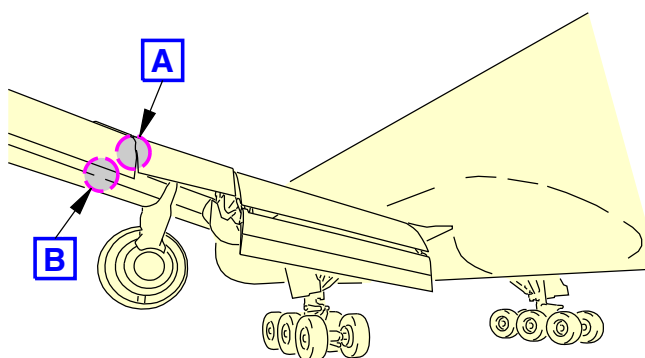
12-21-09

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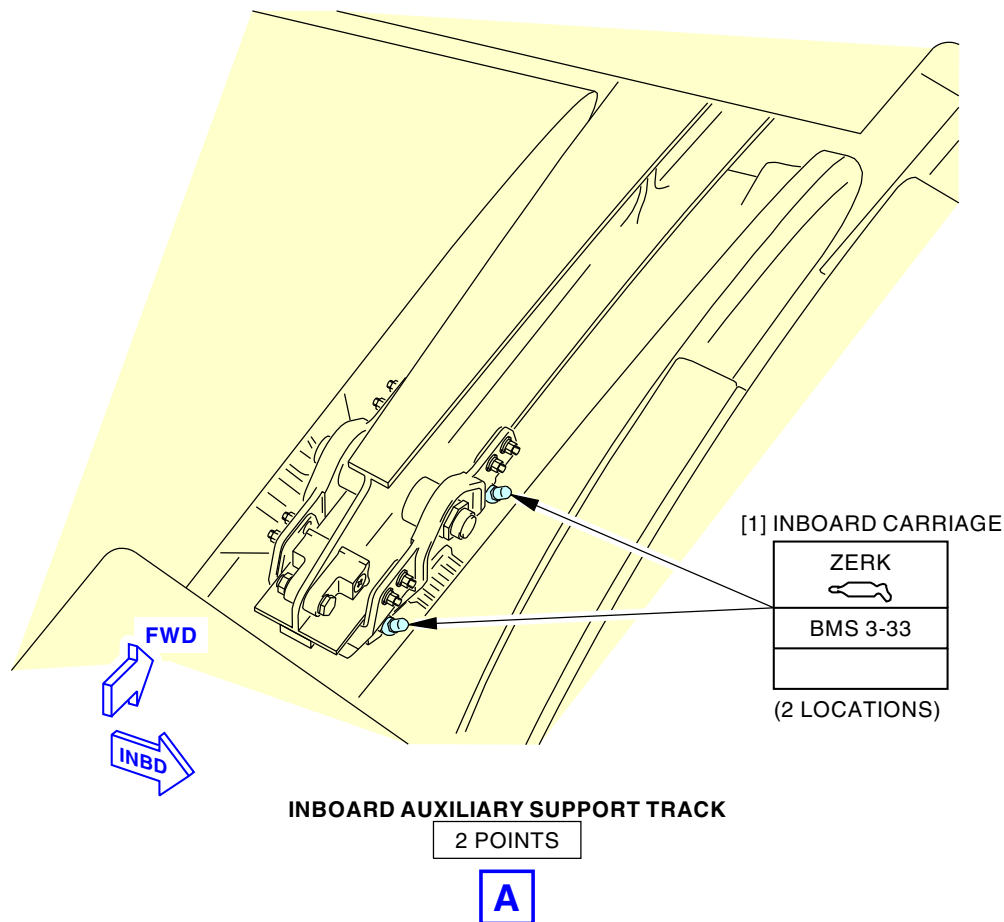
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LEFT WING
(RIGHT WING IS EQUIVALENT)



E63637 S0006401834_V2

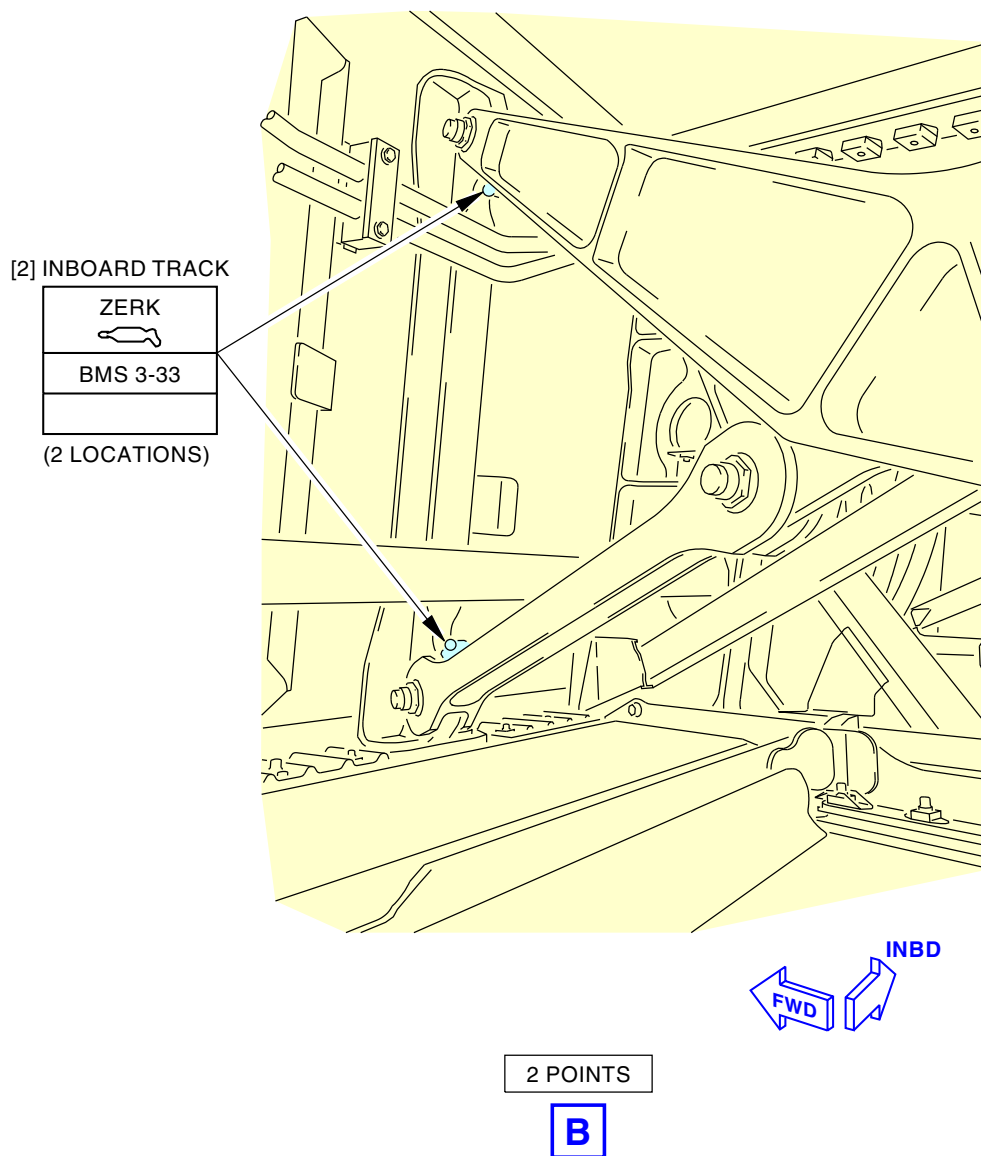
Inboard Auxiliary Support Track and Carriage Servicing
Figure 312/12-21-09-990-812 (Sheet 1 of 2)

EFFECTIVITY
ARO ALL

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E23199 S0006401835_V2

**Inboard Auxiliary Support Track and Carriage Servicing
Figure 312/12-21-09-990-812 (Sheet 2 of 2)**

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TASK 12-21-09-600-801

14. Flap Skew Sensor - Lubrication

(Figure 313)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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)
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
D00633	Grease - Aircraft General Purpose	BMS3-33

C. Location Zones

Zone	Area
555	Left Wing Inboard Main Flap
567	Left Wing Outboard Flap
571	Flap Support Fairing No. 4
573	Flap Support Fairing No. 3
576	Flap Support Fairing No. 2
577	Flap Support Fairing No. 1
655	Right Wing Inboard Main Flap
667	Right Wing Outboard Flap
671	Flap Support Fairing No. 5
673	Flap Support Fairing No. 6
676	Flap Support Fairing No. 7
677	Flap Support Fairing No. 8

D. Prepare for Lubrication

SUBTASK 12-21-09-760-001

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

SUBTASK 12-21-09-480-011



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

EFFECTIVITY
ARO ALL

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SUBTASK 12-21-09-480-012



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 12-21-09-860-039



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.

- (4) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-09-210-007



WARNING

MAKE SURE THAT THE THRUST REVERSER COWLS ARE CLOSED WHEN YOU OPERATE THE FLAPS AND SLATS. THE SLATS CAN HIT THE THRUST REVERSER COWLS IF THEY ARE OPEN. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (5) Make sure the thrust reverser cowls are closed.

SUBTASK 12-21-09-210-008



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.

- (6) Make sure the Air-Driven Pump (ADP) door is fully open or fully closed.

SUBTASK 12-21-09-860-041

- (7) Extend the trailing edge flaps to the 30-unit position. To extend them, do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 12-21-09-860-042

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

SUBTASK 12-21-09-860-043



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE TRAILING EDGE FLAP BEFORE YOU DO WORK ON THE FLAP SYSTEM. THE FLAPS MOVE QUICKLY. THEY CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (9) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

E. Lubricate the Flap Skew Sensor

SUBTASK 12-21-09-640-030

- (1) Lubricate the inboard and outboard flap skew sensors using grease, D00633 (Figure 313).

EFFECTIVITY
ARO ALL

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Table 313/12-21-09-993-829

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
[1]	FORWARD CONTROL ROD	grease, D00633	BMS3-33	FLUSH	1
[2]	FLAP SKEW SENSOR	grease, D00633	BMS3-33	ZERK	2
[3]	AFT CONTROL ROD	grease, D00633	BMS3-33	FLUSH	1
[4]	FORWARD CONTROL ROD	grease, D00633	BMS3-33	FLUSH	1
[5]	FLAP SKEW SENSOR	grease, D00633	BMS3-33	ZERK	2
[6]	AFT CONTROL ROD	grease, D00633	BMS3-33	FLUSH	1
[7]	FLAP SKEW SENSOR	grease, D00633	BMS3-33	ZERK	2
[8]	LOWER CONTROL ROD END	grease, D00633	BMS3-33	FLUSH	1
[9]	UPPER CONTROL ROD END	grease, D00633	BMS3-33	FLUSH	1
[10]	FLAP SKEW SENSOR	grease, D00633	BMS3-33	ZERK	2
[11]	AFT CONTROL ROD END	grease, D00633	BMS3-33	FLUSH	1
[12]	FORWARD CONTROL ROD END	grease, D00633	BMS3-33	FLUSH	1

F. Put the Airplane Back Its Usual Condition

SUBTASK 12-21-09-860-044

(1) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-09-860-045



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.

(2) For the center hydraulic system, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.

SUBTASK 12-21-09-860-046

(3) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-09-860-047

(4) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

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SUBTASK 12-21-09-860-048



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

———— **END OF TASK** ————

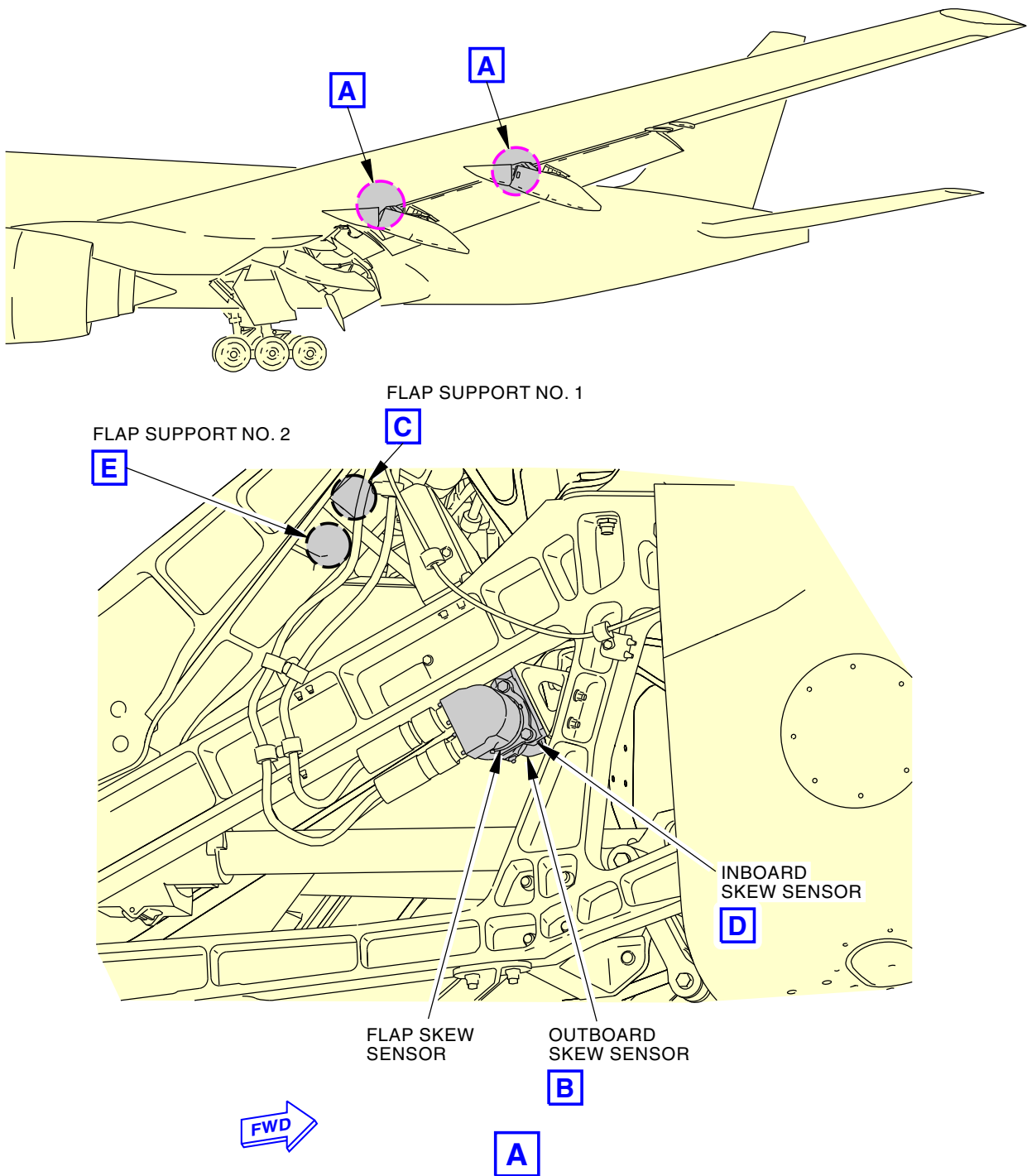
EFFECTIVITY
ARO ALL

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2002443 S0000392481_V2

Flap Skew Sensor Lubrication
Figure 313/12-21-09-990-814 (Sheet 1 of 7)

EFFECTIVITY
ARO ALL

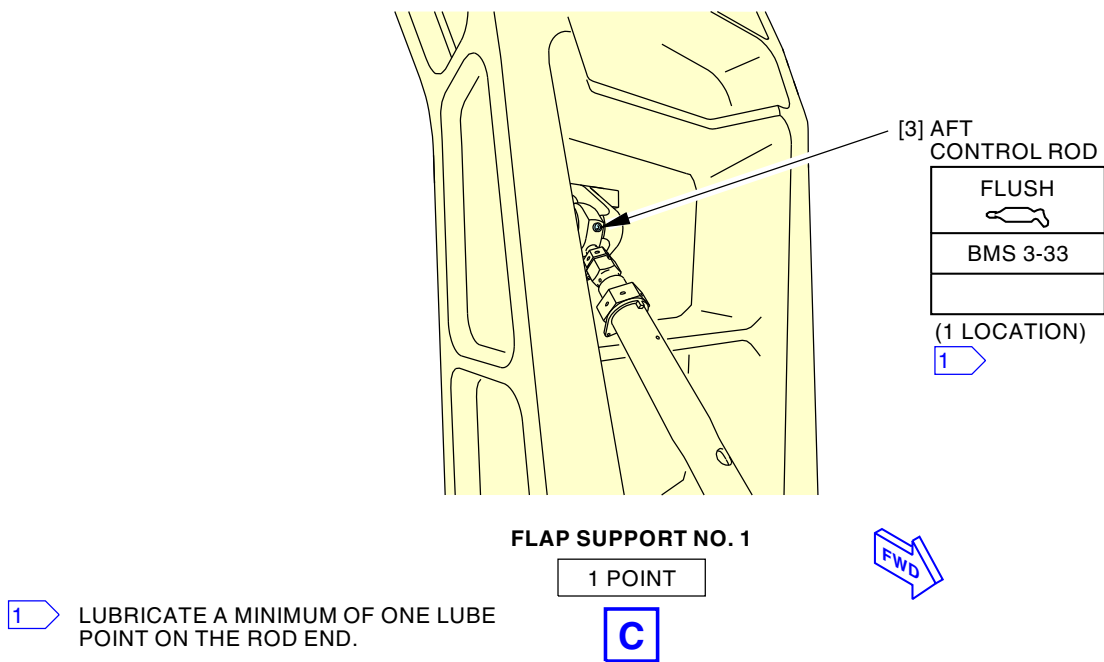
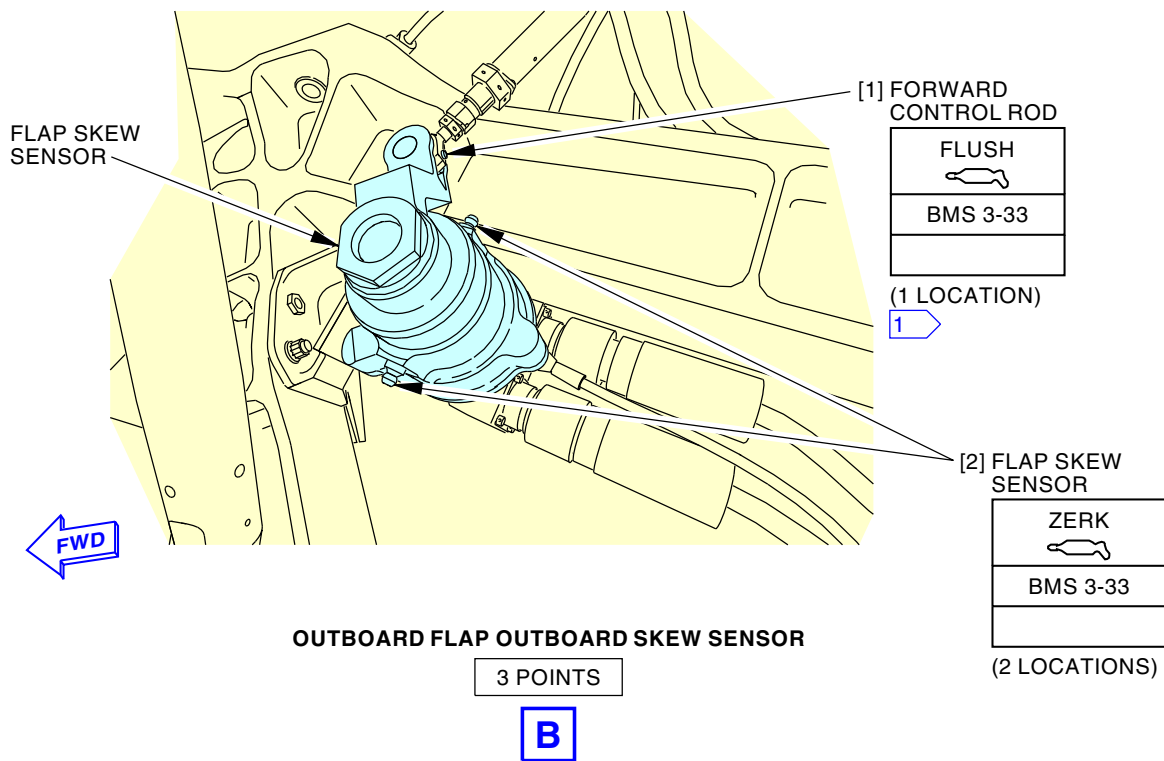
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2002635 S0000392482_V2

Flap Skew Sensor Lubrication
Figure 313/12-21-09-990-814 (Sheet 2 of 7)

EFFECTIVITY
ARO ALL

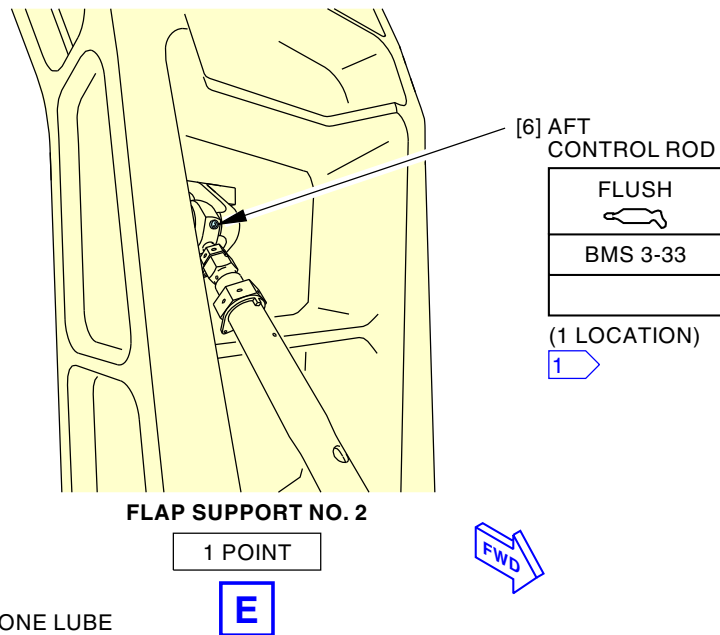
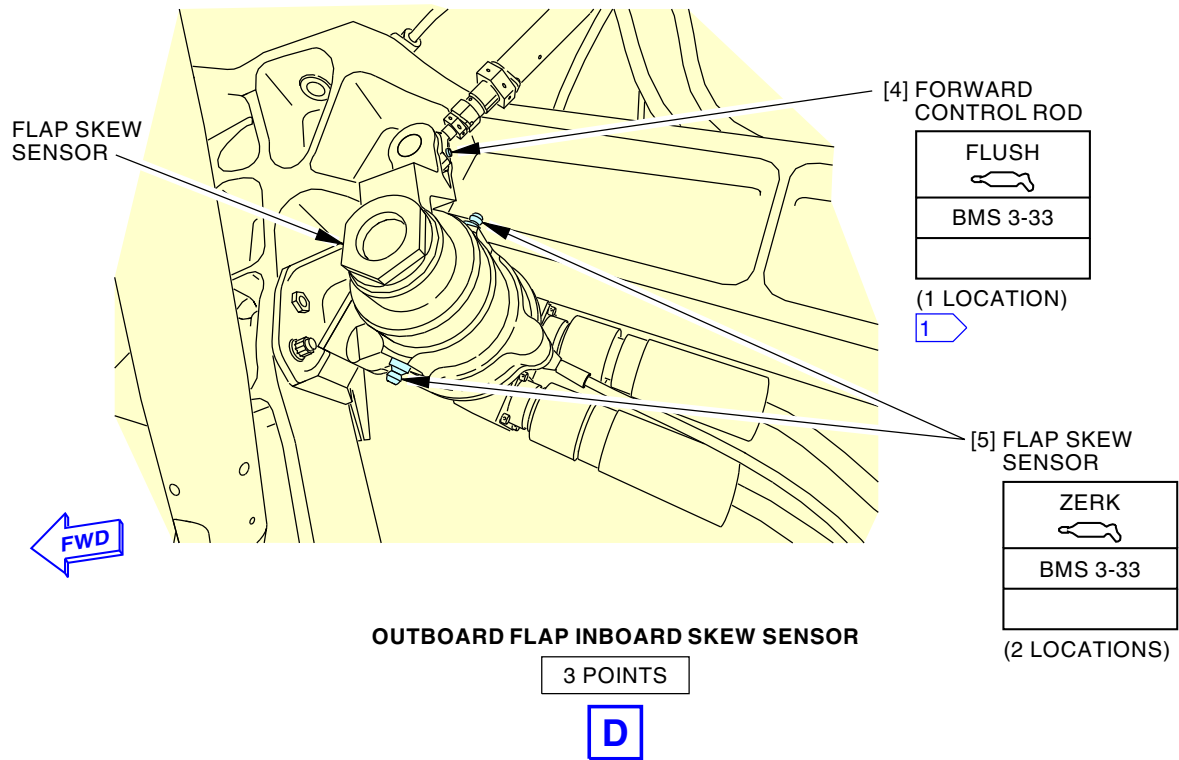
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1 LUBRICATE A MINIMUM OF ONE LUBE POINT ON THE ROD END.

2004236 S0000393178_V2

Flap Skew Sensor Lubrication
Figure 313/12-21-09-990-814 (Sheet 3 of 7)

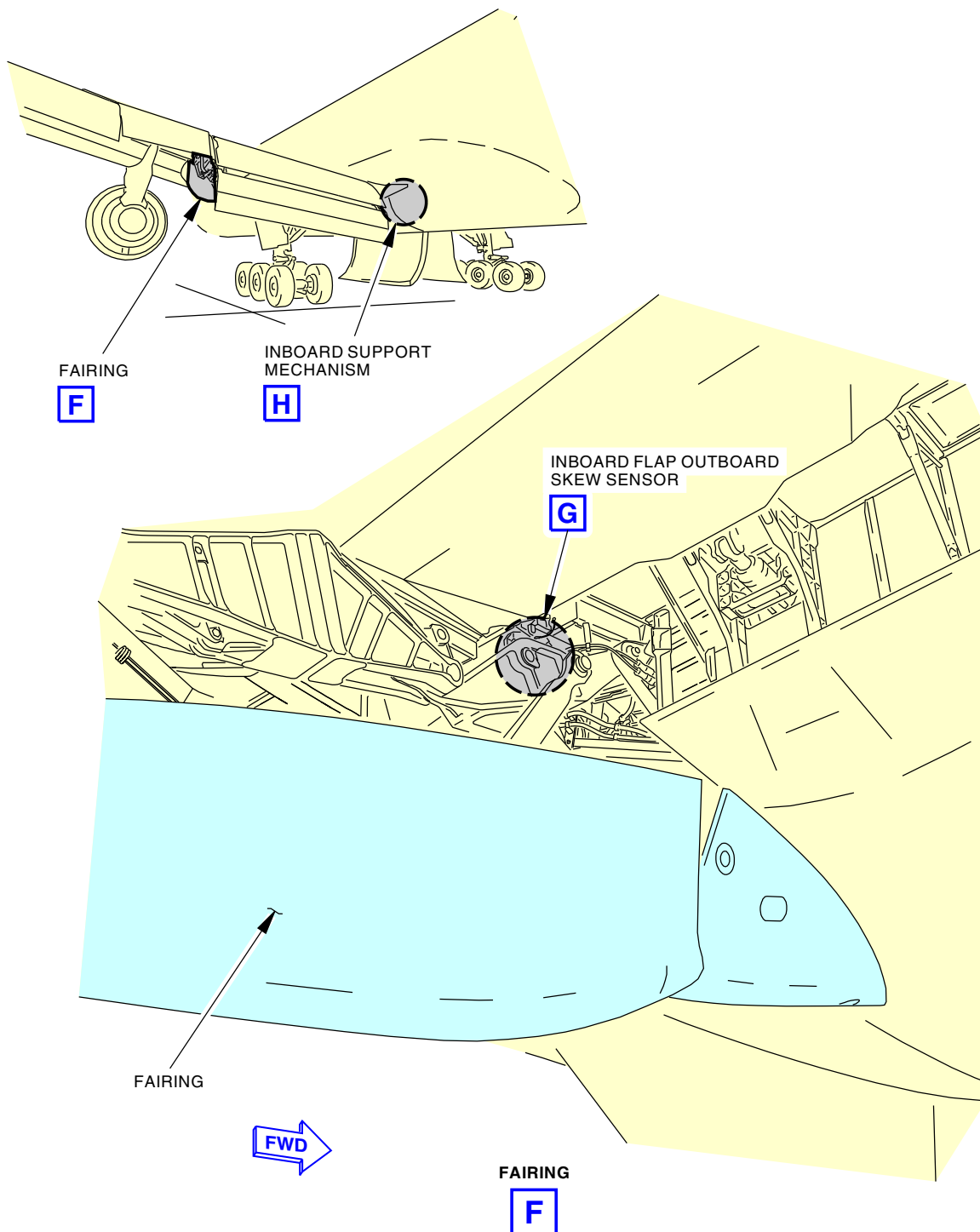
EFFECTIVITY
ARO ALL

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2002646 S0000392483_V3

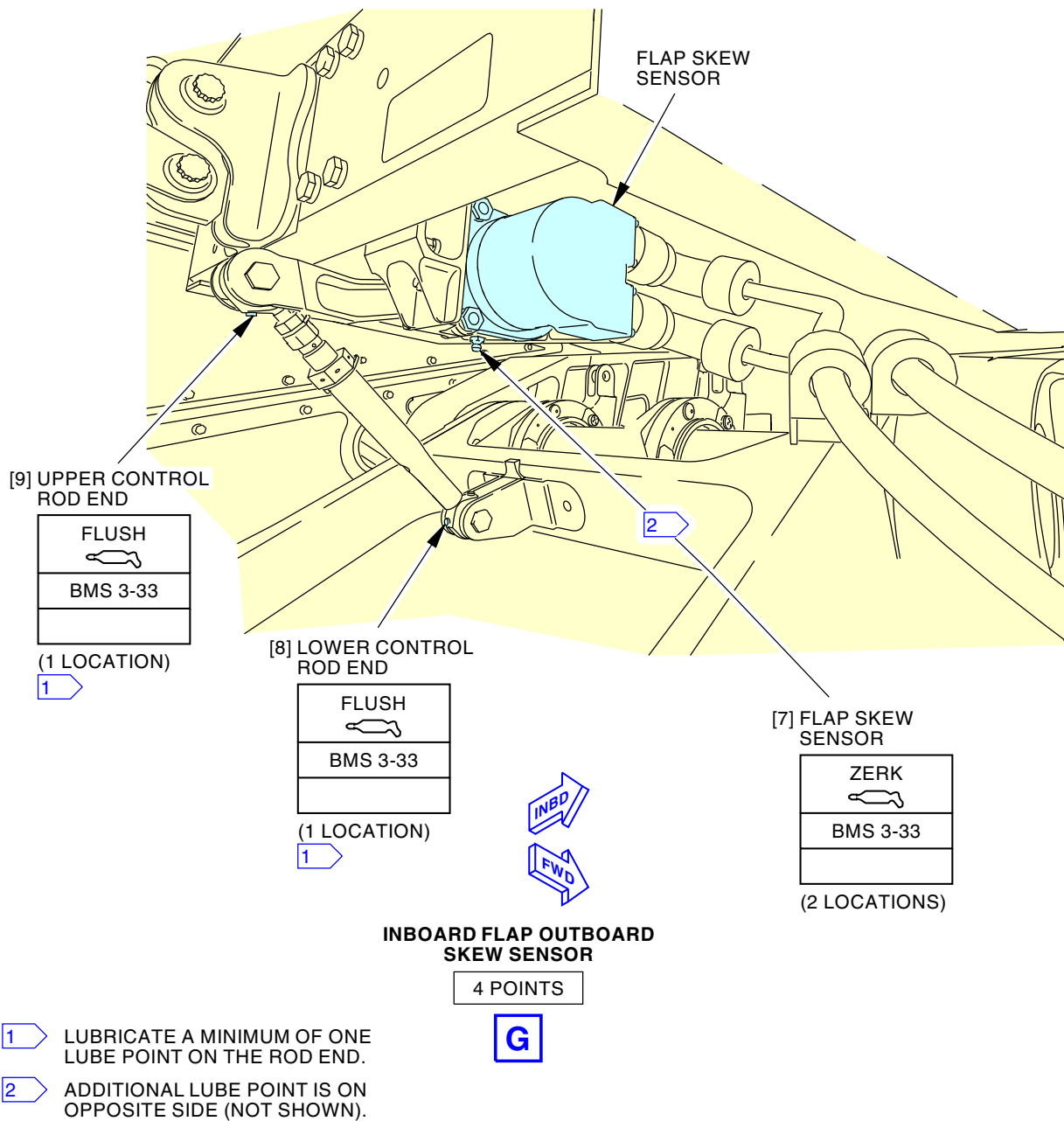
**Flap Skew Sensor Lubrication
Figure 313/12-21-09-990-814 (Sheet 4 of 7)**

**EFFECTIVITY
ARO ALL**

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2002779 S0000392581_V2

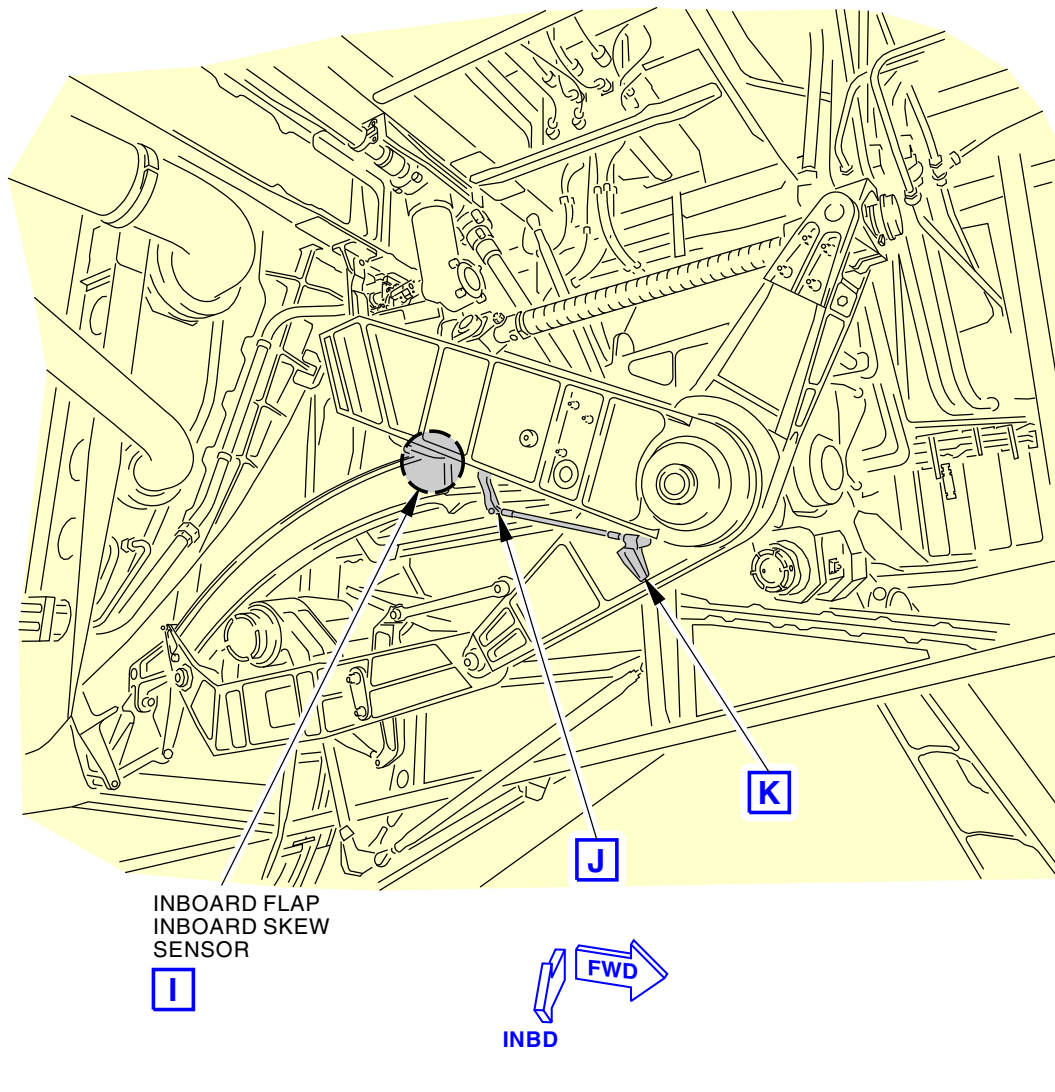
**Flap Skew Sensor Lubrication
Figure 313/12-21-09-990-814 (Sheet 5 of 7)**

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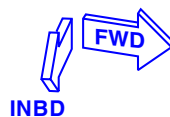
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INBOARD FLAP
INBOARD SKEW
SENSOR

I



INBOARD SUPPORT MECHANISM

H

2002788 S0000392582_V2

Flap Skew Sensor Lubrication
Figure 313/12-21-09-990-814 (Sheet 6 of 7)

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- 1 LUBRICATE A MINIMUM OF ONE LUBE POINT ON THE ROD END.
- 2 ADDITIONAL LUBE POINT IS ON OPPOSITE SIDE (NOT SHOWN).

2002832 S0000392583_V3

Flap Skew Sensor Lubrication
Figure 313/12-21-09-990-814 (Sheet 7 of 7)

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SPOILER/SPEEDBRAKE LUBRICATION - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
- (1) Lubricate the Spoilers - Use this procedure to lubricate the bearings at the attachment points of the PCUs and the bearings at the spoiler hinge points.

TASK 12-21-10-600-802

2. Lubricate the Outboard Spoilers

(Figure 301)

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)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)

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-1719	Equipment - Lock, Inboard and Outboard Spoiler Actuators Part #: J27005-48 Supplier: 81205 Opt Part #: J27005-33 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
562	Spoiler No. 5
563	Spoiler No. 4
564	Spoiler No. 3
565	Spoiler No. 2
566	Spoiler No. 1
662	Spoiler No. 10
663	Spoiler No. 11
664	Spoiler No. 12
665	Spoiler No. 13
666	Spoiler No. 14

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E. Prepare for the Procedure

SUBTASK 12-21-10-860-011

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

SUBTASK 12-21-10-860-012



MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE TRAILING EDGE FLAPS. THE FLAPS WILL MOVE AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 12-21-10-860-013

- (3) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

SUBTASK 12-21-10-860-014

- (4) Put the three FLT CONTROL HYD VALVE POWER switches on the P61 panel for the WING in the SHUT OFF position and attach DO-NOT-OPERATE tags.

SUBTASK 12-21-10-860-015

- (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>
A	1	CBA1-C	ACE PWR
D	2	CBD2-C	PFC LANE 1
D	4	CBD4-C	PFC LANE 2
D	6	CBD6-C	PFC LANE 3
D	8	CBD8-C	PFC BAT INTLK

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-L	ACE PWR
B	4	CBB4-L	AUTO SPDBRK (L,R)
D	2	CBD2-L	PFC LANE 1
D	4	CBD4-L	PFC LANE 2
D	6	CBD6-L	PFC LANE 3
D	8	CBD8-L	PFC BAT INTLK

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-R	ACE PWR
B	4	CBB4-R	AUTO-SPDBRK (L,R)
D	2	CBD2-R	PFC LANE 1
D	4	CBD4-R	PFC LANE 2
D	6	CBD6-R	PFC LANE 3
D	8	CBD8-R	PFC BAT INTLK

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SUBTASK 12-21-10-860-016

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

Left Power Management Panel, P110

Row	Col	Number	Name
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11
K	28	C27608	ACE-L2 PWR

SUBTASK 12-21-10-860-021

- (7) Operate the manual release cam and lift the spoilers.

SUBTASK 12-21-10-480-002

- (8) Install the inboard and outboard spoiler actuators lock equipment, SPL-1719, for the outboard spoilers.

F. Procedure

SUBTASK 12-21-10-640-002

- (1) Do these steps to lubricate the outboard spoilers (Table 301):

- (a) To lubricate the rod end bearing for the PCUs, add grease, D00633, until clean grease comes out of the bearing (View C, Figure 301).

NOTE: Rod end bearing lubrication requires that grease come out of the bearing between the bearing and the pin. If grease only comes out between the bearing and the rod end housing, the bearing is not properly lubricated.

- (b) To lubricate the two pillow block bearings at the forward end of the PCUs, add grease, D00633, until clean grease comes out of the bearing (View E, Figure 301).

- (c) To lubricate the spoiler hinge bearings, add grease, D00633, until clean grease comes out of the bearings (View E and View D, Figure 301).

NOTE: There is one zerk fitting on each of the two middle hinges (for each spoiler). There are two flush fittings on each of the two outer hinges (for each spoiler).

- (d) Remove the unwanted grease from around the bearings.

Table 301/12-21-10-993-806

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Outboard Spoiler PCU	grease, D00633	BMS3-33	Zerk	15
2	Spoiler Hinge Link	grease, D00633	BMS3-33	Flush	20
3	Spoiler Center Hinge	grease, D00633	BMS3-33	Zerk	10

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-10-080-002

- (1) Remove the inboard and outboard spoiler actuators lock equipment, SPL-1719, from the outboard spoilers.

SUBTASK 12-21-10-860-017

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

Power Supply Assembly Center, M24301

Row	Col	Number	Name
A	1	CBA1-C	ACE PWR
D	2	CBD2-C	PFC LANE 1

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(Continued)

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	4	CBD4-C	PFC LANE 2
D	6	CBD6-C	PFC LANE 3
D	8	CBD8-C	PFC BAT INTLK

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-L	ACE PWR
B	4	CBB4-L	AUTO SPDBRK (L,R)
D	2	CBD2-L	PFC LANE 1
D	4	CBD4-L	PFC LANE 2
D	6	CBD6-L	PFC LANE 3
D	8	CBD8-L	PFC BAT INTLK

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-R	ACE PWR
B	4	CBB4-R	AUTO-SPDBRK (L,R)
D	2	CBD2-R	PFC LANE 1
D	4	CBD4-R	PFC LANE 2
D	6	CBD6-R	PFC LANE 3
D	8	CBD8-R	PFC BAT INTLK

SUBTASK 12-21-10-860-018

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

Left Power Management Panel, P110

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11
K	28	C27608	ACE-L2 PWR

SUBTASK 12-21-10-860-022

- (4) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 12-21-10-860-023

- (5) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.

SUBTASK 12-21-10-860-019

- (6) Remove the DO-NOT-OPERATE tags and put the three FLT CONTROL HYD VALVE POWER switches on the P61 panel for the WING in the NORM position.

SUBTASK 12-21-10-860-020

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

————— **END OF TASK** —————

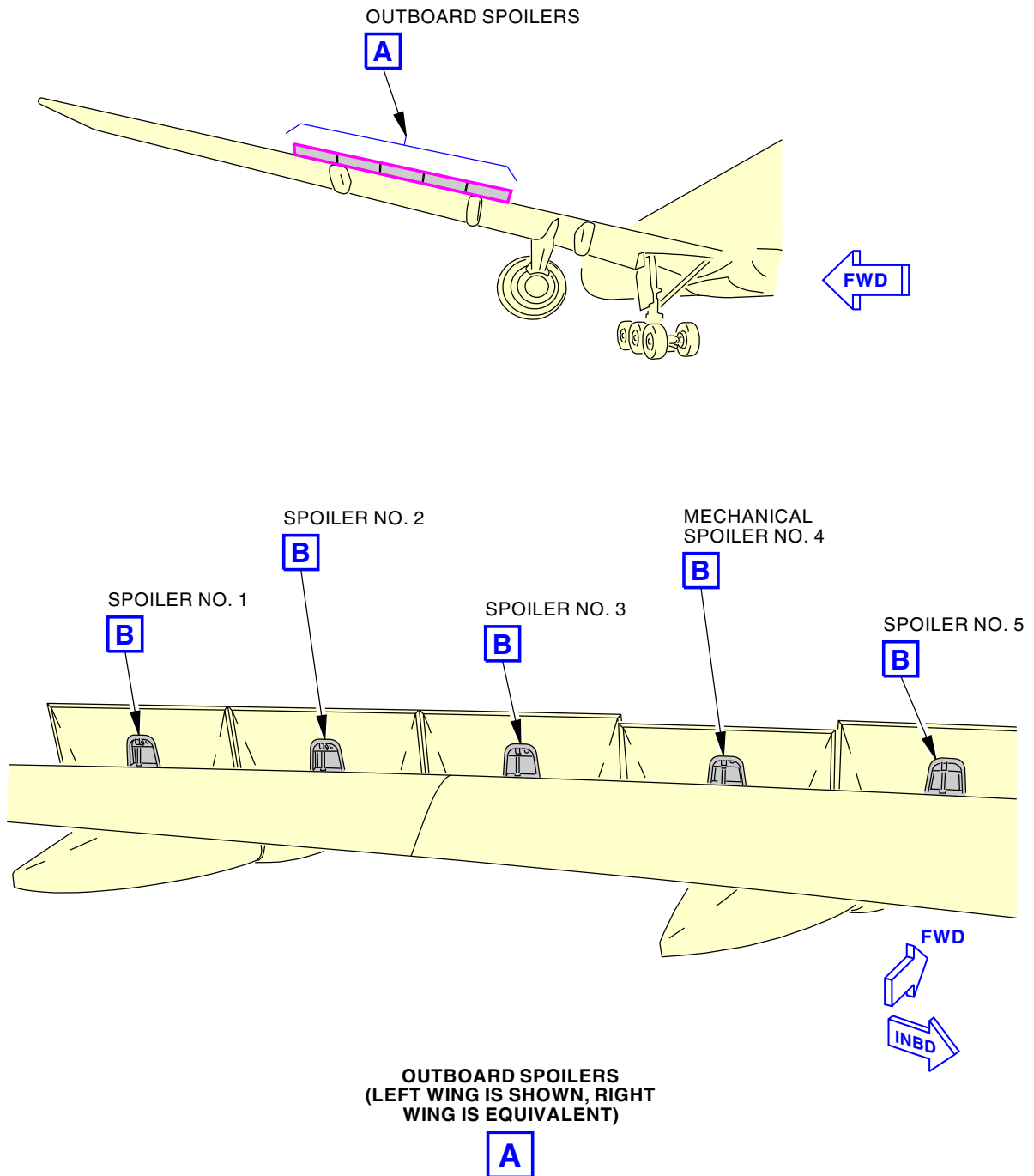
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E25082 S0006401840_V2

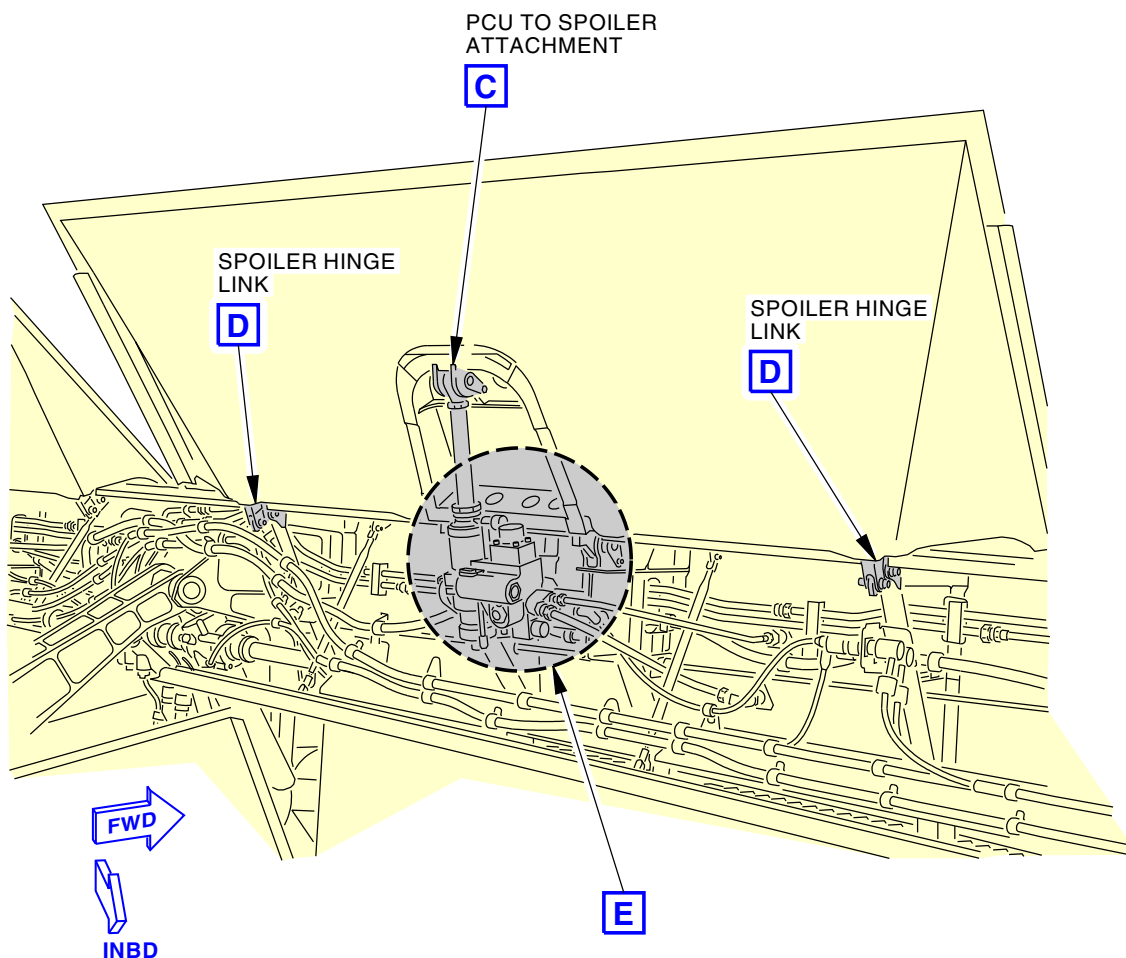
Outboard Spoiler Servicing
Figure 301/12-21-10-990-801 (Sheet 1 of 4)

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OUTBOARD SPOILER NO. 5
(OUTBOARD SPOILERS NO. 1,2,3,4,10,11,12,13,14 ARE EQUIVALENT)

[B]

E25127 S0006401841_V2

Outboard Spoiler Servicing
Figure 301/12-21-10-990-801 (Sheet 2 of 4)

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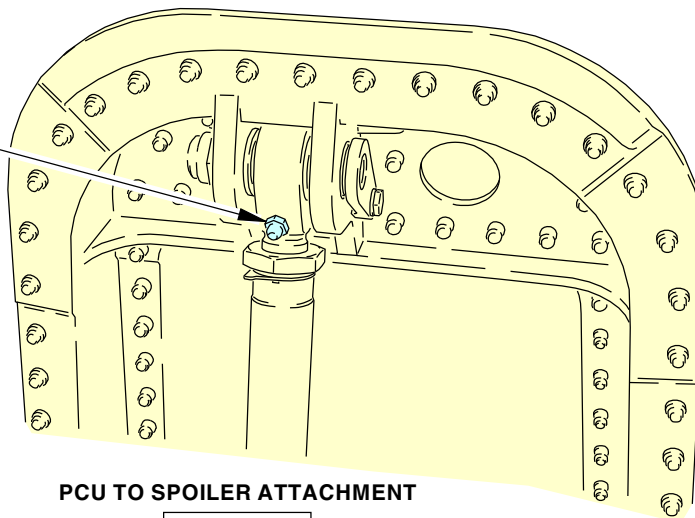
[1] OUTBOARD
SPOILER PCU

ZERK

BMS 3-33

(1 LOCATION)

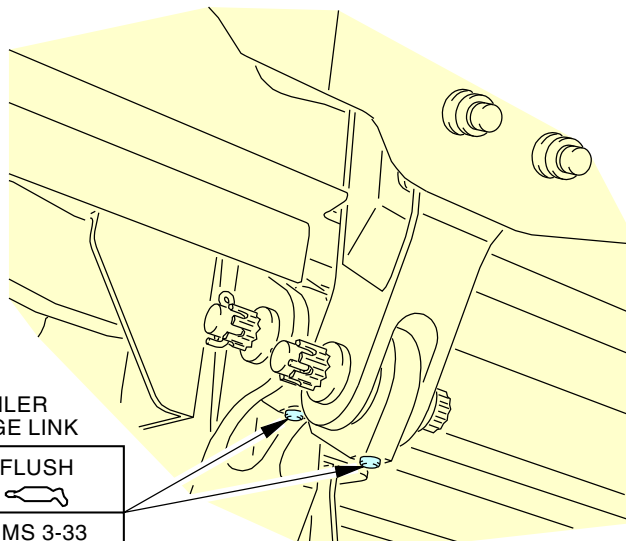
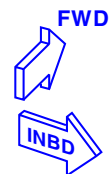
1



PCU TO SPOILER ATTACHMENT

1 POINT

C



[2] SPOILER
HINGE LINK

FLUSH

BMS 3-33

(2 LOCATIONS)

SPOILER HINGE LINK

2 POINTS

D



1

LUBRICATE A MINIMUM OF ONE LUBE
POINT ON EACH OUTBOARD SPOILER
PCU ROD.

E25206 S0006401842_V5

Outboard Spoiler Servicing
Figure 301/12-21-10-990-801 (Sheet 3 of 4)

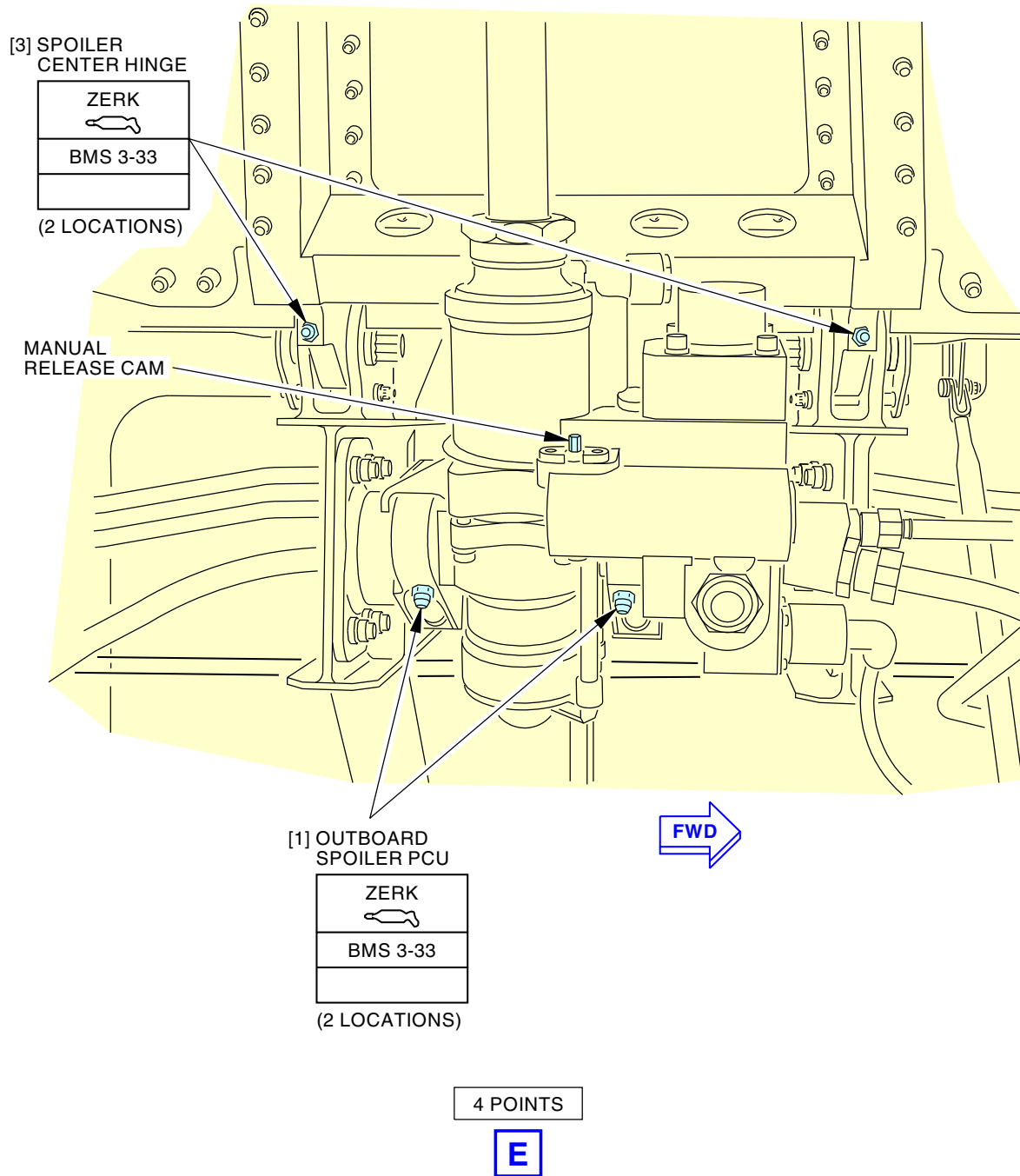
EFFECTIVITY
ARO ALL

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E25806 S0006401843_V4

**Outboard Spoiler Servicing
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TASK 12-21-10-600-801

3. Lubricate the Inboard Spoilers

(Figure 302)

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)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
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)
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)

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-1719	Equipment - Lock, Inboard and Outboard Spoiler Actuators Part #: J27005-48 Supplier: 81205 Opt Part #: J27005-33 Supplier: 81205

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
553	Spoiler No. 7
554	Spoiler No. 6
653	Spoiler No. 8
654	Spoiler No. 9

E. Access Panels

Number	Name/Location
552BB	Inboard Fixed Trailing Edge Panel
552FB	Inboard Fixed Trailing Edge Panel
652BB	Inboard Fixed Trailing Edge Panel
652FB	Inboard Fixed Trailing Edge Panel

F. Prepare for the Procedure

SUBTASK 12-21-10-860-001

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

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SUBTASK 12-21-10-860-002

- (2) Lift the spoilers to install the lock tool on the spoiler PCU with one of two methods.

NOTE: Use Method A to lift all the spoilers at one time with the hydraulic system. Use Method B, to open the applicable access panel, operate the manual release cam and lift the spoiler manually.

- (3) Method A. Do these steps to lift the spoilers, using the hydraulic system:



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.

- (a) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.



BEFORE THE FLAPS ARE MOVED, MAKE SURE THE AREA AROUND THE FLAPS IS CLEAR OF EQUIPMENT AND PERSONS. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.
(c) Put the speedbrake lever in the up position (this will move the spoilers up).
(d) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.



MAKE SURE THAT THERE IS NO HIGH PRESSURE RESIDUAL TRAPPED IN THE HYDRAULIC SUPPLY LINES BETWEEN THE HYDRAULIC SOVS AND THE POWER CONTROL UNIT (PCUS) AFTER YOU CLOSE ALL HYDRAULIC SOVS. TRAPPED RESIDUAL PRESSURE CAN MOVE THE FLIGHT CONTROL SURFACES AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT DUE TO UN-COMMANDED MOVEMENT.

- (e) Put the three FLT CONTROL HYD VALVE POWER switches on the P61 panel for the WING in the SHUT OFF position and attach DO-NOT-OPERATE tags.
(f) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
(g) Open these circuit breakers and install safety tags:

Power Supply Assembly Center, M24301

Row	Col	Number	Name
A	1	CBA1-C	ACE PWR
D	2	CBD2-C	PFC LANE 1
D	4	CBD4-C	PFC LANE 2
D	6	CBD6-C	PFC LANE 3
D	8	CBD8-C	PFC BAT INTLK

Power Supply Assembly Left, M24101

Row	Col	Number	Name
A	1	CBA1-L	ACE PWR
D	2	CBD2-L	PFC LANE 1
D	4	CBD4-L	PFC LANE 2
D	6	CBD6-L	PFC LANE 3

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(Continued)

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	8	CBD8-L	PFC BAT INTLK

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-R	ACE PWR
D	2	CBD2-R	PFC LANE 1
D	4	CBD4-R	PFC LANE 2
D	6	CBD6-R	PFC LANE 3
D	8	CBD8-R	PFC BAT INTLK

- (h) 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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11
K	28	C27608	ACE-L2 PWR

- (i) Install the inboard and outboard spoiler actuators lock equipment, SPL-1719, for the inboard spoilers.
- (4) Method B. Do these steps to raise each spoiler manually:



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.

- (a) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.



BEFORE THE FLAPS ARE MOVED, MAKE SURE THE AREA AROUND THE FLAPS IS CLEAR OF EQUIPMENT AND PERSONS. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-804.
- (c) Do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.



MAKE SURE THAT THERE IS NO HIGH PRESSURE RESIDUAL TRAPPED IN THE HYDRAULIC SUPPLY LINES BETWEEN THE HYDRAULIC SOVS AND THE POWER CONTROL UNIT (PCUS) AFTER YOU CLOSE ALL HYDRAULIC SOVS. TRAPPED RESIDUAL PRESSURE CAN MOVE THE FLIGHT CONTROL SURFACES AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT DUE TO UN-COMMANDED MOVEMENT.

- (d) Put the three FLT CONTROL HYD VALVE POWER switches on the P61 panel for the WING in the SHUT OFF position and attach DO-NOT-OPERATE tags.
- (e) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

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- (f) 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>
A	1	CBA1-C	ACE PWR
D	2	CBD2-C	PFC LANE 1
D	4	CBD4-C	PFC LANE 2
D	6	CBD6-C	PFC LANE 3
D	8	CBD8-C	PFC BAT INTLK

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-L	ACE PWR
D	2	CBD2-L	PFC LANE 1
D	4	CBD4-L	PFC LANE 2
D	6	CBD6-L	PFC LANE 3
D	8	CBD8-L	PFC BAT INTLK

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-R	ACE PWR
D	2	CBD2-R	PFC LANE 1
D	4	CBD4-R	PFC LANE 2
D	6	CBD6-R	PFC LANE 3
D	8	CBD8-R	PFC BAT INTLK

- (g) 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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11
K	28	C27608	ACE-L2 PWR

- (h) Remove these access panels to get access to the manual release cam for the inboard spoilers.

- 1) For the left wing, open these access panels:

<u>Number</u>	<u>Name/Location</u>
552BB	Inboard Fixed Trailing Edge Panel
552FB	Inboard Fixed Trailing Edge Panel

- 2) For the right wing, open these access panels:

<u>Number</u>	<u>Name/Location</u>
652BB	Inboard Fixed Trailing Edge Panel
652FB	Inboard Fixed Trailing Edge Panel

- (i) Turn the manual release cam to the REL position and lift the spoiler (View E, Figure 302).
(j) Install the inboard and outboard spoiler actuators lock equipment, SPL-1719.

G. Procedure

SUBTASK 12-21-10-640-001

- (1) Do these steps to lubricate the inboard spoilers (Table 302):

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- (a) To lubricate the rod end bearing for the PCUs, add grease, D00633, until clean grease comes out of the bearing (View B, Figure 302).

NOTE: Only lubricate the bearings on the rod end bearings. The bearing at the front of the PCU does not use grease.

NOTE: Rod end bearing lubrication requires that grease come out of the bearing between the bearing and the pin. If grease only comes out between the bearing and the rod end housing, the bearing is not properly lubricated.

- (b) To lubricate the spoiler hinge bearings, add grease, D00633, until clean grease comes out of the bearings (View B and View C, Figure 302).

NOTE: There is one zerk fitting on each of the two middle hinges (for each spoiler). And there are two flush fittings on each of the two outer hinges (for each spoiler).

- (c) Remove unwanted grease from around the bearings.

Table 302/12-21-10-993-805

Inboard Spoiler Lubrication					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Spoiler Center Hinge	grease, D00633	BMS3-33	Zerk	4
2	Inboard Spoiler PCU	grease, D00633	BMS3-33	Zerk	2
3	Spoiler Hinge Link	grease, D00633	BMS3-33	Flush	8

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-10-080-001

- (1) Remove the inboard and outboard spoiler actuators lock equipment, SPL-1719, for the inboard spoilers.

SUBTASK 12-21-10-840-001

NOTE: You must use the steps outlined by the same method A or B that was used to lift the spoilers to return the airplane to its usual condition.

- (2) Method A. Do these steps to return the airplane to its usual condition if you lifted the spoilers using the hydraulic system:

- (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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11
K	28	C27608	ACE-L2 PWR

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

- 1) Make sure that PFC circuit breakers are closed last:

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-C	ACE PWR
D	2	CBD2-C	PFC LANE 1
D	4	CBD4-C	PFC LANE 2
D	6	CBD6-C	PFC LANE 3
D	8	CBD8-C	PFC BAT INTLK

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Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-L	ACE PWR
D	2	CBD2-L	PFC LANE 1
D	4	CBD4-L	PFC LANE 2
D	6	CBD6-L	PFC LANE 3
D	8	CBD8-L	PFC BAT INTLK

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-R	ACE PWR
D	2	CBD2-R	PFC LANE 1
D	4	CBD4-R	PFC LANE 2
D	6	CBD6-R	PFC LANE 3
D	8	CBD8-R	PFC BAT INTLK



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.

- (c) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
- (d) Put the three FLT CONTROL HYD VALVE POWER switches for the WING in the NORM position.
- (e) Move the speedbrake lever to the down position.



BEFORE THE FLAPS ARE MOVED, MAKE SURE THE AREA AROUND THE FLAPS IS CLEAR OF EQUIPMENT AND PERSONS. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (f) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.
 - (g) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.
 - (h) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.
- (3) Method B. Do these steps to return the airplane to its usual condition if you lifted the spoilers manually by operating the release cam.
- (a) Turn the manual release cam to the NORM position.
 - (b) Install these access panels, if they were removed:
 - (c) For the left wing, close these access panels:

<u>Number</u>	<u>Name/Location</u>
552BB	Inboard Fixed Trailing Edge Panel
552FB	Inboard Fixed Trailing Edge Panel

- (d) For the right wing, close these access panels:

<u>Number</u>	<u>Name/Location</u>
652BB	Inboard Fixed Trailing Edge Panel
652FB	Inboard Fixed Trailing Edge Panel

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- (e) 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>
K	26	C27610	FLPRN PCU RIB(BYP)/SPLR 4&11
K	28	C27608	ACE-L2 PWR

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

1) Make sure that PFC circuit breakers are closed last:

Power Supply Assembly Center, M24301

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-C	ACE PWR
D	2	CBD2-C	PFC LANE 1
D	4	CBD4-C	PFC LANE 2
D	6	CBD6-C	PFC LANE 3
D	8	CBD8-C	PFC BAT INTLK

Power Supply Assembly Left, M24101

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-L	ACE PWR
D	2	CBD2-L	PFC LANE 1
D	4	CBD4-L	PFC LANE 2
D	6	CBD6-L	PFC LANE 3
D	8	CBD8-L	PFC BAT INTLK

Power Supply Assembly Right, M24201

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	CBA1-R	ACE PWR
D	2	CBD2-R	PFC LANE 1
D	4	CBD4-R	PFC LANE 2
D	6	CBD6-R	PFC LANE 3
D	8	CBD8-R	PFC BAT INTLK



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.

- (g) Do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801.
- (h) Put the three FLT CONTROL HYD VALVE POWER switches for the WING in the NORM position.
- (i) Move the speedbrake lever to the down position.



WARNING

BEFORE THE FLAPS ARE MOVED, MAKE SURE THE AREA AROUND THE FLAPS IS CLEAR OF EQUIPMENT AND PERSONS. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (j) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

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- (k) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-805.
- (l) Do this task: Main Hydraulic System Power Removal, TASK 29-11-00-860-808.

SUBTASK 12-21-10-860-009

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

———— **END OF TASK** ————

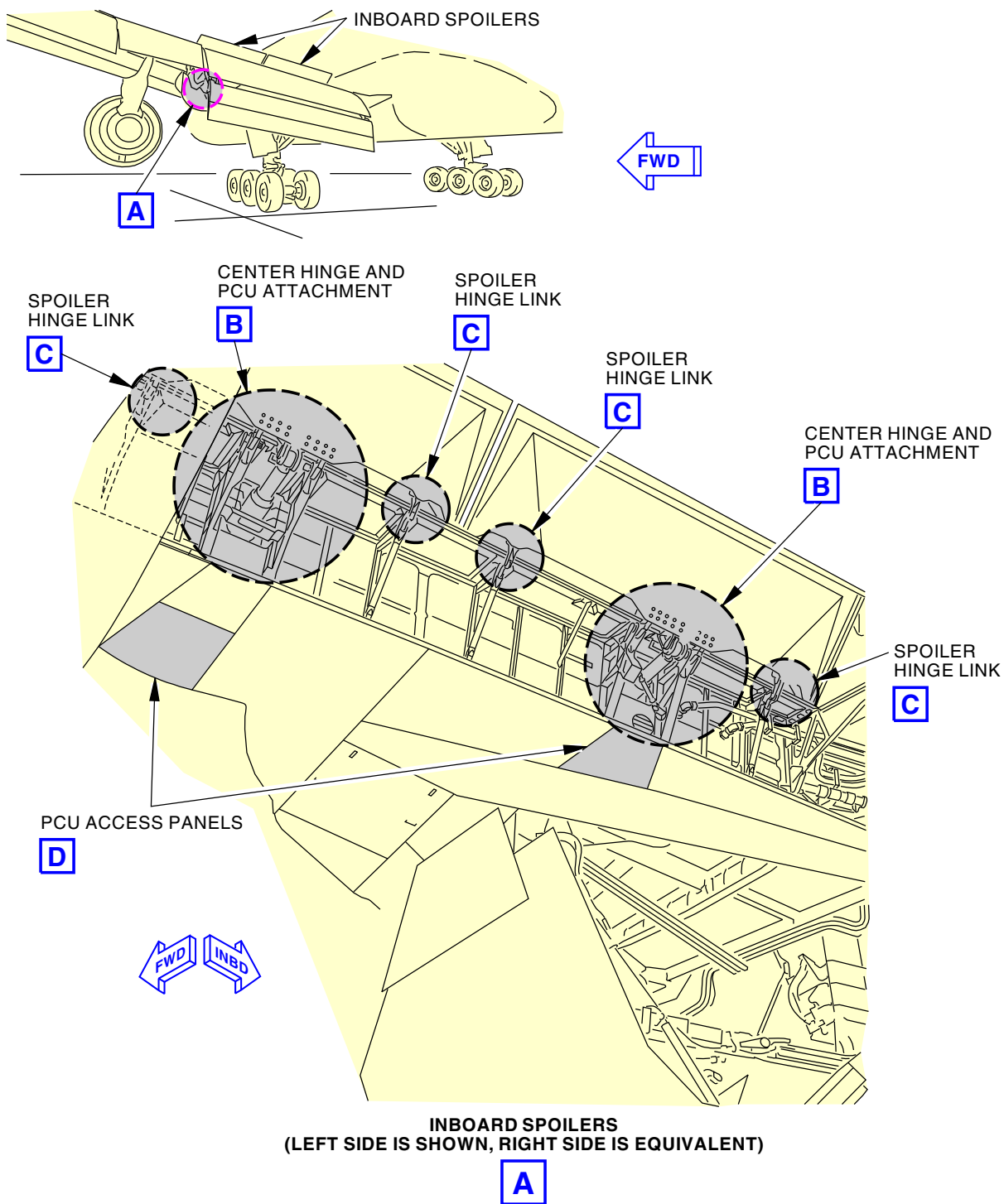
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E25794 S0006401846_V3

**Inboard Spoiler Servicing
Figure 302/12-21-10-990-802 (Sheet 1 of 5)**

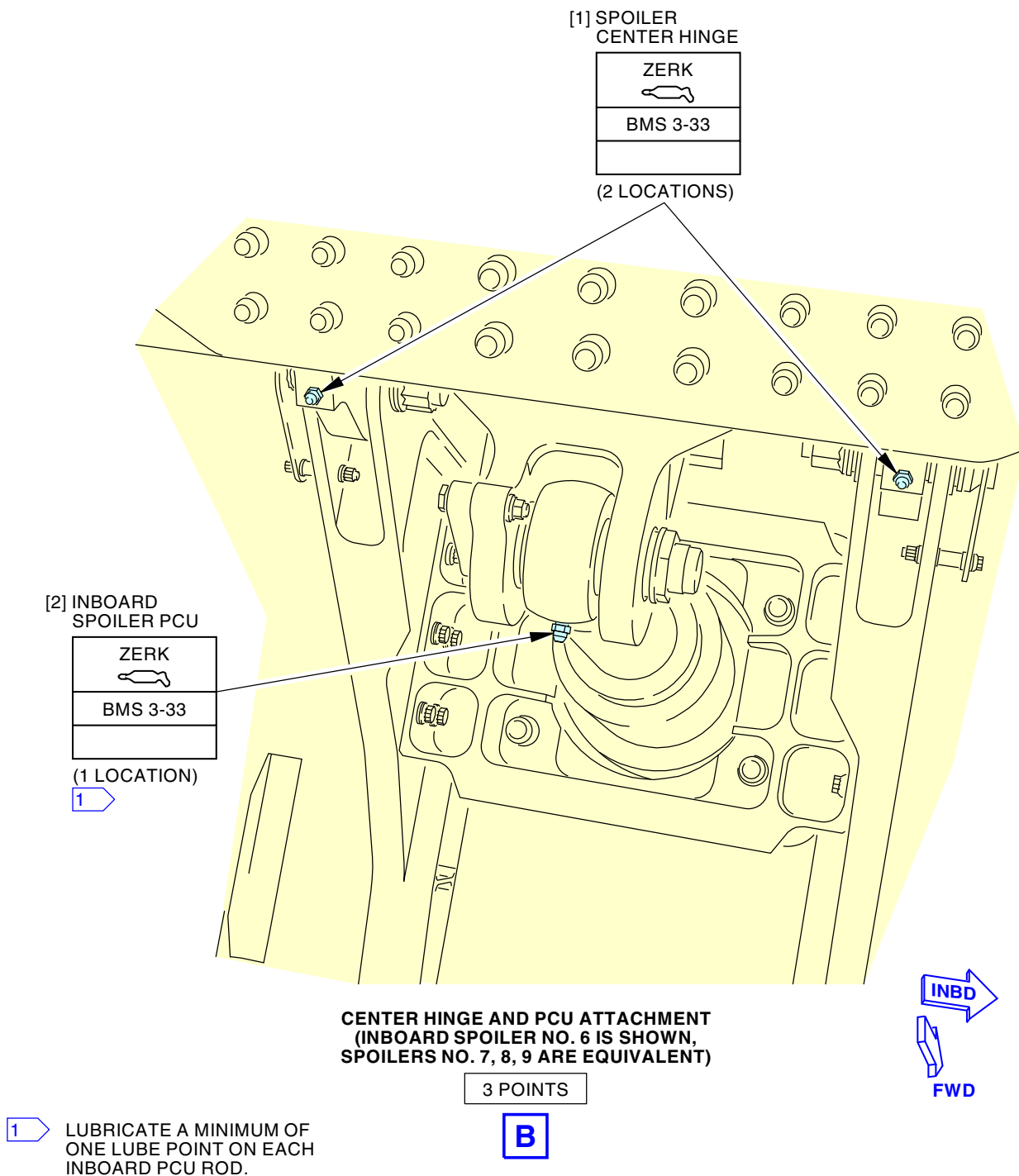
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E25803 S0006401847_V4

**Inboard Spoiler Servicing
Figure 302/12-21-10-990-802 (Sheet 2 of 5)**

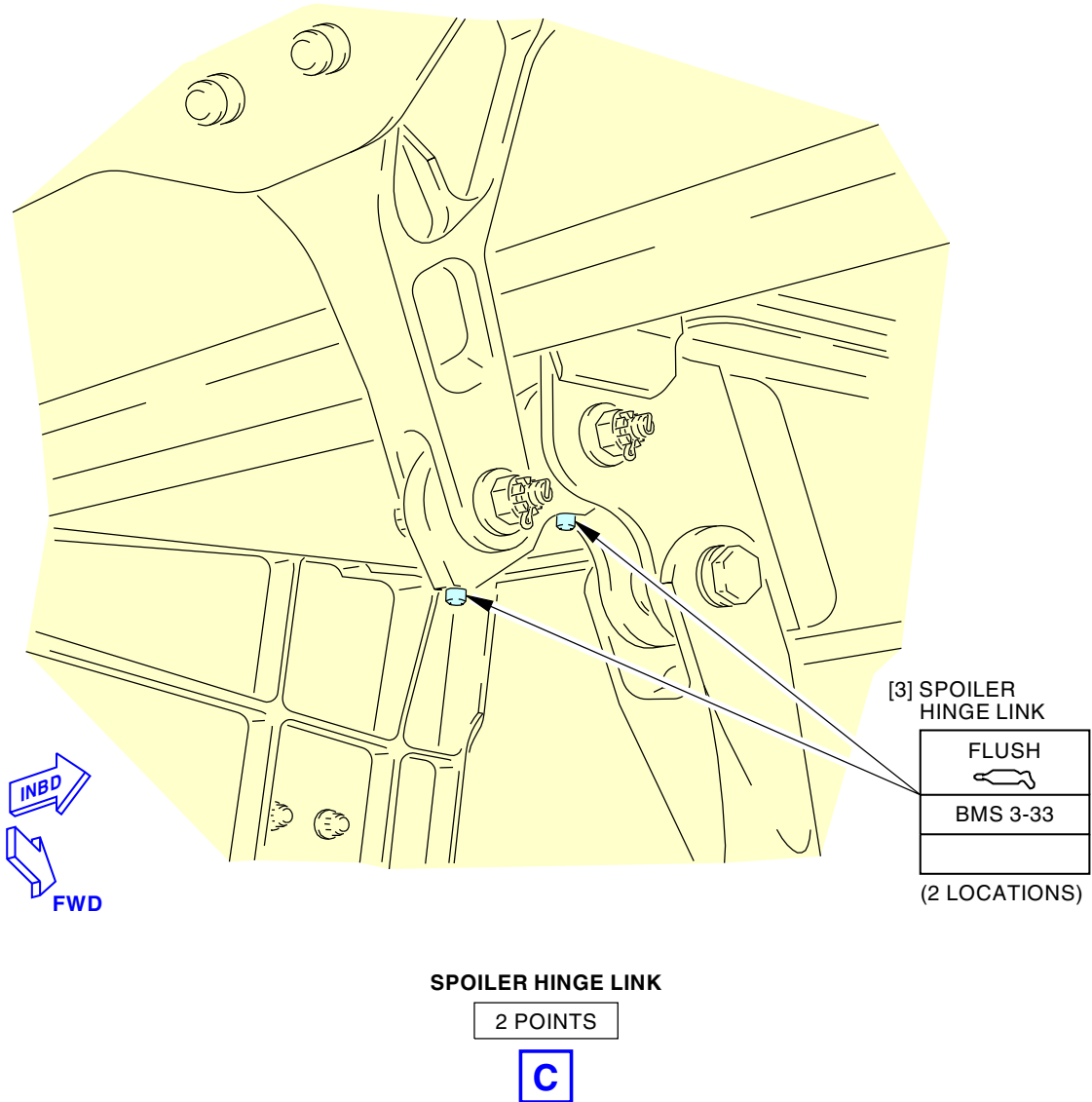
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E32538 S0006401848_V5

Inboard Spoiler Servicing
Figure 302/12-21-10-990-802 (Sheet 3 of 5)

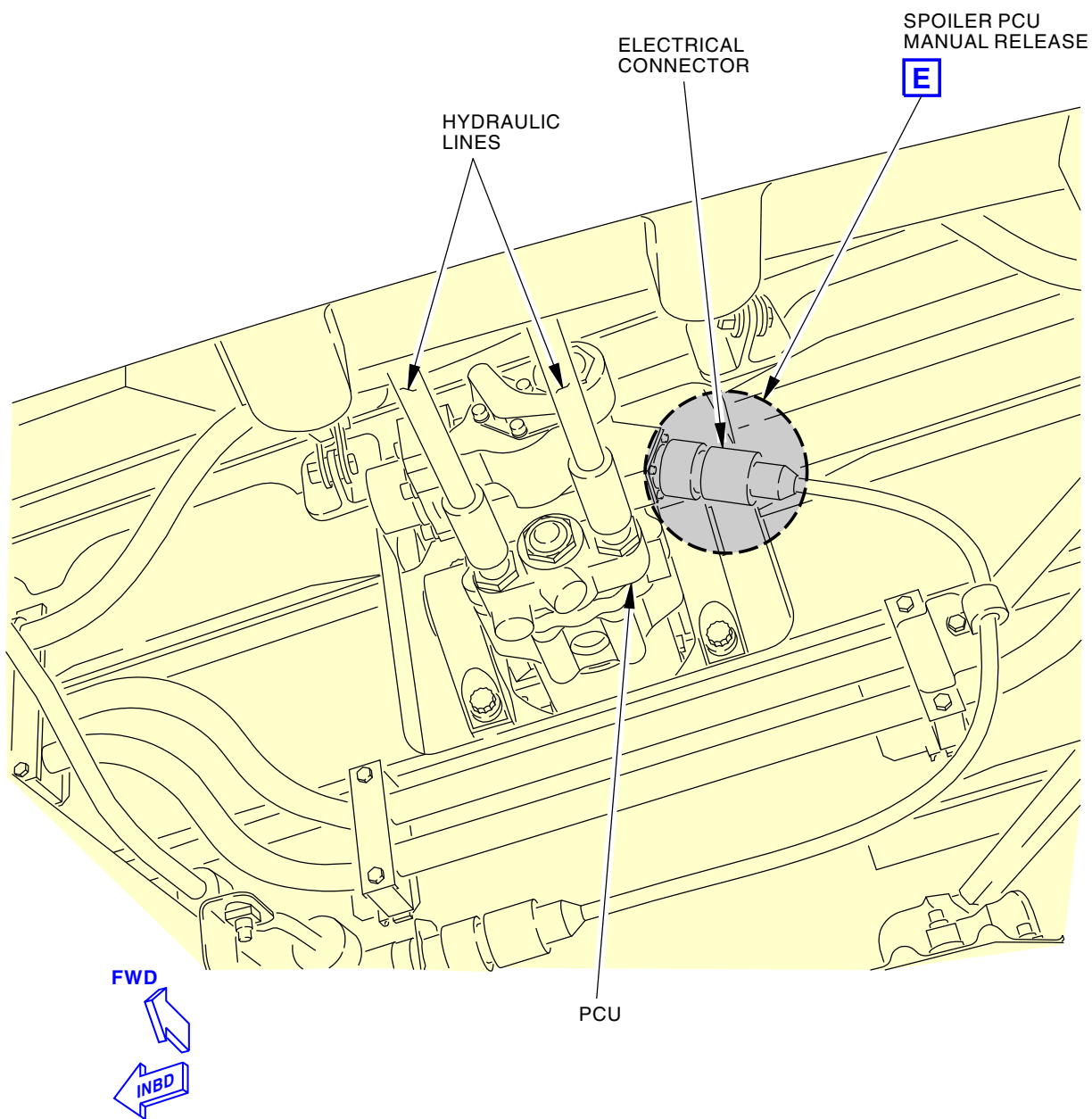
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OUTBOARD PCU
(VIEW LOOKING THRU ACCESS PANEL, INBOARD PCU IS EQUIVALENT)

D

E58579 S0006401849_V2

Inboard Spoiler Servicing
Figure 302/12-21-10-990-802 (Sheet 4 of 5)

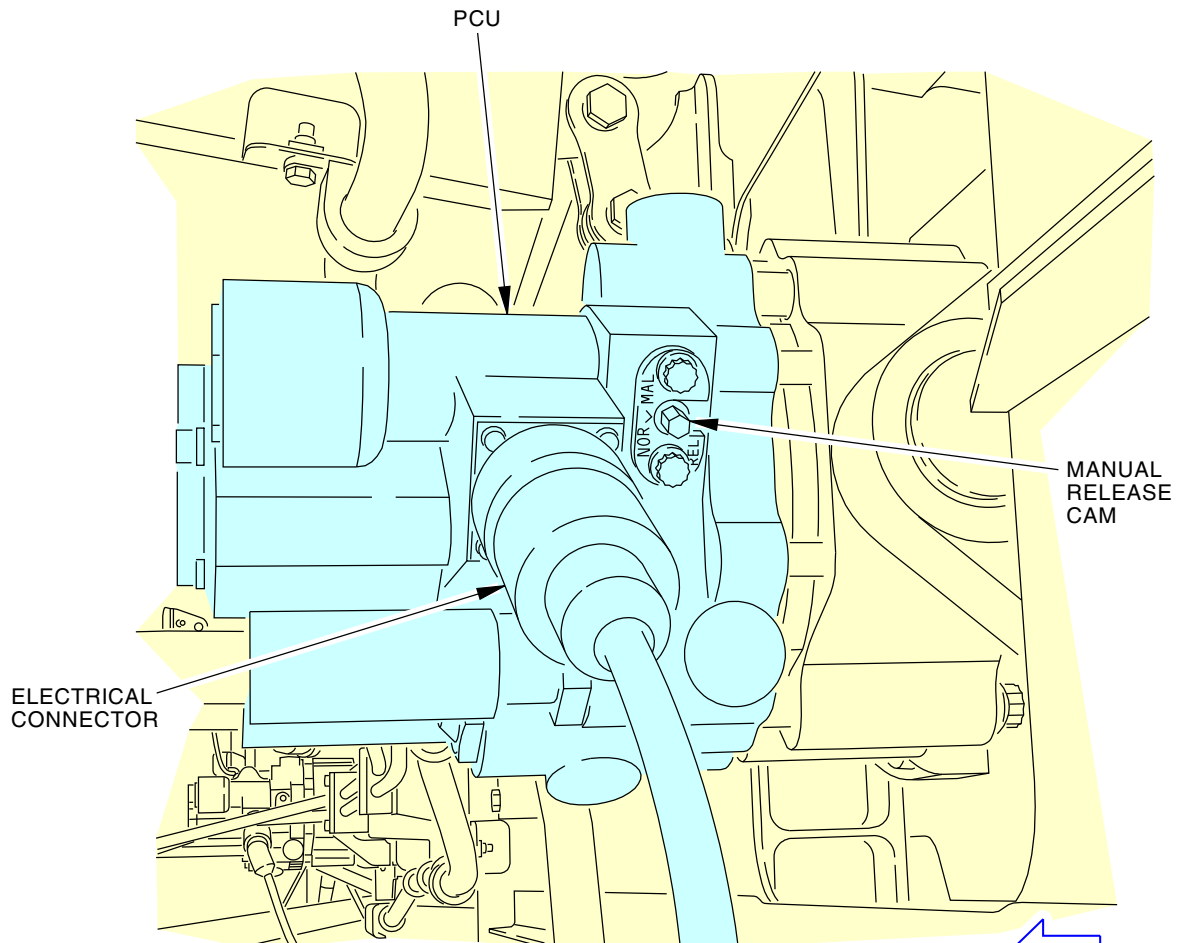
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**SPOILER PCU MANUAL RELEASE
(EXAMPLE)**

E



E58580 S0006401850_V2

**Inboard Spoiler Servicing
Figure 302/12-21-10-990-802 (Sheet 5 of 5)**

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MAIN LANDING GEAR SUPPORT BEAM - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure supplies instructions to lubricate the support beams for the two main landing gear.

TASK 12-21-11-640-802-002

2. Main Landing Gear Support Beam Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) This task provides instruction to lubricate the main landing gear support beam.

B. **References**

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)

C. **Consumable Materials**

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. **Location Zones**

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

E. **Access Panels**

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

F. **Prepare for the Procedure**

SUBTASK 12-21-11-480-002-002



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.

- (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 12-21-11-010-004-002



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 12-21-11-010-005-002

- (3) Open the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

NOTE: You must open these access panels to lubricate the beam.

G. Procedure

SUBTASK 12-21-11-640-003-002



YOU MUST BE CAREFUL WHEN YOU CONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS. YOU MUST ALSO BE CAREFUL WHEN YOU DISCONNECT THE GREASE GUN FROM THE LUBRICATION FITTINGS. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE MAIN LANDING GEAR SUPPORT BEAM. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, YOU CAN BLOW THE LUBRICATION FITTINGS OFF THE LANDING GEAR.

- (1) Use the grease gun to lubricate the main landing gear support beam with grease, D00633 (Figure 301) (Table 301).

NOTE: Table 301 makes a list of all the lubrication fittings for the main landing gear support beam.

SUBTASK 12-21-11-640-004-002

- (2) If a fitting blows off, do these steps:
- (a) Make sure there is not a blockage in the lubrication path.
 - (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 301/12-21-11-993-803-002

Main Landing Gear Support Beam					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	MAIN LANDING GEAR BEAM	grease, D00633	BMS3-33	Zerk	4
2	AFT LOWER STAB BRACE FITTING	grease, D00633	BMS3-33	Zerk	2
3	LOWER STAB BRACE REAR SPAR FITTING	grease, D00633	BMS3-33	Zerk	1
4	HANGER LINK	grease, D00633	BMS3-33	Zerk	6
5	AFT HANGER LINK FRAME	grease, D00633	BMS3-33	Zerk	1
6	FORWARD HANGER LINK FRAME	grease, D00633	BMS3-33	Zerk	1

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-11-010-006-002

- (1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel

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(Continued)

<u>Number</u>	<u>Name/Location</u>
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 12-21-11-410-002-002



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.

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

————— END OF TASK —————

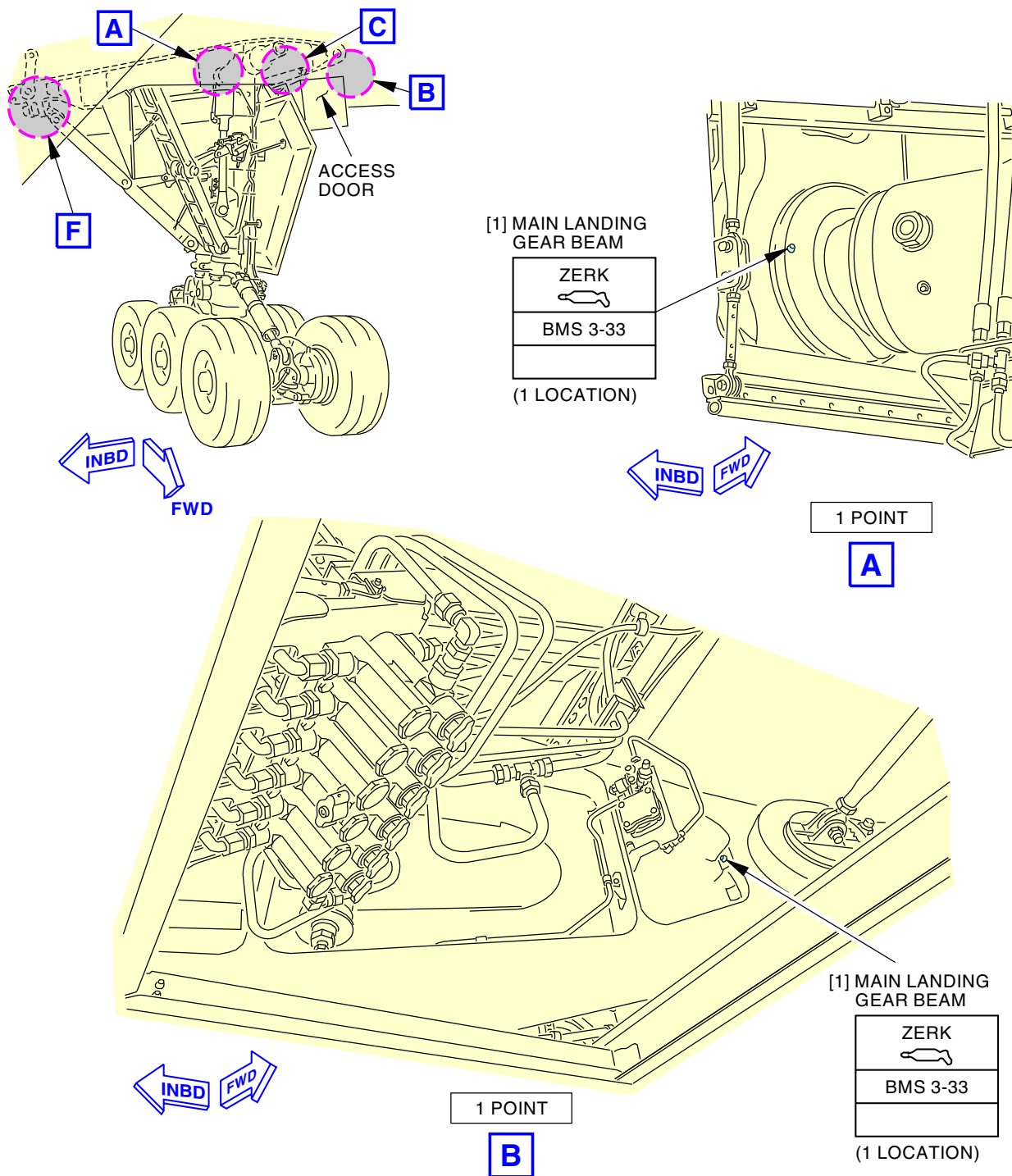
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Main Landing Gear Support Beam Servicing
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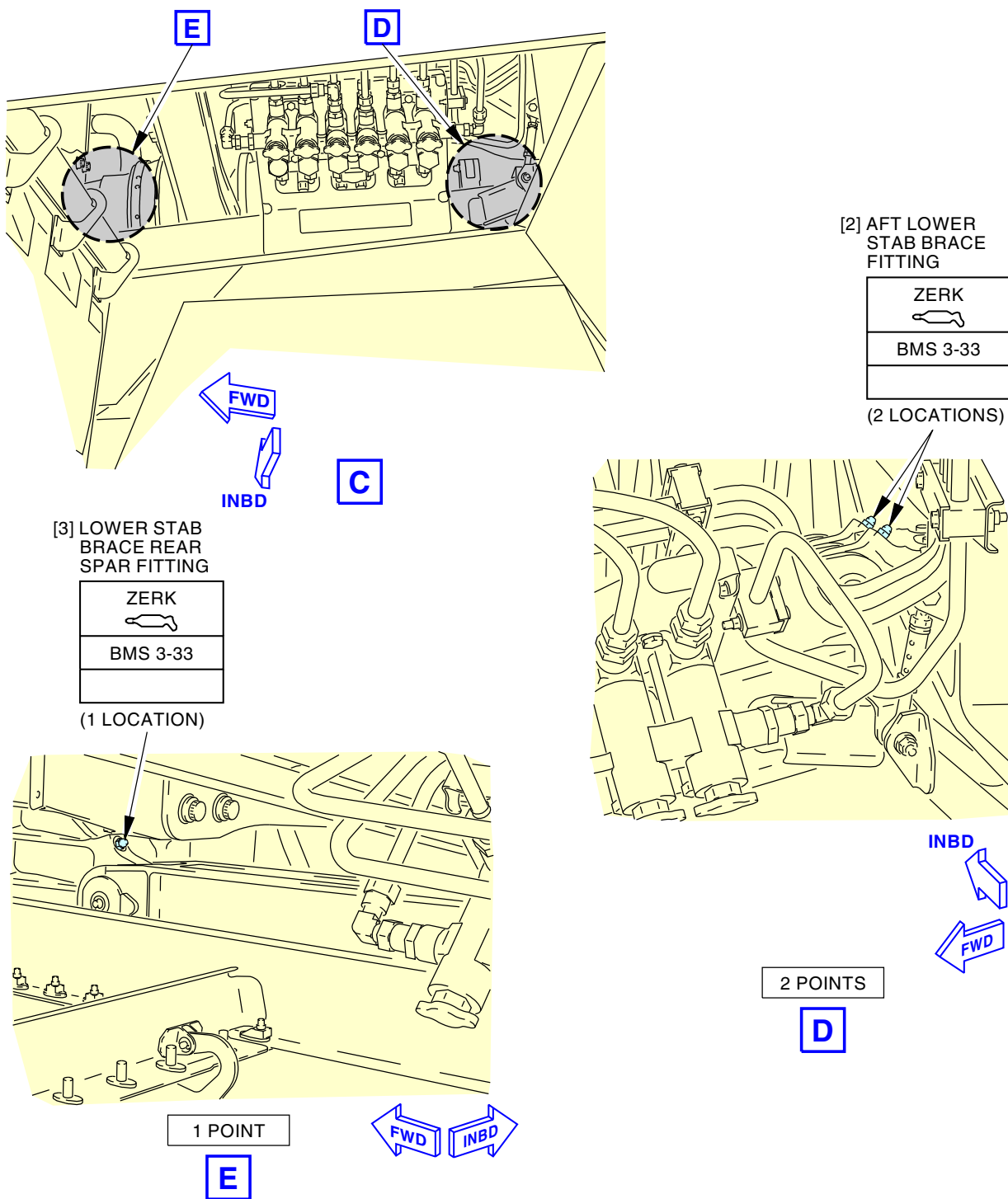
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**Main Landing Gear Support Beam Servicing
Figure 301/12-21-11-990-802-002 (Sheet 2 of 3)**

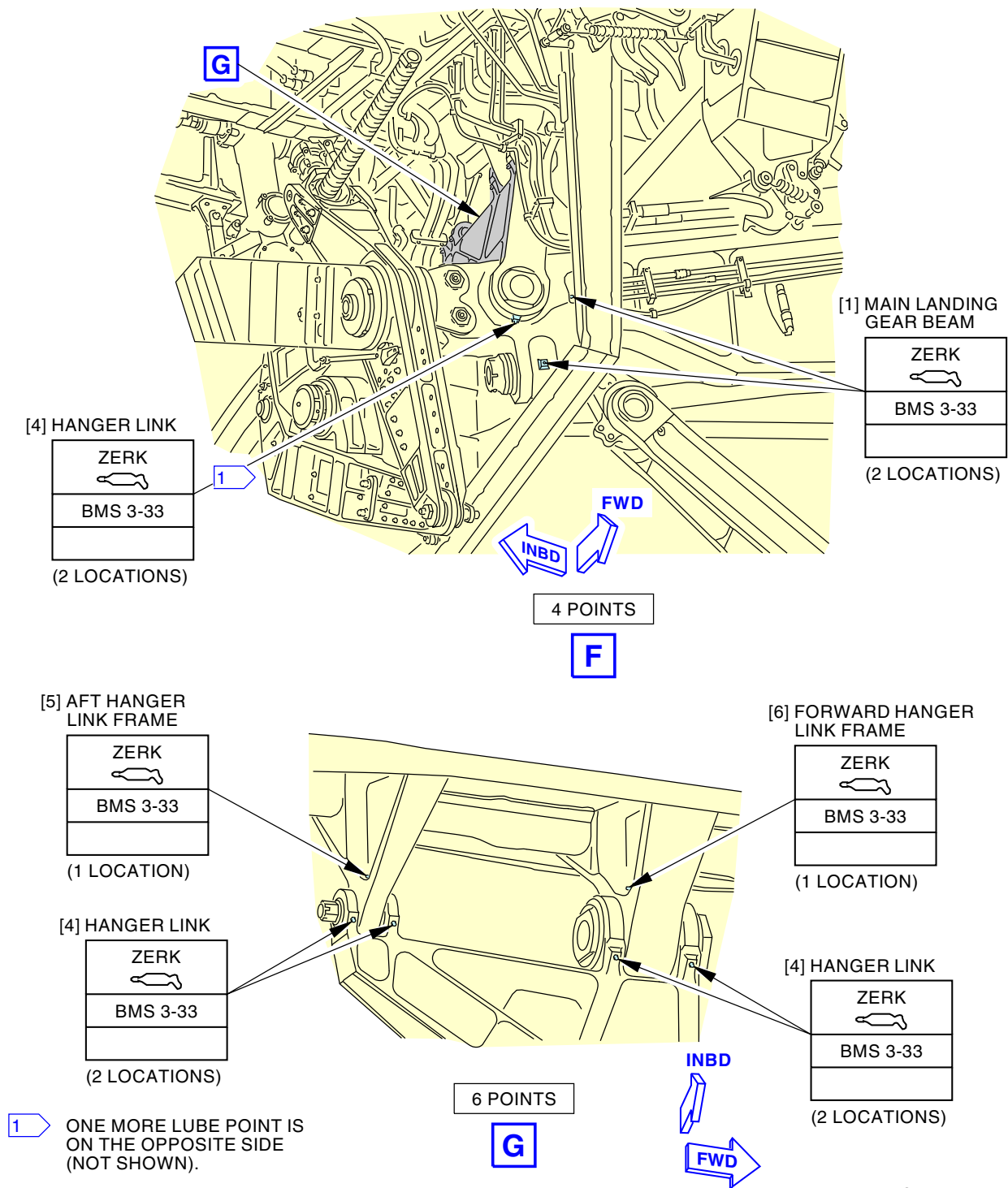
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M57221 S0006401867_V3

Main Landing Gear Support Beam Servicing
Figure 301/12-21-11-990-802-002 (Sheet 3 of 3)

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NOSE LANDING GEAR AND ACTUATING MECHANISMS - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The first procedure supplies instructions to lubricate the upper components of the nose landing gear and actuating mechanisms.
 - (2) The second procedure supplies instructions to lubricate the lower components of the nose landing gear and actuating mechanisms.
- C. If you will service the landing gear in cold weather, refer to this task: Lubrication of Landing Gear During Cold Weather Operation, TASK 12-21-00-600-801.

TASK 12-21-12-640-802

2. Nose Landing Gear and Actuating Mechanism's Upper Components Lubrication

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task supplies instructions to lubricate the upper components of the nose landing gear and actuating mechanisms.

B. References

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)

C. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
113	Nose Landing Gear Wheel Well, Left
114	Nose Landing Gear Wheel Well, Right
711	Nose Landing Gear

E. Prepare for the Procedure

SUBTASK 12-21-12-480-002



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.

- (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 12-21-12-010-002



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.

F. Procedure

SUBTASK 12-21-12-640-001



CAUTION

YOU MUST BE CAREFUL WHEN YOU CONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS. YOU MUST ALSO BE CAREFUL WHEN YOU DISCONNECT THE GREASE GUN FROM THE LUBRICATION FITTINGS. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE NOSE LANDING GEAR AND ACTUATING MECHANISMS. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, YOU CAN BLOW THE LUBRICATION FITTINGS OFF THE LANDING GEAR.

- (1) Use the grease gun to lubricate the nose landing gear and actuating mechanisms with grease, D00633 (Recommended) or grease, D00013 (Alternative), (Table 301) (Figure 301).
- (a) Lubricate the actuator rod ends grease fitting to which you can get access.
- NOTE: Actuator rod ends are fitted with two grease fittings.
- (b) To lubricate the upper drag strut fitting [2], enter the forward access area and remove grease that extrudes inside the airplane.
- 1) If necessary, remove the insulation blankets.

SUBTASK 12-21-12-640-002

- (2) If a fitting blows off, do these steps:
- (a) Make sure there is not a blockage in the lubrication path.
- (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 301/12-21-12-993-803 Nose Landing Gear Upper End Components Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Upper Drag Strut, Sidewall	grease, D00633	BMS3-33	Zerk	2
1	Upper Drag Strut, Bottom	grease, D00633	BMS3-33	Zerk	2
2	Drag Strut Fitting	grease, D00633	BMS3-33	Zerk	2
3	Retract Actuator Fitting	grease, D00633	BMS3-33	Zerk	2
4	Retract Actuator, Rod End	grease, D00633	BMS3-33	Zerk	2
4	Retract Actuator, Head End	grease, D00633	BMS3-33	Zerk	1
5	Outer cylinder	grease, D00633	BMS3-33	Zerk	2
5	Outer cylinder, Actuator Fitting	grease, D00633	BMS3-33	Zerk	1

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Table 301/12-21-12-993-803 Nose Landing Gear Upper End Components Lubrication (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
5	Outer cylinder, Trunnion	grease, D00633	BMS3-33	Zerk	2
6	Trunnion Fitting	grease, D00633	BMS3-33	Zerk	2
7	Steering Crank	grease, D00633	BMS3-33	Zerk	1
8	Lock Actuator Pin	grease, D00633	BMS3-33	Zerk	1
9	Lock Actuator	grease, D00633	BMS3-33	Zerk	1
10	Lock Link Fitting	grease, D00633	BMS3-33	Zerk	2
11	Steering Spring Cartridge	grease, D00633	BMS3-33	Zerk	1
11a	Steering Spring Cartridge (Rod End)	grease, D00633	BMS3-33	Flush	1
12	Forward Input Arm	grease, D00633	BMS3-33	Zerk	1
13	Aft Lock Link	grease, D00633	BMS3-33	Zerk	2
14	Forward Lock Link	grease, D00633	BMS3-33	Zerk	4
15	Lower Drag Strut, Top	grease, D00633	BMS3-33	Zerk	1
15	Lower Drag Strut, Bottom	grease, D00633	BMS3-33	Zerk	1
16	Drag Strut Pin Bracket	grease, D00633	BMS3-33	Zerk	1

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-12-410-002



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.

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

———— **END OF TASK** ————

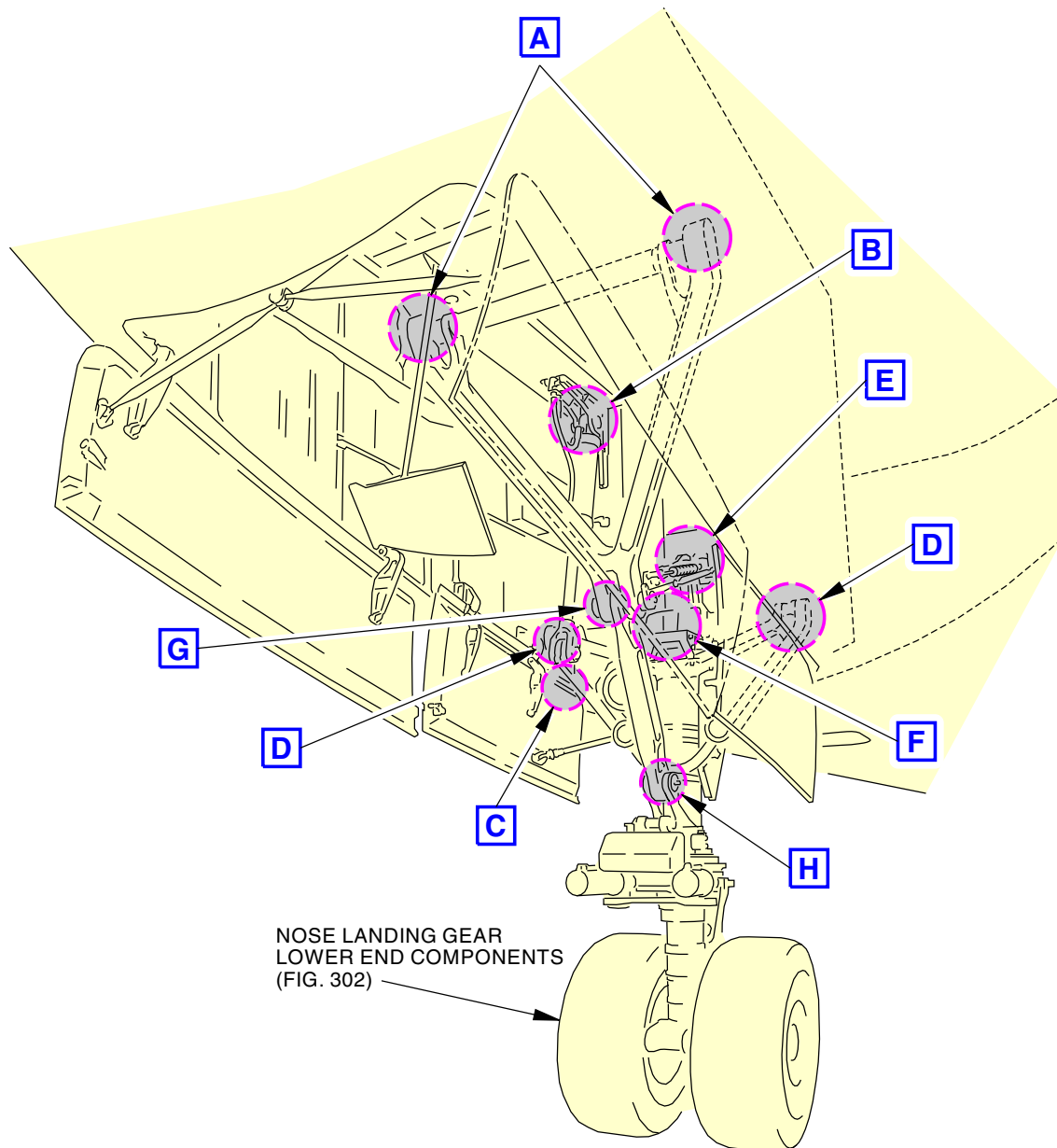
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C14250 S0006401883_V2

Nose Landing Gear Upper End Components Servicing
Figure 301/12-21-12-990-801 (Sheet 1 of 6)

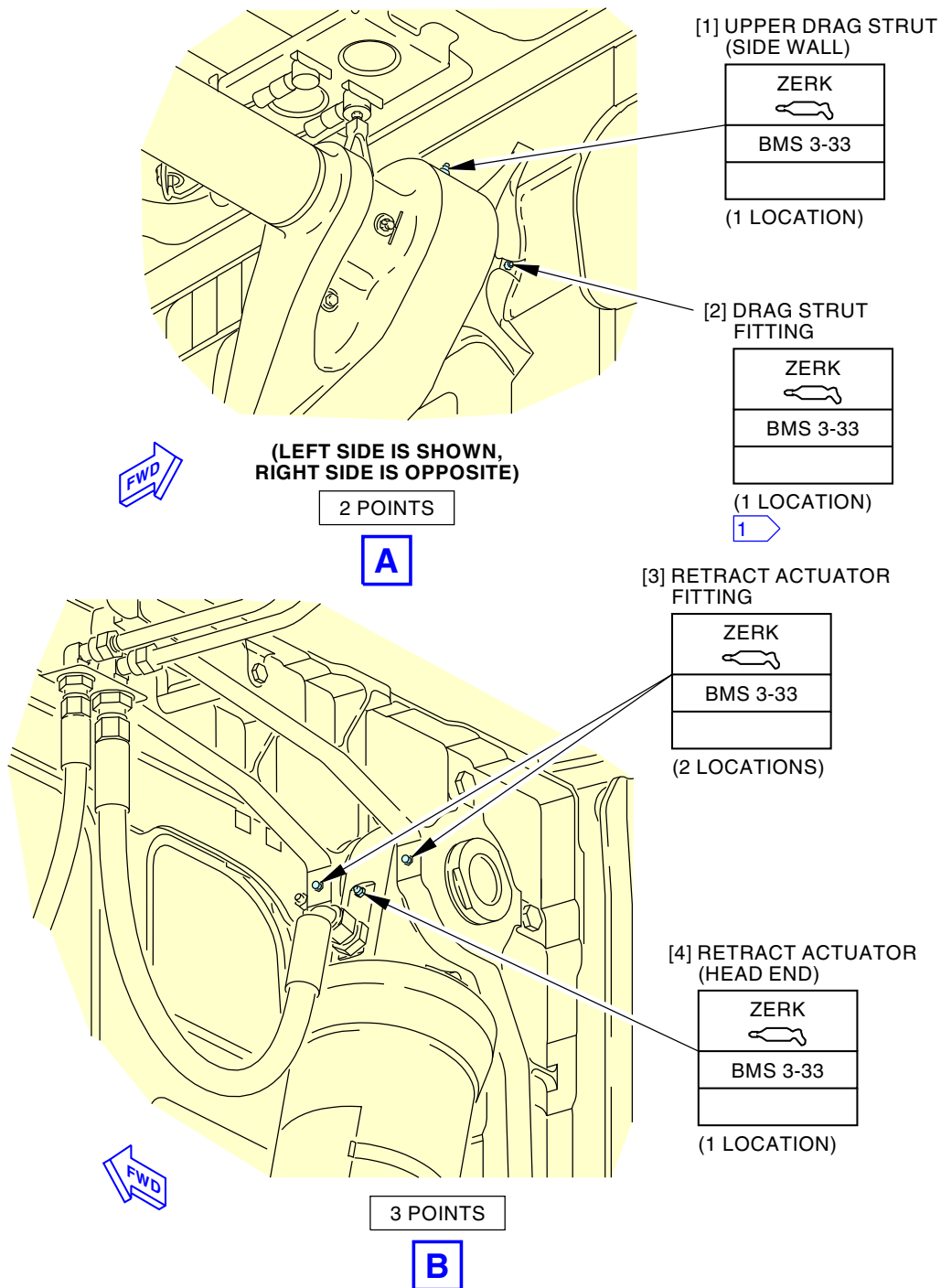
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1 GREASE WILL EXTRUDE INTO AIRPLANE INTERIOR. ENTER FORWARD ACCESS AREA AND REMOVE EXCESS GREASE.

C14265 S0006401884_V2

Nose Landing Gear Upper End Components Servicing
Figure 301/12-21-12-990-801 (Sheet 2 of 6)

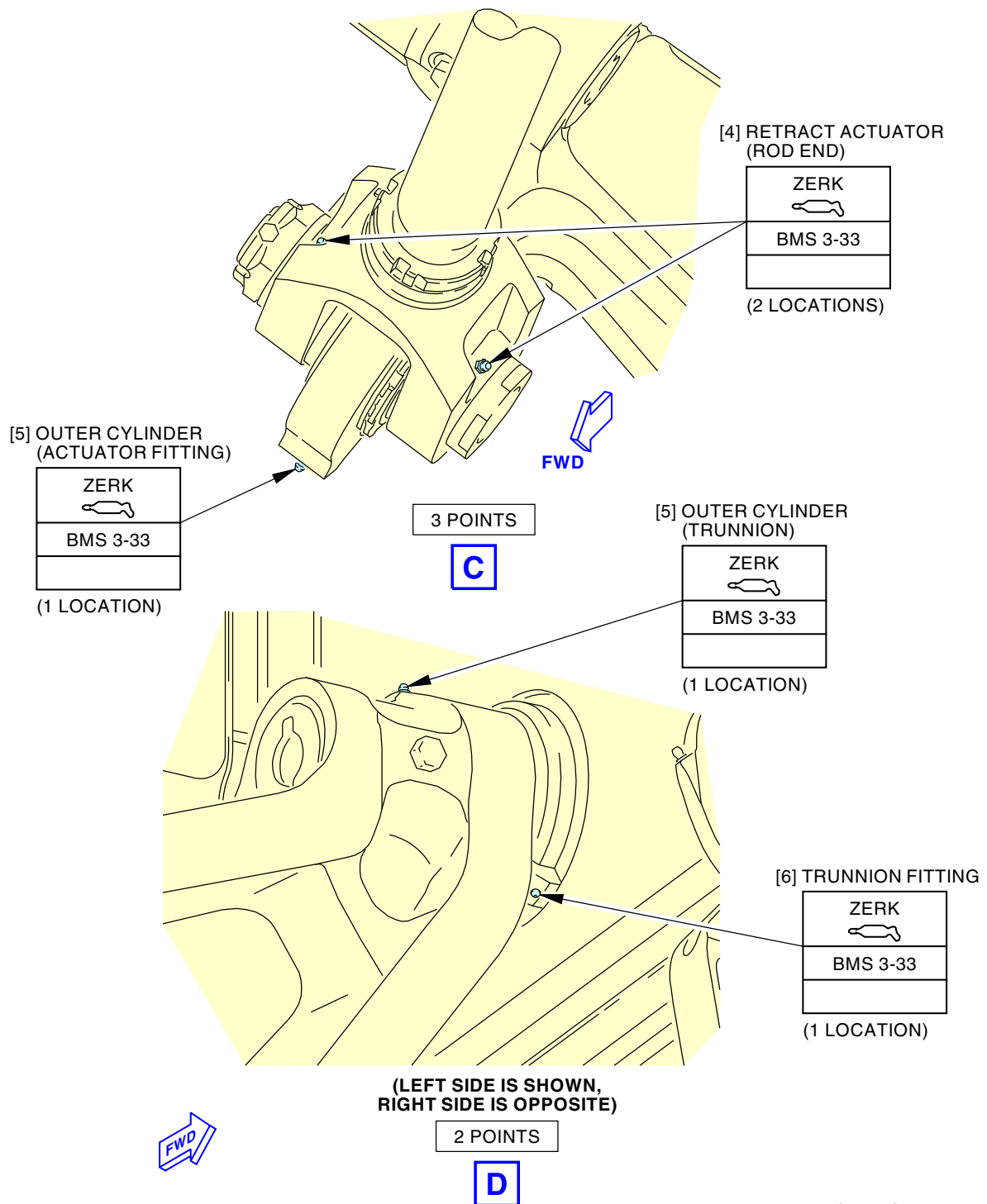
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C14288 S0006401885_V2

Nose Landing Gear Upper End Components Servicing
Figure 301/12-21-12-990-801 (Sheet 3 of 6)

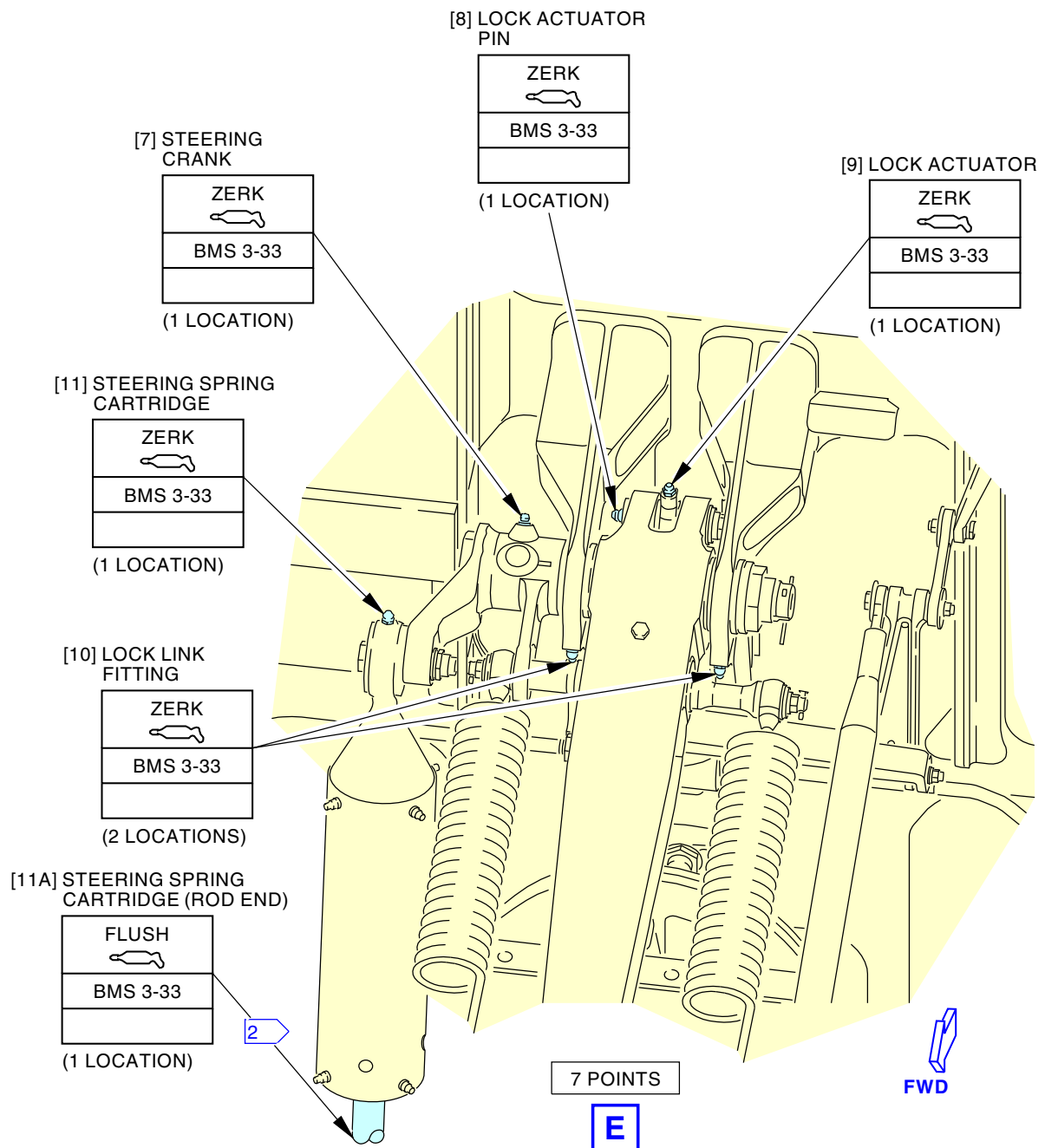
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2 IT IS ONLY NECESSARY TO LUBRICATE THE FITTING TO WHICH YOU CAN GET ACCESS.

C14296 S0006401886_V3

**Nose Landing Gear Upper End Components Servicing
Figure 301/12-21-12-990-801 (Sheet 4 of 6)**

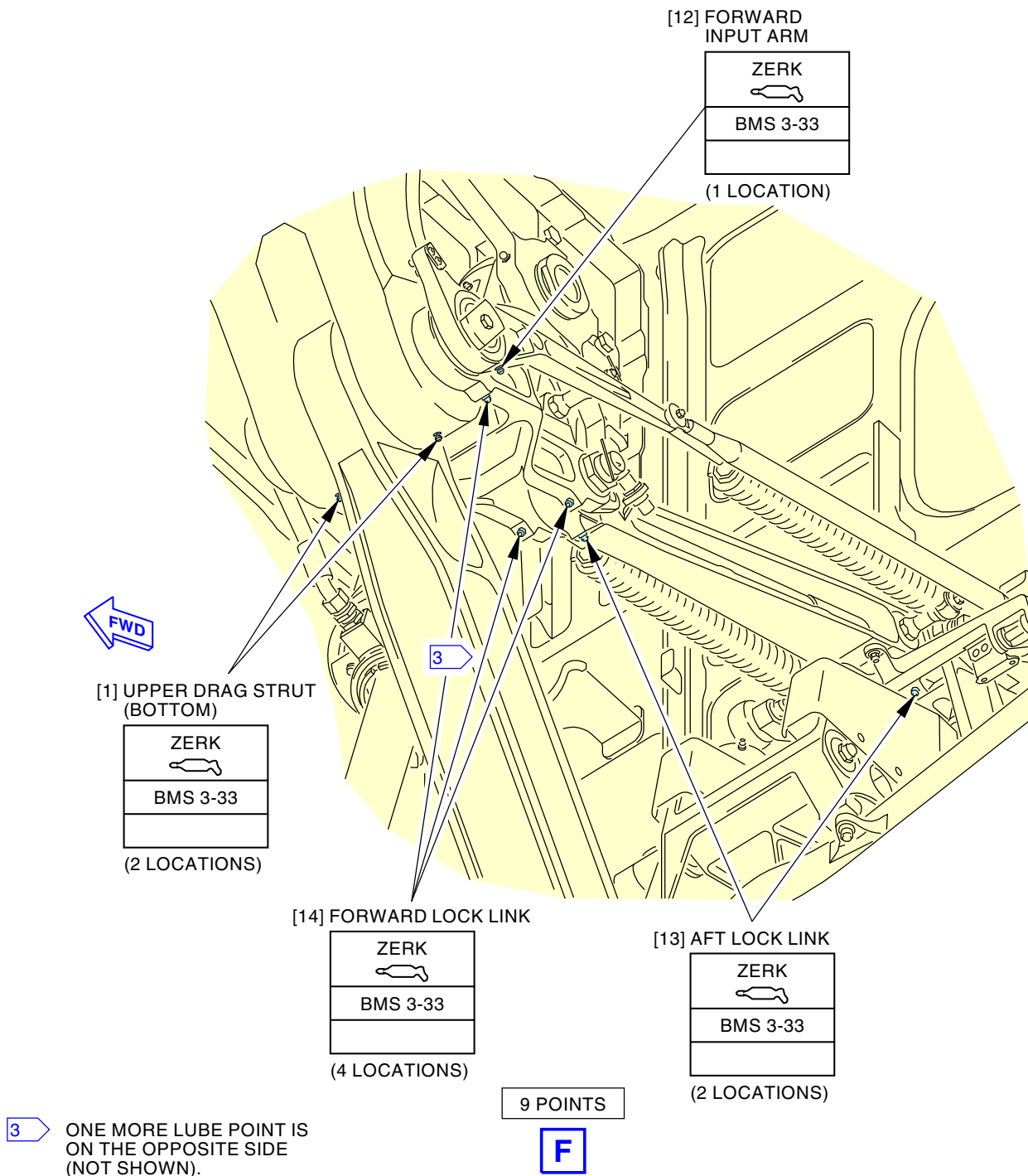
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C14309 S0006401887_V2

Nose Landing Gear Upper End Components Servicing
Figure 301/12-21-12-990-801 (Sheet 5 of 6)

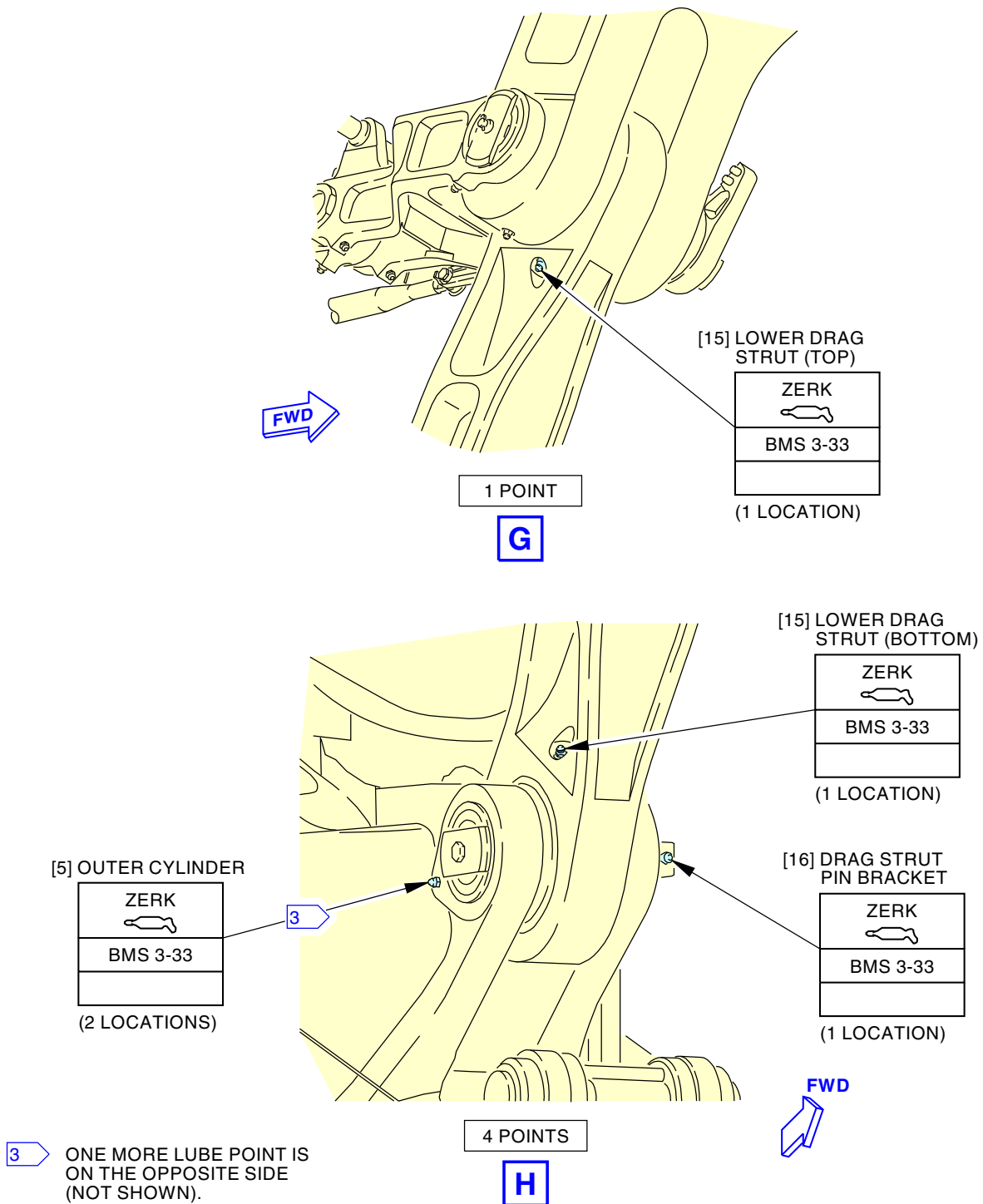
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C14321 S0006401888_V2

Nose Landing Gear Upper End Components Servicing
Figure 301/12-21-12-990-801 (Sheet 6 of 6)

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TASK 12-21-12-640-801

3. Nose Landing Gear and Actuating Mechanism's Lower Components Lubrication

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task provides instructions to lubricate the lower components of the nose landing gear and actuating mechanisms.

B. References

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)

C. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
711	Nose Landing Gear

E. Prepare for the Procedure

SUBTASK 12-21-12-480-001



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.

- (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 12-21-12-010-001



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 AND DAMAGE TO EQUIPMENT.

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

F. Procedure

SUBTASK 12-21-12-640-004



CAUTION

YOU MUST BE CAREFUL WHEN YOU CONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS. YOU MUST ALSO BE CAREFUL WHEN YOU DISCONNECT THE GREASE GUN FROM THE LUBRICATION FITTINGS. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

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(CAUTION PRECEDES)



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE NOSE LANDING GEAR AND ACTUATING MECHANISMS. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, YOU CAN BLOW THE LUBRICATION FITTINGS OFF THE LANDING GEAR.

- (1) Use the grease gun to lubricate the nose landing gear and actuating mechanisms with grease, D00633 (Recommended) or grease, D00013 (Alternative), (Table 302) (Figure 302).

NOTE: Use Table 302 as a list of all the lubrication fittings for the nose landing gear and actuating mechanisms.

- (a) Lubricate the actuator rod ends grease fitting to which you can get access.

NOTE: Actuator rod ends are fitted with two grease fittings.



CAUTION

DO NOT OVER LUBRICATE THE GLAND NUT. USE MINIMUM PRESSURE ON THE HAND PUMP TO APPLY THE GREASE. IF YOU OVER LUBRICATE WITH TOO MUCH PRESSURE DAMAGE TO SHOCK STRUT SEALS MAY OCCUR.

- (b) FOR THE GLAND NUT: Apply the equivalent of 3-5 pumps of a medium size grease gun.

SUBTASK 12-21-12-640-005

- (2) If a fitting blows off, do these steps:

- (a) Make sure there is not a blockage in the lubrication path.

- (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 302/12-21-12-993-804 Nose Landing Gear Lower End Components Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Support Torque Tube ^{*[1]}	grease, D00633	BMS3-33	Zerk	2
2	Steering Actuator	grease, D00633	BMS3-33	Zerk	2
3	Steering Collar	grease, D00633	BMS3-33	Zerk	10
4	Inner Cylinder	grease, D00633	BMS3-33	Zerk	2
5	Support Plate ^{*[1]}	grease, D00633	BMS3-33	Zerk	2
6	Upper Torsion Link	grease, D00633	BMS3-33	Zerk	2
7	Lower Torsion Link	grease, D00633	BMS3-33	Zerk	4
8	Gland Nut ^{*[2]} ^{*[3]} ^[4]	grease, D00633	BMS3-33	Zerk	1
9	Tow Fitting	grease, D00633	BMS3-33	zerk	2

^{*[1]} Use a manual grease gun, or, a restricted, pressurized grease gun, whose lubricant flowrate does not exceed 0.65 lb/min (0.3 kg/min), to minimize the possibility of seal migration or separation, during lubrication.

^{*[2]} Do not over lubricate the gland nut. Use minimum pressure on the hand pump to apply the grease. Apply the equivalent of 3-5 pumps of a medium size grease gun. If you over lubricate with too much pressure the scraper ring can be pushed out of position in the gland nut.

^{*[3]} Some gland nuts do not have lubrication fittings, it is not necessary to lubricate these gland nuts.

^{*[4]} Do not lubricate if the gland nut lubrication fitting has been removed and the hole plugged.

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SUBTASK 12-21-12-600-001

- (3) Nose Wheel Steering Actuator trunnion bearings with a partially migrated or separated bearing seal may remain in-service provided the following is accomplished:
- (a) Ensure the bearing seal will not cause any type of interference which would prevent normal operation of the steering system.
 - 1) If necessary, the seal may be removed to avoid potential interference.
 - (b) Perform lubrication of the bearing(s) every 100 flight hours until the discrepant bearing(s) can be replaced at the next convenient maintenance opportunity where the appropriate equipment and manpower are available.
 - 1) Bearings that exhibit signs of corrosion should be replaced.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-12-410-001



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.

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

————— **END OF TASK** —————

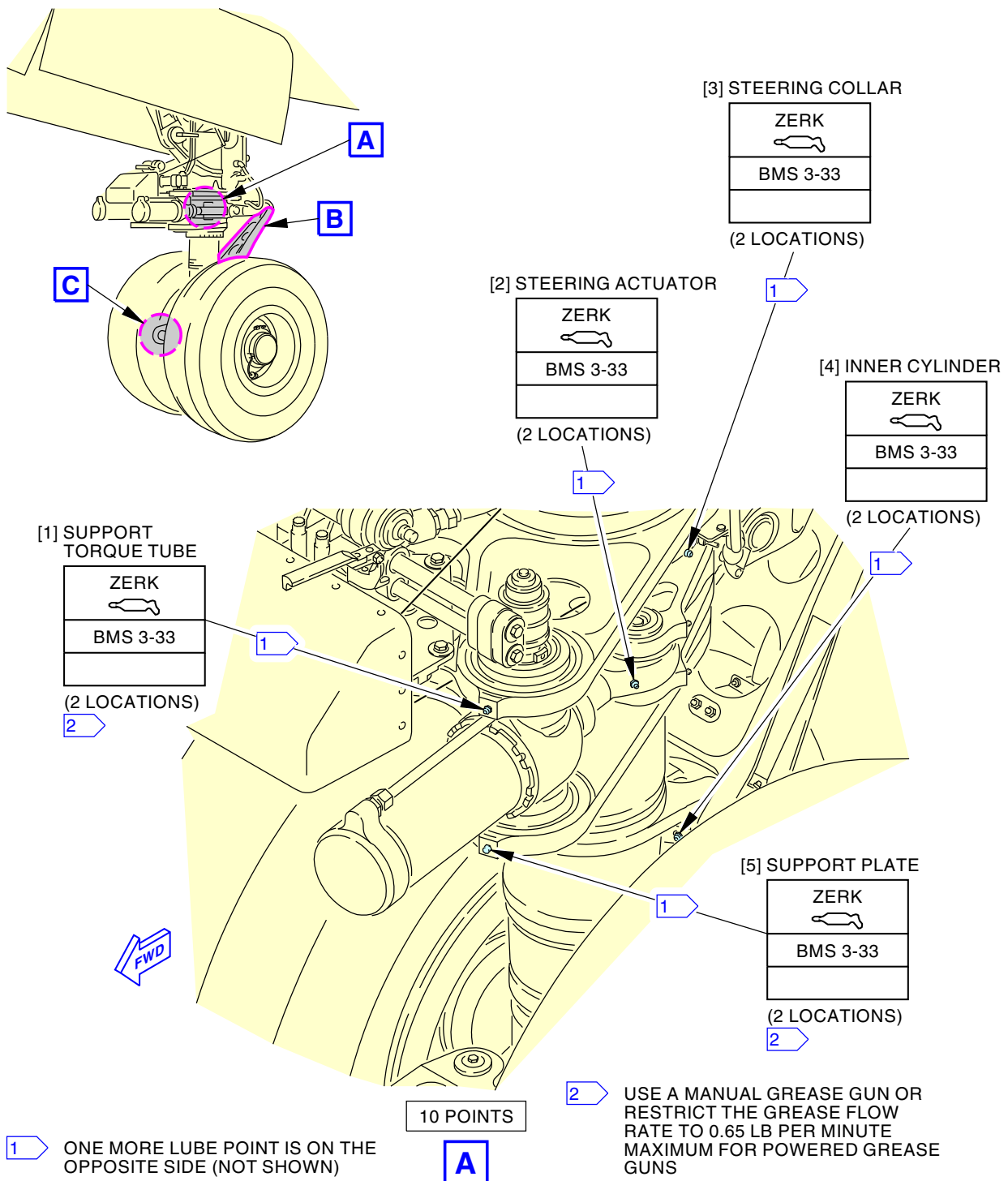
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**Nose Landing Gear Lower End Components Servicing
Figure 302/12-21-12-990-802 (Sheet 1 of 3)**

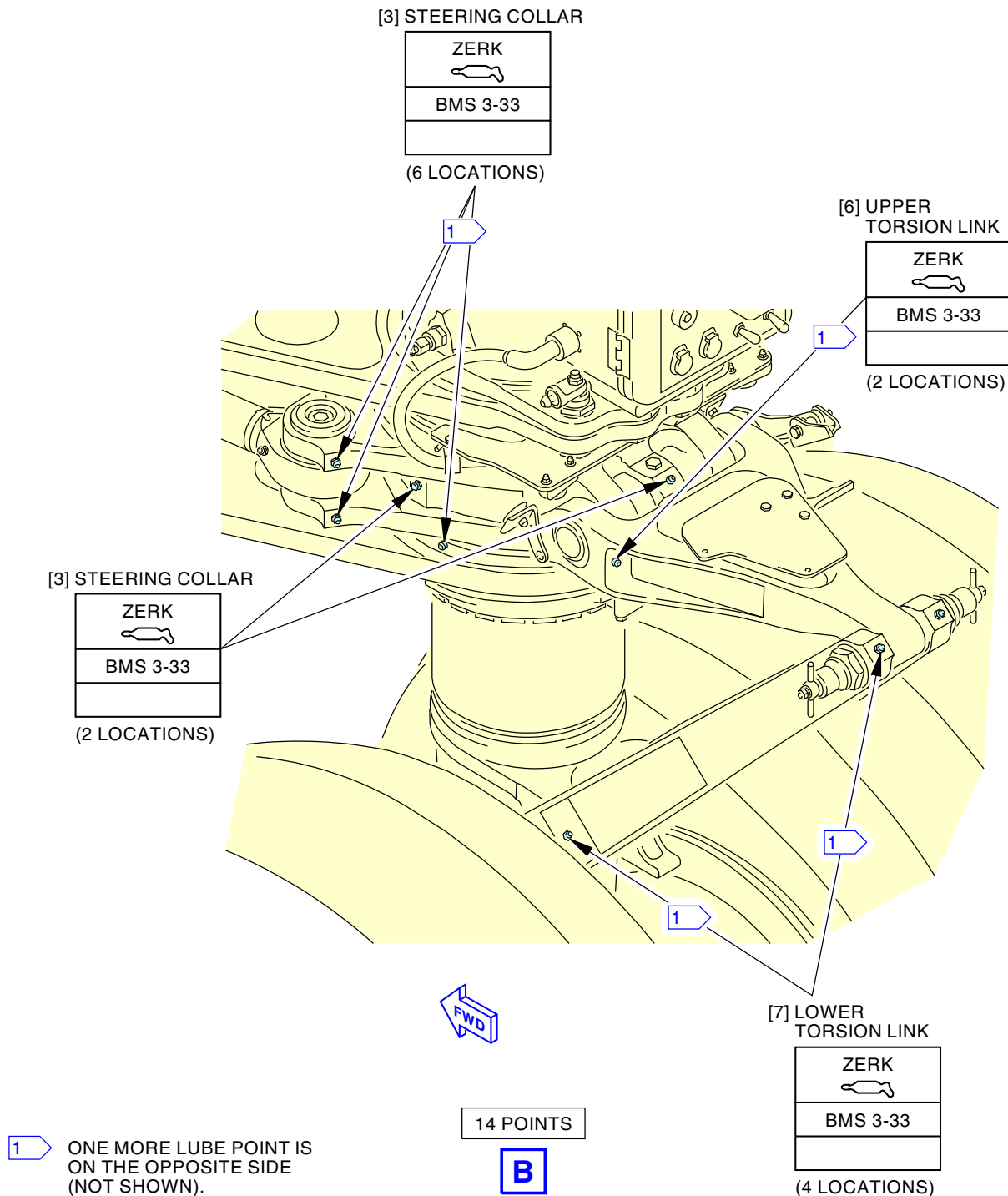
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E55915 S0006401892_V2

Nose Landing Gear Lower End Components Servicing
Figure 302/12-21-12-990-802 (Sheet 2 of 3)

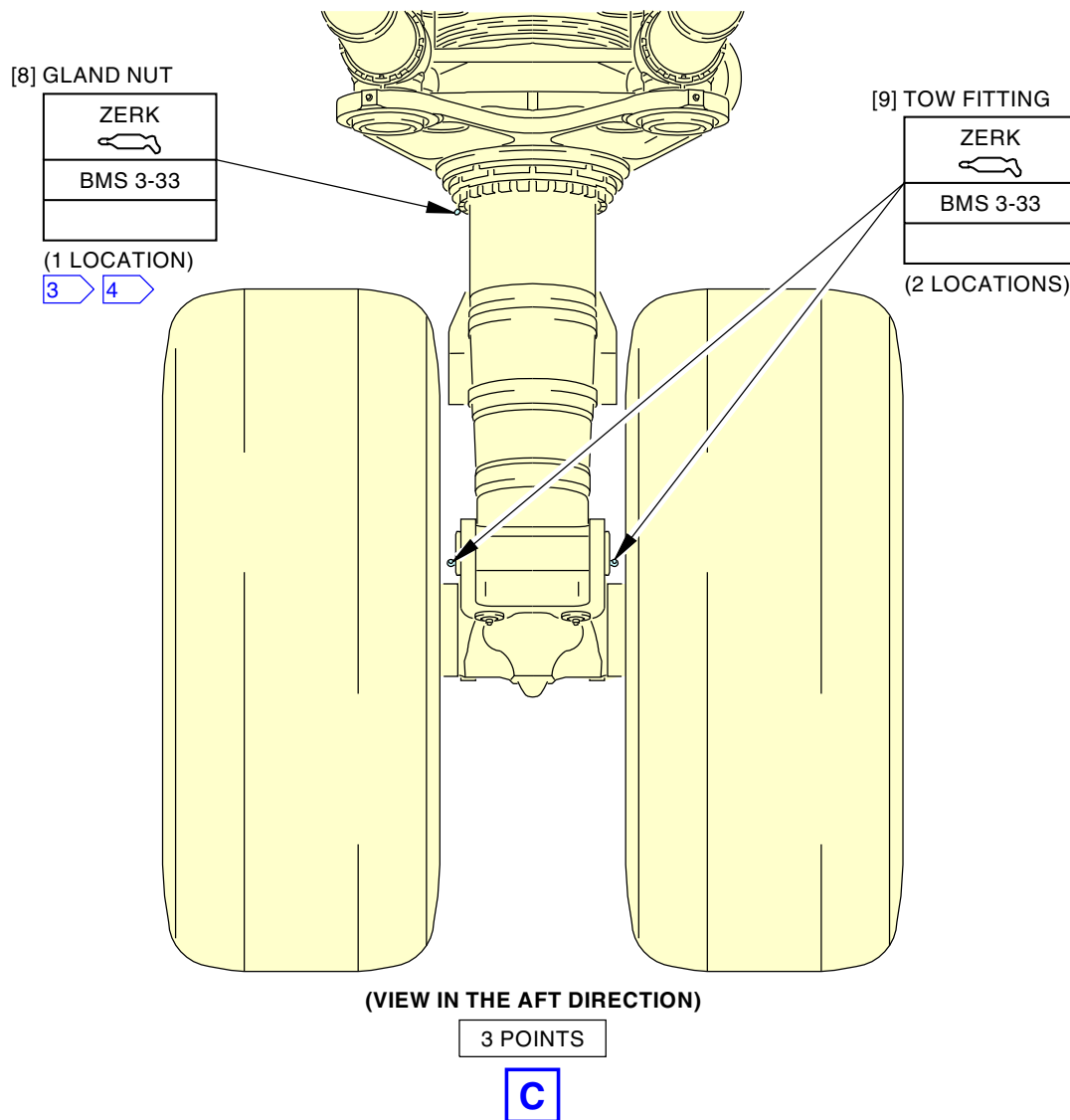
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CAUTION:

DO NOT OVER LUBRICATE THE GLAND NUT. USE MINIMUM PRESSURE ON THE HAND PUMP TO APPLY THE GREASE. APPLY THE EQUIVALENT OF 3-5 PUMPS OF A MEDIUM SIZE GREASE GUN. IF YOU OVER LUBRICATE WITH TOO MUCH PRESSURE DAMAGE TO SHOCK STRUT SEALS MAY OCCUR.

SOME GLAND NUTS DO NOT HAVE LUBRICATION FITTINGS. IT IS NOT NECESSARY TO LUBRICATE THESE GLAND NUTS.

C14400 S0006401893_V2

Nose Landing Gear Lower End Components Servicing Figure 302/12-21-12-990-802 (Sheet 3 of 3)

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NOSE LANDING GEAR DOORS AND ACTUATING MECHANISMS - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure supplies instructions to lubricate the nose landing gear doors and actuating mechanisms.
- C. If you will service the landing gear in cold weather, refer to this task: Lubrication of Landing Gear During Cold Weather Operation, TASK 12-21-00-600-801.

TASK 12-21-13-640-801

2. Nose Landing Gear Doors and Actuating Mechanisms Lubrication

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) This task provides instructions to lubricate the nose landing gear doors and actuating mechanisms.

B. **References**

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)

C. **Consumable Materials**

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS3-33)
D00633	Grease - Aircraft General Purpose	BMS3-33

D. **Location Zones**

Zone	Area
113	Nose Landing Gear Wheel Well, Left
114	Nose Landing Gear Wheel Well, Right
711	Nose Landing Gear

E. **Prepare for the Procedure**

SUBTASK 12-21-13-490-001

 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.

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SUBTASK 12-21-13-490-002



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.

F. Procedure

SUBTASK 12-21-13-640-001



CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.



USE BMS3-24 AS A REPLACEMENT FOR BMS3-33. DO NOT MIX THE TWO. FULLY CLEAN PARTS WITH BMS3-33.

- (1) Use the grease gun to lubricate the nose landing gear doors and actuating mechanisms with grease, D00633 (Recommended), grease, D00015 (Alternative) or grease, D00013 (Alternative) (Figure 301).

NOTE: Table 301 makes a list of all the lubrication fittings for the nose landing gear doors and actuating mechanisms.

NOTE: Actuator rod ends are fitted with two grease fittings. It is only necessary to lubricate the fitting to which you can get access.

SUBTASK 12-21-13-640-002

- (2) If a fitting blows off, do these steps:
- (a) Make sure there is not a blockage in the lubrication path.
 - (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 301/12-21-13-993-801

Nose Landing Gear Doors and Actuating Mechanisms Lubrication					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Operating Spindle, left and right	grease, D00633	BMS3-33	Zerk	1
2	Operating Strut, left and right	grease, D00633	BMS3-33	Zerk	1
3	Bolt, left and right	grease, D00633	BMS3-33	Zerk	1
4	Spindle Support, left and right	grease, D00633	BMS3-33	Zerk	1
5	Head end door actuator pin	grease, D00633	BMS3-33	Zerk	1
6	Head end door actuator	grease, D00633	BMS3-33	Zerk	1

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Table 301/12-21-13-993-801 (Continued)

Nose Landing Gear Doors and Actuating Mechanisms Lubrication					
Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
7	Rod end door actuator	grease, D00633	BMS3-33	Zerk	1
8	Right operating control rod	grease, D00633	BMS3-33	Flush	2
9	Left operating control rod	grease, D00633	BMS3-33	Flush	2
10	Rod end door actuator pin	grease, D00633	BMS3-33	Zerk	1
11	Operating bellcrank	grease, D00633	BMS3-33	Zerk	1
12	Rod End Bearing	grease, D00633	BMS3-33	Flush	1

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-13-090-001

 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.

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

———— **END OF TASK** ————

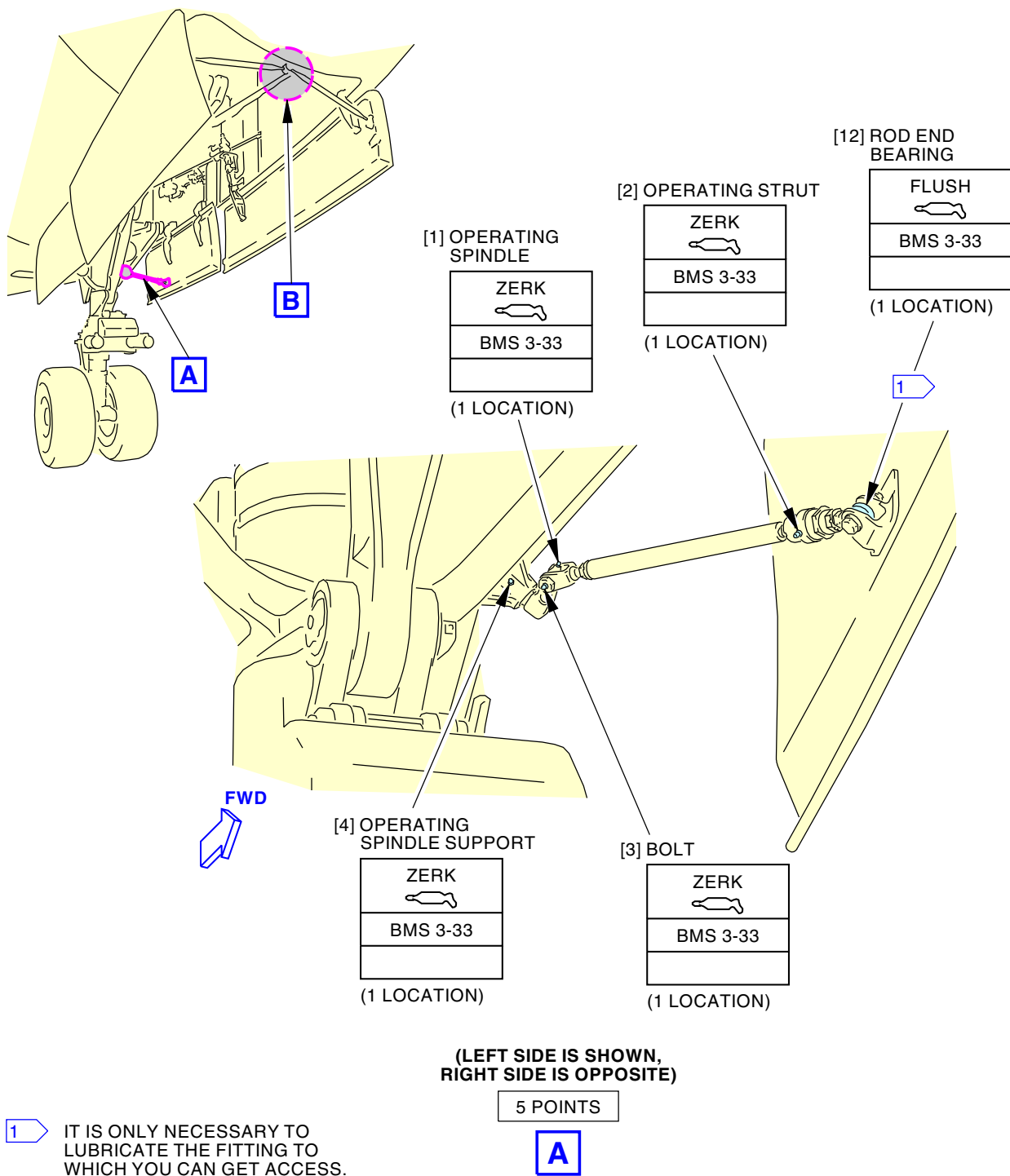
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Nose Landing Gear Doors and Actuating Mechanisms Servicing Figure 301/12-21-13-990-801 (Sheet 1 of 2)

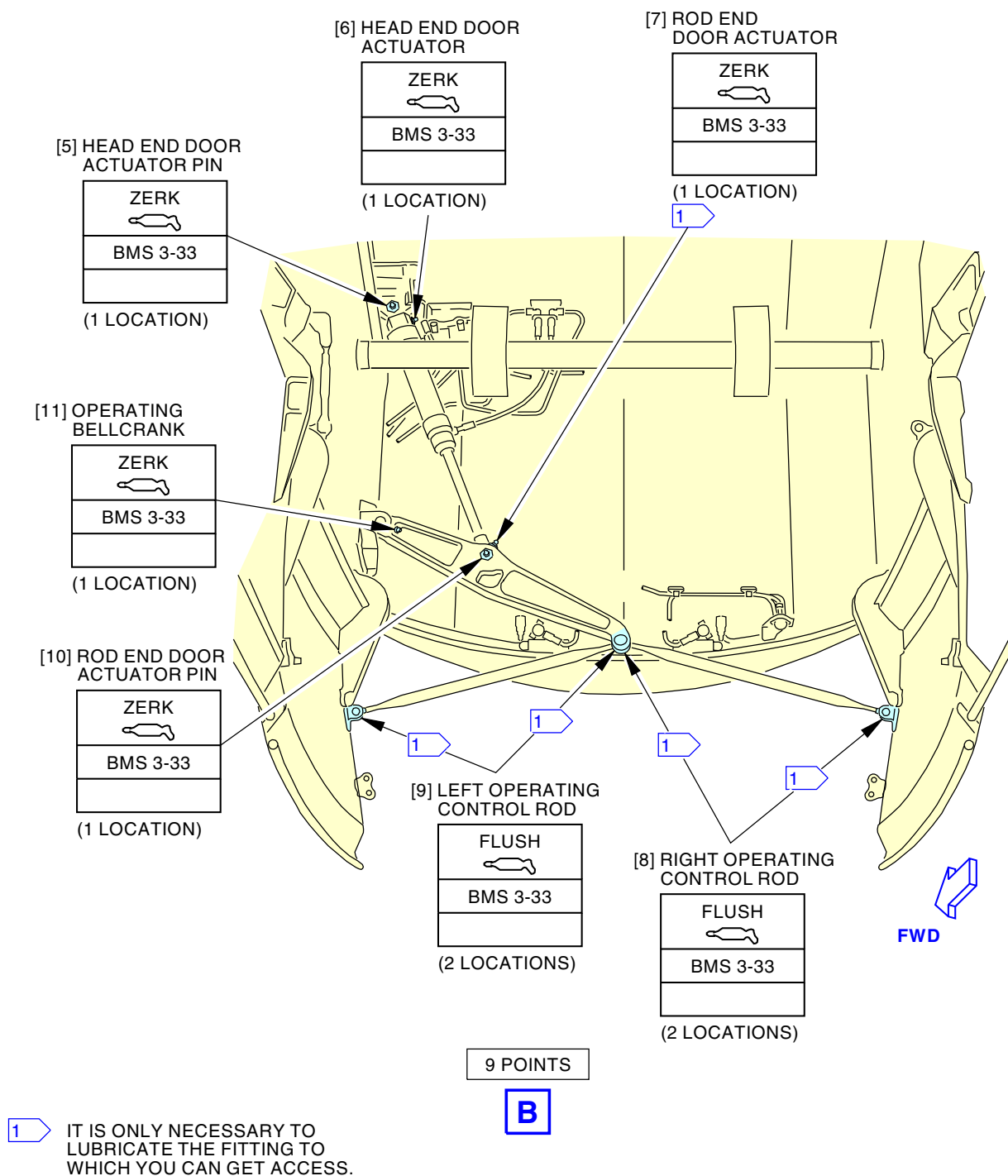
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E12499 S0006401899_V3

Nose Landing Gear Doors and Actuating Mechanisms Servicing
Figure 301/12-21-13-990-801 (Sheet 2 of 2)

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MAIN LANDING GEAR AND ACTUATING MECHANISMS - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure provides instructions to do these tasks:
 - (1) The lubrication of the upper main landing gear and actuating mechanisms.
 - (2) The lubrication of the forward trunnion bearing housing and retract arm.
 - (3) The lubrication of the lower main landing gear and actuating mechanisms.
 - (4) The lubrication of the pivot joint for the main landing gear.
 - (5) The lubrication of the main landing gear hydraulic strut.
 - (6) The lubrication of the main landing gear center axle.
- C. These procedures show only the left main landing gear, but they are applicable to the right main landing gear also.
- D. If you will service the landing gear in cold weather, refer to this task: Lubrication of Landing Gear During Cold Weather Operation, TASK 12-21-00-600-801.

TASK 12-21-14-640-805-002

2. Upper Main Landing Gear and Actuating Mechanisms Lubrication

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task provides instructions to lubricate the upper main landing gear and actuating mechanisms.

B. References

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)
32-00-50-040-801	Main Landing Gear Steering System Deactivation (P/B 201)
32-00-50-440-801	Main Landing Gear Steering System Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
731	Left Main Landing Gear
741	Right Main Landing Gear

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

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F. Prepare for the Procedure

SUBTASK 12-21-14-490-005-002



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 12-21-14-490-006-002



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 12-21-14-040-004



MAKE SURE THE MAIN LANDING GEAR STEERING SYSTEM IS ISOLATED FROM HYDRAULIC POWER BEFORE YOU DO WORK NEAR THE TIRES, WHEELS, OR BRAKES. IF YOU DO NOT DO THIS, THE AFT AXLES CAN AUTOMATICALLY TURN. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Deactivate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Deactivation, TASK 32-00-50-040-801.

SUBTASK 12-21-14-010-010-002

- (4) Open the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

NOTE: You must open these access panels to lubricate the upper reaction link, the lower reaction link, and the retract fitting link.

G. Procedure

SUBTASK 12-21-14-640-010-002



CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

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(CAUTION PRECEDES)



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.

- (1) Use the grease gun to lubricate the main landing gear and actuating mechanisms (Figure 301) (Table 301).

NOTE: The tables makes a list of all the lubrication fittings for the main landing gear and actuating mechanisms.

NOTE: Remove excess grease from all fittings after lubrication.

SUBTASK 12-21-14-640-011-002

- (2) When you lubricate the main landing gear and actuating mechanism, you will use these lubricants:

(a) grease, D00633

SUBTASK 12-21-14-420-005-002

- (3) If a fitting blows off, do these steps:

(a) Make sure there is not a blockage in the lubrication path.

(b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 301/12-21-14-993-816-002 Main Landing Gear and Actuating Mechanisms Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	UPPER REACTION LINK	grease, D00633	BMS3-33	Zerk	5
2	RETRACT ARM	grease, D00633	BMS3-33	Zerk	4
3	LOWER REACTION LINK	grease, D00633	BMS3-33	Zerk	4
4	RETRACT FITTING LINK	grease, D00633	BMS3-33	Zerk	2
5	OUTER CYLINDER	grease, D00633	BMS3-33	Zerk	5
6	MAIN GEAR RETRACT ACTUATOR	grease, D00633	BMS3-33	Zerk	2
7	UPLOCK HOOK ACTUATOR	grease, D00633	BMS3-33	Zerk	3
8	UPLOCK HOOK	grease, D00633	BMS3-33	Zerk	1
9	INBOARD SIDE BRACE LOCK LINK	grease, D00633	BMS3-33	Zerk	2
10	UPPER SIDE BRACE SPINDLE	grease, D00633	BMS3-33	Zerk	2
11	UPPER SIDE BRACE	grease, D00633	BMS3-33	Zerk	4
12	LOWER SIDE BRACE	grease, D00633	BMS3-33	Zerk	4
13	LOWER SIDE BRACE SPINDLE	grease, D00633	BMS3-33	Zerk	2
14	SIDE BRACE LOCK LINK	grease, D00633	BMS3-33	Zerk	17
15	SIDE BRACE DOWN LOCK ACTUATOR	grease, D00633	BMS3-33	Zerk	1
16	SIDE BRACE LOCK LINK SPINDLE FITTING	grease, D00633	BMS3-33	Zerk	1

EFFECTIVITY
ARO ALL

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Table 301/12-21-14-993-816-002 Main Landing Gear and Actuating Mechanisms Lubrication (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
17	SIDE BRACE LOCK LINK SPINDLE	grease, D00633	BMS3-33	Zerk	1
18	UPPER DRAG BRACE SPINDLE	grease, D00633	BMS3-33	Zerk	2
19	UPPER DRAG BRACE	grease, D00633	BMS3-33	Zerk	4
20	LOWER DRAG BRACE SPINDLE	grease, D00633	BMS3-33	Zerk	1
21	LOWER DRAG BRACE	grease, D00633	BMS3-33	Zerk	4
22	INBOARD SIDE BRACE LOCK LINK	grease, D00633	BMS3-33	Zerk	2
23	DRAG BRACE DOWN LOCK ACTUATOR	grease, D00633	BMS3-33	Zerk	1
24	DRAG BRACE LOCK LINK	grease, D00633	BMS3-33	Zerk	17
25	DRAG BRACE LOCK LINK SPINDLE	grease, D00633	BMS3-33	Zerk	1
26	DRAG BRACE LOCK LINK SPINDLE FITTING	grease, D00633	BMS3-33	Zerk	1
27	DRAG BRACE DOOR ATTACH BASE	grease, D00633	BMS3-33	Zerk	1

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-14-010-011-002

- (1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 12-21-14-440-004

- (2) Activate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Activation, TASK 32-00-50-440-801.

SUBTASK 12-21-14-090-003-002



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.

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

———— **END OF TASK** ————

EFFECTIVITY
ARO ALL

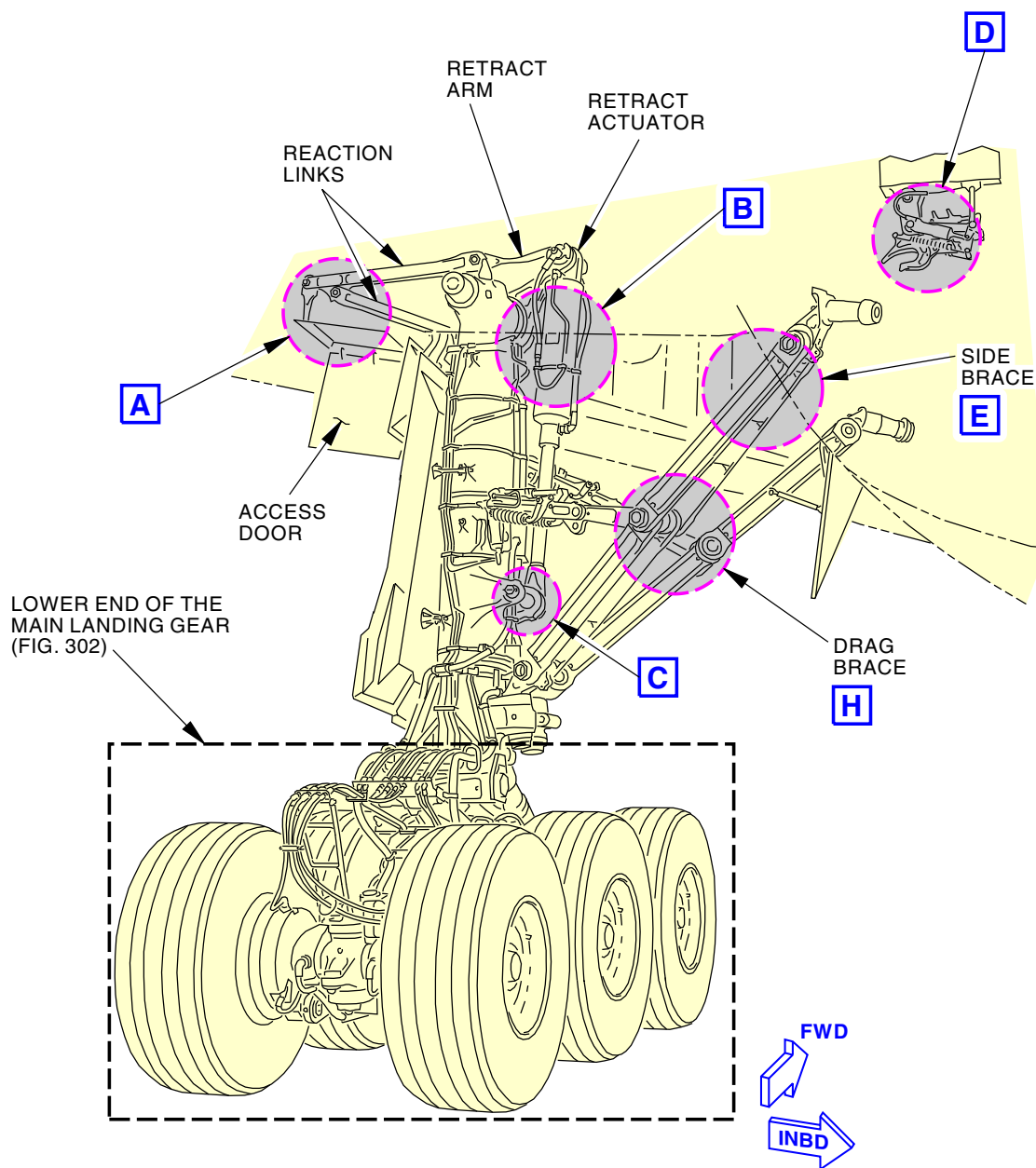
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**LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR IS EQUIVALENT)**

M52204 S0006401944_V3

**Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 1 of 11)**

EFFECTIVITY
ARO ALL

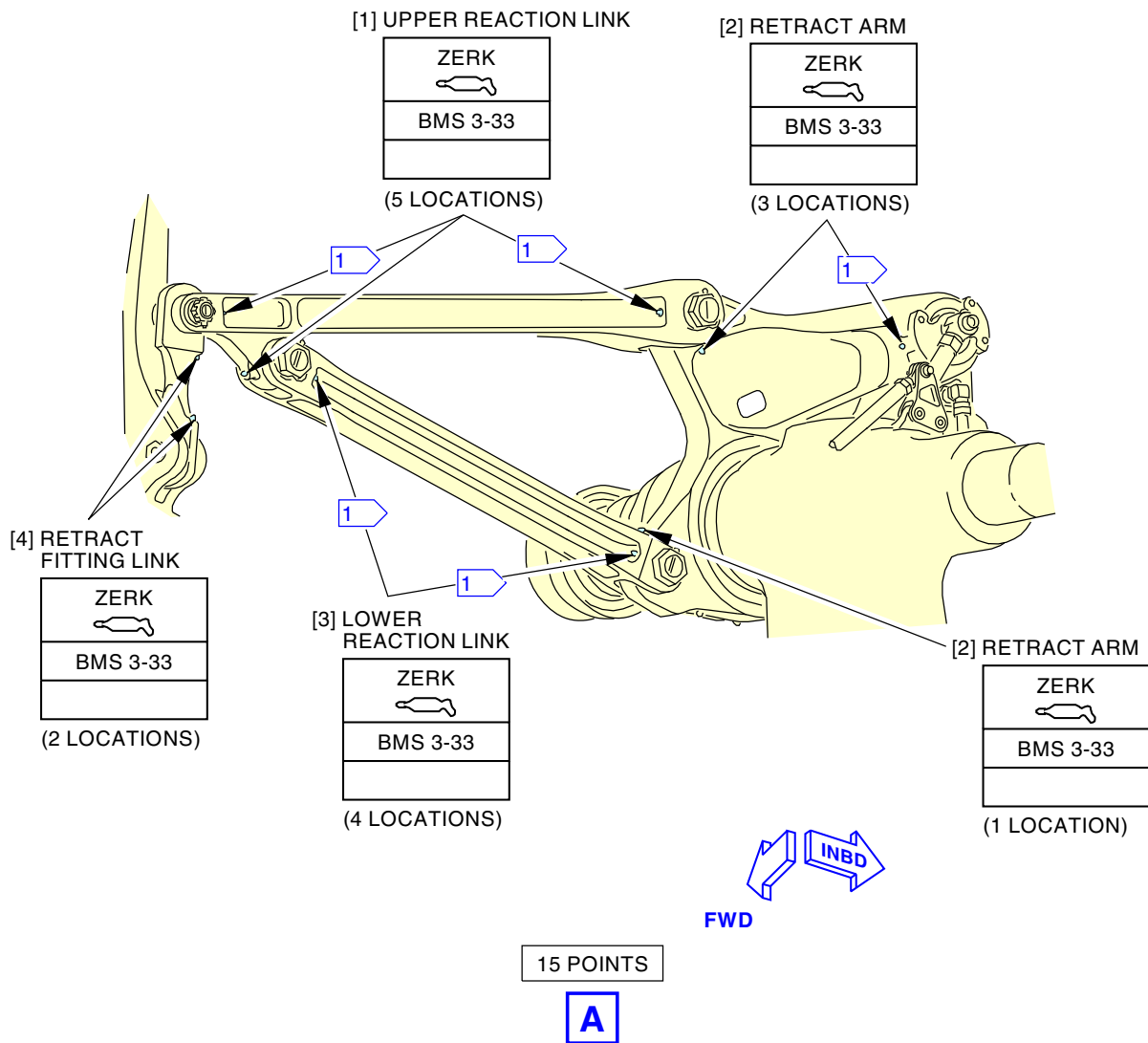
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NOTE:

SURROUNDING COMPONENTS
NOT SHOWN FOR CLARITY.

1 ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

M52276 S0006401945_V8

Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 2 of 11)

EFFECTIVITY
ARO ALL

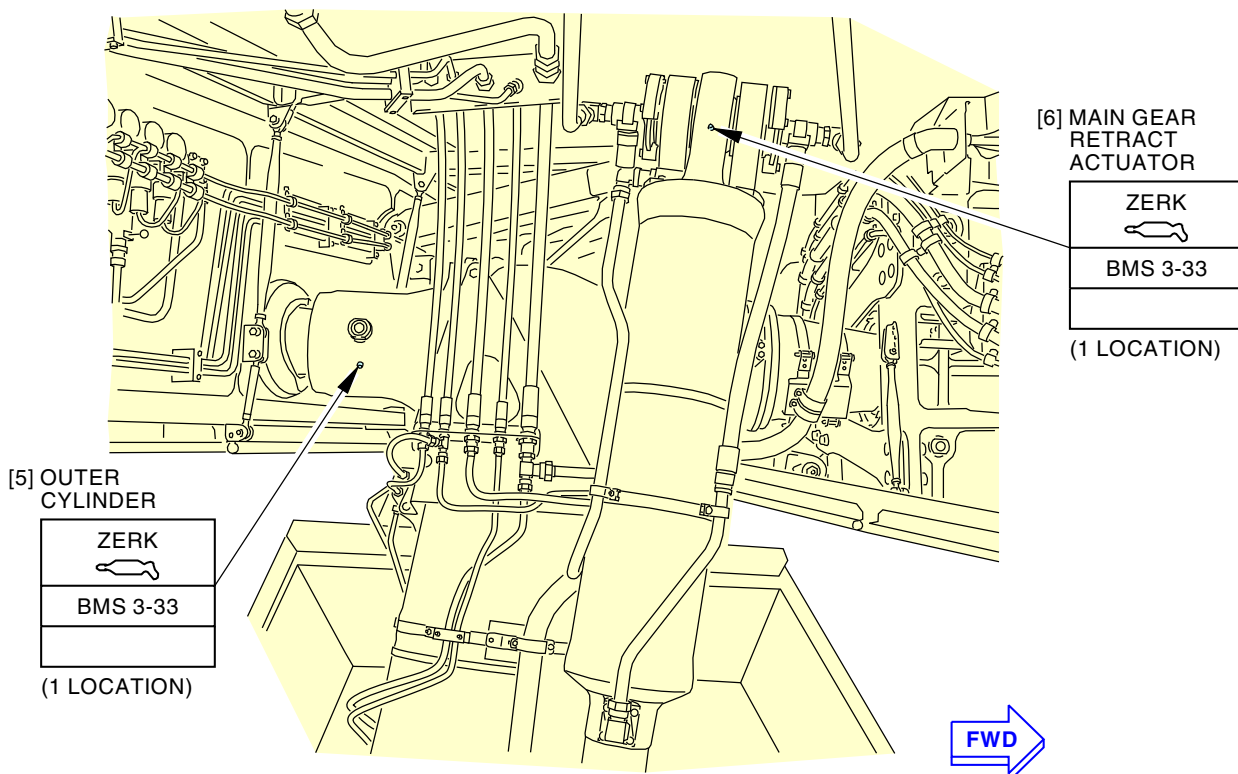
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2 POINTS

B

M52307 S0006401946_V4

**Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 3 of 11)**

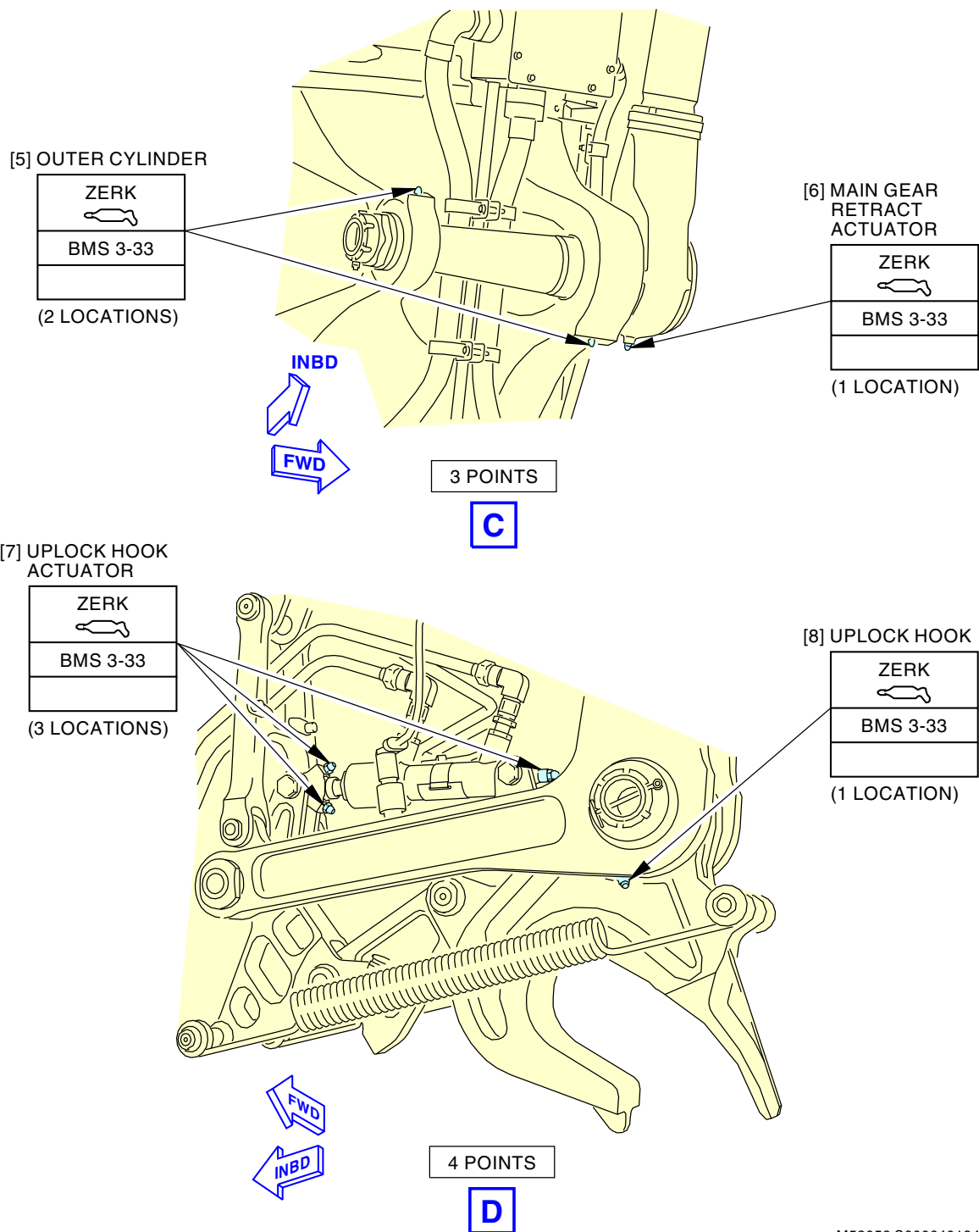
EFFECTIVITY
ARO ALL

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M53058 S0006401947_V4

Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 4 of 11)

EFFECTIVITY
ARO ALL

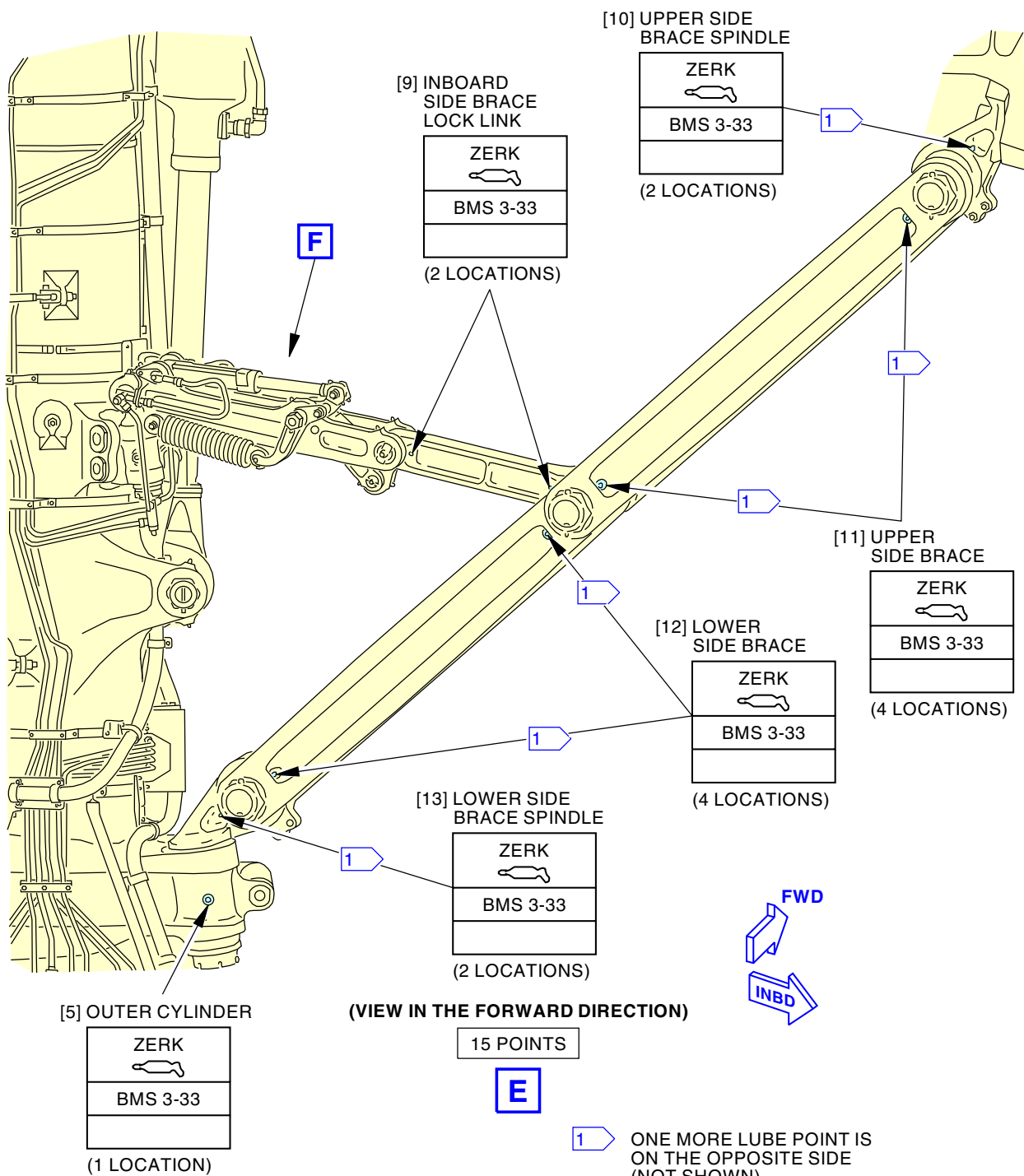
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M53681 S0006401948_V3

Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 5 of 11)

EFFECTIVITY
ARO ALL

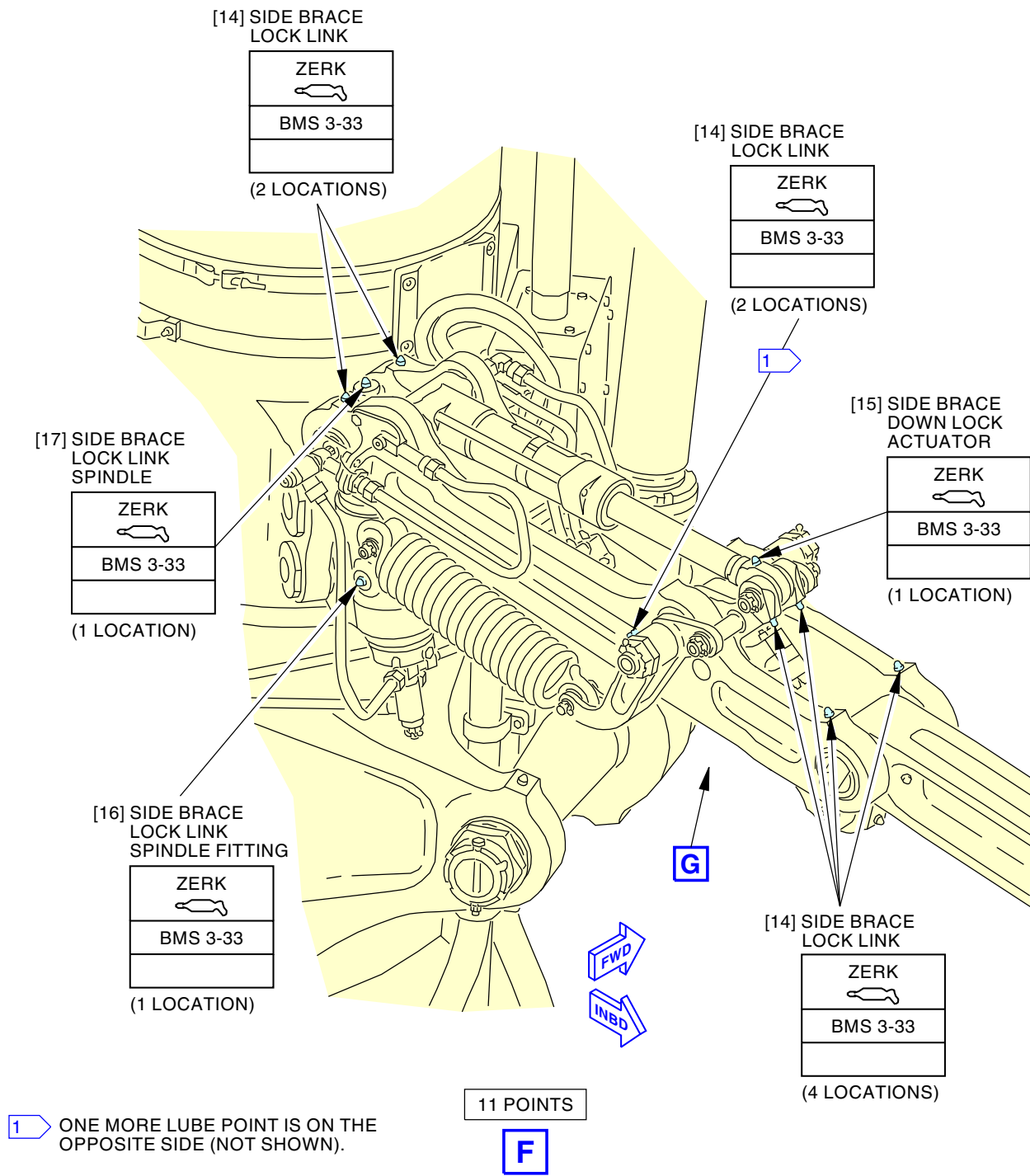
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M53969 S0006401949_V5

Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 6 of 11)

EFFECTIVITY
ARO ALL

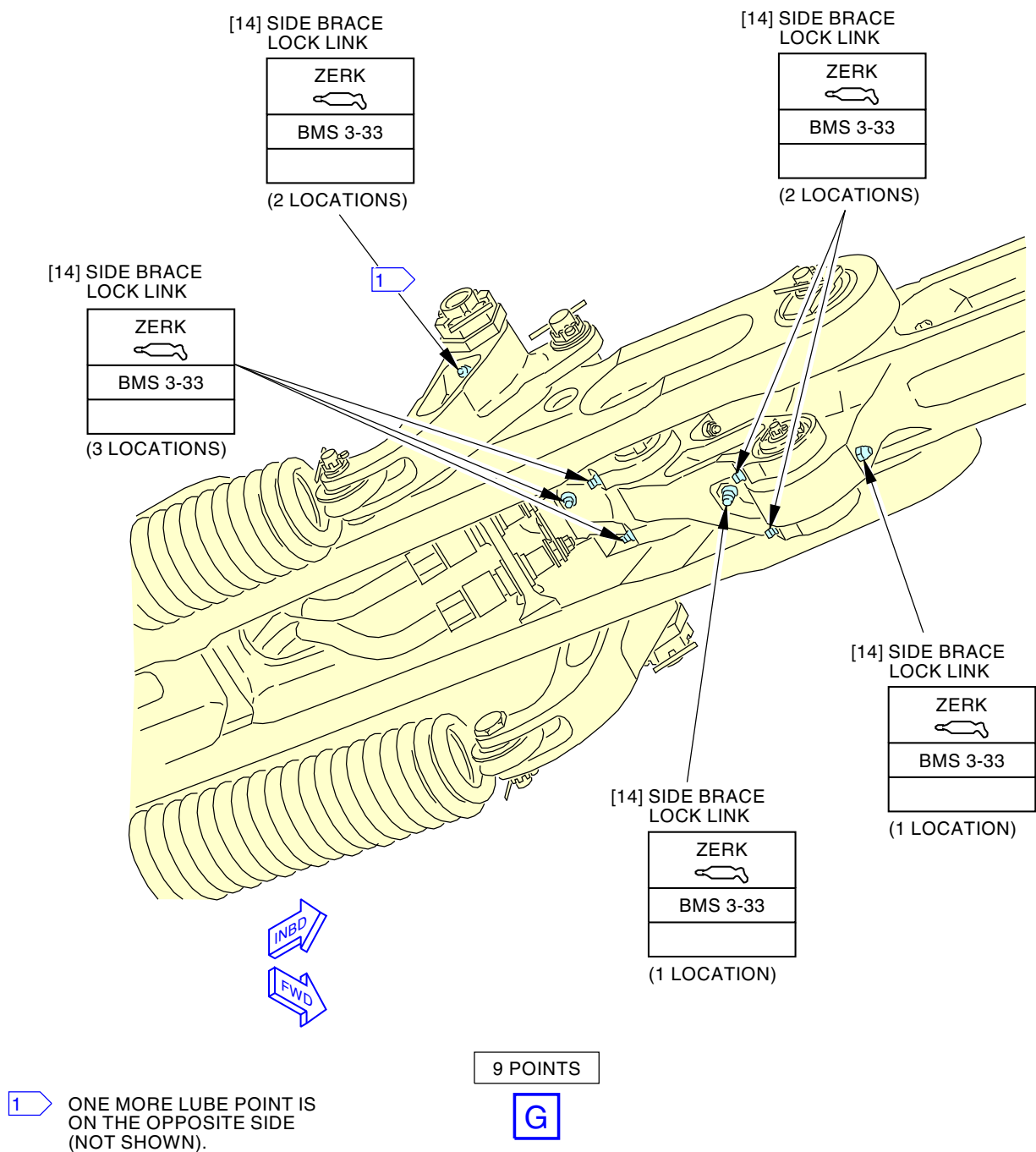
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M54053 S0006401950_V3

Lubrication of the Upper End for the Main Landing Gear Figure 301/12-21-14-990-814-002 (Sheet 7 of 11)

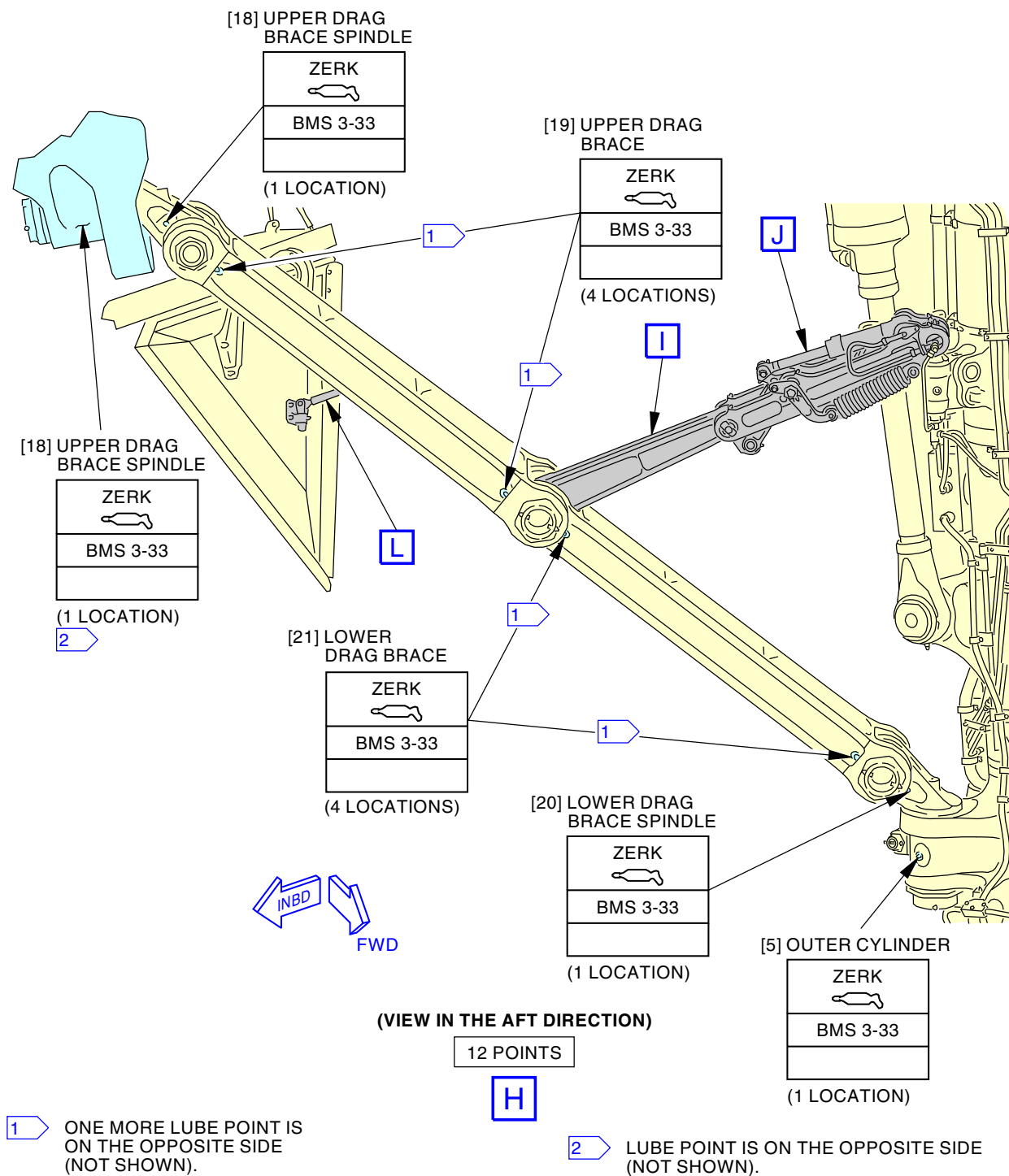
EFFECTIVITY
ARO ALL

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M54138 S0006401951_V4

Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 8 of 11)

EFFECTIVITY
ARO ALL

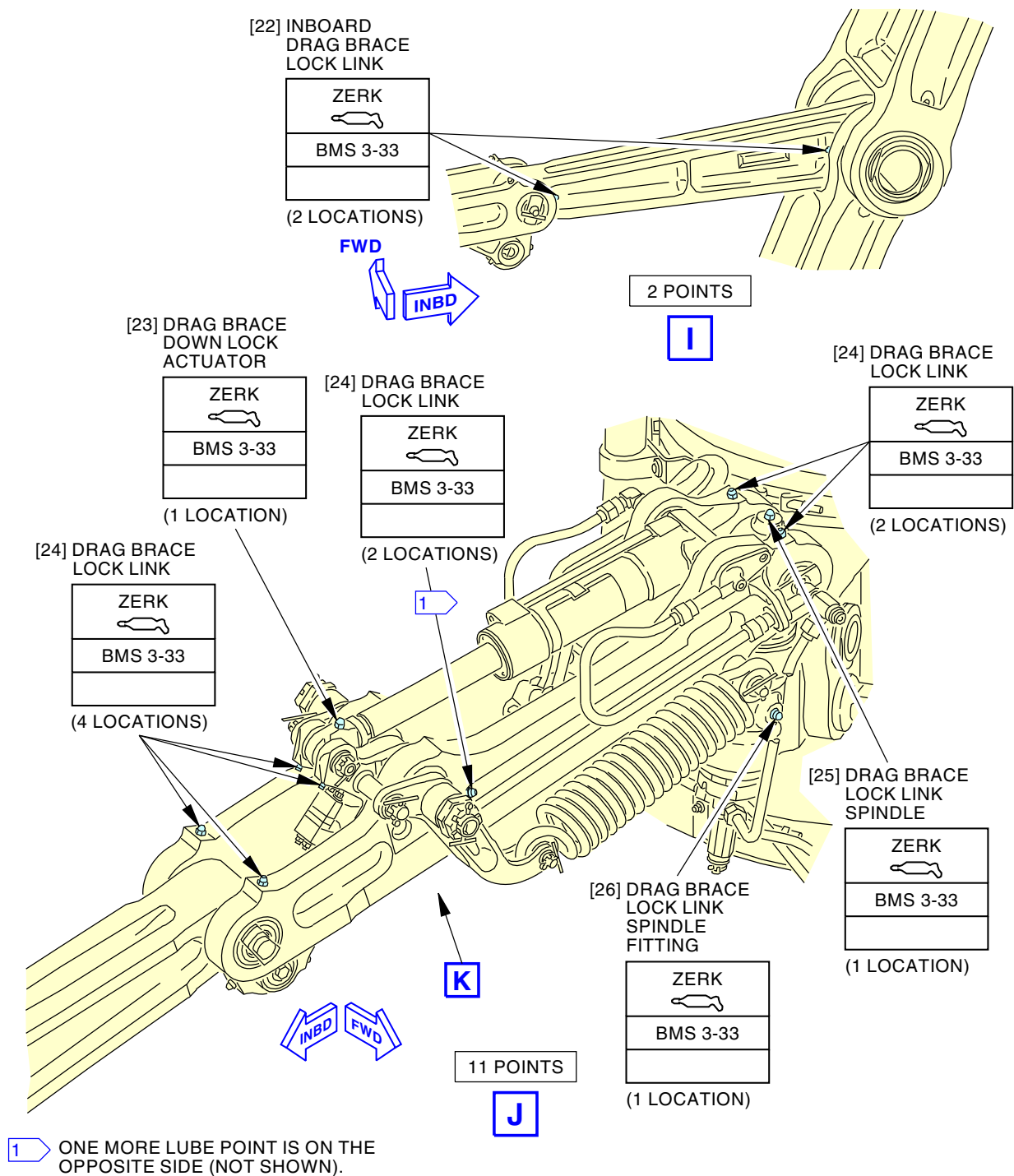
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M54317 S0006401952_V3

**Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 9 of 11)**

EFFECTIVITY
ARO ALL

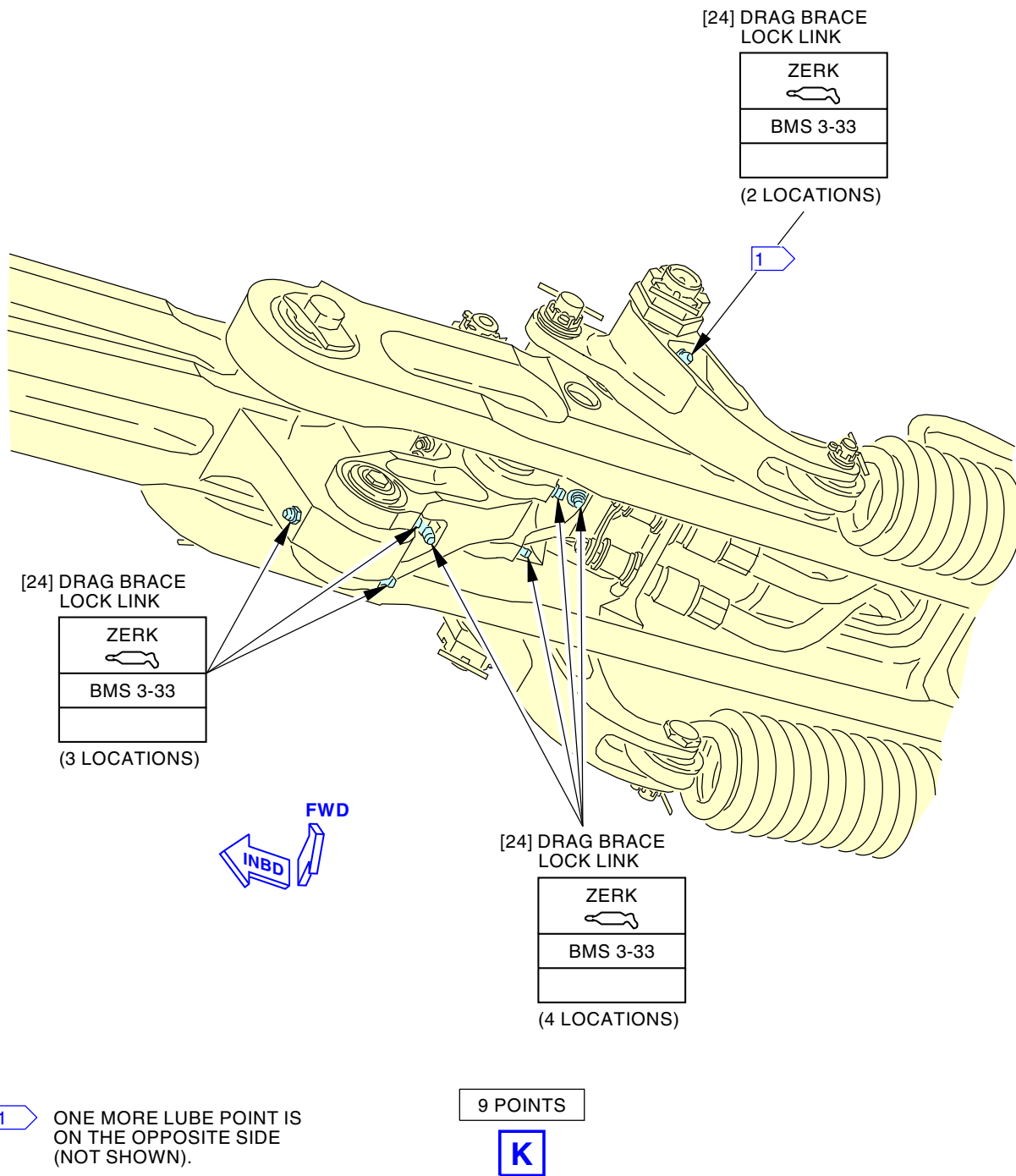
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M54464 S0006401953_V3

Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 10 of 11)

EFFECTIVITY
ARO ALL

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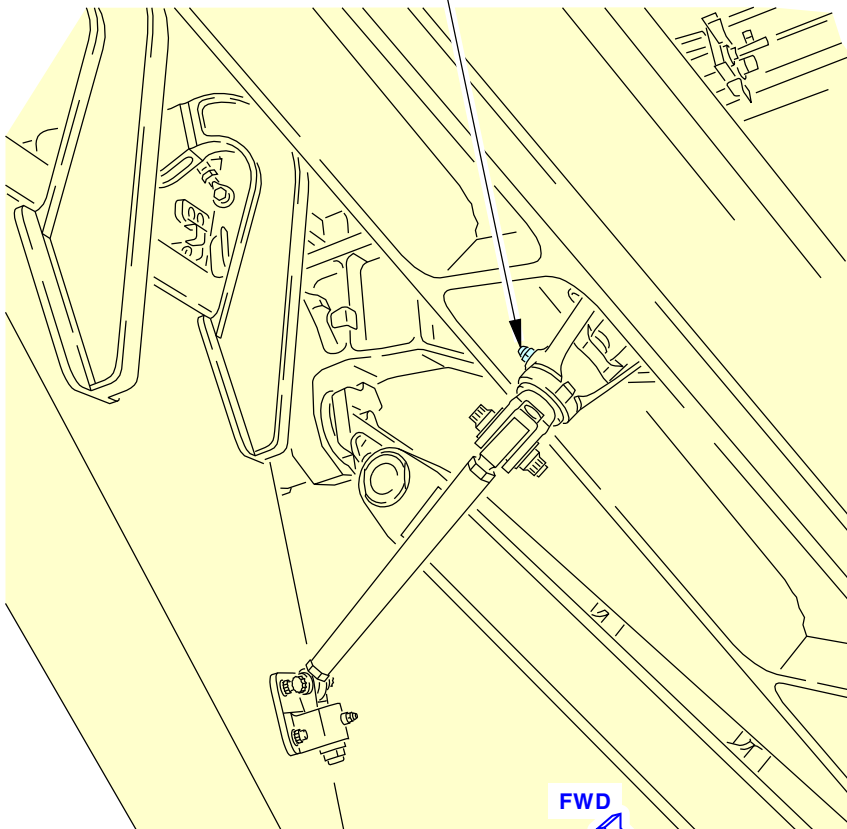
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[27] DRAG BRACE
DOOR ATTACH
BASE

ZERK

BMS 3-33

(1 LOCATION)



1 POINT



M54470 S0006401954_V3

Lubrication of the Upper End for the Main Landing Gear
Figure 301/12-21-14-990-814-002 (Sheet 11 of 11)

EFFECTIVITY
ARO ALL

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TASK 12-21-14-640-814-002

3. Forward Trunnion Bearing Housing and Retract Arm Lubrication

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task provides instructions to lubricate the components of main landing gear.

B. References

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)
32-00-50-040-801	Main Landing Gear Steering System Deactivation (P/B 201)
32-00-50-440-801	Main Landing Gear Steering System Activation (P/B 201)
32-12-11-020-801	Main Landing Gear Trunnion Door Removal (P/B 401)
32-12-11-420-801	Main Landing Gear Trunnion Door Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00528	Grease - Aircraft - Royco 11MS	
D00633	Grease - Aircraft General Purpose	BMS3-33
D50255	Grease - Aircraft And Instrument	MIL-PRF-32014

D. Location Zones

Zone	Area
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
731	Left Main Landing Gear
741	Right Main Landing Gear

E. Access Panels

Number	Name/Location
551BB	Inboard Fixed Trailing Edge Panel
551DB	Inboard Fixed Trailing Edge Panel
651BB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

F. Prepare for the Procedure

SUBTASK 12-21-14-480-008-002



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

EFFECTIVITY
ARO ALL

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SUBTASK 12-21-14-010-016-002



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) To open the landing gear doors and install the safety pins, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 12-21-14-040-010-002



WARNING

MAKE SURE THE MAIN LANDING GEAR STEERING SYSTEM IS ISOLATED FROM HYDRAULIC POWER BEFORE YOU DO WORK NEAR THE TIRES, WHEELS, OR BRAKES. IF YOU DO NOT DO THIS, THE AFT AXLES CAN AUTOMATICALLY TURN. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Deactivate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Deactivation, TASK 32-00-50-040-801

SUBTASK 12-21-14-010-019-002

- (4) If necessary to get access to the attaching screws on the panels, do this task: Main Landing Gear Trunnion Door Removal, TASK 32-12-11-020-801.

SUBTASK 12-21-14-010-017-002

- (5) Open the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

NOTE: You must open these access panels to lubricate the upper reaction link, the lower reaction link, and the retract fitting link.

Open the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
551BB	Inboard Fixed Trailing Edge Panel
651BB	Inboard Fixed Trailing Edge Panel

NOTE: You must open these access panels to lubricate the forward trunnion bearing housing.

G. Procedure

SUBTASK 12-21-14-640-031-002



CAUTION

CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

EFFECTIVITY
ARO ALL

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(CAUTION PRECEDES)



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.

- (1) Use the grease gun to lubricate the components of main landing gear (Figure 302), (Table 302).

NOTE: The tables makes a list of all the lubrication fittings for the main landing gear.

NOTE: Remove excess grease from all fittings after lubrication.

SUBTASK 12-21-14-640-032-002

- (2) When you lubricate the main landing gear, you will use these lubricants:
- (a) grease, D00633(Recommended) or grease, D00013 (Alternative)
 - (b) grease, D50255(Recommended) or Royco 11MS grease, D00528 (Optional).

SUBTASK 12-21-14-420-012-002

- (3) If a fitting blows off, do these steps:
- (a) Make sure there is not a blockage in the lubrication path.
 - (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 302/12-21-14-993-826-002 Components of Main Landing Gear Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	RETRACT ARM ^{*[1]}	grease, D50255	MIL-PRF-32014	Zerk	2
		Royco 11MS grease, D00528	-		
2	FORWARD TRUNNION BEARING HOUSING ^{*[2]}	grease, D00633	BMS3-33	Zerk	2

*[1] To Avoid intermixing greases, select one grease type. Purge per AMM 12-21-00 if changing grease type or if intermixing occurs. Note: MIL-PRF-32014, grease D50255 (Recommended), ROYCO-11MS, D00528 (Optional).

*[2] Use a flexible grease hose extension to get better access.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-14-010-018-002

- (1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
551BB	Inboard Fixed Trailing Edge Panel
551DB	Inboard Fixed Trailing Edge Panel
651BB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 12-21-14-410-011-002

- (2) If the trunnion door was removed, do this task: Main Landing Gear Trunnion Door Installation, TASK 32-12-11-420-801.

SUBTASK 12-21-14-440-010-002

- (3) Activate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Activation, TASK 32-00-50-440-801

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ARO ALL

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SUBTASK 12-21-14-410-008-002



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.

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

———— **END OF TASK** ————

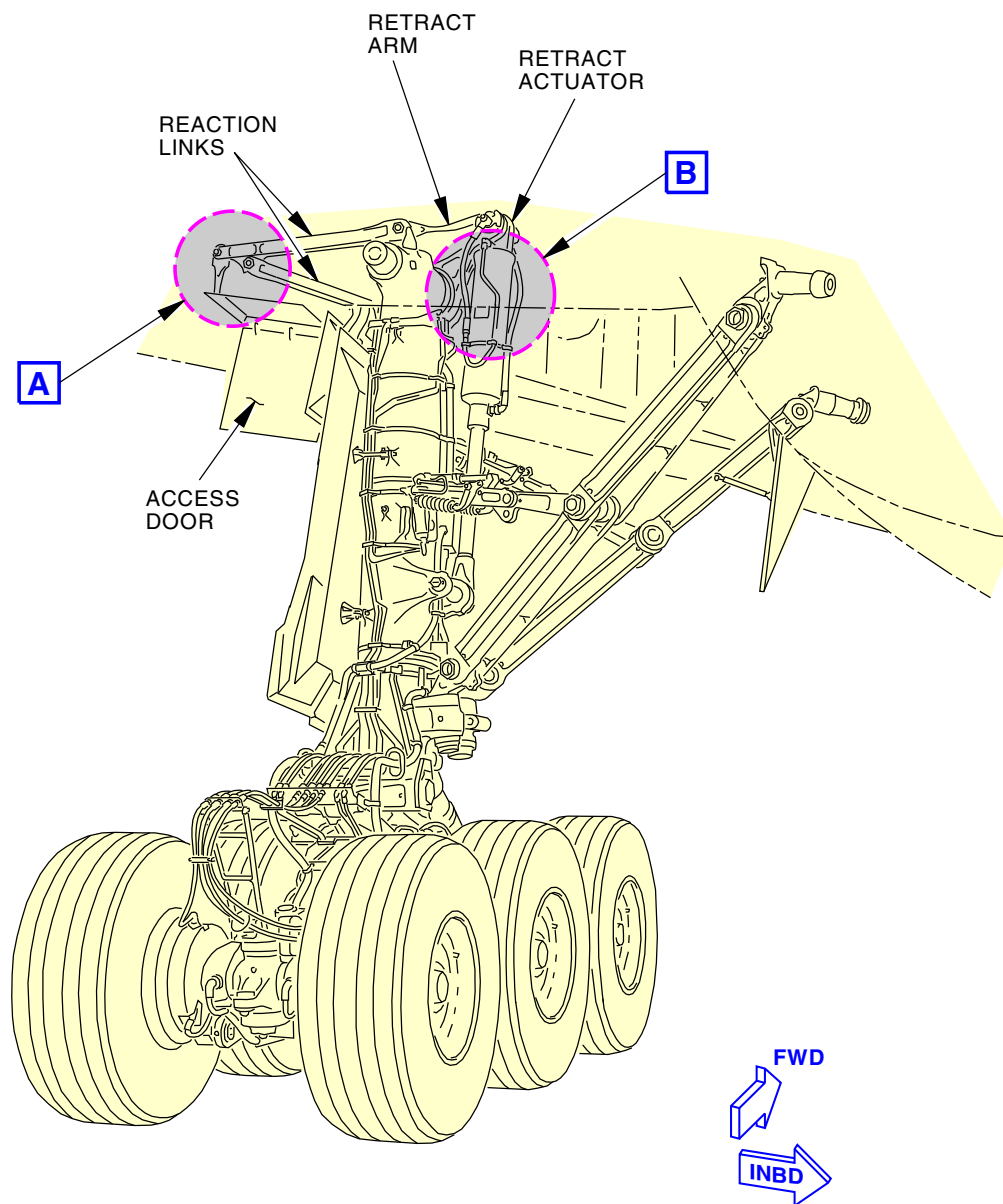
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ARO ALL

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**LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR IS EQUIVALENT)**

2419064 S0000557489_V2

**Components of Main Landing Gear Lubrication
Figure 302/12-21-14-990-821-002 (Sheet 1 of 3)**

EFFECTIVITY
ARO ALL

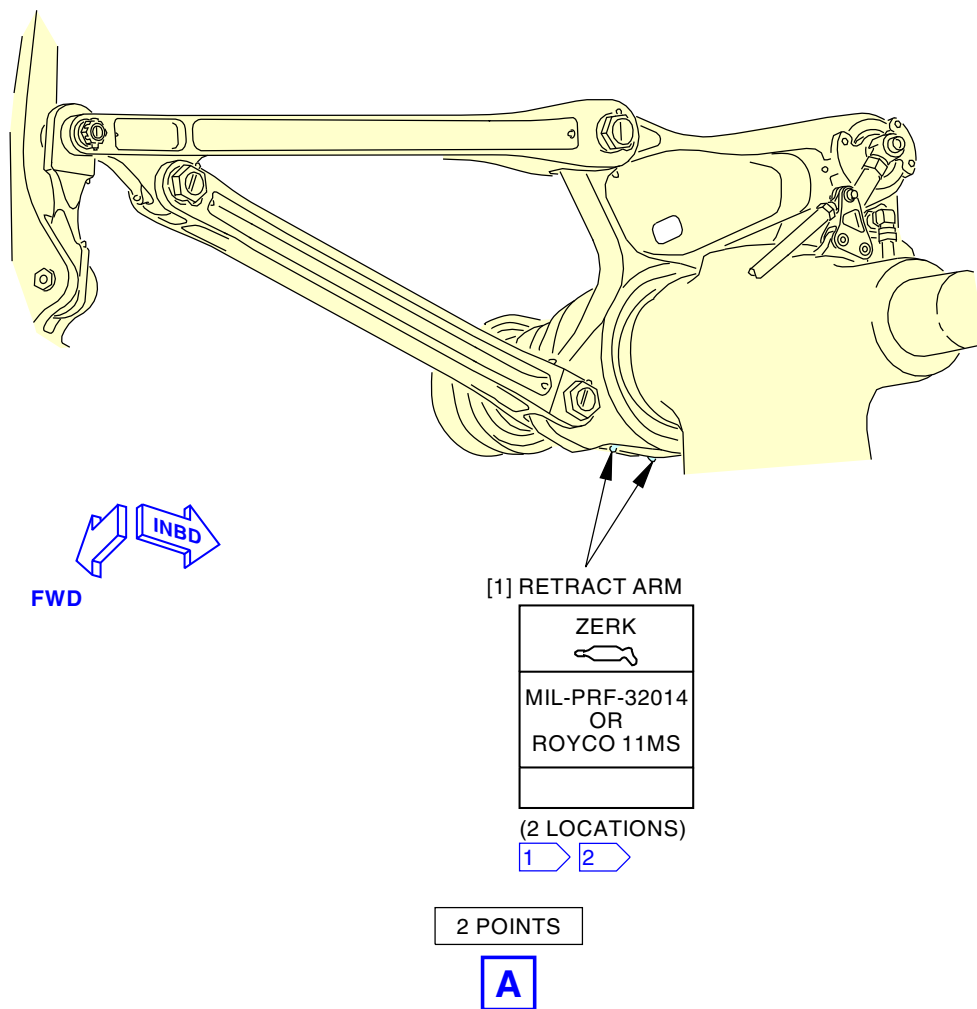
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1 ENSURE GREASE EXTRUDES FROM A MINIMUM OF SIX (6) GREASE GROOVE LOCATIONS ON THE AFT SIDE OF THE RETRACT ARM. ALSO SQUEEZE OUT AT THE BUSHING ID INTERFACE MUST BE SEEN AROUND THE CIRCUMFERENCE OF THE BUSHING WITH A GAP NOT TO EXCEED A SPAN OF ANY THREE (3) CONSECUTIVE GREASE GROOVE LOCATIONS (90 DEGREES). ON THE FORWARD SIDE ENSURE THAT GREASE EXTRUDES AT BOTH THE UPPER AND LOWER SLOTS OF THE RETRACT ARM RETENTION WASHER.

2 TO AVOID INTERMIXING GREASES, SELECT ONE GREASE TYPE. PURGE PER AMM-12-21-00 IF CHANGING GREASE TYPE OR IF INTERMIXING OCCURS.

NOTE:

MIL-PRF-32014, GREASE D50255 (RECOMMENDED).
ROYCO 11MS, GREASE D00528 (OPTIONAL).

2419074 S0000557490_V2

Components of Main Landing Gear Lubrication
Figure 302/12-21-14-990-821-002 (Sheet 2 of 3)

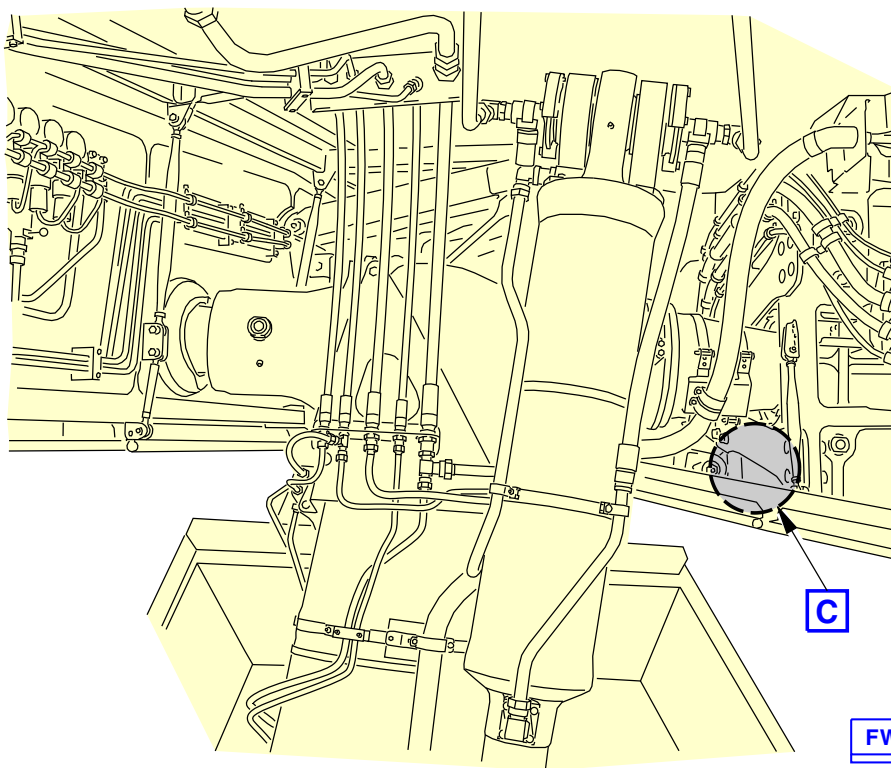
EFFECTIVITY
ARO ALL

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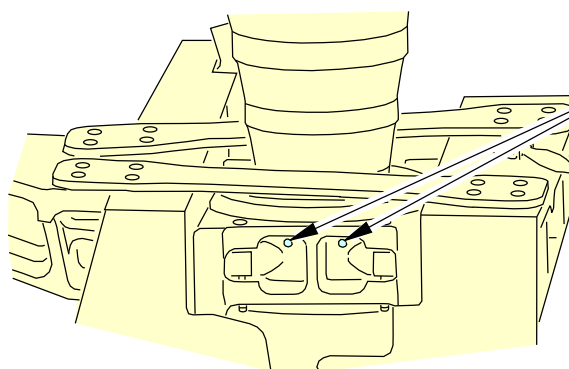
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B

FWD



[2] FORWARD TRUNNION
BEARING HOUSING

ZERK

BMS 3-33

(2 LOCATIONS)

3

INBD

(VIEW IN THE UP DIRECTION)

2 POINTS

3

USE OF A FLEXIBLE GREASE HOSE
EXTENSION MAY IMPROVE ACCESS.

C

2419083 S0000557491_V2

Components of Main Landing Gear Lubrication
Figure 302/12-21-14-990-821-002 (Sheet 3 of 3)

EFFECTIVITY
ARO ALL

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TASK 12-21-14-640-806-002

4. Lower Main Landing Gear and Actuating Mechanisms Lubrication

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task provides instructions to lubricate the lower main landing gear and actuating mechanisms.

B. References

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)
32-00-50-040-801	Main Landing Gear Steering System Deactivation (P/B 201)
32-00-50-440-801	Main Landing Gear Steering System Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00233	Grease - Aircraft, General Purpose, Wide Temperature - Mobil 28	MIL-PRF-81322
D00378	Grease - Aircraft, General Purpose, Wide Temperature - Aeroshell 22	MIL-PRF-81322
D00528	Grease - Aircraft - Royco 11MS	
D00633	Grease - Aircraft General Purpose	BMS3-33
D00642	Lubricant - Aeroshell 11-MS	
D50005	Grease - Wheel Bearing - Mobil Aviation Grease SHC 100	
D50255	Grease - Aircraft And Instrument	MIL-PRF-32014

D. Location Zones

Zone	Area
731	Left Main Landing Gear
741	Right Main Landing Gear

E. Prepare for the Procedure

SUBTASK 12-21-14-490-009-002

 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.

EFFECTIVITY
ARO ALL

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SUBTASK 12-21-14-490-010-002



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 12-21-14-040-006



MAKE SURE THE MAIN LANDING GEAR STEERING SYSTEM IS ISOLATED FROM HYDRAULIC POWER BEFORE YOU DO WORK NEAR THE TIRES, WHEELS, OR BRAKES. IF YOU DO NOT DO THIS, THE AFT AXLES CAN AUTOMATICALLY TURN. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Deactivate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Deactivation, TASK 32-00-50-040-801.

F. Procedure

SUBTASK 12-21-14-640-013-002



DO NOT APPLY TOO MUCH GREASE TO THE LANDING GEAR BRAKES. IF YOU APPLY TOO MUCH GREASE, A FIRE CAN OCCUR WHEN THE BRAKES BECOME HOT.



CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.

- (1) Use the grease gun to lubricate the main landing gear and actuating mechanisms (Figure 303) (Table 303).

NOTE: The table makes a list of all the lubrication fittings for the main landing gear and actuating mechanisms.

NOTE: The thrust pivot washer [15] has six grease fittings, in pairs of two, around the edge of the washer. It is only necessary to lubricate the pair of grease fitting to which you can get easy access.

NOTE: The brakes have two grease fittings [17]. You only need to lubricate one fitting, use the lubrication fitting to which you can get access.

NOTE: Remove excess grease from all fittings after lubrication.

SUBTASK 12-21-14-640-014-002

- (2) When you lubricate the main landing gear and actuating mechanism, you will use these lubricants:
- (a) grease, D00633
 - (b) Royco 11MS grease, D00528

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- (c) Aeroshell 22 grease, D00378, or Mobil 28 grease, D00233 or Mobil Aviation Grease SHC 100 grease, D50005
- (d) grease, D50255

SUBTASK 12-21-14-420-006-002

- (3) If a fitting blows off, do these steps:
 - (a) Make sure there is not a blockage in the lubrication path.
 - (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 303/12-21-14-993-817-002 Main Landing Gear and Actuating Mechanisms Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	TORSION LINK	grease, D00633	BMS3-33	Zerk	7
2	SHOCK STRUT OUTER CYLINDER	grease, D00633	BMS3-33	Zerk	4
3	SHOCK STRUT INNER CYLINDER*[1]	grease, D50255	MIL-PRF-32014	Zerk	4
		Royco 11MS grease, D00528	-		
		Aeroshell 11-MS lubricant, D00642	-		
3A	SHOCK STRUT INNER CYLINDER	grease, D00633	BMS3-33	Zerk	2
3B	SHOCK STRUT INNER CYLINDER	grease, D50255	MIL-PRF-32014	Zerk	2
4	AFT TRUCK BEAM LUG	grease, D00633	BMS3-33	Zerk	1
5	AFT AXLE STEERING CRANK	grease, D00633	BMS3-33	Zerk	1
5A	AFT AXLE STEERING CRANK*[1]	grease, D50255	MIL-PRF-32014	Zerk	2
		Royco 11MS grease, D00528	-		
		Aeroshell 11-MS lubricant, D00642	-		
6	STEERING TRUCK COMPONENTS	grease, D00633	BMS3-33	Zerk	6
7	AFT AXLE REACTION LINK*[1]	grease, D50255	MIL-PRF-32014	Zerk	1
		Royco 11MS grease, D00528	-		
		Aeroshell 11-MS lubricant, D00642	-		
8	STEERING ACTUATOR	Royco 11MS grease, D00528	-	Zerk	1
		Aeroshell 11-MS lubricant, D00642	-		
9	AFT AXLE PIVOT INSERT	grease, D00633	BMS3-33	Zerk	2

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Table 303/12-21-14-993-817-002 Main Landing Gear and Actuating Mechanisms Lubrication (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
10	CENTER AXLE LOCK PIN	grease, D00633	BMS3-33	Zerk	1
11A	TRUCK BEAM - FWD AXLE	grease, D00633	BMS3-33	Zerk	2
11B	TRUCK BEAM - CENTER AXLE ^{*[2]}	grease, D50255	MIL-PRF-32014	Zerk	2
12	AFT AXLE	grease, D00633	BMS3-33	Zerk	2
13	AFT INBOARD BRAKE ROD ^{*[1]}	grease, D50255	MIL-PRF-32014	Zerk	1
		Royco 11MS grease, D00528	-		
		Aeroshell 11-MS lubricant, D00642	-		
14	AFT OUTBOARD BRAKE ROD ^{*[1]}	grease, D50255	MIL-PRF-32014	Zerk	1
		Royco 11MS grease, D00528	-		
		Aeroshell 11-MS lubricant, D00642	-		
15	AFT AXLE THRUST PIVOT WASHER	grease, D00633	BMS3-33	Zerk	2
16	HYDRAULIC SUPPORT AFT ARM	grease, D00633	BMS3-33	Zerk	4
17	BRAKE (REMOVE UNWANTED GREASE)	Aeroshell 22 grease, D00378	MIL-PRF-81322	Zerk	6
		Mobil 28 grease, D00233	-		
		Mobil Aviation Grease SHC 100 grease, D50005	-		
18	BRAKE FITTING (REMOVE ^{*[1]} UNWANTED GREASE)	grease, D50255	MIL-PRF-32014	Zerk	12
		Royco 11MS grease, D00528	-		
		Aeroshell 11-MS lubricant, D00642	-		
19	CENTER BRAKE PIN	grease, D00633	BMS3-33	Zerk	4
20	HYDRAULIC STRUT	grease, D00633	BMS3-33	Zerk	2
21	FORWARD TRUCK BEAM LUG	grease, D00633	BMS3-33	Zerk	2
22	FORWARD OUTBOARD BRAKE ROD ^{*[1]}	grease, D50255	MIL-PRF-32014	Zerk	1
		Royco 11MS grease, D00528	-		

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Table 303/12-21-14-993-817-002 Main Landing Gear and Actuating Mechanisms Lubrication (Continued)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
		Aeroshell 11-MS lubricant, D00642	-		
23	FORWARD INBOARD BRAKE ROD ^{*[1]}	grease, D50255	MIL-PRF-32014	Zerk	2
		Royco 11MS grease, D00528	-		
		Aeroshell 11-MS lubricant, D00642	-		
24	TRUCK TILT STOP	grease, D00633	BMS3-33	Zerk	1

*[1] To avoid intermixing greases, select one grease type. Purge per AMM12-21-00 if changing gease type or if intermixing occurs. NOTE: MIL-PRF-32014, grease D50255 (Recommended), ROYCO 11MS, grease D00528, or Areoshell 11 MS, grease D00642, (Optional) where applicable.

*[2] Reference 32-CMR-01

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-14-440-006

- (1) Activate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Activation, TASK 32-00-50-440-801.

SUBTASK 12-21-14-090-004-002



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.

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

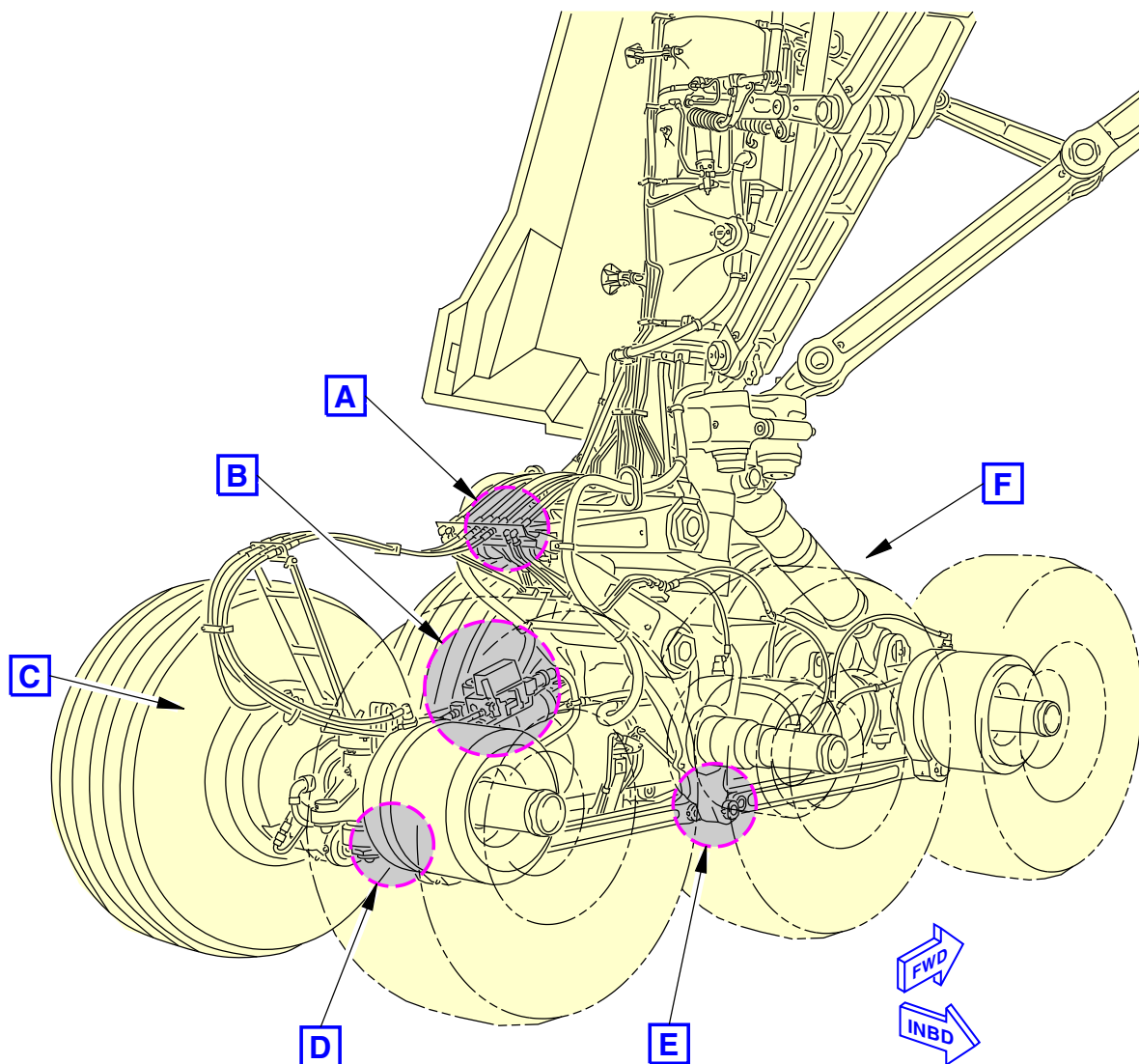
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LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR IS EQUIVALENT)

M54742 S0006401957_V2

Lubrication of the Lower End for the Main Landing Gear
Figure 303/12-21-14-990-815-002 (Sheet 1 of 7)

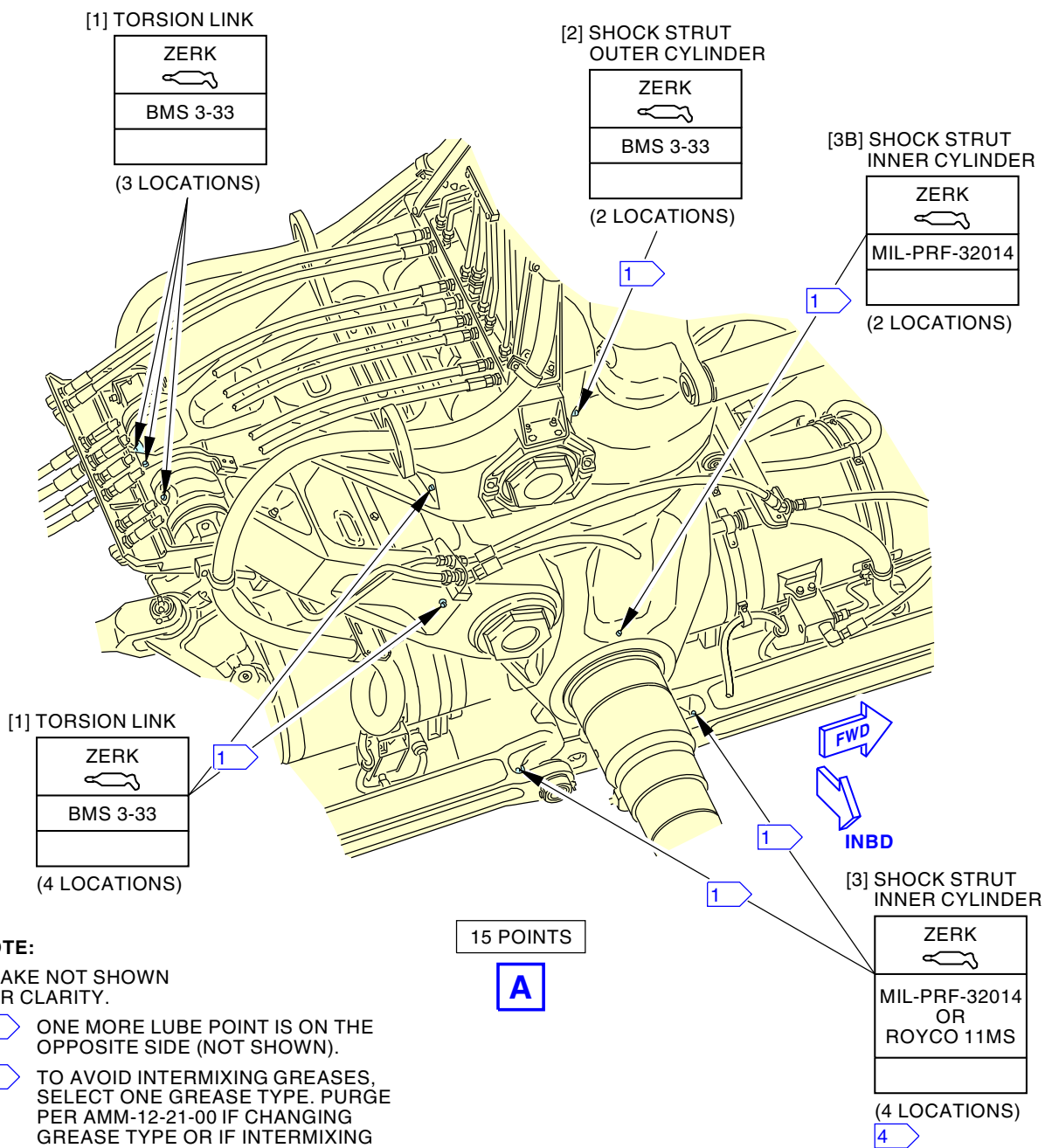
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NOTE:

BRAKE NOT SHOWN
FOR CLARITY.

- 1 ONE MORE LUBE POINT IS ON THE
OPPOSITE SIDE (NOT SHOWN).
- 4 TO AVOID INTERMIXING GREASES,
SELECT ONE GREASE TYPE. PURGE
PER AMM-12-21-00 IF CHANGING
GREASE TYPE OR IF INTERMIXING
OCCURS.

NOTE:

MIL-PRF-32014, GREASE D50255
(RECOMMENDED). ROYCO 11MS,
GREASE D00528 (OPTIONAL).

2006649 S0000394643_V3

Lubrication of the Lower End for the Main Landing Gear
Figure 303/12-21-14-990-815-002 (Sheet 2 of 7)

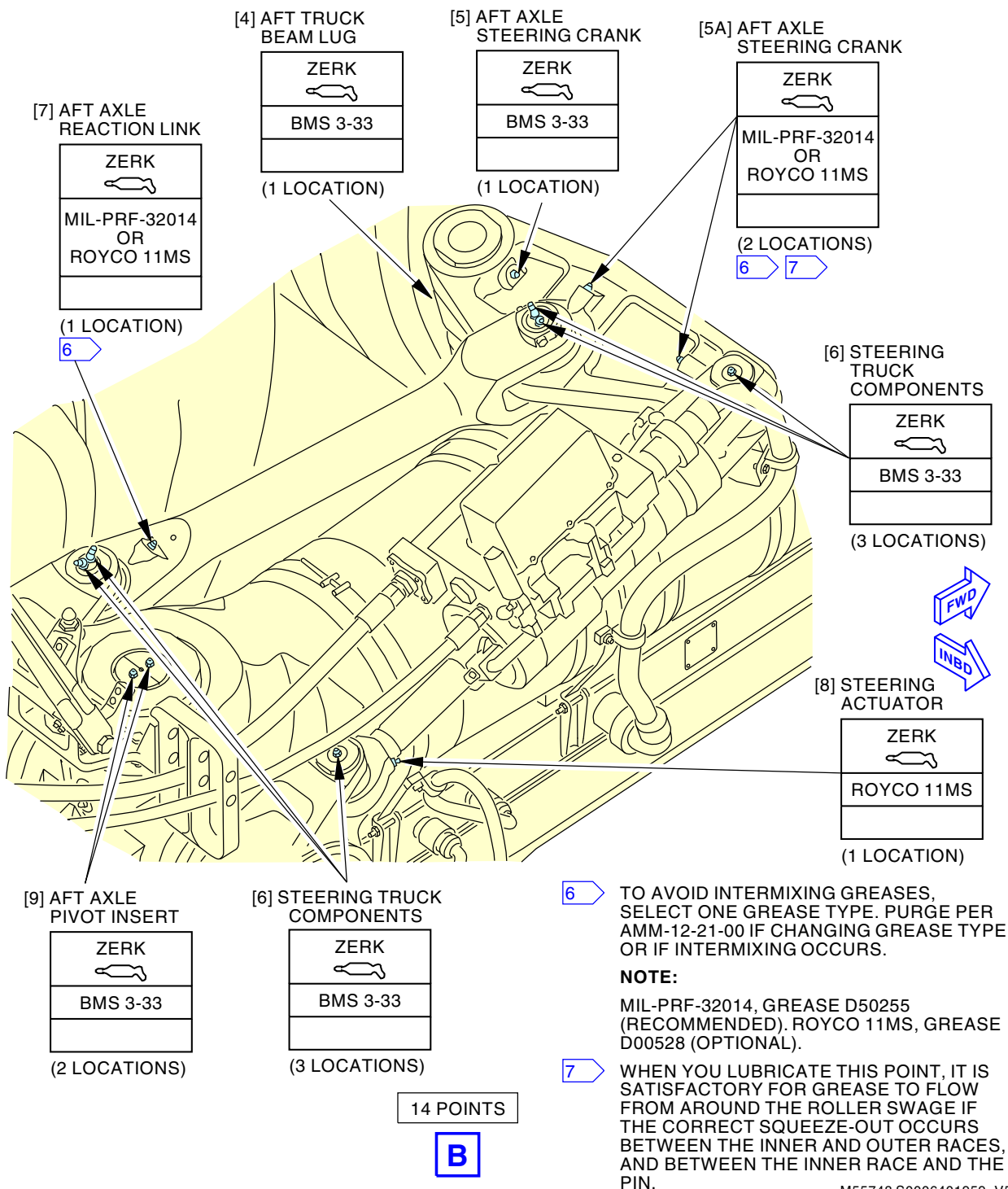
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Lubrication of the Lower End for the Main Landing Gear
Figure 303/12-21-14-990-815-002 (Sheet 3 of 7)

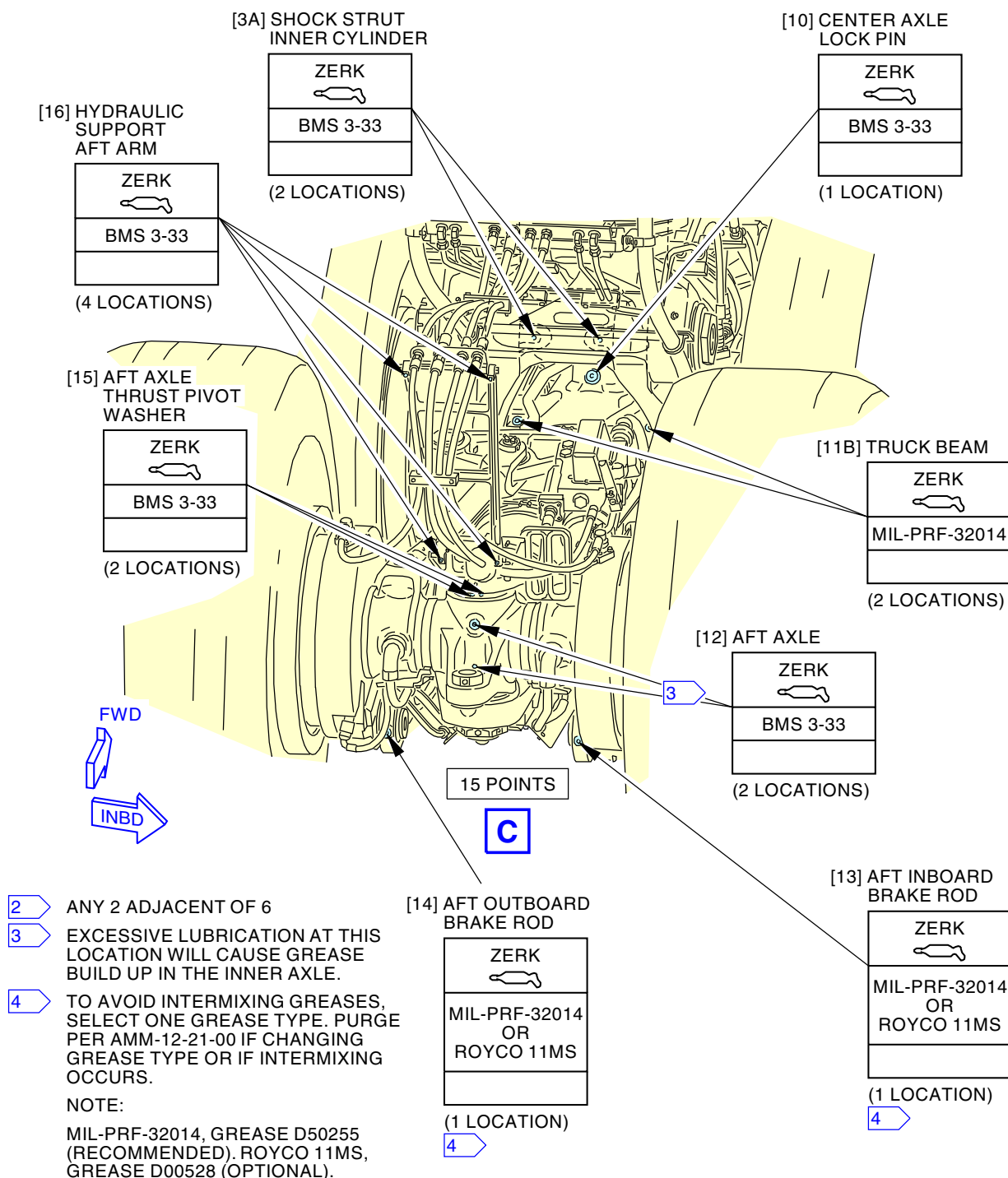
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2006683 S0000394658_V4

**Lubrication of the Lower End for the Main Landing Gear
Figure 303/12-21-14-990-815-002 (Sheet 4 of 7)**

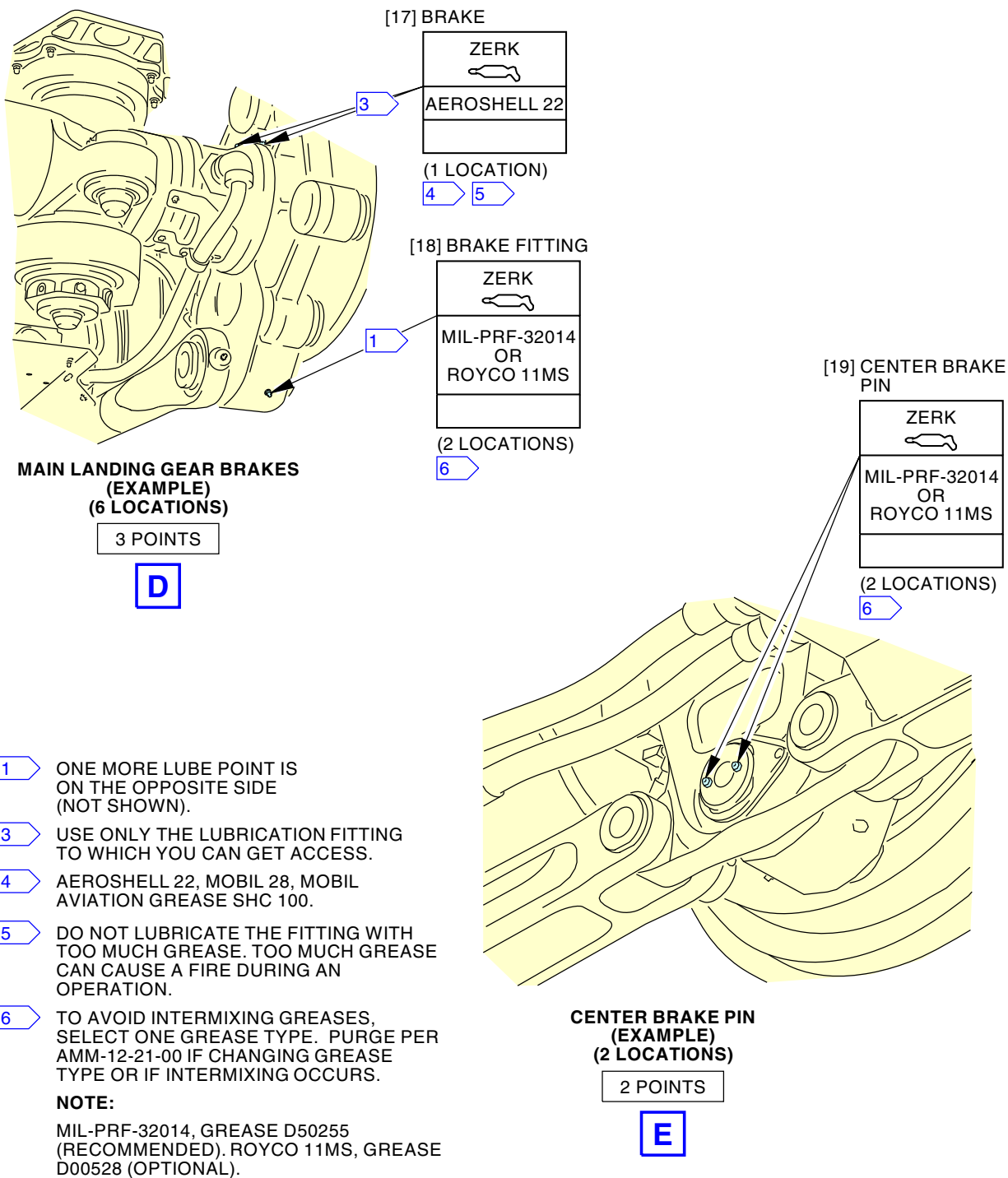
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M56279 S0006401961_V5

**Lubrication of the Lower End for the Main Landing Gear
Figure 303/12-21-14-990-815-002 (Sheet 5 of 7)**

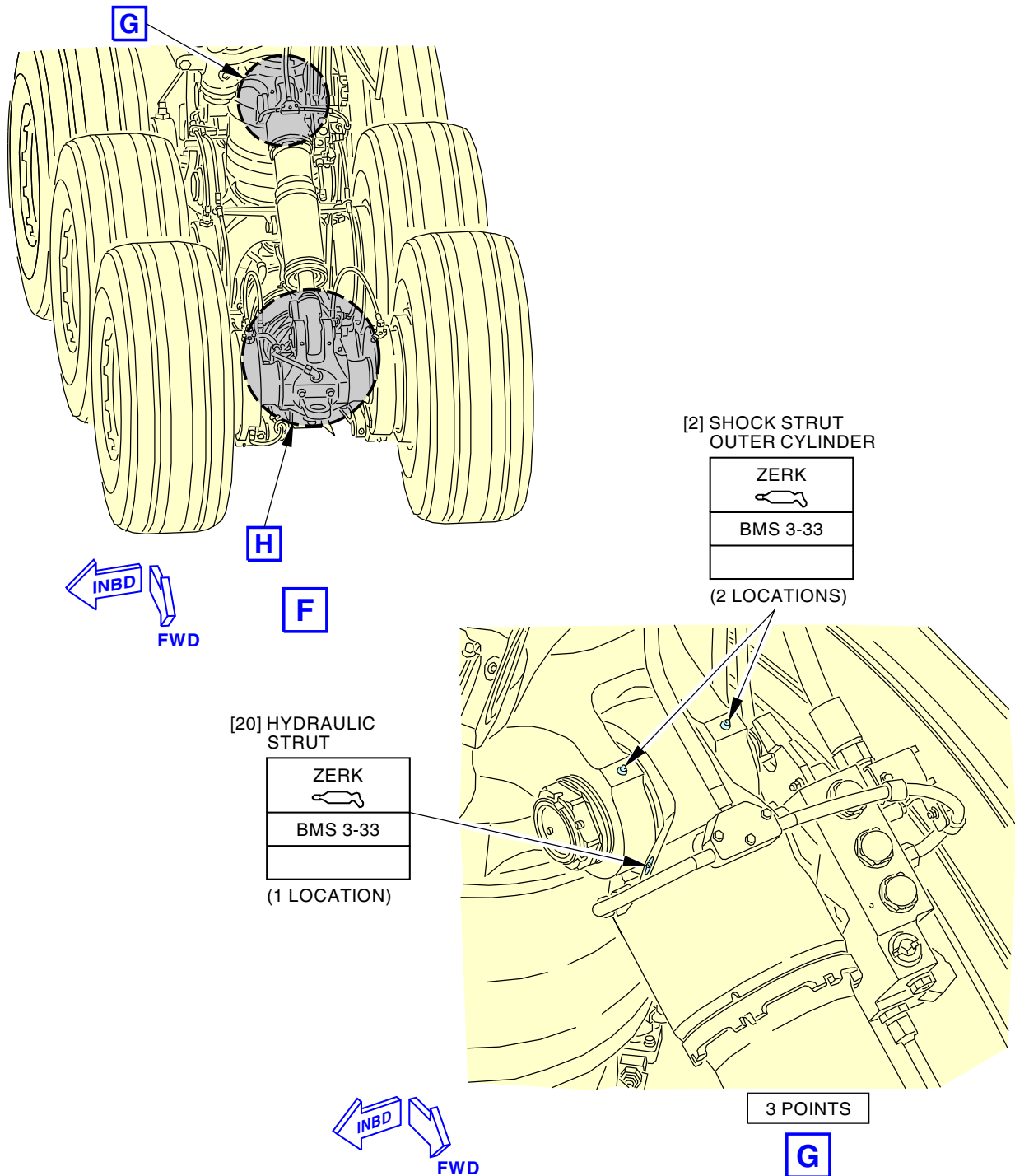
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M56284 S0006401962_V2

Lubrication of the Lower End for the Main Landing Gear
Figure 303/12-21-14-990-815-002 (Sheet 6 of 7)

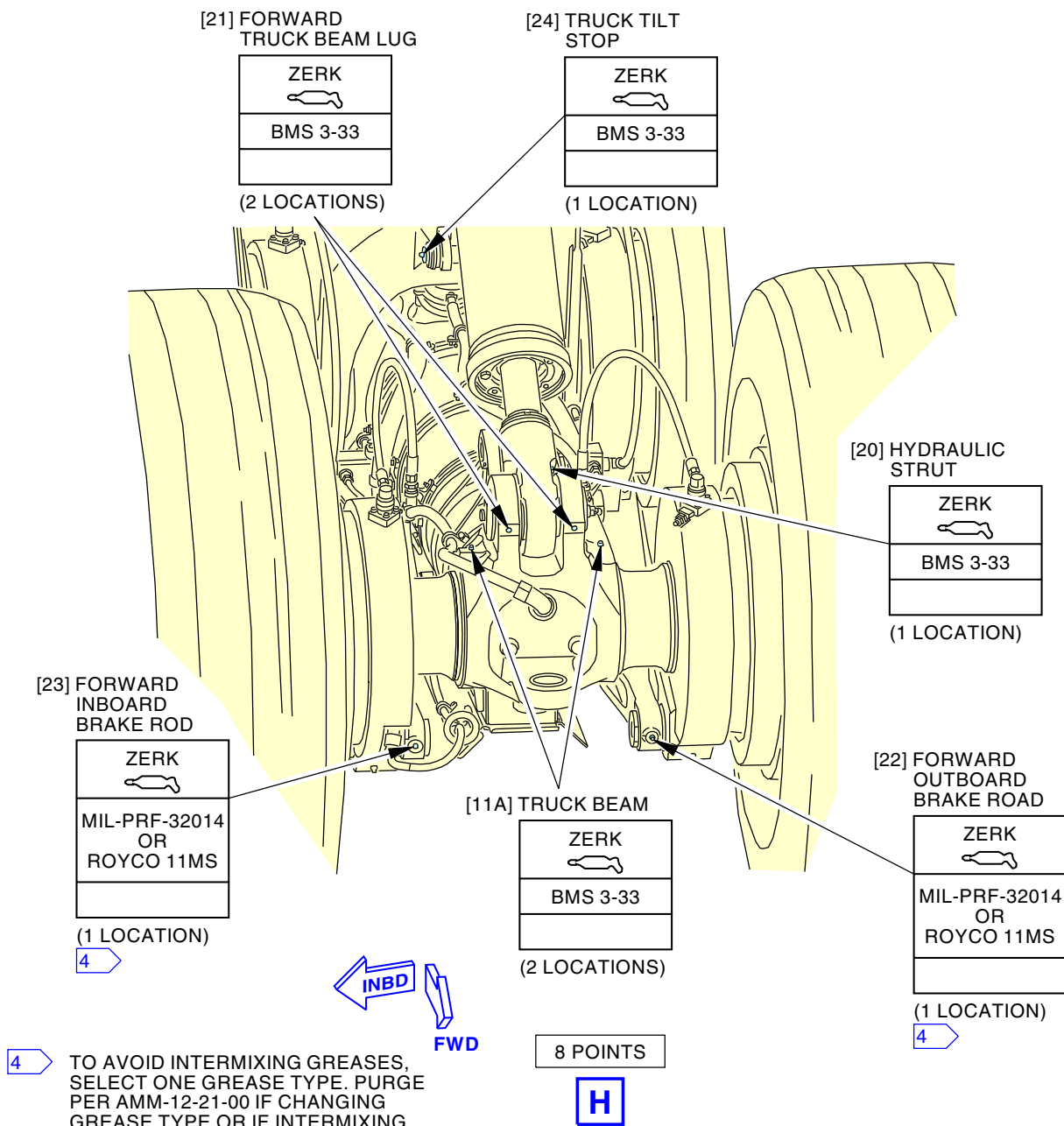
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4 TO AVOID INTERMIXING GREASES, SELECT ONE GREASE TYPE. PURGE PER AMM-12-21-00 IF CHANGING GREASE TYPE OR IF INTERMIXING OCCURS.

NOTE:

MIL-PRF-32014, GREASE D50255 (RECOMMENDED). ROYCO 11MS, GREASE D00528 (OPTIONAL).

M76533 S0006401963_V5

Lubrication of the Lower End for the Main Landing Gear
Figure 303/12-21-14-990-815-002 (Sheet 7 of 7)

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TASK 12-21-14-640-807-002

5. Main Landing Gear Hydraulic Strut Lubrication

A. General

(1) This task is a scheduled maintenance task to lubricate the main landing gear hydraulic strut.

B. References

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)
32-00-50-040-801	Main Landing Gear Steering System Deactivation (P/B 201)
32-00-50-440-801	Main Landing Gear Steering System Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
731	Left Main Landing Gear
741	Right Main Landing Gear

E. Prepare for the procedure

SUBTASK 12-21-14-490-002-002



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 12-21-14-490-001-002



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 12-21-14-040-007



WARNING

MAKE SURE THE MAIN LANDING GEAR STEERING SYSTEM IS ISOLATED FROM HYDRAULIC POWER BEFORE YOU DO WORK NEAR THE TIRES, WHEELS, OR BRAKES. IF YOU DO NOT DO THIS, THE AFT AXLES CAN AUTOMATICALLY TURN. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Deactivate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Deactivation, TASK 32-00-50-040-801.

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F. Lubricate the MLG Hydraulic Strut

SUBTASK 12-21-14-640-016-002



CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.

- (1) Use the grease gun to lubricate the MLG hydraulic strut (Figure 304).

NOTE: The table makes a list of all the lubrication fittings.

NOTE: Remove excess grease from all fittings after lubrication.

SUBTASK 12-21-14-640-015-002

- (2) When you lubricate the MLG hydraulic strut, use these lubricants:

(a) grease, D00633

SUBTASK 12-21-14-420-007-002

- (3) If a fitting blows off, do these steps:

(a) Make sure there is not a blockage in the lubrication path.

(b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 304/12-21-14-993-819-002 Main Landing Gear Hydraulic Strut Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	HYDRAULIC STRUT	grease, D00633	BMS3-33	Zerk	2
2	SHOCK STRUT OUTER CYLINDER	grease, D00633	BMS3-33	Zerk	2
3	FORWARD TRUCK BEAM LUG	grease, D00633	BMS3-33	Zerk	2

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-14-440-007

- (1) Activate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Activation, TASK 32-00-50-440-801.

SUBTASK 12-21-14-090-001-002



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.

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

———— **END OF TASK** ————

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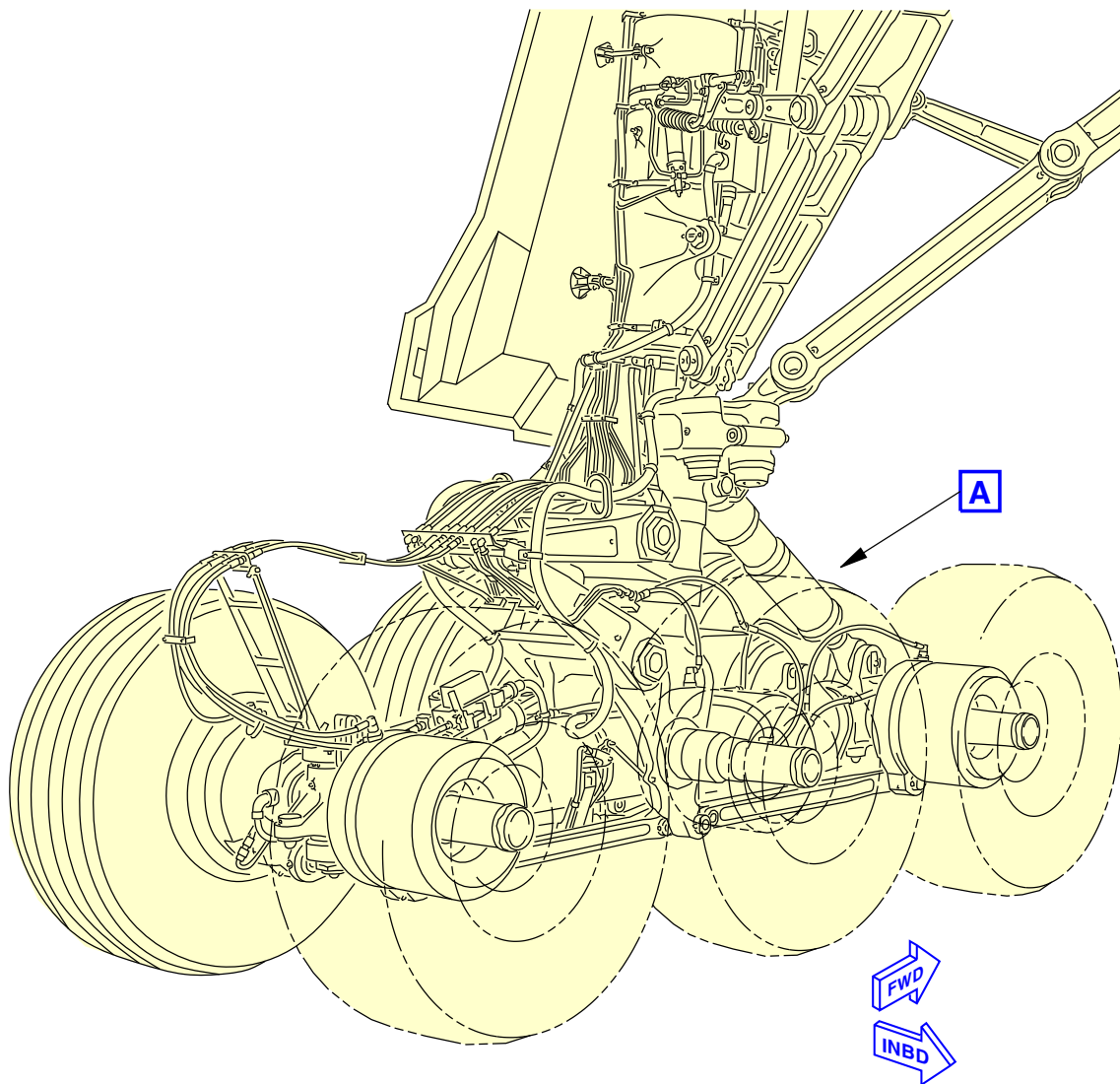
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LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR IS EQUIVALENT)

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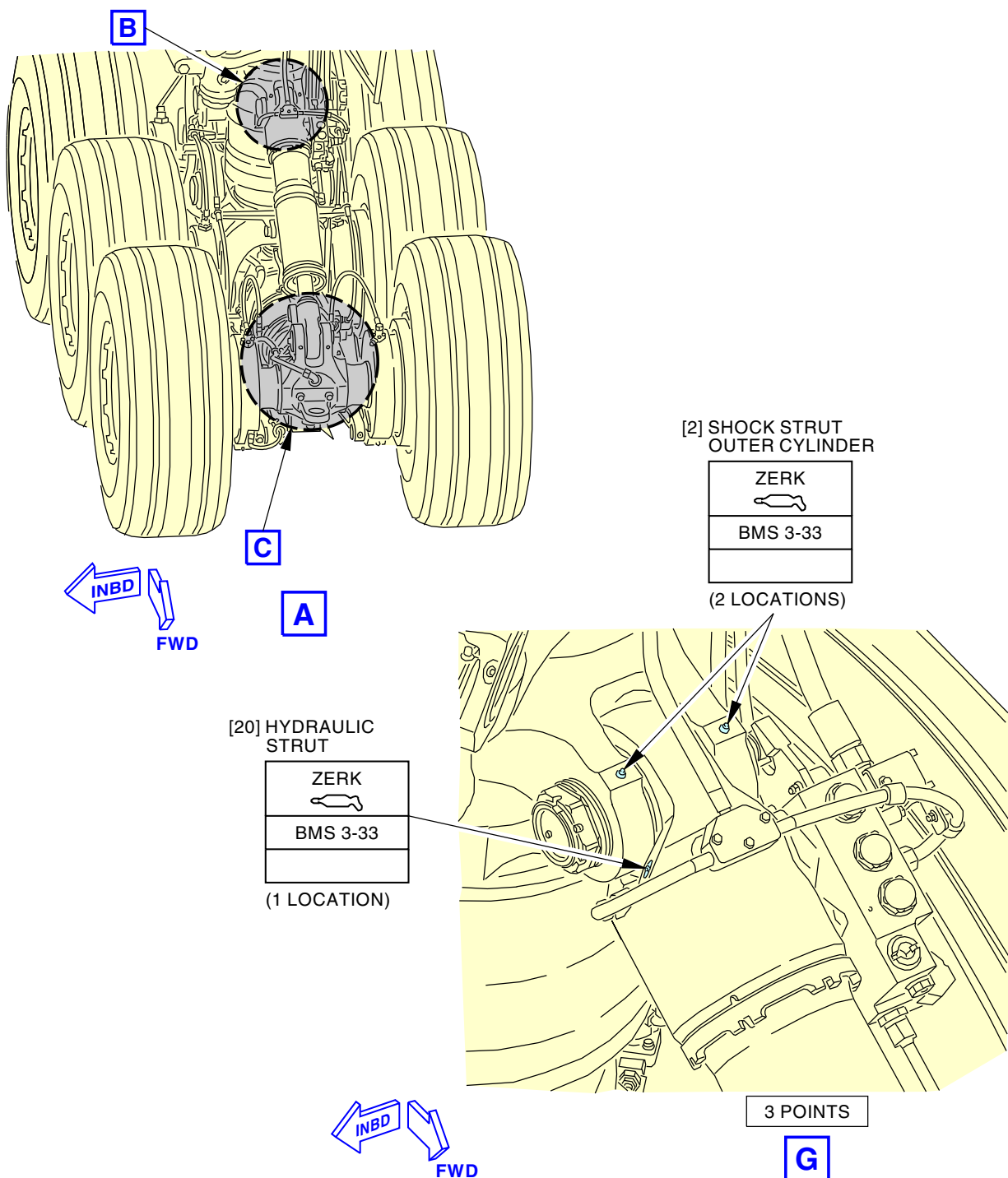
MLG Hydraulic Strut Lubrication
Figure 304/12-21-14-990-816-002 (Sheet 1 of 3)

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MLG Hydraulic Strut Lubrication
Figure 304/12-21-14-990-816-002 (Sheet 2 of 3)

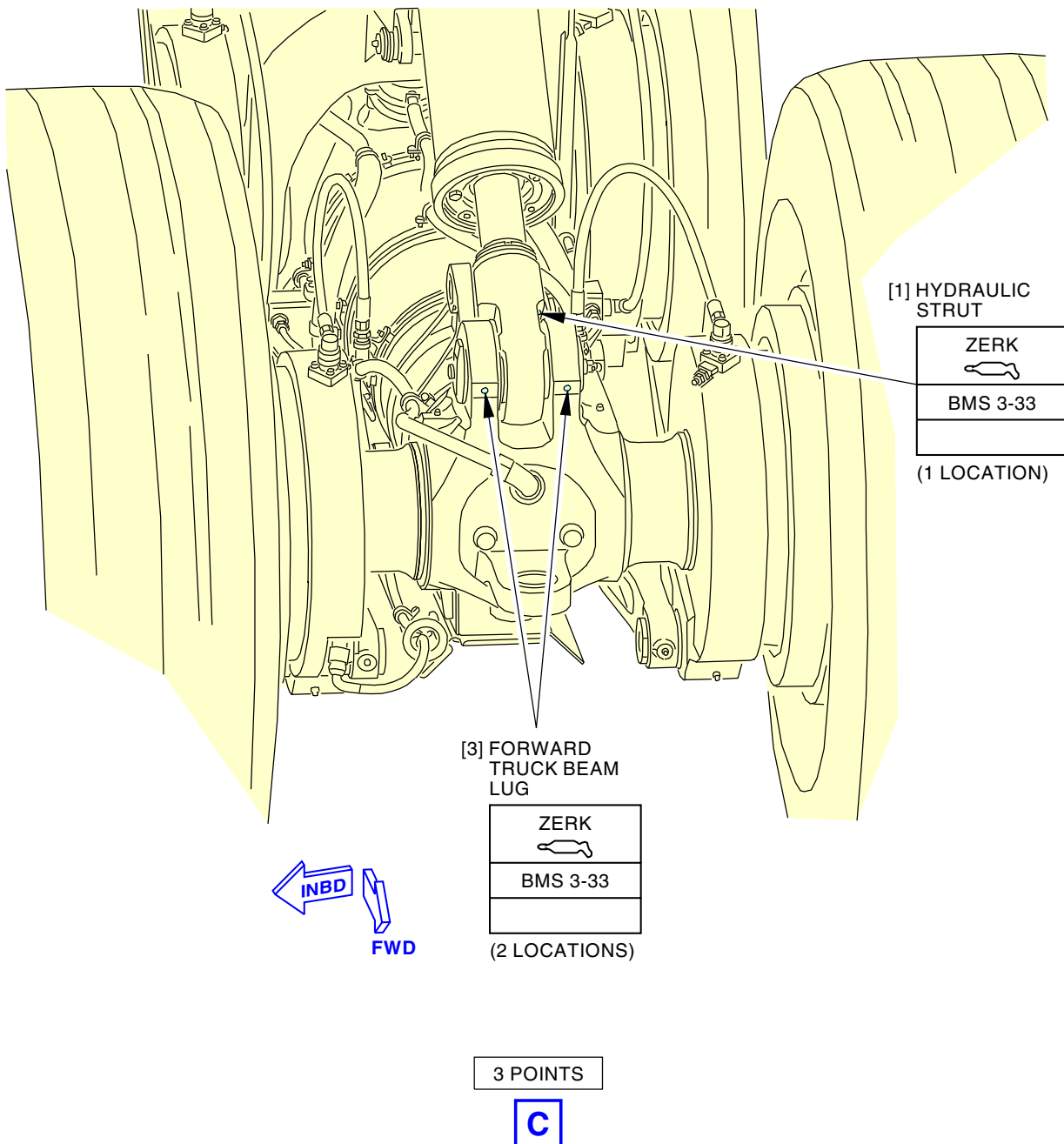
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MLG Hydraulic Strut Lubrication
Figure 304/12-21-14-990-816-002 (Sheet 3 of 3)

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TASK 12-21-14-640-812-002

6. Main Landing Gear Center Axle Lubrication

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task provides instructions to lubricate the main landing gear pivot joint.

B. References

Reference	Title
12-21-00-640-802	Intermixing or Purging of Greases (P/B 301)
20-10-29-420-801	Lubrication Fitting 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)
32-00-50-040-801	Main Landing Gear Steering System Deactivation (P/B 201)
32-00-50-440-801	Main Landing Gear Steering System Activation (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D50255	Grease - Aircraft And Instrument	MIL-PRF-32014

D. Location Zones

Zone	Area
731	Left Main Landing Gear
741	Right Main Landing Gear

E. Prepare for the Procedure

SUBTASK 12-21-14-490-015-002



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 12-21-14-490-016-002



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.

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SUBTASK 12-21-14-040-008



MAKE SURE THE MAIN LANDING GEAR STEERING SYSTEM IS ISOLATED FROM HYDRAULIC POWER BEFORE YOU DO WORK NEAR THE TIRES, WHEELS, OR BRAKES. IF YOU DO NOT DO THIS, THE AFT AXLES CAN AUTOMATICALLY TURN. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Deactivate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Deactivation, TASK 32-00-50-040-801.

F. Procedure

SUBTASK 12-21-14-640-025-002



CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.

- (1) Use the grease gun to lubricate the main landing gear pivot joint.
NOTE: The table makes a list of all the lubrication fittings for the main landing gear pivot joint.
NOTE: Dispense grease into each grease fitting until the used grease is visually removed and only new grease comes out in one or more locations at the joint interface.
NOTE: Remove excess grease from all fittings after lubrication.

SUBTASK 12-21-14-640-028

- (2) When you lubricate the main landing gear pivot joint, you will use these lubricants:
 - (a) grease, D50255.

SUBTASK 12-21-14-420-010-002

- (3) If a fitting blows off, do these steps:
 - (a) Make sure there is not a blockage in the lubrication path.
 - (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 305/12-21-14-993-822-002

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1A	INNER CYLINDER	grease, D50255	MIL-PRF-32014	Zerk	2
2A	TRUCK BEAM	grease, D50255	MIL-PRF-32014	Zerk	2

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-14-440-008

- (1) Activate the steering system for the main landing gear. Do this task: Main Landing Gear Steering System Activation, TASK 32-00-50-440-801.

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SUBTASK 12-21-14-090-007-002



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.

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

———— **END OF TASK** ————

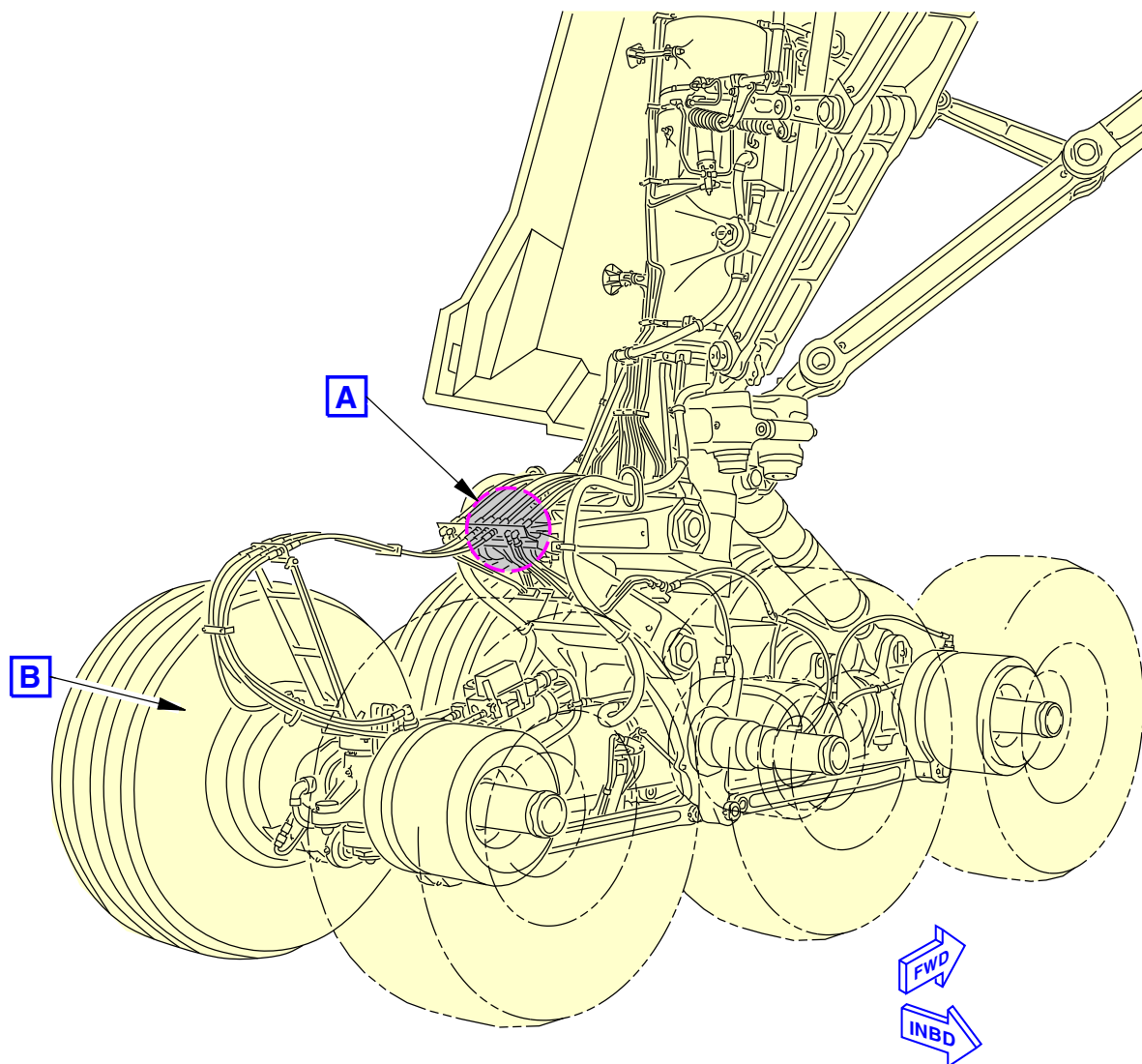
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**LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR IS EQUIVALENT)**

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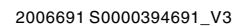
**Main Landing Gear Pivot Joint
Figure 305/12-21-14-990-819-002 (Sheet 1 of 3)**

EFFECTIVITY
ARO ALL

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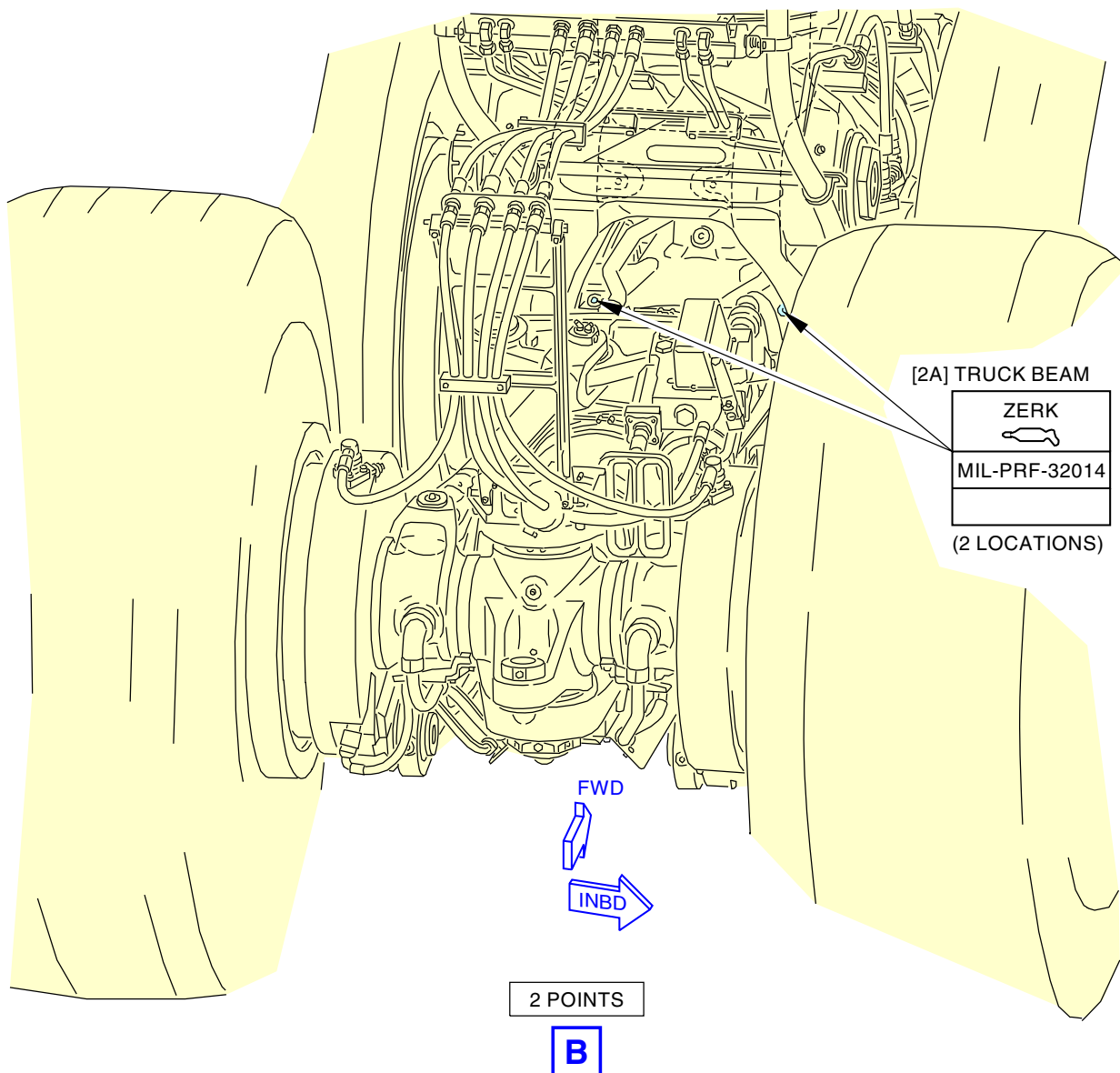
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Main Landing Gear Pivot Joint
Figure 305/12-21-14-990-819-002 (Sheet 2 of 3)

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2006693 S0000394704_V3

Main Landing Gear Pivot Joint
Figure 305/12-21-14-990-819-002 (Sheet 3 of 3)

EFFECTIVITY
ARO ALL

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MAIN LANDING GEAR DOORS AND ACTUATING MECHANISMS - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure supplies instructions to lubricate the main landing gear doors and actuating mechanisms.
- C. If you will service the landing gear in cold weather, refer to this task: Lubrication of Landing Gear During Cold Weather Operation, TASK 12-21-00-600-801.

TASK 12-21-15-640-802-002

2. Main Landing Gear Doors and Actuating Mechanisms Lubrication

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task supplies instructions to lubricate the main landing gear doors and actuating mechanisms.

B. References

Reference	Title
20-10-29-420-801	Lubrication Fitting 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)

C. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
732	Left Main Landing Gear Body Door
733	Left Main Landing Gear Shock Strut Door
734	Left Main Landing Gear Drag Strut Door
735	Left Main Landing Gear Trunnion Door
742	Right Main Landing Gear Body Door
743	Right Main Landing Gear Shock Strut Door
744	Right Main Landing Gear Drag Strut Door
745	Right Main Landing Gear Trunnion Door

EFFECTIVITY
ARO ALL

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E. Prepare for the Procedure

SUBTASK 12-21-15-490-001-002



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 12-21-15-490-002-002



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.

F. Procedure

SUBTASK 12-21-15-640-002-002



CAUTION

CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.



CAUTION

DO NOT USE A PRESSURE OF MORE THAN 2500 PSIG WHEN YOU LUBRICATE THE STRUCTURE. IF YOU USE A PRESSURE OF MORE THAN 2500 PSIG, DAMAGE TO THE LUBRICATION FITTINGS CAN OCCUR.

- (1) Use the grease gun to lubricate the main landing gear doors and actuating mechanisms with grease, D00633 (Recommended) or grease, D00013 Alternative) (Figure 301) (Table 301).

NOTE: The table makes a list of all the lubrication fittings for the main landing gear doors and actuating mechanisms (Table 301).

NOTE: Actuator rod ends are fitted with two grease fittings. It is only necessary to lubricate the fitting to which you can get access.

SUBTASK 12-21-15-420-002-002

- (2) If a fitting blows off, do these steps:
 - (a) Make sure there is not a blockage in the lubrication path.
 - (b) Do this task: Lubrication Fitting Installation, TASK 20-10-29-420-801.

Table 301/12-21-15-993-804-002 Main Landing Gear Doors and Actuating Mechanisms Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	BODY DOOR ACTUATOR	BMS 3-33	Zerk	2
2	BODY DOOR HINGE BEAM	BMS 3-33	Zerk	1
3	BODY DOOR UPLOCK ROLLER FITTING	BMS 3-33	Zerk	2
4	UPLOCK ROLLER FITTING BOLT	BMS 3-33	Zerk	1

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**Table 301/12-21-15-993-804-002 Main Landing Gear Doors and Actuating Mechanisms Lubrication
(Continued)**

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
5	BODY DOOR HINGE FITTING	BMS 3-33	Zerk	3
6	TRUNNION DOOR AFT DRIVE HINGE	BMS 3-33	Zerk	1
7	TRUNNION DOOR FORWARD FIXED HINGE	BMS 3-33	Zerk	1
8	DRAG BRACE DOOR FIXED HINGE	BMS 3-33	Zerk	2
9	DRAG BRACE DRIVE FITTING	BMS 3-33	Zerk	1
10	UPLOCK HOOK	BMS 3-33	APPLY TO SURFACE	1

G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-15-090-001-002



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.

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

———— **END OF TASK** ————

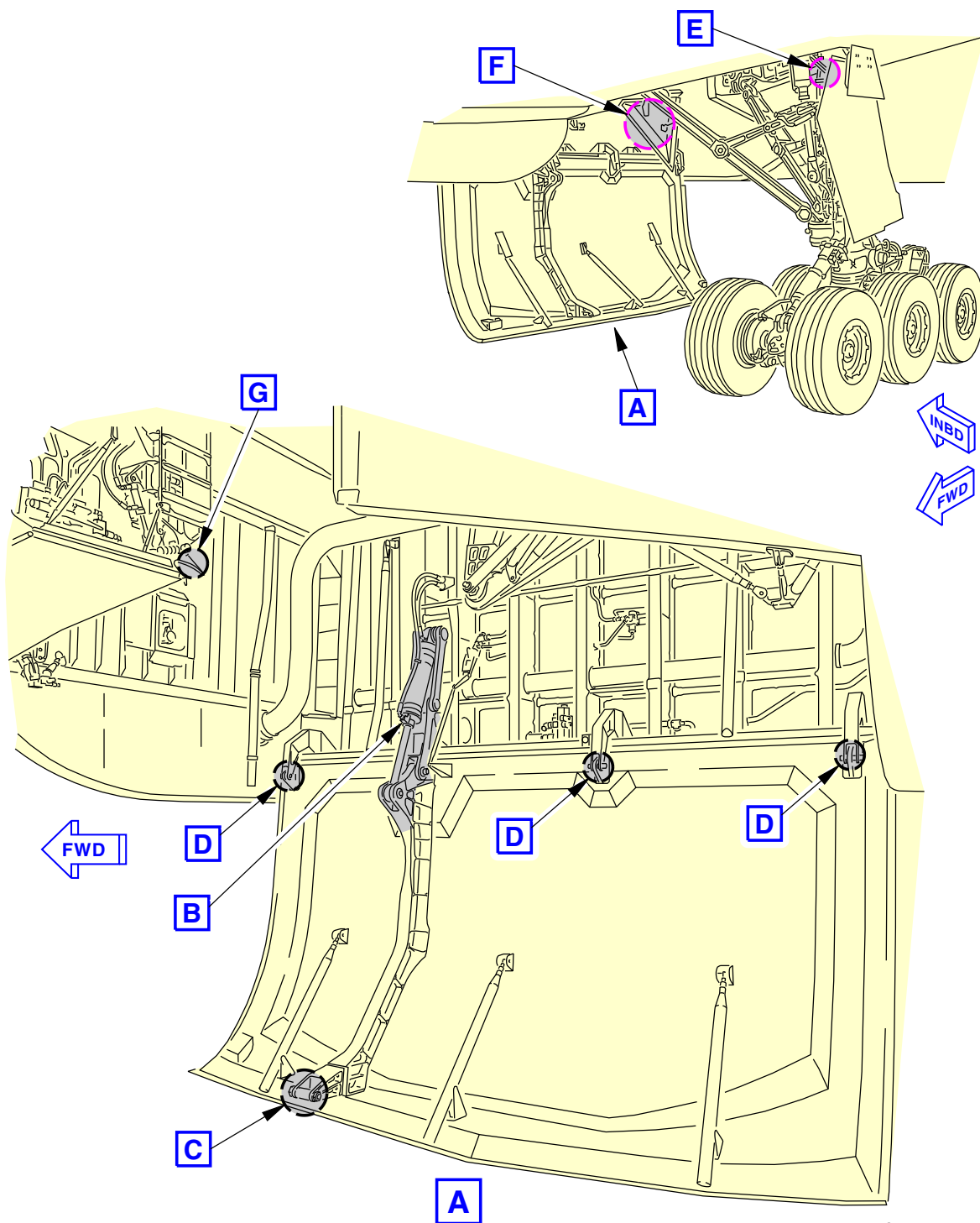
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**Main Landing Gear Doors and Actuating Mechanisms Servicing
Figure 301/12-21-15-990-803-002 (Sheet 1 of 5)**

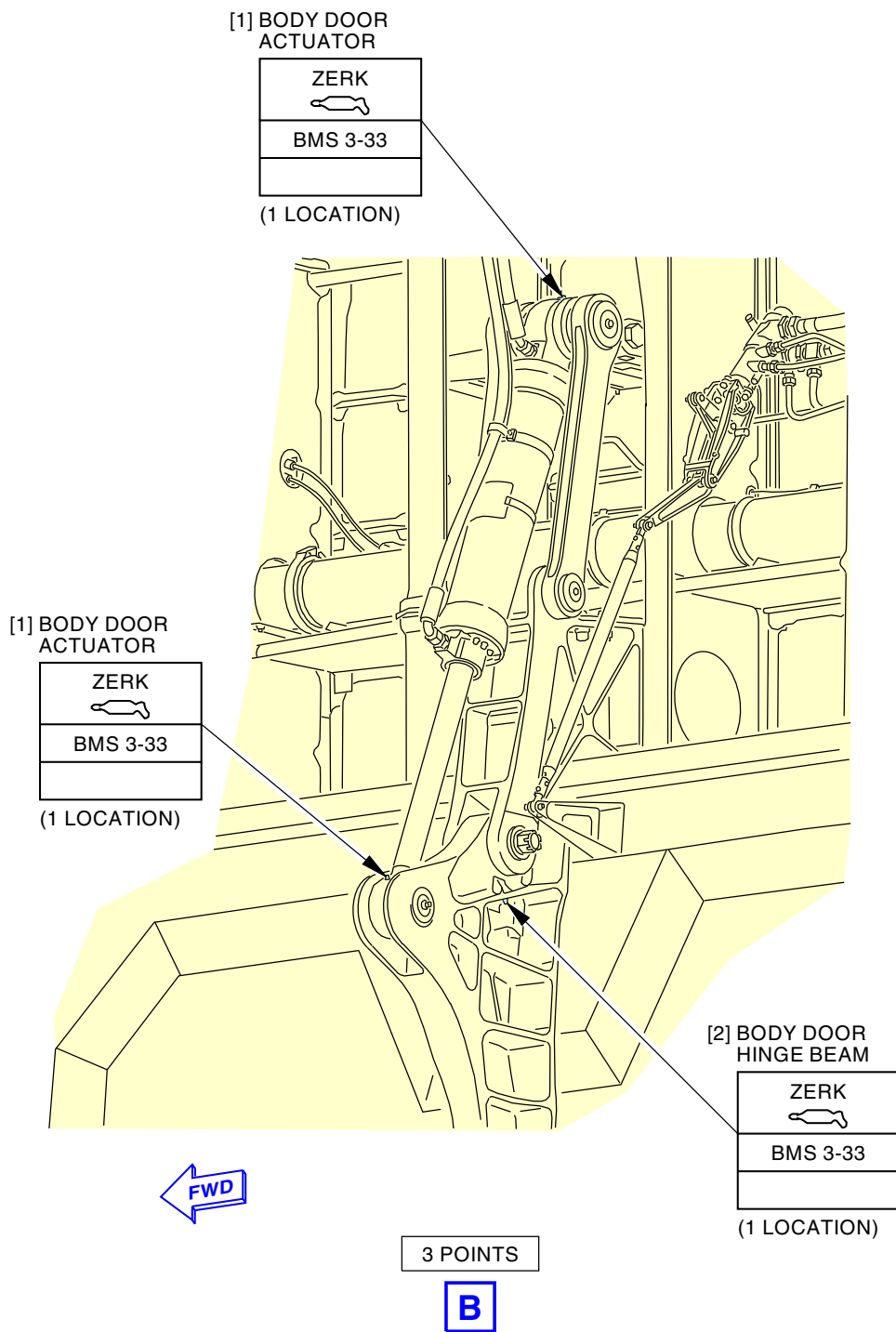
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M56070 S0006402038_V2

Main Landing Gear Doors and Actuating Mechanisms Servicing
Figure 301/12-21-15-990-803-002 (Sheet 2 of 5)

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[3] BODY DOOR
UNLOCK ROLLER
FITTING

ZERK

BMS 3-33

(2 LOCATIONS)

1

[4] UNLOCK ROLLER
FITTING BOLT

ZERK

BMS 3-33

(1 LOCATION)

WIPE SURFACE
CLEAN



12 POINTS

C

[5] BODY DOOR
HINGE FITTING

ZERK

BMS 3-33

(1 LOCATION
ON EACH HINGE,
3 HINGES ON
THE DOOR)



(EXAMPLE)

1 POINT

D

1

ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

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Main Landing Gear Doors and Actuating Mechanisms Servicing Figure 301/12-21-15-990-803-002 (Sheet 3 of 5)

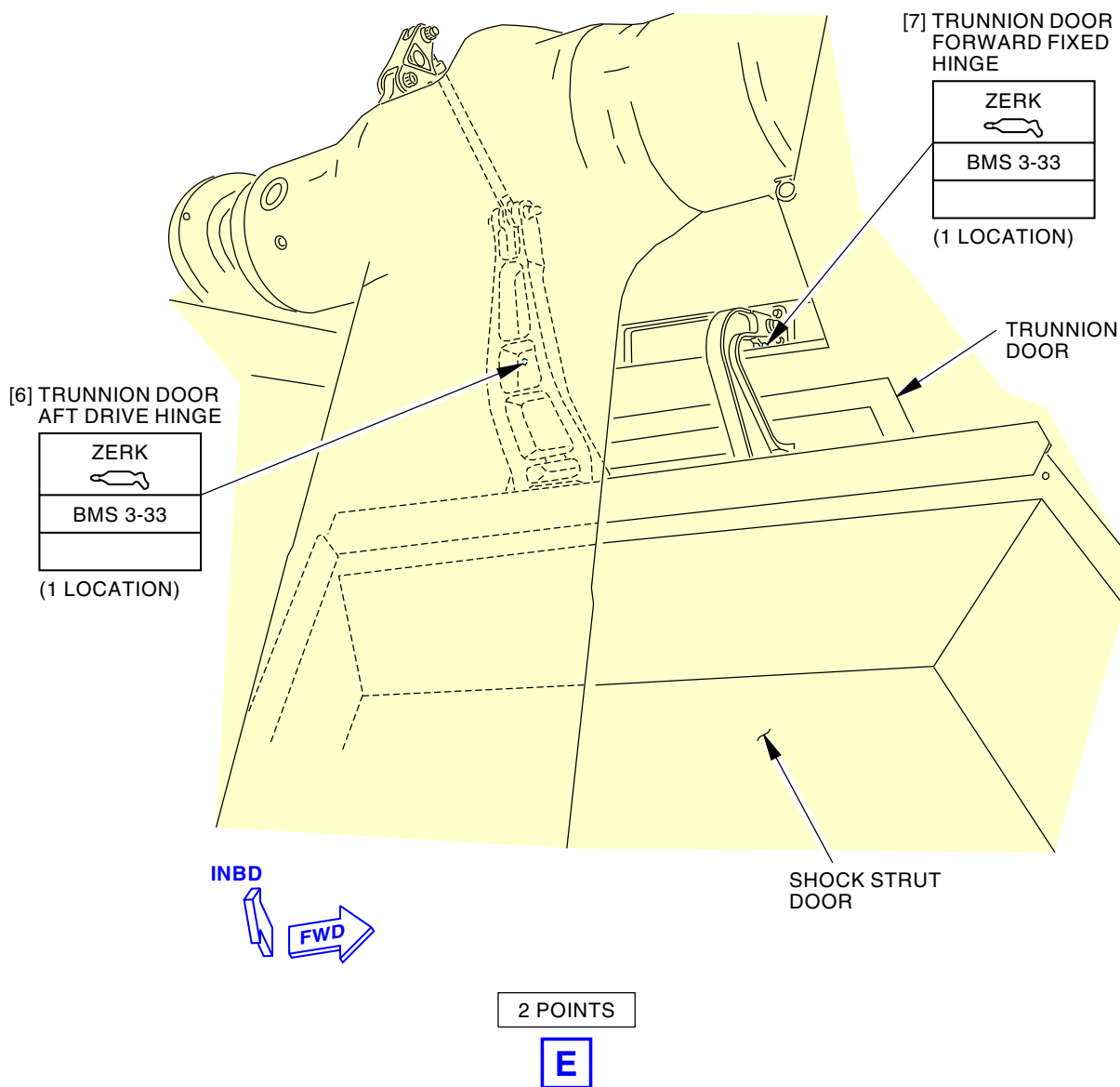
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**Main Landing Gear Doors and Actuating Mechanisms Servicing
Figure 301/12-21-15-990-803-002 (Sheet 4 of 5)**

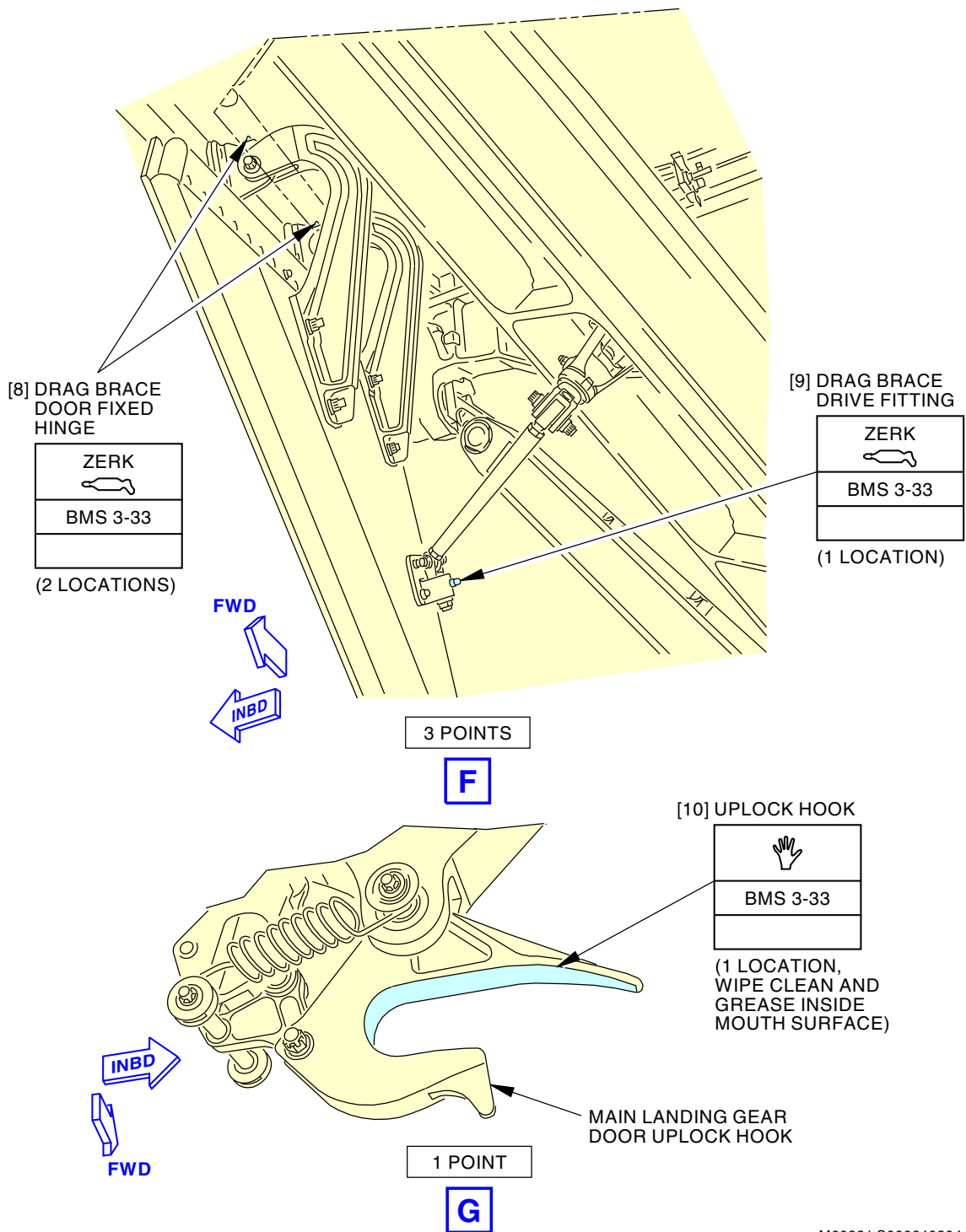
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**Main Landing Gear Doors and Actuating Mechanisms Servicing
Figure 301/12-21-15-990-803-002 (Sheet 5 of 5)**

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PASSENGER ENTRY DOOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The servicing of the passenger entry door.
 - (2) The lubrication of the girt bar.

TASK 12-21-20-640-801

2. Passenger Entry Door Servicing

(Figure 301, Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
25-65-00-040-801	Disarm the Off-Wing Escape System (P/B 201)
25-65-00-440-801	Arm the Off-Wing Escape System (P/B 201)
25-66-01-000-801	Door-Mounted Escape Slide Pack Removal (P/B 401)
25-66-01-400-801	Door-Mounted Escape Slide Pack Installation (P/B 401)
52-12-02-000-801	Exterior Handle Mechanism Removal (P/B 401)
52-12-02-400-801	Exterior Handle Mechanism Installation (P/B 401)
52-12-25-000-803	Upper Liner Removal (P/B 201)
52-12-25-400-803	Upper Liner Installation (P/B 201)

B. Consumable Materials

Reference	Description	Specification
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
B50073	Alcohol - Isopropyl	ASTM D 770
D00113	Lubricant - Solid Film, Liquid Dispersed	BMS3-8
D00633	Grease - Aircraft General Purpose	BMS3-33
D50125	Grease - Extreme Low Temperature, Dow Corning 33	

C. Location Zones

Zone	Area
831	Left No. 1 Passenger Entry Door - Section 41
832	Left No. 2 Passenger Entry Door - Section 43
833	Left No. 3 Overwing Door - Section 44
834	Left No. 4 Passenger Entry Door - Section 46
835	Left No. 5 Passenger Entry Door - Section 47
841	Right No. 1 Passenger Entry Door - Section 41
842	Right No. 2 Passenger Entry Door - Section 43
843	Right No. 3 Overwing Door - Section 44
844	Right No. 4 Passenger Entry Door - Section 46
845	Right No. 5 Passenger Entry Door - Section 47

EFFECTIVITY
ARO ALL

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D. Prepare for Servicing

SUBTASK 12-21-20-860-001

- (1) Make sure the door is safe as follows:
 - (a) Make sure the mode select handle is in the MANUAL/DISARM position.
 - (b) For PED 1, 2, 4 and 5, turn the EPAS battery safety switch to the DISARM position.
NOTE: If the EPAS battery safety switch is in the DISARM position, the aft hinge cover will not be flush.
 - (c) For overwing emergency exit door (PED 3), do this task: Disarm the Off-Wing Escape System, TASK 25-65-00-040-801.

SUBTASK 12-21-20-010-001

- (2) Get access to the door mechanisms as follows:
 - (a) For PED 1, 2, 4 and 5, do this task: Door-Mounted Escape Slide Pack Removal, TASK 25-66-01-000-801.
 - (b) Do this task: Upper Liner Removal, TASK 52-12-25-000-803

E. Procedure

SUBTASK 12-21-20-100-001

- (1) Do these steps to clean the components of the exterior handle:
 - (a) Remove and disassemble the exterior handle, do this task: Exterior Handle Mechanism Removal, TASK 52-12-02-000-801.
NOTE: Inboard clutch does not have to be removed, unless there is defect to the solid film lubricant.
 - (b) Clean the Karon coated surfaces on the inboard and outboard clutch with solvent, B00316 or alcohol, B50073.
 - (c) Clean the existing solid film lubricant on the outboard clutch with alcohol, B50073.
 - (d) Clean the existing solid film lubricant on the inboard clutch with high pressure air.
 - (e) Dry the components with clean shop air to prevent contamination.
 - (f) Examine the solid film lubricant, D00113 on the inboard and outboard clutch. Check for cracks, gaps in the finish or foreign object debris.
 - 1) If no defects or foreign object debris are found, continue to the step to assemble the exterior handle.
 - 2) If defects or foreign object debris are found, reapply a very thin layer of solid film lubricant, D00113 to all surfaces of the inboard and outboard clutch other than the Karon coated surfaces (Figure 302).
NOTE: Lubricant must not get on the exterior handle shaft. This will prevent damage to the Karon coating on the inner surface of the inboard clutch.
NOTE: The lubricant must be applied with a cup type spray gun of one quart or less capacity.
 - a) Shake the spray gun before each spray to make sure that the lubricant is fully mixed.
 - b) Use the spray gun at a distance of 6 in. (152 mm) - 8 in. (203 mm) from the work surface.
NOTE: The lubricant must be applied at a rate that prevents runs and sags between the spray nozzle and the work surface.

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ARO ALL

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- (g) Assemble the exterior handle, do this task: Exterior Handle Mechanism Installation, TASK 52-12-02-400-801.

SUBTASK 12-21-20-640-001

- (2) Lubricate the components shown in (Table 301) with applicable grease.

Table 301/12-21-20-993-802 Passenger Entry Door Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Vent Door Interlock Rod (1)	grease, D00633	BMS3-33	Grease Gun	2
2	Guide Rollers (4)	grease, D00633	BMS3-33	Grease Gun	4
3	Latch Rollers (2)	grease, D00633	BMS3-33	Grease Gun	2
4	Handle Cam Rollers (2)	grease, D00633	BMS3-33	Grease Gun	2
5	Gas Spring Rod (1)	grease, D00633	BMS3-33	Grease Gun	1
6	Rod End (1)	grease, D00633	BMS3-33	Grease Gun	2
7	Mode Select Mechanism Roller (1)	grease, D00633	BMS3-33	Grease Gun	1
8	Push/Pull Cable (1)	Dow Corning 33 grease, D50125 (light)	-	Brush	1

- (a) Do not lubricate components that are not on the list.

NOTE: The inner shaft, inboard spring, inboard and outboard clutches have a Karon layer. The Karon layer does not use lubricant. If grease is applied to these parts, or to the exterior handle shaft, it can decrease movement (Figure 302).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-20-410-001

- (1) Close access as follows:
- (a) Do this task: Upper Liner Installation, TASK 52-12-25-400-803.
 - (b) For PED 1, 2, 4 and 5, do this task: Door-Mounted Escape Slide Pack Installation, TASK 25-66-01-400-801.

SUBTASK 12-21-20-860-010

- (2) For PED 1, 2, 4 and 5, turn the EPAS battery safety switch to the ARM position.

SUBTASK 12-21-20-860-002

- (3) For overwing emergency exit door (PED 3), do this task: Arm the Off-Wing Escape System, TASK 25-65-00-440-801.

———— **END OF TASK** ————

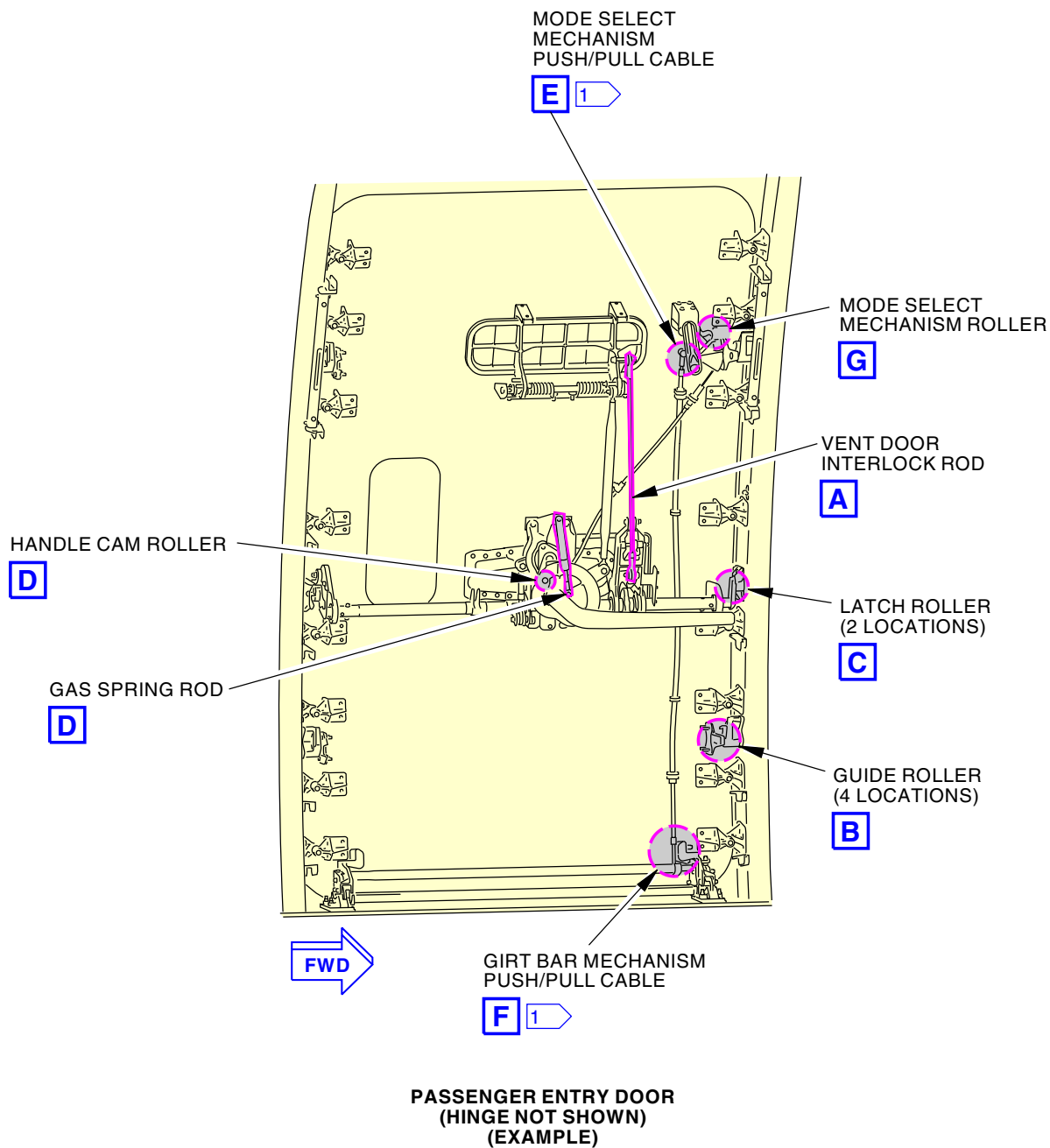
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1 NOT APPLICABLE ON THE OVERWING EXIT DOOR

D07513 S0006402058_V2

**Passenger Entry Door Servicing
Figure 301/12-21-20-990-801 (Sheet 1 of 5)**

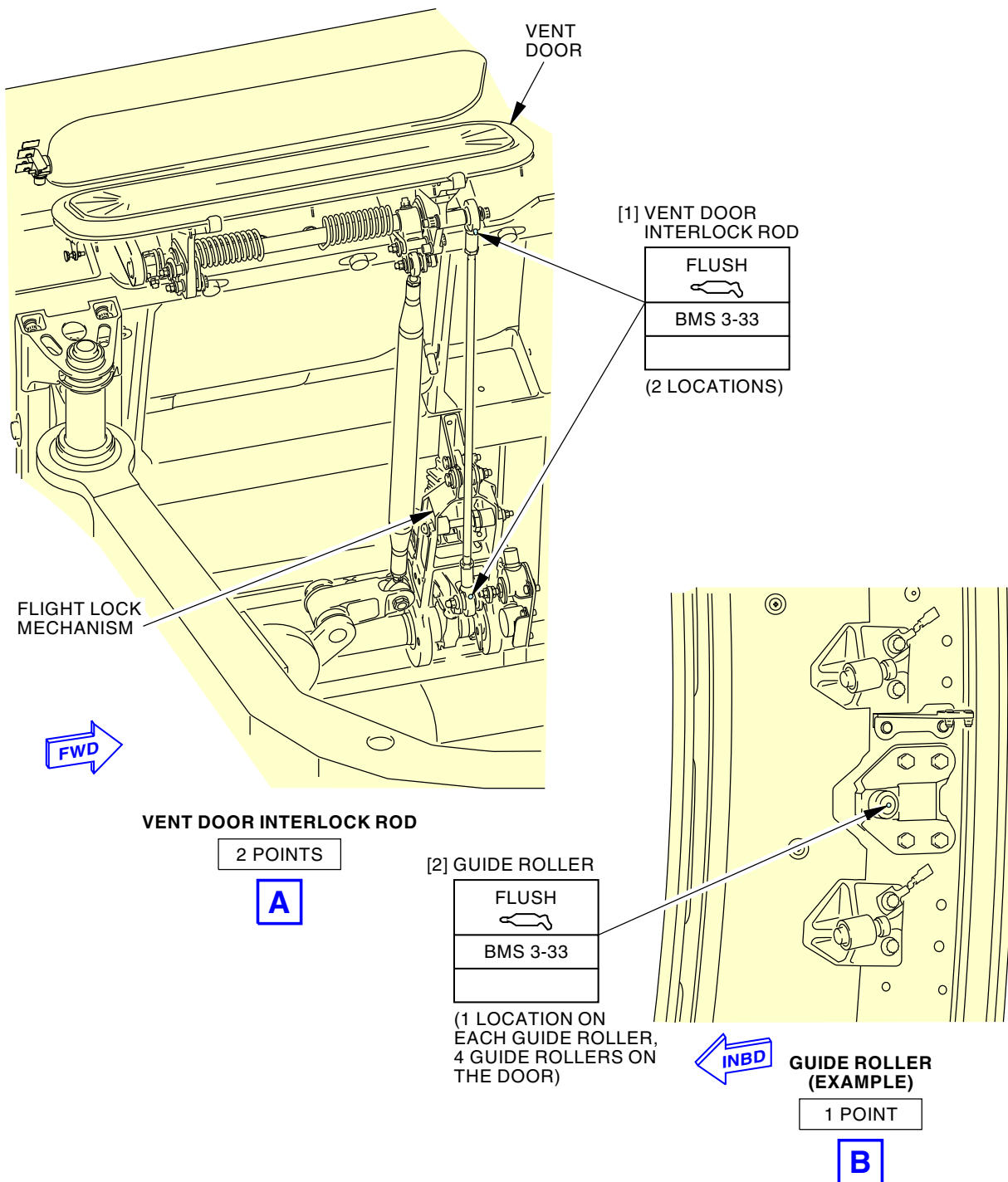
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D07720 S0006402060_V7

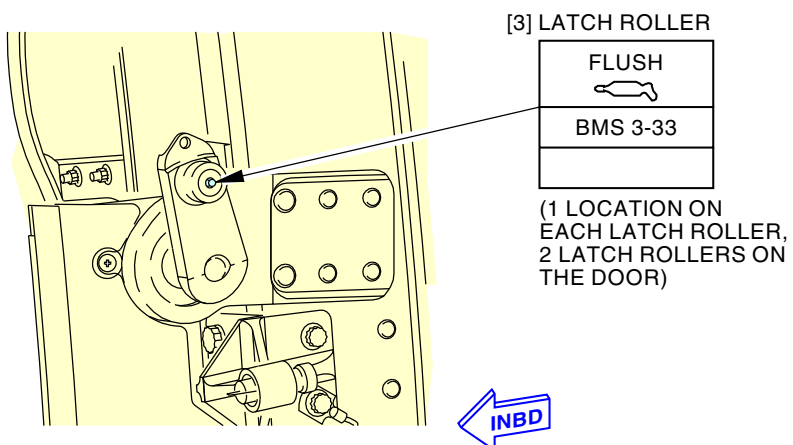
Passenger Entry Door Servicing
Figure 301/12-21-20-990-801 (Sheet 2 of 5)

EFFECTIVITY
ARO ALL

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LATCH ROLLER (EXAMPLE)

1 POINT

C

[4] HANDLE CAM ROLLERS

FLUSH

BMS 3-33

(2 LOCATIONS)

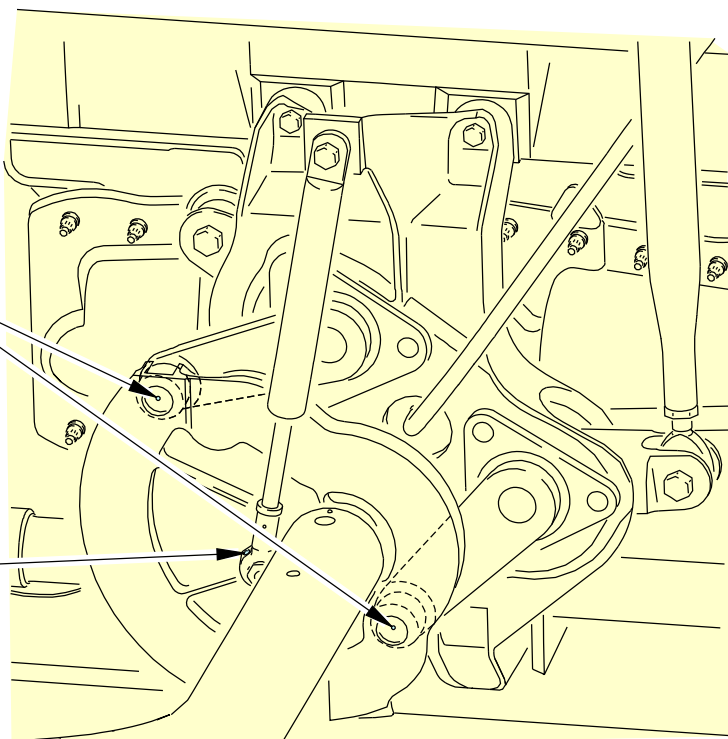
[5] GAS SPRING ROD

FLUSH

BMS 3-33

(1 LOCATION)

FWD



HANDLE CAM ROLLER AND GAS SPRING ROD

3 POINTS

D

D07742 S0006402061_V5

Passenger Entry Door Servicing Figure 301/12-21-20-990-801 (Sheet 3 of 5)

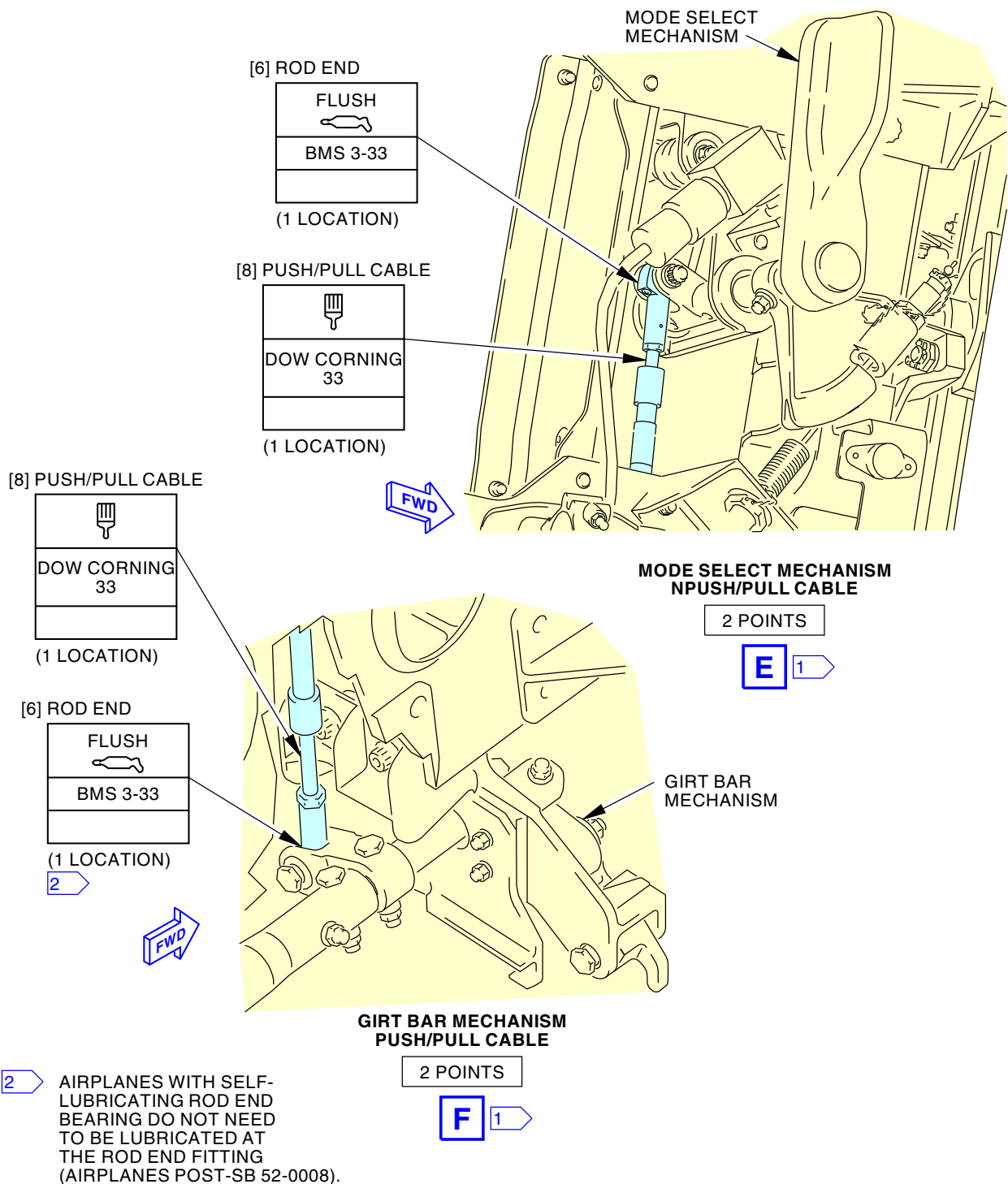
EFFECTIVITY
ARO ALL

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D07743 S0006402062_V9

Passenger Entry Door Servicing
Figure 301/12-21-20-990-801 (Sheet 4 of 5)

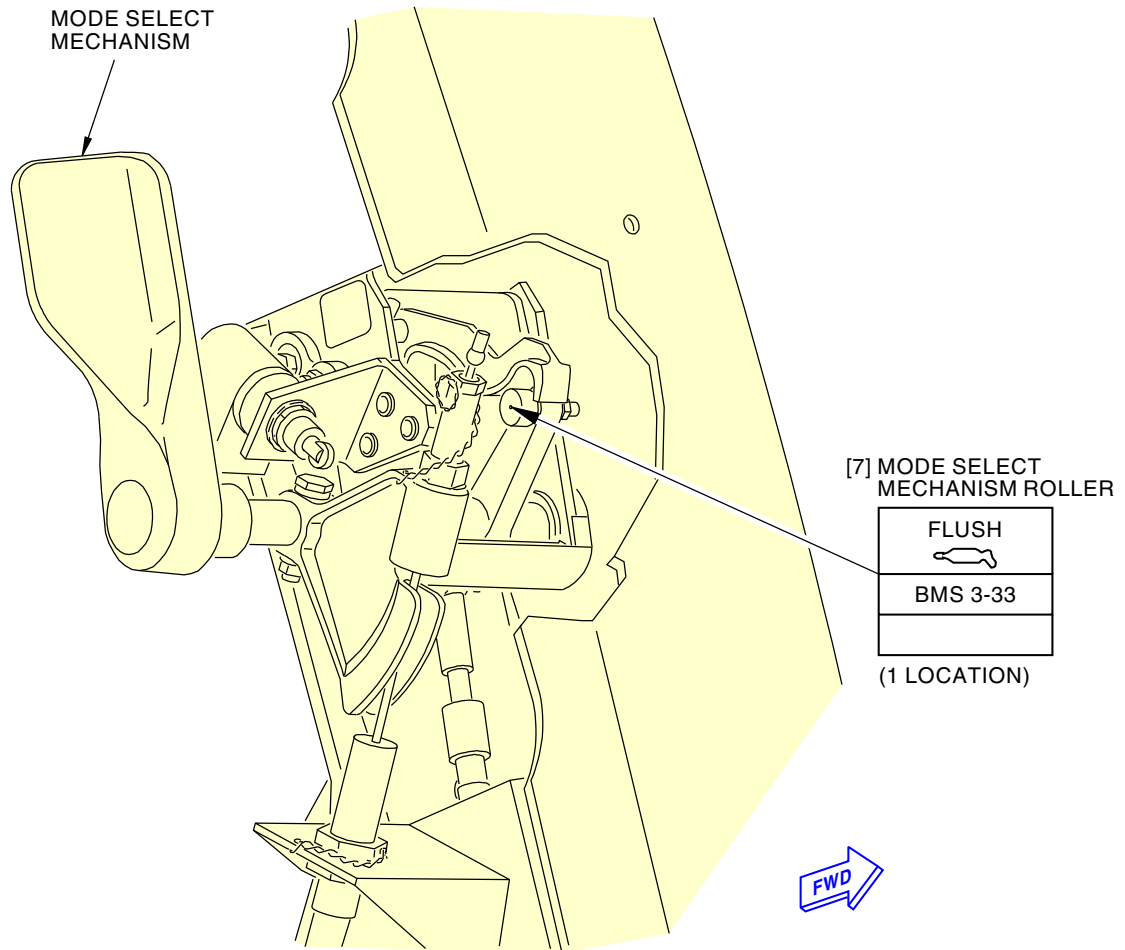
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**MODE SELECT MECHANISM
ROLLER**

1 POINT

G

E25185 S0006402064_V5

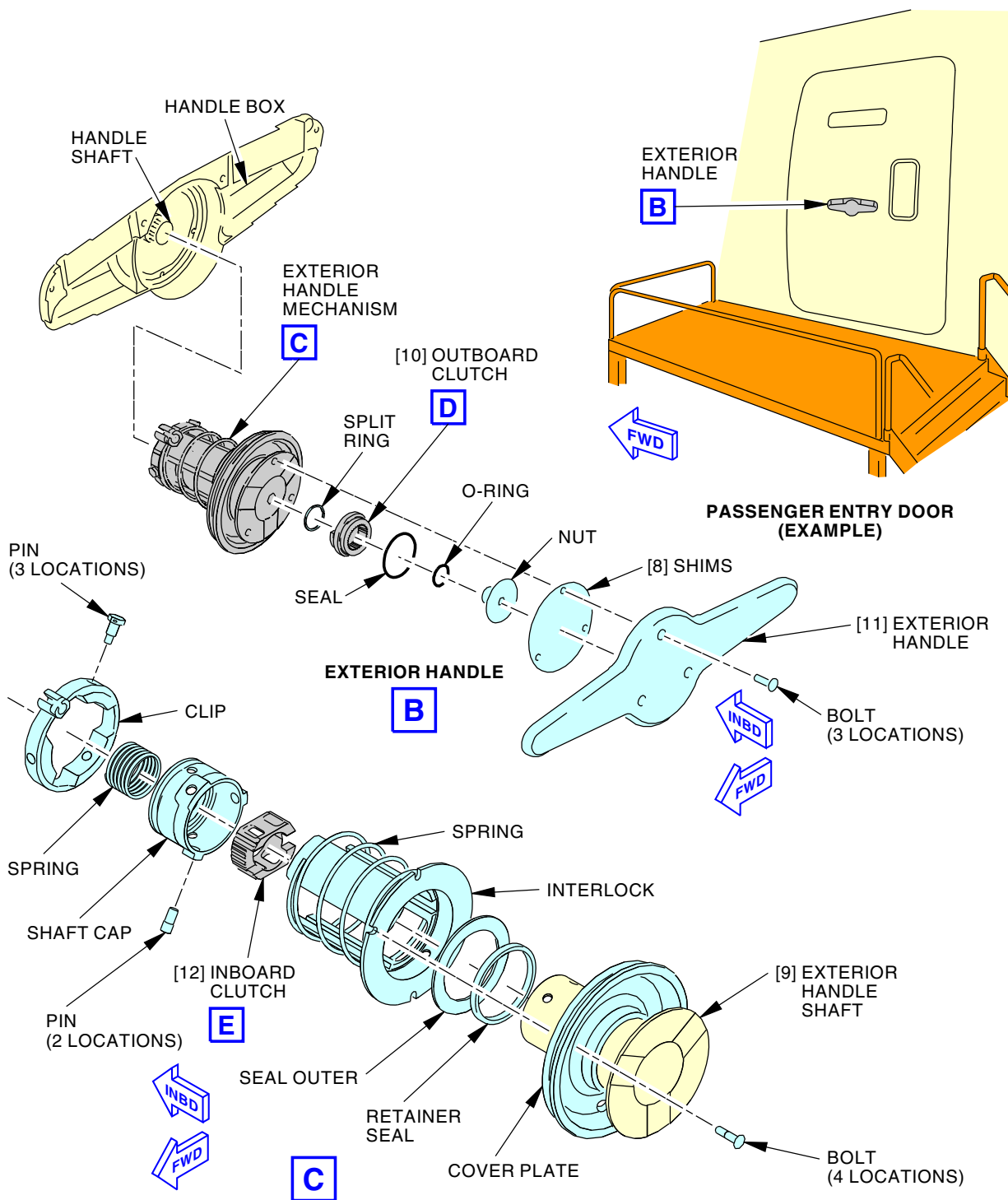
**Passenger Entry Door Servicing
Figure 301/12-21-20-990-801 (Sheet 5 of 5)**

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ARO ALL

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2792908 S0000635842_V1

Exterior Handle Mechanism Servicing
Figure 302/12-21-20-990-803 (Sheet 1 of 2)

EFFECTIVITY
ARO ALL

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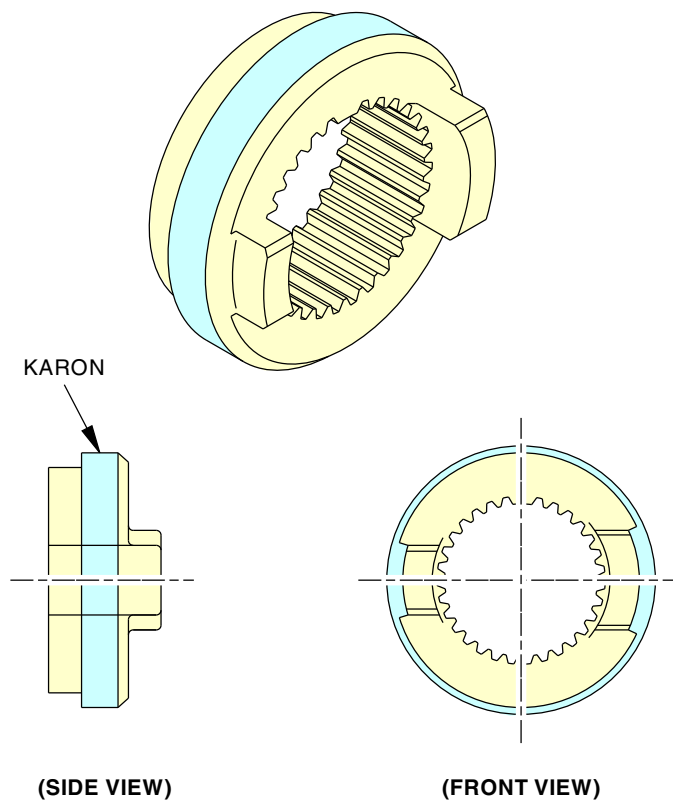
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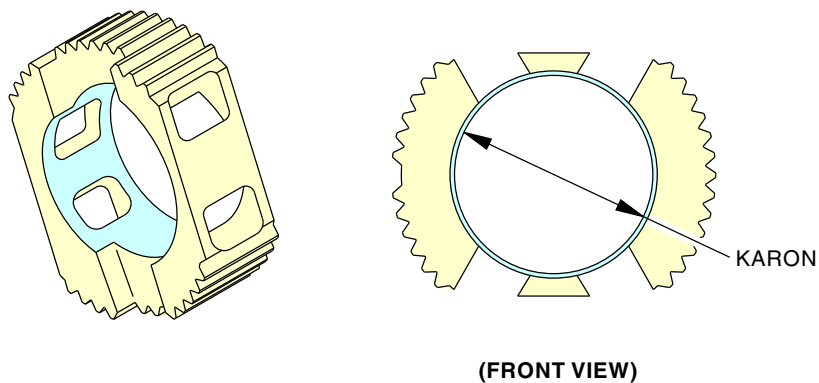


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OUTBOARD CLUTCH

D



INBOARD CLUTCH

E

 SURFACES HAVE KARON COATING

2792909 S0000635843_V1

Exterior Handle Mechanism Servicing
Figure 302/12-21-20-990-803 (Sheet 2 of 2)

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TASK 12-21-20-640-803

3. Girt Bar - Lubrication

(Figure 303)

A. References

Reference	Title
25-66-01-000-801	Door-Mounted Escape Slide Pack Removal (P/B 401)
25-66-01-400-801	Door-Mounted Escape Slide Pack Installation (P/B 401)
52-12-00-730-801	Passenger Entry Door System Test (P/B 501)
52-12-00-820-801	Passenger Entry Door Adjustment (P/B 501)
52-12-25-000-801	Access Panels Removal (P/B 201)
52-12-25-400-801	Access Panels Installation (P/B 201)
52-12-25-400-803	Upper Liner 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-1985	Hold-Open - Passenger Entry Door Part #: J52001-34 Supplier: 81205
SPL-1997	Simulator - Rigging, Passenger Door Escape Slide Part #: J52014-1 Supplier: 81205
STD-1160	Stand - Cabin and General Access Stand, Adjustable Height, Max. Height 18 Feet, Platform 5 Feet by 10 Feet

C. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

D. Location Zones

Zone	Area
221	Passenger Compartment, Left - Section 41
222	Passenger Compartment, Right - Section 41
231	Passenger Compartment, Left - Section 43
232	Passenger Compartment, Right - Section 43
241	Passenger Compartment, Left - Section 44
242	Passenger Compartment, Right - Section 44
251	Passenger Compartment, Left - Section 46
252	Passenger Compartment, Right - Section 46
261	Passenger Compartment, Left - Section 47
262	Passenger Compartment, Right - Section 47

E. Procedure

SUBTASK 12-21-20-860-011

- (1) Make sure the mode select handle is in the MANUAL/DISARM position.

SUBTASK 12-21-20-010-002

- (2) Get access to the girt bar mechanism as follows:
 - (a) Do this task: Door-Mounted Escape Slide Pack Removal, TASK 25-66-01-000-801.

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- (b) Install the passenger door escape slide rigging simulator, SPL-1997.

NOTE: If you do not install this tool, it will be difficult to close the door after it is opened because the door will be too high to enter the cutout.

- (c) Do this task: Access Panels Removal, TASK 52-12-25-000-801.

NOTE: Only remove the applicable aft or forward bottom access panel.

- (d) Make sure the adjustable height cabin and general access stand, STD-1160 is outboard of the door.

- (e) Open the door until the hinge is perpendicular to the door.

- (f) Install the passenger entry door hold-open, SPL-1985.

SUBTASK 12-21-20-640-002

- (3) Lubricate the girt bar mechanism with grease, D00633 as shown on Figure 303.

SUBTASK 12-21-20-860-012

- (4) Do an adjustment of the girt bar mechanism as follows:

- (a) Do this task: Passenger Entry Door Adjustment, TASK 52-12-00-820-801.

NOTE: Only do the Girt Bar Mechanism Adjustment.

SUBTASK 12-21-20-980-001

- (5) Close access as follows:

- (a) Remove the passenger entry door hold-open, SPL-1985.

- (b) Close and latch the door.

- (c) Remove the passenger door escape slide rigging simulator, SPL-1997.

- (d) Do this task: Door-Mounted Escape Slide Pack Installation, TASK 25-66-01-400-801.

- (e) Do this task: Upper Liner Installation, TASK 52-12-25-400-803.

SUBTASK 12-21-20-410-002

- (6) Do a test on the girt bar mechanism as follows:

- (a) Do this task: Passenger Entry Door System Test, TASK 52-12-00-730-801.

NOTE: Only do the Girt Bar Mechanism Test.

SUBTASK 12-21-20-410-003

- (7) Do this task: Access Panels Installation, TASK 52-12-25-400-801.

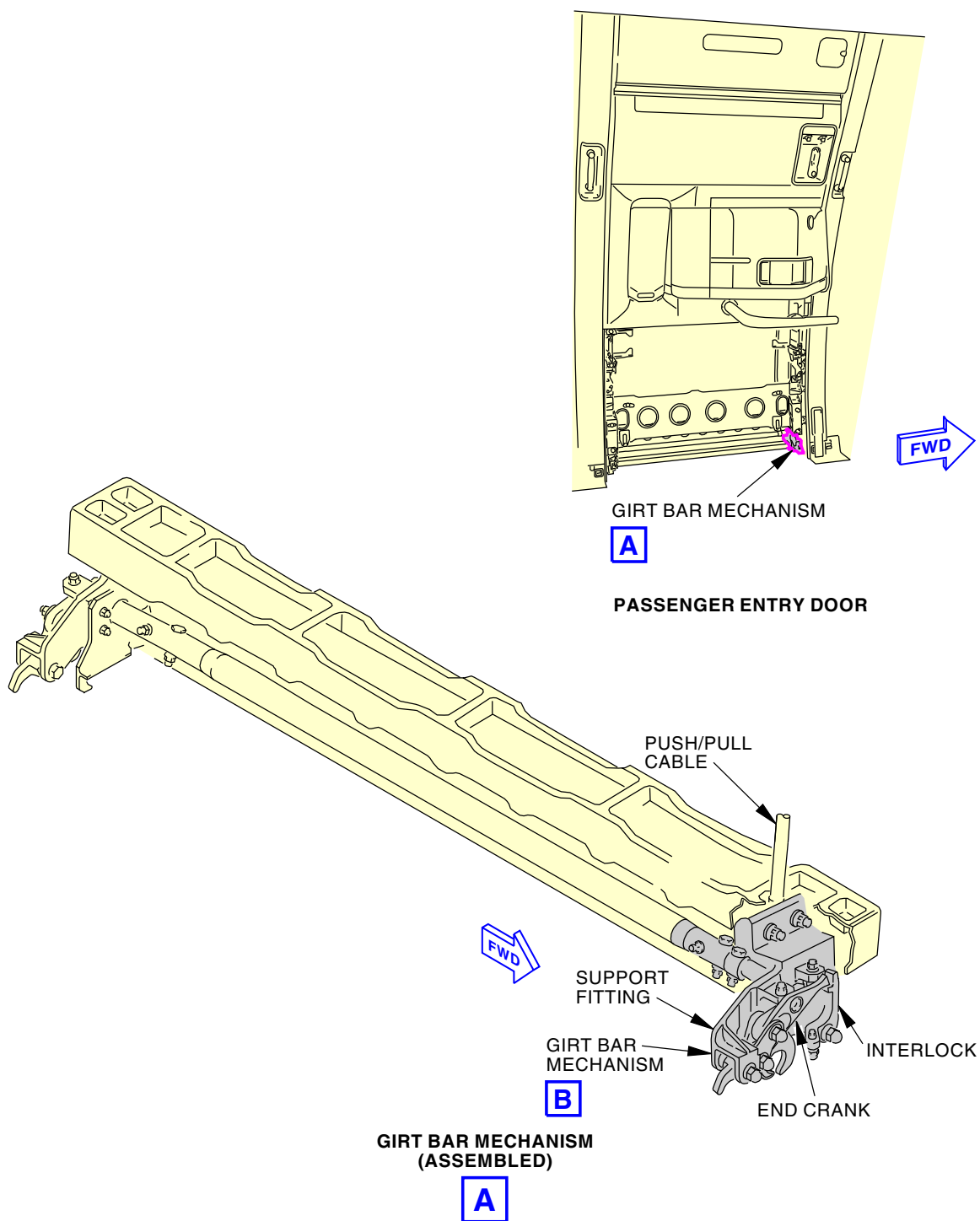
————— **END OF TASK** —————

EFFECTIVITY
ARO ALL

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2524473 S0000593840_V1

Girt Bar - Lubrication
Figure 303/12-21-20-990-802 (Sheet 1 of 2)

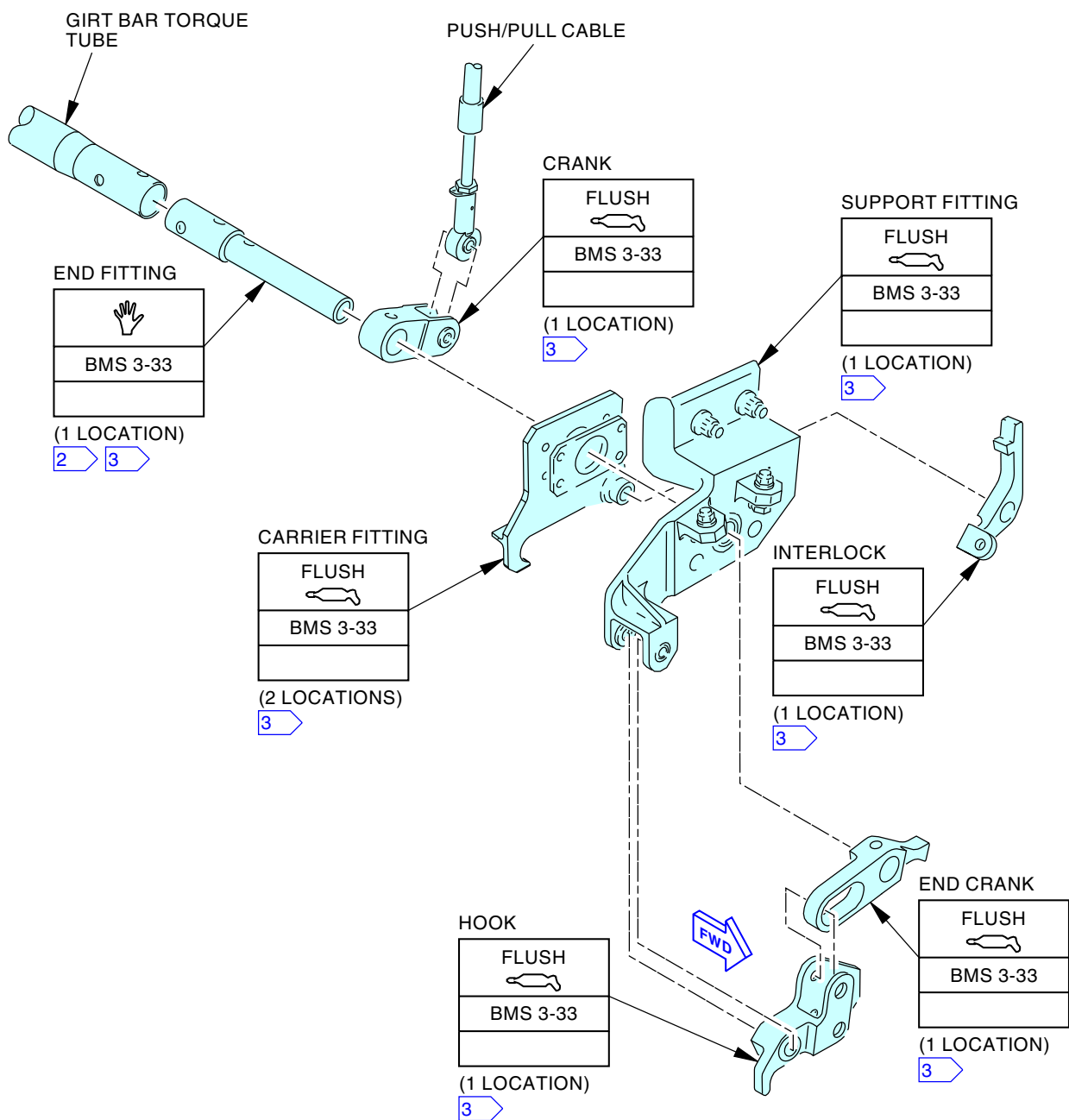
EFFECTIVITY
ARO ALL

12-21-20

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- 1 THE SWEEPER SEAL AND GIRT HAVE BEEN REMOVED FROM THIS VIEW.
- 2 LUBRICATE THE ROUND SURFACE.
- 3 BMS 3-33 (RECOMMENDED)
DC 33 LIGHT (ALTERNATE)

GIRT BAR MECHANISM (EXPLODED VIEW)

B 1

2524474 S0000593974_V1

Girt Bar - Lubrication
Figure 303/12-21-20-990-802 (Sheet 2 of 2)

EFFECTIVITY
ARO ALL

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LARGE CARGO DOOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The servicing of the forward cargo door hinge.
 - (2) The servicing of the forward cargo door components.
 - (3) The servicing of the forward cargo door mechanisms.

TASK 12-21-21-640-801

2. Forward Cargo Door Hinge Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. **Consumable Materials**

Reference	Description	Specification
D00091	Oil - General Purpose, Low Temperature, Lubricating	MIL-PRF-7870 (NATO O-142)

B. **Location Zones**

Zone	Area
821	Forward Large Cargo Door

C. **Procedure**

SUBTASK 12-21-21-640-001

- (1) Lubricate the components shown in (Table 301) with the applicable material:
 - (a) oil, D00091

Table 301/12-21-21-993-804 Door Hinge Lubrication (Fig. 301)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Hinge Pins and Hinges (10)	oil, D00091	MIL-PRF-7870 (NATO O-142)	Fill	10

———— **END OF TASK** ————

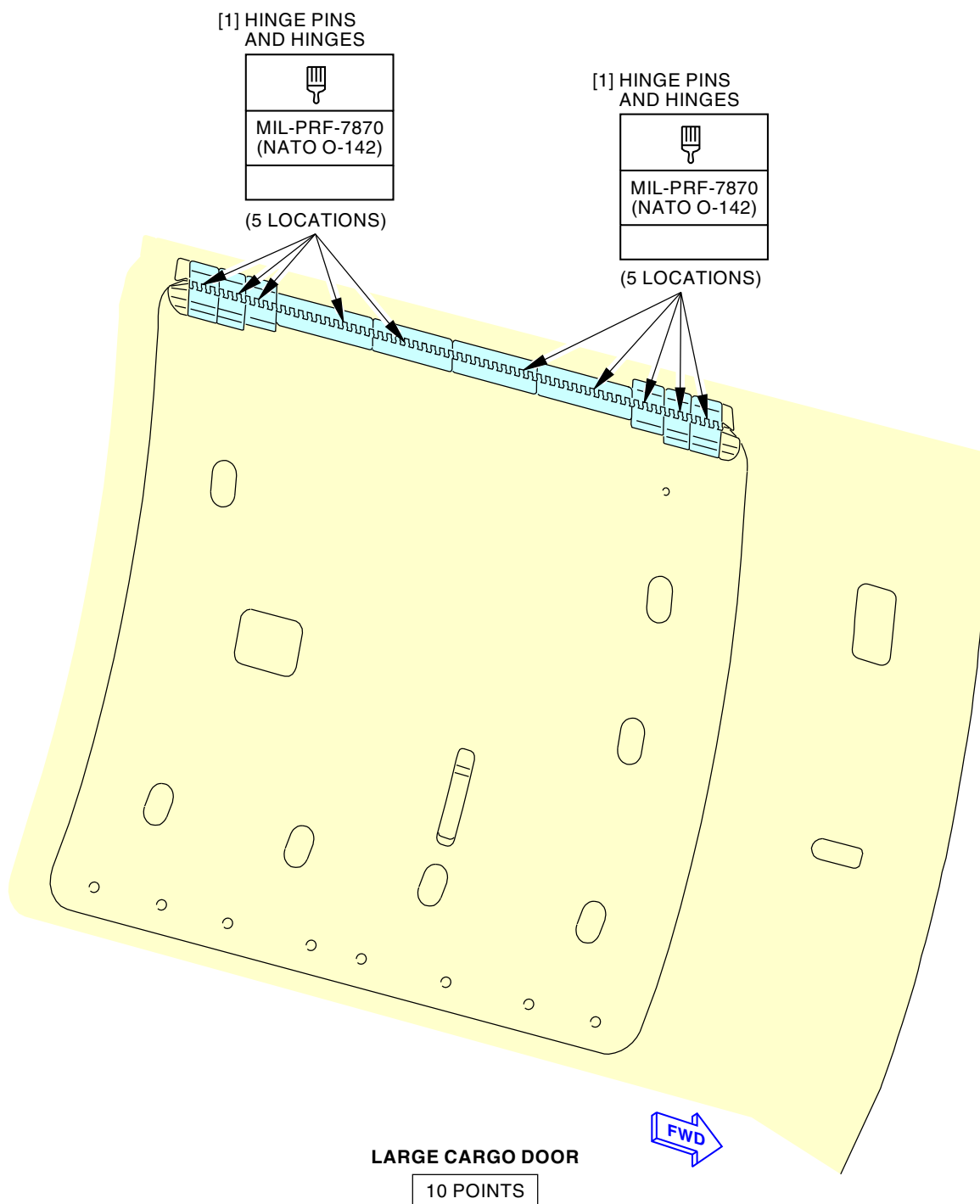
EFFECTIVITY
ARO ALL

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E32313 S0006402079_V3

Door Hinge Servicing
Figure 301/12-21-21-990-806

EFFECTIVITY
ARO ALL

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TASK 12-21-21-640-802

3. **Forward Cargo Door Components Servicing**

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. **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

B. **Location Zones**

Zone	Area
821	Forward Large Cargo Door

C. **Procedure**

SUBTASK 12-21-21-640-002

(1) Lubricate the components shown in (Table 302) with the applicable material:

- (a) grease, D00633 (preferred)
- (b) grease, D00013 (alternate)

Table 302/12-21-21-993-805 Door Components Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Drive Links (2)	grease, D00633	BMS3-33	Grease Gun	4
2	Lock Handle Catch Pin (1)	grease, D00633	BMS3-33	Brush	1
3	Main Cam Latches (8)	grease, D00633	BMS3-33	Grease Gun	8
4	Main Cam Latches (8)	grease, D00633	BMS3-33	Brush	8
5	Main Cam Latch Pins (8)	grease, D00633	BMS3-33	Brush	8
6	Pull-In Hooks (2)	grease, D00633	BMS3-33	Brush	2
7	Pull-In Pins (2)	grease, D00633	BMS3-33	Brush	2
8	Centering Rollers (2)	grease, D00633	BMS3-33	Grease Gun	2

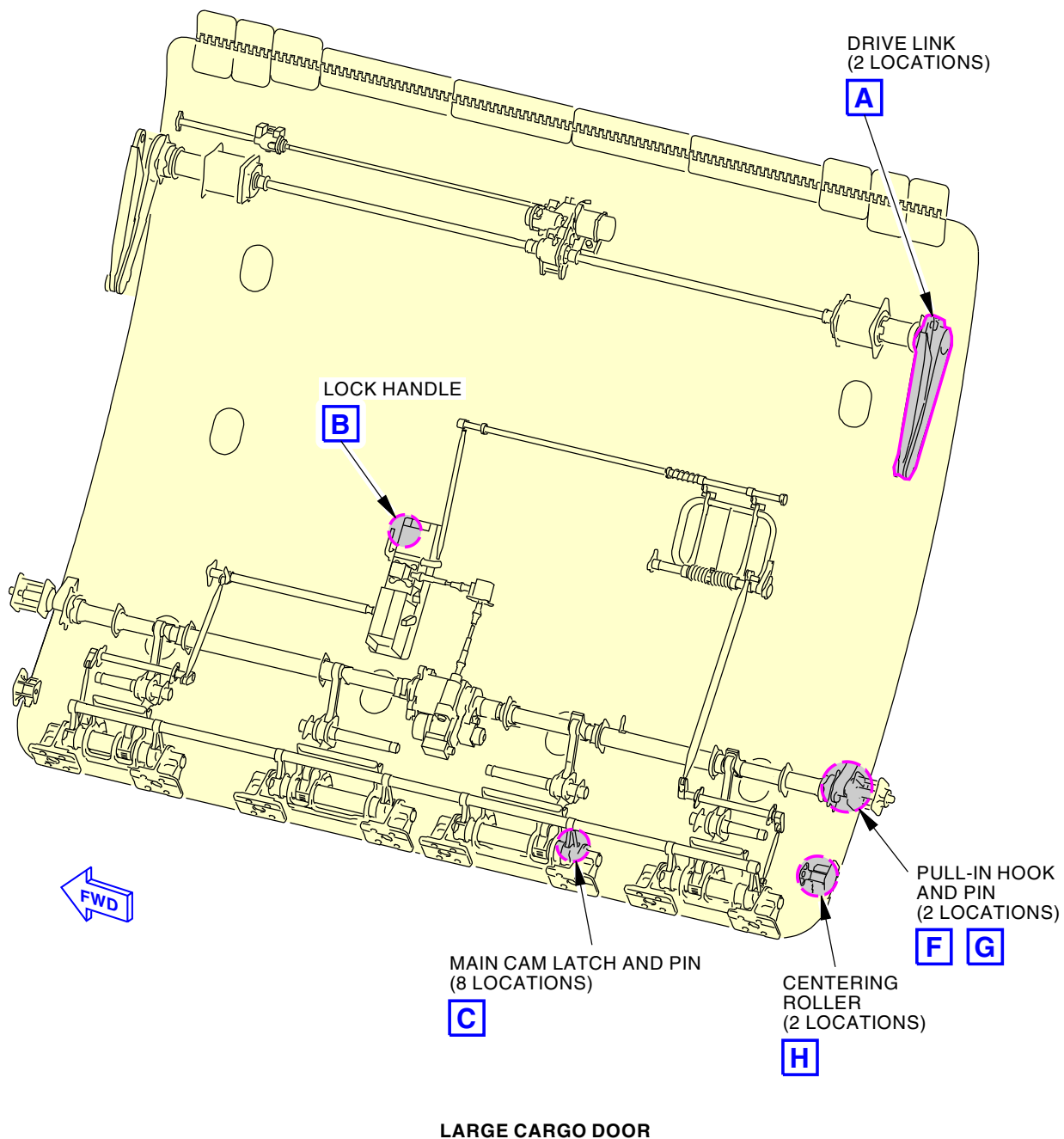
————— END OF TASK —————

EFFECTIVITY
ARO ALL

D633W101-ARO

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G83513 S0006402080_V2

Door Components Servicing
Figure 302/12-21-21-990-805 (Sheet 1 of 5)

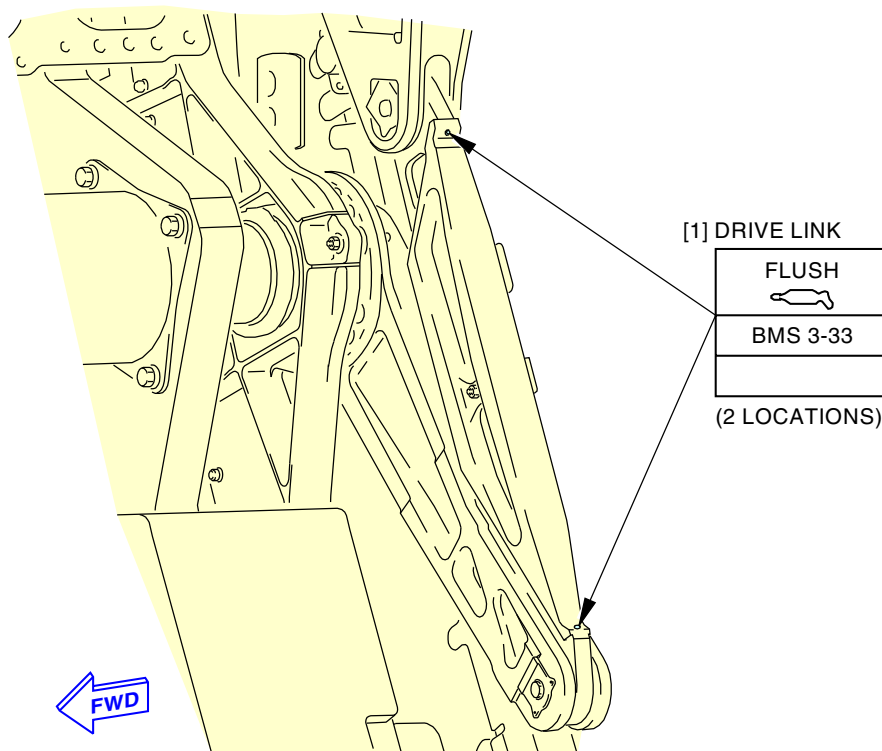
EFFECTIVITY
ARO ALL

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E32568 S0006402083_V4

Door Components Servicing
Figure 302/12-21-21-990-805 (Sheet 2 of 5)

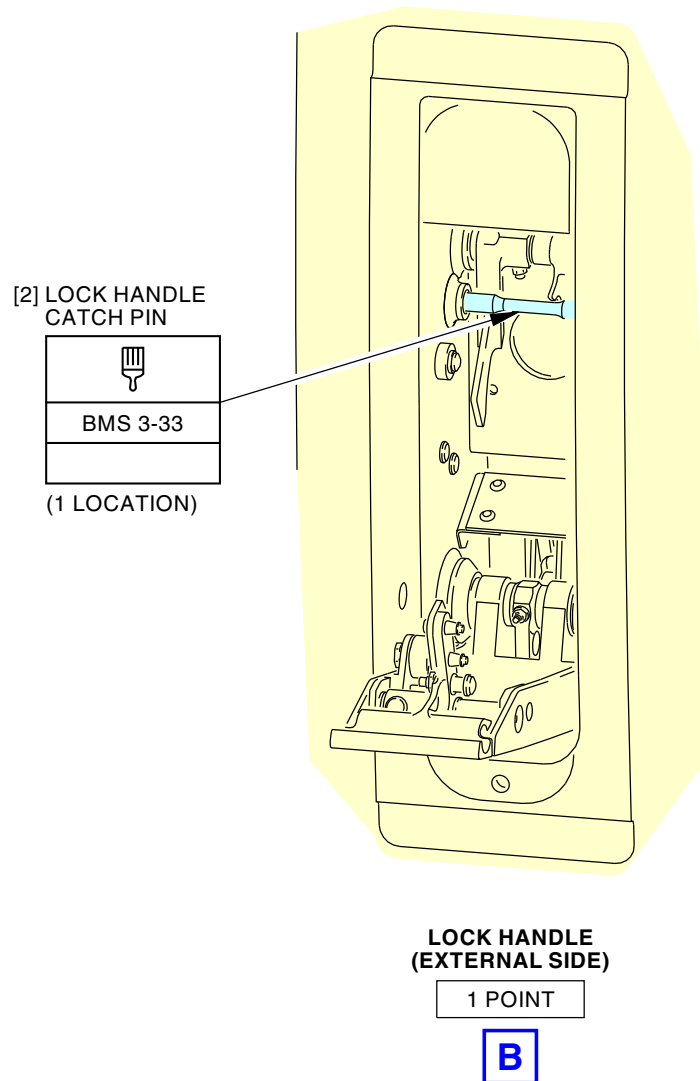
EFFECTIVITY ARO ALL	

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D633W101-ARO

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D15445 S0006402084_V4

Door Components Servicing
Figure 302/12-21-21-990-805 (Sheet 3 of 5)

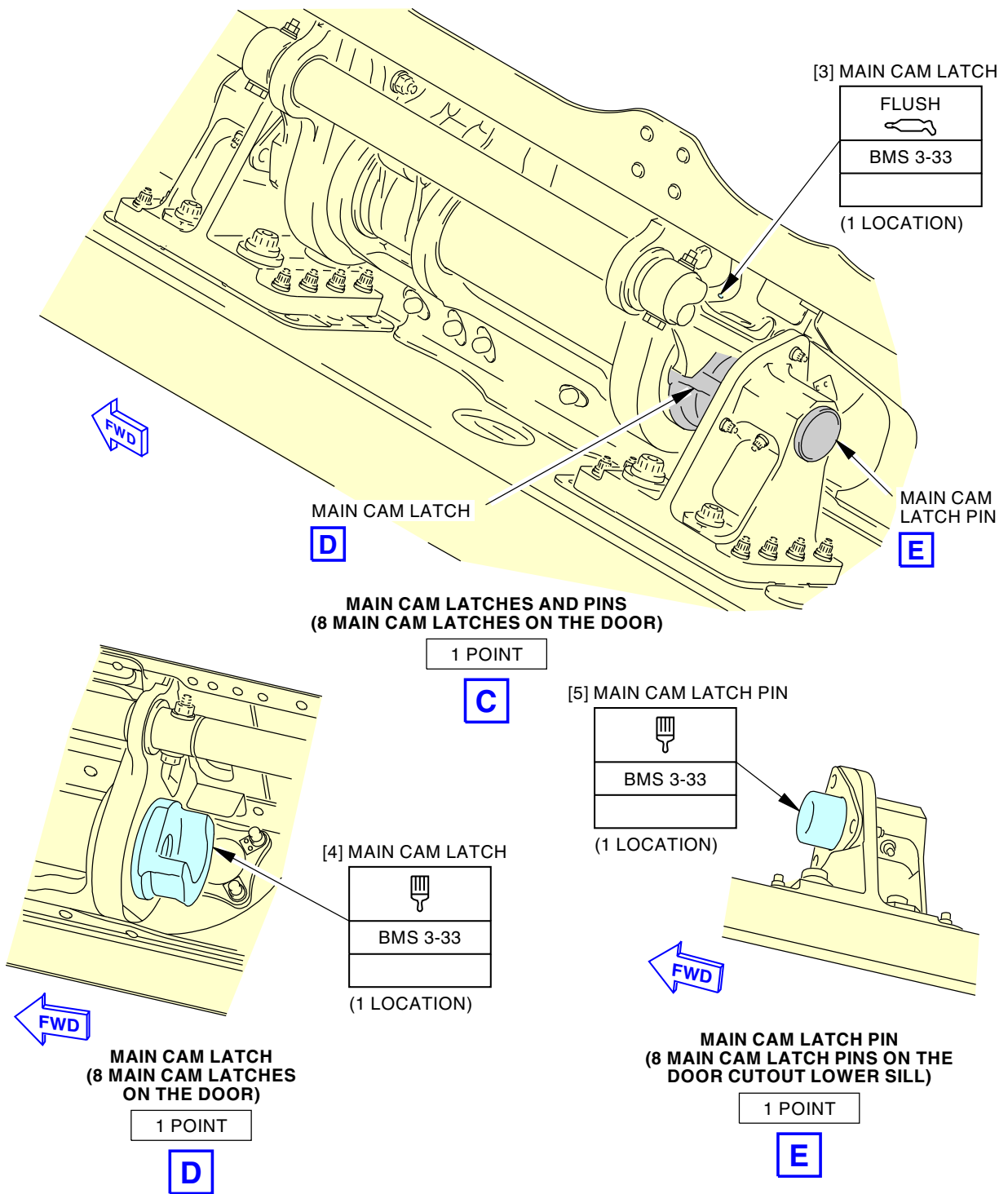
EFFECTIVITY
ARO ALL

D633W101-ARO

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E33090 S0006402085_V5

**Door Components Servicing
Figure 302/12-21-21-990-805 (Sheet 4 of 5)**

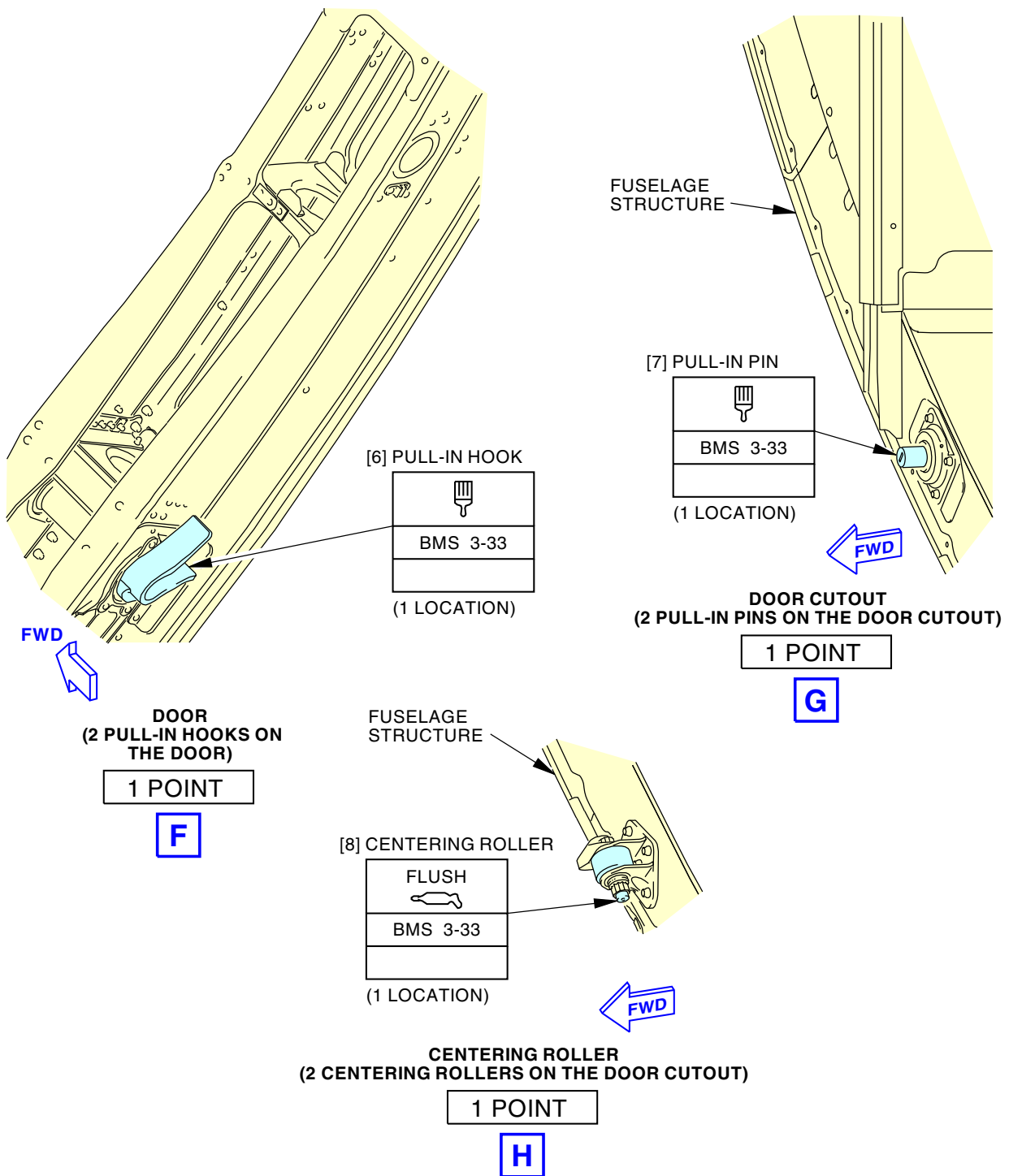
EFFECTIVITY
ARO ALL

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G83886 S0006402086_V6

**Door Components Servicing
Figure 302/12-21-21-990-805 (Sheet 5 of 5)**

EFFECTIVITY
ARO ALL

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TASK 12-21-21-640-803

4. Forward Cargo Door Mechanisms Servicing

(Figure 303)

NOTE: This procedure is a scheduled maintenance task.

A. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. Location Zones

Zone	Area
821	Forward Large Cargo Door

C. Prepare for Servicing

SUBTASK 12-21-21-010-001

- (1) Remove the door lining.

D. Procedure

SUBTASK 12-21-21-640-003

- (1) Lubricate the components shown in (Table 303) with the applicable material:
(a) grease, D00633

Table 303/12-21-21-993-806 Door Mechanisms Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Vent Door Pushrods (2)	grease, D00633	BMS3-33	Grease Gun	4
2	Interlock Pushrod (1)	grease, D00633	BMS3-33	Grease Gun	2
3	Lock Handle Pushrods (2)	grease, D00633	BMS3-33	Grease Gun	4
4	Main Cam Latch Links (8)	grease, D00633	BMS3-33	Grease Gun	16
5	Pull-In Hooks (2)	grease, D00633	BMS3-33	Grease Gun	2
6	Pull-In Pins (2)	grease, D00633	BMS3-33	Grease Gun	4

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-21-410-001

- (1) Install the door lining.

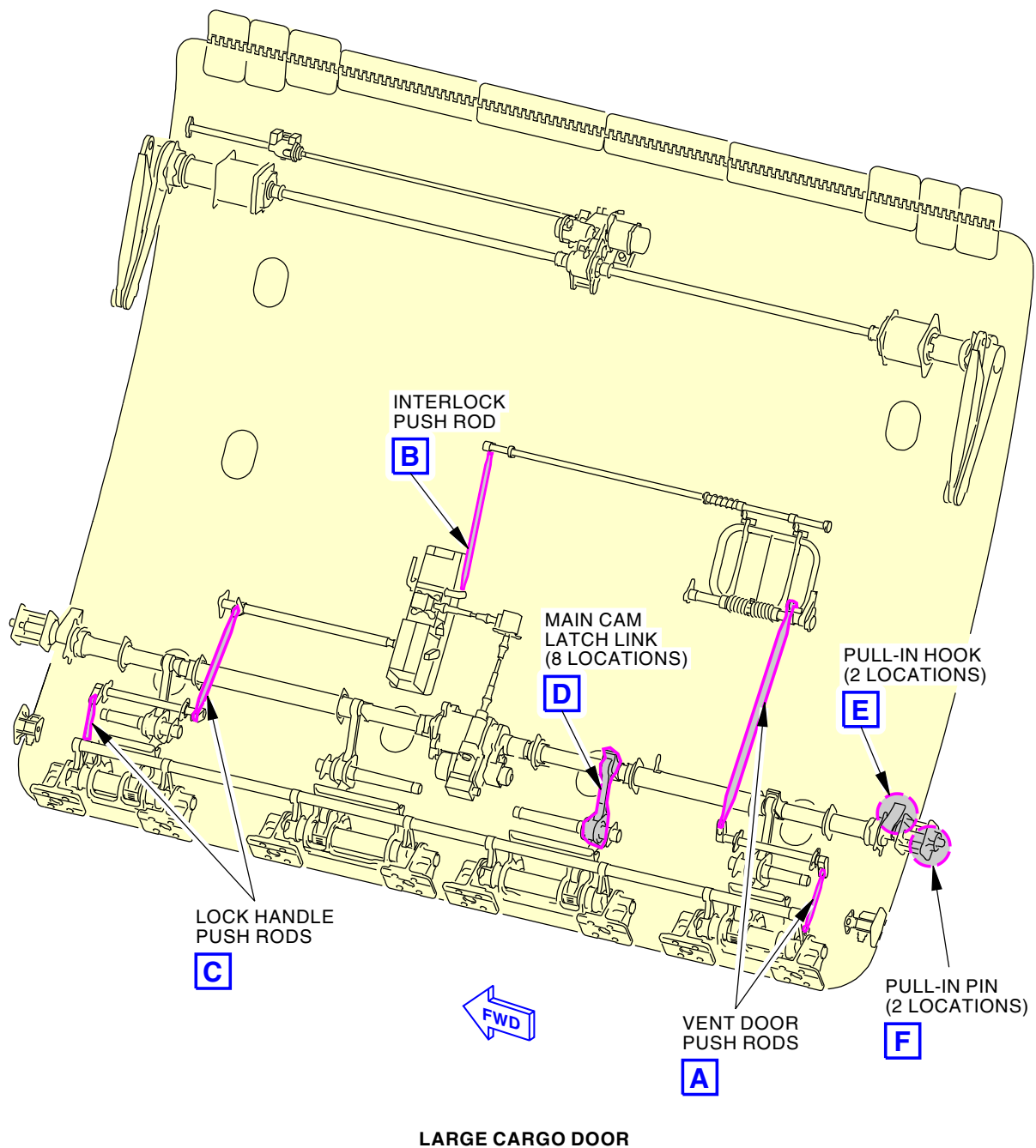
————— **END OF TASK** —————

EFFECTIVITY
ARO ALL

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G83904 S0006402089_V3

Door Mechanisms Servicing
Figure 303/12-21-21-990-804 (Sheet 1 of 5)

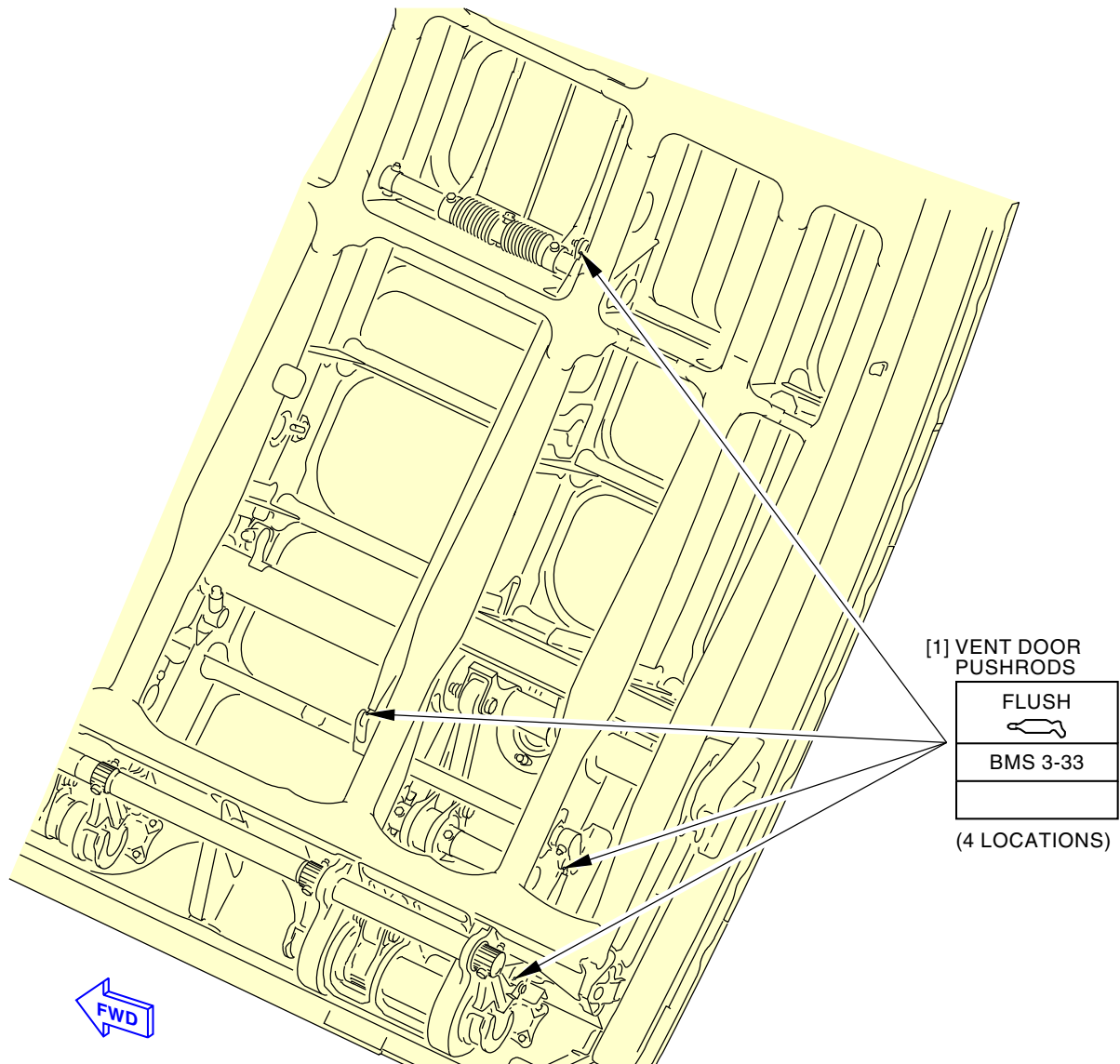
EFFECTIVITY
ARO ALL

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VENT DOOR PUSHRODS

4 POINTS

A

G83918 S0006402090_V4

Door Mechanisms Servicing
Figure 303/12-21-21-990-804 (Sheet 2 of 5)

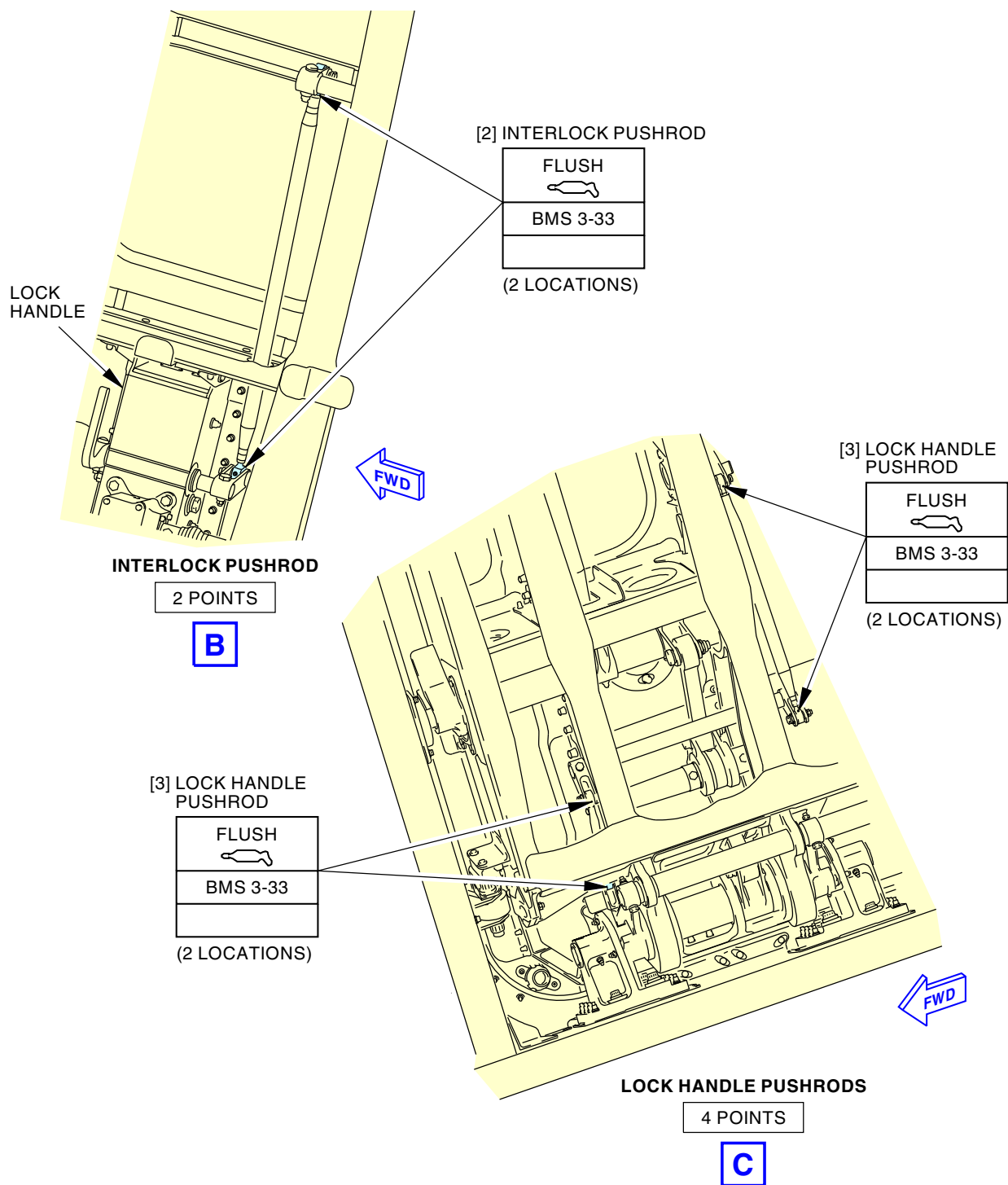
EFFECTIVITY
ARO ALL

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E32613 S0006402091_V4

Door Mechanisms Servicing
Figure 303/12-21-21-990-804 (Sheet 3 of 5)

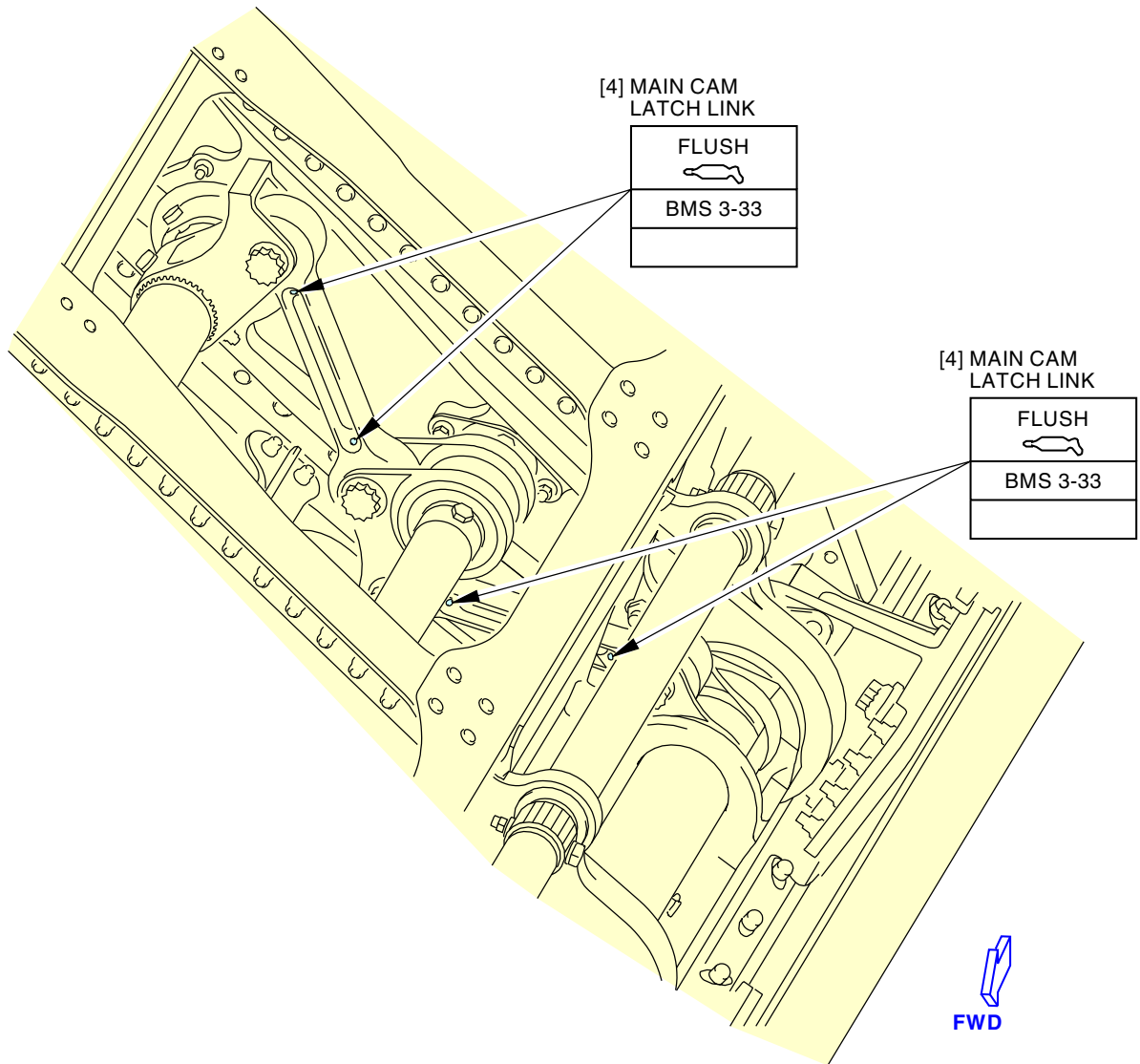
EFFECTIVITY
ARO ALL

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MAIN CAM LATCH LINK
(8 MAIN CAM LATCH LINKS ON THE DOOR)

4 POINTS



D15382 S0006402092_V4

Door Mechanisms Servicing
Figure 303/12-21-21-990-804 (Sheet 4 of 5)

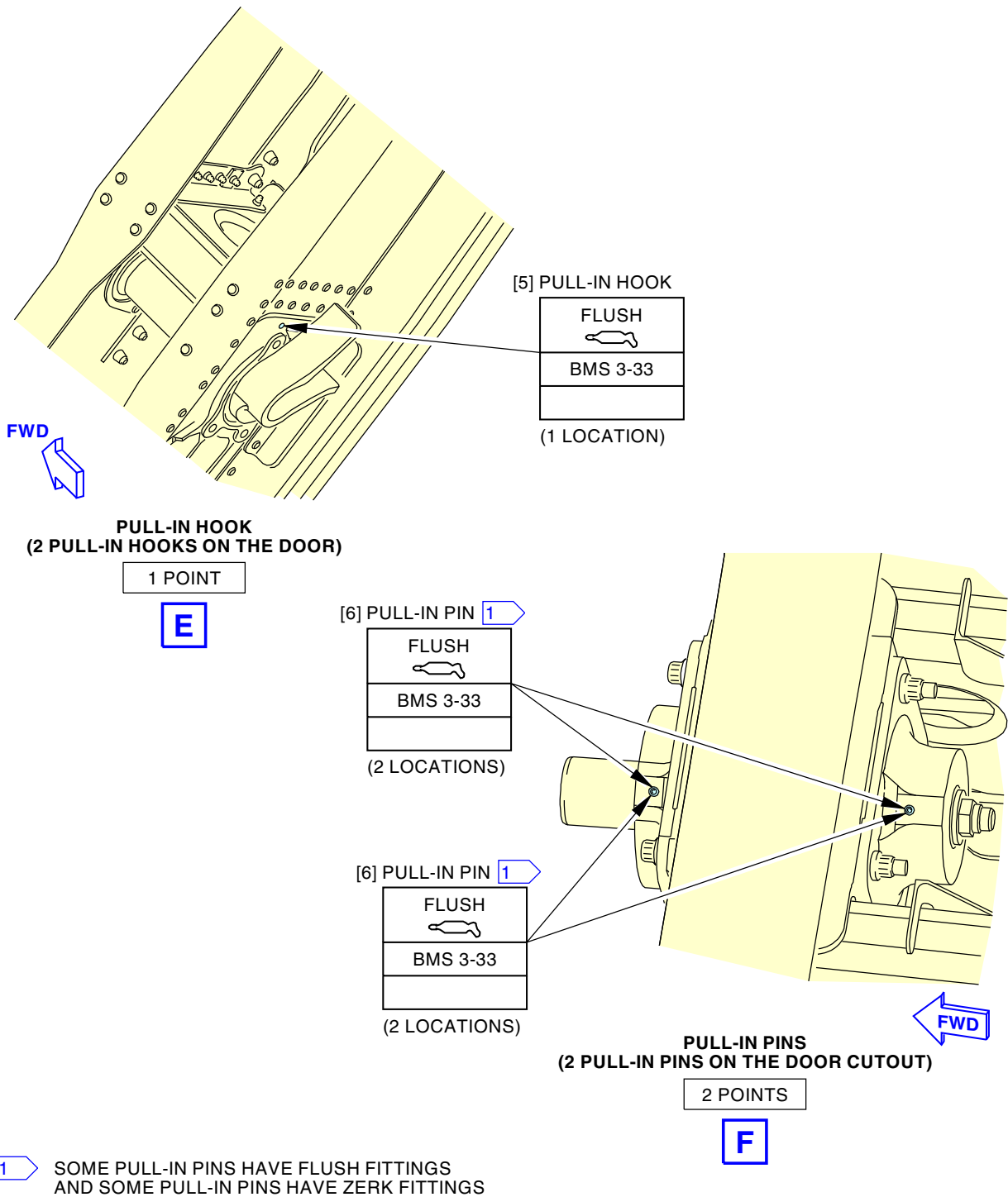
EFFECTIVITY
ARO ALL

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E32640 S0006402093_V5

Door Mechanisms Servicing
Figure 303/12-21-21-990-804 (Sheet 5 of 5)

EFFECTIVITY
ARO ALL

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SMALL CARGO DOOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The servicing of the small cargo door.

TASK 12-21-22-600-801

2. Small Cargo Door Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. **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

B. **Location Zones**

Zone	Area
823	Aft Small Cargo Door

C. **Prepare for Servicing**

SUBTASK 12-21-22-010-001

- (1) Remove the applicable door lining.

D. **Procedure**

SUBTASK 12-21-22-640-001

- (1) Lubricate the components shown in (Table 301) with the applicable material:
 - (a) grease, D00633 (preferred)
 - (b) grease, D00013 (alternate)

Table 301/12-21-22-993-803 Small Cargo Door Lubrication

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
1	Hinge Arm	grease, D00633(preferred) or grease, D00013 (alternate)	Grease Gun	2
2	Adjustment Rod	grease, D00633(preferred) or grease, D00013 (alternate)	Grease Gun	4
3	Latch Roller	grease, D00633(preferred) or grease, D00013 (alternate)	Grease Gun	2

EFFECTIVITY
ARO ALL

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Table 301/12-21-22-993-803 Small Cargo Door Lubrication (Continued)

Item No.	Nomenclature	Lubricant	Method of Application	Number of Locations
4	Lockout Push Rod	grease, D00633(preferred) or grease, D00013 (alternate)	Grease Gun	2
5	Vent Door Push Rod	grease, D00633(preferred) or grease, D00013 (alternate)	Grease Gun	2

E. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-22-410-001

- (1) Install the door lining.

————— **END OF TASK** —————

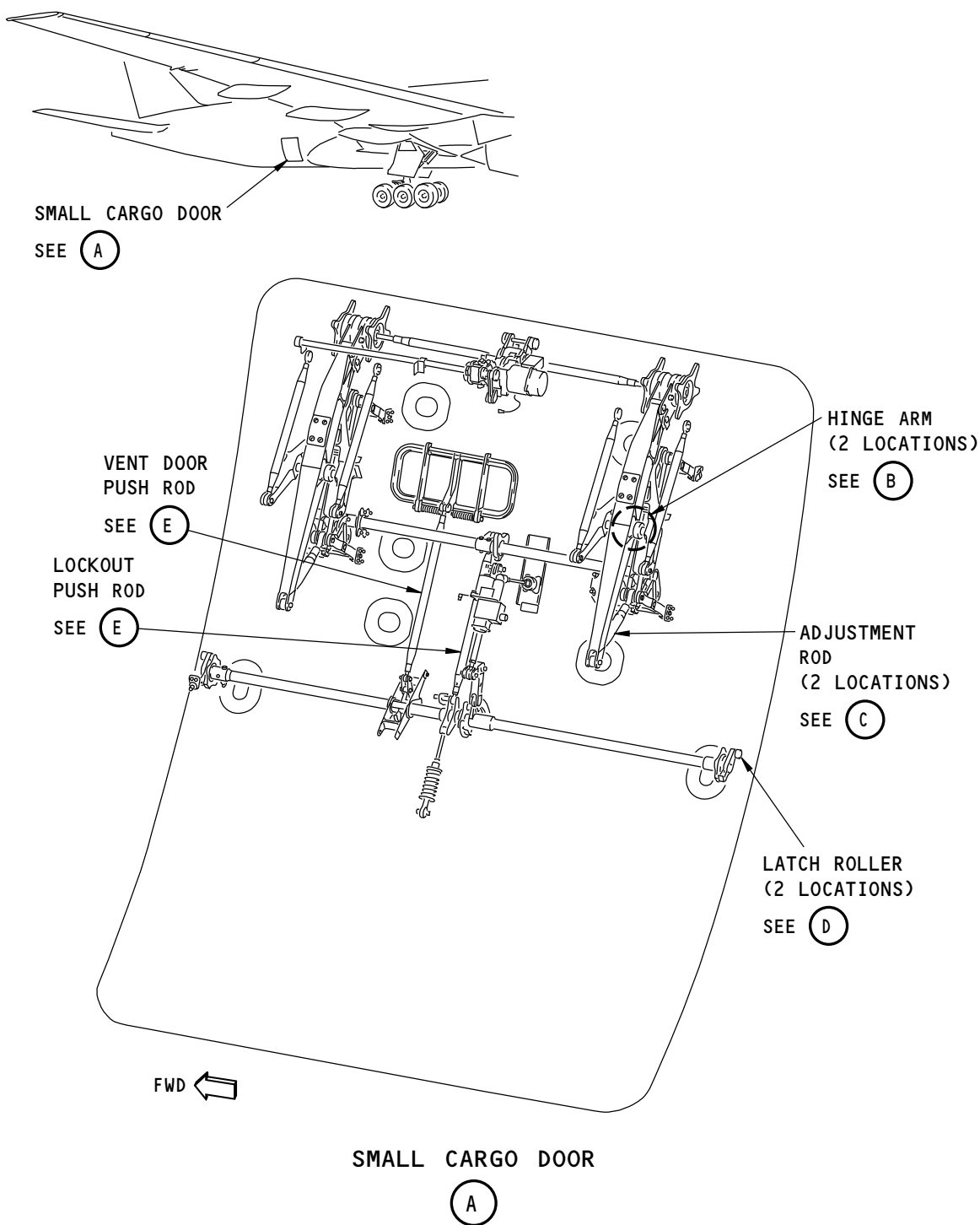
EFFECTIVITY
ARO ALL

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E82124 S0006402098_V1

**Small Cargo Door Servicing
Figure 301/12-21-22-990-801 (Sheet 1 of 4)**

EFFECTIVITY
ARO ALL

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[1] HINGE ARM

FLUSH 
BMS 3-33 OR MIL-PFR- 23827

(1 LOCATION ON
EACH HINGE ARM,
2 HINGE ARMS ON
THE DOOR)

HINGE ARM
(EXAMPLE)

1 POINT

(B)

[1] HINGE ARM

[2] ADJUSTMENT
ROD

FLUSH 
BMS 3-33 OR MIL-PFR- 23827

(2 LOCATIONS ON
EACH ADJUSTMENT ROD,
2 ADJUSTMENT RODS
ON THE DOOR)

ADJUSTMENT ROD
(EXAMPLE)

2 POINTS

(C)

E82136 S0006402099_V4

Small Cargo Door Servicing
Figure 301/12-21-22-990-801 (Sheet 2 of 4)

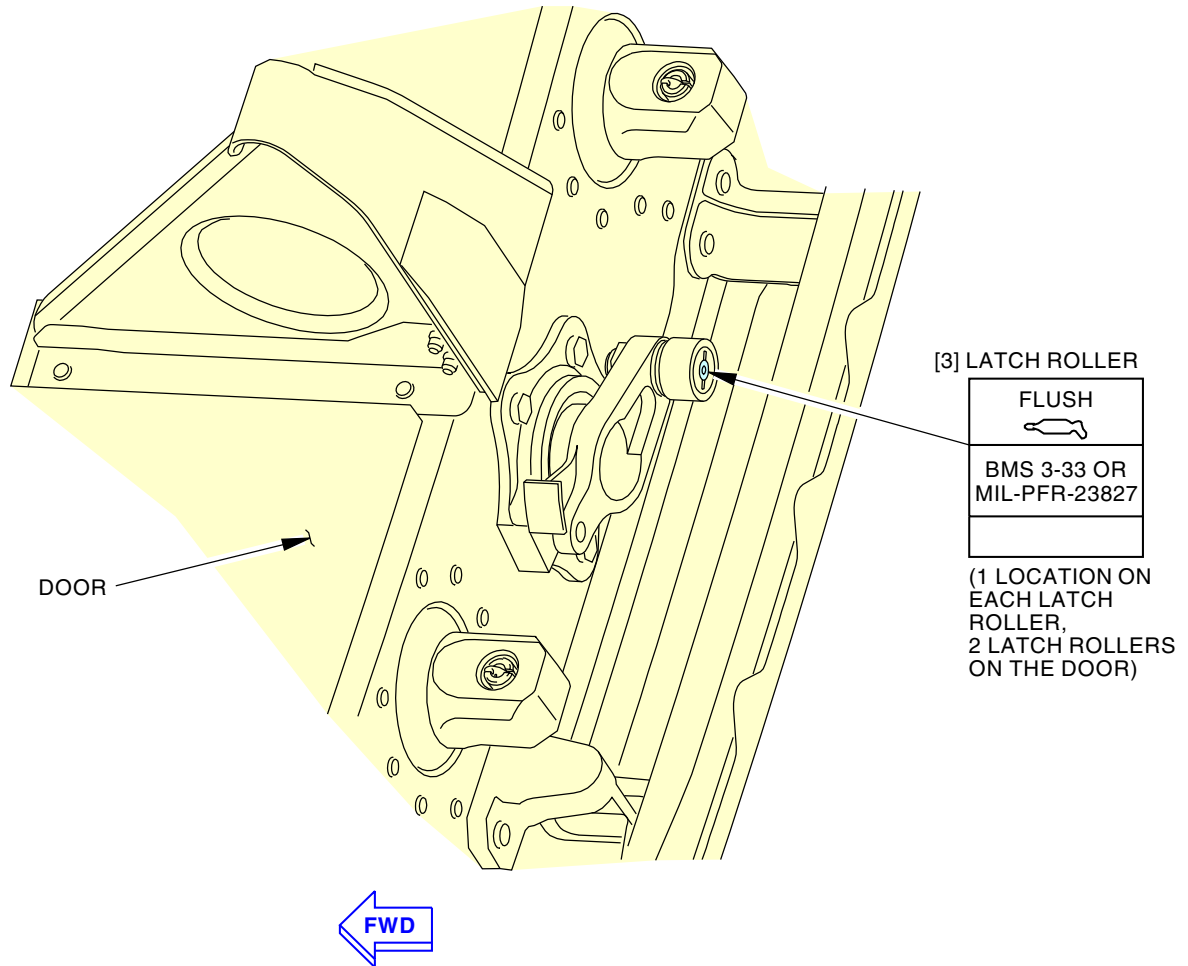
EFFECTIVITY
ARO ALL

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**LATCH ROLLER
(EXAMPLE)**

1 POINT

D

E82150 S0006402100_V4

Small Cargo Door Servicing
Figure 301/12-21-22-990-801 (Sheet 3 of 4)

EFFECTIVITY
ARO ALL

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[5] VENT DOOR
PUSH ROD

FLUSH 
BMS 3-33 OR MIL-PFR- 23827

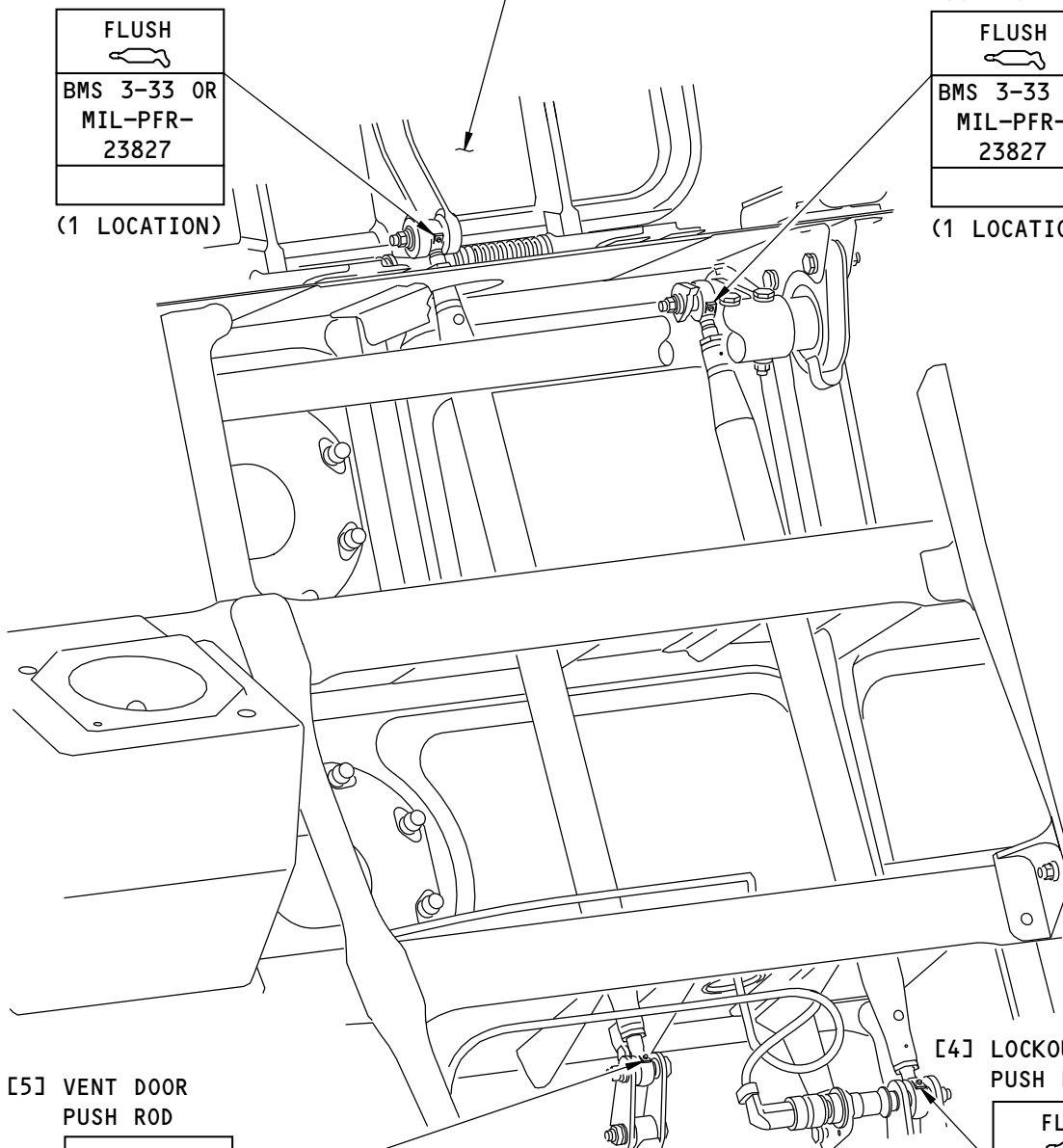
(1 LOCATION)

VENT DOOR

[4] LOCKOUT
PUSH ROD

FLUSH 
BMS 3-33 OR MIL-PFR- 23827

(1 LOCATION)



[5] VENT DOOR
PUSH ROD

FLUSH 
BMS 3-33 OR MIL-PFR- 23827

(1 LOCATION)

**VENT DOOR PUSH ROD AND
LOCKOUT CONTROL PUSH ROD**

FWD 

4 POINTS

E

[4] LOCKOUT
PUSH ROD

FLUSH 
BMS 3-33 OR MIL-PFR- 23827

(1 LOCATION)

E82859 S0006402101_V4

**Small Cargo Door Servicing
Figure 301/12-21-22-990-801 (Sheet 4 of 4)**

EFFECTIVITY
ARO ALL

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BULK CARGO DOOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
B. This procedure has these tasks:
(1) The servicing for the bulk cargo door.

TASK 12-21-23-640-801

2. Bulk Cargo Door Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. Consumable Materials

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

B. Location Zones

Zone	Area
825	Bulk Cargo Door

C. Prepare for Servicing

SUBTASK 12-21-23-010-001

- (1) Remove the applicable door lining.

D. Procedure

SUBTASK 12-21-23-640-001

- (1) Lubricate the components shown in (Table 301) with the applicable material:
(a) grease, D00633

E. Put the Airplane Back in Its Usual Condition

SUBTASK 12-21-23-410-001

- (1) Install the lining.

SUBTASK 12-21-23-640-002

- (2) Use the table that follows for the bulk cargo door lubrication.

Table 301/12-21-23-993-802 Bulk Cargo Door Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Probe Support Fittings (4)	grease, D00633	BMS3-33	Grease Gun	4

————— **END OF TASK** —————

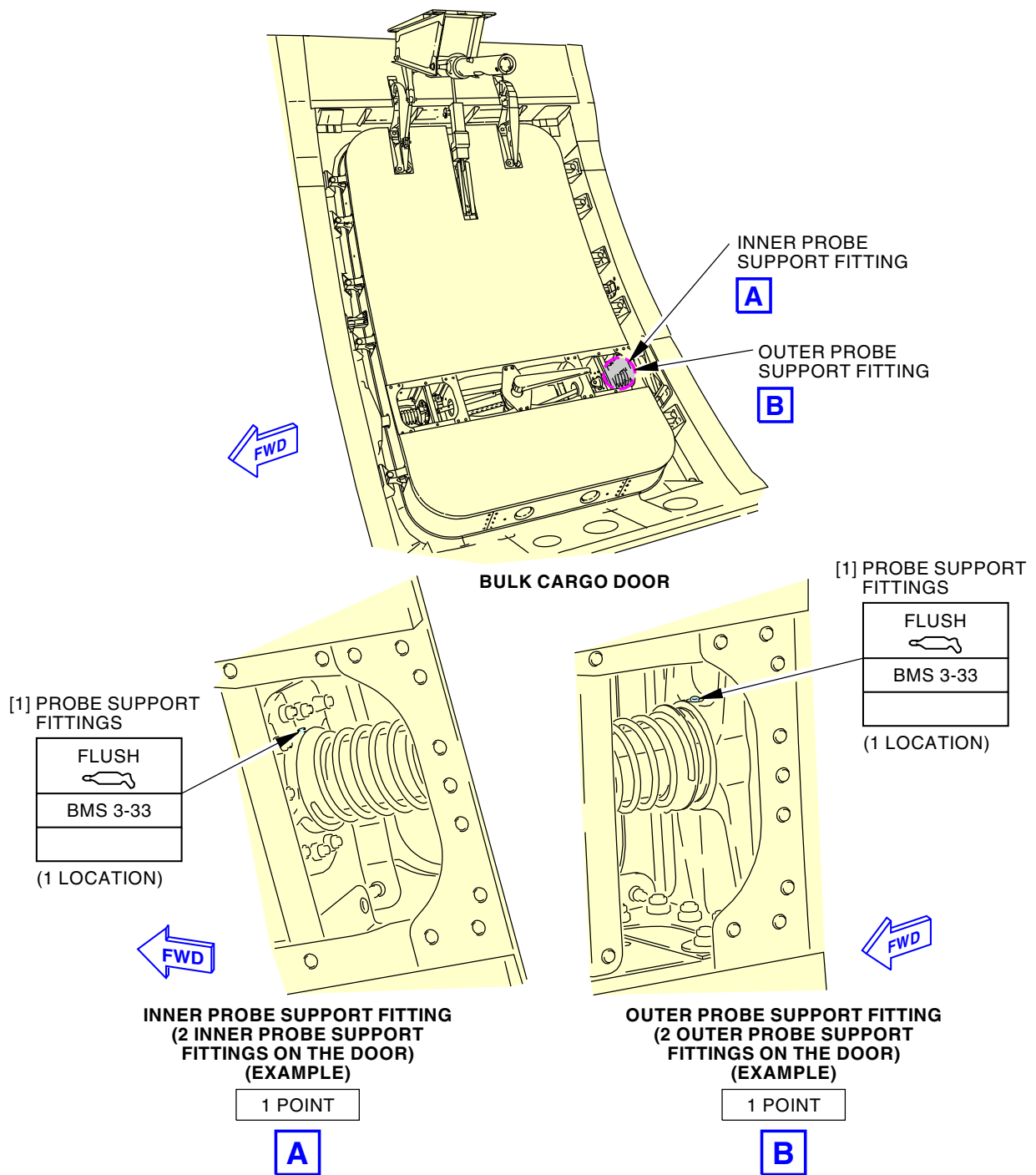
EFFECTIVITY
ARO ALL

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D10074 S0006402106_V4

**Bulk Cargo Door Servicing
Figure 301/12-21-23-990-801**

EFFECTIVITY
ARO ALL

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FORWARD ACCESS DOOR - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The servicing of the forward access door.

TASK 12-21-24-640-801-006

2. Forward Access Door Servicing - 300ER

NOTE: This procedure is a scheduled maintenance task.

A. **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

B. **Location Zones**

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well

C. **Access Panels**

Number	Name/Location
112AL	Forward Access Door

D. **Job Set-up**

SUBTASK 12-21-24-010-012

- (1) Open access panels, reference Figure 301, Figure 302.

E. **Prepare for Servicing**

SUBTASK 12-21-24-010-013

- (1) Get access to this access panel:

<u>Number</u>	<u>Name/Location</u>
112AL	Forward Access Door

F. **Procedure**

SUBTASK 12-21-24-640-013

- (1) Lubricate the components shown in (Table 301).

SUBTASK 12-21-24-640-014

- (2) Operate the handle to get the grease, D00633 (preferred) or grease, D00013 (alternate) into the bearing.

G. **Put the Airplane Back to Its Usual Condition**

SUBTASK 12-21-24-410-012

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
112AL	Forward Access Door

EFFECTIVITY
ARO ALL

12-21-24

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Table 301/12-21-24-993-814

Item No	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Latch Pin [1]	grease, D00633 (preferred)	BMS3-33	Brush	1
		grease, D00013	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)		

H. Job Close-up

SUBTASK 12-21-24-410-013

(1) Close access panels, reference Figure 301, Figure 302.

———— **END OF TASK** ————

EFFECTIVITY
ARO ALL

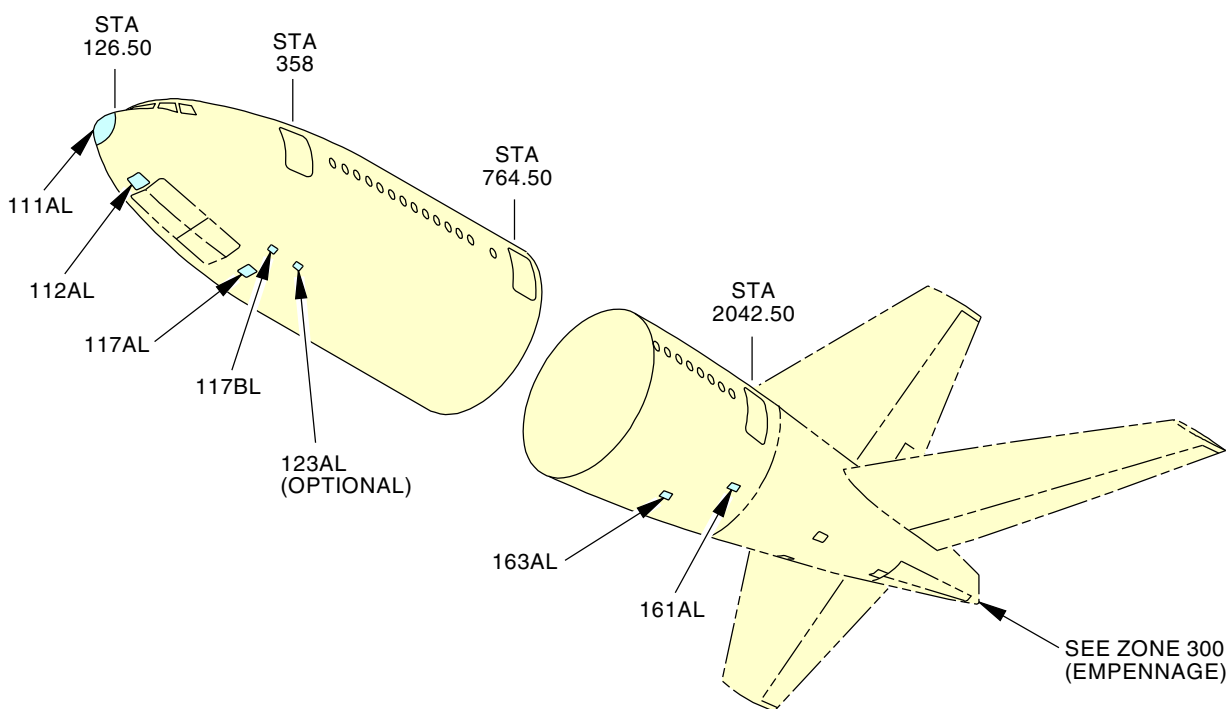
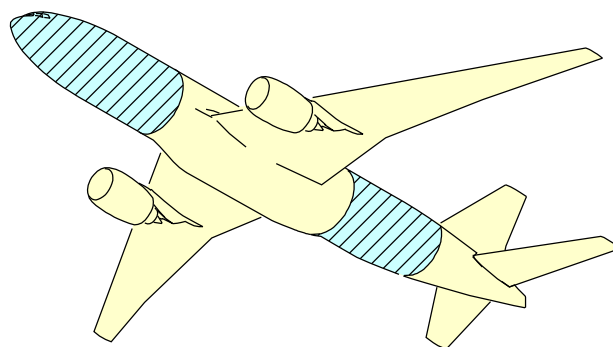
D633W101-ARO

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2461071 S0000572985_V2

Major Zones 100 and 200 - Fuselage - Left Side
Figure 301/12-21-24-990-818

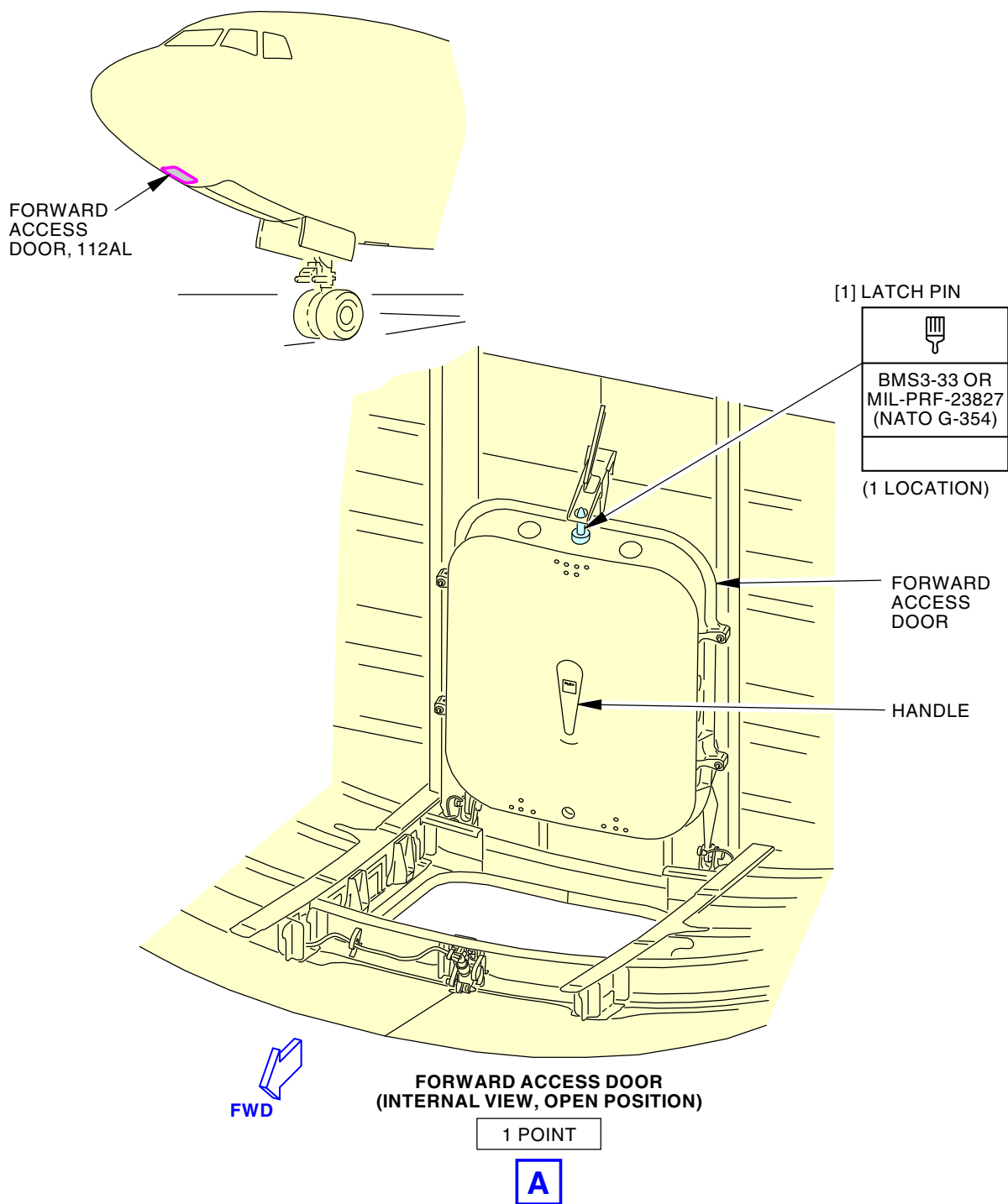
EFFECTIVITY
ARO ALL

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D12572 S0006402111_V5

Forward Access Door Servicing
Figure 302/12-21-24-990-812

EFFECTIVITY
ARO ALL

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MAIN EQUIPMENT CENTER ACCESS DOOR - SERVICING

1. **General**

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has this task:
- (1) The servicing of the main equipment center access door.

TASK 12-21-25-640-801

2. **Main Equipment Center Access Door Servicing**

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. 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

B. Location Zones

Zone	Area
117	Main Equipment Center, Left

C. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

D. Prepare for Servicing

SUBTASK 12-21-25-010-001

- (1) Get access to this access door:

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Procedure

SUBTASK 12-21-25-640-001

- (1) Lubricate the components shown in Table 301.

SUBTASK 12-21-25-640-002

- (2) Operate the handle to get the grease, D00633 (preferred) or grease, D00013 (alternate) into the bearing.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-25-410-001

- (1) Close this access door:

Number	Name/Location
117AL	Main Equipment Center Access Door

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ARO ALL

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Table 301/12-21-25-993-802 Main Equipment Center Access Door Lubrication (Fig. 301)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Latch Pin [1]	grease, D00633 (preferred) or grease, D00013 (alternate)	BMS3-33 or MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)	Brush	1

———— **END OF TASK** ————

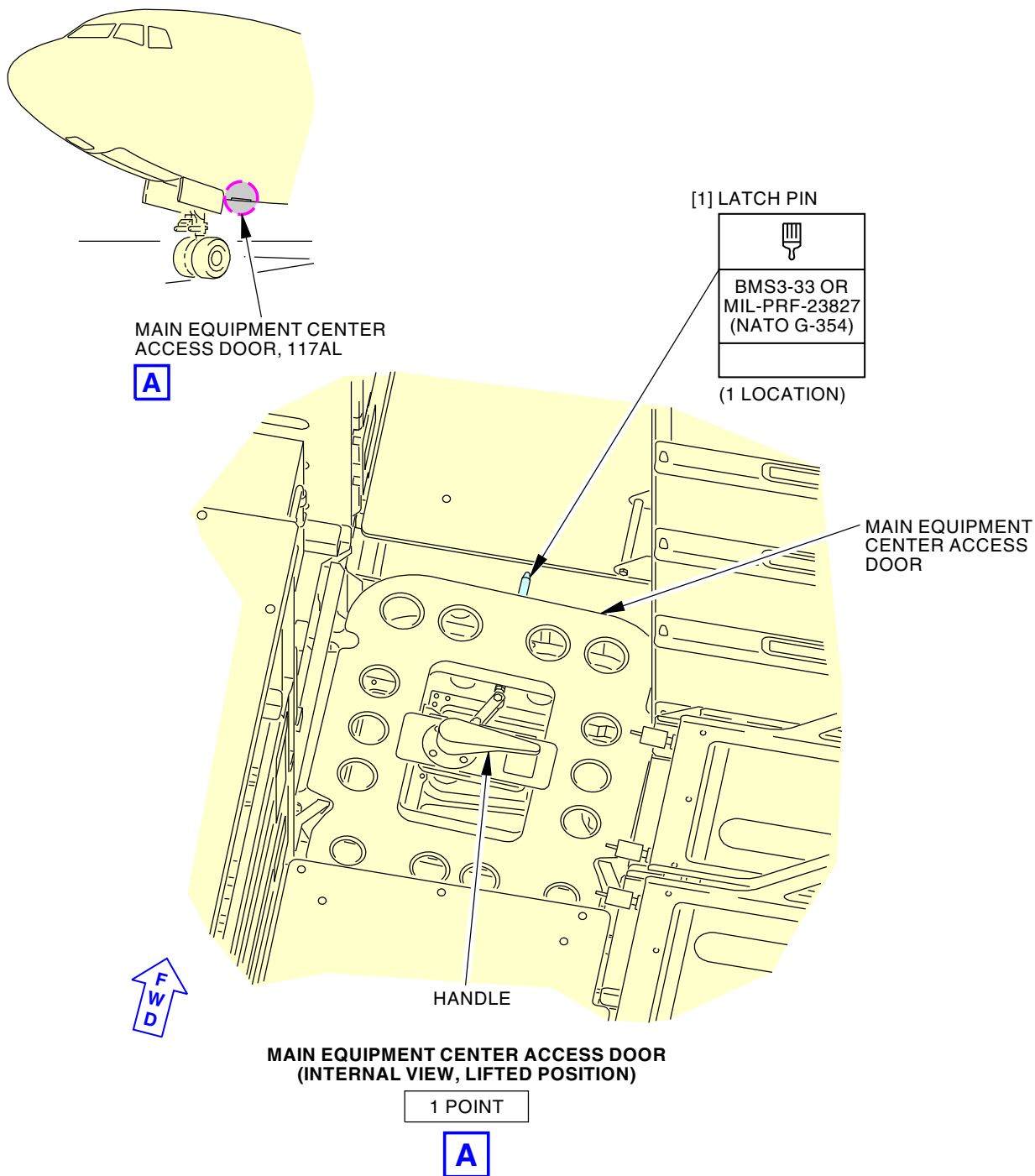
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ARO ALL

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**MAIN EQUIPMENT CENTER ACCESS DOOR
(INTERNAL VIEW, LIFTED POSITION)**

1 POINT

A

D13857 S0006402116_V5

**Main Equipment Center Access Door Servicing
Figure 301/12-21-25-990-801**

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RAM AIR TURBINE (RAT) - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Lubricate the Ram Air Turbine (RAT) Actuator
 - (2) Lubricate the Ram Air Turbine (RAT) Strut and the Door Actuation Link.

TASK 12-21-30-640-801

2. Lubricate the Ram Air Turbine (RAT) Actuator

(Figure 301)

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. **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. **Location Zones**

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. **Procedure**

SUBTASK 12-21-30-860-001

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 12-21-30-640-001



CAUTION

CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

- (2) Use the grease gun to lubricate the actuator for the ram air turbine with grease, D00633 (preferred) or grease, D00013 (alternate) (Table 301).

SUBTASK 12-21-30-140-001

- (3) Remove the unwanted grease, D00633 or grease, D00013 from the bearings on the actuator.

SUBTASK 12-21-30-860-002

- (4) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

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Table 301/12-21-30-993-803 Ram Air Turbine (RAT) Actuator Lubrication (Fig. 301)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	RAT Actuator	grease, D00633 (preferred) or grease, D00013 (alternate)	BMS3-33 or MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)	Zerk	2

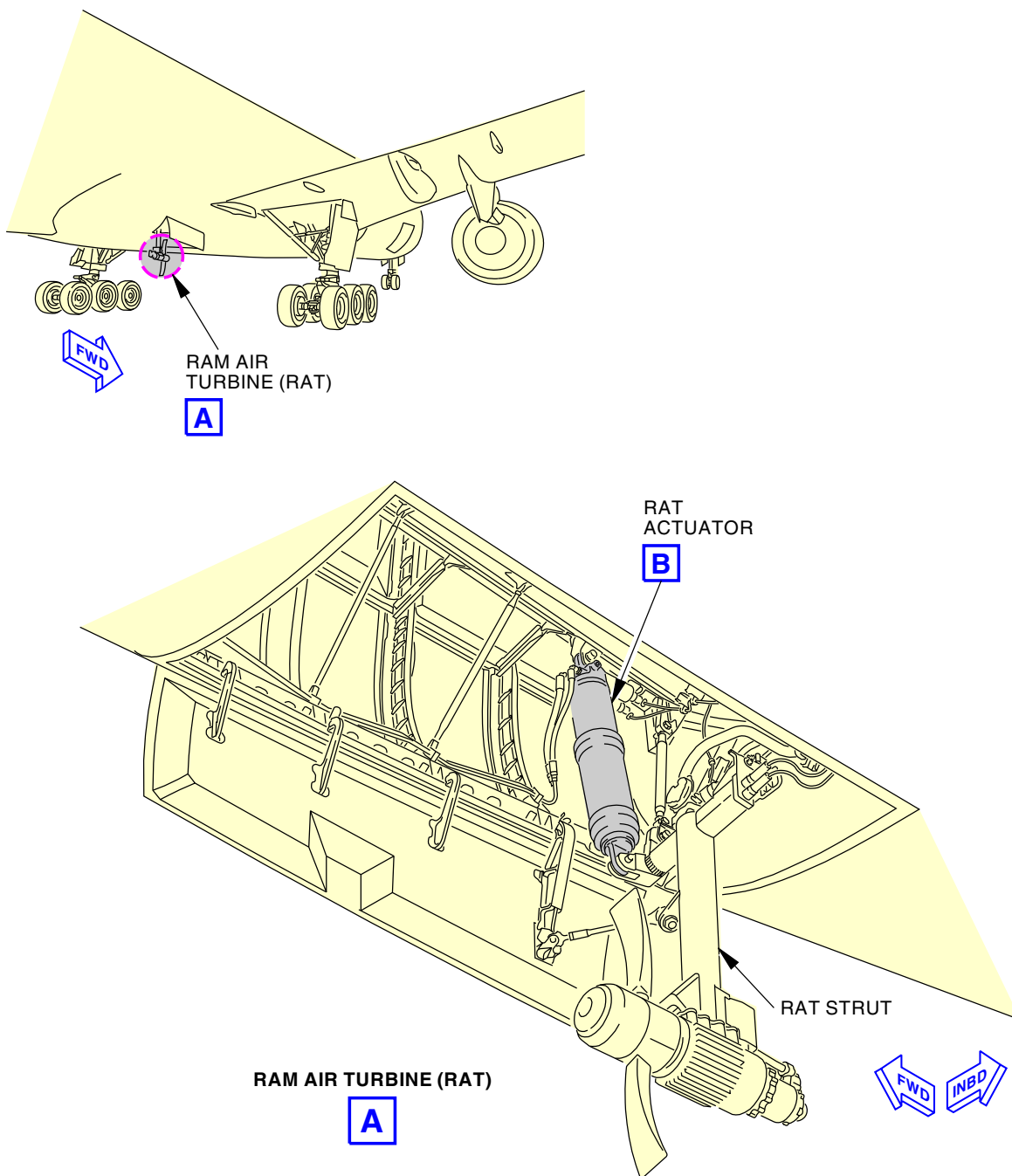
———— **END OF TASK** ————

EFFECTIVITY
ARO ALL

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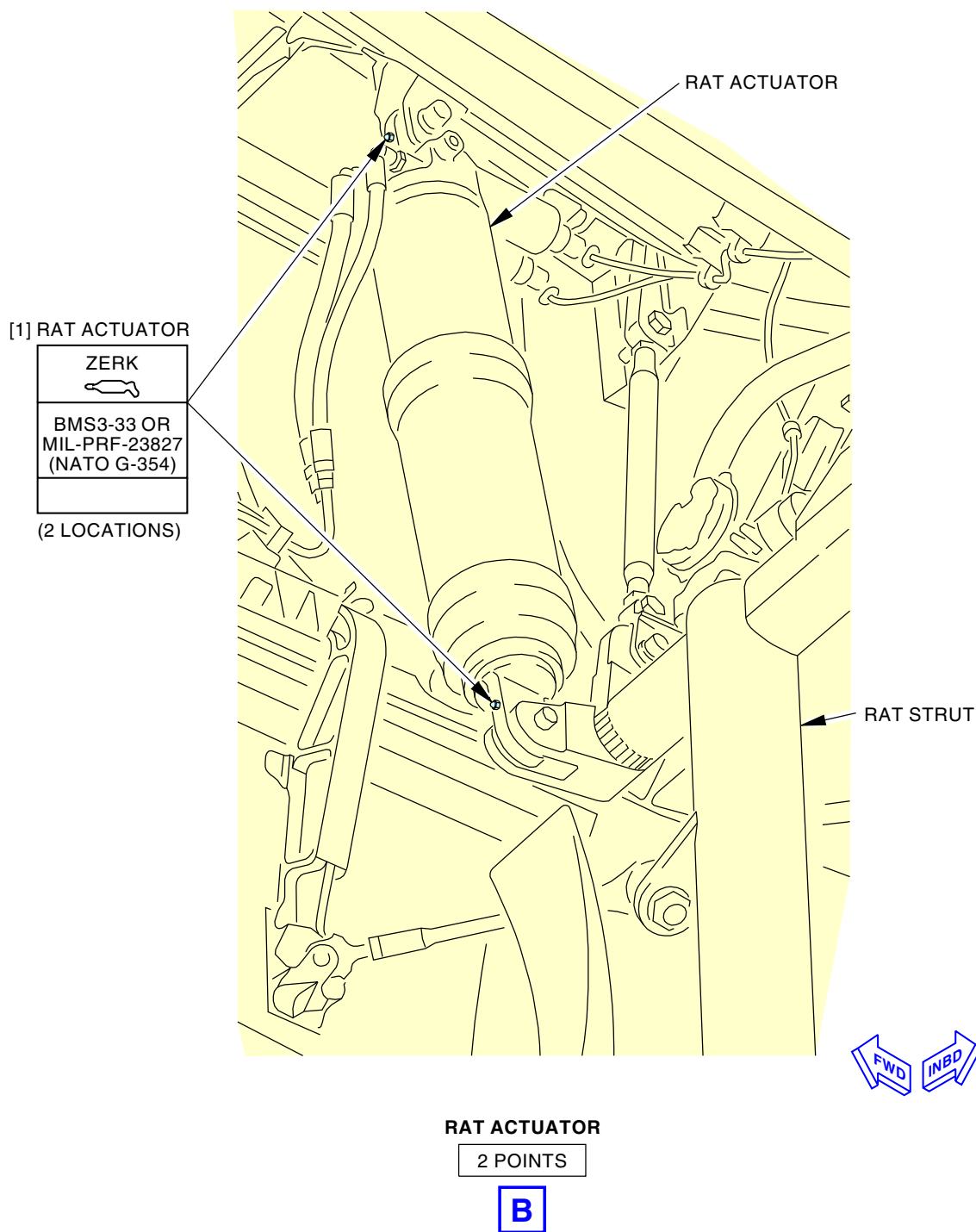
**Ram Air Turbine (RAT) Actuator Servicing
Figure 301/12-21-30-990-801 (Sheet 1 of 2)**

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ARO ALL

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**Ram Air Turbine (RAT) Actuator Servicing
Figure 301/12-21-30-990-801 (Sheet 2 of 2)**

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TASK 12-21-30-640-802

3. Lubricate the Ram Air Turbine (RAT) Strut and Door Actuation Link (Figure 302)

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. 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. Location Zones

Zone	Area
198	Aft Wing-to-Body Fairings, Right

D. Procedure

SUBTASK 12-21-30-860-003

- (1) Do this task: Ram Air Turbine (RAT) Extension, TASK 29-21-00-860-801.

SUBTASK 12-21-30-640-002



CONNECT AND DISCONNECT THE GREASE GUN TO THE LUBRICATION FITTINGS CAREFULLY. IF YOU ARE NOT CAREFUL, THE GREASE GUN CAN CAUSE DAMAGE TO THE LUBRICATION FITTINGS.

- (2) Use the grease gun to lubricate the strut pivot for the ram air turbine (RAT) with grease, D00633 (preferred) or grease, D00013 (alternate) (Table 302).

SUBTASK 12-21-30-640-003

- (3) Use the grease gun to lubricate the door actuation link for the RAT with grease, D00633 (preferred) or grease, D00013 (alternate).

NOTE: The door end of the door actuation link has two lube fittings. Use only the lube fitting which is the easiest to get access to.

SUBTASK 12-21-30-140-002

- (4) Remove the unwanted grease, D00633 or grease, D00013 from the bearings on the RAT strut pivot and the door actuation link.

SUBTASK 12-21-30-860-004

- (5) Do this task: Ram Air Turbine (RAT) Retraction, TASK 29-21-00-860-802.

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Table 302/12-21-30-993-804 Ram Air Turbine (RAT) Strut and Door Actuation Link Lubrication (Fig. 302)

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	RAT Strut Pivot	grease, D00633 (preferred) or grease, D00013 (alternate)	BMS3-33 or MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)	Zerk	2
2	RAT Door Actuation Link	grease, D00633 (preferred) or grease, D00013 (alternate)	BMS3-33 or MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)	Zerk	2

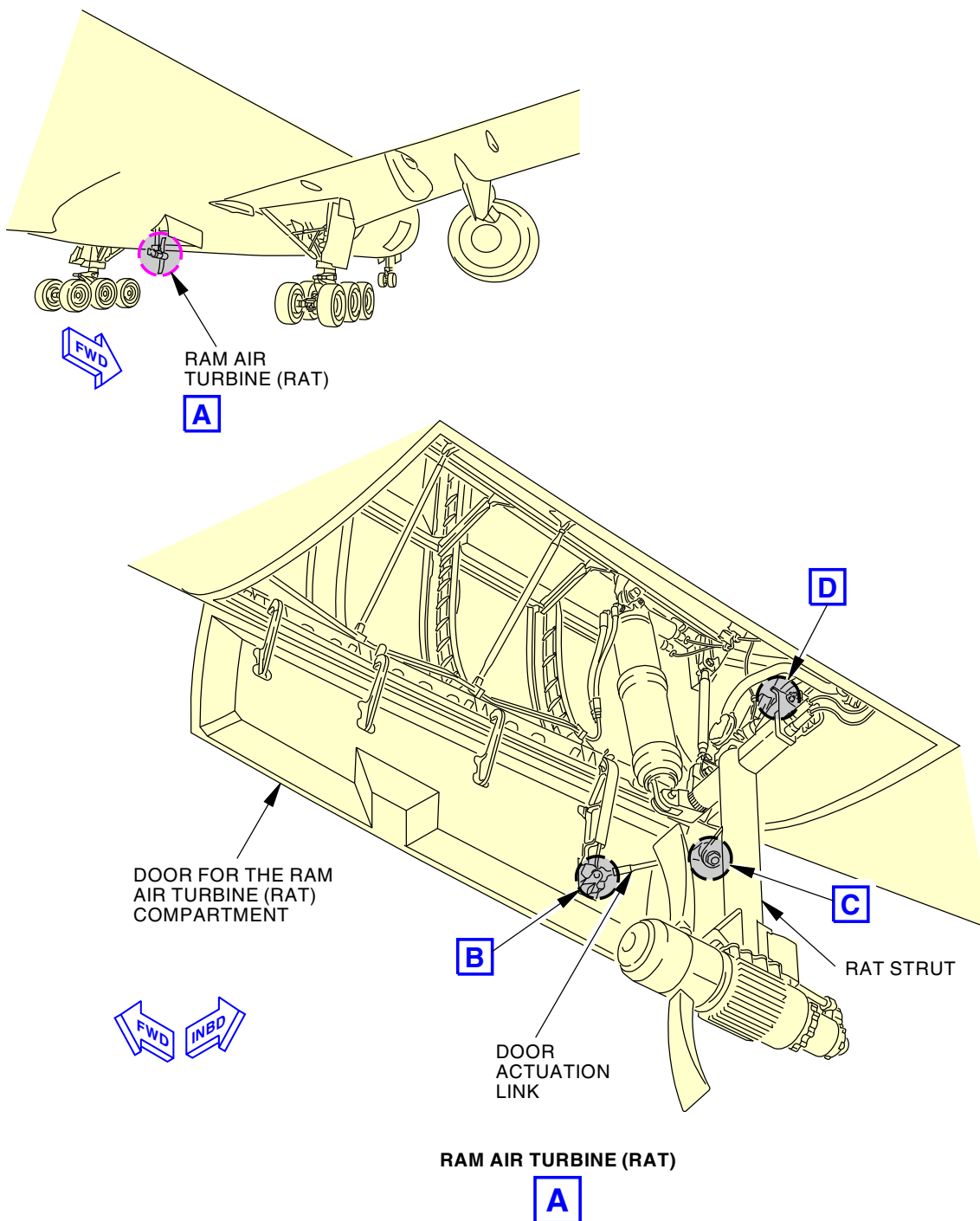
———— **END OF TASK** ————

EFFECTIVITY
ARO ALL

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**Ram Air Turbine (RAT) Strut and Door Actuation Link Servicing
Figure 302/12-21-30-990-802 (Sheet 1 of 4)**

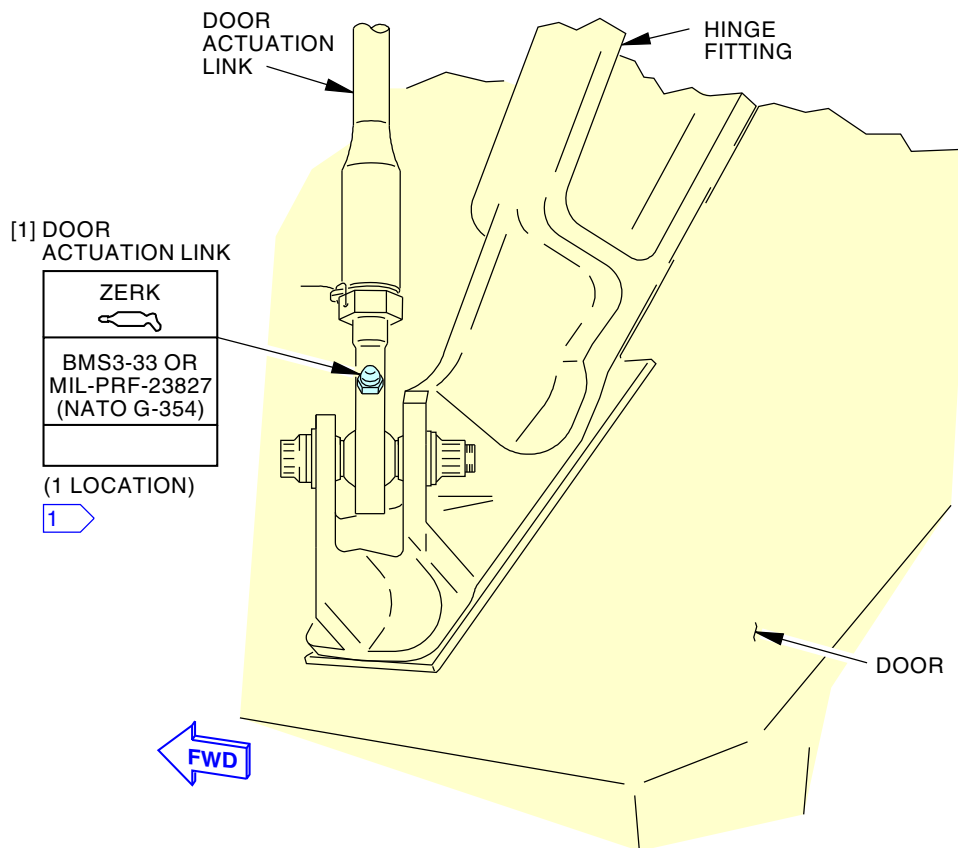
EFFECTIVITY
ARO ALL

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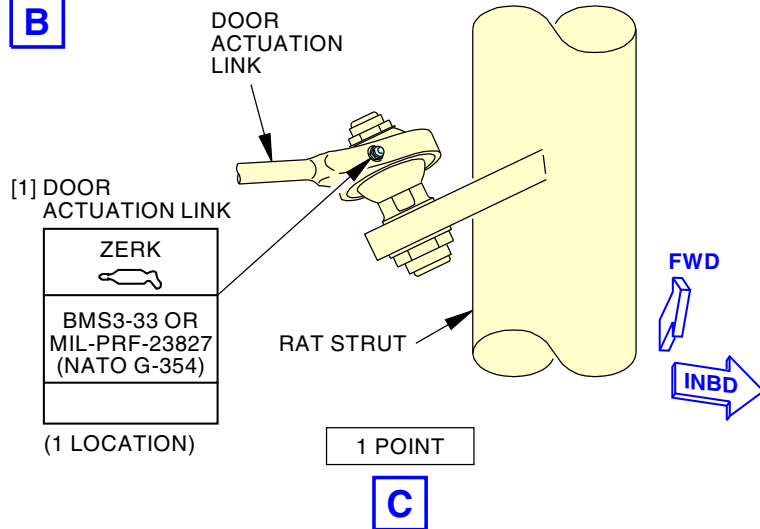
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1 POINT

B



1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN). LUBRICATE ONLY ONE LUBE POINT.

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Ram Air Turbine (RAT) Strut and Door Actuation Link Servicing
Figure 302/12-21-30-990-802 (Sheet 2 of 4)

EFFECTIVITY
ARO ALL

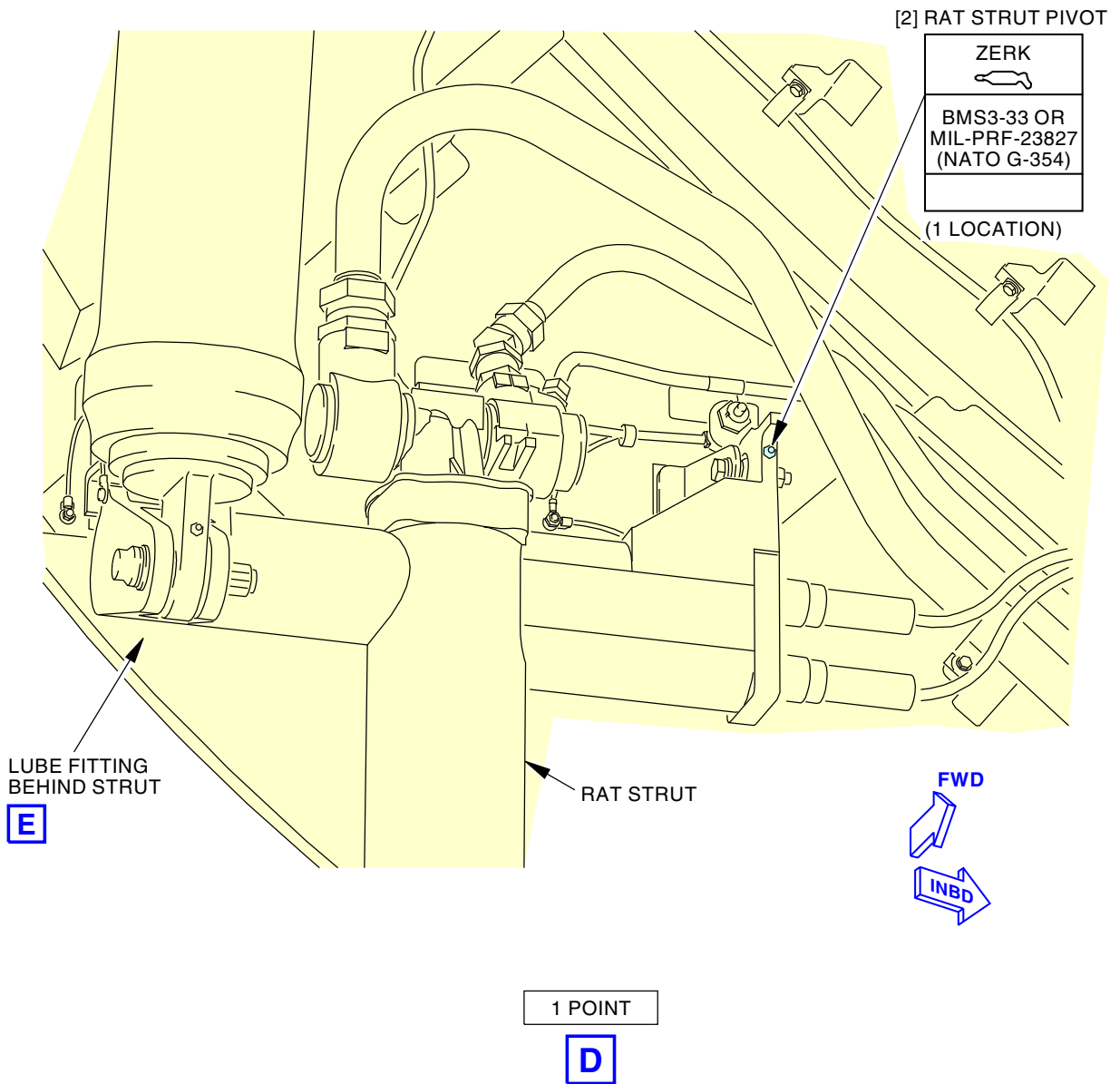
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Ram Air Turbine (RAT) Strut and Door Actuation Link Servicing
Figure 302/12-21-30-990-802 (Sheet 3 of 4)

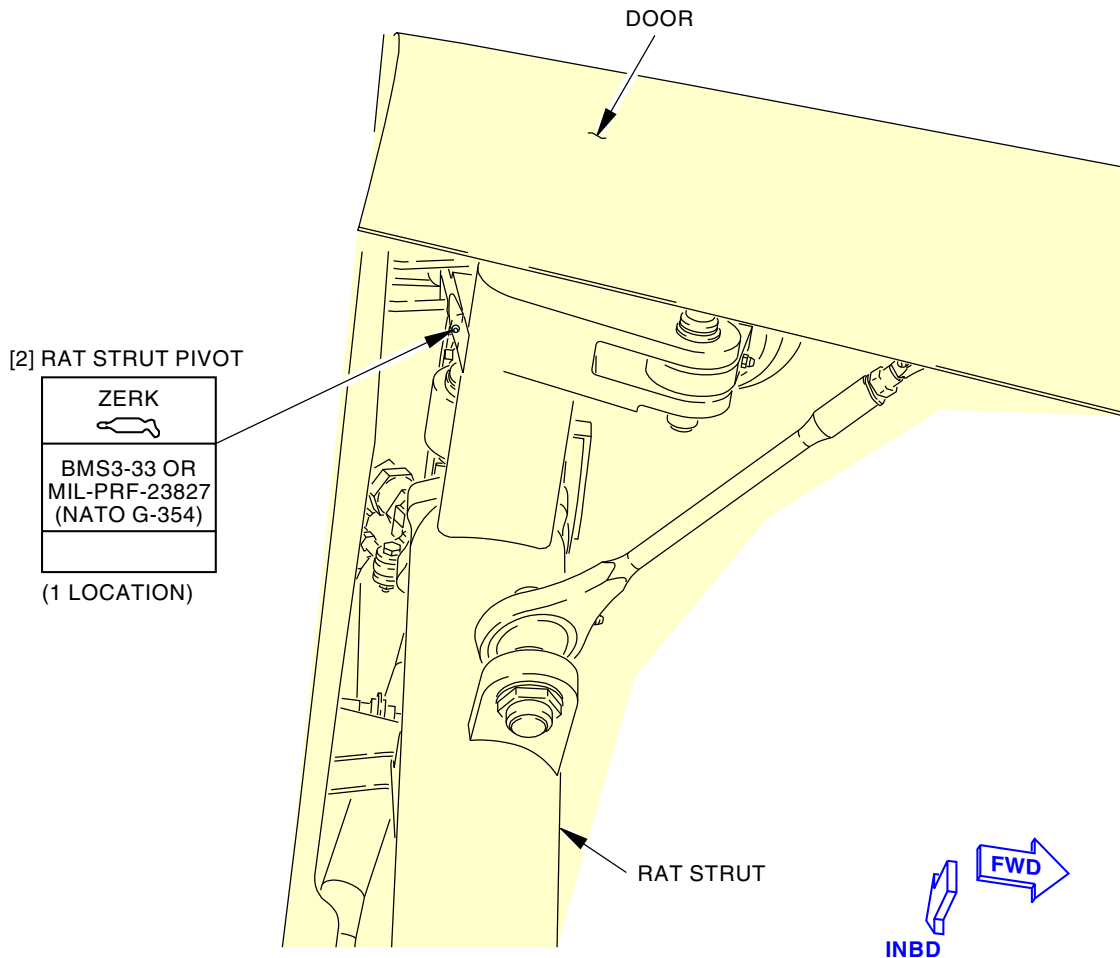
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ARO ALL

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1 POINT

E

E13427 S0006402128_V4

Ram Air Turbine (RAT) Strut and Door Actuation Link Servicing
Figure 302/12-21-30-990-802 (Sheet 4 of 4)

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CONTROL CABLES LUBRICATION - SERVICING

1. General

- A. Use this procedure to lubricate the control cables.

TASK 12-21-31-600-801

2. Control Cable Lubrication

A. **References**

Reference	Title
27-02-20-610-802-002	Primary Flight Control Cables - Location and Part Data (P/B 201)
32-00-20-800-801	Landing Gear Control Cables - Location and Part Data (P/B 201)

B. **Consumable Materials**

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33

C. **Procedure**

SUBTASK 12-21-31-640-001



DO NOT CLEAN THE CABLES WITH A SOLVENT OR MIXED GREASE. THE SOLVENT OR MIXED GREASE WILL REMOVE GREASE FROM THE CABLES. THE SOLVENT CAN ALSO MAKE THE GREASE TOO THIN.

- (1) Use a dry cloth to remove the used lubricant and all unwanted material from the surface of the control cable.

NOTE: Do this for the full length of the cable travel through the fair leads, air pressure seals, on pulleys, quadrants, and the drums.

NOTE: The control cable system must be displaced full travel in each direction for complete inspection at fairleads, air pressure seals, grommets, quadrants, drums, and over pulleys.

SUBTASK 12-21-31-640-002



DO NOT APPLY SOLVENTS, GREASE, OR OIL TO STAINLESS STEEL CONTROL CABLES. THESE MATERIALS CAN COLLECT CONTAMINATION THAT CAN CAUSE DAMAGE TO THE INTERNAL SURFACES OF THE CRES CABLE STRANDS. THIS CAN DECREASE THE SERVICE LIFE OF THE CABLE.

- (2) Use an applicator to apply grease, D00633 to the cable for its full length.

NOTE: Move the cable full travel to apply lubricant to full length of cable.

NOTE: Do not apply grease, D00633 to stainless steel (CRES) cables.

NOTE: The lower loop cable of the nose landing gear steering control is corrosion resistant steel (CRES).

- (a) Make sure you can see a thin strip of grease, D00633 in the cable grooves.

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SUBTASK 12-21-31-640-003

- (3) Touch the cable with a clean paper wipe to make sure there is sufficient grease, D00633 on the cable.

NOTE: If you can see the blue green color of the grease, D00633 on the paper, there is sufficient grease, D00633 on the cable. Do not rub the paper lengthwise along the cable.

SUBTASK 12-21-31-640-004

- (4) Look at the applicable maintenance manual sections that follow for information on cable routing:
- (a) Do this task: Primary Flight Control Cables - Location and Part Data, TASK 27-02-20-610-802-002.
 - (b) Do this task: Landing Gear Control Cables - Location and Part Data, TASK 32-00-20-800-801.

————— **END OF TASK** —————

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STRUT - SERVICING (LUBRICATION)

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure provides the data to lubricate the strut attach fittings.

TASK 12-21-32-600-802

2. Lubricate the Strut Attach Fittings

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
54-51-01-040-802-002	Prepare the Strut for Maintenance Operations (P/B 201)
54-51-01-440-802-002	Put the Strut Back to its Usual Condition (P/B 201)
54-52-03-000-801	Underwing Fairing Removal (P/B 401)
54-52-03-400-801	Underwing Fairing Installation (P/B 401)
54-52-06-000-801	Aft Fairing Access Panel Removal (P/B 401)
54-52-06-400-801	Aft Fairing Access Panel Installation (P/B 401)
57-41-10-000-801	Wing Leading Edge Panel Removal (P/B 401)
57-41-10-400-801	Wing Leading Edge Panel Installation (P/B 401)

B. **Consumable Materials**

Reference	Description	Specification
D00014	Grease - Molybdenum Disulfide, Low & High Temperature	MIL-G-21164 (NATO G-353)

C. **Location Zones**

Zone	Area
432	Forward Torque Box - Left Nacelle Strut
433	Aft Torque Box - Left Nacelle Strut
442	Forward Torque Box - Right Nacelle Strut
443	Aft Torque Box - Right Nacelle Strut

D. **Access Panels**

Number	Name/Location
431GL	Left Access Cover, Left Strut
431GR	Right Access Cover, Left Strut
434ER	Right Access Panel, Left Strut Aft Fairing
441GL	Left Access Cover, Right Strut
441GR	Right Access Cover, Right Strut
444EL	Left Access Panel, Right Strut Aft Fairing
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel

E. **Prepare for the Servicing**

SUBTASK 12-21-32-040-002

- (1) Do this task: Prepare the Strut for Maintenance Operations, TASK 54-51-01-040-802-002.

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SUBTASK 12-21-32-010-004

- (2) To remove the underwing fairings for the applicable strut, do this task:

Underwing Fairing Removal, TASK 54-52-03-000-801

<u>Number</u>	<u>Name/Location</u>
431GL	Left Access Cover, Left Strut
431GR	Right Access Cover, Left Strut
441GL	Left Access Cover, Right Strut
441GR	Right Access Cover, Right Strut

NOTE: This gives access to the inboard and outboard aft upper spar fuse pins.

SUBTASK 12-21-32-010-005

- (3) To remove the aft fairing panels for the applicable strut, do this task:

Aft Fairing Access Panel Removal, TASK 54-52-06-000-801

<u>Number</u>	<u>Name/Location</u>
434ER	Right Access Panel, Left Strut Aft Fairing
444EL	Left Access Panel, Right Strut Aft Fairing

NOTE: This gives access to the diagonal brace.

SUBTASK 12-21-32-010-006

- (4) To remove the applicable wing leading edge panels, do this task:

Wing Leading Edge Panel Removal, TASK 57-41-10-000-801

<u>Number</u>	<u>Name/Location</u>
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel

NOTE: This gives access to the upper link.

F. Lubricate the Strut Attach Fittings

SUBTASK 12-21-32-640-002

- (1) Do these steps to lubricate each attach fitting listed in Table 301 for the applicable strut as shown on Figure 301:
- (a) Inject the grease, D00014 into the fitting until grease shows at the other side of the joint.
 - (b) Remove the unwanted grease from the fitting with a rag.

Table 301/12-21-32-993-803 Wing Nacelle Attach Fitting Lubrication

Item No.	Nomenclature	Lubricant	Specification	Method of Application	Number of Locations
1	Aft Upper Spar Fitting	grease, D00014	MIL-G-21164 (NATO G-353)	Zerk	1
2	Aft Upper Spar Fitting	grease, D00014	MIL-G-21164 (NATO G-353)	Zerk	1
3	Aft Diagonal Brace Fitting	grease, D00014	MIL-G-21164 (NATO G-353)	Zerk	1
4	Aft Upper Link Fitting	grease, D00014	MIL-G-21164 (NATO G-353)	Zerk	2

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 12-21-32-410-004

- (1) To install the underwing fairings, do this task:

Underwing Fairing Installation, TASK 54-52-03-400-801

<u>Number</u>	<u>Name/Location</u>
431GL	Left Access Cover, Left Strut
431GR	Right Access Cover, Left Strut
441GL	Left Access Cover, Right Strut
441GR	Right Access Cover, Right Strut

SUBTASK 12-21-32-410-005

- (2)

To install the aft fairing access panels, do this task:

Aft Fairing Access Panel Installation, TASK 54-52-06-400-801

<u>Number</u>	<u>Name/Location</u>
434ER	Right Access Panel, Left Strut Aft Fairing
444EL	Left Access Panel, Right Strut Aft Fairing

SUBTASK 12-21-32-410-006

- (3) To install the wing leading edge panels, do this task:

Wing Leading Edge Panel Installation, TASK 57-41-10-400-801

<u>Number</u>	<u>Name/Location</u>
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel

SUBTASK 12-21-32-440-002

- (4) Do this task: Put the Strut Back to its Usual Condition, TASK 54-51-01-440-802-002.

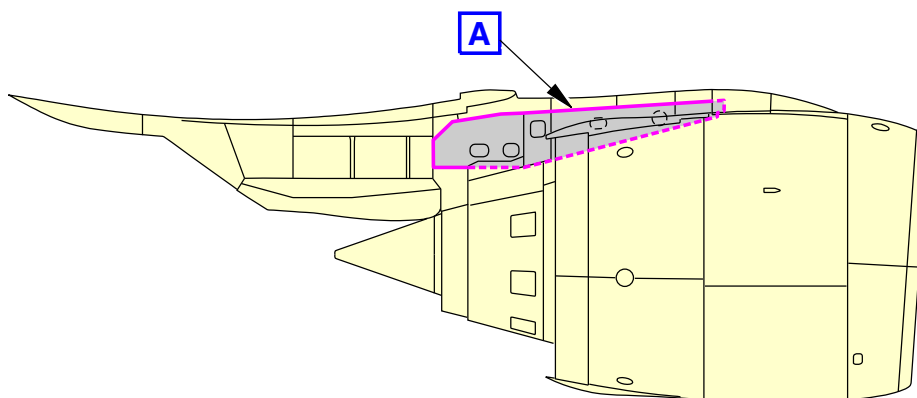
———— **END OF TASK** ————

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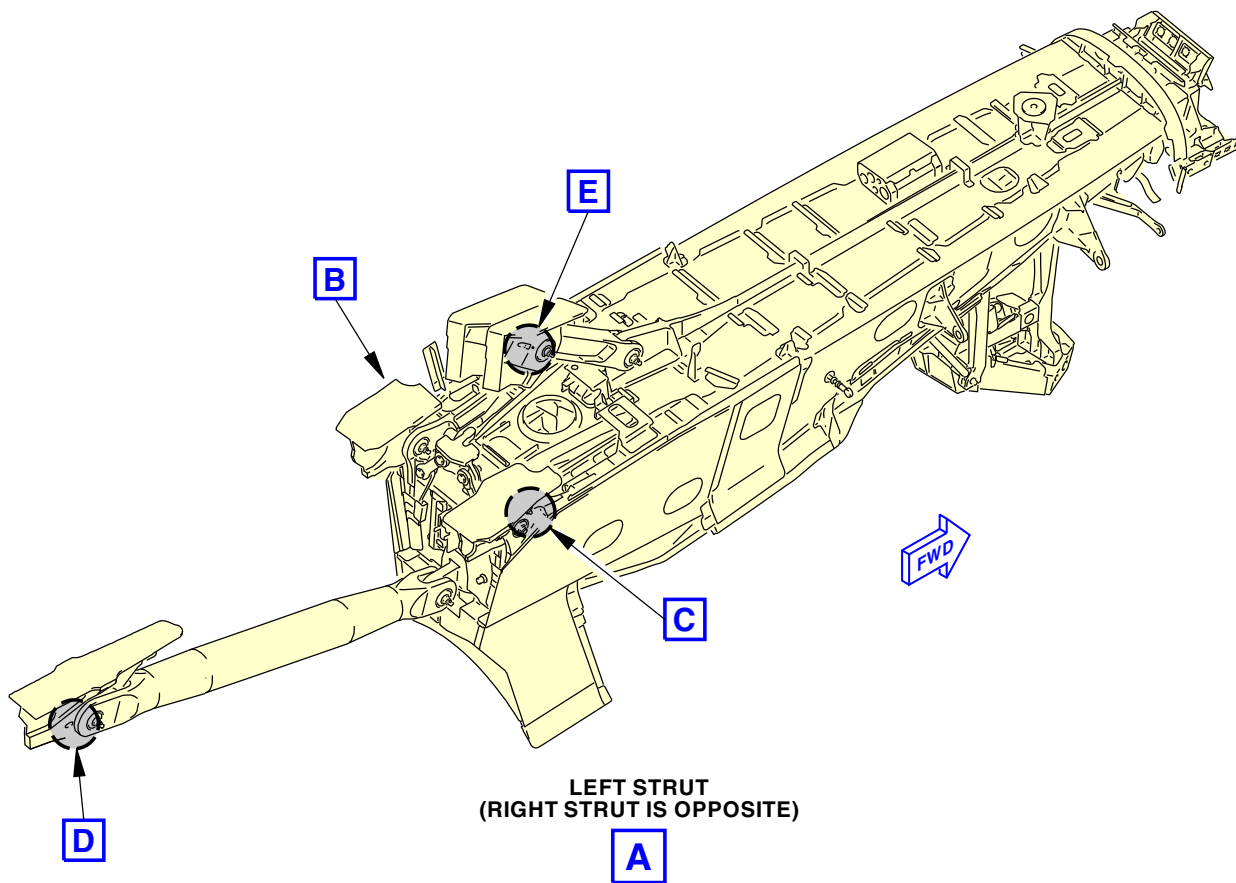
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GENERAL ELECTRIC



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**Wing Nacelle Attach Fittings Lubrications
Figure 301/12-21-32-990-804 (Sheet 1 of 3)**

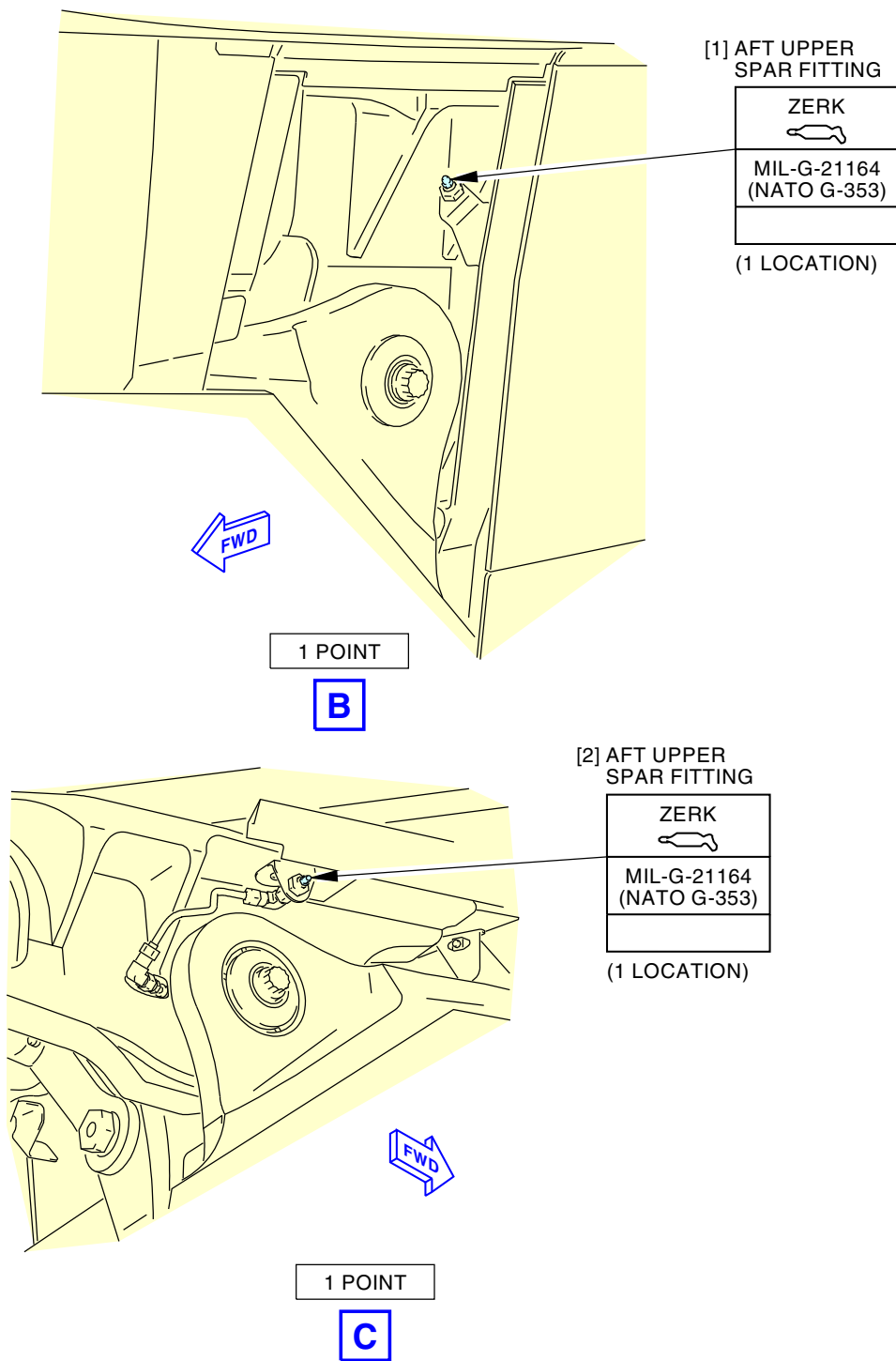
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**Wing Nacelle Attach Fittings Lubrications
Figure 301/12-21-32-990-804 (Sheet 2 of 3)**

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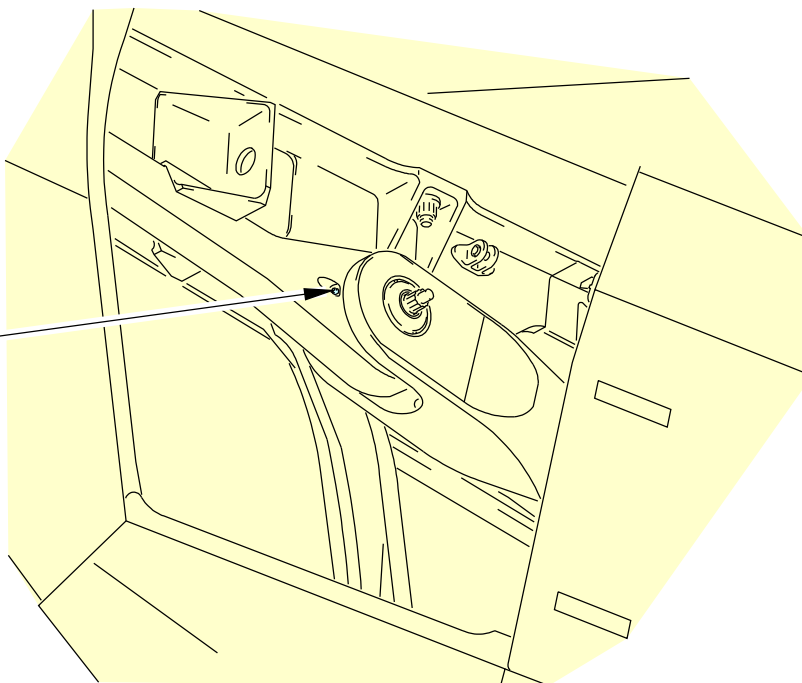
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[3] AFT DIAGONAL BRACE FITTING

ZERK

MIL-G-21164 (NATO G-353)

(1 LOCATION)



1 POINT

D

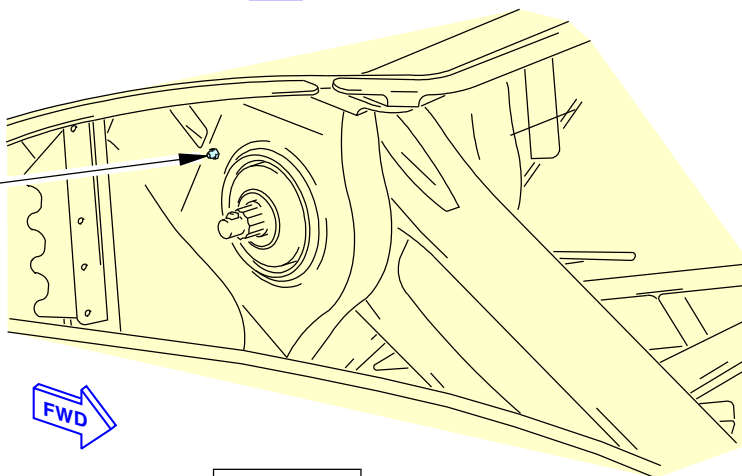


[4] AFT UPPER LINK FITTING

ZERK

MIL-G-21164 (NATO G-353)

(2 LOCATIONS)



2 POINTS

E



1

ONE MORE LUBE POINT IS
ON THE OPPOSITE SIDE
(NOT SHOWN).

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Wing Nacelle Attach Fittings Lubrications
Figure 301/12-21-32-990-804 (Sheet 3 of 3)

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Flap and Spoiler Handle Lubrication

1. General

- A. This procedure has two tasks:
- (1) Lubricate the flap handle.
 - (2) Lubricate the spoiler handle.

TASK 12-21-33-610-801

2. Flap Handle Lubrication

A. Consumable Materials

Reference	Description	Specification
D00386	Lubricant - Solid Film, Air Cured, Corrosion Inhibiting	MIL-L-23398 (NATO S-749)
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G00365	Paper	

B. Location Zones

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

C. Procedure

SUBTASK 12-21-33-860-001

- (1) Fully extend the flap handle.

SUBTASK 12-21-33-913-001



PUT A COVER ON THE COMPONENTS NEAR THE AREA BEFORE YOU PAINT. PAINT CONTAMINATION WILL CAUSE DAMAGE TO THE COMPONENTS.

- (2) Use plastic coated paper, G00365 and Scotch Flatback Masking Tape 250, G00270 to mask off the surrounding area from overspray.

SUBTASK 12-21-33-640-001

- (3) Generously apply lubricant, D00386 to the sliding part of the handle. Use of an extension straw will allow the lubricant to be sprayed in hard to reach places and direct the spray to a localized area.

NOTE: If the handle had previously been lubricated with another type of lubricant, disassemble the handle and thoroughly clean the handle parts before lubrication.

SUBTASK 12-21-33-615-001

- (4) Clean up overspray per BAC5750.

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SUBTASK 12-21-33-840-001

- (5) Allow to air dry if possible.

NOTE: The lubricant will dry within minutes; however, the coating (resin system) that holds the pigments will not be cured for several hours depending on the temperature. The lubricant will cure within 6 hours at 77 +/- 3 degrees F (25 +/- 2 degrees C). 24 hours gives the best wear and corrosion protection.

————— **END OF TASK** —————

TASK 12-21-33-610-802

3. Spoiler Handle Lubrication

A. Consumable Materials

Reference	Description	Specification
D00386	Lubricant - Solid Film, Air Cured, Corrosion Inhibiting	MIL-L-23398 (NATO S-749)
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G00365	Paper	

B. Location Zones

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

C. Procedure

SUBTASK 12-21-33-860-002

- (1) Fully extend the spoiler handle.

SUBTASK 12-21-33-913-002



PUT A COVER ON THE COMPONENTS NEAR THE AREA BEFORE YOU PAINT. PAINT CONTAMINATION WILL CAUSE DAMAGE TO THE COMPONENTS.

- (2) Use plastic coated paper, G00365 and Scotch Flatback Masking Tape 250, G00270 to mask off the surrounding area from overspray.

SUBTASK 12-21-33-640-002

- (3) Generously apply lubricant, D00386 to the sliding part of the handle. Use of an extension straw will allow the lubricant to be sprayed in hard to reach places and direct the spray to a localized area.

NOTE: If the handle had previously been lubricated with another type of lubricant, disassemble the handle and thoroughly clean the handle parts before lubrication.

SUBTASK 12-21-33-615-002

- (4) Clean up overspray per BAC5750.

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SUBTASK 12-21-33-840-002

- (5) Allow to air dry if possible.

NOTE: The lubricant will dry within minutes; however, the coating (resin system) that holds the pigments will not be cured for several hours depending on the temperature. The lubricant will cure within 6 hours at 77 +/- 3 degrees F (25 +/- 2 degrees C). 24 hours gives the best wear and corrosion protection.

———— **END OF TASK** ————

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NO. 2 WINDOW - SERVICING

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has one task:
 - (1) Lubricate the ball screw on the No. 2 flight compartment window.
 - (2) Lubricate the bearings on the No. 2 flight compartment window.

TASK 12-21-34-610-801

2. No. 2 Window Servicing

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. **Consumable Materials**

Reference	Description	Specification
D00633	Grease - Aircraft General Purpose	BMS3-33
G00365	Paper	

B. **Location Zones**

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

C. **Procedure**

SUBTASK 12-21-34-940-001

- (1) Put plastic coated paper, G00365 below the ball screw assembly to keep the grease, D00633 away from the equipment.

SUBTASK 12-21-34-010-001

- (2) Open the window as needed for access.

SUBTASK 12-21-34-640-001

- (3) Apply the grease, D00633 to the ball screw through the top outboard side of the drive track.

———— **END OF TASK** ————

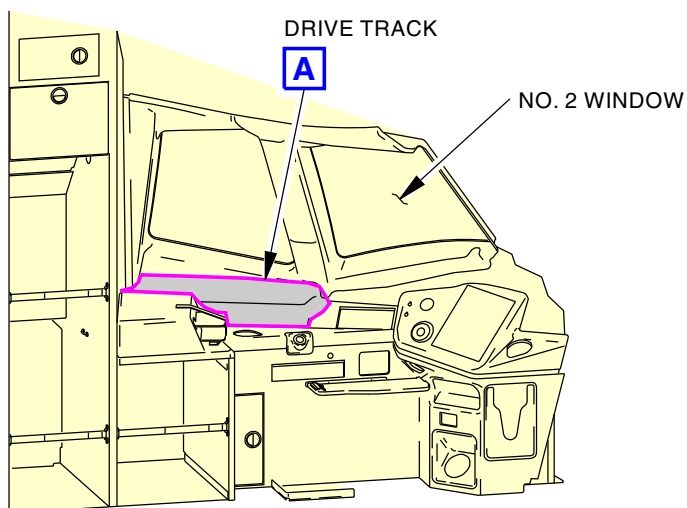
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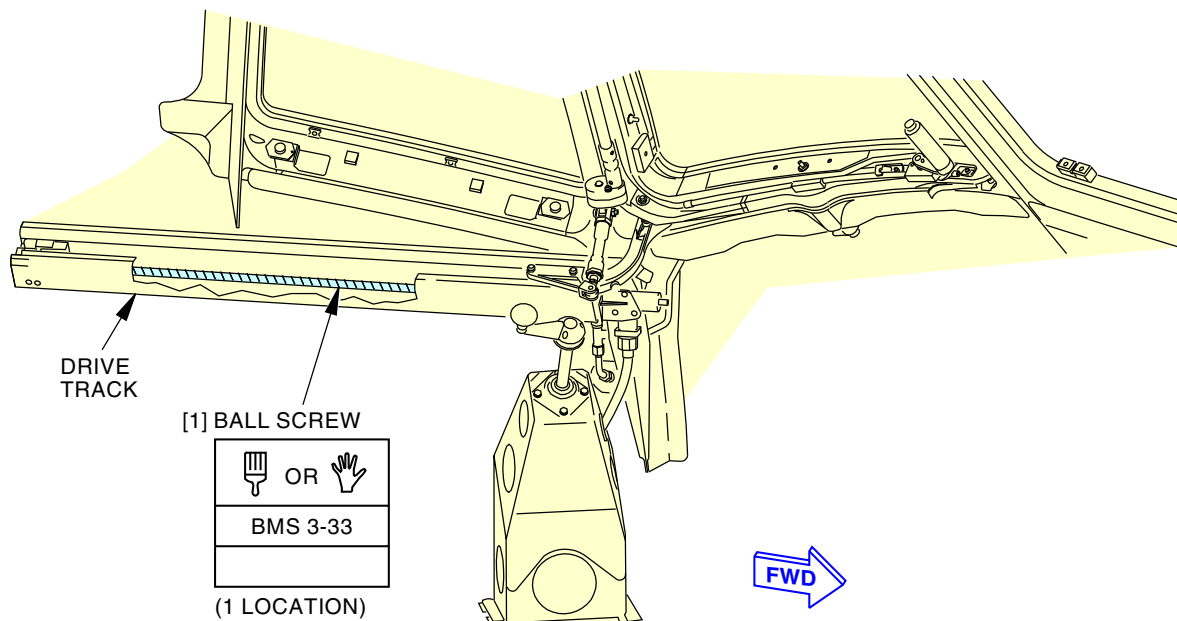
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FLIGHT COMPARTMENT



DRIVE TRACK LUBRICATION

1 POINT

A

C05551 S0006402150_V2

No. 2 Window Lubrication
Figure 301/12-21-34-990-801

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TASK 12-21-34-640-801

3. No.2 Window Bearing Lubrication

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
56-11-02 P/B 401	NO. 2 OPENABLE WINDOW - REMOVAL/INSTALLATION

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. Location Zones

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

D. Procedure

SUBTASK 12-21-34-020-001

- (1) Open or remove the window when necessary for access (NO. 2 OPENABLE WINDOW - REMOVAL/INSTALLATION, PAGEBLOCK 56-11-02/401).

SUBTASK 12-21-34-640-002

- (2) Apply lubricant to the Forward Upper Bearing Cluster:
- (a) Apply grease, D00013 to the bearing that moves in the window track.
- NOTE: The bearing that moves in the track is an open bearing.
- (b) Apply grease, D00633 to the bearing that does not move in the window track.

SUBTASK 12-21-34-640-003

- (3) Apply lubricant to the Aft Upper Bearing Cluster:
- (a) Apply grease, D00633 to the upper bearing in the cluster.

———— **END OF TASK** ————

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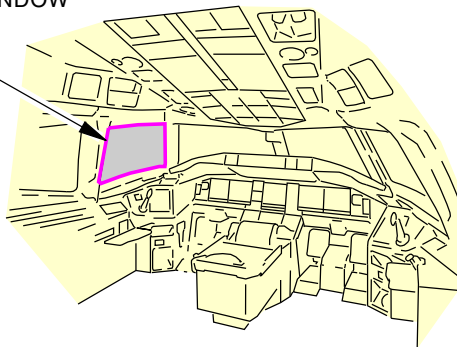
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NO. 2 WINDOW

A



FLIGHT COMPARTMENT

[1] FORWARD UPPER BEARINGS

 OR 
MIL-PRF-23827

(1 LOCATION)

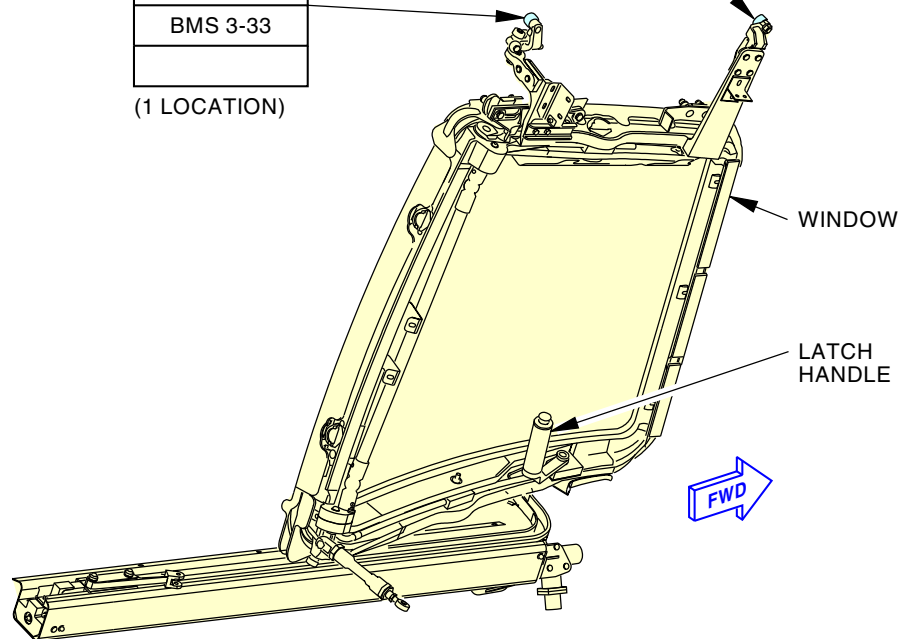
FLUSH 
BMS 3-33

(1 LOCATION)

[2] AFT UPPER BEARING

FLUSH 
BMS 3-33

(1 LOCATION)



NO. 2 WINDOW
(EXAMPLE)

A

1368245 S0000247453_V3

No.2 Window Bearing Lubrications
Figure 302/12-21-34-990-802

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ENGINE - SERVICING (OIL CHANGE)

1. General

A. This section contains these tasks:

- (1) Engine oil change because of oil deterioration (breakdown).
- (2) Flush the engine oil system because of oil contamination by wear metals, fuel or solids.
- (3) Flush the engine oil tank because of contamination by solids or fluids other than fuel.

TASK 12-22-01-610-805-002

2. Engine Oil Change

(Figure 301)

A. General

- (1) This task is the procedure to change the engine oil.
- (2) You must open the fan cowl panels and the thrust reversers to get access to the components to do an oil change.
- (3) You must do an idle leak check after you change the oil.

B. References

Reference	Title
12-13-01-130-803-002	Engine Oil Replenishing (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-00-00-700-804-H01	Test No. 5 - Idle Leak Check (P/B 501)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-211	Coupling - Valve Part #: OMP2505-3 Supplier: 33068
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1

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(Continued)

Reference	Description	Specification
D50043 [C02-058]	Compound - Antiseize, Acheson GP460 (For Threaded Fasteners 0.250 Inches Diameter Or Larger, C02-079 Is An Alternative)	GE A50TF201 Class A
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Accessory gearbox	72-00-05-20E-035	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

H. Prepare for the Engine Oil Change

SUBTASK 12-22-01-010-025



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER(S). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR

- (1) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left and right fan cowl panels, do this task:
Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

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- (e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

I. Engine Oil Change

SUBTASK 12-22-01-680-041-002

- (1) Drain the engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 as follows:

NOTE: The Mobil Jet Oil II, D00520 is an alternate brand of oil type.



CAUTION

MAKE SURE THAT YOU CLEAN THE OIL TANK SCUPPER TO REMOVE UNWANTED MATERIAL THAT MAY GET INTO THE OIL TANK. DAMAGE TO THE ENGINE CAN OCCUR.

- (a) Clean the oil tank scupper with the cotton wiper, G00034 before you remove the oil tank filler cap.



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY FIVE MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

- (b) Open the engine oil tank filler cap.

NOTE: Do not let oil get on the engine or other components. Immediately clean the oil when it falls on the engine or other components.

- 1) Put the locking lever on the oil tank filler cap in the not locked position.

NOTE: The locking lever will be vertical to the top of the oil tank filler cap when it is in the not locked position.

- 2) Turn the locking lever on the oil tank filler cap to the OPEN position.

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- 3) Pull the oil tank filler cap straight up until the dipstick is above the edge of the manual gravity filling cap assembly.

NOTE: The dipstick is attached to the bottom of the oil tank filler cap and has a lanyard that is attached to the inside of the manual gravity filling cap assembly.

- (c) Put two oil resistant containers (5 gal)(19 Liter), STD-1055 below the fan case.
- (d) Remove the cap [6] from the drain valve (self closing) [3] in the oil tank return tube [1].
- (e) Install the valve coupling, COM-211 to the drain valve (self closing) [3] at the oil tank return tube [1].
- (f) Drain the engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 into the clean oil resistant container (5 gal)(19 Liter), STD-1055.
- (g) Remove the valve coupling, COM-211 from the drain valve (self closing) [3] in the oil tank return tube [1].
- (h) Install the cap [6] to the drain valve (self closing) [3] in the oil tank return tube [1].
- (i) Remove the cap [5] from the drain valve (self closing) [4] in the oil tank supply tube [2].
- (j) Install the valve coupling, COM-211 on the drain valve (self closing) [4] in the oil tank supply tube [2].
- (k) Drain the engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 into a clean oil resistant container (5 gal)(19 Liter), STD-1055.
- (l) Remove the valve coupling, COM-211 from the drain valve (self closing) [4] in the oil tank supply tube [2].
- (m) Install the cap [5] to the drain valve (self closing) [4] in the oil tank supply tube [2].

SUBTASK 12-22-01-680-042-002

- (2) Drain the accessory gearbox [13]:
- (a) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - (b) Remove the four bolts [30] that attach the AGB sump tube hose [29] to the lube and scavenge pump [14].
 - (c) Carefully move the AGB sump tube hose [29] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the accessory gearbox [13] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - (d) Examine the gasket seal [28] on the Accessory Gear Box (AGB) sump tube port for damage.
 - 1) If the gasket seal [28] is damaged, do these steps:
 - a) Remove and discard the damaged gasket seal [28].
 - b) Lubricate a new gasket seal [28] with clean oil, D00552 [C02-019].
 - 2) If the gasket seal [28] is not damaged, lubricate the gasket seal [28] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
 - (e) Make sure the gasket seal [28] is in its position on the mount flange of the AGB sump tube hose [29].
 - (f) Put the AGB sump tube hose [29] in its position on the lube and scavenge pump [14].
 - (g) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [30].

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- (h) Install the bolts [30] that attach the AGB sump tube hose [29] to the lube and scavenge pump [14].
 - 1) Tighten the bolts [30] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).

SUBTASK 12-22-01-610-023-002

- (3) Do this task: Engine Oil Replenishing, TASK 12-13-01-130-803-002.

J. Put the Airplane Back to its Usual Condition.

SUBTASK 12-22-01-410-023



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left and right thrust reversers on the applicable engine:
 - (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
 - 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine
 - (b) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
 - 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

K. Engine Oil Change Test

SUBTASK 12-22-01-790-011-002

- (1) Do this task: Test No. 5 - Idle Leak Check, TASK 71-00-00-700-804-H01.

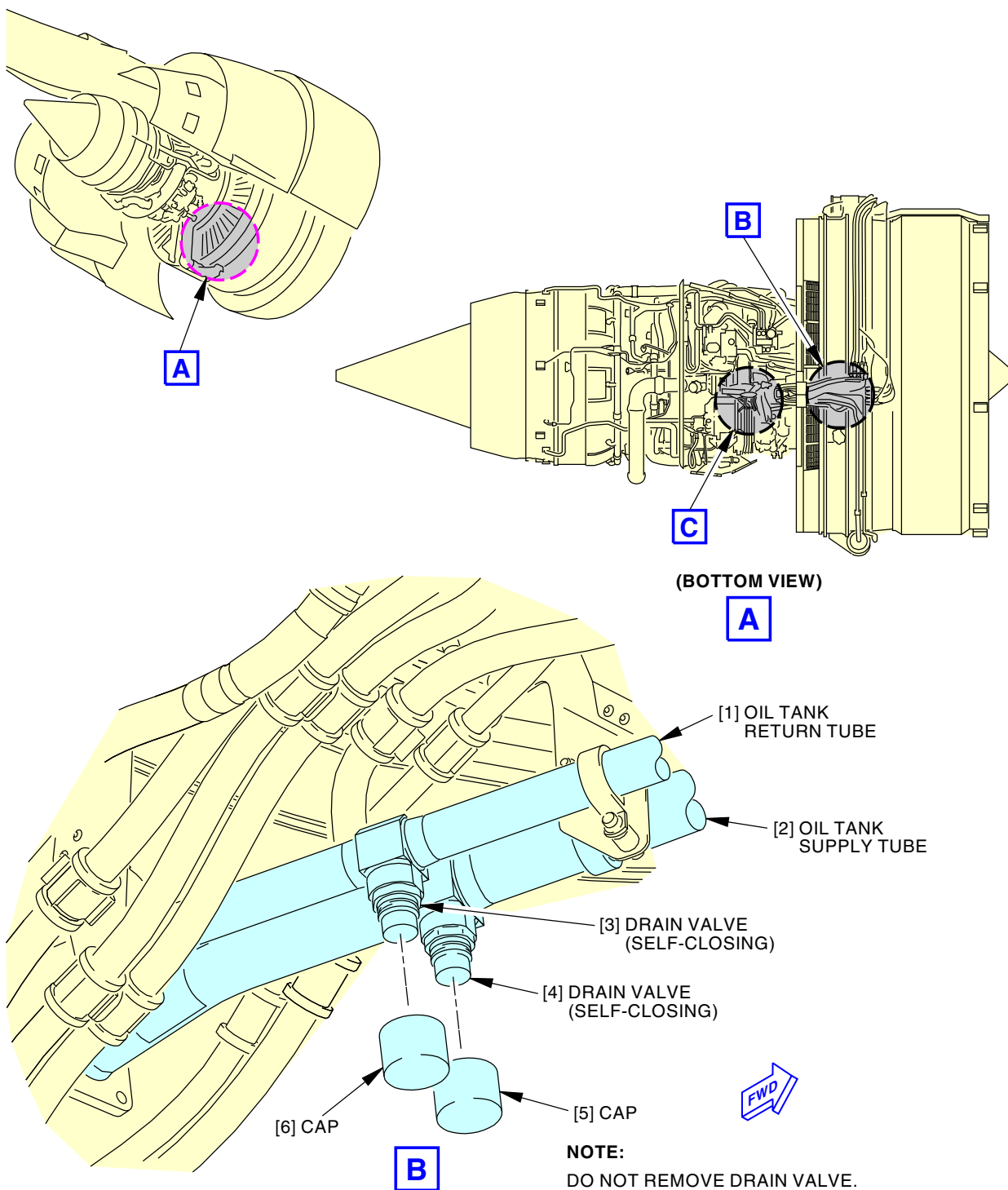
————— END OF TASK —————

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**Engine Oil (Change) Servicing
Figure 301/12-22-01-990-807-002 (Sheet 1 of 3)**

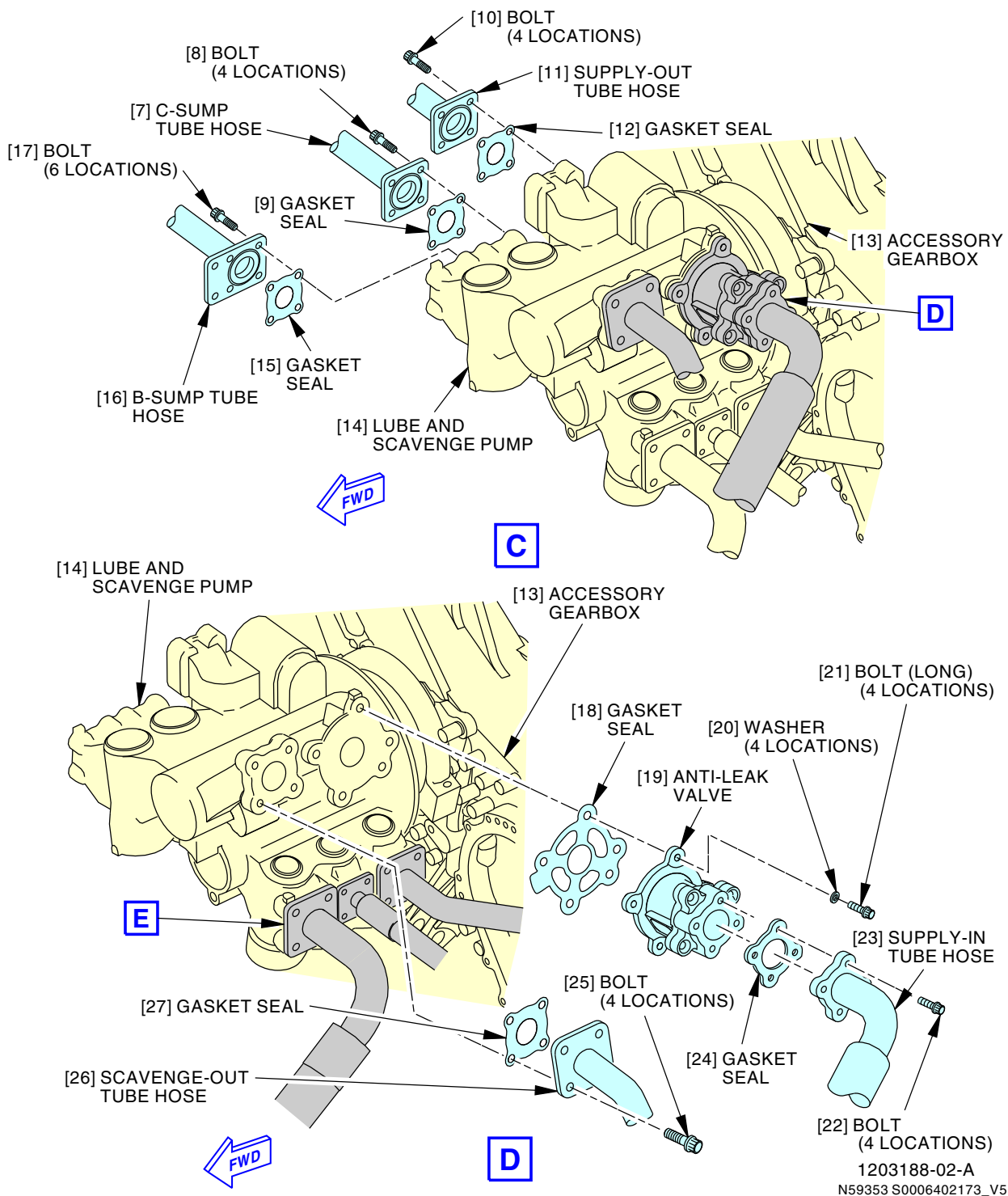
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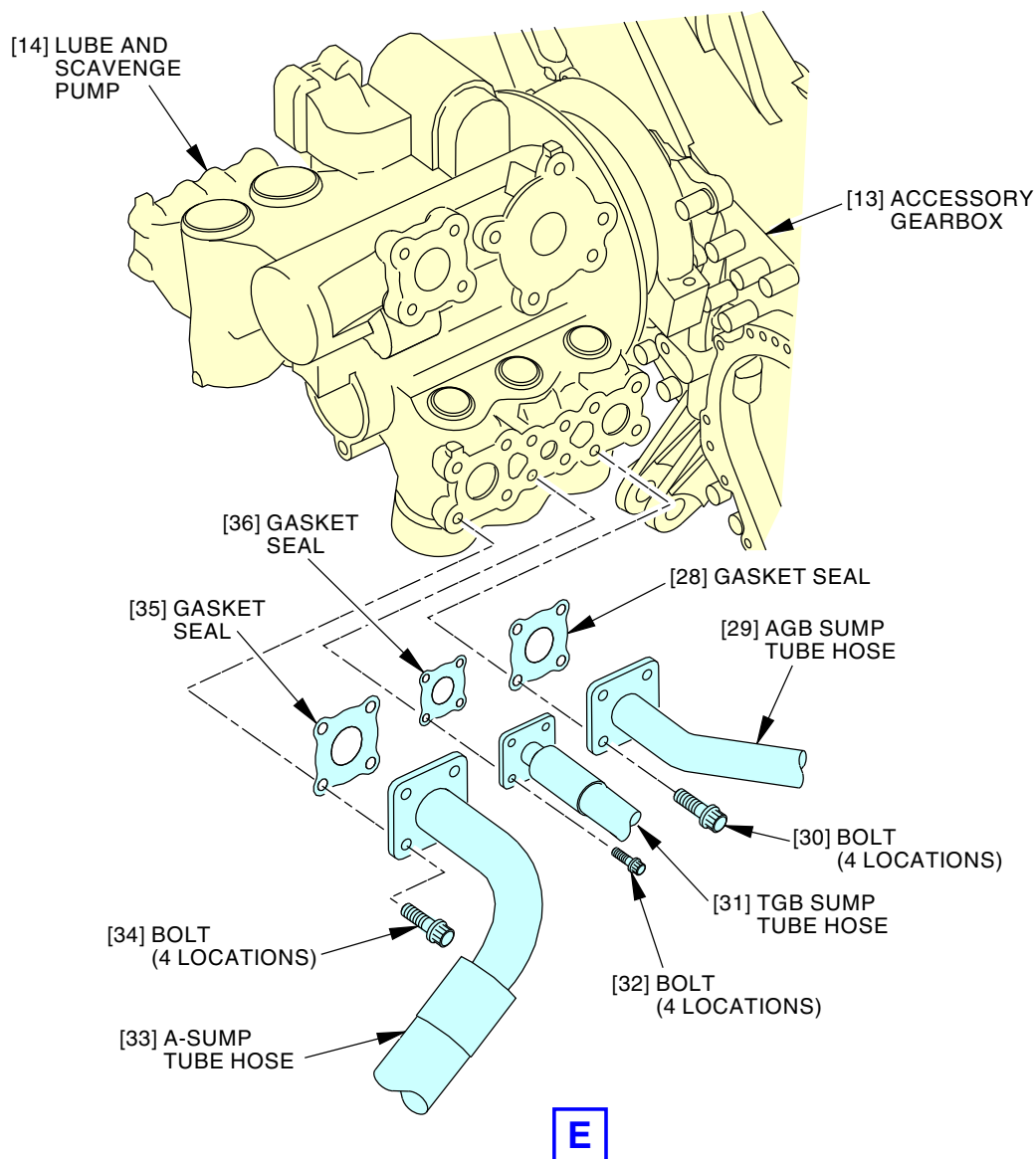
Engine Oil (Change) Servicing
Figure 301/12-22-01-990-807-002 (Sheet 2 of 3)

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2810825 S0000646898_V2

**Engine Oil (Change) Servicing
Figure 301/12-22-01-990-807-002 (Sheet 3 of 3)**

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TASK 12-22-01-170-803-002

3. Flush the Engine Oil System

(Figure 301)

A. General

- (1) Do this task to flush the engine oil system with clean engine oil.

B. References

Reference	Title
12-13-01-130-803-002	Engine Oil Replenishing (P/B 301)
24-25-07-000-801	Oil/Oil Heat Exchanger Removal (P/B 401)
24-25-07-400-801	Oil/Oil Heat Exchanger Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-00-00-700-804-H01	Test No. 5 - Idle Leak Check (P/B 501)
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)
79-21-01-000-803-H00	Main Fuel/Oil Heat Exchanger Removal (P/B 401)
79-21-01-400-801-H01	Main Fuel/Oil Heat Exchanger Installation (P/B 401)
79-21-04-000-801-H01	Scavenge Oil Inlet Screens Removal (P/B 201)
79-21-04-210-801-H01	Scavenge Oil Inlet Screens Inspection (P/B 201)
79-21-04-400-801-H01	Scavenge Oil Inlet Screens Installation (P/B 201)
79-21-07-000-801-H01	Oil Filter Element Removal (P/B 401)
79-21-07-400-801-H01	Oil Filter Element Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-211	Coupling - Valve Part #: OMP2505-3 Supplier: 33068
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1
D50043 [C02-058]	Compound - Antiseize, Acheson GP460 (For Threaded Fasteners 0.250 Inches Diameter Or Larger, C02-079 Is An Alternative)	GE A50TF201 Class A

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Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Accessory gearbox	72-00-05-20E-035	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

H. Prepare for the Engine Oil System Flush

SUBTASK 12-22-01-010-024



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER(S). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR

- (1) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
 - (d) For the left and right fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
 - (e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

I. Flush The Engine Oil System

SUBTASK 12-22-01-680-043-002



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY FIVE MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

- (1) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the engine:



CAUTION

DO NOT LET OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO EQUIPMENT.

- (a) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the engine oil tank:



CAUTION

MAKE SURE THAT THE OIL TANK SCUPPER IS CLEAN. IF THE SCUPPER IS NOT CLEAN, IT CAN CAUSE CONTAMINATION OF THE OIL SYSTEM. THIS CAN CAUSE DAMAGE TO THE ENGINE.

- 1) Clean the oil tank scupper with the cotton wiper, G00034 before you remove the oil tank filler cap.
- 2) Open the engine oil tank filler cap:
 - a) Put the oil tank filler cap locking lever in its not locked position.
 - b) Turn the locking lever on the filling cap to the OPEN position.
 - c) Pull the cap straight up until the dipstick is above the edge of the manual gravity filling cap assembly.

NOTE: The dipstick is attached to the bottom of the oil tank filling cap and has a lanyard that is attached to the inside of the manual gravity filling cap assembly.

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- 3) Put two oil resistant containers (5 gal)(19 Liter), STD-1055 below the fan case.
- 4) Remove the cap [6] from the drain valve (self closing) [3] in the oil tank return tube [1].
- 5) Install the valve coupling, COM-211 to the drain valve (self closing) [3] at the oil tank return tube [1].
- 6) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 into the clean oil resistant container (5 gal)(19 Liter), STD-1055.
- 7) Remove the valve coupling, COM-211 from the drain valve (self closing) [3] in the oil tank return tube [1].
- 8) Install the cap [6] to the drain valve (self closing) [3] in the oil tank return tube [1].
- 9) Remove the cap [5] from the drain valve (self closing) [4] in the oil tank supply tube [2].
- 10) Install the valve coupling, COM-211 on the drain valve (self closing) [4] in the oil tank supply tube [2].
- 11) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 into a clean oil resistant container (5 gal)(19 Liter), STD-1055.
- 12) Remove the valve coupling, COM-211 from the drain valve (self closing) [4] in the oil tank supply tube [2].
- 13) Install the cap [5] to the drain valve (self closing) [4] in the oil tank supply tube [2].
- (b) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the accessory gearbox [13]:
 - 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the four bolts [30] that attach the AGB sump tube hose [29] to the lube and scavenge pump [14].
 - 3) Carefully move the AGB sump tube hose [29] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the accessory gearbox [13] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 4) Examine the gasket seal [28] on the Accessory Gear Box (AGB) sump tube port for damage.
 - a) If the gasket seal [28] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [28].
 - <2> Lubricate a new gasket seal [28] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [28] is not damaged, lubricate the gasket seal [28] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
 - 5) Make sure the gasket seal [28] is in its position on the mount flange of the AGB sump tube hose [29].
 - 6) Put the AGB sump tube hose [29] in its position on the lube and scavenge pump [14].
 - 7) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [30].
 - 8) Install the bolts [30] that attach the AGB sump tube hose [29] to the lube and scavenge pump [14].
 - a) Tighten the bolts [30] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).

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- (c) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the A-sump tube hose [33]:
- 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the four bolts [34] that attach the A-sump tube hose [33] to the lube and scavenge pump [14].
 - 3) Carefully move the A-sump tube hose [33] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the lube and scavenge pump [14] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 4) Examine the gasket seal [35] on the A-sump tube port for damage.
 - a) If the gasket seal [35] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [35].
 - <2> Lubricate a new gasket seal [35] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [35] is not damaged, lubricate the gasket seal [35] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
 - 5) Make sure the gasket seal [35] is in its position on the mount flange of the A-sump tube hose [33].
 - 6) Put the A-sump tube hose [33] in its position on the lube and scavenge pump [14].
 - 7) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [34].
 - 8) Install the bolts [34] that attach the A-sump tube hose [33] to the lube and scavenge pump [14].
 - a) Tighten the bolts [34] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- (d) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the TGB sump tube hose [31]:
- 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the four bolts [32] that attach the TGB sump tube hose [31] to the lube and scavenge pump [14].
 - 3) Carefully move the TGB sump tube hose [31] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the lube and scavenge pump [14] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 4) Examine the gasket seal [36] on the TGB sump tube port for damage.
 - a) If the gasket seal [36] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [36].
 - <2> Lubricate a new gasket seal [36] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [36] is not damaged, lubricate the gasket seal [36] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
 - 5) Make sure the gasket seal [36] is in its position on the mount flange of the TGB sump tube hose [31].
 - 6) Put the TGB sump tube hose [31] in its position on the lube and scavenge pump [14].
 - 7) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [32].

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- 8) Install the bolts [32] that attach the TGB sump tube hose [31] to the lube and scavenge pump [14].
 - a) Tighten the bolts [32] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- (e) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the scavenge-out tube hose [26]:
 - 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the four bolts [25] that attach the scavenge-out tube hose [26] to the lube and scavenge pump [14].
 - 3) Carefully move the scavenge-out tube hose [26] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the lube and scavenge pump [14] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 4) Examine the gasket seal [27] on the scavenge-out tube port for damage.
 - a) If the gasket seal [27] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [27].
 - <2> Lubricate a new gasket seal [27] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [27] is not damaged, lubricate the gasket seal [27] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
 - 5) Make sure the gasket seal [27] is in its position on the mount flange of the scavenge-out tube hose [26].
 - 6) Put the scavenge-out tube hose [26] in its position on the lube and scavenge pump [14].
 - 7) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [25].
 - 8) Install the bolts [25] that attach the scavenge-out tube hose [26] to the lube and scavenge pump [14].
 - a) Tighten the bolts [25] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- (f) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the supply-in tube hose [23], and the anti-leak valve [19]:
 - 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the bolts [22] that attach the supply-in tube hose [23] to the anti-leak valve [19] and permit the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 to drain from the hose and the anti-leak valve [19] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 3) Remove the gasket seal [24].
 - 4) Remove the bolts [21] and washers [20] that attach the anti-leak valve [19] to the lube and scavenge pump [14] and permit the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 to drain from the anti-leak valve [19] and the lube and scavenge pump [14] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 5) Remove the gasket seal [18].
 - 6) Examine the gasket seal [18] for damage.
 - a) If the gasket seal [18] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [18].

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- <2> Lubricate a new gasket seal [18] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [18] is not damaged, lubricate the gasket seal [18] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
- 7) Put the gasket seal [18] in its position on the lube and scavenge pump [14].
- 8) Put the anti-leak valve [19] in its position on the lube and scavenge pump [14].
- 9) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [21].
- 10) Install the bolts [21] and washers [20] that attach the anti-leak valve [19] to the lube and scavenge pump [14].
 - a) Tighten the bolts [21] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- 11) Examine the gasket seal [24] for damage.
 - a) If the gasket seal [24] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [24].
 - <2> Lubricate a new gasket seal [24] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [24] is not damaged, lubricate the gasket seal [24] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
- 12) Put the gasket seal [24] in its position on the anti-leak valve [19].
- 13) Put the supply-in tube hose [23] in its position on the anti-leak valve [19].
- 14) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [22].
- 15) Install the bolts [22] that attach the supply-in tube hose [23] to the anti-leak valve [19].
 - a) Tighten the bolts [22] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- (g) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the supply-out tube hose [11]:
 - 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the four bolts [10] that attach the supply-out tube hose [11] to the lube and scavenge pump [14].
 - 3) Carefully move the supply-out tube hose [11] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the lube and scavenge pump [14] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 4) Examine the gasket seal [12] on the Supply-out tube port for damage.
 - a) If the gasket seal [12] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [12].
 - <2> Lubricate a new gasket seal [12] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [12] is not damaged, lubricate the gasket seal [12] with clean engine oil, oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
 - 5) Make sure the gasket seal [12] is in its position on the mount flange of the supply-out tube hose [11].
 - 6) Put the supply-out tube hose [11] in its position on the lube and scavenge pump [14].

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- 7) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [10].
- 8) Install the bolts [10] that attach the supply-out tube hose [11] to the lube and scavenge pump [14].
 - a) Tighten the bolts [10] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- (h) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the C-sump tube hose [7]:
 - 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the four bolts [8] that attach the C-sump tube hose [7] to the lube and scavenge pump [14].
 - 3) Carefully move the C-sump tube hose [7] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the lube and scavenge pump [14] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 4) Examine the gasket seal [9] on the C-sump tube port for damage.
 - a) If the gasket seal [9] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [9].
 - <2> Lubricate a new gasket seal [9] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [9] is not damaged, lubricate the gasket seal [9] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
 - 5) Make sure the gasket seal [9] is in its position on the mount flange of the C-sump tube hose [7].
 - 6) Put the C-sump tube hose [7] in its position on the lube and scavenge pump [14].
 - 7) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [8].
 - 8) Install the bolts [8] that attach the C-sump tube hose [7] to the lube and scavenge pump [14].
 - a) Tighten the bolts [8] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- (i) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the B-sump tube hose [16]:
 - 1) Put an oil resistant container (5 gal)(19 Liter), STD-1055 below the accessory gearbox [13].
 - 2) Remove the six bolts [17] that attach the B-sump tube hose [16] to the lube and scavenge pump [14].
 - 3) Carefully move the B-sump tube hose [16] away from the lube and scavenge pump [14] and permit the engine oil to drain from the hose and the lube and scavenge pump [14] into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 4) Examine the gasket seal [15] on the B-sump tube port for damage.
 - a) If the gasket seal [15] is damaged, do these steps:
 - <1> Remove and discard the damaged gasket seal [15].
 - <2> Lubricate a new gasket seal [15] with clean oil, D00552 [C02-019].
 - b) If the gasket seal [15] is not damaged, lubricate the gasket seal [15] with clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.

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- 5) Make sure the gasket seal [15] is in its position on the mount flange of the B-sump tube hose [16].
- 6) Put the B-sump tube hose [16] in its position on the lube and scavenge pump [14].
- 7) Put the lubricant Acheson GP460 compound, D50043 [C02-058] on the threads of the bolts [17].
- 8) Install the bolts [17] that attach the B-sump tube hose [16] to the lube and scavenge pump [14].
 - a) Tighten the bolts [17] to 110 in-lb (12.4 N·m) - 120 in-lb (13.6 N·m).
- (j) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the scavenge inlet screens:
 - 1) Do this task: Scavenge Oil Inlet Screens Removal, TASK 79-21-04-000-801-H01.
 - 2) Do a visual check of each scavenge inlet screen (TASK 79-21-04-210-801-H01) and permit the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 to drain into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 3) Do this task: Scavenge Oil Inlet Screens Installation, TASK 79-21-04-400-801-H01.
- (k) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the main fuel/oil heat exchanger:
 - 1) Do this task: Main Fuel/Oil Heat Exchanger Removal, TASK 79-21-01-000-803-H00.
 - 2) Permit the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 and the fuel to drain from the heat exchanger into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 3) Do this task: Main Fuel/Oil Heat Exchanger Installation, TASK 79-21-01-400-801-H01.
- (l) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the VSCF oil/oil heat exchanger:
 - 1) Do this task: Oil/Oil Heat Exchanger Removal, TASK 24-25-07-000-801.
 - 2) Permit the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 to drain from the heat exchanger into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 3) Do this task: Oil/Oil Heat Exchanger Installation, TASK 24-25-07-400-801.
- (m) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the starter:
 - 1) Put the oil resistant container (5 gal)(19 Liter), STD-1055 under the starter.
 - 2) Push the oil drain and fill plug in and turn the plug in the counterclockwise direction to the unlocked position with your hand.
 - 3) Remove the oil drain and fill plug from the starter.
 - 4) Attach the starter heli-lock drain and fill line to the oil drain and fill port.
 - 5) Attach the starter oil pressure drain kit to the drain and fill line.
 - 6) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the starter into the oil resistant container (5 gal)(19 Liter), STD-1055.
 - 7) Remove the starter oil pressure drain kit from the drain and fill line.
 - 8) Remove the starter heli-lock drain and fill line from the starter.
 - 9) Remove and discard the preformed packing from the oil fill and drain plug.
 - 10) Apply clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 on a new preformed packing.
 - 11) Put the new preformed packing on the oil fill and drain plug.

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- 12) Install the oil fill and drain plug in the starter.
 - a) Turn the oil fill and drain plug in a clockwise direction with your hand and push the plug into the locked position.
- (n) Fill the starter with engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520:
 - 1) Attach the starter heli-lock drain and fill line to the starter oil drain and fill port.
 - 2) Attach the starter oil pressure fill kit to the drain and fill line.



MAKE SURE THAT YOU FILL THE STARTER WITH NO MORE THAN ONE QUART (0.946 LITER) OF OIL. DAMAGE TO THE STARTER CAN OCCUR IF YOU FILL IT WITH TOO MUCH OIL.

- 3) Fill the starter with 22.2 ounces (0.750 cc) of clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520.
- 4) Look at the starter oil sight gauge to make sure the oil quantity reads full.
- 5) Remove the starter oil pressure fill kit from the drain and fill line.
- 6) Remove the starter heli-lock drain and fill line from the starter.
- 7) Remove and discard the preformed packing from the oil fill and drain plug.
- 8) Apply clean engine oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 on a new preformed packing.
- 9) Put the new preformed packing on the oil fill and drain plug.
- 10) Install the oil fill and drain plug in the starter.
 - a) Turn the oil fill and drain plug in a clockwise direction with your hand and push the plug into the locked position.
- (o) Install the oil filler cap into the manual gravity filling cap assembly.
 - 1) Align the cap and dipstick with the filler neck.
 - 2) Carefully insert the dipstick and cap straight into the filler neck assembly and push the cap into the neck securely.

NOTE: Make sure the lanyard is not outside the filler neck assembly.
 - 3) Turn the locking lever clockwise to the closed position.
 - 4) Secure the locking lever by pushing the lever down so that it is flat against the filler cap.
 - 5) Do a check of the cap to make sure the filler cap is closed tightly and is in the locked position.

SUBTASK 12-22-01-900-003-002

- (2) To replace the engine oil filter do this tasks:
 - (a) Do this task: Oil Filter Element Removal, TASK 79-21-07-000-801-H01.
 - (b) Do this task: Oil Filter Element Installation, TASK 79-21-07-400-801-H01.

SUBTASK 12-22-01-610-024-002

- (3) Do this task: Engine Oil Replenishing, TASK 12-13-01-130-803-002.

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SUBTASK 12-22-01-410-022



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Do these tasks in sequence to safely close the left and right thrust reversers on the applicable engine:
- (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
- 1) Close these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|-------------------------------------|
| 415AL | Left Thrust Reverser, Left Engine |
| 416AR | Right Thrust Reverser, Left Engine |
| 425AL | Left Thrust Reverser, Right Engine |
| 426AR | Right Thrust Reverser, Right Engine |
- (b) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
- 1) Close these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|------------------------------------|
| 413AL | Left Fan Cowl Panel, Left Engine |
| 414AR | Right Fan Cowl Panel, Left Engine |
| 423AL | Left Fan Cowl Panel, Right Engine |
| 424AR | Right Fan Cowl Panel, Right Engine |
- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 12-22-01-790-012-002

- (5) Do this task: Test No. 5 - Idle Leak Check, TASK 71-00-00-700-804-H01.

NOTE: Operate the engine until the engine oil temperature indication increases to 65 degrees C and maintain operation for a minimum of five minutes to thoroughly cycle the engine oil through the system.

SUBTASK 12-22-01-610-025-002

- (6) Do this task again to drain the engine oil system task.

————— **END OF TASK** —————

TASK 12-22-01-610-806-002

4. Flush the Oil Tank

(Figure 301)

A. General

- (1) Do this task to flush the oil tank with clean engine oil.

B. References

<u>Reference</u>	<u>Title</u>
12-13-01-130-803-002	Engine Oil Replenishing (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

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Reference	Title
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-00-00-700-804-H01	Test No. 5 - Idle Leak Check (P/B 501)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-211	Coupling - Valve Part #: OMP2505-3 Supplier: 33068
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

F. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

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G. Prepare for the Oil Tank Flush

SUBTASK 12-22-01-010-028



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER(S). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR

- (1) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

- (d) For the left and right fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

H. Flush the Oil Tank

SUBTASK 12-22-01-680-044-002

- (1) If you know that the contaminated oil is isolated to only the oil tank, do these steps:



DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY FIVE MINUTES AFTER AN ENGINE IS STOPPED. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

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(WARNING PRECEDES)



DO NOT LET OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.

- (a) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 from the oil tank.



MAKE SURE THAT THE OIL TANK SCUPPER IS CLEAN. IF THE SCUPPER IS NOT CLEAN, IT CAN CAUSE CONTAMINATION OF THE OIL SYSTEM. THIS CAN CAUSE DAMAGE TO THE ENGINE.

- 1) Clean the oil tank scupper with the cotton wiper, G00034 before you remove the oil tank filler cap.
 - 2) Open the engine oil tank filler cap.
 - a) Put the oil tank filler cap locking lever in its not locked position.
 - b) Turn the locking lever on the oil tank filler cap to the OPEN position.
 - c) Pull the oil tank filler cap straight up until the dipstick is above the edge of the manual gravity filling cap assembly.
- NOTE: The dipstick is attached to the bottom of the oil tank filler cap and has a lanyard that is attached to the inside of the manual gravity filling cap assembly.
- 3) Put two oil resistant containers (5 gal)(19 Liter), STD-1055 below the fan case.
 - 4) Remove the cap [5] from the drain valve (self closing) [4] in the oil tank supply tube [2].
 - 5) Install the valve coupling, COM-211 to the drain valve (self closing) [4] at the oil tank supply tube [2].
 - 6) Drain the oil, D00552 [C02-019] or Mobil Jet Oil II, D00520 into the clean oil resistant container (5 gal)(19 Liter), STD-1055.
 - 7) Remove the valve coupling, COM-211 from the drain valve (self closing) [4] in the oil tank supply tube [2].
 - 8) Install the cap [5] to the drain valve (self closing) [4] in the oil tank supply tube [2].
- (b) Do this task: Engine Oil Replenishing, TASK 12-13-01-130-803-002.

I. Put the Airplane Back to its Usual Condition

SUBTASK 12-22-01-410-026



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left and right thrust reversers on the applicable engine:
 - (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.

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- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

- (b) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.

- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

J. Oil Tank Flush Test

SUBTASK 12-22-01-790-013-002

- (1) Do this task: Test No. 5 - Idle Leak Check, TASK 71-00-00-700-804-H01.

NOTE: Operate the engine until the engine oil temperature indication increases to 65 degrees C and maintain operation for a minimum of five minutes to thoroughly cycle the engine oil through the system.

————— **END OF TASK** —————

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AIR-DRIVEN PUMP (ADP) TURBINE GEARBOX ASSEMBLY (TGA) - SERVICING

1. **General**

- A. This procedure has one task. This task replaces the oil in the turbine gearbox assembly (TGA) on the air-driven pump (ADP).
- B. There are two air-driven pumps in the wing to body fairing on the aft left side.

TASK 12-22-04-610-801

2. **Replace the Oil in the Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA)**

A. General

- (1) The turbine gearbox assembly (TGA) is usually filled with oil, MIL-PRF-23699. For cold weather operation, the TGA possibly will contain oil, MIL-L-7808. For data on cold weather operation, refer to (TASK 12-33-01-600-803).

B. References

Reference	Title
12-33-01-600-803	Cold Weather Maintenance Procedure (P/B 301)
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)

C. Tools/Equipment

Reference	Description
STD-1058	Container - Oil Resistant, 1 Gallon, (4 Liter)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00109	Oil - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 (Supersedes MIL-L-7808)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	29-11-10-50-280	ARO ALL
5	Packing	29-11-10-50-245	ARO ALL

F. Location Zones

Zone	Area
197	Aft Wing-to-Body Fairings, Left

G. Access Panels

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

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H. Procedure

SUBTASK 12-22-04-860-001

- (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 12-22-04-040-001



CAUTION DO NOT OPERATE THE TRAILING EDGE FLAPS WHILE THE ADP ACCESS DOOR IS OPEN. IF YOU DO, IT CAN CAUSE DAMAGE TO THE ADP ACCESS DOOR.

- (2) Install a DO-NOT-OPERATE tag on the flap lever on the P10 panel.

SUBTASK 12-22-04-010-001

- (3) Open this access panel:

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

SUBTASK 12-22-04-680-001

- (4) Do the these steps to drain the oil from the turbine gearbox assembly (TGA) of the air-driven pump (ADP):
 - (a) Hold a oil resistant container 1 gal, (4 l), STD-1058 below the drain port to catch the oil.
 - (b) Remove the plug [4] from the drain port on the heat exchanger [6] of the TGA.
 - (c) Drain all the oil from the TGA into the container.
 - (d) Remove the packing [5] from the plug [4].
 - (e) Apply oil to the new packing [5] for the drain plug [4] with oil from the TGA.
 - (f) Install the new packing [5] on the plug [4].
 - (g) Install the plug [4] in the drain port on the heat exchanger [6] of the TGA.
 - 1) Torque the case drain plug [4] to 220 in-lb (24.9 N·m) to 240 in-lb (27.1 N·m).
 - (h) Safety the plug [4] with a lockwire.
 - (i) Remove the container from below the drain port.

SUBTASK 12-22-04-900-001

- (5) If the indicator [7] shows a differential pressure indication, replace the ADP TGA Filter Element and reset the indicator [7], do these tasks:
 - (a) Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Removal, TASK 29-11-19-000-801.
 - (b) Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Filter Element Installation, TASK 29-11-19-400-801.

SUBTASK 12-22-04-610-001

- (6) Do these steps to add oil to the TGA:
 - (a) Remove the plug [1] from the fill port on the TGA.

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DO NOT MIX OILS OF DIFFERENT TYPES OR BRAND NAMES. SOME OILS WILL CHEMICALLY CHANGE WHEN YOU MIX THEM. THIS CAN CAUSE DAMAGE TO THE EQUIPMENT.



DO NOT USE LUBRICATING OIL, D00068, WHEN THE AIR TEMPERATURE ON THE GROUND IS LOWER THAN -40 °F. THE HIGH VISCOSITY OF THIS LUBRICATING OIL, AT TEMPERATURES LOWER THAN -40 °F, CAN CAUSE DAMAGE TO THE TGA.

- (b) Add lubricating oil, D00068, through the fill port on the TGA, until the oil level is at the top of the fill port:

NOTE: If the air temperature on the ground is lower than -40 °F, usually you must use lubricating oil, D00109. For data on cold weather maintenance, refer to (TASK 12-33-01-600-803).

- (c) Remove the packing [2] from the plug [1].
(d) Apply oil to the new packing [2] for the plug [1].
(e) Install the new packing [2] on the plug [1].
(f) Install the plug [1] in the fill port on the TGA.
 1) Torque the fill port plug [1] to 90 in-lb (10.2 N·m) to 95 in-lb (10.7 N·m).
(g) Safety the plug [1] with a lockwire.
(h) Remove all oil from the outer surface of the TGA with a rag.

SUBTASK 12-22-04-410-001

- (7) Close this access panel:

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

SUBTASK 12-22-04-080-001

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

SUBTASK 12-22-04-860-002

- (9) 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 —————

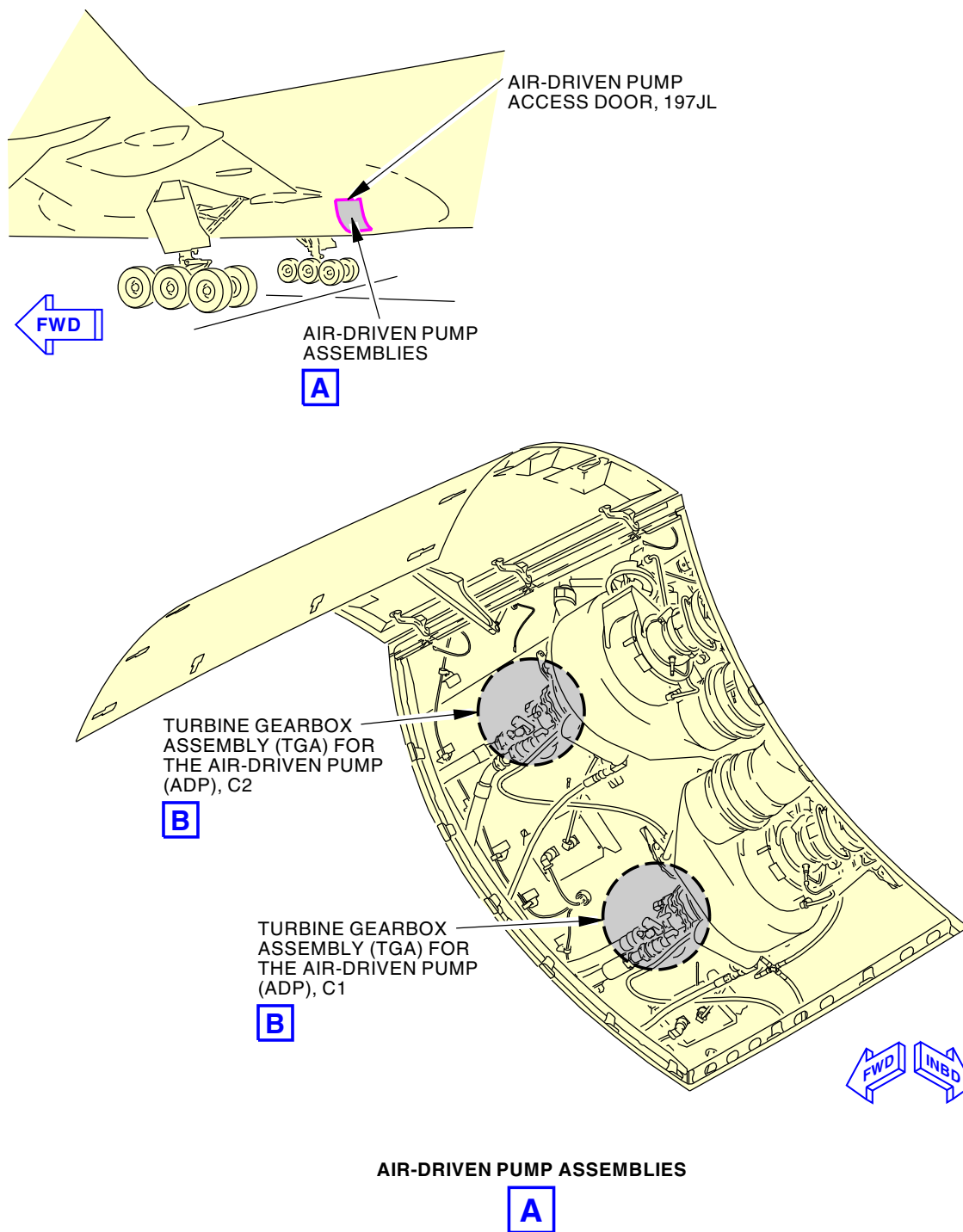
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Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Servicing
Figure 301/12-22-04-990-801 (Sheet 1 of 2)

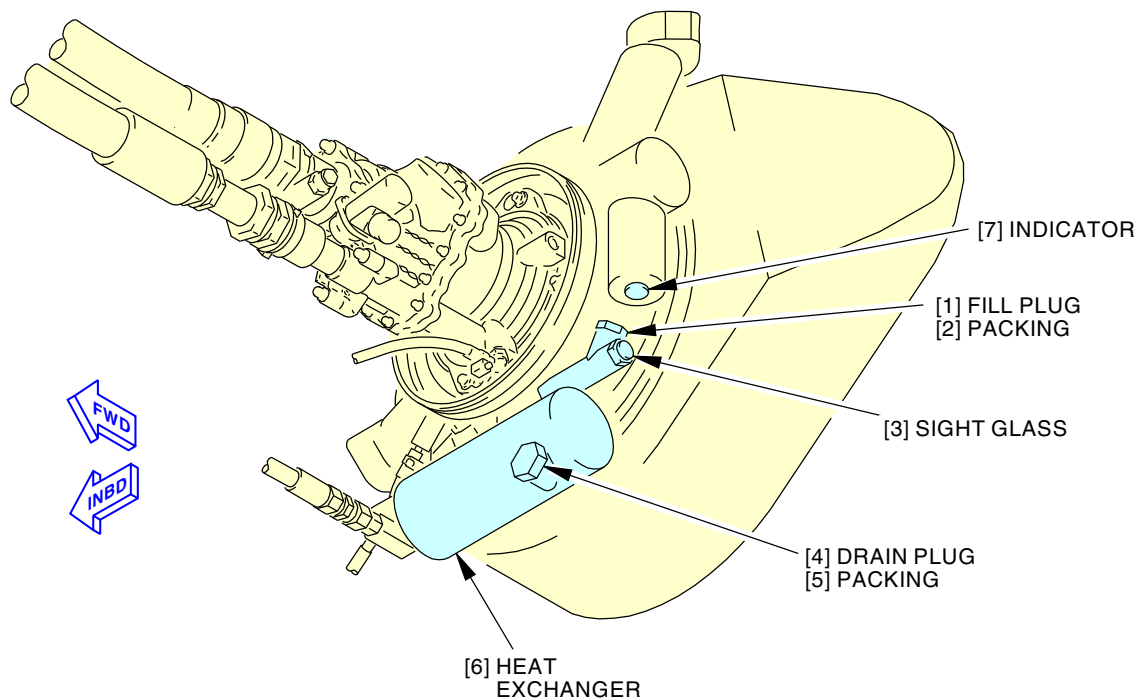
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TURBINE GEARBOX ASSEMBLY (TGA)
(EXAMPLE)

B

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Air-Driven Pump (ADP) Turbine Gearbox Assembly (TGA) Servicing
Figure 301/12-22-04-990-801 (Sheet 2 of 2)

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AUXILIARY POWER UNIT OIL CHANGE - SERVICING

1. General

- A. This procedure has these tasks:
- (1) Drain the APU oil
 - (2) Flush the APU oil
 - (a) You must do this task if you change oil types.
 - (3) Fill the APU oil.
- B. The auxiliary power unit is referred to as the APU.

TASK 12-22-05-610-801

2. Drain the APU Oil

(Figure 301)

A. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

C. Consumable Materials

Reference	Description	Specification
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

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

E. Access Panels

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

F. Procedure

SUBTASK 12-22-05-860-001

- (1) Operate the APU at a no load condition for five minutes:

NOTE: When you operate the APU, the oil will flow through the engine. When the oil flows, it will collect the unwanted material that the oil filters do not collect.

- (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
- (b) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

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SUBTASK 12-22-05-860-002

- (2) Move the APU selector on the P5 overhead panel to the OFF position and attach a DO-NOT-OPERATE tag.

SUBTASK 12-22-05-860-008

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

APU Auxiliary Panel, P49

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

Standby Power Management Panel, P310

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

SUBTASK 12-22-05-010-001

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

Open these APU access doors:

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

SUBTASK 12-22-05-680-001



DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (5) Do these steps to drain the APU oil:
 - (a) Put the oil resistant container (5 gal)(19 Liter), STD-1055 under the APU gearbox.
 - (b) Remove the magnetic chip collector [1].

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ARO ALL; MAGNETIC CHIP COLLECTORS WITH THE PACKING AND SEAL



DO NOT REMOVE THE PERMANENT SECONDARY SEAL FROM THE MAGNETIC CHIP COLLECTOR. THE REMOVAL OF THE SECONDARY SEAL WILL CAUSE DAMAGE TO THE MAGNETIC CHIP COLLECTOR.

- (c) Remove the packing [2] from the magnetic chip collector [1].
- 1) Discard the packing [2].

ARO ALL; MAGNETIC CHIP COLLECTORS WITH THE TWO PACKINGS

- (d) Remove the two packings [2] from the magnetic chip collector [1].
- 1) Discard the two packings [2].

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- (e) Remove the drain plug [3].
- NOTE: The oil will begin to drain into the container.
- (f) Remove the packing [4] from the drain plug [3].
- 1) Discard the packing [4].
- (g) Do these steps after you drain the APU oil:
- 1) Lubricate the two or three new packing [2] and packing [4] with Mobil Jet Oil II, D00520.
 - 2) Install the packing [4] on the drain plug [3].
 - 3) Install the drain plug [3] into the APU.
 - a) Tighten to 150 in-lb (17 N·m).

ARO ALL; MAGNETIC CHIP COLLECTORS WITH THE PACKING AND SEAL

- 4) Install the packing [2] on the magnetic chip collector [1].
- NOTE: If the permanent secondary seal [8] is damaged or worn, it is permitted to replace the it with the new packing [2].

ARO ALL; MAGNETIC CHIP COLLECTORS WITH THE TWO PACKINGS

- 5) Install the two packings [2] on the magnetic chip collector [1].

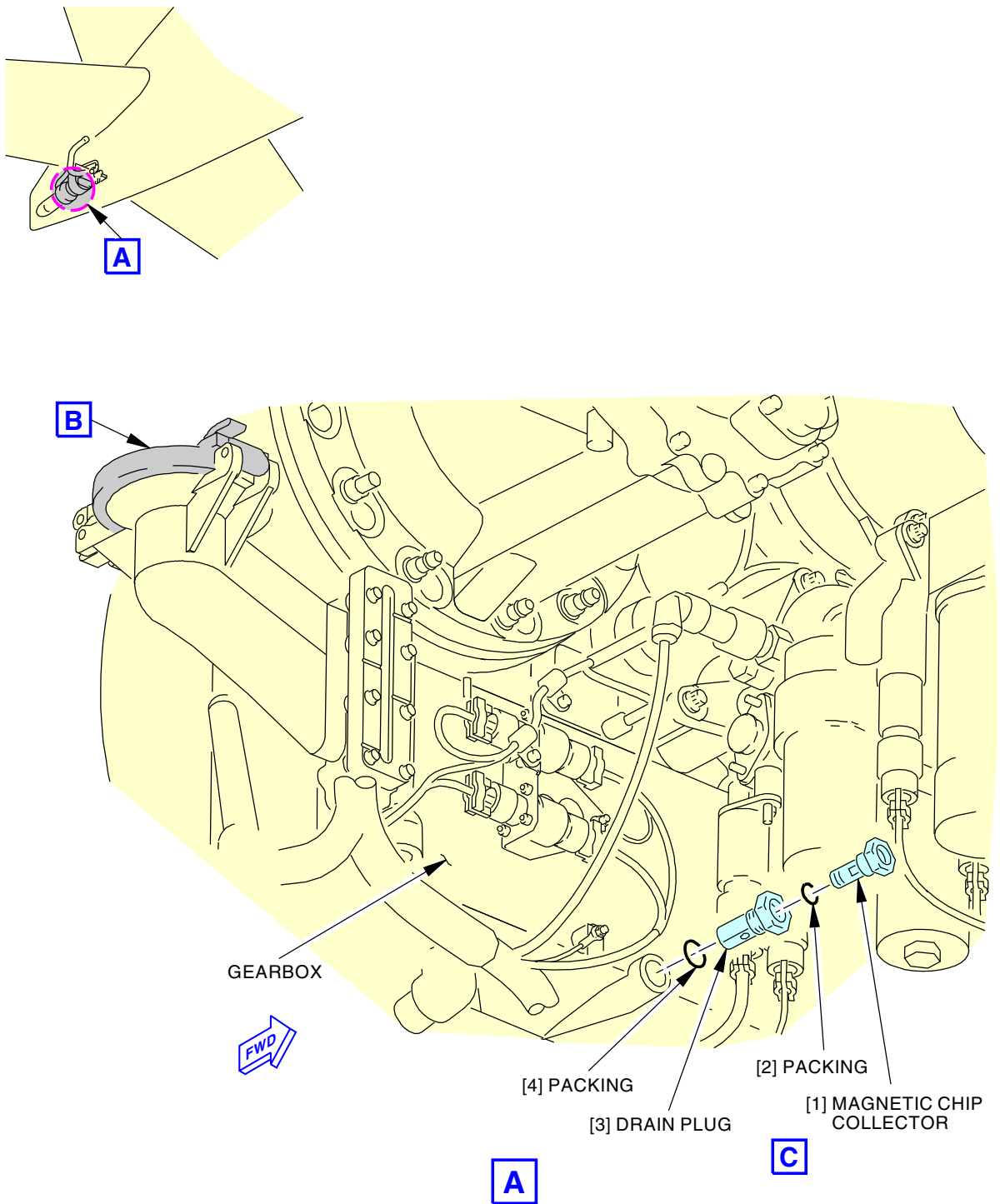
ARO ALL

- 6) Install the magnetic chip collector [1] in the drain plug [3].
- 7) Push and turn the magnetic chip collector [1] clockwise.

NOTE: When the magnetic chip collector is in the locked position, it will align with the hex on the housing.
- 8) Install a MS20995C32 lockwire, G01048 on the drain plug [3].

———— **END OF TASK** ————

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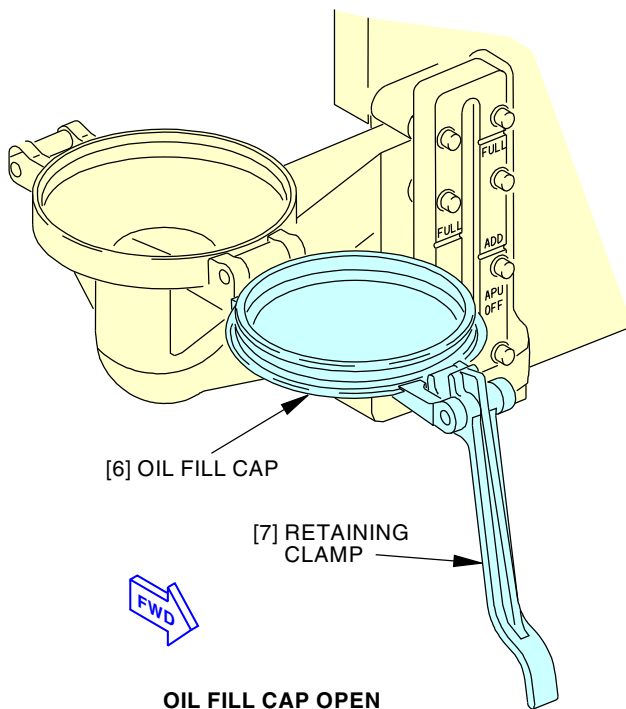
APU Oil Servicing
Figure 301/12-22-05-990-801 (Sheet 1 of 3)

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OIL FILL CAP OPEN

B

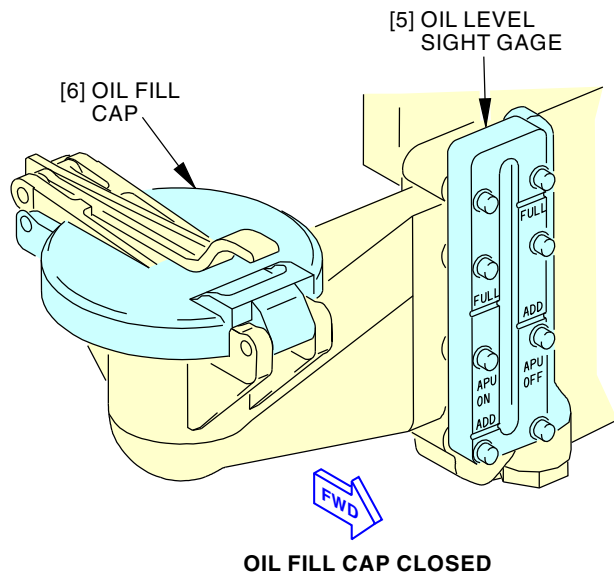
[1] MAGNETIC CHIP COLLECTOR

[2] PACKING

[8] PERMANENT SECONDARY SEAL

MAGNETIC CHIP COLLECTOR

C



OIL FILL CAP CLOSED

B

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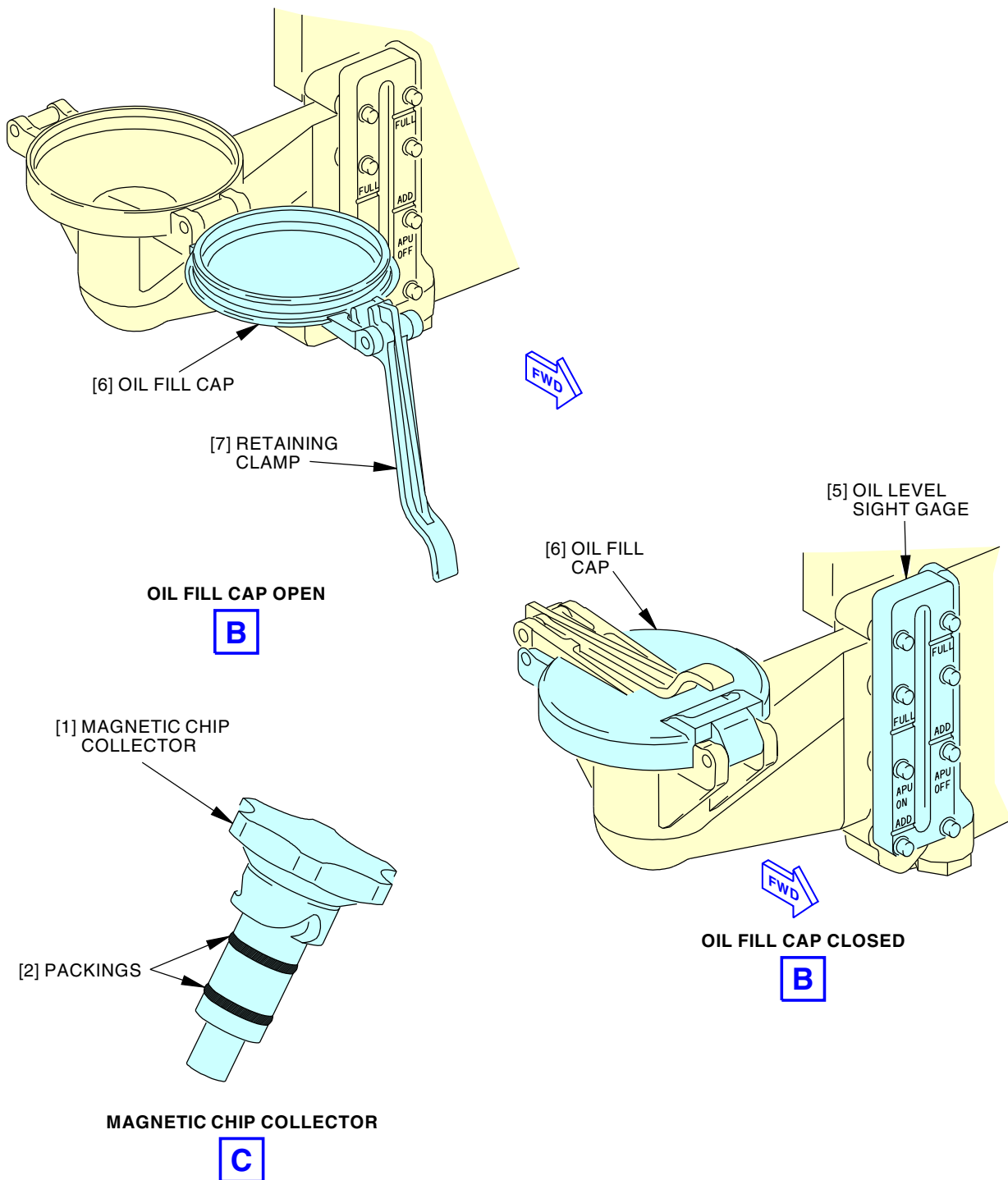
**APU Oil Servicing
Figure 301/12-22-05-990-801 (Sheet 2 of 3)**

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THE PACKING AND SEAL**

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APU Oil Servicing
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TASK 12-22-05-610-802

3. Flush the APU Oil

A. General

- (1) If you change oil types, you must flush the APU oil system.
- (2) This task gives the steps necessary to flush the APU oil system.

B. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-27-03-000-801	Oil Filter Element Removal (P/B 401)
49-27-03-000-802	Generator Scavenge Oil Filter Element Removal (P/B 401)
49-27-03-400-801	Oil Filter Element Installation (P/B 401)
49-27-03-400-802	Generator Scavenge Oil Filter Element Installation (P/B 401)

C. Location Zones

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

D. Procedure

SUBTASK 12-22-05-170-001

- (1) Do the steps that follow to flush the APU oil:
 - (a) Do this task: Drain the APU Oil, TASK 12-22-05-610-801.
 - (b) Do this task to add the new oil type: Fill the APU with Oil, TASK 12-22-05-600-801.
 - (c) Operate the APU at a no load condition for ten minutes:
 - 1) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 2) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.
 - (d) Do this task: Drain the APU Oil, TASK 12-22-05-610-801.
 - (e) Do this task: Fill the APU with Oil, TASK 12-22-05-600-801.
 - (f) Replace the oil filter element.

These are the tasks:

Oil Filter Element Removal, TASK 49-27-03-000-801,
Oil Filter Element Installation, TASK 49-27-03-400-801.
 - (g) Replace the generator scavenge filter element.

These are the tasks:

Generator Scavenge Oil Filter Element Removal, TASK 49-27-03-000-802,
Generator Scavenge Oil Filter Element Installation, TASK 49-27-03-400-802.

————— **END OF TASK** —————

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TASK 12-22-05-600-801

4. Fill the APU with Oil

(Figure 301)

A. General

- (1) This procedure gives the steps necessary to fill the APU gearbox with oil.
- (2) The oil reservoir is the gearbox housing and holds 8 qt (7.6 l). If the APU is new or if the air/oil cooler is replaced, 10 qt (9.5 l) of oil are necessary.

NOTE: When the APU OFF side of the oil level sight gage indicates FULL, the APU gearbox will contain 7.25 qt (6.86 l). This is also the maximum oil quantity that is displayed in EICAS.

- (3) Use only these types and brands of oil:
 - (a) Type I, MIL-PRF-7808 (-65 °F to 130 °F, -54 °C to 54 °C):
 - 1) Eastman Turbo Oil 2389, D00637
 - 2) Castrol 399.
 - (b) Type I, Def Stan 91-94 (-65 °F to 130 °F, -54 °C to 54 °C):
 - 1) Aeroshell Turbine Oil 390
 - 2) Castrol 325.
 - (c) Type II, MIL-PRF-23699 (-40 °F to 130 °F, -40 °C to 54 °C):
 - 1) Eastman Turbo Oil 2380, D00519
 - 2) Castrol 5000
 - 3) Hatcol 3211
 - 4) Hatcol 3611
 - 5) Mobil Jet Oil II
 - 6) Aeroshell Turbine Oil 500
 - 7) Royco Turbine Oil 500.
 - (d) Type II, DOD-L-85734 or Def Stan 91-100 (-40 °F to 130 °F, -40 °C to 54 °C):
 - 1) Royco 555
 - 2) Aeroshell 555.
 - (e) Type II, MIL-PRF-23699, (High Thermal Stability)
 - 1) Aeroshell Turbine Oil 560
 - 2) Eastman Turbo Oil 2197, D50016
 - 3) Mobil Jet Oil 254
 - 4) Mobil Jet Oil 387
 - 5) Royco Turbine Oil 560.
 - (f) Def Stan 91-98:
 - 1) Aeroshell 750
 - 2) Castrol 98.
- (4) The oil fill port is located on the top right side of the gearbox.

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B. References

Reference	Title
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00519	Oil - Engine - Eastman Turbo Oil 2380	MIL-PRF-23699F-STD and UK spec DEF STAN 91-101/2
D00520	Oil - Engine - Mobil Jet Oil II	MIL-PRF-23699F-Class STD (Standard)
D00637	Oil - Engine - Eastman Turbo Oil 2389	MIL-PRF-7808L grade 3
D50016	Oil - Engine - Eastman Turbo Oil 2197	MIL-PRF-23699F Class HTS (High Thermal Stability)

D. Location Zones

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

E. Access Panels

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

F. Procedure

SUBTASK 12-22-05-860-004

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

SUBTASK 12-22-05-860-009

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

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

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

SUBTASK 12-22-05-010-002

- (3) To open the APU access doors, do this task:

APU Access Doors (Open), TASK 49-11-02-010-801

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

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

SUBTASK 12-22-05-600-001

(4) Do the steps that follow to fill the APU oil:



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE APU IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

DO NOT LET OIL GET ON THE APU OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- Pull up on the retaining clamp [7] and disengage it from the oil fill cap [6].
- Open the oil fill cap [6].



CAUTION

DO NOT MIX TWO TYPES OF OIL WHEN YOU ADD THE OIL IN THE APU. IT IS PERMITTED TO MIX DIFFERENT BRANDS OF OIL WITH THE SAME TYPE OF OIL WHEN YOU ADD THE OIL IN THE APU. A MIXTURE OF TWO TYPES OF OIL IN THE APU CAN CAUSE DAMAGE TO THE APU.

- Slowly add Mobil Jet Oil II, D00520, until the oil level is at the FULL line on the APU OFF side of the oil level sight gage [5].

NOTE: It is recommended that you use Type I oil if the APU will be started in very cold conditions below -40 °F (-40 °C).

- Close the oil fill cap [6].
- Engage the retaining clamp [7] and push it down.

SUBTASK 12-22-05-860-006

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

SUBTASK 12-22-05-860-010

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

APU Auxiliary Panel, P49

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

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Standby Power Management Panel, P310

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

SUBTASK 12-22-05-210-001

- (7) Do the steps that follow to do the leak check:
- (a) Operate the APU at a no load condition for 5 minutes:
- 1) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.
 - 2) Examine the drain plug [4] for leakage.
 - 3) Do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

SUBTASK 12-22-05-410-001

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

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

———— **END OF TASK** ————

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INTEGRATED DRIVE GENERATOR - SERVICING (OIL CHANGE)

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) IDG Oil Change
 - (2) IDG Oil Level Check
 - (3) IDG Oil Filter Blocked Condition Check
 - (4) IDG Remote Oil Level Sensing System Check

TASK 12-22-07-600-802

2. IDG Oil Change

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives instructions to change the oil of the IDG.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
24-11-02-000-803-002	IDG Oil Filter Removal (P/B 401)
24-11-02-400-803-002	IDG Oil Filter Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

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Reference	Description
COM-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
G50003 [P05-287]	Lockwire - MS20995C20, Corrosion-Resistant Steel - 0.020 Inch (0.508mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	24-11-01-14-315 24-11-01-14B-020	ARO ALL ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Procedure

SUBTASK 12-22-07-010-012



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:
 - (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
 - (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
 - (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

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- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

SUBTASK 12-22-07-860-023

- (2) Release the pressure from the IDG:

- (a) Remove the dust cap from the overflow drain valve.
- (b) Connect the overflow coupling to the overflow hose.
- (c) Put the free end of the overflow hose into an oil resistant container (5 gal)(19 Liter), STD-1055.



WARNING

WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE TO THE OVERFLOW DRAIN COUPLING, PUT A RAG AROUND THE FITTING. THE RAG WILL PREVENT THE OIL SPRAY CAUSED BY PRESSURE IN THE IDG CASE. HOT OIL CAN CAUSE INJURIES.



CAUTION

DO NOT DISCONNECT THE OIL OVERFLOW HOSE AND COUPLING FROM THE OVERFLOW DRAIN VALVE UNTIL YOU COMPLETE THE SERVICING AND THE OIL OVERFLOW DECREASES TO DROPS. IF THE HOSE AND COUPLING ARE DISCONNECTED FROM DRAIN VALVE BEFORE YOU COMPLETE THE SERVICING, THIS CAN CAUSE OIL OVERFILL CONDITION IN THE GENERATOR. AN OIL OVERFILL CONDITION CAN CAUSE DAMAGE TO THE GENERATOR DURING OPERATION.

- (d) Connect the overflow coupling and the overflow hose to the overflow drain valve.

NOTE: It is usual for some oil to drain.

- (e) Let the oil, that drains from the overflow hose, flow into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 12-22-07-020-003



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (3) Remove the case drain plug [2] and let the oil flow into the oil resistant container (5 gal)(19 Liter), STD-1055.

NOTE: Be prepared to catch 1 gal (4 l) of oil.

SUBTASK 12-22-07-020-004

- (4) Remove and discard the o-ring [1] from the case drain plug [2].

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SUBTASK 12-22-07-960-002

- (5) Replace the oil filter (TASK 24-11-02-000-803-002 and TASK 24-11-02-400-803-002).

SUBTASK 12-22-07-480-003

- (6) Connect the fill coupling and the pressure fill hose from the service engine oil servicing cart, COM-1537 to the pressure fill valve.

SUBTASK 12-22-07-860-024

- (7) Use the engine oil servicing cart, COM-1537 to put oil, D00068 or oil, D00071 into the IDG until one of these two things occur:
- (a) The color of the oil that comes out of the case drain is the same as the color of the oil in the service cart.
 - (b) 1 gal (4 l) to 1.5 gal (5.7 l) of oil flows from the IDG case drain.

SUBTASK 12-22-07-420-002



DO NOT TORQUE MORE THAN THE APPROVED TORQUE VALUES. THIS WILL HELP PREVENT DAMAGE TO THE EQUIPMENT.

- (8) Do the steps that follow to install the case drain plug [2]:
- (a) Lubricate the new o-ring [1] with oil, D00068 or oil, D00071.
 - (b) Install the new o-ring [1] on the case drain plug [2].
 - (c) Install the case drain plug [2] and tighten to 55 in-lb (6.2 N·m)-75 in-lb (8.5 N·m).
 - (d) Install a MS20995C20 lockwire, G50003 [P05-287] on the case drain plug [2].

SUBTASK 12-22-07-610-002

- (9) Do this task: IDG Oil Fill, TASK 12-13-03-600-802.

I. Put The Airplane Back To Its Usual Condition

SUBTASK 12-22-07-410-009



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
- (a) To close the left thrust reversers, do this task:
Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) To close the left fan cowl panel,s do this task:
Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

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(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

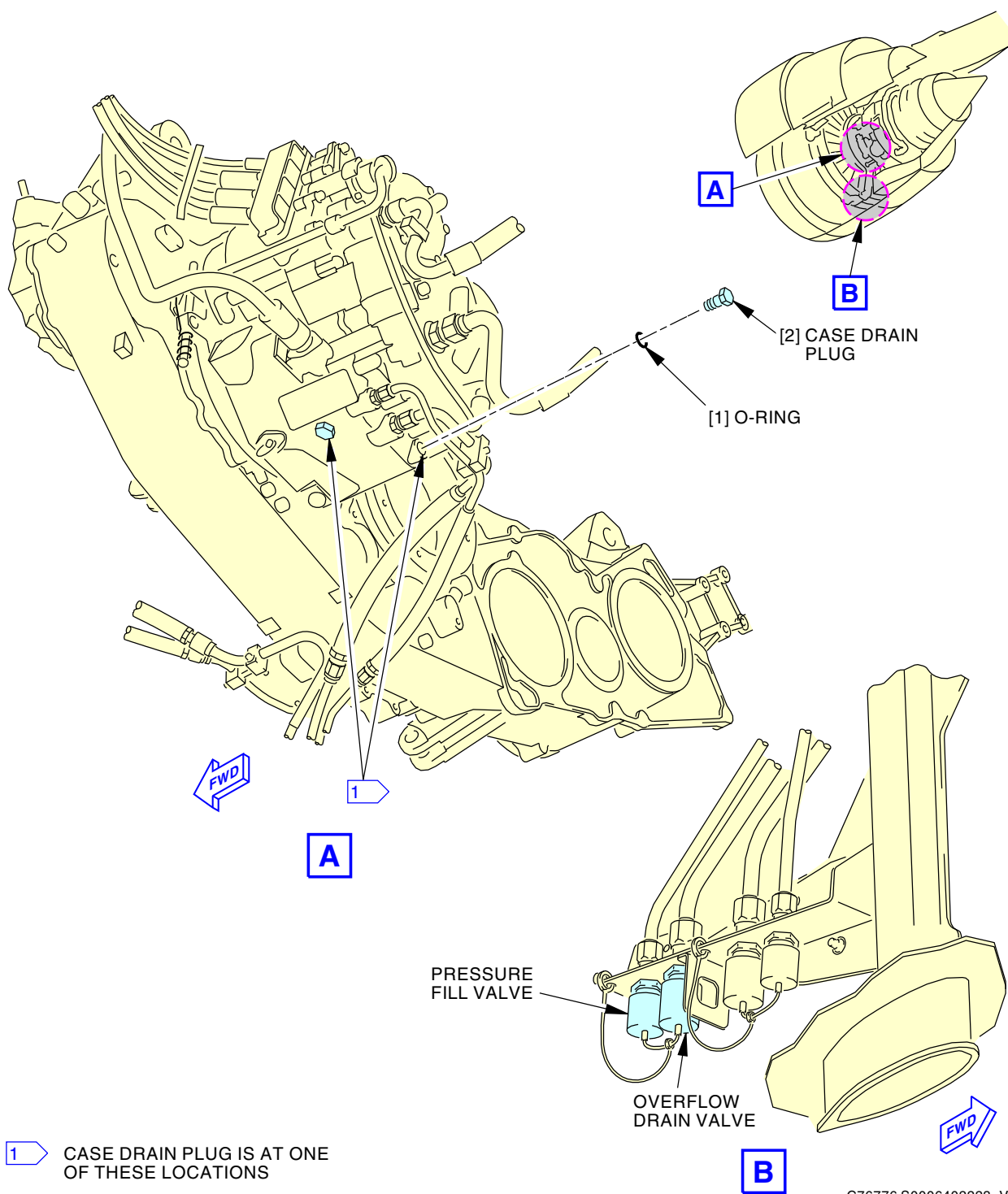
———— **END OF TASK** ————

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IDG Oil Change
Figure 301/12-22-07-990-807

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TASK 12-22-07-200-803

3. IDG Oil Level Check

(Figure 302)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has these checks:

(a) IDG oil level check from the Multi Function Display (MFD)

NOTE: The Electrical Maintenance page provides an indication of IDG oil level which is accurate 5 minutes after engine shutdown.

(b) IDG oil level check from the sightglass.

NOTE: The oil level sightglass on the IDG provides an indication of IDG oil level which is accurate 5 minutes after engine shutdown.

(2) You can do a check of the IDG oil level from the MFD or the sightglass.

B. References

Reference	Title
12-13-03-600-802	IDG Oil Fill (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

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

E. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

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(Continued)

Number	Name/Location

425AL	Left Thrust Reverser, Right Engine

F. IDG Oil Level Check from the Multi Function Display (MFD)

SUBTASK 12-22-07-610-004

- (1) Wait a minimum of 5 minutes after engine shutdown for an accurate indication of the IDG oil level.

SUBTASK 12-22-07-860-014

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

SUBTASK 12-22-07-860-015

- (3) Get access to the electrical maintenance page (TASK 31-61-00-800-804).

SUBTASK 12-22-07-860-016

- (4) Make sure the electrical maintenance page display NORMAL for the IDG oil level.

SUBTASK 12-22-07-860-017

- (5) If the electrical maintenance page displays SERVICE for the IDG oil level, then do the check of the oil level from the sightglass.

G. IDG Oil Level Check from the Sightglass

SUBTASK 12-22-07-610-005

- (1) Wait a minimum of 5 minutes after an engine shutdown for an accurate indication of the IDG oil level.

SUBTASK 12-22-07-010-010



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

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SUBTASK 12-22-07-210-003



DO NOT DO A CHECK OF THE OIL LEVEL OF A DISCONNECTED IDG. THIS CAN CAUSE AN INCORRECT OIL QUANTITY IN THE IDG. THE OPERATION OF AN IDG WITH AN INCORRECT OIL QUANTITY CAN CAUSE DAMAGE TO EQUIPMENT.

- (3) Do the oil level check of the IDG.
 - (a) Clean the sight glass surface with a cotton wiper, G00034.
 - (b) Stop this task for a minimum of 5 minutes of stable time after the engine is off.
 - (c) Examine the sight glass for the oil level.

SUBTASK 12-22-07-860-018

- (4) If the oil level is below the applicable oil level marks on the sight glass, do this task: IDG Oil Fill, TASK 12-13-03-600-802.

NOTE: A leak may be responsible for a low oil level reading, therefore if frequent servicing is required, do an oil leak check.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-07-410-007



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
 - (a) To close the left thrust reversers, do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) To close the left fan cowl panels, do this task:

Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— END OF TASK —————

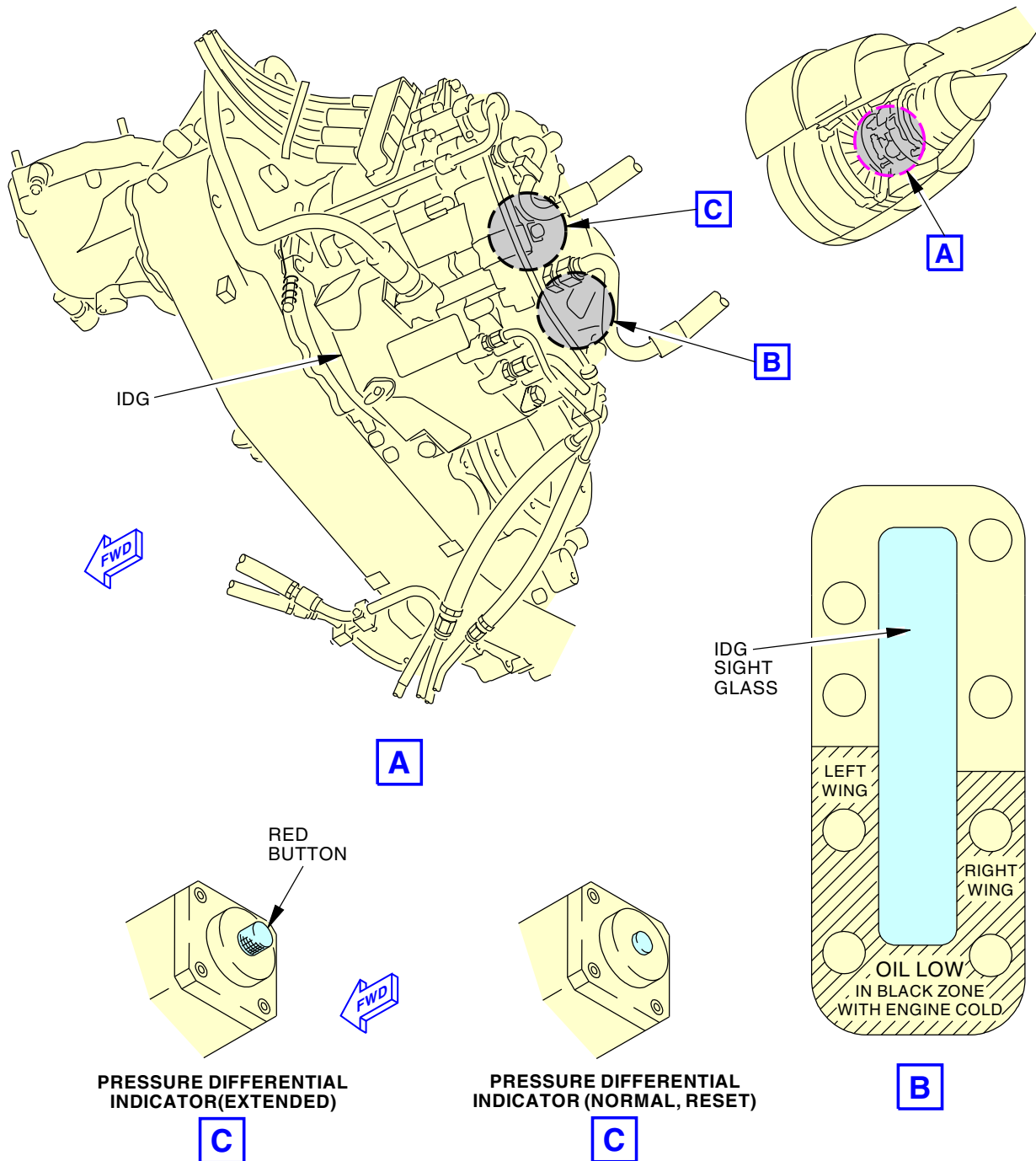
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IDG Oil Level Check
Figure 302/12-22-07-990-805

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TASK 12-22-07-200-802

4. IDG Oil Filter Blocked Condition Check

(Figure 302 (Sheet 1))

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task has these checks:
 - (a) IDG oil filter blocked condition check from the Multi Function Display (MFP).
 - (b) IDG oil filter blocked condition check from the IDG.
- (2) You can do a check of the IDG oil filter from the MFD or the IDG.

B. References

Reference	Title
24-11-01-000-801-001	IDG Removal (P/B 401)
24-11-01-400-801-001	IDG Installation (P/B 401)
24-11-02-200-801	IDG Oil Filter Inspection/Check (P/B 201)
24-22-00-860-801	Supply Primary External Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

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

D. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

E. IDG Oil Filter Blocked Condition Check from the MFD

SUBTASK 12-22-07-860-010

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

SUBTASK 12-22-07-860-011

- (2) Get access to the electrical maintenance page (TASK 31-61-00-800-804).

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SUBTASK 12-22-07-860-012

- (3) Make sure the electrical maintenance page display NORMAL for the associated IDG.

SUBTASK 12-22-07-860-013

- (4) If the electrical maintenance page display "--" or BLOCKED for the associated IDG, then do the oil filter blocked condition check from the IDG.

F. IDG Oil Filter Blocked Condition Check from the IDG

SUBTASK 12-22-07-010-005

 WARNING	DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine

423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine

425AL	Left Thrust Reverser, Right Engine

SUBTASK 12-22-07-210-002

- (2) Examine the differential pressure indicator.

- (a) Make sure the differential pressure indicator (red button) is not extended.
- (b) If the differential pressure indicator (red button) is extended and the operator chooses not to use the alternate procedure, then do the following:

- 1) Replace the IDG. To replace the IDG,

These are the tasks:

IDG Removal, TASK 24-11-01-000-801-001,

IDG Installation, TASK 24-11-01-400-801-001.

- (c) If the differential pressure indicator (red button) is extended, then the following alternate steps may be done:

NOTE: Sunstrand SIL 327 contains additional information about the alternate DPI extension procedure.

- 1) Check the differential pressure indicator (DPI) decal on the IDG for the number of DPI extensions that have occurred on the IDG.

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- a) If this is the fourth (4th) DPI extension, then replace the IDG. To replace the IDG,
These are the tasks:
IDG Removal, TASK 24-11-01-000-801-001,
IDG Installation, TASK 24-11-01-400-801-001.
- b) If this is not the fourth (4th) DPI extension, then continue.
- 2) Inspect the IDG filter for metal particles. To inspect the IDG filter, do this task: IDG Oil Filter Inspection/Check, TASK 24-11-02-200-801.
- 3) If no metal particles are visible and there are no EICAS or maintenance messages, then do the following:
 - a) Reset the differential pressure indicator (red button).
 - b) Change the IDG oil. To change the oil, do this task: IDG Oil Change, TASK 12-22-07-600-802 .
 - c) Mark the next unmarked number on the IDG DPI decal by rubbing the number with a blunt tool or by blacking out the number with a permanent ink marker.

G. Put the Airplane Back to Its Usual Condition.

SUBTASK 12-22-07-410-005



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
 - (a) To close the left thrust reversers, do this task:
Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00

<u>Number</u>	<u>Name/Location</u>
415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
 - (b) To close the left fan cowl panels, do this task:
Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00

<u>Number</u>	<u>Name/Location</u>
413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
 - (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
 - (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

————— END OF TASK —————

TASK 12-22-07-700-801

5. IDG Remote Oil Level Sensing System Check

A. General

- (1) This task has this check:
 - (a) IDG Remote Oil Level Sensing System Check.

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B. Location Zones

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

C. IDG Remote Oil Level Sensing System Check

SUBTASK 12-22-07-750-001

- (1) Do this task: IDG Oil Level Check, TASK 12-22-07-200-803.
 - (a) Perform both the IDG Oil Level Check from the Multi Function Display (MFD) and the IDG Oil Level Check from the Sightglass.
 - (b) Compare both of these IDG oil level readings and verify that the reading from the MFD is the same as the reading from the sightglass.

———— **END OF TASK** ————

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BACKUP GENERATOR - SERVICING (OIL CHANGE)

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains the task to change the oil in the backup generator system.

TASK 12-22-09-600-802

2. Backup Generator Oil Change

(Figure 301)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) This task gives instructions to change the oil in the backup generator system.

B. References

Reference	Title
12-13-07-600-801	Backup Generator Oil Fill (P/B 301)
24-25-02-000-803-002	Backup Generator Oil Filter Removal (P/B 401)
24-25-02-400-803-002	Backup Generator Oil Filter Installation (P/B 401)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1537	Cart - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

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D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
G50003 [P05-287]	Lockwire - MS20995C20, Corrosion-Resistant Steel - 0.020 Inch (0.508mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	24-25-01-02B-525	ARO ALL

F. Location Zones

Zone	Area
411	Engine, Left
421	Engine, Right

G. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine

H. Procedure

SUBTASK 12-22-09-010-004



WARNING

DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:

- (a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.
- (b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.
- (c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.
- (d) For the left fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

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

413AL	Left Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine

- (e) For the left thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

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

415AL	Left Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine

SUBTASK 12-22-09-860-004

- (2) Release the pressure from the backup generator:

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- (a) Open the dust cap from the overflow valve.
- (b) Connect the overflow coupling to the overflow hose.
- (c) Put the free end of the overflow hose into an oil resistant container (5 gal)(19 Liter), STD-1055.



WARNING

WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE TO THE OVERFLOW DRAIN COUPLING, PUT A RAG AROUND THE FITTING. THE RAG WILL PREVENT THE OIL SPRAY CAUSED BY PRESSURE IN THE IDG CASE. HOT OIL CAN CAUSE INJURIES.



CAUTION

DO NOT DISCONNECT THE OIL OVERFLOW HOSE AND COUPLING FROM THE OVERFLOW DRAIN VALVE UNTIL YOU COMPLETE THE SERVICING AND THE OIL OVERFLOW DECREASES TO DROPS. IF THE HOSE AND COUPLING ARE DISCONNECTED FROM DRAIN VALVE BEFORE YOU COMPLETE THE SERVICING, THIS CAN CAUSE OIL OVERFILL CONDITION IN THE GENERATOR. AN OIL OVERFILL CONDITION CAN CAUSE DAMAGE TO THE GENERATOR DURING OPERATION.

- (d) Connect the overflow coupling and the overflow hose to the overflow drain valve.
NOTE: It is usual for some oil to drain.
- (e) Let the oil that drains from the overflow hose flow into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 12-22-09-860-005

- (3) Put a oil resistant container (5 gal)(19 Liter), STD-1055 under the case drain plug.

SUBTASK 12-22-09-020-004



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (4) Do the steps that follow to remove the case drain plug [2]:



CAUTION

USE TWO WRENCHES WHEN YOU LOOSEN OR TIGHTEN THE CONNECTION. ONE WRENCH WILL HOLD ONE SIDE OF THE CONNECTION IN ITS POSITION. ONE WRENCH WILL TURN THE OTHER SIDE OF THE CONNECTION. IF YOU DO NOT OBEY THIS TWO-WRENCH PROCEDURE, YOU CAN CAUSE DAMAGE TO THE CONNECTION COMPONENTS.

- (a) For improved access to the case drain plug [2], remove the spacer seepage line [3].
- (b) Remove the case drain plug [2] and let the oil flow into the oil resistant container (5 gal)(19 Liter), STD-1055.

SUBTASK 12-22-09-020-005

- (5) Remove and discard the o-ring [1] from the case drain plug [2].

SUBTASK 12-22-09-960-002

- (6) Replace the oil filter (TASK 24-25-02-000-803-002 and TASK 24-25-02-400-803-002).

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SUBTASK 12-22-09-480-002

- (7) Connect the fill coupling and the pressure fill hose from the service engine oil servicing cart, COM-1537 to the pressure fill valve.

SUBTASK 12-22-09-860-006

- (8) Use the service engine oil servicing cart, COM-1537 to put oil, D00068 or oil, D00071 into the backup generator until one of these two conditions occur:
- (a) The color of the oil that come out of the case drain is the same as the color of the oil in the service cart.
 - (b) 1 gal (4 l) of oil flows from the backup generator case drain.

SUBTASK 12-22-09-420-002

- (9) Do the steps that follow to install the case drain plug [2]:
- (a) Lubricate the new o-ring [1] with oil, D00068 or oil, D00071.
 - (b) Install the new o-ring [1] on the case drain plug [2].
 - (c) Install the case drain plug [2] and tighten to 40 +15 / -0 in-lb (4.5 +1.7 / -0.0 N·m).
 - (d) Install the MS20995C20 lockwire, G50003 [P05-287] on the case drain plug [2].

SUBTASK 12-22-09-410-004



USE TWO WRENCHES WHEN YOU LOOSEN OR TIGHTEN THE CONNECTION. ONE WRENCH WILL HOLD ONE SIDE OF THE CONNECTION IN ITS POSITION. ONE WRENCH WILL TURN THE OTHER SIDE OF THE CONNECTION. IF YOU DO NOT OBEY THIS TWO-WRENCH PROCEDURE, YOU CAN CAUSE DAMAGE TO THE CONNECTION COMPONENTS.

- (10) Install the spacer seepage line [3].
- (a) Tighten the fittings to 260 +20 / -0 in-lb (29 +3 / -0 N·m).

SUBTASK 12-22-09-610-002

- (11) Do this task: Backup Generator Oil Fill, TASK 12-13-07-600-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 12-22-09-410-005



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser on the applicable engine:
- (a) To close the left thrust reversers, do this task:
Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|------------------------------------|
| 415AL | Left Thrust Reverser, Left Engine |
| 425AL | Left Thrust Reverser, Right Engine |
- (b) To close the left fan cowl panels, do this task:
Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|----------------------------------|
| 413AL | Left Fan Cowl Panel, Left Engine |

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

423AL	Left Fan Cowl Panel, Right Engine

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
- (d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

———— **END OF TASK** ————

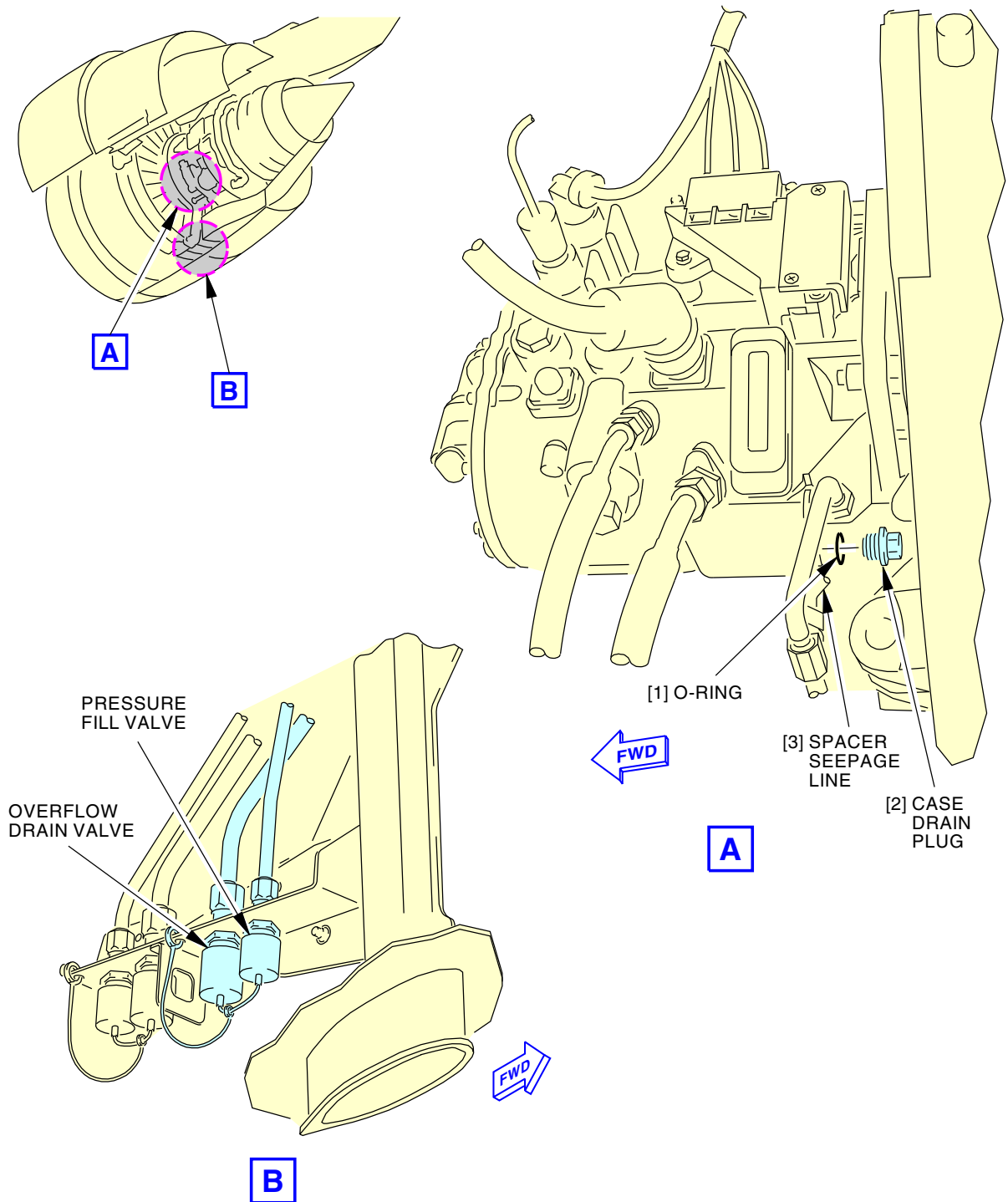
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Backup Generator Oil Change
Figure 301/12-22-09-990-803

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AIRPLANE (FILTER IDENTIFICATION) - SERVICING

1. General

- A. This section provides a list of airplane system filters that require scheduled cleaning or replacement. A complete list of required inspections, cleanings and replacement intervals can be found in the Maintenance Planning Document (MPD).
- B. This procedure has one tasks:
- (1) Identify filters that require servicing.

TASK 12-23-01-800-801

2. Filter Identification

A. Procedure

SUBTASK 12-23-01-800-001

- (1) In the (Table 301), find the list of airplane system filters that require scheduled cleaning or replacement.

Table 301/12-23-01-993-801 Filter Identification

FILTERS	CHAPTER	TYPE	#/AIRP	ZONE	ENGINE TYPE
AIR CONDITIONING					
Upper Recirculation Air Filter	21-25-02	Disposable	4	234, 254	All
Lower Recirculation Air Filter	21-25-08	Disposable	4	121, 122	All
Galley Ventilation Filters	21-26-03	Disposable	1/galley	variable	All
Equipment Cooling Air Filters	21-27-02	Restorable	1	121	All
Positive Pressure Relief Filter	21-32-02	Disposable	2	121	All
ELECTRICAL POWER					
IDG Oil Filter	24-11-02	Disposable	2 or 4	400	All
Backup Generator Oil Filter	24-25-02	Disposable	2	400	All
Equipment Cooling Air Filters	21-27-02	Restorable	1	121	All
Positive Pressure Relief Filter	21-32-02	Disposable	2	121	All
ELECTRICAL POWER					
IDG Oil Filter	24-11-02	Disposable	2	400	All
Backup Generator Oil Filter	24-25-02	Disposable	2	400	All
HYDRAULICS					
Reservoir Pressurization Filter	29-11-25	Restorable	3	144, 434, 444	All
WATER AND WASTE					
Liquid Separator Air Filter	38-32-02	Restorable	3	161	All
Vacuum Blower Air Filter	38-32-06	Restorable	2	161	All
Compressor Inlet Air Filter	38-42-02	Disposable	1	162	All
APU Duct Bleed Air Inline Filter	38-42-10	Disposable	1	166	All

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Table 301/12-23-01-993-801 Filter Identification (Continued)

FILTERS	CHAPTER	TYPE	#/AIRP	ZONE	ENGINE TYPE
ENGINE FUEL Fuel Pump Filter	73-11-02	Disposable	2	411, 421	GE, 4000

———— **END OF TASK** ————

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AIRPLANE CLEANING AND POLISHING - SERVICING

1. General

- A. This procedure has these tasks:
 - (1) Clean (wet wash) the external surfaces of the airplane.
 - (2) Clean (waterless wash) the external surfaces of the airplane.
 - (3) Polish the external surfaces of the airplane.
- B. Use this procedure to clean and polish the external surfaces of the airplane. Clean the external surfaces frequently to help prevent corrosion and to extend the life of the airplane structure. Clean the surfaces that do not have paint more frequently than the painted surfaces.
- C. Failure to remove coverings from static ports or covers from pitot probes before flight may cause large errors in airspeed-sensing and altitude-sensing signals, which may lead to loss of safe flight.

TASK 12-25-01-100-801

2. Clean (Wet Wash) the External Surfaces of the Airplane

A. General

- (1) This section includes these procedures:

NOTE: Boeing considers water pressure above 80 psi (552 kPa) to be “high pressure”.

 - (a) Remove light material (dust and dirt) from smooth surfaces
 - (b) Remove moderately heavy material (oil and mud) from smooth surfaces
 - (c) Remove heavy material (grease and exhaust particles) from smooth surfaces
 - (d) Remove material around sensitive components
 - (e) Remove unwanted hydraulic fluid
 - (f) Clean with foam.
- (2) Use the Remove Material Around Sensitive Components procedure to clean the areas that contain mechanical, electrical, or hydraulic components. These areas include the wheel wells, flight control surfaces, and landing gear.



WARNING

WEAR CLOTHING AND EQUIPMENT THAT WILL PREVENT INJURY WHEN YOU CLEAN THE AIRPLANE. THE LIQUIDS USED IN THIS PROCEDURE CAN CAUSE INJURY TO SKIN AND EYES.

- (3) Use this procedure to help decrease filiform corrosion under paint on clad aluminum surfaces. Clean the external surfaces frequently to help prevent corrosion and to extend the life of the airplane structure. Clean the surfaces that do not have paint more frequently than the painted surfaces.
- (4) When moderately heavy or heavy material removal is necessary, remove the heavier material first. Then clean the airplane with the procedure for light material removal.
- (5) To clean large areas, use non-atomizing spray equipment, swabs, and brushes. To clean small areas, use rags, brushes, and sponges. Do not clean an area so large that the cleaner dries on the surface before you can flush it with water.
- (6) To clean the windows in the flight compartment, do this task: Flight Compartment Glass Window - Inner Surface Cleaning, TASK 12-16-02-100-801.
- (7) To clean the windows in the passenger compartment, do this task: Clean the Passenger Windows, TASK 12-16-03-100-801.

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- (8) All cleaning materials should meet the requirements of D6-17487, Evaluation of Airplane Maintenance Materials.

B. References

Reference	Title
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
12-16-02-100-801	Flight Compartment Glass Window - Inner Surface Cleaning (P/B 301)
12-16-03-100-801	Clean the Passenger Windows (P/B 301)
12-21	AIRPLANE LUBRICATION
20-10-27-400-801	Attach Flight Control and Nacelle Surfaces Personnel Equipment Shock Absorbing Lanyard (P/B 201)
20-41-00-910-801	Static Grounding (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
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)
51-24-09 P/B 701	CORROSION-INHIBITING COMPOUND - CLEANING/PAINTING

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-1519	Cover - Protective, Total Air Temperature Probe Part #: FTC102 Supplier: 0P9C7
COM-2497	Cover - Probe, Pitot Static Part #: KPC3-825-8 Supplier: 0P9C7
COM-2499	Cover - Vane, Angle of Attack Part #: R/C-AOAC-2 Supplier: 0P9C7
COM-2500	Cover - Protective, Main Landing Gear Wheels/Brakes
COM-2519	Cover - Protective, Nose Landing Gear Wheels Part #: FC-777NLGTC-S Supplier: 7S813
SPL-1513	Cover - Probe, Ice Detector Part #: 0061BN1 Supplier: 59885
SPL-2498	Pole - Removal/Installation, Pitot Static Probe Cover Part #: A10002-9 Supplier: 81205 Opt Part #: A10002-1 Supplier: 81205
SPL-10698	Cover, Inlet, GE9X Part #: FC-GE90-11B-EIC Supplier: 7S813
SPL-10699	Plug - Thrust Reverser, GE90-115B Part #: RA70301 Supplier: 2R201
SPL-10700	Plug - Exhaust Nozzle, GE90-115B Part #: RA70302 Supplier: 2R201

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Reference	Description
SPL-14189	Protective Cover - AOA Vane Part #: C10004-1 Supplier: 81205
STD-1086	Gloves - Rubber
STD-1137	Glasses - Safety

D. Consumable Materials

Reference	Description	Specification
B00005	Cleaner - Alkaline - Cee Bee 280	
B00008	Cleaner - Alkaline - Oakite 204	
B00012	Cleaner - Alkaline - Turco Jet Clean C	
B00013	Cleaner - Alkaline - Dubois C-1102	
B00014	Cleaner - Zip-Chem Products Calla 301 Heavy Duty Cleaner	
B00016	Cleaner - Alkaline - TEC Formula No. 1	
B00017	Cleaner - Alkaline - Pace B-82 (Formerly Pacific B-82)	BMS11-12
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00090	Solvent - Inhibited Trichloroethane 1,1,1	MIL-T-81533
B00402	Cleaner - Aerospace Equipment	MIL-PRF-87937
B50114	Cleaner - General Purpose, Super Bee 210	AMS 1526A,AMS 1530B,D6-17487 Rev N,D6-7127 Rev K, DPM 5216
B50301	Cleaner - Aircraft, Exterior, Interior, Heavy Duty	
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)
G00291	Tape - Aluminum Foil, Scotch 425	AMS-T-23397 / L-T-80
G02219	Tape - Yellow Vinyl Adhesive, Scotch Brand No.471, 1.5 Inches (38.1 mm) Wide	
G02443	Tape - Barricade, Non-Adhesive, Orange, 3 (76 mm) Inches Wide, 4 mils (0.102 mm) Thick, "REMOVE BEFORE FLIGHT"	
G02444	Tag - Red Paper, "STATIC PORTS COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G02447	Tag - Red Paper, "PITOT PROBES COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G51215	Tag - Red Paper, "ANGLE OF ATTACK COVERED" - 3 Inches (76.2 Mm) Wide, 6 Inches (152.4 Mm) Long	
G51270	Tape - Masking, Intertape PG777	

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E. Prepare to Clean the Airplane



DO NOT LET THE CLEANER DRY. THE DRIED CLEANER CAN CAUSE CORROSION AND DAMAGE TO THE AIRPLANE SURFACE.

SUBTASK 12-25-01-800-001

- (1) For alkaline cleaners (cleaner, B00402), mix the cleaners in the proportions shown in Table 301.

NOTE: These cleaners are used for light material removal.

Table 301/12-25-01-993-801 Water Base Alkaline Cleaners

Dilution Ratios (Number of Volumes of Water per One Volume of Cleaner)			
Cleaner	Lightly Dirty	Moderately Dirty	Very Dirty
Pace B-82 alkaline cleaner, B00017	7	3	2
Cee Bee 280 cleaner, B00005	10	4	2
Oakite 204 cleaner, B00008	10	4	2
TEC Formula No. 1 cleaner, B00016	10	4	2
Dubois C-1102 cleaner, B00013	10	4	3
Calla 301 cleaner, B00014	10	4	3
Turco Jet Clean C cleaner, B00012	20	5	3
Super Bee 210 cleaner, B50114	4	3	2
Ardrox 1900B cleaner, B50301	10	7	5

SUBTASK 12-25-01-800-002

- (2) For solvent emulsion cleaners, mix the cleaners in the proportions shown in Table 302.

NOTE: These cleaners are used for moderate material removal.

Table 302/12-25-01-993-802 Solvent Emulsion Cleaners

Dilution Ratio (Number of Volumes of Water per Volume of Cleaner)		
Cleaner	Water	Cleaning Solvent
Any Cleaner in Table 301	3 to 7	1

SUBTASK 12-25-01-100-002

- (3) For heavy duty cleaning, mix the cleaner in the proportions shown in Table 303.

Table 303/12-25-01-993-803 Heavy Duty Cleaners

Dilution Ratio (Number of Volumes of Water per Volume of Cleaner)		
Cleaner	Water	Cleaning Solvent
Super Bee 210 cleaner, B50114	1	1 to 3
Ardrox 1900B cleaner, B50301	0	1

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SUBTASK 12-25-01-500-001



KEEP THE SOLVENTS AWAY FROM SOURCES OF HEAT, FIRE OR SPARKS. IF YOU DO NOT, AN EXPLOSION CAN OCCUR.

DO NOT PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES OR CLOTHING. DO NOT BREATHE THE VAPORS. WEAR PROTECTIVE CLOTHING AND EYE PROTECTION. MAKE SURE THERE IS A GOOD FLOW OF CLEAN AIR. IN A CONFINED SPACE, USE MECHANICAL VENTILATION FOR RESPIRATORY PROTECTION. INJURY TO PERSONS CAN OCCUR.

- (4) Move all of the equipment that you will use with flammable solvents away from sources of heat.

SUBTASK 12-25-01-860-001

- (5) Do this task: Static Grounding, TASK 20-41-00-910-801.

SUBTASK 12-25-01-860-002

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

SUBTASK 12-25-01-840-001

- (7) Close all of the passenger doors, cargo doors, emergency exits, and access doors and panels.

NOTE: If the doors cannot be closed because of other servicing, be careful that no fluid gets into the cabin area.

SUBTASK 12-25-01-840-002



WHEN THERE ARE COVERS ON THE STATIC PORTS, MAKE SURE THAT PERSONNEL CAN SEE THE CONDITION FROM THE GROUND. COVERS ON STATIC PORTS CAN CAUSE LARGE ERRORS IN AIRSPEED AND ALTITUDE SIGNALS. THIS IS DANGEROUS DURING FLIGHT.



WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE COVERS CAN COME OFF AND DAMAGE ENGINES.



KEEP CLEANING AGENTS OUT OF AREAS THAT CONTAIN MECHANICAL, ELECTRICAL, OR HYDRAULIC COMPONENTS. CLEANING AGENTS THAT GO INTO THESE AREAS CAN REMOVE NECESSARY LUBRICANTS, FREEZE DURING AIRPLANE FLIGHT, OR CAUSE CORROSION.

- (8) Install covers on components to prevent contamination:



MAKE SURE THAT THE PITOT PROBE COVER IS IN GOOD CONDITION. FIBERS FROM THE COVER WITH OTHER CONTAMINATION CAN CAUSE A BLOCKAGE IN THE PROBE. THIS CAUSES DAMAGE TO THE PROBE.

- (a) Install a pitot static probe cover, COM-2497 on the pitot probes with the pitot static probe cover removal/installation pole, SPL-2498 (Figure 301).
- (b) Install the probe cover, SPL-1513 on the ice detector probes.
- (c) Cover the Angle-Of-Attack (AOA) vane (Figure 305).
- 1) Cover the AOA sensors with masking tape, G51270 solvent-resistant masking tape.

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- a) Apply masking tape, G51270 over the blade and plate.
NOTE: This is to allow easier removal of Scotch 425 aluminum tape.
- 2) Cover the masking tape, G51270 solvent-resistant tape with Scotch 425 Aluminum Foil Tape, G00291.
 - a) Shingle the aluminum foil tape from the plate up to the blade tip until all of the masking tape is covered.
- (d) Put angle of attack vane cover, COM-2499 (recommended) or AOA vane protective cover, SPL-14189 (optional) on the AOA sensors.
- (e) Install the probe cover, COM-1519 on the total air temperature probes.
- (f) Install the applicable covers on the engine inlets:
 - 1) GE90: inlet cover, SPL-10698
- (g) Install the applicable covers on the turbine exhausts:
 - 1) GE90: exhaust nozzle plug, SPL-10700
- (h) Install the applicable plugs in the fan reversers:
 - 1) GE90: thrust reverser plug, SPL-10699
- (i) Install a main landing gear wheels/brakes protective cover, COM-2500 on each main landing gear wheel/brake and a nose landing gear wheels protective cover, COM-2519 on each nose landing gear wheel.

SUBTASK 12-25-01-840-008

- (9) Attach a "PITOT PROBES COVERED" tag, G02447, to the left control wheel in the flight deck with wire.

SUBTASK 12-25-01-840-029

- (10) Attach an "ANGLE OF ATTACK COVERED" tag, G51215, to the left control wheel in the flight deck with wire.

SUBTASK 12-25-01-840-003



WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE COVERS CAN COME OFF AND DAMAGE ENGINES.



DO NOT SPRAY DETERGENT OR WATER DIRECTLY INTO OR AT THE OPENINGS IN THE LIST. IF YOU DO, DAMAGE TO THE AIRPLANE AND ENGINES CAN OCCUR.

- (11) Use yellow vinyl adhesive Scotch Brand No.471 tape, G02219 and black polyethylene sheet polyethylene film, G00252 to cover the following components, but do not seal them air-tight (Figure 302):
 - (a) Surge tank and fuel tank vents and fuel tank pressure relief valves (Figure 304)
 - (b) APU exhaust duct outlet port
 - (c) APU eductor scoop on the air inlet duct
 - (d) APU air/oil cooler opening
 - (e) Ram air inlet and outlet doors
 - (f) Forward and aft outflow valves

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(g) Positive Pressure Relief Valve

SUBTASK 12-25-01-840-009



WARNING

WHEN THERE ARE COVERS ON THE STATIC PORTS, MAKE SURE THAT PERSONNEL CAN SEE THE CONDITION FROM THE GROUND. COVERS ON STATIC PORTS CAN CAUSE LARGE ERRORS IN AIRSPEED AND ALTITUDE SIGNALS. THIS IS DANGEROUS DURING FLIGHT.



CAUTION

DO NOT SPRAY DETERGENT OR WATER DIRECTLY INTO OR AT THE STATIC PORTS. DAMAGE TO THE STATIC PORTS COULD OCCUR.



CAUTION

WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE COVERS CAN COME OFF AND DAMAGE ENGINES.

- (12) Use yellow vinyl adhesive Scotch Brand No.471 tape, G02219, and orange barricade tape, G02443 that has "REMOVE BEFORE FLIGHT" printed on it in black letters to cover the static ports in the following manner (Figure 301, Figure 303):



WARNING

DO NOT PUT VINYL ADHESIVE TAPE ON THE STATIC PORTS. THE TAPE, OR THE REMAINING CONTAMINATION AFTER YOU REMOVE THE TAPE CAN CAUSE LARGE ERRORS IN AIRSPEED, AND ALTITUDE SIGNALS. THIS MAKES FLIGHT DANGEROUS.

- (a) Clean the area around each static port with naphtha solvent, B00083 or equivalent, and a clean dry rag where you will put the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (Figure 303).
- (b) Put one end of approximately a 4 ft (1 m) piece of the orange barricade tape, G02443 over the holes of the static port and secure the upper edge with 5 inches of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (Figure 303, step 1 and 2).
 - 1) Smooth the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 on the airplane surface to make sure the bond is satisfactory.
- (c) Put a 5 in. (127 mm) piece of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 on each vertical edge of the barricade tape overlapping the first strip of adhesive tape (Figure 303, step 3).
- (d) Put an 8 in. (203 mm) piece of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 horizontally over the orange barricade tape, G02443, below the static port holes, overlapping the vertical strips of adhesive tape (Figure 303, step 4).
- (e) The orange barricade tape, G02443, should be allowed to stream down so it is visible from the ground.

SUBTASK 12-25-01-840-010

- (13) Attach a "STATIC PORTS COVERED" tag, G02444 printed on it in black letters, to the top of the left control wheel in the flight deck with wire.

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SUBTASK 12-25-01-840-004



WARNING

WEAR CLOTHING AND EQUIPMENT THAT WILL PREVENT INJURY WHEN YOU CLEAN THE AIRPLANE. THE LIQUIDS USED IN THIS PROCEDURE CAN CAUSE INJURY TO SKIN AND EYES.

- (14) Wear rubber glove, STD-1086 and safety glasses, STD-1137 to prevent injury to your skin and eyes.

SUBTASK 12-25-01-480-001

- (15) Do this task: Attach Flight Control and Nacelle Surfaces Personnel Equipment Shock Absorbing Lanyard, TASK 20-10-27-400-801.

SUBTASK 12-25-01-840-005

- (16) Do not let the tires stay in the liquid that was used to clean the airplane longer than the time necessary to clean the airplane.

SUBTASK 12-25-01-840-006



CAUTION

MAKE SURE THAT MIXTURE OR WATER DO NOT GET IN THE STEEL OR CARBON BRAKE HEAT-SINKS. CONTAMINATION CAN CAUSE DAMAGE TO CARBON BRAKES AND DECREASE BRAKE PERFORMANCE FOR CARBON AND STEEL BRAKES.

- (17) Make sure the brakes are properly covered.

SUBTASK 12-25-01-840-007



CAUTION

DO NOT USE AGED OR STRATIFIED CLEANING CONCENTRATES ON AIRCRAFT SURFACES. CORROSION, STAINING, AND OTHER HARMFUL EFFECTS COULD RESULT.

- (18) Examine the cleaner before you use it.
- (a) If cleaner does not look mixed, then mix it again.
 - (b) Examine the cleaner again after one hour.
 - 1) Discard the cleaner if it does not stay in a mixed condition.

F. Clean the Airplane

SUBTASK 12-25-01-110-001

- (1) Remove light material (dust and dirt) from smooth surfaces.
- (a) Move the flaps to the fully retracted position.



CAUTION

USE ONLY THE SPECIFIED SOLUTIONS IN THE SPECIFIED CONCENTRATIONS. IF YOU USE OTHER SOLUTIONS OR CONCENTRATIONS, DAMAGE TO EQUIPMENT CAN OCCUR.

- (b) Mix the water-base alkaline cleaner from Table 301 for the condition of the surface that you will clean.

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WARNING

DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.



CAUTION

KEEP THE NOZZLE OF SPRAY EQUIPMENT MORE THAN 12 INCHES AWAY FROM THE SURFACE OF THE AIRPLANE. THE SPRAY CAN CAUSE DAMAGE TO THE SURFACE.

- (c) Apply water to the area that you will clean.
- (d) Apply the cleaner to the applicable area with non-atomizing spray equipment, swabs, or brushes.
 - 1) To prevent scratches on the surface, soak the brushes in the cleaner before you use them.
- (e) Let the cleaner soak for approximately five minutes.
 - 1) If necessary, apply the cleaner again to keep the surface wet.
- (f) Rub the surface with a brush to help remove unwanted material.



CAUTION

YOU MUST IMMEDIATELY FLUSH THE CLEANING AGENT FROM THE SURFACES WITH WATER TO PREVENT DAMAGE. THE CLEANER CAN CAUSE CORROSION TO THE ALUMINUM ACOUSTICAL LININGS AND THE ALUMINUM STRUCTURAL SURFACES.

- (g) Flush the surface with clean, warm water (160°F (71°C) maximum).
- (h) Dry the wet surface with air or towels.

SUBTASK 12-25-01-110-002

- (2) Remove moderately heavy material (oil and mud) from smooth surfaces.

- (a) Move the flaps to the fully retracted position.

NOTE: To clean the flaps in the extended position, refer to the Remove Material Around Sensitive Components procedure.



WARNING

KEEP THE SOLVENTS AWAY FROM SOURCES OF HEAT, FIRE, OR SPARKS. HEAT OR SPARKS CAN CAUSE AN EXPLOSION. DO NOT LET THE SOLVENTS GET INTO YOUR EYES OR ON YOUR SKIN OR CLOTHING. USE EYE PROTECTION. MAKE SURE THAT YOU USE AIRFLOW EQUIPMENT WHEN YOU DO WORK IN A CLOSED SPACE. IF YOU DO NOT OBEY, YOU CAN CAUSE INJURY TO PERSONS.

- (b) Mix the solvent emulsion cleaner from Table 302.
- (c) Mix the cleaner until it is thick and creamy.

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WARNING

DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.



CAUTION

KEEP THE NOZZLE OF SPRAY EQUIPMENT MORE THAN 12 INCHES AWAY FROM THE SURFACE OF THE AIRPLANE. THE SPRAY CAN CAUSE DAMAGE TO THE SURFACE.



CAUTION

DO NOT LET THE SOLVENT EMULSION CLEANER TOUCH ACRYLIC WINDOWS OR RUBBER PARTS. THE SOLVENT EMULSION CLEANER WILL CAUSE DAMAGE TO ITEMS THAT CONTAIN ACRYLIC OR RUBBER.

- (d) Apply a heavy layer of cleaner to the applicable area with non-atomizing spray equipment, mops, or brushes.
- (e) Let the cleaner soak for five to ten minutes.
 - 1) If necessary, apply the cleaner again to keep the surface wet.
- (f) Rub the surface with a brush to help remove unwanted material.



CAUTION

YOU MUST IMMEDIATELY FLUSH THE CLEANING AGENT FROM THE SURFACES WITH WATER TO PREVENT DAMAGE. THE CLEANER CAN CAUSE CORROSION TO THE ALUMINUM ACOUSTICAL LININGS AND THE ALUMINUM STRUCTURAL SURFACES.

- (g) Flush the surface with clean, warm water (160°F (71°C) maximum).
- (h) Dry the wet surfaces with air or towels.

SUBTASK 12-25-01-110-003

- (3) Remove heavy material (grease and exhaust particles) from smooth surfaces.
 - (a) Use the procedure to remove moderately heavy material (oil and mud) from smooth surfaces with these changes:
 - 1) Use a heavy duty cleaner from Table 303.
 - 2) Let the cleaner soak for 15 minutes maximum.



CAUTION

USE THE CLEANER CAREFULLY. THE ABRASIVES IN THIS CLEANER CAN REMOVE THE FINISH ON CLAD ALUMINUM. THE CLEANER CAN ALSO DECREASE THE CORROSION RESISTANCE OF ANODIZED ALUMINUM. THIS CAN CAUSE DAMAGE TO THE SURFACE.

- 3) For stains that are not removed by the cleaners in Table 303, use Ceebee Majorclean.

SUBTASK 12-25-01-110-004

- (4) Remove material around sensitive components.

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YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO INSTALL THE DOOR LOCKS ON THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT INSTALL THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.
- (b) If you clean the flaps, extend them to the fully down position.
- (c) Clean electrical components per SWPM 20-10-04.
- (d) Mix the water-base alkaline cleaner from Table 301 for the condition of the surface that you will clean.
 - 1) For heavy material (grease and exhaust particles), mix the heavy duty cleaner from Table 303.



DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.

- (e) Apply the cleaner to the applicable area with swabs or brushes.
 - 1) To prevent scratches on the surface, soak the brushes in the cleaner before you use them.
- (f) Let the cleaner soak for approximately five minutes.
 - 1) If necessary, apply the cleaner again to keep the surface wet.



DO NOT REMOVE THE LUBRICANT FROM THE INTERNAL LUBRICATED AREAS. THEY MUST KEEP THE NECESSARY LUBRICANT. WIPE OFF ONLY THE EXTERNAL UNWANTED LUBRICANT.

- (g) Carefully rub the surface with a clean brush to help remove unwanted material.



YOU MUST IMMEDIATELY FLUSH THE CLEANING AGENT FROM THE SURFACES WITH WATER TO PREVENT DAMAGE. THE CLEANER CAN CAUSE CORROSION TO THE ALUMINUM ACOUSTICAL LININGS AND THE ALUMINUM STRUCTURAL SURFACES.

- (h) Flush the surface with clean, warm water (160°F (71°C) maximum).
- (i) Dry the wet surface with air or towels.



YOU MUST LUBRICATE ALL THE BEARINGS AND JOINTS IN THE AREA YOU CLEANED. THE LUBRICANT WILL REMOVE THE UNWANTED FLUIDS WHICH COULD FREEZE, OR CAUSE CORROSION TO THE BEARING OR THE JOINT. IF YOU DO NOT LUBRICATE THE BEARINGS AND JOINTS, DAMAGE TO THE COMPONENTS CAN OCCUR.

- (j) Lubricate all bearings and joints in the cleaned area as shown in applicable in AMM SECTION 12-21.

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- (k) Apply corrosion inhibiting compound as required in the cleaned area per CORROSION-INHIBITING COMPOUND - CLEANING/PAINTING, PAGEBLOCK 51-24-09/701 and CPM 20-60-00, PT 1.



YOU MUST CAREFULLY DO THE STEPS IN THE TASK BELOW TO REMOVE THE DOOR LOCKS FROM THE LANDING GEAR DOORS. THE DOORS CAN CLOSE QUICKLY IF YOU DO NOT REMOVE THE DOOR LOCKS CORRECTLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

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

SUBTASK 12-25-01-110-005

- (5) Remove unwanted hydraulic fluid.
- (a) Clean the unwanted hydraulic fluid with a mop or rags.



DO NOT USE WATER OR CLEANERS THAT CONTAIN FLAMMABLE SOLVENTS TO CLEAN WARM COMPONENTS. DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (b) Use the solvent, B00090 to clean the hydraulic fluid from warm components.

SUBTASK 12-25-01-110-006

- (6) Clean with foam.

NOTE: Use foam when it is possible that the cleaner will stay on the surface for up to 15 minutes.

- (a) Fill the tank of the foam generator.

NOTE: If you do not have a foam generator, mix the liquid quickly to make foam.

- 1) Use a liquid that contains one part of cleaner (from Table 301 or Oakite 74-L) and 10 to 20 parts of water.



DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT. HIGH-PRESSURE SPRAY EQUIPMENT CAN PUT LIQUIDS INTO BEARINGS, JOINTS, BRAKES, ELECTRICAL CONNECTORS, AND OTHER SEALED COMPONENTS. LIQUIDS THAT GO INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS. FREEZE DURING AIRPLANE FLIGHT CAN CAUSE LOSS OF AIRPLANE CONTROL AND POSSIBLE PERSONAL INJURY.



KEEP THE NOZZLE OF SPRAY EQUIPMENT MORE THAN 12 INCHES AWAY FROM THE SURFACE OF THE AIRPLANE. THE SPRAY CAN CAUSE DAMAGE TO THE SURFACE.

- (b) Apply water to the area you will clean.
- (c) Apply a heavy layer of foam cleaner.
- (d) Let the cleaner soak for 5 to 15 minutes.
- 1) If necessary, apply the cleaner again to keep the surface wet.
- (e) Rub the surface with a brush to help remove unwanted material.

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CAUTION

YOU MUST IMMEDIATELY FLUSH THE CLEANING AGENT FROM THE SURFACES WITH WATER TO PREVENT DAMAGE. THE CLEANER CAN CAUSE CORROSION TO THE ALUMINUM ACOUSTICAL LININGS AND THE ALUMINUM STRUCTURAL SURFACES.

- (f) Flush the surface with clean, warm water (160°F (71°C) maximum).
- (g) Dry the wet surface with air or towels.

G. Put the Airplane Back In Its Usual Condition

SUBTASK 12-25-01-840-019



WARNING

FAILURE TO REMOVE COVERS FROM PITOT PROBES BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



CAUTION

REMOVE ALL COVERS. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (1) If installed, remove the covers and plugs from the following components:



CAUTION

MAKE SURE THE PITOT-STATIC PROBE COVERS ARE IN GOOD WORKING CONDITION WITH NO EVIDENCE OF DAMAGE, ESPECIALLY FRAYING AROUND THE COVER OPENING. FRAYED FIBERS FROM THE COVER COMBINED WITH OTHER SUBSTANCES SUCH AS DIRT, GREASE AND FLUIDS CAN CAUSE OBSTRUCTION IN THE PROBE.

- (a) Pitot probes
- (b) Ice detector probes
- (c) Angle-of-Attack vane
- (d) Total air temperature probes
- (e) Engine inlets
- (f) Engine turbine exhausts
- (g) Fan reversers
- (h) Landing gear wheels/brakes

SUBTASK 12-25-01-840-012

- (2) Remove the "PITOT PROBES COVERED" tag, G02447 from the left control wheel in the flight deck.

SUBTASK 12-25-01-840-030

- (3) Remove the "ANGLE OF ATTACK COVERED" tag, G51215, from the left control wheel in the flight deck.

SUBTASK 12-25-01-840-013



WARNING

FAILURE TO REMOVE BARRICADE TAPE AND VINYL ADHESIVE TAPE FROM ALL OF THE STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.

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(WARNING PRECEDES)



REMOVE ALL BARRICADE TAPE AND VINYL ADHESIVE TAPE. ENGINES SHOULD NOT BE OPERATED WITH COVERINGS IN PLACE BECAUSE THE COVERINGS CAN COME OFF AND DAMAGE THE ENGINES.

- (4) Remove all orange barricade tape, G02443, covers, polyethylene sheet polyethylene film, G00252, and yellow vinyl adhesive Scotch Brand No.471 tape, G02219 from the following openings:
- (a) Static Ports
 - 1) Inspect each static port and if necessary use naphtha solvent, B00083, or equivalent, and a clean dry rag to remove residue, dirt and other contaminants from around the ports.
 - (b) Surge tank and fuel tank vents and fuel tank pressure relief valves

NOTE: If the pressure relief valve is found open, water may have entered the fuel tank. This water needs to be removed before flight.
 - (c) APU exhaust duct outlet port
 - (d) APU eductor scoop on the air inlet duct
 - (e) APU air/oil cooler opening
 - (f) Ram air inlet and outlet doors
 - (g) Forward and aft outflow valves
 - (h) Positive Pressure Relief Valve

SUBTASK 12-25-01-840-014

- (5) Remove the "STATIC PORTS COVERED" tag, G02444 from the left control wheel in the flight deck.

SUBTASK 12-25-01-860-003

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

SUBTASK 12-25-01-170-001

- (7) Drain the fuel from the fuel tank sump drains (TASK 12-11-02-680-801).

NOTE: A large quantity of water in the surge tank or in a fuel tank can indicate that water entered the tank during washing.

- (a) Continue to drain fuel/water from the tank until no water drains from the tank.

NOTE: Excess water in the fuel can cause engine operational issues including engine shutdown.

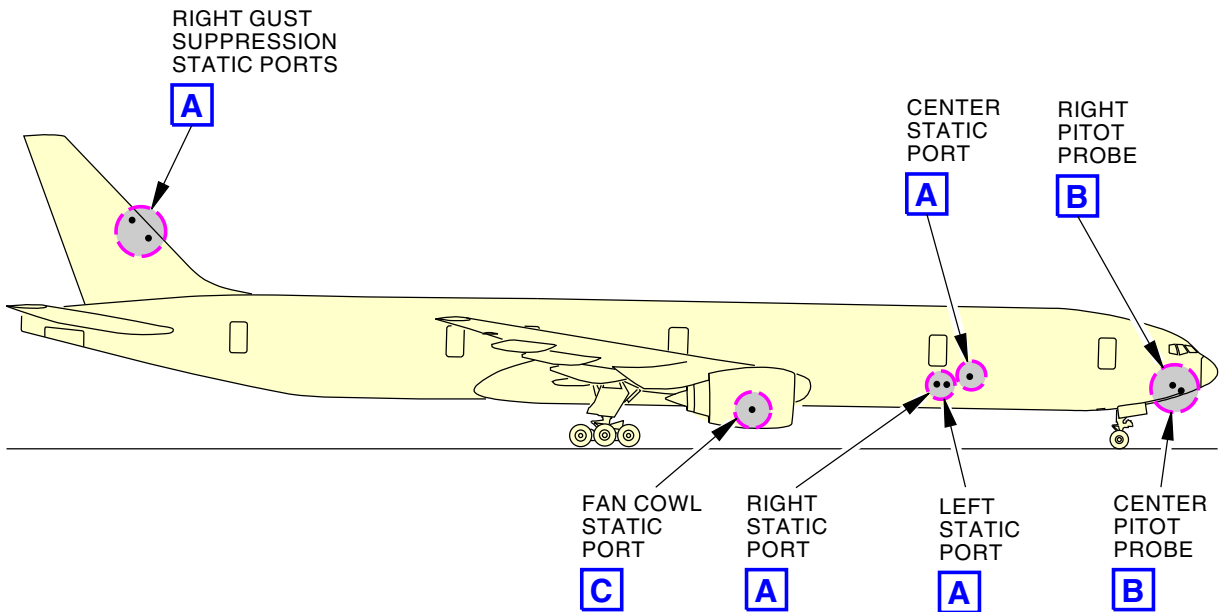
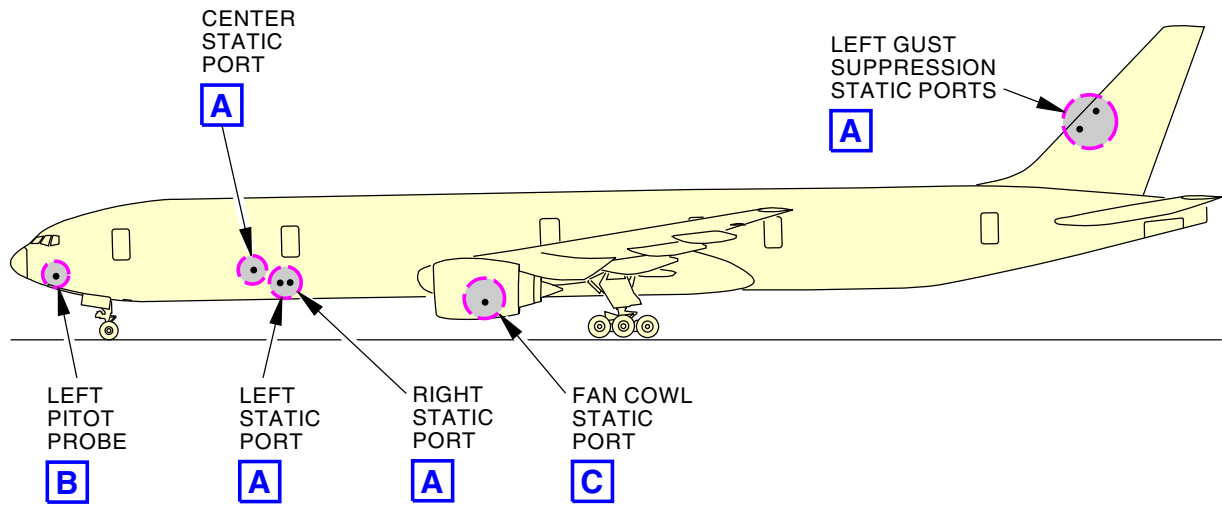
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ARO ALL

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G64907 S0006402263_V4

Pitot Static System - Component Location
Figure 301/12-25-01-990-804 (Sheet 1 of 2)

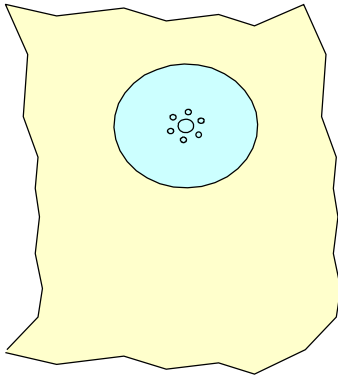
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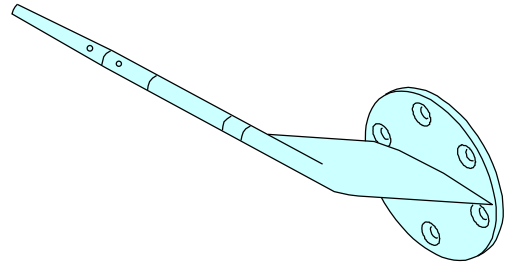
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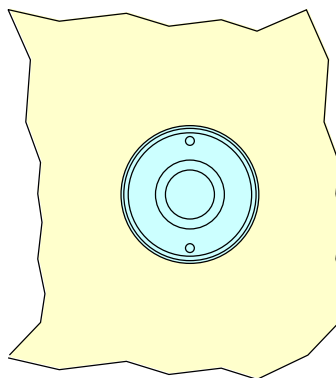
**LEFT, RIGHT AND CENTER STATIC PORT,
GUST SUPPRESSION STATIC PORTS
(EXAMPLE)**

A



**PITOT PROBE
(LEFT IS SHOWN, RIGHT
AND CENTER ARE OPPOSITE)**

B



FAN COWL STATIC PORT

C

G64911 S0006402264_V3

Pitot Static System - Component Location
Figure 301/12-25-01-990-804 (Sheet 2 of 2)

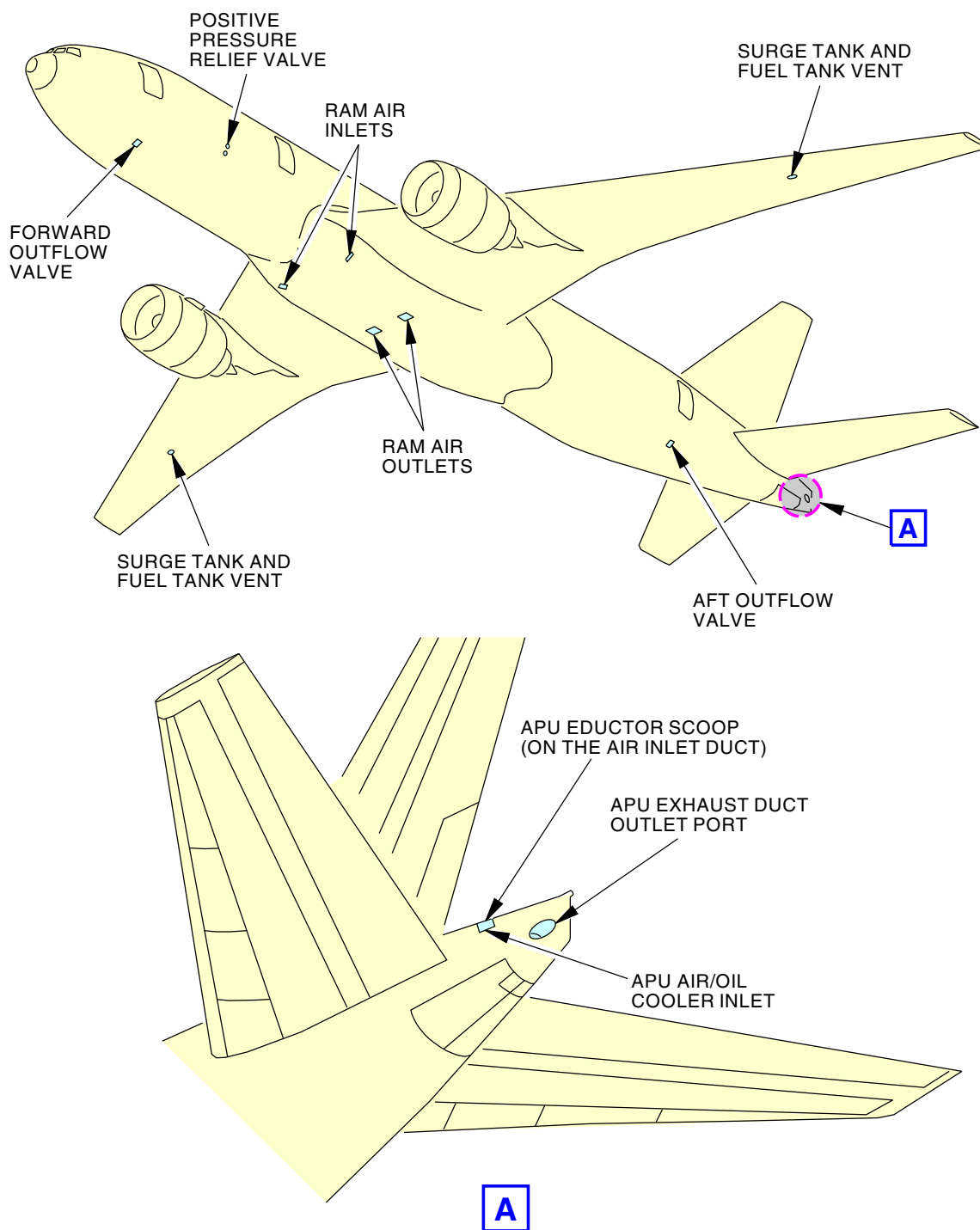
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H95394 S0006402266_V3

Component Locations
Figure 302/12-25-01-990-813

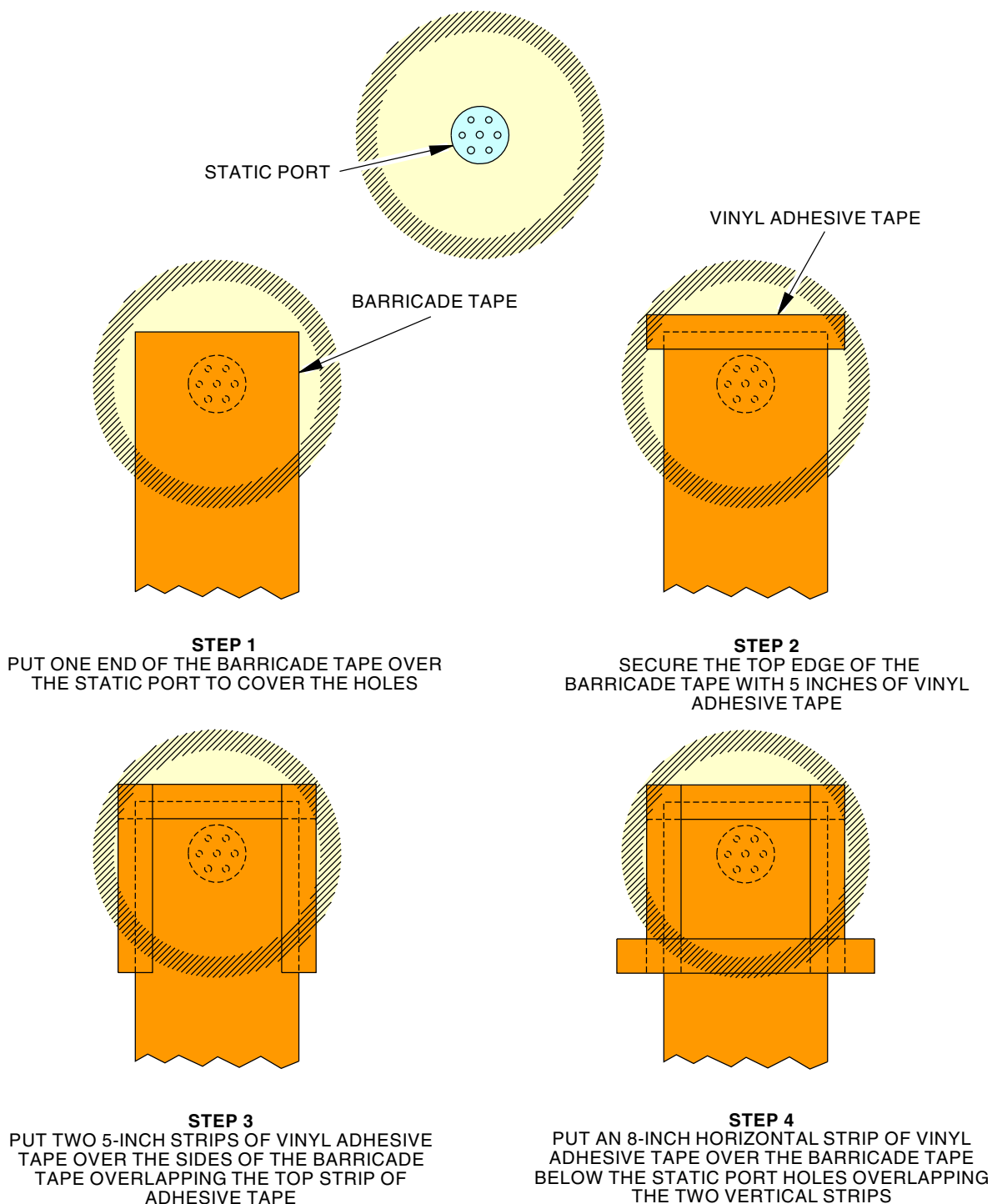
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G64912 S0006402265_V2

**Static Port Cover Procedure
Figure 303/12-25-01-990-805**

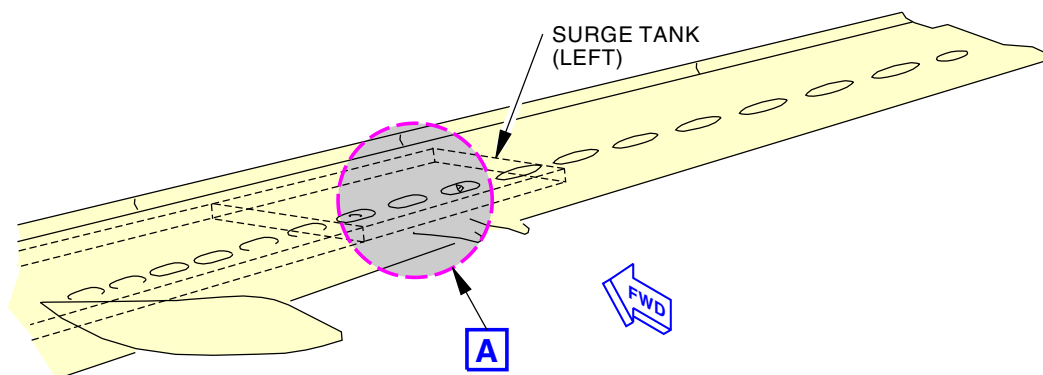
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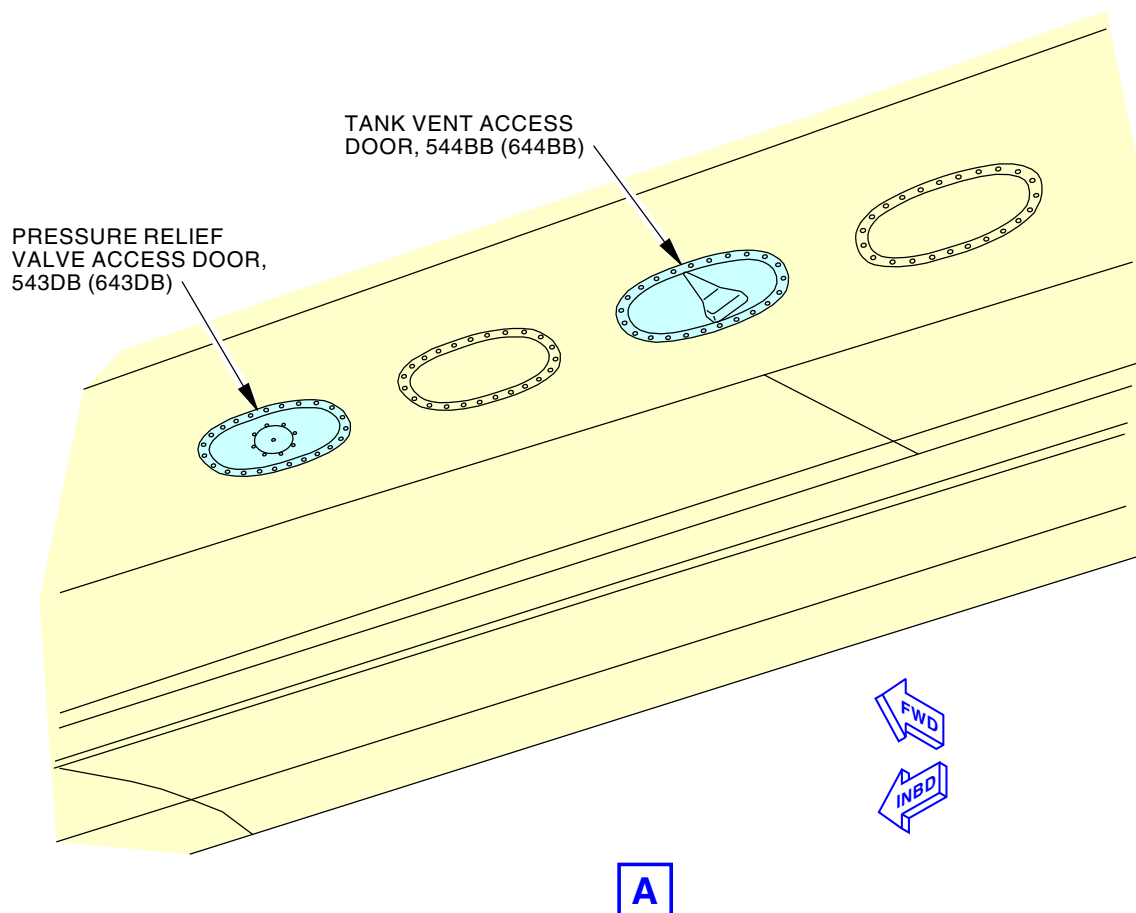
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**LEFT WING - 500 SERIES
(RIGHT WING - 600 SERIES IS EQUIVALENT)**



2507974 S0000589974_V1

**Surge Tank - Component Location
Figure 304/12-25-01-990-812**

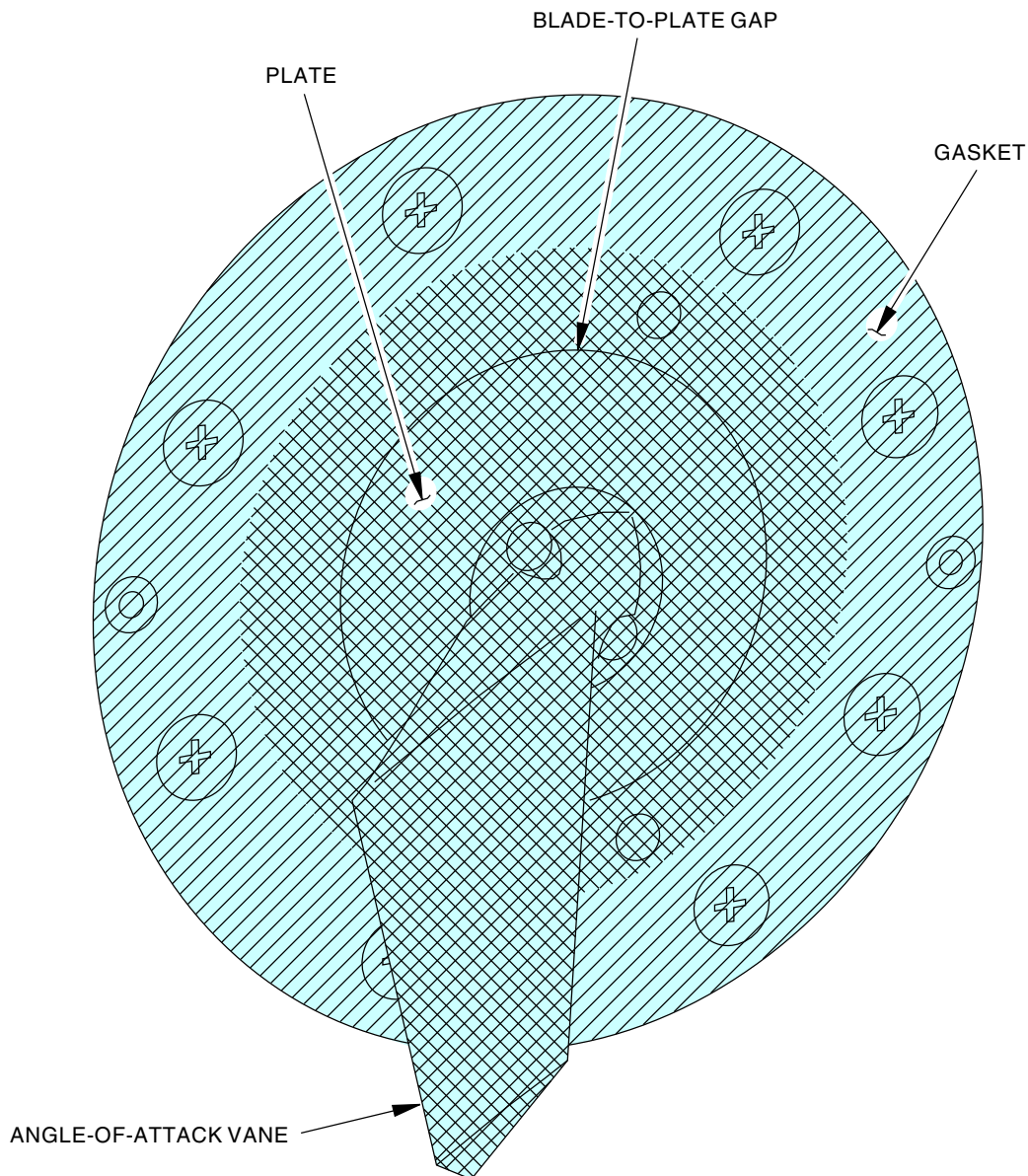
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MASK AREA FOR TEMPORARY PROTECTIVE COATING REMOVAL, FUSELAGE CLEANING AND APPLICATION OF CHEMICAL CONVERSION COATING, PRIMER, AND PAINT.



ADDITIONAL MASK AREA FOR APPLICATION OF CHEMICAL CONVERSION COATING, PRIMER, AND PAINT.

2156571 S0000472425_V3

**Angle-of-Attack Vane Tape Application Area
Figure 305/12-25-01-990-811**

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TASK 12-25-01-100-803

3. Clean (Waterless Wash) the External Surfaces of the Airplane

A. General

- (1) For all dry wash materials and dry wash systems, Boeing recommends diluting the dry wash material and washing the airplane according to the manufacturer's instructions.
- (2) To clean the windows in the flight compartment, do this task: Flight Compartment Glass Window - Inner Surface Cleaning, TASK 12-16-02-100-801.
- (3) To clean the windows in the passenger compartment, do this task: Clean the Passenger Windows, TASK 12-16-03-100-801.
- (4) Dry wash materials should not be used near the static ports.
- (5) All dry wash cleaning materials should meet the requirements of D6-17487, Evaluation of Airplane Maintenance Materials.

B. References

Reference	Title
12-16-02-100-801	Flight Compartment Glass Window - Inner Surface Cleaning (P/B 301)
12-16-03-100-801	Clean the Passenger Windows (P/B 301)
20-10-27-400-801	Attach Flight Control and Nacelle Surfaces Personnel Equipment Shock Absorbing Lanyard (P/B 201)
20-41-00-910-801	Static Grounding (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1086	Gloves - Rubber
STD-1137	Glasses - Safety

D. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
G02219	Tape - Yellow Vinyl Adhesive, Scotch Brand No.471, 1.5 Inches (38.1 mm) Wide	
G02443	Tape - Barricade, Non-Adhesive, Orange, 3 (76 mm) Inches Wide, 4 mils (0.102 mm) Thick, "REMOVE BEFORE FLIGHT"	
G02444	Tag - Red Paper, "STATIC PORTS COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G50492	Pad - 3M Scotch Brite 7448 Ultra Fine Pad	MIL-A-9962A Type III Grade AAA

E. Prepare to Clean the Airplane

SUBTASK 12-25-01-860-004

- (1) Do this task: Static Grounding, TASK 20-41-00-910-801.

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SUBTASK 12-25-01-860-005

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

SUBTASK 12-25-01-840-020

- (3) Close all of the passenger doors, cargo doors, emergency exits, and access doors and panels.

SUBTASK 12-25-01-840-021



WARNING

WHEN THERE ARE COVERS ON THE STATIC PORTS, MAKE SURE THAT PERSONNEL CAN SEE THAT CONDITION FROM THE GROUND. ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT COMPARTMENT TO SHOW THAT THE STATIC PORTS HAVE COVERS. COVERS ON THE STATIC PORTS CAN CAUSE LARGE ERRORS IN AIRSPEED AND ALTITUDE SIGNALS. THIS IS DANGEROUS DURING FLIGHT.



WARNING

DO NOT PUT VINYL ADHESIVE TAPE ON THE STATIC PORTS. THE TAPE, OR THE REMAINING CONTAMINATION AFTER YOU REMOVE THE TAPE CAN CAUSE LARGE ERRORS IN AIRSPEED, AND ALTITUDE SIGNALS. THIS MAKES FLIGHT DANGEROUS.

- (4) Use yellow vinyl adhesive Scotch Brand No.471 tape, G02219, and orange barricade tape, G02443 that has "REMOVE BEFORE FLIGHT" printed on it in black letters to cover the static ports in the following manner (Figure 306, Figure 307):
- Clean the area around each static port with naphtha solvent, B00083 or equivalent, and a clean dry rag where you will put the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (Figure 307).
 - Put one end of approximately a 4-foot piece of the orange barricade tape, G02443 over the holes of the static port and secure the upper edge with 5 inches of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 (Figure 307, steps 1 and 2).
 - Smooth the yellow vinyl adhesive Scotch Brand No.471 tape, G02219 on the airplane surface to make sure the bond is satisfactory.
 - Put a five-inch piece of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 on each vertical edge of the barricade tape overlapping the first strip of adhesive tape (Figure 307, step 3).
 - Put an 8-inch piece of yellow vinyl adhesive Scotch Brand No.471 tape, G02219 horizontally over the orange barricade tape, G02443, below the static port holes, overlapping the vertical strips of adhesive tape (Figure 307, step 4).
 - The orange barricade tape, G02443, should be allowed to stream down so it is visible from the ground.

SUBTASK 12-25-01-840-022

- (5) Attach a "STATIC PORTS COVERED" tag, G02444 printed on it in black letters, to the top of the left control wheel in the flight deck with wire.

SUBTASK 12-25-01-840-023

- (6) Wear rubber glove, STD-1086 and safety glasses, STD-1137 to prevent injury to your skin and eyes.

SUBTASK 12-25-01-840-024

- (7) Do this task: Attach Flight Control and Nacelle Surfaces Personnel Equipment Shock Absorbing Lanyard, TASK 20-10-27-400-801.

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F. Clean the Airplane

SUBTASK 12-25-01-110-007

- (1) Clean the airplane using the dry wash material.
 - (a) Move the flaps to the fully retracted position.
 - (b) Apply the dry wash material to the area that you will clean with a clean cloth or white Scotch-Brite 7448 pad, G50492.
 - (c) Allow the cleaning material to dry per the manufacturer's recommendations.
 - (d) Wipe the area with a clean, dry cloth.
 - (e) Check the area that has just been cleaned to make sure that all dirt and contaminants have been removed.

G. Put the Airplane Back In Its Usual Condition

SUBTASK 12-25-01-840-025



MAKE SURE THAT ALL BARRICADE TAPE, VINYL ADHESIVE TAPE, AND TAPE RESIDUE IS REMOVED FROM THE STATIC PORTS. IF THE HOLES BECOME CLOGGED WITH TAPE RESIDUE, INCORRECT AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS CAN OCCUR. THIS CAN CAUSE DANGEROUS FLIGHT CONDITIONS.

- (1) Remove all orange barricade tape, G02443 and yellow vinyl adhesive Scotch Brand No.471 tape, G02219 from the static ports.
 - (a) Inspect each static port and if necessary use naphtha solvent, B00083, or equivalent, and a clean dry rag to remove residue, dirt and other contaminants from around the ports.

SUBTASK 12-25-01-840-026

- (2) Remove the "STATIC PORTS COVERED" tag, G02444 from the left control wheel in the flight deck.

SUBTASK 12-25-01-840-027

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

————— **END OF TASK** —————

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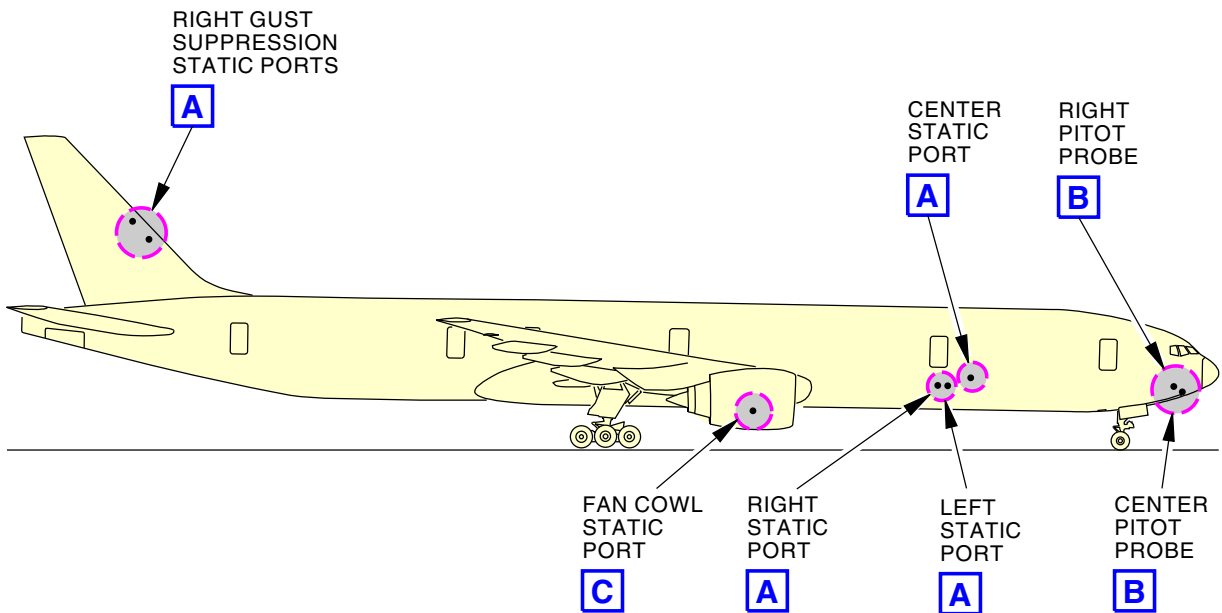
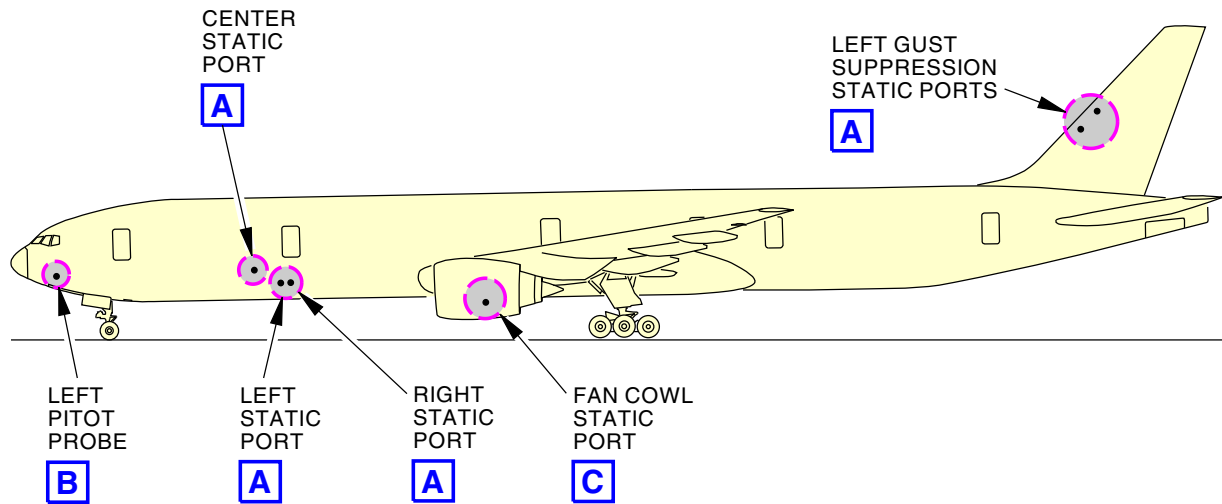
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Pitot Static System - Component Location
Figure 306/12-25-01-990-807 (Sheet 1 of 2)

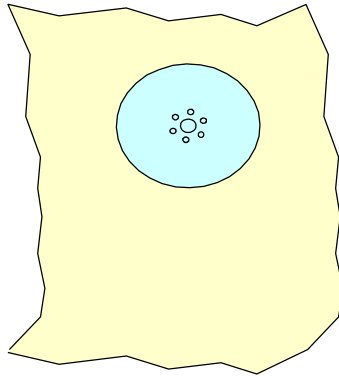
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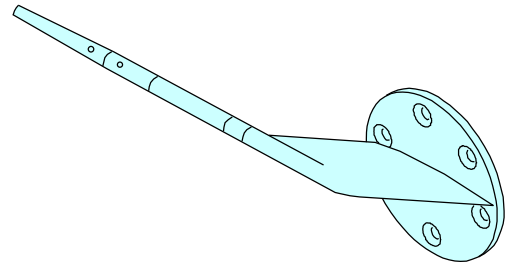
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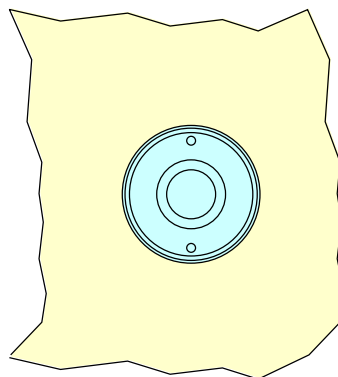
LEFT, RIGHT AND CENTER STATIC PORT,
GUST SUPPRESSION STATIC PORTS
(EXAMPLE)

A



PITOT PROBE
(LEFT IS SHOWN, RIGHT
AND CENTER ARE OPPOSITE)

B



FAN COWL STATIC PORT

C

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Pitot Static System - Component Location
Figure 306/12-25-01-990-807 (Sheet 2 of 2)

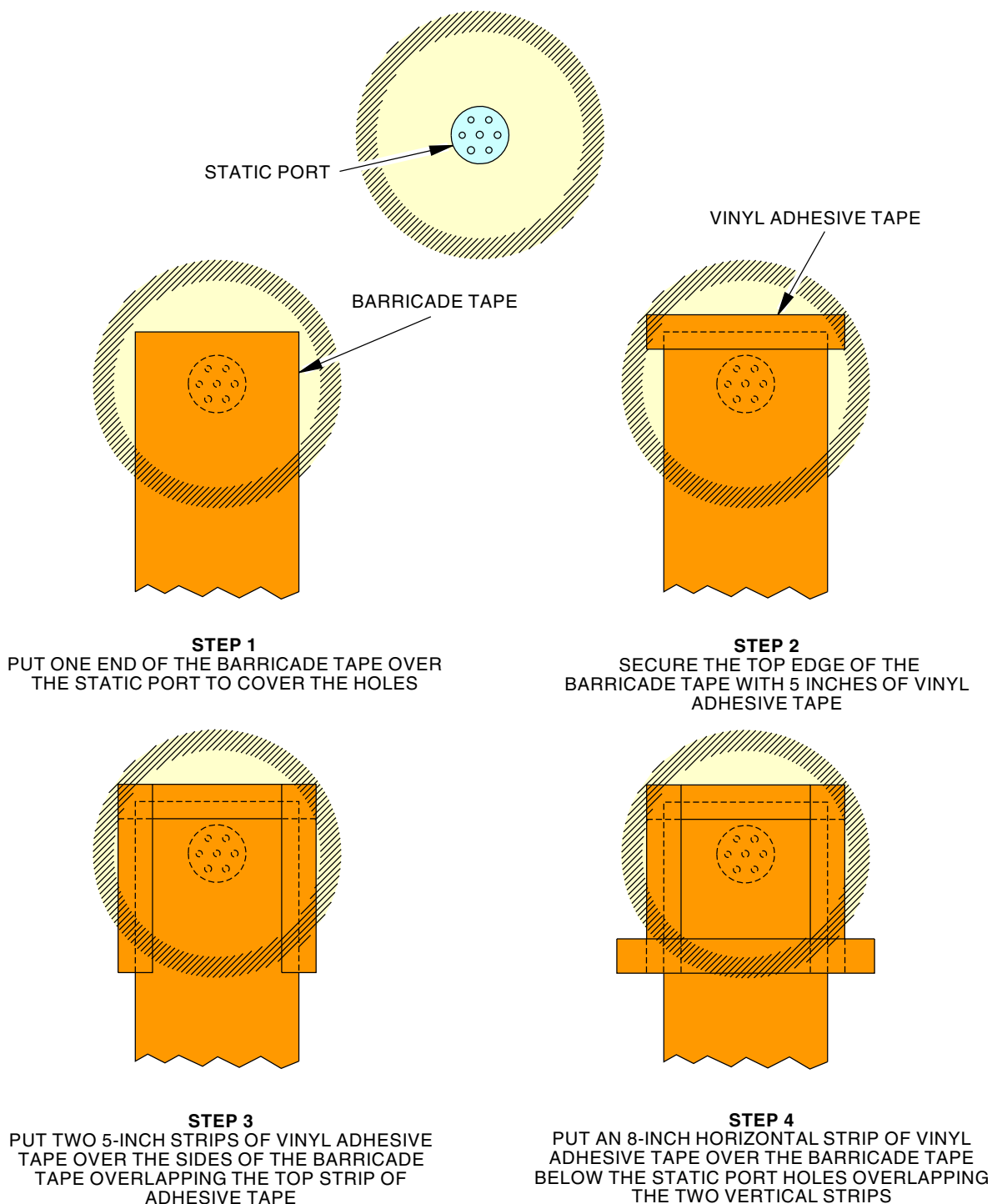
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**Static Port Cover Procedure
Figure 307/12-25-01-990-808**

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TASK 12-25-01-100-802

4. Polish the External Surfaces of the Airplane

A. References

Reference	Title
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)

B. Tools/Equipment

Reference	Description
STD-1205	Wheel - Buffer, Cotton Cloth, 80/92 Thread Count, Spiral Sewn, 6 Inch Diameter, 7/8 Inch Thick, 1/4 Inch Arbor Hole
STD-1206	Tool - Burnishing
STD-1207	Sander/Polisher - Orbital, Air Driven

C. Consumable Materials

Reference	Description	Specification
B00047	Acid - Technical Grade, Nitric (61%-68.2% Purity)	A-A-59105
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00232	Cleaner - Sodium Hydroxide	P-S-631
B00570	Polish - Exterior Aircraft - Bonderite C-MC 1495 X polish (Formerly Turco 1495-X)	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
D00504	Grease - Petrolatum	VV-P-236
E00056	Compound - Potassium Nitrate	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G00116	Sponge - Synthetic	
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G01659	Swab - Cotton Or Rayon, (Disposable)	
G02219	Tape - Yellow Vinyl Adhesive, Scotch Brand No.471, 1.5 Inches (38.1 mm) Wide	
G02443	Tape - Barricade, Non-Adhesive, Orange, 3 (76 mm) Inches Wide, 4 mils (0.102 mm) Thick, "REMOVE BEFORE FLIGHT"	
G02444	Tag - Red Paper, "STATIC PORTS COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	
G02447	Tag - Red Paper, "PITOT PROBES COVERED" - 3 inches (76.2 mm) Wide, 6 inches (152.4 mm) Long	

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D. Prepare to Polish the Surface

SUBTASK 12-25-01-100-001

- (1) Do this task: Clean (Wet Wash) the External Surfaces of the Airplane, TASK 12-25-01-100-801.

E. Polish the Surface

SUBTASK 12-25-01-600-001

NOTE: Polishing is only accomplished on unpainted surfaces. Painted surfaces do not get polished.

NOTE: Any polish that is listed in D6-9002 is acceptable for polishing.



DO NOT POLISH THE STATIC PORTS. IF MATERIAL GOES INTO THE STATIC PORTS, IT CAN CAUSE LARGE ERRORS IN AIR DATA. INCORRECT AIR DATA CAN MAKE FLIGHT DANGEROUS.

- (1) PROCEDURE I - Polish the surface to repair light stains or to make the surface bright.
 - (a) Use the cotton wiper, G00034 to remove the outer layer of protection as necessary.
 - (b) Manually or mechanically polish the surface as follows:
 - 1) ALTERNATIVE I - Manually polish the surface.
 - a) Apply Bonderite C-MC 1495 X polish, B00570 to the cotton wiper, G00034.
 - b) Rub the damaged area of the surface with the cotton wiper, G00034.

NOTE: Rub in the direction of the grain of the metal until you get the necessary finish.
 - 2) ALTERNATIVE II - Mechanically polish the surface.
 - a) Apply Bonderite C-MC 1495 X polish, B00570 to the cotton cloth buffer wheel, STD-1205.
 - b) Polish the damaged area of the surface with the orbital air-driven sander/polisher, STD-1207 and cotton cloth buffer wheel, STD-1205.
 - (c) Remove the remaining polish material with solvent and wipers.

NOTE: Always wipe in the direction of the grain of the metal.
 - (d) If necessary, use ALTERNATIVE I or II to polish the surface again.
 - 1) If the polished area is too bright, rub the area with an ultrafine abrasive mat, G00251.
 - 2) Remove the dried polish with solvent and wipers.
 - (e) Rub the area around the polished area to get a constant finish.
 - (f) Clean the external surfaces of the airplane in the polished area.
 - (g) Put some water on the surface, and make sure the water becomes drops.
 - (h) If the surface was conversion coated before it was polished, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 12-25-01-600-002

- (2) PROCEDURE II - Polish the surface to remove heavy stains or scratches that do not penetrate the clad aluminum.
 - (a) Use these steps to find if the scratch penetrated the clad aluminum:
 - 1) Apply solvent, B00083 to a cotton wiper, G00034.
 - 2) Use the cotton wiper, G00034 to clean the area around the scratch.

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- 3) Dry the surface.
- 4) Apply Scotch Flatback Masking Tape 250, G00270 around the scratch.
 - a) Make sure there is no more than 1/32 in. (0.79 mm) of bare metal around the scratch.



MAKE SURE THAT YOU PUT ON SPLASH GOGGLES OR A FACE SHIELD AND CHEMICAL RESISTANT GLOVES WHEN YOU APPLY THE CLAD PENETRATING SOLUTION. IF YOU GET THE CLAD PENETRATING SOLUTION IN YOUR EYES OR ON YOUR SKIN, IMMEDIATELY FLUSH IT WITH CLEAN WATER. INJURIES TO PERSONNEL CAN OCCUR.

- 5) Prepare the clad penetrating solution as follows:
 - a) Mix 200 grams of potassium nitrate compound, E00056 and 100 grams of cleaner, B00232 with sufficient water to make one liter of clad penetrating solution.



MAKE SURE THAT YOU PUT ON SPLASH GOGGLES OR A FACE SHIELD AND CHEMICAL RESISTANT GLOVES WHEN YOU APPLY THE CLAD PENETRATING SOLUTION. IF YOU GET THE CLAD PENETRATING SOLUTION IN YOUR EYES OR ON YOUR SKIN, IMMEDIATELY FLUSH IT WITH CLEAN WATER. INJURIES TO PERSONNEL CAN OCCUR.



MAKE SURE THAT YOU PUT THE CLAD PENETRATING SOLUTION ONLY ON THE SCRATCH. THE SOLUTION WILL CAUSE DAMAGE TO THE SURFACE WHERE IT IS APPLIED.

- 6) Apply one drop of clad penetrating solution with the point of a toothpick to the deepest part of the scratch.

NOTE: Use the minimum quantity of the clad penetrating solution necessary to flow to the bottom of the scratch.
- 7) If there is a positive reaction, immediately flush the scratch with water. Do not let the clad penetrating solution stay on the scratch for more than three minutes.
 - a) Do not let the clad penetrating solution stay on the scratch for more than three minutes.

NOTE: If the bottom of the scratch becomes black, then the scratch penetrated the clad to the base metal.



DO NOT ADD WATER TO ACID. ALWAYS ADD ACID TO WATER. ACID IS EXPLOSIVE WHEN WATER IS ADDED TO IT. IF YOU ADD WATER TO ACID, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)



DO NOT GET THE NITRIC ACID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ACID. PUT ON SPLASH GOGGLES, AND GLOVES FOR PROTECTION WHEN YOU USE THE NITRIC ACID. KEEP THE ACID AWAY FROM SPARKS, FLAME, AND HEAT. NITRIC ACID IS A POISONOUS AND FLAMMABLE SOLVENT. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- 8) Prepare the nitric acid solution as follows:
 - a) Mix one volume of acid, B00047 with two to three volumes of water.



DO NOT GET THE NITRIC ACID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ACID. PUT ON SPLASH GOGGLES, AND GLOVES FOR PROTECTION WHEN YOU USE THE NITRIC ACID. KEEP THE ACID AWAY FROM SPARKS, FLAME, AND HEAT. NITRIC ACID IS A POISONOUS AND FLAMMABLE SOLVENT. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- 9) Apply one drop of the nitric acid solution to the scratch.
- 10) Let the nitric acid solution stay on the scratch for one-half to one minute.
- 11) Flush the scratch with clean water.



DO NOT GET THE CONVERSION COATING ON YOUR SKIN OR IN YOUR EYES. PUT ON PROTECTIVE CLOTHING, GOGGLES AND A FACE MASK. USE IN A WELL VENTILATED AREA. DO NOT BREATHE THE GAS. IF YOU GET THE CONVERSION COATING ON YOUR SKIN YOU MUST FLUSH IT AWAY WITH WATER IMMEDIATELY. IF YOU GET THE CONVERSION COATING IN YOUR EYES, FLUSH IT AWAY WITH WATER FOR AT LEAST 15 MINUTES, THEN GET MEDICAL AID IMMEDIATELY. DO NOT LET THE MATERIALS USED TO APPLY OR REMOVE THE CONVERSION COATING BECOME DRY BECAUSE THEY CAN CAUSE A FIRE. ALL SUCH MATERIALS MUST BE FULLY FLUSHED IN COLD WATER AND THEN DISCARDED.

- 12) Apply coating, C00064 (Alodine 1000) to the scratch with a swab, G01659, cotton wiper, G00034, or sponge, G00116.
 - (b) If the scratch penetrated the clad aluminum, do PROCEDURE III.
 - (c) Clean the area around the scratch.
 - (d) If the surface is badly scratched, rub it with fine or ultrafine abrasive mat, G00251 to make it smoother.
 - (e) Polish with the air-driven sander/polisher as follows:

NOTE: Polish with the Schaffner No. 521 white bar compound until all of the gray undercoat is removed. Then apply the No. 4094 green coloring bar compound. Always clean the surface with solvent before you change to a different bar compound.

- 1) Remove the dried polish material from the buffer wheel with a wheel rasp or a coarse file.

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- 2) Apply the applicable polishing compound to the buffer wheel.
- 3) Hold the buffer wheel parallel to the direction that you polish.
- 4) Polish in the forward-to-aft direction.
- 5) Use sufficient pressure to remove the stains and scratches.
- 6) Move the buffer wheel in the correct direction to keep the finish in a good condition.
- 7) Apply the applicable polishing compound to the buffer wheel frequently.
- 8) Remove the dried polish material from buffer wheel frequently.
- 9) Remove the dried polish material from the airplane surface with the wipers and solvent.

NOTE: Put solvent on the heavy polish material to make it soft before you wipe it off.

- 10) Clean the external surfaces of the airplane in the polished area.
- 11) Put some water on the surface, and make sure the water becomes drops.
- 12) If the surface was conversion coated before it was polished, do this task: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 12-25-01-600-003

- (3) PROCEDURE III - Polish the surface to repair damage that penetrates the clad aluminum.

NOTE: There is a test in PROCEDURE II to find if a scratch penetrates the clad aluminum.

- (a) Use the cotton wiper, G00034 to clean the damaged area.

NOTE: Wipe the damaged area carefully to prevent scratches.

- (b) Remove the burr edge as follows:

- 1) Apply the grease, D00504 to the burnishing tool, STD-1206.
- 2) Move the burnishing tool, STD-1206 in the direction of the scratch so that the clad aluminum material is moved into the defective area.

NOTE: Keep the area that you burnish to a minimum.

- 3) Move the burnishing tool, STD-1206 on the repaired area so the area has a smooth surface, and so the stress is applied on a large area.
- 4) If the burnished area blends in with the adjacent surface, no further work is necessary.
- 5) If the burnished area does not blend in with the adjacent surface, continue as shown in PROCEDURE II.

F. Put the Airplane Back In Its Usual Condition

SUBTASK 12-25-01-840-015



FAILURE TO REMOVE COVERS FROM PITOT PROBES BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



REMOVE ALL COVERS. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (1) Remove covers from the following components, if installed:

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- (a) Pitot probes
- (b) Ice detector probes
- (c) Angle-of-Attack vane
- (d) Engine inlets
- (e) Engine turbine exhausts
- (f) Fan reversers
- (g) Landing gear wheels/brakes

SUBTASK 12-25-01-840-016

- (2) Remove the "PITOT PROBES COVERED" tag, G02447 from the left control wheel in the flight deck.

SUBTASK 12-25-01-840-017



FAILURE TO REMOVE BARRICADE TAPE AND VINYL ADHESIVE TAPE FROM ALL OF THE STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.



REMOVE ALL OF THE BARRICADE TAPE, AND VINYL ADHESIVE TAPE. DO NOT OPERATE THE ENGINES WITH THE COVERS ON. THE COVERS CAN COME OFF AND CAUSE DAMAGE TO THE ENGINES.

- (3) Remove all orange barricade tape, G02443, covers, polyethylene sheet polyethylene film, G00252, and yellow vinyl adhesive Scotch Brand No.471 tape, G02219 from the following openings:
 - (a) Static Ports
 - 1) Inspect each static port and if necessary use naphtha solvent, B00083, or equivalent, and a clean dry rag to remove residue, dirt and other contaminants from around the ports.
 - (b) Surge tank and fuel tank vents
 - (c) APU exhaust duct outlet port
 - (d) APU oil cooling air exhaust port
 - (e) Equipment cooling ground supply valve port
 - (f) Overboard exhaust valve port
 - (g) Smoke clearance valve port
 - (h) Ram air inlet and outlet doors
 - (i) Outflow valve
 - (j) Doors
 - (k) Positive Pressure Relief Valve

SUBTASK 12-25-01-840-018

- (4) Remove the "STATIC PORTS COVERED" tag, G02444 from the left control wheel in the flight deck.

———— **END OF TASK** ————

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BIRD STRIKE CLEANING - MAINTENANCE PRACTICES

1. General

A. This procedure contains one task.

- (1) The task is to safely remove the bird remains from an airplane exterior.

TASK 12-25-04-100-801

2. Bird Strike Cleaning

A. **General**

- (1) This procedure contains the steps for the safe removal of bird remains from an airplane exterior.

B. **References**

Reference	Title
05-51-18-210-801	Bird/Hail Strike Conditional Inspection (P/B 201)

C. **Consumable Materials**

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
B50167	Cleaner - Zip-Chem Products Calla 7127 Disinfectant	
B50280	Cleaner - Zip-Chem Products Calla 1452 Disinfectant	
G01043	Cloth - Lint-free	
G50140	Gloves - Protective, Latex or Nitrile	
G50436	Disinfectant - EnviroTru 1453 (Supersedes EcoTru 1453)	

D. **Procedure**

SUBTASK 12-25-04-010-001

- (1) Gain access to the suspected bird strike area.

SUBTASK 12-25-04-940-001



WARNING

PUT ON EQUIPMENT FOR PROTECTION BEFORE YOU TOUCH THE BIRD CARCASS, BLOOD, GUTS, AND RESIDUE. THIS CAN CONTAIN BACTERIA AND VIRUSES THAT CAN CAUSE ILLNESSES, AND INJURIES TO PERSONNEL.



WARNING

DO NOT LET THE BIRD CARCASS OR OTHER PIECES OF THE BIRD TOUCH YOUR SKIN. DISCARD THE BIRD PIECES IN A PLASTIC DISPOSAL BAG. THE BIRD PIECES CAN CONTAIN INFECTIOUS MATERIALS (BACTERIA AND VIRUSES). THEY CAN CAUSE ILLNESSES, AND INJURIES TO PERSONNEL.

- (2) Before you touch any of the bird remains, put on protective gloves, G50140.

SUBTASK 12-25-04-140-001

- (3) Clean the bird pieces from the airplane.

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WARNING

PUT THE BIRD PIECES INTO PLASTIC DISPOSAL BAGS WHEN YOU REMOVE THEM FROM THE AIRPLANE. OBEY THE AIRLINE POLICY, LOCAL HEALTH DEPARTMENT, AND LAW ENFORCEMENT REGULATIONS WHEN YOU DISCARD THIS MATERIAL. OBEY THESE INSTRUCTIONS TO PREVENT INJURIES TO PERSONNEL.

- (a) Discard the bird pieces in a plastic bag.
- (b) Using a lint-free cloth, G01043, clean the area with alcohol, B00130 and EnviroTru 1453 Disinfectant, G50436 or Calla 7127 cleaner, B50167 or Calla 1452 cleaner, B50280.
- (c) Make sure that you remove all of the bird material from the airplane.

SUBTASK 12-25-04-940-002

- (4) After you remove the bird pieces from the airplane, do this task: Bird/Hail Strike Conditional Inspection, TASK 05-51-18-210-801.

———— **END OF TASK** ————

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COLD WEATHER MAINTENANCE - SERVICING

1. General

- A. Airplane operation in cold weather conditions can cause special problems. These problems occur because of the effects of the ice, snow, slush, frost, and low temperatures. This procedure gives data for protection against ice, snow, slush and frost from the airplane. The procedure also gives data for the prevention of subsequent accumulation of ice, snow, slush and frost. It also includes other related data for the operation of the airplane in cold weather. The operator must find and use the correct procedures for the weather conditions that occur.
- B. You must make sure the maintenance procedures for operation during ice, snow and/or frost conditions are satisfactory for the conditions. Use the data that follow to make sure the procedures are satisfactory:
- (1) Previous weather conditions.
 - (2) The equipment or materials that are available.
 - (3) The weather conditions at the airport where you will operate.
- C. In cold weather it is necessary to drain the fuel tank sumps prior to refueling to remove water from the fuel tanks if the airplane has been idle for more than 45 minutes prior to refueling. Drain the fuel tank sumps again after refueling if the airplane has been idle for 2 hours or more after refueling, prior to departure, do this task: Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801
- In cold weather water can freeze, and not let the drain valves open.
- D. If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps.
- (1) Refer to FUEL SUMP - OPERATION, PAGEBLOCK 12-11-02/301 for the procedure to sump the fuel in cold weather.
- E. Low temperatures (below freezing) can affect grease viscosity. Lubricate landing gear and flight control components in warm weather or a heated hangar.
- (1) Refer to Lubrication of Landing Gear During Cold Weather Operation, TASK 12-21-00-600-801.
- F. Definitions
- (1) Ice that has accumulated on the fan blades while the airplane has been on the ground for a prolonged stop, such as a plane that has been parked overnight, is considered Ground-Accumulated Ice.
 - (a) Ground-Accumulated Ice must be removed before engine start.
 - (2) Ice that has accumulated on the fan blades while the engine is operating at idle power is considered Operational Ice.
 - (a) Operational Ice is allowed before departure because it can be removed by engine run-ups during taxi-out.
 - (3) Deicing is a procedure to remove frost, ice or snow from the airplane. Hot water or a hot mixture of water and deicing/anti-icing fluid is applied.
 - (a) Alternate methods of deicing are forced air and infrared deicing. Refer to FAA Notice 8000.XXX for the current winter season, which includes industry information on these alternate methods.
 - (4) Anti-icing is a procedure to make sure that ice, snow and/or frost does not collect and become attached to the airplane surfaces. Anti-icing fluid or a mixture of anti-icing fluid and water is applied to the airplane.

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- (5) One step deicing/anti-icing applies a hot deicing/anti-icing fluid or mixture of fluid and water. Use the conditions that follow to make a decision on how hot to make the fluid or fluid and water mixture.
 - (a) The ambient temperature
 - (b) The weather conditions
- (6) Two step deicing/anti-icing has the steps that follow:
 - (a) Apply hot water or a hot mixture of deicing/anti-icing fluid and water to remove the ice.
 - (b) Immediately follow with an overspray of a deicing/anti-icing fluid or a mixture of deicing/anti-icing fluid and water for anti-icing. This step must be done less than 3 minutes after you started the first step. If it is necessary, do the procedure area by area.
- (7) Holdover time is the approximate time anti-icing fluid will keep the frost, ice, or snow off of the airplane surfaces that have protection.

NOTE: You cannot find the level of protection or holdover time with precision. The weather conditions and the fluid/fluid mixture will have an effect on the holdover time. Refer to FAA Notice 8000.XXX for the current winter season. This document includes tables for holdover times for all commercially available deicing fluids that have been certified for the current winter season.



USE THE CORRECT EQUIPMENT FOR EACH TYPE OF FLUID. THE INCORRECT EQUIPMENT WILL DECREASE THE TIME THAT THE FLUID WILL PREVENT ICE. ICE CAN PREVENT THE FREE MOVEMENT OF FLIGHT CONTROL SURFACES. THIS CAUSES A DANGEROUS CONDITION DURING FLIGHT.

- (8) Type I (not thickened) deicing/anti-icing fluids usually have a minimum of 80 percent Glycol. The temperature makes the viscosity change but shear stress does not. These fluids give anti-icing for only a short-time.
- (9) Type II, Type III, and Type IV (thickened) deicing/anti-icing fluids usually have a minimum of 50 percent Glycol. There is also 45 to 50 percent water plus thickeners and inhibitors. The temperature and the shear stress that is applied can make the viscosity of these fluids change. They are usually highly viscous at low levels of shear stress. When the shear stress increases, their viscosity decreases very quickly. Type II, Type III, and Type IV fluids give longer holdover times than Type I deicing/anti-icing fluids.



KEEP WATER OUT OF THE STATIC PORTS. WATER CAN FREEZE AND CAUSE A BLOCKAGE OF THE PORTS. ICE IN THE STATIC PORTS IS DANGEROUS DURING FLIGHT.

- (10) An airplane that is parked, for this cold weather procedure, is an airplane in the loading area for a short time to be prepared for departure. If the airplane stays in the loading area through the night in cold weather conditions, refer to the guidelines for parked airplanes in this procedure.
 - (a) Cold weather operation does not include an airplane that is parked for a long time. If the airplane has been parked for a long time, do the applicable procedure to put the airplane back into service from this section: PARKING, SECTION 10-11.
- (11) Slush is ice and/or snow that is not fully melted. Thus, the ice removal/anti-icing procedures for ice and snow removal apply to slush. A special procedure for slush is not necessary.

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- G. The application of Type II, III, and IV fluid, especially when used in a one-step process or in the first step of a two-step process, may cause residues to collect in aerodynamically quiet areas, cavities and gaps. The application of hot water or heated Type I fluid in the first step of a two-step process will minimize the formation of residues. Residues may rehydrate and freeze under certain temperature, high humidity and/or rain conditions and may block or impede critical flight control systems. If a Type II, III, or IV fluid is used in a one-step process or in the first step of a two-step process, then an appropriate inspection and cleaning program should be established. Whenever suitable, deice and anti-ice with only Type I.
- H. Deicing fluid residues can slowly migrate out of crevice areas after being removed from open areas by cleaning. Repeated cleaning of the aircraft may be necessary. The deicing fluid residue inspection and cleaning steps in this procedure should be used to remove these residues.
- I. Start of electronic equipment in the cold weather operation is the same as usual operation. A special procedure is not necessary.
- J. Do not operate Air Driven Pump (ADP) with lubricating oil MIL-L-23699 if the temperature is below -40 °F (-40 °C). The ADP is not designed to operate with this oil in -40 degrees. Use approved oil for (ADP) per MIL-L-7808 (EXXON 2389).
- K. Do not operate Integrated Drive System (IDG) with lubricating oil MIL-L-23699 if the temperature is below -40 °F (-40 °C). Use approved oil for (IDG) per MIL-L-7808 (EXXON 2389), do this task: IDG Oil Fill, TASK 12-13-03-600-802.
- L. To start engines in cold weather, do this task: Engine Operation Preparation, TASK 71-00-00-800-834-H00.
- M. To start the APU in cold weather, do this task: APU Starting and Operation, TASK 49-11-00-860-804.

TASK 12-33-01-600-803

2. Cold Weather Maintenance Procedure

(Figure 301)

A. References

Reference	Title
10	PARKING, MOORING, STORAGE, AND RETURN TO SERVICE
10-11-03-860-801	Prepare the Airplane to be Parked in High Winds - Preferred Configuration (P/B 201)
12-11-02 P/B 301	FUEL SUMP - OPERATION
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
12-17-01-610-801	Waste Tank Servicing (P/B 301)
71-00-00-800-835-H00	Engine Start (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.

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Reference	Description
COM-2479	Truck - Deicer, Washer Part #: ELEPHANT GAMMA Supplier: R2829 Part #: MT43P21 Supplier: 1H5P4 Part #: TEMPEST DEICER Supplier: 93408 Opt Part #: TRUMP 2000 Supplier: 93408

C. Consumable Materials

Reference	Description	Specification
G02301	Fluid - Aircraft Deicing/Anti-Icing (SAE Type I)	AMS 1424/1
G02460	Fluid - Aircraft Deicing/Anti-Icing, Non-Newtonian (SAE Type II, III, IV)	SAE AMS1428

D. Procedure

SUBTASK 12-33-01-660-022

(1) Guidelines



OBEY THE SAFETY PRECAUTIONS. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.



REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

(a) Obey these precautions:

- 1) Use a mixture that has sufficient glycol for the wing area that has the lowest temperature.
- 2) Do not use a 50/50 mixture of type-II, -III, or -IV fluid when there is frost or ice on the bottom surface of the wing.

NOTE: This is an indication that the wing temperature is less than the outside air temperature (the wing was cold-soaked).

- 3) If you do not use a sufficient quantity of anti-icing fluid in the mixture, the wing will not stay free of ice for a sufficient time (it decreases the hold-over time).

NOTE: This especially occurs when you use type-I fluids during deicing (the 1st step).

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CAUTION

THE REPEATED APPLICATION OF TYPE II, TYPE III, AND TYPE IV DEICING /ANTI-ICING FLUIDS, WITHOUT THE SUBSEQUENT APPLICATION OF TYPE I DEICING/ANTI-ICING FLUIDS OR HOT WATER, MAY CAUSE A RESIDUE TO COLLECT IN AERODYNAMICALLY QUIET AREAS. THIS RESIDUE MAY RE-HYDRATE AND FREEZE UNDER CERTAIN TEMPERATURES, HIGH HUMIDITY AND/OR RAIN CONDITIONS. THIS RESIDUE MAY BLOCK OR IMPEDE CRITICAL FIGHT CONTROL SYSTEMS. THIS RESIDUE MAY REQUIRE REMOVAL.

- (b) Many conditions can have an effect on which procedure you use to remove ice, snow, or frost or to make sure it does not collect and become attached to the airplane surfaces. Each operator must look at the local weather conditions. If it is possible, use the procedures that were used before under the same conditions. In general, Type II, Type III, and Type IV fluids give a longer holdover time than Type I fluids. Use Type II, Type III, and Type IV fluids to decrease the risk that ice, snow, or frost will collect on the airplane during a long taxi. Table 301, Table 302 give the general guidelines to help you find the correct ice, snow, or frost removal procedure. This gives you the same procedure you would find when you use the detailed guidelines in this procedure.

NOTE: The applicable fluids which obey the Boeing document D6-17487, "Certification Test of Airplane Material" and conform to any of the following specifications, are acceptable fluids.

Table 301/12-33-01-993-801 Guideline for the Application of Type I Fluid Mixture

OUTSIDE AIR TEMPERATURE (OAT)	ONE-STEP PROCEDURE DEICING/ANTI-ICING	TWO-STEP PROCEDURE	
		FIRST STEP: DEICING	SECOND STEP: ANTI-ICING
27°F (-3°C) and higher	Use a mixture of fluid and water at a minimum of 140°F (60°C) and a maximum of 180°F (82°C) at the nozzle. The freezing point of the mixture must be lower than the temperature that you calculate when you subtract 18°F (10°C) from the OAT.	Use a mixture of fluid and water at a minimum of 140°F (60°C) and a maximum of 180°F (82°C) at the nozzle. NOTE: Do the second step before the fluid from the first step freezes. Usually, you do the second step less than three minutes after the first step.	Use a mixture of fluid and water at a minimum of 140°F (60°C) and a maximum of 180°F (82°C) at the nozzle. The freezing point of the mixture must be lower than the temperature that you calculate when you subtract 18°F (10°C) from the OAT.

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Table 301/12-33-01-993-801 Guideline for the Application of Type I Fluid Mixture (Continued)

OUTSIDE AIR TEMPERATURE (OAT)	ONE-STEP PROCEDURE DEICING/ANTI-ICING	TWO-STEP PROCEDURE	
		FIRST STEP: DEICING	SECOND STEP: ANTI-ICING
Lower than 27°F (-3°C)	Use a mixture of fluid and water at a minimum of 140°F (60°C) and a maximum of 180°F (82°C) at the nozzle. The freezing point of the mixture must be lower than the temperature that you get when you subtract 18°F (10°C) from the OAT.	Use a mixture of fluid and water at a minimum of 140°F (60°C) and a maximum of 180°F (82°C) at the nozzle. The freezing point of the mixture must be lower than the temperature that you calculate when you subtract 5°F (3°C) from OAT. NOTE: Do the second step before the fluid from the first step freezes. Usually, you do the second step less than three minutes after the first step.	Use a mixture of fluid and water at a minimum of 140°F (60°C) and a maximum of 180°F (82°C) at the nozzle. The freezing point of the mixture must be lower than the temperature that you calculate when you subtract 18°F (10°C) from the OAT.
NOTE: The temperature of the fluid mixture can not be higher than the fluid manufacturer's recommendation. NOTE: This table is applicable for the use of Type I Holdover Time Guidelines. If holdover times are not required, a temperature of 140°F (60°C) at the nozzle is desirable. NOTE: Use more glycol in the mixture when the wing skin temperature is less than the outside air temperature. It is possible for the wing to be colder than the OAT.			

Table 302/12-33-01-993-802 Guideline for the Application of Type II, Type III and Type IV Fluid Mixtures

OUTSIDE AIR TEMPERATURE (OAT)	ONE-STEP PROCEDURE DEICING/ ANTI-ICING	TWO-STEP PROCEDURE	
		1ST STEP: DEICING	2ND STEP: ANTI-ICING
27°F (-3°C) and above	50/50 Heated Type II, II, or IV	Heated water or a heated mix of Type I, Type II, Type III or Type IV and water	50/50 Type II, II or IV
Below 27°F (-3°C) to 7°F (-14°C)	75/25 Heated Type II, III, or IV	Heated suitable mix of Type I, Type II, Type III, or Type IV, and water with FP not more than 5°F (3°C) above actual OAT	75/25 Type II, III or IV
Below 7°F (-14°C) to -13°F (-25°C)	100/0 Heated Type II, III or IV	Heated suitable mix of Type I, Type II, Type III, or Type IV, and water with FP not more than 5°F (3°C) above actual OAT	100/0 Type II, III or IV
Below -13°F (-25°C)	Type II / IV fluid may be used below -13°F (-25°C) provided that the freezing point of the fluid is at least 13°F (7°C) below OAT and that aerodynamic acceptance criteria are met. Type III fluid may be used below 14°F (-10°C) provided that the freezing point of the fluid is at least 13°F (7°C) below OAT and that aerodynamic acceptance criteria are met. Consider the use of Type I when Type II, III, or IV fluid can not be used.		
1) To be applied before first step fluid freezes, typically within 3 minutes. 2) Clean aircraft may be anti-iced with unheated fluid.			

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Table 302/12-33-01-993-802 Guideline for the Application of Type II, Type III and Type IV Fluid Mixtures (Continued)

OUTSIDE AIR TEMPERATURE (OAT)	ONE-STEP PROCEDURE DEICING/ ANTI-ICING	TWO-STEP PROCEDURE	
		1ST STEP: DEICING	2ND STEP: ANTI-ICING
NOTE: For heated fluids, a fluid temperature not less than 140°F (60°C) and a maximum of 180°F (82°C) at the nozzle is desirable. Upper temperature limit shall not exceed fluid manufacturers recommendations.			

- (c) This is a list of Type I (Newtonian) fluids:
 - 1) aircraft deicing fluid, G02301
- (d) This is a list of Type II, Type III, and Type IV (non-Newtonian) fluids:
 - 1) fluid, G02460
- (e) Use a heated mixture of water and either Type I, II, III or IV deicing/anti-icing fluids when you do the one-step ice removal/anti-icing. The quantity of water mixed with the fluid, and the temperature you use, are affected by the following:
 - 1) The weather conditions
 - 2) The holdover protection that is necessary
 - 3) The condition of the airplane.
- (f) It is necessary to have sufficient fluid temperature and flow rate to flush the ice and snow from the airplane surfaces when it collects there. More ice, snow or frost will not collect on the airplane surfaces where there is remaining fluid. The mixture and type of fluid used will have an effect on the holdover time. The weather conditions can make it necessary to apply the fluid/water mixture again. This will be necessary to remove the frozen fluid that collected since the fluid/water mixture was last applied. This is also done to increase the protection time.
- (g) For the best ice or snow removal, you must increase the temperature of deicing fluid and hot water to 140°F (60°C) - 180°F (82°C) at the nozzle. A fine to medium spray is recommended to apply the fluid across a large area of ice or snow. This will cause the ice or snow to melt the fastest. A solid flow of fluid is recommended to flush the ice or snow from the airplane surfaces.
- (h) A layer of anti-icing fluid will give protection from ice, snow, and frost if you apply the fluid to a dry wing on a cold soaked airplane. A mixture of anti-icing fluid and water (the ambient temperature will have an effect on when to use a mixture with water) will also give protection if you apply it to a dry wing.
- (i) Since the temperature of the external surfaces of the airplane can be below freezing, ice can attach to the surface. There can be clear ice below the layer of snow or slush, which is not easy to find. Make sure that all the ice is removed after you do the ice removal or ice removal/anti-icing procedure. It may be necessary to feel the surface to do the inspection.
- (j) When precipitation is continuous, the two-step ice removal/anti-icing procedure is usually recommended. The quantity of the fluid used in the mixture is affected by the following:
 - 1) The airline experience
 - 2) The instructions of the fluid manufacturer
- (k) Make sure there is no ice, snow, or frost on the wing for the takeoff. To do this, you must carefully examine the airplane before the departure.

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- (l) You must remove snow from a parked airplane regularly. This will make sure that a large quantity of snow will not collect and possibly freeze on the airplane surface.



CAUTION

CAREFULLY MOVE ROPES OR FABRIC HOSES ON THE WING OR FUSELAGE. THE MOVEMENT OF THE ROPES OR HOSES CAN CAUSE DAMAGE TO EQUIPMENT THAT IS INSTALLED ON THE SURFACE OF THE WING OR FUSELAGE.

- (m) Use brooms with long handles to remove the snow from the wings and horizontal stabilizers. You can use ropes or a fabric fire hose to remove snow from the fuselage. Move the rope or hose back and forth on top of the fuselage as you move it aft.
- (n) Before you move an airplane out of a warm hangar during icing conditions, do the anti-icing procedure on the airplane. this will make it less likely that ice or snow will melt when it touches the warm airplane and then freeze again.
- (o) If you remove ice with water that is not hot you must do it in a warm hangar, if it is possible. Keep the airplane in the hangar until the surfaces are dry. It will be necessary to do a check of those areas where the water can collect and freeze. If anti-icing fluid is applied, it is not as necessary for the airplane to dry.
- (p) General Precautions



WARNING

DO NOT GET DEICING/ANTI-ICING FLUID IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. PUT ON GOGGLES, GLOVES, AND CLOTHING FOR PROTECTION WHEN YOU USE DEICING/ANTI-ICING FLUID. DEICING/ANTI-ICING FLUID IS POISONOUS. IT CAN CAUSE INJURIES TO PERSONNEL.



CAUTION

DO NOT POINT THE FLUID STREAM DIRECTLY ON THE SURFACE OF THE AIRPLANE (NORMAL, OR PERPENDICULAR TO THE SURFACE). APPLY THE FLUID AT A LOW ANGLE TO PREVENT DAMAGE TO AIRPLANE SURFACES. HIGH-PRESSURE FLUID CAN CAUSE DAMAGE TO AIRPLANE SURFACES.

- 1) Do not point a spray of deicing/anti-icing fluid directly at or into the pitot inlets, TAT probes, gust suppression static ports or static ports, (Figure 301).
- 2) Do not point a spray of hot deicing fluid or hot water directly at cold windows.
- 3) Make sure the AC packs are shut off prior to deicing.
- 4) Do not spray deicing/anti-icing fluid near the APU inlet and Ram Air inlets.
- 5) Do not spray deicing fluid directly into engine, APU, scoops, vents, drains, etc.
- 6) Do not exceed an impingement pressure of 50 psi (345 kPa) at the surface.
- 7) Do not point a solid flow of fluid directly at the airplanes surfaces.
- 8) Make sure that ice and snow is not pushed into the areas around the flight controls during ice and snow removal.
- 9) Remove all of the ice or snow from the door and girt bar areas before you close a door.
- 10) Do not open the cargo doors during snow and ice removal.
- 11) Remove the ice and snow from the cargo containers before you put them on the airplane.
- 12) Before you close the doors, put anti-icing fluid on these areas.

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- a) The pressure relief doors
 - b) The lower door sill
 - c) The bottom edge of the door
- 13) Do not use hard or sharp tools to remove ice from the airplane surface.
- 14) The right and left sides of the wing and the right and left sides of the horizontal stabilizer must get the same and full deicing/anti-icing procedure.
- 15) If contamination exists only in a limited area (such as a spoiler panel) and there is no active precipitation, it is permitted to deice only that area, but the same area should also be treated on the other wing.
- 16) If you use SAE Type II, III, or IV fluids, remove all of the deicing/anti-icing fluid from the cockpit windows. Make sure you closely examine windows with wipers installed. Make sure that fluid is removed from all forward areas where it can flow back on the windshields during taxi and takeoff. These areas must be clean before departure.

NOTE: Deicing/anti-icing fluid can be removed by rinsing with approved cleaner and a soft cloth or flushing with type I fluid.

 WARNING	YOU MUST REMOVE DEICING/ANTI-ICING FLUID RESIDUES BEFORE TOO MUCH COLLECTS. RESIDUES CAN COLLECT IN AERODYNAMICALLY QUIET AREAS. THESE RESIDUES CAN PREVENT THE MOVEMENT OF CRITICAL FLIGHT CONTROL SYSTEMS. THIS CAN CAUSE SYSTEM DAMAGE, AND DANGEROUS FLIGHT CONDITIONS.

- 17) After ice removal/anti-icing procedure has been done many times, you must examine the following areas for deicing/anti-icing fluid residues, remove the residues, and re-lubricate affected components as follows:
- a) Gain access to the following areas where flight controls and other system components are located:
 - <1> Wing rear spar areas, including the actuating components for the spoilers, ailerons, flaps, flaperons and the control surface hinges and balance bays.
 - <2> Wing leading edge devices, including the actuating components.
 - <3> Horizontal stabilizer rear spar, including the actuating components for the elevators, elevator tabs (if applicable) and the control surface hinges and balance bays.
 - <4> Vertical stabilizer, including actuating components for the rudder, and the control surface hinges.
 - <5> APU bay and bilge area of the tailcone.
 - b) Visually inspect for dry or re-hydrated residues in the areas mentioned above.

NOTE: Dry residue will normally be a thin film that may be partially covered with dirt or grease. Re-hydrated residue will often be a thicker, gel-like substance.

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WARNING

DO NOT APPLY WATER TO THE CONTROL CABLES WHEN THE TEMPERATURE IS AT OR BELOW 32°F (0°C). ICE CAN FORM ON THE CABLES AND PREVENT THE OPERATION OF IMPORTANT FLIGHT CONTROL SYSTEMS DURING FLIGHT.

- c) Do not apply water to the control cables if the temperature is less than 32°F (0°C)
- d) Spray the area with a fine mist of warm water to re-hydrate any residue and wait at least 15 minutes to allow the re-hydration to occur.
- e) Remove the residues by hand with rags or soft brushes using warm water or a mixture of warm water and Type I fluid.
 - <1> You can also use a low pressure stream of water or compressed air to rinse away the residues.
 - <a> When rinsing the residues away, make sure the residues do not flow into crevice areas that are not accessible.
- f) Check all drain holes in the areas where residues were removed to make sure that they are clear and not blocked by the residues.
- g) Re-lubricate bearings, fittings, and control cables in areas that were cleaned as required.
- h) Re-apply corrosion inhibiting compound to all surfaces and components in areas that were cleaned as required.
- (q) When there is slush on the runways, examine the aircraft when it gets to the ramp. Look for slush that has collected on the airplane or damage to the airplane surfaces.
 - 1) Examine these areas for ice and damage to the skin panels (remove the ice):
 - a) The leading edges
 - b) The flaps
 - c) The flap wells
 - d) The vertical stabilizer
 - e) The rudder
 - f) The bottom and the top surface of the horizontal stabilizers and elevators.
 - 2) Examine the wheel well areas for ice, slush, and snow that collected. Deice as necessary.
 - 3) Examine the skin panels behind the wheel wells for damaged edges.
- (r) Make sure the concentration of the deicing/anti-icing fluid is correct before you apply it to the airplane.



WARNING

DO NOT WALK ON THE WINGS OR THE HORIZONTAL STABILIZER. ICE OR SNOW ON THESE SURFACES IS NOT SAFE. MAINTENANCE PERSONS CAN FALL WHICH MAY CAUSE PERSONAL INJURY OR AIRPLANE DAMAGE.

- (s) Use a boomtruck, a cherry-picker, or deicer/washer truck, COM-2479.

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SUBTASK 12-33-01-660-023



THE REPEATED APPLICATION OF TYPE II, TYPE III, AND TYPE IV DEICING /ANTI-ICING FLUIDS, WITHOUT THE SUBSEQUENT APPLICATION OF TYPE I DEICING/ANTI-ICING FLUIDS OR HOT WATER, MAY CAUSE A RESIDUE TO COLLECT IN AERODYNAMICALLY QUIET AREAS. THIS RESIDUE MAY RE-HYDRATE AND FREEZE UNDER CERTAIN TEMPERATURES, HIGH HUMIDITY AND/OR RAIN CONDITIONS. THIS RESIDUE MAY BLOCK OR IMPEDE CRITICAL FLIGHT CONTROL SYSTEMS. THIS RESIDUE MAY REQUIRE REMOVAL.

(2) Specific Requirements

(a) Probes and Sensors

1) Pitot Probe, Static Ports, Gust Suppression Static Ports and Total Air Temperature (TAT) Probes (Figure 301).

- a) Look for ice that is attached to the surface near the pitot probe, static port, gust suppression static ports, and TAT probe inlets.

NOTE: Ice near the gust suppression ports can cause the gust suppression system to fail off. If the gust suppression system fails off, the function will be disabled until it is reset by maintenance personnel. The gust suppression system is used to improve aircraft ride quality and is not required for safe flight.

- <1> In the area 4 ft (1 m) or less from the pitot probes, static ports, gust suppression static ports, and TAT probe inlets, use de-icing/anti-icing fluid.

NOTE: The pitot probes and TAT probes have heat capability that will only be activated when the engines are turned on.

- <a> Make sure that you do not spray de-icing/anti-icing fluid directly at or into the pitot probes, static ports, gust suppression static ports, or TAT probes.

- If you applied too much fluid to the fuselage near the static ports, examine the nearest in-line drain and remove the water if it has collected there.

- <2> In the area close to the pitot probes, static ports, and TAT probe inlets, carefully apply warm air until the ice melts.

2) Angle-of-Attack (AOA) Sensor (Figure 301)

- a) Make sure that no ice or snow is on the sensors.
- b) Make sure the sensors are free to move.

- <1> If there is ice in the area 4 ft (1 m) or less from the AOA sensor, use de-icing/anti-icing fluid.

NOTE: The AOA sensors have heat capability that will only be activated when the engines are turned on.

- <a> Make sure that you do not spray de-icing/anti-icing fluid directly at or into the AOA sensors.

- <2> In the area close to the AOA sensor inlets, carefully apply warm air until the ice melts.

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(b) Control Surfaces

- 1) Retract the wing flaps, slats, and spoilers during icing conditions or when snow falls. If it is necessary to operate these controls, make sure they are not blocked by ice or snow before you retract them.

NOTE: If an airplane comes to the gate with the flaps not fully retracted during icing conditions or when snow falls, examine those flaps that are not fully retracted. Look for ice or snow that has collected before they are retracted.

- 2) All of the control surfaces must have no ice, snow, or frost on them. After the deicing procedure, make sure there is no moisture caught in the hinges, guide tracks and actuators for the flight controls. This moisture could subsequently freeze. Apply deicing/anti-icing fluid for protection.
- 3) Open the leading edge devices and look for ice or snow.

(c) Wing and Horizontal Tail Surfaces



BE CAREFUL WHEN YOU REMOVE THE ICE AND SNOW FROM THE WING SURFACES NEAR THE VORTEX GENERATORS. IF YOU ARE NOT CAREFUL YOU CAN CAUSE DAMAGE TO THE VORTEX GENERATORS.

- 1) The wing, including winglets (if installed) and horizontal tail surfaces must have no ice, snow, and frost on them.

NOTE: A layer of frost $\frac{1}{8}$ in. (3 mm) thick or less on the lower wing surfaces (in the spar area) is permitted if it is caused by very cold fuel. But, all of these areas must have no ice, snow or frost on them:

- Leading edge devices
- Control surfaces, including the upper and lower surfaces of the horizontal stabilizer
- Tab surfaces
- The top wing surface

- 2) The leading edge surfaces must have no ice, snow or frost on them. Examine the areas between the movable surfaces and the surfaces that do not move to make sure there is no ice.
- 3) The right and left sides of the horizontal stabilizer must get the same and full deicing/anti-icing procedure.
 - a) If contamination exists only in a limited area (such as a spoiler panel) and there is no active precipitation, it is permitted to deice only that area, but the same area should also be treated on the other wing.

(d) Fuselage and Vertical Tail Surfaces

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BE CAREFUL WHEN YOU REMOVE ICE AND SNOW FROM THE FUSELAGE AREA WHERE THERE ARE LIGHTS AND ANTENNA. IF YOU ARE NOT CAREFUL, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

- 1) The fuselage and the vertical tail surfaces, including the left and right sides of the vertical stabilizer, must have no ice or snow on them. Ice and snow increase the aerodynamic drag and the weight of the airplane.
NOTE: Thin hoar frost is permitted on the top surface of the fuselage if all the vents and ports are clear. Thin hoar frost is a white deposit of constant thickness with a sharp crystalline texture. It usually occurs on surfaces that are outside on the cold night with no clouds. Hoar frost is thin. You can see items on the surface below the layer of frost, such as paint lines, marks or letters.
- 2) Remove all of the snow from the nose radome area. If you do not do this the snow will blow back and decrease the pilot's vision on takeoff.
- 3) Do not apply hot deicing fluid or hot water directly on the pilot's windshield or passenger windows. You can let the fluid flow over the windows after you apply it to the top of the cabin. This is permitted since the fluid will be cool when it gets to the windows.
- 4) Do not direct a spray of deicing/anti-icing fluid directly into the inlet duct or exhaust of the APU.
- 5) If SAE Type II, III or IV fluids are used, then all of the deicing/anti-icing fluid on the cockpit windows must be removed before departure. Look closely at the windows with wipers installed. Also look at all forward areas where fluid can flow on the windshields during taxi and takeoff. These areas must be clear before departure.
NOTE: Deicing/anti-icing fluid can be removed by rinsing with approved cleaner and a soft cloth or flushing with type I fluid.

(e) Engines and APU



ALL PERSONNEL MUST AVOID DANGER AREAS IN FRONT AND REAR OF POWER PLANT DURING GROUND RUNNING OPERATIONS. THE ENGINE IS CAPABLE OF DEVELOPING ENOUGH SUCTION AT THE INLET DUCT TO PULL A MAN UP TO OR PARTIALLY INTO THE DUCT WITH POSSIBLE FATAL RESULTS. THEREFORE, WHEN APPROACHING ANY TYPE OF JET ENGINE, PRECAUTIONS MUST BE TAKEN TO KEEP CLEAR OF THE INTAKE AIR STREAM. THE SUCTION NEAR THE INTAKE CAN ALSO PULL IN HATS, GLASSES, LOOSE CLOTHING AND WIPE-RAGS FROM POCKETS. ANY LOOSE ARTICLES MUST BE MADE SECURE OR REMOVED BEFORE WORKING AROUND THE ENGINE.

- 1) For the safety of persons, do not operate the engines or the APU during the ice removal/anti-icing operations. But, if it is necessary to do ice removal/anti-icing procedure during engine and/or APU operation, do the steps that follow:
 - a) Make sure the engine is at idle speed.
 - b) Do not point the spray of deicing/anti-icing fluids directly into the engine or APU inlet.

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DO NOT START THE ENGINES IN AREAS WHERE THERE ARE PUDDLES OF DEICING OR ANTI-ICING FLUID. MOVE THE AIRPLANE TO A DIFFERENT LOCATION. THE FLUID CAN GO INTO THE ENGINE COMPRESSOR. THESE FLUIDS CAN CAUSE COMPRESSOR STALL, AND ENGINE SURGE.



MAKE SURE THAT THERE IS NO SNOW, ICE, OR EQUIPMENT IN THE APU INLET AREA BEFORE YOU START THE APU. DAMAGE TO THE APU CAN OCCUR.

- 2) If the engines/APU are on, do the steps that follow to keep the fumes out of the cabin when you apply deicing/anti-icing fluid in the area of the engines/APU inlets.
 - a) Close the valves for the air conditioning pack to the cabin.

NOTE: This will keep the fumes out of the cabin when you apply deicing/anti-icing fluid in the area of the engines/APU inlets.
 - b) Close the shutoff valves for the APU air supply.
 - 3) Turn the bleed air switches for the APU/Engine to OFF before you do the ice removal procedure. When the ice is removed, let the vapors decrease to zero before you put the bleed air switches to ON.
 - 4) Do not direct a spray of deicing/anti-icing fluid directly into the areas below:
 - a) The inlet ducts for the engine or APU
 - b) Exhausts
 - c) Engine thrust reversers
 - d) Engine inlet
 - e) Probes attached to the strut
 - f) Engine bleed air ducts.
 - 5) Remove the ice from the Vortex generator on the APU inlet door when the APU is not in operation.
 - 6) Remove Ground-Accumulated Ice from the fan blades prior to engine start.
- (f) Brakes
- 1) When deicing or anti-icing the airplane, protect the wheels and brakes from fluid contamination with the methods below:
 - a) Do not direct a spray of deicing or anti-icing fluid at the wheels or brakes.

NOTE: Carbon brakes which have been intentionally soaked with deicing or anti-icing fluids should be removed and decontaminated per the procedures found in the applicable supplier's component maintenance manual.
 - b) Use suitable covers on the wheels and brakes when operationally feasible.
 - c) Apply the parking brake to reduce incidental contamination of brake friction surfaces when operationally feasible.

NOTE: The brakes do not need to be re-applied if the wheels have not rotated since the last brake application.
 - 2) Manually remove snow or ice accumulation from the wheel, brake, and tires.

NOTE: You can use a hot air blower.

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(g) Landing Gear and Doors

- 1) Make sure that there is not a layer of ice or snow on the movable parts and the position indication switches for the landing gear.

NOTE: This could prevent the correct operation of the landing gear.

- 2) Make sure you do not remove lubricants or make the lubricants thinner when you apply deicing/anti-icing fluids.

NOTE: Parts that are not lubricated can seize or not operate without the correct servicing.

- 3) Remove the ice and snow from these areas:

- a) The landing gear doors
- b) The door latches
- c) The uplock mechanism
- d) The uplock hook
- e) The downlock mechanism
- f) The bungee springs
- g) The lock actuators
- h) The position indication switches.

NOTE: It is the airline's decision to apply or not apply anti-icing fluid as protection after the ice is removed.

- 4) Make sure that ice has not collected on the steering cables for the nose wheel. Remove the ice if it is necessary.
- 5) Examine the alternate extend system for ice that has collected in the areas that are open and not heated:
 - a) The landing gear alternate extension system control cables and mechanism
 - b) The external mechanism for the landing gear.



CAUTION

DO NOT TRY TO MOVE THE AIRPLANE IF THE TIRES ARE FROZEN TO THE GROUND. MAKE SURE THAT THE WHEELS TURN WHEN YOU MOVE THE AIRPLANE. IF THE WHEELS DO NOT TURN, DAMAGE TO THE WHEELS AND THE AIRPLANE CAN OCCUR.

- 6) Remove the ice and snow from the ground areas around the landing gear. This will make it less possible that the tires will freeze to the ground. This will also prevent unwanted aircraft movement because of the wind or engine operation.
 - a) Use warm air or deicing fluid to release the tires from the ground or to remove frozen material.
 - b) Salt is not recommended since it can collect on the metal parts and cause corrosion.

(h) Wing Fuel Tanks

- 1) Frost can occur on the bottom of the wings in the fuel tank areas in temperatures above freezing. This is caused by the condensation of moisture in the air when it touches on the cold surfaces that are below freezing. The frost will usually melt when you add fuel that is a higher temperature. If the frost continues and is more than 1/8 in. (3 mm) thick, remove it before take-off.
- 2) Clear ice can occur on the top of the wing when these conditions occur:

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- a) The temperature of the fuel in the tank is below freezing
 - b) The ambient temperature is above freezing
 - c) There is rain, drizzle or fog.
- 3) Carefully examine the top of the wing to see if there is clear ice. Use the equipment that is necessary to get sufficient access to the top of the wing to do this check. It is possible that the clear ice can only be found by touch. You must remove clear ice and anti-ice the wing, if it is necessary, before the takeoff.
- (i) If the temperature of the fuel is below 32°F (0°C), do not drain the fuel tank sumps.
- 1) Refer to FUEL SUMP - OPERATION, PAGEBLOCK 12-11-02/301 for the procedure to sump the fuel in cold weather.
- (j) Miscellaneous
- 1) Drains
 - a) Examine all of the waste water and condensate drains on the airplane to make sure there are no blockages because of ice or other material. It is not necessary to put a plug on the drains during the ice removal anti-icing procedure. But do not point a fluid spray at these drain areas.
 - 2) Windshield Wiper Blades
 - a) Remove the ice that collected on windshield wiper blades.

E. Hot Water Deicing

SUBTASK 12-33-01-660-025

- (1) You can use hot water at 140°F (60°C)-180°F (82°C) maximum nozzle temperature to remove ice and snow from the airplane surfaces when the ambient temperature is 27°F (-3°C), stable or on the increase.

SUBTASK 12-33-01-660-026

- (2) To prevent the water from freezing again you must apply anti-icing fluid to the surface immediately after you remove the ice with hot water.

F. One-Step Ice Removal/Anti-Icing

SUBTASK 12-33-01-660-028

- (1) The application of Type II, III, and IV fluid, especially when used in a one-step process or in the first step of a two-step process, may cause residues to collect in aerodynamically quiet areas, cavities and gaps. The application of hot water or heated Type I fluid in the first step of a two-step process will minimize the formation of residues. Residues may re-hydrate and freeze under certain temperature, high humidity and/or rain conditions and may block or impede critical flight control systems. If a Type II, III, or IV fluid is used in a one-step process or in the first step of a two-step process, then an appropriate inspection and cleaning program should be established. Whenever suitable, deice and anti-ice with only Type I.
- (2) You can do the one-step ice removal/anti-icing procedure, with the deicing/anti-icing fluid heated to 140°F (60°C)-180°F (82°C) at the nozzle. Use this procedure to remove the ice and snow from the airplane when the temperature is less than 28°F (-2°C). After you use the mixture to make the airplane surfaces clean, the remaining fluid will give some anti-ice protection.

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SUBTASK 12-33-01-660-029

- (3) The fluid mixed with the water can be Type I deicing (ice removal)/anti-icing fluid, Type II, Type III or Type IV deicing/anti-icing fluid. The holdover time will be longer with the Type II, Type III, and Type IV deicing/anti-icing fluid. With each fluid, the quantity of fluid to use in the mixture is affected by the following.
- (a) The airline experience
 - (b) The fluid specification
 - (c) The manufacturer's recommendations
 - (d) The weather conditions.

SUBTASK 12-33-01-660-042

- (4) If additional treatment is required before flight, the full deicing/anti-icing procedure must be performed. Ensure that any residues from previous treatments are flushed off.

G. Two-Step Deicing/Anti-Icing

SUBTASK 12-33-01-660-031

- (1) The application of Type II, III, and IV fluid, especially when used in a one-step process or in the first step of a two-step process, may cause residues to collect in aerodynamically quiet areas, cavities and gaps. The application of hot water or heated Type I fluid in the first step of a two-step process will minimize the formation of residues. Residues may re-hydrate and freeze under certain temperature, high humidity and/or rain conditions and may block or impede critical flight control systems. If a Type II, III, or IV fluid is used in a one-step process or in the first step of a two-step process, then an appropriate inspection and cleaning program should be established. Whenever suitable, deice and anti-ice with only Type I.
- (2) Two-step ice removal/anti-icing procedure is usually the recommended procedure when the precipitation conditions are continuous. The second step must be done no more than 3 minutes after the first step. Do the procedure area by area if it is necessary.

SUBTASK 12-33-01-660-032

- (3) The items that follow will have an effect on the hold-over time you get after you do the anti-icing procedure.
- (a) The fluid that was used
 - (b) The weather conditions.

SUBTASK 12-33-01-660-033

- (4) Do not apply an additional coating of anti-icing fluid on top of contaminated fluid (fluid that has been absorbing precipitation). If additional treatment is required before flight, the full deicing/anti-icing procedure must be performed. Ensure that any residues from previous treatment are flushed off.

H. Park the Airplane

SUBTASK 12-33-01-580-005



IF HIGH WINDS ARE POSSIBLE, OBEY THE INSTRUCTIONS IN THIS TASK. HIGH WINDS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO THE AIRPLANE

- (1) If high winds are possible, do this task: Prepare the Airplane to be Parked in High Winds - Preferred Configuration, TASK 10-11-03-860-801



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- (2) Make sure that the area where you park the airplane is free of ice and snow.

NOTE: Use the procedures in PARKING, MOORING, STORAGE, AND RETURN TO SERVICE, CHAPTER 10 for other conditions.

SUBTASK 12-33-01-580-006

- (3) When possible, point the airplane into the direction the wind is usually from.
- (a) Put the wing flaps to the full up position. This will lock the outboard ailerons in their neutral position.
 - (b) Put the stabilizer position to 4 units of trim (2 degrees down for the stabilizer leading edge).

SUBTASK 12-33-01-660-034



MAKE SURE YOU EXAMINE THE ENGINE-AIR-INLET AREAS IMMEDIATELY AFTER SHUTDOWN FOR SIGNS OF ICE. REMOVE THE ICE WHILE THE ENGINES ARE COOL, AND BEFORE YOU INSTALL THE ENGINE PROTECTION PLUGS AND COVERS. IF YOU INSTALL THE PLUGS WHILE THE ENGINE IS WARM, THE ICE WILL MELT AND THEN FREEZE AGAIN. THIS CAN CAUSE DAMAGE TO THE ENGINE.

- (4) Install all the plugs and covers, where available, for the intake or exhaust ducts and the different probes such as the pitot tubes. Use a brush to apply a thin layer of anti-ice fluid to the airplane surface before you install the cover. The covers will not freeze to the airplane if you do so.

I. Engine Operation

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SUBTASK 12-33-01-660-036

- (1) See cold weather starting procedures in (TASK 71-00-00-800-835-H00).

ARO ALL

SUBTASK 12-33-01-660-038

- (2) Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts. Remove all the ice or snow from the engine inlet ducts before you start the engines.

SUBTASK 12-33-01-660-039

- (3) Engine icing can occur when the conditions that follow occur:

NOTE: You must use the thermal anti-icing system for the engine/nacelle when these conditions occur.

- (a) There is moisture that you can see (clouds, fog, rain, snow, sleet, or ice crystals).
- (b) You will do ground operations with the static air temperature below 50°F (10°C).

SUBTASK 12-33-01-840-001

- (4) Before you start the engines make sure there are no fluids around the exhaust areas that can start ignition.

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J. Fuel Icing

SUBTASK 12-33-01-660-040



IF YOU CAN DRAIN THE FUEL FROM THE DRAIN VALVE AFTER YOU APPLIED HOT AIR TO THE EXTERIOR FOR 3 TO 5 MINUTES, DO NOT THINK THAT ALL THE ICE IS MELTED. THE ICE ADJACENT TO THE UNIT YOU ARE NOT SURE ABOUT CAN MELT AND LET SOME WATER AND FUEL TO FLOW FROM THE DRAIN. BUT, A PIECE OF ICE CAN STAY BEHIND. IF THE FUEL DOES NOT FLOW FROM THE DRAIN VALVE, CONTINUE TO APPLY HOT AIR FOR A SHORT TIME, AND FREQUENTLY DO A CHECK OF THE FLOW FROM THE DRAIN VALVE. CATCH THE FUEL IN A CONTAINER AND MAKE SURE ALL OF THE WATER IS REMOVED. THE HEAT APPLIED TO THE SUMP DRAIN VALVES FOR THE OUTBOARD MAIN AND RESERVE TANKS WILL NOT REMOVE THE ICE WHICH HAS COLLECTED IN THE TANK SUMP OR IN THE DRAIN LINE BETWEEN THE TANK SUMP AND VALVE. TO REMOVE THIS ICE, YOU MUST PUT THE AIRPLANE IN A WARM HANGAR FOR SUFFICIENT TIME TO MELT THE ICE. THEN DRAIN THE SUMPS UNTIL THE WATER IS REMOVED.

- (1) In cold weather it is necessary to drain the fuel tank sumps prior to refueling to remove water from the fuel tanks if the airplane has been idle for more than 45 minutes prior to refueling. Drain the fuel tank sumps again after refueling if the airplane has been idle for 2 hours or more after refueling, prior to departure, do this task: Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801

In cold weather water can freeze, and not let the drain valves open. If fuel will not drain from the sumps, do these steps:



MAKE SURE THAT THE FUEL TANKS ARE SEALED. FUEL FUMES ARE FLAMMABLE. THE IGNITION OF FUEL FUMES CAN CAUSE FIRES, AND EXPLOSIONS. THESE CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (a) Make sure the fuel tanks are sealed.



DO NOT LET THE TEMPERATURE INCREASE TO 158°F (70°C). TEMPERATURES HIGHER THAN THIS CAN CAUSE THE IGNITION OF FUEL FUMES, FIRES, AND EXPLOSIONS. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (b) Apply air that is not hotter than 158°F (70°C) to the area of the fuel sump.
- (c) The items that follow have the most effect on the quantity of water in aviation fuels:
 - 1) Where the fuel is kept
 - 2) How the fuel is moved.

SUBTASK 12-33-01-660-043

- (2) Fuel that is open to moisture or the usual atmospheric conditions contains more water than that kept in tightly sealed containers. This water in the fuel, when there is high humidity and temperature conditions that change, can be more than three gallons in each thousand gallons of fuel. As the temperature decreases, there is a separation of the water and the fuel. The water will collect at the lowest point in the tank and freeze if the temperature is sufficiently low. If the water has collected and frozen in the sumps (shown by no flow from the drain valves), do the step that follows:

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- (a) Apply heat (hot air that is resistant to explosion) to the bottom of the wing in the area of the tank sumps.

K. Toilets and Potable Water

SUBTASK 12-33-01-660-041

- (1) In an airplane that operates, there is sufficient heat around so the water will not freeze. When the airplane does not operate and is let stay in an area that is not heated, more servicing is necessary, as follows, if the cabin temperature decrease below the freezing point:

NOTE: Table 1 shows how long an airplane can remain with windows and doors closed, without heat, before interior temperatures fall below freezing.

Table 1. Minutes Before Interior of Airplane Falls Below Freezing

Initial Interior Temperature	Exterior Temperatures		
	-15°F (-26°C)	15°F (-9°C)	30°F (-1°C)
40°F (4°C)	13	32	142
50°F (10°C)	27	60	200
60°F (16°C)	39	81	236
70°F (21°C)	49	98	260

- (a) Potable Water



DRAIN THE WATER SYSTEM. IF THE WATERLINES HAVE WATER IN THEM, THEY CAN FREEZE IN COLD WEATHER. THIS CAN CAUSE DAMAGE TO THE WATERLINES.

- 1) Do this task: Potable Water System - Drain. TASK 12-14-01-600-803.
- (b) Toilets
- 1) Do this task: Waste Tank Servicing, TASK 12-17-01-610-801.

———— **END OF TASK** ————

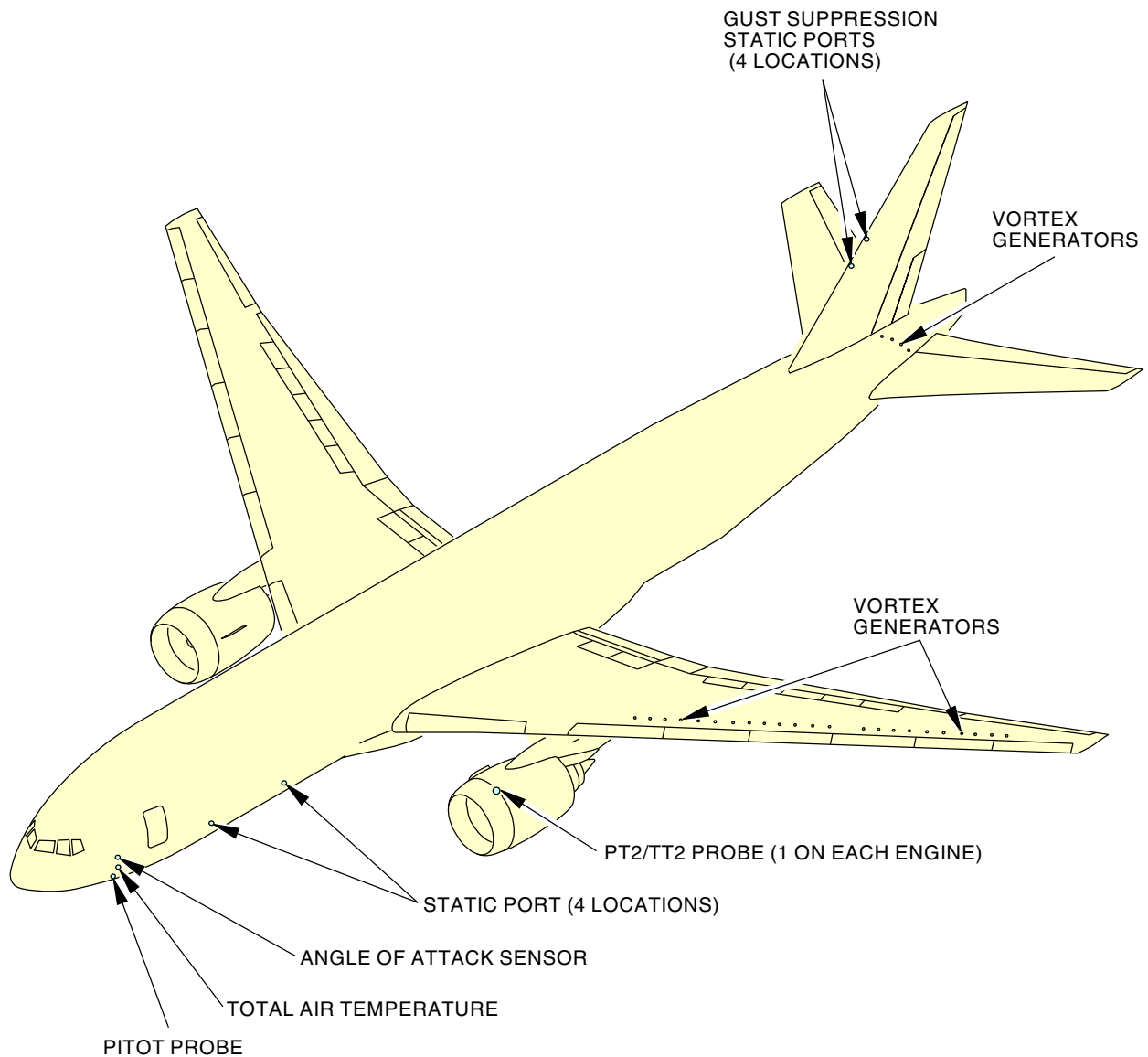
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)

H04052 S0006402290_V2

Probe Locations
Figure 301/12-33-01-990-809

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EXTREME COLD WEATHER MAINTENANCE - SERVICING

1. General

A. This procedure has these tasks:

- (1) Cold Weather Attended Parking
- (2) Return the Airplane to Service After Cold Weather Attended Parking
- (3) Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)
- (4) Return the Airplane to Service After Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)

TASK 12-33-02-600-801

2. Cold Weather Attended Parking

A. General

- (1) This procedure is to park the airplane in an attended parking condition. Attended parking is generally used when the aircraft will be on the ground for a period of time between flights ready for immediate operation.
 - (a) Unattended parking is generally used when the airplane will be on the ground in a non-operational condition between flights. For unattended parking, refer to Cold Weather Unattended Parking at Temperatures Below 32°F (0°C), TASK 12-33-02-600-802.
 - (b) During short term parking, the cabin and flight deck temperatures are maintained above 32°F (0°C), and the engine oil temperature is maintained above -35°F (-37°C) while the airplane is on the ground.
- (2) In the usual operation of the airplane, air comes through the airplane structure. During flight, the water vapor in the air can condense and freeze in the airplane. When you continuously operate the airplane in cold weather, ground temperatures below the freezing point will not let the ice melt.
 - (a) For airplanes that operate continuously in extreme cold weather, put the airplane into a heated hangar periodically to thaw the insulation blankets and other equipment.
 - (b) To remove the ice, do this task: Interior Ice Conditional Inspection, TASK 05-51-53-210-801.
- (3) If the ambient temperature is colder than 32°F (0°C), refer to Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801 if sumping of the fuel tanks is necessary.
- (4) Low temperatures (below freezing) can affect grease viscosity. Lubricate landing gear and flight control components in warm weather or a heated hangar.
 - (a) Refer to Lubrication of Landing Gear During Cold Weather Operation, TASK 12-21-00-600-801.
- (5) When adding fuel, you must use these requirements:
 - (a) Use fuels that meet specification ASTM D1655; or
 - (b) Use fuels that meet specification GOST 10227:
 - 1) RT (PT, Russian spelling)
 - 2) TS-1 (TC-1, Russian spelling)
 - (c) Approved fuel additives are:

NOTE: Adding an anti-icing fuel additive may help in the sumping of the fuel tanks.

 - 1) Fuel Additive, specification GOST 8313, Fluid I (also known as Fluid E)

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- a) Fluid I may be used at a mixture of no more than 0.15 percent by volume.
- 2) Fuel additive, specification ASTM D4171.
 - a) ASTM D4171 may be used at a mixture of no more than 0.15 percent by volume.
- (6) For airplanes originating in a warm environment and terminating in a cold environment, do the following.
 - (a) Over-inflate the shock struts by approximately 1 in. (25 mm).
- (7) Definitions:
 - (a) Ice that has accumulated on the engine fan blades while the airplane has been on the ground for a prolonged stop, such as a plane that has been parked overnight, is considered Ground-Accumulated Ice.
 - 1) Ground-Accumulated Ice must be removed before engine start.
 - (b) Ice that has accumulated on the engine fan blades while the engine is operating at idle power is considered Operational Ice.
 - 1) Operational Ice is allowed before departure because it can be removed by engine run-ups during taxi-out.

B. References

Reference	Title
05-51-53-210-801	Interior Ice Conditional Inspection (P/B 201)
10-11-01-580-804	Park the Airplane (Normal Parking) (P/B 201)
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
12-15-03-780-801	Landing Gear Tire Pressure Check (P/B 301)
12-21-00-600-801	Lubrication of Landing Gear During Cold Weather Operation (P/B 301)
12-22-07-200-803	IDG Oil Level Check (P/B 301)
21-00-00-800-801	Supply Conditioned Air to the Airplane (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
71-00-00-800-802-H01	Engine Operation Limits (P/B 201)
71-00-00-800-834-H00	Engine Operation Preparation (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. 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-2478	Heater - External Cabin, Trailer Mounted Part #: ACU-2000 Supplier: 6L481 Part #: EH30 Supplier: 4TVG2 Part #: MARK IV-700 COLDBUSTER Supplier: 12008 Opt Part #: MARK I COLDBUSTER Supplier: 12008 Opt Part #: MARK IV COLDBUSTER Supplier: 12008
COM-2500	Cover - Protective, Main Landing Gear Wheels/Brakes

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(Continued)

Reference	Description
STD-3925	Heater - Blower, Explosion Proof, Electric

D. Consumable Materials

Reference	Description	Specification
D00109	Oil - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 (Supersedes MIL-L-7808)
D00523	Oil - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Number O-156	MIL-PRF-23699 (Supersedes MIL-L-23699)

E. 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
500	Left Wing
600	Right Wing
700	Landing Gear and Landing Gear Doors
800	Passenger and Cargo Compartment Doors

F. Access Panels

Number	Name/Location
195CL	ECS Low Pressure Connection Door
196CR	ECS Low Pressure Connection Door

G. Procedure

SUBTASK 12-33-02-490-001



WARNING

WHEN THE PITOT PROBES HAVE COVERS ON THEM, MAKE SURE THAT A PERSON ON THE GROUND CAN SEE THE COVERS. ALSO MAKE SURE YOU ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT COMPARTMENT AS A REMINDER THAT THE PITOT PROBES HAVE COVERS ON THEM. IF THE COVERS ARE NOT REMOVED FROM THE PITOT PROBES, INCORRECT AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS CAN OCCUR. THIS CAN CAUSE DANGEROUS FLIGHT CONDITIONS.

- (1) Install covers on the pitot probes and static ports.

SUBTASK 12-33-02-480-002

- (2) Install the engine inlet and exhaust covers as soon as possible after landing.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install, and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient air temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

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SUBTASK 12-33-02-480-003

- (3) Cover the main landing gear tires with main landing gear wheels/brakes protective cover, COM-2500.

SUBTASK 12-33-02-480-004

- (4) Cover the nose landing gear tires with plastic sheeting.

SUBTASK 12-33-02-580-001

- (5) Do this task: Park the Airplane (Normal Parking), TASK 10-11-01-580-804.

SUBTASK 12-33-02-880-001

- (6) Do one of the steps that follow to maintain the flight deck and cabin temperature at or warmer than 32°F (0°C):
 - (a) Use the APU or a ground air source to run both ECS packs:
 - 1) Do this task: Supply Conditioned Air to the Airplane, TASK 21-00-00-800-801.
NOTE: If the APU is off and the APU oil temp is colder than -35°F (-37°C), warm the APU prior to starting.
 - (b) Use a heater, COM-2478 or suitable substitute to heat the airplane through one of these access panels:
These are the panels:

Number	Name/Location
195CL	ECS Low Pressure Connection Door
196CR	ECS Low Pressure Connection Door
 - (c) Use a heater, COM-2478 or suitable substitute with multiple hoses to heat the airplane through the main deck and upper entry doors.

SUBTASK 12-33-02-210-001

- (7) Use the EICAS engine oil temperature indicator to monitor the engine oil temperature when the engines are not running.
NOTE: If the oil is colder than -58°F (-50°C), the EICAS indication will be blank.
 - (a) To view the oil temperature when the engines are not running, turn on the EEC ground test power.
 - (b) If the engine oil temperature shown on the EICAS approaches -35°F (-37°C), use one of the methods that follow to keep the engine warm.
 - 1) Method 1: External Heating
 - a) Remove the inlet and exhaust covers.



CAUTION

DO NOT OPERATE THE ENGINE IF THE OIL TEMPERATURE IS LESS THAN THE SPECIFIED LIMIT. IF THE OIL TEMPERATURE IS TOO LOW, DAMAGE TO THE ENGINE BEARINGS CAN OCCUR.

- b) Heat the engine core to a minimum of -35°F (-37°C) with an external cabin heater.
 - <1> Use an explosion proof electric blower - heater, STD-3925 or suitable substitute.
 - <2> If you use a multiple hose ground cart heater, COM-2478 or equivalent, direct one heater hose in the exhaust to heat the engine core, and one heater hose on the engine gearbox.

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- <3> If you use a multiple hose ground cart (YMP-350 heater or equivalent), direct one heater hose in the exhaust to heat the engine core, and one heater hose on the engine gearbox.
- <4> If you use a single hose ground cart (Herman Nelson heater or equivalent), direct the heater hose on the engine gearbox.
- c) Make sure the engine oil temperature on the EICAS is warmer than -35°F (-37°C).

NOTE: This is to prevent damage to the engine bearings when you start the engines.

NOTE: If the oil is colder than -58°F (-50°C), the EICAS indication will be blank.

- d) Remove the heater from the engine and install the engine covers.

NOTE: Heaters can be used to maintain the engine oil temperature warmer than -35°F (-37°C) for extended periods if necessary.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

2) Method 2: Start Engines

- a) See cold weather starting procedures in Engine Operation Preparation, TASK 71-00-00-800-834-H00.
- b) See engine operating limits in Engine Operation Limits, TASK 71-00-00-800-802-H01.
- c) Make sure that there are no fluids around the engine exhaust areas that can start ignition before you start the engines.
- d) Do this task: IDG Oil Level Check, TASK 12-22-07-200-803.

NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, D00109, instead of oil, D00523. The only oil, D00109 approved for Sundstrand IDGs is Exxon 2389.

- e) Turn the L and R GEN CNTL switches on the P5 pilots' overhead panel to OFF.



CAUTION

REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

- f) Remove Ground-Accumulated Ice from fan blades.
- g) Remove all the ice or snow from the engine inlet ducts and fan blades before you start the engines.

NOTE: Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts.

- h) Engine icing can occur when the conditions that follow occur:

NOTE: You must use the thermal anti-icing system for the engines/nacelles when these conditions occur.

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- <1> There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.
- <2> You will do ground operations with the static air temperature is less than 50°F (10°C).
- i) Start the engines in cold weather, do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
 - <1> Start the engines one at a time.
- j) Make sure you have positive oil pressure indicated by the time the engine has accelerated to stabilized minimum idle.
- k) Monitor the IDG frequency and oil out temperature on the EICAS maintenance page (Showing a Maintenance Page, TASK 31-61-00-800-804).
- l) When the IDG frequency is 400 ± 5 Hz and the IDG oil out temperature is warmer than 0°C and increasing for both engines, turn the L and R GEN CNTL switches on the P5 pilots' overhead panel to ON.
- m) Run the engines at idle until the oil temperature is at or above 86°F (30°C).
- n) Make sure the oil temperature is at least 86°F (30°C) before you increase the power above idle.
- o) Run the engines at idle until the oil temperature is at or warmer than 86°F (30°C).
- p) Before shutdown of the engines, run the engines at idle for a minimum of 10 minutes.

NOTE: This will let the engine temperature stabilize.
- q) Do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.
- r) Install the inlet and exhaust covers.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

SUBTASK 12-33-02-200-001

- (8) Continue to use the engine oil temperature indicator on the EICAS to monitor the engine oil temperature when the engines are not running.

SUBTASK 12-33-02-210-002

- (9) Visually check the wing lower surface for fuel leaks.

SUBTASK 12-33-02-210-026

- (10) Check the landing gear tire pressure and inflate as required Landing Gear Tire Pressure Check, TASK 12-15-03-780-801.

SUBTASK 12-33-02-210-003

- (11) Visually check the landing gear and service if necessary.
 - (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.
 - (b) For airplanes originating in a warm environment and terminating in a cold environment, do the following:
 - 1) Over-inflate the shock struts by approximately 1 in. (25 mm).

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- 2) Perform a single point pressure/extension check while in the colder location.
 - a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the AMM shock strut servicing band.
 - (c) For airplanes originating in a cold environment and terminating in a warm environment, do the following:
 - 1) Perform a single point pressure/extension check before departure.
 - a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the servicing band.
- NOTE:** When the airplane arrives in the warmer location, the strut will appear slightly over-inflated. Do not re-service the struts if the airplane will soon return to the colder climate. However, if the airplane will remain in service at a warmer location, then re-service the struts.

————— END OF TASK —————

TASK 12-33-02-600-804

3. Return the Airplane to Service After Cold Weather Attended Parking

A. General

- (1) This task is for airplanes in short term parking when the cabin and flight deck temperatures have been maintained above 32°F (0°C), and the engine oil temperature has been maintained above -35°F (-37°C).

B. References

Reference	Title
10-11-01-580-804	Park the Airplane (Normal Parking) (P/B 201)
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-22-07-200-803	IDG Oil Level Check (P/B 301)
12-33-01-600-803	Cold Weather Maintenance Procedure (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-22-00-860-803	Supply APU Generator Power (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
32-41-06-000-801	Brake Disconnect Removal (P/B 401)
32-41-06-400-801	Brake Disconnect Installation (P/B 401)
32-45-07-000-801	Main Landing Gear Brake Removal (P/B 401)
32-45-07-400-801	Main Landing Gear Brake Installation (P/B 401)
71-00-00-800-802-H01	Engine Operation Limits (P/B 201)
71-00-00-800-834-H00	Engine Operation Preparation (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)

C. Tools/Equipment

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

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Reference	Description
COM-2478	Heater - External Cabin, Trailer Mounted Part #: ACU-2000 Supplier: 6L481 Part #: EH30 Supplier: 4TVG2 Part #: MARK IV-700 COLDBUSTER Supplier: 12008 Opt Part #: MARK I COLDBUSTER Supplier: 12008 Opt Part #: MARK IV COLDBUSTER Supplier: 12008
STD-3925	Heater - Blower, Explosion Proof, Electric

D. Consumable Materials

Reference	Description	Specification
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3

E. Procedure

SUBTASK 12-33-02-860-022

- (1) Do the steps at the end of the task for Put the Airplane Back to Its Usual Condition for Return to Service: Park the Airplane (Normal Parking), TASK 10-11-01-580-804.

SUBTASK 12-33-02-090-001

- (2) Remove the covers from the pitot probes and static ports.
 - (a) Make sure there is no ice blocking the pitot probe openings.
 - 1) If ice causes a blockage of the pitot probe openings, carefully apply warm air until the ice melts.

SUBTASK 12-33-02-860-020

- (3) Supply electrical power.
 - (a) Apply a minimum of two electrical power sources from the list below:

NOTE: You can use two external power sources, or the APU with one additional external power source.

 - 1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805
 - 2) Do this task: Supply Primary External Power, TASK 24-22-00-860-801
 - 3) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802
 - 4) Do this task: Supply APU Generator Power, TASK 24-22-00-860-803

NOTE: To improve starting capability of the APU at temperatures colder than -35°F (-37°C), use low viscosity oil, D00071.

NOTE: The EICAS may indicate low APU oil quantity for the first 5 minutes after the APU start or until the APU has warmed up.

SUBTASK 12-33-02-040-001



MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES. MAKE SURE THAT THE INBOARD FAN DUCT COWL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED. THE FLIGHT CONTROL SURFACES CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Turn off flight control hydraulic power.
 - (a) Move the toggle switches for the FLT CONTROL HYD VALVE POWER on the P61 panel to SHUT OFF.

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- (b) Make sure that the VALVE CLOSED lights are illuminated for all the switches.
 - 1) If any VALVE CLOSED light is not illuminated, do the steps that follow for the light that is off.
 - a) Move the switch to NORM.
 - b) Move the switch to SHUT OFF.

SUBTASK 12-33-02-910-001

- (5) Supply conditioned air to the airplane:
 - (a) Make sure the outflow valves are in the OPEN position.
 - (b) Make sure the upper and lower recirculation fan switches are in the ON position.
 - (c) Close the pack and zone circuit breakers if they are open.
 - (d) Put all zone selectors to the 12 o'clock position.
 - (e) Make sure the Trim Air switches are ON.
 - (f) Put the left and right pack switches to AUTO.

SUBTASK 12-33-02-440-001



DO NOT OPERATE THE AILERONS, RUDDER, ELEVATOR, BRAKES, SPOILERS, STABILIZERS OR FLAPS UNTIL THE PUMPS OPERATE FOR A MINIMUM OF 15 MINUTES. IF YOU OPERATE THE HYDRAULIC COMPONENTS BEFORE THE SYSTEM IS WARM, DAMAGE TO THE PUMPS AND COMPONENTS CAN OCCUR.

- (6) Turn on the hydraulic system electric motor pumps 15 minutes before starting the engines.
 - NOTE: This will make sure the hydraulic system operates normally and will prolong the life of the component.
 - Leave the motor pumps running until the engine-driven pumps are operating.
 - (a) Make sure these electric pump switches are in the ON position, on the overhead Hydraulic Control Panel.
 - 1) HYD PUMPS C ELEC 1
 - 2) HYD PUMPS C ELEC 2
 - 3) HYD PUMPS L ELEC
 - 4) HYD PUMPS R ELEC
 - (b) If the hydraulic pressure in one system increases, then drops to zero, do the steps that follow:
 - NOTE: Repeat the steps a maximum of three times. After three times (cycles), you must find the cause of the pressure drop.
 - 1) Turn the electric motor pump OFF.
 - 2) Turn the electric motor pump ON.
 - (c) Leave the motor pumps running until the engine-driven pumps are operating.
 - (d) If the hydraulic pressure in one system increases then drops to zero do the steps that follow.
 - NOTE: Repeat the steps a maximum of three times. After three times (cycles), you must find the cause of the pressure drop.
 - 1) Turn the demand pump OFF.

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- 2) Turn the demand pump ON.

SUBTASK 12-33-02-610-001

- (7) Service the hydraulic system if necessary: Hydraulic Reservoir Fluid Level Check,
TASK 12-12-01-610-801

SUBTASK 12-33-02-210-016

- (8) Visually check the wing lower surface for fuel leaks.

SUBTASK 12-33-02-210-017

- (9) Inspect the wheel wells for ice/snow/slush on the Alternate Landing Gear System components.
 - (a) Remove the ice/snow/slush.

SUBTASK 12-33-02-210-018

- (10) Visually check the landing gear.
 - (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.
 - (b) Look for leaks on the MLG and NLG retract actuators.
 - (c) For airplanes that will originate in a cold environment and will terminate in a warm environment, do the steps that follow.
 - 1) If the strut is under-inflated and no leaks are present, service with nitrogen to bring the strut to the low end of the servicing band.

NOTE: When the airplane arrives in the warmer location, the strut will appear slightly over-inflated. Do not re-service the struts if the airplane will soon return to the colder climate. However, if the airplane will remain in service at a warmer location, re-service the struts.

SUBTASK 12-33-02-000-001

- (11) Remove the plastic sheeting from the tires.

SUBTASK 12-33-02-210-019

- (12) Check for flat-spotted tires.

NOTE: In extreme cold temperatures, tires can become flat-spotted. The flat spots will go away during taxi.

 - (a) If flat-spotted tires are found, alert the flight crew that unusual noise from the landing gear may be heard and is a normal condition during initial taxi due to flat spots.

SUBTASK 12-33-02-910-002

- (13) If the temperature has reached -35°F (-37°C) or colder during the cold soak, heat the landing gear inner cylinder locally for a minimum of 15 minutes.

NOTE: This will help to warm the landing gear actuation system and brake system before brake function is tested.

SUBTASK 12-33-02-650-001

- (14) When adding fuel, you must use these requirements.
 - (a) If the temperature of the fuel is colder than 32°F (0°C), do not drain the fuel tank sumps. To check for water at the fuel tank sump drain valves with the fuel temperature colder than 32°F (0°C), do one of the steps that follow to raise the temperature of the fuel.
 - 1) Fill the tanks with warm fuel.
 - 2) Move the airplane into a warm hangar.

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- (b) Make sure that the fuel temperature is at least 6°F or 3°C warmer than the fuel freeze point or -45°F (-43°C), whichever is warmer. Use the ASTM method to determine the freeze point.

NOTE: The Fuel Quantity Indicator on the wing fuel station can indicate slowly or not show numbers in extreme cold conditions. Use an external fuel flow meter to show the amount of fuel added to the airplane.

- 1) Use fuels that meet specification ASTM D1655; or
- 2) Use fuels that meet specification GOST 10227:
 - a) RT (PT, Russian spelling)
 - b) TS-1 (TC-1, Russian spelling)
- (c) Approved fuel additives.

NOTE: Adding an anti-icing fuel additive may help in the sumping of the fuel tanks.

- 1) Fuel Additive, specification GOST 8313, Fluid I (also known as Fluid E)
 - a) Fluid I may be used at a mixture of no more than 0.15 percent by volume.
- 2) Fuel Additive, specification ASTM 4171
 - a) Fuel additive may be used at a mixture of no more than 0.15 percent by volume.

SUBTASK 12-33-02-860-021

- (15) At temperatures colder than -22°F (-30°C), do these steps before starting the engines:
- (a) Apply localized heat to the inner cylinder of the nose and main gear.
 - (b) Pump the brake pedals 20 times shortly and verify extension/retraction of brake pistons at each brake.
 - 1) If brake operation is not normal, do the steps that follow:
 - a) Provide local warming to the brake.
 - b) Repeat the test until proper operation is observed.
 - c) If the difficulty continues:
 - <1> Do this task: Brake Disconnect Removal, TASK 32-41-06-000-801.
 - <2> Do this task: Brake Disconnect Installation, TASK 32-41-06-400-801.
 - <3> Do this task: Main Landing Gear Brake Removal, TASK 32-45-07-000-801.
 - <4> Do this task: Main Landing Gear Brake Installation, TASK 32-45-07-400-801.

SUBTASK 12-33-02-200-021

- (16) Use the EICAS engine oil temperature indicator to monitor the engine oil temperature when the engines are not running.
- NOTE: If the oil is colder than -58°F (-50°C), the EICAS indication will be blank.
- (a) To view the oil temperature when the engines are not running, turn on the EEC ground test power.
 - (b) If the engine oil temperature shown on the EICAS approaches -35°F (-37°C), do the steps that follow:
 - 1) Remove the inlet and exhaust covers.

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- 2) Heat the engine core to a with a explosion proof electric blower - heater, STD-3925 or suitable substitute:
 - a) If you use a multiple hose ground cart heater, COM-2478 direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine gearbox.
 - b) If you use a multiple hose ground cart (YMP-350 heater), direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine gearbox.
 - c) If you use a single hose ground cart (Herman Nelson heater), direct the heater hose on the engine gearbox.
- 3) Make sure the engine oil temperature on the EICAS display is above -35°F (-37°C) to prevent damage to the engine bearings before you start the engines.
- 4) Prepare to start the engines:
 - a) See cold weather starting procedures in Engine Operation Preparation, TASK 71-00-00-800-834-H00.
 - b) See engine operating limits in Engine Operation Limits, TASK 71-00-00-800-802-H01.
 - c) Turn the L and R GEN CNTL switches on the P5 pilots' overhead panel to OFF.



CAUTION

REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

- d) Remove Ground-Accumulated Ice from fan blades.
- e) Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts. Remove all the ice or snow from the engine inlet ducts and fan blades before you start the engines.
- f) Engine icing can occur when the conditions that follow occur:

NOTE: You must use the thermal anti-icing system for the engines/nacelles when these conditions occur.

<1> There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.

<2> You will do ground operations with the static air temperature is less than 50°F (10°C).
- g) Do this task: IDG Oil Level Check, TASK 12-22-07-200-803.

NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, D00071 lubricant instead of MIL-L-23699 lubricant. The only MIL-PRF-7808 lubricants approved for use in temperatures colder than -35°F (-37°C) for Hamilton Sundstrand IDGs are Exxon 2389, BPTO 2389, Aero Shell 390, and Castrol 325.
- h) Before you start the engines, make sure there are no fluids around the exhaust areas that can start ignition.

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

NOTE: During starts under extreme cold conditions oil pressure may exceed the normal range due to high oil viscosity. With oil temperature stabilized, oil pressure should be in the normal range.

<1> Start the engines one at a time.

- j) Make sure you have positive oil pressure indicated by the time the engine has accelerated to stabilized minimum idle.
- k) Run the engines at idle until the oil temperature is at or above 86°F (30°C).
- l) Make sure the oil temperature is at least 86°F (30°C) before you increase the power above idle.
- m) Monitor the IDG frequency and oil out temperature on the EICAS maintenance page.
- n) When the IDG frequency is 400 ± 5 Hz and the IDG oil out temperature is warmer than 0° and increasing for all four engines, turn the L and R GEN CNTL switches on the P5 pilots' overhead panel to ON.

SUBTASK 12-33-02-440-002



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.

- (17) Turn the flight control hydraulic power to normal.
- (a) Move the toggle switches for the FLT CONTROL HYD VALVE POWER on the P61 panel to NORM.
- (b) Make sure that the VALVE CLOSED lights are not illuminated for all the switches.
- 1) If any VALVE CLOSED light is illuminated, do the steps that follow for the light that is on.
- a) Move the switch to SHUT OFF.
- b) Move the switch to NORM.

SUBTASK 12-33-02-280-001



DO NOT OPERATE THE AILERONS, RUDDER, ELEVATOR, BRAKES, SPOILERS, STABILIZERS OR FLAPS UNTIL THE PUMPS OPERATE FOR A MINIMUM OF 15 MINUTES. IF YOU OPERATE THE HYDRAULIC COMPONENTS BEFORE THE SYSTEM IS WARM, DAMAGE TO THE PUMPS AND COMPONENTS CAN OCCUR.

- (18) Do the functions of the flight control systems that follow:
- (a) Slowly (1 to 2 seconds), move the control column, wheel, rudder pedals, and the ground spoilers.
- NOTE: You must complete at least 10 cycles of each control to near full travel.
- 1) Verify that the movement of the flight control systems are normal on the EICAS display flight controls synoptic.
- (b) Run the stabilizer trim full travel nose up and nose down using the column mounted trim switch.

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- (c) Select the flaps to the full down position.
NOTE: Wait for the flaps to reach the full down position.
- (d) Select the flaps to the full up position.
NOTE: Wait for the flaps to reach the full up position.
- (e) Prepare for the autopilot check:
 - 1) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.
 - 2) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.
 - 3) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.
- (f) Operate the autopilot servos as follows:
 - 1) Engage one autopilot channel
 - 2) Engage vertical speed mode
 - a) Select vertical speed of 2000 fpm.
NOTE: Wait for column motion to stop.
 - b) Select vertical speed of -2000 fpm.
NOTE: Wait for column motion to stop.
 - 3) Engage heading select mode.
 - a) Select 30 degree heading change to the left of airplane heading.
NOTE: Wait for wheel motion to stop.
 - b) Select 30 degree heading change to the right of airplane heading.
NOTE: Wait for wheel motion to stop.
 - 4) Repeat steps 1 through 3 for the other autopilot channel.

SUBTASK 12-33-02-660-003

- (19) Do the task that follows to prepare for flight:
 - (a) Do this task: Cold Weather Maintenance Procedure, TASK 12-33-01-600-803.

————— **END OF TASK** —————

TASK 12-33-02-600-802

4. Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)

A. General

- (1) This task is for cold weather unattended parking of airplanes. This is where the temperature of the cabin and flight deck will not be maintained warmer than 32°F (0°C). This is also where the engines will not be maintained warmer than -40°F (-40°C).
 - (a) For airplanes subject to requirements of the Aviation Register (AR) of the Interstate Aviation Committee: overnight or extended parking (airplane unattended) in temperatures colder than -40°F (-40°C) is prohibited. Do this task to maintain the airplane in a attended parking condition: Cold Weather Attended Parking, TASK 12-33-02-600-801.

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- (2) In the usual operation of the airplane, air comes through the airplane structure. During flight, the water vapor in the air can condense and freeze in the airplane. When you continuously operate the airplane in cold weather, ground temperatures below the freezing point will not let the ice melt.
 - (a) For airplanes that operate continuously in extreme cold weather, put the airplane into a heated hangar periodically to thaw the insulation blankets and other equipment.
 - (b) To remove the ice, do this task: Interior Ice Conditional Inspection, TASK 05-51-53-210-801.
- (3) If the ambient temperature is colder than 32°F (0°C), refer to Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801 if sumping of the fuel tanks is necessary.
- (4) Low temperatures (below freezing) can affect grease viscosity. Lubricate landing gear and flight control components in warm weather or a heated hangar.
 - (a) Refer to Lubrication of Landing Gear During Cold Weather Operation, TASK 12-21-00-600-801.
- (5) When adding fuel, you must use these requirements:
 - (a) Make sure the fuel temperature is at least 6°F or 3°C above the fuel freeze point. Use the ASTM method to determine the freeze point.

NOTE: The Fuel Quantity Indicator on the wing fuel station can indicate slowly or not show numbers in extreme cold conditions. Use an external fuel flow meter to show the amount of fuel added to the airplane.
 - (b) Use fuels that meet specification ASTM D1655; or
 - (c) Use fuels that meet specification GOST 10227:
 - 1) RT (PT, Russian spelling)
 - 2) TS-1 (TC-1, Russian spelling)
 - (d) Approved fuel additives are:

NOTE: Adding an anti-icing fuel additive may help in the sumping of the fuel tanks.

 - 1) Fuel Additive, specification GOST 8313, Fluid I (also known as Fluid E)
 - a) Fluid I may be used at a mixture of no more than 0.15 percent by volume.
 - 2) Fuel additive, specification ASTM D4171.
 - a) ASTM D4171 may be used at a mixture of no more than 0.15 percent by volume.
- (6) Definitions:
 - (a) Ice that has accumulated on the engine fan blades while the airplane has been on the ground for a prolonged stop, such as a plane that has been parked overnight, is considered Ground-Accumulated Ice.
 - 1) Ground-Accumulated Ice must be removed before engine start.
 - (b) Ice that has accumulated on the engine fan blades while the engine is operating at idle power is considered Operational Ice.
 - 1) Operational Ice is allowed before departure because it can be removed by engine run-ups during taxi-out.

B. References

Reference	Title
05-51-53-210-801	Interior Ice Conditional Inspection (P/B 201)

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Reference	Title
09-11-00-580-801	Maintenance Towing (P/B 201)
10-11-01-580-804	Park the Airplane (Normal Parking) (P/B 201)
10-11-02 P/B 201	PROLONGED PARKING - MAINTENANCE PRACTICES
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
12-14-01-616-802	Potable Water System - Drain (P/B 301)
12-15-03-780-801	Landing Gear Tire Pressure Check (P/B 301)
12-17-01-610-801	Waste Tank Servicing (P/B 301)
12-21-00-600-801	Lubrication of Landing Gear During Cold Weather Operation (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-30-00-700-804	Main Battery Charge Capacity - System Test (P/B 501)
24-30-00-700-805	APU Battery Charge Capacity - System Test (P/B 501)
24-31-01-000-801	Main Battery Removal (P/B 401)
24-31-05-000-801	APU Battery Removal (P/B 401)
24-35-01-000-801	Power Supply Assembly Removal (P/B 401)
24-35-02-000-801	FCDC Batteries Removal (P/B 401)
25-64-02-960-801	Megaphone Battery Replacement (P/B 201)
33-51-06-960-802	Power Supply - Battery Pack Replacement (P/B 201)
33-51-06-960-803	Power Supply - Power Supply Replacement (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-2500	Cover - Protective, Main Landing Gear Wheels/Brakes

D. 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
500	Left Wing
600	Right Wing
700	Landing Gear and Landing Gear Doors
800	Passenger and Cargo Compartment Doors

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E. Procedure

SUBTASK 12-33-02-420-002

- (1) Install the inlet and exhaust covers.

NOTE: Keep the engine covers in a warm location before you install them on the airplane. Covers that are cold or frozen may be difficult to install, and may freeze to the engine inlet and exhaust.

NOTE: At very low ambient air temperatures, the time for the engine to cool to -35°F (-37°C) can be greatly increased by the use of engine inlet and exhaust covers.

SUBTASK 12-33-02-480-005

- (2) Cover the main landing gear tires with main landing gear wheels/brakes protective cover, COM-2500.

SUBTASK 12-33-02-480-006

- (3) Cover the nose landing gear tires with plastic sheeting.

SUBTASK 12-33-02-480-001

- (4) Do this task: Park the Airplane (Normal Parking), TASK 10-11-01-580-804.
 - (a) If the airplane will be parked for longer than 7 days, refer to PROLONGED PARKING - MAINTENANCE PRACTICES, PAGEBLOCK 10-11-02/201.

NOTE: Prepare to park the airplane for extended periods.

SUBTASK 12-33-02-210-008

- (5) Visually check the wing lower surface for fuel leaks.

SUBTASK 12-33-02-210-020

- (6) Do this task: Landing Gear Tire Pressure Check, TASK 12-15-03-780-801.

SUBTASK 12-33-02-210-021

- (7) Visually check the landing gear and service if necessary.
 - (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.
 - (b) For airplanes originating in a warm environment and terminating in a cold environment, do the following:
 - 1) Over-inflate the shock struts by approximately 1 in. (25 mm).
 - 2) Perform a single point pressure/extension check while in the colder location.
 - a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the AMM shock strut servicing band.
 - (c) For airplanes originating in a cold environment and terminating in a warm environment, do the following:
 - 1) Perform a single point pressure/extension check before departure.
 - a) If the strut is under-inflated and no leaks are present, then service with nitrogen to bring the strut back onto the low end of the servicing band.

NOTE: When the airplane arrives in the warmer location, the strut will appear slightly over-inflated. Do not re-service the struts if the airplane will soon return to the colder climate. However, if the airplane will remain in service at a warmer location, then re-service the struts.

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SUBTASK 12-33-02-680-001



DRAIN THE WATER SYSTEM. IF THE WATERLINES HAVE WATER IN THEM, THEY CAN FREEZE IN COLD WEATHER. THIS CAN CAUSE DAMAGE TO THE WATERLINES.

- (8) Do this task: Potable Water System - Drain, TASK 12-14-01-616-802.

NOTE: The potable water system must be fully drained to make sure it will not freeze.

- (a) Make sure all galley inserts, coffee pots, water heaters, filters, and boilers are empty and supply lines are drained using the manufacturers instructions.

SUBTASK 12-33-02-800-004

- (9) Drain and flush the waste system, do this task: Waste Tank Servicing, TASK 12-17-01-610-801.

NOTE: The toilet flushing system must be fully drained to make sure it will not freeze.

SUBTASK 12-33-02-020-001

- (10) If you need to tow the airplane, do this task Maintenance Towing, TASK 09-11-00-580-801.

- (a) If you need to tow the airplane without electrical power, then follow the steps below:

NOTE: Boeing does not recommend towing the airplane when electrical power is not available to operate the brake hydraulic system. If towing without power is necessary, without electrical power, if you do not obey this warning, it can cause injury to persons or damage to the airplane.

- 1) Tell the tow vehicle driver of the situation.
- 2) Tow speeds must be decreased to walking speed (or a speed which will allow the tow vehicle to stop the airplane in a short distance) or you must not tow the airplane.
- 3) Make sure the brake accumulator is charged with a minimum of 2800 psi (19,305 kPa).

NOTE: With a minimum of 2800 psi (19,305 kPa) in the accumulator, you can apply the brakes no more than three (3) times before the accumulator is depleted below the precharge (red band) level where no brakes will be available.

SUBTASK 12-33-02-620-001

- (11) Prepare the airplane for storage:

NOTE: Do not remove the batteries from the emergency radio beacons in the slide/raft covers and life rafts.

- (a) Close the outflow valve.
- (b) Remove the megaphone battery, do this task: Megaphone Battery Replacement, TASK 25-64-02-960-801.
- (c) Remove the emergency light batteries, do this task: Power Supply - Battery Pack Replacement, TASK 33-51-06-960-802.
- (d) Remove the batteries from the light modules at the main entry doors 1, 2, 4, and 5 (if applicable), do this task: Power Supply - Power Supply Replacement, TASK 33-51-06-960-803.
- (e) Open the "BATT INTLK" circuit breaker (D8) on the face of the following flight control power supply assemblies (PSA): Remove the applicable rack-mounted electronic PSA, do this task: Power Supply Assembly Removal, TASK 24-35-01-000-801.

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- 1) M24101 Left PSA located on the E1-6 equipment shelf.
 - 2) M24201 Right PSA located on the E5-1 equipment shelf.
 - 3) M24301 Center PSA located on the E2-6 equipment shelf.
- (f) Remove the applicable electrical equipment rack-mounted flight control direct current (FCDC) batteries, do this task: FCDC Batteries Removal, TASK 24-35-02-000-801
- 1) M24102 Left FCDC battery located on the E1-6 equipment shelf.
 - 2) M24202 Right FCDC battery located on the E5-2 equipment shelf.
 - 3) M24302 Center FCDC battery located on the E2-5 equipment shelf.
- (g) Make sure the E1, E2, and E5 electronic rack-mounted equipment is in good condition and has no corrosion.
- (h) Remove the entry door EPAS batteries.
- 1) The EPAS batteries are located in the left and right upper deck doors.
- (i) Put the electronic packages in plastic bags and keep them in a warm location where the temperature remains above 50°F (10°C).
- (j) Apply electrical power to all the electrical/electronic equipment remaining in the airplane for a minimum of 2 hours, do this task: Supply Primary External Power, TASK 24-22-00-860-801.
- 1) Make sure the main and APU batteries are in the fully charged condition.
 - a) Do this task: Main Battery Charge Capacity - System Test, TASK 24-30-00-700-804.
 - b) Do this task: APU Battery Charge Capacity - System Test, TASK 24-30-00-700-805.
- (k) Disconnect the APU battery, do this task: APU Battery Removal, TASK 24-31-05-000-801.
- NOTE: You can connect the battery for APU operations.
- (l) Disconnect the Main battery, do this task: Main Battery Removal, TASK 24-31-01-000-801
- (m) Put all batteries in a warm location where the temperature remains above 50°F (10°C).

SUBTASK 12-33-02-550-006

- (12) Close all the main cabin doors, galley service doors, cargo compartment doors, access doors, and flight compartment windows.

NOTE: This will prevent snow from getting into the airplane interior.

————— **END OF TASK** —————

TASK 12-33-02-600-803

5. Return the Airplane to Service After Cold Weather Unattended Parking at Temperatures Below 32°F (0°C)

A. General

- (1) This task is for airplanes that were parked unattended when the temperature of the flight deck and cabin was not maintained warmer than 32°F (0°C). This is also where the engines were not maintained warmer than -40°F (-40°C).
- (2) If the temperature has remained warmer than -40°F (-40°C) passenger cabin warming is not necessary, but warming is required for the flight deck and EE bay.

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- (3) For temperatures colder than 5°F (-15°C), the EE bay must be warmed before the electronics are energized.
- (4) For temperatures colder than -4°F (-20°C), the flight deck must be warmed before the electronics are energized.

B. References

Reference	Title
10-11-01-580-804	Park the Airplane (Normal Parking) (P/B 201)
10-11-02-210-803	Put the Airplane back to service when parked/stored for 7 days (1 week) or more. (P/B 201)
12-12-01-610-801	Hydraulic Reservoir Fluid Level Check (P/B 301)
12-15-01-610-809	Main Landing Gear Shock Strut Fluid Check (P/B 301)
12-15-02-610-804-002	Nose Landing Gear Shock Strut Fluid Check (P/B 301)
12-15-03-780-801	Landing Gear Tire Pressure Check (P/B 301)
12-15-08-900-801	Crew Oxygen Cylinder Servicing - Cylinder Replacement (P/B 301)
12-22-07-200-803	IDG Oil Level Check (P/B 301)
12-33-01 P/B 301	COLD WEATHER MAINTENANCE - SERVICING
20-41-00-910-801	Static Grounding (P/B 201)
22-11-00 P/B 501	AUTOPILOT FLIGHT DIRECTOR SYSTEM - ADJUSTMENT/TEST
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-802	Supply Secondary External Power (P/B 201)
24-22-00-860-803	Supply APU Generator Power (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-30-00-700-804	Main Battery Charge Capacity - System Test (P/B 501)
24-30-00-700-805	APU Battery Charge Capacity - System Test (P/B 501)
24-31-01-400-801	Main Battery Installation (P/B 401)
24-31-05-400-801	APU Battery Installation (P/B 401)
24-35-01-400-801	Power Supply Assembly Installation (P/B 401)
24-35-02-400-801	FCDC Batteries Installation (P/B 401)
25-64-02-710-801	Megaphone Operational Test (P/B 201)
25-64-02-960-801	Megaphone Battery Replacement (P/B 201)
29-11-00-860-801	Main Hydraulic System Pressurization (P/B 201)
29-11-00-860-803	Main Hydraulic System Pressurization with an Alternating Current Motor Pump (P/B 201)
32-41-00-870-802	Normal Hydraulic Brake System - Bleeding (P/B 201)
32-42-00-700-801	Antiskid/Autobrake System - Functional Test (P/B 501)
32-45-07-000-801	Main Landing Gear Brake Removal (P/B 401)
32-45-07-400-801	Main Landing Gear Brake Installation (P/B 401)
33-51-00-720-801	Emergency Lights - Functional Test (P/B 501)
33-51-06-960-802	Power Supply - Battery Pack Replacement (P/B 201)
33-51-06-960-803	Power Supply - Power Supply Replacement (P/B 201)
34-21-01-400-801	Air Data Inertial Reference Unit - Installation (P/B 401)
34-21-02-400-801	Secondary Attitude Air Data Reference Unit Installation (P/B 401)
49-11-00-860-804	APU Starting and Operation (P/B 201)

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Reference	Title
71-00-00-800-802-H01	Engine Operation Limits (P/B 201)
71-00-00-800-834-H00	Engine Operation Preparation (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-2478	Heater - External Cabin, Trailer Mounted Part #: ACU-2000 Supplier: 6L481 Part #: EH30 Supplier: 4TVG2 Part #: MARK IV-700 COLDBUSTER Supplier: 12008 Opt Part #: MARK I COLDBUSTER Supplier: 12008 Opt Part #: MARK IV COLDBUSTER Supplier: 12008
STD-3925	Heater - Blower, Explosion Proof, Electric

D. Consumable Materials

Reference	Description	Specification
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3

E. 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
500	Left Wing
600	Right Wing
700	Landing Gear and Landing Gear Doors
800	Passenger and Cargo Compartment Doors

F. Access Panels

Number	Name/Location
112AL	Forward Access Door
117AL	Main Equipment Center Access Door
195CL	ECS Low Pressure Connection Door
196CR	ECS Low Pressure Connection Door

G. Procedure

SUBTASK 12-33-02-550-005

- (1) Do the steps at the end of the task for Put the Airplane Back In Its Usual Condition for Return to Service: Park the Airplane (Normal Parking), TASK 10-11-01-580-804.
 - (a) For airplanes that were parked for longer than 7 days, do the applicable task for the length of the parking period: Put the Airplane back to service when parked/stored for 7 days (1 week) or more., TASK 10-11-02-210-803.

SUBTASK 12-33-02-800-005

- (2) Remove the covers from the pitot probes and static ports.

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- (a) Make sure that there is no ice blocking the pitot probe and static port openings.
 - 1) If ice causes a blockage, carefully apply warm air until the ice melts.

SUBTASK 12-33-02-880-002

- (3) Do these steps to warm the interior of the airplane:

- (a) Secure the interior doors in the open position.
 - 1) lavatory doors
 - 2) flight deck door
 - 3) closet doors
 - 4) galley bin doors
 - 5) overhead stowage bin doors.



CAUTION

THE AIR ENTERING THE CONDITIONED AIR GROUND SERVICE PORT MUST NOT EXCEED 158 °F (70 °C) AND THE PRESSURE MUST NOT EXCEED 15 INCHES (38 CENTIMETERS) OF WATER AT THE POINT WHERE THE AIR ENTERS THE BODY OF THE AIRPLANE.

- (b) For ground equipment with multiple heating hoses (YMP-350), do the steps that follow:
 - 1) Put the outflow valve to the OPEN position.
 - 2) Connect one heating hose to either of the ECS Low Pressure Connection Door:

These are the access doors:

<u>Number</u>	<u>Name/Location</u>
195CL	ECS Low Pressure Connection Door
196CR	ECS Low Pressure Connection Door

- 3) Insert two heating hoses into the Main Equipment Center through the Main Equipment Center access door:

This is the access door:

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

- 4) Insert one heating hose through the Forward Access Door:

This is the access door:

<u>Number</u>	<u>Name/Location</u>
112AL	Forward Access Door



CAUTION

THE AIR ENTERING THE CONDITIONED AIR GROUND SERVICE PORT MUST NOT EXCEED 158 °F (70 °C) AND THE PRESSURE MUST NOT EXCEED 15 INCHES (38 CENTIMETERS) OF WATER AT THE POINT WHERE THE AIR ENTERS THE BODY OF THE AIRPLANE.

- (c) For ground equipment with one heating hose to warm the airplane, do the steps that follow:
 - 1) For a single hose ground cart (Herman Nelson heater) turn the outflow valve to the one-half CLOSED position.
 - 2) Insert one heating hose into the Main Equipment Center through the Main Equipment Center access door:

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This is the access door:

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

- 3) Attach the return air hose to the Forward Access Door:

This is the access door:

<u>Number</u>	<u>Name/Location</u>
112AL	Forward Access Door

- (d) Warm the interior of the airplane before you energize any of the electronics:
- 1) Make sure you maintain the flight deck temperature at or above -4°F (-20°C) for 30 minutes before you energize any of the electronics.
 - 2) Make sure you maintain the EE Bay temperature at or above 5°F (-15°C) for 30 minutes before you energize any of the electronics.
 - 3) If an additional ground heating cart is available, heat the aft galley.

NOTE: Heating of the passenger cabin is not necessary before APU start, but can decrease the time it takes to raise the cabin to operating temperature with the ECS system.

SUBTASK 12-33-02-630-001

- (4) Activate the electrical/electronic systems.

NOTE: Before electrical power is applied, visually make sure all control lever positions agree with the movable control surface positions.

- (a) Make sure there is an electrical ground on the airplane:
- 1) Do this task: Static Grounding, TASK 20-41-00-910-801.
- (b) Make sure all switches that are not necessary are in the OFF position.
- NOTE: This does not include the switches used to activate the systems.
- (c) Install the applicable electrical equipment rack-mounted flight control direct current (FCDC) batteries, do this task: FCDC Batteries Installation, TASK 24-35-02-400-801.
- 1) M24102 Left FCDC battery located on the E1-6 equipment shelf.
 - 2) M24202 Right FCDC battery located on the E5-2 equipment shelf.
 - 3) M24302 Center FCDC battery located on the E2-5 equipment shelf.
- (d) Close the "BATT INTLK" circuit breaker (D8) on the face of the following flight control power supply assemblies (PSA): Install the applicable rack-mounted electronic PSA, do this task: Power Supply Assembly Installation, TASK 24-35-01-400-801.
- 1) M24101 Left PSA located on the E1-6 equipment shelf.
 - 2) M24201 Right PSA located on the E5-1 equipment shelf.
 - 3) M24301 Center PSA located on the E2-6 equipment shelf.
- (e) Make sure the E1, E2, and E5 electronic rack-mounted equipment is in good condition and has no corrosion.
- (f) Install the inertial reference systems if they were removed:
- 1) Do this task: Air Data Inertial Reference Unit - Installation, TASK 34-21-01-400-801.
 - 2) Do this task: Secondary Attitude Air Data Reference Unit Installation, TASK 34-21-02-400-801.

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- (g) Install or connect the main batteries if it is applicable, do this task: Main Battery Installation, TASK 24-31-01-400-801.
- (h) Connect the APU battery, do this task: APU Battery Installation, TASK 24-31-05-400-801.
- (i) Install the emergency light batteries, do this task: Power Supply - Battery Pack Replacement, TASK 33-51-06-960-802L.
 - 1) If the emergency light batteries stayed on the airplane during storage, do the step that follows:
NOTE: If you disconnected the wires to the battery packs from the electrical power source, connect the wires.
 - a) Make sure the circuit breakers for charging the emergency light batteries are closed.
 - b) If you removed the battery cartridges from the airplane, install the cartridges.
- (j) Install the megaphone battery:
 - 1) Do this task: Megaphone Battery Replacement, TASK 25-64-02-960-801.
 - 2) Do this task: Megaphone Operational Test, TASK 25-64-02-710-801.
- (k) Install the batteries from the light modules at the main entry doors 1, 2, 4, and 5 (if applicable), do this task: Power Supply - Power Supply Replacement, TASK 33-51-06-960-803.
- (l) Install the batteries from the light modules at the overwing exit doors 3 (if applicable), do this task: Power Supply - Power Supply Replacement, TASK 33-51-06-960-803.
- (m) Install the Squib batteries.
 - 1) The squib batteries are located in the left and right upper deck doors.
- (n) Install all of the other batteries:
 - 1) Make a check of the batteries in the emergency radio beacons.
NOTE: These batteries are located in the BBMe slide/raft covers and the life raft. These batteries are only activated when they are touched by water.
 - 2) Install the flashlight batteries and other equivalent non-rechargeable batteries.
NOTE: These batteries could have been moved to other areas, or other airplanes. If they were, install new batteries when the airplane is put back in service.
- (o) Close all the applicable circuit breakers for the electrical/electronic components.
- (p) Close this circuit breaker:

Overhead Circuit Breaker Panel, P11

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	22	C32615	LDG GEAR PARKING BRAKE VALVE

for the parking brake valve.

NOTE: If the circuit breakers for the Antiskid/Autobrake Control Unit were opened to prevent EICAS and BITE message errors, close these circuit breakers.

- (q) Close all of the applicable circuit breakers on the overhead circuit breaker panel.
- (r) Close the circuit breakers on the main power distribution panels P110 and P210.
- (s) Apply electrical power to all the electrical/electronic equipment in the airplane for a minimum of 2 hours, do this task: Supply Primary External Power, TASK 24-22-00-860-801

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- 1) Make sure the main battery is in the fully charged condition, do this task: Main Battery Charge Capacity - System Test, TASK 24-30-00-700-804
- 2) Make sure the APU battery is in the fully charged condition, do this task: APU Battery Charge Capacity - System Test, TASK 24-30-00-700-805



DO NOT TURN ON THE EMERGENCY LIGHT SYSTEM IF POWER HAS NOT BEEN APPLIED TO THE INSTALLED SYSTEM WHILE THE AIRPLANE WAS PARKED FOR 6 DAYS OR MORE. DO NOT TURN ON THE SYSTEM FOR A MINIMUM OF 90 MINUTES AFTER YOU APPLY ELECTRICAL POWER. DO NOT DO A FUNCTIONAL TEST UNTIL THE BATTERIES HAVE BEEN CHARGED FOR A MINIMUM OF 90 MINUTES. THIS IS NECESSARY BECAUSE THE SYSTEM MUST BE CHARGED BEFORE IT IS ABLE TO OPERATE CORRECTLY.

- 3) Make sure the Emergency Light System battery packs are in the fully charged condition.

NOTE: The battery packs in the emergency light power supplies are continuously charged when electrical power is supplied to the airplane, unless the emergency light switches are set to the on mode. If the battery packs are fully drained, maximum time necessary to charge them is 90 minutes.



DO NOT TURN ON THE EMERGENCY LIGHT SYSTEM IF POWER HAS NOT BEEN APPLIED TO THE INSTALLED SYSTEM WHILE THE AIRPLANE WAS PARKED FOR 6 DAYS OR MORE. DO NOT TURN ON THE SYSTEM FOR A MINIMUM OF 90 MINUTES AFTER YOU APPLY ELECTRICAL POWER. DO NOT DO A FUNCTIONAL TEST UNTIL THE BATTERIES HAVE BEEN CHARGED FOR A MINIMUM OF 90 MINUTES. THIS IS NECESSARY BECAUSE THE SYSTEM MUST BE CHARGED BEFORE IT IS ABLE TO OPERATE CORRECTLY.

- 4) Do the system test of the emergency light system, do this task: Emergency Lights - Functional Test, TASK 33-51-00-720-801.

NOTE: The battery packs in the emergency light power supplies are continuously charged when electrical power is supplied to the airplane, unless the emergency light switches are set to the on mode. If the battery packs are fully drained, maximum time necessary to charge them is 90 minutes.

- (t) Make sure the applicable switches are returned to the correct position after the power is connected.

SUBTASK 12-33-02-880-003

- (5) Make sure the flight deck has been warmed and maintained at or above -4°F (-20°C) for 30 minutes, then do the steps that follow:

- (a) Disconnect the ground heat cart.
- (b) Close all panels as applicable:

- 1) Remove the heating hose to the ECS Low Pressure Connection Door:

These are the access doors:

<u>Number</u>	<u>Name/Location</u>
195CL	ECS Low Pressure Connection Door
196CR	ECS Low Pressure Connection Door

- 2) Remove the heating hoses in the Main Equipment Center:

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This is the access door:

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

- 3) Remove the heating hose in the Main Equipment Centers:

This is the access door:

<u>Number</u>	<u>Name/Location</u>
112AL	Forward Access Door

- (6) Apply a minimum of two electrical power sources from the list below:

NOTE: You can use two external power sources, or the APU with one additional external power source.

- (a) Do this task: Supply Electrical Power, TASK 24-22-00-860-805
- (b) Do this task: Supply Primary External Power, TASK 24-22-00-860-801
- (c) Do this task: Supply Secondary External Power, TASK 24-22-00-860-802
- (d) Do this task: Supply APU Generator Power, TASK 24-22-00-860-803

NOTE: To improve starting capability of the APU at temperatures below -40°F (-40°C), use low viscosity oil, D00071.

NOTE: The EICAS may indicate low APU oil quantity for the first 5 minutes after the APU start or until the APU has warmed up.

- 1) Use EICAS to monitor the APU oil temperature before you start the APU.

NOTE: The minimum starting temperature for the APU is -40°F (-40°C). If the APU oil temperature is below the minimum starting limit, you must warm the APU before starting.

- a) If the APU oil temperature shown EICAS is below -40°F (-40°C), heat the APU compartment for 15 minutes before starting the APU.

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

- (7) Supply conditioned air to the airplane:

- (a) Make sure the outflow valves are in the OPEN position.
- (b) Make sure the upper and lower recirculation fan switches are in the ON position.
- (c) Close the pack and zone circuit breakers if they are open.
- (d) Put all zone selectors to the 12 o'clock position.
- (e) Make sure the Trim Air switches are ON.
- (f) Put the left and right pack switches to AUTO.

SUBTASK 12-33-02-040-002



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.

- (8) Turn off flight control hydraulic power.

- (a) Move the toggle switch for the FLT CONTROL HYD VALVE POWER on the P61 panel to OFF.

- 1) Make sure that the VALVE CLOSED lights are illuminated for all switches.

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- a) If any VALVE CLOSED light is not illuminated, do the steps that follow for the light that is off.
 - <1> Move the switch to NORM.
 - <2> Move the switch to SHUT OFF.

SUBTASK 12-33-02-860-013



DO NOT CYCLE THE CONTROL COLUMN, WHEEL, RUDDER PEDALS, BRAKE PEDALS, GROUND SPOILERS, STABILIZER OR FLAPS UNTIL THE PUMPS HAVE RUN FOR AT LEAST 15 MINUTES.

- (9) Turn on the hydraulic system electric motor pumps 15 minutes before starting the engines.

NOTE: This will make sure the hydraulic system operates normally and will prolong the life of the components.

NOTE: Leave the motor pumps running until the engine-driven pumps are operating.

 - (a) Do this task: Main Hydraulic System Pressurization with an Alternating Current Motor Pump, TASK 29-11-00-860-803.
 - (b) Select these electric and air driven pump switches to the ON position, on the overhead Hydraulic Control Panel.
 - 1) HYD PUMPS C ELEC 1
 - 2) HYD PUMPS C ELEC 2
 - 3) HYD PUMPS L ELEC
 - 4) HYD PUMPS R ELEC
 - 5) HYD PUMP C AIR DEM
 - (c) Leave the motor pumps running until the engine-driven pumps are operating.
 - (d) If the hydraulic pressure in one system increases, then drops to zero, do the steps that follow:

NOTE: Repeat the steps a maximum of three times. After three times (cycles), you must find the cause of the pressure drop.

 - 1) Turn the electric motor pump OFF,
 - 2) Turn the electric motor pump ON.

SUBTASK 12-33-02-610-002

- (10) Service the hydraulic system if necessary: Hydraulic Reservoir Fluid Level Check, TASK 12-12-01-610-801

SUBTASK 12-33-02-210-022

- (11) Visually check the wing lower surface for fuel leaks.

SUBTASK 12-33-02-210-023

- (12) Inspect the wheel wells for ice/snow/slush on the Alternate Landing Gear System components.
 - (a) Remove the ice/snow/slush.

SUBTASK 12-33-02-210-024

- (13) Visually check the landing gear.
 - (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.
 - (b) Look for leaks on the MLG and NLG retract actuators.

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- (c) For airplanes that will originate in a cold environment and will terminate in a warm environment, do the steps that follow.

- 1) If the strut is under-inflated and no leaks are present, service with nitrogen to bring the strut to the low end of the servicing band.

NOTE: When the airplane arrives in the warmer location, the strut will appear slightly over-inflated. Do not re-service the struts if the airplane will soon return to the colder climate. However, if the airplane will remain in service at a warmer location, re-service the struts.

SUBTASK 12-33-02-630-002

- (14) Remove the plastic sheeting from the tires.

SUBTASK 12-33-02-210-025

- (15) Check for flat-spotted tires.

NOTE: In extreme cold temperatures, tires can become flat-spotted. The flat spots will go away during taxi.

- (a) If flat-spotted tires are found, alert the flight crew that unusual noise from the landing gear may be heard and is a normal condition during initial taxi due to flat spots.

SUBTASK 12-33-02-800-002

- (16) If the temperature has reached -35°F (-37°C) or colder during the cold soak, heat the landing gear inner cylinder locally for a minimum of 15 minutes.

NOTE: This will help to warm the landing gear actuation system and brake system before brake function is tested.

SUBTASK 12-33-02-210-012

- (17) Do this task: Landing Gear Tire Pressure Check, TASK 12-15-03-780-801.

SUBTASK 12-33-02-210-013

- (18) Do this task: Main Landing Gear Shock Strut Fluid Check, TASK 12-15-01-610-809.

SUBTASK 12-33-02-210-014

- (19) Do this task: Nose Landing Gear Shock Strut Fluid Check, TASK 12-15-02-610-804-002.

SUBTASK 12-33-02-860-016

- (20) When adding fuel, you must use these requirements:

- (a) Make sure the fuel temperature is at least 6°F or 3°C above the fuel freeze point. Use the ASTM method to determine the freeze point.

NOTE: The Fuel Quantity Indicator on the wing fuel station can indicate slowly or not show numbers in extreme cold conditions. Use an external fuel flow meter to show the amount of fuel added to the airplane.

- (b) Use fuels that meet specification ASTM D1655; or

- (c) Use fuels that meet specification GOST 10227:

- 1) RT (PT, Russian spelling)
2) TS-1 (TC-1, Russian spelling)

- (d) Approved fuel additives are:

NOTE: Adding an anti-icing fuel additive may help in the sumping of the fuel tanks.

- 1) Fuel Additive, specification GOST 8313, Fluid I (also known as Fluid E)
a) Fluid I may be used at a mixture of no more than 0.15 percent by volume.
2) Fuel additive, specification ASTM D4171.

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- a) ASTM D4171 may be used at a mixture of no more than 0.15 percent by volume.

SUBTASK 12-33-02-860-015

- (21) At temperatures below -22°F (-30°C) pump the brake pedals eight (8) times shortly before starting the engines. At each wheel, verify extension/retraction of brake pistons.
 - (a) If brake operation is not normal, do the steps that follow:
 - 1) Provide local warming to the brake
 - 2) Do this task: Antiskid/Autobrake System - Functional Test, TASK 32-42-00-700-801.
 - 3) Do this task: Normal Hydraulic Brake System - Bleeding, TASK 32-41-00-870-802.
 - 4) Repeat the test until proper operation is observed.
 - a) If the difficulty persists,
These are the tasks:
Main Landing Gear Brake Removal, TASK 32-45-07-000-801,
Main Landing Gear Brake Installation, TASK 32-45-07-400-801.

SUBTASK 12-33-02-800-006

- (22) Use the EICAS engine oil temperature indicator to monitor the engine oil temperature when the engines are not running.

NOTE: If the oil is colder than -58°F (-50°C), the EICAS indication will be blank.

 - (a) To view the oil temperature when the engines are not running, turn on the EEC ground test power.
 - (b) If the engine oil temperature shown on the EICAS approaches -35°F (-37°C), do the steps that follow:
 - 1) Remove the inlet and exhaust covers.
 - 2) Heat the engine core to a with a explosion proof electric blower - heater, STD-3925 or suitable substitute:
 - a) If you use a multiple hose ground cart heater, COM-2478 direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine gearbox.
 - b) If you use a multiple hose ground cart (YMP-350 heater), direct one heater hose in the inlet to heat the engine core, and one heater hose on the engine gearbox.
 - c) If you use a single hose ground cart (Herman Nelson heater), direct the heater hose on the engine gearbox.
 - 3) Make sure the engine oil temperature on the EICAS display is above -35°F (-37°C) to prevent damage to the engine bearings before you start the engines.
 - 4) Prepare to start the engines:
 - a) See cold weather starting procedures in Engine Operation Preparation, TASK 71-00-00-800-834-H00.
 - b) See engine operating limits in Engine Operation Limits, TASK 71-00-00-800-802-H01.
 - c) Turn the L and R GEN CNTL switches on the P5 pilots' overhead panel to OFF.

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CAUTION

REMOVE ICE AND SNOW FROM THE ENGINE. IF YOU DO NOT REMOVE THE ICE AND SNOW, DAMAGE TO THE ENGINE CAN OCCUR.

- d) Remove Ground-Accumulated Ice from fan blades.
- e) Large pieces of ice and/or snow that go into the engine inlet can cause damage to the internal engine parts. Remove all the ice or snow from the engine inlet ducts and fan blades before you start the engines.
- f) Engine icing can occur when the conditions that follow occur:
NOTE: You must use the thermal anti-icing system for the engines/nacelles when these conditions occur.
 - <1> There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.
 - <2> You will do ground operations with the static air temperature is less than 50°F (10°C).
- g) Do this task: IDG Oil Level Check, TASK 12-22-07-200-803.
NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, D00071 lubricant instead of MIL-L-23699 lubricant. The only MIL-PRF-7808 lubricants approved for use below -35°F (-37°C) for Hamilton Sundstrand IDGs are Exxon 2389, BPTO 2389, Aero Shell 390, and Castrol 325.
- h) Before you start the engines, make sure there are no fluids around the exhaust areas that can start ignition.
- i) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.
NOTE: During starts under extreme cold conditions oil pressure may exceed the normal range due to high oil viscosity. With oil temperature stabilized, oil pressure should be in the normal range.
 - <1> Start the engines one at a time.
- j) Make sure you have positive oil pressure indicated by the time the engine has accelerated to stabilized minimum idle.
- k) Run the engines at idle until the oil temperature is at or above 86°F (30°C).
- l) Make sure the oil temperature is at least 86°F (30°C) before you increase the power above idle.
- m) Monitor the IDG frequency and oil out temperature on the EICAS maintenance page.
- n) When the IDG frequency is 400 ± 5 Hz and the IDG oil out temperature is warmer than 0° and increasing for all four engines, turn the L and R GEN CNTL switches on the P5 pilots' overhead panel to ON.



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SUBTASK 12-33-02-440-003



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.

- (23) Turn the flight control hydraulic power to normal.
- (a) Move the toggle switches for the FLT CONTROL HYD VALVE POWER on the P61 panel to NORM.
 - (b) Make sure that the VALVE CLOSED lights are not illuminated for all the switches.
 - 1) If any VALVE CLOSED light is illuminated, do the steps that follow for the light that is on.
 - a) Move the switch to SHUT OFF.
 - b) Move the switch to NORM.

SUBTASK 12-33-02-860-014



DO NOT OPERATE THE AILERONS, RUDDER, ELEVATOR, BRAKES, SPOILERS, STABILIZERS OR FLAPS UNTIL THE PUMPS OPERATE FOR A MINIMUM OF 15 MINUTES. IF YOU OPERATE THE HYDRAULIC COMPONENTS BEFORE THE SYSTEM IS WARM, DAMAGE TO THE PUMPS AND COMPONENTS CAN OCCUR.

- (24) Do the functions of the flight control systems that follow:
- (a) Slowly (1 to 2 seconds), move the control column, wheel, rudder pedals, and the ground spoilers.

NOTE: You must complete at least 10 cycles of each control to near full travel.

 - 1) Verify that the movement of the flight control systems are normal on EICAS.
 - (b) Run the stabilizer trim full travel nose up and nose down using the column mounted trim switch.
 - (c) Select the flaps to the full down position.

NOTE: Wait for the flaps to reach the full down position.
 - (d) Select the flaps to the full up position.

NOTE: Wait for the flaps to reach the full up position.
 - (e) Prepare for the autopilot check (AUTOPILOT FLIGHT DIRECTOR SYSTEM - ADJUSTMENT/TEST, PAGEBLOCK 22-11-00/501:
 - 1) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.
 - 2) Make sure that the VHF NAV and IRS switches, on the P5 forward overhead panel, are in the NORMAL positions.
 - 3) Set the left and right IRS select switches, on the P5 aft overhead panel, to the ALIGN or NAV position.

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

- 4) Make sure hydraulic power is applied to systems A and B. To supply hydraulic power, do this task: Main Hydraulic System Pressurization, TASK 29-11-00-860-801

NOTE: Hydraulic power is necessary for surface test.

- (f) Operate the autopilot servos as follows:

- 1) Engage one autopilot channel
- 2) Engage vertical speed mode

- a) Select vertical speed of 2000 fpm.

NOTE: Wait for column motion to stop.

- b) Select vertical speed of -2000 fpm.

NOTE: Wait for column motion to stop.

- 3) Engage heading select mode.

- a) Select 30 degree heading change to the left of airplane heading.

NOTE: Wait for wheel motion to stop.

- b) Select 30 degree heading change to the right of airplane heading.

NOTE: Wait for wheel motion to stop.

- 4) Repeat steps 1 through 3 for the other two autopilot channels.

SUBTASK 12-33-02-800-003

- (25) Do this procedure to prepare for flight: COLD WEATHER MAINTENANCE - SERVICING, PAGEBLOCK 12-33-01/301.

SUBTASK 12-33-02-800-001

- (26) Observe the flight crew and portable oxygen systems.

- (a) It may be noted that the pressure in the flight crew and portable oxygen systems may indicate lower than normal at cold temperatures (TASK 12-15-08-900-801) for temperature effects).

———— **END OF TASK** ————

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