

B757 MANUAL SUPPLEMENT - ATP 3510
SECTION 1 CHAPTER 12
CONTROL PAGE - ISSUE 9

- A. File the attached Temporary Revision/Alerts in the Manual Supplement in ATA Chapter/Section/Subject/Page sequence
- B. File this Control Page in front of the Chapter TRs/Alerts.
- C. The following list shows active TRs/Alerts together with TRs/Alerts added by this control page.

Chapter Section Subject	Page		TR/Alert No.
12-13-04	301		12-584
12-15-01	313		12-579
12-15-02	313		12-580
12-21-09	301	* Boe	12-1001
12-21-14	301	Alert	12-568
12-21-18	306		12-583
12-25-01	301	Alert	12-574

- D. Remove and Destroy the following TRs/Alerts:

* Indicates TRs/Alerts issued with this control page

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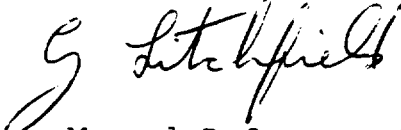
**AIRPLANE
NB322**

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28 August, 1998

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 12-584

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DA1/8566/78.



For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 12-13-04 Page 301

REASON FOR REVISION

Additional information.

ACTION

B. Consumable Materials

Read the following additional note

NOTE: For the oil type to be used on BA aircraft, refer to the Ramp Servicing Manual ATP.07005

Originator: C.IVERS
Reference: 49D134
Workbook: --

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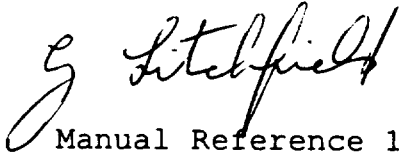
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8 April, 1998

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TEMPORARY REVISION No. 12-579

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For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 12-15-01 Page 313

REASON FOR REVISION

To ensure the shock strut extension is within limits.

ACTION

5. Servicing of the Shock Strut with Fluid and Nitrogen

Ignore existing steps F.(4) and G.(4) and read the following:

- (4) Raise an ADD to inflate the shock strut again at an interval between 5 and 10 landings after you did a complete oil and nitrogen servicing.
- (5) Raise an ADD to visually inspect the shock strut for normal extension at each transit and check 1 until the ADD in step (4) is cleared. If the extension is found to be outside the normal range, nitrogen servicing MUST be accomplished before further flight.

Originator: I.PRINCE
Reference: 2637
Workbook: 12-223

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**ATP
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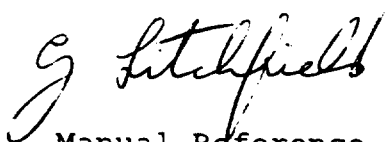
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757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 12-580

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DA1/8566/78.



For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 12-15-02 Page 313

REASON FOR REVISION

To ensure the shock strut extension is within limits.

ACTION

5. Servicing of the Shock Strut with Fluid and Nitrogen

Ignore existing steps F.(4) and G.(4) and read the following:

- (4) Raise an ADD to inflate the shock strut again at an interval between 5 and 10 landings after you did a complete oil and nitrogen servicing.
- (5) Raise an ADD to visually inspect the shock strut for normal extension at each transit and check 1 until the ADD in step (4) is cleared. If the extension is found to be outside the normal range, nitrogen servicing MUST be accomplished before further flight.

Originator: I.PRINCE
Reference: 2637
Workbook: 12-223

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Page 313

TRAILING EDGE FLAP SYSTEM - SERVICING

TEMPORARY REVISION 12-1001

FILING INSTRUCTIONS

This temporary revision applies only to document D633N132. For the printed manual, file this temporary revision adjacent to the page(s) affected.

For the microfilm manual, file this temporary revision in sequence by ATA number. Mark the microfilm cartridge to indicate that it has been changed by temporary revision(s).

This temporary revision will be incorporated in the revision dated Sep 28/01.

This temporary revision affects MPD Task Cards: 12-21-09-3A, 12-21-09-3B, 12-21-09-3C, 12-21-09-3D, 12-21-09-3E, 12-21-09-3F, 12-21-09-3G.

Revision reason: Changed the data to show BMS 3-33 grease as the recommended grease.

This temporary revision furnishes an advance copy of the enclosed page(s) which supersede any previously issued page(s). The information thereon is to be used until this revision is either incorporated or rescinded.

At the end of this TR there is a TR Status Report for document D633N132.

REVISED LIST OF EFFECTIVE PAGES FOR THIS DOCUMENT

PAGE	DATE	CODE	PAGE	DATE	CODE	PAGE	DATE	CODE
* 301	JUL 18/01	01.101	317	MAY 28/01	03	333	MAY 28/01	01
* 302	MAY 28/01	01	318	SEP 28/99	02	334	MAY 28/01	01
* 303	SEP 28/00	01	319	MAY 28/01	02	335	MAY 28/01	01
* 304	JUL 18/01	01.101	320	MAY 28/01	02	336	MAY 28/01	08
305	MAY 28/01	01	321	SEP 28/99	02	337	SEP 28/00	01
306	SEP 28/99	06	322	MAY 28/01	01	338	SEP 28/00	01
* 307	MAY 28/01	08	323	MAY 28/01	01	339	SEP 28/00	01
* 308	JUL 18/01	11.101	324	SEP 28/99	01	340	SEP 28/00	01
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312	MAY 28/01	03	328	MAY 28/01	04	344	MAY 28/01	01
* 313	JUL 18/01	04.101	329	MAY 28/01	01	345	MAY 28/01	01
* 314	MAY 28/01	03	330	MAY 28/01	01	346	MAY 28/01	15
315	MAY 28/01	03	331	MAY 28/01	01	347	MAY 28/01	01
316	MAY 28/01	03	332	MAY 28/01	01	348	SEP 28/00	01

* INDICATES PAGE INCLUDED IN THIS TEMPORARY REVISION.

(CONTINUED ON NEXT PAGE)

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THIS TR CREATED AT
 2001/07/11.22:14:54 UTC

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REVISED LIST OF EFFECTIVE PAGES FOR THIS DOCUMENT

PAGE	DATE	CODE	PAGE	DATE	CODE	PAGE	DATE	CODE
349	MAY 28/01	01						
350	MAY 28/01	01						
351	MAY 28/01	01						
352	MAY 28/01	01						
353	MAY 28/01	01						
354	MAY 28/01	01						
355	SEP 28/00	01						
356	MAY 28/01	01						
357	SEP 28/00	01						
358	MAY 28/01	01						
* 359	JUL 18/01	01.1						
* 360	SEP 28/00	01						
* 361	JUL 18/01	05.1						
* 362	MAY 28/01	03						

* INDICATES PAGE INCLUDED IN THIS TEMPORARY REVISION.

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TRAILING EDGE FLAP SYSTEM - SERVICING

1. General

A. This procedure contains tasks to lubricate the trailing edge (TE) flap system:

- Flap Transmission System
- Flap Drive Gearboxes, Torque Limiters and Universal Joint
- Flap Power Drive Unit
- Outboard Flap Mechanism
- Inboard Flap Mechanism
- Torque Tube Couplings
- Flap Power Drive Unit Control Rods

B. For a complete lubrication of the TE Flap System, it is necessary to do all seven tasks in this procedure. If you will do all seven tasks, it is not necessary to repeat the same steps in the "Prepare for the Servicing" paragraph. Put the airplane back to its usual condition after you complete all the necessary lubrications.

TASK 12-21-09-603-019

2. Lubricate the Trailing Edge Flap Transmission System

A. Equipment

- (1) Needle Adapter, Lubrication - Model 6789
Alemite Division, Stuart Warner Co.

B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
(2) D00013 Grease - MIL-G-23827 (alternative)

C. References

- (1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
(3) AMM 32-00-15/201, Landing Gear Door Locks
(4) AMM 32-00-20/201, Landing Gear Downlocks

D. Access

(1) Location Zones

- | | |
|---------|--|
| 143 | Left MLG Wheel Well |
| 144 | Right MLG Wheel Well |
| 550/650 | Wing Trailing Edge - Aft of Rear Spar and Inboard of Spoiler No. 4 (Left) 9 (Right) |
| 560/660 | Wing Trailing Edge - Aft of Rear Spar and Outboard of Spoiler No. 5 (Left) 8 (Right) |

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E. Prepare for the Servicing

S 413-013

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-273

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-011

- (3) Move the flap control lever to the 30 unit detent.

S 213-012

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 493-003

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

S 213-014

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-015

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-016

- (8) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-017

- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-018

- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT

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- (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- (d) 11J18, FLAP LOAD RELIEF
- (e) 11J33, WARN ELEX A

F. Lubrication for the Flap Drive Transmissions.

NOTE: The procedure to fill the transmission with oil is located in AMM 12-13-06/301.

S 643-232

CAUTION: USE A HAND PUMP TO LUBRICATE BALLSCREW. A PRESSURE PUMP CAN CAUSE DAMAGE TO THE SEAL.

- (1) Lubricate the ballscrews (Fig. 307).

S 643-233

- (2) Lubricate the universal joints (Fig. 308).
- G. Put the Airplane Back to Its Usual Condition

S 863-274

- (1) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-024

- (2) Move the flap control lever to the zero (FLAPS UP) detent.

S 213-025

- (3) Make sure that the TE flaps and LE slats move to the fully retracted position.

S 093-026

- (4) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.

S 863-027

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:

- (a) 6D20, ALTN SLAT PWR
- (b) 6D23, ALTN FLAP PWR

S 863-028

- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

- (a) 11B18, WARN ELEX B
- (b) 11D31, HYDRAULICS PTU CONT

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- (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- (d) 11J18, FLAP LOAD RELIEF
- (e) 11J33, WARN ELEX A

S 093-029

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 863-030

- (8) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-033

- (9) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-150

3. Lubricate the Flap Drive Gearboxes, Torque Limiters and Universal Joints

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00013 Grease - MIL-G-23827 (alternative)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

(1) Location Zones

- | | |
|---------|--|
| 143 | Left MLG Wheel Well |
| 144 | Right MLG Wheel Well |
| 550/650 | Wing Trailing Edge - Aft of Rear Spar and Inboard of Spoiler No. 4 (Left) 9 (Right) |
| 560/660 | Wing Trailing Edge - Aft of Rear Spar and Outboard of Spoiler No. 5 (Left) 8 (Right) |

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- S 213-172
- (3) Make sure that the TE flaps and LE slats move to the fully retracted position.
- S 093-173
- (4) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.
- S 863-174
- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR
- S 863-175
- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A
- S 093-176

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).
- S 863-177
- (8) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

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S 863-178

- (9) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-121

4. Lubricate the Trailing Edge Flap Power Drive Unit (PDU)

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
(2) D00013 Grease - MIL-G-23827 (alternative)

NOTE: AIRPLANES WITH -14 OR SUBSEQUENT PDU'S;
use only MIL-G-21164 grease to lubricate the PDU.

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
(3) AMM 32-00-15/201, Landing Gear Door Locks
(4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
143 Left MLG Wheel Well
144 Right MLG Wheel Well

D. Prepare for Service

S 413-125

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF
THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD
OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-277

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-122

- (3) Move the flap control lever to the 30 unit detent.

S 213-123

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats
are in the fully extended position.

S 493-124

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

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S 863-149

- (5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-234

5. Lubricate the Outboard Trailing Edge Flap Mechanism

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00013 Grease - MIL-G-23827 (alternative)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
570/670 Wing Trailing Edge Flap Track Fairings

D. Prepare for the Servicing

S 413-096

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-278

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-093

- (3) Move the flap control lever to the 30 unit detent.

S 213-094

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 493-095

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

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S 213-097

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-098

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-099

- (8) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-100

- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-101

- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

E. Procedure

S 643-112

- (1) Lubricate the outboard flap mechanism, forward fairing attach point, bell crank and control rods, aft attach fitting, aft fairing pivot, aft flap support track, and main flap track (Fig. 305).

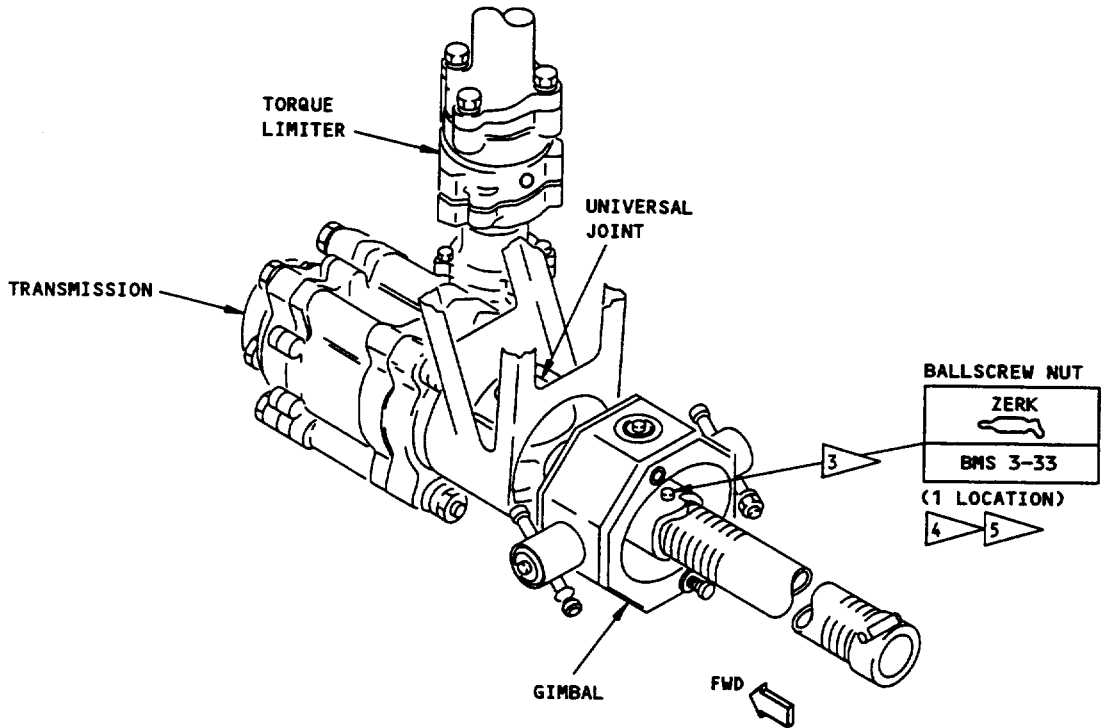
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**INBOARD BALLSCREW
 (1 INBOARD BALLSCREW ON EACH WING)**

1 POINT

(B) 2

- 1 FULLY EXTEND THE FLAPS TO LUBRICATE
- 2 GET ACCESS THROUGH THE WHEEL WELL OF THE MAIN GEAR TO LUBRICATE
- 3 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN). LUBE ONE SIDE ONLY
- 4 **CAUTION:** USE A HAND PUMP TO LUBRICATE THE BALLSCREW. PRESSURE PUMPS MAY DAMAGE THE SEALS AND CAUSE FAILURE.

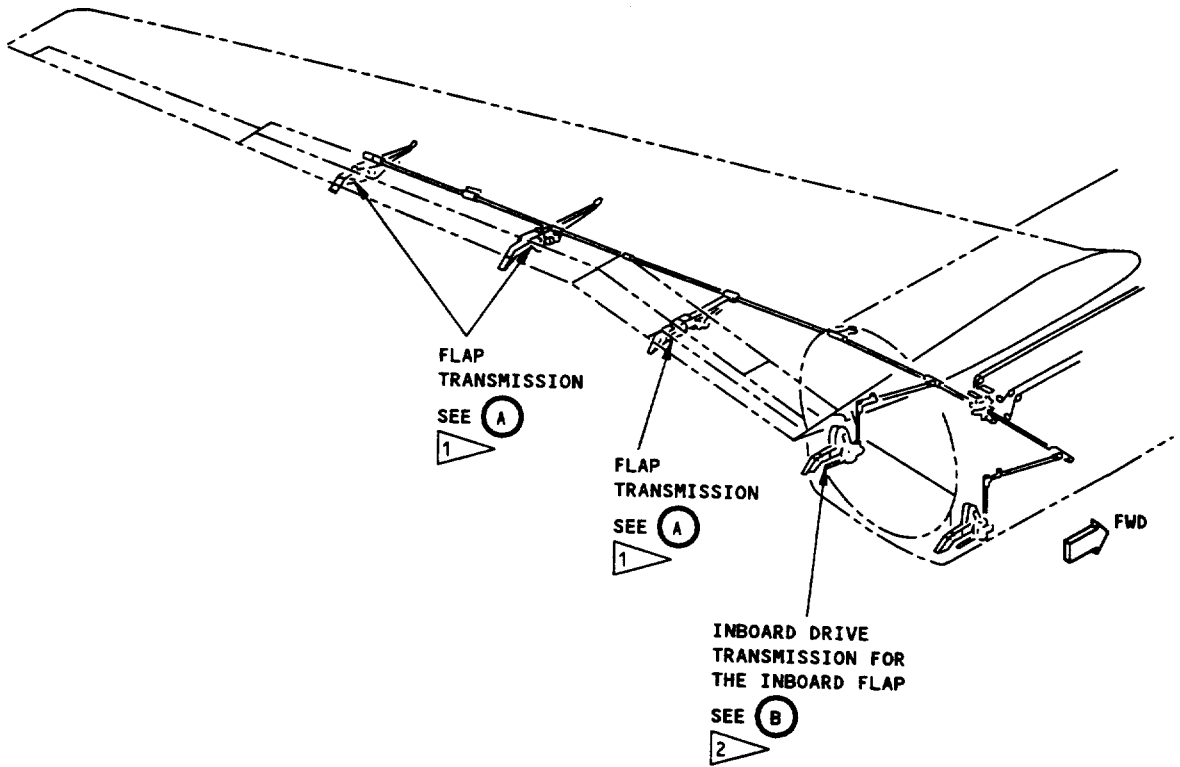
LUBRICATE UNTIL GREASE FLOWS OUT FROM THE BLEED HOLE.

- 5 BMS 3-33 RECOMMENDED
 MIL-G-23827 OPTIONAL

Lubrication for the TE Flap Ballscrews
 Figure 307 (Sheet 3)

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LEFT WING
(RIGHT WING IS OPPOSITE)

TE Flap Universal Joint and Gimbal Servicing
Figure 308 (Sheet 1)

EFFECTIVITY

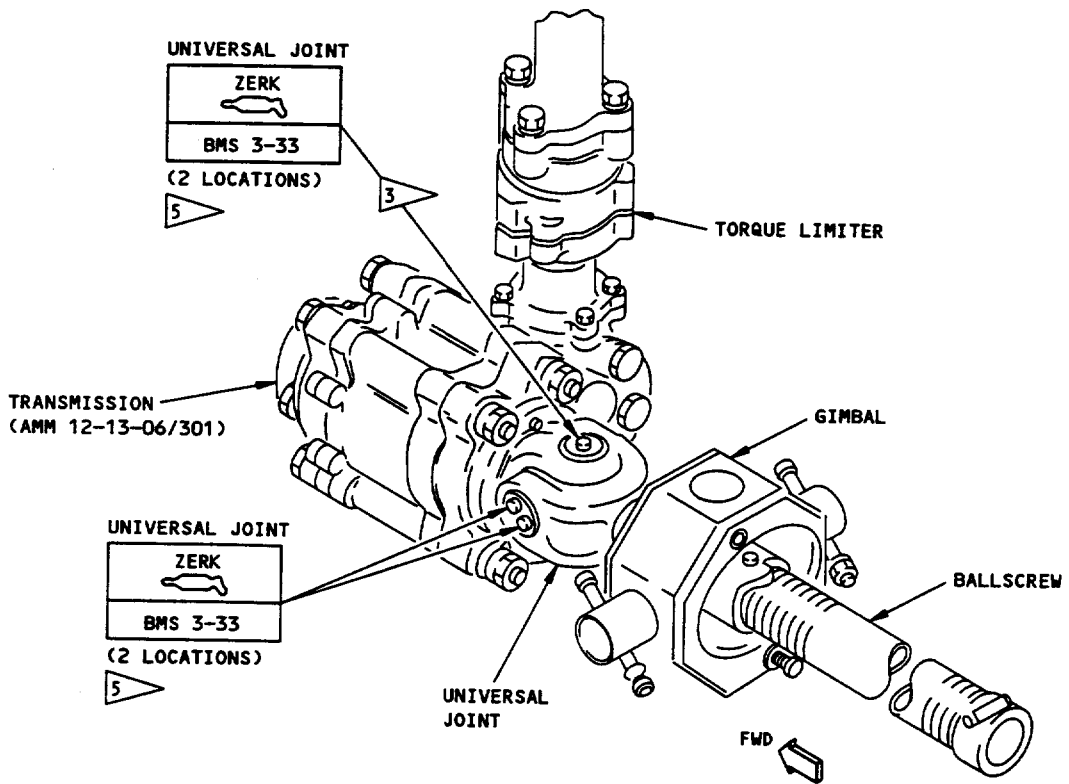
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**FLAP TRANSMISSION
 (3 FLAP TRANSMISSIONS ON EACH WING)**

4 POINTS

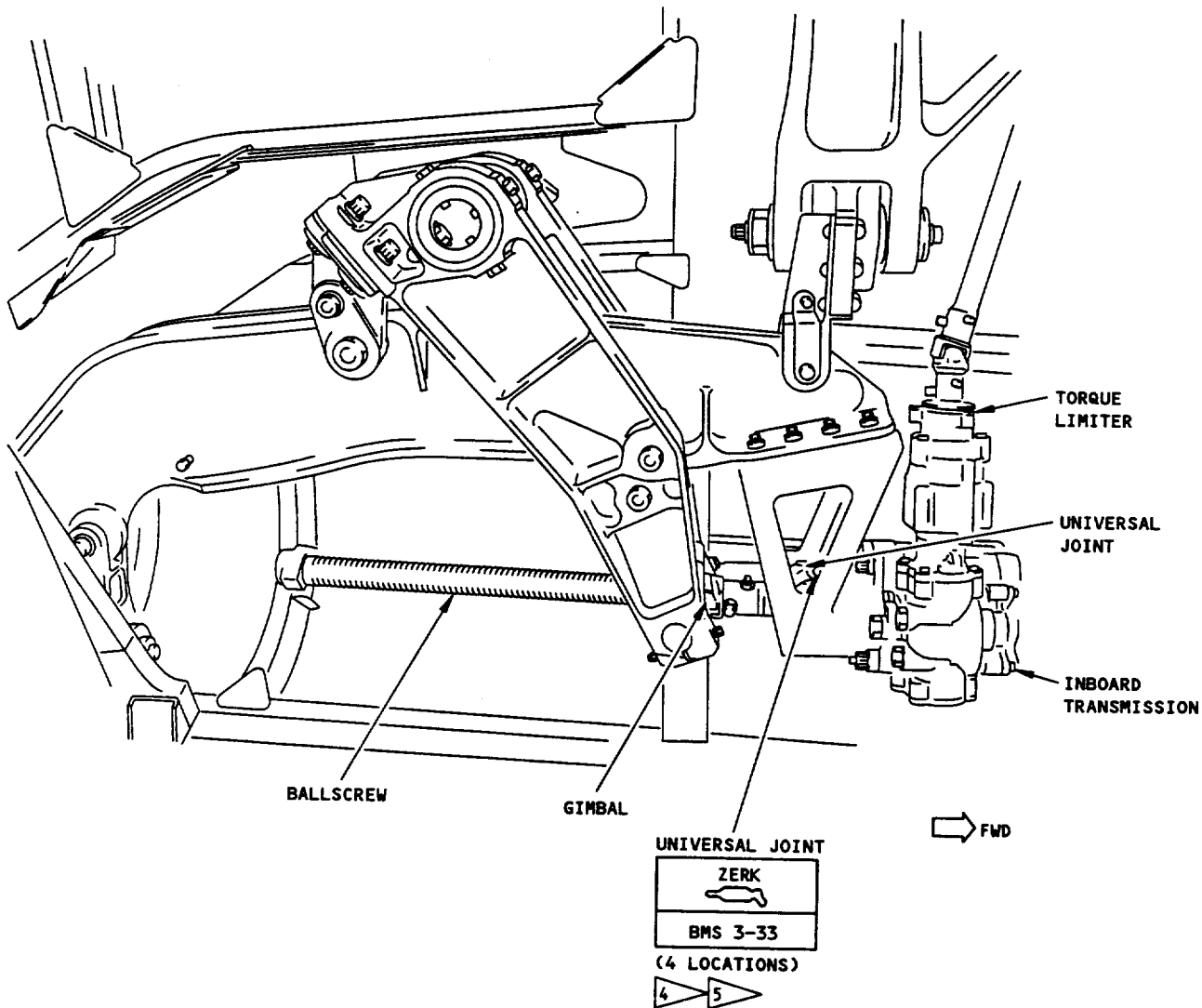
A 1

- 1 FULLY EXTEND THE FLAPS TO LUBRICATE
- 2 GET ACCESS THROUGH THE WHEEL WELL OF THE MAIN GEAR TO LUBRICATE
- 3 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 4 USE THE NEEDLE ADAPTER ON THE GREASE GUN. INSERT THE NEEDLE ADAPTER THROUGH THE TRANSMISSION SUPPORT TO GET TO THE LUBE POINT. TURN THE U-JOINT WITH THE ALTERNATE TE-FLAP DRIVE (AMM 27-51-00/201) TO GET TO ALL U-JOINT LUBE POINTS
- 5 BMS 3-33 RECOMENDED
 MIL-G-23827 OPTIONAL

**TE Flap Universal Joint and Gimbal Servicing
 Figure 308 (Sheet 2)**

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INBOARD DRIVE TRANSMISSION FOR THE INBOARD FLAP

4 POINTS

(B) 2

TE Flap Universal Joint and Gimbal Servicing
 Figure 308 (Sheet 3)

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TEMPORARY REVISION STATUS REPORT FOR DOCUMENT D633N132

THIS LIST CONTAINS ALL TRs WITH TR DATES AFTER SEP 28/00. THIS LIST CREATED AT 2001/07/11.22:14:54 UTC

TR NUMBER	TR DATE	DATE INCORPORATED	SUBJECT	TR NUMBER	TR DATE	DATE INCORPORATED	SUBJECT
12-1001	JUL 18/01	* ACTIVE	12-21-09				
27-1002	FEB 02/01	# 27-1003	27-62-00				
27-1003	MAR 07/01	MAY 28/01	27-62-00				
28-1001	SEP 29/00	JAN 28/01	28-22-11				
32-1001	OCT 26/00	JAN 28/01	32-42-11				
35-1001	JAN 29/01	MAY 28/01	35-21-04				
70-1001	DEC 14/00	JAN 28/01	70-12-04				

* INDICATES TR WAS ACTIVE AT THE TIME OF THIS REPORT;
 REMOVE IT WHEN YOU RECEIVE THE REGULAR REVISION DATED SEP 28/01.
 # INDICATES TR WAS SUPERSEDED BY THE TR LISTED.

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TR STATUS REPORT

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757 MAINTENANCE MANUAL

ALERT No. 12-568

THIS ALERT REVISION IS ISSUED BY BRITISH AIRWAYS QUALITY AND TECHNICAL SERVICES AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.



For CHIEF ENGINEER QUALITY AND TECHNICAL SERVICES.

Manual Reference 12-21-14 Page 301

REASON FOR REVISION

Inadequate and incorrect lubrication of the truck pivot pin joint has resulted in two fractured trucks.

ACTION

MAIN GEAR AND ACTUATING MECHANISMS SERVICING

Read the following additional information

1. General

Corrosion can occur inside landing gear joints if grease is not applied regularly. Severe corrosion in high strength steel landing gear joints can result in landing gear failure. If any of the following are encountered during greasing it must be reported to the engineer in charge for further investigation.

- (a) Grease exuding from joint is rust colored.
- (b) Grease exudes from an unusual place (joint defective).
- (c) Lube fitting inadvertently removed with grease gun.
- (d) Lube fitting missing.
- (e) Lube fitting blocked.

2. Lubricate the Main Landing Gear and Actuating Mechanisms

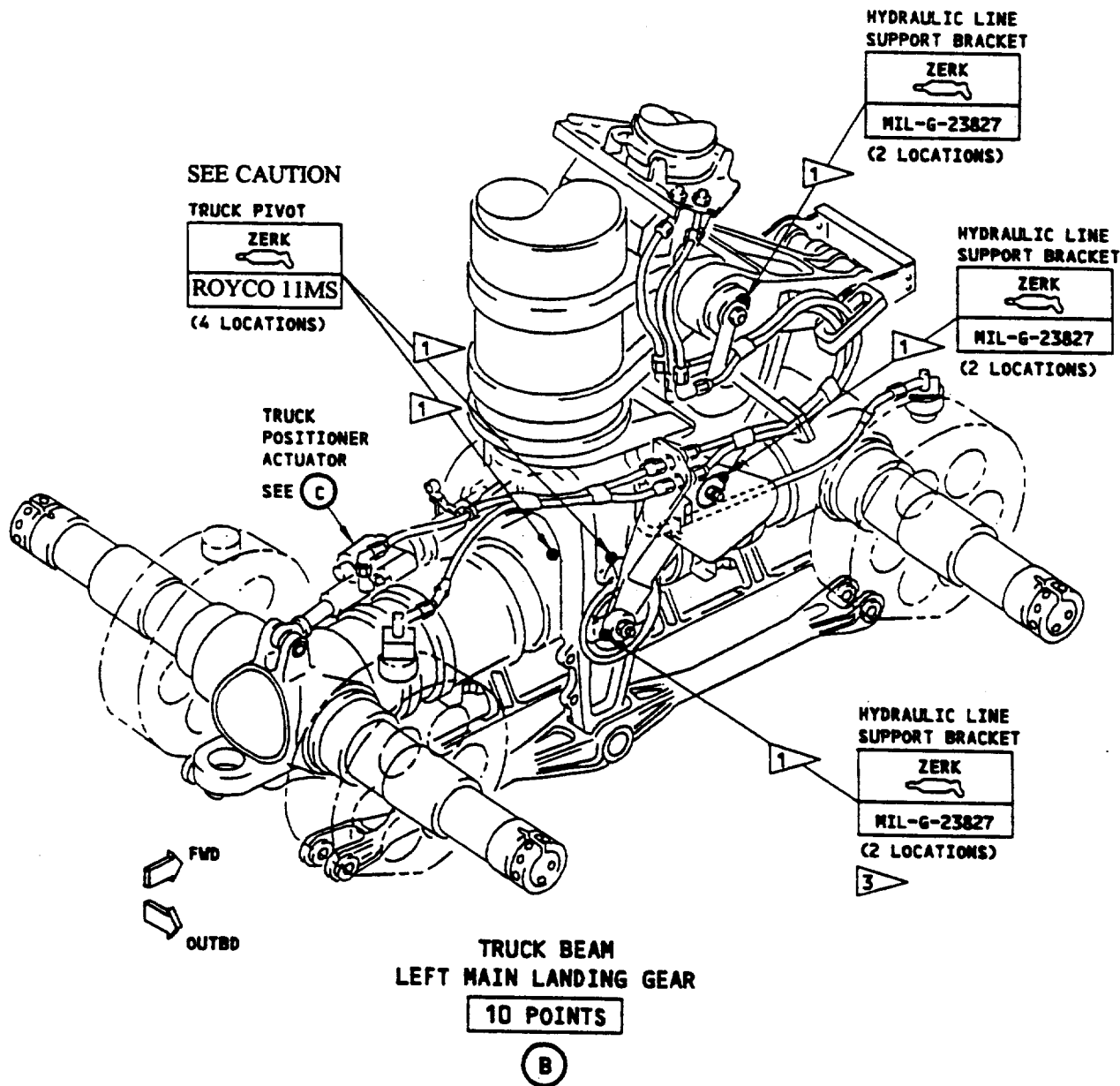
The grease to be used for lubricating the truck pivot and the brake rods is now ROYCO 11MS (See overleaf)

CAUTION: WHEN LUBRICATING THE TRUCK PIVOT PIN ENSURE GREASE EXUDES FROM BOTH SIDES OF THE PIN/BUSHING OUTLET AT THE INBOARD AND OUTBOARD ENDS OF THE PIN. IF GREASE DOES NOT EXUDE FROM THESE AREAS IT MUST BE REPORTED TO THE ENGINEER IN CHARGE AND INVESTIGATED BEFORE FURTHER FLIGHT. INADEQUATE AND INCORRECT LUBRICATION CAN RESULT IN TRUCK FAILURE.

Persons performing a supervisory function are responsible for informing their appropriate staff of the substance of this ATP Alert.

Originator: K.DONAGHY
Reference: 0000001992
Workbook: 12-216

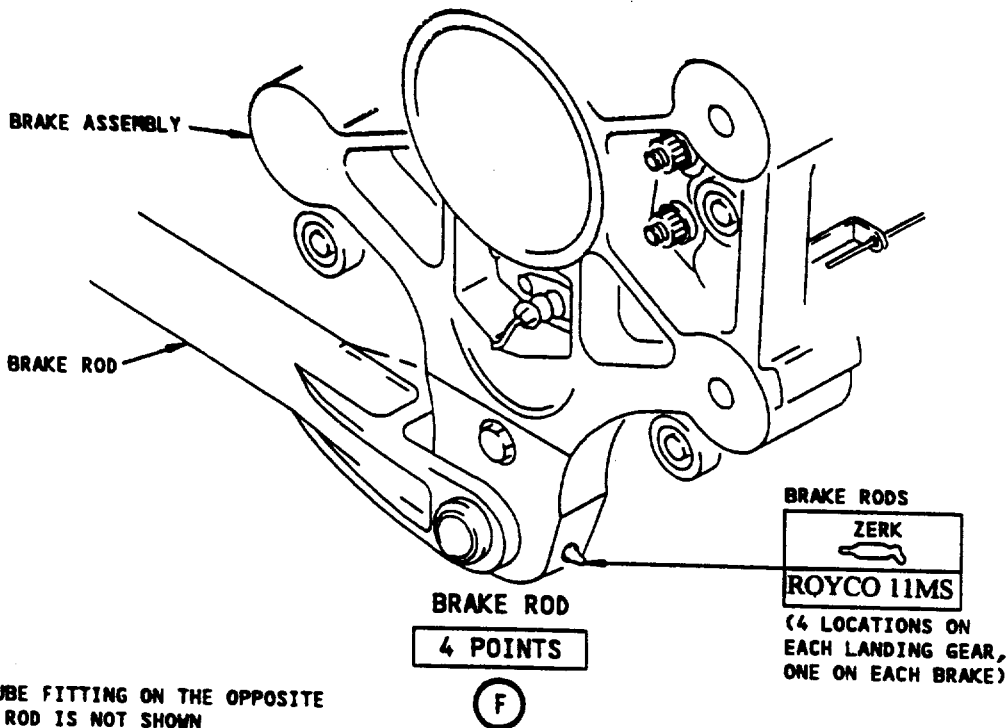
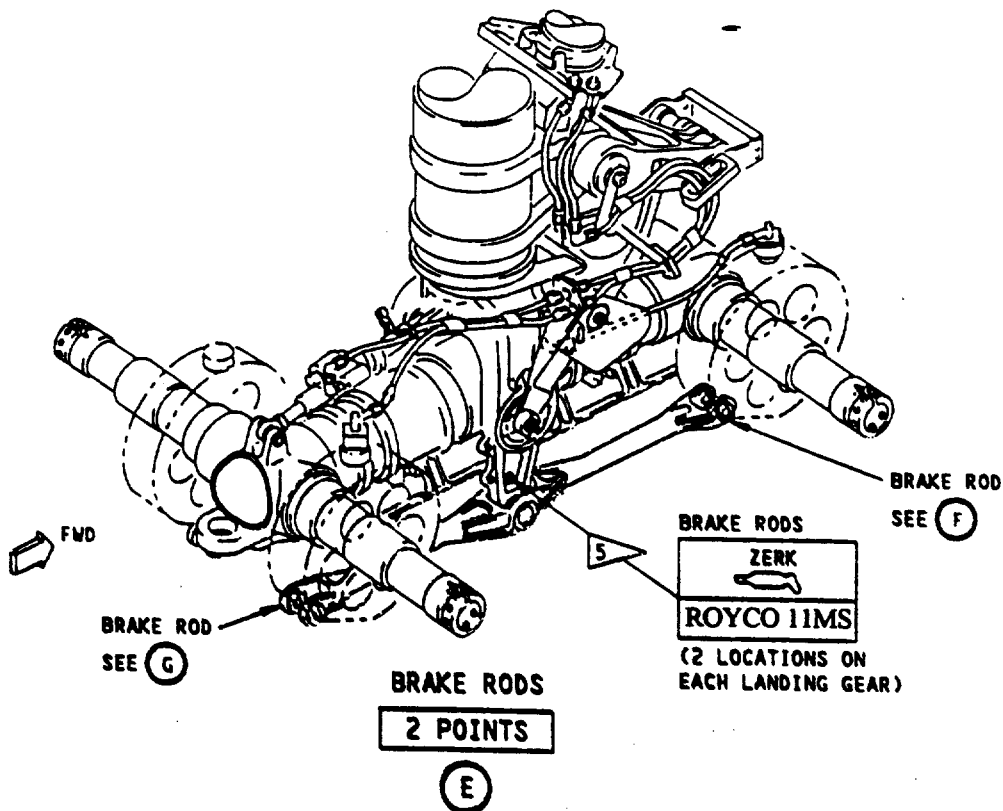
12-21-14
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NOTE: THE TIRES ARE SHOWN REMOVED.

- 1** ONE MORE LOCATION IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 3** ON SOME AIRPLANES THIS IS A SMOOTH FITTING.

Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 3)



5 THE LUBE FITTING ON THE OPPOSITE BRAKE ROD IS NOT SHOWN

Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 6)

**ATP
TEMPORARY
REVISION**

AIRPLANE

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29 June, 1998

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 12-583

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.



For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 12-21-18 Page 306

REASON FOR REVISION

To ensure harness latch roll pins do not become corroded.

ACTION

7. Lubricate the Lower Harness Latch

Read the following additional steps

A. Consumables

(2) A-A-50493 Lubricant (penetrating), Pt No.LPSLST

D. Procedure

(2A) Lubricate latch roll pins (View A, Fig overleaf) ensure good penetration of lubricant to roll pins. Wipe excess lubricant from exterior of latch.

Originator: J.GODWIN

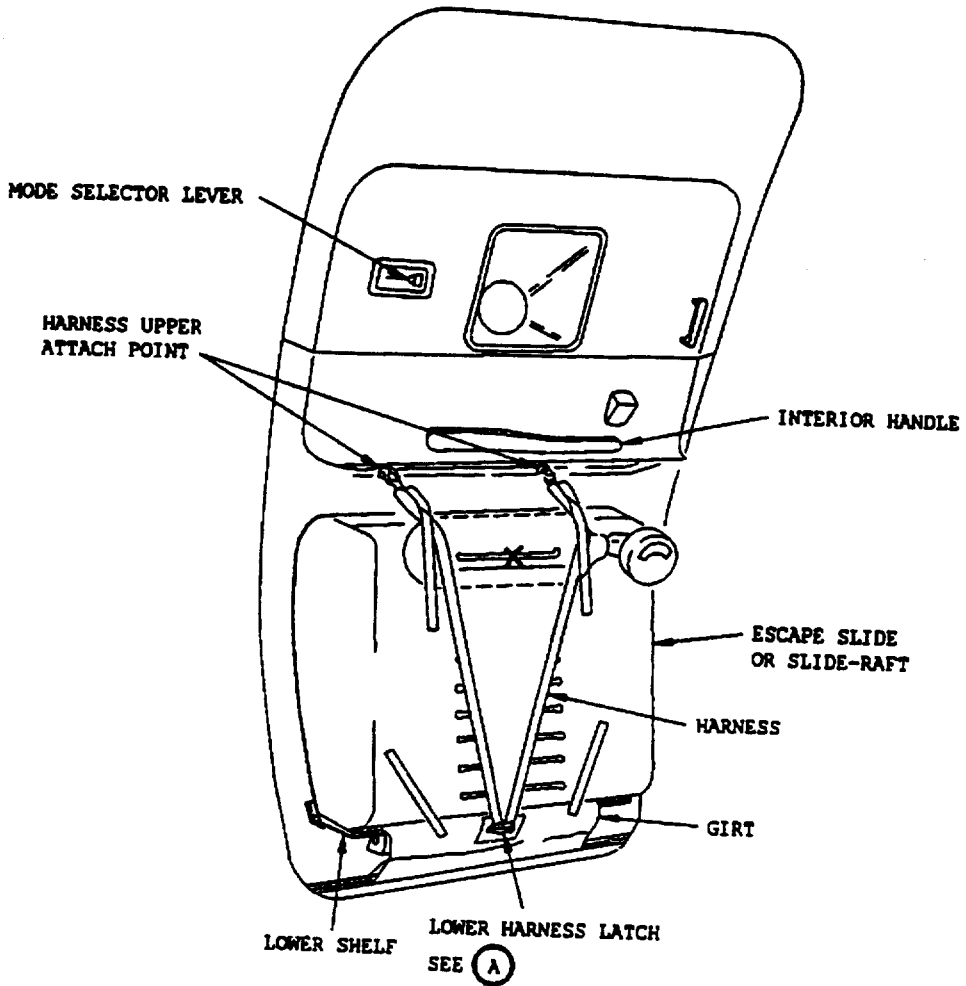
Reference: 0003023

Workbook: 12-224

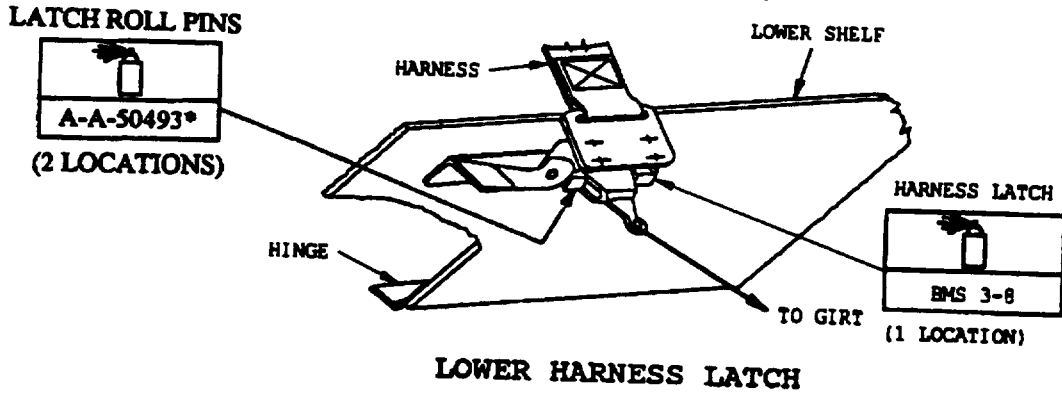
12-21-18

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←



NO. 1, 2, OR 4 PASSENGER DOOR
(COVER NOT SHOWN)



1 POINT

(A)

*PART NUMBER LPSLST

Escape Slide or Slide-Raft Lower Harness Latch
Figure 304

ATP ALERT

AIRPLANE

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4 March, 1998

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ALERT No. 12-574

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA) AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.



For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 12-25-01 Page 301

REASON FOR REVISION

1. This Alert is intended to increase awareness of the possible consequences of not removing protective covers from pitot probes or static ports prior to flight and increase awareness that air data ports are covered by introducing a warning label.
2. To communicate CAA Requirement Detailed in Airworthiness Notice No. 12, Appendix 57, Issue 1.

ACTION

The primary cause of a recent accident where another operators aircraft crashed into the Pacific Ocean was loss of air data sensing due to blockage of the aircraft's static ports. The ports had been covered with adhesive tape during the aircraft's previous maintenance input, but the tape had inadvertently not been removed prior to service. This accident reaffirmed that it is imperative that aircraft are not returned to service with their pitot or static ports covered. The following warning note applies whenever pitot or static probes or ports are covered during any form of maintenance activity.

WARNING: WHEN PITOT PROBES/ STATIC PORTS ARE COVERED ENSURE THAT THIS CONDITION IS VISIBLE FROM THE GROUND. IN ADDITION, ATTACH A LABEL TO THE LEFT CONTROL WHEEL AS A REMINDER THAT THE PITOT PROBES/ STATIC PORTS ARE COVERED. FAILURE TO REMOVE THESE COVERINGS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED AND ALTITUDE SENSOR OUTPUTS WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.

As stated in the above warning note, a red paper label, part number 2000S, must be attached to the left control wheel whenever pitot or static ports are covered. Write on the label PITOT PROBES COVERED and/or STATIC PORTS COVERED as applicable.

Persons performing a supervisory function are responsible for informing their appropriate staff of the substance of this ATP Alert.

Originator: A.E.Morgan.

Reference: ESA.104.AEM.753.

Workbook: 10-22

12-25-01

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ALERT. 12-574 (Cont'd)

Airworthiness Notice 12 , Appendix 57, issue 1, refers to a serious incident where half of an aircraft's primary reference flight instruments were lost during take off. The reason for the malfunction was that 2 of the 4 pitot head blanking covers had not been removed before flight.

The pre-departure check carried out before the aircraft was returned to service occurred at night when it was raining. Two pitot head covers were missed during the check and not removed. It is very probable that weather and darkness contributed to the incident.

Reliance on warning or attention getting flags attached to blanks or covers is not by itself sufficient to ensure the covers are identified and removed before flight, particularly in darkness or adverse weather conditions.

To comply with the requirements of Notice 12 Appendix 57, issue 1, whenever pitot or static ports are covered there must be a clear unambiguous entry in the Technical Log saying that the aircraft's pitot and/or static ports are covered and the aircraft is no longer airworthy as a result of the installation.

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FUEL TANK PRESSURE FUELING

1. General (Fig. 301)

- A. The pressure refuel method is usually used to refuel the airplane. During the pressure refuel operation, the fuel quantity indicating system (FQIS) (AMM 28-41-00/001) operates with the pressure refuel system. The FQIS processor controls the automatic shutoff operation. The refuel personnel can operate the fueling control switches at the fueling control panel to stop the FQIS processor during the refuel operation. If you can not refuel the airplane by the automatic shutoff operation, you can refuel the airplane by the manual shutoff operation.
- B. The fueling station is found in the right wing leading edge, near slat No. 3. The fueling station has pressure fueling adapters, grounding points, a light, an interphone jack, and a fueling control panel. Aluminum foil markers installed on the fueling station door give the refuel procedures, and the applicable cautions.
- C. It is necessary to have 28v dc of electrical power to refuel the airplane.

NOTE: You can get electrical power from the ground handling bus or the hot battery bus.

- D. If you cannot get electrical power, you can operate the fueling shutoff valves manually (AMM 28-21-00/001). While there is no electrical power, you can measure the fuel quantity if you use the fuel measuring sticks. The fuel measuring sticks are found in the wing lower skin (AMM 28-44-00/001).
- E. The fueling manifold holds 120 pounds (55 kilograms) of fuel. After the pressure refuel operation, the fuel caught in the fueling manifold drains into the center fuel tank. This quantity of fuel can show on the FQIS indicators after the refuel operation.
- F. Drain the fuel tank sumps before the refuel operation to help keep water out of the fuel tank (AMM 12-11-03/301).
- G. There is a fuel overflow system to stop fuel overflow leakage (AMM 28-21-00/001). If the fuel overflow system does not operate correctly and there is fuel leakage, stop the pressure refuel operation immediately to keep the fire hazard to a minimum.
 - (1) Refuel the main tanks with approximately equal quantities of fuel.

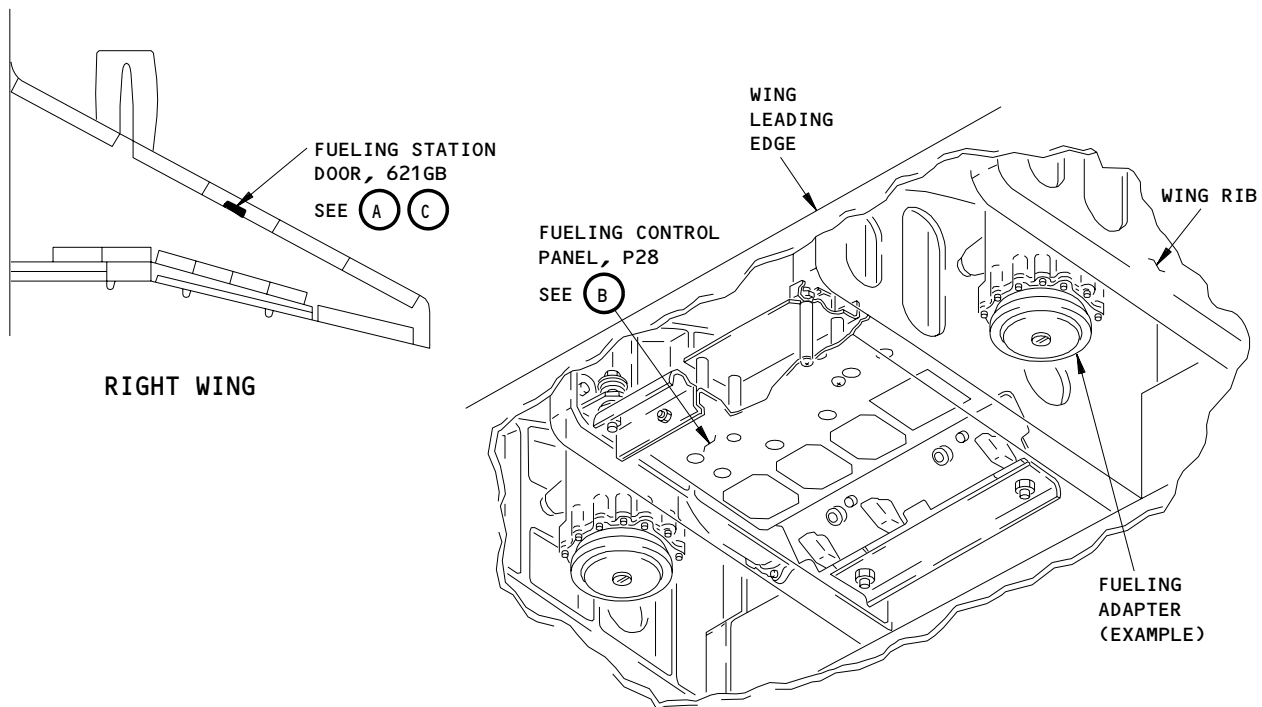
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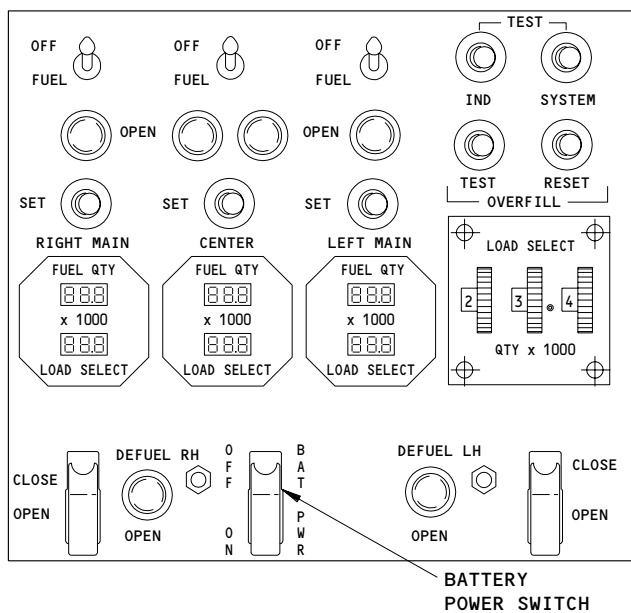
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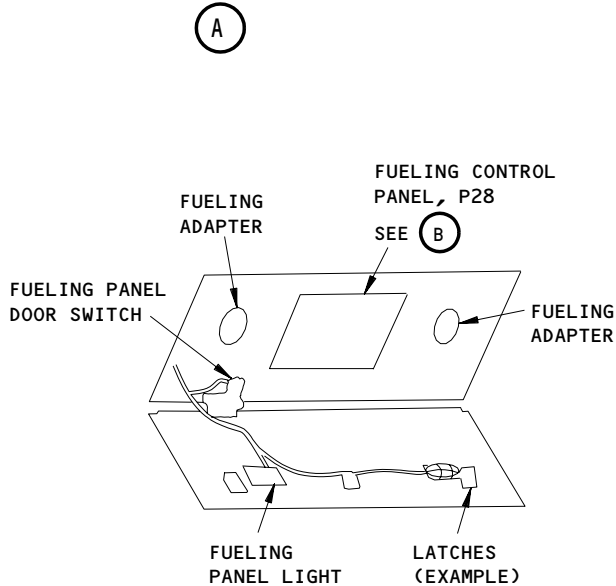
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FUELING STATION DOOR, 621GB



FUELING CONTROL PANEL, P28



FUELING STATION DOOR, 621GB

Pressure Refuel Operation
Figure 301

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- (2) If the APU is used during refuel operations, the left main tank must have sufficient fuel to let the APU operate continuously.
- (3) You can refuel all the tanks at the same time or in sequence.
- H. This procedure has these tasks:
 - (1) Precautions and Limits for the Refuel Operation
 - (2) Prepare the Airplane for a Refuel Operation
 - (3) Pressure Refuel Operation
 - (4) Pressure Refuel Operation – With Inoperative Fueling Shutoff Valve(s) or No Electrical Power

TASK 12-11-01-653-272

2. Precautions and Limits for the Refuel Operation

A. General

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

B. References

- (1) AMM 28-21-00/601, Pressure Fueling System
- (2) AMM 49-11-00/201, Auxiliary Power Unit

C. Access

(1) Location Zones

- 531 Center Wing Tank (Left)
- 542 Main Tank – Rib No. 17 to No. 21 (Left)
- 543 Surge Tank – Rib No. 21 to Rib No. 23 (Left)
- 621 Leading Edge to Front Spar (Right)
- 631 Center Wing Tank (Right)
- 642 Rib No. 17 to No. 21 (Right)
- 643 Rib No. 21 to No. 23 (Right)

D. Fuel Servicing Regulation Requirements

S 913-273

- (1) Each operator is responsible for complying with the local, state and national regulations regarding airplane fuel servicing. It is possible that fire codes and standards make it necessary to use different or more restrictive procedures than those that follow. Make sure the procedures used during the refuel operation give sufficient protection to persons and equipment.

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S 913-274

- (2) If you make a decision not to do this recommended procedure, you must have an approved alternate procedure.

E. Emergency Procedures

S 653-275

- (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.

S 653-276

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

S 653-277

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

F. Fuel Spill Procedure

S 653-278

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

S 653-279

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

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S 653-280

WARNING: DO THESE STEPS IF A FUEL SPILL OCCURS DURING THE REFUEL OPERATION. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) If a fuel spill occurs, do these steps:
- (a) Stop the refuel operation.
 - (b) Notify persons onboard the airplane.
 - (c) Unload the APU and shut it down. To do this, do this task:
APU Shutdown Procedures (AMM 49-11-00/201).
 - 1) Do not start the APU until the spill fuel is removed and there is no risk from spilled fuel or vapors.
 - (d) Find and correct the cause of the fuel spill.
 - (e) Inspect enclosed areas to make sure they are free of fuel vapor.
 - (f) Do not begin the refuel operation or start the APU again until the fire department or the person(s) with the authority to make safety decisions have given approval.

G. Passenger Precautions

S 653-281

WARNING: OBEY THE PASSENGER PRECAUTIONS DURING A REFUEL OPERATION. IF YOU DO NOT OBEY THESE REQUIREMENTS, INJURY TO PERSONS CAN OCCUR.

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

S 653-282

- (2) A hazardous area must be identified for passengers that board or unload during a refuel operation. Barriers must be in position to stop passengers from entering this hazardous area.

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H. Airplane System Precautions

S 653-283

WARNING: OBEY THE AIRPLANE SYSTEM PRECAUTIONS DURING A REFUEL OPERATION. IF YOU DO NOT OBEY THESE REQUIREMENTS, A FIRE OR EXPLOSION CAN OCCUR.

- (1) Do not operate the HF communication system during a refuel operation.

S 653-284

- (2) Obey these restrictions on maintenance tasks during a refuel operation:
- (a) Do not connect or disconnect the battery chargers, airplane ground-power generators or other electrical ground-power components.
 - 1) Do not test the power equipment until after the refuel operation is complete.
 - (b) Do not fill or change oxygen bottles.
 - (c) Do not remove electrical power.

NOTE: Damage to the refuel system components can occur.

- (d) Do not begin the refuel operation if a fire warning light or engine overheat warning light shows in the flight compartment.
- (e) Do not begin the refuel operation if any part of the landing gear is unusually hot.

S 653-285

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN 600 US GALLONS (4020 POUNDS/1827 KILOGRAMS) OF FUEL IN EITHER MAIN FUEL TANK. THE HYDRAULIC SYSTEM CAN BECOME TOO HOT IF THE HEAT EXCHANGER IS NOT IN FUEL.

- (3) Do not operate a hydraulic system if the tank that has the heat exchanger for that hydraulic system is empty.

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S 653-290

- (4) 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) Pressure relief valves for the surge tank (2 locations)

S 653-286

- (5) Make sure the surge tank vents are not blocked before you begin the refuel operation.

S 653-291

- (6) Do an inspection of the fueling adapter before you connect the refuel nozzle:

- (a) Make sure there are no fuel leaks.
(b) Make sure each of the screws that attach the adapter is not loose or damaged.
(c) Make sure the mating surfaces of the fuel hose and fueling adapter are clean and free from unwanted material.
(d) Make sure the slots and lugs on the fueling adapter are not damaged.

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

- (e) Use a wear gage to make sure the adapter is in the operational limits (AMM 28-21-00/601).

S 653-287

- (7) Make sure the landing gear wheel chocks do not touch the tires. Place the wheel chocks about 3 inches away from the tires.

NOTE: The wheel chocks can wedge against the tire after you fuel.

S 653-288

- (8) If you do a refuel operation with a main engine operating, it is an emergency procedure and you must obey all airport and operator-provided emergency procedures.

I. APU Operations During Refuel and Defuel Operations - Limits and Precautions

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S 863-289

WARNING: OBEY THE PROCEDURES, PRECAUTIONS AND LIMITS FOR APU OPERATION DURING THE REFUEL OPERATION. IF YOU DO NOT, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) If the APU is operating during the refuel operation, do these steps:
- (a) To obey the limits for the operation of the APU, do this task: APU Starting and Operation (AMM 49-11-00/201).
 - (b) You can start the APU during the refuel operation 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 refuel operation.
 - (d) If the low pressure indication light comes on for the APU DC fuel pump, immediately shut down the APU (AMM 49-11-00/201) 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: STOP THE REFUEL OPERATION IF THERE IS A PROTECTIVE AUTOMATIC SHUTDOWN OF THE APU OR A FAILURE TO START CONDITION. INJURY TO PERSONS OR 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 steps:
- 1) Complete the refuel operation before you try to start the APU again.
 - 2) Stop the refuel operation and disconnect the fuel hose(s) from the fueling adapter(s) before you try to start the APU again.

WARNING: DO THESE STEPS IF AN APU FIRE OCCURS DURING THE REFUEL OPERATION. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (f) If an APU fire occurs, do these steps in this sequence:
- 1) Stop the refuel operation.
 - 2) The APU should shut down automatically. If it does not shut down automatically, do this task: APU Emergency Shutdown (AMM 49-11-00/201).
 - 3) Discharge the APU fire bottles (AMM 49-11-00/201).
 - 4) Notify persons on board the airplane and Airport Fire Services.

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WARNING: DO THESE STEPS IF A FUEL SPILLAGE OCCURS DURING THE REFUEL OPERATION. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (g) If fuel spillage occurs, do these steps:
- 1) Stop the refuel operation.
 - 2) Notify persons onboard the airplane.
 - 3) Unload the APU and shut it down. To do this, do this task: APU Usual Shutdown (AMM 49-11-00/201).
 - 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 THE FUELING VEHICLES ARE NOT PARKED IN THE EXHAUST STREAM OF THIS AIRPLANE OR ANY 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.

NOTE: Make sure the APU exhaust stream does not impinge on fueling vehicles for other airplanes. Make sure the fueling vehicles for this airplane are out of the APU exhaust stream of adjacent airplanes.

J. Airplane Separation Distance Limits

S 653-292

WARNING: OBEY THE AIRPLANE SEPARATION DISTANCES DURING A REFUEL OPERATION. IF YOU DO NOT OBEY THESE REQUIREMENTS, A FIRE OR EXPLOSION CAN OCCUR.

- (1) Maintain the separation distance for equipment or ignition sources given in Table 301.

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TABLE 301	
EQUIPMENT OR IGNITION SOURCES	REFUEL/DEFUEL SEPARATION DISTANCE * [1]
Adjacent airplane engine or APU	50 feet (15 meters)
Fuel service equipment - measured from engine or exhaust system	10 feet (3 meters) from fuel vents
Ground power units	20 feet (6 meters)
Airplane servicing equipment - measured from the engine or exhaust system	10 feet (3 meters)
Airplane servicing equipment during an overwing refuel operation	Not under the trailing edge of the wing
Electrical equipment that is likely to cause arcs or sparks	50 feet (15 meters)
Photographic equipment/flash units	10 feet (3 meters)
Battery powered equipment	10 feet (3 meters) from fuel servicing equipment or fuel spills * [2]
Open flames, heat sources, lighted smoking material and any other potential ignition sources	50 feet (15 meters)
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.

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

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S 653-293

WARNING: OBEY THE AIRPLANE SEPARATION DISTANCES DURING A REFUEL OPERATION. IF YOU DO NOT OBEY THESE REQUIREMENTS, A FIRE OR EXPLOSION CAN OCCUR.

- (2) Maintain the separation distance for the electrical/electronic systems given in Table 302.

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TABLE 302	
POWER (EIRP) *[1] OF EQUIPMENT TRANSMITTING RADAR OR RADIO	REFUEL/DEFUEL SEPARATION DISTANCE *[2]
More than 100 watts (radio or radar)	200 feet (60 meters)
25 to 100 watts (radio or radar)	50 feet (30 meters)
Less than 25 watts *[3] *[4]	10 feet (3 meters)

- *[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, etc. There are low power, very 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).
- *[4] Phased array flatplate weather radar systems have an average power output of less than 5 watts.

K. Fuel Requirements

S 653-372

WARNING: OBEY THE FUEL GRADE LIMITATION. IF YOU USE THE INCORRECT GRADE OF FUEL, ENGINE FLAMEOUT, PERFORMANCE DEGRADATION, OR DAMAGE CAN OCCUR.

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

L. Fuel Servicing Equipment Precautions

S 653-294

WARNING: OBEY THE FUEL SERVICING EQUIPMENT PRECAUTIONS DURING A REFUEL OPERATION. IF YOU DO NOT OBEY THESE REQUIREMENTS, A FIRE OR AN EXPLOSION CAN OCCUR.

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

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S 653-295

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

S 653-296

- (3) Do not disable the fuel shutoff controls (deadman controls).

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

S 653-297

- (4) When you position the 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 emergency slide chute deployment areas.

M. Ground Equipment and Airplane Servicing Equipment Precautions

S 653-298

WARNING: OBEY THE FUEL SERVICING EQUIPMENT PRECAUTIONS DURING A REFUEL OPERATION. IF YOU DO NOT OBEY THESE REQUIREMENTS, A FIRE OR AN EXPLOSION CAN OCCUR.

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

S 653-299

- (2) Do not put ground equipment below the fuel system vents at the wingtips.

NOTE: The fuel tanks are vented through the wingtip vents. An explosive mixture of fuel vapor can exist at these locations.

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S 653-300

- (3) Make sure all stands, ladders, vehicles and equipment that can come in contact with the airplane are removed before the refuel operation begins.

NOTE: Added fuel weight will compress the landing gear shock struts and lower the airplane.

N. Personnel Precautions

S 653-301

WARNING: OBEY THE PERSONNEL PRECAUTIONS DURING A REFUEL OPERATION. IF YOU DO NOT OBEY THESE REQUIREMENTS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Personnel that refuel the airplane must be trained in the safe operation of these systems and procedures:
 - (a) 757 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 (wingtips, engine locations, etc.)

S 653-302

- (2) Personnel must wear eye protection (chemical splash goggles or safety glasses and face shield) during the connection of the fuel hose and during the initial pressurization of the fuel hose after hookup.

S 653-303

- (3) At some airport locations, a fuel safety person may be needed to monitor the airplane refuel operations.

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0. Fueling Zone

S 653-304

WARNING: OBEY THE FUELING ZONE PRECAUTIONS. IF YOU DO NOT OBEY THESE REQUIREMENTS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Refuel operations must only be done in airport approved areas. Correct separation distances must be available in these areas.

S 653-305

- (2) A fueling zone exists around the airplane anytime the airplane is being prepared for a refuel operation or during a refuel operation.

S 653-307

- (3) Fire protection equipment, emergency rescue equipment, and approved fire extinguishers must be available in these areas.

S 653-306

- (4) Within the fueling zone, obey these requirements:
- (a) Obey the equipment separation requirements (Tables 301 and 302).
 - (b) Only authorized persons and vehicles are permitted in the fueling zone.
 - (c) Passengers are not permitted in the fueling zone.
 - (d) All personnel must assume that a refuel operation is in progress any time a fuel service 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 where it will operate.
 - (g) Do not keep the vehicle engines running unless it is necessary for airplane maintenance or servicing.

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- (h) Metal wheels or studded tires are not permitted.
- (i) Do not approach within 50 feet (15 meters) 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.

P. Adverse Weather Condition Precautions

S 653-308

WARNING: STOP THE REFUEL OPERATION DURING ATMOSPHERIC ELECTRICAL ACTIVITY. DO NOT CONNECT A HEADSET AND DO NOT TOUCH ELECTRICAL CONNECTIONS TO THE AIRPLANE. LIGHTNING STRIKES CAN CAUSE INJURIES TO PERSONNEL, AND A FIRE OR AN EXPLOSION DURING A REFUEL OPERATION.

- (1) When thunderstorms or lightning are within a 10 mile (16 kilometer) radius of the immediate area, do these steps:
 - (a) Contact the airport authority, air traffic control, or flight compartment crew for guidance on the decision to continue or suspend refuel operations.
 - (b) Make sure you stop the refuel operation when the refuel operations are suspended.
 - (c) Disconnect and remove any external headsets.
 - (d) Do not touch any electrical connections.

S 653-309

- (2) 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. Fueling procedures should stop if strong wind conditions are present.

S 653-311

- (3) Strong wind conditions can also cause the unwanted movement of items or equipment which can hit the airplane or injure persons. Wind gusts can damage the airplane structure. Fueling procedures should stop if strong wind conditions are present.

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S 653-312

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

TASK 12-11-01-653-313

3. Prepare the Airplane for a Refuel Operation

A. General

- (1) This procedure prepares the airplane for a pressure refuel operation.

B. References

- (1) AMM 06-44-00/201, Wing Access Doors and Panels
- (2) AMM 08-21-00/201, Leveling
- (3) AMM 12-11-03/301, Fuel Sump Draining

C. Access

- (1) Location Zone
621 Leading Edge to Front Spar (Right)

- (2) Access Panel
621GB Fueling Station Door

D. Prepare the Airplane

S 653-314

WARNING: OBEY THE REFUEL OPERATION PRECAUTIONS. IF YOU DO NOT OBEY THESE REQUIREMENTS, A FIRE OR AN EXPLOSION CAN OCCUR.

- (1) Read and obey the precautions in this task: Precautions and Limits for Fuel Servicing.

S 213-315

- (2) Make sure the airplane attitude is in a 0.3 nose down longitudinal and 0.0 degree lateral (± 2.0 degrees longitudinal and lateral) (AMM 08-21-00/201).

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S 653-316

- (3) Drain the water from the fuel tank sumps before you start the refuel operation (AMM 12-11-03/301).

S 653-317

- (4) Make sure the pressure relief valves in the surge tanks are closed.

S 863-318

WARNING: MAKE SURE THE EXHAUST OF ADJACENT AIRCRAFT DOES NOT GO INTO A FLAMMABLE VAPOR ZONE DURING THE REFUEL OPERATION. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) If an adjacent aircraft is operating its APU, make sure the APU exhaust stream does not go into a flammable vapor zone of your airplane (for example, the fuel vents or the area around the fueling station and the fuel vehicles).

S 863-322

WARNING: DO NOT OPERATE THE LEADING EDGE SLATS. SLAT OPERATION CAN CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONS.

- (6) Install a DO-NOT-OPERATE tag to the flap control lever.

S 863-324

- (7) Supply electrical power (AMM 24-22-00/201).

S 013-319

- (8) Open the fueling station door, 621GB (AMM 06-44-00/201).

S 213-320

- (9) Make sure the fueling panel light comes on.

NOTE: The fueling panel light shows there is 28v dc power at the fueling control panel.

- (a) If the fueling panel light does not come on, put the battery power switch in the BAT position.

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TASK 12-11-01-653-001

4. Pressure Refuel Operation (Fig. 301)

A. References

- (1) AMM 06-44-00/201, Wing Access Doors and Panels
- (2) AMM 20-41-00/201, Static Grounding
- (3) AMM 24-22-00/201, Electrical Power Control
- (4) AMM 28-26-00/201, Defueling
- (5) AMM 49-11-00/201, APU Power Plant
- (6) FIM 28-41-00/101, Fuel Quantity Indicating System
- (7) WDM 28-21-22, Refueling Control

B. Access

- (1) Location Zone
621 Leading Edge to Front Spar (Right)

- (2) Access Panel
621GB Fueling Station Door

C. Prepare the Airplane for a Refuel Operation

S 653-325

WARNING: OBEY ALL THE REFUEL OPERATION PRECAUTIONS. FAILURE TO OBEY THE REFUEL PRECAUTIONS CAN CAUSE SERIOUS INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Read and obey the precautions in this task: Precautions and Limits for Fuel Servicing.

S 653-335

- (2) Do this task: Prepare the Airplane for a Refuel Operation.

D. Connect the Refuel Equipment

S 653-326

- (1) Do the operator supplied procedures to position the fuel vehicle.

S 423-336

CAUTION: ATTACH BONDING CABLES ONLY TO SPECIFIED POINTS ON THE AIRPLANE. INCORRECTLY ATTACHED BONDING CABLES CAN CAUSE SCRATCHES. THESE SCRATCHES CAN CAUSE CORROSION AND CRACKS ON STRESSED PARTS. BONDING CABLES ATTACHED TO COMPOSITE DOORS OR FAIRINGS DO NOT GIVE AN ELECTRICAL BOND.

- (2) Connect the bonding cable attached to the refuel nozzle to an approved airplane electrical ground (AMM 20-41-00/201).

NOTE: The bonding cable is not necessary if there is electrical continuity between the fueling source and the fueling adapter.

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S 653-328

- (3) Connect the fuel hose to the fueling adapter.

NOTE: The 757 aircraft does not have a fuel jettison system, so it is not necessary for fuel adapter caps to be installed on the fueling adapters.

- (a) Make sure there are no fuel leaks.
- (b) Make sure each of the screws that attach the adapter is not loose or damaged.
- (c) Make sure the fueling adapter is clean and not damaged.
- (d) Connect the refuel nozzles to one or two of the fueling adapters.

E. Prepare the Fuel Sheet

S 973-332

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

S 973-333

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

S 973-334

CAUTION: DO NOT EXCEED THE FUEL SYSTEM LIMITATIONS (WEIGHT AND BALANCE MANUAL SEC 1-20). DAMAGE TO THE AIRPLANE COULD OCCUR.

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

F. Pressure Refuel Setup

S 713-337

- (1) Push the TEST IND switch on the fueling control panel, P28, to do a test on the load select indicators.

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S 713-338

- (2) Make sure all eights (8) show on the top and bottom displays of the load select indicators.

NOTE: If the message "PUSH SET" shows on the fuel quantity indicator display there is a FQIS failure. The FQIS failure will not let the FQIS system stop the fueling operation at the fuel quantity selected. You must do the fuel quantity BITE procedure on the FQIS processor menus "PRESENT FAULTS ?" and "FAULT HISTORY ?" to correct the problem. For the "FAULT HISTORY ?" menu, you only have to look at the FLIGHT LEG 0 faults (FIM 28-41-00/101, Fig. 104).

You can continue to fuel the airplane if you push the SET button. The upper and lower display will go off, or they will go on and off while the fuel quantity is shown in the display. If the fuel quantity indication goes on and off, the actual fuel quantity shown can be incorrect. To continue fueling you must fuel the airplane manually. To do this you will need to use the fuel measuring sticks to make sure you have the correct quantity of fuel in the fuel tanks.

NOTE: If the message "-A.-", "-b.-", or "-A.b" shows on the fuel quantity indicators there is a bus A, bus B, or bus A and B failure. To correct the problem, do the procedure in FIM 28-41-00/101, Fig. 110.

The FQIS will continue to operate if one bus (A or B) is bad. You can continue to fuel the airplane if only one bus (A or B) is bad.

If the two busses (A and B) are bad, the message "-A.b" will show and all indicators will go off. You can continue to fuel the airplane by the "Pressure Refuel Operation - With Inoperative Fueling Shutoff Valve(s) or No Electrical Power" procedure (AMM 12-11-01/301).

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S 863-331

- (3) Push and release each fueling valve light.
 - (a) Make sure each fueling valve light comes on and then goes off.

G. Pressure Refuel Operation

S 653-339

- (1) For the automatic shutoff operation, do these steps:
 - (a) For each fuel tank that you are to refuel, set the fuel quantity as follows:
 - 1) At the LOAD SELECT control, set the thumbwheel switches to the necessary quantity of fuel.
 - 2) Push the SET switch for the applicable fuel tank for one (1) second and release.

NOTE: If the message "FAIL" shows in the bottom display, there is a load select indicator failure. Do a check of the load select indicator, M638, and the applicable wiring (WDM 28-21-22).

- 3) Make sure the quantity on the LOAD SELECT control shows on the bottom display of the applicable load select indicator.
 - a) If you make an error during the selection procedure, push the applicable SET switch and do the procedure again.

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(b) Put the applicable fueling valve switches to the FUEL position.

NOTE: The FQIS processor controls the start of fueling. The fueling shutoff valves close automatically, if a malfunction occurs, or if the set fuel quantity is put into the fuel tank.

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

If you put the fueling valve switches to the OFF position during automatic fueling, the pressure fueling operation stops.

CAUTION: DO NOT USE MORE THAN 55 PSI FUEL PRESSURE AT THE REFUEL NOZZLE. IF YOU USE MORE THAN 55 PSI FUEL PRESSURE, YOU CAN CAUSE DAMAGE TO THE REFUELING SYSTEM COMPONENTS

- (c) Activate the fuel shutoff control switch (deadman switch) to start the fuel flow.
- 1) Make sure the applicable blue fueling valve lights come on.
 - a) If a blue fueling valve light does not come on, push the OVERFILL RESET switch.
 - b) If the blue fueling valve light still does not come on, do the task: Pressure Refuel Operation - With Inoperative Fueling Shutoff Valve(s) or No Electrical Power, for the applicable tank.
- (d) Monitor the fuel quantity for each fuel tank.
- (e) Push the SYSTEM TEST switch to do a test of the refueling system.

NOTE: When you push the SYSTEM TEST switch during the refuel operation, it causes the FQPU to test the pressure refueling system. The FQPU does a load select test, and a full tank shutoff test. After these tests are done the fueling valves will close in sequence. The fueling valves will then open and the refuel operation will continue.

(f) To do a overfill system test, do the steps that follow:

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

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CAUTION: DO NOT USE MORE THAN 40 PSI FUEL PRESSURE AT THE FUELING NOZZLE FOR THE OVERFILL SYSTEM TEST. IF YOU USE MORE THAN 40 PSI FUEL PRESSURE, YOU CAN CAUSE DAMAGE TO THE REFUEL SYSTEM COMPONENTS.

- 1) Decrease the refuel nozzle pressure to 40 psi.
- 2) Push the OVERFILL TEST switch on the fueling control panel, P28.
- 3) Make sure the fueling valve lights go off.

NOTE: This shows that the fueling shutoff valves are closed.

- 4) Push the OVERFILL RESET switch on the fueling control panel, P28.
- 5) Make sure the fueling valve lights come on.

NOTE: This shows that the fueling valves are open.

- (g) When fueling is done, put the fueling valve switches for all the applicable tanks to the OFF position.

NOTE: The FQIS system will automatically close the applicable fueling shutoff valves when the set fuel quantity is put in the fuel tank or the fuel tank is full.

- (h) Release the fuel shutoff control switch (deadman switch).
(i) Make sure the fueling valve lights go off.

NOTE: This shows that the fueling shutoff valves are closed.

S 653-343

- (2) For the manual shutoff operation, do these steps:
(a) If the displays on the load select indicators are not clear, push the SET switch to make the displays clear and to set the manual shutoff mode.

CAUTION: DO NOT USE MORE THAN 55 PSI FUEL PRESSURE AT THE REFUEL NOZZLE. IF YOU USE MORE THAN 55 PSI FUEL PRESSURE, YOU CAN CAUSE DAMAGE TO THE REFUELING SYSTEM COMPONENTS.

- (b) Activate the fuel shutoff control switch (deadman switch) to start the fuel flow.
(c) To open the fueling shutoff valves, do the steps that follow:
1) Put the applicable fueling valve switches to the FUEL position.
2) Make sure the applicable blue fueling valve lights come on.
3) If you cannot open the applicable fueling shutoff valves electrically, push the OVERFILL RESET switch.

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- 4) If the fueling shutoff valve does not stay open, push and hold the OVERFILL RESET switch until the fuel tank quantity is reached, or do the task: Pressure Refuel Operation - With Inoperative Fueling Shutoff Valve(s) or No Electrical Power.
- (d) Monitor the fuel quantity on the LOAD SELECT indicator.
- (e) Release the fuel shutoff control switch (deadman switch) on the fueling source to stop the refuel operation when you get the correct quantity of fuel in the fuel tank.
- S 653-344
- (3) Make sure the onboard fuel load is in a valid pre-flight fuel distribution.
- S 653-345
- (4) Transfer fuel to balance the fuel load if it is necessary (AMM 28-26-00/201).
- S 863-346
- (5) Wait one (1) minute to let the FQIS system stabilize.
- S 973-347
- (6) Make a record of the actual fuel quantities from the load select indicators.
- S 973-348
- (7) Make a record of the actual fuel quantity from the fuel vehicle flowmeter.
- S 973-349
- (8) Do the discrepancy check and make sure it is within limits.
- NOTE: Per operator's requirement.
- S 973-350
- (9) Complete the Fuel Sheet.
- S 973-351
- (10) Complete the Delivery Receipt, if necessary.
- S 973-352
- (11) Give a copy of the forms to the airline representative or flight crew.

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H. Put the Airplane Back to Its Usual Condition

- S 093-072
- (1) Disconnect the refuel nozzles.
- S 093-129
- (2) Disconnect the bonding cable that you connected between the fueling source and the airplane.
- S 863-151
- (3) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.
- S 863-024
- (4) If the battery power switch is in the BAT position, put the battery power switch to the PWR position.
- S 413-025
- (5) Close the fueling station door, 621GB.

TASK 12-11-01-653-050

5. Pressure Refuel Operation - With Inoperative Fueling Shutoff Valve(s) or No Electrical Power

A. References

- (1) AMM 06-44-00/201, Wing Access Doors and Panels
- (2) AMM 20-41-00/201, Static Grounding
- (3) AMM 28-26-00/201, Defueling
- (4) AMM 28-44-00/201, Fuel Quantity Measuring Stick
- (5) AMM 32-00-15/201, Landing Gear Door Locks
- (6) AMM 32-00-20/201, Landing Gear Downlocks

B. Access

- (1) Location Zones
 - 133 Wing Center Section (Left)
 - 134 Wing Center Section (Right)
 - 551 Rear Spar to MLG Support Beam (Left)
 - 621 Leading Edge to Front Spar (Right)
 - 651 Rear Spar to MLG Support Beam (Right)

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- (2) Access Panels
 - 551BB Access Panel (Left)
 - 621GB Fueling Station Door
 - 651BB Access Panel (Right)

C. Prepare the Airplane for a Refuel Operation

S 653-353

WARNING: OBEY THE REFUEL OPERATION PRECAUTIONS. IF YOU DO NOT OBEY THESE REQUIREMENTS, A FIRE OR AN EXPLOSION CAN OCCUR.

- (1) Read and obey the precautions in this task: Precautions and Limits for Fuel Servicing.

S 653-356

- (2) Do this task: Prepare the Airplane for a Refuel Operation.

S 013-051

CAUTION: THERE IS NO AUTOMATIC SHUTDOWN OR OVERFILL PROTECTION WITHOUT ELECTRICAL POWER. IF YOU DO NOT MONITOR THE FUEL QUANTITY, A FUEL SPILL CAN OCCUR.

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

- (3) For the left or right main fueling shutoff valve, open the access door, 551EBX or 651EBX, to get access to the fueling shutoff valve (AMM 06-44-00/201).

S 013-053

- (4) To get access to the left or right center fueling shutoff valve, do the steps that follow:
 - (a) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

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WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (b) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

NOTE: The nose and main landing gear doors open at the same time by ground release.

S 213-136

- (5) Make sure the fuel shutoff control switch (deadman switch) is released.

S 213-180

- (6) Make sure there is no pressure in the fueling manifold.

NOTE: The fueling manifold will release pressure through the manifold-drain check valve when the fueling source pressure is removed and when there is less than 22,000 pounds (9980 kilograms) of fuel in the center tank. It can be necessary to wait for approximately twenty (20) minutes until the pressure in the fueling manifold is completely released. If you open one of the fueling shutoff valves electrically (from the fueling control panel), the pressure in the fueling manifold will be released immediately.

S 983-000

CAUTION: REMOVE THE PRESSURE FROM THE FUELING MANIFOLD BEFORE YOU MANUALLY OPEN THE FUELING SHUTOFF VALVE. IF YOU DO NOT REMOVE THE PRESSURE, DAMAGE TO THE FUELING SHUTOFF VALVE OR THE FUELING MANIFOLD CAN OCCUR.

- (7) Open the applicable fueling shutoff valve manually as follows:

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

- (a) Turn the override screw (knurled knob) 10 to 13 turns in the counterclockwise direction.

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

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D. Connect the Refuel Equipment

S 653-357

- (1) Do the operator supplied procedures to position the fuel vehicle.

S 493-135

CAUTION: ATTACH BONDING CABLES ONLY TO SPECIFIED POINTS ON THE AIRPLANE. INCORRECTLY ATTACHED BONDING CABLES CAN CAUSE SCRATCHES. THESE SCRATCHES CAN CAUSE CORROSION AND CRACKS ON STRESSED PARTS. BONDING CABLES ATTACHED TO COMPOSITE DOORS OR FAIRINGS DO NOT GIVE AN ELECTRICAL BOND.

- (2) Connect the bonding cable attached to the refuel nozzle to an approved airplane electrical ground (AMM 20-41-00/201).

NOTE: The bonding cable is not necessary if there is electrical continuity between the fueling vehicle and the fueling adapter.

S 013-057

CAUTION: DO NOT USE MORE THAN 55 PSI FUEL PRESSURE AT THE FUELING NOZZLE. IF YOU USE MORE THAN 55 PSI FUEL PRESSURE, DAMAGE TO THE FUELING SYSTEM COMPONENTS CAN OCCUR.

- (3) Open the fueling station door, 621GB (AMM 06-44-00/201).

S 493-076

- (4) Connect the fuel hose(s) to the fueling adapter(s):

NOTE: The 757 aircraft does not have a fuel jettison system, therefore it is not necessary for fuel adapter caps to be installed on the fueling adapters.

- (a) Make sure there are no fuel leaks at the fueling adapter.
(b) Make sure each of the screws that attach the adapter is not loose or damaged.

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CAUTION: MAKE SURE THE FUELING ADAPTER IS CLEAN AND NOT DAMAGED. A DAMAGED ADAPTER CAN CAUSE A FUEL LEAK. A FUEL LEAK CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (c) Make sure the fueling adapter is clean and not damaged (Fig. 301).
- (d) Connect the refuel nozzles to one or two of the fueling adapters.

E. Prepare the Fuel Sheet

S 973-360

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

S 973-359

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

S 973-358

CAUTION: DO NOT EXCEED THE FUEL SYSTEM LIMITATIONS (WEIGHT AND BALANCE MANUAL SEC 1-20). DAMAGE TO THE AIRPLANE CAN OCCUR.

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

F. Pressure Refuel Operation

S 653-060

CAUTION: DO NOT USE MORE THAN 55 PSI FUEL PRESSURE AT THE FUELING NOZZLE. IF YOU USE MORE THAN 55 PSI FUEL PRESSURE, DAMAGE TO THE FUELING SYSTEM COMPONENTS CAN OCCUR.

- (1) Release the fuel shutoff control switch (deadman switch) to start the flow of fuel.

S 213-061

- (2) If there is no electrical power available, use the fuel measuring sticks to monitor the fuel quantity in the tanks (AMM 28-44-00/201).

S 653-066

- (3) Release the deadman switch to stop the refuel operation when you get the correct quantity of fuel in the fuel tank.

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S 213-002

- (4) Make sure there is no pressure in the fueling manifold.

NOTE: The fueling manifold will release pressure through the manifold-drain check valve when the fueling source pressure is removed and when there is less than 22,000 pounds (9980 kilograms) of fuel in the center tank. It can be necessary to wait for approximately twenty (20) minutes until the pressure is completely released from the fueling manifold. If you open one of the fueling shutoff valves electrically (from the fueling control panel), the pressure in the fueling manifold will be released immediately.

S 983-009

CAUTION: REMOVE THE PRESSURE FROM THE FUELING MANIFOLD BEFORE YOU MANUALLY CLOSE THE FUELING SHUTOFF VALVE. IF YOU DO NOT REMOVE THE PRESSURE, DAMAGE TO THE FUELING SHUTOFF VALVE OR THE FUELING MANIFOLD CAN OCCUR.

- (5) To close the fueling shutoff valves manually, do the steps that follow:
- (a) Turn the override screw (knurled knob) on the fueling shutoff valve 10 to 13 turns in the clockwise direction until the override screw is tightened.
 - (b) Install the lockwire on the override screw (knurled knob) of the fueling shutoff valve.

S 973-362

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

S 973-363

- (7) Transfer fuel to balance the fuel load if it is necessary (AMM 28-26-00/201).

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S 973-364
(8) Wait one (1) minute to let the FQIS system stabilize.

S 973-361
(9) Make a record of the actual fuel quantities from the load select indicators or fuel measuring sticks.

S 973-365
(10) Make a record of the actual fuel quantity from the fuel vehicle flowmeter.

S 973-366
(11) Do the discrepancy check and make sure it is within limits.

NOTE: Per operator's requirement.

S 973-367
(12) Complete the Fuel Sheet.

S 973-368
(13) Complete the Delivery Receipt, if necessary.

S 973-369
(14) Give a copy of the forms to the airline representative or flight crew.

G. Put the Airplane Back to Its Usual Condition

S 093-077
(1) Disconnect the refuel nozzles.

S 093-131
(2) Disconnect the bonding cable that you connected between the fueling source and the airplane.

S 413-067
(3) Close the fueling station door, 621GB (AMM 06-44-00/201).

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S 413-068

- (4) Install the applicable wing access panel, 551EBX or 651EBX, if removed (AMM 06-44-00/201).

S 093-079

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

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FUEL TANK OVERWING FUELING

TASK 12-11-02-653-001

1. Overwing Refuel Operation (Fig. 301)

A. General

- (1) Overwing fueling of the main tanks is done if the pressure fueling equipment or electrical power is not available. If there is electrical power available, you can monitor the fuel quantity with the load select indicators at the fueling station (AMM 28-41-00/001). If there is no electrical power available, you can monitor the fuel quantity with fuel measuring sticks (AMM 28-44-00/201).
- (2) Fueling limits:
 - (a) Fuel must agree with the jet fuel specification ASTM D1655.
 - (b) Do not fill the fuel tank at a rate more than the fueling rate of 100 GPM.
 - (c) Fill the fuel tanks with approximately equal quantities of fuel.
 - (d) You can fill the fuel tanks in any sequence or at the same time.

B. References

- (1) AMM 06-44-00/201, Wing Access Doors and Panels
- (2) AMM 12-11-03/301, Fuel Sump Draining
- (3) AMM 20-10-27/201, Flight Controls Safety Harness Receptacle
- (4) AMM 20-41-00/201, Static Grounding
- (5) AMM 24-22-00/201, Electrical Power Control
- (6) AMM 27-51-00/201, Trailing Edge Flaps
- (7) AMM 27-81-00/201, Leading Edge Slats
- (8) AMM 28-41-00/001, Fuel Quantity Indicating System
- (9) AMM 28-44-00/201, Fuel Quantity Measuring Sticks

C. Access

- (1) Location Zones
 - 542 Main Tank - Rib No. 17 to No. 21 (Left)
 - 621 Leading Edge to Front Spar (Right)
 - 642 Main Tank - Rib No. 17 to No. 21 (Right)

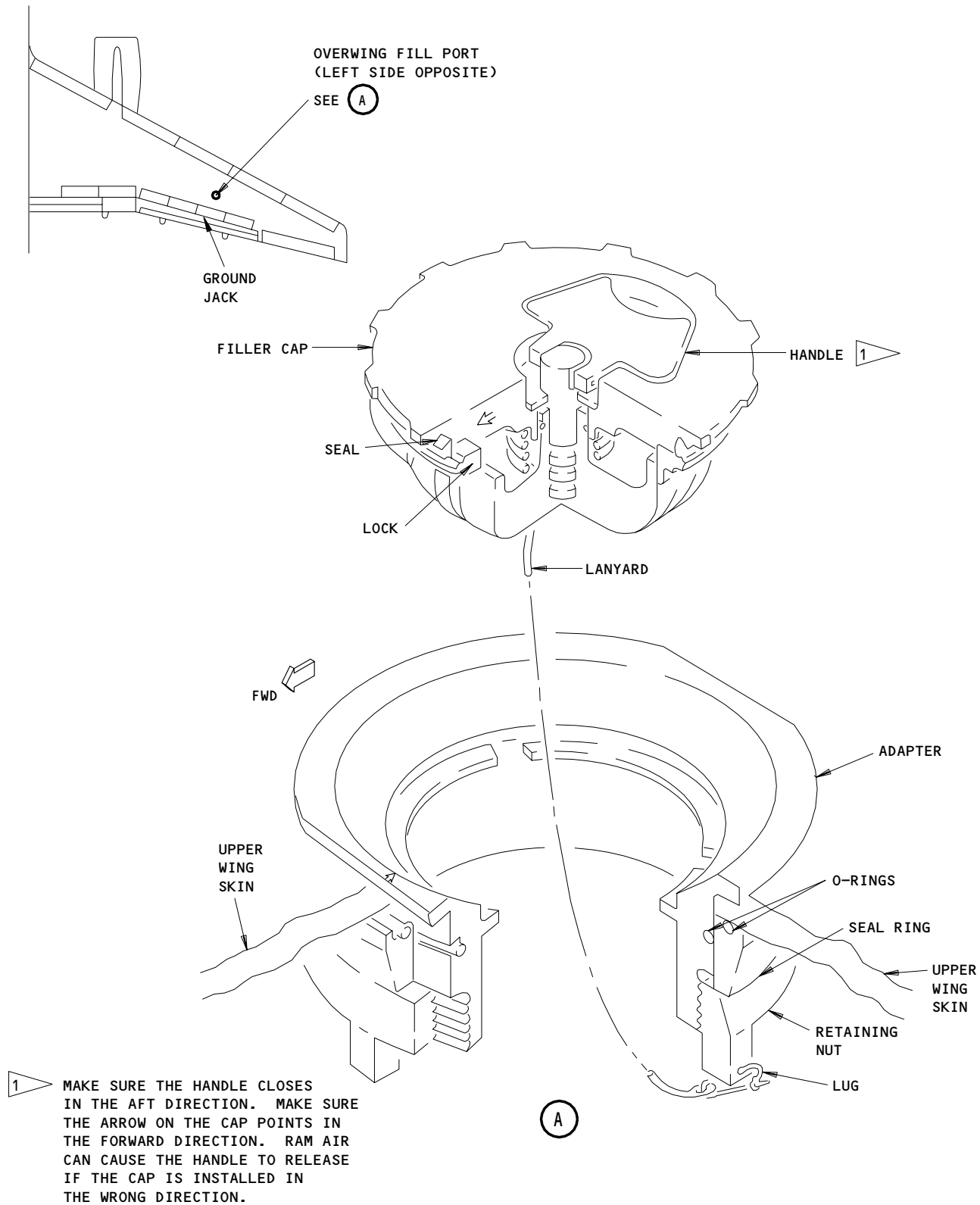
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Fuel Tank Overwing Fueling
Figure 301

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- (2) Access Panel
621GB Fueling Station Door

D. Prepare the Airplane for an Overwing Refuel Operation

S 653-038

WARNING: OBEY ALL THE REFUEL OPERATION PRECAUTIONS. FAILURE TO OBEY THE REFUEL OPERATION PRECAUTIONS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Read and obey the precautions in this task: Precautions and Limits for Fuel Servicing (AMM 12-11-01/301).

S 863-042

- (2) Supply electrical power, if it is available (AMM 24-22-00/201).
 - (a) Make sure these circuit breakers are closed:
 - 1) On the overhead circuit breaker panel, P11:
 - a) 11C34, FUEL QTY 1
 - b) 11L19, FUEL QTY 2

S 863-048

- (3) Do not operate the APU during an overwing refuel operation.

S 863-037

- (4) Make sure the airplane attitude is in a 0.3 nose down longitudinal and 0.0 degree lateral (+/- 2.0 degree longitudinal and lateral) (AMM 08-21-00/201).

S 683-029

- (5) To keep water out of the fuel, drain the fuel tank sumps before the refuel operation (AMM 12-11-03/301).

S 213-045

- (6) Make sure the pressure relief valves in the surge tanks are closed.

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S 043-046

WARNING: DO THE DEACTIVATION PROCEDURE OF THE LEADING EDGE SLATS. IF THE LEADING EDGE SLAT OPERATES ACCIDENTALLY, IT CAN CAUSE INJURY.

- (7) Do the deactivation procedure of the leading edge slats (AMM 27-81-00/201).

S 043-047

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE TRAILING EDGE FLAPS. ACCIDENTAL OPERATION OF THE TRAILING EDGE FLAPS CAN CAUSE INJURY TO PERSONS.

- (8) Do the deactivation procedure for the trailing edge flaps (AMM 27-51-00/201).

E. Connect the Fueling Equipment

S 483-049

WARNING: DO NOT POSITION FUEL SERVICING EQUIPMENT OR AIRPLANE SERVICING EQUIPMENT UNDER THE WING DURING AN OVERWING REFUEL OPERATION. AN OVERWING FUEL SPILL CAN CAUSE FUEL TO FLOW FROM THE WING SURFACE ONTO EQUIPMENT UNDER THE WING. A FUEL SPILL CAN CAUSE A FIRE OR EXPLOSION.

- (1) Use the operator supplied procedures to position the fuel vehicle.

S 913-002

WARNING: YOU MUST GROUND THE AIRPLANE TO AN APPROVED EARTH GROUND AND BOND THE REFUEL SOURCE BEFORE THE OVERWING REFUEL OPERATION. IF YOU DO NOT FOLLOW THIS PROCEDURE, A STATIC SPARK CAN CAUSE FUEL VAPOR TO IGNITE.

- (2) Connect a grounding cable from an approved earth ground to an approved electrical ground point on the airplane (static ground) (AMM 20-41-00/201).

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S 913-054

- (3) Connect one grounding cable from the fueling source to an approved earth ground (AMM 20-41-00/201).

S 913-055

- (4) Connect a bonding cable from the fueling source to an approved airplane electrical ground point (AMM 20-41-00/201).

S 493-021

WARNING: YOU MUST WEAR A SAFETY HARNESS WHEN YOU DO AN OVERWING REFUEL OPERATION. A SERIOUS INJURY CAN OCCUR IF YOU FALL FROM THE WING.

- (5) Put on a safety harness and connect the harness to the supplied harness receptacle (AMM 20-10-27/201).

S 483-065

- (6) Put pads on the wing surface to prevent damage from the refuel nozzle, fuel hose, and personnel.

S 483-056

WARNING: DO NOT DRAG THE REFUEL NOZZLE OR FUEL HOSE ACROSS THE WING SURFACE. DAMAGE TO THE WING SURFACE CAN OCCUR.

- (7) Connect the fuel hose to the overwing fill port:

WARNING: BOND THE OVERWING REFUEL NOZZLE TO THE AIRPLANE BEFORE THE FILLER CAP IS REMOVED. THIS CONNECTION MUST STAY IN POSITION UNTIL AFTER THE FILLER CAP IS INSTALLED. THE REFUEL NOZZLE MUST STAY IN CONTACT WITH THE OVERWING FILL PORT DURING THE REFUEL OPERATION. IF YOU DO NOT FOLLOW THIS PROCEDURE, A STATIC SPARK CAN CAUSE FUEL VAPOR TO IGNITE.

- (a) Connect the bonding cable for the refuel nozzle to an approved airplane bonding point (AMM 20-41-00/201).

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WARNING: MAKE SURE THE FUEL LEVEL FOR THE APPLICABLE TANK IS BELOW THE LEVEL OF THE OVERWING FILL PORT BEFORE YOU REMOVE THE FILLER CAP OR A FUEL SPILL CAN OCCUR. A FUEL SPILL CAN CAUSE A FIRE OR AN EXPLOSION.

CAUTION: KEEP ALL OBJECTS AWAY FROM THE OVERWING FILL PORT. REMOVE ALL OBJECTS FROM YOUR SHIRT POCKET (PENS, CIGARETTES, LIGHTERS, ETC.) BEFORE YOU REMOVE THE FILLER CAP. IF AN OBJECT DOES FALL INTO THE FUEL TANK, CONTACT AN AIRLINE REPRESENTATIVE. FIND AND REMOVE THE OBJECT IMMEDIATELY. UNWANTED OBJECTS IN THE FUEL TANK CAN CAUSE DAMAGE TO IN-TANK EQUIPMENT AND ELECTRICAL WIRING.

(b) Remove the filler cap from the overwing fill port of the main fuel tank.

CAUTION: MAKE SURE THE FUELING HOSE DOES NOT TOUCH A VORTEX GENERATOR. IF THE FUELING HOSE AND VORTEX GENERATOR TOUCH, DAMAGE CAN OCCUR.

- (c) Put the refuel nozzle into the overwing fill port.
- (d) Use a nozzle extension or spout to make sure the fuel does not splash into the fuel tank.
- (e) Make sure the nozzle extension is below the level of the fuel.
- (f) Make sure the refuel nozzle stays in contact with overwing fill port during the refuel operation.

F. Overwing Refuel Operation

S 973-039

- (1) Make a record of these values on the fuel sheet:
 - (a) Pre-uptift fuel quantity for each fuel tank.

NOTE: If there is no electrical power or the FQIS system is inoperative, use the fuel measuring sticks to calculate the pre-uptift fuel quantity in each fuel tank.

- (b) Final fuel quantity necessary in each fuel tank.
- (c) Fuel to be uptifted converted to volume.

S 013-004

- (2) Open the fueling station door, 621GB (AMM 06-44-00/201).

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S 213-005

- (3) Make sure the fueling panel light comes on.

NOTE: When the fueling panel light comes on, it shows that there is electrical power at the fueling control panel, P28.

- (a) If the fueling panel light does not come on, put the battery power switch on the fueling control panel, P28, to the BAT position.
(b) Make sure the fueling panel light comes on.

S 983-006

- (4) If electrical power is not available, do the steps that follow:
(a) Use a screwdriver to push up and turn the end caps on the applicable fuel measuring stick in the counterclockwise direction.
(b) Lower the fuel measuring stick (AMM 28-44-00/201).

S 653-053

WARNING: DO NOT FILL THE FUEL TANKS AT A RATE MORE THAN THE FUELING RATE OF 100 GALLONS PER MINUTE (GPM). IF THE FUELING RATE IS MORE THAN 100 GPM, THE STATIC DISCHARGE CAUSED BY THE HIGH FUELING RATE CAN CAUSE A FIRE OR EXPLOSION.

- (5) Activate the fuel shutoff control switch (deadman switch) to start the fuel flow.

S 213-012

- (6) Use the load select indicators or fuel measuring sticks, as applicable, to monitor the quantities of fuel put in the fuel tank.

G. Stop the Overwing Refuel Operation

S 653-013

- (1) Release the fuel shutoff control switch (deadman switch) to stop the fuel flow when the set quantity of fuel is put in the fuel tanks.

S 093-014

- (2) Disconnect the refuel nozzle from the airplane.

S 433-024

CAUTION: MAKE SURE THE FILLER CAP IS INSTALLED IN THE CORRECT DIRECTION. IF THE FILLER CAP IS NOT INSTALLED IN THE CORRECT DIRECTION, RAM AIR CAN CAUSE THE CAP TO RELEASE DURING FLIGHT.

- (3) Install the filler cap in the overwing fill port.
(a) Make sure the arrow on the adapter points in the aft direction.

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(b) Make sure that the filler cap is installed in the adapter with the handle locked aft and down (Fig. 301).

S 093-016

(4) Disconnect the bonding cable for the refuel nozzle.

S 093-017

(5) Remove all equipment used for the overwing refuel operation (pads on the wing surface, safety harness, etc.).

S 653-058

(6) Transfer fuel to the center tank, as necessary (AMM 28-26-00/201).

S 973-063

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

S 973-064

(8) Make a record of the actual fuel quantities from the load select indicators or the fuel measuring sticks.

S 973-062

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

S 973-040

(10) Complete the Fuel Sheet.

S 973-041

(11) Complete the Delivery Receipt.

S 973-050

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

S 863-051

(13) Make sure all the fueling control panel, P28, switches are in the CLOSED position (if necessary).

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S 863-052

- (14) Put the battery power switch on the fueling control panel, P28, to the OFF position (if necessary).

H. Put the Airplane Back to Its Usual Condition

S 413-019

- (1) If opened, close the fueling station door, 621GB (AMM 06-44-00/201).

S 983-018

- (2) If opened, lift and put the applicable fuel measuring sticks to the usual position.
 - (a) Use a screwdriver and push up and turn the end cap on the fuel measuring stick clockwise until the fuel measuring stick is locked in the usual position (AMM 28-44-00/201).

S 083-059

- (3) Do these steps in this sequence to remove the bonding/grounding cables (AMM 20-41-00/201):
 - (a) Disconnect the bonding cable from the airplane to the fuel source.
 - (b) Disconnect the grounding cable from the earth ground to the fuel source.
 - (c) Disconnect the grounding cable from the airplane to the earth ground.

S 083-066

- (4) Do the operator supplied procedures to move the fuel vehicle.

S 863-060

WARNING: DO THE ACTIVATION PROCEDURE FOR THE TRAILING EDGE FLAPS. THE FLAPS MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS.

- (5) Do the activation procedure for the trailing edge flaps (AMM 27-51-00/201).

S 863-061

WARNING: DO THE ACTIVATION PROCEDURE OF THE LEADING EDGE SLATS. THE LEADING EDGE SLATS MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS.

- (6) Do the activation procedure of the leading edge slats (AMM 27-81-00/201).

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FUEL SUMP DRAINING

1. General

- A. This procedure contains two tasks. the first task gives instructions to drain the fuel tank sumps in the main, surge and center fuel tanks. The second task gives instructions to remove the poppet valves for the sump drain valves to let the fuel drain faster from the main, surge and center tanks.
- B. The fuel tank sumps must be drained regularly for the removal of the water from the fuel tanks. Each fuel tank sump has a drain valve that that drains the water from the fuel tank. Before you sump the tank a quantity of time is necessary for the separation of water from fuel. The time rate to isolate the fuel from the water is 1 hour for each foot of fuel depth.
- C. Do not drain the sumps while you fill the airplane with fuel or immediately after you fill the airplanes with fuel. The water will be mixed with the fuel. In cold weather the water can freeze. This could cause the drain valve to stay in the closed position or cause damage to the o-ring when you open the valve. It could also prevent proper re-seating of the primary or secondary poppet after you sump. For cold weather maintenance, refer to AMM 12-33-01/301.
- D. Look at each fuel sample for water, for ice, or for contamination. Water in the fuel usually shows as a layer below the fuel or as small bubbles in the fuel. The ice crystals usually shows as a cloudiness or a haziness in the fuel. Fuel with no water, ice, or contamination is clear and bright. You can easily see material through it.

NOTE: Jet-A fuel can have different colors. It can have a range of colors from yellow (straw) color to no color. The words "clear and bright" do not refer to the color of fuel. Yellow fuel or fuel that has no color can be "clear and bright" as specified above.

NOTE: Put one or two drops of food coloring into the container before you drain a fuel sample into it. This will help you find water in the fuel, since the water will have color.

- E. A large quantity of water drained from one tank before fueling can show a blocked automatic sumping pump. For removal of an automatic sumping pump, refer to AMM 28-22-06/401.

TASK 12-11-03-683-001

2. Drain the Fuel Tank Sumps (Fig. 301)

A. General

- (1) Jet fuels can have unwanted water that it collects during airplane operation. This is because the air can be moist or wet and condensation can get into the fuel tanks. It is necessary to drain the fuel tanks sumps regularly to remove this unwanted water. The best airplane attitude to drain the sumps is a pitch of 0.3 degree nose-down (+/- 0.1 degree) longitudinal, and a 0.0 degrees (+/- 0.1 degree) lateral roll.

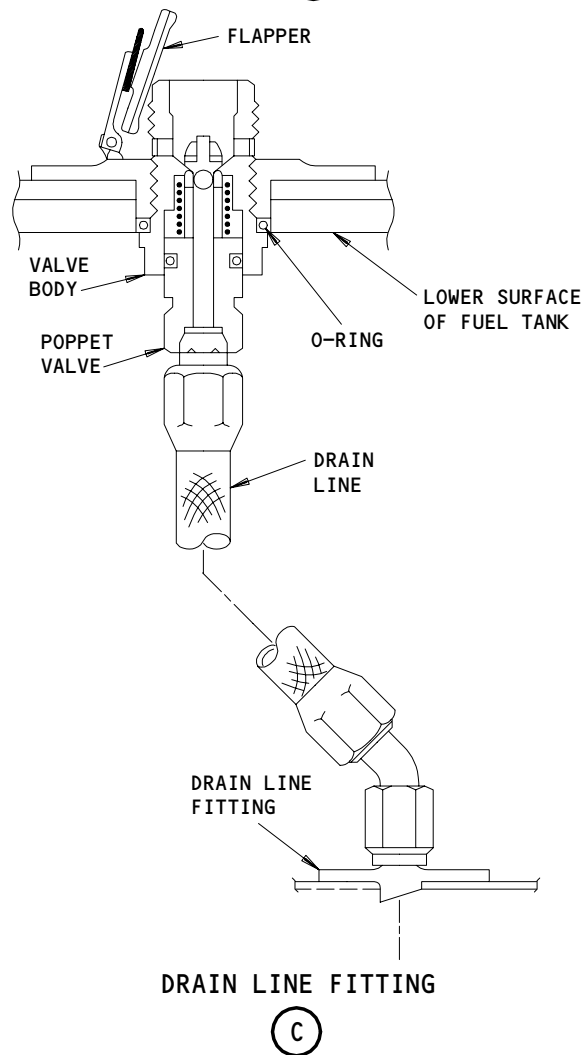
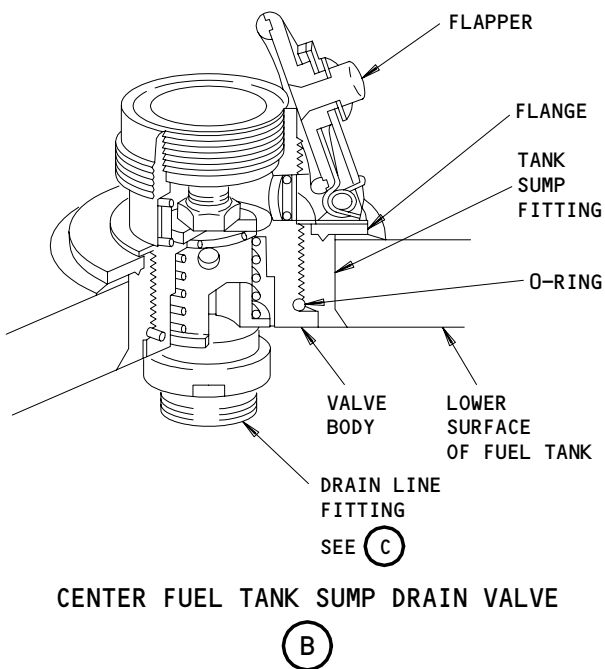
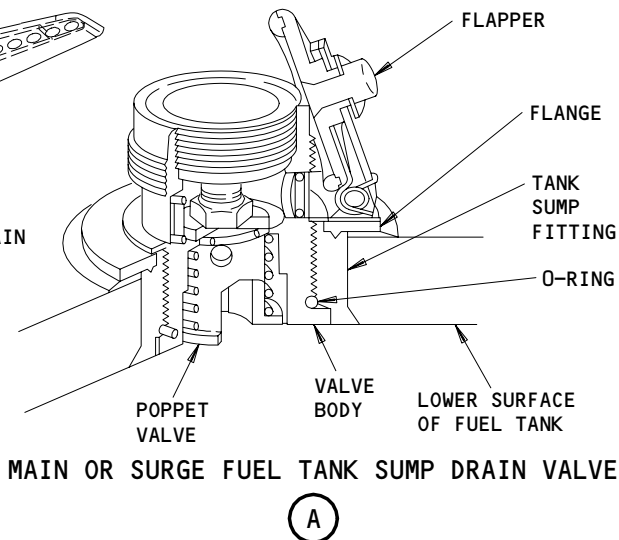
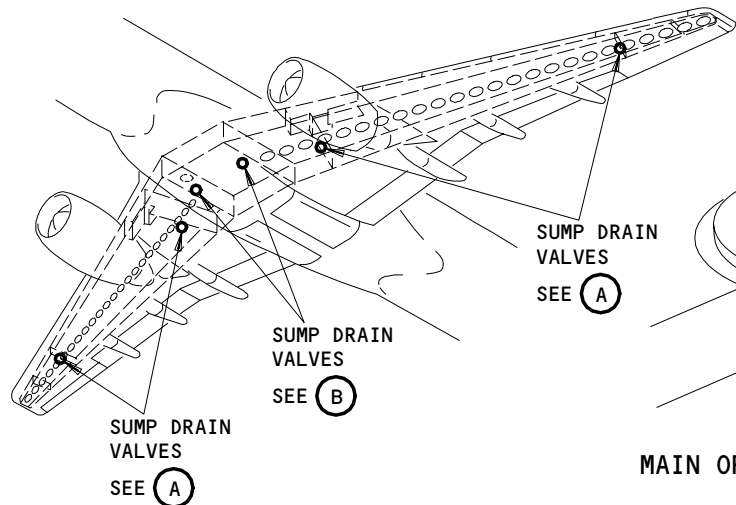
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Fuel Sump Draining
Figure 301

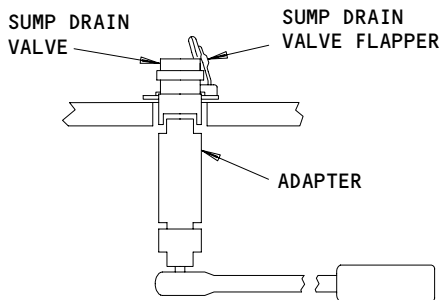
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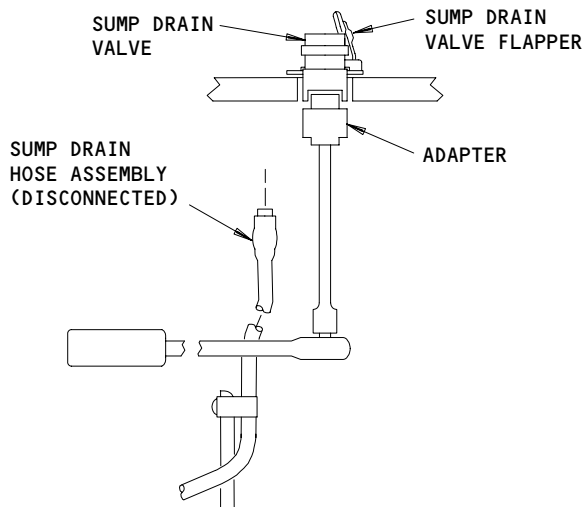
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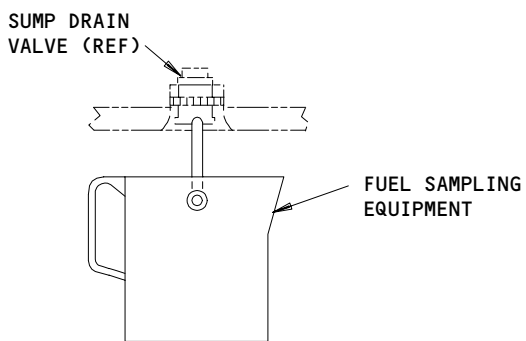


SURGE AND MAIN TANKS

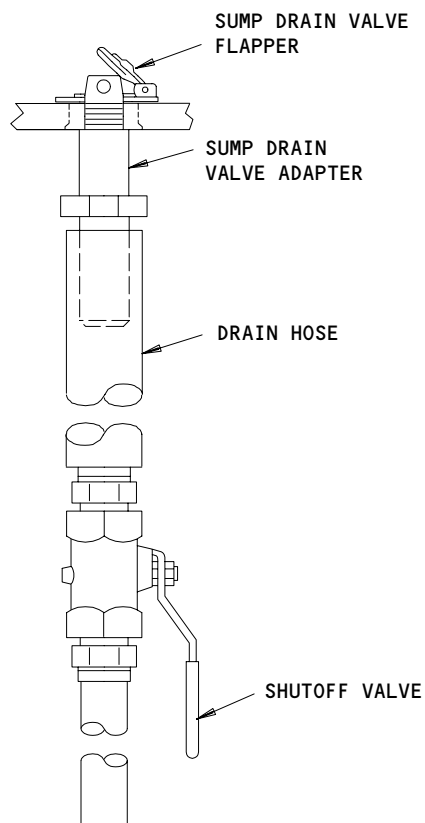


CENTER TANK

SUMP DRAIN REMOVAL ADAPTER



FUEL SAMPLING MATERIAL



SUMP DRAIN ADAPTER AND HOSE

Fuel Sump Draining
Figure 302

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B. Equipment

- (1) Fuel Sampling Receptacle, B12004-1
- (2) Clear plastic or glass container - 1 gallon capacity

C. Consumable Materials

- (1) B00130 Alcohol - Isopropyl, to clean the equipment

D. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 12-33-01/301, Cold Weather Maintenance
- (3) AMM 28-10-00/201, Microbial Growth
- (4) AMM 28-11-00/701, Fuel Tanks
- (5) AMM 28-22-06/401, Automatic Sumping Jet Pump

E. Access

(1) Location Zones

- | | |
|-----|---|
| 193 | Wing to Body - Forward Lower Half (Left) |
| 194 | Wing to Body - Forward Lower Half (Right) |
| 541 | Main Tank - Rib No. 5 to No. 17 (Left) |
| 543 | Surge Tank - Rib No. 21 to No. 23 (Left) |
| 641 | Main Tank - Rib No. 5 to No. 17 (Right) |
| 643 | Surge Tank - Rib No. 21 to No. 23 (Right) |

(2) Access Panels

- | | |
|-------|--------------------------------|
| 193GL | Fuel Drain Access Door (Left) |
| 194DR | Fuel Drain Access Door (Right) |

F. Drain the Main and Surge Fuel Tank Sumps

S 213-002

- (1) Find the main or surge fuel tank sump drain valves as shown on Fig. 301.

S 483-003

- (2) Put the top end of the fuel sampling receptacle against the bottom of the poppet valve on the sump drain valve (View A).

S 683-004

- (3) Drain each fuel tank sump until the fuel that goes into the container does not contain water.

S 083-005

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

S 213-028

- (5) Do a visual inspection of the fuel in the container.
 - (a) If you see red dye in the fuel, do this task: Fuel Tanks Contaminated with Red Dye (AMM 28-11-00/701).
 - (b) If you see other contamination, do these steps:
 - 1) Clean the fuel sampling equipment with isopropyl alcohol and dry completely.

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- 2) With a sterilized glass container, get another sample of fuel.
- 3) Do this task: Do a Detection Check for Microbial Growth. (AMM 28-10-00/201).

G. Drain the Center Fuel Tank Sumps

S 013-006

- (1) Open the applicable fuel drain access door 194DR or 193GL (AMM 06-41-00/201).

S 483-007

- (2) Put the container below the drain line fitting on the sump drain valve (View C).

NOTE: Use the container only. The fuel sampling receptacle is not necessary.

S 863-008

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

S 683-009

- (4) Drain each fuel tank sump until the fuel that goes into the container does not contain water.

S 863-010

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

S 213-029

- (6) Do a visual inspection of the fuel in the container.
 - (a) If you see red dye in the fuel, do this task: Fuel Tanks Contaminated with Red Dye (AMM 28-11-00/701).
 - (b) If you see other contamination, do these steps:
 - 1) With a sterilized glass container, get another sample of fuel.
 - 2) Do this task: Do a Detection Check for Contamination with Microbes or Fungus (AMM 28-11-00/701).

S 413-011

- (7) Close the applicable fuel drain access door 194DR or 193GL (AMM 06-41-00/201).

TASK 12-11-03-653-012

3. Drain the Remaining Fuel Through the Fuel Tank Sumps (Fig. 302)

A. General

- (1) This procedure is used to drain all fuel that remains in the fuel tank after defueling and before purging and fuel tank entry.
- (2) The best airplane attitude to drain the sumps is a pitch of 0.3 degree nose-down (+/- 0.1 degree) longitudinal, and a 0.0 degrees (+/- 0.1 degree) lateral roll.

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B. Equipment

- (1) Container - applicable for fuel.
- (2) Adapter, Sump Drain Valve Removal/Installation - B28001-1
Adapter, Main and Surge Tanks - B28001-2
Adapter, Center Tank - B28001-5
- (3) Hose Adapter, Sump Drain - B28002-1

C. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 28-11-05/401, Fuel Sump Drain Valve

D. Access

(1) Location Zones

- 193 Wing to Body - Forward Lower Half (Left)
- 194 Wing to Body - Forward Lower Half (Right)
- 541 Main Tank - Rib No. 5 to No. 17 (Left)
- 543 Surge Tank - Rib No. 21 to No. 23 (Left)
- 641 Main Tank - Rib No. 5 to No. 17 (Right)
- 643 Surge Tank - Rib No. 21 to No. 23 (Right)

(2) Access Panels

- 193GL Fuel Drain Access Door (Left)
- 194DR Fuel Drain Access Door (Right)

E. Procedure

S 653-013

- (1) To drain the fuel tank sumps in the main fuel tanks and the surge tanks, do the steps that follow:
 - (a) Remove the primary poppet of the sump drain valve (AMM 28-11-05/401).
 - (b) Close the shutoff valve on the sump drain hose.
 - (c) Install the sump drain hose adapter in the sump drain valve.
 - (d) If it is necessary, install an extension hose or suitable drain connection to the sump drain hose.
 - (e) Open the shutoff valve on the sump drain hose.
 - (f) Drain the fuel into a suitable container.
 - (g) After you drain the fuel, close the shutoff valve.
 - (h) Remove the extension hose or drain connection, if installed.
 - (i) Remove the sump drain hose.
 - (j) Install the poppet valve in the sump drain valve (AMM 28-11-05/401).

S 653-024

- (2) To drain the fuel tank sumps in the center fuel tank, do the steps that follow:
 - (a) Open the applicable left or right fuel sump drain door, 193GL or 194DR (AMM 06-41-00/201).
 - (b) Disconnect the drain line at the poppet valve of the sump drain valve.
 - (c) Remove the sump drain valve (AMM 28-11-05/401).

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- (d) Close the shutoff valve on the sump drain hose adapter.
- (e) Install the sump drain hose adapter in the fuel tank sump.
- (f) If it is necessary, install an extension hose or suitable drain connection to the sump drain hose.
- (g) Drain the fuel into an applicable container.
- (h) After you drain the fuel, close the shutoff valve.
- (i) After you drain all the fuel, remove the drain hose.
- (j) Install the sump drain valve (AMM 28-11-05/401).
- (k) Connect the drain line at the poppet valve of the sump drain valve.
- (l) Close the applicable fuel sump drain door, 193GL or 194DR (AMM 06-41-00/201).

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APU FUEL LINE SHROUD DRAINING

1. General

- A. It is necessary to drain the APU fuel line shroud regularly to remove water condensation from the APU fuel line shroud. To remove water you must open the sump drain valve on the APU fuel line shroud. The sump drain valve is between the main gear wheel wells.
- B. This procedure contains instructions to drain the shroud for the APU fuel line of water or fuel that is caught in the shroud for the APU fuel line. If there is fuel caught in the shroud there is a leak in the APU fuel line.

TASK 12-11-04-683-001

2. Drain the APU Fuel Line Shroud (Fig. 301)

A. Equipment

- (1) Fuel Sampling Receptacle, B12004-1

B. References

- (1) AMM 12-33-01/301, Cold Weather Maintenance
- (2) AMM 28-25-05/401, APU Fuel Line and Shroud

C. Access

- (1) Location Zones
149 Aft Section of Keel beam

D. Procedure

S 483-002

- (1) Put the probe end of the fuel sampling receptacle against the bottom of the primary poppet on the sump drain valve.

S 483-003

- (2) Push the fuel sampling receptacle up into the poppet to catch any fuel or water from the fuel line shroud.

S 213-004

- (3) If the sump drain valve is frozen, refer to Cold Weather Maintenance (AMM 12-33-01/301).

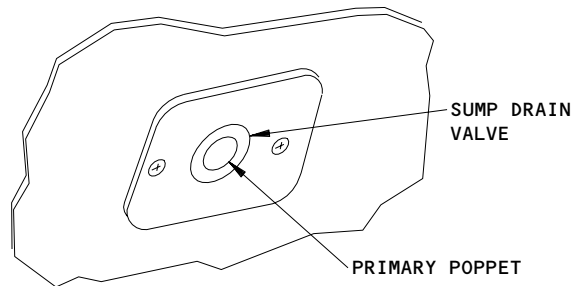
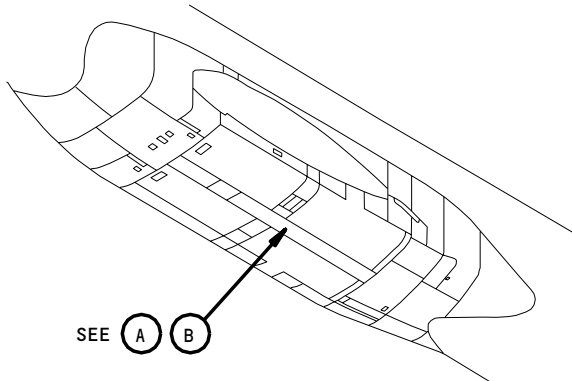
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(A)

**APU FUEL LINE
SHROUD DRAIN**

(B)

APU Fuel Line Shroud Sump Drain Valve
Figure 301

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S 083-005

- (4) When the flow of liquid stops, remove the fuel sampling receptacle and let the primary poppet on the sump drain valve close.

S 773-007

- (5) If there is water and fuel mixed together in the sample, let the sample of water and fuel separate so you can measure the quantity of fuel as follows:
- (a) If there is more than 1 liter of fuel in the sample, you must repair the leak in the APU fuel line (AMM 28-25-05/401).
 - (b) If there is less than one liter of fuel, repeat the check after 24 hours to see if you get more than 2 ounces of fuel.
 - (c) If there is more than 2 ounces of fuel in the sample after 24 hours, you must repair the leak in the APU fuel line (AMM 28-25-05/401).
 - (d) If there is less than 2 ounces of fuel in the sample after 24 hours, you can return the airplane to service without repair.

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HYDRAULIC SYSTEMS – SERVICING

1. General

A. This procedure has three tasks. The first task does a check of the fluid level in the hydraulic reservoirs. The second task fills the hydraulic reservoirs with the manual procedure. The third task fills the hydraulic reservoirs with the pressure procedure.

NOTE: To get the correct fluid level in the reservoirs, you must fill the reservoirs in these conditions:

- all landing gear in the down position
- all landing gear doors closed
- the steering and flight controls in the neutral position.

When you fill the reservoir in the right system, the pressure gage for the brake accumulator must show at least 2500 psi.

B. You can use the sight gage on each reservoir to do a check that the indicating system for the hydraulic quantity shows the level accurately.

TASK 12-12-01-703-053

2. Fluid Level Check for the Hydraulic Reservoirs

A. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 24-22-00/201, Electrical Power – Control
- (3) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (4) AMM 32-00-15/201, Main Gear Door Locks
- (5) AMM 32-00-20/201, Landing Gear Downlocks

B. Access

(1) Location Zones

- | | |
|---------|--------------------------------------|
| 143 | Left MLG Wheel Well |
| 144 | Right MLG Wheel Well |
| 197 | Wing to Body – Aft Lower Half (Left) |
| 211/212 | Control Cabin |

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- (2) Access Panels
197KL Central Hydraulic Service Center

C. Procedure (Fig. 301)

S 863-002

- (1) Supply electrical power (AMM 24-22-00/201).

S 013-003

- (2) Open the access panel, 197KL, for the central hydraulic service center (AMM 06-41-00/201).

S 863-004

- (3) Put the reservoir fill valve to the position (L, R, or C) for the hydraulic system on which you will do the check.

S 863-005

- (4) Make sure the six EICAS circuit breakers on the overhead panel, P11, are closed.

S 863-006

- (5) Do these steps before you do a check of the fluid level in the right hydraulic system:

- (a) Make sure the pressure gage on the brake accumulator, in the aft left wing-to-body fairing, shows a minimum of 2500 psi.

CAUTION: YOU MUST HAVE FLUID IN THE RIGHT SYSTEM RESERVOIR, BEFORE YOU OPERATE THE HYDRAULIC PUMPS OR YOU MUST PRESSURIZE THE RIGHT SYSTEM WITH A HYDRAULIC SERVICE CART. IF YOU OPERATE THE HYDRAULIC PUMPS WITHOUT SUFFICIENT FLUID IN THE RESERVOIR, YOU CAN CAUSE DAMAGE TO THE PUMPS.

- (b) If the pressure gage does not show a minimum of 2500 psi, pressurize the right hydraulic system (AMM 29-11-00/201).

- (c) Remove hydraulic power, after the right hydraulic system pressurizes the brake accumulator to a minimum of 2500 psi (AMM 29-11-00/201).

S 863-007

- (6) Push the ELEC/HYD switch on the EICAS MAINT panel, on the right side panel, P61.

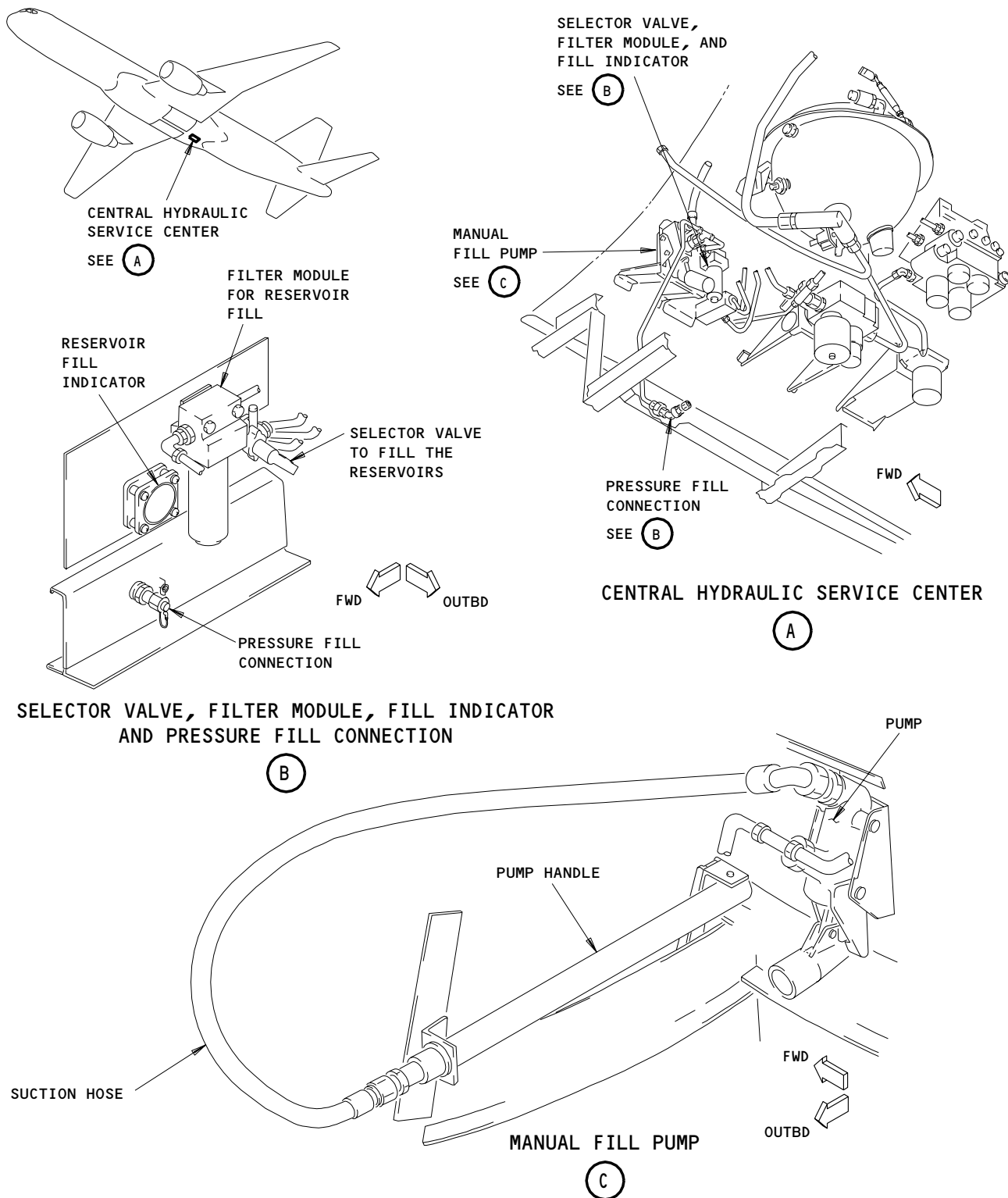
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Central Hydraulic Service Center
Figure 301

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S 213-008

- (7) Make sure the O/F or the RF indication does not show on the EICAS display adjacent to the (L, C, R) HYD QTY indication.

S 213-009

- (8) Make sure the reservoir fill indicator, at the central hydraulic service center, shows in the area that has a color, as follows:
- (a) Red for the left system
 - (b) Blue for the center system
 - (c) Green for the right system.

S 683-054

WARNING: HYDRAULIC FLUID, BMS 3-11, CAN CAUSE INJURY TO PERSONS. IF YOU GET THE HYDRAULIC FLUID ON YOUR SKIN, FLUSH YOUR SKIN WITH WATER. IF YOU GET THE HYDRAULIC FLUID IN YOUR EYES, FLUSH YOUR EYES WITH WATER AND GET MEDICAL AID. IF YOU EAT OR DRINK THE HYDRAULIC FLUID, GET MEDICAL AID.

- (9) If the EICAS display or the reservoir fill indicator shows that a reservoir is too full, lower the fluid level as follows:
- (a) For the center system, open the access panel, 197KL, for the central hydraulic service center (AMM 06-41-00/201).
 - (b) For the left or right system, make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

WARNING: DO THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (c) For the left or right system, open the doors for the landing gear and install the door locks (AMM 32-00-15/201).
- (d) Remove the pressure from the applicable hydraulic system and the reservoir (AMM 29-11-00/201).
- (e) Open the drain valve on the applicable hydraulic reservoir.
- (f) Drain the hydraulic fluid into a container.
- (g) Close the reservoir drain valve when the reservoir fill indicator shows in the area that has a color.
- (h) Safety the reservoir drain valve with a lockwire.
- (i) For the center system, close the access panel, 197KL, for the central hydraulic service center (AMM 06-41-00/201).

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WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(j) For the left or right system,
remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 613-011

(10) If the EICAS display or the reservoir fill indicator shows that the reservoir is not full, increase the fluid level with one of these procedures:

- (a) Fill the Hydraulic Reservoir with the Manual Procedure
- (b) Fill the Hydraulic Reservoir with the Pressure Procedure.

S 863-012

(11) Put the reservoir fill valve to the CLOSED position.

S 863-013

(12) Close the access panel, 197KL, for the central hydraulic service center (AMM 06-41-00/201).

S 863-014

(13) Remove electrical power, if it is not necessary (AMM 24-22-00/201).

TASK 12-12-01-613-015

3. Fill the Hydraulic Reservoir - Manual Procedure

A. Consumable Materials

- (1) D00153 Hydraulic Fluid, Fire-Resistant -
BMS 3-11

B. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

C. Access

- (1) Location Zones
197 Wing to Body - Aft Lower Half (Left)

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- (2) Access Panels
197KL Central Hydraulic Service Center

D. Procedure (Fig. 301)

S 863-016

- (1) Supply electrical power (AMM 24-22-00/201).

S 863-017

- (2) Open the access door, 197KL, for the central hydraulic service center (AMM 06-41-00/201).

S 863-018

- (3) Do these steps before you fill the reservoir in the right hydraulic system:
- (a) Make sure the pressure gage on the brake accumulator, in the aft left wing-to-body fairing, shows a minimum of 2500 psi.

CAUTION: YOU MUST HAVE FLUID IN THE RIGHT SYSTEM RESERVOIR, BEFORE YOU OPERATE THE HYDRAULIC PUMPS OR YOU MUST PRESSURIZE THE RIGHT SYSTEM WITH A HYDRAULIC SERVICE CART. IF YOU OPERATE THE HYDRAULIC PUMPS WITHOUT SUFFICIENT FLUID IN THE RESERVOIR, YOU CAN CAUSE DAMAGE TO THE PUMPS.

- (b) If the pressure gage does not show a minimum of 2500 psi, pressurize the right hydraulic system (AMM 29-11-00/201).

- (c) Remove hydraulic power, after the right hydraulic system pressurizes the brake accumulator to a minimum of 2500 psi (AMM 29-11-00/201).

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (d) For the left or right system, remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 023-022

CAUTION: USE CLEAN HYDRAULIC FLUID, BMS 3-11, AND CLEAN EQUIPMENT TO FILL THE HYDRAULIC SYSTEM RESERVOIRS. IF YOU DO NOT USE CLEAN HYDRAULIC FLUID AND EQUIPMENT, CONTAMINATION OF THE HYDRAULIC SYSTEM CAN OCCUR.

ALL CURRENTLY QUALIFIED BMS 3-11, TYPE IV HYDRAULIC FLUIDS ARE INTERCHANGEABLE AND INTERMIXABLE IN ANY PROPORTION.

- (4) Remove the suction hose from the pump handle.

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S 163-020

- (5) Clean the suction hose with a rag.

S 613-059

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

NOTE: All currently qualified BMS 3-11, Type IV and Type V hydraulic fluids are interchangeable and intermixable in any proportion (767-SL-29-045).

S 023-023

- (7) Remove the pump handle from the brackets.

S 423-024

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

S 613-050

WARNING: BE CAREFUL TO NOT FILL THE RESERVOIR TO MORE THAN THE NECESSARY LEVEL. IF YOU PUT TOO MUCH FLUID IN THE RESERVOIRS, THE FLUID CAN GO INTO THE DUCTS OF THE PNEUMATIC SYSTEM AND THE AIR CONDITIONING PACKS. THIS CAN CAUSE SMOKE AND DANGEROUS FUMES TO GO INTO THE FLIGHT COMPARTMENT AND THE PASSENGER CABIN. IF CONTAMINATION OF THE PNEUMATIC SYSTEM OCCURS AGAIN AND AGAIN, IT CAN CAUSE DAMAGE TO THE TITANIUM DUCTS.

- (9) Do these steps for each hydraulic reservoir you will fill:
- (a) Put the reservoir fill valve to the position (L, R, or C) for the hydraulic system in which you will fill the reservoir.
 - (b) Operate the manual fill pump to fill the reservoir.
 - (c) Monitor the reservoir fill indicator while you fill the reservoir.
 - (d) Stop when the reservoir fill indicator shows at the top of the area that has a color, as follows:
 - 1) Red for the left system (6.6 gal./25 liters)
 - 2) Blue for the center system (3.5 gal./13 liters)
 - 3) Green for the right system (6.6 gal./25 liters).
 - (e) Make sure the six EICAS circuit breakers on the overhead panel, P11, are closed.
 - (f) Push the ELEC/HYD switch on the EICAS MAINT panel, on the right side panel, P61.
 - (g) Make sure the (L, R, C) HYD QTY indication on the EICAS display shows as follows:
 - 1) 1.00 (± 0.08 for the left or right system)
 - 2) 1.00 (± 0.14 for the center system)

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S 613-026

- (10) If you fill a hydraulic reservoir after the replacement of a component or when there is no hydraulic fluid in the system, do these steps:
- (a) Pressurize the applicable hydraulic system (AMM 29-11-00/201).
 - (b) Operate all the flight control surfaces through three full cycles.
 - (c) Remove hydraulic power (AMM 29-11-00/201).
 - (d) Do the steps to fill the hydraulic reservoir again.

S 863-027

- (11) Put the reservoir fill valve in the CLOSED position.

S 023-028

- (12) Remove the pump handle from the socket of the manual fill pump.

S 423-029

- (13) Put the pump handle in the brackets.

S 613-030

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

S 683-031

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

S 163-032

- (16) Remove the hydraulic fluid from the suction hose with a rag.

S 423-033

- (17) Put the suction hose into the pump handle.

S 863-034

- (18) Remove electrical power if it is not necessary (AMM 24-22-00/201).

S 413-039

- (19) Close the access panel, 197KL, for the central hydraulic service center (AMM 06-41-00/201).

TASK 12-12-01-613-036

4. Fill the Hydraulic Reservoir - Pressure Procedure

A. Equipment

- (1) Hydraulic Ground Service Cart, with Hydraulic Fluid, Fire-Resistant - BMS 3-11

B. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels.
- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

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C. Consumable Materials

- (1) D00153 Hydraulic Fluid, Fire-Resistant -
BMS 3-11

D. Access

- (1) Location Zones
197 Wing to Body - Aft Lower Half (Left)

- (2) Access Panels
197KL Central Hydraulic Service Center

E. Procedure (Fig. 301)

S 863-037

- (1) Supply electrical power (AMM 24-22-00/201).

S 013-038

- (2) Open the access door, 197KL, for the central hydraulic service center (AMM 06-41-00/201).

S 863-040

- (3) Do these steps before you fill the reservoir in the right hydraulic system:

- (a) Make sure the pressure gage on the brake accumulator, in the aft left wing-to-body fairing, shows a minimum of 2500 psi.

CAUTION: YOU MUST HAVE FLUID IN THE RIGHT SYSTEM RESERVOIR, BEFORE YOU OPERATE THE HYDRAULIC PUMPS OR YOU MUST PRESSURIZE THE RIGHT SYSTEM WITH A HYDRAULIC SERVICE CART. IF YOU OPERATE THE HYDRAULIC PUMPS WITHOUT SUFFICIENT FLUID IN THE RESERVOIR, YOU CAN CAUSE DAMAGE TO THE PUMPS.

- (b) If the pressure gage does not show a minimum of 2500 psi, pressurize the right hydraulic system (AMM 29-11-00/201).
- (c) Remove hydraulic power, after the right hydraulic system pressurizes the brake accumulator to a minimum of 2500 psi (AMM 29-11-00/201).

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WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (d) For the left or right system, remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 493-052

CAUTION: USE CLEAN HYDRAULIC FLUID, BMS 3-11, AND CLEAN EQUIPMENT TO FILL THE HYDRAULIC SYSTEM RESERVOIRS. IF YOU DO NOT USE CLEAN HYDRAULIC FLUID AND EQUIPMENT, CONTAMINATION OF THE HYDRAULIC SYSTEM CAN OCCUR.

ALL CURRENTLY QUALIFIED BMS 3-11, TYPE IV HYDRAULIC FLUIDS ARE INTERCHANGEABLE AND INTERMIXABLE IN ANY PROPORTION.

- (4) Connect the ground service cart to the pressure fill connection.

S 613-051

WARNING: BE CAREFUL TO NOT FILL THE RESERVOIR TO MORE THAN THE NECESSARY LEVEL. IF YOU PUT TOO MUCH FLUID IN THE RESERVOIRS, THE FLUID CAN GO INTO THE DUCTS OF THE PNEUMATIC SYSTEM AND THE AIR CONDITIONING PACKS. THIS CAN CAUSE SMOKE AND DANGEROUS FUMES TO GO INTO THE FLIGHT COMPARTMENT AND THE PASSENGER CABIN. IF CONTAMINATION OF THE PNEUMATIC SYSTEM OCCURS AGAIN AND AGAIN, IT CAN CAUSE DAMAGE TO THE TITANIUM DUCTS.

- (5) Do these steps for each hydraulic reservoir you will fill:
(a) Put the reservoir fill valve to the position (L, R, or C) for the hydraulic system in which you will fill the reservoir.

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

- (b) Operate the hydraulic service cart.
(c) Monitor the reservoir fill indicator while you fill the reservoir.
(d) Stop when the reservoir fill indicator shows at the top of the area that has a color, as follows:
1) Red for the left system (6.6 gal./25 liters)
2) Blue for the center system (3.5 gal./13 liters)
3) Green for the right system (6.6 gal./25 liters).
(e) Make sure the six EICAS circuit breakers on the overhead panel, P11, are closed.
(f) Push the ELEC/HYD switch on the EICAS MAINT panel, on the right side panel, P61.

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- (g) Make sure the (L, R, C) HYD QTY indication on the EICAS display shows as follows:
- 1) 1.00 (± 0.08 for the left or right system)
 - 2) 1.00 (± 0.14 for the center system)

S 613-043

- (6) If you fill a hydraulic reservoir after the replacement of a component or when there is no hydraulic fluid in the system, do these steps:
- (a) Pressurize the applicable hydraulic system (AMM 29-11-00/201).
 - (b) Operate all the flight control surfaces through three full cycles.
 - (c) Remove hydraulic power (AMM 29-11-00/201).
 - (d) Do the steps to fill the hydraulic reservoir again.

S 863-044

- (7) Put the reservoir fill valve in the CLOSED position.

S 613-045

- (8) Stop the hydraulic ground service cart.

S 093-046

- (9) Disconnect the hydraulic ground service cart from the pressure fill connection.

S 433-047

- (10) Install a cap on the pressure fill connection.

S 863-048

- (11) Remove electrical power if it is not necessary (AMM 24-22-00/201).

S 413-049

- (12) Close the access door, 197KL, for the central hydraulic service center (AMM 06-41-00/201).

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ENGINE (OIL REPLENISHING) – SERVICING

1. General

- A. This procedure contains these 3 tasks:
 - (1) Do a check of the engine oil level,
 - (2) Add oil to the engine oil system (when oil is in the system),
 - (3) Add oil to the engine oil system (when oil is not in the system).
- B. Engine oil tank replenishment may be achieved by one of two pressure fill methods (dependent on available equipment) or by gravity fill.
- C. Allow a minimum period of 10 minutes and maximum period of 1 hour after the engine has completed its last flight for engine oil replenishment.

NOTE: Over an extended period, a small change in oil level from that noted immediately after oil replenishment can be seen. This is because gravity or temperature change can cause a change in the level of the oil in the system.

- D. If an unusual fall of oil tank contents is noted after a long period of time with the engine stopped, do this procedure:
(FIM 79-31-00/101, Fig. 103A).
- E. If you need to add oil to the engine oil system, use the Add Oil to the Engine Oil System (When Oil is in the System) procedure.
- F. Do the Add Oil to the Engine Oil System (When Oil is not in the System) procedure only when a procedure in the Maintenance Manual tells you to do it.

TASK 12-13-01-213-001

2. Do a Check of the Engine Oil Level

- A. References
 - (1) AMM 24-22-00/201, Electrical Power-Control
- B. Access
 - (1) Location Zones
 - 414 Left Engine Right Fan Cowl Panel
 - 424 Right Engine Right Fan Cowl Panel
 - (2) Access Panels
 - 414BR Left Engine Oil Filler Access Door
 - 424BR Right Engine Oil Filler Access Door

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C. Do a check of the engine oil level (Method 1) (Fig. 301)

S 863-075

- (1) Make sure the engine has been shutdown for a minimum of ten minutes but less than one hour.
 - (a) If the engine has been shutdown for more than one hour, operate the engine at minimum idle for five minutes (AMM 71-00-00/201) and check the oil level again.

NOTE: Over an extended time, you can see a small change in the oil level from what you saw after you filled the oil tank. This is the result of oil movement through the oil system under the effects of gravity and temperature change.

S 013-002

- (2) Open the oil filler access door.

S 213-003

- (3) Find the oil level shown in the oil quantity sight glass of the oil tank.
 - (a) If the oil level is at the FULL mark, the oil level is satisfactory.
 - (b) If the oil level is below the FULL mark, do the procedure: Add Oil to the Engine Oil System (When Oil is in the System).

D. Do a check of the engine oil level (Method 2)

S 863-076

- (1) Make sure the engine has been shutdown for a minimum of ten minutes but less than one hour.
 - (a) If the engine has been shutdown for more than one hour, operate the engine at minimum idle for five minutes (AMM 71-00-00/201) and check the oil level again.

NOTE: Over an extended time, you can see a small change in the oil level from what you saw after you filled the oil tank. This is the result of oil movement through the oil system under the effects of gravity and temperature change.

S 863-054

- (2) Supply ground electrical power (AMM 24-22-00/201).

S 213-052

- (3) Examine the oil quantity gage in the flight compartment.
 - (a) If the oil level gage shows full, then remove ground electrical power (AMM 24-22-00/201).
 - (b) If you see the oil level gage below full, do the procedure: Add Oil to the Engine Oil System (When Oil is in the System).

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S 413-048

CAUTION: CORRECTLY LATCH THE OIL FILLER ACCESS DOOR. IF YOU DO NOT CORRECTLY LATCH THE OIL FILLER ACCESS DOOR, IT CAN BLOW OFF IN FLIGHT.

(4) Close the oil filler access door.

TASK 12-13-01-613-004

3. Add Oil to the Engine Oil System (When Oil is in the System)

A. General

- (1) ON ENGINES WITH RR SB 79-9427;
Use the gravity fill procedure.
- (2) ON ENGINES WITHOUT RR SB 79-9427;
Use one of these procedures to add oil to the oil system.
 - (a) Pressure fill, or
 - (b) Gravity fill.
- (3) If possible, add the same brand of oil to the engine oil system.
 - (a) You can add a different brand of oil if it is necessary.
- (4) The list of approved engine oils are given in RR SB 12-F139.

B. Equipment

- (1) Pressure Fill Method With Rolls-Royce Equipment:
 - (a) RR 3409536 - Oil replenishing gun
 - (b) RR U999092 - Hose
 - (c) RR UT954 - Pressure fill hose adapter/coupling assembly
- (2) Pressure Fill Method Without Rolls-Royce Equipment:
 - (a) Oil replenishing rig - specially made
- (3) Container - approximately 1 quart (1 liter) minimum capacity
- (4) Drain hose - with a connector which will connect with the oil tank overflow connector.
- (5) Combustible Gas Detector - Rolls-Royce 1018157
- (6) Draeger Hand Pump - Rolls-Royce 1013832
(Used with the Hydrocarbon 2 Tube)

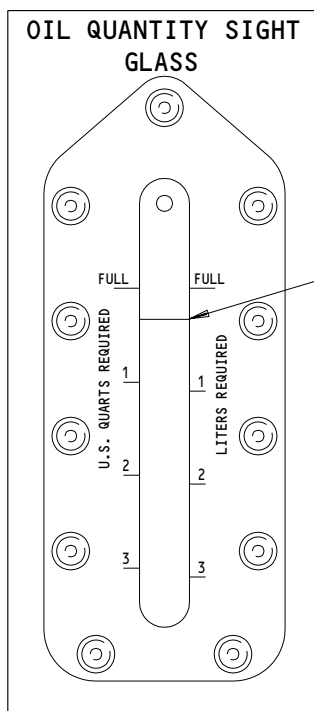
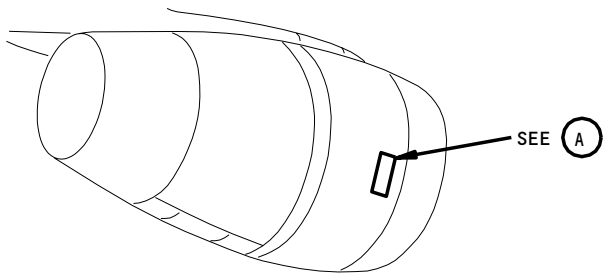
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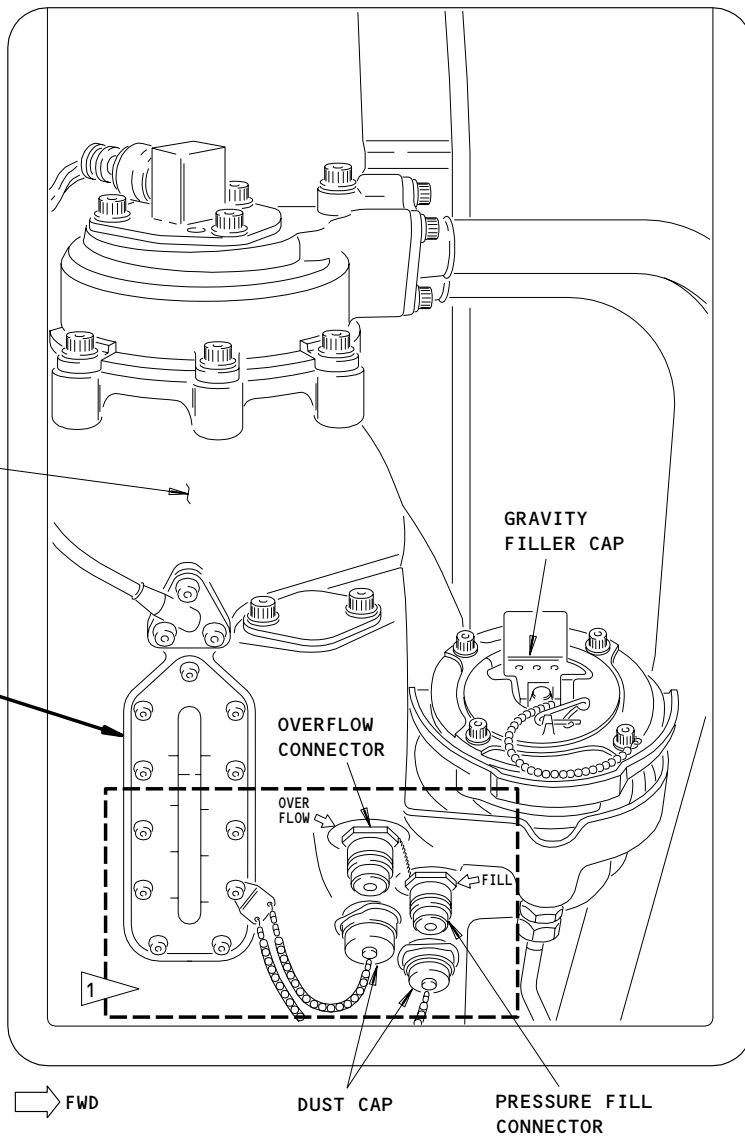
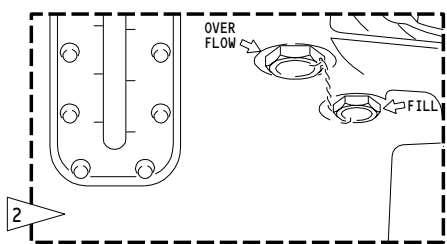
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B



VIEW THROUGH THE OIL FILLER ACCESS DOOR

A

- 1 ENGINES WITHOUT RR SB 79-9427
- 2 ENGINES WITH RR SB 79-9427

61727

Engine Oil Fillers
Figure 301

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- (7) Hydrocarbon 2 Tube - Rolls-Royce 1013833
(Used with Draeger Hand Pump)
- C. Consumable Materials
 - (1) Oil - For RB211-535 Engines (Refer to RR SB 12-F139).
- D. Access
 - (1) Location Zones
 - 414 Left Engine Right Fan Cowl Panel
 - 424 Right Engine Right Fan Cowl Panel
 - (2) Access Panels
 - 414BR Left Engine Oil Filler Access Door
 - 424BR Right Engine Oil Filler Access Door
- E. Prepare to Add the Engine Oil

S 643-082

WARNING: DO NOT LET THE ENGINE OIL TOUCH YOUR SKIN FOR A LONG TIME. YOU CAN ABSORB TOXIC MATERIALS THROUGH YOUR SKIN IF YOU LET THE OIL TOUCH YOUR SKIN FOR A LONG TIME.

DO NOT TOUCH THE ENGINE OIL SYSTEM PARTS IF THE ENGINE IS HOT. THE OIL SYSTEM STAYS HOT FOR MORE TIME THAN THE OTHER ENGINE PARTS. YOU CAN INJURE YOURSELF IF YOU TOUCH A HOT OIL SYSTEM.

CAUTION: DO NOT LET ALKALINE CLEANING FLUIDS TOUCH THE OIL WHICH WILL GO INTO THE ENGINE. VERY SMALL AMOUNTS OF ALKALINE CLEANING FLUIDS WILL DAMAGE THE ENGINE OIL.

DO NOT LET ENGINE OIL TOUCH PARTS WHICH DO NOT NORMALLY TOUCH OIL. ENGINE OIL CAN DAMAGE RUBBER, PAINT, AND OTHER ENGINE PARTS.

CAUTION: IF YOU CHANGE TO A DIFFERENT APPROVED OIL TYPE, YOU MUST ADD THE REPLACEMENT OIL TO THE TANK DURING THE REGULAR SERVICING OF THE ENGINE. DO NOT DRAIN THE OIL SYSTEM AND FILL IT WITH THE REPLACEMENT OIL IN ONE OPERATION. IF YOU DO NOT OBEY THIS INSTRUCTION, YOU CAN CAUSE DAMAGE TO THE ENGINE.

- (1) Open the oil filler access door.

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S 863-006

- (2) Make sure the engine has been shutdown for a minimum of ten minutes but less than one hour.
 - (a) If the engine has been shutdown for more than one hour, operate the engine at minimum idle for five minutes (AMM 71-00-00/201) and check the oil level again.

NOTE: Over an extended time, you can see a small change in the oil level from what you saw after you filled the oil tank. This is the result of oil movement through the oil system under the effects of gravity and temperature change.

F. Use the Pressure Fill Method to Add the Engine Oil

S 013-008

- (1) Remove the dust caps from the pressure fill and overflow connectors on the oil tank.

S 493-009

- (2) Connect the drain hose to the oil tank overflow connector.

S 493-010

- (3) Put the loose end of the drain hose in the container.

S 613-011

- (4) Do these steps if you will use the RR equipment:
 - (a) Assemble the replenishing gun, the hose and the pressure fill hose adapter/coupling assembly.
 - (b) Remove the quick-disconnect (Q.D.) cover from the pressure fill hose adapter/coupling assembly.
 - (c) Connect the pressure fill hose adapter/coupling to the oil tank pressure fill connector.
 - (d) Install the oil container to the oil replenishing gun.
 - (e) Use the oil replenishing gun to add the oil to the engine oil system.
 - 1) Add oil until the oil level in the oil quantity sight glass shows FULL.
 - (f) Disconnect the pressure fill hose adapter/coupling assembly from the pressure fill connector on the oil tank.

S 613-012

- (5) Do these steps if you will use the oil replenishing rig to add the oil:
 - (a) Connect the oil replenishing rig to the pressure fill connector on the oil tank.
 - (b) Use the oil replenishing rig to add oil to the oil system.
 - 1) Add oil until the oil level in the oil tank oil quantity sight glass shows FULL.

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(c) Disconnect the oil replenishing rig from the oil tank pressure fill connector on the oil tank.

S 093-013

(6) Remove the drain hose from the overflow connector on the oil tank.

S 413-014

(7) Install the dust caps onto the pressure fill and overflow connectors on the oil tank.

G. Use the Gravity Fill Method to Add the Engine Oil

S 013-073

CAUTION: IF YOU THINK THERE ARE FUEL FUMES WHEN YOU REMOVE THE OIL FILLER CAP, IMMEDIATELY DO THE FAULT ISOLATION PROCEDURE "OIL QUANTITY INDICATION HIGHER THAN EXPECTED OR RISING" (FIM 79-31-00/101). USE ONE OF THESE METHODS TO FIND IF FUEL HAS CONTAMINATED THE OIL SYSTEM.

METHOD 1: USE A DRAEGER HAND PUMP (RR 1013832), WITH A HYDROCARBON 2 TUBE (RR 1013833) TO DO A CHECK FOR THE FUEL FUMES. USE THE MANUFACTURER'S INSTRUCTIONS TO DO THIS CHECK.

METHOD 2: USE A COMBUSTIBLE GAS DETECTOR (RR 1018157) TO DO A CHECK FOR THE FUEL FUMES. DO THE PROCEDURE THAT FOLLOWS TO DO THIS CHECK.

(1) Remove the gravity filler cap.
(a) If you smell fuel in the oil when the oil filler is opened or the oil quantity is abnormally high, then you must do this procedure: 'Use the Combustible Gas Detector to Detect the Fuel Vapor in the Oil'.

S 613-016

(2) Pour the oil into the oil filler opening.
(a) Add the oil until the oil level in the oil quantity sight glass shows FULL.

S 413-017

(3) Install the gravity filler cap.

H. Use a Combustible Gas Detector (RR Part No. 1018157) to Detect Fuel Vapor in the Oil

S 823-035

(1) Calibrate the combustible gas detector as follows:
(a) Turn on the detector.
(b) Adjust the detector until a fast ticking can be heard.
(c) Add a few drops of jet fuel to a container of hot water.
(d) Immediately put the gas detector sensor near the hot vapor.
(e) The gas detector should produce a high pitched tone.

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(f) If there is no change in the tone, recharge or install a new battery unit.

S 943-036

(2) Turn on the combustable gas detector.

S 943-037

(3) Let the unit warm up until you hear a ticking noise.

NOTE: This should occur in approximately one minute.

S 943-038

(4) Adjust the sensitivity knob until a rapid ticking signal is heard.

S 793-039

(5) Install the sensor head just in the oil tank filler neck.

S 753-040

(6) If vapors are located, the detector will give a high pitched tone.

S 753-041

(7) If a warning tone is noted while you check the oil tank, make sure that the fuel vapor is not from a spill in the general area external to the oil system.

S 753-042

(8) If it is necessary, get a sample from the oil system.

S 753-043

(9) Do the check again, away from the engine.

S 683-044

(10) When a positive sample is found, laboratory analysis should be requested to confirm before you make a decision.

S 683-045

(11) If the sample is positive then the problem should be corrected immediately (FIM 79-31-00/101).

I. Put the Airplane Back to its Usual Condition

S 413-018

CAUTION: CORRECTLY LATCH THE OIL FILLER ACCESS DOOR. IF YOU DO NOT CORRECTLY LATCH THE OIL FILLER ACCESS DOOR, IT CAN BLOW OFF IN FLIGHT.

(1) Close the oil filler access door.

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TASK 12-13-01-613-019

4. Add Oil to the Oil System (When Oil is not in the System)

A. General

- (1) Use this procedure after you fully drain the oil system.
 - (a) When you fully drain the oil system, you let air get in the oil system.
 - (b) When you use this procedure, you remove the air in the oil system while you add the oil.
- (2) ON ENGINES WITH RR SB 79-9427;
Use the gravity fill procedure.
- (3) ON ENGINES WITHOUT RR SB 79-9427;
Use one of these procedures to add oil to the oil system.
 - (a) Pressure fill, or
 - (b) Gravity fill.
- (4) Try to use the pressure fill method to add the engine oil.
 - (a) If necessary, you can usually use the gravity fill method.
 - (b) Do not use the gravity fill method after you replace the FCOC and the engine module 03.

NOTE: The gravity fill method does not remove the air from the FCOC and the engine module 03.

- (5) If possible, add the same brand of oil that was in the engine oil system before you drained it.
 - (a) You can add a different brand of oil if it is necessary.

B. Equipment

- (1) Pressure Fill Method:
 - (a) Pressure fill rig - specially made.
The pressure fill rig must be able to continuously pump 23 to 25 U.S. pints (10.9 to 11.8 liters) of oil with a pressure of 17 to 27 psi.
 - (b) Container - approximately 1 quart (1 liter) minimum capacity

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- (2) Gravity Fill Method:
 - (a) Funnel
 - (b) Flexible, transparent hose - diameter as is necessary to connect to the funnel, approximately 3 foot (1 meter) length
- C. Consumable Materials
 - (1) Oil - For RB211-535 Engines (AMM 20-30-04/201)
- D. References
 - (1) AMM 71-00-00/201, Power Plant
 - (2) AMM 71-11-04/201, Fan Cowl Panels
 - (3) AMM 79-11-00/301, Engine Servicing (Oil Change)
 - (4) AMM 79-21-03/401, Magnetic Chip Detector
- E. Access
 - (1) Location Zones
 - 413 Left Engine Left Fan Cowl Panel
 - 414 Left Engine Right Fan Cowl Panel
 - 423 Right Engine Left Fan Cowl Panel
 - 424 Right Engine Right Fan Cowl Panel
 - (2) Access Panels
 - 413AL Left Engine Left Fan Cowl Panel
 - 414BR Left Engine Oil Filler Access Door
 - 423AL Right Engine Left Fan Cowl Panel
 - 424BR Right Engine Oil Filler Access Door
- F. Prepare to Add the Engine Oil

S 643-083

WARNING: DO NOT LET THE ENGINE OIL TOUCH YOUR SKIN FOR A LONG TIME. YOU CAN ABSORB TOXIC MATERIALS THROUGH YOUR SKIN IF YOU LET THE OIL TOUCH YOUR SKIN FOR A LONG TIME.

DO NOT TOUCH THE ENGINE OIL SYSTEM PARTS IF THE ENGINE IS HOT. THE OIL SYSTEM STAYS HOT FOR MORE TIME THAN THE OTHER ENGINE PARTS. YOU CAN INJURE YOURSELF IF YOU TOUCH A HOT OIL SYSTEM.

CAUTION: DO NOT LET ENGINE OIL TOUCH PARTS WHICH DO NOT NORMALLY TOUCH OIL. ENGINE OIL CAN DAMAGE RUBBER, PAINT, AND OTHER ENGINE PARTS.

DO NOT LET ALKALINE CLEANING FLUIDS TOUCH THE OIL WHICH WILL GO INTO THE ENGINE. VERY SMALL AMOUNTS OF ALKALINE CLEANING FLUIDS WILL DAMAGE THE ENGINE OIL.

- (1) Refer to the Engine Fan Cowl DECAL for the oil type used.

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S 013-084

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

(2) Open the fan cowl panels (AMM 71-11-04/201).

S 683-021

CAUTION: MAKE SURE THE OIL SYSTEM IS DRAINED BEFORE YOU ADD THE OIL. YOU WILL PUT TOO MUCH OIL IN THE ENGINE IF YOU USE THIS PROCEDURE WHEN THE OIL SYSTEM IS NOT DRAINED. IF YOU PUT TOO MUCH OIL IN THE OIL SYSTEM, YOU CAN CAUSE OIL TO GO INTO THE IP AND HP COMPRESSOR ROTOR DRUMS. THIS WILL CAUSE HIGH ENGINE VIBRATION.

DO NOT REMOVE THE HIGH SPEED EXTERNAL GEARBOX CORE PLUGS TO DRAIN THE GEARBOX (THE CORE PLUGS HAVE CASTELLATED HEADS AND HAVE "KU" AND A FOUR DIGIT NUMBER WRITTEN ON THEM). IF YOU REMOVE THE CORE PLUGS TO DRAIN THE GEARBOX, THE GEARBOX WILL HAVE A LEAK AT THE CORE PLUGS AFTER YOU INSTALL THEM.

(3) Make sure the oil system is drained.

S 943-034

CAUTION: DO NOT USE THE GRAVITY FILL METHOD TO ADD THE OIL AFTER YOU REPLACE THE ENGINE MODULE 03. THE GRAVITY FILL METHOD DOES NOT REMOVE THE AIR FROM THE FCOC AND THE ENGINE MODULE 03.

IF YOU USE THE GRAVITY FILL METHOD TO ADD THE ENGINE OIL AFTER YOU REPLACE THE ENGINE MODULE 03, THE INTERNAL GEARBOX BEVEL GEARS WILL BE DAMAGED DURING THE NEXT ENGINE START.

(4) Get the equipment for the method you will use to add the oil.

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G. Use the Pressure Fill Method to Add the Engine Oil (Fig. 302)

S 013-051

- (1) Remove the HP/IP turbine bearing MCD housing (AMM 79-21-03/401).

S 613-023

- (2) Put the container under the MCD housing opening to catch the oil which will come out of the MCD housing opening when you do this procedure.

S 013-024

- (3) Remove the cap from the priming connector on the oil pressure filter housing.

S 493-025

- (4) Connect the pressure fill rig hose to the oil priming connector.

S 613-026

- (5) Use the pressure fill rig to add oil to the engine oil system.
(a) Add the oil at a pressure of 17 - 27 psi.

CAUTION: DO NOT ADD MORE THAN 25 U.S. PINTS (11.8 LITERS) OF OIL. IF YOU ADD TOO MUCH OIL, YOU CAN PUT TOO MUCH OIL IN THE BEARING CHAMBERS. THIS CAN CAUSE OIL TO GO INTO THE IP AND HP COMPRESSOR ROTOR DRUMS, WHICH WILL CAUSE HIGH VIBRATION.

(b) Add 23 - 25 U.S. pints (10.9 - 11.8 liters) of oil.

(c) Add all the oil continuously; after you start to add the oil, do not stop until you add all the oil.

(d) Approximately 1.8 U.S. pints (0.85 liters) of oil will come out of the HP/IP MCD housing opening when you add the oil.

S 093-027

- (6) Disconnect the pressure fill rig hose from the priming connector on the oil pressure filter housing.

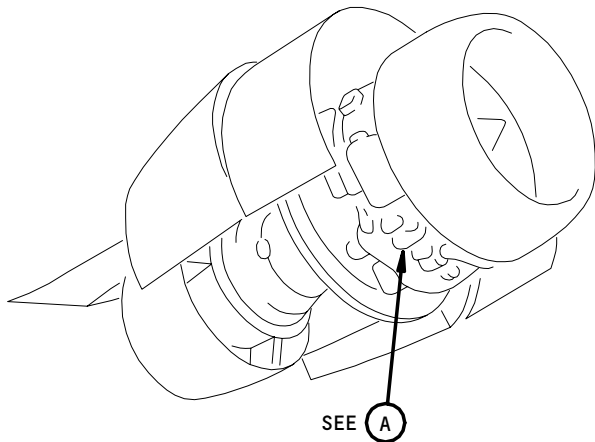
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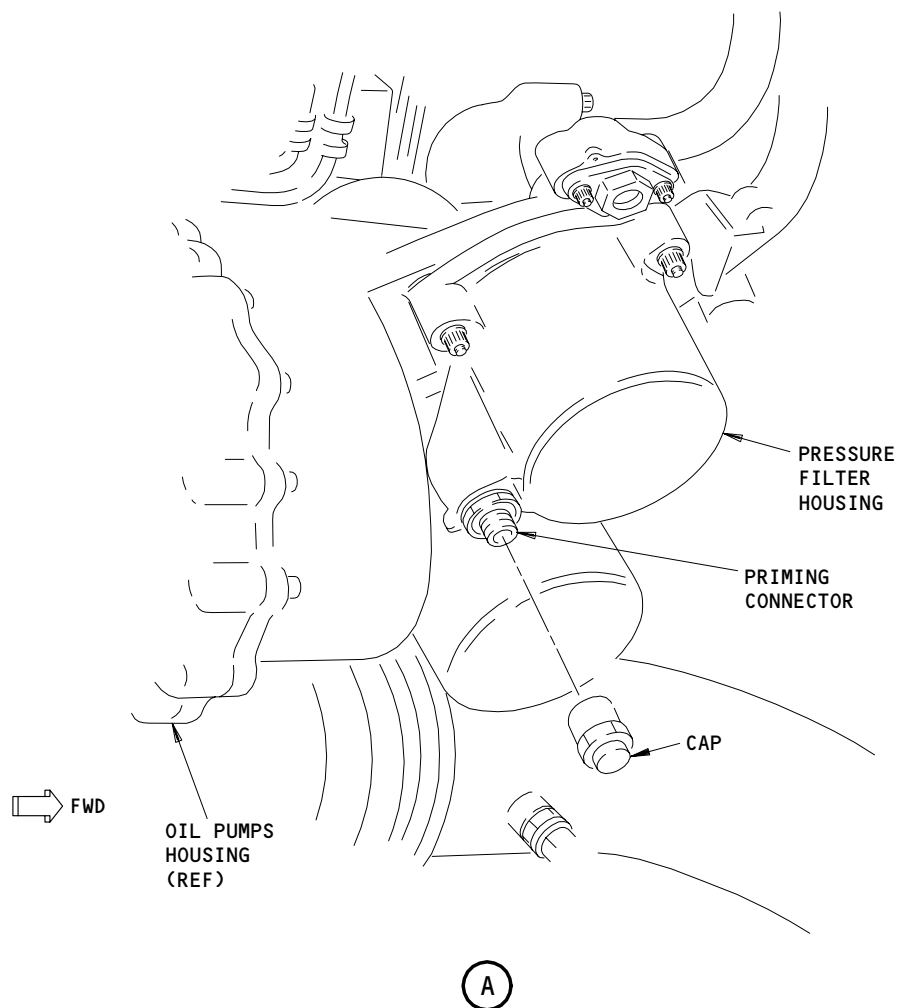
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SEE (A)



Engine Oil System Priming Connector
Figure 302

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S 413-028

- (7) Install the cap onto the priming connector.

S 413-029

- (8) Safety the cap.

S 613-030

- (9) Install the HP/IP bearing MCD housing and the MCD (AMM 79-21-03/401).

S 613-031

- (10) Do this procedure: Add Oil to the Engine Oil System (When Oil is in the System) to add 23-25 U.S. pints (10.9-11.8 liters) of oil.

NOTE: Do not use the oil tank quantity sight glass to determine the amount of oil you will add. If you add oil until the oil level in the oil tank oil quantity sight glass shows FULL, a large amount of oil will go out of the oil breather outlet duct the next time you start the engine.

S 943-032

- (11) Put the Airplane Back To Its Usual Condition
H. Use the Gravity Fill Method to Add the Engine Oil (Fig. 303)

S 013-035

- (1) Remove the HS gearbox breather cover.

S 493-036

- (2) Put the hose on the end of the funnel.

S 493-037

- (3) Put the hose into the breather housing as far as you can.

S 613-038

CAUTION: DO NOT ADD MORE THAN 28.2 U.S. PINTS (13.4 LITERS) OF OIL. IF YOU ADD TOO MUCH OIL, YOU CAN PUT TOO MUCH OIL IN THE BEARING CHAMBERS. THIS CAN CAUSE OIL TO GO INTO THE IP AND HP COMPRESSOR ROTOR DRUMS, WHICH WILL CAUSE HIGH VIBRATION.

- (4) Add 27.0 - 28.2 U.S. pints (12.8 to 13.4 litres) of oil to the HS gearbox through the funnel.

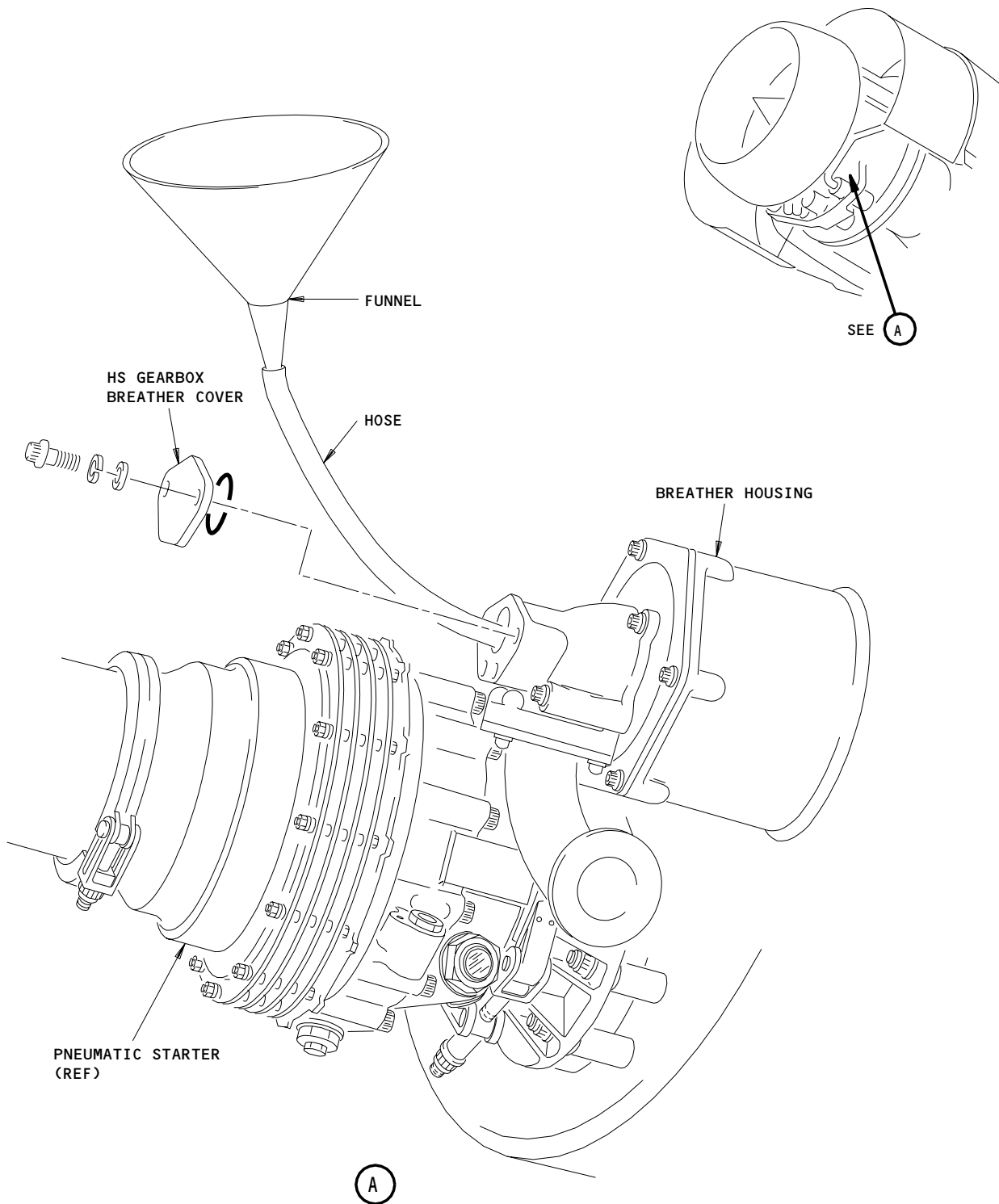
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Engine Oil System Gravity Fill Method
Figure 303

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S 093-039

- (5) Remove the tube from the breather housing.

S 413-040

- (6) Install a new seal ring onto the HS gearbox breather cover.

S 413-041

- (7) Put the HS gearbox cover on the breather housing and install the bolts and the washers.

S 613-042

- (8) Do this procedure: Add Oil to the Engine Oil System (When Oil is in the System) to add 19.8-21.0 U.S. pints (9.4-10.0 liters) of oil.

NOTE: Do not use the oil tank quantity sight glass to determine the amount of oil you will add. If you add oil until the oil level in the oil tank oil quantity sight glass shows FULL, a large amount of oil will go out of the oil breather outlet duct the next time you start the engine.

I. Put the Airplane Back to its Usual Condition

S 713-043

WARNING: USE AMM 71-00-00/201 TO OPERATE THE POWER PLANT. IF YOU DO NOT USE THIS PROCEDURE, YOU CAN CAUSE DAMAGE TO EQUIPMENT OR INJURY TO PERSONS.

- (1) Use the Power Plant Dry-Motor procedure to motor the engine for 30 seconds (AMM 71-00-00/201).

S 413-044

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (2) Close the fan cowl panels (AMM 71-11-04/201).

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S 613-045

- (3) After the next engine run, do the Add Oil to the Engine Oil System (When Oil is in the System) procedure.

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ENGINE STARTER – SERVICING (ADD OIL)

TASK 12-13-02-613-001

1. Add Oil to the Engine Starter

A. General

- (1) This procedure contains the steps to add oil to the engine starter. Do not drain the the oil that is in the starter for this procedure.
- (2) The approved oils in the consumable materials paragraph are not listed in an order of preference and are considered equal.
- (3) Oils that have been reclaimed to the approved Rolls-Royce standards for the appropriate viscosity grade, are approved for use.

B. Consumable Materials

- (1) D00170, BP Turbine Oil 2380
- (2) D00170, BP Turbine Oil 25
- (3) D00170, Aeroshell Turbine Oil 560
(Use in Hamilton Standard Starters Only)
- (4) D00170, Aeroshell Turbine Oil 555
- (5) D00170, Mobil Jet Oil II
- (6) D00170, Mobil Jet Oil 254
- (7) D00170, Aeroshell Turbine Oil 500 (ATO 500)
- (8) D00170, Castrol 5000 Gas Turbine Oil
- (9) Lockwire
British Spec – B.S. DTD. 189A, 22 SWG,
American Spec – 21 AWG
OMat No. – 238

C. References

- (1) AMM 70-02-01/201, Identification, Lubrication and Fitting of Rubber Sealing Rings
- (2) AMM 70-51-00/201, Torque Tightening Technique
- (3) AMM 71-11-04/201, Fan Cowl Panels

D. Access

- (1) Location Zones
 - 410 Power Plant
 - 420 Power Plant

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(2) Access Panels

- 413AL Fan Cowl Panel, Left
- 423AL Fan Cowl Panel, Right

E. Prepare to Add Oil to the Engine Starter.

S 643-038

WARNING: DO NOT LET THE OIL TOUCH YOUR SKIN FOR A LONG TIME. THE SYNTHETIC OIL USED IN THIS ENGINE CONTAINS ADDITIVES WHICH CAN BE TOXIC IF THEY ARE ABSORBED THROUGH THE SKIN.

CAUTION: VERY SMALL QUANTITIES OF SOME TYPES OF ALKALINE CLEANING FLUIDS CAN CAUSE FAILURE OF THE SYNTHETIC OIL. USE VERY CLEAN CONTAINERS AND EQUIPMENT.

THE OIL CAN CAUSE DAMAGE TO PAINT AND SOME TYPES OF RUBBER. ANY OIL THAT GETS ON TO THESE PARTS MUST BE CLEANED IMMEDIATELY.

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (1) Open the left fan cowl panel for the applicable engine (AMM 71-11-04/201).
 - (a) Find the starter on the lower left side of the engine.

F. Add Engine Starter Oil (Fig. 301)

S 033-003

- (1) Remove the plug at the oil fill port.
 - (a) Discard the seal ring.

S 613-004

- (2) For the left engine, add clean approved oil to the starter until the oil level is at the mid-position on the sight glass.

S 613-035

- (3) For the right engine, add clean approved oil until oil flows from the fill port.

S 433-005

- (4) Install the oil fill plug:
 - (a) Lubricate a new seal ring and install it in the oil fill plug (AMM 70-02-01/201).
 - (b) Install the plug on the oil fill port on the starter.
 - 1) Tighten the plug to 20 to 35 pound-inches (2.2 to 3.9 Newton meters) (AMM 70-51-00/201).
 - (c) Install the lockwire.

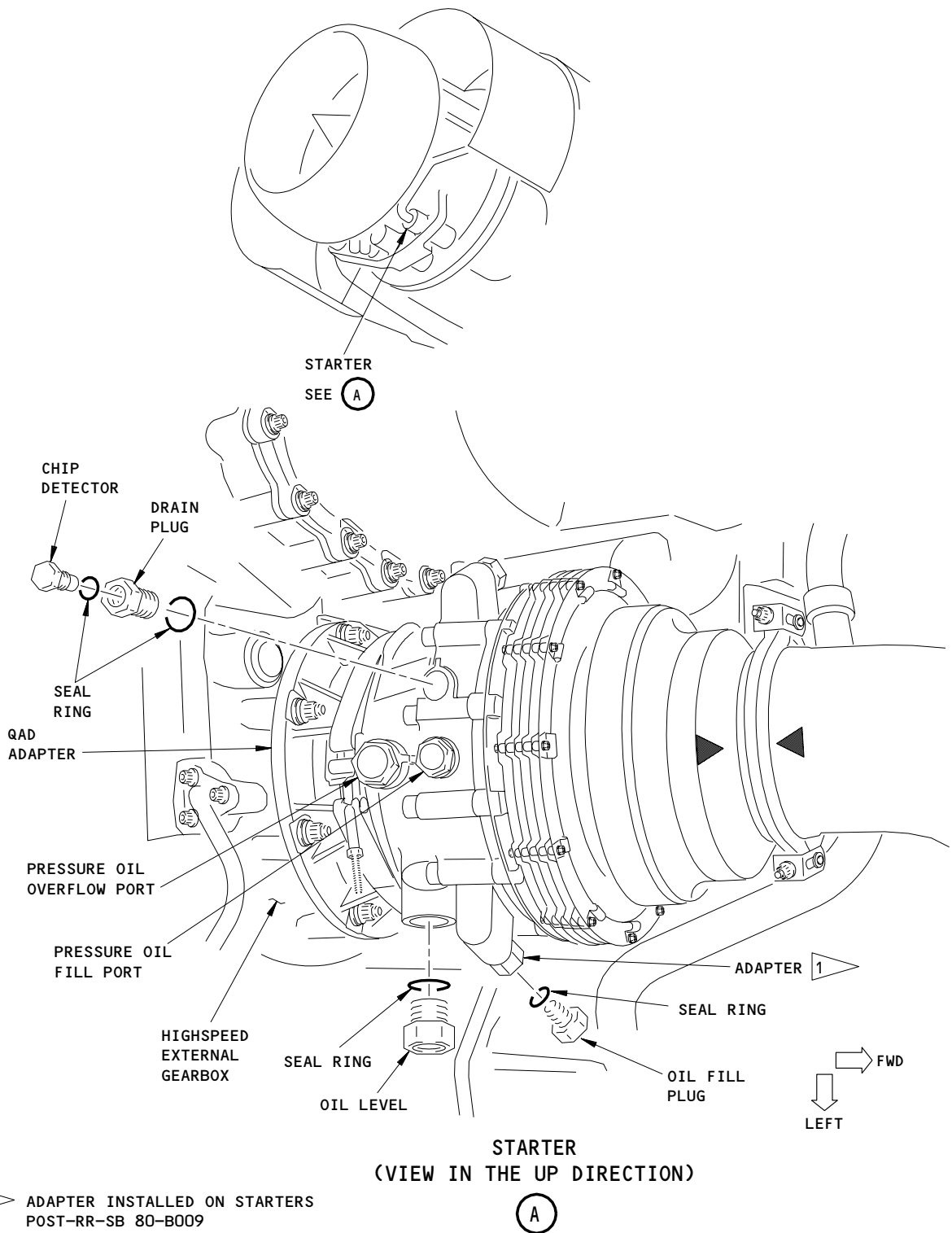
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Engine Starter - Add Oil
Figure 301

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G. Put the Airplane back to the Usual Condition.

S 163-022

(1) Clean the parts of the engine that are touched by the oil.

S 413-016

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

(2) Close the fan cowl panels that you opened (AMM 71-11-04/201).

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INTEGRATED DRIVE GENERATOR (IDG) – SERVICING

1. General

- A. This procedure has four tasks:
 - (1) IDG Oil Level Check.
 - (2) IDG Oil Servicing.
 - (3) IDG Oil Change.
- B. There are also shorter procedures for the IDG oil servicing (Fig. 301) and the IDG oil level (Fig. 302).
- C. Do not service a disconnected IDG.

TASK 12-13-03-213-006

2. IDG OIL Level Check (Fig. 303)

A. General

- (1) The IDG oil level check can be done through the IDG access panel, if the engine cowl panels are not open.

NOTE: If the IDG low oil level indicator is missing, damaged or hard to read, do the IDG oil servicing task.

- (2) The IDG low oil level indicator shows when the oil level is below the minimum required oil level for safe operation. It does not indicate if the IDG is over serviced. The only way to ensure proper IDG oil level is to hook up the overflow drain hose and add oil to the IDG. If the oil level of the IDG is in doubt, hook up the overflow drain hose and add oil to the IDG.

B. References

- (1) AMM 24-41-03/401, BPCU BITE

C. Access

(1) Location Zones

- 212 Flight Compartment
- 410 Power Plant Nacelle (Left)
- 420 Power Plant Nacelle (Right)

(2) Access Panels

- 413CL IDG Access Panel (Left Engine)
- 423CL IDG Access Panel (Right Engine)

D. Prepare to check the IDG Oil Level

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757 MAINTENANCE MANUAL

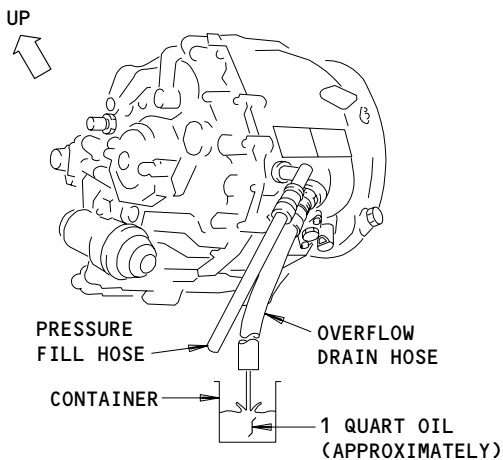
NOTE: DO NOT SERVICE IDG IF IDG IS DISCONNECTED. REFER TO 24-20-00 FAULT ISOLATION AND CORRECT "DISCONNECT TRIP" BITE MESSAGE.

STEP ONE

ATTACH OVERFLOW DRAIN AND PRESSURE FILL HOSES.

SOME OIL MAY COME OUT OVERFLOW DRAIN HOSE WHEN HOSE IS CONNECTED.

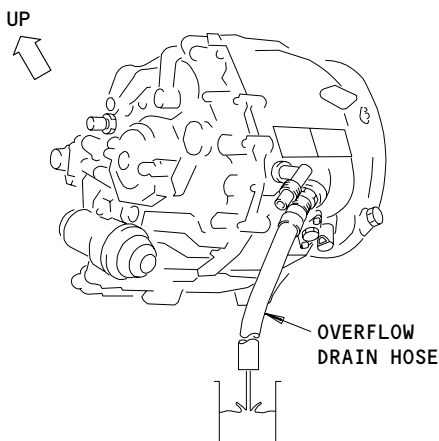
PUMP OIL INTO IDG UNTIL APPROXIMATELY ONE QUART OF OIL COMES OUT OVERFLOW DRAIN HOSE.



STEP TWO

REMOVE PRESSURE FILL HOSE ONLY.

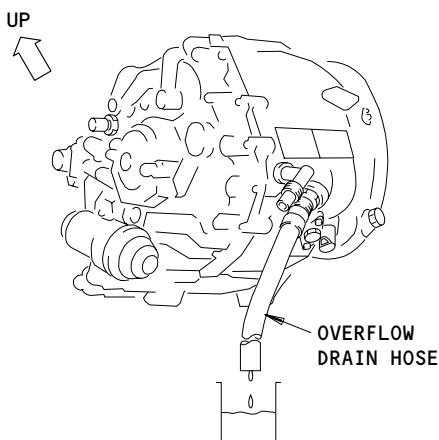
INSTALL COVER.



STEP THREE

REMOVE OVERFLOW DRAIN HOSE WHEN DRAINAGE SLOWS TO DROPS.

INSTALL COVER.



Summarized Servicing Procedure
Figure 301

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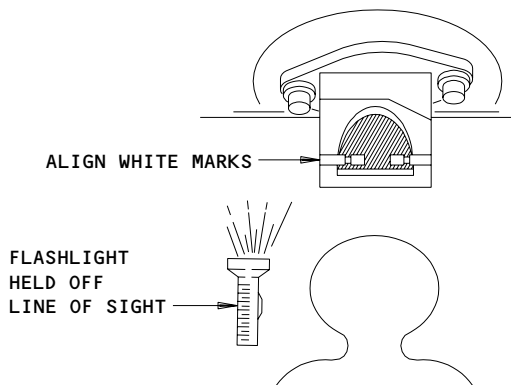
01

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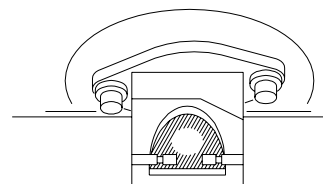
204556

NOTE: DO NOT CHECK OIL LEVEL IF IDG IS DISCONNECTED. REFER TO 24-20-00 FAULT ISOLATION AND CORRECT "DISCONNECT TRIP" BITE MESSAGE.

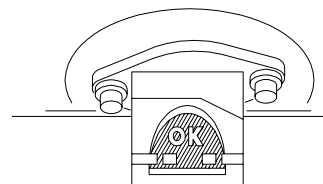
1. LOOK AT VIEWING FACE OF LOW OIL LEVEL INDICATOR.
 - WIPE CLEAN IF DIRTY
 - USE FLASHLIGHT IF IDG HAS "OK" LOW OIL INDICATOR OR IF TOO DARK TO SEE WHITE ALIGNMENT MARKS. DO NOT SHINE FLASHLIGHT DIRECTLY ON VIEWING FACE BECAUSE REFLECTION WILL MAKE READING DIFFICULT.
2. CHANGE YOUR LINE OF SIGHT UNTIL WHITE MARKS ARE ALIGNED.



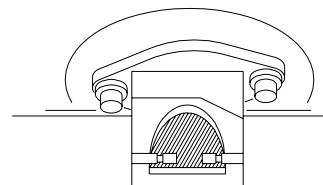
3. LOOK FOR SILVER SPOT IN VIEWING FACE.
 - SILVER SPOT SEEN - SERVICING REQUIRED.
 - FOR IDG WITHOUT "OK" LOW OIL INDICATOR:
 - SILVER SPOT NOT SEEN - SERVICING NOT REQUIRED.
 - FOR IDG WITH "OK" LOW OIL INDICATOR:
 - "OK" SEEN - SERVICING NOT REQUIRED.



ANY SILVER SPOT LARGE OR SMALL - SERVICING REQUIRED



"OK"
NO SERVICING REQUIRED



NO SILVER SPOT -
NO SERVICING REQUIRED

Summarized Low Oil Level Check Procedure
Figure 302

EFFECTIVITY

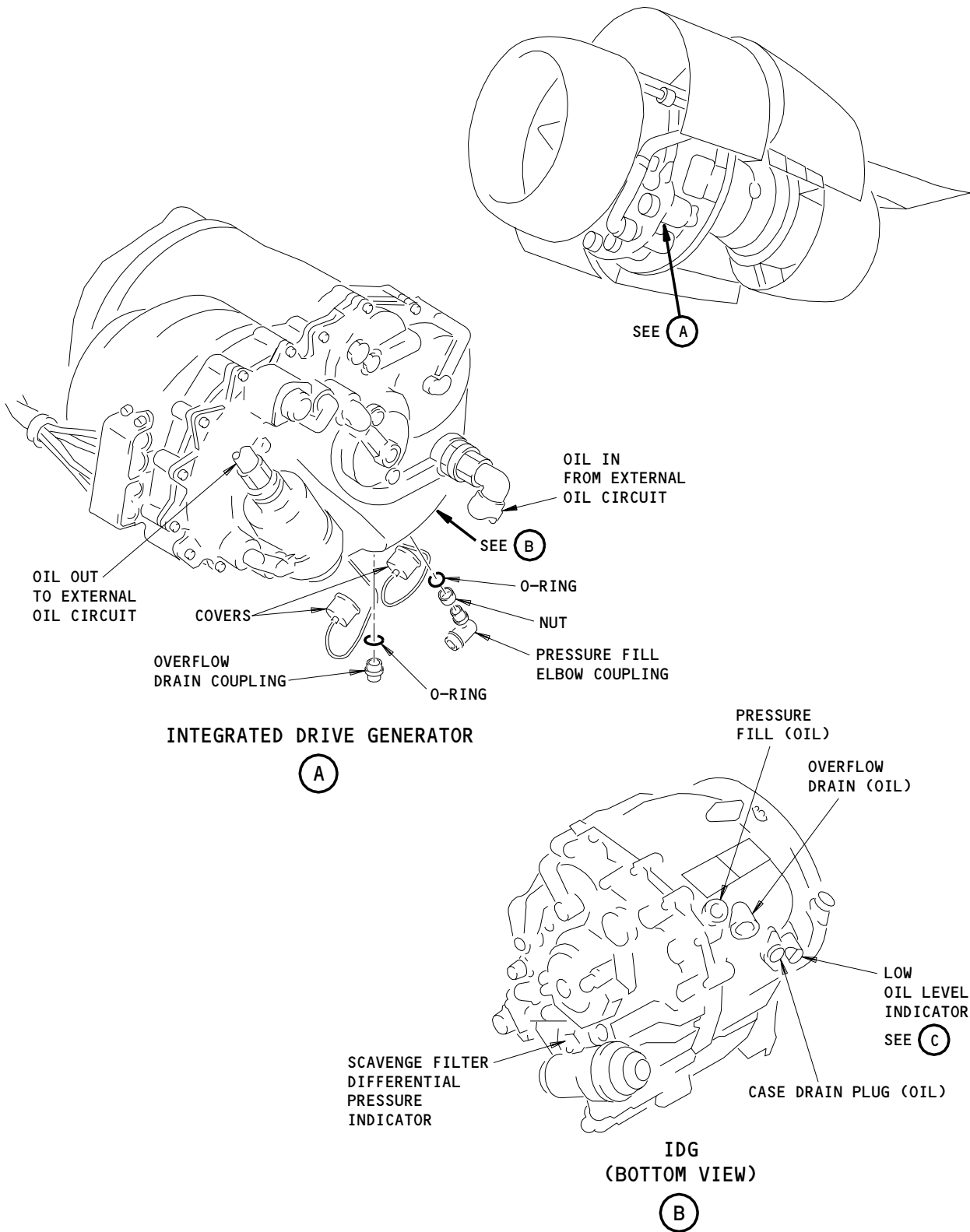
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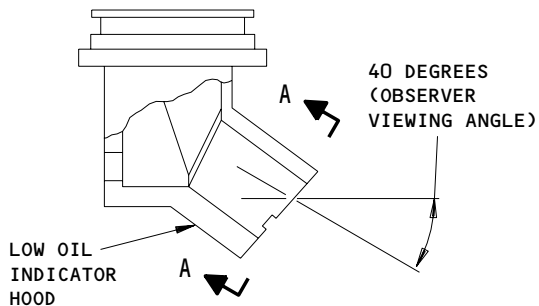
Integrated Drive Generator Oil Servicing
Figure 303 (Sheet 1)

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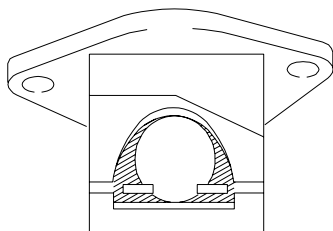
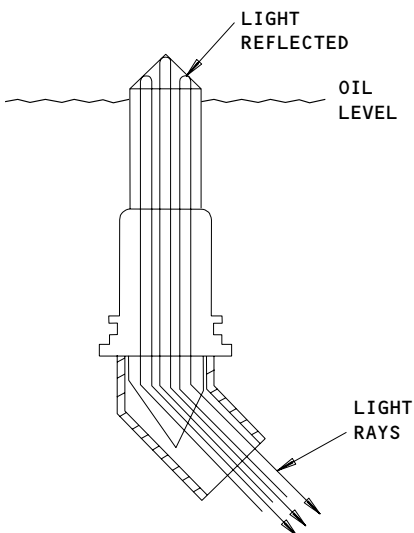
03

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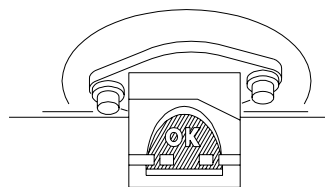
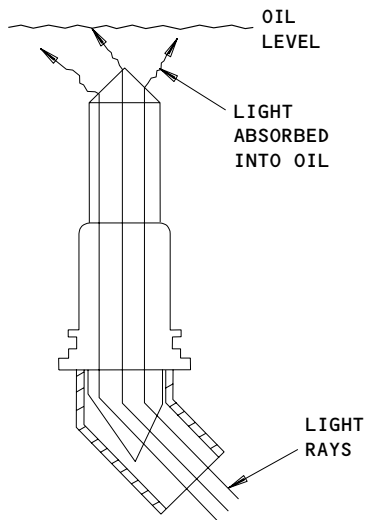


**SIDE VIEW
LOW OIL LEVEL INDICATOR**

(C)

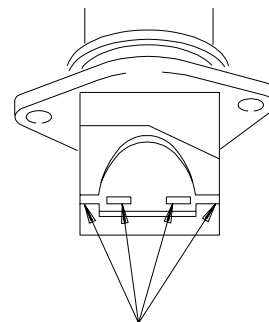


ANY SILVER SPOT
LARGE OR SMALL -
SERVICING REQUIRED



NO SILVER SPOT -
NO SERVICING REQUIRED

NOTE: BOTH TYPES OF
PRISMS ARE
PRESENTLY IN USE.



WHITE MARKS ALIGNED:
PROPER VIEWING ANGLE

A-A

**Integrated Drive Generator Oil Servicing
Figure 303 (Sheet 2)**

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S 213-032

CAUTION: A DISCONNECTED IDG MUST BE REMOVED FROM AN AIRPLANE IN LESS THAN 50 FLIGHT HOURS. AFTER 50 FLIGHT HOURS, DAMAGE TO THE IDG CAN OCCUR.

(1) Do a check to find if the IDG is disconnected.

NOTE: Do not do an oil level check of a disconnected IDG, because it will be incorrect.

- (a) Does a DISCONNECT TRIP message show on the bus power control unit (AMM 24-41-03/401).
- (b) Correct the DISCONNECT TRIP message if it is necessary (AMM 24-41-03/401).
- (c) If the IDG is not disconnected, continue to do a check of the IDG oil level.
- (d) If an oil level check is necessary after a flight, start the check after 5 minutes of the engine shutdown.

S 013-008

(2) Open the IDG access panel, if the engine cowls are not open.

E. IDG Oil Level Check

S 213-009

(1) Do a check of the IDG oil level.

S 213-043

(2) Make sure the IDG low oil level indicator is clean, not damaged, missing or leaking.

(a) If the low oil level indicator is missing, damaged or hard to read, do the IDG oil servicing task.

NOTE: A plug will be installed in the IDG low oil level indicator location if the indicator is removed.

NOTE: An operational IDG low oil level indicator is not required for airplane dispatch.

(b) Clean the face of the oil level indicator if it is necessary.

(c) Look at the oil level indicator so the white marks align, and then examine the face of the indicator.

1) Use a flashlight if it is necessary, but do not point the light directly at the indicator.

(d) If the "OK" indication can be seen, the IDG servicing is not necessary.

(e) If there is a silver mark on the face of the indicator, do the IDG Oil Servicing.

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S 413-010

- (3) Close the IDG access panel.

TASK 12-13-03-613-001

3. IDG Oil Servicing (Fig. 303)

A. General

- (1) Do the IDG oil servicing through the IDG access panel, unless the engine cowl panels are open.

B. References

- (1) AMM 20-30-04/201, Lubricants
- (2) AMM 24-41-03/401, BPCU BITE

C. Equipment

- (1) Oil Service Dispenser - Risbridger UZ/7/1826 (preferred)
- (2) Oil Service Dispenser - Malabar WF150-1
- (3) Oil Service Cart - Malabar 53361

NOTE: The cart must have a Ozone coupling OMP2506-3 or the equivalent to connect with the pressure fill coupling.

- (4) Container - 5 gallon capacity
- (5) Overflow drain hose, with an adapter
Ozone OMP2505-3 or optional oil overflow drain
tool, Risbridger 2315 or equivalent

D. Consumable Materials

- (1) Oil - MIL-L-23699 (AMM 20-30-04)

E. Access

- (1) Location Zones
212 Flight Compartment
410 Power Plant Nacelle (Left)
420 Power Plant Nacelle (Right)

(2) Access Panels

- 413CL IDG Access Panel (Left Engine)
- 423CL IDG Access Panel (Right Engine)

F. Prepare to do the IDG Oil Servicing

S 013-002

- (1) Open the IDG access panel if the engine cowls are not open.

S 213-003

CAUTION: A DISCONNECTED IDG MUST BE REMOVED FROM AN AIRPLANE IN LESS THAN 50 FLIGHT HOURS. AFTER 50 FLIGHT HOURS, DAMAGE TO THE IDG CAN OCCUR.

- (2) Do a check to find if the IDG is disconnected.

NOTE: It is not necessary to service a disconnected IDG.

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- (a) Does a DISCONNECT TRIP message show on the bus power control unit (AMM 24-41-03/401).
 - 1) Correct the DISCONNECT TRIP message if it is necessary (AMM 24-41-03/401).
- (b) If the IDG is not disconnected, continue with the servicing procedure.

G. IDG Oil Servicing

S 613-005

- (1) Do the IDG oil servicing.
 - (a) Remove the cover from the overflow drain coupling for the IDG.
 - (b) Put a container below the IDG to catch the oil which will flow from the IDG.
 - (c) Put the end of the overflow drain hose into the container.

WARNING: BE CAREFUL WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE. PRESSURE IN THE IDG CAN CAUSE HOT OIL TO COME OUT OF THE OVERFLOW DRAIN COUPLING AND CAUSE INJURY TO PERSONS.

CAUTION: MAKE SURE YOU USE THE CORRECT ADAPTER (OZONE OMP2505-3) TO ATTACH THE OVERFILL DRAIN HOSE TO THE OVERFILL DRAIN COUPLING ON THE IDG. AN INCORRECT ADAPTER WILL NOT RELEASE THE PRESSURE IN THE IDG. THIS CAN CAUSE AN INCORRECT OIL LEVEL IN THE IDG AND THE SUBSEQUENT FAILURE OF THE IDG.

- (d) Connect the overflow drain hose to the overflow drain coupling for the IDG.
- (e) Permit the oil to flow from the IDG into the container.

NOTE: It is usual for some of the oil to drain from the IDG when you connect the hose.

- (f) Remove the cover from the pressure fill coupling for the IDG.
- (g) Connect the hose on the oil service equipment to the pressure fill coupling for the IDG.

NOTE: Make sure the service cart pressure fill hose has only oil and does not have air mixed with oil in the hose.

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CAUTION: WHEN YOU FILL THE IDG WITH OIL, DO NOT MIX TYPES OF OIL. TO MIX OILS COULD CAUSE DAMAGE TO THE IDG.

(h) Use the pump on the service cart to fill the IDG with oil.

CAUTION: CONTINUE TO PUT OIL INTO THE IDG UNTIL A MINIMUM OF 1 QUART (1 LITER) OF CLEAR OIL FLOWS INTO THE CONTAINER. THE IDG CAN BE DAMAGED BY INCORRECT OIL FILL PROCEDURES.

(i) Stop pumping oil into the IDG when approximately one quart (1 liter) of oil flows from the overflow drain hose into the container and no air is mixed with the overflow oil.

NOTE: The one quart (1 liter) of oil does not include the oil that drained when the hose was connected to the overflow drain coupling or air mixed with the overflow oil.

(j) Disconnect the hose on the oil service equipment, from the pressure fill coupling for the IDG.

(k) Install the cover on the pressure fill coupling for the IDG.

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.

(l) When the oil flow from the overflow drain hose decreases to drops, wait two minutes then remove the overflow drain hose.

(m) Install the cover on the overflow drain coupling for the IDG.

(n) Close the IDG access panel.

TASK 12-13-03-613-014

4. IDG Oil Change (Fig. 303)

A. General

(1) This procedure replaces the oil in the IDG and external cooling circuit with new oil.

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B. References

- (1) AMM 24-11-02/201, Scavenge Filter
- (2) AMM 71-11-04/201, Fan Cowl Panels

C. Equipment

- (1) Oil Service Dispenser - Risbridger UZ/7/1826 (preferred)
- (2) Oil Service Dispenser - Malabar WF150-1
- (3) Oil Service Cart -Malabar 53361

NOTE: The cart must have a Ozone coupling OMP2506-3 or the equivalent to connect with the pressure fill coupling.

- (4) Container - 5-gallon capacity

D. Consumable Materials

- (1) Oil - MIL-L-23699 (AMM 20-30-04)

E. IDG Oil Change

S 683-015

- (1) Drain the IDG oil.

CAUTION: MAKE SURE YOU USE THE CORRECT ADAPTER (OZONE OMP2505-3) TO ATTACH THE OVERFILL DRAIN HOSE TO THE OVERFILL DRAIN COUPLING ON THE IDG. AN INCORRECT ADAPTER WILL NOT RELEASE THE PRESSURE IN THE IDG. THIS CAN CAUSE AN INCORRECT OIL LEVEL IN THE IDG AND THE SUBSEQUENT FAILURE OF THE IDG.

- (a) Open the Fan Cowl Panels (AMM 71-11-04/201).
- (b) Remove the cover from the overflow drain coupling on the IDG.
- (c) Put a container below the IDG.
- (d) Put the end of the overflow drain hose into the container.

WARNING: BE CAREFUL WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE. PRESSURE IN THE IDG CAN CAUSE HOT OIL TO COME OUT OF THE OVERFLOW DRAIN COUPLING AND CAUSE INJURY TO PERSONS.

- (e) Connect the overflow drain hose to the overflow drain coupling on the IDG.

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(f) Permit the oil to flow from the IDG into the container.

NOTE: It is usual for some of the oil to drain from the IDG when you connect the hose.

(g) Remove the case drain plug and allow the oil to flow from the IDG into the container.

(h) Remove the o-ring from the case drain plug and discard it.

S 613-016

(2) Change the IDG oil.

S 613-049

WARNING: USE THE FOLLOWING STEPS ONLY WHEN CHANGING THE IDG OIL OR OIL AND SCAVENGE FILTER. DO NOT USE THIS PROCEDURE IF OTHER WORK IS DONE ON THE IDG OR THE EXTERNAL OIL COOLING CIRCUIT. IF YOU USE THESE STEPS WITH OTHER IDG PROCEDURES, FALSE IDG OIL LEVEL INDICATIONS CAN OCCUR. DAMAGE TO THE IDG CAN OCCUR IF THE OIL LEVEL IS TOO HIGH OR TOO LOW.

(3) When only replacing the IDG oil, do the following steps:

(a) Replace the scavenge filter (AMM 24-11-02/201).

(b) Connect the fill hose on the service cart to the pressure fill coupling on the IDG.

NOTE: Make sure the service cart does not have air in the fill hose.

(c) Pump oil into the IDG until clean oil flows out of the IDG drain fitting.

NOTE: To make sure that all of the oil in the external cooling circuit is replaced with new oil. A minimum of 1.5 gallons of oil should drain out of the IDG after you start to pump oil into the IDG.

(d) Lubricate and install a new o-ring on the case drain plug.

(e) Install the case drain plug.

(f) Tighten the case drain plug to 55-75 Pound-Inches.

(g) Lock the case drain plug with a wire.

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CAUTION: WHEN YOU FILL THE IDG WITH OIL, YOU MUST NOT MIX TYPES OF OIL IF YOU MIX THE OILS, YOU CAN CAUSE DAMAGE TO THE IDG.

- (h) Use the pump on the oil servicing equipment to fill the IDG and the external oil cooling circuit with oil.

NOTE: When you start to put the oil into the IDG, oil could flow from the overflow drain hose. This does not show that the IDG is full.

- (i) Stop pumping oil into the IDG when approximately one quart of oil flows from the overflow drain hose into the container.

NOTE: The approximately one quart of oil (including the small amount that may have drained when you connected the overflow drain hose) overflow ensures that the IDG oil level is correct.

S 613-044

- (4) Do the Idle Leak Test for the Oil and Fuel Systems (AMM 71-00-00/501).

S 793-047

- (5) Do a leak check of the IDG and the external cooling system.
 - (a) If leaks are found, do the following steps:
 - 1) Repair the leaks
 - 2) Add oil to the IDG, do the IDG servicing task.
 - 3) Run the engine at ground idle power and check for leaks. Refer to Power Plant Tests 3A (AMM 71-00-00/501).
 - (b) If the IDG oil leaks are repaired, do the following steps:
 - 1) Remove the cover from the OVERFLOW drain valve.
 - 2) Put a container below the IDG to catch the oil which will flow from the IDG.
 - 3) Put the end of the overflow drain hose into the container.

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WARNING: BE CAREFUL WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE. PRESSURE IN THE IDG CAN CAUSE HOT OIL TO COME OUT OF THE OVERFLOW DRAIN COUPLING AND CAUSE INJURY TO PERSONS.

CAUTION: USE THE CORRECT ADAPTER TO RELEASE THE PRESSURE FROM THE IDG. INCORRECT ADAPTER WILL NOT RELEASE THE PRESSURE IN THE IDG. THIS CAN CAUSE AN INCORRECT OIL LEVEL IN THE IDG AND THE SUBSEQUENT FAILURE OF THE IDG.

- 4) Hook up the overflow drain hose to the overflow drain coupling.
 - a) Let the oil flow into the container.

NOTE: It is usual for some oil to drain from the IDG when you connect the hose.

- 5) Remove the cover from the pressure fill valve.
- 6) Connect the pressure fill hose with its fitting (OMP2506-3).

CAUTION: WHEN YOU FILL THE IDG WITH OIL, YOU MUST NOT MIX TYPES OF OIL. IF YOU MIX THE OILS, YOU CAN CAUSE DAMAGE TO THE IDG.

- 7) Use the pump on the oil service equipment to fill the IDG with oil.

NOTE: When you start to put oil into the IDG, oil could flow from the overflow drain hose. This does not show that the IDG is full.

- 8) Stop pumping oil into the IDG when approximately 1 quart of oil flows out of the overflow drain into the container.

NOTE: The approximately one quart of oil (including the small amount that may have drained when you connected the overflow drain hose) overflow ensures that the IDG oil level is correct.

- 9) Disconnect the hose on the oil service equipment from the IDG pressure fill coupling.
- 10) Install the cover on the pressure fill coupling.

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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.

- 11) When the oil from the overflow drain hose decreases to a drop, wait two minutes then remove the overflow drain hose.
 - 12) Install the cover on the IDG overflow drain coupling.
- (c) If no leaks are found, do the following steps:
- 1) Wait for 5 minutes, after engine shutdown, for the IDG oil level to become stable.
 - 2) Remove the cover from the OVERFLOW drain valve.
 - 3) Put a container below the IDG to catch the oil which will flow from the IDG.
 - 4) Put the end of the overflow drain hose into the container.

WARNING: BE CAREFUL WHEN YOU CONNECT THE OVERFLOW DRAIN HOSE. PRESSURE IN THE IDG CAN CAUSE HOT OIL TO COME OUT OF THE OVERFLOW DRAIN COUPLING AND CAUSE INJURY TO PERSONS.

CAUTION: USE THE CORRECT ADAPTER TO RELEASE THE PRESSURE FROM THE IDG. INCORRECT ADAPTER WILL NOT RELEASE THE PRESSURE IN THE IDG. THIS CAN CAUSE AN INCORRECT OIL LEVEL IN THE IDG AND THE SUBSEQUENT FAILURE OF THE IDG.

- 5) Hook up the overflow drain hose to the overflow drain coupling.
 - a) Let the oil flow into the container.

NOTE: It is usual for some oil to drain from the IDG when you connect the hose.

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- 6) Remove the cover from the pressure fill valve.
- 7) Connect the pressure fill hose with its fitting (OMP2506-3).

CAUTION: WHEN YOU FILL THE IDG WITH OIL, YOU MUST NOT MIX TYPES OF OIL. IF YOU MIX THE OILS, YOU CAN CAUSE DAMAGE TO THE IDG.

- 8) Use the pump on the oil service equipment to fill the IDG with oil.

NOTE: When you start to put oil into the IDG, oil could flow from the overflow drain hose. This does not show that the IDG is full.

- 9) Stop pumping oil into the IDG when approximately 1 quart of oil flows out of the overflow drain into the container.

NOTE: The approximately one quart of oil (including the small amount that may have drained when you connected the overflow drain hose) overflow ensures that the IDG oil level is correct.

- 10) Disconnect the hose on the oil service equipment from the IDG pressure fill coupling.
- 11) Install the cover on the pressure fill coupling.

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.

- 12) When the oil from the overflow drain hose decreases to a drop, wait two minutes then remove the overflow drain hose.
- 13) Install the cover on the IDG overflow drain coupling.

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14) Close the Fan Cowl Panels (AMM 71-11-04/201).

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APU - SERVICING (FILL THE OIL)

TASK 12-13-04-613-001

1. APU - Servicing

A. General

- (1) An oil reservoir is in the bottom of the gearbox. The oil reservoir holds 6.2 quarts. A manual fill port with a scupper drain is on the left side of the gearbox. You can pressure fill the oil reservoir also.
- (2) You can use EICAS or the sight gage to do a check of the APU oil level. On some APUs, the sight gage can be used with the APU off or with the APU in operation. The sight gage is aft of the oil fill port on the left side of the APU.
- (3) ON GUI 001-114, 116-999;
There is a low oil level switch on the APU that sends a signal to the EICAS computers when the oil level is 4.25 quarts or less (with the engine stopped). The APU OIL QTY message will show when the low oil level switch sends a signal for 60 seconds.
- (4) ON GUI 115;
There is an oil quantity transmitter on the APU that shows the oil quantity on EICAS. The transmitter sends signals to EICAS, which shows FULL, 0.75, 0.50, 0.25, or ADD on the PERF/APU display. When the oil level is 4.25 qts or less for 60 seconds (with the engine stopped), the transmitter sends a signal to EICAS and the APU OIL QTY message shows.
- (5) Use only these types and brands of oil:
 - (a) Synthetic Base Oil, Type I - MIL-PRF-7808 (-65°F to 130°F, -54°C to 54°C):
 - 1) BP Aero Turbine Oil 15
 - 2) BP Turbo Oil 2389
 - 3) Brayco 880
 - 4) Castrol 3C
 - (b) Def Stan 91-94, Type I (-65°F to 130°F, -54°C to 54°C):
 - 1) Aeroshell Turbine Oil 390
 - 2) Castrol 325

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- 3) Castrol 399
 - (c) Synthetic Base Oil, Type II - MIL-PRF-23699 (-40°F to 130°F, -40°C to 54°C):
 - 1) Aeroshell or Royco Turbine Oil 500
 - 2) Aeroshell or Royco Turbine Oil 560
 - 3) BP Turbine Oil 2197
 - 4) BP Turbo Oil 2380
 - 5) Castrol 5000
 - 6) Hatco 3611
 - 7) Mobil Jet Oil 254

 - 8) Mobil Jet Oil II
 - 9) Royco 899
 - (d) DOD-L-85734 and Def Stan 91-100, Type II (-40°F to 130°F, -40°C to 54°C):
 - 1) Aeroshell Turbine Oil or Royco 555
- B. Consumable Materials
- (1) D00068 Oil, Aircraft Turbine Engine, Synthetic Base, Type II - MIL-PRF-23699 (NATO O-156) or D00071 Oil, Aircraft Turbine Engine, Synthetic Base, Type I - MIL-PRF-7808 or
 - (2) D00077 Aeroshell Turbine Oil 555, DOD-L-85734 and Def Stan 91-100, Type II or
 - (3) D00635 Aeroshell Turbine Oil 390, Def Stan 91-94, Type I or
 - (4) D00636 Castrol 325, Def Stan 91-94, Type I or
 - (5) D50051 Royco 555, DOD-L-85734 and Def Stan 91-100, Type II
- C. References
- (1) AMM 24-22-00/201, Electrical Power - Control
 - (2) AMM 31-41-00/201, EICAS
 - (3) AMM 49-11-00/201, Auxiliary Power Unit
- D. Access
- (1) Location Zones
 - 154 Aft Cargo Compartment - Right
 - 211 Flight Compartment - Left
 - 212 Flight Compartment - Right
 - 315 APU Compartment - Left
 - 316 APU Compartment - Right

 - (2) Access Panels
 - 315AL APU Access Door - Left
 - 316AR APU Access Door - Right
 - 822 Aft Cargo Door

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E. Do a Check of the APU Oil Level.

S 213-024

- (1) Use one of these procedures to do a check of the oil level in the APU:
 - (a) Use the EICAS display to do a check of the oil level.
 - 1) Supply electrical power (AMM 24-22-00/201).
 - 2) Look for the APU OIL QTY message on the EICAS STATUS display.
 - 3) If the APU OIL QTY message is on EICAS, fill the APU oil.
 - (b) ON AN OIL SIGHT GAGE WITHOUT A FULL MARK FOR THE APU ON; Use the sight gage when the APU is off to do a check of the oil level.
 - 1) Open the left APU access door, 315AL, and right APU access door, 316AR:
 - a) Open the latches on the APU access doors.
 - b) Open the left access door.
 - c) Push the right access door up and pull the spring latch aft until the latch disengages.
 - d) Open the right access door.
 - e) Engage the support rods for the APU access doors.
 - 2) Look at the oil level in the sight gage.
 - 3) If the oil level is below the ADD on the sight gage for the APU OFF, fill the APU oil.

WARNING: DO NOT REMOVE THE OIL FILL CAP WHEN THE APU IS IN OPERATION. IF THE OIL FILL CAP IS REMOVED WHEN THE APU OPERATES, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (c) ON AN OIL SIGHT GAGE WITH A FULL MARK FOR THE APU ON; use the sight gage when the APU operates to do a check of the oil level.

NOTE: You can only do a check of the APU oil level when the engine operates if the sight gage has a mark for the APU ON.

- 1) Open the left APU access door, 315AL, and right APU access door, 316AR:
 - a) Open the latches on the APU access doors.
 - b) Open the left access door.
 - c) Push the right access door up and pull the spring latch aft until the latch disengages.
 - d) Open the right access door.

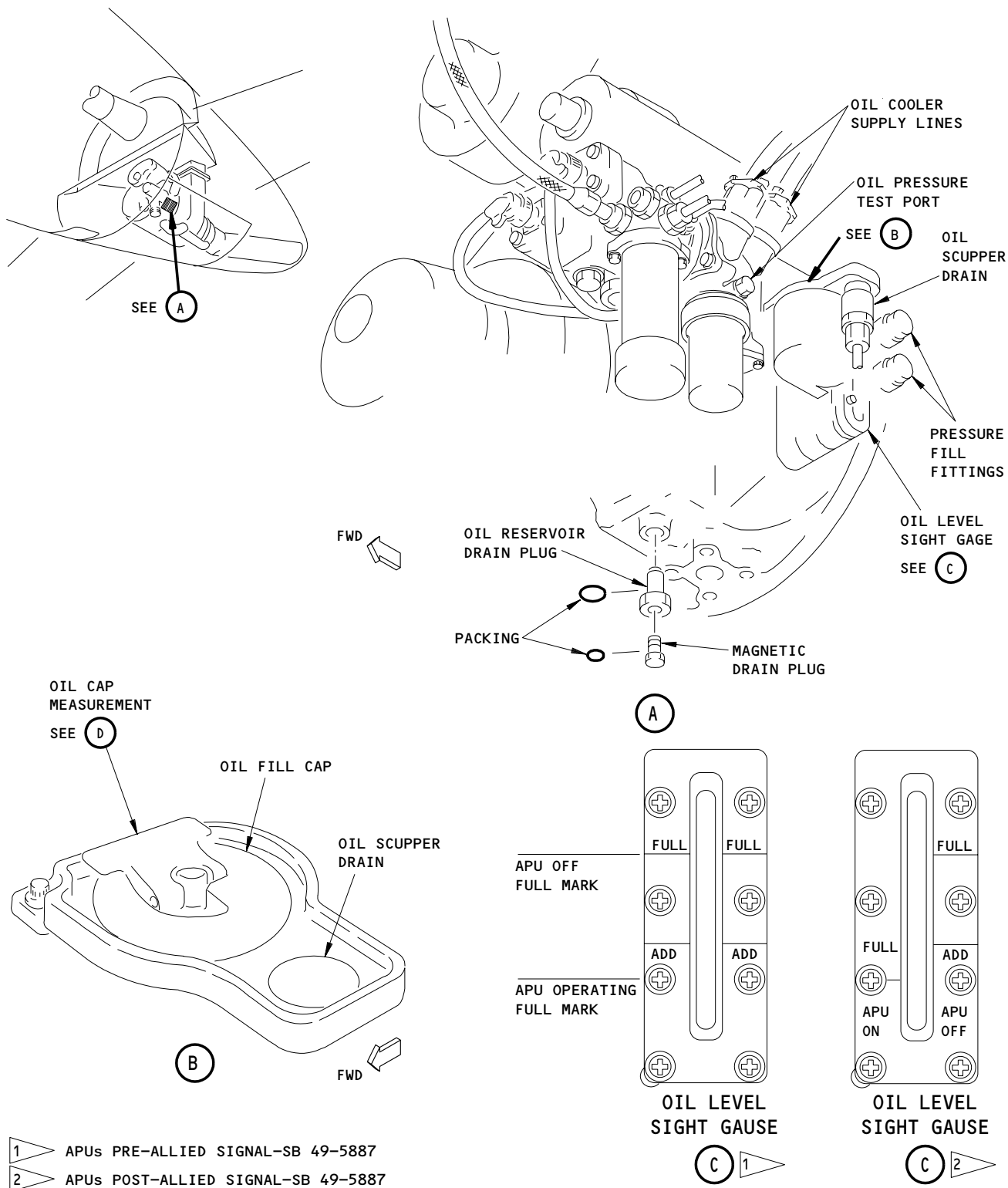
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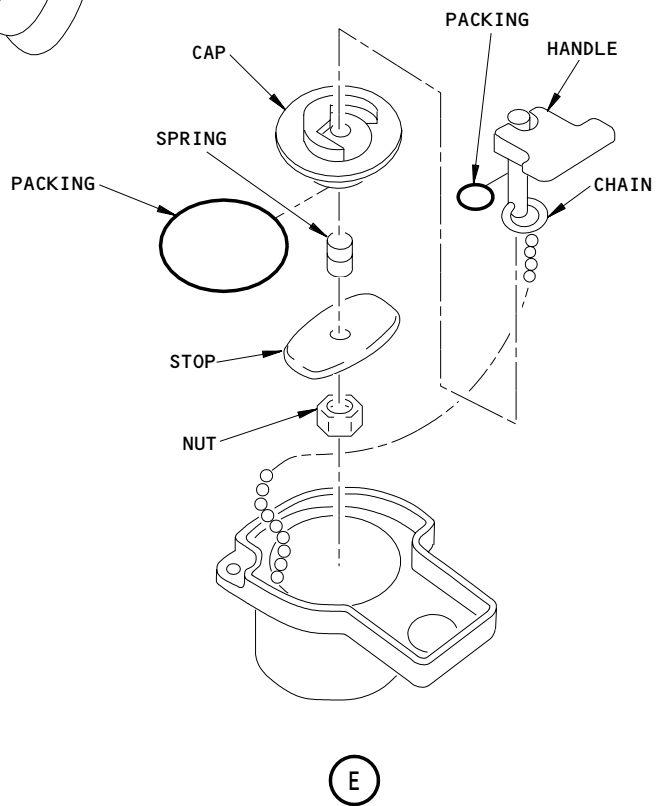
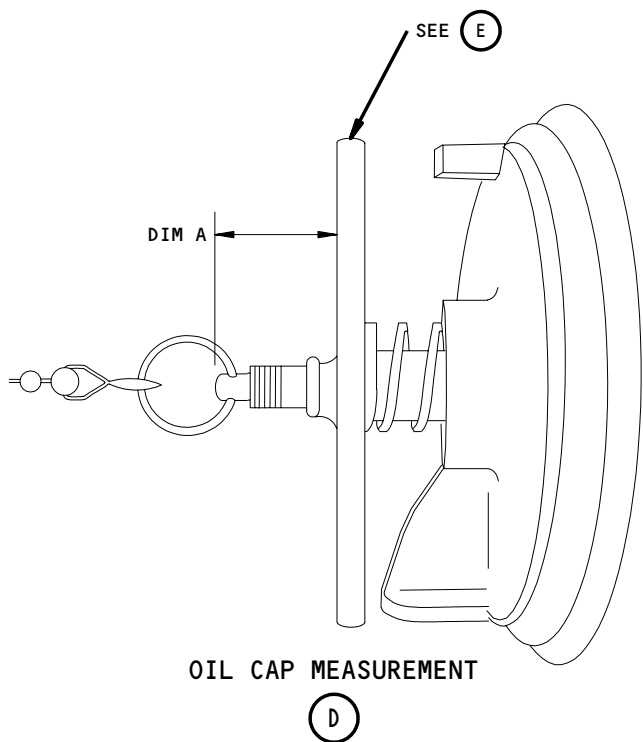


- 1 APUs PRE-ALLIED SIGNAL-SB 49-5887
- 2 APUs POST-ALLIED SIGNAL-SB 49-5887

APU Oil Servicing
Figure 301 (Sheet 1)

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APU Oil Servicing
Figure 301 (Sheet 2)

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- e) Engage the support rods for the APU access doors.
 - 2) Look at the oil level in the sight gage.
 - 3) If the oil level is below the FULL mark for the APU ON, do these steps:
 - a) Use the APU Operation procedure to do the APU shutdown (AMM 49-11-00/201).
 - b) Fill the APU oil.
- F. Fill the APU Oil (Gravity Fill Method) (Fig. 301).

S 863-002

- (1) Make sure the APU control switch is in OFF position and attach a DO-NOT-OPERATE tag.

S 863-003

- (2) Open this circuit breaker on the overhead panel P11 and attach a DO-NOT-CLOSE tag:
 - (a) 11B34, APU MN BAT CONT or APU ALTN CONT

S 863-004

- (3) Open this circuit breaker on the E6 rack in the aft equipment center and attach a DO-NOT-CLOSE tag:
 - (a) APU CONT

S 013-005

- (4) If it is necessary, open the left APU access door, 315AL, and right APU access door, 316AR:
 - (a) Open the latches on the APU access doors.
 - (b) Open the left access door.
 - (c) Push the right access door up and pull the spring latch aft until the latch disengages.
 - (d) Open the right access door.
 - (e) Engage the support rods for the APU access doors.

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S 613-028

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 PROTECTIVE CLOTHES, GOGGLES, AND EQUIPMENT OR LET THE APU 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.

- (5) Do these steps to fill the APU gearbox with oil:
(a) Clean the oil fill cap before it is removed.

WARNING: DO NOT REMOVE THE OIL FILL CAP IF THE APU IS HOT, AND THE OIL LEVEL IS AT OR ABOVE THE FULL MARK. THE HOT OIL CAN CAUSE INJURY.

- (b) Remove the oil fill cap.

CAUTION: DO NOT MIX TWO TYPES OF OIL (MIL-PRF-7808 AND MIL-PRF-23699) 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 THE TWO TYPES OF OIL IN THE APU CAN CAUSE DAMAGE TO THE APU.

- (c) Slowly add oil until the oil flows into the scupper drain.

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).

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- (d) Check the packings on the oil fill cap, if you find deterioration or damage, do these steps:
 - 1) Replace the packing on the cap.
 - 2) Measure and record dimension A.
 - 3) Remove the chain from the handle assembly.
 - 4) Remove the nut, stop, spring and cap from the handle.
 - 5) Replace the packing on the handle.
 - 6) Install the cap, spring, stop and nut on the handle and tighten the nut until dimension A you recorded in the previous steps is obtained.
 - 7) Install the chain onto the cap assembly.
 - (e) Install the oil fill cap and make sure the cap is tight.
- G. Fill the APU Oil (Pressure Fill Method) (Fig. 301)
- S 863-020
- (1) Make sure the APU control switch is in OFF position and attach a DO-NOT-OPERATE tag.
- S 863-021
- (2) Open this circuit breaker on the overhead panel P11 and attach a DO-NOT-CLOSE tag:
 - (a) 11B34, APU MN BAT CONT or APU ALTN CONT
- S 863-022
- (3) Open this circuit breaker on the E6 rack in the aft equipment center and attach a DO-NOT-CLOSE tag:
 - (a) APU CONT
- S 013-023
- (4) If it is necessary, open the left APU access door, 315AL, and right APU access door, 316AR:
 - (a) Open the latches on the APU access doors.
 - (b) Open the left access door.
 - (c) Push the right access door up and pull the spring latch aft until the latch disengages.

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- (d) Open the right access door.
- (e) Engage the support rods for the APU access doors.

S 013-009

- (5) Remove the caps from the oil pressure fittings.
 - (a) Clean the oil pressure fittings.

S 493-010

WARNING: DO NOT KEEP THE OIL ON YOUR SKIN FOR A LONG TIME. IF YOU DO NOT CLEAN THE OIL OFF YOUR SKIN, THE OIL CAN CAUSE INJURY.

CAUTION: DO NOT MIX TWO TYPES OF OIL (MIL-PRF-7808 AND MIL-PRF-23699) 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 THE TWO TYPES OF OIL IN THE APU CAN CAUSE DAMAGE TO THE APU.

IF YOU DO NOT CLEAN THE OIL OFF, THE OIL CAN CAUSE A STAIN ON YOUR CLOTHES AND PAINT CAN BECOME SOFT.

DO NOT PUT TOO MUCH OIL IN THE RESERVOIR OR YOU CAN CAUSE THE APU TO HAVE A SHUTDOWN FROM LOW OIL PRESSURE.

- (6) Connect the oil supply and the oil overflow hoses to the pressure fittings.

S 613-011

- (7) Slowly add oil until you see oil in the overflow hose.

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).

S 093-012

- (8) When the oil from the overflow hose is at a slow drip, remove the pressure fill hoses.

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S 413-013

- (9) Install the caps on the pressure fittings.
H. Put the Airplane Back to Its Usual Condition

S 863-014

- (1) If the APU OIL QTY message is shown on EICAS, do the Maintenance Message Erase Procedure (AMM 31-41-00/201).

S 413-015

- (2) Close the left APU access door, 315AL, and right APU access door, 316AR:
- (a) Disengage the support rods for the APU access doors.
 - (b) Put the support rods in the clips on the inner side of the APU access doors.
 - (c) Lift the right access door until the spring latch, at the forward end of the door, catches and holds the door on the fuselage frame.
 - (d) Lift the left access door and align it with the right access door.
 - (e) Close and latch the APU access doors.

S 863-016

- (3) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the E6 rack in the aft equipment center.
- (a) APU CONT

S 863-017

- (4) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the overhead panel P11:
- (a) 11B34, APU MN BAT CONT or APU ALTN CONT

S 863-018

- (5) Remove the DO-NOT-OPERATE tag from the APU control switch.

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TRAILING EDGE FLAP TRANSMISSION – SERVICING (OIL REPLENISHING)

1. General

- A. This procedure contains two tasks:
- (1) A task to add oil to the trailing edge (TE) flap transmission.
 - (2) A task to drain and refill the trailing edge (TE) flap transmissions.

TASK 12-13-06-613-001

2. Add Oil to the TE Flap Transmission

A. Consumable Materials

- (1) Lubricating Fluid, Flap Transmission – Optional fluids given below:
 - (a) D00467 Fluid, Landing gear shock strut – BMS3-32, Type II
 - (b) D00590 Fluid, Flap drive system – Brayco 795
 - (c) D00503 Castrol Aero 40
 - (d) D00465 Royco LGF
- (2) Location Zones

143	Left MLG Wheel Well
144	Right MLG Wheel Well
550/650	Wing Trailing Edge – Aft of Rear Spar and Inboard of Spoiler No. 4 (Left) 9 (Right)
560/660	Wing Trailing Edge – Aft of Rear Spar and Outboard of Spoiler No. 5 (Left) 8 (Right)
710	Nose Landing Gear and Doors
730/740	Main Landing Gear and Doors

B. Prepare for the Servicing

S 413-008

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

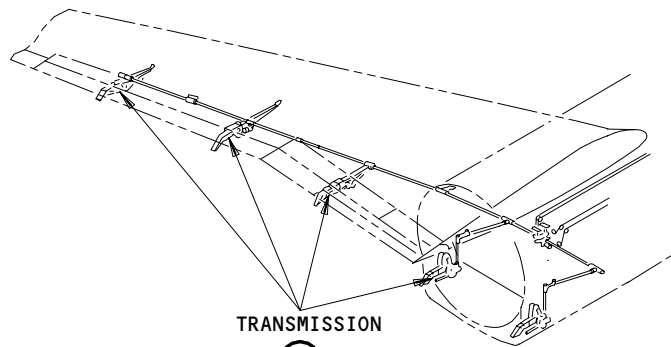
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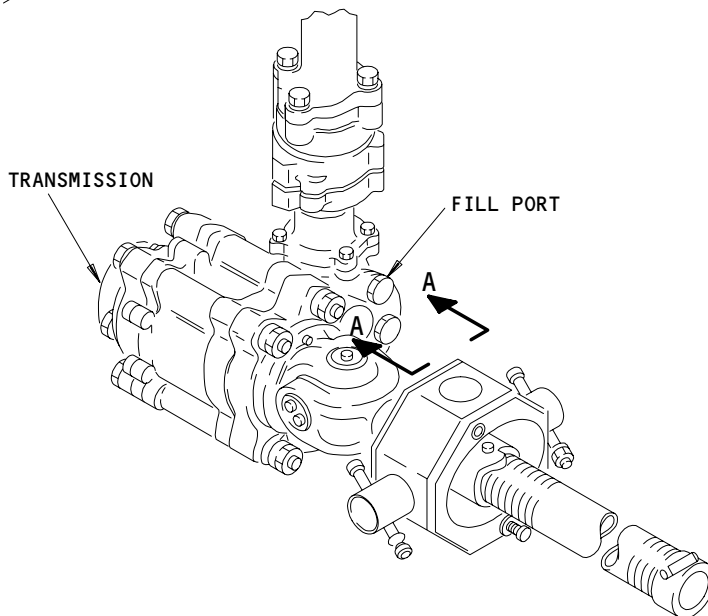
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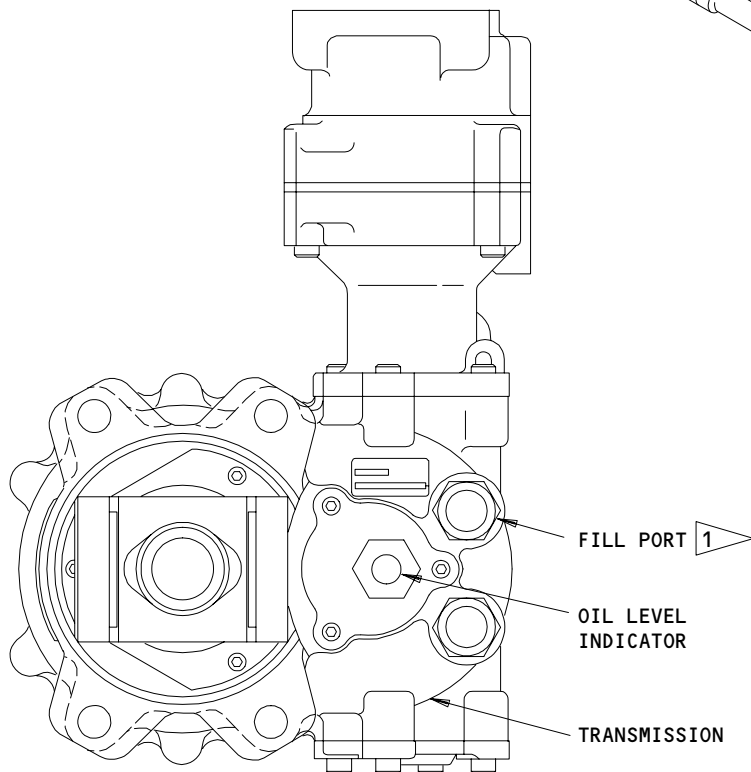
TRANSMISSION
SEE (A)

LEFT WING SHOWN
(RIGHT WING OPPOSITE)



TRANSMISSION (EXAMPLE)
(8 LOCATIONS)

(A)



A-A

1 FILL TO THE LEVEL OF THE FILL PORT

Servicing for the Transmissions of the TE Flap Drive
Figure 301

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- S 863-025
- (2) Supply electrical power (AMM 24-22-00/201).
- S 863-026
- (3) Pressurize the left hydraulic system (AMM 29-11-00/201).
- S 863-009
- (4) Move the flap control lever to the 30 unit detent.
- S 213-010
- (5) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.
- S 493-011
- (6) Attach a DO-NOT-OPERATE tag to the flap control lever.
- S 213-012
- (7) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).
- S 493-013

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (8) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).
- S 863-014
- (9) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).
- S 863-015
- (10) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR
- S 863-016
- (11) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

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C. Add the Oil for the Flap Transmission (Fig. 301)

S 213-003

- (1) Examine the oil level indicator.
 - (a) If you cannot see the oil level in the sight glass, do the steps that follow:
 - 1) Remove the plug for the fill port.
 - 2) Fill the flap transmission with oil to the level of the fill port.

S 413-005

- (2) Install the plug for the fill port, if it was removed.

D. Put the Airplane Back to Its Usual Condition

S 863-027

- (1) Supply electrical power (AMM 24-22-00/201).

S 863-028

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-017

- (3) Move the flap control lever to the zero (FLAPS UP) detent.

S 213-018

- (4) Make sure that the TE flaps and LE slats move to the fully retracted position.

S 093-019

- (5) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.

S 863-020

- (6) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-021

- (7) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

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S 093-022

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(8) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 863-023

(9) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-024

(10) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-13-06-603-029

3. Drain and Refill the TE Flap Transmissions

A. Special Tools and Equipment

(1) Container - Oil Resistant, 5 Gallon (18.93 liter) (commercially available)

B. Consumable Materials

(1) Lubricating Fluid, Flap Transmission - Optional fluids given below:

- (a) D00467 Fluid, Landing gear shock strut - BMS3-32, Type II
- (b) D00590 Fluid, Flap drive system - Brayco 795
- (c) D00503 Castrol Aero 40
- (d) D00465 Royco LGF

C. References

- (1) AMM 27-51-00/201, Trailing Edge Flap System
- AMM 27-51-30/201, Inboard Trailing Edge Flap Track Fairing
- AMM 27-51-31/201, Outboard Trailing Edge Flap Track Fairing
- AMM 29-11-00/201, Main (Left, Right and Center) Hydraulic Systems
- AMM 32-00-15/201, Landing Gear Door Lock
- AMM 32-00-20/201, Landing Gear Downlock

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D. Access

(1) Location Zones

143	Left MLG Wheel Well
144	Right MLG Wheel Well
550/650	Wing Trailing Edge – Aft of Rear Spar and Inboard of Spoiler No. 4 (Left) 9 (Right)
560/660	Wing Trailing Edge – Aft of Rear Spar and Outboard of Spoiler No. 5 (Left) 8 (Right)

E. Procedure

S 863-043

- (1) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-031

- (2) Move the flap control lever to the 30-unit position to extend the trailing edge flaps (AMM 27-51-00/201).

S 863-044

- (3) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 493-047

- (4) Attach a DO-NOT-OPERATE tag to the flap control lever.

S 213-048

- (5) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-051

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-050

- (7) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 013-033

- (8) Remove the applicable forward flap track fairing for #1, #2, #7 or #8 transmission, or inboard flap track fairing for #3 or #6 transmission (AMM 27-51-30/201, 27-51-31/201).

S 863-034

- (9) Put an oil resistant 5 gallon (18.93 liter) container under the drain plug.

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S 683-035

- (10) Do these tasks to drain the transmission:
- (a) Remove the drain plug and the packing from the transmission.
 - (b) Wait for the fluid to drain from the transmission.
 - (c) Lubricate the new packing with fluid.
 - (d) Install the drain plug and the new packing in the drain port.
 - (e) Tighten the drain plug to 20-60 inch-pounds (2.26-6.78 newton-meters).

S 613-036

- (11) Do these tasks to fill the transmission with fluid:
- (a) Remove the fill plug and the packing from the fill port.
 - (b) Add the fluid to the transmission until the fluid is at the level of the fill port.
 - (c) Lubricate the new packing with fluid.
 - (d) Install the fill plug and new packing in the fill port.
 - (e) Tighten the fill plug to 20-60 inch-pounds (2.26-6.78 newton-meters).

F. Put the Airplane Back to Its Usual Condition

S 083-037

- (1) Remove the oil resistant container and other items used.

S 163-038

- (2) Wipe up spilled fluid.

S 413-039

- (3) Install the flap track fairings (AMM 27-51-30/201, 27-51-31/201).

S 863-045

- (4) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-041

- (5) Move the flap control lever to the UP position to retract the flaps (AMM 27-51-00/201).

S 863-046

- (6) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

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POTABLE WATER SYSTEM – SERVICING

1. General

- A. This procedure gives the instructions to drain the potable water system and to fill the potable water tank.
- B. This Chapter/Section/Subject/Page Block uses Configurations (CONFIGs) to identify different water system configurations used by operators:
CONFIGURATION 1:
airplanes with standard capacity (60 gal) water tank –
ie, used for airplanes with the recirc toilet system.
CONFIGURATION 2:
airplanes with increased capacity (120 gal) water tank –
ie, used for airplanes with the vacuum waste system.
- C. If an operator does not have a particular configuration in their fleet, that CONFIG's procedure will be LIMITED as CONFIGURATION NOT USED and will contain no instructions.

TASK 12-14-01-683-001-001

2. Drain the Potable Water System (Fig. 301)

- A. Reference
 - (1) AMM 52-49-00/001, Exterior Service Doors
- B. Access
 - (1) Location Zone
 - 165 Area Aft of Bulk Cargo Compartment (Left)
 - (2) Access Panel
 - 165AL Potable Water Service Panel (757-200 4DR Airplanes)
 - 165BL Potable Water Service Panel (757-200 OWX Airplanes)
- C. Procedure

S 683-071-001

WARNING: IF THE POTABLE WATER SYSTEM IS NOT DRAINED OR IN NORMAL SERVICE A MINIMUM OF ONE TIME EACH THREE DAYS, THE GROWTH OF BACTERIA CAN OCCUR. IF BACTERIA GROWTH CONTINUES, AND YOU DRINK THE WATER, ILLNESS CAN OCCUR.

- (1) Obey this warning for this task.

S 863-002-001

- (2) Open the applicable HEATERS LAV WATER circuit breaker on the right miscellaneous electrical equipment panel, P37, row F and attach a DO-NOT-CLOSE tag.

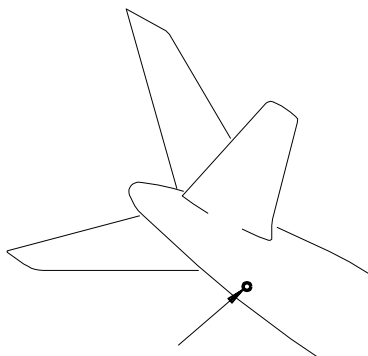
S 863-003-001

- (3) Open the applicable HEATERS LAV WATER or LAV WTR HTR circuit breaker on the miscellaneous relay panel, P70, row A and attach a DO-NOT-CLOSE tag.

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AIRPLANES WITH STANDARD CAPACITY TANK
(AIRPLANES WITH RECIRC TOILETS)

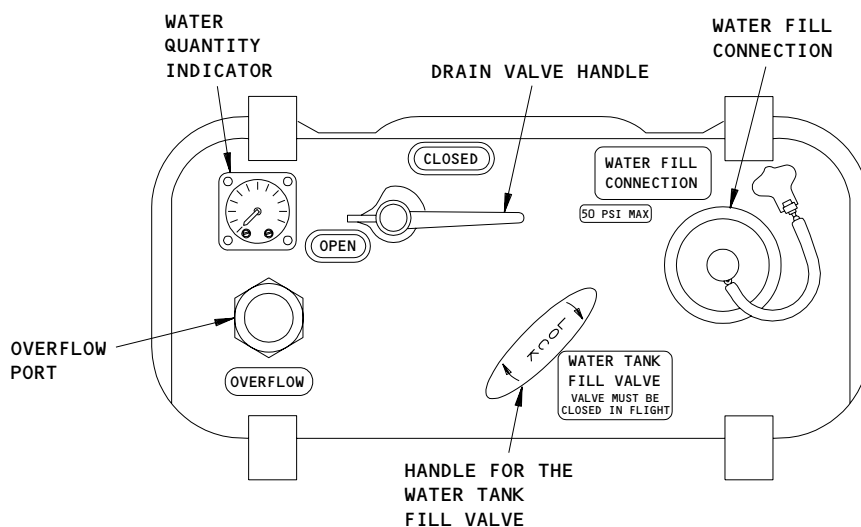
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POTABLE WATER SERVICE PANEL, 165AL

SEE (A)



POTABLE WATER SERVICE PANEL, 165AL

(A)

Potable Water System Servicing
Figure 301

EFFECTIVITY
AIRPLANES WITH STANDARD CAPACITY TANK
(AIRPLANES WITH RECIRC TOILETS)

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- S 013-069-001
- (4) Open the aft potable water service panel, AMM 52-49-00/001.
- S 483-004-001
- (5) Connect the drain hose to the overflow port at the potable water service panel.
- S 683-008-001
- (6) Turn the drain valve handle on the potable water service panel to OPEN.
- S 683-013-001
- (7) Move the WATER TANK FILL VALVE to the OPEN position to speed draining.
- S 683-021-001
- (8) Open the shutoff valve for the water supply in each lavatory.
- S 683-022-001
- (9) Open the water drain valve in each lavatory.
- S 683-023-001
- (10) Open the shutoff valve for the water supply and all the water faucets (both HOT and COLD sides), coffee makers, and water boilers in each galley.
- S 683-024-001
- (11) When no more water drains from the overflow port do these steps:
- (a) To deactivate the potable water air compressor, do this task:
Potable Water System - Pressure Release (AMM 38-10-00/201).
 - (b) Move the handle for the WATER TANK FILL VALVE to the CLOSED position.
 - (c) Turn the drain valve handle to CLOSED.
- S 093-025-001
- (12) Disconnect the drain hose from the overflow port at the potable water service panel.
- S 413-030-001
- (13) Close the door for the aft potable water service panel, AMM 52-49-00/001.

EFFECTIVITY

AIRPLANES WITH STANDARD CAPACITY TANK (AIRPLANES WITH RECIRC TOILETS)
--

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S 683-032-001

- (14) Close the water drain valve in each lavatory.

NOTE: Leave the shutoff valves for the water supply open.

S 683-034-001

- (15) Close all the water faucets, coffee makers, and water boilers in each galley.

NOTE: Leave the shutoff valves for the water supply open.

TASK 12-14-01-613-035-001

3. Fill the Potable Water Tank (Fig. 301)

A. Reference

- (1) AMM 52-49-00/001, Exterior Service Doors

B. Access

- (1) Location Zone

165 Area Aft of Bulk Cargo Compartment (Left)

- (2) Access Panel

165AL Potable Water Service Panel (757-200 4DR Airplanes)

165BL Potable Water Service Panel (757-200 0WX Airplanes)

C. Procedure

S 863-036-001

- (1) To release pressure from the potable water system, do this task:
Potable Water System - Pressure Release (AMM 38-10-00/201).

S 013-070-001

- (2) Open the door for the potable water service panel, AMM 52-49-00/001.

S 013-039-001

- (3) Open the cap on the water fill connection.

S 493-040-001

- (4) Connect the water supply hose to the water fill connection.

NOTE: We recommend that you use a water pressure of
25 psi (175 kPa) to fill the potable water system.
Do not use a water pressure of more than 55 psi (380 kPa).

S 613-042-001

- (5) Move the handle for the WATER TANK FILL VALVE to the OPEN position.

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(AIRPLANES WITH RECIRC TOILETS)

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- S 613-051-001
- (6) Fill the potable water tank with water until water flows from the overflow port on the service panel.
- S 613-052-001
- (7) Stop the supply of water to the potable water tank.
- S 613-053-001
- (8) Move the WATER TANK FILL VALVE handle to the CLOSED position.
- S 093-063-001
- (9) Disconnect the water supply hose from the water fill connection and let the fill line drain.
- S 413-064-001
- (10) Close the cap on the water fill connection.
- S 413-065-001
- (11) To restore pressure to the potable water system, do this task:
Potable Water System - Restore Pressure (AMM 38-10-00/201).
- S 413-066-001
- (12) Close the door for the potable water service panel,
AMM 52-49-00/001.
- S 863-067-001
- (13) If the potable water system was drained before you filled it then do the steps that follow:
- (a) Remove the DO-NOT-CLOSE tag and close the HEATERS LAV WATER circuit breakers on the right miscellaneous electrical equipment panel, P37.
 - (b) Remove the DO-NOT-CLOSE tag and close the HEATER LAV WATER or LAV WTR HTR circuit breakers on the miscellaneous relay panel, P70.

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AIRPLANES WITH STANDARD CAPACITY TANK
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POTABLE WATER SYSTEM - SERVICING

TASK 12-14-01-603-068-002

1. Potable Water System - Increased Capacity Tank (120 Gallon)

A. General

(1) This configuration is NOT USED.

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CONFIGURATION NOT USED

12-14-01

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MAIN GEAR SHOCK STRUT – SERVICING

1. General

- A. This procedure contains the data necessary to do the inspection/servicing of the shock strut of the main landing gear.
- (1) Do the Prepare to Inspect/Service the Shock Strut procedure before you do any of the inspection/servicing procedures in this section.
 - (2) Do the Put the Airplane Back to Its Usual Condition procedure after you do any of the inspection/servicing procedures in this section.
- B. You can see fluid loss on or around the shock strut when there is oil on the gear or puddles of oil on the ground. Fluid loss can also occur with very slow leakage that you may not see. If you think that the strut does not have the correct amount of oil, do the Pressure Check at Two Points. If you think the strut has the correct amount of oil do the Servicing of the Shock Strut with Nitrogen Only.

TASK 12-15-01-613-048

2. Main Gear Shock Strut Fluids

A. Shock Strut Fluids

S 613-049

CAUTION: 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.

CAUTION: DO NOT ADD THE LUBRIZOL DIRECTLY INTO THE SHOCK STRUT. THOROUGHLY PRE-MIX THE LUBRIZOL WITH 10 PARTS OF SHOCK STRUT FLUID BEFORE YOU ADD THE FLUID INTO THE STRUT.

- (1) You must add a lubricant to the shock strut during the servicing. As an alternative, you can use a fluid which has an added lubricant. For usual servicing when small quantities of fluid are necessary, you can use fluid without lubricant to fill the shock strut.

S 613-050

- (2) 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.

S 613-051

- (3) 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.

S 613-052

- (4) Use BMS 3-32, Type I to fill the shock strut for the first time when new, or after overhaul. There is a corrosion inhibitor in the MIL-H-6083 fluid.

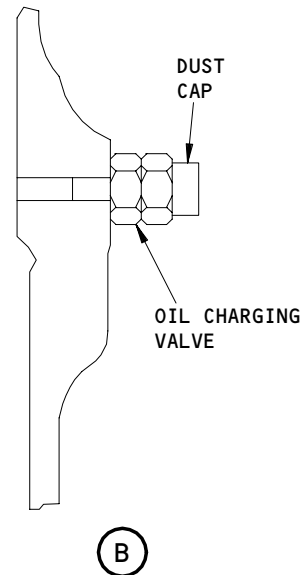
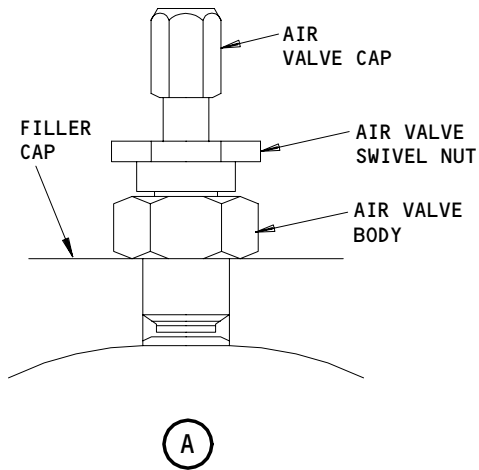
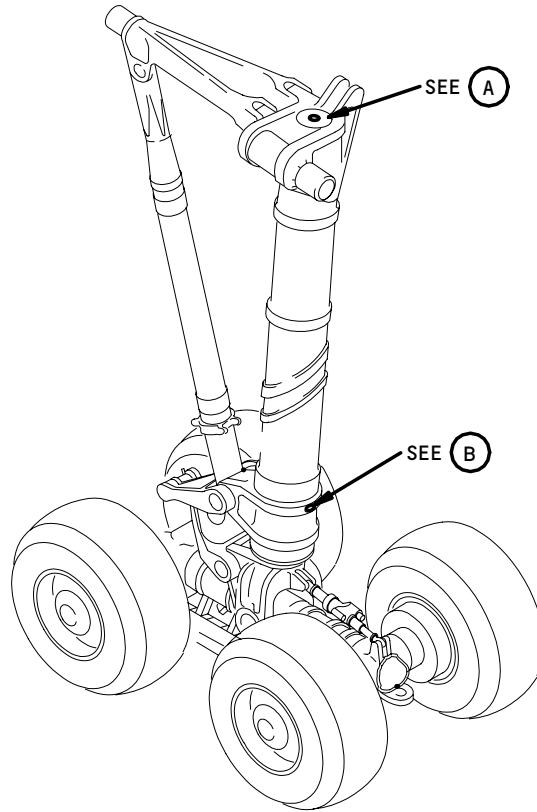
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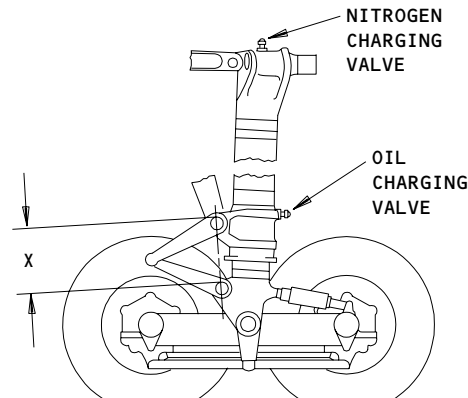
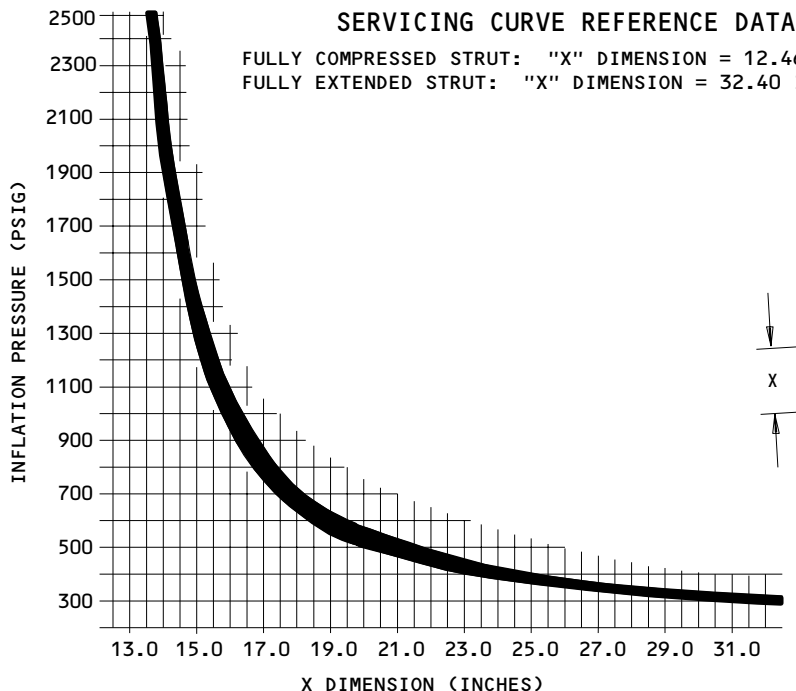
Servicing of the Shock Strut for the Main Landing Gear
Figure 301

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NOTE: WHEN YOU COMPLETELY DEFLATE THE SHOCK STRUT, YOU MUST FOLLOW THE INSTRUCTIONS TO DO THE OIL AND NITROGEN SERVICING.

NITROGEN SERVICING ONLY:

1. WITH THE AIRPLANE WEIGHT ON THE MAIN LANDING GEAR, MEASURE THE PRESSURE OF THE SHOCK STRUT WITH A PRESSURE GAGE.
2. ON THE SERVICING CURVE, FIND THE X DIMENSION WHICH AGREES WITH THE MEASURED PRESSURE.
3. ADD OR RELEASE DRY NITROGEN UNTIL YOU GET THE X DIMENSION IN THE CORRECT RANGE.

1 PREFERRED;

USE FULLY FORMULATED BMS 3-32 TYPE I (WITH CORROSION INHIBITOR) OR TYPE II (WITHOUT CORROSION INHIBITOR). BMS 3-32 TYPE I IS USED TO FILL THE STRUT THE FIRST TIME AFTER BEING OVERHAULED. REFILLS MAY BE DONE WITH BMS 3-32 TYPE II.

OPTIONAL;

FOR BMS TYPE I - MIX MIL-H-6083 WITH 2.4% BY VOLUME OF LUBRIZOL 1395.

FOR BMS TYPE II - MIX MIL-H-5606 WITH 2.4% BY VOLUME OF LUBRIZOL 1395.

NOTE: AVOID ADDING LUBRIZOL DIRECTLY INTO THE STRUT. PRE-MIX THE LUBRIZOL WITH 10 PARTS OF STRUT FLUID PRIOR TO FILLING SHOCK STRUT.

OIL AND NITROGEN SERVICING:

1. OPEN THE NITROGEN VALVE AND DEFLATE THE SHOCK STRUT COMPLETELY.
2. FILL THE SHOCK STRUT WITH MIL-H-5606 FLUID THRU THE OIL CHARGING VALVE. FILL THE SHOCK STRUT UNTIL THE FLUID FLOWS INTO THE DRAIN BUCKET AND IS FREE OF BUBBLES. EACH TIME YOU COMPLETELY FILL THE SHOCK STRUT WITH OIL, ADD 32 FLUID OUNCES OF LUBRIZOL 1395. **1** CLOSE THE OIL CHARGING VALVE.
3. WITH THE AIRPLANES WEIGHT ON THE MAIN LANDING GEAR, INFLATE THE SHOCK STRUT APPROXIMATELY 1 INCH. MEASURE THE PRESSURE OF THE SHOCK STRUT WITH A PRESSURE GAGE. ON THE SERVICING CURVE, FIND THE X DIMENSION WHICH AGREES WITH THE MEASURED PRESSURE. DO THE SERVICING OF THE SHOCK STRUT WITH DRY NITROGEN.
4. **IMPORTANT:** WHEN YOU DO THE INITIAL DRY NITROGEN SERVICING OF THE SHOCK STRUT, INFLATE THE SHOCK STRUT TO THE X DIMENSION PLUS 1.5 INCHES. CLOSE THE NITROGEN CHARGING VALVE.
5. AFTER THE AIRPLANE HAS MADE 5-10 LANDINGS, DO THE NITROGEN SERVICING FOR THE SHOCK STRUT AGAIN. DO NOT DEFLATE THE STRUT.

Servicing Chart for the Shock Strut of the Main Landing Gear
Figure 302

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S 613-053

- (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.

S 613-054

- (6) If the proper mixture is not available, you can use MIL-H-6083 or MIL-H-5606 fluid without additives to top off the strut. Try not to do this, however, because the additive that is already in the strut will become more diluted. This will make it less effective.

S 613-055

- (7) It is not necessary to change the seals in the shock strut if you drained the strut and filled with one of the other fluids.

S 613-056

- (8) Use the premixed fluid, BMS 3-32 Type I and Type II, if it is possible. This is more convenient for the operator and will remove the possibility of error that can occur when the operator mixes the fluids.

S 613-057

- (9) Qualified vendors and vendor codes for the shock strut fluids are listed in AMM 20-30-04/201.

B. Preferred (Pre-mixed) Shock Strut Fluids

S 613-058

- (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.

S 613-059

- (2) BMS 3-32, Type II -
This is MIL-H-5606 fluid pre-mixed with 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate.

C. Optional (Not Pre-mixed) Shock Strut Fluids

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S 613-060

CAUTION: YOU MUST MIX SHOCK STRUT FLUIDS THAT ARE NOT PRE-MIXED BEFORE YOU FILL THE STRUT. IF YOU POUR UNDILUTED LUBRIZOL DIRECTLY INTO A STRUT IT CAN SETTLE TO THE BOTTOM AND NOT MIX CORRECTLY. UNDILUTED LUBRIZOL CAN ALSO CAUSE THE STRUT SEALS TO SWELL AND SOFTEN.

CAUTION: YOU MUST MIX 1 PART LUBRIZOL 1395 WITH 10 PARTS MIL-H-6083 OR MIL-H-5606 TO DILUTE THE LUBRIZOL BEFORE YOU ADD IT TO THE STRUT. IF YOU DO NOT DILUTE LUBRIZOL BEFORE YOU ADD IT TO THE STRUT IT CAN CAUSE DAMAGE TO THE STRUT AND SEALS.

- (1) MIL-H-6083 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for MIL-H-6083 and mixed with 2.4 percent by volume of Lubrizol 1395.

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.

S 613-061

- (2) MIL-H-5606 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for MIL-H-5606 and mixed with 2.4 percent by volume of Lubrizol 1395.

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.

TASK 12-15-01-843-020

3. Examine the Fluid Level of the Shock Strut

A. General

- (1) This procedure supplies instructions to check the level of the hydraulic fluid in the shock strut of the main landing gear.
- (2) 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 between the shock strut extensions, the more accurate the fluid measurement will be.
 - (a) You can obtain the different shock strut extensions one of two ways:
 - 1) You can take the shock strut measurements at two different airplane weights, for example, before and after fueling the airplane, or,
 - 2) If the airplane is on jacks, you can use floor jacks or the airplane jacks to compress or extend the shock strut.
 - (b) You should have a difference of 2 - 4 inches (51 - 102 mm) between the two shock strut extensions to do the check.

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B. Equipment

- (1) Strut Inflation Tool - F70200-14
- (2) Pressure Gage, 250 to 2500 PSIG - Commercially Available

C. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks
- (2) AMM 32-00-20/201, Landing Gear Down Locks
- (3) AMM 07-11-01/201, Jacking Airplane

D. Access

- (1) Location Zones
731/741 Main Landing Gear

E. Prepare to Check the Hydraulic Fluid Level in the Shock Strut

S 493-021

- (1) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-022

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

- (2) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

NOTE: The doors for the main and nose landing gear open at the same time when you use the ground release lever.

S 863-023

- (3) Put the control lever for the landing gear in the OFF position and attach a DO-NOT-OPERATE tag.

F. Check the hydraulic fluid level of the shock strut for the main landing gear:

NOTE: If you think the strut fluid level is correct, then do the Nitrogen Servicing Only task and adjust the nitrogen volume as necessary.

S 223-025

- (1) Check the hydraulic fluid level with the airplane at the first shock strut extension:
 - (a) Remove the cap from the air valve.
 - (b) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

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WARNING: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (c) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (d) Measure the actual "X" dimension on the strut as shown on Fig. 302.
- (e) Use the chart on Fig. 302 to find the "X" dimension that corresponds to the pressure you measured.
- (f) Compare the "X" dimension from the chart to the "X" dimension that you actually measured.
- (g) If the actual measured "X" dimension is within the upper and lower limits of the "X" dimension from the chart, then do the steps for a pressure check at the second point.
- (h) If the actual measured "X" dimension is not within the upper and lower limits of the "X" dimension from the chart, then do the Nitrogen Servicing Only to get the measured "X" dimension within the limits. Then do the steps for a pressure check at the second point.

S 213-033

- (2) Check the hydraulic fluid level with the airplane at the second shock strut extension:

NOTE: To get a different shock strut extension, you can have the airplane at a different weight, or, if the airplane is lifted on jacks, you can use the airplane jacks or floor jacks to compress or extend the shock strut.

You should have a difference of 2 - 4 inches between the two shock strut extensions to do the check.

- (a) Remove the cap from the air valve.
- (b) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

WARNING: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (c) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (d) Measure the actual "X" dimension on the strut as shown on Fig. 302.
- (e) Use the chart on Fig. 302 to find the "X" dimension that corresponds to the pressure you measured.
- (f) Compare the "X" dimension from the chart to the "X" dimension that you actually measured.

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- (g) If the actual measured "X" dimension is within the upper and lower limits of the "X" dimension from the chart, then do these steps to complete the check:
 - 1) Tighten the swivel nut to 5 - 7 pound-feet to close the air valve.
 - 2) Remove the pressure gage from the shock strut.
 - 3) Install the cap for the air valve.
- (h) If the actual measured "X" dimension is not within the upper and lower limits of the "X" dimension from the chart, then do the Fluid and Nitrogen Servicing to adjust the fluid level.

NOTE: If only one of the two pressure checks is satisfactory, then the fluid volume is not correct.

- (i) Tighten the swivel nut to 5 - 7 pound-feet to close the air valve.
- (j) Remove the pressure gage from the shock strut.
- (k) Install the cap on the air valve.

TASK 12-15-01-603-027

4. Servicing of the Shock Strut with Nitrogen Only

A. Equipment

- (1) Strut Inflation Tool - F70200-14
- (2) Pressure Gage, 250 to 2500 PSIG - Commercially Available

B. Consumable Materials

- (1) Dry nitrogen (recommended), 2200 psi (commercially available)
- (2) Dry air (optional), 2200 psi (commercially available)

C. References

- (1) AMM 07-11-01/201, Jacking Airplane

D. Nitrogen Servicing - Airplane Not on Jacks

S 613-029

- (1) Do these steps to service the shock strut with nitrogen:
 - (a) Remove the cap from the air valve.
 - (b) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

WARNING: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (c) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (d) Measure the actual "X" dimension on the strut as shown on Fig. 302.
- (e) Use the chart on Fig. 302 to find the "X" dimension that corresponds to the pressure you measured.

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- (f) Add nitrogen to the shock strut until the measured "X" dimension gets to the upper end of the limit of the "X" dimension from the chart.

NOTE: It is recommended to use the upper end of the limit to allow for some leakage.

- (g) Tighten the swivel nut to 5 -7 pound-feet to close the air valve.
- (h) Remove the pressure gage from the shock strut.
- (i) Install the cap for the air valve.

E. Nitrogen Servicing - Airplane on Jacks

S 613-030

- (1) Do these steps to service the shock strut with nitrogen:
 - (a) Lift the airplane until the shock struts for both main gear are fully extended (AMM 07-11-01/201). Look at the chart on Fig. 302 to make sure the strut is fully extended.
 - (b) Remove the cap from the air valve.
 - (c) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

WARNING: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (d) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (e) Measure the actual "X" dimension on the strut as shown on Fig. 302.
- (f) Use the chart on Fig. 302 to find the "X" dimension that corresponds to the pressure you measured.
- (g) Add nitrogen to the shock strut until the pressure is 300 +/- 20 psig.
- (h) Tighten the swivel nut to 5 -7 pound-feet to close the air valve.
- (i) Remove the pressure gage from the shock strut.
- (j) Install the cap for the air valve.

S 583-031

- (2) Lower the airplane and remove the jacks (AMM 07-11-01/201).

TASK 12-15-01-603-001

5. Servicing of the Shock Strut with Fluid and Nitrogen

A. General

- (1) If the shock strut is new or has been overhauled then use the procedure to replace the fluid.

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B. Equipment

- (1) Strut Inflation Tool - F70200-14
- (2) Pressure Gage, 250 to 2500 PSIG - Commercially Available
- (3) Container, 5 Gallon Capacity

C. Consumable Materials

- (1) Dry nitrogen (recommended), 2200 psi (commercially available)
- (2) Dry air (optional), 2200 psi (commercially available)
- (3) D00467 Fluid - Fully Formulated BMS 3-32 Type I, II (Preferred)
- (4) D00212 Hydraulic Fluid MIL-H-5606 or MIL-H-6083 (Optional)
- (5) D00510 Lubrizol 1395 (Optional)

D. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks
- (2) AMM 32-00-20/201, Landing Gear Downlocks

E. Access

- (1) Location Zones
731/741 Main Landing Gear

F. Procedure to Adjust the Fluid Level of the Shock Strut

S 863-005

WARNING: MAKE SURE THE AREA BELOW THE WING IS CLEAR BEFORE YOU DEFLATE THE SHOCK STRUT. IF YOU DEFLATE ONE SHOCK STRUT, THE WING TIP CAN MOVE DOWN AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Deflate the shock strut of the main landing gear.
 - (a) Remove the cap from the air valve (Detail A, Fig. 301).

WARNING: LOOSEN THE SWIVEL NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT LOOSEN THE AIR VALVE BODY. AIR PRESSURE CAN BLOW THE VALVE OFF AND CAN CAUSE INJURY TO PERSONS.

- (b) Loosen the swivel nut for the air valve a maximum of two turns.
- (c) Let the shock strut fully deflate.
- (d) Install a flexible hose on the air valve and put the other end of the hose in the drain bucket.

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- (e) Fully loosen the swivel nut for the air valve to open the valve.

S 613-006

CAUTION: USE ONLY THE TYPE OF FLUID WHICH IS SPECIFIED IN THIS PROCEDURE TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

CAUTION: 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.

- (2) Fill the shock strut with fluid.
 - (a) Remove the dust cap from the oil charging valve (Fig. 301, Detail B).
 - (b) Attach an oil charging line to the oil charging valve.
 - (c) Make sure the air valve is fully open.

CAUTION: CLEAN ALL THE LEAKED HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE TIRES.

- (d) Fill the shock strut with fluid until the fluid flows into the drain bucket.
- (e) Continue to fill the shock strut until the fluid which flows into the bucket is free of bubbles.
- (f) Remove the oil charging line.
- (g) Replace the dust cap for the oil charging valve.
- (h) Remove the overflow hose from the air valve.

S 863-007

- (3) Inflate the shock strut for the main landing gear with dry Nitrogen.
 - (a) Install the strut inflation tool. Use the instructions supplied with the tool.

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CAUTION: NITROGEN ENTRAINMENT IN THE FLUID CAN CAUSE THE SHOCK STRUT TO DEFLATE TOO MUCH. WHEN THE SHOCK STRUT IS DEFLATED, THE "X" DIMENSION FROM FIGURE 302 SHOULD BE INCREASED 1.5 INCHES FOR A GIVEN PRESSURE TO COMPENSATE FOR THE NITROGEN ENTRAINMENT.

- (b) Add nitrogen to the shock strut until the "X" dimension is 1.5 inches above the upper limit for the indicated pressure, as shown on Fig. 302.
- (c) Tighten the swivel nut to 5 - 7 pound-feet to close the air valve (Detail A, Fig. 301).
- (d) Remove the strut inflation tool.
- (e) Install the cap for the air valve (Detail A, Fig. 301).

S 843-064

- (4) Return the airplane to service.

S 613-038

- (5) After 5 to 10 service landings, do these steps to check the pressure of the shock strut.
 - (a) Examine the shock strut pressure and x dimension.
 - 1) Inflate the shock strut according to servicing chart (Fig. 302).
 - 2) Service the shock strut with dry nitrogen again.

G. Procedure to Replace the Fluid in the Shock Strut (A New or Overhauled Shock Strut)

S 613-040

WARNING: MAKE SURE THE AREA BELOW THE WING IS CLEAR BEFORE YOU DEFLATE THE SHOCK STRUT. IF YOU DEFLATE ONE SHOCK STRUT, THE WING TIP CAN MOVE DOWN AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Deflate the shock strut of the main landing gear.
 - (a) Remove the cap from the air valve (Detail A, Fig. 301).

WARNING: LOOSEN THE SWIVEL NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT LOOSEN THE AIR VALVE BODY. AIR PRESSURE CAN BLOW THE VALVE OFF AND CAN CAUSE INJURY TO PERSONS.

- (b) Loosen the swivel nut for the air valve a maximum of two turns.
- (c) Let the shock strut fully deflate.

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- (d) Install a flexible hose on the air valve and put the other end of the hose in the drain bucket.
- (e) Fully loosen the swivel nut for the air valve to open the valve.

S 613-035

CAUTION: USE ONLY THE TYPE OF FLUID WHICH IS SPECIFIED IN THIS PROCEDURE TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

CAUTION: 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.

- (2) Fill the shock strut with fluid.
 - (a) Remove the dust cap from the oil charging valve (Fig. 301, Detail B).
 - (b) Attach an oil charging line to the oil charging valve.
 - (c) Make sure the air valve is fully open.

CAUTION: CLEAN ALL THE LEAKED HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE TIRES.

- (d) Fill the shock strut with fluid until the fluid flows into the drain bucket.
- (e) Continue to fill the shock strut until the fluid which flows into the bucket is free of bubbles.
- (f) Remove the oil charging line.
- (g) Replace the dust cap for the oil charging valve.
- (h) Remove the overflow hose from the air valve.

S 613-036

- (3) Inflate the shock strut for the main landing gear with dry Nitrogen.
 - (a) Remove the hose from the air valve.
 - (b) Install the strut inflation tool. Use the instructions supplied with the tool.

CAUTION: NITROGEN ENTRAINMENT IN THE FLUID CAN CAUSE THE SHOCK STRUT TO DEFLATE TOO MUCH. WHEN THE SHOCK STRUT IS DEFLATED, THE "X" DIMENSION FROM FIGURE 302 SHOULD BE INCREASED 1.5 INCHES FOR A GIVEN PRESSURE TO COMPENSATE FOR THE NITROGEN ENTRAINMENT.

- (c) Add nitrogen to the shock strut until the "X" dimension is 1.5 inches above the upper limit for the indicated pressure, as shown on Fig. 302.
- (d) Tighten the swivel nut to 5 - 7 pound-feet to close the air valve (Detail A, Fig. 301).

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- (e) Remove the strut inflation tool.
- (f) Install the cap for the air valve (Detail A, Fig. 301).

S 843-065

- (4) Return the airplane to service.

S 613-039

- (5) After 5 to 10 service landings, do these steps to check the pressure of the shock strut.
 - (a) Examine the shock strut pressure and x dimension.
 - 1) Inflate the shock strut according to servicing chart (Fig. 302).
 - 2) Service the shock strut with dry nitrogen again.

TASK 12-15-01-843-037

6. Put the Airplane Back to Its Usual Condition

A. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks

B. Put the Airplane Back to its Usual Condition

S 863-009

- (1) Remove the DO-NOT-OPERATE tag from the control lever for the landing gear.

S 863-008

- (2) Put the control lever for the landing gear to the DN position.

S 093-010

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

- (3) Remove the door locks and close the doors (AMM 32-00-15/201).

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NOSE GEAR SHOCK STRUT – SERVICING

1. General

- A. This procedure contains the data necessary to do the servicing of the shock strut for the nose landing gear.
- (1) Do the Prepare to Inspect/Service the Shock Strut procedure before you do any of the inspection/servicing procedures in this section.
 - (2) Do the Put the Airplane Back to Its Usual Condition procedure after you do any of the inspection/servicing procedures in this section.
- B. You can see fluid loss on or around the shock strut when there is oil on the gear or puddles of oil on the ground. Fluid loss can also occur with very slow leakage that you may not see. If you think that the strut does not have the correct amount of oil, do the Pressure Check at Two Points. If you think the strut has the correct amount of oil do the Servicing of the Shock Strut with Nitrogen Only.

TASK 12-15-02-613-055

2. Nose Gear Shock Strut Fluids

A. Shock Strut Lubricants

S 643-069

CAUTION: 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.

CAUTION: DO NOT ADD THE LUBRIZOL DIRECTLY INTO THE SHOCK STRUT. THOROUGHLY PRE-MIX THE LUBRIZOL WITH 10 PARTS OF SHOCK STRUT FLUID BEFORE YOU ADD THE FLUID INTO THE STRUT.

- (1) You must add a lubricant to the shock strut during the servicing. As an alternative, you can use a fluid which has an added lubricant. For usual servicing when small quantities of fluid are necessary, you can use fluid without lubricant to fill the shock strut.

B. Shock Strut Fluids

S 643-057

- (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.

S 643-058

- (2) 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.

S 643-059

- (3) Use BMS 3-32, Type I to fill the shock strut for the first time when new, or after overhaul. There is a corrosion inhibitor in the MIL-H-6083 fluid.

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S 643-060

- (4) 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.

S 643-061

- (5) If the proper mixture is not available, You can use MIL-H-6083 or MIL-H-5606 fluid without additives to top off the strut. Try not to do this, however, because the additive that is already in the strut will become more diluted. This will make it less effective.

S 643-062

- (6) It is not necessary to change the seals in the shock strut if you drained the strut and filled with one of the other fluids.

S 643-063

- (7) Use the premixed fluid, BMS 3-32 Type I and Type II, if it is possible. This is more convenient for the operator and will remove the possibility of error that can occur when the operator mixes the fluids.

S 643-064

- (8) Qualified vendors and vendor codes for the shock strut fluids are listed in AMM 20-30-04/201.

C. Preferred (Pre-mixed) Shock Strut Fluids

S 643-065

- (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.

S 643-066

- (2) BMS 3-32, Type II -
This is MIL-H-5606 fluid pre-mixed with 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate.

D. Optional (Not Pre-mixed) Shock Strut Fluids

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S 643-067

CAUTION: YOU MUST MIX SHOCK STRUT FLUIDS THAT ARE NOT PRE-MIXED BEFORE YOU FILL THE STRUT. IF YOU POUR UNDILUTED LUBRIZOL DIRECTLY INTO A STRUT IT CAN SETTLE TO THE BOTTOM AND NOT MIX CORRECTLY. UNDILUTED LUBRIZOL CAN ALSO CAUSE THE STRUT SEALS TO SWELL AND SOFTEN.

CAUTION: YOU MUST MIX 1 PART LUBRIZOL 1395 WITH 10 PARTS MIL-H-6083 OR MIL-H-5606 TO DILUTE THE LUBRIZOL BEFORE YOU ADD IT TO THE STRUT. IF YOU DO NOT DILUTE LUBRIZOL BEFORE YOU ADD IT TO THE STRUT IT CAN CAUSE DAMAGE TO THE STRUT AND SEALS.

- (1) MIL-H-6083 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for MIL-H-6083 and mixed with 2.4 percent by volume of Lubrizol 1395.

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.

S 643-068

- (2) MIL-H-5606 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for MIL-H-5606 and mixed with 2.4 percent by volume of Lubrizol 1395.

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.

TASK 12-15-02-613-054

3. Examine the Fluid Level of the Shock Strut

A. General

- (1) This procedure supplies instructions to check the level of the hydraulic fluid in the shock strut of the nose landing gear.
- (2) 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 between the shock strut extensions, the more accurate the fluid measurement will be.
 - (a) You can obtain the different shock strut extensions one of two ways:
 - 1) You can take the shock strut measurements at two different airplane weights, for example, before and after fueling the airplane, or,
 - 2) If the airplane is on jacks, you can use floor jacks or the airplane jacks to compress or extend the shock strut.

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(b) You should have a difference of 2 - 4 inches (51 - 102 mm) between the two shock strut extensions to do the check.

B. Equipment

- (1) Strut Inflation Tool - F70200-14
- (2) Pressure Gage, 250 to 2500 PSIG - Commercially Available

C. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks
- (2) AMM 32-00-20/201, Landing Gear Down Locks
- (3) AMM 07-11-01/201, Jacking Airplane

D. Access

- (1) Location Zones
711 Nose Landing Gear

E. Prepare to Check the Hydraulic Fluid Level in the Shock Strut

S 483-048

- (1) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 483-053

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

- (2) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

NOTE: The doors for the main and nose landing gear open at the same time when you use the ground release lever.

S 483-050

- (3) Put the control lever for the landing gear in the OFF position and attach a DO-NOT-OPERATE tag.

F. Check the hydraulic fluid level of the shock strut for the nose landing gear

NOTE: If you think the strut fluid level is correct, then do the Nitrogen Servicing Only task and adjust the nitrogen volume as necessary.

S 223-051

- (1) Check the hydraulic fluid level with the airplane at the first shock strut extension:
 - (a) Remove the cap from the air valve.
 - (b) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

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WARNING: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (c) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (d) Measure the actual "X" dimension on the strut as shown on Fig. 302.
- (e) Use the chart on Fig. 302 to find the "X" dimension that corresponds to the pressure you measured.
- (f) Compare the "X" dimension from the chart to the "X" dimension that you actually measured.
- (g) If the actual measured "X" dimension is within the upper and lower limits of the "X" dimension from the chart, then do the steps for a pressure check at the second point.
- (h) If the actual measured "X" dimension is not within the upper and lower limits of the "X" dimension from the chart, then do the Nitrogen Servicing Only to get the measured "X" dimension within the limits. Then do the steps for a pressure check at the second point.

S 223-052

- (2) Check the hydraulic fluid level with the airplane at the second shock strut extension:

NOTE: To get a different shock strut extension, you can have the airplane at a different weight, or, if the airplane is lifted on jacks, you can use the airplane jacks or floor jacks to compress or extend the shock strut.

You should have a difference of 2 - 4 inches between the two shock strut extensions to do the check.

- (a) Remove the cap from the air valve.
- (b) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

WARNING: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (c) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (d) Measure the actual "X" dimension on the strut as shown on Fig. 302.
- (e) Use the chart on Fig. 302 to find the "X" dimension that corresponds to the pressure you measured.
- (f) Compare the "X" dimension from the chart to the "X" dimension that you actually measured.

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- (g) If the actual measured "X" dimension is within the upper and lower limits of the "X" dimension from the chart, then do these steps to complete the check:
 - 1) Tighten the swivel nut to 5 - 7 pound-feet to close the air valve.
 - 2) Remove the pressure gage from the shock strut.
 - 3) Install the cap for the air valve.
- (h) If the actual measured "X" dimension is not within the upper and lower limits of the "X" dimension from the chart, then do the Fluid and Nitrogen Servicing to adjust the fluid level.

NOTE: If only one of the two pressure checks is satisfactory, then the fluid volume is not correct.

- (i) Tighten the swivel nut to 5 - 7 pound-feet to close the air valve.
- (j) Remove the pressure gage from the shock strut.
- (k) Install the cap on the air valve.

TASK 12-15-02-613-029

4. Servicing of the Shock Strut with Nitrogen Only

A. Equipment

- (1) Strut Inflation Tool - F70200-14
- (2) Pressure Gage, 0 to 2000 PSIG - Commercially Available

B. Consumable Materials

- (1) Dry nitrogen (recommended), 2200 psi (commercially available)
- (2) Dry air (optional), 2200 psi (commercially available)

C. References

- (1) AMM 07-11-02/201, Jacking Airplane Nose

D. Nitrogen Servicing - Airplane Not on Jacks

S 223-030

- (1) Do these steps to service the shock strut with nitrogen:
 - (a) Remove the cap from the air valve.
 - (b) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

CAUTION: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (c) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (d) Measure the actual "X" dimension on the strut as shown on Fig. 302.
- (e) Use the chart on Fig. 302 to find the "X" dimension that corresponds to the pressure you measured.

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- (f) Add nitrogen to the shock strut until the measured "X" dimension gets to the upper end of the limit of the "X" dimension from the chart.

NOTE: It is recommended to use the upper end of the limit to allow for some leakage.

- (g) Tighten the swivel nut to 5 -7 pound-feet to close the air valve.
- (h) Remove the pressure gage from the shock strut.
- (i) Install the cap for the air valve.

E. Nitrogen Servicing - Airplane on Jacks

S 613-031

- (1) Do these steps to service the shock strut with nitrogen:
 - (a) Lift the nose of the airplane until the shock strut for the nose gear is fully extended (AMM 07-11-02/201). Look at the chart on Fig. 302 to make sure the strut is fully extended.
 - (b) Remove the cap from the air valve.
 - (c) Install a pressure gage on the shock strut to measure the pressure. Use the instructions supplied with the tool.

CAUTION: LOOSEN THE NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT REMOVE THE VALVE BODY ON A PRESSURIZED STRUT. AIR PRESSURE CAN BLOW THE VALVE OUT AND INJURE PERSONNEL.

- (d) Loosen the swivel nut for the air valve two turns and measure the pressure of the shock strut.
- (e) Add nitrogen to the shock strut until the pressure is 200 +/- 10 psig.
- (f) Tighten the swivel nut to 5 -7 pound-feet to close the air valve.
- (g) Remove the pressure gage from the shock strut.
- (h) Install the cap for the air valve.

S 583-032

- (2) Lower the nose of the airplane and remove the jacks (AMM 07-11-02/201).

TASK 12-15-02-603-002

5. Servicing of the Shock Strut with Fluid and Nitrogen

A. Equipment

- (1) Shock Strut Inflation Tool - F70200-14
- (2) Pressure Gage, 0 to 2000 PSIG - Commercially Available

B. Consumable Materials

- (1) Dry nitrogen (recommended), 2200 psi (commercially available)
- (2) Dry air (optional), 2200 psi (commercially available)
- (3) D00467 Fluid - Fully Formulated BMS 3-32 Type I, II (Preferred)
- (4) D00212 Hydraulic Fluid MIL-H-5606 or MIL-H-6083 (Optional)
- (5) D00510 Lubrizol 1395

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C. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks
- (2) AMM 32-00-20/201, Landing Gear Downlocks

D. Access

- (1) Location Zones
711 Nose Landing Gear

E. Procedure to Adjust the Fluid Level of the Shock Strut

S 863-005

- (1) Deflate the shock strut of the nose landing gear.
 - (a) Remove the cap from the air valve (Detail A, Fig. 301).
 - (b) Install a flexible hose on the air valve and put the other end of the hose in the drain bucket.

WARNING: LOOSEN THE SWIVEL NUT FOR THE AIR VALVE A MAXIMUM OF TWO TURNS. DO NOT LOOSEN THE AIR VALVE BODY. AIR PRESSURE CAN BLOW THE VALVE OFF AND CAN CAUSE INJURY TO PERSONS.

- (c) Loosen the swivel nut for the air valve two turns.
- (d) Let the shock strut fully deflate.
- (e) Fully loosen the swivel nut for the air valve to open the valve.

S 613-033

CAUTION: USE ONLY THE TYPE OF FLUID WHICH IS SPECIFIED IN THIS PROCEDURE TO FILL THE SHOCK STRUT. IF YOU USE AN INCORRECT FLUID, IT CAN CAUSE DAMAGE TO THE SEALS.

CAUTION: 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.

- (2) Fill the shock strut with fluid.
 - (a) Remove the dust cap from the oil charging valve.
 - (b) Attach an oil charging line to the oil charging valve.
 - (c) Make sure the air valve is fully open.

CAUTION: CLEAN ALL THE HYDRAULIC FLUID FROM THE TIRES IMMEDIATELY. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE TIRES.

- (d) Fill the shock strut with fluid until the fluid flows into the drain bucket.
- (e) Continue to fill the shock strut until the fluid which flows into the bucket is free of bubbles.
- (f) Remove the oil charging line.
- (g) Replace the dust cap for the oil charging valve.
- (h) Remove the overflow hose from the air valve.

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S 863-010

- (3) Inflate the shock strut of the nose landing gear with dry nitrogen.
- (a) Remove the hose from the air valve , if it is installed.
 - (b) Install the strut inflation tool on the shock strut. Use the instructions supplied with the tool.

CAUTION: NITROGEN ENTRAINMENT IN THE FLUID CAN CAUSE THE SHOCK STRUT TO DEFLATE TOO MUCH. WHEN THE SHOCK STRUT IS DEFLATED, THE "X" DIMENSION FROM FIGURE 302 SHOULD BE INCREASED 1.0 INCHES FOR A GIVEN PRESSURE TO COMPENSATE FOR THE NITROGEN ENTRAINMENT.

- (c) Open the nitrogen charging valve.
- (d) Add Nitrogen to the shock strut until the "X" dimension is 1.0 inch (2.5 cm) above the upper limit for a given pressure on the chart (Fig. 302).
- (e) Tighten the nut to 5-7 pound-feet to close the air valve (Detail A, Fig. 301).
- (f) Remove the strut inflation tool.
- (g) Install the cap for the air valve.

S 843-070

- (4) Return the airplane to service.

S 613-034

- (5) After 5 to 10 service landings, do these steps to check the pressure of the shock strut.
- (a) Exame the shock trut pressure and x dimension.
 - 1) Inflate the shock trut according to servicing chart (Fig. 302).
 - 2) Service the shock trut with dry nitrogen again.

TASK 12-15-02-843-039

6. Put the Airplane Back to Its Usual Condition

A. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks

B. Put the Airplane Back to Its Usual Condition

S 863-007

- (1) Remove the DO-NOT-OPERATE tag from the control lever for the landing gear.

S 863-008

- (2) Put the control lever for the landing gear to the DN position.

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S 093-009

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

(3) Remove the door locks and close the doors (AMM 32-00-15/201).

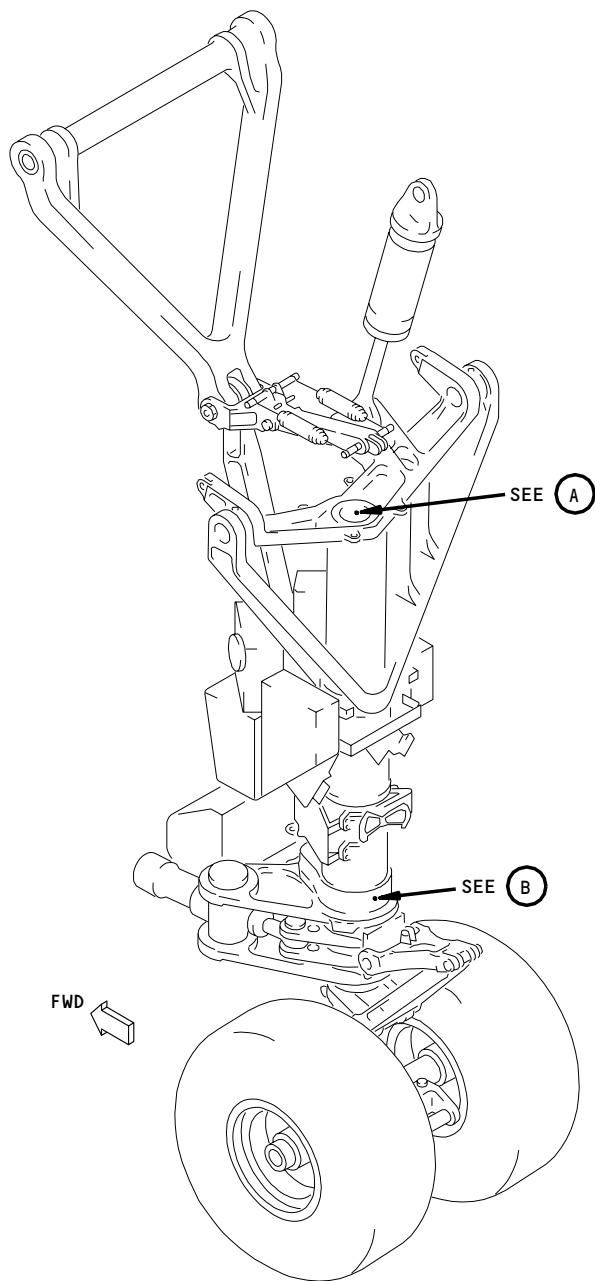
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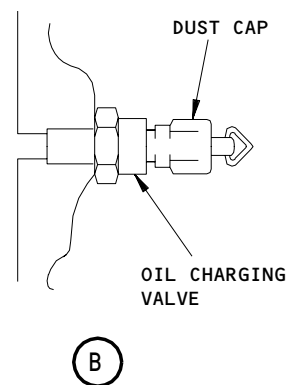
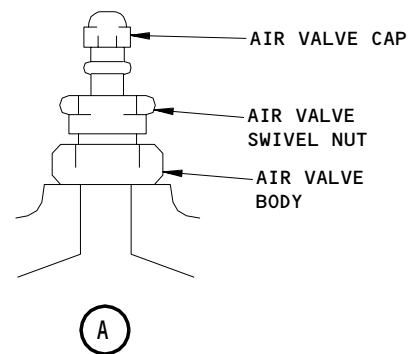
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NOSE LANDING GEAR



Servicing of the Shock Strut for the Nose Landing Gear
Figure 301

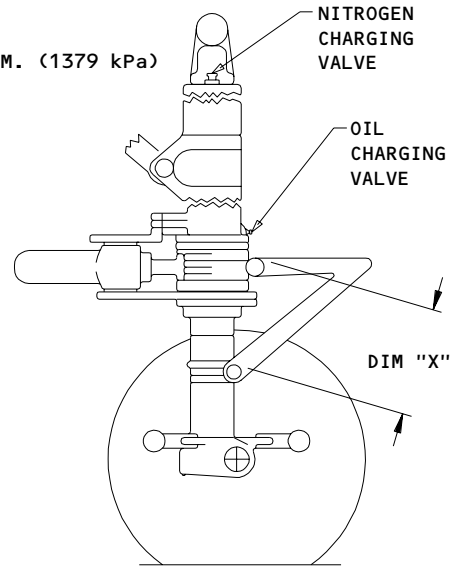
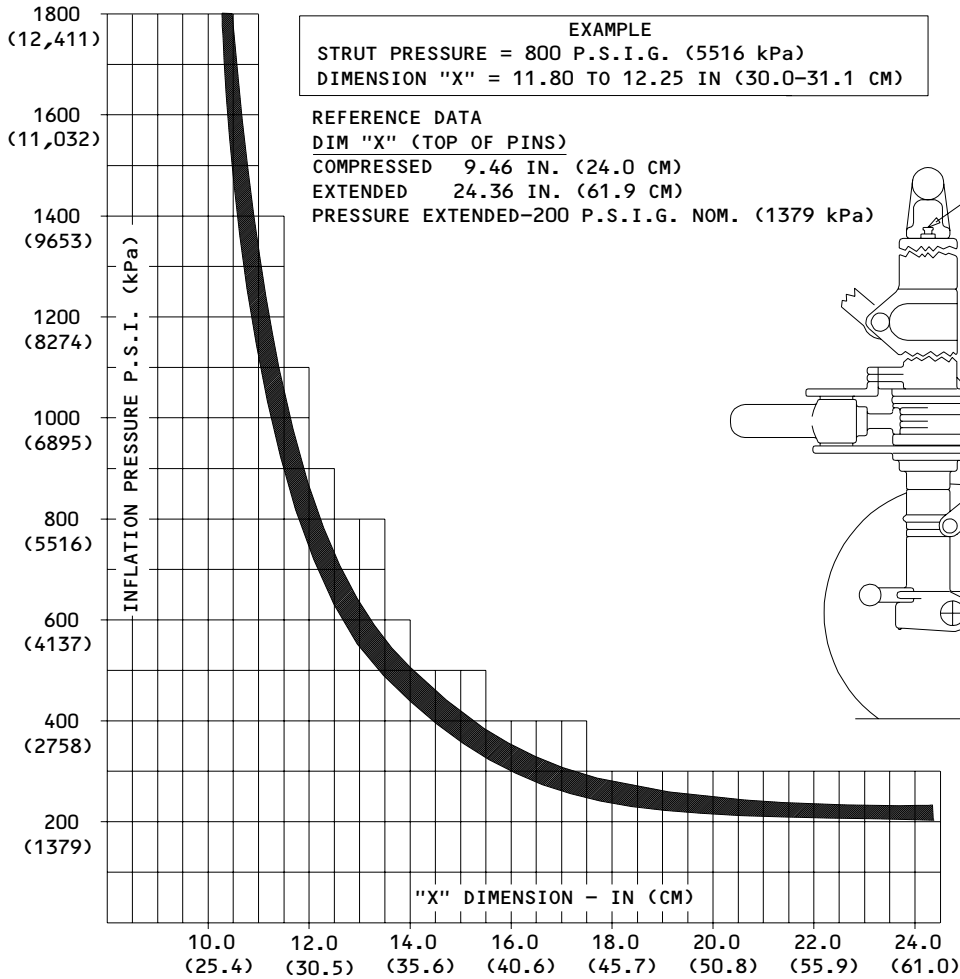
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SERVICING INSTRUCTIONS 757-200 N.L.G. SHOCK STRUT



Servicing Chart for the Shock Strut of the Nose Landing Gear
Figure 302 (Sheet 1)

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SERVICING INSTRUCTIONS - 757-200 N.L.G. SHOCK STRUT

NITROGEN SERVICING ONLY

1. WITH APL WEIGHT ON GEAR DETERMINE STRUT PRESSURE WITH GAUGE.
2. DETERMINE CORRESPONDING "X" DIMENSION FOR THE PRESSURE FROM SERVICING CHART.
3. ADD OR RELEASE DRY NITROGEN TO OBTAIN THE CORRECT "X" DIMENSION WITHIN THE SERVICING BAND.

AND THE CORRESPONDING "X" DIMENSION FOR THIS PRESSURE FROM SERVICING CHART.

7. **IMPORTANT** FOR INITIAL NITROGEN SERVICING INFLATE THE STRUT TO THE "X" DIMENSION OBTAINED IN STEP 6 PLUS 1.0 INCHES (2.54 cm). CLOSE NITROGEN VALVE. AFTER SEVERAL LANDINGS PROCEED TO STEP 8.

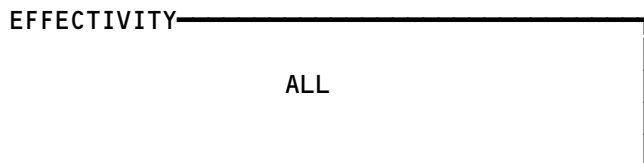
OIL AND NITROGEN SERVICING

4. OPEN NITROGEN VALVE AND DEFLATE STRUT COMPLETELY.
5. FILL WITH BMS 3-32 (TYPE I OR II) FLUID THRU OIL CHARGING VALVE UNTIL OIL FLOWS BUBBLE FREE OUT OF NITROGEN VALVE PORT.
6. WITH APL WEIGHT ON GEAR INFLATE STRUT APPROXIMATELY ONE INCH (2.54 cm) AND DETERMINE STRUT PRESSURE WITH GAUGE

8. AFTER SEVERAL LANDING RESERVICE WITH DRY NITROGEN PER STEPS 1, 2, & 3 ABOVE.

NOTE: IF THE STRUT HAS BEEN COMPLETELY DEFLATED FOR ANY REASON, SERVICE WITH OIL AND NITROGEN PER STEPS 4 THRU 8. PERIODIC OIL SERVICING SHOULD BE PERFORMED PER SECTION 12 OF THE BOEING MAINTENANCE MANUAL.

Servicing Chart for the Shock Strut of the Nose Landing Gear
Figure 302 (Sheet 2)



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LANDING GEAR TIRES - SERVICING

1. General

A. This procedure contains one task. The task is to inflate a tire by one of these two procedures:

- (1) Fill the tires with nitrogen to the pressure that is necessary.
- (2) Add nitrogen and air (if it is necessary) to a tire that is not fully inflated.

NOTE: We use the word "refill" or the word "top-off" as an alternative to the word "add" as shown in these examples:

- Add nitrogen and air to a tire.
- Refill the tire with nitrogen and air.
- Top-off the tire with nitrogen and air.

TASK 12-15-03-613-001

2. Servicing of the Main and Nose Gear Tires

A. Equipment

- (1) Tire Inflation Tool - F70199-1

B. Consumable Materials

- (1) Dry Nitrogen - Commercial grade (99.5 percent pure nitrogen), from a regulated source
- (2) Dry Air - If nitrogen is not available - a source of clean dry air with maximum moisture content that is equivalent to an atmospheric dew point of -20°F (-29°C), from a regulated pressure source

C. References

- (1) AMM 32-45-01/401, Main Gear Tires
- (2) AMM 32-45-02/401, Nose Gear Tires

D. Access

(1) Location Zones

- 731 Left Main Landing Gear
- 741 Right Main Landing Gear
- 711 Nose Landing Gear

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E. Preparation for Servicing of the Main and Nose Gear Tires

S 843-030

CAUTION: USE A CALIBRATED GAGE WITH AN APPROVED DIAL TO DO A CHECK OF THE TIRE PRESSURE. IF THE GAGE IS NOT ACCURATE, YOU CAN INFLATE THE TIRE TO THE INCORRECT PRESSURE. THIS CAN CAUSE DAMAGE TO THE TIRE.

- (1) Obey this CAUTION during all of this task.

S 843-042

- (2) Some airplanes have a tire pressure gage installed in the wheels. The tire pressure gage is part of an assembly that includes the gage and the tire fill valve. You can use the gage for walk-around inspections and other fast checks. You must use a calibrated gage with an approved dial when you inflate a tire. You must also use the calibrated gage when the tire pressure indication must be very accurate.

S 843-039

- (3) All tires must initially be inflated with nitrogen.

S 843-041

- (4) You can add air to the tire when nitrogen is not available, but you must obey this limit:
- (a) The oxygen in the air that you add must not be more than 5 percent of the total tire volume.

S 843-038

- (5) Two procedures to refill the tire are given in paragraph 2.F.(3)(d), Service the Main and Nose Gear Tires (Fig. 301).
- (a) The first procedure permits one value of 13 psi for the sum of all the air refill pressures. This procedure is more easy to use than the second procedure. You can use it when the refill pressure will not be more than the limit of 13 psi for the air refills.
- (b) The second procedure permits different refill pressure values for the full range of permitted tire pressures. Use this procedure if the air refill pressure that is necessary is more than 13 psi.

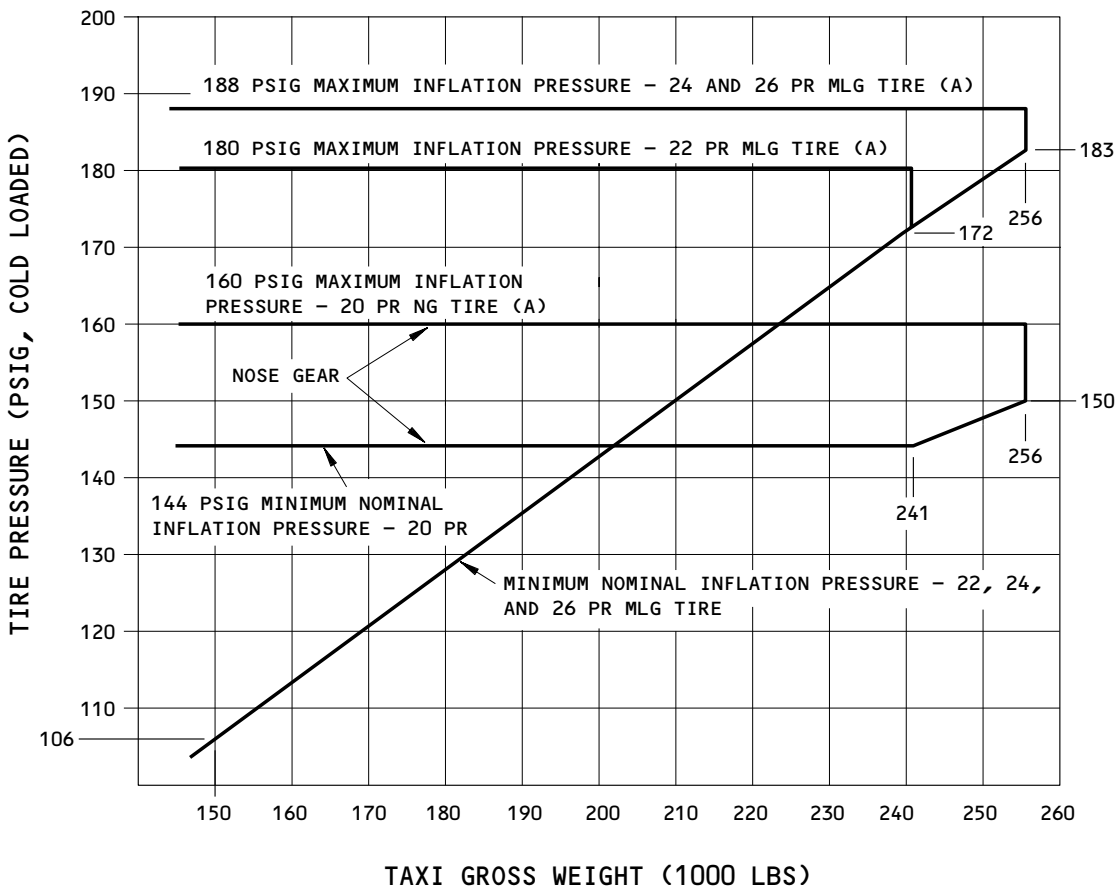
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757-200

- NOTES:**
1. TIRE PRESSURES MUST BE BETWEEN THE MINIMUM AND MAXIMUM LIMITS SHOWN IN THE CHART THAT CORRESPOND TO THE EXPECTED MAXIMUM TAXI WEIGHT AND THE TIRES IN USE. FOR EXAMPLE, THE 24 AND 26 PR MAIN GEAR TIRES ON A 230,000 POUND GROSS WEIGHT AIRPLANE CAN BE INFLATED FROM 164 PSI (MINIMUM) TO 188 PSI (MAXIMUM). THE LIMITS INCLUDE GAGE TOLERANCES.
 2. ALL MAIN GEAR TIRES SHOULD BE INFLATED TO THE SAME PRESSURE ± 5 PSI.
 3. INFLATION PRESSURES ARE FOR LOADED TIRES (AIRPLANE WEIGHT ON THE TIRES). FOR UNLOADED TIRES, REDUCE PRESSURE BY 4%.
 4. 24 PR MAIN GEAR TIRES ARE NECESSARY FOR AIRPLANES WITH MAX TAXI GROSS WEIGHTS THAT ARE MORE THAN 241,000 POUNDS (PR = PLY RATING)
- (A) MAXIMUM PRESSURE, INCLUDING TOLERANCE.

Landing Gear Tire Inflation Pressure Limits
Figure 301

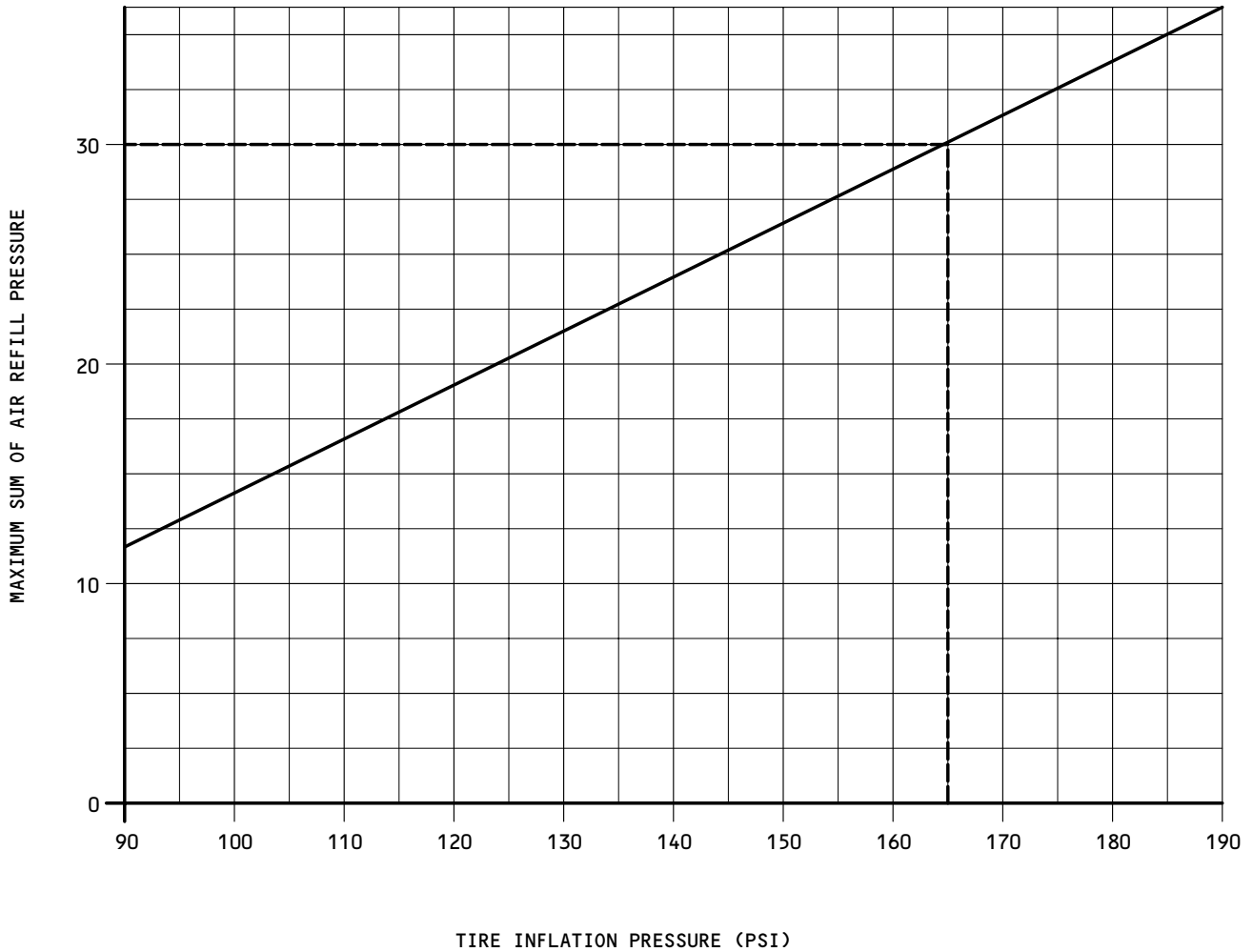
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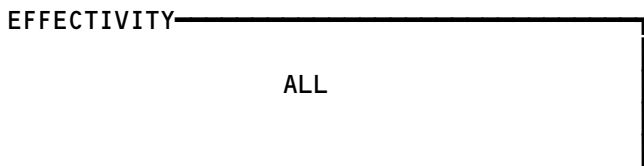
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Air Refill Pressure
Figure 302



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275020

S 843-034

CAUTION: INCREASE THE TIRE PRESSURES WHEN YOU OPERATE THE AIRPLANE AT A HIGHER GROSS WEIGHT AGAIN (SEE FIG. 301). THE TIRES WILL BE DAMAGED IF YOU OPERATE THEM AT PRESSURES LESS THAN THE VALUES SHOWN IN THE CHART.

- (6) When you operate the airplane at less than the maximum weight, you can decrease the tire pressure. You can decrease it to the value for the lower maximum weight (Fig. 301). An example of this type of operation is when you use the airplane for pilot training.

S 843-035

- (7) You must do a check of tire pressures each day with an accurate gage. You must do the checks when the tires are cool. You must not do a check of tire pressure for a minimum of 2 hours after a flight. You must not bleed gas from a hot tire to adjust the tire pressure to the correct value.

F. Procedure

S 613-002

- (1) Do a check of the tire pressure.
(a) 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.

- 1) If the main landing gear tires and nose 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: Main Landing Gear and Nose Gear HOT Tire Pressure Check (AMM 12-15-03/301).
- (b) Do a check of the tire pressure with an accurate gage.
(c) Compare the tire pressure indication on the gage with the correct pressure for the airplane gross weight (Fig. 301).
(d) If the measured tire pressure is below the necessary pressure by no more than 5 percent, inflate the tire to the necessary pressure.
(e) If the measured tire pressure is between 5%-10% below the necessary pressure, do these steps:

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WARNING: USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

SERVICING CART AND ALL PERSONNEL SHALL BE POSITIONED FORE OR AFT (TREAD SIDE) OF TIRE WHEN SERVICING TO PREVENT INJURIES, DEATH AND EQUIPMENT DAMAGE.

- 1) Inflate the tire to the necessary pressure.
- 2) Do a check of the pressure again after 24 hours.

CAUTION: TIRES THAT REQUIRE FREQUENT REFILLS TO MAINTAIN THE NOMINAL SERVICE PRESSURE ARE LIKELY TO HAVE A TREAD LOSS OR CARCASS RUPTURE IF THEY ARE LEFT IN SERVICE TOO LONG. THESE TIRES SHOULD BE REMOVED FROM SERVICE AS SOON AS POSSIBLE.

- 3) If the tire pressure is more than 5% below the necessary pressure again, replace the tire.
 - a) Remove the wheel and tire assembly (AMM 32-45-01/401, Main Gear) (AMM 32-45-02/401, Nose Gear).
 - b) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - c) Write the cause of the tire removal on the tire to help the inspectors when they examine the tire.
- (f) If the measured tire pressure is between 10%-20% below the necessary tire pressure, do these steps:
 - 1) Replace the wheel and tire assembly.
 - a) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - b) Write the cause of the tire removal on the tire to help the inspectors when they examine the tire.
- (g) If the measured tire pressure is more than 20% below the necessary tire pressure, do these steps:
 - 1) Replace the tire and wheel assembly.
 - a) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.

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- b) Write the cause of the tire removal on the tire to help the inspectors when they examine the tire.
- 2) If the wheel and tire assembly has turned with the airplane weight on it after the pressure has decreased, replace the wheel and tire assembly installed on the opposite side of that axle.
 - a) 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.
 - b) Send the tire for inspection for damage.

S 613-006

WARNING: INITIALLY FILL THE TIRE WITH NITROGEN. A HOT TIRE THAT IS FILLED WITH AIR WILL MAKE EXPLOSIVE GASES. IF YOU FILL THE TIRE WITH AIR, AN EXPLOSION CAN OCCUR AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) To inflate a tire (initial inflation):
 - (a) Use the instructions on the tire inflation tool and install the tool.

WARNING: USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

SERVICING CART AND ALL PERSONNEL SHALL BE POSITIONED FORE OR AFT (TREAD SIDE) OF TIRE WHEN SERVICING TO PREVENT INJURIES, DEATH AND EQUIPMENT DAMAGE.

- (b) Inflate the tire with nitrogen to the pressure shown on Fig. 301.
- (c) Remove the tire inflation tool.

S 613-004

- (3) To add nitrogen or air to a tire that is not fully inflated (top-off):
 - (a) Use the instructions on the tire inflation tool and install the tool.
 - (b) If the volume of the oxygen in the tire will be more than 5 percent, refill the tire as follows:

NOTE: See the refill procedure in the steps that follow to calculate the volume of oxygen.

- 1) Deflate the tire to atmospheric pressure.
- 2) Inflate the tire by the procedure to inflate the tire for initial inflation.
- (c) Refill (top-off) the tire with nitrogen to the pressure that is necessary (Fig. 301).

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- (d) Refill (top-off) the tire with air as shown in Procedure 1 or Procedure 2.

NOTE: You can use air when nitrogen is not available but you must obey this limit:

- The air that you add can not cause the volume of the oxygen in the tire to be more than 5 percent.
- To make sure that the oxygen does not become more than 5 percent, use one of the procedures that follow (Procedure 1 or Procedure 2):

1) Procedure 1:

- a) Make a record of the quantity of the air that you add each time that you refill the tire. The sum of all the air refill pressures must not be more than 13 psi.

EXAMPLE: You can add one 6 psi and one 7 psi refill of air. Deflate the tire and inflate it with nitrogen when it is necessary to increase the pressure again.

2) Procedure 2:

- a) Make a record of the quantity of the air that you add each time that you refill the tire (for example, 5 psi, 8 psi, etc.). The sum of all the quantities of air that you add must not be more than the maximum quantity shown in Fig. 302.

EXAMPLE: For example, you initially inflate the tire to 165 psi with nitrogen. As shown in Fig. 302, the sum of all the quantities of air that you add can not be more than 30 psi. For example, you can add one 6 psi, one 14 psi, and two 5 psi refills. When it is necessary to add gas to the tire again, you must deflate the tire and inflate it with nitrogen.

S 093-005

- (4) Remove the tire inflation tool.

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TASK 12-15-03-213-008

3. Main Landing Gear and Nose Gear HOT Tire Pressure Check

NOTE: The hot tire pressure check procedure is intended for occasional use only. It is not intended to be used as a permanent alternative method to performing the more accurate cold tire checks. The more accurate cold tire pressure check method should be used as frequently as possible to avoid possible tire service life problems such as tread losses and carcass ruptures.

A. References

- (1) AMM 05-51-14/201, High Energy Stop
- (2) AMM 32-45-01/401, Main Gear Tires
- (3) AMM 32-45-02/401, Nose Gear Tires
- (4) AMM 32-00-15/201, Landing Gear Downlock Pins

B. Equipment

- (1) Gage - Tire Pressure, 0-300 psig (0-2069 KPa) (commercially available)
- (2) F70199-1 Inflator - Tire, Landing Gear Tires

C. Consumable Materials

- (1) G00018 Nitrogen, Gaseous, pressurizing - BB-N-411, Type I or MIL-PRF-27401, Type I

D. Access

- (1) Location Zones
 - 731 Left Main Landing Gear
 - 741 Right Main Landing Gear
 - 711 Nose Landing Gear

E. Prepare for the Procedure

S 843-044

WARNING: DO NOT GO NEAR WHEEL, BRAKE, OR TIRE EQUIPMENT WHICH ARE SUSPECTED OF BEING OVERHEATED. DO THE PROCEDURE FOR HIGH ENERGY STOP/HEAT DAMAGE. INJURY TO PERSONS CAN OCCUR.

- (1) If the wheel, brake, or tire equipment is suspected of being overheated, examine the landing gear cylinders, wheels and brakes after the high energy stop condition (AMM 05-51-14/201).

S 843-046

- (2) The intent of this procedure 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.

S 843-047

- (3) 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.

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S 843-048

- (4) 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 procedure as an alternative inspection just prior to dispatch.

S 843-049

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.

- (5) Use a gage to measure the tire pressures.

S 423-024

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.

- (6) If the downlock pins are not installed in the nose and main landing gear, install the landing gear downlock pins (AMM 32-00-15/201).

F. Procedure

S 613-010

- (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 main landing gear tire pressures can be higher than normal; this could cause you to over-inflate a suspected low pressure tire.

S 613-023

CAUTION: MAKE SURE THE DIRECT READING GAGE 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) If all of the main landing gear 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) Use the pressure gage to measure the main landing gear tire pressures.

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S 613-011

- (3) Use the tire pressure tables for the main landing gear (Fig. 301, Fig. 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.

- (a) For the applicable airplane maximum taxi weight and tire, find the minimum service pressure.

S 613-013

- (4) Make sure that all of the main landing gear tire pressures are above the minimum "cold" specified pressures for the airplane's maximum taxi weight.

S 613-022

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.

- (5) If the pressure of one tire is low, calculate the average of the other seven tires.

S 613-015

- (6) If the pressure of the low tire is 5% - 10% less than the average pressure of the other seven tires, do these steps:

WARNING: USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Connect the inflator, F70199-1 to the inflation valve and inflate the tire with nitrogen, BB-N-411, Type I or MIL-PRF-27401, Type I to the average value of the other seven tires.

- (b) Remove the inflator, F70199-1 from the inflation valve.

S 613-016

- (7) If the pressure of one tire is more than 10% below the average pressure of the other seven tires, do these steps:

- (a) Replace the tire and wheel assembly (AMM 32-45-01/401).

- 1) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.

- a) Write the cause of the tire removal on the tire to help the inspectors when they examine the tire.

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S 613-026

- (8) If the tire pressure of one tire is more than 20% below the average pressure of the other seven tires, do these steps:
- (a) Replace the tire and wheel assembly.
 - 1) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - a) Write the cause of the tire removal on the tire to help the inspectors when they examine the tire.
 - (b) Replace the wheel and tire assembly installed on the opposite side of that axle.
 - 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.

S 613-017

- (9) Use the pressure gage to measure the nose landing gear pressures.

S 613-018

- (10) For the applicable airplane maximum taxi weight and tire, find the minimum nose tire service pressure (Fig. 301).

S 613-019

- (11) Make sure both of the nose gear tires are above the minimum cold specified pressures for the the airplane's maximum weight.

S 613-021

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.

- (12) If the pressure of one tire is 5%-10% below the pressure of the other tire, do these steps:

WARNING: USE A REGULATED PRESSURE SOURCE TO SERVICE THE TIRES. AN UNREGULATED PRESSURE SOURCE CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Connect the inflator, F70199-1 to the inflation valve and inflate the tire with nitrogen, BB-N-411, Type I or MIL-PRF-27401, Type I to the value of the other tire.
- (b) Remove the inflator, F70199-1 from the inflation valve.

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S 613-025

- (13) If the tire pressure of one tire is more than 10% below the pressure of the other tire, do these steps:
- (a) Replace the tire and wheel assembly (32-45-02/401).
 - 1) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - a) Write the cause of the tire removal on the tire to help the inspectors when they examine the tire.

S 613-027

- (14) If the tire pressure of one tire is more than 20% below the pressure of the other tire, do these steps:
- (a) Replace the tire and wheel assembly.
 - 1) Send the wheel and tire assembly for an inspection to find the cause for the low tire pressure.
 - a) Write the cause of the tire removal on the tire to help the inspectors when they examine the tire.
 - (b) Replace the wheel and tire assembly installed on the opposite side of the axle.
 - 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.

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PARKING BRAKE ACCUMULATOR – SERVICING

1. General

- A. The parking brake accumulator is filled with dry nitrogen to a pressure shown on the Fig. 301 placard. The charging valve for the accumulator and the pressure gauge are found in the aft fairing hydraulic equipment compartment.

TASK 12-15-04-613-001

2. Fill the Parking Brake Accumulator (Fig. 301)

A. Equipment

- (1) Pressurized Nitrogen Source (2000 psi)

B. References

- (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
(2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
(3) AMM 32-00-20/201, Landing Gear Downlocks
(4) AMM 32-44-00/001, Parking Brake System

C. Access

- (1) Location Zone
197 Wing to Body – Aft Lower Half (Left)
- (2) Access Panel
197KL Hydraulic Bay Access Door

D. Procedure

S 213-006

- (1) Make sure the downlocks on the nose and main landing gear are installed (AMM 32-00-20/201).

S 493-007

- (2) Put chocks on the landing gear wheels. Place wheel chocks about 3 inches away from the tires.

S 863-008

- (3) Remove the pressure from the main left and right hydraulic systems (AMM 29-11-00/201).

S 863-009

- (4) Release the parking brake, if it is set (AMM 32-44-00/001)

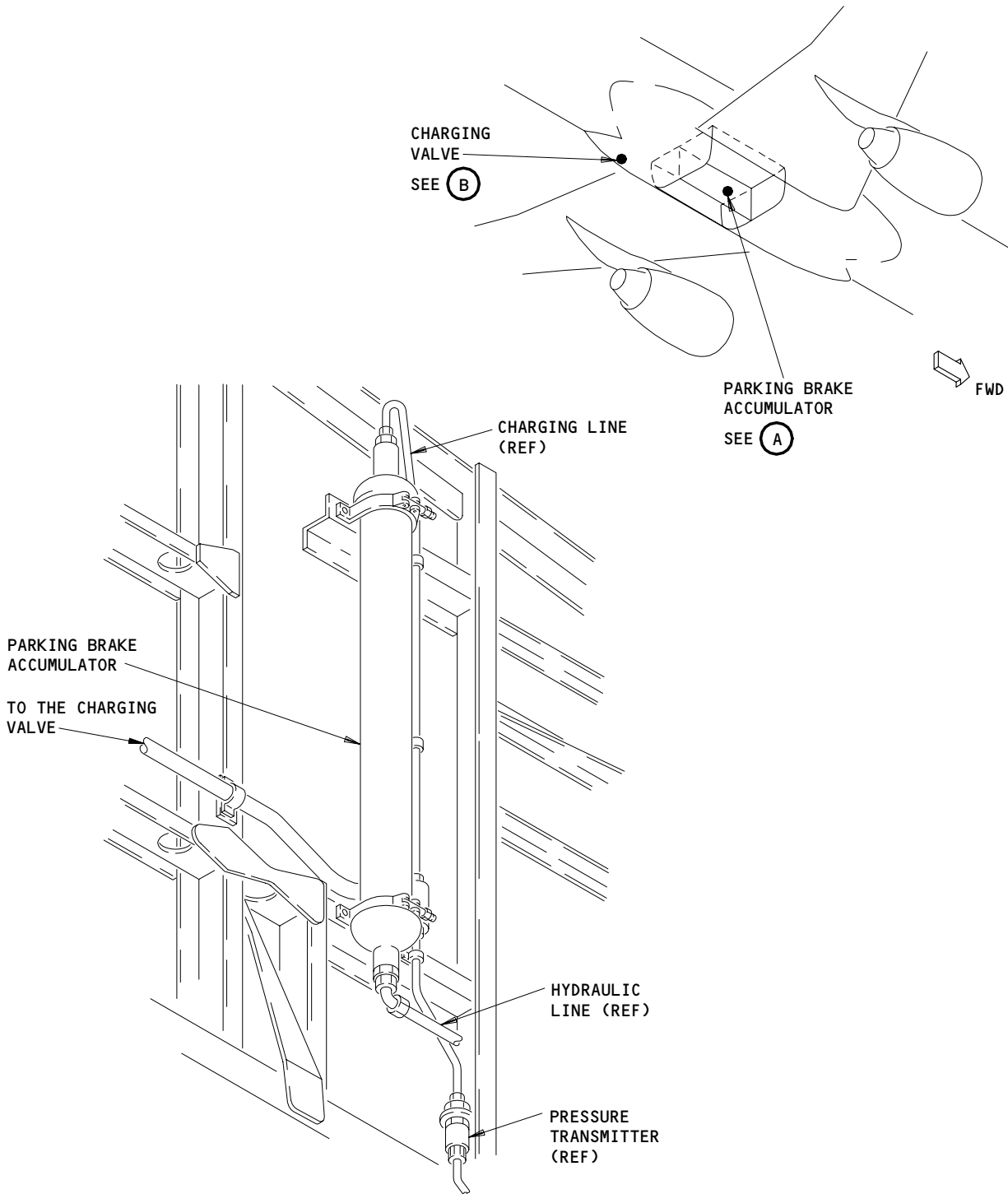
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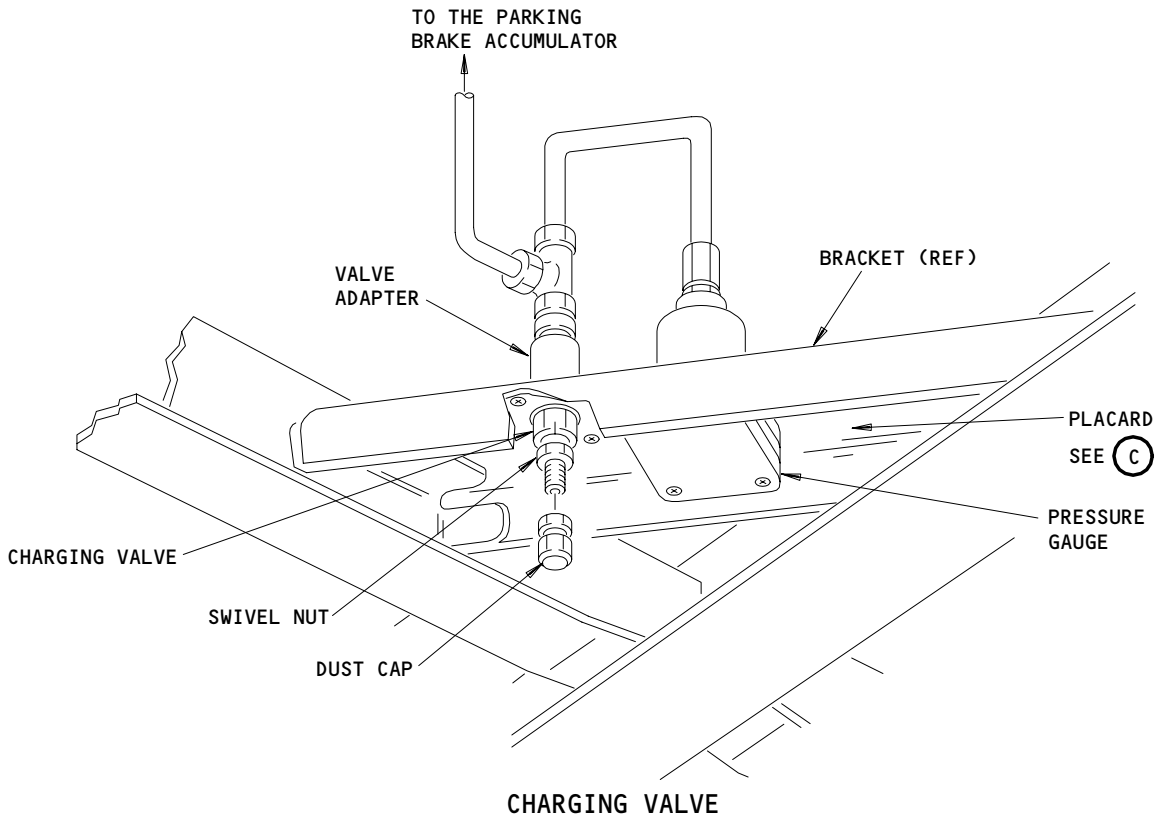
PARKING BRAKE ACCUMULATOR

(A)

Parking Brake Accumulator Servicing Location
Figure 301 (Sheet 1)

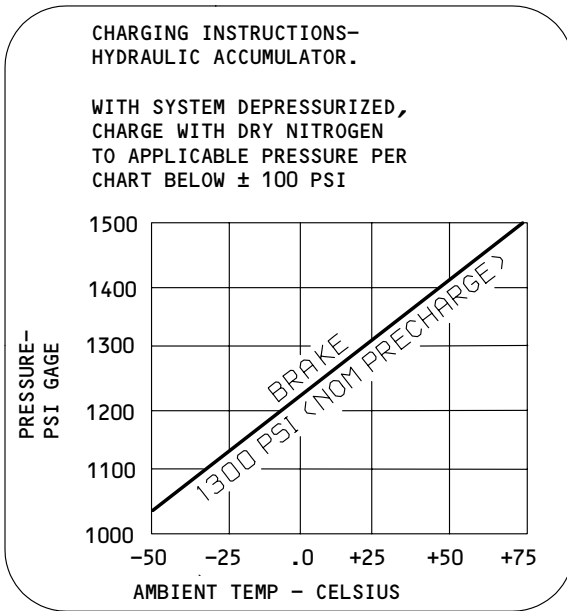
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CHARGING VALVE

(B)



PLACARD

(C)

Parking Brake Accumulator Servicing Location
Figure 301 (Sheet 2)

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S 013-002

- (5) Open the hydraulic bay access door, 197KL, to get access to the charging valve for the parking brake accumulator (AMM 06-41-00/201).

NOTE: The parking brake accumulator is installed in the right wheel well but it is not necessary to get access to it for this procedure.

S 863-014

- (6) Operate the left and right brake pedals a minimum of seven times to release the hydraulic oil pressure from the parking brake accumulator.

S 863-015

- (7) Wait ten minutes after you have released the oil pressure from the parking brake accumulator or until the accumulator temperature becomes stable.

S 213-003

- (8) Look and make sure the precharge pressure shown on the pressure gage, found adjacent to the charging valve, is in the range shown on the placard (View B).

S 613-004

- (9) If the pressure shown is not in the range shown on the placard (View C), do the steps that follow to charge the parking brake accumulator.

- (a) Remove the dust cap from the charging valve.
(b) Attach the nitrogen source to the charging valve.

WARNING: DO NOT LOOSEN THE CHARGING VALVE. THE INTERNAL PRESSURE COULD BLOW THE CHARGING VALVE OUT, AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (c) Loosen the swivel nut one turn.
(d) Charge the parking brake accumulator to the pressure shown on the placard (View C), adjacent to the charging valve.

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- (e) Tighten the swivel nut.
- (f) Operate the brake pedals a minimum of seven times to remove the hydraulic oil pressure from the brake accumulator.
- (g) Wait ten minutes.
- (h) Do a check of the precharge pressure again after the accumulator temperature becomes stable. If the precharge pressure is below the placard requirements, repeat steps (c) through (h).

- (i) Remove the nitrogen source from the charging valve.
- (j) Install the dust cap on the charging valve (View B).

S 863-011

- (10) Pressurize the right hydraulic systems as necessary to supply the parking brake pressure (AMM 29-11-00/201).

S 863-012

- (11) Wait ten minutes or until the accumulator temperature becomes stable.

S 863-005

- (12) Depressurize the hydraulic system (AMM 29-11-00/201).

S 863-018

- (13) Operate the brake pedals a minimum of seven times to remove the hydraulic oil pressure from the brake accumulator.

S 863-019

- (14) Wait ten minutes or until the accumulator temperature becomes stable.

S 213-020

- (15) Make sure that the precharge pressure that shows on the accumulator pressure gage is within placard requirements.

S 793-016

- (16) Do a test of the parking brake system to make sure that there are no leaks (AMM 32-44-00/501).

NOTE: It is not necessary to do a check for leaks if you did not need to service the accumulator.

S 413-010

- (17) Close the hydraulic bay access door, 197KL (AMM 06-41-00/201).

S 093-013

- (18) Remove the chocks from the landing gear wheels.

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HYDRAULIC MOTOR GENERATOR ACCUMULATOR – SERVICING

1. General

- A. This procedure contains the data necessary to do the servicing of the 5kva hydraulic motor generator (HMG) accumulator.

TASK 12-15-06-613-001-001

2. HMG Accumulator Servicing

A. References

- (1) 29-11-00/201, Main Hydraulic Systems
- (2) 32-00-15/201, Landing Gear Door Locks
- (3) 32-00-20/201, Landing Gear Downlocks

B. Equipment

- (1) Pressurized Nitrogen Source (2000 psi)
- (2) Door Locks, Main Landing Gear

C. Access

- (1) Location Zones
143/144 Main Landing Gear Body
- (2) Access Panels
732/742 Main Landing Gear Body Doors

D. Prepare to do the HMG Accumulator Servicing.

S 493-002-001

- (1) Make sure the landing gear downlocks are installed (Ref 32-00-20/201).

S 493-003-001

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Open the doors for the main landing gear, and install the door locks (Ref 32-00-15/201).

S 863-004-001

- (3) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).

E. Do the HMG Accumulator Servicing

S 213-005-001

- (1) Do a check of the pressure shown on the accumulator pressure gage.
 - (a) If the accumulator pressure is within the limits specified on the servicing placard, no servicing is required.
 - (b) If the pressure is not within the specified limits, service the accumulator.

EFFECTIVITY
AIRPLANES WITH A CHARGING VALVE IN THE
MAIN LANDING GEAR WHEEL WELL.

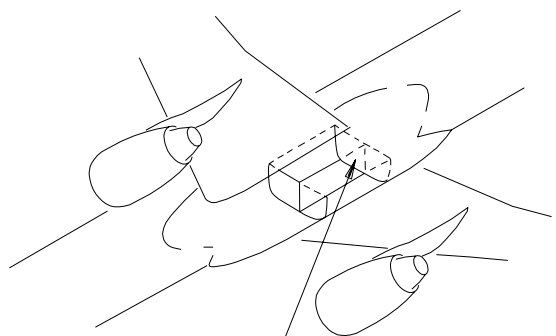
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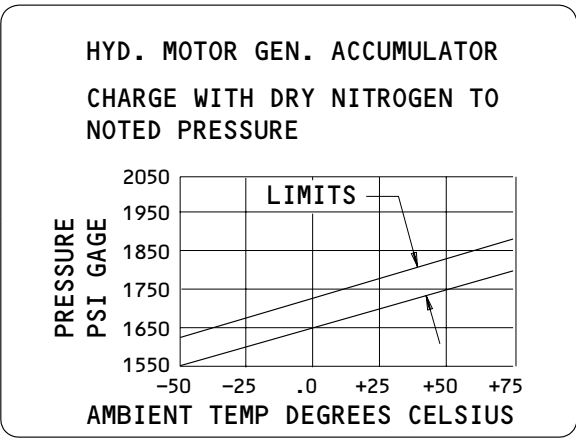
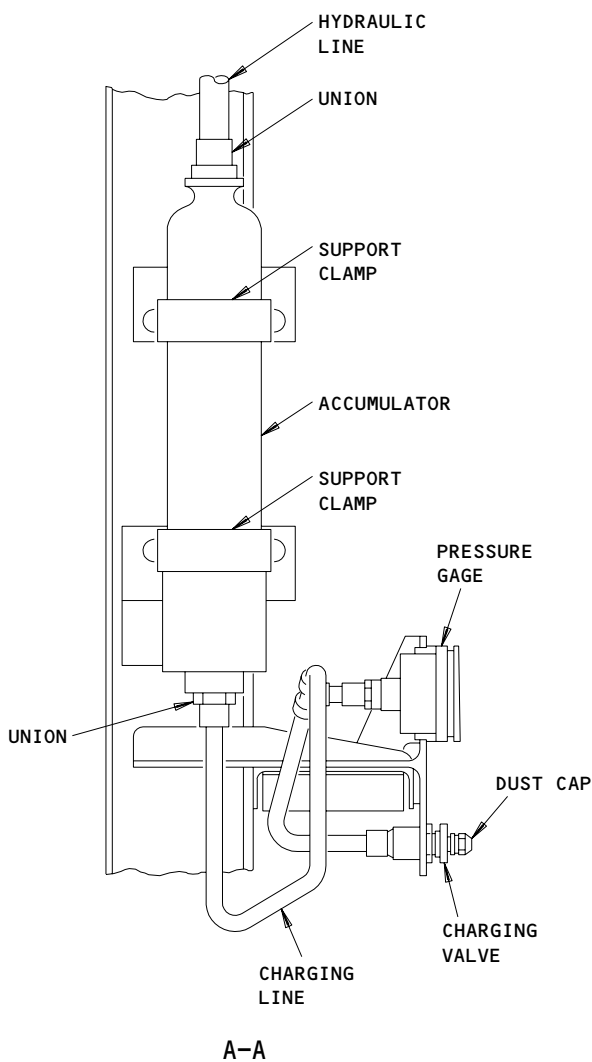
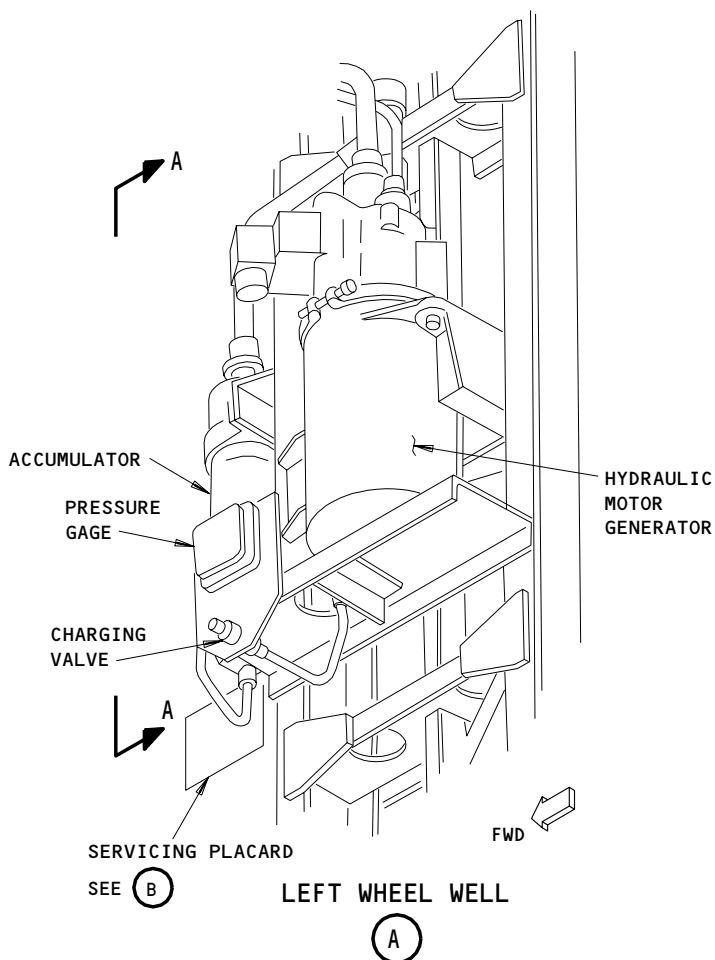
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LEFT WHEEL WELL
SEE (A)



SERVICING PLACARD
(B)

Hydraulic Motor Generator Accumulator Servicing
Figure 301

EFFECTIVITY—
AIRPLANES WITH A CHARGING VALVE IN THE
MAIN LANDING GEAR WHEEL WELL.

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CONFIG 1
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S 863-006-001

- (2) If the pressure shown is above the specified limits, do these steps:
(a) Remove the cap from the charging valve.

WARNING: LOOSEN THE CHARGING VALVE A SMALL INCREMENT TO RELEASE THE ACCUMULATOR PRESSURE. INTERNAL PRESSURE CAN BLOW THE CHARGING VALVE OUT AND CAN CAUSE INJURY TO PERSONS.

- (b) Loosen the charging valve a small increment to release the pressure to the limits shown on the servicing placard.

S 863-007-001

- (3) If the pressure shown is below the specified limits, do these steps:
(a) Remove the charging valve cap, and attach the nitrogen source.
(b) Loosen the swivel nut one turn.
(c) Add nitrogen to the accumulator to the pressure shown on the placard.
(d) Tighten the swivel nut.
(e) Remove the nitrogen source, and install the valve cap.

S 863-008-001

- (4) Pressurize the left hydraulic system if it is necessary (Ref 29-11-00/201).

S 093-009-001

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Remove the door locks, and close the landing gear doors (Ref 32-00-15/201).

EFFECTIVITY
AIRPLANES WITH A CHARGING VALVE IN THE
MAIN LANDING GEAR WHEEL WELL.

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HYDRAULIC MOTOR GENERATOR ACCUMULATOR – SERVICING

1. General

- A. This procedure contains the data necessary to do the servicing of the 10kva hydraulic motor generator (HMG) accumulator.

TASK 12-15-06-613-001-002

2. HMG Accumulator Servicing

A. References

- (1) AMM 29-11-00/201, Main Hydraulic Systems

B. Equipment

- (1) Pressurized Nitrogen Source (2000 psi)

C. Access

- (1) Location Zones

1974 Wing to Body - AFT Lower Half (Left)

- (2) Access Panels

197KL Central Hydraulic Service Center

D. Prepare to do the HMG Accumulator Servicing.

S 013-009-002

- (1) Open the access panel 197KL for the central hydraulic service center.

S 863-002-002

- (2) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

E. Do the HMG Accumulator Servicing

S 213-003-002

- (1) Do a check of the pressure shown on the accumulator pressure gage.
(a) If the accumulator pressure is within the limits specified on the servicing placard, no servicing is required.
(b) If the pressure is not within the specified limits, service the accumulator.

S 863-004-002

- (2) If the pressure shown is above the specified limits, do these steps:
(a) Remove the cap from the charging valve.

WARNING: LOOSEN THE CHARGING VALVE A SMALL INCREMENT TO RELEASE THE ACCUMULATOR PRESSURE. INTERNAL PRESSURE CAN BLOW THE CHARGING VALVE OUT AND CAN CAUSE INJURY TO PERSONS.

- (b) Loosen the charging valve a small increment to release the pressure to the limits shown on the servicing placard.

EFFECTIVITY
AIRPLANES WITH CHARGING VALVE IN THE
CENTRAL HYDRAULIC SERVICE CENTER.

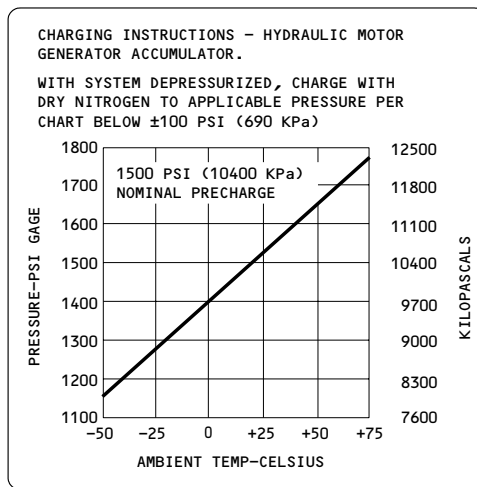
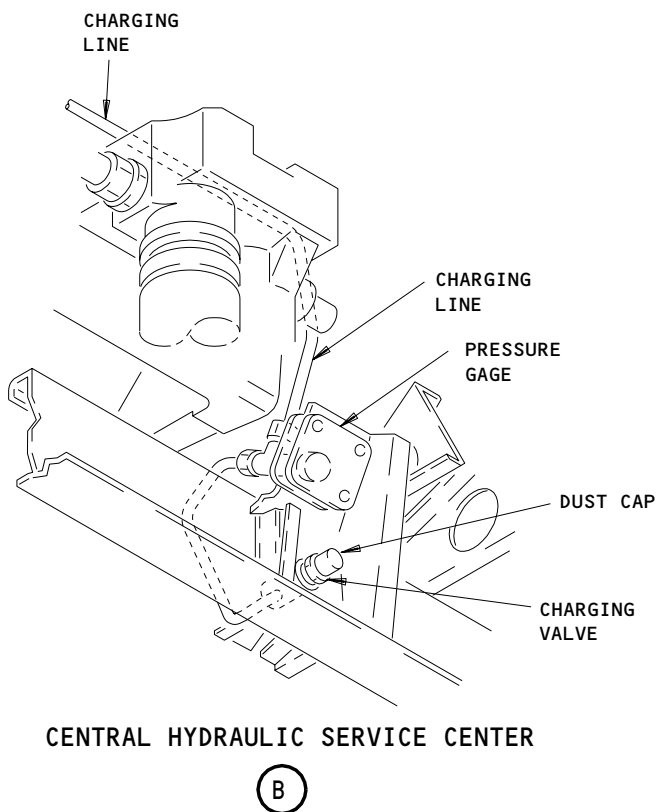
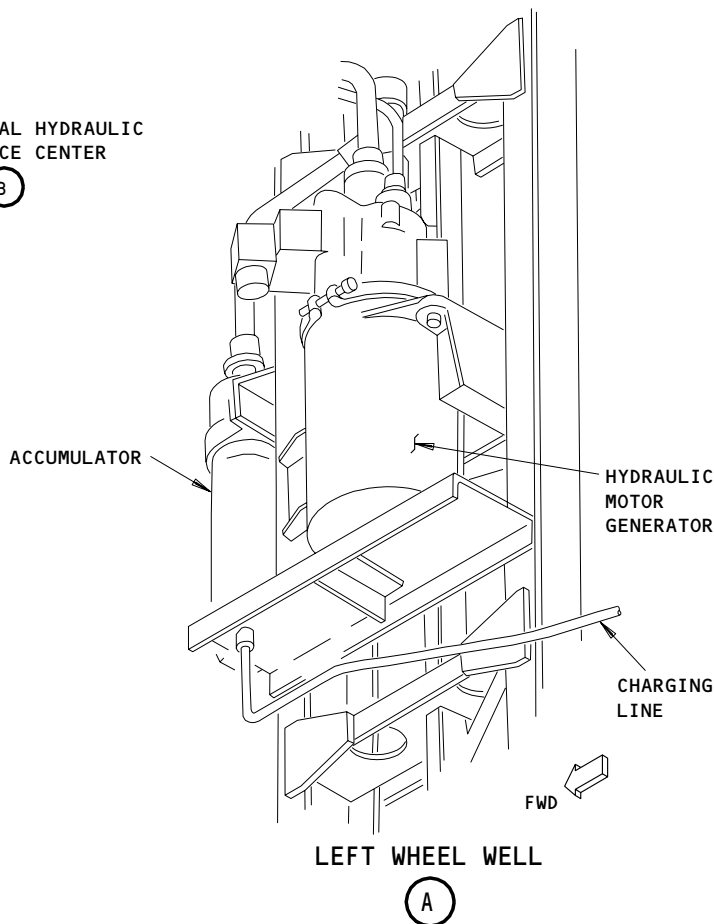
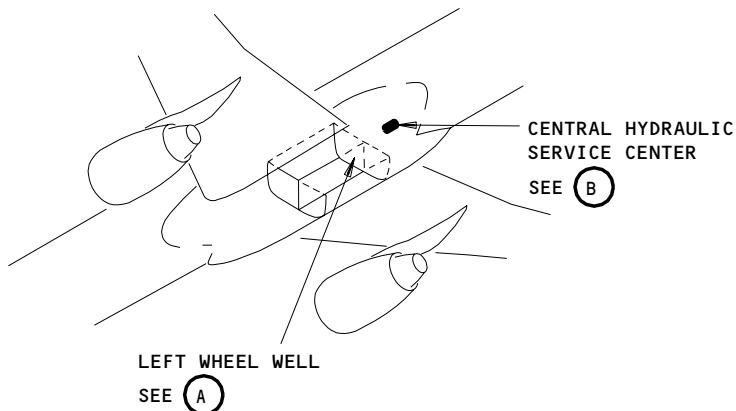
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SERVICING PLACARD
(MOUNTED ON THE CENTRAL HYDRAULIC SERVICE CENTER ACCESS DOOR)

Hydraulic Motor Generator Accumulator Servicing
Figure 301

EFFECTIVITY
AIRPLANES WITH CHARGING VALVE IN THE CENTRAL HYDRAULIC SERVICE CENTER.

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- S 863-005-002
- (3) If the pressure shown is below the specified limits, do these steps:
- (a) Remove the charging valve cap, and attach the nitrogen source.
 - (b) Loosen the swivel nut one turn.
 - (c) Add nitrogen to the accumulator to the pressure shown on the placard.
 - (d) Tighten the swivel nut.
 - (e) Remove the nitrogen source, and install the valve cap.
- S 863-006-002
- (4) Pressurize the left hydraulic system if it is necessary (AMM 29-11-00/201).
- S 413-007-002
- (5) Close the access panel 197KL which covers the central hydraulic service center.

EFFECTIVITY
AIRPLANES WITH CHARGING VALVE IN THE
CENTRAL HYDRAULIC SERVICE CENTER.

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OXYGEN – SERVICING

1. General

- A. The servicing procedure for the crew oxygen system gives the instructions to remove unserviceable cylinders and install serviceable cylinders. For GUI 115, which has a remote fill panel, an alternative procedure is also given. It gives the instructions to do an external-fill of the cylinders.
- B. For servicing of the portable oxygen system, instructions are given to remove unserviceable cylinders, and to install serviceable cylinders.
- C. Oxygen Requirements
 - (1) Oxygen for use in airplanes must agree with these specifications:

NOTE: Oxygen that agrees with Specification MIL-0-27210, Type I, agrees with these specifications and is recommended. The quantity of water can be different as given in S.A.E. (AS 1065).

- (a) It must contain not less than 99.5% oxygen by volume.
- (b) It must be free of poisonous contamination to the maximum level possible.
- (c) It must have less than 0.005 milligram of water in each liter at 70°F and a pressure of 760 millimeters of HG.

D. Precaution Data

- (1) Before you do a servicing procedure, read the safety precautions and general maintenance instructions in 35-00-00.

WARNING: USE ONLY CLEAN COMPONENTS THAT COME FROM A SEALED BAG. MAKE SURE THAT THE LABEL ON THE BAG IDENTIFIES THE COMPONENTS AS SUFFICIENTLY CLEAN FOR THE OXYGEN SYSTEM. CONTAMINATION ON COMPONENTS CAN CAUSE A FIRE OR AN EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT

- (2) Make sure your hands, clothing, tools, the area, and the equipment are clean. They must be free of petroleum, oil and grease, hydraulic fluid, or dirt. Use only oxygen clean components in the oxygen system

NOTE: Oxygen clean fittings come from a sealed package labeled for 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.

- (3) Keep the oxygen away from all the things that can start ignition. For example: heat, sparks, flame, and smoking can start ignition.
- (4) Do not let the oxygen mix with other gases, fumes, or flammable materials.

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- (5) Use only aviation-grade breathing oxygen.

NOTE: Welding oxygen and hospital oxygen can be satisfactory to breathe, but it can contain too much water. The water can freeze and stop the flow in the lines, regulators, and valves.

WARNING: YOU MUST OPEN THE SHUTOFF VALVE SLOWLY, OR HIGH TEMPERATURES CAN OCCUR. THIS CAN START AN IGNITION WITH THE OXYGEN AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (6) Open all the oxygen valves slowly, to the full open position. This will decrease the risk of a fire.

TASK 12-15-08-603-001

2. Crew Oxygen System Servicing (Cylinder Replacement) (Fig. 301)

A. General

- (1) The crew oxygen cylinder is on the right side of the forward cargo compartment.
- (2) Put a workstand below the forward cargo compartment door for better access.

B. Equipment

- (1) Caps and Plugs - Clean, Packaged (for oxygen ports and open lines)
- (2) Oxygen Cylinders - Fully Charged and Serviceable
- (3) Spanner Wrench - Commercially Available

C. Consumable Materials

- (1) G00092 Oxygen System Leak Detection Compound
- (2) G02479 Lockwire - Copper (0.020 inch Diameter) (NASM20995CY20)

D. References

- (1) AMM 20-11-00/201, Standard Torque Values
- (2) AMM 20-41-00/201, Static Grounding
- (3) AMM 24-22-00/201, Electrical Power - Control
- (4) AMM 35-11-00/201, Crew Oxygen System

E. Access

- (1) Location Zones
122 Forward Cargo Compartment (Right)

F. Procedure - Remove the Crew Oxygen Cylinder

S 913-192

- (1) Read and obey the Crew Oxygen System - Maintenance Practices procedures (AMM 35-11-00/201).

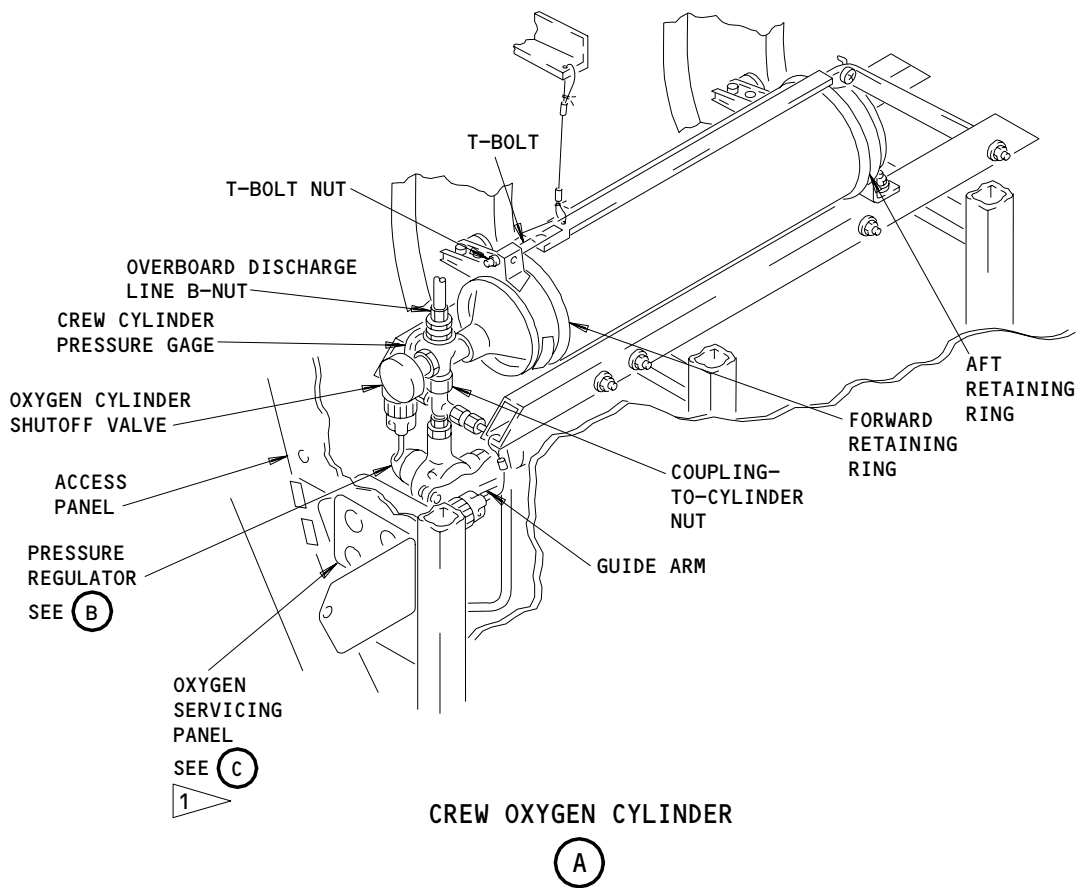
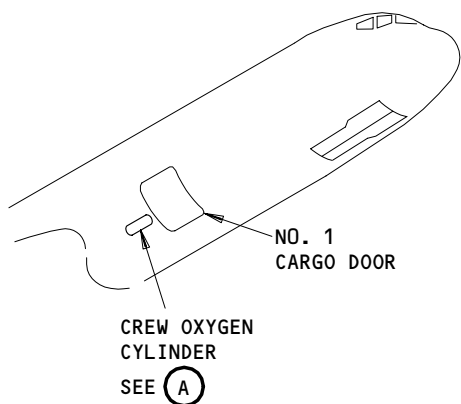
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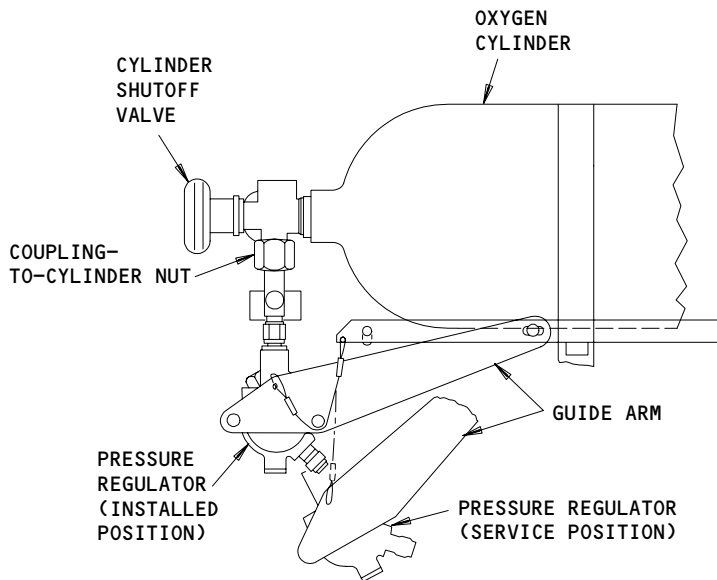
1 NOT INSTALLED ON ALL AIRPLANES

Crew Oxygen Servicing
Figure 301 (Sheet 1)

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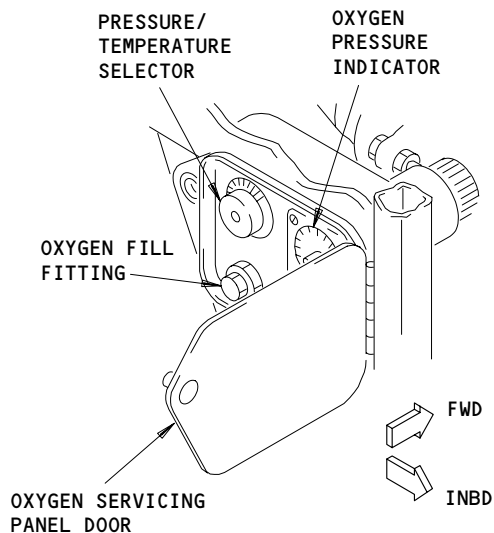
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BOEING
757
MAINTENANCE MANUAL



PRESSURE REGULATOR

(B)



OXYGEN SERVICING PANEL

(C) 1

1 NOT ON ALL AIRPLANES

Crew Oxygen Servicing
Figure 301 (Sheet 2)

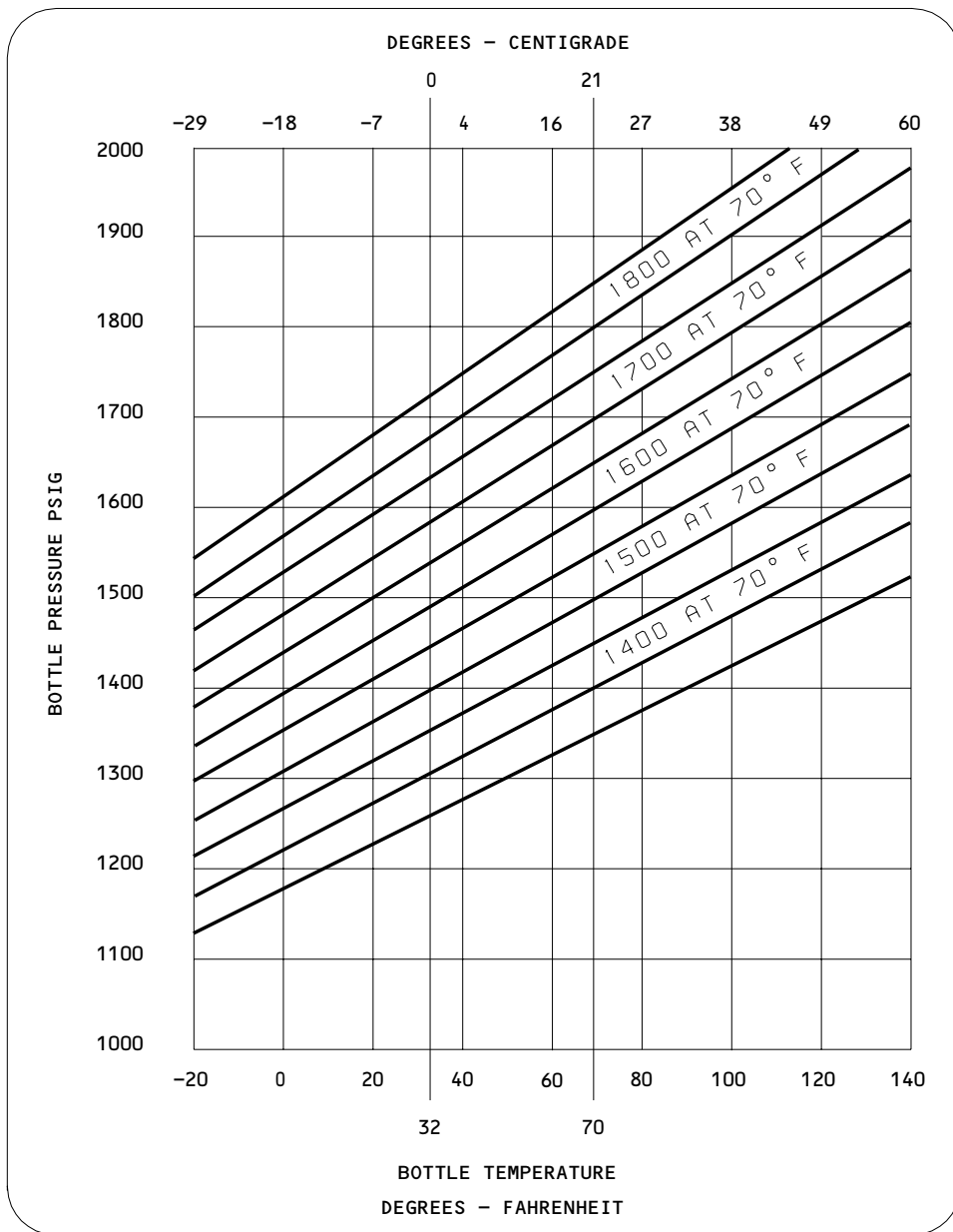
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TEMPERATURE - DEGREES-FAHRENHEIT
OXYGEN CYLINDER PRESSURE/TEMPERATURE CORRECTION CHART

Oxygen Cylinder Temperature - Pressure
Figure 302

EFFECTIVITY

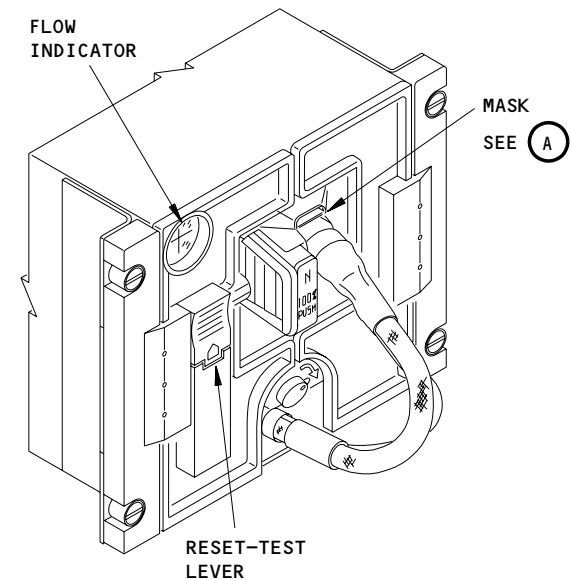
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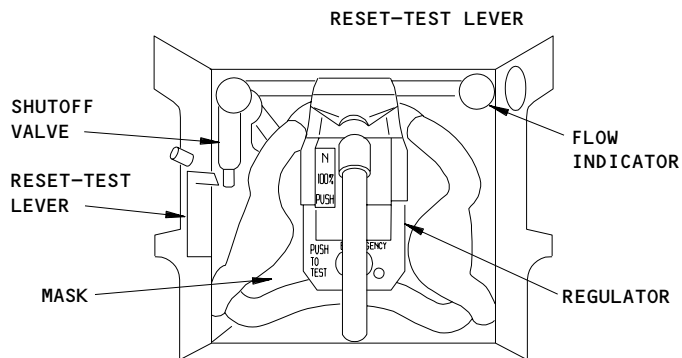
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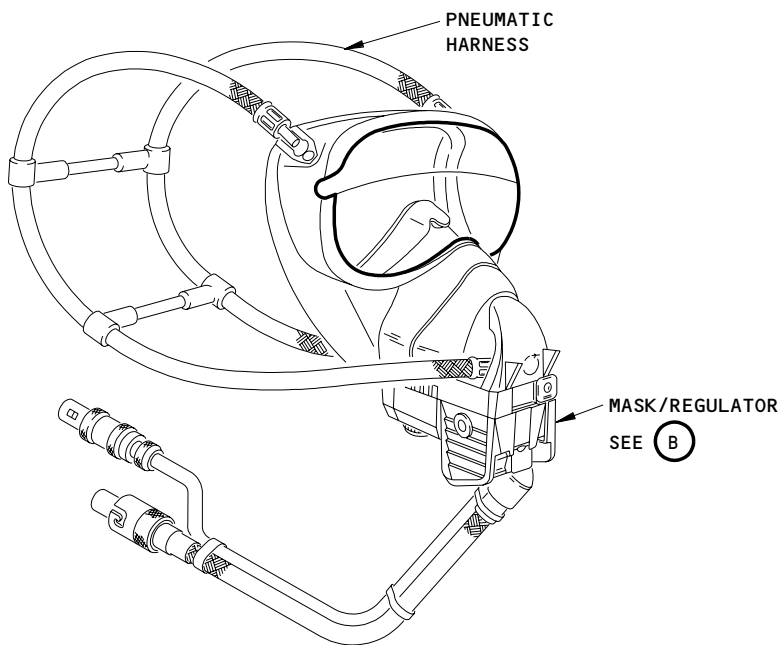
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MASK STORAGE BOX (DOORS CLOSED)

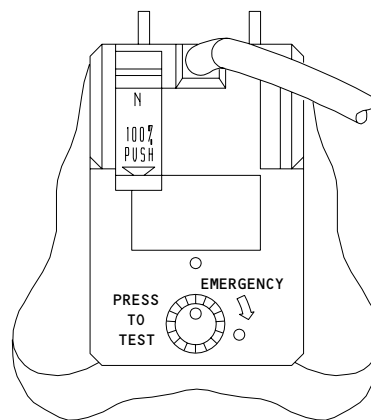


MASK STORAGE BOX (DOORS OPEN)



MASK (SHOWN INFLATED)

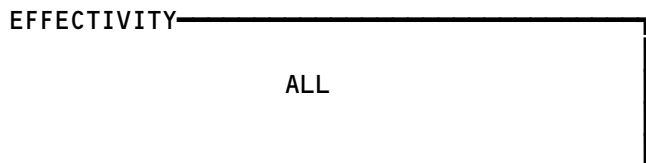
(A)



MASK/REGULATOR

(B)

Crew Oxygen Flow Diagram
Figure 303



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S 493-191

WARNING: DURING THE SERVICING PROCEDURES OF THE CREW OXYGEN SYSTEM, MAKE SURE THAT THE AIRCRAFT AND OXYGEN CART IS CORRECTLY GROUNDED. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Make sure the airplane is grounded correctly (AMM 20-41-01/201).

S 043-144

- (3) Remove the electrical power (AMM 24-22-00/201).

S 013-005

- (4) Open the access panel for the crew oxygen cylinder.

S 863-193

CAUTION: DO NOT TIGHTEN THE SHUTOFF VALVE MORE THAN 25 INCH-POUNDS (3 NEWTON METERS). TOO MUCH TORQUE CAN CAUSE DAMAGE TO THE SHUTOFF VALVE.

- (5) Close the shutoff valve for the crew oxygen cylinder slowly.

NOTE: The shutoff valve can be tightened by hand which is equivalent to 25 pound-inches.

S 333-194

WARNING: 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.

- (6) Slowly loosen the coupling-to-cylinder nut to bleed the pressure. Then, fully disconnect the cylinder.

S 033-008

- (7) Disconnect the overboard discharge line (B-nut) from the oxygen cylinder neck.

S 033-009

- (8) Turn the regulator down to the service position.

S 023-010

- (9) Remove the T-bolt nut, turn the forward retaining ring in the forward direction.

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S 023-011

- (10) Pull the oxygen cylinder forward and remove it.

NOTE: The weight of an oxygen cylinder is usually 35 to 43 pounds.

S 493-195

WARNING: USE ONLY CLEAN COMPONENTS THAT COME FROM A SEALED BAG. MAKE SURE THAT THE LABEL ON THE BAG IDENTIFIES THE COMPONENTS AS SUFFICIENTLY CLEAN FOR THE OXYGEN SYSTEM. CONTAMINATION ON COMPONENTS CAN CAUSE A FIRE OR AN EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (11) Install caps on the oxygen cylinder port and the open lines to prevent contamination of the system (AMM 35-11-00/201).

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.

S 423-196

- (12) When you remove a cylinder with a metal valve-seat in the shutoff valve, you will find a cap. A chain holds the cap to the valve. Install this cap on the inlet/outlet line and tighten it to 350-400 inch pounds.

NOTE: IF YOU DO NOT TIGHTEN THE CAP CORRECTLY, THE CYLINDER PRESSURE CAN DECREASE.

G. Procedure - Install the Crew Oxygen Cylinder

S 913-197

- (1) Read and obey the Maintenance Practices procedures for the crew oxygen system (Ref 35-11-00/201).

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S 493-184

WARNING: DURING THE SERVICING PROCEDURES OF THE CREW OXYGEN SYSTEM, MAKE SURE THAT THE AIRCRAFT AND OXYGEN CART IS CORRECTLY GROUNDED. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Make sure the airplane is grounded correctly (AMM 20-41-01/201).

S 043-145

- (3) Remove electrical power if it is not necessary for other tasks (AMM 24-22-00/201).

S 213-185

- (4) Make sure that the oxygen cylinder hydrostatic test date complies with current regulations.

NOTE: The hydrostatic test date must be within the prescribed service life limit. The service life limit is established by national regulatory authorities, the cylinder manufacturer, and/or the airline.

NOTE: The last hydrostatic test date will be on a label near the top of the oxygen cylinder.

S 033-186

- (5) Remove all the lockwire or cotter pins that hold the cap on the oxygen cylinder.

S 023-188

WARNING: 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.

- (6) Slowly turn the cap to let all the gas bleed out. Then, fully remove the cap.

NOTE: There are pressure-type caps for the oxygen cylinders with metal valve-seats in the shutoff valves. They are usually held to the cylinder with chains. Do not cut or remove these chains.

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S 033-020

- (7) Remove the caps from the oxygen cylinder ports and airplane lines.

NOTE: Do not remove the recoil plug on the overboard discharge port. The recoil plug permits the bottle to discharge through ports that are diametrically opposite. This will decrease the effects of the thrust. Tighten the recoil plug with you hand only.

S 213-021

- (8) Examine the fittings and threads to make sure they are all clean and serviceable.

S 423-022

- (9) Put the oxygen cylinder on the rollers.

S 423-087

- (10) Push the cylinder in the aft direction until it touches the aft retaining ring.

S 423-023

- (11) Put the forward retaining ring in its position above the forward end of the oxygen cylinder.

S 423-024

- (12) Install and tighten the T-bolt to the applicable torque value (AMM 20-11-00/201).

NOTE: Make sure the T-bolt holds the crew oxygen cylinder tightly to prevent all forward or aft movement.

NOTE: Make sure the threads of the T-bolt extend through the nut with at least the chamfer visible.

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S 423-189

WARNING: DO NOT USE LUBRICANTS OR GASKETS WHEN YOU CONNECT THE FITTINGS IN THE OXYGEN SYSTEM. THE GASKETS OR LUBRICANTS CAN CAUSE A FIRE OR AN EXPLOSION WHEN THEY ARE NEAR PRESSURIZED OXYGEN. THIS CAN CAUSE DAMAGE TO EQUIPMENT OR INJURIES TO PERSONS

- (13) Do these steps to connect the regulator:
(a) Remove the recoil plug.

WARNING: THE UNION THAT IS INSTALLED IN THE VALVE BODY AT THE OVERBOARD DISCHARGE PORT CONTAINS A BURST-DISC ASSEMBLY. IF YOU CHANGE IT, THE BURST-DISC ASSEMBLY CAN BE DAMAGED AND WILL PERMIT SUDDEN THRUST LOADS AND A FIRE. USE A SPANNER WRENCH ON THE UNION.

- (b) Connect the overboard-discharge line with a spanner wrench.

NOTE: Make sure the connection is tight. Use a spanner wrench when you connect it to prevent change, movement and then failure of the burst-disc assembly.

- (c) Turn the regulator up to its installed position and connect the coupling-to-cylinder nut.

S 863-026

- (14) Supply electrical power (AMM 24-22-00/201).

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S 863-190

WARNING: YOU MUST OPEN THE SHUTOFF VALVES SLOWLY, OR HIGH TEMPERATURES CAN OCCUR. THIS CAN START AN IGNITION WITH THE OXYGEN AND CAN CAUSE INJURY TO PERSONS AND DAMAGE THE EQUIPMENT.

CAUTION: DO NOT TIGHTEN THE SHUTOFF VALVE ON EACH OXYGEN CYLINDER MORE THAN 25 INCH POUNDS (3 NEWTON METERS). TOO MUCH TORQUE CAN CAUSE DAMAGE TO THE SHUTOFF VALVE.

(15) Slowly turn the shutoff valve for the oxygen cylinder to the fully open position. Then, turn the shutoff valve back 1/4-turn.

NOTE: Do not apply more than 25 pound-inches (2.8 newton meters) of torque. Use only your hand to turn the shutoff valve.

S 433-029

(16) Install the inspection wire to hold the valve in this position.

NOTE: Use the 0.020 inch diameter cad/copper lockwire (AMM 20-10-23/401).

S 793-031

(17) Do a leakage check on the oxygen cylinder couplings with the leak detection compound.

S 793-032

(18) Remove the leak detection compound with a clean cloth immediately after you do the check.

S 213-033

(19) Immediately compare the pressure shown on the status page of the EICAS and the pressure shown on the cylinder gage.

NOTE: The difference of the pressure values must be less than 100 PSI.

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S 433-034

- (20) For oxygen cylinders with a cap held by a chain, install the lockwire on the cap to decrease its movement.

S 413-035

- (21) Close the access door for the oxygen cylinder.

H. System Operational Check

S 043-169

- (1) Gain access to the crew oxygen mask regulator on the flight deck.

S 443-170

- (2) Press and hold the test lever or button for 5 seconds.

S 213-171

- (3) Make sure the pressure on the oxygen pressure indicator does not drop more than 100 psig.

NOTE: If there is a drop of 100 psig, or a slow recovery of indicated pressure, verify the cylinder is in the full open position.

S 203-172

- (4) Make sure there is an audible release.

S 213-173

- (5) Make sure the safety button is set to the Emergency Position.

NOTE: Rotate the lever clockwise to set it to the Emergency Position.

S 043-174

- (6) Press and hold the reset test lever in the direction of the arrow.

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S 213-179

- (7) Make sure the safety button is set to the non-Emergency Position.

NOTE: Rotate the lever counterclockwise to set it back to the non-Emergency Position.

S 863-036

- (8) Remove the electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-15-08-603-096

3. GUI 115;

Crew Oxygen System Servicing (External Fill) (Fig. 301)

A. General

- (1) The servicing of the crew oxygen system includes the steps to add oxygen with the external ground servicing equipment.
- (2) The servicing panel is on the right side of the forward cargo compartment, aft of the No. 1 cargo door.
- (3) A valve controls the fill rate and the final pressure.
- (4) Read and obey the information that follows before you do the servicing.
- (5) If it is necessary to do the servicing two times, you must set the temperature and pressure dials to the changed values. This will make sure the automatic-shutdown occurs at the correct cylinder pressure. You must do the steps that follow:
 - (a) Set the temperature dial to the new temperature value.
 - (b) Set the pressure dial to the new pressure value.
- (6) Approved Servicing Persons
 - (a) Permit only approved persons to do the oxygen servicing. An approved person must know:
 - 1) The operation of the oxygen servicing panel that is on the airplane,
 - 2) The operation of the ground servicing equipment,

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- 3) The connection procedure of the ground servicing equipment to the filler port of the airplane servicing panel,
 - 4) What to do if there is an emergency situation.
- (7) Precaution Data
- (a) Before you do the oxygen system servicing, read 35-11-00/201, Maintenance Practices.
 - (b) Make sure your hands, clothing, tools, the area, and the equipment are all clean. They must be free of all petroleum, oil and grease, hydraulic fluid, and dirt.
 - (c) Keep the oxygen away from all the materials that can start an ignition. For examples; heat, sparks, flame, and smoking can start an ignition.
 - (d) Do not let the oxygen mix with other gases, fumes, or flammable materials.
 - (e) Use only aviation-grade breathing oxygen.

NOTE: Welding oxygen and hospital oxygen can be satisfactory to breathe, but it can contain too much water. The water can freeze and stop the flow in the lines, the regulators, and the valves.

- (f) You must open the shutoff valves slowly. If you open the valves quickly, the oxygen can get too hot. If you open the valves slowly, you decrease the risk of a fire.
- (g) Use the pressure reducing valve on the oxygen servicing equipment to control the supply pressure.

B. Equipment

WARNING: MAKE SURE THAT THE SERVICE HOSE, FILL FITTINGS, AND TOOLS ARE FREE OF DIRT, OIL, OR GREASE THAT MIGHT ENTER THE OXYGEN SYSTEM. CONTAMINATION ON TOOLS, THE SERVICE HOSE, OR FITTINGS CAN CAUSE A FIRE OR EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

(1) Oxygen - Ground Servicing Equipment

NOTE: You must have all these components for a satisfactory system.

- (a) Oxygen storage cylinders, high-pressure, with shutoff valves to supply the oxygen. There must be sufficient pressure and volume to fill the airplane oxygen cylinder to their capacity.

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- (b) Manifold and other high-pressure tubes made from brass or a corrosion resistant steel.
- (c) Check-valves with a brass body and with metal seats.
- (d) A filter with a sintered-bronze filter element.
- (e) A pressure reducing valve with these properties:
 - 1) Heavy-duty type with a brass body,
 - 2) Manual pressure adjustment 0 to 3010 psi (20753.2 kPa),
 - 3) Pressure gages to show the supply cylinder pressure at the inlet port and the reduced pressure at the outlet port,
 - 4) Outlet port relief valve that is set at 2400 PSI (16547.4 kPa),
 - 5) Outlet port that is vented to ambient pressure when the valve is closed.
- (f) A shutoff valve for the oxygen supply with these properties:
 - 1) Slow opening,
 - 2) Heavy-duty type,
 - 3) Metal-to-metal valve seats,
 - 4) Clockwise shutoff.
- (g) A supply hose with these properties:

NOTE: MS22028 hose assembly meets the specifications. Refer to Military Specification MIL-H-26633. Refer to QPL-26633-8 for a list of the approved vendors.

- 1) High pressure capability,
 - 2) Flexible,
 - 3) Teflon-lined for oxygen service,
 - 4) Approximately 50 feet(15240.0 mm) long.
- (h) A supply hose adapter that is made of brass or a corrosion resistant steel.

NOTE: The adapter must connect with the airplane filler port. The airplane filler port end fitting is a cone-type connection with a 0.375-24 UNF-3A thread - Refer to AND10089-3. The adapter must be a 120-degree elbow.

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- (i) Protective cover (metal cap and polyethylene bag) to stop the contamination of the supply hose adapter.
- (j) A storage capability for the supply hose and for the adapter end of the hose.
- (k) A static ground cable that is permanently attached to the equipment.

WARNING: MAKE SURE THAT THE SERVICE HOSE, FILL FITTINGS, AND TOOLS ARE FREE OF DIRT, OIL, OR GREASE THAT MIGHT ENTER THE OXYGEN SYSTEM. CONTAMINATION ON TOOLS, THE SERVICE HOSE, OR FITTINGS CAN CAUSE A FIRE OR EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (l) A supplemental cylinder oxygen gage with these properties:
 - 1) Accurate to ± 1 psig (6.9 kPa),
 - 2) 2-pound (.9 kilograms) graduations.
 - (2) A thermometer - (Fahrenheit or Centigrade)
- C. Consumable Materials
- (1) G00019 Oxygen

NOTE: Oxygen that agrees with Specification MIL-0-27210, Type I, is recommended.

- D. References
- (1) AMM 20-30-96/201, Airplane Structure Cleaning Solvents (Series 96)
 - (2) AMM 20-41-00/201, Static Grounding
 - (3) AMM 24-22-00/201, Electrical Power - Control
 - (4) AMM 35-11-00/201, Crew Oxygen System
 - (5) AMM 35-11-12/401, Oxygen Fill Fitting

- E. Access
- (1) Location Zones
 - 122 Forward Cargo Compartment (Right)

F. Prepare for the Servicing Procedure

- S 913-041
- (1) Read and obey all the data in the General paragraphs before you start the servicing operation.

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S 493-213

WARNING: DURING THE SERVICING PROCEDURES OF THE CREW OXYGEN SYSTEM, MAKE SURE THAT THE AIRCRAFT AND OXYGEN CART IS CORRECTLY GROUNDED. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Ground the airplane and oxygen servicing equipment (AMM 20-41-00/201).

S 913-219

WARNING: MAKE SURE THAT THE SERVICE HOSE, FILL FITTINGS, AND TOOLS ARE FREE OF DIRT, OIL, OR GREASE THAT MIGHT ENTER THE OXYGEN SYSTEM. CONTAMINATION ON TOOLS, THE SERVICE HOSE, OR FITTINGS CAN CAUSE A FIRE OR EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

- (3) Before you move the supply hose to the airplane, do these steps:
- (a) Remove the protective cover from the supply hose adapter.
 - (b) Examine the adapter to make sure it is clean.
 - (c) Set the pressure reducing valve to supply an outlet pressure of 100 to 150 psig (689.5 to 1034.2 kPa).
 - (d) Slowly open the shutoff valve to blow the contamination from the supply hose and adapter.
 - (e) Close the shutoff valve on the supply cart.
 - (f) Put the cover back on the supply hose adapter.

S 013-044

- (4) Get access to the oxygen servicing panel (Fig. 301).

S 213-048

- (5) Before you fill the cylinder, do the steps that follow:
- (a) Find the pressure values shown on the crew oxygen indicator on the servicing panel and the pressure shown on the oxygen cylinder gage.

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- (b) Correct the cylinder pressure to the standard temperature (70°F) (21.1C) to find if the servicing is necessary (Fig. 302). The pressures at 70°F(21.1C) are shown by the slanted lines and by the filling chart placard. The filling chart is on the back side of the access door for the oxygen service panel.

EXAMPLE: With a pressure of 1685 PSIG (11617.5 kPa) and at an ambient temperature of 20°F(6.6C) in the cylinder compartment, do this to find the corrected pressure:

- Find the intersection of 1685 PSIG (11617.6 kPa) (on the vertical scale) and 20°F (6.6C) (on the horizontal scale).
- Use the slanted lines that are nearest to this intersection to find the pressure that occurs when the temperature is 70°F(21.1C).
- In this example the pressure at standard temperature is 1850 psi(12755 kPa) and the servicing is not necessary.

- (c) If less than 50 psi(344.7 kPa)(corrected pressure) is shown on the indicator or the gage, remove the cylinder. Connect a supplemental gage to find the pressure more accurately.

NOTE: Use a supplemental gage with 2-pound (.9 kilograms) graduations. Refer to the cylinder replacement task for the instructions.

- 1) If less than 5 psi(34.5 kPa) is shown on the supplemental gage, the cylinder is unserviceable because of water contamination. You must install a serviceable cylinder.
- 2) If more than 5 psi(34.5 kPa) is shown on the supplemental gage, the cylinder is serviceable. Install the cylinder for servicing.

TASK 12-15-08-123-182

4. Servicing the Passenger Oxygen Cylinders
A. Procedure - Servicing the Oxygen Cylinder

S 863-064

- (1) Make sure the shutoff valve on the cylinder is open.

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- S 113-065
- (2) Make sure the area near the oxygen service panel is clean.
- S 033-066
- (3) Remove the dust cap from the fill fitting.
- S 113-067
- (4) Clean the fill fitting and the cap with cleaning solvents, Series 96 (AMM 20-30-96/201).
- S 213-068
- (5) Examine the fill fitting port.
- (a) If you see signs of contamination, replace the fill fitting (AMM 35-11-12/401).
- S 033-069
- (6) Remove the protective cover from the supply hose adapter.
- S 483-224
- (7) Connect the supply hose adapter to the fill fitting port.
- S 863-071
- (8) Find the correct crew oxygen system pressure. Set the pressure dial to this pressure.
- S 863-073
- (9) Find the temperature of the aircraft oxygen cylinder area. Set the temperature selector to this temperature.
- S 863-075
- (10) Adjust the pressure reducing valve of the ground servicing equipment to permit more than 150 psi of outlet pressure.
- S 613-220
- WARNING:** YOU MUST OPEN THE SHUTOFF VALVE SLOWLY, OR HIGH TEMPERATURES CAN OCCUR. THIS CAN START AN IGNITION WITH THE OXYGEN AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT.
- (11) Slowly open the shutoff valve on the supply cart to full open. Make sure there are no leaks.

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S 613-077

- (12) Very slowly adjust the pressure reducing valve to increase the outlet pressure to a value equal to the airplane indicator pressure.

S 613-078

WARNING: DO NOT LET THE CYLINDER PRESSURE GO HIGHER THAN 2300 PSIG. TOO MUCH PRESSURE CAN CAUSE AN EXPLOSION. THIS CAN CAUSE INJURIES TO PERSONNEL, OR CAUSE DAMAGE TO THE EQUIPMENT.

- (13) Gradually change the pressure reducing valve until the outlet pressure is kept at 200 to 250 psi (1379 to 1724 kPa) above the lowest system pressure, until the automatic shutoff occurs.

S 613-079

- (14) After the automatic shutoff occurs at the necessary pressure, and the flow has stopped, close the shutoff valve on the supply cart. Reset the pressure reducing valve to zero.

S 033-221

WARNING: 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.

- (15) When you are done with the servicing, do these steps to bleed the ground cart hose through the cart bleed hose:
- (a) Gradually loosen the supply hose adapter to release the remaining pressure.
 - (b) Disconnect the supply hose from the filler port on the servicing panel.
 - (c) Install the protective cover on the supply hose adapter.
 - (d) Put the supply hose in its stowage position.

S 433-083

- (16) Install the dust cap on the filler port of the airplane servicing panel.

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S 413-084
(17) Close and latch the servicing panel door.

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NO. 1, 2, AND 4 PASSENGER DOOR
EMERGENCY POWER RESERVOIR - SERVICING (GASEOUS)

1. General

- A. This procedure gives the instructions to pressurize the emergency power reservoir for the No. 1, 2, or 4 passenger door. It is necessary to pressurize a reservoir after a passenger door is opened with emergency power, or when the reservoir pressure gage shows less than 2500 psi at 70°F.

NOTE: A pressure indication that is in the green band on the pressure gage is not always satisfactory. Refer to the chart on Fig. 301 for the correct pressures for different temperatures.

- B. Before you do the servicing on the emergency power reservoir, make sure the reservoir agrees with the hydrostatic test specifications of the Vendor's Component Maintenance Manual.

NOTE: Reservoirs must have a hydrostatic test every three years. The latest test date is on a label at the top of the cylinder.

TASK 12-15-10-603-001

2. Servicing - Emergency Power Reservoir (Fig. 301)

A. Equipment

- (1) Safety Pin Set - Passenger Door Emergency Power Reservoir, B52009-1

NOTE: The safety pin set is a set of two pins connected by a lanyard. If the safety pin set is not available, you can use two bolts (3/16-inch diameter by 1 1/4-inch grip) as an alternative. Install one bolt above and one bolt below the reservoir plunger. Attach tags to the bolts to identify the bolts for removal.

B. Consumable Materials

- (1) Clean, dry nitrogen
(2) B00074 Solvent - Spec. P-D-680, Dry Cleaning

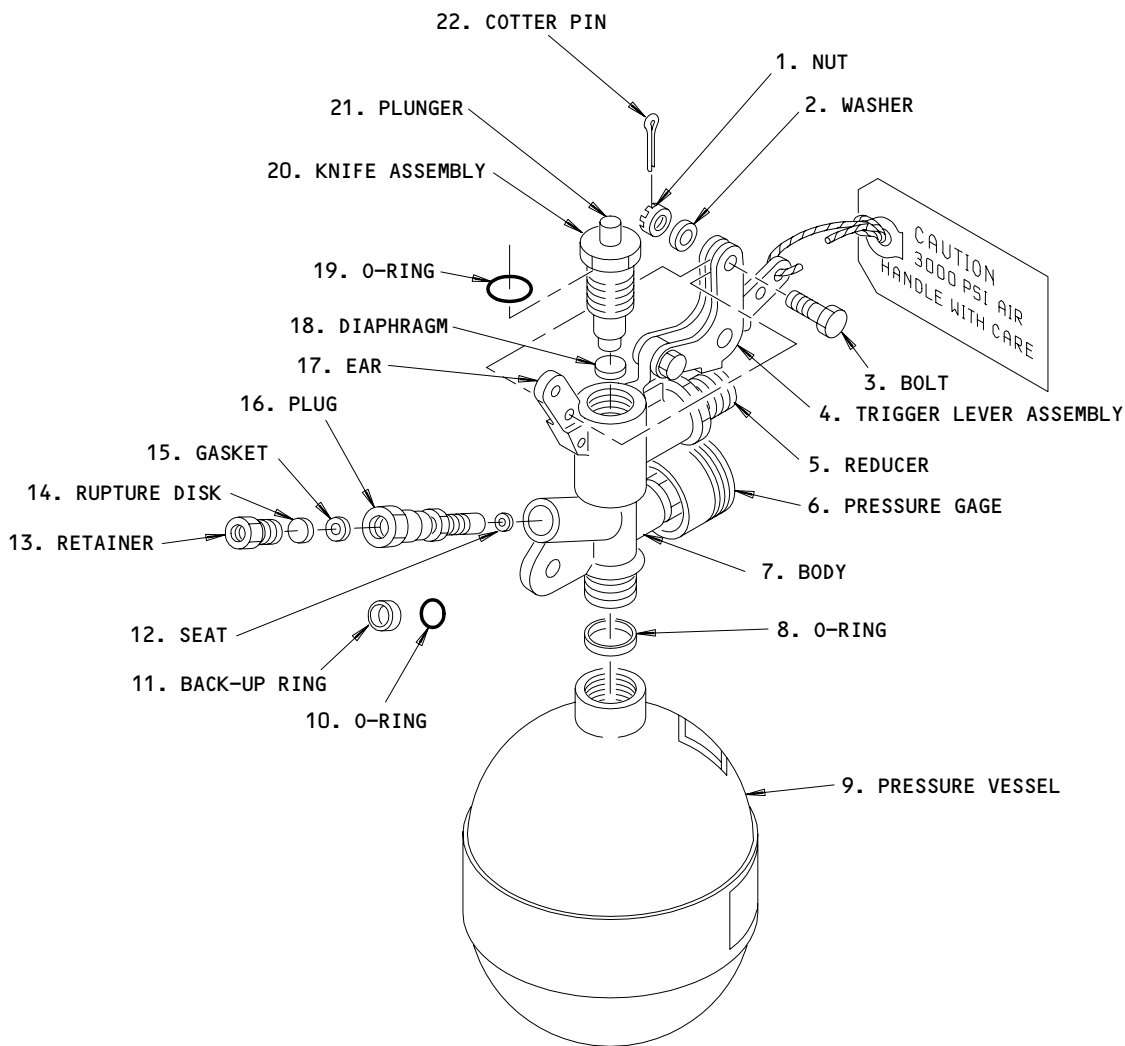
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EMERGENCY POWER RESERVOIR

Passenger Door Emergency Power Reservoir Servicing
Figure 301 (Sheet 1)

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C. References

(1) AMM 52-11-30/401, Emergency Power Reservoir - Removal/Installation

D. Access

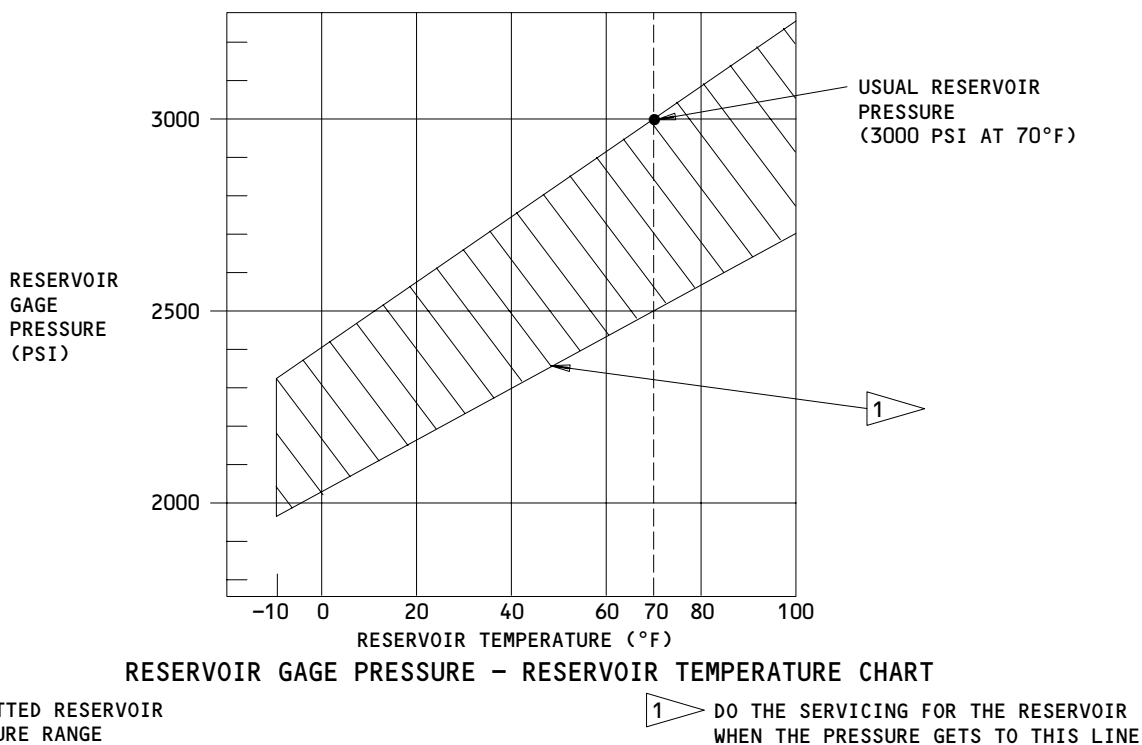
(1) Location Zones

831	No. 1 Passenger Door (Left)
832	No. 2 Passenger Door (Left)
836	No. 4 Passenger Door (Left)
841	No. 1 Passenger Door (Right)
842	No. 2 Passenger Door (Right)
846	No. 4 Passenger Door (Right)

E. Procedure

S 493-002

(1) Install the safety pins on the emergency power reservoir.



Passenger Door Emergency Power Reservoir Servicing
Figure 301 (Sheet 2)

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- S 023-003
(2) Remove the emergency power reservoir (AMM 52-11-30/401).
- S 033-004
(3) Remove the lockwire from the plug (16).
- S 033-005
(4) Loosen the plug (16) one turn to bleed the remaining pressure from the reservoir.
- S 093-006
(5) Remove the safety pins from the reservoir.
- S 033-007
(6) Remove the plug (16) from the body (17).
- S 033-008
(7) Remove the back-up ring (11) and the O-ring (10) from the plug (16).
- S 033-009
(8) Discard the back-up ring (11) and the O-ring (10).
- S 213-010
(9) Examine the rupture disk (14) as follows:
(a) Make sure there is a lockwire installed on the retainer (13).
(b) Blow into the plug (16) to make sure there are no air leaks around the rupture disk (14).
(c) If the lockwire on the retainer (13) was broken or removed, or there are leaks in the rupture disk (14), then do these steps:
1) Remove the retainer (13), rupture disk (14), and gasket (15) from the plug (16).
2) Discard the rupture disk (14) and the gasket (15).
- S 033-011
(10) Remove the seat (12) from the body (7).

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S 033-012

(11) Discard the seat (12).

S 033-013

(12) Remove the cotter pin (22), nut (1), washer (2), and bolt (3) that attach the trigger lever assembly (4) to the ear (17) on the body (7).

S 823-014

(13) Move the trigger lever assembly (4) to the side.

S 033-015

(14) Remove the knife assembly (20), O-ring (19), and diaphragm (18) from the body (7).

S 033-016

CAUTION: MAKE SURE YOU REMOVE AND DISCARD THE CENTER SECTION OF THE DIAPHRAGM (18). IF THE CENTER SECTION OF THE DIAPHRAGM (18) IS NOT REMOVED, IT IS POSSIBLE THAT THE RESERVOIR WILL NOT OPERATE CORRECTLY.

(15) Remove the center section of the diaphragm (18).

NOTE: If the center section is not found easily, look for it in the knife assembly (20), body (7), or pressure vessel (9).

S 033-017

(16) Discard the center section of the diaphragm (18).

S 113-018

(17) Use dry cleaning solvent to clean the plug (16), trigger lever assembly (4), knife assembly (20), and the other parts disassembled during the above steps.

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- S 113-019
(18) Dry the parts fully with dry compressed air (approximately 25 psi).
- S 213-020
(19) Examine all of the parts for damage such as nicks, burrs, stripped or crossed threads, corrosion, or distortion.
- S 433-011
(20) Replace the damaged parts, if it is necessary.
- S 213-012
(21) Make sure the trigger lever assembly (4) moves freely.
- S 823-013
(22) Push the plunger (21) of the knife assembly (20) into the housing and then release the plunger (21).
- S 213-014
(23) Make sure the spring pushes the plunger (21) easily and freely.
- S 213-015
(24) Make sure the surface of knife assembly (20) which touches the diaphragm (18) is smooth, with no nicks or scratches.
- S 433-016
(25) If the body (7) was removed, then do these steps:
(a) Install the O-ring (8) on the body (7).
(b) Install the body (7) on the pressure vessel (9).
(c) Tighten the body to 360-400 pound-inches.
- S 433-017
(26) Install the diaphragm (18), with a new center section, in the body (7). Make sure the teflon side is in the direction of the pressure vessel.
- S 433-018
(27) Install the O-ring (19) on the knife assembly (20).
- S 433-019
(28) Install the knife assembly (20) in the body (7).

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S 433-020

(29) Tighten the knife assembly (20) to 180-200 pound-inches.

S 823-021

(30) Move the trigger lever assembly (4) into position.

S 433-022

(31) Install the bolt (3), washer (2), nut (1), and cotter pin (22) to connect the trigger lever assembly (4) to the ear (17) on the body (7).

S 493-023

(32) Install the safety pins around the plunger (21).

S 433-024

(33) If the retainer (13) was removed from the body (7), install a new gasket (15), new rupture disk (14), and retainer (13) into the plug (16).

S 433-025

(34) Tighten the retainer (13) to 72-79 pound-inches.

S 433-026

(35) Install a new seat (12) in the body (7).

S 433-027

(36) Install a new O-ring (10) and a new back-up ring (11) on the plug (16).

S 433-028

(37) Install the plug (16) on the body (7). Tighten the plug (16) on the body (7) with your fingers.

S 033-029

(38) Loosen the plug (16) one turn.

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S 493-030

(39) Connect a source of clean, dry nitrogen to the reducer (5).

S 613-031

(40) Apply 3000 psi at 70°F to the reducer (5).

S 433-032

(41) Tighten the plug (16) before you disconnect the external pressure source.

S 613-033

(42) Bleed the external pressure source.

S 093-034

(43) Disconnect the external pressure source from the reducer (5).

S 783-035

(44) Make sure the pressure gage (6) on the reservoir shows the pressure applied in the above steps, within 100 psi.

S 793-036

(45) Do a check for leaks at all possible points on the reservoir assembly.

NOTE: You can use a soap and water solution to look for leaks.

S 363-037

(46) Repair the leaks, if it is necessary.

S 433-038

(47) Tighten the retainer (13) to 72-79 inch-pounds.

S 433-039

(48) Install a lockwire from the retainer (13) to the plug (16).

S 433-040

(49) Install a lockwire from the plug (16) to the ear (17) of the body (7).

S 423-041

(50) Install the emergency power reservoir (AMM 52-11-30/401).

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LANDING GEAR SHOCK STRUT FLUIDS

1. General

- A. This procedure contains a description of the fluids that are used to service the shock strut.

TASK 12-15-11-613-017

2. Landing Gear Shock Strut Fluids

A. General

- (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-H-6083 or MIL-H-5606 fluids 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-H-6083 or MIL-H-5606 fluid 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-H-6083 or MIL-H-5606 fluid 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.
- (9) Recommended (Pre-Mixed) Shock Strut Fluids
 - (a) 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.

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- (b) BMS 3-32, Type II - This is MIL-H-5606 fluid pre-mixed with 1.5 percent by volume of Lubrizol 1395 and 1 percent by volume of methyl oleate.
- (10) Alternative (Not Pre-Mixed) Shock Strut Fluids
- (a) MIL-H-6083 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for MIL-H-6083 and mixed with 2.4 percent by volume of Lubrizol 1395 (41:1 ratio).
- 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.
- (b) MIL-H-5606 fluid plus 2.4 percent by volume of Lubrizol 1395 - This mixture can be made from any approved source for MIL-H-5606 and mixed with 2.4 percent by volume of Lubrizol 1395 (41:1 ratio).
- 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.
- (11) Shock Strut Fluid Precautions
- (a) 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.
- (b) 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.
- (c) 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.

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RAIN REPELLENT BOTTLE – SERVICING

1. General (Fig. 301)

- A. The rain repellent bottle is on the bulkhead next to the first observers seat.
- B. You must replace the rain repellent bottle when you find one of these indications:
 - (1) The repellent level float is below the line on the replacement placard.
 - (2) The pressure gage shows pressure in the yellow band.

TASK 12-16-01-613-002

2. Rain Repellent Bottle – Servicing (Fig. 301)

A. Access

- (1) Location Zone
211 Control Cabin – Section 41 (Left)

B. Procedure

S 863-003

- (1) Turn the manual shutoff valve handle to the horizontal (closed) position.

S 033-012

- (2) Release the bottle clamp.

S 023-011

WARNING: DO NOT LET THE RAIN REPELLENT FLUID TOUCH YOUR SKIN OR EYES. THE FLUID CAN CAUSE IRRITATION. DO NOT BREATHE THE FUMES. IF THE FLUID TOUCHES YOU, WASH YOUR SKIN OR EYES WITH WATER.

- (3) Remove the bottle from the receptacle.

S 213-005

- (4) Examine the bottle seat and the O-ring for damage.

S 423-006

CAUTION: TIGHTEN THE BOTTLE WITH YOUR HAND ONLY. TOO MUCH TORQUE CAN CAUSE A LEAK.

- (5) Install the new bottle on the receptacle, and tighten the bottle with your hand.

S 433-007

- (6) Tighten the bottle clamp.

S 863-008

- (7) Turn the manual shutoff valve to the vertical (open) position.

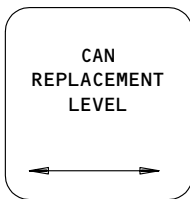
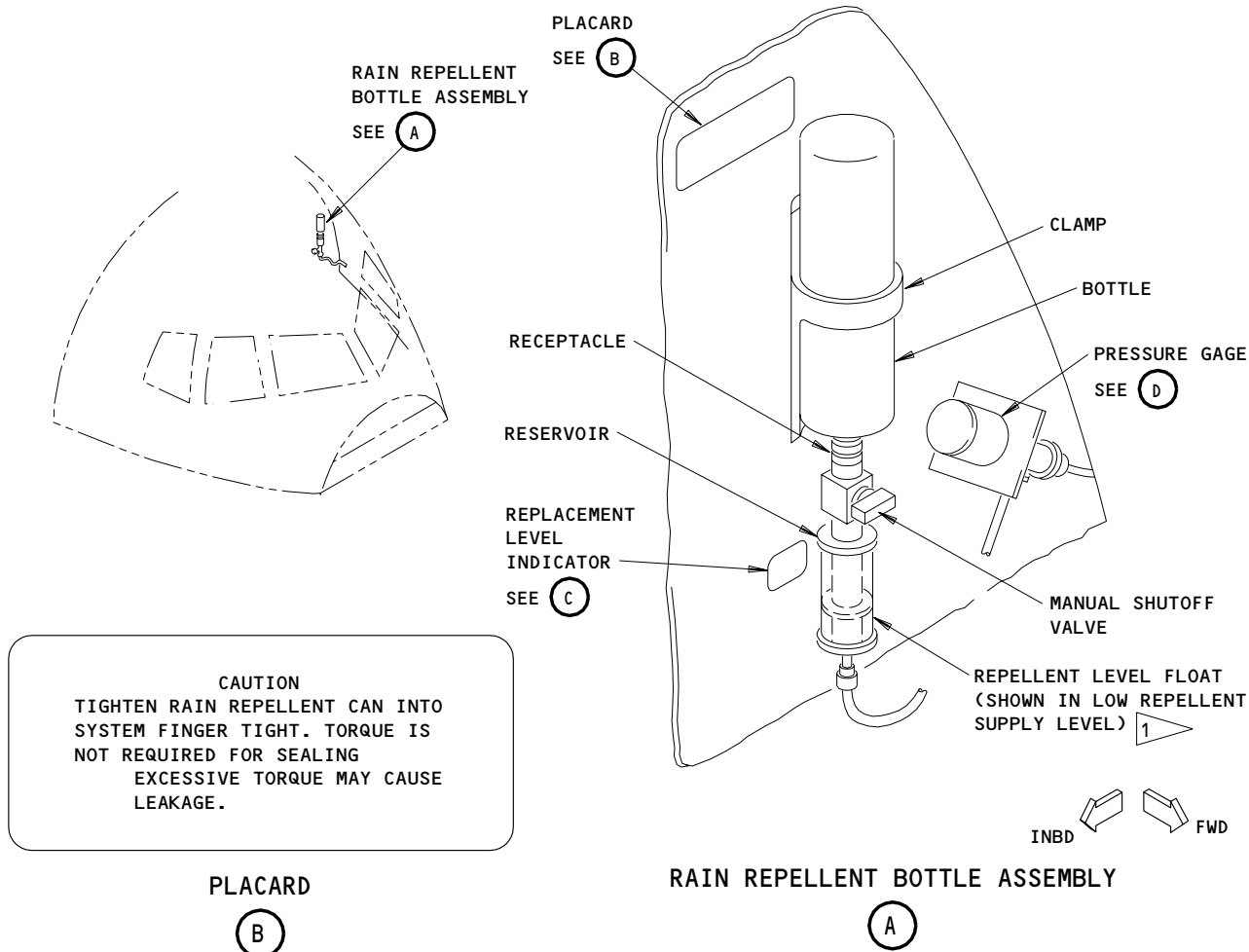
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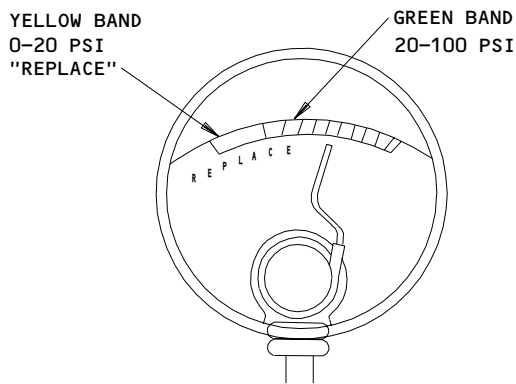
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REPLACEMENT LEVEL INDICATOR

(C)



PRESSURE GAGE

(D)

1 WHEN RESERVOIR IS EMPTY, YOU CAN SEE THE FLOAT AT THE BOTTOM OF THE RESERVOIR

WHEN THE RESERVOIR IS FULL, YOU CAN SEE THE FLOAT AT THE TOP OF THE RESERVOIR.

Rain Repellent Bottle Servicing
Figure 301

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- S 213-009
- (8) Make sure the pressure gage shows in the green band.
- S 213-010
- (9) Make sure the repellent level float is at the top of the visual reservoir.

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FLIGHT COMPARTMENT WINDOWS - SERVICING

1. General

- A. This procedure contains two tasks:
- (1) The first task is the instructions to clean the flight compartment windows.
 - (2) The second task is the instructions to apply wax on the No. 2 and No. 3 flight compartment windows.
- B. Do not apply wax on the No. 1 flight compartment windows.

TASK 12-16-02-113-001

2. Clean the Flight Compartment Windows

- A. Consumable Materials
- (1) G01989 Castile Soap
 - (2) B00106 Chamois - KK-C-300 Oil Tan Leather
 - (3) G01991 Rain Repellent Residue Remover Pad - Leeder 275-G (For use on NO. 1 glass window).
 - (4) B00130 Alcohol, isopropyl - TT-I-735
 - (5) B00083 Naptha - TT-I-95
- B. Access
- (1) Location Zone
211/212 Control Cabin - Section 41
- C. Procedure

S 163-027

CAUTION: DO NOT USE ABRASIVE CLEANERS OR CLEANERS THAT CONTAIN FLUORIDES ON HYDROPHOBIC COATED WINDOWS. THE USE OF THESE CLEANERS WILL REMOVE THE HYDROPHOBIC COATING.

- (1) Do these steps to clean the No. 1 windows (glass):

WARNING: YOU MUST PUT THE WINDOW HEAT SWITCHES IN THE OFF POSITION AND MAKE SURE THE WINDOW-HEAT-INOP LIGHTS COME ON. IF THESE SWITCHES ARE IN THE ON POSITION OR THE LIGHTS ARE OFF, YOU WILL GET AN ELECTRICAL SHOCK WHEN YOU TOUCH THE WINDOW. ELECTRICAL SHOCKS CAN CAUSE INJURY OR DEATH.

- (a) Put these WINDOW HEAT switches on the pilot's overhead panel, P5, in the OFF position, and attach DO-NOT-OPERATE tags:
- 1) LEFT FWD
 - 2) LEFT SIDE
 - 3) RIGHT FWD
 - 4) RIGHT SIDE

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MAINTENANCE MANUAL

- (b) Make sure the WINDOW-HEAT-INOP lights are on.
- (c) Apply either isopropyl alcohol or water with soap to the inner and outer surfaces of each window with a chamois that is moist with water.
- (d) Rub the windows, with very light hand pressure, until the windows are clean.

NOTE: Remove the remaining rain repellent residue from the windows with the rain repellent residue remover pad.

- (e) If the rain repellent stays on the window, use the rain repellent as a solvent with a moist cloth and water.

NOTE: Use the rain repellent from the rain repellent system.

- (f) Flush the window with clean water and dry it with a clean, moist chamois.
- (g) If you used the rain repellent as a solvent, make sure it is not on the airplane.
- (h) Remove the unwanted materials from the windows with clean water.

CAUTION: DO NOT RUB A DRY WINDOW. IF YOU RUB A DRY WINDOW, YOU WILL CAUSE SCRATCHES AND YOU WILL MAKE AN ELECTROSTATIC CHARGE. THE SCRATCHES WILL REDUCE THE VISUAL CAPACITY OF THE WINDOW. THE ELECTROSTATIC CHARGE WILL MAKE THE DUST STAY ON THE WINDOW.

- (i) Rub the windows with a chamois that is moist with water to remove most of the water from the windows.
- (j) Remove the DO-NOT-OPERATE tags and put these WINDOW HEAT switches in the ON position:
- (k) LEFT FWD
 - 1) LEFT SIDE
 - 2) RIGHT FWD
 - 3) RIGHT SIDE

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S 163-016

(2) Do these steps to clean the No. 2 and 3 windows (acrylic):

WARNING: YOU MUST PUT THE WINDOW HEAT SWITCHES IN THE OFF POSITION AND MAKE SURE THE WINDOW-HEAT-INOP LIGHTS COME ON. IF THESE SWITCHES ARE IN THE ON POSITION OR THE LIGHTS ARE OFF, YOU WILL GET AN ELECTRICAL SHOCK WHEN YOU TOUCH THE WINDOW. ELECTRICAL SHOCKS CAN CAUSE INJURY OR DEATH.

- (a) Put these WINDOW HEAT switches on the pilot's overhead panel, P5, in the OFF position, and attach DO-NOT-OPERATE tags:
 - 1) LEFT FWD
 - 2) LEFT SIDE
 - 3) RIGHT FWD
 - 4) RIGHT SIDE
- (b) Make sure the WINDOW-HEAT-INOP lights are on.
- (c) Use a chamois to apply naphtha or a soap solution to the inner and outer surfaces of the windows.

CAUTION: IF YOU OPEN THE NO. 2 WINDOW TO WASH THE OUTSIDE OF THE WINDOW, BE CAREFUL NOT TO CAUSE DAMAGE TO THE BULB SEAL. DAMAGED SEALS CAN CAUSE AIR LEAKS DURING FLIGHT.

- (d) Clean the windows with the minimum necessary pressure.
- (e) Flush the window with clean water.

CAUTION: DO NOT RUB A DRY WINDOW PANE. SCRATCHES OR AN ELECTROSTATIC CHARGE CAN OCCUR IF YOU RUB A DRY WINDOW PANE. THE SCRATCHES WILL DECREASE THE VISUAL CAPACITY OF THE WINDOW PANE. AN ELECTROSTATIC CHARGE CAN COLLECT DUST PARTICLES ON THE WINDOW PANE.

- (f) Dry the window with a clean, moist chamois.

NOTE: You can apply wax on the inner and outer surfaces of No. 2 and 3 windows.

- (g) Remove the DO-NOT-OPERATE tags and put these WINDOW HEAT switches in the ON position:
 - 1) LEFT FWD
 - 2) LEFT SIDE
 - 3) RIGHT FWD
 - 4) RIGHT SIDE

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TASK 12-16-02-113-012

3. Apply Wax to the No. 2 and No. 3 Flight Compartment Windows

A. General

(1) Apply wax to only the No. 2 and No. 3 windows.

B. Consumable Materials

- (1) B00709 Static Stop Cleaner Wax
- (2) B00707 DuPont No. 7 Auto Polish and Cleaner
- (3) B00708 Johnsons Pride
- (4) B00099 Wax - Simoniz Paste
- (5) G01990 Cotton Flannel - Commercially Available

C. Access

- (1) Location Zone
211/212 Control Cabin - Section 41

D. Procedure

S 863-014

WARNING: YOU MUST PUT THE WINDOW HEAT SWITCHES IN THE OFF POSITION. MAKE SURE THE WINDOW-HEAT-INOP LIGHTS ARE ON. IF THESE SWITCHES ARE IN THE ON POSITION OR THE LIGHTS ARE OFF, YOU WILL GET AN ELECTRICAL SHOCK WHEN YOU TOUCH THE WINDOW. ELECTRICAL SHOCKS CAN CAUSE INJURY OR DEATH.

- (1) Put these WINDOW HEAT switches on the pilot's overhead panel, P5, in the OFF position and attach DO-NOT-OPERATE tags:
 - (a) LEFT FWD
 - (b) LEFT SIDE
 - (c) RIGHT FWD
 - (d) RIGHT SIDE

S 113-019

- (2) Make sure the WINDOW-HEAT-INOP lights are on.

S 113-015

- (3) Make sure the flight compartment windows are clean.

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S 113-016

- (4) Apply a thin layer of wax on the inner and outer surfaces of the window with a cotton flannel cloth.

S 113-025

- (5) Rub the window with a clean cotton flannel cloth until you cannot see the wax.

S 863-024

- (6) Remove the DO-NOT-OPERATE tags and put these WINDOW HEAT switches in the ON position:
- (a) LEFT FWD
 - (b) LEFT SIDE
 - (c) RIGHT FWD
 - (d) RIGHT SIDE

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PASSENGER WINDOWS - SERVICING

1. General

- A. This procedure contains two tasks:
 - (1) The first task gives two different procedures.
 - (a) In the first procedure you will remove and disassemble the windows. You will clean all the surfaces of the windows.
 - (b) In the second procedure, you will not remove the windows. You will only clean the inner surface of the inner pane and the outer surface of the outer pane.
- B. The inner pane is part of the decorative panel. It is not necessary to disassemble it when you clean it.

TASK 12-16-03-113-001

2. Clean the Passenger Window

- A. Consumable Materials
 - (1) G01989 Castile Soap - Commercially Available
 - (2) B00106 Chamois - Spec KK-C-300 Oil Tan
 - (3) B00709 WAX - STATIC STOP CLEANER (CAST ACRYLIC PANES ONLY)
 - (4) G00073 Antistatic Agent - (Windows)
Activol 139 OM
 - (5) G00027 Cheesecloth - BMS 15-5 Shurwipe, boil
and drain three times
- B. References
 - (1) 56-21-01/401, Passenger Windows
- C. Access
 - (1) Location Zones
 - 221/222 Passenger Cabin - Section 41
 - 231/232 Passenger Cabin - Section 43
 - 241/242 Passenger Cabin - Section 45
 - 251/252 Passenger Cabin - Section 46
- D. Procedure - Remove, Clean and Apply Antistatic Agent to the Windows

NOTE: This procedure is for the all surfaces of the inner, middle, and outer window panes. It is necessary to remove and disassemble the windows for this procedure.

S 023-011

- (1) Remove the window from the airplane. Disassemble the middle and outer panes from the seal (Ref 56-21-01).

S 113-012

- (2) Apply the soap solution to the window with a chamois that is moist with clean water.

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S 113-013

- (3) Rub the windows with the chamois, with very light hand pressure, until the windows are clean.

S 113-017

- (4) Remove the unwanted materials from the window with clean water.

S 163-015

CAUTION: DO NOT RUB A DRY WINDOW. IF YOU RUB A DRY WINDOW, YOU WILL CAUSE SCRATCHES AND YOU WILL MAKE AN ELECTROSTATIC CHARGE. THE SCRATCHES WILL REDUCE THE VISUAL CAPACITY OF THE WINDOW. THE ELECTROSTATIC CHARGE WILL MAKE THE DUST STAY ON THE WINDOWS.

- (5) Rub the windows with a chamois that is moist with water to remove most of the water from the windows.

S 613-016

- (6) Apply the antistatic agent as follows (optional):
- (a) Mix 10 parts (by weight) antistatic agent with 120 parts water.
 - (b) Soak the boiled cheesecloth in the antistatic solution.
 - (c) Rub the windows with the cheesecloth that is soaked with the antistatic solution.
 - (d) Let the window dry.
 - (e) Rub the windows with a clean and dry cheesecloth that was boiled. Rub the window in straight line movements until the window is glossy.

NOTE: Water will remove the antistatic solution. Keep the window dry.

S 213-017

- (7) Examine the seal for damage. Make sure it is not worn before you assemble the middle and outer panes. Install a new seal, if it is necessary.

S 423-018

- (8) Install the windows (Ref 56-21-01).

E. Procedure - Clean Only the Outer Surface of the Outer Pane and the Inner Surface of the Inner Pane With the Windows Installed

S 113-007

- (1) Apply the soap solution to the outer surface of the outer pane and the inner surface of the inner pane.

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S 163-021

CAUTION: DO NOT DISTURB THE HEAT SENSORS WHEN CLEANING THE INTERIOR SURFACE. DISRUPTION CAN CAUSE THE CONNECTORS TO BECOME LOOSE AND OVERHEAT.

- (2) Rub the windows with very light hand pressure with a chamois that is moist with water until the window is clean.

S 113-009

- (3) Remove the soap and the unwanted materials from the panes with clean water.

S 113-010

CAUTION: DO NOT RUB A DRY WINDOW. IF YOU RUB A DRY WINDOW, YOU WILL CAUSE SCRATCHES AND YOU WILL MAKE AN ELECTROSTATIC CHARGE. THE SCRATCHES WILL REDUCE THE VISUAL CAPACITY OF THE WINDOW. THE ELECTROSTATIC CHARGE WILL MAKE THE DUST STAY ON THE WINDOWS.

- (4) Rub the windows with a chamois that is moist with water to remove the water from the window.

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WASTE TANK – SERVICING

1. General

- A. The procedure that follows must be done for each toilet tank on the airplane.
- B. Antifreeze must be added to the toilet tanks only when the airplane is going to freeze. For recommended antifreezes, see this procedure: COLD WEATHER MAINTENANCE – SERVICING (AMM 12-33-01/301).
- C. If you add antifreeze, make sure the total volume of the flushing fluid and the antifreeze is not more than 3 gallons. If you add more than 3 gallons of fluid to the toilet tank it can get too full if the toilets are used a large number of times.

TASK 12-17-01-613-001

2. Service the Toilet Tank(s) (Fig. 301)

A. Equipment

- (1) Toilet service cart
- (2) Handle Assembly, Monogram Part Number 12224

B. Consumable Materials

- (1) B00490 Chemical Precharge (Deodorant)
 - (a) Chemical Precharge:
 - 1) Sani-Pak SP77000 Series and SP97000 Series
Celeste Industries
Easton, MD
 - 2) Honey Bee 33
McGean-Rohco Inc.
Cleveland, Ohio
 - 3) Honey Bee 24
McGean-Rohco, Incorporated
Cleveland, Ohio

C. References

- (1) AMM 12-33-01/301, Cold Weather Maintenance

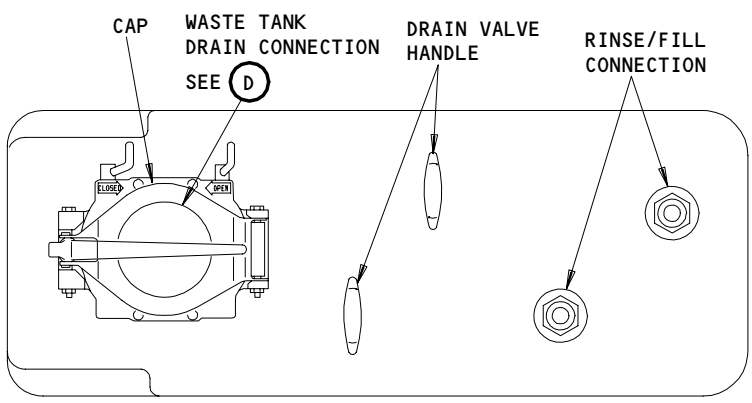
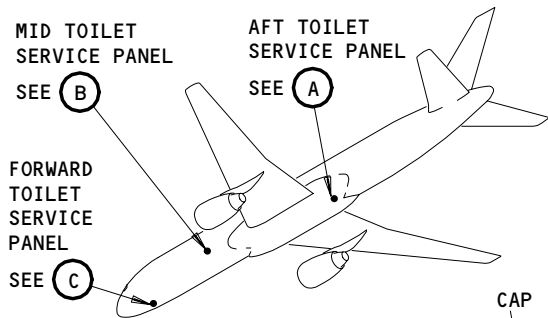
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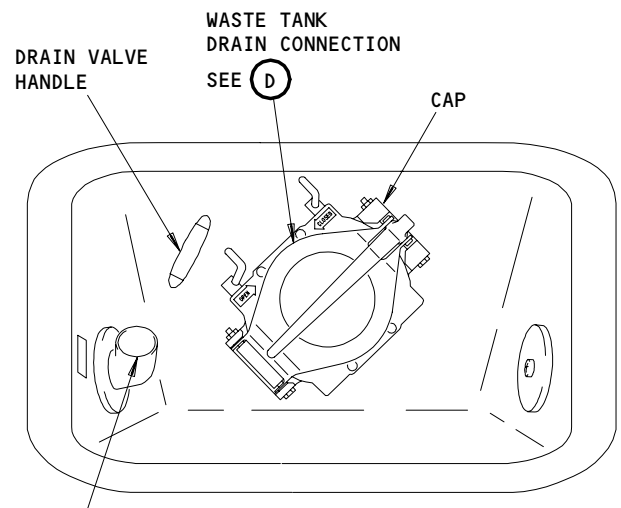
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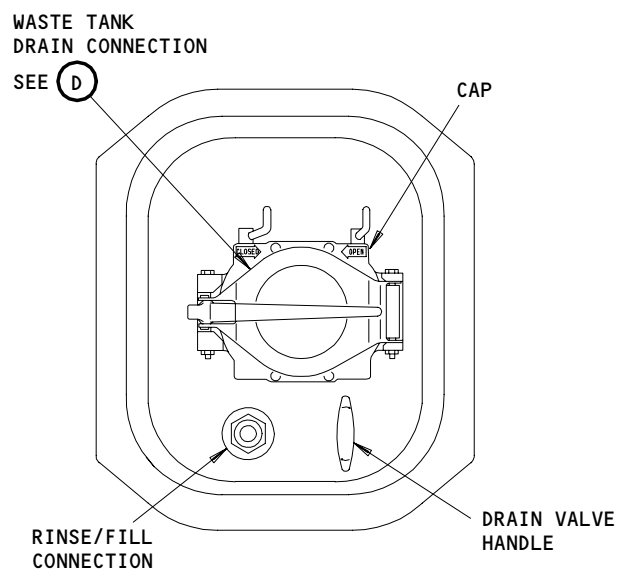
AFT TOILET SERVICE PANEL

(A)



MID TOILET SERVICE PANEL

(B)



FORWARD TOILET SERVICE PANEL

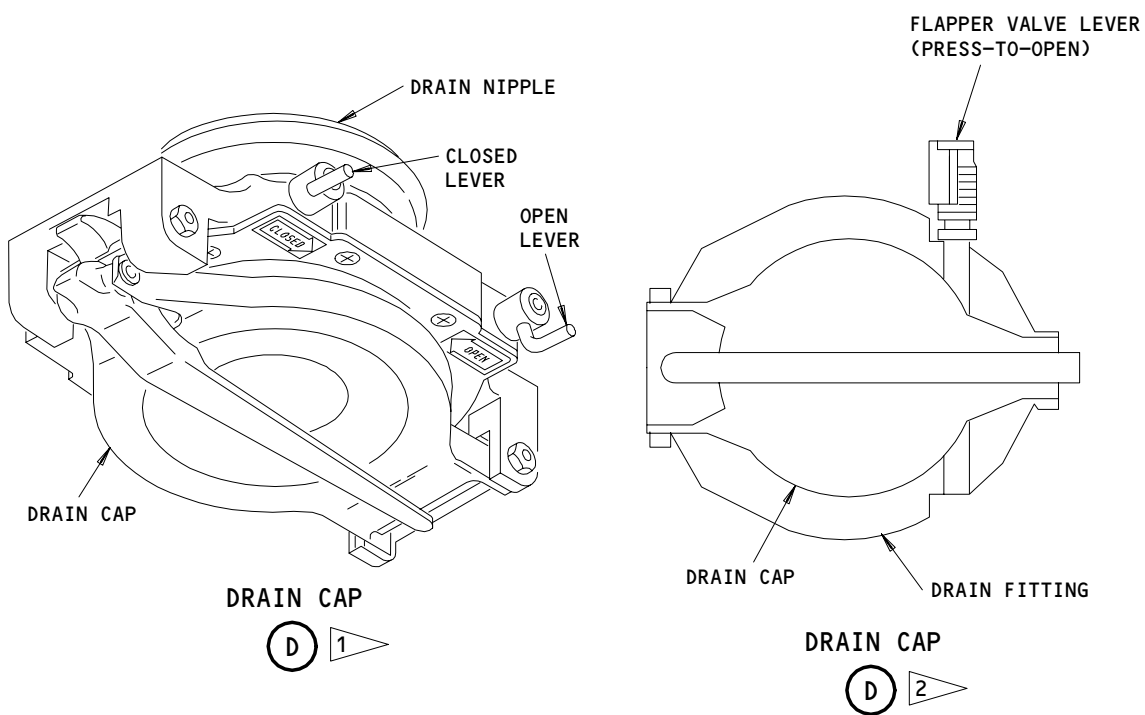
(C)

Waste-Tank Servicing
Figure 301 (Sheet 1)

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- 1 AIRPLANES WITH DRAIN CAPS WITH OPEN/CLOSE LEVERS
- 2 AIRPLANES WITH DRAIN CAPS WITH PUSH-TO-OPEN LEVERS

Waste-Tank Servicing
Figure 301 (Sheet 2)

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- (2) AMM 24-22-00/201, Electrical Power - Control
- (3) AMM 52-49-00/001, Exterior Service Doors

D. Access

- (1) Location Zone
 - 100 Lower Half of Fuselage
- (2) Access Panels
 - 119AL Forward Toilet Service Panel
 - 121AL Forward Toilet Service Panel
 - 149GL Mid Toilet Service Panel

E. Procedure

- S 863-003
 - (1) Supply external electrical power or APU generator electrical power (AMM 24-22-00/201).
- S 863-004
 - (2) Make sure this circuit breaker on the APU external power panel, P34, is closed:
 - (a) 34A3(A), FILL CONT LAV
- S 863-007
 - (3) Make sure this circuit breaker on the right miscellaneous electrical equipment panel, P37, is closed:
 - (a) 37D8, LAV FILL VALVE
- S 863-010
 - (4) Open the door for the toilet service panel, AMM 52-49-00/001.
- S 013-011

CAUTION: DO NOT LET TOILET FLUIDS GET ON THE AIRPLANE. STAINS ON THE SKIN OF THE AIRPLANE ARE AN INDICATION OF A LEAK WHEN THE AIRPLANE IS IN FLIGHT OR OF UNSATISFACTORY SERVICING PROCEDURES. TOILET FLUIDS CAN CAUSE CORROSION ON THE AIRPLANE STRUCTURE.

- (5) Open the cap on the waste tank drain connection.

NOTE: Fluid in the drain line is an indication that the drain valve may have a leak.

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S 493-012

- (6) Do these steps to connect the toilet service cart:
- (a) Connect the flush line to the rinse/fill connection.
 - (b) Connect the drain hose of the toilet service cart to the waste tank drain connection.
 - (c) If the drain hose for the toilet service cart has a Y-fitting, pull the T-handle fully out.

NOTE: This gives clearance for the flapper valve in the waste tank drain connection.

- (d) Open the flapper valve in the waste tank drain connection.

NOTE: To do this turn the OPEN lever 1/4 turn in the direction of the OPEN arrow.

S 683-027

- (7) Pull the T-handle on the service panel in the down direction and turn it to lock the drain valve open.

NOTE: For the best results, drain the toilet tanks one at a time. If a drain line is blocked, you can pressurize the airplane cabin to 4 psi (maximum) to make the drain line clear.

NOTE: The toilet service line pressure should not exceed 10.0 PSID.

S 683-069

- (8) Make sure you hear or feel flow in the drain hose.
- (a) If you do not get flow in the drain hose or not load on the control cable for the toilet tank drain valve, do these steps:
 - 1) Remove the shroud on the toilet.
 - 2) Do a check to make sure the control cable is serviceable.

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- 3) If the control cable is not serviceable, disconnect the control cable at the quick disconnect and then use the handle assembly to manually open the toilet tank drain valve.
- 4) If the control cable is not serviceable, replace the control cable (AMM 38-32-10/401).
- 5) Put the toilet shroud back in its usual position.

S 613-029

- (9) When the toilet tank has drained, push the T-handle on the service panel in the up direction to close the drain valve.

NOTE: Turn the T-handle to the not locked position before you move it to the closed position.

S 173-030

- (10) Pump a minimum of 6 gallons of water through the rinse/fill connection to flush the toilet tank. As you pump the water, pull and release the T-handle on the service panel 3 to 10 times to clean the drain valve.

NOTE: Recommended pressure: 20-50 psig.
Maximum Pressure: 60 psig.

S 173-031

- (11) Stop the pump on the toilet service cart.

S 683-032

- (12) Pull the handle for the drain valve down and turn it to lock the drain valve open.

S 683-033

- (13) Drain the toilet tanks fully.

S 613-034

- (14) Unlock and release the handle for the drain valve to close the drain valve.

NOTE: Let the handle for the drain valve move quickly into the closed position. This makes a water tight seal at the drain valve.

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S 093-035

- (15) Do these steps to disconnect the toilet service cart:
- (a) Do these steps to close the flapper valve in the waste tank drain line:
 - 1) Turn the CLOSE lever in the direction of the CLOSED arrow and hold the CLOSED lever in the closed position.
 - 2) Turn the OPEN lever in the opposite direction of the OPEN arrow to lock the flapper valve in the closed position.
 - (b) For the drain cap with the push-to-open lever for the flapper valve, close and lock the drain cap.

NOTE: The flapper valve will move to the closed position at the same time the drain cap is moved to the closed position.

- (c) Disconnect the flush line.
- (d) Disconnect the waste drain hose.

S 493-051

- (16) Connect the chemical tank on the toilet service cart to the rinse/fill connection.

S 613-052

- (17) Put a minimum of 2 gallons (or the quantity shown on the service panel door placard) of water and toilet flushing deodorant into each toilet tank.

NOTE: The minimum required amount of precharge necessary to enable proper toilet pump operation is at least 2 gallons of precharge. Because of ramp slope variations and servicing equipment tolerances, Boeing recommends that 3 gallons of precharge be used to ensure that an adequate amount has been supplied and to improve deodorization. The minimum quantity can be used if maximum waste capacity is desired.

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NOTE: If the airplane is going to freeze, antifreeze may be needed in the toilet tanks. For recommended antifreezes, see this procedure:
COLD WEATHER MAINTENANCE - SERVICING (AMM 12-33-01/301).

S 093-055

- (18) Disconnect the flush line.

NOTE: Make sure the flush line is fully drained when you disconnect the toilet precharge connection.

S 163-056

- (19) Clean and dry all the components and the door of the toilet service panel.

S 213-070

- (20) Make sure that the rinse/fill connection has no leakage.

S 413-068

- (21) FLUSH PORTS WITH A CAP;
Close the cap on the flush port.

S 213-057

- (22) Make sure the seal in the cap for the waste tank drain connection is in good condition. Look for aging, cuts, wear, or other signs of deterioration.

S 213-058

- (23) Make sure the end of the waste tank drain connection does not have nicks, dents, scratches, or cracks.

S 213-071

- (24) Make sure that the waste tank drain connection has no leakage.

S 413-059

- (25) Close the cap on the waste tank drain connection.

S 413-060

- (26) Close the door for the toilet service panel, AMM 52-49-00/001.

S 863-061

- (27) Remove electrical power if it is not necessary, AMM 24-22-00/201.

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AIRPLANE LUBRICATION - SERVICING

1. General

A. This procedure contains these tasks:

- (1) General Instruction for Lubrication
- (2) Changing of Approved Grease Brands or Specification Types

TASK 12-21-00-913-001

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 sections of the Aircraft Maintenance Manual (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 to 250°F (-73 to 121°C) range:

- 1) BMS 3-33
- 2) MIL-PRF-23827
- 3) MIL-G-21164 (NATO G-353)

(b) BMS 3-33 is the preferred general-purpose aviation grease recommended by Boeing for applications exposed to temperatures of less than 250°F. It is recommended because it shows better wear, corrosion protection, and low temperature torque properties.

- 1) BMS 3-33 is satisfactory to be used:
 - a) When MIL-PRF-23827 was specified.
 - b) When MIL-G-21164 was specified and MIL-PRF-23827 is given as an option.
 - c) When BMS 3-24 is specified for use in which the maximum service temperature is not more than 250°F.
- 2) BMS 3-33 cannot be used where MIL-G-21164 or Royco 11MS are the only greases specified because BMS 3-33 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.

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- (3) Special Performance Greases
 - (a) Special performance greases include:
 - 1) Royco 11MS
 - 2) MIL-PRF-81322 (NATO G-354)
 - 3) BMS 3-33 (preferred)
 - 4) BMS 3-24 (alternate)
 - (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) BMS 3-32, Type II Landing Gear Shock Strut Fluid, Anti-Wear
 - (b) MIL-H-5606, Hydraulic Fluid, Petroleum base, Aircraft (NATO H-515)
 - (c) MIL-PRF-7870, Lubricating Oil, 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 (Fig. 301). If necessary, more data is given near the lubrication block to help you lubricate the airplane correctly. Each block shows this data:
 - 1) The lubrication method
 - 2) The type of lubricant
 - 3) 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 Boeing Service Letter 757-SL-20-022, Summary of Most Commonly Used Greases on Boeing Airplanes.
- B. Reference
- (1) AMM 20-10-29/401, Lubrication Fittings
- C. Lubrication Application Procedures and Cautions

S 913-002

- (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.

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S 913-003

(2) Do these steps for correct lubrication:

CAUTION: DO NOT LET DIRT, FILINGS, AND OTHER UNWANTED MATERIAL GET IN THE LUBRICANT DURING AND AFTER LUBRICATION.

(a) Remove dirt from the grease fittings before you attach the grease gun.

WARNING: DO NOT SET THE GUN TO A PRESSURE THAT IS MORE THAN 2500 PSI (17237 KPa). 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) Make sure that the pressure that you set is less than 2500 psi (17237 KPa).

(c) Set the pressure at 100 to 200 psi (689 - 1379 KPa) unless otherwise specified.

NOTE: This is usually sufficient to push out the used grease.

(d) Find all of the lubrication points that are identified in the specific maintenance task.

1) Use the specified lubricant.

2) Use an Alemite Midget flush adapter (No. 314150) for flush-type grease fittings.

3) Apply all lubricants slowly and smoothly.

4) Dispense grease into the grease fitting until the used grease is visually removed and only new grease comes out.

NOTE: This removes contamination along with the used grease.

(e) After lubrication, remove the unwanted grease or lubricating fluid that is around the part or on other parts with a wiper to prevent contamination and damage to other surfaces.

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CAUTION: LUBRICATE ONLY THE APPLICATIONS THAT HAVE LUBRICATION FITTINGS. DO NOT LUBRICATE TEFLON BEARINGS AND BUSHINGS BECAUSE LUBRICANTS MAY CAUSE DAMAGE TO THE TEFLON AND DECREASE THE LIFE OF THE BEARING.

(f) Do not lubricate Teflon bearings and bushings.

NOTE: It is not necessary to lubricate these bearings.

- (g) 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 (AMM 20-10-29/401).
- (h) 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.

TASK 12-21-00-913-004

3. Changing of Approved Grease Brands or Specification Types

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.

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- 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. Procedure

S 913-005

- (1) Make sure that the grease that you use is permitted by the specific AMM instructions and your local maintenance practices.

S 913-006

- (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 wipes.
 - (b) Lubricate the bearing surfaces with the new grease.

S 913-007

- (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.

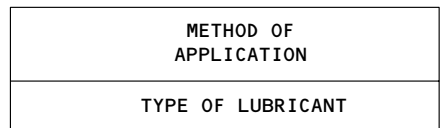
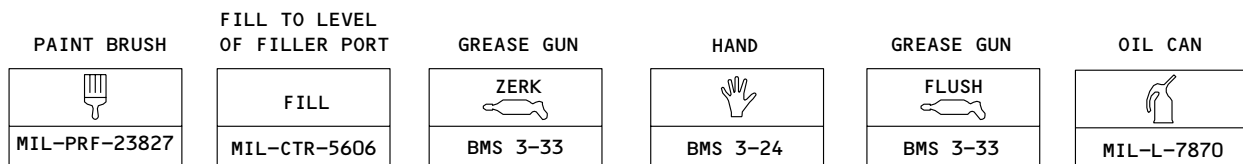
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
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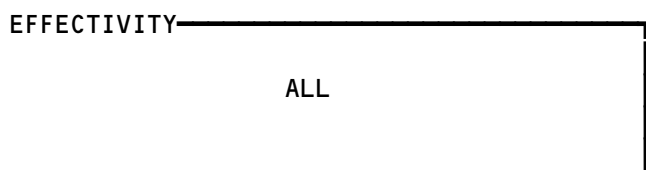
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(Sample Symbol)

 FLAG NOTES ARE USED TO PROVIDE ALTERNATE LUBRICANT AND ADDITIONAL INSTRUCTION.

Lubrication Symbols
Figure 301



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ELEVATOR CONTROL SYSTEM – SERVICING (LUBRICATION)

1. General

- A. This procedure contains these tasks to lubricate components in the elevator control system:
- (1) Prepare to lubricate the elevator control system.
 - (2) Elevator power control actuator (PCA) lubrication.
 - (3) Lubricate the elevator hinge and power control actuator (PCA) input.
- B. For a complete lubrication of the Elevator Control System, it is necessary to do all three tasks in this procedure. If you perform all three tasks, it is not necessary to repeat the same steps in the "Prepare to Lubricate the Elevator Control System" task. Put the airplane back to its usual condition after you complete all the necessary lubrications tasks.

TASK 12-21-04-643-001

2. Prepare to Lubricate the Elevator Control System

A. Equipment

- (1) Lock Assemblies from Elevator PCA Lockout Equipment B27009-12, as follows:
- (a) Lock Assembly, PCA – B27009-2

NOTE: The PCA lock assembly can be installed on either the left, right, or center PCAs. It contains a shear-out device to prevent damage caused by accidental system operation during maintenance.

- (b) Lock Assembly, PCA Input Linkage – B27009-3

NOTE: The input linkage lock assembly holds the linkage in the elevator up position during maintenance. It is installed on the center PCA linkage.

B. References

- (1) AMM 06-42-00/201, Empennage Access Doors and Seals
- (2) AMM 24-22-00/201, Electrical Power – Control
- (3) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

C. Access

- (1) Location Zones
- 335 Left Horizontal Stab – Rear Spar to Trailing Edge
 - 345 Right Horizontal Stab – Rear Spar to Trailing Edge

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D. Prepare For Lubrication (Fig. 303)

S 863-002

- (1) Approximately position the stabilizer to the neutral position (6 units of trim).

S 863-003

- (2) Remove the pressure from the right and center hydraulic systems and reservoirs (AMM 29-11-00/201).

S 863-004

- (3) Pull the control column full aft and use a rope to hold the control column in this position.

S 863-010

- (4) Attach DO-NOT-OPERATE tags to the control column.

S 863-005

- (5) Put the L, R, and C FLT CONTROL SHUTOFF switches on sidewall panel, P61, to OFF.

S 863-006

- (6) Put the RIGHT and CENTER STAB TRIM SHUTOFF valve switches on control stand panel, P10, to the CUTOUT position.

S 863-007

- (7) Open these circuit breakers on overhead panel, P11, and attach DO-NOT-CLOSE tags:

- (a) 11B19, STAB TRIM ALT (IF INSTALLED)
- (b) 11C12, STAB TRIM SHUTOFF RIGHT
- (c) 11C13, STAB TRIM SHUTOFF LEFT
- (d) 11H11 or 11C05, STAB TRIM CONT L
- (e) 11H17, FLT CONT SHUTOFF TAIL LEFT
- (f) 11H18, FLT CONT SHUTOFF TAIL CTR
- (g) 11H20, STAB TRIM CONT R

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(h) 11H28, FLT CONT SHUTOFF TAIL RIGHT

S 013-022

(8) Open access panels 335DB and 345DB (AMM 06-42-00/201).

S 493-008

WARNING: INSTALL BOTH ELEVATOR LOCK ASSEMBLIES (PCA AND PCA LINKAGE LOCK ASSEMBLIES). INSTALL THE PCA LINKAGE LOCK ASSEMBLY BEFORE THE PCA LOCK ASSEMBLY. USE A ROPE TO HOLD THE ELEVATOR CONTROL COLUMN IN THE FULL AFT POSITION WHILE THE LOCK ASSEMBLIES ARE INSTALLED. THESE PRECAUTIONS WILL PREVENT INJURY TO PERSONS AND DAMAGE TO THE AIRPLANE.

(9) Manually move the elevator up and install elevator PCA lockout equipment as follows (Fig. 303).

NOTE: A force of approximately 60 pounds (267 newtons) on the elevator trailing edge is necessary to lift the elevator.

(a) Install the PCA linkage lock assembly as shown in Detail B.

(b) Install the PCA lock assembly.

TASK 12-21-04-643-011

3. Elevator Power Control Actuator (PCA) - Lubrication

A. Consumable Materials

(1) D00633 Grease, Corrosion Preventive - BMS 3-33 (Recommended)

NOTE: BMS 3-33 is the preferred grease for the elevator control system. BMS 3-33 has a distinct green color which becomes black in service. BMS 3-24 (the alternate grease) has a brown color which becomes dark brown in service. When you change to a different grease, it is important to fully purge out the old grease.

(2) D00015 Grease, Corrosion Preventive - BMS 3-24 (Alternate)

(3) D00013 Grease - MIL-PRF-23827 (Alternate)

B. Access

(1) Location Zones

335 Left Horizontal Stab - Rear Spar to Trailing Edge

345 Right Horizontal Stab - Rear Spar to Trailing Edge

C. Lubricate the Elevator Power Control Actuator (PCA)

S 643-016

(1) Do this task: Prepare to Lubricate the Elevator Control System.

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S 643-009

- (2) Lubricate the elevator PCA (Fig. 302).

NOTE: Make sure the grease passes through the lubrication passage into the bearing cavities. Make sure the grease completely fills the bearing cavities. Do not permit the grease to prematurely exit the bearing through the openings in the grease retainers, without first filling the bearing cavity.

D. Put the Airplane Back to Its Usual Condition

S 013-026

- (1) Manually move the elevator up and remove the elevator PCA lockout equipment.

NOTE: A force of approximately 60 pounds (267 newtons) on the elevator trailing edge is necessary to lift the elevator.

- (a) Remove the PCA lock assembly.
(b) Remove the PCA linkage lock assembly.

S 013-027

- (2) Close access panels 335DB and 345DB (AMM 06-42-00/201).

S 863-028

- (3) Close these circuit breakers on overhead panel, P11:
- (a) 11B19, STAB TRIM ALT (IF INSTALLED)
 - (b) 11C12, STAB TRIM SHUTOFF RIGHT
 - (c) 11C13, STAB TRIM SHUTOFF LEFT
 - (d) 11H11 or 11C05, STAB TRIM CONT L
 - (e) 11H17, FLT CONT SHUTOFF TAIL LEFT
 - (f) 11H18, FLT CONT SHUTOFF TAIL CTR
 - (g) 11H20, STAB TRIM CONT R
 - (h) 11H28, FLT CONT SHUTOFF TAIL RIGHT

S 863-029

- (4) Put the RIGHT and CENTER STAB TRIM SHUTOFF valve switches on control stand panel, P10, to the Normal position.

S 863-030

- (5) Put the L, R, and C FLT CONTROL SHUTOFF switches on sidewall panel, P61, to ON.

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TASK 12-21-04-643-012

4. Lubricate the Elevator Hinge and Power Control Actuator (PCA) Input Linkage

A. Consumable Materials

- (1) D00633 Grease, Corrosion Preventive - BMS 3-33 (Recommended)

NOTE: BMS 3-33 is the preferred grease for the elevator control system. BMS 3-33 has a distinct green color which becomes black in service. BMS 3-24 (the alternate grease) has a brown color which becomes dark brown in service. When you change to a different grease, it is important to fully purge out the old grease.

- (2) D00015 Grease, Corrosion Preventive - BMS 3-24 (Alternate)

- (3) D00013 Grease - MIL-PRF-23827 (Optional)

B. Access

(1) Location Zones

335 Left Horizontal Stab - Rear Spar to Trailing Edge

345 Right Horizontal Stab - Rear Spar to Trailing Edge

C. Lubricate the Elevator Hinge and Power Control Actuator (PCA) Input Linkage

S 643-017

- (1) Do this task: Prepare to Lubricate the Elevator Control System.

S 643-013

- (2) Lubricate the elevator hinge (Fig. 301).

NOTE: Make sure the grease passes through the lubrication passage into the bearing cavities. Make sure the grease completely fills the bearing cavities. Do not permit the grease to prematurely exit the bearing through the openings in the grease retainers, without first filling the bearing cavity.

S 643-015

- (3) Lubricate the elevator PCA input linkage (Fig. 302).

D. Put the Airplane Back to Its Usual Condition

S 013-020

- (1) Manually move the elevator up and remove the elevator PCA lockout equipment.

NOTE: A force of approximately 60 pounds (267 newtons) on the elevator trailing edge is necessary to lift the elevator.

- (a) Remove the PCA lock assembly.

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(b) Remove the PCA linkage lock assembly.

S 013-023

(2) Close access panels 335DB and 345DB (AMM 06-42-00/201).

S 863-019

(3) Close these circuit breakers on overhead panel, P11:

(a) 11B19, STAB TRIM ALT (IF INSTALLED)

(b) 11C12, STAB TRIM SHUTOFF RIGHT

(c) 11C13, STAB TRIM SHUTOFF LEFT

(d) 11H11 or 11C05, STAB TRIM CONT L

(e) 11H17, FLT CONT SHUTOFF TAIL LEFT

(f) 11H18, FLT CONT SHUTOFF TAIL CTR

(g) 11H20, STAB TRIM CONT R

(h) 11H28, FLT CONT SHUTOFF TAIL RIGHT

S 863-024

(4) Put the RIGHT and CENTER STAB TRIM SHUTOFF valve switches on control stand panel, P10, to the Normal position.

S 863-025

(5) Put the L, R, and C FLT CONTROL SHUTOFF switches on sidewall panel, P61, to ON.

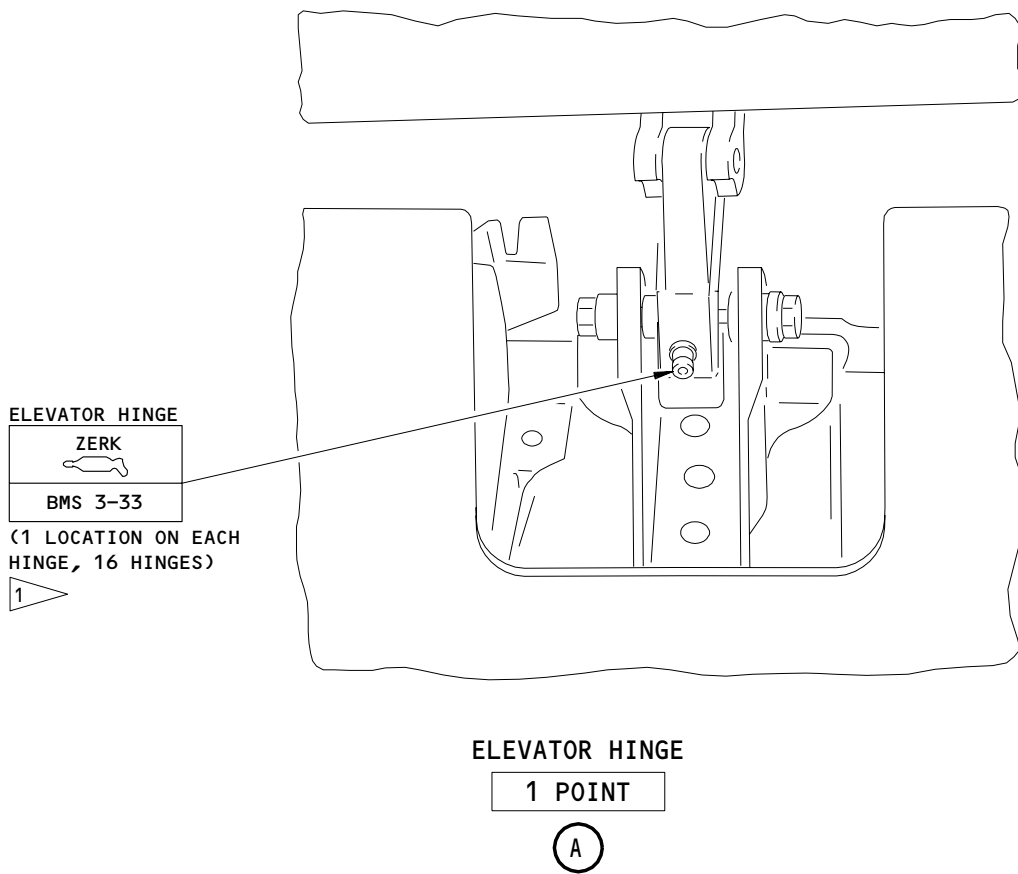
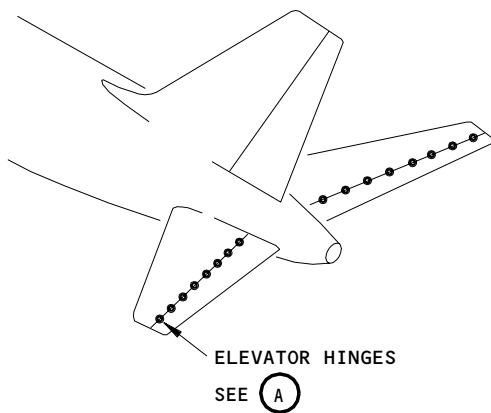
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1 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Elevator Hinge and Input Linkage Lubrication
Figure 301 (Sheet 1)

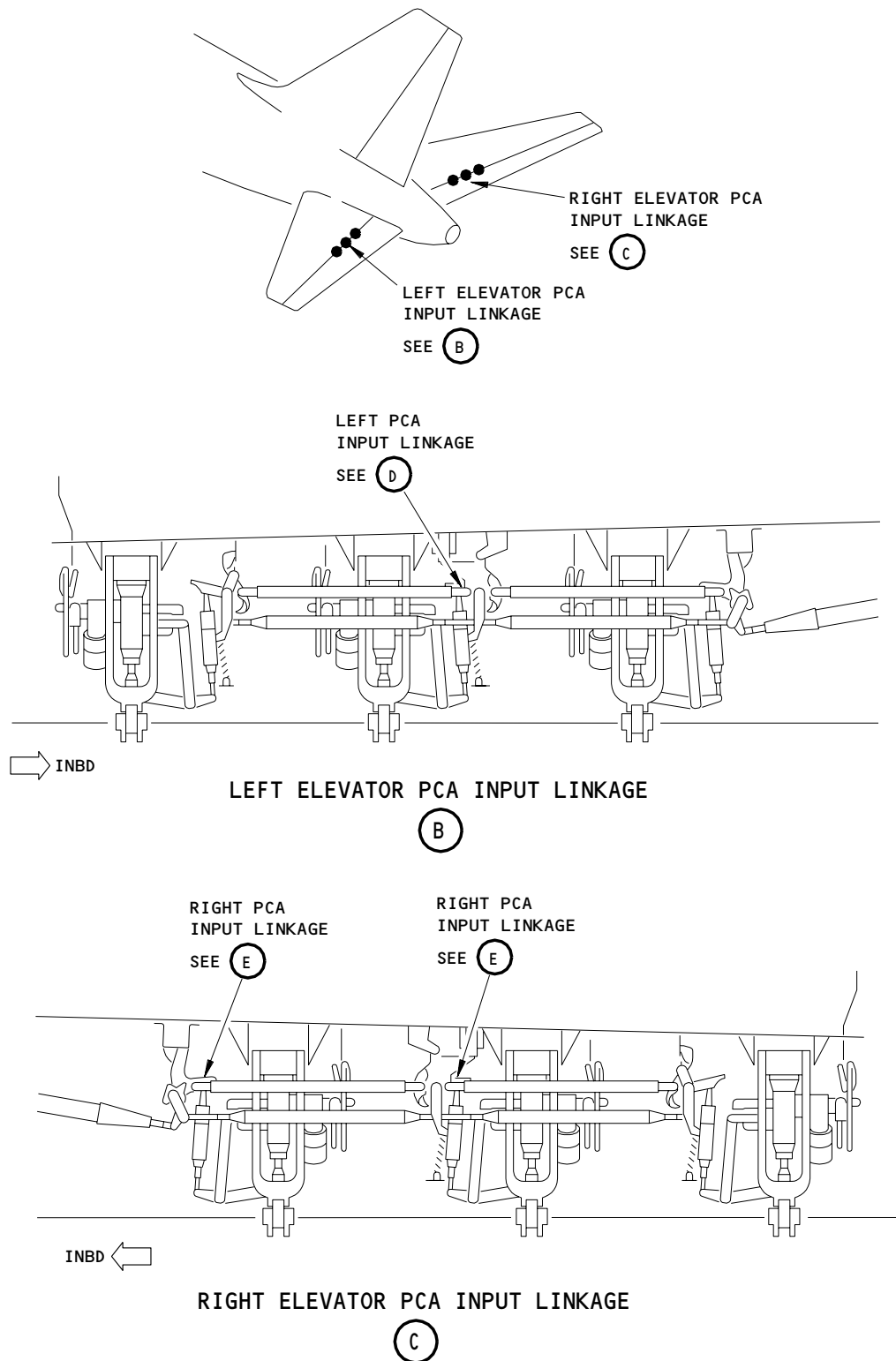
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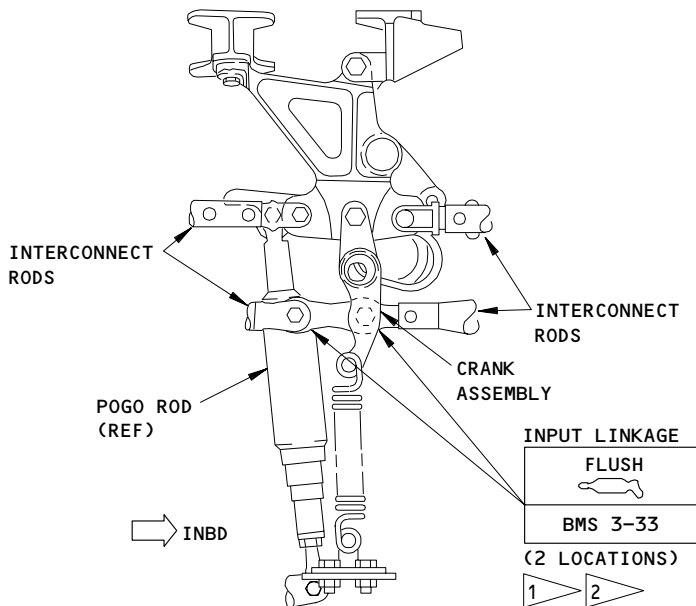
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Elevator Hinge and Input Linkage Lubrication
Figure 301 (Sheet 2)

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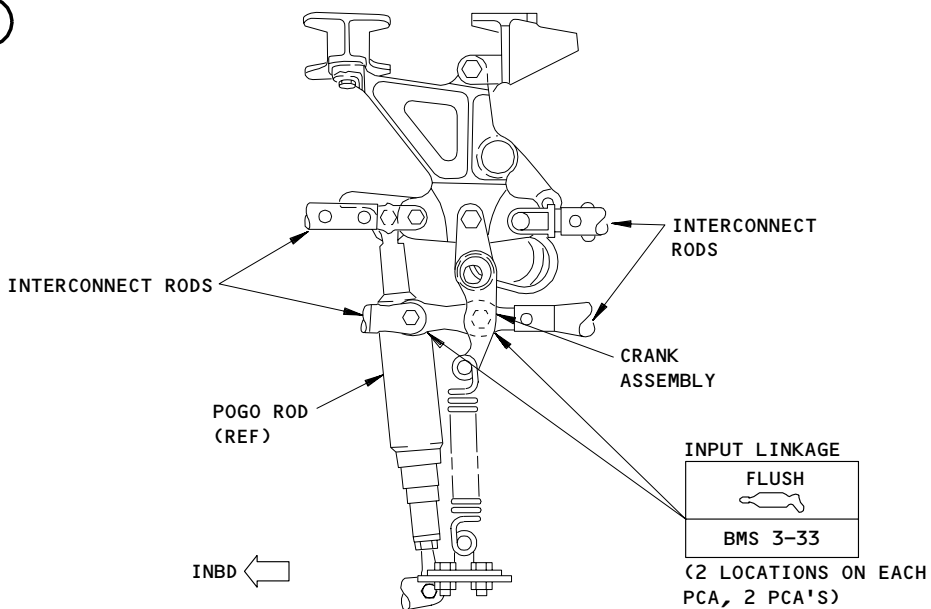
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INPUT LINKAGE FOR LEFT PCA

2 POINTS

(D)



INPUT LINKAGE FOR RIGHT PCA

2 POINTS

(E)

- 1 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
- 2 LUBRICATE ONLY THE ROD ENDS
WHICH CONTAIN TWO BEARINGS,
AS IDENTIFIED IN DETAIL A AND B

Elevator Hinge and Input Linkage Lubrication
Figure 301 (Sheet 3)

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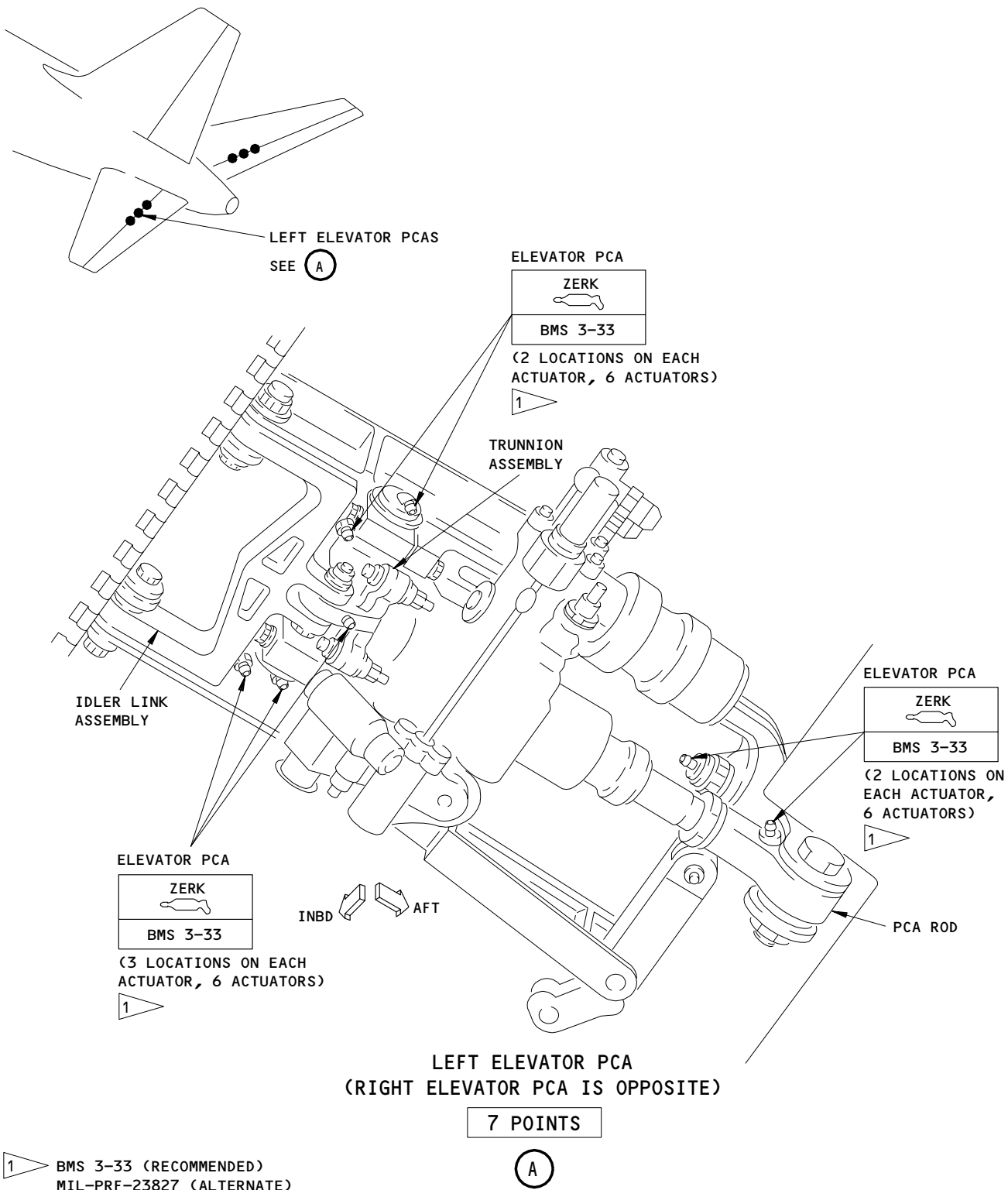
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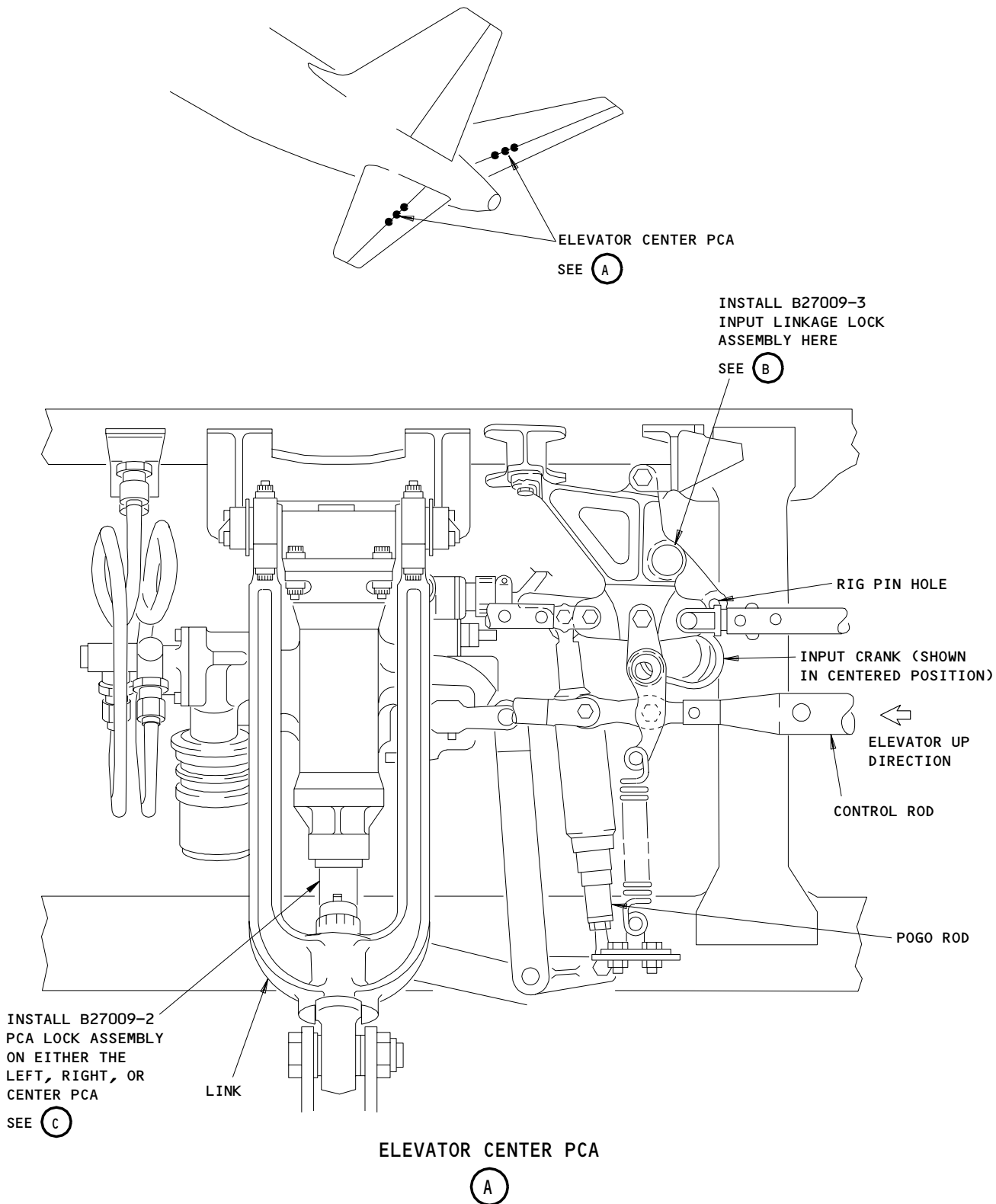
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Elevator Power Control Actuator (PCA) Lubrication
Figure 302

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Elevator PCA Lockout Equipment Installation
Figure 303 (Sheet 1)

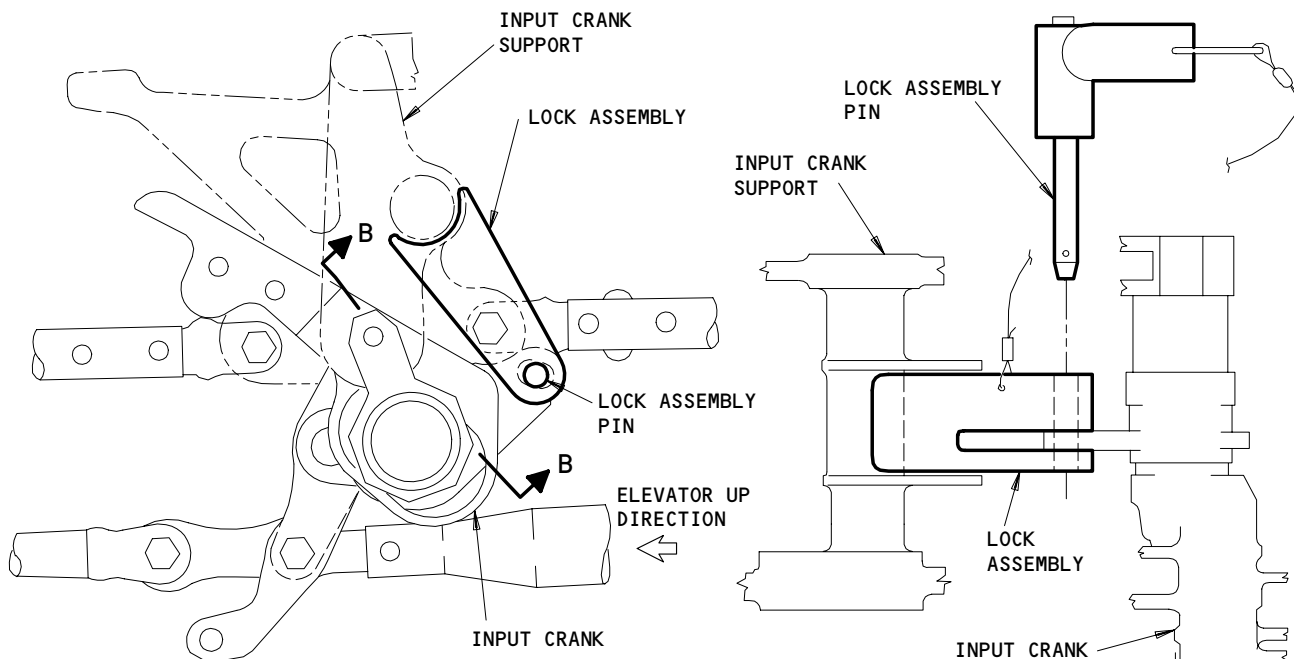
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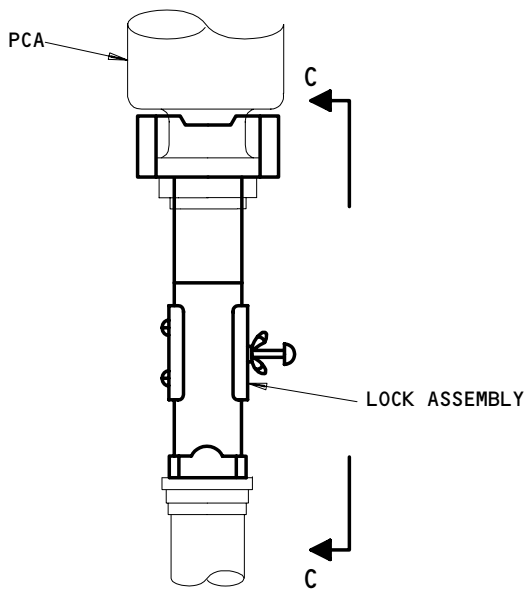
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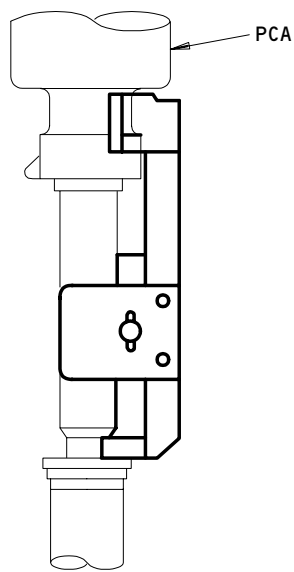
**LOCK ASSEMBLY B27009-3
(PCA LINKAGE IN UP POSITION)**

(B) 1



**LOCK ASSEMBLY B27009-2
(PCA EXTENDED)**

(C) 1



C-C

1 INSTALL LOCK ASSEMBLY B27009-3 BEFORE B27009-2

**Elevator PCA Lockout Equipment Installation
Figure 303 (Sheet 2)**

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HORIZONTAL STABILIZER TRIM CONTROL SYSTEM – SERVICING (LUBRICATION)

1. General

- A. This procedure contains steps to lubricate the stabilizer ballscrew, ballnut, gimbals and pivot bearings of the horizontal-stabilizer-trim control system.

TASK 12-21-05-603-046

2. Lubricate the Horizontal Stabilizer Trim Control System

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
(2) D00013 Grease – MIL-PRF-23827 (Alternate)

B. Access

- (1) Location Zone
311 Area Aft of Pressure Bulkhead to BS 1787.45 (Left)
(2) Location Zone
330/340 Horizontal Stabilizer and Elevator

C. References

- (1) AMM 06-42-00/201, Empennage Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power-Control
(3) AMM 27-51-00/201, Trailing Edge Flap System
(4) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

D. Prepare for the Lubrication

S 863-005

- (1) Supply electrical power (AMM 24-22-00/201).

S 863-006

- (2) Open the following circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
(a) 11C6, CSEU 1L AC or FLT CONT ELEC 1L AC
(b) 11C8, CSEU 2L AC or FLT CONT ELEC 2L AC
(c) 11G17, CSEU 1R AC or FLT CONT ELEC 1R AC
(d) 11G27, CSEU 2R AC or FLT CONT ELEC 2R AC

S 013-007

WARNING: STAY OFF SERVICE ACCESS DOORS 311AL AND 313AL. THE WEIGHT OF A PERSON CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR IF A PERSON FELL THROUGH THE DOOR OPENING.

- (3) Open the access door, 311AL, to the forward stabilizer-compartment (AMM 06-42-00/201).

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S 863-008

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND THE STABILIZER ARE FULLY POWERED SURFACES. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (4) Pressurize the right and center hydraulic systems (AMM 29-11-00/201).
 - (a) Move the trailing edge flaps and the leading edge slats to the takeoff positions (Flap lever between 1 and 20 units).

E. Procedure - Stabilizer Trim Control System Lubrication

S 213-010

- (1) Make sure that the flap lever is in the takeoff position.

NOTE: If the flaps are in the takeoff range, the stabilizer will not cutout early and will move through its full range of travel so that the entire ballscrew can be lubricated.

S 863-011

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND THE STABILIZER ARE FULLY POWERED SURFACES. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-012

- (3) Put the STAB TRIM SHUTOFF switches on the P10 panel to CUTOUT.

S 643-047

- (4) Remove any old grease and dirt from the ballscrew threads by wiping them with a clean, dry, non-abrasive cloth.

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S 643-048

- (5) Lubricate the upper and lower stabilizer gimbals with BMS 3-33 grease (Fig. 301).

S 643-049

- (6) Lubricate the horizontal stabilizer hinge fittings with BMS 3-33 grease (Fig. 302).

S 863-016

- (7) Put one of the STAB TRIM SHUTOFF switches on the P10 panel to NORM.

NOTE: This will activate only one of the stabilizer hydraulic motors and slow the speed of the ballscrew movement.

S 863-017

- (8) Move the captain's stabilizer-trim control-wheel-switches up (airplane nose down).
(a) Make sure that the stabilizer moves to its full leading edge up position.

S 863-019

- (9) Release the stabilizer-trim control-wheel-switches.

S 863-020

- (10) Put one of the STAB TRIM SHUTOFF switches on the P10 panel to CUTOUT.

S 863-059

- (11) Apply grease by the hand method to lubricate the bottom of the ballscrew between the ballnut and the endstop (Fig. 303).

S 863-028

- (12) Put one of the STAB TRIM SHUTOFF switches on the P10 panel to NORM.

NOTE: This will activate only one of the stabilizer hydraulic motors and slow the speed of the ballscrew movement.

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S 863-029

- (13) Move the captain's stabilizer-trim control-wheel-switches down (airplane nose up).
- (a) Make sure that the stabilizer moves to its full leading edge down position.

S 863-030

- (14) Release the stabilizer-trim control-wheel-switches.

S 863-031

- (15) Put the STAB TRIM SHUTOFF switches on the P10 panel to CUTOUT.

S 643-058

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND THE STABILIZER ARE FULLY POWERED SURFACES. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (16) Apply grease by the hand method to lubricate the top of the ballscrew between the ballnut and the endstop (Fig. 303).

S 643-052

- (17) Clear any hardened grease from the grease vent with a non-metallic pick.

S 643-057

- (18) Do the following to put fresh grease into the ballscrew ballnut.
- (a) While the upper gimbal is in the top or bottom position and not moving, put grease into the ballscrew ballnut until new grease comes out the vent holes near the bottom of the ballnut and/or the bottom seal.
- (b) Visually confirm that new grease exists through the vent holes or from the bottom seal (Figure 301).

NOTE: It may take 100 or more strokes of a manual grease gun (or a total of about 50 cc) before grease reaches the vent holes and/or bottom seal. It is normal for grease to come out the top seal before it comes out the vent holes.

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- (c) If no grease comes out of the vent holes, replace the ballscrew actuator (AMM 27-41-10/401).
- (d) Clear the vent holes of excess grease if necessary.
- (e) Set one of the STAB TRIM SHUTOFF switches on the P10 panel to NORM.

NOTE: This will activate only one of the stabilizer hydraulic motors and slow the speed of the ballscrew movement.

- (f) Use the stabilizer trim switches on the control wheel to run the actuator for one complete cycle of the ballnut (endstop to the endstop).
- (g) Repeat step (a) to put grease into the ballscrew ballnut. Visually confirm that the grease exits through the seals at both ends of the ballnut. Grease exiting the ballnut shall be visually inspected for signs of metallic debris, discolored water, rust or other harmful particles. If any of these items exit from the ballscrew ballnut, replace the ballscrew actuator (AMM 27-41-10/401).

NOTE: If no grease comes out of the lower vent holes, it may be an indication of faulty seals and/or a contaminated or corroded ballscrew ballnut.

- (h) Run the actuator again for one complete cycle of the ballnut (endstop to the endstop).

NOTE: The cycling of the actuator is intended to work the lubricant throughout the ballnut assembly.

F. Put the Airplane Back to its Usual Condition

S 863-039

- (1) Close the access door, 311AL, to the forward stabilizer-compartment (AMM 06-42-00/201).

S 863-035

- (2) Remove the power from the right, center, and left hydraulic systems (AMM 29-11-00/201).

S 043-034

- (3) Remove electrical power, if it is not necessary (AMM 24-22-00/201).

S 863-036

- (4) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11C6, CSEU 1L AC or FLT CONT ELEC 1L AC
 - (b) 11C8, CSEU 2L AC or FLT CONT ELEC 2L AC
 - (c) 11G17, CSEU 1R AC or FLT CONT ELEC 1R AC
 - (d) 11G27, CSEU 2R AC or FLT CONT ELEC 2R AC

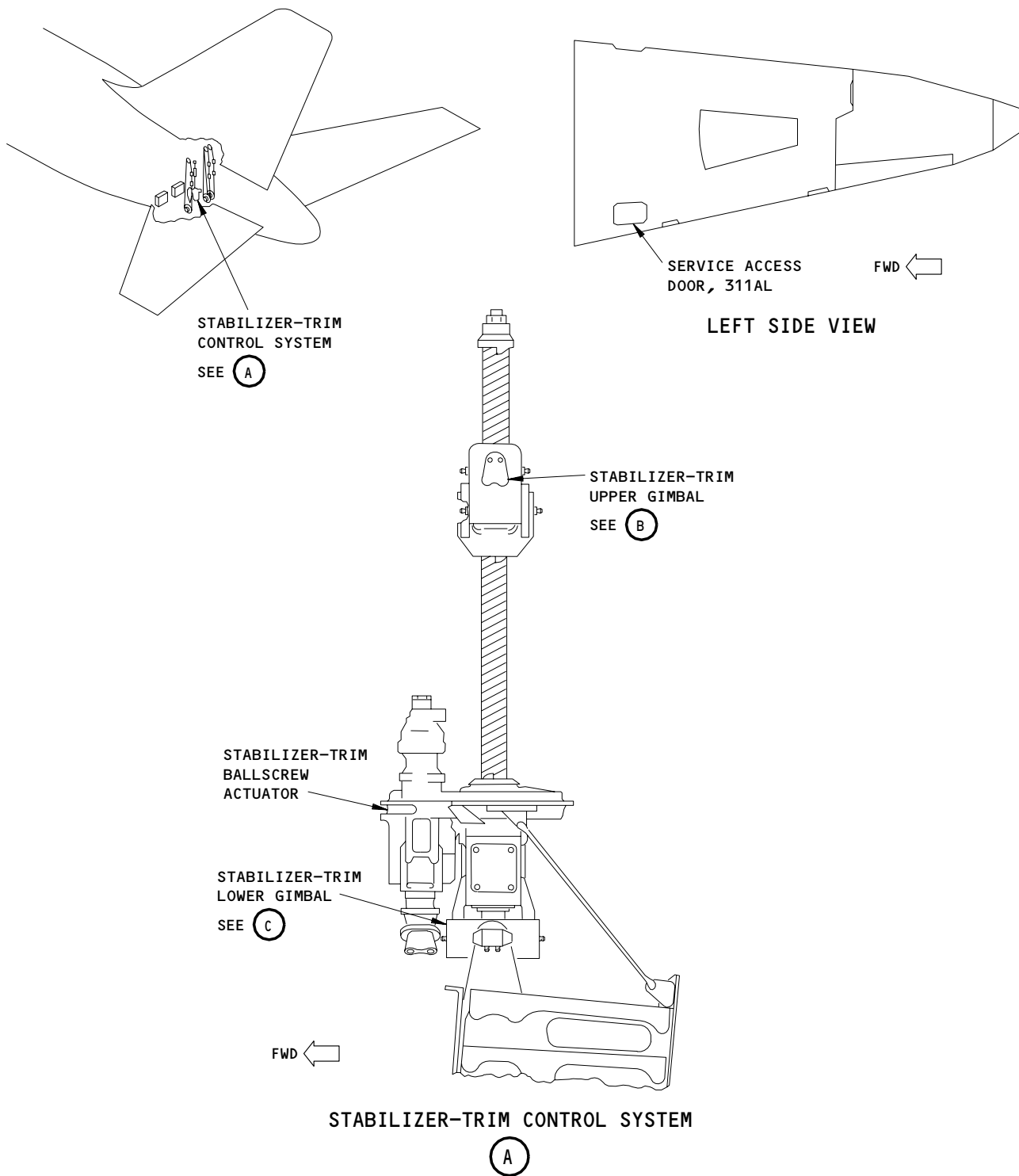
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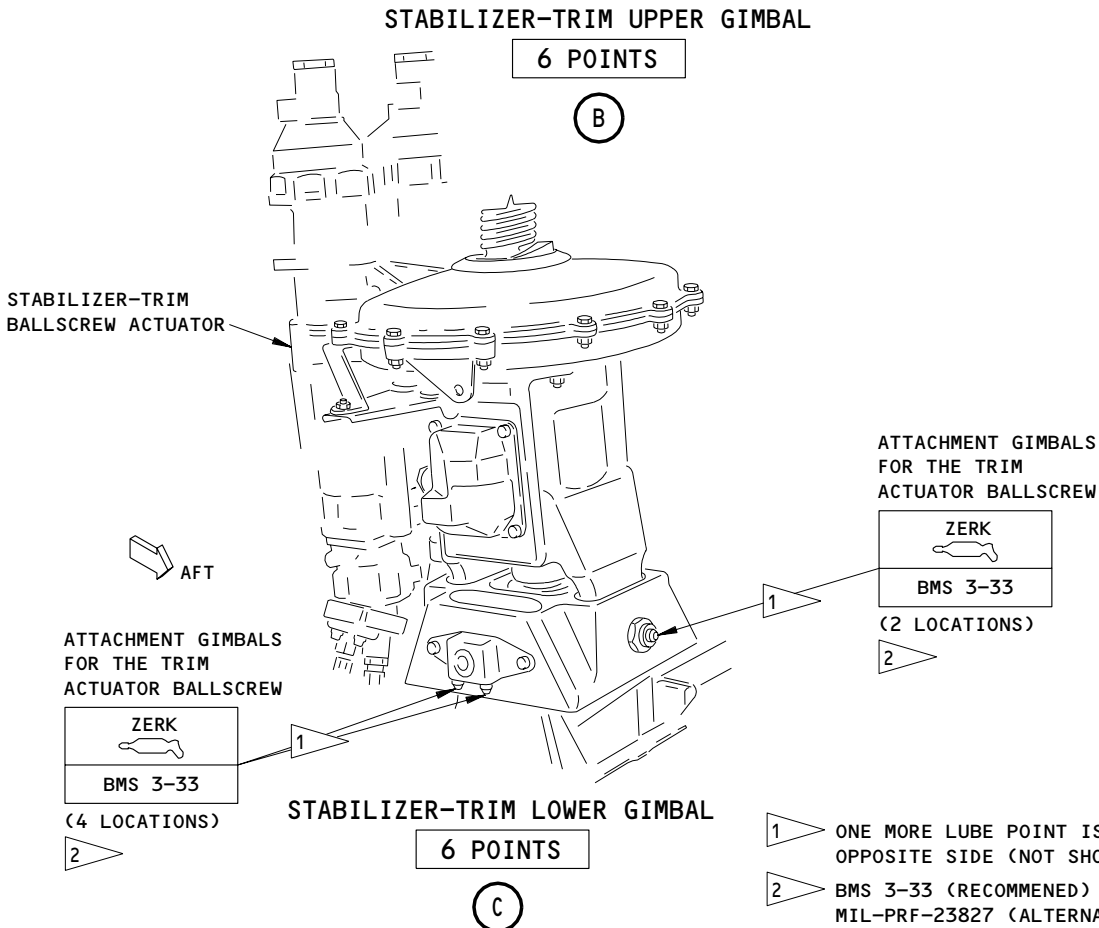
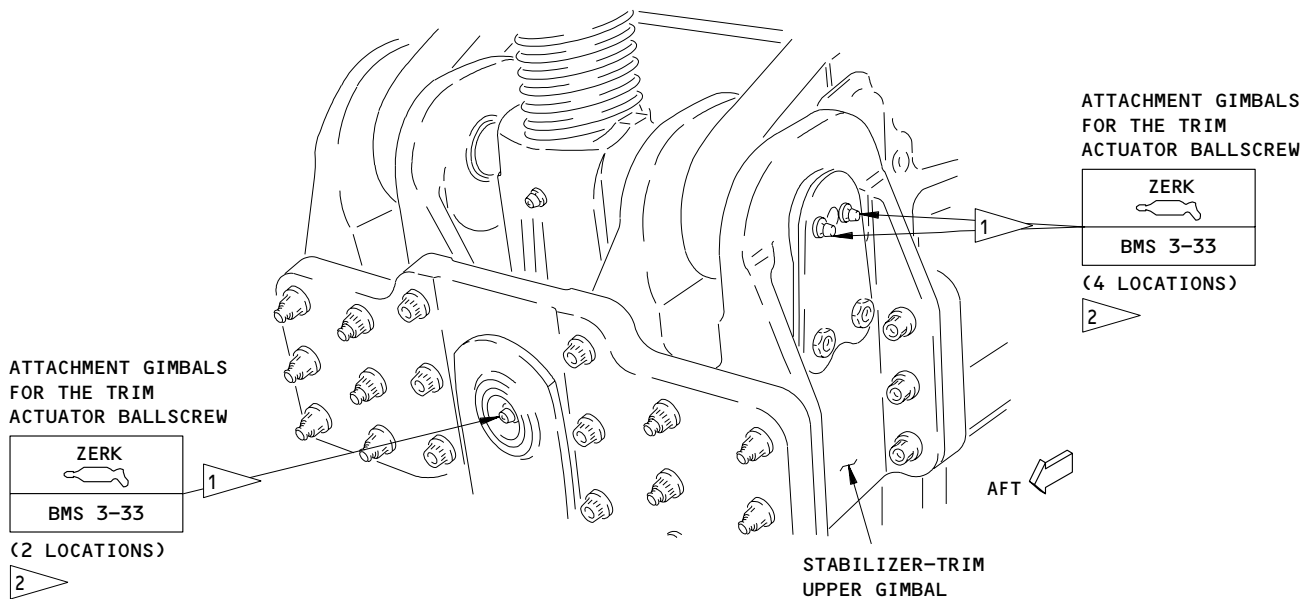
Stabilizer Trim Control Attachment Gimbal Lubrication
Figure 301 (Sheet 1)

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Stabilizer Trim Control Attachment Gimbal Lubrication
Figure 301 (Sheet 2)

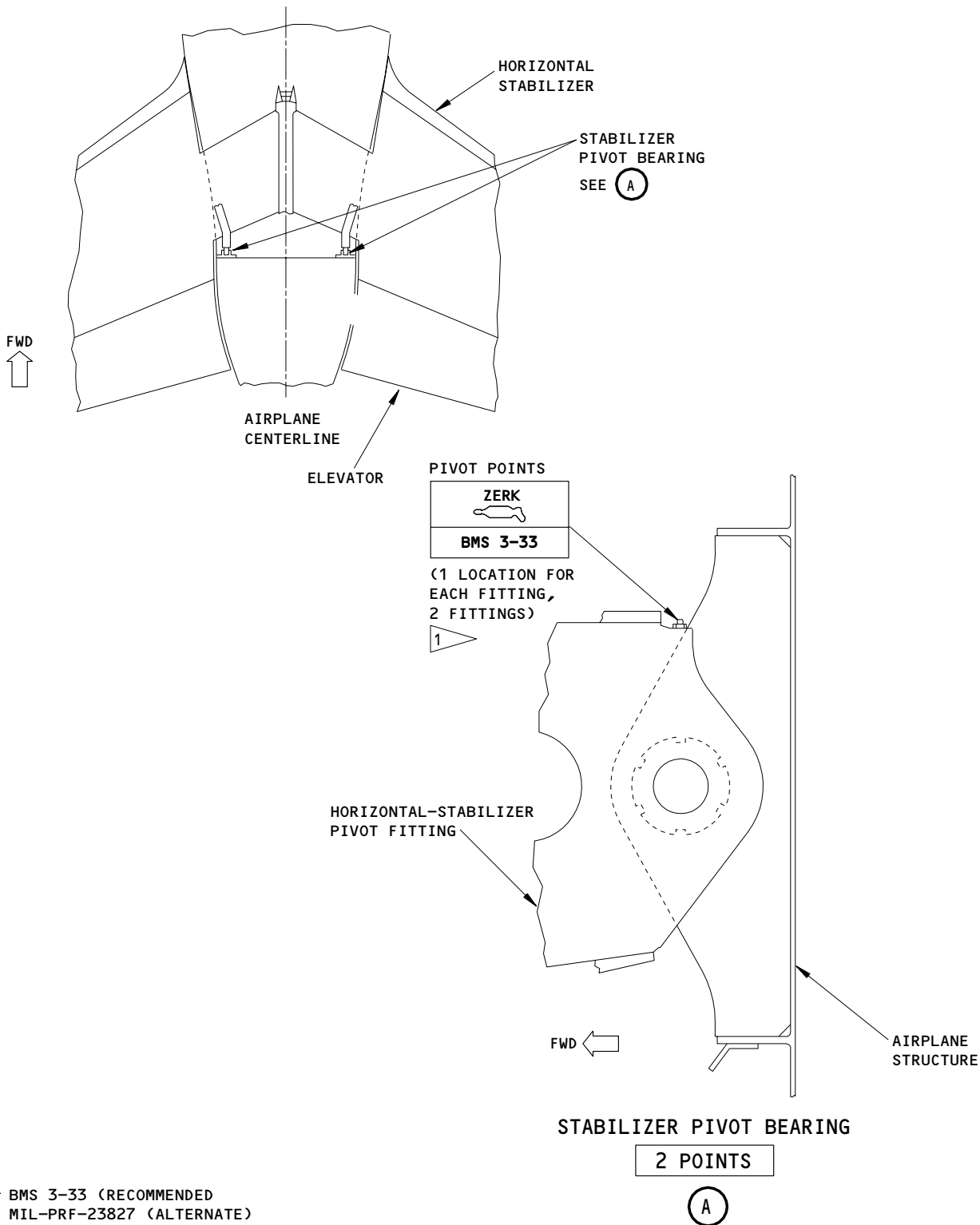
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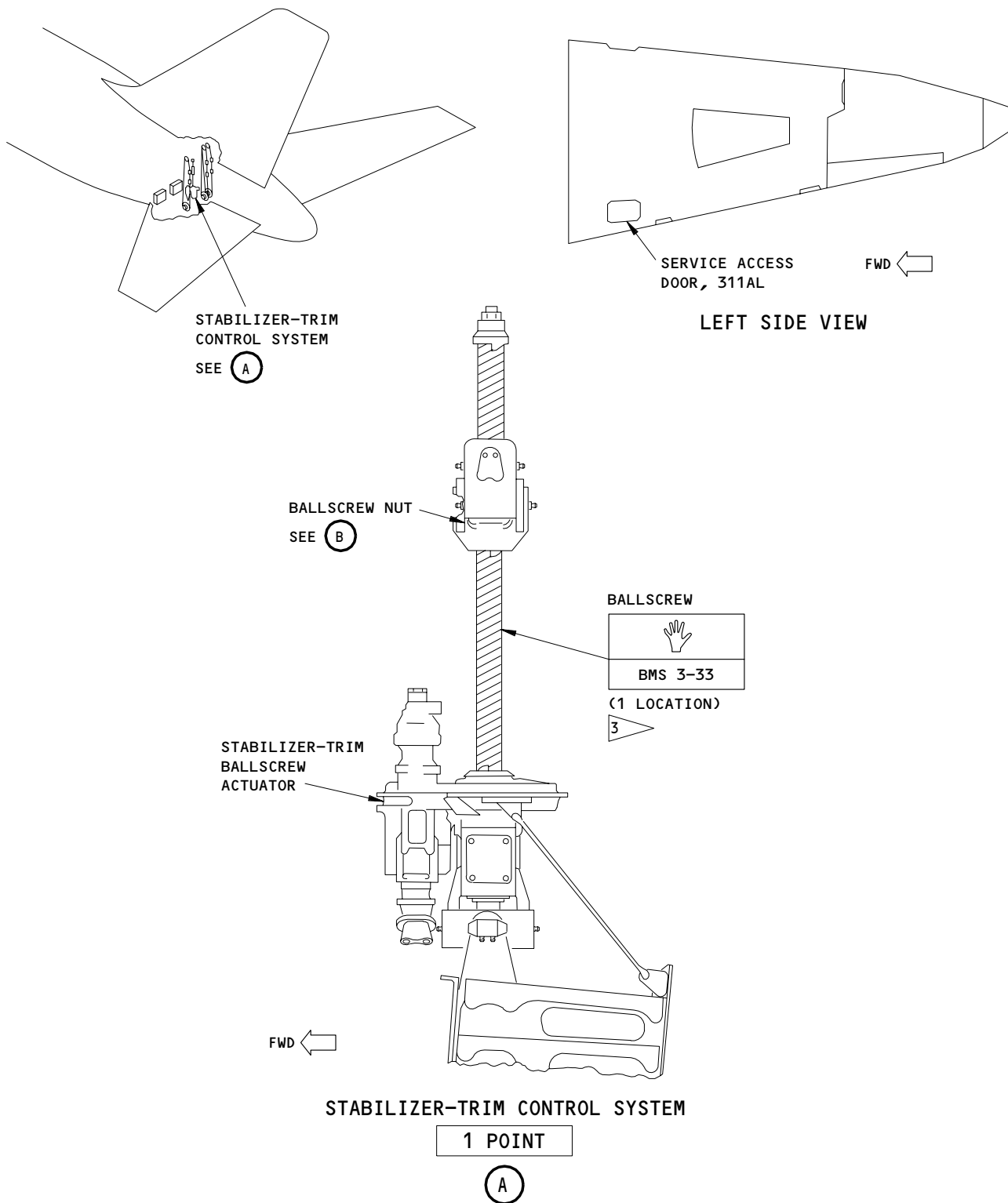
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Stabilizer Pivot Bearings Lubrication
Figure 302

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Stabilizer Ballscrew and Ballnut Lubrication
Figure 303 (Sheet 1)

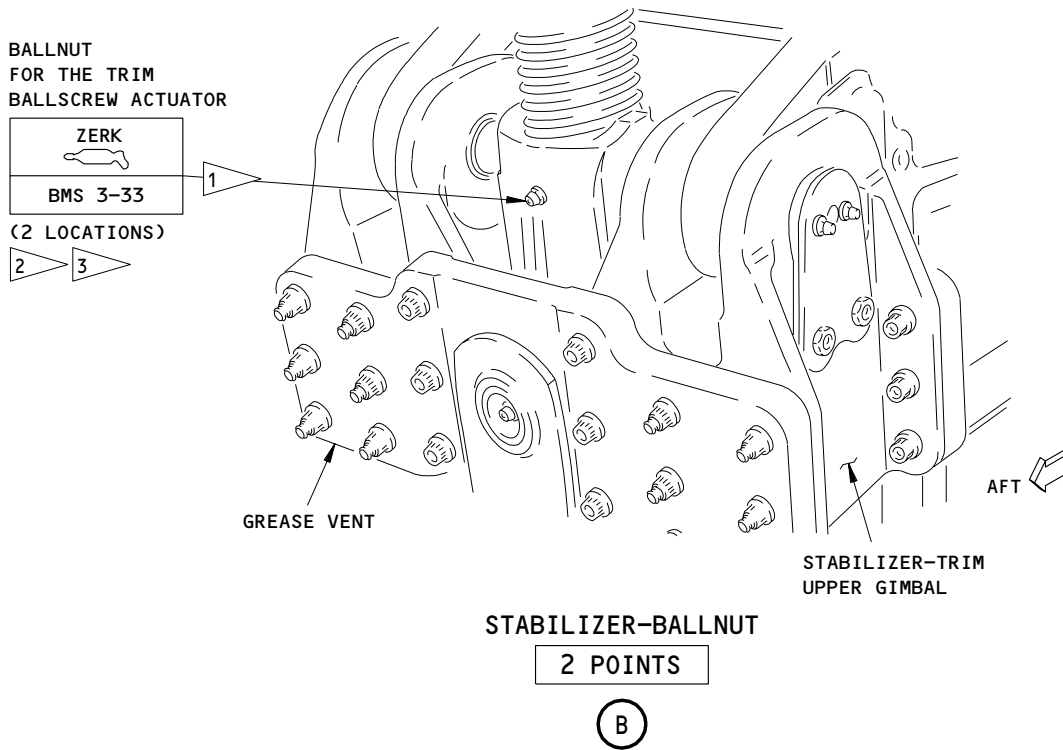
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J87789



- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 2 PUT THE STABILIZER AT 15 UNITS OF TRIM FOR THE BEST ACCESS TO THE AFT LUBE FITTING ON THE BALLNUT
- 3 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Stabilizer Ballscrew and Ballnut Lubrication
Figure 303 (Sheet 2)

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RUDDER AND RUDDER TRIM CONTROL SYSTEM – SERVICING

1. General

A. This procedure contains these tasks:

- Rudder Hinge and Yaw Damper Summing Lever – Lubrication
- Rudder PCA – Lubrication

TASK 12-21-06-643-002

2. Rudder Hinge and Yaw Damper Summing Lever – Lubrication

A. Equipment

- (1) Rudder PCA Lockout Equipment – B27013-20
(Includes: PCA Lockout Tool – B27013-14
AFT Quadrant Lockout Tool – B27013-21)

B. Consumable Materials

- (1) D00633 Grease, Corrosion Preventive – BMS 3-33 (Recommended)
D00015 Grease, Corrosion Preventive – BMS 3-24 (Alternate)

C. References

- (1) 06-42-00/201, Empennage Access Doors and Panels

D. Access

- (1) Location Zone
 - 324 Vertical Stabilizer – Rear Spar to Trailing Edge
 - 325 Rudder

(2) Access Panels

- 324CL Rudder Hinge and PCAs
- 324AL Body to Fin Seal
- 324BL Aft Side of Rear Spar and Rudder Hinge
- 324DL Aft side of Rear Spar and Rudder Hinge
- 324EL Aft Side of Rear Spar and Rudder Hinge

E. Procedure

S 013-007

- (1) Open access panels 324AL, 324BL, and 324CL to get access to the yaw damper summing linkages (Ref 06-42-00/201).

S 863-012

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (2) Supply pressure to the left, right, and center hydraulic systems (AMM 29-11-00/201).

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S 863-011

CAUTION: AVOID RUDDER SURFACE TRAVEL TO THE EXTREME FAR LEFT PRIOR TO OR DURING RUDDER ADJUSTMENT. FULL LEFT TRAVEL OF THE RUDDER BEFORE RIGGING COMPLETION RESULTS IN FULL RETRACTION OF THE PCA'S. THIS MAY CAUSE SURFACE CONTACT BETWEEN THE RUDDER LEADING EDGE AND A PCA.

- (3) Move the rudder pedals to their full right position and do these steps:

CAUTION: INSTALL THE AFT QUADRANT LOCKOUT TOOL BEFORE THE PCA LOCKOUT TOOL. STRUCTURAL DAMAGE CAN OCCUR IF THE TWO TOOLS ARE NOT USED TOGETHER AND IN THE CORRECT SEQUENCE.

- (a) Install the aft quadrant lockout tool (Fig. 304).
(b) Release the rudder pedals.

S 863-029

- (4) Remove the pressure from the hydraulic systems that supplies the PCAs (AMM 29-11-00/201).

NOTE: The right system supplies the top PCA.
The left system supplies the middle PCA.
The center system supplies the bottom PCA.

S 493-013

WARNING: DO NOT INSTALL THE PCA LOCKOUT TOOL WHEN HYDRAULIC PRESSURE IS SUPPLIED. THE RUDDER CAN MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Install the PCA lockout tool (Fig. 304).

S 863-016

- (6) Move the FLT CONTROL SHUTOFF switches L, C, and R on the right side panel, P61, to OFF. Attach DO-NOT-OPERATE tags and make sure the amber switch position legend lights come ON.

S 863-014

- (7) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11H17, FLT CONT SHUTOFF TAIL LEFT
 - (b) 11H18, FLT CONT SHUTOFF TAIL CTR
 - (c) 11H28, FLT CONT SHUTOFF TAIL RIGHT
 - (d) 11J10, PCU MON SENSOR
 - (e) 11J11, PCU MON MOD

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- S 643-001
(8) Lubricate the rudder hinges as shown (Fig. 301).
- S 643-003
(9) Lubricate the yaw damper linkages as shown (Fig. 303).
- S 863-017
(10) Make sure the power from the left, right, and center hydraulic systems is removed (AMM 29-11-00/201).
- S 093-018

WARNING: DO NOT REMOVE THE PCA LOCKOUT TOOL WITH HYDRAULIC POWER ON. THE RUDDER CAN MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (11) Do these steps with hydraulic power removed:
(a) Remove the PCA lockout tool.
(b) Remove the aft quadrant lockout tool.

- S 863-019
(12) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel, P11:
(a) 11H17, FLT CONT SHUTOFF TAIL LEFT
(b) 11H18, FLT CONT SHUTOFF TAIL CTR
(c) 11H28, FLT CONT SHUTOFF TAIL RIGHT
(d) 11J10, PCU MON SENSOR
(e) 11J11, PCU MON MOD

- S 413-010
(13) Close access panels 324CL, 324AL, 324BL, 324DL, and 324EL (AMM 06-42-00/201).

TASK 12-21-06-643-004

3. Rudder Power Control Actuator (PCA) - Lubrication

A. Equipment

- (1) Rudder PCA Lockout Equipment - B27013-20

B. Consumable Materials

- (1) D00633 Grease, Corrosion Preventive - BMS 3-33 (Recommended)
D00015 Grease, Corrosion Preventive - BMS 3-24 (Alternate)

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C. References

- (1) 06-42-00/201, Empennage Access Doors and Panels

D. Access

- (1) Location Zone
324 Vertical Stabilizer – Rear Spar to Trailing Edge
- (2) Access Panels
324CL Rudder Hinge and PCAs

E. Procedure

S 013-006

- (1) Open access panel 324CL to get access to the rudder PCAs (AMM 06-42-00/201).

S 863-020

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (2) Supply pressure to the left, right, and center hydraulic systems (AMM 29-11-00/201).

S 863-021

CAUTION: AVOID RUDDER SURFACE TRAVEL TO THE EXTREME FAR LEFT PRIOR TO OR DURING RUDDER ADJUSTMENT. FULL LEFT TRAVEL OF THE RUDDER BEFORE RIGGING COMPLETION RESULTS IN FULL RETRACTION OF THE PCA'S. THIS MAY CAUSE SURFACE CONTACT BETWEEN THE RUDDER LEADING EDGE AND A PCA.

- (3) Move the rudder pedals to their full right position and do these steps:

CAUTION: INSTALL THE AFT QUADRANT LOCKOUT TOOL BEFORE THE PCA LOCKOUT TOOL. STRUCTURAL DAMAGE CAN OCCUR IF THE TWO TOOLS ARE NOT USED TOGETHER AND IN THE CORRECT SEQUENCE.

- (a) Install the aft quadrant lockout tool (Fig. 304).
(b) Release the rudder pedals.

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S 863-030

- (4) Remove the pressure from the hydraulic systems that supplies the PCAs (AMM 29-11-00/201).

NOTE: The right system supplies the top PCA.
The left system supplies the middle PCA.
The center system supplies the bottom PCA.

S 493-022

WARNING: DO NOT INSTALL THE PCA LOCKOUT TOOL WHEN HYDRAULIC PRESSURE IS SUPPLIED. THE RUDDER CAN MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Install the PCA lockout tool (Fig. 304).

S 863-023

- (6) Move the FLT CONTROL SHUTOFF switches L, C, and R on the right side panel, P61, to OFF. Attach DO-NOT-OPERATE tags and make sure the amber switch position legend lights come ON.

S 863-024

- (7) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11H17, FLT CONT SHUTOFF TAIL LEFT
 - (b) 11H18, FLT CONT SHUTOFF TAIL CTR
 - (c) 11H28, FLT CONT SHUTOFF TAIL RIGHT
 - (d) 11J10, PCU MON SENSOR
 - (e) 11J11, PCU MON MOD

S 643-005

- (8) Lubricate the rudder PCAs as shown (Fig. 302).

S 863-025

- (9) Make sure the power from the left, right, and center hydraulic systems is removed (AMM 29-11-00/201).

S 093-026

WARNING: DO NOT REMOVE THE PCA LOCKOUT TOOL WITH HYDRAULIC POWER ON. THE RUDDER CAN MOVE QUICKLY AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (10) Do these steps with hydraulic power removed:
- (a) Remove the PCA lockout tool.
 - (b) Remove the aft quadrant lockout tool.

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S 863-027

- (11) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the overhead panel, P11:
- (a) 11H17, FLT CONT SHUTOFF TAIL LEFT
 - (b) 11H18, FLT CONT SHUTOFF TAIL CTR
 - (c) 11H28, FLT CONT SHUTOFF TAIL RIGHT
 - (d) 11J10, PCU MON SENSOR
 - (e) 11J11, PCU MON MOD

S 413-009

- (12) Close access panel 324CL (AMM 06-42-00/201).

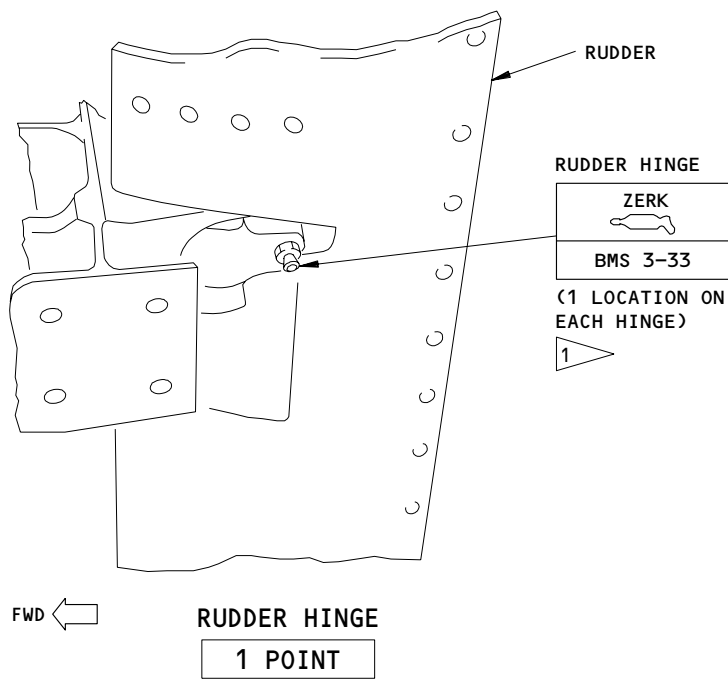
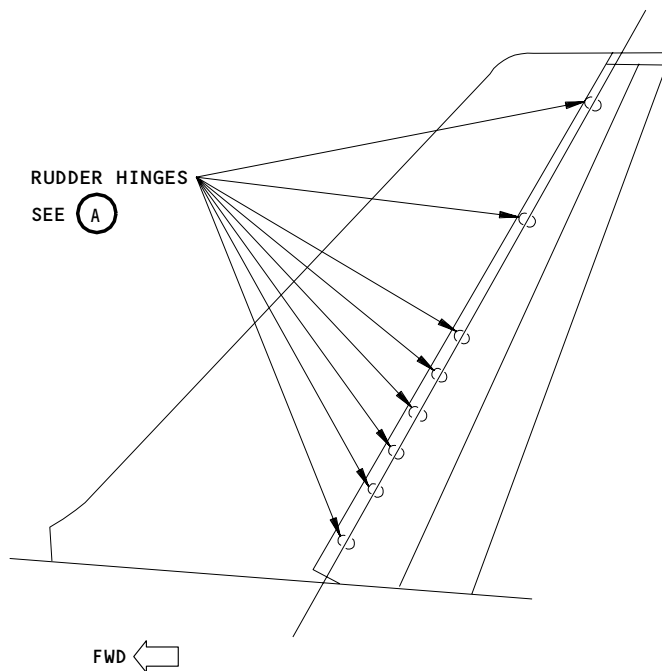
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1 BMS 3-33 (RECOMMENDED)
BMS 3-24 (ALTERNATE)

Rudder Hinge Lubrication
Figure 301

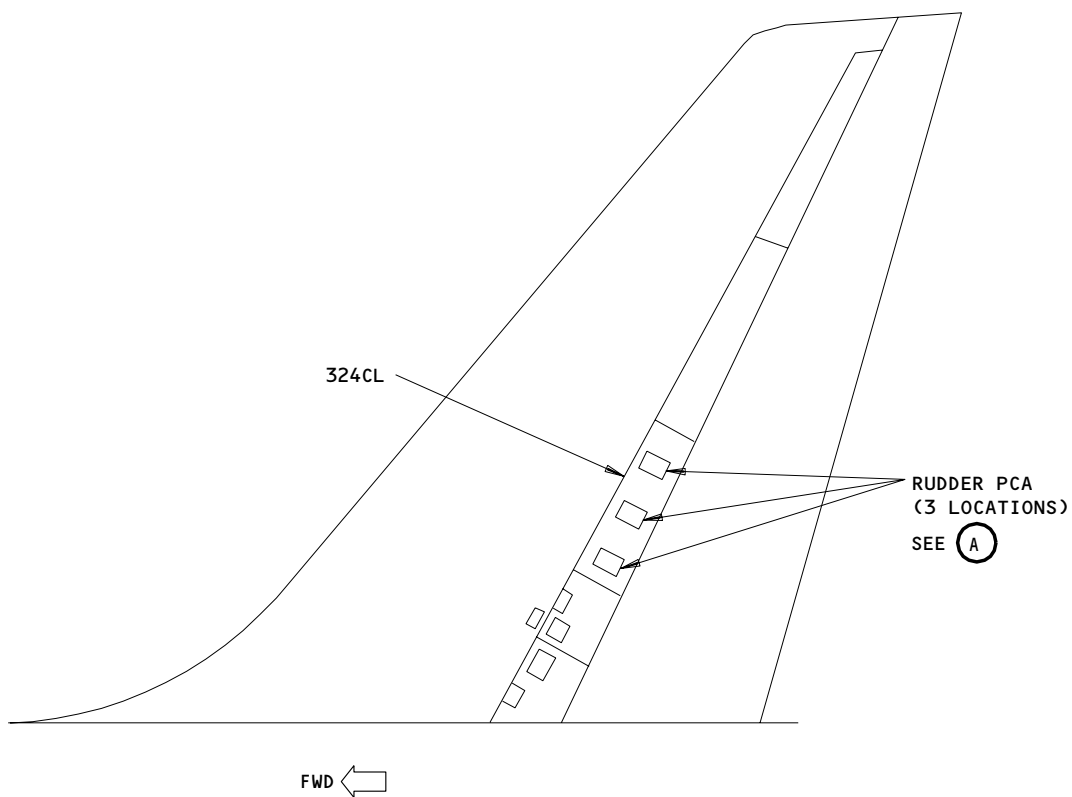
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Rudder Power Control Actuator Lubrication
Figure 302 (Sheet 1)

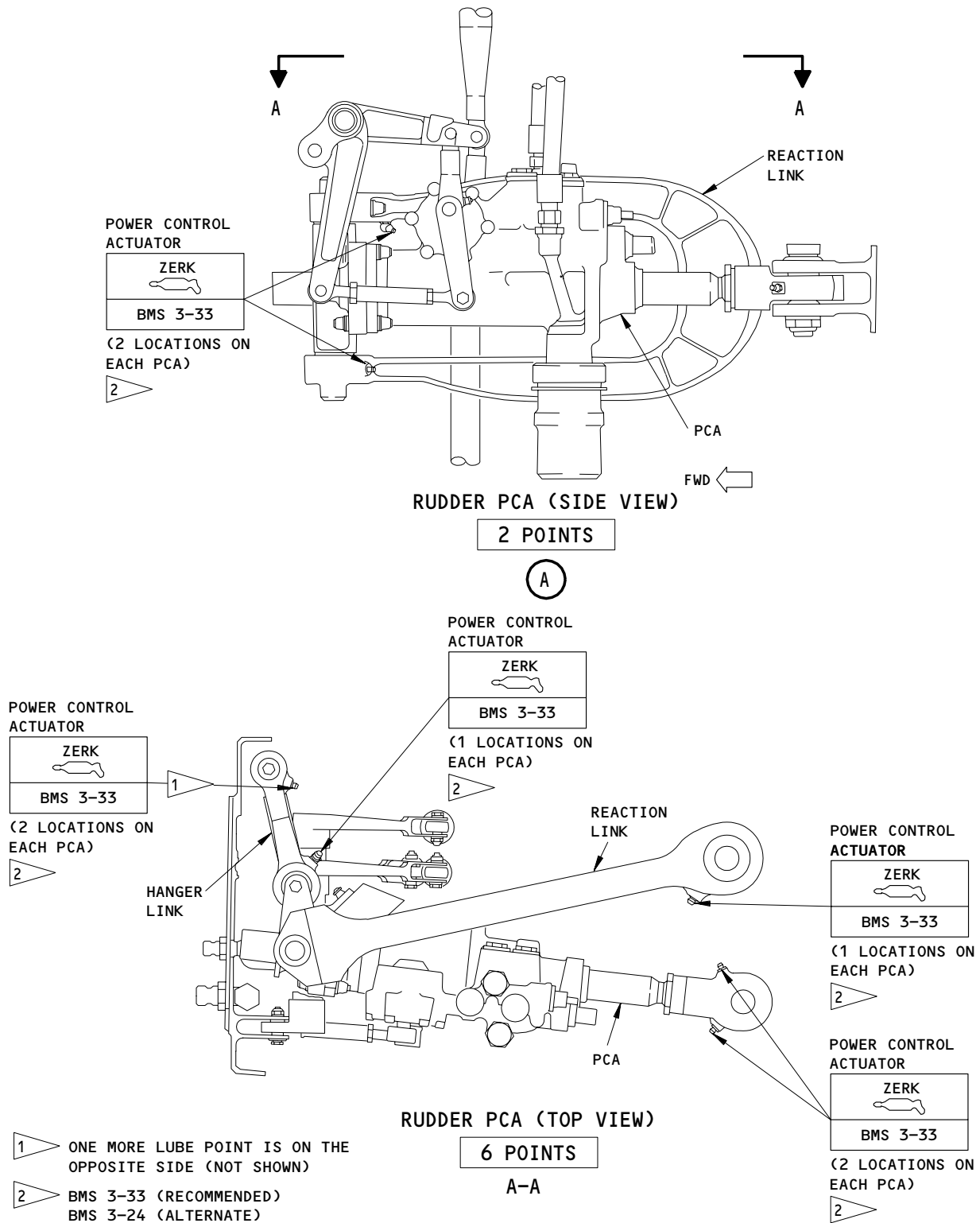
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Rudder Power-Control-Actuator - Servicing (Lubrication)
Figure 302 (Sheet 2)

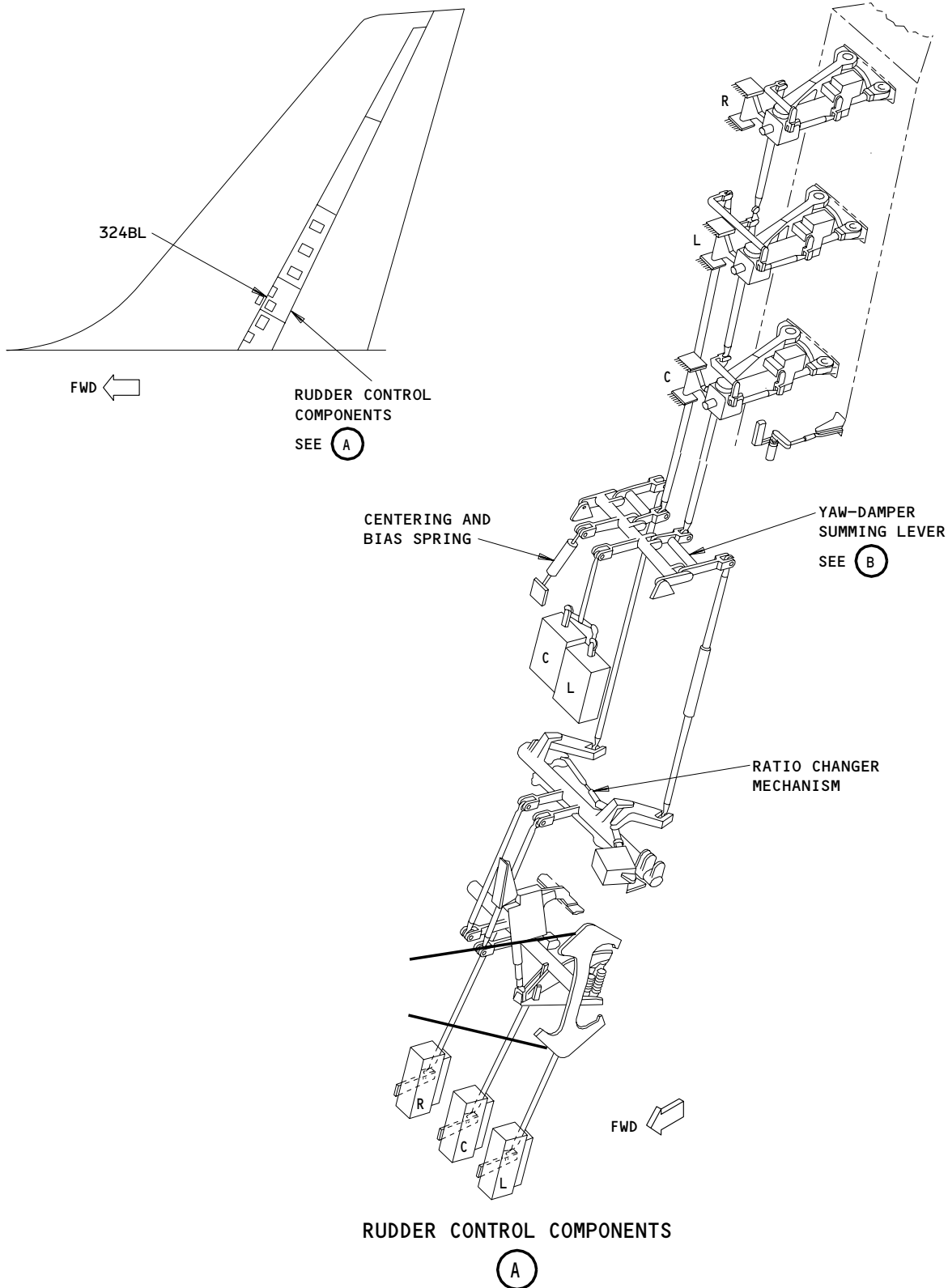
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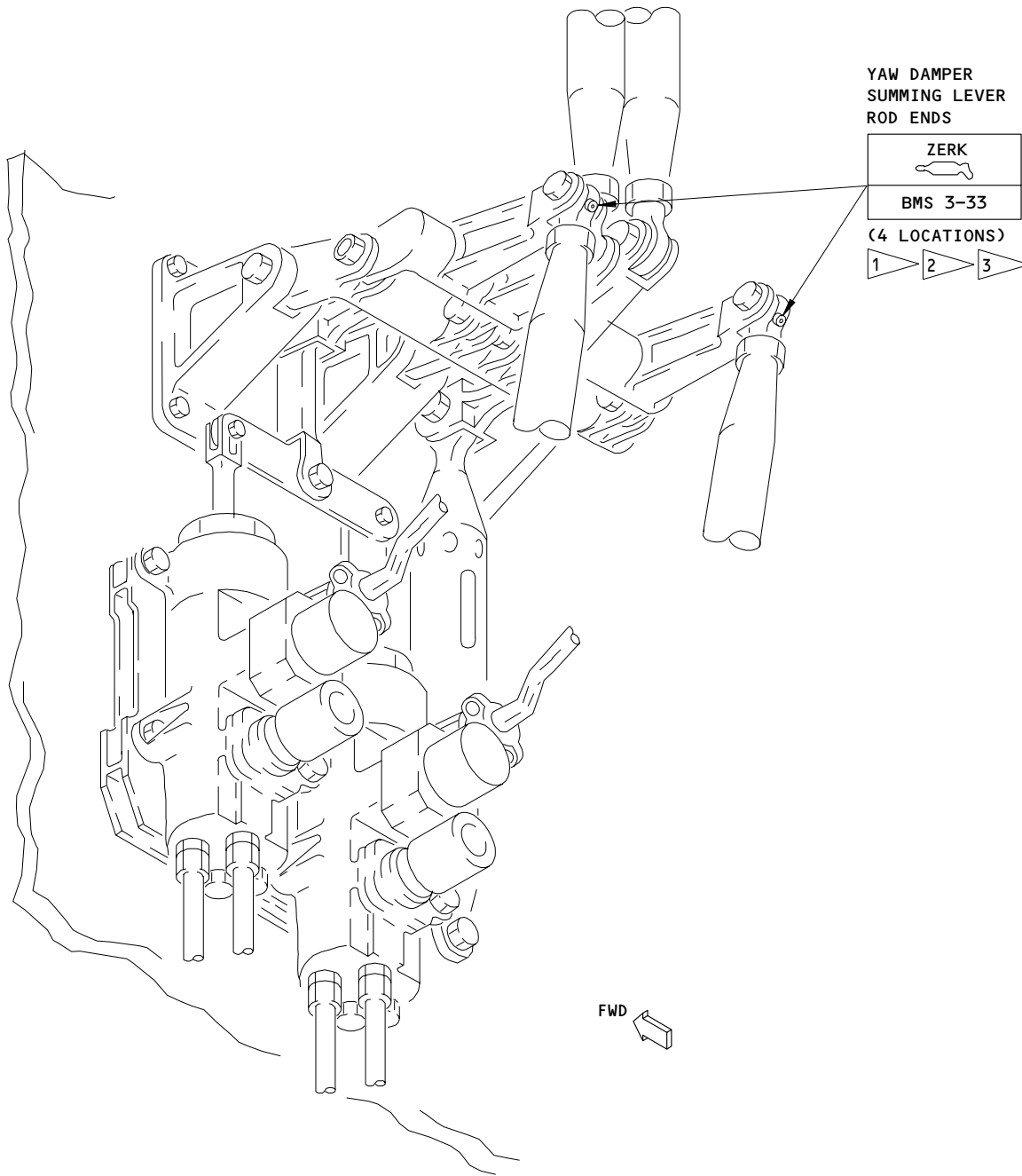
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Ratio Changer and Yaw-Damper Mechanisms Lubrication
Figure 303 (Sheet 1)

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YAW DAMPER SUMMING LEVER

- 1 ADDITIONAL LUBRICATION FITTINGS ON THE LOWER ROD ENDS (NOT SHOWN).
- 2 NO LUBRICATION FITTINGS INDICATE SELF-LUBRICATING ROD END BEARING(S).
- 3 BMS 3-33 (RECOMMENDED)
BMS 3-24 (ALTERNATE)

4 POINTS

(B)

Ratio Changer and Yaw Damper Mechanisms Lubrication
Figure 303 (Sheet 2)

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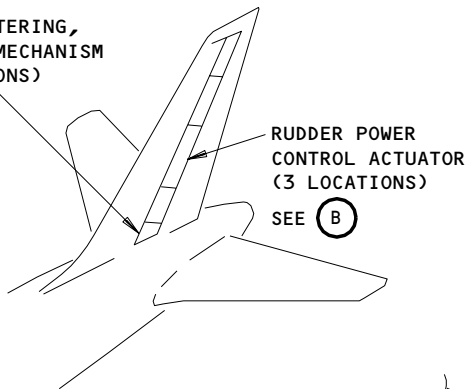
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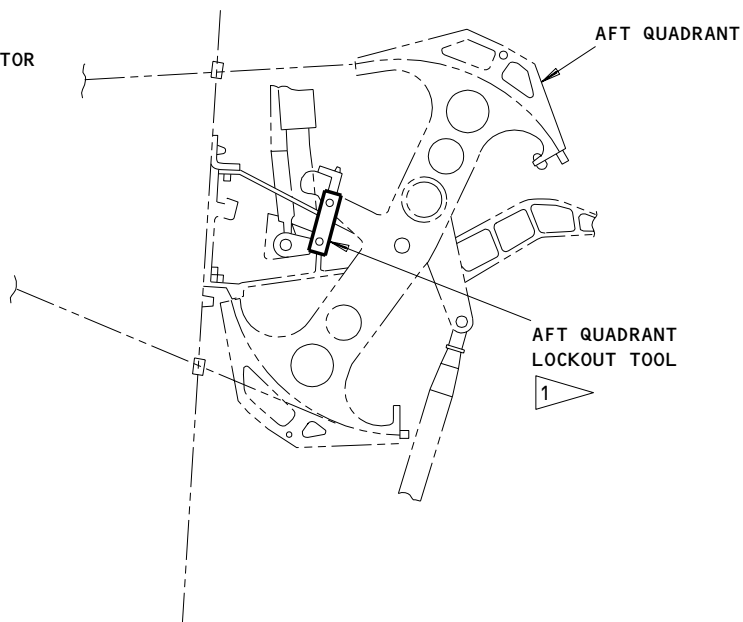
FEEL, CENTERING,
AND TRIM MECHANISM
(3 LOCATIONS)

SEE (A)



RUDDER POWER
CONTROL ACTUATOR
(3 LOCATIONS)

SEE (B)

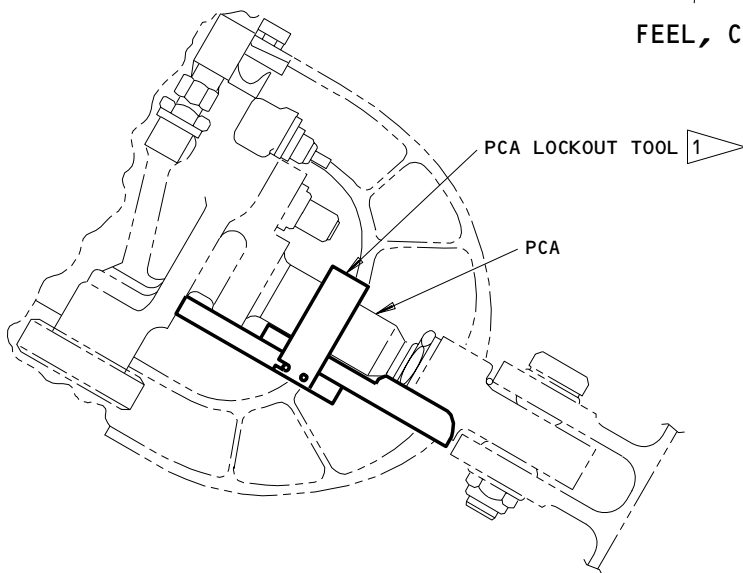


AFT QUADRANT

AFT QUADRANT
LOCKOUT TOOL
1

FEEL, CENTERING, AND TRIM MECHANISM

(A)



PCA LOCKOUT TOOL 1

PCA

RUDDER POWER CONTROL ACTUATOR

(B)

1

CAUTION: INSTALL THE AFT QUADRANT LOCKOUT TOOL BEFORE THE PCA LOCKOUT TOOL. STRUCTURAL DAMAGE CAN OCCUR IF THE TWO TOOLS ARE NOT USED TOGETHER AND IN THE CORRECT SEQUENCE.

Rudder Power Control Actuator Lockout Equipment Installation
Figure 304

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AILERON AND AILERON-TRIM-CONTROL SYSTEM - SERVICING

1. General

- A. This procedure contains the data necessary to lubricate the aileron and aileron trim control system.

TASK 12-21-07-613-006

2. Aileron and Aileron Trim Control - Lubrication

A. Consumable Materials

- (1) D00633 Grease, Corrosion Preventive - BMS 3-33 (recommended)
- (2) D00015 Grease, Corrosion Preventive - BMS 3-24 (Alternate)
- (3) D00013 Grease, Corrosion Preventive - MIL-PRF-23827 (Alternate)

B. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 29-11-00/201, Main (Left, Right, and Center) Hydraulic System

C. Access

(1) Location Zones

- 561 Rear Spar to Trailing Edge (Left)
- 661 Rear Spar to Trailing Edge (Right)

(2) Access Panels

- 561AB/661AB
- 561BB/661BB
- 561CB/661CB
- 561FB/661FB
- 561GB/661GB
- 561HB/661HB

(3) Access Panels

- 561CB/661CB

D. Procedure

S 863-001

- (1) Make sure the left, right, and center hydraulic systems do not have power (Ref 29-11-00/201).

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S 863-023

- (2) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11J14, AILERON POS L
 - (b) 11J15, AILERON TRIM
 - (c) 11J23, AILERON POS R

S 013-002

- (3) Open these access panels (Ref 06-44-00/201):
- (a) 561/661AB to get access to the aileron quadrant.
 - (b) 561/661BB to get access to the aileron hinge.
 - (c) 561/661CB to get access to the aileron hinge.
 - (d) 561/661FB to get access to the aileron hinge.
 - (e) 561/661GB to get access to the aileron hinge.
 - (f) 561/661HB to get access to the aileron hinge.

S 643-003

- (4) Lubricate the aileron control system as shown (Figs. 301).

S 643-009

- (5) lubricate the aileron power control actuators (Fig. 301A).

S 413-007

- (6) Close these access panels (Ref 06-44-00/201):
- (a) 561/661AB, access to the aileron quadrant
 - (b) 561/661BB, access to the aileron hinge
 - (c) 561/661CB, access to the aileron hinge
 - (d) 561/661FB, access to the aileron hinge
 - (e) 561/661GB, access to the aileron hinge
 - (f) 561/661HB, access to the aileron hinge.

S 863-022

- (7) Remove the DO-NOT CLOSE tags and close these circuit breakers on the overhead panel, P11:
- (a) 11J14, AILERON POS L
 - (b) 11J15, AILERON TRIM
 - (c) 11J23, AILERON POS R

TASK 12-21-07-613-016

3. Aileron and Aileron Trim Control - Lubrication

A. Consumable Materials

- (1) D00633 Grease, Corrosion Preventive - BMS 3-33 (recommended)
- (2) D00015 Grease, Corrosion Preventive - BMS 3-24 (Alternate)
- (3) D00013 Grease, Corrosion Preventive - MIL-PRF-23827 (Alternate)

B. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 29-11-00/201, Main (Left, Right, and Center) Hydraulic System

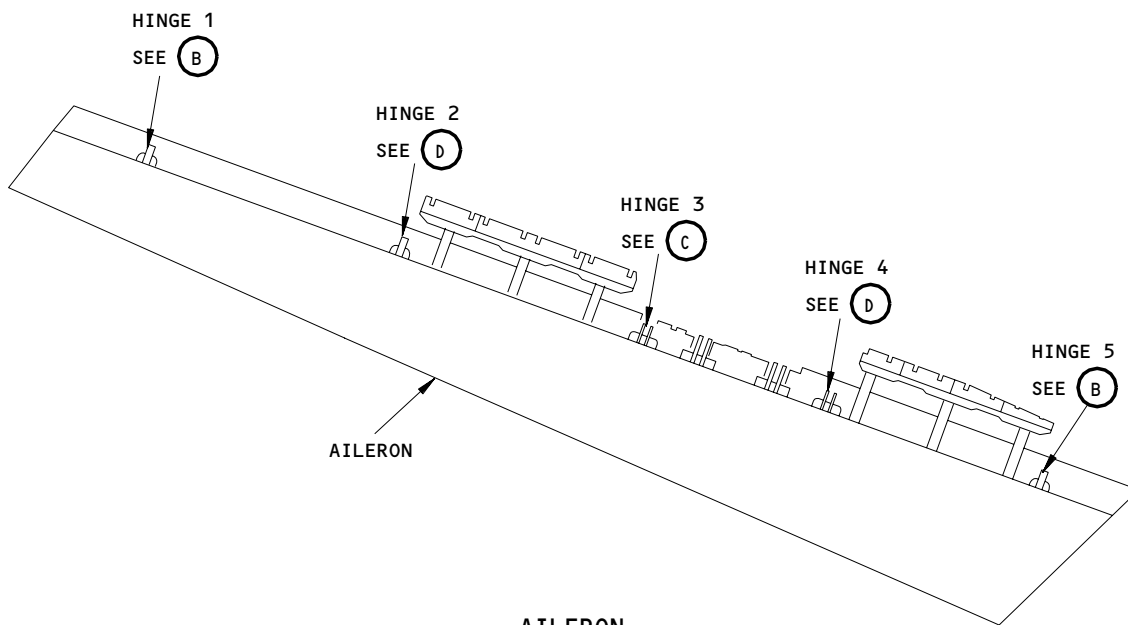
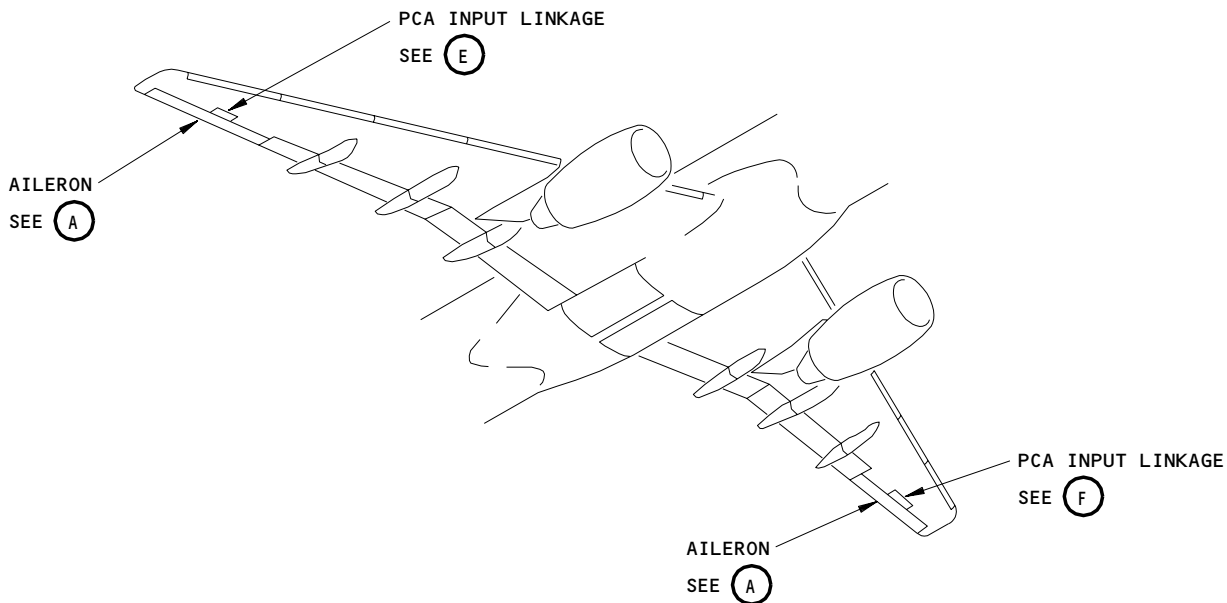
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AILERON
(RIGHT SIDE IS SHOWN, LEFT SIDE IS OPPOSITE)

(A)

Aileron and Aileron-Trim-Control System Lubrication
Figure 301 (Sheet 1)

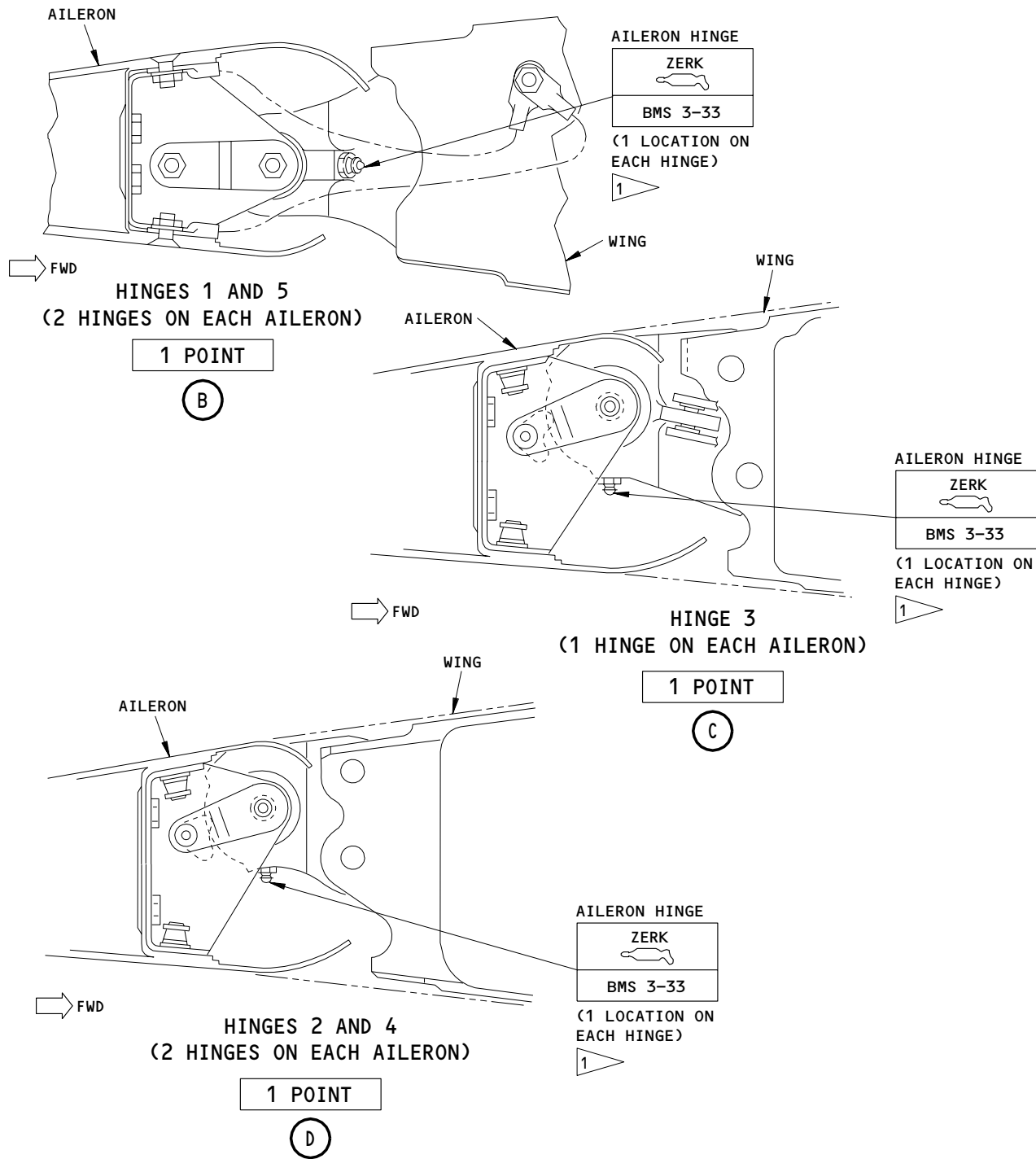
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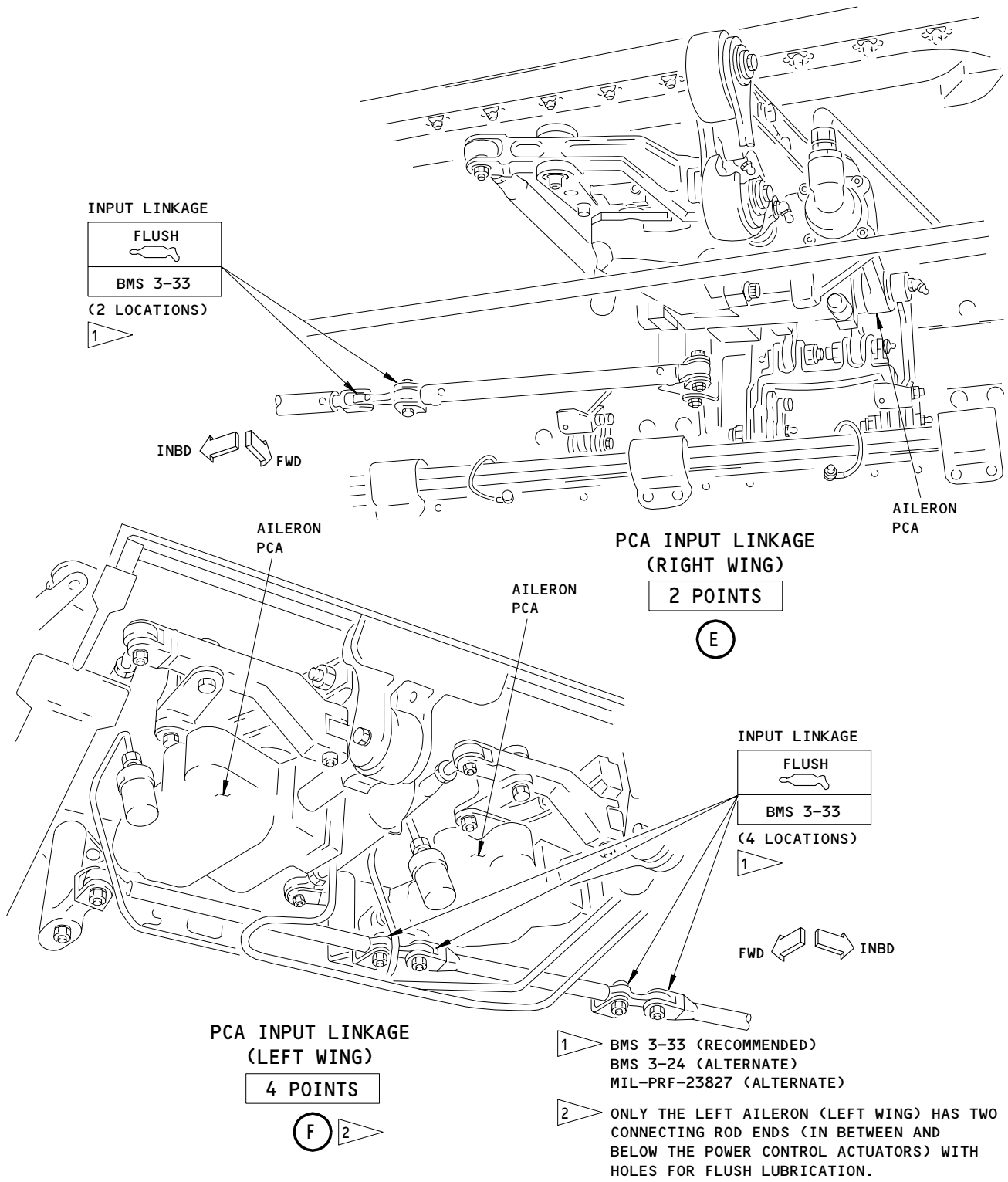


1 BMS 3-33 (RECOMMENDED)
BMS 3-24 (ALTERNATE)
MIL-PRF-23827 (ALTERNATE)

Aileron and Aileron Trim Control System Lubrication
Figure 301 (Sheet 2)

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Aileron and Aileron Trim Control System Lubrication
Figure 301 (Sheet 3)

EFFECTIVITY

ALL

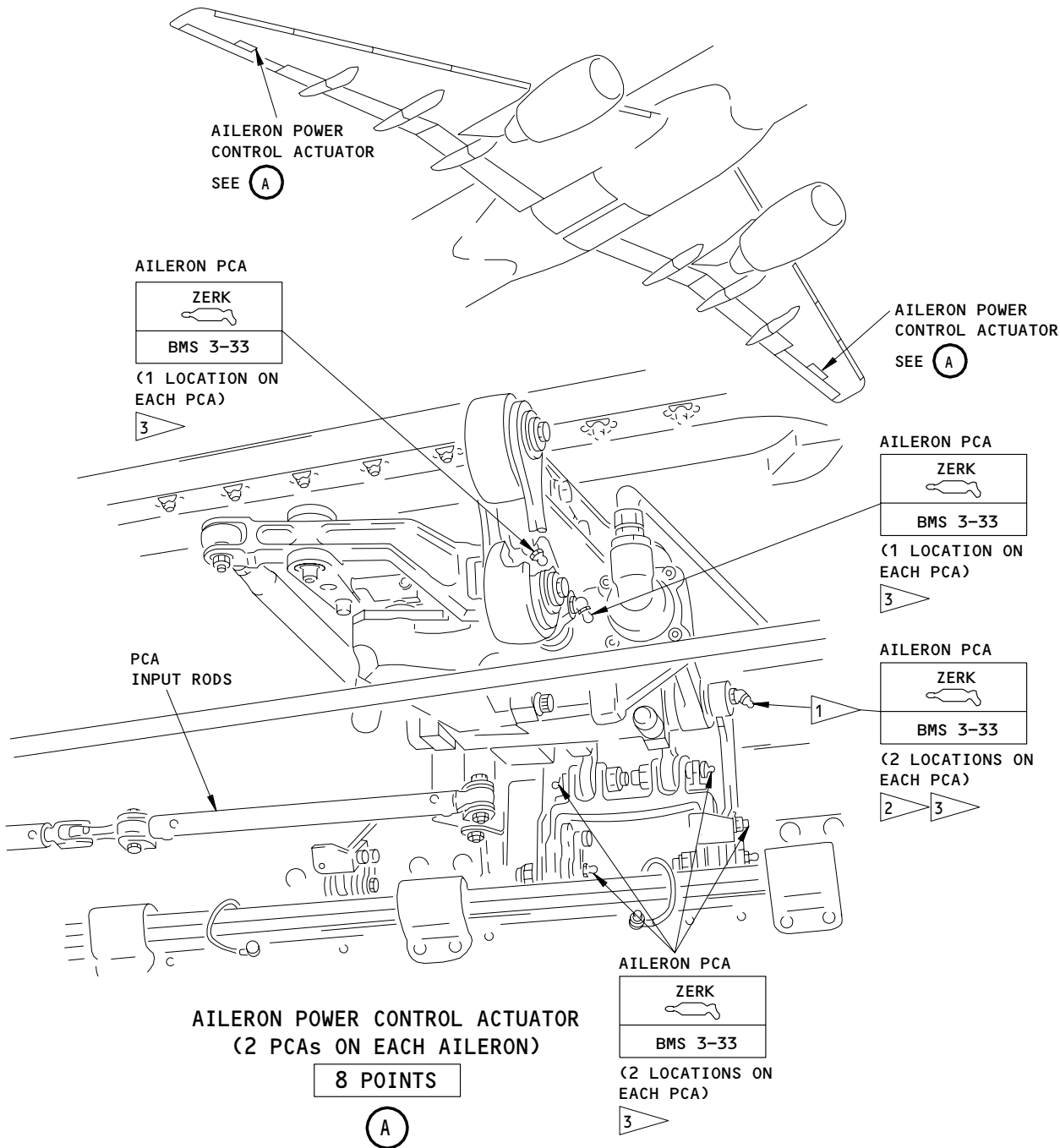
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BOEING
757
MAINTENANCE MANUAL



- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 2 USE A HAND (NON-PNEUMATIC PRESSURE) OPERATED GUN TO PREVENT BUSHING MIGRATION.
- 3 BMS 3-33 (RECOMMENDED)
BMS 3-24 (ALTERNATE)
MIL-PRF-23827 (ALTERNATE)

Aileron and Aileron Trim Control System Lubrication
Figure 301A

EFFECTIVITY	
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C. Access

(1) Location Zones

- 561 Rear Spar to Trailing Edge (Left)
- 661 Rear Spar to Trailing Edge (Right)

(2) Access Panels

- 561AB/661AB
- 561BB/661BB
- 561CB/661CB
- 561FB/661FB
- 561GB/661GB
- 561HB/661HB

(3) Access Panels

- 561CB/661CB

D. Procedure

S 863-017

- (1) Make sure the left, right, and center hydraulic systems do not have power (Ref 29-11-00/201).

S 013-018

- (2) Open these access panels (Ref 06-44-00/201):
- (a) 561/661AB to get access to the aileron quadrant.
 - (b) 561/661BB to get access to the aileron hinge.
 - (c) 561/661CB to get access to the aileron hinge.
 - (d) 561/661FB to get access to the aileron hinge.
 - (e) 561/661GB to get access to the aileron hinge.
 - (f) 561/661HB to get access to the aileron hinge.

S 643-019

- (3) Lubricate the aileron control system as shown (Figs. 301).

S 643-020

- (4) lubricate the aileron power control actuators (Fig. 301A).

S 413-021

- (5) Close these access panels (Ref 06-44-00/201):
- (a) 561/661AB, access to the aileron quadrant
 - (b) 561/661BB, access to the aileron hinge
 - (c) 561/661CB, access to the aileron hinge
 - (d) 561/661FB, access to the aileron hinge
 - (e) 561/661GB, access to the aileron hinge
 - (f) 561/661HB, access to the aileron hinge.

TASK 12-21-07-613-010

4. Aileron and Aileron Trim Control - Lubrication

A. Consumable Materials

- (1) D00633 Grease, Corrosion Preventive - BMS 3-33
(recommended)

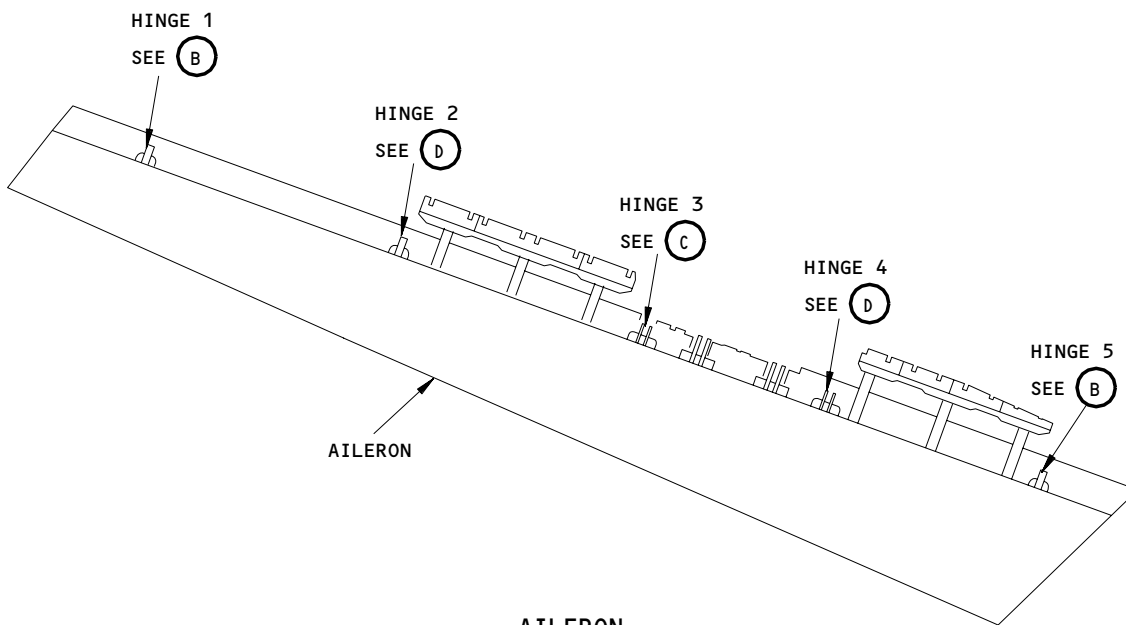
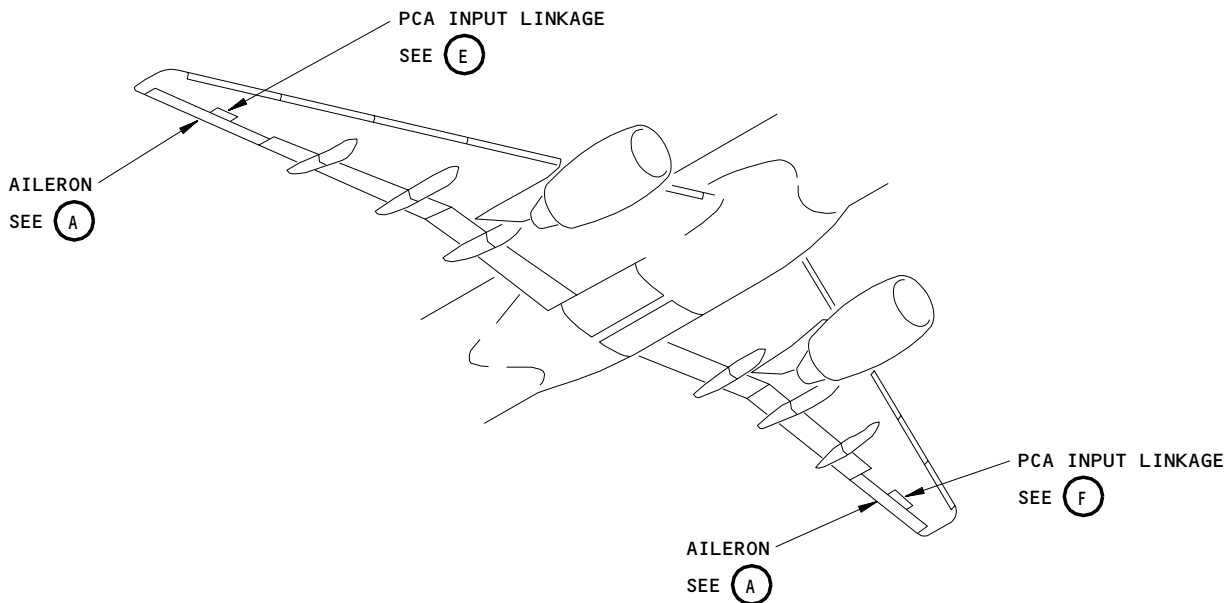
EFFECTIVITY

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AILERON
(RIGHT SIDE IS SHOWN, LEFT SIDE IS OPPOSITE)

(A)

Aileron and Aileron-Trim-Control System Lubrication
Figure 301 (Sheet 1)

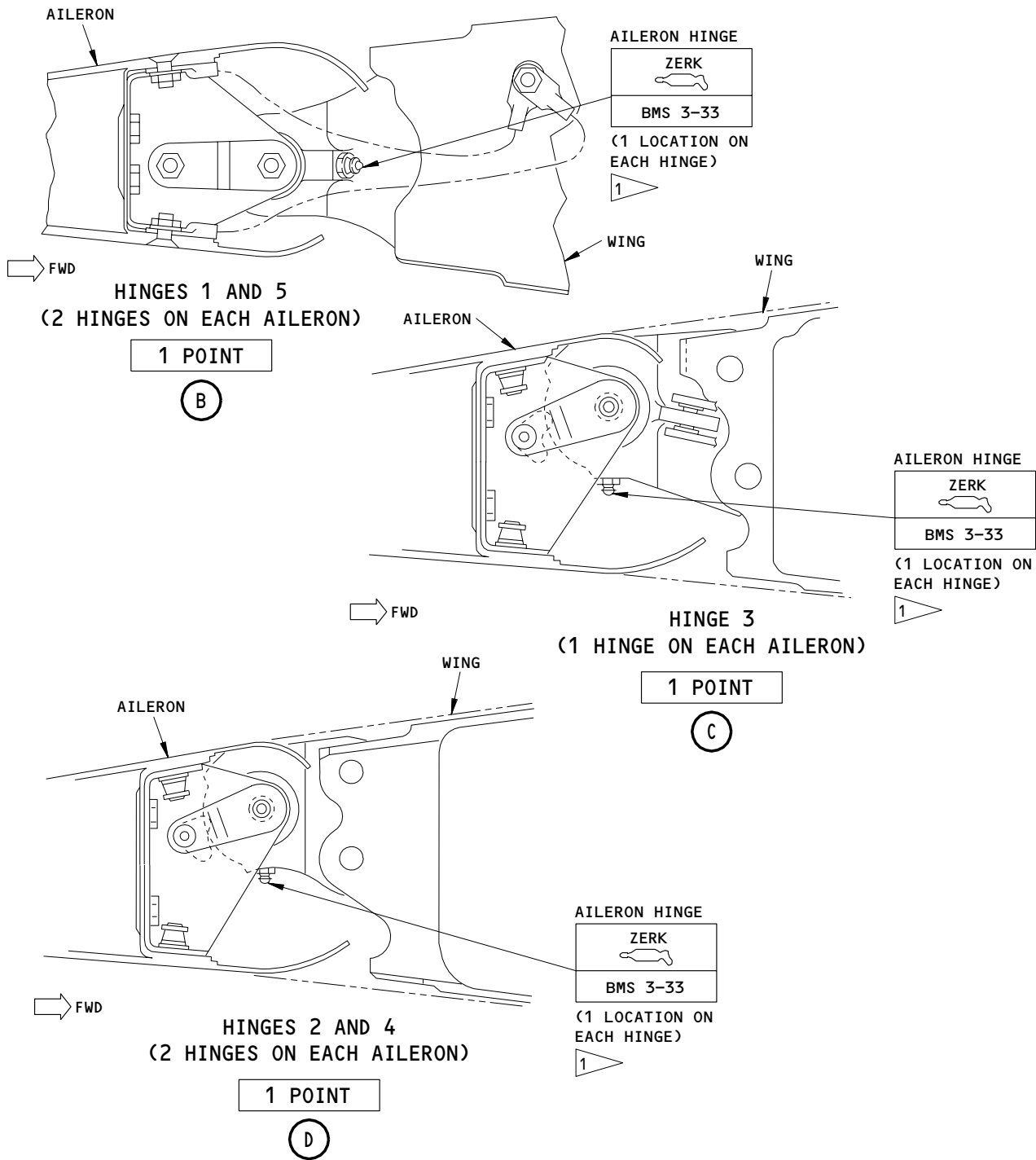
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1 BMS 3-33 (RECOMMENDED)
BMS 3-24 (ALTERNATE)
MIL-PRF-23827 (ALTERNATE)

Aileron and Aileron Trim Control System Lubrication
Figure 301 (Sheet 2)

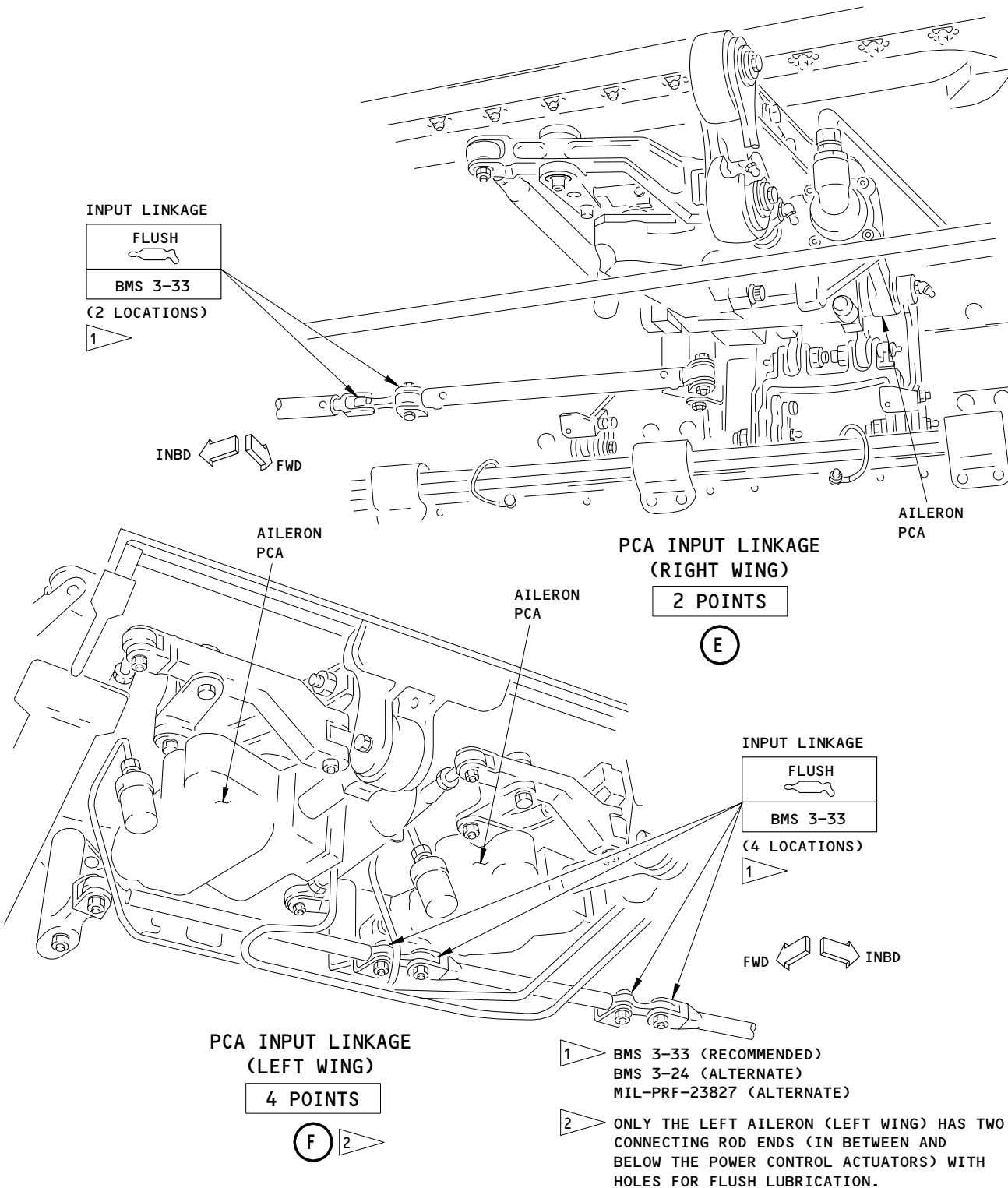
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Aileron and Aileron Trim Control System Lubrication
Figure 301 (Sheet 3)

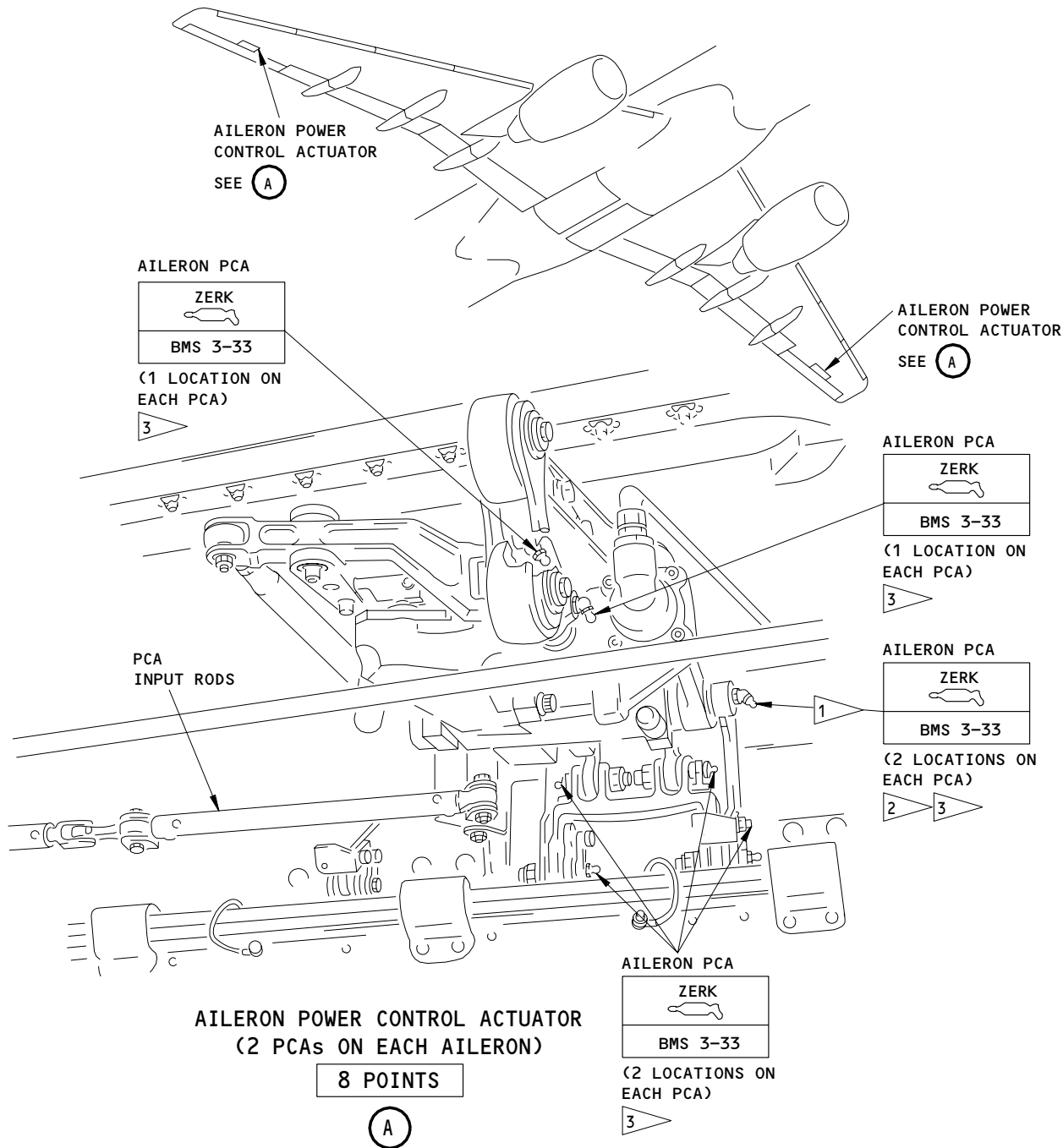
EFFECTIVITY

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- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 2 USE A HAND (NON-PNEUMATIC PRESSURE) OPERATED GUN TO PREVENT BUSHING MIGRATION.
- 3 BMS 3-33 (RECOMMENDED)
BMS 3-24 (ALTERNATE)
MIL-PRF-23827 (ALTERNATE)

Aileron and Aileron Trim Control System Lubrication
Figure 301A

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- (2) D00015 Grease, Corrosion Preventive - BMS 3-24 (Alternate)
- (3) D00013 Grease, Corrosion Preventive - MIL-PRF-23827 (Alternate)

B. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 29-11-00/201, Main (Left, Right, and Center) Hydraulic System

C. Access

(1) Location Zones

- 561 Rear Spar to Trailing Edge (Left)
- 661 Rear Spar to Trailing Edge (Right)

(2) Access Panels

- 561AB/661AB
- 561BB/661BB
- 561CB/661CB
- 561FB/661FB
- 561GB/661GB
- 561HB/661HB

(3) Access Panels

- 561CB/661CB

D. Procedure

S 863-011

- (1) Make sure the left, right, and center hydraulic systems do not have power (Ref 29-11-00/201).

S 013-012

- (2) Open these access panels (Ref 06-44-00/201):
 - (a) 561/661AB to get access to the aileron quadrant.
 - (b) 561/661BB to get access to the aileron hinge.
 - (c) 561/661CB to get access to the aileron hinge.
 - (d) 561/661FB to get access to the aileron hinge.
 - (e) 561/661GB to get access to the aileron hinge.
 - (f) 561/661HB to get access to the aileron hinge.

S 643-013

- (3) Lubricate the aileron control system as shown (Figs. 301).

S 643-014

- (4) lubricate the aileron power control actuators (Fig. 301A).

S 413-015

- (5) Close these access panels (Ref 06-44-00/201):
 - (a) 561/661AB, access to the aileron quadrant
 - (b) 561/661BB, access to the aileron hinge
 - (c) 561/661CB, access to the aileron hinge
 - (d) 561/661FB, access to the aileron hinge
 - (e) 561/661GB, access to the aileron hinge

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| (f) 561/661HB, access to the aileron hinge.

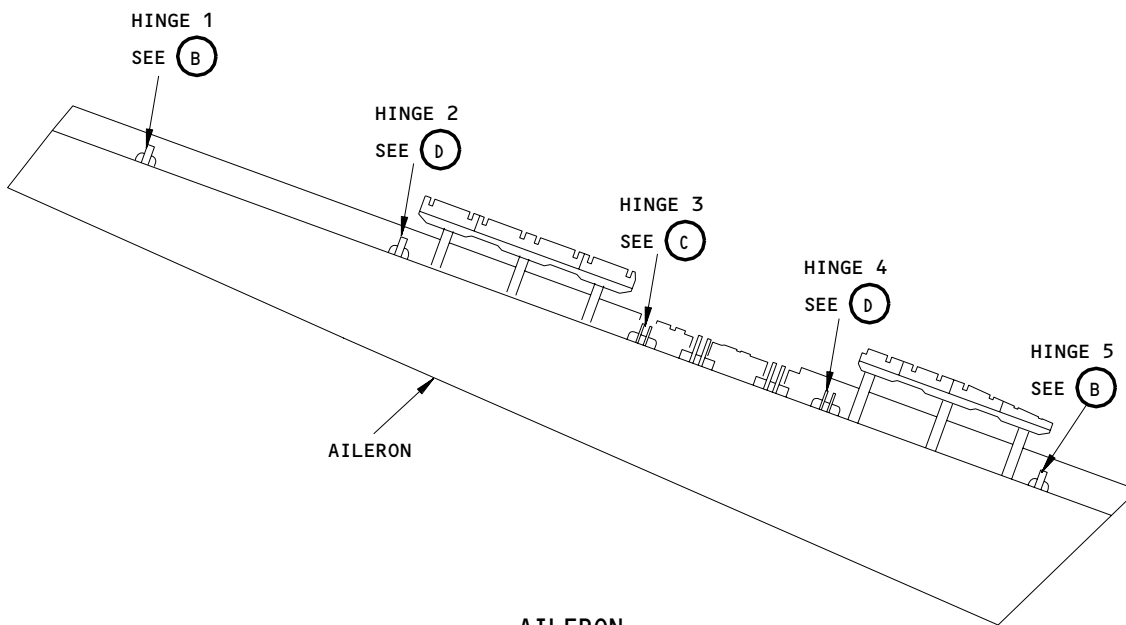
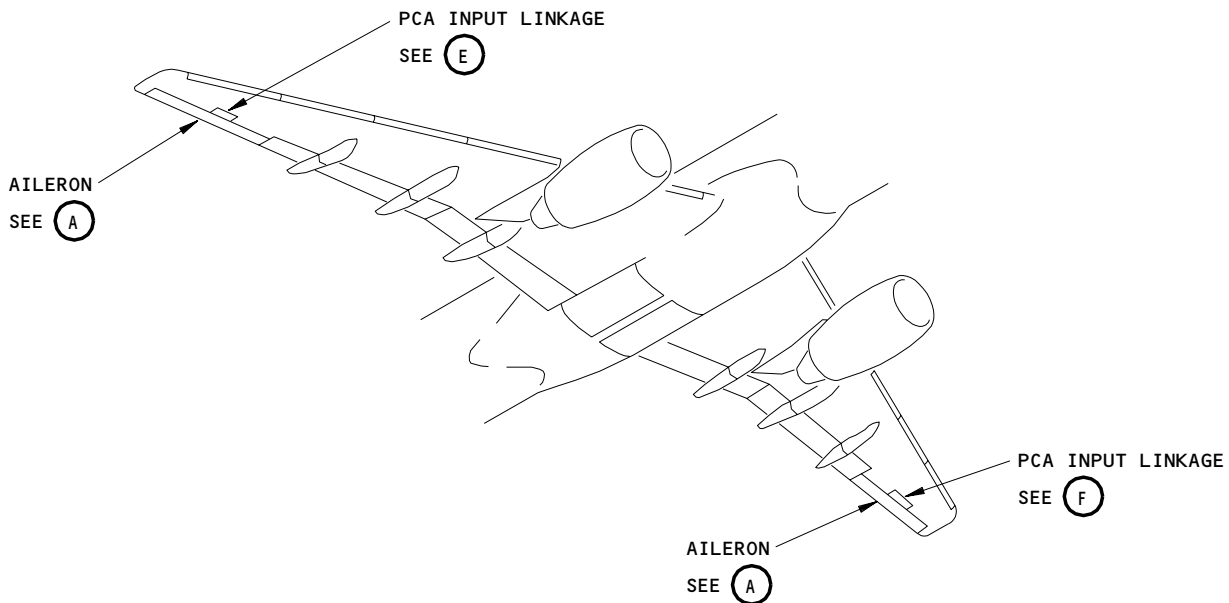
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AILERON
(RIGHT SIDE IS SHOWN, LEFT SIDE IS OPPOSITE)

(A)

Aileron and Aileron-Trim-Control System Lubrication
Figure 301 (Sheet 1)

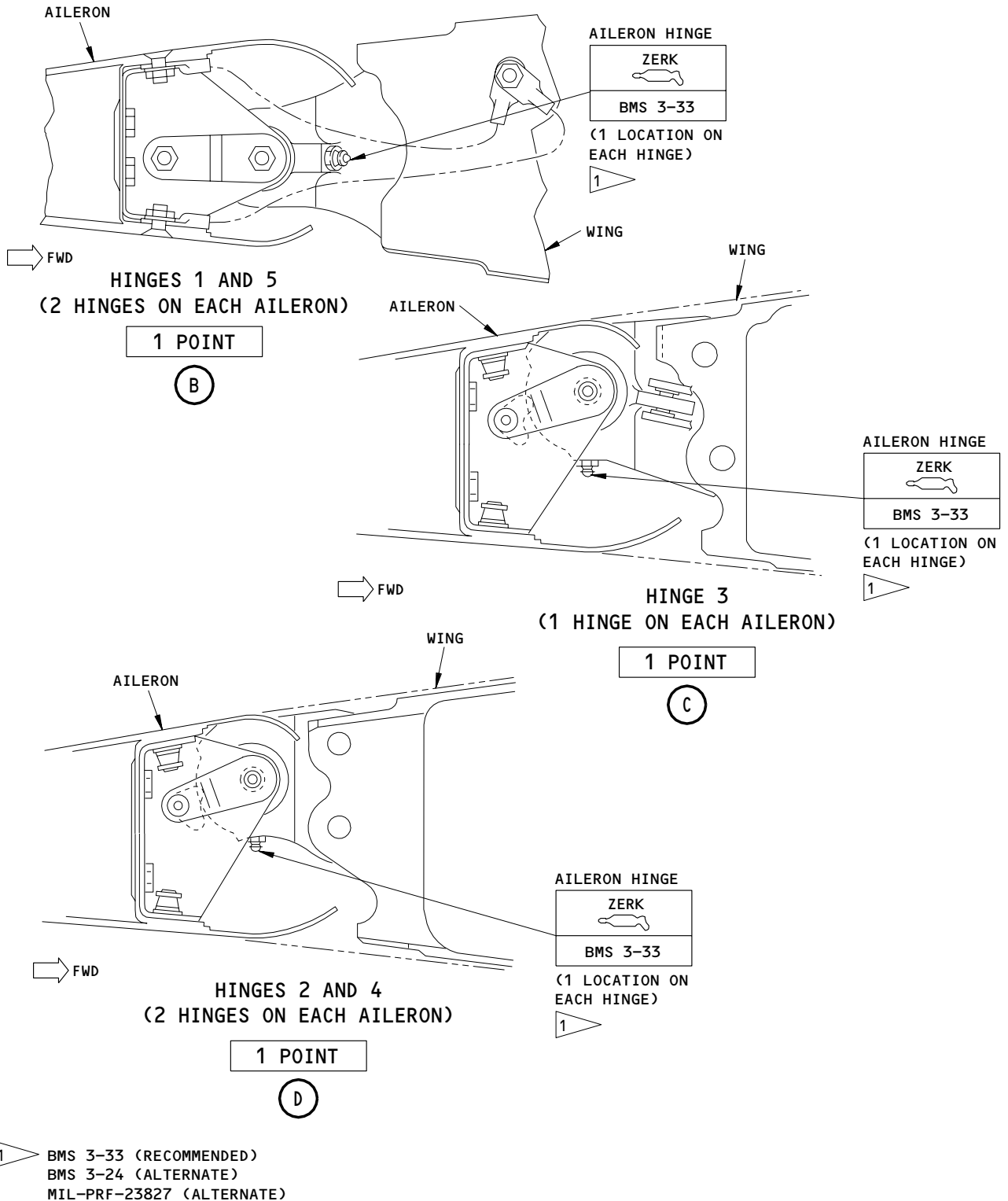
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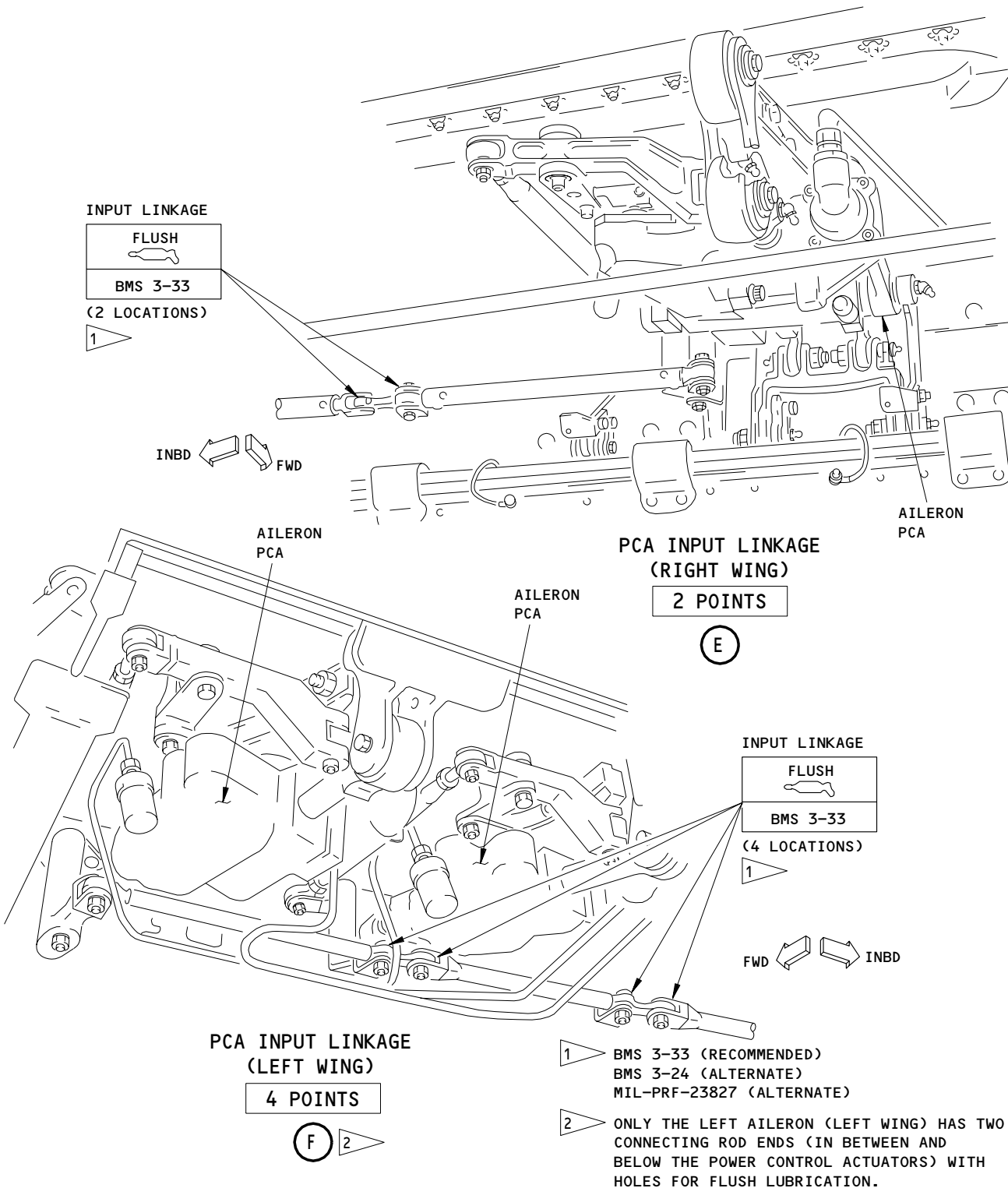
Aileron and Aileron Trim Control System Lubrication
Figure 301 (Sheet 2)

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Aileron and Aileron Trim Control System Lubrication
Figure 301 (Sheet 3)

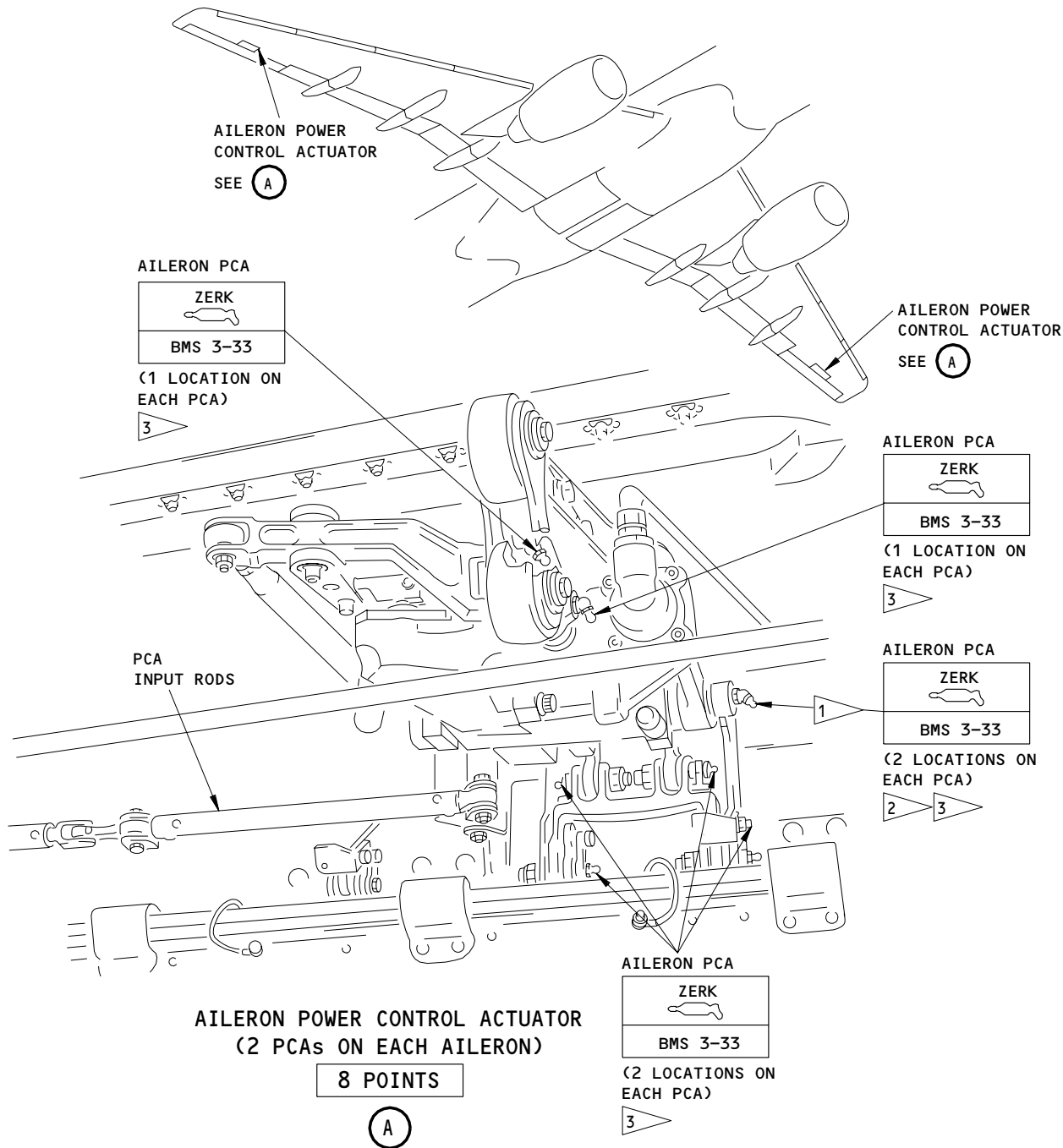
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- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 2 USE A HAND (NON-PNEUMATIC PRESSURE) OPERATED GUN TO PREVENT BUSHING MIGRATION.
- 3 BMS 3-33 (RECOMMENDED)
BMS 3-24 (ALTERNATE)
MIL-PRF-23827 (ALTERNATE)

Aileron and Aileron Trim Control System Lubrication
Figure 301A

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LEADING EDGE SLAT SYSTEM (LUBRICATION) – SERVICING

1. General

A. This procedure contains these six tasks to lubricate the leading edge (LE) slat system:

- lubricate the torque tube couplings
- lubricate the main and auxiliary track rollers (bearings through bolts with lube fittings only), lubricate the rub surfaces on the main tracks and auxiliary tracks, and lubricate the rub surfaces between the main track sector gears and rotary actuator pinion gears.
- lubricate the slat loss sensing and indication cable tube
- lubricate the angle gearbox gears
- lubricate the LE slat power drive unit (PDU) gears
- lubricate the LE slat power drive unit (PDU) control rod.

TASK 12-21-08-643-029

2. Lubricate the Torque Tube Couplings

A. Equipment

- (1) Trailing Edge Flap Power Drive Unit Lock - B27008-1
- (2) Circuit Breaker Lockout Clip
(Commercially Available)
- (3) LE Slat Drive Lock Set - B27020-31
(Includes CB Locks B27020-25 and B27065-1.
Valve Locks B27020-32 or B27077-1 are not
used in this procedure)

B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00014 Grease - MIL-G-21164 (alternate)

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(3) D00013 Grease - MIL-PRF-23827 (alternate)

C. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 24-22-00/201, Electrical Power - Control
- (3) AMM 27-81-00/201, LE Slat System - Maintenance Practices
- (4) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (5) 32-00-15/201, Landing Gear Door Locks
- (6) 32-00-20/201, Landing Gear Downlocks
- (7) 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zones

- 193/194 Wing to Body - Forward Lower Half
- 211/212 Control Cabin
- 510/610 Wing Leading Edge - Forward of Front Spar and Inboard of Nacelle Strut
- 520/620 Wing Leading Edge - Forward of Front Spar and Outboard of Nacelle Strut
- 710 Nose Landing gear and Doors
- 715/716 Nose landing Gear Wheel Well
- 730/740 Left and Right Main Landing Gears and Doors
- 732/742 Main Landing Gear Wheel Well
- 821 Forward Cargo Compartment

(2) Access Panels

- 511CB LE Slat Power Drive Unit
- 193BL LE Slat PDU Bypass Valve
- 511DB/611DB Main and Auxiliary Track Roller Lubrication
- 511FB/611FB Main and Auxiliary Track Roller Lubrication
- 511HB/611HB Main and Auxiliary Track Roller Lubrication
- 521AB/621AB LE Slat Drive Mechanism, Tracks, Rollers
- 521CB/621CB LE Slat Drive Mechanism, Tracks, Rollers
- 521EB/621EB LE Slat Drive Mechanism, Tracks, Rollers
- 521GB LE Slat Drive Mechanism, Tracks, Rollers
- 621HB Main and Auxiliary Track Roller Lubrication
- 521KB/621KB LE Slat Drive Mechanism, Tracks, Rollers
- 521MB/621MB LE Slat Drive Mechanism, Tracks, Rollers
- 521PB/621PB LE Slat Drive Mechanism, Tracks, Rollers
- 521RB/621RB LE Slat Drive Mechanism, Tracks, Rollers
- 521UBX/621UBX Wing Nacelle Attach Fitting, Lubrication Points
- 1251 Forward Cargo Compartment Aft Wall Panels

E. Prepare for the Lubrication

S 043-186

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU OR DAMAGE TO EQUIPMENT.

- (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Ref 78-31-00/201).

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- S 843-166
- (2) Make sure the trailing edge (TE) flaps and LE slats are fully extended (AMM 27-81-00/201).
- S 843-167
- (3) Make sure the flap control lever is in the 30-unit detent.
- S 933-168
- (4) Install a DO-NOT-OPERATE tag the flap control lever.
- S 843-169
- (5) Make sure the downlocks are installed on the nose and main landing gear (Ref 32-00-20/201).

S 843-170

WARNING: INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Open the doors for the main landing gear and install the door locks (AMM 32-00-15/201).
- S 863-171
- (7) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).
- S 483-172
- (8) Install a PDU lock in the TE flap PDU at the forward bulkhead of the left main gear wheel well (Fig. 307).
- S 863-173
- (9) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11J33, WARN ELEX A
- S 863-174
- (10) Open this circuit breaker on the P11 panel and install circuit breaker lock (B27065-1):
- (a) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- S 863-175
- (11) Open these circuit breakers on the main power distribution panel, P6, and install circuit breaker locks (B27020-25):
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

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S 013-176

(12) Remove the applicable access panels that follow (Ref 06-44-00/201):

NOTE: It is possible that some of the lube points can be reached through the access doors.

- (a) 511CB or 193BL LE Slat Power Drive Unit.
- (b) 511DB/611DB Main and Auxiliary Track Roller Lubrication
- (c) 511FB/611FB Main and Auxiliary Track Roller Lubrication
- (d) 511HB/611HB Main and Auxiliary Track Roller Lubrication
- (e) 521AB/621AB LE Slat Drive mechanism, Tracks, Rollers
- (f) 521CB/621CB LE Slat Drive Mechanism, Tracks, Rollers
- (g) 521EB/621EB LE Slat Drive Mechanism, Tracks, Rollers
- (h) 521GB LE Slat Drive Mechanism, Tracks, Rollers
- (i) 621HB Main and Auxiliary Track Roller Lubrication
- (j) 521KB/621KB LE Slat Drive Mechanism, Tracks, Rollers
- (k) 521MB/621MB LE Slat Drive Mechanism, Tracks, Rollers
- (l) 521PB/621PB LE Slat Drive mechanism, Tracks, Rollers
- (m) 521RB/621RB LE Slat Drive Mechanism, Tracks, Rollers
- (n) 521UBX/621UBX Wing Nacelle Attach Fitting, Lubrication Points #
- (o) 1251 Forward Cargo Compartment Aft Wall Panels

S 293-301

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.

(13) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 643-177

(14) Lubricate the torque tube couplings as shown (Fig. 301).

NOTE: Remove aft wall panels of the forward cargo compartment. If it necessary, remove the air conditioning filter support, and disconnect and move aside the mix manifold assembly to lube six couplings behind the aft end bulkhead. Use an extended grease tube fitting to reach lube holes.

F. Put the Airplane Back to Its Usual Condition

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S 293-302

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.

- (1) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 413-178

- (2) Install the access panels that follow (Ref 06-44-00/201):
 - (a) 511CB or 193BL LE Slat Power Drive Unit.
 - (b) 511DB/611DB Main and Auxiliary Track Roller Lubrication
 - (c) 511FB/611FB Main and Auxiliary Track Roller Lubrication
 - (d) 511HB/611HB Main and Auxiliary Track Roller Lubrication
 - (e) 521AB/621AB LE Slat Drive Mechanism, Tracks, Rollers
 - (f) 521CB/621CB LE Slat Drive Mechanism, Tracks, Rollers
 - (g) 521EB/621EB LE Slat Drive Mechanism, Tracks, Rollers
 - (h) 521GB LE Slat Drive Mechanism, Tracks, Rollers
 - (i) 621HB Main and Auxiliary Track Roller Lubrication
 - (j) 521KB/621KB LE Slat Drive Mechanism, Tracks, Rollers
 - (k) 521MB/621MB LE Slat Drive Mechanism, Tracks, Rollers
 - (l) 521PB/621PB LE Slat Drive Mechanism, Tracks, Rollers
 - (m) 521RB/621RB LE Slat Drive Mechanism, Tracks, Rollers
 - (n) 521UBX/621UBX Wing Nacelle Attach Fitting, Lubrication Points #
 - (o) 1251 Forward Cargo Compartment Aft Wall Panels

S 083-181

- (3) Remove the PDU lock from the TE flap PDU (Fig. 307).

S 863-182

- (4) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
 - (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J33, WARN ELEX A

S 863-183

- (5) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P6 panel:
 - (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-180

- (6) Remove the DO-NOT-OPERATE tag from the flap control lever.

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S 843-179

- (7) Make sure the TE flaps and LE slats are fully retracted with the flap control lever in the zero (FLAPS UP) detent (AMM 27-81-00/201).

S 843-033

WARNING: REMOVE THE DOOR LOCKS. BE AWARED THAT THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (8) Remove the locks for the landing gear doors and close the doors (Ref 32-00-15/201).

S 863-184

- (9) Remove electrical power (Ref 24-22-00/201).

S 443-185

- (10) Do the activation procedure for the thrust reverser (Ref 78-31-00/201).

TASK 12-21-08-613-278

3. Lubricate the Main and Auxiliary Track Rollers (bearings through bolts with lube fittings only) and rub surfaces at the Outboard LE Slats

A. Equipment

- (1) Trailing Edge Flap Power Drive Unit Lock - B27008-1
- (2) Circuit Breaker Lockout Clip
(Commercially Available)
- (3) LE Slat Drive Lock Set - B27020-31
(includes CB Locks B27020-25 and B27065-1.
Valve Locks B27020-32 or B27077-1 are not used in this procedure)

B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00013 Grease - MIL-PRF-23827 (Alternate)
- (3) D00014 Grease - MIL-G-21164 (Alternate)
- (4) D00015 Grease - BMS 3-24 (Alternate)

C. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 24-22-00/201, Electrical Power - Control
- (3) AMM 27-81-00/201, LE Slat System - Maintenance Practices
- (4) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (5) 32-00-15/201, Landing Gear Door Locks
- (6) 32-00-20/201, Landing Gear Downlocks
- (7) 78-31-00/201, Thrust Reverser System

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D. Access

(1) Location Zones

193/194	Wing to Body - Forward Lower Half
211/212	Control Cabin
510/610	Wing Leading Edge - Forward of Front Spar and Inboard of Nacelle Strut
520/620	Wing Leading Edge - Forward of Front Spar and Outboard of Nacelle Strut
730/740	Left and Right Main Landing Gears and Doors
732/742	Left and Right Main Landing Gear Wheel Well

(2) Access Panels

621HB	Main and Auxiliary Track Roller Lubrication
521AB/621AB	LE Slat Drive Mechanism, Tracks, Rollers
521CB/621CB	LE Slat Drive Mechanism, Tracks, Rollers
521EB/621EB	LE Slat Drive Mechanism, Tracks, Rollers
521GB	LE Slat Drive Mechanism, Tracks, Rollers
521KB/621KB	LE Slat Drive Mechanism, Tracks, Rollers
521MB/621MB	LE Slat Drive Mechanism, Tracks, Rollers
521PB/621PB	LE Slat Drive Mechanism, Tracks, Rollers
521RB/621RB	LE Slat Drive Mechanism, Tracks, Rollers

E. Prepare for the Lubrication

S 843-010

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU OR DAMAGE TO EQUIPMENT.

- (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Ref 78-31-00/201).

S 843-011

- (2) Make sure the trailing edge (TE) flaps and LE slats are fully extended (AMM 27-81-00/201).

S 843-002

- (3) Make sure the flap control lever is in the 30-unit detent.

S 933-003

- (4) Install a DO-NOT-OPERATE tag on the flap control lever.

S 843-012

- (5) Make sure the landing gear downlocks for the nose and main landing gear are installed (Ref 32-00-20/201).

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S 843-013

WARNING: USE AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Open the doors for the main landing gear and install the door locks (Ref 32-00-15/201).

S 863-014

- (7) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).

S 843-015

- (8) Install a PDU lock in the TE flap PDU at the forward bulkhead of the left main gear wheel well (Fig. 307).

S 863-005

- (9) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11J33, WARN ELEX A

S 863-007

- (10) Open this circuit breaker on the P11 panel and install circuit breaker lock (B27065-1):
- (a) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM

S 863-006

- (11) Open these circuit breakers on the main power distribution panel, P6, and install circuit breaker locks (B27020-25):
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 013-009

- (12) Remove the applicable access panels that follow (Ref 06-44-00/201):

NOTE: It is possible that some of the lube points can be reached through the access doors.

- (a) 521AB/621AB LE Slat drive Mechanism, Tracks, Rollers
- (b) 521CB/621CB LE Slat Drive Mechanism, Tracks, Rollers
- (c) 521EB/621EB LE Slat Drive Mechanism, Tracks, Rollers
- (d) 521GB LE Slat Drive Mechanism, Tracks, Rollers
- (e) 621HB Main and Auxiliary Track Roller Lubrication
- (f) 521KB/621KB LE Slat Drive Mechanism, Tracks, Rollers
- (g) 521MB/621MB LE Slat Drive mechanism, Tracks, Rollers
- (h) 521PB/621PB LE Slat Drive Mechanism, Tracks, Rollers
- (i) 521RB/621RB LE Slat Drive mechanism, Tracks, Rollers

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S 293-303

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.

- (13) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 013-279

- (14) Lubricate the roller bearings, lubricate the rub surfaces on the main and auxiliary tracks, and lubricate the rub surfaces between the main track sector gears and the rotary actuator pinion gears for the left (right) outboard slats (Fig. 303).

NOTE: Lubricate roller bearings through bolts with lube fittings only.

F. Put the Airplane Back to Its Usual Condition

S 293-304

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.

- (1) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 413-008

- (2) Install the access panels for the left (right) outboard LE slats that follow (Ref 06-44-00/201):
- (a) 521AB/621AB LE Slat Drive Mechanism, Tracks, Rollers
 - (b) 521CB/621CB LE Slat Drive Mechanism, Tracks, Rollers
 - (c) 521EB/621EB LE Slat Drive Mechanism, Tracks, Rollers
 - (d) 521GB LE Slat Drive Mechanism, Tracks, Rollers
 - (e) 621HB Main and Auxiliary Track Roller Lubrication
 - (f) 521KB/621KB LE Slat Drive Mechanism, Tracks, Rollers
 - (g) 521MB/621MB LE Slat Drive Mechanism, Tracks, Rollers
 - (h) 521PB/621PB LE Slat Drive Mechanism, Tracks, Rollers
 - (i) 521RB/621RB LE Slat Drive Mechanism, Tracks, Rollers

S 843-022

- (3) Remove the PDU lock from the TE flap PDU (Fig. 307).

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S 863-023

- (4) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J33, WARN ELEX A

S 863-024

- (5) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P6 panel:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 933-004

- (6) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 843-021

- (7) Make sure the TE flaps and LE slats are fully retracted with the flap control lever in the zero (FLAPS UP) detent (AMM 27-81-00/201).

S 843-035

WARNING: USE AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (8) Remove the door locks from the landing gear doors and close the doors (Ref 32-00-15/201).

S 863-026

- (9) Remove the electrical power if it is not necessary (Ref 24-22-00/201).

S 843-027

- (10) Do the activation procedure for the thrust reverser (Ref 78-31-00/201).

TASK 12-21-08-613-280

4. Lubricate the Main and Auxiliary Track Rollers (lubricate roller bearings through bolts with lube fitting only) and rub surfaces at Inboard LE Slats

A. Equipment

- (1) Trailing Edge Flap Power Drive Unit Lock - B27008-1
- (2) Circuit Breaker Lockout Clip
(Commercially Available)
- (3) LE Slat Drive Lock Set - B27020-31
(includes CB Locks B27020-25 and B27065-1.
Valve Locks B27020-32 or B27077-1 are not used in this procedure)

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B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00013 Grease - MIL-PRF-23827 (Alternate)
- (3) D00014 Grease - MIL-G-21164 (Alternate)
- (4) D00015 Grease - BMS 3-24 (Alternate)

C. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 24-22-00/201, Electrical Power - Control
- (3) AMM 27-81-00/201, LE Slat System - Maintenance Practices
- (4) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (5) 32-00-15/201, Landing Gear Door Locks
- (6) 32-00-20/201, Landing Gear Downlocks
- (7) 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zones

- 193/194 Wing to Body - Forward Lower Half
- 211/212 Control Cabin
- 510/610 Wing Leading Edge - Forward of Front Spar and Inboard of Nacelle Strut
- 520/620 Wing Leading Edge - Forward of Front Spar and Outboard of Nacelle Strut
- 730/740 Left and Right Main Landing Gears and Doors
- 732/742 Left and Right Main Landing Gear Wheel Well

(2) Access Panels

- 511DB/611DB Main and Auxiliary Track Roller Lubrication
- 511FB/611FB Main and Auxiliary Track Roller Lubrication
- 511HB/611HB Main and Auxiliary Track Roller Lubrication

E. Prepare for the Lubrication

S 843-050

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU OR DAMAGE TO EQUIPMENT.

- (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Ref 78-31-00/201).

S 843-051

- (2) Make sure the trailing edge (TE) flaps and LE slats are fully extended (AMM 27-81-00/201).

S 843-052

- (3) Make sure the flap control lever is in the 30-unit detent.

S 933-053

- (4) Install a DO-NOT-OPERATE tag on the flap control lever.

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S 843-054

- (5) Make sure the landing gear downlocks for the nose and main landing gear are installed (Ref 32-00-20/201).

S 843-055

WARNING: USE AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Open the doors for the main landing gear and install the door locks (Ref 32-00-15/201).

S 863-056

- (7) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).

S 843-057

- (8) Install a PDU lock in the TE flap PDU at the forward bulkhead of the left main gear wheel well (Fig. 307).

S 863-058

- (9) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11J33, WARN ELEX A

S 863-059

- (10) Open this circuit breaker on the P11 panel and install circuit breaker lock (B27065-1):
- (a) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM

S 863-060

- (11) Open these circuit breakers on the main power distribution panel, P6, and install circuit breaker locks (B27020-25):
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 013-061

- (12) Remove the applicable access panels that follow (Ref 06-44-00/201):

NOTE: It is possible that some of the lube points can be reached through the access doors.

- (a) 511DB/611DB Main and Auxiliary Track Roller Lubrication
- (b) 511FB/611FB Main and Auxiliary Track Roller Lubrication
- (c) 511HB/611HB Main and Auxiliary Track Roller Lubrication

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S 293-305

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.

- (13) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 013-281

- (14) Lubricate the roller bearings, lubricate the rub surfaces on the main and auxiliary tracks, and lubricate the rub surfaces between the main track sector gears and the rotary actuator pinion gears for the left (right) inboard LE slats (Fig. 302)

NOTE: Lubricate roller bearings through bolts with lube fittings only.

F. Put the Airplane Back to Its Usual Condition

S 293-306

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.

- (1) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 413-063

- (2) Install the access panels for the left (right) inboard LE slats that follow (Ref 06-44-00/201):
- (a) 511DB/611DB Main and Auxiliary Track Roller Lubrication
 - (b) 511FB/611FB Main and Auxiliary Track Roller Lubrication
 - (c) 511HB/611HB Main and Auxiliary Track Roller Lubrication

S 843-066

- (3) Remove the PDU lock from the TE flap PDU (Fig. 307).

S 863-067

- (4) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J33, WARN ELEX A

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S 863-068

- (5) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P6 panel:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 933-065

- (6) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 843-064

- (7) Make sure the TE flaps and LE slats are fully retracted with the flap control lever in the zero (FLAPS UP) detent (AMM 27-81-00/201).

S 843-069

WARNING: USE AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (8) Remove the door locks from the landing gear doors and close the doors (Ref 32-00-15/201).

S 863-070

- (9) Remove the electrical power if it is not necessary (Ref 24-22-00/201).

S 843-071

- (10) Do the activation procedure for the thrust reverser (Ref 78-31-00/201).

TASK 12-21-08-643-031

5. Lubricate the Slat Loss Sensing and Indication Cable Tube

A. Equipment

- (1) Trailing Edge Flap Power Drive Unit Lock - B27008-1
- (2) Circuit Breaker Lockout Clip
(Commercially Available)
- (3) LE Slat Drive Lock Set - B27020-31
(includes CB Locks B27020-25 and B27065-1.
Valve Locks B27020-32 or B27077-1 are not used in this procedure)

B. Consumable Materials

- (1) D00121 Silicone Grease - Grease-DC-33
(Dow Corning)

C. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 24-22-00/201, Electrical Power - Control
- (3) AMM 27-81-00/201, LE Slat System - Maintenance Practices
- (4) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (5) 32-00-15/201, Landing Gear Door Locks
- (6) 32-00-20/201, Landing Gear Downlocks

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- (7) 78-31-00/201, Thrust Reverser System
- D. Access
- (1) Location Zones
- | | |
|---------|---|
| 193/194 | Wing to Body - Forward Lower Half |
| 211/212 | Control Cabin |
| 510/610 | Wing Leading Edge - Forward of Front Spar and Inboard of Nacelle Strut |
| 520/620 | Wing Leading Edge - Forward of Front Spar and Outboard of Nacelle Strut |
| 730/740 | Left and Right Main Landing Gears and Doors |
| 732/742 | Left and Right Main Landing Gear Wheel Well |
- (2) Access Panels
- | | |
|-------------|---|
| 511HB/611HB | Main and Auxiliary Track Roller Lubrication |
| 521KB/621KB | LE Slat Drive Mechanism, Tracks, Rollers |

E. Prepare for the Lubrication

S 043-188

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU OR DAMAGE TO EQUIPMENT.

- (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Ref 78-31-00/201).
- S 213-187
- (2) Make sure the trailing edge (TE) flaps and LE slats are fully extended (AMM 27-81-00/201).
- S 863-189
- (3) Make sure the flap control lever is in the 30-unit detent.
- S 863-190
- (4) Install a DO-NOT-OPERATE tag on the flap control lever.
- S 483-191
- (5) Make sure the downlocks are installed on the nose and main landing gear (Ref 32-00-20/201).
- S 483-192

WARNING: USE AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Open the doors for the main landing gear and install the door locks (Ref 32-00-15/201).

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- S 863-193
- (7) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).
- S 483-194
- (8) Install a PDU lock in the TE flap PDU at the forward bulkhead of the left main gear wheel well (Fig. 307).
- S 863-195
- (9) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11J33, WARN ELEX A
- S 863-196
- (10) Open this circuit breaker on the P11 panel and install circuit breaker lock (B27065-1):
- (a) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- S 863-197
- (11) Open these circuit breakers on the main power distribution panel, P6, and install circuit breaker locks (B27020-25):
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR
- S 013-198
- (12) Remove the applicable access panels that follow (Ref 06-44-00/201):
- NOTE:** It is possible that some of the lube points can be reached through the access doors.
- (a) 511HB/611HB Main and Auxiliary Track Roller Lubrication
 - (b) 521KB/621KB LE Slat Drive mechanism, Tracks, Rollers

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S 293-307

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.

- (13) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 643-199

- (14) Lubricate the slat loss sensor guide tube for the outboard slats as shown in Fig. 306 or for the inboard slats as shown in Fig. 306A.

NOTE: If you pull the cable during lubrication, a LE SLAT ASYM message will be shown on the EICAS computer. Do not pull the cable if it is not necessary.

F. Put the Airplane Back to Its Usual Condition

S 293-308

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.

- (1) Keep clean and free of all unwanted objects (FOD), the housing (can) assemblies of the slat main tracks, at all time.

S 413-200

- (2) Install the access panels that follow (Ref 06-44-00/201):
(a) 511HB/611HB Main and Auxiliary Track Roller Lubrication
(b) 521KB/621KB LE Slat Drive Mechanism, Tracks, Rollers

S 083-203

- (3) Remove the PDU lock from the TE flap PDU (Fig. 307).

S 863-204

- (4) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
(a) 11B18, WARN ELEX B
(b) 11D31, HYDRAULICS PTU CONT
(c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
(d) 11J33, WARN ELEX A

S 863-205

- (5) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P6 panel:
(a) 6D20, ALTN SLAT PWR

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(b) 6D23, ALTN FLAP PWR

S 863-202

(6) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 863-201

(7) Make sure the TE flaps and LE slats are fully retracted with the flap control lever in the zero (FLAPS UP) detent (AMM 27-81-00/201).

S 843-036

WARNING: USE AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(8) Remove the locks from the main landing gear doors and close the doors (Ref 32-00-15/201).

S 863-206

(9) Remove the electrical power if it is not necessary (Ref 24-22-00/201).

S 443-207

(10) Do the activation procedure for the thrust reverser (Ref 78-31-00/201).

TASK 12-21-08-643-032

6. Lubricate the Angle Gearbox Gears

A. Equipment

- (1) Trailing Edge Flap Power Drive Unit Lock - B27008-1
- (2) Circuit Breaker Lockout Clip
(Commercially Available)
- (3) LE Slat Drive Lock Set - B27020-31
(includes CB Locks B27020-25 and B27065-1.
Valve Locks B27020-32 or B27077-1 are not used in this procedure)

B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
- (2) D00014 Grease - MIL-G-21164 (alternate)
- (3) D00013 Grease - MIL-PRF-23827 (alternate)
- (4) C00259 Primer - BMS 10-11, Type 1

C. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 24-22-00/201, Electrical Power - Control
- (3) AMM 27-81-00/201, LE Slat System - Maintenance Practices
- (4) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (5) 32-00-15/201, Landing Gear Door Locks
- (6) 32-00-20/201, Landing Gear Downlocks
- (7) 78-31-00/201, Thrust Reverser System

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D. Access

(1) Location Zones

193/194	Wing to Body - Forward Lower Half
211/212	Control Cabin
510/610	Wing Leading Edge - Forward of Front Spar and Inboard of Nacelle Strut
520/620	Wing Leading Edge - Forward of Front Spar and Outboard of Nacelle Strut
730/740	Left and Right Main Landing Gears and Doors
732/742	Left and Right Main Landing Gear Wheel Well

(2) Access Panels

191CL/192CR	L E Slat Drive Angle Gearbox
-------------	------------------------------

E. Prepare for the Lubrication

S 043-208

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU OR DAMAGE TO EQUIPMENT.

- (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Ref 78-31-00/201).

S 863-209

- (2) Make sure the trailing edge (TE) flaps and LE slats are fully extended (AMM 27-81-00/201).

S 863-210

- (3) Make sure the flap control lever is in the 30-unit detent.

S 863-211

- (4) Install a DO-NOT-OPERATE tag on the flap control lever.

S 843-212

- (5) Make sure the landing gear downlocks for the nose and main landing gear are installed (Ref 32-00-20/201).

S 483-213

WARNING: USE AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Open the doors for the main landing gear and install the door locks (Ref 32-00-15/201).

S 863-214

- (7) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).

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- S 483-215
- (8) Install a PDU lock in the TE flap PDU at the forward bulkhead of the left main gear wheel well (Fig. 307).
- S 863-216
- (9) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11J33, WARN ELEX A
- S 863-217
- (10) Open this circuit breaker on the P11 panel and install circuit breaker lock (B27065-1):
- (a) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- S 863-218
- (11) Open these circuit breakers on the main power distribution panel, P6, and install circuit breaker locks (B27020-25):
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR
- S 013-219
- (12) Remove the access panels that follow (Ref 06-44-00/201):
- (a) 191CL/192CR LE Slat Drive Angle Gearbox
- S 863-016
- (13) Put the manual override lever on the bypass valve of the LE slat (left wing body fairing forward of wing) in bypass (POS 1).
- F. Lubricate the Internal Gears of the Angle Gearbox (Fig. 305)
- S 013-041
- (1) Remove the drain covers to get access to the internal gears.

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S 643-042

- (2) Turn the torque tubes for the LE slat by hand and fill the gear teeth with grease by hand.

NOTE: You can use the Airnut Setter/Square Drive Procedure to move the slats manually (AMM 27-81-01/401).

NOTE: Turn the torque tube approximately 1 turn to make sure you applied a sufficient quantity of grease to the gear teeth.

NOTE: With the left hydraulic system pressure removed and the bypass valve in position 1, you should be able to turn the torque tubes by hand. If more leverage for turning the torque tubes is needed, a strap wrench on the torque tube couplings (not on the torque tubes) can be used. Another option is to disconnect the torque tubes on each side of the angle gear box, but make sure not to turn the adjacent torque tubes. If you turn the adjacent torque tubes you will have to adjust the slat drive system.

S 863-043

- (3) Turn the torque tubes for the LE slat by hand to retract the LE slats after the angle gearbox is fully lubricated.

S 843-020

- (4) Put the manual override lever in the usual position (POS 2).
- G. Put the Airplane Back to Its Usual Condition

S 413-220

- (1) Install the access panels that follow (Ref 06-44-00/201):
 - (a) 191CL/192CR LE Slat Drive Angle Gearbox

S 083-223

- (2) Remove the lock on the power drive unit for the TE flap.

S 863-224

- (3) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
 - (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J33, WARN ELEX A

S 863-225

- (4) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P6 panel:
 - (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

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S 863-222

- (5) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 863-221

- (6) Make sure the TE flaps and LE slats are fully retracted with the flap control lever in the zero (FLAPS UP) detent (AMM 27-81-00/201).

S 843-037

WARNING: USE AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Remove the door locks from the main landing gear doors and close the doors (Ref 32-00-15/201).

S 863-226

- (8) Remove the electrical power if it is not necessary (Ref 24-22-00/201).

S 443-227

- (9) Do the activation procedure for the thrust reverser (Ref 78-31-00/201).

TASK 12-21-08-643-030

7. Lubricate the Leading Edge (LE) Slat Power Drive Unit (PDU) Gears

A. Equipment

- (1) Trailing Edge Flap Power Drive Unit Lock - B27008-1
(2) Circuit Breaker Lockout Clip
(Commercially Available)
(3) LE Slat Drive Lock Set - B27020-31
(includes CB Locks B27020-25 and B27065-1.
Valve Locks B27020-32 or B27077-1 are not
used in this procedure)

B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00014 Grease - MIL-G-21164 (alternate)
(3) D00013 Grease - MIL-PRF-23827 (alternate)

C. References

- (1) 06-44-00/201, Wing Access Doors and Panels
(2) 24-22-00/201, Electrical Power - Control
(3) AMM 27-81-00/201, LE Slat System - Maintenance Practices
(4) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
(5) 32-00-15/201, Landing Gear Door Locks
(6) 32-00-20/201, Landing Gear Downlocks
(7) 78-31-00/201, Thrust Reverser System

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D. Access

(1) Location Zones

193/194	Wing to Body - Forward Lower Half
211/212	Control Cabin
510/610	Wing Leading Edge - Forward of Front Spar and Inboard of Nacelle Strut
520/620	Wing Leading Edge - Forward of Front Spar and Outboard of Nacelle Strut
730/740	Left and Right Main Landing Gears and Doors
732/742	Left and Right Main Landing Gear Wheel Well

(2) Access Panels

511CB	LE Slat Power Drive Unit
193BL	LE Slat PDU Bypass Valve

E. Prepare for the Lubrication

NOTE: The LE Slat PDU is found aft of the left wing strakelet and is installed on the left wing front spar.

S 043-228

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU OR DAMAGE TO EQUIPMENT.

- (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Ref 78-31-00/201).

S 863-229

- (2) Make sure the trailing edge (TE) flaps and LE slats are fully extended (AMM 27-81-00/201).

S 863-230

- (3) Make sure the flap control lever is in the 30-unit detent.

S 863-231

- (4) Install a DO-NOT-OPERATE tag on the flap control lever.

S 843-232

- (5) Make sure the downlocks are installed on the nose and main landing gear (Ref 32-00-20/201).

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S 483-233

WARNING: USE AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Open the doors for the main landing gear and install the door locks (Ref 32-00-15/201).

S 863-234

- (7) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).

S 483-235

- (8) Install a PDU lock in the TE flap PDU at the forward bulkhead of the left main gear wheel well (Fig. 307).

S 863-236

- (9) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11J33, WARN ELEX A

S 863-237

- (10) Open this circuit breaker on the P11 panel and install circuit breaker lock (B27065-1):
- (a) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM

S 863-238

- (11) Open these circuit breakers on the main power distribution panel, P6, and install circuit breaker locks (B27020-25):
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 013-239

- (12) Remove the access panels that follow (Ref 06-44-00/201):
- (a) 511CB, LE Slat Power Drive Unit.

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(b) 193BL, LE Slat PDU Bypass Valve.

S 863-298

- (13) Put the manual override lever on the bypass valve of the LE slat PDU (left wing body fairing forward of wing - Access panel 193BL) in bypass (POS 1).

S 863-311

- (14) Attach a DO-NOT-OPERATE tag on the manual override lever.

F. Lubricate the Internal Gears of the LE Slat PDU (Fig. 304)

S 013-045

- (1) Remove the button plugs to get access to the internal gears.

S 643-019

- (2) Turn the torque tubes for the LE slat by hand and fill the gear teeth with grease by hand.

NOTE: Turn the torque tube approximately 1 3/4 turns to make sure that you apply a sufficient quantity of grease to all of the gear teeth.

NOTE: With the left hydraulic system pressure removed and the bypass valve in position 1, you should be able to turn the torque tubes by hand. If more leverage for turning the torque tubes is needed, a strap range on the torque tube couplings (not on the torque tubes) can be used. Another option is to disconnect the torque tubes on each side of the PDU, but make sure not to turn the adjacent torque tubes. If you turn the adjacent torque tubes you will have to adjust the slat drive system.

S 863-046

- (3) Turn the torque tubes for the LE slat by hand to fully retract the LE slats.

S 843-299

- (4) Put the manual override lever in the usual position (POS 2).

G. Put the Airplane Back to Its Usual Condition

S 083-243

- (1) Remove the PDU lock from the TE flap PDU (Fig. 307).

S 083-312

- (2) Remove the DO-NOT-OPERATE tag on the manual override lever.

S 863-313

- (3) Move the manual override lever on the TE Flap PDU Bypass Valve to the usual position (POS 2).

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S 413-240

- (4) Install the access panels that follow (Ref 06-44-00/201):
- (a) 511CB, LE Power Drive Unit.
 - (b) 193BL, LE Slat PDU Bypass Valve.

S 863-244

- (5) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J33, WARN ELEX A

S 863-245

- (6) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P6 panel:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-242

- (7) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 843-241

- (8) Make sure the TE flaps and LE slats are fully retracted with the flap control lever in the zero (FLAPS UP) detent.

S 843-038

WARNING: USE AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (9) Remove the locks from the main landing gear and close the doors (Ref 32-00-15/201).

S 863-246

- (10) Remove the electrical power if it is not necessary (Ref 24-22-00/201).

S 443-247

- (11) Do the activation procedure for the thrust reverser (Ref 78-31-00/201).

TASK 12-21-08-643-249

8. Lubricate the Leading Edge (LE) Slat Power Drive Unit (PDU) Control Rod

A. Equipment

- (1) Trailing Edge Flap Power Drive Unit Lock - B27008-1
- (2) Circuit Breaker Lockout Clip
(Commercially Available)

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- (3) LE Slat Drive Lock Set - B27020-31
 (includes CB Locks B27020-25 and B27065-1.
 Valve Locks B27020-32 or B27077-1 are not
 used in this procedure)

B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
- (2) D00014 Grease - MIL-G-21164 (alternate)
- (3) D00013 Grease - MIL-PRF-23827 (alternate)

C. References

- (1) 06-44-00/201, Wing Access Doors and Panels
- (2) 24-22-00/201, Electrical Power - Control
- (3) AMM 27-81-00/201, LE Slat System - Maintenance Practices
- (4) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (5) 32-00-15/201, Landing Gear Door Locks
- (6) 32-00-20/201, Landing Gear Downlocks
- (7) 78-31-00/201, Thrust Reverser System

D. Access

(1) Location Zones

- | | |
|---------|---|
| 193/194 | Wing to Body - Forward Lower Half |
| 211/212 | Control Cabin |
| 510/610 | Wing Leading Edge - Forward of Front Spar and Inboard of Nacelle Strut |
| 520/620 | Wing Leading Edge - Forward of Front Spar and Outboard of Nacelle Strut |
| 730/740 | Left and Right Main Landing Gears and Doors |
| 732/742 | Left and Right Main Landing Gear Wheel Well |

(2) Access Panels

- | | |
|-------|--------------------------|
| 511CB | LE Slat Power Drive Unit |
| 193BL | LE Slat PDU Bypass Valve |

E. Prepare for the Lubrication

NOTE: The LE Slat PDU is found aft of the left wing strakelet and installed on the left wing front spar.

S 043-250

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU OR DAMAGE TO EQUIPMENT.

- (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (Ref 78-31-00/201).

S 863-251

- (2) Make sure the trailing edge (TE) flaps and LE slats are fully extended (AMM 27-81-00/201).

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- S 863-252
- (3) Make sure the flap control lever is in the 30-unit detent.
- S 863-253
- (4) Install a DO-NOT-OPERATE tag on the flap control lever.
- S 843-254
- (5) Make sure the downlocks are installed on the nose and main landing gear (Ref 32-00-20/201).
- S 483-255
- WARNING:** USE AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.
- (6) Open the doors for the main landing gear and install the door locks (Ref 32-00-15/201).
- S 863-256
- (7) Remove the pressure from the left hydraulic system (Ref 29-11-00/201).
- S 013-261
- (8) Remove the access panels that follow (AMM 06-44-00/201):
- (a) 511CB, LE Slat Power Drive Unit.
 - (b) 193BL, LE Slat PDU Bypass Valve.
 - (c) Move the manual override lever on the TE Flap PDU Bypass Valve to the (POS 1).
 - (d) Attach a DO-NOT-OPERATE tag on the manual override lever.
- S 483-257
- (9) Install a PDU lock in the TE flap PDU at the forward bulkhead of the left main gear wheel well (Fig. 307).
- S 863-258
- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11J33, WARN ELEX A
- S 863-259
- (11) Open this circuit breaker on the P11 panel and install circuit breaker lock (B27065-1):
- (a) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM

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S 863-260

- (12) Open these circuit breakers on the main power distribution panel, P6, and install circuit breaker locks (B27020-25):
 - (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

F. Lubricate the control rod of the LE Slat PDU (Fig. 308)

S 643-276

- (1) Lubricate the control rod.

G. Put the Airplane Back to Its Usual Condition

S 083-270

- (1) Remove the PDU lock from the TE flap PDU (Fig. 307).
 - (a) 511CB, LE Slat Power Drive Unit.
 - (b) Remove the DO-NOT-OPERATE tag on the manual override lever.
 - (c) Move the manual override lever on the TE Flap PDU Bypass Valve to the usual position (POS 2).

S 413-314

- (2) Install the access panels that follow (AMM 06-44-00/201):

S 863-271

- (3) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P11 panel:
 - (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J33, WARN ELEX A

S 863-272

- (4) Remove the circuit breaker locks and the DO-NOT-CLOSE tags, and close these circuit breakers on the P6 panel:
 - (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-269

- (5) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 843-268

- (6) Make sure the TE flaps and LE slats are fully retracted with the flap control lever in the zero (FLAPS UP) detent (AMM 27-81-00/201).

S 843-273

WARNING: USE AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Remove the locks from the main landing gear and close the doors (Ref 32-00-15/201).

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- S 863-274
- (8) Remove the electrical power if it is not necessary
(Ref 24-22-00/201).
- S 443-275
- (9) Do the activation procedure for the thrust reverser
(Ref 78-31-00/201).

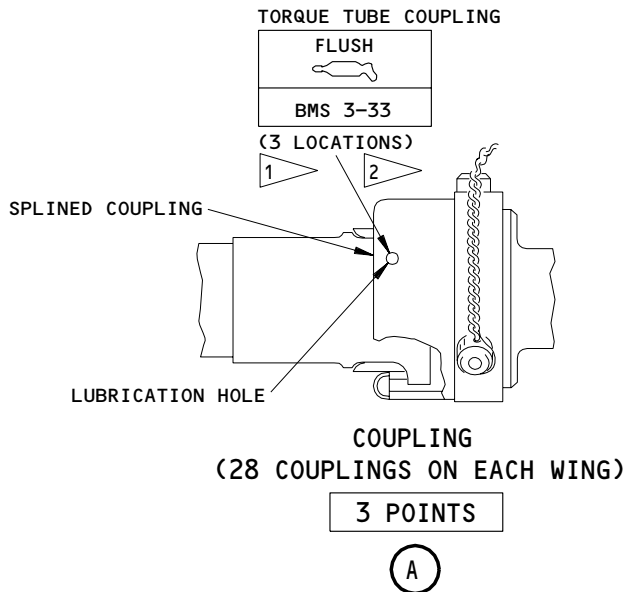
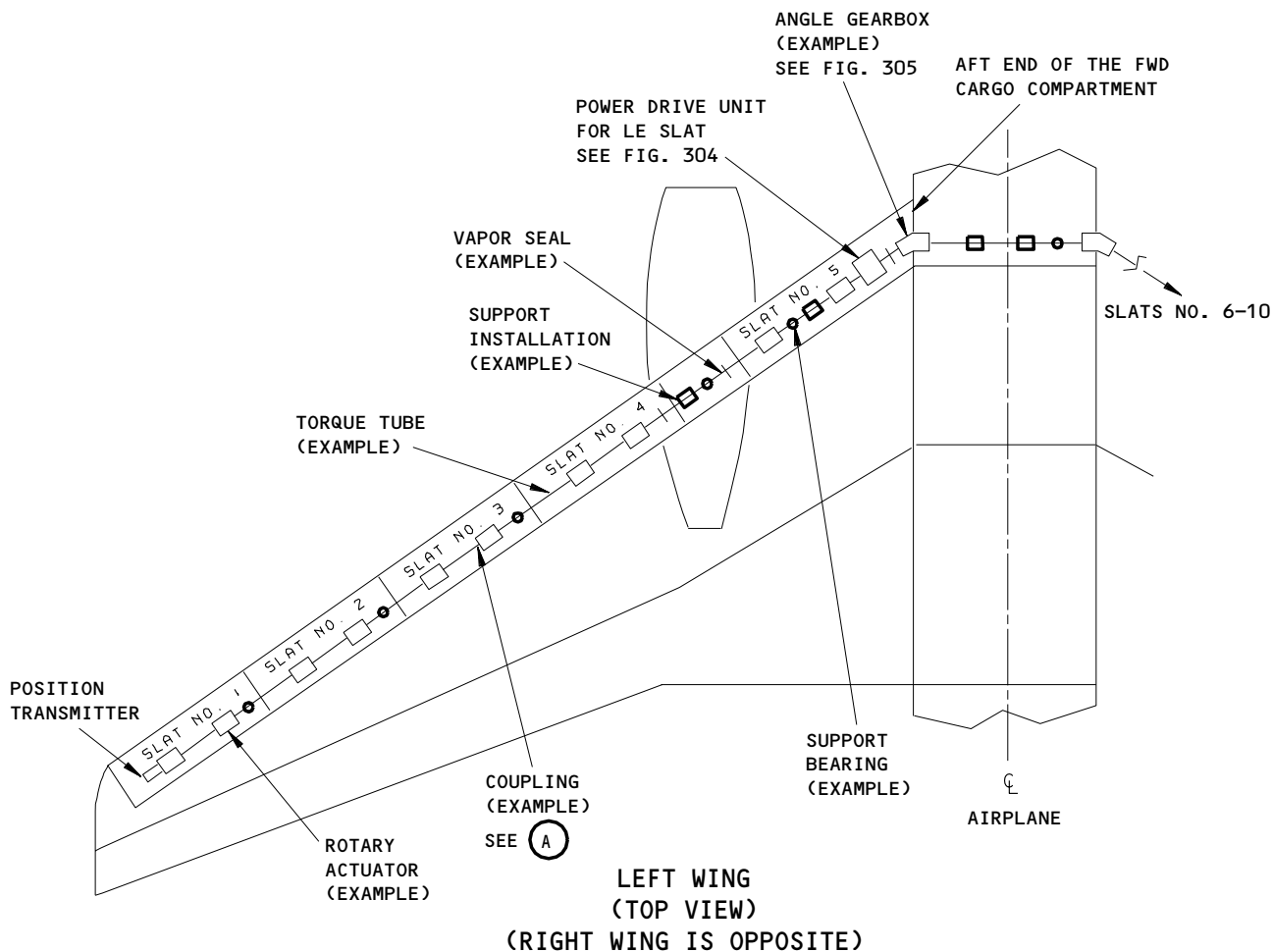
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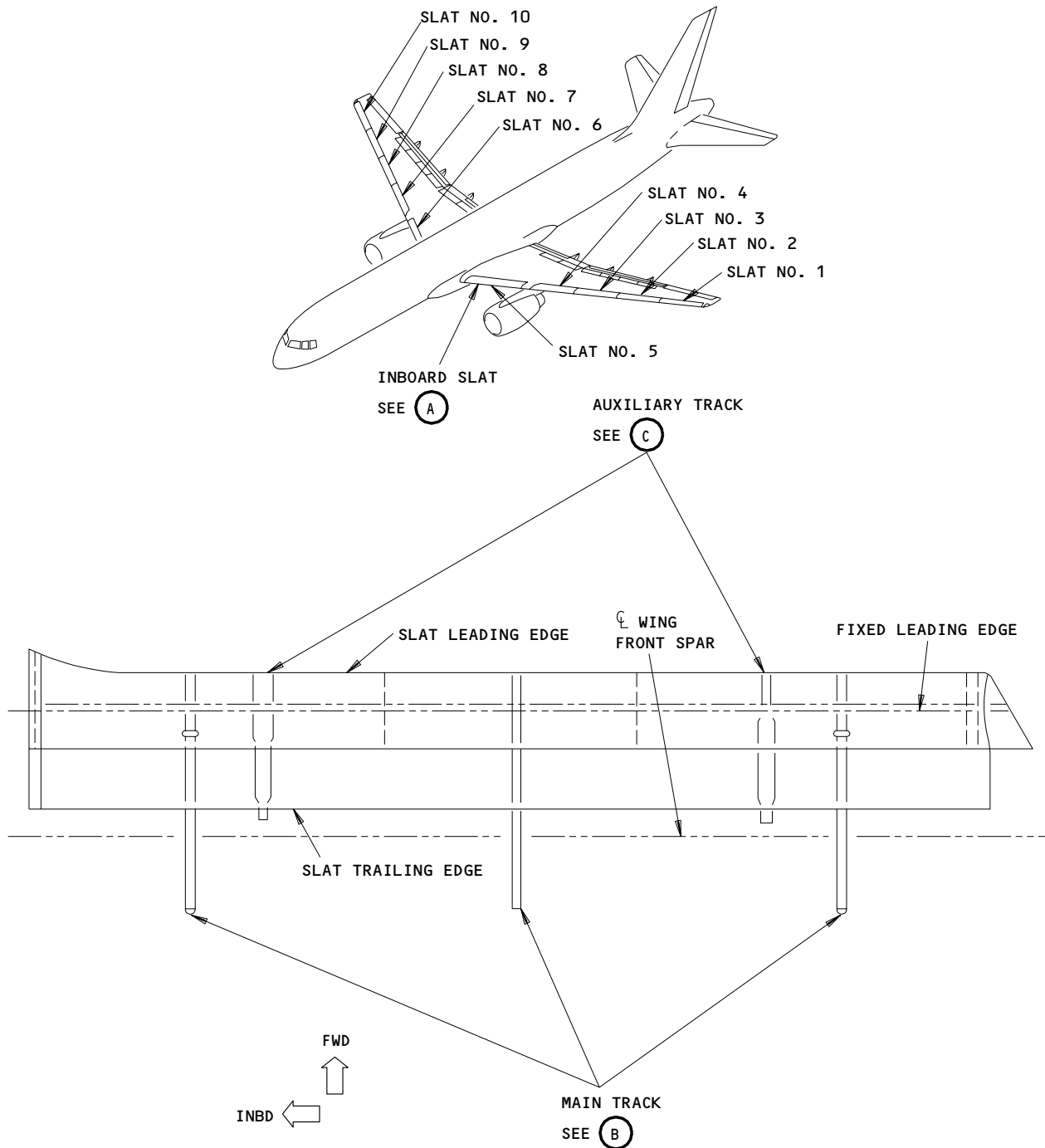


- 1 MOVE THE TORQUE TUBE AXIALLY, FULL TRAVEL, TO THE END TO BE LUBED. FILL THE COUPLING CAVITY WITH GREASE THROUGH EACH OF THE THREE LUBRICATION HOLES
- 2 BMS 3-33 RECOMMENDED
MIL-G-21164 OPTIONAL
MIL-PRF-23827 OPTIONAL

Leading Edge Slat Drive Torque Tube Lubrication
Figure 301

EFFECTIVITY	ALL
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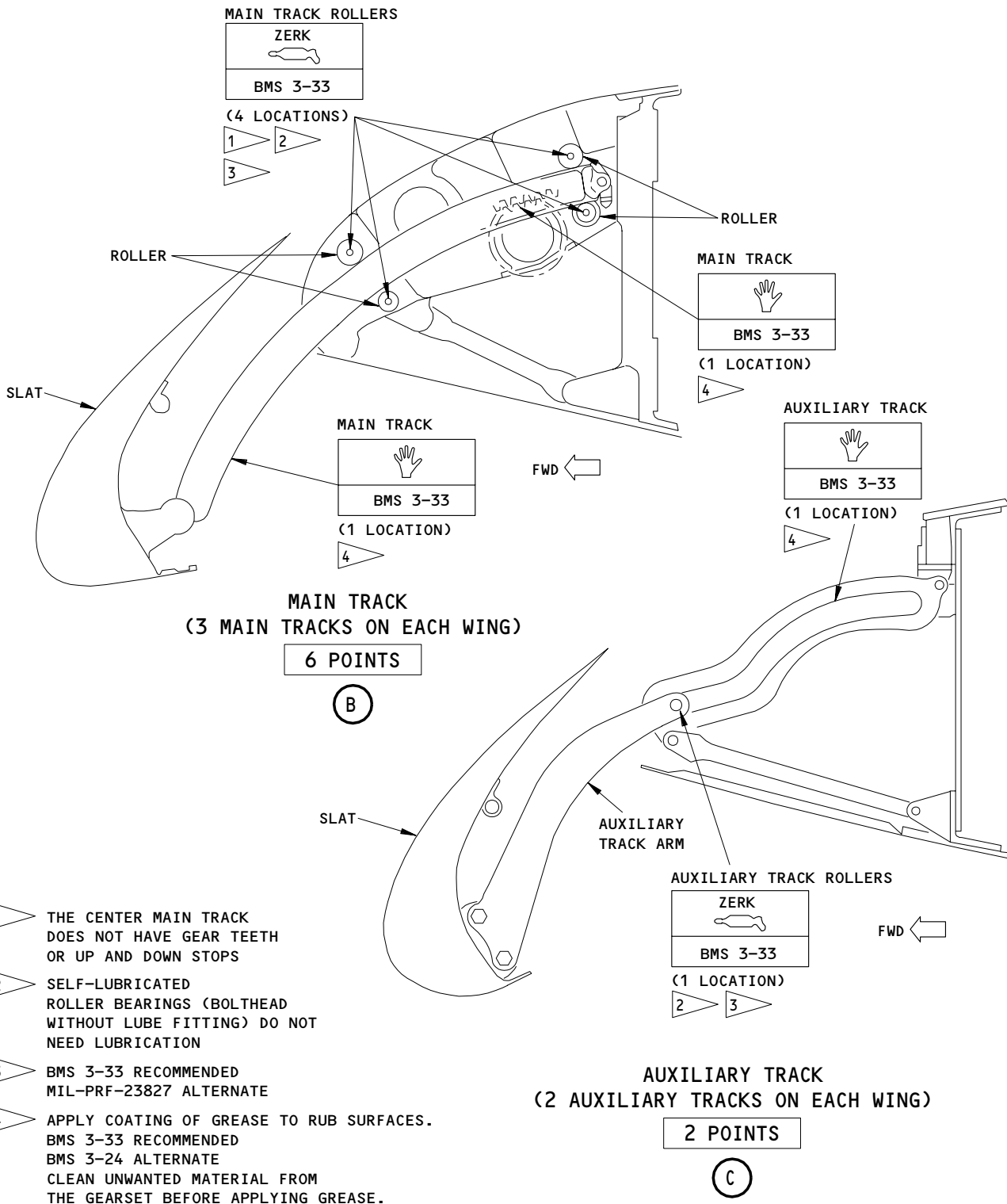
LEFT INBOARD SLAT NO. 5, BOTTOM VIEW
(RIGHT INBOARD SLAT NO. 6 IS OPPOSITE)

(A)

Inboard Leading Edge Slat Lubrication
Figure 302 (Sheet 1)

EFFECTIVITY	ALL
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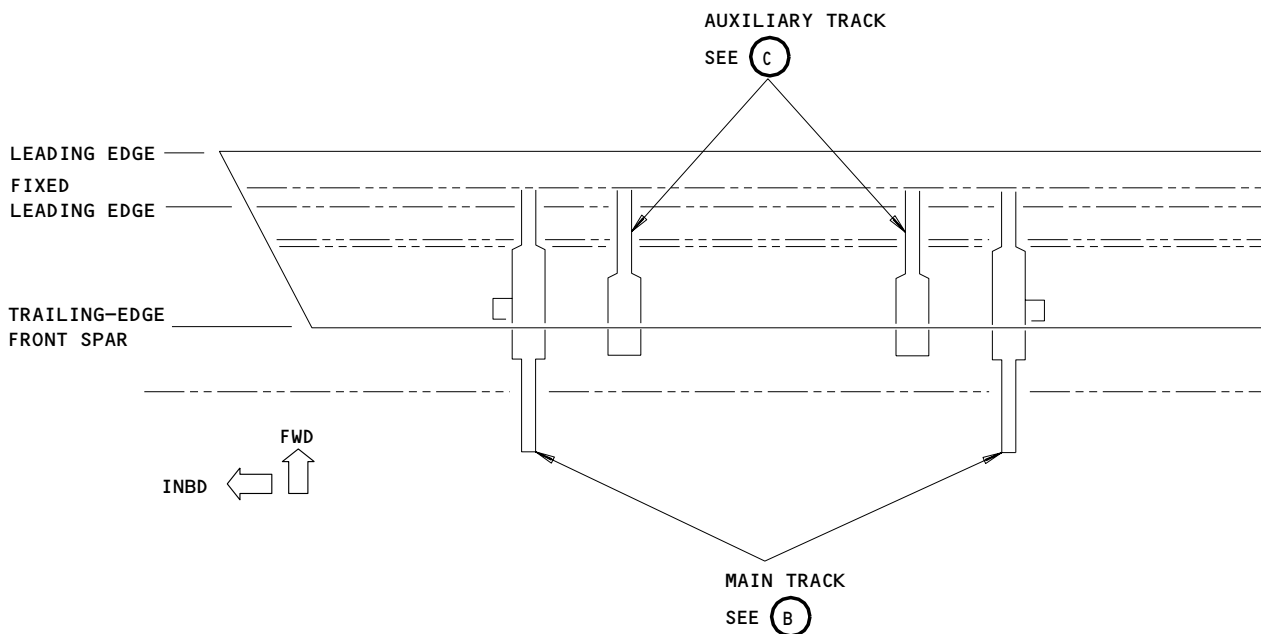
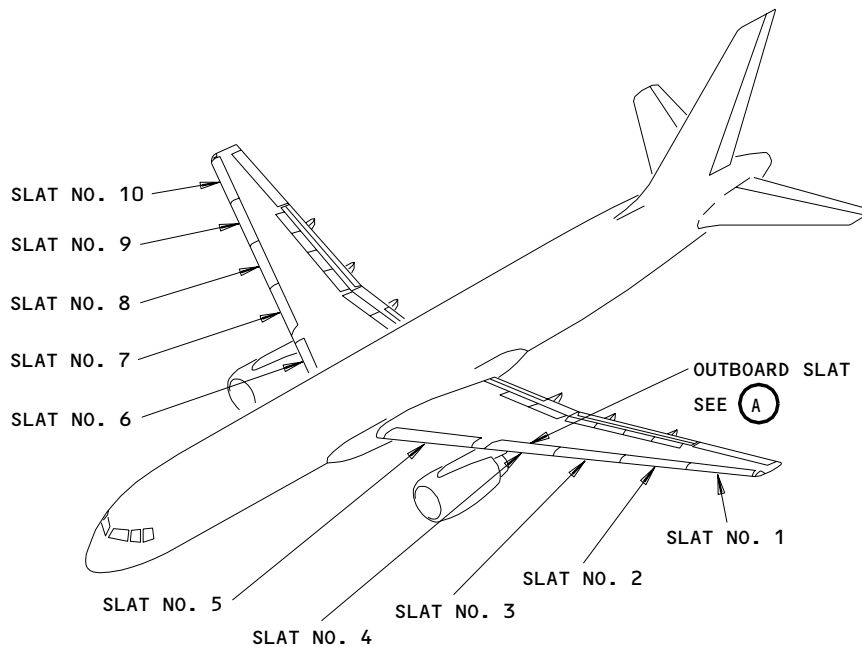
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Inboard Leading Edge Slat Lubrication
Figure 302 (Sheet 2)

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LEFT OUTBOARD SLAT NO. 4, BOTTOM VIEW
(EXAMPLE, OUTBOARD SLATS NO. 1-3 LEFT WING
AND NO. 7-10 RIGHT WING)

(A)

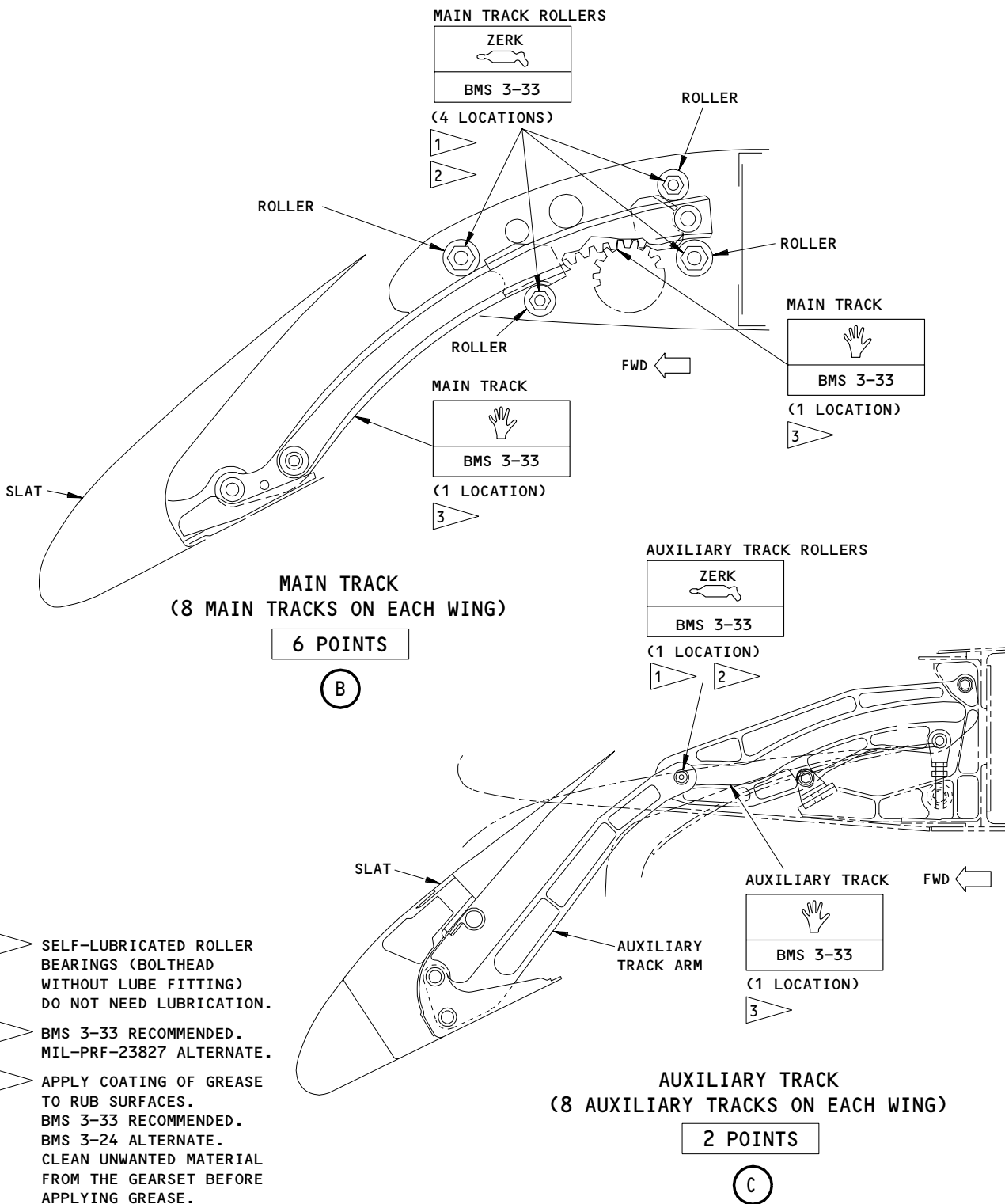
Outboard Leading Edge Slat Lubrication
Figure 303 (Sheet 1)

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Outboard Leading Edge Slat Lubrication
Figure 303 (Sheet 2)

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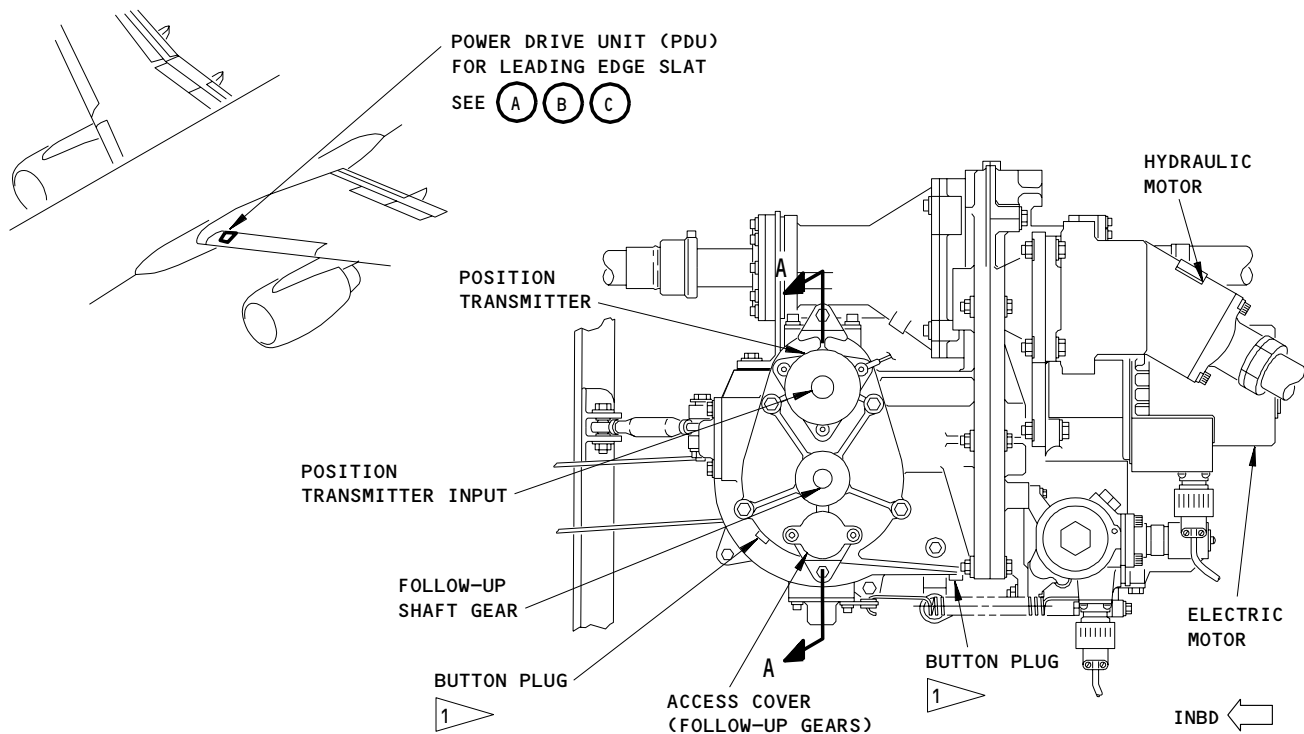
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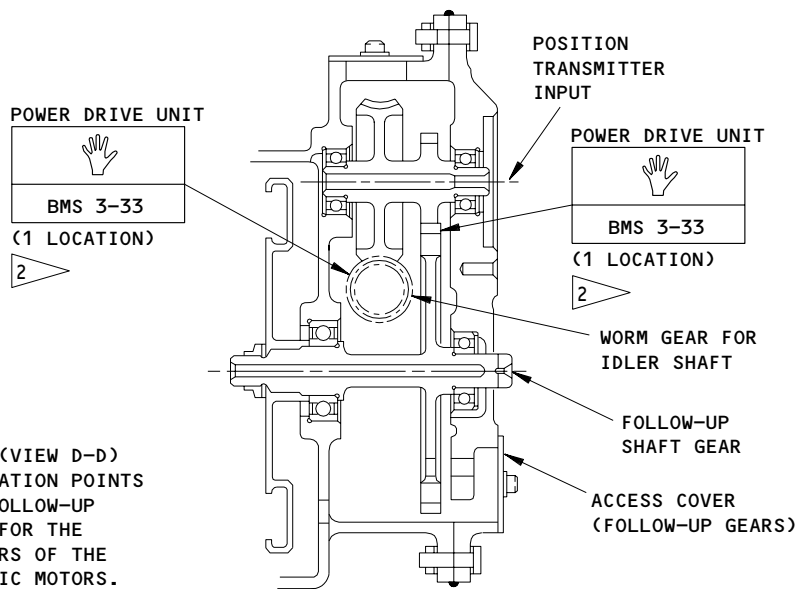
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PDU FOR LEADING EDGE SLAT

(A)



2 POINTS

A-A

1 REMOVE BUTTON PLUGS (VIEW D-D) TO GET TO THE LUBRICATION POINTS FOR THE WORM GEAR, FOLLOW-UP SHAFT AND GEAR, AND FOR THE PINION AND IDLER GEARS OF THE ELECTRIC AND HYDRAULIC MOTORS.

2 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE

Leading Edge Slat Power Drive Unit Lubrication
Figure 304 (Sheet 1)

EFFECTIVITY

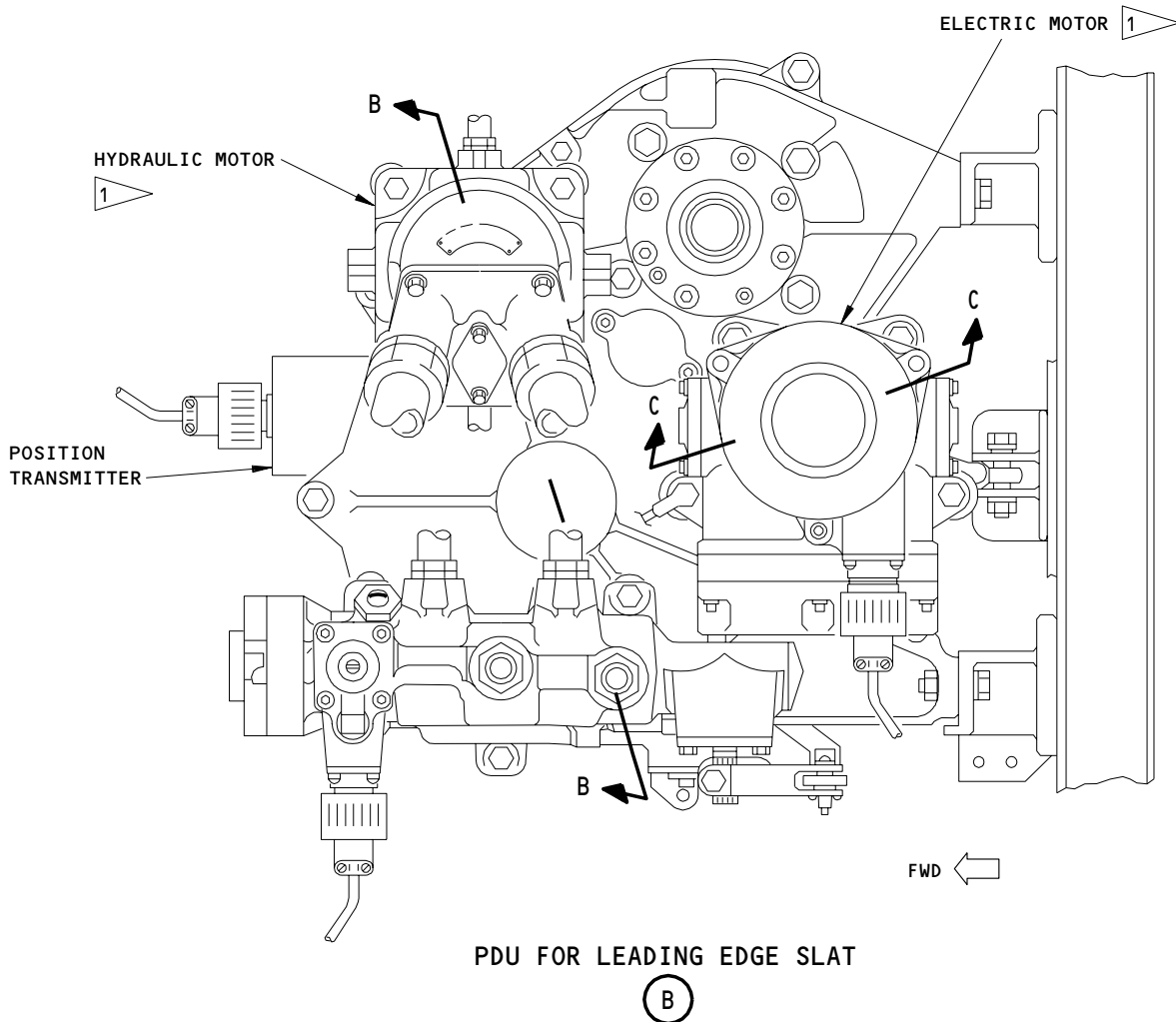
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Leading Edge Slat Power Drive Unit Lubrication
Figure 304 (Sheet 2)

EFFECTIVITY

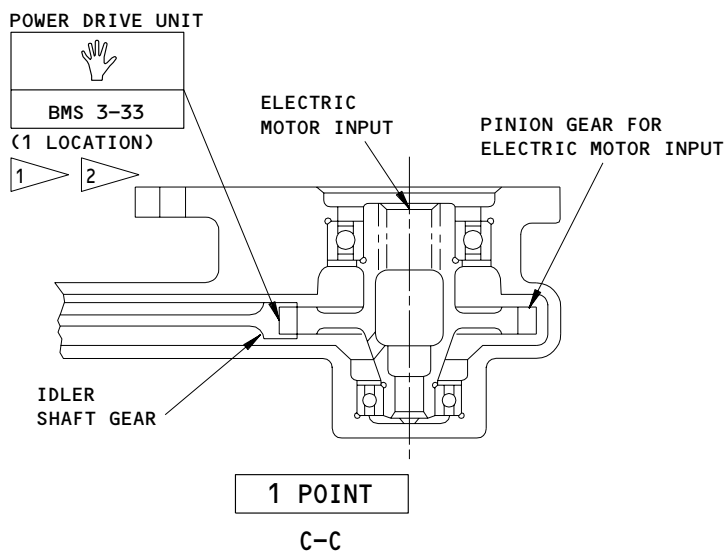
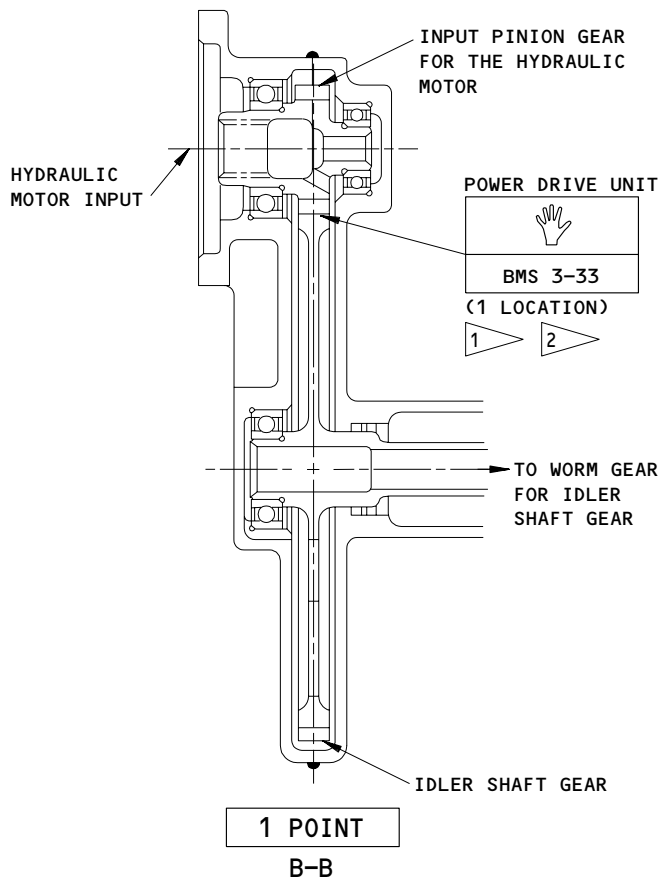
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Leading Edge Slat Power Drive Unit Lubrication
Figure 304 (Sheet 3)

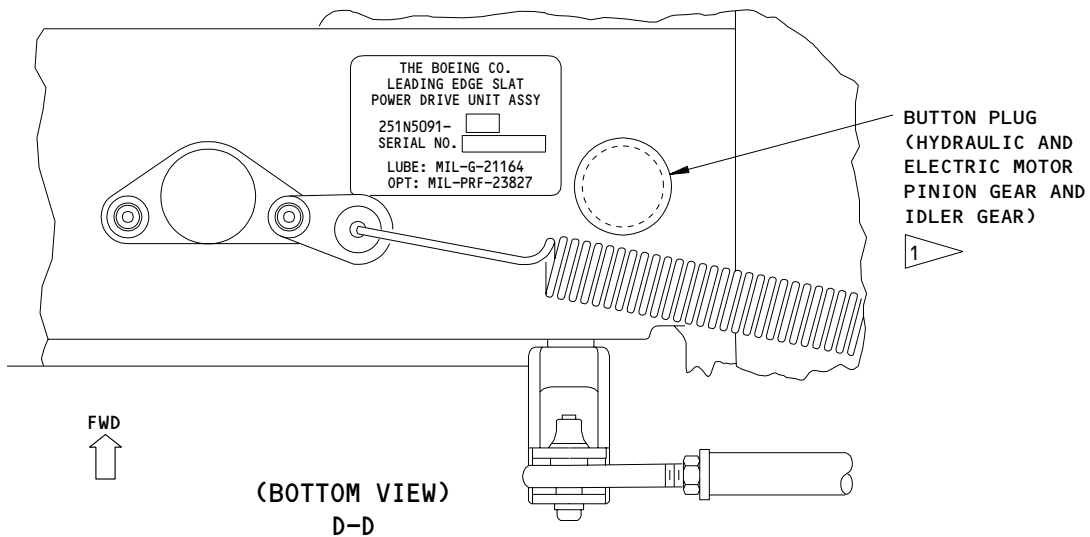
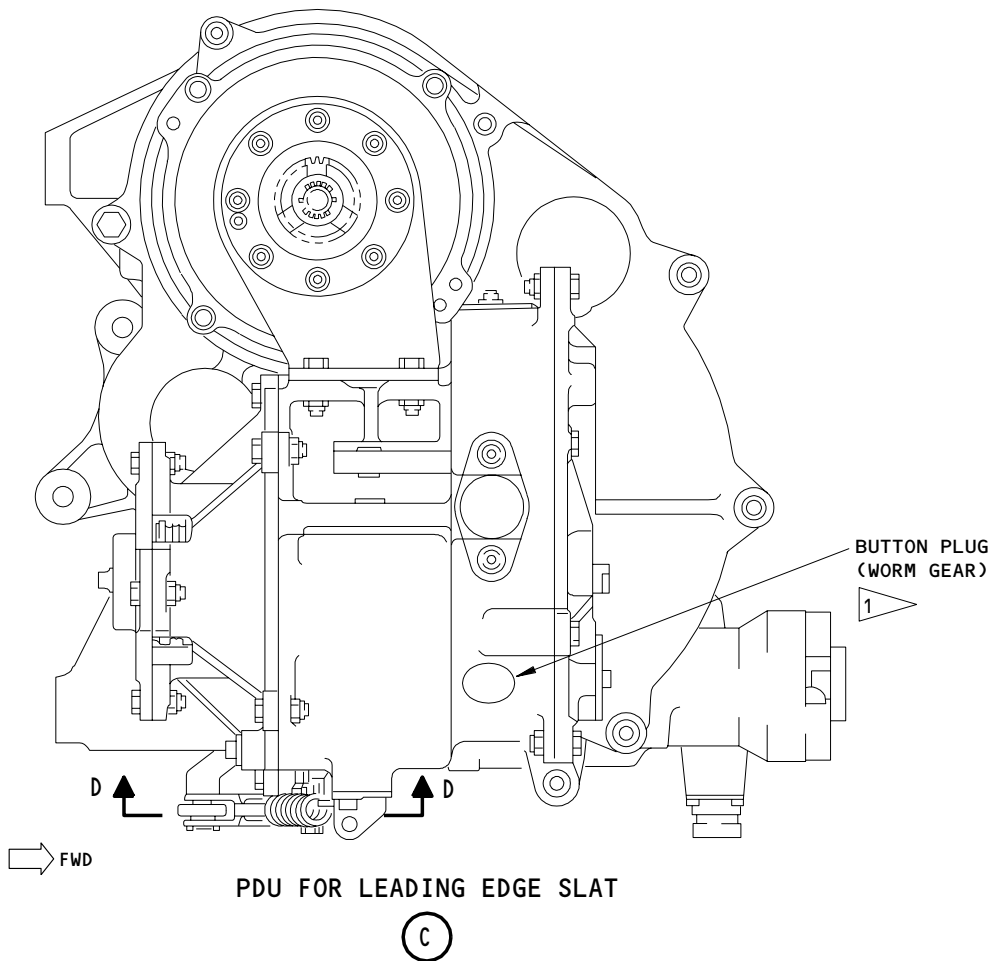
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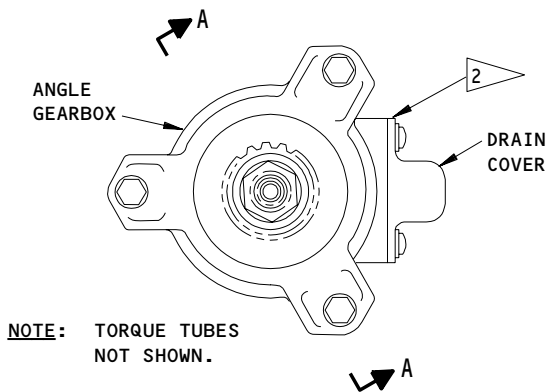
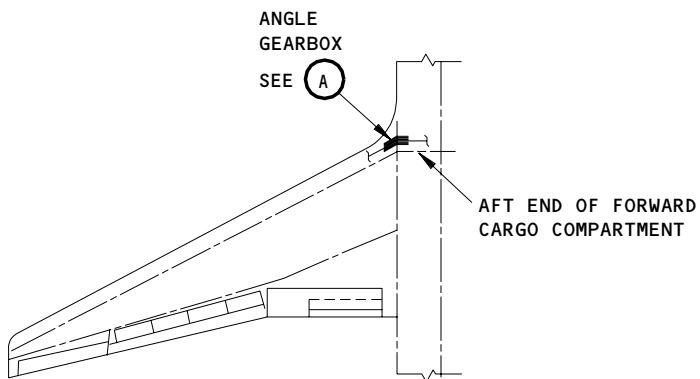
Leading Edge Slat Power Drive Unit Lubrication
Figure 304 (Sheet 4)

EFFECTIVITY	
	ALL

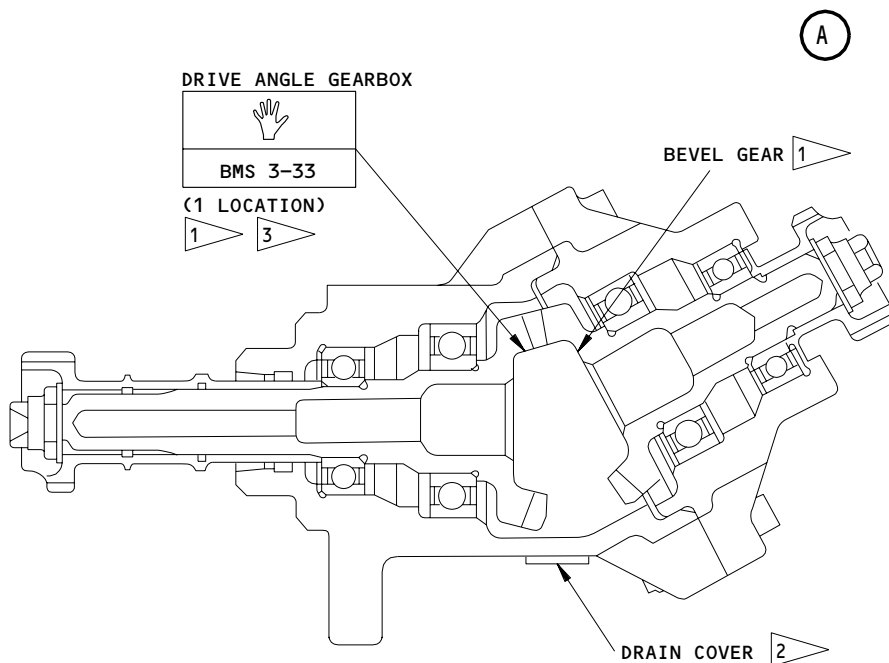
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LEFT ANGLE GEARBOX
(TOP VIEW)
(RIGHT ANGLE GEARBOX IS OPPOSITE)



1 LUBRICATE THE INTERNAL GEAR BY THE STEP-BY-STEP PROCEDURE IN THIS SUBJECT. GET TO THE LUBRICATION POINT THROUGH THE DRAIN COVER

2 WHEN THE DRAIN COVER IS INSTALLED APPLY ONE COAT OF PRIMER AROUND THE EDGE (AMM 51-21-10/701)

3 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE

1 POINT

A-A

Leading Edge Slat Drive Angle Gearbox Lubrication
Figure 305

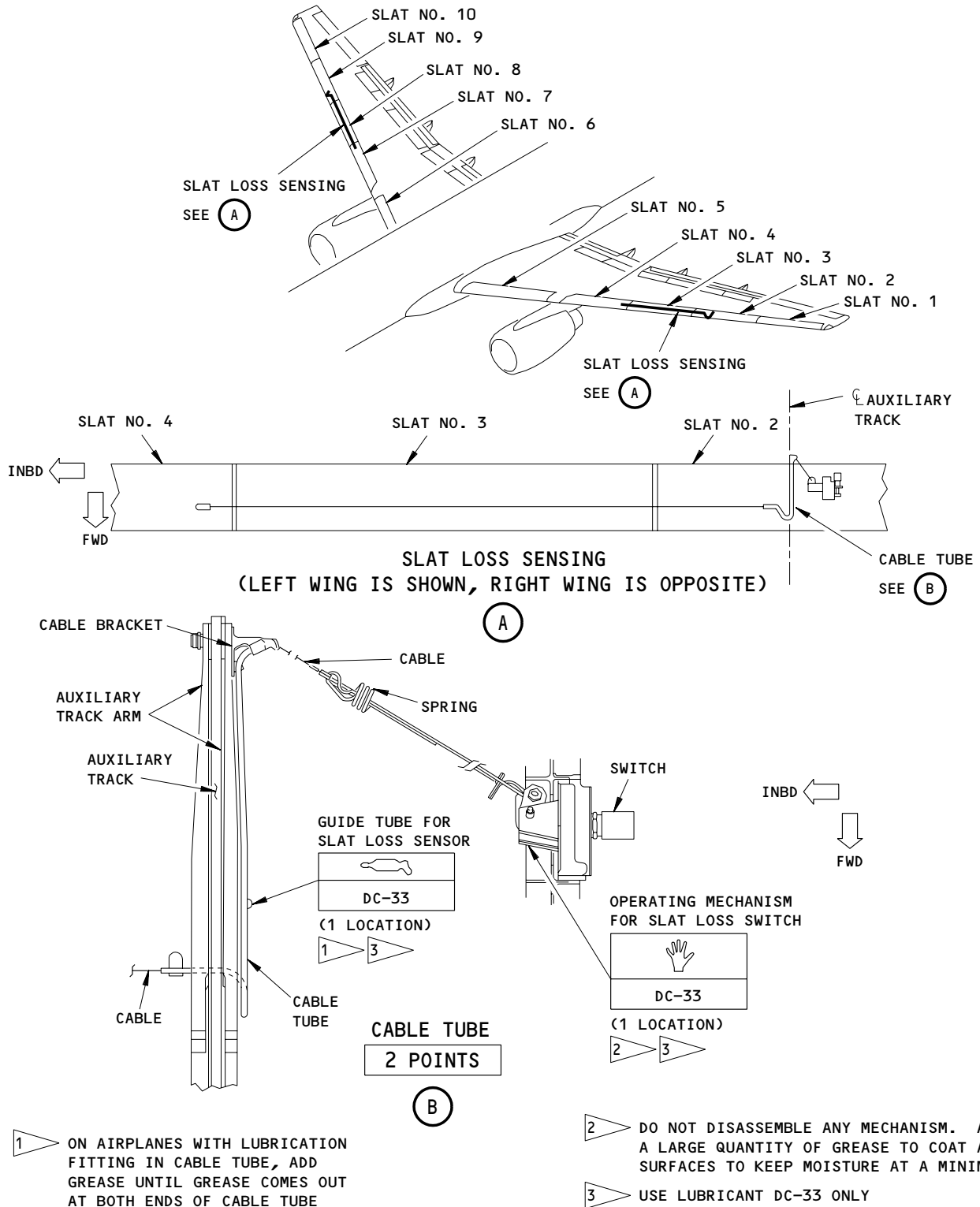
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Slat Loss Sensing and Indication Cable Tube Lubrication
Figure 306

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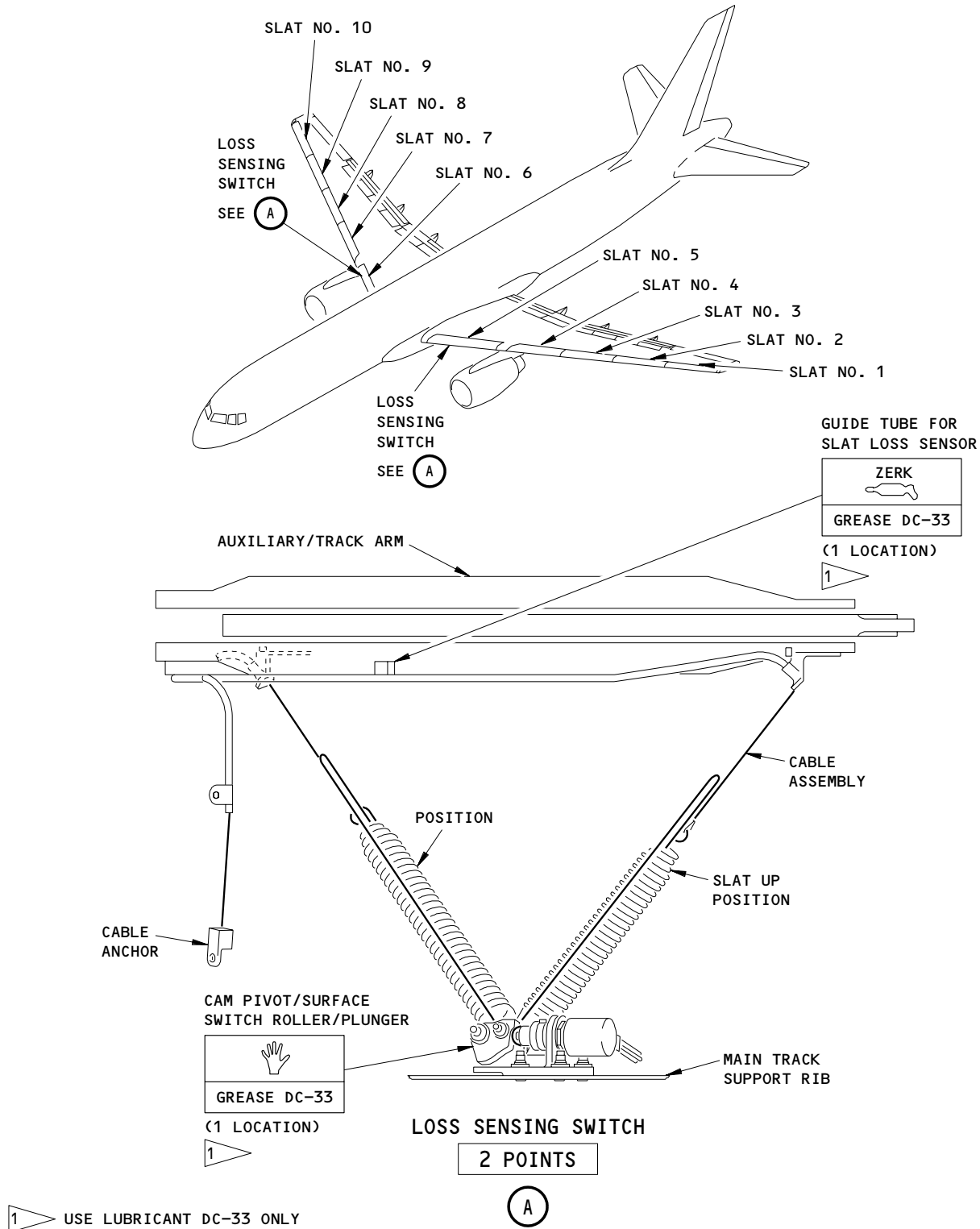
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BOEING

757 MAINTENANCE MANUAL



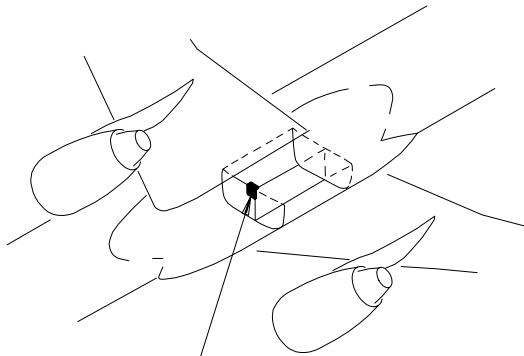
Inboard Leading Edge Slat Loss Sensing Lubrication
Figure 306A

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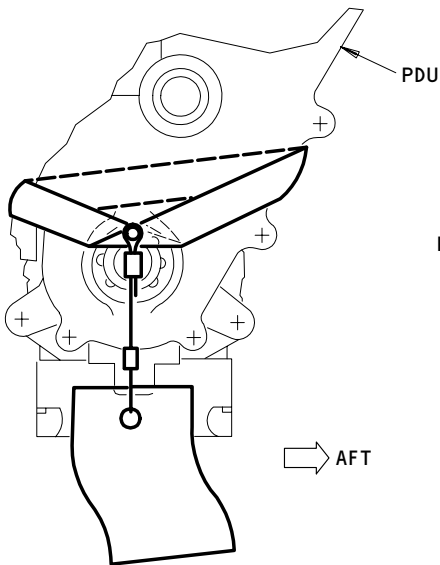
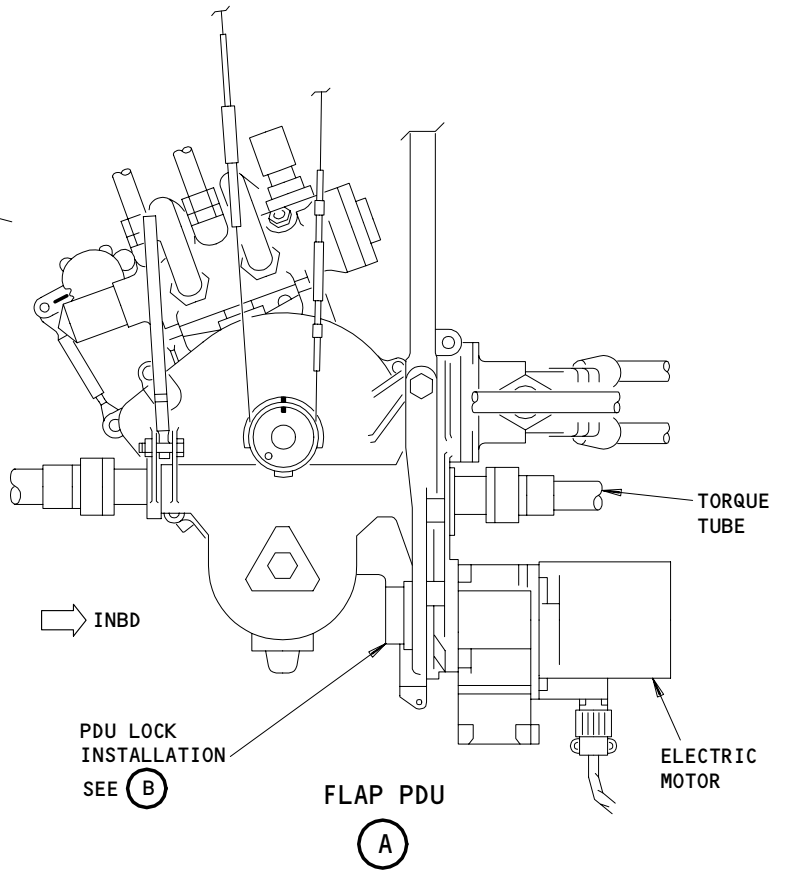
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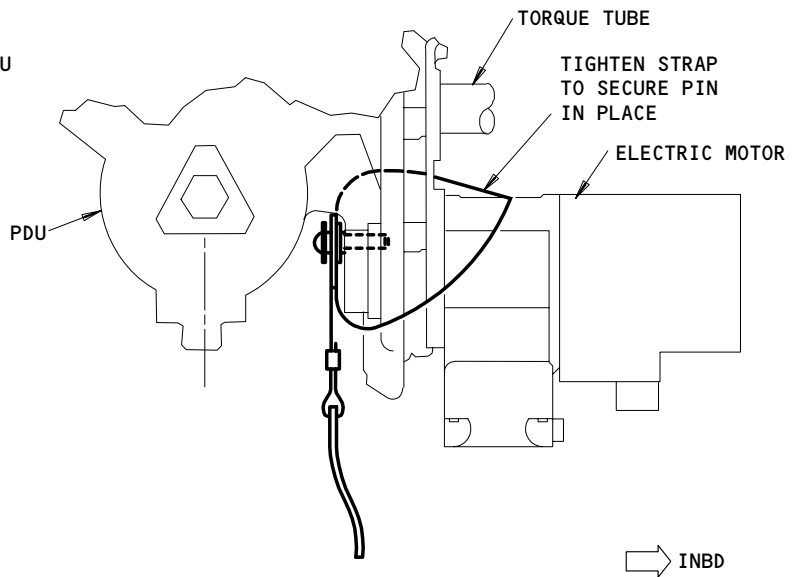
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TE FLAP PDU
SEE (A)



TE FLAP PDU LOCK
(B)



TE FLAP PDU LOCK
(B)

TE-Flap PDU Lock
Figure 307

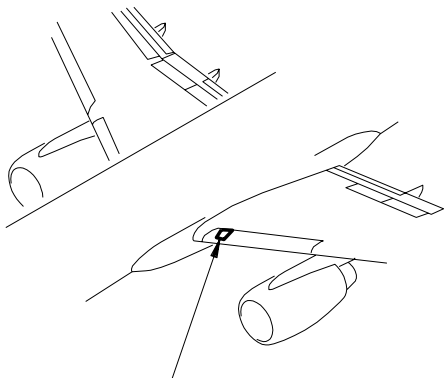
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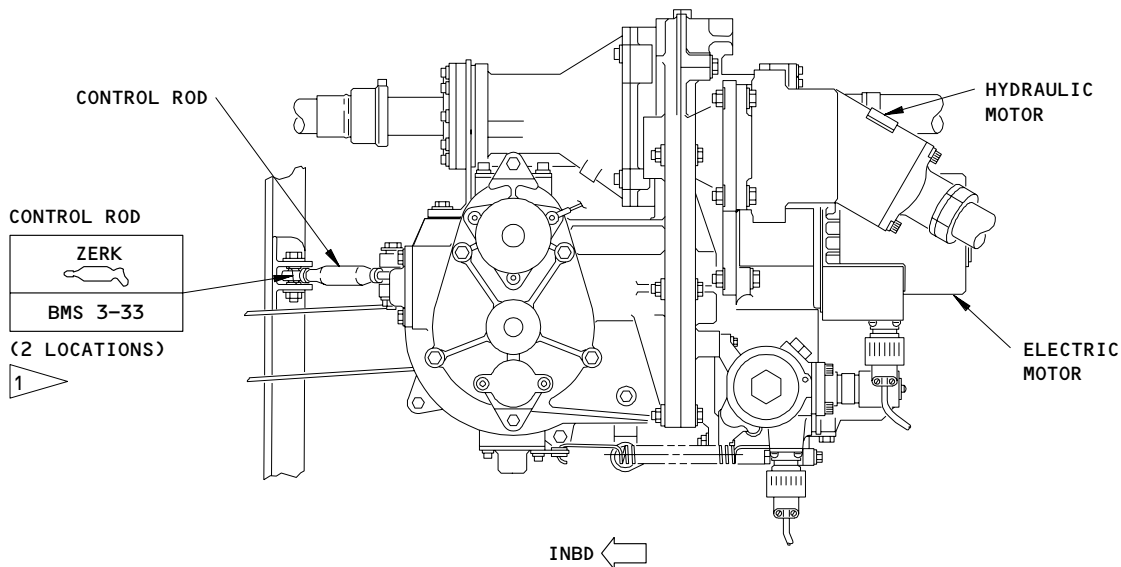
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POWER DRIVE UNIT (PDU)
FOR LEADING EDGE SLAT

SEE (A)



PDU FOR LEADING EDGE SLAT

2 POINTS

(A)

- 1 BMS 3-33 (RECOMMENDED)
- MIL-G-21164 (ALTERNATE)
- MIL-PRF-23827 (ALTERNATE)

Leading Edge Slat Power Drive Unit Control Rod Lubrication
Figure 308

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TRAILING EDGE FLAP SYSTEM – SERVICING

1. General

A. This procedure contains tasks to lubricate the trailing edge (TE) flap system:

- Flap Transmission System
- Flap Drive Gearboxes, Torque Limiters and Universal Joint
- Flap Power Drive Unit
- Outboard Flap Mechanism
- Inboard Flap Mechanism
- Torque Tube Couplings
- Flap Power Drive Unit Control Rods

B. For a complete lubrication of the TE Flap System, it is necessary to do all seven tasks in this procedure. If you will do all seven tasks, it is not necessary to repeat the same steps in the "Prepare for the Servicing" paragraph. Put the airplane back to its usual condition after you complete all the necessary lubrications.

TASK 12-21-09-603-019

2. Lubricate the Trailing Edge Flap Transmission System

A. Equipment

- (1) Needle Adapter, Lubrication – Model B6783
Alemite Division, Stuart Warner Co.

B. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (recommended)
- (2) D00013 Grease – MIL-PRF-23827 (Alternate)

C. References

- (1) AMM 24-22-00/201, Electrical Power – Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

D. Access

- (1) Location Zones
 - 143 Left MLG Wheel Well
 - 144 Right MLG Wheel Well
 - 550/650 Wing Trailing Edge – Aft of Rear Spar and Inboard of Spoiler No. 4 (Left) 9 (Right)
 - 560/660 Wing Trailing Edge – Aft of Rear Spar and Outboard of Spoiler No. 5 (Left) 8 (Right)

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E. Prepare for the Servicing

S 413-013

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-273

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-011

- (3) Move the flap control lever to the 30 unit detent.

S 213-012

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 493-003

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

S 213-014

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-015

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-016

- (8) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-017

- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-018

- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT

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- (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- (d) 11J18, FLAP LOAD RELIEF
- (e) 11J33, WARN ELEX A

S 863-293

- (11) Move the manual override lever on the TE flap PDU bypass valve to the bypass position (POS 1).

S 493-294

- (12) Install a DO-NOT-OPERATE tag on the manual override lever.

S 493-295

- (13) Install the PDU lock in the TE flap PDU.

F. Lubrication for the Flap Drive Transmissions.

NOTE: The procedure to fill the transmission with oil is located in AMM 12-13-06/301.

S 643-232

CAUTION: USE A HAND PUMP TO LUBRICATE BALLSCREW. A PRESSURE PUMP CAN CAUSE DAMAGE TO THE SEAL.

- (1) Using a hand pump, lubricate the ballscrews (Figure 307).

S 643-233

- (2) Using a hand pump, lubricate the universal joints (Figure 308).

G. Put the Airplane Back to Its Usual Condition

S 493-308

- (1) Remove the PDU lock from the TE flap PDU.

S 493-316

- (2) Remove the DO-NOT-OPERATE tag on the manual override lever.

S 863-313

- (3) Move the manual override lever on the TE flap PDU bypass valve to the usual position (POS 2).

S 863-274

- (4) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-024

- (5) Move the flap control lever to the zero (FLAPS UP) detent.

S 213-025

- (6) Make sure that the TE flaps and LE slats move to the fully retracted position.

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S 093-026

- (7) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 863-027

- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-028

- (9) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

S 093-029

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (10) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 863-030

- (11) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-033

- (12) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-150

3. Lubricate the Flap Drive Gearboxes, Torque Limiters and Universal Joints

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00013 Grease - MIL-PRF-23827 (alternate)
- (3) D00014 Grease - MIL-G-21164 (alternate)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

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C. Access

(1) Location Zones

143	Left MLG Wheel Well
144	Right MLG Wheel Well
550/650	Wing Trailing Edge – Aft of Rear Spar and Inboard of Spoiler No. 4 (Left) 9 (Right)
560/660	Wing Trailing Edge – Aft of Rear Spar and Outboard of Spoiler No. 5 (Left) 8 (Right)

(2) Access Panel

551BB/651BB	Landing Gear Actuator
-------------	-----------------------

D. Prepare for the Servicing

S 413-154

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-275

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-151

- (3) Move the flap control lever to the 30 unit detent.

S 213-152

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 493-153

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

S 213-155

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-156

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

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- S 863-157
- (8) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

- S 863-158
- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

- S 863-159
- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

- S 863-296
- (11) Move the manual override lever on the TE flap PDU bypass valve to the bypass position (POS 1).

- S 493-297
- (12) Install a DO-NO-OPERATE tag on the manual override lever.

- S 493-298
- (13) Install the PDU lock in the TE flap PDU.
- E. Lubrication for the Internal Gears of the Flap Drive Gearboxes

- S 643-162
- (1) Lubricate the internal gears of the flap drive gearboxes (Fig. 302).
- F. Lubrication for the Torque Limiters (Fig. 301)

- S 643-261
- (1) TORQUE LIMITERS (ON THE FLAP TRANSMISSION) WITH A GREASE FITTING; Lubricate the torque limiters.

NOTE: Use MIL-PRF-23827 grease to lubricate the torque limiters.

- S 643-262
- (2) TORQUE LIMITERS (ON THE FLAP TRANSMISSION) WITH AN OIL FILL PORT; Lubricate the torque limiters.

NOTE: Use Brayco 795 oil as the preferred alternative to BMS 3-32, Type II to lubricate the torque limiters.

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G. Lubrication for the Universal Joints (Fig. 302)

S 643-237

- (1) Lubricate the universal joints.

H. Put the Airplane Back to Its Usual Condition

S 493-309

- (1) Remove the PDU lock from the TE flap PDU.

S 863-314

- (2) Remove the DO-NOT-OPERATE tag on the manual override lever.

S 863-315

- (3) Move the manual override lever on the TE flap PDU bypass valve to the usual position (POS 2).

S 863-276

- (4) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-171

- (5) Move the flap control lever to the zero (FLAPS UP) detent.

S 213-172

- (6) Make sure that the TE flaps and LE slats move to the fully retracted position.

S 093-173

- (7) Remove the DO-NOT-OPERATE tag from the flap control lever.

S 863-174

- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:

- (a) 6D20, ALTN SLAT PWR
- (b) 6D23, ALTN FLAP PWR

S 863-175

- (9) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:

- (a) 11B18, WARN ELEX B
- (b) 11D31, HYDRAULICS PTU CONT
- (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- (d) 11J18, FLAP LOAD RELIEF
- (e) 11J33, WARN ELEX A

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S 093-176

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(10) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 863-177

(11) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-178

(12) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-121

4. Lubricate the Trailing Edge Flap Power Drive Unit (PDU)

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00014 Grease - MIL-G-21164 (alternate)
- (3) D00015 Grease - BMS 3-24 (alternate)
- (4) D00013 Grease - MIL-PRF-23827 (alternate)

NOTE: AIRPLANES WITH -14 OR SUBSEQUENT PDU'S;
use only MIL-G-21164 grease to lubricate the PDU.

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
 - 143 Left MLG Wheel Well
 - 144 Right MLG Wheel Well

D. Prepare for Service

S 413-125

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

(1) Close the engine-fan duct-cowling, if open.

S 863-277

(2) Pressurize the left hydraulic system (AMM 29-11-00/201).

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- S 863-122
- (3) Move the flap control lever to the 30 unit detent.
- S 213-123
- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.
- S 493-124
- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.
- S 213-126
- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-127

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-128

- (8) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-129

- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-130

- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

E. Lubrication for the TE Flap PDU (Fig. 303)

S 643-135

- (1) Make sure the torque tube splined couplings are lubricated.

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S 643-136

(2) Lubricate the TE Flap PDU.

F. Lubrication for the Internal Gears of the TE Flap PDU (Fig. 303)

S 643-289

CAUTION: AIRPLANES WITH -14 OR SUBSEQUENT PDU'S;
USE ONLY MIL-G-21164 GREASE TO LUBRICATE THE PDU. THE OPTIONAL
GREASE (MIL-PRF-23827) CAN CAUSE DAMAGE TO THE INTERNAL GEARS
IN THE PDU.

- (1) Lubricate the Internal Gears (all except the worm wheel for the TE flap PDU) with the steps that follow:
- (a) Move the manual override lever on the TE flap PDU bypass valve to the bypass position (POS 1).
 - (b) Remove the access covers and drain covers as necessary.
 - (c) Turn the torque tube, and at the same time, lubricate the gear teeth by hand with the steps that follow:

- 1) Fill the gear teeth with grease.

NOTE: Approximately two turns of the torque tube are necessary to make sure the grease is transmitted to all the teeth on the TE flap PDU.

- (d) Replace the access covers and drain covers.
- (e) Move the manual override lever on the TE flap PDU bypass valve to the usual position (POS 2).

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY TO A PERSON OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (f) Pressurize the left hydraulic system (AMM 29-11-00/201).

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- (g) Remove the DO-NOT-OPERATE tag from the flap control lever.
- (h) Move the flap control lever to the zero (FLAPS UP) detent, and permit the TE flaps and LE slats to move to the fully retracted position.
- (i) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 643-139

- (2) Lubricate the Worm Wheel on the TE flap PDU with the steps that follow (Section C-C):
 - (a) Remove the two drain covers from the PDU to get to the worm wheel.
 - (b) Move the manual override lever on the PDU bypass valve to the usual position (POS 2), if the valve is in the bypass position.

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES WHEN HYDRAULIC POWER IS SUPPLIED. AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, AND STABILIZER ARE FULLY POWERED SURFACES. INJURY TO A PERSON OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (c) Pressurize the left hydraulic system (AMM 29-11-00/201).
- (d) Remove the DO-NOT-OPERATE tag from the flap control lever.
- (e) Move the flap control lever to the 1-unit detent and permit the TE flaps to move to the 1-unit position, and the LE slats to move to the intermediate position.
- (f) Move and hold the manual override lever on the bypass valve for the PDU to the bypass position (POS 1).
- (g) Lubricate the worm wheel.
- (h) Move the manual override lever back to the usual position (POS 2).
- (i) Move the flap control lever to the 20-unit, 25-unit, and 30-unit detents, and at each detent do the steps that follow:
 - 1) Move and hold the manual override lever in the bypass (POS 1).
 - 2) Lubricate the worm wheel.
 - 3) Move the manual override lever back to the usual position (POS 2).

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- (j) Move the flap control lever to the zero (FLAPS UP) detent, and permit the TE flaps and LE slats to move to the fully retracted position.
 - (k) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).
 - (l) Install the drain covers.
- G. Put the Airplane Back to Its Usual Condition

S 093-144

- (1) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.

S 863-145

- (2) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-146

- (3) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
 - (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

S 093-147

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

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S 863-149

- (5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-234

5. Lubricate the Outboard Trailing Edge Flap Mechanism

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00015 Grease - BMS 3-24 (alternate)
- (3) D00013 Grease - MIL-PRF-23827 (Alternate)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
570/670 Wing Trailing Edge Flap Track Fairings

D. Prepare for the Servicing

S 413-096

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-278

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-093

- (3) Move the flap control lever to the 30 unit detent.

S 213-094

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 493-095

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

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S 213-097

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-098

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-099

- (8) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-100

- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
(a) 6D20, ALTN SLAT PWR
(b) 6D23, ALTN FLAP PWR

S 863-101

- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
(a) 11B18, WARN ELEX B
(b) 11D31, HYDRAULICS PTU CONT
(c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
(d) 11J18, FLAP LOAD RELIEF
(e) 11J33, WARN ELEX A

S 013-291

- (11) Open access panels 573AB, 573DL, 573ER, 574AB, 574DL and 574ER (AMM 06-44-00/201).

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S 863-299

- (12) Move the manual override lever on the TE flap PDU bypass valve to the bypass position (POS 1).

S 493-300

- (13) Install a DO-NOT-OPERATE tag on the manual override lever.

S 493-301

- (14) Install the PDU lock in the TE flap PDU.

E. Procedure

S 643-112

- (1) Lubricate the outboard flap mechanism, forward fairing attach point, bell crank and control rods, aft attach fitting, aft fairing pivot, aft flap support track, and main flap track (Fig. 305).

F. Put the Airplane Back to Its Usual Condition

S 493-310

- (1) Remove the PDU lock from the TE flap PDU.

S 093-317

- (2) Remove the DO-NOT-OPERATE tag on the manual override lever.

S 863-318

- (3) Move the manual override lever on the TE flap PDU bypass valve to the usual position (POS 2).

S 863-279

- (4) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-113

- (5) Move the flap control lever to the zero (FLAPS UP) detent.

S 213-114

- (6) Make sure that the TE flaps and LE slats move to the fully retracted position.

S 093-115

- (7) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.

S 863-116

- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:

(a) 6D20, ALTN SLAT PWR

(b) 6D23, ALTN FLAP PWR

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S 863-117

- (9) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

S 013-292

- (10) Close access panels 573AB, 573DL, 573ER, 574AB, 574DL and 574ER (AMM 06-44-00/201).

S 093-118

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (11) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 863-119

- (12) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-120

- (13) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-235

6. Lubricate the Inboard Trailing Edge Flap Mechanism

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00014 Grease - MIL-G-21164 (alternate)
- (3) D00013 Grease - BMS 3-24 (alternate)
- (4) D00013 Grease - MIL-PRF-23827 (Alternate)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
570/670 Wing Trailing Edge Flap Track Fairings

D. Prepare for the Servicing

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S 413-067

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-280

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-064

- (3) Move the flap control lever to the 30 unit detent.

S 213-065

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 493-066

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

S 213-068

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-069

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-070

- (8) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-071

- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
(a) 6D20, ALTN SLAT PWR
(b) 6D23, ALTN FLAP PWR

S 863-072

- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
(a) 11B18, WARN ELEX B

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- (b) 11D31, HYDRAULICS PTU CONT
- (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
- (d) 11J18, FLAP LOAD RELIEF
- (e) 11J33, WARN ELEX A

S 643-302

- (11) Move the manual override lever on the TE flap PDU bypass valve to the bypass position (POS 1).

S 493-303

- (12) Install a DO-NOT-OPERATE tag on the manual override lever.

S 493-304

- (13) Install the PDU lock in the TE flap PDU.

E. Procedure

S 643-082

- (1) Lubricate the inboard flap carriages, tracks, and fairings (Fig. 304).

F. Put the Airplane Back to Its Usual Condition

S 493-311

- (1) Remove the PDU lock from the TE flap PDU.

S 093-321

- (2) Remove the DO-NOT-OPERATE tag on the manual override lever.

S 863-322

- (3) Move the manual override lever on the TE flap PDU bypass valve to the usual position (POS 2).

S 863-281

- (4) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-084

- (5) Move the flap control lever to the zero (FLAPS UP) detent.

S 213-085

- (6) Make sure that the TE flaps and LE slats move to the fully retracted position.

S 093-086

- (7) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.

S 863-087

- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
 - (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

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S 863-088

- (9) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

S 093-089

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (10) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).

S 863-090

- (11) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-091

- (12) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-603-213

7. Lubricate the Torque Tube Couplings

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00014 Grease - MIL-G-21164 (alternate)
- (3) D00013 Grease - MIL-PRF-23827 (alternate)
- (4) D00015 Grease - BMS 3-24 (alternate)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

(1) Location Zones

- | | |
|---------|--|
| 143 | Left MLG Wheel Well |
| 144 | Right MLG Wheel Well |
| 550/650 | Wing Trailing Edge - Aft of Rear Spar and Inboard of Spoiler No. 4 (Left) 9 (Right) |
| 560/650 | Wing Trailing Edge - Aft of Rear Spar and Outboard of Spoiler No. 5 (Left) 8 (Right) |

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- (2) Access Panel
551BB/651BB Landing Gear Actuator

D. Prepare for the Servicing

S 413-217

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-282

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-214

- (3) Move the flap control lever to the 30 unit detent.

S 213-215

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 493-216

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

S 213-218

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-219

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

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- S 863-220
- (8) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).
- S 863-221
- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR
- S 863-222
- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A
- E. Lubrication for the Flap Torque Tube Couplings (Fig. 302)
- S 013-223
- (1) Do the steps that follow as necessary to get access to lubricate the torque tube couplings:
- (a) Move the manual override lever on the TE flap PDU bypass valve to the bypass (POS 1) position.
 - (b) Lubricate the torque tube couplings.
- NOTE: If necessary, turn the torque tube by hand to get access to the lubrication points on the torque tube couplings.
- (c) Move the manual override lever on the TE flap PDU bypass valve to the usual position (POS 2).
- F. Put the Airplane Back to Its Usual Condition
- S 863-283
- (1) Pressurize the left hydraulic system (AMM 29-11-00/201).
- S 863-224
- (2) Move the flap control lever to the zero (FLAPS UP) detent.
- S 213-225
- (3) Make sure that the TE flaps and LE slats move to the fully retracted position.
- S 093-226
- (4) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.

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S 863-227

- (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR

S 863-228

- (6) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A

S 093-229

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Remove the door locks from the landing gear doors and close the doors (AMM 29-11-00/201).

S 863-230

- (8) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

S 863-231

- (9) Remove the electrical power if it is not necessary (AMM 24-22-00/201).

TASK 12-21-09-643-238

8. Lubricate the Trailing Edge Flap Power Drive Unit (PDU) Control Rods

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (recommended)
- (2) D00014 Grease - MIL-G-21164 (alternate)

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(3) D00015 Grease - BMS 3-24 (alternate)

(4) D00013 Grease - MIL-PRF-23827 (Alternate)

B. References

- (1) AMM 24-22-00/201, Electrical Power - Control
- (2) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (3) AMM 32-00-15/201, Landing Gear Door Locks
- (4) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
 - 143 Left MLG Wheel Well
 - 144 Right MLG Wheel Well

D. Prepare for Service

S 863-239

CAUTION: MAKE SURE THE ENGINE-FAN DUCT-COWLING IS CLOSED. IF THE ENGINE-FAN DUCT-COWLING IS NOT CLOSED POSSIBLE DAMAGE COULD OCCUR TO EQUIPMENT.

- (1) Close the engine-fan duct-cowling, if open.

S 863-284

- (2) Pressurize the left hydraulic system (AMM 29-11-00/201).

S 863-240

- (3) Move the flap control lever to the 30 unit detent.

S 863-241

- (4) Make sure the trailing edge (TE) flaps and leading edge (LE) slats are in the fully extended position.

S 863-242

- (5) Attach a DO-NOT-OPERATE tag to the flap control lever.

S 863-244

- (6) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 483-245

WARNING: USE THE PROCEDURE IN AMM 32-00-15 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

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- S 863-247
- (8) If the left hydraulic system is pressurized, remove the pressure from the left hydraulic system (AMM 29-11-00/201).
- S 863-248
- (9) Open these circuit breakers on the main power distribution panel, P6, and attach DO-NOT-CLOSE tags:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR
- S 863-249
- (10) Open these circuit breakers on the overhead panel, P11, and attach DO-NOT-CLOSE tags:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A
- S 493-305
- (11) Move the manual override lever on the TE flap PDU bypass valve to the bypass position (POS 1).
- S 493-306
- (12) Install a DO-NOT-OPERATE tag on the manual override lever.
- S 493-307
- (13) Install the PDU lock in the TE flap PDU.
- E. Lubrication for the TE Flap PDU Control Rods (Fig. 306)
- S 643-250
- (1) Lubricate the control rods.
- F. Put the Airplane Back to Its Usual Condition
- S 493-312
- (1) Remove the PDU lock from the TE flap PDU.

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- S 093-319
- (2) Remove the DO-NOT-OPERATE tag on the manual override lever.
- S 863-320
- (3) Move the manual override lever on the TE flap PDU bypass valve to the usual position (POS 2).
- S 863-285
- (4) Pressurize the left hydraulic system (AMM 29-11-00/201).
- S 863-251
- (5) Move the flap control lever to the zero (FLAPS UP) detent.
- S 863-252
- (6) Make sure that the TE flaps and LE slats move to the fully retracted position.
- S 863-253
- (7) Remove the DO-NOT-OPERATE tag from the flap control lever, if installed.
- S 863-254
- (8) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 panel:
- (a) 6D20, ALTN SLAT PWR
 - (b) 6D23, ALTN FLAP PWR
- S 863-255
- (9) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
- (a) 11B18, WARN ELEX B
 - (b) 11D31, HYDRAULICS PTU CONT
 - (c) 11H23, FLAP/SLAT ALTN DR SHUTOFF ARM
 - (d) 11J18, FLAP LOAD RELIEF
 - (e) 11J33, WARN ELEX A
- S 083-256
- WARNING:** USE THE PROCEDURE IN AMM 32-00-15 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.
- (10) Remove the door locks from the landing gear doors and close the doors (AMM 32-00-15/201).
- S 863-257
- (11) Remove the pressure from the left hydraulic system (AMM 29-11-00/201).

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S 863-258
(12) Remove electrical power if it is not necessary (AMM 24-22-00/201).

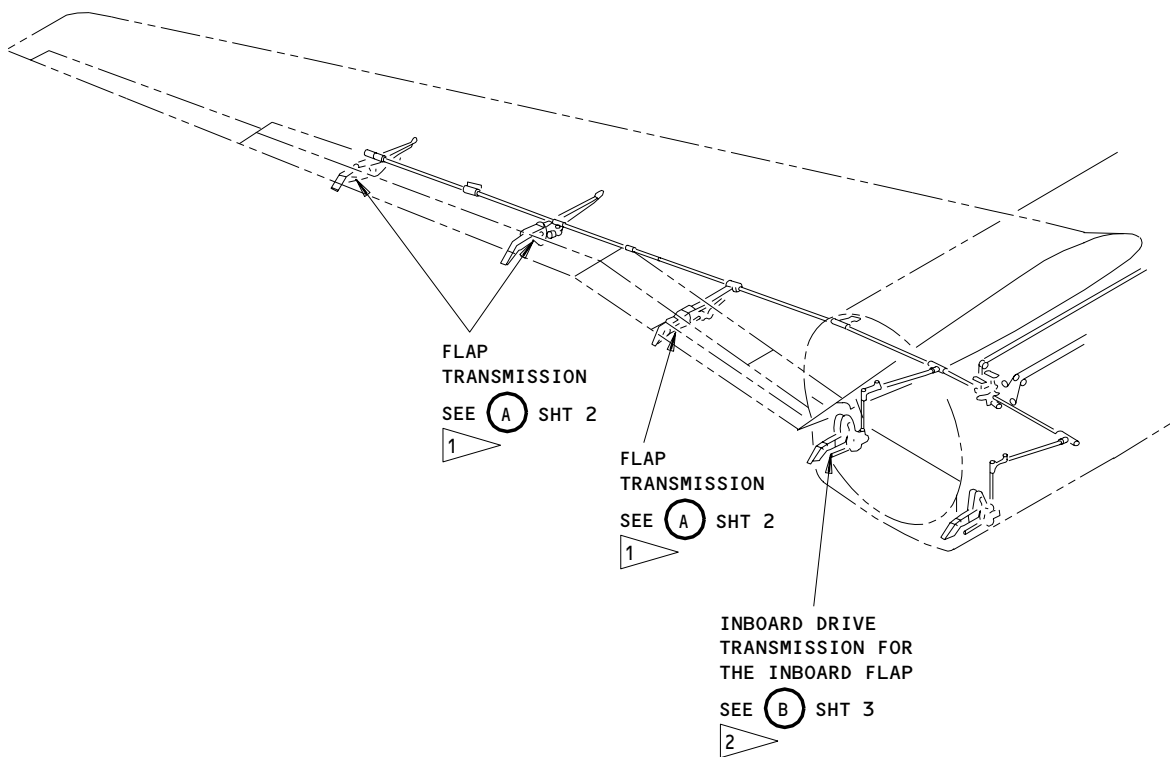
EFFECTIVITY

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LEFT WING IS SHOWN
(RIGHT WING IS OPPOSITE)

Lubrication for the TE Flap Drive Transmission
Figure 301 (Sheet 1)

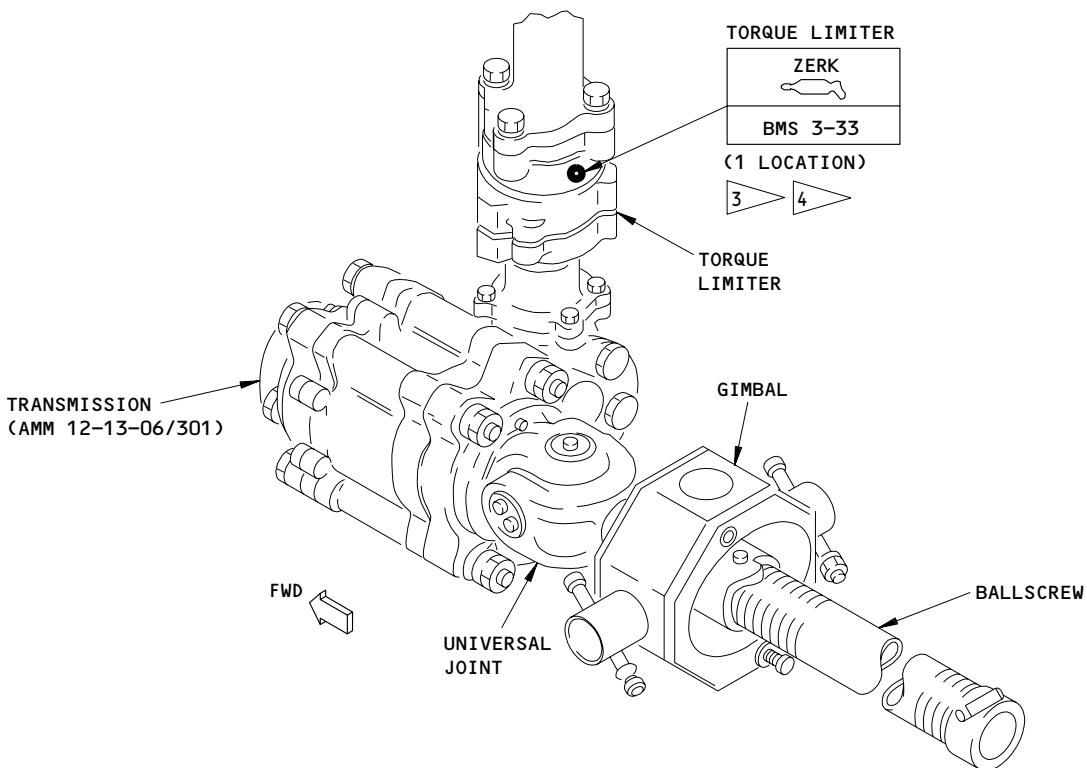
EFFECTIVITY	ALL
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**FLAP TRANSMISSION
(3 FLAP TRANSMISSIONS ON EACH WING)**

1 POINT

A 1

- 1 FULLY EXTEND THE FLAPS TO LUBRICATE
- 2 GET ACCESS THROUGH THE WHEEL WELL OF THE MAIN GEAR TO LUBRICATE
- 3 FILL WITH GREASE UNTIL THE GREASE FLOWS OUT FROM THE LOWER VENT HOLES OF THE TORQUE LIMITER
- 4 BMS 3-33 RECOMMENDED
MIL-PRF-23827 ALTERNATE
MIL-G-21164 ALTERNATE

Lubrication for the TE Flap Drive Transmission
Figure 301 (Sheet 2)

EFFECTIVITY

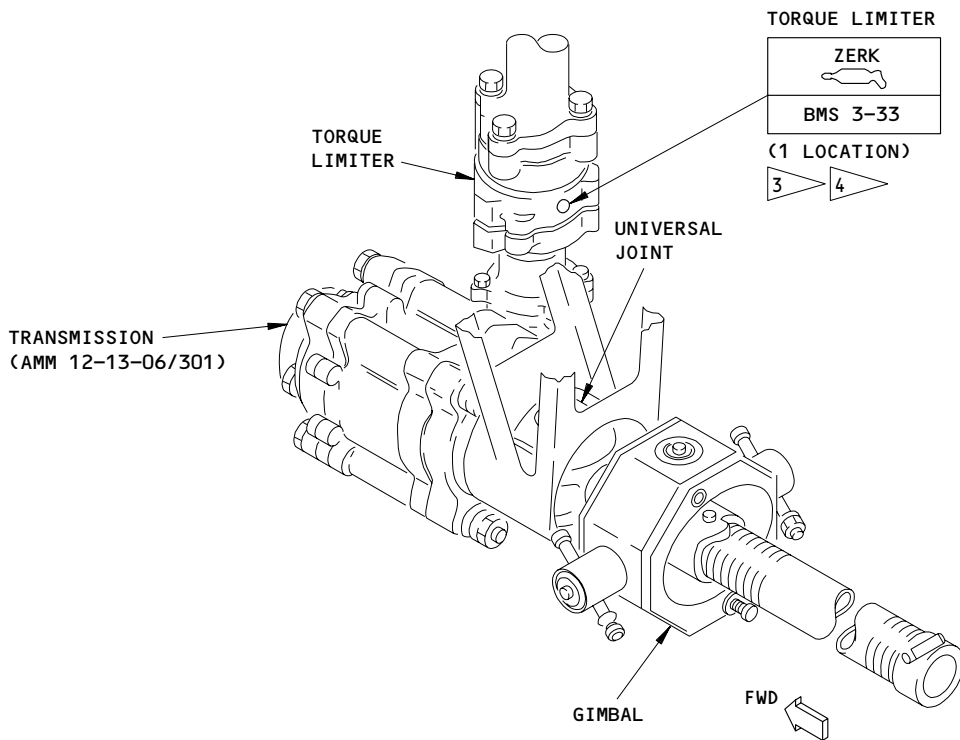
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INBOARD TRANSMISSION
(1 INBOARD TRANSMISSION ON EACH WING)

1 POINT

B 2

Lubrication for the TE Flap Drive Transmission
Figure 301 (Sheet 3)

EFFECTIVITY

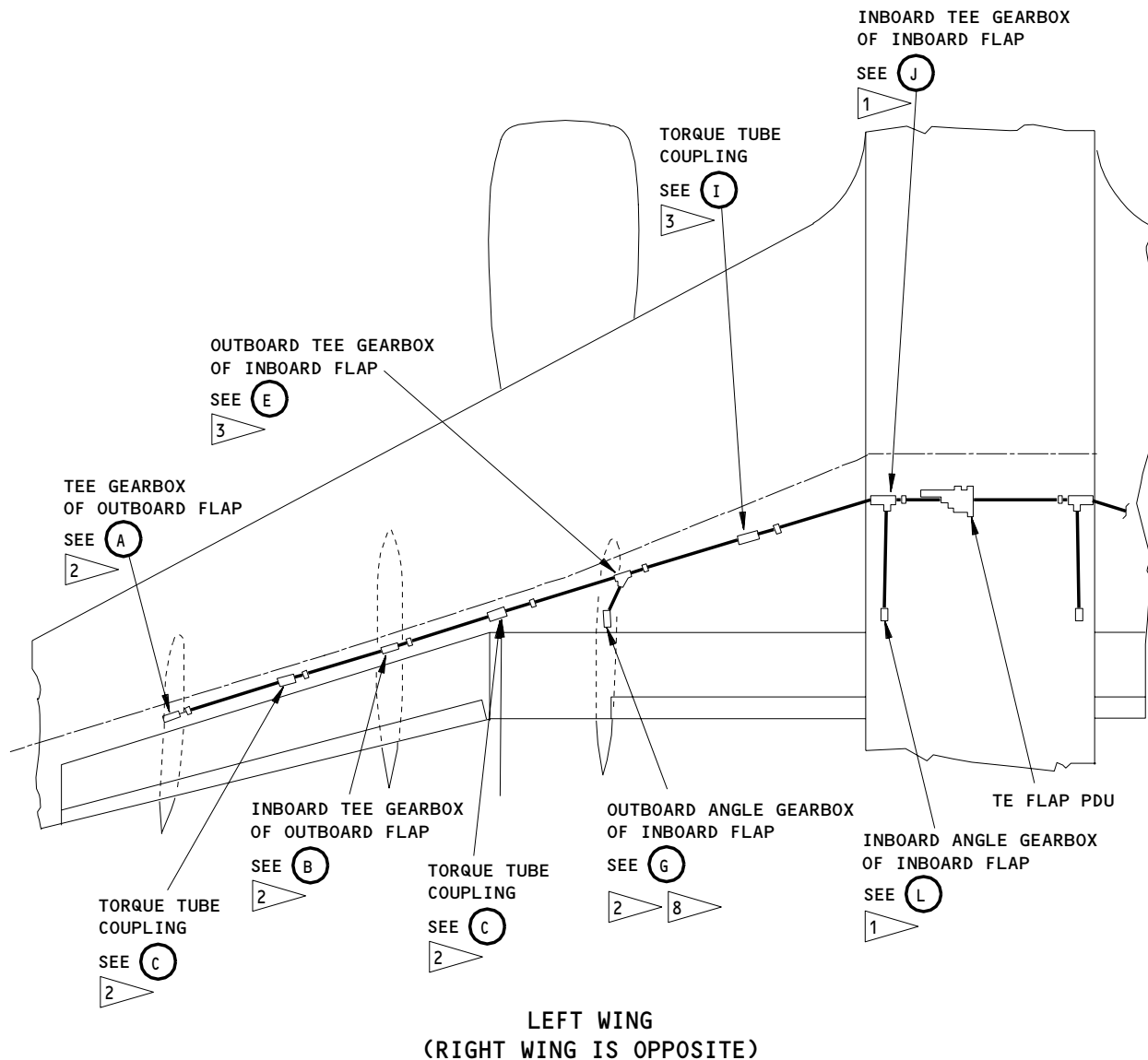
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- 1 GO INTO THE WHEEL WELLS OF THE MAIN LANDING GEAR TO LUBRICATE
- 2 GET TO THE LUBE POINTS WHEN THE FLAPS ARE FULLY EXTENDED
- 3 OPEN ACCESS PANELS 551BB, 651BB TO LUBRICATE
- 4 BEFORE YOU LUBRICATE, MOVE THE TORQUE TUBE AXIALLY FULL TRAVEL TO THAT END. FILL THE COUPLING CAVITY WITH GREASE THROUGH EACH OF THE THREE LUBRICATION HOLES. DO THE PROCEDURE AGAIN FOR THE OTHER END OF THE TORQUE TUBE.
- 5 REMOVE THE COVER TO GET TO THE BEVEL GEARS TURN THE SHAFT GEAR AND FILL THE GEAR TEETH WITH GREASE BY HAND
- 6 GREASE THE EXPOSED SPLINES
- 7 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE
- 8 YOU CAN ACCESS THE TORQUE TUBE COUPLING AT THE OUTBOARD ANGLE GEARBOX FROM THE TOP OF THE WING

Lubrication for the TE Flaps Drive
Figure 302 (Sheet 1)

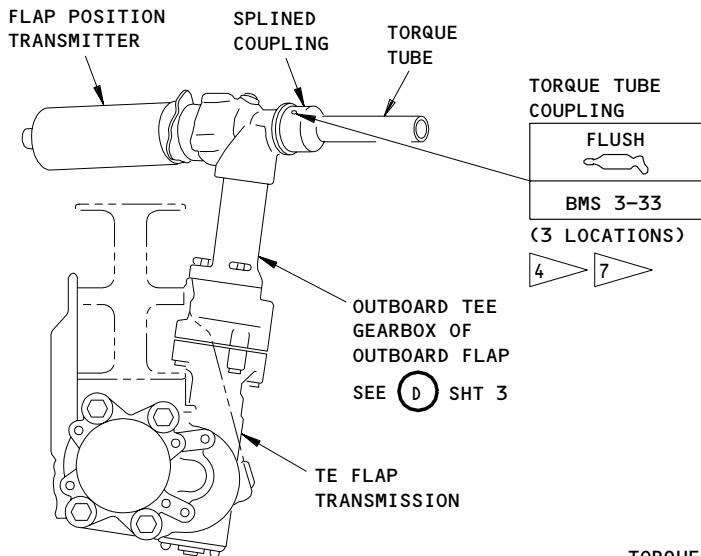
EFFECTIVITY

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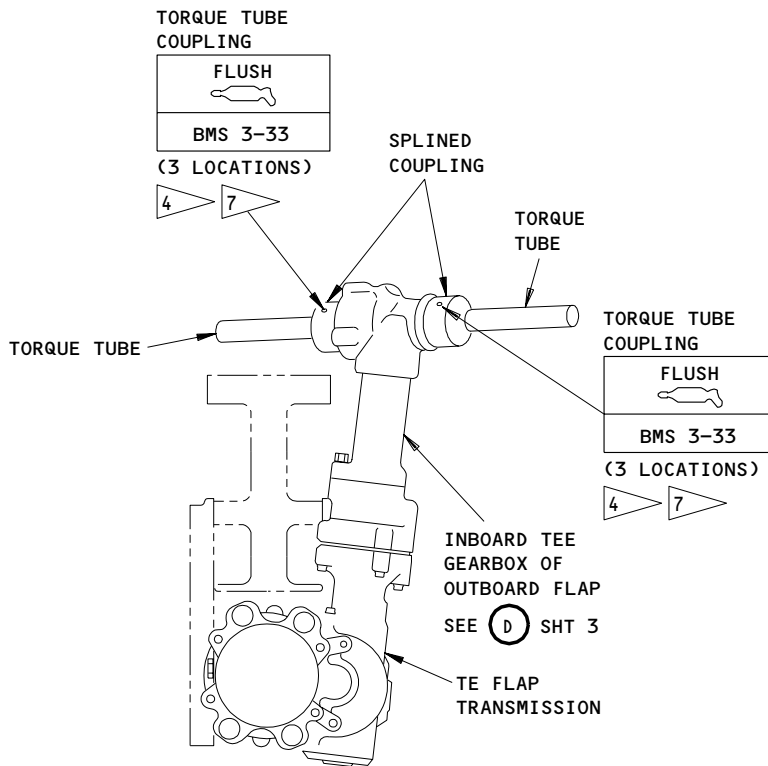
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TEE GEARBOX OF OUTBOARD FLAP
(VIEW IN THE AFT DIRECTION)

3 POINTS

(A) 2



TORQUE TUBE COUPLING
(VIEW IN THE AFT DIRECTION)

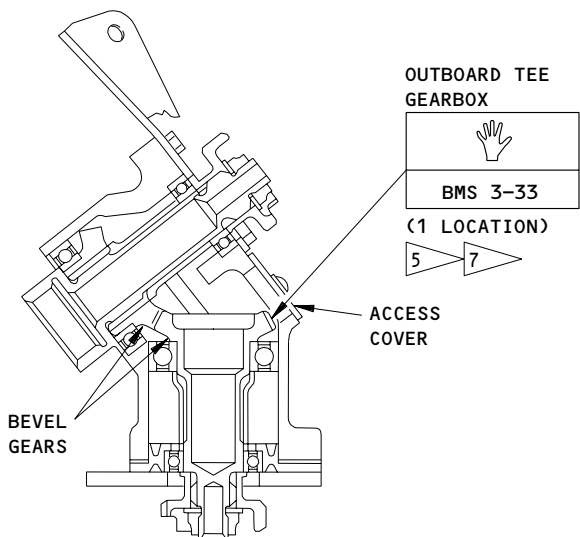
6 POINTS

(B) 2

Lubrication for the TE Flaps Drive
Figure 302 (Sheet 2)

EFFECTIVITY	ALL
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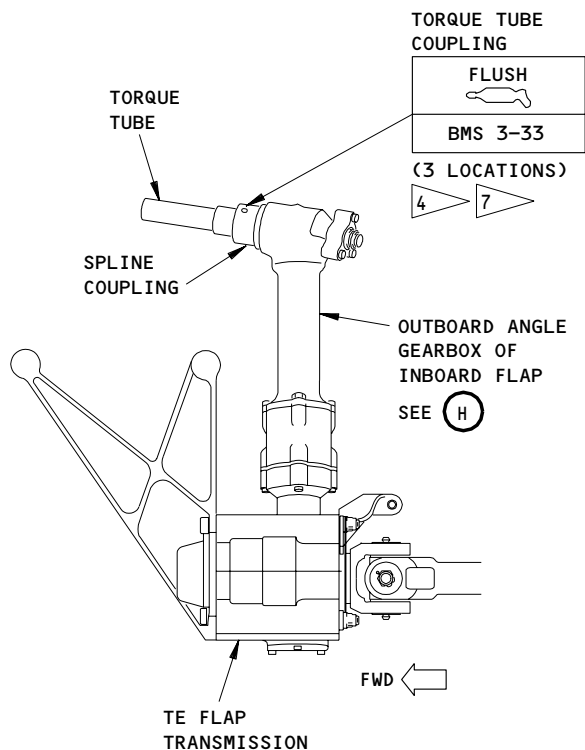
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OUTBOARD TEE GEARBOX OF INBOARD FLAP

1 POINT

(F) 3



OUTBOARD ANGLE GEARBOX OF INBOARD FLAP

3 POINTS

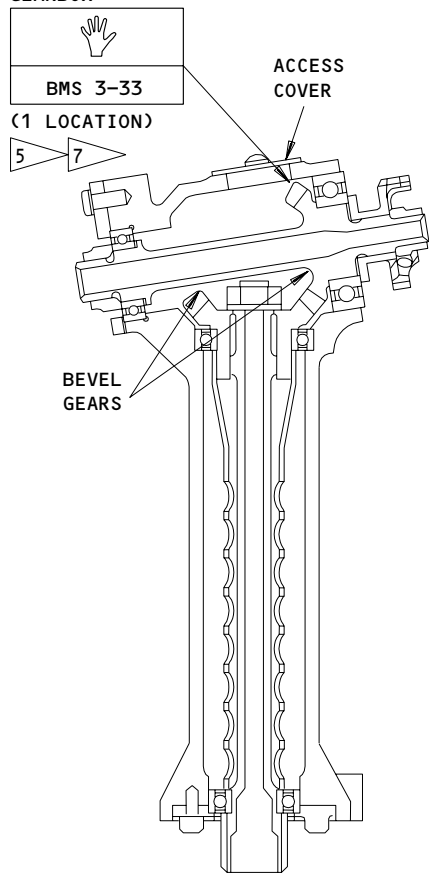
(G) 2

Lubrication for the TE Flaps Drive
Figure 302 (Sheet 4)

EFFECTIVITY	ALL
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OUTBOARD ANGLE
GEARBOX

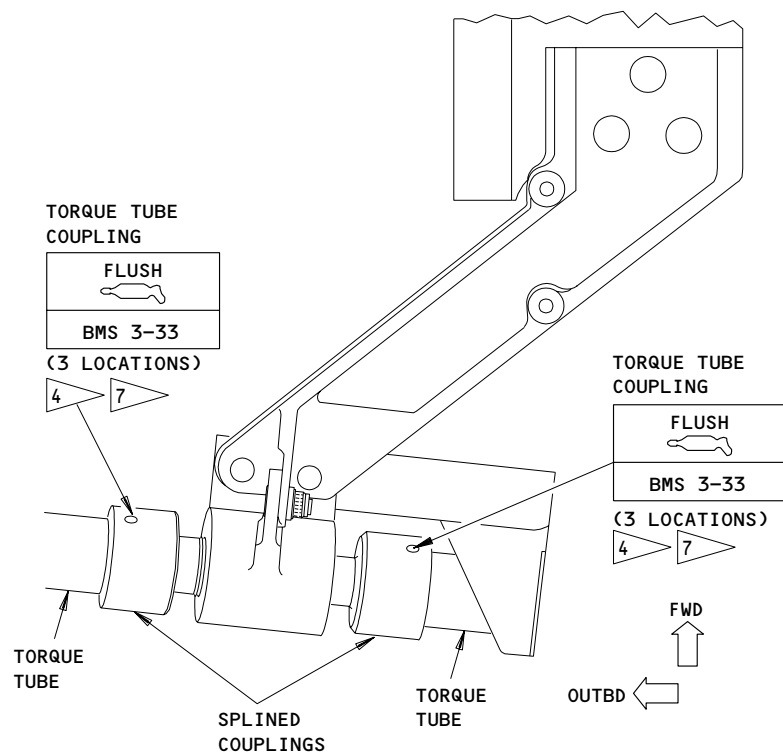


OUTBOARD ANGLE GEARBOX
OF INBOARD FLAP

1 POINT
(H) 2

TORQUE TUBE
COUPLING

FLUSH
BMS 3-33
(3 LOCATIONS)
4 7



TORQUE TUBE
COUPLING

FLUSH
BMS 3-33
(3 LOCATIONS)
4 7

TORQUE TUBE COUPLING

6 POINTS
(I) 3

Lubrication for the TE Flaps Drive
Figure 302 (Sheet 5)

EFFECTIVITY

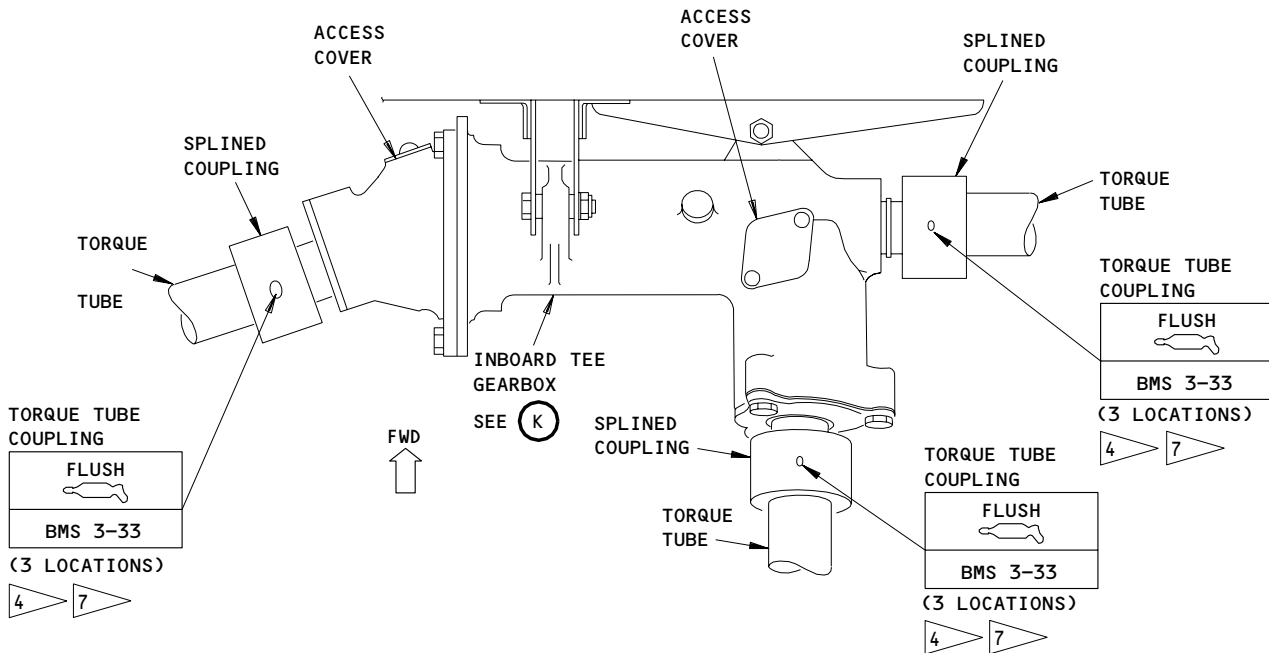
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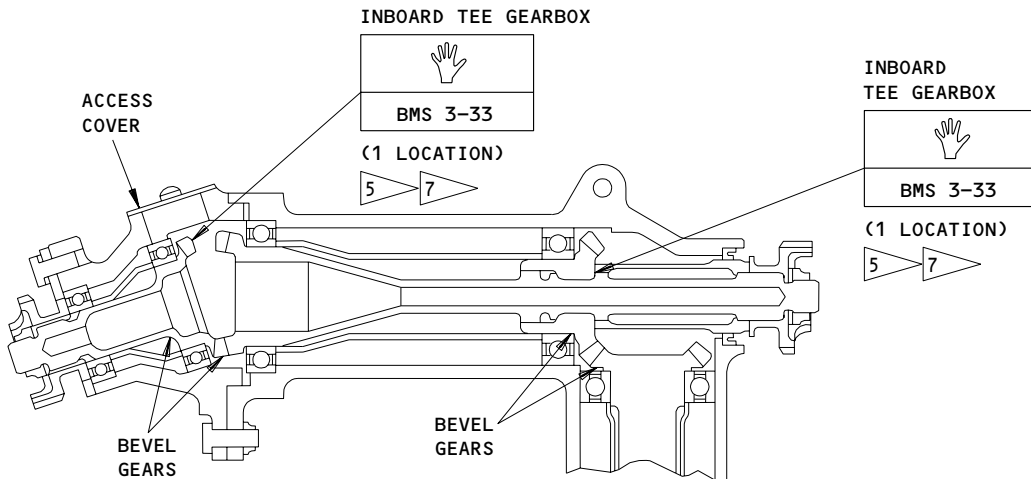
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INBOARD TEE GEARBOX OF INBOARD FLAP

9 POINTS



INBOARD TEE GEARBOX

2 POINTS



Lubrication for the TE Flaps Drive
Figure 302 (Sheet 6)

EFFECTIVITY

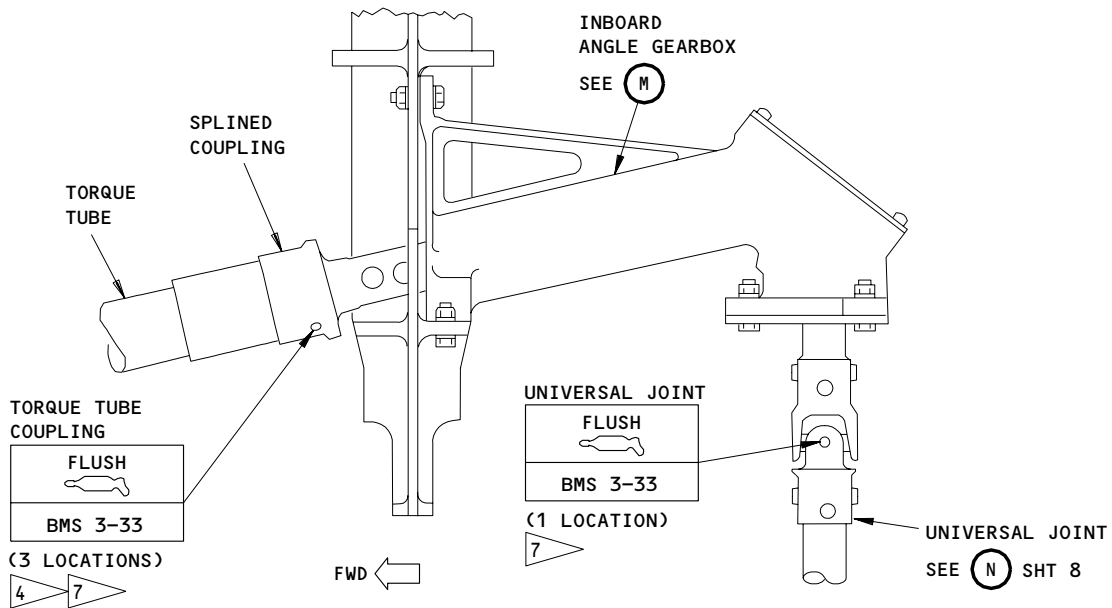
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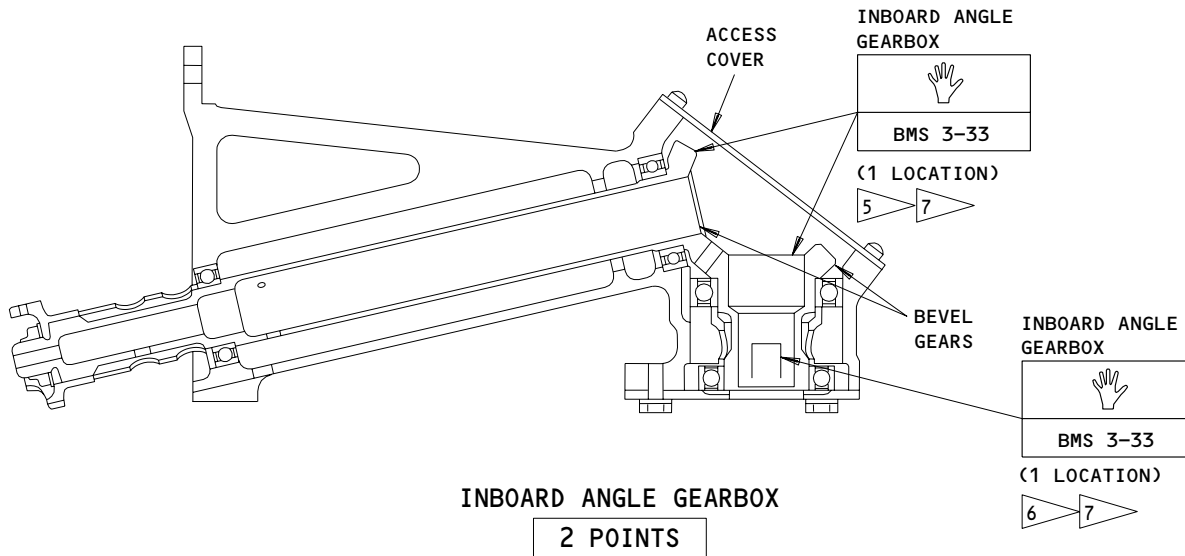
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INBOARD ANGLE GEARBOX OF INBOARD FLAP

4 POINTS

(L) 1



(M) 1

Lubrication for the TE Flaps Drive
Figure 302 (Sheet 7)

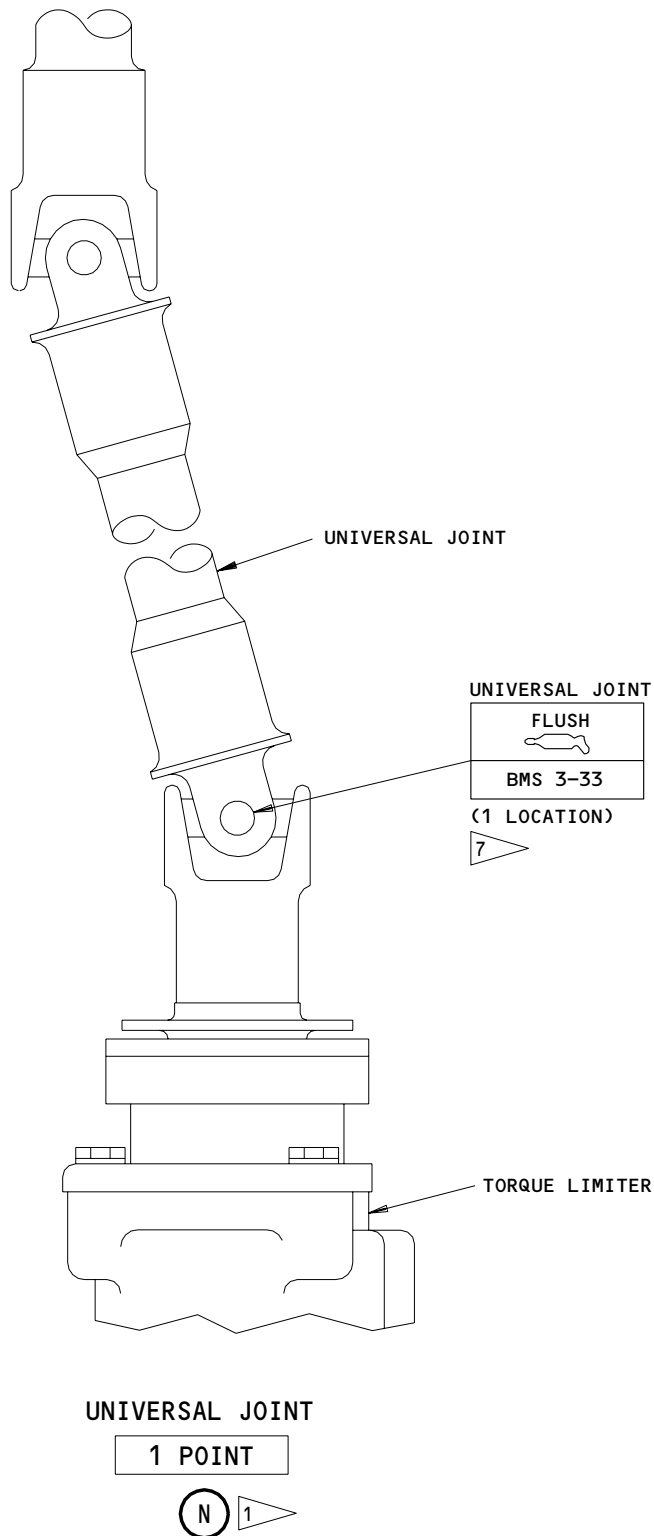
EFFECTIVITY

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Lubrication for the TE Flaps Drive
Figure 302 (Sheet 8)

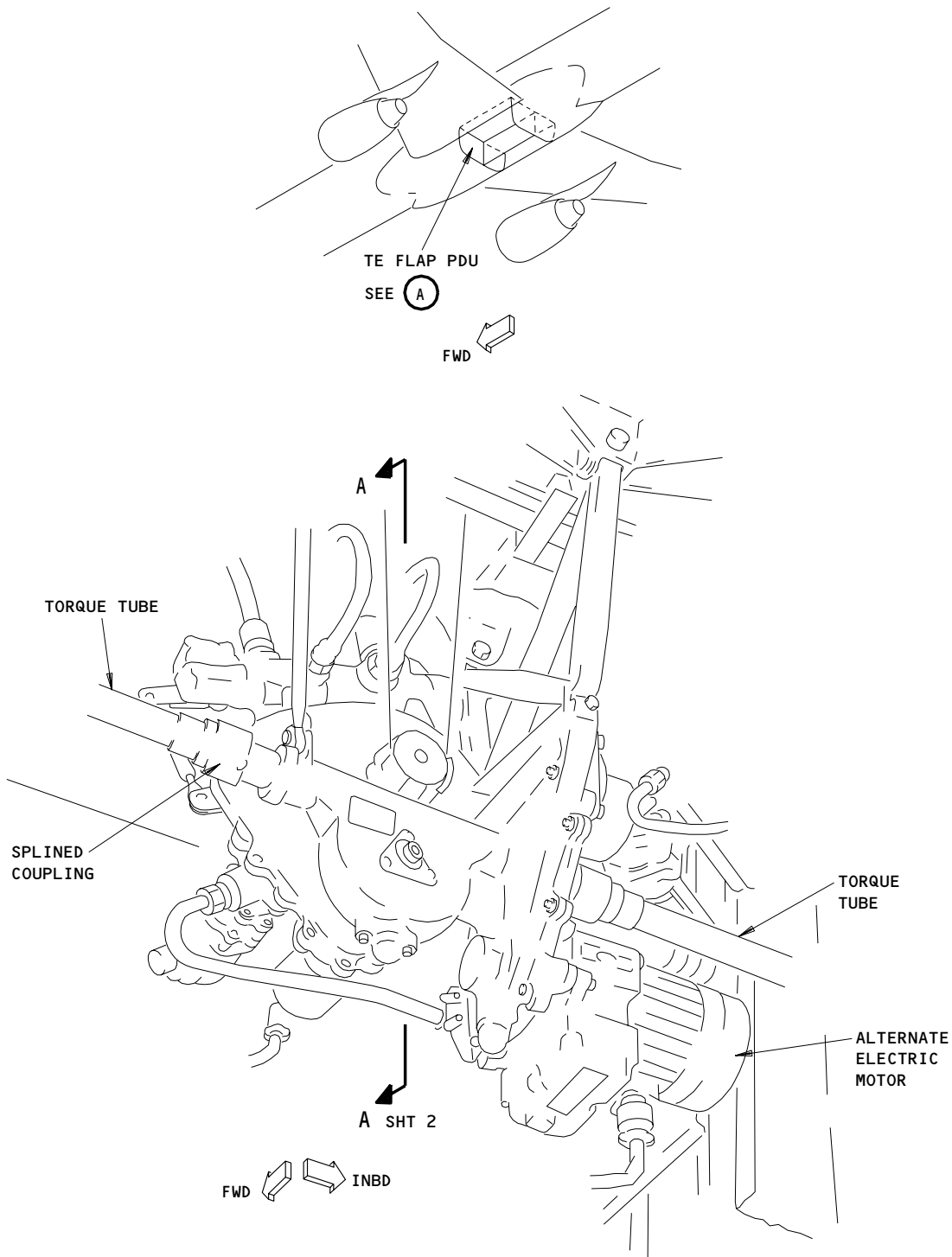
EFFECTIVITY	ALL

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TE FLAP POWER DRIVE UNIT (PDU)

(A)

Lubrication for the TE Flap Power Drive Unit
Figure 303 (Sheet 1)

EFFECTIVITY

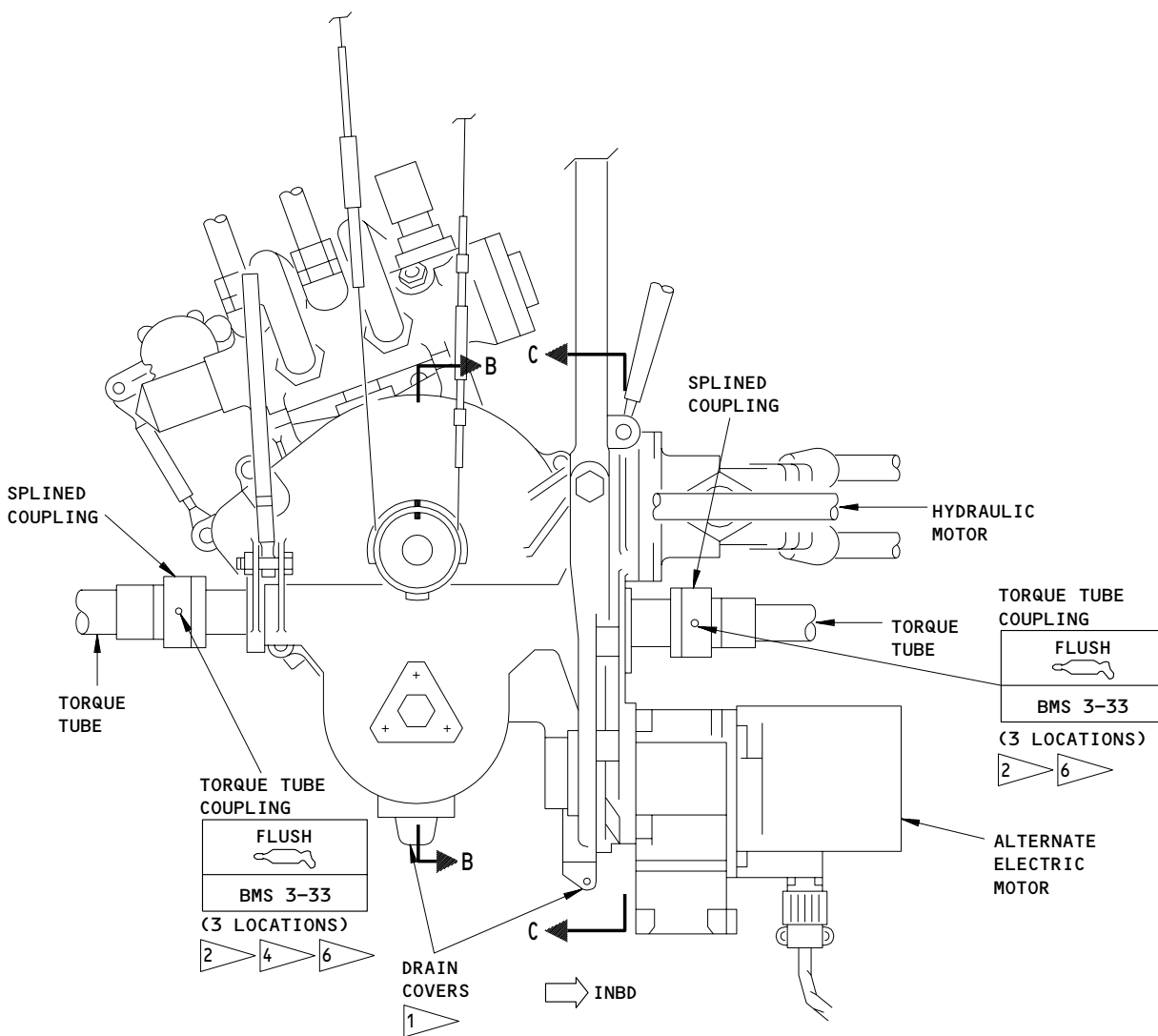
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TE FLAP PDU
(FORWARD VIEW)

6 POINTS

A-A

- 1 REMOVE THE DRAIN COVERS TO GET TO THE WORM WHEEL AND PINION GEARS
- 2 FILL THE COUPLING CAVITY WITH GREASE THROUGH EACH OF THE THREE LUBRICATION HOLES. DO THE PROCEDURE AGAIN FOR THE OTHER END OF THE TORQUE TUBE
- 4 ROTATE THE TORQUE TUBE COUNTERCLOCKWISE (FACING INBD) BY HAND TO LUBRICATE THE PDU GEAR TEETH
- 6 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE

Lubrication for the TE Flap Power Drive Unit
Figure 303 (Sheet 2)

EFFECTIVITY

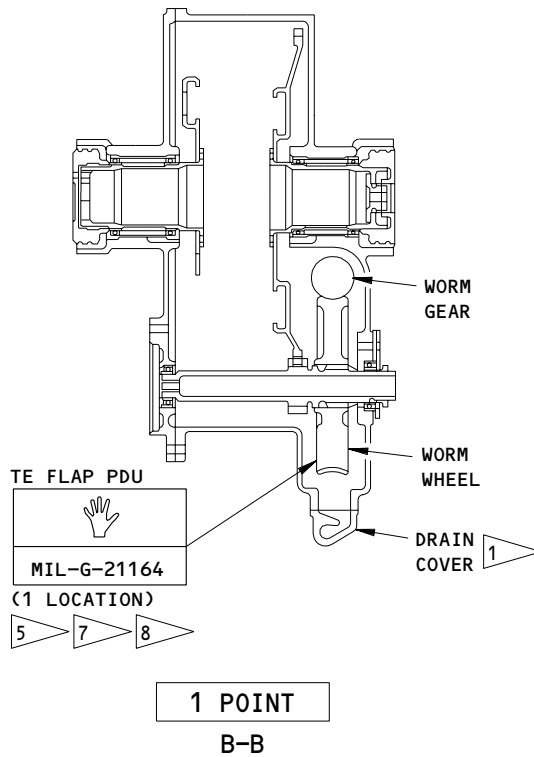
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- 1 REMOVE THE DRAIN COVERS TO GET TO THE WORM WHEEL AND PINION GEARS
- 5 FILL THE GEAR TEETH WITH GREASE BY HAND
- 7 **CAUTION:** AIRPLANES WITH -14 OR SUBSEQUENT PDU'S; USE ONLY MIL-G-21164 GREASE TO LUBRICATE THE PDU. THE OPTIONAL GREASE (MIL-PRF-23827) CAN CAUSE DAMAGE TO THE INTERNAL GEARS IN THE PDU.
- 8 ONLY USE THIS LUBRICANT

Lubrication for the TE Flap Power Drive Unit
Figure 303 (Sheet 3)

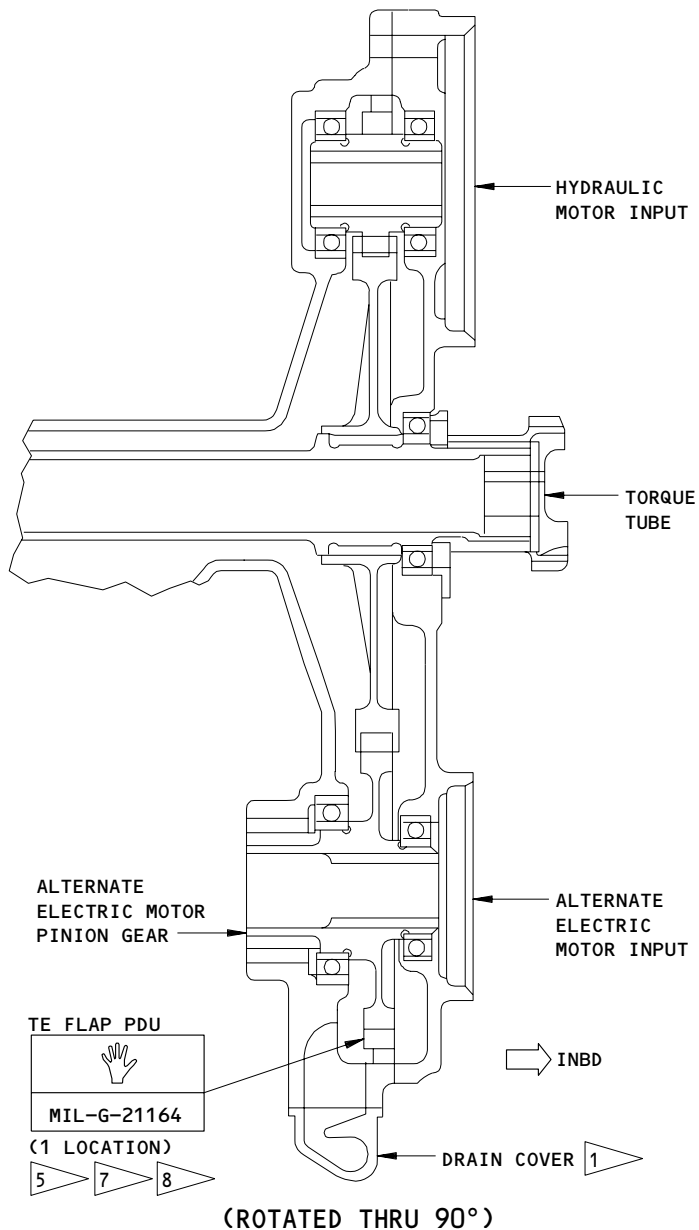
EFFECTIVITY

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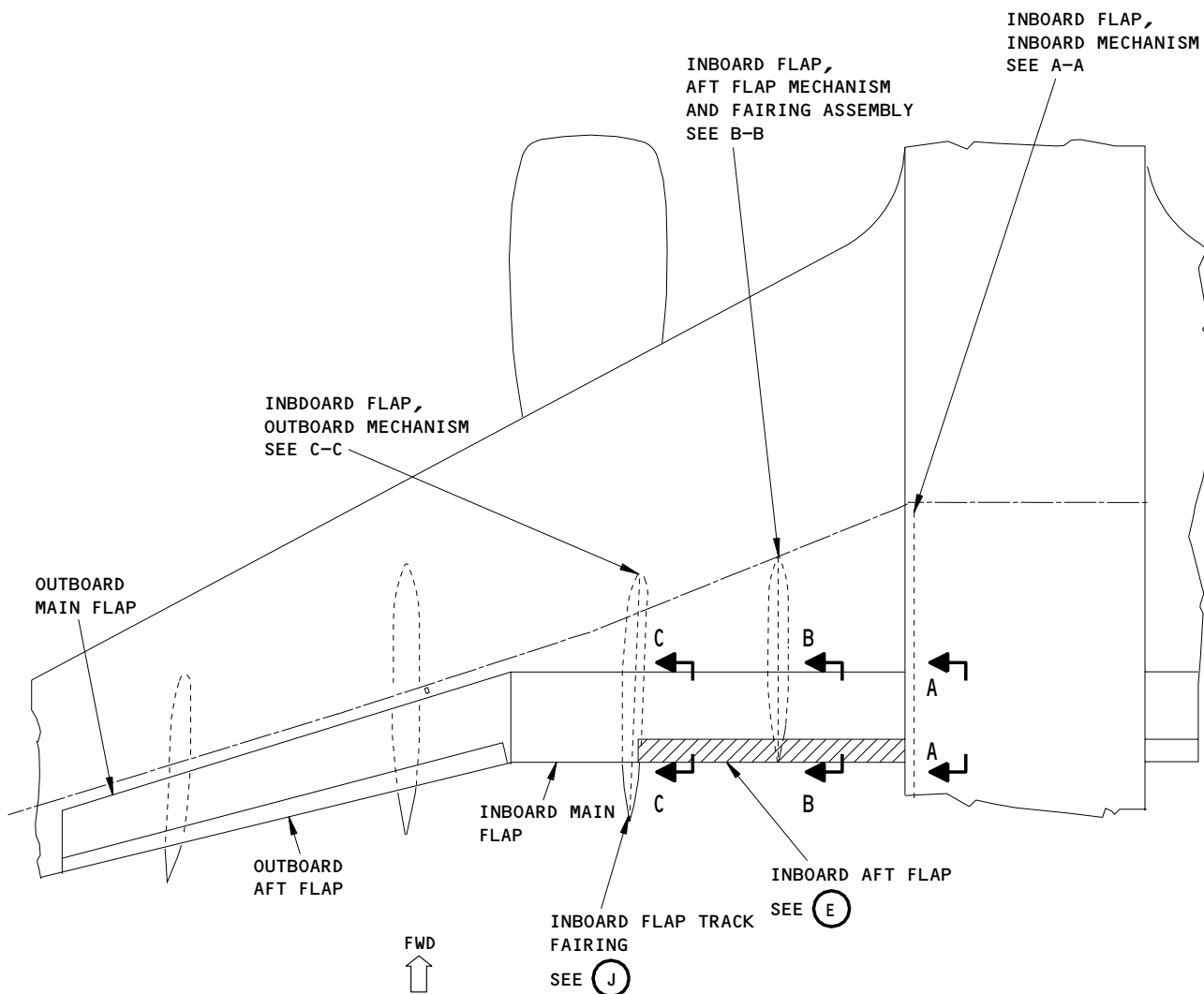


- 1 REMOVE THE DRAIN COVERS TO GET TO THE WORM WHEEL AND PINION GEARS
- 5 FILL THE GEAR TEETH WITH GREASE BY HAND
- 7 **CAUTION:** AIRPLANES WITH -14 OR SUBSEQUENT PDU's; USE ONLY MIL-G-21164 GREASE TO LUBRICATE THE PDU. THE OPTIONAL GREASE (MIL-PRF-23827) CAN CAUSE DAMAGE TO THE INTERNAL GEARS IN THE PDU.
- 8 ONLY USE THIS LUBRICANT

Lubrication for the TE Flap Power Drive Unit
Figure 303 (Sheet 4)

EFFECTIVITY	ALL
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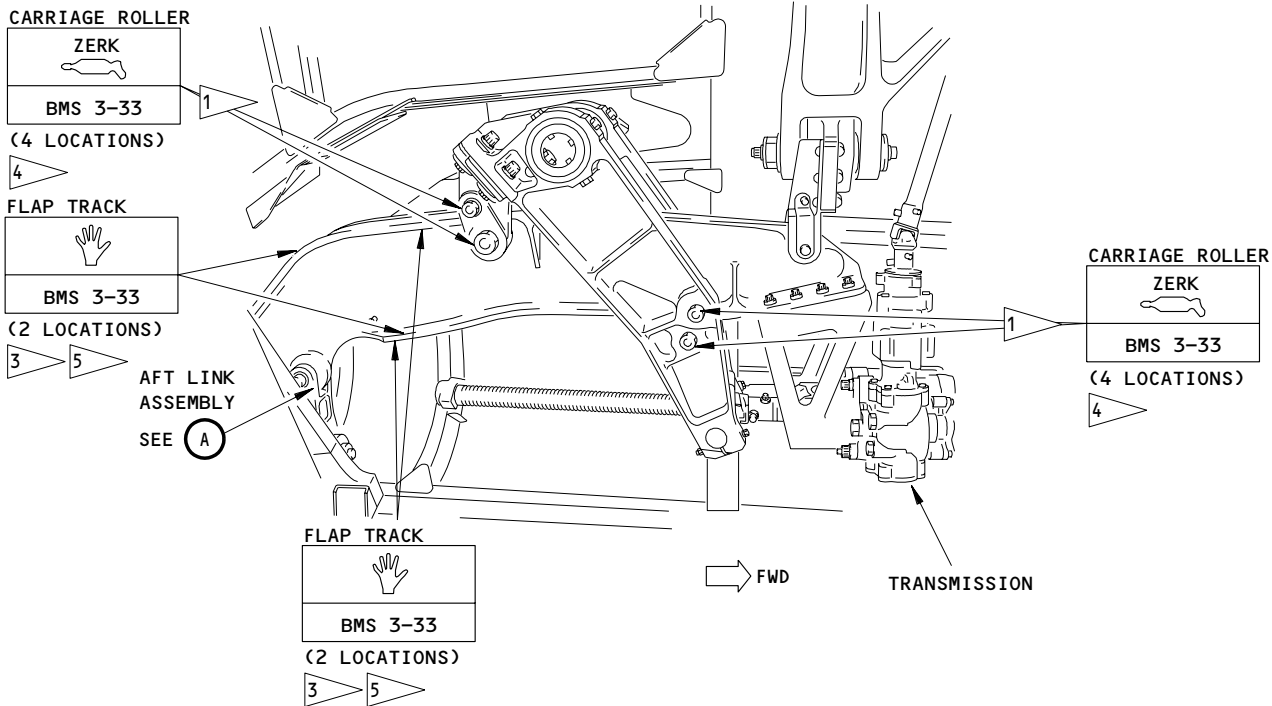


LEFT WING
(TOP VIEW)
(RIGHT WING IS OPPOSITE)

Lubrication for the Inboard TE Flaps
Figure 304 (Sheet 1)

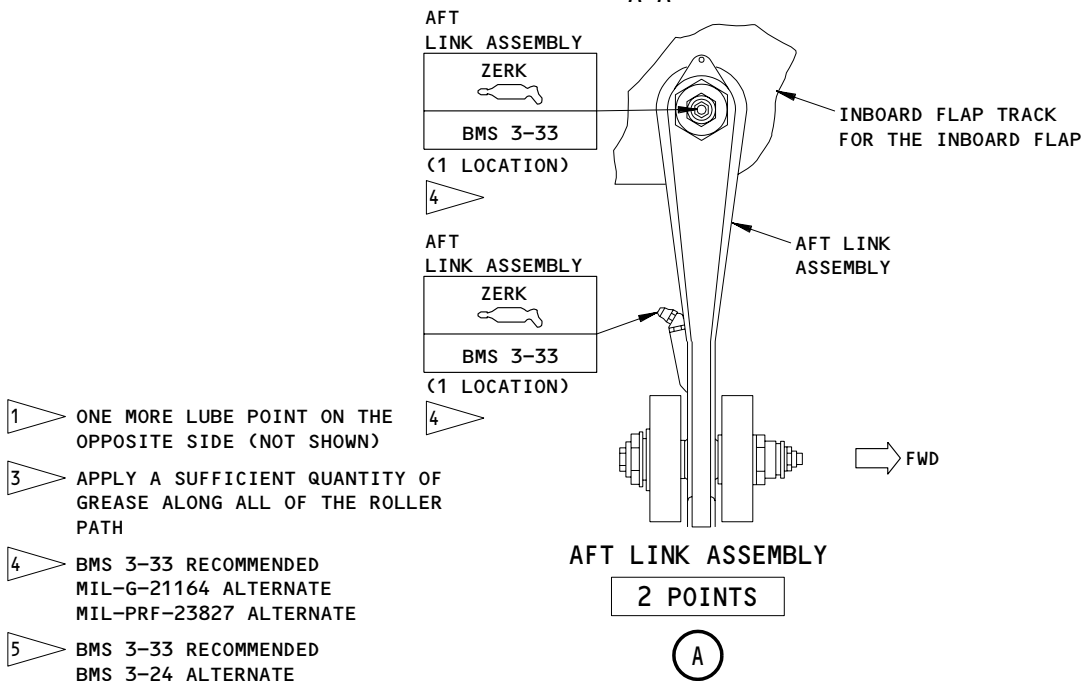
EFFECTIVITY	ALL
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INBOARD FLAP, INBOARD MECHANISM
(VIEW IN THE INBOARD DIRECTION)

12 POINTS
A-A

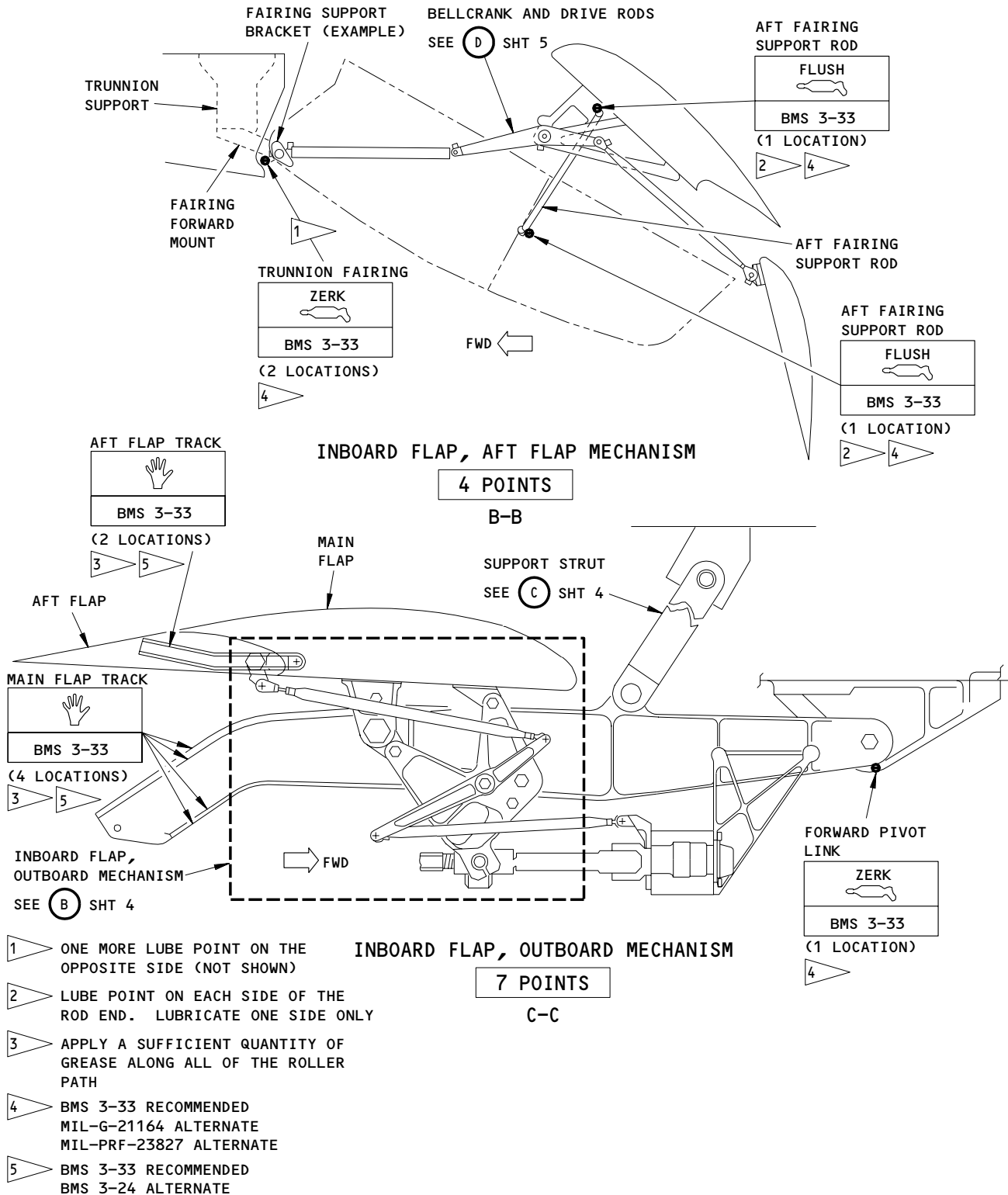


- 1 ONE MORE LUBE POINT ON THE OPPOSITE SIDE (NOT SHOWN)
- 3 APPLY A SUFFICIENT QUANTITY OF GREASE ALONG ALL OF THE ROLLER PATH
- 4 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE
- 5 BMS 3-33 RECOMMENDED
BMS 3-24 ALTERNATE

Lubrication for the Inboard TE Flaps
Figure 304 (Sheet 2)

EFFECTIVITY	ALL
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Lubrication for the Inboard TE Flaps
Figure 304 (Sheet 3)

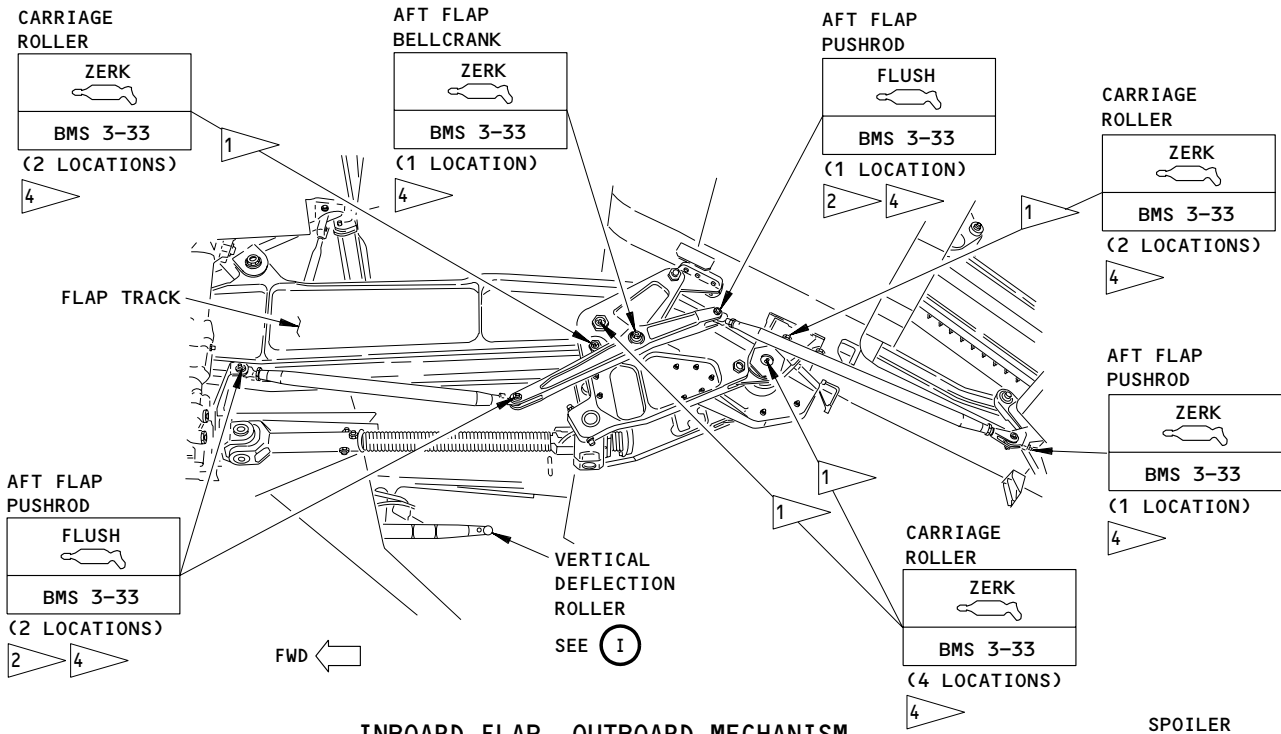
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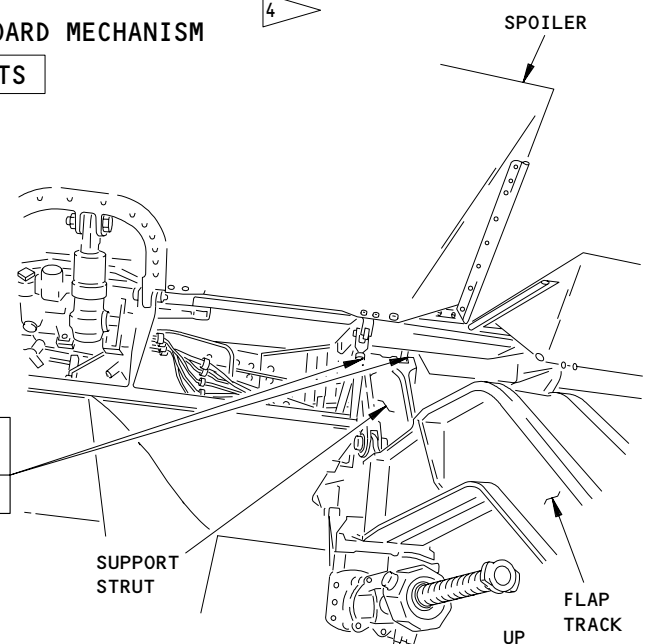
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INBOARD FLAP, OUTBOARD MECHANISM

13 POINTS

(B)



SUPPORT STRUT (VIEW IN THE FORWARD DIRECTION)

2 POINTS

(C)

- 1 ▷ ONE MORE LUBE POINT ON THE OPPOSITE SIDE (NOT SHOWN)
- 2 ▷ LUBE POINT ON EACH SIDE OF THE ROD END. LUBRICATE ONE SIDE ONLY
- 4 ▷ BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE

Lubrication for the Inboard TE Flaps
Figure 304 (Sheet 4)

EFFECTIVITY

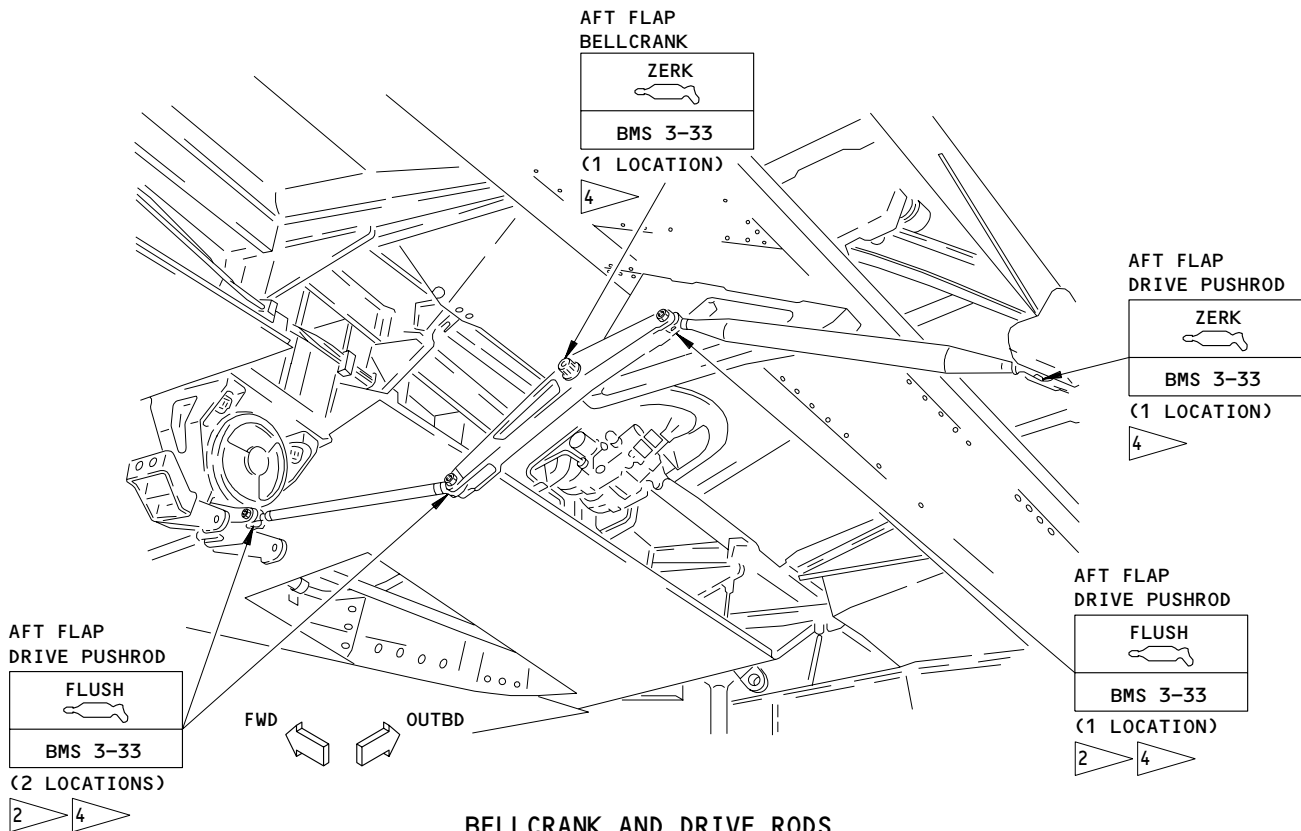
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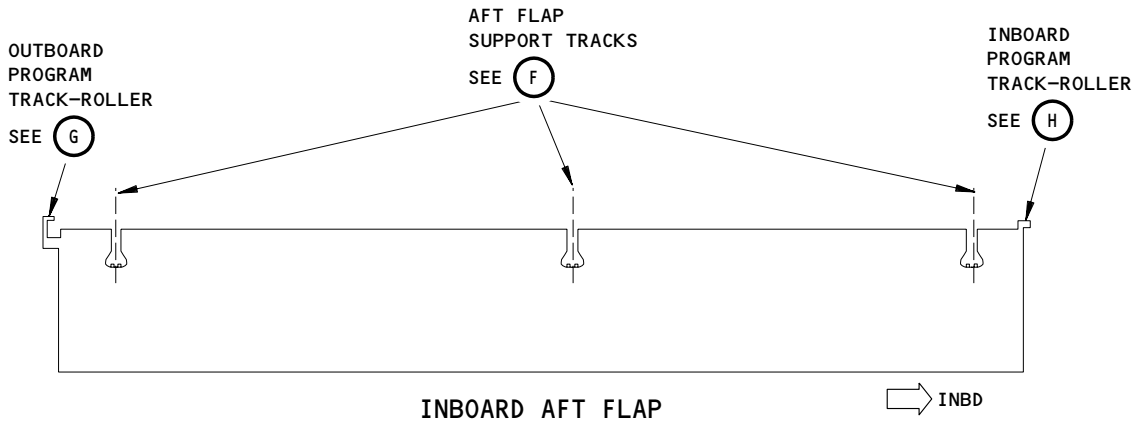
598544



BELLCRANK AND DRIVE RODS

5 POINTS

(D)



(E)

2 ▽ LUBE POINT ON EACH SIDE OF THE ROD END.
LUBRICATE ONE SIDE ONLY.

4 ▽ BMS 3-33 RECOMMENDED
MIL-G-21164 OPTIONAL
MIL-PRF-23827 OPTIONAL

Lubrication for the Inboard TE Flaps
Figure 304 (Sheet 5)

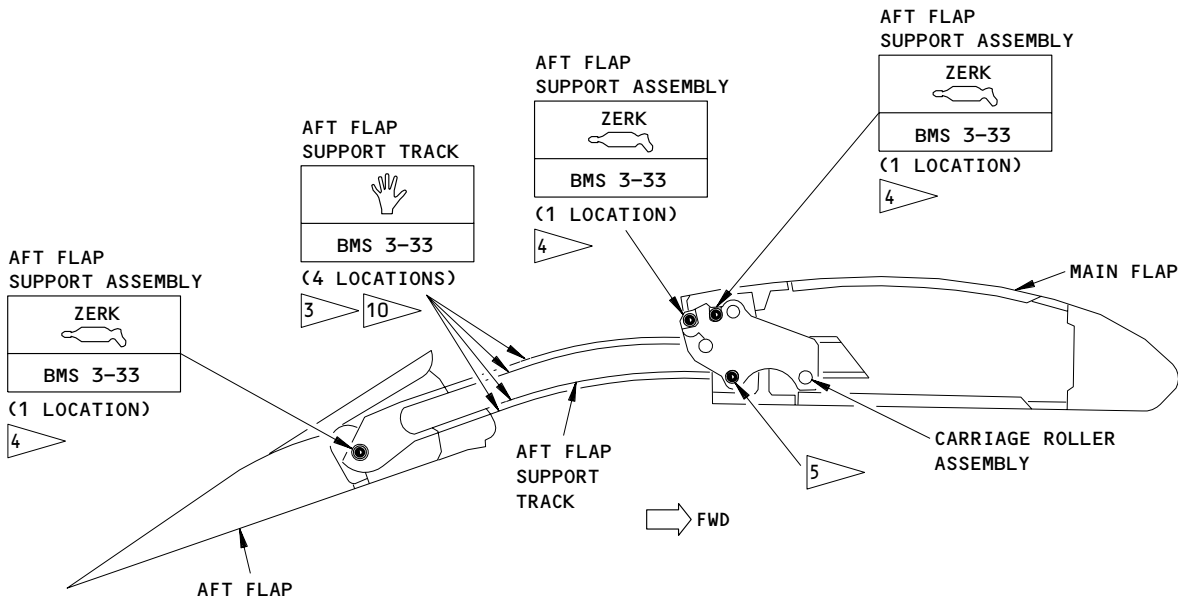
EFFECTIVITY

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**AFT FLAP SUPPORT TRACK
(3 ON EACH INBOARD FLAP)**

7 POINTS

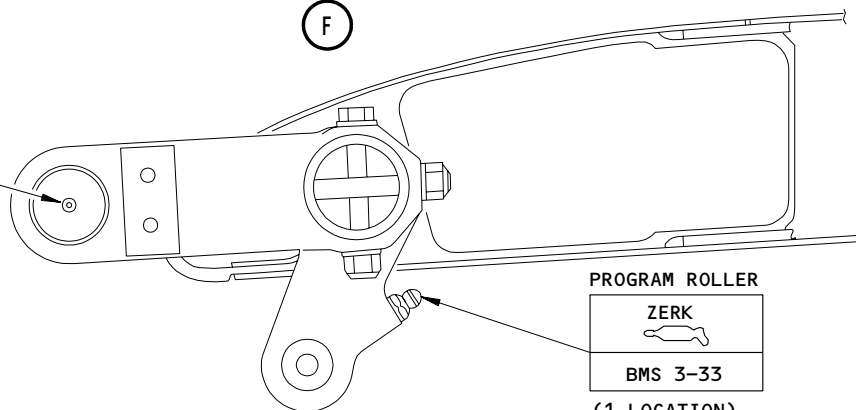
(F)

PROGRAM ROLLER

FLUSH
BMS 3-33

(1 LOCATION)

4



PROGRAM ROLLER

ZERK
BMS 3-33

(1 LOCATION)

4

3 APPLY A SUFFICIENT QUANTITY OF GREASE ALONG ALL OF THE ROLLER PATH

4 BMS 3-33 RECOMMENDED
MIL-G-21164 OPTIONAL
MIL-PRF-23827 OPTIONAL

5 SMALL ROLLER BEARINGS ARE SELF-LUBRICATED

10 BMS 3-33 RECOMMENDED
BMS 3-24 OPTIONAL

**OUTBOARD PROGRAM TRACK-ROLLERS
(2 ON EACH AFT FLAP)**

2 POINTS

(G)

Lubrication for the Inboard TE Flaps
Figure 304 (Sheet 6)

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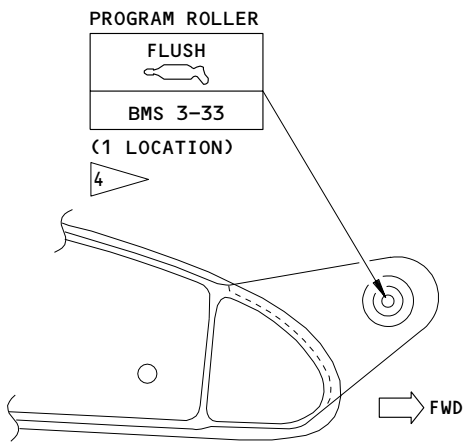
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BOEING

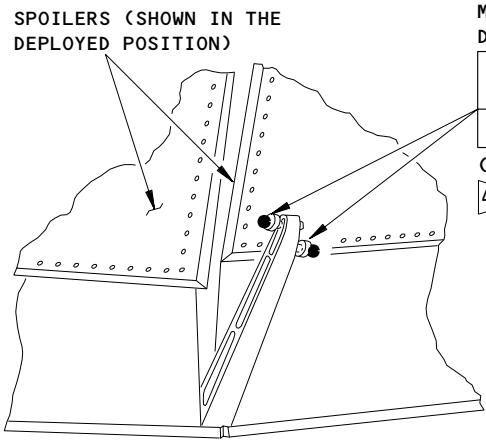
757 MAINTENANCE MANUAL



**INBOARD PROGRAM TRACK-ROLLER
(1 ON EACH AFT FLAP)**

1 POINT

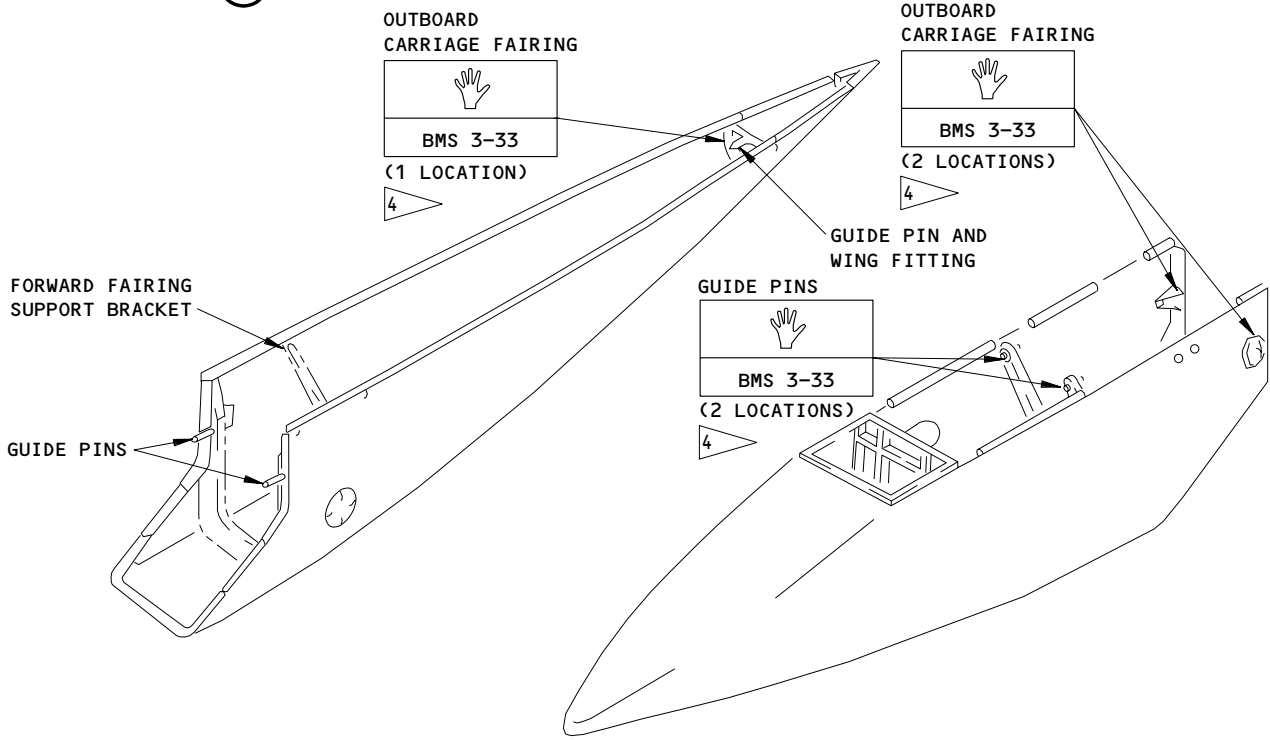
H



**VERTICAL DEFLECTION ROLLERS
(TE MAIN FLAP, INBOARD/OUTBOARD)**

2 POINTS

I



INBOARD FLAP TRACK FAIRING

5 POINTS

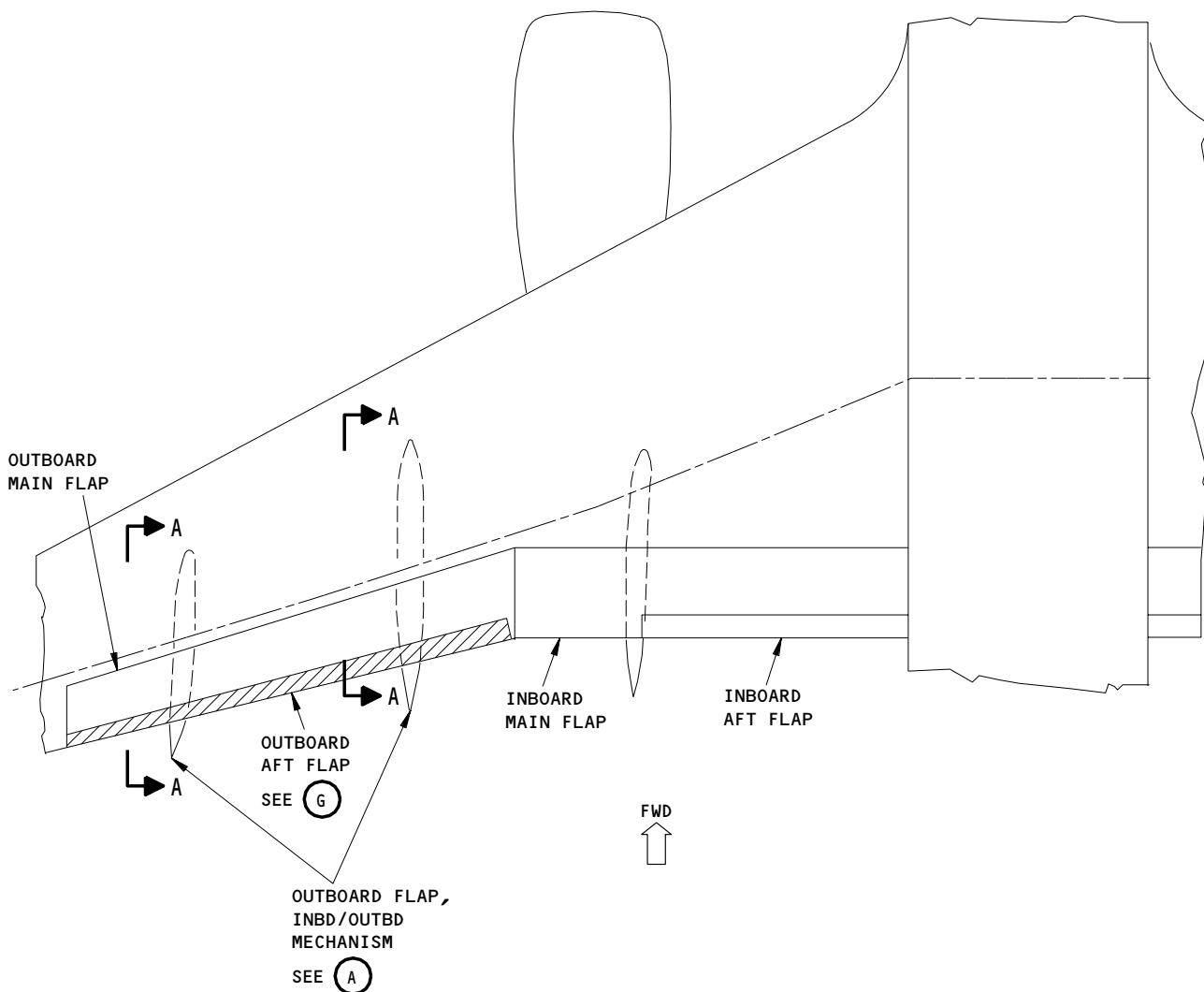
J

4 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE

Lubrication for the Inboard TE Flaps
Figure 304 (Sheet 7)

EFFECTIVITY	ALL
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LEFT WING
(TOP VIEW)
(RIGHT WING IS OPPOSITE)

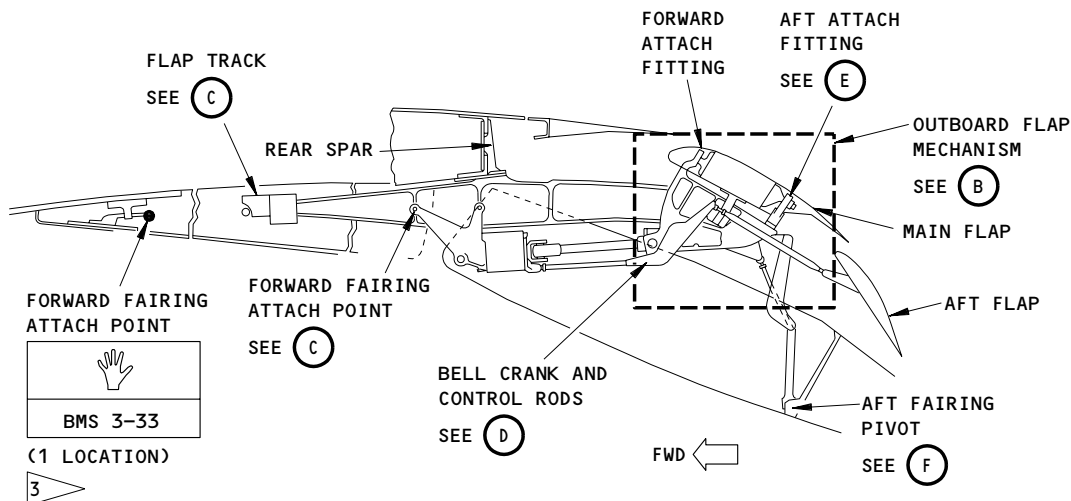
Lubrication for the Outboard TE Flaps
Figure 305 (Sheet 1)

598727	EFFECTIVITY
	ALL

12-21-09

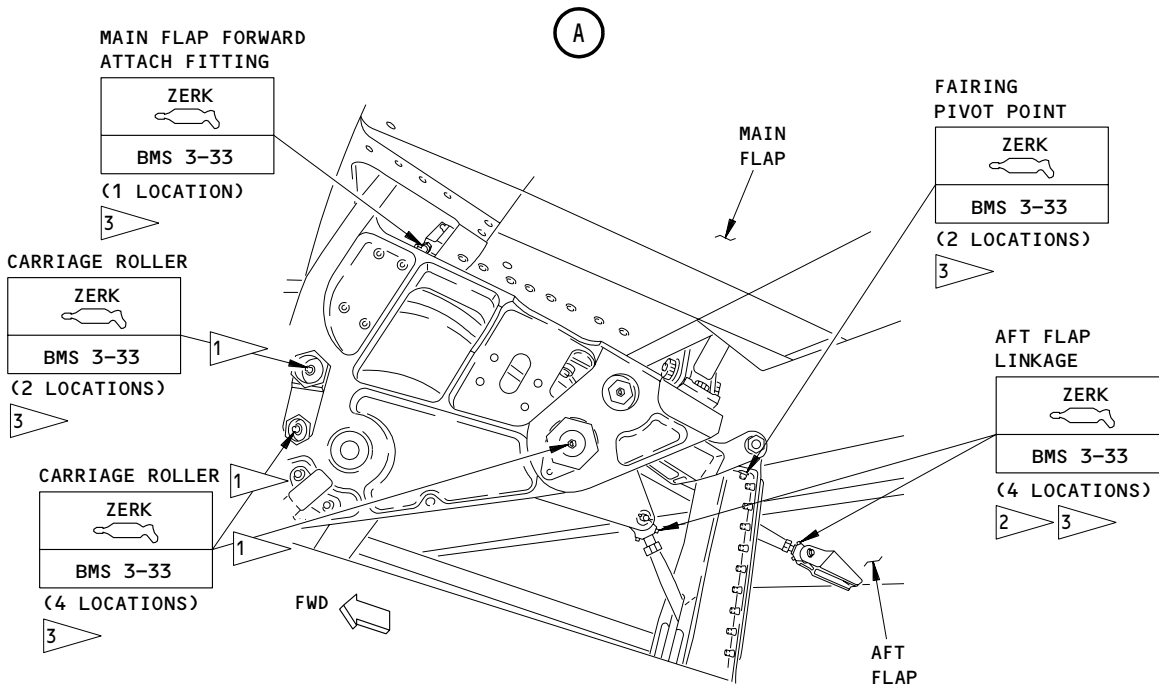
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OUTBOARD FLAP, INBOARD/OUTBOARD MECHANISM

1 POINT



OUTBOARD FLAP MECHANISM

13 POINTS

- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 2 LUBE POINT ON EACH SIDE OF THE ROD END. LUBRICATE ONE SIDE ONLY.
- 3 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE

(B)

Lubrication for the Outboard TE Flaps
Figure 305 (Sheet 2)

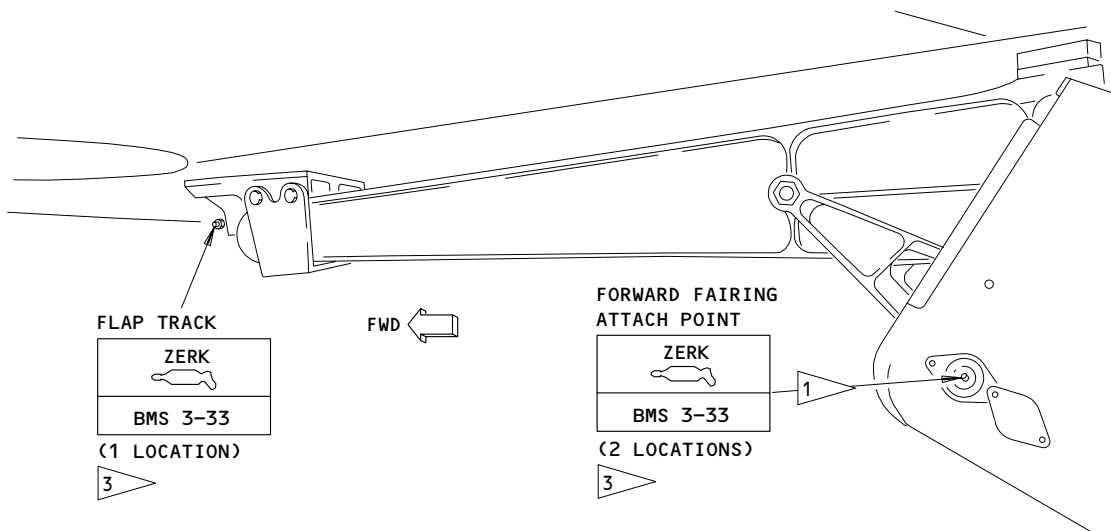
EFFECTIVITY

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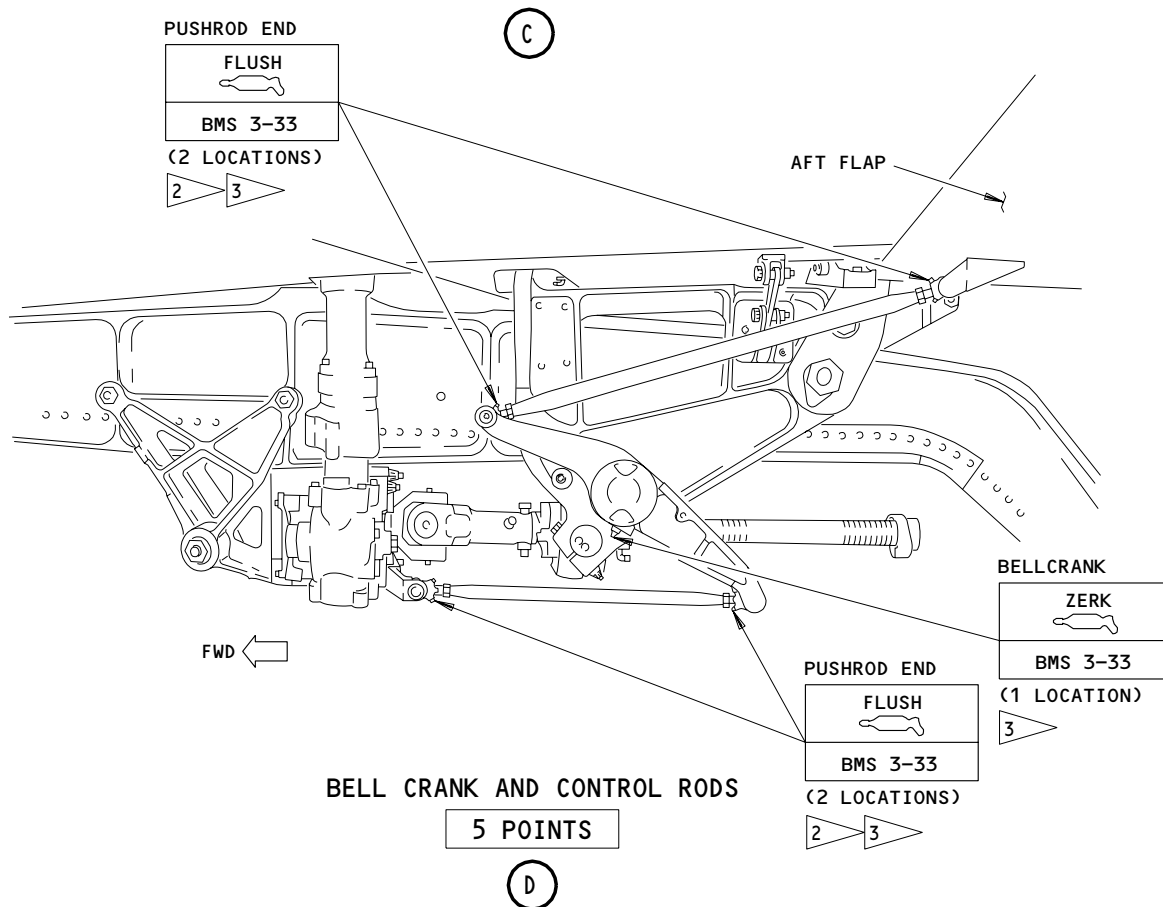
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FORWARD FAIRING ATTACH POINT AND FLAP TRACK
3 POINTS



BELL CRANK AND CONTROL RODS
5 POINTS

Lubrication for the Outboard TE Flaps
Figure 305 (Sheet 3)

EFFECTIVITY

ALL

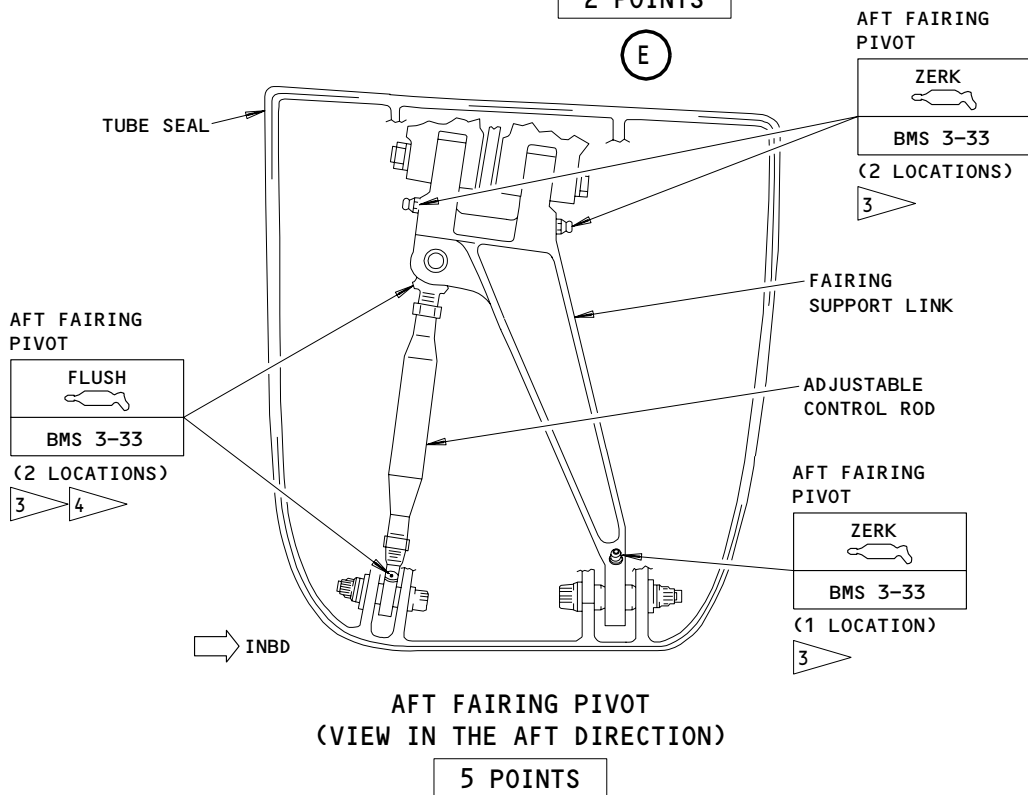
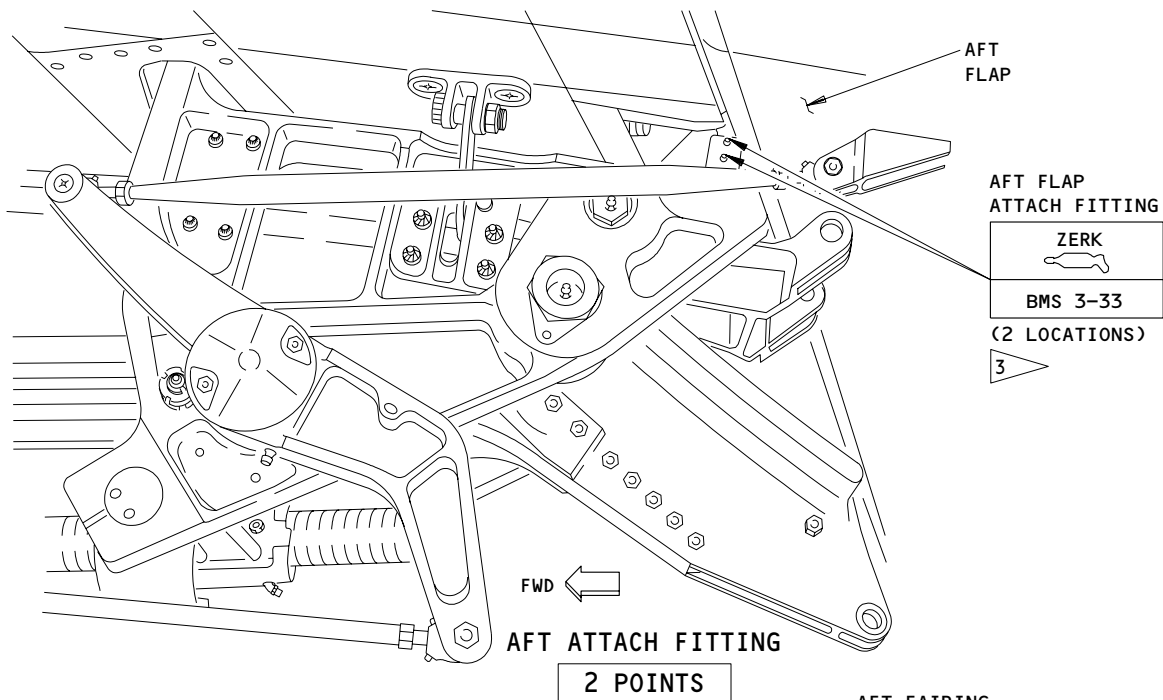
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BOEING
757
MAINTENANCE MANUAL



Lubrication for the Outboard TE Flaps
Figure 305 (Sheet 4)

EFFECTIVITY

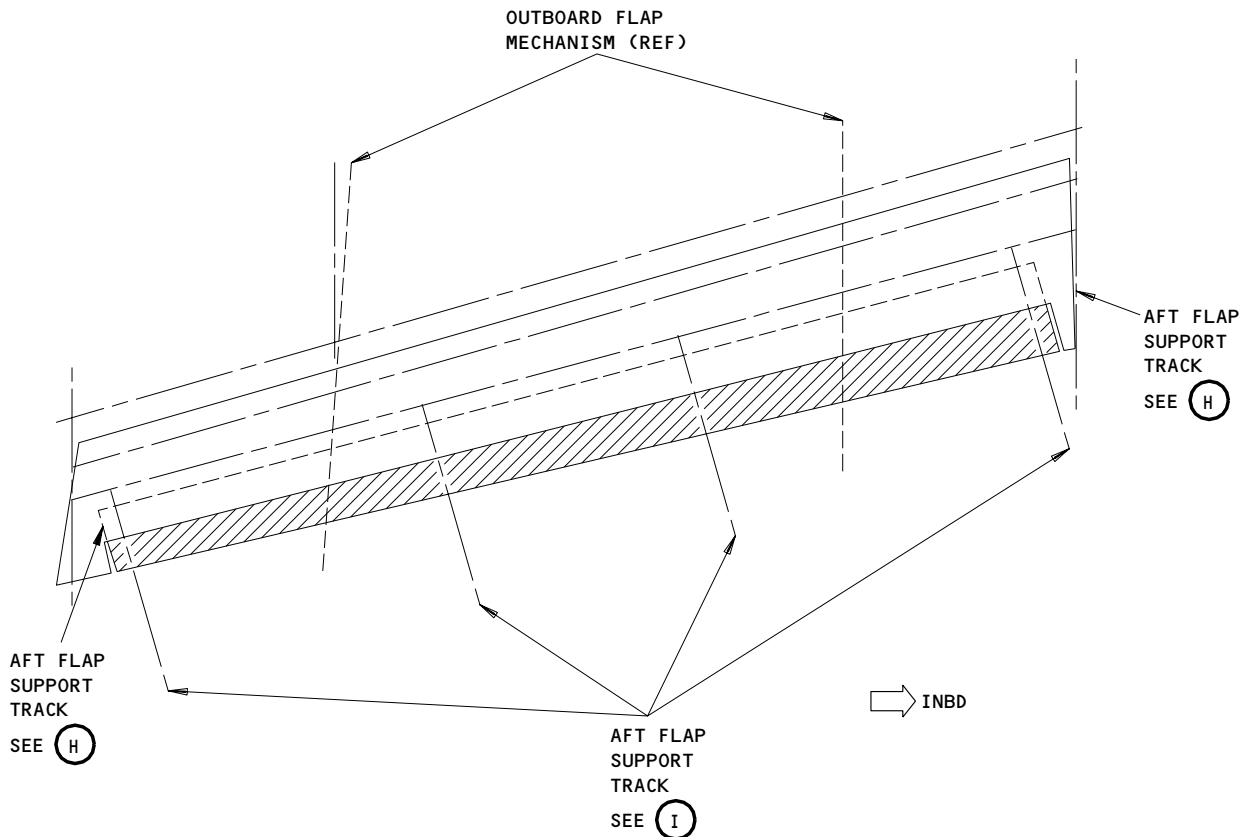
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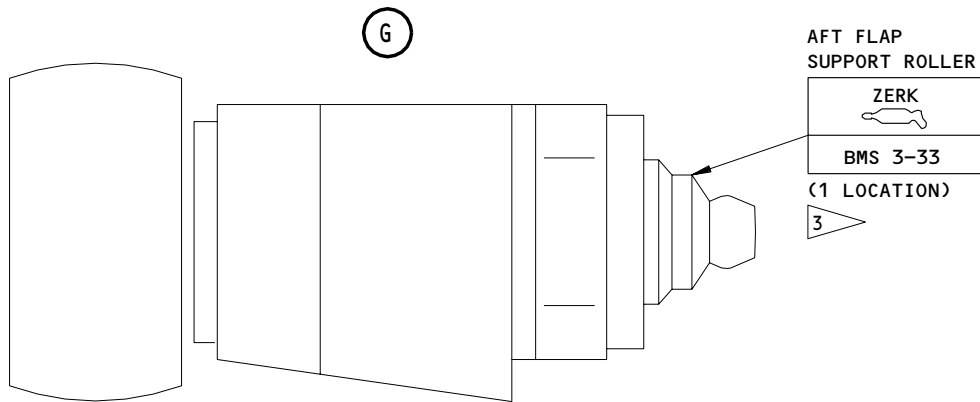
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OUTBOARD AFT FLAP
(TOP VIEW)



AFT FLAP SUPPORT TRACK
(2 ON EACH OUTBOARD AFT FLAP)

1 POINT

(H)

Lubrication for the Outboard TE Flaps
Figure 305 (Sheet 5)

EFFECTIVITY

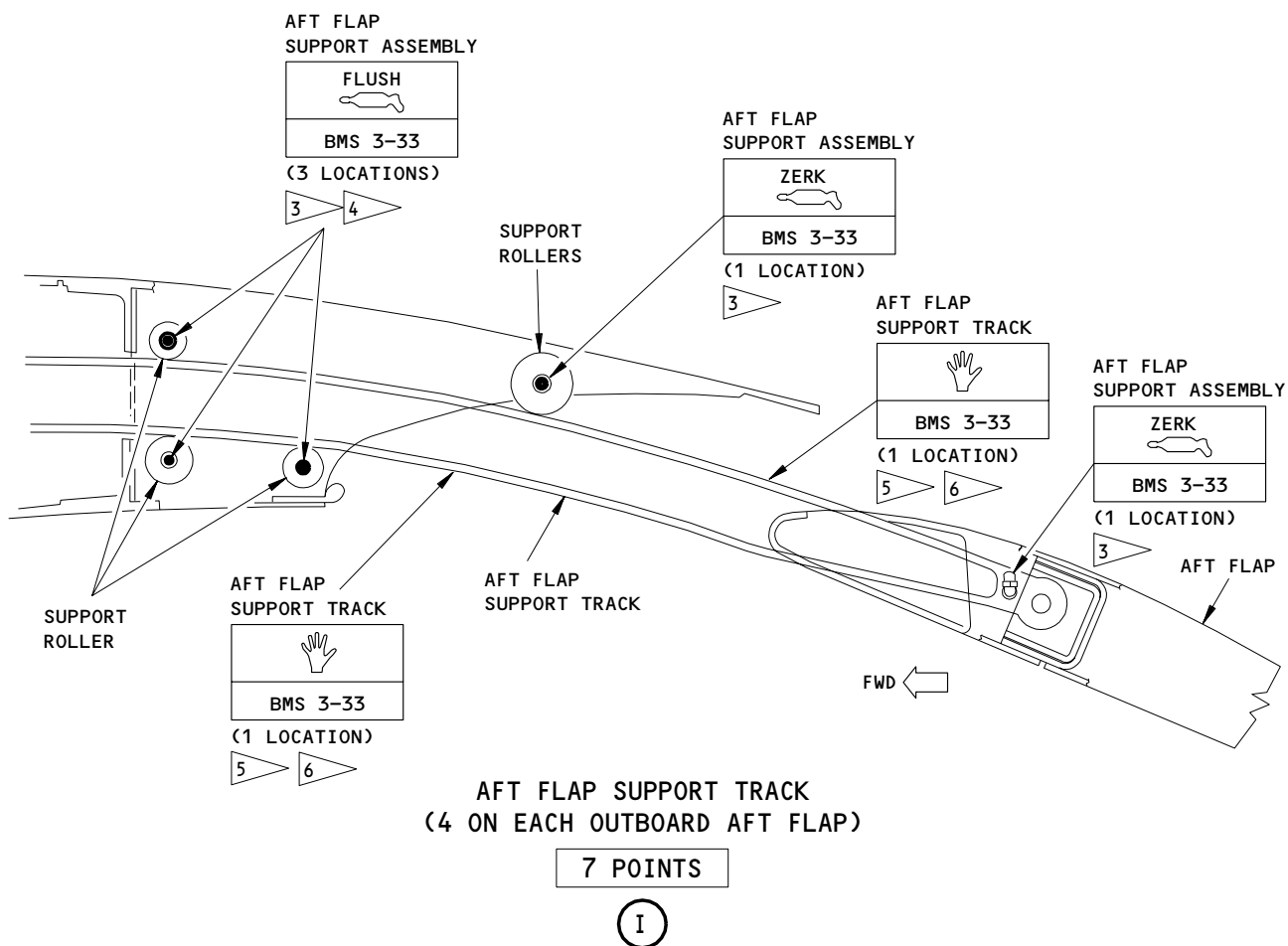
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80333



- 4 LUBRICATION POINTS CAN BE THE ZERK TYPE FITTINGS ON SOME AIRPLANES
- 5 APPLY A SUFFICIENT QUANTITY OF GREASE ALONG ALL OF THE ROLLER SURFACES
- 6 BMS 3-33 RECOMMENDED
BMS 3-24 ALTERNATE

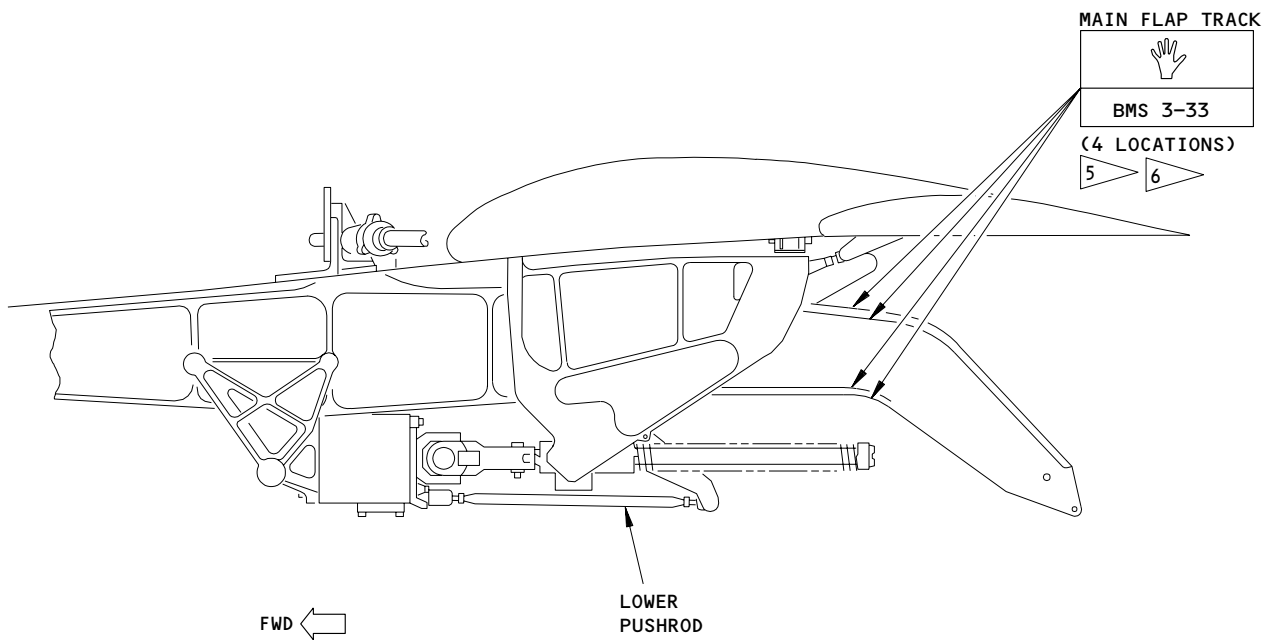
Lubrication for the Outboard TE Flaps
Figure 305 (Sheet 6)

EFFECTIVITY	
	ALL

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MAIN FLAP TRACK
(2 ON EACH OUTBOARD MAIN FLAP)
4 POINTS
A-A

Lubrication for the Outboard TE Flaps
Figure 305 (Sheet 7)

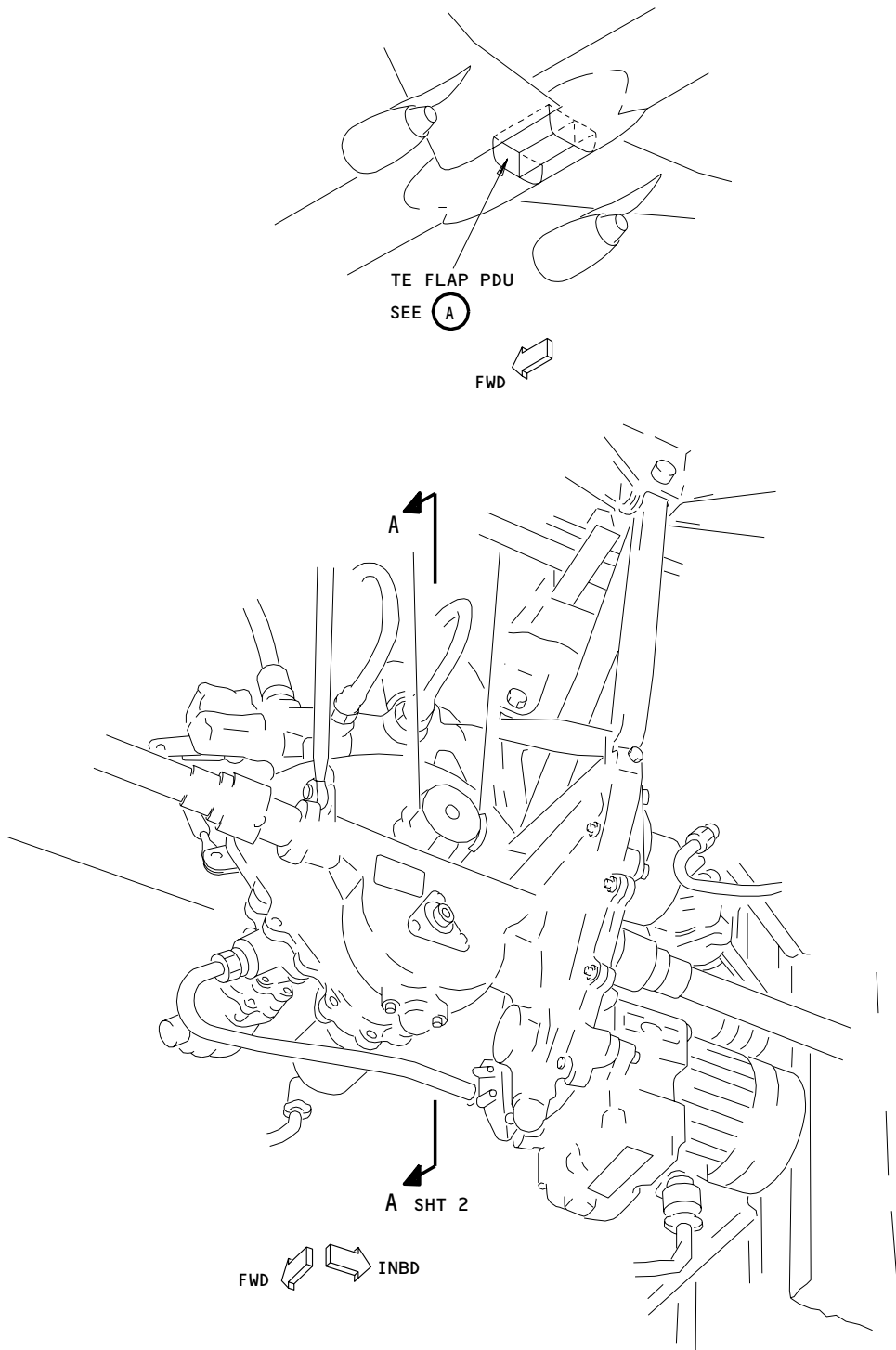
EFFECTIVITY	ALL
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TE FLAP POWER DRIVE UNIT (PDU)

(A)

Lubrication for the TE Flap Power Drive Unit Control Rods
Figure 306 (Sheet 1)

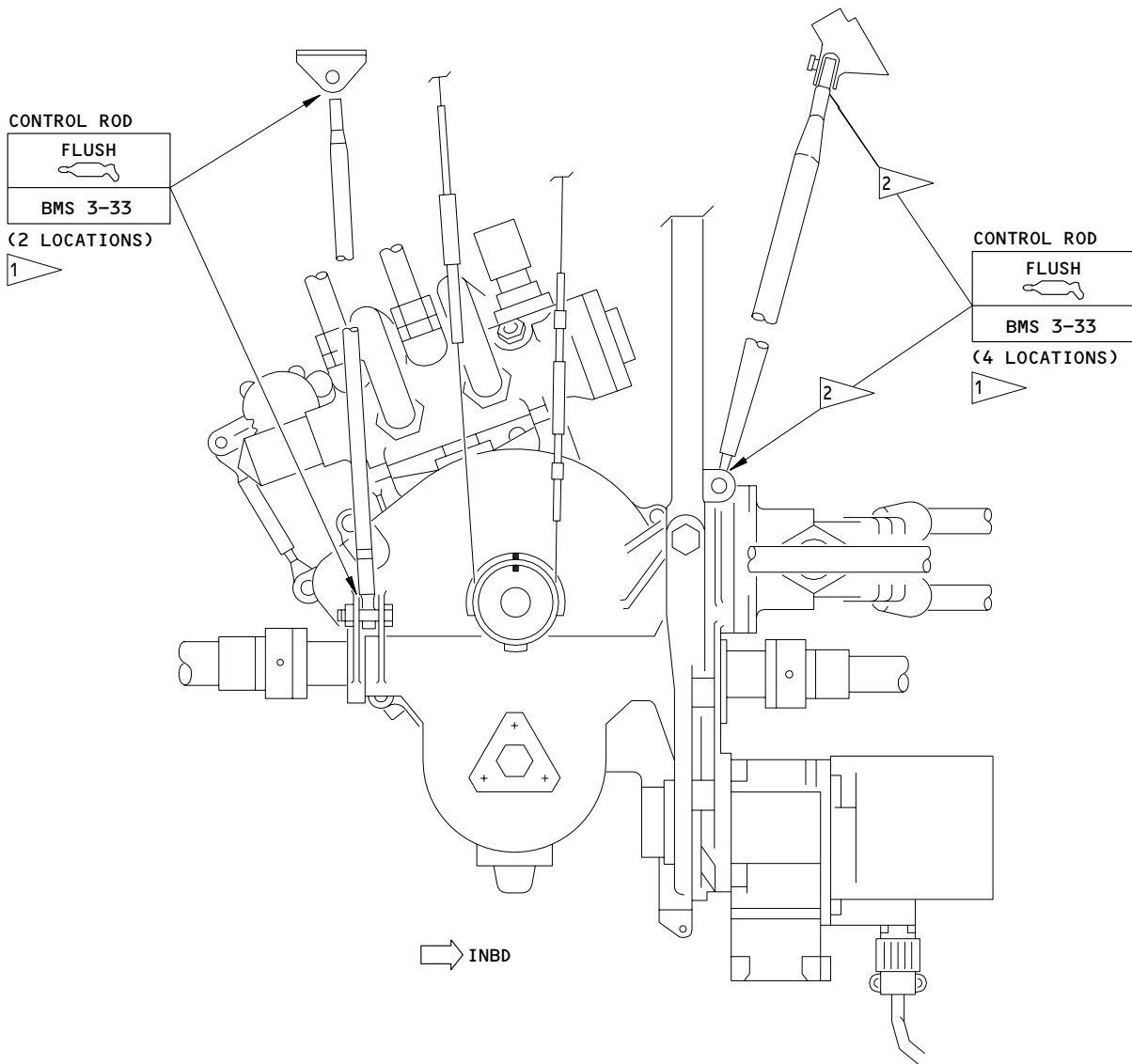
EFFECTIVITY

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TE FLAP PDU
(VIEW IN THE AFT DIRECTION)

6 POINTS

A-A

- 1 BMS 3-33 RECOMMENDED
MIL-G-21164 ALTERNATE
MIL-PRF-23827 ALTERNATE
- 2 ONE MORE LUBE POINT IS
FOUND ON THE FORWARD SIDE
(NOT SHOWN)

Lubrication for the TE Flap Power Drive Unit Control Rods
Figure 306 (Sheet 2)

EFFECTIVITY

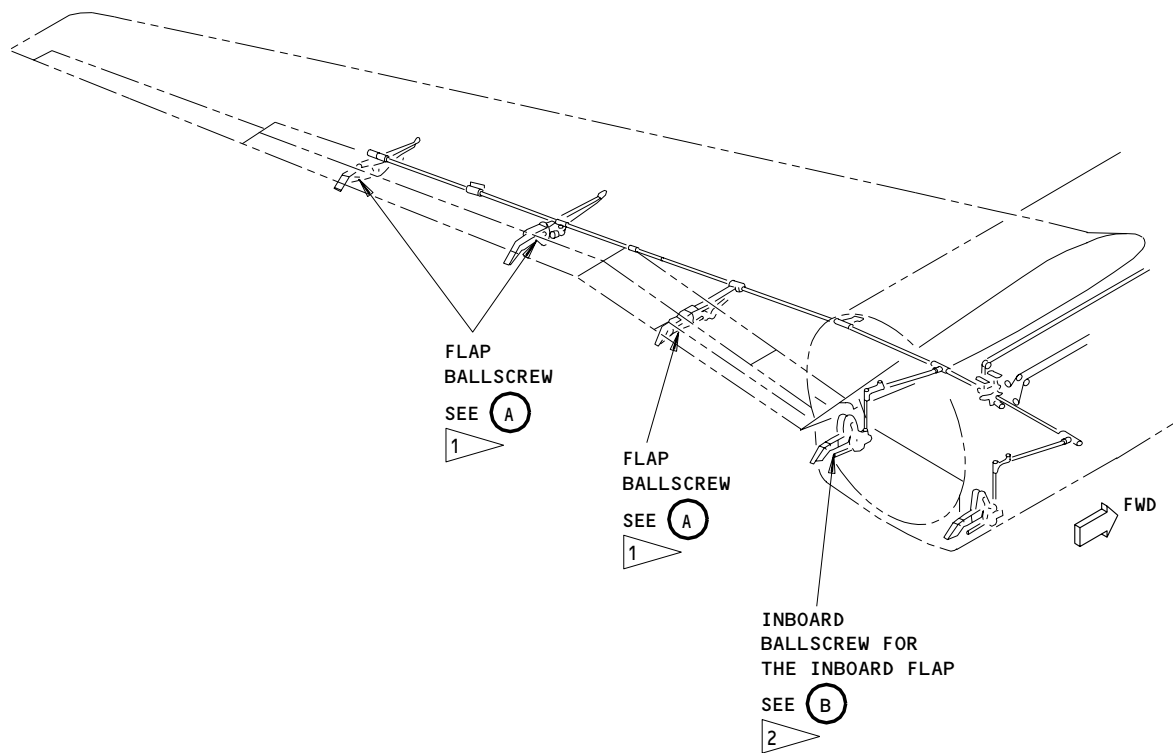
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LEFT WING
(RIGHT WING IS OPPOSITE)

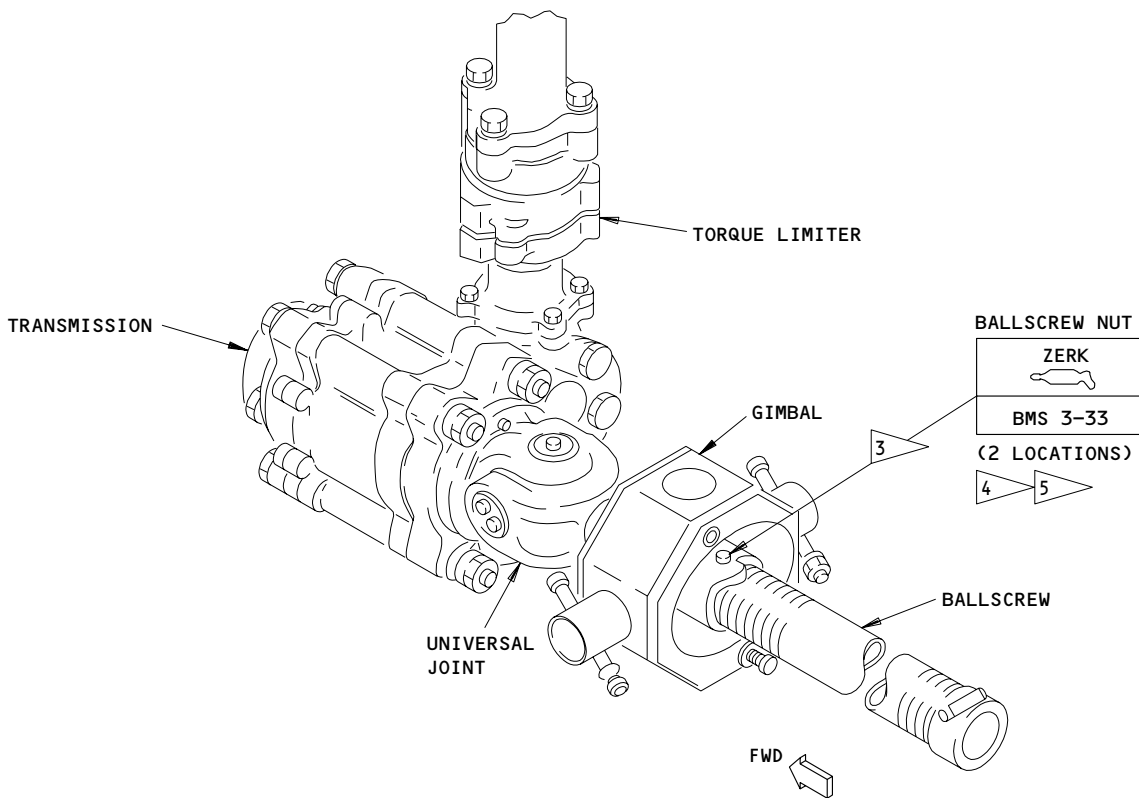
Lubrication for the TE Flap Ball screws
Figure 307 (Sheet 1)

EFFECTIVITY	ALL
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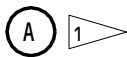
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FLAP BALLSCREW
(3 FLAP BALLSCREWS ON EACH WING)

2 POINTS



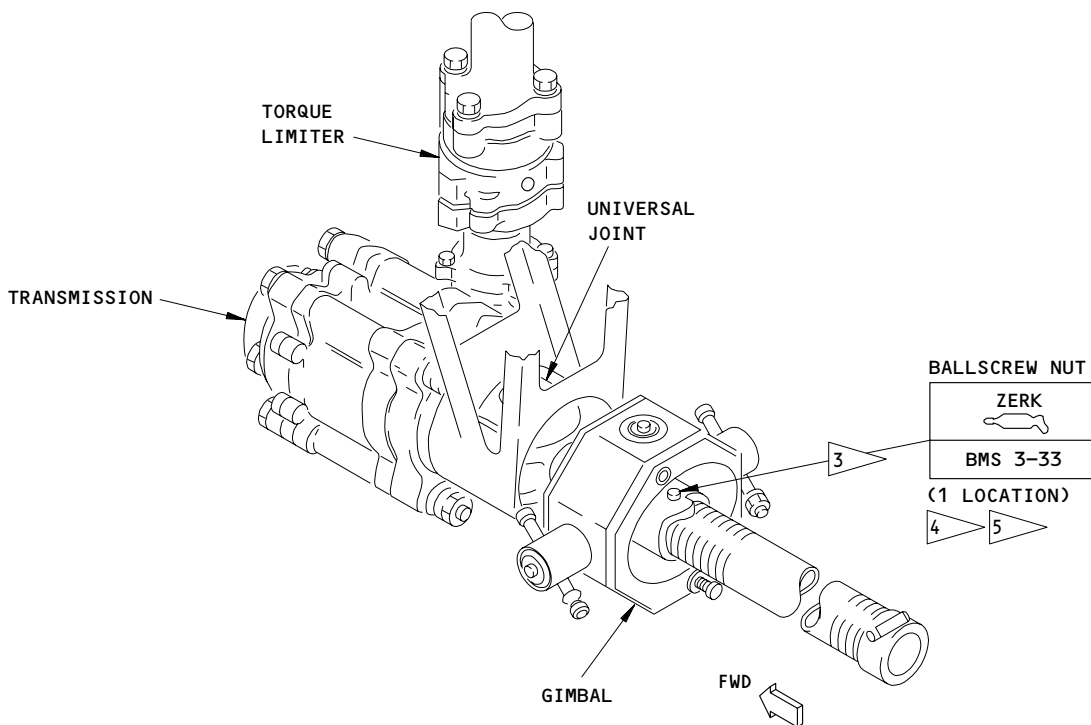
Lubrication for the TE Flap Ballscrews
Figure 307 (Sheet 2)

EFFECTIVITY	
	ALL

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**INBOARD BALLSCREW
(1 INBOARD BALLSCREW ON EACH WING)**

1 POINT

(B) 2

- 1 FULLY EXTEND THE FLAPS TO LUBRICATE
- 2 GET ACCESS THROUGH THE WHEEL WELL OF THE
- 3 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN). LUBE ONE SIDE ONLY
- 4 **CAUTION:** USE A HAND PUMP TO LUBRICATE THE BALLSCREW. PRESSURE PUMPS MAY DAMAGE THE SEALS AND CAUSE FAILURE.

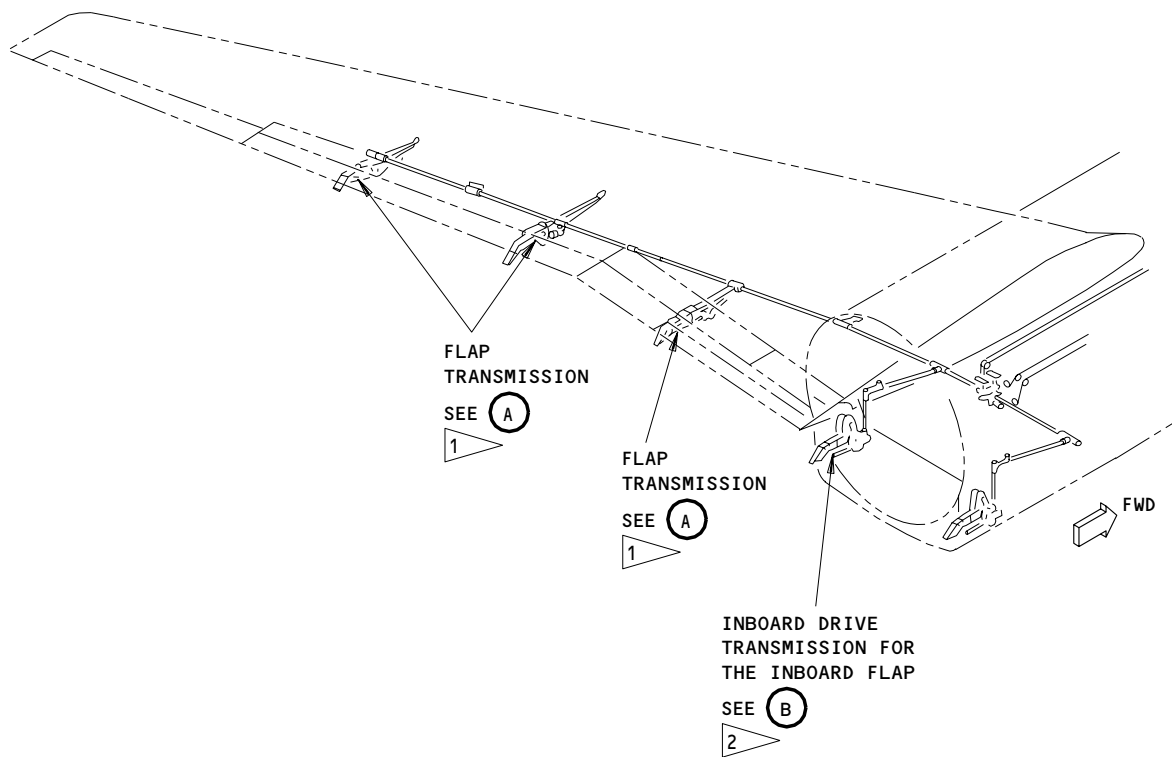
LUBRICATE UNTIL GREASE FLOWS OUT FROM THE BLEED HOLE.

- 5 BMS 3-33 RECOMMENDED
MIL-PRF-23827 ALTERNATE

Lubrication for the TE Flap Ballscrews
Figure 307 (Sheet 3)

EFFECTIVITY	ALL
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LEFT WING
(RIGHT WING IS OPPOSITE)

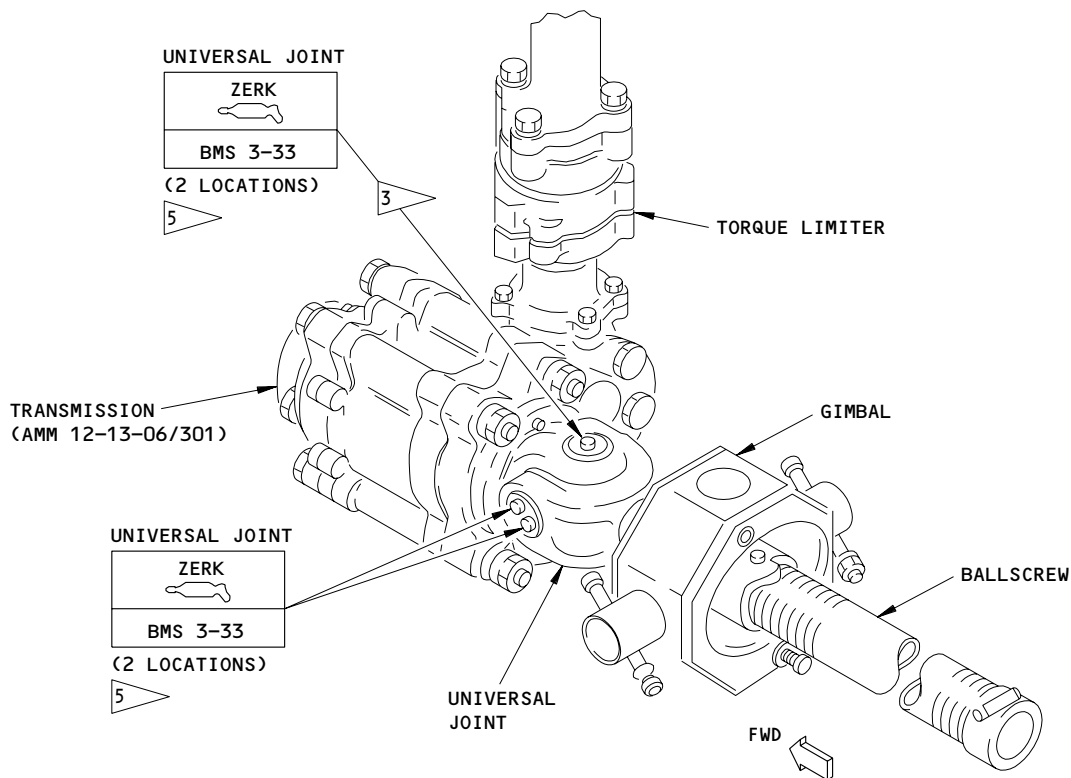
TE Flap Universal Joint and Gimbal Servicing
Figure 308 (Sheet 1)

EFFECTIVITY	ALL
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**FLAP TRANSMISSION
(3 FLAP TRANSMISSIONS ON EACH WING)**

4 POINTS

A 1

- 1 FULLY EXTEND THE FLAPS TO LUBRICATE
- 2 GET ACCESS THROUGH THE WHEEL WELL OF THE MAIN GEAR TO LUBRICATE
- 3 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 4 USE THE NEEDLE ADAPTER ON THE GREASE GUN. INSERT THE NEEDLE ADAPTER THROUGH THE TRANSMISSION SUPPORT TO GET TO THE LUBE POINT. TURN THE U-JOINT WITH THE ALTERNATE TE-FLAP DRIVE (AMM 27-51-00/201) TO GET TO ALL U-JOINT LUBE POINTS
- 5 BMS 3-33 RECOMMENDED
MIL-PRF-23827 ALTERNATE

TE Flap Universal Joint and Gimbal Servicing
Figure 308 (Sheet 2)

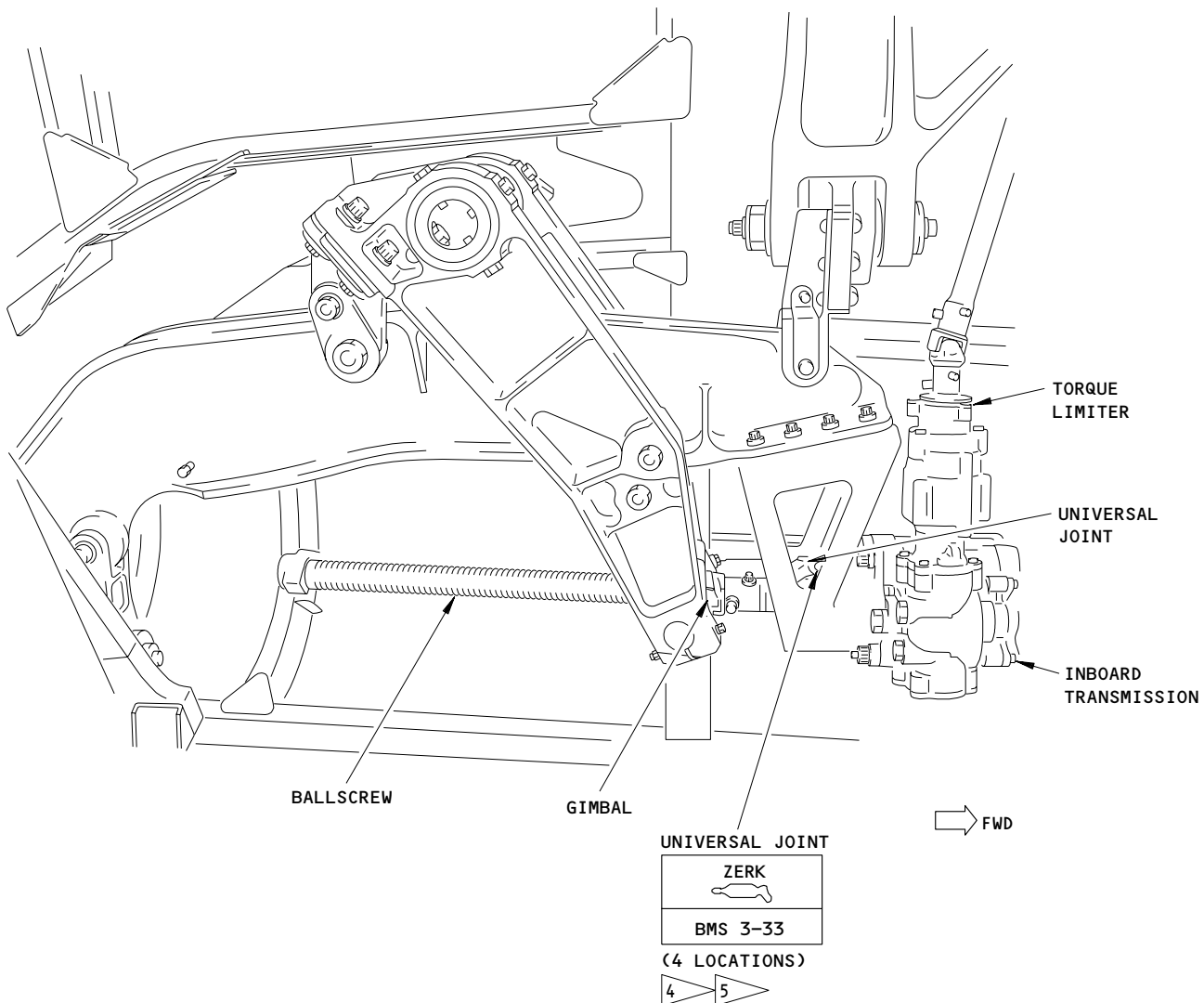
EFFECTIVITY

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INBOARD DRIVE TRANSMISSION FOR THE INBOARD FLAP

4 POINTS

(B) 2

TE Flap Universal Joint and Gimbal Servicing
Figure 308 (Sheet 3)

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SPOILER/SPEEDBRAKE CONTROL SYSTEM – SERVICING

1. General

- A. This procedure supplies the data necessary to lubricate the Spoiler/Speedbrake control system.

TASK 12-21-10-613-001

2. Spoiler/Speedbrake Control System – Lubrication

A. Equipment

- (1) Adapter, Spoiler Hinge Lubrication – B12006-1

B. Consumable Materials

- (1) D00633 Grease, BMS 3-33 (Recommended)
(2) D00013 Grease, MIL-PRF-23827 (Alternate)
(3) D00015 Grease, BMS 3-24 (Alternate)

C. References

- (1) 27-51-00/201, Trailing Edge Flap System
(2) 27-61-00/201, Spoiler/Speedbrake Control System
(3) 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

D. Access

(1) Zones

- 565/665 Spoilers number 1 and 12
564/664 Spoilers number 2 and 11
563/663 Spoilers number 3 and 10
562/662 Spoilers number 4 and 9
554/654 Spoilers number 5 and 8
553/653 Spoilers number 6 and 7

E. Prepare for the Lubrication

S 863-002

- (1) Extend the trailing edge flaps.

S 043-003

- (2) Do the Deactivation Procedure for the flaps (Ref 27-51-00/201).

S 863-008

WARNING: MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (3) Do the Spoiler/Speedbrake Deactivation Procedure (Ref 27-61-00/201).

S 863-005

- (4) Remove the power from the left, right, and center hydraulic systems (Ref 29-11-00/201).

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F. Procedure

S 863-013

- (1) Remove the lock from the PCA that you will lubricate.

NOTE: Re-install the lock after you finish with the lubrication.

S 863-009

WARNING: MAKE SURE YOU DO NOT SUPPLY HYDRAULIC POWER TO THE PCA DURING MAINTENANCE. IF YOU SUPPLY HYDRAULIC POWER, THE SPOILER PANEL WILL RETRACT IMMEDIATELY AND CAN CAUSE INJURY TO PERSONS.

- (2) Operate the manual release cam, on the bottom of the PCA, and lift the spoiler (Fig. 301).

S 643-007

- (3) Apply a force to the lubrication equipment as shown (Fig. 302) and move the spoiler until the bearings have grease. This will occur when you turn the inner race approximately 30 to 45 degrees away from the outer race of the link bearings.

NOTE: When you move the spoiler, the ports in the outer race align with the grooves in the inner race ball. Grease will flow into the bearing when the ports are aligned with the grooves.

G. Put the Airplane Back to Its Usual Condition

S 443-011

- (1) Do the Spoiler/Speedbrake activation procedure (Ref 27-61-00/201).

S 443-010

- (2) Do the activation procedure for the flaps (Ref 27-51-00/201).

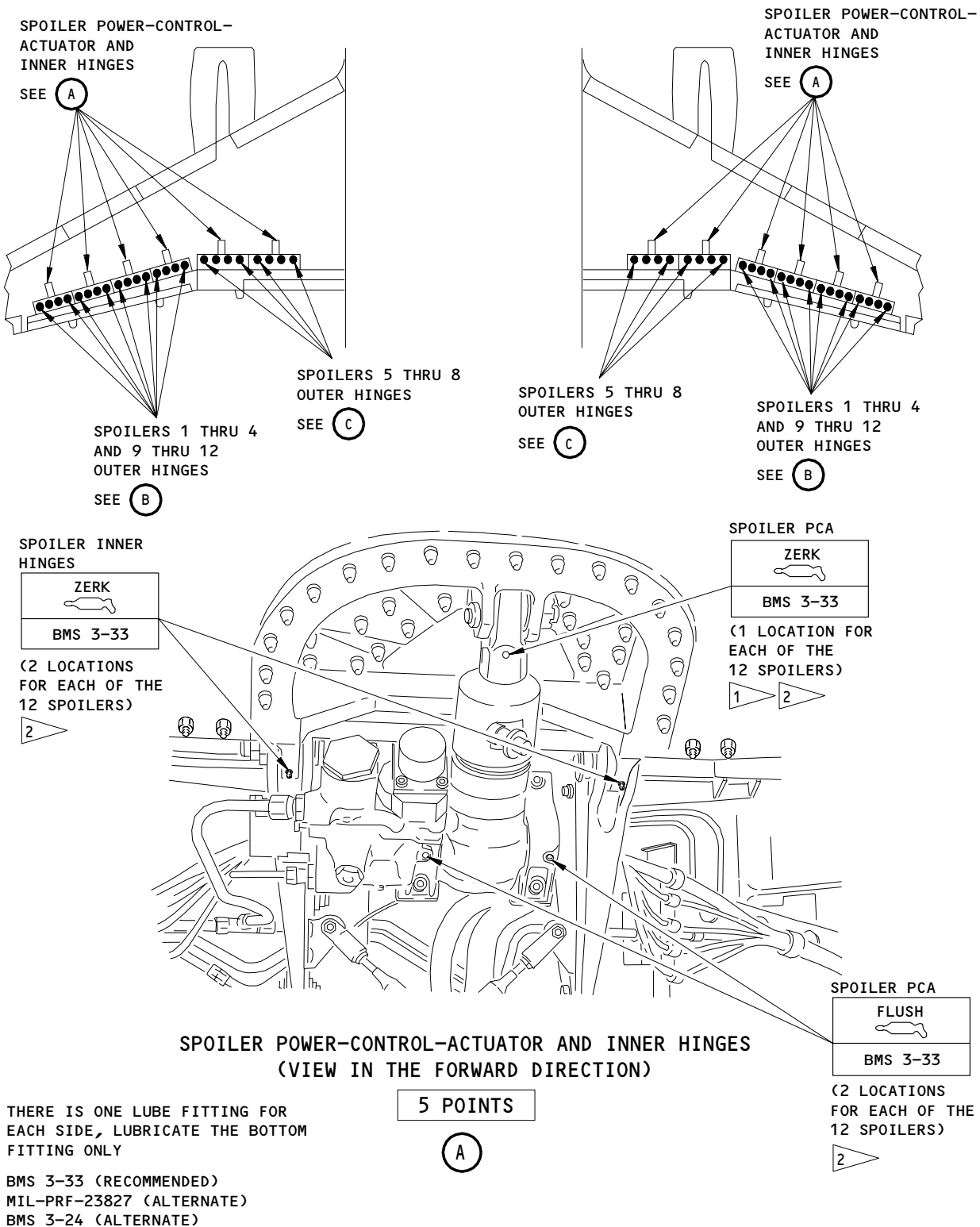
EFFECTIVITY

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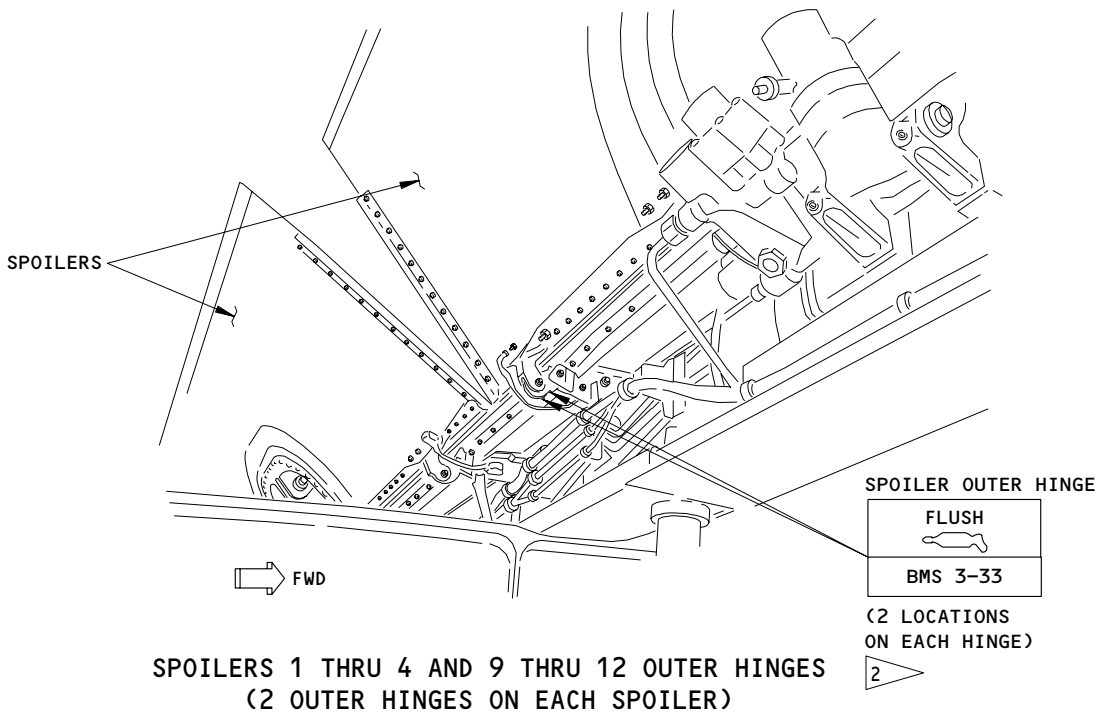
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Spoiler/Speedbrake Control System Lubrication
Figure 301 (Sheet 1)

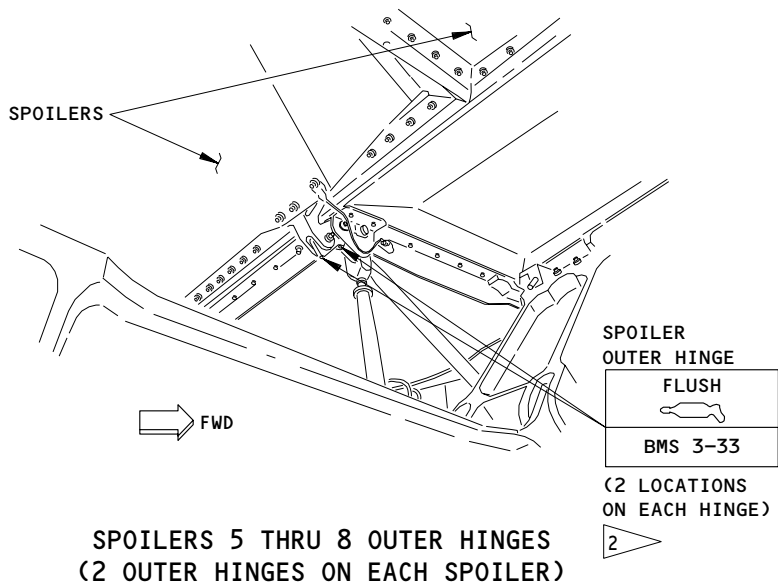
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2 POINTS

(B)



2 POINTS

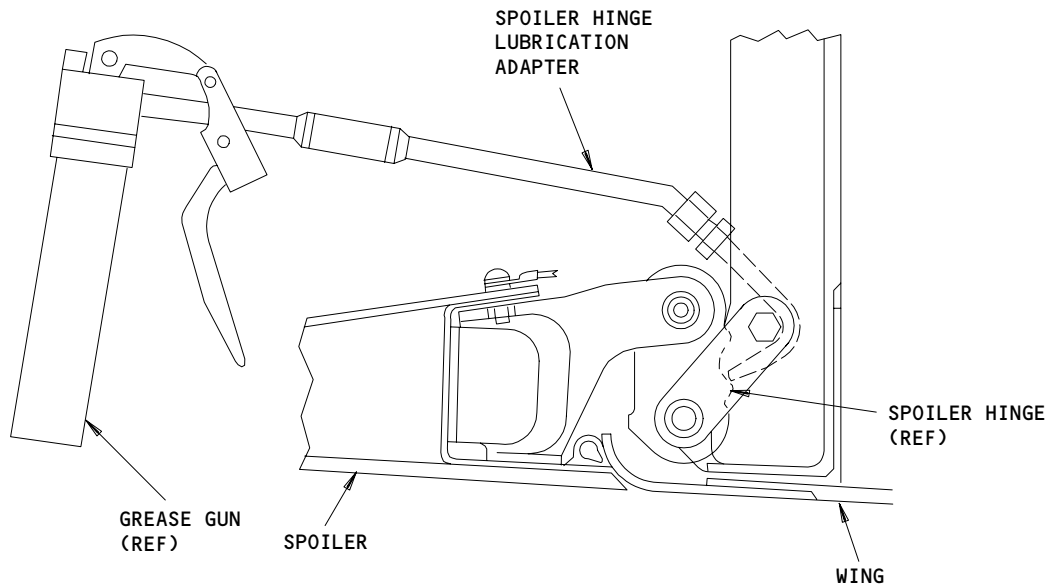
(C)

2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
BMS 3-24 (ALTERNATE)

Spoiler/Speedbrake Control System Lubrication
Figure 301 (Sheet 2)

EFFECTIVITY	ALL
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Spoiler Hinge Lubrication Adapter
Figure 302

EFFECTIVITY	
	ALL

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NOSE GEAR AND ACTUATING MECHANISMS – SERVICING

1. General

- A. This procedure contains the data necessary to lubricate the nose landing gear and the actuating mechanisms.

TASK 12-21-12-603-001

2. Lubricate the Nose Landing Gear and the Actuating Mechanisms

A. Equipment

- (1) Towing Lever Lockpin - A09003-1

B. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00013 Grease - MIL-PRF-23827 (Alternate)

C. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks
(2) AMM 32-00-20/201, Landing Gear Downlocks

D. Access

- (1) Location Zones
711 Nose Landing Gear

E. Prepare to Lubricate the Nose Landing Gear

S 493-002

- (1) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-003

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

- (2) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

S 863-009

- (3) Make sure the steering collar is in the center.

EFFECTIVITY

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S 863-010

- (4) Put the towing lever in the TOWING position.

S 493-011

- (5) Install the towing lever lockpin.

F. Lubricate the Nose Landing Gear and the Actuating Mechanisms

S 643-007

CAUTION: DO NOT USE A PRESSURE OF MORE THAN 3000 PSI WHEN YOU LUBRICATE THE NOSE LANDING GEAR. A PRESSURE MORE THAN 3000 PSI CAN CAUSE THE LUBRICATION FITTING TO BLOW OFF.

- (1) If a fitting does blow off, do the steps that follow:
- (a) Make sure there is not a blockage or unwanted material in the lubrication path.
 - (b) Install a new lubrication fitting (AMM 20-10-29/401).

S 643-005

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. THE GREASE GUN CAN CAUSE DAMAGE TO THE FITTING.

CAUTION: DO NOT USE THE METERING VALVE MODULE AS A STEP WHEN YOU LUBRICATE THE NOSE LANDING GEAR. IF YOU USE THE VALVE AS A STEP, YOU CAN CAUSE DAMAGE TO THE COMPENSATOR OF THE METERING VALVE.

CAUTION: FOR LUBRICATION OF THE BEARINGS ON THE NWS ACTUATOR TRUNNION USE A MANUAL GREASE GUN OR RESTRICT THE GREASE FLOW RATE TO 0.65 LB/MIN MAXIMUM. THIS WILL PREVENT POSSIBLE BEARING SEAL DAMAGE.

- (2) Lubricate the nose landing gear and the actuating mechanisms as shown on Fig. 301.

G. Put the Airplane Back to Its Usual Condition

S 093-008

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

- (1) Remove the door locks and close the doors (AMM 32-00-15/201).

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- S 863-012
- (2) Make sure the steering collar is accurately in the center.
- S 093-013
- (3) Remove the towing lever lockpin.
- S 863-014
- (4) Make sure the towing lever moves to the NORMAL position.

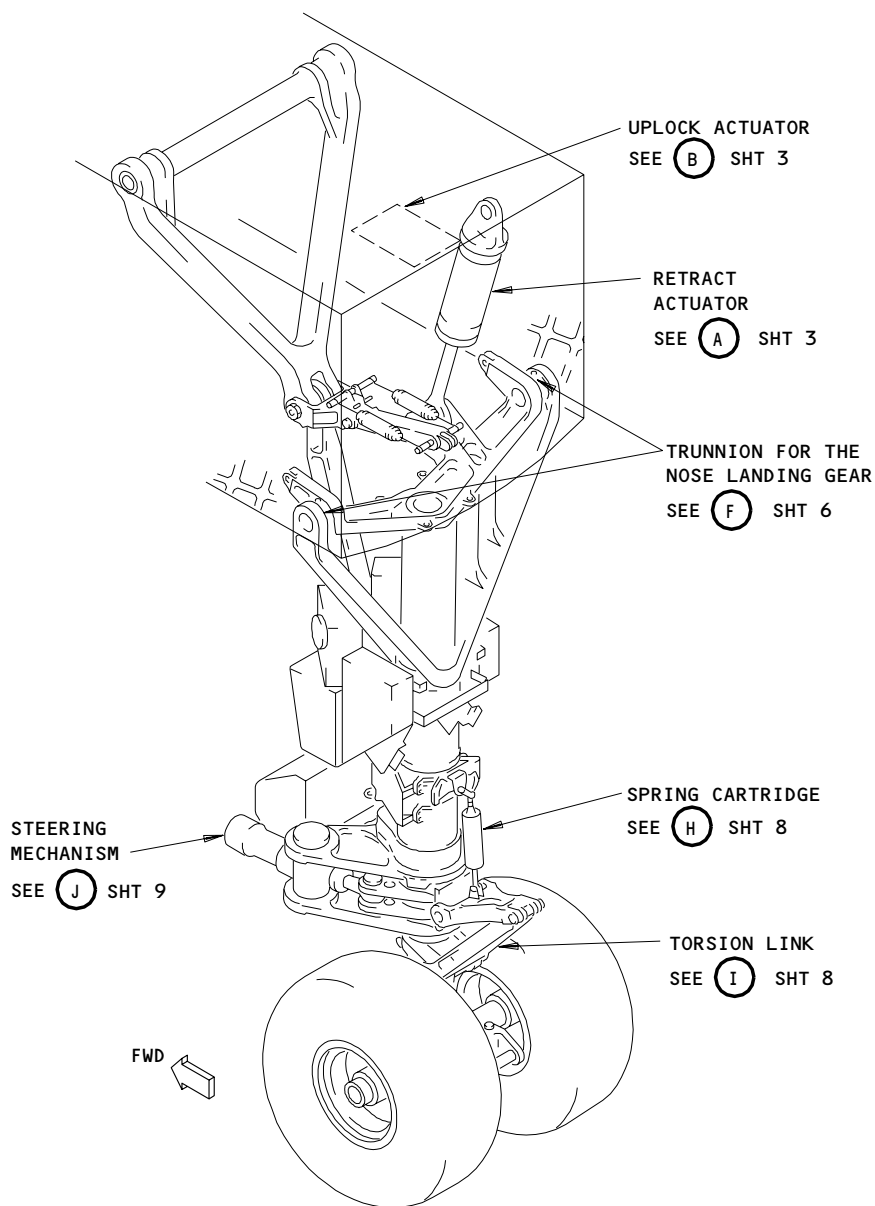
EFFECTIVITY

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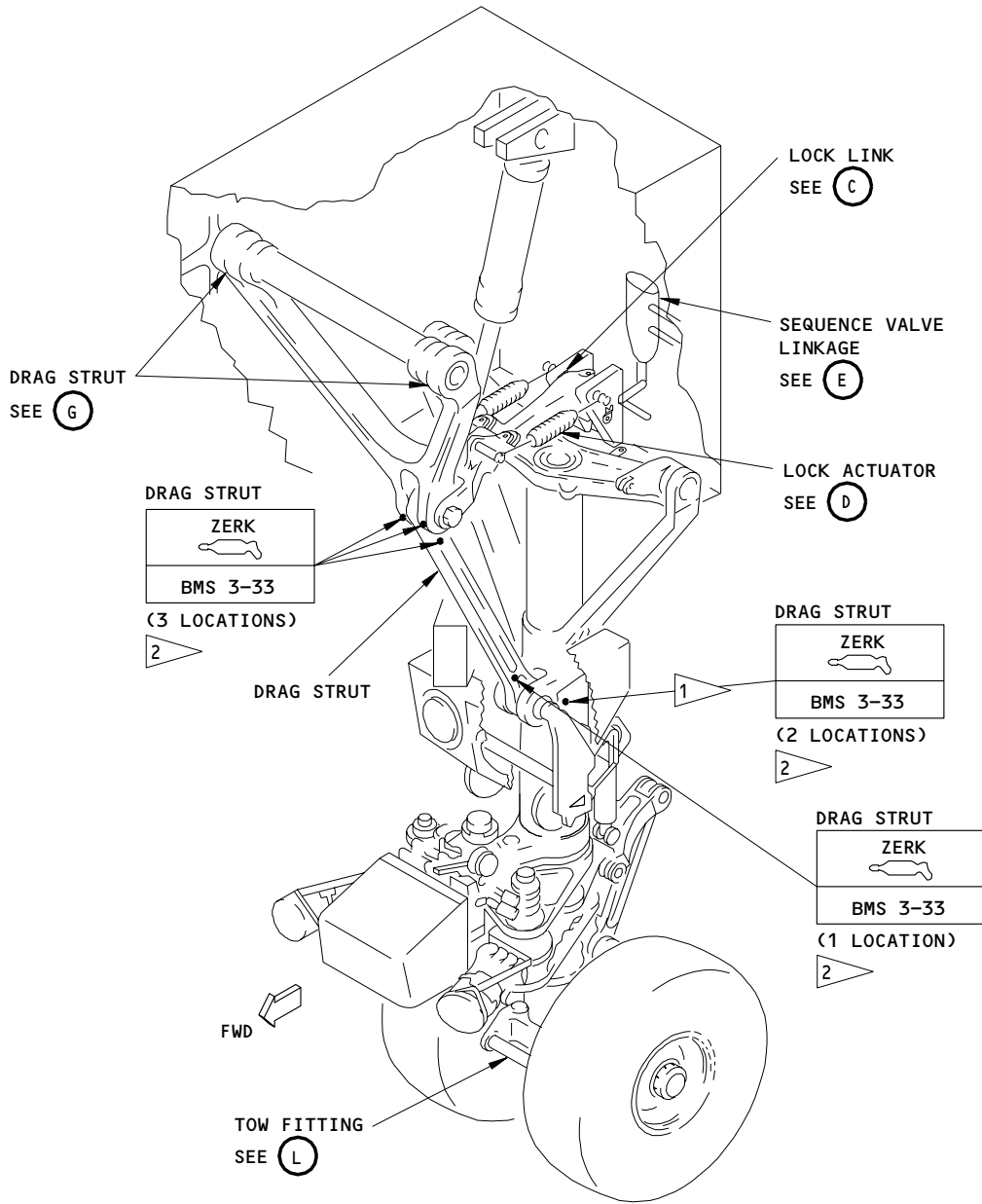
Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 1)

EFFECTIVITY	
	ALL

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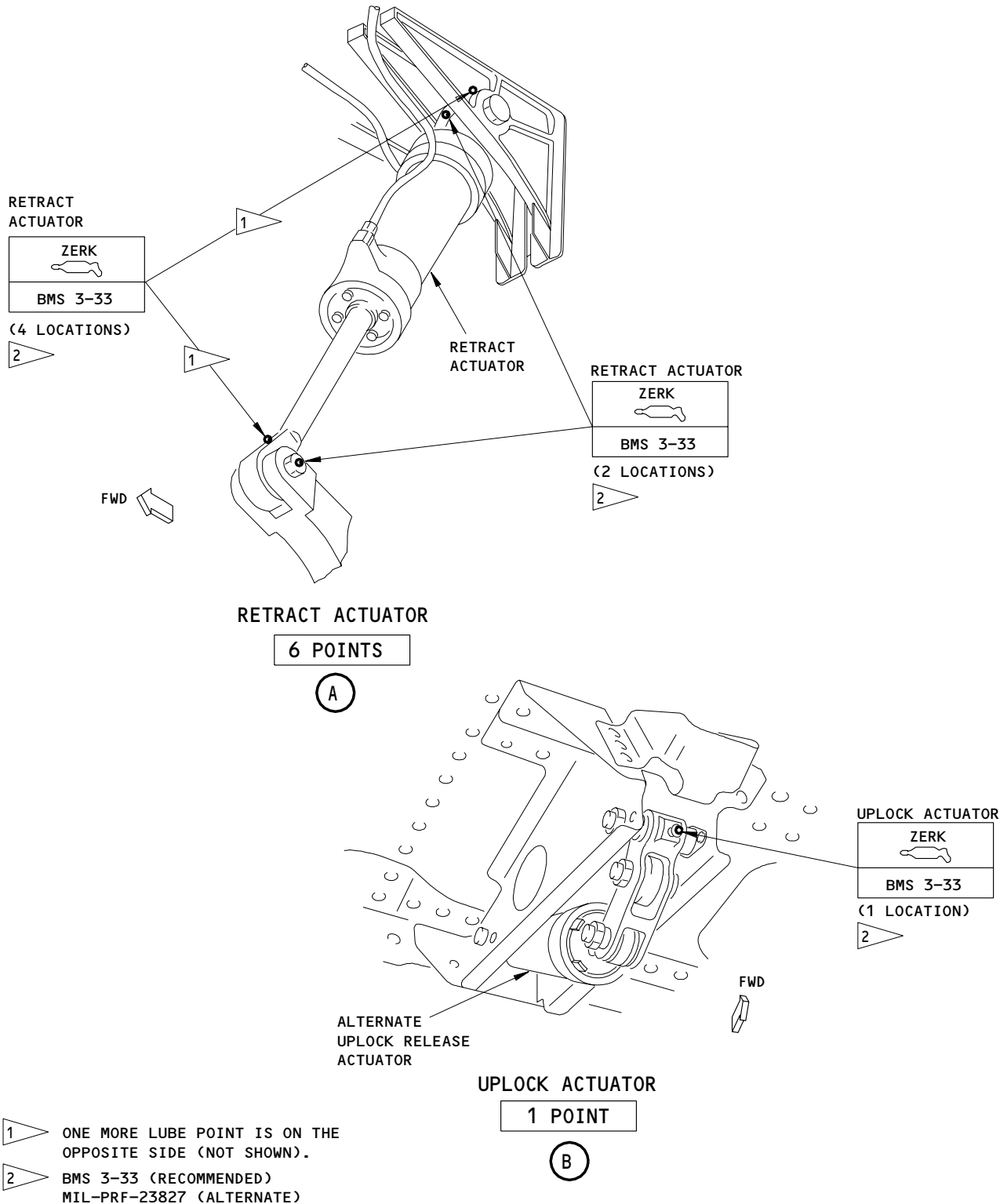
6 POINTS

- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 2)

EFFECTIVITY	ALL
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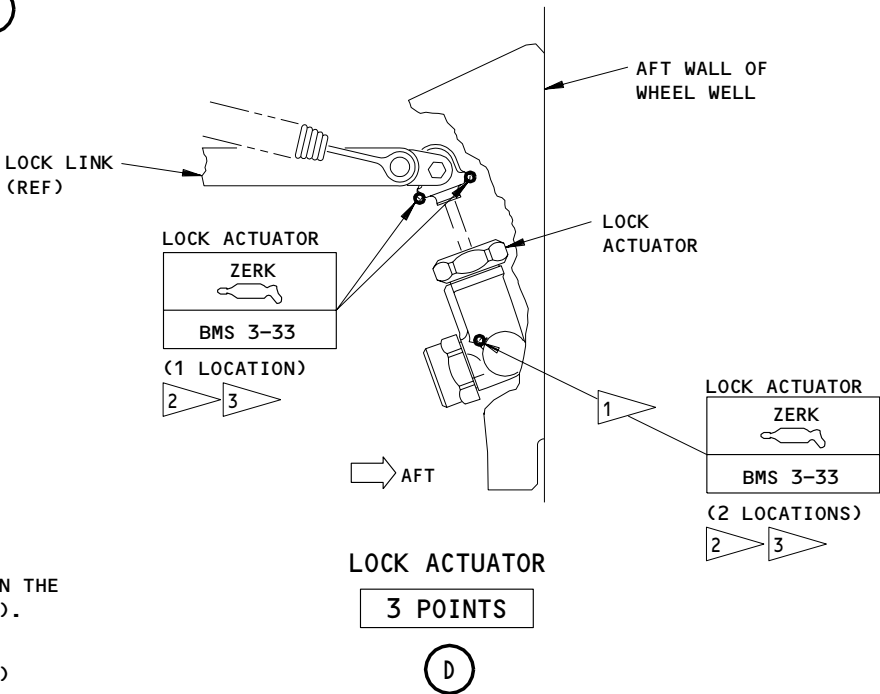
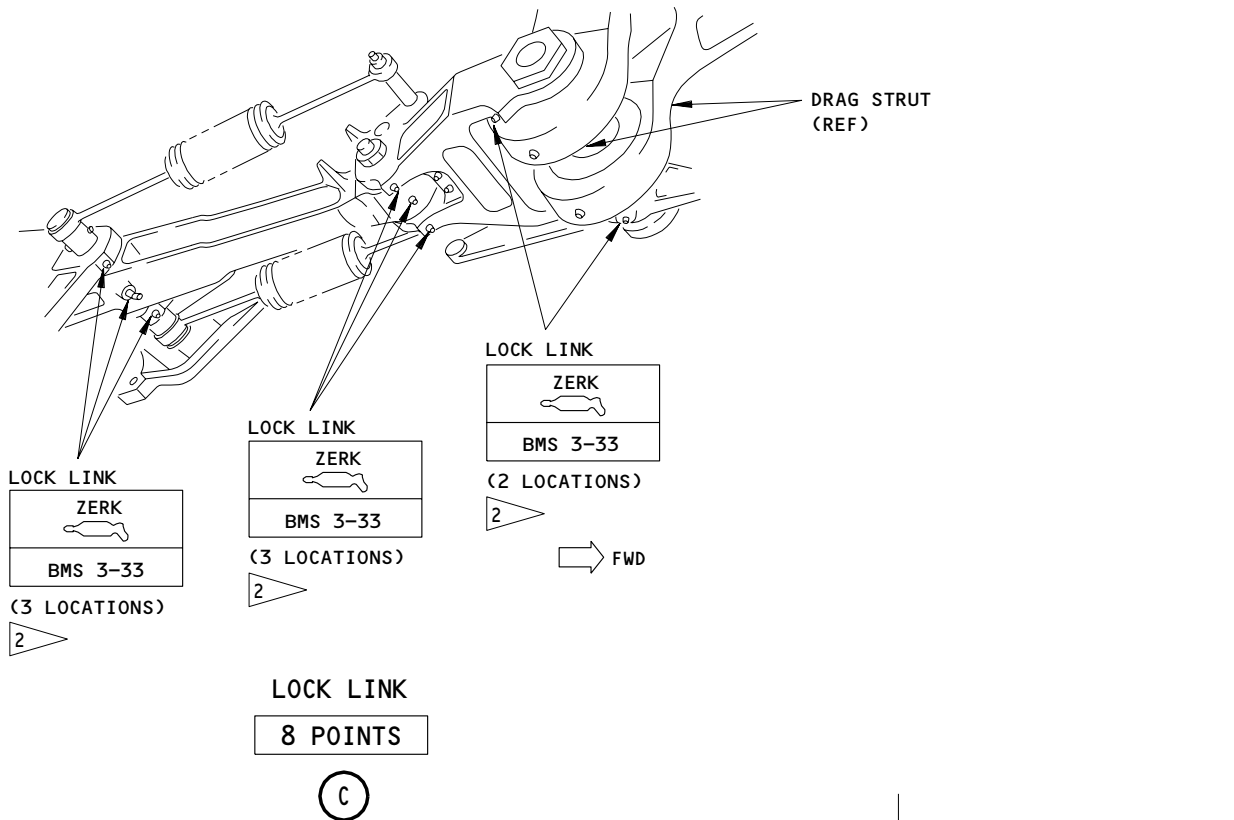
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Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 3)

EFFECTIVITY	ALL
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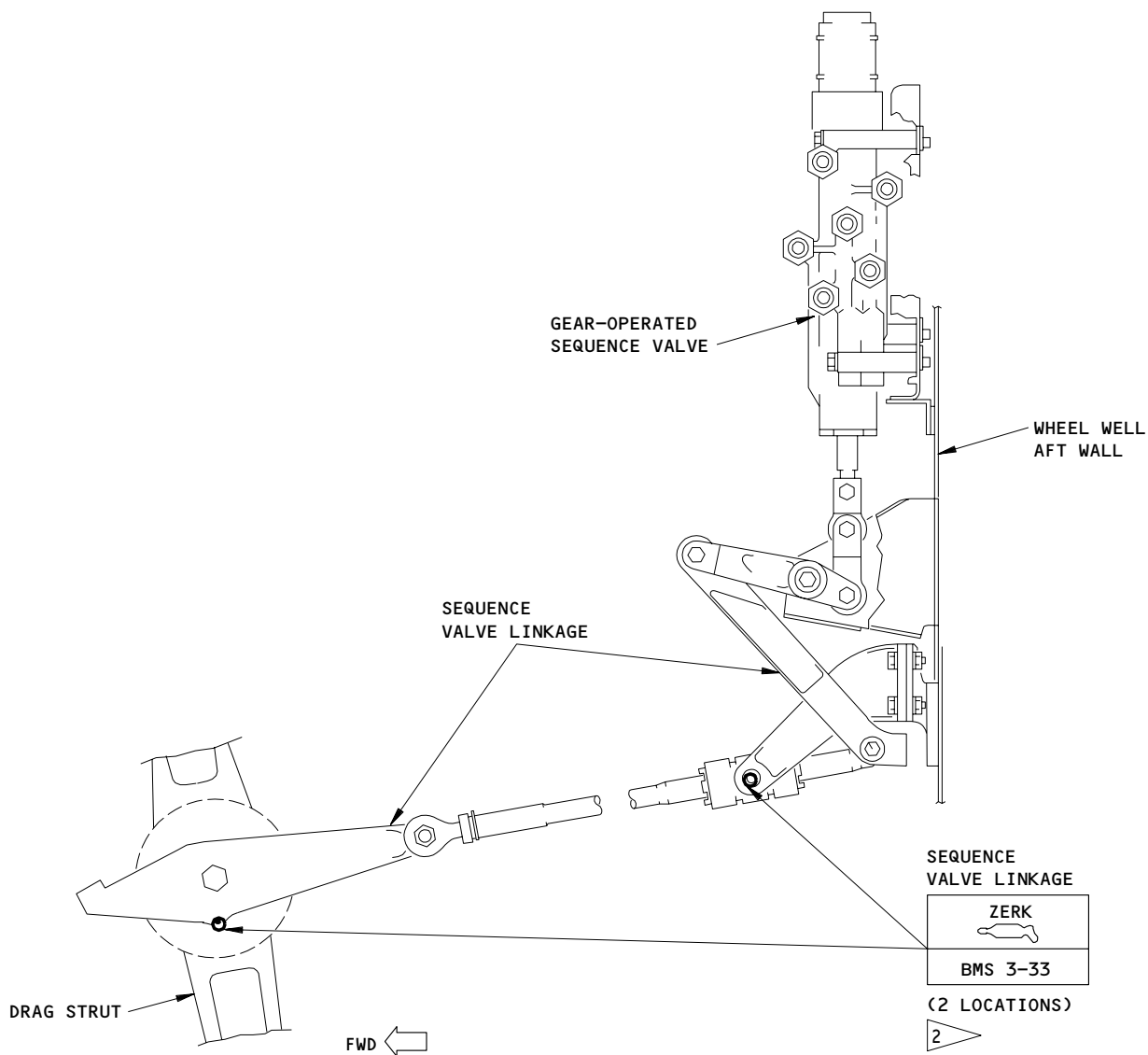


- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
- 3 LUBE FITTING ON THE TWO SIDES OF THE BEARING, LUBE ONE FITTING ONLY

Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 4)

EFFECTIVITY	ALL
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SEQUENCE VALVE LINKAGE

2 POINTS

(E)

2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

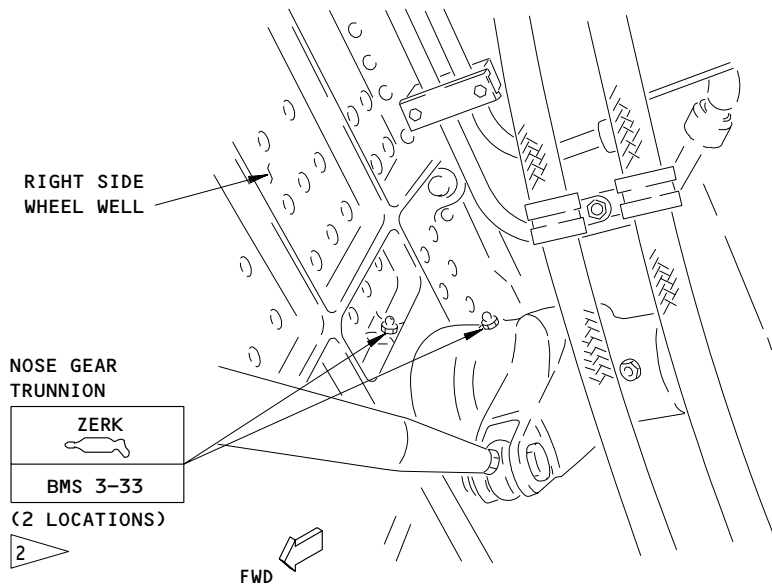
Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 5)

EFFECTIVITY	ALL
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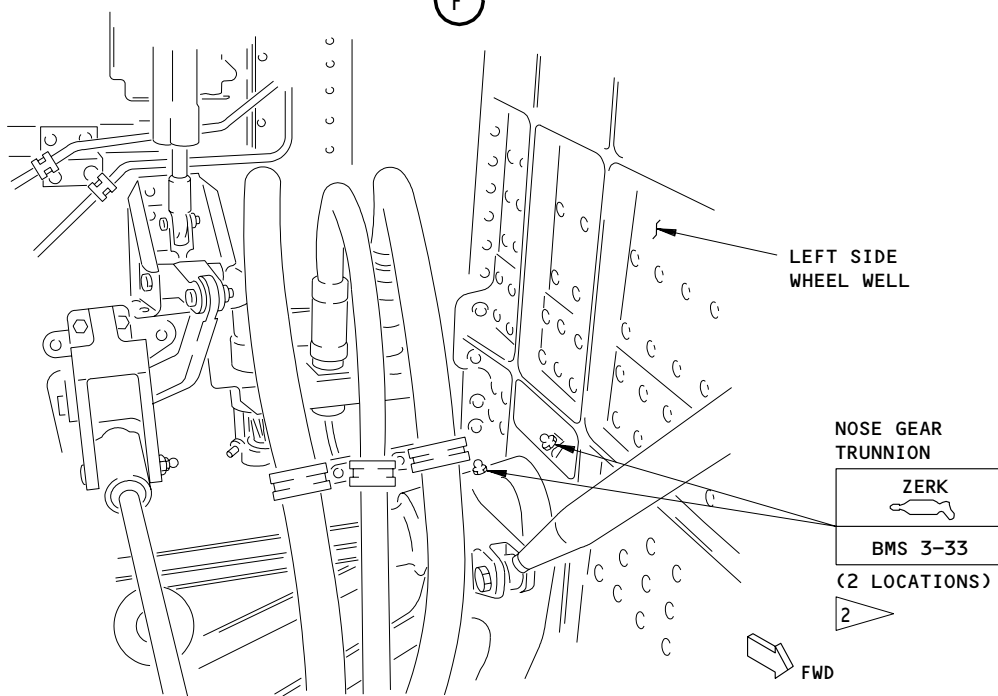
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TRUNNION (RIGHT SIDE)

2 POINTS

(F)



TRUNNION (LEFT SIDE)

2 POINTS

(F)

2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 6)

EFFECTIVITY

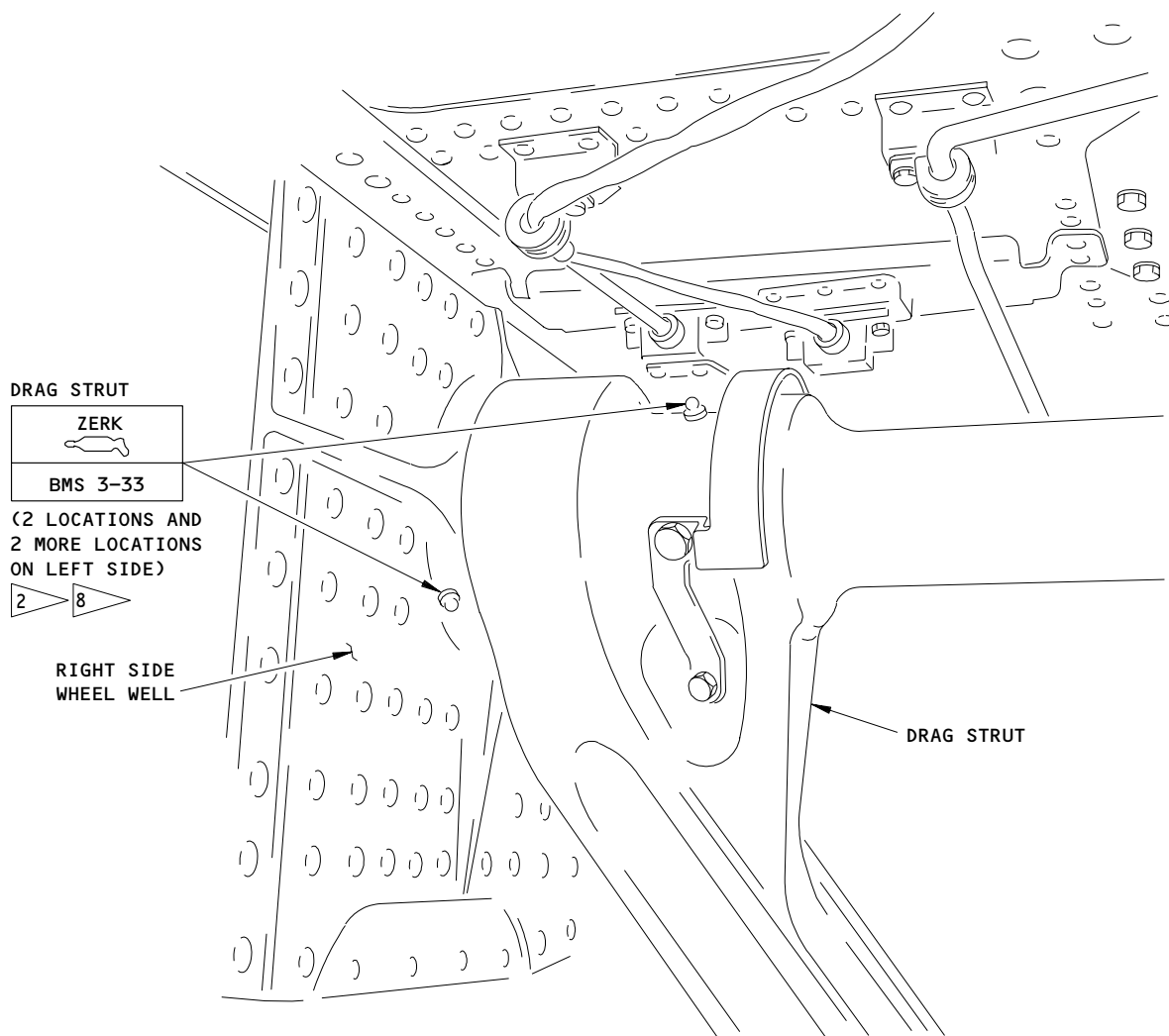
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**DRAG STRUT
(RIGHT SIDE IS SHOWN,
LEFT SIDE IS OPPOSITE)**

4 POINTS

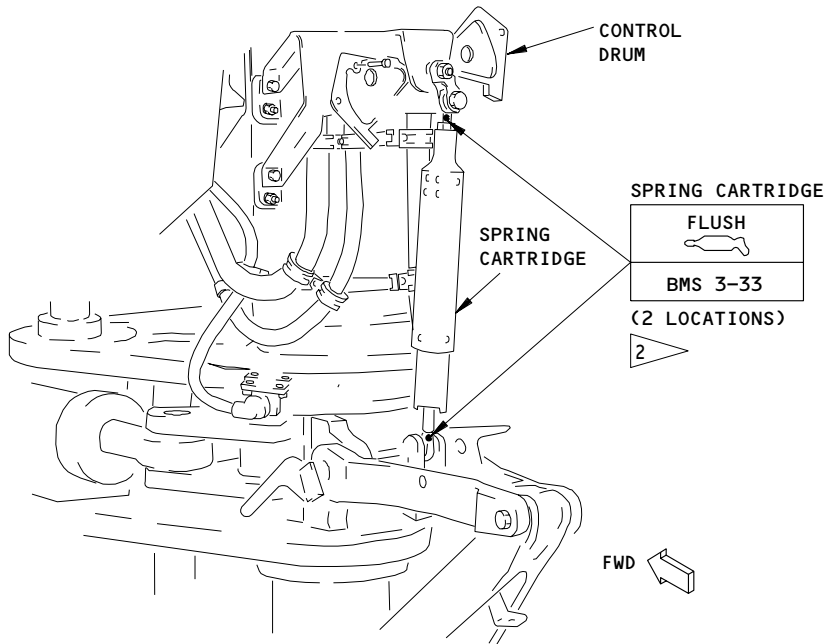
G

- 2** BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
- 8** DO A CHECK BEHIND THE WHEEL WELL WALL FOR UNWANTED GREASE. THE GREASE CAN FLOW OUT OF THE DRAG STRUT SHAFT AND COLLECT ON THE STRUCTURE. REMOVE THE UNWANTED GREASE TO PREVENT A BLOCKAGE OF THE DRAIN PATHS.

**Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 7)**

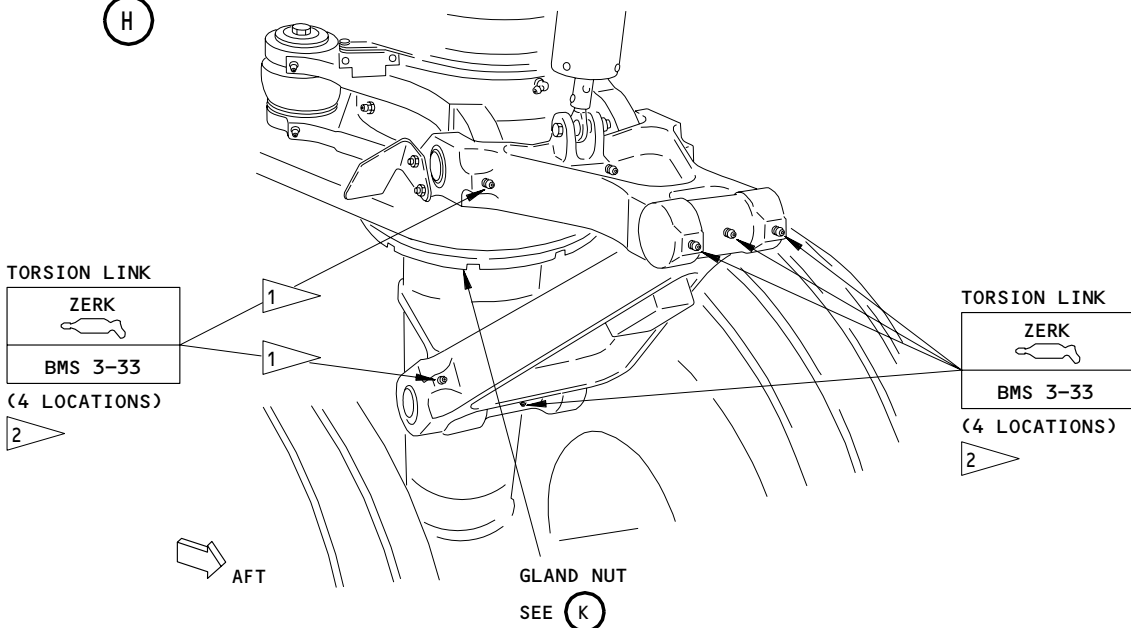
EFFECTIVITY	
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SPRING CARTRIDGE
2 POINTS

(H)



TORSION LINK
8 POINTS

(I)

- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 8)

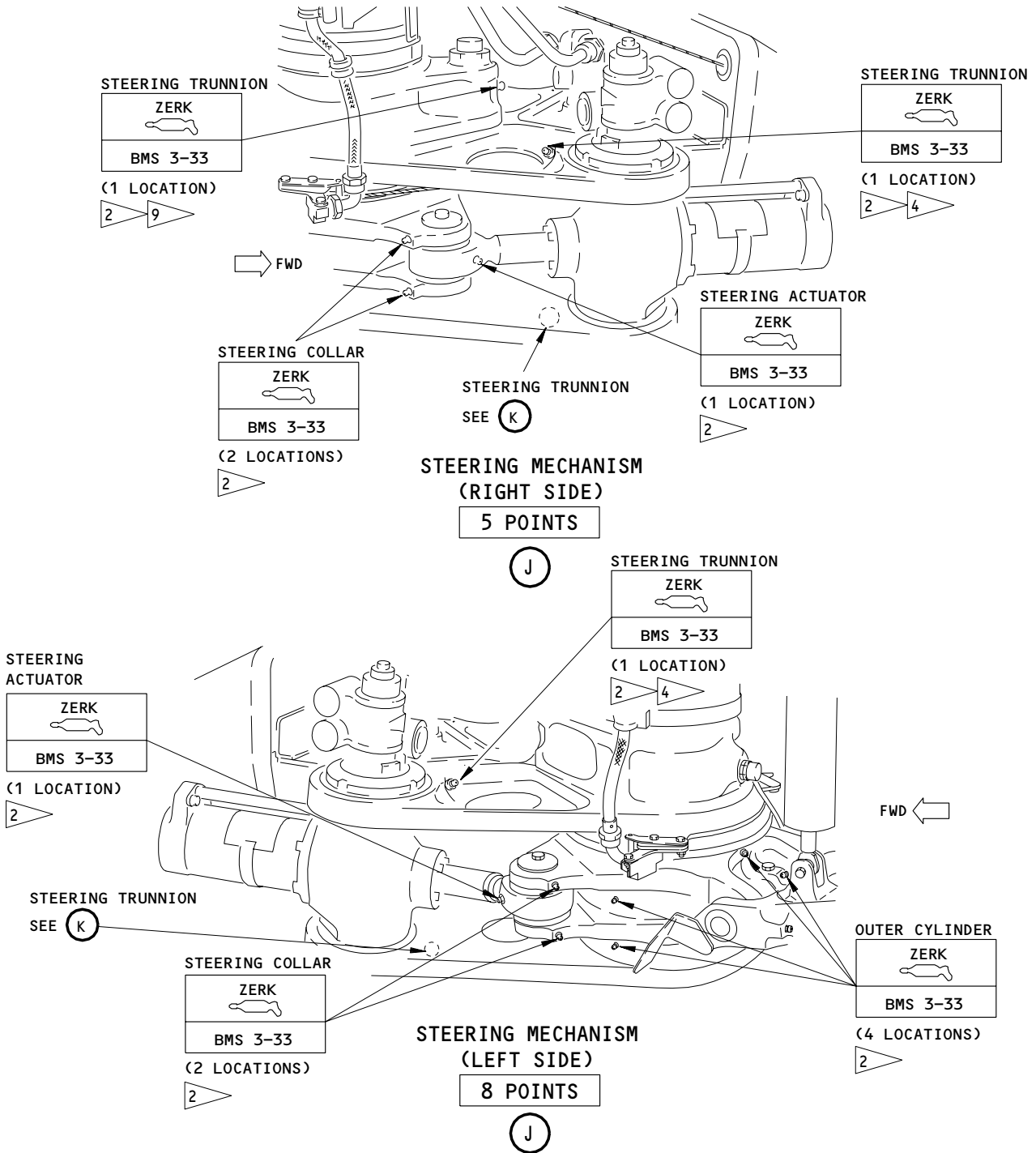
EFFECTIVITY

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2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

4 USE A MANUAL GREASE GUN OR RESTRICT THE
GREASE FLOW RATE TO 0.65 LB PER MINUTE MAXIMUM.

9 APPLY GREASE ONLY IF ZERK FITTING IS
PRESENT.

Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 9)

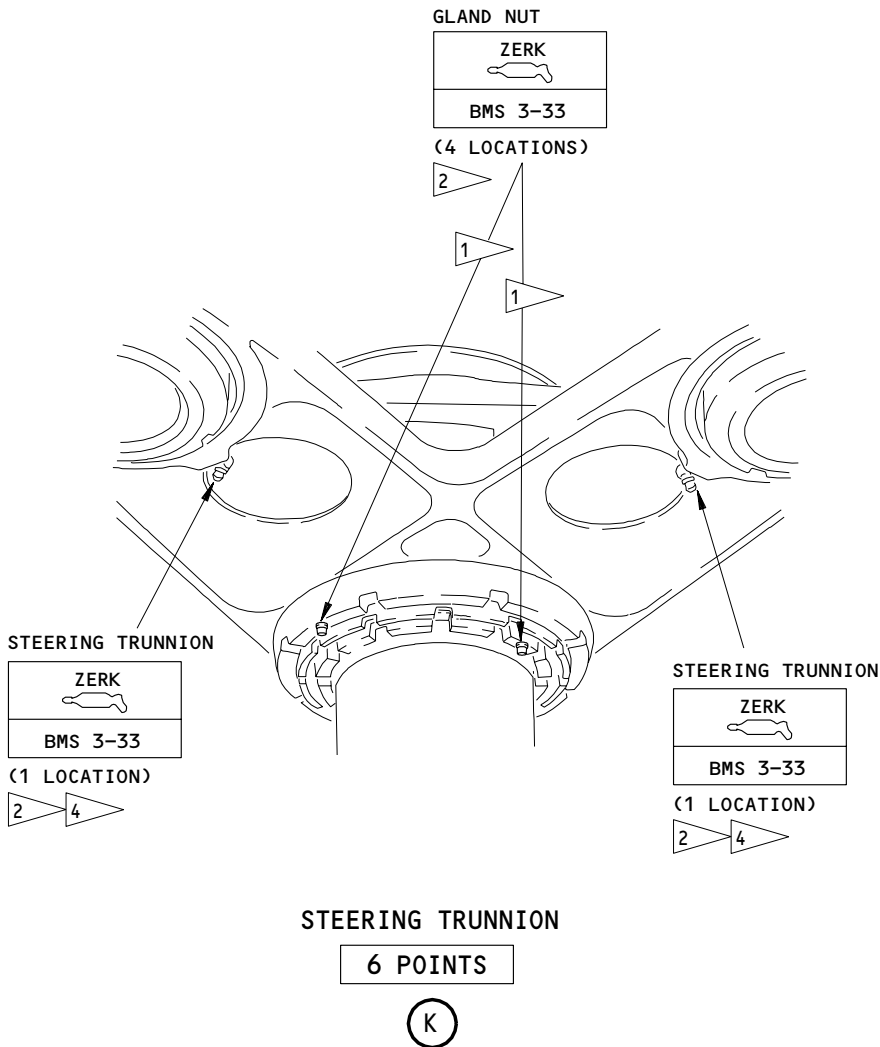
EFFECTIVITY

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- 1 ONE MORE LUBE FITTING IS ON THE OPPOSITE SIDE (NOT SHOWN). IF THERE ARE NO LUBE FITTINGS ON THE GLAND NUT, LUBRICATION IS NOT NECESSARY.
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
- 4 USE A MANUAL GREASE GUN OR RESTRICT THE GREASE FLOW RATE TO 0.65 LB PER MINUTE MAXIMUM.

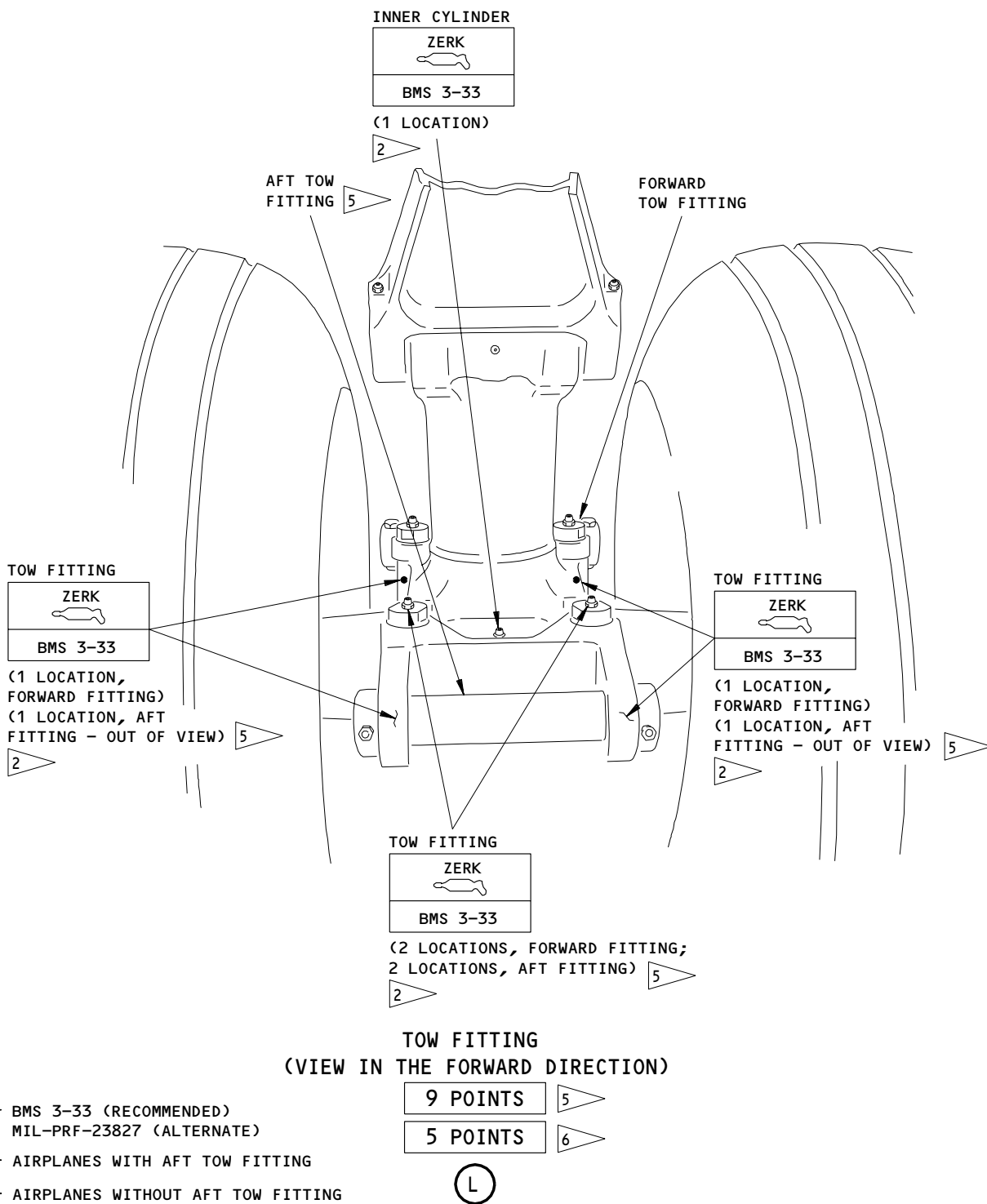
Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 10)

EFFECTIVITY	ALL
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Lubrication of the Actuating Mechanisms and the Nose Landing Gear
Figure 301 (Sheet 11)

EFFECTIVITY	
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NOSE GEAR DOORS AND ACTUATING MECHANISMS – SERVICING

1. General

- A. This procedure contains the data necessary to lubricate the doors and the actuating mechanisms of the nose landing gear.

TASK 12-21-13-603-001

2. Lubricate the Doors and the Actuating Mechanisms of the Nose Landing Gear

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
(2) D00013 Grease – MIL-PRF-23827 (Alternate)

B. References

- (1) 32-00-15/201, Landing Gear Door Locks
(2) 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
- | | |
|---------|-------------------------|
| 711 | Nose Landing Gear (NLG) |
| 713/714 | Forward NLG Door |
| 715/716 | Aft NLG Door |

D. Prepare to Lubricate the Doors and the Actuating Mechanisms

S 493-002

- (1) Make sure the downlocks are installed on the nose and main landing gear (Ref 32-00-20).

S 493-003

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

- (2) Open the doors for the landing gear and install the door locks (Ref 32-00-15).

E. Lubricate the Doors and the Actuating Mechanisms

S 643-004

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. THE GREASE GUN CAN CAUSE DAMAGE TO THE FITTING.

- (1) Lubricate the doors and the actuating mechanisms as shown on Fig. 301.

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F. Put the Airplane Back to Its Usual Condition

S 093-006

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

- (1) Remove the door locks and close the doors (AMM 32-00-15/201).

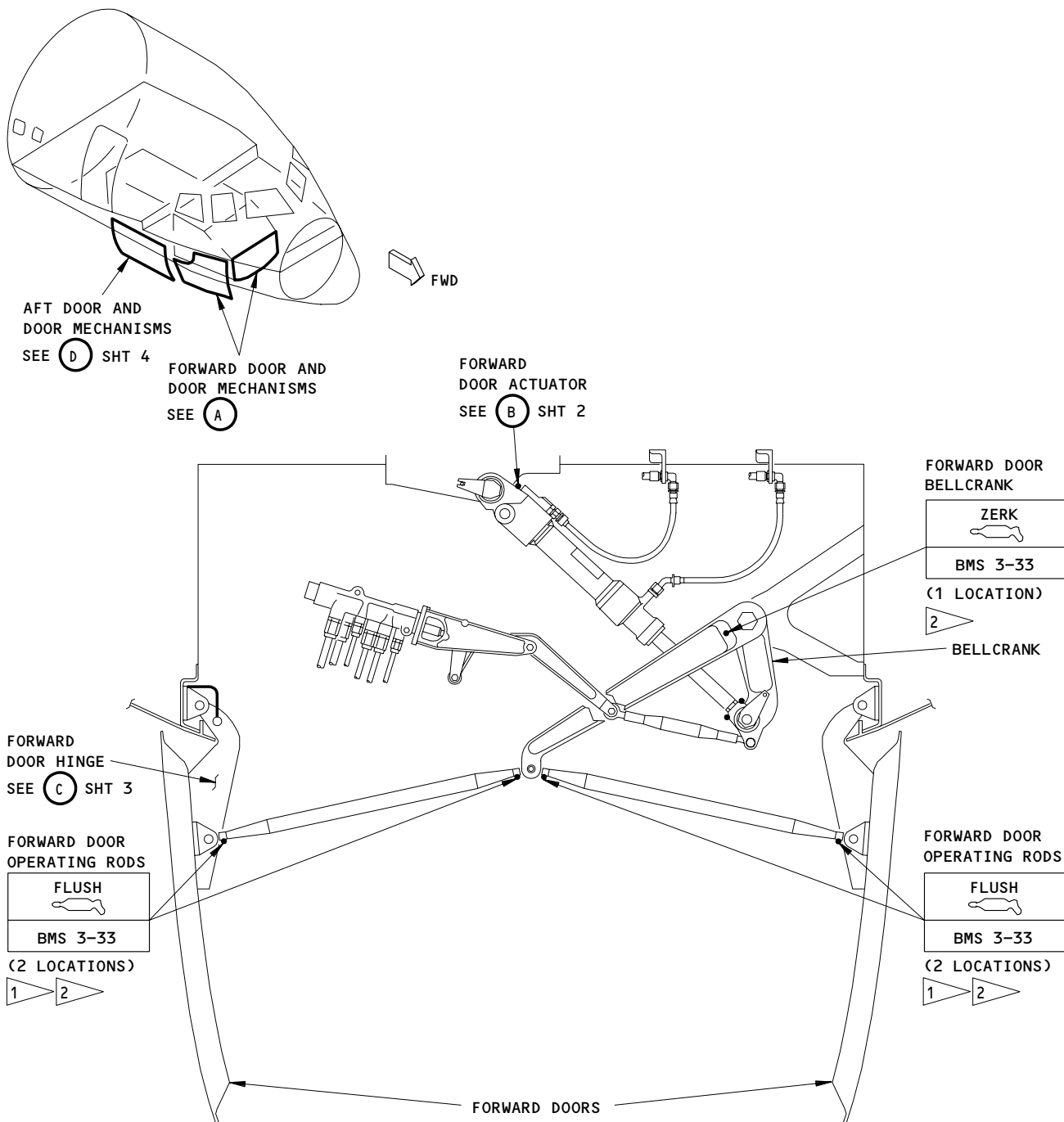
EFFECTIVITY

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FORWARD DOOR AND DOOR MECHANISMS
(VIEW IN THE FORWARD DIRECTION)

- 1 TWO LUBE FITTINGS ARE ON THE ROD END, LUBE ONLY ONE FITTING
- 2 BMS 3-33 RECOMMENDED MIL-PRF-23827 ALTERNATE

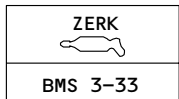
5 POINTS
A

Lubrication of the Actuating Mechanisms on the Nose Landing Gear Doors
Figure 301 (Sheet 1)

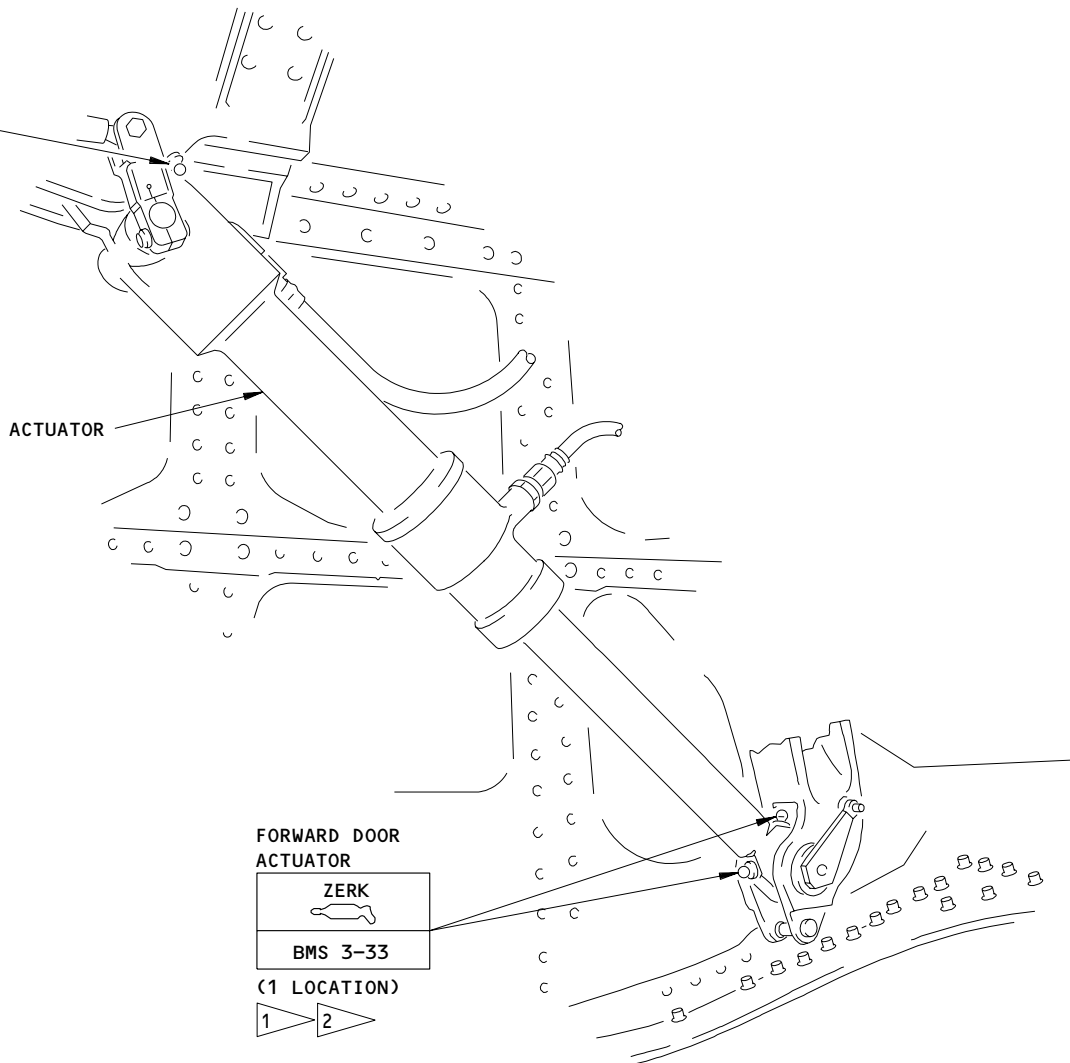
EFFECTIVITY	ALL
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FORWARD DOOR
ACTUATOR





(1 LOCATION)



FORWARD DOOR ACTUATOR
(VIEW IN THE FORWARD DIRECTION)

2 POINTS

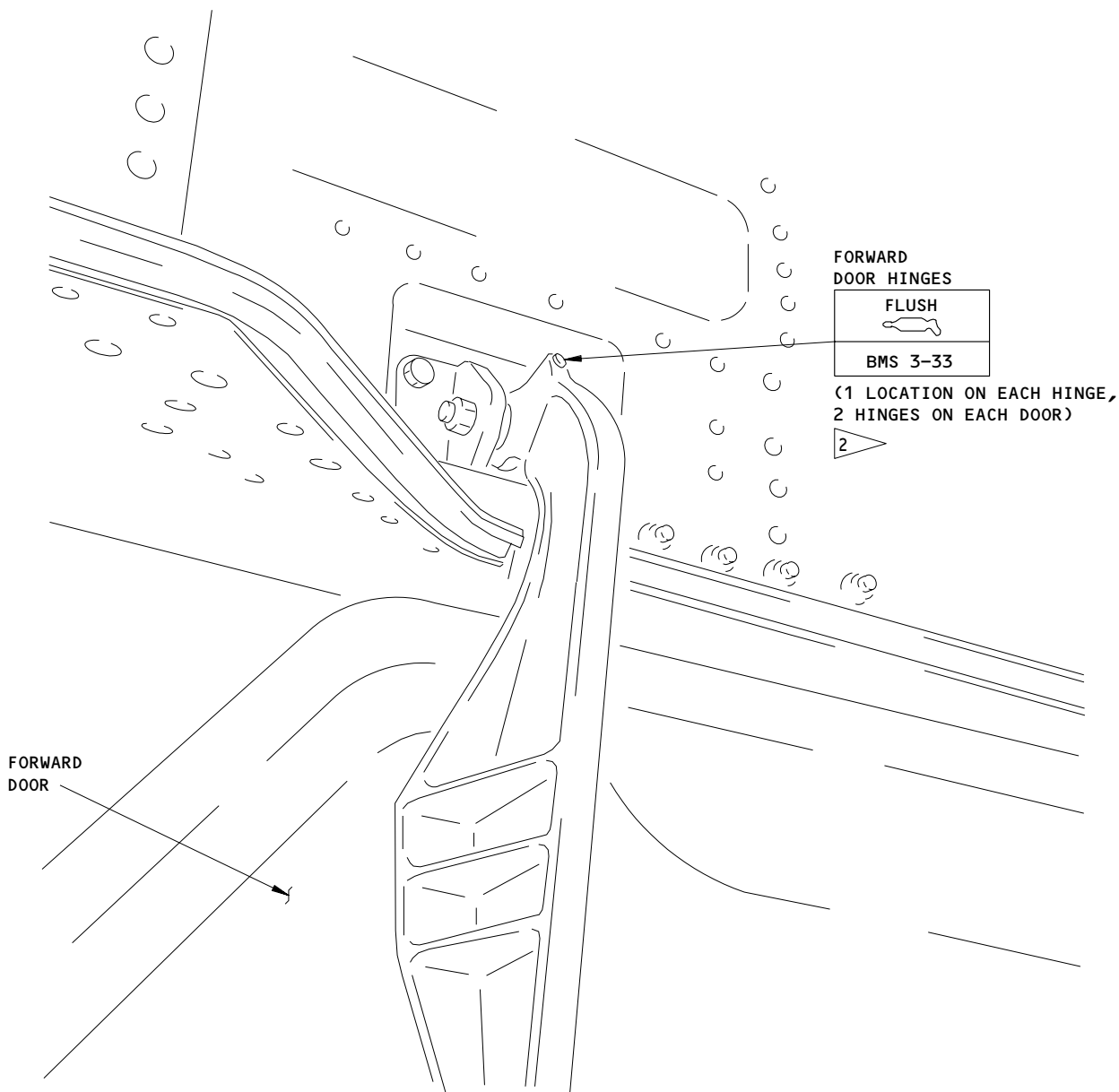


- 1  TWO LUBE FITTINGS ARE ON THE ROD END, LUBE ONLY ONE FITTING
- 2  BMS 3-33 RECOMMENDED
MIL-PRF-23827 ALTERNATE

Lubrication of the Actuating Mechanisms on the Nose Landing Gear Doors
Figure 301 (Sheet 2)

EFFECTIVITY	ALL
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FORWARD DOOR HINGE
(RIGHT DOOR IS SHOWN)

2 POINTS

2 BMS 3-33 RECOMMENDED
MIL-PRF-23827 ALTERNATE

(C)

Lubrication of the Actuating Mechanisms on the Nose Landing Gear Doors
Figure 301 (Sheet 3)

EFFECTIVITY	
	ALL

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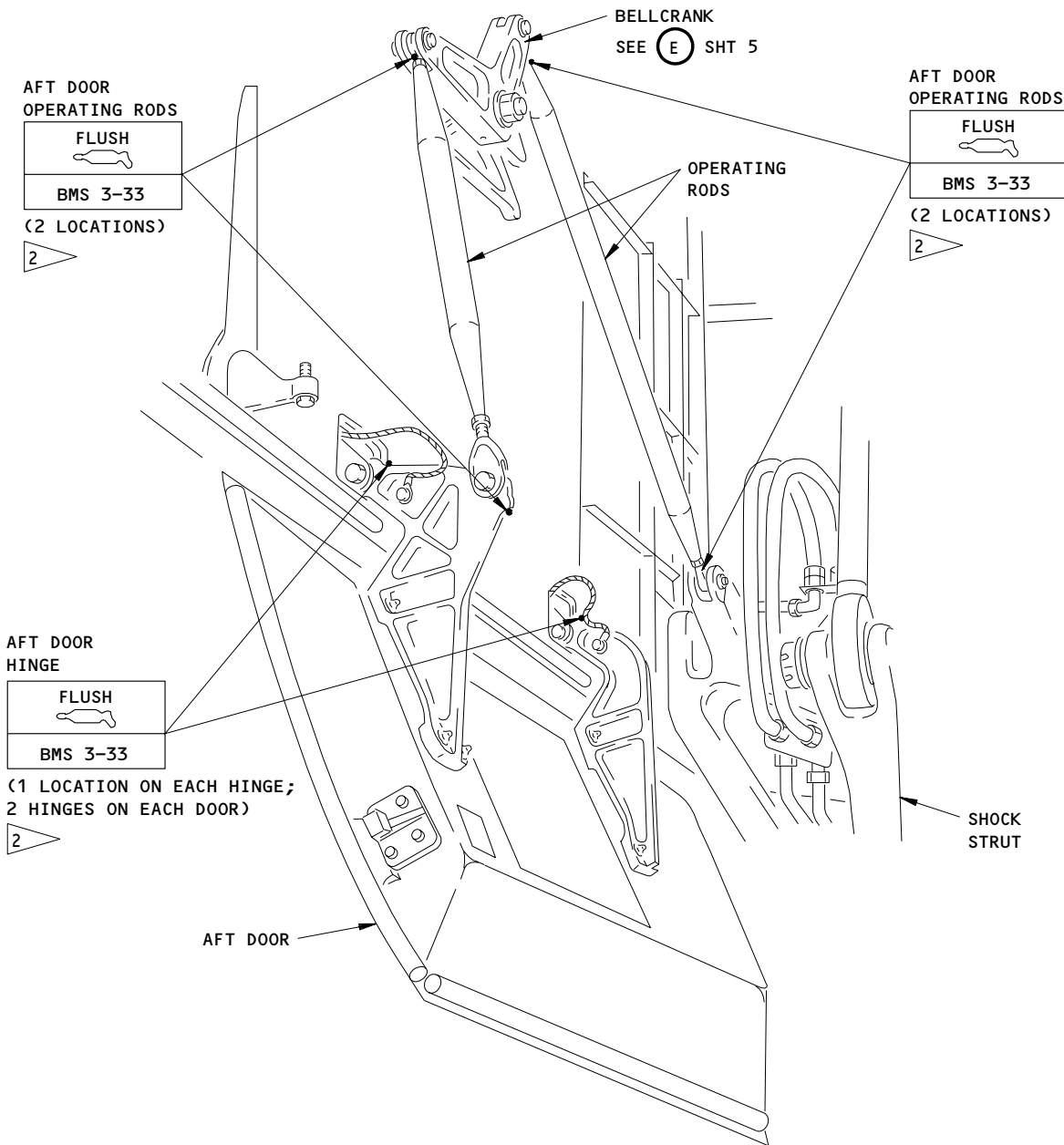
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334612

BOEING

757 MAINTENANCE MANUAL



AFT DOOR AND DOOR MECHANISMS
(RIGHT DOOR IS SHOWN)
(VIEW IN THE AFT DIRECTION)

6 POINTS

D

2 BMS 3-33 RECOMMENDED
MIL-PRF-23827 ALTERNATE

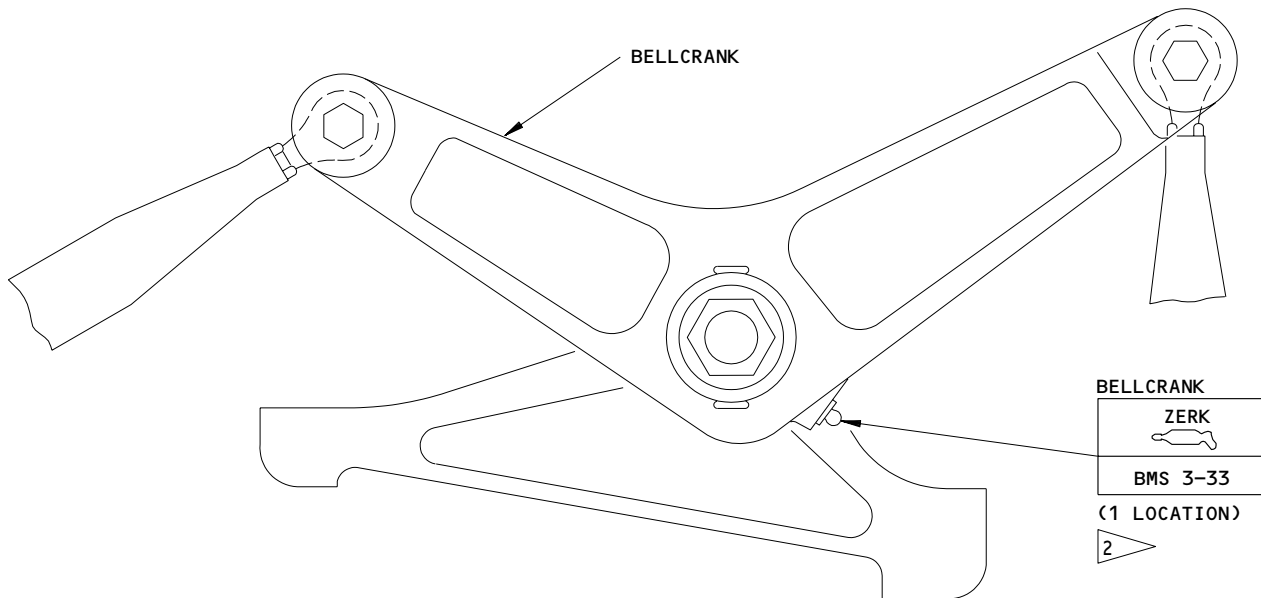
Lubrication of the Actuating Mechanisms on the Nose Landing Gear Doors
Figure 301 (Sheet 4)

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	ALL

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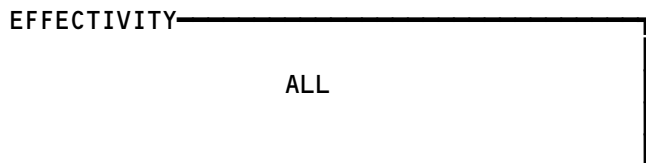
BELLCRANK
(RIGHT DOOR IS SHOWN)
(VIEW IN THE OUTBOARD DIRECTION)

1 POINT

E

2 BMS 3-33 RECOMMENDED
MIL-PRF-23827 ALTERNATE

Lubrication of the Actuating Mechanisms on the Nose Landing Gear Doors
Figure 301 (Sheet 5)



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MAIN GEAR AND ACTUATING MECHANISMS – SERVICING

1. General

- A. This procedure contains the data necessary to lubricate the main landing gear and the actuating mechanisms.

TASK 12-21-14-603-001

2. Lubricate the Main Landing Gear and the Actuating Mechanisms

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
- (2) D00013 Grease – MIL-PRF-23827 (Alternate)
- (3) Wheel Bearing Grease –
Aircraft, General Purpose, Wide Temperature:
 - (a) D00378 – Aeroshell 22
 - (b) D00233 – Mobilgrease 28
 - (c) D00258 – Aeroshell 5 (Alternative)
- (4) D00528 Lubricant – ROYCO 11MS

B. References

- (1) AMM 06-44-00/201, Wings Access Doors and Panels
- (2) AMM 32-00-15/201, Landing Gear Door Locks
- (3) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
 - 731/741 Main Landing Gear
- (2) Access Panels
 - 551BB Main Landing Gear Actuator – Left
 - 651BB Main Landing Gear Actuator – Right

D. Prepare to Lubricate the Main Landing Gear and the Actuating Mechanisms

S 493-002

- (1) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-003

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

- (2) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

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S 013-008

- (3) Remove the main gear actuator panels 551BB/651BB (AMM 06-44-00/201).
E. Lubricate the Main Landing Gear and the Actuating Mechanisms

S 643-004

WARNING: DO NOT USE A PRESSURE OF MORE THAN 3000 PSI WHEN YOU LUBRICATE THE MAIN LANDING GEAR. A PRESSURE MORE THAN 3000 PSI CAN CAUSE THE LUBRICATION FITTING TO COME OFF WITH AN EXPLOSIVE FORCE.

- (1) If a fitting does blow off, do the steps that follow:
(a) Make sure there is not a blockage or unwanted material in the lubrication path.
(b) Install a new lubrication fitting (Ref 20-10-29).

S 643-005

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. THE GREASE GUN CAN CAUSE DAMAGE TO THE FITTING.

- (2) Lubricate the upper end of the main landing gear (Fig. 301).

S 643-010

- (3) Lubricate the lower end of the main landing (Fig. 302).

S 643-011

- (4) Lubricate the uplock assembly (Fig. 303).

S 643-012

- (5) Lubricate the Brake assembly on the main landing gear (Fig. 304).
F. Put the Airplane Back to Its Usual Condition

S 413-009

- (1) Install the main gear actuator panels 551BB/651BB (AMM 06-44-00/201).

S 093-006

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

- (2) Remove the door locks and close the doors (AMM 32-00-15/201).

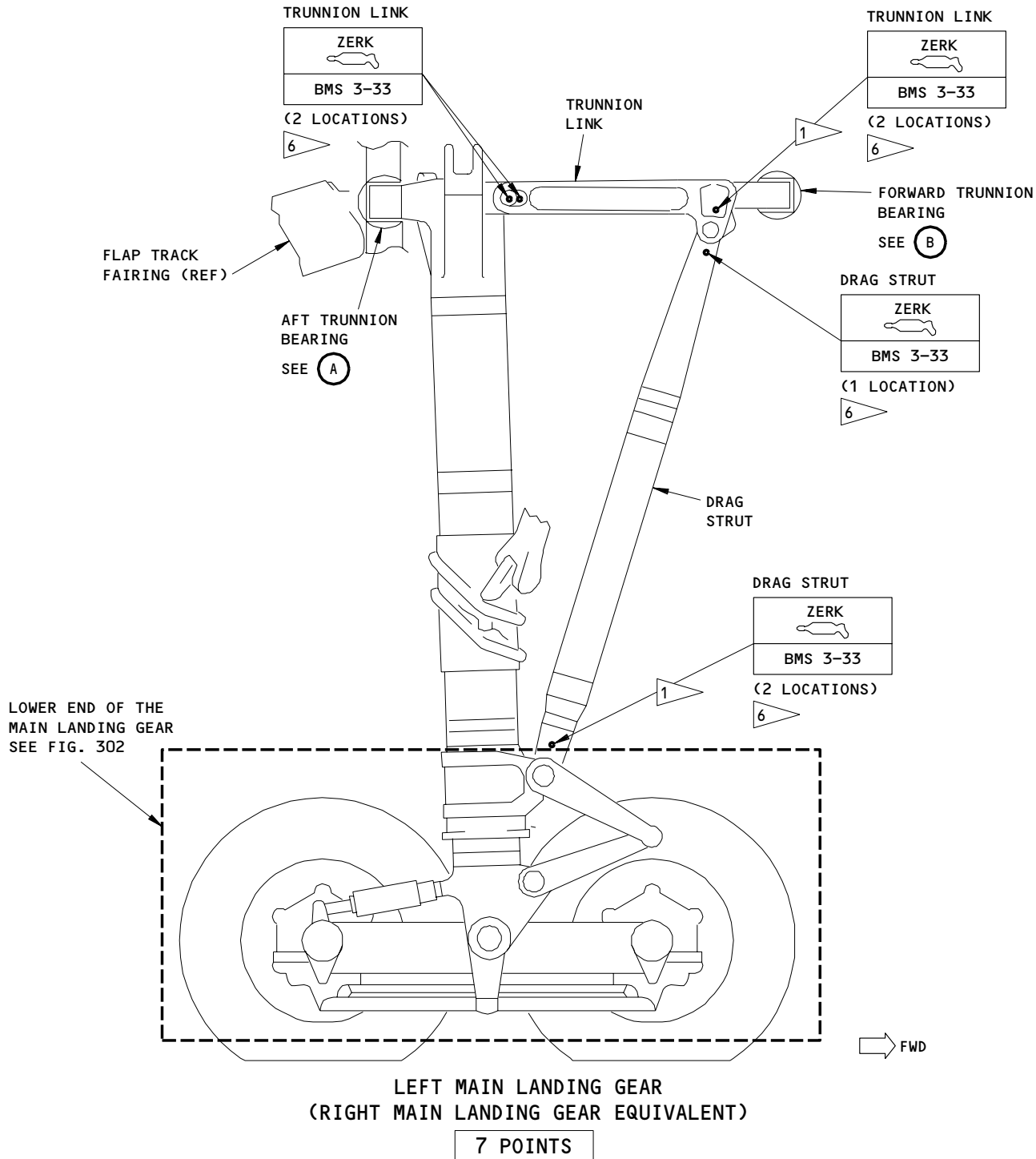
EFFECTIVITY

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1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

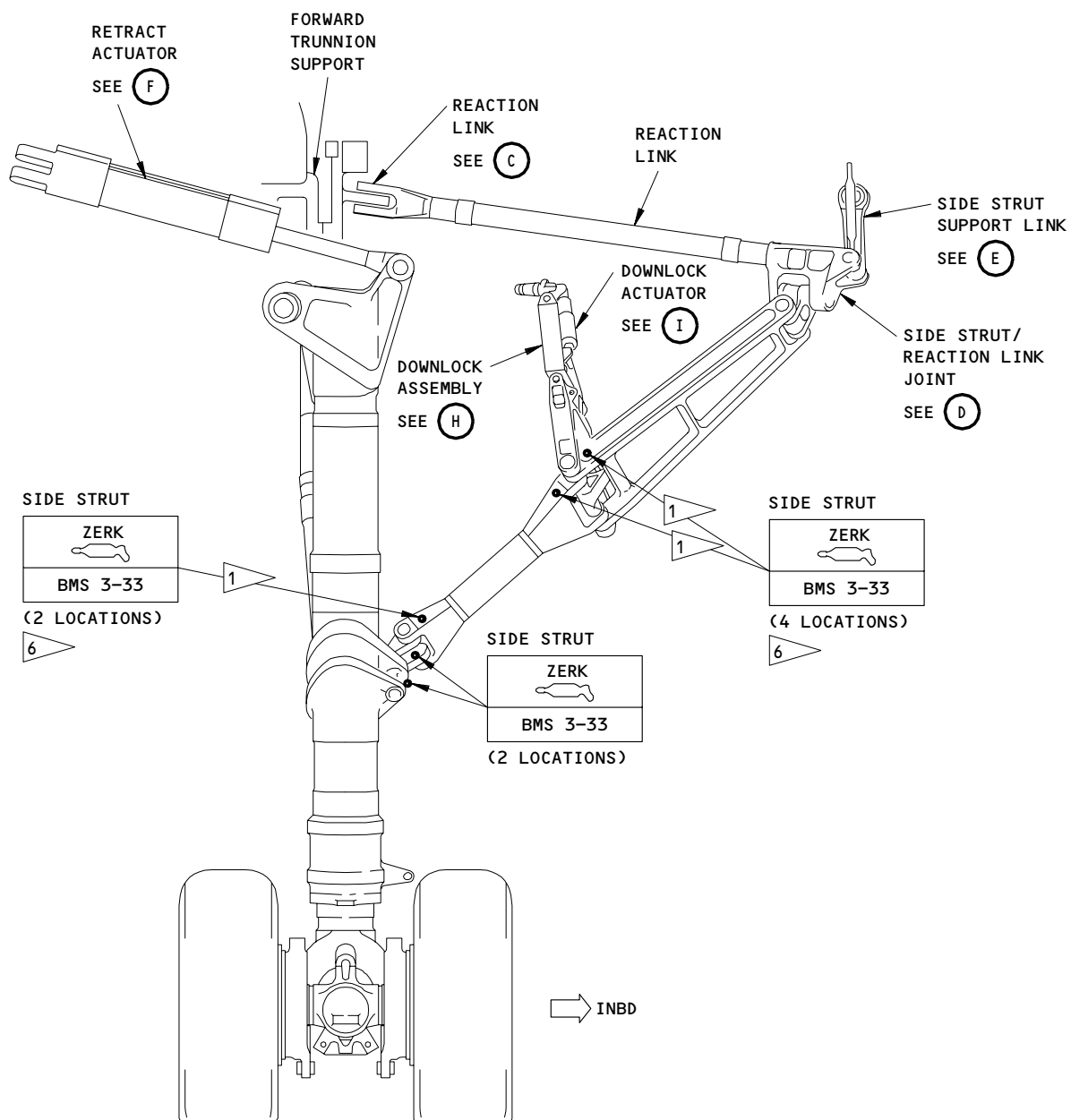
6 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 1)

EFFECTIVITY	ALL
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69298



LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR EQUIVALENT)

8 POINTS

1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

6 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

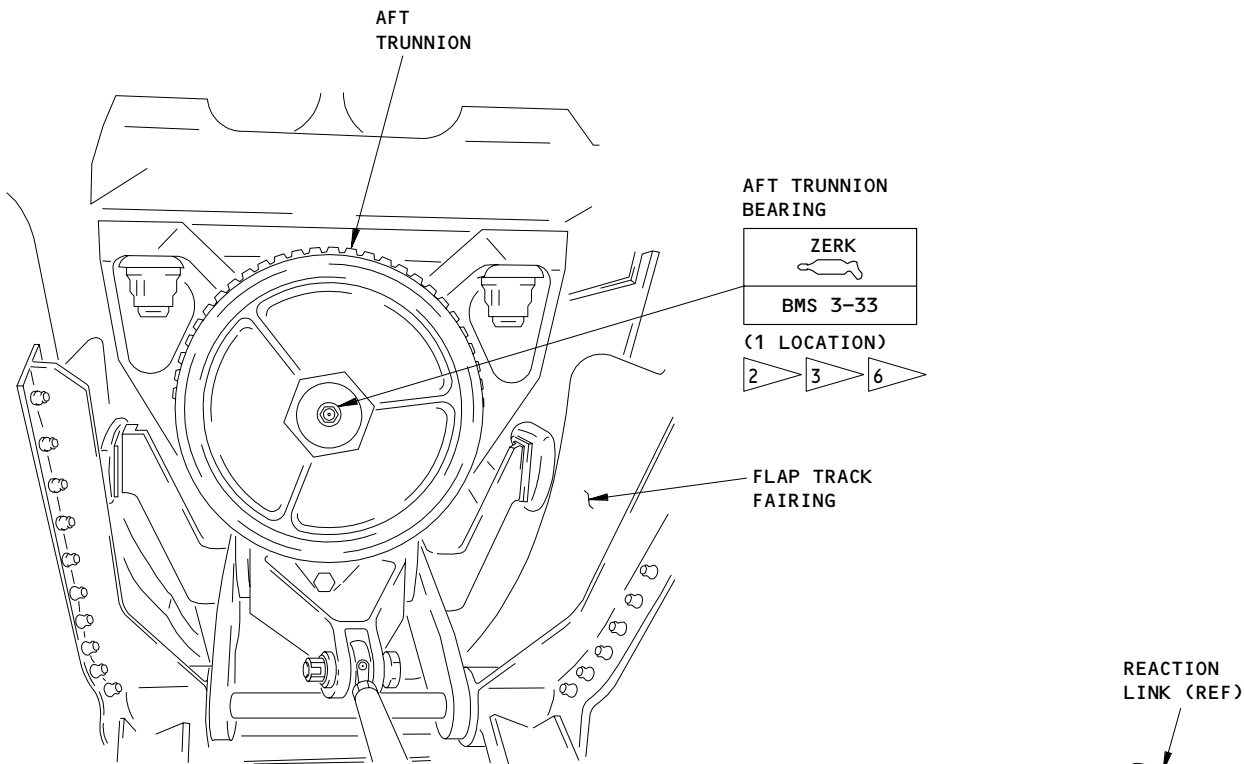
Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 2)

EFFECTIVITY	ALL
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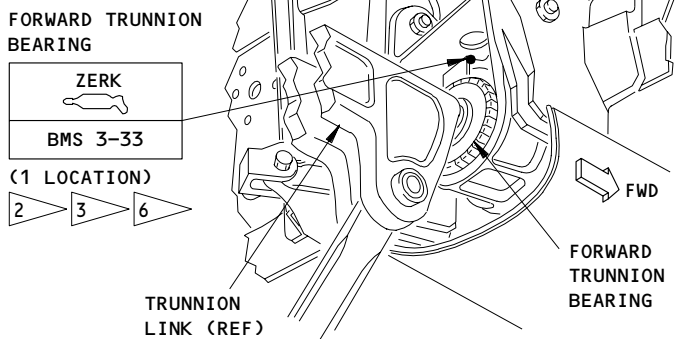
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**AFT TRUNNION BEARING
(VIEW IN THE FORWARD DIRECTION)**

1 POINT

(A)



FORWARD TRUNNION BEARING

1 POINT

(B)

- 2** LUBRICATE TO 400 PSI MAXIMUM PRESSURE
- 3** THE AFT TRUNNION BEARING LUBE FITTING IS ACCESSIBLE WITH THE FLAPS EXTENDED.
- 6** BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

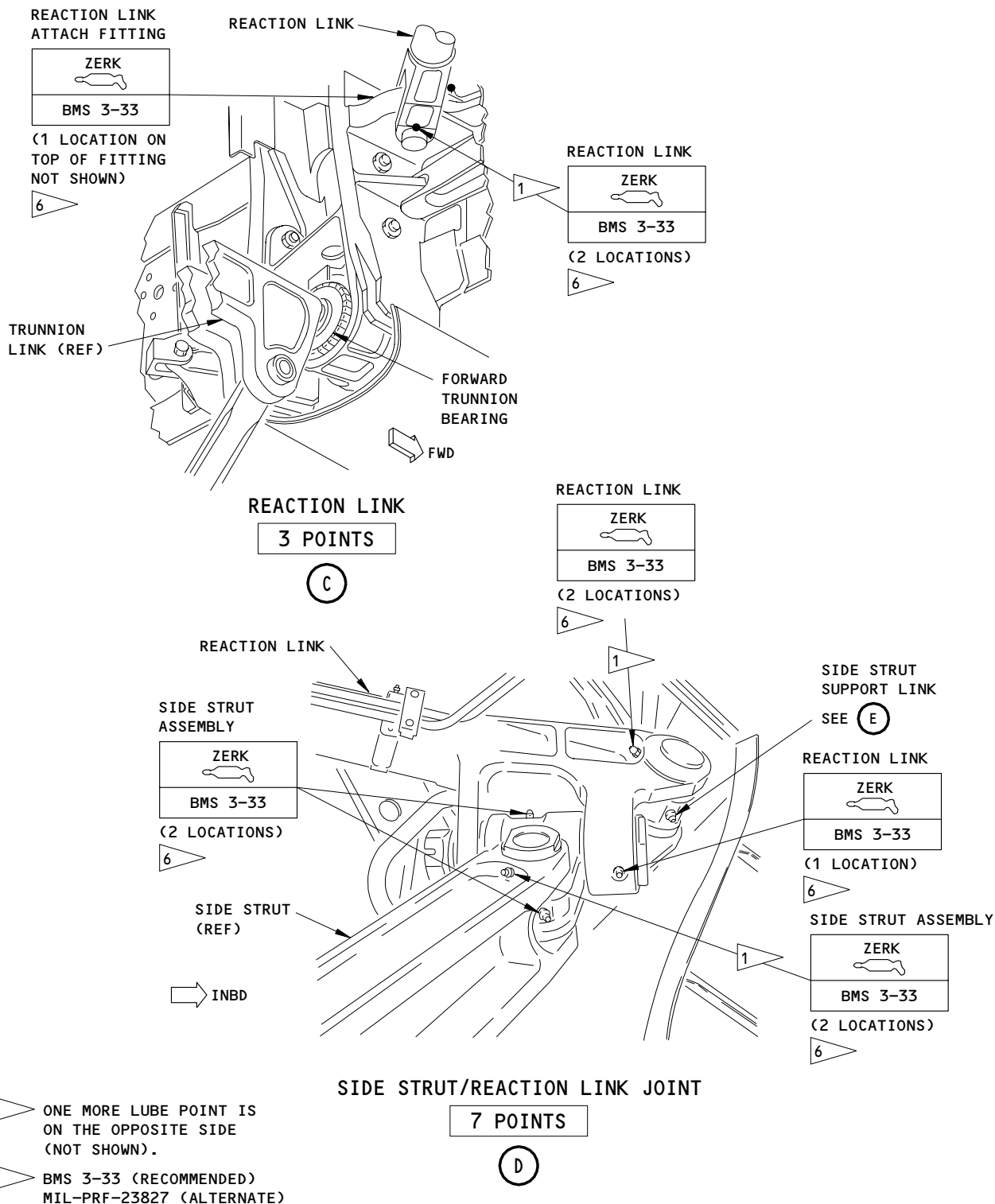
**Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 3)**

EFFECTIVITY	ALL
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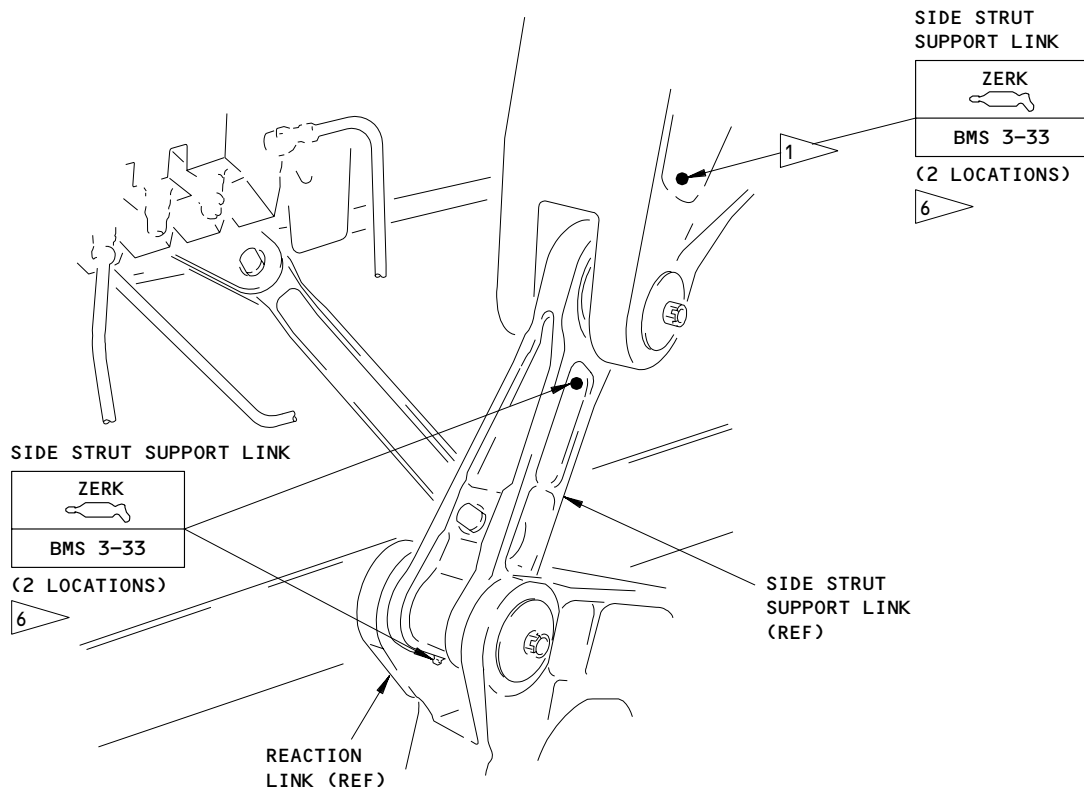
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Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 4)

EFFECTIVITY	ALL
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SIDE STRUT SUPPORT LINK

4 POINTS

(E)

1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

6 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 5)

EFFECTIVITY

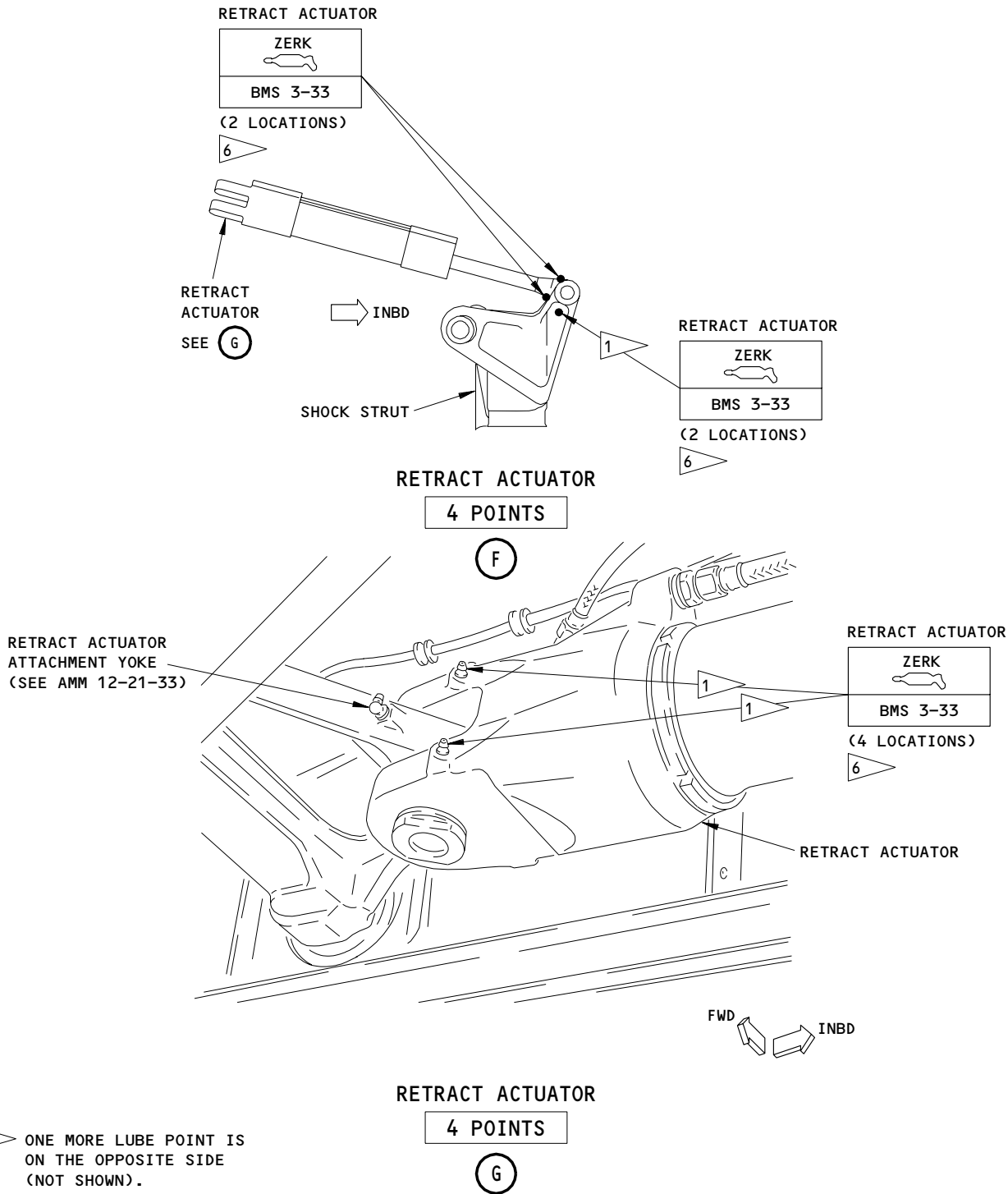
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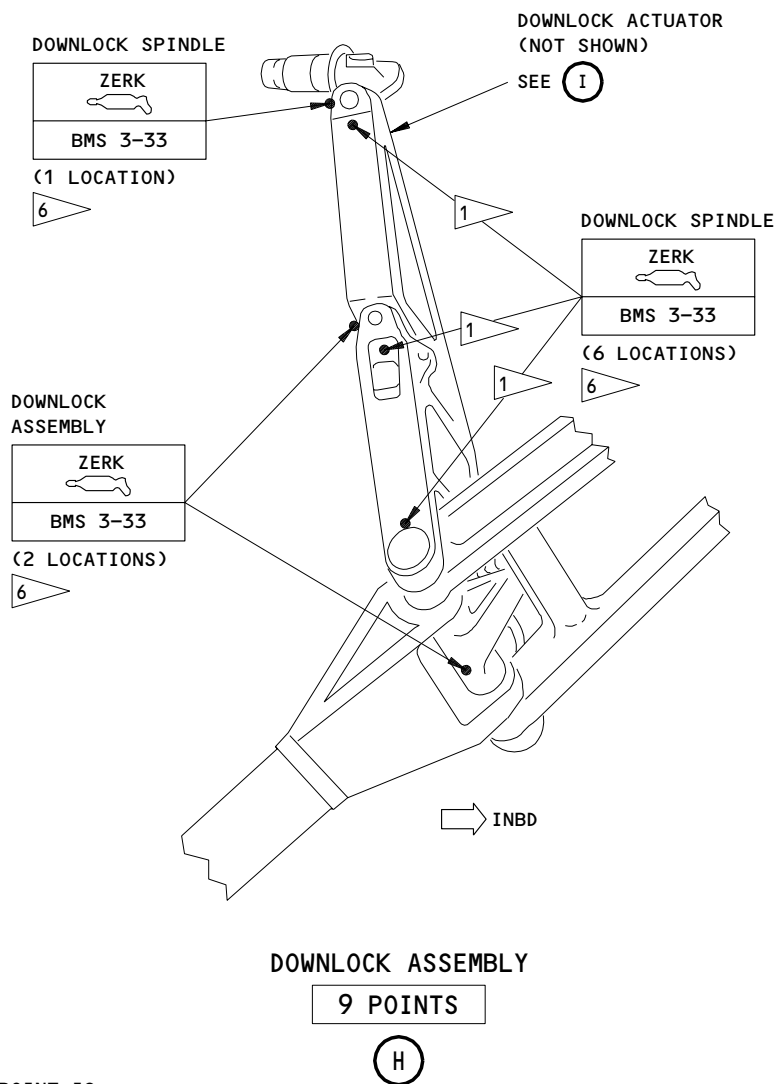
320497



Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 6)

EFFECTIVITY	ALL
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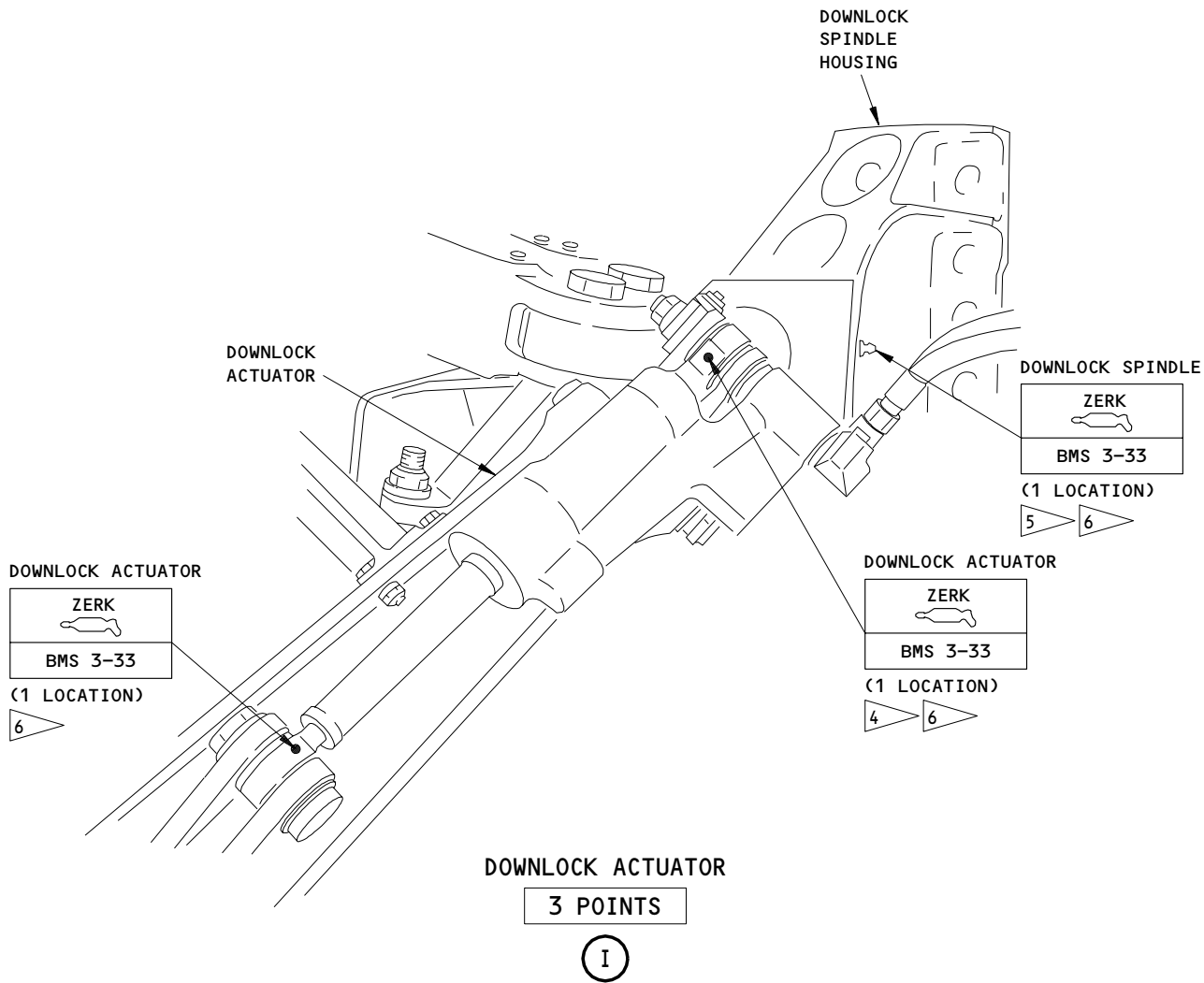


- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 6 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 7)

EFFECTIVITY	ALL
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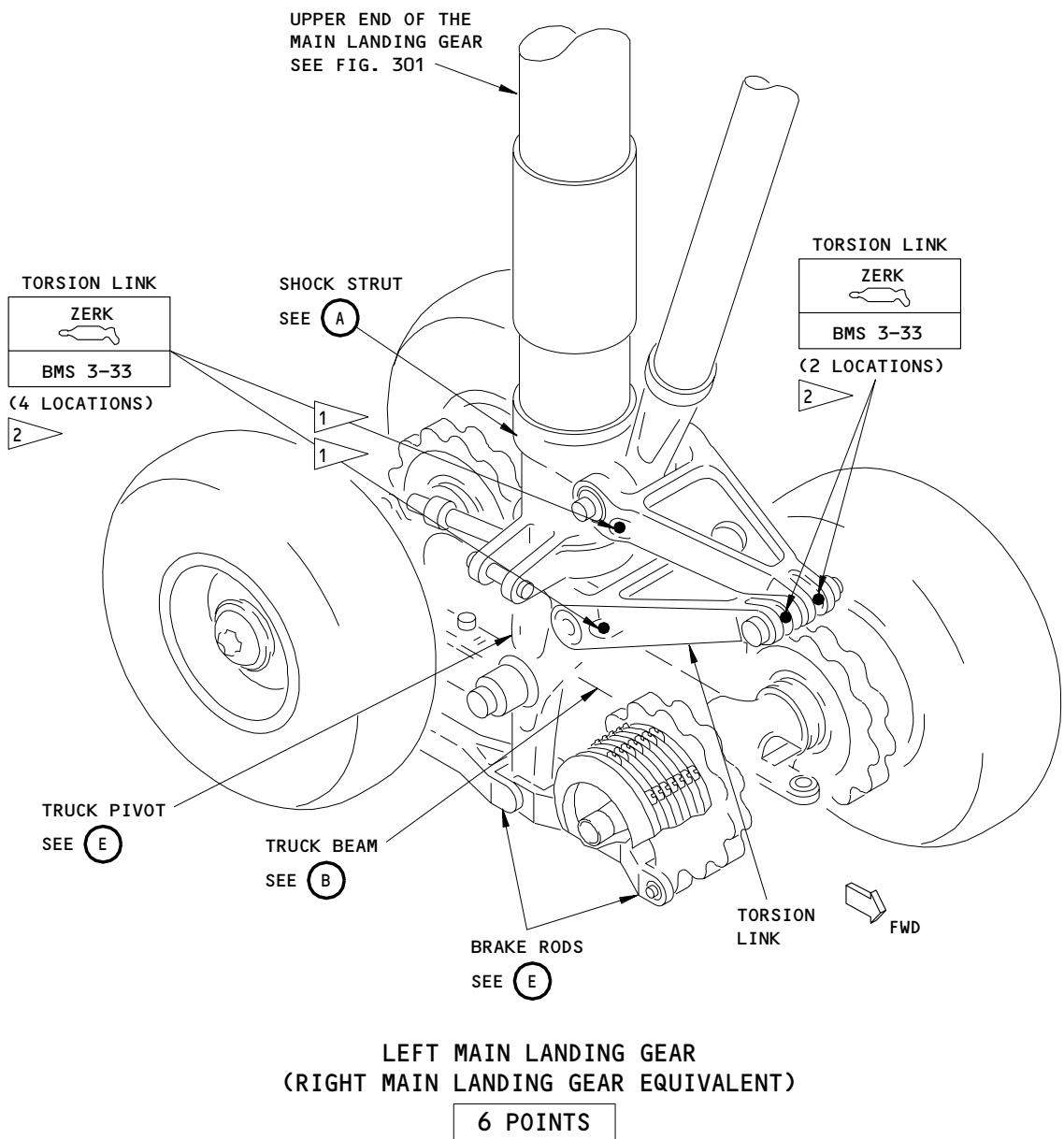


- 4 THE HEAD END OF THE ACTUATOR CAN HAVE TWO LUBE FITTINGS. LUBRICATE ONLY THE MOST ACCESSIBLE FITTING.
- 5 THE LUBE FITTING ON THE DOWNLOCK SPINDLE HOUSING IS BEHIND THE FLANGE.
- 6 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication on the Upper End of the Main Landing Gear
Figure 301 (Sheet 8)

EFFECTIVITY	ALL
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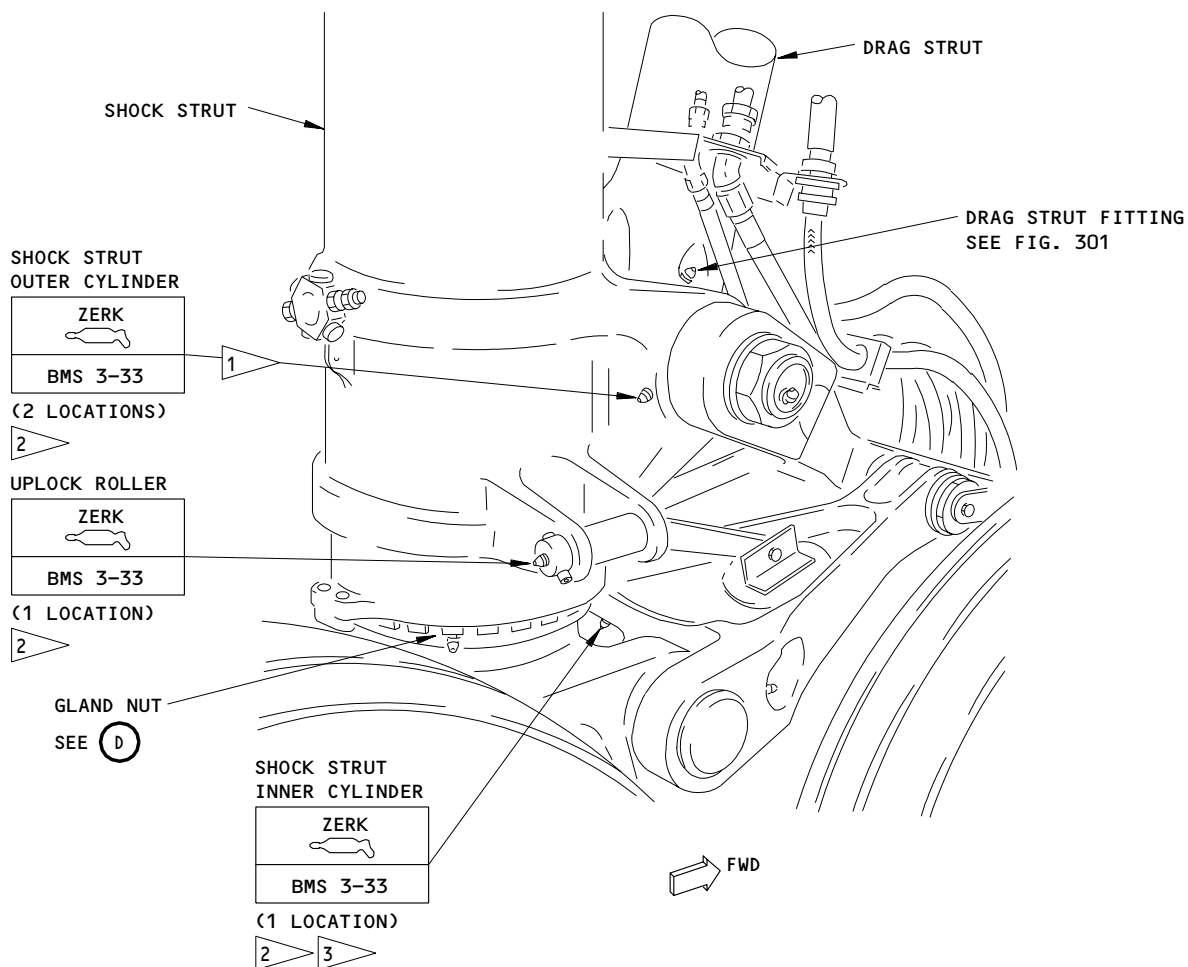


- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 1)

EFFECTIVITY	ALL
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SHOCK STRUT
4 POINTS

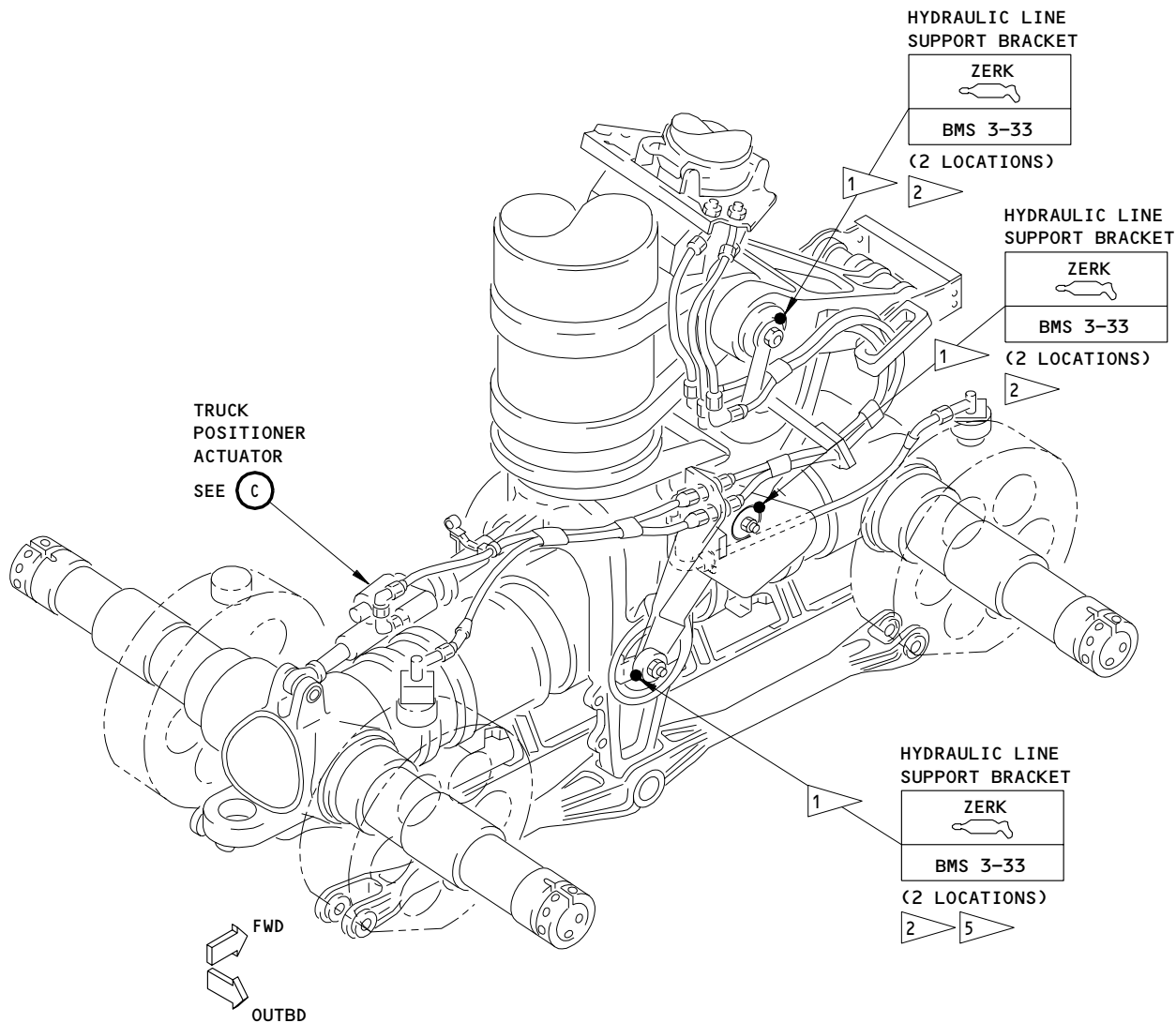
A

- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
- 3 THE FITTING IS ON THE BOTTOM SIDE OF THE SHOCK STRUT LUG (CENTERED BELOW THE LOWER TORSION LINK)

Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 2)

EFFECTIVITY	
ALL	

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**TRUCK BEAM
LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR EQUIVALENT)**

6 POINTS

(B)

NOTE: THE TIRES ARE SHOWN REMOVED.

- 1** ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 2** BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
- 5** ON SOME AIRPLANES THIS IS A SMOOTH FITTING.

Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 3)

EFFECTIVITY	ALL
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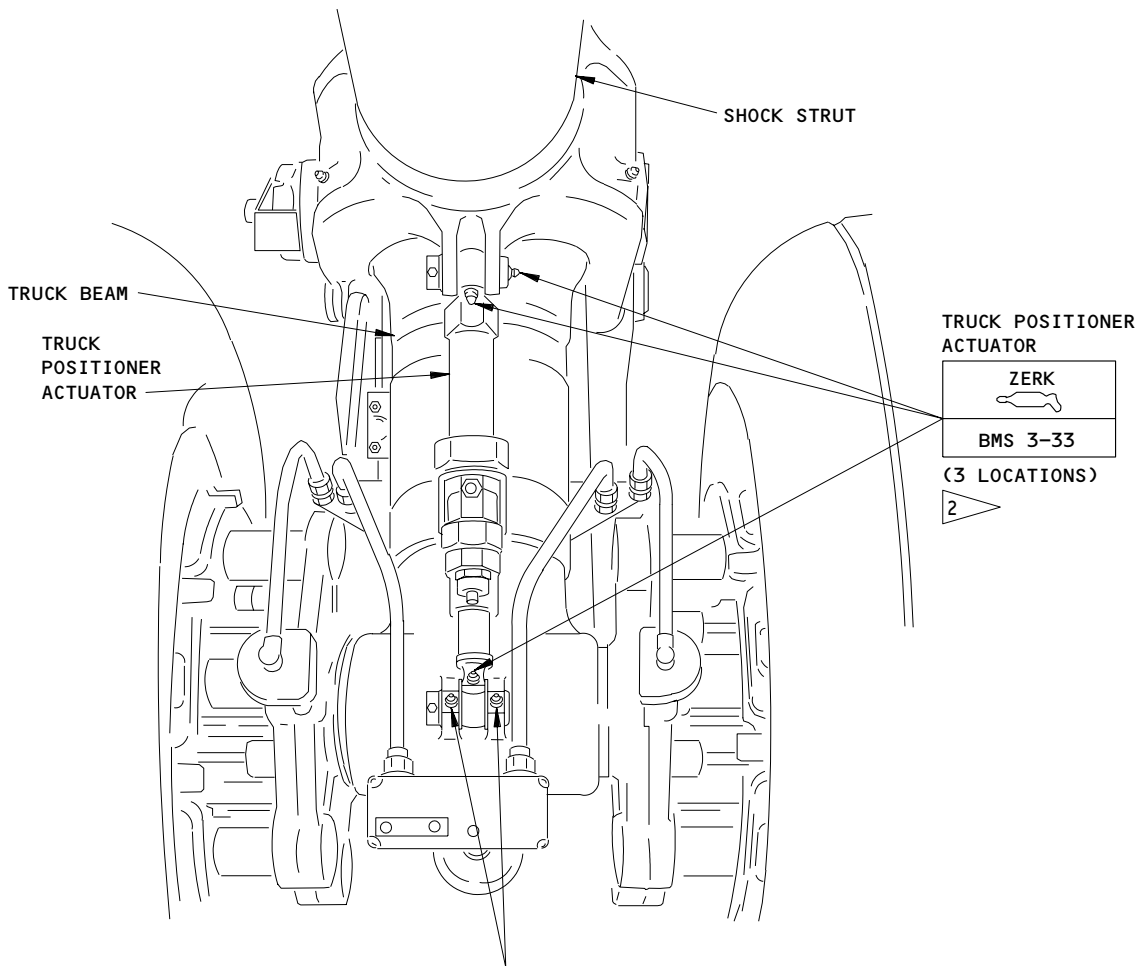
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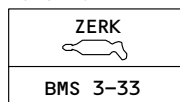
320470

BOEING

757 MAINTENANCE MANUAL



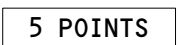
TRUCK POSITIONER ACTUATOR



(2 LOCATIONS)



TRUCK POSITIONER ACTUATOR
(VIEW IN THE FORWARD DIRECTION)



2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)



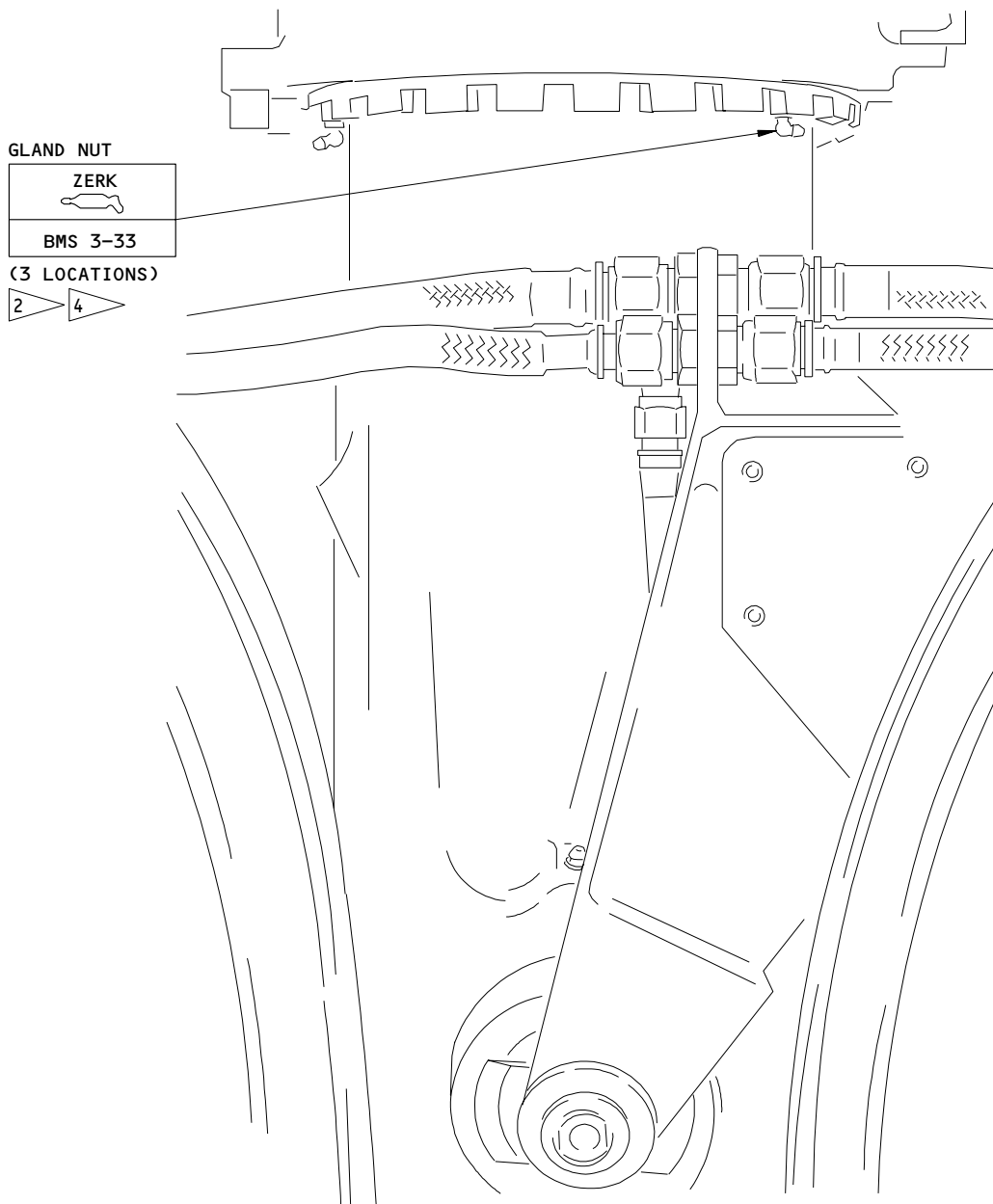
Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 4)

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	ALL

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GLAND NUT
(VIEW IN THE INBOARD DIRECTION)

3 POINTS

D

2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

4 A TOTAL OF 3 LUBE FITTINGS
ARE AROUND THE GLAND NUT. IF THERE ARE NO LUBE FITTINGS ON
THE GLAND NUT, LUBRICATION IS NOT NECESSARY.

Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 5)

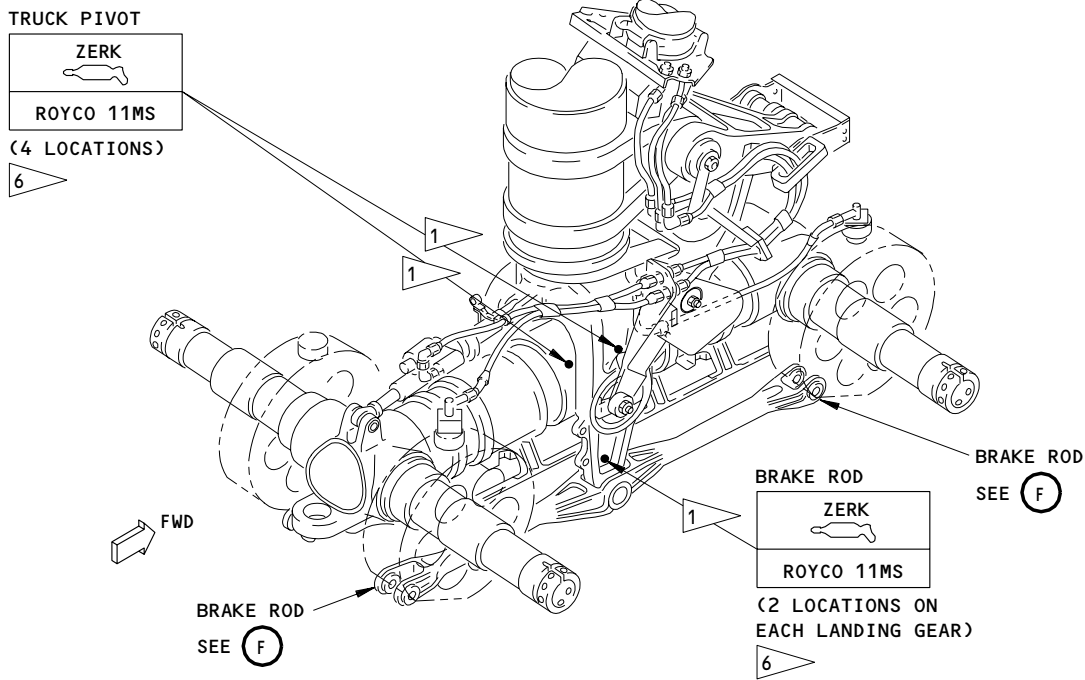
EFFECTIVITY

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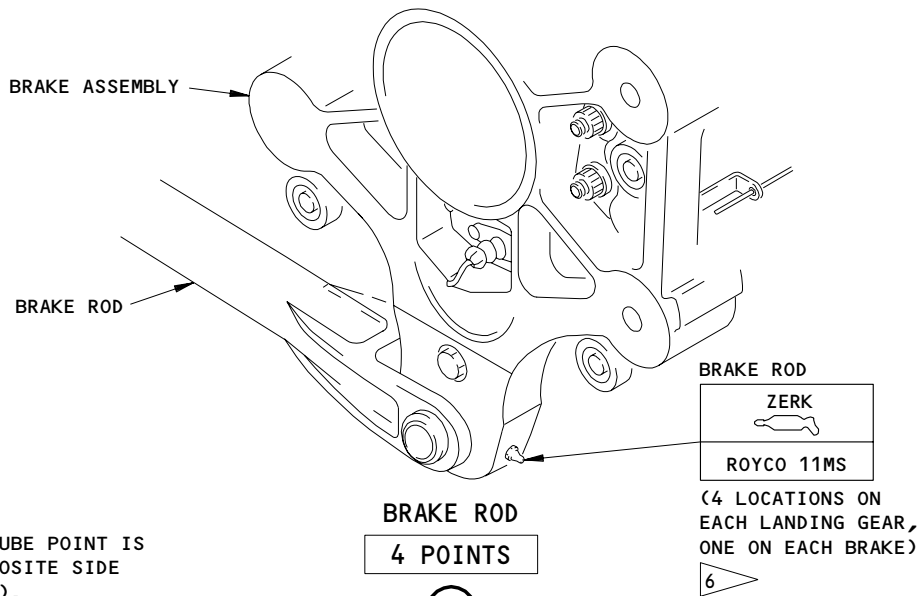
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TRUCK PIVOT AND BRAKE RODS

6 POINTS

(E)



1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).

6 ONLY USE THIS LUBRICANT

Lubrication on the Lower End of the Main Landing Gear
Figure 302 (Sheet 6)

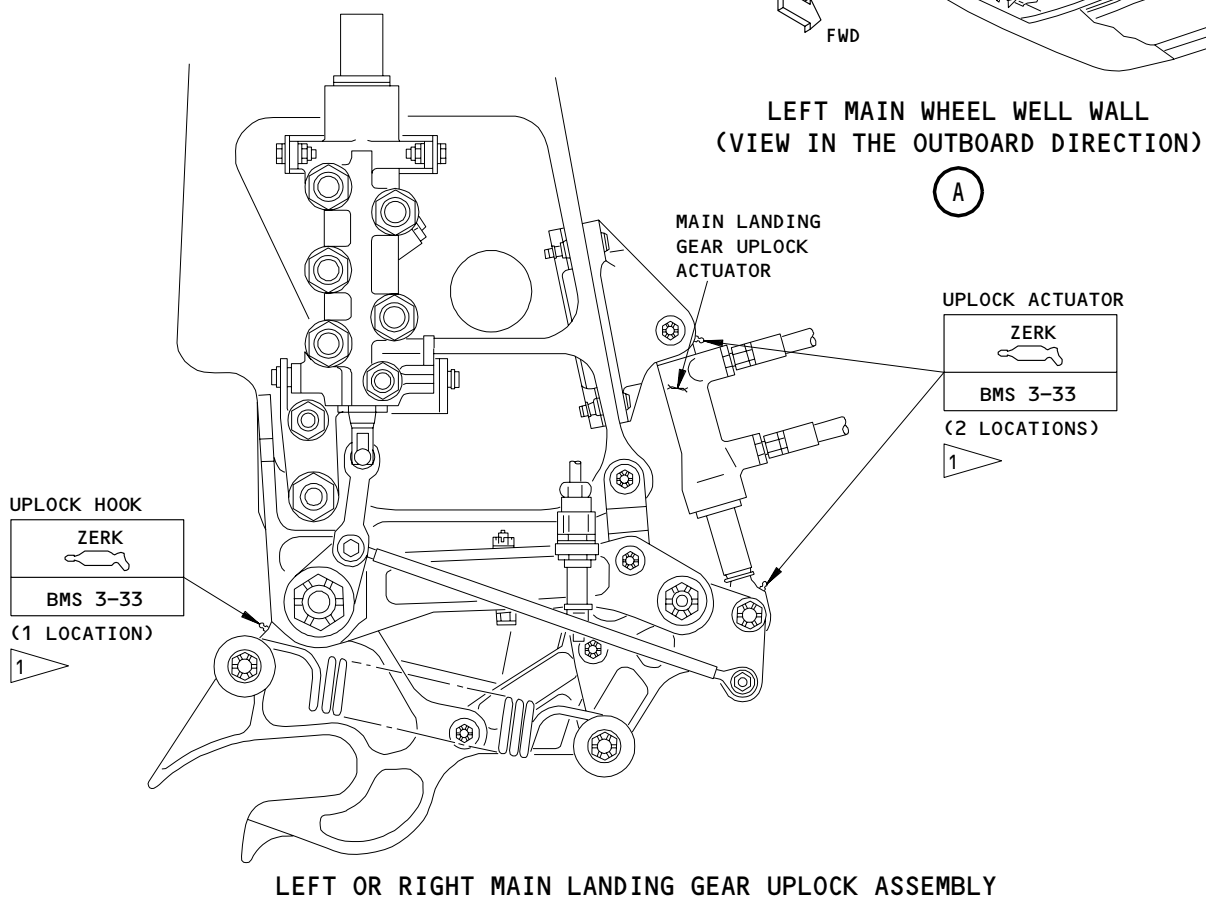
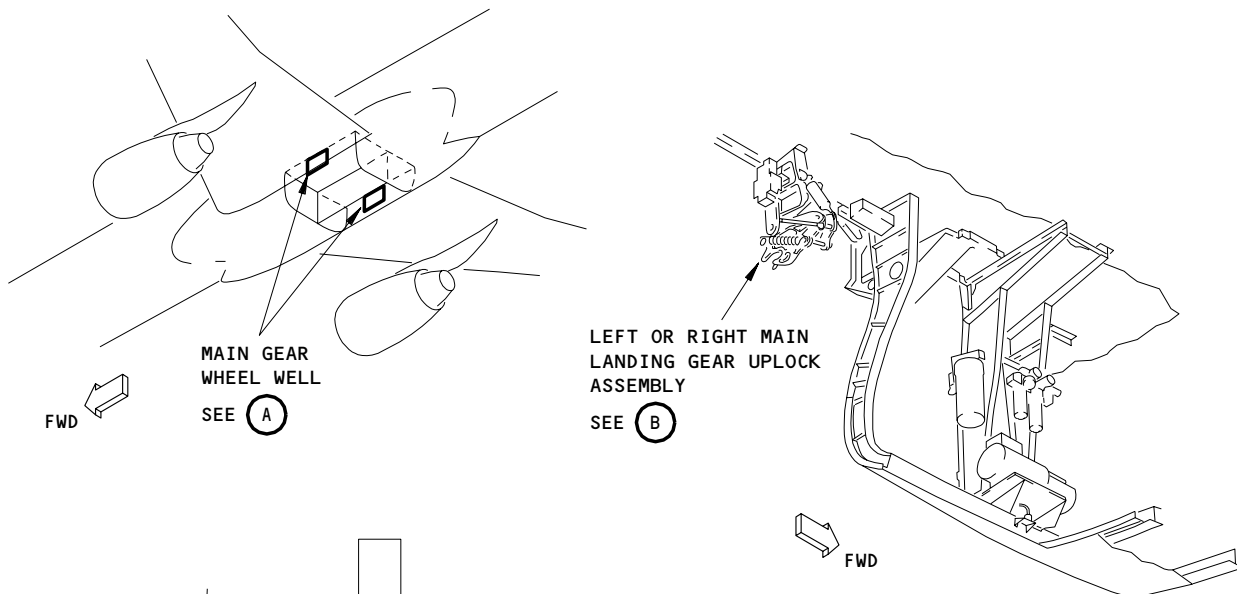
EFFECTIVITY

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UPLOCK HOOK
ZERK
BMS 3-33
(1 LOCATION)
1

UPLOCK ACTUATOR
ZERK
BMS 3-33
(2 LOCATIONS)
1

LEFT OR RIGHT MAIN LANDING GEAR UPLOCK ASSEMBLY

1 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

3 POINTS

(B)

Lubrication on the Uplock Assembly of the Main Landing Gear
Figure 303

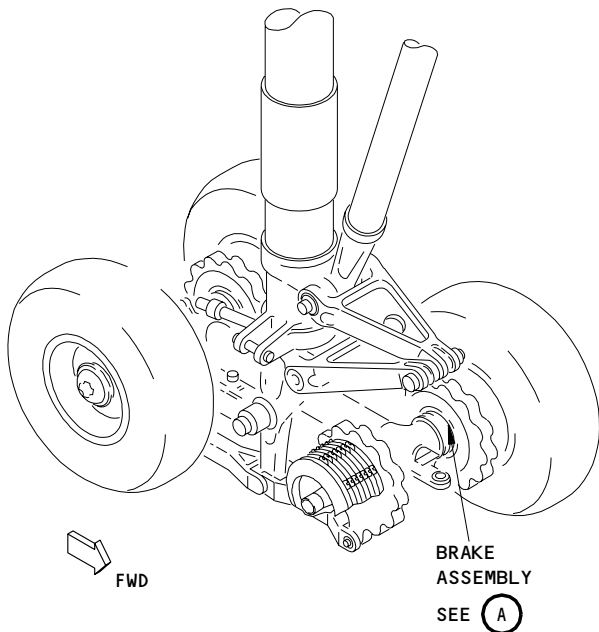
EFFECTIVITY

ALL

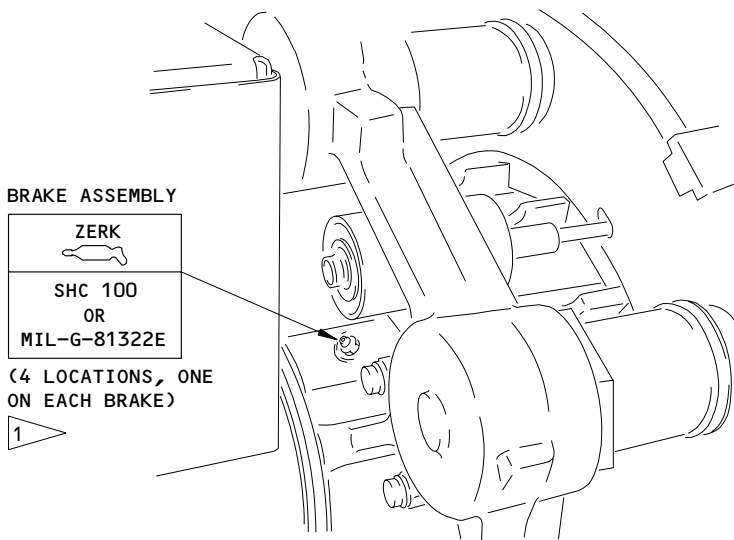
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LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR EQUIVALENT)



BRAKE ASSEMBLY

4 POINTS

(A)

1 AEROSHELL 22 (OPTIONAL)

Lubrication of the Brake Assembly on the Main Landing Gear
Figure 304

EFFECTIVITY	ALL
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MAIN GEAR DOORS AND ACTUATING MECHANISMS – SERVICING

1. General

- A. This procedure contains the data necessary to lubricate the main landing gear doors and their actuating mechanisms.

TASK 12-21-15-603-001

2. Lubricate the Main Landing Gear Doors and Their Actuating Mechanisms

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
(2) D00013 Grease – MIL-PRF-23827 (Alternate)

B. References

- (1) AMM 32-00-15/201, Landing Gear Door Locks
(2) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
731/741 Main Landing Gear (MLG)
732/742 MLG Body Doors
733/743 MLG Oleo Doors

- D. Prepare to Lubricate the Main Landing Gear Doors and Their Actuating Mechanisms.

S 493-002

- (1) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-003

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

- (2) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

- E. Lubricate the Main Landing Gear Doors and Their Actuating Mechanisms

S 643-004

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. THE GREASE GUN CAN CAUSE DAMAGE TO THE FITTING.

- (1) Lubricate the main landing gear doors and their actuating mechanisms as shown on Fig. 301.

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F. Put the Airplane Back to Its Usual Condition

S 093-005

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

- (1) Remove the door locks and close the doors (AMM 32-00-15/201).

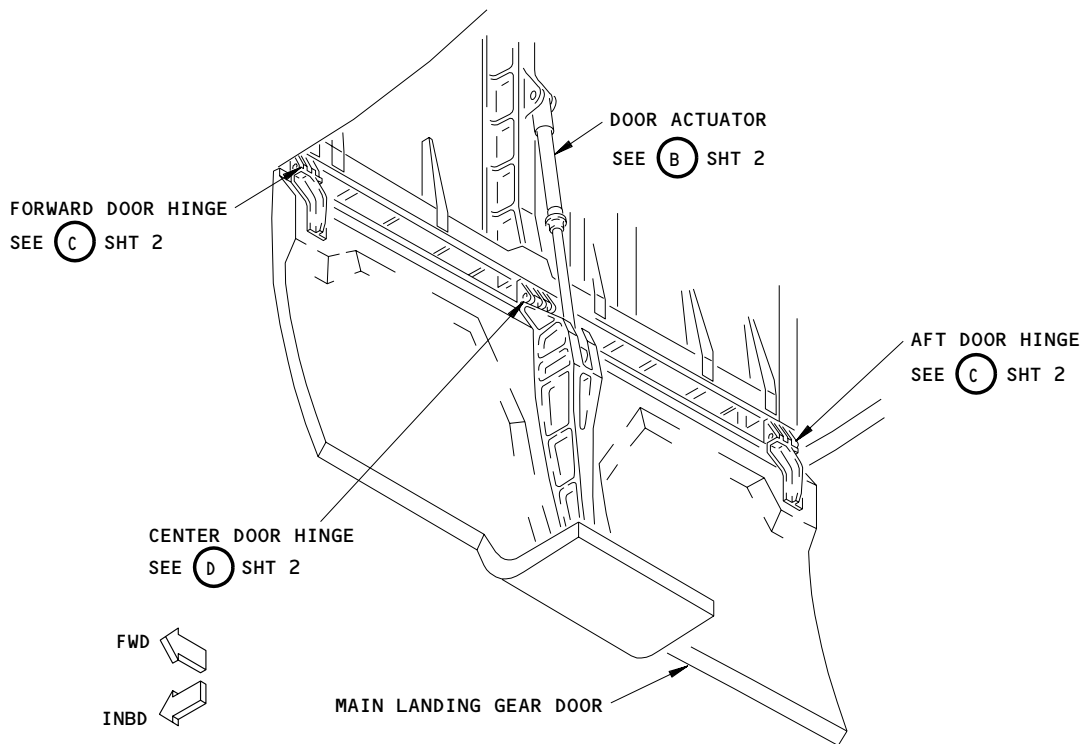
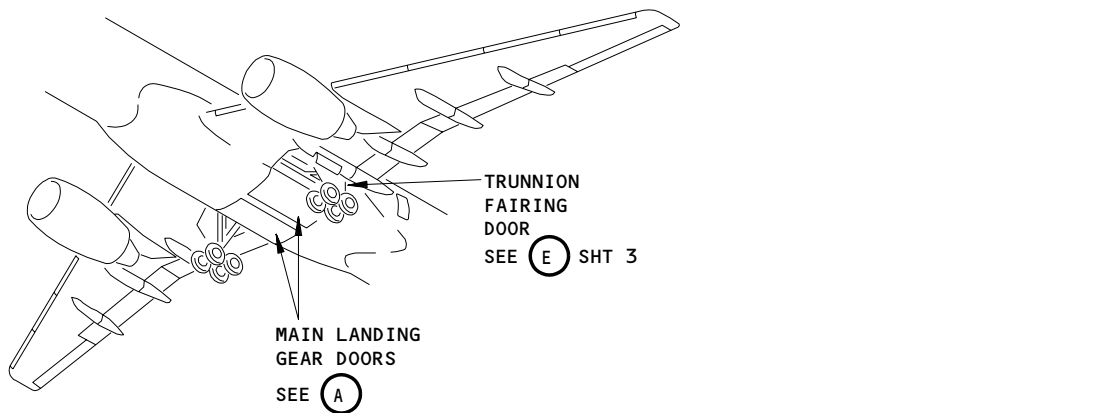
EFFECTIVITY

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LEFT MAIN LANDING GEAR
(RIGHT MAIN LANDING GEAR EQUIVALENT)

(A)

Lubrication of the Main Landing Gear Doors and the Actuating Mechanisms
Figure 301 (Sheet 1)

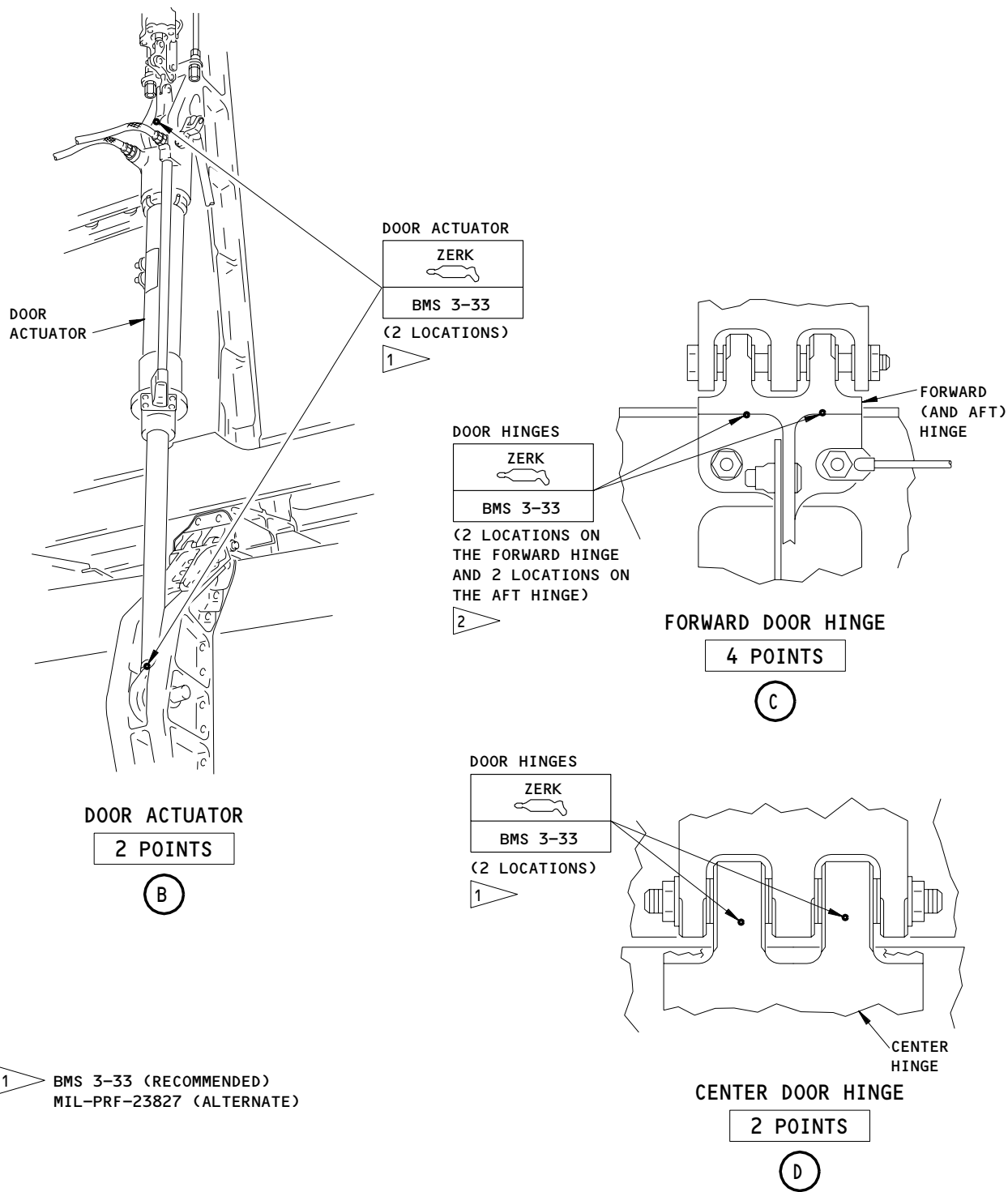
EFFECTIVITY	
	ALL

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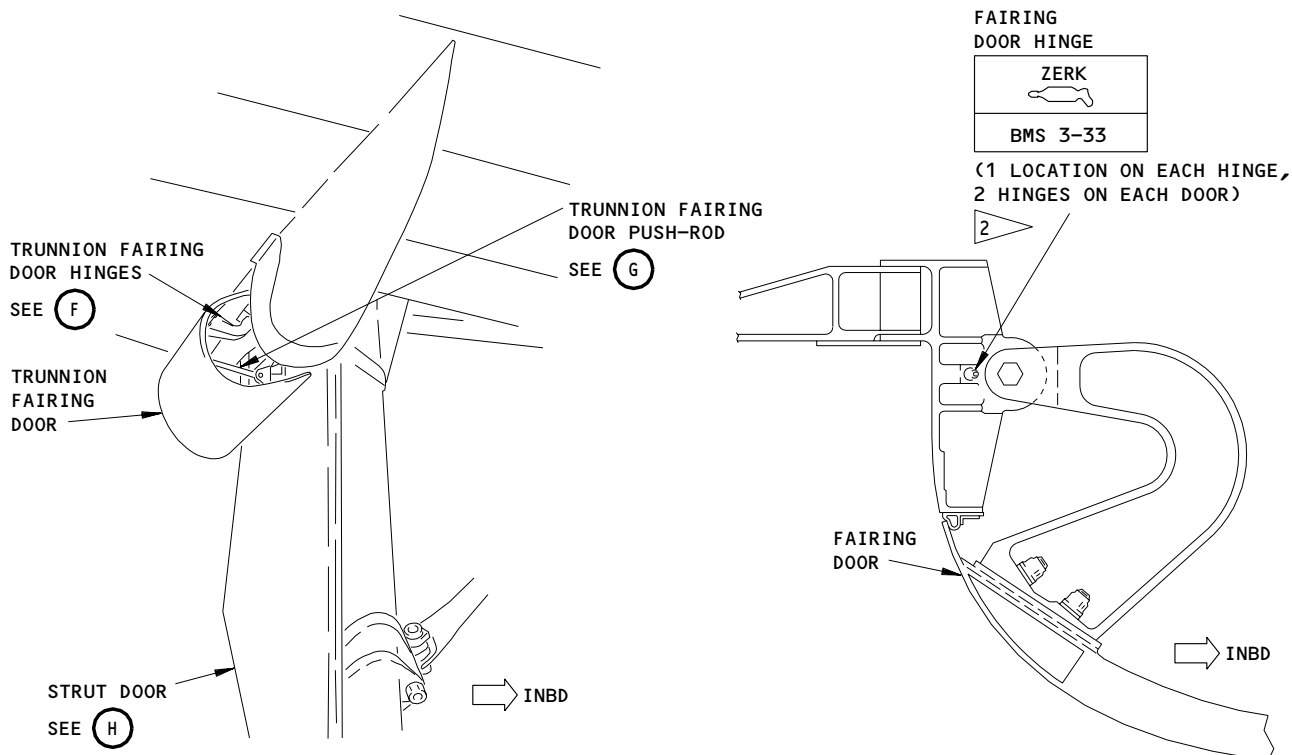
333946



Lubrication of the Main Landing Gear Doors and the Actuating Mechanisms
Figure 301 (Sheet 2)

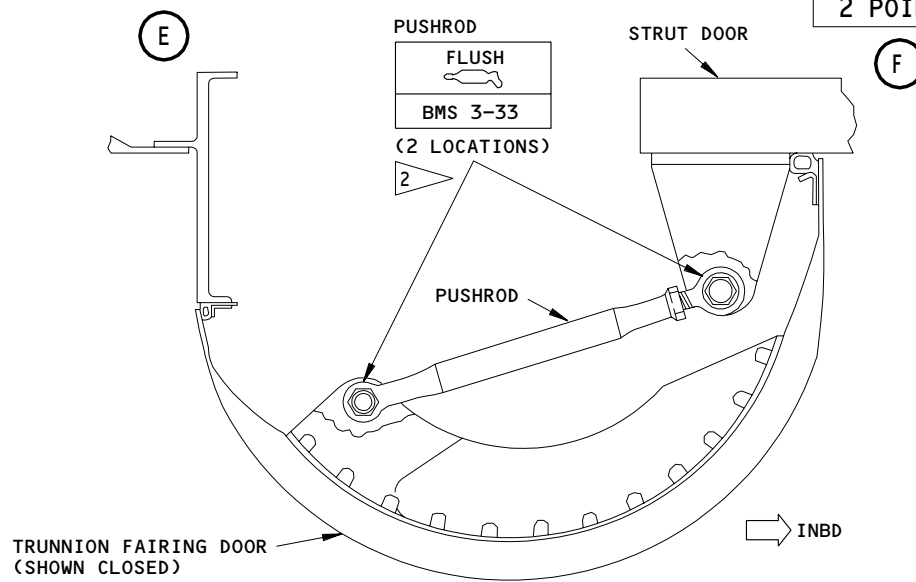
EFFECTIVITY	
	ALL

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LEFT TRUNNION FAIRING DOOR
(RIGHT TRUNNION FAIRING DOOR IS EQUIVALENT)

TRUNNION FAIRING DOOR HINGES



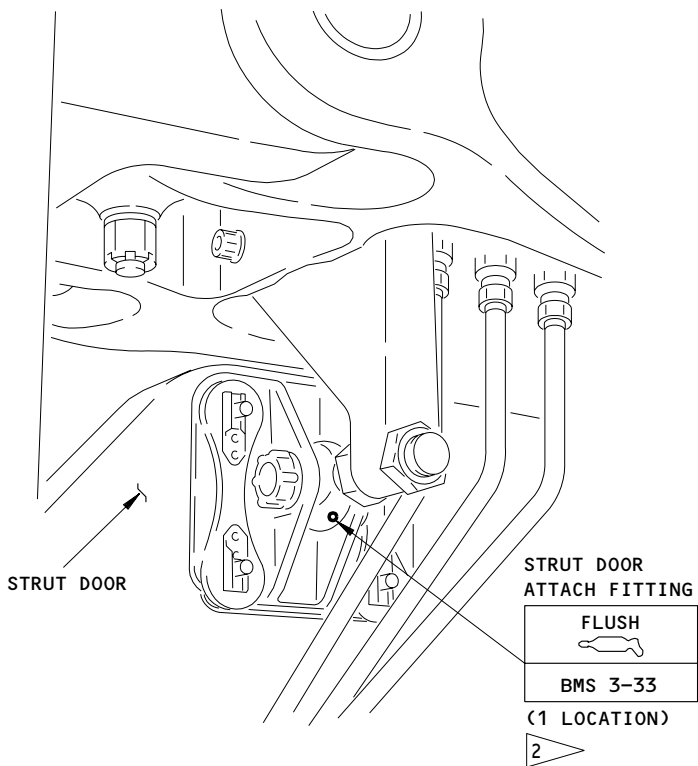
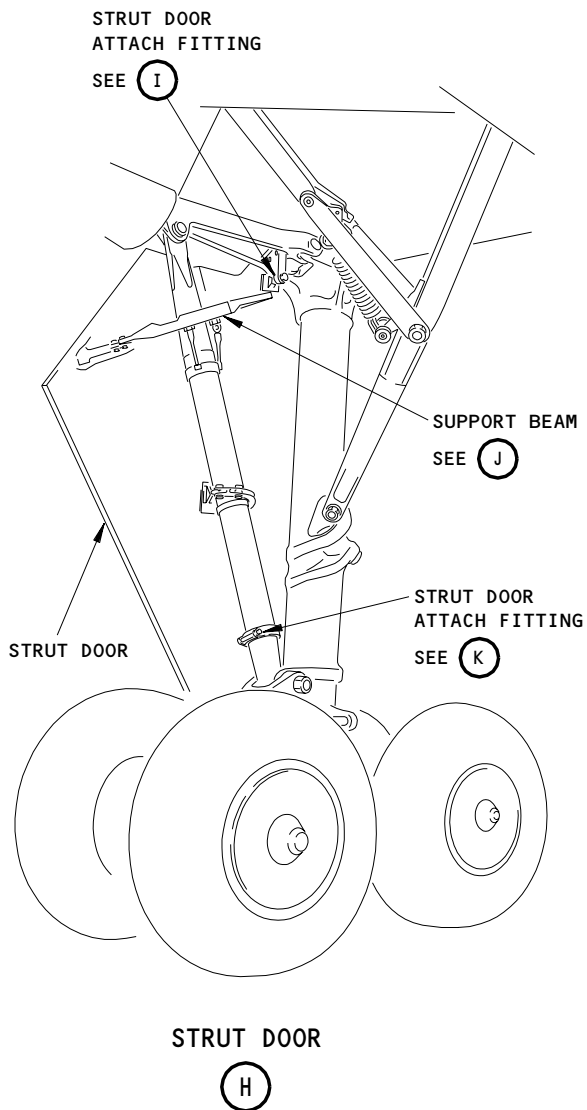
2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication of the Main Landing Gear Doors and the Actuating Mechanisms
Figure 301 (Sheet 3)

EFFECTIVITY	ALL
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334066



STRUT DOOR ATTACH FITTING

1 POINT

(I)

2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication of the Main Landing Gear Doors and the Actuating Mechanisms
Figure 301 (Sheet 4)

EFFECTIVITY

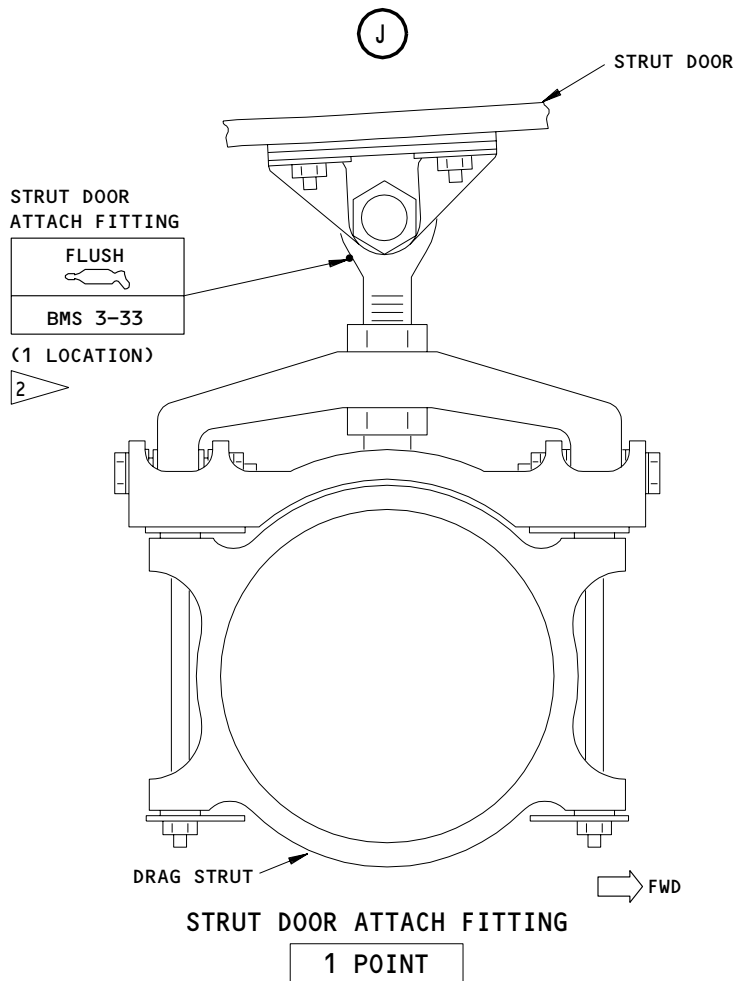
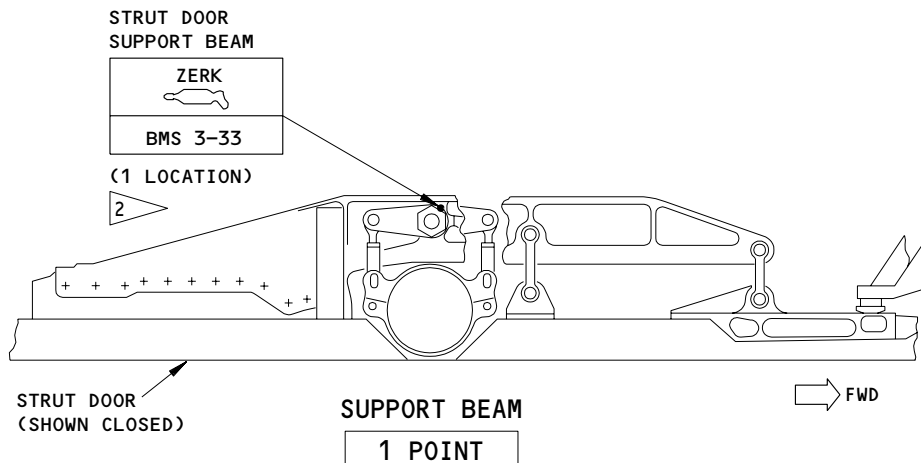
ALL

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2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Lubrication of the Main Landing Gear Doors and the Actuating Mechanisms
Figure 301 (Sheet 5)

EFFECTIVITY

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NO. 1, 2, AND 4 PASSENGER DOORS - SERVICING

1. General

- A. This procedure contains these tasks:
- (1) Lubricate the No. 1, 2, or 4 passenger door.
 - (2) Lubricate the door hinge torque tube, and body hinge torque tube.
 - (3) Lubricate the passenger door emergency mechanism.
 - (4) Lubricate the passenger door girt bar.
 - (5) Lubricate the passenger door latch crank bearings and latch crank rollers.
 - (6) Lubricate the lower harness latch.
 - (7) Lubricate the emergency power assist support assembly bearing.

TASK 12-21-18-643-001

2. Lubricate the No. 1, 2, or 4 Passenger Door

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
- (2) D00013 Grease - MIL-PRF-23827 (Alternate)
- (3) D00015 Grease - BMS 3-24 (Alternative)
- (4) D00566 Lubricant, Solid Film - BMS 3-8
- (5) D00210 Grease - Light consistency DC-33

B. References

- (1) 52-11-02/401, Door Lining

C. Access

(1) Location Zones

- | | |
|-----|------------------------------|
| 831 | No. 1 Passenger Door (Left) |
| 832 | No. 2 Passenger Door (Left) |
| 836 | No. 4 Passenger Door (Left) |
| 841 | No. 1 Passenger Door (Right) |
| 842 | No. 2 Passenger Door (Right) |
| 846 | No. 4 Passenger Door (Right) |

(2) Access Panels

- | | |
|-------|--|
| 221AL | Body Hinge Torque Tube, No. 1 Door (Left) |
| 222AR | Body Hinge Torque Tube, No. 1 Door (Right) |
| 231AL | Body Hinge Torque Tube, No. 2 Door (Left) |
| 232AR | Body Hinge Torque Tube, No. 2 Door (Right) |
| 251AL | Body Hinge Torque Tube, No. 4 Door (Left) |
| 252AR | Body Hinge Torque Tube, No. 4 Door (Right) |

D. Procedure

S 013-002

- (1) Remove the access panels for the body hinge torque tube.

S 013-003

- (2) Remove the escape slide cover and lower door lining (Ref 52-11-02).

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- S 643-004
(3) Lubricate the latch crank rollers as shown (View A, Fig. 301).
- S 643-028
(4) Lubricate the door hinge torque tube as shown (View B, Fig. 301).
- S 643-029
(5) Lubricate the body hinge torque tube as shown (View C, Fig. 301).
- S 643-030
(6) Lubricate the guide arm as shown (View D, Fig. 301).
- S 643-031
(7) Lubricate the activate/deactivate mechanism for the No. 1 or 2 passenger door as shown (View D, Fig. 302).
- S 643-032
(8) Lubricate the girt bar mechanism as shown (View E, Fig. 302).
- S 643-005
(9) Lubricate the handle mechanism as shown (View F, Fig. 302). Do these steps:
(a) Close and latch the door.
(b) Lubricate the latch crank bearings (View F, Fig. 302).
- S 643-033
(10) Lubricate the girt bar slide mechanism as shown (Views B and C, Fig. 303).
- S 643-034
(11) Lubricate the lower harness latch as shown (View A, Fig. 304).
- S 413-006
(12) Install the lower door lining and escape slide cover (Ref 52-11-02).
- S 413-007
(13) Install the access panels for the body hinge torque tube.

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TASK 12-21-18-123-047

3. Lubricate the Passenger Door Hinge Torque Tube, and Body Hinge Torque Tube

NOTE: This is a scheduled maintenance task.

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
- (2) D00013 Grease - MIL-PRF-23827 (Alternate)

B. References

- (1) 52-11-02/401, Door Lining

C. Access

(1) Location Zones

- 831 No. 1 Passenger Door (Left)
- 832 No. 2 Passenger Door (Left)
- 836 No. 4 Passenger Door (Left)
- 841 No. 1 Passenger Door (Right)
- 842 No. 2 Passenger Door (Right)
- 846 No. 4 Passenger Door (Right)

(2) Access Panels

- 221AL Body Hinge Torque Tube, No. 1 Door (Left)
- 222AR Body Hinge Torque Tube, No. 1 Door (Right)
- 231AL Body Hinge Torque Tube, No. 2 Door (Left)
- 232AR Body Hinge Torque Tube, No. 2 Door (Right)
- 251AL Body Hinge Torque Tube, No. 4 Door (Left)
- 252AR Body Hinge Torque Tube, No. 4 Door (Right)

D. Procedure

S 013-020

- (1) Remove the access panels for the body hinge torque tube.

S 013-021

- (2) Remove the escape slide cover and lower door lining (Ref 52-11-02).

S 643-023

- (3) Lubricate the door hinge torque tube as shown (View B, Fig. 301).

S 643-024

- (4) Lubricate the body hinge torque tube as shown (View C, Fig. 301).

S 413-025

- (5) Install the lower door lining and escape slide cover (Ref 52-11-02).

S 413-026

- (6) Install the access panels for the body hinge torque tube.

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TASK 12-21-18-643-013

4. Lubricate the Passenger Door Emergency Mechanism

NOTE: This is a scheduled maintenance task.

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
- (2) D00013 Grease - MIL-PRF-23827 (Alternate)
- (3) D00210 Grease - Light consistency DC-33

B. References

- (1) 52-11-02/401, Door Lining

C. Access

(1) Location Zones

831	No. 1 Passenger Door (Left)
832	No. 2 Passenger Door (Left)
836	No. 4 Passenger Door (Left)
841	No. 1 Passenger Door (Right)
842	No. 2 Passenger Door (Right)
846	No. 4 Passenger Door (Right)

D. Procedure

S 013-014

- (1) Remove the escape slide cover, lower door lining, and upper door lining. (Ref 52-11-02).

S 643-015

- (2) Lubricate the activate/deactivate mechanism for the No. 1, 2, or 4 passenger door as shown (View D, Fig. 302).

S 643-016

- (3) Lubricate the girt bar mechanism as shown (View E, Fig. 302).

S 413-018

- (4) Install the upper door lining, lower door lining, and escape slide cover (Ref 52-11-02).

TASK 12-21-18-643-009

5. Lubricate the Passenger Door Girt Bar

NOTE: This is a scheduled maintenance task.

A. Consumable Materials

- (1) D00210 Grease - Light consistency DC-33

B. References

- (1) 52-11-02/401, Door Lining

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C. Access

(1) Location Zones

831	No. 1 Passenger Door (Left)
832	No. 2 Passenger Door (Left)
836	No. 4 Passenger Door (Left)
841	No. 1 Passenger Door (Right)
842	No. 2 Passenger Door (Right)
846	No. 4 Passenger Door (Right)

D. Procedure

S 643-011

- (1) Lubricate the girt bar slide mechanism as shown (Views B and C, Fig. 303).
(a) Apply the grease in a thin layer.

S 643-049

- (2) Cycle the girt bar several times and wipe off any build-up of DC-33 grease.

TASK 12-21-18-643-039

6. Lubricate the Passenger Door Latch Crank Bearings and Latch Crank Rollers

NOTE: This is a scheduled maintenance task.

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00013 Grease - MIL-PRF-23827 (Alternate)

B. References

- (1) 52-11-02/401, Door Lining

C. Access

(1) Location Zones

831	No. 1 Passenger Door (Left)
832	No. 2 Passenger Door (Left)
836	No. 4 Passenger Door (Left)
841	No. 1 Passenger Door (Right)
842	No. 2 Passenger Door (Right)
846	No. 4 Passenger Door (Right)

D. Procedure

S 013-041

- (1) Remove the escape slide cover and lower door lining (Ref 52-11-02).

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- S 643-022
(2) Lubricate the latch crank rollers as shown (View A, Fig. 301).
- S 643-042
(3) Lubricate the handle mechanism as shown (View F, Fig. 302). Do these steps:
(a) Close and latch the door.
(b) Lubricate the latch crank bearings (View F, Fig. 302).
- S 413-043
(4) Install the lower door lining and escape slide cover (Ref 52-11-02).

TASK 12-21-18-643-040

7. Lubricate the Lower Harness Latch

NOTE: This is a scheduled maintenance task.

A. Consumable Materials

- (1) D00566 Lubricant, Solid Film - BMS 3-8

B. References

- (1) 52-11-02/401, Door Lining

C. Access

- (1) Location Zones

831	No. 1 Passenger Door (Left)
832	No. 2 Passenger Door (Left)
836	No. 4 Passenger Door (Left)
841	No. 1 Passenger Door (Right)
842	No. 2 Passenger Door (Right)
846	No. 4 Passenger Door (Right)

D. Procedure

- S 013-044
(1) Remove slide cover (Ref 52-11-02).
- S 643-045
(2) Lubricate the lower harness latch as shown (View A, Fig. 304).
- S 413-046
(3) Install the slide cover (Ref 52-11-02).

TASK 12-21-18-643-035

8. Lubricate the Emergency Power Assist Support Assembly Bearing

NOTE: This is a scheduled maintenance task.

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00013 Grease - MIL-PRF-23827 (Alternate)

EFFECTIVITY

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02

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B. References

- (1) 25-21-06/401, Doorway Lining

C. Access

(1) Location Zones

831	Left No. 1 Passenger Door
832	Left No. 2 Passenger Door
836	Left No. 4 Passenger Door
841	Right No. 1 Passenger Door
842	Right No. 2 Passenger Door
846	Right No. 4 Passenger Door

D. Procedure

S 013-036

- (1) Remove the doorway lining on the side of the body hinge torque tube (AMM 25-21-06/401).

S 643-037

- (2) Lubricate the emergency power assist support assembly bearing (View E, Fig. 301).

S 413-038

- (3) Install the doorway lining (AMM 25-21-06/401).

EFFECTIVITY

ALL

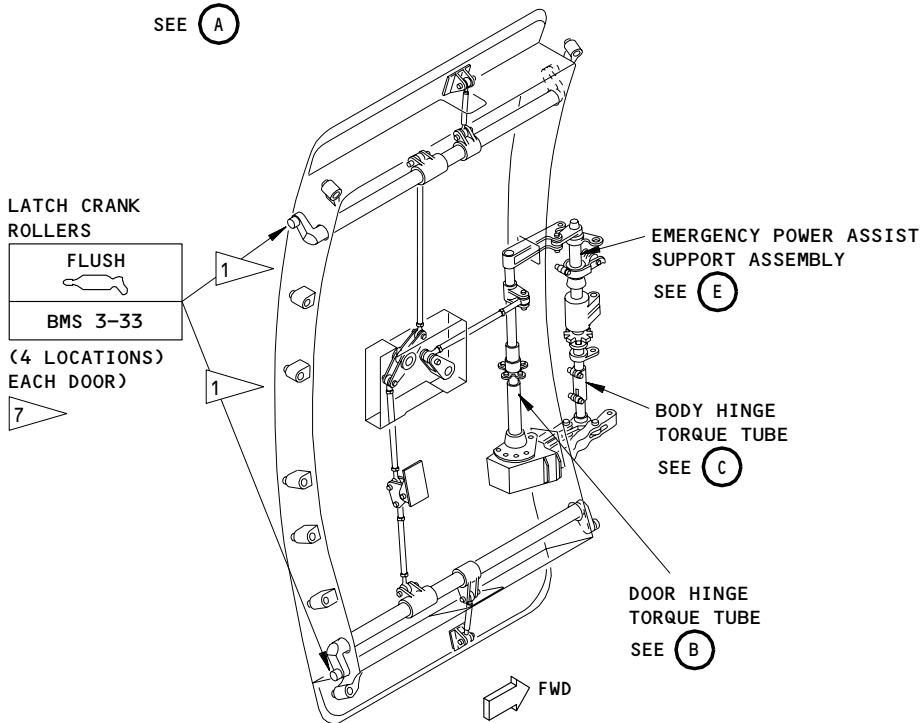
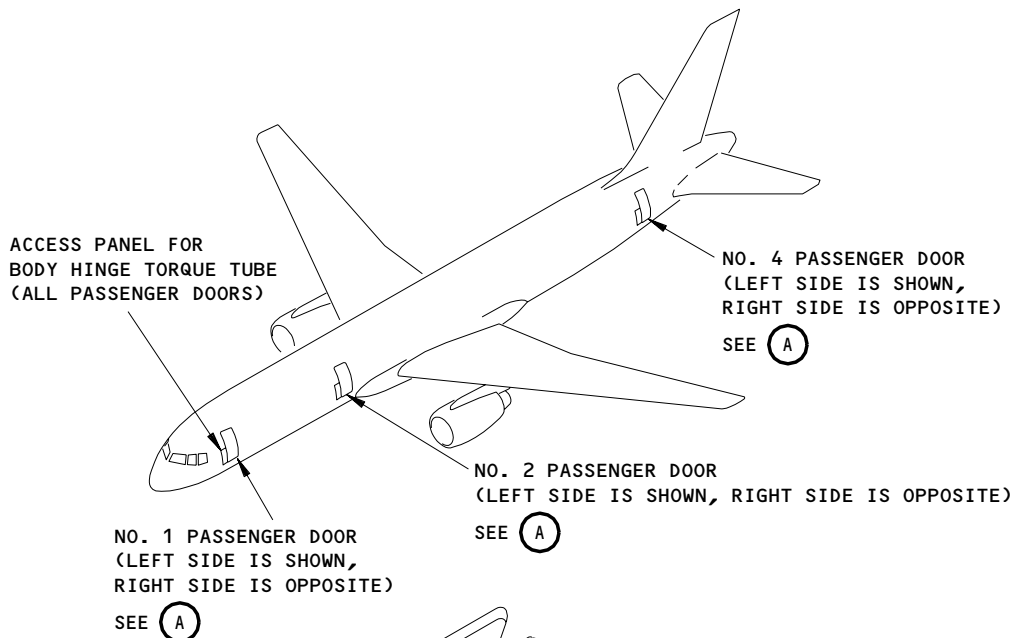
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NO. 1, 2 OR 4 PASSENGER DOOR
(INTERNAL VIEW)

4 POINTS

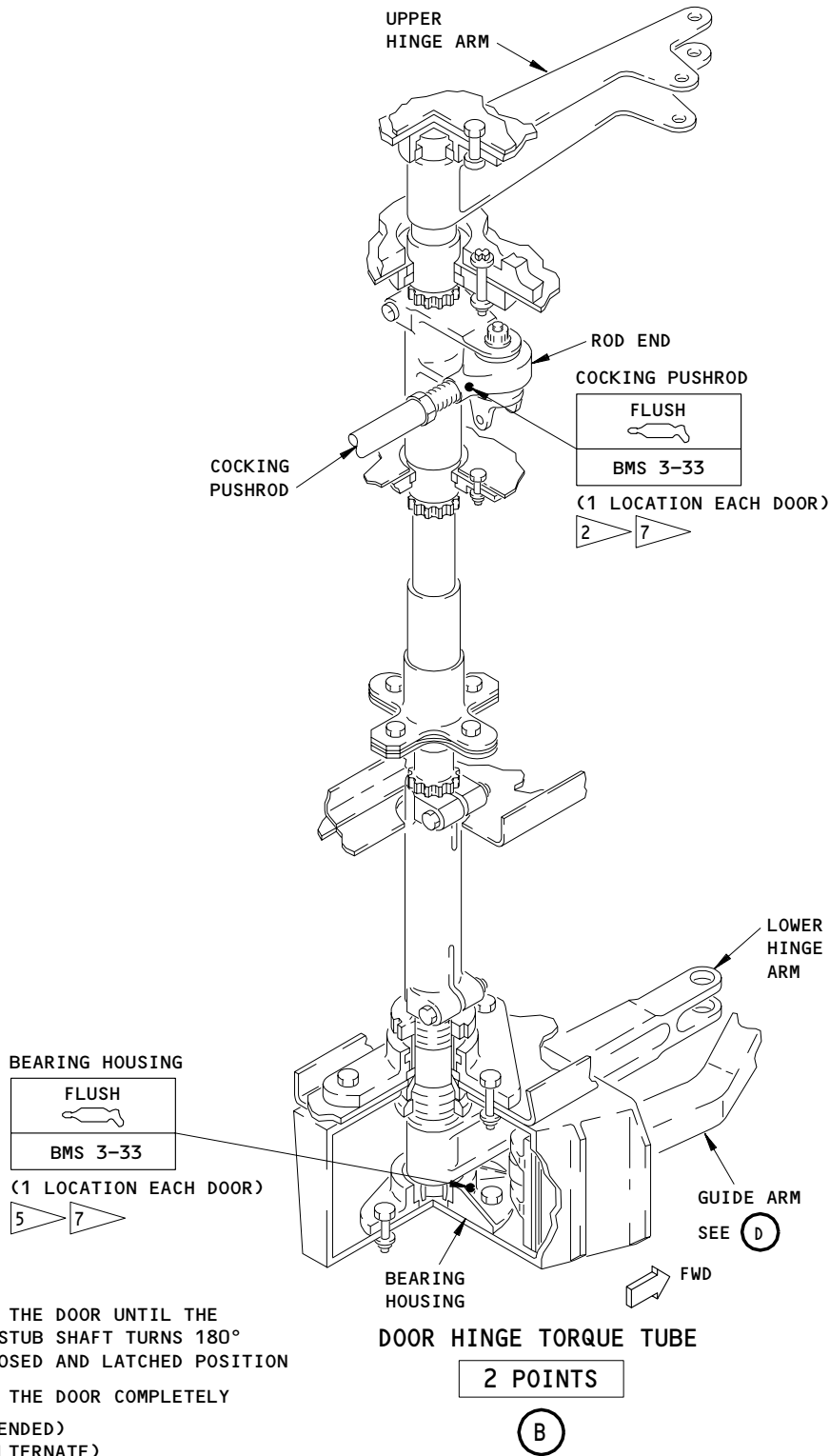
A

- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN).
- 7 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Passenger Doors Lubrication
Figure 301 (Sheet 1)

EFFECTIVITY	ALL
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2 FOR ACCESS, OPEN THE DOOR UNTIL THE INTERIOR HANDLE STUB SHAFT TURNS 180° FROM THE DOOR CLOSED AND LATCHED POSITION

5 FOR ACCESS, OPEN THE DOOR COMPLETELY

7 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Passenger Doors Lubrication
Figure 301 (Sheet 2)

EFFECTIVITY

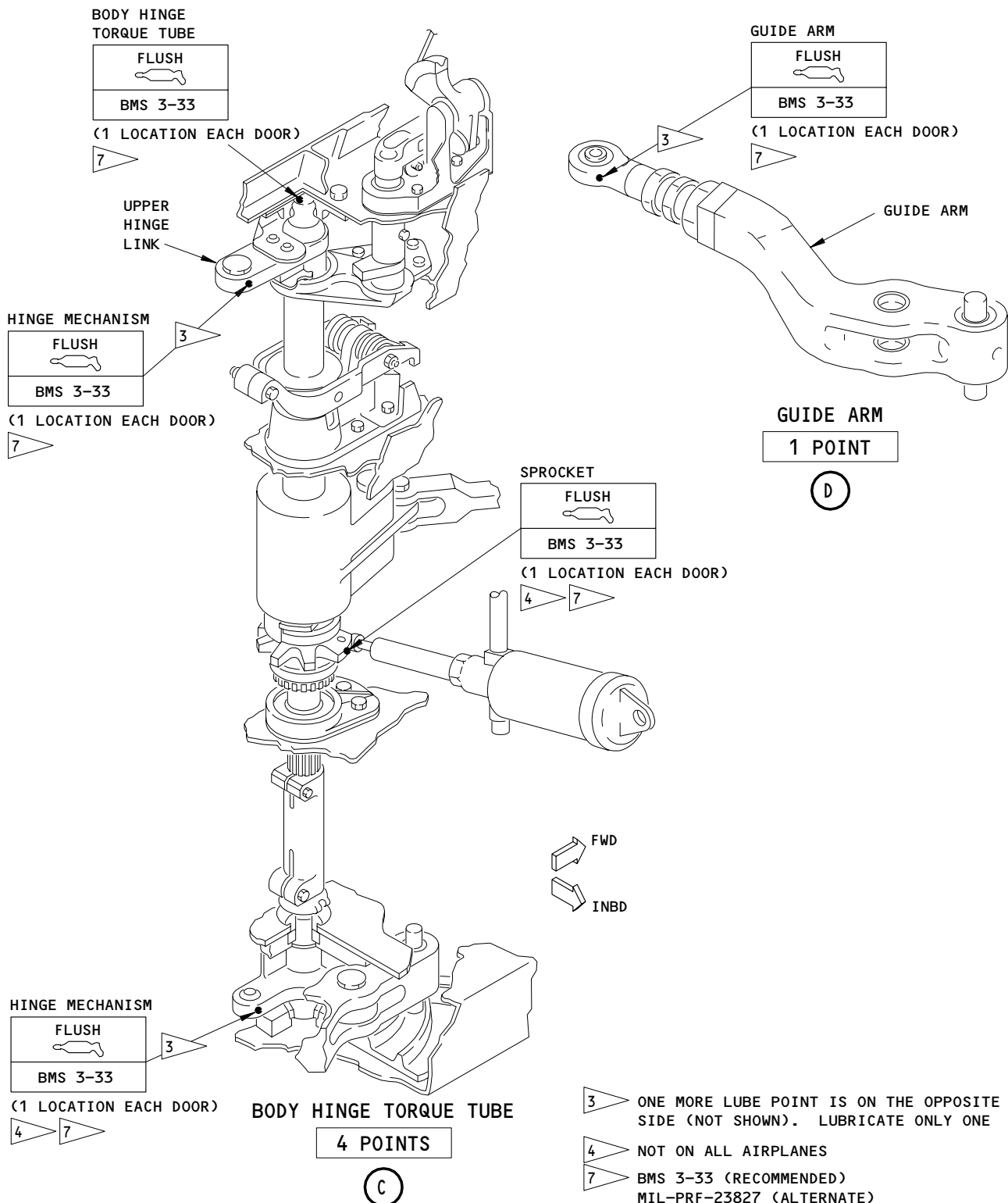
ALL

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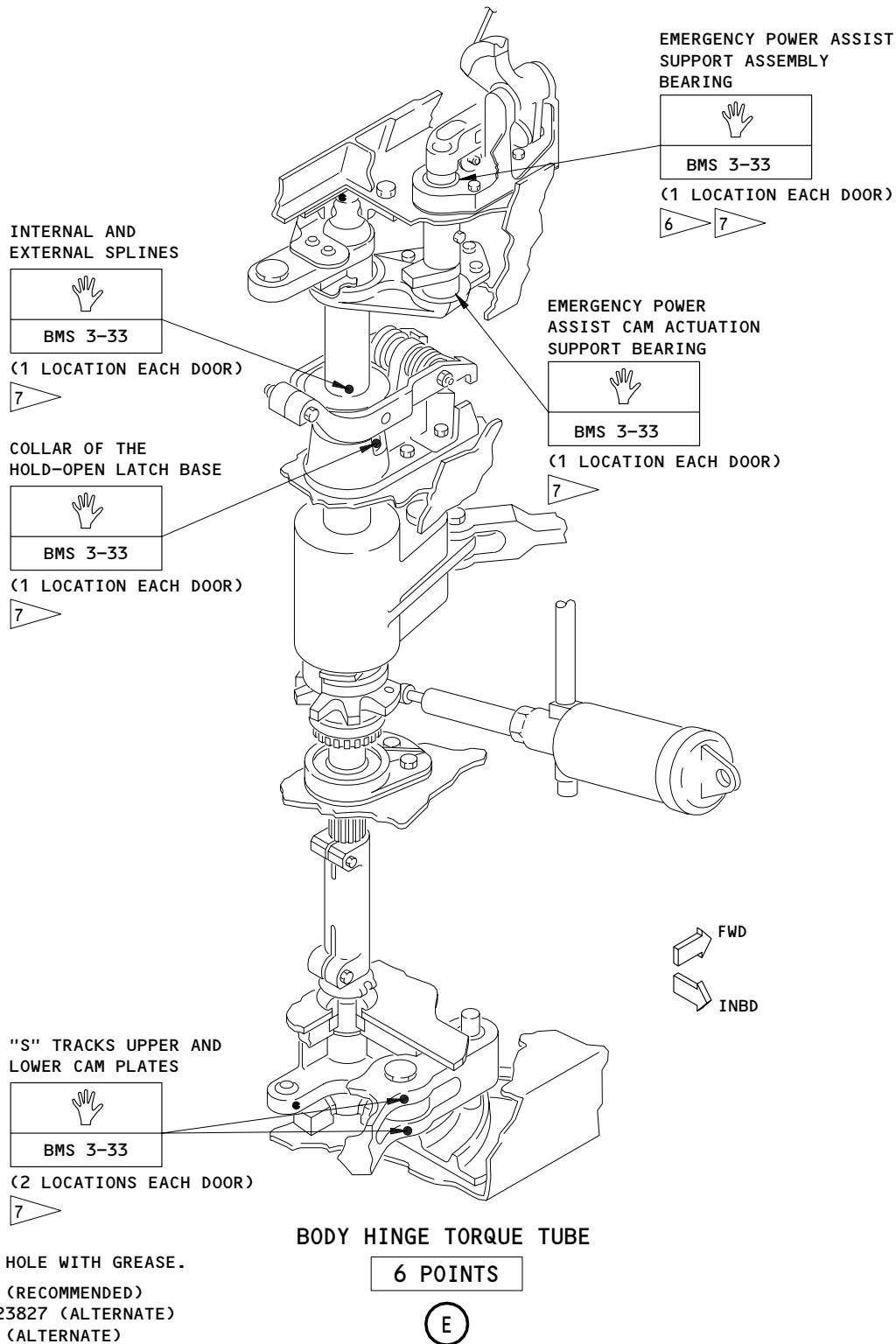
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Passenger Doors Lubrication
Figure 301 (Sheet 3)

EFFECTIVITY	
	ALL

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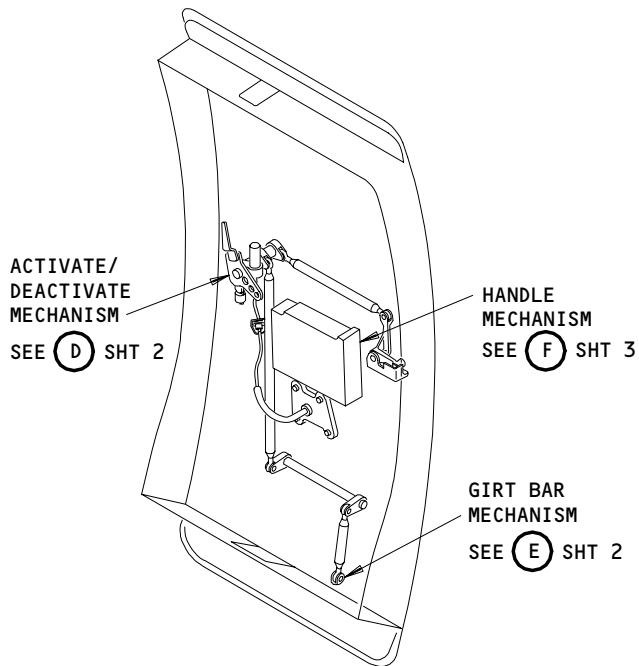
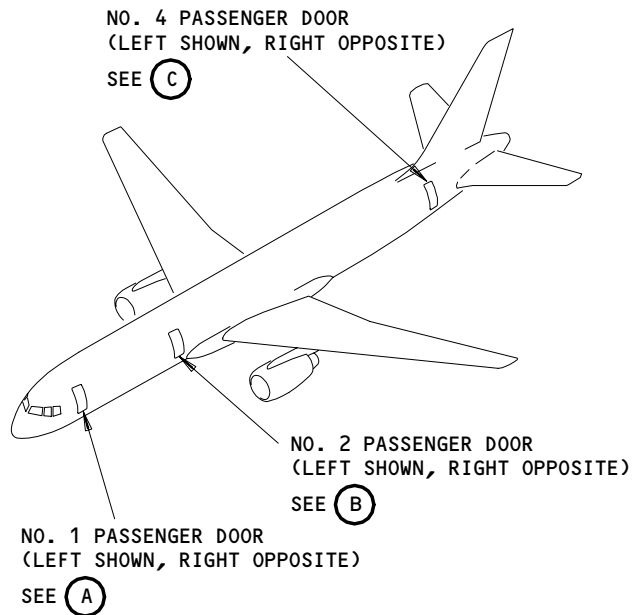
Passenger Doors Lubrication
Figure 301 (Sheet 4)

EFFECTIVITY	ALL
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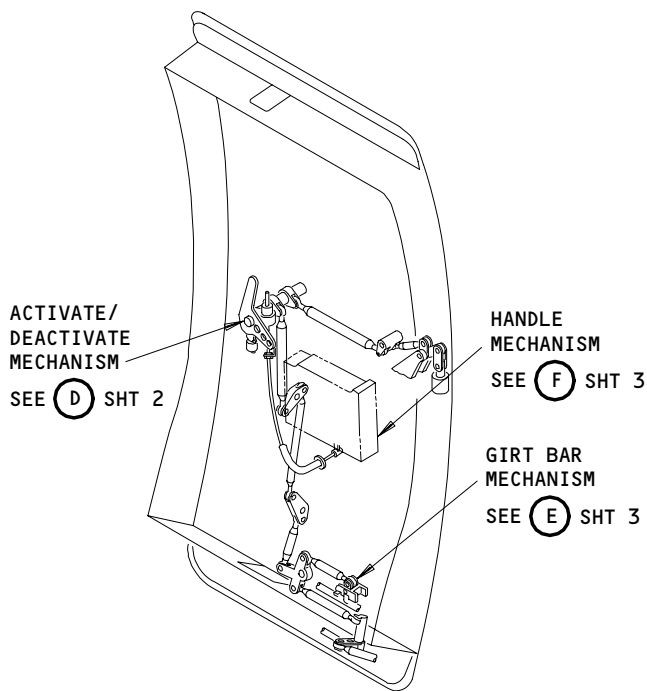
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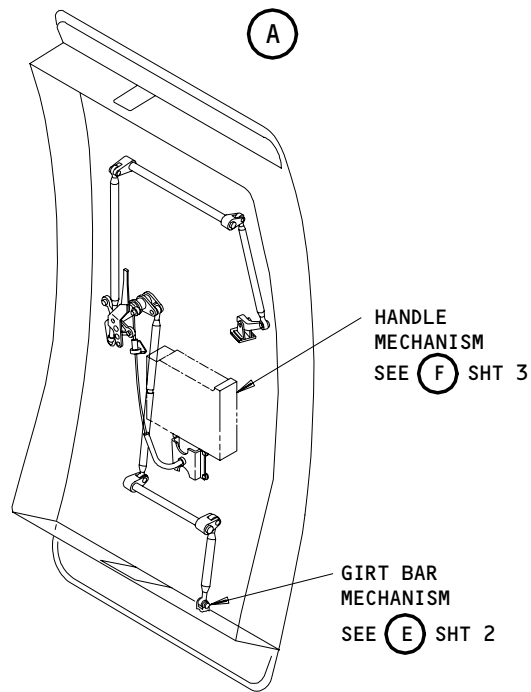
NO. 1 PASSENGER DOOR
(INTERNAL VIEW)

(A)



NO. 2 PASSENGER DOOR
(INTERNAL VIEW)

(B)



NO. 4 PASSENGER DOOR
(INTERNAL VIEW)

(C)

Passenger Door Emergency Mechanism Lubrication
Figure 302 (Sheet 1)

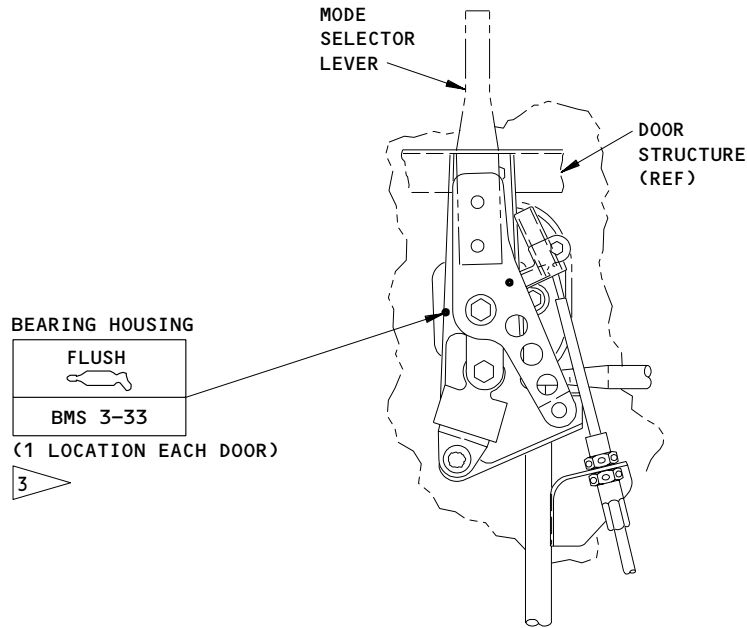
EFFECTIVITY

ALL

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01

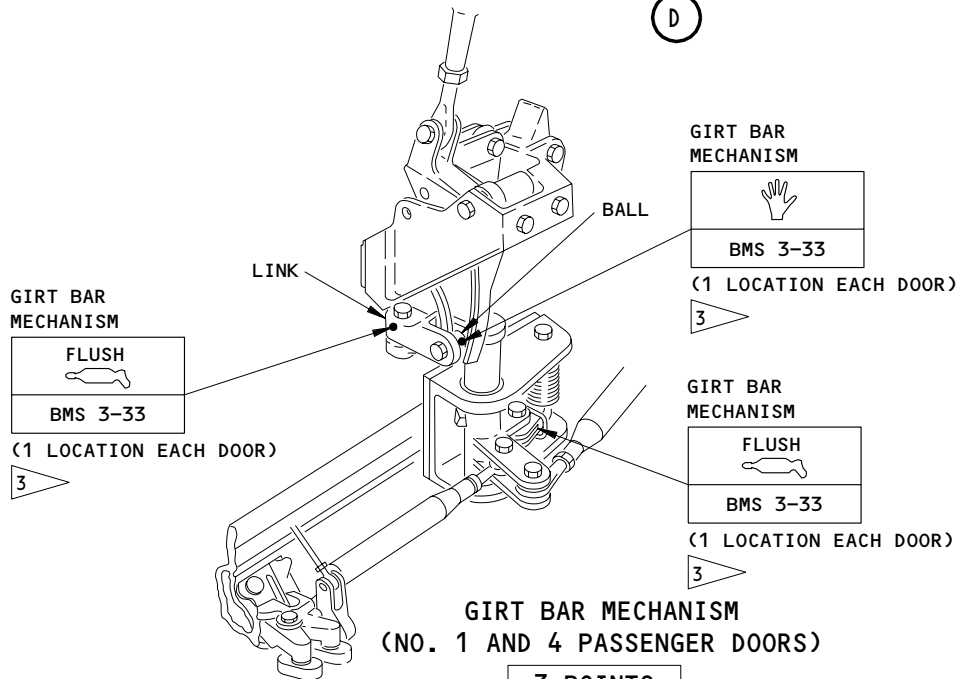
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ACTIVATE/DEACTIVATE MECHANISM
(NO. 1 AND 2 PASSENGER DOORS)

1 POINT

D



3 POINTS

E

3 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

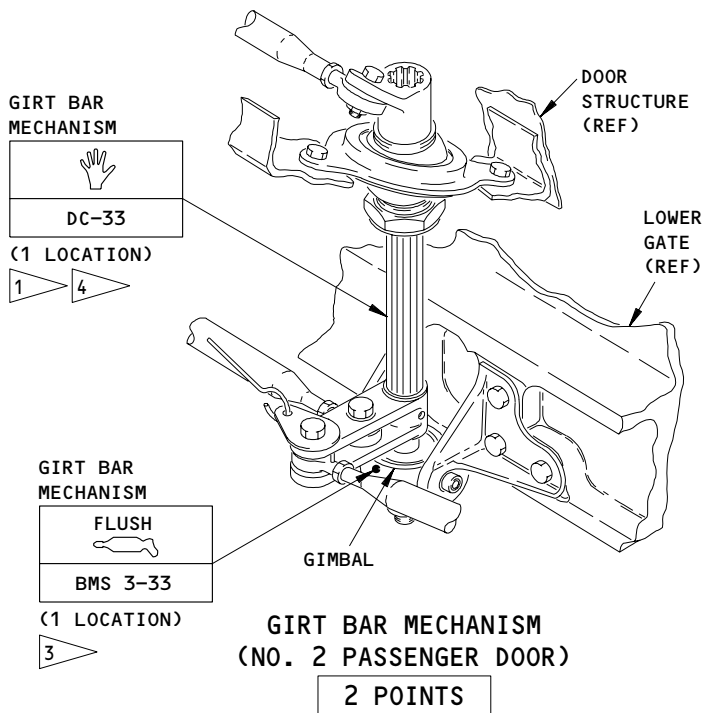
Passenger Door Emergency Mechanism Lubrication
Figure 302 (Sheet 2)

EFFECTIVITY	ALL
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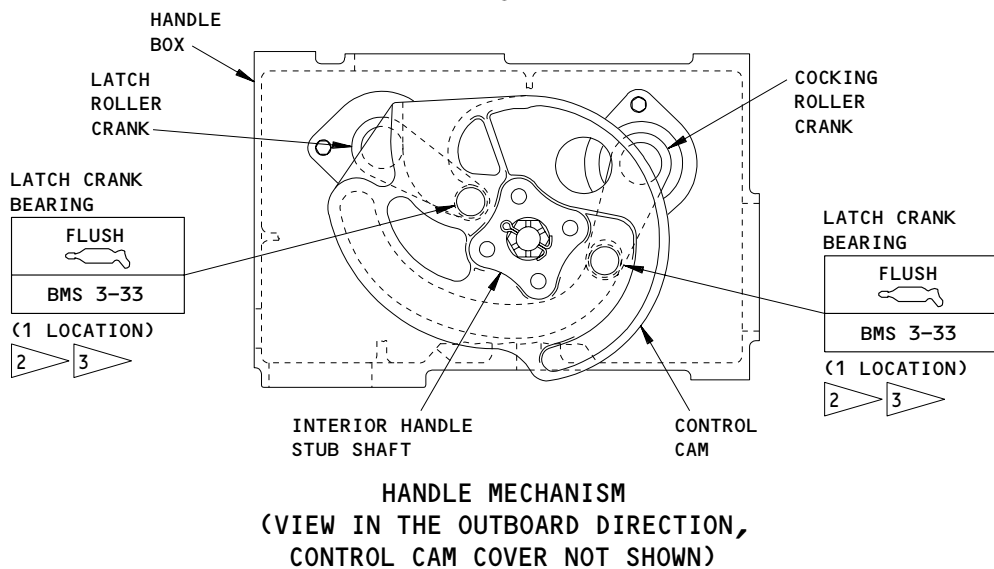
12-21-18

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E



F

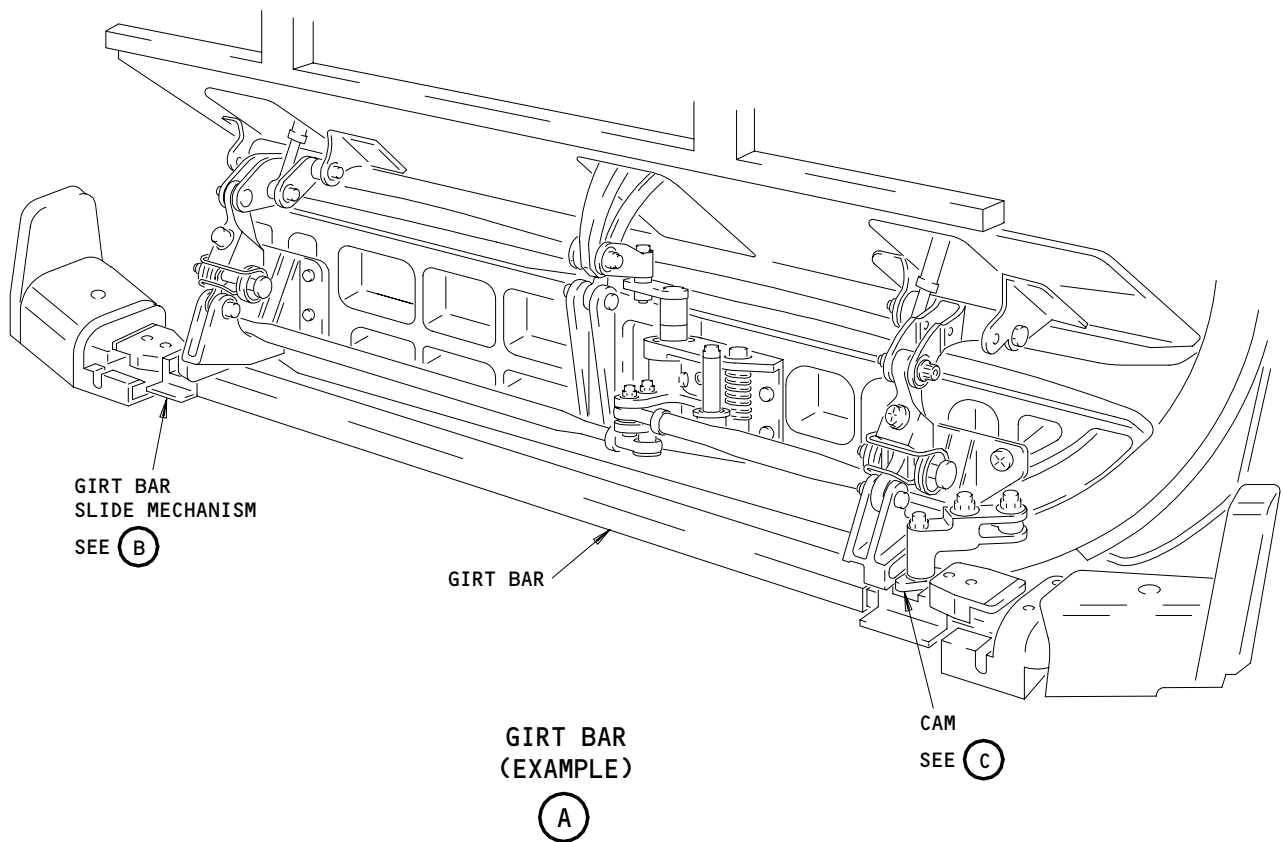
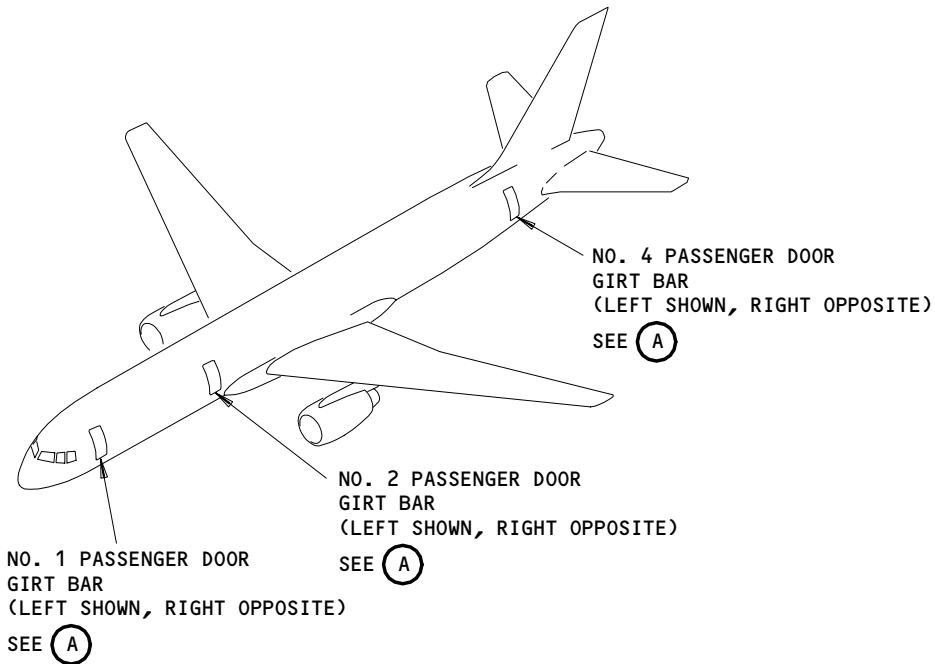
- 1 ▷ CLEAN AND LUBRICATE THE SURFACES OF THE SPLINE SHAFT THAT MOVE
- 2 ▷ GET ACCESS THROUGH THE HOLE IN THE CONTROL CAM. THE DOOR MUST BE IN THE CLOSED AND LATCHED POSITION

- 3 ▷ BMS-3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)
- 4 ▷ ONLY USE THIS LUBRICANT

Passenger Door Emergency Mechanism Lubrication
Figure 302 (Sheet 3)

EFFECTIVITY	ALL
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Passenger Door Girt Bar Lubrication
Figure 303 (Sheet 1)

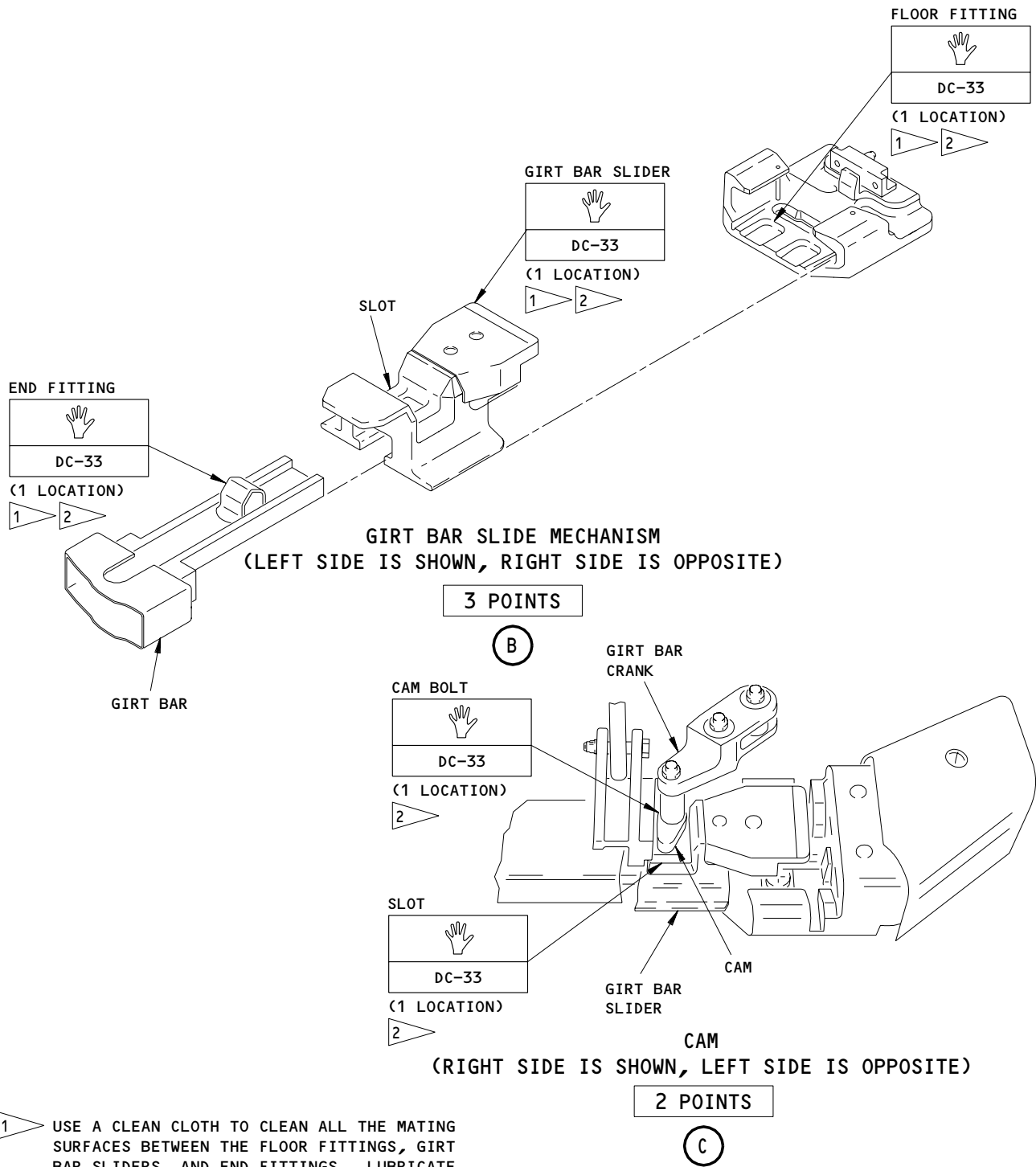
EFFECTIVITY	
	ALL

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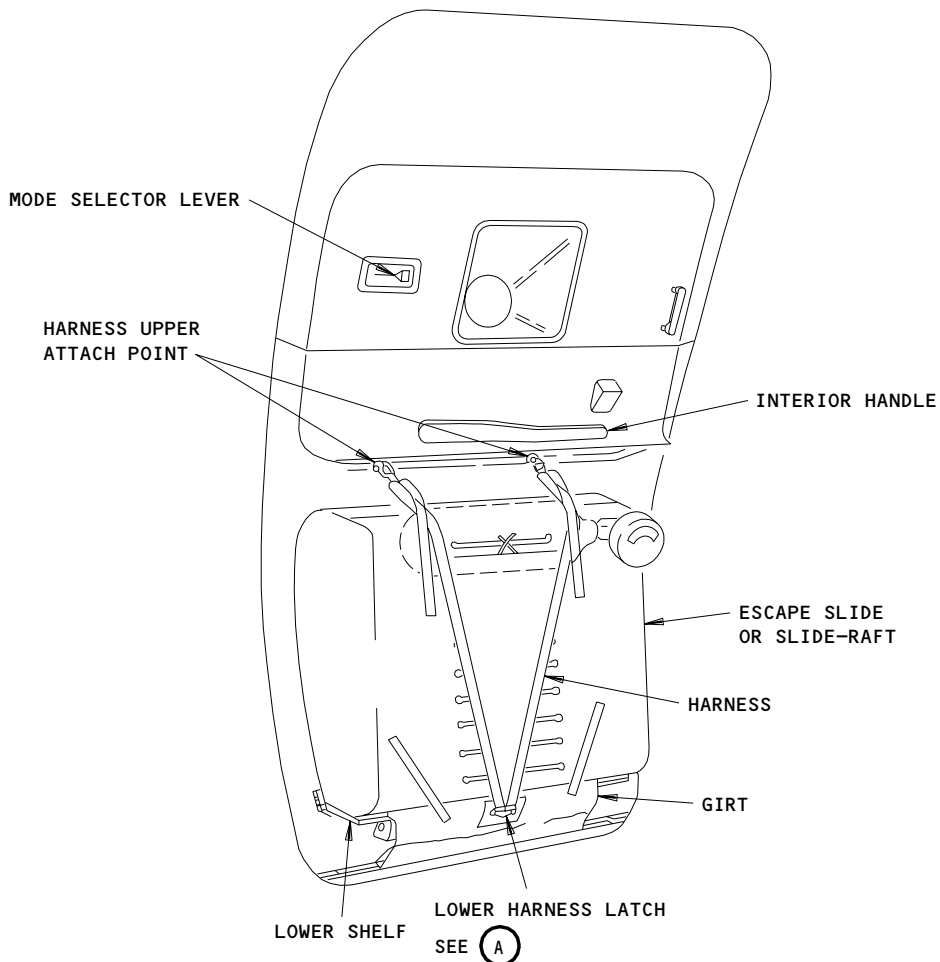


- 1 USE A CLEAN CLOTH TO CLEAN ALL THE MATING SURFACES BETWEEN THE FLOOR FITTINGS, GIRT BAR SLIDERS, AND END FITTINGS. LUBRICATE THE MATING SURFACES WITH A THIN LAYER OF GREASE
- 2 ONLY USE THIS LUBRICANT

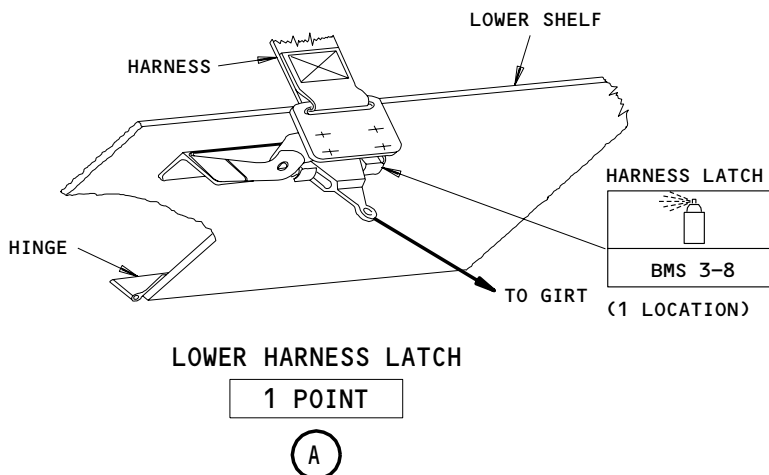
Passenger Door Girt Bar Lubrication
Figure 303 (Sheet 2)

EFFECTIVITY	ALL
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NO. 1,2, OR 4 PASSENGER DOOR
(COVER NOT SHOWN)



Escape Slide or Slide-Raft Lower Harness Latch
Figure 304

EFFECTIVITY	
	ALL

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766438

NO. 3 EMERGENCY EXIT DOOR – SERVICING

1. General

- A. This procedure gives instructions to lubricate the No. 3 emergency exit door.

TASK 12-21-21-643-001

2. Lubricate the No. 3 Emergency Exit Door (Fig. 301)

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
(2) D00013 Grease, MIL-PRF-23827 (Alternate)

B. References

- (1) AMM 25-66-03/401, No. 3 Emergency Exit Door Escape Slide
(2) AMM 52-21-03/401, No. 3 Emergency Exit Door Lining

C. Access

- (1) Location Zones
835/845 No. 3 Emergency Exit Door

D. Procedure – Lubricate the No. 3 Emergency Exit Door

S 013-005

- (1) Remove the escape slide and door cover (AMM 25-66-03/401).

S 013-002

- (2) Remove the door lining (AMM 52-21-03/401).

S 643-004

- (3) Lubricate the door as shown (Fig. 301).

S 413-003

- (4) Install the door lining (AMM 52-21-03/401).

S 413-006

- (5) Install the escape slide and slide cover (AMM 25-66-03/401).

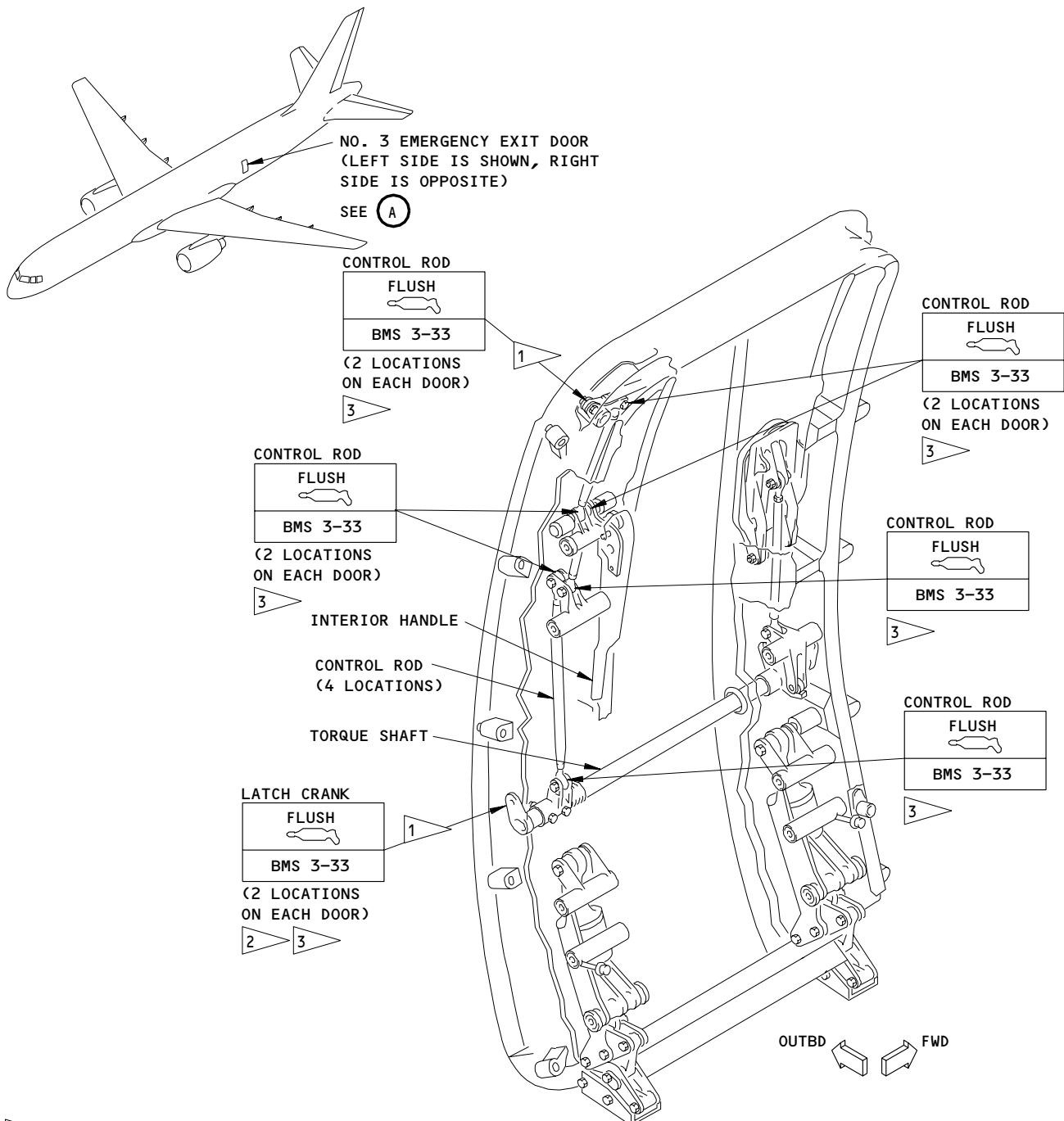
EFFECTIVITY

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- 1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)
- 2 NOT ALL DOORS HAVE LATCH CRANKS THAT REQUIRE LUBRICATION
- 3 BMS 3-33 (RECOMMENDED) MIL-PRF-23827 (ALTERNATE)

**NO. 3 EMERGENCY EXIT DOOR
(SHOWN WITH THE LINING AND ESCAPE SLIDE REMOVED)**

10 POINTS

A

**No. 3 Emergency Exit Door Lubrication
Figure 301**

EFFECTIVITY	
	ALL

12-21-21

69691

NO. 1 AND 2 CARGO DOORS – SERVICING

1. General

A. This procedure gives instructions to lubricate the No. 1 and 2 cargo doors.

TASK 12-21-22-643-002

2. Lubricate the No. 1 and 2 Cargo Doors

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
- (2) D00013 Grease, MIL-PRF-23827 (Alternate)

B. References

- (1) 52-34-00/601, No. 1 and 2 Cargo Door Inspection/Check.

C. Access

- (1) Location Zones
 - 821 No. 1 Cargo Door
 - 822 No. 2 Cargo Door

D. Procedure – Lubricate the No. 1 and 2 Cargo Doors

S 643-003

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. DAMAGE TO THE LUBRICATION FITTING CAN EASILY OCCUR.

- (1) Lubricate the No. 1 and 2 cargo doors as shown on Fig. 301.

NOTE: Turn the rod ends on the pushrod to get access to the lubrication fittings if necessary (Ref 52-34-00).

EFFECTIVITY

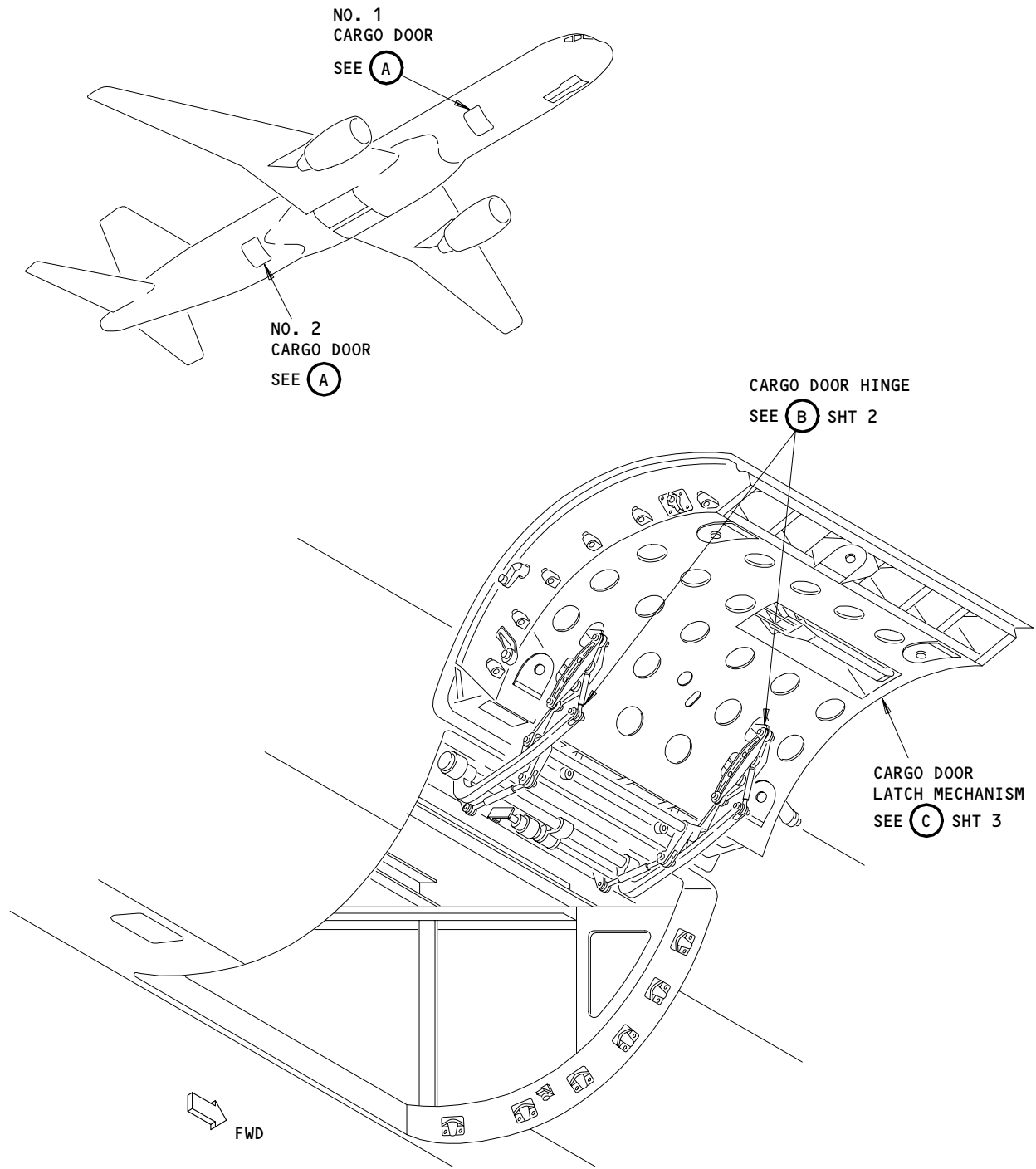
ALL

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NO. 1 OR NO. 2 CARGO DOOR
(SHOWN WITH THE DOOR OPEN)

(A)

No. 1 and No. 2 Cargo Door Lubrication
Figure 301 (Sheet 1)

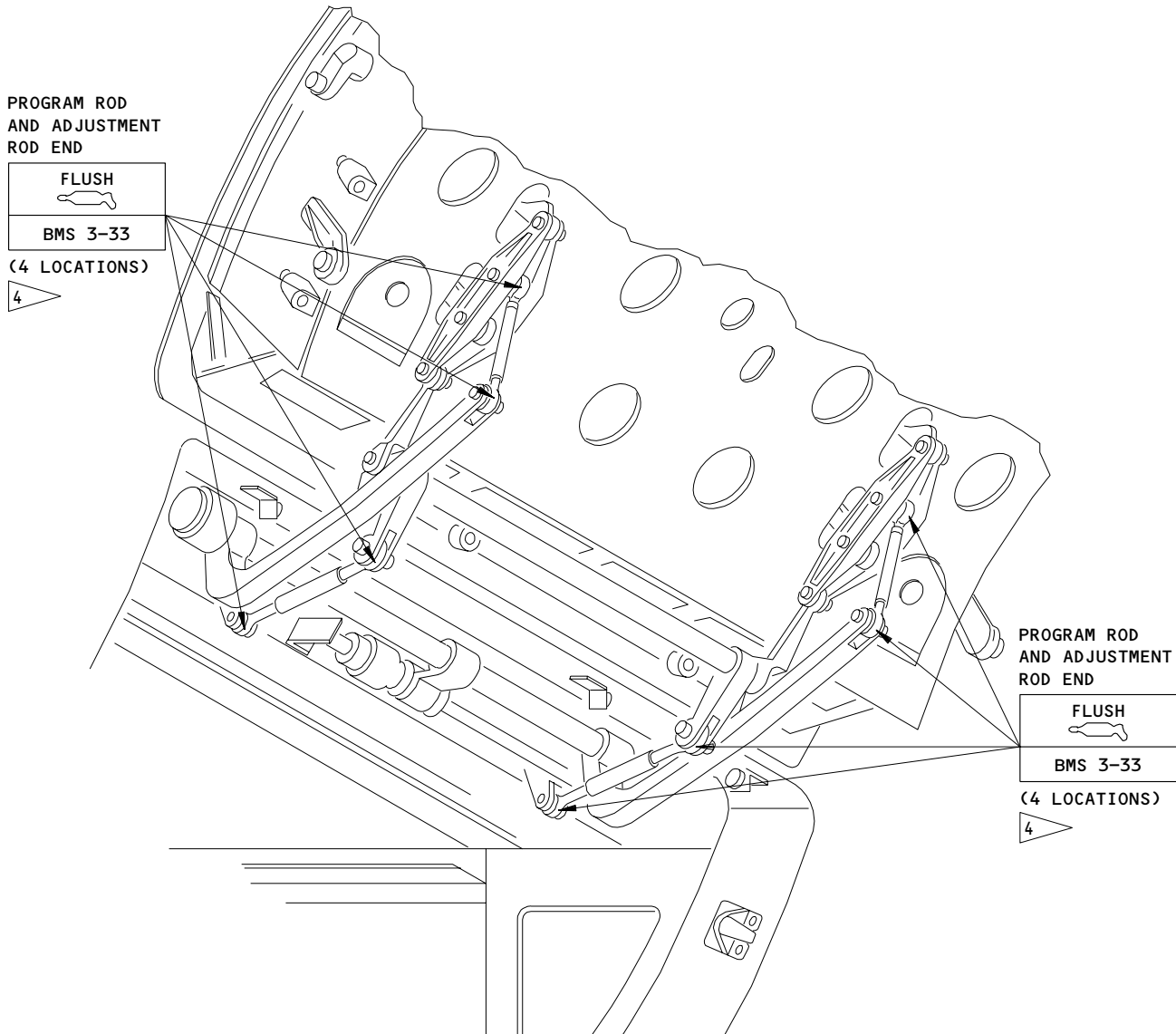
EFFECTIVITY	
	ALL

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CARGO DOOR HINGE
(SHOWN WITH THE DOOR OPEN)

8 POINTS

(B)

4 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

No. 1 and No. 2 Cargo Door Lubrication
Figure 301 (Sheet 2)

EFFECTIVITY	ALL
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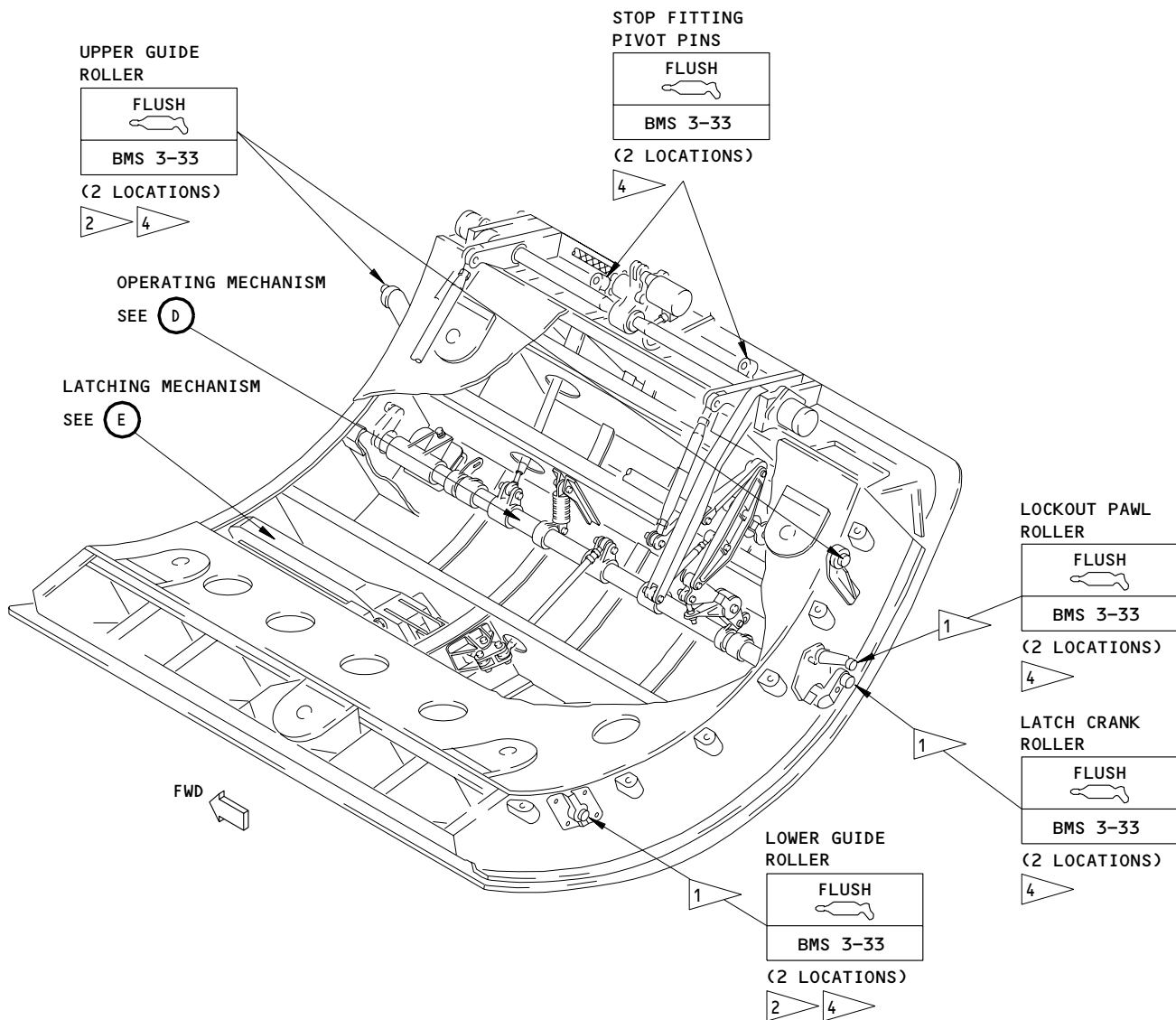
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**CARGO DOOR LATCH MECHANISM
(VIEW IN THE OUTBOARD DIRECTION)
(SHOWN WITH THE DOOR CLOSED)**

10 POINTS

(C)

1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE (NOT SHOWN)

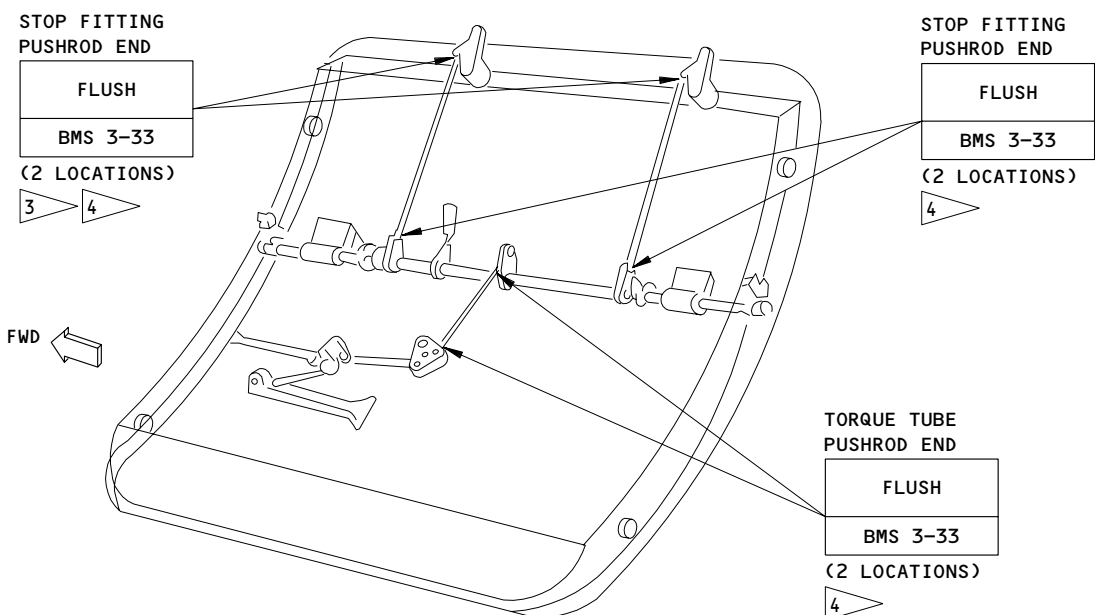
4 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

2 YOU MUST APPLY LUBRICANT TO THE UPPER AND LOWER GUIDE ROLLER ON THE NO. 1 CARGO DOOR. DO NOT APPLY LUBRICANT TO THE UPPER AND LOWER GUIDE ROLLER ON THE NO. 2 CARGO DOOR BECAUSE THE NO. 2 CARGO DOOR HAS SELF-LUBRICATED BEARINGS.

No. 1 and No. 2 Cargo Door Lubrication
Figure 301 (Sheet 3)

EFFECTIVITY	ALL
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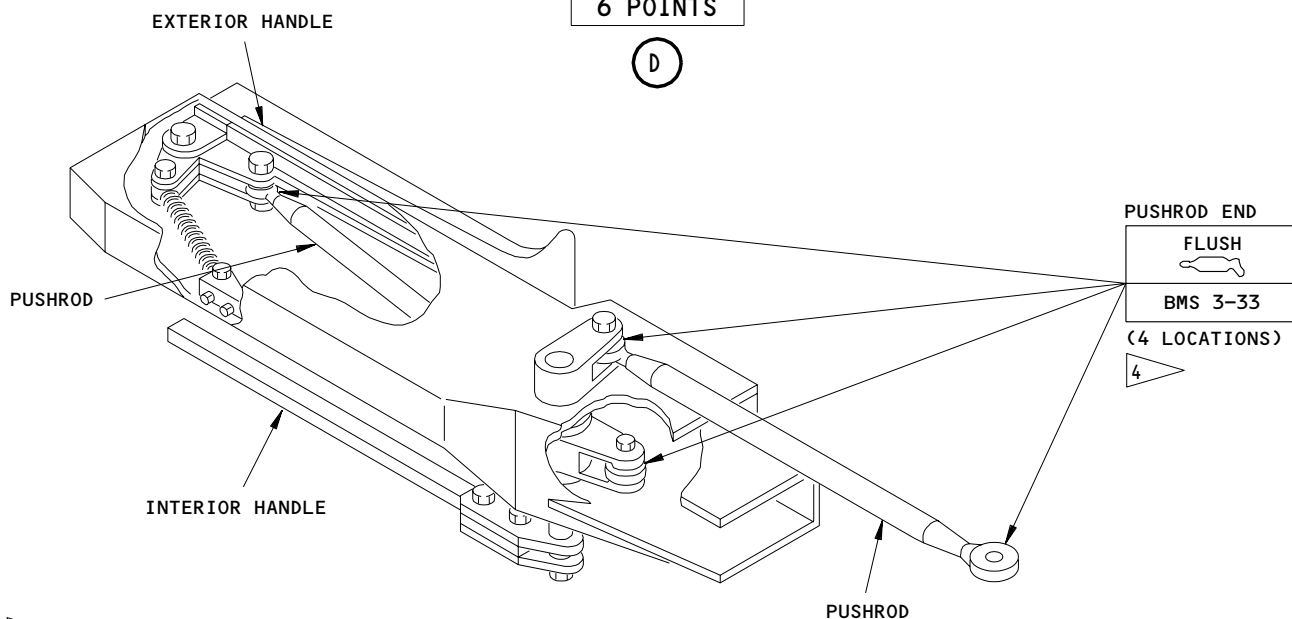
12-21-22



**OPERATING MECHANISM
(SHOWN WITH THE DOOR CLOSED)**

6 POINTS

D



LATCHING MECHANISM

4 POINTS

E

3 CLOSE AND LATCH THE DOOR BEFORE YOU GET ACCESS TO THE LUBRICATION FITTINGS ON THE UPPER LOCK PUSHROD.

4 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

**No. 1 and No. 2 Cargo Door Lubrication
Figure 301 (Sheet 4)**

EFFECTIVITY

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NO. 3 CARGO DOOR - SERVICING

TASK 12-21-24-643-001

1. Lubricate the No. 3 Cargo Door

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
- (2) D00013 Grease, MIL-PRF-23827 (Alternate)

B. Access

- (1) Location Zone
823 No. 3 Cargo Door

C. Procedure - Lubricate the No. 3 Cargo Door

S 643-004

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. DAMAGE TO THE LUBRICATION FITTING CAN EASILY OCCUR.

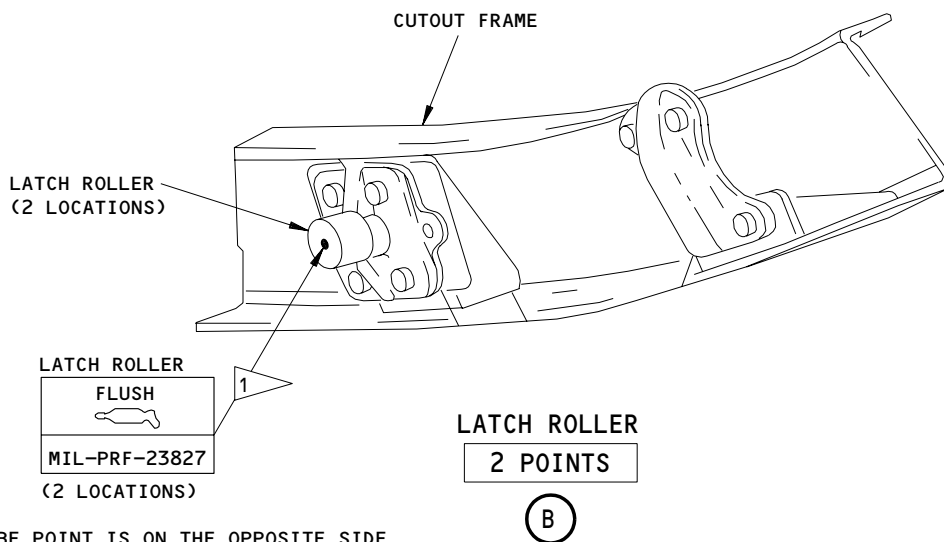
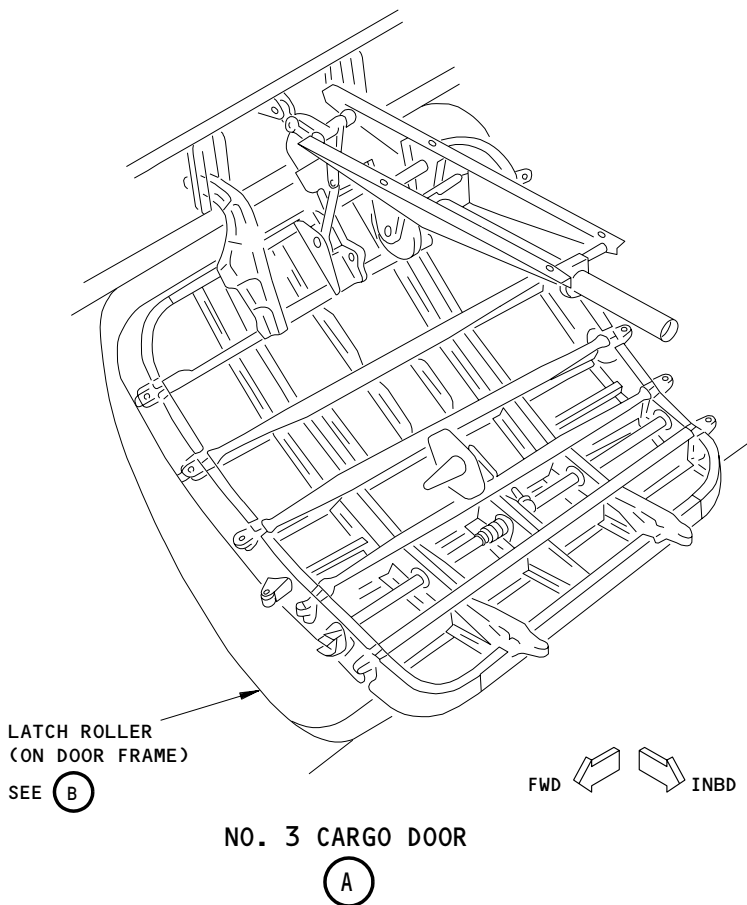
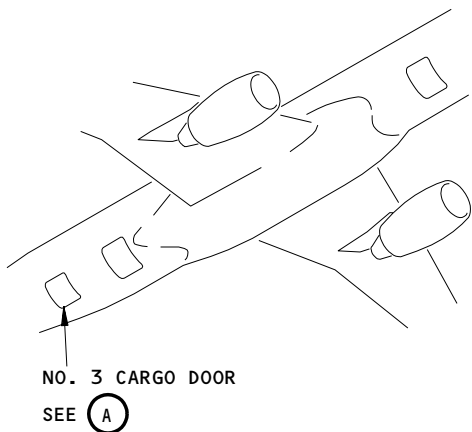
- (1) Lubricate the No. 3 cargo door as shown in Fig. 301.

EFFECTIVITY
AIRPLANES WITH NO. 3 CARGO DOOR

12-21-24

01

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1 ONE MORE LUBE POINT IS ON THE OPPOSITE SIDE
(NOT SHOWN)

No. 3 Cargo Door Lubrication
Figure 301

EFFECTIVITY
AIRPLANES WITH NO. 3 CARGO DOOR

12-21-24

EQUIPMENT COMPARTMENT AND EXTERIOR SERVICE DOORS - SERVICING

1. General

- A. This procedure contains three tasks. The first task gives instructions to lubricate the air conditioning access door. The second task gives instructions to lubricate the forward access door. The third task gives instructions to lubricate the electrical/electronics access door.

TASK 12-21-27-643-001

2. Lubricate the Air Conditioning Access Door (Fig. 301)

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00013 Grease, MIL-PRF-23827 (Alternate)

B. Access

- (1) Location Zone
100 Lower Half of Fuselage

(2) Access Panels

193HL/194ER Air Conditioning Access Door

C. Procedure - Lubricate the Air Conditioning Access Door

S 643-002

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. DAMAGE TO THE LUBRICATION FITTING CAN EASILY OCCUR.

- (1) Lubricate the air conditioning access door as shown (Fig. 301).

TASK 12-21-27-643-003

3. Lubricate the Forward Access Door (Fig. 302)

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00013 Grease, MIL-PRF-23827 (Alternate)

B. Access

- (1) Location Zone
100 Lower Half of Fuselage

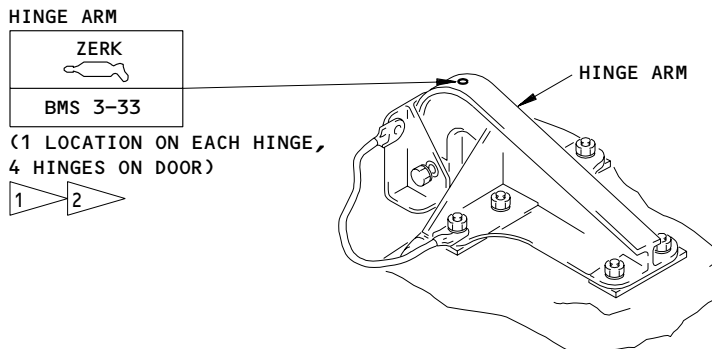
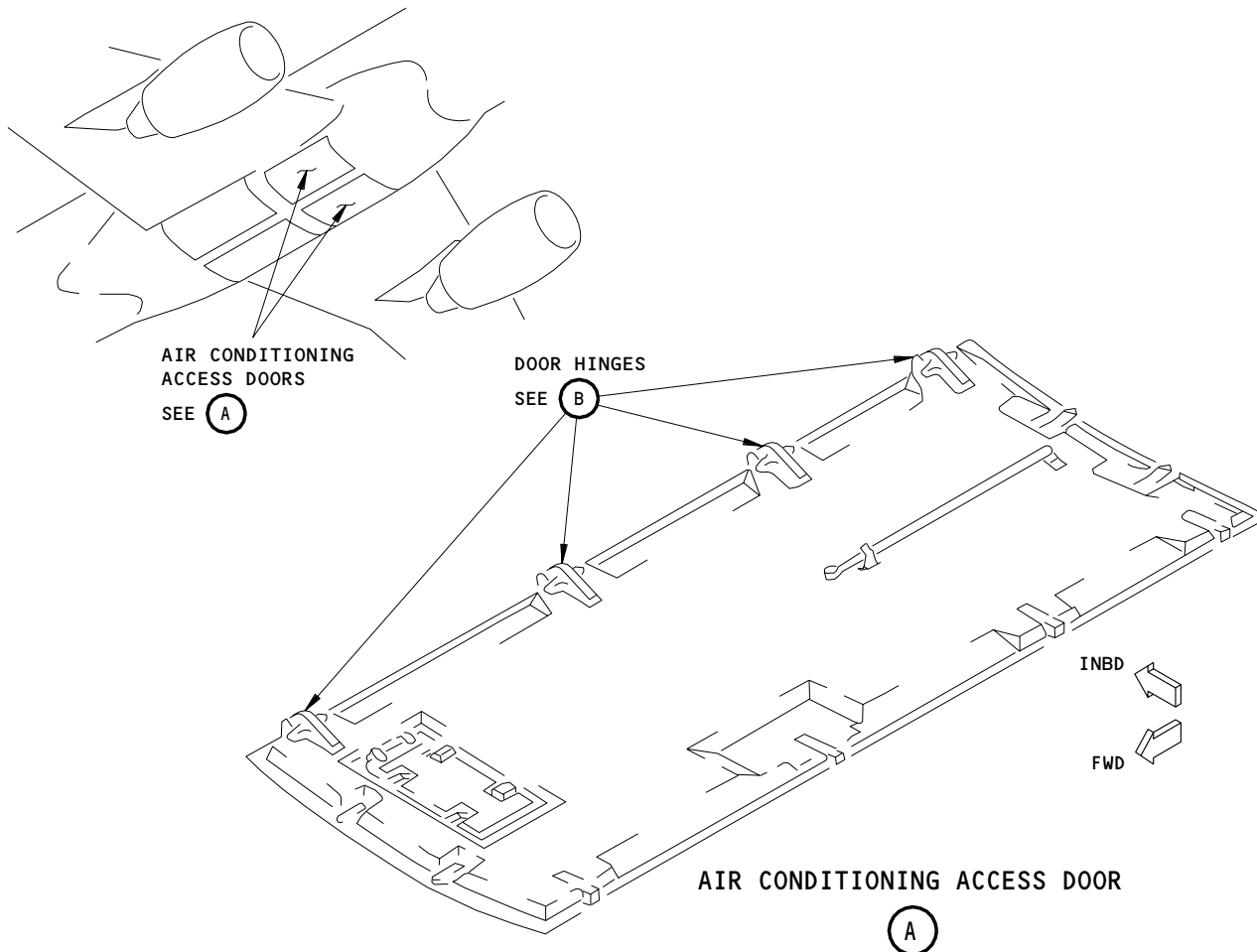
EFFECTIVITY

ALL

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DOOR HINGE
(EXAMPLE, 4 LOCATIONS)

1 POINT

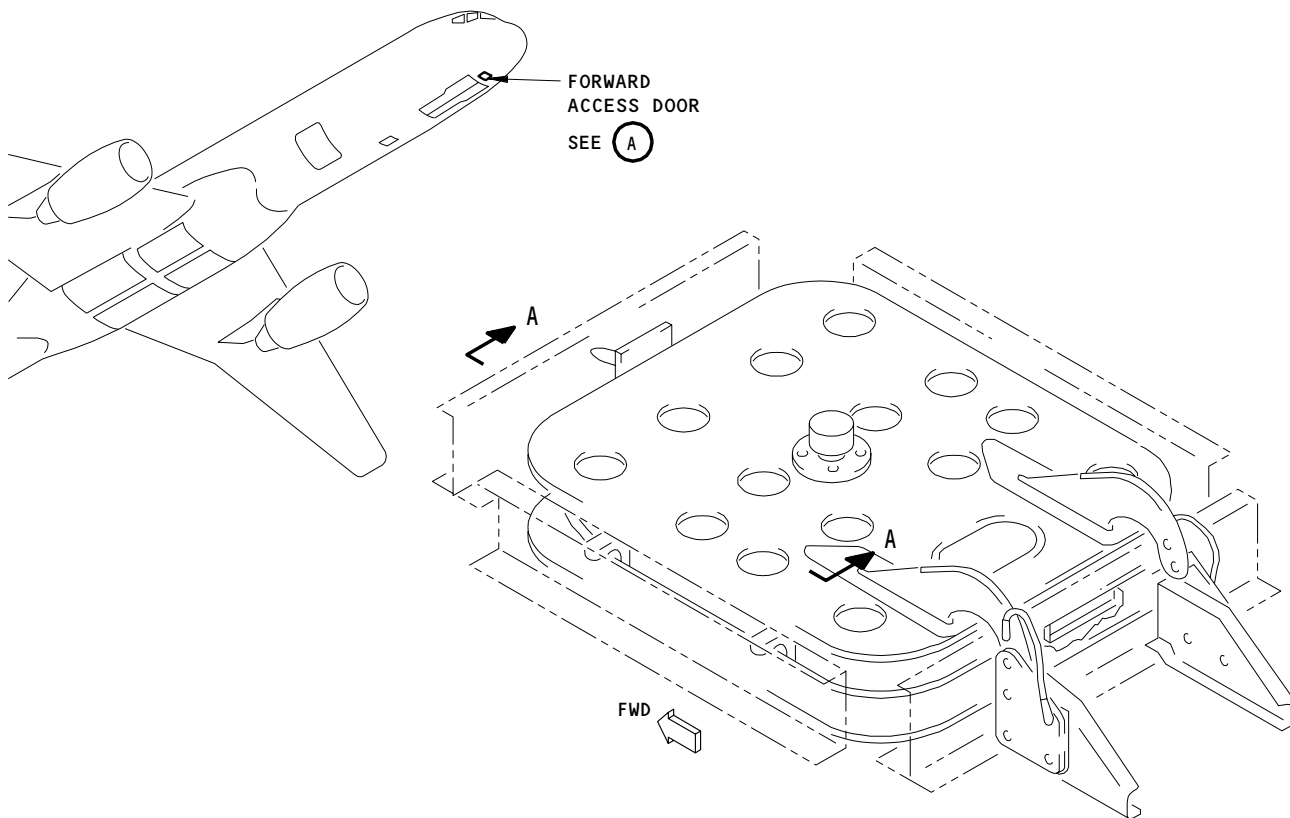
(B)

- 1 OPEN THE AIR CONDITIONING ACCESS DOOR FOR LUBRICATION.
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Air Conditioning Access Door Lubrication
Figure 301

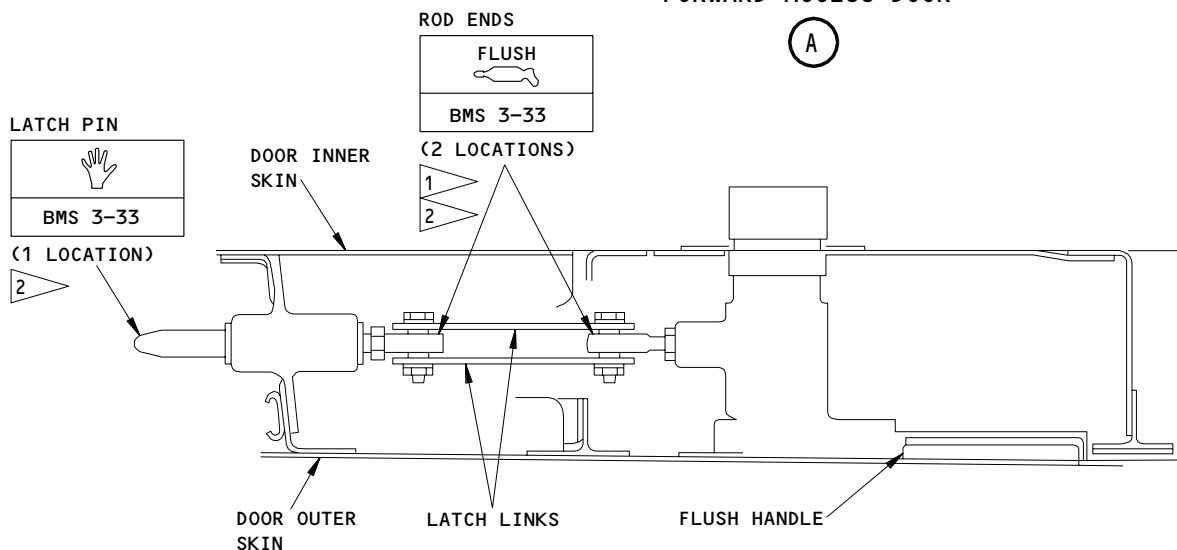
EFFECTIVITY	
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FORWARD ACCESS DOOR

(A)



LATCH PIN
BMS 3-33
(1 LOCATION)

ROD ENDS
FLUSH
BMS 3-33
(2 LOCATIONS)

- 1 IT IS NOT NECESSARY TO LUBRICATE ROD ENDS WITH SEALED BEARINGS.
- 2 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

DOOR LATCH MECHANISM

3 POINTS

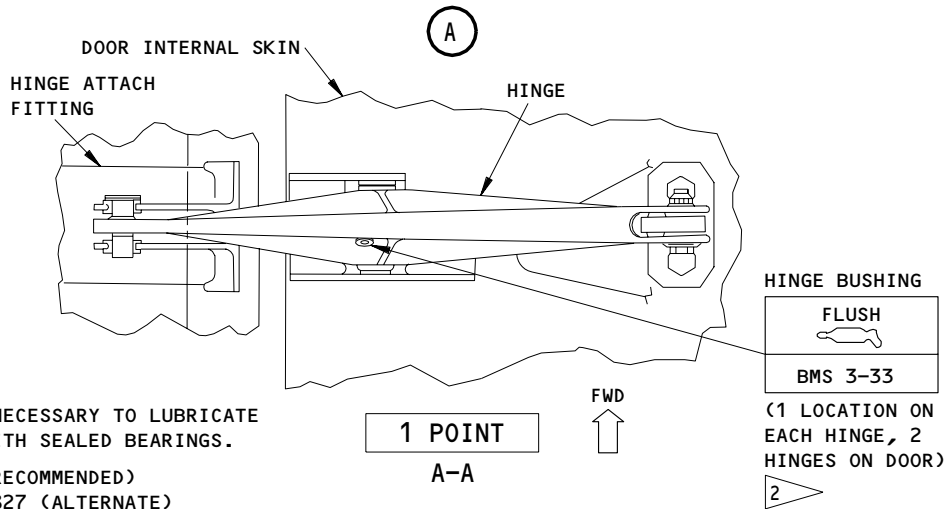
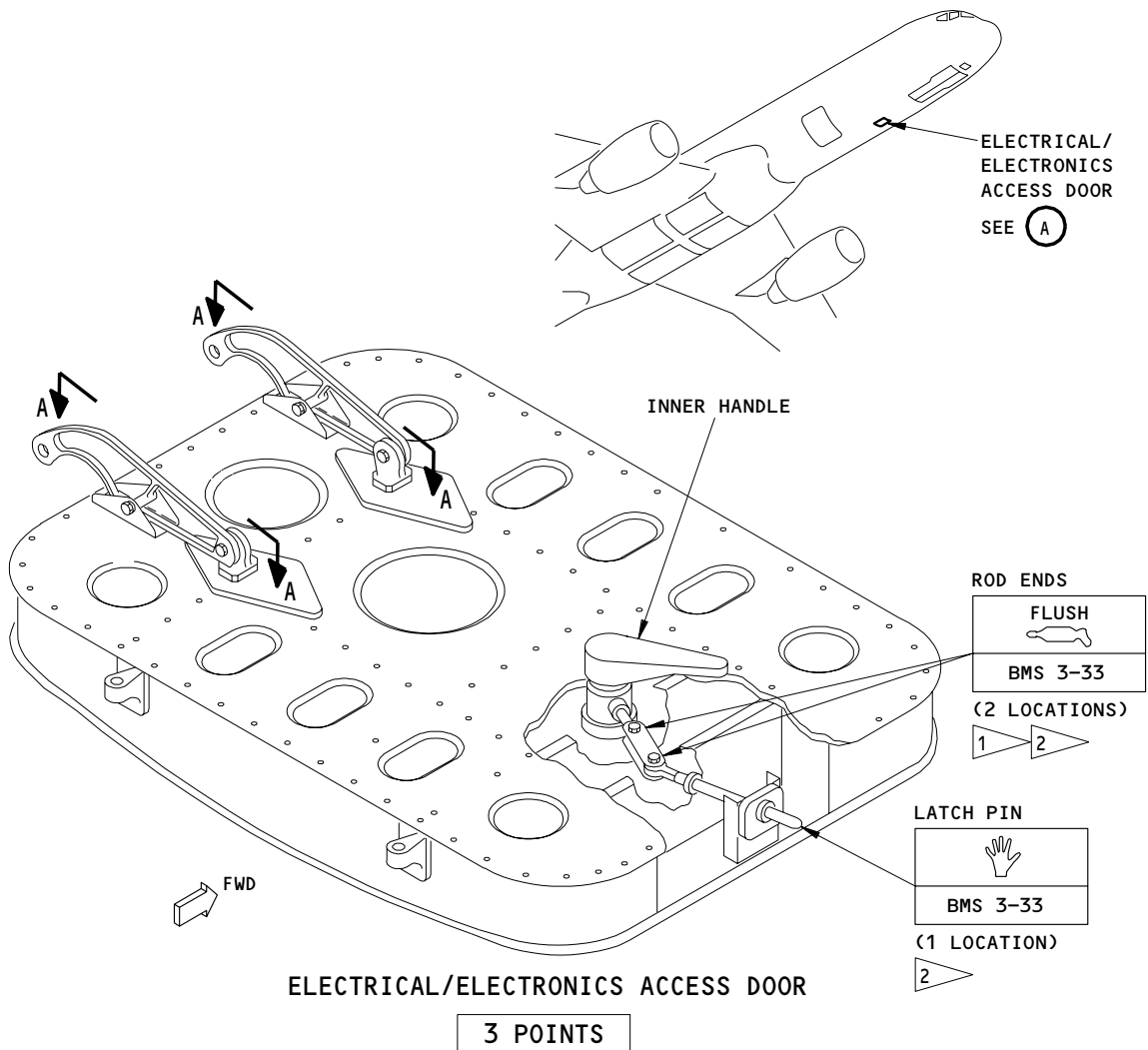
A-A

Forward Access Door Lubrication
Figure 302

EFFECTIVITY	
	ALL

12-21-27

678144



- 1 IT IS NOT NECESSARY TO LUBRICATE ROD ENDS WITH SEALED BEARINGS.
- 2 BMS 3-33 (RECOMMENDED) MIL-PRF-23827 (ALTERNATE)

Electrical/Electronics Access Door Lubrication
Figure 303

EFFECTIVITY	ALL
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12-21-27

- (2) Access Panel
113AL Forward Access Door

C. Procedure - Lubricate the Forward Access Door

S 643-004

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. DAMAGE TO THE LUBRICATION FITTING CAN EASILY OCCUR.

- (1) Lubricate the forward access door as shown (Fig. 302).

TASK 12-21-27-643-005

4. Lubricate the Electrical/Electronics Access Door (Fig. 303)

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
- (2) D00013 Grease, MIL-PRF-23827 (Alternate)

B. Access

- (1) Location Zone
100 Lower Half of Fuselage

- (2) Access Panel
119BL Electrical/Electronics Access Door

C. Procedure - Lubricate the Electrical/Electronics Access Door

S 643-006

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. DAMAGE TO THE LUBRICATION FITTING CAN EASILY OCCUR.

- (1) Lubricate the electrical/electronics access door as shown (Fig. 303).

EFFECTIVITY

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RAM AIR TURBINE (RAT) - SERVICING

1. General

- A. This procedure has one task. This task lubricates the ram air turbine (RAT).

TASK 12-21-30-643-001

2. Lubricate the Ram Air Turbine (RAT) (Fig. 301)

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00013, Grease, MIL-PRF-23827 (Alternate)

B. References

- (1) 29-21-00/201, Ram Air Turbine (RAT) System

C. Access

- (1) Location Zone
198 Wing to Body - Aft Lower Half (Right)

D. Procedure

S 863-002

- (1) Extend the ram air turbine (RAT) (Ref 29-21-00).

S 643-003

- (2) Lubricate the bearings and bushings as shown.

S 163-005

- (3) Remove the unwanted grease.

S 863-004

- (4) Retract the ram air turbine (RAT) (Ref 29-21-00).

EFFECTIVITY

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SUPPORT FITTING
FOR THE DEPLOYMENT
ACTUATOR
SEE (B) SHT 2

DEPLOYMENT
ACTUATOR

COMPARTMENT FOR THE
RAM AIR TURBINE (RAT)
SEE (A)

FWD

SUPPORT
FRAME
SEE (C) SHT 2

RAT STRUT

DOOR LINK
SEE (D) SHT 3

RAT
COMPARTMENT
DOOR

COMPARTMENT FOR THE
RAM AIR TURBINE (RAT)

(A)

Ram Air Turbine (RAT) Lubrication
Figure 301 (Sheet 1)

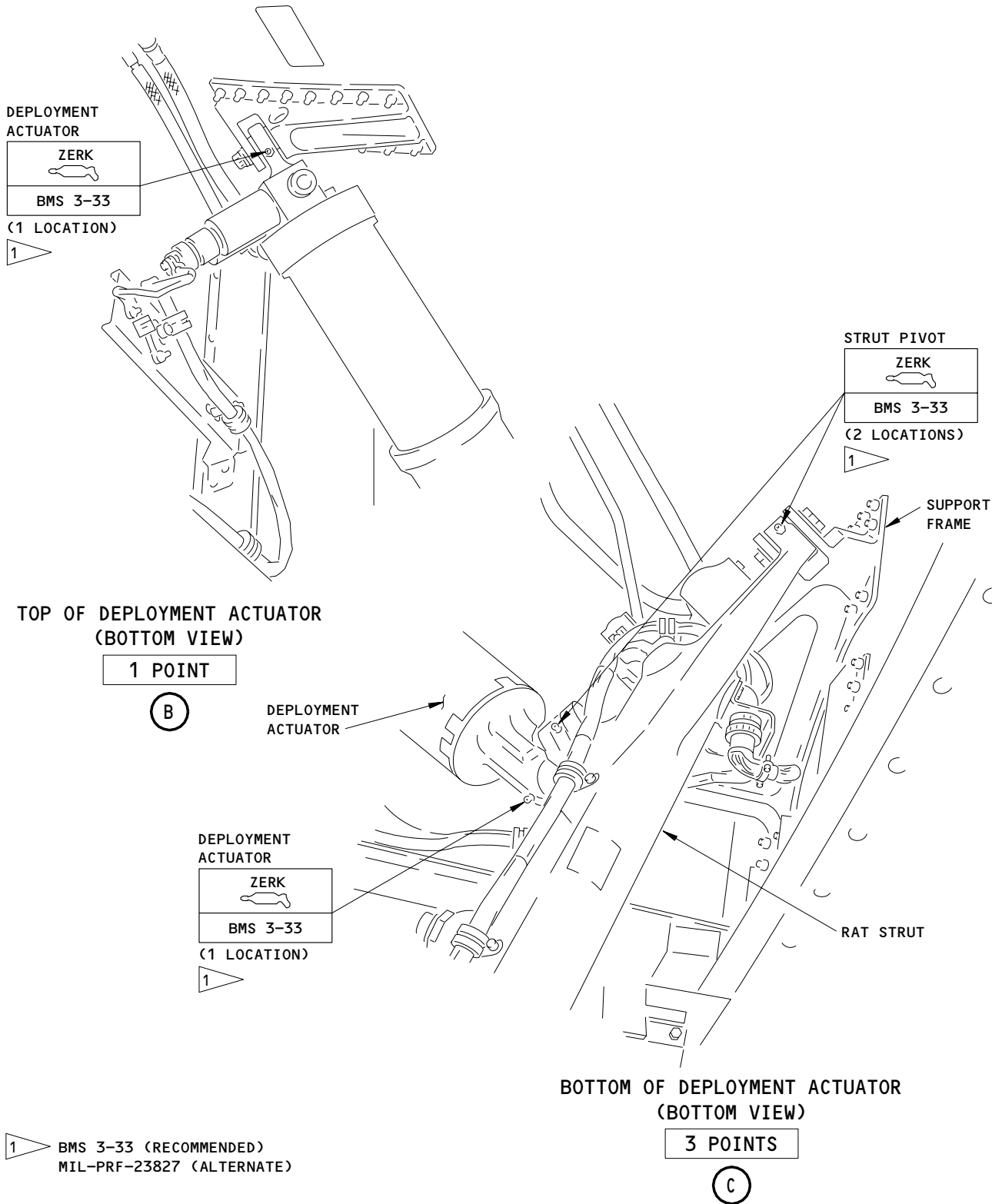
EFFECTIVITY

ALL

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Ram Air Turbine (RAT) Lubrication
Figure 301 (Sheet 2)

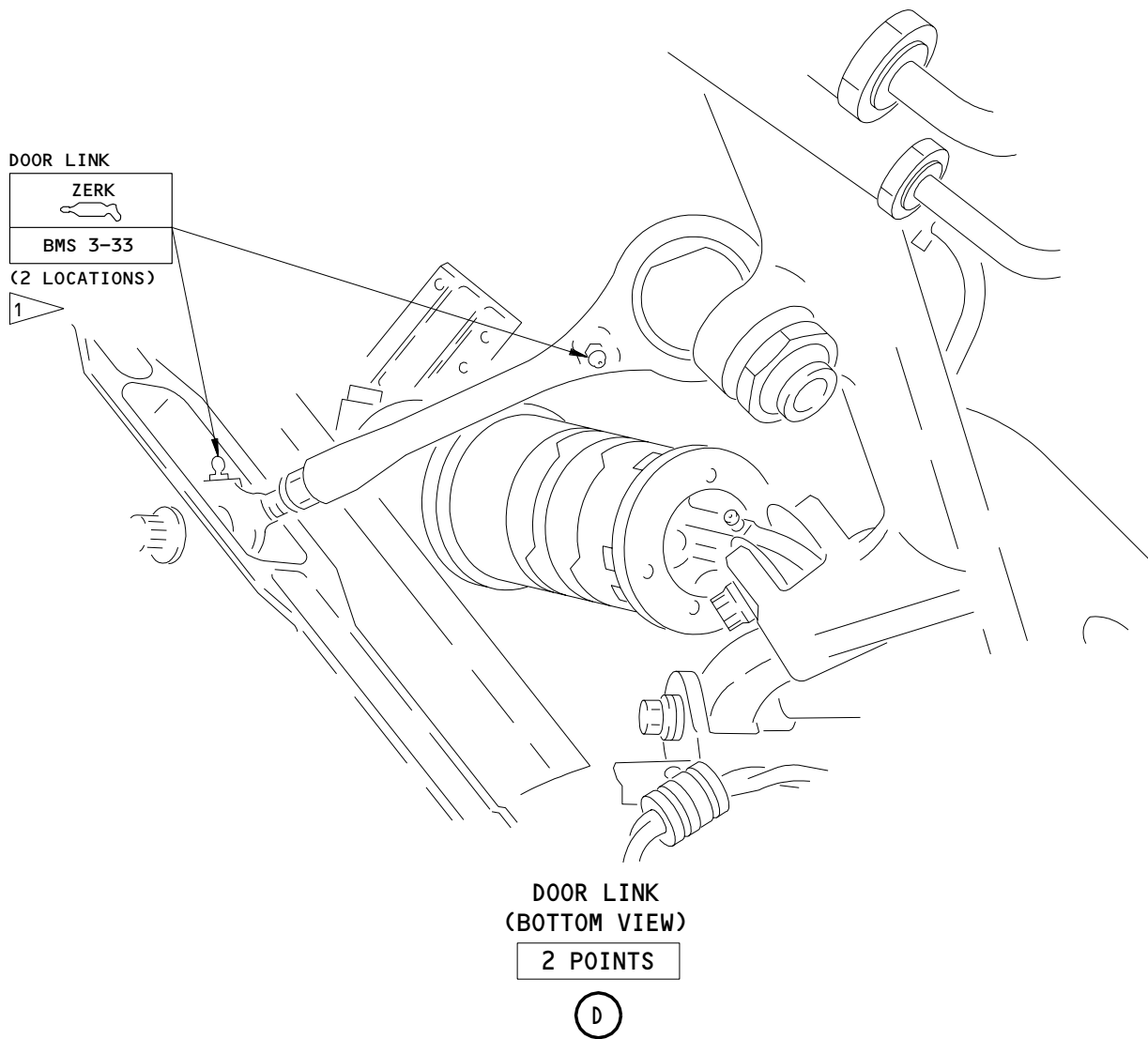
EFFECTIVITY	
	ALL

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1 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Ram Air Turbine (RAT) Lubrication
Figure 301 (Sheet 3)

EFFECTIVITY	ALL
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CONTROL CABLES - SERVICING (LUBRICATION)

TASK 12-21-31-643-001

1. Control Cables - Lubrication

A. Consumable Materials

- (1) D00633 - Grease, Corrosion Preventive, BMS 3-33 (Recommended)
- (2) D00015 Grease, airplane ball and roller bearings, corrosion preventive, BMS 3-24 (Alternate)

B. Procedure

S 643-004

CAUTION: DO NOT USE SOLVENT OR HEAT TO THIN THE GREASE ON THE CONTROL CABLES. DO NOT USE SOLVENT TO CLEAN THE CONTROL CABLES. THE SOLVENT REMOVES GREASE FROM THE CABLE. DO NOT APPLY OR SPRAY BMS 3-23 ON THE CONTROL CABLES.

- (1) Use a lint-free cloth that is clean and dry to clean the control cables.

NOTE: Remove all unwanted material from the surface of the control cable. Do this for the full length of the cable travel through the fair leads, air pressure seals, on pulleys, quadrants and drums.

NOTE: Do not lubricate CRES cables.

S 643-003

- (2) Lubricate the control cables:

CAUTION: THE CONTROL CABLES IN THE WING AND NACELLE AREA ARE NEAR HIGH TEMPERATURE SOURCES. THE LUBRICANTS WILL DETERIORATE AT A FASTER RATE THAN ON OTHER CONTROL CABLES. EXAMINE THE CONDITION OF THESE CABLES AT MORE FREQUENT INTERVALS.

- (a) Use an applicator or a brush to apply a light, even layer of grease to the cable for the full length of travel.
 - 1) Do not apply grease to the areas that follow, they will receive grease during cable movement:
 - a) Through the fairleads.
 - b) Through the air pressure seals.

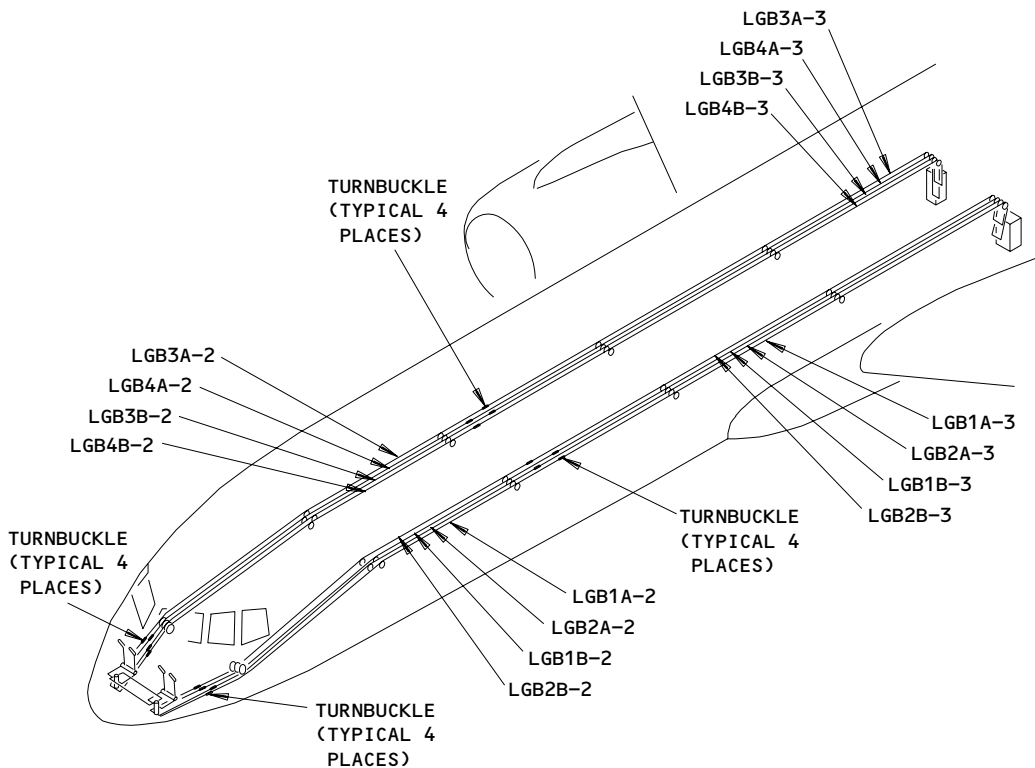
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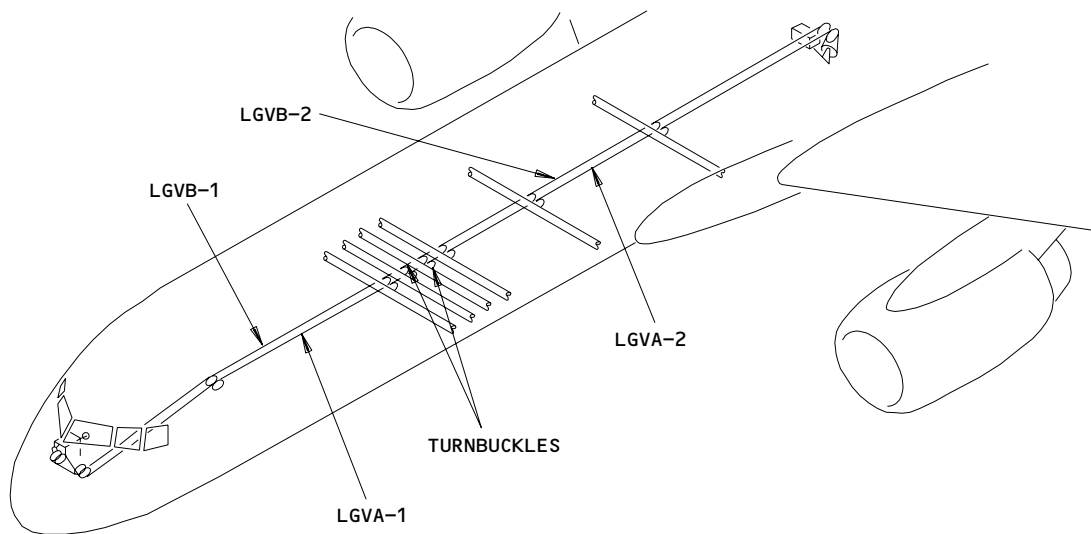
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LANDING GEAR BRAKE CONTROL CABLES



LANDING GEAR EXTENSION AND RETRACTION CONTROL CABLES

Landing Gear Control Cables
Figure 301 (Sheet 1)

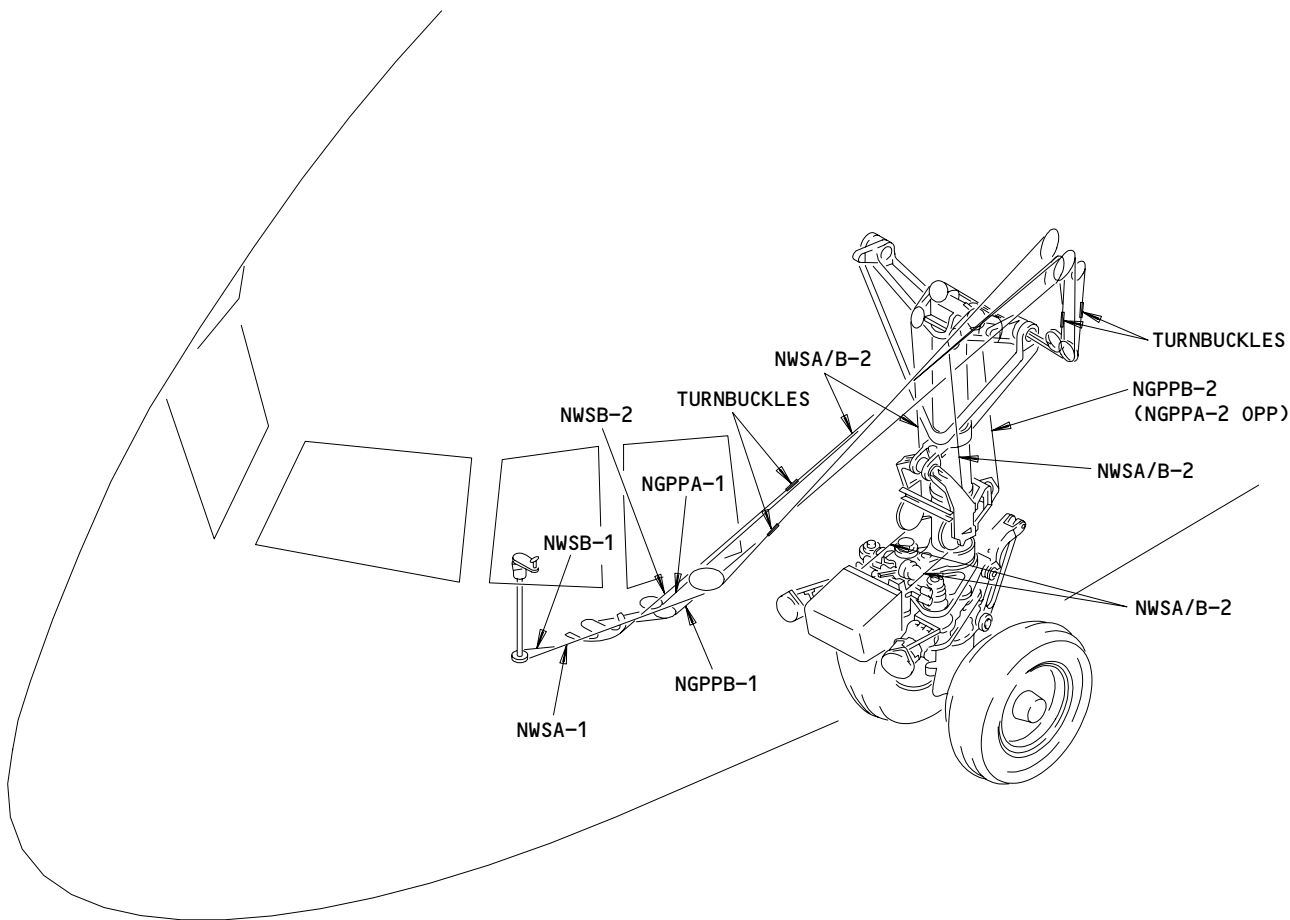
EFFECTIVITY	
	ALL

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NOSE WHEEL STEERING CONTROL CABLES

Landing Gear Control Cables
Figure 301 (Sheet 2)

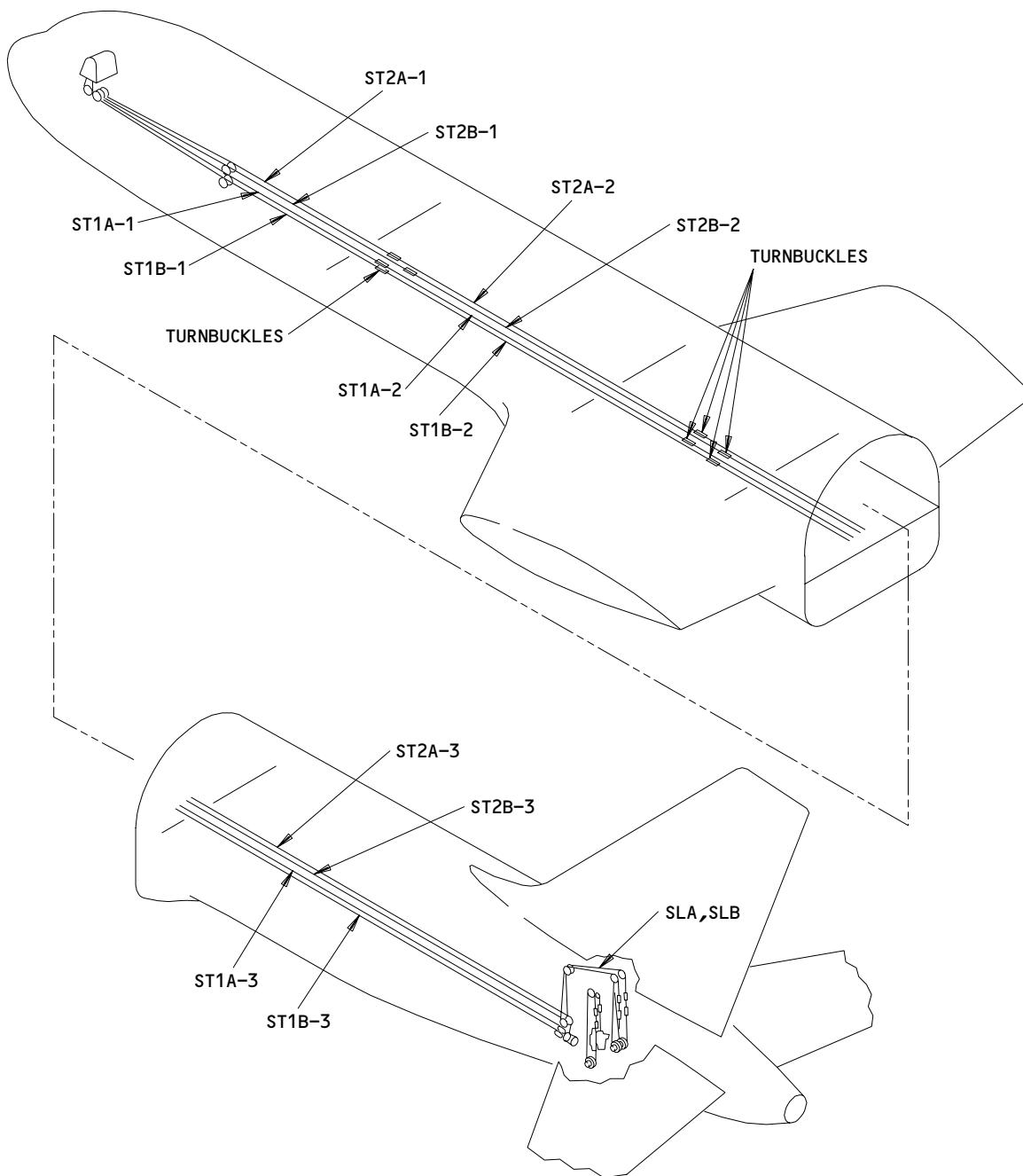
EFFECTIVITY	
	ALL

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Horizontal Stabilizer Trim Control Cables
Figure 302

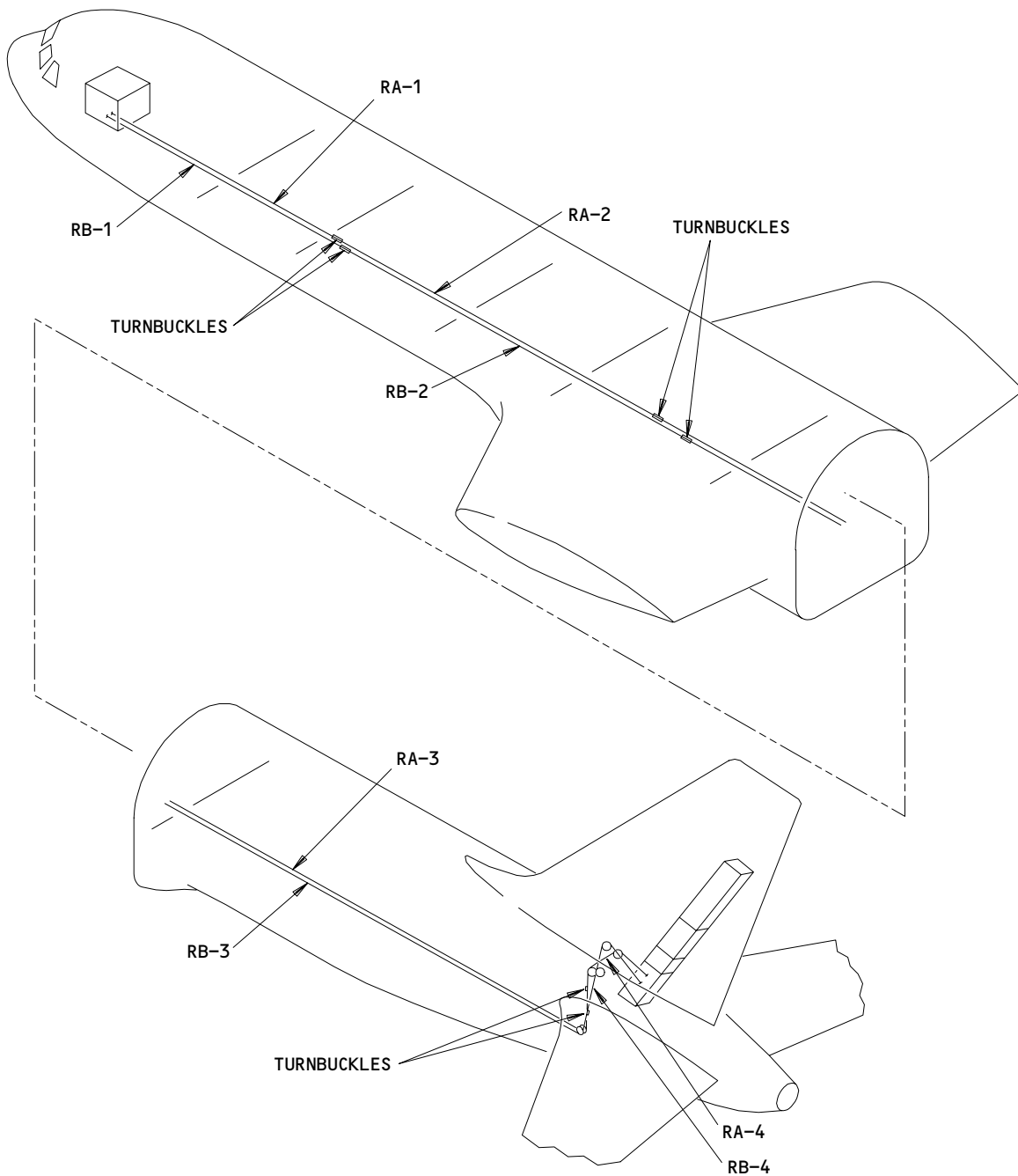
EFFECTIVITY	
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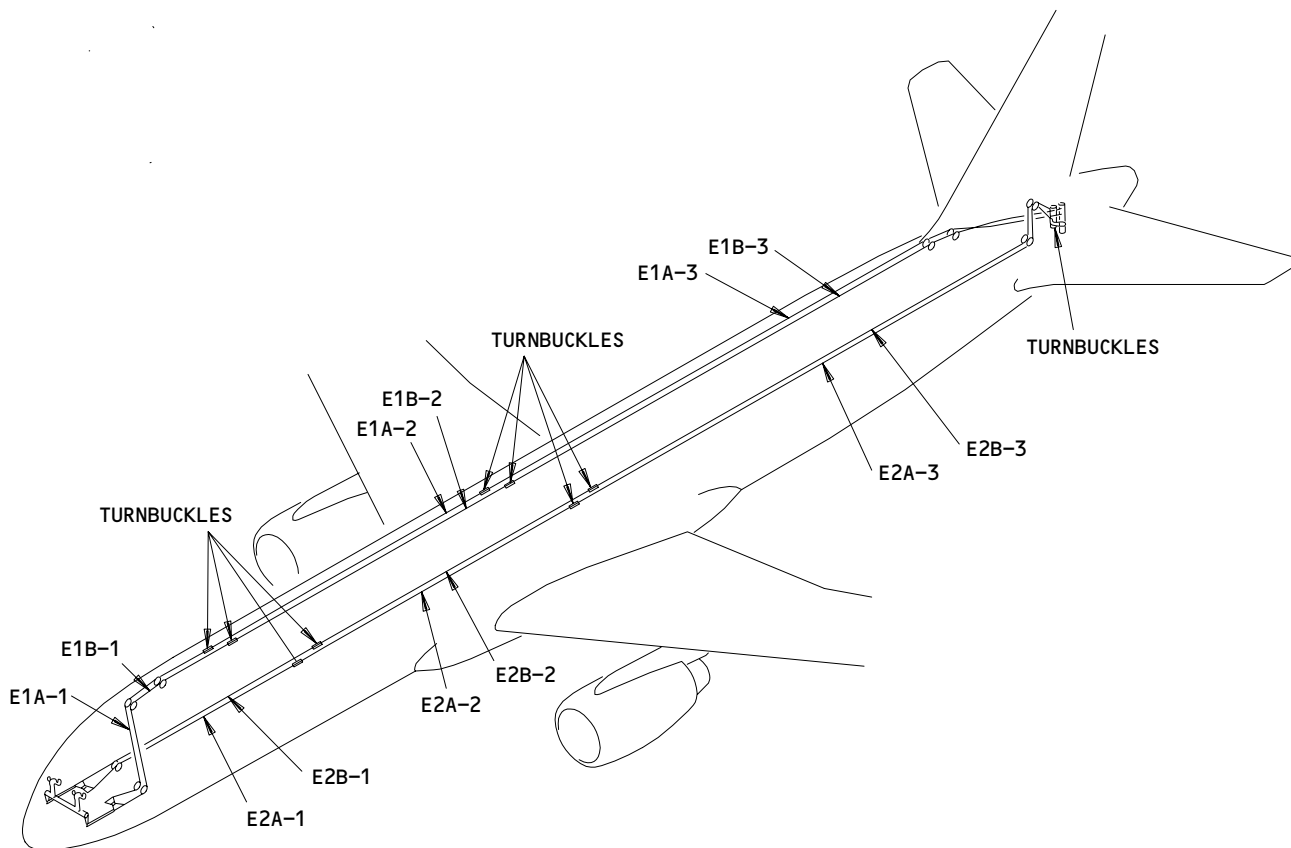
Rudder Control Cables
Figure 303

EFFECTIVITY	
	ALL

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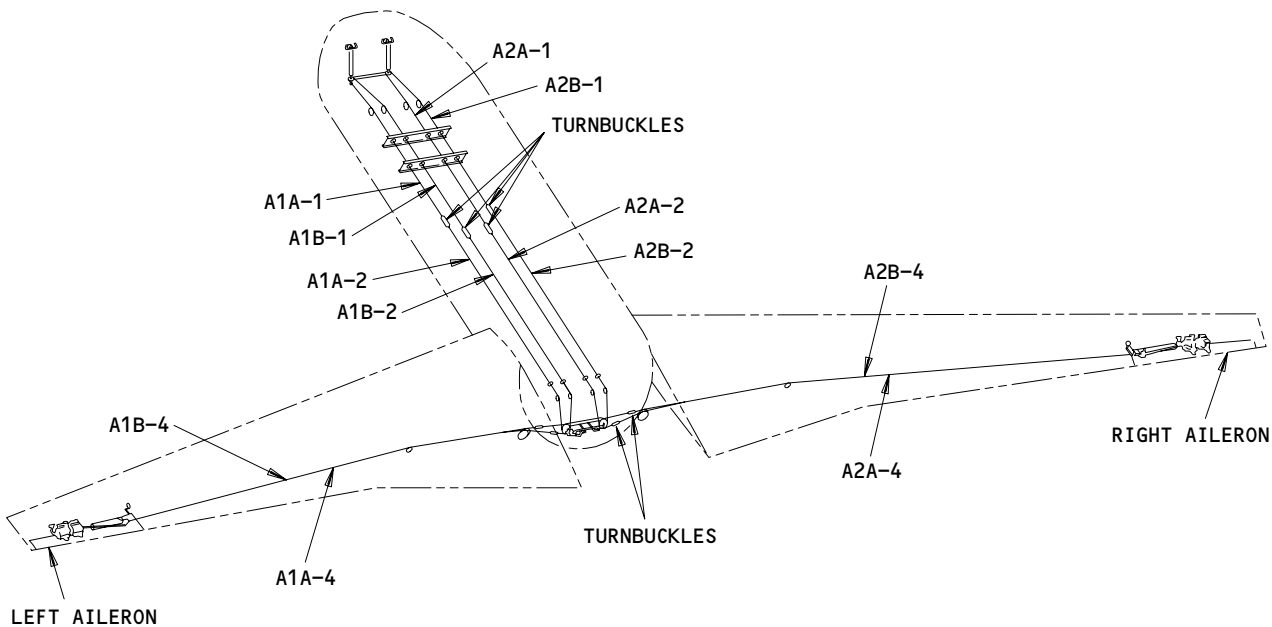
Elevator Control Cables
Figure 304

EFFECTIVITY	ALL
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01

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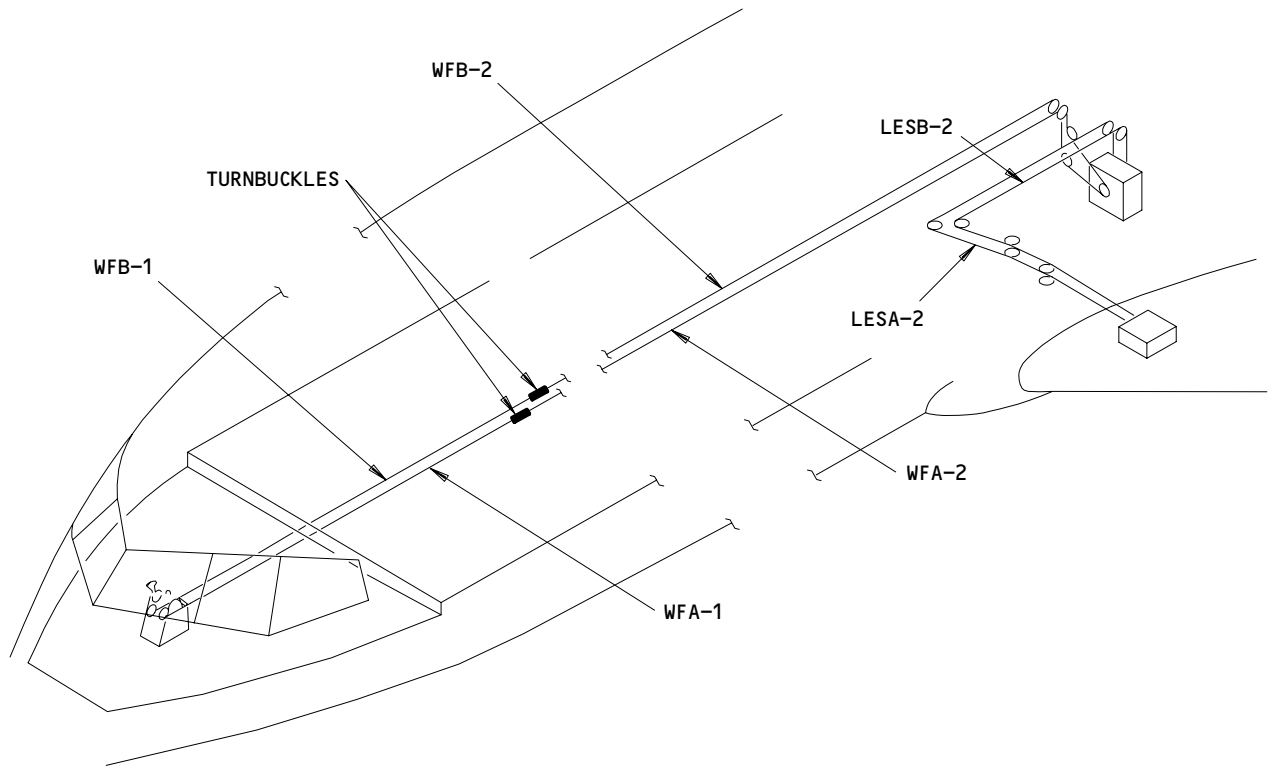
Aileron Control System Cables
Figure 305

EFFECTIVITY ————
ALL

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01

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Flap/Slat Control Cables
Figure 306

EFFECTIVITY

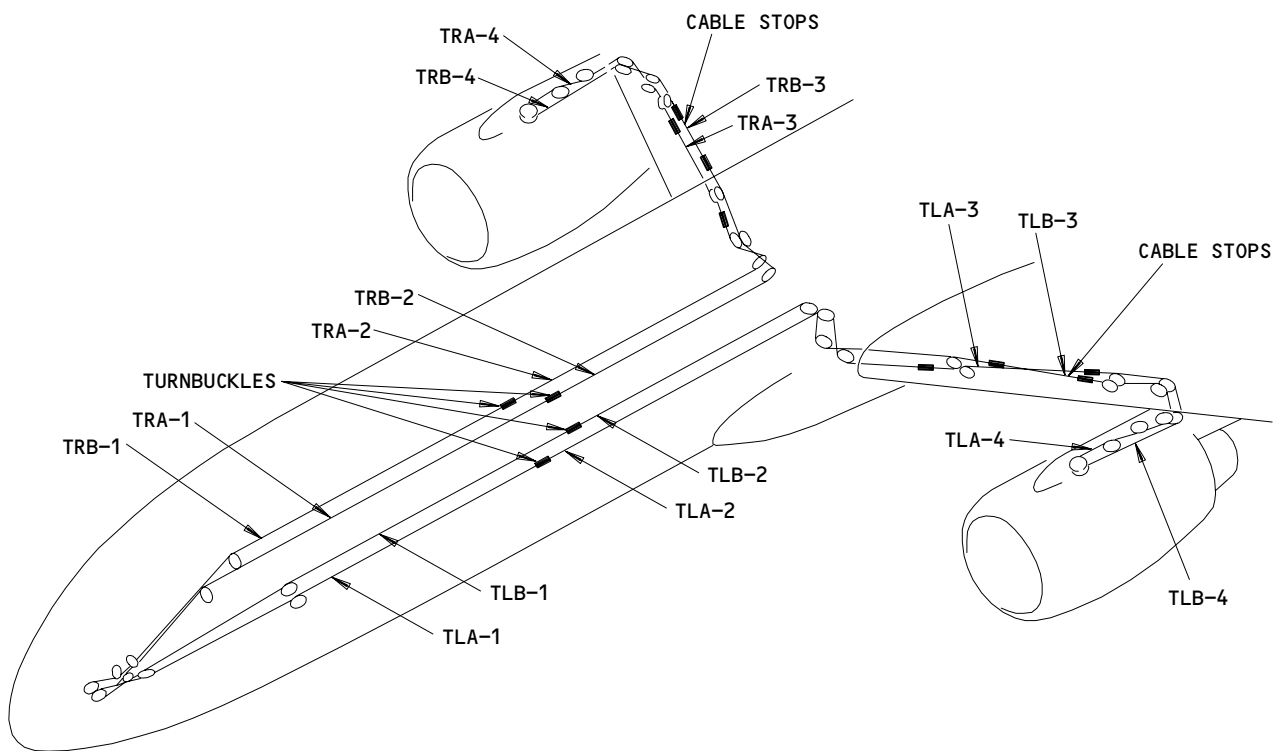
ALL

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Engine Thrust Control Cables
Figure 307

EFFECTIVITY	
	ALL

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 **BOEING**
757
MAINTENANCE MANUAL

- c) On the pulleys.
 - d) On the quadrants.
 - e) On the drums.
- (b) Wipe the control cable with a clean cloth to remove unwanted grease but leave a thin visible film of grease on the control cable.

EFFECTIVITY

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WING NACELLE ATTACH FITTINGS – SERVICING (LUBRICATION)

1. General

- A. This procedure gives information on how to lubricate the attach fittings of the wing nacelle (Fig. 301).

TASK 12-21-32-643-003

2. Lubricate the Attach Fittings of the Wing Nacelle

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
(2) D00108 Grease – MIL-PRF-23827 (AMM 20-30-04/201) (Alternate)
D00014 – MIL-G-21164 OPT

B. Access

(1) Location Zones

- 444/434 Left Power Plant Nacelle
511 Leading Edge to Front Spar – Left
611 Leading Edge to Front Spar – Right

(2) Access Panels

- 434AL/444AL Aft Fairing Access Panel
434DR/444DR Aft Fairing Access Panel
511KT/611KT Blowout Access Panel

C. Lubricate the Attach Fittings of the Wing Nacelle (Fig. 301)

S 013-001

- (1) Open the aft fairing access panel.

S 013-002

- (2) Open the blowout access panel which is found under the wing or the access panels which are found above the wing (511KT, 611KT).

S 643-004

- (3) Lubricate the attach fittings of the wing nacelle as shown in Fig. 301.

S 413-006

- (4) Close the access panel on the aft fairing.

EFFECTIVITY

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 **BOEING**
757
MAINTENANCE MANUAL

S 413-009

- (5) Close the blowout access panel which is found under the wing or the access panels which are found above the wing (511KT, 611KT).

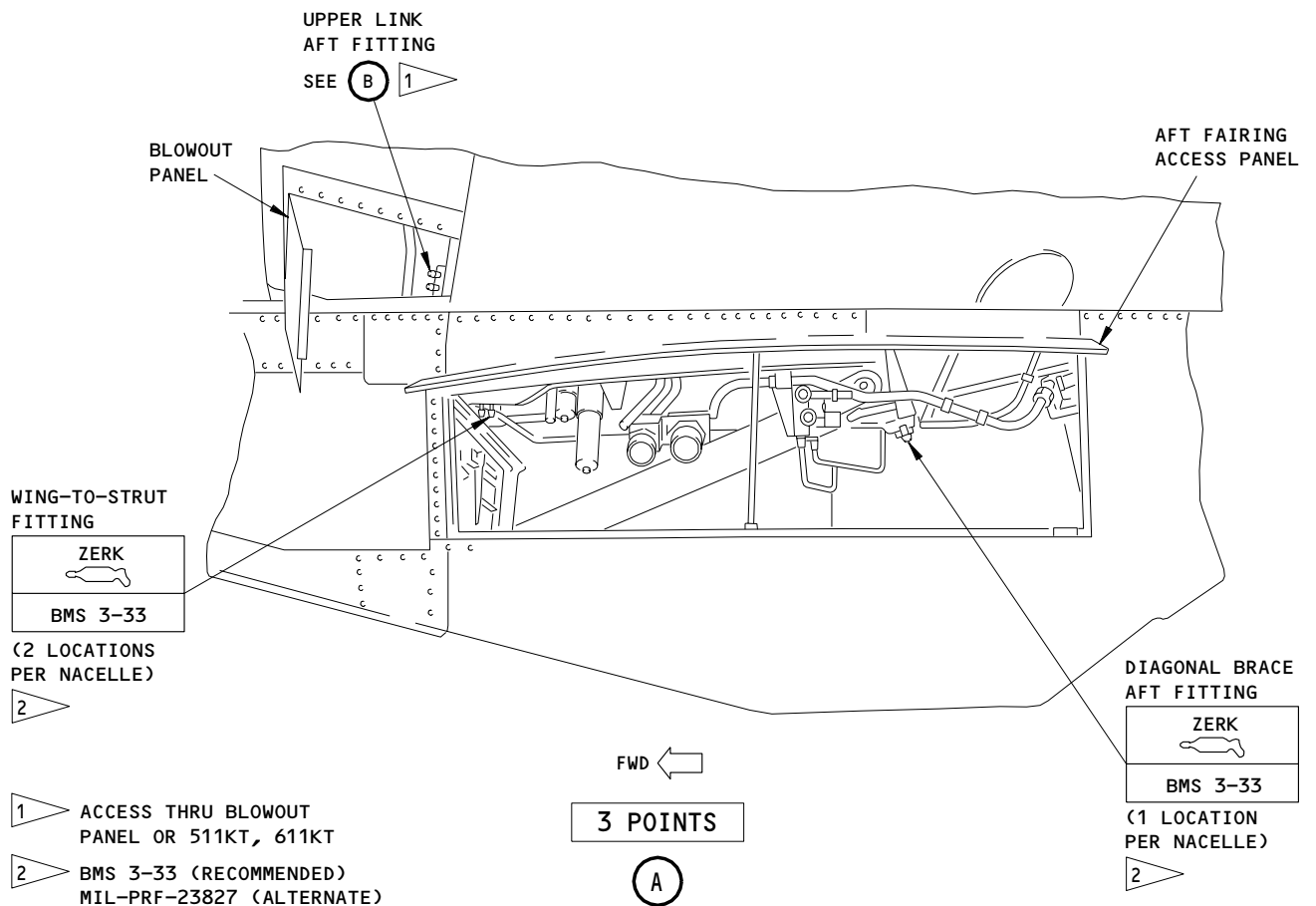
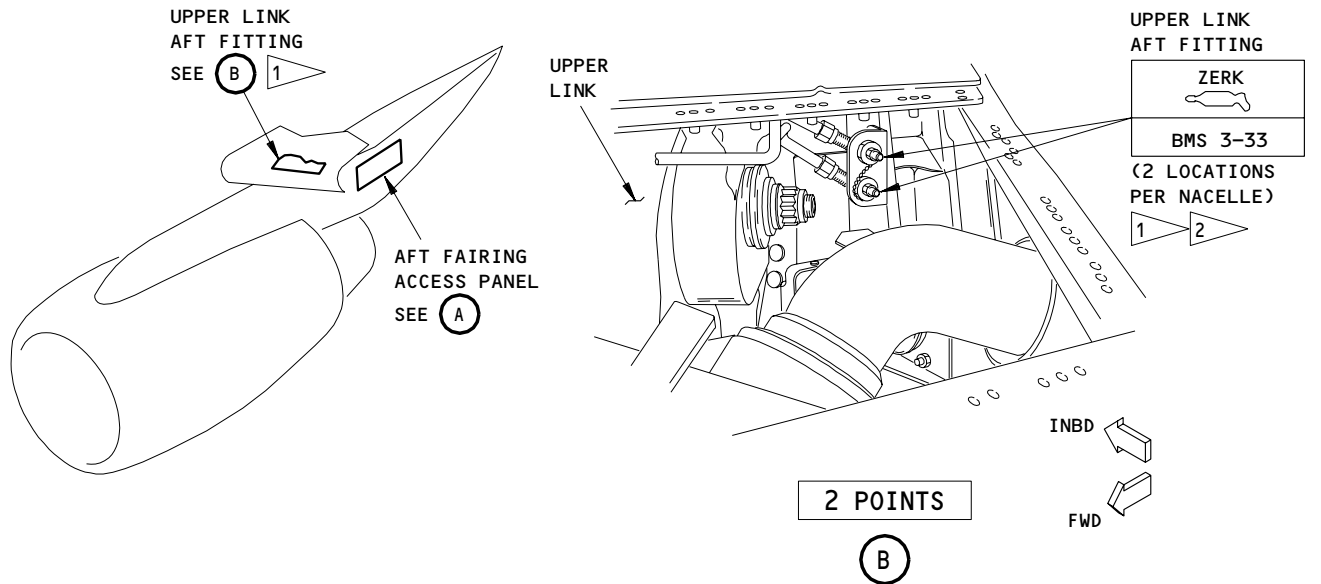
EFFECTIVITY

ALL

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- 1 ACCESS THRU BLOWOUT PANEL OR 511KT, 611KT
- 2 BMS 3-33 (RECOMMENDED) MIL-PRF-23827 (ALTERNATE)

Wing Nacelle Attach Fittings Lubrication
Figure 301

EFFECTIVITY

ALL

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323571

WING STRUCTURE LUBRICATION – SERVICING

1. General

- A. This procedure contains one task. The task is to lubricate the wing structure.

TASK 12-21-33-643-004

2. Lubricate the Wing Structure

A. Consumable Materials

- (1) D00633 Grease – BMS 3-33 (Recommended)
(2) D00013 Grease – MIL-PRF-23827 (Alternate)

B. References

- (1) AMM 06-44-00/201, Wings Access Doors and Panels
(2) AMM 32-00-15/201, Landing Gear Door Locks
(3) AMM 32-00-20/201, Landing Gear Downlocks

C. Access

- (1) Location Zones
500/600 Wing

(2) Access Panels

- 551BB Landing Gear Actuator – Left
651BB Landing Gear Actuator – Right

D. Procedure

S 213-001

- (1) Make sure the downlocks are installed on the nose and main landing gear (AMM 32-00-20/201).

S 493-002

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Open the doors for the landing gear and install the door locks (AMM 32-00-15/201).

EFFECTIVITY

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01.1

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S 013-008

- (3) Remove the main gear actuator panels 551BB/651BB (AMM 06-44-00/201).

S 643-005

CAUTION: BE CAREFUL WHEN YOU DISENGAGE THE GREASE GUN FROM THE LUBRICATION FITTING. DAMAGE TO THE LUBRICATION FITTING CAN EASILY OCCUR.

- (4) Lubricate the wing structure (Fig. 301).

S 413-007

- (5) Install the main gear actuator panels 551BB/651BB (AMM 06-44-00/201).

S 093-003

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Remove the door locks from the landing gear door and close the doors (AMM 32-00-15/201).

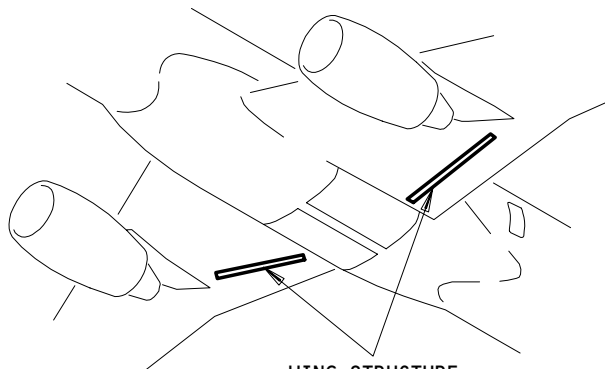
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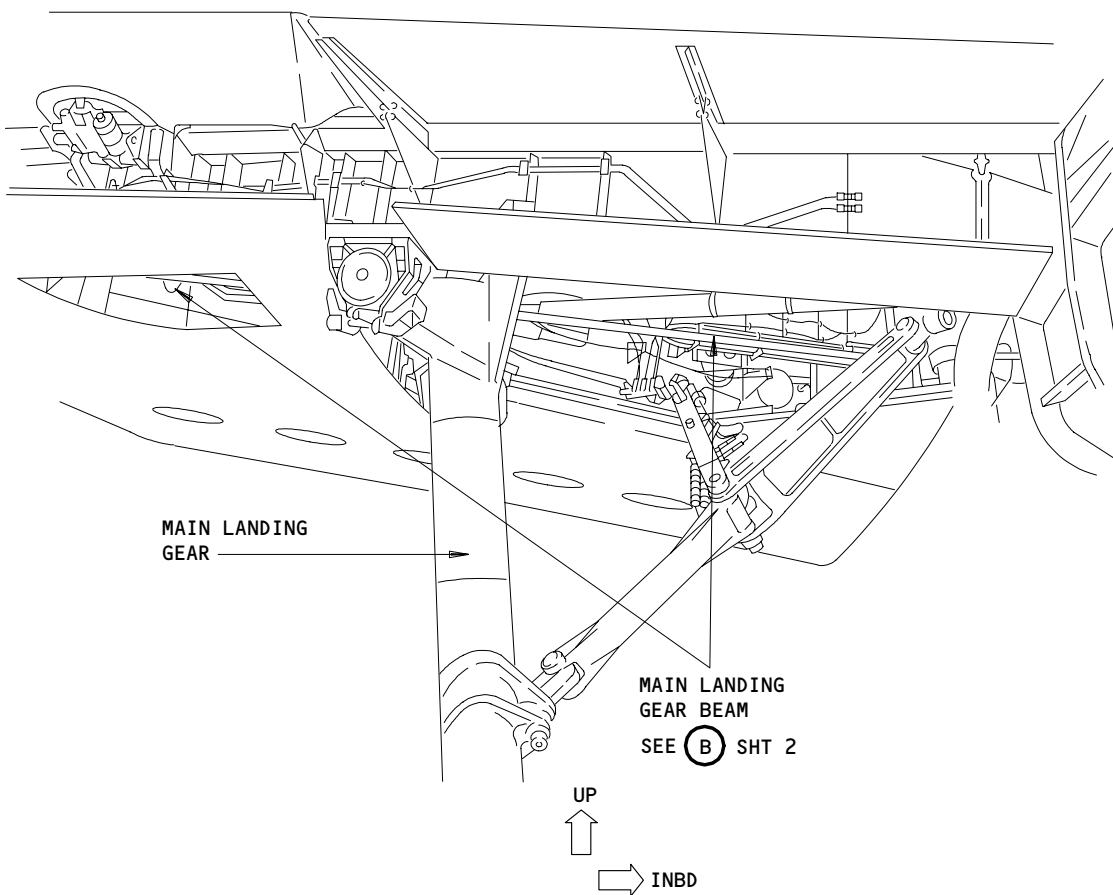
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WING STRUCTURE

SEE (A)



MAIN LANDING
GEAR

MAIN LANDING
GEAR BEAM
SEE (B) SHT 2

UP

INBD

WING STRUCTURE

(A)

Wing Structure Lubrication
Figure 301 (Sheet 1)

EFFECTIVITY

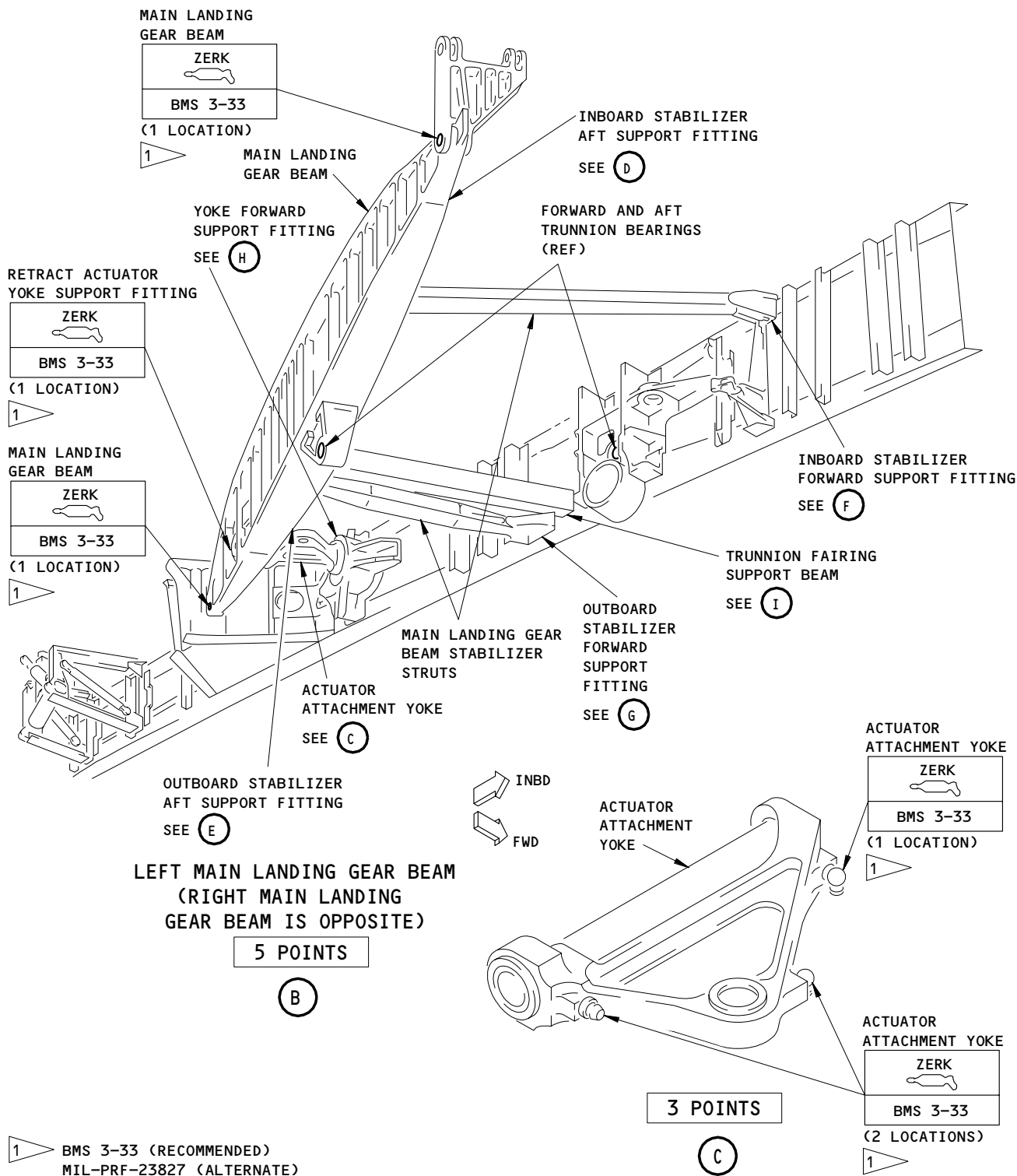
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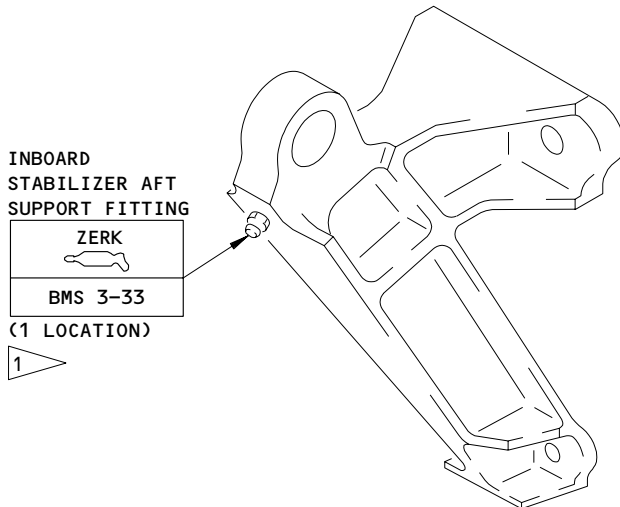
Wing Structure Lubrication
Figure 301 (Sheet 2)

EFFECTIVITY	ALL
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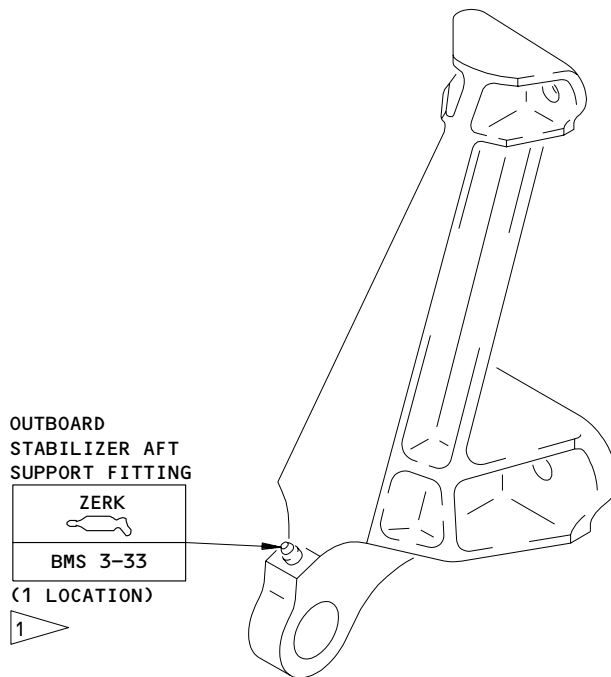
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1 POINT

D



1 POINT

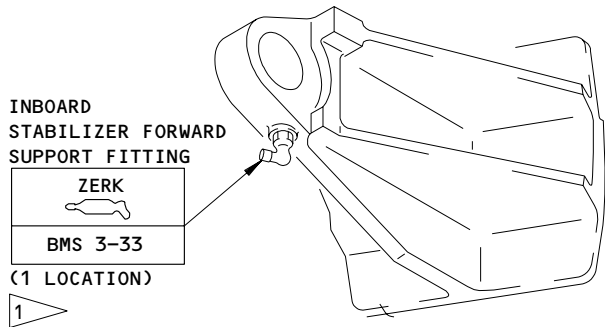
E

1 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Wing Structure Lubrication
Figure 301 (Sheet 3)

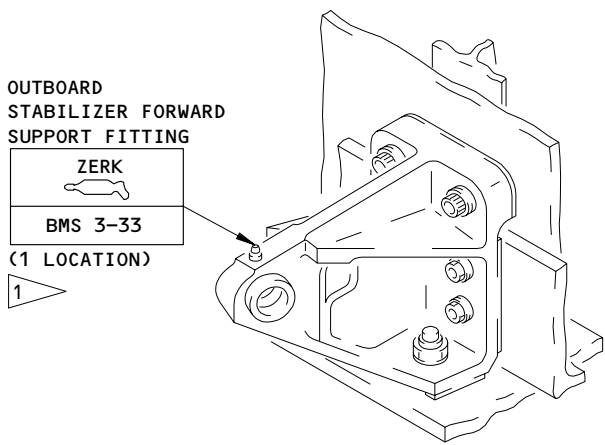
EFFECTIVITY	ALL
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12-21-33



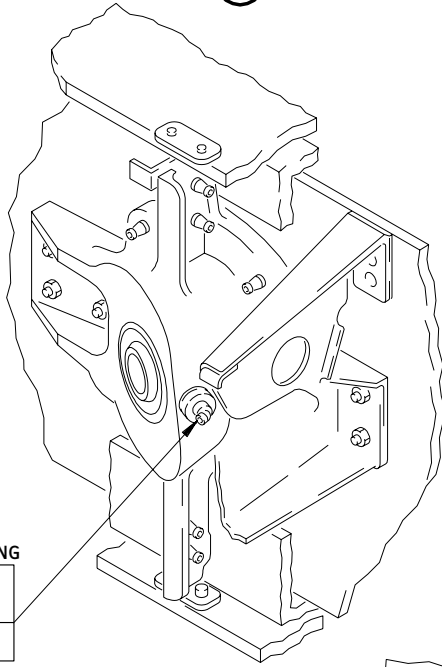
1 POINT

F



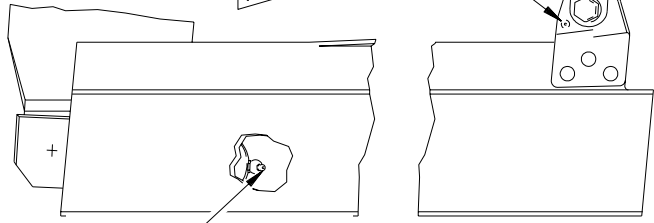
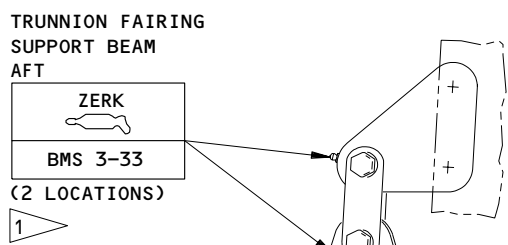
1 POINT

G



1 POINT

H



3 POINTS

I

1 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

Wing Structure Lubrication
Figure 301 (Sheet 4)

EFFECTIVITY	ALL
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12-21-33

128752

NO.2 WINDOW - SERVICING (LUBRICATION)

1. General

- A. This procedure gives instructions to lubricate the ballscrews on the No. 2 flight compartment windows.

TASK 12-21-34-643-001

2. Lubricate the No. 2 Window Ballscrew (Fig. 301)

A. Consumable Materials

- (1) D00633 Grease - BMS 3-33 (Recommended)
(2) D00013 Grease, MIL-PRF-23827 (Alternate)

B. Access

- (1) Location Zone
211/212 Control Cabin - Section 41

C. Procedure - Lubricate the Ballscrew

S 493-002

- (1) Put paper under the ballscrew assembly to keep the grease spray off the lower interior equipment.

S 643-003

- (2) Apply the grease through the carriage to lubricate the ballscrew.

S 713-004

- (3) Operate the carriage through its full range of travel.

S 643-005

- (4) Lubricate the ballscrew again if it is necessary.

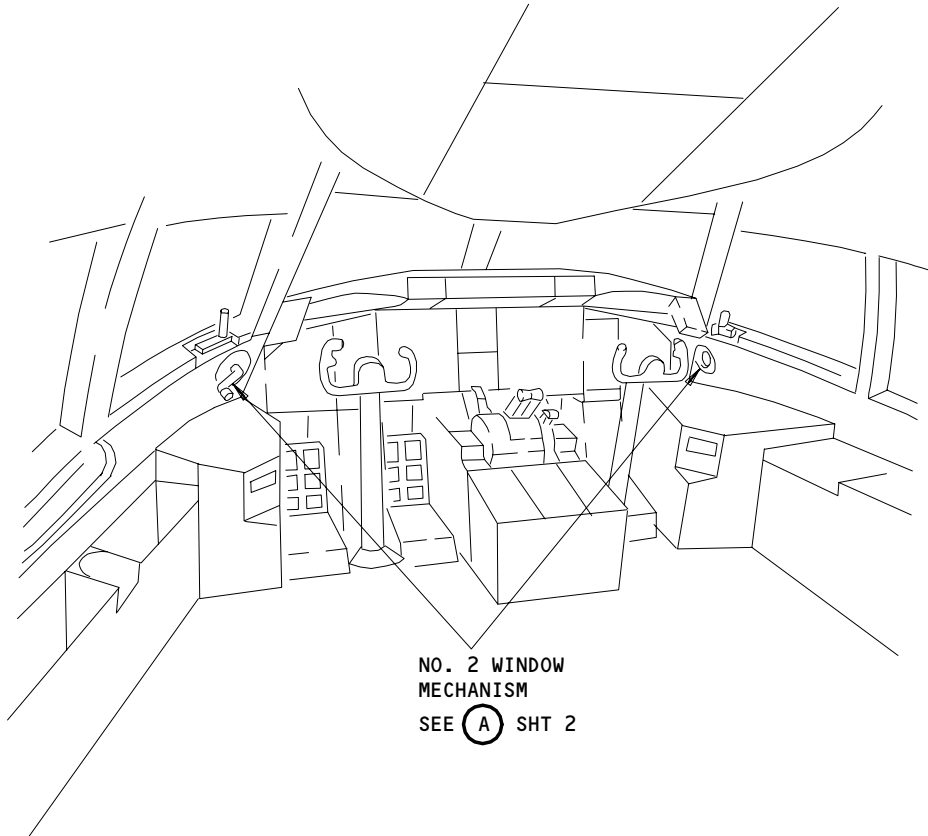
EFFECTIVITY

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No. 2 Window Lubrication
Figure 301 (Sheet 1)

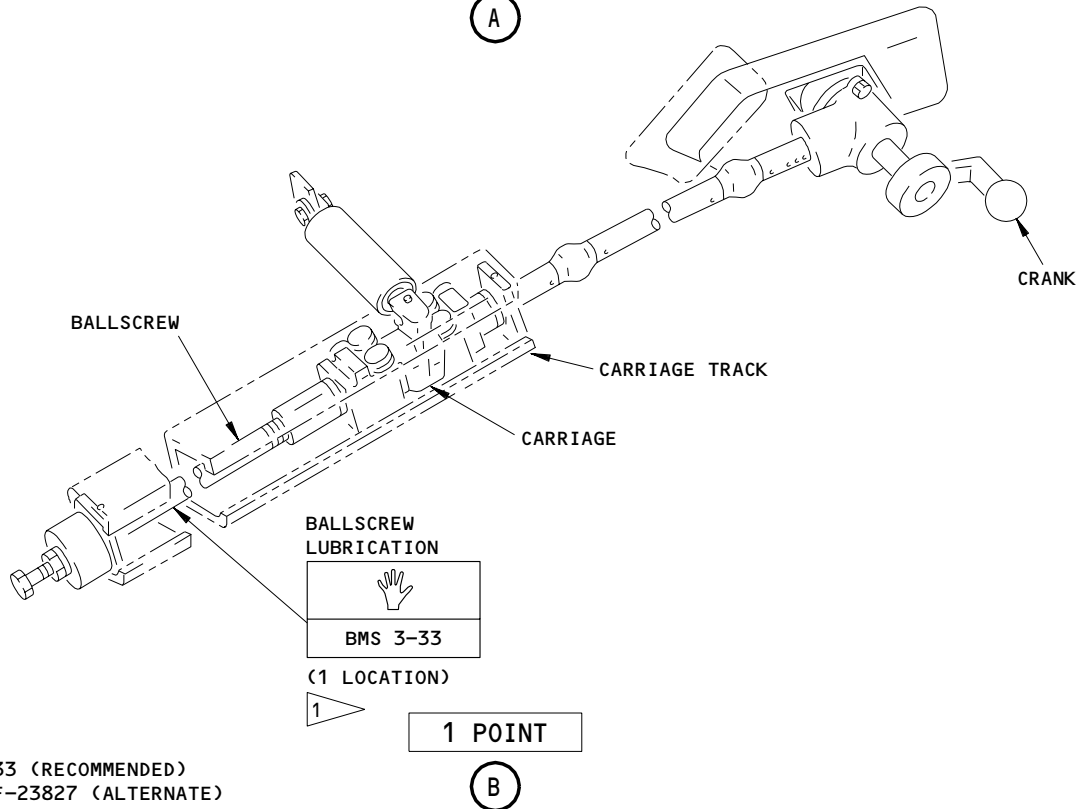
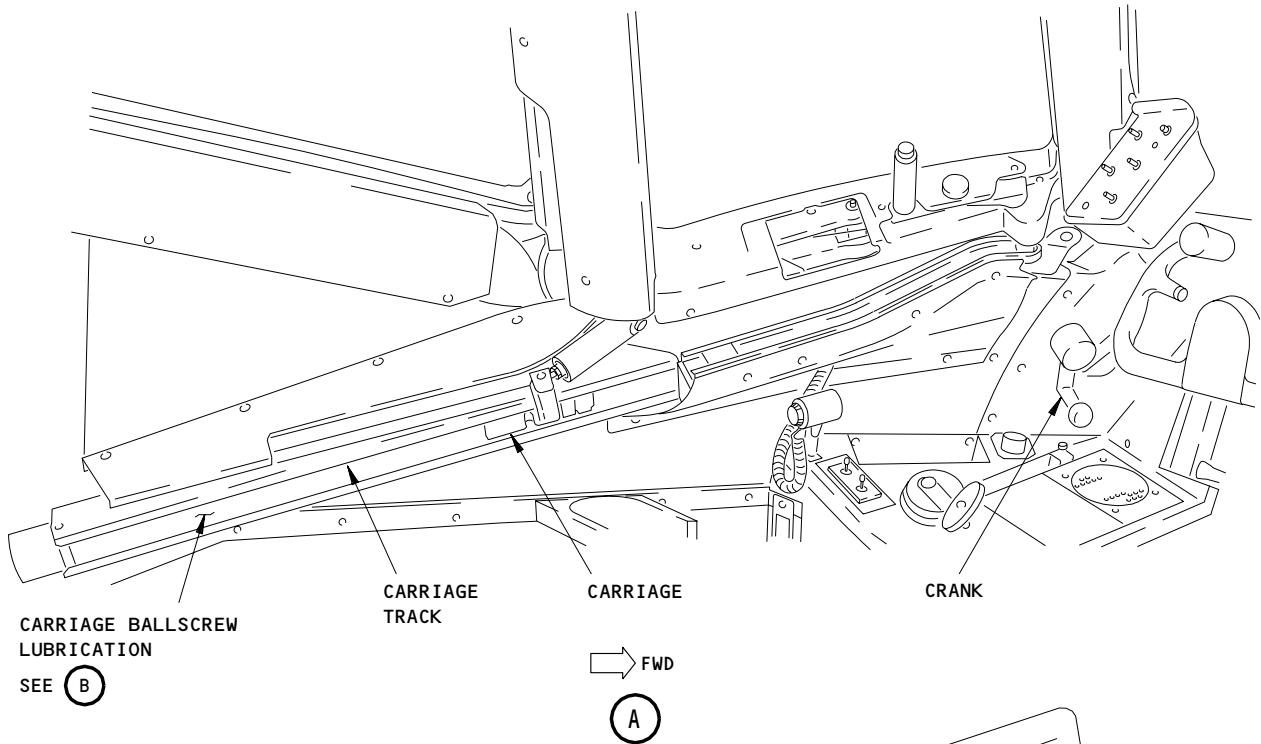
EFFECTIVITY	
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204238



1 BMS 3-33 (RECOMMENDED)
MIL-PRF-23827 (ALTERNATE)

No. 2 Window Lubrication
Figure 301 (Sheet 2)

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THRUST LEVERS – SERVICING

1. General

- A. This procedure gives the instructions to lubricate the titanium thrust levers.
- B. As an alternate to this procedure, you can remove the thrust levers from the control stand to lubricate the reverse thrust lever latch.

TASK 12-21-35-643-001

2. Do the Servicing of the Thrust Levers

- A. Consumable Materials
 - (1) D00549 Compound – Antiseize, C5A, Fel-Pro Inc. or MIL-A-907 equivalent. (AMM 20-30-04)
 - (2) G01163 Cloth – Clean Absorbent, 1x2 foot (AMM 20-30-07)
- B. References
 - (1) AMM 76-11-04/401, Thrust Levers' Rails, Covers and Seals.
 - (2) AMM 78-31-00/201, Thrust Reverser System
- C. Access
 - (1) Location Zones
 - 210 Flight Compartment
- D. Lubricate Reverse Thrust Lever Latch (Fig. 301)

S 043-002

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO YOU AND DAMAGE TO EQUIPMENT.

- (1) Do the Thrust Reverser Deactivation Procedure for ground maintenance (AMM 78-31-00/201).

S 863-003

- (2) Open this circuit breaker of the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
 - (a) 11G11, AUTO SPEEDBRAKE

S 013-004

- (3) Remove the center cover, the center cover seal, and the rail from the control stand (AMM 76-11-04/401).

S 493-005

- (4) Put the cloth below the latch of the reverse thrust lever to catch any leakage from the lubricant.

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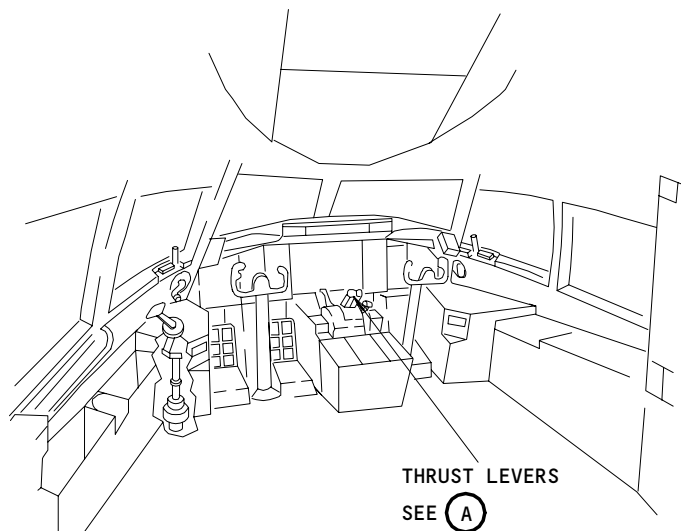
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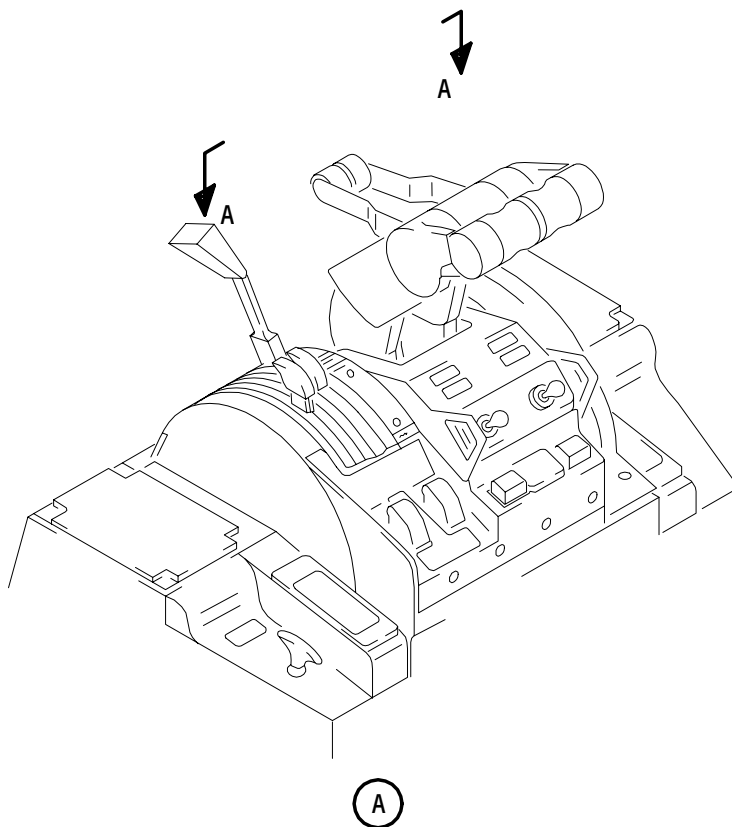
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FLIGHT COMPARTMENT



Thrust Lever Servicing
Figure 301 (Sheet 1)

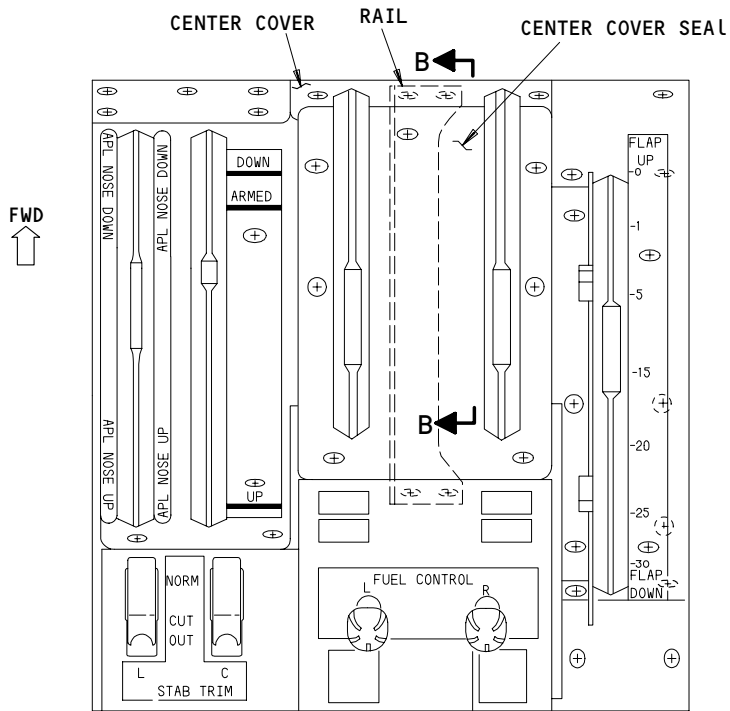
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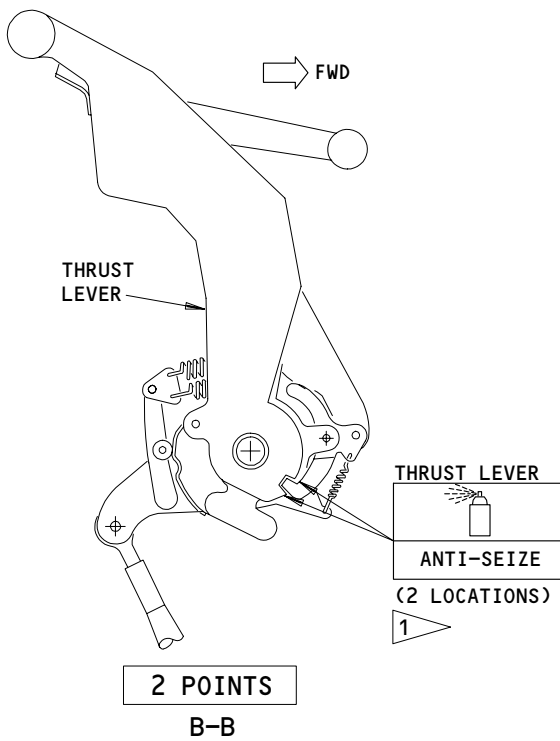
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**THRUST LEVER
(TOP VIEW)
A-A**



1 APPLY THE ANTI-SEIZE COMPOUND TO THE LATCH AND THE NOTCH.

**Thrust Lever Servicing
Figure 301 (Sheet 2)**

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S 643-006

CAUTION: USE ONLY FEL-PRO C5A ANTI-SEIZE COMPOUND OR MIL-A-907 EQUIVALENT. USE OF OTHER LUBRICANTS CAN RESULT IN TOO MUCH LOAD ON THE REVERSE THRUST LEVER.

- (5) Use a clean applicator to apply anti-seize compound to the surfaces where the latch and notch engage.
(a) Move the reverse thrust lever to make sure all the surfaces are lubricated.

S 753-007

- (6) Move the reverse thrust lever forward and back and listen for a metallic scraping sound as the latch moves out of the notch.
(a) If no sound is heard, the latch is correctly lubricated.

S 643-008

- (7) Do the procedure again for the other latch.

S 093-009

- (8) Remove the cloth.

S 863-013

- (9) Put the reverse thrust lever back to the forward and down position.

S 413-010

- (10) Install the rail, the center cover seal, and the cover seal onto the control stand (AMM 76-11-04/401).

S 863-011

- (11) Remove the DO-NOT-CLOSE identifier and close these circuit breaker on the overhead panel P11:
(a) 11G11, AUTO SPEEDBRAKE

S 443-012

- (12) Do the Thrust Reverser Activation Procedure (AMM 78-31-00/201).

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ENGINE STARTER - SERVICING (OIL CHANGE)

1. General

- A. This procedure contains two tasks.
- (1) The first task examines the chip detector and drains the oil from the starter.
 - (2) The second task fills the starter with oil.

TASK 12-22-02-683-002

2. Drain the Engine Starter Oil

A. General

WARNING: DO NOT LET THE OIL TOUCH YOUR SKIN FOR A LONG TIME. THE SYNTHETIC OIL USED IN THIS ENGINE CONTAINS ADDITIVES WHICH CAN BE TOXIC IF THEY ARE ABSORBED THROUGH THE SKIN.

CAUTION: DO NOT LET THE OIL FLOW ON TO PARTS THAT DO NOT USUALLY TOUCH THE OIL. THE OIL CAN CAUSE DAMAGE TO PAINT AND SOME TYPES OF RUBBER. ANY OIL THAT GETS ON TO THESE PARTS MUST BE CLEANED IMMEDIATELY.

VERY SMALL QUANTITIES OF SOME TYPES OF ALKALINE CLEANING FLUIDS CAN CAUSE FAILURE OF THE SYNTHETIC OIL. USE VERY CLEAN CONTAINERS AND EQUIPMENT.

DO NOT PUT OIL THAT YOU HAVE DRAINED INTO THE ENGINE.

- (1) You must follow this WARNING and CAUTION for the entire task.

B. Equipment

- (1) Clean Container - minimum capacity:
 - 1.2 U.S. pints
 - 1 Imperial pint
 - 0.568 Litres

C. Consumable Materials

- (1) Lockwire
 - British Spec - DTD. 189A 22. S.W.G.
 - American Spec - 21 A.W.G.
 - OMat No. - 238

D. References

- (1) AMM 70-02-01/201, Identification, Lubrication and Fitting of Rubber Sealing Rings
- (2) AMM 71-11-04/201, Fan Cowl Panels
- (3) AMM 80-11-01/401, Engine Starter

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- (4) AMM 80-11-01/601, Starter Inspection/Check.
- E. Access
 - (1) Location Zones
 - (a) 413 Fan Cowl Panel (Left)
 - (b) 414 Fan Cowl Panel (Right)
 - (c) 423 Fan Cowl Panel (Left)
 - (d) 424 Fan Cowl Panel (Right)
 - (2) Access Panels
 - (a) 413AL Fan Cowl Panel (Left)
 - (b) 414AL Fan Cowl Panel (Right)
 - (c) 423AL Fan Cowl Panel (Left)
 - (d) 424AL Fan Cowl Panel (Right)
- F. Drain the Starter Oil (Fig. 301)

S 013-011

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

- (1) Open the left and right fan cowl panels for the applicable engine (AMM 71-11-04/201).

S 213-004

- (2) Examine the chip detector (AMM 80-11-01/601).

S 683-005

- (3) Drain the engine starter oil as follows:
 - (a) Put the container under the starter to collect the unwanted oil.
 - (b) Remove the drain plug.
 - 1) Discard the seal ring.
 - (c) Let the oil drain completely.
 - (d) Install the drain plug as follows:
 - 1) Lubricate a new seal ring and the drain plug threads with oil (AMM 70-02-01/201).

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- 2) Install the seal ring on the drain plug.
- 3) Install the drain plug in the starter.
 - a) Tighten the drain plug to 10-25 pound-inches (1.1-2.8 Newton meters).
 - b) Install lockwire to the drain plug.

TASK 12-22-02-613-001

3. Fill the Engine Starter with Oil

A. General

- (1) Oils that have been reclaimed to the approved Rolls-Royce standards for the appropriate viscosity grade, are approved for use.

WARNING: DO NOT LET THE OIL TOUCH YOUR SKIN FOR A LONG TIME. THE SYNTHETIC OIL USED IN THIS ENGINE CONTAINS ADDITIVES WHICH CAN BE TOXIC IF THEY ARE ABSORBED THROUGH THE SKIN.

CAUTION: DO NOT LET THE OIL FLOW ON TO PARTS THAT DO NOT USUALLY TOUCH THE OIL. THE OIL CAN CAUSE DAMAGE TO PAINT AND SOME TYPES OF RUBBER. ANY OIL THAT GETS ON TO THESE PARTS MUST BE CLEANED IMMEDIATELY.

VERY SMALL QUANTITIES OF SOME TYPES OF ALKALINE CLEANING FLUIDS CAN CAUSE FAILURE OF THE SYNTHETIC OIL. USE VERY CLEAN CONTAINERS AND EQUIPMENT.

DO NOT PUT OIL THAT YOU HAVE DRAINED INTO THE ENGINE.

- (2) You must follow this WARNING and CAUTION for the entire task.

B. Consumable Materials

(1) Approved Oils

- (a) D00170, BP Turbine Oil 2380
- (b) D00170, BP Turbine Oil 25
- (c) D00170, AeroShell Turbine Oil 555
- (d) D00170, Castrol 580 Gas Turbine Oil
- (e) D00170, Mobil Jet Oil II

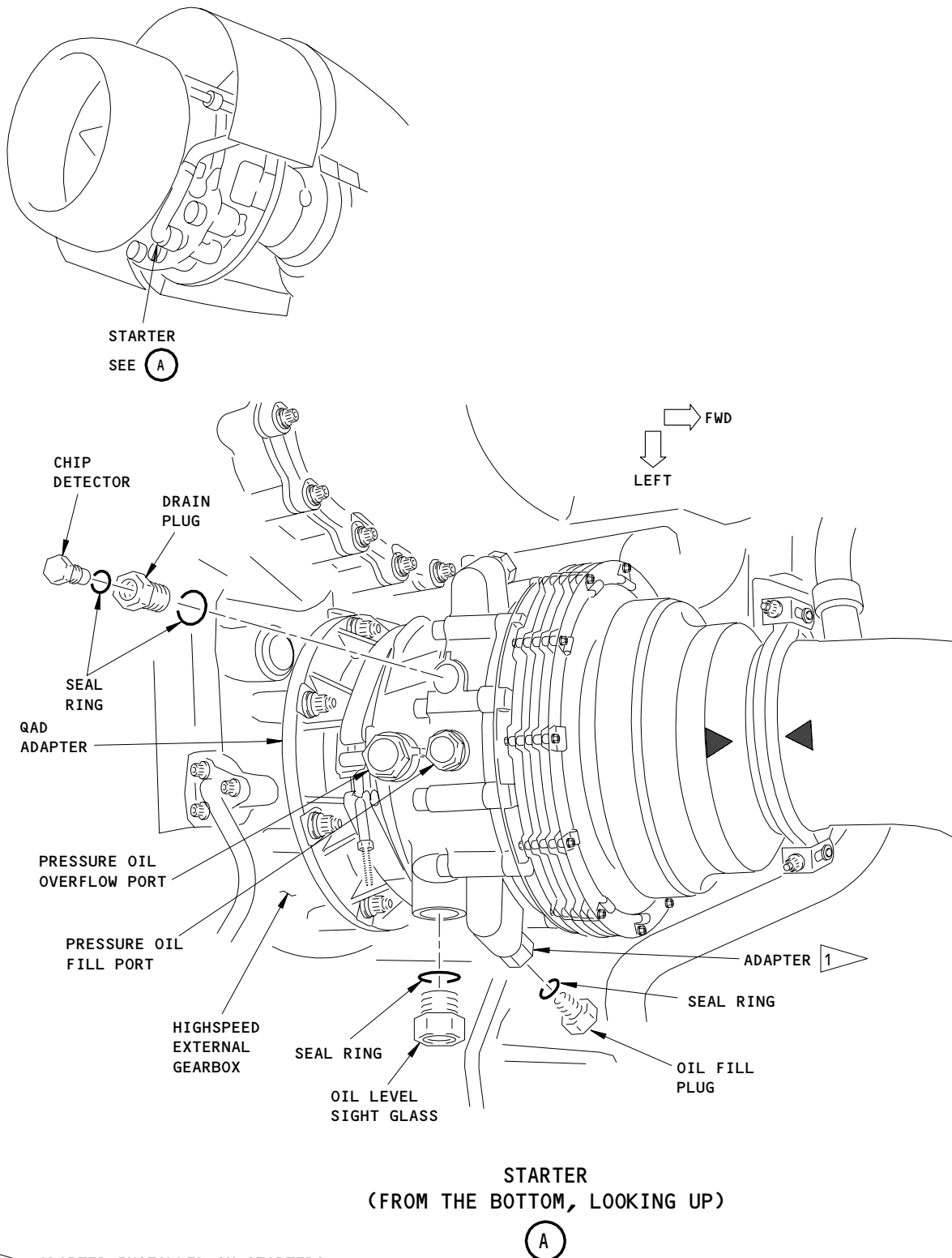
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1 ADAPTER INSTALLED ON STARTERS WITH RR SB 80-B009

Engine Starter - Oil Change
Figure 301

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- (f) D00170, Mobil Jet Oil 254
- (g) D00170, Aeroshell Turbine Oil 500 (ATO 500)
- (h) D00170, Aeroshell Turbine Oil 560
(Use in Hamilton Standard Starters Only)
- (2) Lockwire
British Spec - DTD. 189A 22 SWG
American Spec 21 AWG
OMat No. - 238
- C. References
 - (1) AMM 70-02-01/201, Identification, Lubrication and Fitting of Rubber Sealing Rings
 - (2) AMM 71-11-04/201, Fan Cowl Panels
- D. Access
 - (1) Location Zones
 - (a) 413 Fan Cowl Panel (Left)
 - (b) 414 Fan Cowl Panel (Right)
 - (c) 423 Fan Cowl Panel (Left)
 - (d) 424 Fan Cowl Panel (Right)
 - (2) Access Panels
 - (a) 413AL Fan Cowl Panel (Left)
 - (b) 414AL Fan Cowl Panel (Right)
 - (c) 423AL Fan Cowl Panel (Left)
 - (d) 424AL Fan Cowl Panel (Right)
- E. Procedure

S 613-016

- (1) Fill the starter with oil as follows (Fig. 301):
 - (a) Remove the plug at the oil fill port.
 - 1) Discard the seal ring.
 - (b) For the left engine, add clean approved oil to the starter until the oil level is at the mid-position on the sight glass.
 - (c) For the right engine, add clean approved oil to the starter until oil flows from the fill port.
 - (d) Install the oil fill plug:
 - 1) Lubricate a new seal ring with oil (AMM 70-02-01/201).
 - 2) Install the seal ring on the oil fill plug.
 - 3) Install the oil fill plug in the starter.
 - a) Tighten the oil fill plug to 20-35 pound-inches (2.3-3.9 Newton meters).
 - b) Install lockwire to the oil fill plug.

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4) Clean unwanted oil from the starter.

S 413-017

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU CLOSE THE FAN COWL PANEL. IF THE PRECAUTIONS ARE NOT OBEYED, DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

(2) Close the fan cowl panels that you opened (AMM 71-11-04/201).

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AIRPLANE SERVICING (FILTER IDENTIFICATION)

TASK 12-23-00-613-001

1. Airplane Servicing (Filter Identification)

A. General

(1) The tables that follow show the filters that must have regular maintenance. The procedures to clean or replace the filters or the filter elements are given in the last column.

NAME	ELEMENT TYPE	CHAPTER
AIR CONDITIONING		
Conditioned Air Return Air Grills	Cleanable	21-23-05
L & R Recirculation Air Filter	Replaceable	21-25-02
Galley Ventilation Filter	Replaceable	21-26-03
Zone Temperature Sensor Filter	Replaceable	21-61-11
AUTOFLIGHT		
Pitch Control Servo Filter	Cleanable	22-12-01
Autopilot Rollout Guidance Servo Filter	Cleanable	22-13-01
Autopilot Lateral Control Servo Filter	Cleanable	22-13-03
Yaw Damper Servo Filter	Replaceable	22-21-02
ELECTRICAL POWER		
IDG Scavenge Pump Filter	Replaceable	24-11-02
FLIGHT CONTROLS		
Aileron PCA Filter	Replaceable	27-11-20
RRCA Filter	Replaceable	27-21-13
Spoiler PCA Filter Screen	Replaceable	27-61-02
FUEL		
Center Tank Sump Screen Assembly	Cleanable	28-22-00
Main Tank Sump Screen Assembly	Cleanable	28-22-00
Fuel Inlet Screen	Cleanable	28-22-04
HYDRAULIC POWER		
System C Return Filter	Replaceable	29-11-13
System L and R Return Filter	Replaceable	29-11-15
Reservoir Pressurization Air Filter	Cleanable	29-11-16
EDP Pressure Filter	Replaceable	29-11-17
EDP Case Drain Filter	Replaceable	29-11-17

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NAME	ELEMENT TYPE	CHAPTER
System L & R ACMP Pressure Filter	Replaceable	29-11-18
System L & R Case Drain Filter	Replaceable	29-11-18
System C ACMP Pressure Filter	Replaceable	29-11-19
System C ACMP Case Drain Filter	Replaceable	29-11-19
Reservoir Fill Filter	Replaceable	29-18-04
RAT Pressure Filter	Cleanable	29-21-11
RAT Case Drain Filter	Cleanable	29-21-11
PTU Pressure Filter	Replaceable	29-22-02
PTU Case Drain Filter	Replaceable	29-22-05
INDICATING/RECORDING SYSTEMS		
Digital Flight Data Acquisition Unit	Cleanable	31-31-03
EICAS Video Display Cooling Air Inlet Screen	Cleanable	31-41-01
LANDING GEAR		
Brake Pressure Control Valve Screen Filter	Replaceable	32-41-05
Alternate Antiskid Module Inlet Filter	Replaceable	32-42-03
Alternate Antiskid Module Screen Filter	Cleanable	32-42-03
Normal Antiskid Module Inlet Filter	Replaceable	32-42-03
Normal Antiskid Module Screen Filter	Cleanable	32-42-03
Antiskid Shuttle Valve Filter	Replaceable	32-42-07
Autobrake Valve Module Filter	Replaceable	32-42-09
Nose Gear Steering Metering Valve Module Filter Screen	Cleanable	32-51-12
NAVIGATION		
L & R Air Data Computer Cooling Air Inlet Screens	Cleanable	34-12-01
Altitude Alert Cooling Air Inlet Screen	Cleanable	34-16-01
L, R & C Inertia Reference Unit Cooling Air Inlet Screens	Cleanable	34-21-01
L, R & C Electronic Flight Instrument System Sum Generator Cooling Air Inlet Screens	Cleanable	34-22-01

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NAME	ELEMENT TYPE	CHAPTER
Electronic Attitude Director Indicator Cooling Air Inlet Screen	Cleanable	34-22-03
Electronic Horizontal Situation Indicator Cooling Air Inlet Screen	Cleanable	34-22-04
L, R & C Instrument Landing System Cooling Air Inlet Screens	Cleanable	34-31-01
L, R & C Radio Altimeter Cooling Air Inlet Screens	Cleanable	34-33-01
Weather Radar Transceiver Mount Filter	Replaceable	34-43-01
Ground Proximity Warning Computer Cooling Air Inlet Screen	Cleanable	34-46-01
L & R Voice Omni Range/Marker Receiver Cooling Air Inlet Screens	Cleanable	34-51-01
Air Traffic Control Cooling Air Inlet Screen	Cleanable	34-53-01
L & R Distance Measuring Equipment Interrogator Cooling Air Inlet Screens	Cleanable	34-55-01
L Automatic Direction Finder Cooling Air Inlet Screen	Cleanable	34-57-01
R Automatic Direction Finder Cooling Air Inlet Screen	Cleanable	34-57-01
WATER/WASTE		
Potable Water Compressor Air Filter	Replaceable	38-15-02
Bleed Air Filter	Replaceable	38-15-02
AIRBORNE AUXILIARY POWER		
APU Oil Pressure Filter Element	Replaceable	49-27-03
APU Oil Generator Scavenge Filter Element	Replaceable	49-27-03
APU Fuel Filter Element	Replaceable	49-31-04
APU Fuel High Pressure Filter	Cleanable	49-31-07
APU Flow Divider Fitter Element	Cleanable	49-31-08
APU Surge Valve Filter Element	Cleanable	49-53-06
ENGINE FUEL AND CONTROL		
Low Pressure Fuel Filter Element	Replaceable	73-11-10

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NAME	ELEMENT TYPE	CHAPTER
High Pressure Fuel Filter	Replaceable	73-11-12
OIL		
Pressure Oil Filter Element	Cleanable	79-21-07
Scavenge Oil Filter Element	Replaceable	79-21-08
STARTING		
Starter Control Valve Filter	Cleanable	80-11-08

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AIRPLANE SERVICING (CLEAN AND POLISH)

1. General

- A. 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.
- B. The liquids used in this procedure can cause injury to the skin and eyes, or damage to the airplane. Always wear clothing that will prevent injury when you clean the airplane. The cleaners can cause corrosion if they are not removed completely from the airplane surfaces. The solvent that is mixed with the cleaners is flammable. Keep the solvent away from sources of heat.
- C. Failure to remove covers from pitot probes or coverings from static ports before flight may cause large errors in airspeed-sensing and altitude-sensing signals, which may lead to loss of safe flight.
- D. Cleaning materials should meet the requirements of D6-17487, Evaluation of Airplane Maintenance Materials.

TASK 12-25-01-103-001

2. Clean the External Surfaces of the Airplane

A. General

NOTE: Boeing considers water pressure above 80 psi to be "high pressure".

- (1) This section includes these procedures:
 - (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.
- (3) 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.
- (4) 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.

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- (5) Do not clean with water that is hotter than 160°F.
- (6) To clean the windows in the flight compartment, refer to AMM 12-16-02/301, Flight Compartment Windows.
- (7) To clean the windows in the passenger compartment, refer to AMM 12-16-03/301, Passenger Windows.

B. Equipment

- (1) Pitot Probe Protective Covers - KPC3-480-325
- (2) Pitot Probe Cover Removal/Installation Pole - B10002-1
- (3) Angle of Attack Sensor - R/C-A0AC-2 (Sesame Technologies)
- (4) Landing Gear Door Locks (Ref 32-00-15)
- (5) Spray Equipment
- (6) Source of compressed air - commercially available
- (7) Mops - commercially available
- (8) Boots - commercially available
- (9) Gloves - commercially available
- (10) Face mask or goggles - commercially available
- (11) Apron - commercially available

C. Consumable Materials

- (1) B00090 Degreasing Fluid - MIL-T-81533A
- (2) B00261 Cleaner - Oakite 74L (foam cleaning)
- (3) B00215 Soft bristle fiber brush
- (4) B00316 Solvent - Aliphatic Naphtha, TT-N-95, Type I
- (5) B00291 Cleaner - Ceebee Majorclean
- (6) B00130 Solvent - Isopropyl Alcohol
- (7) G02443 Orange barricade tape, 3 inches wide, 4 mils thick, non-adhesive, with "REMOVE BEFORE FLIGHT" printed on it in black letters.
- (8) G02219 3M Scotch Brand No. 471 vinyl adhesive tape (1.5 inches wide) bright yellow color
- (9) G02444 Red paper tag (3 inches wide, 6 inches long) with attaching wire that has "STATIC PORTS COVERED" printed on it in black letters - P/N 2000S.
- (10) G02447 Red paper tag (3 inches wide, 6 inches long) with attaching wire that has "PITOT PROBES COVERED" printed on it in black letters - P/N 1000P.
- (11) G00252 Black polyethylene sheet, 6 mils thick

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Water-Base Alkaline Cleaners (Ref 20-30-02) Table 301			
	DILUTION RATIO: NUMBER OF VOLUMES OF WATER PER ONE VOLUME OF CLEANER		
CLEANER	LIGHTLY DIRTY	MODERATELY DIRTY	VERY DIRTY
B00017 PACIFIC CHEMICAL B-82	7	3	2
B00004 KELITE 28	10	4	2
B00005 CEEBEE 280	10	4	2
B00008 OAKITE 204	10	4	2
B00016 TEC NO. 1	10	4	2
B00018 METACLEAN AC	10	4	2
B00013 DUBOIS C-1102	10	4	3
B00014 CALLA 301	10	4	3
B00010 PENNWALT 2271R	10	3	2
B00012 TURCO JET CLEAN C	20	5	3

Solvent Emulsion Cleaners Table 302		
	DILUTION RATIO: NUMBER OF VOLUMES OF WATER AND CLEANING SOLVENT PER ONE VOLUME OF CLEANER	
CLEANER	WATER	CLEANING SOLVENT
ANY CLEANER IN TABLE 301	2	5 TO 6

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Heavy Duty Cleaners Table 303		
	DILUTION RATIO: NUMBER OF VOLUMES OF WATER OR CLEANING SOLVENT TO ONE VOLUME OF CLEANER	
CLEANER	WATER	CLEANING SOLVENT
B00022 AIRSHOW W	5 TO 15	

D. References

- (1) AMM 20-41-00/201, Static Grounding
- (2) AMM 24-22-00/201, Control (Supply Power)
- (3) AMM 32-00-15/201, Landing Gear Door Ground Operations and Locking Procedure

E. Prepare to Clean the Airplane

NOTE: Be careful when you clean the airplane in very hot weather. The heated surface of the airplane can dry the cleaners before you can flush them with water. The dried cleaners can stain the surface.

S 503-002

WARNING: KEEP ALL OF THE EQUIPMENT THAT YOU USE WITH FLAMMABLE SOLVENTS AWAY FROM SOURCES OF HEAT. IF THERE IS WIND, MAKE SURE THE SOLVENTS DO NOT FALL ON ELECTRICAL EQUIPMENT OR WARM COMPONENTS.

- (1) Move all of the equipment that you will use with flammable solvents away from sources of heat.

S 863-003

- (2) Statically ground the airplane (AMM 20-41-00/201).

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- S 863-052
- (3) Remove electrical power (AMM 24-22-00/201).
- S 843-004
- (4) Close all of the passenger doors, cargo doors, emergency exits, and access doors and panels.
- S 843-039

WARNING: WHEN THE PITOT PROBES ARE COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. IN ADDITION, ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT DECK AS A REMINDER THAT PITOT PROBES ARE COVERED. FAILURE TO OBSERVE AND REMOVE COVERINGS OVER PITOT PROBES BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.

CAUTION: USE COVERS, BLACK POLYETHYLENE SHEET, AND YELLOW VINYL ADHESIVE TAPE TO KEEP LIQUIDS OUT OF AREAS THAT CONTAIN MECHANICAL, ELECTRICAL, OR HYDRAULIC COMPONENTS. LIQUIDS WHICH ENTER THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS.

CAUTION: WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

CAUTION: MAKE SURE THE PITOT 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.

- (5) Put the covers on these components:
- (a) Pitot probes (See Fig. 301 for locations of pitot probes)
 - (b) Engine inlet, fan exhaust, and turbine exhaust (AMM 71-00-03/201)
 - (c) Brakes
 - (d) Tires

- S 843-027
- (6) Attach a red paper tag that has "PITOT PROBES COVERED" printed on it in black letters, to the top of the left control in the flight deck with wire.

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S 843-028

CAUTION: WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (7) Use yellow vinyl adhesive tape and black polyethylene sheet to cover these openings, but do not seal them air-tight:
- (a) Surge tank and fuel tank vents
 - (b) APU exhaust duct outlet port
 - (c) APU oil cooling air exhaust port
 - (d) Overboard exhaust valve port
 - (e) Ram air inlet and outlet doors
 - (f) Outflow valve

S 843-040

WARNING: WHEN THE STATIC PORTS ARE COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. IN ADDITION, ATTACH A TAG TO THE LEFT CONTROL WHEEL IN THE FLIGHT DECK AS A REMINDER THAT STATIC PORTS ARE COVERED. FAILURE TO OBSERVE AND REMOVE COVERINGS OVER STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE -SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.

CAUTION: WHENEVER AN OPENING IS COVERED, MAKE SURE THAT CONDITION IS VISIBLE FROM THE GROUND. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (8) Use yellow vinyl adhesive tape and orange barricade tape that has "REMOVE BEFORE FLIGHT" printed on it in black letters to cover the alternate static ports and elevator feel static ports in the following manner (see Fig. 301 for the locations of the static ports. See Fig. 302 Sheet 1, for illustrations of the static port cover placement procedure for alternate and elevator feel static ports):

WARNING: DO NOT PLACE 3M NO. 471 YELLOW VINYL ADHESIVE TAPE OVER THE HOLES OF THE STATIC PORTS.

- (a) Clean the area around each static port with aliphatic naphtha or equivalent, and a clean dry rag where you will put the 3M No. 471 yellow vinyl adhesive tape (see Fig. 302 Sheet 1).

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- (b) Place one end of approximately a 4-foot piece of the orange barricade tape over the holes of the static port and secure the upper edge with 5 inches of No. 471 yellow vinyl adhesive tape (see Fig. 302 Sheet 1, Steps 1 and 2).

NOTE: Smooth the 3M No. 471 yellow vinyl adhesive tape on the airplane surface to make sure the bond is satisfactory.

- 1) Do not put vinyl adhesive tape over the holes of the static port.
- (c) Put a 5-inch piece of vinyl adhesive tape on each vertical edge of the barricade tape overlapping the first strip of adhesive tape. (See Fig. 302 Sheet 1, Step 3)
- (d) Put an 8-inch piece of vinyl adhesive tape horizontally over the barricade tape below the static port holes, overlapping the two vertical strips of adhesive tape. (See Fig. 302 step 4)

S 423-048

- (9) For the primary static ports, use the following static port cover procedure (see Fig. 302 Sheet 2 for illustrations of the primary static port cover placement procedure. See Fig. 301 for the locations of the primary static ports).

WARNING: DO NOT PLACE 3M NO. 471 YELLOW VINYL ADHESIVE TAPE OVER THE HOLES OF THE STATIC PORTS.

- (a) Clean the area around each primary static port with aliphatic naphtha or equivalent, and a clean dry rag where you will put the 3M No. 471 yellow vinyl adhesive tape (see Fig. 302 Sheet 2).
- (b) Place one end of a 4-foot piece of the orange barricade tape over the holes of the upper primary static port and secure the upper edge with 5 inches 3M No. 471 yellow vinyl adhesive tape (see Fig. 302 Sheet 2, Steps 1 and 2).

NOTE: Smooth the 3M No. 471 yellow vinyl adhesive tape on the airplane surface to make sure the bond is satisfactory.

- 1) Do not put vinyl adhesive tape over the holes of the static ports.
- (c) Put an 8-inch strip of 3M No. 471 yellow vinyl adhesive tape on each vertical edge of the barricade tape overlapping the first strip of adhesive tape (see Fig. 302, Sheet 2, Step 3).
- (d) Put an 8-inch strip of 3M No. 471 yellow vinyl adhesive tape below the lower primary static port holes overlapping the two vertical strips of adhesive tape (see Fig. 302 Sheet 2, Step 4).
- (e) The barricade tape should be allowed to stream down so it is visible from the ground.

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S 843-030

- (10) Attach a red paper tag that has "STATIC PORTS COVERED" printed on it in black letters, to the top of the left control wheel in the flight deck with wire.

S 843-047

- (11) Use plastic membranes to cover the components in Table 304. All components are identified in Fig. 303 thru Fig. 317.

S 843-051

CAUTION: YOU MUST COVER THE NOSE LANDING GEAR WHEEL BEARINGS PRIOR TO WASHING THE AIRPLANE. IF THE WHEEL BEARINGS ARE NOT COVERED, THIS CAN CAUSE THE WHEEL BEARINGS TO FAIL.

- (12) Cover the nose landing gear wheel bearings with a plastic membrane before washing.

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TABLE 304

Item Description	Location	Figure Number	Sheet
Hydraulics: Flight Controls, Locations	-	303	1
Aileron PCUs	1	303	2,3
Outboard Spoiler PCUs	2	303	4,5
Inboard Spoiler PCUs	3	303	4,5
Lateral Autopilot Actuator	4	303	6
High Lift Components:			
Power Drive Unit - TE Flap:			
Hydraulic Motor	6	304	1
Torque Tube	7	304	1
Alternate Electric Motor	8	304	1
Control Valve Assembly	9	304	1
Bypass Valve	10	304	2
Position Transmitter	11	304	2
TE Flap Control Valve	5	304	3
No. 1 & 8 TE Angle Tee Gearbox Assembly:	12	305	
No. 2 & 7 TE Angle Tee Gearbox Assembly	13	305	
Bearing Assembly - TE Flap Drive Torque Support	14	306	
Bearing Assembly - TE Flap Drive Torque Support	15	306	
Bearing Assembly - TE Flap Drive Torque Support	16	306	
Bearing Assembly - TE Flap Drive Torque Support	17	306	
No. 3 & 6 TE Tee Gearbox Assembly	18	307	
No. 3 & 6 TE Angle Gearbox Assembly	19	308	

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TABLE 304

Item Description	Location	Figure Number	Sheet
No. 4 & 5 TE Angle Gearbox Assembly	20	309	
No. 4 & 5 TE Tee Gearbox Assembly	21	310	
No. 1, 2 & 7, 8 Outboard Flap Transmissions	22	311	
No. 3, 4 & 5, 6 Inboard Flap Transmissions	23	312	
No. 1 to 20 LE Rotary Actuators, Location		313	1
Rotary Actuator Assembly	24	313	2
LE Angle Gearbox	25	314	
Brake System:			
Brake Metering Valve	26	315	
Parking Brake Valve	27	316	
Nose Wheel Steering:			
Actator Trunnion Bearings	28	317	2
Actuator Rod End Bearings	29	317	1
Actuator Rod Seals	30	317	1
Summing Mechanism	31	317	2
Spring Cartridge and Quadrant	32	317	1
Pulleys	33	317	2

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TABLE 304			
Item Description	Location	Figure Number	Sheet
Wheels:			
Nose Landing Gear Wheel Bearings	34	318	

S 843-024

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. WET AIRPLANE SURFACES ARE DANGEROUS WHEN YOU WALK ON THEM.

(13) Wear gloves and goggles to prevent injury to your skin and eyes. Wear a safety harness when you walk on wet surfaces above the ground.

S 843-008

(14) Do not let the tires stay in the liquid that was used to clean the airplane.

NOTE: The tires can be left in the cleaning liquid while the plane is being washed and then rolled away to a clean area.

S 843-022

CAUTION: MAKE SURE MIXTURE OF WATER AND CLEANER DOES NOT GET IN THE STEEL OR CARBON BRAKE HEAT SINKS. CONTAMINATION CAN CAUSE DAMAGE TO CARBON BRAKES AND REDUCE BRAKE PERFORMANCE FOR CARBON AND STEEL BRAKES.

(15) Make sure the brakes are properly covered.

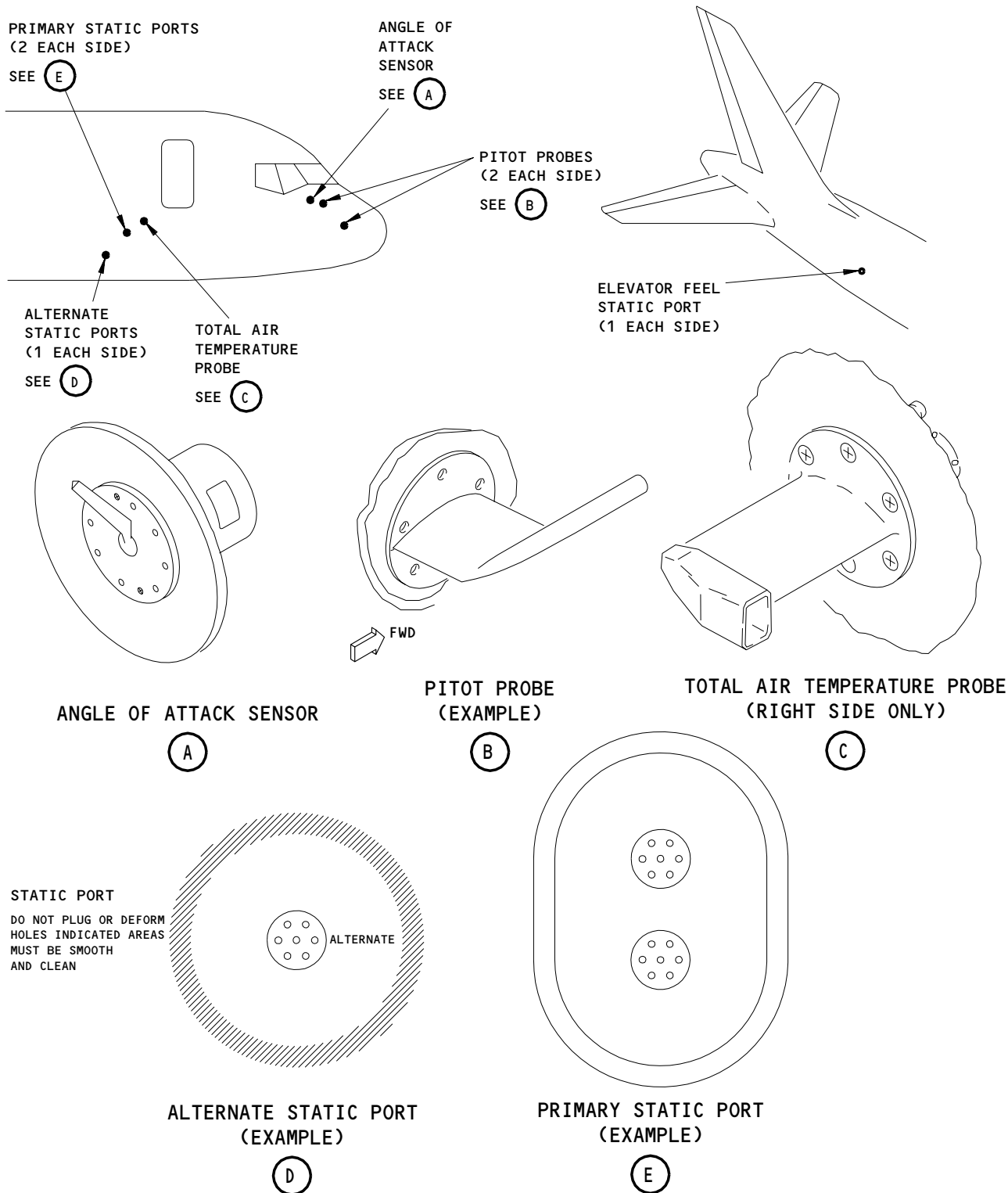
EFFECTIVITY

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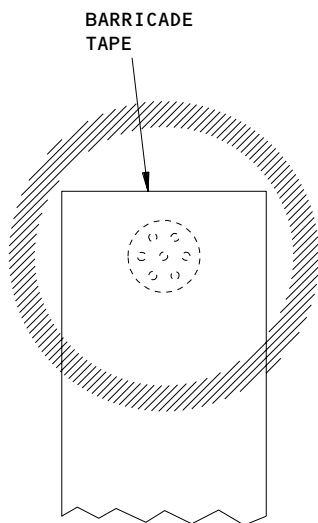
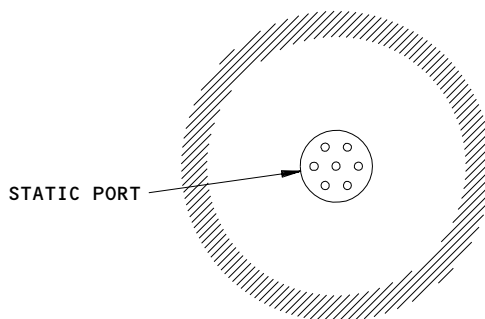
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Pitot-Static System - Component Location
Figure 301

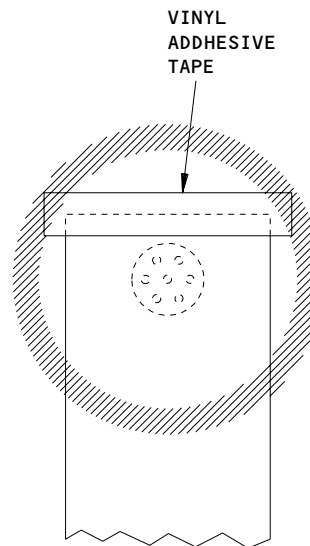
EFFECTIVITY	ALL
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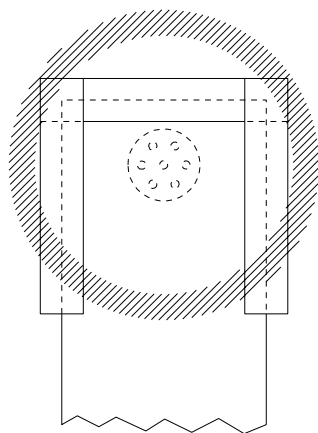
STEP 1

PUT ONE END OF THE BARRICADE TAPE OVER THE STATIC PORT TO COVER THE HOLES



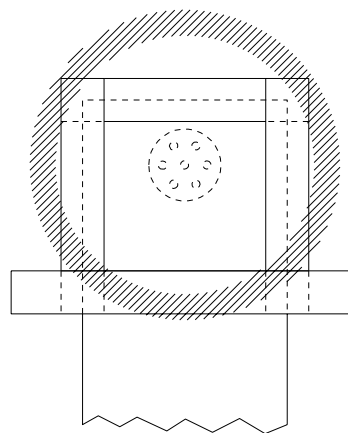
STEP 2

SECURE THE TOP EDGE OF THE BARRICADE TAPE WITH 5 INCHES OF VINYL ADHESIVE TAPE



STEP 3

PUT TWO 5-INCH STRIPS OF VINYL ADHESIVE TAPE OVER THE SIDES OF THE BARRICADE TAPE OVERLAPPING THE TOP STRIP OF ADHESIVE TAPE



STEP 4

PUT AN 8-INCH HORIZONTAL STRIP OF VINYL ADHESIVE TAPE OVER THE BARRICADE TAPE BELOW THE STATIC PORT HOLES OVERLAPPING THE TWO VERTICAL STRIPS

Static Port Cover Procedure
Figure 302 (Sheet 1)

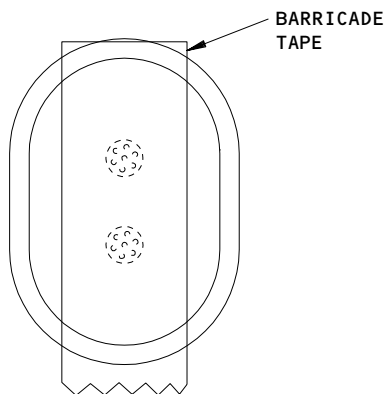
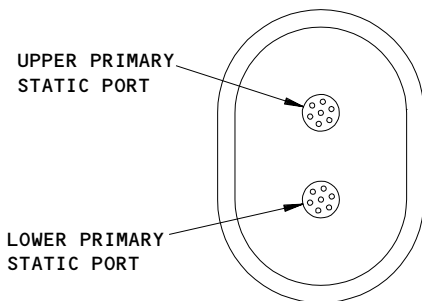
EFFECTIVITY	ALL
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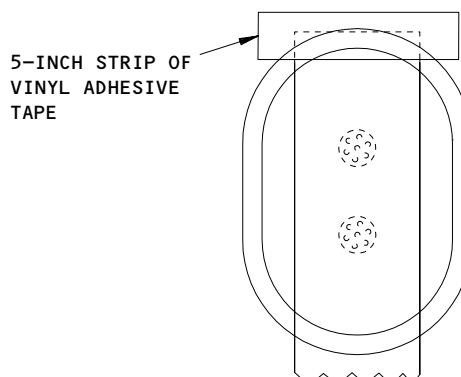
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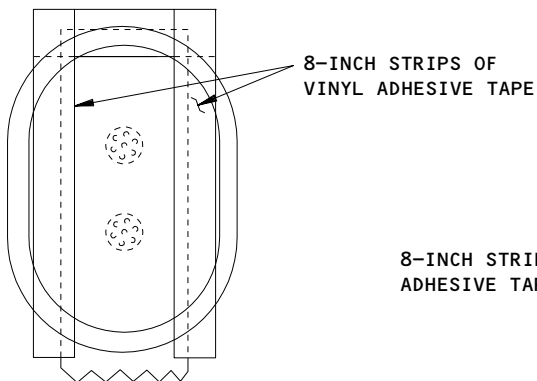
STEP 1

PUT ONE END OF THE BARRICADE TAPE OVER THE STATIC PORTS TO COVER BOTH STATIC PORTS



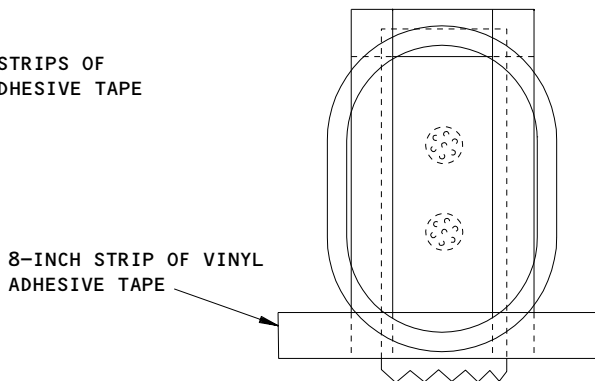
STEP 2

SECURE THE TOP EDGE OF THE BARRICADE TAPE WITH 5 INCHES OF VINYL ADHESIVE TAPE



STEP 3

PUT TWO STRIPS OF VINYL ADHESIVE TAPE, EACH A MINIMUM OF 8 INCHES IN LENGTH, OVER THE SIDES OF THE BARRICADE TAPE, OVERLAPPING THE TOP STRIP OF ADHESIVE TAPE



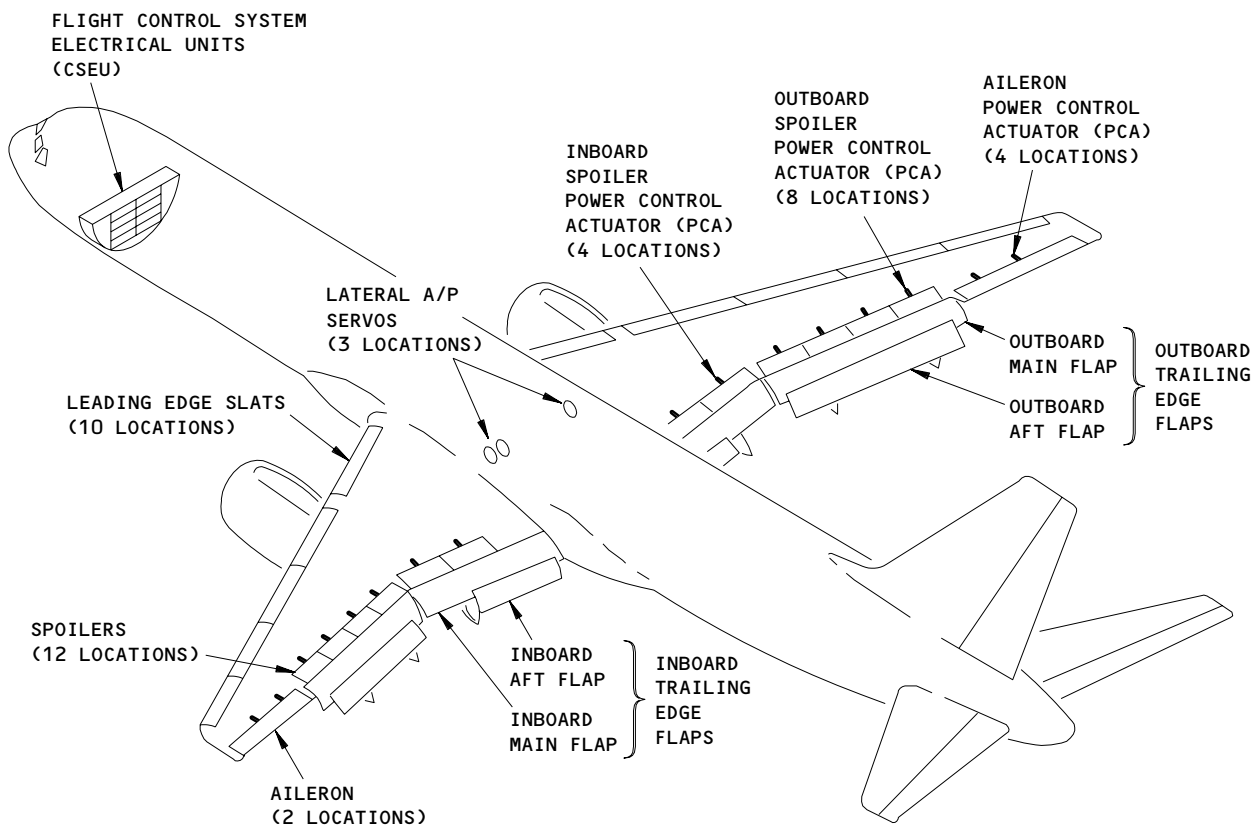
STEP 4

PUT AN 8-INCH STRIP OF VINYL ADHESIVE TAPE HORIZONTALLY OVER THE BARRICADE TAPE BELOW THE STATIC PORT HOLES, OVERLAPPING THE TWO VERTICAL STRIPS

Static Port Cover Procedure
Figure 302 (Sheet 2)

EFFECTIVITY	ALL
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Flight Controls Locations
Figure 303 (Sheet 1)

EFFECTIVITY	ALL
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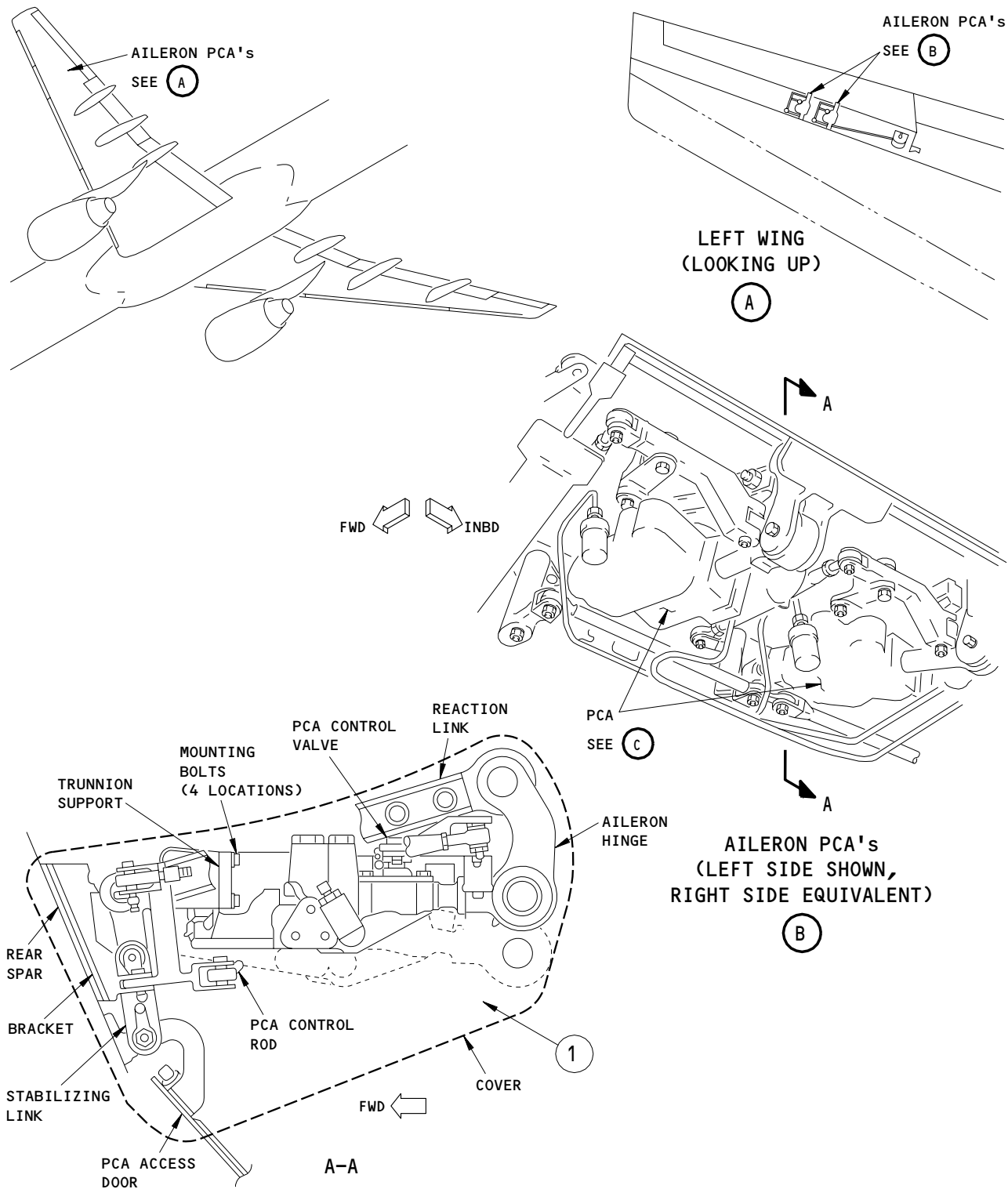
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BOEING

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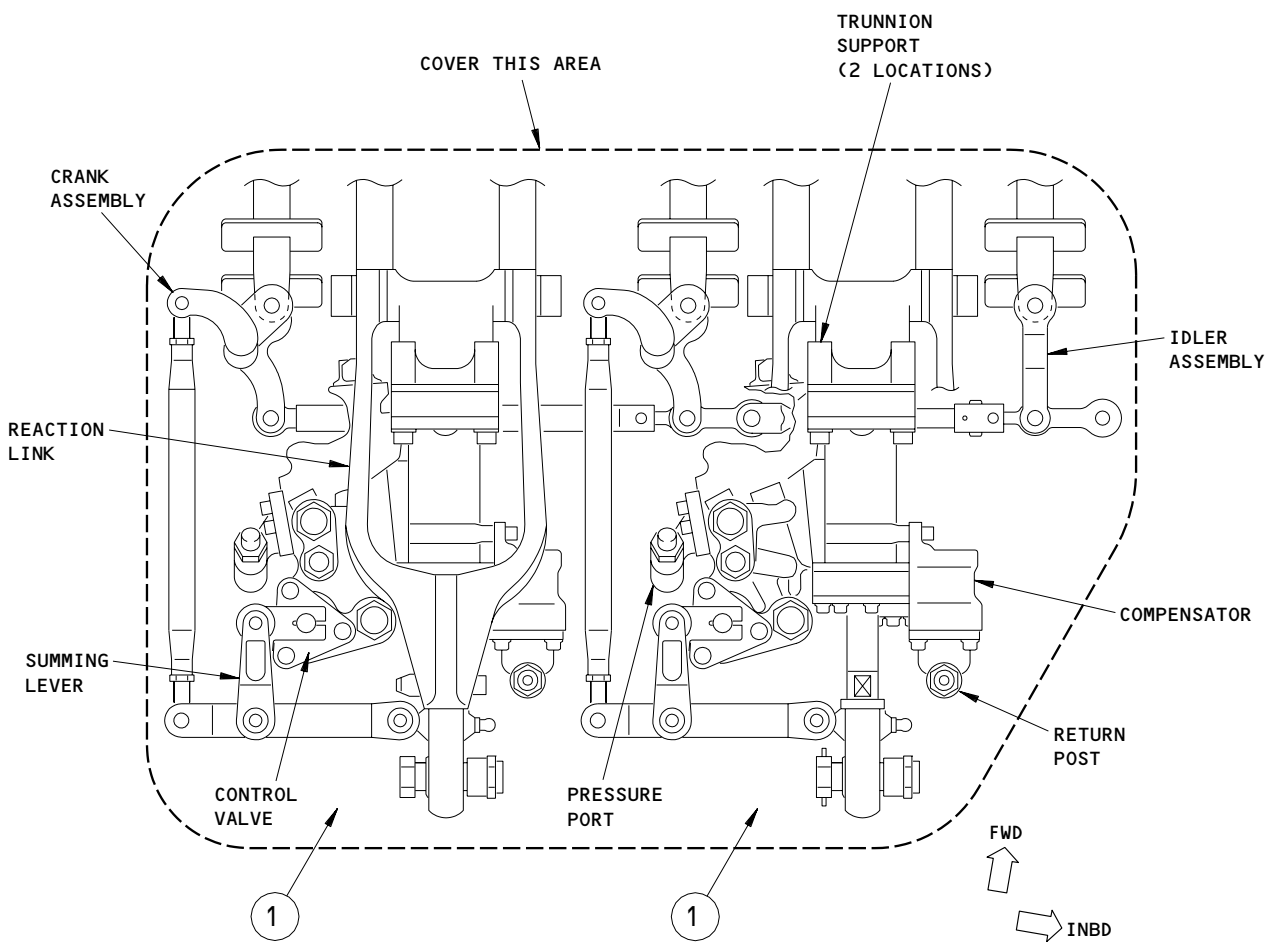
Flight Controls Locations
Figure 303 (Sheet 2)

EFFECTIVITY	ALL
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AILERON POWER CONTROL ACTUATOR
AND CONTROL LINKAGE
(PLAN VIEW - LOOKING DOWN)

(C)

Flight Controls Locations
Figure 303 (Sheet 3)

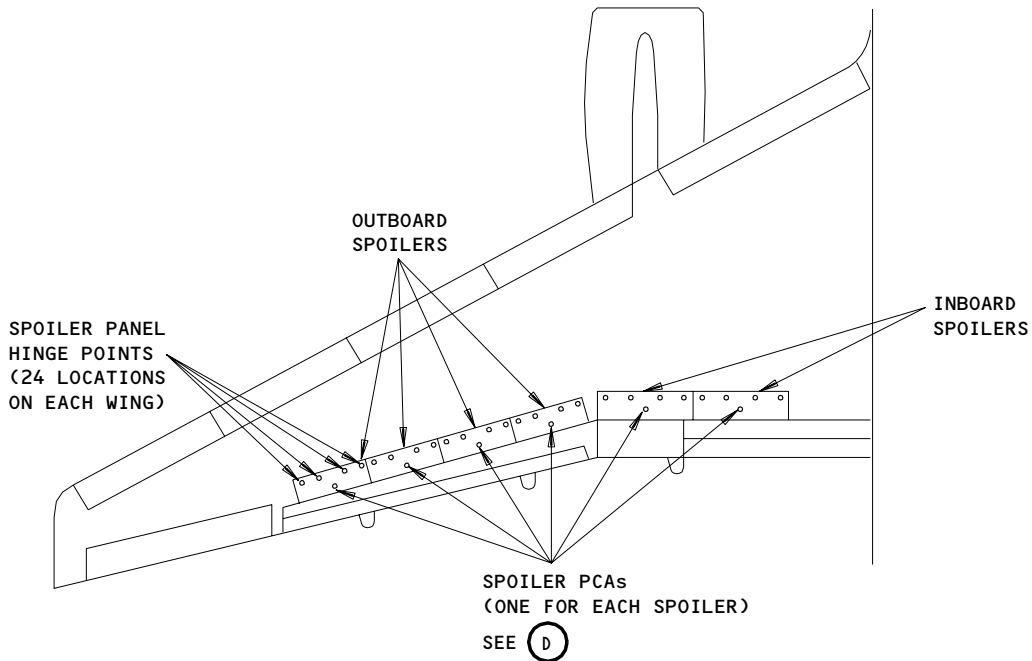
EFFECTIVITY	ALL
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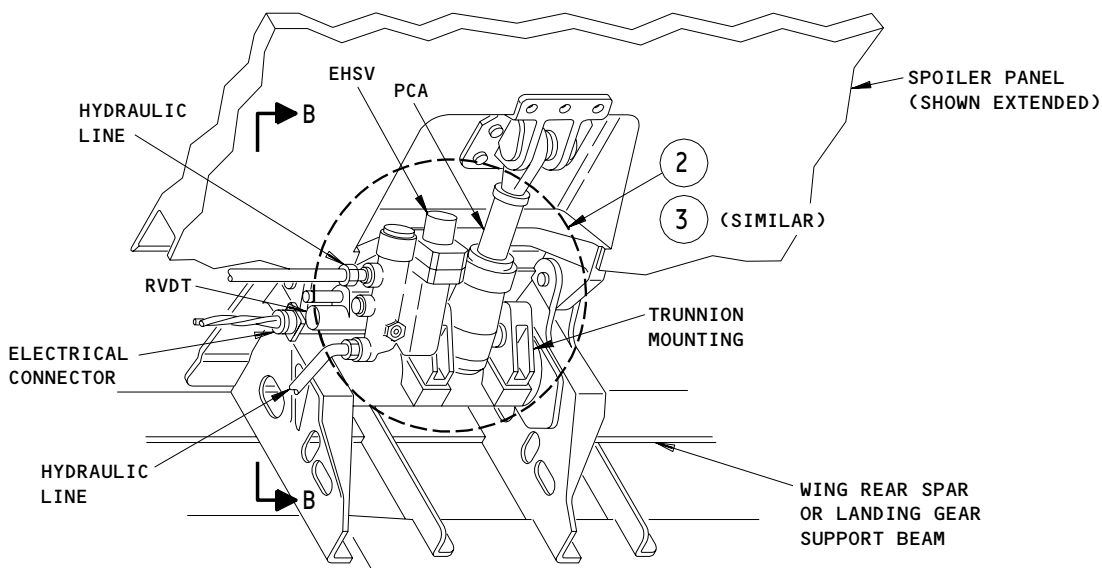
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LEFT WING
(PLAN VIEW)



SPOILER POWER CONTROL ACTUATOR

(D)

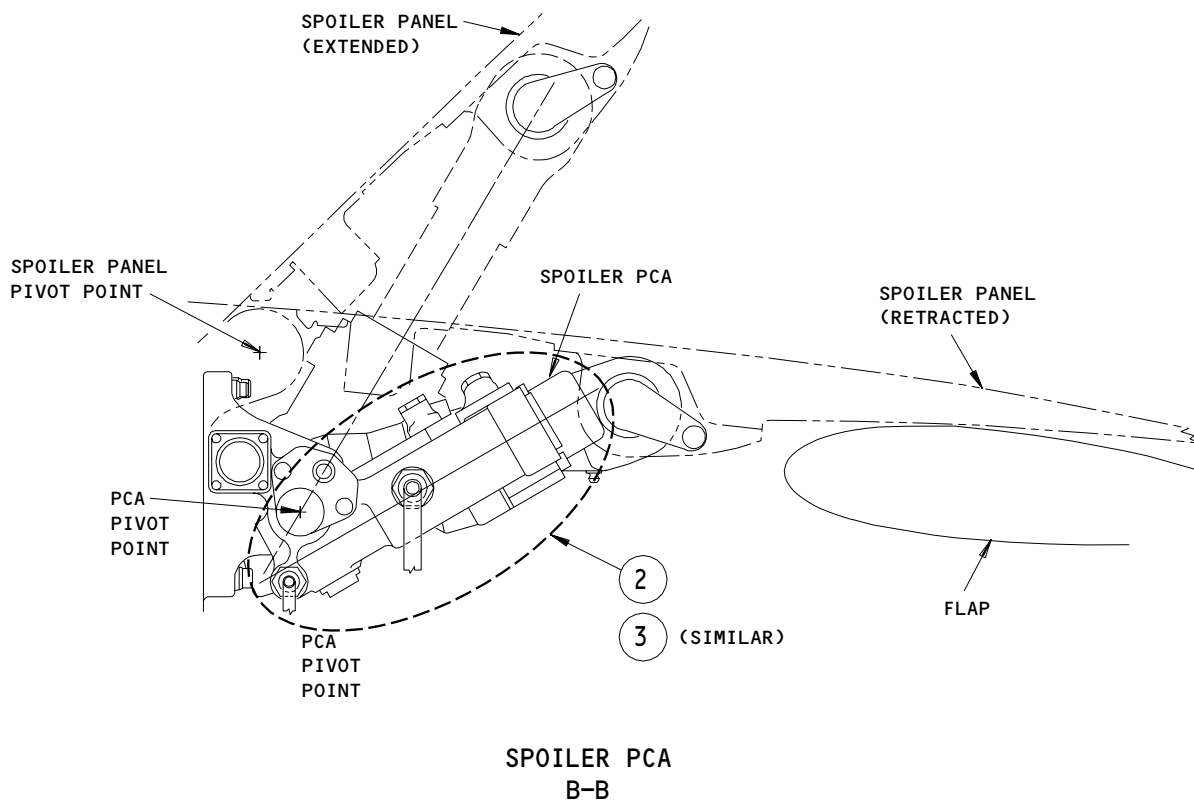
Flight Controls Locations
Figure 303 (Sheet 4)

EFFECTIVITY	
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Flight Controls Locations
Figure 303 (Sheet 5)

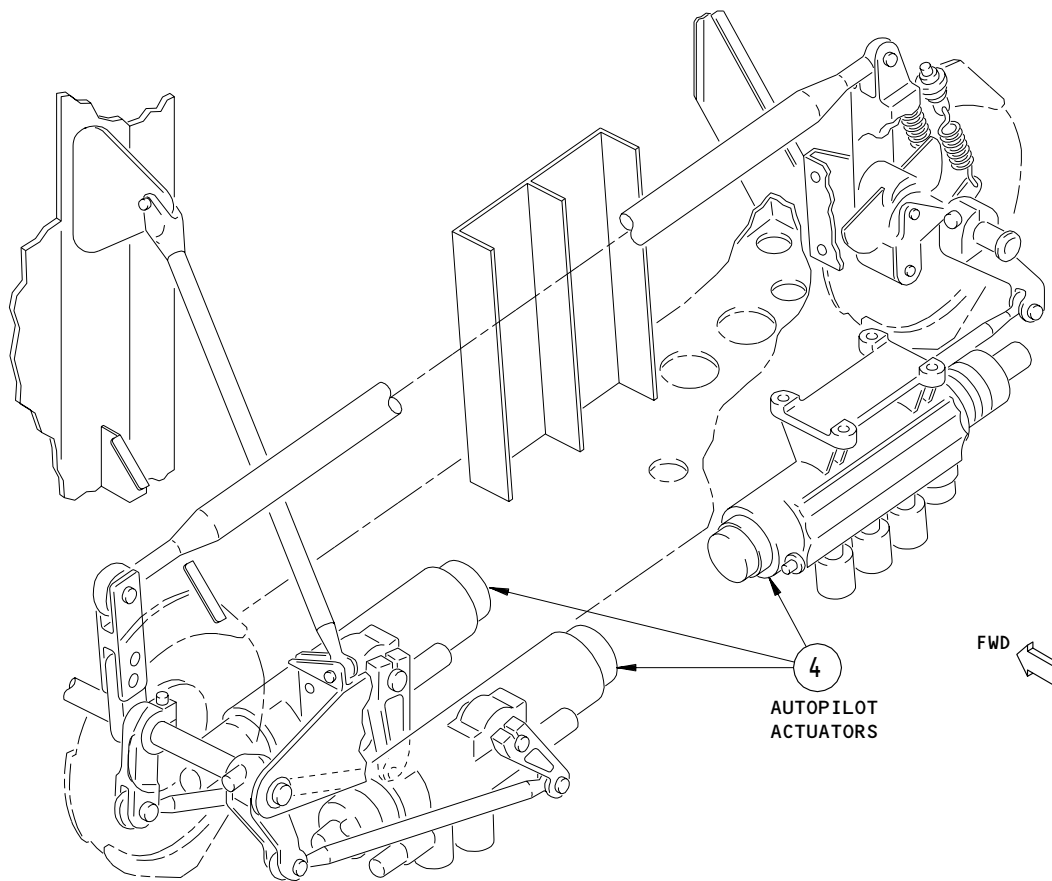
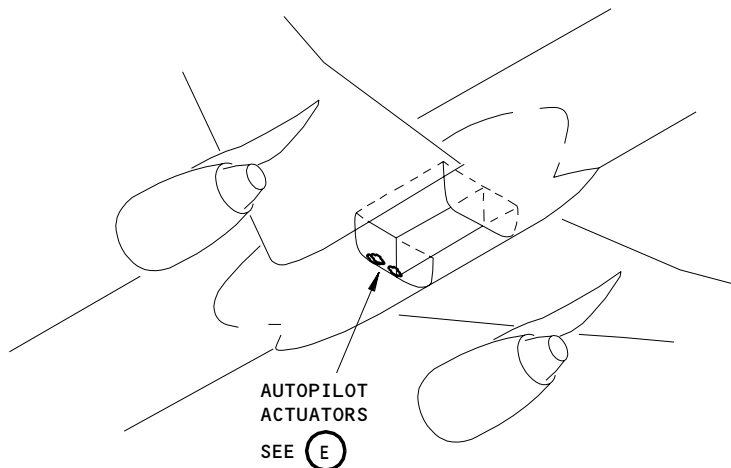
EFFECTIVITY	ALL
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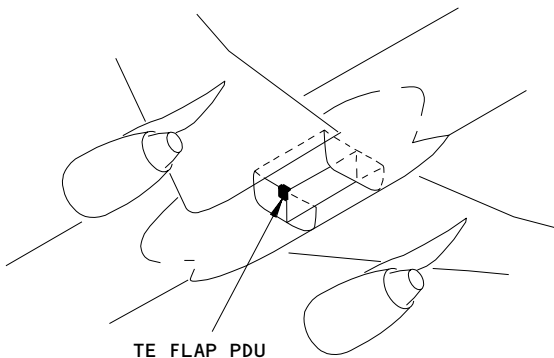
AUTOPILOT ACTUATORS

E

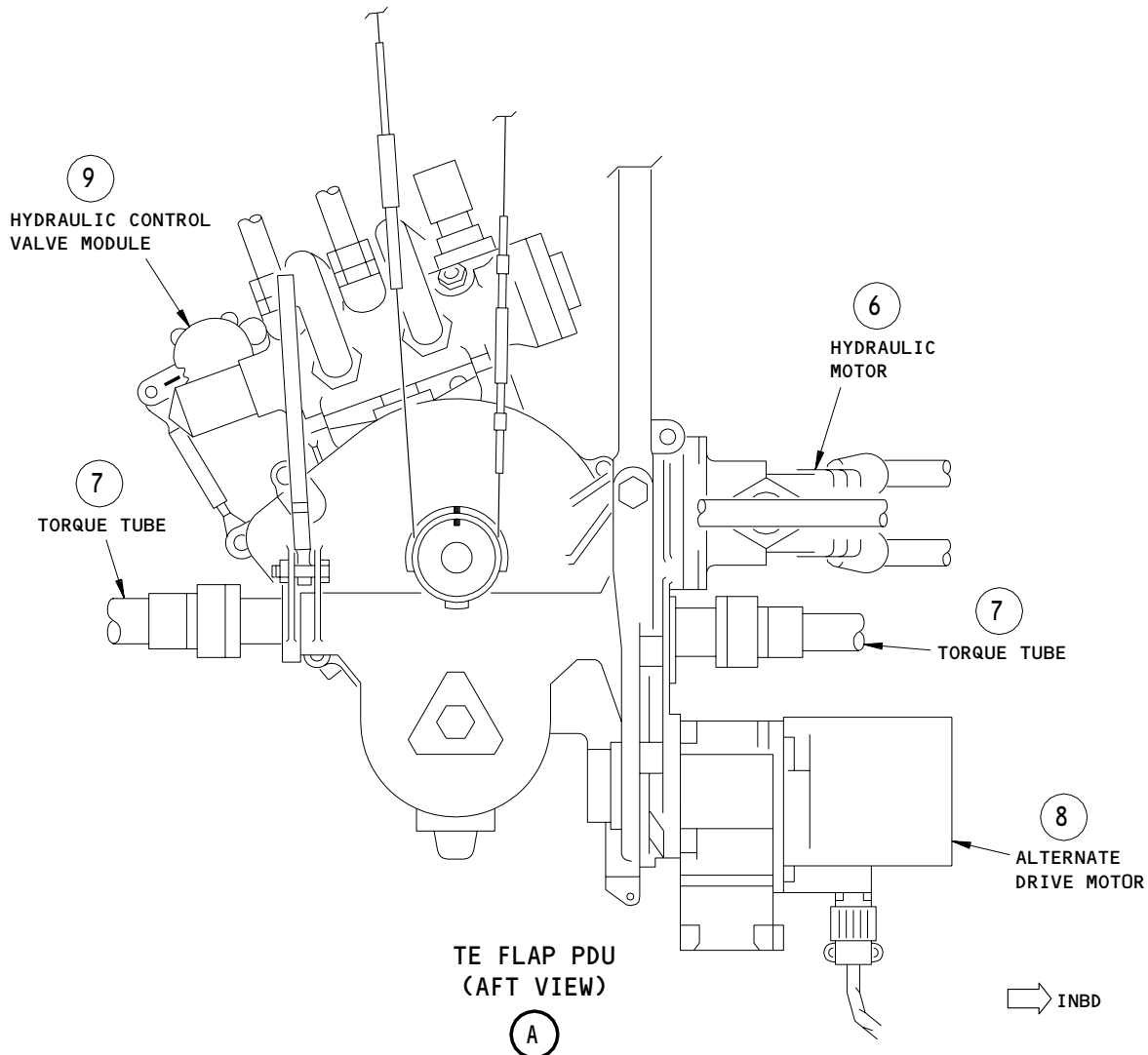
Flight Controls Locations
Figure 303 (Sheet 6)

EFFECTIVITY	ALL
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TE FLAP PDU
SEE (A) (B)



TE Flap, Power Drive Unit (PDU) (Looking Forward)
Figure 304 (Sheet 1)

EFFECTIVITY

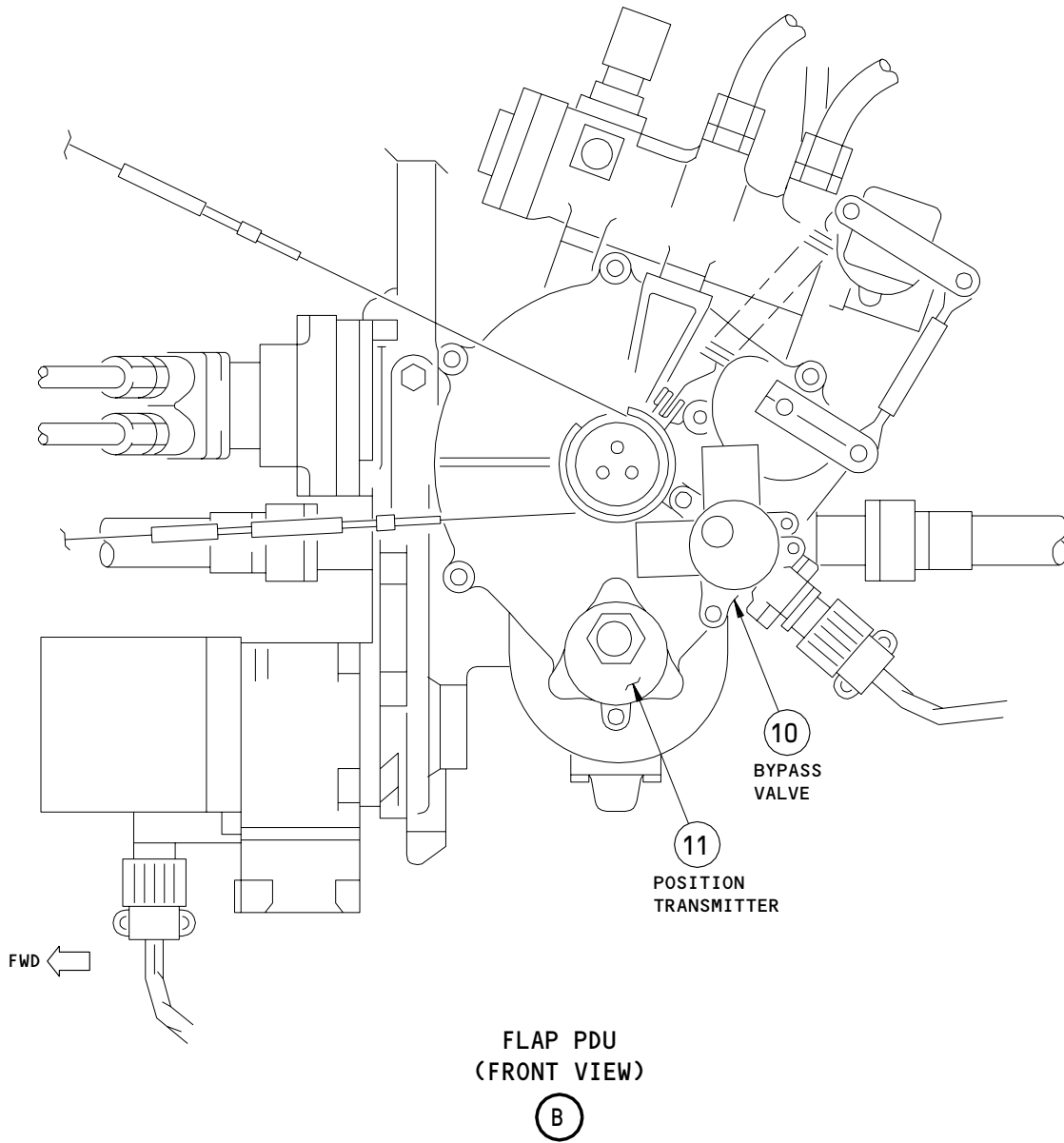
ALL

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H21918



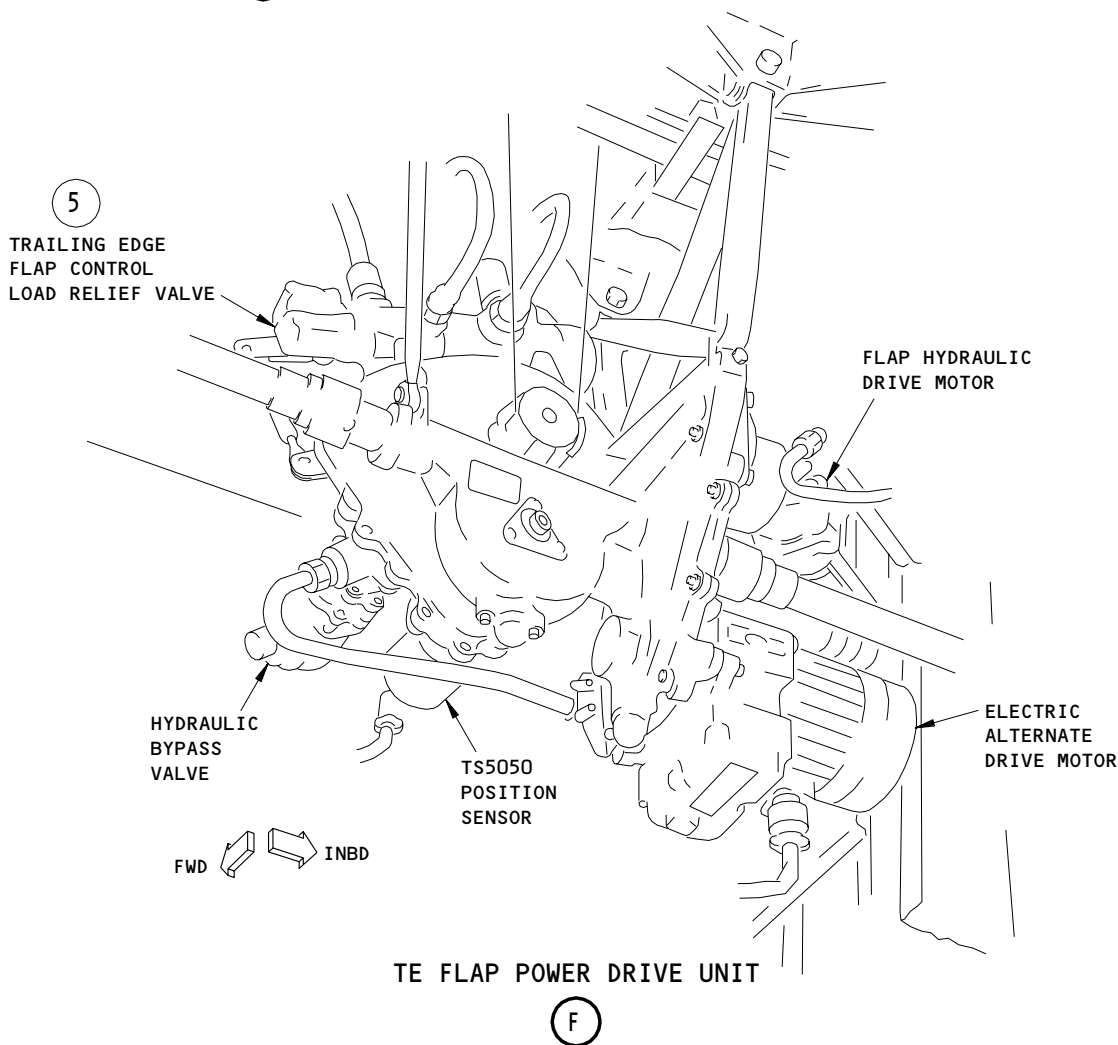
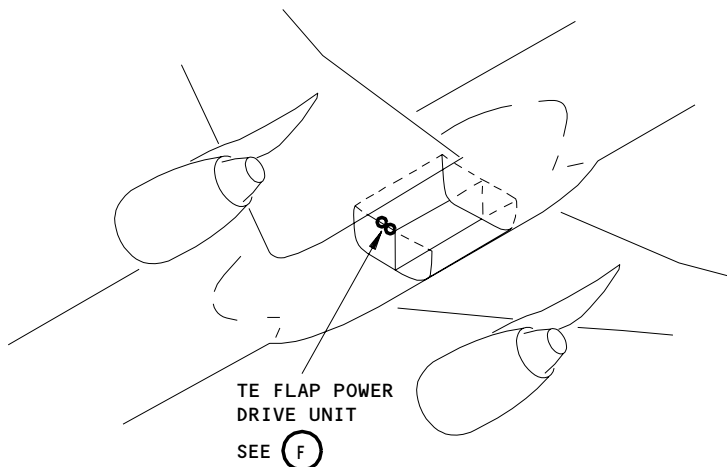
TE Flap, Power Drive Unit (PDU) (Looking Aft)
Figure 304 (Sheet 2)

EFFECTIVITY	
	ALL

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TE Flap, Power Drive Unit (PDU) (Looking Aft)
Figure 304 (Sheet 3)

EFFECTIVITY

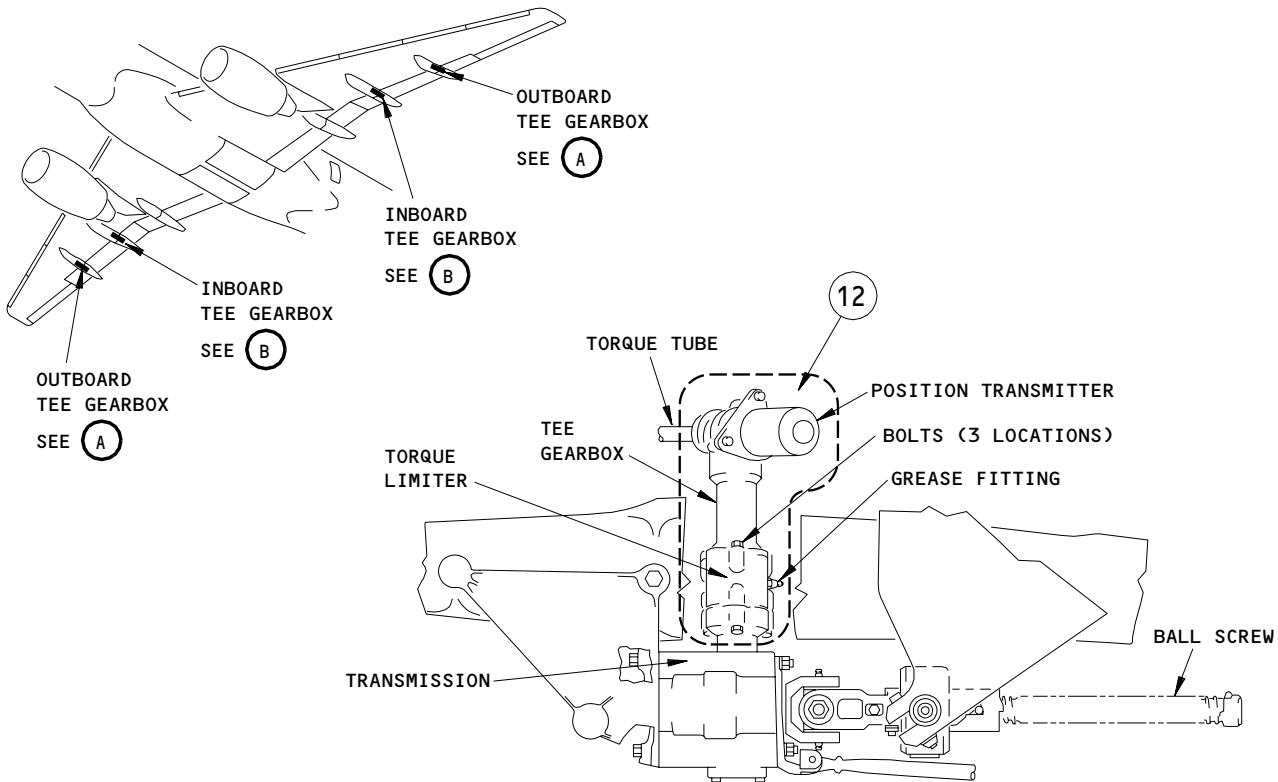
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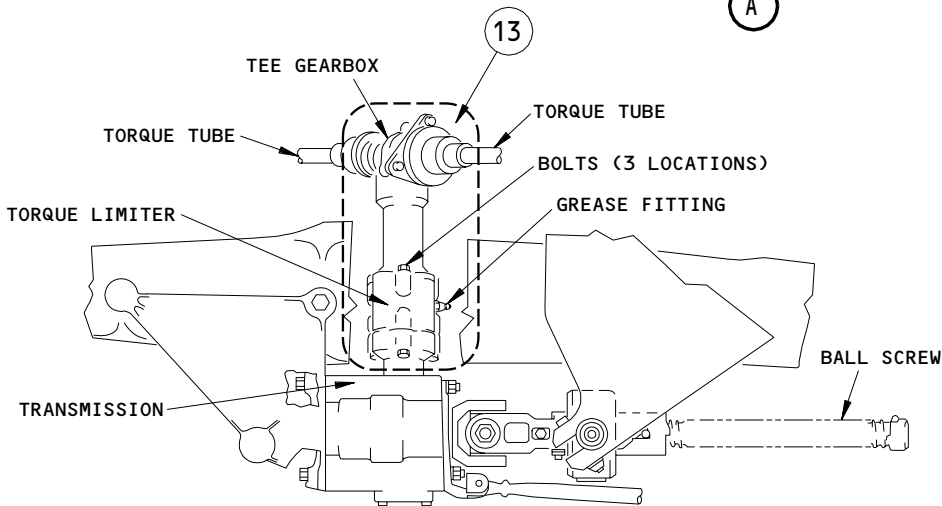
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H33631



NOS. 1 AND 8
T. E. ANGLE TEE GEARBOX ASSEMBLY

(A)



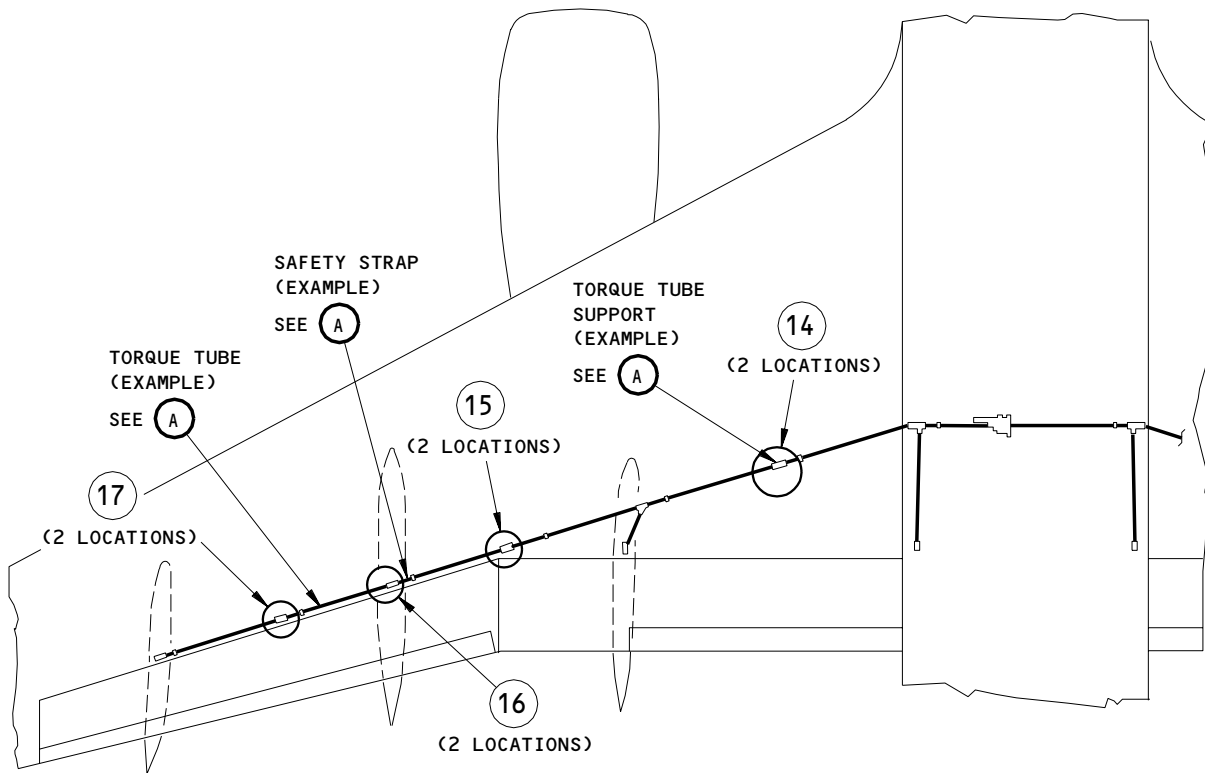
NOS. 2 AND 7
T. E. ANGLE GEARBOX ASSEMBLY

(B)

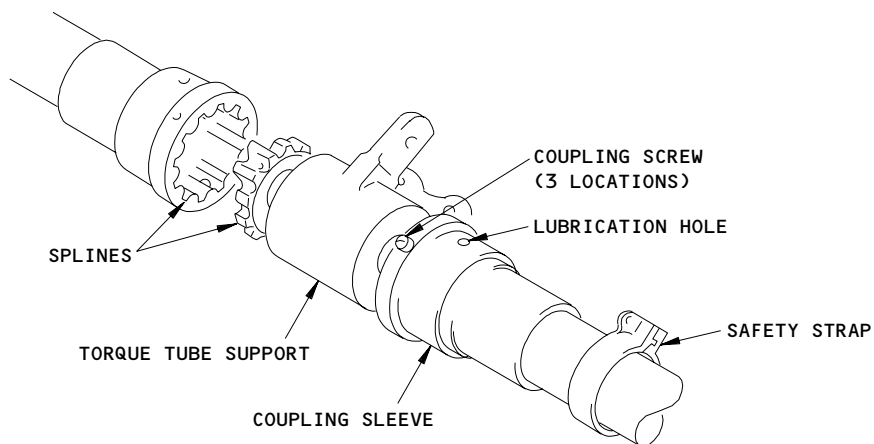
Nos. 1 and 8 T. E. Angle Tee Gearbox Assembly and
Nos. 2 and 7 T. E. Angle Gearbox Assembly
Figure 305

EFFECTIVITY	
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TE FLAP TORQUE TUBES



TORQUE TUBE
(RIGHT WING OPPOSITE)

(A)

Bearing Assembly, TE Flap Drive Torque Support
Figure 306

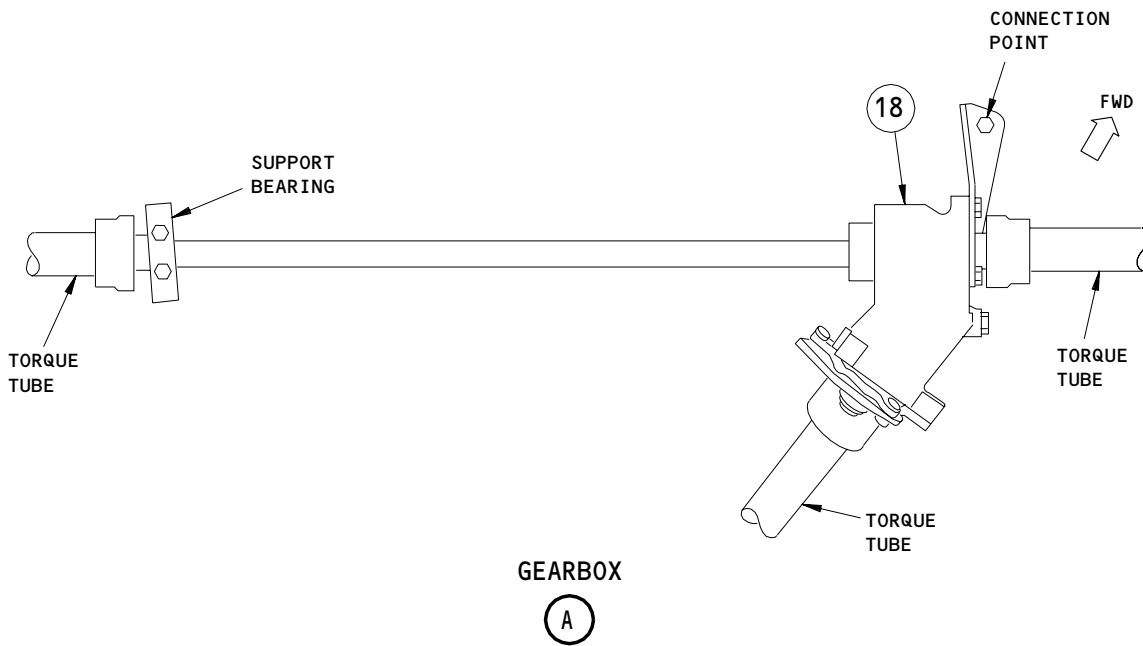
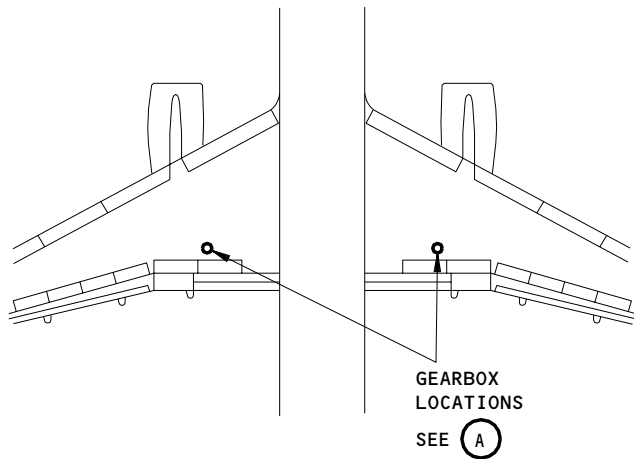
EFFECTIVITY	
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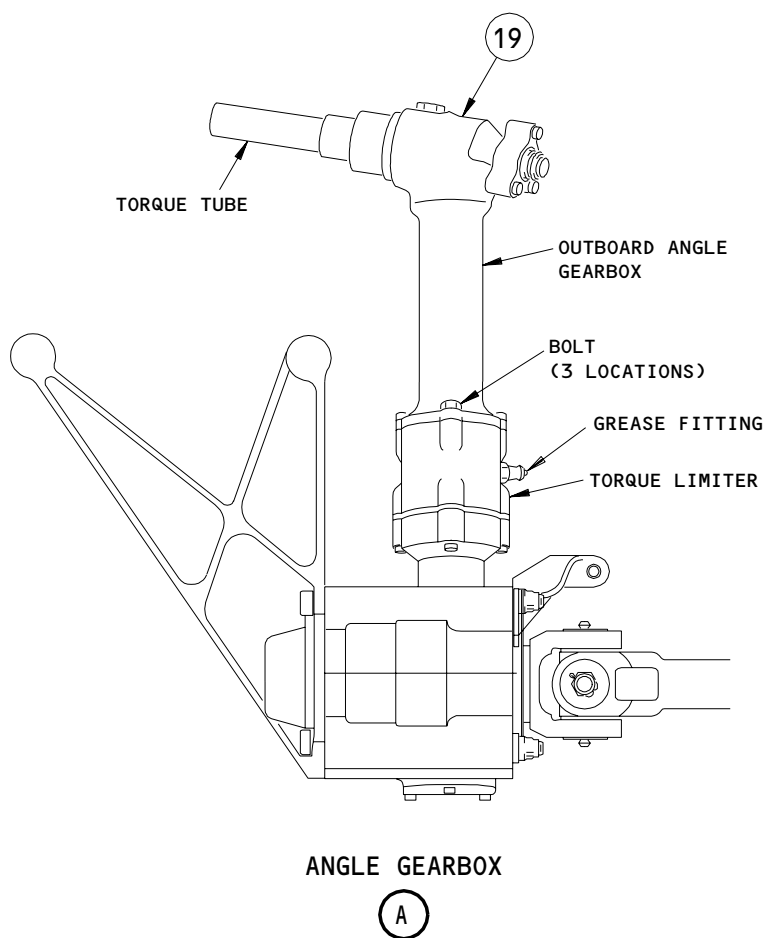
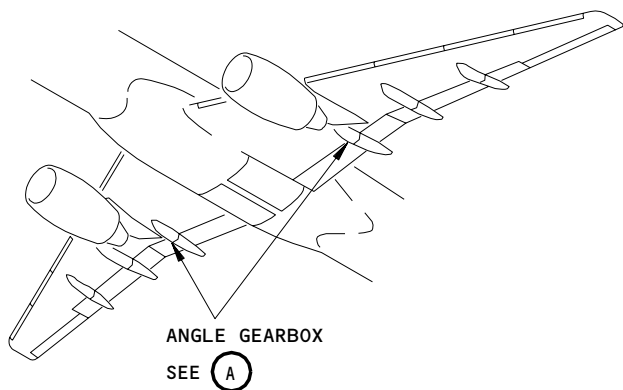
Nos. 3 and 6 T. E. Tee Gearbox Assembly
Figure 307

EFFECTIVITY	ALL
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Nos. 3 and 6 T. E. Angle Gearbox Assembly
Figure 308

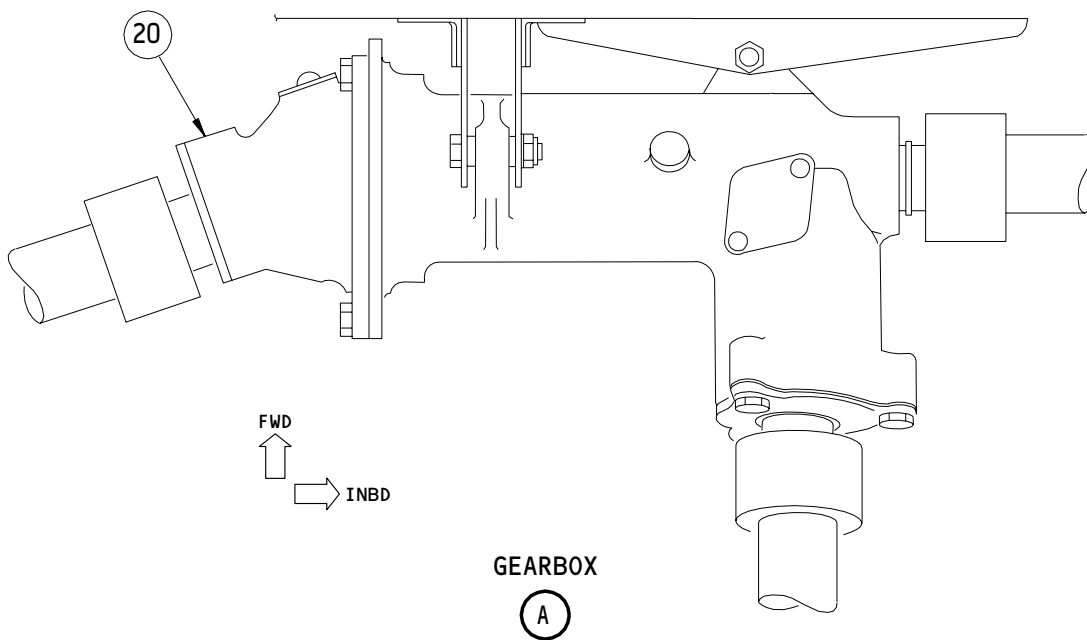
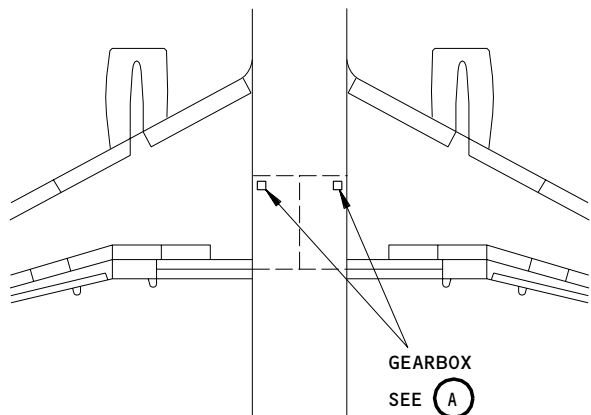
EFFECTIVITY	
	ALL

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Nos. 4 and 5 T. E. Angle Tee Gearbox
Figure 309

EFFECTIVITY

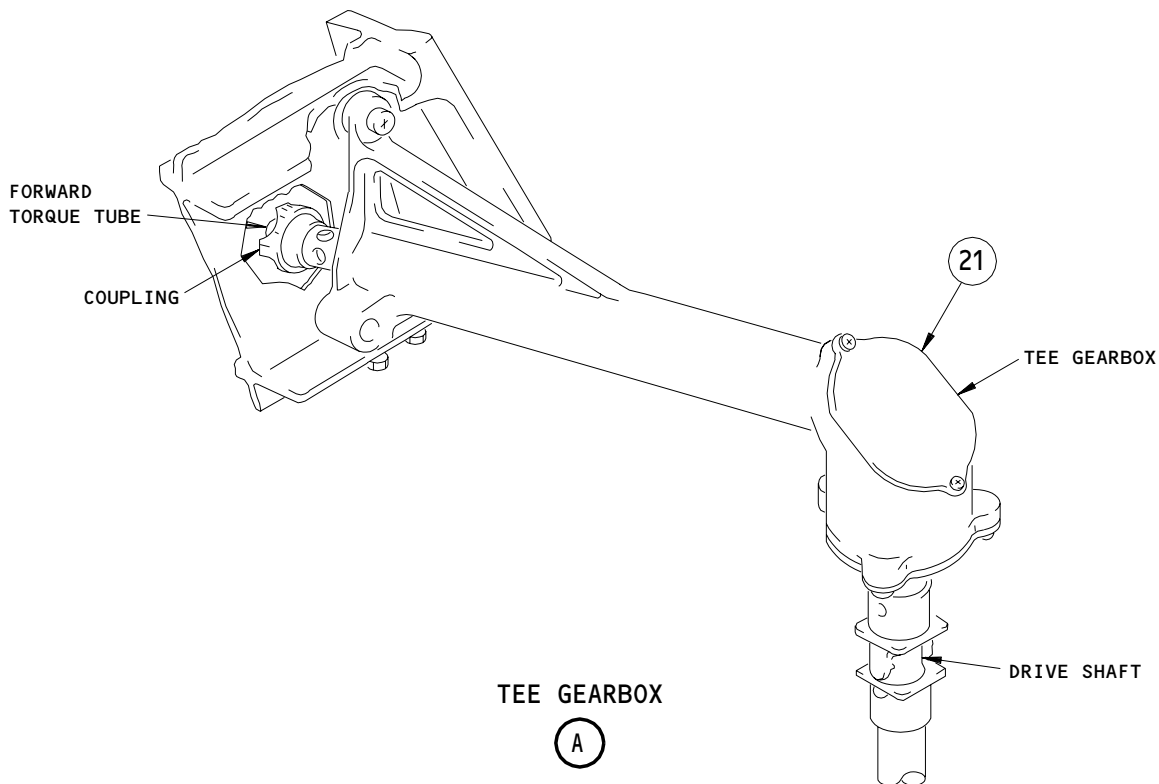
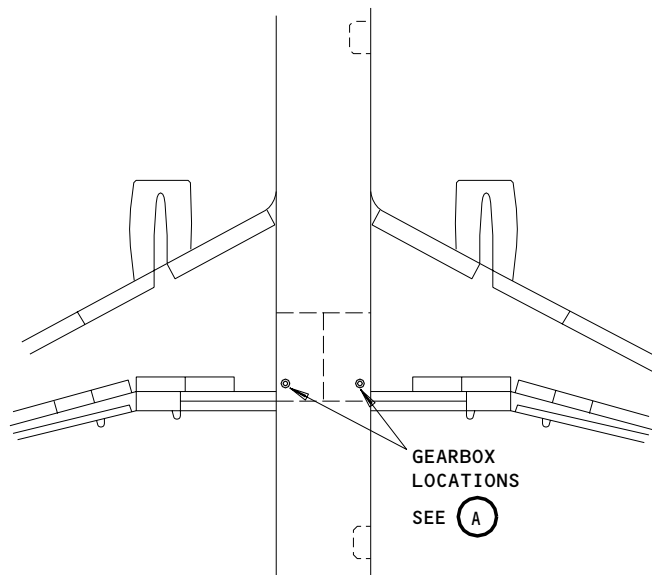
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H21914



Nos. 4 and 5 Tee Gearbox Assembly
Figure 310

EFFECTIVITY	
	ALL

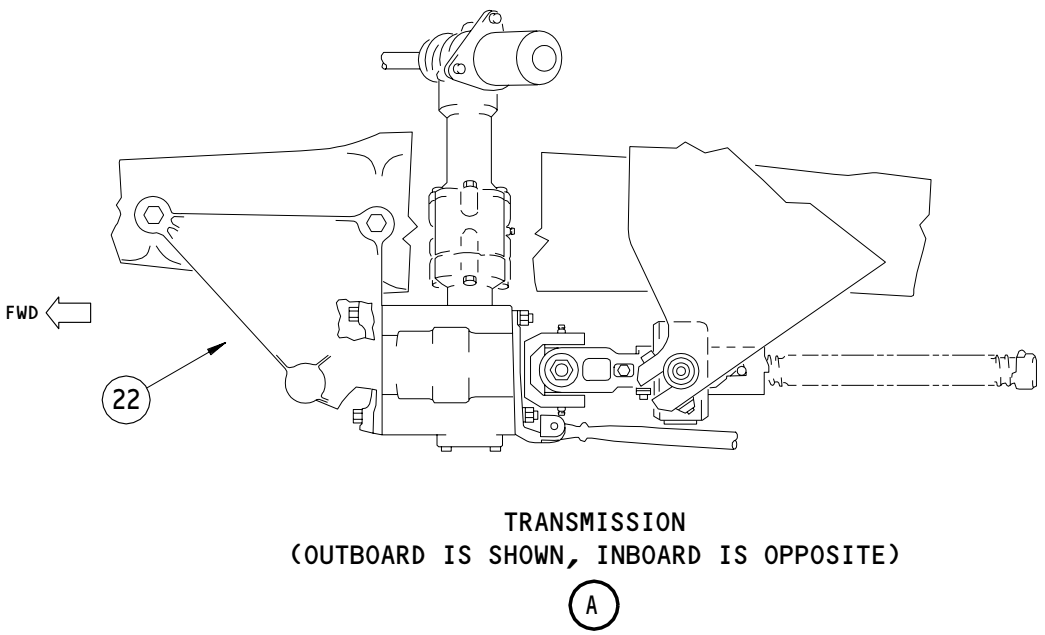
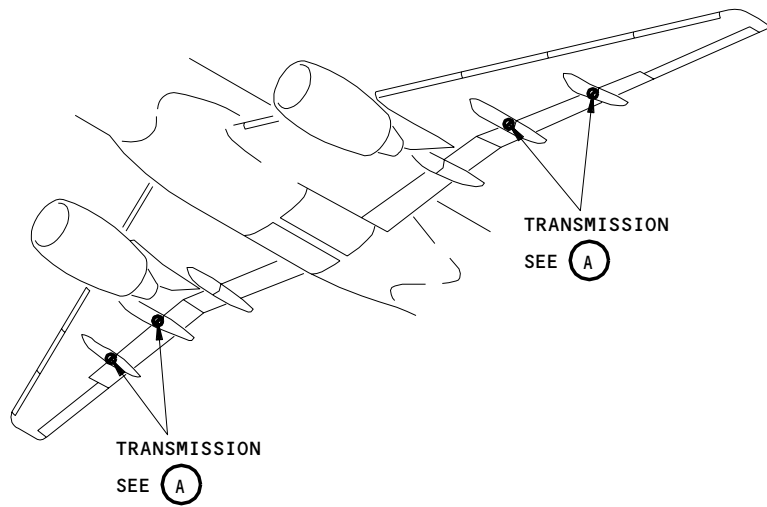
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H22074

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757
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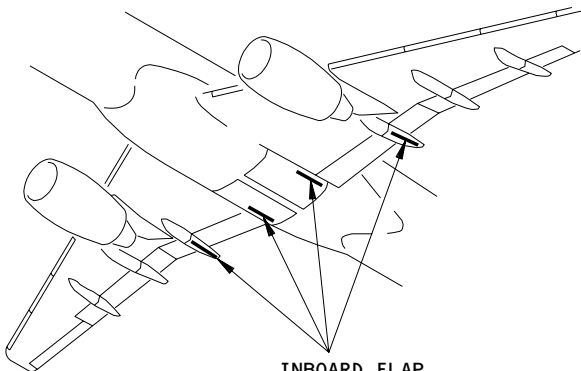


Nos. 1, 2, 7 and 8 T. E. Outboard Flap Transmission
Figure 311

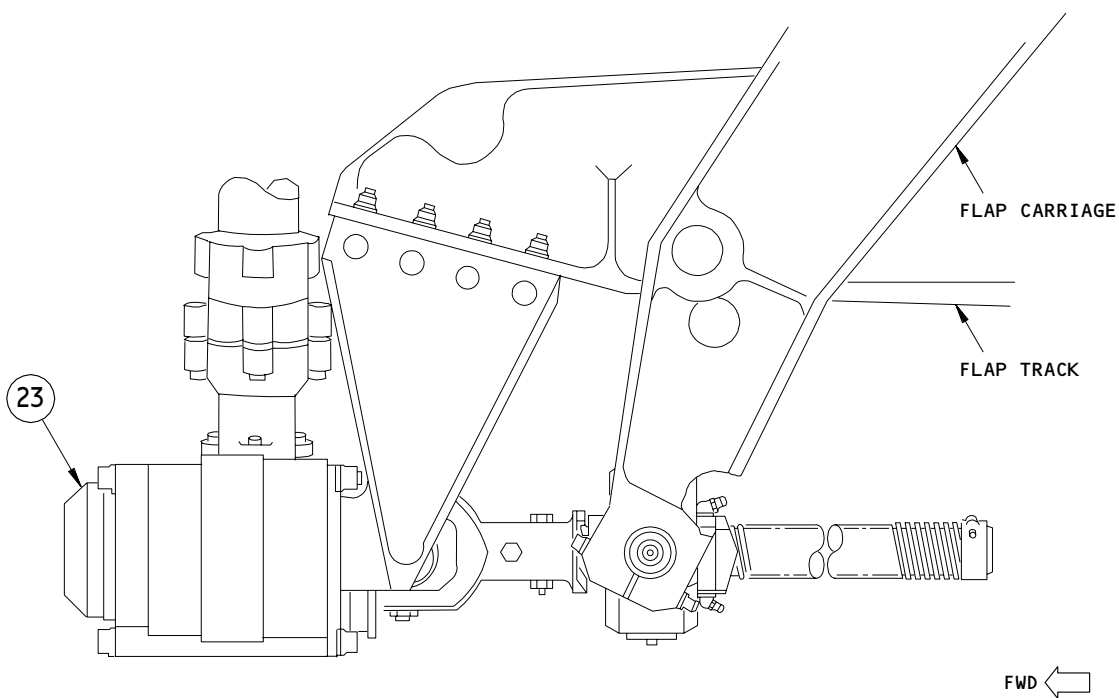
EFFECTIVITY	
	ALL

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INBOARD FLAP
TRANSMISSIONS
SEE (A)



INBOARD FLAP TRANSMISSION

(A)

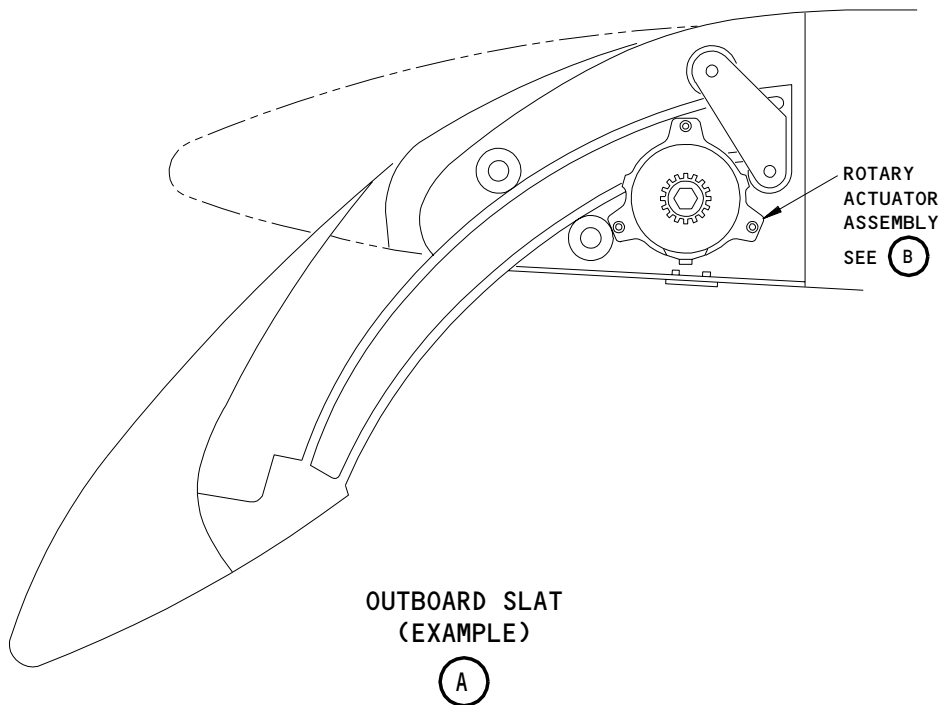
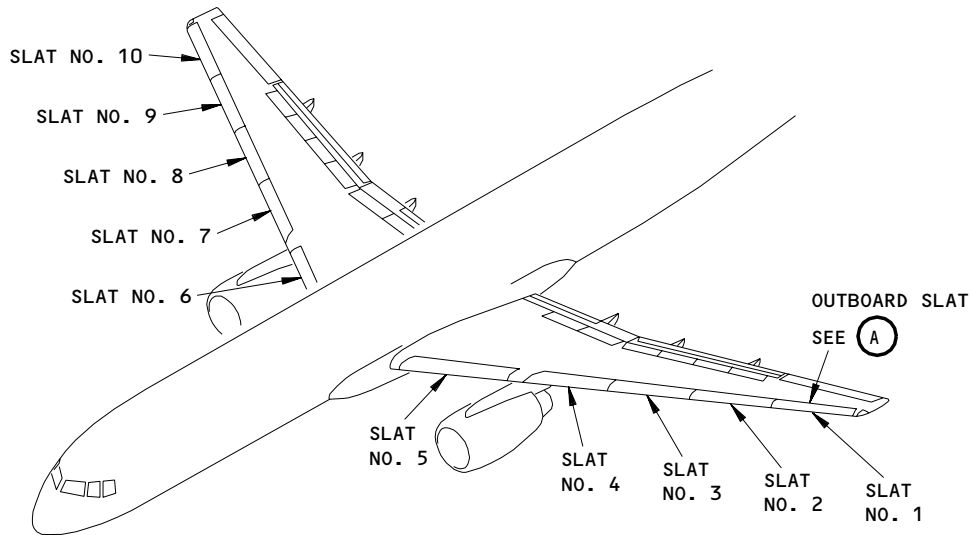
Nos. 3, 4, 5 and 6 T. E. Inboard Flap Transmissions
Figure 312

EFFECTIVITY	
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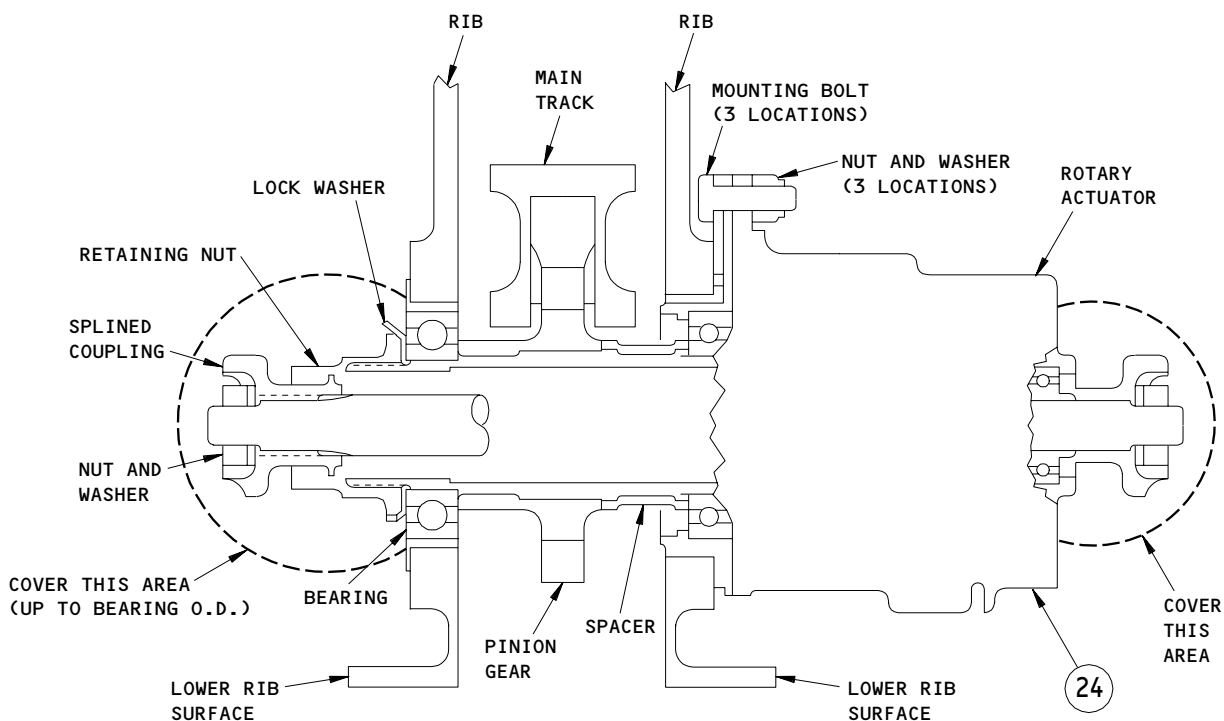
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Nos. 1 thru 20 L. E. Rotary Actuators
Figure 313 (Sheet 1)

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ROTARY ACTUATOR ASSEMBLY

(B)

Nos. 1 thru 20 L. E. Rotary Actuators
Figure 313 (Sheet 2)

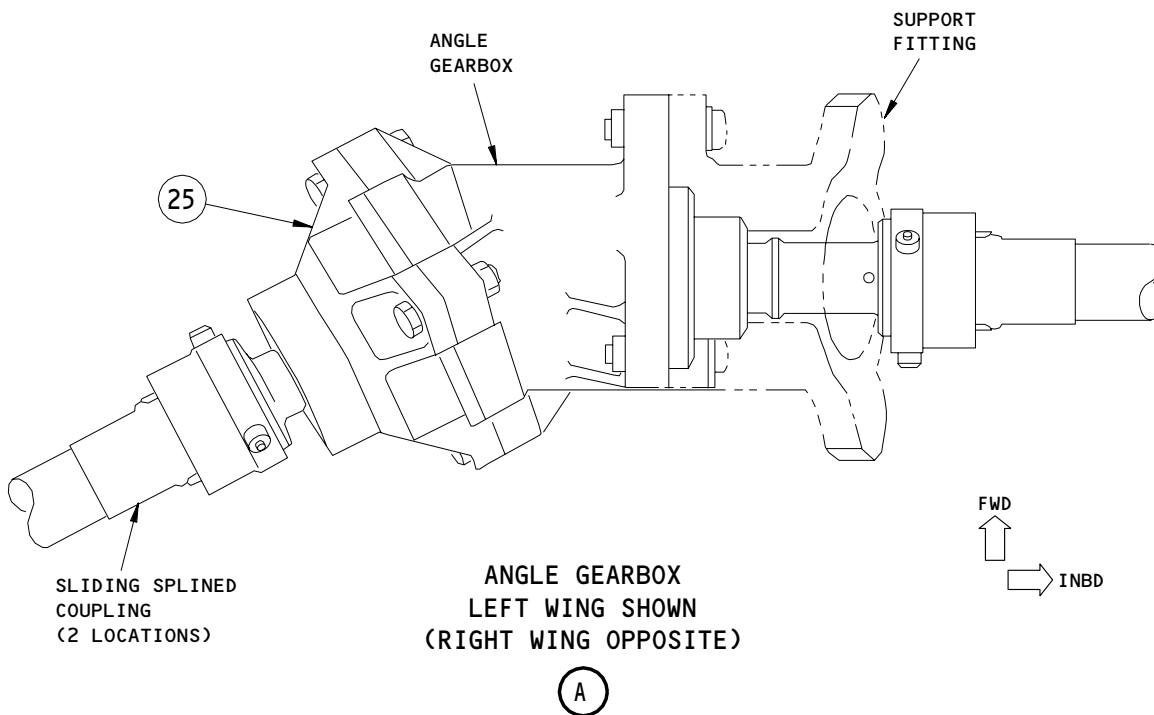
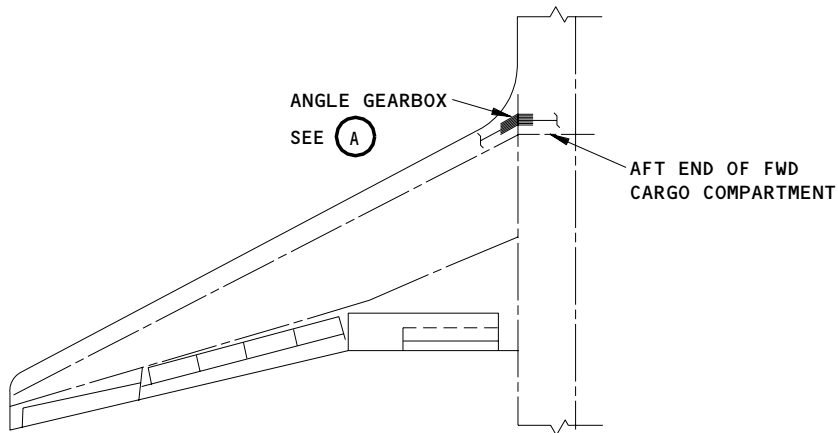
EFFECTIVITY	
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H22169



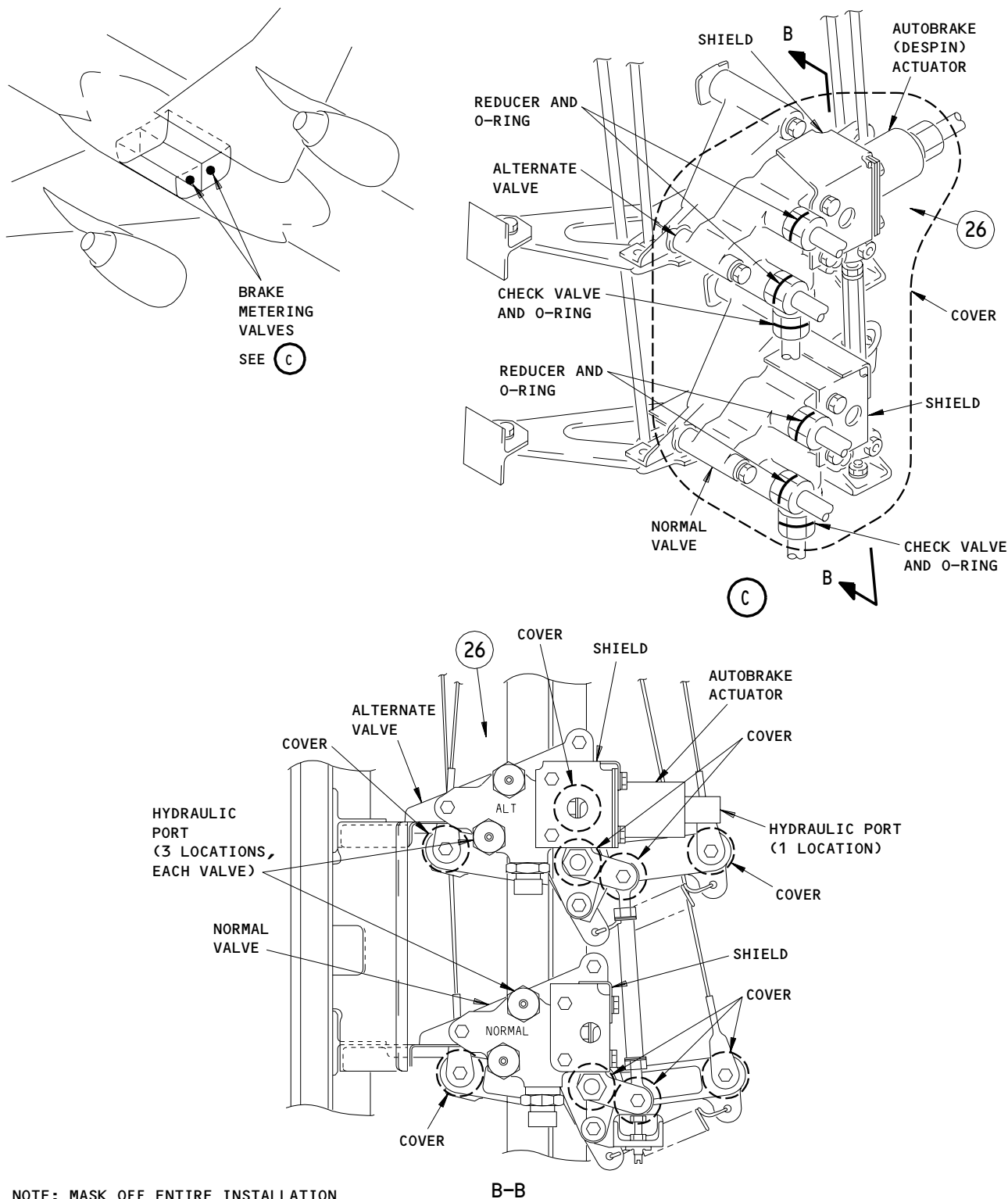
L. E. Angle Gearbox
Figure 314

EFFECTIVITY	ALL
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NOTE: MASK OFF ENTIRE INSTALLATION OR EACH BEARING JOINT

Brake Metering Valve
Figure 315

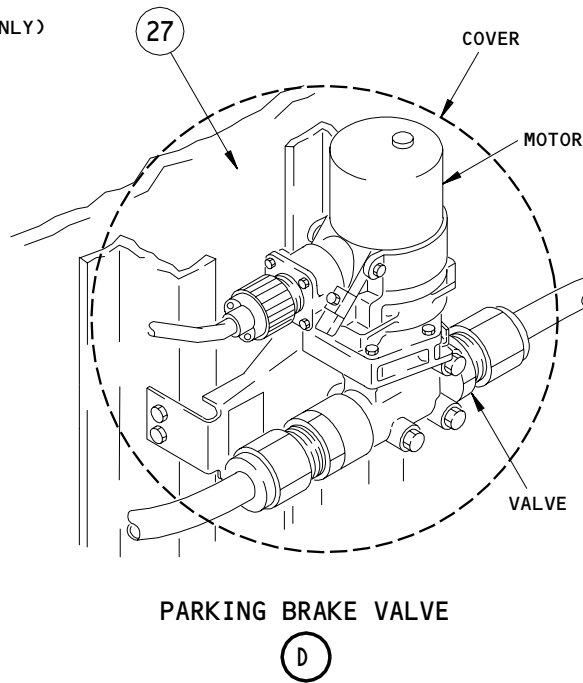
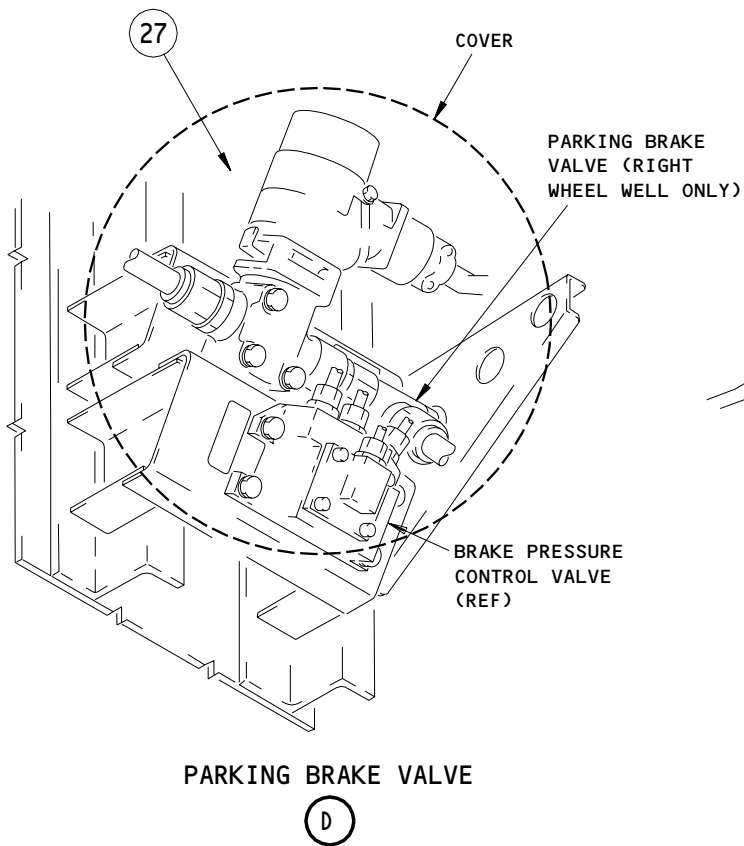
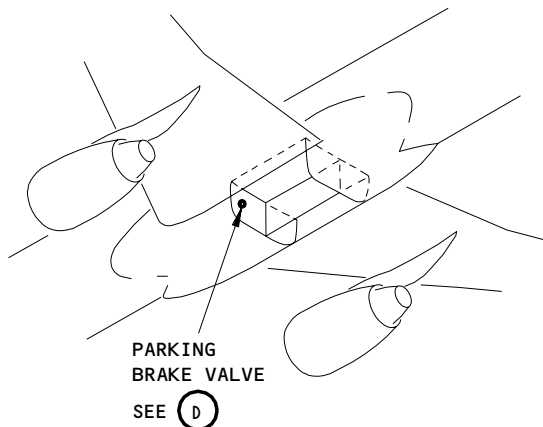
EFFECTIVITY	
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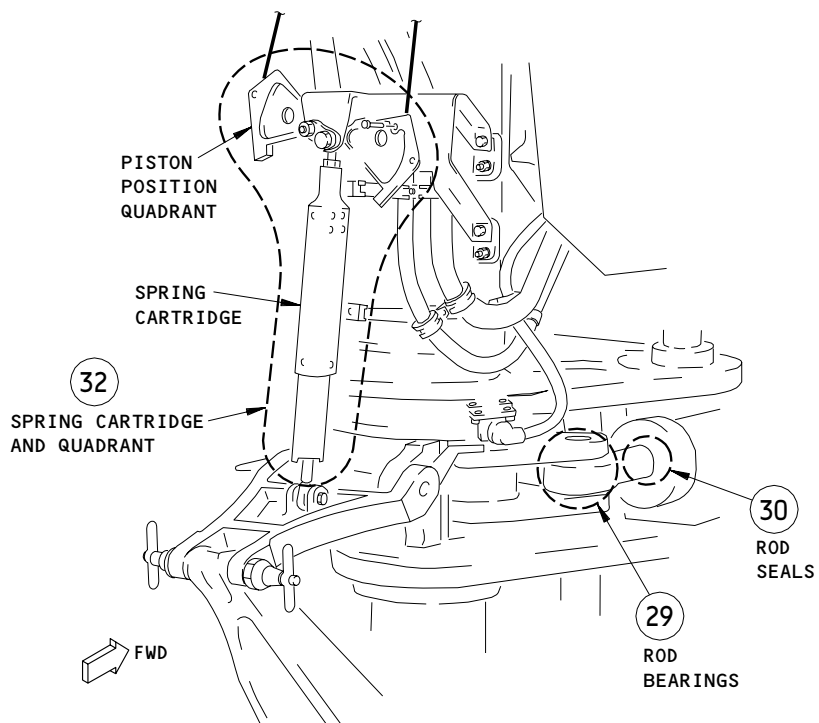
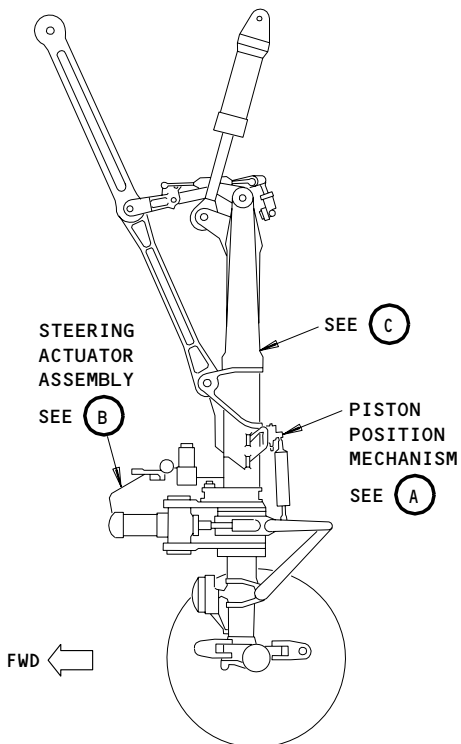
Parking Brake Valve (Alternate Mountings)
Figure 316

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PISTON POSITION MECHANISM
(SHOCK STRUT SHOWN IN THE EXTENDED POSITION)

(A)

Nose Wheel Steering Components
Figure 317 (Sheet 1)

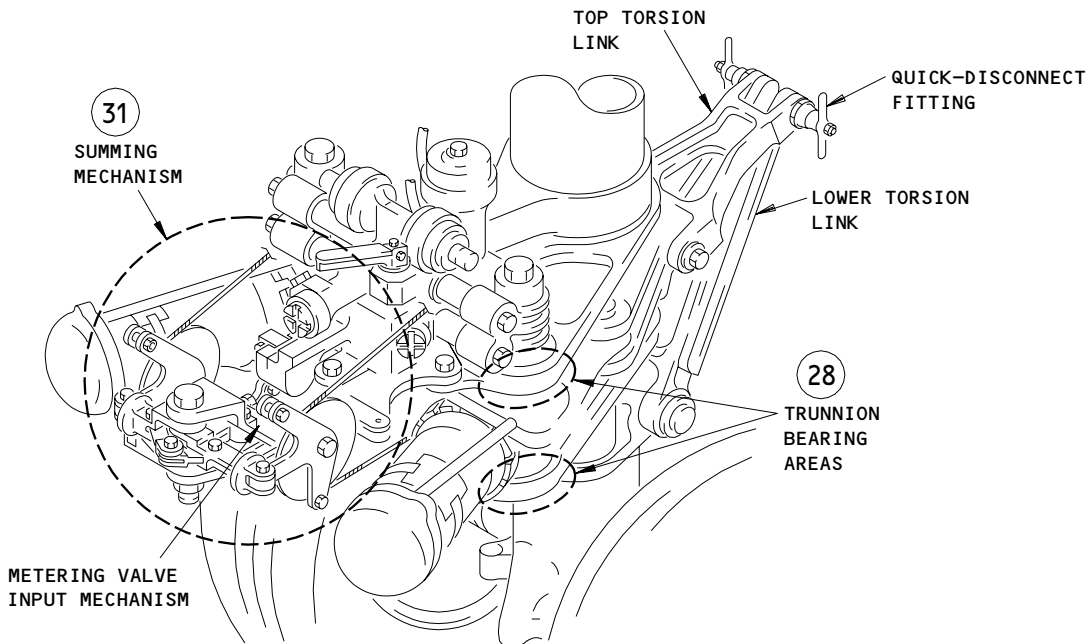
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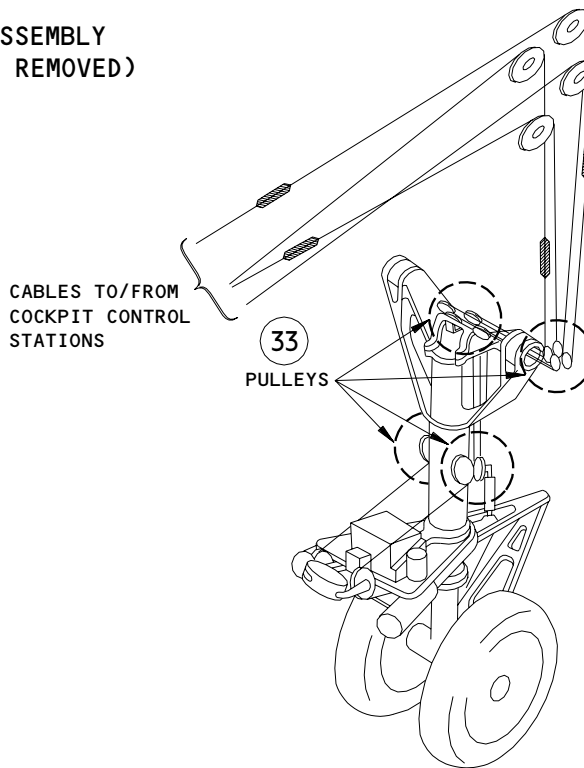
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H22172



STEERING ACTUATOR ASSEMBLY
(SHOWN WITH THE COVER REMOVED)

(B)



(C)

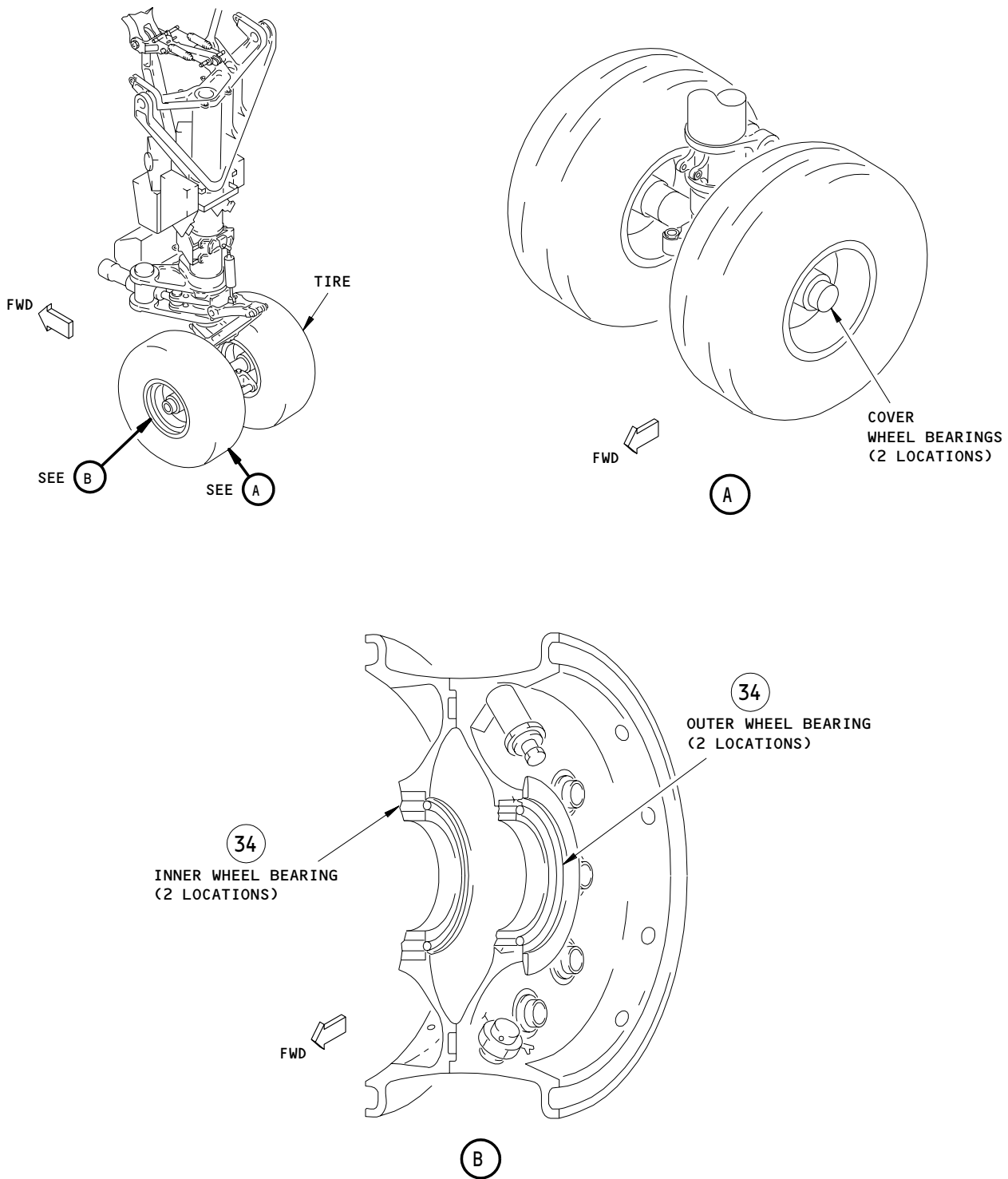
Nose Wheel Steering Components
Figure 317 (Sheet 2)

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Nose Gear Wheel Bearings
Figure 318

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S 843-009

CAUTION: DO NOT USE A CLEANER IF IT IS IN A STRATIFIED (NOT MIXED) CONDITION. A CLEANER THAT IS STRATIFIED CAN STAIN OR CAUSE CORROSION TO AIRPLANE SURFACES.

(16) Examine the cleaner before you use it. If the cleaner does not look mixed, then mix it again. Examine the cleaner again after one hour. Discard the cleaner if it does not stay in a mixed condition.

F. Clean the Airplane

S 113-010

- (1) Remove Light Material (dust and dirt) from Smooth Surfaces
(a) Move the flaps to the fully retracted position.

NOTE: To clean the flaps in the extended position, refer to the procedure to Remove Material Around Sensitive Components.

CAUTION: DO NOT USE THE CLEANERS IN HIGHER CONCENTRATIONS THAN SHOWN IN TABLE 301. HIGHER CONCENTRATIONS CAN CAUSE DAMAGE TO ACRYLIC WINDOWS, STAINS ON PAINTED SURFACES, AND CORROSION ON METALS.

- (b) Mix the water-base alkaline cleaner from Table 301 for the condition of the surface that you will clean.

WARNING: DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT TO CLEAN MECHANICAL, ELECTRICAL, OR HYDRAULIC COMPONENTS. LIQUIDS THAT GET INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS.

CAUTION: KEEP THE NOZZLE OF THE 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.

NOTE: 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. Apply the cleaner again if necessary to keep the surface wet.
(f) Rub the surface with a brush to help remove unwanted material.

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CAUTION: MAKE SURE YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. THE CLEANER CAN CAUSE CORROSION IF IT IS NOT REMOVED COMPLETELY FROM THE AIRPLANE SURFACE.

- (g) Flush the surface with clean, warm water (160°F maximum).
- (h) Dry the wet surfaces with air or towels.

S 113-011

- (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 procedure to Remove Material Around Sensitive Components.

WARNING: KEEP THE CLEANING SOLVENT THAT IS USED IN THE SOLVENT EMULSION CLEANERS AWAY FROM SOURCES OF HEAT. THE CLEANING SOLVENT IS FLAMMABLE.

- (b) Mix the solvent emulsion cleaner from Table 302.
- (c) Mix the cleaner until it is thick and creamy.

WARNING: DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT TO CLEAN MECHANICAL, ELECTRICAL, OR HYDRAULIC COMPONENTS. LIQUIDS THAT GET INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS.

CAUTION: KEEP THE NOZZLE OF THE 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. Do not let the cleaner dry on the surface.
- (f) Rub the surface with a brush to help remove unwanted material.

CAUTION: MAKE SURE YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. THE CLEANER CAN CAUSE CORROSION IF IT IS NOT REMOVED COMPLETELY FROM THE AIRPLANE SURFACE.

- (g) Flush the surface with clean, warm water (160°F maximum).
- (h) Dry the wet surfaces with air or towels.

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S 113-012

- (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 CEEBEE MAJORCLEAN WITH CARE. THE ABRASIVES IN THIS CLEANER CAN REMOVE THE LUSTER ON CLAD ALUMINUM. THE CLEANER CAN ALSO DECREASE THE CORROSION RESISTANCE OF ANODIZED ALUMINUM.

- 3) For stains that are not removed by the cleaners in Table 303, use Ceebee Majorclean.

S 113-013

- (4) Remove Material Around Sensitive Components

WARNING: REFER TO AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS FOR THE LANDING GEAR. THE DOORS CAN FALL AND CAUSE INJURY OR DAMAGE IF THE LOCKS ARE NOT INSTALLED CORRECTLY.

- (a) Open the landing gear doors, and install the door locks (AMM 32-00-15/201).
- (b) If you will clean the flaps, extend them to the fully down position.
- (c) Mix the water-base alkaline cleaner from Table 301 for the condition of the surface that you will clean. For heavy material (grease and exhaust particles), mix the heavy duty cleaner from Table 303.

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 GET INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS.

- (d) Apply the cleaner to the applicable area with swabs or brushes.

NOTE: 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. Apply the cleaner again if necessary to keep the surface wet.

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CAUTION: DO NOT REMOVE THE LAYER OF GREASE AROUND MECHANICAL JOINTS. THIS GREASE LUBRICATES THE JOINT AND PREVENTS CORROSION.

(f) Carefully rub the surface with a clean brush to help remove unwanted material.

CAUTION: MAKE SURE YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. THE CLEANER CAN CAUSE CORROSION IF IT IS NOT REMOVED COMPLETELY FROM THE AIRPLANE SURFACE.

(g) Flush the surface with clean, warm water (160°F maximum).

(h) Dry the wet surfaces with air or towels.

CAUTION: 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 JOINT. IF YOU DO NOT LUBRICATE THE BEARINGS AND JOINTS, DAMAGE TO THE COMPONENTS CAN OCCUR.

(i) Lubricate of the bearings and joints in the cleaned area (Ref Chapter 12).

WARNING: REFER TO AMM 32-00-15/201 TO REMOVE THE DOOR LOCKS FOR THE LANDING GEAR. THE DOORS CAN FALL AND CAUSE INJURY OR DAMAGE IF THE LOCKS ARE NOT REMOVED CORRECTLY.

(j) Remove the door locks for the landing gear, and close the landing gear doors (AMM 32-00-15/201).

S 113-014

(5) Remove Unwanted Hydraulic Fluid

CAUTION: IF HYDRAULIC FLUID GETS ON THE CARBON BRAKES, YOU MUST REPLACE THE BRAKES. HYDRAULIC FLUID SPILLS ON TIRES CAN BE CLEANED WITH SOAPY WATER.

(a) Clean the unwanted hydraulic fluid with a mop or rags.

CAUTION: DO NOT USE WATER OR CLEANERS THAT CONTAIN FLAMMABLE SOLVENTS TO CLEAN WARM COMPONENTS.

(b) Use the MIL-T-81533A degreasing fluid to clean the hydraulic fluid from warm components.

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S 113-015

(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. Use a liquid that contains one part of cleaner (from Table 301 or Oakite 74L) and 10 to 20 parts of water.

NOTE: If you do not have a foam generator, mix the liquid quickly to make the foam.

WARNING: DO NOT USE HIGH-PRESSURE SPRAY EQUIPMENT TO CLEAN MECHANICAL, ELECTRICAL, OR HYDRAULIC COMPONENTS. LIQUIDS THAT GET INTO THESE AREAS CAN CAUSE CORROSION, FREEZE DURING AIRPLANE FLIGHT, OR REMOVE NECESSARY LUBRICANTS.

CAUTION: KEEP THE NOZZLE OF THE 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 that you will clean.
(c) Apply a heavy layer of foam cleaner.
(d) Let the cleaner soak for 5 to 15 minutes. Apply the cleaner again if necessary to keep the surface wet.
(e) Rub the surface with a brush to help remove unwanted material.

CAUTION: MAKE SURE YOU FLUSH THE SURFACE SUFFICIENTLY TO REMOVE ALL OF THE CLEANER. THE CLEANER CAN CAUSE CORROSION IF IT IS NOT REMOVED COMPLETELY FROM THE AIRPLANE SURFACE.

- (f) Flush the surface with clean, warm water (160°F maximum).
(g) Dry the wet surfaces with air or towels.

G. Put the Airplane Back In Its Usual Condition

S 843-041

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.

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CAUTION: 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:
 - (a) Pitot probes
 - (b) Angle of Attack Sensor
 - (c) Engine inlet, fan exhaust, and turbine exhaust
(AMM 71-00-03/201)
 - (d) Brakes
 - (e) Tires

S 843-033

- (2) Remove the "PITOT PROBES COVERED" tag from the left control wheel in the flight deck.

S 843-042

WARNING: FAILURE TO REMOVE BARRICADE TAPE AND VINYL ADHESIVE TAPE FROM STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.

CAUTION: REMOVE ALL BARRICADE TAPE, COVERS, POLYETHYLENE SHEET AND VINYL ADHESIVE TAPE. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (3) Remove all barricade tape, covers, polyethylene sheet and vinyl adhesive tape from the following openings:
 - (a) Static ports
 - 1) Inspect each static port and if necessary use naphtha or equivalent, to remove all tape residue, dirt and other contaminants around the port.
 - (b) Surge tanks and fuel vents
 - (c) APU exhaust duct outlet port
 - (d) APU oil cooling air exhaust port
 - (e) Overboard exhaust valve port
 - (f) Ram air inlet and outlet doors
 - (g) Outflow valve

S 843-034

- (4) Remove the "STATIC PORTS COVERED" tag from the left control wheel in the flight deck.

TASK 12-25-01-103-016

3. Polish the External Surfaces of the Airplane

A. Equipment

- (1) Bonnet, Wool Pile - commercially available

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- (2) Buffer Wheel, Cotton cloth, 80/92 thread count, Spiral sewn, 4- or 6-inch diameter, 5/8- or 7/8-inch thick, 1/4-inch diameter arbor hole - commercially available
- (3) Buffer Wheel, Hard Cloth, machine sewn, bias-type, 7 x 3 x 5/8-inch, 16 Ply - commercially available
- (4) Burnishing Tool - commercially available
- (5) Sander/Polisher, Orbital, Air-Driven - commercially available

B. Consumable Materials

- (1) C00523 Alodine 1000 - MIL-C-5541
- (2) B00047 Acid Nitric - O-N-350
- (3) G00033 Cheesecloth - Woven, Rymplecloth No. 301
- (4) B00568 Compound - Cutting and Coloring, Schaffner No. 521, White Bar
- (5) B00567 Compound - Coloring, Schaffner No. 4094, Green Bar
- (6) D00281 Lubricant - Petroleum jelly
- (7) G02045 Pad - Scotch Brite, Fine or Ultrafine
- (8) B00569 Paste - Fine Polishing, Schaffner No. AS0410
- (9) B00570 Polish - Turco 1495-X
- (10) G00033 Wiper - BMS 15-5D, Class A

C. References

- (1) AMM 51-21-04/701, Alodine Coating

D. Prepare to Polish the Surface

S 103-017

- (1) Do the procedure to Clean the External Surfaces of the Airplane to clean the surfaces that you will polish.

NOTE: Any polish listed in D6-9002 is acceptable for polishing.

E. Polish the Surface

NOTE: Polishing is only accomplished on unpainted surfaces.
Painted surfaces do not get polished.

S 603-043

WARNING: DO NOT POLISH THE STATIC PORTS. IF POLISHING MATERIAL ENTERS THE STATIC PORTS, IT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.

- (1) PROCEDURE I - Polish the surface to repair light stains or to make the surface bright.
 - (a) Use the wiper 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 AS-0410 fine polishing paste or Turco 1495-X polish to the BMS 15-5D Class A wiper.

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- b) Rub the damaged area of the surface with the wiper.

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 AS-0410 fine polishing paste or Turco 1495-X polish to the BMS 15-5D Class A wiper.
 - b) Polish the damaged area of the surface with the orbital, air-driven sander/polisher.
- (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.

NOTE: If the polished area is too bright, rub the area with an ultrafine Scotch-Brite pad. Remove the dried polish with solvent and wipers.

- (e) Rub the area around the polished area to get a constant finish.
- (f) Do the procedure to 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, apply Alodine 1000 with a swab, cloth, or sponge (AMM 51-21-04/701).

S 603-019

- (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 TT-N-95 cleaning solvent to a wiper.
 - 2) Use the wiper to clean the area around the scratch.
 - 3) Dry the surface.
 - 4) Apply masking tape around the scratch.

NOTE: Make sure there is no more than 1/32 inch of bare metal around the scratch.

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WARNING: DO NOT GET CLAD PENETRATING SOLUTION IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. IF YOU GET CLAD PENETRATING SOLUTION IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. IF YOU GET CLAD PENETRATING SOLUTION ON YOUR SKIN, IMMEDIATELY FLUSH YOUR SKIN WITH WATER. MAKE SURE YOU WEAR SPLASH GOGGLES OR A FACE SHIELD. MAKE SURE YOU WEAR CHEMICAL RESISTANT GLOVES WHEN YOU PREPARE THE CLAD PENETRATING SOLUTION.

- 5) Prepare the clad penetrating solution as follows:
a) Mix 200 grams of Potassium Nitrate (KN03) and 100 grams of Sodium Hydroxide (NaOH) with sufficient water to make one liter of clad penetrating solution.

WARNING: DO NOT GET CLAD PENETRATING SOLUTION IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. IF YOU GET CLAD PENETRATING SOLUTION IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. IF YOU GET CLAD PENETRATING SOLUTION ON YOUR SKIN, IMMEDIATELY FLUSH YOUR SKIN WITH WATER. MAKE SURE YOU PUT ON SPLASH GOGGLES OR A FACE SHIELD. MAKE SURE YOU PUT ON CHEMICAL RESISTANT GLOVES WHEN YOU APPLY THE CLAD PENETRATING SOLUTION..

CAUTION: MAKE SURE 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.

NOTE: If the bottom of the scratch becomes black, then the scratch penetrated the clad to the base metal.

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WARNING: ONLY ADD ACID TO WATER. NEVER ADD WATER TO ACID OR A VIOLENT REACTION MAY OCCUR.

WARNING: DO NOT GET NITRIC ACID IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. IF NITRIC ACID GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. IF NITRIC ACID GETS ON YOUR SKIN, IMMEDIATELY FLUSH YOUR SKIN WITH WATER. MAKE SURE YOU WEAR SPLASH GOGGLES OR A FACE SHIELD. MAKE SURE YOU PUT ON A RESPIRATOR AND ACID RESISTANT GLOVES WHEN YOU PREPARE THE NITRIC ACID SOLUTION.

- 8) Prepare the nitric acid solution as follows:
a) Mix one volume of acid, O-N-350 with two to three volumes of water.

WARNING: DO NOT GET NITRIC ACID IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. IF NITRIC ACID GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. IF NITRIC ACID GETS ON YOUR SKIN, IMMEDIATELY FLUSH YOUR SKIN WITH WATER. MAKE SURE YOU WEAR SPLASH GOGGLES OR A FACE SHIELD. MAKE SURE YOU PUT ON ACID RESISTANT GLOVES AND A RESPIRATOR WHEN YOU APPLY THE NITRIC ACID SOLUTION.

- 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.

WARNING: DO NOT GET CHEMICAL CONVERSION COATING IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. IMMEDIATELY FLUSH CHEMICAL CONVERSION COATING FROM YOUR SKIN. IF CHEMICAL CONVERSION COATING GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER FOLLOWED BY AN EYE WASH OF BORIC ACID SOLUTION. MAKE SURE YOU PUT ON SPLASH GOGGLES OR A FACE SHIELD WHEN YOU APPLY THE CHEMICAL CONVERSION COATING. MAKE SURE YOU PUT ON A RESPIRATOR AND PROTECTIVE GLOVES WHEN YOU APPLY THE CHEMICAL CONVERSION COATING. KEEP THE CHEMICAL CONVERSION COATING AWAY FROM SPARKS, FLAME, AND HEAT. CHEMICAL CONVERSION COATING IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- 12) Apply Alodine 1000 to the scratch with a swab, cloth, or sponge (AMM 51-21-04/701).
(b) If the scratch penetrated the clad aluminum, do PROCEDURE III.

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- (c) Do the procedure to Clean the External Surfaces of the Airplane to clean around the scratch.
- (d) If the surface is badly scratched, rub it with fine or ultrafine Scotch-Brite pads to make it smoother.
- (e) Polish with the air-driven sander/polisher as follows:

NOTE: Polish the airplane surface first with Schaffner No. 521 white bar compound. Polish with the Schaffner No. 521 white bar compound until all of the gray undercast 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.
- 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) Do the procedure to 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, apply Alodine 1000 with a swab, cloth, or sponge (AMM 51-21-04/701).

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S 603-020

- (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 soft wipers to clean the damaged area.

NOTE: Wipe the damaged area carefully to prevent scratches.

- (b) Remove the burr edge as follows:

- 1) Apply the lubricant to the burnishing tool.
- 2) Move the burnishing tool 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 minimum.

- 3) Move the burnishing tool 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 does not blend in with the adjacent surface, continue as shown in PROCEDURE II.

- F. Put the Airplane Back In Its Usual Condition

S 843-044

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.

CAUTION: MAKE SURE THE PITOT 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.

- (1) Remove the coverings from the following components:
 - (a) Pitot probes
 - (b) Angle of Attack Sensor
 - (c) Engine inlet, fan exhaust, and turbine exhaust (AMM 71-00-03/201)
 - (d) Brakes

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(e) Tires

S 843-036

- (2) Remove the "PITOT PROBES COVERED" tag from the left control wheel in the flight deck.

S 843-045

WARNING: FAILURE TO REMOVE BARRICADE TAPE AND VINYL ADHESIVE TAPE FROM STATIC PORTS BEFORE FLIGHT MAY CAUSE LARGE ERRORS IN AIRSPEED-SENSING AND ALTITUDE-SENSING SIGNALS, WHICH MAY LEAD TO LOSS OF SAFE FLIGHT.

CAUTION: REMOVE ALL BARRICADE TAPE, COVERS, POLYETHYLENE SHEET AND VINYL ADHESIVE TAPE. ENGINES SHOULD NOT BE OPERATED WITH COVERS IN PLACE BECAUSE THE COVERS CAN COME OFF AND DAMAGE THE ENGINES.

- (3) Remove all barricade tape, covers, polyethylene sheet and vinyl adhesive tape from the following openings:

(a) Static ports

- 1) Inspect each static port and if necessary use naphtha or equivalent, to remove all tape residue, dirt and other contaminants around the port.

(b) Surge tank and fuel vents

(c) APU exhaust duct outlet port

(d) APU oil cooling air exhaust port

(e) Overboard exhaust valve port

(f) Ram air inlet and outlet doors

(g) Outflow valve

S 843-038

- (4) Remove the "STATIC PORTS COVERED" tag from the left control wheel in the flight deck.

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BIRD STRIKE CLEANING – MAINTENANCE PRACTICES

1. General

- A. The procedure has the steps for the safe removal of pieces of a bird from an aircraft exterior.

TASK 12-25-04-102-001

2. Bird Strike Cleaning

A. Consumable Materials

- (1) B00130 – Alcohol, Isopropyl – TT-1-735
- (2) G01043 – Cloth, Lint-Free
- (3) G50140 – Gloves, Protective
- (4) G50436 – Disinfectant

B. References

- (1) AMM 05-51-18/201, Bird/Hail Strike Conditional Inspection

C. Procedure

S 012-002

- (1) Gain access to the suspected bird strike area.

S 112-003

WARNING: PUT ON EQUIPMENT FOR PROTECTION BEFORE YOU TOUCH THE BIRD CARCASS, BLOOD, GUTS, AND AN 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.

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.

- (2) Clean the bird pieces from the airplane.
 - (a) Discard the bird pieces in a plastic bag.
 - (b) Clean the area with isopropyl alcohol and disinfectant.
 - (c) Make sure that you remove all signs of bird material from the airplane.

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- (3) After you remove the bird pieces from the airplane, do this task:
Bird/Hail Strike Conditional Inspection (AMM 05-51-18/201).

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COLD WEATHER MAINTENANCE – SERVICING

1. General

- A. Airplane operation in cold weather conditions causes special problems. These problems occur because of the effects of the ice, snow, slush, frost, and low temperatures. This procedure has the data on protection against or removal of ice, snow, slush and frost from the airplane. 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 procedures for operation of equipment during ice, snow and/or frost conditions are satisfactory for the conditions of operation. Use the data that follow to make sure the procedures are satisfactory:
 - (1) Previous cold 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. In cold weather water can freeze, and not let the drain valves open.
- D. Low temperatures (below freezing) can affect grease viscosity. Lubricate landing gear and flight control components in warm weather or a heated hanger. If lubrication must be accomplished in cold weather, warm air or electric heat blankets can be used to heat the components and the grease gun. For the landing gear, an enclosure can be fabricated around the strut to make the heating more efficient. Do not apply heat directly to tires.
- E. 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 take-off.

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- (2) Ice that has accumulated on the fan blades while the engine is idle 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 the 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.
- (5) One step ice removal/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 the fluid and water mixture:
 - (a) The ambient temperature.
 - (b) The weather conditions.
- (6) Two step ice removal/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 a spray 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 the airplane surfaces that have protection.

NOTE: You cannot find the level of protection or the 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.

- (8) Type I (not thickened) deicing/anti-icing fluids usually have a minimum of 80 percent Glycol. The temperature makes the viscosity change but the shear stress does not. These fluids give anti-icing protection for only a short time.

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- (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 very 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.
- (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 the departure. If the airplane stays in the loading area through the night in cold weather conditions, refer to the Guidelines for Parked Airpalnes in this procedure. Cold weather operation does not include an airplane that is parked for a long time. This is included in AMM 10-11-02/201.
- (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.
- F. 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.
- G. 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.
- H. Start electronic equipment in the cold weather conditions the same as in the usual conditions. A special procedure is not necessary.
- I. The engine start procedure for cold weather operation is given in AMM 71-00-00/201.
- J. The APU start procedure is given in AMM 49-11-00/201.

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2. Cold Weather Maintenance Procedure

A. References

- (1) 10-11-03/201, Parking in High Winds
- (2) 12-14-01/301, Potable Water System
- (3) 12-17-01/301, Waste Tank
- (4) 71-00-00/201, Power Plant

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B. Equipment

- (1) Ground equipment that is correct and satisfactory to use with the materials that follow:
 - (a) Deicing/Anti-icing Truck
 - (b) Boomtruck or Cherry-Picker
 - (c) Water
 - (d) Type I, II, III, or IV Deicing Fluid
 - (e) Type I, II, III, or IV Anti-icing Fluid
 - (f) Hot Air Source

C. Consumable Materials

NOTE: The applicable fluids which obey the Boeing document D6-17487, "Evaluation of Airplane Maintenance Materials" and conform to any of the following specifications, are acceptable fluids:

- (1) Type I (newtonian) fluids:
 - (a) G02301 Fluid SAE AMS 1424 latest revision
- (2) Type II, Type III, and Type IV (non-newtonian) fluids:
 - (a) G02301 Fluid SAE AMS 1428 latest revision

D. Guidelines

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WARNING: MAKE SURE YOU USE THE CORRECT EQUIPMENT FOR THE FLUID YOU USE. MECHANICAL OR EQUIPMENT SHEAR OF THE FLUID CAN OCCUR IF THE CORRECT EQUIPMENT IS NOT USED. IF THIS OCCURS, THE VISCOSITY OF MANY TYPE II, TYPE III, AND TYPE IV FLUIDS AND THE HOLDOVER TIME WILL DECREASE. MAKE SURE YOU REFER TO THE MANUFACTURER'S GUIDELINES FOR THE FLUID THAT YOU USE.

(1) General

- (a) 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 with 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.
- (b) Use a hot mixture of water and the Type I, Type II, Type III, or Type IV deicing/anti-icing fluids when you do the one-step ice removal/anti-icing procedure. 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.

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- (c) 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.

CAUTION: DO NOT POINT A SOLID FLOW OF FLUID DIRECTLY AT THE SURFACE. APPLY THE FLUID AT A LOW ANGLE TO PREVENT DAMAGE TO THE AIRPLANE SURFACES. DO NOT USE A HIGH PRESSURE SPRAY TO BLOW THE ICE AND SNOW OFF THE AIRPLANE SURFACES.

- (d) For the best ice or snow removal, you must increase the temperature of the deicing fluid and hot water to 140–180°F (60–82°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. Make sure the maximum force of the solid flow of fluid on the surfaces is not more than 10 psi on an area of 25 square inches. This will prevent damage to the surfaces.
- (e) 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.
- (f) 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.
- (g) When the precipitation is continuous, the two-step ice removal/anti-icing procedure is usually recommended. The quantity of fluid to use in the mixture is affected by the following:
- 1) The airline experience
 - 2) The instructions of the fluid manufacturer
 - 3) The air temperature


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GUIDELINE SUMMARY FOR APPLICATION OF TYPE I FLUID MIXTURES (MINIMUM CONCENTRATIONS) AS A FUNCTION OF OAT			
OUTSIDE AIR TEMPERATURE OAT	ONE-STEP PROCEDURE	TWO-STEP PROCEDURE	
	DEICING/ANTI-ICING	1ST STEP: DEICING	2ND STEP: ANTI-ICING 
27°F (-3°C) AND ABOVE	MIX OF FLUID AND WATER HEATED TO 140°F (60°C) MINIMUM, 180°F (82°C) MAXIMUM AT THE NOZZLE, WITH A FREEZING POINT OF AT LEAST 18°F (10°C) BELOW OAT	WATER OR A MIX OF FLUID AND WATER HEATED 140°F (60°C) MINIMUM AT THE NOZZLE	MIX OF FLUID AND WATER HEATED TO 140°F (60°C) MINIMUM, 180°F (82°C) MAXIMUM AT THE NOZZLE, WITH FREEZING POINT OF AT LEAST 18°F (10°C) BELOW OAT
27°F (-3°C) BELOW		FP OF HEATED FLUID MIXTURE SHALL BE NOT MORE THAN 5°F (3°C) ABOVE ACTUAL OAT	

TYPE I FLUID

°C DEGREES CELSIUS
°F DEGREES FAHRENHEIT
OAT OUTSIDE AIR TEMPERATURE
FP FREEZING POINT

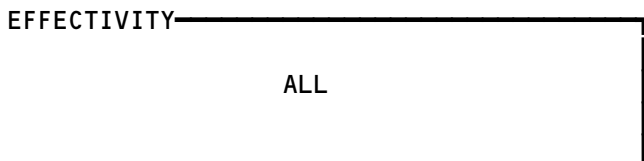
CAUTION: WING SKIN TEMPERATURES MAY DIFFER AND IN SOME CASES MAY BE LOWER THAN OAT.
A STRONGER MIX (MORE GLYCOL) CAN BE USED UNDER THESE CONDITIONS.

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) MINIMUM,
180°F (82°C) MAXIMUM AT THE NOZZLE IS DESIRABLE.



UPPER TEMPERATURE LIMIT SHALL NOT EXCEED FLUID MANUFACTURER'S
RECOMMENDATION.

 TO BE APPLIED BEFORE FIRST STEP FLUID FREEZES, TYPICALLY WITHIN 3 MINUTES

Fluid Mixture Guidelines for Deicing
Figure 301 (Sheet 1)



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GUIDELINE FOR APPLICATION OF TYPE II, III, AND IV FLUID MIXTURES			
OUTSIDE AIR TEMPERATURE OAT	ONE-STEP PROCEDURE 	TWO-STEP PROCEDURE	
	DEICING/ANTI-ICING	1ST STEP: DEICING	2ND STEP: ANTI-ICING 
27°F (-3°C) AND ABOVE	50/50 HEATED TYPE II, III OR IV	HEATED WATER OR A HEATED MIX OF TYPE I, II, III, OR IV AND WATER	50/50 TYPE II, III 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, II, III, OR 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		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 CANNOT BE USED.		



TYPE II, III, AND IV FLUIDS

CAUTION: WING SKIN TEMPERATURES MAY DIFFER AND, IN SOME CASES MAY BE LOWER THAN OAT. A STRONGER MIX (MORE GLYCOL) CAN BE USED UNDER THESE CONDITIONS.

AS FLUID FREEZING MAY OCCUR, 50/50 TYPE II, III OR IV FLUID SHALL NOT BE USED FOR THE ANTI-ICING STEP OF A COLD-SOAKED WING AS INDICATED BY FROST OR ICE ON THE LOWER SURFACE OF THE WING IN THE AREA OF THE FUEL TANK.

AN INSUFFICIENT AMOUNT OF ANTI-ICING FLUID, ESPECIALLY IN THE SECOND STEP OF A TWO-STEP PROCEDURE, MAY CAUSE A SUBSTANTIAL LOSS OF HOLDOVER TIME, PARTICULARLY WHEN USING A TYPE I FLUID MIXTURE FOR THE FIRST STEP (DEICING).

NOTE: FOR HEATED FLUIDS, A FLUID TEMPERATURE OF 140°F (60°C) MINIMUM, AND 180°F (82°C) MAXIMUM AT THE NOZZLE IS DESIRABLE. UPPER TEMPERATURE LIMIT SHALL NOT EXCEED FLUID MANUFACTURER'S RECOMMENDATIONS.

-  TO BE APPLIED BEFORE FIRST STEP FLUID FREEZES, TYPICALLY WITHIN 3 MINUTES
-  CLEAN AIRCRAFT MAY BE ANTI-ICED WITH UNHEATED FLUID.

Fluid Mixture Guidelines for Deicing
Figure 301 (Sheet 2)

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- (h) 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.
- (i) 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. EQUIPMENT THAT IS INSTALLED ON THE SURFACE OF THE WING OR FUSELAGE CAN BE DAMAGED BY THE MOVEMENT OF THE ROPES OR FABRIC HOSE.

- (j) 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 the snow from the fuselage. Move the rope or hose back and forth on the top of the fuselage as you move it aft.
- (k) 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 freeze again.
- (l) If you remove ice with water that is not hot, you must do it in a warm hangar. Keep the airplane in the hangar until the surfaces are dry. It will be necessary to do a check for 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.

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(2) General Precautions

WARNING: DEICING/ANTI-ICING FLUID IS DANGEROUS. DO NOT LET IT TOUCH THE SKIN OR EYES, AND USE CLOTHING THAT GIVES SUFFICIENT PROTECTION.

- (a) Do not point a spray of deicing/anti-icing fluid directly at or into the pitot inlets, TAT probes or static ports.
- (b) Do not point a spray of hot deicing fluid or hot water directly at cold windows.
- (c) Do not point a spray of deicing/anti-icing fluid directly into the engine, APU, scoops, vents, drains, etc.
- (d) Do not use more than 10 psi on an area of 25 square inches. Do not point a solid flow of fluid directly at the airplane surfaces.
- (e) Make sure that ice and/or snow is not pushed into the areas around the flight controls during ice and snow removal.
- (f) Remove all of the ice or snow from the door and girt bar areas before you close a door.

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- (g) Do not open the cargo doors if it is not necessary. Remove the ice and snow from the cargo containers before you put them on the airplane. Before the doors are closed for flight, put anti-icing fluid on these areas:
 - 1) The pressure relief doors
 - 2) The lower doorsills
 - 3) The bottom edge of the door.
- (h) Do not use hard or sharp tools to remove the ice from the airplane surface.
- (i) The right and left sides of the wing and horizontal stabilizer must get the same ice removal/anti-icing procedure.
 - 1) 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.
- (j) If SAE Type II, III or IV fluids are used, then remove all of the deicing/anti-icing fluid from the cockpit windows before departure. Make sure you carefully examine the windows with the wipers installed. Make sure that fluid is removed from all the forward areas where it can flow back on the windshields during the taxi and takeoff. These areas must be clean before the 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.

- (k) After the 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:
- (l) If the ambient temperature is at or below freezing, move the airplane to a heated hangar.
 - 1) Gain access to the following areas where flight controls and other system components are located:
 - a) Wing rear spar areas, including the actuating components for the spoilers, ailerons, flaps, and the control surface hinges and balance bays.

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- b) Wing leading edge devices, including the actuating components.
 - c) Horizontal stabilizer rear spar, including the actuating components for the elevators, elevator tabs (if applicable) and the control surface hinges and balance bays.
 - d) Vertical stabilizer, including actuating components for the rudder, and the control surface hinges.
 - e) APU bay and bilge area of the tailcone.
- 2) Visually inspect for dry or rehydrated residues in the areas mentioned above.

NOTE: Dry residue will normally be a thin film that may be partially covered with dirt or grease. Rehydrated residue will often be a thicker, gel-like substance.

WARNING: DO NOT APPLY WATER TO THE CONTROL CABLES WHEN THE TEMPERATURE IS AT OR BELOW 32 DEGREES FAHRENHEIT (0 DEGREES CENTIGRADE). ICE CAN FORM ON THE CABLES AND PREVENT THE OPERATION OF IMPORTANT FLIGHT CONTROL SYSTEMS DURING FLIGHT.

- 3) Spray the area with a fine mist of warm water to rehydrate any residue and wait at least 15 minutes to allow the rehydration to occur.
 - 4) Remove the residues by hand with rags or soft brushes using warm water or a mixture of warm water and Type I fluid.
 - a) You can use a low pressure stream of water or compressed air to rinse away the residues.
 - b) When rinsing the residues away, make sure the residues do not flow into crevice areas that are not accessible.
 - c) Check all drain holes in the areas where residues were removed to make sure that they are clear and not blocked by the residues.
 - d) Re-lubricate bearings, fittings, and control cables in areas that were cleaned as required.
 - e) Re-apply corrosion inhibiting compound to all surfaces and components in areas that were cleaned as required.
- (m) When there is slush on the runways, examine the airplane when it gets to the ramp. Look for slush that collected on the airplane or damage to the airplane surfaces.
- 1) Examine the areas that follow for ice that collected and damage to the skin panels (remove the ice if it is necessary):
 - a) The leading edges
 - b) The flaps
 - c) The flap wells
 - d) The vertical stabilizer
 - e) The rudder

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- f) The bottom and the top surfaces of the horizontal stabilizers and elevators.
 - 2) Examine the wheel well areas for ice, slush and snow that collected. Remove the ice if it is necessary.
 - 3) Examine the skin panels behind the wheel wells for damaged edges.
- (n) 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.

- (o) Use a boom truck or a cherry-picker to do deicing/anti-icing.

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(3) Specific Requirements

WARNING: 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.

(a) Probes and Sensors

- 1) Pitot Probe, Static Ports, and Total Air Temperature (TAT) Probes (Fig. 302)
 - a) Look for ice that is attached to the surface 4 feet or less from the pitot inlets, static port, and TAT probe inlets. Remove all the ice in these areas.
 - b) Do not point a spray of deicing/anti-icing fluid directly at or into the pitot inlets, static ports, or the TAT probes.
 - c) If ice causes a blockage of the static openings, carefully apply warm air until the ice melts.
 - d) If you applied too much fluid to the fuselage near the static ports, examine the nearest in-line drain. Remove the water if it is collected there.
- 2) Angle-of-Attack Sensor (Fig. 302)
 - a) Make sure that no ice and/or snow is on the sensors. Make sure the sensors are free to move. Apply deicing fluid if it is necessary.

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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 these 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 you remove the ice, make sure there is no moisture collected 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

CAUTION: BE CAREFUL WHEN YOU REMOVE THE ICE AND SNOW FROM THE WING AND TAIL SURFACES NEAR THE VORTEX GENERATOR. 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, or frost on them.

NOTE: A layer of frost 1/8-inch 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 surfaces that move and the surfaces that do not move to make sure there is no ice.
- 3) Set the horizontal stabilizer leading edge in the full up and the elevator trailing edge in the full down limit (equivalent to airplane nose down) during deicing procedures.

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NOTE: Horizontal stabilizer leading edge in the full up and the elevator trailing edge in the full down positions will help prevent deicing fluid flow into the balance bay areas.

- 4) The right and left sides of the horizontal stabilizer must get the same ice removal/anti-icing procedures.
 - 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

CAUTION: 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 layer of constant thickness with a sharp crystalline texture. It usually occurs on surfaces that are out on a 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 aft and decrease the pilots' vision on the takeoff.
- 3) Do not apply hot deicing fluid or hot water directly on the pilots' windshield or the passenger windows. You can let the fluid flow on 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.

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- 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 the departure. Carefully examine the windows with the wipers installed. Also, examine the forward areas where the fluid can flow aft on the windshields during the taxi and takeoff. These areas must be clear before the 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

WARNING: PERSONS MUST STAY CLEAR OF THE DANGEROUS AREAS IN FRONT OF OR IN BACK OF AN ENGINE (REF 71-00-00). INJURY OR DEATH OF PERSONS CAN OCCUR IN THESE AREAS.

WARNING: MAKE SURE THE APU INLET AREA IS CLEAR BEFORE YOU START THE APU. THE APU CAN BE DAMAGED BY ICE OR SNOW THAT HAS COLLECTED IF IT GOES INTO THE INLET. ALSO, PERSONS MUST STAY CLEAR OF THE APU EXHAUST AREA (CHAPTER 49) WHEN THE UNIT IS OPERATING. INJURY OR DEATH OF PERSONS CAN OCCUR IN THESE AREAS.

- 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 the ice removal/anti-icing procedure during engine and/or APU operation, do the steps that follow:
 - a) Make sure the engine and/or the APU is at idle speed
 - b) Do not point the spray of deicing/anti-icing fluids directly into the engine and/or APU inlet.

CAUTION: 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 THE COMPRESSOR TO STALL AND THE ENGINE TO SURGE.

- 2) If the engines/APU are on, do the steps that follow:
 - a) Close the valves for the air conditioning pack to the cabin.
 - b) Close the shutoff valves for the APU air supply.
- 3) This will keep the fumes out of the cabin when you apply deicing/anti-icing fluid in the area of the engines/APU inlets.

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- 4) 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.
 - 5) Do not point 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.
 - 6) Make sure the APU inlet door moves freely.
 - 7) Remove Ground-Accumulated Ice from fan blades prior to take-off.
- (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 fluids 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 wheels, brakes or tires. A hot air blower may be used for this purpose.
- (g) Landing Gear and Doors
- 1) Make sure there is not a layer of ice and/or snow on the movable parts and the position indication switches for the landing gear. This could prevent the correct operation of the landing gear. Make sure you do not remove lubricants or make the lubricants thinner when you apply deicing/anti-icing fluids. Parts that are not lubricated can seize or not operate without the correct servicing.
 - 2) Remove the ice and snow from these areas:
 - a) The landing gear doors
 - b) The door latches

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- 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
- 3) 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 did not collect 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 these areas that are open and not heated:
 - a) The actuators that unlock the landing gear and doors during alternate extension
 - b) The external mechanism for the landing gear.

CAUTION: DO NOT MOVE THE AIRPLANE IF THE TIRES FREEZE TO THE GROUND. MAKE SURE THE WHEELS TURN WHEN YOU MOVE THE AIRPLANE.

- 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 airplane 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 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 inch thick, remove it before the takeoff.
 - 2) Clear ice can occur on the top of the wing when these conditions occur:
 - 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) Miscellaneous

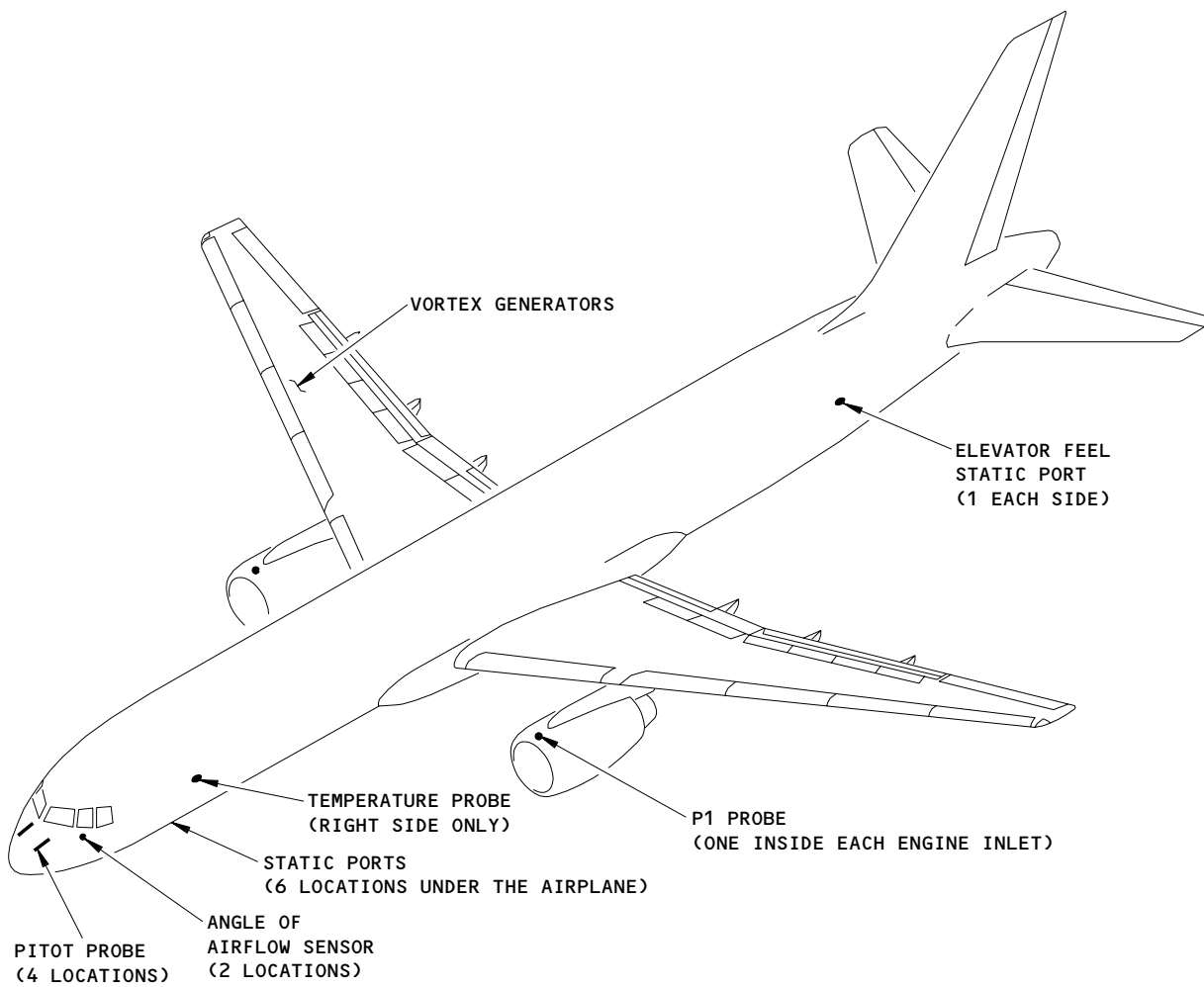
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Probe Location
Figure 302

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- 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 or 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 the windshield wiper blades.

E. Hot Water Ice Removal Procedure

S 663-078

- (1) You can use hot water at 140-180°F (60-82°C) maximum nozzle temperature to remove ice and snow from the airplane surfaces when the ambient temperature is 27°F (-2.8°C), stable or on the increase.

S 663-079

- (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 Procedure

S 663-109

- (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 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.

S 663-081

- (2) You can do the one-step ice removal/anti-icing procedure, with the deicing/anti-icing fluid heated to 140-180°F (60-82°C) at the nozzle. Use this procedure to remove the ice and snow from the airplane when the temperature is below 28°F (-2.2°C). After you use the mixture to make the airplane surfaces clean, the remaining fluid will give some anti-icing protection.

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S 663-082

- (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 fluids. With each fluid, the quantity of fluid to use in the mixture is affected by the following :
- (a) The airline experience
 - (b) The fluid specifications
 - (c) The manufacturer's recommendations
 - (d) The weather conditions.

S 663-083

- (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 Ice Removal/Anti-Icing Procedure

S 663-110

- (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 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.

S 663-084

- (2) The 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 you begin the first step. Do the procedure area by area if it is necessary.

S 663-085

- (3) The holdover time you get after you do the anti-icing procedure is affected by the following:
- (a) The fluid that was used
 - (b) The weather conditions.

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S 663-101

- (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. Operation Checks

S 713-087

- (1) Before you start the engine, do the steps that follow to make sure the systems will operate correctly:
 - (a) Operate all the control surfaces. Use a person on the ground to make sure the control surfaces move the full travel.
 - (b) Examine the openings in the pitot probe, probes installed on the strut or in the engine inlet, and the static ports. Make sure they are clear of ice or snow.
 - (c) Make sure there is no ice or snow collected on the landing gear and or in the wheel wells.
 - (d) Make sure all the inlets are clear of ice or snow.
 - (e) Make sure all the drains are clear and not blocked.
 - (f) Make sure the engine compressor can turn freely.

NOTE: If the fan (N1) cannot turn during an engine start because of ice, this can cause heavy damage. When it is possible that water collected in the engine at freezing temperatures, you must make sure the fan (N1) can turn before you start the engine. You can see the low pressure (LP) rotor fan blades turn from the ground. If the wind does not turn the fan, you can turn it by hand. If you will motor the engine to make sure the engine compressor turns, use the procedure in 71-00-00.

- (g) Make sure all of the doors, including the doors to the off-wing escape slide compartments, are clear of ice.

I. To Park the Airplane

S 583-107

- (1) The area where you will park the airplane must be clear of ice and snow. Chapter 10 gives the full procedures to park the airplane. Use the procedure in Chapter 10 if more steps are necessary because of the weather conditions and length of time the airplane will be parked.

S 583-089

- (2) When it is possible, point the airplane into the direction the wind is usually from.
 - (a) Put the wing flaps to the full up position.

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CAUTION: IF HIGH WINDS ARE POSSIBLE, SET THE STABILIZER TRIM. THE STABILIZER TRIM SETTING IS DIFFERENT IF THERE ARE HIGH WINDS. IF YOU DO NOT OBEY THE PARKING PROCEDURE, DAMAGE OF THE AIRPLANE CAN OCCUR.

- (b) If high winds are possible, set the stabilizer trim (AMM 10-11-03/201).
- (c) Put the stabilizer position to 4 units of trim (0° stabilizer position).

S 493-090

CAUTION: EXAMINE THE ENGINE INTAKE AREAS IMMEDIATELY AFTER SHUTDOWN FOR ICE THAT IS THERE. REMOVE THE ICE WHILE THE TEMPERATURE OF THE ENGINE DECREASES AND BEFORE YOU INSTALL THE ENGINE PROTECTIVE PLUGS AND COVERS. IF YOU INSTALL THE PLUGS BEFORE THE TEMPERATURE OF THE ENGINE DECREASES, THE REMAINING HEAT IN THE ENGINE WILL MELT THE ICE TO WATER. THIS WATER WILL FLOW TO THE BOTTOM OF THE FAN SECTION. IT WILL FREEZE AGAIN WHEN THE TEMPERATURE OF THE ENGINE IS BELOW FREEZING. THIS WILL LOCK THE TIPS OF THE FAN LOWER BLADES IN ICE.

- (3) 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 this.

J. Engine Operation

S 863-091

- (1) The full procedures to operate the engines in cold weather conditions are in 71-00-00.

S 663-092

- (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.

S 663-093

- (3) Engine icing can occur when the conditions that follow occur:
 - (a) There is moisture you can see such as clouds, fog, rain, snow, sleet or ice crystals.
 - (b) You will do ground operations with the static air temperature below 50°F.

S 663-094

- (4) You must use the thermal anti-icing system for the engine/nacelle when these conditions occur.

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S 843-095

- (5) Before you start the engines, make sure there are no fluids around the exhaust areas that can start ignition.

S 833-096

- (6) Look for fuel leak from the FFG.
- (a) If you find fuel leaks from these FFG's, you must do a fuel leakage check with the engine at idle.
- (b) Refer to the FFG Drains Leakage - Acceptance Limits to find if the FFG is serviceable (AMM 71-71-00/601).

NOTE: Engine fuel flow governors (FFG), type number 022AA have fluoracarbon (Viton) seals fitted. Small external fuel leaks can occur when:

- the FFG's are operated
- the fuel supply is operated
- both are operated

below a ground ambient temperature of -30°F (-34.4°C).

K. Fuel Icing

S 683-098

CAUTION: 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 FUEL 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 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.

S 613-105

- (2) The items that follow have the most effect on the quantity of water in aviation fuels:
- (a) Where the fuel is kept

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(b) How the fuel is moved.

S 683-099

- (3) 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 3 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:

(a) Apply heat (hot air that is resistant to explosion) to the bottom of the wing in the area of the tank sumps.

L. Toilets and Potable Water

S 613-100

- (1) The water will not freeze in an airplane that operates because there is sufficient heat in the area. When the airplane does not operate and is let stay in an area that is not heated, more servicing is necessary. Do the steps that follow if the cabin temperature will decrease below the freezing point:

(a) Potable Water

CAUTION: MAKE SURE TO DRAIN THE POTABLE WATER SYSTEM. THE POTABLE WATER SYSTEM LINES CAN FREEZE IN COLD WEATHER. IF THE SYSTEM WATER FREEZES, DAMAGE TO THE WATERLINES AND LEAKAGE AROUND THE OUTFLOW VALVE CAN OCCUR.

1) You must drain all of the water from the potable water system (AMM 12-14-01/301).

(b) Toilets

1) To make sure it will not freeze, you can add antifreeze fluids to the water used to flush the toilet. Be careful in the selection of the materials you use. The antifreeze and the flushing deodorizer detergent can make foam when mixed. Foam can also occur when antifoam agents break down when they mix with a deodorizing detergent. Look at the fluid manufacturers' instructions to see if they can be mixed.

2) To make sure it will not freeze, you must fully drain the toilet flushing system, as applicable (AMM 12-17-01/301).

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EXTREME COLD WEATHER MAINTENANCE – SERVICING

1. General

A. This procedure has these tasks:

- (1) Short term parking at temperatures below -22°F (-30°C).
- (2) Return the Airplane to Service After Short Term Parking at Temperatures Below -22°F (-30°C).
- (3) Overnight or extended parking (airplane unattended) at temperatures below 5°F (-15°C).
- (4) Return the airplane to service after overnight or extended parking at temperatures below 5°F (-15°C).
 - (a) During continuous operation in cold weather, it may be necessary to remove ice from the interior of the airplane (AMM 05-51-53/201).

B. Definitions:

- (1) 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.
 - (a) Ground-Accumulated Ice must be removed before take-off.
- (2) Ice that has accumulated on the engine fan blades while the engine is idle is considered Operational Ice.
 - (a) Operational Ice is allowed before departure because it can be removed by engine run-ups during taxi-out.

TASK 12-33-02-603-067

2. Short Term Parking at Temperatures Below -22°F (-30°C)

A. General

- (1) Use this procedure when the cabin and flight deck temperature is kept above 32°F (0°C) and the engine oil temperature is kept above -40°F (-40°C) while the airplane is on the ground.
- (2) In cold weather it is necessary to install covers on the pitot probes and static ports.
- (3) Use the special requirements in this procedure to refuel the airplane in cold weather.

B. References

- (1) AMM 10-11-01/201, Park the Airplane (Normal Parking)
- (2) AMM 12-13-03/301, IDG Servicing
- (3) AMM 12-15-01/301, Main Landing Gear Shock Strut Servicing
- (4) AMM 12-15-02/301, Nose Landing Gear Shock Strut Servicing
- (5) AMM 12-15-03/301, Landing Gear Tires
- (6) AMM 12-33-01/301, Cold Weather Maintenance Procedure
- (7) AMM 21-00-00/201, Supply Conditioned Air to the Airplane
- (8) AMM 24-22-00/201, Supply Electrical Power
- (9) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems

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MAINTENANCE MANUAL

- (10) AMM 32-41-08/401, Brake Hydraulic Disconnect Removal/Installation
- (11) AMM 32-42-00/501, Antiskid/Autobrake System Adjustment/Test
- (12) AMM 32-41-10/401, Main Gear Wheel Brake Removal/Installation
- (13) AMM 71-00-00/201, Power Plant

C. Equipment

- (1) MARK I COLDBUSTER Heater - External Cabin, Trailer Mounted, Diesel Powered, Spencer Industries, Inc. (Vendor Code 12008) 8410 Dallas Ave. S, Seattle, WA 98108-4423

D. Consumable Materials

- (1) D00109 Oil - Aircraft turbine engine, synthetic base

E. Access

(1) Location Zones

- 100 Lower Half of Fuselage
- 200 Upper Half of Fuselage
- 300 Empennage
- 400 Powerplant and Nacelle Struts
- 500 Left Wing
- 600 Right Wing
- 700 Landing Gear and Landing Gear Doors
- 800 Doors

(2) Access Panel

- 193DL Ground Air Service Connection

F. Procedure

S 483-160

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.

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S 553-068

- (2) Do the Cold Weather Maintenance procedure (AMM 12-33-01/301).

S 653-154

CAUTION: 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 DRAIN VALVE UNIT CAN MELT AND LET SOME WATER AND FUEL FLOW FROM THE DRAIN. BUT, A PIECE OF ICE CAN STAY BEHIND. IF THE FUEL DOES NOT FLOW FROM THE DRAIN, CONTINUE TO APPLY HOT AIR FOR A SHORT TIME, AND FREQUENTLY DO A CHECK OF THE FLOW FROM THE DRAIN. CATCH THE FUEL IN A CONTAINER AND MAKE SURE ALL OF THE WATER IS REMOVED.

- (3) If the airplane is parked more than 45 minutes before it is refueled, drain the fuel tank sumps (AMM 12-11-03/301) before you refuel the airplane.
- (a) If it is necessary, apply heat (hot air that is resistant to explosion) to the bottom of the wing in the area of the tank sumps.

S 653-150

- (4) If the airplane is parked more than two hours after it is refueled, drain the fuel tank sumps (AMM 12-11-03/301) before departure.
- (a) If it is necessary, apply heat (hot air that is resistant to explosion) to the bottom of the wing in the area of the tank sumps.

S 653-151

- (5) When you refuel the airplane, use these requirements:
- (a) Make sure the fuel temperature is at least 6°F (3°C) above the fuel freeze point or -45.4°F (-43°C), whichever is higher. 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)

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(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 TU-6-10-1458, Fluid I-M (also known as Fluid E- Methanol).
 - a) Fluid I-M may be used at a mixture of no more than 0.15 percent each, by volume.
- 3) Fuel Additive, specification GOST 17477, Fluid TGF.
 - a) Fluid TGF may be used at a mixture of no more than 0.15 percent by volume.
- 4) Fuel Additive, specification TU-6-10-1457, Fluid TGF-M (also known as Fluid TGF- Methanol).
 - a) Fluid TGF-M may be used at a mixture of no more than 0.15 percent each, by volume.

S 583-069

- (6) Do the Park the Airplane (Normal Parking) procedure (AMM 10-11-01/201).

S 423-071

- (7) 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 oil to cool to -40°F (-40°C) can be greatly increased by the use of engine inlet and exhaust covers.

S 883-070

- (8) Do one of the steps that follow to maintain the cabin temperature at or above 32°F (0°C):
- (a) Use the APU or a ground air source to run both ECS packs:
 - 1) Do the Supply Conditioned Air to the Airplane procedure (AMM 21-00-00/201).
 - 2) Use a heater, MARK I COLDBUSTER to heat the airplane through the ground air service connection panel, 193DL.

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S 213-072

- (9) Use the EICAS engine oil temperature indicator to monitor the engine oil temperature.
- (a) To view the oil temperature when the engines are not running, turn on the EEC ground test power.

S 213-147

- (10) Use the procedures in Power Plant Operation (Cold Weather) (AMM 71-00-00/201) to keep the engine oil temperature above -40°F (-40°C).

S 603-076

- (11) Fill the IDG with oil as required (AMM 12-13-03/301).

NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, MIL-L- 7808 instead of MIL-L-23699 lubricant. The only MIL-L-7808 lubricant approved for Sundstrand IDGs is Exxon 2389.

S 213-077

- (12) Visually check the wing lower surface for fuel leaks.

S 213-078

- (13) Visually check the landing gear.
- (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.

S 213-079

- (14) Check the landing gear tire pressure and inflate as required (AMM 12-15-03/301).

S 213-080

- (15) Check the main landing gear shock strut fluid (AMM 12-15-01/301).
- (a) 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 inch.
 - 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.

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- (b) For airplanes originating in a cold environment and terminating in a warm environment, do the following:
 - 1) Perform a single point pressure/extension check.
 - 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 a 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.

S 213-081

- (16) Check the nose landing gear shock strut fluid (AMM 12-15-02/301).
 - (a) 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 inch.
 - 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.
 - (b) For airplanes originating in a cold environment and terminating in a warm environment, do the following:
 - 1) Perform a single point pressure/extension check.
 - 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 a 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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TASK 12-33-02-603-161

3. Return the Airplane to Service After Short Term Parking at Temperatures Below -22°F (-30°C)

A. References

- (1) AMM 12-33-01/301, Cold Weather Maintenance Procedure
- (2) AMM 24-22-00/201, Supply Electrical Power
- (3) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (4) AMM 32-41-10/401, Main Gear Wheel Brake - Removal/Installation
- (5) AMM 32-42-00/501, Antiskid/Autobrake System - Functional Test
- (6) AMM 71-00-00/201, Start the engines (Cold Weather)

B. Procedure

NOTE: Do these steps immediately before flight.

S 083-162

- (1) Remove the covers from the pitot probes and static ports.
 - (a) Make sure there is no ice blocking the pitot probe or static port openings.
 - 1) If ice causes a blockage of the pitot probe or static port openings, carefully apply warm air until the ice melts.

S 863-165

CAUTION: DO NOT APPLY GROUND ELECTRICAL POWER BEFORE THE FLIGHT DECK TEMPERATURE HAS REACHED -4°F (-20°C).

- (2) Provide electrical power (AMM 24-22-00/201).

S 863-164

- (3) Turn on the hydraulic system electric motor pumps 30 minutes before starting the engines (AMM 29-11-00/201).

NOTE: This will make sure the hydraulic system operates normally and will prolong the life of the components.

- (a) Make sure these electric pump switches are in the ON position, on the overhead Hydraulic Control Panel.
 - 1) HYD PUMPS C ELEC I
 - 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 these steps:

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.

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- (c) Leave the motor pumps running until the engine-driven pumps are operating.

S 863-084

- (4) At ambient 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 these steps:
- 1) Provide local warming to the brake.
 - 2) Do the Antiskid/Autobrake System - Functional Test (AMM 32-42-00/501).

NOTE: Do the tasks for the brakes only:
System Interface,
Antiskid Brake Release, and
Autobrake Application.

To do an operational check with the Antiskid Brake Release task, you do not need to install pressure gages at each brake. As an alternative to this, make sure that there is brake piston movement.

- 3) Repeat the test until proper operation is observed.
- 4) If the difficulty continues, replace the brake (AMM 32-41-10/401).

S 203-087

- (5) Make sure the fuel temperature is at least 6°F (3°C) above the fuel freeze point, based on the ASTM method for determining freeze point.
- (a) The fuel temperature must remain above -40°F (-43°C).

S 213-088

- (6) Prepare the airplane for flight (AMM 12-33-01/301).

S 863-089

- (7) Start the engines (Cold Weather) (AMM 71-00-00/201).

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TASK 12-33-02-603-090

4. Overnight or Extended Parking (Airplane Unattended) at Temperatures Below 5°F (-15°C)

A. General

- (1) Use this procedure if the temperature inside the airplane goes below 32°F (0°C) or the engine oil temperature goes below -40°F (-40°C).
- (2) Use the special requirements in this procedure to refuel the airplane in cold weather.

B. References

- (1) AMM 09-11-00/201, Tow the Airplane
- (2) AMM 10-11-01/201, Park the Airplane (Normal Parking)
- (3) AMM 10-11-02/201, Prolonged Parking
- (4) AMM 12-13-03/301, IDG Servicing
- (5) AMM 12-14-01/301, Potable Water System Drain
- (6) AMM 12-17-01/301, Waste Tank Servicing
- (7) AMM 12-33-01/301, Cold Weather Maintenance Procedure
- (8) AMM 24-22-00/201, Supply Electrical Power
- (9) AMM 24-31-01/401, Main Battery Removal/Installation
- (10) AMM 24-31-03/401, APU Battery Removal/Installation
- (11) AMM 33-51-07/201, Power Supply - Battery Pack

C. Consumable Materials

- (1) D00109 Oil - Aircraft turbine engine, synthetic base - MIL-L-7808
- (2) Location Zones
 - 100 Lower Half of Fuselage
 - 200 Upper Half of Fuselage
 - 300 Empennage
 - 400 Powerplant and Nacelle Struts
 - 500 Left Wing
 - 600 Right Wing
 - 700 Landing Gear and Landing Gear Doors
 - 800 Doors

D. Procedure

S 423-091

- (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.

At very low ambient air temperatures, the time for the engine to cool to -40°F (-40°C) can be greatly increased by the use of engine inlet and exhaust covers.

S 553-092

- (2) Do the Cold Weather Maintenance procedure (AMM 12-33-01/301).

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S 503-093

- (3) Do the Park the Airplane (Normal Parking) procedure (AMM 10-11-01/201).

S 503-094

- (4) If the airplane will be parked for longer than 7 days, prepare the airplane for storage for more than seven days (AMM 10-11-02/201).

S 653-152

- (5) When you refuel the airplane, use these requirements:
(a) Make sure the fuel temperature is at least 6°F (3°C) above the fuel freeze point or -45.4°F (-43°C), whichever is higher. 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 10277:
1) TS-1 (TC-1, Russian spelling)
2) RT (PT, 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 TU-6-10-1458, Fluid I-M (also known as Fluid E- Methanol).
a) Fluid I-M may be used at a mixture of no more than 0.15 percent each, by volume.
3) Fuel Additive, specification GOST 17477, Fluid TGF.
a) Fluid TGF may be used at a mixture of no more than 0.15 percent by volume.
4) Fuel Additive, specification TU-6-10-1457, Fluid TGF-M (also known as Fluid TGF- Methanol).
a) Fluid TGF-M may be used at a mixture of no more than 0.15 percent each, by volume.

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S 603-095

- (6) Fill the IDG with oil as required (AMM 12-13-03/301).

NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, MIL-L-7808 instead of MIL-L-23699 lubricant. The only MIL-L-7808 lubricant approved for Sundstrand IDGs is Exxon 2389.

S 213-096

- (7) Visually check the wing lower surface for fuel leaks.

S 213-097

- (8) Visually check the landing gear.
(a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.

S 683-166

CAUTION: MAKE SURE TO DRAIN THE POTABLE WATER SYSTEM. THE POTABLE WATER SYSTEM LINES CAN FREEZE IN COLD WEATHER. IF THE SYSTEM WATER FREEZES, DAMAGE TO THE WATERLINES AND LEAKAGE AROUND THE OUTFLOW VALVE CAN OCCUR.

- (9) Fully drain the potable water system (AMM 12-14-01/301).

S 683-100

- (10) Make sure all galley inserts, coffee pots, water heaters, filters, and boilers are empty and supply lines are drained using the manufacturer's instructions.

S 683-101

WARNING: THE GLYCOL (ANTIFREEZE) MUST NOT CONTAIN ANY FORM OF "STOP LEAK" CHEMICAL AS THIS CAN CAUSE DAMAGE TO THE SYSTEM COMPONENTS.

- (11) If you do not drain the waste system, add glycol.

NOTE: Use the fluid manufacturer's recommendations for mixture ratios (AMM 12-17-01/301).

- (a) If the glycol-water mixture does not provide adequate protection, fully drain the waste system (AMM 12-17-01/301).

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S 623-102

(12) Do the preservation for the electrical/electronic systems.

NOTE: Do not remove the batteries from the emergency radio beacons in the slide/raft covers and life rafts.

- (a) Remove the emergency light batteries, do this task: Power Supply - Battery Pack Replacement (AMM 33-51-07/201).
- (b) Remove the batteries from the power supply module for the emergency lights, do this task: Power Supply - Battery Pack Replacement (AMM 33-51-07/201).
- (c) Remove the megaphone battery.
- (d) Apply electrical power to all of the electrical/electronic equipment remaining in the airplane for a minimum of 2 hours (AMM 24-22-00/201).
 - 1) Look at the EICAS to make sure the main battery and the APU battery are fully charged.
- (e) Put all batteries in a warm location where the temperature stays above 50°F (10°C).

S 553-104

(13) Prepare the airplane for storage:

- (a) Close the outflow valve.
- (b) Open the battery bus circuit breaker.
- (c) Remove the main batteries and APU batteries and put them in a warm location where the temperature stays above 50°F (10°C) (AMM 24-31-01/401 and 24-31-03/401).
- (d) 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.

S 023-148

(14) If you need to tow the airplane, install the main battery and APU battery (AMM 24-31-01/401 and AMM 24-31-03/401).

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WARNING: BOEING DOES NOT RECOMMEND TOWING THE AIRPLANE WHEN ELECTRICAL POWER IS NOT AVAILABLE TO OPERATE THE BRAKE HYDRAULIC SYSTEM. IF TOWING WITHOUT POWER IS REQUIRED, TELL THE TOW VEHICLE DRIVER. 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. WITHOUT ELECTRICAL POWER, THERE IS ONLY ACCUMULATOR PRESSURE AVAILABLE TO OPERATE THE BRAKES THREE (3) TIMES. IF YOU DO NOT OBEY THIS WARNING, IT CAN CAUSE INJURY TO PERSONS OR DAMAGE TO THE AIRPLANE.

(a) Tow the airplane (AMM 09-11-00/201).

NOTE: With a minimum of 2800 psi, 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.

(b) Remove the main batteries and APU batteries and put them in a warm location where the temperature stays above 50°F (10°C) (AMM 24-31-01/401 and 24-31-03/401).

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TASK 12-33-02-603-105

5. Return the Airplane to Service After overnight or Extended Parking at Temperatures Below 5°F (-15°C)

A. General

- (1) If the temperature has remained above -40°F (-40°C), Main Deck warming is not necessary.
- (2) For temperatures below -4°F (-20°C), make sure the flight deck is warmed and maintained at -4°F (-20°C) for 30 minutes.
- (3) If the temperature has been below -40°F (-40°C) within the last 12 hours, warm the airplane.

B. References

- (1) AMM 10-11-02/201, Prolonged Parking
- (2) AMM 12-11-01/301, Fuel Tank Pressure Fueling
- (3) AMM 12-13-03/301, IDG Servicing
- (4) AMM 12-15-01/301, Main Gear Shock Strut Servicing
- (5) AMM 12-15-02/301, Nose Gear Shock Strut Servicing
- (6) AMM 12-15-03/301, Landing Gear Tires
- (7) AMM 12-15-08/301, Oxygen
- (8) AMM 12-33-01/301, Cold Weather Maintenance
- (9) AMM 20-41-00/201, Static Grounding
- (10) AMM 21-00-00/201, Air Conditioning
- (11) AMM 22-10-00/501, Autopilot (Flight Controls)
- (12) AMM 24-22-00/201, Supply Electrical Power
- (13) AMM 24-31-01/401, Main Battery Removal/Installation
- (14) AMM 24-31-03/401, APU Battery Removal/Installation
- (15) AMM 29-11-00/201, Main (Left, Right, and Center) Hydraulic Systems
- (16) AMM 32-41-10/401, Main Landing Gear Brake Removal/Installation
- (17) AMM 33-51-00/501, Emergency Lights - Functional Test
- (18) AMM 33-51-07/201, Power Supply - Battery Pack
- (19) AMM 49-11-00/201, APU Starting and Operation
- (20) AMM 71-00-00/201, Power Plant

C. Equipment

- (1) MARK I COLDBUSTER Heater - External Cabin, Trailer Mounted, Diesel Powered, Spencer Industries, Inc. (Vendor Code 12008)
8410 Dallas Ave. S., Seattle WA 98108-4423
- (2) B12007-1 Ladder

D. Consumable Materials

- (1) D00109 Oil, Aircraft turbine engine, synthetic base - MIL-L-7808

E. Access

(1) Location Zones

- | | |
|-----|-------------------------------------|
| 100 | Lower Half of Fuselage |
| 200 | Upper Half of Fuselage |
| 300 | Empennage |
| 400 | Power Plant and Nacelle Struts |
| 500 | Left Wing |
| 600 | Right Wing |
| 700 | Landing Gear and Landing Gear Doors |
| 800 | Doors |

(2) Access Panels

- (a) 113AL Forward Equipment Bay Access Panel

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- (b) 119BL Main Equipment Center Access Panel
- (c) 193DL Conditioned Air Ground Service Panel.

F. Procedure

S 663-106

CAUTION: 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 DRAIN VALVE UNIT 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, CONTINUE TO APPLY HOT AIR FOR A SHORT TIME, AND FREQUENTLY DO A CHECK OF THE FLOW FROM THE DRAIN. CATCH THE FUEL IN A CONTAINER AND MAKE SURE ALL OF THE WATER IS REMOVED.

- (1) If the airplane is parked more than 45 minutes before it is refueled, drain the fuel tank sumps (AMM 12-11-03/301) before you refuel the airplane.
 - (a) If it is necessary, apply heat (hot air that is resistant to explosion) to the bottom of the wing in the area of the tank sumps.

S 653-153

- (2) If the airplane is parked more than two hours after it is refueled, drain the fuel tank sumps (AMM 12-11-03/301) before departure.
 - (a) If it is necessary, apply heat (hot air that is resistant to explosion) to the bottom of the wing in the area of the tank sumps.

S 553-107

- (3) Do the Cold Weather Maintenance procedure (AMM 12-33-01/301).

S 553-108

- (4) Put the airplane back to a serviceable condition after storage (AMM 10-11-02/201).

S 883-109

- (5) If the ambient temperature is -40°F (-40°C) or below within the last 12 hours, do these steps:
 - (a) Secure the lavatory doors in the open position.

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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 these steps:

NOTE: It will take approximately 60 minutes to raise the flight deck temperature from -54°F (-65°C) to -4°F (-20°C) with the YMP-350 heating unit.

- 1) Put the outflow valve to the OPEN position.
- 2) Connect one heating hose to the 193DL conditioned air ground service panel.
- 3) Open the access panel 119BL and gain access with a B12007-1 Ladder or equivalent.
- 4) Insert two heating hoses in the main equipment center through the access panel 119BL.
- 5) Insert one heating hose into the forward equipment bay through the access panel 113AL.
- 6) Keep the flight deck temperature at or above -4°F (-20°C) for 30 minutes before you remove the heating equipment.

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 a single heating hose (Herman Nelson heater), do these steps:

- 1) Connect the heating hose to the 193DL conditioned air ground service panel.
- 2) Open the access panel 119BL and gain access with a B12007-1 Ladder or equivalent.
- 3) Attach the return hose to the 119BL main equipment center bay door.
- 4) Keep the flight deck temperature at or above -4°F (-20°C) for 30 minutes before you remove the heating equipment.

(d) Use the procedures in (AMM 71-00-00/201) to warm the engines.

NOTE: It is not necessary to complete the engine warming before proceeding to the following steps.

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S 633-110

- (6) Activate the electrical/electronic systems.

NOTE: Before electrical power is applied, visually make sure all control lever positions agree with the movable control surfaces.

- (a) Make sure there is an electrical ground on the airplane (AMM 20-41-00/201).
 - 1) Do the Park the Airplane (Normal Parking) procedure (AMM 10-11-02/201).
- (b) Make sure all switches that are not necessary are in the OFF position.

NOTE: This does not include the switches to activate the systems.

- (c) Install the main batteries (AMM 24-31-01/401).
- (d) Install the APU battery (AMM 24-31-03/401).
- (e) Install the emergency light batteries (AMM 33-51-07/201).
 - 1) If the emergency light batteries stayed on the airplane during storage, do these steps:

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.
- (f) 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 slide/raft covers and the life raft. These batteries are only activated when they are touched by water.

- 2) Install the flashlight, megaphone, 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.

- (g) Close all of the applicable circuit breakers for the electronic/electrical components.

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(h) Close the circuit breaker 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.

(i) Close all of the applicable circuit breakers on the overhead circuit breaker panels.

(j) Close the circuit breakers on the main power distribution panels.

CAUTION: DO NOT APPLY GROUND ELECTRICAL POWER BEFORE THE FLIGHT DECK TEMPERATURE HAS REACHED -4°F (-20°C).

(k) Apply electrical power to all the electrical/electronic equipment for a minimum of 2 hours (AMM 24-22-00/201).

1) Make sure the main and APU batteries are fully charged.

CAUTION: 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.

2) 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.

3) Do the system test of the emergency light system (AMM 33-51-00/501).

(l) Make sure the applicable switches are returned to the correct position after the power is turned on.

S 863-111

(7) After the flight deck temperature has been kept at or above -4°F (-20°C) for 30 minutes, do these steps:

(a) Disconnect the ground cart.

(b) Close all panels as applicable.

1) Remove the heating hose to the air conditioned air ground service panel, 193DL.

2) Remove the B12007-1 Ladder from access panel, 119BL.

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- 3) Remove the heating hoses in the Main Equipment Center Access Panel, 119BL.
- 4) Make sure the main equipment center bay door 119BL is closed.
- 5) Remove the heating hose in the Forward Equipment Bay Access Panel, 113AL.
- 6) Make sure the forward equipment bay door 113AL is closed.
- (c) Make sure the outflow valves are in the OPEN position.
- (d) Close the battery bus circuit breakers.
- (e) Start the APU with the battery or ground power (AMM 49-11-00/201) .

NOTE: To improve starting capability of the APU at temperatures below -40°F (-40°C), it may be desirable to use low viscosity oil (MIL-L-7808).

The EICAS may indicate low APU oil quantity for the first 5 minutes after the APU start or until the APU has warmed up.

- (f) Make sure the recirculation fan switches are in the ON position.
- (g) Close the pack and zone circuit breakers if they are open.
- (h) Put all zone selectors in the 12 o'clock position.
- (i) Make sure the Trim Air switches are ON.
- (j) Turn the left and right pack switches to AUTO (AMM 21-00-00/201).

S 863-112

CAUTION: 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.

- (8) Turn on the hydraulic system electric motor pumps 30 minutes before starting the engines.

NOTE: This will make sure the hydraulic system operates normally and will prolong the life of the components.

- (a) Use alternating current motor pump to pressurize the main hydraulic system (AMM 29-11-00/201).
- (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
- (c) Leave the motor pumps running until the engine-driven pumps are operating.

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- (d) If the hydraulic pressure in one system increases, then drops to zero, do these steps:

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.

S 863-113

- (9) Do these functions of the flight control systems:

- (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) You must complete at least 10 cycles of each control to near full travel.
 - 2) 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 trim switch.
- (c) Select the flaps to the full down position and wait for the flaps to reach the full down position.
- (d) Select the flaps to the full up position and wait for the flaps to reach the full up position.
- (e) Prepare for the autopilot check (AMM 22-10-00/501).
- 1) Set the autopilot stab trim cutout switch, on the control stand, to the CUTOUT position.

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- 2) Make sure hydraulic power is applied to the the left and right hydraulic systems (AMM 29-11-00/201).
- (f) Operate the autopilot servos:
- 1) Engage one autopilot channel.
 - 2) Engage vertical speed mode.
 - a) Select vertical speed of 2000 fpm and wait for the column motion to stop.
 - b) Select vertical speed of -2000 fpm and wait for the column motion to stop.
 - 3) Engage heading select mode.
 - a) Select 30 degree heading change to the left of the airplane heading and wait for wheel motion to stop.

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- b) Select 30 degree heading change to the right of the airplane heading and wait for wheel motion to stop.
- 4) Repeat steps 1 thru 3 for the other two autopilot channels.

S 863-114

- (10) At temperatures below -22°F (-30°C) pump the brake pedal (8) times shortly before starting the engines. At each wheel, verify extension/retraction of brake pistons.
 - (a) If brake operation is not normal, do these steps:
 - 1) Provide local warming to the brake.
 - 2) Repeat the test until proper operation is observed.
 - 3) If the difficulty persists, replace the brake (AMM 32-41-10/401).

S 203-115

- (11) Inspect the wheel wells for ice/snow/slush on the Alternate Landing Gear System Components. Clear as necessary.

S 603-116

- (12) Fill the IDG with oil as required (AMM 12-13-03/301).

NOTE: If the IDG is serviced for cold weather operation, use the preferred oil, MIL-L-7808 lubricant instead of MIL-L-23699 lubricant. The only MIL-L-7808 lubricant approved for Sundstrand IDGs is Exxon 2389.

S 213-117

- (13) Visually check the wing lower surface for fuel leaks.

S 213-118

- (14) Visually check the landing gear.
 - (a) Wipe the inner cylinder with a clean cloth to check for hydraulic leakage from the seals.

S 213-119

- (15) Check the tire pressure and inflate the tires as required (AMM 12-15-03/301).

S 213-120

- (16) Check the main gear shock strut and service as required (AMM 12-15-01/301).
 - (a) 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 inch.
 - 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.

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- (b) For airplanes originating in a cold environment and terminating in a warm environment, do the following:
- 1) Perform a single point pressure/extension check.
 - 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 a 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.

S 213-121

- (17) Check the nose gear shock strut, and service as required (AMM 12-15-02/301).
- (a) 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 inch.
 - 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.
- (b) For airplanes originating in a cold environment and terminating in a warm environment, do the following:
- 1) Perform a single point pressure/extension check.
 - 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 a 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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S 863-122

(18) When you refuel the airplane, use these requirements:

- (a) Make sure the fuel temperature is at least 6°F (3°C) above the fuel freeze point or -45.4°F (-43°C), whichever is higher. 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)

(b) 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 TU-6-10-1458, Fluid I-M (also known as Fluid E- Methanol).
 - a) Fluid I-M may be used at a mixture of no more than 0.15 percent each, by volume.
- 3) Fuel Additive, specification GOST 17477, Fluid TGF.
 - a) Fluid TGF may be used at a mixture of no more than 0.15 percent by volume.
- 4) Fuel Additive, specification TU-6-10-1457, Fluid TGF-M (also known as Fluid TGF- Methanol).
 - a) Fluid TGF-M may be used at a mixture of no more than 0.15 percent each, by volume.

S 603-123

(19) Start the engines (AMM 71-00-00/201).

S 803-126

(20) 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 (AMM 12-15-08/301).

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