CHAPTER

78

EXHAUST

BOEING

737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 78
EXHAUST

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

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EXHAUST - DDG MAINTENANCE PROCEDURES

1. General

A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Procedures Guide (DDPG). These tasks prepare the airplane for flight with systems/components that are inoperative.

B. This procedure also has the tasks that put the airplane back to its usual condition.

C. These are the task for the components in the exhaust system:

(1) MMEL 78-1 (DDPG) Preparation - Thrust Reversers Inoperative.

(2) MMEL 78-1 (DDPG) Restoration - Thrust Reversers Inoperative.

TASK 78-00-00-040-801-F00

2. MMEL 78-1 (DDPG) Preparation - Thrust Reversers Inoperative

(Figure 901), (Figure 902)

A. General

(1) This task gives the maintenance steps which prepare the airplane for flight with the thrust reversers inoperative.

(2) These are the conditions for this task:

(a) One reverser may be inoperative provided the inoperative reverser is secured in the forward thrust position.

NOTE: Some or all of the EAU Fault Lights can be ON for the deactivated thrust reverser.

1) No EAU Fault Lights should be ON for the active thrust reverser

2) Open the applicable circuit breakers and attach lock collars.

3) Install the 315A2258-2 deactivation pins [1] (two in each thrust reverser sleeve) in the left and right thrust reverser sleeves.

NOTE: The four deactivation pins are located in the 012A8102 fly-away kit. The fly-away kit bag is marked 737NG GROUND SUPPORT EQUIPMENT.

4) You must make sure that the sync locks are in the locked position.

NOTE: There are two procedures that can be used to make sure that the sync locks are in the locked position. The first one is used if the thrust reverser can be stowed and deployed with hydraulic power. The second is used if the thrust reverser will not stow or deploy with hydraulic power.

5) Lockwire the reverse thrust lever to the applicable forward thrust lever.

6) Attach a REVERSER INOP tag on the reverse thrust lever.

7) Attach an INOP tag on the REVERSER light on the aft P5 panel.

B. References

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pins	25-10-00-01-010	HAP 001-007

E. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Thrust Reversers That Will Deploy and Stow With Hydraulic Power

SUBTASK 78-00-00-860-001-F00

(1) If the thrust reverser will deploy and stow with hydraulic power, do these steps to make sure that the sync locks will lock:

(a) For the applicable engine, make sure that the start lever is in the CUTOFF position.

1) Attach a DO-NOT-OPERATE tag.

(b) Make sure that the applicable thrust lever is in the idle position.

1) Attach a DO-NOT-OPERATE tag.

(c) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(d) Pressurize the applicable hydraulic system, do this task: (Hydraulic System A or B Pressurization, TASK 29-11-00-860-801)

1) For Engine 1, pressurize hydraulic system A.

2) For Engine 2, pressurize hydraulic system B.

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AFT OF THE APPLICABLE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Slowly move the applicable reverse thrust lever up and aft to extend (deploy) the thrust reverser.

(f) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

(g) For engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK

(h) Slowly move the applicable reverse thrust lever down and forward to the retract (stow) position.

1) Make sure that the thrust reverser sleeves do not retract (stow).

NOTE: This is the indication that the sync locks are in the locked position.

(i) Slowly move the applicable reverse thrust lever up and aft to the extend (deploy) position.

(j) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

(k) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK

(l) Do these steps to reset the EAU to clear the deploy and stow faults that were set in the previous steps:

NOTE: The EAU reset will clear the fault lights that were set during the sync lock test above. The fault that are the reason for this thrust reverser deactivation will still exist, and those fault lights will stay on.

1) To get access to the EAU, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

NOTE: The EAU is on the E3-2 shelf.

2) Push and hold the FAULT RESET button on the EAU for a minimum of two seconds.

3) Then wait for at least 30 seconds.

4) Make sure all the fault lights go off.

(m) Slowly move the applicable reverse thrust lever down and forward to retract (stow) the thrust reverser.

(n) For Engine 1, open these circuit breakers and install safety locks:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

(o) For Engine 2, open these circuit breakers and install safety locks:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

(p) Do these steps to install the 315A2258-2 deactivation pins [1] in the left and right thrust reverser sleeves on the applicable engine:

NOTE: The four deactivation pins are painted red and are part of the 012A8102 fly-away kit. The fly-away kit bag is marked 737NG GROUND SUPPORT EQUIPMENT. You must install two deactivation pins in each of the thrust reverser sleeves.

1) Get the four deactivation pins [1] that are in the fly-away kit.
2) Put Never-Seez NSBT-8N compound, D00006 on the threads of the 315A2258-2 deactivation pins [1].
3) Install two deactivation pins [1] in the right thrust reverser sleeve and two deactivation pins [1] in the left thrust reverser sleeve.
   a) Make sure that the deactivation pins [1] go through the deactivation pin holes and into the aft cascade support ring.
   b) Tighten the deactivation pins [1] to 110 to 125 inch pounds (12.4 to 14.1 Newton meters).

      NOTE: The upper deactivation pin protrudes from the outer cowl approximately 1.75 inches (44.5 mm). The lower deactivation pin protrudes from the outer cowl approximately 0.50 inch (12.7 mm)

(q) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

(r) Remove the DO-NOT-OPERATE tag from the start lever.

(s) Remove the DO-NOT-OPERATE tag from the thrust levers.

(t) Lockwire the reverse thrust lever to the applicable forward thrust lever.

(u) Install a REVERSER INOP tag on the applicable reverse thrust lever.

(v) Install an INOP tag on the REVERSER light on the aft P5 panel.

H. Thrust Reversers That Will Not Deploy and Stow With Hydraulic Power

SUBTASK 78-00-00-040-001-F00

(1) If the thrust reverser will not deploy and stow with hydraulic power, do these steps to make sure that there is no power to the sync locks:

(a) For Engine 1, open this circuit breaker and install safety lock:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

(b) For Engine 2, open this circuit breaker and install safety lock:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK

(c) Do this check of the EAU to make sure that there is no power to the sync lock:

1) To get access to the EAU, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

NOTE: The EAU is on the E3-2 shelf.

2) Push and hold the T/R STOW FAULTS switch for the applicable engine.

3) Make sure that all of the lights come on for approximately one second.

4) Make sure that these lights go off for the applicable engine:

a) V148 L SLEEVE SYNC LOCK PWR

b) V150 R SLEEVE SYNC LOCK PWR

5) Release the T/R STOW FAULTS switch.

6) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

(d) If the SYNC LOCK PWR lights go off, do these steps to install the 315A2258-2 deactivation pins [1] in the left and right thrust reverser sleeves on the applicable engine:

NOTE: The four deactivation pins are painted red and are part of the 012A8102 fly-away kit. The fly-away kit bag is marked 737NG GROUND SUPPORT EQUIPMENT. You must install two deactivation pins in each of the thrust reverser sleeves.

1) For Engine 1, open this circuit breaker and install safety lock:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

2) For Engine 2, open this circuit breaker and install safety lock:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

3) Get the four deactivation pins [1] that are in the fly-away kit.

4) Put Never-Seez NSBT-8N compound, D00006 on the threads of the 315A2258-2 deactivation pins [1].

5) Install two deactivation pins [1] in the right thrust reverser sleeve and two deactivation pins [1] in the left thrust reverser sleeve.
   a) Make sure that the deactivation pins [1] go through the deactivation pin holes and into the aft cascade support ring.
   b) Tighten the deactivation pins [1] to 110 to 125 inch pounds (12.4 to 14.1 Newton meters).

      NOTE: The upper deactivation pin protrudes from the outer cowl approximately 1.75 inches (44.5 mm). The lower deactivation pin protrudes from the outer cowl approximately 0.50 inches (12.7 mm)

6) Lockwire the reverse thrust lever to the applicable forward thrust lever.
7) Install a REVERSER INOP tag on the applicable reverse thrust lever.
8) Install an INOP tag on the REVERSER light on the aft P5 panel.

(e) If the SYNC LOCK PWR lights stay on, do these steps:

1) For Engine 1, open this circuit breaker and install safety lock:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

2) For Engine 2, open this circuit breaker and install safety lock:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

3) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.
4) Disconnect the electrical connectors from the sync locks on the left and right thrust reversers on the applicable engine.
   a) For the left thrust reverser, disconnect electrical connector, D1008.
   b) For the right thrust reverser, disconnect electrical connector, D1016.
   c) Put a protection cap on the electrical connectors and receptacles.
   d) Safety the electrical connectors to the thrust reverser with a tie strap or tape.
5) Do these steps to install the 315A2258-2 deactivation pins [1] in the left and right thrust reverser sleeves on the applicable engine:

   NOTE: The four deactivation pins are painted red and are part of the 012A8102 fly-away kit. The fly-away kit bag is marked 737NG GROUND SUPPORT EQUIPMENT. You must install two deactivation pins in each of the thrust reverser sleeves.

   a) Get the four deactivation pins [1] that are in the fly-away kit.
   b) Put Never-Seez NSBT-8N compound, D00006 on the threads of the 315A2258-2 deactivation pins [1].
   c) Install two deactivation pins [1] in the right thrust reverser sleeve and two deactivation pins [1] in the left thrust reverser sleeve.
   d) Make sure that the deactivation pins [1] go through the deactivation pin holes and into the aft cascade support ring.

e) Tighten the deactivation pins [1] to 110 to 125 inch pounds (12.4 to 14.1 Newton meters).

NOTE: The upper deactivation pin protrudes from the outer cowl approximately 1.75 inches (44.5 mm). The lower deactivation pin protrudes from the outer cowl approximately 0.50 inches (12.7 mm)

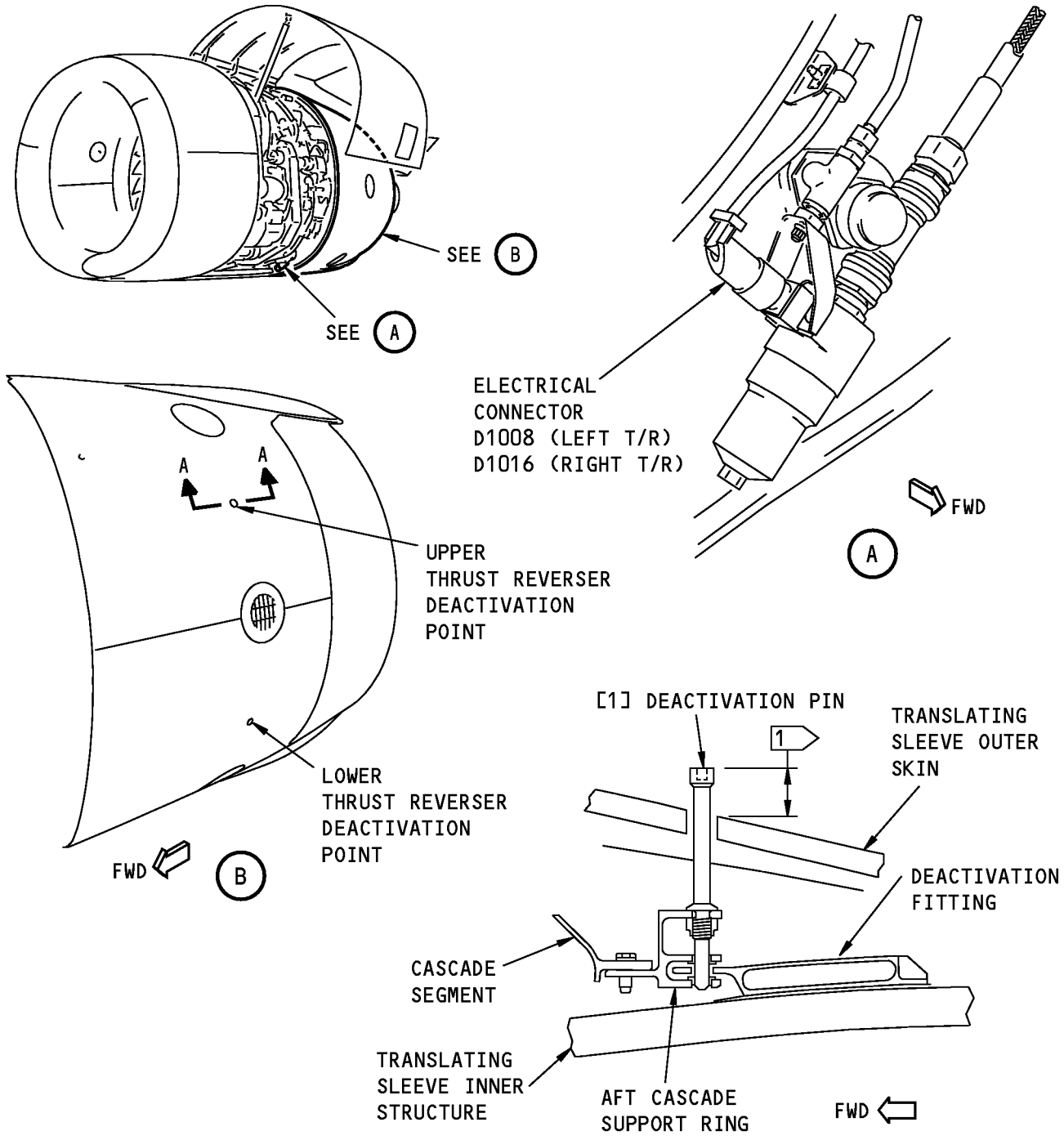
6) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

7) Lockwire the reverse thrust lever to the applicable forward thrust lever.

8) Install a REVERSER INOP tag on the applicable reverse thrust lever.

9) Install an INOP tag on the REVERSER light on the aft P5 panel.

END OF TASK

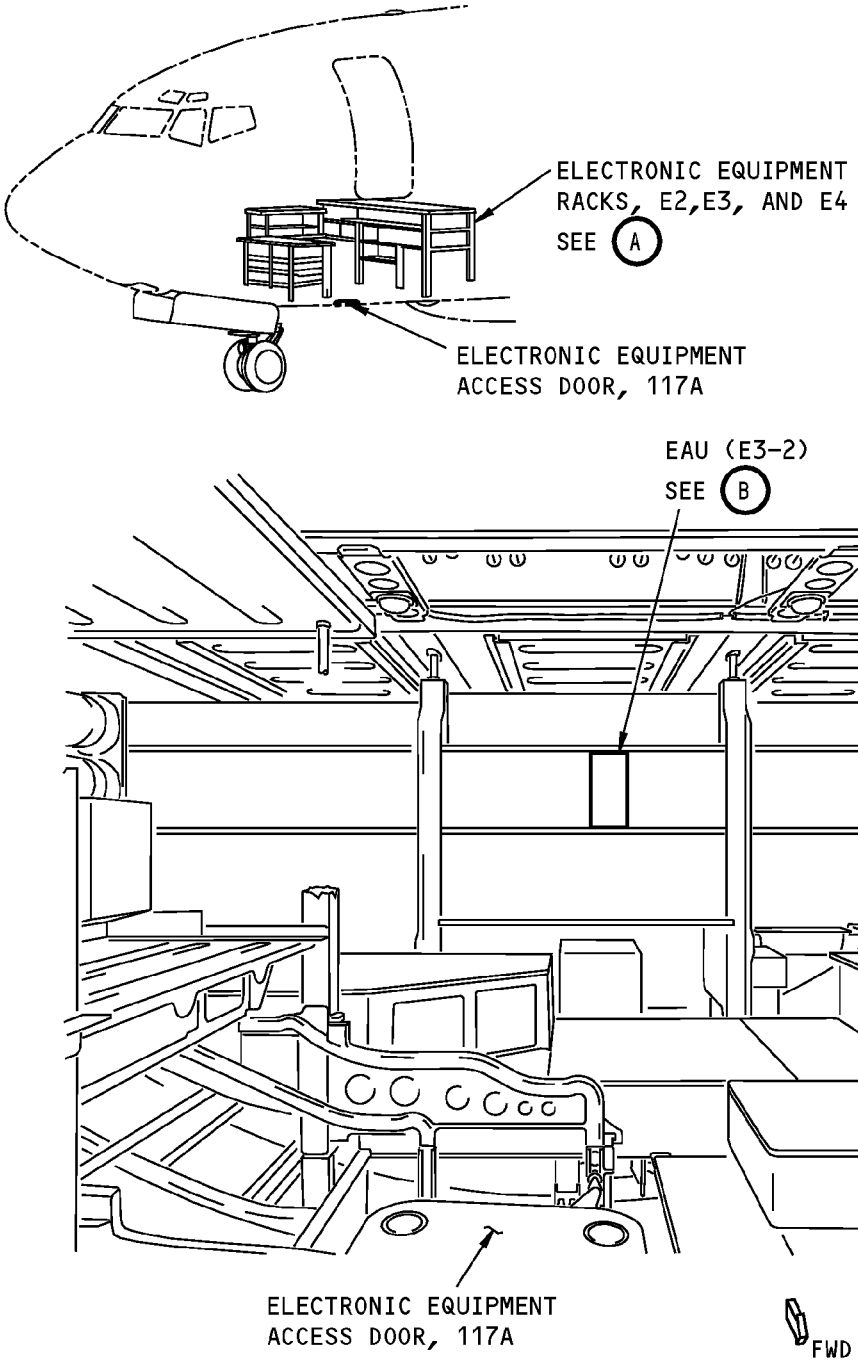


NOTE: LEFT THRUST REVERSER IS SHOWN, RIGHT THRUST REVERSER IS THE SAME.

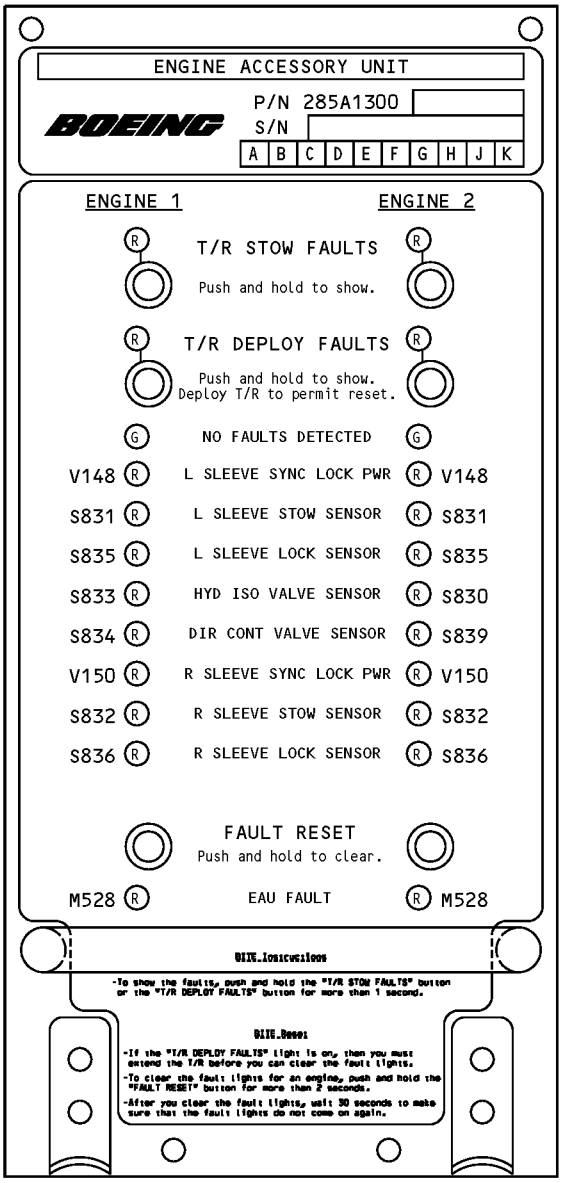
A–A

1 UPPER DEACTIVATION PIN - PROTRUDES APPROXIMATELY 1.75 INCHES (44.5mm)
LOWER DEACTIVATION PIN - PROTRUDES APPROXIMATELY 0.50 INCH (12.7mm)

Thrust Reverser Sleeve Deactivation
Figure 901/78-00-00-990-801-F00



Engine Accessory Unit (EAU)
Figure 902 (Sheet 1 of 2)/78-00-00-990-802-F00



ENGINE ACCESSORY UNIT

B

Engine Accessory Unit (EAU)
Figure 902 (Sheet 2 of 2)/78-00-00-990-802-F00

TASK 78-00-00-440-801-F00

3. MMEL 78-1 (DDPG) Restoration - Thrust Reversers Inoperative

(Figure 901), (Figure 902)

A. General

(1) This task puts the airplane back to its usual condition after operation with the thrust reversers inoperative.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Procedure

SUBTASK 78-00-00-440-001-F00

(1) Remove the 315A2258-2 deactivation pins [1] from the left and right thrust reverser sleeves on the applicable engine:

NOTE: You must remove the two deactivation pins from each of the thrust reverser sleeves.

(a) Put the four deactivation pins [1] in the 012A8102 fly-away kit and stow on the airplane.

NOTE: The fly-away kit bag is marked 737NG GROUND SUPPORT EQUIPMENT.

SUBTASK 78-00-00-860-002-F00

(2) If the electrical connectors were disconnected from the sync locks, do these steps for the applicable engine:

(a) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

(b) Connect the electrical connectors to the sync locks on the left and right thrust reversers:

1) For the left thrust reverser, connect electrical connector, D1008.

2) For the right thrust reverser, connect electrical connector, D1016.

SUBTASK 78-00-00-860-003-F00

(3) For Engine 1, remove the safety locks and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-00-00-860-004-F00

(4) For Engine 2, remove the safety locks and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

SUBTASK 78-00-00-860-005-F00

(5) Remove the lockwire and REVERSER INOP tag from the applicable reverse thrust lever.

SUBTASK 78-00-00-860-006-F00

(6) Remove the INOP tag from the REVERSER light on the aft P5 panel.

SUBTASK 78-00-00-810-001-F00

(7) Do the applicable fault isolation task in the FIM to correct the problem.

SUBTASK 78-00-00-410-001-F00

(8) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00‘.

——————— END OF TASK ———————

TURBINE EXHAUST SYSTEM - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has two tasks:

(1) A visual check of the labyrinth seals on the primary nozzle and the fire barriers that are on the aft cowl panels on the left and right thrust reversers.

(2) A visual check of the primary nozzle and plug for damage.

TASK 78-11-00-210-801-F00

2. Labyrinth Seal and Fire Barrier Inspection

(Figure 601)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This is a scheduled maintenance task to do a visual check of the labyrinth seals that are on the primary nozzle. This task also does a visual check of the fire barriers that are installed on the aft cowl panels on the left and right thrust reversers on an engine.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
SRM 54-30-02	Structural Repair Manual
SRM 54-40-02	Structural Repair Manual

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
417	Engine 1 - Primary Exhaust Nozzle and Plug
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right
427	Engine 2 - Primary Exhaust Nozzle and Plug

D. Prepare for the Inspection

SUBTASK 78-11-00-010-001-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Procedure

SUBTASK 78-11-00-210-001-F00

(1) Do a visual check of the labyrinth seals on the primary nozzle for damage:

(a) Cracks, nicks, gouges, scratches, holes or punctures.

1) If you find damage, refer to the SRM 54-40-02 for the permitted limits.

2) If you find damage that is more than the limits, replace the labyrinth seals Component Maintenance Manual (CMM) 78-11-37.

SUBTASK 78-11-00-210-002-F00

(2) Do a visual check for missing labyrinth seals and loose or missing bolts that hold each labyrinth seal in its position:

(a) If you find missing labyrinth seals, replace the labyrinth seals CMM 78-11-37.

(b) If you find missing bolts, replace the bolts CMM 78-11-37.

(c) If you find loose bolts, tighten the bolts.

1) Tighten the bolts to 72-88 pound-inches (8.1-9.9 Newton meters).

SUBTASK 78-11-00-210-003-F00

(3) Do a visual check of the fire barriers on the aft cowl of the left and right thrust reversers for damage as follows:

(a) Cracks, gouges, scratches, dents, holes, punctures and corrosion.

1) If you find damage, refer to the SRM 54-30-02 for the permitted limits.

2) If you find damage that is more than the limits, replace the fire barriers SRM 54-30-02.

SUBTASK 78-11-00-210-004-F00

(4) Do a visual check for missing fire barriers and for loose or missing rivets that hold each fire barrier in its position.

(a) Missing fire barriers are not serviceable.

(b) Replace missing fire barriers and missing or loose rivets SRM 54-30-02.

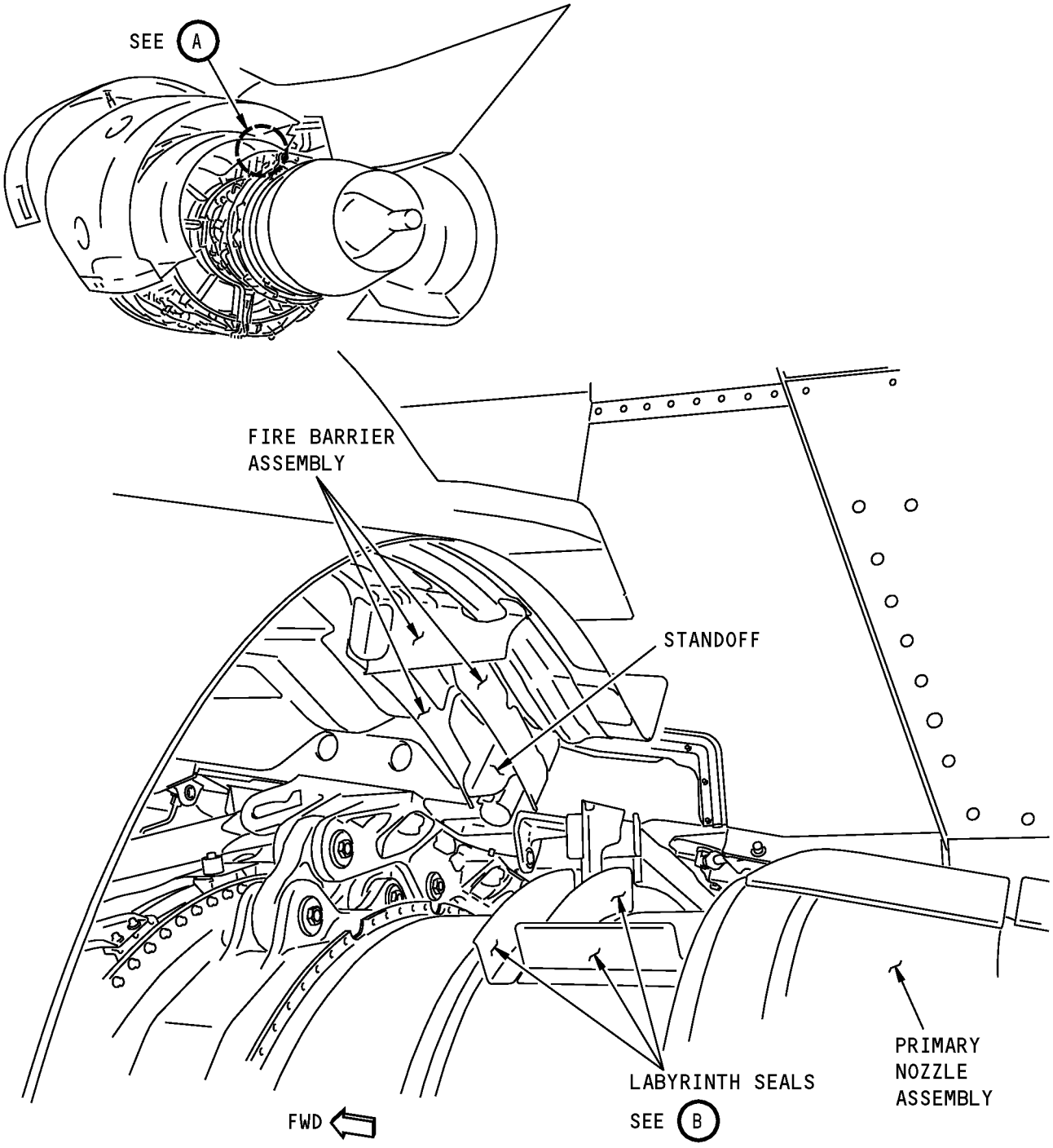
F. Put the Airplane Back to its Usual Condition

SUBTASK 78-11-00-410-001-F00

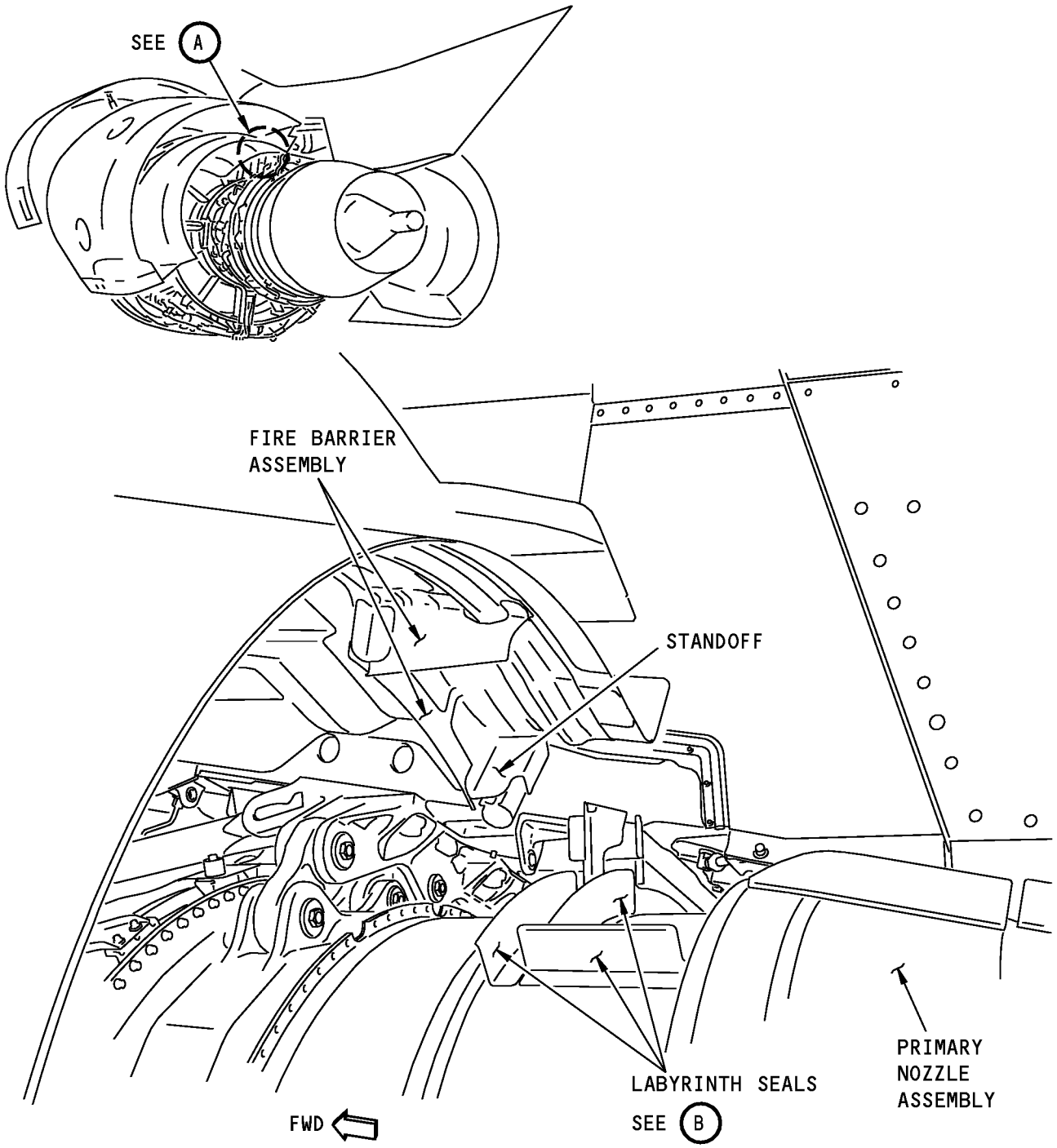
WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

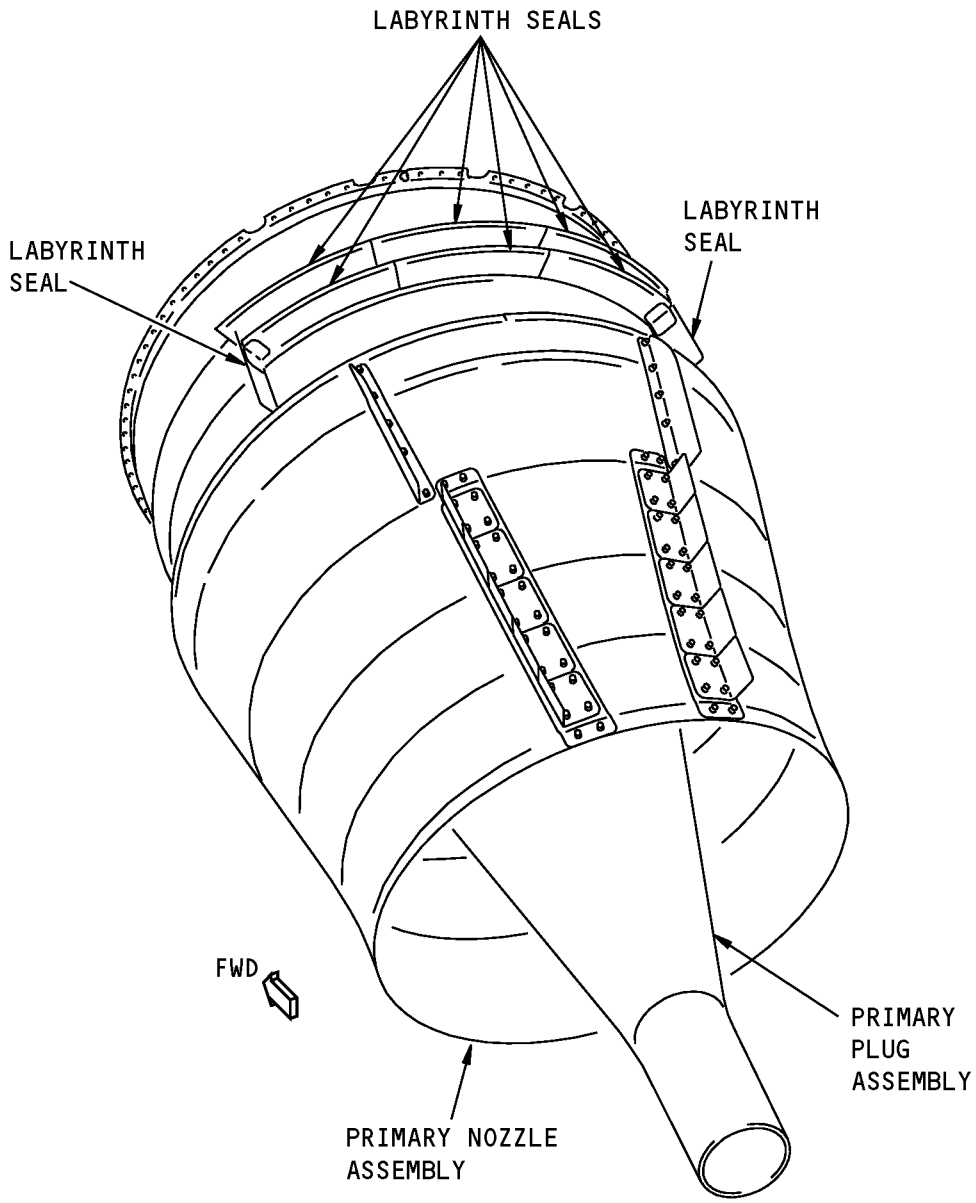
——————— END OF TASK ———————



Turbine Exhaust System Inspection
Figure 601 (Sheet 1 of 3)/78-11-00-990-801-F00



Turbine Exhaust System Inspection
Figure 601 (Sheet 2 of 3)/78-11-00-990-801-F00



NOTE: SOME ENGINE COMPONENTS ARE NOT SHOWN.

LABYRINTH SEALS

B

Turbine Exhaust System Inspection
Figure 601 (Sheet 3 of 3)/78-11-00-990-801-F00

TASK 78-11-00-210-802-F00

3. Primary Nozzle Assembly and Primary Plug Assembly Inspection

(Figure 601)

A. General

(1) This task is for a visual check of the primary nozzle assembly and primary plug assembly for damage.

B. References

Reference	Title
78-11-01-400-801-F00	Primary Nozzle Assembly Installation (P/B 401)
78-11-02-400-801-F00	Primary Plug Assembly Installation (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
SRM 54-40-02	Structural Repair Manual

C. Location Zones

Zone	Area
417	Engine 1 - Primary Exhaust Nozzle and Plug
427	Engine 2 - Primary Exhaust Nozzle and Plug

D. Prepare for the Inspection

SUBTASK 78-11-00-010-002-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Procedure

SUBTASK 78-11-00-210-005-F00

(1) Do a visual check of the primary nozzle assembly and primary plug assembly for damage as follows:

(a) Nicks, gouges, scratches, cracks, dents, holes or punctures.

1) If you find nicks, gouges, scratches, cracks or dents, refer to the SRM 54-40-02 for the permitted limits and repair procedures.

2) For the primary nozzle assembly, if you find holes or punctures, refer to the Component Maintenance Manual (CMM) 78-11-37 for the permitted limits and repair procedures.

3) For the primary plug assembly, if you find holes or punctures, refer to the CMM 78-11-38 for the permitted limits and repair procedures.

SUBTASK 78-11-00-210-006-F00

(2) Do a visual check for loose or missing bolts that hold the primary nozzle assembly and primary plug assembly in its position:

(a) Loose or missing bolts are not serviceable.

1) For the primary nozzle assembly, replace and tighten the bolts Primary Nozzle Assembly Installation, TASK 78-11-01-400-801-F00.

2) For the primary plug assembly, replace and tighten the bolts Primary Plug Assembly Installation, TASK 78-11-02-400-801-F00.

SUBTASK 78-11-00-220-001-F00

(3) Do a visual inspection of the primary nozzle for aft weld seam.

(a) Cracks.

1) For a crack not more than 3.0 inches (76.2 mm) in length, continued operation is permitted with the conditions that follow:

a) The ends of the crack are stop drilled with a 0.25 inch (6.35 mm) diameter hole.

b) You must do daily inspections.

2) For a crack not more than 6.0 inches (152.4 mm) in length, one revenue flight will be permitted with the conditions that follow:

a) The crack occurs in the outboard lower quadrant (6 o'clock to 9 o'clock when aft looking forward on engine #1, and 6 o'clock to 3 o'clock when aft looking forward on engine #2).

b) The ends of the crack are stop drilled with a 0.25 inch (6.35 mm) diameter hole.

3) For a crack not more than 15.0 inches (381.0 mm) in length, one ferry flight is permitted with the conditions that follow:

a) The crack occurs in the outboard lower quadrant (6 o'clock to 9 o'clock when aft looking forward on engine #1, and 6 o'clock to 3 o'clock when aft looking forward on engine #2).

b) The ends of the crack are stop drilled with a 0.25 inch (6.35 mm) diameter hole.

c) During flight, monitor the EGT vs. rotor speeds (N1 & N2) of both engines. Compare the engine parameters of the two engines, and if the engine with the cracked nozzle changes significantly relative to the other engine, then its power should be reduced to idle. This change in engine parameters could be an indication of imminent nozzle separation.

F. Put the Airplane Back to its Usual Condition

SUBTASK 78-11-00-410-002-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——————— END OF TASK ———————

PRIMARY NOZZLE ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the primary nozzle assembly.

(2) The installation of the primary nozzle assembly.

TASK 78-11-01-000-801-F00

2. Primary Nozzle Assembly Removal

(Figure 401), (Figure 402)

A. General

(1) This task is for the removal of the primary nozzle assembly.

(2) The primary nozzle assembly is found on the aft end of the power plant, attached to the turbine rear frame.

(3) For this procedure, the primary nozzle assembly will be referred to as the nozzle.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2419	Equipment - Handling, Primary Exhaust Sleeve and Plug (Part #: C78009-33, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
417	Engine 1 - Primary Exhaust Nozzle and Plug
427	Engine 2 - Primary Exhaust Nozzle and Plug

E. Prepare for the Removal

SUBTASK 78-11-01-860-001-F00

(1) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 78-11-01-860-002-F00

(2) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	4	C00154	ENGINE 2 START VALVE

SUBTASK 78-11-01-010-001-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Primary Nozzle Assembly Removal

SUBTASK 78-11-01-020-001-F00

WARNING: MAKE SURE THAT THE FULL WEIGHT OF THE NOZZLE IS SATISFACTORILY HELD BEFORE YOU REMOVE THE BOLTS. THE NOZZLE WEIGHS APPROXIMATELY 108 POUNDS (49.1 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE NOZZLE CAN FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do these steps to remove the bolts that attach the nozzle [4] (Figure 401):

HAP ALL; ENGINES WITH THE BOLTS MOUNTED AFT TO FORWARD AND TWO WASHERS

(a) Remove the six bolts [6], washers [3] and [5], and nuts [2] that attach the two bootstrap brackets [1].

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(b) Remove the six bolts [9], washers [5], and nuts [2] that attach the two bootstrap brackets [1].

HAP ALL

(c) Mark the bolt hole locations for the two bootstrap brackets [1] on the flange of the turbine rear frame.

NOTE: This will identify the bootstrap bracket locations for the subsequent installation and it will make the installation easier.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED AFT TO FORWARD AND TWO WASHERS

(d) Remove all of the bolts [7], washers [3] and [5], and nuts [2], but not the bolts at the 10:00 o'clock and 2:00 o'clock positions.

NOTE: If you remove the bolts before you attach the nozzle to the handling equipment, the removal of the bolts is easier.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(e) Remove all of the bolts [8], washers [5], and nuts [2], but not the bolts at the 10:00 o'clock and 2:00 o'clock positions.

NOTE: If you remove the bolts before you attach the nozzle to the handling equipment, the removal of the bolts is easier.

HAP ALL

(f) If you use the equipment, SPL-2419, to remove the nozzle, do these steps (Figure 402):

1) Attach the jack adapter to the transmission jack.

2) Attach the jack adapter to the nozzle [4] with the straps.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED AFT TO FORWARD AND TWO WASHERS

(g) Remove the remaining two bolts [7], washers [3] and [5], and nuts [2].

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(h) Remove the remaining two bolts [8], washers [5], and nuts [2].

HAP ALL

(i) PREFERRED METHOD:

Discard the nuts [2].

(j) OPTIONAL METHOD:

If you choose to re-use the nuts [2], then examine them to make sure that they are good condition.

SUBTASK 78-11-01-020-002-F00

CAUTION: LOWER THE NOZZLE UNTIL THE LABYRINTH SEALS ARE DISENGAGED. IF YOU DO NOT LOWER THE NOZZLE SUFFICIENTLY, DAMAGE TO THE LABYRINTH SEALS CAN OCCUR. IF YOU LOWER THE NOZZLE TOO MUCH, DAMAGE TO THE PRIMARY PLUG ASSEMBLY CAN OCCUR.

(2) Lower the nozzle [4] approximately one inch until the two sides of the labyrinth seals are disengaged.

SUBTASK 78-11-01-020-003-F00

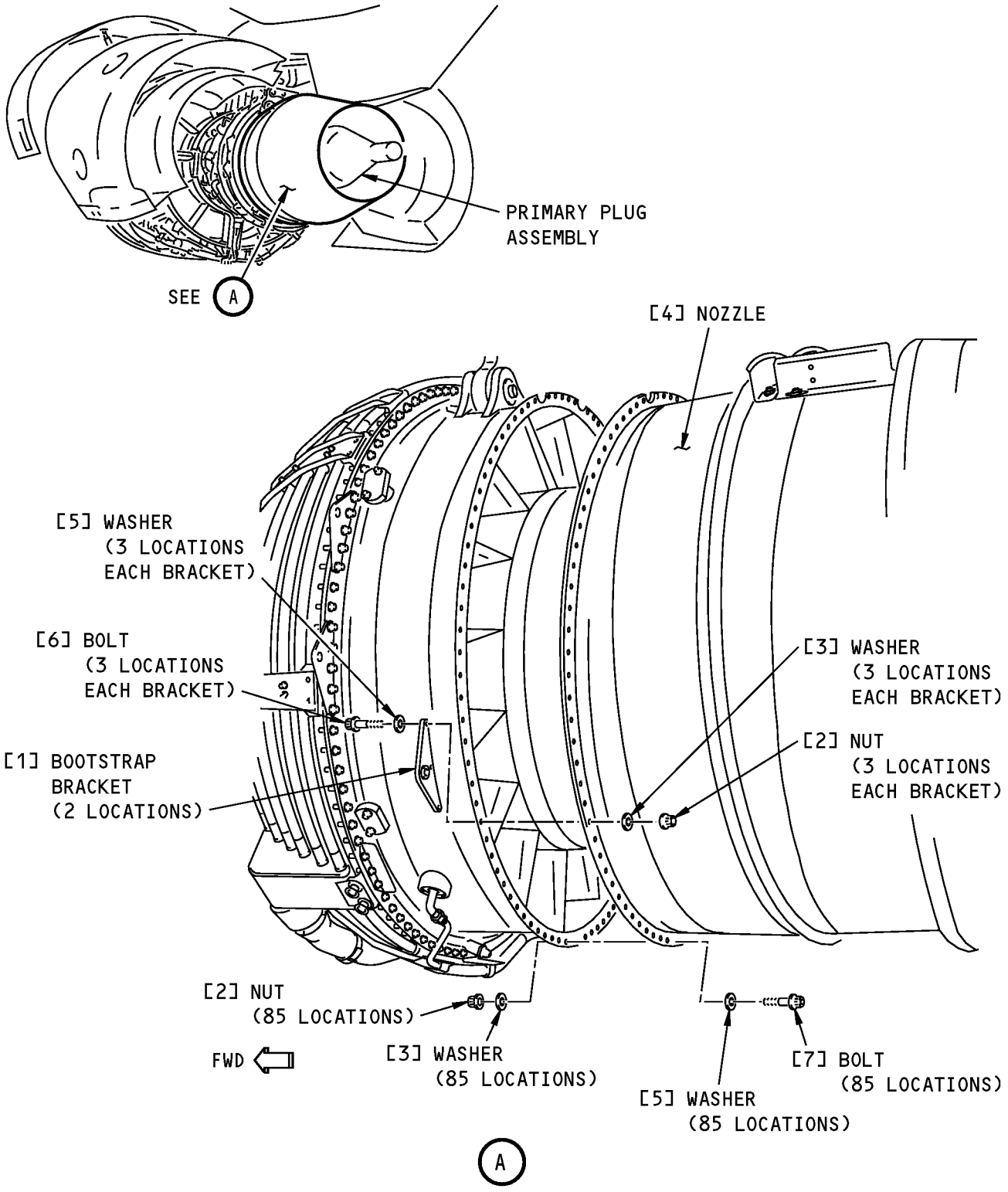
(3) Move the nozzle [4] aft until it is clear of the primary plug assembly and then lower.

SUBTASK 78-11-01-020-004-F00

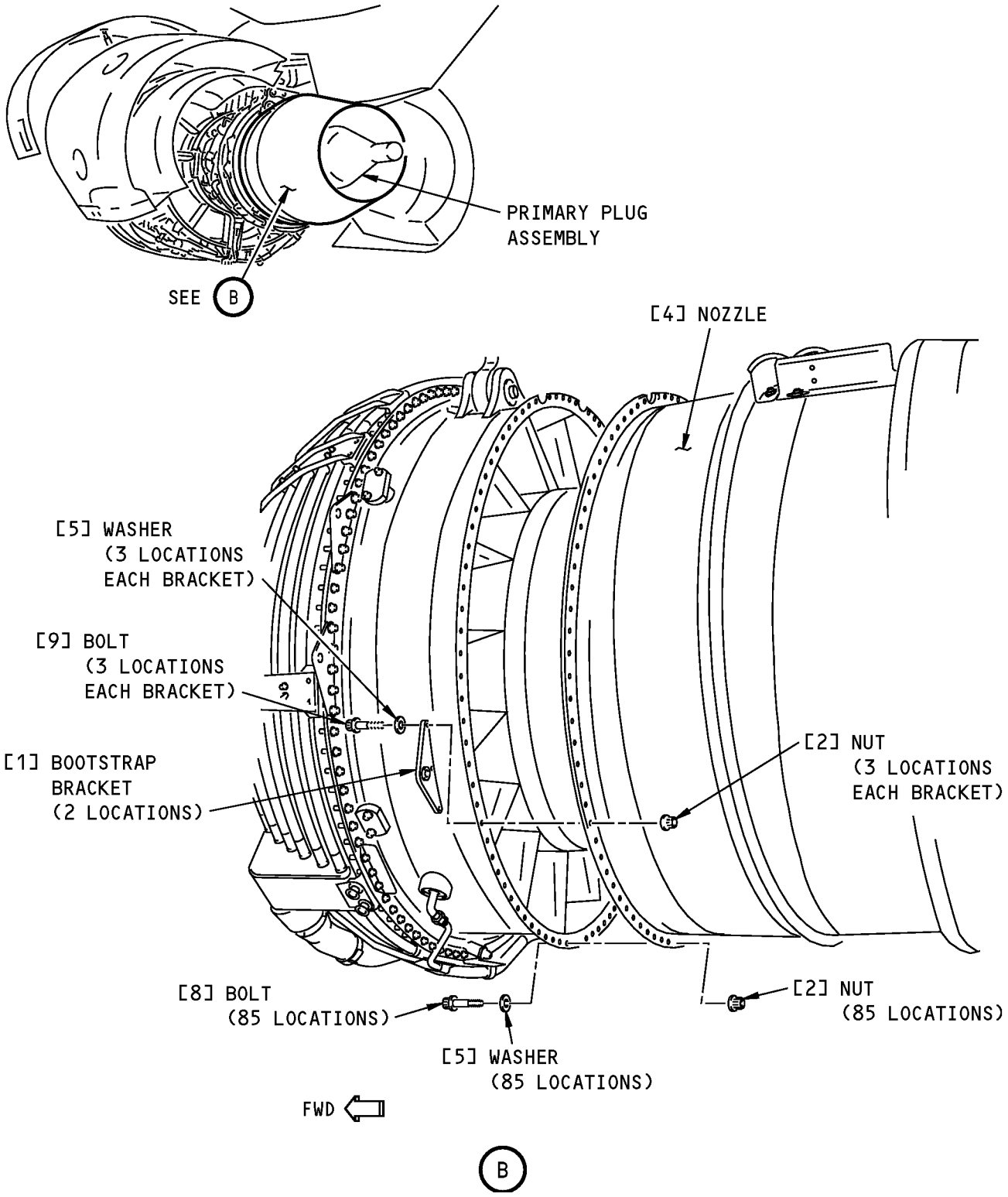
WARNING: USE A MINIMUM OF THREE PERSONS TO MOVE THE NOZZLE. THE NOZZLE WEIGHS APPROXIMATELY 108 POUNDS (49.1 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE NOZZLE COULD FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Remove the nozzle [4] from the jack adapter.

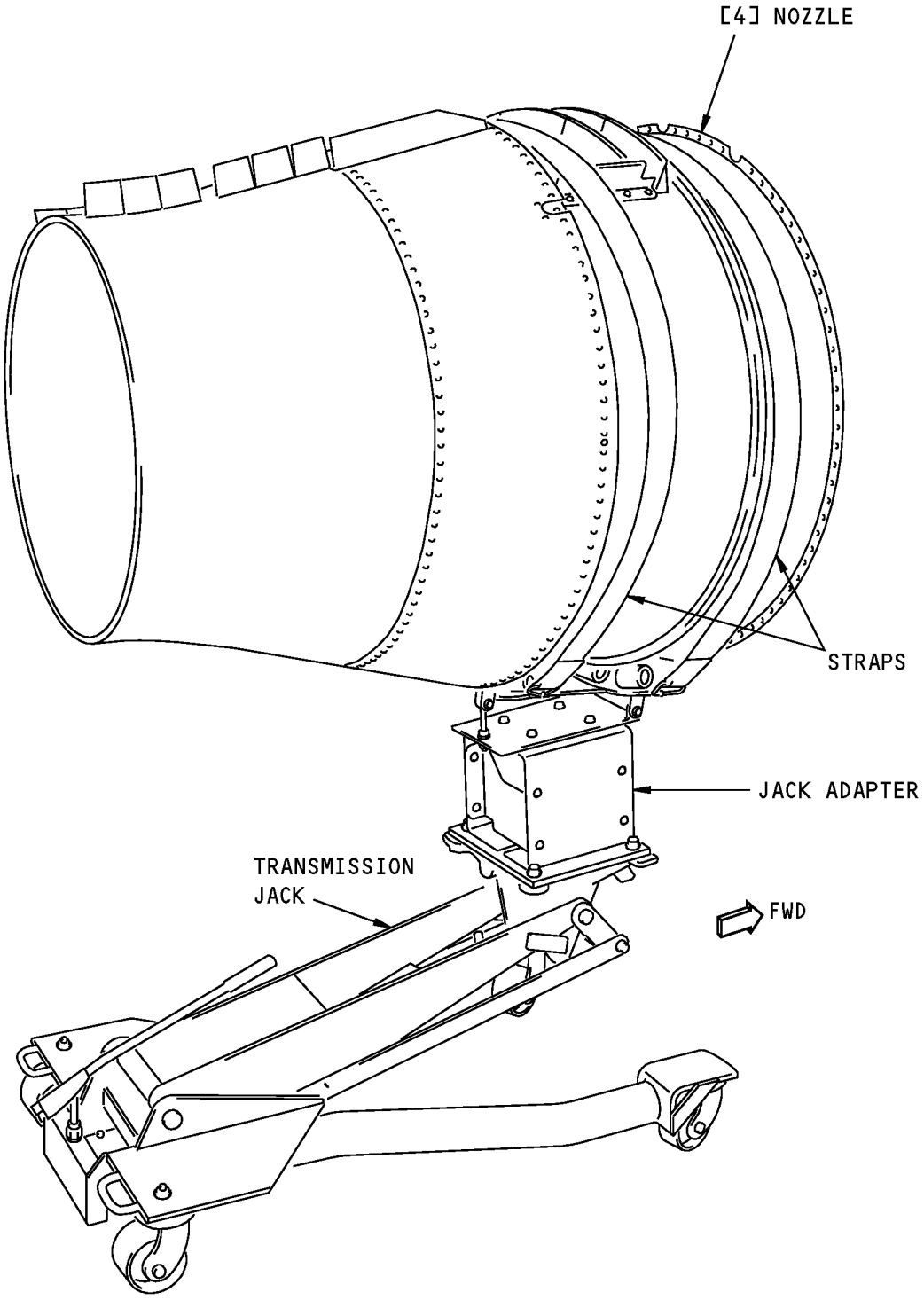
END OF TASK



Primary Nozzle Assembly Installation
Figure 401 (Sheet 1 of 2)/78-11-01-990-801-F00



Primary Nozzle Assembly Installation
Figure 401 (Sheet 2 of 2)/78-11-01-990-801-F00



Primary Nozzle Assembly Handling Equipment
Figure 402/78-11-01-990-802-F00

TASK 78-11-01-400-801-F00

3. Primary Nozzle Assembly Installation

(Figure 401), (Figure 402)

A. General

(1) This task is for the installation of the primary nozzle assembly.

(2) For this task the primary nozzle assembly will be referred to as the nozzle.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(3) On the airplanes up to production line 149, the bolts used were longer bolts, BACB30US4-8 at 85 locations, and BACB30US4-12 at 6 locations. These bolts were installed from aft to forward orientation with two washers, one under the bolthead and one under the nut.

(4) At production line 150, the bolts were replaced by shorter bolts, BACB30US4-6 at 85 locations and BACB30US4-10 at 6 locations. These bolts were installed from from forward to aft orientation with one washer under the bolt head.

(5) At production line 355 to current airplanes, these bolts were changed to BACB30PN4-6 at 85 locations and BACB30PN4-10 at 6 locations. These bolts are installed from from forward to aft orientation with one washer under the bolt head.

(6) Bolts BACB30US4-6 are optional to BACB30PN4-6. Bolts BACB30US4-10 are optional to BACB30PN4-10. Bolt BACB30US4-8 with washer BACW10BP4ACU under the bolt head can be used in place of BACB30US4-6 or BACB30PN4-6.

HAP ALL

B. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2419	Equipment - Handling, Primary Exhaust Sleeve and Plug (Part #: C78009-33, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Nozzle	78-11-00-01-085	HAP 001-007
		78-11-00-01A-070	HAP 008-013, 015-026, 028-054, 101-999

F. Location Zones

Zone	Area
417	Engine 1 - Primary Exhaust Nozzle and Plug
427	Engine 2 - Primary Exhaust Nozzle and Plug

G. Primary Nozzle Assembly Installation

SUBTASK 78-11-01-480-001-F00

(1) If you use the equipment, SPL-2419, to install the nozzle [4], do these steps (Figure 402):

(a) Attach the jack adapter to the transmission jack.

WARNING: USE A MINIMUM OF THREE PERSONS TO MOVE THE NOZZLE. THE NOZZLE WEIGHS APPROXIMATELY 108 POUNDS (49.1 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE NOZZLE COULD FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(b) Put the nozzle [4] on the jack adapter.

1) Make sure that the alignment pin on the nozzle [4] will align with the alignment hole on the flange of the turbine rear frame.

NOTE: The alignment hole is the first hole counterclockwise from the 12:00 o'clock position.

(c) Attach the nozzle [4] to the jack adapter, with the straps.

SUBTASK 78-11-01-420-002-F00

(2) Do these steps to put the nozzle [4] in the correct position on the engine (Figure 401):

CAUTION: MAKE SURE THAT YOU LIFT THE NOZZLE UNTIL THE NOZZLE CLEARS THE PRIMARY PLUG ASSEMBLY. IF YOU LIFT THE NOZZLE TOO MUCH, DAMAGE TO THE LABRINTH SEALS CAN OCCUR. IF YOU DO NOT LIFT THE NOZZLE SUFFICIENTLY, DAMAGE TO THE PRIMARY PLUG ASSEMBLY CAN OCCUR.

(a) Lift the nozzle [4] and then move it forward.

(b) Align the alignment pin with the alignment hole on the flange of the turbine rear frame.

NOTE: The alignment hole is the first hole counterclockwise from the 12:00 o'clock position.

SUBTASK 78-11-01-420-001-F00

(3) Do these steps to install the nozzle [4] (Figure 401):

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

NOTE: Bolts BACB30US4-6 are optional to BACB30PN4-6. Bolts BACB30US4-10 are optional to BACB30PN4-10. Bolt BACB30US4-8 with washer BACW10BP4ACU under the bolt head can be used in place of BACB30US4-6 or BACB30PN4-6.

HAP ALL

(a) PREFERRED METHOD;

1) Get 91 new nuts [2].

(b) OPTIONAL METHOD:

1) If you choose to re-use the nuts [2], then make sure that they are good condition.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED AFT TO FORWARD AND TWO WASHERS

(c) Apply Never-Seez NSBT-8N compound, D00006, to the threads of the bolts [6] and [7].

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(d) Apply Never-Seez NSBT-8N compound, D00006, to the threads of the bolts [8] and [9].

HAP ALL

CAUTION: INSTALL THE TWO BOOTSTRAP BRACKETS IN THE CORRECT LOCATION. IF THE TWO BOOTSTRAP BRACKETS ARE NOT INSTALLED CORRECTLY, THE AFT BOOTSTRAP EQUIPMENT CAN NOT BE INSTALLED.

(e) Install the two bootstrap brackets [1] on the forward side of the flange of the turbine rear frame at the locations that were identified with tape.

1) If the bootstrap bracket locations are not identified, then do these steps:

a) Install one bootstrap bracket [1] at the hole positions 30, 31 and 32 clockwise from the alignment pin.

b) Install the other bootstrap bracket [1] at the hole positions 28, 29 and 30 counterclockwise from the alignment pin.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED AFT TO FORWARD AND TWO WASHERS

(f) Install the six bolts [6], washers [3] and [5], and nuts [2] that attach the bootstrap brackets [1].

NOTE: The washer [5] goes under the bolt head. The bolts [6] for this installation have a grip length that is equal to 12.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(g) Install the six bolts [9], washers [5], and nuts [2] that attach the bootstrap brackets [1].

NOTE: The washer [5] goes under the bolt head. The bolts [9] for this installation have a grip length that is equal to 10.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED AFT TO FORWARD AND TWO WASHERS

(h) Install a bolt [7], washer [3] and [5], and nut [2] at the approximate 10:00 o'clock and 2:00 o'clock position.

NOTE: The washer [5] goes under the bolt head. The bolts [7] for this installation have a grip length that is equal to 8.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(i) Install a bolt [8], washer [5], and nut [2] at the approximate 10:00 o'clock and 2:00 o'clock position.

NOTE: The washer [5] goes under the bolt head. The bolts [8] for this installation have a grip length that is equal to 6.

HAP ALL

(j) Remove the jack adapter from the nozzle.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED AFT TO FORWARD AND TWO WASHERS

(k) Install the remaining bolts [7], washers [3] and [5], and nuts [2].

NOTE: The countersunk washer goes below the bolt head. The bolts [7] for this installation have a grip length that is equal to 8.

HAP ALL; ENGINES WITH THE BOLTS MOUNTED FORWARD TO AFT AND ONE WASHER

(l) Install the remaining bolts [8], washers [5], and nuts [2].

NOTE: The washer [5] goes below the bolt head. The bolts [8] for this installation have a grip length that is equal to 6.

HAP ALL

(m) Tighten the nuts [2] to 70-80 pound-inches (7.9-9.0 Newton meters).

NOTE: It is optional to tighten the bolt to 72-88 pound-inches (8.1-9.9 Newton meters) where access to the nut is limited.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 78-11-01-410-001-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-11-01-860-004-F00

(2) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 78-11-01-860-005-F00

(3) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	4	C00154	ENGINE 2 START VALVE

——————— END OF TASK ———————

PRIMARY PLUG ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the primary plug assembly.

(2) The installation of the primary plug assembly.

TASK 78-11-02-000-801-F00

2. Primary Plug Assembly Removal

(Figure 401), (Figure 402)

A. General

(1) The primary plug assembly is found on the aft end of the power plant, attached to the inner flange of the turbine rear frame.

(2) The primary plug assembly has two parts: the forward plug assembly and the aft plug skin.

(3) For this procedure, the primary plug assembly will be referred to as the plug, the forward plug assembly will be referred to as the forward plug and the aft plug skin will be referred to as the aft plug.

(4) The forward plug and aft plug are a matched set when fabricated and must be kept together. The forward plug and aft plug are replaced as a matched set.

(5) To remove the forward plug, you must remove the primary nozzle assembly.

(6) To remove the aft plug, it is not necessary to remove the primary nozzle assembly.

B. References

Reference	Title
78-11-01-000-801-F00	Primary Nozzle Assembly Removal (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2419	Equipment - Handling, Primary Exhaust Sleeve and Plug (Part #: C78009-33, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
D00600 [CP2162]	Oil - Penetrating - Liquid Wrench	

E. Location Zones

Zone	Area
417	Engine 1 - Primary Exhaust Nozzle and Plug
427	Engine 2 - Primary Exhaust Nozzle and Plug

F. Prepare for the Removal

SUBTASK 78-11-02-860-001-F00

(1) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 78-11-02-860-002-F00

(2) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	4	C00154	ENGINE 2 START VALVE

SUBTASK 78-11-02-010-001-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-11-02-010-002-F00

(4) If it is necessary to remove the forward plug, do this task: Primary Nozzle Assembly Removal, TASK 78-11-01-000-801-F00.

G. Primary Plug Assembly Removal

SUBTASK 78-11-02-020-001-F00

WARNING: MAKE SURE THAT THE FULL WEIGHT OF THE AFT PLUG IS SATISFACTORILY HELD BEFORE YOU REMOVE THE BOLTS. THE AFT PLUG WEIGHS APPROXIMATELY 14 POUNDS (6.0 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE AFT PLUG CAN FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do these steps to remove the aft plug [3] (Figure 401):

(a) Remove the 24 bolts [2] that attach the aft plug [3] to the forward plug [1].

(b) Remove the aft plug [3].

SUBTASK 78-11-02-020-002-F00

(2) Use the exhaust sleeve and plug removal equipment, SPL-2419 to remove the forward plug, do these steps (Figure 402):

(a) Attach the jack adapter to the transmission jack.

(b) Attach the jack adapter to the forward plug [1] with the straps.

SUBTASK 78-11-02-020-003-F00

WARNING: MAKE SURE THAT THE FULL WEIGHT OF THE FORWARD PLUG IS SATISFACTORILY HELD BEFORE YOU REMOVE THE NUTS. THE FORWARD PLUG WEIGHS APPROXIMATELY 40 POUNDS (18 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE FORWARD PLUG CAN FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do these steps to remove the forward plug [1] (Figure 401):

(a) Apply Liquid Wrench oil, D00600 [CP2162] to the studs and nuts [5].

(b) Remove the 16 nuts [5] and washers [4].

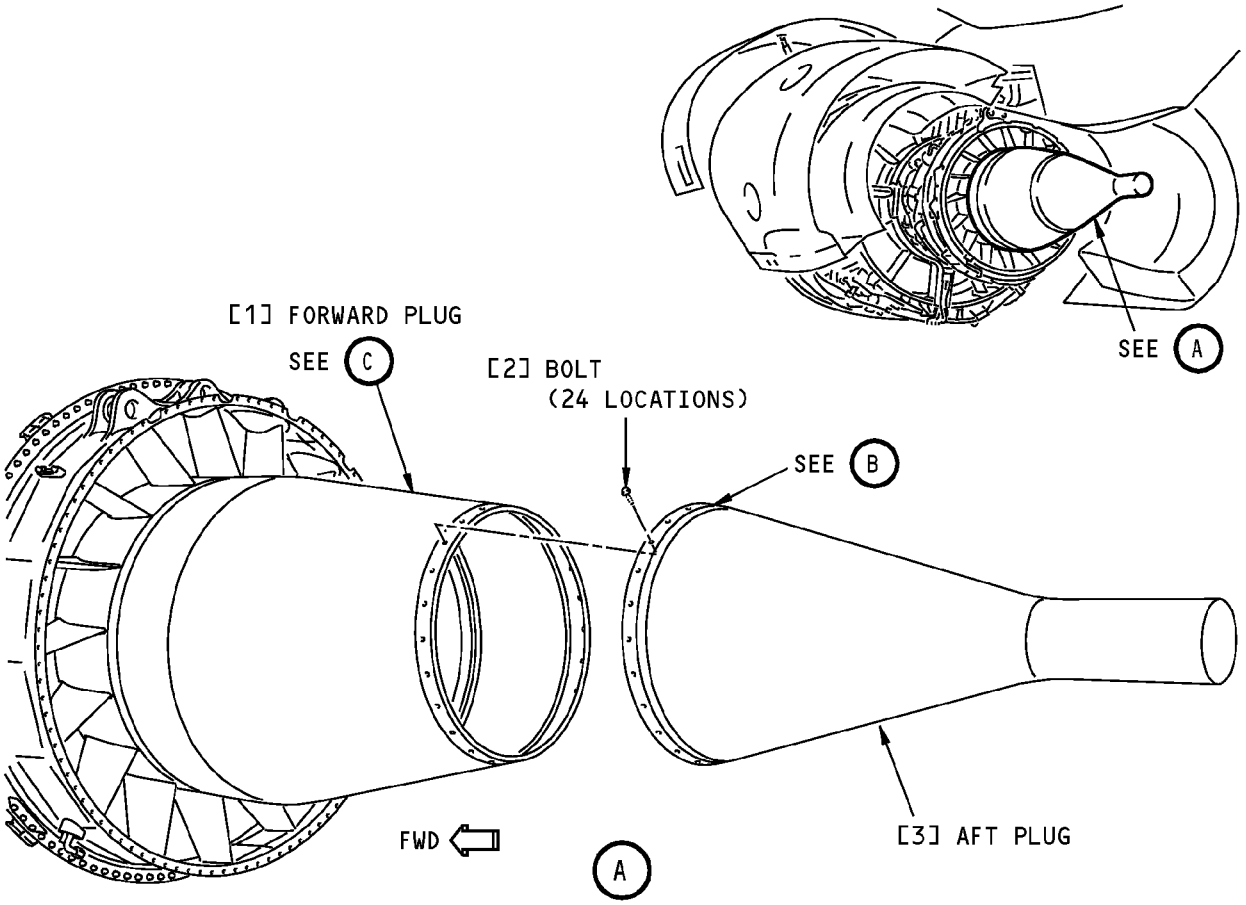
(c) Move the forward plug [1] aft until it is away from the studs and then lower.

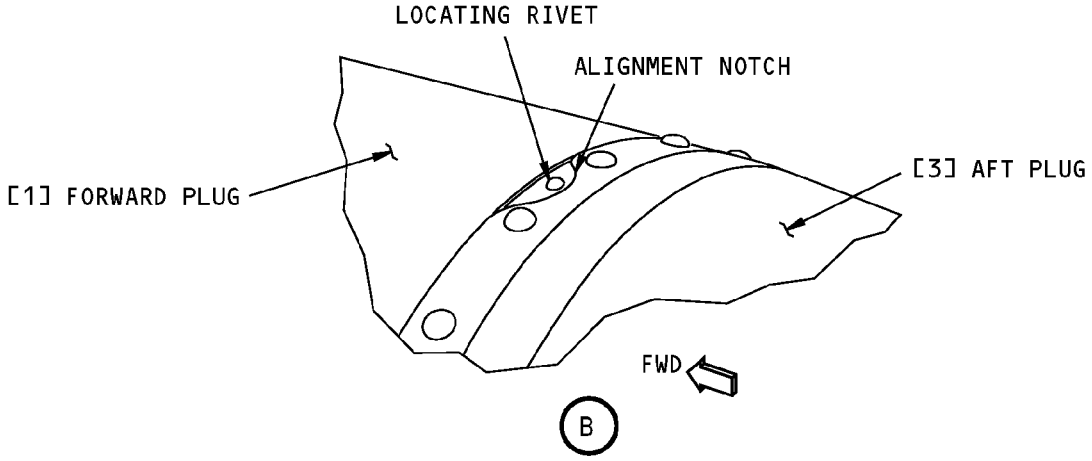
SUBTASK 78-11-02-550-001-F00

(4) Make sure the component parts of the primary plug assembly, the aft plug [3], and forward plug [1] are kept together.

NOTE: The forward plug and aft plug are a matched set.

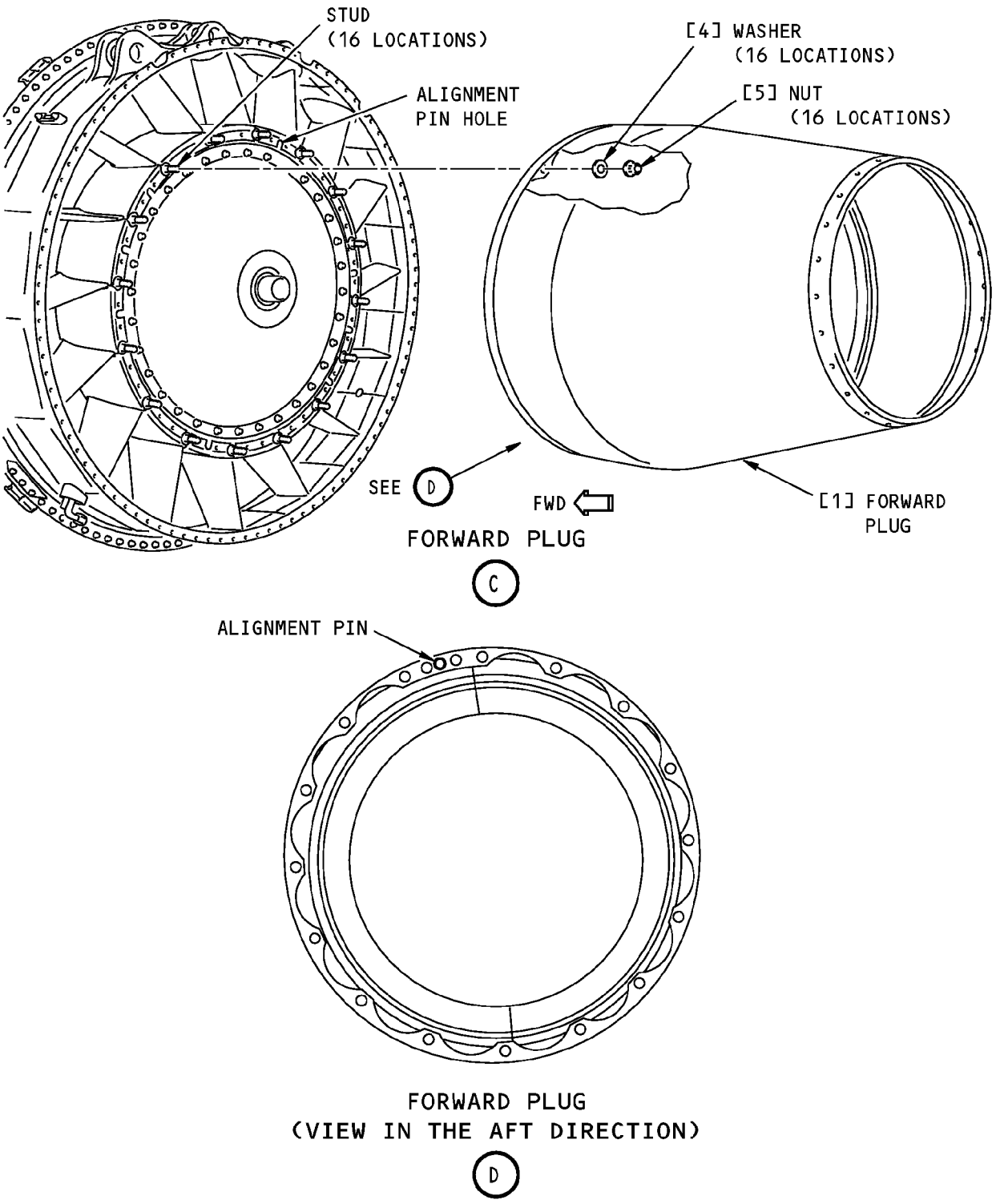
——————— END OF TASK ———————



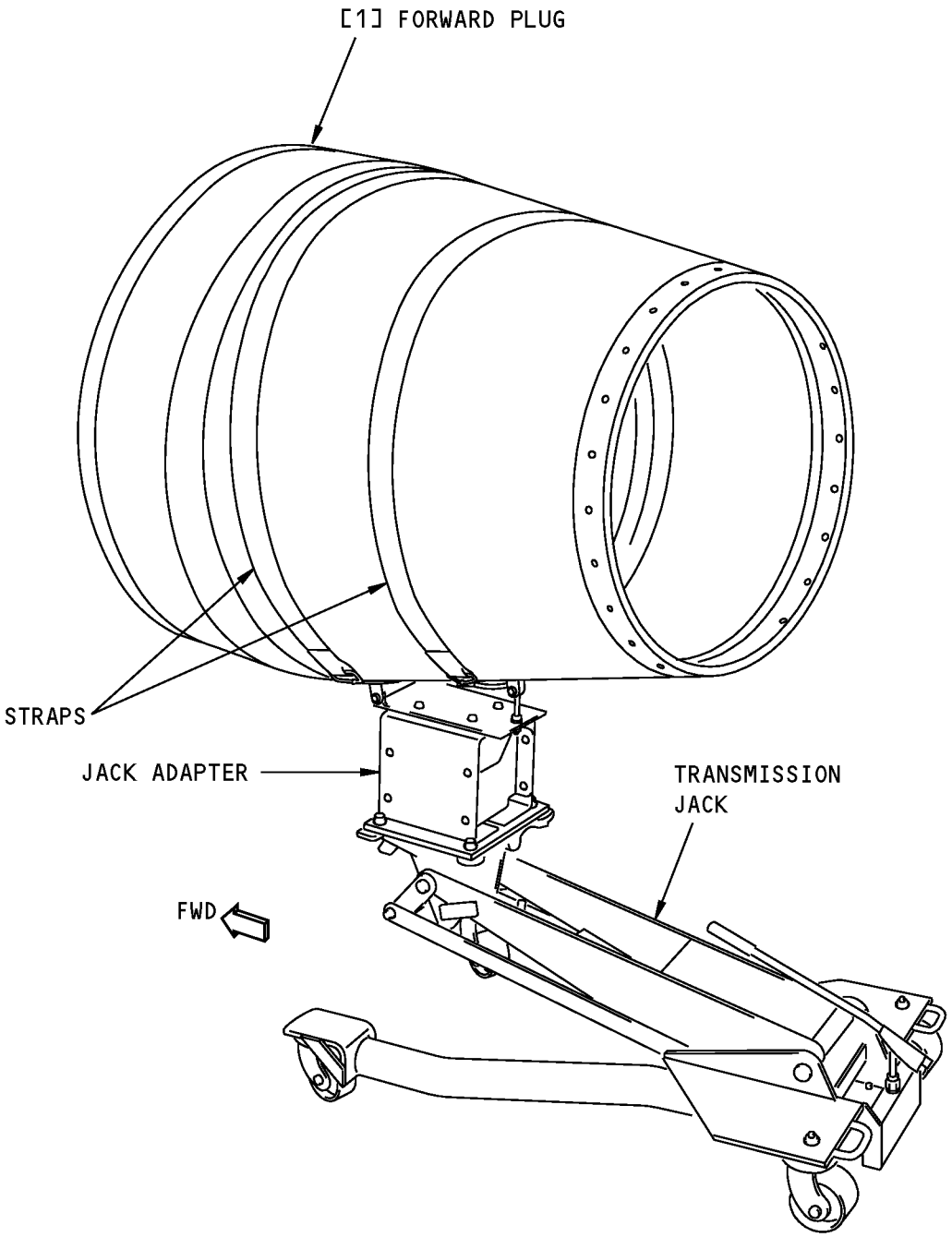


NOTE: PRIMARY NOZZLE ASSEMBLY NOT SHOWN.

Primary Plug Assembly Installation
Figure 401 (Sheet 1 of 2)/78-11-02-990-801-F00



Primary Plug Assembly Installation
Figure 401 (Sheet 2 of 2)/78-11-02-990-801-F00



Primary Plug Assembly Handling Equipment
Figure 402/78-11-02-990-802-F00

TASK 78-11-02-400-801-F00

3. Primary Plug Assembly Installation

(Figure 401), (Figure 402)

A. References

Reference	Title
70-10-02-910-801-F00	General Precautions During the Removal and Installation of Engine Components (P/B 201)
78-11-01-400-801-F00	Primary Nozzle Assembly Installation (P/B 401)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Tools/Equipment

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

Reference	Description
SPL-2419	Equipment - Handling, Primary Exhaust Sleeve and Plug (Part #: C78009-33, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

C. Consumable Materials

Reference	Description	Specification
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Forward plug	78-11-02-01-040	HAP ALL
3	Aft plug	78-11-02-01-020	HAP ALL

E. Location Zones

Zone	Area
417	Engine 1 - Primary Exhaust Nozzle and Plug
427	Engine 2 - Primary Exhaust Nozzle and Plug

F. Primary Plug Assembly Installation

SUBTASK 78-11-02-210-002-F00

(1) Make sure the component parts of the primary plug assembly, the aft plug [3], and forward plug [1] are a matched set before you install them.

SUBTASK 78-11-02-210-001-F00

(2) Make sure that the forward and aft plug flange surfaces are clean and free of contamination General Precautions During the Removal and Installation of Engine Components, TASK 70-10-02-910-801-F00.

(a) If you find contamination, clean the surfaces with solvent, B00062.

SUBTASK 78-11-02-400-001-F00

(3) Use the primary exhaust sleeve and plug equipment, SPL-2419 to install the forward plug; do these steps (Figure 402):

(a) Attach the jack adapter to the transmission jack.

(b) Put the forward plug [1] on the jack adapter.

1) Make sure that the alignment pin will align with the alignment hole on the inner flange of the turbine rear frame.

(c) Attach the forward plug [1] to the jack adapter with the straps.

SUBTASK 78-11-02-020-004-F00

WARNING: MAKE SURE THE FULL WEIGHT OF THE FORWARD PLUG IS SATISFACTORILY HELD UNTIL YOU INSTALL THE NUTS. THE FORWARD PLUG WEIGHS APPROXIMATELY 40 POUNDS (18 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE FORWARD PLUG COULD FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Do these steps to install the forward plug [1] (Figure 401):

(a) Apply antiseize Never-Seez NSBT-8N compound, D00006, to the threads of the studs.

(b) Lift the forward plug [1] and move it forward.

1) Make sure that you align the alignment pin with the alignment hole in the inner flange of the turbine rear frame.

(c) Install the 16 washers [4] and nuts [5].

1) Tighten the nuts to 500-650 inch-pounds (56.5-73.4 newton-meters).

SUBTASK 78-11-02-410-001-F00

(5) Do these steps to install the aft plug [3] (Figure 401):

NOTE: The forward plug and aft plug are a matched set .

(a) Apply antiseize Never-Seez NSBT-8N compound, D00006, to the threads of the bolts [2].

(b) Align the alignment notch with the locating rivet at the 12:00 o'clock position on the forward plug [1].

(c) Move the aft plug [3] forward and over the attach flange of the forward plug [1].

(d) Install the 24 bolts [2] to attach the aft plug [3].

1) Tighten the bolts [2] to 68-82 inch-pounds (7.6-9.3 newton-meters).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 78-11-02-410-002-F00

(1) If you removed the primary nozzle assembly, do this task: Primary Nozzle Assembly Installation, TASK 78-11-01-400-801-F00.

SUBTASK 78-11-02-410-003-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-11-02-860-005-F00

(3) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 78-11-02-860-006-F00

(4) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	4	C00154	ENGINE 2 START VALVE

END OF TASK

THRUST REVERSER SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks to operate the thrust reverser system:

(1) Open the thrust reverser (Selection).

(2) Close the thrust reverser (Selection).

(3) Open the thrust reverser (Hand Pump Procedure).

(4) Close the thrust reverser (Hand Pump Procedure).

(5) Open the thrust reverser (Manual Procedure).

(6) Close the thrust reverser (Manual Procedure).

(7) Open the thrust reverser (65-Degree Maintenance Position).

(8) Close the thrust reverser (65-Degree Maintenance Position).

(9) Thrust Reverser Operation - Extend (Selection).

(10) Thrust Reverser Operation - Retract (Selection).

(11) Thrust Reverser Operation - Extend (Power Procedure).

(12) Thrust Reverser Operation - Retract (Power Procedure).

(13) Thrust Reverser Operation - Extend (Manual Procedure).

(14) Thrust Reverser Operation - Retract (Manual Procedure).

(15) Thrust Reverser Deactivation for Ground Maintenance.

(16) Thrust Reverser Activation after Ground Maintenance.

TASK 78-31-00-010-801-F00

2. Open the Thrust Reverser (Selection)

A. General

(1) The purpose of this procedure is to permit the mechanics to select the applicable task to open the thrust reverser.

B. Procedure

SUBTASK 78-31-00-010-003-F00

(1) Do one of these tasks to open the thrust reverser:

(a) Do this task: Open the Thrust Reverser (Hand Pump Procedure), TASK 78-31-00-000-802-F00.

(b) Do this task: Open the Thrust Reverser (Manual Procedure), TASK 78-31-00-010-805-F00.

(c) Do this task: Open the Thrust Reverser (65-Degree Maintenance Position), TASK 78-31-00-000-803-F00.

——————— END OF TASK ———————

TASK 78-31-00-010-804-F00

3. Close the Thrust Reverser (Selection)

A. General

(1) The purpose of this procedure is to permit the mechanics to select the applicable task to close the thrust reverser.

B. Procedure

SUBTASK 78-31-00-010-004-F00

(1) Do one of these tasks to close the thrust reverser:

(a) Do this task: Close the Thrust Reverser (Hand Pump Method), TASK 78-31-00-410-802-F00.

(b) Do this task: Close the Thrust Reverser (Manual Procedure), TASK 78-31-00-410-803-F00.

(c) Do this task: Close the Thrust Reverser (65-Degree Maintenance Position), TASK 78-31-00-410-804-F00.

———————— END OF TASK ————————

TASK 78-31-00-000-802-F00

4. Open the Thrust Reverser (Hand Pump Procedure)

A. General

(1) This task can be used to open the left or right thrust reverser on the applicable engine.

(2) The leading edge flaps and slats must be retracted and deactivated before the left or the right thrust reverser on an engine is opened.

(3) It is recommended that the left and right fan cowl panels be opened. The fan cowl panels have a 28-degree and 55-degree open position. The fan cowl panel adjacent to the thrust reverser that is to be opened must be in the 55-degree open position.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2417	Pump - Hand, Opening System, Thrust Reverser (Part #: A78019-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: B54001-30, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: C78005-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2431	Assembly - Lock, Thrust Reverser Actuator, CFM56-7 (Part #: C78023-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PR˜ F-23699F, Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808, Grade 3

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

G. Procedure

SUBTASK 78-31-00-860-072-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU OPEN THE LEFT OR THE RIGHT THRUST REVERSER ON AN ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-00-040-001-F00

(2) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-00-040-002-F00

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

(3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-00-010-005-F00

CAUTION: MAKE SURE THAT THE FAN COWL PANEL ADJACENT TO THE THRUST REVERSER THAT IS TO BE OPENED IS IN THE 55-DEGREE FULL OPEN POSITION. THIS WILL PREVENT DAMAGE TO THE FAN COWL PANEL AND THE THRUST REVERSER.

(4) It is recommended that the left and right fan cowl panels be opened Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

Open these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

SUBTASK 78-31-00-860-135-F00

(5) Make sure that these access panels are closed before you open the thrust reverser:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

SUBTASK 78-31-00-010-006-F00

WARNING: DO NOT OPEN THE THRUST REVERSER IN HIGH WINDS, IN SUDDEN WIND CONDITIONS, OR IF THE WIND VELOCITY IS MORE THAN 40 KNOTS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT GO OR PUT A PART OF YOUR BODY BETWEEN THE ENGINE AND THE THRUST REVERSER UNLESS THE OPENING ACTUATOR SAFETY LOCK IS INSTALLED. IF THE THRUST REVERSER SUDDENLY CLOSES, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT BE OR PUT A PART OF YOUR BODY IN THE PATH OF THE THRUST REVERSER WHILE YOU OPEN THE THRUST REVERSER. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR IF THE THRUST REVERSER SUDDENLY CLOSES.

CAUTION: DO NOT POWER EXTEND THE THRUST REVERSER SLEEVES IF THE THRUST REVERSER IS OPEN. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE THRUST REVERSER AND ADJACENT STRUCTURES CAN OCCUR.

(6) Do these steps to open the thrust reverser (Figure 201), (Figure 202):

(a) These are the panel identification numbers:

Number	Name/Location
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

(b) Disengage the six latches along the bottom centerline of the thrust reverser.

1) Disengage the latches in sequence from the aft latch 6 to the forward latch 1.

(c) Remove the dust cap from the inlet fitting on the opening actuator and from the thrust reverser hand pump opening system, SPL-2417.

(d) Make sure that the thrust reverser hand pump opening system, SPL-2417 is full of oil, D00071 or oil, D00068.

(e) Close the return valve on the hand pump.

(f) Connect the hand pump hose to the inlet fitting on the opening actuator.

CAUTION: MAKE SURE THAT THE FILTER ON THE HAND PUMP HOSE DOES NOT INTERFER WITH THE MOVING THRUST REVERSER. THE FILTER CAN TURN ON THE END OF THE HAND PUMP HOSE AND CAUSE DAMAGE TO THE EQUIPMENT.

(g) Make sure that the filter on the hand pump hose is out of the way of the moving thrust reverser.

(h) Operate the hand pump to pump oil into the opening actuator to lift the thrust reverser.

(i) These are the indications that the thrust reverser is in the full open position and the opening actuator is locked:

1) Listen for the click sound of the lock collar.

2) Make sure that the word LOCKED shows on the bottom of the extended piston.

3) Make sure that you can see the red band on the actuator rod.

(j) Install the actuator safety assembly, SPL-2431 on the extended piston rod.

NOTE: The part number of the actuator safety lock is C78023-2. The part number listed (C78023-1) is the set of two actuator safety locks.

(k) Open the return valve on the hand pump to let the weight of the thrust reverser be held by the locked opening actuator.

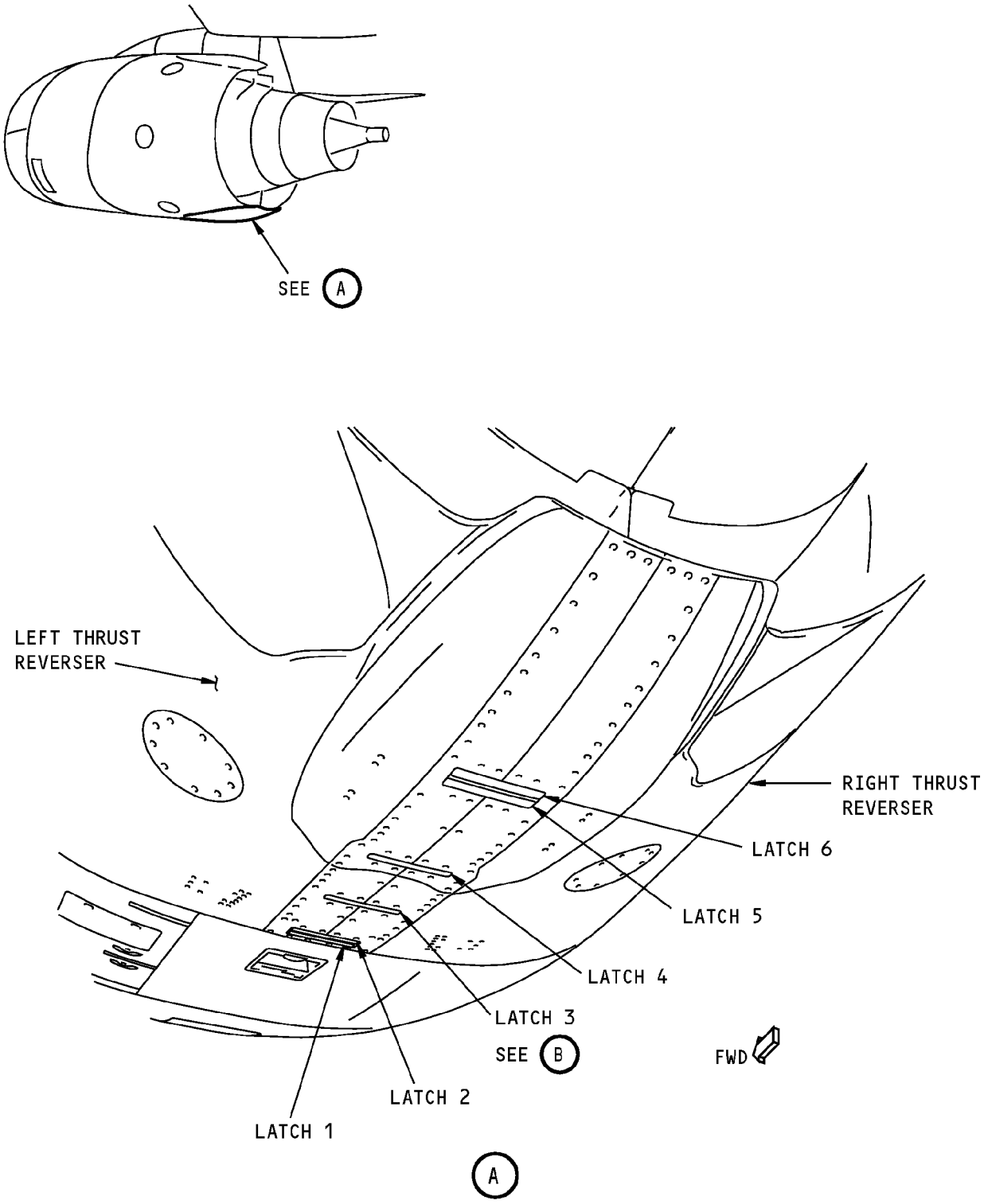
WARNING: MAKE SURE THAT THE RETURN VALVE ON THE HAND PUMP IS CLOSED WHEN THE THRUST REVERSER IS HELD BY THE LOCKED OPENING ACTUATOR. IF THE RETURN VALVE IS LEFT OPEN, THE ENGINE OIL CAN CONTINUE TO DRAIN OUT OF THE ACTUATOR INTO THE HAND PUMP. DECREASED ENGINE OIL CAN PERMIT THE THRUST REVERSER TO CLOSE QUICKLY DURING SUBSEQUENT OPERATIONS TO CLOSE THE THRUST REVERSER. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(l) Immediately close the return valve on the hand pump after the thrust reverser is lowered and the weight is held by the locked opening actuator.

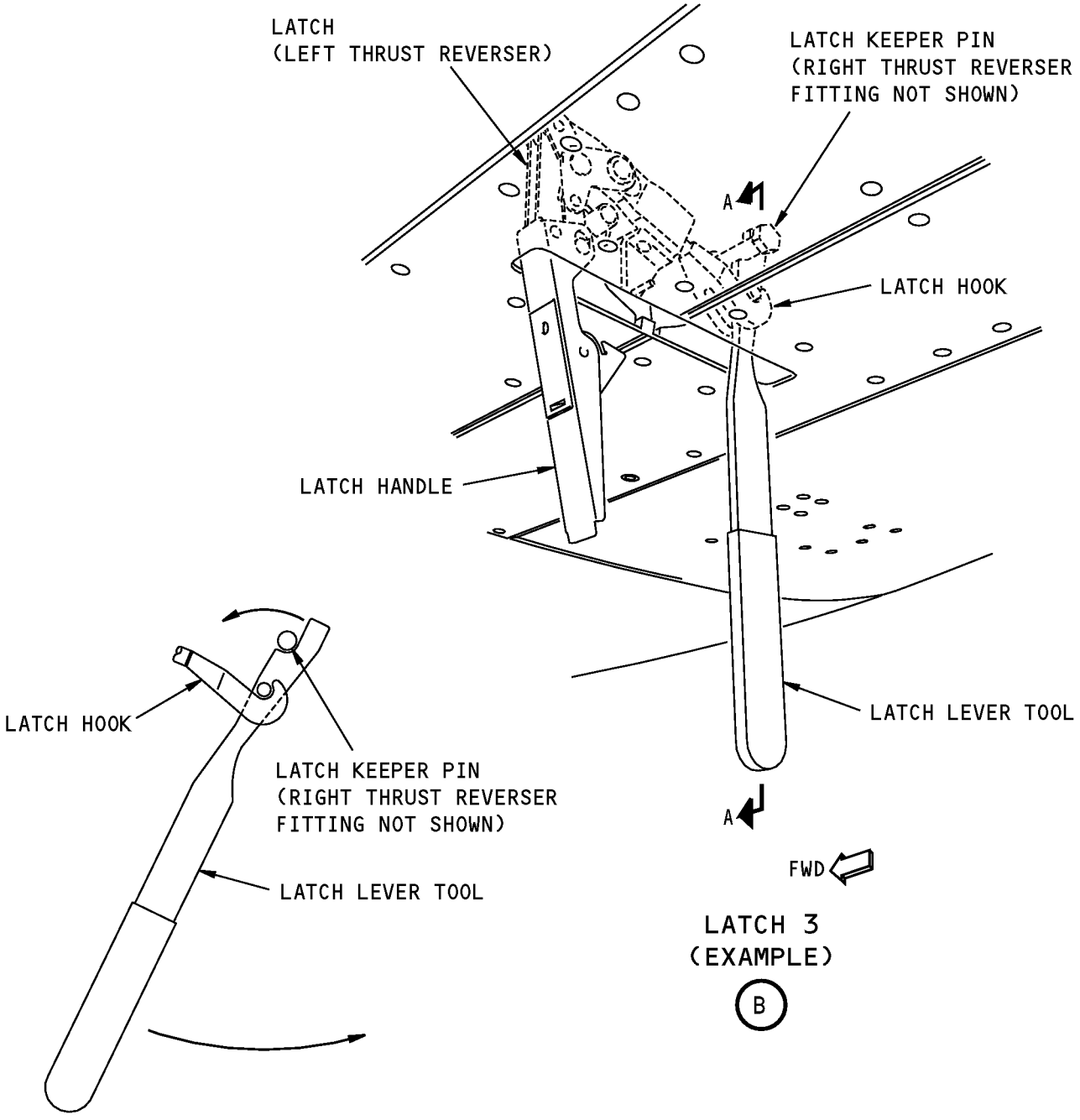
WARNING: USE CARE WHEN THE HAND PUMP HOSE IS DISCONNECTED FROM THE OPENING ACTUATOR. A SPRAY OF OIL CAN COME FROM THE HOSE. ENGINE OIL IS POISONOUS AND CAN CAUSE INJURY TO PERSONS.

(m) If it is necessary to disconnect the hand pump, install dust caps on the inlet fitting on the opening actuator and the hand pump hose.

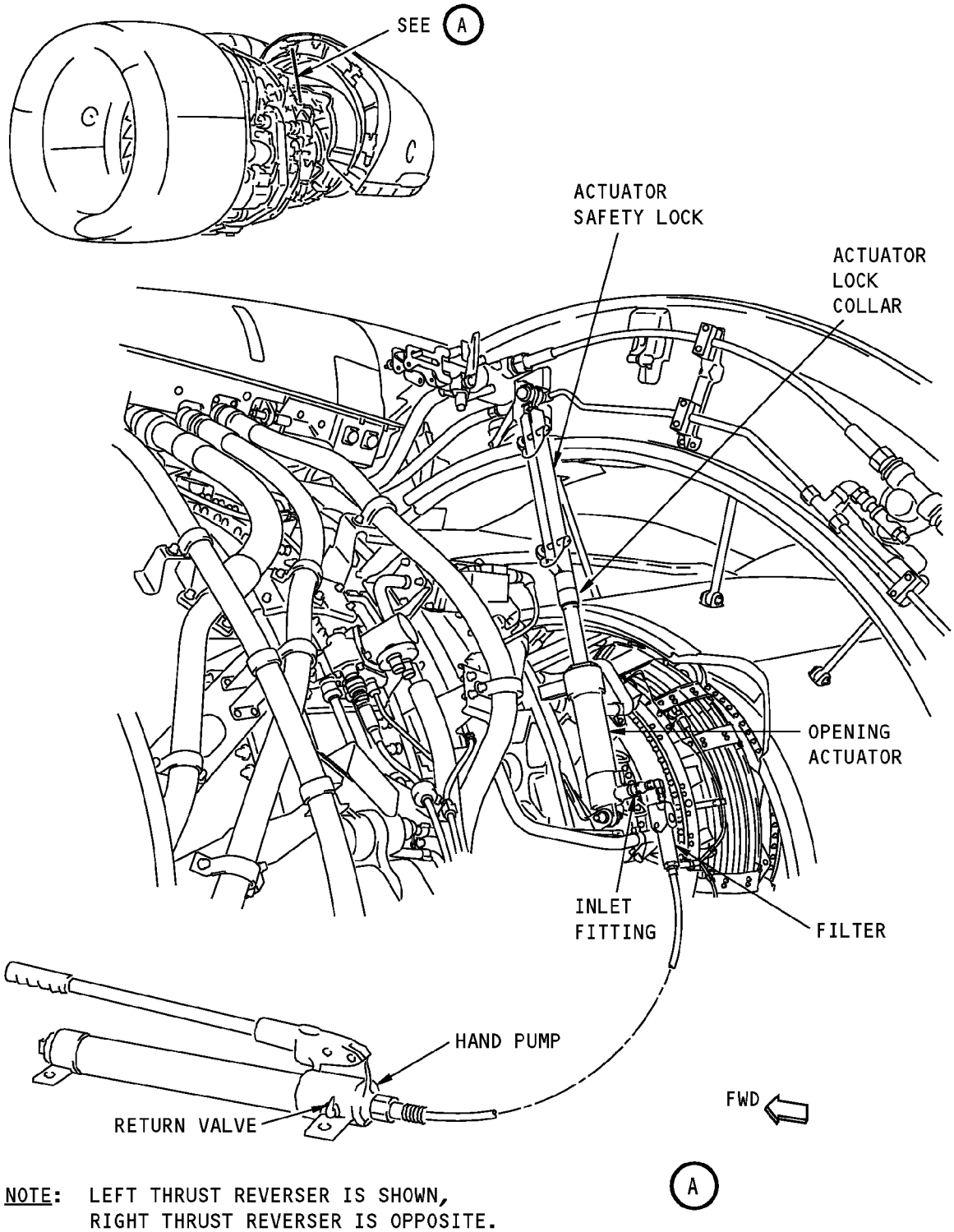
——————— END OF TASK ———————



Thrust Reverser Latch Release
Figure 201 (Sheet 1 of 2)/78-31-00-990-806-F00



Thrust Reverser Latch Release
Figure 201 (Sheet 2 of 2)/78-31-00-990-806-F00



NOTE: LEFT THRUST REVERSER IS SHOWN,
RIGHT THRUST REVERSER IS OPPOSITE.

Thrust Reverser Actuator Safety Lock and Hand Pump
Figure 202/78-31-00-990-807-F00

TASK 78-31-00-410-802-F00

5. Close the Thrust Reverser (Hand Pump Method)

(Figure 202)

A. General

(1) This task can be used to close the left or right thrust reverser on the applicable engine.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-08-870-801-F00	Fill and Bleed Procedure (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2417	Pump - Hand, Opening System, Thrust Reverser (Part #: A78019-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: B54001-30, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: C78005-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2431	Assembly - Lock, Thrust Reverser Actuator, CFM56-7 (Part #: C78023-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2434	Tool - Latching, Thrust Reverser C-Duct Halves (Part #: C78020-14, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: C78020-11, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1253	Pump - Hydraulic, Hand

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PR˜ F-23699F, Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808, Grade 3

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

G. Procedure

SUBTASK 78-31-00-410-006-F00

WARNING: DO NOT CLOSE THE THRUST REVERSER IN HIGH WINDS, IN SUDDEN WIND CONDITIONS, OR IF THE WIND VELOCITY IS MORE THAN 40 KNOTS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT GO OR PUT A PART OF YOUR BODY BETWEEN THE ENGINE AND THE THRUST REVERSER UNLESS THE OPENING ACTUATOR SAFETY LOCK IS INSTALLED. IF THE THRUST REVERSER SUDDENLY CLOSES, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT BE OR PUT A PART OF YOUR BODY IN THE PATH OF THE THRUST REVERSER WHILE YOU CLOSE THE THRUST REVERSER. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR IF THE THRUST REVERSER SUDDENLY CLOSES.

CAUTION: MAKE SURE THAT THE AREA BETWEEN THE THRUST REVERSER AND THE TURBINE EXHAUST SLEEVE FIRESEALS AND THE ENGINE IS CLEAR OF ALL OBJECTS. THIS WILL PREVENT DAMAGE TO THE EQUIPMENT WHEN YOU CLOSE THE THRUST REVERSER.

CAUTION: MAKE SURE THAT THE V-BLADE ON THE THRUST REVERSER ALIGNS WITH AND FULLY ENGAGES THE V-GROOVE ON THE FAN CASE WHEN YOU CLOSE THE THRUST REVERSER. IF THE V-BLADE AND V-GROOVE ARE NOT ALIGNED AND FULLY ENGAGED, DAMAGE TO THE THRUST REVERSER CAN OCCUR.

(1) Do these steps to close the thrust reverser (Figure 201), (Figure 202):

(a) These are the panel identification numbers:

Number	Name/Location
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

(b) Remove the dust caps from the inlet fitting on the opening actuator and from the thrust reverser hand pump opening system, SPL-2417.

(c) Make sure that the thrust reverser hand pump opening system, SPL-2417 is full of oil, D00071 or oil, D00068.

(d) Make sure that the return valve on the hand pump is closed.

(e) Connect the hand hydraulic pump, STD-1253 hose to the inlet fitting on the opening actuator.

CAUTION: MAKE SURE THAT THE FILTER ON THE HAND PUMP HOSE DOES NOT INTERFER WITH THE MOVING THRUST REVERSER. THE FILTER CAN TURN ON THE END OF THE HAND PUMP HOSE AND CAUSE DAMAGE TO THE EQUIPMENT.

(f) Make sure that the filter on the hand pump hose is out of the way of the moving thrust reverser.

WARNING: ALWAYS USE THE HAND PUMP TO EXTEND THE OPENING ACTUATOR AND LIFT THE WEIGHT OF THE THRUST REVERSER OFF THE ACTUATOR LOCK. IF YOU DO NOT USE THE HAND PUMP, AIR OR A VACUUM COULD GET INTO THE OPENING ACTUATOR. THIS COULD CAUSE THE THRUST REVERSER TO CLOSE QUICKLY WHEN THE ACTUATOR LOCK COLLAR IS DISENGAGED. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT OPEN THE RETURN VALVE ON THE HAND PUMP UNTIL YOU REMOVE THE SAFETY LOCK AND DISENGAGE THE ACTUATOR LOCK COLLAR. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(g) With the return valve closed on the hand pump, operate the hand pump to remove the load from the opening actuator locks.

(h) Remove the actuator safety assembly, SPL-2431 from the extended piston rod.

NOTE: The part number of the actuator safety lock is C78023-2. The part number listed (C78023-1) is the set of two actuator safety locks.

(i) Push up on the actuator lock collar to disengage the lock.

(j) Make sure that the v-blade on the thrust reverser and the v-groove on the fan case are aligned and fully engaged.

WARNING: DO THE ACTUATOR FILL AND BLEED PROCEDURE IF THE OPENING ACTUATOR RETRACTS TOO QUICKLY FOR MORE THAN 0.5 INCH (1.2 CM). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(k) Open the return valve on the hand pump and lower the thrust reverser.

NOTE: The opening actuator has a controlled rate at which it should retract. Usually the actuator piston rod will initially move quickly a small amount, less than 0.5 inch (1.2 cm).

1) If the opening actuator retracts quickly for more than 0.5 inch (1.2 cm), then, do this task: Fill and Bleed Procedure, TASK 78-31-08-870-801-F00.

(l) Close the return valve on the hand pump.

(m) Disconnect the hand pump hose from the opening actuator.

(n) Install dust caps on the inlet fitting on the opening actuator and the hand pump hose.

(o) Do these steps to engage the latches along the bottom centerline of the thrust reverser:

1) Use the latching tool, SPL-2434, in latch 2 to pull the thrust reversers together.

2) As you pull the thrust reversers together with the latching lever in latch 2, engage forward latch 1.

3) Engage the latches in sequence from latch 2 to the aft latch 6.

NOTE: Use the latching lever as it is necessary to engage the hooks on the keeper pins.

H. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-410-007-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

Close these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

SUBTASK 78-31-00-440-002-F00

(2) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-00-440-003-F00

(3) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

——————— END OF TASK ———————

TASK 78-31-00-010-805-F00

6. Open the Thrust Reverser (Manual Procedure)

A. General

(1) This task can be used to open the left or right thrust reverser on the applicable engine if you cannot use the opening actuator.

(a) It is recommended that the Hand Pump Procedure be used. Use the Manual Procedure only if the opening actuator is not operational or the hand pump is not available.

(2) The leading edge flaps and slats must be retracted and deactivated before the left or the right thrust reverser on an engine is opened.

(3) It is recommended that the left and right fan cowl panels be opened. The fan cowl panels have a 28-degree and 55-degree open position. The fan cowl panel adjacent to the thrust reverser that is to be opened must be in the 55-degree open position.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2431	Assembly - Lock, Thrust Reverser Actuator, CFM56-7 (Part #: C78023-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

F. Procedure

SUBTASK 78-31-00-040-003-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU OPEN THE LEFT OR THE RIGHT THRUST REVERSER ON AN ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-00-040-004-F00

(2) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-00-040-005-F00

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

(3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-00-010-020-F00

CAUTION: MAKE SURE THAT THE FAN COWL PANEL ADJACENT TO THE THRUST REVERSER THAT IS TO BE OPENED IS IN THE 55-DEGREE FULL OPEN POSITION. THIS WILL PREVENT DAMAGE TO THE FAN COWL PANEL AND THE THRUST REVERSER.

(4) It is recommended that the left and right fan cowl panels be opened Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

Open these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

SUBTASK 78-31-00-860-136-F00

(5) Make sure that these access panels are closed before you operate the thrust reverser:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

SUBTASK 78-31-00-010-007-F00

WARNING: DO NOT OPEN THE THRUST REVERSER IN HIGH WINDS, SUDDEN WIND CONDITIONS OR IF THE WIND VELOCITY IS MORE THAN 40 KNOTS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT GO OR PUT A PART OF YOUR BODY BETWEEN THE ENGINE AND THE THRUST REVERSER UNLESS THE OPENING ACTUATOR SAFETY LOCK IS INSTALLED. IF THE THRUST REVERSER SUDDENLY CLOSES, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT BE OR PUT A PART OF YOUR BODY IN THE PATH OF THE THRUST REVERSER WHILE YOU OPEN THE THRUST REVERSER. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR IF THE THRUST REVERSER SUDDENLY CLOSES.

CAUTION: DO NOT POWER EXTEND THE THRUST REVERSER SLEEVES WHEN THE THRUST REVERSER IS OPEN. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE THRUST REVERSER AND ADJACENT STRUCTURES CAN OCCUR.

(6) Do these steps to open the thrust reverser (Figure 201), (Figure 202):

(a) These are the panel identification numbers:

Number	Name/Location
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

(b) Disengage the six latches along the bottom centerline of the thrust reverser.

1) Disengage the latches in sequence from latch 6 to latch 1.

WARNING: BE CAREFUL WHEN YOU OPEN THE THRUST REVERSER. APPROXIMATELY 210 POUNDS (95 KG) OF FORCE IS NECESSARY TO LIFT THE THRUST REVERSER. IF YOU ARE NOT CAREFUL, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(WARNING PRECEDES)

WARNING: DO NOT OPEN THE THRUST REVERSER TOO QUICKLY. THIS CAN CAUSE A VACUUM WHICH WILL HAVE AN EFFECT ON THE NORMAL OPERATION (SNUBBING ACTION) OF THE OPENING ACTUATOR. WHEN THE ACTUATOR LOCK IS DISENGAGED FOR THE CLOSE PROCEDURE, THE THRUST REVERSER CAN CLOSE SUDDENLY. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Use a minimum of two persons to slowly lift the thrust reverser from the forward end to the fully open position.

(d) These are the indications that the thrust reverser is in the fully open position and the opening actuator is locked:

1) Listen for the click sound of the lock collar.

2) Make sure that the word LOCKED shows on the bottom of the extended piston.

3) Make sure that you can see the red band on the actuator rod.

(e) Install the actuator safety assembly, SPL-2431 on the extended piston rod.

NOTE: The part number of the actuator safety lock is C78023-2. The part number listed (C78023-1) is the set of two actuator safety locks.

———————— END OF TASK ————————

TASK 78-31-00-410-803-F00

7. Close the Thrust Reverser (Manual Procedure)

A. General

(1) This task can be used to close the left or right thrust reverser on the applicable engine if you cannot use the opening actuator.

(a) It is recommended that the Hand Pump Procedure be used. Use the Manual Procedure only if the opening actuator is not operational or the hand pump is not available.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-08-870-801-F00	Fill and Bleed Procedure (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2431	Assembly - Lock, Thrust Reverser Actuator, CFM56-7 (Part #: C78023-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2434	Tool - Latching, Thrust Reverser C-Duct Halves (Part #: C78020-14, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: C78020-11, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

F. Procedure

SUBTASK 78-31-00-410-008-F00

WARNING: MAKE SURE THAT YOU USE A STABLE FORCE (A MINIMUM OF TWO PERSONS AT THE FORWARD END) TO HOLD UP THE THRUST REVERSER BEFORE YOU DISENGAGE THE ACTUATOR LOCKS. THERE COULD BE AIR OR A VACUUM IN THE ACTUATOR WHICH CAN DECREASE THE SNUBBING ACTION OF THE OPENING ACTUATOR. THE THRUST REVERSER CAN CLOSE QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

WARNING: DO THE ACTUATOR FILL AND BLEED PROCEDURE IF THE OPENING ACTUATOR CAN RETRACT QUICKLY FOR MORE THAN 0.5 INCH (1.2 CM). IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: BE CAREFUL WHEN YOU CLOSE THE THRUST REVERSER. APPROXIMATELY 210 POUNDS (95 KG) OF FORCE IS NECESSARY TO LIFT AND HOLD THE THRUST REVERSER. IF YOU ARE NOT CAREFUL, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT GO OR PUT A PART OF YOUR BODY BETWEEN THE ENGINE AND THE THRUST REVERSER UNLESS THE OPENING ACTUATOR SAFETY LOCK IS INSTALLED. IF THE THRUST REVERSER SUDDENLY CLOSES, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT BE OR PUT A PART OF YOUR BODY IN THE PATH OF THE THRUST REVERSER WHILE YOU CLOSE THE THRUST REVERSER. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR IF THE THRUST REVERSER SUDDENLY CLOSES.

CAUTION: MAKE SURE THAT THE AREA BETWEEN THE THRUST REVERSER AND THE TURBINE EXHAUST SLEEVE FIRESEALS AND THE ENGINE IS CLEAR OF ALL OBJECTS. THIS WILL HELP PREVENT DAMAGE TO THE EQUIPMENT WHEN YOU CLOSE THE THRUST REVERSER.

(CAUTION PRECEDES)

CAUTION: MAKE SURE THAT THE V-BLADE ON THE THRUST REVERSER ALIGNS WITH AND FULLY ENGAGES THE V-GROOVE ON THE FAN CASE WHEN YOU CLOSE THE THRUST REVERSER. IF THE V-BLADE AND V-GROOVE ARE NOT ALIGNED AND FULLY ENGAGED, DAMAGE TO THE THRUST REVERSER CAN OCCUR.

(1) Do these steps to close the thrust reverser (Figure 201), (Figure 202):

(a) These are the access panel identification numbers:

Number	Name/Location
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

(b) Use a stable force (a minimum of two persons at the forward end) to lift the thrust reverser to remove the load from the opening actuator.

(c) Use one more person to do these steps:

1) Remove the actuator safety assembly, SPL-2431 from the extended piston rod.

NOTE: The part number of the actuator safety lock is C78023-2. The part number listed (C78023-1) is the set of two actuator safety locks.

2) Push up on the actuator lock collar to disengage the lock.

3) Make sure that the v-blade on the thrust reverser and the v-groove on the fan case are aligned and fully engaged.

(d) Use a minimum of two persons to slowly close the thrust reverser.

1) If the opening actuator can retract quickly for more 0.5 inch (1.2 cm), then, do this task: Fill and Bleed Procedure, TASK 78-31-08-870-801-F00.

NOTE: The opening actuator has a controlled rate at which it should retract. Usually the actuator piston rod can initially move quickly a small amount, less than 0.5 inch (1.2 cm).

(e) Do these steps to engage the latches along the bottom centerline of the thrust reverser:

1) Use the latching tool, SPL-2434, in latch 2 to pull the thrust reversers together.

2) As you pull the thrust reversers together with the latching lever in latch 2, engage the forward latch 1.

3) Engage the latches in sequence from the latch 2 to the aft latch 6.

NOTE: Use the latching lever as it is necessary to engage the hooks on the keeper pins.

G. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-410-009-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

Close these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2

(Continued)

Number	Name/Location
424	Right Fan Cowl, Engine 2

SUBTASK 78-31-00-440-004-F00

(2) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-00-440-005-F00

(3) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

——————— END OF TASK ———————

TASK 78-31-00-000-803-F00

8. Open the Thrust Reverser (65-Degree Maintenance Position)

A. General

(1) This task is used to open the outboard thrust reverser on Engine 1 or Engine 2 to the 65-degree open position.

(2) This task is used when the precooler is removed while the engine is on the airplane.

(3) These tasks must be done to open the outboard thrust reverser to the 65-degree open position:

(a) Remove the outboard fan cowl panel.

(b) Remove the outboard forward and aft hinge fairings from the thrust reverser and the outboard strut fairings.

(c) Disconnect the hydraulic flexhoses, electrical connectors and opening actuator from the outboard thrust reverser.

(d) Open the inboard thrust reverser to the 45-degree open position.

(4) It is optional to install the 45-degree arm assembly to hold the inboard thrust reverser open.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
54-52-01-010-801	Forward Fairing Removal (P/B 401)
54-52-03-010-801	Wing Junction Fairing Removal (P/B 401)
71-11-02-000-801-F00	Remove the Fan Cowl Panel (Selection) (P/B 401)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2433	Equipment - Hold Open, Thrust Reverser Cowl, CFM56-7 Engine (Part #: C78019-15, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2438	Equipment - Hold-Open, 65-Degree, T/R Cowl, CFM56-7 Engine (Part #: C78021-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

(Continued)

Reference	Description
STD-1095	Crane - Lift, 2000 Lb Capacity, 30 Foot Height
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Consumable Materials

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

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
431DL	Forward Strut Fairing, Left Underwing Fairing, Strut 1
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2
441DR	Forward Strut Fairing, Right Underwing Fairing, Strut 2
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

G. Procedure

SUBTASK 78-31-00-860-073-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE THRUST REVERSER THAT IS NEAR THE LEADING EDGE FLAPS AND SLATS OR BEFORE YOU OPEN THE LEFT OR THE RIGHT THRUST REVERSER ON AN ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-00-040-007-F00

(2) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-00-860-074-F00

(3) For the Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-00-860-075-F00

(4) For the Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-00-040-008-F00

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

(5) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-00-860-108-F00

(6) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(a) For Engine 1, remove power from hydraulic system A.

(b) For Engine 2, remove power from hydraulic system B.

SUBTASK 78-31-00-860-076-F00

(7) Depressurize the applicable hydraulic system; do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 78-31-00-860-137-F00

(8) Make sure that these access panels are closed before you open the thrust reverser:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

SUBTASK 78-31-00-010-008-F00

(9) Remove the outboard fan cowl panels from the applicable engine:

Remove the Fan Cowl Panel (Selection), TASK 71-11-02-000-801-F00

Number	Name/Location
413	Left Fan Cowl, Engine 1
424	Right Fan Cowl, Engine 2

SUBTASK 78-31-00-010-009-F00

(10) Open the inboard fan cowl access panels on the applicable engine:

Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00

Number	Name/Location
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2

SUBTASK 78-31-00-010-010-F00

(11) Remove the forward and aft hinge fairings from the applicable outboard thrust reverser: (Figure 203)

Number	Name/Location
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2

SUBTASK 78-31-00-010-011-F00

(12) Do this task: Forward Fairing Removal, TASK 54-52-01-010-801.

Remove the applicable outboard mid strut fairings:

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2

SUBTASK 78-31-00-010-017-F00

(13) Do this task: Wing Junction Fairing Removal, TASK 54-52-03-010-801.

Remove the applicable outboard underwing-strut fairings:

Number	Name/Location
431DL	Forward Strut Fairing, Left Underwing Fairing, Strut 1
441DR	Forward Strut Fairing, Right Underwing Fairing, Strut 2

SUBTASK 78-31-00-020-002-F00

WARNING: MAKE SURE THAT YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE HYDRAULIC LINES. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT LET HYDRAULIC FLUID GET ON THE THRUST REVERSER OR ENGINE COMPONENTS. IMMEDIATELY CLEAN A COMPONENT IF HYDRAULIC FLUID GETS ON IT. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE EQUIPMENT.

(CAUTION PRECEDES)

CAUTION: USE TWO WRENCHES TO LOOSEN THE COUPLING NUTS. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(14) Disconnect the extend line and the retract line flexhoses from the upper locking actuator on the outboard thrust reverser (Figure 204).

NOTE: To decrease hydraulic fluid spray when the coupling nuts are loosened, wrap cotton wiper, G00034, around the wrench, coupling nut and hydraulic line.

(a) Use a hydraulic resistant container to collect hydraulic fluid that drains from the flexhoses.

(b) Use a hydraulic fitting plug or wrap cotton wiper, G00034, around the extend line and retract line flexhose coupling nuts to catch residual hydraulic fluid that will drain from the system.

NOTE: The diameter of the return (retract) line is 0.375 inches and the pressure (deploy) line is 0.750 inches.

1) Make sure that the hydraulic fitting plug does not have contamination on it.

(c) Use a hydraulic fitting cap on the extend and retract upper actuator ports.

NOTE: When the thrust reverser is lifted to the 65-degree open position, the hydraulic fluid that is in the lines will drain from the actuator ports.

1) Make sure that the hydraulic fitting cap does not have contamination on it.

(d) If a hydraulic fitting cap is not available, do these steps to drain the hydraulic fluid from the thrust reverser.

1) Wrap cotton wiper, G00034, around the electrical connector on the sync lock on the lower actuator.

NOTE: The cloth will catch the hydraulic fluid and prevent contamination of the electrical connector.

2) Put a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 below the lower actuator to collect hydraulic fluid.

3) Disconnect the coupling nut on the sync shaft tubing at the upper port of the lower actuator.

4) Disconnect the hydraulic retract line at the upper port of the lower actuator.

5) Let the hydraulic fluid drain into the container.

6) Re-connect the coupling nut for the lower sync shaft to the lower actuator.

a) Tighten the coupling nut to 855-945 pound-inches (96.6-106.8 Newton meters).

b) Loosen the coupling nut.

c) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.8 Newton meters).

7) Re-connect the coupling nut of the lower retract line to the lower actuator.

a) Tighten the coupling nut to 256-283 pound-inches (29.0-32.0 Newton meters).

b) Loosen the coupling nut.

c) Tighten the coupling nut again to 256-283 pound-inches (29.0-32.0 Newton meters).

8) Remove the cotton wiper, G00034, from the electrical connector on the sync lock.

SUBTASK 78-31-00-020-004-F00

(15) For the outboard thrust reverser, do these steps to disconnect the electrical connectors from the strut receptacles (Figure 204):

(a) For Engine 1, disconnect the electrical connectors, D30002 and D30008.

(b) For Engine 2, disconnect the electrical connectors, D30006 and D30010.

SUBTASK 78-31-00-010-012-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. THIS WILL PREVENT INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(16) Open the inboard and outboard thrust reverser; do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00

(Figure 201).

NOTE: To get access to install the inboard lockpin for the 65-degree hold-open equipment, it is necessary to open the inboard thrust reverser also.

SUBTASK 78-31-00-010-013-F00

(17) Do these steps to install the sling on the outboard thrust reverser (Figure 205):

(a) Remove the screws [24] from the four locations that are marked "GSE" on the latch beam fairing.

(b) Remove the bolts [22] and washers [23] from the storage holes in the sling attach fittings [21].

(c) Put the screws [24] in the storage holes.

(d) Put the two GSE sling attach fittings [21] on the latch beam.

(e) Install the two bolts [22] with a washer [23] under each bolt head in each sling attach fitting [21].

1) Tighten the bolts to 30-50 pound-inches (3.4-5.7 Newton meters).

(f) Attach the master link to the 30 foot height (2000 lbs capacity) lift crane, STD-1095.

(g) Slowly lift the hoist until there is a load on the sling straps and the sling will hold the weight of the thrust reverser; but, do not lift the thrust reverser at this time.

SUBTASK 78-31-00-020-005-F00

(18) Do these steps to disconnect the opening actuator from the outboard thrust reverser (Figure 206):

(a) Remove the nut [36], washer [32], alignment washer [34], bushing [33], two washers [35] and bolt [31], from the fitting on the fan case.

NOTE: If a longer bolt was used, there will be three washers [35].

(b) To remove the load from the bolt and to make the removal from the attach fitting easier, lift the thrust reverser with the sling.

(c) Temporarily attach the opening actuator to the thrust reverser with a tie.

1) Make sure that the tie is not attached to a hydraulic tube or the wire harness.

SUBTASK 78-31-00-010-014-F00

(19) Do these steps to attach the 65-degree equipment, SPL-2438 (Figure 207):

NOTE: The 65-degree hold-open equipment consists of a strut attach beam, a 65-degree arm support, a beam assembly, two retention pins and two lockpins.

(a) Use the two lockpins [49] to attach the strut attach beam [41] to the two clevis brackets on the strut.

(b) Slowly lift the thrust reverser with the sling until you can install the 65-degree arm support [44].

(c) Attach the 65-degree arm support [44] to the strut attach beam [41] as follows:

WARNING: MAKE SURE THAT YOU CORRECTLY ENGAGE THE ARM SUPPORT INTO THE STRUT ATTACH BEAM. IF YOU DO NOT, THE HOLD-OPEN EQUIPMENT WILL NOT HOLD THE WEIGHT OF THE THRUST REVERSER. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

1) Engage the inboard end of the 65-degree arm support [44] into the strut attach beam [41].

2) As you hold the 65-degree arm support [44], install a lockpin [45] to attach it to the strut attach beam [41].

(d) Install the beam assembly [42] on the 65-degree arm support [44] with the retention pin [43].

NOTE: Make sure that the longer side of the beam assembly faces forward.

(e) Make sure that the 65-degree arm support [44] is correctly engaged and that the lockpins [45] and retention pin [43] are correctly installed.

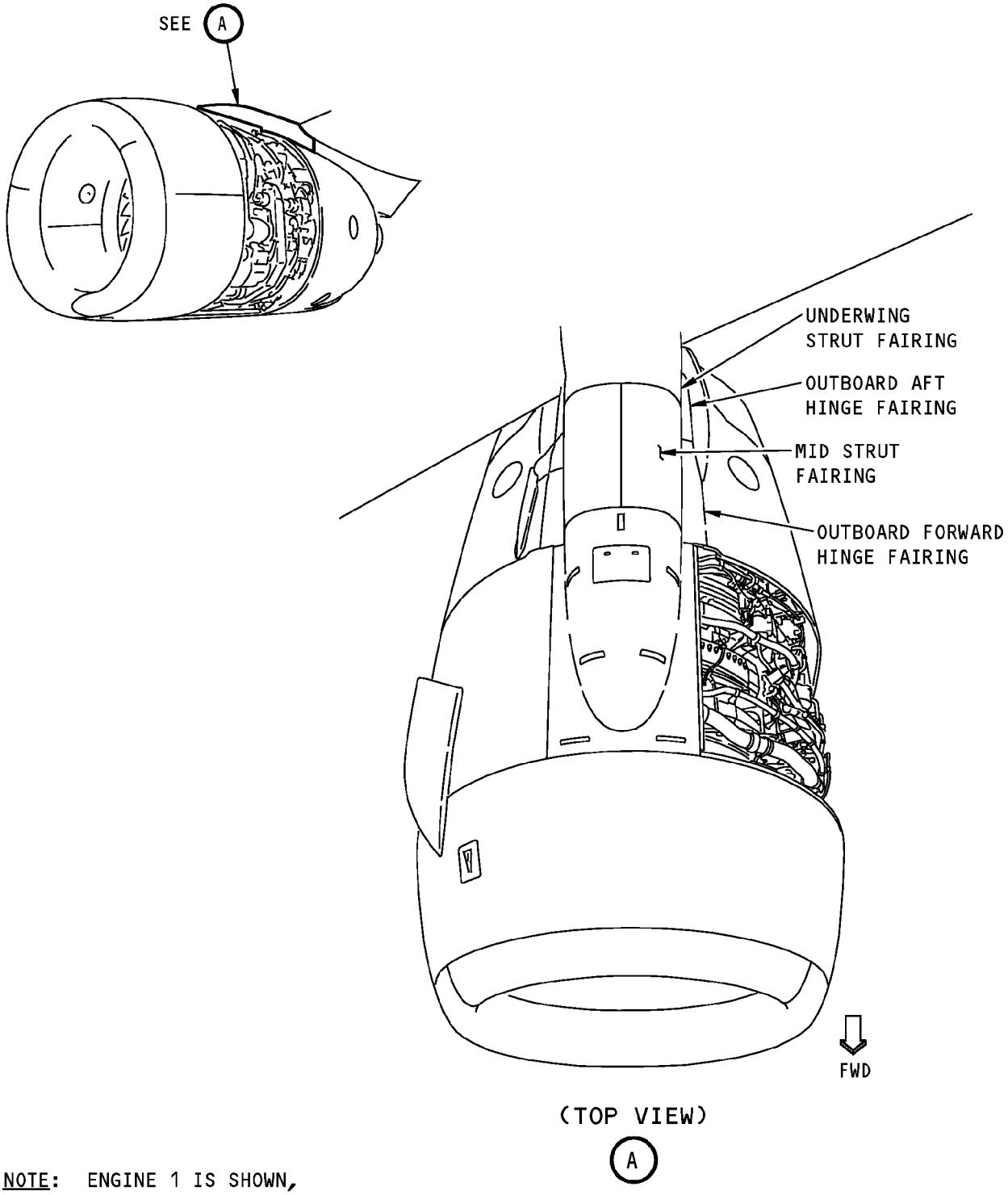
(f) Slowly lower the thrust reverser until the weight is held by the 65-degree hold-open equipment.

1) As you lower the thrust reverser, make sure that the two adjustment pins on the beam assembly [42] will engage the compression-rod receiver cups on the thrust reverser.

(g) If you will install the 45-degree hold open equipment, SPL-2433 arm support [46] and beam assembly [48] for the inboard thrust reverser for other maintenance, do the steps above again .

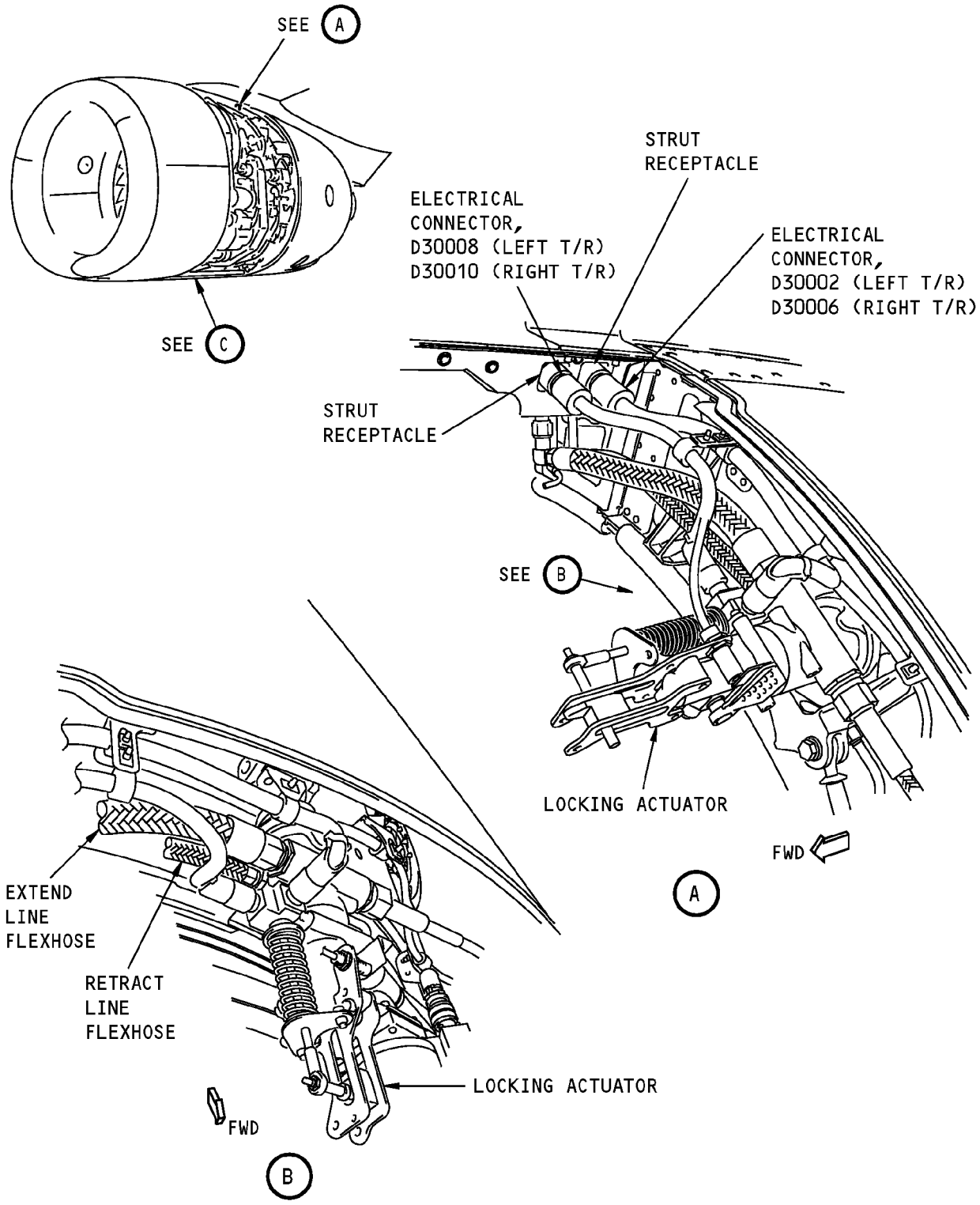
NOTE: This step is optional, it is not necessary to install the 45-degree arm assembly for the precooler removal and installation.

END OF TASK

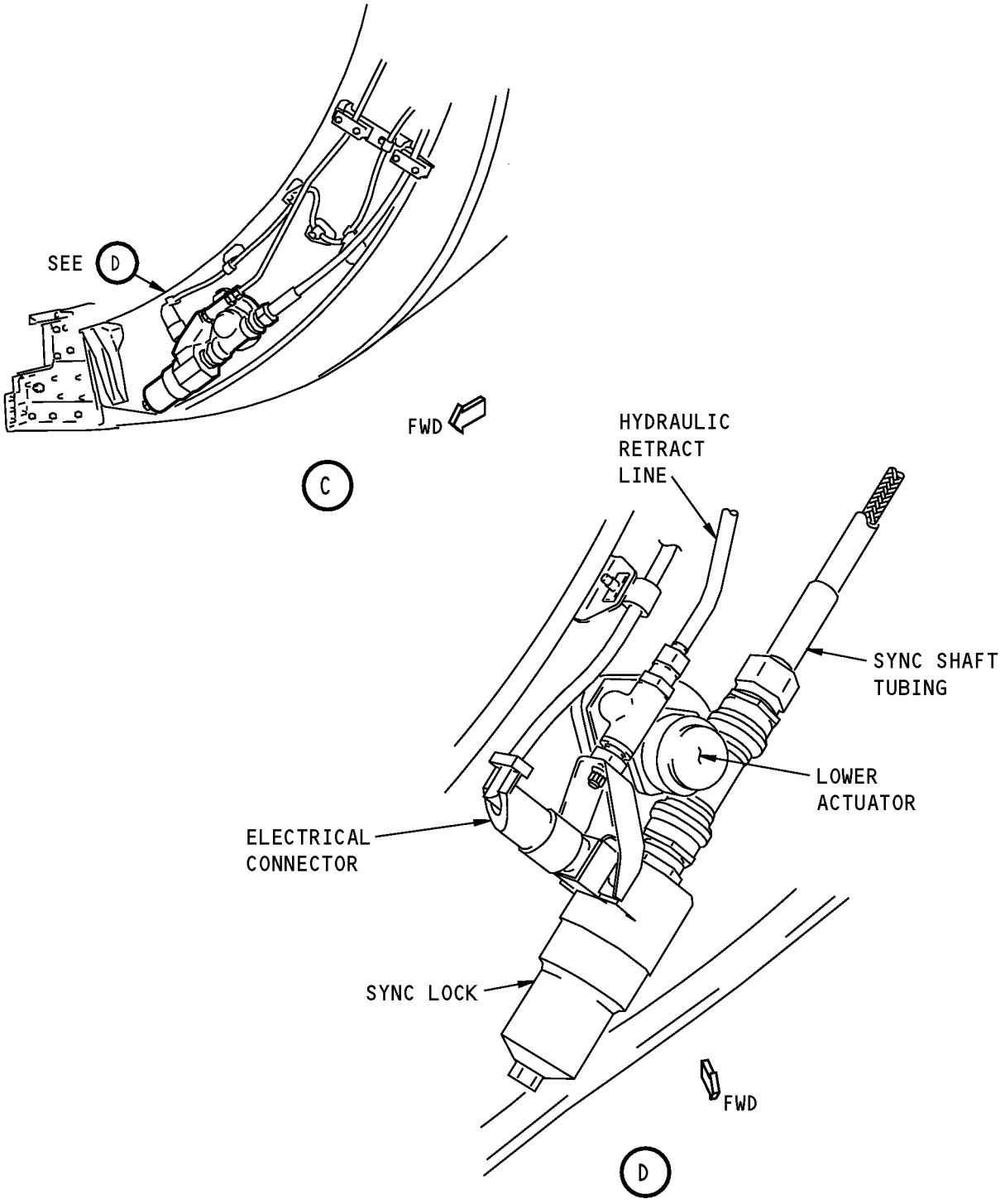


NOTE: ENGINE 1 IS SHOWN,
ENGINE 2 IS OPPOSITE.

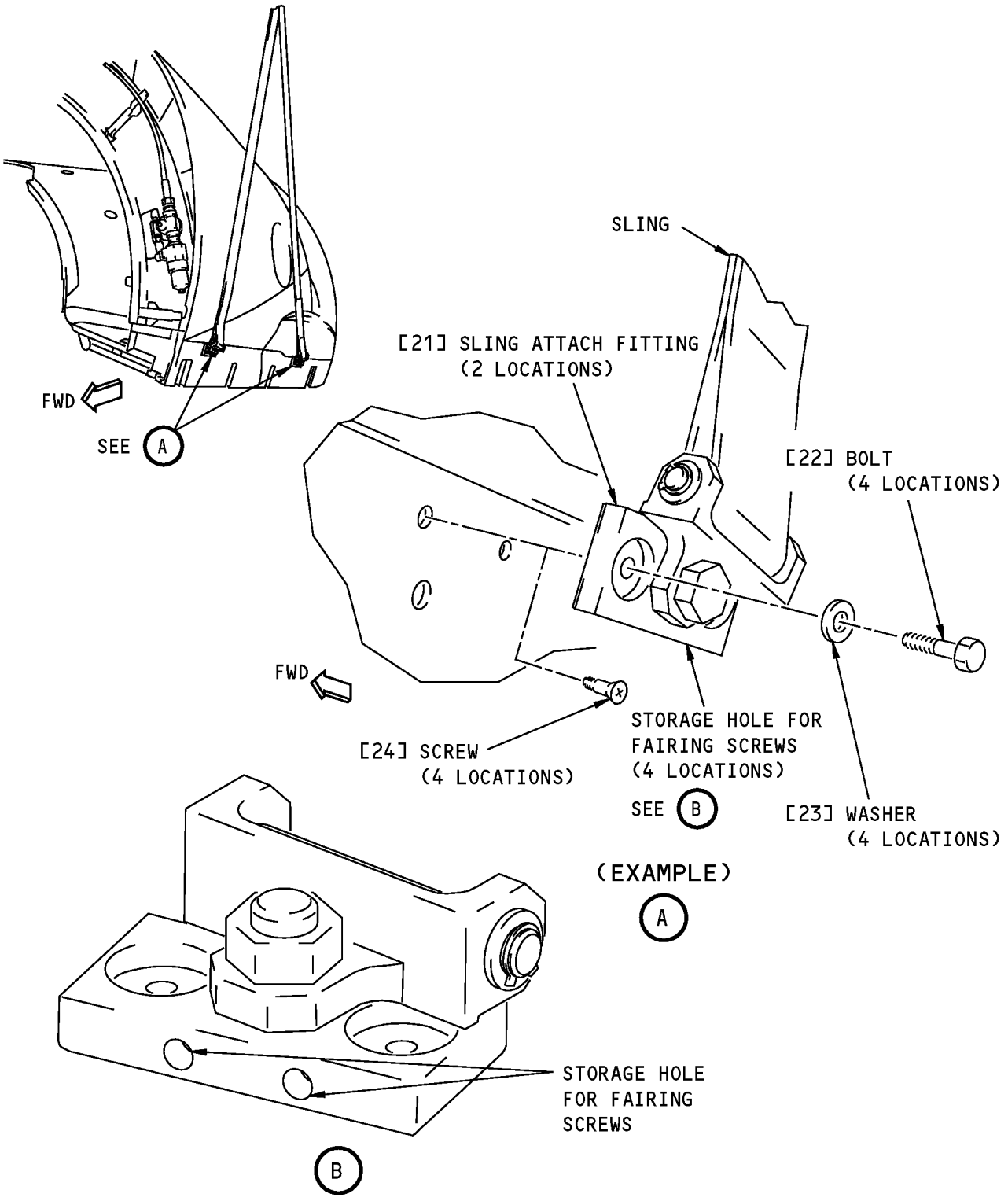
Strut and Hinge Fairings
Figure 203/78-31-00-990-808-F00



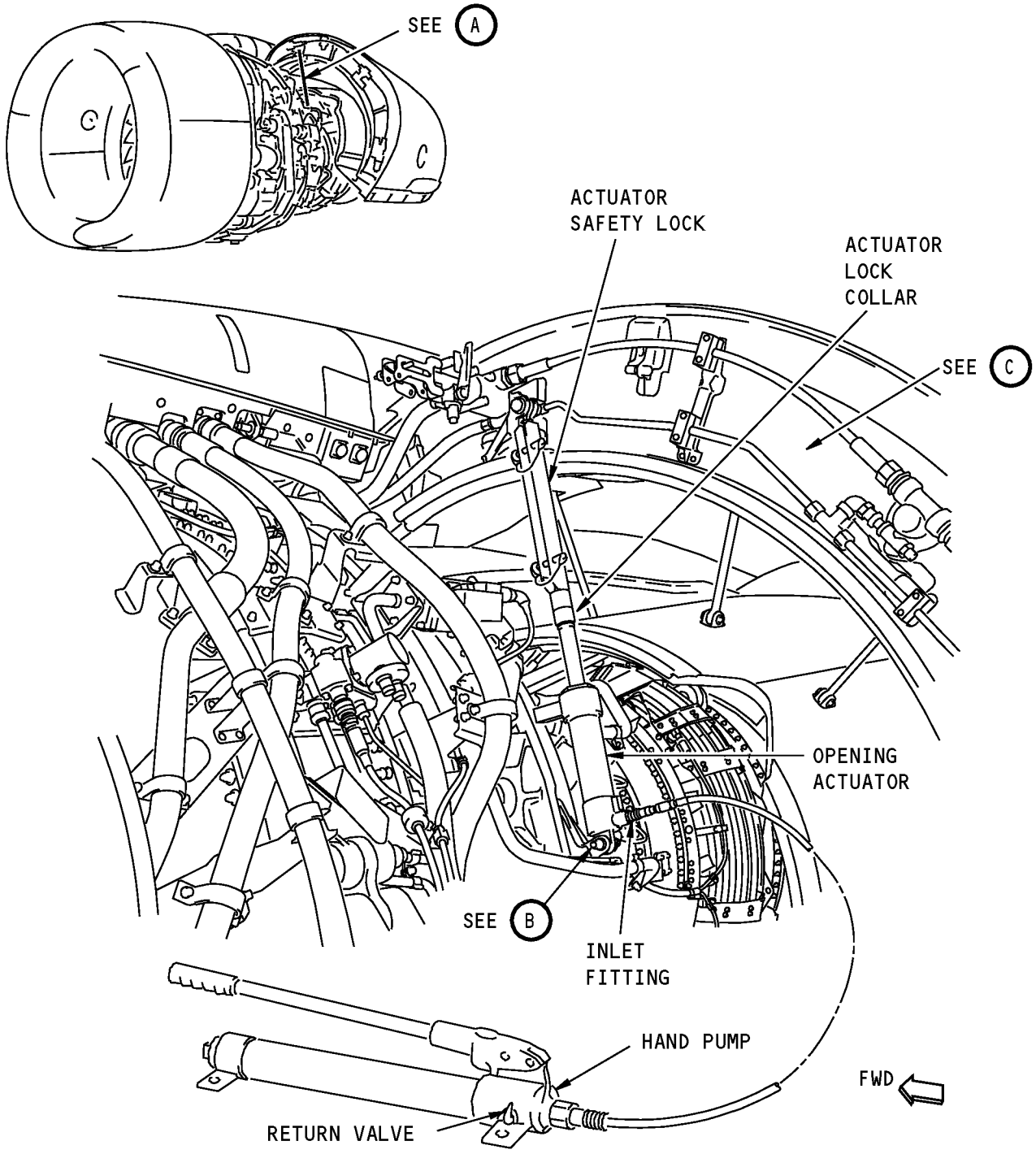
Hydraulic and Electrical Connections
Figure 204 (Sheet 1 of 2)/78-31-00-990-809-F00



Hydraulic and Electrical Connections
Figure 204 (Sheet 2 of 2)/78-31-00-990-809-F00



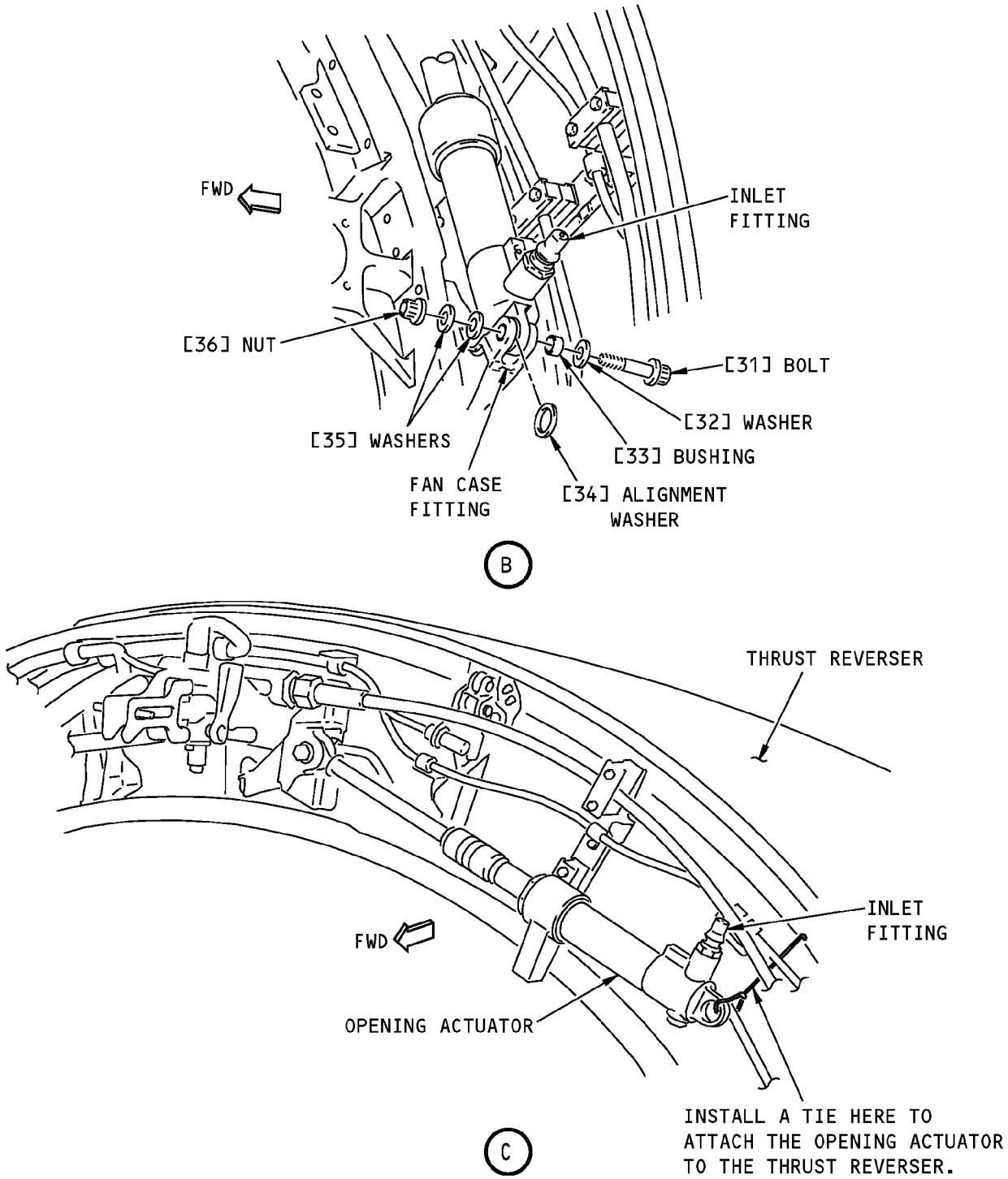
Thrust Reverser Sling Installation
Figure 205/78-31-00-990-810-F00



NOTE: LEFT THRUST REVERSER IS SHOWN,
RIGHT THRUST REVERSER IS OPPOSITE.

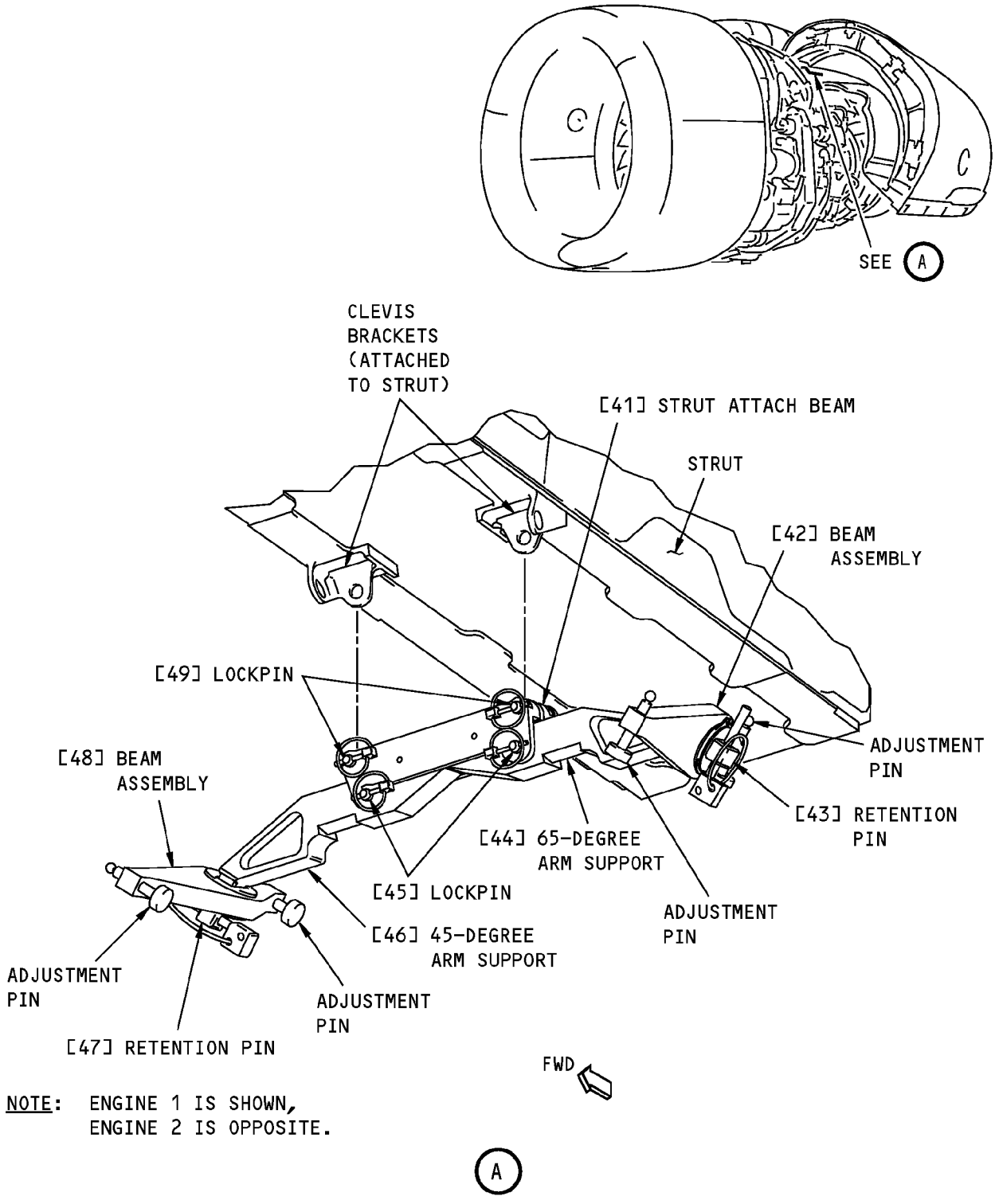
A

Thrust Reverser Opening Actuator Disconnect
Figure 206 (Sheet 1 of 2)/78-31-00-990-811-F00



NOTE: LEFT THRUST REVERSER SIDE SHOWN, RIGHT THRUST REVERSER IS OPPOSITE.

Thrust Reverser Opening Actuator Disconnect
Figure 206 (Sheet 2 of 2)/78-31-00-990-811-F00



Thrust Reverser 65 Degree Hold-Open Equipment Installation
Figure 207/78-31-00-990-812-F00

TASK 78-31-00-410-804-F00

9. Close the Thrust Reverser (65-Degree Maintenance Position)

A. General

(1) This task is used to remove the 65-degree hold-open equipment and close the thrust reverser.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
54-52-01-410-801	Forward Fairing Installation (P/B 401)
54-52-03-410-801	Wing Junction Fairing Installation (P/B 401)
71-11-02-400-801-F00	Install the Fan Cowl Panel (Selection) (P/B 401)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-21-00-700-804-F00	EEC TEST (P/B 501)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

C. Tools/Equipment

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

Reference	Description
SPL-2431	Assembly - Lock, Thrust Reverser Actuator, CFM56-7 (Part #: C78023-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2433	Equipment - Hold Open, Thrust Reverser Cowl, CFM56-7 Engine (Part #: C78019-15, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2438	Equipment - Hold-Open, 65-Degree, T/R Cowl, CFM56-7 Engine (Part #: C78021-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1095	Crane - Lift, 2000 Lb Capacity, 30 Foot Height

D. Consumable Materials

Reference	Description	Specification
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS 3-33)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
431DL	Forward Strut Fairing, Left Underwing Fairing, Strut 1
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2
441DR	Forward Strut Fairing, Right Underwing Fairing, Strut 2

G. Procedure

SUBTASK 78-31-00-480-001-F00

(1) If the sling is not installed, do these steps to install the sling.

(a) Remove the screws [24] from the four locations that are marked "GSE" on the latch beam fairing.

(b) Remove the bolts [22] and washers [23] from the storage holes in the sling attach fittings [21].

(c) Put the screws [24] in the storage holes.

(d) Put the two GSE sling attach fittings [21] on the latch beam.

(e) Install the two bolts [22] with a washer [23] under each bolt head in each sling attach fitting [21].

1) Tighten the bolts to 30-50 pound-inches (3.4-5.7 Newton meters).

(f) Attach the master link to the 30 foot height (2000 lbs capacity) lift crane, STD-1095.

(g) Slowly lift the hoist until there is a load on the sling straps and the sling will hold the weight of the thrust reverser; but, do not lift the thrust reverser at this time.

SUBTASK 78-31-00-080-001-F00

(2) Do these steps to remove the 65-degree equipment, SPL-2438 (Figure 207):

(a) Lift the thrust reverser with the sling a small distance to take the weight of the thrust reverser off the beam assembly [42].

(b) Turn the adjustment pins on the beam assembly [42] to disengage them from the compression-rod receiver cups.

(c) Remove the retention pin [43] and the beam assembly [42].

(d) Remove the lockpin [45] and the 65-degree arm support [44].

(e) If the 45-degree hold open equipment, SPL-2433 arm assembly is installed on the inboard side of the strut attach beam, do these steps:

1) Make sure that the weight of the inboard thrust reverser is held by the opening actuator.
2) Turn the adjustment pins on the beam assembly [48] to disengage them from the compression-rod receiver cups.
3) Remove the retention pin [47] and the beam assembly [48].
4) Remove the lockpin [45] and the 45-degree arm assembly [46].

(f) Remove the two lockpins [49] and strut attach beam [41] from the strut.

SUBTASK 78-31-00-420-001-F00

(3) Do these steps to connect the opening actuator (Figure 206):

(a) Apply grease, D00015 to the shank of the bolt [31].

NOTE: Do not get grease on the threads of the bolts.

(b) Lower the thrust reverser until the opening actuator can be aligned with the attach fitting on the fan case.

(c) If not already done, push up on the actuator lock collar to disengage the lock so that the rod end can be lifted or lowered.

(d) Lift or lower the opening actuator to align it with the attach fitting on the fan case.

(e) Install the bolt [31], bushing [33], washer [32], alignment washer [34], two (or three) washers [35] and nut [36].

1) Make sure that the alignment washer [34] is installed with the teflon surface against the actuator spherical bearing.
2) Tighten the nut [36] to 370-690 pound-inches (41.8-77.9 Newton meters).

(f) Remove the dust cap from the inlet fitting on the opening actuator.

(g) Connect the hand pump to the inlet fitting.

(h) With the return valve on the hand pump closed, operate the hand pump to extend and lock the opening actuator.

1) These are the indications that the opening actuator is locked:
a) Listen for the click sound of the lock collar.
b) Make sure that the word LOCKED shows on the bottom of the extended piston.
c) Make sure that you can see the red band on the actuator rod.
2) Install the actuator safety assembly, SPL-2431 on the extended piston rod.

NOTE: The part number of the actuator safety lock is C78023-2. The part number listed (C78023-1) is the set of two actuator safety locks.

SUBTASK 78-31-00-080-002-F00

(4) Do these steps to remove the sling (Figure 205):

(a) Slowly lower the hoist to release the load on the sling straps.

(b) Remove the two bolts [22] and washers [23] from each of the sling attach fittings.

(c) Re-install the four screws [24] in the hole locations marked "GSE" on the latch beam fairing.

NOTE: The screws are for aerodynamic smoothness.

(d) Install the bolts [22] and washers [23] into the storage holes on the sling attach fittings.

SUBTASK 78-31-00-420-002-F00

(5) Do these steps to connect the electrical connectors (Figure 204):

(a) For Engine 1, connect the electrical connectors, D30002 and D30008, to the strut receptacles.

(b) For Engine 2, connect the electrical connectors, D30006 and D30010, to the strut receptacles.

SUBTASK 78-31-00-420-003-F00

WARNING: MAKE SURE THAT YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID COULD LEAK FROM THE FROM THE HYDRAULIC LINES. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: USE TWO WRENCHES TO TIGHTEN THE COUPLING NUTS. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND FITTINGS CAN OCCUR.

(6) Do these steps to connect the thrust reverser hydraulic lines (Figure 204):

(a) If hydraulic fitting plugs were installed on the flexhoses, use a hydraulic resistant container to catch the residual hydraulic fluid that is in the flexhoses.

1) Remove the hydraulic fitting plugs.

(b) If cotton wiper, G00034 is around the flexhoses, remove the cloth.

(c) If installed, remove the hydraulic fitting caps from the upper actuator ports.

(d) Connect the extend line flexhose to the upper locking actuator.

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.8 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.8 Newton meters).

(e) Connect the retract line flexhose to the upper locking actuator.

1) Tighten the coupling nut to 257-284 pound-inches (29.0-32.0 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 257-284 pound-inches (29.0-32.0 Newton meters).

H. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-410-010-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS, BUT DO NOT DO THE THRUST REVERSER OR LEADING EDGE ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close and latch the thrust reverser; but do not do the thrust reverser or leading edge activation at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

(a) These are the panel identification numbers:

Number	Name/Location
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

SUBTASK 78-31-00-010-018-F00

(2) Do this task: Forward Fairing Installation, TASK 54-52-01-410-801.

Install the outboard mid strut fairings:

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2

SUBTASK 78-31-00-010-019-F00

(3) Do this task: Wing Junction Fairing Installation, TASK 54-52-03-410-801.

Install the outboard underwing-strut fairings:

Number	Name/Location
431DL	Forward Strut Fairing, Left Underwing Fairing, Strut 1
441DR	Forward Strut Fairing, Right Underwing Fairing, Strut 2

SUBTASK 78-31-00-410-011-F00

(4) Install the forward hinge fairings and the aft hinge fairings:

(Figure 203)

Number	Name/Location
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2

SUBTASK 78-31-00-860-077-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize system A.

(b) For Engine 2, pressurize system B.

SUBTASK 78-31-00-860-078-F00

(6) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-00-860-079-F00

(7) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-00-440-006-F00

(8) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-00-710-015-F00

(9) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Do a check of the connections and flexhoses on the thrust reverser for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-31-00-710-016-F00

(10) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

NOTE: This check will make sure that the electrical connections for the LVDT's are correct.

(a) Make sure that no LVDT maintenance messages show.

1) If a maintenance message shows, do the applicable fault isolation task in the Fault Isolation Manual for that maintenance message.

2) If no maintenance messages show, the electrical connections for the LVDT are correct.

SUBTASK 78-31-00-410-017-F00

(11) Do this task: Install the Fan Cowl Panel (Selection), TASK 71-11-02-400-801-F00.

Install the outboard fan cowl panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
424	Right Fan Cowl, Engine 2

SUBTASK 78-31-00-410-018-F00

(12) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

Close the inboard fan cowl panels;

Number	Name/Location
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2

SUBTASK 78-31-00-440-011-F00

(13) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

END OF TASK

TASK 78-31-00-980-801-F00

10. Thrust Reverser Operation - Extend (Selection)

A. General

(1) The purpose of this procedure is to permit the mechanics to select the applicable task to extend the thrust reverser.

B. Procedure

SUBTASK 78-31-00-860-080-F00

(1) Do one of these tasks to extend the thrust reverser:

(a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.

———————— END OF TASK ————————

TASK 78-31-00-980-802-F00

11. Thrust Reverser Operation - Retract (Selection)

A. General

(1) The purpose of this task is to permit the mechanics to select the applicable task to retract the thrust reverser.

B. Procedure

SUBTASK 78-31-00-860-081-F00

(1) Do one of these tasks to retract the thrust reverser:

(a) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

———————— END OF TASK ————————

TASK 78-31-00-980-803-F00

12. Thrust Reverser Operation - Extend (Manual Procedure)

A. General

(1) This task is used to manually extend the left or right thrust reverser sleeve.

(2) To engage the manual drive shaft in the sync lock, the lock release pin in the 3/8-inch square opening at the end of the sync lock must be pushed in.

(3) The sync lock is on the lower hydraulic actuator on the torque box.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

E. Prepare to do the Procedure

SUBTASK 78-31-00-040-010-F00

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

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-00-010-021-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

Open these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

SUBTASK 78-31-00-860-133-F00

(3) Make sure that these access panels are closed before you operate the thrust reverser:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

F. Manually Extend the Thrust Reverser

SUBTASK 78-31-00-980-001-F00

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AFT OF THE APPLICABLE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(WARNING PRECEDES)

CAUTION: STOP THE MANUAL EXTENSION OF THE THRUST REVERSER IF THE THRUST REVERSER EXTENDS AT AN ANGLE. THIS IS AN INDICATION THAT THERE ARE SYNC SHAFTS THAT ARE BROKEN OR NOT INSTALLED. YOU MUST FIND AND CORRECT THE PROBLEM BEFORE YOU EXTEND THE THRUST REVERSER AGAIN.

CAUTION: DO NOT APPLY MORE THAN 50 POUND-INCHES OF TORQUE WHEN YOU TURN THE SQUARE DRIVE WRENCH TO EXTEND THE THRUST REVERSER. IF MORE TORQUE IS APPLIED, DAMAGE TO THE SYNC LOCK CAN OCCUR.

CAUTION: DO NOT USE AN EXTENSION BAR OR OTHER TOOLS TO MOVE THE MANUAL UNLOCK LEVER ON THE LOCKING ACTUATOR. IF YOU USE AN EXTENSION BAR OR OTHER TOOLS, DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: IF THE THRUST REVERSER IS IN THE 45-DEGREE OPEN POSITION, DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10 INCHES. MONITOR THE POSITION OF THE THRUST REVERSER SLEEVE AS IT IS EXTENDED TO MAKE SURE THAT THERE IS NO INTERFERENCE WITH THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(1) Obey all of these WARNINGS and CAUTIONS when you do this procedure.

SUBTASK 78-31-00-860-084-F00

(2) Do these steps to release the lock on the locking actuator (Figure 208):

(a) Move the manual unlock lever forward.

(b) Hold the manual unlock lever in the forward position as you push the detent pin in.

(c) Release the manual unlock lever.

SUBTASK 78-31-00-980-002-F00

CAUTION: DO NOT STRIKE THE END OF THE SYNC LOCK OR THE 3/8-INCH DRIVE WRENCH TO PUSH THE LOCK RELEASE PIN IN TO ENGAGE THE MANUAL DRIVE. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE SYNC LOCK CAN OCCUR.

(3) Do these steps to manually extend the thrust reverser (Figure 209):

(a) Put a 5/8-inch open end wrench on the hex nut at end of the sync lock.

(b) Put a 3/8-inch square drive wrench with a 6-inch (15 cm) extension into the 3/8-inch square opening.

NOTE: The wrench will go into the opening approximately 0.30 inch (7.62 mm).

(c) As you apply continuous pressure on the lock release pin with the square drive wrench, slowly move the open end wrench a small amount, in one direction and then the other, until the lock release pin goes in.

CAUTION: AS YOU EXTEND THE THRUST REVERSER, APPLY CONTINUOUS PRESSURE ON THE LOCK RELEASE PIN WITH THE SQUARE DRIVE WRENCH TO KEEP THE LOCK RELEASE PIN PUSHED IN. THIS WILL KEEP THE MANUAL DRIVE FULLY ENGAGED. IF YOU EXTEND THE THRUST REVERSER WHEN THE MANUAL DRIVE IS NOT FULLY ENGAGED, DAMAGE TO THE SYNC LOCK CAN OCCUR.

(d) To extend the left thrust reverser sleeve, turn the wrench counterclockwise.

(e) To extend the right thrust reverser sleeve, turn the wrench clockwise.

NOTE: The sleeve will be in the fully extended position when you hear the override clutch on the manual drive make a "ratcheting" sound.

(f) If the thrust reverser is in the 45-degree open position, do these steps:

1) For the inboard thrust reverser sleeve, do these steps:

a) Make sure that the leading edge flaps are completely retracted.

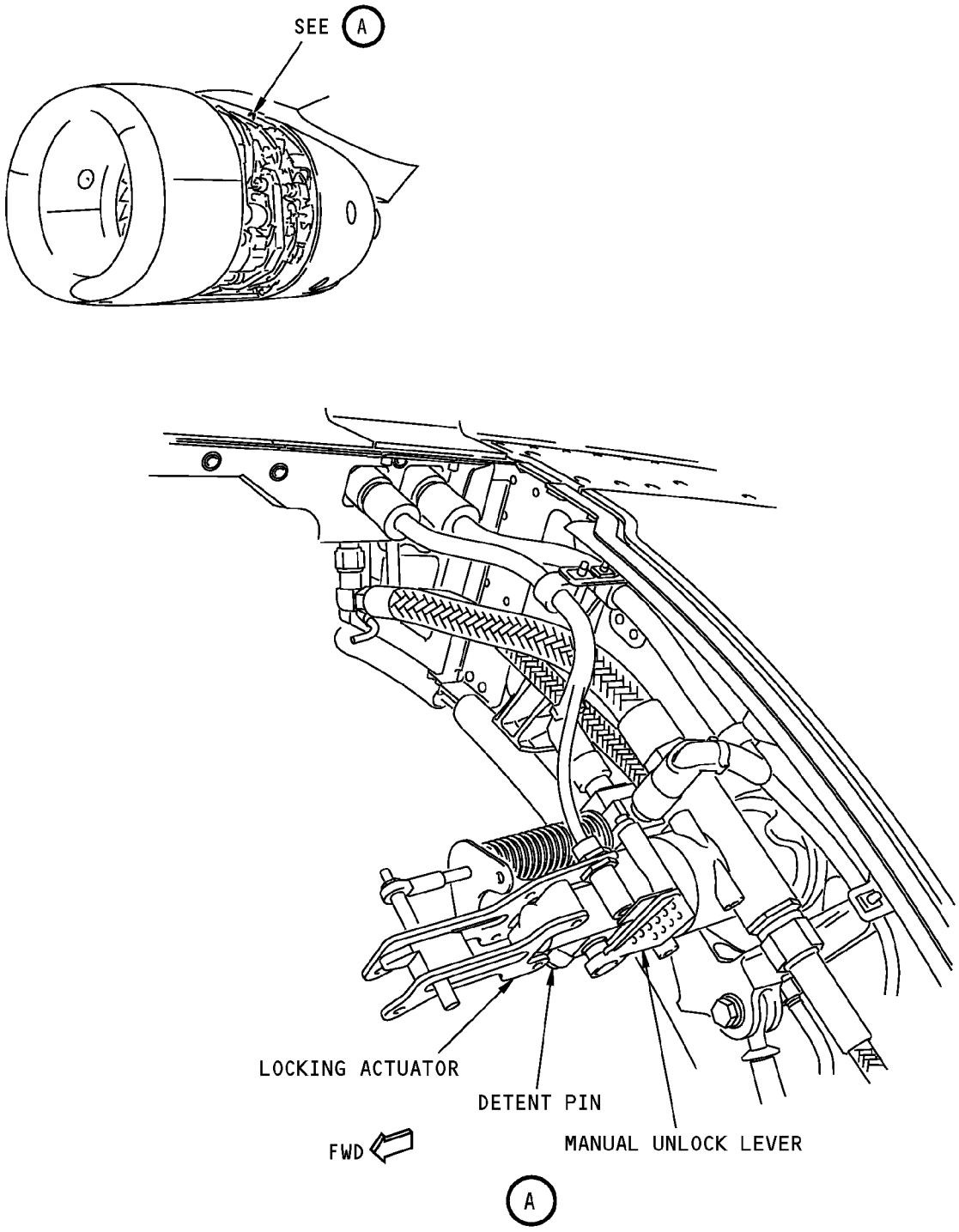
b) Monitor the position of the thrust reverser sleeve as it is extended to make sure that it does not touch the wing.

c) Manually extend the thrust reverser sleeve no more than 10 inches (154.0 mm) from the forward edge of the torque box.

2) For the outboard thrust reverser sleeve, there is no interference with the wing.

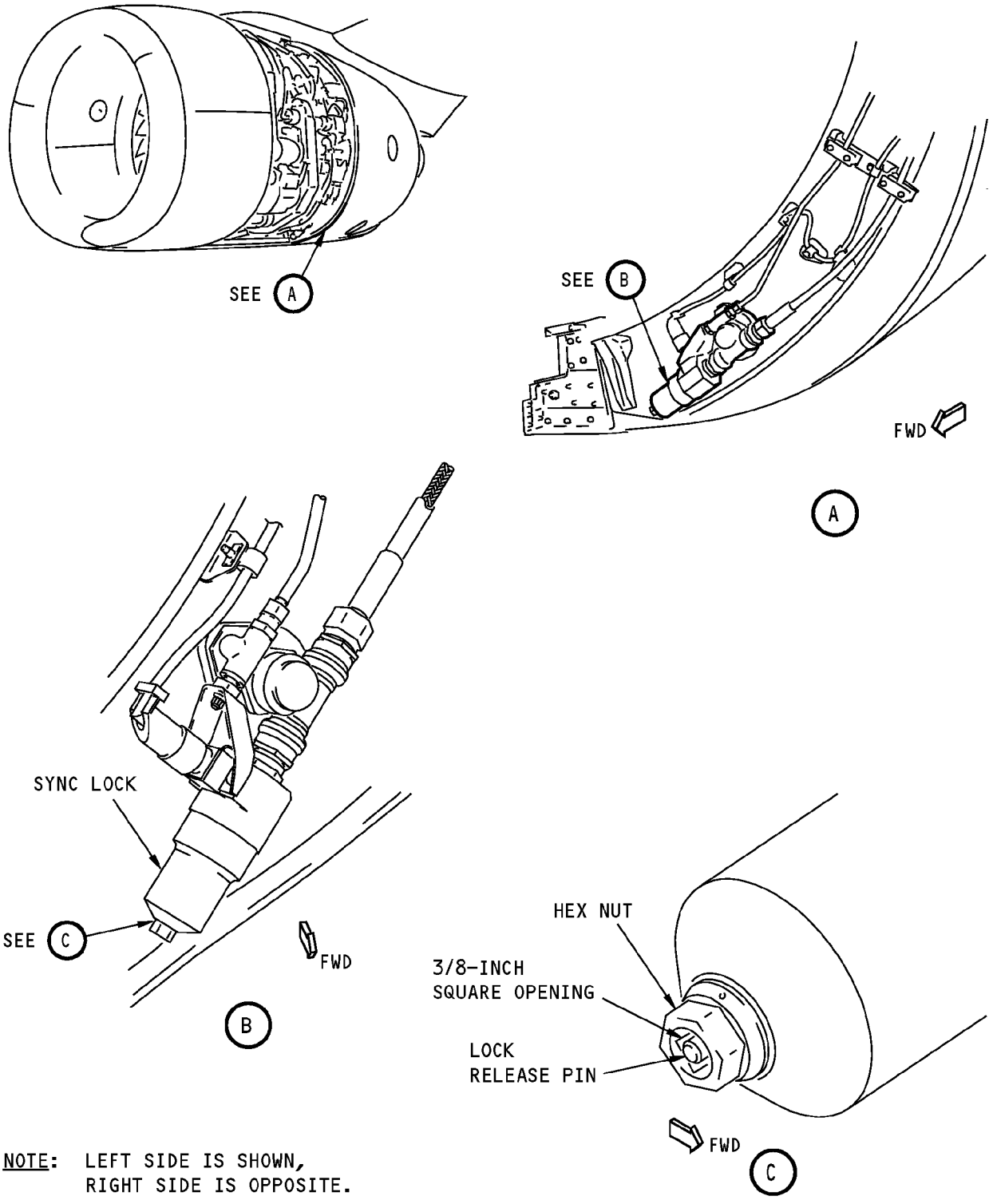
(g) Remove the square drive wrench from the sync lock.

—————— END OF TASK ——————



NOTE: LEFT SIDE IS SHOWN,
RIGHT SIDE IS OPPOSITE.

Manual Unlock of the Locking Actuator
Figure 208/78-31-00-990-813-F00



Thrust Reverser Sync Lock Manual Drive
Figure 209/78-31-00-990-814-F00

TASK 78-31-00-980-804-F00

13. Thrust Reverser Operation - Retract (Manual Procedure)

A. General

(1) This task is to manually retract the left or right thrust reverser sleeve on an engine.

(2) To engage the manual drive shaft in the sync lock, the lock release pin in the 3/8-inch square opening at the end of the sync lock must be pushed in.

(3) The sync lock is on the lower hydraulic actuator on the torque box.

(4) Hydraulic power can be necessary to completely retract and lock the thrust reverser.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
FIM 78-31 TASK 801	Engine Accessory Unit (EAU) BITE Procedure

C. Tools/Equipment

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

Reference	Description
SPL-2418	Lockpin - Equipment, Thrust Reverser Actuation Module Lockout (Part #: C78004-1, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

F. Manually Retract the Thrust Reverser

SUBTASK 78-31-00-040-012-F00

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

(1) If not already done, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-00-010-016-F00

(2) If not already done, do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

Open these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

G. Manually Retract the Thrust Reverser

SUBTASK 78-31-00-980-003-F00

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA FORWARD OF THE APPLICABLE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: STOP THE MANUAL RETRACTION OF THE THRUST REVERSER IF THE THRUST REVERSER RETRACTS AT AN ANGLE. THIS IS AN INDICATION THAT THERE ARE SYNC SHAFTS THAT ARE BROKEN OR NOT INSTALLED. YOU MUST FIND AND CORRECT THE PROBLEM BEFORE YOU RETRACT THE THRUST REVERSER AGAIN. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

CAUTION: DO NOT APPLY MORE THAN 50 POUND-INCHES OF TORQUE WHEN YOU TURN THE SQUARE DRIVE WRENCH TO RETRACT THE THRUST REVERSER. IF MORE TORQUE IS APPLIED, DAMAGE TO THE SYNC LOCK CAN OCCUR.

CAUTION: DO NOT USE HYDRAULIC POWER TO RETRACT THE THRUST REVERSER IF IT IS OPEN. MONITOR THE POSITION OF THE THRUST REVERSER SLEEVE AS IT IS MANUALLY RETRACTED TO MAKE SURE THAT THERE IS NO INTERFERENCE WITH THE WING. THIS WILL PREVENT DAMAGE TO EQUIPMENT.

(1) Obey all of these WARNINGS and CAUTIONS when you do this procedure.

SUBTASK 78-31-00-980-004-F00

(2) To manually retract the thrust reverser, do these steps:

NOTE: To completely retract and lock the thrust reverser, it can be necessary to use hydraulic power. You can use a wrench to partially retract the thrust reverser; however if the locking actuator does not lock, hydraulic power will be necessary to completely retract and lock the thrust reverser.

CAUTION: DO NOT STRIKE THE END OF THE SYNC LOCK OR THE 3/8-INCH DRIVE WRENCH TO PUSH THE LOCK RELEASE PIN IN TO ENGAGE THE MANUAL DRIVE. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE SYNC LOCK CAN OCCUR.

(a) Do these steps to unlock the sync lock and engage the manual drive (Figure 209):

1) Put a 5/8-inch open end wrench on the hex nut at the end of the sync lock.

2) Put a 3/8-inch square drive wrench with a 6-inch (15 cm) extension into the 3/8-inch square opening.

NOTE: The wrench will go into the opening approximately 0.30 inch (7.62 mm).

3) As you apply continuous pressure on the lock release pin with the square drive wrench, slowly move the open end wrench a small amount, in one direction or the other, until the lock release pin goes in.

CAUTION: AS YOU RETRACT THE THRUST REVERSER, APPLY CONTINUOUS PRESSURE ON THE LOCK RELEASE PIN WITH THE SQUARE DRIVE WRENCH TO KEEP THE LOCK RELEASE PIN PUSHED IN. THIS WILL KEEP THE MANUAL DRIVE FULLY ENGAGED. IF YOU RETRACT THE THRUST REVERSER WHEN THE MANUAL DRIVE IS NOT FULLY ENGAGED, DAMAGE TO THE SYNC LOCK CAN OCCUR.

4) To retract the left thrust reverser sleeve, turn the wrench clockwise.

5) To retract the right thrust reverser sleeve, turn the wrench counterclockwise.

NOTE: The sleeve will be at the manual track limit when you hear the override clutch on the manual drive make a "ratcheting" sound. If the locking actuator has not locked at this time, hydraulic power will be necessary to completely retract and lock the thrust reverser.

6) Remove the wrench from the sync lock.

SUBTASK 78-31-00-860-120-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AROUND THE THRUST REVERSERS. THE SLEEVE WILL EXTEND WHEN THE LOCKOUT PIN IS REMOVED FROM THE MANUAL ISOLATION VALVE HANDLE. IF THERE ARE PERSONS OR EQUIPMENT IN THE AREA WHEN THE THRUST REVERSER EXTENDS OR RETRACTS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT OPERATE THE THRUST REVERSER WHEN ELECTRICAL POWER INTERRUPTIONS (FOR MORE THAN A NORMAL BUS TRANSFER) CAN OCCUR. IF THERE IS A LOSS OF ELECTRICAL POWER WHEN THE THRUST REVERSER IS IN TRANSIT, DAMAGE TO THE SYNC LOCKS CAN OCCUR AND THE SYNC LOCK OPERATIONAL TEST MUST BE DONE.

CAUTION: MAKE SURE THAT THE THRUST REVERSER IS CLOSED AND LATCHED BEFORE YOU USE HYDRAULIC POWER TO EXTEND OR RETRACT THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(3) If it is necessary to use hydraulic power to fully retract the thrust reverser, do these steps to unlock the sync locks and subsequently operate the thrust reverser. If the locking actuator is locked, these steps are not necessary, continue to the step for the check of the REVERSER light.

(a) Make sure that the thrust reverser is closed and latched before you use hydraulic power to extend or retract the thrust reverser (TASK 78-31-00-010-804-F00).

(b) Remove the DO-NOT-OPERATE tag and move the reverse thrust lever up and aft to the extended (deployed) position.

NOTE: The reverse thrust lever must be in the extended (deployed) position to unlock the sync locks.

(c) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

(d) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

(e) Remove the lockpin, SPL-2418 from the manual shutoff valve handle on the control valve module (TASK 78-31-00-440-803-F00).

NOTE: The thrust reverser will extend, as soon as the lockpin is removed.

1) Make sure that the manual shutoff valve handle moves counterclockwise to the vertical position.
2) Put the lockpin, SPL-2418 in its cotton storage bag and store on the airplane.

(f) Do these steps when the thrust reverser is in the extended (deployed) position to reset the EAU:

NOTE: This will clear all deploy or stow faults that were set in the previous steps.

1) To get access to the EAU, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

NOTE: The EAU is on the E3-2 shelf.

2) Push and hold the FAULT RESET button on the EAU for a minimum of two seconds.

(g) Slowly move the applicable reverse thrust lever down and forward to retract (stow) the thrust reverser (TASK 78-31-00-980-806-F00).

(h) Make sure that the applicable REVERSER light in the flight compartment is off.

1) If the REVERSER light is on, do this task: FIM 78-31 TASK 801.

(i) Remove the DO-NOT-OPERATE tag from the start lever.

(j) Remove the DO-NOT-OPERATE tag from the thrust lever.

(k) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 78-31-00-200-001-F00

(4) If the locking actuator is locked and hydraulic power is not necessary, do this check of the applicable REVERSER light:

(a) Make sure that the applicable REVERSER light in the flight compartment is off.

1) If the REVERSER light is on, do this task: FIM 78-31 TASK 801.

(b) Remove the DO-NOT-OPERATE tag from the start lever.

(c) Remove the DO-NOT-OPERATE tag from the thrust lever.

(d) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 78-31-00-410-014-F00

(5) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

Close these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

——————— END OF TASK ———————

TASK 78-31-00-980-805-F00

14. Thrust Reverser Operation - Extend (Power Procedure)

A. General

(1) This task will extend the two thrust reverser sleeves on the applicable engine, with the use of the airplane hydraulic system.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
FIM 78-31 TASK 801	Engine Accessory Unit (EAU) BITE Procedure

C. Tools/Equipment

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

Reference	Description
SPL-2418	Lockpin - Equipment, Thrust Reverser Actuation Module Lockout (Part #: C78004-1, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left

(Continued)

Zone	Area
426	Engine 2 - Thrust Reverser, Right

E. Access Panels

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

F. Procedure

SUBTASK 78-31-00-860-109-F00

CAUTION: DO NOT OPERATE THE THRUST REVERSER WHEN ELECTRICAL POWER INTERRUPTIONS (FOR MORE THAN A NORMAL BUS TRANSFER) CAN OCCUR. IF THERE IS A LOSS OF ELECTRICAL POWER WHEN THE THRUST REVERSER IS IN TRANSIT, DAMAGE TO THE SYNC LOCKS CAN OCCUR AND THE SYNC LOCK OPERATIONAL TEST MUST BE DONE.

(1) Do not operate the thrust reverser if there will be electrical power interruptions (for more than a normal bus transfer) while the thrust reverser is in transit.

SUBTASK 78-31-00-860-110-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: MAKE SURE THAT THE THRUST REVERSER IS CLOSED AND LATCHED. IF THE THRUST REVERSER IS NOT CLOSED AND LATCHED WHEN THE THRUST REVERSER SLEEVE IS EXTENDED WITH HYDRAULIC POWER, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Make sure that the thrust reverser is closed and latched (TASK 78-31-00-010-804-F00).

SUBTASK 78-31-00-860-134-F00

(3) Make sure that these access panels are closed before you operate the thrust reverser:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

SUBTASK 78-31-00-860-087-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) If not already done, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize system A.

(b) For Engine 2, pressurize system B.

SUBTASK 78-31-00-080-003-F00

(5) Make sure that the lockpin, SPL-2418 is not installed in the control valve module (TASK 78-31-00-440-803-F00).

SUBTASK 78-31-00-860-088-F00

(6) For Engine 1, make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

SUBTASK 78-31-00-860-089-F00

(7) For Engine 2, make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

SUBTASK 78-31-00-860-128-F00

(8) If you want the REV indication to show on the display unit and the interlock to release, move the ENGINE START switch on the forward overhead P5 panel to the CONT position for the applicable engine.

NOTE: It is not necessary to apply power to the EEC to extend and retract the thrust reverser. However, because the EEC is not powered, the reverse thrust lever will be blocked by the interlock and will not move to the full reverse thrust position; and, the REV message will not indicate the sleeve position.

SUBTASK 78-31-00-860-091-F00

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE AREA AROUND THE THRUST REVERSER. IF THERE ARE PERSONS OR EQUIPMENT IN THE AREA WHEN THE THRUST REVERSER EXTENDS OR RETRACTS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEM A (MAIN FUEL TANK 1) OR HYDRAULIC SYSTEM B (MAIN FUEL TANK 2) FOR M0RE THAN TWO MINUTES UNLESS THE APPLICABLE TANK HAS MORE THAN 1675 POUNDS (761 KILOGRAMS) OF FUEL. IF THERE IS NOT 1675 POUNDS (761 KILOGRAMS) OF FUEL IN THE TANK, LET THE RESERVOIR COOL TO AMBIENT TEMPERATURE AFTER TWO MINUTES OF OPERATION BEFORE YOU CONTINUE THE TEST. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Move the applicable reverse thrust lever up and aft to the extend position.

(a) If the thrust reverser sleeves will be retracted immediately, wait 10 seconds before you move the applicable reverse thrust lever forward and down to the retract (stow) position.

NOTE: For Engine 1, if the movement of the reverse thrust lever through the extend (deploy) and retract (stow) cycle is less than 10 seconds, the thrust reverser hydraulic volumetric fuse can close and stop the hydraulic fluid flow. If the fuse closes, do the steps below to reset the fuse.

NOTE: For Engine 2, there is no thrust reverser volumetric hydraulic fuse in the supply line from system B.

WARNING: YOU MUST DO THE DEACTIVATION OF THE THRUST REVERSER IF THE THRUST REVERSER SLEEVES WILL NOT BE IMMEDIATELY MOVED TO THE RETRACTED POSITION. ACCIDENTAL MOVEMENT OF THE THRUST REVERSER SLEEVES CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(b) If the thrust reverser sleeves will not be retracted immediately, do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

(c) If the thrust reverser sleeves will not be retracted immediately, make sure that the ENGINE START switch is off.

SUBTASK 78-31-00-280-001-F00

(10) If the hydraulic power was removed for ground maintenance while the thrust reverser is extended (deployed), it can cause the REVERSER Light to come on and the HYD ISO VALVE SENSOR fault to show.

NOTE: The Hydraulic Isolation Valve is spring loaded to the closed position. If the hydraulic power removed the spring can close the valve. The HYD ISO VALVE SENSOR fault can show if the valve closes while the thrust reverser is extended.

(a) If the REVERSER Light is on and the HYD ISO VALVE SENSOR fault shows, then, do this task: FIM 78-31 TASK 801.

NOTE: If no other faults are present, then the EAU BITE Procedure will reset the system.

G. Reset The Hydraulic Fuse

SUBTASK 78-31-00-800-002-F00

(1) If it is necessary to reset the fuse, do these steps:

NOTE: The volumetric hydraulic fuse will open when the hydraulic pressure on the two sides of the fuse are approximately the same.

(a) Remove power from hydraulic system A; do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(b) Depressurize hydraulic system A; do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

(c) Wait 20 seconds.

(d) Pressurize hydraulic system A; do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

———————— END OF TASK ————————

TASK 78-31-00-980-806-F00

15. Thrust Reverser Operation - Retract (Power Procedure)

A. General

(1) This task retracts the two thrust reverser sleeves on the applicable engine with the use of the airplane hydraulic system.

(2) This task also gives instructions to unlock the sync locks if the thrust reverser is deactivated and the sleeve extended.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

(Continued)

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
FIM 78-31 TASK 801	Engine Accessory Unit (EAU) BITE Procedure
FIM 78-31 TASK 804	T/R DEPLOY FAULTS - HYD ISO VALVE SENSOR - Fault Isolation

C. Tools/Equipment

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

Reference	Description
SPL-2418	Lockpin - Equipment, Thrust Reverser Actuation Module Lockout (Part #: C78004-1, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Procedure

SUBTASK 78-31-00-860-111-F00

CAUTION: DO NOT OPERATE THE THRUST REVERSER WHEN ELECTRICAL POWER INTERRUPTIONS (FOR MORE THAN A NORMAL BUS TRANSFER) CAN OCCUR. IF THERE IS A LOSS OF ELECTRICAL POWER WHEN THE THRUST REVERSER IS IN TRANSIT, DAMAGE TO THE SYNC LOCKS CAN OCCUR AND THE SYNC LOCK OPERATIONAL TEST MUST BE DONE.

(1) Do not operate the thrust reverser if there will be electrical power interruptions (for more than a normal bus transfer) while the thrust reverser is in transit.

SUBTASK 78-31-00-860-112-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: MAKE SURE THAT THE THRUST REVERSER IS CLOSED AND LATCHED. IF THE THRUST REVERSER IS NOT CLOSED AND LATCHED WHEN THE THRUST REVERSER SLEEVE IS RETRACTED, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Make sure that the thrust reverser is closed and latched (TASK 78-31-00-010-804-F00).

SUBTASK 78-31-00-860-092-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) If not already done, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize system A.

(b) For Engine 2, pressurize system B.

SUBTASK 78-31-00-280-002-F00

(4) If the hydraulic power was removed for ground maintenance while the thrust reverser is extended (deployed), it can cause the REVERSER Light to come on and the HYD ISO VALVE SENSOR fault to show.

NOTE: The Hydraulic Isolation Valve is spring loaded to the closed position. With the hydraulic power removed the spring can close the valve. The HYD ISO VALVE SENSOR fault will show if the valve closes while the thrust reverser is extended.

(a) If the REVERSER Light is on and the HYD ISO VALVE SENSOR fault shows, then, do this task: T/R DEPLOY FAULTS - HYD ISO VALVE SENSOR - Fault Isolation, FIM 78-31 TASK 804.

NOTE: If no other faults are present, then the EAU BITE Procedure will reset the system.

SUBTASK 78-31-00-860-129-F00

(5) If you want the REV indication to show on the display unit and the interlock to release, move the ENGINE START switch on the forward overhead P5 panel to the CONT position for the applicable engine.

NOTE: It is not necessary to apply power to the EEC to extend and retract the thrust reverser. However, because the EEC is not powered, the reverse thrust lever will be blocked by the interlock and will not move to the full reverse thrust position; and, the REV message will not indicate the sleeve position.

SUBTASK 78-31-00-710-018-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AROUND THE THRUST REVERSERS. IF THERE ARE PERSONS OR EQUIPMENT IN THE AREA WHEN THE THRUST REVERSER EXTENDS OR RETRACTS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEM A (MAIN TANK 1) OR HYDRAULIC SYSTEM B (MAIN TANK 2) FOR M0RE THAN TWO MINUTES UNLESS THE APPLICABLE TANK HAS MORE THAN 1675 POUNDS (761 KILOGRAMS) OF FUEL. IF THERE IS NOT 1675 POUNDS (761 KILOGRAMS) OF FUEL IN THE TANK, LET THE RESERVOIR COOL TO AMBIENT TEMPERATURE AFTER TWO MINUTES OF OPERATION BEFORE YOU CONTINUE THE TEST. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Move the applicable reverse thrust lever forward and down to the retract (stow) position.

(a) Make sure that you wait 10 seconds before you move the reverse thrust lever between the extend and retract cycle.

NOTE: For Engine 1, if the movement of the reverse thrust lever through the extend (deploy) and retract (stow) cycle is less than 10 seconds, the thrust reverser hydraulic volumetric fuse can close and stop the hydraulic fluid flow. If the fuse closes, do the steps below to reset the fuse.

NOTE: For Engine 2, there is no thrust reverser volumetric hydraulic fuse in the supply line from system B.

SUBTASK 78-31-00-410-016-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AROUND THE THRUST REVERSERS. IF THE TWO SLEEVES ARE NOT COMPLETELY EXTENDED, THEY WILL EXTEND WHEN THE LOCKOUT PIN IS REMOVED FROM THE MANUAL ISOLATION VALVE HANDLE. IF THERE ARE PERSONS OR EQUIPMENT IN THE AREA WHEN THE THRUST REVERSER EXTENDS OR RETRACTS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(7) If the thrust reverser was deactivated, do these steps to unlock the sync locks and subsequently operate the thrust reverser:

NOTE: The reverse thrust lever must be in the extended (deployed) position to unlock the sync locks.

(a) Remove the DO-NOT-OPERATE tag and move the reverse thrust lever up and aft to the extended (deployed) position.

(b) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

(c) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

(d) Remove the lockpin, SPL-2418 from the manual shutoff valve handle on the control valve module (TASK 78-31-00-440-803-F00).

NOTE: If the thrust reverser is not completely extended, it will extend, as soon as the lockpin is removed.

1) Make sure that the manual shutoff valve handle moves counterclockwise to the vertical position.

2) Put the lockpin, SPL-2418 in its cotton storage bag and store on the airplane.

(e) Do these steps when the thrust reverser is in the extended (deployed) position to reset the EAU:

NOTE: This will clear all deploy or stow faults that were set in the previous steps.

1) To get access to the EAU, open this access panel:

Number	Name/Location

(Continued)

Number	Name/Location
117A	Electronic Equipment Access Door

NOTE: The EAU is on the E3-2 shelf.

2) Push and hold the FAULT RESET button on the EAU for a minimum of two seconds.

(f) Move the applicable reverse thrust lever down and forward to retract (stow) the thrust reverser.

(g) Make sure that the applicable REVERSER fault light in the flight compartment is off.

1) If the REVERSER light is on, do this task: FIM 78-31 TASK 801.

(h) Remove the DO-NOT-OPERATE tag from the start lever.

(i) Remove the DO-NOT-OPERATE tag from the thrust lever.

(j) Make sure that the ENGINE START switch is off.

(k) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

G. Reset the Hydraulic Fuse

SUBTASK 78-31-00-800-003-F00

(1) If it is necessary to reset the fuse, do these steps:

NOTE: The volumetric hydraulic fuse will open when the hydraulic pressure on the two sides of the fuse are approximately the same.

(a) Remove power from hydraulic system A; do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(b) Depressurize hydraulic system A; do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

(c) Wait 20 seconds.

(d) Pressurize hydraulic system A; do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

——————— END OF TASK ———————

TASK 78-31-00-040-802-F00

16. Thrust Reverser Deactivation For Ground Maintenance

(Figure 210)

A. General

(1) This task is used to prevent the accidental operation of the thrust reversers on an applicable engine when persons or equipment are in the area.

(2) To isolate the thrust reverser hydraulic system from the airplane hydraulic system, a lockpin is installed in the manual shutoff valve handle and into the control valve module.

(3) The two lockpins, which are in a cotton storage bag, are part of the fly-away kit.

(4) Use this task for ground maintenance only. Do not use this task for deactivation for flight dispatch.

B. Tools/Equipment

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

Reference	Description
SPL-2418	Lockpin - Equipment, Thrust Reverser Actuation Module Lockout (Part #: C78004-1, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 78-31-00-040-016-F00

WARNING: USE THIS PROCEDURE FOR GROUND MAINTENANCE ONLY. THE THRUST REVERSER CAN ACCIDENTALLY EXTEND IF YOU USE THIS PROCEDURE TO DO A DEACTIVATION OF THE THRUST REVERSER FOR FLIGHT DISPATCH.

(1) Make sure that the applicable thrust lever is in the idle position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-31-00-040-017-F00

(2) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-31-00-860-099-F00

(3) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

SUBTASK 78-31-00-860-100-F00

(4) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

SUBTASK 78-31-00-080-005-F00

(5) Do these steps to install the lockpin, SPL-2418 kit:

NOTE: The, C78004-2, thrust reverser lockpins are contained in the C78004-1 lockpin kit. The C78004-1 lockpin kit is contained in the 012A8102 fly-away kit. The fly-away kit bag is marked 737NG GROUND SUPPORT EQUIPMENT.

NOTE: For Engine 1, the control valve module is on the left side of the keel beam in the main gear wheel well.

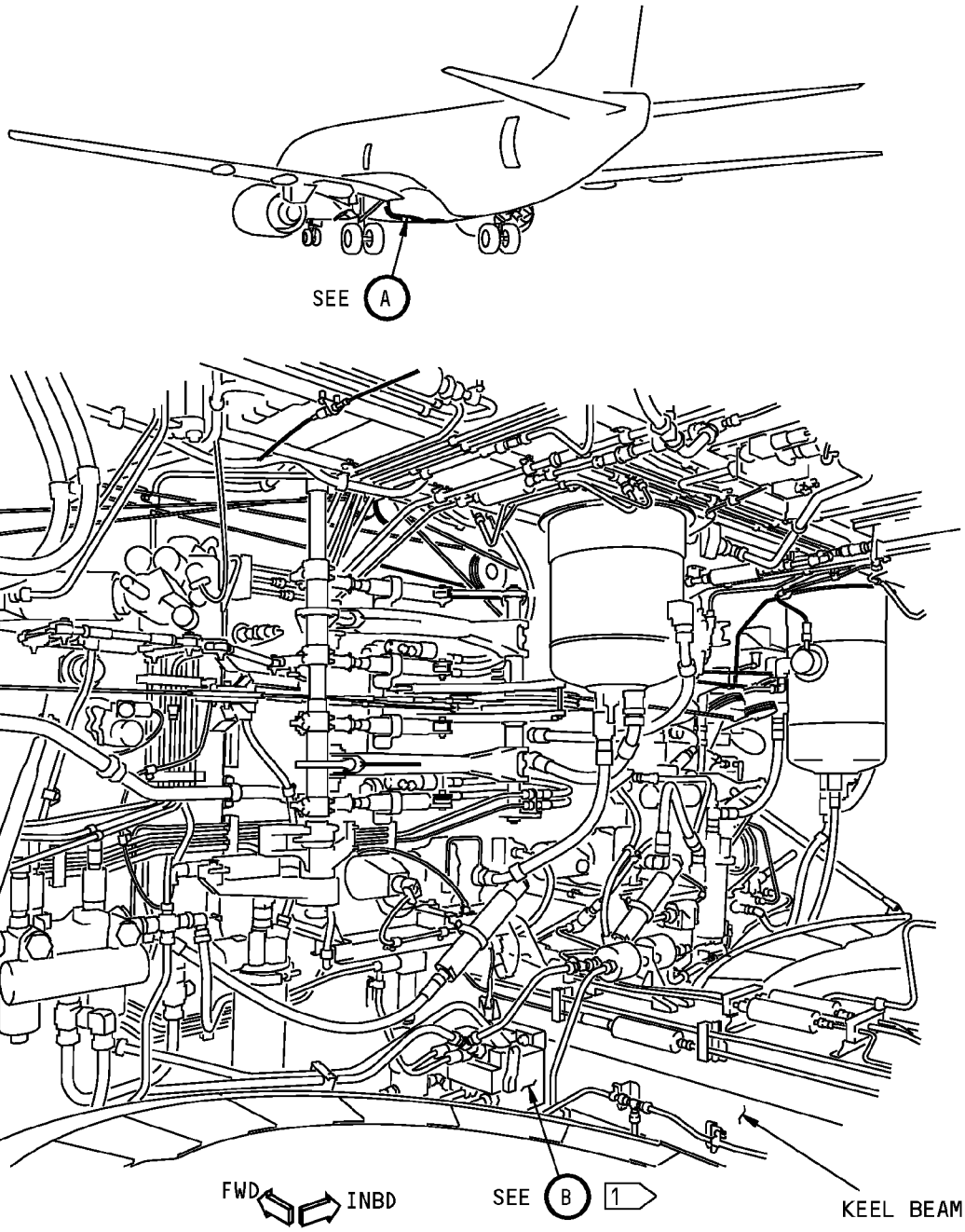
NOTE: For Engine 2, the control valve module is on the right side of the keel beam in the main gear wheel well.

(a) Turn the manual shutoff valve handle clockwise to align the lockpin holes in the manual shutoff valve handle and the control valve module.

(b) Install the lockpin C78004-2.

1) Make sure that the lockpin is pushed fully in and engages the control valve module.

——————— END OF TASK ———————

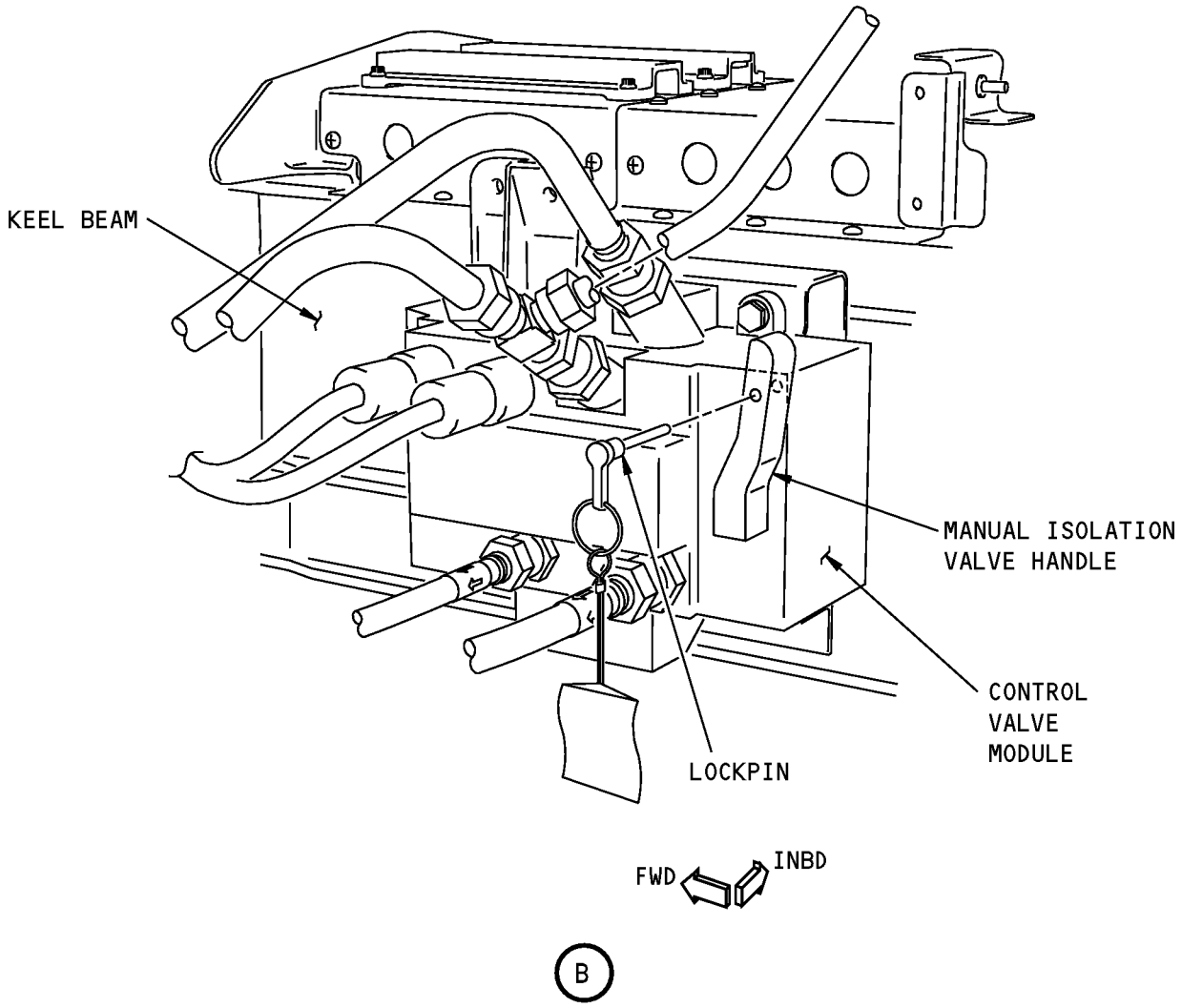


MAIN LANDING GEAR WHEEL WELL

A

1 ENGINE 1 CONTROL VALVE MODULE IS SHOWN, ENGINE 2 CONTROL VALVE IS ON THE RIGHT SIDE OF THE KEEL BEAM.

Thrust Reverser Control Valve Module
Figure 210 (Sheet 1 of 2)/78-31-00-990-815-F00



Thrust Reverser Control Valve Module
Figure 210 (Sheet 2 of 2)/78-31-00-990-815-F00

TASK 78-31-00-440-803-F00

17. Thrust Reverser Activation After Ground Maintenance

(Figure 210)

A. Tools/Equipment

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

Reference	Description
SPL-2418	Lockpin - Equipment, Thrust Reverser Actuation Module Lockout (Part #: C78004-1, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 78-31-00-440-010-F00

WARNING: BEFORE YOU REMOVE THE LOCKPIN FROM THE CONTROL VALVE MODULE, MAKE SURE THAT THE POSITION OF THE REVERSE THRUST LEVER AGREES WITH THE POSITION OF THE THRUST REVERSER SLEEVES. IF THE POSITION OF THE REVERSE THRUST LEVER DOES NOT AGREE WITH THE POSITION OF THE THRUST REVERSER SLEEVES, THE THRUST REVERSER SLEEVES COULD EXTEND OR RETRACT WHEN THE HYDRAULIC SYSTEM IS ACTIVATED. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Unless you are given other instructions, make sure that the position of the reverse thrust lever agrees with the position of the thrust reverser sleeves.

(a) Remove the lockpin, SPL-2418 kit:

1) Remove the lockpin, C78004-2 from the applicable manual shutoff valve handle on the control valve module.

(b) Make sure that the manual shutoff valve handle moves counterclockwise to the vertical position.

(c) Put the lockpin back in the cotton storage bag and store on the airplane.

SUBTASK 78-31-00-860-101-F00

(2) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

SUBTASK 78-31-00-860-102-F00

(3) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

SUBTASK 78-31-00-860-103-F00

(4) Remove the DO-NOT-OPERATE tag from the thrust lever.

SUBTASK 78-31-00-860-104-F00

(5) Remove the DO-NOT-OPERATE tag from the reverse thrust lever.

——————— END OF TASK ———————

THRUST REVERSER SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks:

(1) The Thrust Reverser Normal Operation Test.

(2) The Thrust Reverser Test (Standby Hydraulic System).

(3) The Thrust Reverser Sync Lock Operational Test.

(4) The Thrust Reverser Engine Accessory Unit (EAU) Test.

(5) Thrust Reverser Linear Variable Differential Transformer (LVDT) Test.

TASK 78-31-00-700-801-F00

2. Thrust Reverser Normal Operation Test

A. General

(1) This procedure is a scheduled maintenance task.

(2) This task is used to do a check of the thrust reverser operation if a component was removed or replaced in the thrust reverser hydraulic system.

(3) This task is also used as a scheduled maintenance task to do a check of the wiring between the EAU and the REVERSER light.

(4) This task is also used to do a check of the thrust reverser operation if a thrust reverser was removed or replaced.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
FIM 78-31 TASK 801	Engine Accessory Unit (EAU) BITE Procedure

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Test

SUBTASK 78-31-00-860-105-F00

CAUTION: DO NOT OPERATE THE THRUST REVERSER WHEN ELECTRICAL POWER INTERRUPTIONS (FOR MORE THAN A NORMAL BUS TRANSFER) CAN OCCUR. IF THERE IS A LOSS OF ELECTRICAL POWER WHEN THE THRUST REVERSER IS IN TRANSIT, DAMAGE TO THE SYNC LOCKS CAN OCCUR AND THE SYNC LOCK OPERATIONAL TEST MUST BE DONE.

(1) Do not operate the thrust reverser if there will be electrical power interruptions (for more than a normal bus transfer) while the thrust reverser is in transit.

SUBTASK 78-31-00-860-113-F00

CAUTION: DO NOT EXTEND THE THRUST REVERSER WHEN THE THRUST REVERSER IS OPEN. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Make sure that the applicable thrust reverser is closed and latched.

SUBTASK 78-31-00-860-002-F00

(3) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-860-003-F00

(4) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-31-00-860-004-F00

(5) For the applicable engine, move the ENGINE START switch on the forward overhead P5 panel to the CONT position.

NOTE: This supplies power to the EEC which is necessary for the interlock to release and the REV light indication to operate.

SUBTASK 78-31-00-860-005-F00

(6) For the applicable engine, make sure that the start lever is in the CUTOFF position.

SUBTASK 78-31-00-860-006-F00

(7) Make sure that the applicable thrust lever is in the idle position.

SUBTASK 78-31-00-860-007-F00

(8) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

SUBTASK 78-31-00-860-125-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) If not already done, pressurize the applicable hydraulic system; do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize hydraulic system A.

(b) For Engine 2, pressurize hydraulic system B.

SUBTASK 78-31-00-860-009-F00

(10) Make sure that the REVERSER light on the aft overhead P5 panel is off.

(a) If the REVERSER light is on, do this task: FIM 78-31 TASK 801.

SUBTASK 78-31-00-860-010-F00

(11) Reset the MASTER CAUTION light.

E. Normal Operation Test

SUBTASK 78-31-00-710-001-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AROUND THE THRUST REVERSERS. IF THERE ARE PERSONS OR EQUIPMENT IN THE AREA WHEN THE THRUST REVERSER EXTENDS OR RETRACTS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEM A (MAIN TANK 1) OR HYDRAULIC SYSTEM B (MAIN TANK 2) FOR M0RE THAN TWO MINUTES UNLESS THE APPLICABLE TANK HAS MORE THAN 1675 POUNDS (761 KILOGRAMS) OF FUEL. IF THERE IS NOT 1675 POUNDS (761 KILOGRAMS) OF FUEL IN THE TANK, LET THE RESERVOIR COOL TO AMBIENT TEMPERATURE AFTER TWO MINUTES OF OPERATION BEFORE YOU CONTINUE THE TEST. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Move the applicable reverse thrust lever up and aft to the extend (deploy) position.

NOTE: The REVERSER light on the aft overhead P5 panel could momentarily come on.

(a) Make sure that the thrust reverser sleeves move to the fully extended (deployed) position in these time limits:

1) Thrust reverser control circuit with 0.10 second time delay module, M1666 (Eng 1) / M1667 (Eng 2);

a) Three seconds if you use the airplane electric motor pumps

b) Two seconds if you use an external hydraulic power source with 2750-2850 psi (1896-1965 kpa).

(b) Make sure that the REV light on the P2 panel comes on.

NOTE: The REV light has three positions: 1) amber when the thrust reverser sleeves are in transit, 2) green when the sleeves are in the fully extended (deployed) position, or 3) off when the thrust reverser sleeves are stowed.

1) Make sure that the REV light turns amber when the thrust reverser is in transit.

2) Make sure that the REV light turns green when the thrust reverser is in the fully extended (deployed) position.

(c) Make sure that the REVERSER light on the aft overhead panel P5 is not on.

SUBTASK 78-31-00-710-019-F00

(2) Wait 10 seconds before you move the applicable reverse thrust lever forward and down to the retract (stow) position.

NOTE: For Engine 1, if the movement of the reverse thrust lever through the deploy and stow cycle is less than ten seconds, the thrust reverser hydraulic volumetric fuse can close and stop the hydraulic fluid flow. If the fuse does close, the fuse must be reset and the test restarted. To reset the fuse, do the subtask below, ''Reset the Hydraulic Fuse.''

NOTE: For Engine 2, there is no thrust reverser volumetric hydraulic fuse in the supply line from system B.

SUBTASK 78-31-00-710-002-F00

(3) Move the applicable reverse thrust lever forward and down to the retract (stow) position.

(a) Make sure that the REVERSER light on the aft overhead P5 panel comes on for approximately ten seconds after you move the reverse thrust lever to the retract (stow) position.

1) This is the indication that the wiring between the EAU and the REVERSER light is not damaged.

(b) Make sure that the REV light turns amber when the thrust reverser sleeves are in transit.

(c) Make sure that the REV light goes out when the thrust reverser sleeves are in the retracted (stowed) position.

(d) Make sure that the thrust reverser sleeves move to the fully retracted (stowed) position in these time limits:

1) Five seconds if you use the airplane electric motor pumps.

2) Four seconds if you use an external hydraulic power source with 2750-2850 psi (1896-1965 kpa).

SUBTASK 78-31-00-210-001-F01

(4) Examine the thrust reverser area for hydraulic fluid leaks.

TRAS actuator leakage limit

Normal Operation Limits	Dispatch Limits to Avoid Delay
8 drops per minute (stopped or in operation)	30 drops per minute (stopped or in operation)

F. Reset the Hydraulic Fuse

SUBTASK 78-31-00-800-001-F00

(1) If it is necessary to reset the fuse, do these steps:

NOTE: The volumetric hydraulic fuse will open when the hydraulic pressure on the two sides of the fuse are approximately the same.

(a) Remove power from hydraulic system A; do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(b) Depressurize hydraulic system A; do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

(c) Wait 20 seconds.

(d) Pressurize hydraulic system A; do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

G. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-860-013-F00

(1) Move the ENGINE START switch to the off position.

SUBTASK 78-31-00-860-014-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-860-015-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

END OF TASK

TASK 78-31-00-700-802-F00

3. Thrust Reverser Operation Test (Standby Hydraulic System)

A. General

(1) This test is necessary after a thrust reverser volumetric hydraulic fuse or a shuttle valve was removed or replaced in the standby hydraulic system.

(2) The operation of the thrust reverser with the standby hydraulic system will do a check for leaks in the hydraulic lines and fittings.

(a) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

(3) For Engine 1, when you use the standby hydraulic system, you must connect the return line from hydraulic reservoir A to a hydraulic bench or hydrant, or drain the hydraulic system A reservoir. When the test is completed, fill hydraulic reservoir B. The hydraulic fluid that is used to extend (deploy) the thrust reverser is supplied from the standby hydraulic reservoir and the standby reservoir fills from reservoir B. When the thrust reverser retracts (stows), the hydraulic fluid returns to hydraulic reservoir A.

(4) For Engine 2, when you use the standby hydraulic system, it is not necessary to drain hydraulic reservoir B. The standby hydraulic system fills from reservoir B and returns to reservoir B.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Test

SUBTASK 78-31-00-860-106-F00

CAUTION: DO NOT OPERATE THE THRUST REVERSER WHEN ELECTRICAL POWER INTERRUPTIONS (FOR MORE THAN A NORMAL BUS TRANSFER) CAN OCCUR. IF THERE IS A LOSS OF ELECTRICAL POWER WHEN THE THRUST REVERSER IS IN TRANSIT, DAMAGE TO THE SYNC LOCKS CAN OCCUR AND THE SYNC LOCK OPERATIONAL TEST MUST BE DONE.

(1) Do not operate the thrust reverser if there will be electrical power interruptions (for more than a normal bus transfer) while the thrust reverser is in transit.

SUBTASK 78-31-00-860-016-F00

(2) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-860-017-F00

(3) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-31-00-860-018-F00

(4) For the applicable engine, move the ENGINE START switch on the forward overhead P5 panel to the CONT position.

NOTE: This supplies power to the EEC which is necessary for the interlock to release and the REV light indication to operate.

SUBTASK 78-31-00-860-019-F00

(5) For the applicable engine, make sure that the start lever is in the CUTOFF position.

SUBTASK 78-31-00-860-020-F00

(6) Make sure that the applicable thrust lever is in the idle position.

SUBTASK 78-31-00-860-021-F00

(7) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

SUBTASK 78-31-00-860-022-F00

(8) For the Engine 1 thrust reverser, do these steps:

(a) For hydraulic system A, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(b) For system A reservoir, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

(c) To prevent the leakage of hydraulic fluid when you do the test, connect the system A return line at the system A reservoir to a hydraulic bench or hydrant.

(d) An alternate task to prevent the leakage of hydraulic fluid, is to use the sampling valve to drain the system A reservoir.

NOTE: The reservoir hydraulic level will show on the flight compartment HYDRAULIC gage on the P9 panel.

1) If you drain the system A reservoir to the REFILL level, you can operate the thrust reverser for one cycle.

2) If you drain the system A reservoir to the HALF FULL level, you can operate the thrust reverser for three cycles.

SUBTASK 78-31-00-860-023-F00

CAUTION: MAKE SURE THAT THE THRUST REVERSER IS CLOSED AND LATCHED. IF THE THRUST REVERSER IS NOT CLOSED AND LATCHED WHEN THE THRUST REVERSER SLEEVE IS EXTENDED, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(9) Make sure that the applicable thrust reverser is closed and latched Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-00-860-024-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(10) Do these steps to supply hydraulic power for the standby system:

(a) For the Engine 1 thrust reverser, move the FLT CONTROL switch A to the STBY RUD position or the ALTERNATE FLAPS switch to the ARM position.

NOTE: These switches are on the overhead P5, Flight Control Panel.

(b) For the Engine 2 thrust reverser, move the FLT CONTROL switch B to the STBY RUD position or the ALTERNATE FLAPS switch to the ARM position.

NOTE: These switches are on the overhead P5, Flight Control Panel.

SUBTASK 78-31-00-710-003-F00

(11) Slowly move the applicable reverse thrust lever up and aft to the extend (deploy) position.

NOTE: For Engine 1 and Engine 2, if the movement of the reverse thrust lever through the extend (deploy) and retract (stow) cycle is less than ten seconds, the hydraulic volumetric fuses in the standby hydraulic system can close and stop the hydraulic fluid flow. If the fuses do close, the fuses must be reset and the test must be started again.

(a) If it is necessary to reset the fuses, do these steps:

NOTE: The volumetric hydraulic fuse will open when the hydraulic pressure on the two sides of the fuse are approximately the same.

1) For the Engine 1 thrust reverser, move the FLT CONTROL switch A to the OFF position or the ALTERNATE FLAPS switch to the OFF position.

2) For the Engine 2 thrust reverser, move the FLT CONTROL switch B to the OFF position or the ALTERNATE FLAPS switch to the OFF position.

3) Wait 20 seconds.

4) For the Engine 1 thrust reverser, move the FLT CONTROL switch A to the STBY RUD position or the ALTERNATE FLAPS switch to the ARM position.

5) For the Engine 2 thrust reverser, move the FLT CONTROL switch B to the STBY RUD position or the ALTERNATE FLAPS switch to the ARM position.

(b) Make sure that the thrust reverser sleeves move to the fully extended (deployed) position.

(c) Make sure that the REV light on the P2 panel comes on.

NOTE: The REV light has three positions: 1) amber when the thrust reverser sleeves are in transit, 2) green when the sleeves are in the fully extended (deployed) position, or 3) off when the thrust reverser sleeves are stowed.

1) Make sure that the REV light turns amber when the thrust reverser is in transit.

2) Make sure that the REV light turns green when the thrust reverser is in the fully extended (deployed) position.

SUBTASK 78-31-00-710-004-F00

(12) Move the applicable reverse thrust lever forward and down to the retract (stow) position.

(a) Make sure that the REV light turns amber when the thrust reverser sleeves are in transit.

(b) Make sure that the REV light goes out when the thrust reverser sleeves are in the retracted (stowed) position.

(c) Make sure that the thrust reverser sleeves move to the fully retracted (stowed) position.

E. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-860-025-F00

(1) For Engine 1, do this step:

(a) Move the FLT CONTROL switch A to the OFF position or the ALTERNATE FLAPS switch to the OFF position.

SUBTASK 78-31-00-860-026-F00

(2) For Engine 2, do this step:

(a) Move the FLT CONTROL switch B to the OFF position or the ALTERNATE FLAPS switch to the OFF position.

SUBTASK 78-31-00-860-027-F00

(3) If system A return was connected to a hydraulic bench or hydrant, re-connect the return line to the system A reservoir.

SUBTASK 78-31-00-610-001-F00

(4) Do a check of the system A and B hydraulic reservoir gages.

(a) To fill the hydraulic reservoirs, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 78-31-00-860-030-F00

(5) Move the ENGINE START switch to the off position.

SUBTASK 78-31-00-860-031-F00

(6) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-440-001-F00

(7) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

END OF TASK

TASK 78-31-00-700-803-F00

4. Sync Lock Operational Test

A. General

(1) This procedure is a scheduled maintenance task.

(2) This task is to do a check of the sync locks for the left and right thrust reverser on an engine.

(3) This task is also done to do a check of the sync locks if there was an electrical power interruption when the thrust reverser was in transit.

(4) When the thrust reversers go through the deploy and stow cycle to do a test of the sync locks, it can cause stow and deploy faults that will show on the EAU. After the test is complete, it will be necessary to reset the EAU to clear the faults.

B. References

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
78-34-10-000-801-F00	Thrust Reverser Sync Lock Removal (P/B 401)
78-34-10-400-801-F00	Thrust Reverser Sync Lock Installation (P/B 401)
FIM 78-31 TASK 801	Engine Accessory Unit (EAU) BITE Procedure

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Procedure

SUBTASK 78-31-00-860-033-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-860-034-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-31-00-860-035-F00

(3) For the applicable engine, make sure that the start lever is in the CUTOFF position.

SUBTASK 78-31-00-860-036-F00

(4) Make sure that the applicable thrust lever is in the idle position.

SUBTASK 78-31-00-860-037-F00

(5) Make sure that the REVERSER light on the aft overhead P5 panel is off.

(a) If the REVERSER light is on, do this task: FIM 78-31 TASK 801.

SUBTASK 78-31-00-860-038-F00

(6) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

SUBTASK 78-31-00-860-126-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(7) Pressurize the applicable hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize hydraulic system A.

(b) For Engine 2, pressurize hydraulic system B.

SUBTASK 78-31-00-710-005-F00

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AFT OF THE APPLICABLE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Move the applicable reverse thrust lever up and aft to the extend (deploy) position.

NOTE: It is not necessary to apply power (move the ENGINE START switch to the CONT position) to the EEC to extend and retract the thrust reverser. However, because the EEC is not powered, the reverse thrust lever will be blocked by the interlock and will not move to the full reverse thrust position; and, the REV light will not indicate the sleeve position.

SUBTASK 78-31-00-860-039-F00

(9) After the thrust reversers are fully deployed, remove power from the applicable hydraulic system, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(a) For Engine 1, remove power from hydraulic system A.

(b) For Engine 2, remove power from hydraulic system B.

(c) Wait for 30 seconds.

NOTE: This will allow the hydraulic pressure to decrease before the start of the subsequent step.

NOTE: Residual pressure can move the directional control valve in the subsequent step. To make sure the hydraulic pressure is removed, you can select another hydraulic device in the applicable system.

SUBTASK 78-31-00-860-040-F00

(10) Move the applicable reverse thrust lever down and forward to the retract (stow) position.

NOTE: The step commands the sync locks to lock.

(a) Wait for 30 seconds.

NOTE: This will permit time for all of the timers in the circuits to time out before the hydraulic system is pressurized.

SUBTASK 78-31-00-860-041-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(11) Pressurize the applicable hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize hydraulic system A.

(b) For Engine 2, pressurize hydraulic system B.

SUBTASK 78-31-00-710-006-F00

(12) Make sure that the thrust reverser sleeves do not retract (stow).

NOTE: When the hydraulic system is pressurized, the thrust reverser auto-restow function will try to stow the thrust reverser. However, because the sync locks are locked, the thrust reverser can not retract (stow).

(a) This is the indication that the sync locks are serviceable.

SUBTASK 78-31-00-710-017-F00

(13) If a thrust reverser sleeve does retract (stow), then the applicable sync lock is not serviceable.

(a) Replace the sync lock.

These are the tasks:

- Thrust Reverser Sync Lock Removal, TASK 78-34-10-000-801-F00
- Thrust Reverser Sync Lock Installation, TASK 78-34-10-400-801-F00.

SUBTASK 78-31-00-740-001-F00

(14) Do these steps to read the deploy and stow faults on the EAU:

(a) To get access to the EAU, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

NOTE: The EAU is on the E3-2 shelf.

(b) Push and hold the T/R STOW FAULTS button on the applicable EAU.

(c) Make sure that these lights stay ON for the applicable Engine:

1) For Engine 1;
   a) S831 - L SLEEVE STOW SENSOR.
   b) S835 - L SLEEVE LOCK SENSOR.
   c) S833 - HYD ISO VALVE SENSOR.
   d) S834 - DIR CONT VALVE SENSOR.
   e) S832 - R SLEEVE STOW SENSOR.
   f) S836 - R SLEEVE LOCK SENSOR.
2) For Engine 2;
   a) S831 - L SLEEVE STOW SENSOR.
   b) S835 - L SLEEVE LOCK SENSOR.
   c) S830 - HYD ISO VALVE SENSOR.
   d) S839 - DIR CONT VALVE SENSOR.
   e) S832 - R SLEEVE STOW SENSOR.
   f) S836 - R SLEEVE LOCK SENSOR.

(d) Release the T/R STOW FAULTS button.

SUBTASK 78-31-00-710-007-F00

(15) Do these steps to clear the deploy and stow faults and reset the EAU:

(a) Move the applicable reverse thrust lever up and aft to the extend (deploy) position.

NOTE: The thrust reverser must be in the deploy position to reset the deploy faults.

1) Push and hold the FAULT RESET button on the EAU for a minimum of two seconds.
2) Wait for at least 30 seconds to make sure that the fault lights do not come on again.

(b) Move the applicable reverse thrust lever forward and down to the retract (stow) position.

(c) Make sure that the REVERSER light goes off.

F. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-860-132-F00

(1) After the thrust reversers are fully stowed, remove power from the applicable hydraulic system, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(a) For Engine 1, remove power from hydraulic system A.

(b) For Engine 2, remove power from hydraulic system B.

SUBTASK 78-31-00-860-130-F00

(2) Make sure that the ENGINE START switch is in the OFF position.

SUBTASK 78-31-00-860-045-F00

(3) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-860-046-F00

(4) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-31-00-410-001-F00

(5) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

——————— END OF TASK ———————

TASK 78-31-00-700-804-F00

5. Thrust Reverser Engine Accessory Unit (EAU) Test

(Figure 501)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This task is to do a check of the Engine Accessory Unit (EAU).

(3) The EAU is in the electronic equipment (EE) compartment on the E3-2 shelf.

(4) The equipment number for the EAU is M528.

B. References

Reference	Title
78-34-06-000-801-F00	Engine Accessory Unit Removal (P/B 401)
78-34-06-400-801-F00	Engine Accessory Unit Installation (P/B 401)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Procedure

SUBTASK 78-31-00-010-001-F00

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

Number	Name/Location
117A	Electronic Equipment Access Door

NOTE: The EAU is on the E3-2 shelf.

SUBTASK 78-31-00-710-008-F00

(2) Do these steps to do a check of the EAU for the applicable engine:

(a) Push and hold the T/R STOW FAULTS or the T/R DEPLOY FAULTS button on the EAU.

(b) Make sure that all of the lights come on for one second.

1) If all of the lights do not come on for one second, then, do this task: All Lights Do Not Come On During the BITE Procedure - Fault Isolation (FIM 78-34 TASK 809).

(c) After one second, make sure that all of the lights go out, but the green NO FAULTS DETECTED light.

1) This is the indication that the EAU is serviceable.

(d) Release the T/R STOW FAULTS or the T/R DEPLOY FAULTS button.

(e) If the red EAU FAULT light stays on, then the check for the EAU failed. Do this step:

1) Replace the EAU, M528. These are the tasks:
- Engine Accessory Unit Removal, TASK 78-34-06-000-801-F00
- Engine Accessory Unit Installation, TASK 78-34-06-400-801-F00.

(f) If other fault lights stay on, do the applicable fault isolation task in the Fault Isolation Manual.

SUBTASK 78-31-00-710-020-F00

(3) Do the above steps again for the opposite engine.

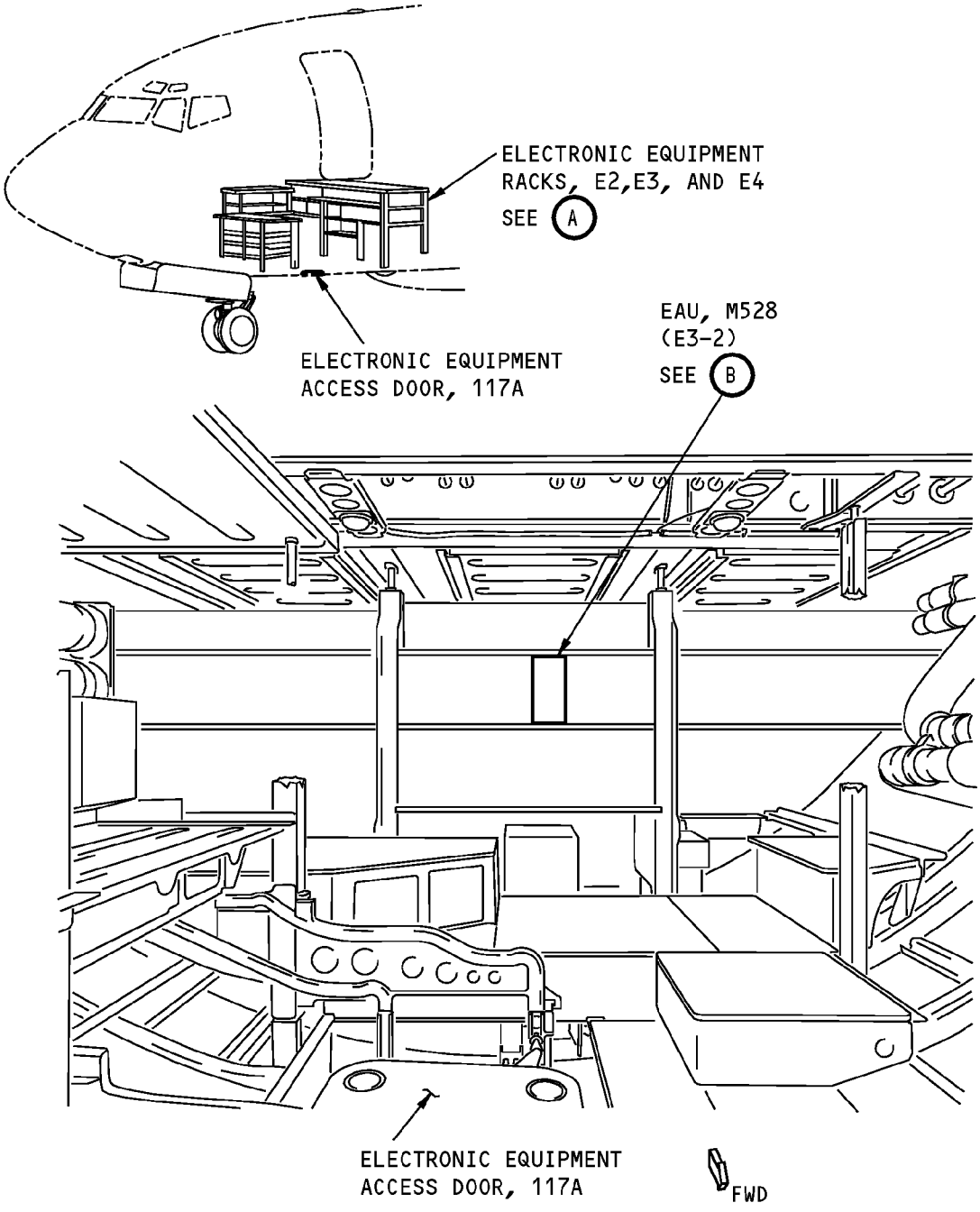
F. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-410-002-F00

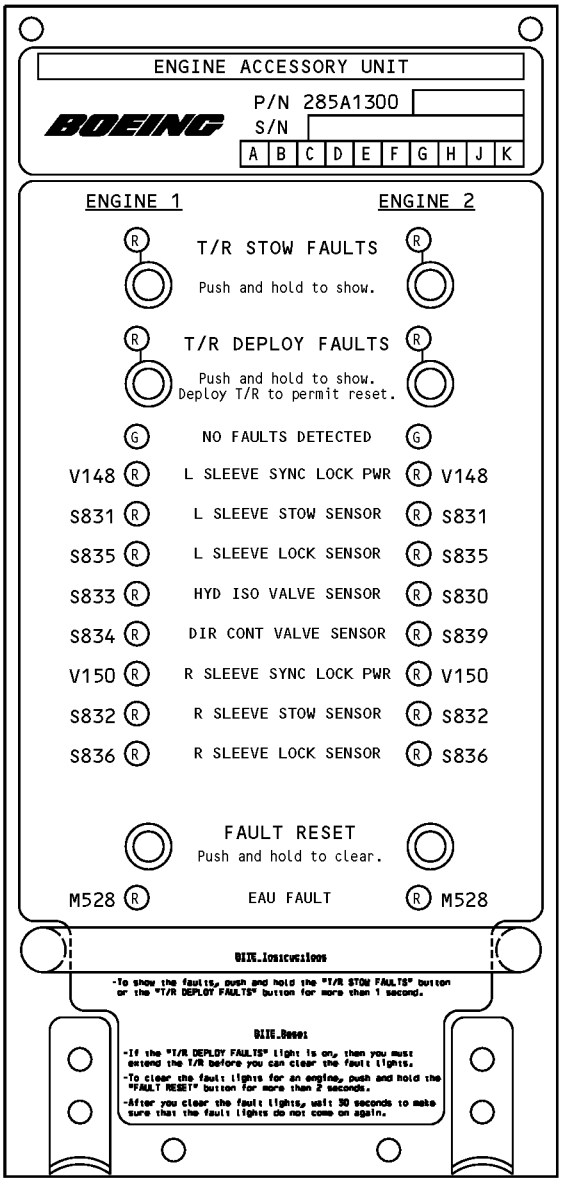
(1) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

END OF TASK



Engine Accessory Unit (EAU)
Figure 501 (Sheet 1 of 2)/78-31-00-990-801-F00



ENGINE ACCESSORY UNIT

B

Engine Accessory Unit (EAU)
Figure 501 (Sheet 2 of 2)/78-31-00-990-801-F00

TASK 78-31-00-700-806-F00

6. Thrust Reverser Linear Variable Differential Transformer (LVDT) Test

(Figure 502)

A. General

(1) This task is to do a check of the linear variable differential (LVDT) after an adjustment.

(2) Use the Flight Management Computer System/Control Display Unit (FMCS CDU) in the flight compartment to do the LVDT test.

B. References

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
78-36-02-820-801-F00	Linear Variable Differential Transformer (LVDT) - Adjustment/Test (P/B 501)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Procedure

SUBTASK 78-31-00-860-107-F00

CAUTION: DO NOT OPERATE THE THRUST REVERSER WHEN ELECTRICAL POWER INTERRUPTIONS (FOR MORE THAN A NORMAL BUS TRANSFER) CAN OCCUR. IF THERE IS A LOSS OF ELECTRICAL POWER WHEN THE THRUST REVERSER IS IN TRANSIT, DAMAGE TO THE SYNC LOCKS CAN OCCUR AND THE SYNC LOCK OPERATIONAL TEST MUST BE DONE.

(1) Do not operate the thrust reverser if there will be electrical power interruptions (for more than a normal bus transfer) while the thrust reverser is in transit.

SUBTASK 78-31-00-860-059-F00

(2) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-860-060-F00

(3) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-31-00-860-116-F00

(4) For the applicable engine, move the ENGINE START switch on the forward overhead P5 panel to the CONT position.

NOTE: This supplies power to the EEC which is necessary for the thrust reverser interlock to release.

SUBTASK 78-31-00-860-061-F00

(5) For the applicable engine, make sure that the start lever is in the CUTOFF position.

SUBTASK 78-31-00-860-062-F00

(6) Make sure that the applicable thrust lever is in the idle position.

SUBTASK 78-31-00-860-065-F00

(7) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

SUBTASK 78-31-00-420-004-F00

CAUTION: DO NOT EXTEND THE THRUST REVERSER WHEN THE THRUST REVERSER IS OPEN. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(8) Make sure that the thrust reverser is closed and latched.

SUBTASK 78-31-00-860-127-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) If not already done, pressurize the applicable hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize hydraulic system A.

(b) For Engine 2, pressurize hydraulic system B.

SUBTASK 78-31-00-860-066-F00

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AFT OF THE APPLICABLE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(10) Move the applicable reverse thrust lever up and aft to the extended (deployed) position.

(a) Make sure that the REV light on the P2 panel turns amber when the thrust reverser is in transit and turns green when the thrust reverser is fully deployed.

SUBTASK 78-31-00-710-014-F00

(11) Do these steps at the Flight Management Computer System/Control Display Unit (FMCS CDU) in the flight compartment:

(a) Push the INIT REF key to show the PERF INIT screen on the FMCS CDU.

(b) Push the INDEX key to show the INIT/REF INDEX screen on the FMCS CDU.

(c) Push these line select keys (LSK) on the FMCS CDU:

1) MAINT.

NOTE: This causes the MAINT BITE INDEX screen to show.

2) ENGINE.

NOTE: This causes the ENGINE/EXCEED BITE INDEX screen to show.

3) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X, for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

4) INPUT MONITORING.

NOTE: This causes the ENGINE X BITE TEST INPUT MONITORING menu to show.

NOTE: This is a warning screen in which you can continue or go back.

5) CONTINUE.

NOTE: This causes the ENGINE X BITE TEST INPUT MONITORING menu to show.

6) CONTROL LOOPS.

NOTE: This causes screen 1 of the CONTROL LOOPS to show.

(d) Push the NEXT PAGE key on the FMCS CDU.

NOTE: This causes screen 2 of the CONTROL LOOPS to show.

(e) Push the NEXT PAGE key on the FMCS CDU again.

NOTE: This causes screen 3 of the CONTROL LOOPS to show.

(f) Push the REV line select key (LSK).

NOTE: This causes the L REVERSER SLEEVE POSITION screen to show.

NOTE: The channel that is in control will be shown first.

1) Make sure that the POSITION CH A indication, for the left thrust reverser sleeve, is 100.0 ±5%.

2) Make sure that the POSITION CH B indication, for the left thrust reverser sleeve, is 100.0 ±5%.

(g) Push the NEXT PAGE key on the FMCS CDU.

NOTE: This causes the R REVERSER SLEEVE POSITION screen to show.

1) Make sure that the POSITION CH A indication, for the right thrust reverser sleeve, is 100.0 ±5%.

2) Make sure that the POSITION CH B indication, for the right thrust reverser sleeve, is 100.0 ±5%.

a) If the indication for the thrust reverser position is not in the limits, do this task: Linear Variable Differential Transformer (LVDT) - Adjustment/Test, TASK 78-36-02-820-801-F00.

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA FORWARD OF THE APPLICABLE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(h) Move the applicable reverse thrust lever forward and down to the retract (stow) position.

1) Make sure that the REV light turns amber when the thrust reverser sleeves are in transit and then goes out when the thrust reverser is fully stowed.

2) Make sure that the POSITION CH A indication, for the right thrust reverser sleeve, is 0.0 ±4%.

3) Make sure that the POSITION CH B indication, for the right thrust reverser sleeve, is 0.0 ±4%.

a) If the indication for the thrust reverser position is not in the limits, do this task: Linear Variable Differential Transformer (LVDT) - Adjustment/Test, TASK 78-36-02-820-801-F00.

(i) Push the PREV PAGE key on the FMCS CDU.

NOTE: This causes the L REVERSER SLEEVE POSITION screen to show.

1) Make sure that the POSITION CH A indication, for the left thrust reverser sleeve, is 0.0 ±4%.

2) Make sure that the POSITION CH B indication, for the left thrust reverser sleeve, is 0.0 ±4%.

(j) If the indication for the thrust reverser position is not in the limits, do this task: Linear Variable Differential Transformer (LVDT) - Adjustment/Test, TASK 78-36-02-820-801-F00.

(k) Push the INIT REF key on the FMCS CDU.

NOTE: This causes the MAINT BITE INDEX screen to show.

(l) Push the INIT REF key on the FMCS CDU again.

NOTE: This causes the PERF INIT screen to show.

E. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-00-860-068-F00

(1) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-31-00-860-069-F00

(2) For Engine 2, remove the safety tags and close these circuit breakers:

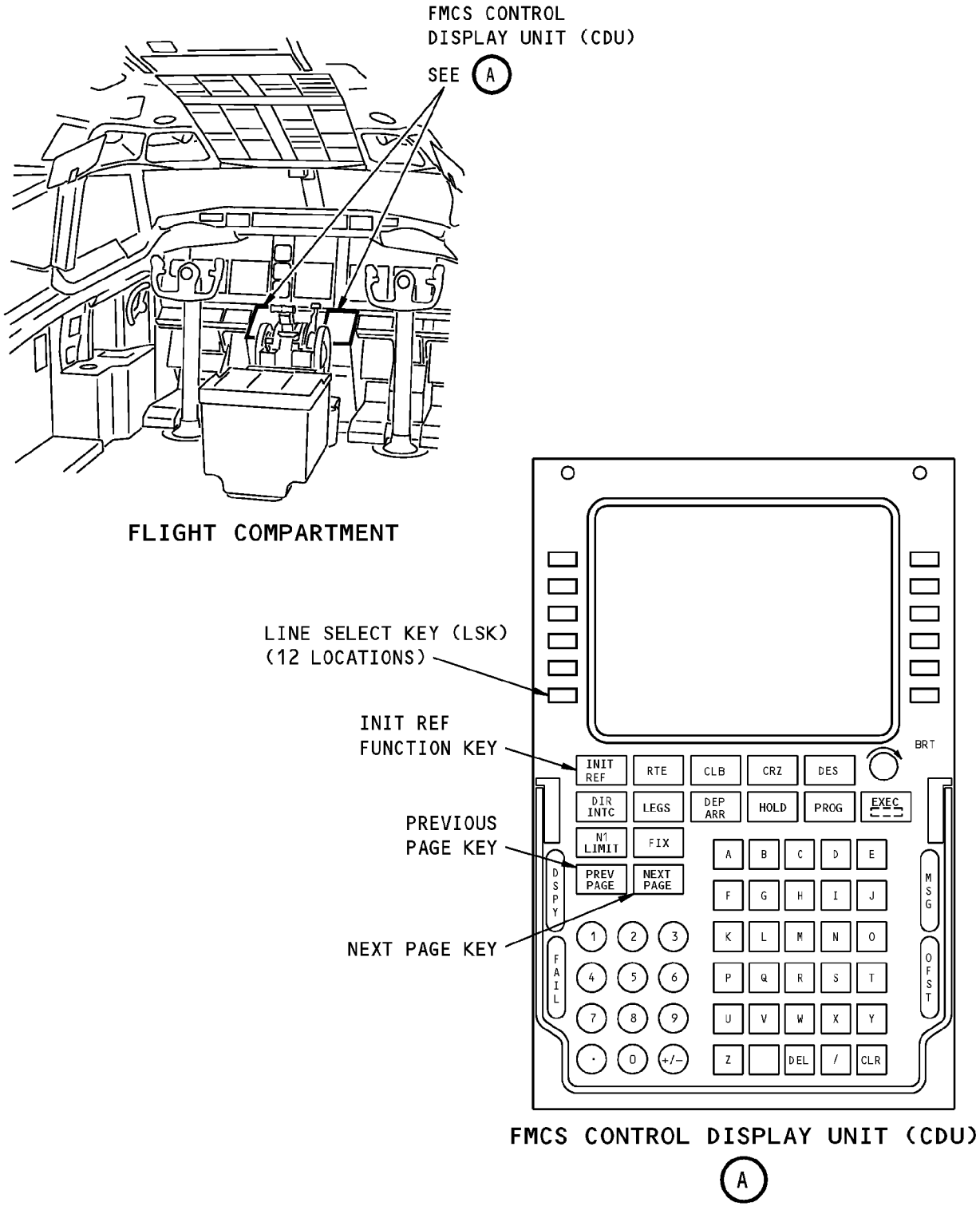
F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-31-00-860-131-F00

(3) Put the ENGINE START switch to the off position.

——————— END OF TASK ———————



Linear Variable Differential Transformer Test
Figure 502/78-31-00-990-802-F00

THRUST REVERSER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser.

(2) The installation of the thrust reverser.

TASK 78-31-01-000-801-F00

2. Thrust Reverser Removal

(Figure 401), (Figure 402), (Figure 403), (Figure 404), (Figure 405), (Figure 406)

A. General

(1) This task is for the removal of the left or right thrust reverser from the applicable engine.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
71-00-02-000-801-F00	Power Plant Removal (P/B 401)
71-11-02-000-801-F00	Remove the Fan Cowl Panel (Selection) (P/B 401)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-804-F00	Close the Thrust Reverser (65-Degree Maintenance Position) (P/B 201)
78-31-09-010-801-F00	Krueger Flap Deflector and Fairing Removal (P/B 401)
78-31-09-400-801-F00	Krueger Flap Deflector Plugs Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-2429	Equipment - Sling, Thrust Reverser, CFM56-7 Engine (Part #: C78018-47, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: C78018-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2430	Hoist - Boom, Ground Based (Part #: C78026-156, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2432	Dolly - Engine Thrust Reverser Transportation, CFM56-3/CFM56-7 Engine (Part #: C78011-37, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2433	Equipment - Hold Open, Thrust Reverser Cowl, CFM56-7 Engine (Part #: C78019-15, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2438	Equipment - Hold-Open, 65-Degree, T/R Cowl, CFM56-7 Engine (Part #: C78021-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

(Continued)

Reference	Description
STD-585	Mat - Protective, 3/8 Inch Minimum Thickness, Minimum 42x60 Inches (1x1.5 meters) with Warning Streamers
STD-1095	Crane - Lift, 2000 Lb Capacity, 30 Foot Height
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Consumable Materials

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

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
416AR	Right Forward Thrust Reverser Hinge Fairing, Engine 1
416BR	Right Aft Thrust Reverser Hinge Fairing, Engine 1
416CR	Right Bump Fairing For Thrust Reverser Hinge Fairing, Engine 1
425AL	Left Forward Thrust Reverser Hinge Fairing, Engine 2
425BL	Left Aft Thrust Reverser Hinge Fairing, Engine 2
425CL	Left Bump Fairing For Thrust Reverser Hinge Fairing, Engine 2
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2

G. Prepare for the Removal

SUBTASK 78-31-01-860-001-F00

CAUTION: DO NOT LIFT OR MOVE THE THRUST REVERSER WITH LESS THAN THREE CASCADE SEGMENTS INSTALLED. MAKE SURE THAT THERE IS NO MORE THAN TWO ADJACENT CASCADE SEGMENTS NOT INSTALLED. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE THRUST REVERSER CAN OCCUR.

(1) Do not lift or move the thrust reverser with less than three cascade segments installed.

(a) Make sure that there is no more than two adjacent cascade segments not installed.

SUBTASK 78-31-01-860-002-F00

(2) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-01-860-003-F00

(3) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-01-860-004-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE THRUST REVERSER THAT IS NEAR THE LEADING EDGE FLAPS AND SLATS OR BEFORE YOU DO WORK ON THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT CAN OCCUR.

CAUTION: MAKE SURE THAT THE LEADING EDGE FLAPS AND SLATS ARE FULLY RETRACTED. IF THE LEADING EDGE FLAPS AND SLATS ARE NOT FULLY RETRACTED, THEN THE THRUST REVERSER CANNOT BE CORRECTLY REMOVED.

(4) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-01-040-001-F00

(5) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-01-040-002-F00

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

(6) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-01-860-005-F00

(7) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(a) For Engine 1, remove power from hydraulic system A.

(b) For Engine 2, remove power from hydraulic system B.

SUBTASK 78-31-01-860-006-F00

(8) Depressurize the applicable hydraulic system; do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 78-31-01-010-001-F00

(9) For the applicable fan cowl panel, do this task: Remove the Fan Cowl Panel (Selection), TASK 71-11-02-000-801-F00.

NOTE: If you remove the fan cowl panel, there will be more room to move the thrust reverser during the removal and the fan cowl panel will not get damaged.

SUBTASK 78-31-01-030-006-F00

(10) If the replacement thrust reverser does not have a Krueger flap deflector and flap fairing installed, remove the Krueger flap deflector and flap fairing from the thrust reverser that is removed.

NOTE: The Krueger flap deflector and Krueger flap fairing are installed only on the inboard translating sleeve.

(a) Do this task: Krueger Flap Deflector and Fairing Removal, TASK 78-31-09-010-801-F00.

SUBTASK 78-31-01-420-009-F00

(11) If the Krueger flap deflector and fairing were removed from the translating sleeve, plugs should be installed in the mounting holes.

NOTE: On the outboard translating sleeve, plugs are installed in the mounting holes for the Krueger flap deflector and fairing. The Krueger flap deflector and fairing are not installed on the outboard translating sleeve. It is possible to install the Krueger flap deflector and fairing on the left or right translating sleeve.

(a) Do this task: Krueger Flap Deflector Plugs Installation, TASK 78-31-09-400-801-F00.

SUBTASK 78-31-01-010-002-F00

(12) If the inboard thrust reverser is to be removed, remove the hinge bump fairing:

NOTE: The hinge bump fairing is installed only on the inboard translating sleeve. The hinge bump fairing is installed over the forward and aft hinge fairings.

(a) Remove the hinge bump fairings from the forward and aft hinge fairings:

Number	Name/Location
416CR	Right Bump Fairing For Thrust Reverser Hinge Fairing, Engine 1
425CL	Left Bump Fairing For Thrust Reverser Hinge Fairing, Engine 2

1) Remove the two long bolts.
2) Remove the five short bolts.
3) Keep the bolts together in a cloth bag for the installation.

SUBTASK 78-31-01-010-003-F00

(13) Remove the inboard forward hinge fairings:

Number	Name/Location
416AR	Right Forward Thrust Reverser Hinge Fairing, Engine 1
425AL	Left Forward Thrust Reverser Hinge Fairing, Engine 2

(a) Remove 12 bolts to remove the inboard forward hinge fairing (Figure 401).

(b) Keep the bolts together in a cloth bag for the installation.

SUBTASK 78-31-01-010-019-F00

(14) Remove the outboard forward hinge fairings:

Number	Name/Location
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2

(a) Remove 18 bolts to remove the outboard forward hinge fairing (Figure 401).

(b) Keep the bolts together in a cloth bag for the installation.

SUBTASK 78-31-01-010-020-F00

(15) Remove the inboard aft hinge fairings:

Number	Name/Location
416BR	Right Aft Thrust Reverser Hinge Fairing, Engine 1
425BL	Left Aft Thrust Reverser Hinge Fairing, Engine 2

(a) Remove seven bolts to remove the inboard forward hinge fairing (Figure 401).

(b) Keep the bolts together in a cloth bag for the installation.

SUBTASK 78-31-01-010-021-F00

(16) Remove the outboard aft hinge fairings:

Number	Name/Location
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2

(a) Remove eight bolts to remove the outboard aft hinge fairing (Figure 401).

(b) Keep the bolts together in a cloth bag for the installation.

H. Thrust Reverser Removal

SUBTASK 78-31-01-860-011-F00

(1) If the six latches along the bottom center line of the thrust reverser are engaged, do this step:

(a) Disengage the latches in sequence from the aft latch 6 to the forward latch 1.

SUBTASK 78-31-01-010-005-F00

(2) Do these steps to disconnect the electrical connectors from the strut receptacles (Figure 402) (View A):

(a) For the left thrust reverser, disconnect the electrical connectors, D30002 and D30008.

(b) For the right thrust reverser, disconnect the electrical connectors, D30006 and D30010.

(c) Install protective caps on the electrical connectors and strut receptacles.

SUBTASK 78-31-01-020-002-F00

WARNING: WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE OPEN PORTS ON THE HYDRAULIC ACTUATOR OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS CAN OCCUR.

CAUTION: DO NOT LET HYDRAULIC FLUID GET ON THE THRUST REVERSER OR ENGINE COMPONENTS. IMMEDIATELY CLEAN A COMPONENT IF HYDRAULIC FLUID GETS ON IT. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE EQUIPMENT.

(CAUTION PRECEDES)

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(3) Do these steps to drain the hydraulic fluid from the hydraulic lines (Figure 402):

NOTE: To decrease hydraulic fluid spray when the coupling nuts are loosened, wrap cotton wiper, G00034, around the wrench, nut and hydraulic line.

(a) Wrap cotton wiper, G00034 around the electrical connector on the sync lock receptacle on the lower actuator.

NOTE: The cloth will catch the hydraulic fluid and prevent contamination of the electrical connector.

(b) Put a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 below the lower actuator to collect hydraulic fluid.

(c) Disconnect the coupling nut on the sync shaft tubing at the upper port of the lower actuator.

(d) Disconnect the hydraulic retract line at the upper port of the lower actuator.

(e) Let the hydraulic fluid drain into the container.

(f) Disconnect the extend line and retract line flexhoses from the upper locking actuator (Figure 402).

(g) Use a hydraulic fitting plug or wrap cotton wiper, G00034 around the extend line and retract line flexhose coupling nuts to catch residual hydraulic fluid that will drain from the system.

NOTE: The diameter of the return (retract) line is 0.375 inches and the pressure (deploy) line is 0.750 inches.

(h) Re-connect the coupling nut for the lower sync shaft to the lower actuator.

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.8 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.8 Newton meters).

(i) Re-connect the coupling nut for the lower retract line to the lower actuator.

1) Tighten the coupling nut to 256-283 pound-inches (29.0-32.0 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 256-283 pound-inches (29.0-32.0 Newton meters).

CAUTION: IF THE GSE 45-DEGREE OR 65-DEGREE HOLD-OPEN EQUIPMENT IS INSTALLED, IT MUST BE REMOVED BEFORE THE THRUST REVERSER REMOVAL. IF THE GSE HOLD OPEN EQUIPMENT IS NOT REMOVED, DAMAGE TO THE UPPER FIRE SHIELD ON THE THRUST REVERSER CAN OCCUR.

(j) If the engine was removed, make sure that the 45-degree hold-open hold open equipment, SPL-2433, is removed.

1) Do this task: Power Plant Removal, TASK 71-00-02-000-801-F00.

(k) If the precooler was removed from the engine, make sure that the 65-degree hold-open equipment, SPL-2438, is removed.

1) Do this task: Close the Thrust Reverser (65-Degree Maintenance Position), TASK 78-31-00-410-804-F00.

SUBTASK 78-31-01-480-002-F00

(4) Do these steps to prepare the thrust reverser [1] for the GSE thrust reverser sling equipment, SPL-2429 installation (Figure 403), (Figure 404):

(a) Put the GSE forward hinge fitting assembly [4] at the forward hinge beam attach point marked "GSE HOIST POINT" (View A-A).

1) Install the lockpin [5].

a) Install the retention pin in the end of the lockpin.

(b) Put the GSE aft hinge fitting assembly [2] at the aft hinge beam attach point marked "GSE HOIST POINT".

1) Install the lockpin [5].

a) Install the retention pin in the end of the lockpin.

(c) Do these steps to install the two lower GSE latch beam fittings [7] on the latch beam (View C):

1) Remove the screws [6] from the four locations that are marked "GSE" on the latch beam fairing.

a) Put the screws [6] in the threaded holes in the GSE latch beam fittings for storage.

2) Put the two GSE latch beam fittings [7] on the latch beam.

3) Install two bolts [11] with a washer [12] under the bolt head in each GSE latch beam fitting [7].

a) Tighten the bolts to 20-50 pound-inches (2.3-5.7 Newton meters).

SUBTASK 78-31-01-480-003-F00

(5) Do these steps to prepare the sling for installation on the thrust reverser [1] (Figure 403), (Figure 404):

(a) Insert the two spud assemblies [8] into the tubes on the lower crossbar (Figure 403), (Figure 404) (View C).

NOTE: The tubes are marked LH for the left thrust reverser removal and RH for the right thrust reverser removal.

1) Make sure that the spud assemblies [8] are in the correct position for the applicable thrust reverser.

2) Install a lockpin [9] in each spud assembly.

a) Install the retention pins in the end of the lockpins.

HAP ALL; AIRPLANES WITH SLING ASSEMBLY WITH AN OVERHEAD CRANE

SUBTASK 78-31-01-480-006-F00

(6) Do these steps to attach the overhead crane to the sling (Figure 403):

(a) Attach the C-beam to the sling (Figure 403) (View A).

1) Make sure that the C-beam is attached in the correct position for the applicable thrust reverser and that the forward arrow is in the forward position.

2) Install the collar and lockpin.

a) Install the retention pin in the end of the lockpin.

(b) Attach the dynamometer to the lift plate and the master link.

(c) Connect the master link to the 30 foot height (2000 lbs capacity) lift crane, STD-1095.

(d) Attach the chain hoist to the lift plate and to the lower attach fitting on the sling.

NOTE: The lower attach fittings are marked LH for the left thrust reverser removal and RH for the right thrust reverser removal.

1) Make sure that the chain hoist is in the correct position on the lower attach fitting for the applicable thrust reverser.

HAP ALL; AIRPLANES WITH SLING ASSEMBLY WITH A BOOM HOIST

SUBTASK 78-31-01-480-007-F00

(7) Do these steps to attach the boom hoist boom hoist, SPL-2430 to the sling (Figure 404):

(a) Put the boom hoist so that the holes in the adapter assembly align with the holes in the lower attach fitting on the sling (View AA).

1) Install the two lockpins.

a) Install a retention pin in the end of each of the lockpins.

HAP ALL

SUBTASK 78-31-01-480-004-F00

WARNING: THE TOOL WEIGHS APPROXIMATELY 225 POUNDS (102 KG), MAKE SURE THAT THE TOOL IS ATTACHED CORRECTLY TO THE OVERHEAD CRANE. IF YOU DO NOT OBEY THIS INSTRUCTION, THE TOOL CAN FALL AND INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT USE THE HOIST POINTS ON THE THRUST REVERSER TRANSLATING SLEEVE TO HOIST THE THRUST REVERSER. THIS WILL PREVENT DAMAGE TO THE TRANSLATING SLEEVE.

(8) Do these steps to attach the sling to the thrust reverser [1] (Figure 403), (Figure 404):

(a)

HAP ALL; AIRPLANES WITH SLING ASSEMBLY WITH AN OVERHEAD CRANE

If the inboard thrust reverser is to be removed, put a protective mat, STD-585 on the leading edge of the wing to prevent damage to the surface.

NOTE: When the tool is put into position and attached to the thrust reverser the chain that is attached to the lower fitting on the sling will hit the leading edge of the wing.

HAP ALL

(b) Align the sling to the thrust reverser [1] with the overhead crane or the boom hoist.

(c) Lower the sling so that the spud assemblies [8] are aligned with the two GSE latch beam fittings [7] on the latch beam (Figure 403), (Figure 404) (View C).

1) Install the lockpins [10].

a) Install the retention pins in the end of the lockpins.

(d) Put the sling in a position to align with the forward [4] and aft [2] GSE hinge fitting assemblies on the hinge beam (Figure 403), (Figure 404) (View A-A).

1) Install two lockpins [3] in each GSE hinge fitting assembly.

a) Install the retention pins in the end of the lockpins.

SUBTASK 78-31-01-010-008-F00

(9) Do these steps to disconnect the opening actuator from the torque box (Figure 405):

(a) Remove the nut [45], washers [42] and [44], bushing [43] and bolt [41] from the torque box fitting.

(b) To remove the load from the bolt or to make the removal of the actuator rod end from the attach fitting easier, lift the thrust reverser with the sling.

HAP ALL; AIRPLANES WITH SLING ASSEMBLY WITH AN OVERHEAD CRANE

(c) Temporarily attach the opening actuator to the fan case with a tie strap.

1) Make sure that the tie is not attached to a wire harness.

HAP ALL; AIRPLANES WITH SLING ASSEMBLY WITH A BOOM HOIST

(d) For the outboard thrust reverser, temporarily attach the opening actuator to the fan case with a tie strap.

1) Make sure that the tie is not attached to a wire harness.

(e) For the inboard thrust reverser, do these steps to remove the opening actuator:

NOTE: When the inboard thrust reverser is removed, the opening actuator will hit the fire seal on the thrust reverser.

1) Remove the bolt [46], washer [47], alignment washer [49], bushing [48], two washers [50] and nut [51] from the fan case fitting.

NOTE: If a longer bolt was used, there will be three washers [50].

2) Remove the opening actuator.

HAP ALL

SUBTASK 78-31-01-020-001-F00

WARNING: THE THRUST REVERSER WEIGHS APPROXIMATELY 554 POUNDS (253 KG), MAKE SURE THAT THE WEIGHT OF THE THRUST REVERSER IS HELD BY THE TOOL. IF YOU DO NOT OBEY THIS INSTRUCTION, THE THRUST REVERSER CAN FALL AND INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(10) Do these steps to remove the thrust reverser [1] (Figure 406):

(a) Do these steps to disconnect the electrical ground strap from the hinge beam (Figure 406) (View B):

1) Use a wrench to hold the head of the ground stud fastener so that it will not turn when you remove the nut.

2) Remove the nut [66] and washer [67] from ground stud.

3) Move the electrical bonding strap off the ground stud and away from the hinge beam.

a) If the same thrust reverser is to be installed, put the washer [67] and nut [66] on the ground stud for storage.

b) If a different thrust reverser is to be installed, put the washer [67] and nut [66] with the new thrust reverser.

(b) Lift the thrust reverser [1] with the sling to get access to and to remove the load from the hinge beam bolts [65] and lockpins [61].

NOTE: At the approximate eight degree open position, access to the hinge bolts is easier.

(c) Remove the lockpins [61] from the forward and aft positions.

(d) Remove the nuts [62], washers [63] and shims [64] or washers [64A] from the forward and aft hinge bolts [65].

NOTE: Some airplanes can have zero to two shims at each bolt location. If you remove shims, keep them with the applicable hinge bolt at its position for the subsequent installation.

NOTE: A 0.040 inch (1.02 mm) nominal washer [64A] can be used as an alternative for the shim [64]. Some airplanes can possibly have zero to four 0.040 inch (1.02 mm) nominal washers. If you remove nominal washers, keep them with the applicable hinge bolt at its position for the subsequent installation.

1) Install the thread protectors on the two hinge bolts [65].

NOTE: The thread protectors are part of the GSE equipment and are in the storage box with the GSE thrust reverser sling equipment, SPL-2429.

2) Lift the thrust reverser with the sling to remove the load from the hinge bolts.

NOTE: If there is still a load on the hinge bolts, adjust the position of the crane so that there is no load on the hinge bolts.

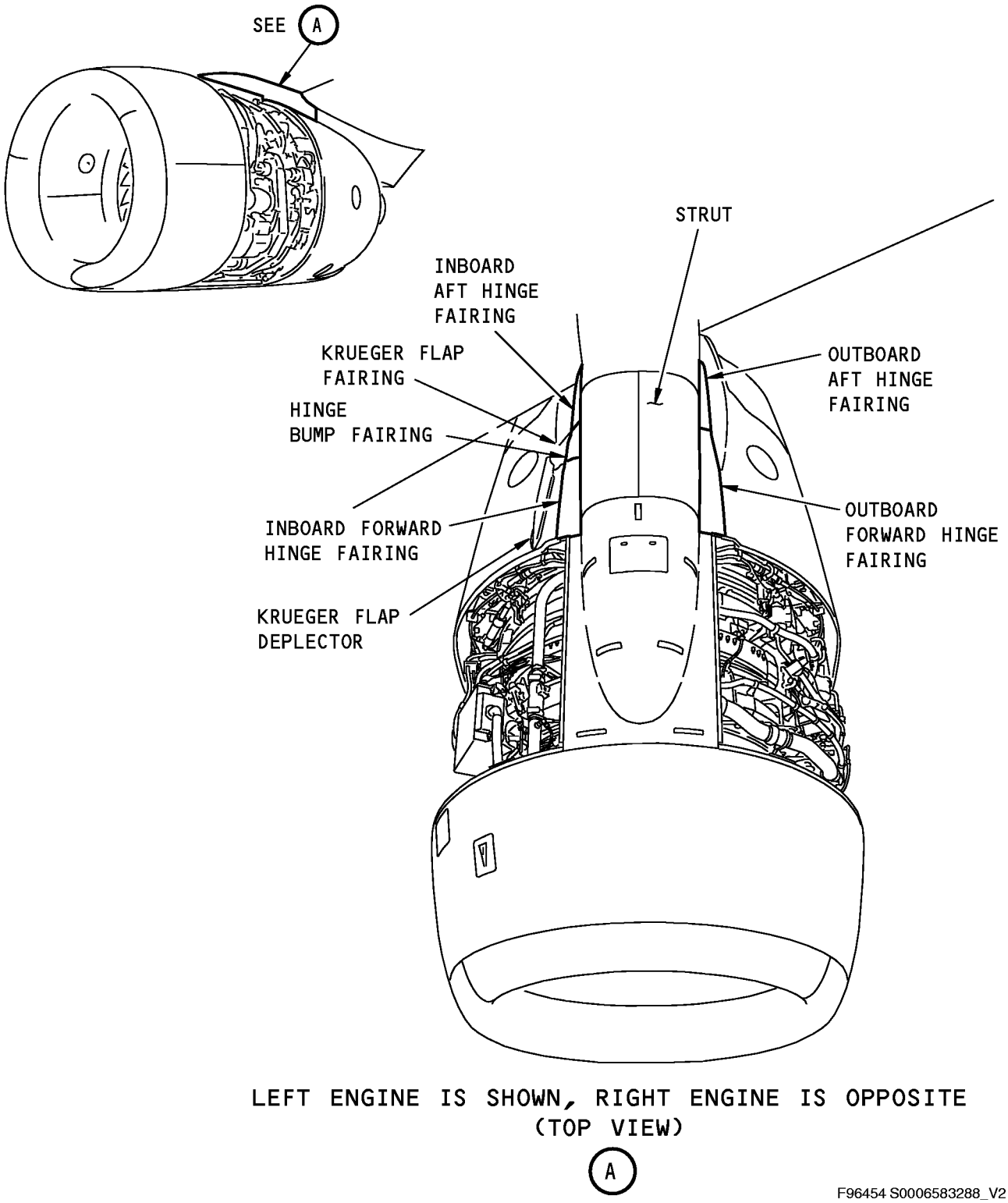
3) Remove the hinge bolts [65].

CAUTION: MAKE SURE THAT YOU MONITOR THE POSITION OF THE THRUST REVERSER WHEN YOU MOVE THE THRUST REVERSER AWAY FROM THE STRUT AND ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, THE THRUST REVERSER CAN HIT THE ADJACENT STRUCTURES AND DAMAGE CAN OCCUR.

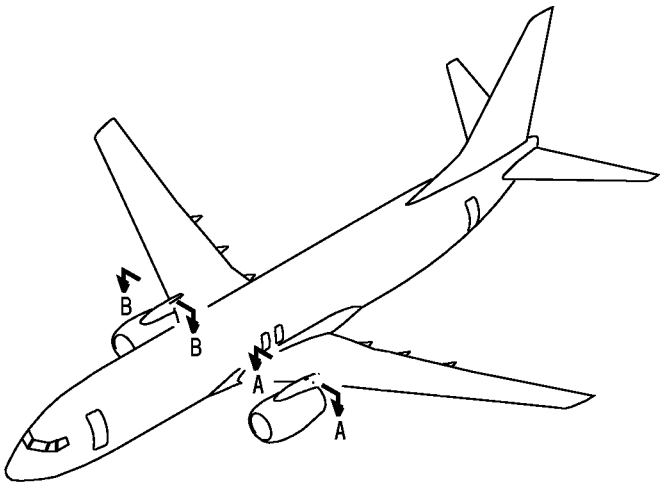
(e) Remove the thrust reverser [1].

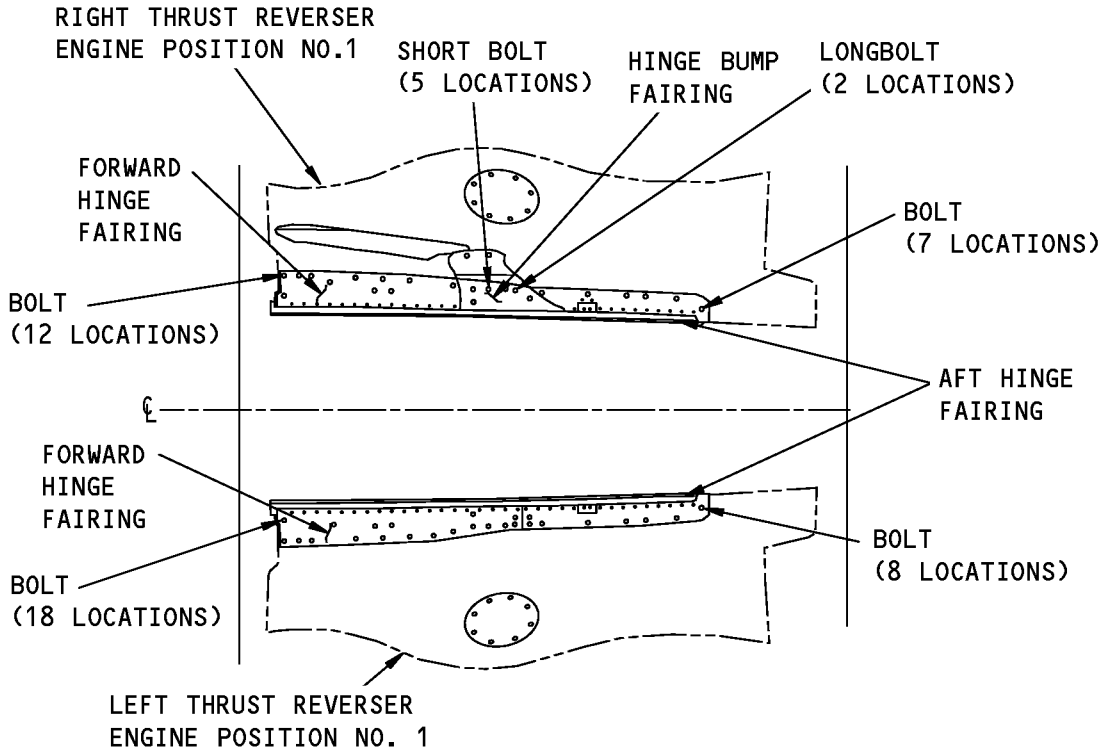
(f) Put the thrust reverser [1] on a suitable pallet or dolly, SPL-2432.

——————— END OF TASK ———————



Thrust Reverser Hinge Fairing Installation
Figure 401 (Sheet 1 of 3)/78-31-01-990-801-F00

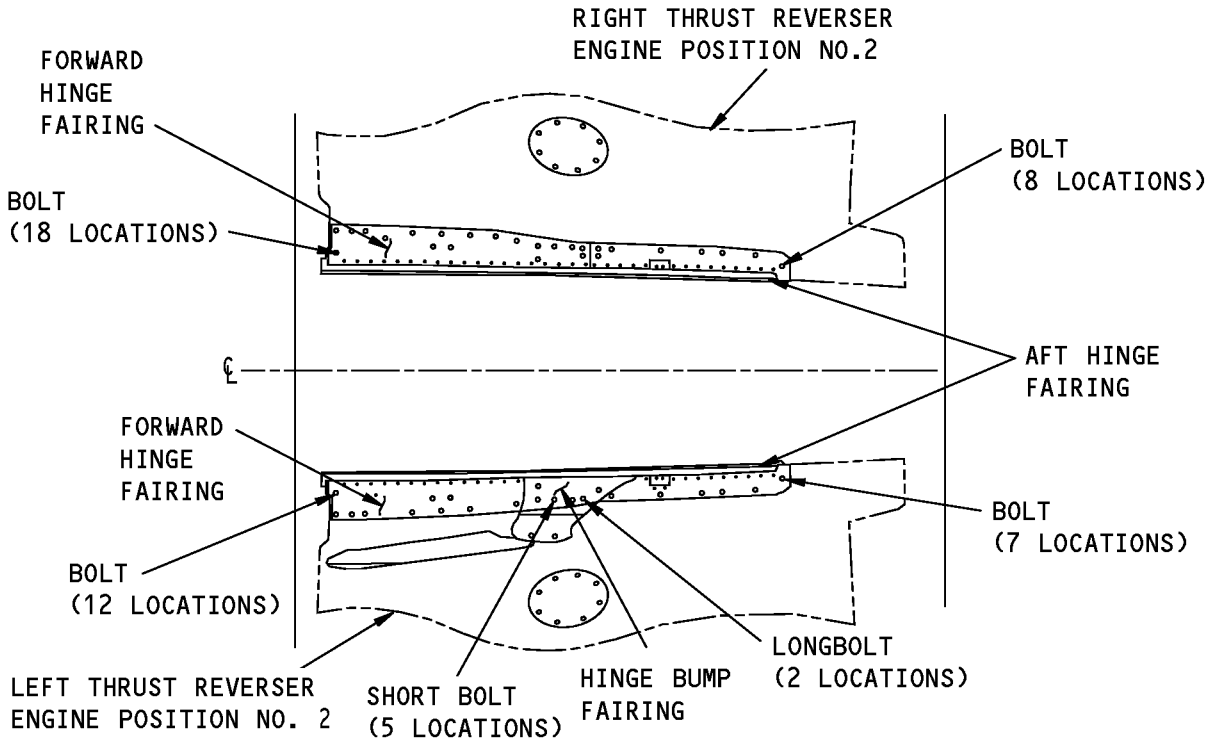




A–A

1463889 S0000266217_V1

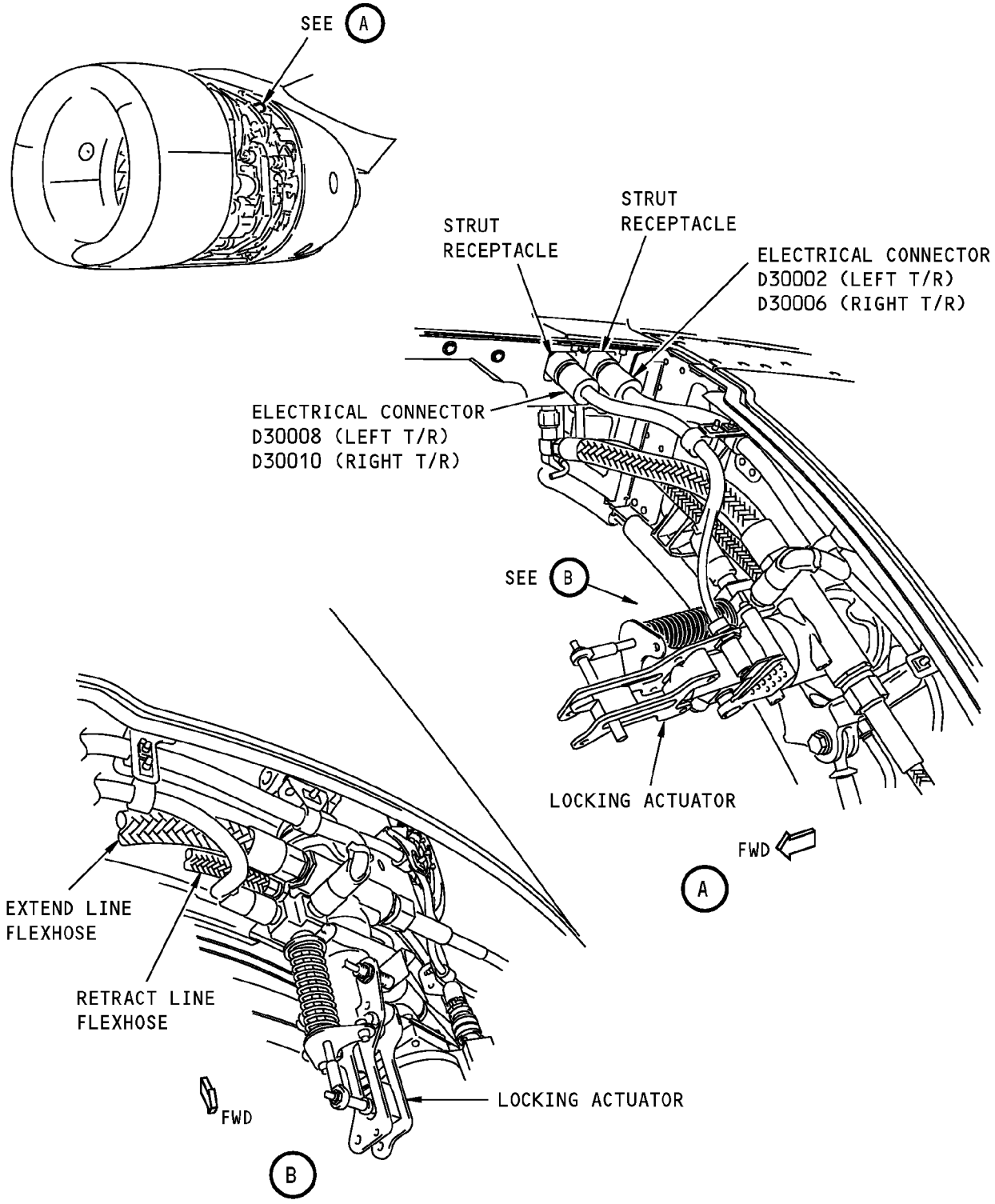
Thrust Reverser Hinge Fairing Installation
Figure 401 (Sheet 2 of 3)/78-31-01-990-801-F00



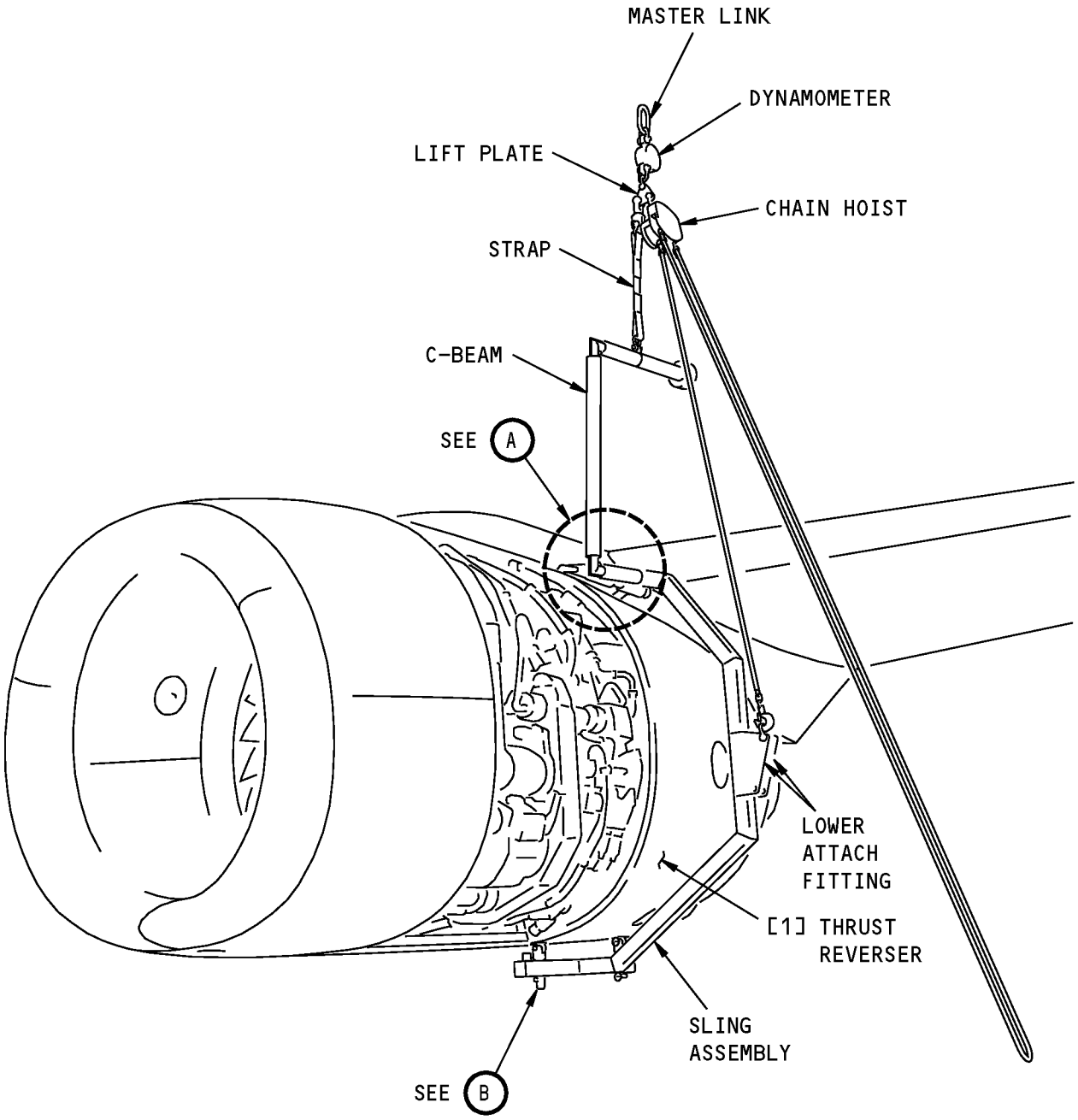
B–B

1466598 S0000267411_V1

Thrust Reverser Hinge Fairing Installation
Figure 401 (Sheet 3 of 3)/78-31-01-990-801-F00

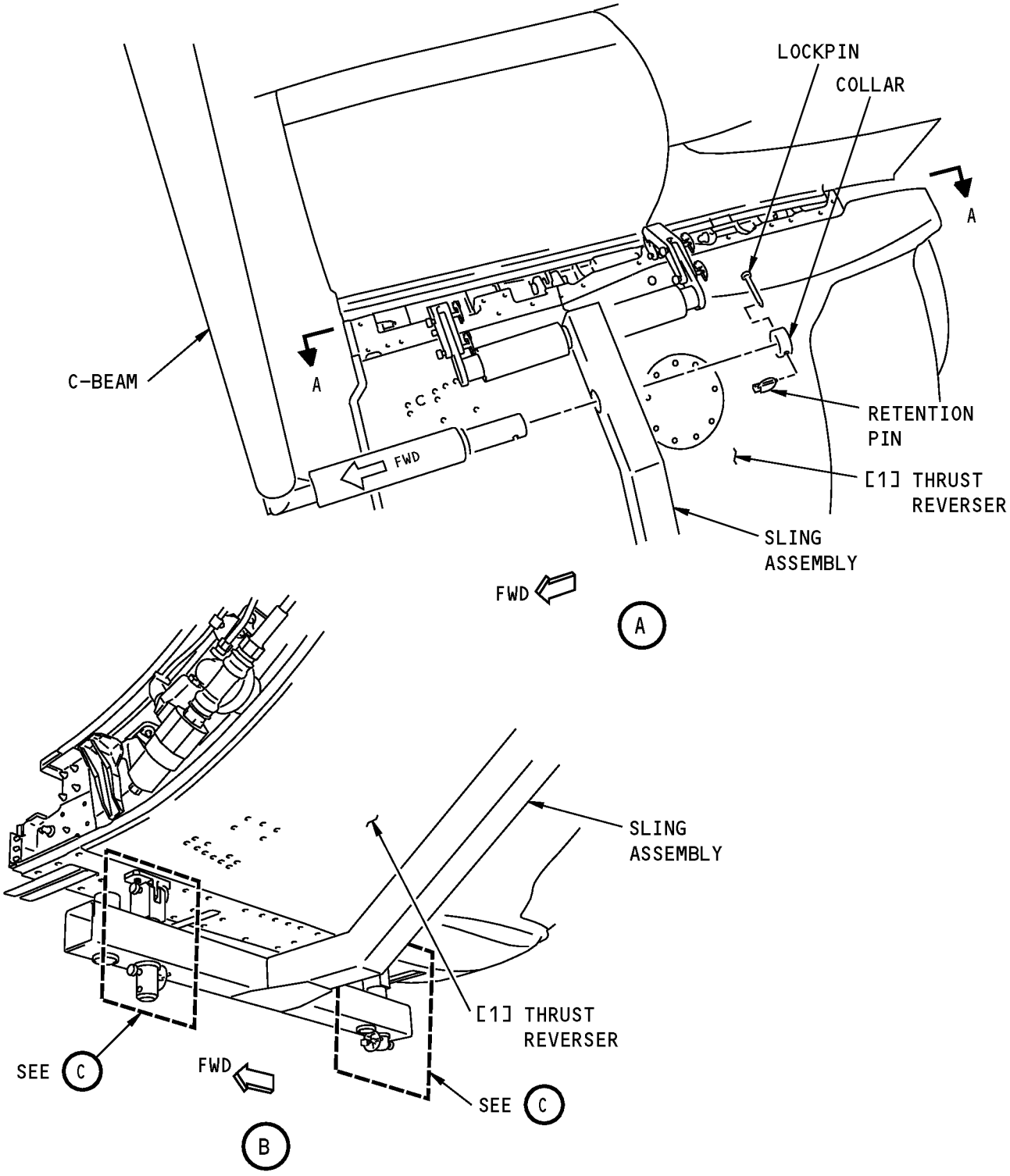


Hydraulic and Electric Connections
Figure 402/78-31-01-990-802-F00

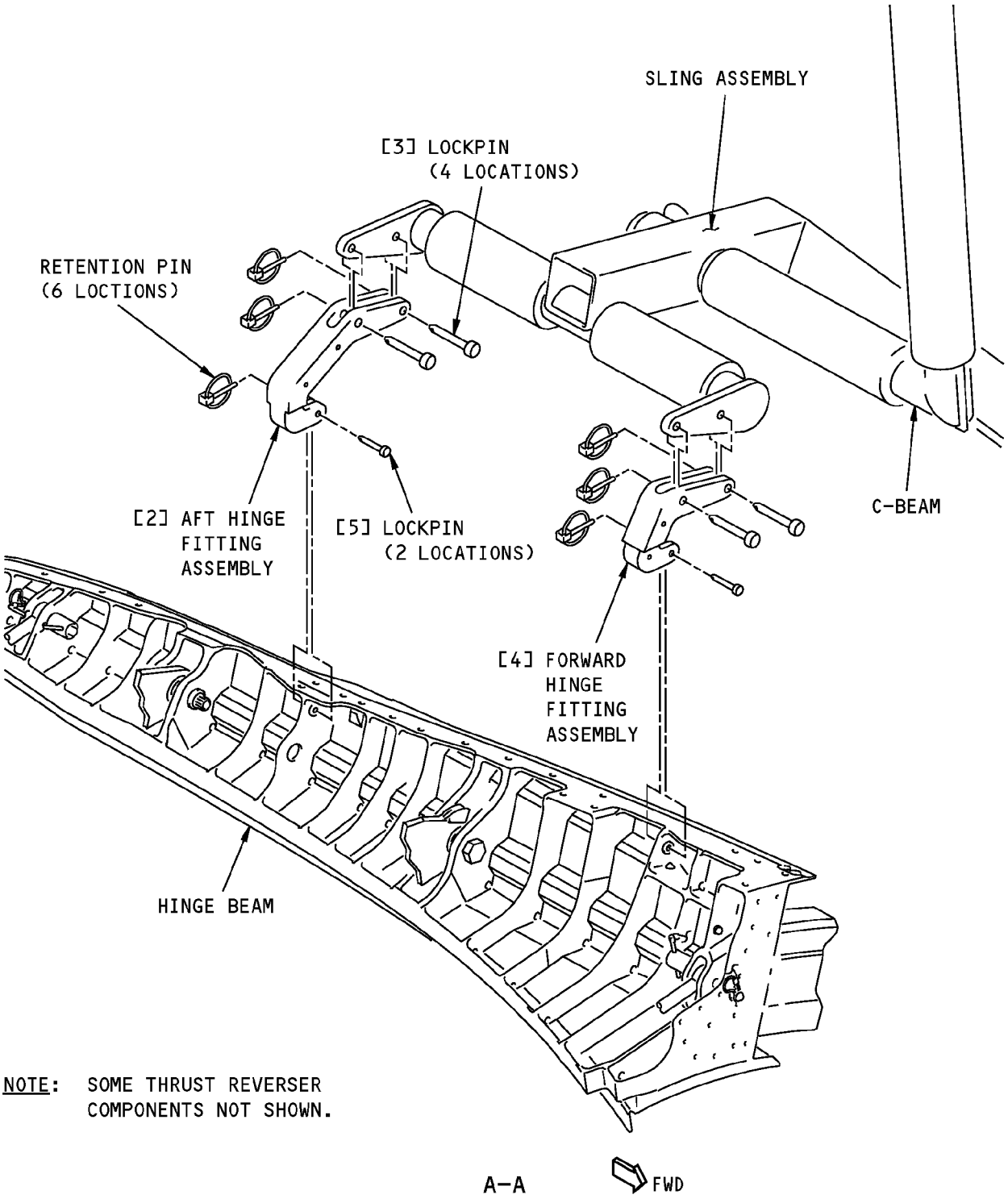


SLING ASSEMBLY WITH OVERHEAD CRANE

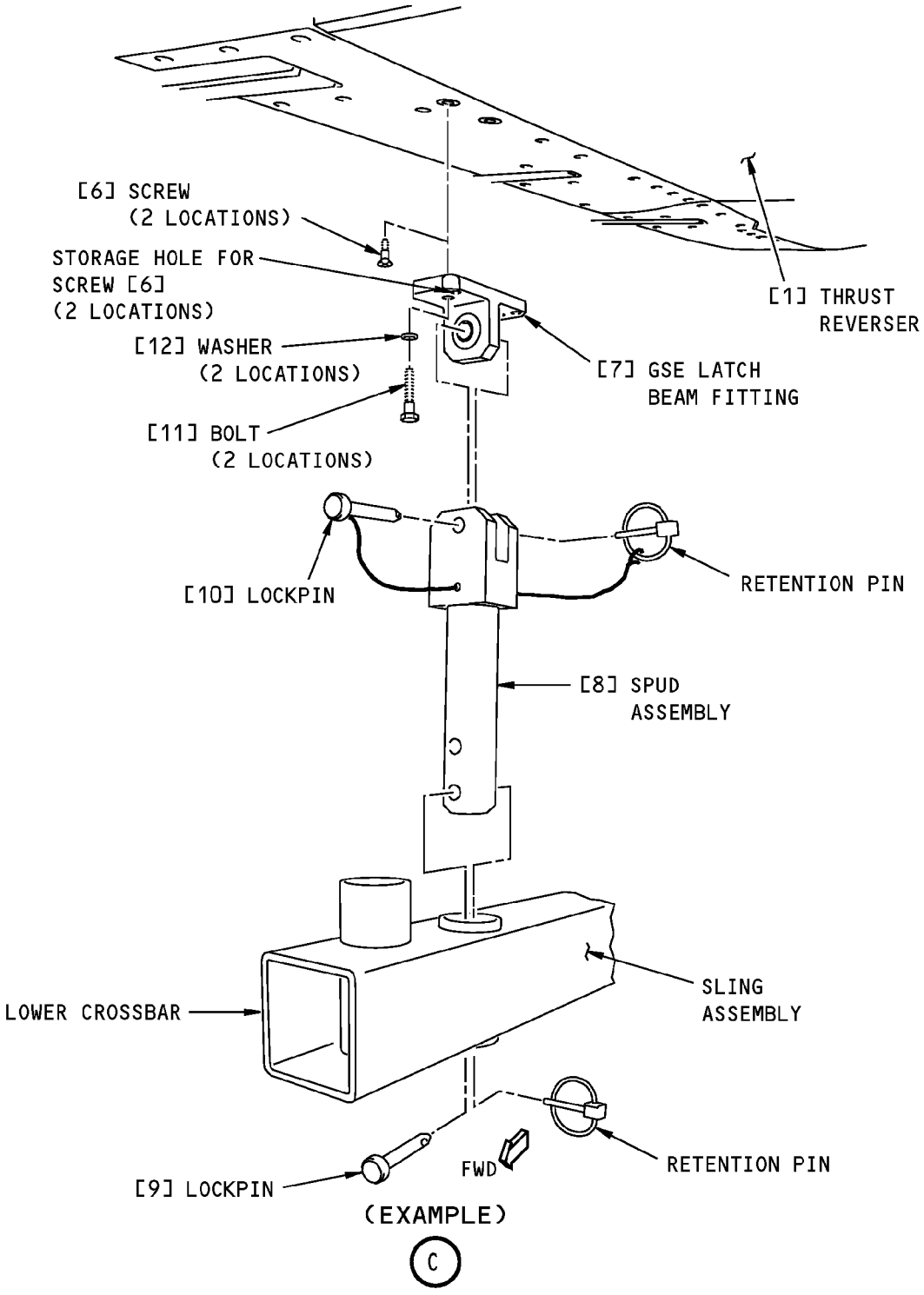
Thrust Reverser (Sling Assembly with Overhead Crane) Installation
Figure 403 (Sheet 1 of 4)/78-31-01-990-803-F00



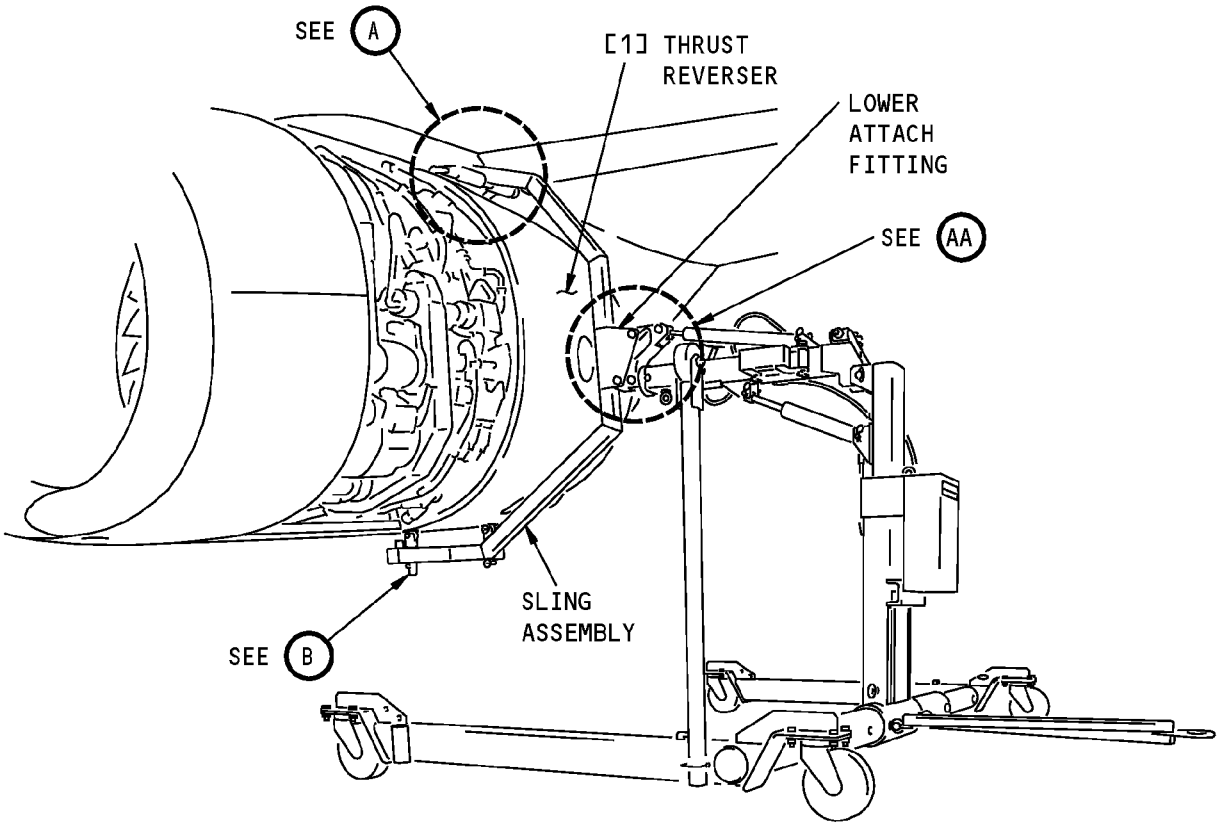
Thrust Reverser (Sling Assembly with Overhead Crane) Installation
Figure 403 (Sheet 2 of 4)/78-31-01-990-803-F00



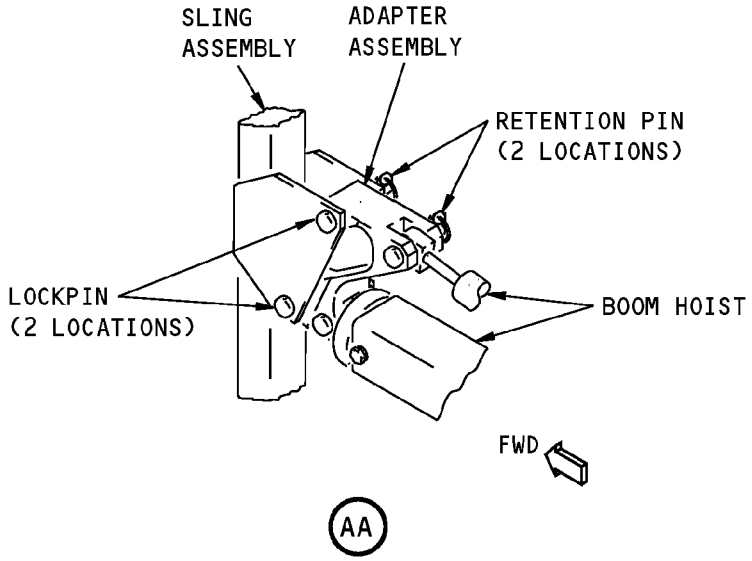
Thrust Reverser (Sling Assembly with Overhead Crane) Installation
Figure 403 (Sheet 3 of 4)/78-31-01-990-803-F00



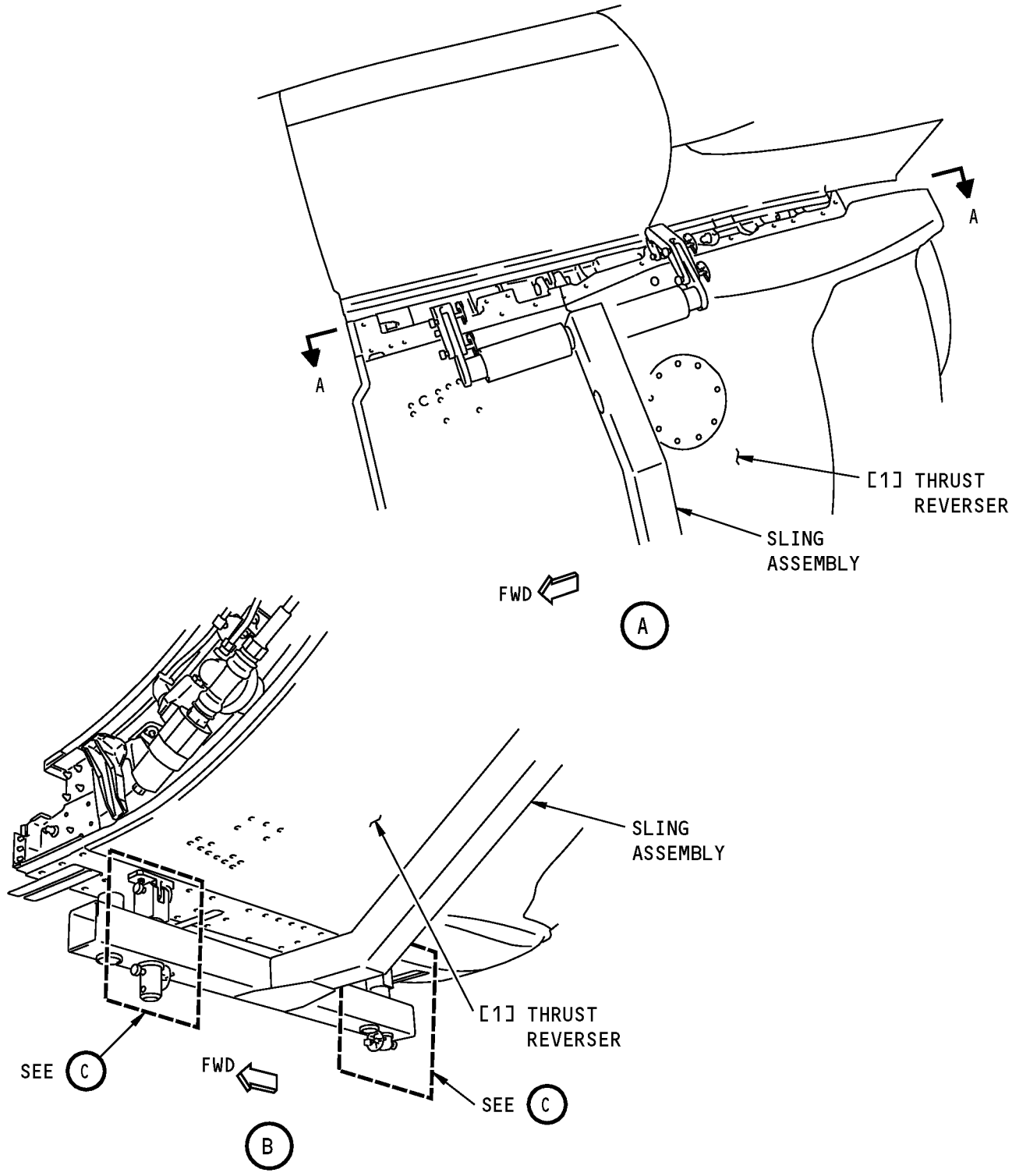
Thrust Reverser (Sling Assembly with Overhead Crane) Installation
Figure 403 (Sheet 4 of 4)/78-31-01-990-803-F00



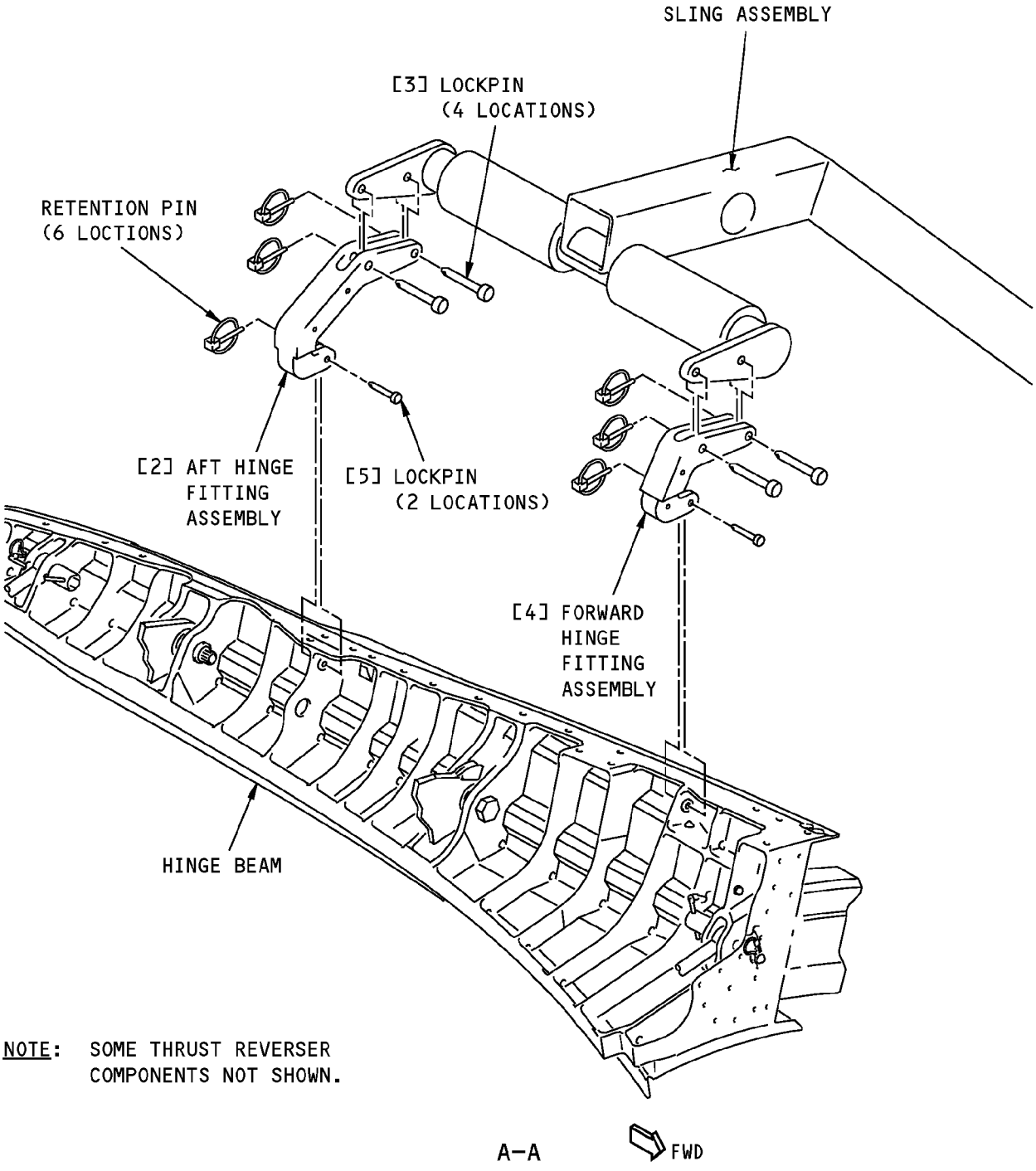
SLING ASSEMBLY WITH BOOM HOIST



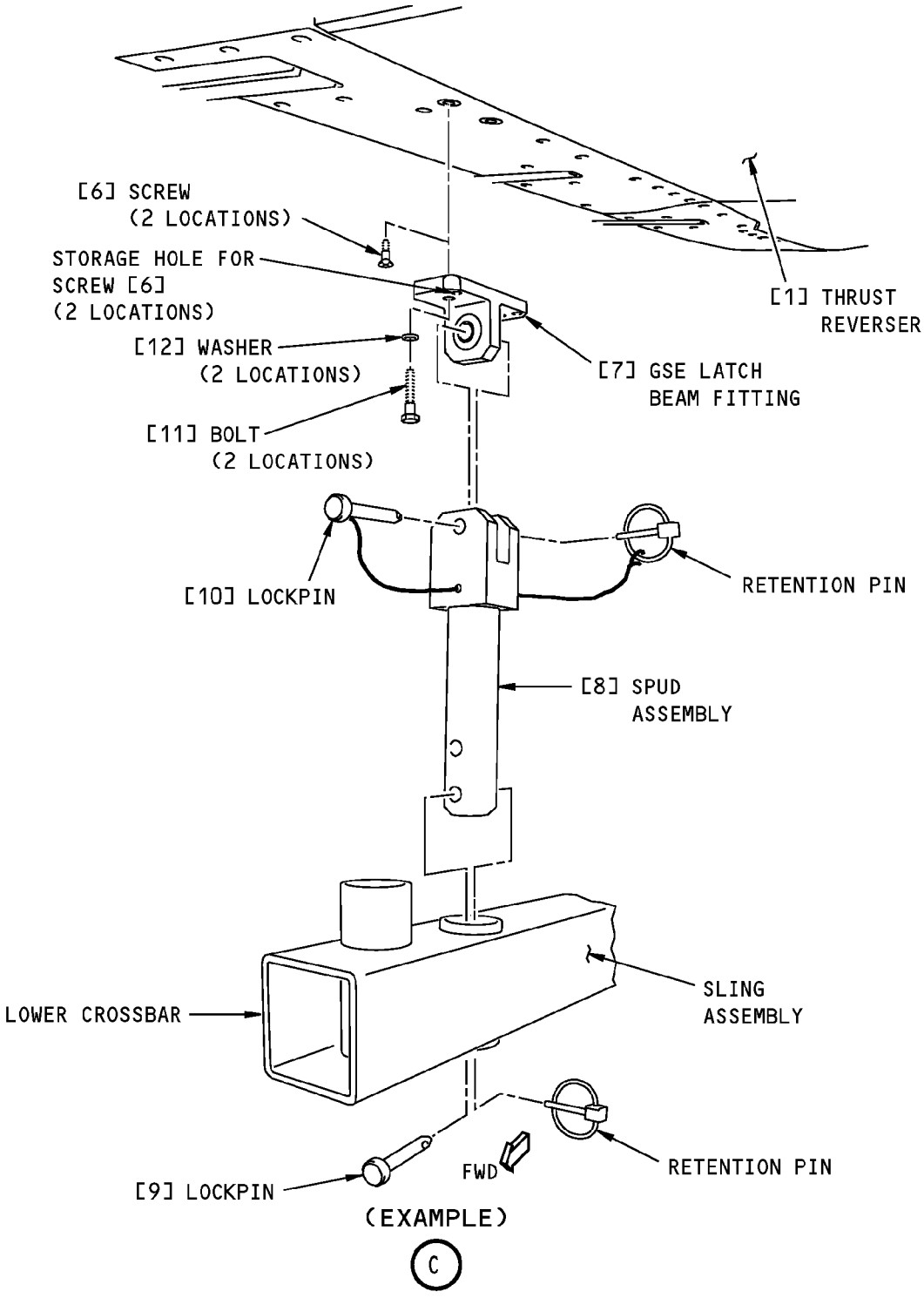
Thrust Reverser (Sling Assembly with Boom Hoist) Installation
Figure 404 (Sheet 1 of 4)/78-31-01-990-810-F00



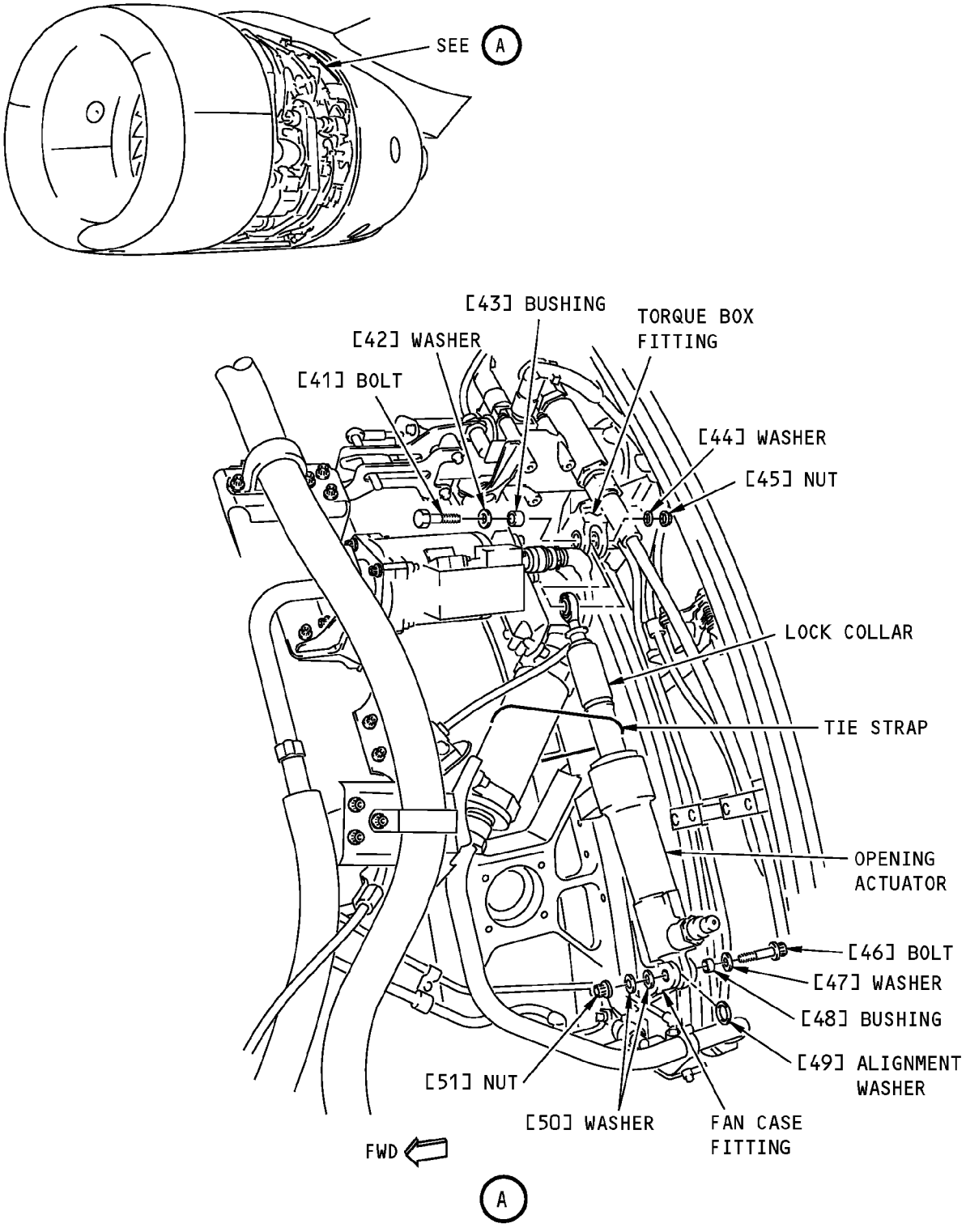
Thrust Reverser (Sling Assembly with Boom Hoist) Installation
Figure 404 (Sheet 2 of 4)/78-31-01-990-810-F00



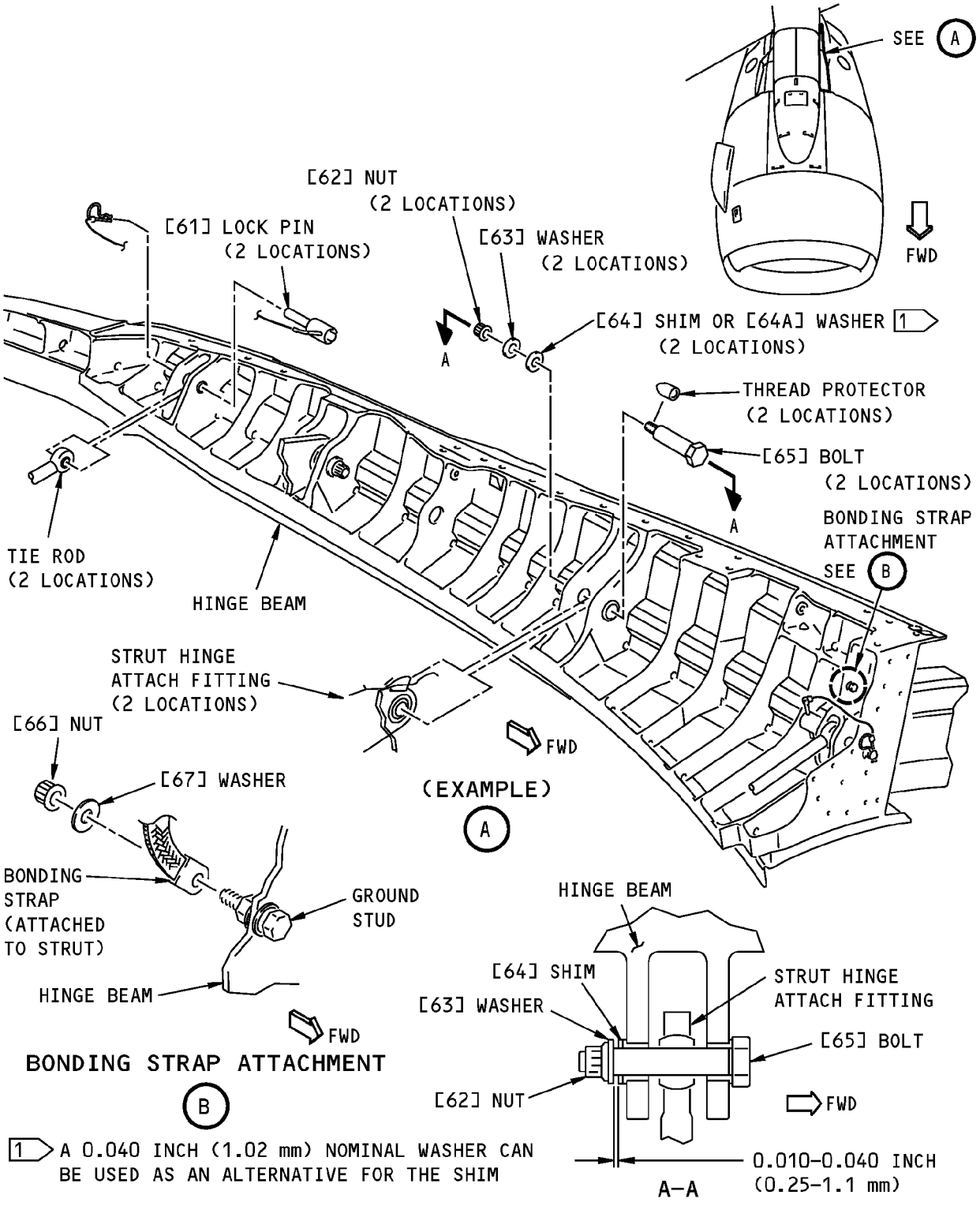
Thrust Reverser (Sling Assembly with Boom Hoist) Installation
Figure 404 (Sheet 3 of 4)/78-31-01-990-810-F00



Thrust Reverser (Sling Assembly with Boom Hoist) Installation
Figure 404 (Sheet 4 of 4)/78-31-01-990-810-F00



Thrust Reverser Opening Actuator Disconnect
Figure 405/78-31-01-990-804-F00



Thrust Reverser Installation
Figure 406/78-31-01-990-805-F00

TASK 78-31-01-400-801-F00

3. Thrust Reverser Installation

(Figure 401), (Figure 402), (Figure 403), (Figure 404), (Figure 405), (Figure 406)

A. General

(1) This task is for the installation of the left or right thrust reverser on the applicable engine.

(2) You must do the thrust reverser adjustment if a different thrust reverser is installed.

NOTE: If you install the same thrust reverser that was removed, it is not necessary to do the adjustment procedure.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
71-11-02-400-801-F00	Install the Fan Cowl Panel (Selection) (P/B 401)
71-11-03-700-801-F00	Fan Cowl Panel Latch Adjustment (P/B 501)
73-21-00-700-804-F00	EEC TEST (P/B 501)
73-21-60-470-801-F00	EEC Software Load (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-01-820-801-F00	Thrust Reverser Adjustment (P/B 501)
78-31-05-000-801-F00	Cascade Removal (P/B 401)
78-31-05-400-801-F00	Cascade Installation (P/B 401)
78-31-09-400-801-F00	Krueger Flap Deflector Plugs Installation (P/B 401)
78-31-09-420-801-F00	Krueger Flap Deflector and Fairing Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)
SPL-2429	Equipment - Sling, Thrust Reverser, CFM56-7 Engine (Part #: C78018-47, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: C78018-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2434	Tool - Latching, Thrust Reverser C-Duct Halves (Part #: C78020-14, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: C78020-11, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-585	Mat - Protective, 3/8 Inch Minimum Thickness, Minimum 42x60 Inches (1x1.5 meters) with Warning Streamers

D. Consumable Materials

Reference	Description	Specification
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS 3-33)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
416AR	Right Forward Thrust Reverser Hinge Fairing, Engine 1
416BR	Right Aft Thrust Reverser Hinge Fairing, Engine 1
416CR	Right Bump Fairing For Thrust Reverser Hinge Fairing, Engine 1
425AL	Left Forward Thrust Reverser Hinge Fairing, Engine 2
425BL	Left Aft Thrust Reverser Hinge Fairing, Engine 2
425CL	Left Bump Fairing For Thrust Reverser Hinge Fairing, Engine 2
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2

G. Prepare to Install the Thrust Reverser

SUBTASK 78-31-01-860-019-F00

(1) Do a check of the engine data plate for the engine type.

NOTE: For 737-600/700/800/900/BBJ airplanes from Line Positions 1 through 2229 with installed replacement tech insertion (TI) CFM56-7BXX/3 SAC engines or non-TI CFM56-7BXX SAC engines incorporating CFM SB 72-0583, it may be necessary that the thrust reversers installed with this engine are the current production configuration or have Boeing SB 737-78-1079 completed. Refer to engine intermix SB 737-71-1588 Revision 3 and later for the permitted thrust reversers that may be necessary with installation of a TI engine or a non-TI engine incorporating CFM SB 72-0583.

NOTE: For all 737-900ER airplanes and 737-600/700/800/900/BBJ airplanes from Line Positions 2230 and on, the thrust reversers installed on this airplane must be the current production configuration or have SB 737-78-1079 completed. This restriction does not depend on the engine installed (TI or non-TI).

NOTE: Thrust reversers that are the current production configuration are P/N 315A2295-219, -220, -221, -222 and all future production units (-229 through -500). SB 737-78-1079 modifies all previous thrust reversers with P/N 315A2295-3 to -202 to the current production configuration and changes the part numbers to P/N 315A2295-503 to -702. These thrust reversers include sealing around the insulation blanket perimeter, have a cooling hole through the inner wall behind the upper No.3 compression fitting and include an additional upper fire seal flange insulation. Refer to AMM 78-31-13/401 for information on the blanket sealing and fire seal flange insulation that may be necessary.

NOTE: Installation of current production thrust reversers or thrust reversers that incorporate SB 737-78-1079 require specific EEC engine software to be installed. Make sure that each engine has EEC software 7.B.R3 installed as a minimum. Refer to SB 737-78-1079 or the task, EEC Software Load, TASK 73-21-60-470-801-F00 for other concurrent requirements.

NOTE: A Technology Insertion (TI) Engine has a ''/3'' after the thrust rating on the engine data plate. An example of a Single Annular Combustor (SAC) Engine with TI is CFM56-7B22/3. An example of a SAC Engine without TI is CFM56-7B22. The ''XX'' in CFM 56-7BXX/3 is the thrust rating of the engine.

(a) Make sure the thrust reverser to be installed is compatible with the installed engine and airplane.

NOTE: Refer to SB 737-78-1079 for a list of all concurrent requirements.

SUBTASK 78-31-01-480-005-F00

WARNING: THE TOOL WEIGHS APPROXIMATELY 225 POUNDS (102 KG), MAKE SURE THAT THE TOOL IS CORRECTLY ATTACHED TO THE OVERHEAD CRANE. IF YOU DO NOT OBEY THIS INSTRUCTION, THE TOOL CAN FALL AND INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT USE THE HOIST POINTS ON THE THRUST REVERSER TRANSLATING SLEEVE TO HOIST THE THRUST REVERSER. THIS WILL PREVENT DAMAGE TO THE TRANSLATING SLEEVE.

(2) Do these steps to prepare for the installation of the thrust reverser [1] (Figure 403), (Figure 404), (Figure 406):

(a) If the left thrust reverser is to be installed, make sure that the latches are taped in the closed position.

NOTE: This will prevent damage to the latches.

(b) If the tool is not installed, do the steps in the removal task to install the thrust reverser sling equipment, SPL-2429 on the thrust reverser (Figure 403), (Figure 404).

(c) Make sure that the thread protectors are installed on the two hinge bolts [65] (Figure 406).

NOTE: The thread protectors are part of the GSE equipment and are in the storage box with the GSE thrust reverser sling equipment, SPL-2429.

(d) Apply grease, D00015, to the shank of the forward and aft hinge bolts [65].

NOTE: Do not get lubricant on the threads of the bolt.

(e) Apply grease, D00015 to the forward and aft lockpins [61].

(f) If the inboard thrust reverser is to be installed, put a protective mat, STD-585 on the leading edge of the wing to prevent damage to the surface.

NOTE: When the tool and the thrust reverser are put into position, the chain on the the chain hoist will hit the leading edge of the wing.

H. Install the Thrust Reverser

SUBTASK 78-31-01-420-001-F00

WARNING: THE THRUST REVERSER WEIGHS APPROXIMATELY 554 POUNDS (253 KG), MAKE SURE THAT THE WEIGHT OF THE THRUST REVERSER IS HELD BY THE TOOL. IF YOU DO NOT OBEY THIS INSTRUCTION, THE THRUST REVERSER CAN FALL AND INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: MAKE SURE THAT YOU MONITOR THE POSITION OF THE THRUST REVERSER WHEN YOU MOVE THE THRUST REVERSER TOWARD THE STRUT AND ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, THE THRUST REVERSER CAN HIT THE ADJACENT STRUCTURES AND DAMAGE CAN OCCUR.

CAUTION: MAKE SURE THAT THE V-BLADE ON THE THRUST REVERSER ALIGNS WITH AND FULLY ENGAGES THE V-GROOVE ON THE FAN CASE WHEN YOU INSTALL THE THRUST REVERSER. IF THE V-BLADE AND V-GROOVE ARE NOT ALIGNED AND FULLY ENGAGED, DAMAGE TO THE THRUST REVERSER CAN OCCUR.

(1) Do these steps to install the thrust reverser [1] (Figure 406):

(a) Lower the thrust reverser [1] until it is near the strut hinge attach fittings.

(b) Put the thrust reverser [1] at the approximate eight degree open position.

NOTE: At the approximate eight degree open position, it will be easier to install the fasteners.

(c) Make sure that the v-blade on the thrust reverser and the v-groove on the fan case are aligned.

(d) Align the attachment holes on the hinge beam and the strut hinge attach fittings.

(e) Install the forward hinge bolt [65] from the forward side.

(f) Install the aft hinge bolt [65] from the aft side.

(g) Align the forward and aft tie rods on the strut with the attachment holes on the hinge beam.

1) Install the forward lockpin [61] from the aft side.

2) Install the aft lockpin [61] from the forward side.

3) Make sure that the ball locks are engaged.

NOTE: When the ball locks are correctly engaged, the lockpin will not pull out of the fitting.

4) Install the retention pins.

(h) Do these steps to install the shims [64] or washers [64A], washers [63] and nuts [62] on the forward and the aft hinge bolts [65].

1) Remove the thread protector.

2) Make sure that the head of the bolt [65] is against the hinge fitting.

3) Install the shims [64] or washers [64A] that were removed during the removal task.

4) Install the washer [63].

5) Hold the washer [63] tightly against the shoulder of the bolt [65].

6) Measure the distance between the shim [64] or washer [64A] and the washer [63].

7) If no shims [64] or washers [64A] are installed, measure the distance between the bushing in hinge beam fitting and the washer [63].

8) Add or remove shims [64] or washers [64A] to get the gap dimension between 0.010-0.040 inch (0.25-1.10 mm).

NOTE: You can peel the shim [64] to get the correct dimension. Do not use more than two shims.

NOTE: The washer [64A] has a nominal thickness of 0.040 inch (1.02 mm). Do not use more than four washers [64A].

9) Install the nut [62].

a) Tighten the nut to 260-425 pound-inches (29.4-48.1 Newton meters).

(i) Make sure that the distance between the shim [64] or washer [64A] and the washer [63] is between 0.010-0.040 inch.

SUBTASK 78-31-01-410-001-F00

(2) Do these steps to connect the electrical ground strap to the hinge beam (Figure 406):

(a) Remove the nut [66] and washer [67] from the ground stud on the hinge beam.

(b) Install the electrical bonding strap on the ground stud.

(c) Install the washer [67] and nut [66].

1) Use a wrench to hold the head of the ground stud fastener so that it will not turn when you tighten the nut.

2) Tighten the nut to 28-35 pound-inches (3.1-3.9 Newton meters).

3) Use a bonding meter, COM-1550, to do a check of the electrical resistance between the terminal of the bonding strap and the hinge beam structure.

a) Make sure that the resistance is no more than 0.001 ohm.

SUBTASK 78-31-01-410-002-F00

(3) If the opening actuator is disconnected from only the torque box, do these steps to re-connect the opening actuator:

(a) Apply grease, D00015 to the shank of the bolt [41].

NOTE: Do not get grease on the threads of the bolts.

(b) Remove the tie strap that attached the opening actuator to the fan case.

(c) Lift the thrust reverser with the sling to align the rod end of the opening actuator with the attach fitting on the torque box.

(d) Install the bolt [41], bushing [43], washers [42] and [44], and nut [45].

1) Tighten the nut to 160-240 pound-inches (16-27 Newton meters).

SUBTASK 78-31-01-420-002-F00

(4) If the opening actuator was removed, do these steps to install the opening actuator:

(a) Apply grease, D00015 to the shank of the bolts [41] and [46].

NOTE: Do not get grease on the threads of the bolts.

(b) Align the opening actuator with the attach fitting on the fan case.

1) Install the bolt [46], washer [47], alignment washer [49], bushing [48], washers [50] and nut [51].

a) Make sure the alignment washer [49] is installed with the teflon surface against the actuator spherical bearing.

b) Tighten the nut [51] to 370-690 pound-inches (41.8-77.9 Newton meters).

(c) Align the actuator rod end with the attach fitting on the thrust reverser torque box.

1) Install the bolt [41], washers [42] and [44], bushing [43] and nut [45].

a) Tighten the nut [45] to 160-240 pound-inches (18-27 Newton Meters).

SUBTASK 78-31-01-080-001-F00

(5) Do these steps to remove the GSE attach fittings and thrust reverser sling equipment, SPL-2429 (Figure 403):

(a) To remove the sling from the thrust reverser, do these steps:

1) Lower the tool so that the thrust reverser is in the closed position.

2) Remove the lockpins [3] that attach the forward [4] and aft [2] GSE hinge fitting assemblies to the sling.

3) Remove the lockpins [10] that attach the sling to the GSE latch beam fittings [7].

4) Remove the sling from the area.

(b) To remove the GSE attach fittings from the thrust reverser, do these steps:

1) Remove the lockpins [5] that attach the forward [4] and aft [2] GSE hinge fitting assemblies to the hinge beam.

2) To remove the GSE latch beam fittings [7], remove the two bolts [11] and washers [12] from each latch beam fitting [7].

3) Re-install a screw [6] in each of the four GSE attachment points marked on the latch beam fairing.

a) Tighten the screws to 30-35 pound-inches (3.4-4.0 Newton meters).

4) Install bolts [11] and washers [12] in the storage holes on the GSE latch beam fitting [7].

SUBTASK 78-31-01-080-002-F00

WARNING: BE CAREFUL WHEN YOU DISCONNECT THE SLING ASSEMBLY. THE SLING ASSEMBLY WEIGHTS 225 POUNDS (102 KG). INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(6) Do these steps to disassemble the sling (Figure 403):

(a) To remove the two spud assemblies [8], remove a lockpin [9] from each spud assembly [8].

(b) Set the sling assembly on the ground.

(c) To remove the C-beam, remove the collar and lockpin (Figure 403) (View A).

1) Put the collar on the C-beam with the lockpin for storage.

(d) Remove the chain hoist from the lift plate and the lower attach fitting on the sling.

(e) Remove the lift plate.

(f) Remove the dynamometer.

(g) Remove the master link from the overhead crane.

(h) Put the sling, C-beam, thread protectors, spud assemblies, forward and aft hinge fitting assemblies, and GSE latch beam assemblies in the tool storage box.

SUBTASK 78-31-01-080-003-F00

WARNING: BE CAREFUL WHEN YOU DISCONNECT THE SLING ASSEMBLY. THE SLING ASSEMBLY WEIGHTS 225 POUNDS (102 KG). INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(7) Do these steps to disassemble the sling (Figure 404):

(a) To remove the two spud assemblies [8], remove a lockpin [9] from each spud assembly [8].

(b) Lower the sling assembly close to the ground.

(c) Remove the two lockpins that attach the adapter assembly to the lower attach fitting on the sling (View AA).

(d) Put the sling, thread protectors, spud assemblies, forward and aft hinge fitting assemblies, and GSE latch beam assemblies in the tool storage box.

SUBTASK 78-31-01-410-003-F00

WARNING: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND FITTINGS CAN OCCUR.

CAUTION: MAKE SURE THAT YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE FROM THE HYDRAULIC LINES. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Do these steps to connect the thrust reverser hydraulic lines (Figure 402):

(a) If hydraulic fitting plugs were installed on the flexhoses, use a hydraulic resistant container to catch the residual hydraulic fluid that is in the flexhoses.

1) Remove the hydraulic fitting plugs.

(b) If cotton wiper, G00034 is around the flexhoses, remove the cloth.

(c) Connect the extend line flexhose to the upper locking actuator.

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.8 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.8 Newton meters).

(d) Connect the retract line flexhose to the upper locking actuator.

1) Tighten the coupling nut to 257-284 pound-inches (29.0-32.0 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 257-284 pound-inches (29.0-32.0 Newton meters).

SUBTASK 78-31-01-410-004-F00

(9) Do these steps to connect the electrical connectors to the strut receptacles (Figure 402):

(a) For the left thrust reverser, connect the electrical connectors, D30002 and D30008, to the strut receptacles.

(b) For the right thrust reverser, connect the electrical connectors, D30006 and D30010, to the strut receptacles.

I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-01-860-018-F00

(1) If a new replacement thrust reverser is installed or a thrust reverser from another engine is installed, look at the part number of the cascade segments to make sure they are installed in the correct position for the left or right engine.

NOTE: The left and right thrust reversers are interchangeable between the left and right engine.

(a) If it is necessary, change the cascade segments to the correct position for the left or right engine location.

1) Do this task: Cascade Removal, TASK 78-31-05-000-801-F00.

2) Do this task: Cascade Installation, TASK 78-31-05-400-801-F00.

(b) Make a record on the thrust reverser data plate to show the thrust reverser part number has changed and include the calendar date, mm/dd/yy.

NOTE: If the cascade segments were changed for the engine location, the thrust reverser has changed configuration. Use the illustrated parts catalog to find the applicable part number for the thrust reverser or contact Boeing.

SUBTASK 78-31-01-860-010-F00

(2) If the inboard thrust reverser was installed, remove the protective mat, STD-585 from the leading edge of the wing.

SUBTASK 78-31-01-410-005-F00

(3) Install the inboard forward hinge fairings.

Number	Name/Location
416AR	Right Forward Thrust Reverser Hinge Fairing, Engine 1
425AL	Left Forward Thrust Reverser Hinge Fairing, Engine 2

(a) Apply grease, D00015 to the bolts before you install the bolts (Figure 401).

(b) Install the 12 bolts in the forward 12 holes and tighten between 45 in-lb (5 N·m) to 55 in-lb (6 N·m).

NOTE: The six aft holes in the inboard forward hinge fairing are common with the hinge bump fairing.

SUBTASK 78-31-01-410-016-F00

(4) Install the outboard forward hinge fairings.

Number	Name/Location
415AL	Left Forward Thrust Reverser Hinge Fairing, Engine 1
426AR	Right Forward Thrust Reverser Hinge Fairing, Engine 2

(a) Apply grease, D00015 to the bolts before you install the bolts (Figure 401).

(b) Install the 18 bolts in the outboard forward hinge fairing holes and tighten between 45 in-lb (5 N·m) to 55 in-lb (6 N·m).

SUBTASK 78-31-01-410-017-F00

(5) Install the inboard aft hinge fairings.

Number	Name/Location
416BR	Right Aft Thrust Reverser Hinge Fairing, Engine 1
425BL	Left Aft Thrust Reverser Hinge Fairing, Engine 2

(a) Apply grease, D00015 to the bolts before you install the bolts (Figure 401).

(b) Install the seven bolts in the inboard aft hinge fairing holes and tighten between 45 in-lb (5 N·m) to 55 in-lb (6 N·m).

NOTE: The one forward hole in the inboard aft hinge fairing is common with the hinge bump fairing.

SUBTASK 78-31-01-410-018-F00

(6) Install the outboard aft hinge fairings.

Number	Name/Location
415BL	Left Aft Thrust Reverser Hinge Fairing, Engine 1
426BR	Right Aft Thrust Reverser Hinge Fairing, Engine 2

(a) Apply grease, D00015 to the bolts before you install the bolts (Figure 401).

(b) Install the eight bolts in the fairing holes and tighten between 45 in-lb (5 N·m) to 55 in-lb (6 N·m).

SUBTASK 78-31-01-430-006-F00

(7) If the inboard thrust reverser was installed, install the hinge bump fairing:

(a) Install the bump fairings over the forward and aft hinge fairings.

Number	Name/Location
416CR	Right Bump Fairing For Thrust Reverser Hinge Fairing, Engine 1
425CL	Left Bump Fairing For Thrust Reverser Hinge Fairing, Engine 2

1) Apply grease, D00015 to the bolts before you install the bolts.

2) Install the five short bolts in the forward five holes and tighten between 45 in-lb (5 N·m) to 55 in-lb (6 N·m).

NOTE: The six forward holes in the hinge bump fairing are common with the inboard forward hinge fairing. The one aft hole in the hinge bump fairing is common with the inboard aft hinge fairing.

3) Install the two short bolts in the aft two holes and tighten between 45 in-lb (5 N·m) to 55 in-lb (6 N·m).

4) Install the two long bolts in the middle two holes and tighten between 45 in-lb (5 N·m) to 55 in-lb (6 N·m).

NOTE: The two middle holes in the hinge bump fairing are common with the inboard forward hinge fairing.

SUBTASK 78-31-01-430-007-F00

(8) If the inboard thrust reverser was installed, make sure that the Krueger flap deflector and the Krueger flap fairing are installed.

NOTE: The Krueger flap deflector and Krueger flap fairing are installed only on the inboard translating sleeve.

(a) Do this task: Krueger Flap Deflector and Fairing Installation, TASK 78-31-09-420-801-F00.

SUBTASK 78-31-01-410-006-F00

(9) If the outboard thrust reverser was installed, make sure that the plugs are install in the mounting holes for the Krueger flap deflector and fairing.

(a) Do this task: Krueger Flap Deflector Plugs Installation, TASK 78-31-09-400-801-F00.

NOTE: On the outboard translating sleeve, plugs are installed in the mounting holes for the Krueger flap deflector and fairing. The Krueger flap deflector and fairing is not installed on the outboard translating sleeve. It is possible to install the Krueger flap deflector and fairing on the left or right translating sleeve.

SUBTASK 78-31-01-820-001-F00

(10) If you did not install the same thrust reverser that was removed, do this task: Thrust Reverser Adjustment, TASK 78-31-01-820-801-F00.

SUBTASK 78-31-01-820-023-F00

(11) If you install the same thrust reverser that was removed, do these steps to engage the latches on the thrust reverser:

(a) Use the latching tool, SPL-2434, in latch 2 to pull the thrust reversers together.

(b) As you pull the thrust reversers together with the latching lever in latch 2, engage forward latch 1.

(c) Engage the latches in sequence from latch 2 to the aft latch 6.

NOTE: Use the latching lever as it is necessary to engage the hooks on the keeper pins.

SUBTASK 78-31-01-410-007-F00

(12) Do this task: Install the Fan Cowl Panel (Selection), TASK 71-11-02-400-801-F00.

(a) If you did not install the same thrust reverser that was removed, do this task: Fan Cowl Panel Latch Adjustment, TASK 71-11-03-700-801-F00.

SUBTASK 78-31-01-860-007-F00

(13) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize system A.

(b) For Engine 2, pressurize system B.

SUBTASK 78-31-01-860-008-F00

(14) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-01-860-009-F00

(15) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-01-440-001-F00

(16) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-01-820-002-F00

(17) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Move the thrust reverser through the deploy and stow cycles until the sleeves move smoothly.

1) If a new replacement thrust reverser is installed or a thrust reverser from another engine is installed, adjustment of the latch beam wear plate spacers will make sure the sleeves move smoothly (TASK 78-31-01-820-801-F00).

a) Move the thrust reverser through the deploy and stow cycles a minimum of 4 times to make sure that the sleeves move smoothly.

(b) Do a check for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-31-01-710-001-F00

(18) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

NOTE: This check will make sure that the electrical connections for the LVDT's are correct.

(a) Make sure that no LVDT maintenance messages show.

1) If a maintenance message shows, do the applicable fault isolation task in the Fault Isolation Manual for that maintenance message.

2) If no maintenance messages show, the electrical connections for the LVDT are correct.

SUBTASK 78-31-01-440-002-F00

(19) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

END OF TASK

THRUST REVERSER - ADJUSTMENT/TEST

1. General

A. This procedure has one task:

(1) The adjustment of the thrust reverser.

TASK 78-31-01-820-801-F00

2. Thrust Reverser Adjustment

(Figure 501), (Figure 502)

A. General

(1) This task is for the adjustment of a replacement thrust reverser if the thrust reverser that was removed is not re-installed.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-11-820-801-F00	Latch Adjustment (P/B 501)
78-31-12-000-801-F00	Fireseal Removal (P/B 401)
78-31-12-400-801-F00	Fireseal Installation (P/B 401)
78-31-24-000-801-F00	Aero Blocker Door Seal Removal (P/B 401)
78-31-24-400-801-F00	Aero Blocker Door Seal Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
G02020	Clay, Modeling	
G02380	Developer - Inspection - Met-L-Chek D-70	
G02415	Agent - Parting, Paste Wax (Johnson's Paste Wax)	
G50146	Developer - Non-acqueous - Dubl-Check D-100	SAE AMS2644

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Thrust Reverser Adjustment

SUBTASK 78-31-01-010-009-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: OBEY THE INSTRUCTIONS TO LOCK THE OPENING ACTUATOR, INSTALL THE ACTUATOR SAFETY LOCK AND CLOSE THE RETURN VALVE ON THE HAND PUMP EACH TIME THAT YOU OPEN THE THRUST REVERSER. THE THRUST REVERSER WILL BE OPENED AND CLOSED SEVERAL TIMES TO DO THE ADJUSTMENT. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-01-820-003-F00

CAUTION: MAKE SURE THAT THERE IS ONLY ONE SPACER UNDER EACH RECEIVER CUP. IF THERE IS MORE THAN ONE SPACER UNDER THE RECEIVER CUPS, AN INCORRECT CLAY CHECK AND DAMAGE TO THE THRUST REVERSER CAN OCCUR.

(2) Do a check of the receiver cups [2] on the upper edge of the inner wall on the left and right thrust reverser:

NOTE: There are three receiver cups on the left thrust reverser and three on the right thrust reverser.

NOTE: Airplanes can have spacers that are 0.8750 inch (22.23 mm) diameter or 2.000 inches (50.8 mm) in diameter.

(a) Make sure that there is no more than one spacer [3] under each receiver cup [2].

HAP ALL; AIRPLANES WITH 0.8750 INCH (22.23 MM) DIAMETER SPACERS

1) If there is more than one spacer [3] under the receiver cup [2], do these steps:

a) Remove the receiver cup [2] and spacers [3].

b) Record the amount of the spacers [3] that are removed and their location for the subsequent installation.

c) Re-install the receiver cup with one spacer.

d) Make sure that the outside diameter of the receiver cup is aligned with the outside diameter of the spacer ±0.010 inch (0.254 mm).

e) Tighten the receiver cup to 95-110 pound-inches (10.7-12.4 Newton meters).

HAP ALL; AIRPLANES WITH 2.000 INCH (50.8 MM) DIAMETER SPACERS

2) If there is more than one spacer [3] under the receiver cup [2], do these steps:

a) Remove the receiver cup [2] and all but one spacer [3].

NOTE: The spacer against the receiver cup fitting will stay in its position, because there is sealant on the surface of the spacer that is adjacent to the receiver cup fitting.

b) Record the amount of the spacers [3] that are removed and their location for the subsequent installation.

c) Make sure that the spacer against the receiver cup fitting is in its position.

d) Re-install the receiver cup [2].

e) Tighten the receiver cup [2] to 95-110 pound-inches (10.7-12.4 Newton meters).

HAP ALL

SUBTASK 78-31-01-820-004-F00

(3) Remove the screw [10], wear plate [11] and spacers [12] from each of the three compression pads on the left thrust reverser.

NOTE: The compression pads are on the lower edge of the inner wall of the thrust reverser.

(a) Keep the screw [10], wear plate [11] and spacers [12] together and record the location from where they were removed for the subsequent installation.

SUBTASK 78-31-01-820-005-F00

(4) Remove the two bolts [7], wear plate [8] and spacers [9] from the wear pad on the lower edge of the aft cowl on the left thrust reverser.

(a) Keep the bolts [7], wear plate [8] and spacers [9] together for the subsequent installation.

F. Prepare for the V-blade to V-groove Clearance and Latch Beam Wear Plate Adjustment

SUBTASK 78-31-01-820-006-F00

(1) Put a piece of clay, G02020, 0.15 inch (3.81 mm) thick into the outer V-groove on the fan frame at the 1:00, 2:00, 4:00, 5:00, 7:00, 8:00, 10:00 and 11:00 o'clock positions.

NOTE: These positions are the same as the engine fan strut locations.

(a) Apply paste wax parting agent, G02415, on the outer V-blade areas on the thrust reverser where the clay will touch.

SUBTASK 78-31-01-820-007-F00

(2) Put a piece of clay, G02020, not less than 0.25 inch (6.4 mm) thick into the inner V-groove on the engine extension ring at the 1:00, 2:00, 4:00, 5:00, 7:00, 8:00, 10:00 and 11:00 o'clock positions.

NOTE: These positions are the same as the engine fan strut locations.

(a) Apply paste wax parting agent, G02415, on the inner V-blade areas on the thrust reverser where the clay will touch.

SUBTASK 78-31-01-010-013-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURES TO OPEN AND CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) In the steps that follow, obey all of the WARNINGS and CAUTIONS in the referenced procedures:

(a) Close and latch the thrust reverser; but, do not do the thrust reverser or leading edge activation at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

1) Make sure that the tension latches have a closing force of 40-60 pounds (178-267 Newton).

a) If the closing force is not in the limits, do this task: Latch Adjustment, TASK 78-31-11-820-801-F00.

(b) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

G. V-blade to V-groove Clearance and Latch Beam Wear Plate Clearance - Adjustment

SUBTASK 78-31-01-820-008-F00

(1) Do these steps to adjust the clearance between the V-blades and V-grooves:

(a) For the inner V-groove, use a caliper to measure the compressed thickness of the clay at the eight locations.

1) Make sure that you record the thickness of the compressed clay and the location from where it was taken.

2) At each radial location, the limit for the inner V-groove to V-blade clearance is 0.090-0.200 inch (2.29-5.08 mm).

(b) For the outer V-groove, use a caliper to measure the compressed thickness of the clay at the eight locations.

1) Make sure that you record the thickness of the compressed clay and the location from where it was taken.

2) For each thrust reverser, calculate the average of the four clay thickness measurements.

3) The limit for the outer V-groove to V-blade average clearance is 0.000-0.020 inch (0.000-0.508 mm).

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(c) Remove the clay from the inner and outer V-groove and clean off the clay residue with solvent, B00062.

(d) If the clearance between the V-grooves and V-blades are in the limits, continue at the steps below to prepare for the compression rod, compression pad and aft cowl wear pad adjustment.

(e) If the clearance between the V-grooves and V-blades are not in the limits, do these steps:

1) Adjust the wear plate spacers [6] at the eight latch beam wear plate locations.

a) Remove the screws [4] that attach the wear plate [5] and spacers [6] to the latch beam.

b) Peel the spacer [6] to decrease the clearance or replace the spacer [6] to increase the clearance.

<1> Maximum spacer [6] thickness between all eight pads is .036".

<2> Maximum spacer [6] thickness between any two pads common to the same set of latches is .018".

<3> Shim the latch beam in one continuous curve and not into a wavy form.

NOTE: A continuous curve will make sure that the sleeves operate smoothly.

c) Re-install the wear plate [5], spacers [6] and screws [4].

2) Do the clay check again and adjust the spacers [6] until the V-groove to V-blade clearance is correct.

a) After the V-groove to V-blade clearance is correct, make sure that when the thrust reverser is closed and latched that the wear plate [5] shim gap is 0.00 inch (0.00 mm).

H. Prepare for the Compression Rod, Compression Pad and Aft Cowl Wear Pad Adjustment

SUBTASK 78-31-01-820-009-F00

(1) Put a piece of clay, G02020, 0.40 inch (12.7 mm) thick in the three compression rod receiver cups [2] on the left thrust reverser.

NOTE: The three compression receiver cups are on the upper edge of the thrust reverser.

(a) Apply paste wax parting agent, G02415, on the end of the compression rod that will touch the clay.

SUBTASK 78-31-01-820-010-F00

(2) At the three compression pads on the right thrust reverser, put a piece of clay, G02020, 0.30 inch (7.62 mm) thick on the wear plates [10].

NOTE: The three compression pads are on the lower edge of the thrust reverser.

(a) Apply paste wax parting agent, G02415, on the compression pads on the left thrust reverser that will touch the clay.

SUBTASK 78-31-01-820-011-F00

(3) At the aft cowl on the right thrust reverser, put a piece of clay, G02020, 0.10 inch (2.54 mm) thick on the wear plate [8].

NOTE: The aft cowl wear plate is on the lower edge at the aft end of the thrust reverser.

(a) Apply paste wax parting agent, G02415, on the aft cowl on the left thrust reverser that will touch the clay.

SUBTASK 78-31-01-010-014-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURES TO OPEN AND CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) In the steps that follow, obey all of the WARNINGS and CAUTIONS in the referenced procedures:

(a) Close and latch the thrust reverser; but, do not do the thrust reverser or leading edge activation at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

(b) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

I. Compression Rod - Adjustment

SUBTASK 78-31-01-820-012-F00

(1) Do these steps to adjust the compression rod to receiver cup [2] clearance:

(a) Use a caliper to measure the compressed thickness of the clay at the three receiver cups [2].

1) Make sure that you record the thickness of the compressed clay and the location from where it was taken.

2) The limits for the compression rod to receiver cup clearance are as follows:

a) For compression rod 1 (forward), the limit is between 0.010-0.040 inch (0.254-1.016 mm).

b) For compression rod 2 (middle) and 3 (aft), the limit is between 0.020-0.050 inch (0.508-1.270 mm).

(b) Remove the clay from the receiver cups.

(c) If the clearance between the compression rods and receiver cups are in the limits, continue at the steps below to do the compression pad adjustment.

(d) If the clearance between the compression rods and receiver cups [2] is not in the limits, do these steps:

1) Remove the receiver cups [2] and spacers [3] from the left and right thrust reversers.

NOTE: If the airplane has 2.000 (50.8 mm) diameter spacers, the spacer against the receiver cup fitting will stay in its position, because there is sealant on the surface of the spacer that is adjacent to the receiver cup fitting.

HAP ALL; AIRPLANES WITH 2.000 INCH (50.8 MM) DIAMETER SPACERS

a) If the spacer does not have sealant, then clean the spacer and receiver cup surfaces that will touch with solvent, B00062 and fay seal with sealant, A00160.

HAP ALL

2) Calculate the amount of spacers [3] that are necessary to adjust the clearance.

NOTE: The thickness of a spacer is 0.016 inch (0.406 mm).

3) Install half of the spacers [3] at the receiver cup [2] on the left thrust reverser and half at the receiver cup [2] on the right thrust reverser.

a) Make sure that there is at least one spacer [3] under each receiver cup [2] but, no more than seven.

HAP ALL; AIRPLANES WITH 0.8750 INCH (22.23 MM) DIAMETER SPACERS

b) Make sure that the outside diameter of the receiver cup is aligned with the outside diameter of the spacer ±0.010 inch (0.254 mm).

HAP ALL; AIRPLANES WITH 2.000 INCH (50.8 MM) DIAMETER SPACERS

c) Make sure that the spacer against the receiver cup fitting has sealant.

HAP ALL

d) Apply Never-Seez NSBT-8N compound, D00006 on the threads of the receiver cup [2].

e) Tighten the receiver cup to 80-95 pound-inches (9-10.7 Newton meters).

J. Compression Pad - Adjustment

SUBTASK 78-31-01-820-013-F00

(1) Do these steps to adjust the compression pad clearance:

(a) Use a caliper to measure the compressed thickness of the clay at the wear plates [11] on the three compression pads.

1) Make sure that you record the thickness of the compressed clay and the location from where it was taken.

2) The limit for the clearance between the wear plates [11] on the compression pads is 0.030 inch -0.000/+0.020 (0.762 mm -0.000/+0.508).

3) Calculate the spacer [12] thickness that is necessary.

Table 501/78-31-01-993-801-F00

Example:

Measured clay thickness	0.300
Minus removed wear plate and spacer thickness	-0.210

(Continued)

Minus the nominal gap		-0.030
Change in spacer thickness	-0.000/+0.020	0.060

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(b) Remove the clay from the wear plates [11] on the compression pads and clean off the clay residue with solvent, B00062.

(c) If the clearance between the wear plates [11] on the compression pads is in the limit, do these steps:

1) Re-install the spacers [12], wearplates [11] and screws [10] that were removed in the previous steps.

a) Apply Never-Seez NSBT-8N compound, D00006 on the threads of the screws [10].

b) Tighten the screws to 25-35 pound-inches (2.83-3.96 Newton meters).

(d) If the clearance between the compression pads is not in the limit, do these steps:

1) Remove or add the change (calculated and recorded above) to the spacers [12] that were removed to get the correct clearance.

2) Install the spacers [12], wearplates [11] and screws [10].

a) Apply Never-Seez NSBT-8N compound, D00006 on the threads of the screws [10].

b) Tighten the screws to 25-35 pound-inches (2.83-3.96 Newton meters).

K. Aft Cowl Wear Pad - Adjustment

SUBTASK 78-31-01-820-014-F00

(1) Do these steps to adjust the clearance between the wear plates [8] at the aft cowl:

(a) Use a caliper to measure the compressed thickness of the clay at the wear plate [8] on the aft cowl.

1) The limit for clearance between the wear plates [8] is 0.000 inch +0.005 (0.000 mm +0.127 mm).

2) Calculate the spacer thickness that is necessary.

Table 502/78-31-01-993-802-F00

Example:		
Measured clay thickness		0.200
Plus		0.010
Minus removed wear plate and spacer thickness		-0.310
Spacer thickness to be removed	+0.005	-0.100

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(b) Remove the clay from the wear plates [8] and clean off the clay residue with solvent, B00062.

(c) If the clearance between the wear plates [8] at the aft cowl is in the limit, do these steps:

1) Clean each side of the spacers [9] that was removed in the previous steps with solvent, B00062.

2) Apply sealant, A00160 to each side of the spacers [9].

3) Re-install the spacers [9], wear plate [8] and bolts [7] that were removed in the previous steps.

a) Tighten the bolts to 10-13 pound-inches (1.13-1.47 Newton meters).

(d) If the clearance between the wear plates [8] at the aft cowl is not in the limits, do these steps:

1) Remove or add spacers [9] to get the correct clearance.

2) Install the spacers [9] and wear plate [8] with the bolts [7].

a) Tighten the bolts to 10-13 pound-inches (1.13-1.47 Newton meters).

SUBTASK 78-31-01-820-015-F00

(2) If adjustments were made to the compression rod, compression pad or aft cowl wear pad, do a clay rig check again.

L. Prepare for the Fireseal and Aero Seal Compression Check

SUBTASK 78-31-01-820-016-F00

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Clean the firesels on the left and right thrust reverser and the areas on the strut, engine and lower edge of the right thrust reverser that the firesels will compress against with solvent, B00062 (Figure 502).

SUBTASK 78-31-01-820-017-F00

(2) Clean the aero seals [1] on the left and right thrust reverser and clean the aft edge of the outer V-groove on the fan case that the aero seal will compress against with solvent, B00062 (Figure 501).

SUBTASK 78-31-01-820-018-F00

(3) Apply Met-L-Chek D-70 developer, G02380 or Dubl-Check D-100 developer, G50146, approximately 2.0 inches (50.8 mm) wide on the areas on the strut, engine and lower edge of the right thrust reverser where the fireseals will touch.

SUBTASK 78-31-01-820-019-F00

(4) Apply Met-L-Chek D-70 developer, G02380, approximately 2.0 inches (50.8 mm) wide on the aft edge of the outer V-groove where the aero seal [1] will touch.

SUBTASK 78-31-01-820-020-F00

(5) Make sure that the developer is dry before the thrust reverser is closed.

NOTE: The developer becomes a white powder with a dull finish when it is dry.

SUBTASK 78-31-01-010-012-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURES TO OPEN AND CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(6) In the steps that follow, obey all of the WARNINGS and CAUTIONS in the referenced procedures:

(a) Close and latch the thrust reverser; but, do not do the thrust reverser or leading edge activation at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

(b) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

M. Fireseal - Adjustment

SUBTASK 78-31-01-820-021-F00

(1) Measure the width of the developer that is on the fireseals.

(a) Make sure that the minimum width of the developer is 0.350 inch (8.89 mm) along the full length of the fireseals.

(b) If the above limit is not met, use the steps below to measure the developer in each section:

1) Divide the fireseal into three sections as follows:

a) The fireseal on the upper edge of a thrust reverser where it compresses against the strut is one section.

b) The fireseal on the forward edge of a thrust reverser where it compresses against the engine is another section.

c) The fireseal on the lower edge of the left thrust reverser where it compresses against the lower edge of the right thrust reverser is another section.

2) For each section, areas where the developer is 0.20-0.35 inch (5.08-8.89 mm) wide is permitted with these condition:

a) The length of each area is not more than 1.50 inches (38.1 mm).

b) The total length of all areas is not more that 3.00 inches (76.2 mm).

3) For each section, areas where the developer is less that 0.20 inch (5.08 mm) wide is permitted with these conditions:

a) The length of each area is not more than 0.25 inch (6.35 mm).

b) The total length of all areas is not more than 1.00 inch (25.4 mm).

4) If the fireseal compression is not in the limits and all of the adjustments above are in the limits, then replace the worn fireseal.

These are the tasks:

- Fireseal Removal, TASK 78-31-12-000-801-F00
- Fireseal Installation, TASK 78-31-12-400-801-F00.

N. Aero Seal - Adjustment

SUBTASK 78-31-01-820-022-F00

(1) Measure the width of the developer that is on the aero seal [1] on the left and right thrust reversers.

(a) Make sure that the minimum width of the developer is 0.35 inch (8.89 mm) for the full length of the aero seal on each thrust reverser.

(b) Areas where the developer is 0.20-0.35 inch (5.08-8.89 mm) wide are permitted with this condition:

1) The total length of all areas on each thrust reverser is not more than 10.0 inches (254.0 mm).

(c) If the aero seal [1] is not in the limits, replace the aero seal.

These are the tasks:

- Aero Blocker Door Seal Removal, TASK 78-31-24-000-801-F00
- Aero Blocker Door Seal Installation, TASK 78-31-24-400-801-F00.

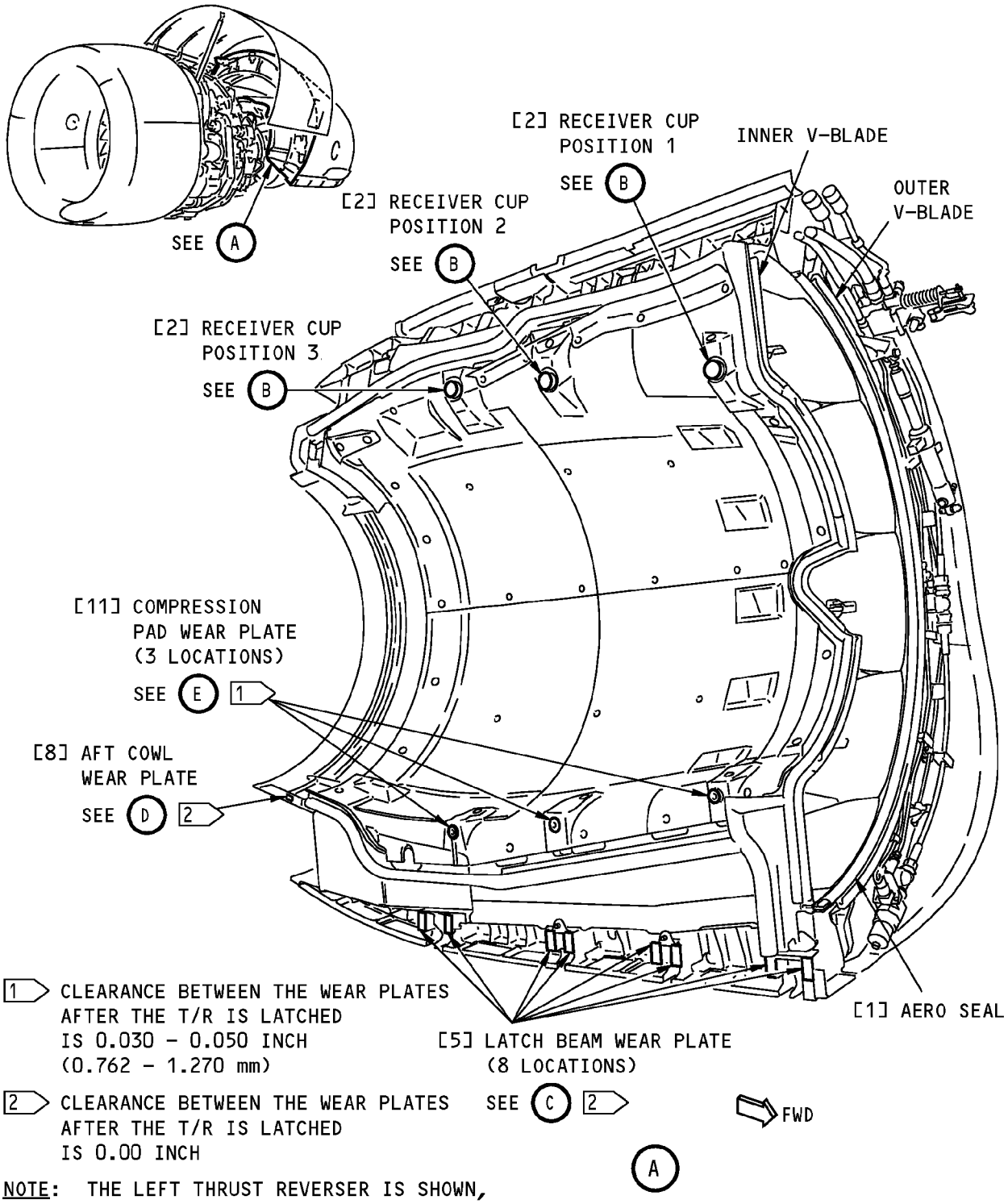
SUBTASK 78-31-01-410-011-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

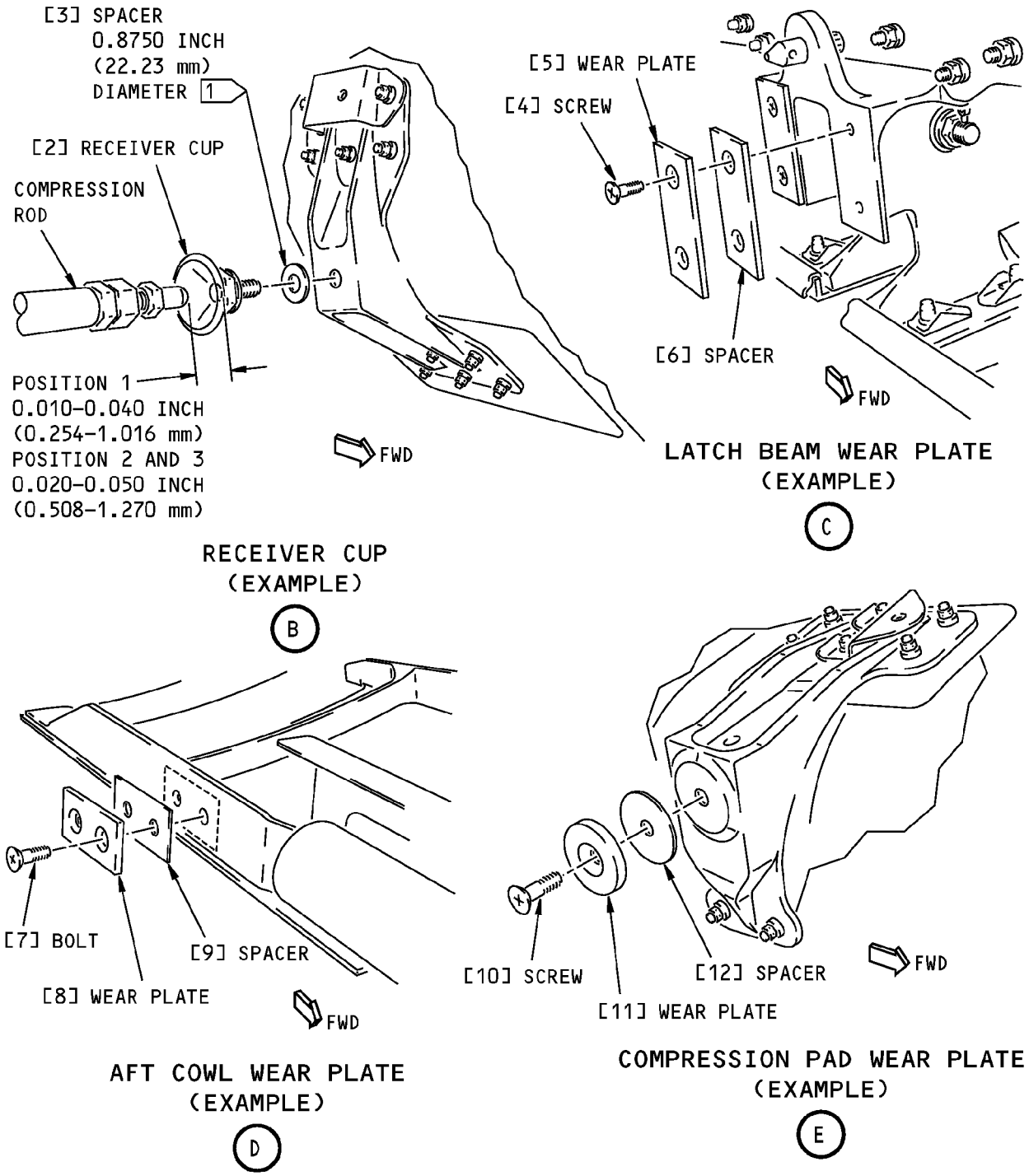
(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

NOTE: It is not necessary to clean off the developer.

——————— END OF TASK ———————

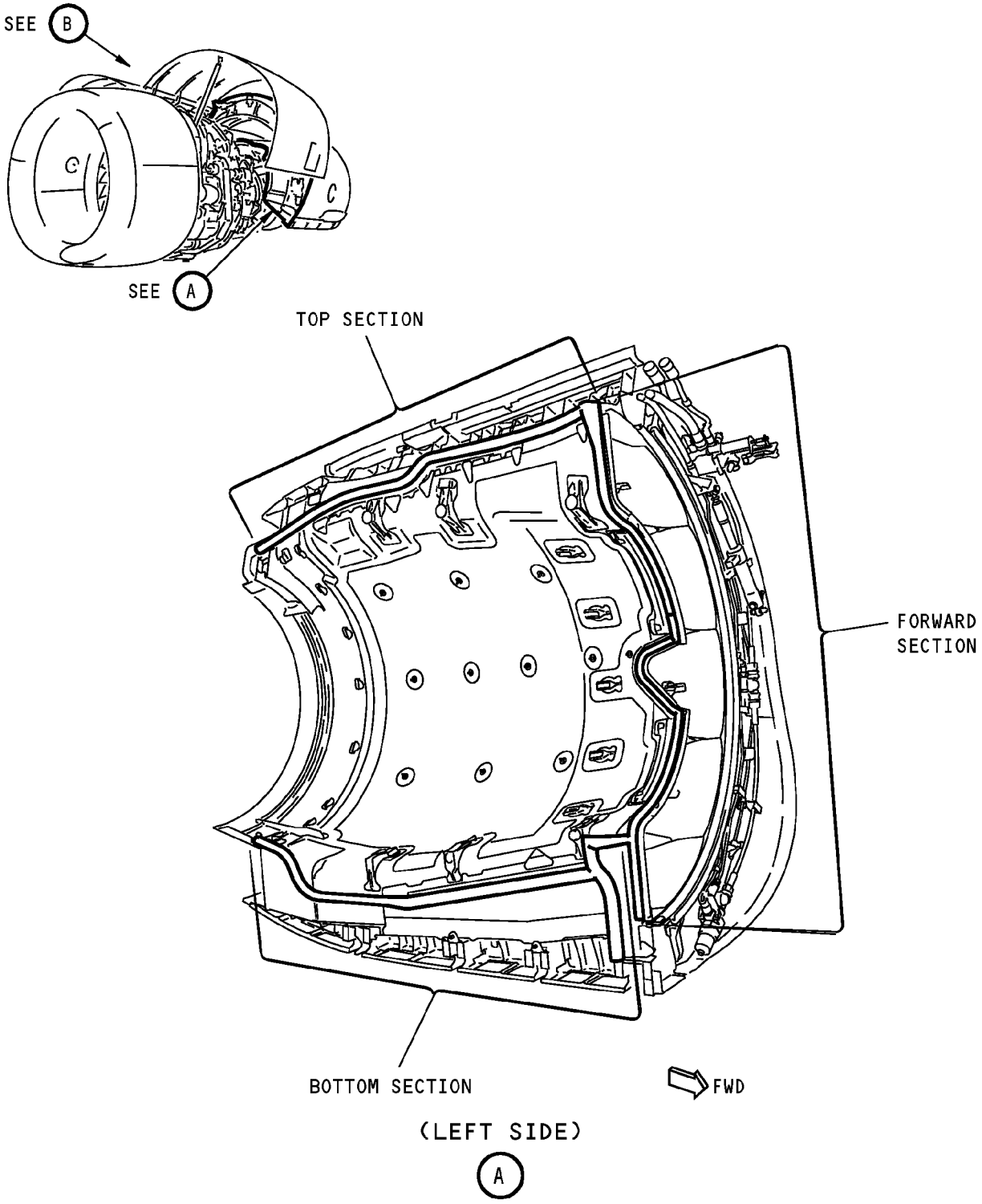


Thrust Reverser Adjustment
Figure 501 (Sheet 1 of 2)/78-31-01-990-807-F00

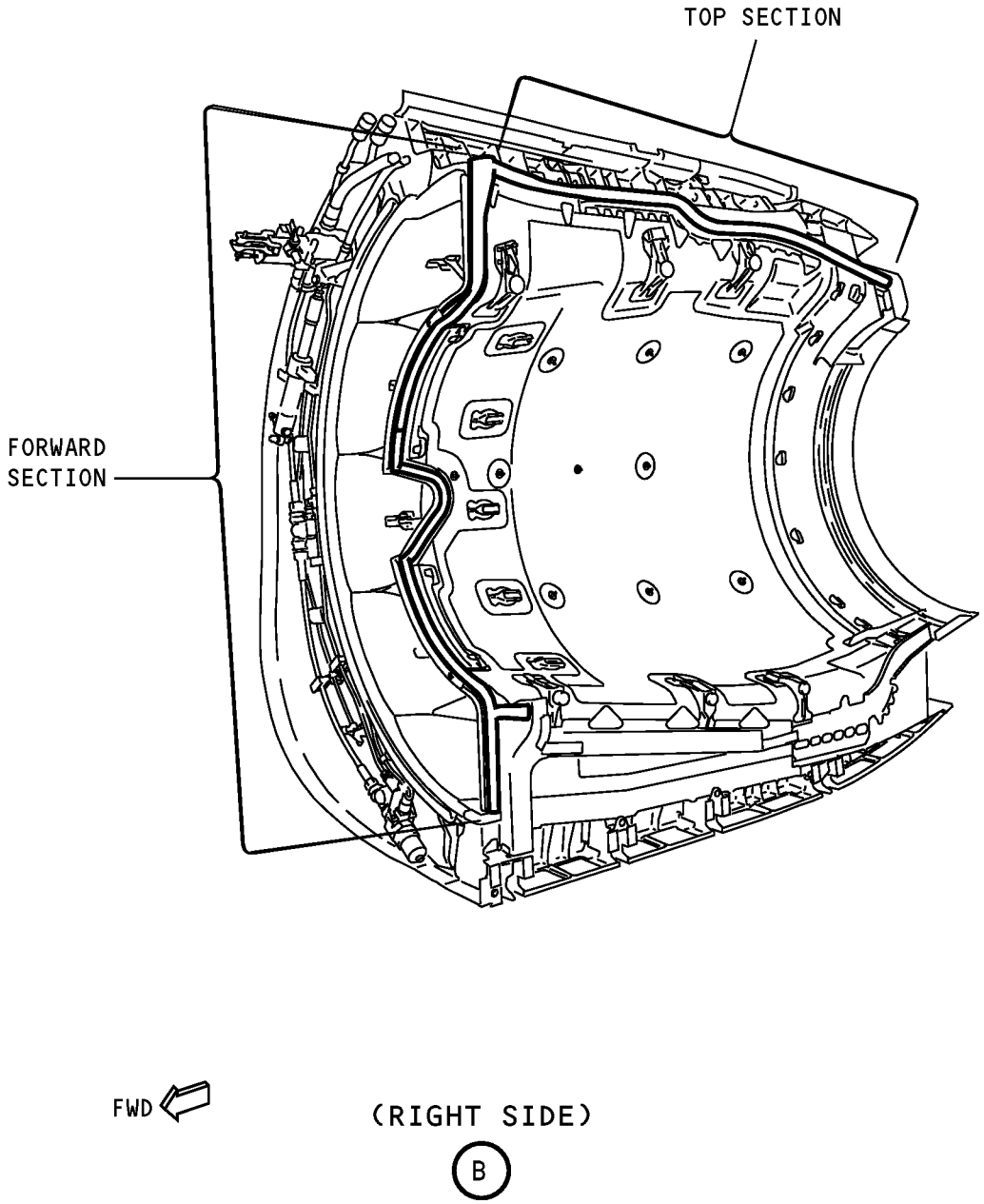


1 > SOME AIRPLANES HAVE 2.000 INCH (50.8 mm) DIAMETER SPACERS

Thrust Reverser Adjustment
Figure 501 (Sheet 2 of 2)/78-31-01-990-807-F00



Fireseal Compression Check
Figure 502 (Sheet 1 of 2)/78-31-01-990-808-F00



Fireseal Compression Check
Figure 502 (Sheet 2 of 2)/78-31-01-990-808-F00

THRUST REVERSER - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks:

(1) A visual inspection of the fan duct walls to make sure that they will provide an aerodynamically smooth surface for the passage of fan air or if there was damage from a RTO duct burst.

(2) An eddy current inspection of the No.2 and No.3 upper compression pad fittings for damage from an overheat condition.

(3) A visual inspection and non-destructive test of the inner walls for damage from an overheat condition.

TASK 78-31-01-200-801-F00

2. Thrust Reverser Fan Duct Wall Inspection

(Figure 601)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This is a task to do a visual inspection check of the fan duct walls for damage.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
SRM 54-30-01	Structural Repair Manual

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Inspection

SUBTASK 78-31-01-010-015-F00

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Thrust Reverser Fan Duct Wall Inspection

SUBTASK 78-31-01-210-001-F00

(1) Look through the forward and aft ends of the fan duct to examine the walls for the damage that follows:

(a) Holes, cracks, nicks, gouges, delamination, dents and edge corrosion.

(b) Pitting in the surface layer (small areas where the surface appears chipped away around the perforation of the acoustic panel) (Figure 602).

NOTE: This pitting can occur during the usual manufacturing process of the acoustic panel. This condition has been inspected and approved for in-service use at the time of manufacture.

1) No action is necessary with the following conditions:

a) The surface area adjacent to each pitting location has the original silver finish and does not show the black panel material.

b) There are no signs of edge erosion.

SUBTASK 78-31-01-210-002-F00

(2) If you find inner wall damage, refer to this procedure for the permitted limits and repair procedures: SRM 54-30-01.

NOTE: Contact Boeing to report the kind of surface damage and areas of severe discoloration found in excess of the permitted limits. Document the damage with digital photographs that can be sent by e-mail, or provide a sketch of the damage that can be e-mailed or faxed.

SUBTASK 78-31-01-280-001-F00

(3) If you find inner wall delamination and disbond damage, do this task: Thrust Reverser Inner Wall Overheat Inspection, TASK 78-31-01-200-803-F00.

SUBTASK 78-31-01-280-002-F00

(4) If you find inner wall damage and the blankets were replaced because of a duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

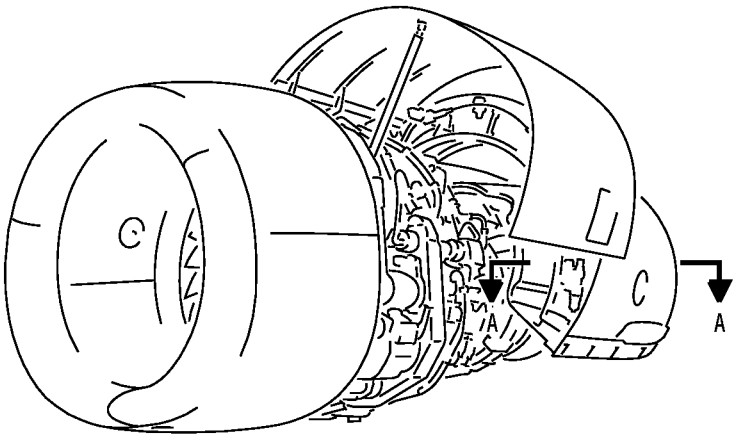
F. Put the Airplane Back to its Usual Condition

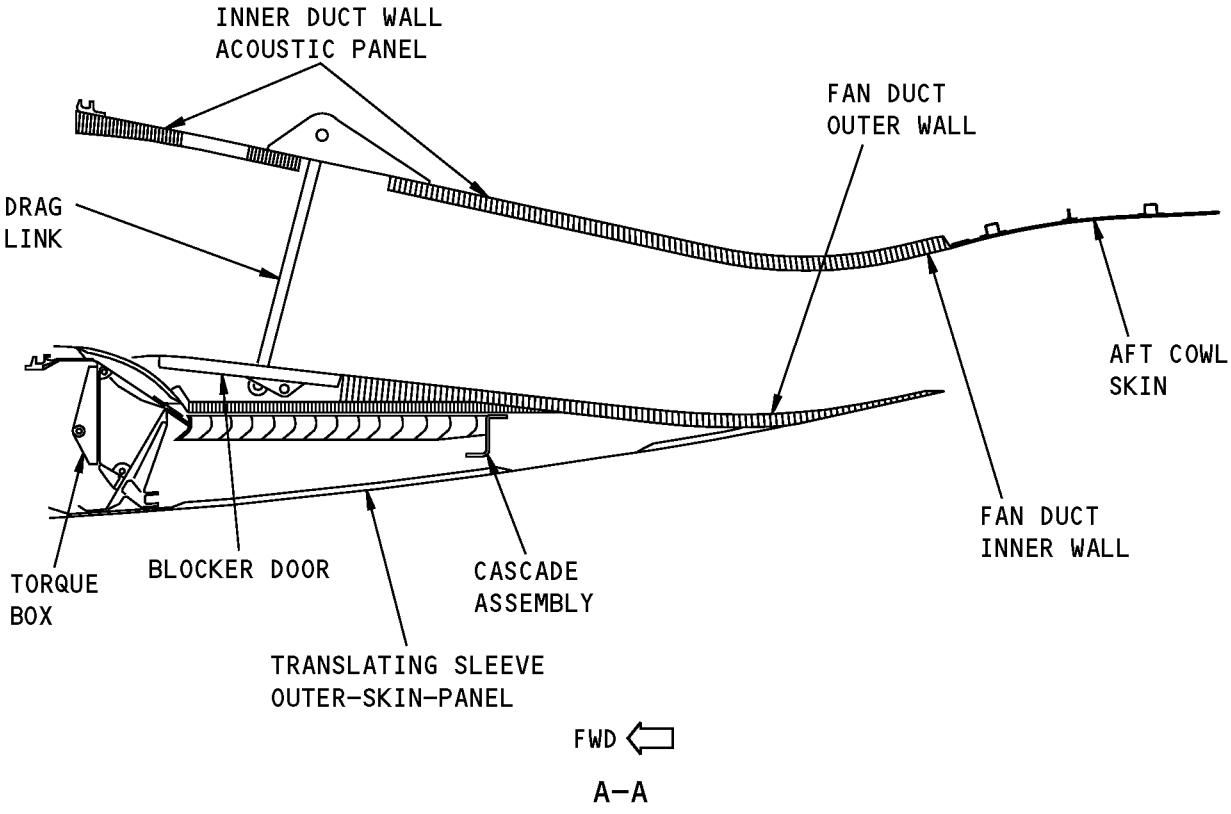
SUBTASK 78-31-01-410-012-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

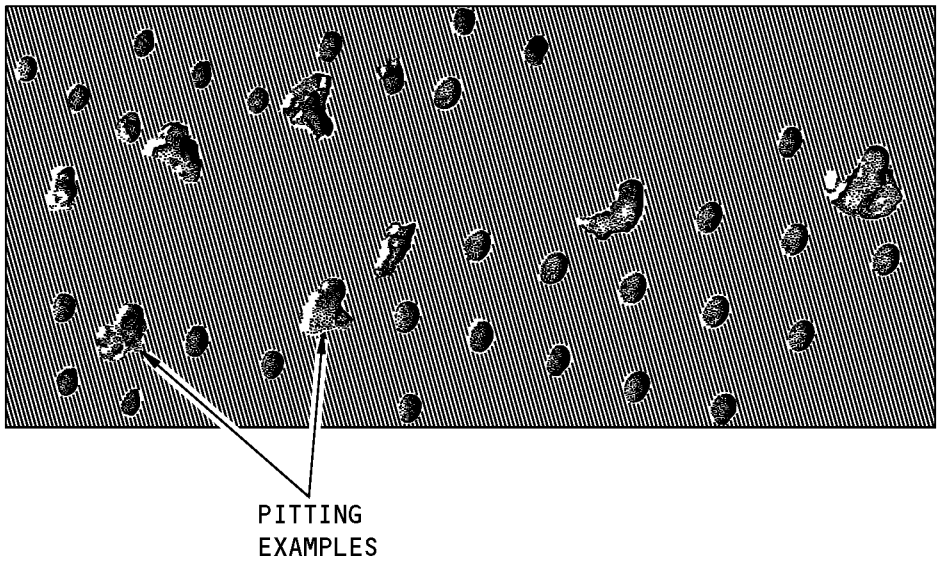
(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——————— END OF TASK ———————





Thrust Reverser Fan Duct Wall Inspection
Figure 601/78-31-01-990-809-F00



Inner Duct Wall Acoustic Panel Inspection
Figure 602/78-31-01-990-811-F00

TASK 78-31-01-200-802-F00

3. Thrust Reverser Upper Inner Wall No.2 and No.3 Compression Pad Overheat Inspection

A. General

(1) This task does a special detailed inspection of the No.2 and No.3 compression pads on the upper bifurcation inner wall for damage from an overheat condition.

(2) This procedure contains the technical intent of SB78-1079 to do an inspection of the No.2 and No.3 compression fittings on the thrust reverser inner wall.

(3) A special detailed inspection is defined as follows:

(a) An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity.

(b) The examination will make extensive use of special inspection techniques and/or equipment.

(c) Intricate cleaning and substantial access or disassembly procedure may be required.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-01-960-802-F00	Thrust Reverser No.2 and No.3 Upper Compression Fitting Replacement (P/B 801)
78-31-13-000-801-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-803-F01	Insulation Blanket Removal (P/B 401)
78-31-13-000-805-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-806-F00	Insulation Blanket Removal (P/B 401)
78-31-13-400-801-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-803-F01	Insulation Blanket Installation (P/B 401)
78-31-13-400-805-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-806-F00	Insulation Blanket Installation (P/B 401)
737 NDT Part 6, 51-00-00, Figure 20	Electrical Conductivity Measurement for Aluminu

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Procedure

SUBTASK 78-31-01-010-017-F00

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-01-030-002-F00

(2) Do this task: Insulation Blanket Removal, TASK 78-31-13-000-801-F00 or Insulation Blanket Removal, TASK 78-31-13-000-803-F01 or Insulation Blanket Removal, TASK 78-31-13-000-805-F00 or Insulation Blanket Removal, TASK 78-31-13-000-806-F00.

E. Procedure

SUBTASK 78-31-01-250-001-F00

(1) Do a special detailed inspection of the upper No.2 and No.3 compression fittings.

NOTE: This inspection is for the aluminum compression fittings. Compression fittings with the part number 315A2118-21 and -22 are made of titanium and are not subject to overheat damage.

(a) Do this procedure: Electrical Conductivity Measurement for Aluminu, 737 NDT Part 6, 51-00-00, Figure 20 Electrical Conductivity Measurement for Aluminu, 737 NDT Part 6, 51-00-00, Figure 20m.

NOTE: The electrical conductivity range for alloy 7075-T73xx is 38.0-42.5% IACS.

1) Measure the conductivity at three measurement locations on each fitting.

2) Use the largest value to determine if the part is satisfactory.

3) If the fitting does not pass the conductivity test, you must replace the fitting.

a) Do this task: Thrust Reverser No.2 and No.3 Upper Compression Fitting Replacement, TASK 78-31-01-960-802-F00.

SUBTASK 78-31-01-210-004-F00

(2) If this inspection was done because of a nacelle duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

F. Put the Airplane Back to the Usual Condition

SUBTASK 78-31-01-430-002-F00

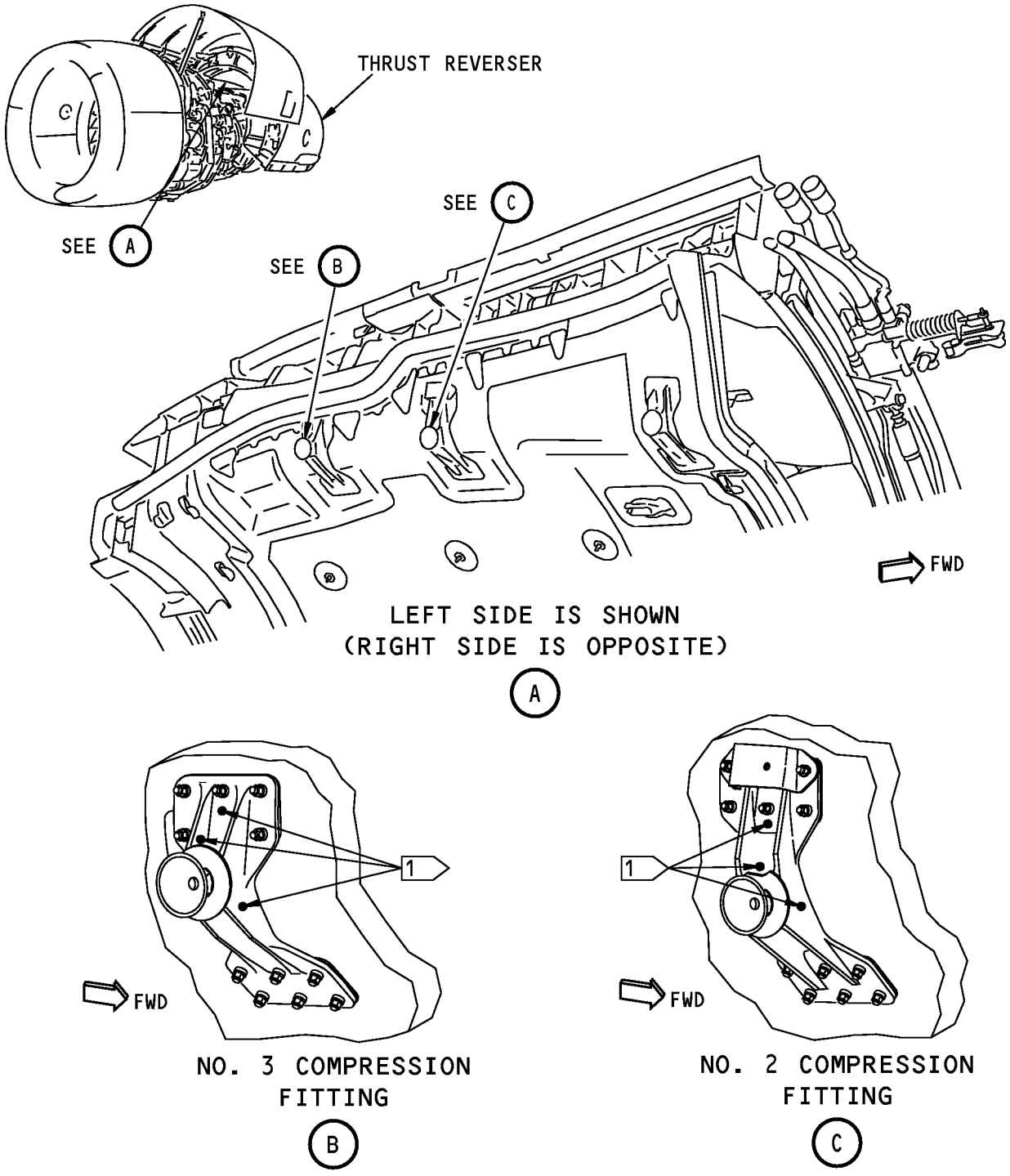
(1) Do this task: Insulation Blanket Installation, TASK 78-31-13-400-801-F00 or Insulation Blanket Installation, TASK 78-31-13-400-803-F01 or Insulation Blanket Installation, TASK 78-31-13-400-805-F00 or Insulation Blanket Installation, TASK 78-31-13-400-806-F00.

SUBTASK 78-31-01-410-014-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK



1 > MEASURE CONDUCTIVITY AT THESE THREE LOCATIONS

Upper Compression Fitting Examination
Figure 603/78-31-01-990-817-F00

TASK 78-31-01-200-803-F00

4. Thrust Reverser Inner Wall Overheat Inspection

A. General

(1) This task does a detailed inspection check of the fan duct inner walls for delamination and disbond damage.

(2) This procedure contains the technical intent of SB78-1079 to do an overheat inspection of the thrust reverser inner wall.

(3) A detailed inspection is defined as follows:

(a) An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity.

(b) Available lighting is supplemented with a direct, good light source at an appropriate intensity.

(c) Inspection aids such as mirrors, magnifying lenses, etc. may be necessary.

(d) Surface cleaning and elaborate procedures may be required.

(4) A special detailed inspection is defined as follows:

(a) An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity.

(b) The examination will make extensive use of special inspection techniques and/or equipment.

(c) Intricate cleaning and substantial access or disassembly procedure may be required.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-13-000-801-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-803-F01	Insulation Blanket Removal (P/B 401)
78-31-13-000-805-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-806-F00	Insulation Blanket Removal (P/B 401)
78-31-13-400-801-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-803-F01	Insulation Blanket Installation (P/B 401)
78-31-13-400-805-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-806-F00	Insulation Blanket Installation (P/B 401)
SRM 51-70-05	Structural Repair Manual
SRM 54-30-01	Structural Repair Manual

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Inspection

SUBTASK 78-31-01-010-018-F00

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-01-030-005-F00

(2) Do this task: Insulation Blanket Removal, TASK 78-31-13-000-801-F00 or Insulation Blanket Removal, TASK 78-31-13-000-803-F01 or Insulation Blanket Removal, TASK 78-31-13-000-805-F00 or Insulation Blanket Removal, TASK 78-31-13-000-806-F00.

SUBTASK 78-31-01-160-003-F00

(3) Clean the inspection surface until it is free of dirt, grease or sealant.

E. Thrust Reverser Inner Wall Overheat Inspection

SUBTASK 78-31-01-212-001-F00

(1) Do a visual check of the inner wall composite structure for the area under the blankets for discoloration or scorched appearance.

NOTE: Discoloration could indicate overheat exposure. Discolorations would appear as areas that are of a different color, usually much darker than the original predominant color of the structure or part that is examined. Discoloration areas of a light color (ex. white) surrounded by darkened areas (dark to medium brown) are also areas that indicate overheat exposure. Areas that are not of interest include discolored areas due to oil, fluid, or soil exposure.

SUBTASK 78-31-01-270-002-F00

(2) Do a special detailed inspection for interply delaminations and skin to core disbonds: THE BOEING COMPANY 737 NDT Part 4, 78-30-02, Ultrasonic Thrust Reverser - Inner Wall or THE BOEING COMPANY 737 NDT Part 4, 78-30-03, Through-Transmission Inspection of the inner wall.

SUBTASK 78-31-01-250-002-F00

(3) If the inner wall area adjacent to the No.2 and No.3 upper compression fittings shows heat damage, do an inspection of the No.2 and No.3 compression fittings.

(a) Do this task: Thrust Reverser Upper Inner Wall No.2 and No.3 Compression Pad Overheat Inspection, TASK 78-31-01-200-802-F00.

SUBTASK 78-31-01-211-002-F00

(4) Do a detailed inspection of the inner wall for signs of heat damage.

(a) Look for indications of heat damage as follows:

1) Very thin cracks in the surface paint.

2) Very thin cracks in the epoxy layers.

3) Missing paint and eroded epoxy layers.

4) Missing paint, eroded epoxy layers and exposed fibers.

NOTE: Heat damage is frequently seen in areas of brown color. Note that brown color is not always an indication of heat damage.

SUBTASK 78-31-01-211-003-F00

(5) Do a detailed inspection of the inner wall for signs of loose fasteners where the inner wall attaches to the hinge beam and at the fasteners for the compression pads.

SUBTASK 78-31-01-211-001-F00

(6) If you find inner wall damage, refer to this procedure for the permitted limits and repair procedures: SRM 54-30-01 or SRM 51-70-05.

NOTE: Contact Boeing to report the kind of surface damage and areas of severe discoloration found in excess of 1000 square inches total on each thrust reverser. Document the damage with digital photographs that can be sent by e-mail, or provide a sketch of the damage that can be e-mailed or faxed. Show the location where the damage is on the structure and show the details of the damage.

SUBTASK 78-31-01-270-001-F00

(7) Inspect the repaired areas after each cure: THE BOEING COMPANY 737 NDT Part 4, 78-30-02, Ultrasonic Thrust Reverser - Inner Wall or THE BOEING COMPANY 737 NDT Part 4, 78-30-03, Through-Transmission Inspection of the inner wall.

SUBTASK 78-31-01-210-003-F00

(8) If the inner wall inspection was done because of a nacelle duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

F. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-01-430-005-F00

(1) Do this task: Insulation Blanket Installation, TASK 78-31-13-400-801-F00 or Insulation Blanket Installation, TASK 78-31-13-400-803-F01 or Insulation Blanket Installation, TASK 78-31-13-400-805-F00 or Insulation Blanket Installation, TASK 78-31-13-400-806-F00.

SUBTASK 78-31-01-410-015-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——————— END OF TASK ———————

THRUST REVERSER- CLEANING/PAINTING

1. General

A. This procedure contains the tasks to install thrust reverser witness marks and the cleaning of teh acoustic surfaces of the thrust reverser.

TASK 78-31-01-370-801-F01

2. Thrust Reverser Witness Mark Installation

(Figure 701 or Figure 702)

A. General

(1) This task gives the instructions to paint a replacement witness mark on the inside surface of the thrust reverser duct.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00 P/B 201	HYDRAULIC SYSTEMS A AND B - MAINTENANCE PRACTICES

C. Tools/Equipment

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

Reference	Description
SPL-9002	Lock Equipment - Thrust Reverser Maintenance (Part #: B78009-26, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-128	Brush - Paint

D. Consumable Materials

Reference	Description	Specification
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
C00033	Coating - Exterior Protective Enamel, Flexibility Use	BMS10-60, Type II
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

E. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine

F. Apply the Witness Mark

SUBTASK 78-31-01-861-001-F00

(1) Supply the electrical power.

(a) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 78-31-01-860-012-F00

WARNING: KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Supply the hydraulic power (HYDRAULIC SYSTEMS A AND B - MAINTENANCE PRACTICES, PAGEBLOCK 29-11-00/201).

SUBTASK 78-31-01-860-013-F00

(3) Slowly move the engine No. 1 (2) reverse thrust lever up and aft to the extended position.

(a) Make sure that the reverser sleeves on engine No. 1 (2) move to the fully extended position.

SUBTASK 78-31-01-860-014-F00

(4) Move the engine No. 1 (2) reverse thrust lever forward and down to the retracted position.

(a) Make sure that the reverser sleeves on engine No. 1 (2) move to the fully retracted position.

SUBTASK 78-31-01-030-001-F00

WARNING: MAKE SURE THAT YOU DEACTIVATE THE DEPLOY CONTROL CIRCUIT. THIS PROCEDURE REQUIRES HYDRAULIC PRESSURE TO BE APPLIED. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Disconnect the electrical connectors D3052 (ENG 1) or D3056 (ENG 2) from the control valve module of the thrust Reverser.

SUBTASK 78-31-01-490-001-F00

(6) Connect the electrical connectors of the ground support equipment wire bundle, thrust reverser maintenance lock equipment, SPL-9002, as follows:

NOTE: This prevents actuation of the deploy circuit.

NOTE: The B78009-5 cable assembly is part of the thrust reverser maintenance lock equipment, B78009. There are two -5 wire bundle cable assemblies in the B78009 tool.

(a) Connect one end of the ground support equipment wire bundle to the connector on the control valve module.

(b) Connect the other end of the ground support equipment wire bundle to the connector for the airplane wire bundle.

SUBTASK 78-31-01-370-002-F00

(7) Prepare the surface to be painted.

(a) Apply a mask around the witness mark area with Scotch Flatback Masking Tape 250, G00270 or equivalent adhesive masking tape.

(b) Roughen and activate the enamel paint on the surface with 400 grit, abrasive mat, G00251 or equivalent abrasive mat.

(c) Use a clean cloth cotton wiper, G00034 that is moist with solvent, B00062 to make the roughened surface clean.

(d) Wipe the surface dry with a dry and clean cotton wiper, G00034 before the solvent becomes dry.

SUBTASK 78-31-01-370-001-F00

(8) Immediately apply 1 coat of black enamel coating, C00033 in the area shown.

(a) Use a paint brush, STD-128 to apply a uniform coat.

SUBTASK 78-31-01-370-003-F00

(9) Remove the masking tape.

SUBTASK 78-31-01-090-001-F00

WARNING: MAKE SURE THAT YOU REACTIVATE THE DEPLOY CONTROL CIRCUIT. THIS PROCEDURE REQUIRED HYDRAULIC PRESSURE TO MAKE SURE THE THRUST REVERSER WAS SAFELY MAINTAINED IN THE RETRACTED POSITION. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER DURING REACTIVATION CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(10) Disconnect the electrical connector for the ground support equipment wire bundle, thrust reverser maintenance lock equipment, SPL-9002, from the control valve module and from the electrical connector for the airplane wire bundle.

SUBTASK 78-31-01-430-001-F00

(11) Connect the electrical connector for the airplane wire bundle to the control valve module.

SUBTASK 78-31-01-860-015-F00

(12) Slowly move the engine No. 1(2) reverse thrust lever up and aft to the extended position.

(a) Make sure that the reverser sleeves on engine No. 1(2) move to the fully extended position.

SUBTASK 78-31-01-860-016-F00

(13) Move the reverse thrust lever forward and down to the retracted position.

(a) Make sure that the reverser sleeves on engine No. 1(2) move to the fully retracted position.

SUBTASK 78-31-01-860-017-F00

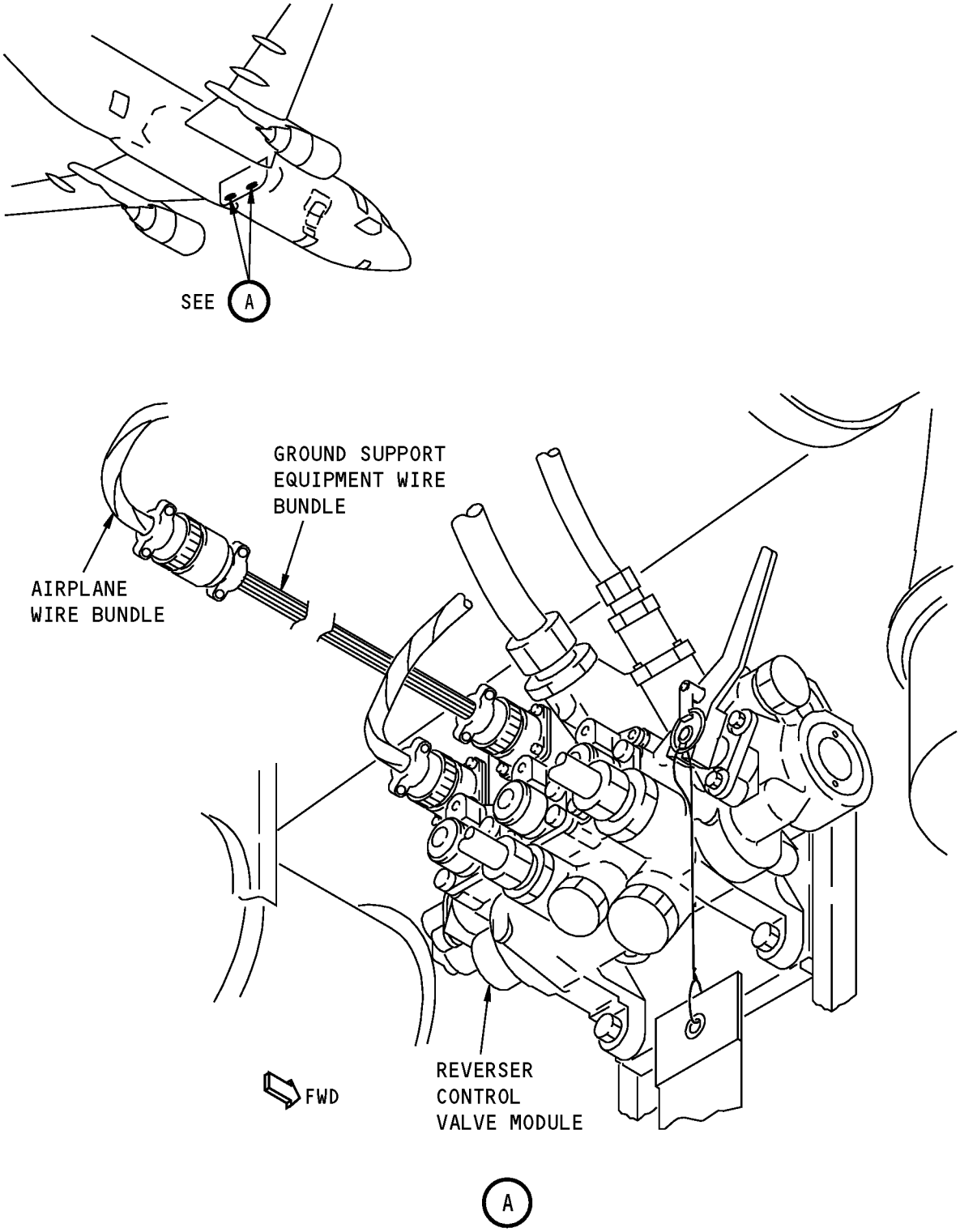
(14) Remove the hydraulic power (HYDRAULIC SYSTEMS A AND B - MAINTENANCE PRACTICES, PAGEBLOCK 29-11-00/201).

SUBTASK 78-31-01-862-001-F00

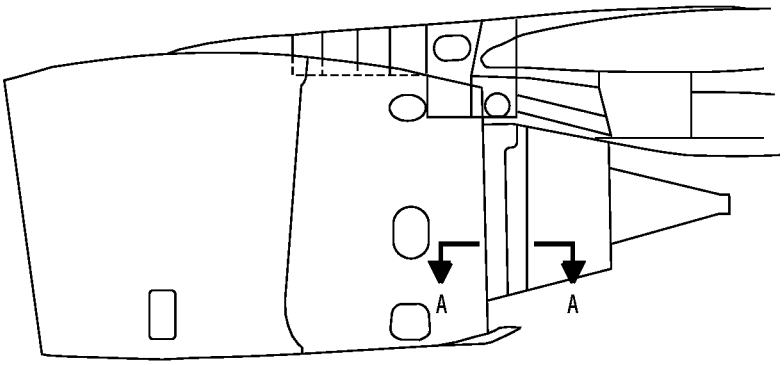
(15) Remove the electrical power if it is not necessary.

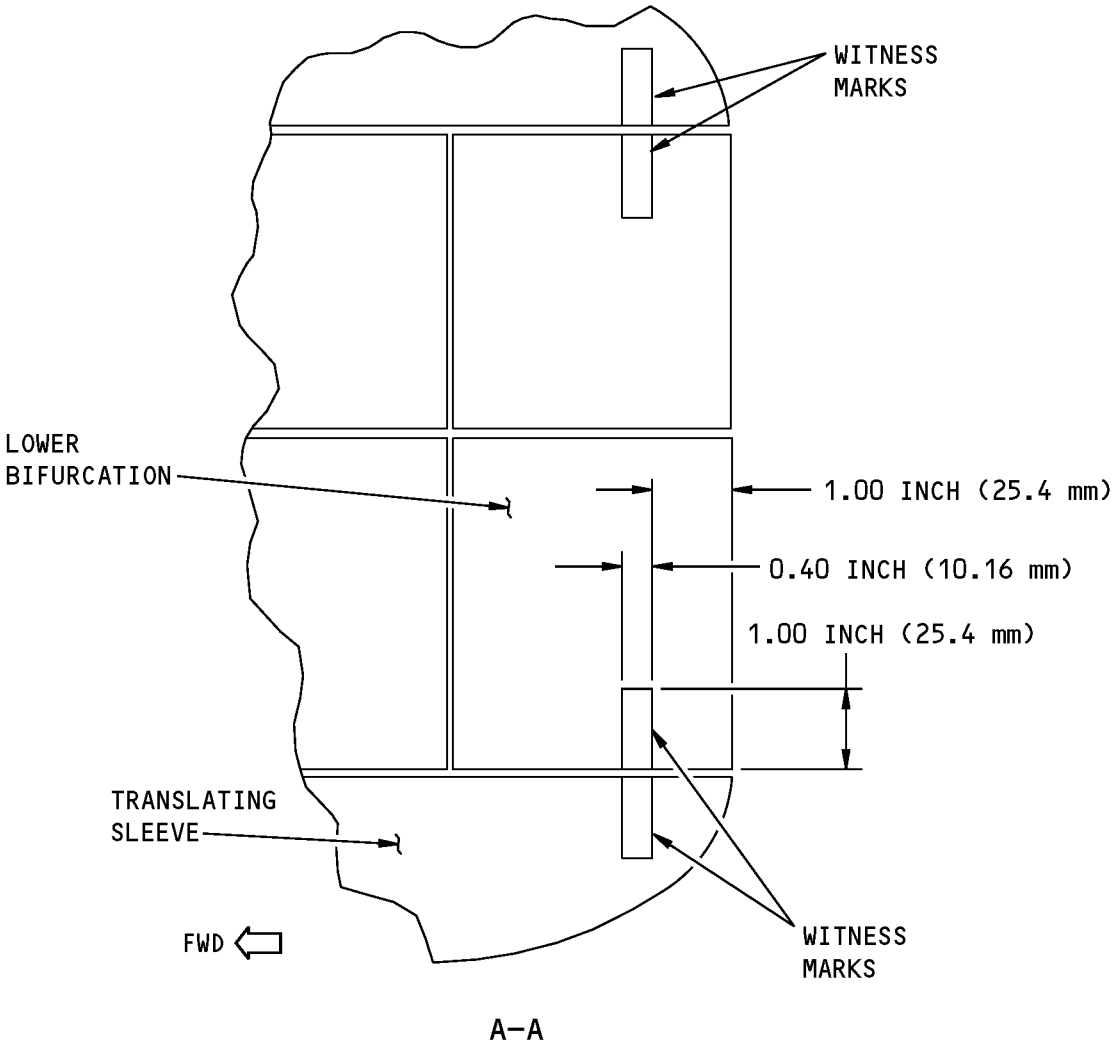
(a) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK



Ground Support Equipment Wire Bundle Installation
Figure 701/78-31-01-990-814-F01





Thrust Reverser Witness Mark
Figure 702/78-31-01-990-815-F01

TASK 78-31-01-160-801-F01

3. Clean the Acoustic Surfaces of the Thrust Reverser

A. General

(1) Special attention should be given to prevent water and cleaning agents from entering the honeycomb cells of the acoustic panels. Follow the steps below to minimize the ingestion of cleaning solutions and water into the acoustic panels.

B. Clean Acoustic surfaces

SUBTASK 78-31-01-110-001-F00

CAUTION: DO NOT LET WATER AND CLEANING AGENTS STAY IN THE PANEL. WATER AND CLEANING AGENTS CAN CAUSE CORROSION OF THE ALUMINUM HONEYCOMB CORE.

(1) Wipe cleaning solutions on with a clean cloth, damp, but not saturated, with cleaning solution.

SUBTASK 78-31-01-110-002-F00

(2) Wipe with a clean cloth, damp with water, to remove all residues.

SUBTASK 78-31-01-160-001-F00

(3) Wipe using a clean dry cloth to remove all moisture.

SUBTASK 78-31-01-110-003-F00

(4) Use ONLY cleaning agents certified to the requirements of document D6-17487, Evaluation of Airplane Maintenance Materials, when cleaning acoustic panels.

SUBTASK 78-31-01-950-001-F00

CAUTION: DO NOT USE A SPRAY WITH STRONG PRESSURE ON SKIN AREAS WITH HOLES OR PUT THEM IN SOLVENTS OR WATER. WATER, CLEANING AGENTS OR SOLVENTS CAN CAUSE CORROSION.

(5) If pressure washing is required for components around acoustic panels, the acoustic portion of the nacelle should be covered to prevent ingestion of the cleaning solutions.

SUBTASK 78-31-01-110-004-F00

(6) Do not vapor-degrease Graphite/Aramid epoxy structures with chlorinated cleaning agents such as Methylene Chloride, Trichoroethylene, and Trichloroethane.

(a) Chlorinated cleaning agents will cause damage to Graphite/Aramid epoxy structures.

SUBTASK 78-31-01-110-005-F00

(7) 1,1,1-Trichloroethane is one of the solvents approved to clean composite components.

(a) Do not sumberge parts in the solvent or permit the part to soak in solvent or you may cause damage to occur.

(b) Use 1,1,1-Trichloroethane only as a wipe solvent.

END OF TASK

THRUST REVERSER - REPAIRS

1. General

A. This procedure has these tasks to repair a thrust reverser component.

(1) A replacement of the thrust reverser hinge beam fire wall.

(2) A replacement of the No.2 and No.3 upper compression fittings.

TASK 78-31-01-960-801-F00

2. Thrust Reverser Hinge Beam Fire Wall Replacement

(Figure 801)

A. General

(1) This task replaces the fire wall plate on the thrust reverser hinge beam.

(2) The fire wall is attached to the aluminum hinge beam of the thrust reverser. The fire wall is made from titanium plate. Some early fire walls do not have a tungsten carbide plasma coating for wear resistance. The upper flange of the firewall can become worn which would allow a breach of the engine fan compartment fire protection features.

(3) The fire wall helps to contain an engine fan case compartment fire from the components on the fan case mounted gearbox.

B. References

Reference	Title
78-31-01-000-801-F00	Thrust Reverser Removal (P/B 401)
78-31-01-400-801-F00	Thrust Reverser Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic (Part #: ST982, Supplier: 81205, A/P Effectivity: 737-ALL)
STD-764	Scraper - Non-metallic

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
C00304	Coating - Teflon Filled, Non Decorative, Sprayable Material	BMS 10-86 Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Replace the Firewall

SUBTASK 78-31-01-010-016-F00

(1) Open the thrust reverser.

WARNING: OBEY THE INSTRUCTIONS IN THIS PROCEDURE WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Do this task: Thrust Reverser Removal, TASK 78-31-01-000-801-F00.

SUBTASK 78-31-01-020-003-F00

(2) Remove the left firewall [1].

(a) Remove thirteen bolts [9] and washers [11] and nuts [10].

(b) Remove two bolts [2] , washers [3] and nuts [3].

(c) Remove two bolts [7] and nuts [8].

(d) Remove one bolt [5] and nut [6].

(e) Use an non-metallic scraper, STD-764 to pry the fire wall from the hinge beam and remove the firewall.

NOTE: The fire wall was installed with fire wall sealant, between the fire wall and the hinge beam flange.

1) Do not scratch or damage the surface of the metal hinge beam.

SUBTASK 78-31-01-020-004-F00

(3) Remove the right firewall [21].

(a) Remove thirteen bolts [22] and washers [24] and nuts [23].

(b) Remove two bolts [29] , washers [31] and nuts [30].

(c) Remove two bolts [25] and nuts [26].

(d) Remove one bolt [27] and nut [28].

(e) Use an non-metallic scraper, STD-764 to pry the fire wall from the hinge beam and remove the firewall.

NOTE: The fire wall was installed with fire wall sealant, between the fire wall and the hinge beam flange.

1) Do not scratch or damage the surface of the metal hinge beam.

SUBTASK 78-31-01-160-002-F00

(4) Clean the surface of the hinge beam with sealant removal tool, SPL-768 to remove old firewall sealant.

(a) Do not scratch or damage the surface of the metal hinge beam.

SUBTASK 78-31-01-350-001-F00

(5) Apply fire wall sealant, A00160 to the forward surface of the hinge beam and to the mating surface of the fire wall.

(a) Prepare the sealant with the manufacturers instructions.

SUBTASK 78-31-01-420-003-F00

(6) Install the left firewall [1].

(a) Position the fire wall on the forward flange of the hinge beam.

(b) Apply fire wall sealant, A00160 to the fasteners and immediately install the fasteners with wet sealant.

(c) Install one bolt [5] and nut [6].

(d) Install two bolts [7] and nuts [8].

(e) Install two bolts [2], washers [4] and nuts [3].

(f) Install thirteen bolts [9] and washers [11] and nuts [10].

(g) Tighten all the fasteners to 15-25 inch-pounds.

(h) Apply a Teflon coating, C00304 to the heads of the fasteners with a cotton wiper, G00034.

SUBTASK 78-31-01-420-004-F00

(7) Install the right firewall [21].

(a) Position the fire wall on the forward flange of the hinge beam.

(b) Apply fire wall sealant, A00160 to the fasteners and immediately install the fasteners with wet sealant.

(c) Install one bolt [27] and nut [28].

(d) Install two bolts [25] and nuts [26].

(e) Install two bolts [29], washers [31] and nuts [30].

(f) Install thirteen bolts [22] and washers [24] and nuts [23].

(g) Tighten all the fasteners to 15-25 inch-pounds.

(h) Apply a Teflon coating, C00304 to the heads of the fasteners with a cotton wiper, G00034.

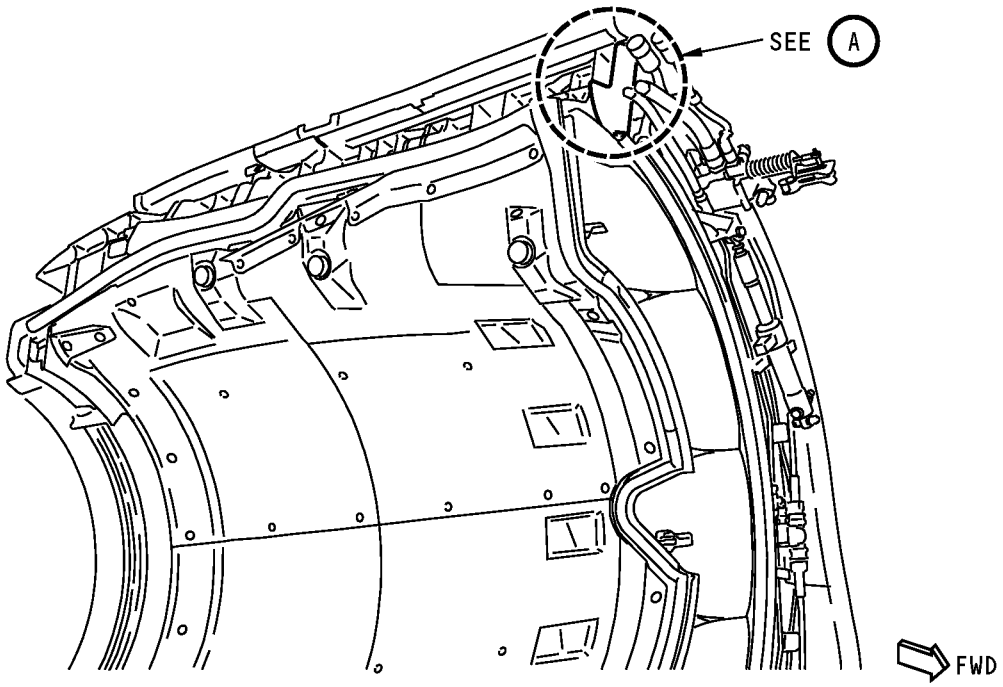
SUBTASK 78-31-01-410-013-F00

(8) Close the thrust reverser.

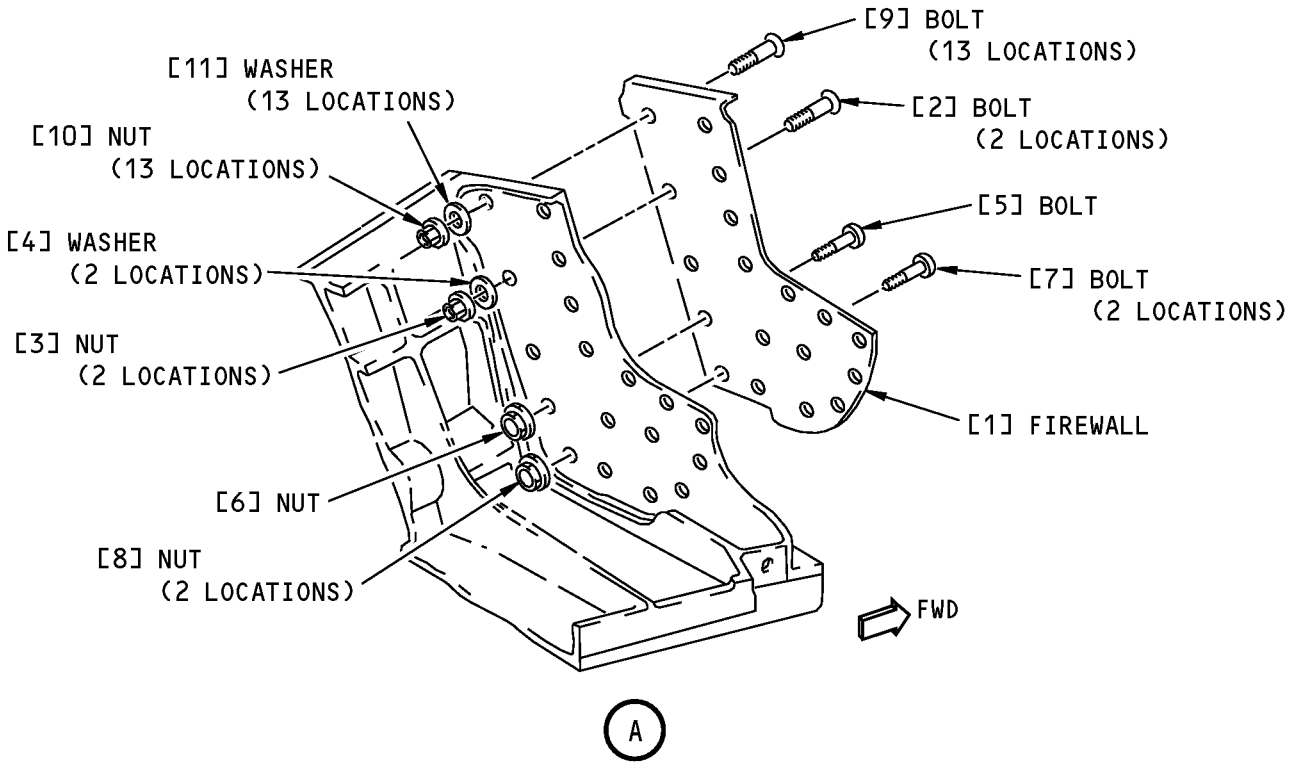
WARNING: OBEY THE INSTRUCTIONS IN THIS PROCEDURE WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Do this task: Thrust Reverser Installation, TASK 78-31-01-400-801-F00.

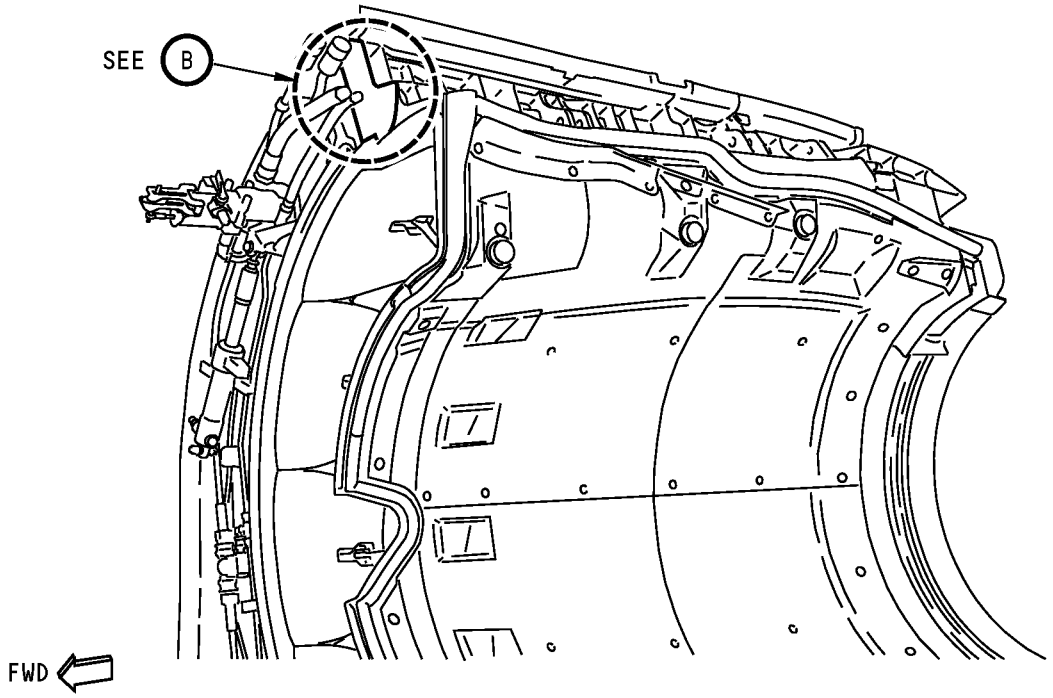
——————— END OF TASK ———————



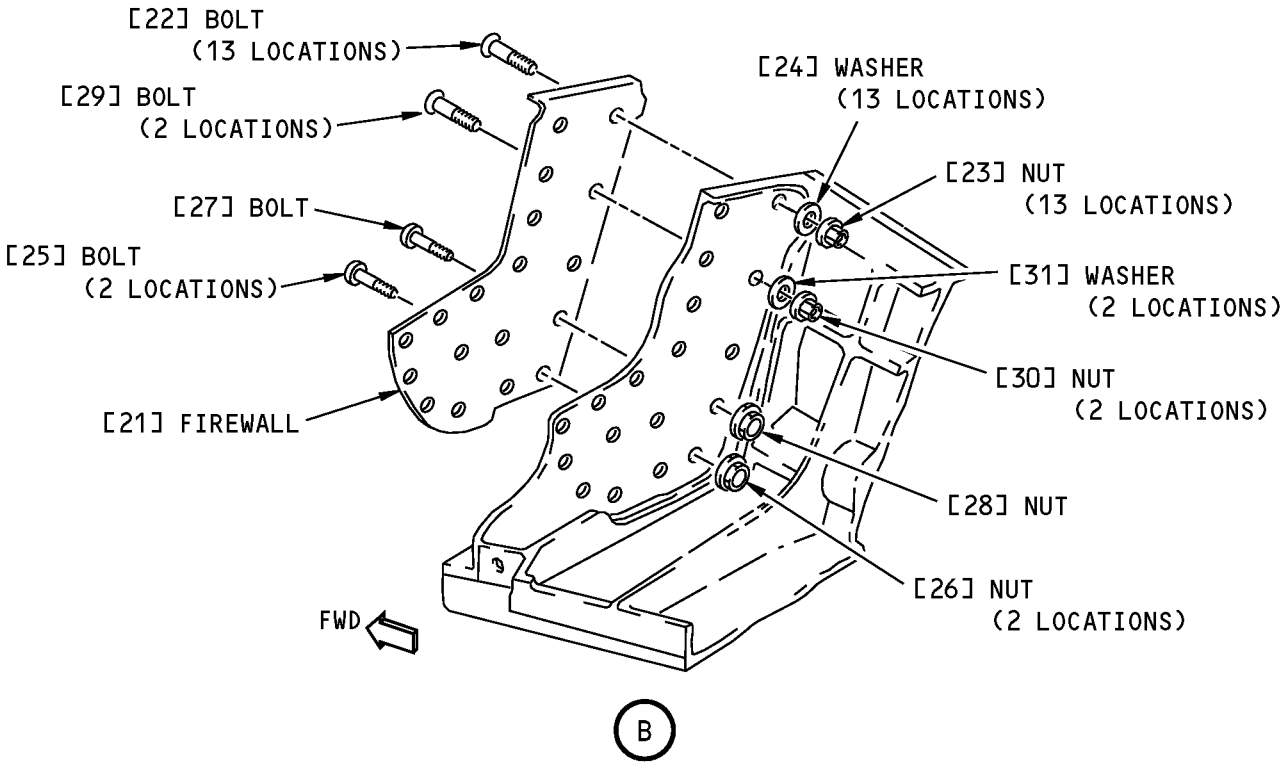
LEFT SIDE THRUST REVERSER



Hinge Beam Fire Wall
Figure 801 (Sheet 1 of 2)/78-31-01-990-816-F00



RIGHT SIDE THRUST REVERSER



Hinge Beam Fire Wall
Figure 801 (Sheet 2 of 2)/78-31-01-990-816-F00

TASK 78-31-01-960-802-F00

3. Thrust Reverser No.2 and No.3 Upper Compression Fitting Replacement

A. General

(1) This task gives the procedure to replace the No.2 and No. 3 upper compression fittings that are installed on the inner wall of the fan duct cowl.

B. References

Reference	Title
78-31-01-000-801-F00	Thrust Reverser Removal (P/B 401)
78-31-01-400-801-F00	Thrust Reverser Installation (P/B 401)
78-31-01-820-801-F00	Thrust Reverser Adjustment (P/B 501)
78-31-13-000-801-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-803-F01	Insulation Blanket Removal (P/B 401)
78-31-13-000-805-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-806-F00	Insulation Blanket Removal (P/B 401)
78-31-13-400-801-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-803-F01	Insulation Blanket Installation (P/B 401)
78-31-13-400-805-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-806-F00	Insulation Blanket Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: $0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: $0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: $0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: $0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: $0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)
STD-325	File - Rotary
STD-449	Gun - Sealant
STD-549	Knife - Putty, Broad Blade
STD-764	Scraper - Non-metallic
STD-765	Scraper - Plastic
STD-1328	Machine - Drilling, Electrical or Pneumatic
STD-1330	Wrench - Hexdrive, Allen Wrench
STD-3729	Fastener - Spring Loaded, Sheet Metal, 3/16 Cleco
STD-6069	Bit - Drill, Size 30 (0.1285 Inch Diameter)

D. Consumable Materials

Reference	Description	Specification
A00803	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type I
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G02061	Marker - Permanent, Felt Tip Pen	
G50069	Tape - Carpet, Double-backed, Adhesive - BMS5-133, Type IV, Class 1	BMS5-133, Type IV, Class 1

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Prepare for the Procedure

SUBTASK 78-31-01-030-003-F00

(1) Do this task: Thrust Reverser Removal, TASK 78-31-01-000-801-F00.

SUBTASK 78-31-01-030-004-F00

(2) If it is necessary, do this task: Insulation Blanket Removal, TASK 78-31-13-000-801-F00 or Insulation Blanket Removal, TASK 78-31-13-000-803-F01 or Insulation Blanket Removal, TASK 78-31-13-000-805-F00 or Insulation Blanket Removal, TASK 78-31-13-000-806-F00.

G. Procedure

SUBTASK 78-31-01-020-005-F00

(1) On the upper compression fittings, remove the compression cup and small washers and large washer from the end of the fitting.

(a) Remove the small washers from the end of the compression fitting.

NOTE: There can be 0 to 5 small washers installed. These washers are used to adjust the location of the thrust reverser compression cup to the compression rods on the strut. The thrust reverser must be adjusted again.

(b) Remove the large washer from the end of the compression fitting.

1) Break the sealant seal between the large washer and the end of the compression fitting.

NOTE: The large washer was installed with sealant applied between the washer and the end of the compression fitting.

(c) Make a record of the compression fitting number where the compression cup and washers and shim were installed.

(d) Keep the compression cup and washers and shim in a separate protective bag for the installation.

SUBTASK 78-31-01-020-006-F00

(2) Remove the No.2 compression fitting.

(a) Use a sealant removal tool, COM-2481 or non-metallic scraper, STD-764 or a plastic scraper, STD-765 to remove the sealant fillet seal and all excess shim material around the edge of the compression fitting on the inner wall.

(b) Use a marker, G02061 to make a wide line or witness line around the edge of each of the four corners of the fitting.

(c) Remove the bolts and self-locking nuts.

1) Use a hexdrive allen wrench, STD-1330 inserted in the end of the shank of the bolt to hold the bolt from rotation as you remove the nut.

2) Make a record of the fastener location and keep the fasteners separated to use the fastener again.

3) Discard the nuts.

NOTE: The self-locking nuts cannot be used again.

(d) Remove the bracket.

(e) Break the sealant seal under the upper compression fitting.

NOTE: The fitting was installed with sealant applied to both side of the shim.

1) Insert a broad blade putty knife, STD-549 between the shim and the fitting and work around the edge of the fitting.

2) Insert wood or teflon wedges as you move and work the putty knife around the edge of the fitting.

3) Use the wedges to separate the fitting from the inner wall.

4) Discard the compression fitting.

(f) Make the inner wall clean of all excess sealant.

1) Make the faying surface clean where the shim is located.

2) If a shim falls off, keep the shim for the installation procedure.

SUBTASK 78-31-01-020-007-F00

(3) Remove the No.3 compression fitting.

(a) Use a sealant removal tool, COM-2481 or non-metallic scraper, STD-764 or a plastic scraper, STD-765 to remove the sealant fillet seal and all excess shim material around the edge of the compression fitting on the inner wall.

(b) Use a marker, G02061 to make a wide line or witness line around the edge of each of the four corners of the fitting.

(c) Remove the bolts and self-locking nuts.

1) Use a hexdrive allen wrench, STD-1330 inserted in the end of the shank of the bolt to hold the bolt from rotation as you remove the nut.

2) Make a record of the fastener location and keep the fasteners separated to use the fastener again.

3) Discard the nuts.

NOTE: The self-locking nuts cannot be used again.

(d) Break the sealant seal under the upper compression fitting.

NOTE: The fitting was installed with sealant applied to both side of the shim.

1) Insert a broad blade putty knife, STD-549 between the shim and the fitting and work around the edge of the fitting.
2) Insert wood or teflon wedges as you move and work the putty knife around the edge of the fitting.
3) Use the wedges to separate the fitting from the inner wall.
4) Discard the compression fitting.

(e) Make the inner wall clean of all excess sealant.

1) Make the faying surface clean where the shim or the heat shield is located.
2) If a shim or the heat shield falls off, keep the part for the installation procedure.

SUBTASK 78-31-01-420-005-F00

(4) Prepare the replacement upper fitting.

NOTE: The replacement upper compression fittings do not have fastener holes pre-drilled in the flanges.

(a) Attach a short length of double-sided adhesive carpet tape, G50069 across the back of the fitting at the foot-flanges.

(b) Get the shim from the old fitting and attach the shim with another length of double-sided adhesive carpet tape, G50069.

(c) Temporarily attach the fitting to the inner wall within the witness line that was marked around the edge of each of the four corners of the fitting.

(d) While the first person holds the fitting in place, have the second person go into the fan exhaust duct with a electrical or pneumatic drilling machine, STD-1328 and a size 30 (0.1285 Inch Diameter) drill bit, STD-6069.

(e) The second person in the fan duct puts a drill bushing into one of the fastener holes.

NOTE: The drill bushing prevents the enlargement of the fastener hole.

(f) The first person under the inner wall pushes the fitting tight against the inner wall as the second person in the fan exhaust duct drills a pilot hole.

1) Put a spring loaded fastener, STD-3729 tool (cleco) into the pilot hole through the fitting to help hold the fitting in position after the first pilot hole is made.
2) Continue to drill pilot holes for the remaining fasteners.

(g) Remove the fitting from the inner wall to a work bench.

(h) Remove the double-sided adhesive carpet tape, G50069 from the shim and the fitting.

1) Remove all adhesive residue from the fitting with a clean cotton wiper, G00034 and solvent, B00062.

(i) Use the pilot holes as a guide to drill the final fastener holes with a double margin, 0.190 in. (4.826 mm) diameter, drill bit.

NOTE: A stepped drill bit if possible. The fastener holes will be 0.190 in. (4.826 mm) to 0.193 in. (4.902 mm) diameter.

1) Continue to drill the pilot holes for the remaining fasteners.

(j) De-burr all the holes with a rotary file, STD-325 or equivalent.

1) Remove all drill residue and chips; make sure that all the holes are clean.

SUBTASK 78-31-01-420-006-F00

(5) Install the No.2 upper compression fitting.

(a) Make the inner wall clean with a clean cotton wiper, G00034 and solvent, B00062.

1) Wipe the solvent before it becomes dry with another clean cloth wiper.

2) Continue to clean the surface until the cloth wiper does not show any soil.

(b) Apply fire wall sealant, A00803 to the inside surface of the fitting or to the inner wall.

1) Use a plastic scraper, STD-765 or non-metallic scraper, STD-764 to work the fire wall sealant to a minimum uniform thicknesss of 0.030 in. (0.762 mm) on the faying surface.

(c) Install the No.2 upper compression fitting with the shims.

1) Cover the bolt shank and bolt threads with fire wall sealant, A00803 before you install the bolts.

2) Install the bolts through the holes from the fan exhaust side with wet sealant.

3) Put the shims on the bolts, between the fitting and the inner wall with fire wall sealant, A00803 on both sides of the shim.

a) If this shim must be replaced, peel the replacement shim to the required thickness.

NOTE: The maximum shim thickness is 0.062 in. (1.575 mm). The maximum gap before fastener installation is 0.010 in. (0.254 mm). Shim if and as required.

b) Shim if and as required.

<1> If the shim if not used, apply fire wall sealant between the fitting and the inner wall.

4) Install the bracket on the compression fitting.

5) From the center line of the fitting and work out to the edge, install the nuts on the bolts.

a) Tighten the nuts on the bolts between 25 in-lb (3 N·m) to 35 in-lb (4 N·m).

(d) Use the fire wall sealant, A00803 that was squeezed out from under the fitting to form a fillet seal around the edge of the fitting and use a sealant gun, STD-449 to apply additional fire wall sealant, A00803 to form the fillet seal.

NOTE: Use the same grade of fire wall sealant for the fillet seal and the faying surface seal.

SUBTASK 78-31-01-420-007-F00

(6) Install the No.3 upper compression fitting.

(a) Make the inner wall clean with a clean cotton wiper, G00034 and solvent, B00062

1) Wipe the solvent before it becomes dry with another clean cloth wiper.

2) Continue to clean the surface until the cloth wiper does not show any soil.

(b) Apply fire wall sealant, A00803 to the inside surface of the fitting or to the inner wall.

1) Use a plastic scraper, STD-765 or non-metallic scraper, STD-764 to work the fire wall sealant to a minimum uniform thicknesss of 0.030 in. (0.762 mm) on the faying surface.

(c) Install the No.3 upper compression fitting with the shims and a heat shield.

1) Use light manual force to form the heat shield to the inner wall.

NOTE: The tab on the heat shield must point forward.

2) Cover the bolt shank and bolt threads with fire wall sealant, A00803 before you install the bolts.

3) Install the bolts through the holes in the inner wall from the fan exhaust side with wet sealant.

4) First, install the heat shield on the bolts, between the fitting and the inner wall with fire wall sealant, A00803 on both sides of the heat shield.

a) Align the top edge of the heat shield with the top edge of the compression fitting.

<1> Do not let the heat shield extend above the top of the compression fitting.

5) Second, install the shims on the bolts, between the fitting and the heat shield with fire wall sealant, A00803 on both sides of the shims.

a) If this shim must be replaced, peel the replacement shim to the required thickness.

NOTE: The maximum shim thickness is 0.052 in. (1.321 mm). The maximum gap before fastener installation is 0.010 in. (0.254 mm).

b) Shim if and as required.

<1> If the shim if not used, apply fire wall sealant between the fitting and the inner wall.

6) From the center line of the fitting and work out to the edge, install the nuts on the bolts.

a) Tighten the nuts on the bolts between 25 in-lb (3 N·m) to 35 in-lb (4 N·m).

(d) Use the fire wall sealant, A00803 that was squeezed out from under the fitting to form a fillet seal around the edge of the fitting and use a sealant gun, STD-449 to apply additional fire wall sealant, A00803 to form the fillet seal.

NOTE: Use the same grade of fire wall sealant for the fillet seal and the faying surface seal.

1) Make sure that the cooling hole under the No.3 compression fitting is not blocked with sealant.

SUBTASK 78-31-01-420-008-F00

(7) Install the compression cup on the compression fitting.

(a) Apply a fay surface seal of the fire wall sealant between the large washer/spacer and the compression fitting.

(b) Install the large washer/spacer between the compression cup and the compression fitting.

(c) Apply Never-Seez NSBT-8N compound, D00006 to the threads of the compression cup.

(d) Make sure that the outside diameter of the large spacer/washer and the diameter compression cup align to within 0.000 ±0.010 in. (0.000 ±0.254 mm).

(e) Install the small washers on the compression cup over the large washer/spacer.

NOTE: There can be 0 to 5 small washers that were removed. These small washers are used to adjust the location of the thrust reverser compression cup to the compression rods on the strut. The thrust reverser must be adjusted again.

(f) Tighten the compression cup between 80 in-lb (9 N·m) to 95 in-lb (11 N·m).

H. Put the Airplane Back to the Usual Condition

SUBTASK 78-31-01-430-003-F00

(1) Do this task: Insulation Blanket Installation, TASK 78-31-13-400-801-F00 or Insulation Blanket Installation, TASK 78-31-13-400-803-F01 or Insulation Blanket Installation, TASK 78-31-13-400-805-F00 or Insulation Blanket Installation, TASK 78-31-13-400-806-F00.

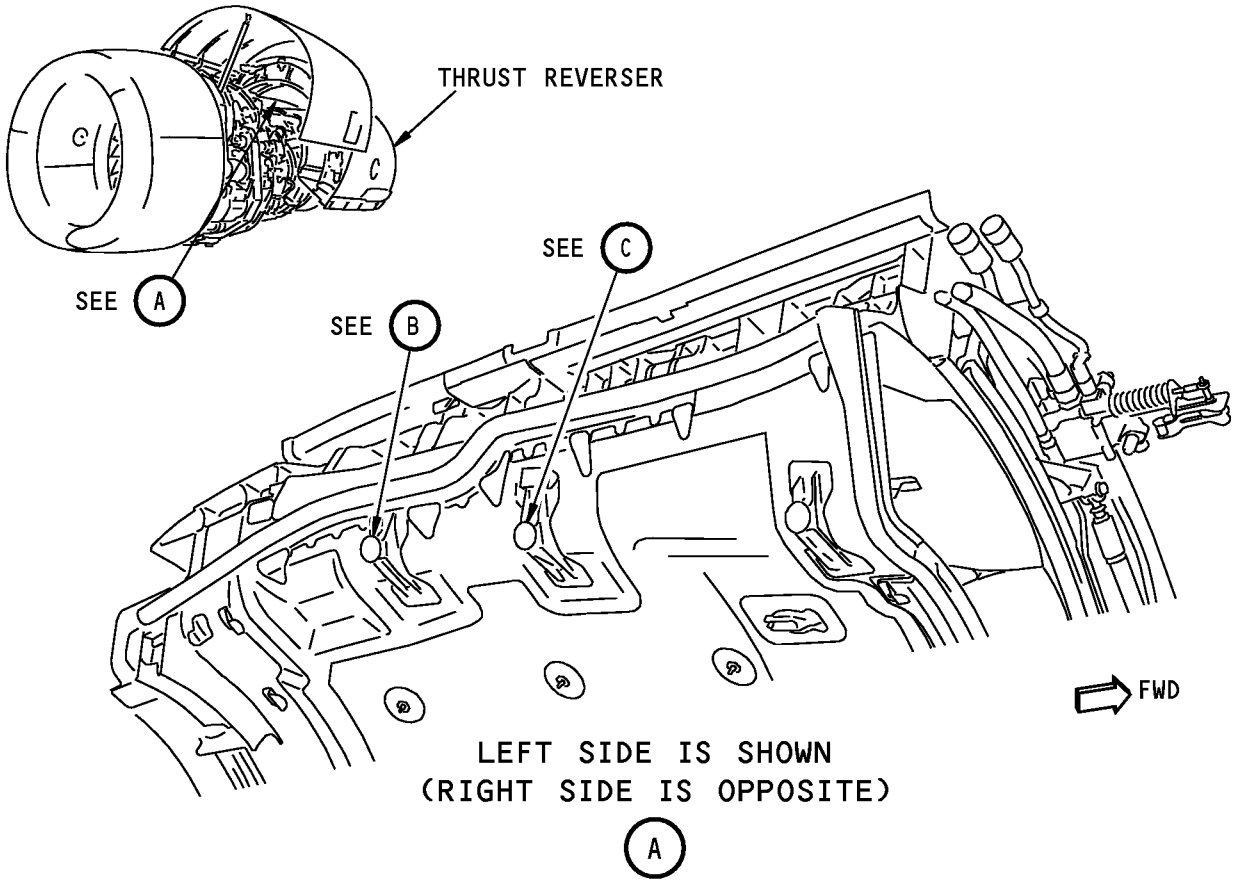
SUBTASK 78-31-01-430-004-F00

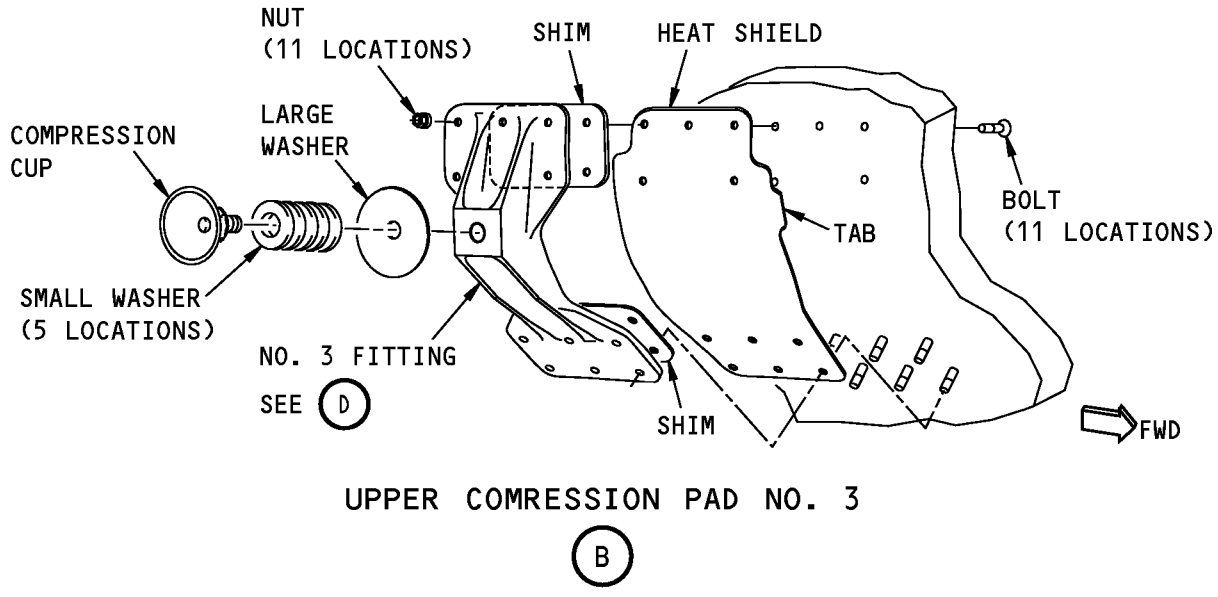
(2) Do this task: Thrust Reverser Installation, TASK 78-31-01-400-801-F00.

SUBTASK 78-31-01-830-001-F00

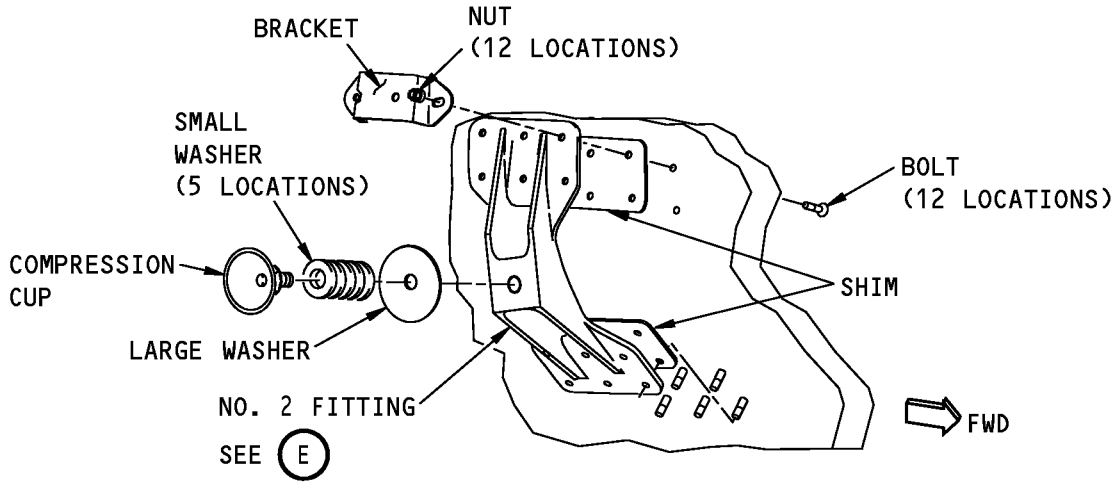
(3) Do this task: Thrust Reverser Adjustment, TASK 78-31-01-820-801-F00.

——————— END OF TASK ———————



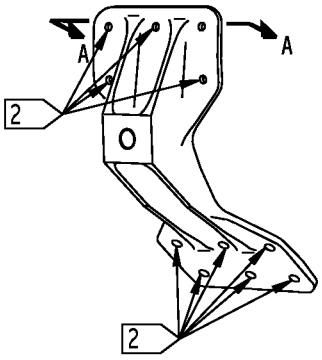


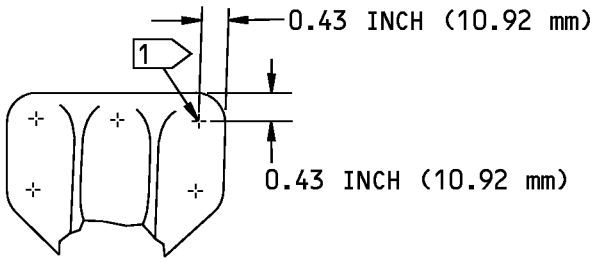
No.2 and No.3 Compression Fittings
Figure 802 (Sheet 1 of 2)/78-31-01-990-818-F00



UPPER COMPRESSION PAD NO. 2

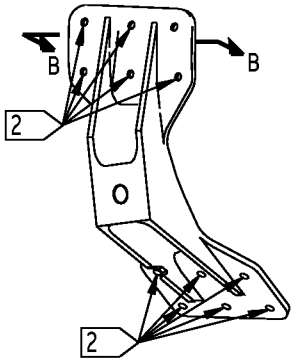
C

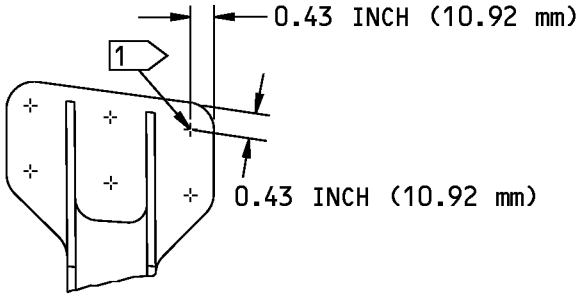




A–A
TYPICAL

D





B–B

E

1 > LOCATION PILOT HOLE, SEE TEXT

2 > BACK DRILL FROM EXISTING HOLES, SEE TEXT

No.2 and No.3 Compression Fittings
Figure 802 (Sheet 2 of 2)/78-31-01-990-818-F00

TRANSLATING SLEEVE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the translating sleeve.

(2) The installation of the translating sleeve.

TASK 78-31-02-000-802-F00

2. Translating Sleeve Removal

(Figure 401), (Figure 402), (Figure 403)

A. General

(1) This task is for the removal of the translating sleeve from the left or right thrust reverser on an engine.

(2) For this task the translating sleeve will be referred to as the sleeve.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)
78-31-02-200-802-F00	Main Slider and Auxiliary Slider Inspection (P/B 601)

C. Tools/Equipment

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

Reference	Description
SPL-2428	Sling - Thrust Reverser Sleeve, CFM56-7 Engine (Part #: C78022-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2430	Hoist - Boom, Ground Based (Part #: C78026-156, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2527	Hoist - Boom, General, 400 lb Max Capacity Attach Adapters to Remove/Install various components (Part #: A20001-82, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G02329	Tape - Aluminum Foil, Pressure Sensitive - Vibration Damping Tape 434	

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right

(Continued)

Zone	Area
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

G. Prepare for the Removal

SUBTASK 78-31-02-010-005-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-02-980-001-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD SLEEVE MORE THAN 10.0 INCHES. MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE SLEEVE AS IT IS EXTENDED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Do these steps to expose the drag link to blocker door hardware:

NOTE: The sleeve must be partially extended to release the load on the drag link and expose the hardware that attaches the drag link to the blocker door.

(a) For the inboard sleeve, do these steps to manually extend the sleeve:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause them to extend a small amount.

2) Monitor the position of the sleeve as it is extended to make sure that it does not touch the leading edge of the wing.

3) Manually extend the sleeve no more than 10.0 inches (250 mm) from the forward edge of the torque box.

4) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard sleeve, manually extend the sleeve approximately 10.0 inches (250 mm).

NOTE: The outboard sleeve will not touch the leading edge of the wing.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

H. Translating Sleeve Removal

SUBTASK 78-31-02-020-001-F00

CAUTION: WHEN YOU WORK IN THE FAN DUCT, USE SUFFICIENT PROTECTION. IF TOOLS OR THE DRAG LINKS FALL OR HIT THE BLOCKER DOORS OR FAN DUCT WALLS, DAMAGE TO THE COMPOSITE PANELS CAN OCCUR.

(1) Do these steps to disconnect the drag links from the blocker doors (Figure 401):

NOTE: It is not necessary to remove the drag links.

(a) Put protective material on the fan duct walls and blocker doors.

(b) Put cotton wiper, G00034 around the anchor fitting and drag link at the inner wall.

NOTE: When the drag link is disconnected from the blocker door, it can move forward or aft and fall against the inner wall. This will cause damage to the inner wall composite panel.

(c) Remove the nut [2], washer [3] and [4], bushing [6], and bolt [5] that attach the drag link [1] to the blocker door.

(d) Put a tie strap through the spherical bearing to hold the ball in its position.

(e) Make sure that there is protection between the drag link and the inner wall.

(f) Use Vibration Damping Tape 434 tape, G02329 to hold the drag link against the inner wall of the fan duct.

(g) Use Vibration Damping Tape 434 tape, G02329, to hold the blocker door against the outer wall of the fan duct and in the retracted position.

SUBTASK 78-31-02-980-002-F00

CAUTION: MAKE SURE THAT THE BLOCKER DOORS ARE TAPED AGAINST THE OUTER WALL OF THE FAN DUCT AND THAT THE FREE END OF THE DRAG LINKS ARE TAPED AGAINST THE INNER WALL OF THE FAN DUCT. IF THE FREE ENDS OF THE DRAG LINKS HIT THE SLEEVE WHEN IT IS RETRACTED, DAMAGE TO THE SLEEVE, THE BLOCKER DOORS AND THE DRAG LINKS CAN OCCUR.

(2) Manually retract the sleeve until it is no more than 3 inches (76 mm) from the fully closed position; do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

NOTE: If the actuator rods are retracted, it will give more clearance between the sleeve and the leading edge. There will be less distance to move the sleeve rearward and the possibility of damage is decreased. The three inch gap is necessary to let you use your hands to push the sleeve rearward.

SUBTASK 78-31-02-410-006-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS, BUT DO NOT DO THE THRUST REVERSER OR LEADING EDGE ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Close the thrust reverser, but do not do the thrust reverser or leading edge activation, or engage the latches at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-02-010-003-F00

(4) Remove the nine bolts [25] from each of the access panels [26] and [29] on the applicable thrust reverser to get access to the actuator rod ends:

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

SUBTASK 78-31-02-020-002-F00

CAUTION: DO NOT LET THE ROD END OF THE HYDRAULIC ACTUATOR TURN WHEN YOU REMOVE THE BOLT. IF THE ROD END TURNS, IT CAN AFFECT THE RIGGING OF THE HYDRAULIC ACTUATOR.

(5) Do these steps to disconnect the actuator rod ends from the attach fittings on the sleeve [21]:

(a) Remove the bolt [22], washers [23] and [27], bushing [24] and nut [28].

(b) Safety the actuator rod end so that it will not turn.

(c) Slide the sleeve aft approximately 2 inches (51 mm) so that the actuator rod end will move out of the attach fitting.

SUBTASK 78-31-02-480-001-F00

(6) Do these steps to prepare the sleeve [21] for the installation of the sling [43] thrust reverser sleeve sling, SPL-2428 (Figure 403):

(a) Align the fastener holes in the attach fitting [48] and the upper actuator attach fitting on the sleeve (View B).

1) Install the lockpin [49].

2) Install the retention pin.

(b) Align the fastener holes in the attach fitting [48] and the middle actuator attach fitting on the sleeve (View C).

1) Install the lockpin [49].

2) Install the retention pin.

(c) Align the forward attach fitting [45] with the forward attach hole marked GSE in the sleeve (View A).

1) Install the bolt [46].

2) Tighten the star wheel [41].

SUBTASK 78-31-02-480-002-F00

WARNING: MAKE SURE THAT THE GSE SLING IS SATISFACTORILY HELD AS IT IS INSTALLED ON THE SLEEVE. THE SLING WEIGHS APPROXIMATELY 45 POUNDS (20 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE SLING CAN FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Do these steps to install the sling [43], thrust reverser sleeve sling, SPL-2428, on the sleeve [21]:

(a) Align the attachment holes on the sling with the upper [48], lower [48] and forward [45] attach fitting holes.

1) Install a lockpin [47] at each of the three locations.

2) Install a retention pin in each of the lockpins.

SUBTASK 78-31-02-020-003-F00

WARNING: MAKE SURE THAT THE WEIGHT OF THE SLEEVE IS SATISFACTORILY HELD BY THE GSE SLING BEFORE YOU REMOVE THE SLEEVE. THE SLEEVE WEIGHS APPROXIMATELY 196 POUNDS (88 KG). IF YOU DO NOT OBEY THIS INSTRUCTION, THE SLEEVE CAN FALL AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

CAUTION: MAKE SURE THAT YOU MONITOR THE POSITION OF THE SLEEVE AND SLING AS YOU MOVE THE SLEEVE AWAY FROM THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, THE SLEEVE CAN HIT THE ADJACENT STRUCTURES AND DAMAGE CAN OCCUR.

(8) Do these steps to remove the sleeve [21]:

(a) Do these steps to re-tape the two upper and lower blocker doors:

NOTE: The upper and lower blocker doors overlap the fixed structure. The upper blocker door must be taped so that it will stay partially open. No tape is necessary on the lower blocker door. The remaining three blocker doors should be taped against the wall.

1) Remove the tape from the upper and lower blocker doors.

2) Cut a new piece of speed tape approximately 15 inches (380 mm) long.

3) Put 5 inches of one end of the tape on the upper blocker door.

4) Put 5 inches of the other end of the tape on the outer wall of the fan duct.

5) Put another piece of speed tape perpendicular to and over the tape on the outer wall of the fan duct.

(b) Manually push the sleeve aft approximately 15 inches (381 mm).

NOTE: If the sleeve is moved aft before the boom hoist is attached to the sling, there will be less distance that the boom hoist has to be moved with it attached to the sleeve. The boom hoist is easier to move before it is attached to the sleeve.

NOTE: The dimension that the sleeve extends aft to the completely extended position is approximately 21.5 inches (546 mm).

(c) Do these steps to attach the sling assembly to the hoist (Figure 403):

1) If using hoist, SPL-2527, move the boom hoist into position to attach the master link on the top position on the sling.
2) If using boom hoist, SPL-2430, move the boom hoist so that the holes in the adapter assembly align with the holes in the lower attach bracket on the sling (View D).
   a) Install the two lockpins.
   b) Install a retention pin in the end of each of the lockpins.

(d) Make sure that the full weight of the sleeve [21] is held by the boom hoist.

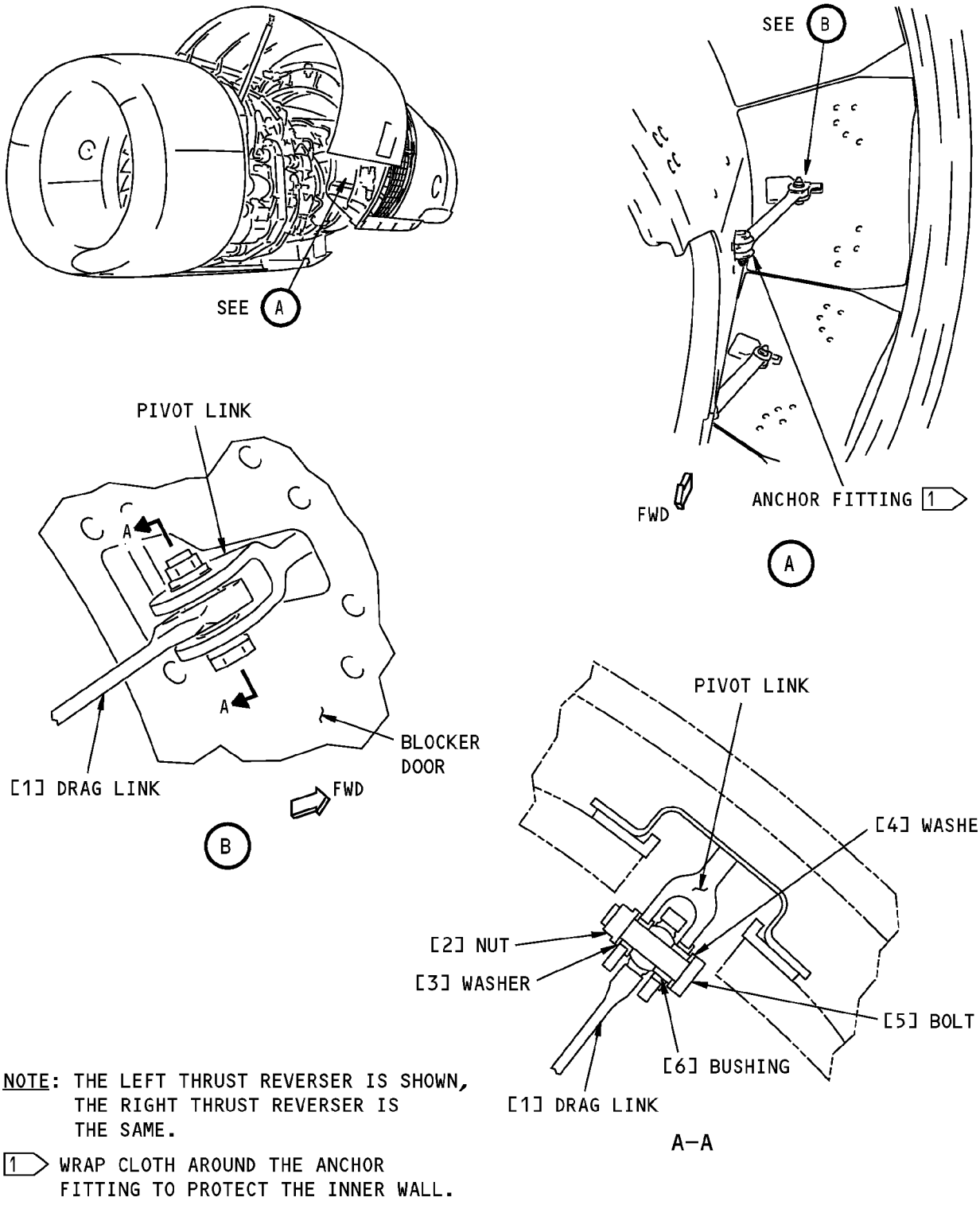
(e) Manually push the sleeve [21] aft and off the tracks.

(f) Put the sleeve [21] on a suitable pallet.

SUBTASK 78-31-02-210-001-F00

(9) Examine the "Rulon J" material on the main and auxiliary sliders, do this task: Main Slider and Auxiliary Slider Inspection, TASK 78-31-02-200-802-F00.

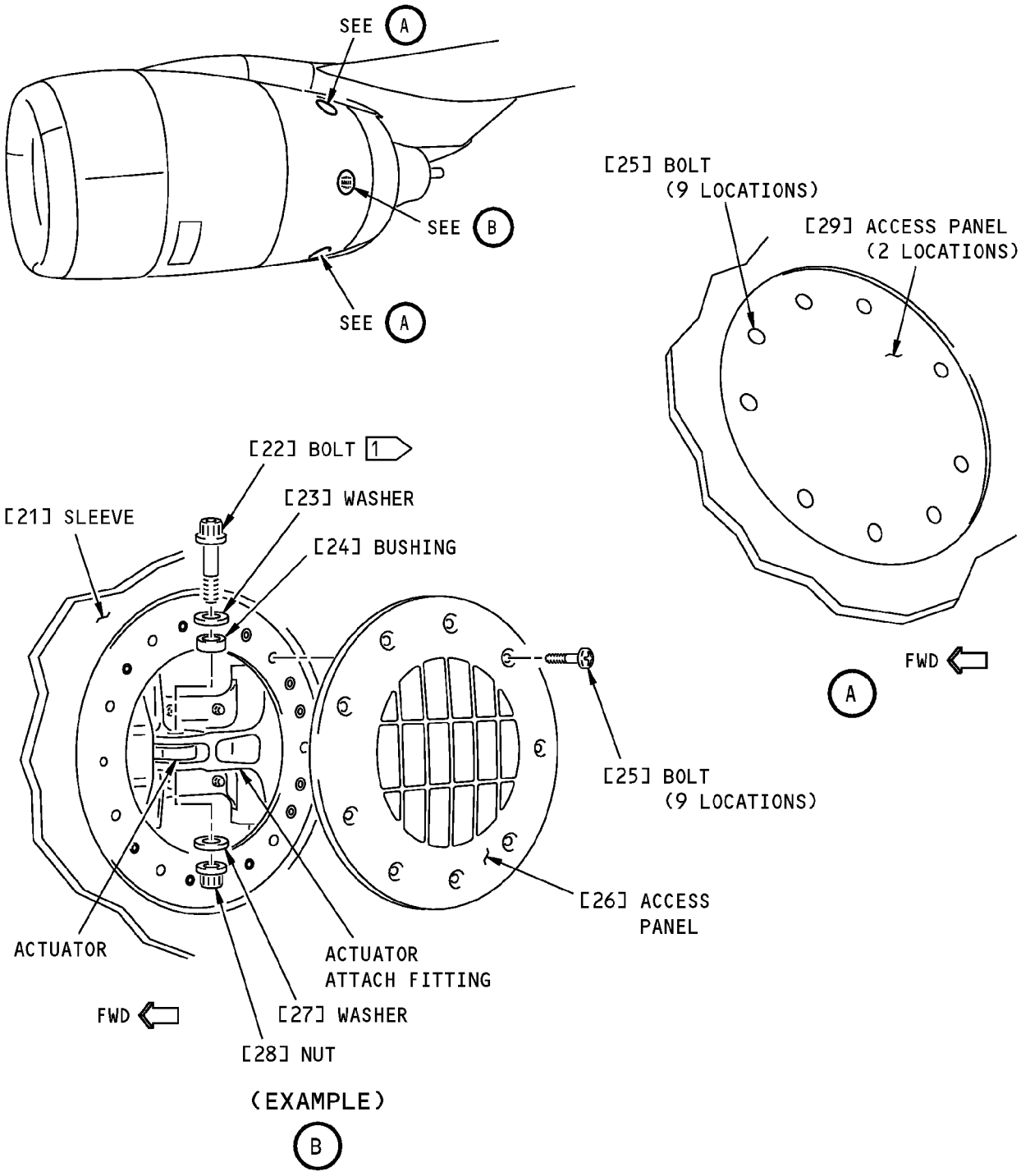
——————— END OF TASK ———————



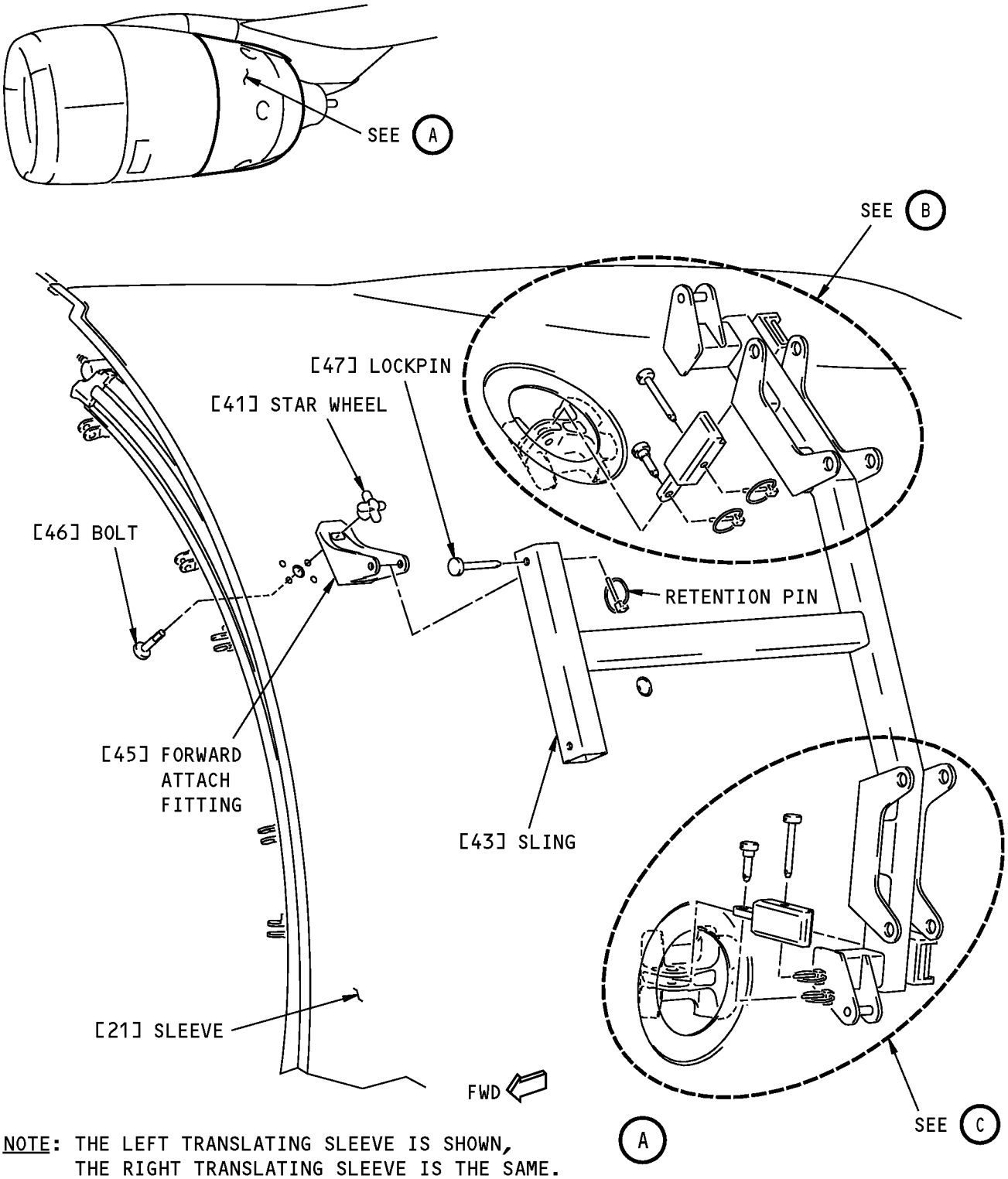
NOTE: THE LEFT THRUST REVERSER IS SHOWN, THE RIGHT THRUST REVERSER IS THE SAME.

1 WRAP CLOTH AROUND THE ANCHOR FITTING TO PROTECT THE INNER WALL.

Drag Link Installation
Figure 401/78-31-02-990-801-F00

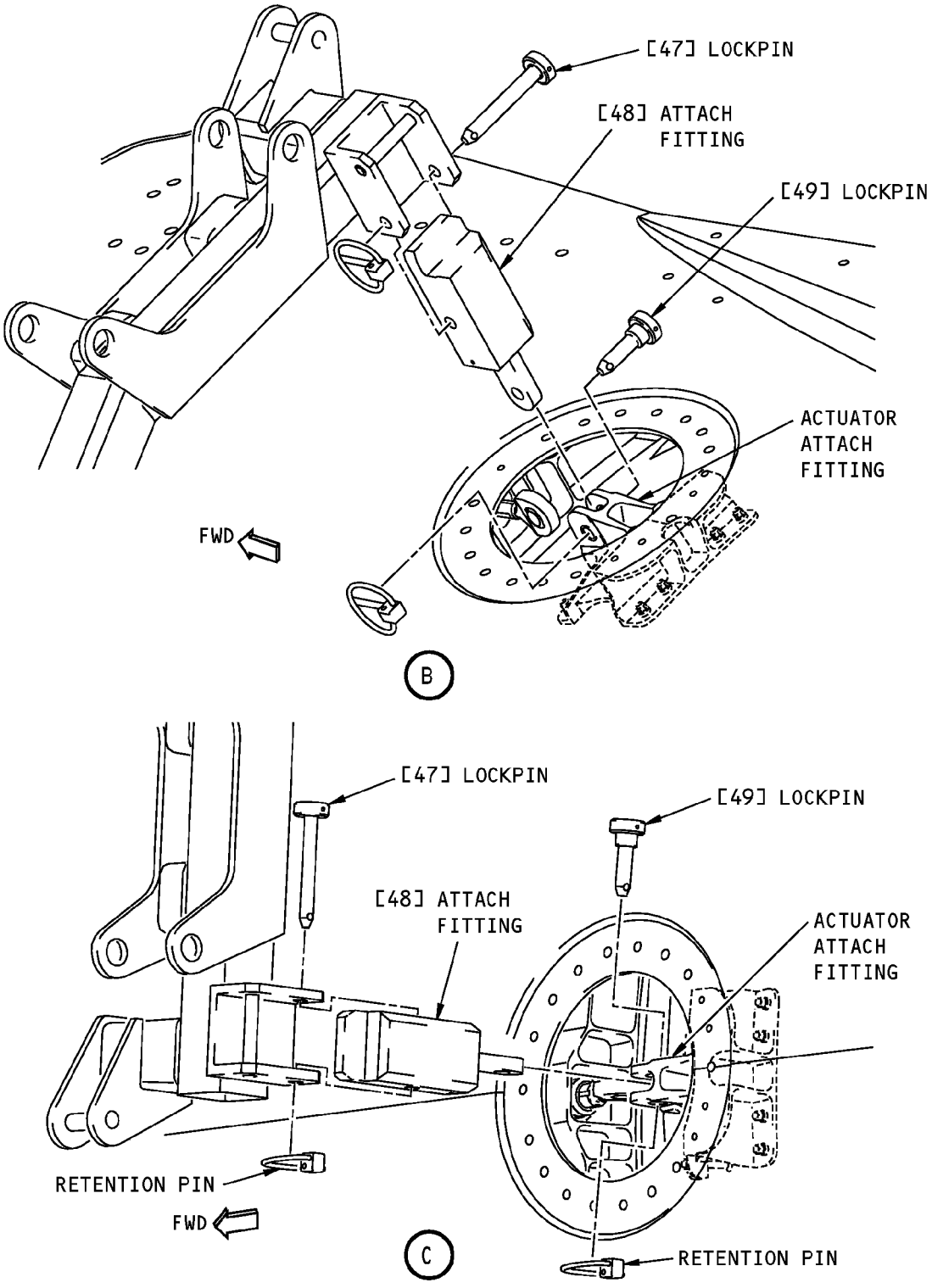


Hydraulic Actuator Rod End Installation
Figure 402/78-31-02-990-802-F00

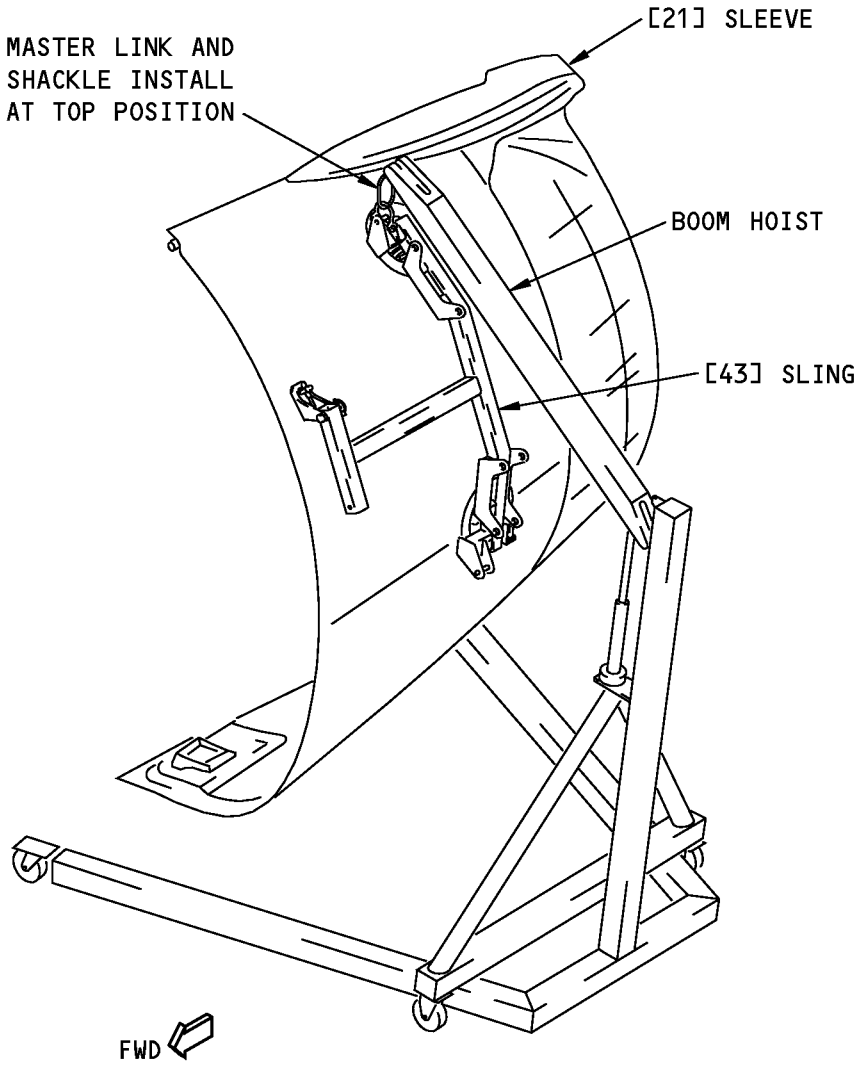


NOTE: THE LEFT TRANSLATING SLEEVE IS SHOWN, THE RIGHT TRANSLATING SLEEVE IS THE SAME.

Translating Sleeve Sling Installation
Figure 403 (Sheet 1 of 4)/78-31-02-990-803-F00



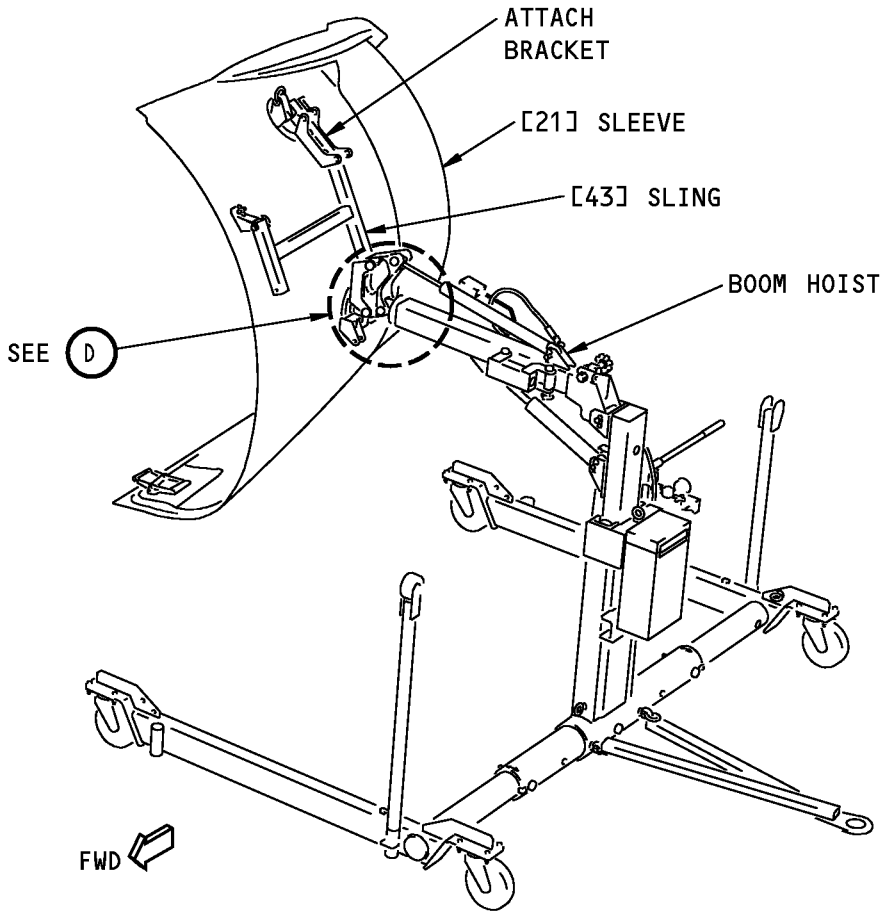
Translating Sleeve Sling Installation
Figure 403 (Sheet 2 of 4)/78-31-02-990-803-F00



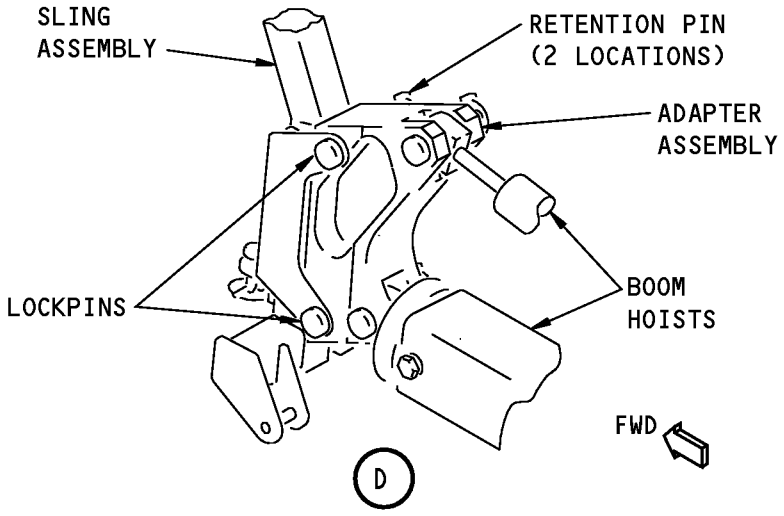
SLING ASSEMBLY (C78022) WITH BOOM HOIST (A20001)

G82876 S0006583320_V2

Translating Sleeve Sling Installation
Figure 403 (Sheet 3 of 4)/78-31-02-990-803-F00



SLING ASSEMBLY (C78022) WITH THRUST
REVERSER BOOM HOIST (C78026)



H76281 S0006583321_V2

Translating Sleeve Sling Installation
Figure 403 (Sheet 4 of 4)/78-31-02-990-803-F00

TASK 78-31-02-400-802-F00

3. Translating Sleeve Installation

(Figure 401), (Figure 402), (Figure 403)

A. General

(1) This task is for the installation of the translating sleeve on the left or right thrust reverser on an engine.

(2) For this task the translating sleeve will be referred to as the sleeve.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-02-990-807-F00	Figure: Thrust Reverser Attach Fitting Inspection (P/B 601)
78-31-09-010-801-F00	Krueger Flap Deflector and Fairing Removal (P/B 401)
78-31-09-420-801-F00	Krueger Flap Deflector and Fairing Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-2428	Sling - Thrust Reverser Sleeve, CFM56-7 Engine (Part #: C78022-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2430	Hoist - Boom, Ground Based (Part #: C78026-156, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
A00803	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type I

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Sleeve	78-31-02-01-365	HAP ALL
		78-31-02-01-366	HAP ALL

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Access Panels

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

H. Translating Sleeve Installation

SUBTASK 78-31-02-210-003-F00

(1) Do these steps to examine the tracks and track liners for damage and contamination:

(a) Look for contamination in the tracks.

1) Clean all contamination from the tracks.

(b) Look for gouges and scratches.

1) If there are scratches or gouges, do the inspection check in this reference (CMM 78-31-37).

SUBTASK 78-31-02-860-003-F00

(2) If you install a new sleeve on the thrust reverser, make sure that the Krueger flap deflector and fairing, and the plugs are in the correct location:

(a) For the inboard sleeve, make sure that the Krueger flap deflector and fairing are installed.

(b) For the outboard sleeve, make sure that the plugs are installed in the mounting holes.

(c) If it is necessary to remove or install the Krueger flap deflector and fairing or the plugs, do the applicable task.

These are the tasks:

- Krueger Flap Deflector and Fairing Removal, TASK 78-31-09-010-801-F00
- Krueger Flap Deflector and Fairing Installation, TASK 78-31-09-420-801-F00.

SUBTASK 78-31-02-420-001-F00

(3) If not already done, do the steps in the removal task to install the sling [43] thrust reverser sleeve sling, SPL-2428, on the sleeve and attach the boom hoist.

SUBTASK 78-31-02-420-005-F00

CAUTION: MAKE SURE THAT THE LOWER BLOCKER DOOR IS NOT TAPED, THE UPPER BLOCKER DOOR IS TAPED SO THAT IT WILL STAY IN THE PARTIALLY OPEN POSITION AND THAT THE REMAINING BLOCKER DOORS ARE TAPED AGAINST THE WALL OF THE SLEEVE AND THAT THE FREE END OF EACH DRAG LINK IS AGAINST THE INNER WALL OF THE FAN DUCT. IF THE FREE END OF THE DRAG LINKS HIT THE SLEEVE, DAMAGE TO THE SLEEVE, THE BLOCKER DOORS AND THE DRAG LINK CAN OCCUR.

(4) Do these steps to prepare the sleeve for installation:

(a) Make sure that the free end of each drag link is taped to the inner wall and that they will not hit the sleeve.

(b) Make sure that the upper blocker door is taped so that it will stay partially open, the lower blocker door is not taped and that the remaining blocker doors are taped against the wall of the sleeve.

NOTE: The upper and lower blocker doors overlap the fixed structure. The upper blocker door must be taped so that it will stay partially open. No tape is necessary on the lower blocker door.

1) If not done, do the steps in the removal task to re-tape the upper blocker door.

SUBTASK 78-31-02-420-002-F00

CAUTION: MAKE SURE THAT THE UPPER AND LOWER SLIDERS ARE ALIGNED WITH THE TRACKS BEFORE YOU TRY TO MOVE THE SLEEVE. MAKE SURE THAT THE TOP AND BOTTOM OF THE SLEEVE MOVE TOGETHER AS YOU MOVE THE SLEEVE ALONG THE TRACKS. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE "RULON J" CAN OCCUR.

(5) Do these steps to install the sleeve [21] on the thrust reverser (Figure 403):

(a) Lift the sleeve [21] with the boom hoist and move it into its position at the rear of the thrust reverser.

(b) Align the sliders on the sleeve [21] with the tracks on the hinge and latch beam.

(c) Engage the sliders in the tracks and push the sleeve [21] forward until the actuator rod ends will align with the actuator attach fittings on the sleeve.

1) Make sure that the top and bottom of the sleeve [21] move together.

SUBTASK 78-31-02-080-001-F00

WARNING: BE CAREFUL WHEN YOU DISCONNECT THE SLING ASSEMBLY. THE SLING WEIGHS 225 POUNDS (102 KG) INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULS OCCUR.

(6) Do these steps to remove the sling from the sleeve [21].

(a) Remove the lockpins that attach the GSE attach fittings [48] and forward attach fitting [45] to the sling.

1) Remove a lockpin [47] from the each of the two attach fittings [48].

2) Remove the lockpin [47] from the forward attach fitting [45].

(b) Remove the sling from the area.

(c) Remove the two lockpins that attach the adapter assembly on the boom hoist, SPL-2430 to the sling.

(d) Remove the attach fittings from the translating sleeve:

1) Remove the lockpins [49] that attach the two attach fittings [48] to the actuator attach fittings on the sleeve.

2) Remove the star wheel [41] and bolt [46] that attaches the forward attach fitting [45] to the sleeve.

(e) Put the sling [43], two attach fittings [48], forward attach fitting [45], star wheel [41] and bolt [46] in the storage box.

SUBTASK 78-31-02-420-003-F00

CAUTION: WHEN YOU PULL ON THE ROD END OF THE HYDRAULIC ACTUATOR, DO NOT LET THE ROD END TURN. IF THE ROD END TURNS, IT CAN AFFECT THE RIGGING OF THE HYDRAULIC ACTUATOR.

(7) Do these steps to connect the three actuator rod ends to the actuator attach fittings on the sleeve [21] (Figure 402):

(a) Make sure the actuator attach fittings have a wear spacer installed (Figure 78-31-02-990-807-F00).

1) If a wear spacer is not installed:

a) Attach a .060 inch x 1.6 inch x 3.2 inch Rulon J wear spacer into place with sealant, A00803.

b) Seal around the edge of the fitting and inner sleeve.

(b) Pull the actuator rod end by hand to align it with the clevis on the attach fitting.

(c) Install the bolt [22], washer [23], bushing [24], washer [27] and nut [28] to attach the rod end.

1) Tighten the nut [28] to 370-690 pound-inches (41.8-78.0 Newton Meters).

SUBTASK 78-31-02-410-002-F00

(8) Install nine bolts [25] in the applicable access panels [26] and [29]:

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

SUBTASK 78-31-02-410-003-F00

(9) Tighten the bolts [25] to 30-50 pound-inches (3.4-5.7 Newton meters).

SUBTASK 78-31-02-980-003-F00

CAUTION: MAKE SURE THAT THE BLOCKER DOORS ARE TAPED AGAINST THE WALL OF THE SLEEVE AND THAT THE FREE END OF THE DRAG LINKS ARE AGAINST THE INNER WALL OF THE FAN DUCT. IF THE FREE ENDS OF THE DRAG LINKS HIT THE SLEEVE, DAMAGE TO THE SLEEVE, THE BLOCKER DOORS AND THE DRAG LINKS CAN OCCUR.

(10) Manually extend the sleeve approximately 10 inches (254 mm), do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

SUBTASK 78-31-02-010-004-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(11) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-02-420-004-F00

(12) Do these steps to attach the drag links to the blocker doors (Figure 401):

(a) Remove the tape from the blocker doors and drag links.

(b) Remove the tie strap that holds the ball in the spherical bearing.

(c) Align the drag link with the pivot link on the blocker door.

(d) Install the bolt [5], washers [3] and [4], bushing [6], and nut [2].

1) Tighten the nut [2] to 160-240 pound-inches (18.1-27.1 Newton meters).

SUBTASK 78-31-02-410-004-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER, BUT DO NOT DO THE THRUST REVERSER OR LEADING EDGE ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(13) Close and latch the thrust reverser, but, do not do the thrust reverser or leading edge activation at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-02-980-004-F00

(14) Manually translate the sleeve through an extend and retract cycle Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(a) Make sure that the sleeve [21] moves smoothly.

SUBTASK 78-31-02-440-001-F00

(15) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-02-710-001-F00

(16) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Operate the thrust reverser through an extend and retract cycle two times to make sure that it operates correctly.

I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-02-410-005-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-02-440-002-F00

(2) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

——————— END OF TASK ———————

TRANSLATING SLEEVE - INSPECTION/CHECK

1. General

A. This procedure has these tasks:

(1) A task to examine the outer-skin-panel and the inner-acoustic-panel on the translating sleeve for damage.

(2) A task to examine the shoe assembly on the main slider and the rulon J on the auxiliary slider when the translating sleeve is removed from the thrust reverser.

(3) A task to examine the thrust reverser attach fitting.

TASK 78-31-02-200-801-F00

2. Translating Sleeve Inspection

(Figure 601)

A. General

(1) This task examines the outer-skin-panel and the inner-acoustic-panel on the translating sleeve for damage.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SRM 54-30-01	Structural Repair Manual

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Inspection

SUBTASK 78-31-02-860-005-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE THRUST REVERSER THAT IS NEAR THE LEADING EDGE FLAPS AND SLATS OR BEFORE YOU OPEN THE LEFT OR THE RIGHT THRUST REVERSER ON AN ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-02-040-003-F00

(2) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-02-040-004-F00

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

(3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

E. Translating Sleeve Outer-Skin-Panel Inspection

SUBTASK 78-31-02-210-004-F00

(1) Examine the outer-skin-panel on the translating sleeve for the damage that follows:

(a) Holes, cracks, nicks, gouges, delamination, dents and edge corrosion.

1) Cracks in the paint layer that do not affect the sealant or the structure of the panel are acceptable.

2) If you find damage, refer to the SRM 54-30-01 for the permitted limits and repair procedures.

F. Translating Sleeve Inner-Acoustic-Panel Inspection

SUBTASK 78-31-02-210-005-F00

(1) Look through the aft end of the fan duct to examine the aft end of the inner-acoustic-panel on the translating sleeve for the damage that follows:

(a) Holes, cracks, nicks, gouges, delamination, dents and edge corrosion.

1) Cracks in the paint layer that do not affect the sealant or the structure of the panel are acceptable.

2) If you find damage, refer to the SRM 54-30-01 for the permitted limits and repair procedures.

(b) Pitting in the surface layer (small areas where the surface appears chipped away around the perforation of the acoustic panel) (Figure 602).

NOTE: This pitting can occur during the usual manufacturing process of the acoustic panel. This condition has been inspected and approved for in-service use at the time of manufacture.

1) No action is necessary with the following conditions:

a) The surface area adjacent to each pitting location has the original silver finish and does not show the black panel material.

b) There are no signs of edge erosion.

SUBTASK 78-31-02-010-006-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-02-210-006-F00

(3) Look through the forward end of the fan duct to examine the forward end of the inner-acoustic-panel on the translating sleeve for the damage that follows:

(a) Holes, cracks, nicks, gouges, delamination, dents and edge corrosion.

1) Cracks in the paint layer that do not affect the sealant or the structure of the panel are acceptable.

2) If you find damage, refer to the SRM 54-30-01 for the permitted limits and repair procedures.

(b) Pitting in the surface layer (small areas where the surface appears chipped away around the perforation of the acoustic panel) (Figure 602)

NOTE: This pitting can occur during the usual manufacturing process of the acoustic panel. This condition has been inspected and approved for in-service use at the time of manufacture.

1) No action is necessary with the following conditions:

a) The surface area adjacent to each pitting location has the original silver finish and does not show the black panel material.

b) There are no signs of edge erosion.

G. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-02-410-008-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

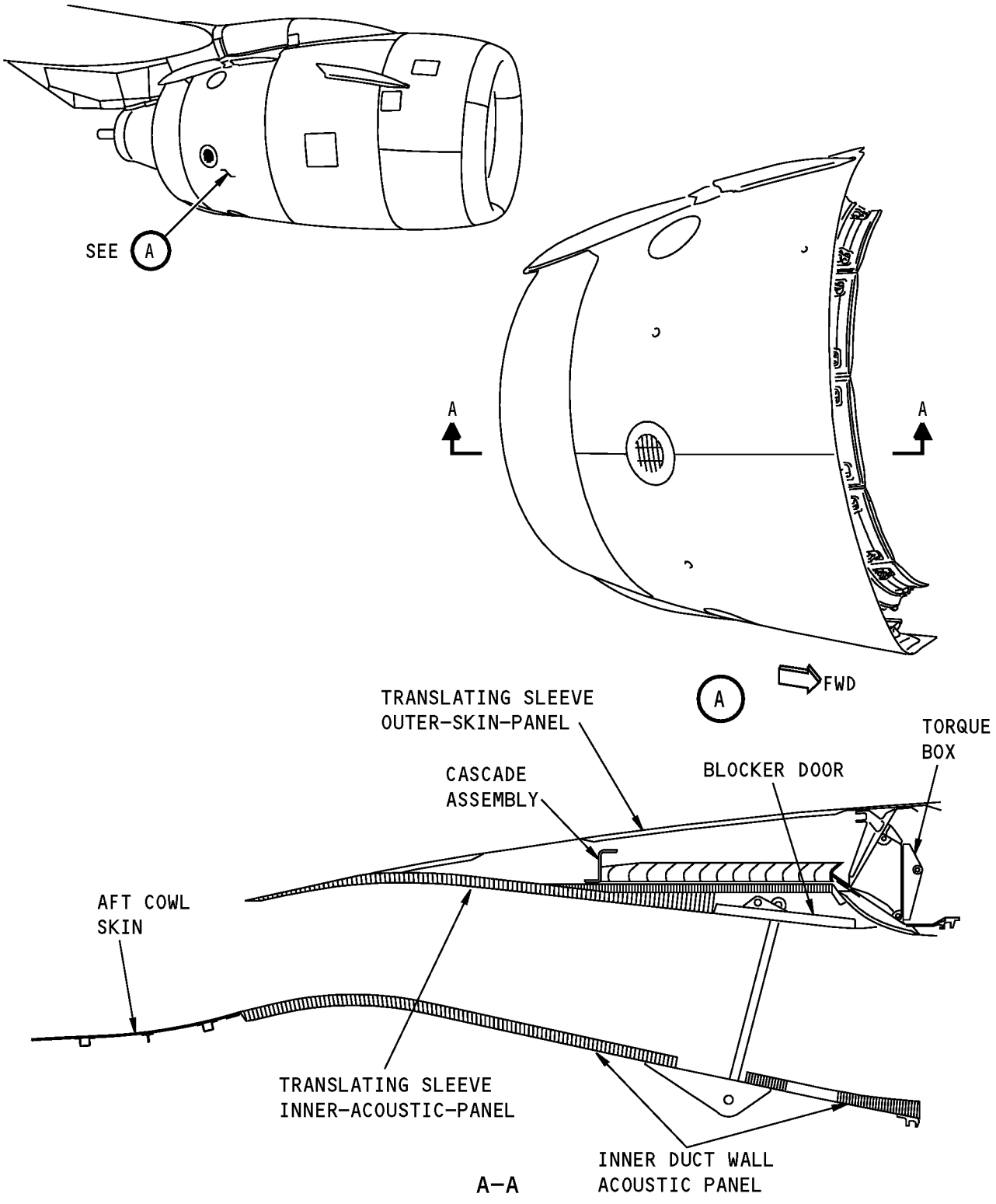
SUBTASK 78-31-02-440-003-F00

(2) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

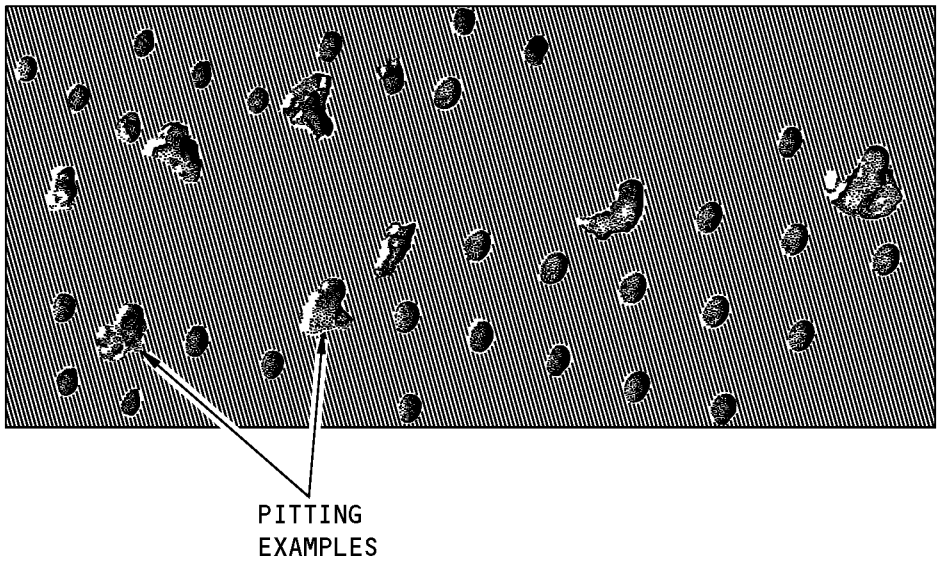
SUBTASK 78-31-02-440-004-F00

(3) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

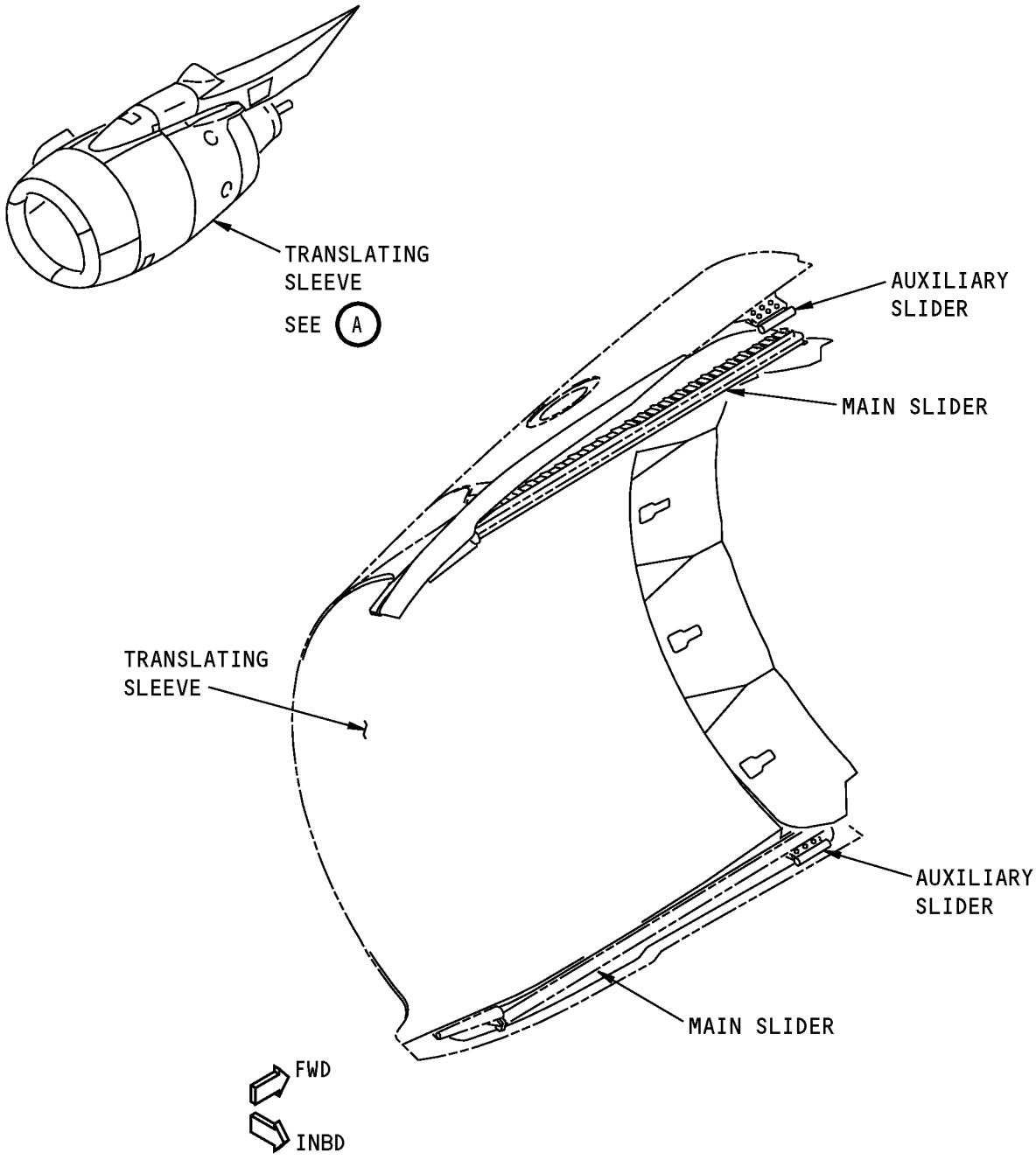
END OF TASK



Translating Sleeve Inspection
Figure 601/78-31-02-990-804-F00



Translating Sleeve Inner-Acoustic-Panel Inspection
Figure 602/78-31-02-990-806-F00



TRANSLATING SLEEVE

A

Main Slider and Auxiliary Slider Inspection
Figure 603/78-31-02-990-805-F00

TASK 78-31-02-200-802-F00

3. Main Slider and Auxiliary Slider Inspection

(Figure 603)

A. General

(1) This task examines the rulon J on the auxiliary slider and on the shoe assembly that is installed on the main slider, when the translating sleeve is removed.

B. References

Reference	Title
78-31-02-000-802-F00	Translating Sleeve Removal (P/B 401)
78-31-02-400-802-F00	Translating Sleeve Installation (P/B 401)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Inspection

SUBTASK 78-31-02-010-007-F00

(1) Do this task: Translating Sleeve Removal, TASK 78-31-02-000-802-F00.

SUBTASK 78-31-02-210-009-F00

(2) Examine the Rulon J on the auxiliary slider and on the shoe assembly that is installed on the main slider for the damage that follows:

(a) Obvious damage, wear through the tape thickness, and disbonding.

1) If you find damage, refer to the Components Maintenance Manual (CMM 78-31-24) for the permitted limits and repair procedures.

SUBTASK 78-31-02-010-008-F00

(3) Do this task: Translating Sleeve Installation, TASK 78-31-02-400-802-F00.

——————— END OF TASK ———————

TASK 78-31-02-200-803-F00

4. Thrust Reverser Attach Fitting Inspection

(Figure 604)

A. General

(1) This task gives the instructions for a visual inspection of the thrust reverser attach fitting assemblies for the hydraulic actuators.

(a) The thrust reverser attach fitting assemblies are installed on the translating sleeve.

(b) There are three (3) attach fittings per thrust reverser half.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Access Panels

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

E. Prepare for the Inspection

SUBTASK 78-31-02-040-006-F00

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (TASK 78-31-00-040-802-F00).

SUBTASK 78-31-02-010-009-F00

(2) Do these steps to remove the access door for the applicable actuator:

(a) To remove the upper actuator access doors [2], remove the nine bolts [1].

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

(b) To remove the middle actuator access doors [2], remove the nine bolts [1].

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

(c) To remove the lower actuator access doors [2], remove the nine bolts [1].

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

F. Procedure

SUBTASK 78-31-02-212-001-F00

(1) Examine the applicable thrust reverser attach fitting for damage:

(a) Cracks are not permitted

(b) Nicks are not permitted

(c) Dents are not permitted

(d) Scratches are not permitted

(e) If the wear spacer [3] is present:

1) Tears are not permitted

2) Holes are not permitted

3) Disbonds not permitted

4) Thickness reduction not permitted.

SUBTASK 78-31-02-869-001-F00

(2) If damage is found on the fitting refer to Structural Repair Manual for the allowable damage limits (SRM 54-30-90).

(a) Replace the fitting if it is more than the allowable damage limits.

1) Do this task: Actuator Fitting Removal, Task CMM 78-31-24.

2) Do this task: Actuator Fitting Installation, Task CMM 78-31-24.

(b) If damage is found on the wear spacer [3] refer to CMM 78-31-24 for the allowable damage limits.

1) Remove and replace the wear spacer [3], if more than the allowable damage limits, per CMM 78-31-24.

G. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-02-410-009-F00

(1) Do these steps to install the access door for the applicable actuator:

(a) For the upper actuator, put the access doors [2] in the correct position to align the bolt holes.

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

(b) For the middle actuator, put the access doors [2] in the correct position to align the bolt holes.

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

(c) For the lower actuator, put the access doors [2] in the correct position to align the bolt holes.

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

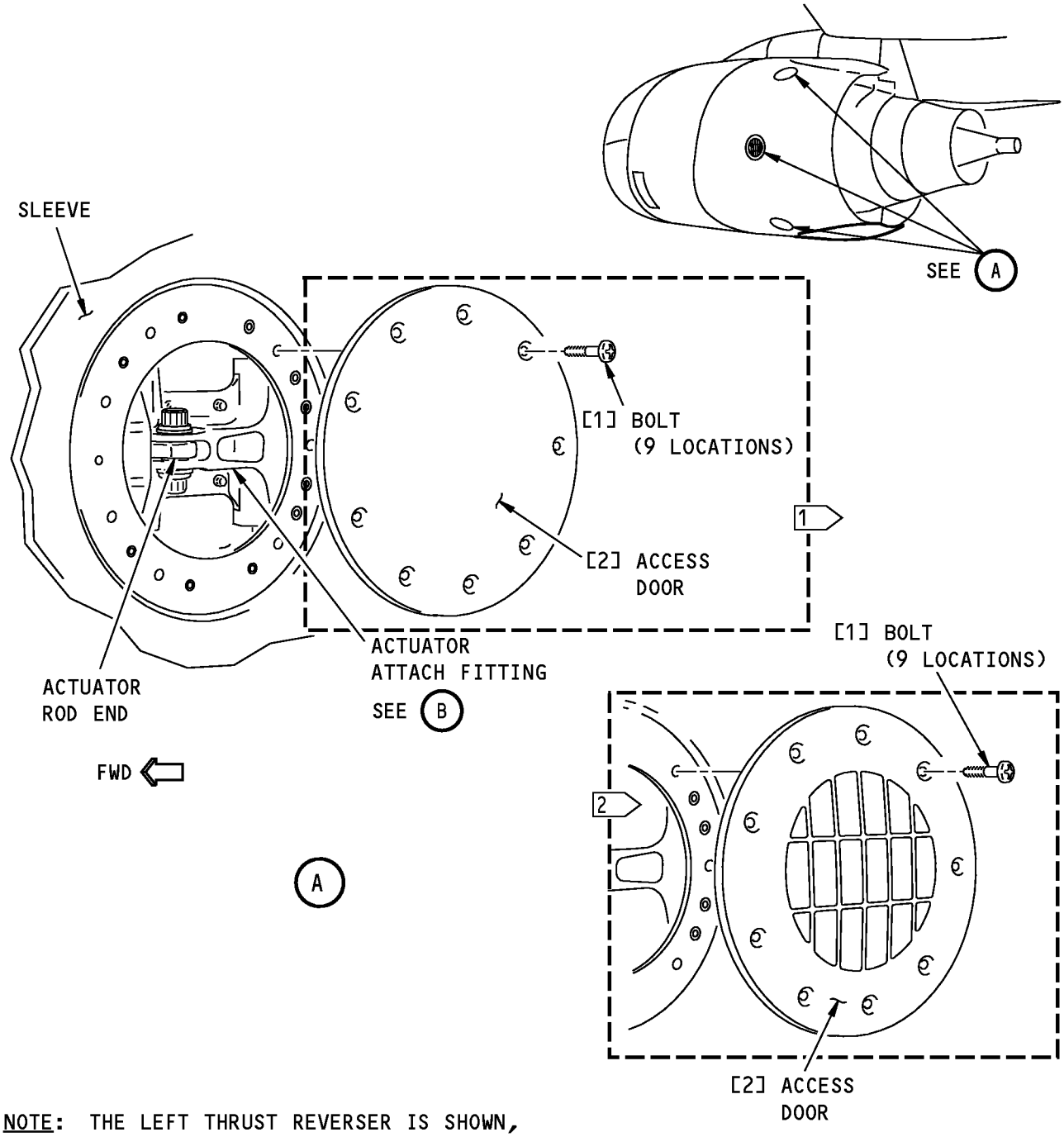
(d) Install the nine bolts [1] to attach the applicable access door [2].

1) Tighten the bolts [1] to 30-50 pound-inches (3.4-5.7 Newton meters).

SUBTASK 78-31-02-440-006-F00

(2) Do the activation procedure for the thrust reverser (TASK 78-31-00-440-803-F00).

——————— END OF TASK ———————



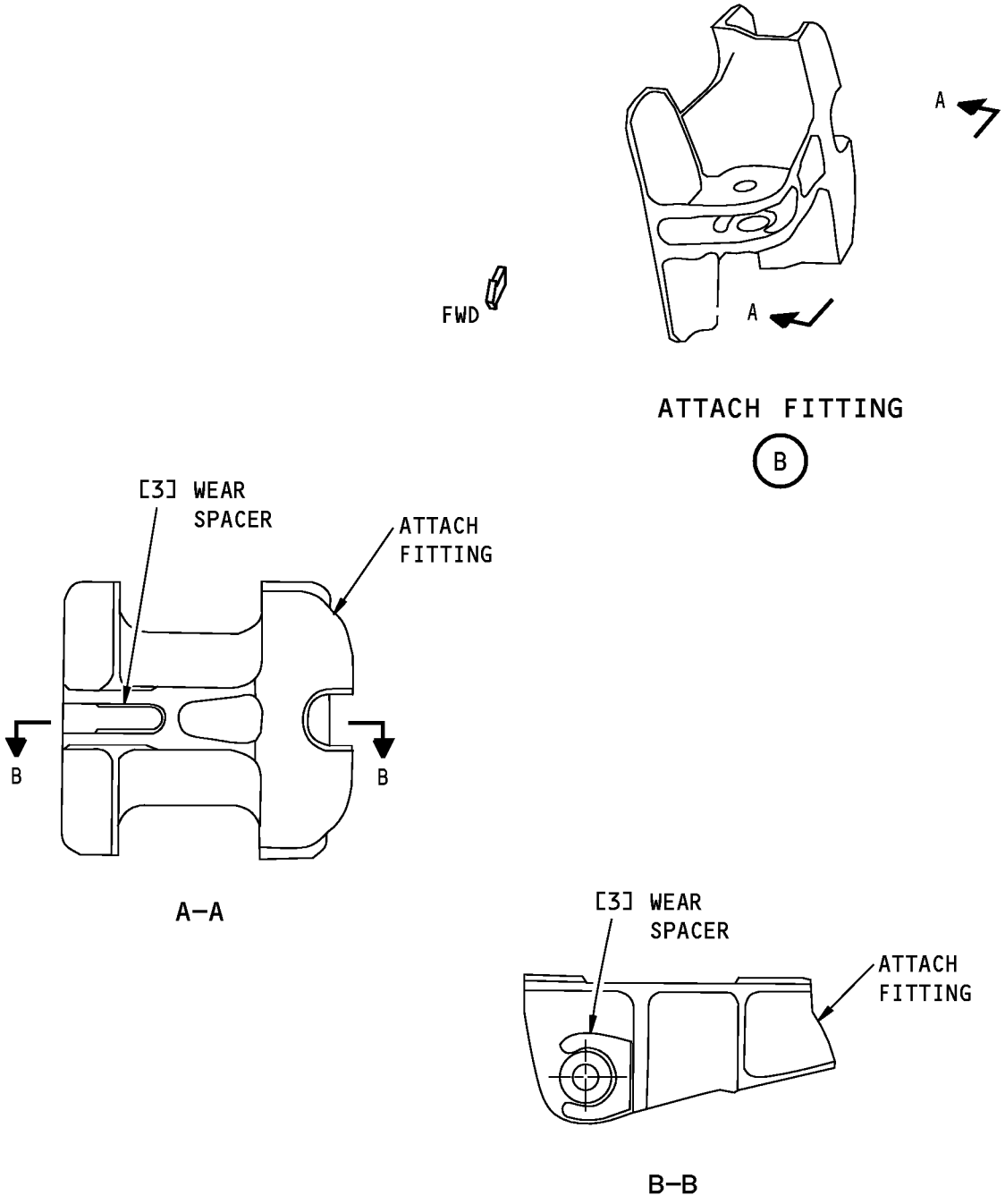
NOTE: THE LEFT THRUST REVERSER IS SHOWN,
THE RIGHT THRUST REVERSER IS THE SAME.

1 > UPPER AND LOWER ACCESS DOOR

2 > MIDDLE ACCESS DOOR

1566561 S0000290423_V2

Thrust Reverser Attach Fitting Inspection
Figure 604 (Sheet 1 of 2)/78-31-02-990-807-F00



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Thrust Reverser Attach Fitting Inspection
Figure 604 (Sheet 2 of 2)/78-31-02-990-807-F00

THRUST REVERSER HYDRAULIC ACTUATORS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) Thrust reverser hydraulic actuator removal (selection).

(2) Thrust reverser hydraulic actuator installation (selection).

(3) The removal of a upper locking hydraulic actuator.

(4) The installation of a upper locking hydraulic actuator.

(5) The removal of a middle hydraulic actuator.

(6) The installation of a middle hydraulic actuator.

(7) The removal of a lower hydraulic actuator.

(8) The installation of a lower hydraulic actuator.

TASK 78-31-03-000-804-F00

2. Thrust Reverser Hydraulic Actuator Removal (Selection)

A. Procedure

SUBTASK 78-31-03-020-042-F00

(1) Do the procedure for the applicable thrust reverser hydraulic actuator:

(a) Do this task:Upper Locking Hydraulic Actuator Removal, TASK 78-31-03-000-801-F00.

(b) Do this task:Middle Hydraulic Actuator Removal, TASK 78-31-03-000-802-F00.

(c) Do this task:Lower Hydraulic Actuator Removal, TASK 78-31-03-000-803-F00.

———————— END OF TASK ————————

TASK 78-31-03-400-804-F00

3. Thrust Reverser Hydraulic Actuator Installation (Selection)

A. Procedure

SUBTASK 78-31-03-420-028-F00

(1) Do the procedure for the applicable thrust reverser hydraulic actuator:

(a) Do this task: Upper Locking Hydraulic Actuator Installation, TASK 78-31-03-400-801-F00.

(b) Do this task: Middle Hydraulic Actuator Installation, TASK 78-31-03-400-802-F00.

(c) Do this task: Lower Hydraulic Actuator Installation, TASK 78-31-03-400-803-F00.

———————— END OF TASK ————————

TASK 78-31-03-000-801-F00

4. Upper Locking Hydraulic Actuator Removal

(Figure 401)

A. General

(1) This task is for the removal of the upper locking hydraulic actuator.

(2) There are three hydraulic actuators on each torque box of the left and right thrust reversers on an engine.

(3) The upper hydraulic actuator is a locking actuator, the middle and lower hydraulic actuators are non-locking actuators.

(4) The upper locking hydraulic actuator will be referred to as the upper locking actuator for this task.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2439	Tool - Actuator, Installation/Removal (Part #: C78025-21, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Consumable Materials

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

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

G. Prepare for the Removal

SUBTASK 78-31-03-040-001-F00

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

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-03-860-002-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE THRUST REVERSER THAT IS NEAR THE LEADING EDGE FLAPS AND SLATS OR BEFORE YOU OPEN THE LEFT OR THE RIGHT THRUST REVERSER ON AN ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-03-040-031-F00

(3) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-03-040-002-F00

(4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(a) For Engine 1, System A.

(b) For Engine 2, System B.

SUBTASK 78-31-03-040-003-F00

(5) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 78-31-03-040-004-F00

(6) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 78-31-03-040-005-F00

(7) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-03-040-006-F00

(8) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-03-010-001-F00

(9) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-31-03-010-002-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES. WHEN THE THRUST REVERSER IS OPENED TO THE 45 DEGREE OPEN POSITION TO REMOVE THE ACTUATOR, THE THRUST REVERSER WILL TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(10) Do these steps to expose the gimbal pins and to prepare for the use of the actuator removal and installation tool:

NOTE: The thrust reverser sleeve must be extended to remove the gimbal pins from the aft side of the torque box and to use the actuator removal and installation tool.

(a) For the inboard thrust reverser sleeve, do these steps to manually extend the thrust reverser sleeve:

1) Manually extend the thrust reverser sleeve no more than 10.0 inches (254.0 mm) from the forward edge of the torque box.

a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard thrust reverser sleeve, manually extend the thrust reverser sleeve to the fully extended position.

NOTE: The outboard thrust reverser sleeve will not touch the leading edge of the wing and if the sleeve is fully extended, the tool will be easier to use.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

SUBTASK 78-31-03-020-001-F00

WARNING: WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE OPEN PORTS OF THE COMPONENT OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS CAN OCCUR.

CAUTION: DO NOT LET HYDRAULIC FLUID GET ON THE THRUST REVERSER OR ENGINE COMPONENTS. IMMEDIATELY CLEAN A COMPONENT IF HYDRAULIC FLUID GETS ON IT. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE EQUIPMENT.

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(11) Do these steps to drain the hydraulic fluid from the hydraulic lines (View G):

NOTE: To decrease hydraulic fluid spray when the coupling nuts are loosened, wrap cotton wiper, G00034, around the wrench, nut and hydraulic line.

(a) Wrap cotton wiper, G00034, around the electrical connector on the sync lock receptacle on the lower actuator.

NOTE: The cloth will catch the hydraulic fluid and prevent damage to the electrical connector.

(b) Loosen the two bolts on each of the two clamp blocks that hold the lower hydraulic retract line.

NOTE: To remove the sleeve fitting on the hydraulic retract line from the actuator port, the hydraulic retract line must be carefully flexed. If the clampblocks are loose, the hydraulic retract line can be flexed easier.

(c) Disconnect the hydraulic retract line at the lower actuator.

1) Carefully remove the sleeve fitting on the hydraulic retract line from the actuator port.

2) let the hydraulic fluid drain into a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

(d) Disconnect the coupling nut on the sync shaft tubing at the lower actuator.

1) Let the hydraulic fluid drain into the 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

(e) Re-connect the coupling nut for the lower sync shaft to the lower actuator.

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.8 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.8 Newton meters).

(f) Re-connect the coupling nut for the lower retract line to the lower actuator.

1) Tighten the coupling nut to 256-283 pound-inches (28.9-32.1 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 256-283 pound-inches (28.9-32.1 Newton meters).

(g) Tighten the two bolts on each of the two clamp blocks that hold the lower hydraulic retract line.

1) Tighten the bolts to 30-35 pound-inches (3.4-4.0 Newton meters).

H. Upper Locking Actuator Removal

SUBTASK 78-31-03-020-002-F00

(1) Disconnect the electrical connectors from the LVDT receptacles on the upper locking actuator [1] (View C):

(a) For the left thrust reverser, disconnect the electrical connectors, D30072 and D30076.

(b) For the right thrust reverser, disconnect the electrical connectors, D30074 and D30078.

SUBTASK 78-31-03-020-003-F00

(2) Do these steps to remove the sleeve lock proximity sensor [8] from the upper locking actuator [1] (View C):

(a) Remove the jamnut [38] from the sleeve lock proximity sensor.

NOTE: It is necessary to remove only the jamnut adjacent to the target.

(b) Remove the sleeve lock proximity sensor [8] and key washer [39].

(c) Re-install the key washer [39] and jam nut [38] on the proximity sensor [8] for storage.

(d) Safety the sleeve lock proximity sensor [8] away from the actuator.

SUBTASK 78-31-03-980-008-F00

(3) Unlock the upper locking actuator (View B).

(a) Move the manual unlock lever [5] forward.

(b) Hold the manual unlock lever in the forward position as you push the detent pin in.

(c) Release the manual unlock lever.

SUBTASK 78-31-03-020-004-F00

(4) Do these steps to disconnect the hydraulic lines from the upper locking actuator [1] (View B and View C):

(a) Disconnect the extend line flexhose [7] from the upper extend port.

(b) Disconnect the retract line flexhose [6] from the upper retract port.

(c) Loosen the two bolts on the clamp block that holds the upper retract hydraulic line [2].

NOTE: To remove the sleeve fitting on the hydraulic retract line from the actuator port, the hydraulic retract line must be carefully flexed. If the clampblocks are loose, the hydraulic retract line can be flexed easier.

(d) Disconnect the retract hydraulic line [2] from the union [3].

1) Carefully remove the sleeve fitting on the upper hydraulic retract line from the actuator port.

(e) Disconnect the sync shaft tubing at the upper locking actuator.

1) Move the coupling nut and tube adapter back along the tubing to get access to the sync shaft end.

2) Flex the sync shaft to remove it from the internal splined port in the upper locking actuator [1].

CAUTION: DO NOT LET DIRT OR CONTAMINATION GET ON THE SYNC SHAFT. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

3) Remove the sync shaft.

a) Make sure that dirt or contamination does not get on the sync shaft.

(f) Remove the union [3] and packing [4] from the lower retract port (View B).

1) Keep the union [3] for the subsequent installation and discard the packing.

(g) Remove the union [9] and packing [10] from the upper retract port (View C).

1) Keep the union [9] for the subsequent installation and discard the packing.

(h) Install protective covers on the hydraulic lines and the actuator ports.

SUBTASK 78-31-03-020-034-F00

(5) Do these steps to remove the two gimbal pins [19] that attach the upper locking actuator [1] to the gimbal ring on the aft side of the torque box (View F):

(a) If you use the clamp assembly tool, SPL-2439 [42] to remove the gimbal pins [19], do these steps (View I):

NOTE: Use a 3/16-inch allen wrench to turn the clamp block screws [40] and use a 1/4-inch allen wrench to turn the adjustment screw [41].

1) If not already done, loosen the clamp block screws [40] sufficiently so that the clamp block will fit over the upper locking actuator [1].

2) Make sure that the adjustment screw [41] is retracted.

NOTE: The adjustment screw is on the forward end of the tool.

3) Tilt the aft end of the clamp assembly tool down and over the aft cascade support ring.

4) Lower the forward end of the clamp assembly tool until the clamp block engages the upper locking actuator [1].

5) Tighten the adjustment screw [41] to move the clamp block aft.

a) Move the clamp block until the aft edge touches where the diameter of the upper locking actuator [1] increases.

6) Tighten the clamp block screws [40].

7) Tighten the adjustment screw [41] to compress the fire seal [30] against the torque box.

(b) Remove a bolt [20] and washer [21] from each of the two gimbal pins [19].

1) Remove the two gimbal pins [19].

(c) If the clamp assembly tool, SPL-2439 [42] was used, loosen the adjustment screw [41] and clamp block screws [40] to remove the tool.

SUBTASK 78-31-03-010-003-F00

(6) Do these steps to remove the access door [15] and disconnect the rod end of the upper locking actuator [1] (View E):

(a) To remove the applicable access doors [15], remove the nine bolts [14].

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

(b) Remove the nut [17], bolt [11], washers [16] and [12], and bushing [13] that attach the rod end to the actuator attach fitting on the sleeve.

SUBTASK 78-31-03-010-013-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSER. MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE INBOARD THRUST REVERSER AS IT IS OPENED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Do these steps to get the necessary clearance to remove the upper locking actuator [1]:

(a) For the inboard thrust reverser, do these steps to open the thrust reverser:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause them to extend a small amount.

2) Monitor the position of the thrust reverser as it is opened to make sure that it does not touch the leading edge of the wing.

3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

(b) For the outboard thrust reverser, open the thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

NOTE: The outboard thrust reverser will not touch the leading edge of the wing.

SUBTASK 78-31-03-010-004-F00

CAUTION: WHEN YOU REMOVE THE UPPER LOCKING ACTUATOR, THE PUSH ROD WILL BE MOVED THOUGH AN OPENING IN THE AFT CASCADE SUPPORT RING AND THE TORQUE BOX. DO NOT LET THE PUSH ROD HIT THE AFT CASCADE SUPPORT RING OR THE TORQUE BOX, DAMAGE TO THE PUSH ROD CAN OCCUR.

(8) Carefully remove the upper locking actuator [1].

SUBTASK 78-31-03-020-006-F00

(9) After you remove the upper locking actuator [1], do these steps:

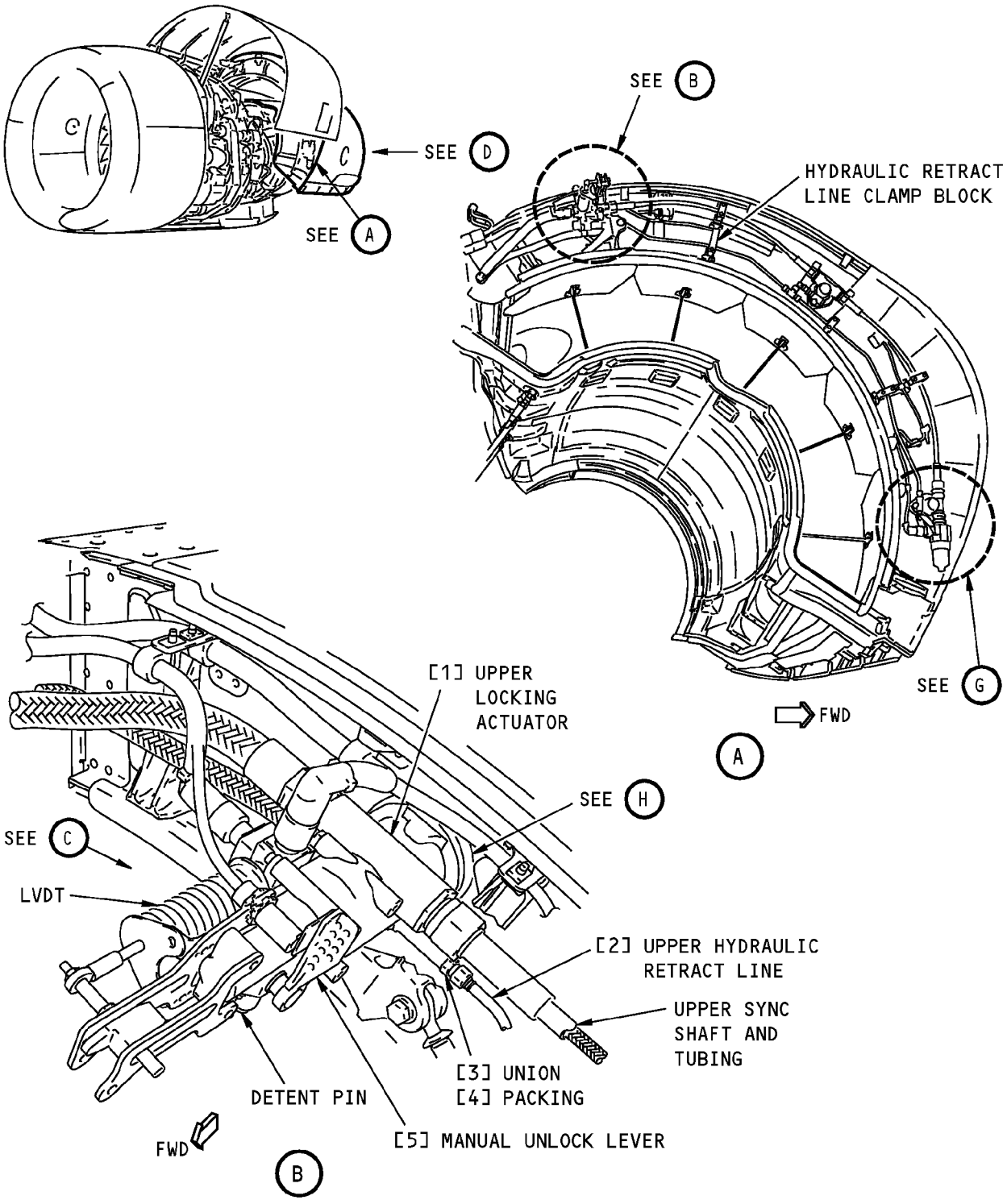
(a) Remove the fire shield [29] and the fire seal [30] from the upper locking actuator [1] (View H).

1) Examine the fire seal [30] for damage.

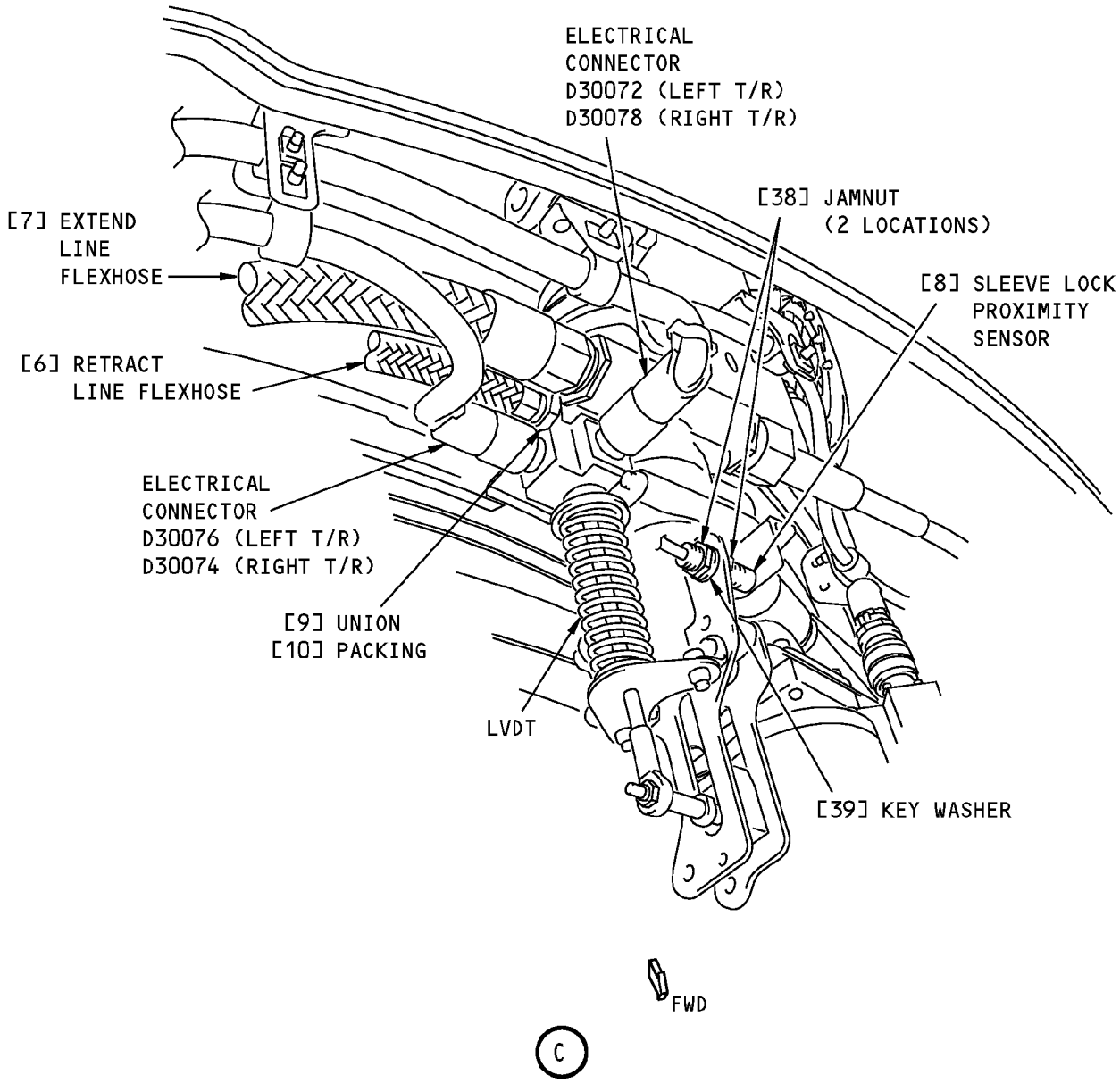
2) If you find no damage, keep the fire seal for the subsequent installation.

3) If you find damage, replace the fire seal [30].

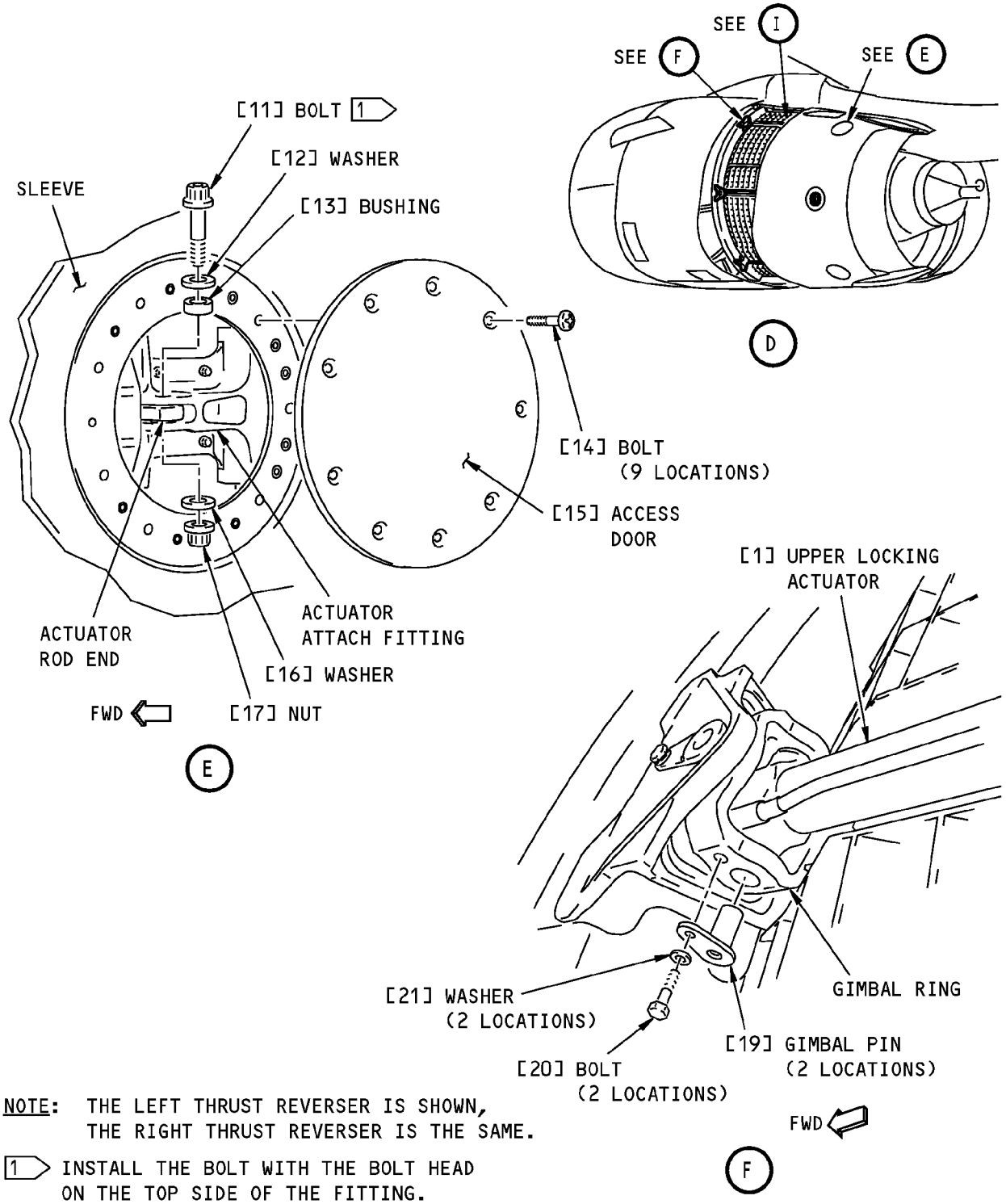
——————— END OF TASK ———————



Upper Locking Actuator Installation
Figure 401 (Sheet 1 of 5)/78-31-03-990-801-F00



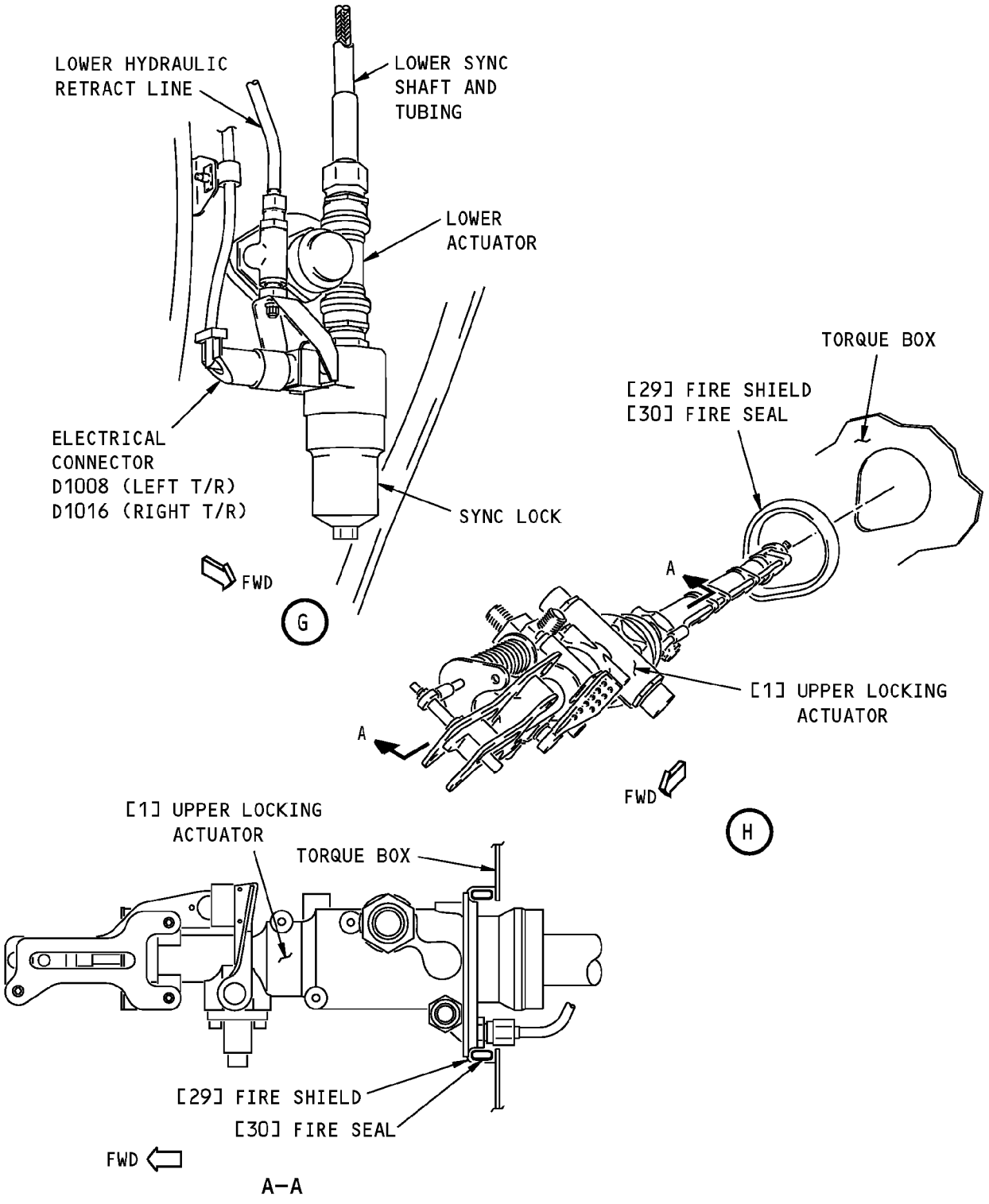
Upper Locking Actuator Installation
Figure 401 (Sheet 2 of 5)/78-31-03-990-801-F00



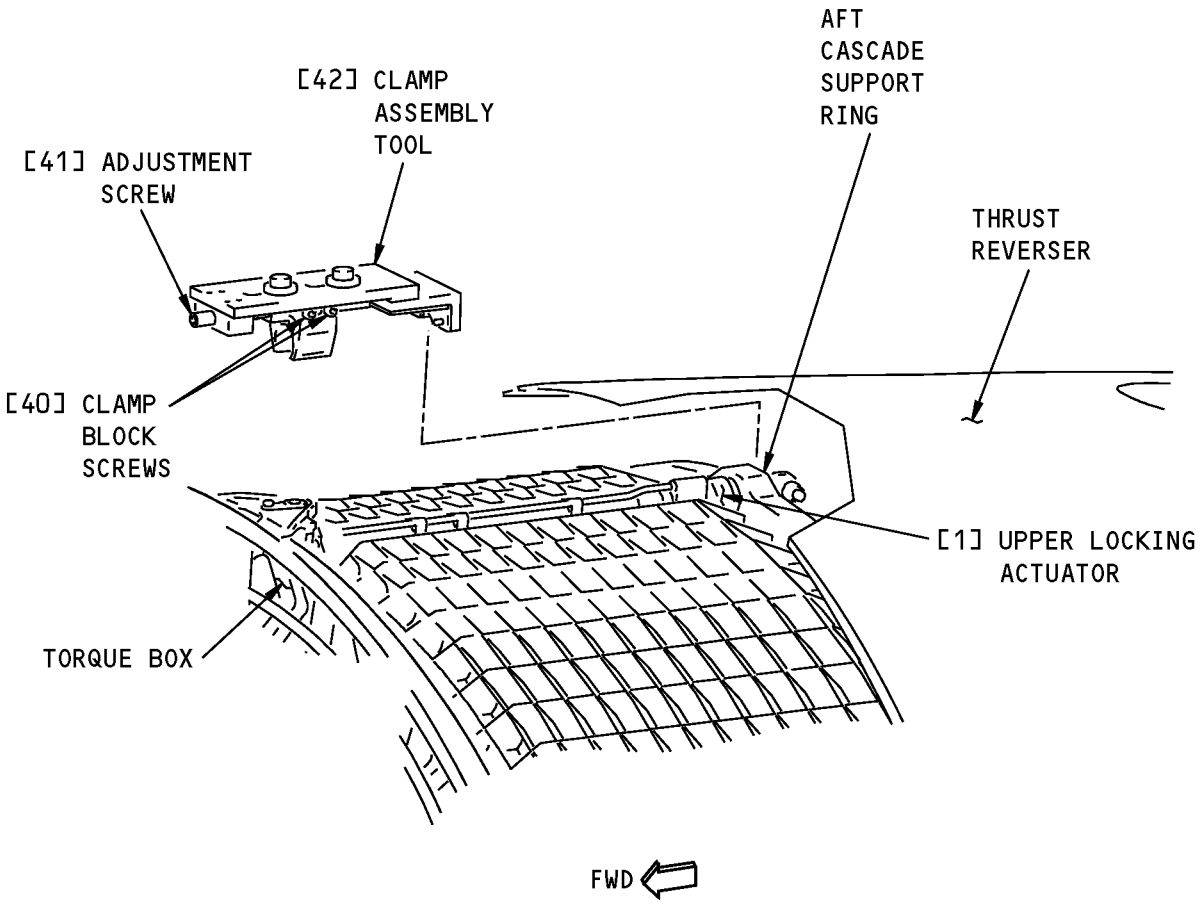
NOTE: THE LEFT THRUST REVERSER IS SHOWN, THE RIGHT THRUST REVERSER IS THE SAME.

1 INSTALL THE BOLT WITH THE BOLT HEAD ON THE TOP SIDE OF THE FITTING.

Upper Locking Actuator Installation
Figure 401 (Sheet 3 of 5)/78-31-03-990-801-F00



Upper Locking Actuator Installation
Figure 401 (Sheet 4 of 5)/78-31-03-990-801-F00



Upper Locking Actuator Installation
Figure 401 (Sheet 5 of 5)/78-31-03-990-801-F00

TASK 78-31-03-400-801-F00

5. Upper Locking Hydraulic Actuator Installation

(Figure 401)

A. General

(1) A same locking actuator can be used on the left or right thrust reverser on an engine.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-21-00-700-804-F00	EEC TEST (P/B 501)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)
78-31-02-990-807-F00	Figure: Thrust Reverser Attach Fitting Inspection (P/B 601)
78-31-04-000-801-F00	Sync Shaft Removal (P/B 401)
78-31-04-400-801-F00	Sync Shaft Installation (P/B 401)
78-34-03-400-801-F00	Thrust Reverser Sleeve Lock Proximity Sensor Installation (P/B 401)
78-34-03-800-801-F00	Sleeve Lock Proximity Sensor Adjustment (P/B 501)

C. Tools/Equipment

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

Reference	Description
SPL-2439	Tool - Actuator, Installation/Removal (Part #: C78025-21, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-9002	Lock Equipment - Thrust Reverser Maintenance (Part #: B78009-26, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
A00803	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type I
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)
D00633	Grease - Aircraft General Purpose	BMS3-33
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Actuator	78-31-03-01-312	HAP ALL
		78-36-02-01-040	HAP 001-013, 015-026, 028-030
		78-36-02-01A-050	HAP ALL
4	Packing	78-31-03-01-175	HAP ALL
10	Packing	78-31-03-01-175	HAP ALL
30	Seal	78-31-03-01-784	HAP ALL

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Access Panels

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

H. Prepare for the Installation

SUBTASK 78-31-03-420-001-F00

(1) Do these steps to install the fire seal [30] and fire shield [29] on the upper locking actuator [1] (View H):

(a) Put the fire seal [30] in the fire shield [29].

(b) Put the fire seal [30] and fire shield [29] over the rod end of the upper locking actuator [1].

1) Make sure that the fire seal [30] will contact the forward side of the torque box.

I. Install the Upper Locking Actuator

SUBTASK 78-31-03-420-002-F00

CAUTION: WHEN YOU INSTALL THE UPPER LOCKING ACTUATOR, THE PUSH ROD WILL BE MOVED THOUGH AN OPENING IN THE TORQUE BOX AND THE AFT CASCADE SUPPORT RING. DO NOT LET THE PUSH ROD HIT THE TORQUE BOX OR THE AFT CASCADE SUPPORT RING, DAMAGE TO THE PUSH ROD CAN OCCUR.

CAUTION: DO NOT LET THE ROD END OF THE UPPER LOCKING ACTUATOR TURN AFTER YOU RELEASE THE ACTUATOR LOCK. IF THE ROD END TURNS, IT CAN AFFECT THE RIGGING OF THE HYDRAULIC ACTUATOR.

(1) Do these steps to install the upper locking actuator [1] (View B):

(a) Unlock the upper locking actuator [1].

1) Move the manual unlock lever [5] forward.

2) Hold the manual unlock lever in the forward position as you push the detent pin in.

3) Release the manual unlock lever.

(b) To extend the rod end, pull the rod end out by hand.

NOTE: Do not let the rod end turn when you extend it manually. Make sure that you hold the rod end when you extend the actuator manually. Do not use hydraulic power to extend the rod end.

1) For the inboard thrust reverser, extend the rod end approximately 10 inches (254 mm).

2) For the outboard thrust reverser, extend the rod end approximately 21 inches (533 mm).

(c) Carefully insert the rod end through the opening in the torque box and aft cascade support ring.

SUBTASK 78-31-03-410-010-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

NOTE: If you close the thrust reverser, it will make the attachment of the rod end of the upper locking actuator and the installation of the access door easier.

SUBTASK 78-31-03-420-003-F00

(3) Do these steps to install the two gimbal pins [19] that attach the upper locking actuator [1] to the gimbal ring on the aft side of the torque box (View F):

(a) Apply grease, D00633 on the shanks of the two gimbal pins [19].

(b) Align the attachment holes in the upper locking actuator [1] and the gimbal ring.

(c) If you use the clamp assembly tool, SPL-2439 [42] to compress the fire seal [30] against the torque box, do these steps (View I):

NOTE: Use a 3/16-inch allen wrench to turn the clamp block screws [40] and use a 1/4-inch allen wrench to turn the adjustment screw [41].

1) If not already done, loosen the clamp block screws [40] sufficiently so that the clamp block will fit over the upper locking actuator [1].

2) Make sure that the adjustment screw [41] is retracted.

NOTE: The adjustment screw is on the forward end of the tool.

3) Tilt the aft end of the clamp assembly tool down and over the aft cascade support ring.

4) Lower the forward end of the clamp assembly tool until the clamp block engages the upper locking actuator [1].

5) Tighten the adjustment screw [41] to move the clamp block aft.

a) Move the clamp block until the aft edge touches where the diameter of the upper locking actuator [1] increases.

6) Tighten the clamp block screws [40].

7) Tighten the adjustment screw [41] to compress the fire seal [30] against the torque box.

8) Turn the housing one direction or the other to align the attachment holes.

(d) To manually compress the fire seal [30] against the torque box, do these steps:

1) Push aft on the forward end of the upper locking actuator [1] to compress the fire seal against the torque box.

2) Turn the housing one direction or the other to align the attachment holes.

(e) Install the two gimbal pins [19].

1) Install a washer [21] and bolt [20] in each of the gimbal pins [19].

a) Tighten the bolts to 30-35 pound-inches (3.4-4.0 Newton meters).

(f) If the clamp assembly tool, SPL-2439 [42] was used, loosen the adjustment screw [41] and clamp block screws [40] to remove the tool.

SUBTASK 78-31-03-420-016-F00

(4) Align the rod end of the upper locking actuator [1] with the clevis on the attach fitting (View E).

(a) Make sure the actuator attach fitting has a wear spacer installed (Figure 78-31-02-990-807-F00).

1) If a wear spacer is not installed:

a) Attach a .060 inch x 1.6 inch x 3.2 inch Rulon J wear spacer into place with sealant, A00803.

b) Seal around the edge of the fitting and inner sleeve.

(b) Install the bushing [13], washers [16] and [12], bolt [11] and nut [17] that attach the rod end.

1) Tighten the nut to 370-690 pound-inches (41.8-78.0 Newton meters).

SUBTASK 78-31-03-410-011-F00

(5) Put the applicable access doors [15] in the correct position to align the bolt holes.

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

(a) Install the nine bolts [14] to attach the access door [15].

1) Tighten the bolts [14] to 30-50 pound-inches (3.4-5.7 Newton meters).

SUBTASK 78-31-03-420-017-F00

(6) Do these steps if the replacement upper locking actuator [1] does not have the union [3] (View B) or union [9] (View C) installed:

(a) Remove the protective covers from the hydraulic actuator ports.

(b) Lubricate a packing [4] and [10] with fluid, D00153 or MCS 352B fluid, D00054.

(c) Install the packing [4] on the union [3].

(d) Install the packing [10] on the union [9].

(e) Lubricate the threads of the union [3] and union [9] with fluid, D00153 or MCS 352B fluid, D00054.

(f) Install the union [3] in the lower retract port (View B).

1) Tighten the union [3] to 256-283 pound-inches (28.9-31.9 Newton meters).

NOTE: Do not double-torque a fitting that has a packing.

(g) Install the union [9] in the upper retract port (View C).

1) Tighten the union [9] to 256-283 pound-inches (28.9-31.9 Newton meters).

NOTE: Do not double-torque a fitting that has a packing.

SUBTASK 78-31-03-020-008-F00

(7) Do these steps to connect the hydraulic lines to the upper locking actuator [1] (View B and View C):

(a) Remove the protective covers from the hydraulic lines and the actuator ports.

(b) Connect the retract hydraulic line [2] to the union [3].

1) Hand tighten the coupling nut at this time.

2) Tighten the two bolts on the clamp block that hold the retract hydraulic line [2].

a) Tighten the bolts to 30-35 pound-inches (3.4-4.0 Newton meters).

3) Tighten the coupling nut on the retract line [2]:

a) Tighten the coupling nut to 256-283 pound-inches (28.9-32.1 Newton meters).

b) Loosen the coupling nut.

c) Tighten the coupling nut again to 256-283 pound-inches (28.9-32.1 Newton meters).

(c) Do these steps to temporarily install the sync shaft and tubing:

NOTE: To manually retract the thrust reverser, the sync shafts must be temporarily installed.

1) If there is contamination, remove the contamination from the sync shaft with a cotton wiper, G00034.

2) Move the coupling nut and tube adaptor along the tubing.

3) Insert the sync shaft into the tubing.

a) Make sure that the sync shaft engages the internal spline in the middle actuator port.

4) Flex the sync shaft and insert the opposite end into the internal spline in the upper locking actuator port.

5) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton meters).

NOTE: This is a temporary installation and it is not necessary to double torque the coupling nuts.

(d) Connect the retract line flexhose [6] to the union [9].

1) Tighten the coupling nut to 256-283 pound-inches (28.9-32.1 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 256-283 pound-inches (28.9-32.1 Newton meters).

(e) Connect the extend line flexhose [7] to the upper extend port.

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.8 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.8 Newton meters).

SUBTASK 78-31-03-020-009-F00

(8) Connect the electrical connectors to the LVDT receptacles on the upper locking actuator [1] (View C):

(a) For the left thrust reverser, connect the electrical connectors, D30072 and D30076.

(b) For the right thrust reverser, connect the electrical connectors, D30074 and D30078.

SUBTASK 78-31-03-020-010-F00

(9) Install the sleeve lock proximity sensor [8] (View C):

(a) Do this task: Thrust Reverser Sleeve Lock Proximity Sensor Installation, TASK 78-34-03-400-801-F00.

(b) Do this task: Sleeve Lock Proximity Sensor Adjustment, TASK 78-34-03-800-801-F00.

SUBTASK 78-31-03-980-009-F00

(10) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

SUBTASK 78-31-03-410-002-F00

WARNING: DO ALL OF THE STEPS AND OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THIS WARNING, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(11) To correctly rig the upper sync shaft between the upper locking actuator and the middle actuator, do this step:

(a) Do the referenced tasks to remove and re-install the upper sync shaft that you temporarily installed.

1) Do this task: Sync Shaft Removal, TASK 78-31-04-000-801-F00.

2) Do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

NOTE: This task uses the thrust reverser maintenance lock equipment, SPL-9002. There are two -5 wire bundle cable assemblies in the B78009 tool assembly.

SUBTASK 78-31-03-040-025-F00

(12) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-03-040-026-F00

(13) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-03-710-001-F00

WARNING: OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THE WARNINGS AND CAUTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(14) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Operate the thrust reverser through the deploy and stow cycles until the sleeves move smoothly.

(b) Examine the thrust reverser area for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-31-03-710-004-F00

(15) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

NOTE: This check will make sure that the electrical connections for the LVDT's are correct.

(a) Make sure that no LVDT maintenance messages show.

1) If a maintenance message shows, do the applicable fault isolation task in the Fault Isolation Manual for that maintenance message.

2) If no maintenance messages show, the electrical connections for the LVDT are correct.

J. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-03-410-003-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-03-040-008-F00

(2) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

——————— END OF TASK ———————

TASK 78-31-03-000-802-F00

6. Middle Hydraulic Actuator Removal

(Figure 402)

A. General

(1) This task is for the removal of the middle hydraulic actuator.

(2) There are three hydraulic actuators on each torque box of the left and right thrust reversers on an engine.

(3) The upper hydraulic actuator is a locking actuator, the middle and lower hydraulic actuators are non-locking actuators.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2439	Tool - Actuator, Installation/Removal (Part #: C78025-21, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Consumable Materials

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

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

G. Prepare for the Removal

SUBTASK 78-31-03-040-009-F00

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

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-03-860-003-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE THRUST REVERSER THAT IS NEAR THE LEADING EDGE FLAPS AND SLATS OR BEFORE YOU OPEN THE LEFT OR THE RIGHT THRUST REVERSER ON AN ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-03-040-032-F00

(3) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-03-040-010-F00

(4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(a) For Engine 1, System A.

(b) For Engine 2, System B.

SUBTASK 78-31-03-040-011-F00

(5) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 78-31-03-040-012-F00

(6) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 78-31-03-040-013-F00

(7) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-03-040-014-F00

(8) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-03-010-005-F00

(9) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-31-03-980-010-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES. WHEN THE THRUST REVERSER IS OPENED TO THE 45 DEGREE OPEN POSITION TO REMOVE THE ACTUATOR, THE THRUST REVERSER WILL TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(10) Do these steps to expose the gimbal pins and to prepare for the use of the actuator removal and installation tool:

NOTE: The thrust reverser sleeve must be extended to remove the gimbal pins from the aft side of the torque box and to use the actuator removal and installation tool.

(a) For the inboard thrust reverser sleeve, do these steps to manually extend the thrust reverser sleeve:

1) Manually extend the thrust reverser sleeve no more than 10.0 inches (254.0 mm) from the forward edge of the torque box.

a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard thrust reverser sleeve, manually extend the thrust reverser sleeve to the fully extended position.

NOTE: The outboard thrust reverser sleeve will not touch the leading edge of the wing and if the sleeve is fully extended, the tool will be easier to use.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

SUBTASK 78-31-03-020-012-F00

WARNING: WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE OPEN PORTS OF THE COMPONENT OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS CAN OCCUR.

CAUTION: DO NOT LET HYDRAULIC FLUID GET ON THE THRUST REVERSER OR ENGINE COMPONENTS. IMMEDIATELY CLEAN A COMPONENT IF HYDRAULIC FLUID GETS ON IT. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE EQUIPMENT.

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(11) Do these steps to drain the hydraulic fluid from the hydraulic lines (View F):

NOTE: To decrease hydraulic fluid spray when the coupling nuts are loosened, wrap cotton wiper, G00034, around the wrench, nut and hydraulic line.

(a) Wrap cotton wiper, G00034, around the electrical connector on the sync lock receptacle on the lower actuator.

NOTE: The cloth will catch the hydraulic fluid and prevent damage to the electrical connector.

(b) Loosen the two bolts on each of the two clampblocks that hold the lower hydraulic retract line.

NOTE: To remove the sleeve fitting on the hydraulic retract line from the actuator port, the hydraulic retract line must be carefully flexed. If the clampblocks are loose, the hydraulic retract line can be flexed easier.

(c) Disconnect the hydraulic retract line at the lower actuator.

1) Carefully remove the sleeve fitting on the hydraulic retract line from the actuator port.

2) Let the hydraulic fluid drain into the 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

(d) Disconnect the coupling nut on the sync shaft tubing at the lower actuator.

1) let the hydraulic fluid drain in a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

(e) Re-connect the coupling nut for the lower sync shaft to the lower actuator.

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.8 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.8 Newton meters).

(f) Re-connect the coupling nut for the lower retract line to the lower actuator.

1) Tighten the coupling nut to 256-283 pound-inches (28.9-32.1 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 256-283 pound-inches (28.9-32.1 Newton meters).

H. Middle Hydraulic Actuator Removal

SUBTASK 78-31-03-020-013-F00

(1) Do these steps to disconnect the hydraulic lines from the middle actuator [51] (View B):

(a) Loosen the two bolts on each of the two clampblocks that hold the upper retract line.

(b) Disconnect the elbow [50] from the tee fitting [56] and the restrictor [54].

(c) Install protective covers on the fittings.

(d) Disconnect the upper and lower sync shaft tubing at the middle actuator.

1) Move the coupling nuts and tube adapters back along the tubing to get access to the sync shaft ends.

2) Flex the sync shaft to remove it from the internal splined port in the actuator.

CAUTION: DO NOT LET DIRT OR CONTAMINATION GET ON THE SYNC SHAFT. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

3) Remove the sync shafts from the upper and lower sync shaft tubing.

a) Make sure that dirt or contamination does not get on the sync shafts.

(e) Remove the restrictor [54] and packing [55] from the upper retract port on the middle actuator (View B).

1) Keep the restrictor [54] for the subsequent installation and discard the packing [55].

(f) Remove the bleed plug [52] and packing [53] from the lower retract port on the middle actuator (View B).

1) Keep the bleed plug [52] for the subsequent installation and discard the packing [53].

(g) Install protective covers on the hydraulic lines and the actuator ports.

SUBTASK 78-31-03-020-028-F00

(2) Do the these steps to remove the two gimbal pins [68] that attach the middle actuator [51] to the gimbal ring on the aft side of the torque box (View E):

(a) If you use the clamp assembly tool, SPL-2439 [42] to remove the gimbal pins [68], do these steps (View I):

NOTE: Use a 3/16-inch allen wrench to turn the clamp block screws [40] and use a 1/4-inch allen wrench to turn the adjustment screw [41].

1) If not already done, loosen the clamp block screws [40] sufficiently so that the clamp block will fit over the middle actuator [51].

2) Make sure that the adjustment screw [41] is retracted.

NOTE: The adjustment screw is on the forward end of the tool.

3) Tilt the aft end of the clamp assembly tool down and over the aft cascade support ring.

4) Lower the forward end of the clamp assembly tool until the clamp block engages the middle actuator [51].

5) Tighten the adjustment screw [41] to move the clamp block aft.

a) Move the clamp block until the aft edge touches where the diameter of the middle actuator [51] increases.

6) Tighten the clamp block screws [40].

7) Tighten the adjustment screw [41] to compress the fire seal [80] against the torque box.

(b) Remove a bolt [69] and washer [70] from each of the gimbal pins [68].

1) Remove the two gimbal pins [68].

(c) If the clamp assembly tool, SPL-2439 [42] was used, loosen the adjustment screw [41] and clamp block screws [40] to remove the tool.

SUBTASK 78-31-03-020-037-F00

(3) Do these steps to remove the access door [64] and disconnect the rod end of the middle actuator [51] (View D):

(a) To remove the applicable access doors [64], remove the nine bolts [63].

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

(b) Remove the nut [66], bolt [60], washers [61] and [65], and bushing [62] that attach the rod end to the actuator attach fitting on the sleeve.

SUBTASK 78-31-03-010-014-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE INBOARD THRUST REVERSER AS IT IS OPENED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do these steps to get the necessary clearance to remove the middle actuator [51]:

(a) For the inboard thrust reverser, do these steps to open the thrust reverser:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause them to extend a small amount.

2) Monitor the position of the thrust reverser as it is opened to make sure that it does not touch the leading edge of the wing.

3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

(b) For the outboard thrust reverser, open the thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

NOTE: The outboard thrust reverser will not touch the leading edge of the wing.

SUBTASK 78-31-03-010-008-F00

CAUTION: WHEN YOU REMOVE THE MIDDLE ACTUATOR, THE PUSH ROD WILL BE MOVED THOUGH AN OPENING IN THE AFT CASCADE SUPPORT RING AND THE TORQUE BOX. DO NOT LET THE PUSH ROD HIT THE AFT CASCADE SUPPORT RING OR THE TORQUE BOX, DAMAGE TO THE PUSH ROD CAN OCCUR.

(5) Carefully remove the middle actuator [51].

SUBTASK 78-31-03-020-015-F00

(6) After you remove the middle actuator [51], do these steps:

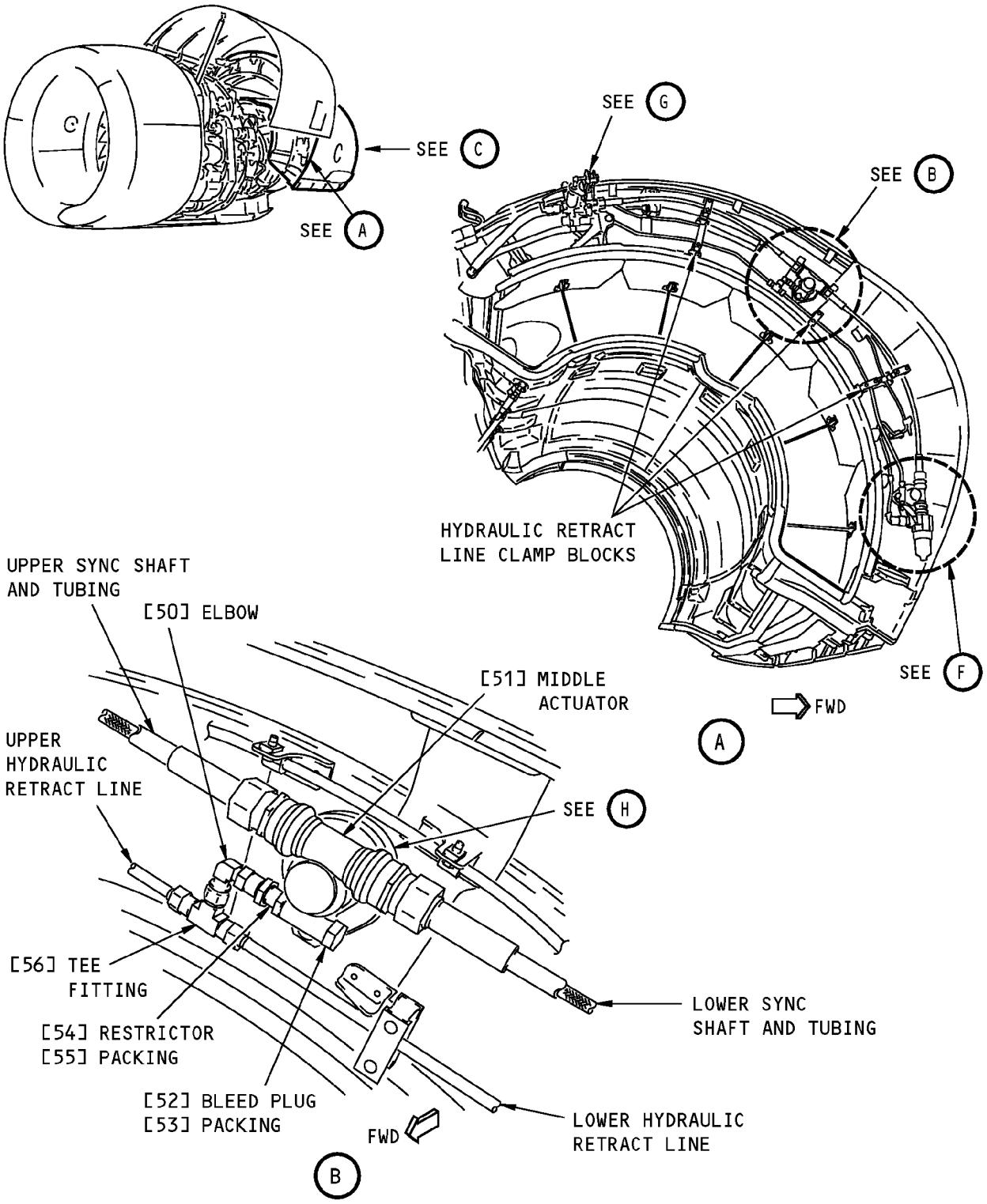
(a) Remove the fire shield [79] and the fire seal [80] from the middle actuator [51] (View H).

1) Examine the fire seal [80] for damage.

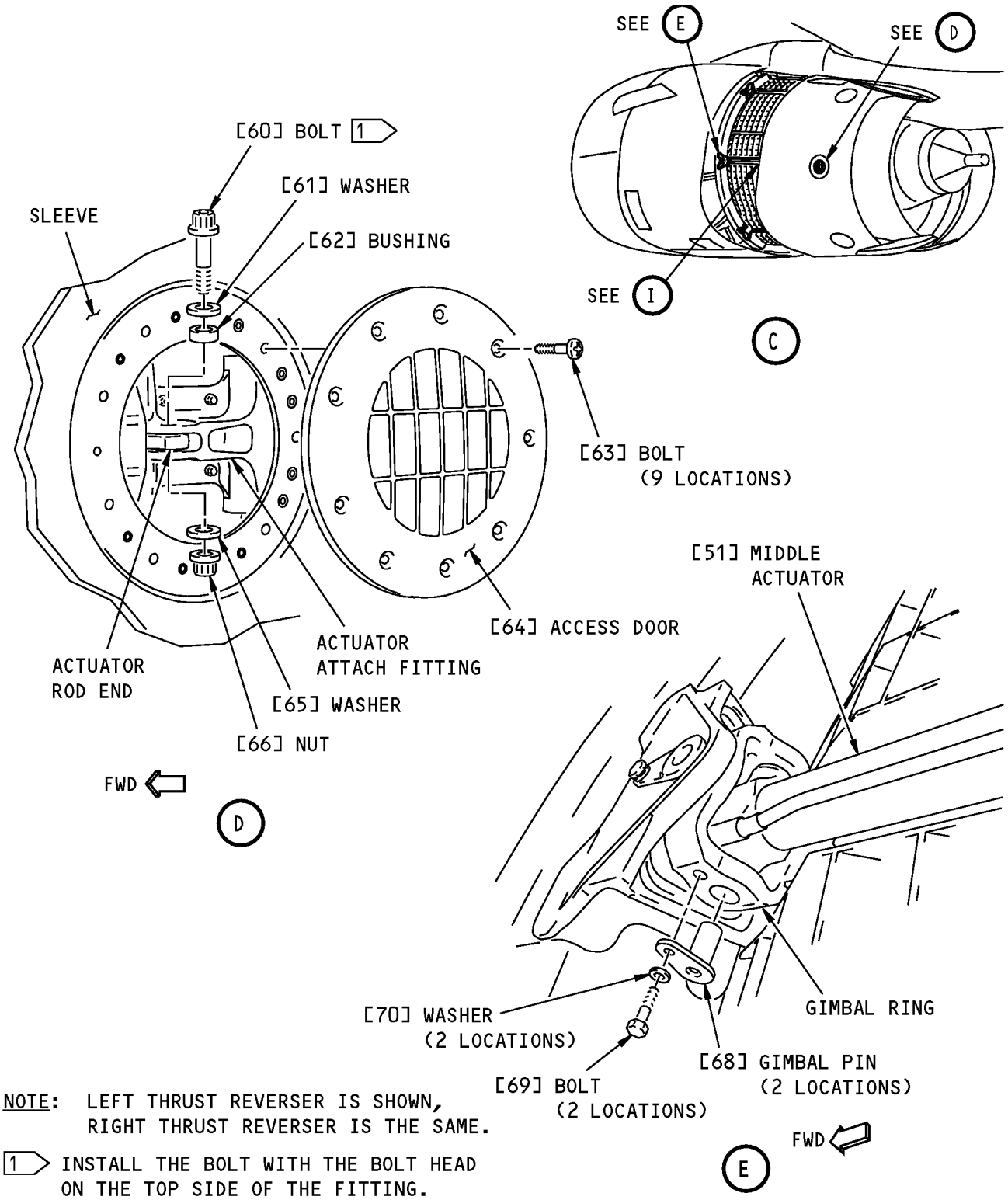
2) If you find no damage, keep the fire seal for the subsequent installation.

3) If you find damage, replace the fire seal [80].

END OF TASK



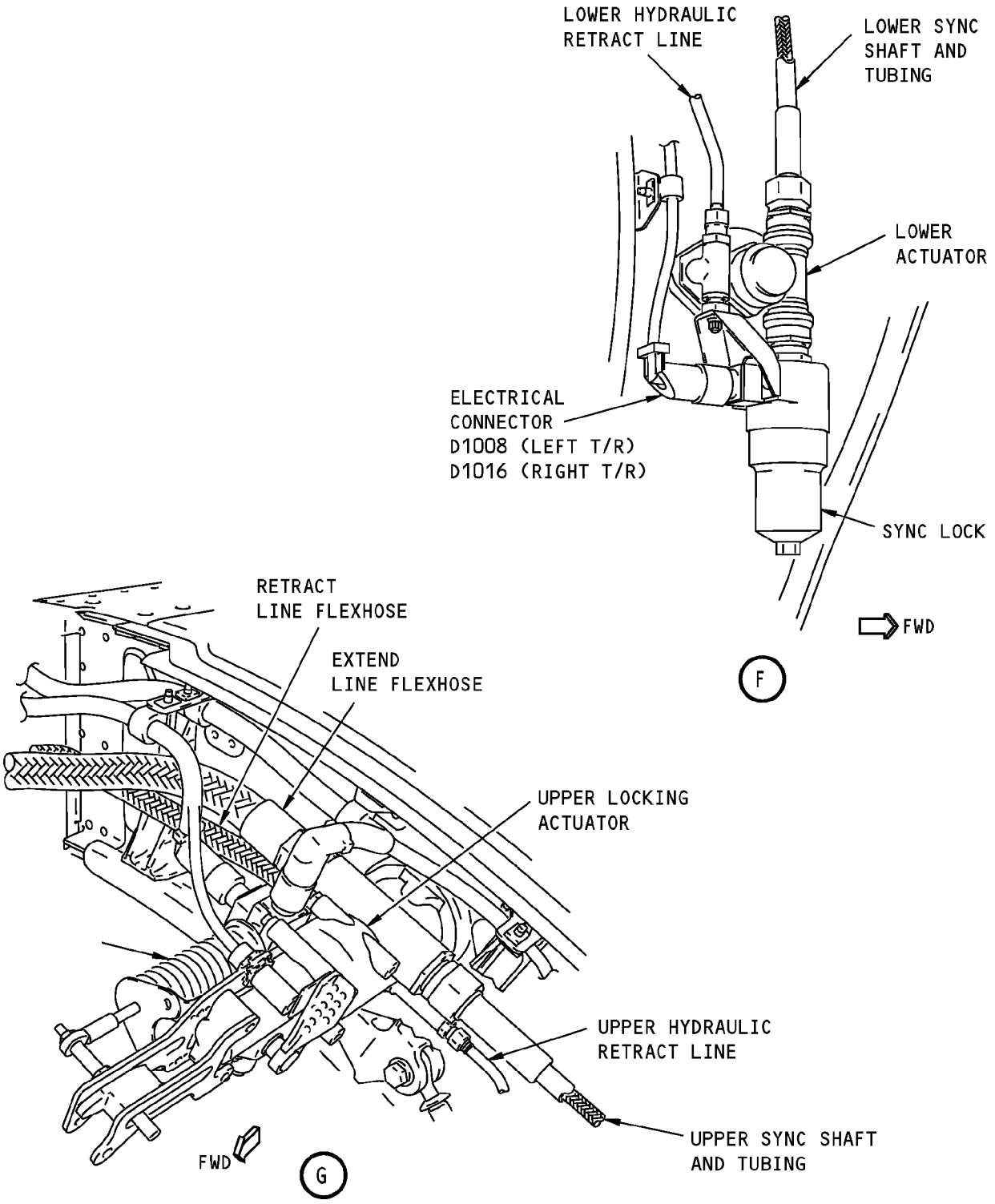
Middle Actuator Installation
Figure 402 (Sheet 1 of 5)/78-31-03-990-802-F00



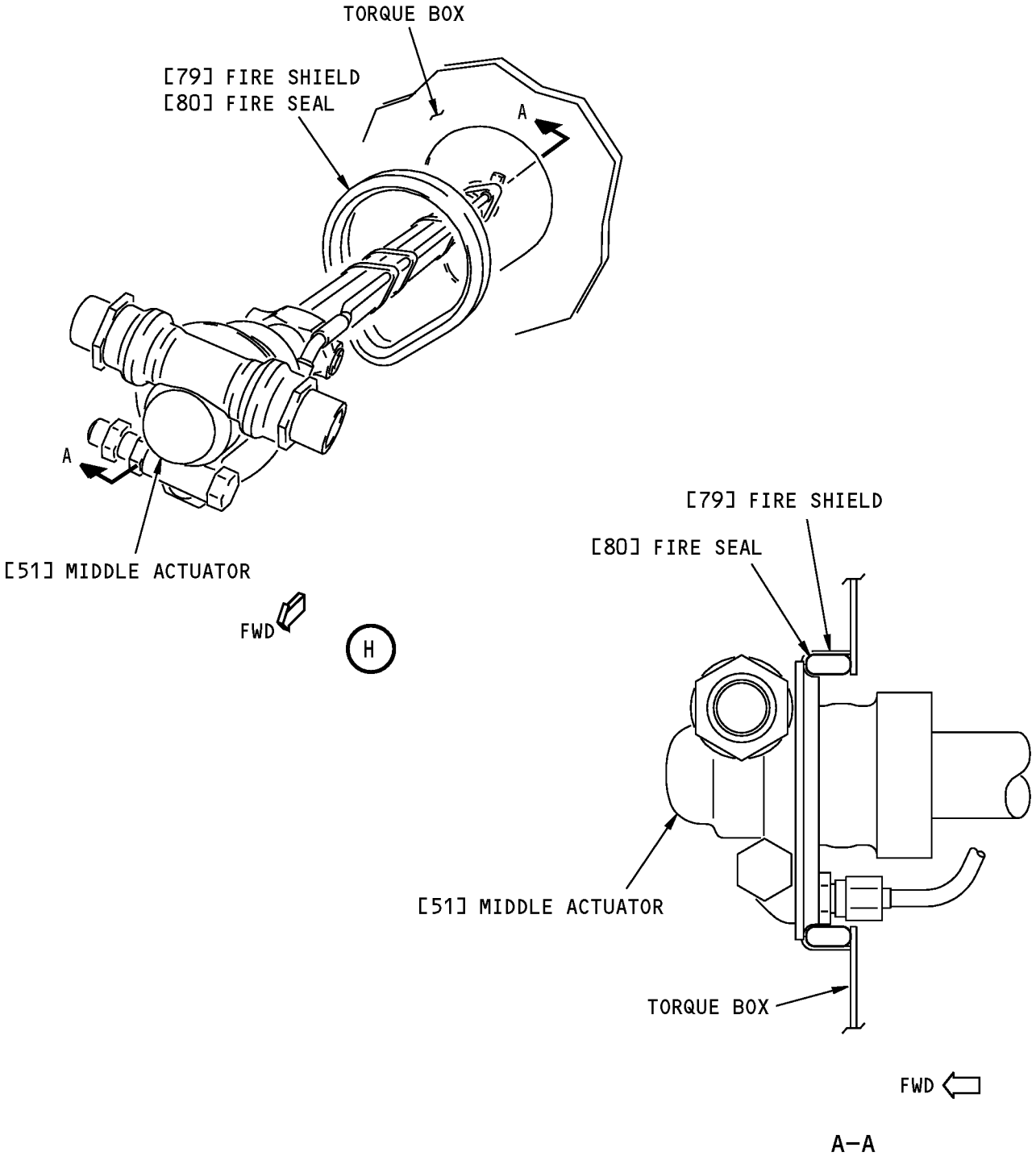
NOTE: LEFT THRUST REVERSER IS SHOWN, RIGHT THRUST REVERSER IS THE SAME.

1 INSTALL THE BOLT WITH THE BOLT HEAD ON THE TOP SIDE OF THE FITTING.

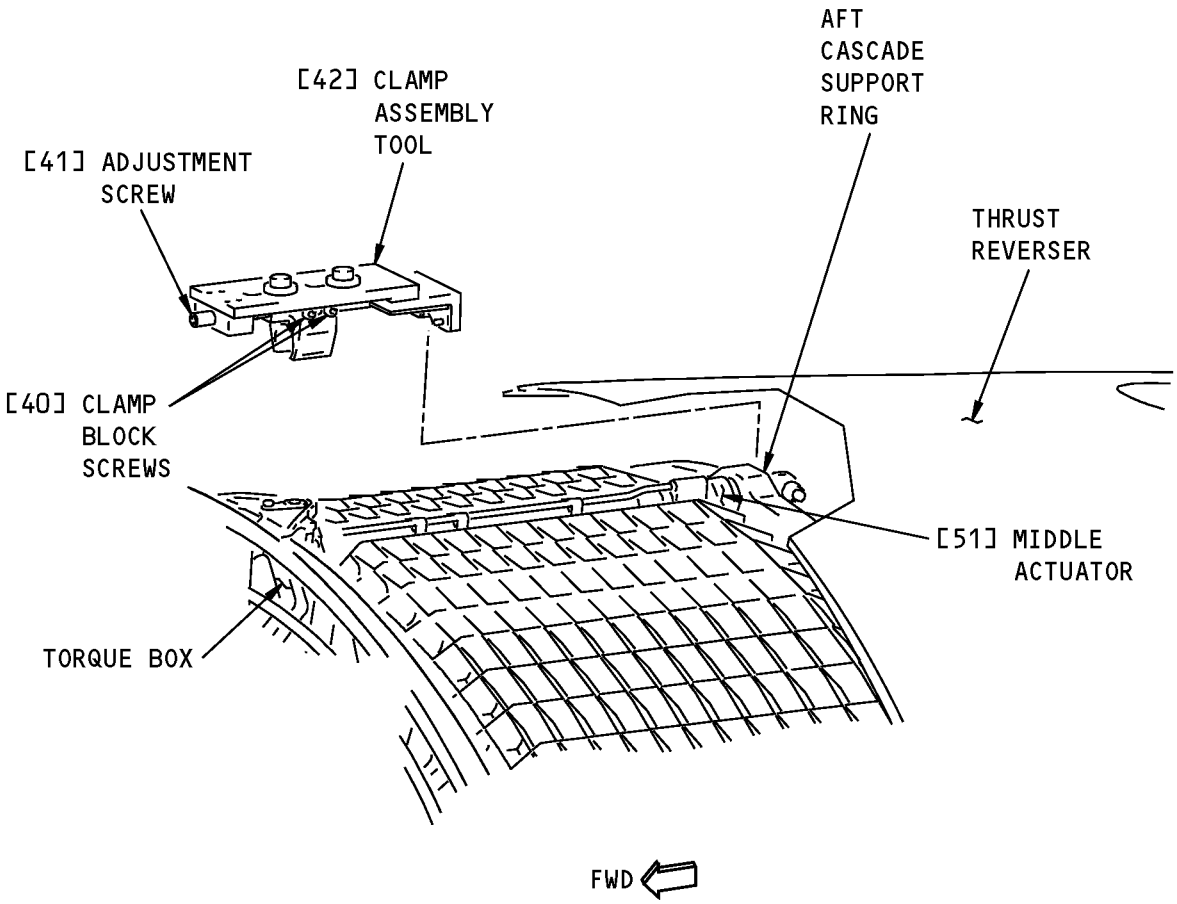
Middle Actuator Installation
Figure 402 (Sheet 2 of 5)/78-31-03-990-802-F00



Middle Actuator Installation
Figure 402 (Sheet 3 of 5)/78-31-03-990-802-F00



Middle Actuator Installation
Figure 402 (Sheet 4 of 5)/78-31-03-990-802-F00



Middle Actuator Installation
Figure 402 (Sheet 5 of 5)/78-31-03-990-802-F00

TASK 78-31-03-400-802-F00

7. Middle Hydraulic Actuator Installation

(Figure 402)

A. General

(1) This task is for the installation of the middle actuator.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)
78-31-02-990-807-F00	Figure: Thrust Reverser Attach Fitting Inspection (P/B 601)
78-31-04-000-801-F00	Sync Shaft Removal (P/B 401)
78-31-04-400-801-F00	Sync Shaft Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-2439	Tool - Actuator, Installation/Removal (Part #: C78025-21, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-9002	Lock Equipment - Thrust Reverser Maintenance (Part #: B78009-26, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
A00803	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type I
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)
D00633	Grease - Aircraft General Purpose	BMS3-33
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
51	Actuator	78-31-03-01-630	HAP ALL
53	Packing	78-31-03-01-215	HAP ALL
55	Packing	78-31-03-01-215	HAP ALL

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
80	Seal	78-31-03-01-784	HAP ALL

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Access Panels

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

H. Prepare for the Installation

SUBTASK 78-31-03-420-005-F00

(1) Do these steps to install the fire seal [80] and fire shield [79] on the middle actuator [51] (View H):

(a) Put the fire seal [80] in the fire shield [79].

(b) Put the fire seal [80] and fire shield [79] over the rod end of the middle actuator [51].

1) Make sure that the fire seal [80] will contact the forward side of the torque box.

I. Install the Middle Hydraulic Actuator

SUBTASK 78-31-03-420-006-F00

CAUTION: WHEN YOU INSTALL THE MIDDLE ACTUATOR, THE PUSH ROD WILL BE MOVED THOUGH AN OPENING IN THE TORQUE BOX AND THE AFT CASCADE SUPPORT RING. DO NOT LET THE PUSH ROD HIT THE TORQUE BOX OR THE AFT CASCADE SUPPORT RING, DAMAGE TO THE PUSH ROD CAN OCCUR.

(1) Do these steps to install the middle actuator [51]:

(a) To extend the rod end of the middle actuator [51], pull the rod end out by hand:

1) For the inboard thrust reverser, extend the rod end approximately 10 inches (254 mm).

2) For the outboard thrust reverser, extend the rod end approximately 21 inches (533 mm).

(b) Carefully insert the rod end through the opening in the torque box and aft cascade support ring.

SUBTASK 78-31-03-410-012-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

NOTE: If you close the thrust reverser, it will make the attachment of the rod end of the middle actuator and the installation of the access door easier.

SUBTASK 78-31-03-420-007-F00

(3) Do the these steps to install the two gimbal pins [68] that attach the middle actuator [51] to the gimbal ring on the aft side of the torque box (View E):

(a) Apply grease, D00633 on the shanks of the two gimbal pins [68].

(b) Align the attachment holes in the middle actuator [51] and the gimbal ring.

(c) If you use the clamp assembly tool, SPL-2439 [42] to compress the fire seal [80] against the torque box, do these steps (View I):

NOTE: Use a 3/16-inch allen wrench to turn the clamp block screws [40] and a 1/4-inch allen wrench to turn the adjustment screw [41].

1) If not already done, loosen the clamp block screws [40] sufficiently, so that the clamp block will fit over the middle actuator [51].

2) Make sure that the adjustment screw [41] is retracted.

NOTE: The adjustment screw is on the forward end of the tool.

3) Tilt the aft end of the clamp assembly tool [42] down and over the aft cascade support ring.

4) Lower the forward end of the clamp assembly tool [42] until the clamp block engages the middle actuator [51].

5) Tighten the adjustment screw [41] to move the clamp block aft.

a) Move the clamp block until the aft edge touches where the diameter of the middle actuator [51] increases.

6) Tighten the clamp block screws [40].

7) Tighten the adjustment screw [41] to compress the fire seal [80] against the torque box.

8) Turn the housing one direction or the other to align the attachment holes.

(d) To manually compress the fire seal [80] against the torque box, do these steps:

1) Push aft on the forward end of the middle actuator [51] to compress the fire seal [80] against the torque box.

2) Turn the housing one direction or the other to align the attachment holes.

(e) Install the two gimbal pins [68].

1) Install a washer [70] and bolt [69] in each of the gimbal pins [68].

a) Tighten the bolts to 30-35 pound-inches (3.4-4.0 Newton meters).

(f) If the clamp assembly tool, SPL-2439 [42] was used, loosen the adjustment screw [41] and clamp block screws [40] to remove the tool.

SUBTASK 78-31-03-420-022-F00

(4) Align the rod end of the middle actuator [51] with the clevis on the attach fitting (View D).

(a) Make sure the actuator attach fitting has a wear spacer installed (Figure 78-31-02-990-807-F00).

1) If a wear spacer is not installed:

a) Attach a .060 inch x 1.6 inch x 3.2 inch Rulon J wear spacer into place with sealant, A00803.

b) Seal around the edge of the fitting and inner sleeve.

(b) Install the bushing [62], washers [61] and [65], bolt [60] and nut [66] that attach the rod end.

1) Tighten the nut [66] to 370-690 pound-inches (41.8-78.0 Newton meters).

SUBTASK 78-31-03-410-013-F00

(5) Put the applicable access doors [64] in the correct position to align the bolt holes.

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

(a) Install the nine bolts [63] to attach the access door [64].

1) Tighten the bolts [63] to 30-50 pound-inches (3.4-5.7 Newton meters).

SUBTASK 78-31-03-020-029-F00

(6) Do these steps if the replacement middle actuator [51] does not have the restrictor [54] or bleed plug [52] (View B):

(a) Remove the protective covers from the hydraulic actuator ports.

(b) Lubricate the packings [53] and [55] with fluid, D00153 or MCS 352B fluid, D00054.

(c) Install the packing [53] on the bleed plug [52].

(d) Install the packing [55] on the restrictor [54].

(e) Lubricate the threads of the bleed plug [52] and restrictor [54] with fluid, D00153 or MCS 352B fluid, D00054.

(f) Install the bleed plug [52] in the lower retract port.

1) Tighten the bleed plug [52] to 256-283 pound-inches (28.9-31.9 Newton meters).

NOTE: Do not double-torque a fitting that has a packing.

(g) Install the restrictor [54] in the upper retract port.

1) Tighten the restrictor [54] to 256-283 pound-inches (28.9-31.9 Newton meters).

NOTE: Do not double-torque a fitting that has a packing.

SUBTASK 78-31-03-020-017-F00

(7) Do these steps to connect and tighten the hydraulic lines (View B):

(a) Remove the protective covers from the hydraulic fittings.

(b) Connect the elbow [50] to the tee fitting [56] and the restrictor [54].

1) Hand tighten the nuts at this time.

(c) Tighten the bolts on the clampblocks that hold the upper and lower retract lines.

1) Tighten the bolts to 30-35 pound-inches (3.4-4.0 Newton meters).

(d) Tighten the nuts on the elbow [50] at the tee fitting [56] and the restrictor [54].

1) Tighten the nuts to 256-283 pound-inches (28.9-32.1 Newton meters).

2) Loosen the nuts.

3) Tighten the nuts again to 256-283 pound-inches (28.9-32.1 Newton meters).

(e) Do these steps to temporarily install the upper and lower sync shaft and tubing:

NOTE: To manually retract the thrust reverser, the sync shafts must be temporarily installed.

1) If there is contamination, remove the contamination from the sync shaft with a cotton wiper, G00034.

2) Move the coupling nut and tube adaptor along the tubing.

3) Insert the sync shaft into the tubing.

a) Make sure that the sync shaft engages the internal spline in the lower and upper actuator port.

4) Flex the sync shaft and insert the opposite end into the internal spline in the middle actuator port.

5) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton meters).

NOTE: This is a temporary installation and it is not necessary to double torque the coupling nut.

SUBTASK 78-31-03-980-011-F00

(8) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

SUBTASK 78-31-03-420-024-F00

WARNING: DO ALL OF THE STEPS AND OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THIS WARNING, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(9) To correctly rig the upper and lower sync shafts, do this step:

(a) Do the reference tasks to remove and re-install the upper and lower sync shafts that you temporarily installed.

1) Do this task: Sync Shaft Removal, TASK 78-31-04-000-801-F00.

2) Do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

NOTE: This task uses the thrust reverser maintenance lock equipment, SPL-9002. There are two -5 wire bundle cable assemblies in the B78009 tool assembly.

SUBTASK 78-31-03-040-027-F00

(10) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-03-040-028-F00

(11) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-03-710-002-F00

WARNING: OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THE WARNINGS AND CAUTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(12) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Operate the thrust reverser through the deploy and stow cycles until the sleeves move smoothly.

(b) Examine the thrust reverser area for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

J. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-03-410-006-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-03-040-016-F00

(2) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

END OF TASK

TASK 78-31-03-000-803-F00

8. Lower Hydraulic Actuator Removal

(Figure 403)

A. General

(1) This task is for the removal of the lower hydraulic actuator.

(2) There are three hydraulic actuators on each torque box of the left and right thrust reversers on an engine.

(3) The upper hydraulic actuator is a locking actuator, the middle and lower hydraulic actuators are non-locking actuators.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2439	Tool - Actuator, Installation/Removal (Part #: C78025-21, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Consumable Materials

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

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Access Panels

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

G. Prepare for the Removal

SUBTASK 78-31-03-040-017-F00

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

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-03-860-004-F00

WARNING: RETRACT THE LEADING EDGE FLAPS AND SLATS AND DO THE DEACTIVATION PROCEDURE BEFORE YOU DO WORK ON THE THRUST REVERSER THAT IS NEAR THE LEADING EDGE FLAPS AND SLATS OR BEFORE YOU OPEN THE LEFT OR THE RIGHT THRUST REVERSER ON AN ENGINE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-03-040-033-F00

(3) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-03-040-018-F00

(4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(a) For Engine 1, System A.

(b) For Engine 2, System B.

SUBTASK 78-31-03-040-019-F00

(5) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 78-31-03-040-020-F00

(6) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 78-31-03-040-021-F00

(7) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-03-040-022-F00

(8) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-03-010-015-F00

(9) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-31-03-980-012-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES. WHEN THE THRUST REVERSER IS OPENED TO THE 45 DEGREE OPEN POSITION TO REMOVE THE ACTUATOR, THE THRUST REVERSER WILL TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(10) Do these steps to expose the gimbal pins and to prepare for the use of the actuator removal and installation tool:

NOTE: The thrust reverser sleeve must be extended to remove the gimbal pins from the aft side of the torque box and to use the actuator removal and installation tool.

(a) For the inboard thrust reverser sleeve, do these steps to manually extend the thrust reverser sleeve:

1) Manually extend the thrust reverser sleeve no more than 10.0 inches (254.0 mm) from the forward edge of the torque box.

a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard thrust reverser sleeve, manually extend the thrust reverser sleeve to the fully extended position.

NOTE: The outboard thrust reverser sleeve will not touch the leading edge of the wing and if the sleeve is fully extended, the tool will be easier to use.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

SUBTASK 78-31-03-020-019-F00

WARNING: WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE OPEN PORTS OF THE COMPONENT OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS CAN OCCUR.

(WARNING PRECEDES)

CAUTION: DO NOT LET HYDRAULIC FLUID GET ON THE THRUST REVERSER OR ENGINE COMPONENTS. IMMEDIATELY CLEAN A COMPONENT IF HYDRAULIC FLUID GETS ON IT. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE EQUIPMENT.

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(11) Do these steps to drain the hydraulic fluid from the hydraulic lines (View B):

NOTE: To decrease hydraulic fluid spray when the coupling nuts are loosened, wrap cotton wiper, G00034, around the wrench, nut and hydraulic line.

(a) Wrap cotton wiper, G00034, around the electrical connector on the sync lock receptacle on the lower actuator.

NOTE: The cloth will catch the hydraulic fluid and prevent damage to the electrical connector.

(b) Loosen the two bolts on each of the two clampblocks that hold the lower hydraulic retract line [132].

NOTE: To remove the sleeve fitting on the hydraulic retract line from the actuator port, the hydraulic retract line must be carefully flexed. If the clampblocks are loose, the hydraulic retract line can be flexed easier.

(c) Disconnect the lower hydraulic retract line [132] at the lower actuator [103].

1) Carefully remove the sleeve fitting on the lower hydraulic retract line [132] from the actuator port.

2) let the hydraulic fluid drain in a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

(d) Disconnect the coupling nut on the sync shaft tubing at the lower actuator [103].

1) Let the hydraulic fluid drain into the 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

2) Move the coupling nut and tube adapter back along the tubing to get access to the sync shaft end.

3) Flex the sync shaft to remove it from the internal splined port in the lower actuator [103].

CAUTION: DO NOT LET DIRT OR CONTAMINATION GET ON THE SYNC SHAFT. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

4) Remove the sync shaft.

a) Make sure that dirt or contamination does not get on the sync shaft.

(e) Remove the union [110] and packing [111] from the upper retract port of the lower actuator (View B).

1) Keep the union [110] for the subsequent installation and discard the packing [111].

(f) Install protective covers on the hydraulic lines and actuator ports.

SUBTASK 78-31-03-020-039-F00

(12) Do these steps to remove the sync lock [105]:

(a) Disconnect the electrical connector from the sync lock receptacle (View B):

1) For the left thrust reverser, disconnect the electrical connector D1008.

2) For the right thrust reverser, disconnect the electrical connector D1016.

(b) Remove the nut [106] and washer [107] from the adapter plug [108].

NOTE: You do not have to remove the two bolts that hold the bracket to the sync lock. After the coupling nut is loose, the bracket will move off the stud.

(c) Loosen the coupling nut on the sync lock [105].

(d) Remove the sync lock [105] and bracket.

(e) Remove the adapter plug [108] and packing [109].

1) Discard the packing [109].

(f) Install protective covers on the sync lock [105] and lower actuator [103].

H. Lower Actuator Removal

SUBTASK 78-31-03-020-040-F00

(1) Do these steps to remove the two gimbal pins [120] that attach the lower actuator [103] to the gimbal ring on the aft side of the torque box (View E):

(a) If you use the clamp assembly tool, SPL-2439 [42] to remove the gimbal pins [120], do these steps (View I):

NOTE: Use a 3/16-inch allen wrench to turn the clamp block screws [40] and use a 1/4-inch allen wrench to turn the adjustment screw [41].

1) If not already done, loosen the clamp block screws [40] sufficiently so that the clamp block will fit over the lower actuator [103].

2) Make sure that the adjustment screw [41] is retracted.

NOTE: The adjustment screw is on the forward end of the tool.

3) Tilt the aft end of the clamp assembly tool down and over the aft cascade support ring.

4) Lower the forward end of the clamp assembly tool until the clamp block engages the lower actuator [103].

5) Tighten the adjustment screw [41] to move the clamp block aft.

a) Move the clamp block until the aft edge touches where the diameter of the lower actuator [103] increases.

6) Tighten the clamp block screws [40].

7) Tighten the adjustment screw [41] to compress the fire seal [123] against the torque box.

(b) Remove a bolt [121] and washer [122] from each of the two gimbal pins [120].

1) Remove the two gimbal pins [120].

(c) If the clamp assembly tool, SPL-2439 [42] was used, loosen the adjustment screw [41] and clamp block screws [40] to remove the tool.

SUBTASK 78-31-03-010-011-F00

(2) Do these steps to remove the access door [116] and disconnect the rod end of the lower actuator [103] (View D):

(a) To remove the applicable access doors [116], remove the nine bolts [115].

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

(b) Remove the nut [118], bolt [112], washers [113] and [117], and bushing [114] that attach the rod end to the actuator attach fitting on the sleeve.

SUBTASK 78-31-03-010-016-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSER. MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE INBOARD THRUST REVERSER AS IT IS OPENED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do these steps to get the necessary clearance to remove the lower actuator [103]:

(a) For the inboard thrust reverser, do these steps to open the thrust reverser:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause them to extend a small amount.

2) Monitor the position of the thrust reverser as it is opened to make sure that it does not touch the leading edge of the wing.

3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

(b) For the outboard thrust reverser, open the thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

NOTE: The outboard thrust reverser will not touch the leading edge of the wing.

SUBTASK 78-31-03-010-012-F00

CAUTION: WHEN YOU REMOVE THE LOWER ACTUATOR, THE PUSH ROD WILL BE MOVED THOUGH AN OPENING IN THE AFT CASCADE SUPPORT RING AND THE TORQUE BOX. DO NOT LET THE PUSH ROD HIT THE AFT CASCADE SUPPORT RING OR THE TORQUE BOX, DAMAGE TO THE PUSH ROD CAN OCCUR.

(4) Carefully remove the lower actuator [103].

SUBTASK 78-31-03-020-022-F00

(5) After you remove the lower actuator [103], do these steps:

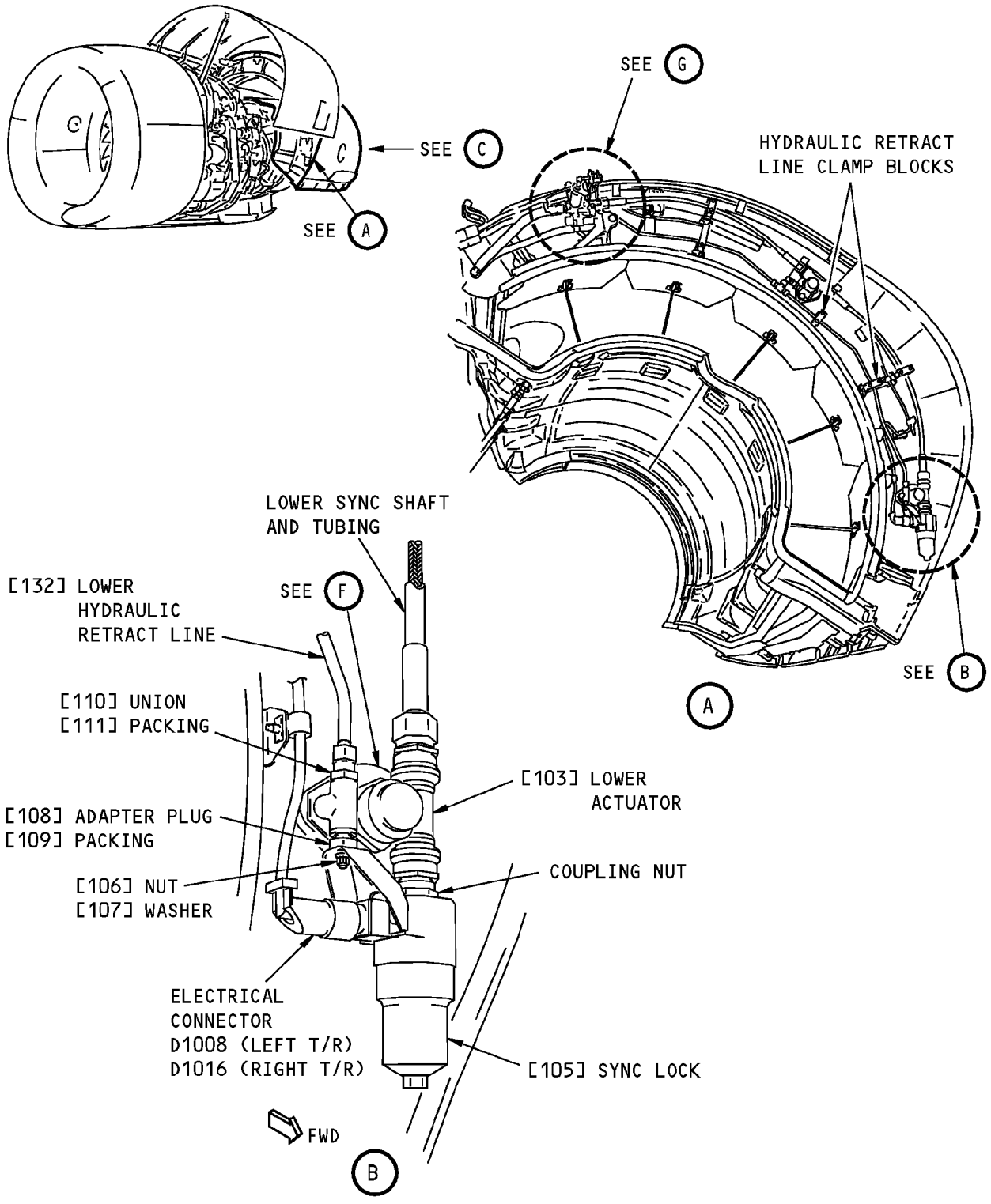
(a) Remove the fire shield [124] and the fire seal [123] from the lower actuator (View F).

1) Examine the fire seal [123] for damage.

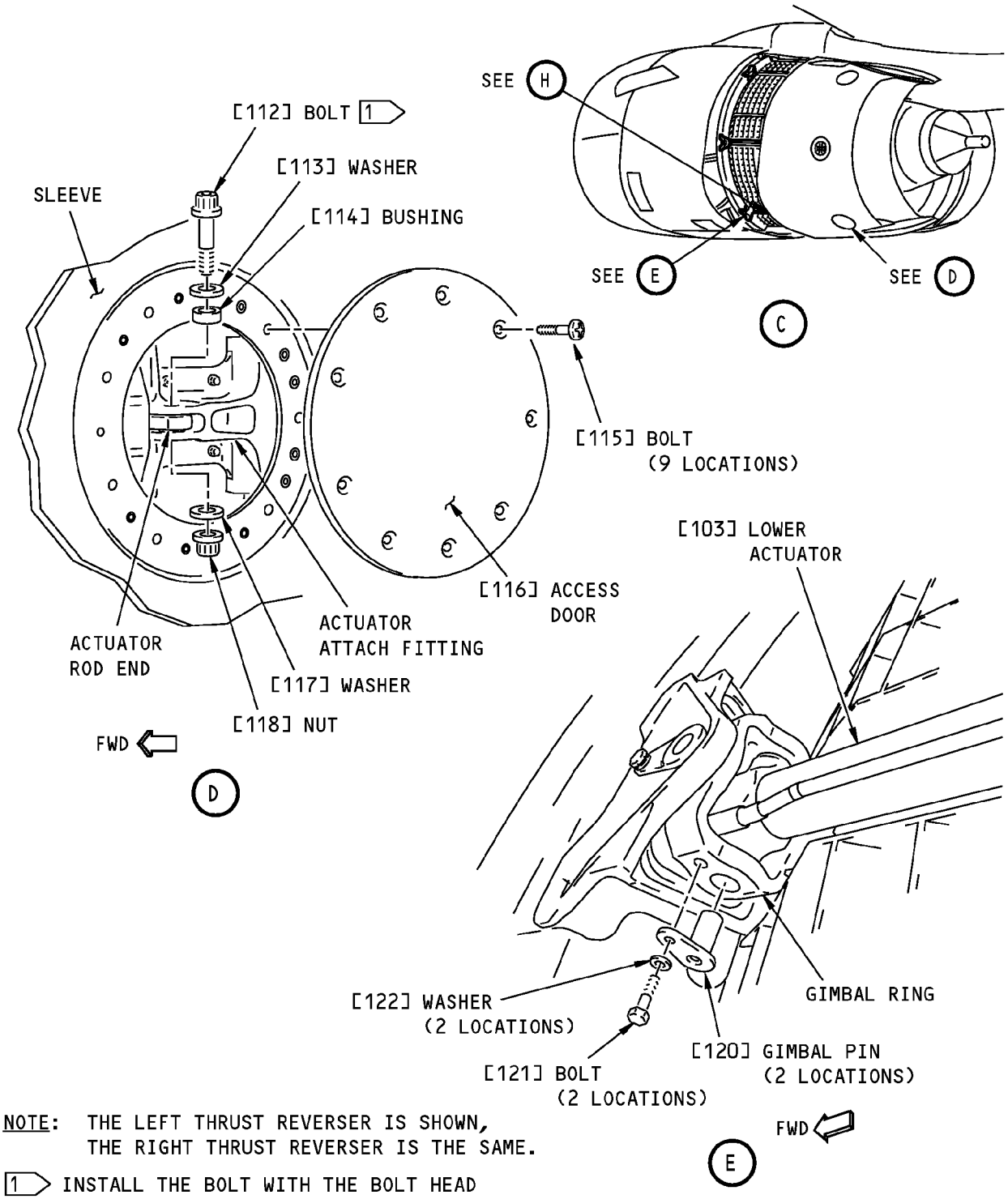
2) If you find no damage, keep the fire seal for the subsequent installation.

3) If you find damage, replace the fire seal [123].

END OF TASK



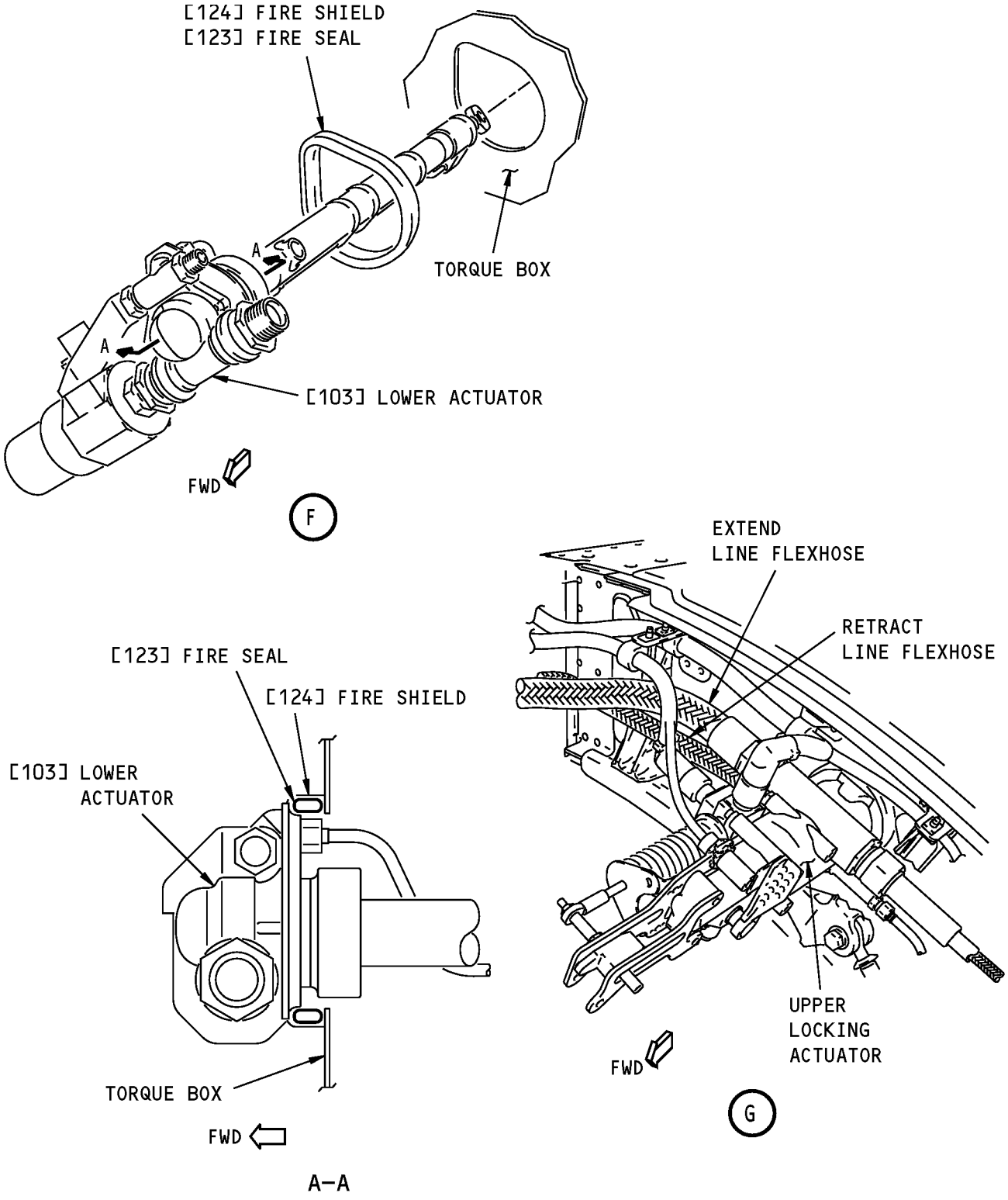
Lower Actuator Installation
Figure 403 (Sheet 1 of 4)/78-31-03-990-803-F00



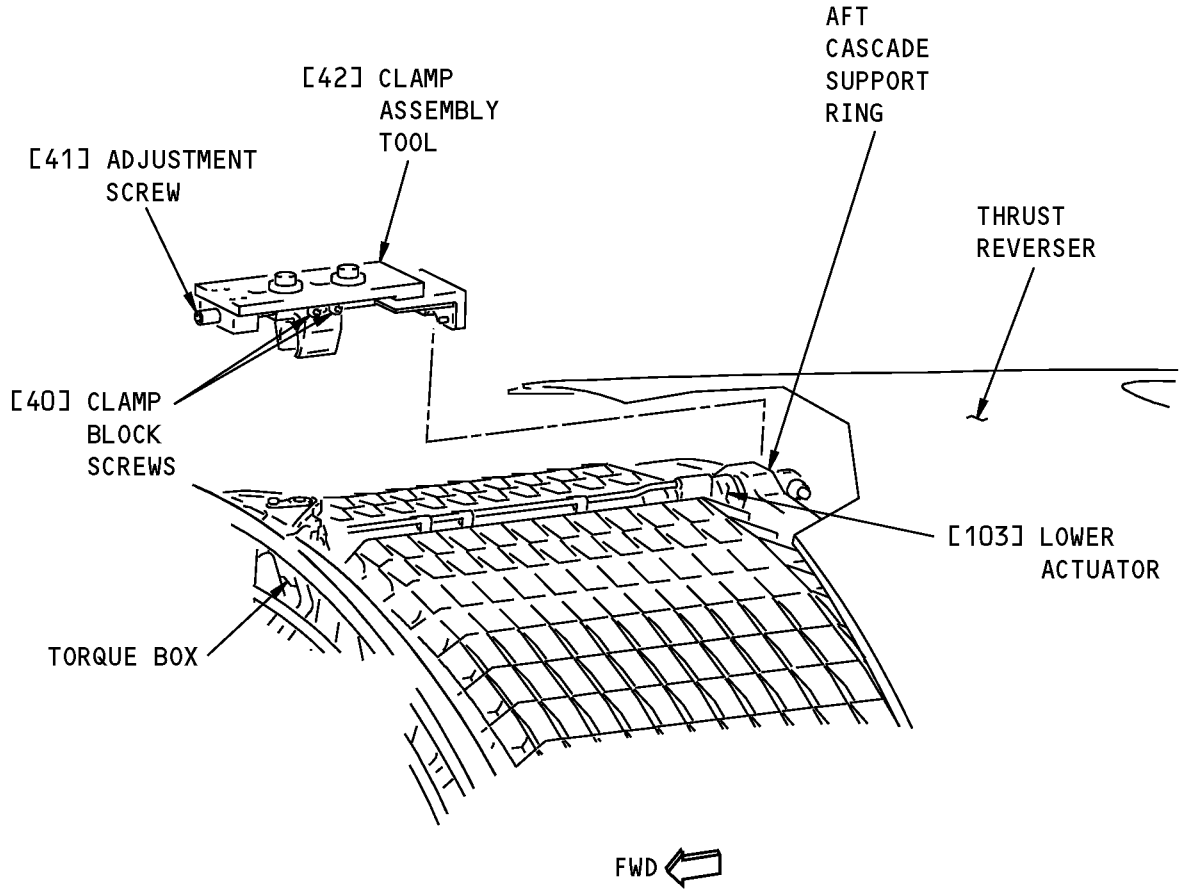
NOTE: THE LEFT THRUST REVERSER IS SHOWN, THE RIGHT THRUST REVERSER IS THE SAME.

1 INSTALL THE BOLT WITH THE BOLT HEAD ON THE TOP SIDE OF THE FITTING.

Lower Actuator Installation
Figure 403 (Sheet 2 of 4)/78-31-03-990-803-F00



Lower Actuator Installation
Figure 403 (Sheet 3 of 4)/78-31-03-990-803-F00



Lower Actuator Installation
Figure 403 (Sheet 4 of 4)/78-31-03-990-803-F00

TASK 78-31-03-400-803-F00

9. Lower Hydraulic Actuator Installation

(Figure 403)

A. General

(1) This task is for the installation of the lower actuator.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-700-803-F00	Sync Lock Operational Test (P/B 501)
78-31-02-990-807-F00	Figure: Thrust Reverser Attach Fitting Inspection (P/B 601)
78-31-04-000-801-F00	Sync Shaft Removal (P/B 401)
78-31-04-400-801-F00	Sync Shaft Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-2439	Tool - Actuator, Installation/Removal (Part #: C78025-21, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-9002	Lock Equipment - Thrust Reverser Maintenance (Part #: B78009-26, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
A00803	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type I
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)
D00633	Grease - Aircraft General Purpose	BMS3-33
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
103	Actuator	78-31-03-01-630	HAP ALL
109	Packing	78-31-03-01-215	HAP ALL
111	Packing	78-31-03-01-215	HAP ALL

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
123	Seal	78-31-03-01-784	HAP ALL

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Access Panels

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

H. Prepare for the Installation

SUBTASK 78-31-03-420-011-F00

(1) Do these steps to install the fire seal [123] and fire shield [124] on the lower actuator [103] (View F):

(a) Put the fire seal [123] in the fire shield [124].

(b) Put the fire seal [123] and fire shield [124] over the rod end of the lower actuator [103].

1) Make sure that the fire seal [123] will contact the forward side of the torque box.

I. Install the Lower Hydraulic Actuator

SUBTASK 78-31-03-420-012-F00

CAUTION: WHEN YOU INSTALL THE LOWER ACTUATOR, THE PUSH ROD WILL BE MOVED THOUGH AN OPENING IN THE TORQUE BOX AND THE AFT CASCADE SUPPORT RING. DO NOT LET THE PUSH ROD HIT THE TORQUE BOX OR THE AFT CASCADE SUPPORT RING, DAMAGE TO THE PUSH ROD CAN OCCUR.

(1) Do these steps to install the lower actuator [103]:

(a) To extend the rod end of the lower actuator [103], pull the rod end out by hand:

1) For the inboard thrust reverser, extend the rod end approximately 10 inches (254 mm).

2) For the outboard thrust reverser, extend the rod end approximately 21 inches (533 mm).

(b) Carefully insert the rod end through the opening in the torque box and aft cascade support ring.

SUBTASK 78-31-03-860-005-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-03-420-013-F00

(3) Do these steps to install the two gimbal pins [120] that attach the lower actuator [103] to the gimbal ring on the aft side of the torque box (View E):

(a) Apply grease, D00633 on the shanks of the two gimbal pins [120].

(b) Align the attachment holes in the lower actuator [103] and the gimbal ring.

(c) If you use the clamp assembly tool, SPL-2439 [42] to compress the fire seal [123] against the torque box, do these steps (View I):

NOTE: Use a 1/4-inch allen wrench to turn the adjustment screw [41] and use a 3/16-inch allen wrench to turn the clamp block screws [40].

1) If not already done, loosen the clamp block screws [40] sufficiently, so that the clamp block will fit over the lower actuator [103].

2) Make sure that the adjustment screw [41] is retracted.

NOTE: The adjustment screw is on the forward end of the tool.

3) Tilt the aft end of the clamp assembly tool [42] down and over the aft cascade support ring.

4) Lower the forward end of the clamp assembly tool [42] until the clamp block engages the lower actuator [103].

5) Tighten the adjustment screw [41] to move the clamp block aft.

a) Move the clamp block until the aft edge touches where the diameter of the lower actuator [103] increases.

6) Tighten the clamp block screws [40].

7) Tighten the adjustment screw [41] to compress the fire seal [123] against the torque box.

8) Turn the housing one direction or the other to align the attachment holes.

(d) To manually compress the fire seal [123] against the torque box, do these steps:

1) Push aft on the forward end of the lower actuator [103] to compress the fire seal [123] against the torque box.

2) Turn the housing one direction or the other to align the attachment holes.

(e) Install the two gimbal pins [120].

(f) Install a washer [122] and bolt [121] in each of the gimbal pins [120].

1) Tighten the bolts [121] to 30-35 pound-inches (3.4-4.0 Newton meters).

(g) If the clamp assembly tool, SPL-2439 [42] was used, loosen the adjustment screw [41] and clamp block screws [40] to remove the tool.

SUBTASK 78-31-03-420-025-F00

(4) Align the rod end of the lower actuator [103] with the clevis on the attach fitting (View D).

(a) Make sure the actuator attach fitting has a wear spacer installed (Figure 78-31-02-990-807-F00).

1) If a wear spacer is not installed:

a) Attach a .060 inch x 1.6 inch x 3.2 inch Rulon J wear spacer into place with sealant, A00803.

b) Seal around the edge of the fitting and inner sleeve.

(b) Install the bushing [114], washers [113] and [117], bolt [112] and nut [118] that attach the rod end.

1) Tighten the nut [118] to 370-690 pound-inches (41.8-78.0 Newton meters).

SUBTASK 78-31-03-410-014-F00

(5) Put the applicable access doors [116] in the correct position to align the bolt holes.

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

(a) Install the nine bolts [115] to attach the access door [116].

1) Tighten the bolts [115] to 30-50 pound-inches (3.4-5.7 Newton meters).

SUBTASK 78-31-03-020-033-F00

(6) Do these steps if the replacement lower actuator [103] does not have the union [110] installed (View B):

(a) Remove the protective covers from the lower actuator ports.

(b) Lubricate a packing [111] with fluid, D00153 or MCS 352B fluid, D00054.

(c) Install the packing [111] on the union [110].

(d) Lubricate the threads of the union [110] with fluid, D00153 or MCS 352B fluid, D00054.

(e) Install the union [110] in the upper retract port.

1) Tighten the union [110] to 256-283 pound-inches (28.9-31.9 Newton meters).

NOTE: Do not double-torque a fitting that has a packing.

SUBTASK 78-31-03-420-015-F00

(7) Do these steps to install the sync lock [105] and the adapter plug [108] (View B):

(a) Lubricate a packing [109] with fluid, D00153, or MCS 352B fluid, D00054.

(b) Install the packing [109] on the adapter plug [108].

(c) Lubricate the threads of the adapter plug [108] with fluid, D00153 or MCS 352B fluid, D00054.

(d) Install the adapter plug [108] in the lower retract port of the lower actuator.

1) Tighten the adapter plug [108] to 256-283 pound-inches (28.9-31.9 Newton meters).

NOTE: Do not double-torque a fitting that has a packing.

(e) Put the sync lock [105] in the correct position.

1) Make sure that the fastener hole in the bracket aligns with the stud on the adapter plug [108].

(f) Hand tighten the coupling nut on the sync lock [105].

(g) Install the washer [107] and nut [106] that connect the bracket to the adapter plug stud.

1) Tighten the nut [106] to 65-100 pound-inches (7.3-11.3 Newton meters).

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE SYNC LOCK, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(h) Tighten the coupling nut on the sync lock [105].

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.7 Newton meters).

SUBTASK 78-31-03-020-024-F00

(8) Do these steps to connect and tighten the hydraulic lines (View B):

(a) Remove the protective covers from the hydraulic lines.

(b) Connect the lower retract hydraulic line [132] to the upper retract port of the lower actuator [103].

1) Hand tighten the coupling nut at this time.

(c) Tighten the two bolts on each of the two clamp blocks that hold the retract hydraulic line [132].

1) Tighten the bolts to 30-35 pound-inches (3.4-4.0 Newton meters).

(d) Tighten the coupling nut on the lower hydraulic retract line [132].

1) Tighten the coupling nut to 256-283 pound-inches (28.9-32.1 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 256-283 pound-inches (28.9-32.1 Newton meters).

(e) Do these steps to temporarily install the lower sync shaft and tubing:

NOTE: To manually retract the thrust reverser, the sync shafts must be temporarily installed.

1) If there is contamination, remove the contamination from the sync shaft with a cotton wiper, G00034.

2) Move the coupling nut and tube adaptors along the tubing.

3) Insert the sync shaft into the tubing.

a) Make sure that the sync shaft engages the internal spline in the middle actuator port.

4) Flex the sync shaft and insert the opposite end into the internal spline in the lower actuator port.

5) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton meters).

NOTE: This is a temporary installation and it is not necessary to double torque the coupling nuts.

SUBTASK 78-31-03-420-014-F00

(9) Connect the electrical connectors to the sync lock receptacle (View B):

(a) For the left thrust reverser, connect the electrical connector, D1008.

(b) For the right thrust reverser, connect the electrical connector, D1016.

SUBTASK 78-31-03-420-026-F00

WARNING: DO ALL OF THE STEPS AND OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THIS WARNING, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(10) To correctly rig the lower sync shaft between the lower actuator [103] and the middle actuator [51], do this step:

(a) Do the reference tasks to remove and re-install the lower sync shaft that you temporarily installed.

1) Do this task:Sync Shaft Removal, TASK 78-31-04-000-801-F00.

2) Do this task:Sync Shaft Installation, TASK 78-31-04-400-801-F00.

NOTE: This task uses the thrust reverser maintenance lock equipment, SPL-9002. There are two -5 wire bundle cable assemblies in the B78009 tool assembly.

SUBTASK 78-31-03-040-029-F00

(11) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-03-040-030-F00

(12) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-31-03-710-003-F00

WARNING: OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THE WARNINGS AND CAUTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(13) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Operate the thrust reverser through the deploy and stow cycles until the sleeves move smoothly.

(b) Examine the thrust reverser area for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-31-03-710-005-F00

(14) Do this task: Sync Lock Operational Test, TASK 78-31-00-700-803-F00.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-03-410-009-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-03-040-024-F00

(2) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

END OF TASK

THRUST REVERSER HYDRAULIC ACTUATORS - INSPECTION/CHECK

1. General

A. This procedure has one task to inspection the thrust reverser hydraulic actuator rod end.

TASK 78-31-03-610-801-F00

2. Thrust Reverser Hydraulic Actuator Rod End Inspection

(Figure 601)

A. General

(1) This task gives the instructions for a visual inspection of the rod ends on the hydraulic actuators.

(a) The rod ends are installed in the translating sleeve on the hydraulic actuators.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Access Panels

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

E. Prepare for the Inspection

SUBTASK 78-31-03-040-035-F00

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (TASK 78-31-00-040-802-F00).

SUBTASK 78-31-03-010-017-F00

(2) Do these steps to remove the access door for the applicable actuator:

(a) To remove the upper actuator access doors [2], remove the nine bolts [1].

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

(b) To remove the middle actuator access doors [2], remove the nine bolts [1].

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

(c) To remove the lower actuator access doors [2], remove the nine bolts [1].

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

F. Procedure

SUBTASK 78-31-03-212-001-F00

(1) Examine the applicable rod end for damage:

(a) Cracks are not permitted

(b) Nicks are not permitted

(c) Dents are not permitted

(d) Scratches are not permitted

(e) Bushing damage is not permitted.

SUBTASK 78-31-03-869-001-F00

(2) If damage is found on the rod end refer to CMM 78-31-18 (Non-locking Actuator) or CMM 78-31-19 (Locking Actuator).

(a) Replace the rod end component per CMM 78-31-18 (Non-locking Actuator) or CMM 78-31-19 (Locking Actuator).

G. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-03-410-016-F00

(1) Do these steps to install the access door for the applicable actuator:

(a) For the upper actuator, put the access doors [2] in the correct position to align the bolt holes.

Number	Name/Location
415DL	Left Thrust Reverser Actuator (Upper), Engine 1
416DR	Right Thrust Reverser Actuator (Upper), Engine 1
425DL	Left Thrust Reverser Actuator (Upper), Engine 2

(Continued)

Number	Name/Location
426DR	Right Thrust Reverser Actuator (Upper), Engine 2

(b) For the middle actuator, put the access doors [2] in the correct position to align the bolt holes.

Number	Name/Location
415EL	Left Thrust Reverser Actuator (Middle), Engine 1
416ER	Right Thrust Reverser Actuator (Middle), Engine 1
425EL	Left Thrust Reverser Actuator (Middle), Engine 2
426ER	Right Thrust Reverser Actuator (Middle), Engine 2

(c) For the lower actuator, put the access doors [2] in the correct position to align the bolt holes.

Number	Name/Location
415FL	Left Thrust Reverser Actuator (Lower), Engine 1
416FR	Right Thrust Reverser Actuator (Lower), Engine 1
425FL	Left Thrust Reverser Actuator (Lower), Engine 2
426FR	Right Thrust Reverser Actuator (Lower), Engine 2

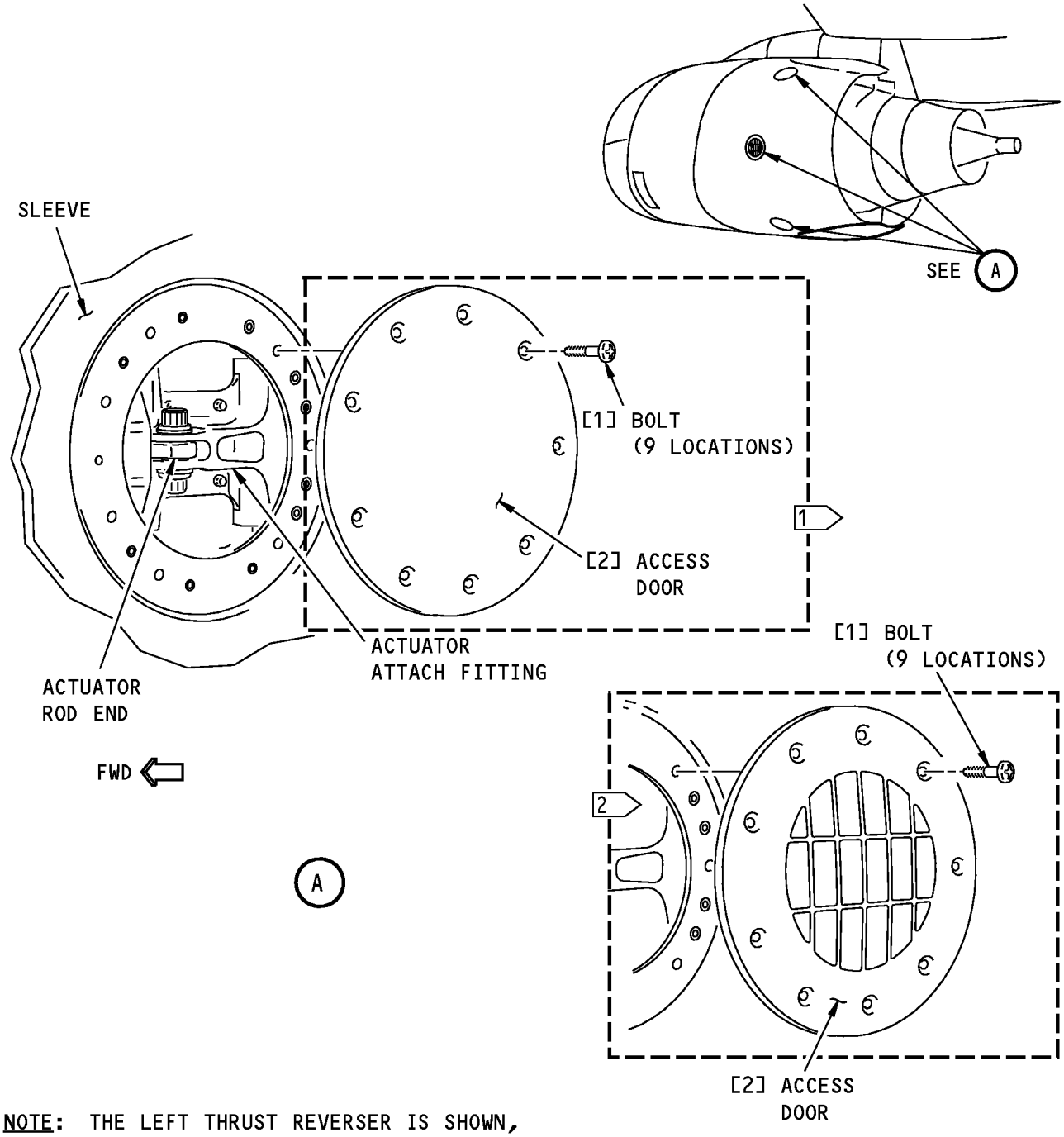
(d) Install the nine bolts [1] to attach the applicable access door [2].

1) Tighten the bolts [1] to 30-50 pound-inches (3.4-5.7 Newton meters).

SUBTASK 78-31-03-440-002-F00

(2) Do the activation procedure for the thrust reverser (TASK 78-31-00-440-803-F00).

END OF TASK



NOTE: THE LEFT THRUST REVERSER IS SHOWN,
THE RIGHT THRUST REVERSER IS THE SAME.

1 > UPPER AND LOWER ACCESS DOOR

2 > MIDDLE ACCESS DOOR

1566546 S0000290424_V2

Thrust Reverser Hydraulic Actuator Rod End Inspection
Figure 601/78-31-03-990-809-F00

THRUST REVERSER HYDRAULIC ACTUATORS - REPAIRS

1. General

A.

This procedure has one task to replace the manual lockout handle assembly on the thrust reverser locking actuator.

TASK 78-31-03-300-801-F01

2. Manual Lockout Handle Assembly Replacement

(Figure 801)

A. General

(1) This task is to replace the manual lockout handle assembly on the upper locking hydraulic actuator.

(2) To do this task, the locking actuator must be in the stowed and locked position.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
73-21-00-700-804-F00	EEC TEST (P/B 501)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-03-000-801-F00	Upper Locking Hydraulic Actuator Removal (P/B 401)
78-31-03-400-801-F00	Upper Locking Hydraulic Actuator Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-4156	Locator Assembly - Proximity Sensor (B78015-28 included in Overhaul Sets B78015-17 and -23) (Part #: B78015-23, Supplier: 81205, A/P Effectivity: 737-600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Lockout handle assembly	78-31-03-01-380	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Procedure

SUBTASK 78-31-03-860-006-F01

(1) For on-wing replacement of the manual lockout handle assembly [1], do these steps:

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

(a) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

(b) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

(c) Make sure the thrust reverser sleeve is in the stowed and locked position.

SUBTASK 78-31-03-000-001-F01

(2) For off-wing replacement of the manual lockout handle assembly [1]:

(a) Do this task: Upper Locking Hydraulic Actuator Removal, TASK 78-31-03-000-801-F00.

(b) Retract and lock the actuator.

SUBTASK 78-31-03-020-041-F01

(3) Do these steps to remove the defective lockout handle assembly [1]:

(a) Mark the position of the handle relative to the actuator housing so that the new handle assembly is installed in the same position.

1) In the locked position, the handle lever is approximately vertical to the axis of the actuator.

(b) Remove the two screws that attach the detent housing to the actuator housing.

(c) Remove the detent housing, manual unlock pin, spring and spring guide.

(d) Remove the nut from the handle assembly.

(e) Remove the shim, unlock lever, torsion spring, and handle assembly.

(f) Do not remove the two bushings.

SUBTASK 78-31-03-420-027-F01

(4) Do these steps to install the new lockout handle assembly [1]:

(a) Install the torsion spring on the new lockout handle assembly [1].

1) Locate one leg of the spring in the hole.

(b) Install the unlock lever in the locked position in the actuator housing (Figure 801)(Sheet 3)

(c) Align the lockout handle assembly [1] with the mark (locked position) and insert the lockout handle assembly [1] through the bushing until the splines just engage.

1) Pull the free leg of the torsion spring around to align with the hole in the housing.

2) Push the handle assembly through until it bottoms on the bushing. Make sure the torsion spring is installed correctly.

(d) Install the shim with the counterbore towards the housing (Figure 802). Make a new shim for these conditions:

1) There is a gap between the shim and the bushing, or

2) The shim counterbore is not bottomed out on the shoulder of the nut.

3) Measure F (the distance from the shoulder end of the handle assembly) and subtract 0.002 inch (0.0508 mm) to get S3 (the necessary shim thickness).

(e) Install the nut and tighten the nut to 20-30 inch-pounds (2.26-3.39 newton-meters):

(f) Pull the lockout handle assembly [1] to the unlocked position and make sure the unlock lever and handle operate correctly with no binding.

(g) Put the lockout handle assembly [1] back to the locked position and make sure the actuator is in the stowed and locked position.

1) Remove the upper access door on the thrust reverser sleeve to get access to the rod end.

2) See if the stop nut is within 0.007-0.033 inch (0.1778-0.8382 mm) of the gland nut.

(h) Do these steps to install the detent housing:

1) Install the spring guide, spring, manual unlock pin and detent housing in the actuator housing.

2) Install the two screws and tighten to 27-30 inch-pounds (3.05-3.39 newton-meters).

3) Safety each screw with lockwire.

(i) Pull the lockout handle assembly [1] to the unlocked position, then push and release the detent pin.

1) Make sure there is no binding and the unlock pin springs back smoothly.

(j) Put the lockout handle assembly [1] back to the locked position and make sure the actuator is in the stowed and locked position.

1) Look through the access area and see if the stop nut is in contact with the gland nut.

(k) Do these steps to install the target on the lockout handle assembly [1] (Figure 803):

1) It is recommended to use proximity sensor locator, SPL-4156, to position the target on the handle.

2) Apply and keep a slight pressure to the handle in the unlock position (light pressure against internal lock sleeve, but do not move sleeve).

3) The target must be 0.350 +/- 0.020 inch (8.29 +/- 0.0508 mm) from the center of the bracket sensor hole.

4) Install the target on the handle.

G. Put The Airplane Back To Its Usual Condition

SUBTASK 78-31-03-410-015-F01

(1) For on-wing replacement of the manual lockout handle, do these steps:

(a) Install the upper access on the thrust reverser sleeve.

(b) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

(c) Do this task:Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-03-400-001-F01

(2) For off-wing replacement of the manual lockout handle assembly [1]:

(a) Do this task: Upper Locking Hydraulic Actuator Installation, TASK 78-31-03-400-801-F00.

SUBTASK 78-31-03-710-006-F01

(3) For on-wing replacement of the manual lockout handle assembly [1], do these checks:

WARNING: OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THE WARNINGS AND CAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

1) Operate the thrust reverser through the deploy and stow cycles until the sleeves move smoothly.

2) Examine the thrust reverser area for hydraulic fluid leaks.

(b) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

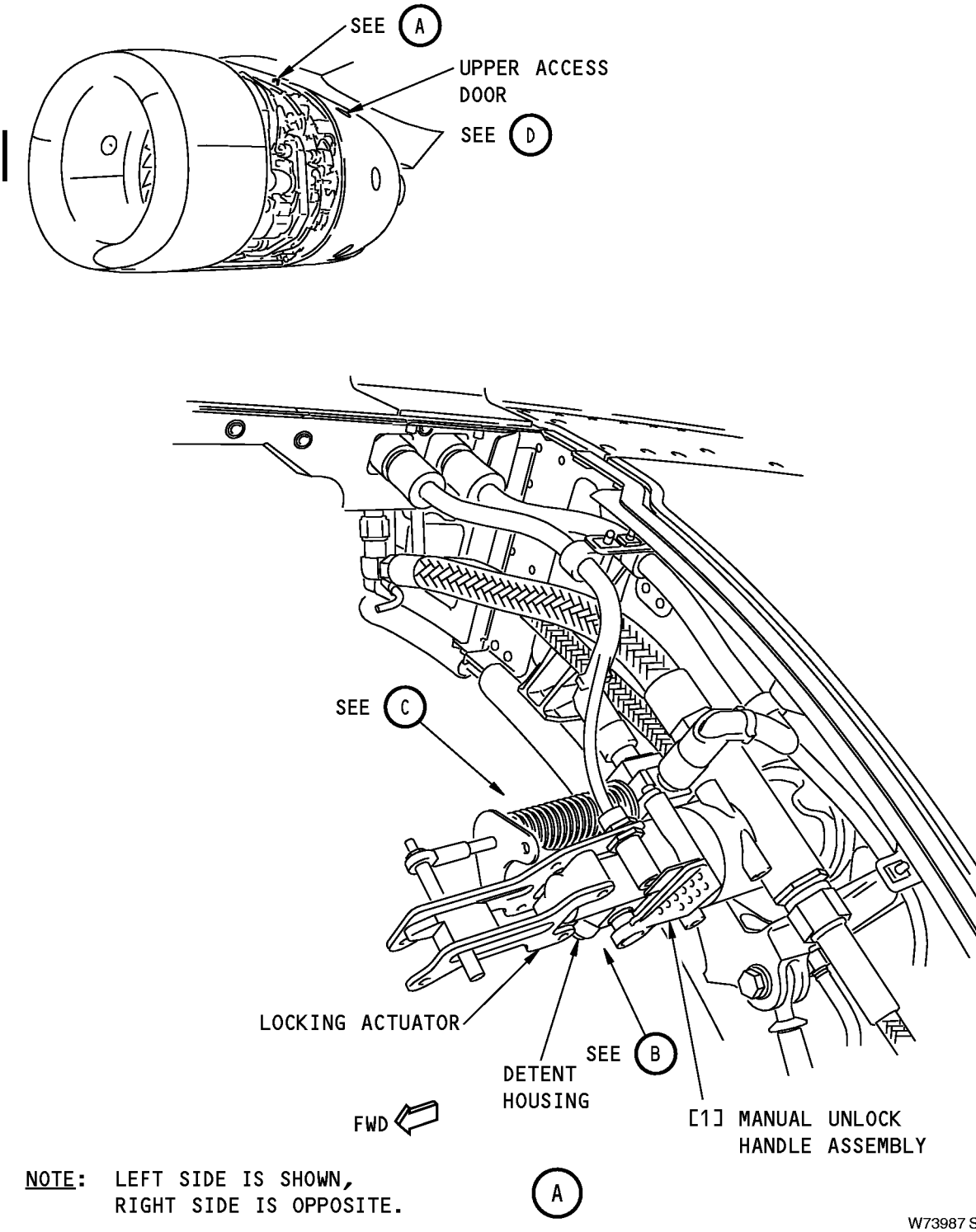
NOTE: This check will make sure that the electrical connections for the LVDT's are correct.

1) Make sure that no LVDT maintenance messages show.

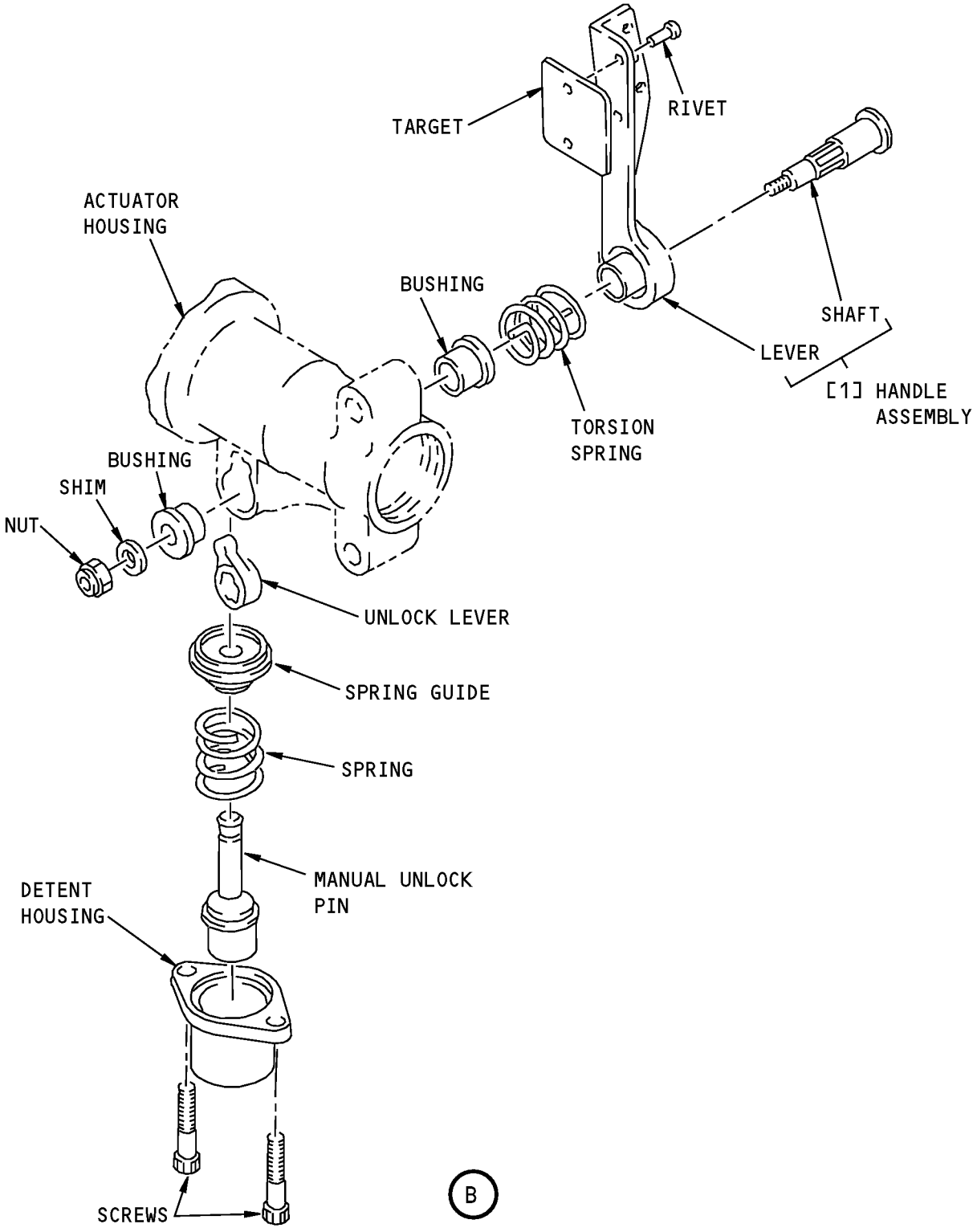
a) If a maintenance message shows, do the applicable fault isolation task in the Fault Isolation Manual for that maintenance message.

b) If no maintenance messages show, the electrical connections for the LVDT are correct.

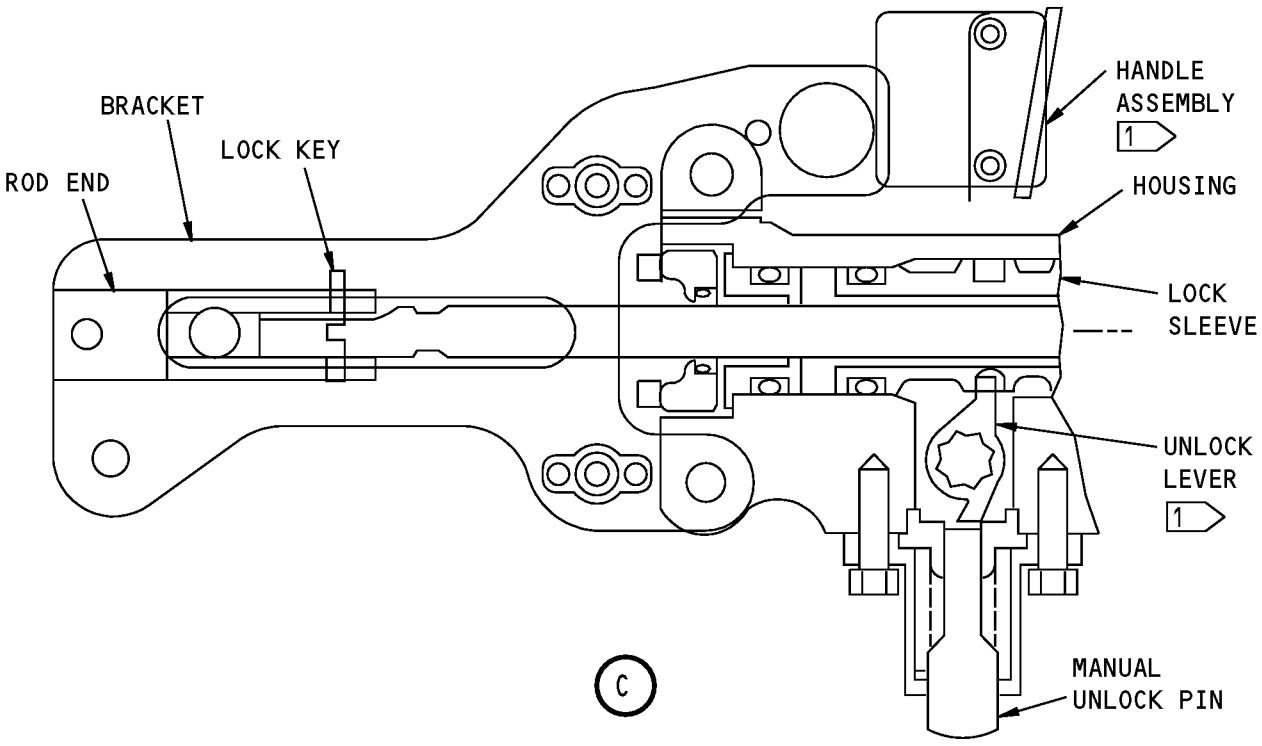
——————— END OF TASK ———————



Manual Lockout Handle Assembly Repair
Figure 801 (Sheet 1 of 4)/78-31-03-990-804-F01

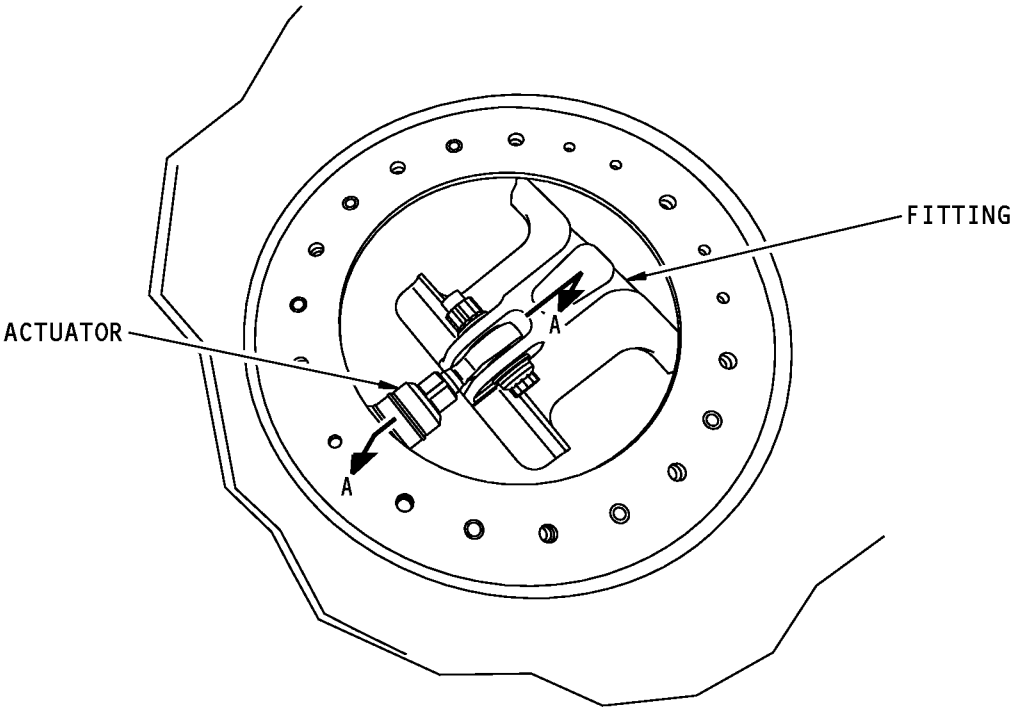


Manual Lockout Handle Assembly Repair
Figure 801 (Sheet 2 of 4)/78-31-03-990-804-F01



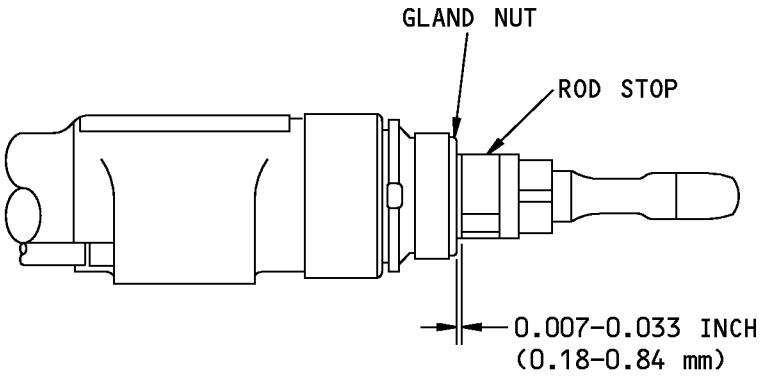
1 SHOWN IN THE LOCKED POSITION

Manual Lockout Handle Assembly Repair
Figure 801 (Sheet 3 of 4)/78-31-03-990-804-F01



UPPER ACCESS DOOR
(REMOVED)

D



UPPER LOCKING ACTUATOR
A-A

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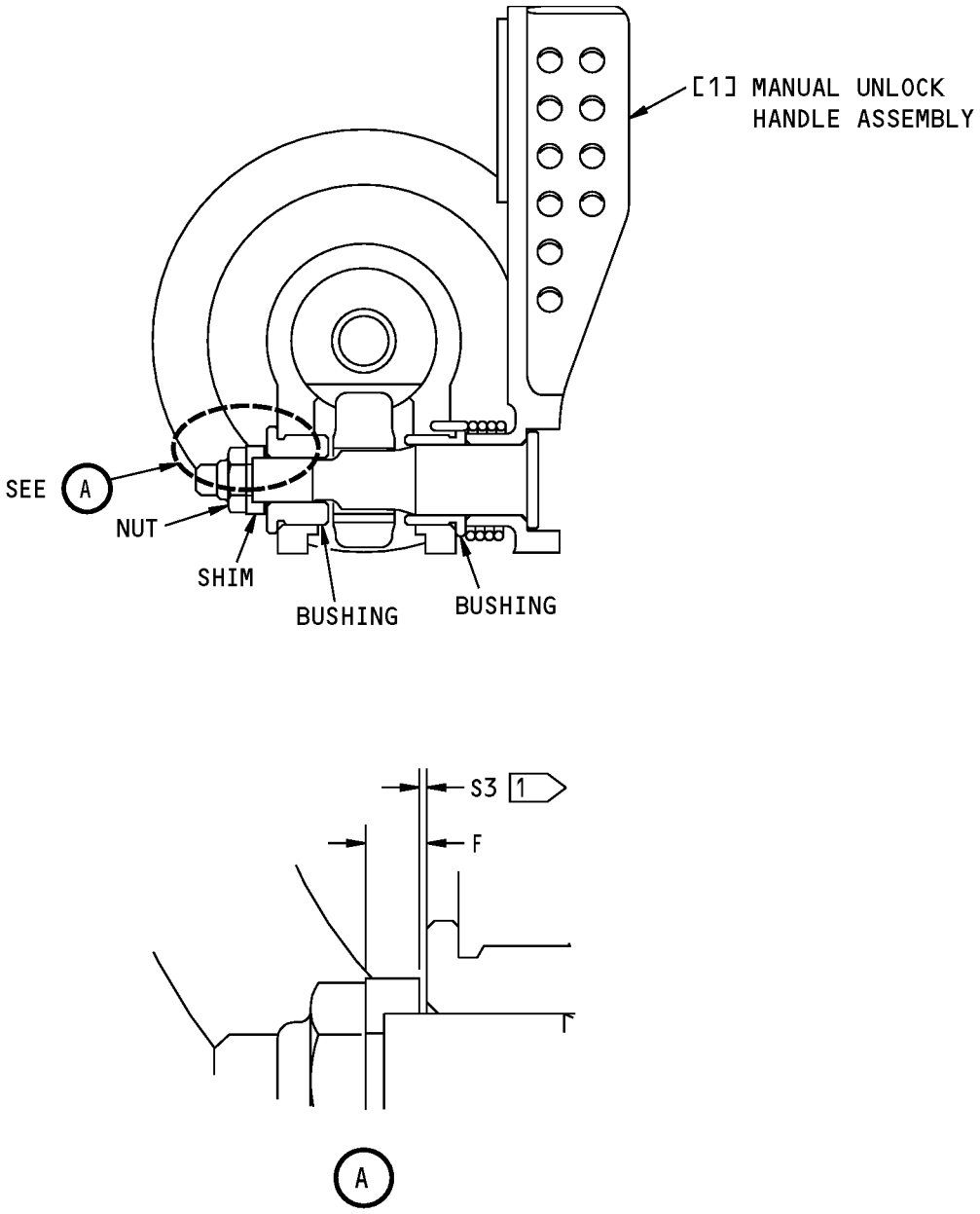
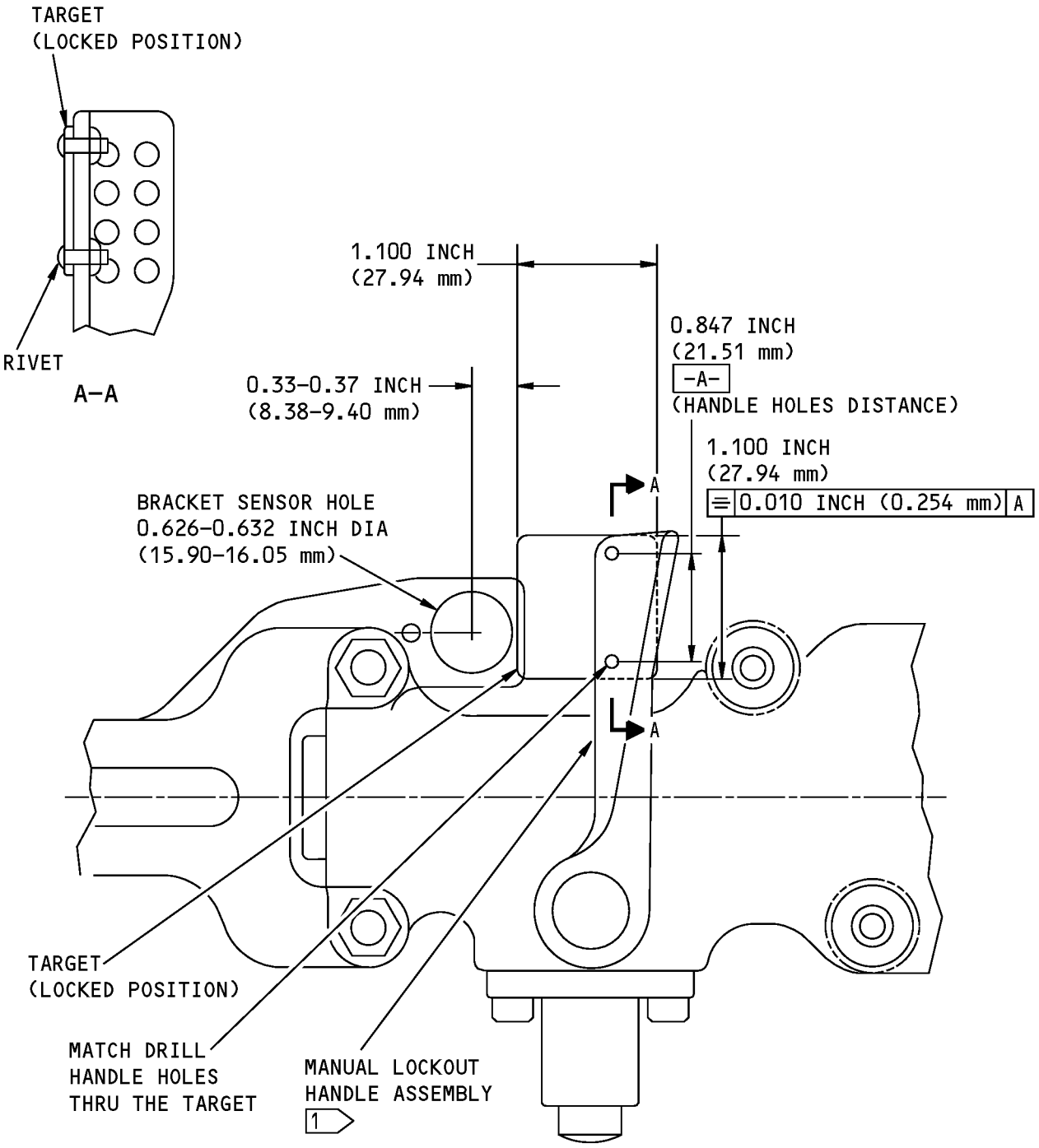
Manual Lockout Handle Assembly Repair
Figure 801 (Sheet 4 of 4)/78-31-03-990-804-F01



1 DIMENSION S3 IS THE NECESSARY SHIM THICKNESS. ADJUST COUNTERBORE DEPTH OF SHIM TO DIMENSION S3.

Shim Installation
Figure 802/78-31-03-990-807-F01



1 APPROXIMATELY PERPENDICULAR WITH ACTUATOR CENTERLINE WHEN PISTON IS IN FULLY LOCKED POSITION.

Target Installation
Figure 803/78-31-03-990-808-F01

SYNC SHAFT - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the sync shafts.

(2) The installation of the sync shafts.

TASK 78-31-04-000-801-F00

2. Sync Shaft Removal

(Figure 401, Figure 402)

A. General

(1) This task is for the removal of the sync shafts from the left or right thrust reverser on an engine.

(2) The sync shaft is between the upper and middle actuators and between the middle and lower actuators on each thrust reverser torque box.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Consumable Materials

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

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Prepare for the Removal

SUBTASK 78-31-04-040-001-F00

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

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-04-860-001-F00

(2) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-04-860-002-F00

(3) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-04-860-003-F00

(4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 78-31-04-860-004-F00

(5) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 78-31-04-010-001-F00

(6) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-31-04-020-001-F00

WARNING: WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID COULD LEAK FROM THE OPEN PORTS OF THE ACTUATORS OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS CAN OCCUR.

CAUTION: DO NOT LET HYDRAULIC FLUID GET ON THE THRUST REVERSER OR ENGINE COMPONENTS. IMMEDIATELY CLEAN A COMPONENT IF HYDRAULIC FLUID GETS ON IT. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE EQUIPMENT.

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(7) Do these steps to drain the hydraulic fluid from the hydraulic lines:

NOTE: To decrease hydraulic fluid spray when the coupling nuts are loosened, wrap cotton wiper, G00034, around the wrench, coupling nut and hydraulic line.

(a) Wrap cotton wiper, G00034 around the electrical connector on the sync lock receptacle on the lower actuator.

NOTE: The cloth will catch the hydraulic fluid and prevent contamination of the electrical connector.

(b) Disconnect the sync shaft tubing at the lower actuator.

(c) Disconnect the hydraulic retract line at the lower actuator.

(d) Let the hydraulic fluid drain into a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

(e) Loosen the coupling nuts on the extend line and retract line flexhoses at the upper actuator.

NOTE: This will let air into the hydraulic lines to let the hydraulic fluid drain.

SUBTASK 78-31-04-420-001-F00

(8) Tighten the coupling nut on the retract line flexhose at the upper actuator.

(a) Tighten the coupling nut to 256-283 pound-inches (28.9-31.9 Newton meters).

(b) Loosen the coupling nut.

(c) Tighten the coupling nut again to 256-283 pound-inches (28.9-31.9 Newton meters).

SUBTASK 78-31-04-420-002-F00

(9) Tighten the coupling nut on the extend line flexhose at the upper actuator.

(a) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton meters).

(b) Loosen the coupling nut.

(c) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.7 Newton meters).

SUBTASK 78-31-04-420-003-F00

(10) Re-connect the retract line at the lower actuator.

(a) Tighten the coupling nut to 256-283 pound-inches (28.9-31.9 Newton meters).

(b) Loosen the coupling nut.

(c) Tighten the coupling nut again to 256-283 pound-inches (28.9-31.9 Newton meters).

SUBTASK 78-31-04-420-006-F00

(11) If the lower sync shaft will not be removed, re-connect the sync shaft tubing at the lower actuator.

(a) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton meters).

(b) Loosen the coupling nut.

(c) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.7 Newton meters).

SUBTASK 78-31-04-010-002-F00

(12) If the upper sync shaft and tubing will be removed, do this step to remove the upper clampblock [11]:

(a) Remove the two bolts [9], two washers [10], clampblock retainer [8] and clampblock [11].

NOTE: To eliminate tubing preload, it is important to keep the clampblock retainer, clampblock and spacers together and to note their position for the subsequent installation.

SUBTASK 78-31-04-010-003-F00

(13) If the lower sync shaft and tubing will be removed, do this step to remove the lower clampblock [18]:

(a) Remove the two bolts [16], two washers [17], clampblock retainer [15] and clampblock [18].

NOTE: To eliminate tubing preload, it is important to keep the clampblock retainer, clampblock and spacers together and to note their position for the subsequent installation.

G. Sync Shaft Removal

SUBTASK 78-31-04-020-002-F00

CAUTION: DO NOT LET DIRT OR CONTAMINATION GET ON THE SYNC SHAFT. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(1) Do these steps to remove the upper or lower sync shaft [4]:

(a) Disconnect the coupling nuts at the two ends of the upper tube [2] or lower tube [3].

(b) Move the coupling nuts and tube adapters back along the tube to get access to the sync shaft ends.

(c) Flex the sync shaft to remove it from the internal splined port in the actuator.

(d) Remove the sync shaft and tube together.

SUBTASK 78-31-04-420-004-F00

WARNING: TO COLLECT RESIDUAL HYDRAULIC FLUID WHEN HYDRAULIC PRESSURE IS APPLIED IN THE SUBSEQUENT INSTALLATION STEPS, TEMPORARILY INSTALL THE TUBING WITHOUT THE SYNC SHAFT. THIS WILL PREVENT INJURY TO PERSONS.

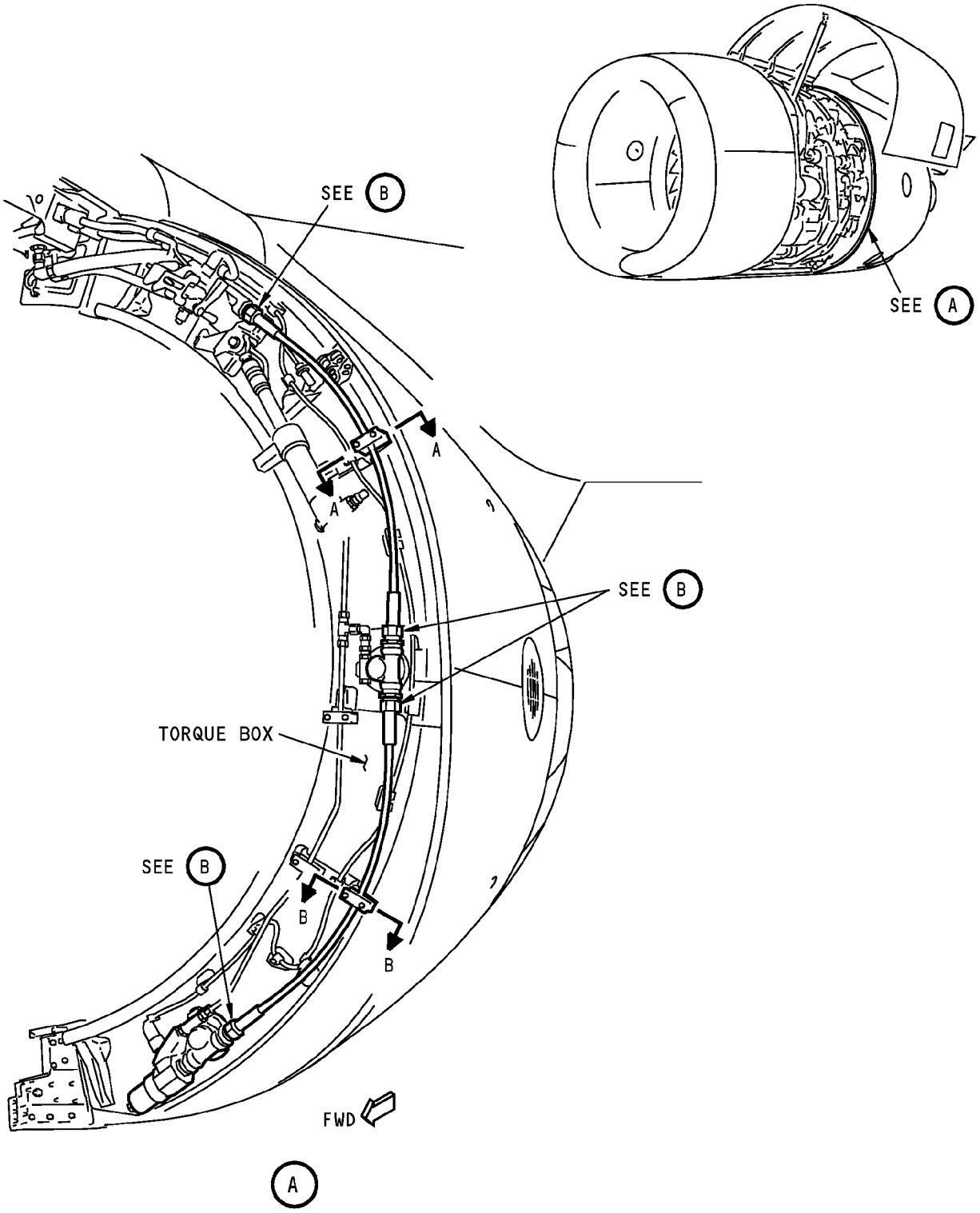
(2) Do these steps to temporarily install the upper tube [2] or lower tube [3] :

(a) Put the upper tube [2] or lower tube [3], without the sync shaft [4], in its position between the actuators.

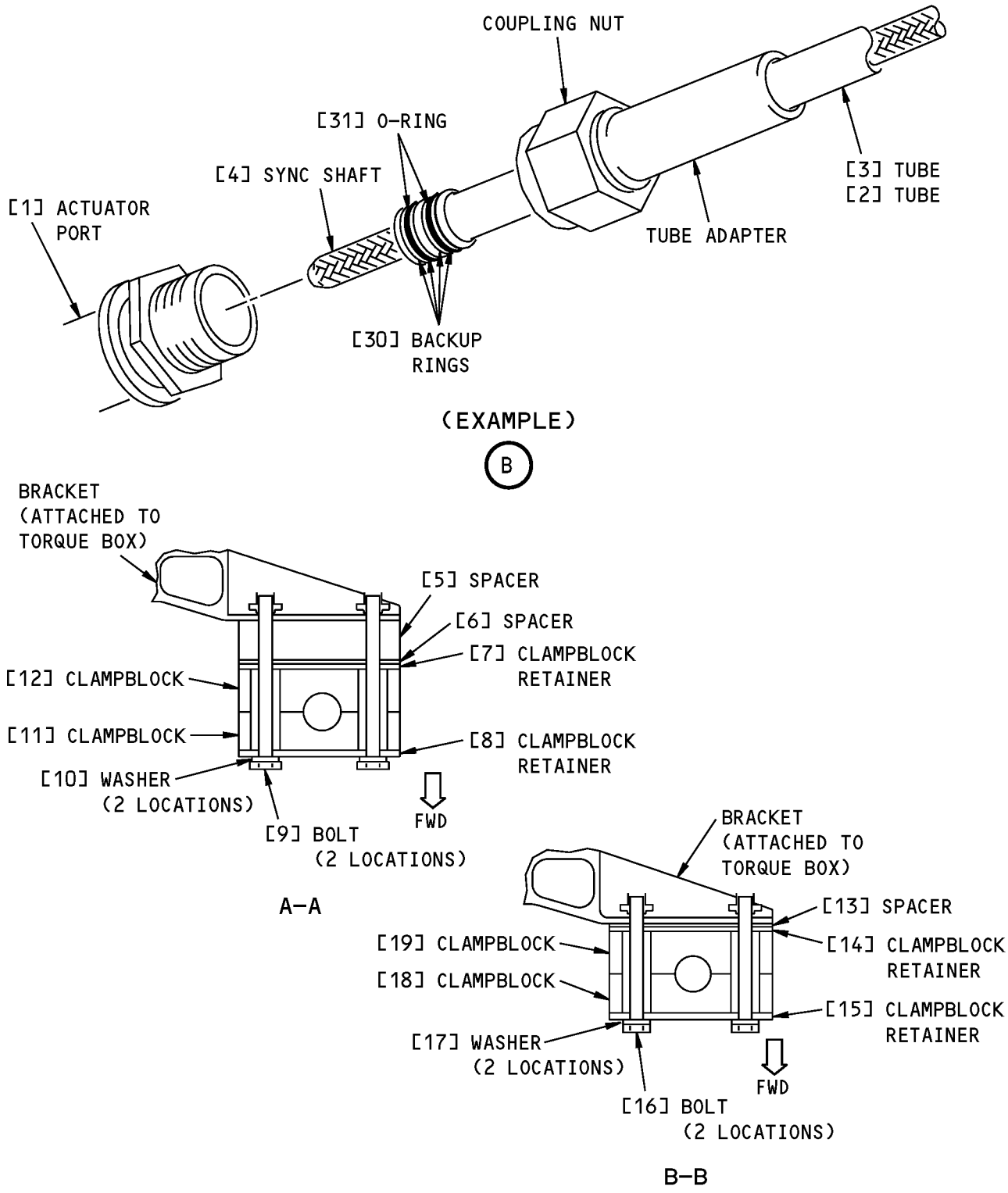
(b) Tighten the coupling nuts to 855-945 pound-inches (96.6-106.7 Newton meters).

NOTE: This is a temporary installation and it is not necessary to double torque the coupling nuts.

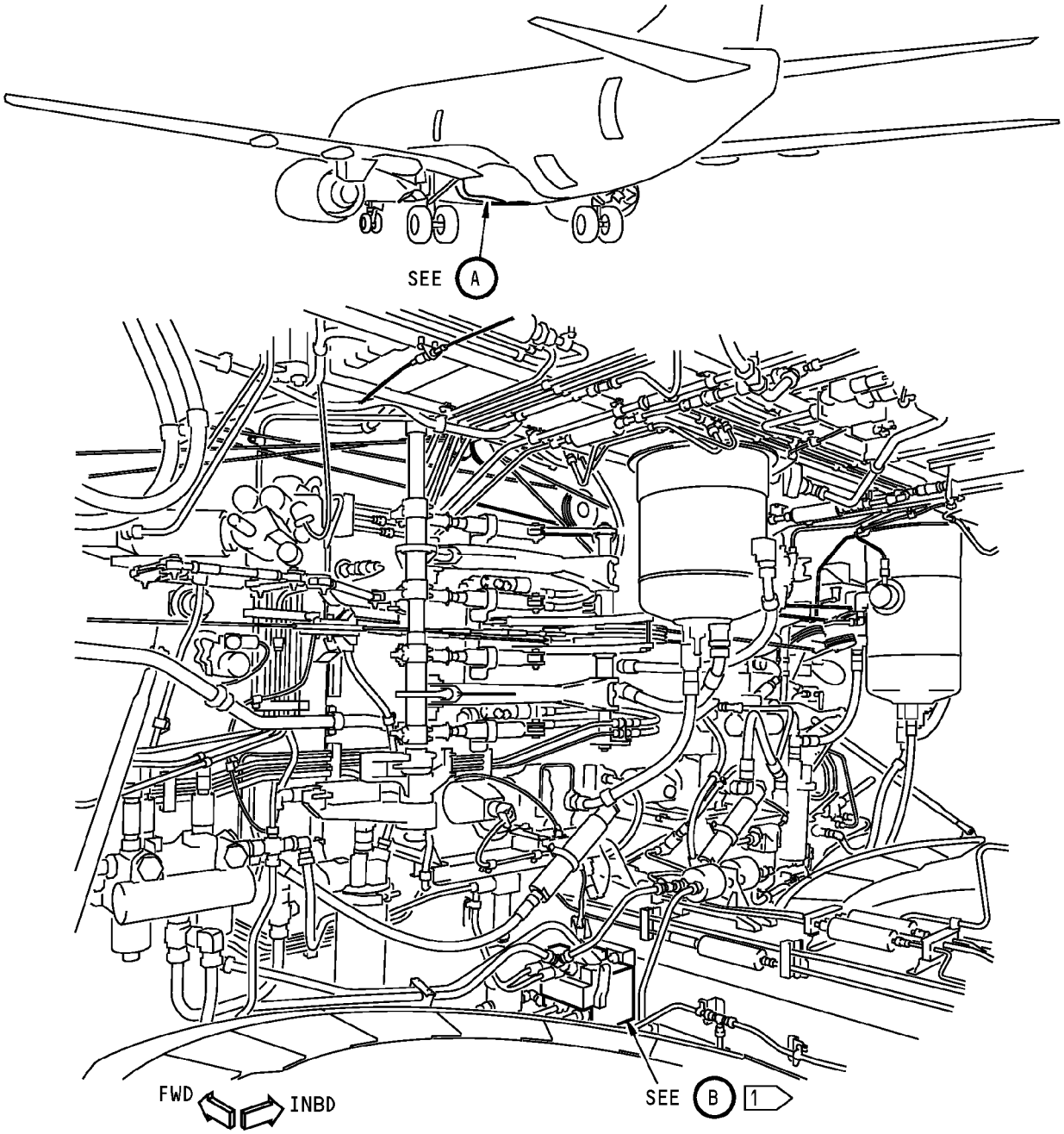
——————— END OF TASK ———————



Sync Shaft Installation
Figure 401 (Sheet 1 of 2)/78-31-04-990-801-F00



Sync Shaft Installation
Figure 401 (Sheet 2 of 2)/78-31-04-990-801-F00

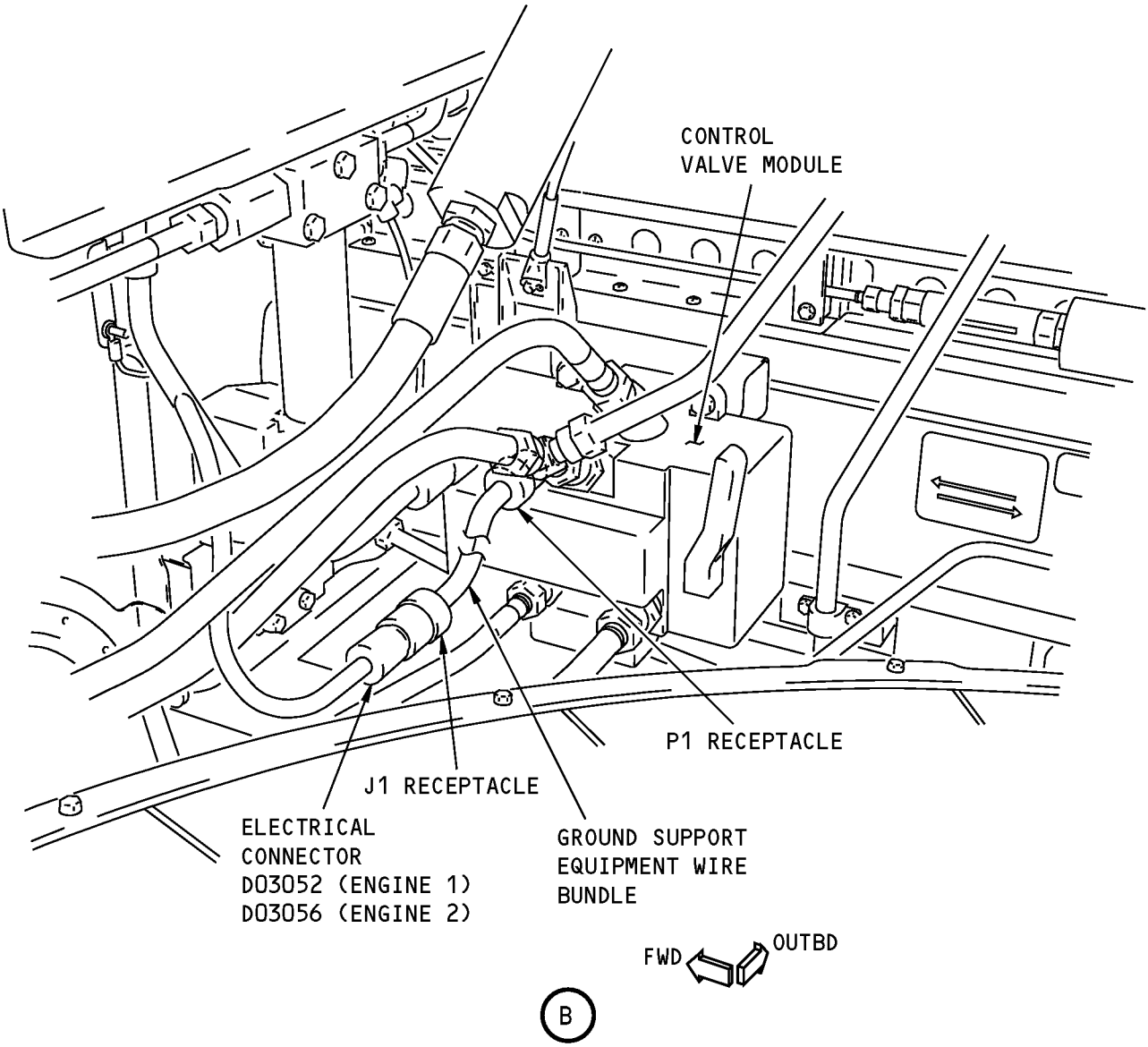


MAIN LANDING GEAR WHEEL WELL

A

1 ENGINE 1 CONTROL VALVE MODULE IS SHOWN,
ENGINE 2 CONTROL VALVE MODULE IS ON THE RIGHT SIDE OF THE KEEL BEAM.

Ground Support Equipment Wire Bundle Installation
Figure 402 (Sheet 1 of 2)/78-31-04-990-802-F00



Ground Support Equipment Wire Bundle Installation
Figure 402 (Sheet 2 of 2)/78-31-04-990-802-F00

TASK 78-31-04-400-801-F00

3. Sync Shaft Installation

(Figure 401, Figure 402)

A. General

(1) After you install the sync shaft and tubing, you must do the thrust reverser normal operational test.

(2) To correctly rig the sync shaft, hydraulic pressure must be applied to the retract side of the thrust reverser actuators when the sync shaft is installed.

(3) The upper and lower sync shafts are interchangeable and can be reversed end for end.

B. References

Reference	Title
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-9002	Lock Equipment - Thrust Reverser Maintenance (Part #: B78009-26, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Tube	78-31-03-01-080	HAP ALL
		78-31-03-01-085	HAP ALL
3	Tube	78-31-03-01-090	HAP ALL
		78-31-03-01-093	HAP 001-013, 015-026, 028-036, 038
4	Shaft	78-31-03-01-125	HAP 001-013, 015-026, 028-036
		78-31-03-01-128	HAP ALL
30	Backup ring	78-31-03-01-110	HAP ALL
31	O-ring	78-31-03-01-115	HAP ALL

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Prepare for the Installation

SUBTASK 78-31-04-480-001-F00

WARNING: DO THE DEACTIVATION OF THE DEPLOY CONTROL CIRCUIT TO MAKE SURE THAT THERE IS HYDRAULIC PRESSURE ONLY IN THE RETRACT LINE OF THE THRUST REVERSER HYDRAULIC SYSTEM. IF YOU DO NOT DO THIS, THERE COULD BE A HIGH PRESSURE LEAK OF HYDRAULIC FLUID AND A SLEEVE DEPLOYMENT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) To prevent the actuation of the deploy circuit, do these steps to connect the B78009-5 cable assembly from the thrust reverser maintenance lock equipment, SPL-9002 to the control valve module:

NOTE: The B78009-5 cable assembly is part of the thrust reverser maintenance lock equipment. There are two -5 wire bundle cable assemblies in the B78009 tool.

(a) Disconnect the electrical connector from the applicable control valve module receptacle.

1) For Engine 1, disconnect the electrical connector, D03052.

2) For Engine 2, disconnect the electrical connector, D03056.

(b) Connect the P1 connector of the -5 cable assembly to the control valve module receptacle.

(c) Connect the electrical connector to the J1 receptacle of the -5 cable assembly.

SUBTASK 78-31-04-860-005-F00

(2) Do these steps to supply hydraulic power to the retract side of the actuators:

(a) Make sure that the tubing is temporarily installed.

(b) Move the applicable reverse thrust lever up and aft to the extend (deploy) position.

NOTE: This will unlock the sync lock.

1) Attach a DO-NOT-OPERATE tag.

(c) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

(d) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THRUST REVERSERS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

1) For engine 1, pressurize hydraulic system A.

2) For engine 2, pressurize hydraulic system B.

(f) Make sure that the reverse thrust lever is up and aft in the extend (deploy) position.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE THRUST REVERSER. BECAUSE THE REVERSE THRUST LEVER IS IN THE EXTEND (DEPLOY) POSITION, IF THE THRUST REVERSER IS PARTIALLY EXTENDED (DEPLOYED) IT WILL RETRACT (STOW) AS SOON AS THE LOCKPIN IS REMOVED FROM THE MANUAL ISOLATION HANDLE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(g) Remove the lockpin from the manual isolation valve handle on the control valve module.

NOTE: Because the cable assembly is installed that disables the deploy actuation circuit, the thrust reverser will retract (stow) as soon as the lockpin is removed from the manual isolation valve handle. This will keep hydraulic pressure on the stow side of the actuators during the flex shaft installation.

1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

H. Sync Shaft Installation

SUBTASK 78-31-04-420-005-F00

(1) Do these steps to install the sync shaft and tube:

(a) Remove the upper tube [2] or lower tube [3] that was temporarily installed.

1) If it is necessary, replace the two new o-rings [31] and four new backup rings [30] on the upper tube [2] or lower tube [3].

a) Slide the coupling nut and tube adapter away from the end of the tube.

b) Remove the two o-rings and four backup rings.

<1> Discard the old o-rings.

c) Clean the seal surfaces and grooves with a clean cotton wiper, G00034 moistened with solvent, B00316.

<1> Wipe all the solvent off the surfaces with a clean, dry cloth.

NOTE: Do not let the solvent dry on the surfaces.

d) Lubricate the new packing with MCS 352B fluid, D00054 or fluid, D00153.

e) Install the two o-rings and four backup rings.

NOTE: An o-ring is installed with two backup rings. There is a backup ring on each side of the o-ring.

f) Slide the coupling nut and tube adapter toward the end of the tube.

(b) If there is contamination on the sync shaft, remove the contamination with a cotton wiper, G00034.

(c) Insert the sync shaft [4] into the tube.

(d) Move the coupling nuts and tube adapters back along the tube to get access to the sync shaft ends.

(e) Insert one end of the sync shaft into the internal spline in the actuator port [1].

(f) Flex the sync shaft and insert the opposite end into the internal spline in the other actuator port [1].

(g) Tighten the coupling nuts enough to engage one or two threads at this time.

(h) Center the tube in the coupling nuts and adapters.

(i) Do these steps to tighten the coupling nuts:

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.7 Newton meters).

SUBTASK 78-31-04-410-001-F00

(2) To install the clampblocks, do these steps:

NOTE: To eliminate tubing preload, it is important to install the clampblock retainer, clampblock and spacers back in their original positions.

(a) For the upper clampblock [11], install the two bolts [9], two washers [10], clampblock retainer [8] and clampblock [11].

(b) For the lower clampblock [18], install the two bolts [16], two washers [17], clampblock retainer [15] and clampblock [18].

(c) Tighten the bolts [9] and [16] to 30-35 pound-inches (3.4-4.0 Newton meters).

SUBTASK 78-31-04-040-004-F00

(3) Do these steps again:

(a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

(b) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

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

(c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

(d) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

(e) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-04-860-007-F00

(4) Move the applicable reverse thrust lever forward and down to the retract (stow) position.

SUBTASK 78-31-04-080-001-F00

(5) Do these steps to disconnect the thrust reverser maintenance lock equipment, SPL-9002, B78009-5 cable assembly, from the control valve module:

(a) Disconnect the P1 connector of the -5 cable assembly from the control valve module receptacle.

(b) Disconnect the electrical connector from the J1 receptacle of the -5 cable assembly.

(c) Connect the electrical connector to the control valve module.

1) For Engine 1, connect the electrical connector, D03052.

2) For Engine 2, connect the electrical connector, D03056.

SUBTASK 78-31-04-980-001-F00

(6) Manually extend and retract the thrust reverser through one cycle.

(a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

SUBTASK 78-31-04-860-008-F00

(7) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	5	C00276	ENGINE 1 THRUST REVERSER CONT
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-31-04-860-009-F00

(8) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	7	C00277	ENGINE 2 THRUST REVERSER CONT

SUBTASK 78-31-04-440-001-F00

(9) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-04-710-001-F00

(10) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Remove the DO-NOT-OPERATE tag from the reverse thrust lever.

(b) Operate the thrust reverser through the extend (deploy) and retract (stow) cycles until all of the air is removed from the thrust reverser hydraulic system.

NOTE: This is shown by a smooth movement of the sleeves.

1) Do a check of the hydraulic tubes and connections for hydraulic fluid leaks.

a) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-04-410-003-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

———————— END OF TASK ————————

SYNC SHAFT - INSPECTION/CHECK

1. General

A. This procedure contains a visual inspection of the Sync Shafts.

TASK 78-31-04-200-801-F00

2. Sync Shaft - Inspection/Check

(Figure 601)

A. References

Reference	Title
78-31-04-000-801-F00	Sync Shaft Removal (P/B 401)
78-31-04-400-801-F00	Sync Shaft Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-3912	Lens - Magnifying, 5x, Hand Held

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Inspection the Sync Shaft

SUBTASK 78-31-04-020-003-F00

(1) For the applicable sync shaft, do this task: Sync Shaft Removal, TASK 78-31-04-000-801-F00.

SUBTASK 78-31-04-210-001-F00

(2) Use a hand held 5x magnifying lens, STD-3912 to do a visual inspection of the sync shaft wires:

(a) Look for a broken wire.

1) If you find a broken wire, then replace the sync shaft; do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

(b) Look for wire strand separations.

1) If the width of the strand separation is equal to or less than the diameter of the wire strand, then the sync shaft is acceptable.

2) If the width of the strand separation is greater than the diameter of the wire strand, then replace the sync shaft; do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

SUBTASK 78-31-04-210-002-F00

(3) Look for twists in the square ends of the sync shaft.

(a) If you find a twist in the square end, then replace the sync shaft; do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

SUBTASK 78-31-04-210-003-F00

(4) Look for kinks in the sync shaft.

(a) If you find a kink that is less than or equal to 0.020 inch (0.508 mm), then the sync shaft is acceptable.

(b) If you find a kink that is greater than 0.020 inch (0.508 mm), then replace the sync shaft; do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

SUBTASK 78-31-04-210-004-F00

(5) Look for abraded or worn areas on the surface of the sync shaft.

(a) If you find abraded or worn areas, then calculate the amount of face wear W:

1) Measure the diameter D2 of the sync shaft at the maximum depth of the worn area.

2) Measure the diameter D1 of the sync shaft in an adjacent area that is not damaged.

3) Subtract diameter D2 from diameter D1 and then divide by 2.

NOTE: (D1 - D2) /2 = W.

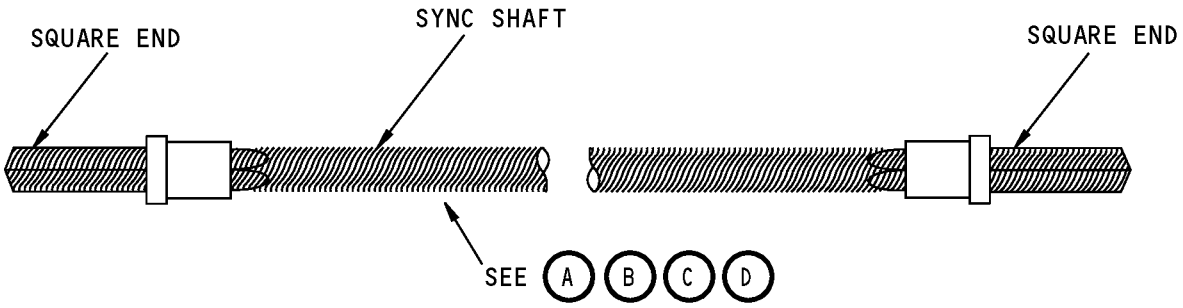
(b) If the face wear W is less than or equal to 0.013 inch (0.330 mm), then the sync shaft is acceptable.

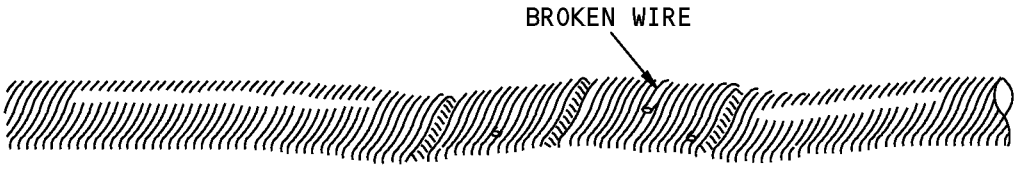
(c) If the face wear W is greater than 0.013 inch (0.330 mm), then replace the sync shaft; do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

SUBTASK 78-31-04-420-007-F00

(6) If the sync shaft is serviceable, do this task: Sync Shaft Installation, TASK 78-31-04-400-801-F00.

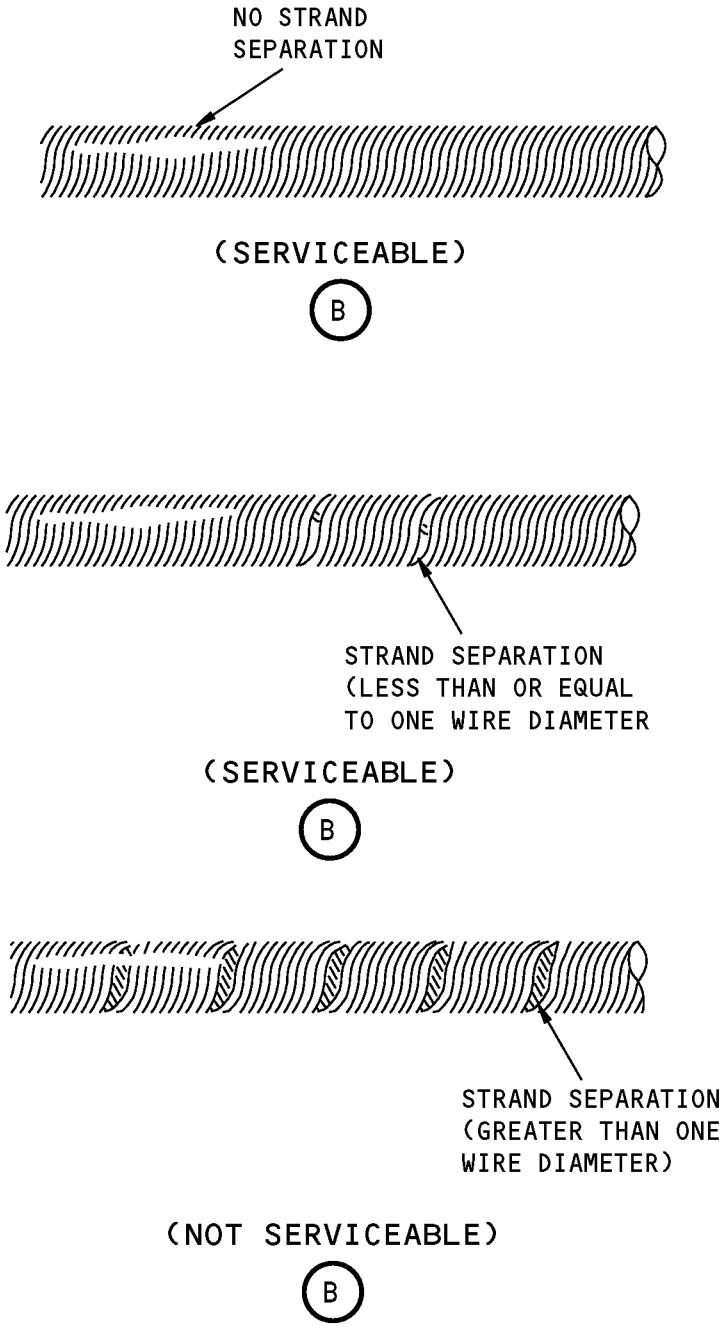
END OF TASK



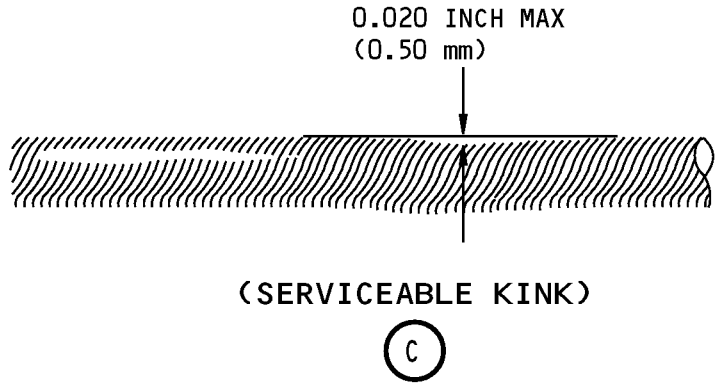


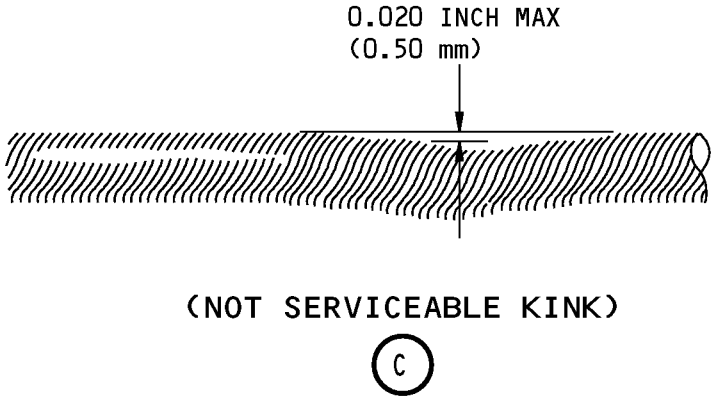
(NOT SERVICEABLE)
A

Sync Shaft
Figure 601 (Sheet 1 of 4)/78-31-04-990-803-F00

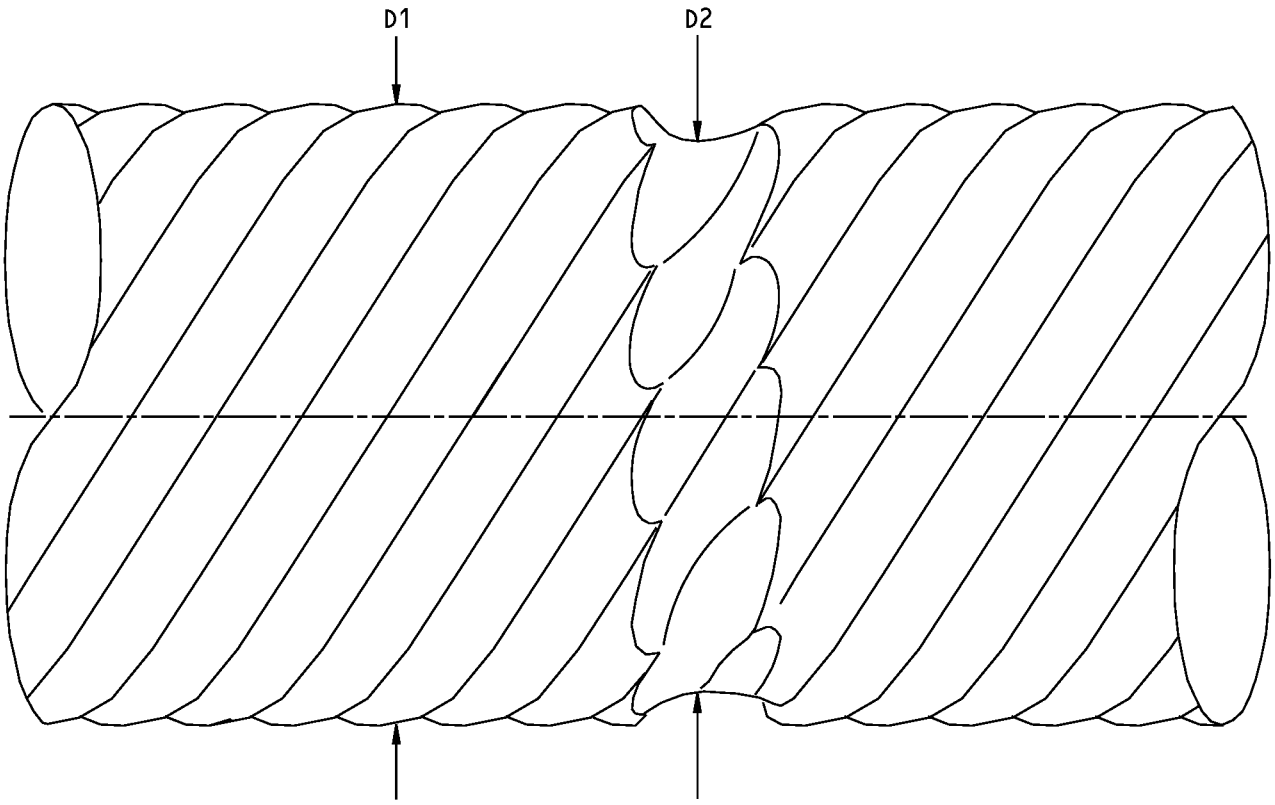


Sync Shaft
Figure 601 (Sheet 2 of 4)/78-31-04-990-803-F00





Sync Shaft
Figure 601 (Sheet 3 of 4)/78-31-04-990-803-F00



Sync Shaft
Figure 601 (Sheet 4 of 4)/78-31-04-990-803-F00

CASCADES - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the cascades.

(2) The installation of the cascades.

TASK 78-31-05-000-801-F00

2. Cascade Removal

(Figure 401), (Figure 402)

A. General

(1) This task is for the removal of the cascades from the left or right thrust reverser on an engine.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-980-805-F00	Thrust Reverser Operation - Extend (Power Procedure) (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-05-840-001-F00

(1) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.

SUBTASK 78-31-05-040-001-F00

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

(2) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

E. Cascade Removal

SUBTASK 78-31-05-000-001-F00

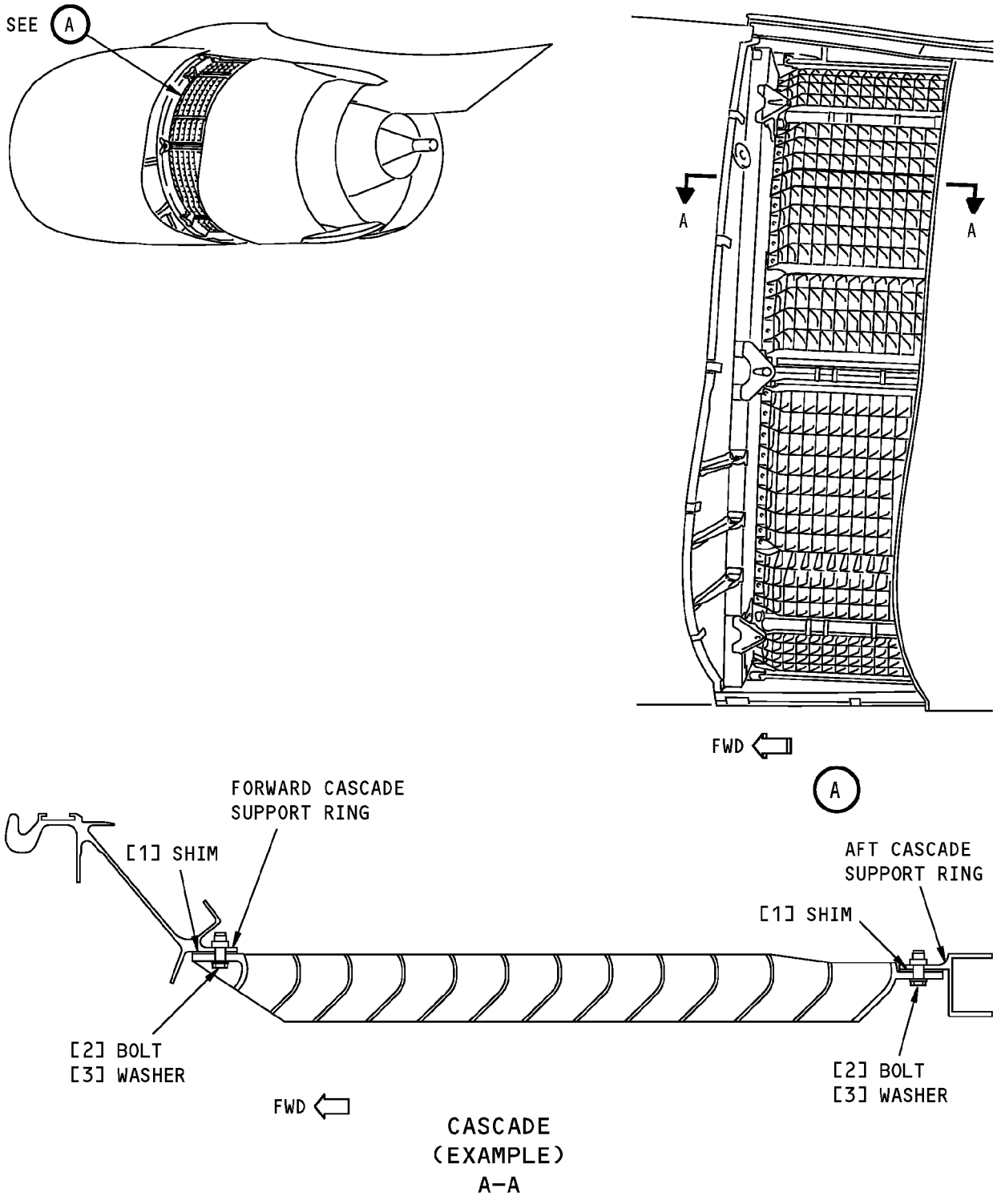
(1) Do these steps to remove the applicable cascade:

(a) Remove the bolts [2] and washers [3] that attach the cascade to the aft cascade support ring.

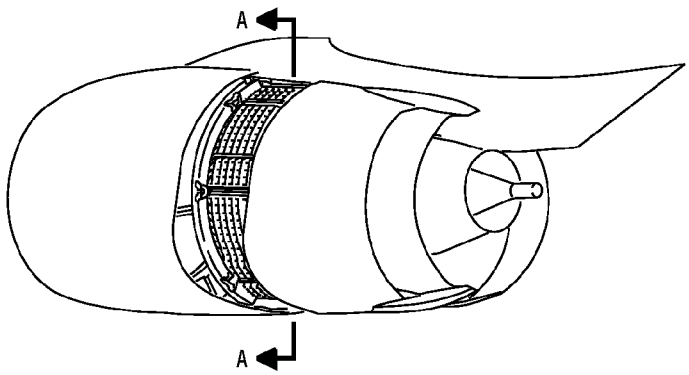
(b) Remove the bolts [2] and washers [3] that attach the cascade to the forward cascade support ring on the torque box.

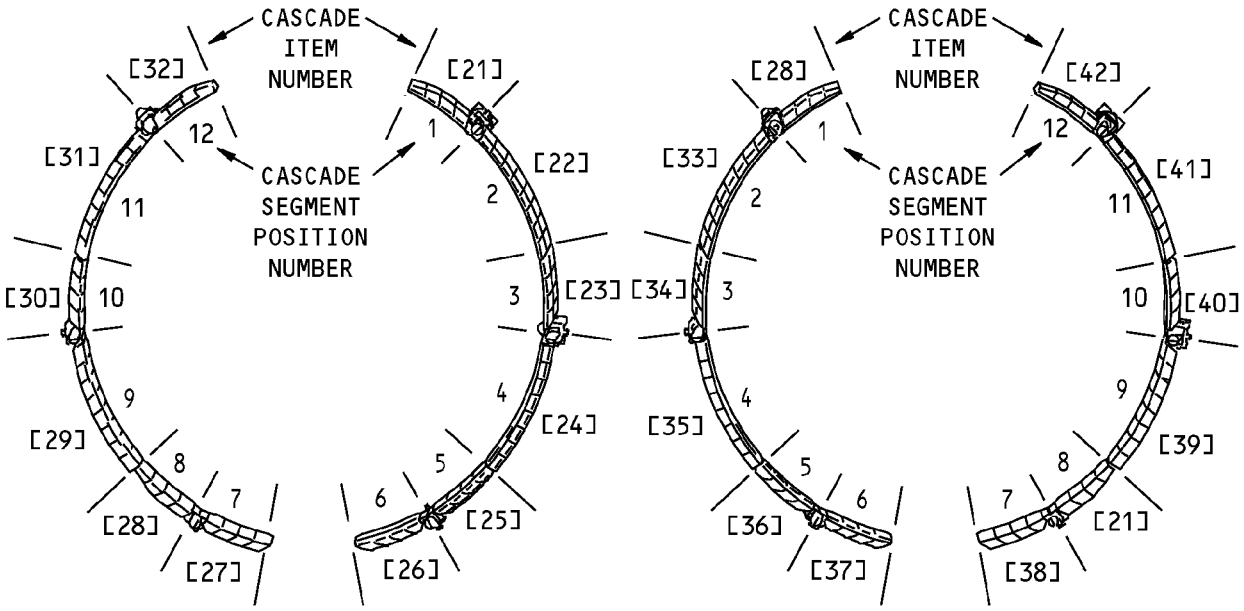
(c) Remove the cascade [21], cascade [22], cascade [23], cascade [24], cascade [25], cascade [26], cascade [27], cascade [28], cascade [29], cascade [30], cascade [31], cascade [32], cascade [33], cascade [34], cascade [35], cascade [36], cascade [37], cascade [38], cascade [39], cascade [40], cascade [41] or cascade [42].

END OF TASK



Cascade Installation
Figure 401/78-31-05-990-801-F00





ENGINE 1
CASCADE POSITION NUMBER
(VIEW IN THE FORWARD DIRECTION)
A–A

ENGINE 2
CASCADE POSITION NUMBER
(VIEW IN THE FORWARD DIRECTION)
A–A

Cascade Positions
Figure 402/78-31-05-990-802-F00

TASK 78-31-05-400-801-F00

3. Cascade Installation

(Figure 401, Figure 402)

A. References

Reference	Title
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS 3-33)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Cascade	78-31-05-01-025	HAP ALL
22	Cascade	Not Specified	
23	Cascade	78-31-05-01-110	HAP ALL
24	Cascade	78-31-05-01-145	HAP ALL
25	Cascade	78-31-05-01-180	HAP ALL
26	Cascade	78-31-05-01-215	HAP ALL
27	Cascade	78-31-05-01-250	HAP ALL
28	Cascade	78-31-05-01-030	HAP ALL
29	Cascade	78-31-05-01-320	HAP ALL
30	Cascade	78-31-05-01-355	HAP ALL
31	Cascade	78-31-05-01-390	HAP ALL
32	Cascade	78-31-05-01-425	HAP ALL
33	Cascade	78-31-05-01-080	HAP ALL
34	Cascade	78-31-05-01-115	HAP ALL
		78-31-05-01-355	HAP ALL
35	Cascade	78-31-05-01-150	HAP ALL
36	Cascade	78-31-05-01-185	HAP ALL
37	Cascade	78-31-05-01-220	HAP ALL
38	Cascade	78-31-05-01-255	HAP ALL
39	Cascade	78-31-05-01-325	HAP ALL
40	Cascade	78-31-05-01-360	HAP ALL
41	Cascade	78-31-05-01-395	HAP ALL
42	Cascade	78-31-05-01-430	HAP ALL

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Cascade Installation

SUBTASK 78-31-05-420-001-F00

CAUTION: MAKE SURE THAT YOU INSTALL THE CASCADES IN THE CORRECT POSITION ON THE THRUST REVERSER. IF THE CASCADES ARE NOT INSTALLED IN THE CORRECT POSITION, ENGINE OPERATIONAL PROBLEMS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Use the table that follows to identify the correct cascade at the applicable cascade position on the applicable engine.

HAP 001-013, 015-026, 028-038 PRE SB 737-78-1076

Table 401/78-31-05-993-802-F00 Positions of the Cascades - Engine 1

Thrust Reverser P/N 315A2295-3 to -202 and reworked P/N 315A2295-503 to -702 Positions of the Cascades - Engine 1*[1]					
Position	**Part Number**	**Item Number**	**Position**	**Part Number**	**Item Number**
1	S315A200-22	[21]	7	S315A200-3	[27]
2	S315A200-6	[22]	8	S315A200-21	[28]
3	S315A200-8	[23]	9	S315A200-18	[29]
4	S315A200-19*[2]	[24]	10	S315A200-1*[3]	[30]
5	S315A200-10	[25]	11	S315A200-15	[31]
6	S315A200-12*[4]	[26]	12	S315A200-13	[32]

*[1] All cascade positions are two-way interchangeable with follow-on cascade P/Ns at the same position on Engine 1 except as noted below.

*[2] Two-way interchangeable with S315A200-47 if position 4, 6, 10 on both engines have cascades S315A200-23/-24/-33/-34/-47/-48 or cascades S315A200-1 or -23, -2 or -24, -11, -12, -19, -20 installed. Do not mix the configurations.

*[3] One-way interchangeable with S315A200-23.

*[4] Two-way interchangeable with S315A200-34 if position 4, 6, 10 on both engines have cascades S315A200-23/-24/-33/-34/-47/-48 or cascades S315A200-1 or -23, -2 or -24, -11, -12, -19, -20 installed. Do not mix the configurations.

Table 402/78-31-05-993-801-F00 Positions of the Cascades - Engine 2

Thrust Reverser P/N 315A2295-3 to -202 and reworked P/N 315A2295-503 to -702 Positions of the Cascades - Engine 2*[1]					
Position	**Part Number**	**Item Number**	**Position**	**Part Number**	**Item Number**
1	S315A200-21	[28]	7	S315A200-4	[38]
2	S315A200-5	[33]	8	S315A200-22	[21]
3	S315A200-7	[34]	9	S315A200-17	[39]
4	S315A200-20*[2]	[35]	10	S315A200-2*[3]	[40]
5	S315A200-9	[36]	11	S315A200-16	[41]

HAP 001-013, 015-026, 028-038 PRE SB 737-78-1076 (Continued)

(Continued)

Thrust Reverser P/N 315A2295-3 to -202 and reworked P/N 315A2295-503 to -702 Positions of the Cascades - Engine 2*[1]					
Position	Part Number	Item Number	Position	Part Number	Item Number
6	S315A200-11*[4]	[37]	12	S315A200-14	[42]

*[1] All cascade positions are two-way interchangeable with follow-on cascade P/Ns at the same position on Engine 2 except as noted below.

*[2] Two-way interchangeable with S315A200-48 if position 4, 6, 10 on both engines have cascades S315A200-23/-24/-33/-34/-47/-48 or cascades S315A200-1 or -23, -2 or -24, -11, -12, -19, -20 installed. Do not mix the configurations.

*[3] One-way interchangeable with S315A200-24.

*[4] Two-way interchangeable with S315A200-33 if position 4, 6, 10 on both engines have cascades S315A200-23/-24/-33/-34/-47/-48 or cascades S315A200-1 or -23, -2 or -24, -11, -12, -19, -20 installed. Do not mix the configurations.

HAP 039-054, 101-999; HAP 001-013, 015-026, 028-038 POST SB 737-78-1076

Table 403/78-31-05-993-803-F00 Positions of the Cascades - Engine 1

Thrust Reverser P/N 315A2295-219 to -222, with follow-on production as -229 through -500, and reworked P/N 315A2295-503 to -702 Positions of the Cascades - Engine 1					
Position	Part Number	Item Number	Position	Part Number	Item Number
1	S315A200-44	[21]	7	S315A200-25	[27]
2	S315A200-28	[22]	8	S315A200-43	[28]
3	S315A200-30	[23]	9	S315A200-40	[29]
4	S315A200-47	[24]	10	S315A200-23	[30]
5	S315A200-32	[25]	11	S315A200-37	[31]
6	S315A200-34	[26]	12	S315A200-35	[32]

Table 404/78-31-05-993-804-F00 Positions of the Cascades - Engine 2

Thrust Reverser P/N 315A2295-219 to -222, with follow-on production as -229 through -500, and reworked P/N 315A2295-503 to -702 Positions of the Cascades - Engine 2					
Position	Part Number	Item Number	Position	Part Number	Item Number
1	S315A200-43	[28]	7	S315A200-26	[38]
2	S315A200-27	[33]	8	S315A200-44	[21]
3	S315A200-29	[34]	9	S315A200-39	[39]

(Continued)

Thrust Reverser P/N 315A2295-219 to -222, with follow-on production as -229 through -500, and reworked P/N 315A2295-503 to -702
Positions of the Cascades - Engine 2

Position	Part Number	Item Number	Position	Part Number	Item Number
4	S315A200-48	[35]	10	S315A200-24	[40]
5	S315A200-31	[36]	11	S315A200-38	[41]
6	S315A200-33	[37]	12	S315A200-36	[42]

HAP ALL

SUBTASK 78-31-05-000-002-F00

(2) Do these steps to install the cascade that was identified in the table:

(a) Apply primer, C00259, to the fastener holes in the cascade, aft cascade support ring and forward cascade support ring.

1) Let the primer dry for 30 minutes.

(b) Lubricate the bolts [2] with grease, D00015.

(c) Install in its position cascade [21], cascade [22], cascade [23], cascade [24], cascade [25], cascade [26], cascade [27], cascade [28], cascade [29], cascade [30], cascade [31], cascade [32], cascade [33], cascade [34], cascade [35], cascade [36], cascade [37], cascade [38], cascade [39], cascade [40], cascade [41] or cascade [42].

(d) Align the bolt holes in the cascade with the fastener holes in the aft cascade support ring and the forward cascade support ring.

(e) Loosely install the bolts [2] with a washer [3] under the head of the bolt in each fastener location (forward and aft) to temporarily hold the cascade in its position.

NOTE: Engage only one or two threads at this time.

(f) Hand tighten only the bolts [2] at the aft cascade support ring at this time.

(g) Do a check of the clearance between the cascade and the forward cascade support ring on the torque box.

1) If the clearance is less than 0.010 inch (0.25 mm), continue at the steps below to tighten the bolts.

2) If the clearance is more than 0.010 inch (0.25 mm), do these steps to decrease the clearance between the cascade and the forward cascade support ring.

NOTE: The shim thickness can not be more than 0.010 inch (0.25 mm).

a) Remove the bolts [2].

b) Install the shims [1].

c) Make sure that the shim [1] thickness is not more than 0.010 inch (0.25 mm).

d) Install the bolts [2].

(h) Do a check of the clearance between the cascade and the aft cascade support ring.

1) If the clearance is less than 0.010 inch (0.25 mm), continue at the steps below to tighten the bolts.

2) If the clearance is more than 0.010 inch (0.25 mm), do these steps to decrease the clearance between the cascade and the aft cascade support ring.

NOTE: The shim thickness can not be more than 0.010 inch (0.25 mm).

a) Remove the bolts [2].

b) Install the shims [1].

c) Make sure that the shim [1] thickness is not more than 0.010 inch (0.25 mm).

d) Install the bolts [2].

(i) Tighten the bolts [2] at the forward and aft cascade support rings to 50-75 pound-inches (5.6-8.5 Newton meters).

(j) Loosen all of the bolts (forward and aft) one-half turn.

(k) Tighten the bolts [2] again to 50-75 pound-inches (5.6-8.5 Newton meters).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-05-440-001-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-05-840-003-F00

(2) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

——————— END OF TASK ———————

CASCADE - INSPECTION/CHECK

1. General

A. This procedure has this task:

(1) An examination of the thrust reverser cascade segments.

TASK 78-31-05-200-801-F01

2. Thrust Reverser Cascade Segments Examination

A. General

(1) The cascade segments are made of a graphite/epoxy material. The cascade segments are mounted between the forward torque box and the aft mounting ring. When the thrust reverser is stowed, the cascade segments are located between the outer and inner skin of the thrust reverser sleeve.

(2) During reverse thrust, the strongbacks transfer the thrust load from the cascade vanes to the forward torque box through the attachment flanges.

B. References

Reference	Title
27-61-00-800-802	Remove Pressure from the Spoiler Hydraulic Systems A and B (P/B 201)
27-61-00-840-802	Put the Spoiler Systems A and B Back to the Condition Before the Pressure Removal (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-980-801-F00	Thrust Reverser Operation - Extend (Selection) (P/B 201)
78-31-00-980-802-F00	Thrust Reverser Operation - Retract (Selection) (P/B 201)
78-31-05-000-801-F00	Cascade Removal (P/B 401)
78-31-05-400-801-F00	Cascade Installation (P/B 401)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

E. Prepare for the Procedure

SUBTASK 78-31-05-040-002-F00

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO PREVENT THE OPERATION OF THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in this sequence to safely deactivate the thrust reverser in the extended position:

(a) Do this task: Remove Pressure from the Spoiler Hydraulic Systems A and B, TASK 27-61-00-800-802.

(b) For the applicable fan cowl panels on the applicable engine, do this task:

Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

(c) Do this task: Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-980-801-F00.

(d) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

F. Procedure

SUBTASK 78-31-05-210-001-F00

(1) Examine the cascade segments for damage, tears, cracks or delaminated areas in the cascade vanes, strongbacks and attachment flanges.

(a) If damage, tears, cracks or delaminated areas in the cascade vanes, strongbacks or attachment flanges is found, replace the cascade segment. These are the tasks: Cascade Removal, TASK 78-31-05-000-801-F00, Cascade Installation, TASK 78-31-05-400-801-F00.

(b) Contact Boeing to report the kind of damage and delamination found for repair disposition.

NOTE: If possible, document the damage with digital photographs that can be sent by e-mail, or provide a sketch of the damage that can be faxed.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-05-440-002-F00

WARNING: DO ALL THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO PREPARE THE THRUST REVERSER FOR OPERATION. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these tasks in this sequence to safely activate the thrust reverser:

(a) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-980-802-F00.

(c) Do this task:

Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00

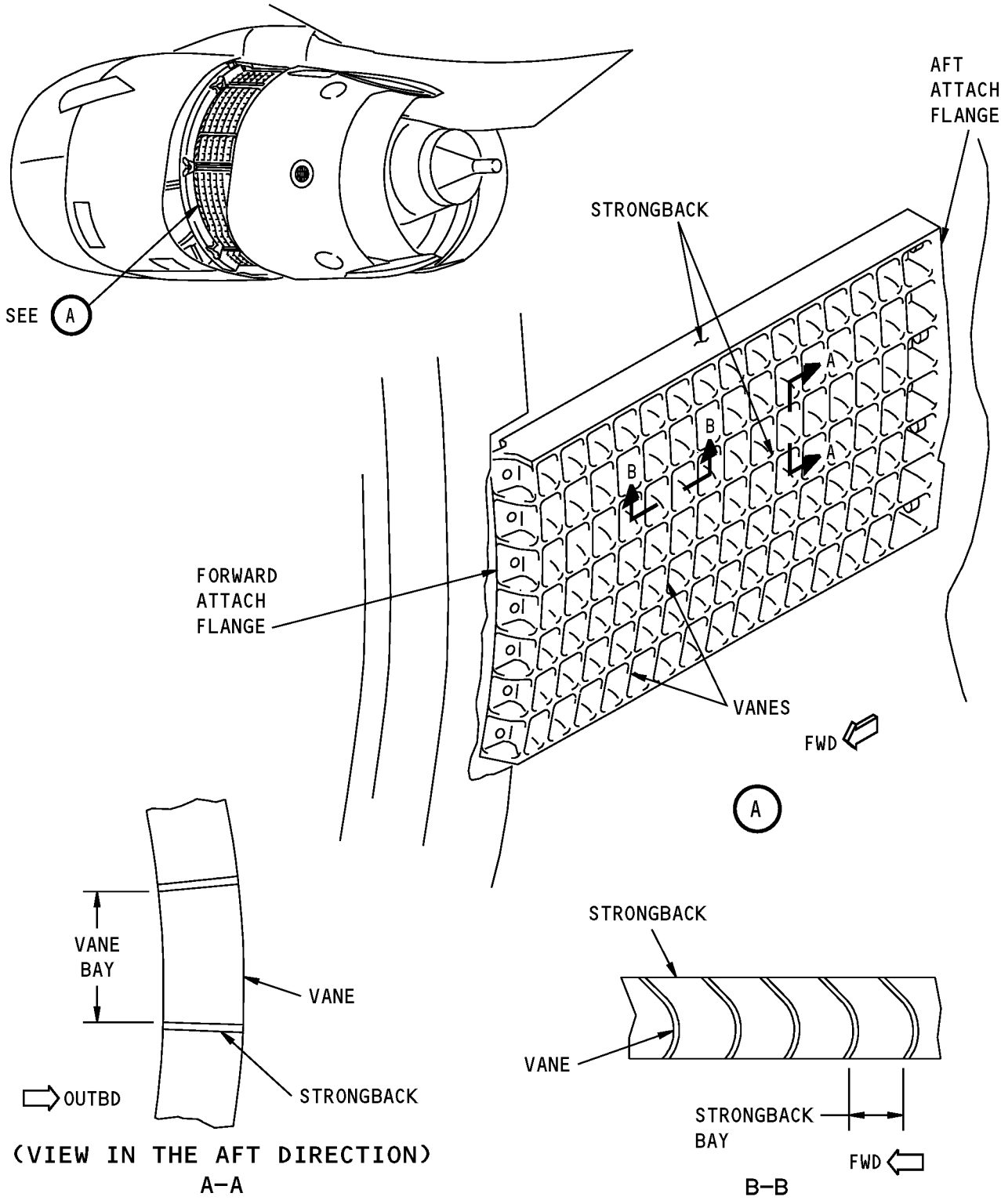
Number	Name/Location

(Continued)

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

(d) Do this task: Put the Spoiler Systems A and B Back to the Condition Before the Pressure Removal, TASK 27-61-00-840-802.

——————— END OF TASK ———————



Thrust Reverser Cascade Segment Inspection
Figure 601/78-31-05-990-803-F00

BLOCKER DOORS - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the blocker doors.

(2) The installation of the blocker doors.

TASK 78-31-06-000-801-F00

2. Blocker Door Removal

(Figure 401)

A. General

(1) This task is for the removal of the blocker doors from the left or right thrust reverser on an engine.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G02329	Tape - Aluminum Foil, Pressure Sensitive - Vibration Damping Tape 434	

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Removal

SUBTASK 78-31-06-010-004-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-06-980-003-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES (25.4 CM). MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE THRUST REVERSER SLEEVE AS IT IS EXTENDED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Do these steps to expose the hardware that attaches the drag link to the blocker door:

NOTE: The sleeve must be partially extended to release the load on the drag link and expose the hardware that attaches the drag link to the blocker door.

(a) For the inboard thrust reverser sleeve, do these steps to manually extend the thrust reverser sleeve:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause them to extend a small amount.

2) Monitor the position of the thrust reverser sleeve as it is extended to make sure that it does not touch the leading edge of the wing.

3) Manually extend the thrust reverser sleeve no more than 10.0 inches (25.4 cm) from the forward edge of the torque box.

4) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard thrust reverser sleeve, manually extend the thrust reverser sleeve approximately 10.0 inches (25.4 cm).

NOTE: The outboard thrust reverser sleeve will not touch the leading edge of the wing.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

F. Blocker Door Removal

SUBTASK 78-31-06-010-005-F00

CAUTION: WHEN YOU WORK IN THE FAN DUCT, USE SUFFICIENT PROTECTION. IF TOOLS OR THE DRAG LINKS FALL OR HIT THE BLOCKER DOORS AND FAN DUCT WALLS, DAMAGE TO THE COMPOSITE PANELS CAN OCCUR.

(1) Do these steps to disconnect the drag link [4] from the blocker door 1 and 6 [1], 2-4 and 7-9 [2], or 5 and 10 [3]:

(a) Put protective material in the fan duct.

(b) Put cotton wiper, G00034 around the anchor fitting and drag link [4] at the inner wall.

NOTE: When the drag link is disconnected from the blocker door, it can move forward or aft and fall against the inner wall. This can cause damage to the inner wall composite panel.

(c) Remove the nut [5], washers [6] and [7], bushing [9], and bolt [8] from the pivot link.

(d) Put a tie strap through the spherical bearing to hold the ball in its position.

(e) Make sure that there is protection between the drag link and the inner wall.

(f) Use Vibration Damping Tape 434 tape, G02329 to hold the drag link against the inner wall of the fan duct.

SUBTASK 78-31-06-020-001-F00

(2) Do these steps to remove blocker door [1] (door 1 and 6), blocker door [2] (door 2-4 and 7-9), or blocker door [3] (door 5 and 10):

(a) Get access to the blocker door hinges from the front of the fan duct.

(b) Make sure that there is protective material in the fan duct.

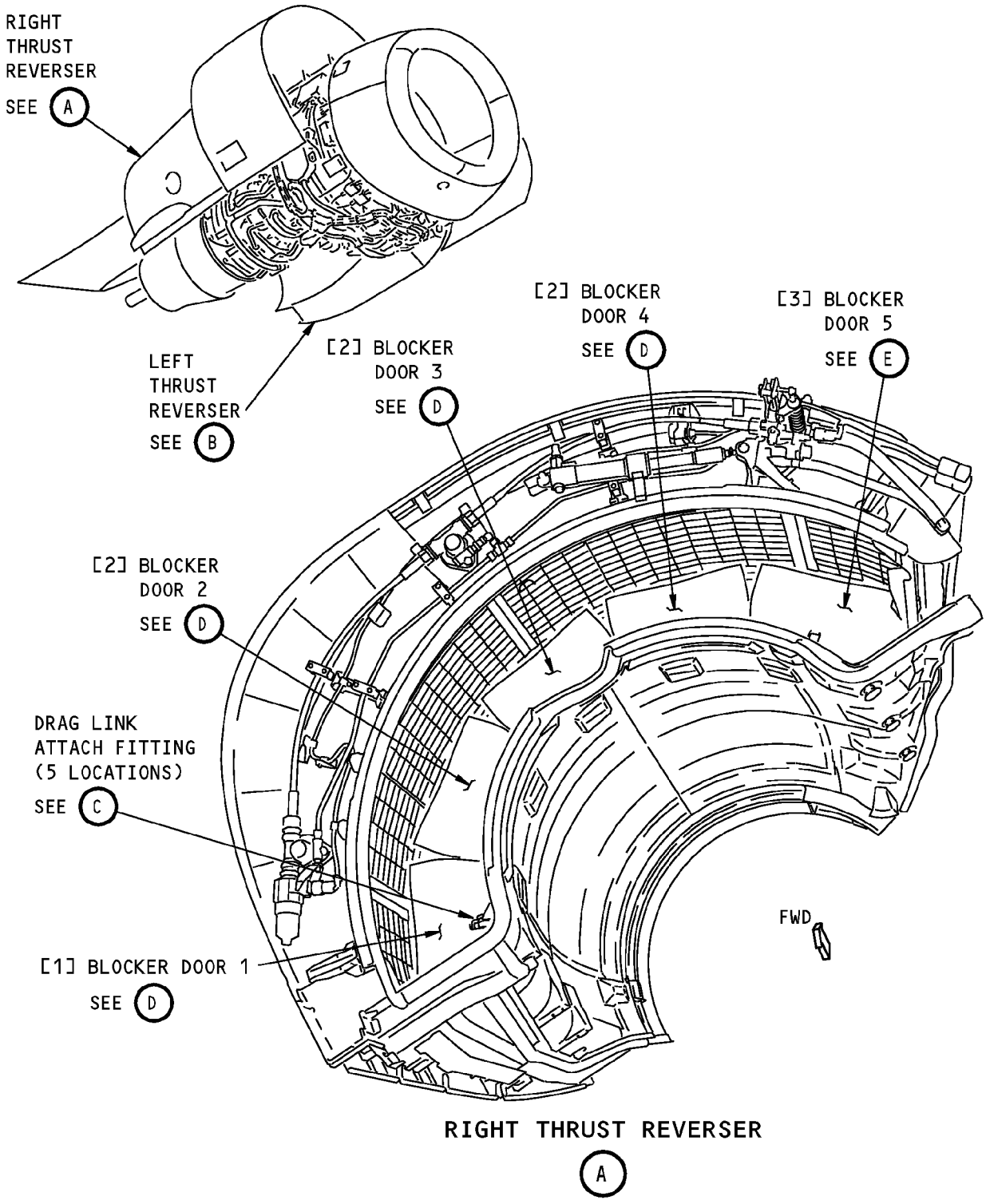
(c) At the floating hinge, remove the bolt [11], two bushings [12], washer [13], anti-rotation bracket [10] and nut [14].

(d) At the clamped hinge, remove the bolt [11], washers [13] and [15], bushing [12] and nut [14].

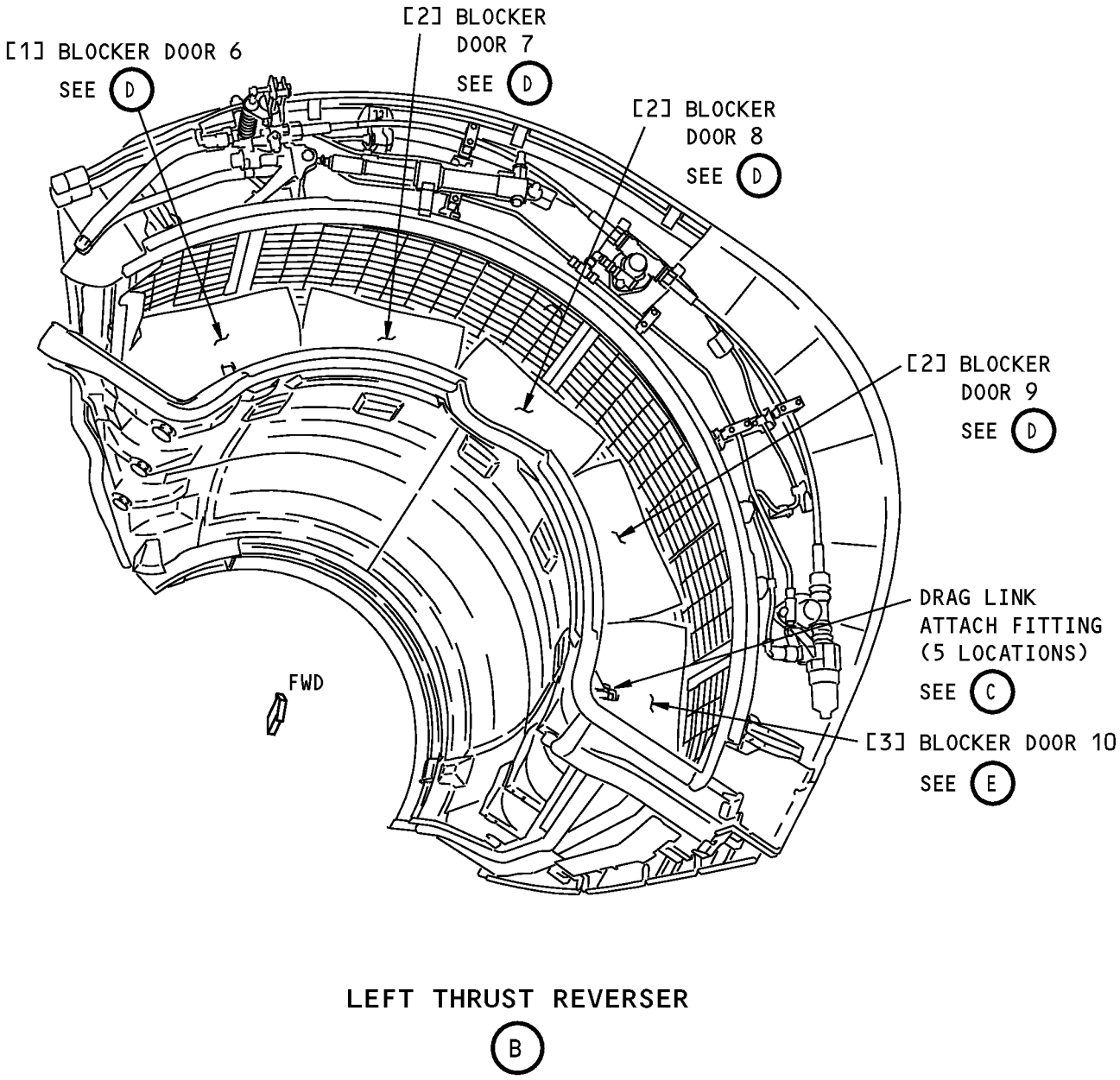
NOTE: The clamped hinge at blocker door [3] has the bushing [12] installed at the threaded end of the bolt. The clamped hinge at blocker door [1] and [2] has the bushing installed at the bolt head.

1) Remove the blocker door.

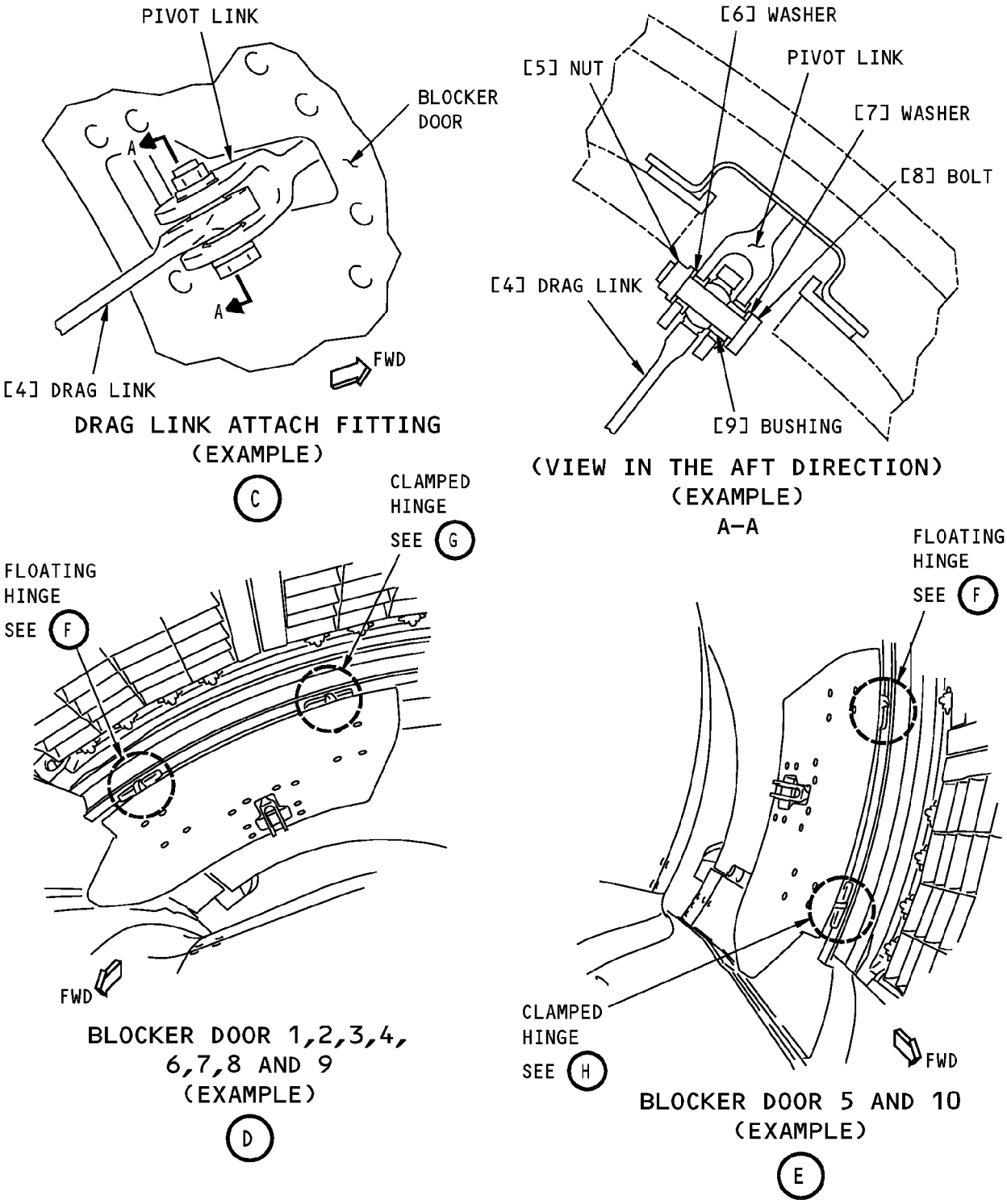
END OF TASK



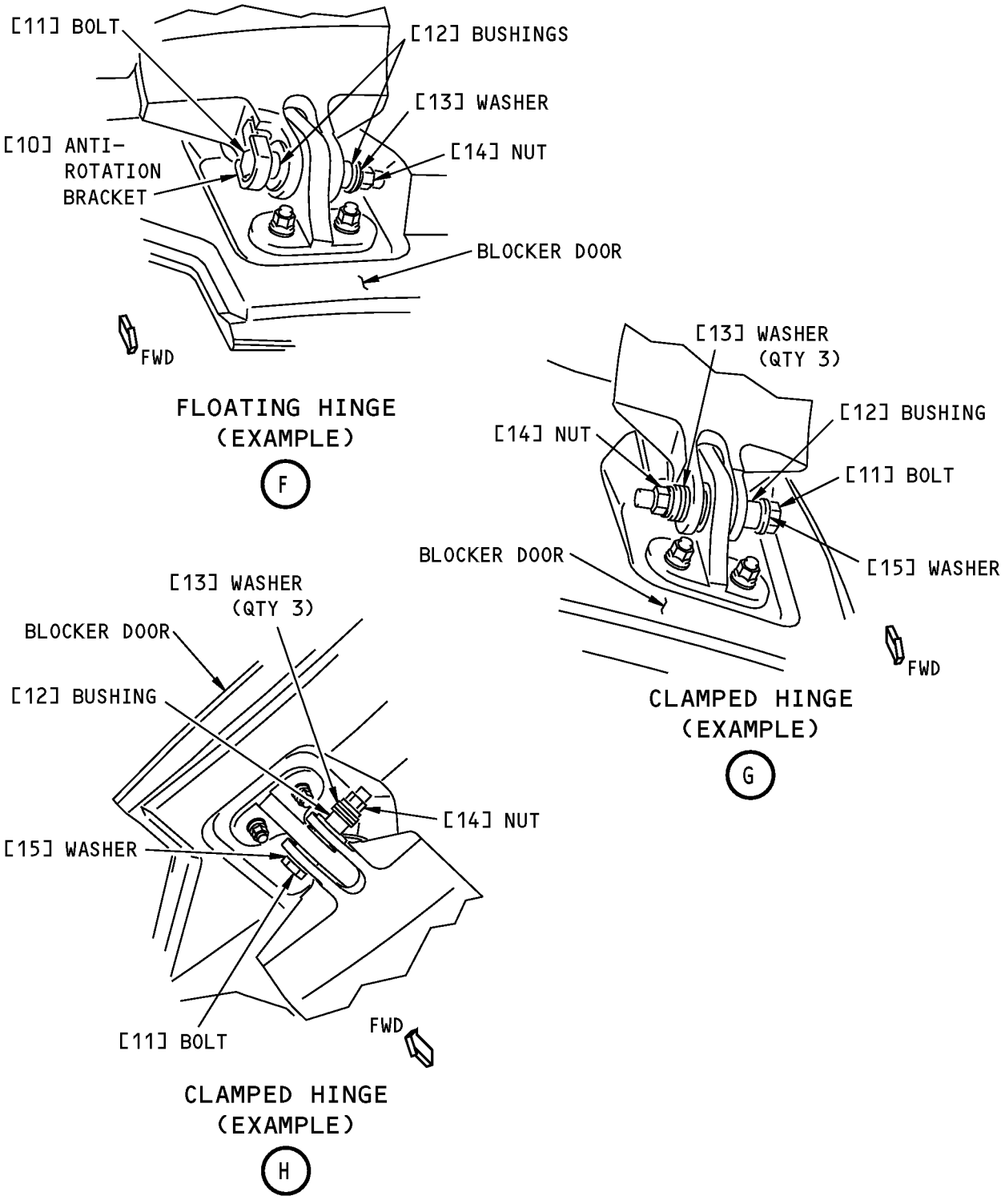
Blocker Door Installation
Figure 401 (Sheet 1 of 4)/78-31-06-990-803-F00



Blocker Door Installation
Figure 401 (Sheet 2 of 4)/78-31-06-990-803-F00



Blocker Door Installation
Figure 401 (Sheet 3 of 4)/78-31-06-990-803-F00



Blocker Door Installation
Figure 401 (Sheet 4 of 4)/78-31-06-990-803-F00

TASK 78-31-06-400-801-F00

3. Blocker Door Installation

(Figure 401)

A. General

(1) This task if for the installation of the blocker door on the left or right thrust reverser on an engine.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)
78-31-00-980-805-F00	Thrust Reverser Operation - Extend (Power Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G02329	Tape - Aluminum Foil, Pressure Sensitive - Vibration Damping Tape 434	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Blocker door	78-31-06-04A-035	HAP ALL
		78-31-06-04B-035	HAP ALL
		78-31-06-04C-055	HAP 001-013, 015-026, 028-030
		78-31-06-05-500	HAP 001-013, 015-026, 028-030
		78-31-06-05A-455	HAP ALL
		78-31-06-05B-455	HAP ALL
2	Blocker door	78-31-06-04A-275	HAP ALL
		78-31-06-04B-275	HAP ALL
		78-31-06-04C-300	HAP 001-013, 015-026, 028-030
		78-31-06-05-305	HAP 001-013, 015-026, 028-030
		78-31-06-05A-275	HAP ALL
		78-31-06-05B-275	HAP ALL
3	Blocker door	78-31-06-04A-455	HAP ALL
		78-31-06-04B-455	HAP ALL
		78-31-06-04C-495	HAP 001-013, 015-026, 028-030
		78-31-06-05-055	HAP 001-013, 015-026, 028-030
		78-31-06-05A-035	HAP ALL
		78-31-06-05B-035	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Blocker Door Installation

SUBTASK 78-31-06-420-001-F00

CAUTION: WHEN YOU WORK IN THE FAN DUCT, USE SUFFICIENT PROTECTION. IF TOOLS FALL OR HIT THE BLOCKER DOORS AND FAN DUCT WALLS, DAMAGE TO THE COMPOSITE PANELS CAN OCCUR.

(1) Do these steps to install blocker door 1 and 6 [1], 2-4 and 7-9 [2], or 5 and 10 [3]:

(a) To install the blocker door [1], blocker door [2] or blocker door [3], align the fastener holes in the blocker door hinge and the sleeve hinge fitting.

(b) At the floating hinge for blocker door [1], [2] or [3], do these steps (View F):

1) Install the bolt [11], anti-rotation bracket [10], two bushings [12], washer [13] and nut [14].

a) Make sure that no more than three threads show at the end of the bolt.

b) Tighten the nut [14] to 65-70 pound-inches (7.3-7.9 Newton meters).

(c) At the clamped hinge for blocker door [1] and [2], do these steps (View G):

1) Install the bolt [11], washers [13] and [15], bushing [12] and nut [14].

a) Make sure that you install the bushing [12] and one washer [15] at the bolt head, and three washers [13] at the nut [14].

b) Make sure that no more than three bolt threads show.

c) Tighten the nut [14] to 65-70 pound-inches (7.3-7.9 Newton meters).

(d) At the clamped hinge for blocker door [3], do these steps (View H):

1) Install the bolt [11], washers [13] and [15], bushing [12], and nut [14].

a) Make sure that you install one washer [15] at the bolt head, and the bushing [12] and three washers [13] at the nut [14].

b) Make sure that no more than three bolt threads show.

c) Tighten the nut [14] to 65-70 inch-pounds (7.3-7.9 Newton meters).

SUBTASK 78-31-06-700-001-F00

(2) Do this check of the blocker door:

NOTE: If there is side movement of the blocker door or if more than three threads show at the end of the bolt at the clamped hinge, this is an indication that the hinge is not clamped.

(a) Make sure that there is no side movement of the blocker door at the hinges.

(b) Make sure that no more than three threads show at the end of the bolts [11].

1) If there is side movement of the blocker door at the hinges, or more than three threads show at the end of the bolt, add more washers [13] at the nut [14].

2) Tighten the nut [14] to 65-70 inch-pounds (7.3-7.9 Newton meters).

SUBTASK 78-31-06-410-003-F00

(3) Do these steps to connect the drag link [4] to blocker door 1 and 6 [1], 2-4 and 7-9 [2], or 5 and 10 [3]:

(a) Remove Vibration Damping Tape 434 tape, G02329 that holds the drag link against the inner wall of the fan duct.

(b) Make sure that there is protective material in the fan duct.

(c) Remove the tie strap that is installed through the spherical bearing to hold the ball in its position.

(d) Align the drag link [4] and pivot link attach holes.

(e) Install the bolt [8], bushing [9], washers [6] and [7], and nut [5].

1) Tighten the nut [5] to 160-240 pound-inches (18.1-27.1 Newton meters).

(f) Remove the protective material and cotton wiper, G00034.

SUBTASK 78-31-06-410-005-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS, BUT DO NOT DO THE THRUST REVERSER OR LEADING EDGE ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Close and latch the thrust reverser; but do not do the thrust reverser or leading edge activation and do not close the fan cowl panels at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-06-980-002-F00

(5) Manually translate the sleeve through an extend and retract cycle.

(a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

1) Make sure that the blocker doors and drag links move smoothly.

G. Installation Test

SUBTASK 78-31-06-440-001-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-06-710-001-F00

(2) Operate the thrust reverser a minimum of three cycles to make sure that the blocker doors and drag links operate correctly.

(a) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

1) Make sure that the blocker doors and drag links operate correctly.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-06-410-004-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-06-440-002-F00

(2) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

——————— END OF TASK ———————

BLOCKER DOOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has one task:

(1) A visual check of the blocker doors.

TASK 78-31-06-200-801-F00

2. Blocker Door Inspection (Visual)

(Figure 601), (Figure 602)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This is a task to do a visual check of the blocker doors.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-980-801-F00	Thrust Reverser Operation - Extend (Selection) (P/B 201)
78-31-00-980-802-F00	Thrust Reverser Operation - Retract (Selection) (P/B 201)
78-31-06-000-801-F00	Blocker Door Removal (P/B 401)
78-31-06-400-801-F00	Blocker Door Installation (P/B 401)
SL 737-SL-78-053-A	Trust Reverser Blocker Door Wear Pad Separation
SRM 54-30-01	Structural Repair Manual

C. Consumable Materials

Reference	Description	Specification
A01085	Adhesive - Epoxy, High Temperature Resistant, 2 Part	BAC5010 Type 111 (BMS5-141)
A50004	Adhesive - Epoxy, Modified Two-Part, General Purpose	BAC5010, Type 117 (BMS5-92, Type V)
B00065	Alcohol - Denatured, Ethyl (Ethanol)	27CFR21.35
B50073	Alcohol - Isopropyl	
C00766	Primer - Nonchromated (For Non-Metalic Composites)	BMS10-103, Type 1
G50381	Abrasive - Aluminum Oxide Paper, 180 Grit	

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Inspection

SUBTASK 78-31-06-010-001-F00

WARNING: OBEY THE INSTRUCTIONS IN THIS PROCEDURE WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Procedure

SUBTASK 78-31-06-210-001-F00

(1) Look for missing blocker doors:

(a) If you find missing blocker doors, replace the blocker doors.

These are the tasks:

1) Blocker Door Removal, TASK 78-31-06-000-801-F00

2) Blocker Door Installation, TASK 78-31-06-400-801-F00.

SUBTASK 78-31-06-210-002-F00

(2) Examine the blocker doors for the damage that follows:

(a) Holes, cracks, nicks, gouges, scratches, delamination, dents and edge damage.

1) If you find damage, refer to the SRM 54-30-01 for the permitted limits and repair procedures.

SUBTASK 78-31-06-860-002-F00

(3) Do this task: Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-980-801-F00.

SUBTASK 78-31-06-210-004-F00

(4) Visually examine the aft surface of each blocker door for missing wear pads.

NOTE: It may be necessary to use a mirror to see all areas.

NOTE: New blocker doors, P/N 315A2510–9 and –10, 315A2512–15 and –17, and 315A2512–16 and –18 do not have wear pads on the blocker door (SL 737-SL-78-053-A).

NOTE: Check the part number of the blocker door before installation of a wear pad that appears to be missing. The new blocker doors can look almost the same to blocker doors with missing wear pads.

(a) If you find a wear pad missing, do the steps that follow:

NOTE: Wear pad replacement requires removal of the blocker door.

1) Make a record of each location where a wear pad is missing.

2) For each affected blocker door location, do this task: Blocker Door Removal, TASK 78-31-06-000-801-F00.

3) If the wear pad is partially installed or is loose, do the step that follows to remove it from the blocker door.

NOTE: Wear pad removal can cause delamination of the blocker door. Recommend to do the inspection of the blocker door after the wear pad is removed.

a) Remove the worn or damage wear pad from the bond assembly.

4) Do this task: Blocker Door Inspection (Visual), TASK 78-31-06-200-801-F00.

5) Do these steps to install the wear pad to the blocker door:

a) Lightly abrade the mating surfaces of the wear pad and the blocker door with 180 grit abrasive paper, G50381 to remove gloss and any contaminants.

NOTE: Do not abrade into fibers.

b) Clean with alcohol, B50073 or alcohol, B00065.

c) Apply adhesive, A50004 to the wear pad.

NOTE: The adhesive, A50004 is the preferred adhesive for in-service replacement of the wear pad. The adhesive, A01085 is the alternate adhesive.

<1> Make sure bondline thickness is 0.003-0.010 inches.

<2> Make sure a fillet of adhesive extends out around the part after squeeze out.

d) Let the adhesive cure.

e) Apply primer, C00766 to surfaces not covered with primer, support or adhesive.

6) For each affected blocker door location, do this task: Blocker Door Installation, TASK 78-31-06-400-801-F00.

SUBTASK 78-31-06-210-003-F00

(5) Examine the blocker door support assemblies:

NOTE: New blocker doors, P/N 315A2510–9 and –10, 315A2512–15 and –17, and 315A2512–16 and –18 do not have wear pads on the blocker door (SL 737-SL-78-053-A).

NOTE: The blocker door support assemblies are the two bumpers that are attached to the translating sleeve below the edge of the each blocker door.

(a) If one support assembly is missing below a blocker door, then the Continue-In-Service limit is a maximum of 14 days.

NOTE: The limit of 14 days is an action to prevent damage. The limit makes it necessary for the replacement of the first missing support because it is possible that the second support could also become detached. Two blocker door supports prevent the vibration of the closed blocker door. One blocker door support is permitted because the door is supported. If the second support were to also become detached, the blocker door will vibrate which will cause wear and damage to the blocker door and the thrust reverser sleeve.

(b) If two support assemblies are missing below a blocker door, then replace the support assemblies (CMM 78-31-24).

NOTE: Continued operation, for a maximum of 14 days, is permitted if one support assembly is re-installed. If a new part is not available, one support assembly from an adjacent door, that has two support assemblies, can be removed and installed.

SUBTASK 78-31-06-860-003-F00

(6) Do this task: Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-980-802-F00.

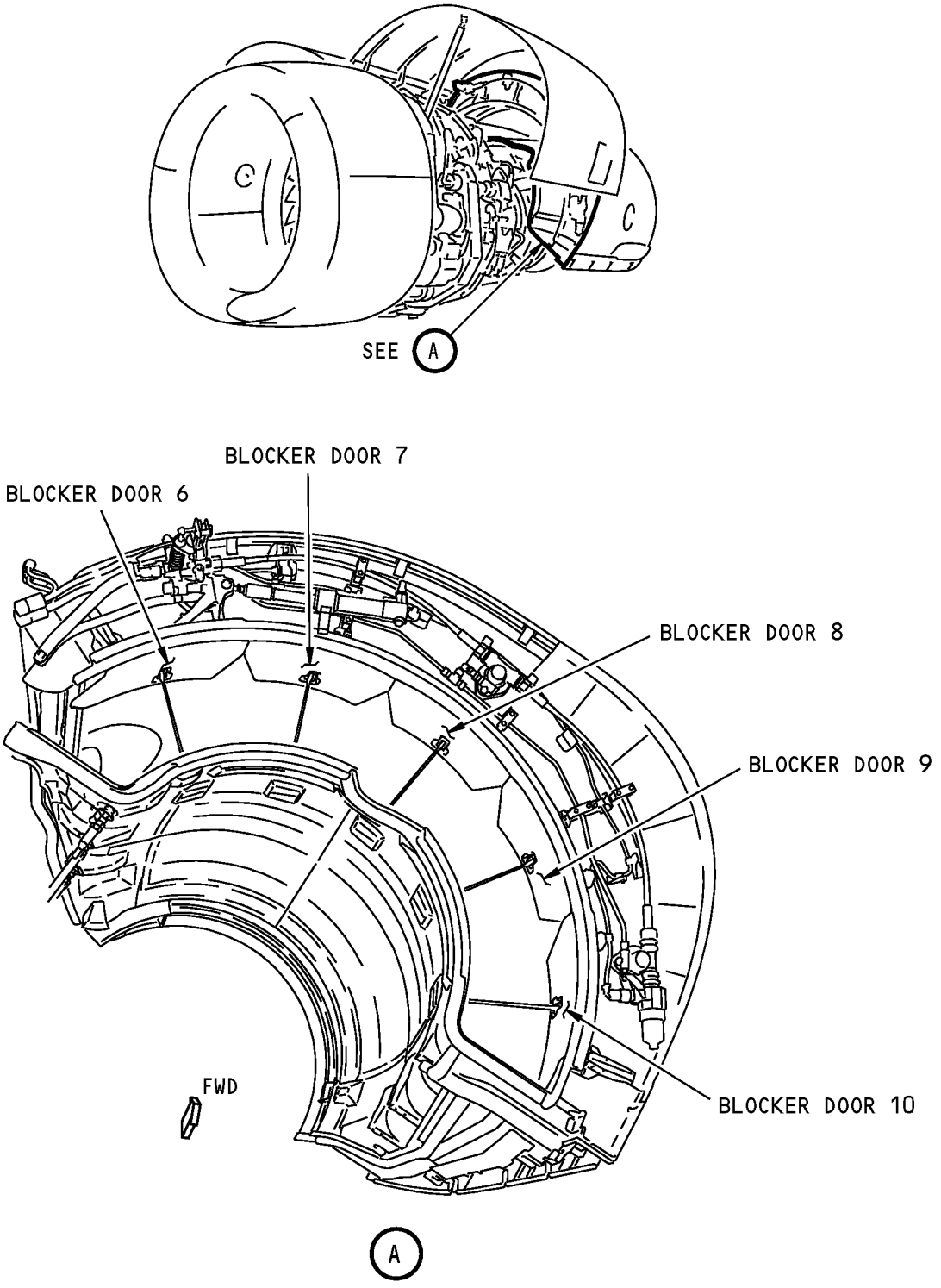
G. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-06-410-001-F00

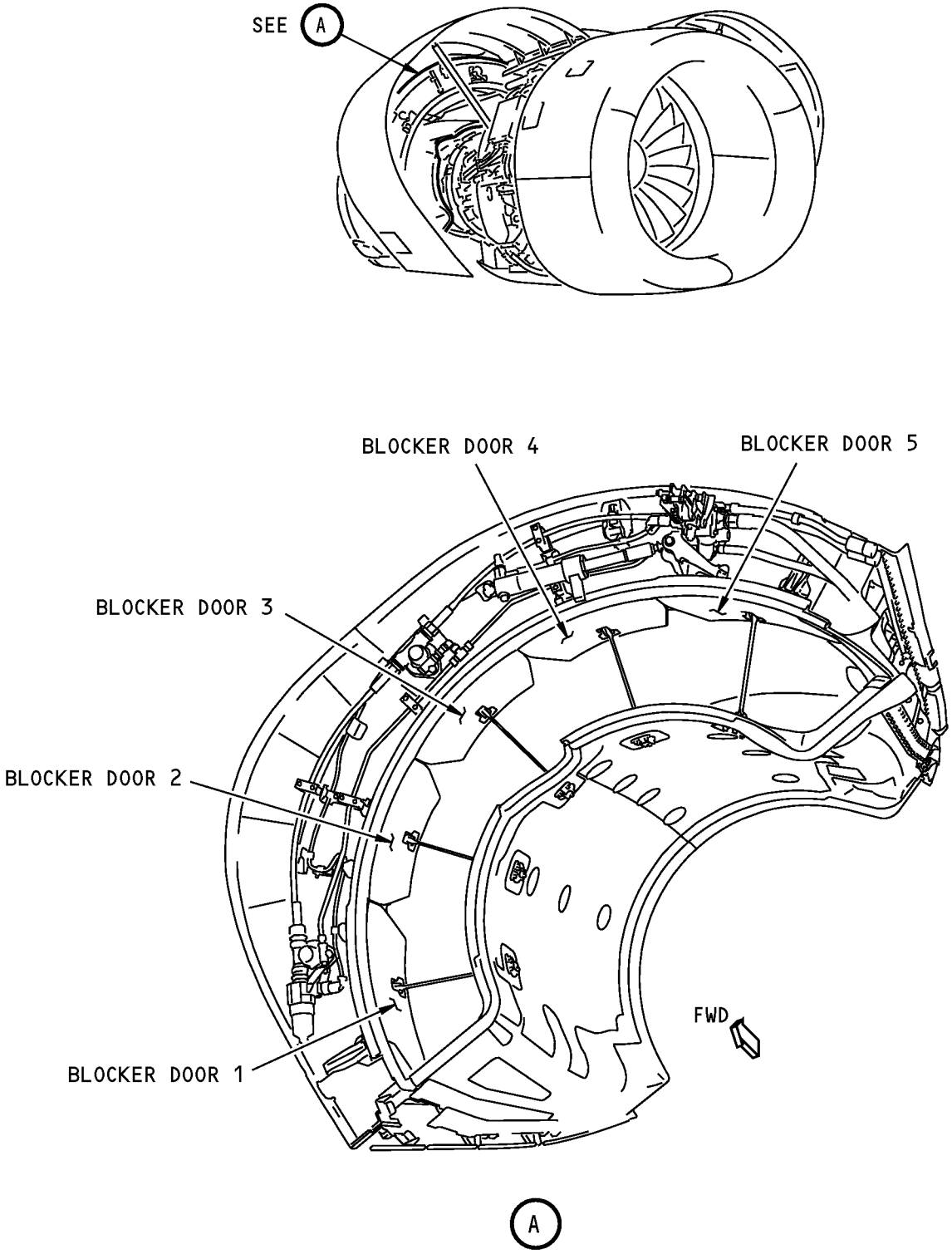
WARNING: OBEY THE INSTRUCTIONS IN THIS PROCEDURE WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK



Left Thrust Reverser Blocker Door Inspection
Figure 601/78-31-06-990-801-F00



Right Thrust Reverser Blocker Door Inspection
Figure 602/78-31-06-990-802-F00

BLOCKER DOOR DRAG LINKS - MAINTENANCE PRACTICES

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has one task:

(1) To replace the ball of the spherical bearing in the blocker door drag link.

TASK 78-31-07-900-801-F00

2. Remove and Inspect the Drag Link Spherical Bearing

(Figure 201)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This is a scheduled maintenance task to examine the ball and the spherical bearing race in the drag link.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)
78-31-00-980-805-F00	Thrust Reverser Operation - Extend (Power Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)

C. Consumable Materials

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

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Ball	78-31-51-10-068	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Prepare for the procedure

SUBTASK 78-31-07-010-008-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-07-980-005-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES (25.4 CM). MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE THRUST REVERSER SLEEVE AS IT IS EXTENDED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Do these steps to expose the hardware that attaches the drag link to the blocker door:

NOTE: The sleeve must be partially extended to release the load on the drag link and expose the hardware that attaches the drag link to the blocker door.

(a) For the inboard thrust reverser sleeve, do these steps to manually extend the thrust reverser sleeve:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause them to extend a small amount.

2) Monitor the position of the thrust reverser sleeve as it is extended to make sure that it does not touch the leading edge of the wing.

3) Manually extend the thrust reverser sleeve no more than 10 in. (25.4 cm) from the forward edge of the torque box.

4) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard thrust reverser sleeve, manually extend the thrust reverser sleeve approximately 10 in. (25.4 cm).

NOTE: The outboard thrust reverser sleeve will not touch the leading edge of the wing.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

G. Procedure

SUBTASK 78-31-07-840-001-F00

CAUTION: WHEN YOU WORK IN THE FAN DUCT, USE SUFFICIENT PROTECTION. IF TOOLS OR THE DRAG LINKS FALL OR HIT THE BLOCKER DOORS AND FAN DUCT WALLS, DAMAGE TO THE COMPOSITE PANELS CAN OCCUR.

(1) For each of the drag links, do these steps to examine the drag link and the spherical bearing:

(a) Put protective material on the fan duct walls and blocker doors.

SUBTASK 78-31-07-210-001-F00

(2) Examine the drag links to look for these conditions:

NOTE: Record the drag link location and condition.

(a) Loose nuts on the drag link bolts

(b) Drag link bolts that have a shank length that is too long

(c) Bushings in the pivot link of the blocker doors that are worn.

(d) Bushings in the drag link anchor fittings that are worn.

(e) The race of the spherical bearings that are loose in the drag link

(f) Pivot links or anchor fittings that have cracks or other damage.

(g) If you find one or more of the problems, then repair or replace the drag link.

SUBTASK 78-31-07-640-001-F00

(3) Do these steps to examine the ball [1] and the spherical bearing race:

(a) Put cotton wiper, G00034 around the anchor fitting and drag link at the inner wall.

NOTE: When the drag link is disconnected from the blocker door, it can move forward or aft and fall against the inner wall. This can cause damage to the inner wall composite panel.

(b) Remove the nut, two washers, bushing and bolt that attach the drag link to the pivot link on the blocker door.

(c) See if the spherical bearing has a removable ball (Figure 202).

NOTE: The ball is removable on spherical bearings with loader slots. The ball is not removable on liner spherical bearings.

SUBTASK 78-31-07-210-002-F00

(4) DRAG LINK SPHERICAL BEARINGS WITH A REMOVABLE BALL;

Examine the ball [1] and the bearing race for pits or scratches (Figure 202).

NOTE: The spherical bearing consists of a ball and a race.

(a) Turn the ball [1] until it will come out of the race of the spherical bearing.

(b) Use a cotton wiper, G00034 to clean the ball [1].

(c) Use a cotton wiper, G00034 to clean the race of the bearing race.

(d) If the ball [1] has pits or scratches, then replace the ball [1].

(e) If the bearing race has pits or scratches, then replace the spherical bearing.

(f) Install the ball [1] in the spherical bearing.

NOTE: The re-application of the solid film lubricant is not recommended.

SUBTASK 78-31-07-210-003-F00

(5) DRAG LINK SPHERICAL BEARINGS WITH A NON-REMOVABLE BALL;

Examine the ball [1] and the bearing race for pits, scratches, tears in the liner or missing linear (Figure 202).

NOTE: The spherical bearing consists of a ball and a race. The ball is not removable on the liner spherical bearing. The liner is attached to the inside of the race.

(a) Turn the ball [1] 90 degrees, use a cotton wiper, G00034 to clean the ball [1].

(b) If the ball [1] has pits or scratches, then replace the spherical bearing.

(c) If you find tears in the liner or missing liner on the race, replace the spherical bearing.

NOTE: The liner material from the race may transfer to the ball which will be light brown in color. Transfer of liner material on to the ball is satisfactory. The liner bearing will not corrode, therefore liner material, dirt, and/or grease should not be mistaken as corrosion on the bearing.

NOTE: The re-application of the solid film lubricant is not recommended.

SUBTASK 78-31-07-420-002-F00

(6) Attach the drag link to the translating sleeve.

(a) Align the drag link with the pivot link on the blocker door.

1) Install the bushing, two washers, bolt and nut.

a) Tighten the nut to 160 in-lb (18.1 N·m)-240 in-lb (27.1 N·m).

(b) Remove the cotton wiper, G00034 from the anchor fitting at the inner wall and the protective material from the fan duct walls and blocker doors.

(c) Manually retract the thrust reverser sleeve. Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00

SUBTASK 78-31-07-410-001-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS, BUT DO NOT DO THE THRUST REVERSER OR LEADING EDGE ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Close and latch the thrust reverser, but do not do the thrust reverser or leading edge activation and do not close the fan cowl panels at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-07-980-006-F00

(8) Manually translate the sleeve through an extend and retract cycle.

(a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

(c) Make sure that the blocker doors and drag links move smoothly.

H. Installation Test

SUBTASK 78-31-07-440-001-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-07-710-002-F00

(2) Operate the thrust reverser an extend and retract cycle to make sure that the blocker doors and drag links operate correctly.

(a) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

(c) Make sure that the blocker doors and drag links operate correctly.

I. Put the Airplane Back to Its Usual Condition

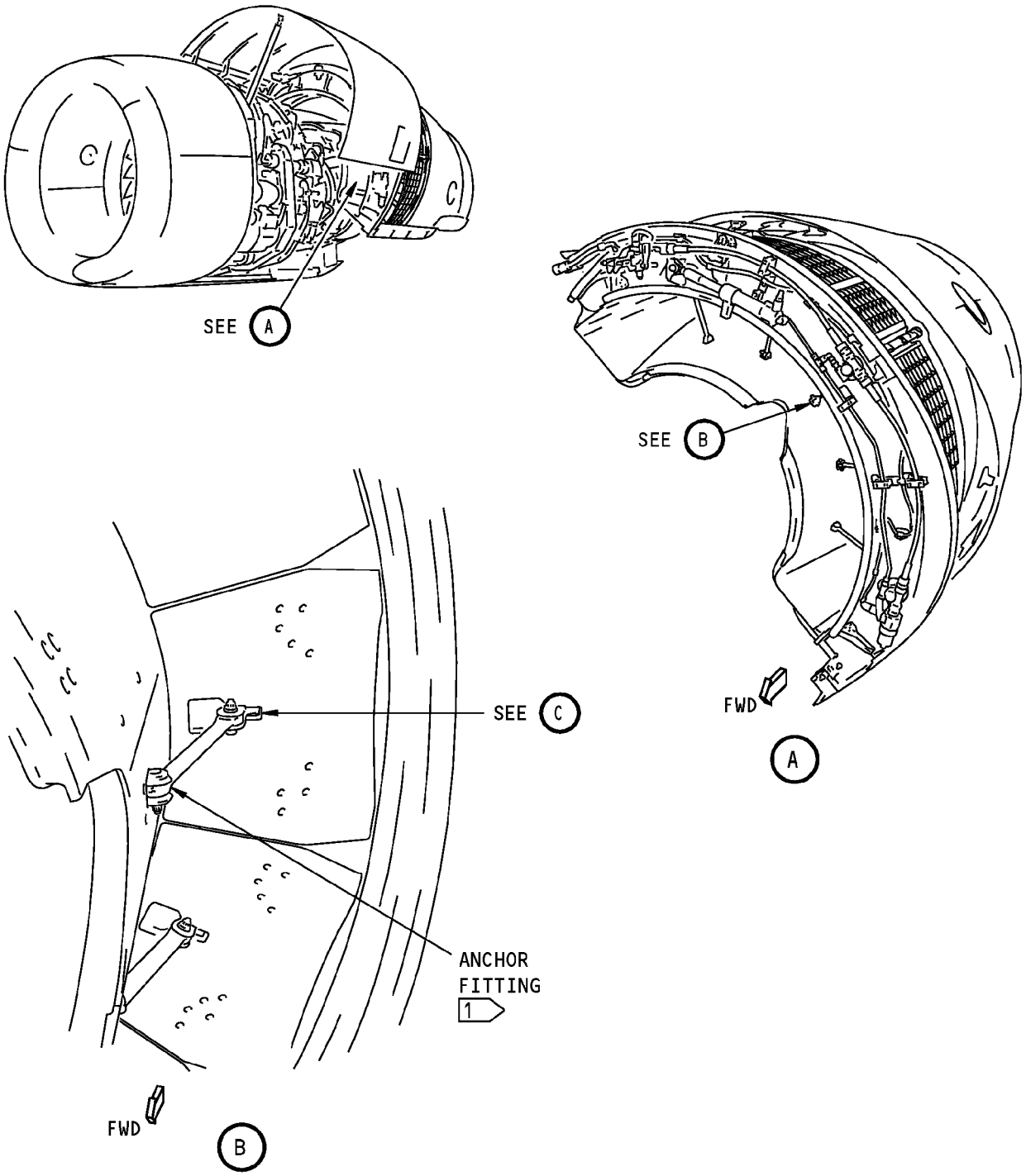
SUBTASK 78-31-07-410-005-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-07-440-002-F00

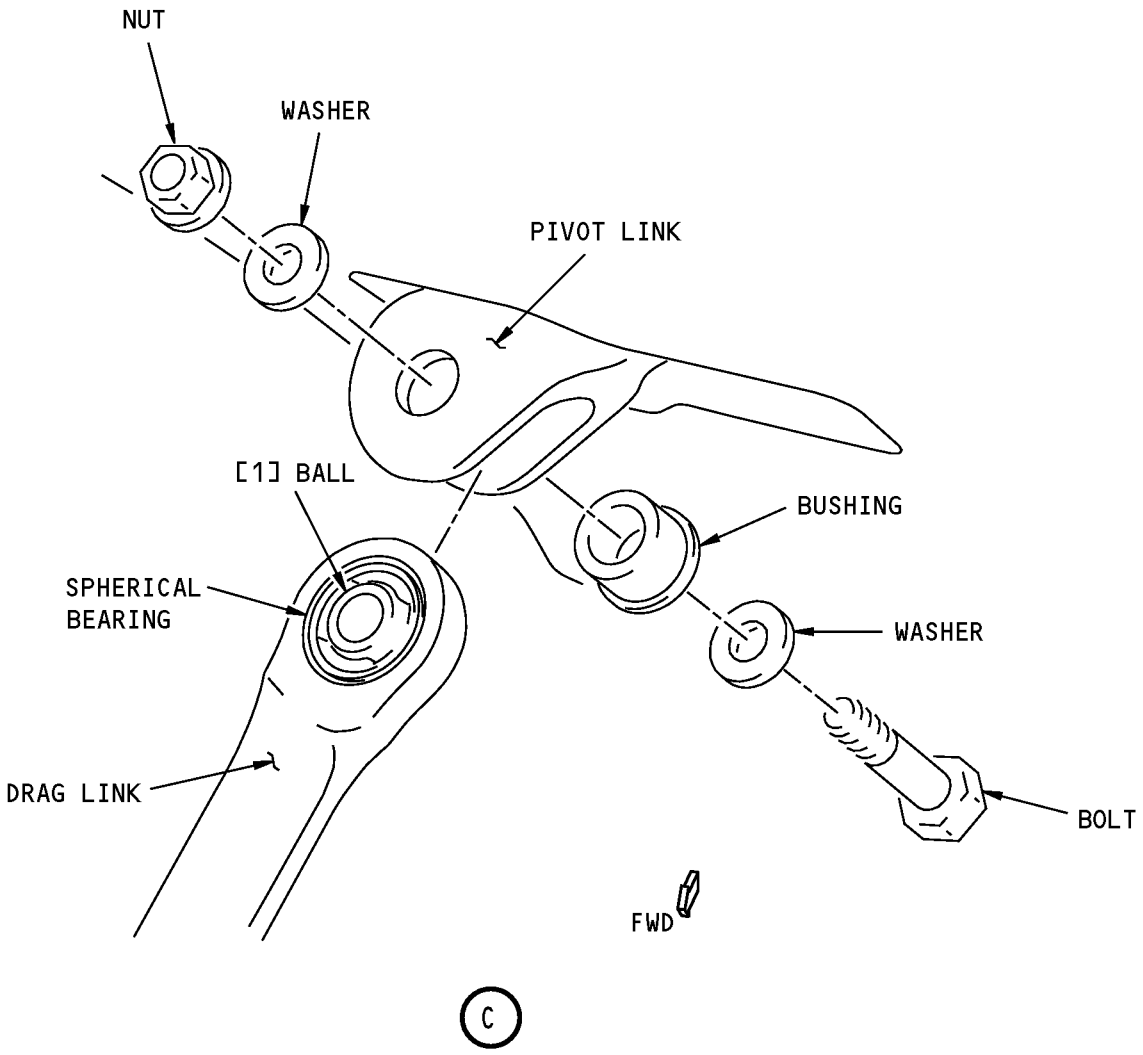
(2) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

END OF TASK

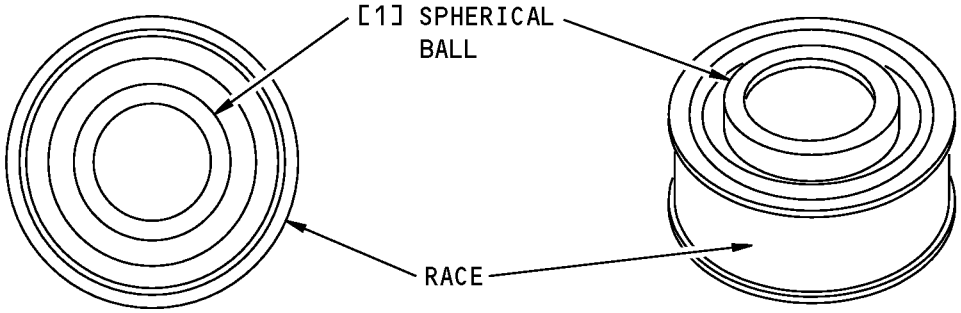


1 WRAP CLOTH AROUND THE ANCHOR FITTING TO PROTECT THE INNER WALL.

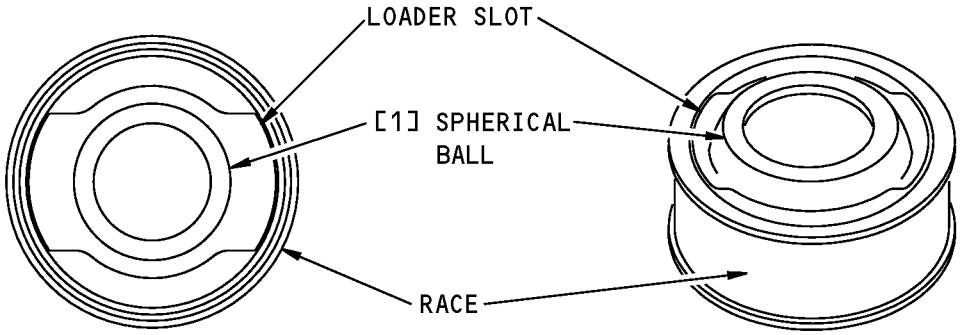
Drag Link Spherical Bearing
Figure 201 (Sheet 1 of 2)/78-31-07-990-802-F00



Drag Link Spherical Bearing
Figure 201 (Sheet 2 of 2)/78-31-07-990-802-F00



BEARING WITH NON-REMOVABLE BALL



BEARING WITH REMOVABLE BALL

Spherical Bearing Type
Figure 202/78-31-07-990-804-F00

BLOCKER DOOR DRAG LINKS - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the blocker door drag links.

(2) The installation of the blocker door drag links.

TASK 78-31-07-000-801-F00

2. Blocker Door Drag Link Removal

(Figure 401)

A. General

(1) This task is for the removal of the blocker door drag links from the left or right thrust reverser on an engine. There are five blocker door drag links on each thrust reverser and the removal task is the same for all of the blocker door drag links.

(2) The blocker door drag links are between the blocker doors and the inner wall of the thrust reverser fan duct.

(3) For this task the blocker door drag links will be referred to as the drag links.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G02329	Tape - Aluminum Foil, Pressure Sensitive - Vibration Damping Tape 434	

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Removal

SUBTASK 78-31-07-010-009-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-07-980-002-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES (25.4 CM). MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE THRUST REVERSER SLEEVE AS IT IS EXTENDED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Do these steps to expose the drag link to blocker door hardware:

NOTE: The sleeve must be partially extended to release the load on the drag link and expose the hardware that attaches the drag link to the blocker door.

(a) For the inboard thrust reverser sleeve, do these steps to manually extend the thrust reverser sleeve:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause then to extend a small amount.

2) Monitor the position of the thrust reverser sleeve as it is extended to make sure that it does not touch the leading edge of the wing.

3) Manually extend the thrust reverser sleeve no more than 10.0 inches (25.4 cm) from the forward edge of the torque box.

4) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard thrust reverser sleeve, manually extend the thrust reverser sleeve approximately 10.0 inches (25.4 cm).

NOTE: The outboard thrust reverser sleeve will not touch the leading edge of the wing.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

F. Drag Link Removal

SUBTASK 78-31-07-020-001-F00

CAUTION: WHEN YOU WORK IN THE FAN DUCT, USE SUFFICIENT PROTECTION. IF TOOLS OR THE DRAG LINKS FALL OR HIT THE BLOCKER DOORS AND FAN DUCT WALLS, DAMAGE TO THE COMPOSITE PANELS CAN OCCUR.

(1) Do these steps to remove the drag link [1]:

(a) Put protective material on the fan duct walls and blocker doors.

(b) Put cotton wiper, G00034 around the anchor fitting and drag link at the inner wall.

NOTE: When the drag link is disconnected from the blocker door, it can move forward or aft and fall against the inner wall. This cause damage to the inner wall composite panel.

(c) Disconnect the drag link [1] at the blocker door:

1) Remove the nut [2], washers [3] and [4], bushing [6], and bolt [5] from the pivot link.

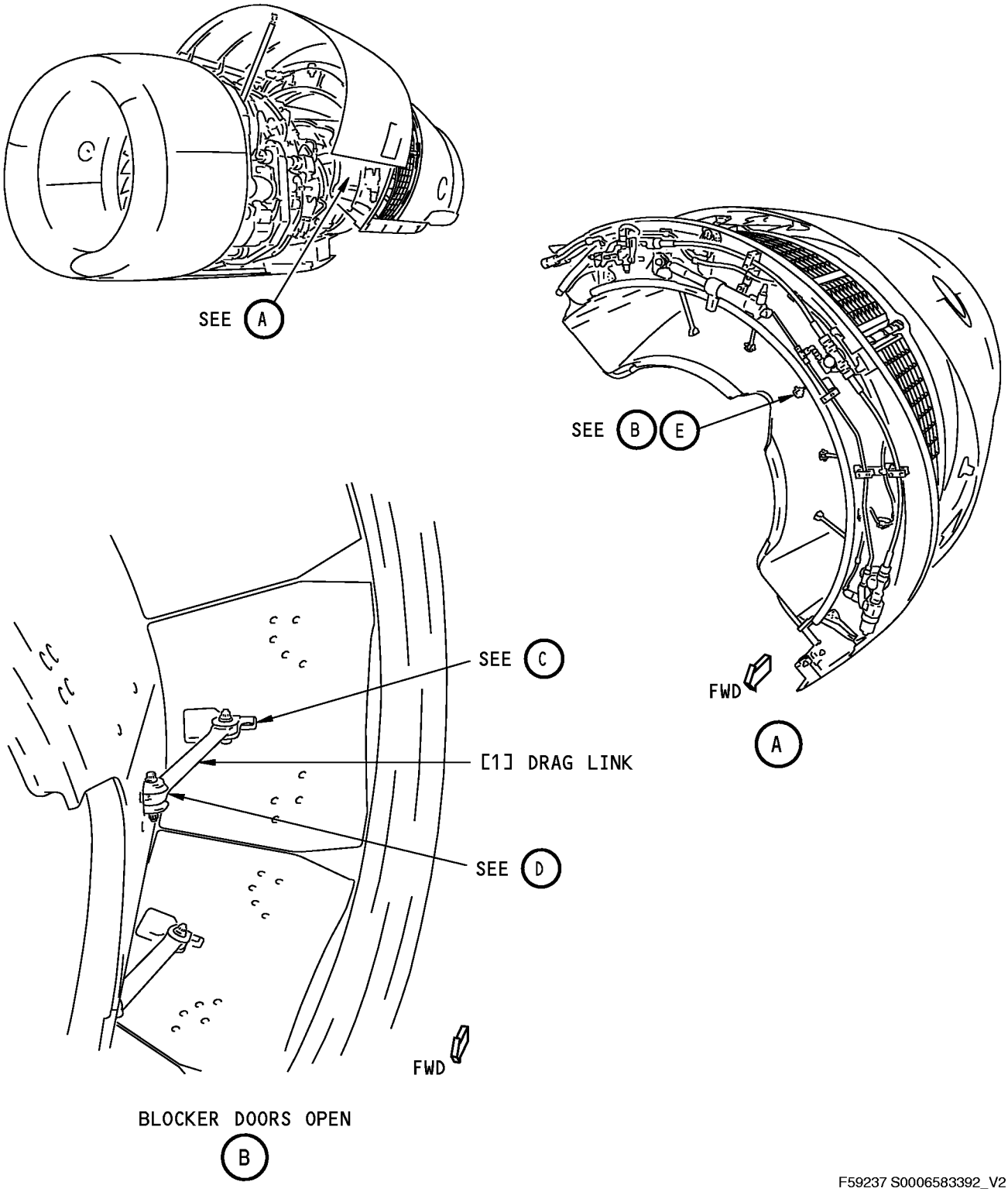
2) Put a tie strap through the spherical bearing to hold the ball in its position.

3) Use Vibration Damping Tape 434 tape, G02329, to hold the blocker door against the outer wall of the fan duct and in the retracted position.

(d) Disconnect the drag link [1] at the inner wall:

1) Remove the nut [11], washers [8] and [10], bushing [9], and bolt [7] from the anchor fitting.
2) Remove the drag link [1].

END OF TASK



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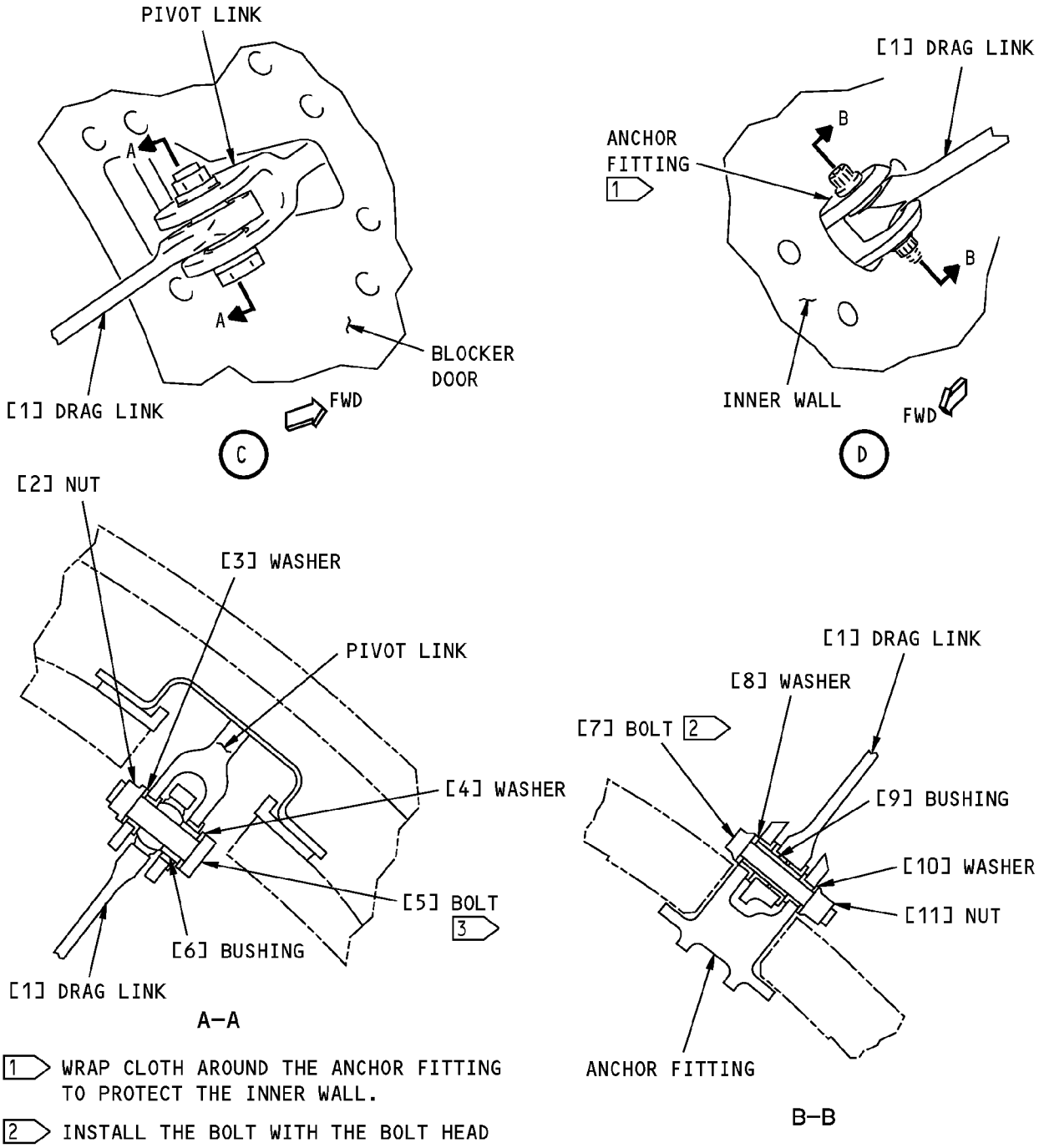
Drag Link Installation
Figure 401 (Sheet 1 of 3)/78-31-07-990-801-F00

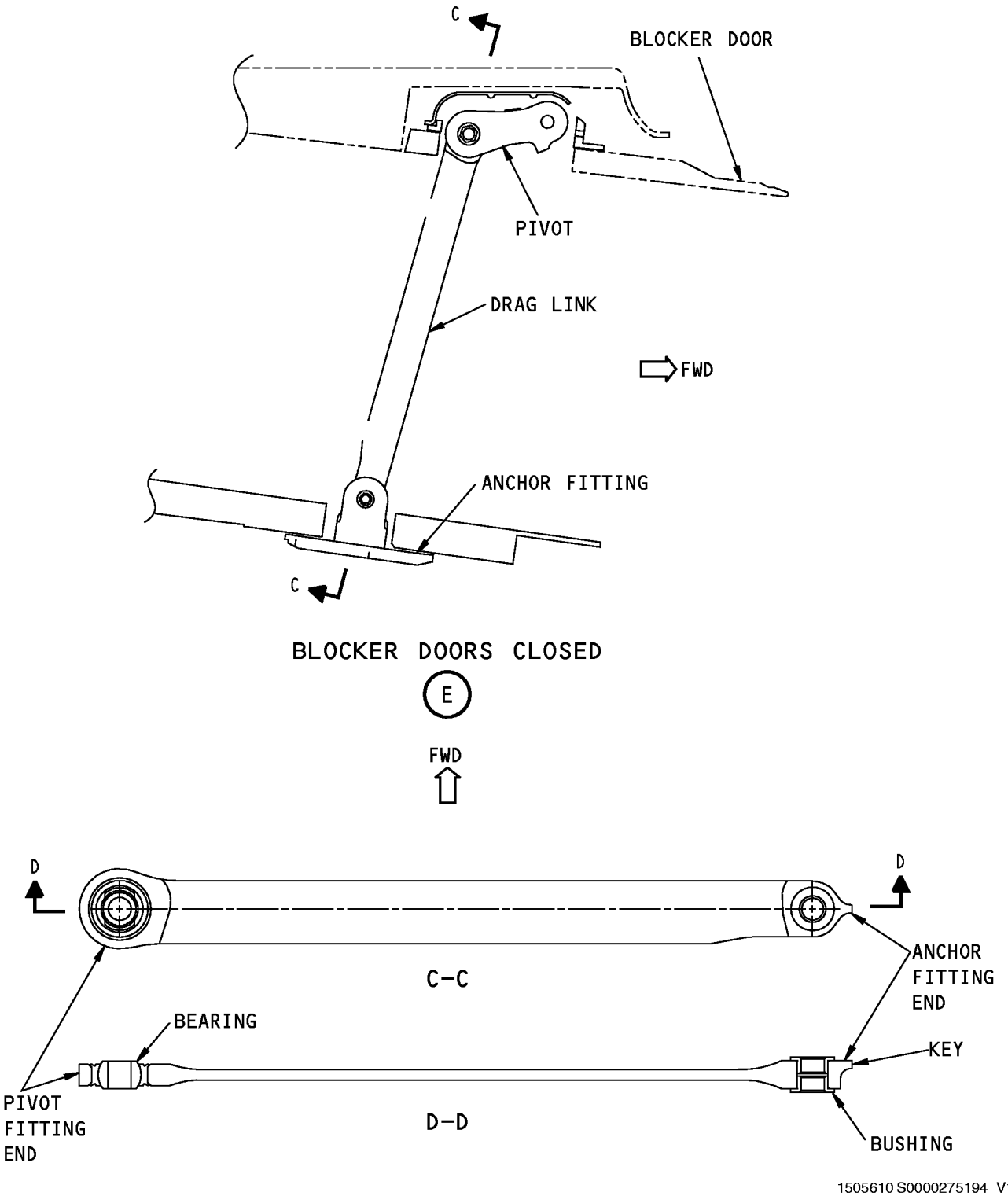


1 WRAP CLOTH AROUND THE ANCHOR FITTING TO PROTECT THE INNER WALL.

2 INSTALL THE BOLT WITH THE BOLT HEAD ON THE TOP SIDE OF THE FITTING.

3 INSTALL THE BOLT WITH THE BOLT HEAD ON THE SAME SIDE OF THE FITTING AS THE [6] BUSHING.

Drag Link Installation
Figure 401 (Sheet 2 of 3)/78-31-07-990-801-F00



Drag Link Installation
Figure 401 (Sheet 3 of 3)/78-31-07-990-801-F00

TASK 78-31-07-400-801-F00

3. Blocker Door Drag Link Installation

(Figure 401)

A. General

(1) This task if for the installation of the blocker door drag links on the left or right thrust reverser on an engine. The installation is the same for all of the drag links.

(2) For this task the blocker door drag links will be referred to as drag links.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)
78-31-00-980-805-F00	Thrust Reverser Operation - Extend (Power Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G02329	Tape - Aluminum Foil, Pressure Sensitive - Vibration Damping Tape 434	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Drag link	78-31-51-10-060	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Drag Link Installation

SUBTASK 78-31-07-420-003-F00

(1) Examine the bottom of the replacement drag link to find the forward edge of the drag link.

NOTE: There is a raised key feature on the side of the drag link that attaches to the drag link anchor fitting. The key only goes across half of the bottom of the drag link. The key moves in a slot in the anchor fitting and should prevent the drag link from being installed in the incorrect direction.The key can be missing from the drag link if key was damaged.

(a) If the key is missing, look at the contours of the leading edge and trailing edge of the drag link and the cut away in the contours near the ends of the drag link (Figure 401).

NOTE: There are flanged bushings installed in the end of the drag link that attaches to the anchor fitting. There is a spherical bearing installed in the end of the drag link that attaches to the pivot fitting in the blocker door.

SUBTASK 78-31-07-000-002-F00

(2) Do these steps to install the drag links:

(a) Make sure that there is protective material on the fan duct walls and the blocker doors.

(b) Make sure that the inner wall has protection; cotton wiper, G00034 is wrapped around the anchor fitting.

NOTE: When the drag link is disconnected from the blocker door, it can move forward or aft and fall against the inner wall. This will cause damage to the inner wall composite panel.

(c) Connect the drag link [1] at the inner wall:

1) Align the drag link [1] and anchor fitting bolt holes.

2) Install the bolt [7], bushing [9], washers [10] and [8], and nut [11].

a) Make sure that the bolt head is on the top side of the fitting.

b) Tighten the nut [11] to 50-75 pound-inches (5.6-8.5 Newton meters).

(d) Connect the drag link [1] at the blocker door:

1) Remove the Vibration Damping Tape 434 tape, G02329, from the blocker door.

2) Remove the tie strap, if you installed it through the spherical bearing to hold the ball in its position.

3) Align the drag link and pivot link bolt holes.

4) Install the bolt [5], bushing [6], washers [4] and [3], and nut [2].

a) Make sure that the bolt head is on the same side of the fitting as the bushing [6].

b) Tighten the nut [2] to 160-240 pound-inches (18.1-27.1 Newton meters).

(e) Remove the cotton wiper, G00034 from the anchor fitting at the inner wall and the protective material from the fan duct walls and blocker doors.

SUBTASK 78-31-07-410-003-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS, BUT DO NOT DO THE THRUST REVERSER OR LEADING EDGE ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Close and latch the thrust reverser; but do not do the thrust reverser or leading edge activation and do not close the fan cowl panels at this time Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-07-980-007-F00

(4) Manually translate the sleeve through an extend and retract cycle.

(a) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

(c) Make sure that the blocker doors and drag links move smoothly.

G. Drag Link Installation Test

SUBTASK 78-31-07-440-003-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-07-710-001-F00

(2) Operate the thrust reverser a minimum of three cycles to make sure that the drag link and blocker door move correctly.

(a) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.

(b) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

(c) Make sure that the blocker doors and drag links operate correctly.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-07-410-006-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-07-440-004-F00

(2) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

——————— END OF TASK ———————

THRUST REVERSER OPENING ACTUATOR - MAINTENANCE PRACTICES

1. General

A. This procedure has one task:

(1) To fill and bleed the thrust reverser opening actuator.

TASK 78-31-08-870-801-F00

2. Fill and Bleed Procedure

A. General

(1) This task gives the instructions to fill and bleed the thrust reverser opening actuator (referred to as the opening actuator) with engine oil. The opening actuator must be removed from the engine to do this task.

(2) This task is necessary when the opening actuator is replaced or when the opening actuator retracts quickly more than 0.5 inch (1.2 cm). This action indicates that there is air or a vacuum in the opening actuator or that the opening actuator is damaged. Usually there is a small amount of movement, less than 0.5 inch (1.2 cm).

B. References

Reference	Title
78-31-08-000-801-F00	Thrust Reverser Opening Actuator Removal (P/B 401)
78-31-08-400-801-F00	Thrust Reverser Opening Actuator Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-2417	Pump - Hand, Opening System, Thrust Reverser (Part #: A78019-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: B54001-30, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: C78005-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PR˜ F-23699F, Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808, Grade 3

E. Procedure

SUBTASK 78-31-08-020-002-F00

WARNING: DO THE FILL AND BLEED PROCEDURE IF THE OPENING ACTUATOR RETRACTS QUICKLY FOR MORE THAN 0.5 INCH (1.2 CM). THIS INDICATES THAT THERE IS AIR OR A VACUUM IN THE OPENING ACTUATOR OR THAT THE OPENING ACTUATOR IS DAMAGED. IF YOU TRY TO OPEN OR CLOSE THE THRUST REVERSER WITH THIS CONDITION, THE THRUST REVERSER COULD QUICKLY CLOSE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Thrust Reverser Opening Actuator Removal, TASK 78-31-08-000-801-F00.

SUBTASK 78-31-08-610-001-F00

(2) Do these steps to prepare the thrust reverser hand pump opening system, SPL-2417:

(a) Make sure that the hand pump is full of oil, D00071, or oil, D00068.

(b) Close the return valve on the hand pump.

(c) Connect the hand pump hose to the inlet fitting on the opening actuator.

SUBTASK 78-31-08-870-001-F00

(3) Do these steps to fill and bleed the opening actuator:

(a) Hold the opening actuator so that the inlet fitting is at the top.

(b) Operate the hand pump to fully extend the opening actuator until there is large increase in resistance; and, then operate the hand pump handle one more time through its full travel.

(c) Open the return valve on the pump.

(d) Keep the opening actuator with inlet fitting at the top; and, use your hand to push the piston rod in to the fully retracted position.

(e) Immediately close the return valve on the hand pump.

(f) Disconnect the hand pump hose from the opening actuator.

SUBTASK 78-31-08-720-001-F00

(4) Do these steps to make sure that there is no air or vacuum in the opening actuator:

(a) Slowly pull the actuator piston rod with your hand until the actuator lock collar engages.

(b) After 60 seconds, move the actuator lock collar to disengage the lock and push the actuator piston rod back to the fully retracted position.

1) The actuator piston rod should move smoothly to the fully retracted position.

NOTE: Usually the actuator piston rod will initially move quickly a small amount, less than 0.5 inch (1.2 cm).

2) If the actuator piston rod quickly retracts more than 0.5 inch (1.2 cm), then repeat the fill and bleed procedure.

3) If there is still too much movement, then replace the opening actuator.

SUBTASK 78-31-08-420-002-F00

(5) Do this task: Thrust Reverser Opening Actuator Installation, TASK 78-31-08-400-801-F00.

——————— END OF TASK ———————

THRUST REVERSER OPENING ACTUATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser opening actuator.

(2) The installation of the thrust reverser opening actuator.

TASK 78-31-08-000-801-F00

2. Thrust Reverser Opening Actuator Removal

(Figure 401)

A. General

(1) This task is for the removal of the thrust reverser opening actuator from the left or right thrust reverser on an engine.

(2) For this procedure, the thrust reverser opening actuator will be referred to as the opening actuator.

B. References

Reference	Title
27-81-00-040-801	Deactivate the Leading Edge Flaps and Slats (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-08-040-001-F00

CAUTION: RETRACT THE LEADING EDGE FLAPS AND SLATS, AND DO THE RELATED DEACTIVATION PROCEDURE BEFORE YOU OPEN THE THRUST REVERSER. IF THE LEADING EDGE FLAPS AND SLATS ARE NOT RETRACTED, DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 78-31-08-040-002-F00

(2) Do this task: Deactivate the Leading Edge Flaps and Slats, TASK 27-81-00-040-801.

SUBTASK 78-31-08-040-003-F00

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

(3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-08-010-001-F00

(4) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

E. Opening Actuator Removal

SUBTASK 78-31-08-020-001-F00

(1) Do these steps to remove the opening actuator [1]:

(a) Disengage the six latches in sequence from the aft latch 6 to the forward latch 1 along the bottom centerline of the thrust reverser.

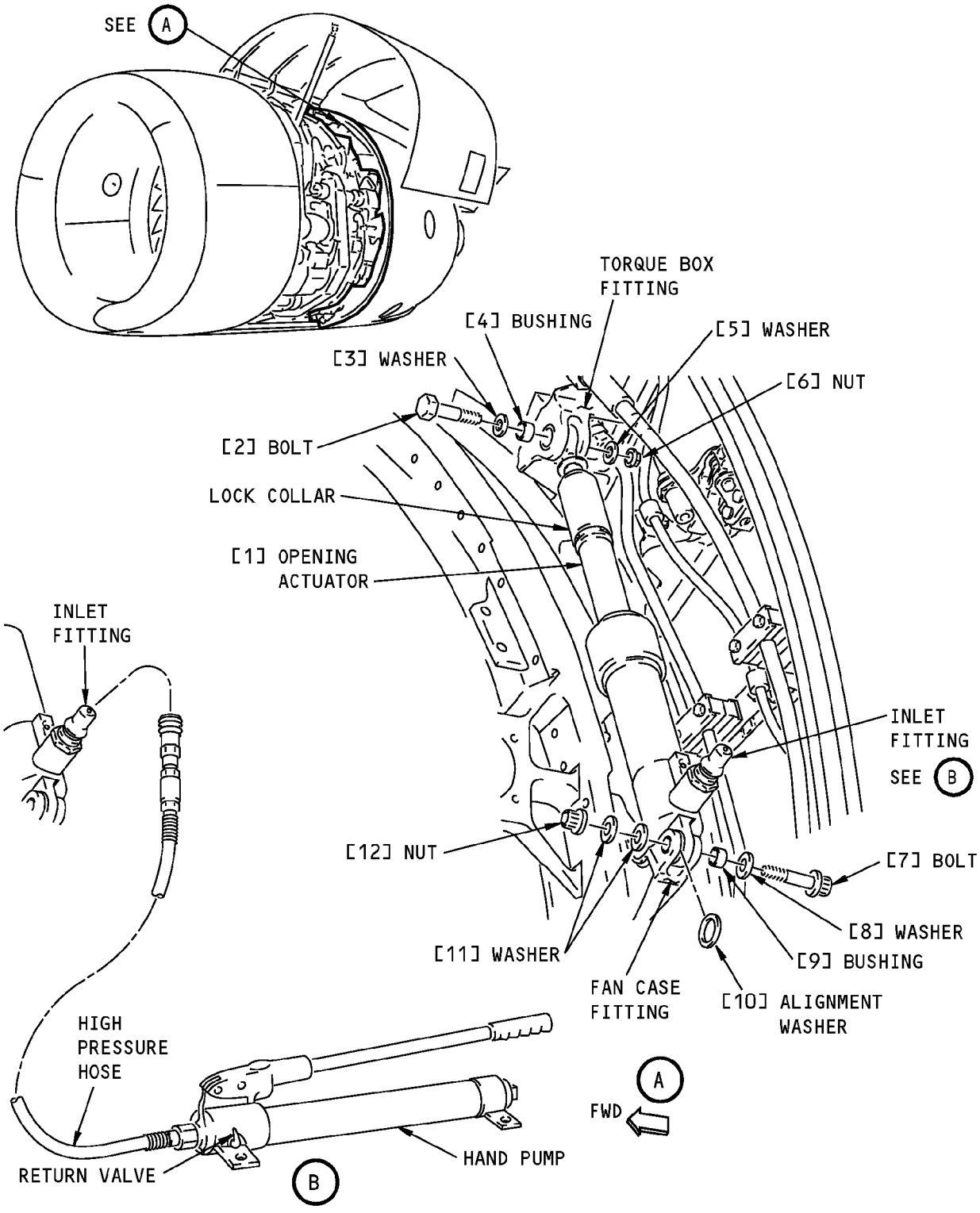
(b) Remove the bolt [7], washer [8], alignment washer [10], bushing [9], two washers [11] and nut [12] from the fitting on the fan case.

NOTE: If a longer bolt was used, there will be three washers [11].

(c) Remove the bolt [2], washer [3] and washer [5], bushing [4] and nut [6] from the fitting on the thrust reverser torque box.

(d) Remove the opening actuator [1].

——————— END OF TASK ———————



Thrust Reverser Opening Actuator Installation
Figure 401/78-31-08-990-801-F00

TASK 78-31-08-400-801-F00

3. Thrust Reverser Opening Actuator Installation

(Figure 401)

A. General

(1) This task is for the installation of the opening actuator.

B. References

Reference	Title
27-81-00-440-801	Reactivate the Leading Edge Flaps and Slats (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-08-870-801-F00	Fill and Bleed Procedure (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-2417	Pump - Hand, Opening System, Thrust Reverser (Part #: A78019-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: B54001-30, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: C78005-21, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-2434	Tool - Latching, Thrust Reverser C-Duct Halves (Part #: C78020-14, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: C78020-11, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Consumable Materials

Reference	Description	Specification
D00015	Grease - Aircraft Bearing (Use BMS 3-24 until existing stocks are depleted, BMS 3-33 supersedes BMS 3-24)	BMS3-24 (Superseded by BMS 3-33)
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PR˜ F-23699F, Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808, Grade 3

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Opening actuator	78-31-08-01-015	HAP 001-013, 015-017, 019
		78-31-08-02-035	HAP 018, 020-026, 028-054, 101-999

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Opening Actuator Installation

SUBTASK 78-31-08-870-002-F00

WARNING: DO THIS TASK TO MAKE SURE THAT THERE IS MINIMUM AIR OR VACUUM IN THE OPENING ACTUATOR. AIR OR A VACUUM IN THE OPENING ACTUATOR COULD CAUSE THE THRUST REVERSER TO CLOSE SUDDENLY WHEN YOU OPEN OR CLOSE THE THRUST REVERSER. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT COULD OCCUR.

(1) If you replace the opening actuator [1], fill and bleed the replacement opening actuator [1] before you install it. To do this, do this task: Fill and Bleed Procedure, TASK 78-31-08-870-801-F00.

SUBTASK 78-31-08-420-001-F00

(2) Do these steps to install the opening actuator [1]:

(a) Apply grease, D00015 to the shank of the bolts [2] and [7].

NOTE: Do not get grease on the threads of the bolts.

(b) Align the opening actuator [1] with the attach fitting on the fan case.

1) Install the bolt [7], washer [8], alignment washer [10], bushing [9], washers [11] and nut [12].

a) Make sure the alignment washer [10] is installed with the teflon surface against the actuator spherical bearing.

b) Tighten the nut [12] to 370-690 pound-inches (41.8-77.9 Newton meters).

(c) Align the actuator rod end with the attach fitting on the thrust reverser torque box.

1) Install the bolt [2], washers [3] and [5], bushing [4] and nut [6].

a) Tighten the nut [6] to 160-240 pound-inches (18-27 Newton meters).

H. Opening Actuator Installation Test

SUBTASK 78-31-08-710-001-F00

WARNING: DO NOT DO THE INSTALLATION TEST FOR THE OPENING ACTUATOR IF THE WIND VELOCITY IS MORE THAN 40 KNOTS. DO NOT DO THE INSTALLATION TEST IN SUDDEN WIND CONDITIONS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

WARNING: DO NOT STAND BETWEEN THE THRUST REVERSER AND THE ENGINE WHEN YOU DO THE INSTALLATION TEST FOR THE OPENING ACTUATOR. IF THE THRUST REVERSER LOWERS QUICKLY, INJURY TO PERSONS CAN OCCUR.

(1) Do these steps to test the opening actuator [1]:

NOTE: You will open the thrust reverser to the half open position and then lower it. You will open it again to the full open position and the opening actuator locks, and then lower the thrust reverser.

(a) Make sure the thrust reverser hand pump opening system, SPL-2417 is full of oil, D00071 or oil, D00068.

(b) Remove the dust cap from the inlet fitting on the opening actuator [1].

(c) Connect the hand pump to the inlet fitting.

(d) Open the thrust reverser to the half open position:

1) With the return valve on the hand pump closed, operate the hand pump to extend the opening actuator [1] and lift the thrust reverser to the half open position.

2) Open the hand pump return valve and let the thrust reverser lower.

(e) Open the thrust reverser to the fully open position:

1) With the return valve on the hand pump closed, operate the hand pump to extend the opening actuator [1] and lift the thrust reverser to the fully open position.

2) These are the indications that the thrust reverser is in the fully open position and the opening actuator [1] is locked:

a) Listen for the click sound of the lock collar.

b) Make sure the word LOCKED shows on the bottom of the extended piston.

c) Make sure that you can see the red band on the actuator rod.

3) Open the return valve on the hand pump to let the weight of the thrust reverser be held by the locked opening actuator [1].

WARNING: DO NOT LEAVE THE RETURN VALVE ON THE HAND PUMP OPEN WHEN THE THRUST REVERSER IS HELD OPEN BY THE LOCKED OPENING ACTUATOR. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

4) After the thrust reverser is held by the opening actuator [1], close the return valve on the hand pump.

WARNING: ALWAYS EXTEND THE OPENING ACTUATOR TO LIFT THE WEIGHT OF THE THRUST REVERSER OFF THE OPENING ACTUATOR LOCK. DO NOT OPEN THE RETURN VALVE ON THE HAND PUMP UNTIL YOU DISENGAGE THE ACTUATOR LOCK COLLAR. THIS WILL PREVENT INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

5) With the return valve closed on the hand pump, operate the hand pump to release the load on the opening actuator [1].

6) Push up on the actuator lock collar to disengage the lock.

7) Open the hand pump return valve and let the thrust reverser lower.

8) Disconnect the hand pump from the opening actuator [1].

9) Install dust caps on the inlet fitting on the opening actuator [1] and the hand pump hose.

10) Push the thrust reversers together so that the latch hooks can be engaged.

a) Use the latching tool, SPL-2434 in latch 2 to pull the thrust reversers together.

b) As you pull the thrust reversers together with the latching lever tool in latch 2, engage latch 1.

c) Engage the latches in sequence from the forward latch 2 to the aft latch 6.

NOTE: Use the latching lever tool as it is necessary to engage the hooks on the keeper pins.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-08-040-005-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 78-31-08-040-006-F00

(2) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-31-08-040-007-F00

(3) Do this task: Reactivate the Leading Edge Flaps and Slats, TASK 27-81-00-440-801.

END OF TASK

KRUEGER FLAP DEFLECTOR, FAIRING AND PLUG - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the Krueger flap deflector and fairing.

(2) The installation of the Krueger flap deflector and fairing.

(3) The removal of the plugs for the Krueger flap deflector and fairing.

(4) The installation of the plugs for the Krueger flap deflector and fairing.

TASK 78-31-09-010-801-F00

2. Krueger Flap Deflector and Fairing Removal

(Figure 401)

A. General

(1) This task is for the removal of the Krueger flap deflector and fairing from the translating sleeve on the inboard thrust reverser on an engine.

(2) Make sure that the Krueger flap deflector and fairing are installed only on the inboard translating sleeve.

(3) It is possible to install the Krueger flap deflector and fairing on the left or right translating sleeve.

(4) On the translating sleeve without the Krueger flap deflector and fairing, plugs are installed in the mounting holes.

B. References

Reference	Title
78-31-00-980-801-F00	Thrust Reverser Operation - Extend (Selection) (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-09-010-001-F00

WARNING: MAKE SURE THAT YOU OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. THIS WILL PREVENT INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task:Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-980-801-F00 .

E. Krueger Flap Deflector Removal

SUBTASK 78-31-09-020-001-F00

(1) Do these steps to remove the Krueger flap deflector [1]:

NOTE: Be sure not to drop hardware, bolts, washers or nuts into the thrust reverser structure or through the cascade vanes.

You get access to these bolts from the inside wall of the outer cowl.

(a) Remove the two aft bolts [7] and washers [8].

(b) Remove the middle bolt [5] and washer [6].

(c) Remove the two forward bolts [4] and washers [3].

(d) To remove the Krueger flap deflector [1], carefully break the sealant bond with a plastic scraper.

F. Krueger Flap Fairing Removal

SUBTASK 78-31-09-020-002-F00

(1) Do these steps to remove the Krueger flap fairing [2]:

NOTE: Be sure not to drop hardware, bolts, washers or nuts into the thrust reverser structure or through the cascade vanes.

(a) Carefully remove the sealant that is applied at the four fastener hole locations.

(b) Remove the two upper bolts [9], washers [11] and nuts [12].

(c) Remove the lower forward bolt [10], washer [13] and nut [14].

(d) The lower aft fastener is a Huck (Asp) fastener.

1) Do the steps in the referenced procedure to remove the pin [15], sleeve [16] and lock collar [16A] (CMM 78-00-08).

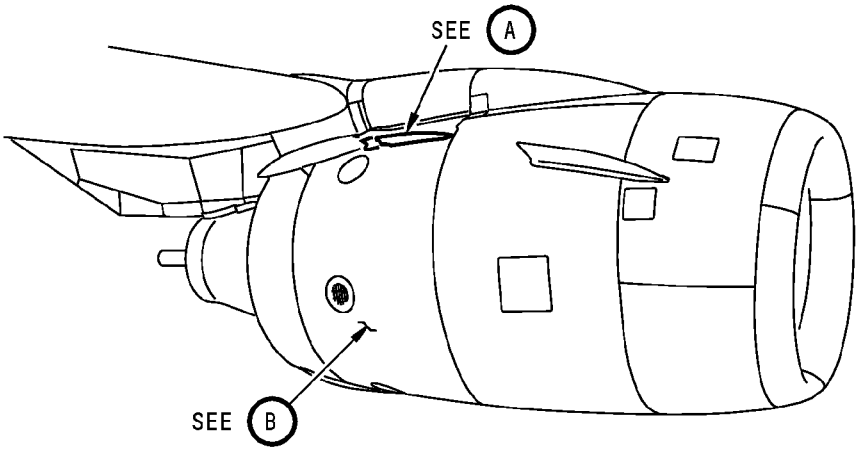
(e) To remove the Krueger flap fairing [2], carefully break the sealant bond with a plastic scraper.

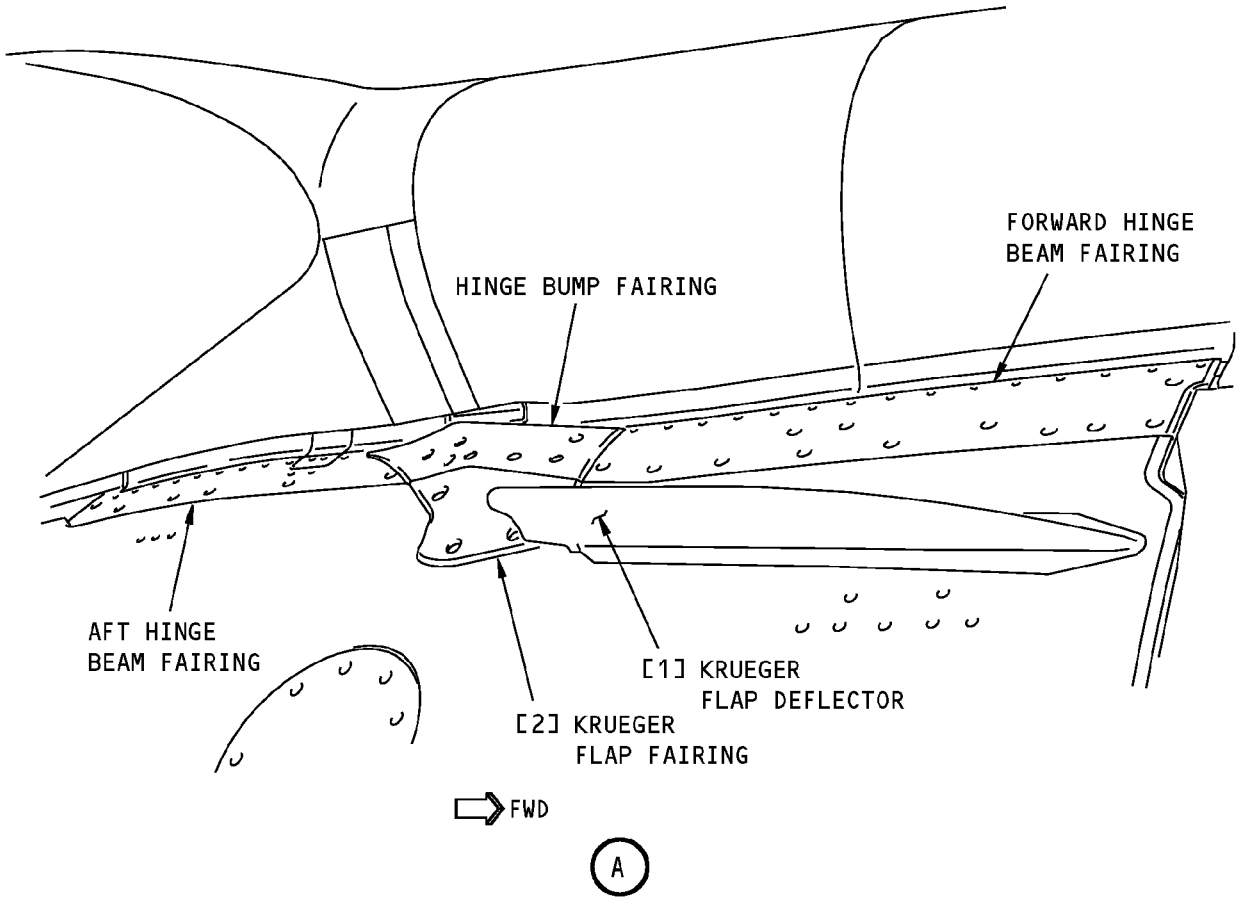
G. Prepare for the Installation

SUBTASK 78-31-09-420-004-F00

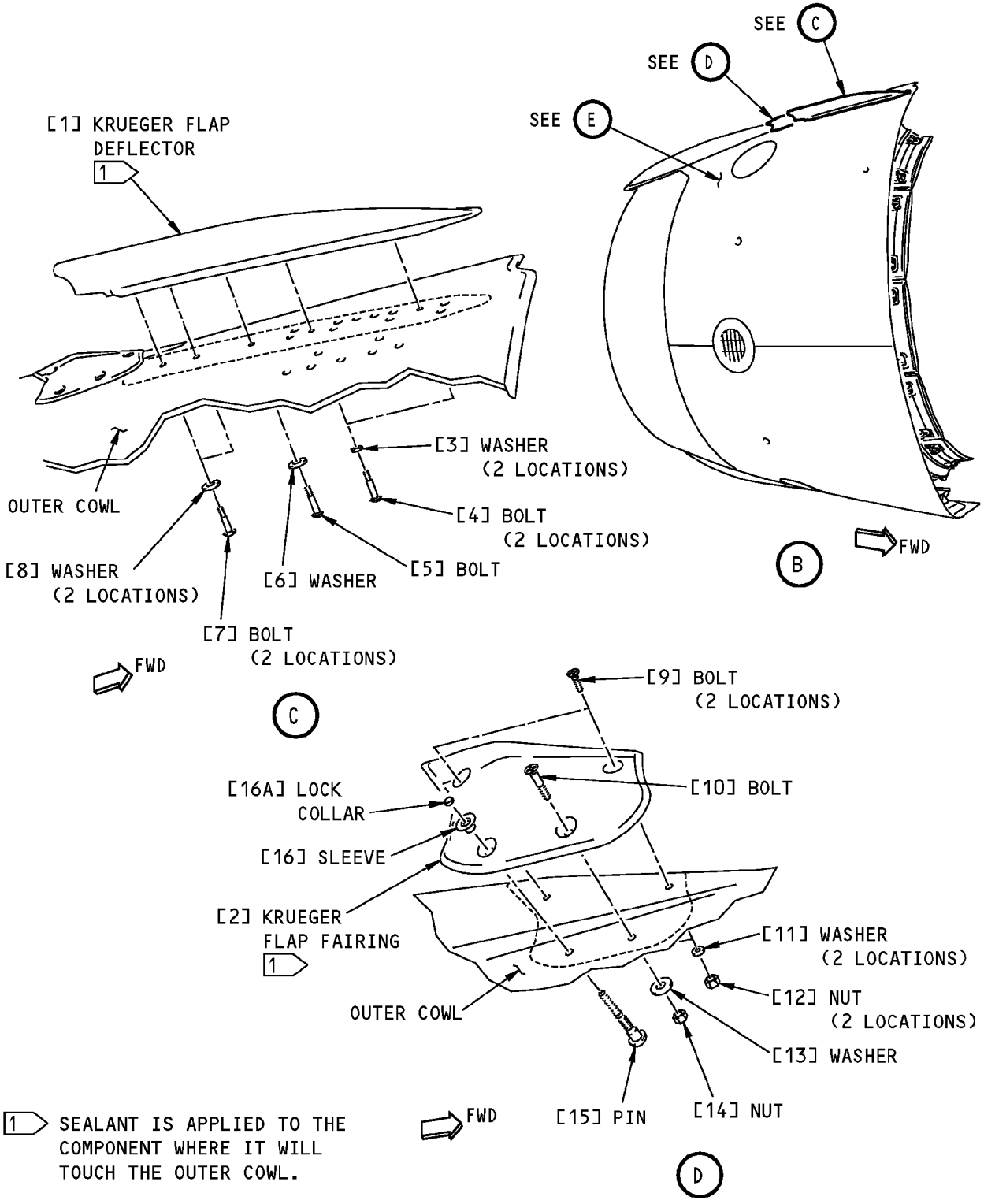
(1) If the Krueger flap deflector and fairing are not to be replaced on this translating sleeve, do this task: Krueger Flap Deflector Plugs Installation, TASK 78-31-09-400-801-F00.

——————— END OF TASK ———————

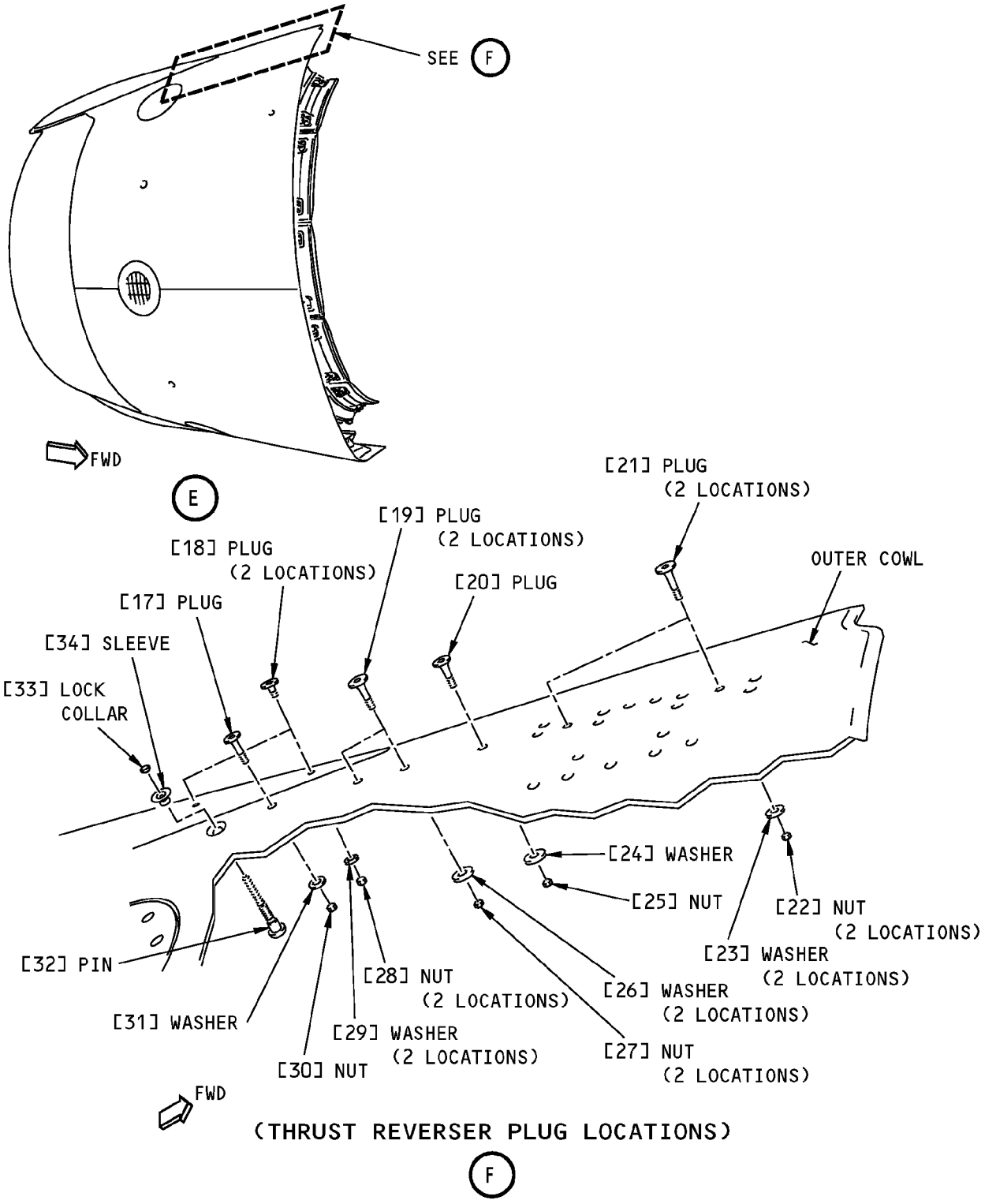




Krueger Flap Deflector and Fairing Installation
Figure 401 (Sheet 1 of 3)/78-31-09-990-801-F00



Krueger Flap Deflector and Fairing Installation
Figure 401 (Sheet 2 of 3)/78-31-09-990-801-F00



Krueger Flap Deflector and Fairing Installation
Figure 401 (Sheet 3 of 3)/78-31-09-990-801-F00

TASK 78-31-09-420-801-F00

3. Krueger Flap Deflector and Fairing Installation

(Figure 401)

A. General

(1) This task is for the installation of the Krueger flap deflector and fairing on the translating sleeve on the inboard thrust reverser on an engine.

(2) Make sure that the Krueger flap deflector and fairing are installed only on the inboard translating sleeve.

(3) It is possible to install the Krueger flap deflector and fairing on the left or right translating sleeve.

(4) On the translating sleeve without the Krueger flap deflector and fairing, plugs are installed in the mounting holes.

B. References

Reference	Title
78-31-00-980-802-F00	Thrust Reverser Operation - Retract (Selection) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A00436	Sealant - Fuel Tank	BMS5-45 (Supersedes BMS 5-26)
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G02415	Agent - Parting, Paste Wax (Johnson's Paste Wax)	

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Deflector	78-31-09-02-015	HAP ALL
2	Fairing	78-31-09-02-055	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Prepare for the Installation

SUBTASK 78-31-09-010-003-F00

(1) If the translating sleeve to be installed must have the Krueger flap deflector and fairing installed, remove the plugs from the translating sleeve.

(a) Do this task: Krueger Flap Deflector Plugs Removal, TASK 78-31-09-000-801-F00.

G. Krueger Flap Fairing Installation

SUBTASK 78-31-09-420-001-F00

CAUTION: THE KRUEGER FLAP FAIRING AND DEFLECTOR ARE INSTALLED ONLY ON THE INBOARD TRANSLATING SLEEVES. IF THE KRUEGER FLAP FAIRING AND DEFLECTOR ARE NOT IN THE CORRECT LOCATION, INCORRECT AIRPLANE PERFORMANCE OR DAMAGE TO THE TRANSLATING SLEEVE CAN OCCUR.

(1) Do these steps to install the Krueger flap fairing [2]:

NOTE: Be sure not to drop hardware, bolts, washers or nuts into the thrust reverser structure or through the cascade vanes.

(a) Put the Krueger flap fairing [2] in the correct position on the outer cowl.

(b) Put Scotch Flatback Masking Tape 250, G00270 on the outer cowl around the periphery of the Krueger flap fairing [2].

(c) Remove the Krueger flap fairing [2].

(d) Apply the paste wax parting agent, G02415, to the outer cowl surface in the area where the Krueger flap fairing [2] will be installed.

(e) Apply sealant, A00436 to the surfaces of the Krueger flap fairing [2] that will be against the outer cowl.

(f) Put the Krueger flap fairing [2] in the correct position on the outer cowl.

1) Apply pressure to the Krueger flap fairing [2] until the sealant pushes out around the fairing.

a) Make sure that the sealant pushes out around the entire periphery of the Krueger flap fairing.

(g) Apply sealant, A00436 to the shank and the threads of the bolts.

NOTE: Additional sealant can be applied to the shank of the bolt or to the washer to make sure that sealant will push out around the washer and the nut.

(h) Install two bolts [9], washers [11] and nuts [12].

(i) Install bolt [10], washer [13] and nut [14].

(j) Tighten the nuts [12] and [14] to 45-50 inch-pounds (5.1-5.7 Newton-meters).

(k) The lower aft fastener is a Huck (Asp) fastener.

1) Do the steps in the referenced procedure to install the pin [15], sleeve [16] and lock collar [16A] (CMM 78-00-08).

(l) Make sure that the sealant pushes out around the head of the bolt.

1) Use a spatula to remove the excess sealant from the bolt head and to make it flush with the adjacent surface.

(m) Remove the Scotch Flatback Masking Tape 250, G00270.

(n) Make sure that the sealant pushes out around the washer and the nut.

1) If the sealant does not push out around the washer and nut, use a brush to add more sealant.

(o) Let the sealant, A00436 cure a minimum of 48 hours at 72-82°F (22-28°C).

H. Krueger Flap Deflector Installation

SUBTASK 78-31-09-420-002-F00

CAUTION: THE KRUEGER FLAP FAIRING AND DEFLECTOR ARE INSTALLED ONLY ON THE INBOARD TRANSLATING SLEEVES. IF THE KRUEGER FLAP FAIRING AND DEFLECTOR ARE NOT IN THE CORRECT LOCATION, INCORRECT AIRPLANE PERFORMANCE OR DAMAGE TO THE TRANSLATING SLEEVE CAN OCCUR.

(1) Do these steps to install the Krueger flap deflector [1]:

NOTE: Be sure not to drop hardware, bolts, washers or nuts into the thrust reverser structure or through the cascade vanes.

(a) Make sure that the Krueger flap fairing [2] is installed.

(b) Put the Krueger flap deflector [1] in the correct position on the outer cowl.

(c) Put Scotch Flatback Masking Tape 250, G00270 on the outer cowl around the periphery of the Krueger flap deflector [1].

(d) Remove the Krueger flap deflector [1].

(e) Apply the paste wax parting agent, G02415, to the outer cowl surface in the area where the Krueger flap deflector [1] will be installed.

(f) Remove the Scotch Flatback Masking Tape 250, G00270.

(g) Apply sealant, A00436 to the surfaces of the Krueger flap deflector [1] that will be against the outer cowl.

(h) Put the Krueger flap deflector [1] in the correct position on the outer cowl.

1) Apply pressure to the Krueger flap deflector [1] until the sealant pushes out around the deflector.

a) Make sure that the sealant pushes out around the entire periphery of the Krueger flap deflector.

(i) Apply sealant, A00436 to the shank and the threads of the bolts.

(j) Install the two forward bolts [4] and washers [3].

(k) Install the middle bolt [5] and washer [6].

1) Tighten the bolts [4] and [5] to 45-50 inch-pounds (5-5.6 newton-meters)

(l) Install the two aft bolts [7] and washers [8].

1) Tighten the bolts [7] to 70-75 inch-pounds (7.9-8.5 newton-meters).

(m) Make sure that the sealant pushes out around the head of the bolt.

1) If the sealant does not push out around the bolt head, use a brush to add more sealant.

(n) Let the sealant, A00436 cure a minimum of 48 hours at 72-82°F (22-28°C).

I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-09-410-001-F00

WARNING: MAKE SURE THAT YOU OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. THIS WILL PREVENT INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-980-802-F00.

END OF TASK

TASK 78-31-09-000-801-F00

4. Krueger Flap Deflector Plugs Removal

(Figure 401)

A. General

(1) This task is for the removal of the plugs in the translating sleeve on the thrust reverser when the Krueger flap deflector and fairing are to be installed.

(2) On the outboard translating sleeve, plugs are installed in the mounting holes for the Kruger flap deflector and fairing. The Krueger flap deflector and fairing are not installed on the outboard translating sleeve.

(3) It is possible to install the Krueger flap deflector and fairing on the left or right translating sleeve. Make sure that the Krueger flap deflector and fairing are installed only on the inboard translating sleeve.

B. References

Reference	Title
78-31-00-980-801-F00	Thrust Reverser Operation - Extend (Selection) (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-09-030-001-F00

(1) Do this task: Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-980-801-F00.

E. Krueger Flap Deflector Plug Removal

SUBTASK 78-31-09-020-003-F00

(1) If the Krueger flap deflector and fairing are to be installed in this translating sleeve, do these steps to remove the plugs in the mounting holes:

NOTE: Be sure not to drop hardware, plugs, washers or nuts into the thrust reverser structure or through the cascade vanes.

(a) The lower aft plug is a Huck (Asp) fastener.

1) Do the steps in the referenced procedure to remove the pin [32], sleeve [34] and lock collar [33] (CMM 78-00-08).

(b) Remove the plug [17], washer [31] and nut [30].

(c) Remove the two plugs [18], washers [29] and nuts [28].

(d) Remove the two plugs [19], washers [26] and nuts [27].

(e) Remove the plug [20], washer [24], and nut [25].

(f) Remove the two forward plugs [21], washers [23] and nuts [22].

——————— END OF TASK ———————

TASK 78-31-09-400-801-F00

5. Krueger Flap Deflector Plugs Installation

(Figure 401)

A. General

(1) This task is for the installation of plugs in the mounting holes when the Krueger flap deflector and fairing are removed from the translating sleeve.

(2) On the outboard translating sleeve, plugs are installed in the mounting holes. The Krueger flap deflector and fairing are not installed on the outboard translating sleeve.

(3) It is possible to install the Krueger flap deflector and fairing on the left or right translating sleeve. Make sure that the Krueger flap deflector and fairing are installed only on the inboard translating sleeve.

B. References

Reference	Title
78-31-00-980-802-F00	Thrust Reverser Operation - Retract (Selection) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A00436	Sealant - Fuel Tank	BMS5-45 (Supersedes BMS 5-26)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Krueger Flap Deflector Plug Installation

SUBTASK 78-31-09-420-003-F00

(1) If the Krueger flap deflector and fairing are not to be replaced on this translating sleeve, do these steps to install the plugs in the mounting holes:

NOTE: Be sure not to drop hardware, plugs, washers or nuts into the thrust reverser structure or through the cascade vanes.

(a) Apply sealant, A00436 to the shank and the threads of the plugs.

NOTE: Additional sealant can be applied to the shank of the plug or to the washer to make sure that sealant will push out around the washer and the nut.

(b) Install the two forward plugs [21], washers [23] and nuts [22].

(c) Install the plug [20], washer [24], and nut [25].

1) Tighten the nuts, [22] and [25], to 30-35 inch-pounds (3.4-4.0 Newton-meters).

(d) Install the two plugs [19], washers [26] and nuts [27].

1) Tighten the nuts [27] to 70-75 inch-pounds (7.9-8.5 Newton-meters).

(e) Install the two plugs [18], washers [29] and nuts [28].

(f) Install the plug [17], washer [31] and nut [30].

1) Tighten the nuts, [28] and [30], to 45-50 inch-pounds (5.1-5.7 Newton-meters).

(g) The lower aft plug is a Huck (Asp) fastener.

1) Do the steps in the referenced procedure to install the pin [32], sleeve [34] and lock collar [33] (CMM 78-00-08).

(h) Make sure that the sealant pushes out around the head of the plug.

1) Use a spatula to remove the excess sealant from the plug head and to make it flush with the adjacent surface.

(i) Make sure that the sealant pushes out around the washer and the nut.

1) If the sealant does not push out around the washer and nut, use a brush to add more sealant.

(j) Let the sealant, A00436 cure a minimum of 48 hours at 72-82°F (22-28°C).

F. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-09-430-001-F00

(1) Do this task: Thrust Reverser Operation - Retract (Selection), TASK 78-31-00-980-802-F00.

——————— END OF TASK ———————

KRUEGER FLAP DEFLECTOR AND FAIRING - INSPECTION/CHECK

1. General

A. This procedure has one task:

(1) A visual inspection of the Krueger flap deflector.

TASK 78-31-09-200-801-F00

2. Krueger Flap Deflector Inspection

A. General

(1) This task is for a visual inspection of the Krueger flap deflector that is on the inboard thrust reverser sleeve at the top of the sleeve.

(2) If the damage is more than the specified limits, the Krueger flap deflector must be replaced.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-09-010-801-F00	Krueger Flap Deflector and Fairing Removal (P/B 401)
78-31-09-420-801-F00	Krueger Flap Deflector and Fairing Installation (P/B 401)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Inspection

SUBTASK 78-31-09-040-001-F00

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

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

E. Procedure

SUBTASK 78-31-09-210-001-F00

(1) Do a check of the Krueger flap deflector for obvious damage:

(a) Scratches, gouges and worn areas are permitted if the depth of the damage is not more than 0.050 inch (1.27 mm).

(b) If the depth of the damage is more than 0.050 inch (1.27 mm), replace the Krueger flap deflector.

These are the tasks:

- Krueger Flap Deflector and Fairing Removal, TASK 78-31-09-010-801-F00
- Krueger Flap Deflector and Fairing Installation, TASK 78-31-09-420-801-F00.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-09-410-002-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

——————— END OF TASK ———————

RUBSTRIP - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the rubstrips.

(2) The installation of the rubstrips.

TASK 78-31-10-000-801-F00

2. Rubstrip Removal

(Figure 401)

A. General

(1) This task is for the removal of the rubstrips from the torque box on the left or right thrust reverser on an engine.

(2) The forward rubstrips interface with the fan cowl panel and the aft rubstrips interface with the thrust reverser translating sleeve.

(3) For this procedure, the rubstrips and shims will be referred to as follows:

Table 401/78-31-10-993-801-F00

RUBSTRIP NUMBER	INTERFACES WITH	REFERRED TO AS
1 1A	Fan Cowl Panel	Forward-Upper Rubstrip Forward-Upper Shim
2 2A	Fan Cowl Panel	Forward-Mid Rubstrip Forward-Mid Shim
3 3A	Fan Cowl Panel	Forward-Lower Rubstrip Forward-Lower Shim
4 4A	Fan Cowl Panel	Forward-Bottom Rubstrip Forward-Bottom Shim
5 5A	Fan Cowl Panel	Hinge Beam Rubstrip Hinge Beam Shim
6 6A	Fan Cowl Panel	Latch Beam Rubstrip Latch Beam Shim
7 7A	Translating Sleeve	Aft-Upper Rubstrip Aft-Upper Shim
8 8A	Translating Sleeve	Aft-Upper-Mid Rubstrip Aft-Upper-Mid Shim
9 9A	Translating Sleeve	Aft-Mid Rubstrip Aft-Mid Shim
10 10A	Translating Sleeve	Aft-Lower-Mid Rubstrip Aft-Lower-Mid Shim
11 11A	Translating Sleeve	Aft-Lower Rubstrip Aft-Lower Shim
12 12A	Translating Sleeve	Aft-Bottom Rubstrip Aft-Bottom Shim
13 13A	Translating Sleeve	Aft Guide Block Aft Guide Block Shim

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare the Removal

SUBTASK 78-31-10-040-001-F00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-31-10-010-001-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-31-10-840-002-F00

(3) Manually extend the thrust reverser sleeve approximately 4 inches (10 cm) to expose the aft rubstrips, do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

E. Forward Rubstrip Removal

(Figure 401)

SUBTASK 78-31-10-010-002-F00

(1) For all of the forward rubstrips, make sure that you keep the shims for the subsequent installation.

NOTE: If the original shim is used with the replacement rubstrip, there will be less adjustment to get the necessary rubstrip height dimensions.

SUBTASK 78-31-10-020-001-F00

(2) To remove the forward-upper rubstrip [1], do these steps (View C):

(a) Remove the bolt [15], radius filler [16], washer [17] and nut [18] from each of the two upper locations.

(b) Remove the remaining 12 bolts [19], washers [17] and nuts [18].

(c) Remove the forward-upper rubstrip [1] and shim [1A].

1) Keep the shim [1A] for the subsequent installation.

SUBTASK 78-31-10-020-002-F00

(3) To remove the forward-mid rubstrip [2], (View D), do these steps:

(a) Remove the fourteen bolts [19], washers [17] and nuts [18].

(b) Remove the forward-mid rubstrip [2] and shim [2A].

1) Keep the shim [2A] for the subsequent installation.

SUBTASK 78-31-10-020-003-F00

(4) To remove the forward-lower rubstrip [3], do these steps (View E):

(a) Remove the 11 bolts [19], washers [17] and nuts [18].

(b) Remove the forward-lower rubstrip [3] and shim [3A].

1) Keep the shim [3A] for the subsequent installation.

SUBTASK 78-31-10-020-004-F00

(5) To remove the forward-bottom rubstrip [4], do these steps (View F):

(a) Remove the 11 bolts [19], washers [17] and nuts [18].

(b) Remove the forward-bottom rubstrip [4] and shim [4A].

1) Keep the shim [4A] for the subsequent installation.

SUBTASK 78-31-10-020-005-F00

(6) To remove the hinge beam rubstrip [5] and shim [5A], do these steps.

(a) Remove the three rivets [25] to remove the rubstrip.

NOTE: Use the standard overhaul practices to remove the rivets.

(b) Remove the hinge beam rubstrip [5] and shim [5A].

1) Keep the shim [5A] for the subsequent installation.

SUBTASK 78-31-10-020-006-F00

(7) To remove the latch beam rubstrip [6], do these steps (View G):

(a) Remove the four bolts [15], washers [17] and nuts [18].

(b) Remove the latch beam rubstrip [6] and shim [6A].

1) Keep the shim [6A] for the subsequent installation.

F. Aft Rubstrip Removal

(Figure 401)

SUBTASK 78-31-10-020-029-F00

(1) For all of the aft rubstrips, make sure that you keep the shims for the subsequent installation.

NOTE: If the original shim is used with the replacement rubstrip, there will be less adjustment to get the necessary rubstrip height dimensions.

SUBTASK 78-31-10-020-007-F00

(2) To remove the aft-upper rubstrip [7], do these steps (View C):

(a) Remove the bolt [23] and nut [20] from each of the two upper locations.

(b) Remove the remaining seven bolts [23], washers [21] and nuts [22].

(c) Remove the aft-upper rubstrip [7] and shim [7A].

1) Keep the shim [7A] for the subsequent installation.

SUBTASK 78-31-10-020-008-F00

(3) To remove the aft-upper-mid rubstrip [8], do these steps (View C):

(a) Remove the seven bolts [23], washers [21] and nuts [22].

(b) Remove the aft-upper-mid rubstrip [8] and shim [8A].

1) Keep the shim [8A] for the subsequent installation.

SUBTASK 78-31-10-020-009-F00

(4) To remove the aft-mid rubstrip [9], do these steps (View D):

(a) Remove the six bolts [23], washers [21] and nuts [22].

(b) Remove the aft-mid rubstrip [9] and shim [9A].

1) Keep the shim [9A] for the subsequent installation.

SUBTASK 78-31-10-020-010-F00

(5) Remove the aft-lower-mid rubstrip [10], do these steps (View D):

(a) Remove the bolt [23], washer [21] and nut [22] from six locations.

(b) Remove the bolt [24], washer [21] and nut [22] from the remaining four locations.

(c) Remove the aft-lower-mid rubstrip [10] and shim [10A].

1) Keep the shim [10A] for the subsequent installation.

SUBTASK 78-31-10-020-011-F00

(6) To remove the aft-lower rubstrip [11], do these steps (View E):

(a) Remove the eight bolts [23], washers [21] and nuts [22].

(b) Remove the aft-lower rubstrip [11] and shim [11A].

1) Keep the shim [11A] for the subsequent installation.

SUBTASK 78-31-10-020-012-F00

(7) To remove the aft-bottom rubstrip [12], do these steps (View F):

(a) Remove the nine bolts [23], washers [21] and nuts [22].

(b) Remove the aft-bottom rubstrip [12] and shim [12A].

1) Keep the shim [12A] for the subsequent installation.

SUBTASK 78-31-10-020-013-F00

(8) To remove the aft guide block [13], do these steps (View E):

NOTE: There are five aft guide blocks on each of the left and right thrust reversers on an engine.

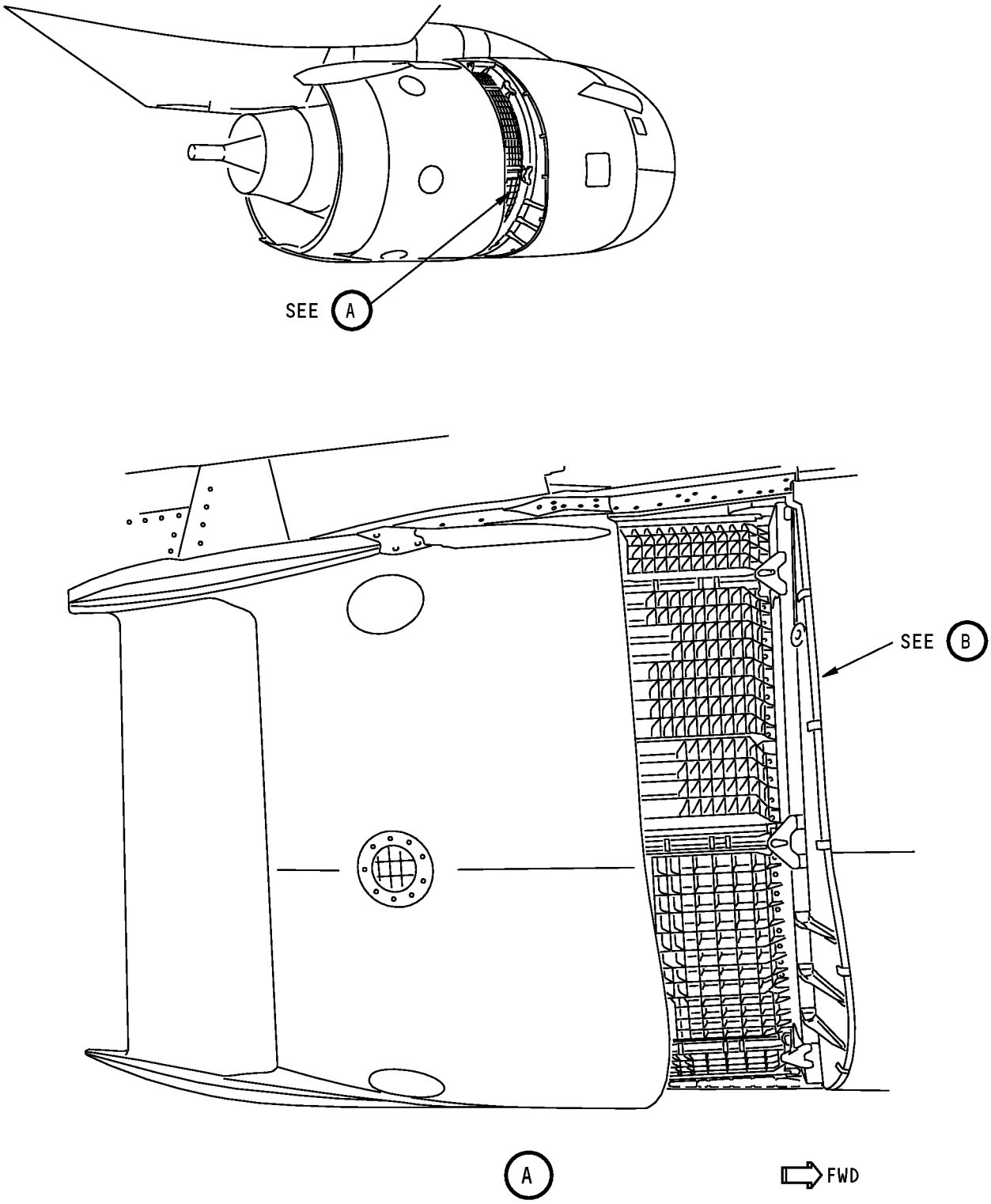
(a) Remove the bolt [23], washer [21] and nut [22].

(b) Remove the bolt [24], washer [21], and nut [22].

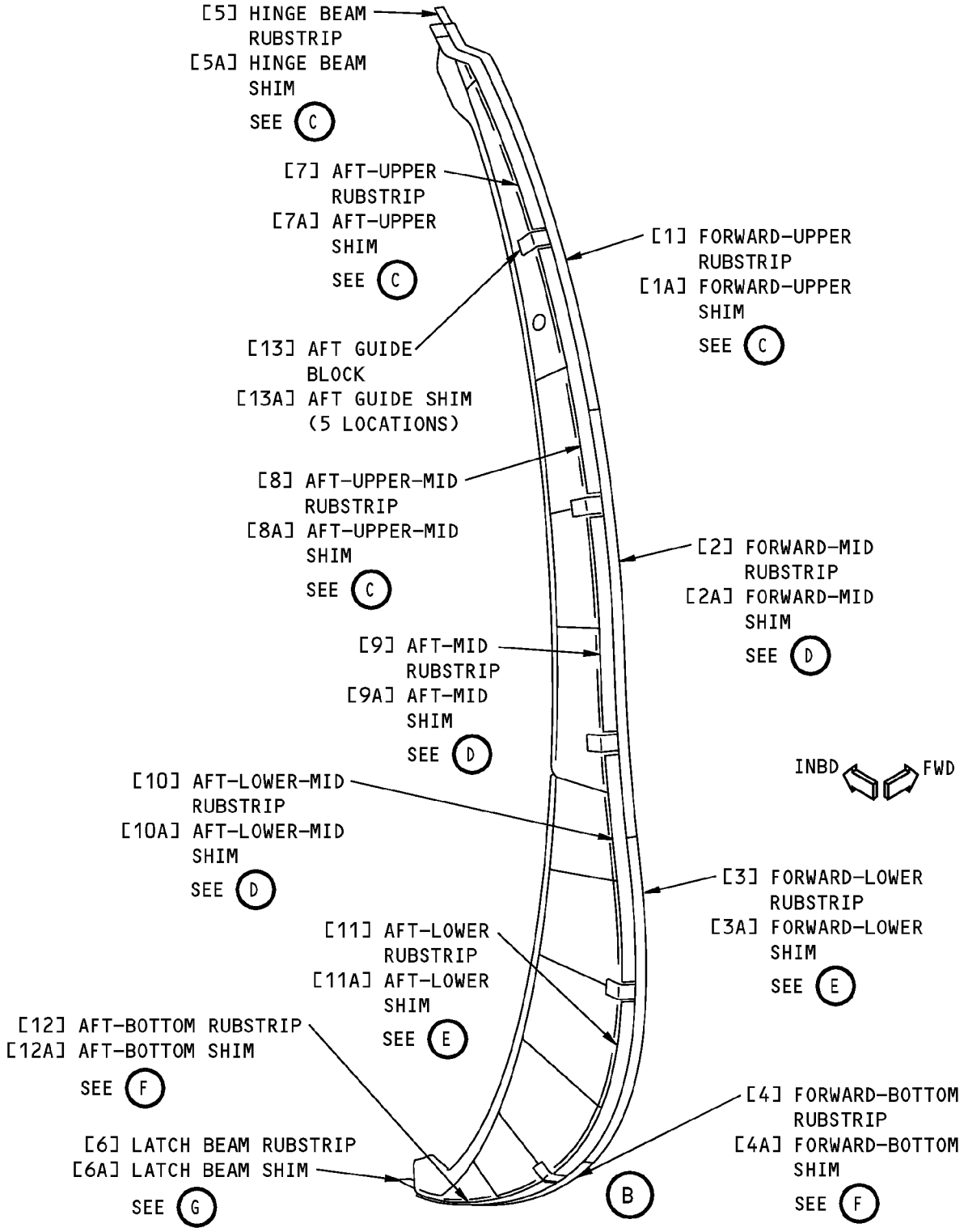
(c) Remove the aft guide block [13] and shim [13A].

1) Keep the shim [13A] for the subsequent installation.

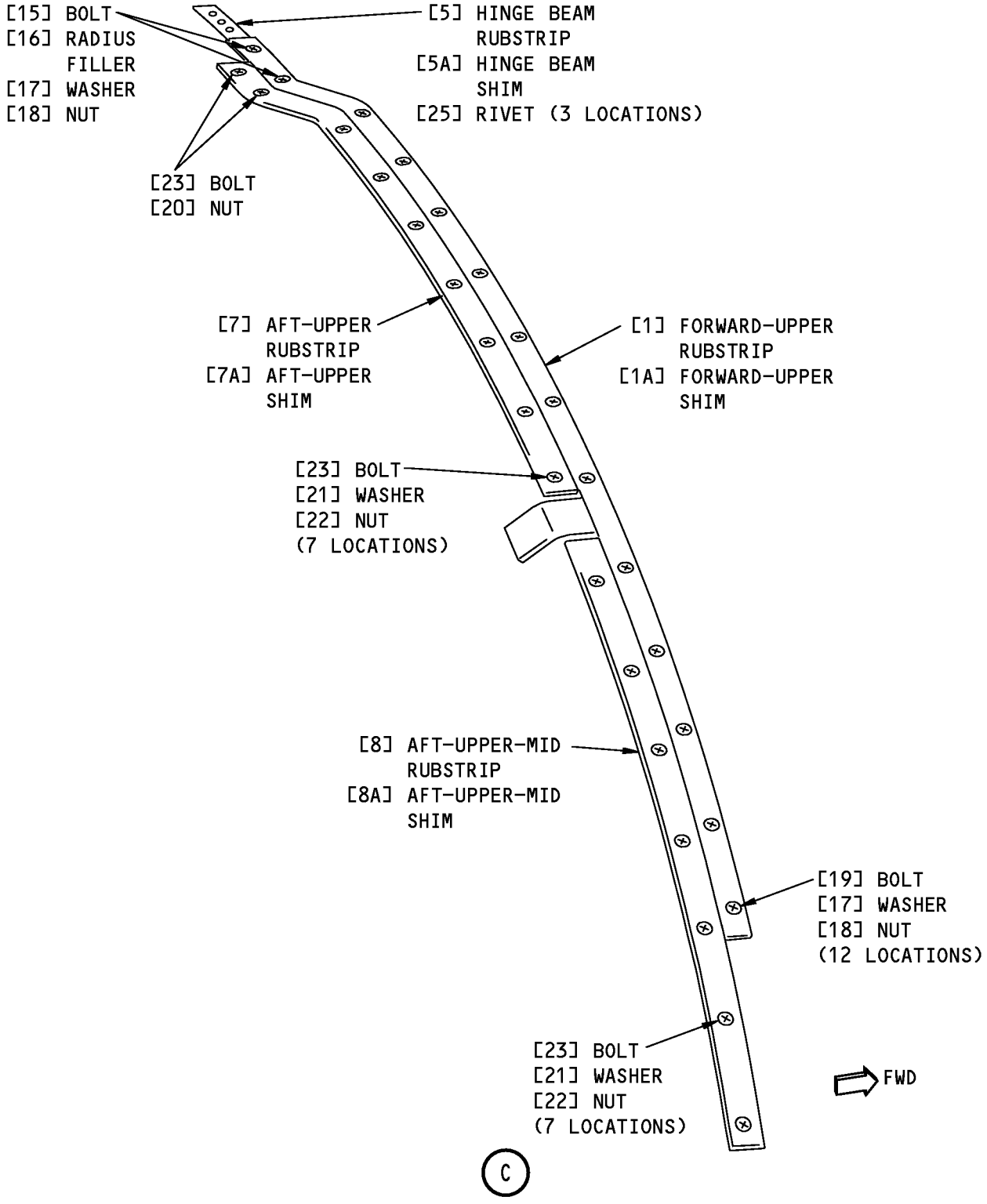
——————— END OF TASK ———————



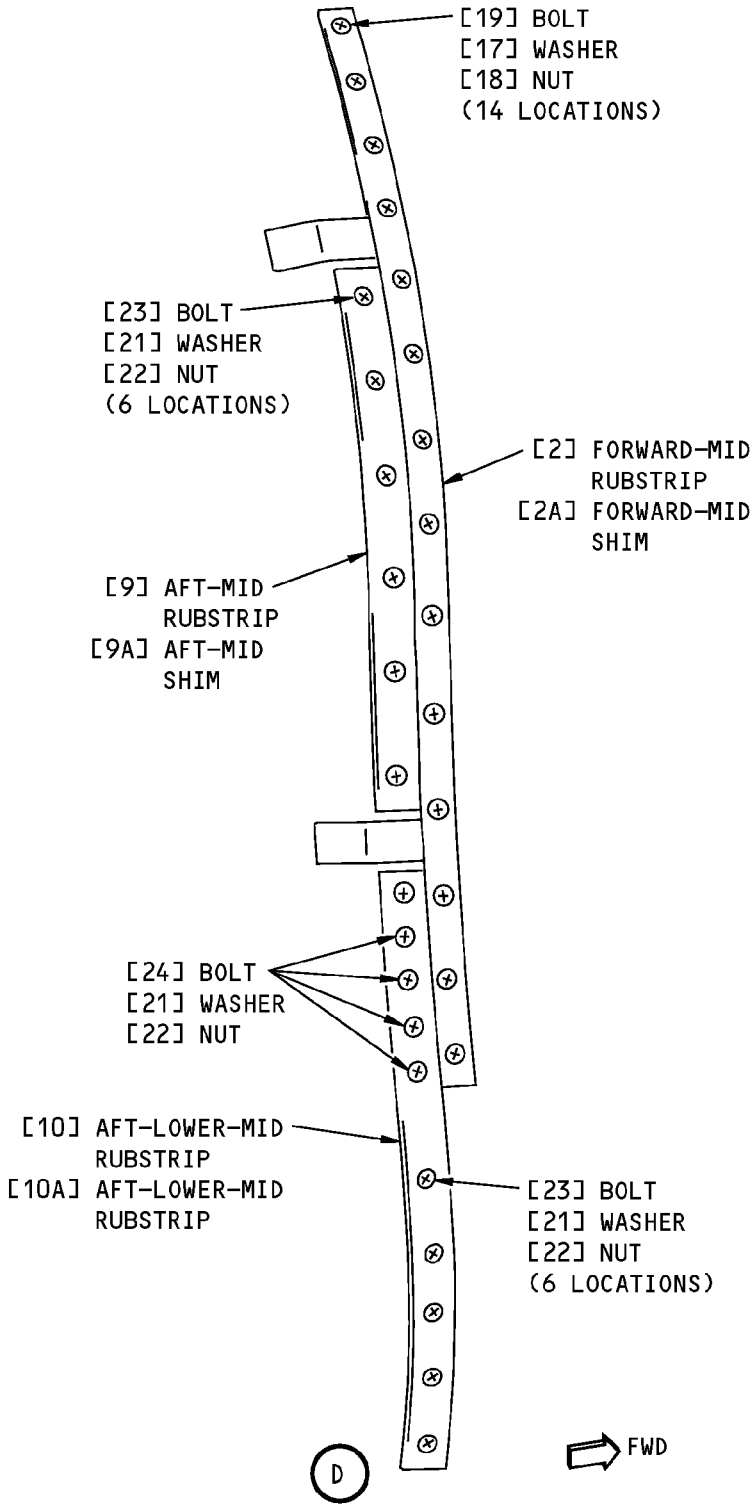
Rubstrip Installation
Figure 401 (Sheet 1 of 7)/78-31-10-990-801-F00



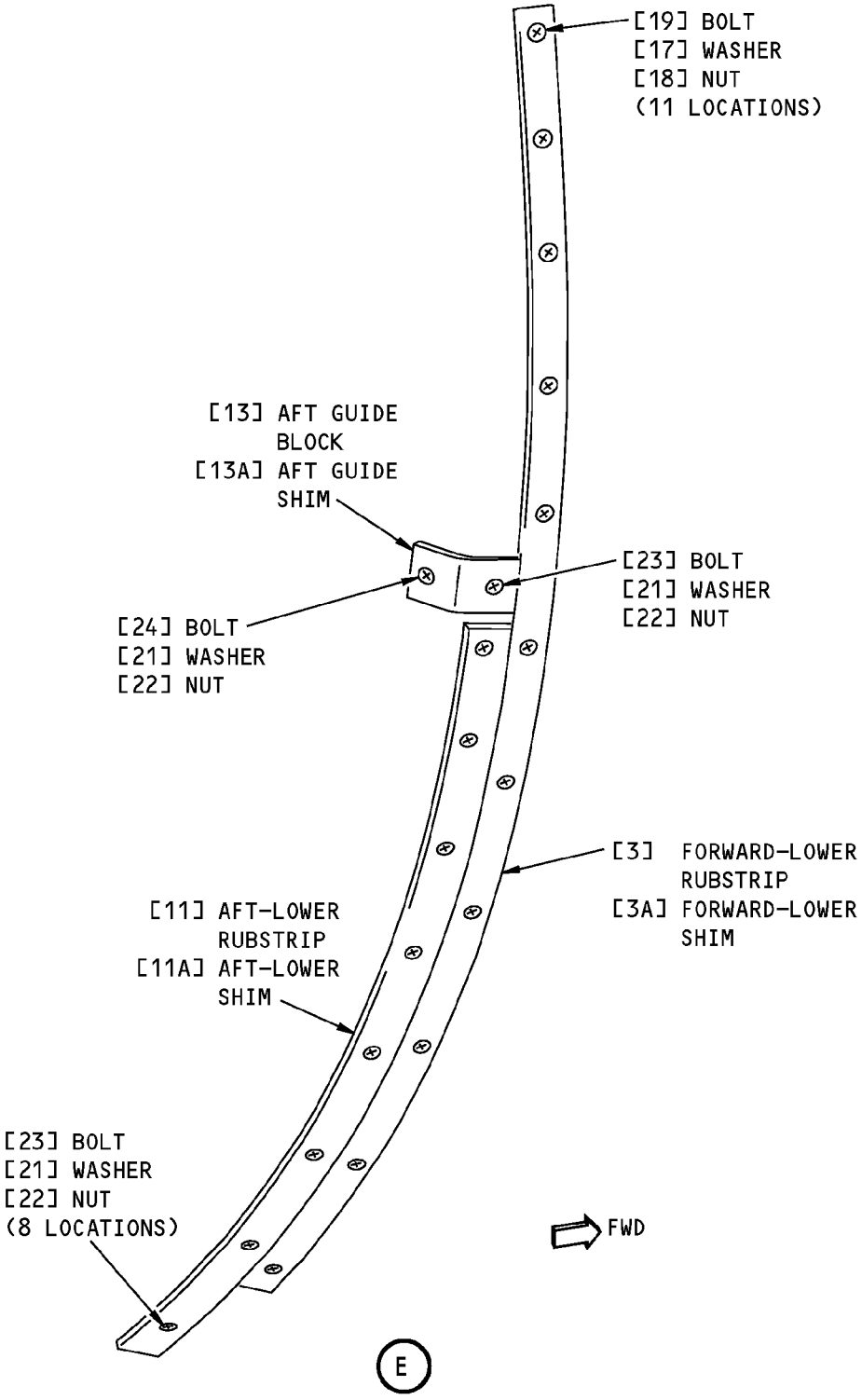
Rubstrip Installation
Figure 401 (Sheet 2 of 7)/78-31-10-990-801-F00



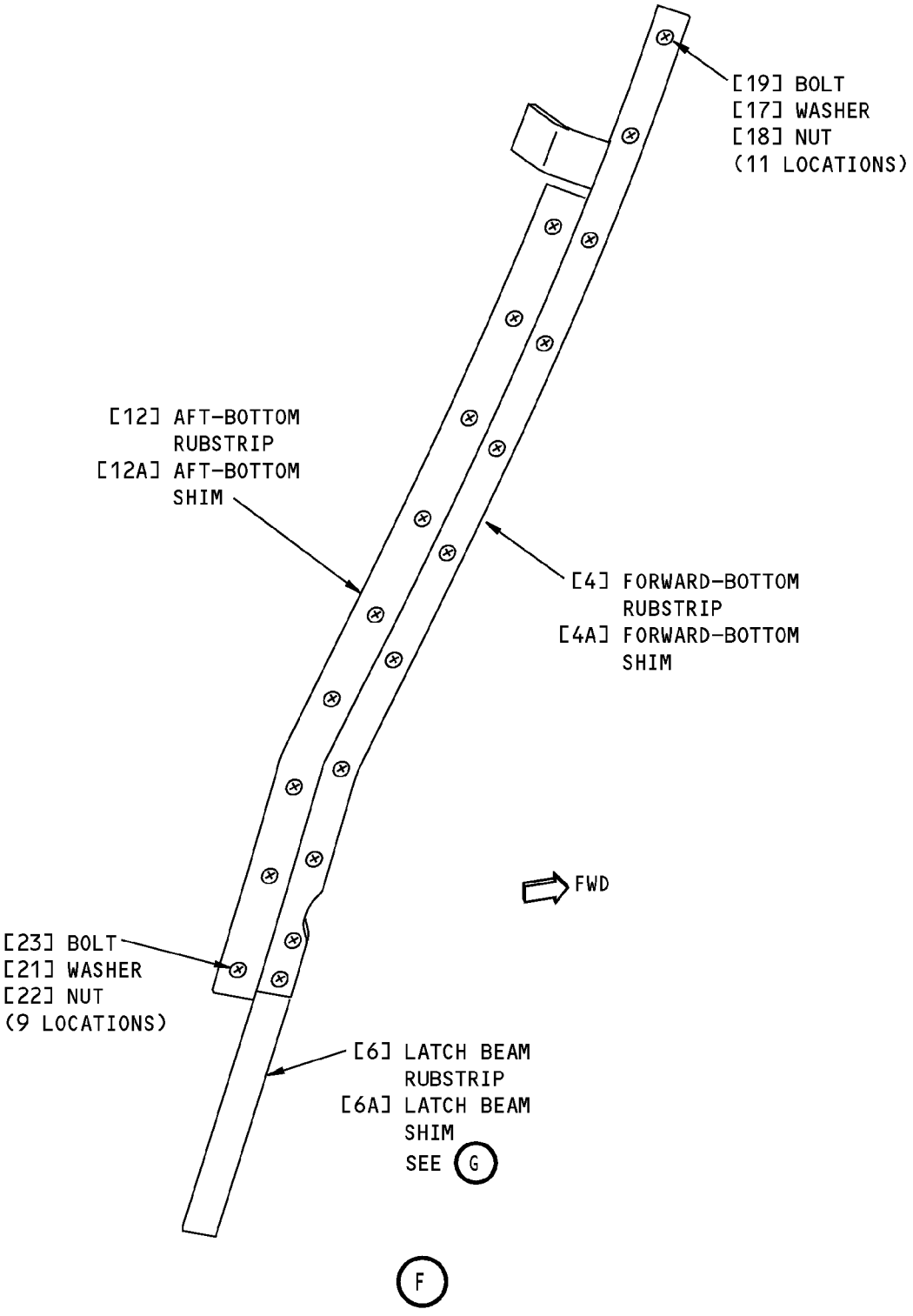
Rubstrip Installation
Figure 401 (Sheet 3 of 7)/78-31-10-990-801-F00



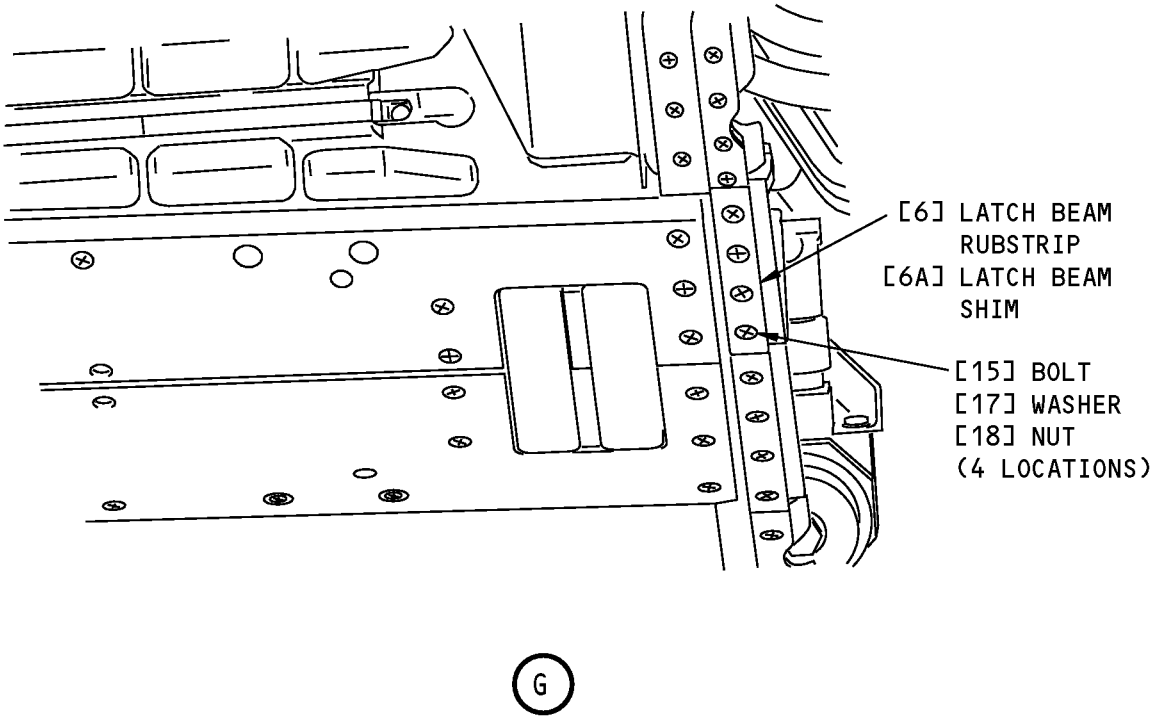
Rubstrip Installation
Figure 401 (Sheet 4 of 7)/78-31-10-990-801-F00



Rubstrip Installation
Figure 401 (Sheet 5 of 7)/78-31-10-990-801-F00



Rubstrip Installation
Figure 401 (Sheet 6 of 7)/78-31-10-990-801-F00



Rubstrip Installation
Figure 401 (Sheet 7 of 7)/78-31-10-990-801-F00

TASK 78-31-10-400-801-F00

3. Rubstrip Installation

(Figure 401)

A. General

(1) This task is for the installation of the rubstrips on the torque box on the left or right thrust reverser on an engine.

(2) The forward rubstrips interface with the fan cowl panel and the aft rubstrips interface with the thrust reverser translating sleeve.

B. References

Reference	Title
71-11-03-700-801-F00	Fan Cowl Panel Latch Adjustment (P/B 501)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-804-F00	Thrust Reverser Operation - Retract (Manual Procedure) (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Rubstrip	78-31-10-01-045	HAP ALL
1A	Shim	78-31-10-01-035	HAP ALL
		78-31-10-01-040	HAP ALL
2	Rubstrip	78-31-10-01-085	HAP ALL
2A	Shim	78-31-10-01-075	HAP ALL
3	Rubstrip	78-31-10-01-120	HAP ALL
3A	Shim	78-31-10-01-110	HAP ALL
4	Rubstrip	78-31-10-01-155	HAP ALL
4A	Shim	78-31-10-01-145	HAP ALL
5	Rubstrip	78-31-10-01-014	HAP ALL
6	Rubstrip	78-31-10-01-185	HAP ALL
6A	Shim	78-31-10-01-180	HAP ALL
7	Rubstrip	78-31-10-01-220	HAP ALL
7A	Shim	78-31-10-01-210	HAP ALL
8	Rubstrip	78-31-10-01-255	HAP ALL
8A	Shim	78-31-10-01-245	HAP ALL
9	Rubstrip	78-31-10-01-290	HAP ALL
9A	Shim	78-31-10-01-280	HAP ALL
10	Rubstrip	78-31-10-01-330	HAP ALL
10A	Shim	78-31-10-01-320	HAP ALL
11	Rubstrip	78-31-10-01-365	HAP ALL
11A	Shim	78-31-10-01-355	HAP ALL
12	Rubstrip	78-31-10-01-400	HAP ALL
12A	Shim	78-31-10-01-390	HAP ALL
13	Block	78-31-10-01-435	HAP ALL
13A	Shim	78-31-10-01-430	HAP ALL

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Installation

SUBTASK 78-31-10-420-002-F00

(1) If all of the rubstrips are removed, install the aft rubstrips and shims before you install the forward rubstrips and shims.

SUBTASK 78-31-10-420-003-F00

(2) Temporarily install the replacement aft rubstrip with the applicable shim that was removed in the removal task.

NOTE: If the original shim is used with the replacement rubstrip, there will be less adjustment to get the necessary rubstrip height dimensions.

SUBTASK 78-31-10-420-004-F00

(3) For all of the aft rubstrips, there can be 0.00-0.050 inch (0.00-1.27 mm) distance between the rubstrips.

F. Translating Sleeve to Rubstrip Dimension Check

SUBTASK 78-31-10-220-001-F00

(1) Do these steps to measure the distance between the aft rubstrips and the translating sleeve:

(a) Slowly retract the translating sleeve manually to the completely retracted position.

1) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

2) Make sure that the translating sleeve moves smoothly over the rubstrips.

3) Stop the retraction of the translating sleeve if there is interference with the rubstrips.

4) If the rubstrip interferes with the movement of the translating sleeve, do these steps:

a) Measure and mark the area on the rubstrip where it is too high.

b) Manually extend the translating sleeve to get access to the rubstrip.

<1> Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

c) Remove the aft rubstrip and shim.

d) Remove the laminations from the shim until the rubstrip is at the correct height.

e) Make sure that you do not remove too many of the lamination skins.

<1> The distance between the translating sleeve and the rubstrip must be no more that 0.0300 inch (0.7600 mm).

f) Re-install the rubstrip and shim.

g) Manually retract the translating sleeve until it is in the completely retracted position.

h) Do the above steps again if there is still interference.

(b) Use a feeler gage to measure the distance between the translating sleeve and each of the rubstrips.

NOTE: Take measurements at several locations on each rubstrip.

1) Record the measurements found at each location for each of the rubstrips.

2) The distance between the aft rubstrip and the translating sleeve must be 0.0000 to 0.0300 inch (0.0000 to 0.7600 mm).

3) If the distance is not in the limits, add a new shim or remove laminations from the original shim to get the necessary distance.

G. Aft Rubstrip Installation

(Figure 401)

SUBTASK 78-31-10-420-005-F00

(1) To install the aft-upper rubstrip [7] and shim [7A] (View C), do these steps:

(a) Align the aft-upper rubstrip [7] and shim [7A] that was removed in the removal task.

(b) Make sure the distance of the aft-upper rubstrip [7] and the translating sleeve is in the limit.

1) If the distance is not in the limits, add a new shim or remove laminations from the original shim to get the necessary distance.

(c) Install two bolts [23] and nuts [20] in the two upper locations.

(d) Install seven bolts [23], washers [21] and nuts [22] in the remaining locations.

(e) Do the Translating Sleeve to Rubstrip Dimension Check again SUBTASK 78-31-10-220-001-F00.

1) If the dimension is correct, tighten the nuts [20] and [22] to 25-35 pound-inches (2.8-3.9 Newton meters).

SUBTASK 78-31-10-420-006-F00

(2) To install the aft-upper-mid rubstrip [8] and shim [8A] (View C), do these steps:

(a) Align the aft-upper-mid rubstrip [8] and shim [8A] that was removed in the removal task.

(b) Make sure the distance of the aft-upper-mid rubstrip [8] and the translating sleeve is in the limit.

1) If the distance is not in the limits, add a new shim or remove laminations from the original shim to get the necessary distance.

(c) Install seven bolts [23], washers [21] and nuts [22].

(d) Do the Translating Sleeve to Rubstrip Dimension Check again SUBTASK 78-31-10-220-001-F00.

1) If the dimension is correct, tighten the nuts [22] to 25-35 pound-inches (2.8-3.9 Newton meters).

SUBTASK 78-31-10-420-007-F00

(3) To install the aft-mid rubstrip [9] and shim [9A] (View D), do these steps:

(a) Align the aft-mid rubstrip [9] and shim [9A] that was removed in the removal task.

(b) Make sure the distance of the aft-mid rubstrip [9] and the translating sleeve is in the limit.

1) If the distance is not in the limits, add a new shim or remove laminations from the original shim to get the necessary distance.

(c) Install six bolts [23], washers [21] and nuts [22].

(d) Do the Translating Sleeve to Rubstrip Dimension Check again SUBTASK 78-31-10-220-001-F00.

1) If the dimension is correct, tighten the nuts [22] to 25-35 pound-inches (2.8-3.9 Newton meters).

SUBTASK 78-31-10-420-008-F00

(4) To install the aft-lower-mid rubstrip [10] and shim [10A] (View D), do these steps:

(a) Align the aft-lower-mid rubstrip [10] and shim [10A] that was removed in the removal task.

(b) Make sure the distance of the aft-upper rubstrip [10] and the translating sleeve is in the limit.

1) If the distance is not in the limits, add a new shim or remove laminations from the original shim to get the necessary distance.

(c) Install six bolts [23], four bolts [24], washers [21] and nuts [22].

(d) Do the Translating Sleeve to Rubstrip Dimension Check again SUBTASK 78-31-10-220-001-F00.

1) If the dimension is correct, tighten the nuts [22] to 25-35 pound-inches (2.8-3.9 Newton meters).

SUBTASK 78-31-10-420-009-F00

(5) To install the aft-lower rubstrip [11] and shim [11A] (View E), do these steps:

(a) Align the aft-lower rubstrip [11] and shim [11A] that was removed in the removal task.

(b) Make sure the distance of the aft-upper rubstrip [11] and the translating sleeve is in the limit.

1) If the distance is not in the limits, add a new shim or remove laminations from the original shim to get the necessary distance.

(c) Install eight bolts [23], washers [21] and nuts [22].

(d) Do the Translating Sleeve to Rubstrip Dimension Check again SUBTASK 78-31-10-220-001-F00.

1) If the dimension is correct, tighten the nuts [22] to 25-35 pound-inches (2.8-3.9 Newton meters).

SUBTASK 78-31-10-420-010-F00

(6) To install the aft-bottom rubstrip [12] and shim [12A] (View F), do these steps:

(a) Align the aft-bottom rubstrip [12] and shim [12A] that was removed in the removal task.

(b) Make sure the distance of the aft-upper rubstrip [12] and the translating sleeve is in the limit.

1) If the distance is not in the limits, add a new shim or remove laminations from the original shim to get the necessary distance.

(c) Install nine bolts [23], washers [21] and nuts [22].

(d) Do the Translating Sleeve to Rubstrip Dimension Check again SUBTASK 78-31-10-220-001-F00.

1) If the dimension is correct, tighten the nuts [22] to 25-35 pound-inches (2.8-3.9 Newton meters).

SUBTASK 78-31-10-420-011-F00

(7) To install the aft guide block [13] and shim [13A] (View E), do these steps:

NOTE: There are five aft guide blocks on the torque box on the left and right thrust reverser on an engine.

(a) Align the aft guide block [13] and shim [13A] that was removed in the removal task.

1) If the distance between the aft guide block and the adjacent rubstrips is not 0.00-0.050 inch (0.00-1.27 mm), cut the aft guide block to get the correct dimension.

(b) Measure the distance between the height of the aft guide block and the height of the adjacent aft rubstrips.

(c) Make sure that the height of the aft guide block is 0.0000 to 0.0200 inch (0.0 to 0.5 mm) below the adjacent aft rubstrips.

1) If the dimension is not correct, add shim or remove the lamination skins from the shim to get the correct dimension.

NOTE: A shim must be installed under the aft guide block.

(d) Install one bolt [23], one bolt [24], washers [21] and nuts [22].

1) Tighten the nuts [22] to 25-35 pound-inches (2.8-3.9 Newton meters).

(e) Slowly retract the translating sleeve manually to the completely retracted position.

1) Do this task: Thrust Reverser Operation - Retract (Manual Procedure), TASK 78-31-00-980-804-F00.

2) Make sure that the translating sleeve moves smoothly over the aft guide blocks.

3) Stop the retraction of the translating sleeve if there is interference with the aft guide blocks or rubstrips.

(f) If there is interference, do the Translating Sleeve to Rubstrip Dimension Check again SUBTASK 78-31-10-220-001-F00.

H. Forward Rubstrip Installation

(Figure 401)

SUBTASK 78-31-10-420-012-F00

(1) For all of the rubstrips, there can be 0.00-0.050 inch (0.00-1.27 mm) distance between the rubstrips.

SUBTASK 78-31-10-020-015-F00

(2) To install the forward-upper rubstrip [1] and shim [1A] (View C), do these steps:

(a) Align the forward-upper rubstrip [1] and shim [1A] that was removed in the removal task.

(b) Install two bolts [15], radius fillers [16], washers [17] and nuts [18] in the two upper locations.

(c) Install 12 bolts [19], washers [17] and nuts [18] in the remaining locations.

1) Tighten the nuts [18] to 15-25 pound-inches (1.7-2.8 Newton meters).

SUBTASK 78-31-10-020-016-F00

(3) To install the forward-mid rubstrip [2] and shim [2A] (View D), do these steps:

(a) Align the forward-mid rubstrip [2] and shim [2A] that was removed in the removal task.

(b) Install the 14 bolts [19], washers [17] and nuts [18].

1) Tighten the nuts [18] to 15-25 pound-inches (1.7-2.8 Newton meters).

SUBTASK 78-31-10-020-017-F00

(4) To install the forward-lower rubstrip [3] and shim [3A] (View E), do these steps:

(a) Align the forward-lower rubstrip [3] and shim [3A] that was removed in the removal task.

(b) Install 11 bolts [19], washers [17] and nuts [18].

1) Tighten the nuts [18] to 15-25 pound-inches (1.7-2.8 Newton meters).

SUBTASK 78-31-10-020-018-F00

(5) To install the forward-bottom rubstrip [4] and shim [4A] (View F), do these steps:

(a) Align the forward-bottom rubstrip [4] and shim [4A] that was removed in the removal task.

(b) Install the 11 bolts [19], washers [17] and nuts [18].

1) Tighten the nuts [18] to 15-25 pound-inches (1.7-2.8 Newton meters).

SUBTASK 78-31-10-020-019-F00

(6) Install the hinge beam rubstrip [5] and shim [5A].

(a) Use shim [5A] if necessary, 0.032 inch (0.813 millimeter) maximum to keep rubstrip [5] between 0.000-0.020 inch (0.000-0.508 millimeter) below the adjacent rubstrip.

(b) Install the rubstrip with the shim under the rubstrip with three rivets [25].

NOTE: The 100 degree shear head rivets, are BACR15CE4M. Use the standard overhaul practices to install the rivets.

1) Determine the size of the rivet to use on the installation.

SUBTASK 78-31-10-020-020-F00

(7) To install the latch beam rubstrip [6] and shim [6A] (View G), do these steps:

(a) Align the latch beam rubstrip [6] and shim [6A] that was removed in the removal task.

(b) Install four bolts [15], washers [17] and nuts [18].

1) Tighten the nuts [18] to 15-25 pound-inches (1.7-2.8 Newton meters).

SUBTASK 78-31-10-820-002-F00

(8) Do this task: Fan Cowl Panel Latch Adjustment, TASK 71-11-03-700-801-F00.

I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-10-440-001-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

END OF TASK

TENSION LATCHES - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser tension latches.

(2) The installation of the thrust reverser tension latches.

TASK 78-31-11-000-801-F00

2. Tension Latch Removal

(Figure 401)

A. General

(1) This task is for the removal of the tension latches from the thrust reverser.

(2) For this task a tension latch will be referred to as a latch.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Removal

SUBTASK 78-31-11-010-001-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGES, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSERS (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Latch Removal

SUBTASK 78-31-11-020-001-F00

(1) Do these steps to remove the applicable latch [1]:

(a) Remove the cotter pin [16] and nut [15].

(b) Use a knife to break the bond of the sealant, that is around the washers, from the attach fitting.

NOTE: After you break the bond of the sealant from the attach fitting, the sealant will come off with the washers.

(c) Remove the washer [14] and washers [11], [12] or [13].

NOTE: There can be one or more washers [11], [12] or [13] at each bolt location. Keep the washers with the applicable bolt at its position for the subsequent installation.

1) To remove latch 1 and latch 2, remove bolt [5].

NOTE: Latch 1 and latch 2 are held in their positions with one bolt. The bolt connects the two latches to the attach fitting.

2) To remove latch 3, remove bolt [4].

3) To remove latch 4, remove bolt [3].

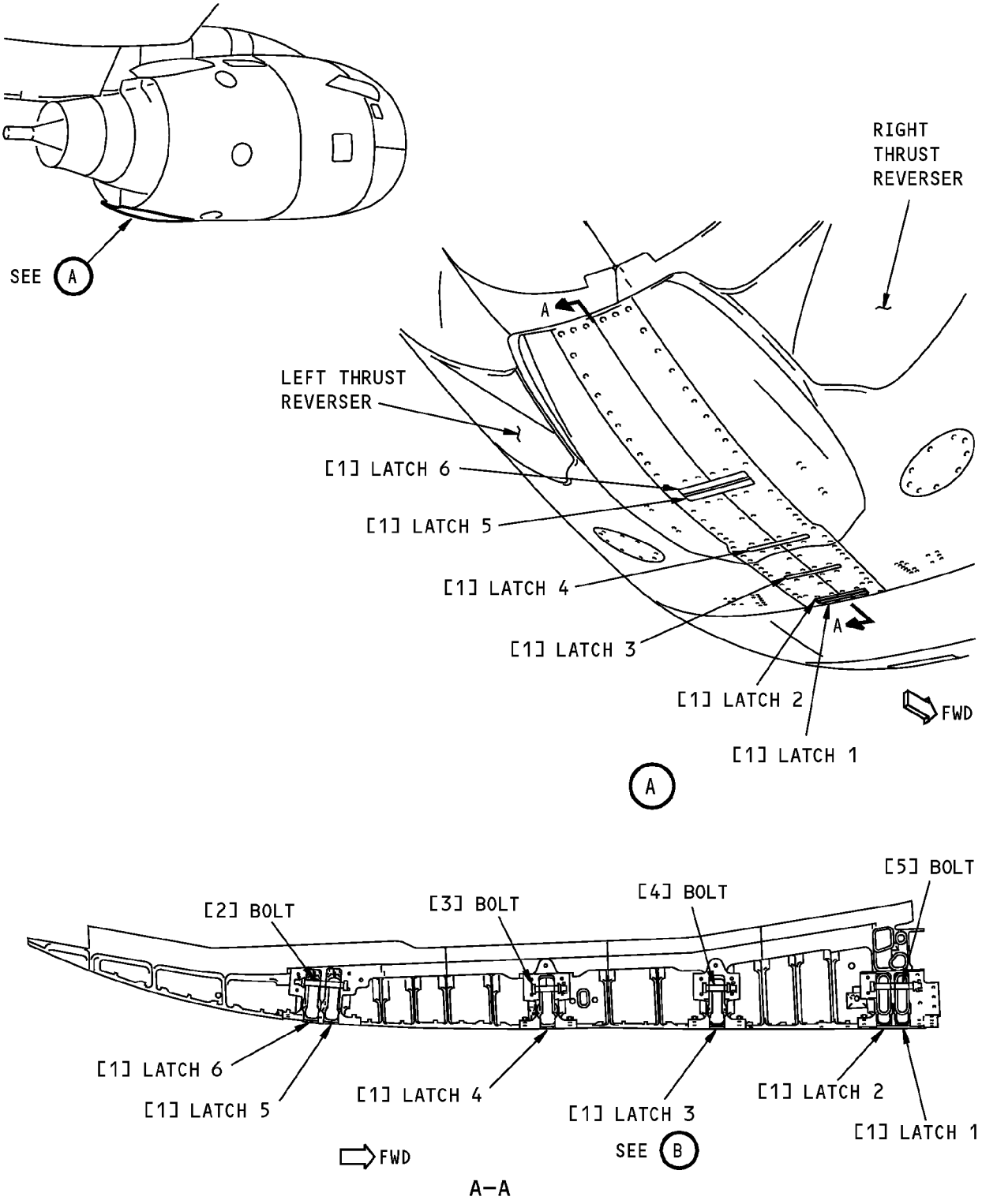
4) To remove latch 5 and latch 6, remove bolt [2].

NOTE: Latch 5 and latch 6 are held in their positions with one bolt. The bolt connects the two latches to the attach fitting.

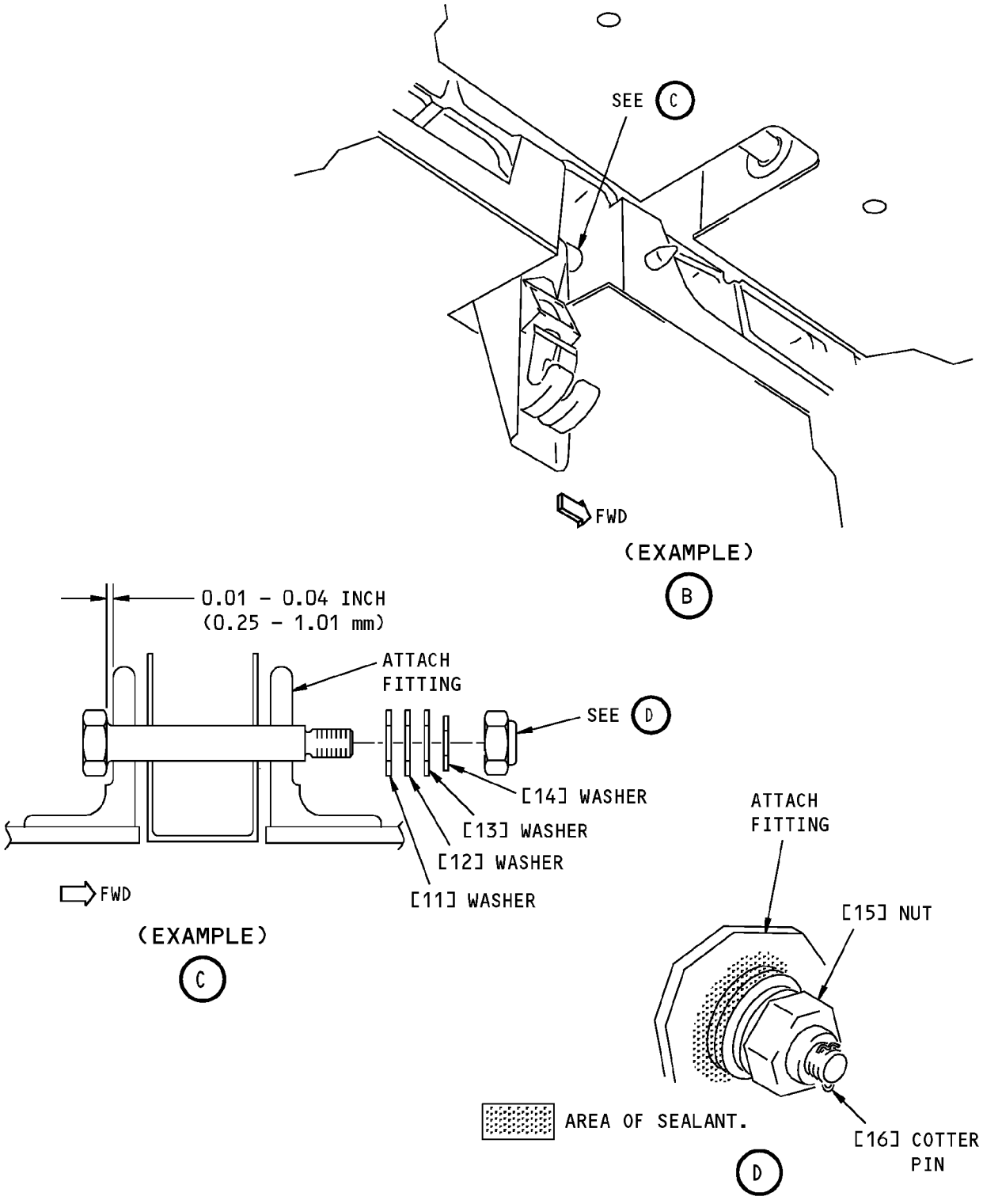
(d) Remove the latch [1].

(e) Remove all of the remaining sealant from the fitting assembly and the washers with solvent, B00062.

——————— END OF TASK ———————



Thrust Reverser Tension Latch Installation
Figure 401 (Sheet 1 of 2)/78-31-11-990-801-F00



Thrust Reverser Tension Latch Installation
Figure 401 (Sheet 2 of 2)/78-31-11-990-801-F00

TASK 78-31-11-400-801-F00

3. Tension Latch Installation

(Figure 401)

A. General

(1) This task is for the installation of the tension latches on the thrust reverser.

B. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-11-820-801-F00	Latch Adjustment (P/B 501)

C. Consumable Materials

Reference	Description	Specification
A00436	Sealant - Fuel Tank	BMS5-45 (Supersedes BMS 5-26)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Latch Installation

SUBTASK 78-31-11-420-001-F00

(1) Do these steps to install the applicable latch [1]:

(a) Install the latch [1] in the attach fitting.

NOTE: The latches are installed with different length bolts. Make sure that you use the correct bolt with the applicable latch or latches.

1) For latch 1 and latch 2, install bolt [5]:

NOTE: Latch 1 and latch 2 are held in their positions with one bolt. The bolt connects the two latches to the attach fitting.

2) For latch 3, install bolt [4].

3) For latch 4, install bolt [3].

4) For latch 5 and latch 6, install bolt [2].

NOTE: Latch 5 and latch 6 are held in their positions with one bolt. The bolt connects the two latches to the attach fitting.

(b) Install the washers [11], [12] or [13] that were removed in the removal task.

(c) Install the washer [14] and nut [15].

1) Hand tighten the nut only.

(d) Measure the distance between the bolt head and the attach fitting (View C) to make sure that the bolt has the correct axial movement.

1) When you measure the distance, move the bolt until the nut holds the washers against the attach fitting.

2) If the dimension is not 0.01-0.04 inch (0.25-1.01 mm), add or remove the applicable washers [11], [12] or [13].

NOTE: The thickness of washer [11] is 0.016 inch, [12] is 0.032 inch and [13] is 0.063 inch.

(e) Tighten the nut [15] to 60-90 pound-inches (6.8-10.2 Newton meters).

(f) Install the cotter pin [16].

1) Bend the ends of the cotter pin [16] around the bolt.

(g) Apply sealant, A00436, around the washers and on the attach fitting.

NOTE: The sealant is used to stop the movement of the washers.

SUBTASK 78-31-11-410-001-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 78-31-11-820-001-F00

(3) Adjust the latches, do this task: Latch Adjustment, TASK 78-31-11-820-801-F00.

END OF TASK

TENSION LATCH - ADJUSTMENT/TEST

1. General

A. This procedure has one task:

(1) The adjustment of the thrust reverser tension latch.

TASK 78-31-11-820-801-F00

2. Latch Adjustment

(Figure 501)

A. General

(1) This procedure is for the adjustment of the thrust reverser tension latches.

(2) The thrust reverser tension latches are at the bottom centerline of the thrust reverser.

(3) For this procedure the thrust reverser tension latch will be called the latch.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1184	Scale - Spring, 0-100 Lbs, Tension

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Adjustment

SUBTASK 78-31-11-040-001-F00

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

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

F. Latch Adjustment

SUBTASK 78-31-11-820-002-F00

(1) Do these steps to adjust the latches:

CAUTION: DO NOT USE MORE THAN 100 POUNDS FORCE ON THE LATCH HANDLE. TOO MUCH FORCE CAN CAUSE DAMAGE TO THE LATCH OR THE LATCH HANDLE.

(a) Apply a 40-60 pounds (178-267 Newtons) of force with a spring scale (0-100 Lbs), STD-1184 on the end of the latch handle to close it.

(b) Make sure the scale force is measured between 0.25-1.00 inch from the end of the handle.

(c) If the force is not in the limits, do these steps:

1) Disengage the latch.
2) Insert a flat head screw driver in the screw driver keyway in the latch housing.
   a) Turn the rachet wheel clockwise to increase the latch tension.
   b) Turn the rachet wheel counterclockwise to decrease the latch tension.
3) Do the above steps again until the latch tension is in the limits.

(d) Adjust the latch tension for the remaining latches.

NOTE: As you do the adjustment on each latch, make sure that the remaining latches are engaged.

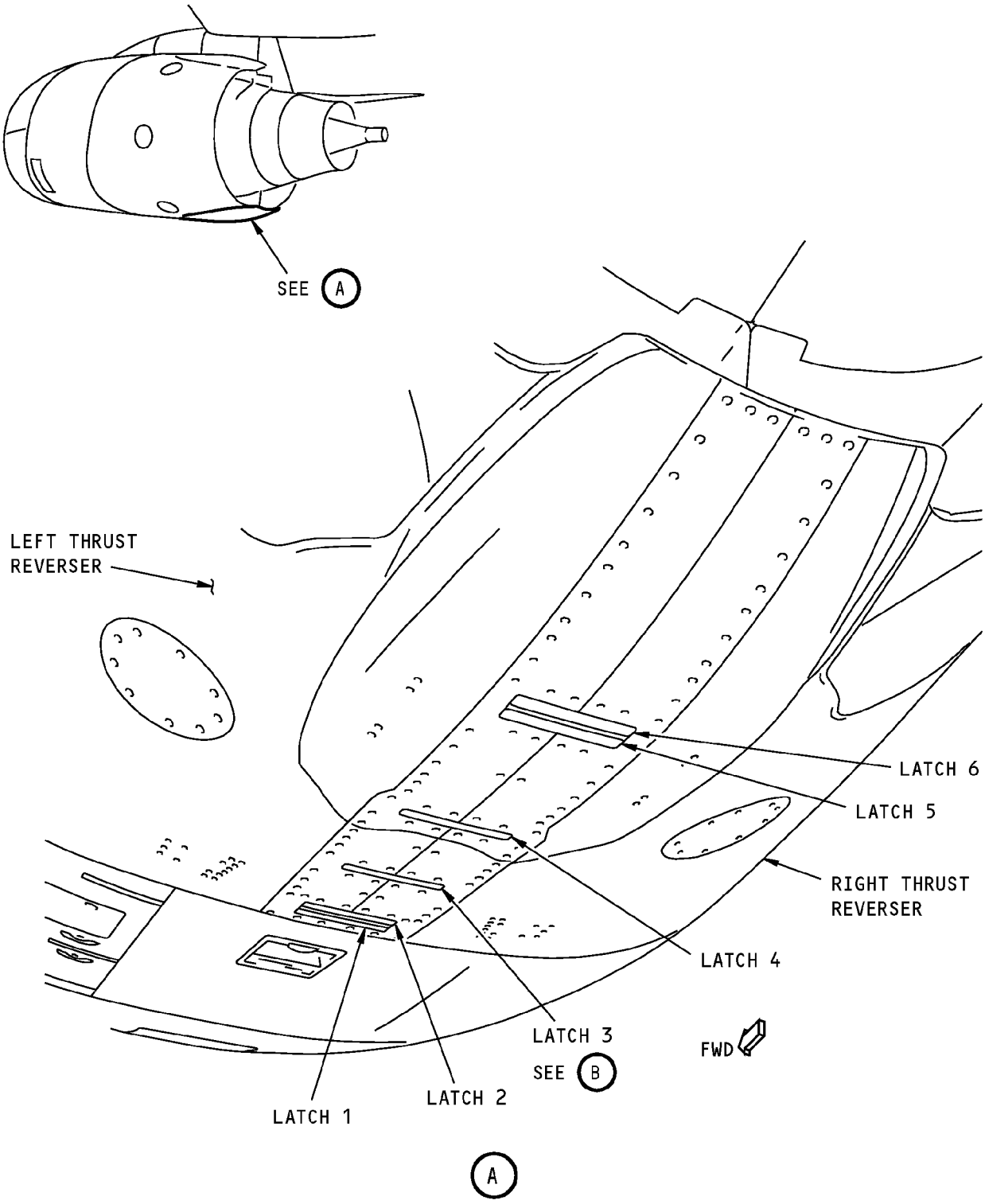
SUBTASK 78-31-11-820-003-F00

(2) After all of the latches are adjusted, do a check of all of the latches again to make sure that the tension for each latch is still in the limits.

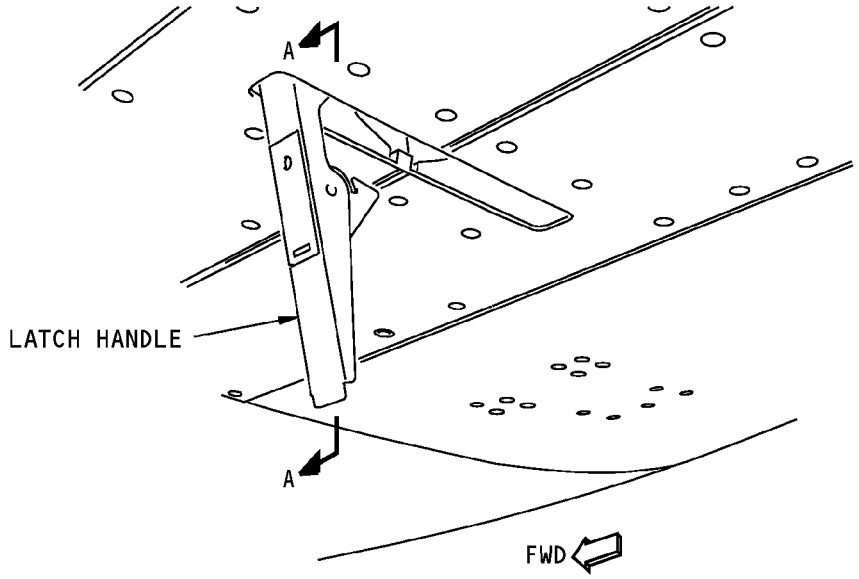
SUBTASK 78-31-11-440-001-F00

(3) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

——————— END OF TASK ———————

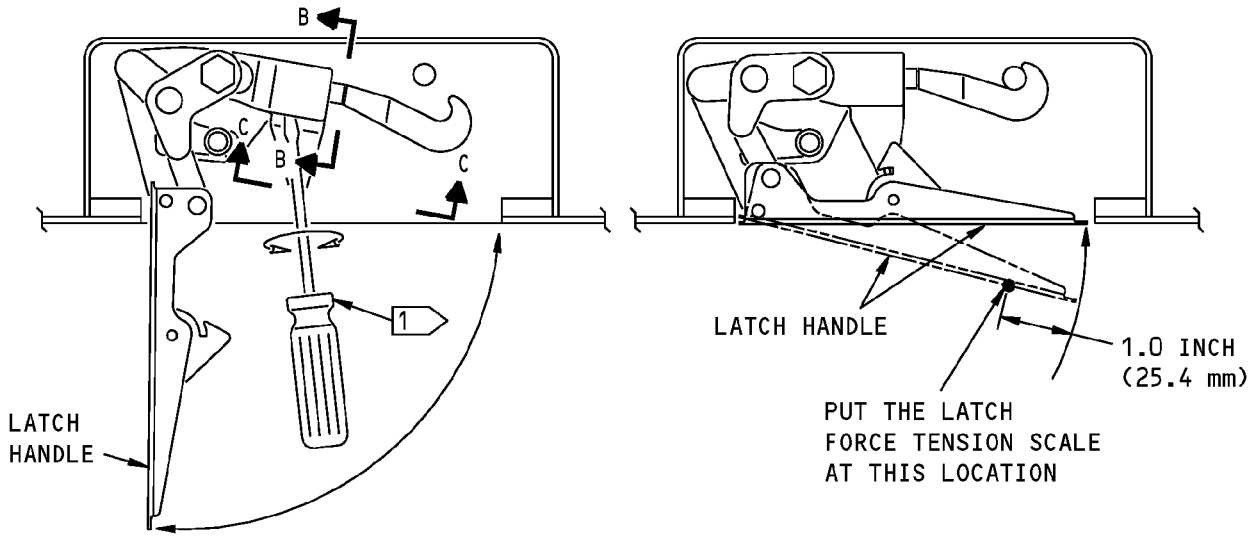


Tension Latch Adjustment
Figure 501 (Sheet 1 of 3)/78-31-11-990-802-F00



LATCH
(EXAMPLE)

B

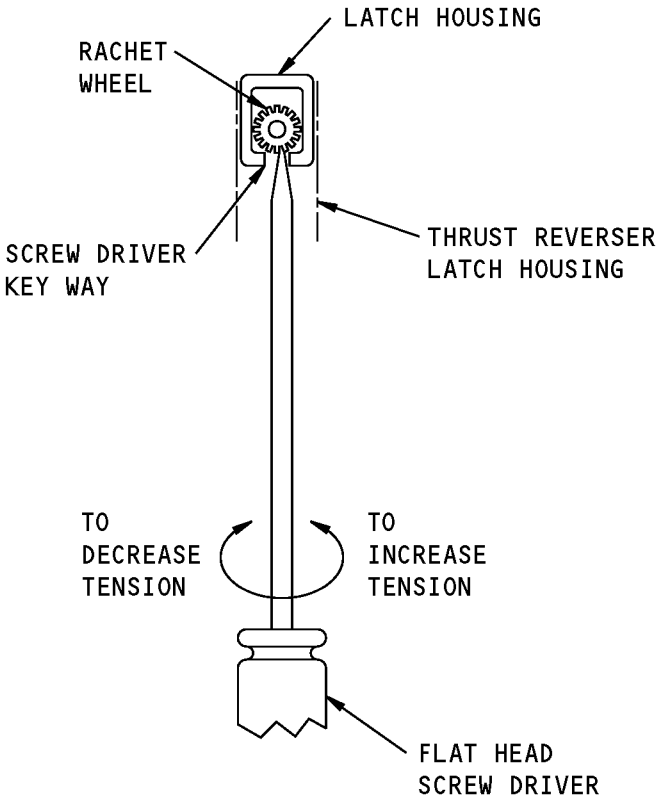


LATCH DISENGAGED LATCH ENGAGED

(VIEW IN THE FORWARD DIRECTION)
A–A

1 TURN CLOCKWISE TO DECREASE TENSION,
TURN COUNTERCLOCKWISE TO INCREASE TENSION.

Tension Latch Adjustment
Figure 501 (Sheet 2 of 3)/78-31-11-990-802-F00



Tension Latch Adjustment
Figure 501 (Sheet 3 of 3)/78-31-11-990-802-F00

FIRESEAL - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks:

(1) The removal of the thrust reverser fireseal.

(2) The installation of the thrust reverser fireseal.

TASK 78-31-12-000-801-F00

2. Fireseal Removal

(Figure 401), (Figure 402), (Figure 403)

A. General

(1) This task is for the removal of the fireseal from the left or right thrust reverser on an engine.

(2) It is important that all sealants are applied correctly. The incorrect application of sealants can decrease the fire protection.

(3) For this task the lower fireseal/aero block seal will be referred to as the block seal.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-12-010-003-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Left Thrust Reverser Fireseal Removal

SUBTASK 78-31-12-020-001-F00

(1) Do these steps to remove the upper fireseal [1] from the left thrust reverser:

(a) Remove all of the sealant that bonds the upper fireseal [1] to the fireseal retainer [3].

NOTE: If the fireseal is to be used again, use care when you remove the sealant to prevent damage to the fireseal.

(b) Carefully remove the sealant from the upper and lower fireseal joint (View A-A).

(c) Remove the upper fireseal [1].

NOTE: If the fireseal is to be used again, use care when you remove the fireseal from the fireseal retainer to prevent damage to the foot of the fireseal.

SUBTASK 78-31-12-020-002-F00

(2) Do these steps to remove the lower fireseal [2] from the left thrust reverser:

(a) Remove all of the sealant that bonds the lower fireseal [2] to the fireseal retainer [3].

NOTE: If the fireseal is to be used again, use care when you remove the sealant to prevent damage to the fireseal.

(b) Carefully remove the sealant from the upper and lower fireseal joint (View A-A).

(c) Do these steps to remove the block seal [4] (View D):

1) Carefully remove the sealant from the area where the block seal [4] is inserted into the lower fireseal [2].

2) Carefully remove the sealant from the block seal joint (View C).

3) Slide the block seal out of the blockseal retainer.

(d) Remove the lower fireseal [2].

NOTE: If the fireseal is to be used again, use care when you remove the fireseal from the fireseal retainer to prevent damage to the foot of the fireseal.

F. Right Thrust Reverser Fireseal Removal

SUBTASK 78-31-12-020-003-F00

(1) Do these steps to remove the upper fireseal [21] from the right thrust reverser:

(a) Remove the sealant that bonds the upper fireseal [21] to the fireseal retainer [23].

NOTE: If the fireseal is to be used again, use care when you remove the sealant to prevent damage to the fireseal.

(b) Carefully remove the sealant from the upper and lower fireseal joint (View A-A).

(c) Remove the upper fireseal [21].

NOTE: If the fireseal is to be used again, use care when you remove the fireseal from the fireseal retainer to prevent damage to the foot of the fireseal.

SUBTASK 78-31-12-020-004-F00

(2) Do these steps to remove the lower fireseal [22] from the right thrust reverser:

(a) Remove the sealant that bonds the lower fireseal [22] to the fireseal retainer [23].

NOTE: If the fireseal is to be used again, use care when you remove the sealant to prevent damage to the fireseal.

(b) Carefully remove the sealant at the upper and lower fireseal joint (View A-A).

(c) Do these steps to remove the block seal [24] (View D):

1) Carefully remove the sealant from the area where the block seal [24] is inserted into the lower fireseal.

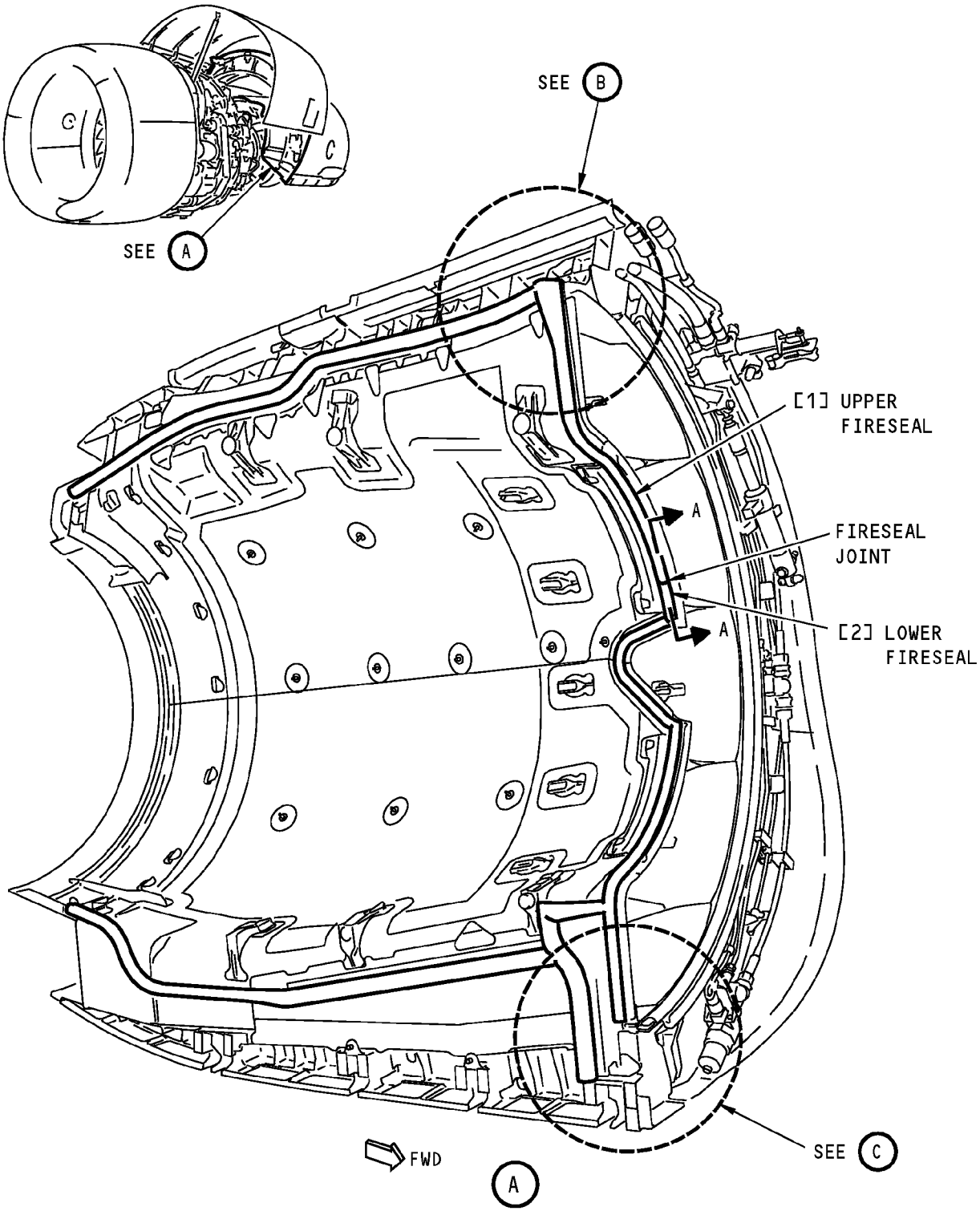
2) Carefully remove the sealant from the block seal joint (View C).

3) Slide the block seal out of the block seal retainer.

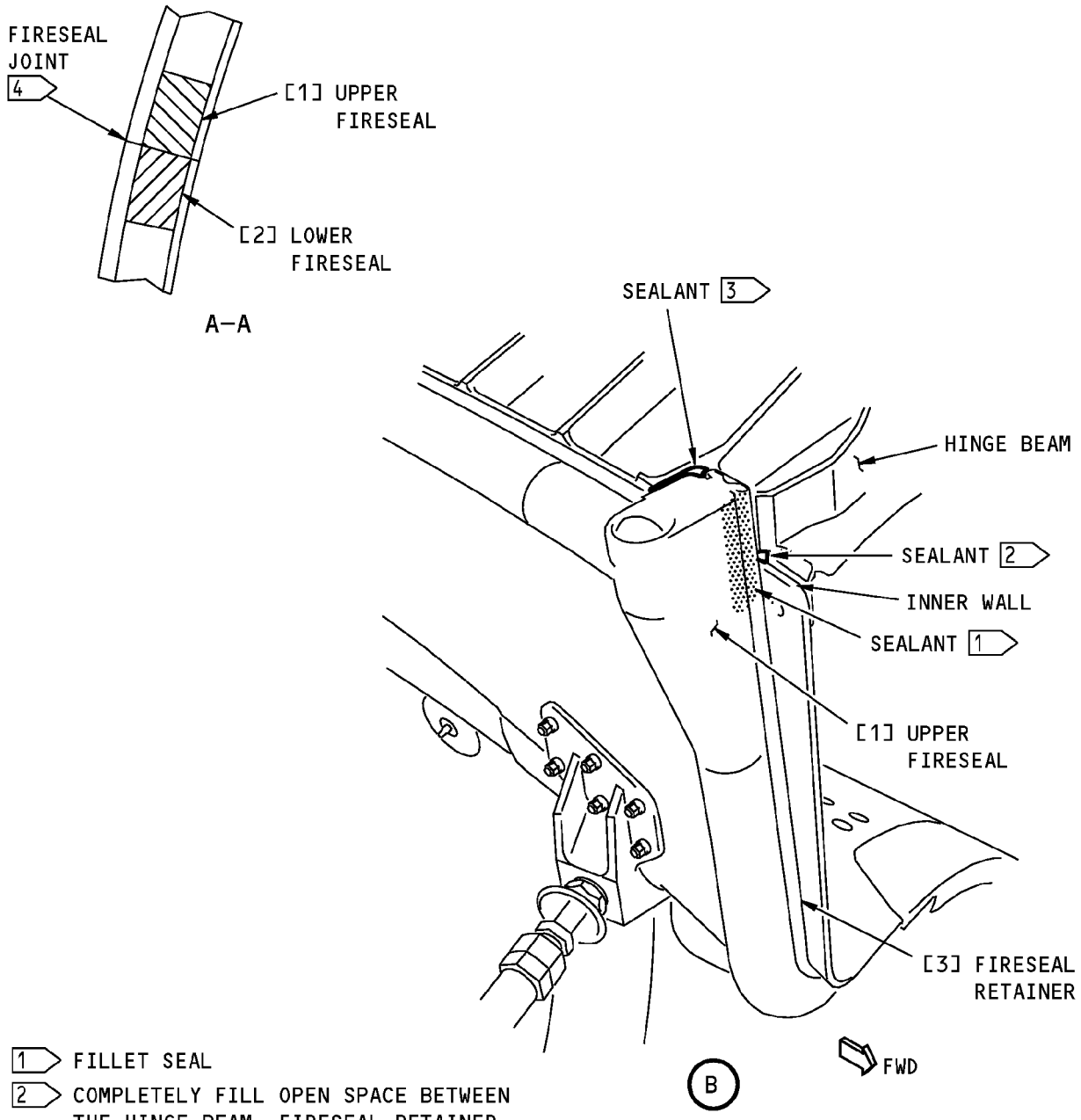
(d) Remove the lower fireseal [22].

NOTE: If the fireseal is to be used again, use care when you remove the fireseal from the fireseal retainer to prevent damage to the foot of the fireseal.

——————— END OF TASK ———————



Left Side Thrust Reverser Fireseal Installation
Figure 401 (Sheet 1 of 3)/78-31-12-990-802-F00



1 FILLET SEAL

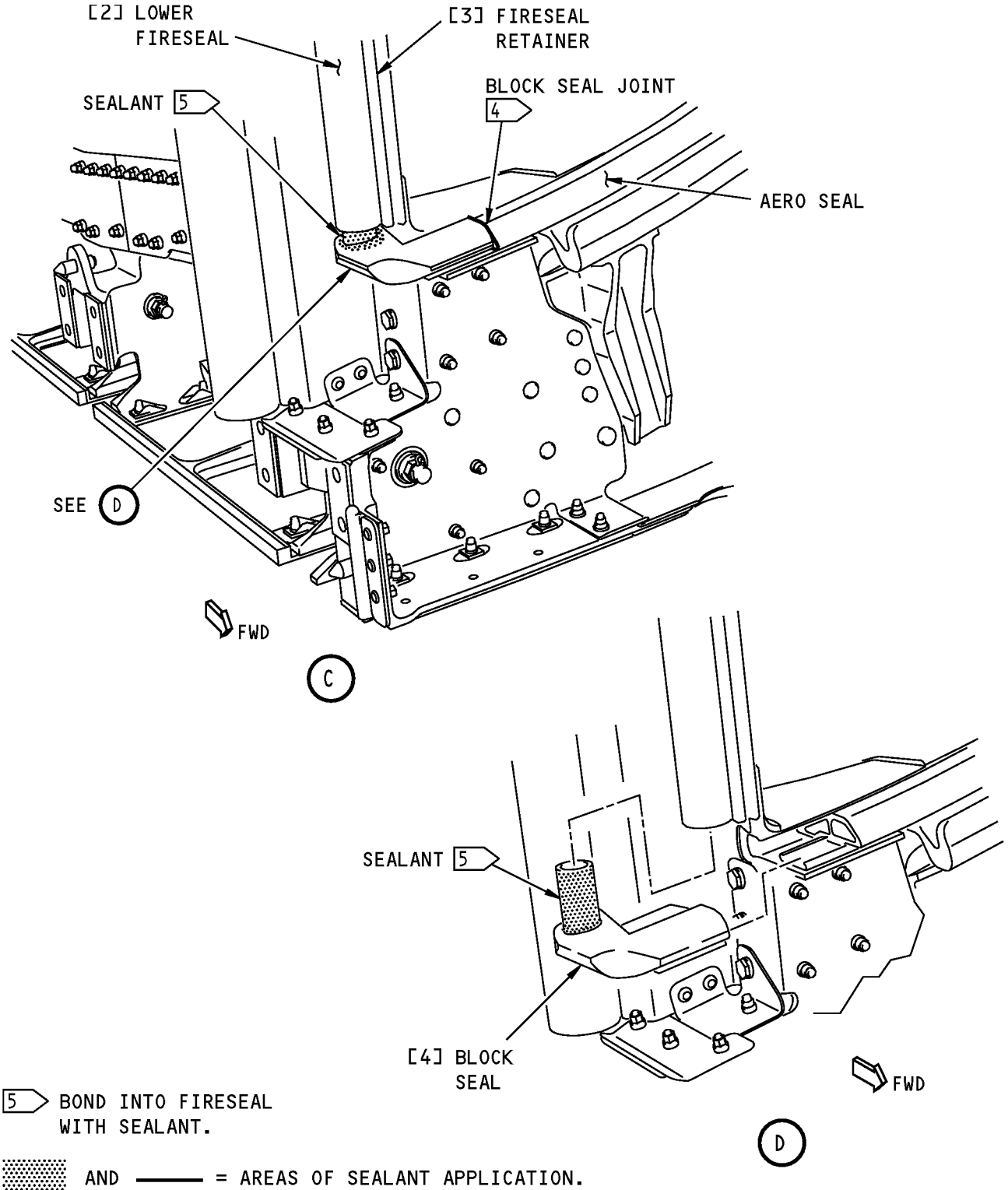
2 COMPLETELY FILL OPEN SPACE BETWEEN THE HINGE BEAM, FIRESEAL RETAINER AND INNER WALL.

3 COMPLETELY FILL OPEN SPACE BETWEEN THE UPPER FIRESEAL AND HINGE BEAM.

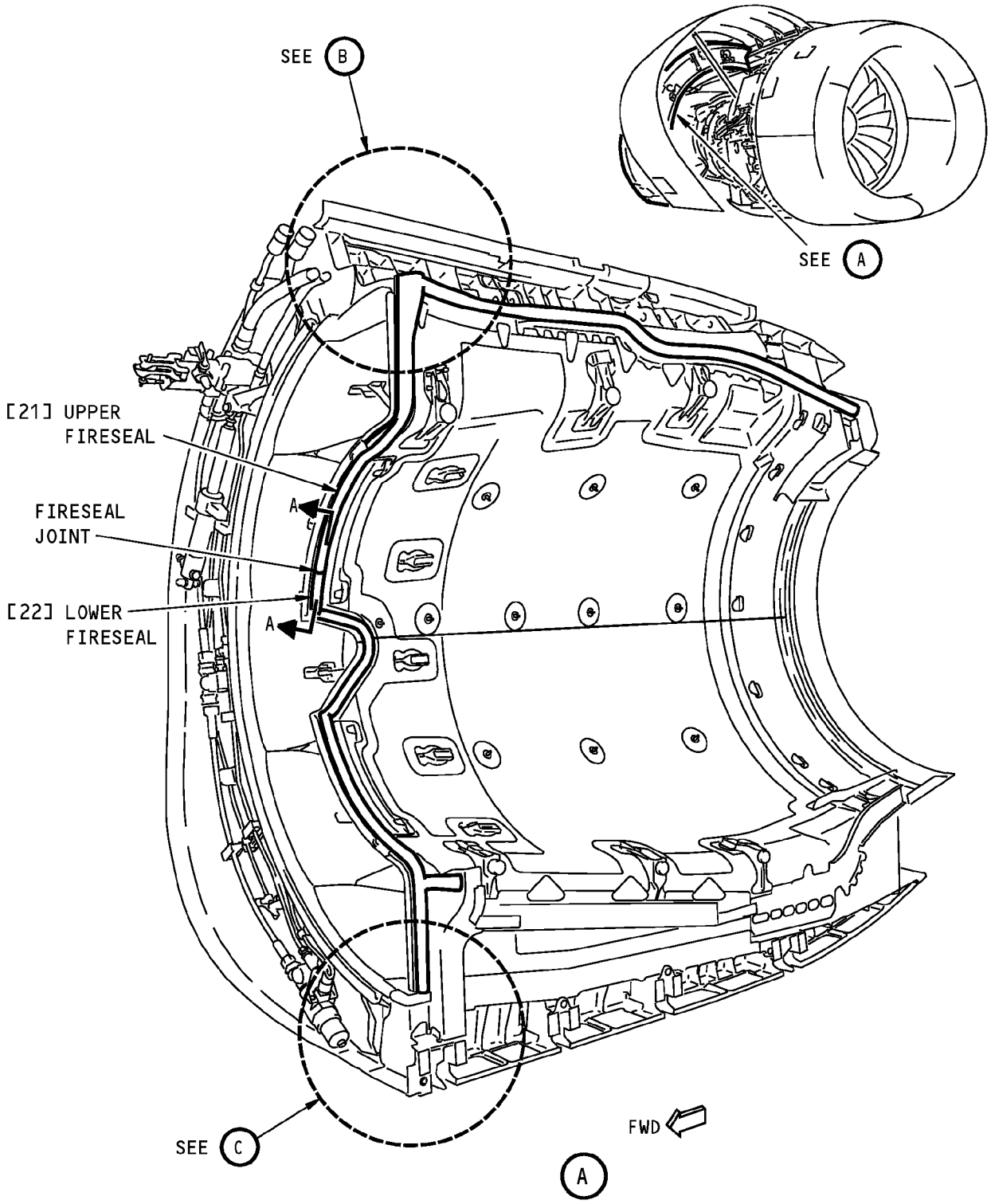
4 FILL THE JOINT WITH SEALANT

AND ——— = AREAS OF SEALANT APPLICATION.

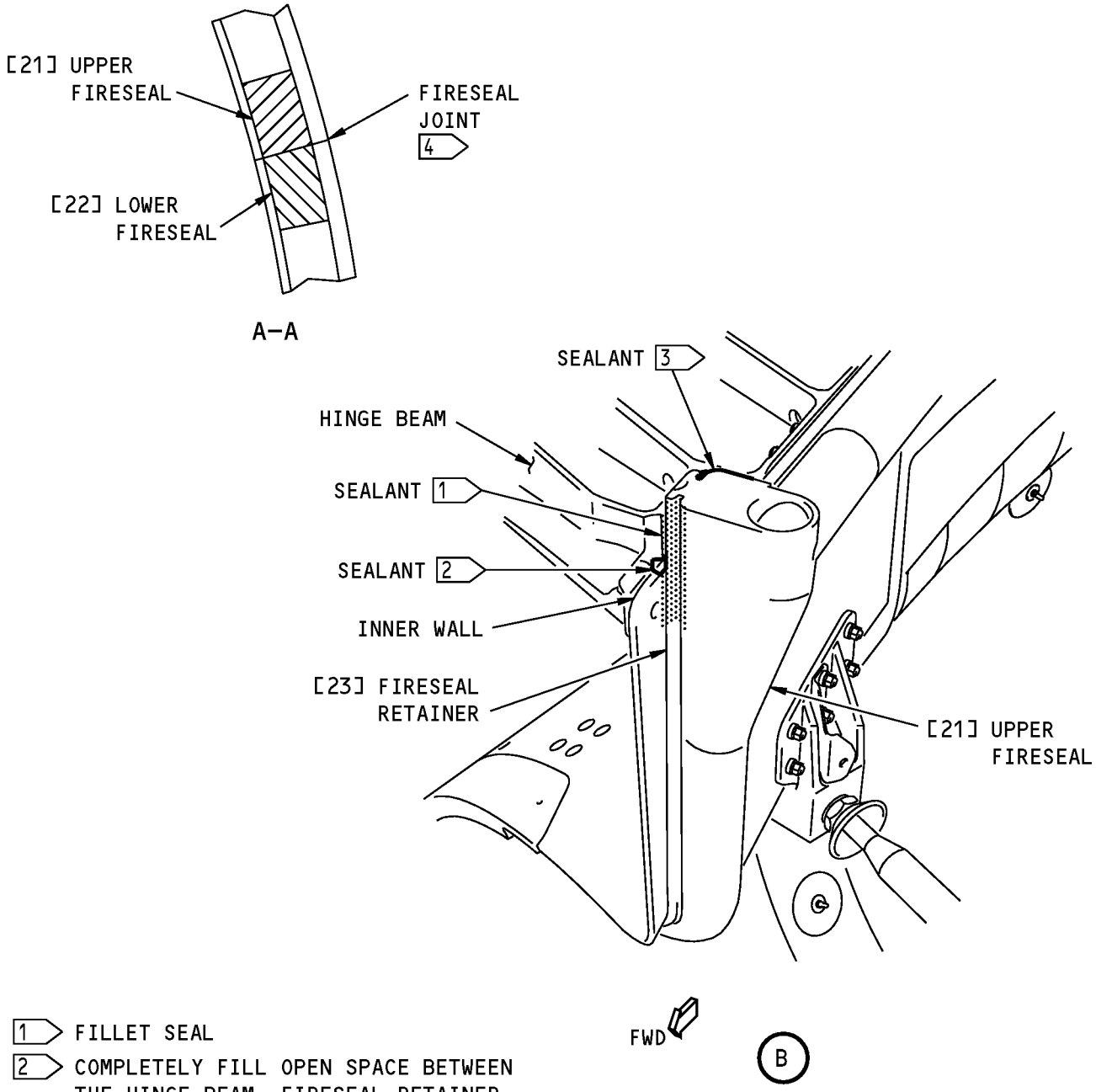
Left Side Thrust Reverser Fireseal Installation
Figure 401 (Sheet 2 of 3)/78-31-12-990-802-F00



Left Side Thrust Reverser Fireseal Installation
Figure 401 (Sheet 3 of 3)/78-31-12-990-802-F00



Right Side Thrust Reverser Fireseal Installation
Figure 402 (Sheet 1 of 3)/78-31-12-990-803-F00



1 > FILLET SEAL

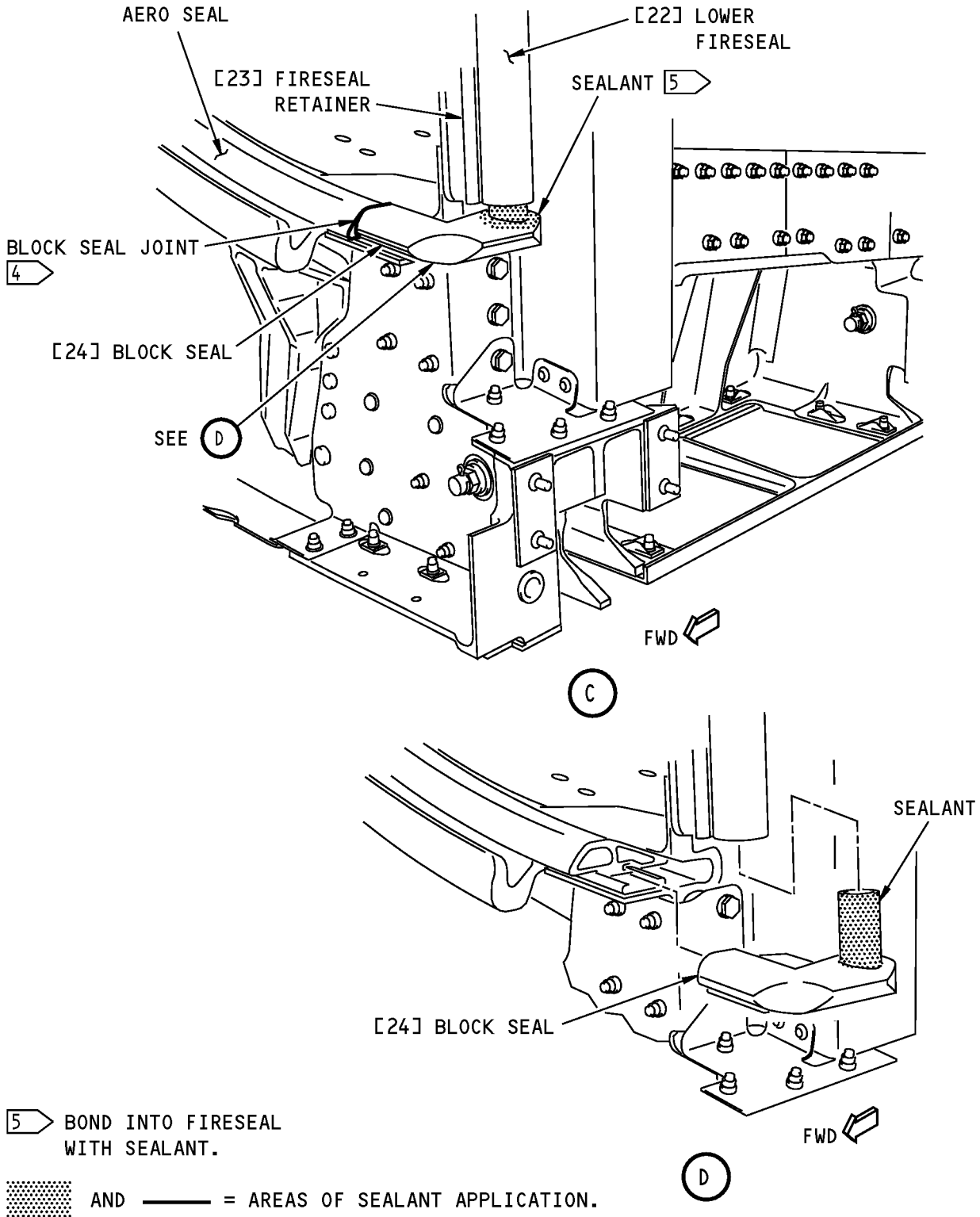
2 > COMPLETELY FILL OPEN SPACE BETWEEN THE HINGE BEAM, FIRESEAL RETAINER AND INNER WALL.

3 > COMPLETELY FILL OPEN SPACE BETWEEN THE UPPER FIRESEAL AND HINGE BEAM.

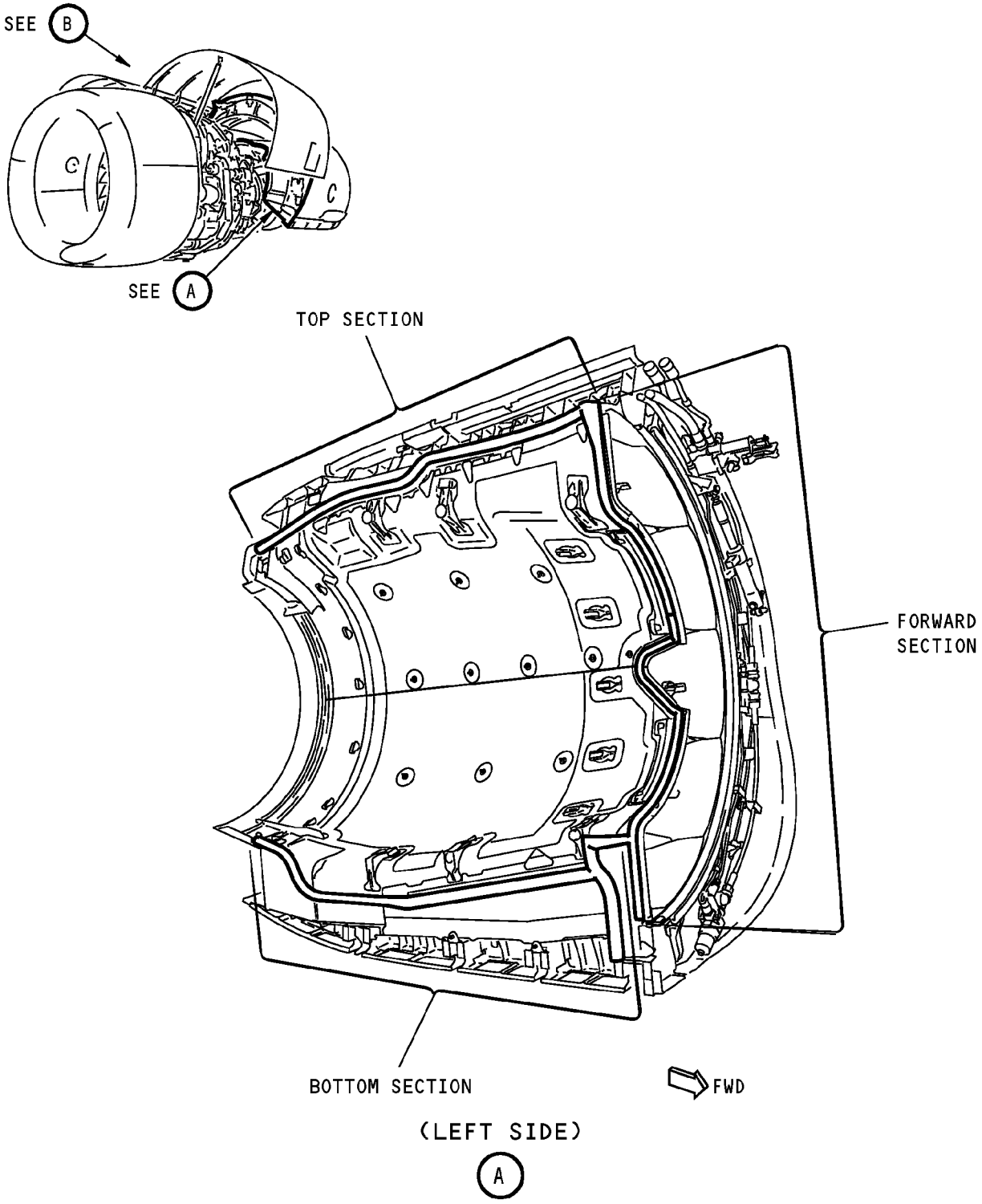
4 > FILL THE JOINT WITH SEALANT

▒▒ AND ——— = AREAS OF SEALANT APPLICATION.

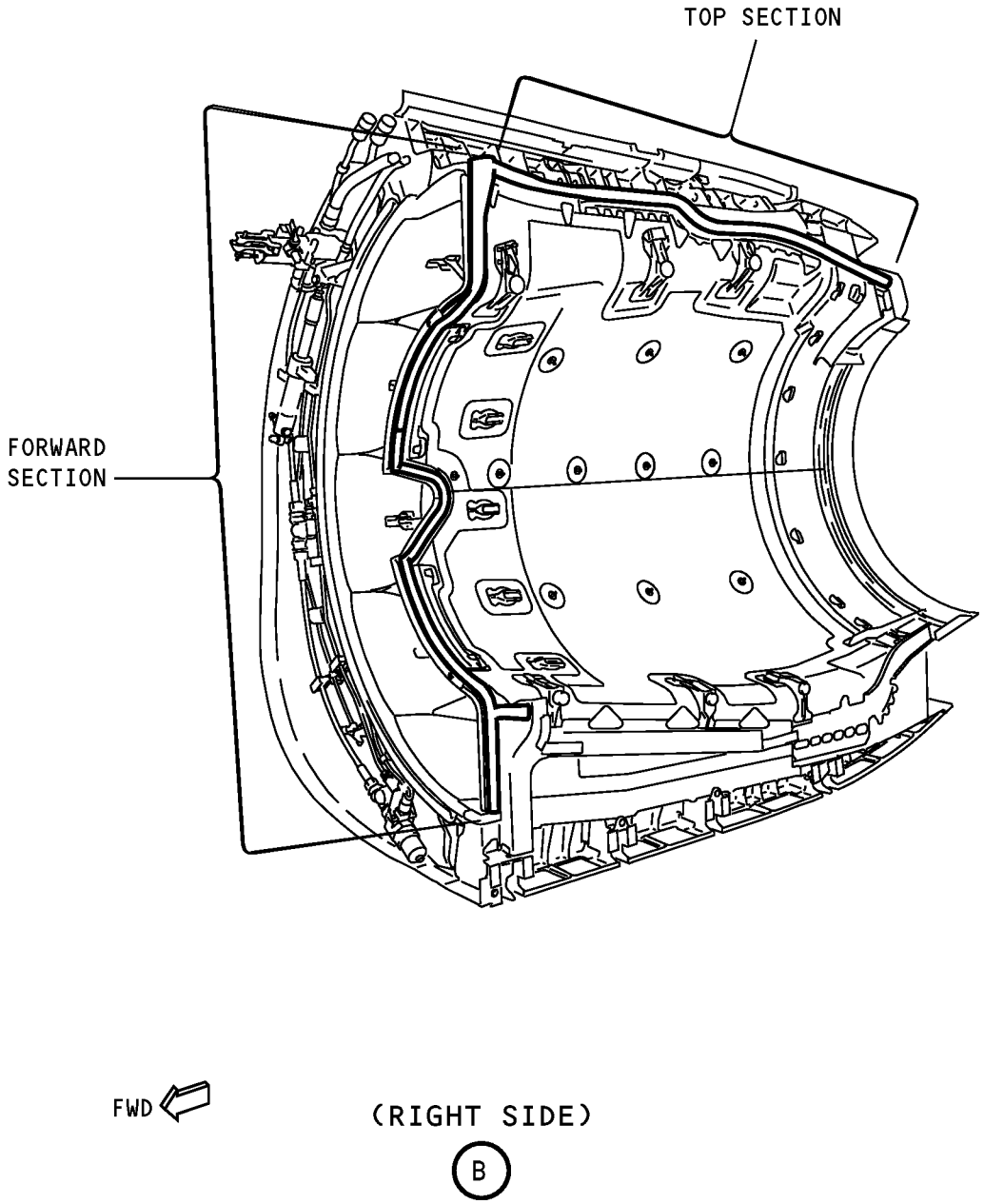
Right Side Thrust Reverser Fireseal Installation
Figure 402 (Sheet 2 of 3)/78-31-12-990-803-F00



Right Side Thrust Reverser Fireseal Installation
Figure 402 (Sheet 3 of 3)/78-31-12-990-803-F00



Fireseal Compression Check
Figure 403 (Sheet 1 of 2)/78-31-12-990-804-F00



Fireseal Compression Check
Figure 403 (Sheet 2 of 2)/78-31-12-990-804-F00

TASK 78-31-12-400-801-F00

3. Fireseal Installation

(Figure 401), (Figure 402), (Figure 403)

A. General

(1) This task is for the installation of the fireseal for the left or right thrust reverser on an engine.

(2) For this task the lower fireseal/aero block seal will be referred to as the block seal.

(3) It is important that all sealants are applied correctly. The incorrect application of sealants can decrease the fire protection.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-410-802-F00	Close the Thrust Reverser (Hand Pump Method) (P/B 201)
78-31-01-820-801-F00	Thrust Reverser Adjustment (P/B 501)

C. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010, Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
G02380	Developer - Inspection - Met-L-Chek D-70	
G50146	Developer - Non-acqueous - Dubl-Check D-100	SAE AMS2644

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Fireseal	78-31-12-01-015	HAP ALL
2	Fireseal	78-31-12-01-025	HAP ALL
4	Seal	78-31-12-01-035	HAP ALL
21	Fireseal	78-31-12-01-020	HAP ALL
22	Fireseal	78-31-12-01-030	HAP ALL
24	Seal	78-31-12-01-055	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Left Thrust Reverser Fireseal Installation

SUBTASK 78-31-12-390-003-F00

(1) The fireseal installation uses RTV 106 adhesive, A00081. It is permitted to use sealant, A00160 Type II, Class -1/2 as an alternative for a faster cure time.

NOTE: For subsequent maintenance of the fireseal, the BMS5-63 is harder to remove.

(a) The cure times are shown in the Fireseal Compression Check SUBTASK 78-31-12-390-001-F00.

SUBTASK 78-31-12-420-001-F00

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do these steps to install the upper fireseal [1] on the left thrust reverser:

(a) Clean all the sealant residue from the fireseal retainer [3] with solvent, B00062.

(b) To install the upper fireseal [1], compress the fireseal foot and push it into the fireseal retainer [3].

1) Make sure that you put the upper fireseal in its position against the lower fireseal at the fireseal joint (View A-A).

a) Clean the area to be sealed with solvent, B00062.

b) Apply RTV 106 adhesive, A00081 to seal the joint (Flagnote 4).

(c) Do these steps to apply sealant, A00160, at the forward upper edge of the upper fireseal [1] (View B):

1) Clean the areas to be sealed with solvent, B00062.

2) Fillet seal from the edge of the hinge beam to the edge of the inner wall (Flagnote 1).

3) Completely fill the open space between the hinge beam, the fireseal retainer [3] and the inner wall (Flagnote 2).

4) Completely fill the open space between the upper fireseal [1] and the hinge beam (Flagnote 3).

(d) Make sure that all the open spaces between the upper seal [1], the fireseal retainer [3], the fireseal retainer support and the inner wall are sealed.

1) Apply sealant, A00160 to fill all open spaces.

SUBTASK 78-31-12-420-002-F00

(3) Do these steps to install the lower fireseal [2] on the left thrust reverser:

(a) Clean all the sealant residue from the fireseal retainer [3] and the fireseal joint with solvent, B00062.

(b) To install the lower fireseal [2], compress the fireseal foot and push it into the fireseal retainer [3].

1) Make sure that you put the lower fireseal in its position against the upper fireseal at the fireseal joint (View A-A).

a) Clean the areas to be sealed with solvent, B00062.

b) Apply RTV 106 adhesive, A00081 to seal the joint (Flagnote 4).

(c) Do these steps to install the block seal [4] (View C):

1) Clean the areas that are to be sealed with solvent, B00062.

2) Apply sealant, A00160 on the circular plug of the block seal [4] (Flagnote 5).

3) Insert the circular plug into the lower fireseal [2].

4) Slide the block seal [4] into the block seal retainer.

5) Apply sealant, A00160 along the block seal [4] where it touches the block seal retainer.

6) Apply RTV 106 adhesive, A00081 to the block seal joint (Flagnote 4).

(d) Do these steps to apply sealant in the open spaces:

1) Visually check for open spaces between the lower fireseal [2], the fireseal retainer [3] and the inner wall.

2) Clean the areas that are to be sealed with solvent, B00062.

3) Apply sealant, A00160, to fill all the open spaces between the lower fireseal [2], the fireseal retainer [3] and the inner wall.

G. Right Thrust Reverser Fireseal Installation

SUBTASK 78-31-12-390-004-F00

(1) The fireseal installation uses RTV 106 adhesive, A00081. It is permitted to use sealant, A00160 Type II, Class -1/2 as an alternative for a faster cure time.

NOTE: For subsequent maintenance of the fireseal, the BMS5-63 is harder to remove.

(a) The cure times are shown in the Fireseal Compression Check SUBTASK 78-31-12-390-001-F00.

SUBTASK 78-31-12-420-003-F00

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do these steps to install the upper fireseal [21] on the right thrust reverser:

(a) Clean all the sealant residue from the fireseal retainer [23] with solvent, B00062.

(b) To install the upper fireseal [21], compress the fireseal foot and push it into the fireseal retainer [23].

1) Make sure that you put the upper fireseal in its position against the lower fireseal at the fireseal joint (View A-A).

a) Clean the area to be sealed with solvent, B00062.

b) Apply RTV 106 adhesive, A00081 to seal the joint (Flagnote 4).

(c) Do these steps to apply sealant, A00160, at the forward upper edge of the upper fireseal [21] (View B):

1) Clean the areas to be sealed with solvent, B00062.

2) Fillet seal from the edge of the hinge beam to the edge of the inner wall (Flagnote 1).

3) Completely fill the open space between the hinge beam, the fireseal retainer [23] and the inner wall (Flagnote 2).

4) Completely fill open space between the upper fireseal [21] and the hinge beam (Flagnote 3).

(d) Make sure that all the open spaces between the upper fireseal [21], the fireseal retainer [3], the fireseal retainer support and the inner wall are sealed.

1) Clean the areas to be sealed with solvent, B00062.

2) Apply sealant, A00160 to fill all open spaces.

SUBTASK 78-31-12-420-004-F00

(3) Do these steps to install the lower fireseal [2] on the right thrust reverser:

(a) Clean all the sealant residue from the fireseal retainer [23] and the fireseal joint with solvent, B00062.

(b) To install the lower fireseal [22], compress the fireseal foot and push it into the fireseal retainer [23].

1) Make sure that you put the lower fireseal in its position against the upper fireseal at the fireseal joint (View A-A).

a) Clean the area to be sealed with solvent, B00062.

b) Apply RTV 106 adhesive, A00081 to seal the joint (Flagnote 4).

(c) Do these steps to install the block seal [24] (View C):

1) Clean the areas that are to be sealed with solvent, B00062.

2) Apply sealant, A00160 on the circular plug of the block seal [24] (Flagnote 5).

3) Insert the circular plug into the lower fireseal [22].

4) Slide the block seal [24] into the block seal retainer.

5) Apply sealant, A00160 along the block seal [24] where it touches the block seal retainer.

6) Apply RTV 106 adhesive, A00081 to the block seal joint (Flagnote 4).

(d) Do these steps to apply sealant in the open spaces:

1) Visually check for open spaces between the lower fireseal [22], the fireseal retainer [23] and the inner wall.

2) Clean the areas that are to be sealed with solvent, B00062.

3) Apply sealant, A00160, to fill all the open spaces between the lower fireseal [22], the fireseal retainer [23] and the inner wall.

H. Fireseal Compression Check

SUBTASK 78-31-12-390-001-F00

(1) Let the sealant cure to the time limits that follow:

(a) Let the RTV 106 adhesive, A00081 cure a minimum of 24 hours at 65-100 degrees F (18-38 C).

(b) Let the sealant, A00160 cure at 72-82 degrees F (22-28 C) for these Types and minimum times:

1) (Type I) 48 hours.

2) (Type II, Class -1/2) 4 hours.

SUBTASK 78-31-12-820-001-F00

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do these steps to prepare for the fireseal compression check:

(a) Clean the fireseals on the left and right thrust reverser and the areas on the strut, engine and lower edge of the right thrust reverser that the fireseals will compress against with solvent, B00062.

(b) Apply Met-L-Chek D-70 developer, G02380 or Dubl-Check D-100 developer, G50146, approximately 2.0 inches (50.8 mm) wide on the areas on the strut, engine and lower edge of the right thrust reverser where the fireseals will touch.

1) Make sure that the developer is dry before you close the thrust reverser.

NOTE: The developer becomes a white powder with a dull finish when it is dry.

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURES TO OPEN AND CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) In the steps that follow, obey all of the WARNINGS and CAUTIONS in the referenced procedures:

1) Close and latch the thrust reverser; but, do not do the thrust reverser or leading edge activation at this time Close the Thrust Reverser (Hand Pump Method), TASK 78-31-00-410-802-F00.

2) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-12-820-002-F00

(3) Measure the width of the developer that is on the fireseals.

(a) Make sure that the minimum width of the developer is 0.350 inch (8.89 mm) along the full length of the fireseals.

(b) If the above limit is not met, use the steps below to measure the developer in each section:

1) Divide the fireseal into three sections as follows (Figure 403):

a) The fireseal on the top edge of a thrust reverser where it compresses against the strut is one section.

b) The fireseal on the forward edge of a thrust reverser where it compresses against the engine is another section.

c) The fireseal on the bottom edge of the left thrust reverser where it compresses against the lower edge of the right thrust reverser is another section.

2) For each section, areas where the developer is 0.20-0.35 inch (5.08-8.89 mm) wide is permitted with these conditions:

a) The length of each area is not more than 1.50 inches (38.1 mm).

b) The total length of all areas is not more that 3.00 inches (76.2 mm).

3) For each section, areas where the developer is less that 0.20 inch (5.08 mm) wide is permitted with these conditions:

a) The length of each area is not more than 0.25 inch (6.35 mm).

b) The total length of all areas is not more than 1.00 inch (25.4 mm).

4) If the fireseal is not in the limits, do this task: Thrust Reverser Adjustment, TASK 78-31-01-820-801-F00.

I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-12-410-003-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

NOTE: It is not necessary to clean off the developer.

——————— END OF TASK ———————

FIRESEAL - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has two tasks:

(1) A visual inspection of the fireseal.

(2) A detailed inspection of the fireseal.

TASK 78-31-12-200-801-F00

2. Fireseal Inspection (Visual Check)

(Figure 601)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This is a scheduled maintenance task to do a visual check of the fireseal.

(3) The fireseal is on the inner surface of each thrust reverser on an engine.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-13-200-801-F00	Insulation Blanket Inspection (P/B 601)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Inspection

SUBTASK 78-31-12-010-001-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Procedure

SUBTASK 78-31-12-210-001-F00

(1) Look for missing fireseal and for obvious damage.

(a) If you find damaged or missing fireseal, do this task: Fireseal Inspection (Detailed), TASK 78-31-12-200-802-F00.

(b) If there is damage to the vertical fire seal at the upper bifurcation, do this task:Insulation Blanket Inspection, TASK 78-31-13-200-801-F00.

NOTE: On the vertical fire seal at the upper bifurcation, an internal splice is on the forward segment, approximately 10 in. (254 mm) from the top segment of the seal. Some fire seals have an internal splice at the top of the fire seal that could cause worn areas on the fire seal. Worn fire seals can cause decreased fire extinguishing function for the engine core. Worn or damaged fire seals can decrease fire containment under the thrust reverser. There can be damage to the thermal insulation blankets on the thrust reverser aft of the vertical fire seal. Damaged vertical fire seals are replaced with new fire seals that do not have an internal splice.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-12-410-001-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——————— END OF TASK ———————

TASK 78-31-12-200-802-F00

3. Fireseal Inspection (Detailed)

(Figure 601)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This is a scheduled maintenance task to do a detailed check of the fireseal.

(3) The fireseal is on the inner surface of each thrust reverser on an engine.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-12-000-801-F00	Fireseal Removal (P/B 401)
78-31-12-400-801-F00	Fireseal Installation (P/B 401)
78-31-13-200-801-F00	Insulation Blanket Inspection (P/B 601)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Inspection

SUBTASK 78-31-12-010-002-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Procedure

SUBTASK 78-31-12-220-001-F00

(1) Visually examine the fireseal for damage:

(a) Cuts, frayed material, missing or loose fireseal, and missing sealant.

SUBTASK 78-31-12-960-001-F00

(2) If you find damage or missing fireseal, replace the fireseal.

(a) Do this task: Fireseal Removal, TASK 78-31-12-000-801-F00.

(b) Do this task: Fireseal Installation, TASK 78-31-12-400-801-F00.

SUBTASK 78-31-12-211-001-F00

(3) If there is damage to the vertical fire seal at the upper bifurcation, do this task:Insulation Blanket Inspection, TASK 78-31-13-200-801-F00.

NOTE: On the vertical fire seal at the upper bifurcation, an internal splice is on the forward segment, approximately 10 in. (254 mm) from the top segment of the seal. Some fire seals have an internal splice at the top of the fire seal that could cause worn areas on the fire seal. Worn fire seals can cause decreased fire extinguishing function for the engine core. Worn or damaged fire seals can decrease fire containment under the thrust reverser. There can be damage to the thermal insulation blankets on the thrust reverser aft of the vertical fire seal. Damaged vertical fire seals are replaced with new fire seals that do not have an internal splice.

SUBTASK 78-31-12-390-002-F00

(4) If you find missing sealant, do the instructions in the task that follows to replace the sealant:

(a) Do this task: Fireseal Installation, TASK 78-31-12-400-801-F00.

SUBTASK 78-31-12-220-002-F00

(5) Do a check for loose, missing, or damaged fireseal retainers.

(a) If you find loose, missing, or damaged fireseal retainers, tighten or replace the fireseal retainers.

1) Do the instructions in this reference (CMM 78-31-37). .

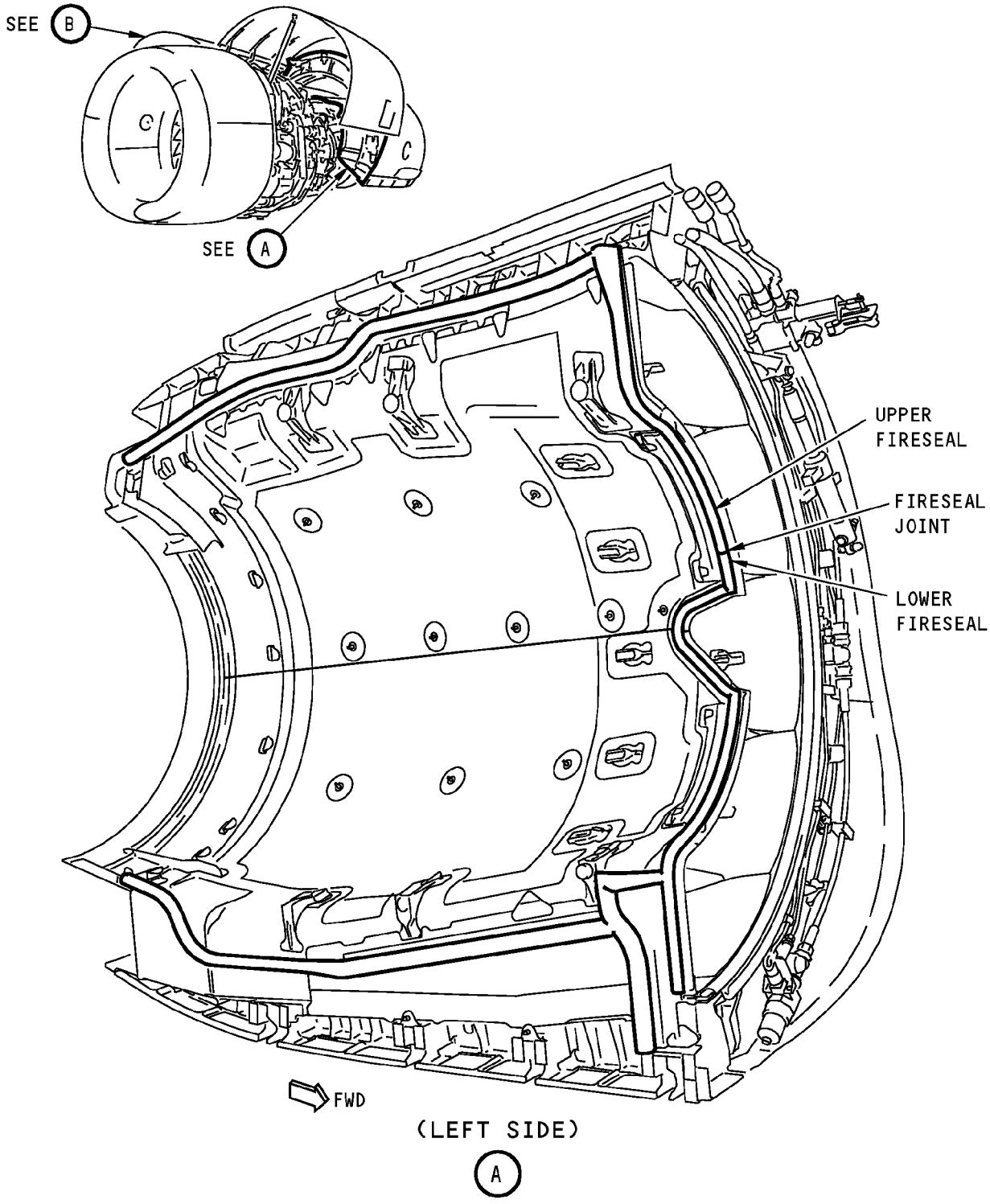
F. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-12-410-002-F00

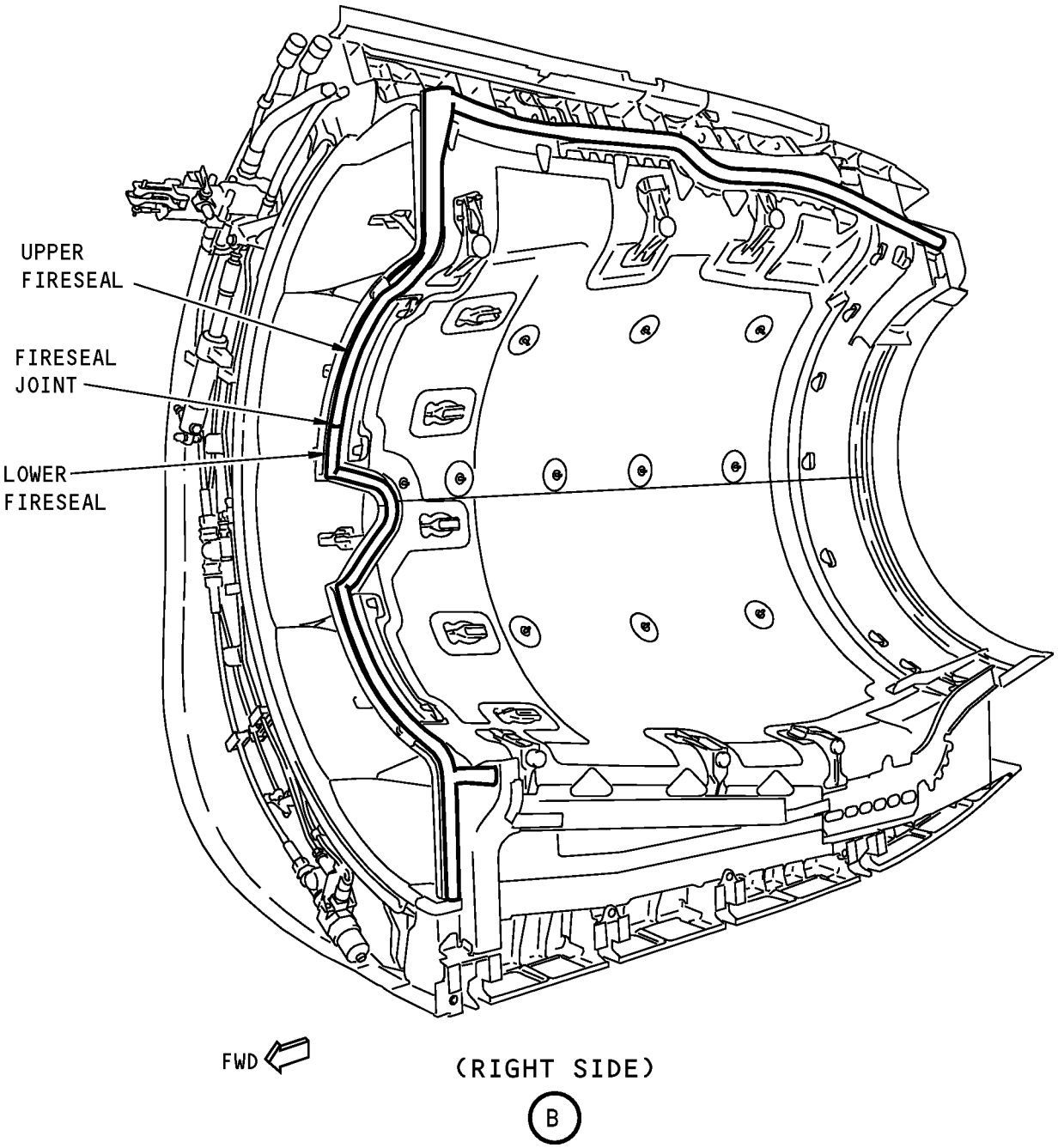
WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK



Thrust Reverser Fireseal Inspection
Figure 601 (Sheet 1 of 2)/78-31-12-990-801-F00



Thrust Reverser Fireseal Inspection
Figure 601 (Sheet 2 of 2)/78-31-12-990-801-F00

INSULATION BLANKET - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the insulation blanket.

(2) The installation of the insulation blanket.

B. These blankets are a thermal insulation and fire barrier layer which is necessary to keep the thrust reverser structurally serviceable from the heat made by the engine during operation and can decrease the damage and repair costs from a duct burst or a fire.

TASK 78-31-13-000-801-F00

2. Insulation Blanket Removal

(Figure 401 and Figure 402)

A. General

(1) This task is for the removal of the insulation blankets from the left and right thrust reverser on an engine.

(2) For this task, the insulation blanket will be referred to as the blanket.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-01-200-801-F00	Thrust Reverser Fan Duct Wall Inspection (P/B 601)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-13-010-001-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Left Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-005-F00

(1) Do these steps to remove the upper blanket [8] from the left thrust reverser (Figure 401):

(a) At the three upper compression pads and the upper blanket cutouts, carefully break the sealant bond with a knife.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7], washers [1] and washers [3].

(c) Remove the upper blanket [8].

SUBTASK 78-31-13-020-006-F00

(2) Do these steps to remove the lower blanket [9] from the left thrust reverser (Figure 401):

(a) At the middle and aft compression pads and the lower blanket cutouts, carefully break the sealant bond with a knife.

(b) Do this step if the upper blanket [8] was not removed:

1) Remove the nuts [2] and [5], screw [7] and washers [1] and [3] that attach the upper blanket [8] and the lower blanket [9] together to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket off the studs to get access to the lower blanket.

(c) Remove the remaining nuts [2] and [5], screws [4], [6], and [7], and washers [1] and [3] that attach the lower blanket to the inner wall.

(d) Remove the lower blanket [9].

F. Right Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-007-F00

(1) Do these steps to remove the upper blanket [31] from the right thrust reverser (Figure 402):

(a) At the three upper compression pads and the upper blanket cutouts, carefully break the sealant bond with a knife.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7] and the washers [1] and [3].

(c) Remove the upper blanket [31].

SUBTASK 78-31-13-020-008-F00

(2) Do these steps to remove the lower blanket [32] from the right thrust reverser (Figure 402):

(a) At the middle and aft compression pads and the lower blanket cutouts, carefully break the sealant bond with a knife.

(b) Do this step if the upper blanket [31] was not removed:

1) Remove the nuts [2] and [5], screw [7], and washers [1] and [3] that attach both the upper blanket [31] and the lower blanket [32] to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket [31] off the studs to get access to the lower blanket [32].

(c) Remove the remaining nuts [2] and [5], screws [4], [6] and [7] and washers [1] and [3].

(d) Remove the lower blanket [32].

G. Inner Wall Examination

SUBTASK 78-31-13-212-008-F00

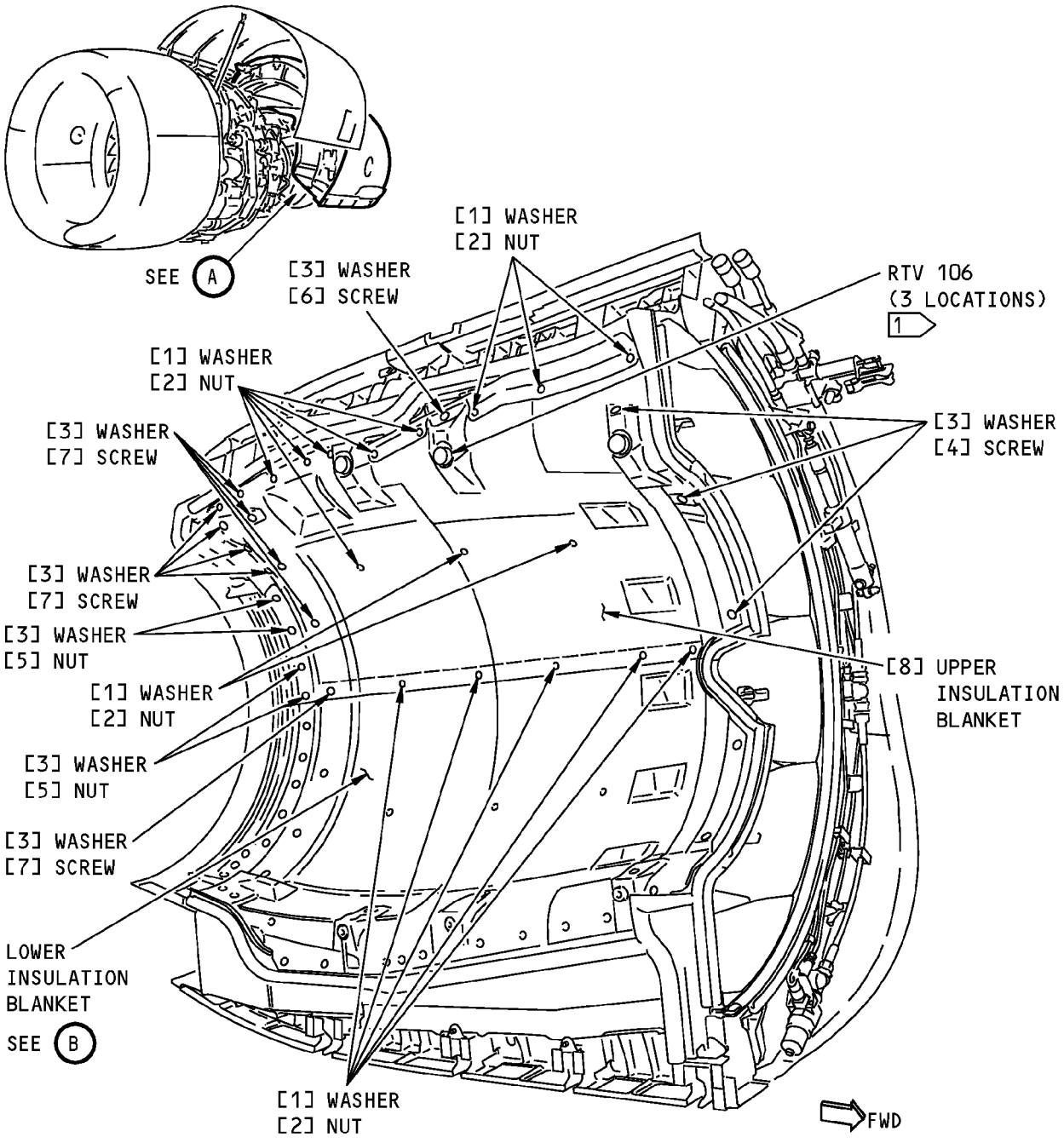
(1) If the insulation blankets are replaced, look for signs of damage to the inner wall, discoloration or a scorched appearance on the inner wall for the area under the blankets.

NOTE: Discoloration could indicate overheat exposure. Discolorations would appear as areas that are of a different color, usually much darker than the original predominant color of the structure or part that is examined. Discoloration areas of a light color (ex. white) surrounded by darkened areas (dark to medium brown) are also areas that indicate overheat exposure. Areas that are not of interest include discolored areas due to oil, fluid, or soil exposure.

(a) If there is damage to the inner wall, do this task:Thrust Reverser Fan Duct Wall Inspection, TASK 78-31-01-200-801-F00.

(b) If the inner wall inspection was done because of a nacelle duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

END OF TASK

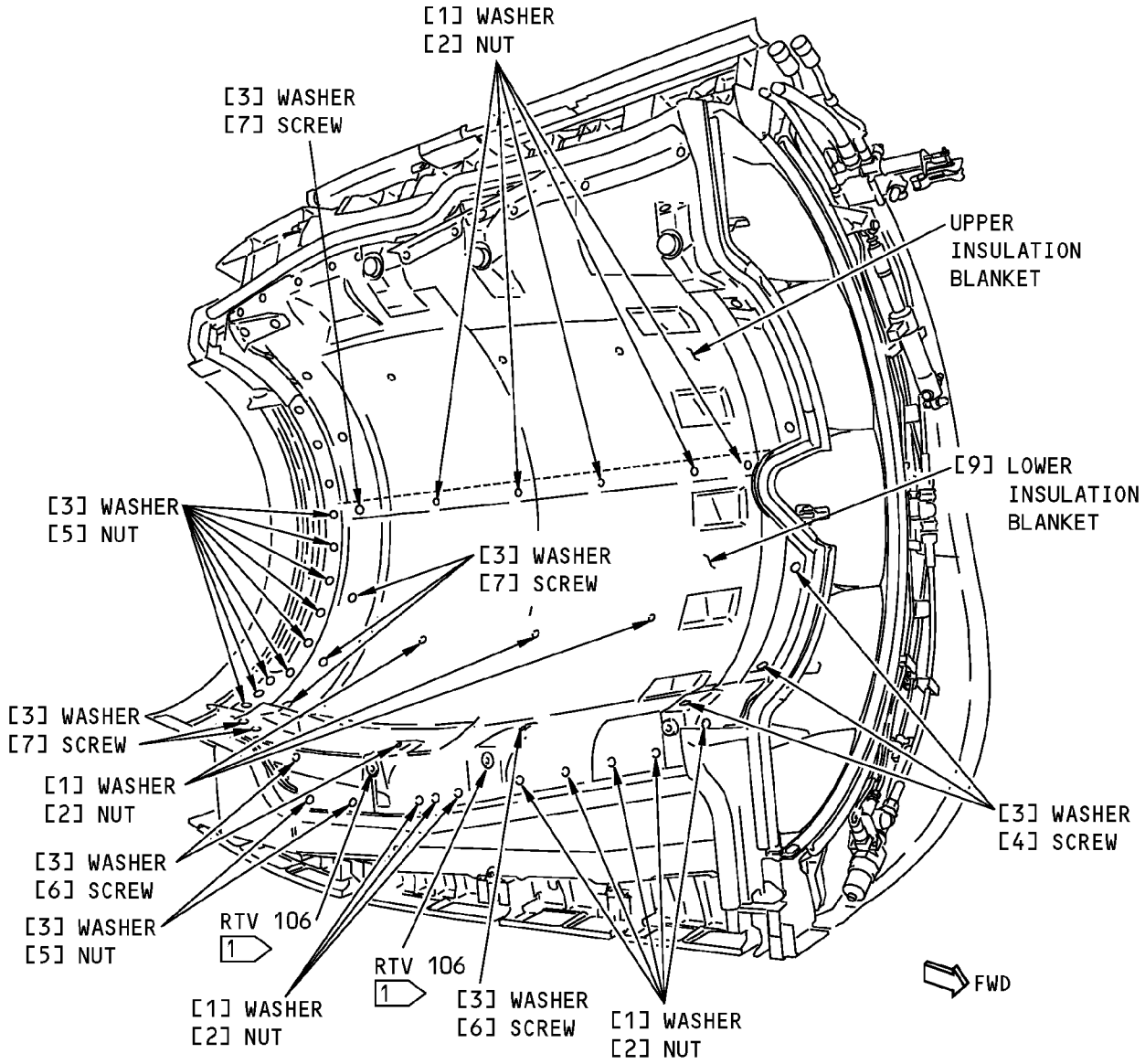


LEFT THRUST REVERSER UPPER INSULATION BLANKET

1 SEAL THE SPACE BETWEEN THE INSULATION BLANKET AND COMPRESSION PAD SPACER.

A

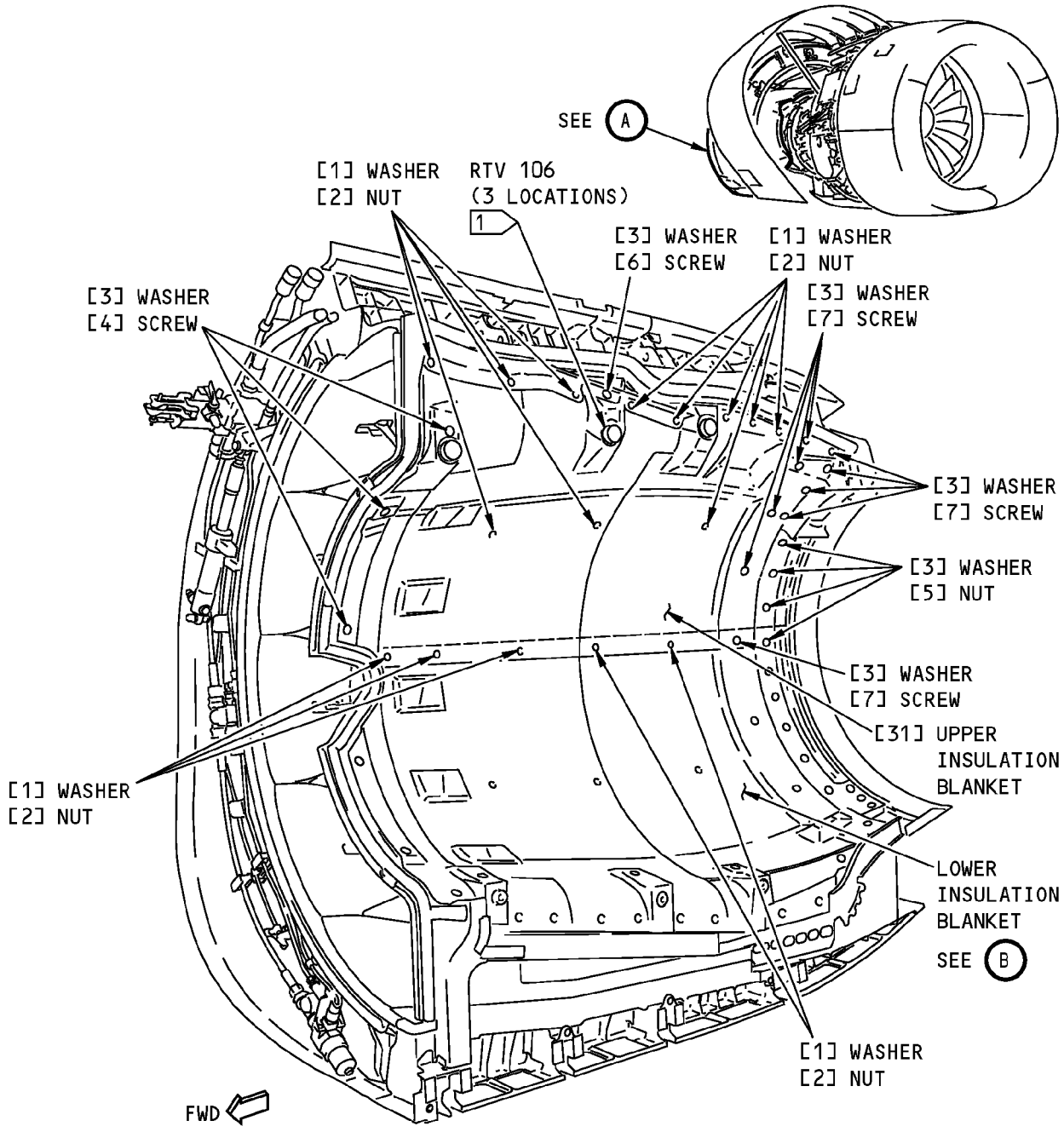
Left Thrust Reverser Insulation Blanket Installation
Figure 401 (Sheet 1 of 2)/78-31-13-990-801-F00



LEFT THRUST REVERSER LOWER INSULATION BLANKET

B

Left Thrust Reverser Insulation Blanket Installation
Figure 401 (Sheet 2 of 2)/78-31-13-990-801-F00

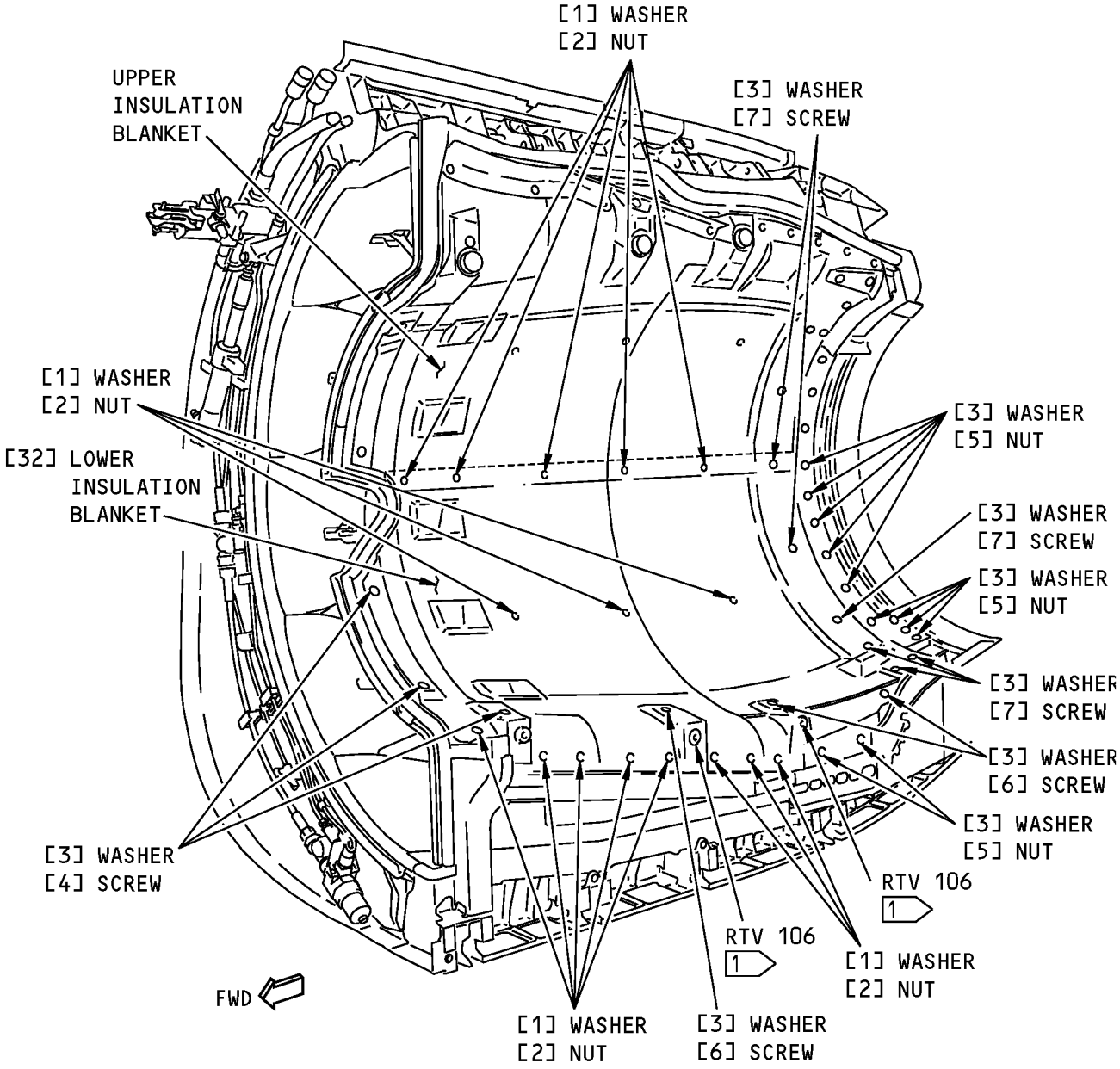


RIGHT THRUST REVERSER UPPER INSULATION BLANKET

1 SEAL THE SPACE BETWEEN THE INSULATION BLANKET AND COMPRESSION PAD SPACER.

A

Right Thrust Reverser Insulation Blanket Installation
Figure 402 (Sheet 1 of 2)/78-31-13-990-802-F00



RIGHT THRUST REVERSER LOWER INSULATION BLANKET

B

Right Thrust Reverser Insulation Blanket Installation
Figure 402 (Sheet 2 of 2)/78-31-13-990-802-F00

HAP 039-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069 OR POST SB 737-78-1079; HAP 021-026, 028-038 POST SB 737-78-1079

TASK 78-31-13-000-805-F00

3. Insulation Blanket Removal

(Figure 403, Figure 404)

A. General

(1) This task is for the removal of the insulation blankets from the left and right thrust reverser on an engine.

(2) For this task, the insulation blanket will be referred to as the blanket.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-01-200-801-F00	Thrust Reverser Fan Duct Wall Inspection (P/B 601)

C. Tools/Equipment

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

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic (Part #: ST982, Supplier: 81205, A/P Effectivity: 737-ALL)
STD-549	Knife - Putty, Broad Blade
STD-764	Scraper - Non-metallic

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Removal

SUBTASK 78-31-13-010-007-F00

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Left Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-032-F00

(1) Remove the flange insulation between the fire seal and the upper blanket.

NOTE: The flange insulation is bonded with sealant to a metal flange under the metal retainer for the fire seal. There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies can be attached to cover the flange on the upper bifurcation. One tapered flange insulation can be attached to cover the flange on the upper bifurcation. The single tapered flange insulation is optional to the two rectangular flange insulations.

(a) Carefully break the sealant bond with a sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549 at these locations:

1) The fillet seal between the flange insulation and the fire seal.

2) The fillet seal between the flange insulation and the blanket.

a) Do not damage the fire seal and the upper blanket.

3) The fillet seal between the flange insulation and the upper bifurcation.

a) Do not damage the composite structure of the inner wall.

(b) Remove all old sealant on the flange and the fire seal retainer.

SUBTASK 78-31-13-020-021-F00

(2) Do these steps to remove the upper blanket [8] from the left thrust reverser (Figure 403):

(a) Carefully break the sealant bond with a sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549 at these locations:

1) The forward edge of the blanket aft of the bulb-type fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the three upper compression pads.

a) Do not damage the upper compression pads.

3) The upper blanket edge and the inner wall below the horizontal fire seal.

a) Do not damage the composite structure of the inner wall.

4) The fillet seal between the upper blanket and the inner wall along the entire forward edge of the blanket aft of the upper v-blade.

a) Above the upper v-blade, the blanket is sealed to the inner wall/upper bifurcation approximately 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7], washers [1] and washers [3].

(c) Remove the upper blanket [8].

SUBTASK 78-31-13-020-022-F00

(3) Do these steps to remove the lower blanket [9] from the left thrust reverser (Figure 403):

(a) Carefully break the sealant bond with a sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549 at these locations.

1) The forward edge of the blanket aft of the fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the forward, middle and aft lower compression pads.

3) The fillet seal between the blanket and the inner wall along the entire forward edge of the blanket.

4) The fillet seal between the blanket and the inner wall along the entire aft and lower edge of the blanket.

(b) Do this step if the upper blanket [8] was not removed:

1) Remove the nuts [2] and [5], screw [7] and washers [1] and [3] that attach the upper blanket [8] and the lower blanket [9] together to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket off the studs to get access to the lower blanket.

(c) Remove the remaining nuts [2] and [5], screws [4], [6], and [7], and washers [1] and [3] that attach the lower blanket to the inner wall.

(d) Remove the lower blanket [9].

SUBTASK 78-31-13-020-033-F00

(4) Examine the upper foam block [70] and the lower foam block [72] that is next to the v-blade fittings on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the blanket and the sealant is removed. The foam block is made of a closed cell, silicone foam rubber.

(a) Look for damage or missing pieces on the foam block.

(b) If it is necessary, replace the foam block.

1) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

G. Right Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-034-F00

(1) Remove the flange insulation between the fire seal retainer and the upper blanket.

NOTE: The flange insulation is bonded with sealant to a metal flange under the metal retainer for the fire seal. There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies are needed to cover the flange on the upper bifurcation. One tapered flange insulation is needed to cover the flange on the upper bifurcation. The single tapered flange insulation is optional to the two rectangular flange insulations.

(a) Carefully break the sealant bond with a sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549 at these locations:

1) The fillet seal between the flange insulation and the fire seal.

2) The fillet seal between the flange insulation and the blanket.

a) Do not damage the fire seal and the upper blanket.

3) The fillet seal between the flange insulation and the upper bifurcation.

a) Do not damage the composite structure of the inner wall.

(b) Remove all old sealant on the flange and the fire seal retainer.

SUBTASK 78-31-13-020-023-F00

(2) Do these steps to remove the upper blanket [31] from the right thrust reverser (Figure 404):

(a) Carefully break the sealant bond with a sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549 at these locations.

1) The forward edge of the blanket aft of the bulb-type fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the three upper compression pads.

a) Do not damage the upper compression pads.

3) The upper blanket edge and the inner wall below the horizontal fire seal.

a) Do not damage the composite structure of the inner wall.

4) The fillet seal between the upper blanket and the inner wall along the entire forward edge of the blanket aft of the upper v-blade.

a) Above the upper v-blade, the blanket is sealed to the inner wall/upper bifurcation approximately 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7] and the washers [1] and [3].

(c) Remove the upper blanket [31].

SUBTASK 78-31-13-020-024-F00

(3) Do these steps to remove the lower blanket [32] from the right thrust reverser (Figure 404):

(a) Carefully break the sealant bond with a sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549 at these locations.

1) The forward edge of the blanket aft of the fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the forward, middle and aft lower compression pads.

3) The fillet seal between the blanket and the inner wall along the entire forward edge of the blanket.

4) The fillet seal between the blanket and the inner wall along the entire aft and lower edge of the blanket.

(b) Do this step if the upper blanket [31] was not removed:

1) Remove the nuts [2] and [5], screw [7], and washers [1] and [3] that attach both the upper blanket [31] and the lower blanket [32] to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket [31] off the studs to get access to the lower blanket [32].

(c) Remove the remaining nuts [2] and [5], screws [4], [6] and [7] and washers [1] and [3].

(d) Remove the lower blanket [32].

SUBTASK 78-31-13-020-035-F00

(4) Examine the upper foam block [71] and the lower foam block [73] that is next to the v-blade fittings on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the blanket and the sealant is removed. The foam block is made of a closed cell, silicone foam rubber.

(a) Look for damage or missing pieces on the foam block.

(b) If it is necessary, replace the foam block.

1) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

H. Inner Wall Examination

SUBTASK 78-31-13-212-006-F00

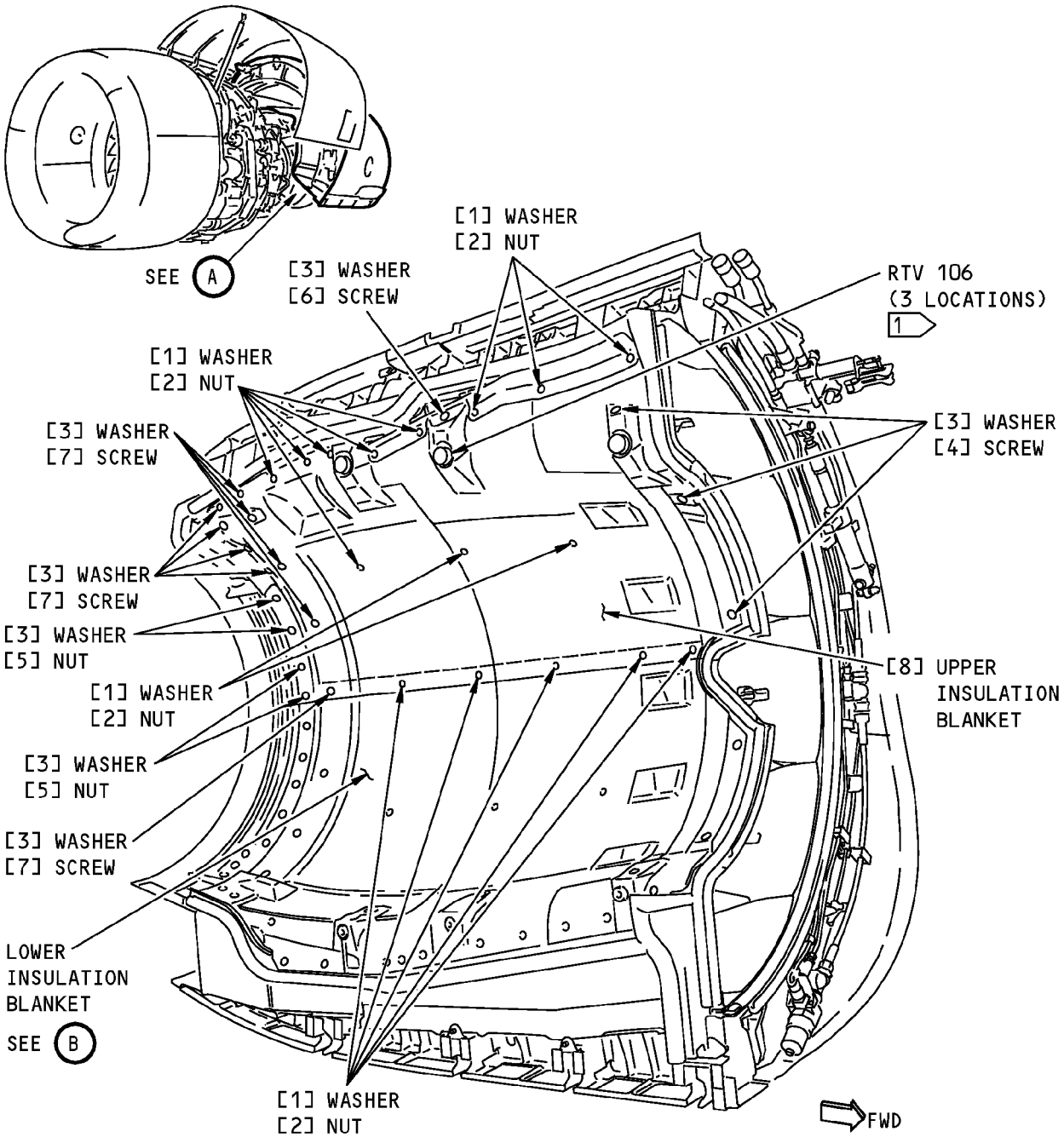
(1) If the insulation blankets are replaced, look for signs of damage to the inner wall, discoloration or a scorched appearance on the inner wall for the area under the blankets.

NOTE: Discoloration could indicate overheat exposure. Discolorations would appear as areas that are of a different color, usually much darker than the original predominant color of the structure or part that is examined. Discoloration areas of a light color (ex. white) surrounded by darkened areas (dark to medium brown) are also areas that indicate overheat exposure. Areas that are not of interest include discolored areas due to oil, fluid, or soil exposure.

(a) If there is damage to the inner wall, do this task:Thrust Reverser Fan Duct Wall Inspection, TASK 78-31-01-200-801-F00.

(b) If the inner wall inspection was done because of a nacelle duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

——————— END OF TASK ———————

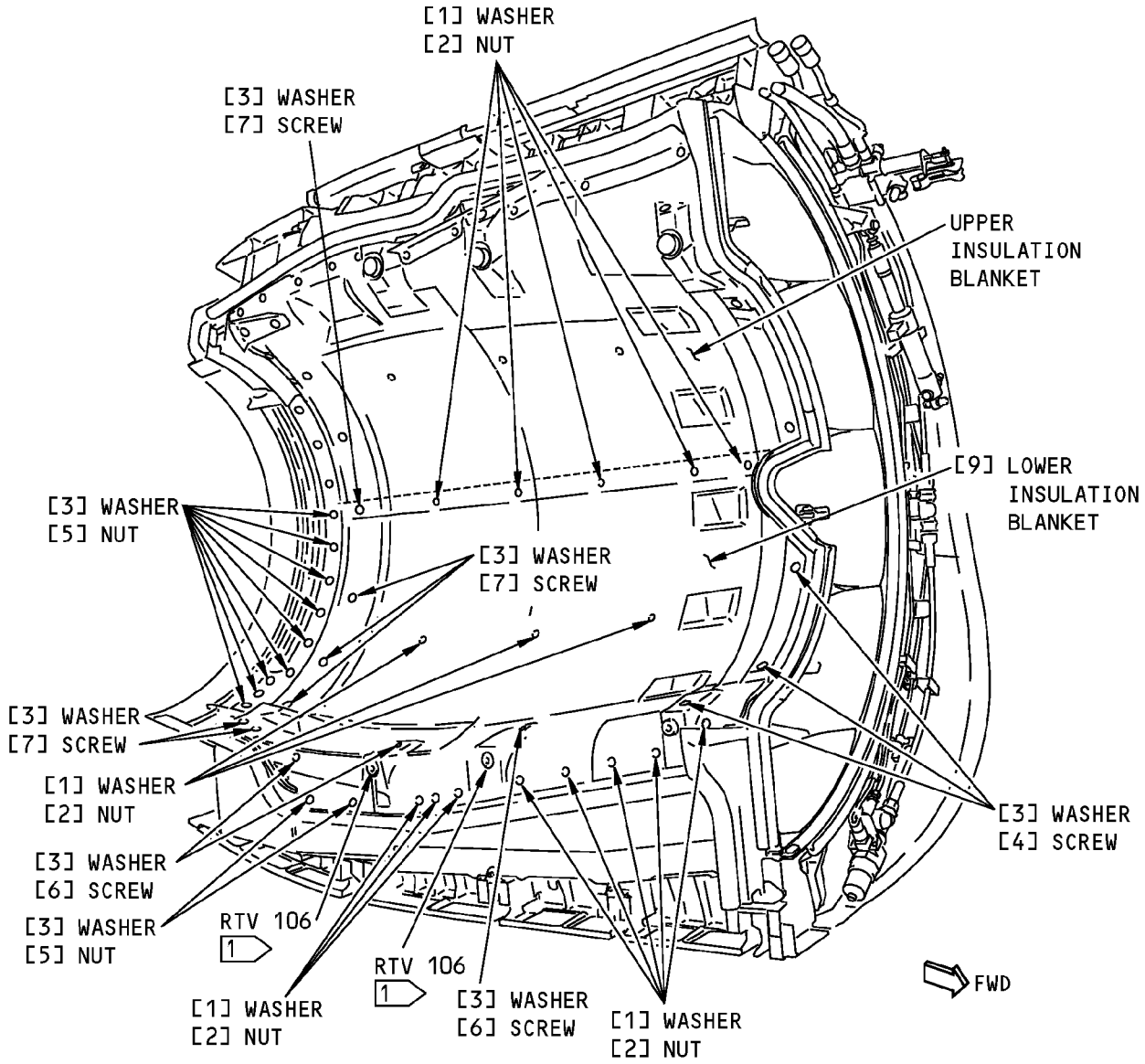


LEFT THRUST REVERSER UPPER INSULATION BLANKET

1 SEAL THE SPACE BETWEEN THE INSULATION BLANKET AND COMPRESSION PAD SPACER.

A

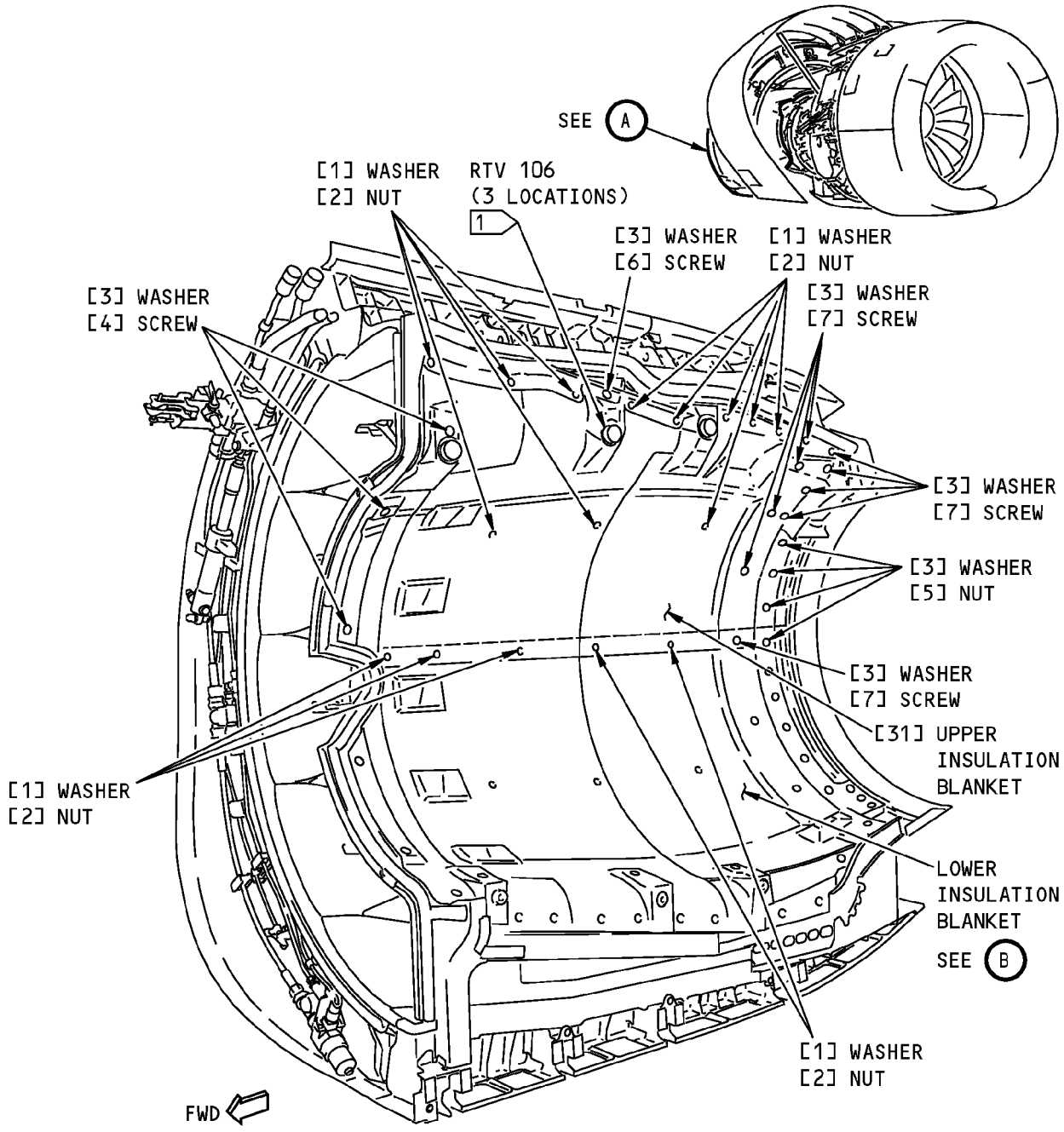
Left Thrust Reverser Insulation Blanket Installation
Figure 403 (Sheet 1 of 2)/78-31-13-990-815-F00



LEFT THRUST REVERSER LOWER INSULATION BLANKET

B

Left Thrust Reverser Insulation Blanket Installation
Figure 403 (Sheet 2 of 2)/78-31-13-990-815-F00

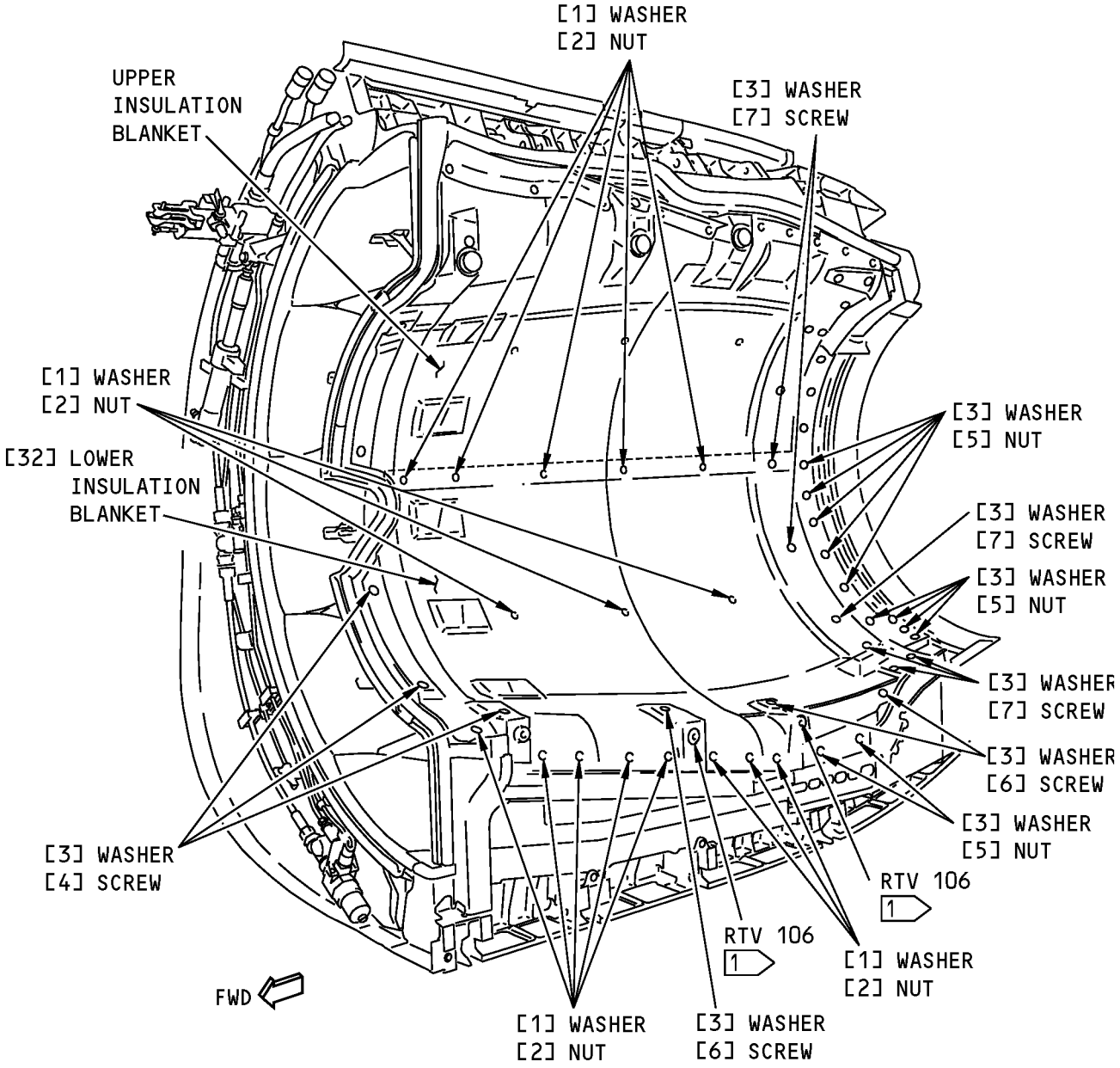


RIGHT THRUST REVERSER UPPER INSULATION BLANKET

1 SEAL THE SPACE BETWEEN THE INSULATION BLANKET AND COMPRESSION PAD SPACER.

A

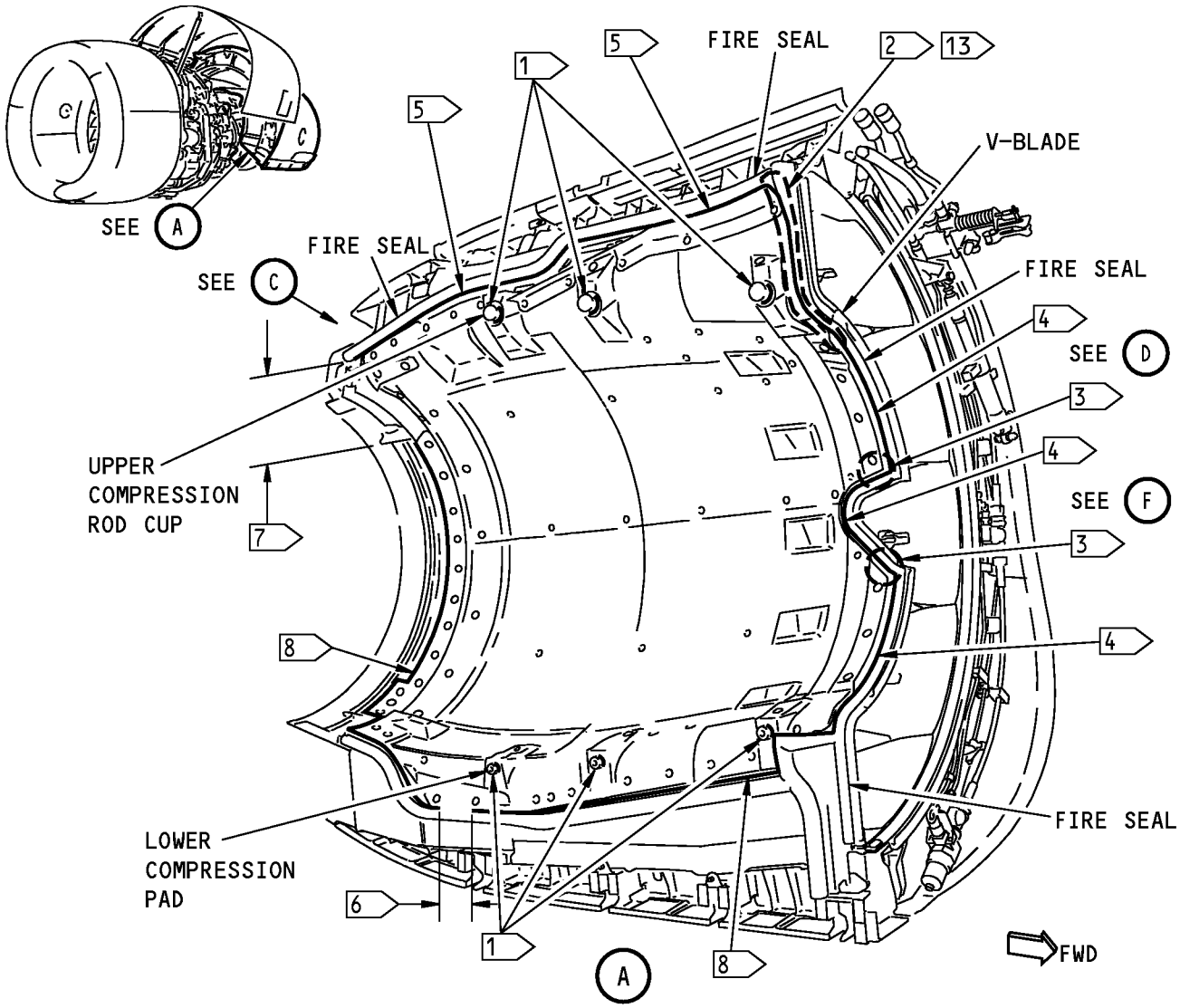
Right Thrust Reverser Insulation Blanket Installation
Figure 404 (Sheet 1 of 2)/78-31-13-990-816-F00



RIGHT THRUST REVERSER LOWER INSULATION BLANKET

B

Right Thrust Reverser Insulation Blanket Installation
Figure 404 (Sheet 2 of 2)/78-31-13-990-816-F00



1 FILLET SEAL GAP BETWEEN BLANKET CUTOUT AND COMPRESSION PAD SPACER WITH RTV 106 SEALANT; SEE TEXT

2 SEAL BLANKET TO INNER WALL WITH SEALANT BMS 5-63, 1.0 - 1.5 INCHES (12.7-19.0 mm) AFT OF BLANKET FORWARD EDGE. USE PARTING AGENT ON INNER WALL; SEE TEXT

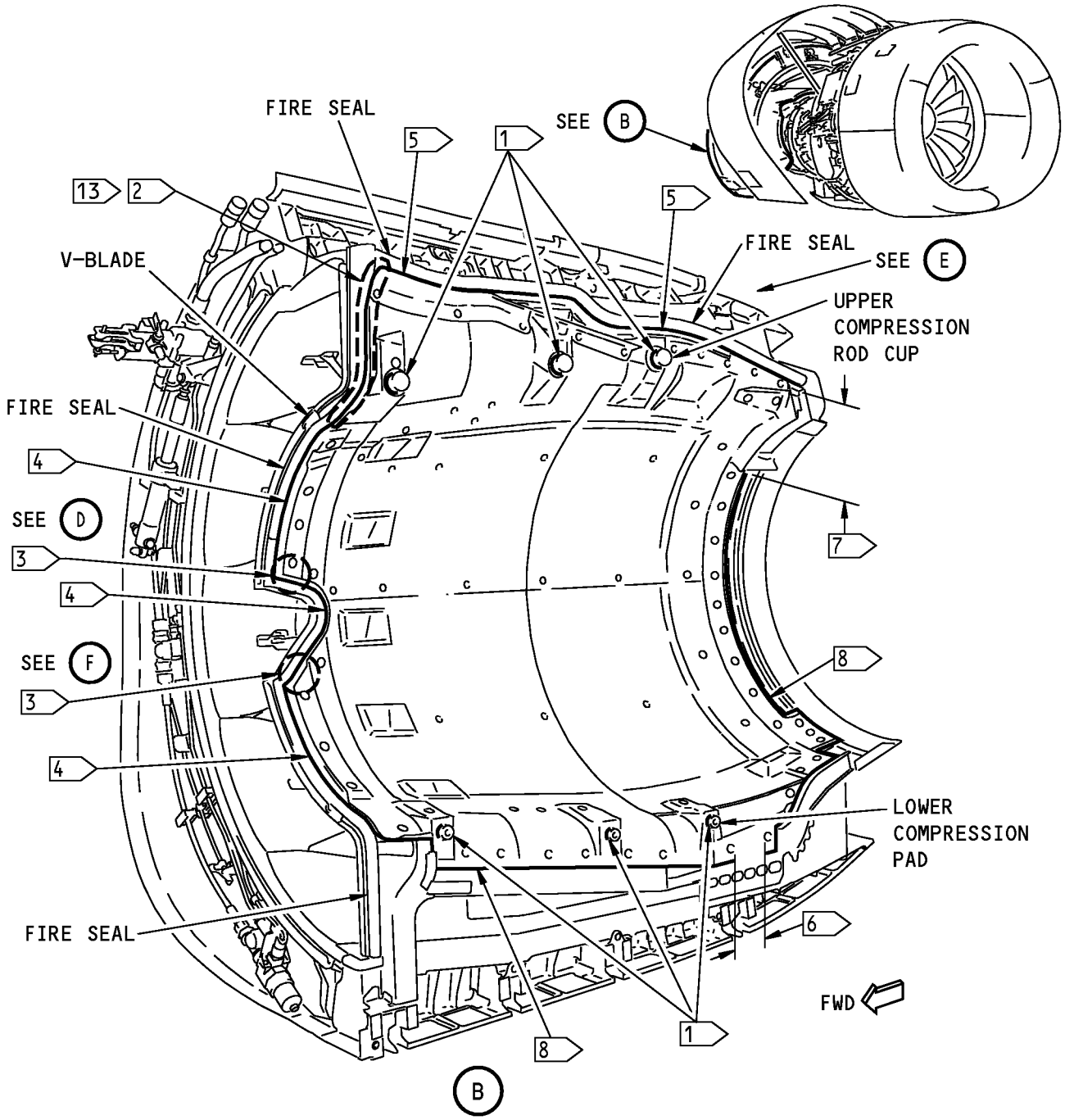
3 GAP BETWEEN BLANKET EDGE AND INNER WALL NOT MORE THAN 0.82 INCH (20.83 mm). SEAL BLANKET EDGE TO INNER WALL FOAM BLOCK; SEE TEXT

4 FILLET SEAL ENTIRE BLANKET FORWARD EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

5 FILLET SEAL ENTIRE BLANKET UPPER EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

1380845 S0000251394_V2

Blanket Sealant Application
Figure 405 (Sheet 1 of 7)/78-31-13-990-817-F00



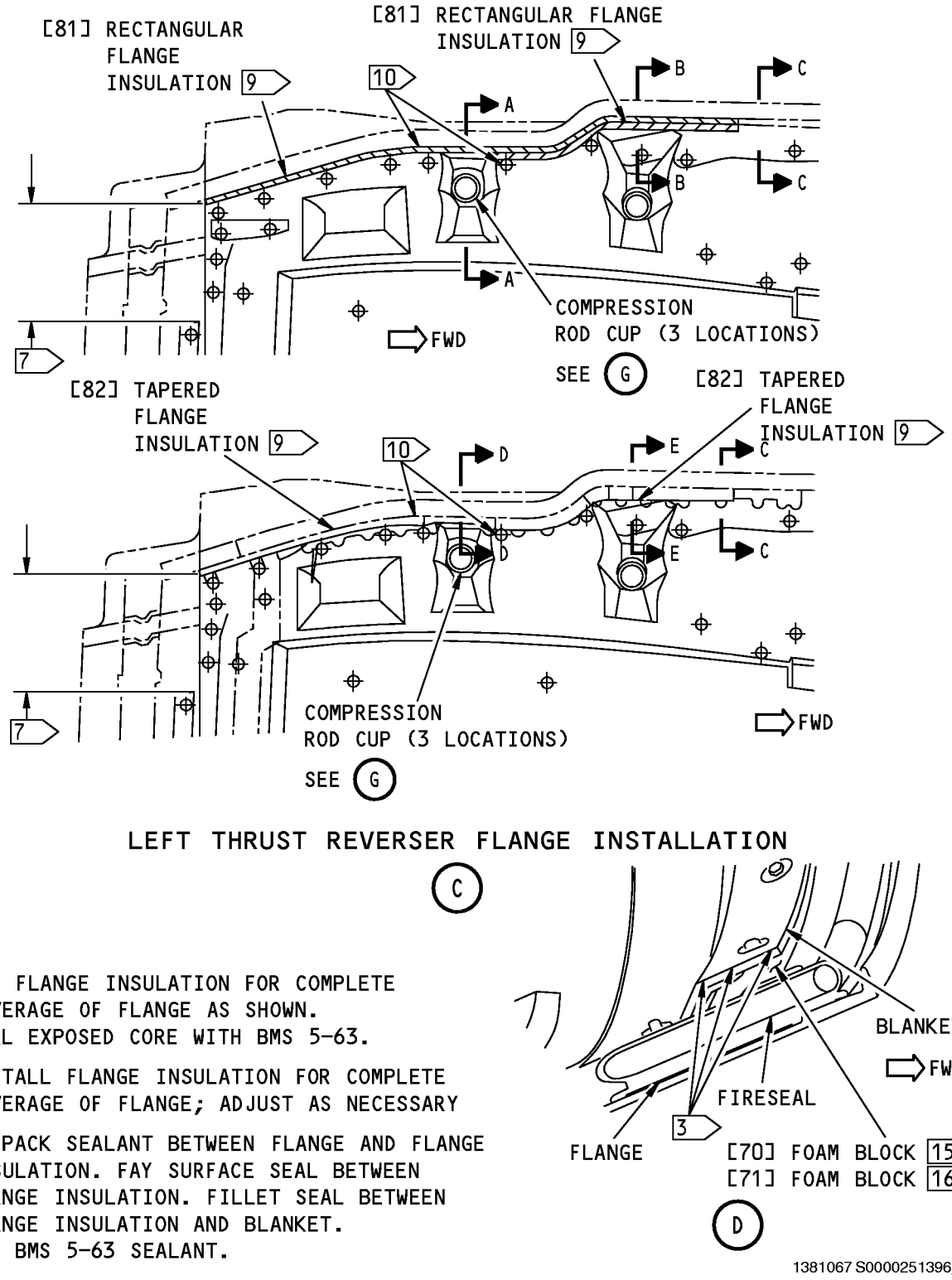
6 NO SEALANT ON DRAINAGE GAP 1.0 - 2.0 INCHES (25.4 - 50.8 mm) LENGTH

7 NO SEALANT ON UPPER AFT BLANKET, 14.3 - 15.3 INCHES (363.2 - 388.6 mm) LENGTH

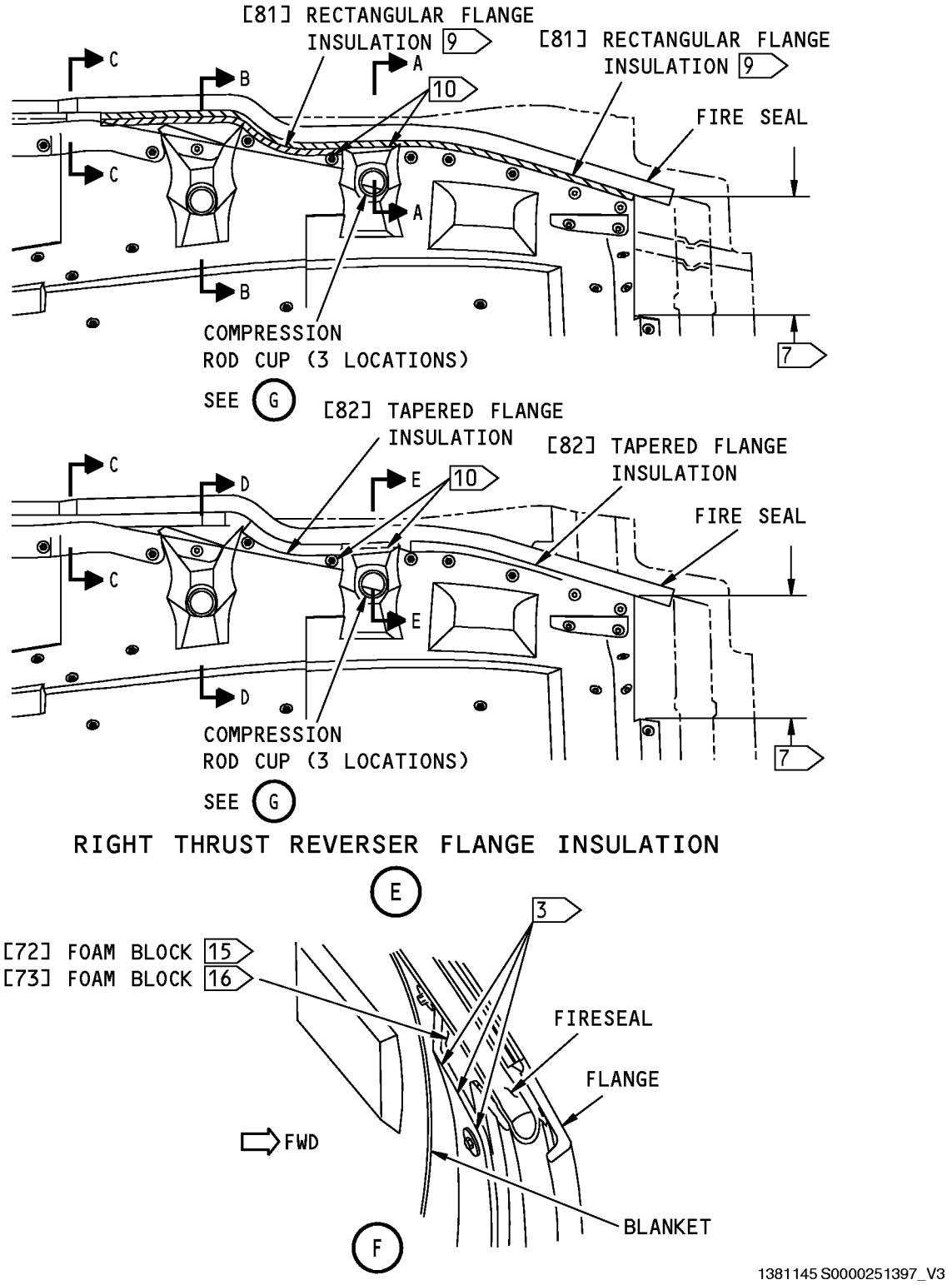
8 FILLET SEAL ENTIRE AFT EDGE AND LOWER EDGE OF BLANKETS TO INNER WALL WITH BMS 5-63; SEE TEXT

1381006 S0000251395_V2

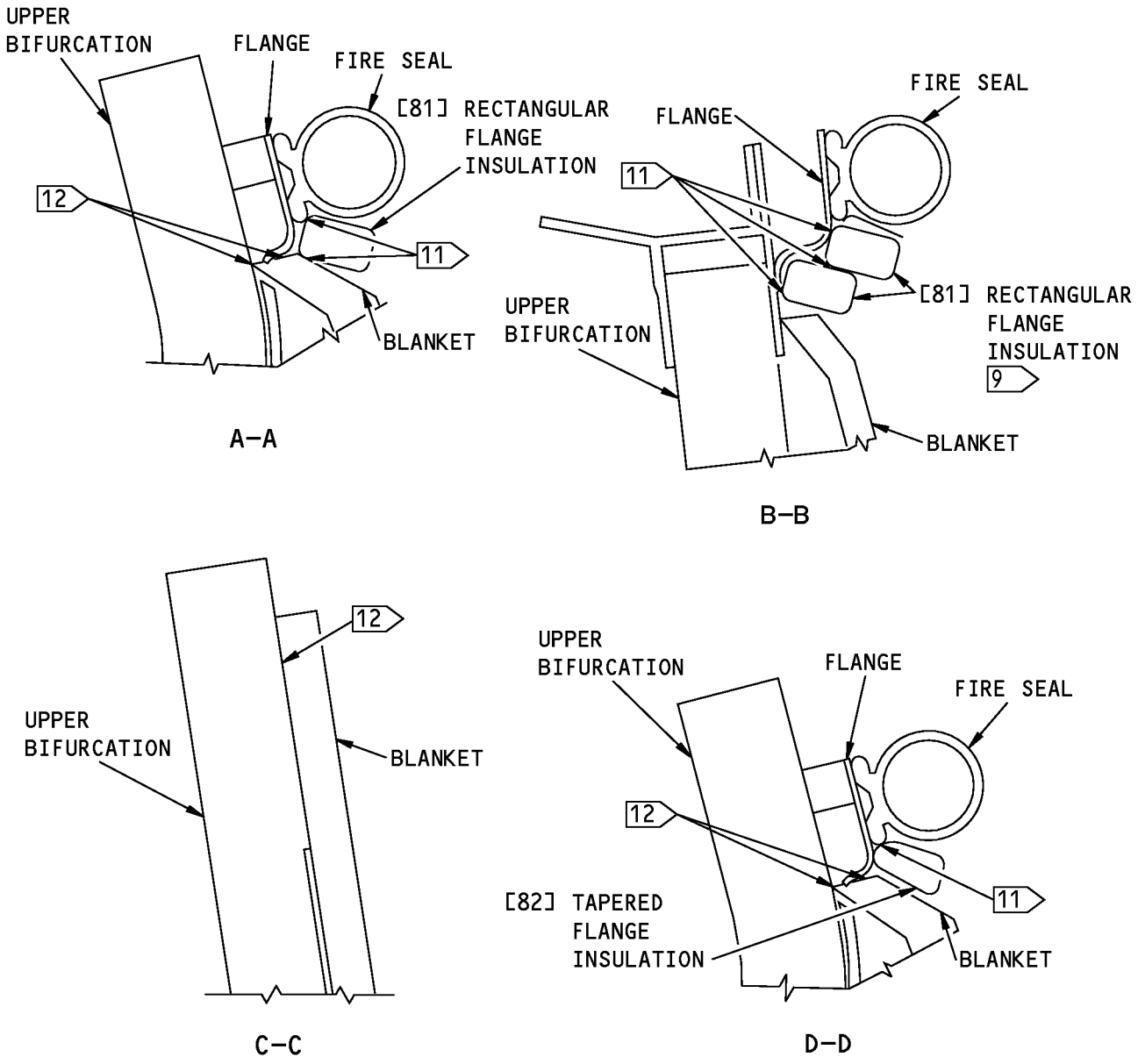
Blanket Sealant Application
Figure 405 (Sheet 2 of 7)/78-31-13-990-817-F00



Blanket Sealant Application
Figure 405 (Sheet 3 of 7)/78-31-13-990-817-F00



Blanket Sealant Application
Figure 405 (Sheet 4 of 7)/78-31-13-990-817-F00

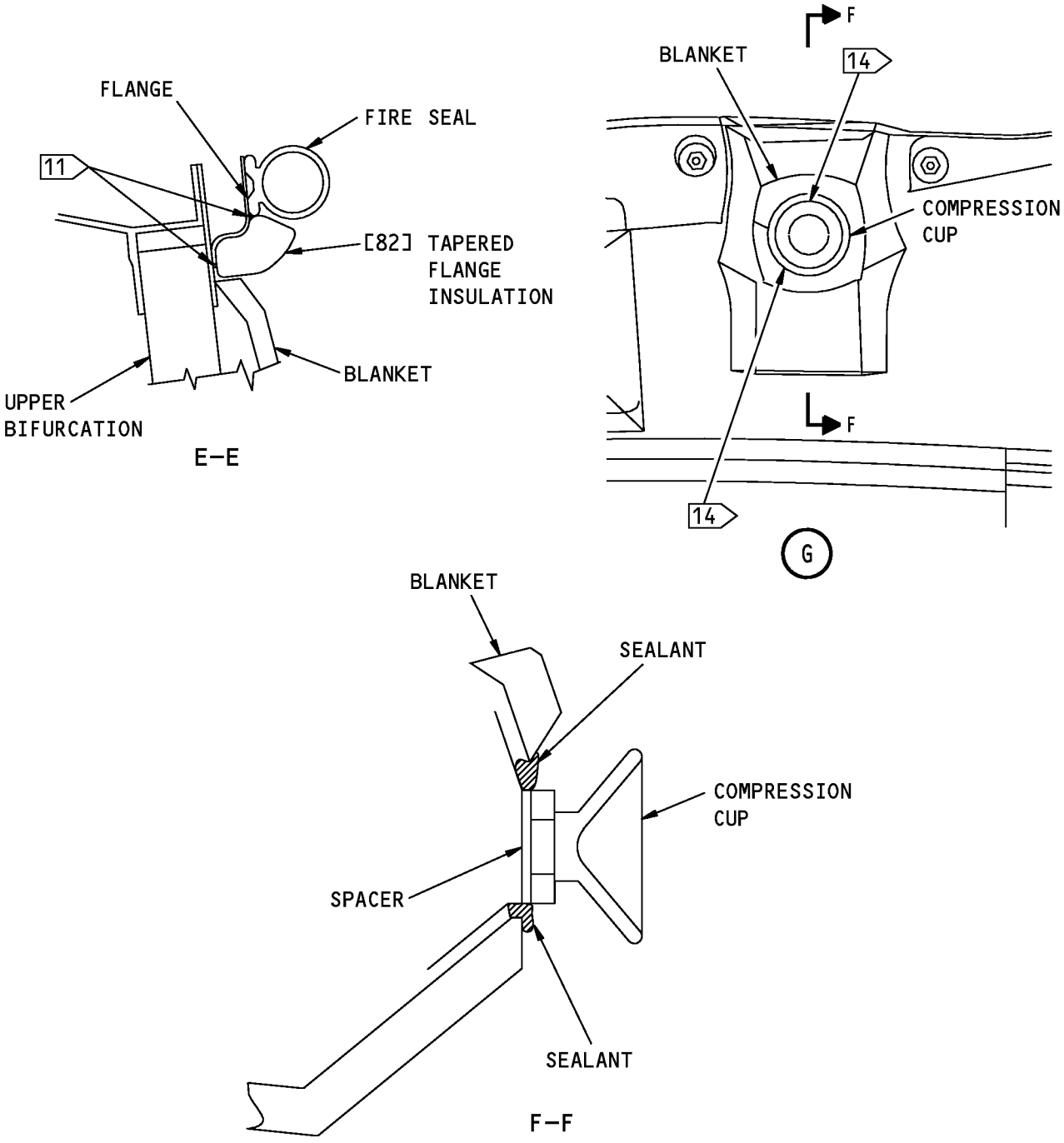


12> FILLET SEAL BETWEEN BLANKET AND INNER WALL; USE BMS 5-63.

13> SEALANT APPLIED FROM UPPER EDGE OF BLANKET TO UPPER EDGE OF UPPER V-BLADE.

1381153 S0000251415_V2

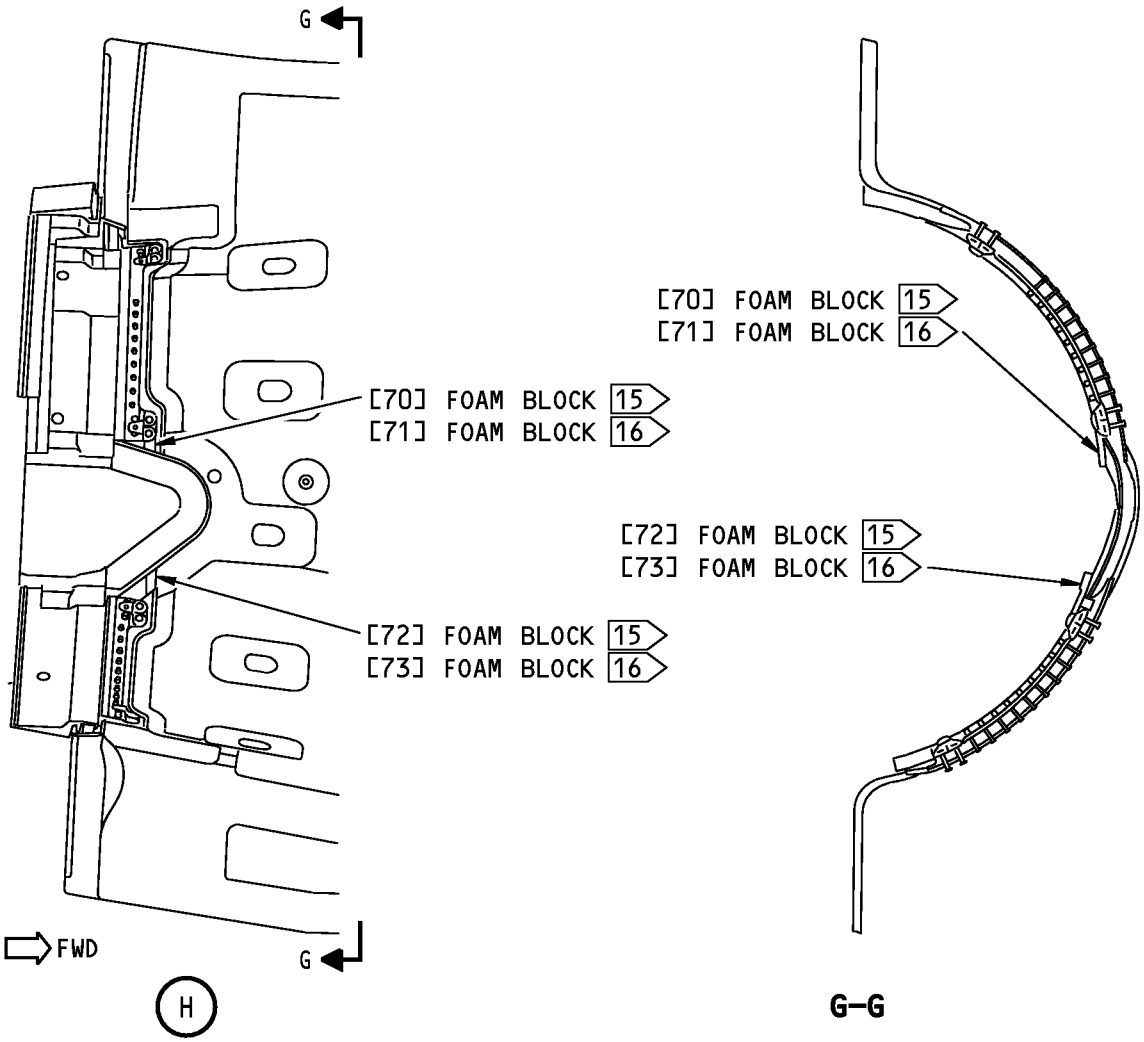
Blanket Sealant Application
Figure 405 (Sheet 5 of 7)/78-31-13-990-817-F00



14 FILLET SEAL BETWEEN BLANKET AND SPACER/COMPRESSION FITTING.

1381159 S0000251416_V3

Blanket Sealant Application
Figure 405 (Sheet 6 of 7)/78-31-13-990-817-F00



15 LEFT INNER WALL
16 RIGHT INNER WALL

1499662 S0000272782_V1

Blanket Sealant Application
Figure 405 (Sheet 7 of 7)/78-31-13-990-817-F00

HAP 021-026, 028-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069

TASK 78-31-13-000-803-F01

4. Insulation Blanket Removal

(Figure 406 and Figure 407)

A. General

(1) This task is for the removal of the insulation blankets from the left and right thrust reverser on an engine.

(2) For this task, the insulation blanket will be referred to as the blanket.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-01-200-801-F00	Thrust Reverser Fan Duct Wall Inspection (P/B 601)

C. Tools/Equipment

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

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic (Part #: ST982, Supplier: 81205, A/P Effectivity: 737-ALL)
STD-549	Knife - Putty, Broad Blade
STD-764	Scraper - Non-metallic

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Removal

SUBTASK 78-31-13-010-005-F01

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Left Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-015-F01

(1) Do these steps to remove the upper blanket [51] from the left thrust reverser:

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully cut or break the sealant bond at these locations:

1) The forward edge of the blanket aft of the fire seal.

a) At the upper bifurcation, the blanket is sealed to the inner wall approximately 0.82 in. (20.83 mm) from the forward edge of the blanket.

2) The blanket cutouts around the three upper compression pads.

3) The upper blanket edge and the inner wall below the horizontal fire seal.

4) The seal between the upper blanket and the inner wall along the entire forward edge of the blanket aft of the upper v-blade.

a) Above the upper v-blade, the blanket is sealed to the inner wall/upper bifurcation approximately 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7], washers [1] and [3].

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(c) Remove the upper blanket [51].

SUBTASK 78-31-13-020-016-F01

(2) Do these steps to remove the lower blanket [52] from the left thrust reverser:

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully cut or break the sealant bond at these locations:

1) The forward edge of the blanket aft of the fire seal.

2) The blanket cutouts around the forward, middle and aft compression pads.

(b) Do this step if the upper blanket [51] was not removed:

1) Remove the nuts [2] and [5], screw [7] and washers [1] and [3] that attach the upper blanket [51] and the lower blanket [52] together to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket off the studs to get access to the lower blanket.

(c) Remove the remaining nuts [2] and [5], screws [4], [6], and [7], and washers [1] and [3] that attach the lower blanket to the inner wall.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(d) Remove the lower blanket [52].

G. Right Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-013-F01

(1) Do these steps to remove the upper blanket [61] from the right thrust reverser:

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully cut or break the sealant bond at these locations:

1) The forward edge of the blanket aft of the fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

2) The blanket cutouts around the three upper compression pads.

3) The upper blanket edge and the inner wall below the horizontal fire seal.

4) The fillet seal between the upper blanket and the inner wall along the entire forward edge of the blanket aft of the upper v-blade.

a) Above the upper v-blade, the blanket is sealed to the inner wall/upper bifurcation approximately 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7], washers [1] and [3].

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(c) Remove the upper blanket [61].

SUBTASK 78-31-13-020-014-F01

(2) Do these steps to remove the lower blanket [62] from the right thrust reverser:

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully break or cut the sealant bond at these locations:

1) The forward edge of the blanket aft of the fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

2) The blanket cutouts around the middle and aft lower compression pads.

3) The fillet seal between the blanket and the inner wall along the entire forward edge of the blanket.

(b) Do this step if the upper blanket [61] was not removed:

1) Remove the nuts [2] and [5], screw [7] and washers [1] and [3] that attach the upper blanket [61] and the lower blanket [62] together to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket off the studs to get access to the lower blanket.

(c) Remove the remaining nuts [2] and [5], screws [4], [6], and [7], and washers [1] and [3] that attach the lower blanket to the inner wall.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(d) Remove the lower blanket [62].

H. Inner Wall Examination

SUBTASK 78-31-13-212-004-F00

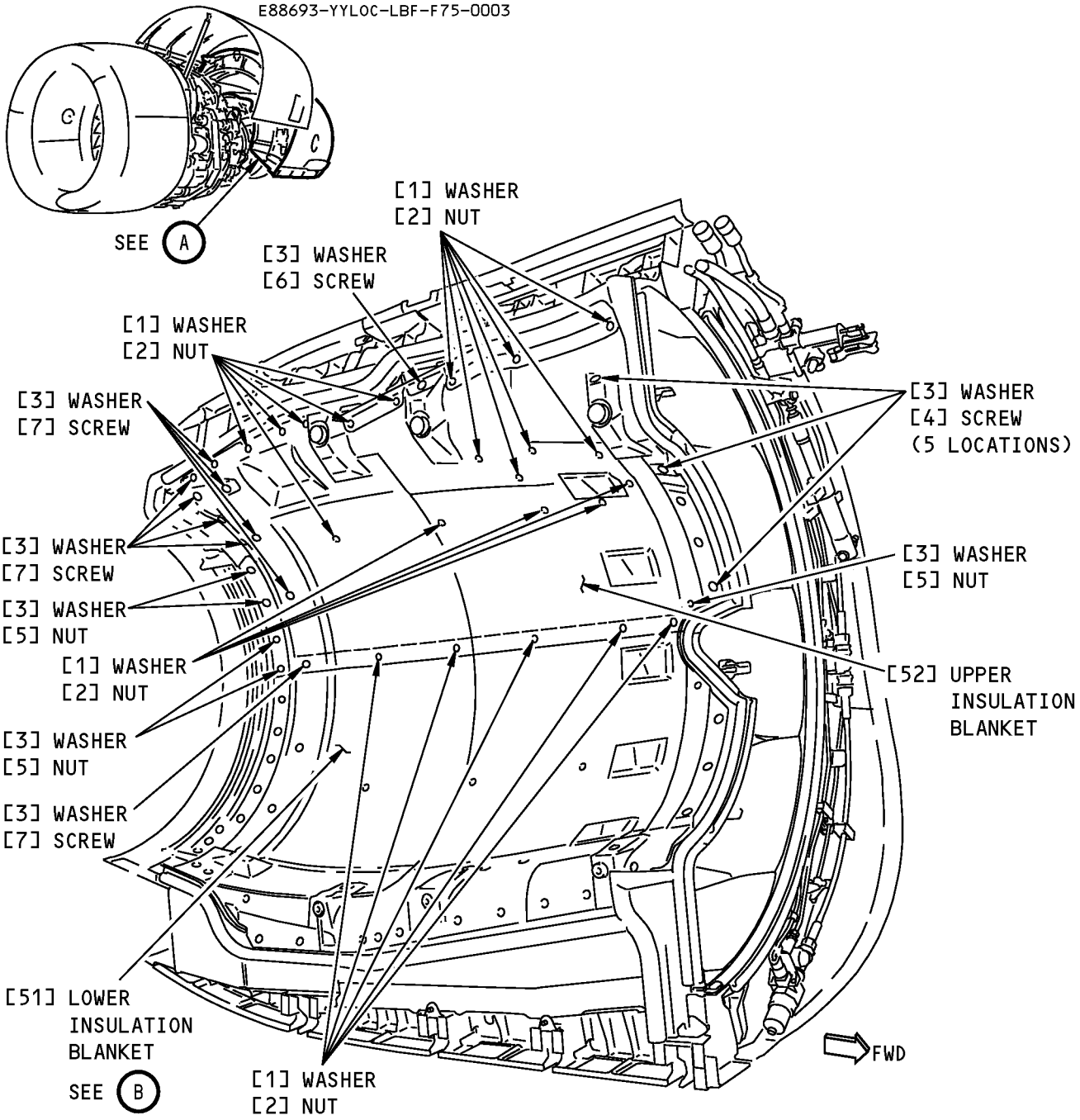
(1) If the insulation blankets are replaced, look for signs of damage, discoloration or a scorched appearance on the inner wall for the area under the blankets.

NOTE: Discoloration could indicate overheat exposure. Discolorations would appear as areas that are of a different color, usually much darker than the original predominant color of the structure or part that is examined. Discoloration areas of a light color (ex. white) surrounded by darkened areas (dark to medium brown) are also areas that indicate overheat exposure. Areas that are not of interest include discolored areas due to oil, fluid, or soil exposure.

(a) If there is damage to the inner wall, do this task: Thrust Reverser Fan Duct Wall Inspection, TASK 78-31-01-200-801-F00.

(b) If the inner wall inspection was done because of a nacelle duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

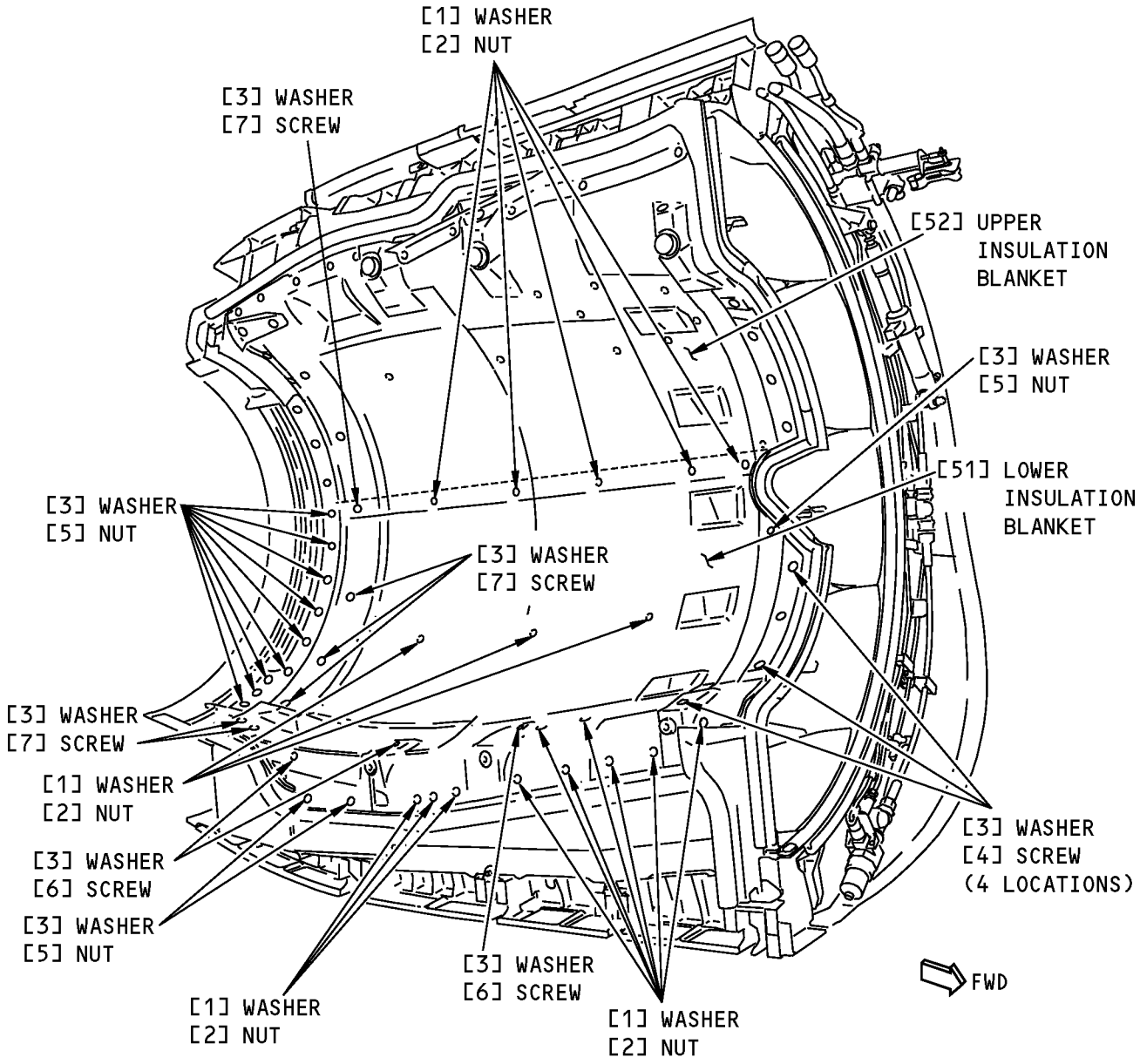
——————— END OF TASK ———————



LEFT THRUST REVERSER UPPER INSULATION BLANKET

A

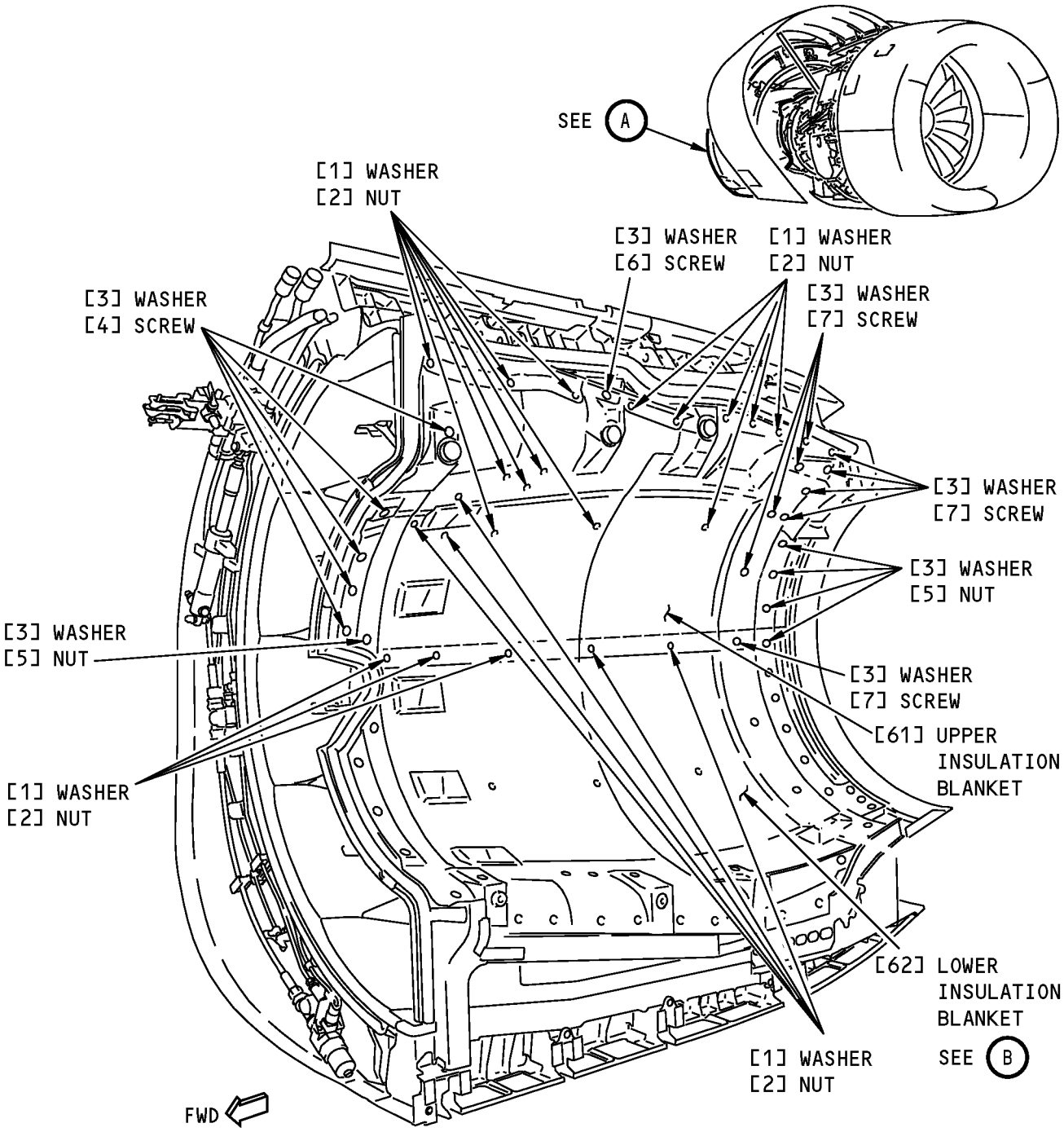
Left Thrust Reverser Insulation Blanket Installation
Figure 406 (Sheet 1 of 2)/78-31-13-990-804-F01



LEFT THRUST REVERSER LOWER INSULATION BLANKET

B

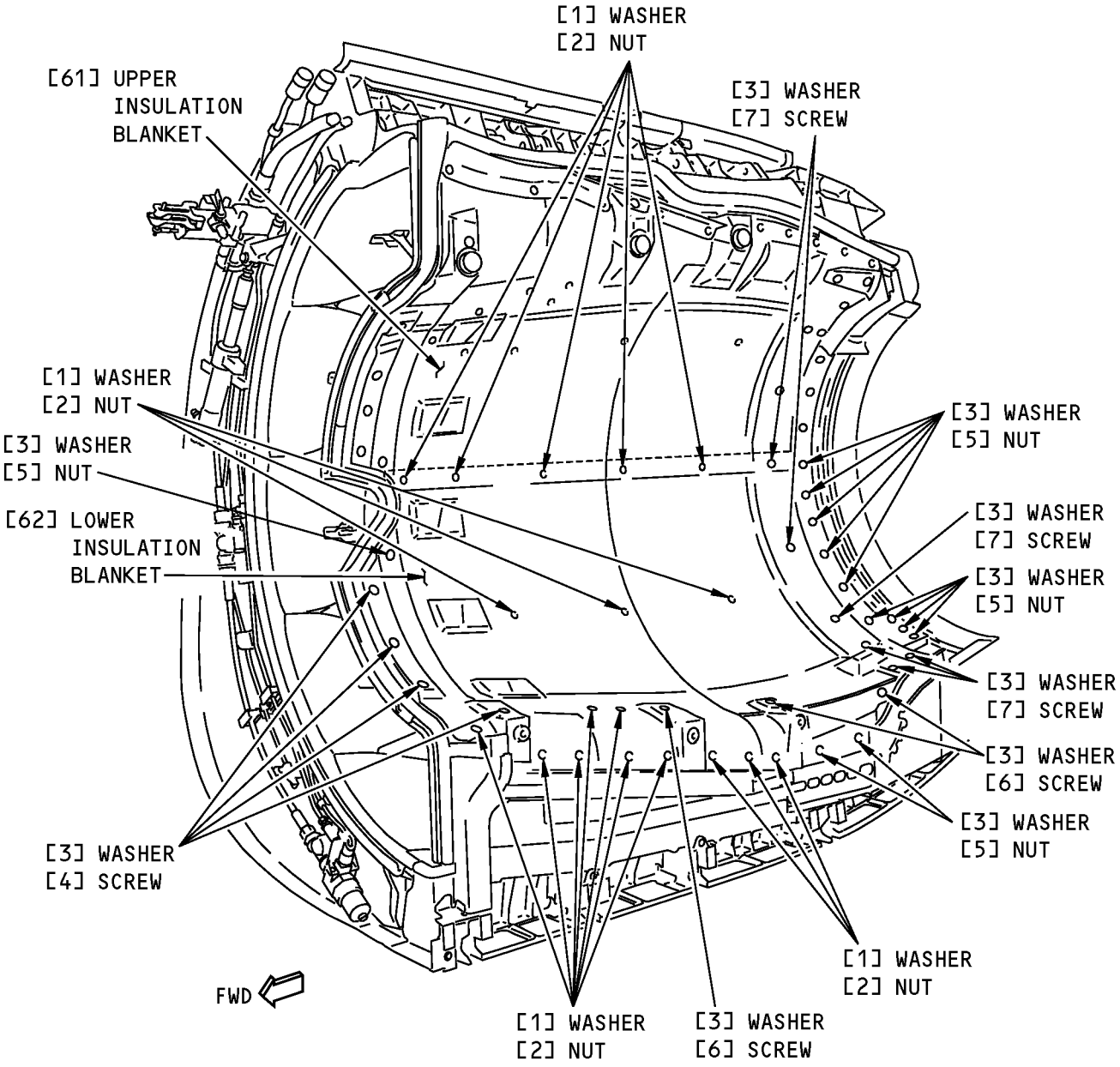
Left Thrust Reverser Insulation Blanket Installation
Figure 406 (Sheet 2 of 2)/78-31-13-990-804-F01



RIGHT THRUST REVERSER UPPER INSULATION BLANKET

A

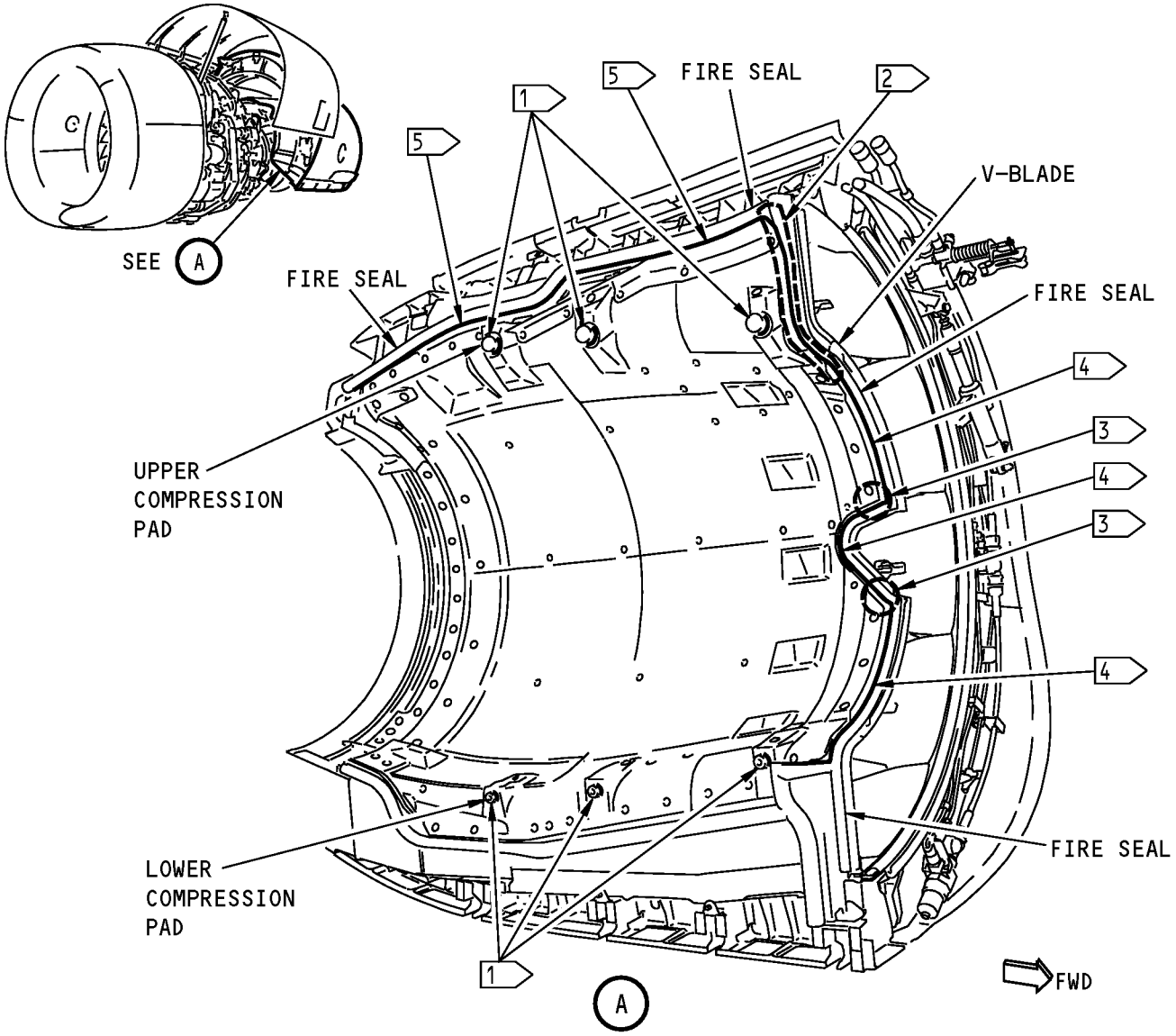
Right Thrust Reverser Insulation Blanket Installation
Figure 407 (Sheet 1 of 2)/78-31-13-990-806-F01



RIGHT THRUST REVERSER LOWER INSULATION BLANKET

B

Right Thrust Reverser Insulation Blanket Installation
Figure 407 (Sheet 2 of 2)/78-31-13-990-806-F01



1 FILLET SEAL GAP BETWEEN BLANKET CUTOUT AND COMPRESSION PAD SPACER WITH RTV 106 SEALANT; SEE TEXT

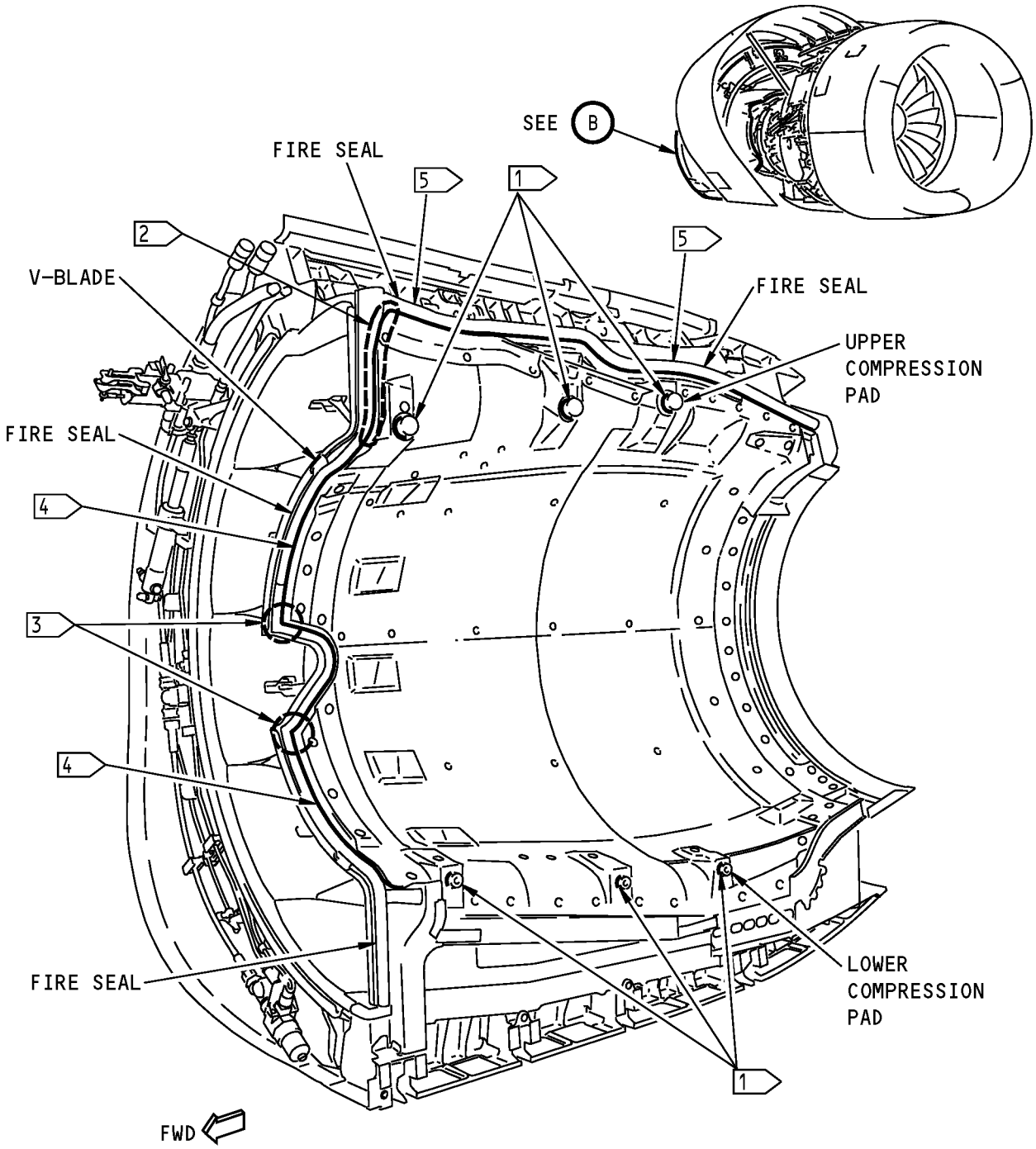
2 SEAL BLANKET TO INNER WALL WITH SEALANT BMS 5-63, 1.0 - 1.5 INCH (12.7-19.0 MM) AFT OF BLANKET FORWARD EDGE. USE PARTING AGENT ON INNER WALL; SEE TEXT

3 GAP BETWEEN BLANKET EDGE AND INNER WALL NOT MORE THAN 0.82 INCH (20.83 MM). SEAL BLANKET EDGE TO INNER WALL FOAM BLOCK; SEE TEXT

4 FILLET SEAL ENTIRE BLANKET FORWARD EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

5 FILLET SEAL ENTIRE BLANKET UPPER EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

Blanket Sealant Application
Figure 408 (Sheet 1 of 2)/78-31-13-990-807-F01



THRUST REVERSER INSULATION BLANKET INSTALLATION

B

Blanket Sealant Application
Figure 408 (Sheet 2 of 2)/78-31-13-990-807-F01

HAP 039-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069 OR POST SB 737-78-1079; HAP 021-026, 028-038 POST SB 737-78-1079

TASK 78-31-13-000-806-F00

5. Insulation Blanket Removal

(Figure 409, Figure 410)

A. General

(1) This task is for the removal of the insulation blankets from the left and right thrust reverser on an engine.

(2) For this task, the insulation blanket will be referred to as the blanket.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-01-200-801-F00	Thrust Reverser Fan Duct Wall Inspection (P/B 601)

C. Tools/Equipment

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

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic (Part #: ST982, Supplier: 81205, A/P Effectivity: 737-ALL)
STD-549	Knife - Putty, Broad Blade
STD-764	Scraper - Non-metallic

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Removal

SUBTASK 78-31-13-010-006-F00

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Left Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-017-F00

(1) Do these steps to remove the upper blanket [51] from the left thrust reverser (Figure 409):

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully cut or break the sealant bond at these locations:

1) The forward edge of the blanket aft of the fire seal.

a) At the upper bifurcation, the blanket is sealed to the inner wall approximately 0.82 in. (20.83 mm) from the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the three upper compression pads.

a) Do not damage the upper compression pads.

3) The upper blanket edge and the inner wall below the horizontal fire seal.

a) Do not damage the composite structure of the inner wall.

4) The seal between the upper blanket and the inner wall along the entire forward edge of the blanket aft of the upper v-blade.

a) Above the upper v-blade, the blanket is sealed to the inner wall/upper bifurcation approximately 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

5) The fillet seal between the flange insulation and the fire seal (Figure 411).

NOTE: The flange insulation is bonded with sealant to a metal flange under the metal retainer for the fire seal. There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies can be attached to cover the flange on the upper bifurcation. One tapered flange insulation can be attached to cover the flange on the upper bifurcation. The single tapered flange insulation is optional to the two rectangular flange insulations.

6) The fillet seal between the flange insulation and the blanket.

7) The seal between the flange insulation and the upper bifurcation.

8) The fillet seal between the blanket and the inner wall along the aft edge of the blanket.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7], washers [1] and [3].

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(c) Remove the upper blanket [51].

(d) Remove all old sealant on the flange and the fire seal retainer.

SUBTASK 78-31-13-020-018-F00

(2) Do these steps to remove the lower blanket [52] from the left thrust reverser (Figure 409):

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully cut or break the sealant bond at these locations:

1) The forward edge of the blanket aft of the fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the forward, middle and aft compression pads.

3) The fillet seal between the blanket and the inner wall along the entire forward edge of the blanket.

4) The fillet seal between the blanket and the inner wall along the entire aft and lower edge of the blanket (Figure 411).

(b) Do this step if the upper blanket [51] was not removed:

1) Remove the nuts [2] and [5], screw [7] and washers [1] and [3] that attach the upper blanket [51] and the lower blanket [52] together to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket off the studs to get access to the lower blanket.

(c) Remove the remaining nuts [2] and [5], screws [4], [6], and [7], and washers [1] and [3] that attach the lower blanket to the inner wall.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(d) Remove the lower blanket [52].

SUBTASK 78-31-13-020-037-F00

(3) Examine the upper foam block [70] and the lower foam block [72] that is next to the v-blade fittings on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the blanket and the sealant is removed. The foam block is made of a closed cell, silicone foam rubber.

(a) Look for damage or missing pieces on the foam block.

(b) If it is necessary, replace the foam block.

1) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

G. Right Thrust Reverser Blanket Removal

SUBTASK 78-31-13-020-019-F00

(1) Do these steps to remove the upper blanket [61] from the right thrust reverser (Figure 410):

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully cut or break the sealant bond at these locations:

1) The forward edge of the blanket aft of the bulb-type fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the three upper compression pads.

a) Do not damage the upper compression pads.

3) The upper blanket edge and the inner wall below the horizontal fire seal.

a) Do not damage the composite structure of the inner wall.

4) The fillet seal between the upper blanket and the inner wall along the entire forward edge of the blanket aft of the upper v-blade.

a) Above the upper v-blade, the blanket is sealed to the inner wall/upper bifurcation approximately 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

5) The fillet seal between the flange insulation and the fire seal (Figure 411).

NOTE: The flange insulation is bonded with sealant to a metal flange under the metal retainer for the fire seal. There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies can be attached to cover the flange on the upper bifurcation. One tapered flange insulation can be attached to cover the flange on the upper bifurcation. The single tapered flange insulation is optional to the two rectangular flange insulations.

6) The fillet seal between the flange insulation and the blanket.

7) The seal between the flange insulation and the upper bifurcation.

8) The fillet seal between the blanket and the inner wall along the aft edge of the blanket.

(b) Remove the nuts [2] and [5], screws [4], [6] and [7], washers [1] and [3].

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(c) Remove the upper blanket [61].

(d) Remove all old sealant on the flange and the fire seal retainer.

SUBTASK 78-31-13-020-020-F00

(2) Do these steps to remove the lower blanket [62] from the right thrust reverser (Figure 410):

(a) Use a sealant removal tool, SPL-768 or non-metallic scraper, STD-764 or very carefully with a broad blade putty knife, STD-549 to carefully break or cut the sealant bond at these locations:

1) The forward edge of the blanket aft of the fire seal.

a) At the middle cutout, the sealant is applied between the blanket edge and the inner wall where the blanket edge is not more than 0.82 in. (20.83 mm) from the inner wall along the forward edge of the blanket.

b) Do not damage the composite structure of the inner wall.

2) The blanket cutouts around the forward, middle and aft lower compression pads.

3) The fillet seal between the blanket and the inner wall along the entire forward edge of the blanket.

4) The fillet seal between the blanket and the inner wall along the entire aft and lower edge of the blanket (Figure 411).

(b) Do this step if the upper blanket [61] was not removed:

1) Remove the nuts [2] and [5], screw [7] and washers [1] and [3] that attach the upper blanket [61] and the lower blanket [62] together to the inner wall.

NOTE: The lower edge of the upper blanket goes over the upper edge of the lower blanket to make an overlap.

2) Move the lower edge of the upper blanket off the studs to get access to the lower blanket.

(c) Remove the remaining nuts [2] and [5], screws [4], [6], and [7], and washers [1] and [3] that attach the lower blanket to the inner wall.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(d) Remove the lower blanket [62].

SUBTASK 78-31-13-020-038-F00

(3) Examine the upper foam block [71] and the lower foam block [73] that is next to the v-blade fittings on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the blanket and the sealant is removed. The foam block is made of a closed cell, silicone foam rubber.

(a) Look for damage or missing pieces on the foam block.

(b) If it is necessary, replace the foam block.

1) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

H. Inner Wall Examination

SUBTASK 78-31-13-212-005-F00

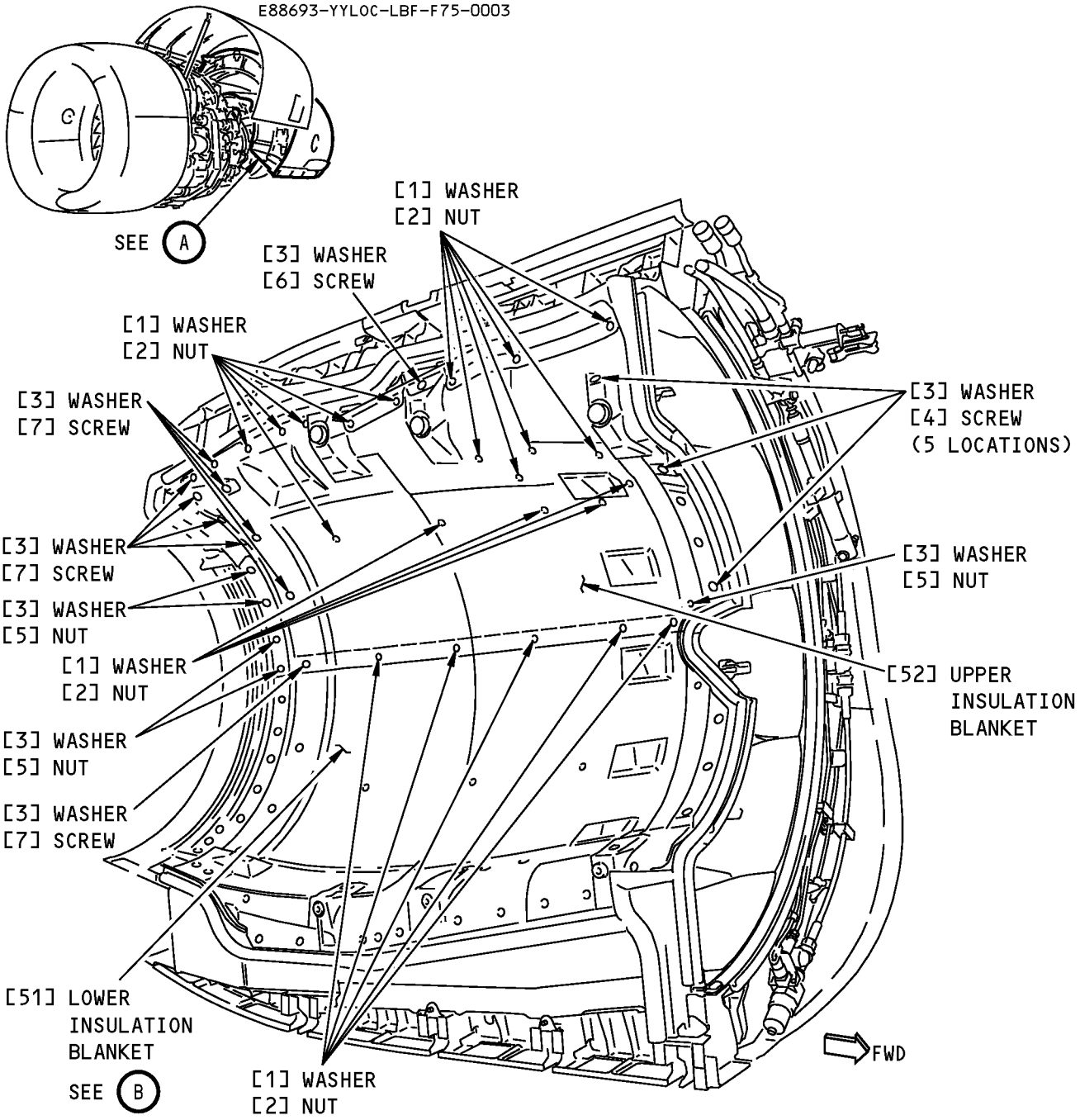
(1) If the insulation blankets are replaced, look for signs of damage, discoloration or a scorched appearance on the inner wall for the area under the blankets.

NOTE: Discoloration could indicate overheat exposure. Discolorations would appear as areas that are of a different color, usually much darker than the original predominant color of the structure or part that is examined. Discoloration areas of a light color (ex. white) surrounded by darkened areas (dark to medium brown) are also areas that indicate overheat exposure. Areas that are not of interest include discolored areas due to oil, fluid, or soil exposure.

(a) If there is damage to the inner wall, do this task: Thrust Reverser Fan Duct Wall Inspection, TASK 78-31-01-200-801-F00.

(b) If the inner wall inspection was done because of a nacelle duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

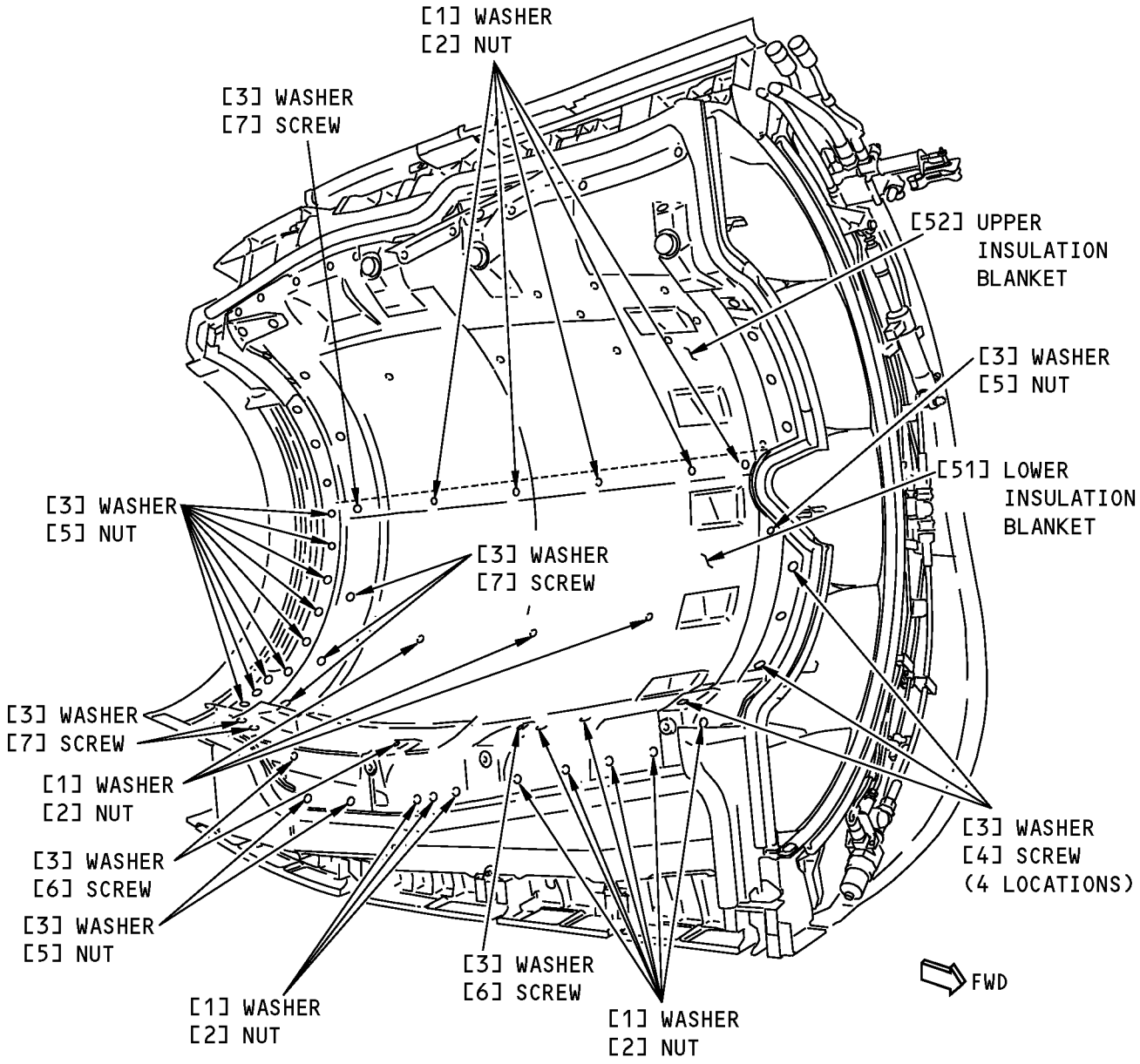
——————— END OF TASK ———————



LEFT THRUST REVERSER UPPER INSULATION BLANKET

A

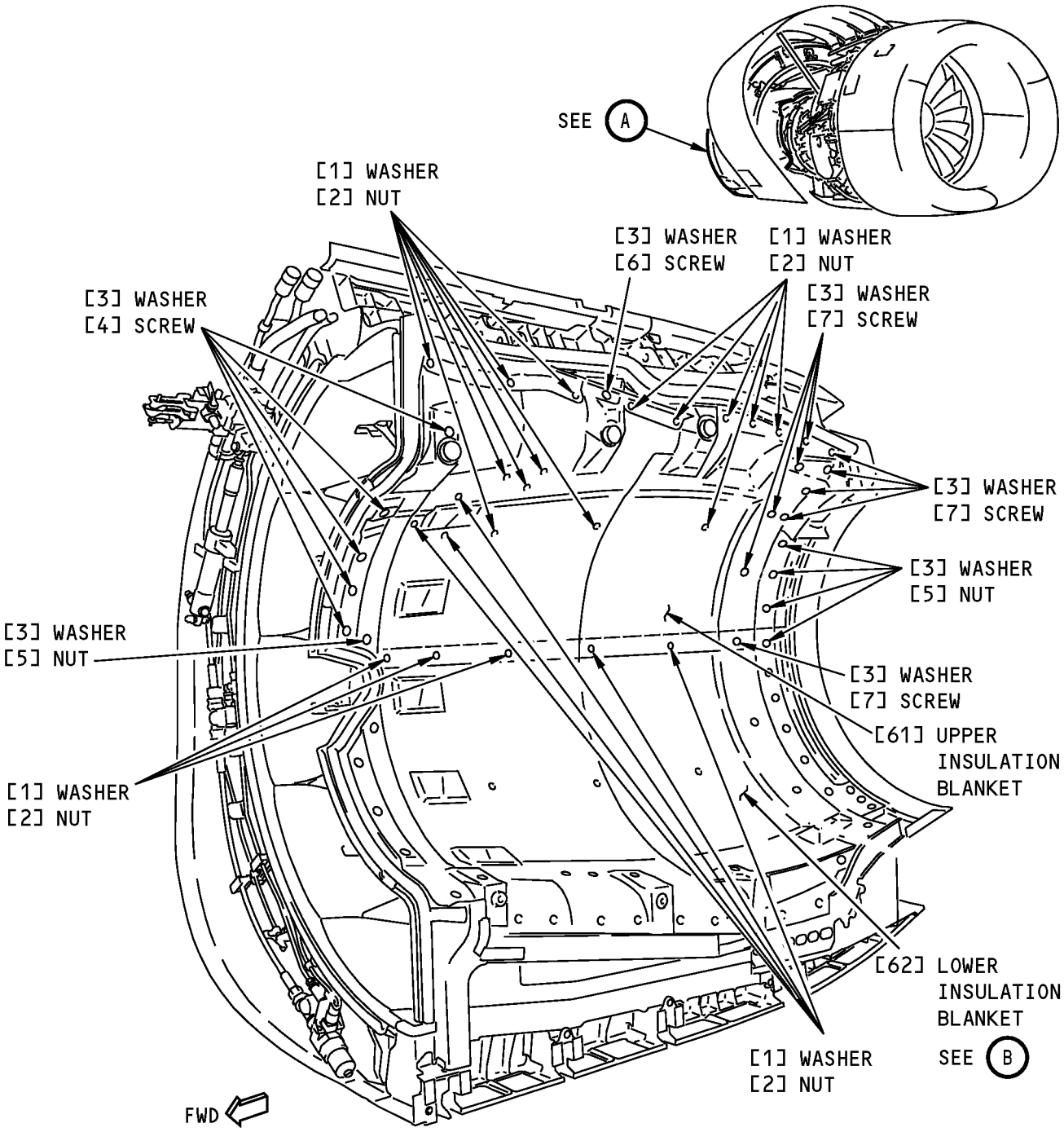
Left Thrust Reverser Insulation Blanket Installation
Figure 409 (Sheet 1 of 2)/78-31-13-990-812-F00



LEFT THRUST REVERSER LOWER INSULATION BLANKET

B

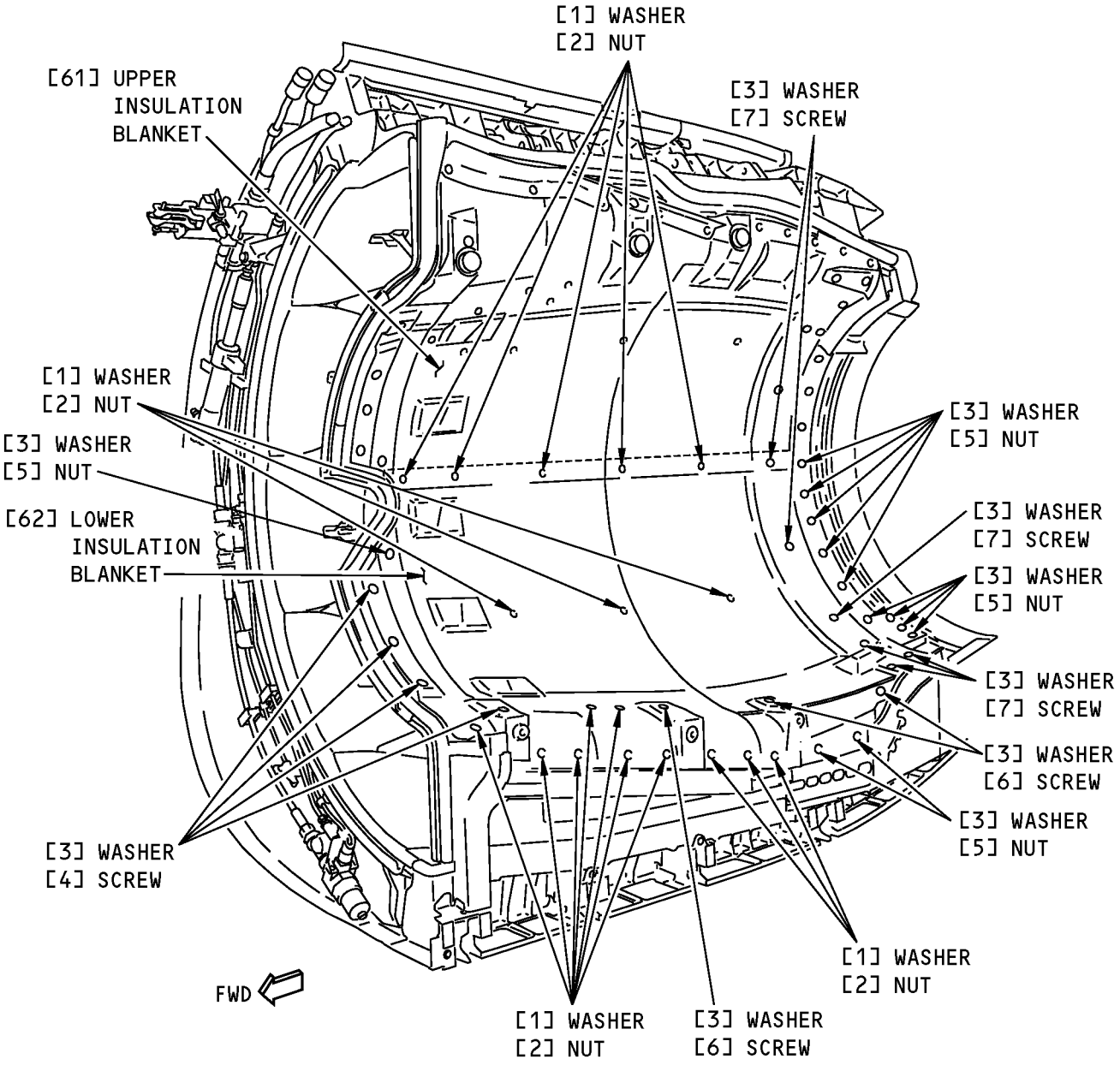
Left Thrust Reverser Insulation Blanket Installation
Figure 409 (Sheet 2 of 2)/78-31-13-990-812-F00



RIGHT THRUST REVERSER UPPER INSULATION BLANKET

A

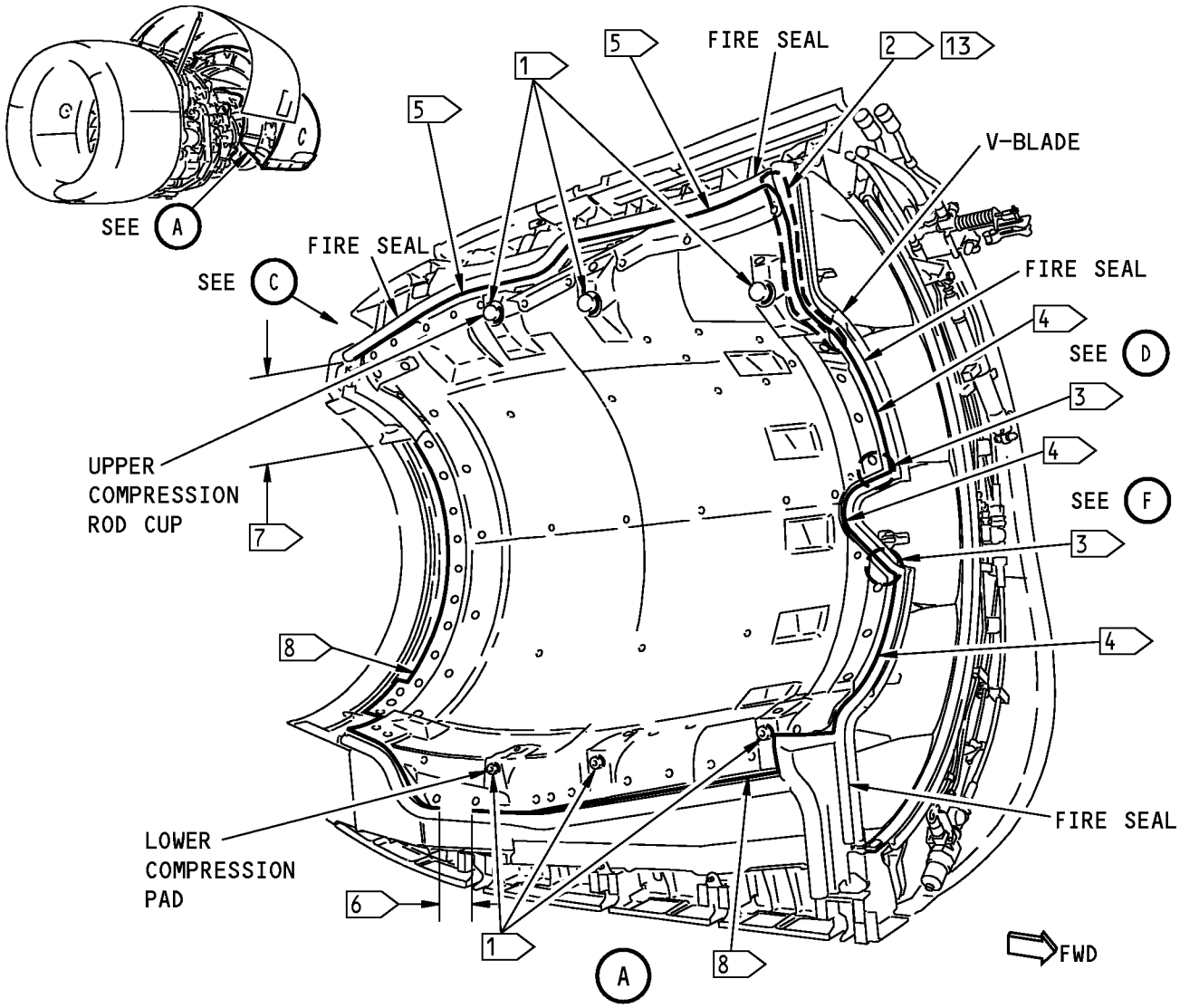
Right Thrust Reverser Insulation Blanket Installation
Figure 410 (Sheet 1 of 2)/78-31-13-990-813-F00



RIGHT THRUST REVERSER LOWER INSULATION BLANKET

B

Right Thrust Reverser Insulation Blanket Installation
Figure 410 (Sheet 2 of 2)/78-31-13-990-813-F00



1 FILLET SEAL GAP BETWEEN BLANKET CUTOUT AND COMPRESSION PAD SPACER WITH RTV 106 SEALANT; SEE TEXT

2 SEAL BLANKET TO INNER WALL WITH SEALANT BMS 5-63, 1.0 - 1.5 INCHES (12.7-19.0 mm) AFT OF BLANKET FORWARD EDGE. USE PARTING AGENT ON INNER WALL; SEE TEXT

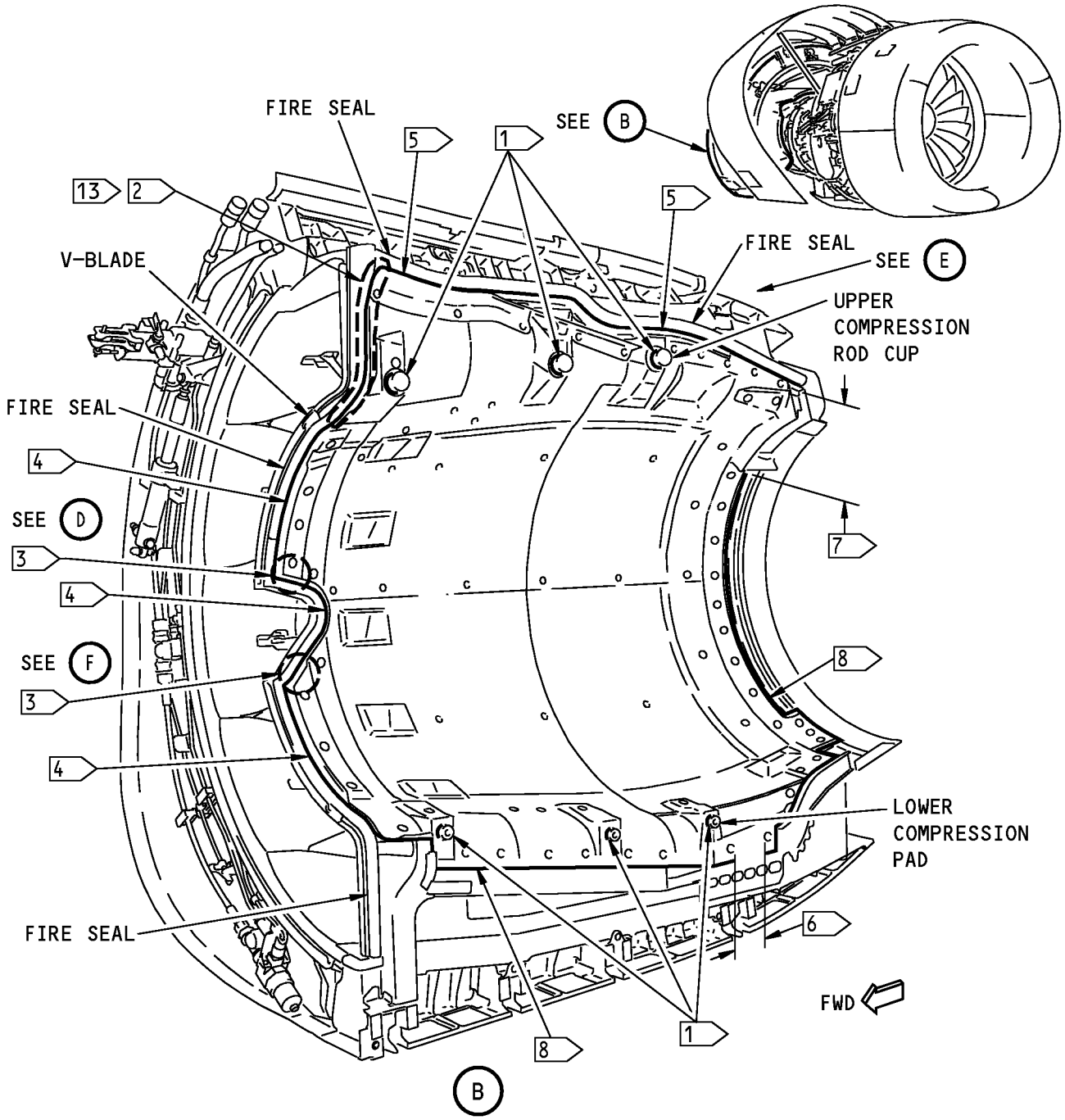
3 GAP BETWEEN BLANKET EDGE AND INNER WALL NOT MORE THAN 0.82 INCH (20.83 mm). SEAL BLANKET EDGE TO INNER WALL FOAM BLOCK; SEE TEXT

4 FILLET SEAL ENTIRE BLANKET FORWARD EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

5 FILLET SEAL ENTIRE BLANKET UPPER EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

1380845 S0000251394_V2

Blanket Sealant Application
Figure 411 (Sheet 1 of 7)/78-31-13-990-814-F00



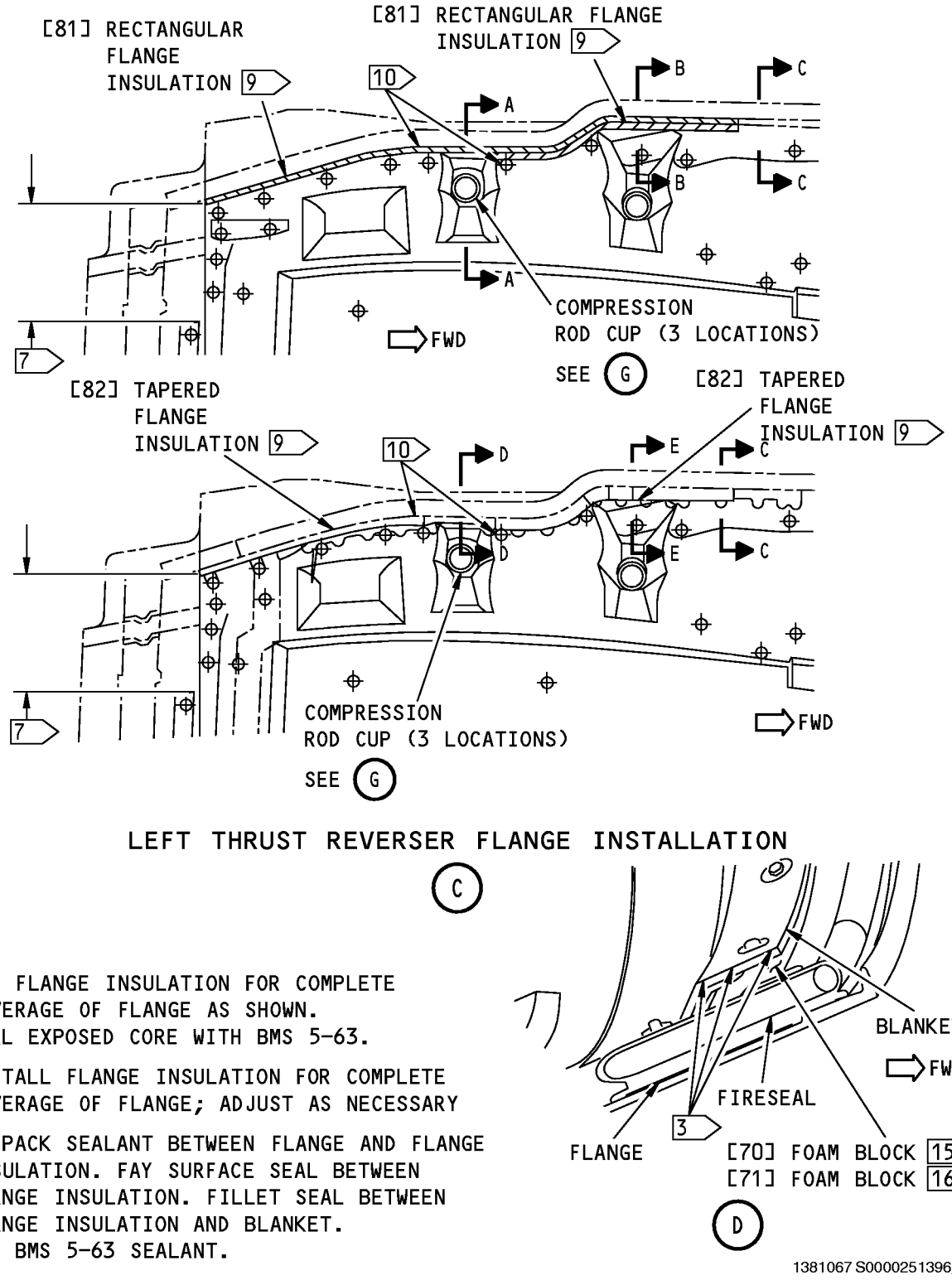
6 NO SEALANT ON DRAINAGE GAP 1.0 - 2.0 INCHES (25.4 - 50.8 mm) LENGTH

7 NO SEALANT ON UPPER AFT BLANKET, 14.3 - 15.3 INCHES (363.2 - 388.6 mm) LENGTH

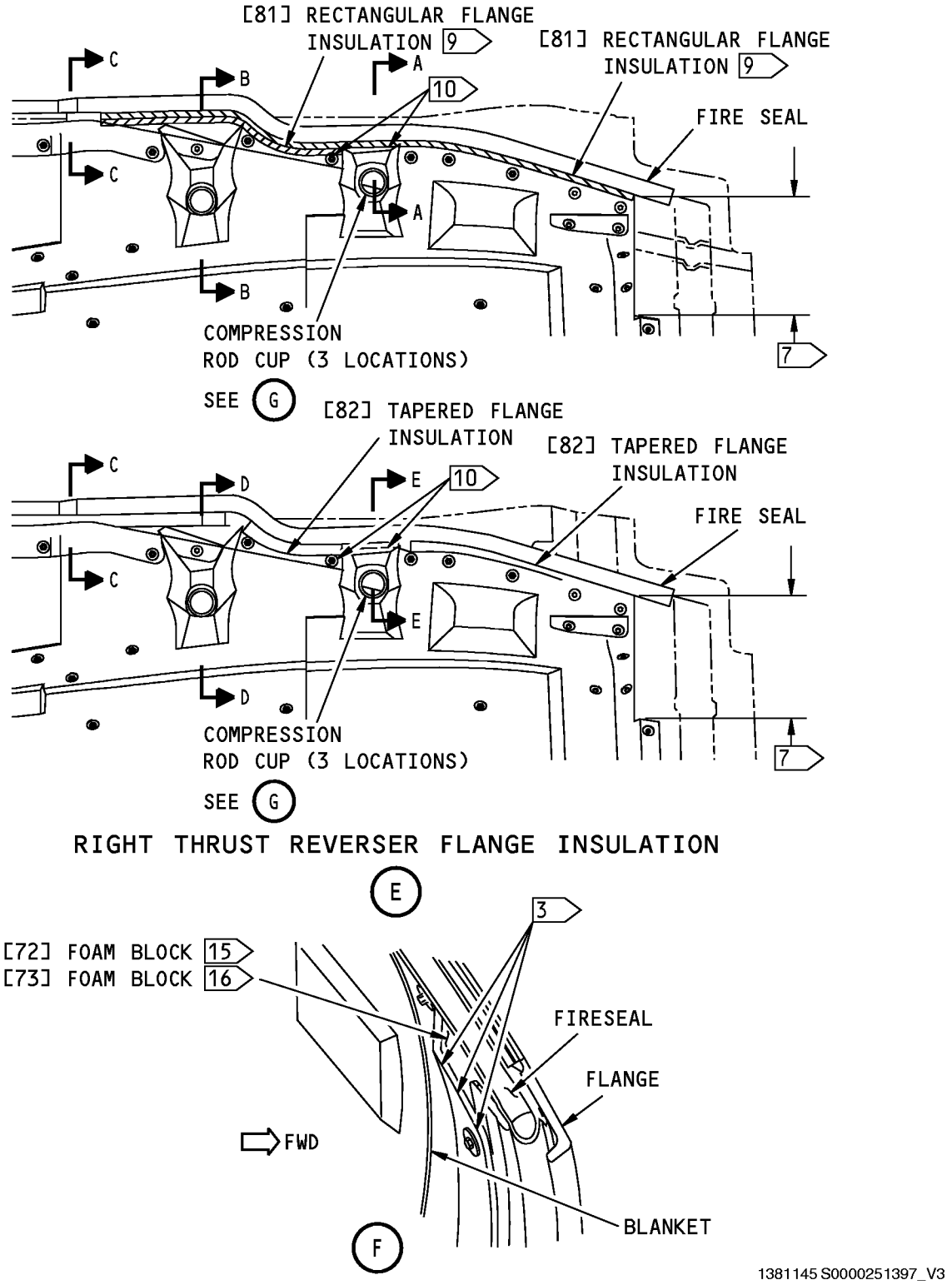
8 FILLET SEAL ENTIRE AFT EDGE AND LOWER EDGE OF BLANKETS TO INNER WALL WITH BMS 5-63; SEE TEXT

1381006 S0000251395_V2

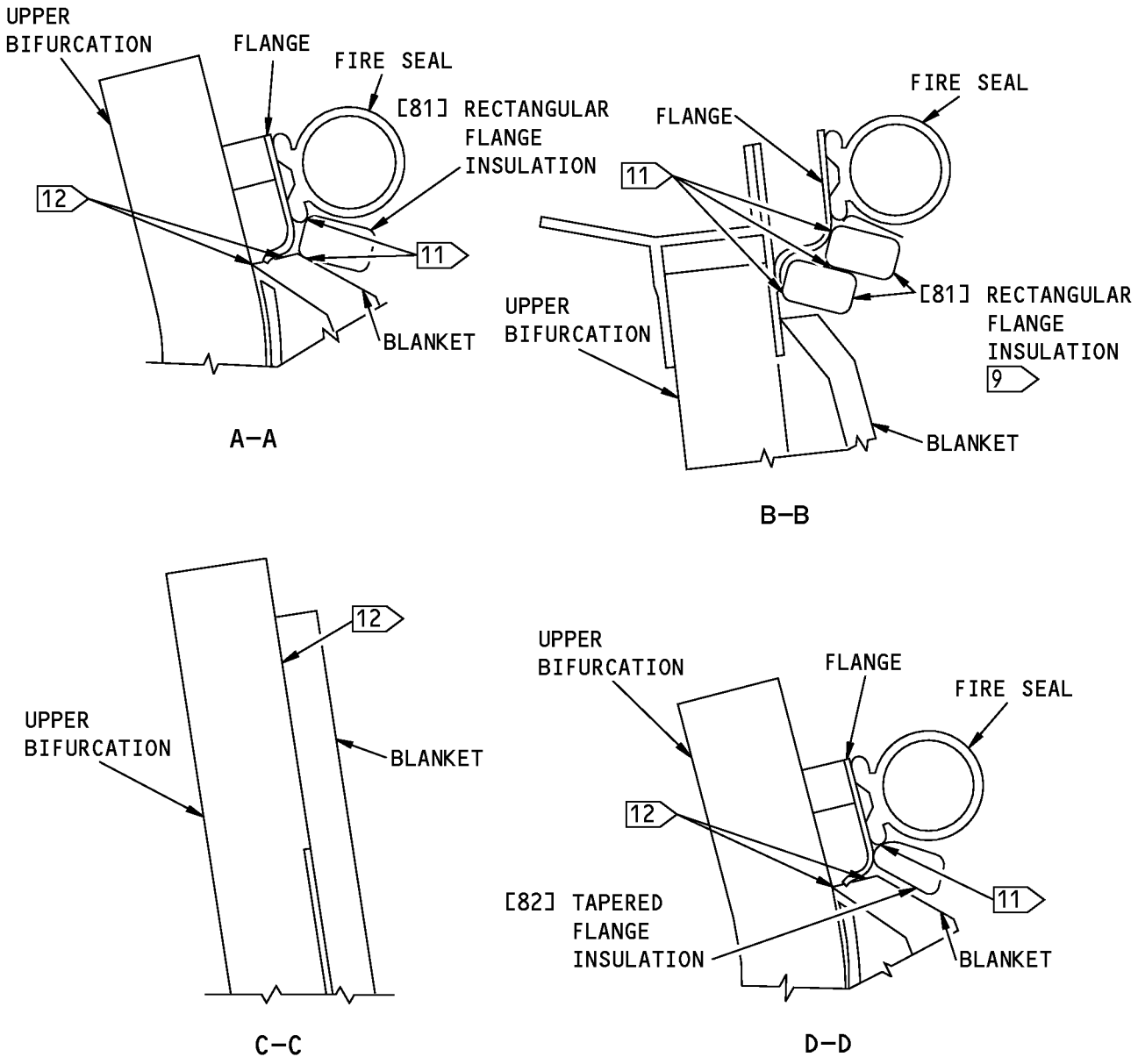
Blanket Sealant Application
Figure 411 (Sheet 2 of 7)/78-31-13-990-814-F00



Blanket Sealant Application
Figure 411 (Sheet 3 of 7)/78-31-13-990-814-F00



Blanket Sealant Application
Figure 411 (Sheet 4 of 7)/78-31-13-990-814-F00

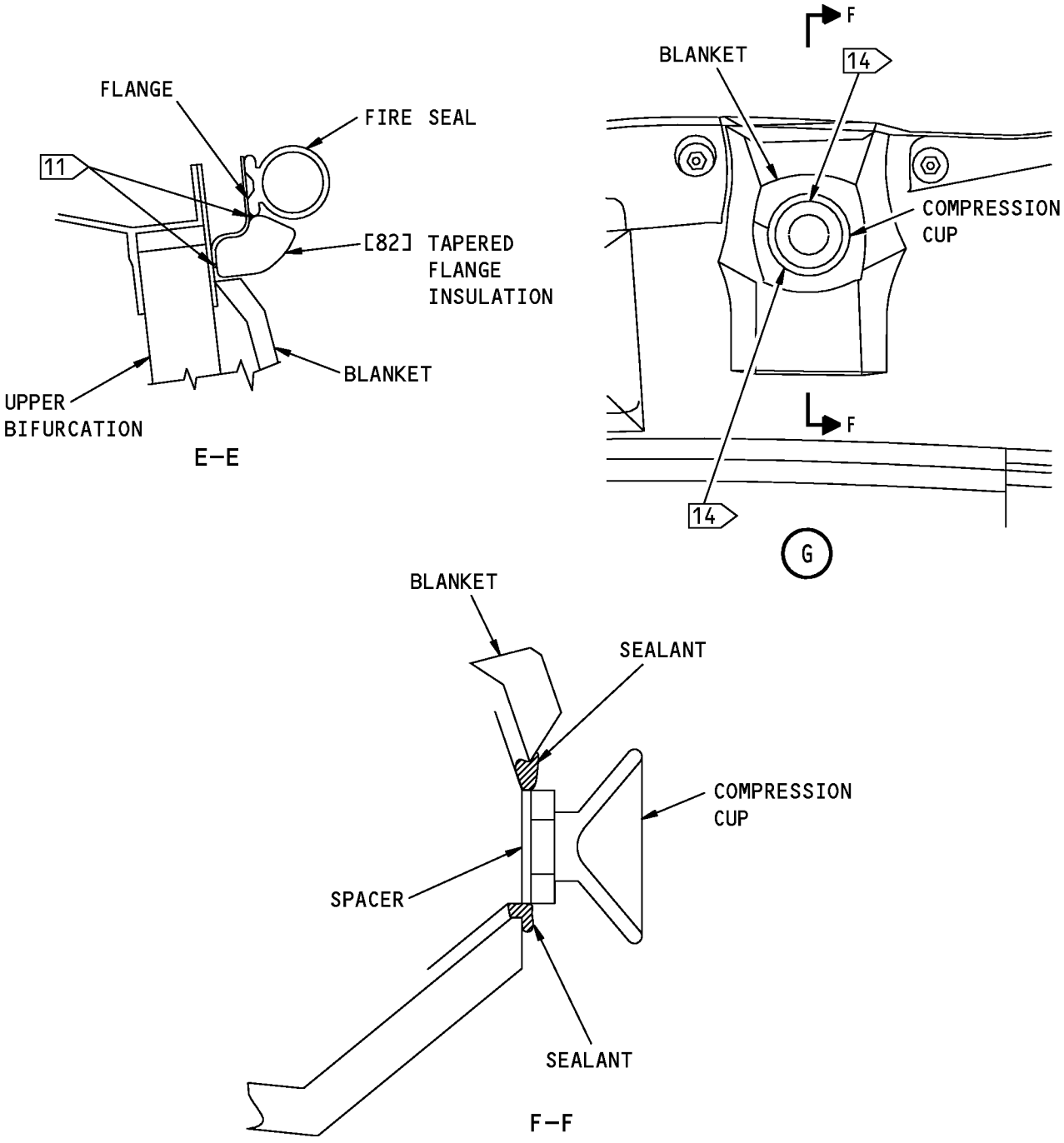


12> FILLET SEAL BETWEEN BLANKET AND INNER WALL; USE BMS 5-63.

13> SEALANT APPLIED FROM UPPER EDGE OF BLANKET TO UPPER EDGE OF UPPER V-BLADE.

1381153 S0000251415_V2

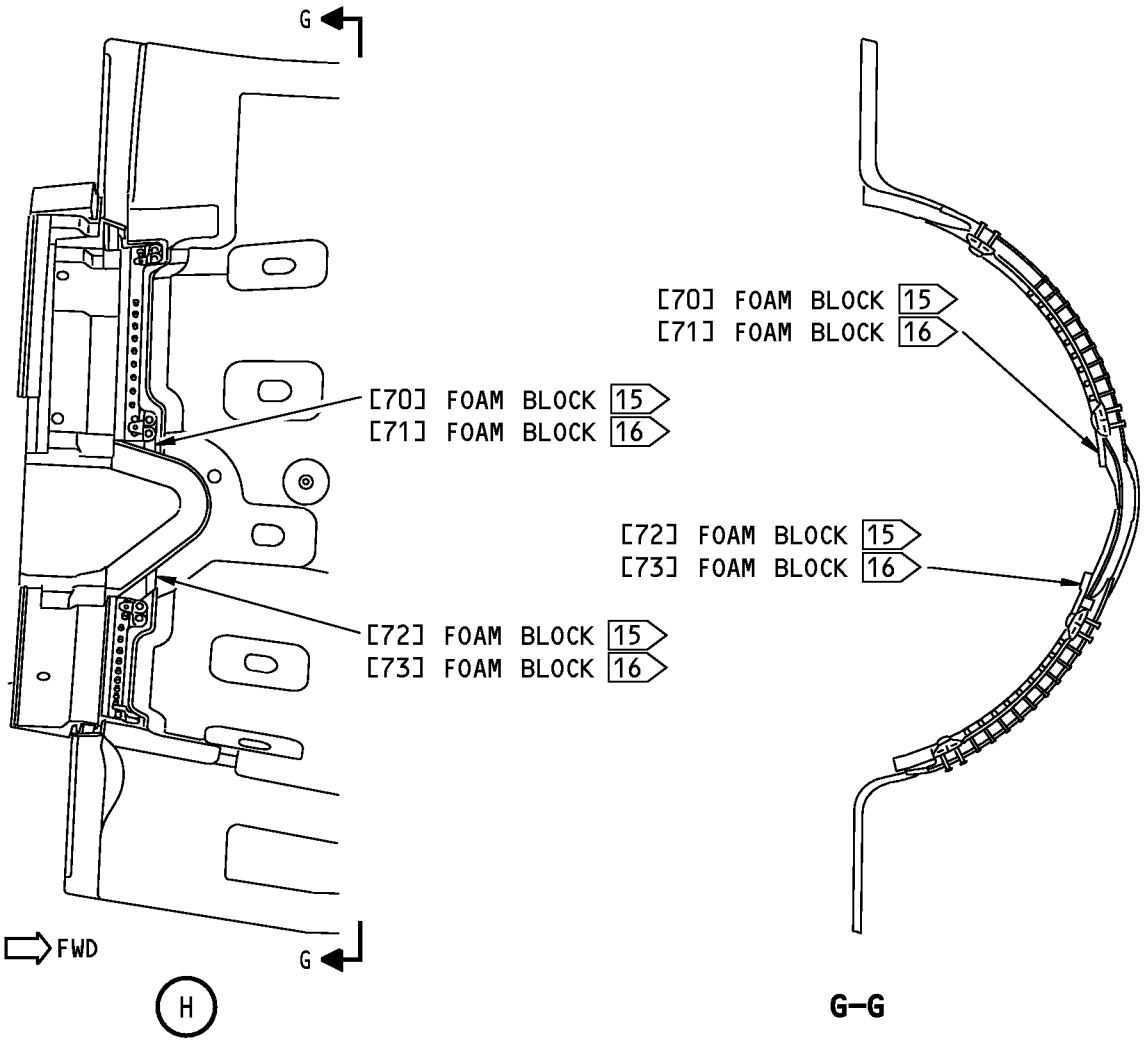
Blanket Sealant Application
Figure 411 (Sheet 5 of 7)/78-31-13-990-814-F00



14 FILLET SEAL BETWEEN BLANKET AND SPACER/COMPRESSION FITTING.

1381159 S0000251416_V3

Blanket Sealant Application
Figure 411 (Sheet 6 of 7)/78-31-13-990-814-F00



15 LEFT INNER WALL
16 RIGHT INNER WALL

1499662 S0000272782_V1

Blanket Sealant Application
Figure 411 (Sheet 7 of 7)/78-31-13-990-814-F00

HAP 039-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069 OR POST SB 737-78-1079; HAP 021-026, 028-038 POST SB 737-78-1079 (Continued)

HAP ALL

TASK 78-31-13-400-801-F00

6. Insulation Blanket Installation

(Figure 401), (Figure 402)

A. General

(1) This task is for the installation of the insulation blanket on the left and right thrust reverser on an engine.

(2) For this task, the insulation blanket will be referred to as the blanket.

B. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-766	Gun - Sealant

D. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010, Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Blanket	78-31-13-01-050	HAP 001-013, 015-026, 028-030
		78-31-13-02-065	HAP ALL
9	Blanket	78-31-13-01-060	HAP 001-013, 015-026, 028-030
		78-31-13-02-055	HAP ALL
31	Blanket	78-31-13-02-050	HAP ALL
32	Blanket	78-31-13-01-065	HAP 001-013, 015-026, 028-030
		78-31-13-02-060	HAP ALL

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Left Thrust Reverser Blanket Installation

SUBTASK 78-31-13-420-005-F00

(1) Do these steps to install the lower blanket [9] on the left thrust reverser (Figure 401):

(a) Make sure that the lower blanket [9] is in the correct position.

(b) Do these steps if the upper blanket [8] was not removed:

1) Put the lower blanket edge under the upper blanket edge to make an overlap at the center of the inner wall.

(c) Install washers [3] and nuts [5] in eleven locations.

(d) Install washers [3] and screws [7] six locations.

(e) Install washers [3] and screws [4] in three locations.

(f) Install washers [3] and screws [6] in three locations.

(g) Install washers [1] and nuts [2] on each of the remaining 16 studs on the lower half of the inner wall.

NOTE: For the nut [2] to lock correctly, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: You can add or remove washers as it is necessary to get the correct dimension. However, you must use a minimum of one washer under the nut.

(h) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(i) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(j) Clean the aft and middle compression pad spacer and the adjacent blanket edge with solvent, B00062.

(k) Fillet seal the space between the compression pad spacer and the adjacent blanket edge with RTV 106 adhesive, A00081.

1) Let the sealant cure in service.

SUBTASK 78-31-13-420-006-F00

(2) Do these steps to install the upper blanket [8] on the left thrust reverser (Figure 401):

(a) Make sure that the upper blanket [8] is in the correct position.

(b) Install washers [3] and screws [4] in three locations.

(c) Install washers [3] and nuts [5] at four locations.

(d) Install washers [3] and screws [7] in nine locations.

(e) Install a washer [3] and screw [6] in one location.

(f) Install nuts [2] and washers [1] on each of the remaining 16 studs on the upper half of the inner wall.

NOTE: For the nut to properly lock, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: You can add or remove washers as it is necessary to get the correct dimension. However, you must use a minimum of one washer under the nut.

(g) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(h) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(i) Clean the forward, middle and aft compression pad spacer and the adjacent blanket edge with solvent, B00062.

(j) Fillet seal the space between the compression pad spacer and the adjacent blanket edge with RTV 106 adhesive, A00081.

1) Let the sealant cure in service.

H. Right Thrust Reverser Blanket Installation

SUBTASK 78-31-13-420-007-F00

(1) Do these steps to install the lower blanket [32] on the right thrust reverser (Figure 402):

(a) Make sure that the lower blanket [32] is in the correct position.

(b) Do these steps if the upper blanket [31] was not removed:

1) Put the lower blanket edge under the upper blanket edge to make an overlap at the center of the inner wall.

(c) Install washers [3] and screws [7] in six locations.

(d) Install washers [3] and screws [4] in three locations.

(e) Install washers [3] and nuts [5] at eleven locations.

(f) Install washers [3] and screws [6] in three locations.

(g) Install washers [2] and nuts [1] on each of the remaining 16 studs on the lower half of the inner wall.

NOTE: For the nut to properly lock, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: You can add or remove washers as it is necessary to get the correct dimension. However, you must use a minimum of one washer under the nut.

(h) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(i) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(j) Clean the middle and aft compression pad spacer and the adjacent blanket edge with solvent, B00062.

(k) Fillet seal the space between the compression pad spacer and the adjacent blanket edge with RTV 106 adhesive, A00081.

1) Let the sealant cure in service.

SUBTASK 78-31-13-420-008-F00

(2) Do these steps to install the upper blanket [31] on the right thrust reverser (Figure 402):

(a) Make sure that the upper blanket [31] is in the correct position.

(b) Install washers [3] and screws [4] in three locations.

(c) Install washers [3] and screws [7] in nine locations.

(d) Install a washer [3] and screw [6] in one location.

(e) Install washers [1] and nuts [2] on each of the remaining 16 studs on the upper half of the inner wall.

NOTE: For the nut [2] to lock correctly, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: You can add or remove washers as it is necessary to get the correct dimension. However, you must use a minimum of one washer under the nut.

(f) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(g) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(h) Clean the forward, middle and aft compression pad spacer and the adjacent blanket edge with solvent, B00062.

(i) Fillet seal the space between the compression pad spacer and the adjacent blanket edge with RTV 106 adhesive, A00081.

1) Let the sealant cure in service.

I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-13-410-001-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

———————— END OF TASK ————————

HAP 039-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069 OR POST SB 737-78-1079; HAP 021-026, 028-038 POST SB 737-78-1079

TASK 78-31-13-400-805-F00

7. Insulation Blanket Installation

(Figure 403, Figure 404)

A. General

(1) This task is for the installation of the insulation blanket on the left and right thrust reverser on an engine.

(2) For this task, the insulation blanket will be referred to as the blanket.

(3) Clean surfaces are required to get the high strength bonds to hold the sealant to the blanket and the inner wall. All unwanted materials such as oils, greases, waxes or dirt must be removed.

B. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic (Part #: ST982, Supplier: 81205, A/P Effectivity: 737-ALL)
STD-549	Knife - Putty, Broad Blade
STD-764	Scraper - Non-metallic
STD-766	Gun - Sealant
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

D. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010, Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A00335	Adhesive - Silicone Rubber, 2 Part, RTV	BAC5010, Type 68
A50025	Adhesive - Condensation Cure, Mouldmaking Rubber, Momentive Performance Materials RTV430 Base (Formerly GE Silicones)	
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00130	Alcohol - Isopropyl	TT-I-735
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00634	Solvent - Stabilized Limonene Cleaner	BMS11-10 Type 1, 2, or 3
C00511	Primer - Adhesion	BAC5010, Type 68
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01061	Water - Distilled	
G02185	Agent - Peelable Parting (Valspar - 4A-183 Green Strippable Coating) (Formerly 598-5002 Green Strippable Coating)	BAC 5000
G02311	Tape - Pressure Sensitive Adhesive, for Masking During Paint Stripping Operations	AMS-T-23397

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Blanket	78-31-13-01-050	HAP 001-013, 015-020
		78-31-13-02-065	HAP 001-013, 015-020, 039-054, 101-999
9	Blanket	78-31-13-01-060	HAP 001-013, 015-020
		78-31-13-02-055	HAP 001-013, 015-020, 039-054, 101-999
31	Blanket	78-31-13-02-050	HAP 001-013, 015-020, 039-054, 101-999
32	Blanket	78-31-13-01-065	HAP 001-013, 015-020

HAP 039-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069 OR POST SB 737-78-1079; HAP 021-026, 028-038 POST SB 737-78-1079 (Continued)

(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
		78-31-13-02-060	HAP 001-013, 015-020, 039-054, 101-999

F. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

G. Left Thrust Reverser Blanket Installation

SUBTASK 78-31-13-960-005-F00

(1) If it is necessary, replace the foam block [70] or foam block [72] next to the v-blade flange fittings on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the sealant is removed. Foam block [70] seals the upper insulation blanket and foam block [72] seals the lower insulation blanket. The foam block is made of a closed cell, silicone foam rubber.

(a) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

(b) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

(c) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

(d) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

(e) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(f) Apply an adhesion primer, C00511 to the inner wall.

(g) Bond the foam block to the inner wall with 2-part silicone RTV430 rubber base, A50025 or 2-part silicone adhesive, A00335 or 1-part silicone RTV 106 adhesive, A00081.

1) Mix the two-part adhesives to the manufacturers instructions.

2) Put the foam block on the inner wall and adjacent to the v-blade and bracket.

3) Make sure the gap between the edge of the foam block and the edge of the inner wall is between 0.070 in. (1.778 mm) and 0.130 in. (3.302 mm).

SUBTASK 78-31-13-160-005-F00

(2) Remove the old sealant from the inner wall of the left thrust reverser:

(a) Remove all old sealant and contamination from the middle and aft lower compression pad spacers and the upper compression pad spacers.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the compression pad fittings.
2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.
3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.
4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.
5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(b) Remove all old sealant and contamination from the thrust reverser inner wall aft of the vertical fire seal and the below the horizontal fire seal.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.
2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.
3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.
4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.
5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(c) Remove all old sealant and contamination from the thrust reverser aft inner wall and on the lower bifurcation.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.
2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.
3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.
4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.
5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(d) Remove all old sealant and contamination from the thrust reverser aft inner wall and on the lower bifurcation.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.
2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(e) Make sure that you remove all of the unwanted sealant.

SUBTASK 78-31-13-420-021-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(3) Do these steps to install the lower blanket [9] on the left thrust reverser (Figure 403):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket.

2) The insulation blanket adjacent to the three lower compression pads.

3) The aft edge of the insulation blanket.

4) The lower edge of the insulation blanket on the lower bifurcation.

(b) Make sure that the lower blanket [9] is in the correct position.

1) Where the foam block [72] and blanket [9] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) If the upper blanket [8] was not removed, put the lower blanket edge under the upper blanket edge to make an overlap at the center of the inner wall.

(d) Install washers [3] and nuts [5] in eleven locations.

(e) Install washers [3] and screws [7] six locations.

(f) Install washers [3] and screws [4] in three locations.

(g) Install washers [3] and screws [6] in three locations.

(h) Install washers [1] and nuts [2] on each of the remaining 16 studs on the lower half of the inner wall.

1) Make sure that the nut does not bottom out on the threads of the stud.

2) For the nut [2] to lock correctly, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

3) You can add or remove washers as it is necessary to get the correct dimension.

4) You must use a minimum of one washer under the nut.

5) The stud is permitted to extend through the nut.

(i) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(j) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(k) Apply sealant to seal these locations on the thrust reverser:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) Apply a fillet seal to the entire forward edge of the lower blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fire seal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Make sure that the forward edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

j) Let the sealant cure in service.

2) Where the foam block [72] and blanket [9] meet, completely seal the edge of the lower blanket to the foam block on the inner wall.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant to the edge of the blanket and the foam block to completely seal the edge to the inner wall.

<1> Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Apply a fillet seal to the entire aft edge of the lower blanket to the inner wall of the thrust reverser (Figure 405).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the aft edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Let the sealant cure in service.

4) Apply a fillet seal to the entire lower edge of the lower blanket to the lower bifurcation of the thrust reverser (Figure 405).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the lower edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to apply the sealant.

<1> Leave a gap in the sealant bead, 1.50 ±0.50 in. (38.10 ±12.70 mm) in length between the aft two blanket fasteners for fluid drainage from behind the blankets.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<3> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Where possible, smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to smooth the sealant.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the lower edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the lower blanket cutouts and the three lower compression pads with sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) Apply a continuous bead of sealant/RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

SUBTASK 78-31-13-420-022-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(4) Do these steps to install the upper blanket [8] on the left thrust reverser (Figure 403):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three upper compression pad spacers.

3) The aft edge of the insulation blanket.

(b) Make sure that the upper blanket [8] is in the correct position.

1) Where foam block [70] and blanket [8] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than above the inner wall of the thrust reverser.

c) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) Install washers [3] and screws [4] in three locations.

(d) Install washers [3] and nuts [5] at four locations.

(e) Install washers [3] and screws [7] in nine locations.

(f) Install a washer [3] and screw [6] in one location.

(g) Install nuts [2] and washers [1] on each of the remaining 16 studs on the upper half of the inner wall.

1) Make sure that the nut does not bottom out on the threads of the stud.

2) For the nut to properly lock, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

3) You can add or remove washers as it is necessary to get the correct dimension.

4) You must use a minimum of one washer under the nut.

5) The stud is permitted to extend through the nut.

(h) Examine the position of the blanket:

1) Make sure that the forward edge of the blanket is less than 0.82 in. (20.83 mm) above the inner wall of the thrust reverser.

2) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

(i) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(j) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(k) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) At the upper bifurcation, seal the forward edge of the upper blanket to the inner wall of the thrust reverser; apply the sealant from the upper edge of the blanket to the upper edge of the upper v-blade.

NOTE: The sealant will extend 1.0 in. (25.4 mm) to 1.5 in. (38.1 mm) aft of the forward edge of the blanket.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185 to the blanket, 1.0 in. (25.4 mm) to 1.5 in. (38.1 mm) aft of the forward edge of the blanket.

b) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

e) Apply sealant between the blanket and the inner wall with a sealant gun; the sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

f) Apply a continuous bead of sealant with a sealant gun, STD-766 on the forward edge of the blanket and the inner wall.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

2) Apply a fillet seal to the entire forward edge of the upper blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B-1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper insulation blanket is completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Where the foam block [70] and blanket [8] meet, completely seal the edge of the upper blanket to the inner wall.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fire seal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

4) Apply a fillet seal to the entire aft edge of the upper blanket to the inner wall of the thrust reverser (Figure 405).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> Leave a gap in the sealant bead, 14.80 ±0.50 in. (375.92 ±12.70 mm) in length, at the upper metal seal on the aft inner wall as shown.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<3> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the aft edge of the upper insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the upper blanket cutouts and the upper compression cups with 1-part sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) At the No.1, No.2 and No.3 compression cups, apply a continuous bead of sealant/ RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

6) Apply a fillet seal on the entire upper edge of the upper blanket and the inner wall structure.

NOTE: The upper edge of the upper blanket is just below the horizontal fire seal.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the upper edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the upper edge of the blanket.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: The two-part fire wall sealant, A00160 used is BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

NOTE: The Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

NOTE: Type II Class B-4 sealant cures in 48 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B-4 sealant is approximately 4.0 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Once applied from the tube, the sealant has a work life of 0.25 hours.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Where possible, smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

7) Install the flange insulation between the fire seal retainer and the upper blanket (Figure 405).

NOTE: There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies are needed to cover the flange on the upper bifurcation. One tapered flange insulation is needed to cover the flange on the upper bifurcation. It is optional to use the tapered flange insulation for the two rectangular flange insulations.

a) Install the two rectangular flange insulation assemblies so that the flange on the upper bifurcation is completely covered.

<1> Install the first rectangular flange insulation assembly from the end of the fire seal to the area forward of the No.2 compression cup.

<a> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the two-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Cut the second rectangular flange insulation assembly to fit beneath the first assembly from the area forward of the No.3 compression cup to the area forward of the No.2 compression cup.

<a> Apply a fay surface seal with sealant between the two rectangular flange insulation pieces.

<b> Apply a fillet seal with sealant between the rectangular flange insulation and the blanket.

<c> Cover the exposed core of the cut rectangular flange insulation with sealant

b) Install the tapered flange insulation so that the flange on the upper bifurcation is completely covered.

<1> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the t wo-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Apply a fillet seal with sealant between the tapered flange insulation and the blanket.

<3> Apply a fillet seal with sealant between the tapered flange insulation and the fire seal retainer.

H. Right Thrust Reverser Blanket Installation

SUBTASK 78-31-13-960-006-F00

(1) If it is necessary, replace the foam block [71] or foam block [73] next to the v-blade fitting on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the sealant is removed. Foam block [71] seals the upper insulation blanket and foam block [73] seals the lower insulation blanket. The foam block is made of a closed cell, silicone foam rubber.

(a) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

(b) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

(c) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

(d) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

(e) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(f) Apply an adhesion primer, C00511 to the inner wall.

(g) Bond the foam block to the inner wall with 2-part silicone RTV430 rubber base, A50025 or 2-part silicone adhesive, A00335 or 1-part silicone RTV 106 adhesive, A00081.

1) Mix the two-part adhesives to the manufacturers instructions.

2) Put the foam block on the inner wall and adjacent to the v-blade and bracket.

3) Make sure the gap between the edge of the foam block and the edge of the inner wall is between 0.070 in. (1.778 mm) to 0.130 in. (3.302 mm).

SUBTASK 78-31-13-160-006-F00

(2) Remove the old sealant from the inner wall of the right thrust reverser:

(a) Remove all old sealant and contamination from the middle and aft lower compression pad spacers and the upper compression pad spacers.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the compression pad fittings.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(b) Remove all old sealant and contamination from the thrust reverser inner wall aft of the vertical fire seal and the below the horizontal fire seal.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(c) Remove all old sealant and contamination from the thrust reverser aft inner wall and on the lower bifurcation.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(d) Make sure that you remove all of the unwanted sealant.

SUBTASK 78-31-13-420-023-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(3) Do these steps to install the lower blanket [32] on the right thrust reverser (Figure 404):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three lower compression pads.

3) The aft edge of the insulation blanket.

4) The lower edge of the insulation blanket on the lower bifurcation.

(b) Make sure that the lower blanket [32] is in the correct position.

1) Where the foam block [73] and blanket [32] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) If the upper blanket [31] was not removed, make sure that the lower blanket edge under the upper blanket edge to make an overlap at the center of the inner wall.

(d) Install washers [3] and screws [7] in six locations.

(e) Install washers [3] and screws [4] in three locations.

(f) Install washers [3] and nuts [5] at eleven locations.

(g) Install washers [3] and screws [6] in three locations.

(h) Install washers [2] and nuts [1] on each of the remaining 16 studs on the lower half of the inner wall.

1) Make sure that the nut does not bottom out on the threads of the stud.

2) For the nut to properly lock, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

3) You can add or remove washers as it is necessary to get the correct dimension.

4) You must use a minimum of one washer under the nut.

5) The stud is permitted to extend through the nut.

(i) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(j) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(k) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) Apply a fillet seal to the entire forward edge of the lower blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper and lower insulation blankets are completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

2) Where the foam block [73] and blanket [32] meet, completely seal the edge of the lower blanket to the inner wall and the foam block.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed to the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Apply a fillet seal to the entire aft edge of the lower blanket to the inner wall of the thrust reverser (Figure 405).
   a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.
   b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.
   c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

      NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

   d) Apply a continuous bead of sealant with a sealant gun, STD-766.

      NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

      <1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

      <2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

   e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

      <1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

   f) Make sure that the aft edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.
   g) Let the sealant cure in service.

4) Apply a fillet seal to the entire lower edge of the lower blanket to the lower bifurcation of the thrust reverser (Figure 405).
   a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the lower edge of the blanket.
   b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.
   c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

      NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to apply the sealant.

<1> Leave a gap in the sealant bead, 1.50 ±0.50 in. (38.10 ±12.70 mm) in length between the aft two blanket fasteners for fluid drainage from behind the blankets.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<3> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Where possible, smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to smooth the sealant.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the lower edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal depressor.

h) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the lower blanket cutouts and the three lower compression pads with sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) Apply a continuous bead of sealant/RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

SUBTASK 78-31-13-420-024-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(4) Do these steps to install the upper blanket [31] on the right thrust reverser (Figure 404):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three upper compression cups.

3) The aft edge of the insulation blanket.

(b) Make sure that the upper blanket [31] is in the correct position.

1) Where foam block [71] and blanket [31] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

(c) Install washers [3] and screws [4] in three locations.

(d) Install washers [3] and screws [7] in nine locations.

(e) Install a washer [3] and screw [6] in one location.

(f) Install washers [1] and nuts [2] on each of the remaining 16 studs on the upper half of the inner wall.

1) Make sure that the nut does not bottom out on the threads of the stud.

2) For the nut [2] to lock correctly, the stud end cannot be recessed more than 0.160 inch (4.0 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

3) You can add or remove washers as it is necessary to get the correct dimension.

4) You must use a minimum of one washer under the nut.

5) The stud is permitted to extend through the nut.

(g) Make sure that the upper blanket is in the correct position.

1) Where the foam block [71] and blanket [31] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(h) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72-82 degrees F (22.2-27.8 degrees C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(i) Tighten the nuts and screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(j) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) At the upper bifurcation, seal the forward edge of the upper blanket to the inner wall of the thrust reverser; apply the sealant from the upper edge of the blanket to the upper edge of the upper v-blade.

NOTE: The sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

a) Apply Valspar 4A-183 green strippable coating, G02185 to the blanket, 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft of the forward edge of the blanket.

b) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

e) Apply sealant between the blanket and the inner wall with a sealant gun; the sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

f) Apply a continuous bead of sealant with a sealant gun, STD-766 along the forward edge of the blanket.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

2) Apply a fillet seal to the entire forward edge of the upper blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper and lower insulation blankets are completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Where the foam block [71] and blanket [31] meet, completely seal the edge of the upper blanket to the inner wall and the foam block.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant to the edge of the blanket and the foam block to completely seal the edge to the inner wall.

<1> Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

4) Apply a fillet seal to the entire aft edge of the upper blanket to the inner wall of the thrust reverser (Figure 405).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the aft edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the upper blanket cutouts and the three upper compression cups with 1-part sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) At the No.1, No.2 and No.3 compression cups, apply a continuous bead of sealant/ RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

6) Apply a fillet seal on the entire upper edge of the upper blanket and the inner wall structure.

NOTE: The upper edge of the upper blanket is just below the horizontal fire seal.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the upper edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the upper edge of the blanket.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Use the two-part fire wall sealant, A00160, BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C)) and 45-55 percent relative humidity.

NOTE: Type II Class B-4 sealant cures in 48 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B-4 sealant is approximately 4.0 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Once applied from the tube, the sealant has a work life of 0.25 hours.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Apply the sealant in a large, continuous bead; the large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

h) Use multiple continuous beads of sealant at areas where there are large gaps; do not inject the sealant behind the blanket.

i) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

j) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

k) Remove the masking tape from the fire seal and discard after the sealant is applied.

l) Let the sealant cure in service.

7) Install the flange insulation between the fire seal retainer and the upper blanket (Figure 405).

NOTE: There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies are needed to cover the flange on the upper bifurcation. One tapered flange insulation is needed to cover the flange on the upper bifurcation. It is optional to use the tapered flange insulation for the two rectangular flange insulations.

a) Install the two rectangular flange insulation assemblies so that the flange on the upper bifurcation is completely covered.

<1> Install the first rectangular flange insulation assembly from the end of the fire seal to the area forward of the No.2 compression cup.

<a> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the two-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Cut the second rectangular flange insulation assembly to fit beneath the first assembly from the area forward of the No.3 compression cup to the area forward of the No.2 compression cup.

<a> Apply a fay surface seal with sealant between the two rectangular flange insulation pieces.

<b> Apply a fillet seal with sealant between the rectangular flange insulation and the blanket.

<c> Cover the exposed core of the cut rectangular flange insulation with sealant

b) Install the tapered flange insulation so that the flange on the upper bifurcation is completely covered.

<1> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the two-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Apply a fillet seal with sealant between the tapered flange insulation and the blanket.

<3> Apply a fillet seal with sealant between the tapered flange insulation and the fire seal retainer.

I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-13-410-007-F00

WARNING: OBEY THE INSTRUCTIONS IN THIS PROCEDURE WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK

HAP 021-026, 028-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069

TASK 78-31-13-400-803-F01

8. Insulation Blanket Installation

(Figure 406, Figure 407)

A. General

(1) This task is for the installation of the insulation blanket on the left and right thrust reverser on an engine.

(2) For this task, the insulation blanket will be referred to as the blanket.

(3) Clean surfaces are required to get the high strength bonds to hold the sealant to the blanket and the inner wall. All unwanted materials such as oils, greases, waxes or dirt must be removed.

B. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic (Part #: ST982, Supplier: 81205, A/P Effectivity: 737-ALL)
STD-549	Knife - Putty, Broad Blade
STD-764	Scraper - Non-metallic
STD-766	Gun - Sealant
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

D. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010, Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A00335	Adhesive - Silicone Rubber, 2 Part, RTV	BAC5010, Type 68
A50025	Adhesive - Condensation Cure, Mouldmaking Rubber, Momentive Performance Materials RTV430 Base (Formerly GE Silicones)	
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00130	Alcohol - Isopropyl	TT-I-735
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00634	Solvent - Stabilized Limonene Cleaner	BMS11-10 Type 1, 2, or 3
C00511	Primer - Adhesion	BAC5010, Type 68
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01061	Water - Distilled	
G02185	Agent - Peelable Parting (Valspar - 4A-183 Green Strippable Coating) (Formerly 598-5002 Green Strippable Coating)	BAC 5000
G02311	Tape - Pressure Sensitive Adhesive, for Masking During Paint Stripping Operations	AMS-T-23397

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Left Thrust Reverser Insulation Blanket Installation

SUBTASK 78-31-13-960-002-F01

(1) If it is necessary, replace the foam block [70] or foam block [72] next to the v-blade fittings on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the sealant is removed. Foam block [70] seals the upper insulation blanket and foam block [72] seals the lower insulation blanket. The foam block is made of a closed cell, silicone foam rubber.

(a) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

(b) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

(c) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

(d) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

(e) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(f) Apply an adhesion primer, C00511 to the inner wall.

(g) Bond the foam block to the inner wall with 2-part silicone RTV430 rubber base, A50025 or 2-part silicone adhesive, A00335 or 1-part silicone RTV 106 adhesive, A00081.

1) Mix the two-part adhesives to the manufacturers instructions.

2) Put the foam block on the inner wall and adjacent to the v-blade and bracket.

3) Make sure the gap between the edge of the foam block and the edge of the inner wall is between 0.070 in. (1.778 mm) and 0.130 in. (3.302 mm).

SUBTASK 78-31-13-160-001-F01

(2) Remove the old sealant from the inner wall of the left thrust reverser:

(a) Remove all old sealant and contamination from the middle and aft lower compression pad spacers and the upper compression pad spacers.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the compression pad fittings.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(b) Remove all old sealant and contamination from the thrust reverser inner wall aft of the vertical fire seal and the below the horizontal fire seal.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(c) Make sure that you remove all of the unwanted sealant.

SUBTASK 78-31-13-420-015-F01

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(3) Do these steps to install the lower blanket [52] on the left thrust reverser (Figure 406):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket.

2) The insulation blanket adjacent to the three lower compression pads.

(b) Make sure that the lower blanket is in the correct position.

1) Where the foam block [72] and blanket [52] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) If the upper blanket [51] was not removed, make sure that the lower edge of the upper blanket overlaps the upper edge of the lower blanket at the center of the inner wall.

(d) Fasten the blanket [52] to the thrust reverser:

1) Install washers [3] and nuts [5] at 12 locations

2) Install washers [3] and screws [7] in six locations

3) Install washers [3] and screws [4] in four locations

4) Install washers [3] and screws [6] in three locations

5) Install washers [1] and nuts [2] on the 18 studs on the lower half of the inner wall.

a) Make sure that the nut does not bottom out on the threads of the stud.

b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

<1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

<2> Make sure that a minimum of one washer [1] is below each nut.

<3> The stud is permitted to extend through the nut.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations on the thrust reverser:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) Apply a fillet seal to the entire forward edge of the lower blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Do not let the sealant touch the fire seal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Make sure that the forward edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

j) Let the sealant cure in service.

2) Where the foam block [72] and blanket [52] meet, completely seal the edge of the lower blanket to the foam block on the inner wall.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant to the edge of the blanket and the foam block to completely seal the edge to the inner wall.

<1> Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Apply a fillet seal to the gap around the lower blanket cutouts and the three lower compression pads with sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) Apply a continuous bead of sealant/RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

SUBTASK 78-31-13-420-016-F01

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(4) Do these steps to install the upper blanket [51] on the left thrust reverser (Figure 406):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three upper compression pad spacers.

(b) Make sure that the upper blanket [51] is in the correct position.

1) Where foam block [70] and blanket [51] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than above the inner wall of the thrust reverser.

c) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) Fasten the blanket [51] to the thrust reverser:

1) Install washers [3] and screws [4] in four locations.

2) Install washers [3] and nuts [5] at five locations.

3) Install washers [3] and screws [7] in nine locations.

4) Install a washer [3] and screw [6] in one location.

5) Install washers [1] and nuts [2] on the 22 studs on the upper half of the inner wall.
   a) Make sure that the nut does not bottom out on the threads of the stud.
   b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

      NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

      <1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

      <2> Make sure that a minimum of one washer [1] is below each nut.

      <3> The stud is permitted to extend through the nut.

(d) Examine the position of the blanket:
   1) Make sure that the forward edge of the blanket is less than 0.82 in. (20.83 mm) above the inner wall of the thrust reverser.
   2) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.
   1) Do these steps to fill the gap:
      a) Remove the nut and washers.
      b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

         <1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

            NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

         <2> Apply enough sealant so that you do not see a gap when you re-install the washer.

      c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations:

   NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

   1) At the upper bifurcation, seal the forward edge of the upper blanket to the inner wall of the thrust reverser; apply the sealant from the upper edge of the blanket to the upper edge of the upper v-blade.

      NOTE: The sealant will extend 1.0 in. (25.4 mm) to 1.5 in. (38.1 mm) aft of the forward edge of the blanket.

      a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185 to the blanket, 1.0 in. (25.4 mm) to 1.5 in. (38.1 mm) aft of the forward edge of the blanket.

b) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

e) Apply sealant between the blanket and the inner wall with a sealant gun; the sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

f) Apply a continuous bead of sealant with a sealant gun, STD-766 on the forward edge of the blanket and the inner wall.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

2) Apply a fillet seal to the entire forward edge of the upper blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B-1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper insulation blanket is completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Where the foam block [70] and blanket [51] meet, completely seal the edge of the upper blanket to the inner wall.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fire seal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

4) Apply a fillet seal to the gap around the upper blanket cutouts and the upper compression cups with 1-part sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) At the No.1, No.2 and No.3 compression cups, apply a continuous bead of sealant/ RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

5) Apply a fillet seal on the entire upper edge of the upper blanket and the inner wall structure.

NOTE: The upper edge of the upper blanket is just below the horizontal fire seal.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the upper edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the upper edge of the blanket.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: The two-part fire wall sealant, A00160 used is BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

NOTE: The Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

NOTE: Type II Class B-4 sealant cures in 48 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B-4 sealant is approximately 4.0 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Once applied from the tube, the sealant has a work life of 0.25 hours.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Where possible, smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

G. Right Thrust Reverser Insulation Blanket Installation

SUBTASK 78-31-13-960-001-F01

(1) If it is necessary, replace the foam block [71] or foam block [73] next to the v-blade fitting on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the sealant is removed. Foam block [71] seals the upper insulation blanket and foam block [73] seals the lower insulation blanket. The foam block is made of a closed cell, silicone foam rubber.

(a) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

(b) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

(c) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

(d) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

(e) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(f) Apply an adhesion primer, C00511 to the inner wall.

(g) Bond the foam block to the inner wall with 2-part silicone RTV430 rubber base, A50025 or 2-part silicone adhesive, A00335 or 1-part silicone RTV 106 adhesive, A00081.

1) Mix the two-part adhesives to the manufacturers instructions.

2) Put the foam block on the inner wall and adjacent to the v-blade and bracket.

3) Make sure the gap between the edge of the foam block and the edge of the inner wall is between 0.070 in. (1.778 mm) to 0.130 in. (3.302 mm).

SUBTASK 78-31-13-160-002-F01

(2) Remove the old sealant from the inner wall of the right thrust reverser:

(a) Remove all old sealant and contamination from the middle and aft lower compression pad spacers and the upper compression pad spacers.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the compression pad fittings.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(b) Remove all old sealant and contamination from the thrust reverser inner wall aft of the vertical fire seal and the below the horizontal fire seal.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(c) Make sure that you remove all of the unwanted sealant.

SUBTASK 78-31-13-420-013-F01

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(3) Do these steps to install the lower blanket [62] on the right thrust reverser (Figure 407):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three lower compression pads.

(b) Make sure that the lower blanket is in the correct position.

1) Where the foam block [73] and blanket [62] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) If the upper blanket [61] was not removed, make sure that the lower edge of the upper blanket overlaps the upper edge of the lower blanket at the center of the inner wall.

(d) Fasten the blanket [62] to the thrust reverser:

1) Install washers [3] and nuts [5] at 12 locations

2) Install washers [3] and screws [7] in six locations

3) Install washers [3] and screws [4] in four locations

4) Install washers [3] and screws [6] in three locations

5) Install washers [1] and nuts [2] on the 18 studs on the lower half of the inner wall.

a) Make sure that the nut does not bottom out on the threads of the stud.

b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

<1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

<2> Make sure that a minimum of one washer [1] is below each nut.

<3> The stud is permitted to extend through the nut.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) Apply a fillet seal to the entire forward edge of the lower blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper and lower insulation blankets are completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

2) Where the foam block [73] and blanket [62] meet, completely seal the edge of the lower blanket to the inner wall and the foam block.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed to the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Apply a fillet seal to the gap around the lower blanket cutouts and the three lower compression pads with sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) Apply a continuous bead of sealant/RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

SUBTASK 78-31-13-420-014-F01

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(4) Do these steps to install the upper blanket [61] on the right thrust reverser (Figure 407):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three upper compression cups.

(b) Make sure that the upper blanket [61] is in the correct position.

1) Where foam block [71] and blanket [61] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

(c) Fasten the blanket [61] to the thrust reverser:

1) Install washers [3] and screws [4] in four locations.

2) Install washers [3] and nuts [5] at five locations.

3) Install washers [3] and screws [7] in nine locations.

4) Install a washer [3] and screw [6] in one location.

5) Install washers [1] and nuts [2] on the 22 studs on the upper half of the inner wall.

a) Make sure that the nut does not bottom out on the threads of the stud.

b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

<1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

<2> Make sure that a minimum of one washer [1] is below each nut.

<3> The stud is permitted to extend through the nut.

(d) Make sure that the upper blanket is in the correct position.

1) Where the foam block [71] and blanket [61] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) At the upper bifurcation, seal the forward edge of the upper blanket to the inner wall of the thrust reverser; apply the sealant from the upper edge of the blanket to the upper edge of the upper v-blade.

NOTE: The sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

a) Apply Valspar 4A-183 green strippable coating, G02185 to the blanket, 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft of the forward edge of the blanket.

b) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

e) Apply sealant between the blanket and the inner wall with a sealant gun; the sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

f) Apply a continuous bead of sealant with a sealant gun, STD-766 along the forward edge of the blanket.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

2) Apply a fillet seal to the entire forward edge of the upper blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper and lower insulation blankets are completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Where the foam block [71] and blanket [61] meet, completely seal the edge of the upper blanket to the inner wall and the foam block.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant to the edge of the blanket and the foam block to completely seal the edge to the inner wall.

<1> Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

4) Apply a fillet seal to the gap around the upper blanket cutouts and the three upper compression cups with 1-part sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) At the No.1, No.2 and No.3 compression cups, apply a continuous bead of sealant/ RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

5) Apply a fillet seal on the entire upper edge of the upper blanket and the inner wall structure.

NOTE: The upper edge of the upper blanket is just below the horizontal fire seal.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the upper edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the upper edge of the blanket.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Use the two-part fire wall sealant, A00160, BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C)) and 45-55 percent relative humidity.

NOTE: Type II Class B-4 sealant cures in 48 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B-4 sealant is approximately 4.0 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Once applied from the tube, the sealant has a work life of 0.25 hours.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Apply the sealant in a large, continuous bead; the large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

h) Use multiple continuous beads of sealant at areas where there are large gaps; do not inject the sealant behind the blanket.

i) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

j) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

k) Remove the masking tape from the fire seal and discard after the sealant is applied.

l) Let the sealant cure in service.

H. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-13-410-005-F01

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——————— END OF TASK ———————

HAP 039-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069 OR POST SB 737-78-1079; HAP 021-026, 028-038 POST SB 737-78-1079

TASK 78-31-13-400-806-F00

9. Insulation Blanket Installation

(Figure 409, Figure 410)

A. General

(1) x

(2) This task is for the installation of the insulation blanket on the left and right thrust reverser on an engine.

(3) For this task, the insulation blanket will be referred to as the blanket.

(4) Clean surfaces are required to get the high strength bonds to hold the sealant to the blanket and the inner wall. All unwanted materials such as oils, greases, waxes or dirt must be removed.

B. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic (Part #: ST982, Supplier: 81205, A/P Effectivity: 737-ALL)
STD-549	Knife - Putty, Broad Blade
STD-764	Scraper - Non-metallic
STD-766	Gun - Sealant
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

D. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010, Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A00335	Adhesive - Silicone Rubber, 2 Part, RTV	BAC5010, Type 68
A50025	Adhesive - Condensation Cure, Mouldmaking Rubber, Momentive Performance Materials RTV430 Base (Formerly GE Silicones)	
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00130	Alcohol - Isopropyl	TT-I-735
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7

(Continued)

Reference	Description	Specification
B00634	Solvent - Stabilized Limonene Cleaner	BMS11-10 Type 1, 2, or 3
C00511	Primer - Adhesion	BAC5010, Type 68
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G01061	Water - Distilled	
G02185	Agent - Peelable Parting (Valspar - 4A-183 Green Strippable Coating) (Formerly 598-5002 Green Strippable Coating)	BAC 5000
G02311	Tape - Pressure Sensitive Adhesive, for Masking During Paint Stripping Operations	AMS-T-23397

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Left Thrust Reverser Insulation Blanket Installation

SUBTASK 78-31-13-960-003-F00

(1) If it is necessary, replace the foam block [70] or foam block [72] next to the v-blade fittings on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the sealant is removed. Foam block [71] seals the upper insulation blanket and foam block [72] seals the lower insulation blanket. The foam block is made of a closed cell, silicone foam rubber.

(a) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

(b) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

(c) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

(d) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

(e) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(f) Apply an adhesion primer, C00511 to the inner wall.

(g) Bond the foam block to the inner wall with 2-part silicone RTV430 rubber base, A50025 or 2-part silicone adhesive, A00335 or 1-part silicone RTV 106 adhesive, A00081.

1) Mix the two-part adhesives to the manufacturers instructions.

2) Put the foam block on the inner wall and adjacent to the v-blade and bracket.

3) Make sure the gap between the edge of the foam block and the edge of the inner wall is between 0.070 in. (1.778 mm) and 0.130 in. (3.302 mm).

SUBTASK 78-31-13-160-003-F00

(2) Remove the old sealant from the inner wall of the left thrust reverser:

(a) Remove all old sealant and contamination from the middle and aft lower compression pad spacers and the upper compression pad spacers.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the compression pad fittings.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(b) Remove all old sealant and contamination from the thrust reverser inner wall aft of the vertical fire seal and the below the horizontal fire seal.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(c) Remove all old sealant and contamination from the thrust reverser aft inner wall and on the lower bifurcation.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(d) Make sure that you remove all of the unwanted sealant.

SUBTASK 78-31-13-420-017-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(3) Do these steps to install the lower blanket [52] on the left thrust reverser (Figure 409):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket.

2) The insulation blanket adjacent to the three lower compression pads.

3) The aft edge of the insulation blanket.

4) The lower edge of the insulation blanket on the lower bifurcation.

(b) Make sure that the lower blanket is in the correct position.

1) Where the foam block [72] and blanket [52] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) If the upper blanket [51] was not removed, make sure that the lower edge of the upper blanket overlaps the upper edge of the lower blanket at the center of the inner wall.

(d) Fasten the blanket [52] to the thrust reverser:

1) Install washers [3] and nuts [5] at 12 locations

2) Install washers [3] and screws [7] in six locations

3) Install washers [3] and screws [4] in four locations

4) Install washers [3] and screws [6] in three locations

5) Install washers [1] and nuts [2] on the 18 studs on the lower half of the inner wall.

a) Make sure that the nut does not bottom out on the threads of the stud.

b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

<1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

<2> Make sure that a minimum of one washer [1] is below each nut.

<3> The stud is permitted to extend through the nut.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations on the thrust reverser:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) Apply a fillet seal to the entire forward edge of the lower blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Do not let the sealant touch the fire seal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Make sure that the forward edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

j) Let the sealant cure in service.

2) Where the foam block [72] and blanket [52] meet, completely seal the edge of the lower blanket to the foam block on the inner wall.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant to the edge of the blanket and the foam block to completely seal the edge to the inner wall.

<1> Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Apply a fillet seal to the entire aft edge of the lower blanket to the inner wall of the thrust reverser (Figure 411).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the aft edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Let the sealant cure in service.

4) Apply a fillet seal to the entire lower edge of the lower blanket to the lower bifurcation of the thrust reverser (Figure 411).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the lower edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to apply the sealant.

<1> Leave a gap in the sealant bead, 1.50 ±0.50 in. (38.10 ±12.70 mm) in length between the aft two blanket fasteners for fluid drainage from behind the blankets.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<3> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Where possible, smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to smooth the sealant.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the lower edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the lower blanket cutouts and the three lower compression pads with sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) Apply a continuous bead of sealant/RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

SUBTASK 78-31-13-420-018-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(4) Do these steps to install the upper blanket [51] on the left thrust reverser (Figure 409):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three upper compression pad spacers.

3) The aft edge of the insulation blanket.

(b) Make sure that the upper blanket [51] is in the correct position.

1) Where foam block [70] and blanket [51] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than above the inner wall of the thrust reverser.

c) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) Fasten the blanket [51] to the thrust reverser:

1) Install washers [3] and screws [4] in four locations.

2) Install washers [3] and nuts [5] at five locations.

3) Install washers [3] and screws [7] in nine locations.

4) Install a washer [3] and screw [6] in one location.

5) Install washers [1] and nuts [2] on the 22 studs on the upper half of the inner wall.

a) Make sure that the nut does not bottom out on the threads of the stud.

b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

<1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

<2> Make sure that a minimum of one washer [1] is below each nut.

<3> The stud is permitted to extend through the nut.

(d) Examine the position of the blanket:

1) Make sure that the forward edge of the blanket is less than 0.82 in. (20.83 mm) above the inner wall of the thrust reverser.

2) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) At the upper bifurcation, seal the forward edge of the upper blanket to the inner wall of the thrust reverser; apply the sealant from the upper edge of the blanket to the upper edge of the upper v-blade.

NOTE: The sealant will extend 1.0 in. (25.4 mm) to 1.5 in. (38.1 mm) aft of the forward edge of the blanket.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185 to the blanket, 1.0 in. (25.4 mm) to 1.5 in. (38.1 mm) aft of the forward edge of the blanket.

b) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

e) Apply sealant between the blanket and the inner wall with a sealant gun; the sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

f) Apply a continuous bead of sealant with a sealant gun, STD-766 on the forward edge of the blanket and the inner wall.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

2) Apply a fillet seal to the entire forward edge of the upper blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B-1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper insulation blanket is completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Where the foam block [70] and blanket [51] meet, completely seal the edge of the upper blanket to the inner wall.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fire seal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

4) Apply a fillet seal to the entire aft edge of the upper blanket to the inner wall of the thrust reverser (Figure 411).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> Leave a gap in the sealant bead, 14.80 ±0.50 in. (375.92 ±12.70 mm) in length, at the upper metal seal on the aft inner wall as shown.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<3> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the aft edge of the upper insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the upper blanket cutouts and the upper compression cups with 1-part sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) At the No.1, No.2 and No.3 compression cups, apply a continuous bead of sealant/ RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

6) Apply a fillet seal on the entire upper edge of the upper blanket and the inner wall structure.

NOTE: The upper edge of the upper blanket is just below the horizontal fire seal.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the upper edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the upper edge of the blanket.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: The two-part fire wall sealant, A00160 used is BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

NOTE: The Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

NOTE: Type II Class B-4 sealant cures in 48 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B-4 sealant is approximately 4.0 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Once applied from the tube, the sealant has a work life of 0.25 hours.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Where possible, smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

7) Install the flange insulation between the fire seal retainer and the upper blanket (Figure 411).

NOTE: There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies are needed to cover the flange on the upper bifurcation. One tapered flange insulation is needed to cover the flange on the upper bifurcation. It is optional to use the tapered flange insulation for the two rectangular flange insulations.

a) Install the two rectangular flange insulation assemblies so that the flange on the upper bifurcation is completely covered.

<1> Install the first rectangular flange insulation assembly from the end of the fire seal to the area forward of the No.2 compression cup.

<a> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the two-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Cut the second rectangular flange insulation assembly to fit beneath the first assembly from the area forward of the No.3 compression cup to the area forward of the No.2 compression cup.

<a> Apply a fay surface seal with sealant between the two rectangular flange insulation pieces.

<b> Apply a fillet seal with sealant between the rectangular flange insulation and the blanket.

<c> Cover the exposed core of the cut rectangular flange insulation with sealant

b) Install the tapered flange insulation so that the flange on the upper bifurcation is completely covered.

<1> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the t wo-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Apply a fillet seal with sealant between the tapered flange insulation and the blanket.

<3> Apply a fillet seal with sealant between the tapered flange insulation and the fire seal retainer.

G. Right Thrust Reverser Insulation Blanket Installation

SUBTASK 78-31-13-960-004-F00

(1) If it is necessary, replace the foam block [71] or foam block [73] next to the v-blade fitting on the forward edge of the inner wall.

NOTE: The blanket covers the attachment fasteners for the v-blade and bracket at the forward edge of the inner wall. The sealant and the foam blocks seal the end of the insulation blanket to the inner wall. The foam block can become damaged when the sealant is removed. Foam block [71] seals the upper insulation blanket and foam block [73] seals the lower insulation blanket. The foam block is made of a closed cell, silicone foam rubber.

(a) Remove the old foam block with a non-metallic scraper, STD-764; do not damage the composite structure of the inner wall.

(b) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

(c) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

(d) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

(e) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(f) Apply an adhesion primer, C00511 to the inner wall.

(g) Bond the foam block to the inner wall with 2-part silicone RTV430 rubber base, A50025 or 2-part silicone adhesive, A00335 or 1-part silicone RTV 106 adhesive, A00081.

1) Mix the two-part adhesives to the manufacturers instructions.

2) Put the foam block on the inner wall and adjacent to the v-blade and bracket.

3) Make sure the gap between the edge of the foam block and the edge of the inner wall is between 0.070 in. (1.778 mm) to 0.130 in. (3.302 mm).

SUBTASK 78-31-13-160-004-F00

(2) Remove the old sealant from the inner wall of the right thrust reverser:

(a) Remove all old sealant and contamination from the middle and aft lower compression pad spacers and the upper compression pad spacers.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the compression pad fittings.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(b) Remove all old sealant and contamination from the thrust reverser inner wall aft of the vertical fire seal and the below the horizontal fire seal.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(c) Remove all old sealant and contamination from the thrust reverser aft inner wall and on the lower bifurcation.

1) Remove the old sealant with sealant removal tool, SPL-768, or non-metallic scraper, STD-764 or very carefully remove the old sealant with a broad blade putty knife, STD-549; do not damage the composite structure of the inner wall.

2) Wipe or scrub the structure with a clean cotton wiper, G00034 to remove all loose soil, grease, hydraulic fluid or oil.

3) Wipe the structure with solvent, B00184 or solvent, B00148 or Limonene solvent, B00634 on a clean cotton wiper, G00034.

4) Wipe the surface dry with a clean cotton wiper, G00034 before the solvent evaporates.

5) Continue to clean the surface with a new clean cloth and solvent until no contamination is shown on the cloth.

(d) Make sure that you remove all of the unwanted sealant.

SUBTASK 78-31-13-420-019-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(3) Do these steps to install the lower blanket [62] on the right thrust reverser (Figure 410):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three lower compression pads.

3) The aft edge of the insulation blanket.

4) The lower edge of the insulation blanket on the lower bifurcation.

(b) Make sure that the lower blanket is in the correct position.

1) Where the foam block [73] and blanket [62] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(c) If the upper blanket [61] was not removed, make sure that the lower edge of the upper blanket overlaps the upper edge of the lower blanket at the center of the inner wall.

(d) Fasten the blanket [62] to the thrust reverser:

1) Install washers [3] and nuts [5] at 12 locations

2) Install washers [3] and screws [7] in six locations

3) Install washers [3] and screws [4] in four locations

4) Install washers [3] and screws [6] in three locations

5) Install washers [1] and nuts [2] on the 18 studs on the lower half of the inner wall.

a) Make sure that the nut does not bottom out on the threads of the stud.

b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

<1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

<2> Make sure that a minimum of one washer [1] is below each nut.

<3> The stud is permitted to extend through the nut.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) Apply a fillet seal to the entire forward edge of the lower blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper and lower insulation blankets are completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

2) Where the foam block [73] and blanket [62] meet, completely seal the edge of the lower blanket to the inner wall and the foam block.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed to the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Apply a fillet seal to the entire aft edge of the lower blanket to the inner wall of the thrust reverser (Figure 411).
   a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.
   b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.
   c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

      NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

   d) Apply a continuous bead of sealant with a sealant gun, STD-766.

      NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

      <1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

      <2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

   e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

      <1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

   f) Make sure that the aft edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.
   g) Let the sealant cure in service.

4) Apply a fillet seal to the entire lower edge of the lower blanket to the lower bifurcation of the thrust reverser (Figure 411).
   a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the lower edge of the blanket.
   b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.
   c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

      NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to apply the sealant.

<1> Leave a gap in the sealant bead, 1.50 ±0.50 in. (38.10 ±12.70 mm) in length between the aft two blanket fasteners for fluid drainage from behind the blankets.

<2> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<3> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Where possible, smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

NOTE: The left lower horizontal fire seal covers the blanket edge which will make it difficult to smooth the sealant.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the lower edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal depressor.

h) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the lower blanket cutouts and the three lower compression pads with sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) Apply a continuous bead of sealant/RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

SUBTASK 78-31-13-420-020-F00

CAUTION: DO NOT BEND THE INSULATION BLANKETS. THE BLANKETS ARE NOT FLEXIBLE. IF BEND THE BLANKETS, YOU CAN CAUSE CRACKS OR OTHER DAMAGE.

CAUTION: LIFT THE LARGER INSULATION BLANKETS CAREFULLY. GIVE SUPPORT TO THE EDGES OF THE BLANKET. THE WEIGHT OF THE BLANKET CAN BEND, TWIST, OR BREAK IT.

(4) Do these steps to install the upper blanket [61] on the right thrust reverser (Figure 410):

(a) Use solvent, B00062 to clean these locations:

1) The forward edge of the insulation blanket

2) The insulation blanket adjacent to the three upper compression cups.

3) The aft edge of the insulation blanket.

(b) Make sure that the upper blanket [61] is in the correct position.

1) Where foam block [71] and blanket [61] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

(c) Fasten the blanket [61] to the thrust reverser:

1) Install washers [3] and screws [4] in four locations.

2) Install washers [3] and nuts [5] at five locations.

3) Install washers [3] and screws [7] in nine locations.

4) Install a washer [3] and screw [6] in one location.

5) Install washers [1] and nuts [2] on the 22 studs on the upper half of the inner wall.

a) Make sure that the nut does not bottom out on the threads of the stud.

b) Make sure that the end of the stud is not more than 0.160 in. (4.064 mm) below the top of the nut.

NOTE: The self-locking feature of the nut may not be engaged if the end of the stud is more than 0.160 in. (4.064 mm) below the top of the nut.

<1> If it is necessary, add or remove washers [1] to get the correct dimension between the nut and the end of the stud.

<2> Make sure that a minimum of one washer [1] is below each nut.

<3> The stud is permitted to extend through the nut.

(d) Make sure that the upper blanket is in the correct position.

1) Where the foam block [71] and blanket [61] meet, do these steps:

a) Make sure that the edge of the blanket does not extend past the edge of the inner wall of the thrust reverser.

b) Make sure that the forward edge of the blanket is less than 0.082 in. (2.083 mm) above the inner wall of the thrust reverser.

<1> To get the required height of the blanket from the inner wall, you can apply an installation force to the blanket as follows:

<a> An installation force of 2.0 lbf (8.9 N) to 5.0 lbf (22.2 N) at 12.0 in. (304.8 mm) intervals, or

<b> An installation force of 1.0 lbf (4.4 N) to 2.5 lbf (11.1 N) at 6.0 in. (152.4 mm) intervals, or

<c> An installation force of 0.5 lbf (2.2 N) to 1.25 lbf (5.56 N) at 3.0 in. (76.2 mm) intervals.

(e) Examine the insulation blankets for gaps at the washers on the installation studs.

1) Do these steps to fill the gap:

a) Remove the nut and washers.

b) Apply firewall sealant, A00160 with a sealant gun, STD-766 to fill the gap.

<1> Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

<2> Apply enough sealant so that you do not see a gap when you re-install the washer.

c) Install the washers and nut.

(f) Tighten the nuts and screws between 25.0 in-lb (2.8 N·m) to 35.0 in-lb (4.0 N·m).

(g) Apply sealant to seal these locations:

NOTE: Do not apply sealant to seal the seam between the upper and lower blankets.

1) At the upper bifurcation, seal the forward edge of the upper blanket to the inner wall of the thrust reverser; apply the sealant from the upper edge of the blanket to the upper edge of the upper v-blade.

NOTE: The sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

a) Apply Valspar 4A-183 green strippable coating, G02185 to the blanket, 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft of the forward edge of the blanket.

b) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

e) Apply sealant between the blanket and the inner wall with a sealant gun; the sealant must extend between 1.00 in. (25.40 mm) to 1.50 in. (38.10 mm) aft from the forward edge of the blanket.

f) Apply a continuous bead of sealant with a sealant gun, STD-766 along the forward edge of the blanket.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

i) Remove the masking tape from the fire seal and discard after the sealant is applied.

j) Let the sealant cure in service.

2) Apply a fillet seal to the entire forward edge of the upper blanket to the inner wall of the thrust reverser.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure that the forward edge of the upper and lower insulation blankets are completely sealed to the inner wall of the thrust reverser.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

3) Where the foam block [71] and blanket [61] meet, completely seal the edge of the upper blanket to the inner wall and the foam block.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the forward edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the blanket edge.

c) Do not let the sealant touch the fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant to the edge of the blanket and the foam block to completely seal the edge to the inner wall.

<1> Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

h) Make sure the edge of the blanket and the foam block are completely sealed the edge of the inner wall.

i) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

j) Remove the masking tape from the fire seal and discard after the sealant is applied.

k) Let the sealant cure in service.

4) Apply a fillet seal to the entire aft edge of the upper blanket to the inner wall of the thrust reverser (Figure 411).

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the aft edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm)from the blanket edge.

c) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity.

d) Apply a continuous bead of sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

<2> A large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Make sure that the aft edge of the lower insulation blanket is completely sealed to the inner wall of the thrust reverser.

g) Let the sealant cure in service.

5) Apply a fillet seal to the gap around the upper blanket cutouts and the three upper compression cups with 1-part sealant/RTV 106 adhesive, A00081 and a sealant gun, STD-766.

NOTE: This sealant has a short work life. Exposure to the air for more than a few minutes will cause a skin to form which will prevent adhesion on the surfaces.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the edge of the blanket cutouts.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the edge of the blanket cutouts.

c) Do not apply silicone primer to the thermal insulation blankets.

d) At the No.1, No.2 and No.3 compression cups, apply a continuous bead of sealant/ RTV 106 adhesive, A00081.

<1> In areas of large gaps, apply the fillet seal using multiple passes of the sealant gun; do not inject large amounts of sealant behind the blanket.

e) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the tool with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

f) Let the sealant cure in service.

NOTE: The sealant will cure in 24 hours at 65.0°F (18.3°C). The adhesive requires a minimum of 20 percent relative humidity to cure. Because the adhesive requires moisture from the air to cure, do not cover the adhesive. There will be the smell of acetic acid until the adhesive has cured.

6) Apply a fillet seal on the entire upper edge of the upper blanket and the inner wall structure.

NOTE: The upper edge of the upper blanket is just below the horizontal fire seal.

a) Apply a parting agent, Valspar 4A-183 green strippable coating, G02185, to the upper edge of the blanket.

b) Make sure that the parting agent covers a minimum 1.0 in. (25.4 mm) from the upper edge of the blanket.

c) Do not let the sealant touch the horizontal fireseal; protect the fire seal with a mask made from adhesive masking masking tape, G02311.

d) Mix the two-part fire wall sealant, A00160 to the manufacturers instructions.

NOTE: Use the two-part fire wall sealant, A00160, BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

NOTE: Type II-Class B1/2 sealant cures in 4 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B1/2 sealant is approximately 0.5 hours at 72°F (22°C) to 82.0°F (28°C)) and 45-55 percent relative humidity.

NOTE: Type II Class B-4 sealant cures in 48 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Cure time is increased at temperatures and humidity less than the above values. Cure time is decreased at temperatures and humidity more than the above values. Application time for Type II-Class B-4 sealant is approximately 4.0 hours at 72°F (22°C) to 82.0°F (28°C) and 45-55 percent relative humidity. Once applied from the tube, the sealant has a work life of 0.25 hours.

e) Move the adjacent fire seal away from the blanket edge as the sealant is applied.

f) Apply the sealant with a sealant gun, STD-766.

NOTE: To minimize entrapped air during sealant application, point the nozzle tip into the seam, keep the tip nearly perpendicular to the line of travel and force a bead of sealant ahead of the nozzle tip.

g) Apply the sealant in a large, continuous bead; the large bead is permitted to make sure there is an adequate seal between the blanket and the adjacent structure.

h) Use multiple continuous beads of sealant at areas where there are large gaps; do not inject the sealant behind the blanket.

i) Smooth the sealant fillets with a hardwood or plastic fillet smoothing spatula, STD-810.

<1> Wet the spatula with a solution of 1:6 to 1:5 isopropyl alcohol, B00130 and distilled water, G01061 to prevent the adhesion of the sealant to the tool.

j) Use a cotton wiper, G00034 to remove all excess sealant from the surface of the fire seal.

k) Remove the masking tape from the fire seal and discard after the sealant is applied.

l) Let the sealant cure in service.

7) Install the flange insulation between the fire seal retainer and the upper blanket (Figure 411).

NOTE: There are two types of flange insulation, a rectangular cross-section insulation and a tapered cross-section insulation. Two rectangular flange insulation assemblies are needed to cover the flange on the upper bifurcation. One tapered flange insulation is needed to cover the flange on the upper bifurcation. It is optional to use the tapered flange insulation for the two rectangular flange insulations.

a) Install the two rectangular flange insulation assemblies so that the flange on the upper bifurcation is completely covered.

<1> Install the first rectangular flange insulation assembly from the end of the fire seal to the area forward of the No.2 compression cup.

<a> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the two-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Cut the second rectangular flange insulation assembly to fit beneath the first assembly from the area forward of the No.3 compression cup to the area forward of the No.2 compression cup.

<a> Apply a fay surface seal with sealant between the two rectangular flange insulation pieces.

<b> Apply a fillet seal with sealant between the rectangular flange insulation and the blanket.

<c> Cover the exposed core of the cut rectangular flange insulation with sealant

b) Install the tapered flange insulation so that the flange on the upper bifurcation is completely covered.

<1> Apply sealant, A00160 to the flange to pack the area between the flange insulation and the flange.

NOTE: Use the two-part fire wall sealant BMS5-63 Type II Class B1/2. It is optional to use BMS5-63 Type II, Class B-4.

<2> Apply a fillet seal with sealant between the tapered flange insulation and the blanket.

<3> Apply a fillet seal with sealant between the tapered flange insulation and the fire seal retainer.

H. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-13-410-006-F00

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

END OF TASK

INSULATION BLANKET - INSPECTION/CHECK

1. General

A. This procedure has one task:

(1) A detailed inspection of the insulation blankets on the thrust reverser.

TASK 78-31-13-200-801-F00

2. Insulation Blanket Inspection

(Figure 601)

A. General

(1) This task is for a visual inspection of the insulation blankets on the left and right thrust reversers on an engine.

(2) There are two insulation blankets installed on the left thrust reverser and two on the right thrust reverser.

(3) The insulation blankets are a thermal insulation and fire barrier layer. They are necessary to keep the thrust reverser structurally serviceable and can decrease the damage and repair costs from a duct burst or a fire.

(4) The cold side of the insulation blanket is against the inner wall of duct and will be referred to as the inner sheet.

(5) The hot side of the insulation blanket is adjacent to the engine and will be referred to as the outer sheet.

(6) The insulant that is between the inner and outer sheets will be referred to as the insulation material.

B. References

Reference	Title
05-51-34-200-802	Nacelle Structure Hot Air Duct Rupture Conditional Inspection (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-01-200-801-F00	Thrust Reverser Fan Duct Wall Inspection (P/B 601)
78-31-13-000-801-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-803-F01	Insulation Blanket Removal (P/B 401)
78-31-13-000-805-F00	Insulation Blanket Removal (P/B 401)
78-31-13-000-806-F00	Insulation Blanket Removal (P/B 401)
78-31-13-300-801-F00	Insulation Blanket Repair (P/B 801)
78-31-13-400-801-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-803-F01	Insulation Blanket Installation (P/B 401)
78-31-13-400-805-F00	Insulation Blanket Installation (P/B 401)
78-31-13-400-806-F00	Insulation Blanket Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Inspection

SUBTASK 78-31-13-010-003-F00

WARNING: DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Procedure

SUBTASK 78-31-13-210-001-F00

(1) If you find damage to the insulation blanket, unless you are given other instructions, replace the insulation blanket.

These are the tasks:

- Insulation Blanket Removal, TASK 78-31-13-000-801-F00 or Insulation Blanket Removal, TASK 78-31-13-000-803-F01 or Insulation Blanket Removal, TASK 78-31-13-000-805-F00 or Insulation Blanket Removal, TASK 78-31-13-000-806-F00
- Insulation Blanket Installation, TASK 78-31-13-400-801-F00 or Insulation Blanket Installation, TASK 78-31-13-400-803-F01 or Insulation Blanket Installation, TASK 78-31-13-400-805-F00 or Insulation Blanket Installation, TASK 78-31-13-400-806-F00.

SUBTASK 78-31-13-212-001-F00

(2) If the insulation blankets are replaced, look for signs of damage to the inner wall, discoloration or a scorched appearance on the inner wall for the area under the blankets.

NOTE: Discoloration could indicate overheat exposure. Discolorations would appear as areas that are of a different color, usually much darker than the original predominant color of the structure or part that is examined. Discoloration areas of a light color (ex. white) surrounded by darkened areas (dark to medium brown) are also areas that indicate overheat exposure. Areas that are not of interest include discolored areas due to oil, fluid, or soil exposure.

(a) If you find inner wall damage, refer to this procedure: Thrust Reverser Fan Duct Wall Inspection, TASK 78-31-01-200-801-F00.

(b) If you find inner wall damage and the blankets were replaced because of a duct burst, do this task: Nacelle Structure Hot Air Duct Rupture Conditional Inspection, TASK 05-51-34-200-802.

SUBTASK 78-31-13-210-002-F00

(3) If the damage is in the limits and conditions, you can do a temporary repair of the insulation blanket on the airplane.

(a) A temporary repair has a Continue-In-Service limit of not more than 500 hours.

NOTE: A temporary repair must be replaced in not more than 500 hours with another temporary repair or a permanent repair.

(b) Do this task: Insulation Blanket Repair, TASK 78-31-13-300-801-F00.

SUBTASK 78-31-13-210-003-F00

(4) Examine the insulation blankets for damage:

(a) Missing insulation material or fluid contamination.

1) Not serviceable.

(b) Cracks and tears

1) Cracks and tears are not permitted.

2) A temporary repair can be done with these conditions:

a) The tear or crack in the outer metal sheet is not longer than 4 inches (102 mm).

b) Around each damaged area in all directions, there is a minimum surface distance that is not damaged of not less than 0.5 inch (13 mm).

c) The damaged area is not less than 0.5 inch (13 mm) from a grommet, sharp bend, attaching parts or edge.

(c) Holes in the outer metal sheet

1) Holes are not permitted.

2) A temporary repair can be done with these conditions:

a) The hole in the outer metal sheet is not more than 0.25 inch (6.4 mm) in diameter.

b) Around each damaged area in all directions, there is a minimum surface distance that is not damaged of not less than 0.5 inch (13 mm).

c) The damaged area is not less than 0.5 inch (13 mm) from a grommet, sharp bend, attaching parts or edge.

SUBTASK 78-31-13-210-004-F00

(5) Examine the insulation blankets for missing sealant:

HAP 021-026, 028-054, 101-999; HAP 001-013, 015-020 POST SB 737-78-1069

(a) Examine the areas at the upper, lower and aft edges of the insulation blanket and the adjacent inner wall for missing sealant.

1) If there is missing sealant, do the applicable steps in the Insulation Blanket Installation procedure to replace the sealant: Insulation Blanket Installation, TASK 78-31-13-400-803-F01.

HAP ALL

(b) For the upper insulation blanket, examine the areas at the forward, middle and aft compression pad spacer and the adjacent blanket edge for missing sealant.

(c) For the lower insulation blanket, examine the areas at the middle and aft compression pad spacer and the adjacent blanket edge for missing sealant.

1) If there is missing sealant, do the applicable steps in the Insulation Blanket Installation procedure to replace the sealant: Insulation Blanket Installation, TASK 78-31-13-400-801-F00 or Insulation Blanket Installation, TASK 78-31-13-400-803-F01 or Insulation Blanket Installation, TASK 78-31-13-400-805-F00 or Insulation Blanket Installation, TASK 78-31-13-400-806-F00.

SUBTASK 78-31-13-210-005-F01

(6) Examine the insulation blankets for gaps at the washers on the installation studs.

(a) Do these steps to fill the gap:

1) Remove the nut and washers.
2) Apply sealant, A00160 (BMS5-63) to fill the gap.
   a) Apply enough sealant so that you do not see a gap when you re-install the washer.
3) Install the washers and nut.

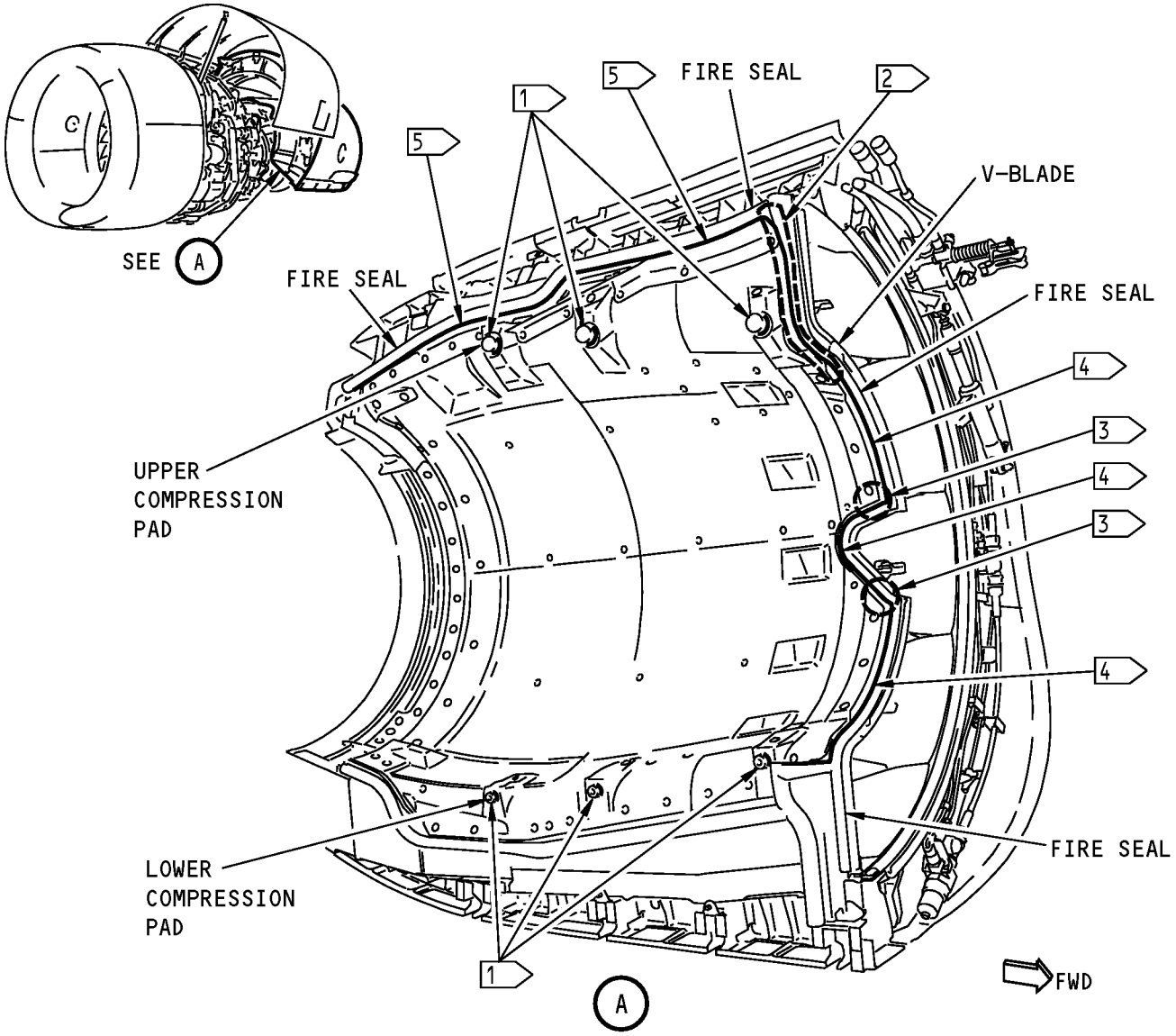
G. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-13-410-003-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——————— END OF TASK ———————



1 FILLET SEAL GAP BETWEEN BLANKET CUTOUT AND COMPRESSION PAD SPACER WITH RTV 106 SEALANT; SEE TEXT

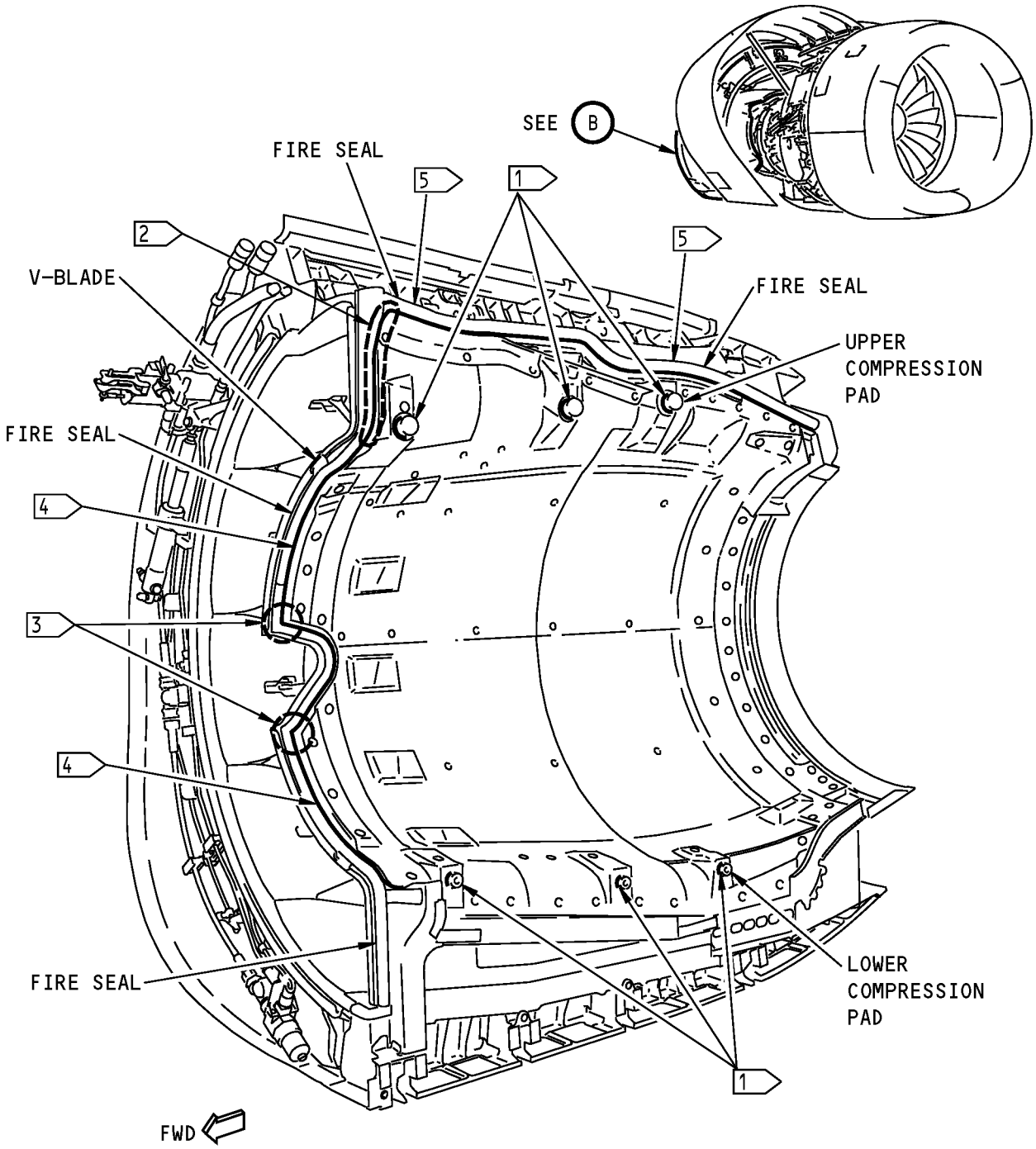
2 SEAL BLANKET TO INNER WALL WITH SEALANT BMS 5-63, 1.0 - 1.5 INCH (12.7-19.0 MM) AFT OF BLANKET FORWARD EDGE. USE PARTING AGENT ON INNER WALL; SEE TEXT

3 GAP BETWEEN BLANKET EDGE AND INNER WALL NOT MORE THAN 0.82 INCH (20.83 MM). SEAL BLANKET EDGE TO INNER WALL FOAM BLOCK; SEE TEXT

4 FILLET SEAL ENTIRE BLANKET FORWARD EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

5 FILLET SEAL ENTIRE BLANKET UPPER EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

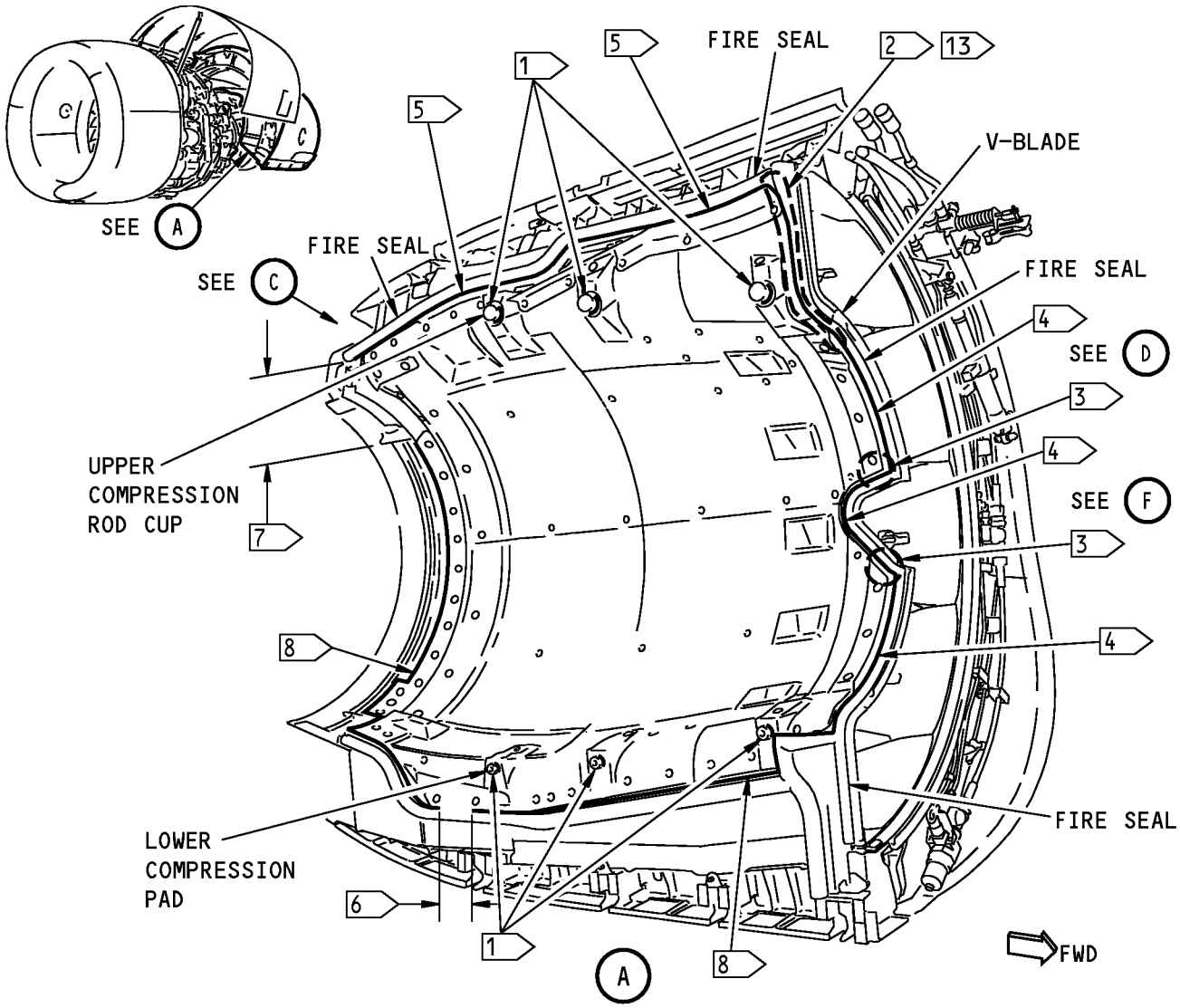
Insulation Blanket Sealant Application
Figure 601 (Sheet 1 of 8)/78-31-13-990-811-F00



THRUST REVERSER INSULATION BLANKET INSTALLATION

B

Insulation Blanket Sealant Application
Figure 601 (Sheet 2 of 8)/78-31-13-990-811-F00



1 FILLET SEAL GAP BETWEEN BLANKET CUTOUT AND COMPRESSION PAD SPACER WITH RTV 106 SEALANT; SEE TEXT

2 SEAL BLANKET TO INNER WALL WITH SEALANT BMS 5-63, 1.0 - 1.5 INCHES (12.7-19.0 mm) AFT OF BLANKET FORWARD EDGE. USE PARTING AGENT ON INNER WALL; SEE TEXT

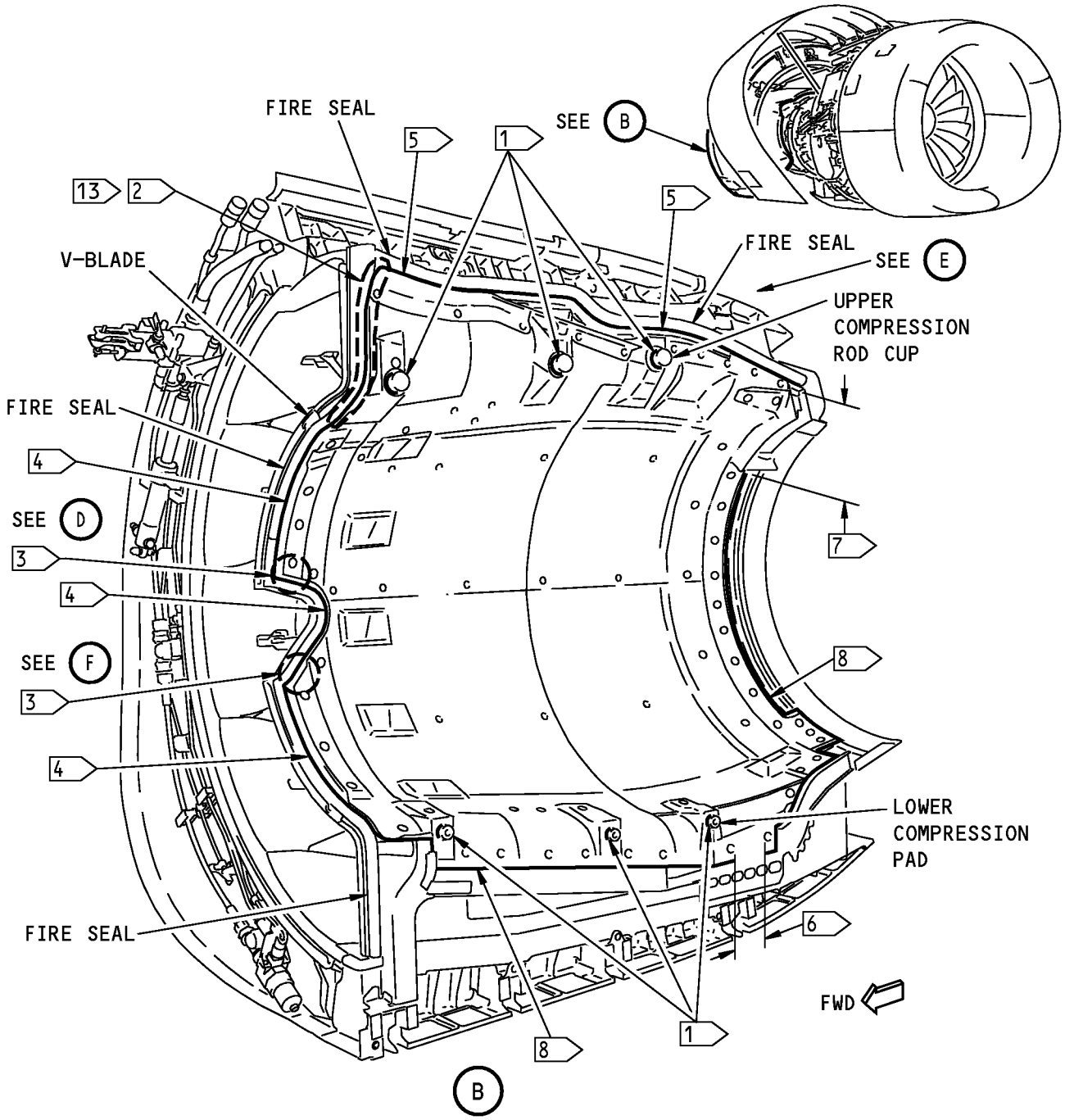
3 GAP BETWEEN BLANKET EDGE AND INNER WALL NOT MORE THAN 0.82 INCH (20.83 mm). SEAL BLANKET EDGE TO INNER WALL FOAM BLOCK; SEE TEXT

4 FILLET SEAL ENTIRE BLANKET FORWARD EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

5 FILLET SEAL ENTIRE BLANKET UPPER EDGE TO INNER WALL WITH SEALANT BMS 5-63; SEE TEXT

1380845 S0000251394_V2

Insulation Blanket Sealant Application
Figure 601 (Sheet 3 of 8)/78-31-13-990-811-F00



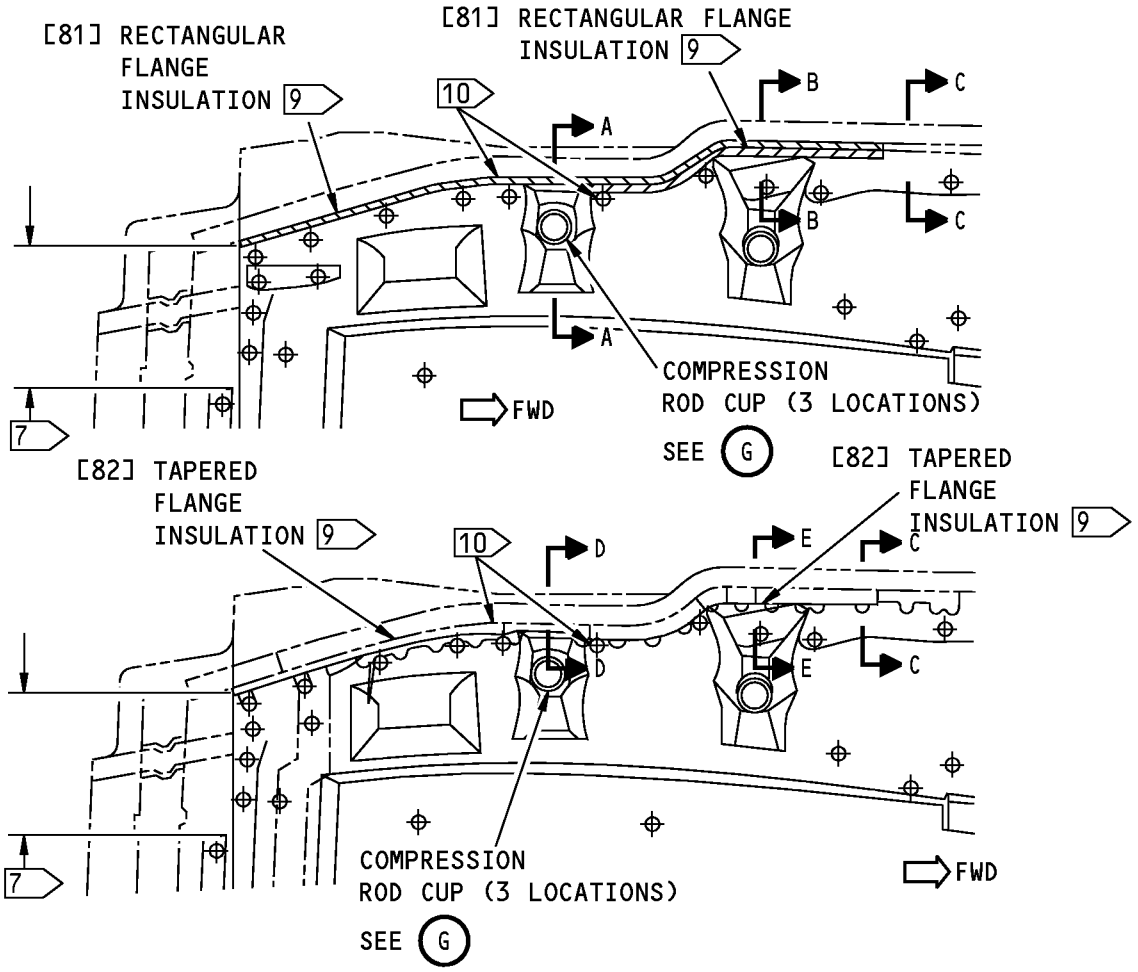
6 NO SEALANT ON DRAINAGE GAP 1.0 - 2.0 INCHES (25.4 - 50.8 mm) LENGTH

7 NO SEALANT ON UPPER AFT BLANKET, 14.3 - 15.3 INCHES (363.2 - 388.6 mm) LENGTH

8 FILLET SEAL ENTIRE AFT EDGE AND LOWER EDGE OF BLANKETS TO INNER WALL WITH BMS 5-63; SEE TEXT

1381006 S0000251395_V2

Insulation Blanket Sealant Application
Figure 601 (Sheet 4 of 8)/78-31-13-990-811-F00

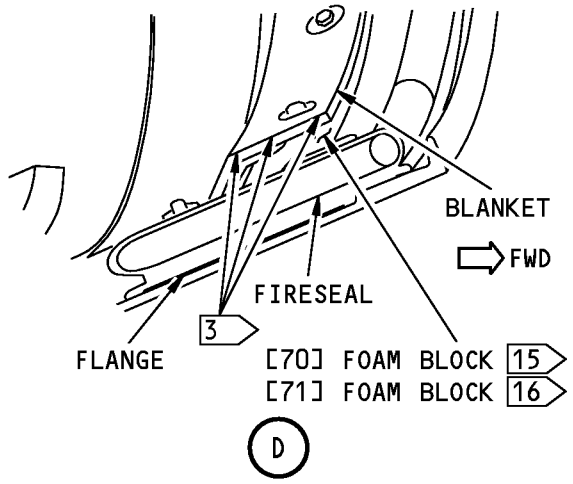


LEFT THRUST REVERSER FLANGE INSTALLATION

9 CUT FLANGE INSULATION FOR COMPLETE COVERAGE OF FLANGE AS SHOWN. SEAL EXPOSED CORE WITH BMS 5-63.

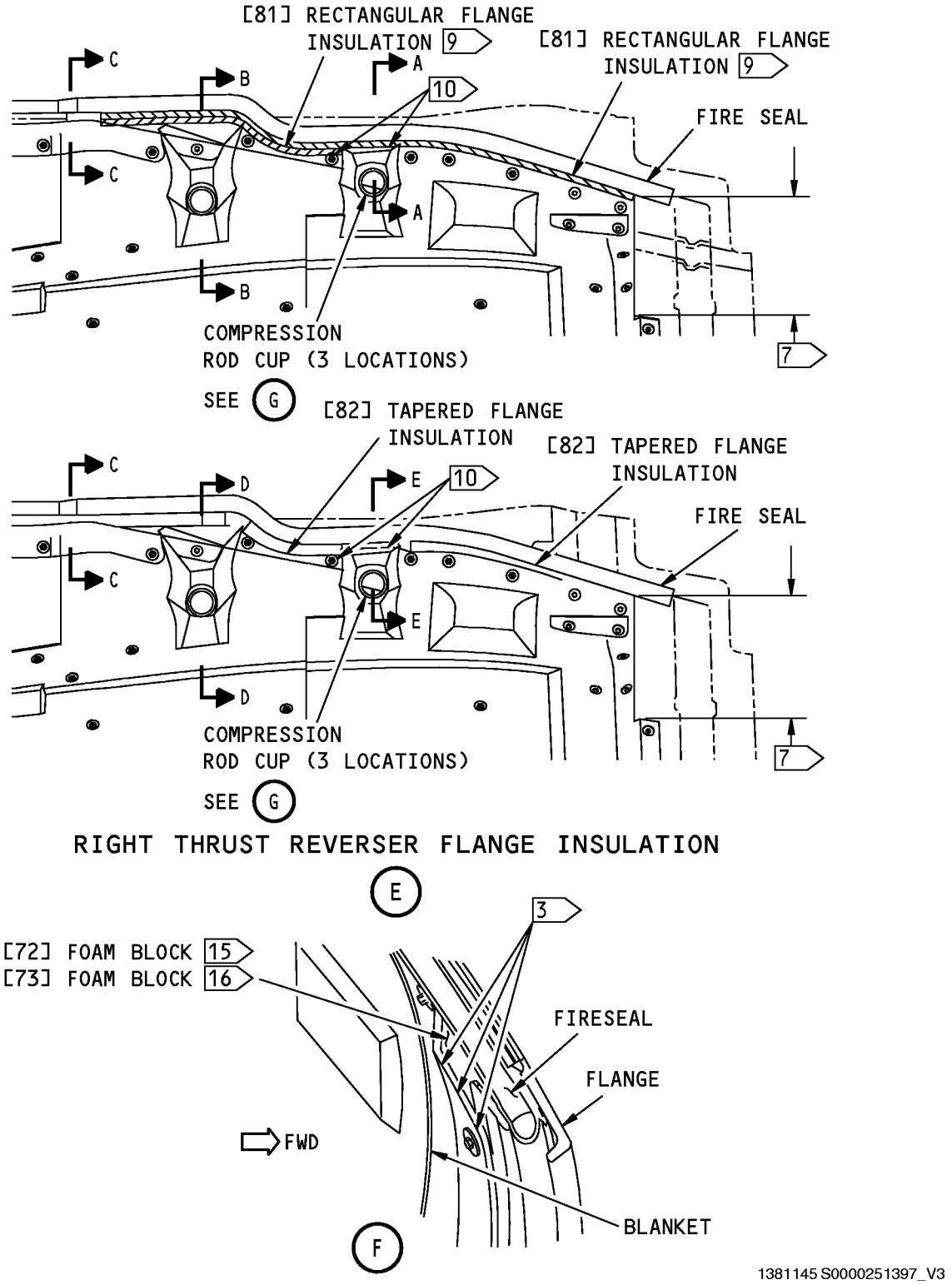
10 INSTALL FLANGE INSULATION FOR COMPLETE COVERAGE OF FLANGE; ADJUST AS NECESSARY

11 PREPACK SEALANT BETWEEN FLANGE AND FLANGE INSULATION. FAY SURFACE SEAL BETWEEN FLANGE INSULATION. FILLET SEAL BETWEEN FLANGE INSULATION AND BLANKET. USE BMS 5-63 SEALANT.

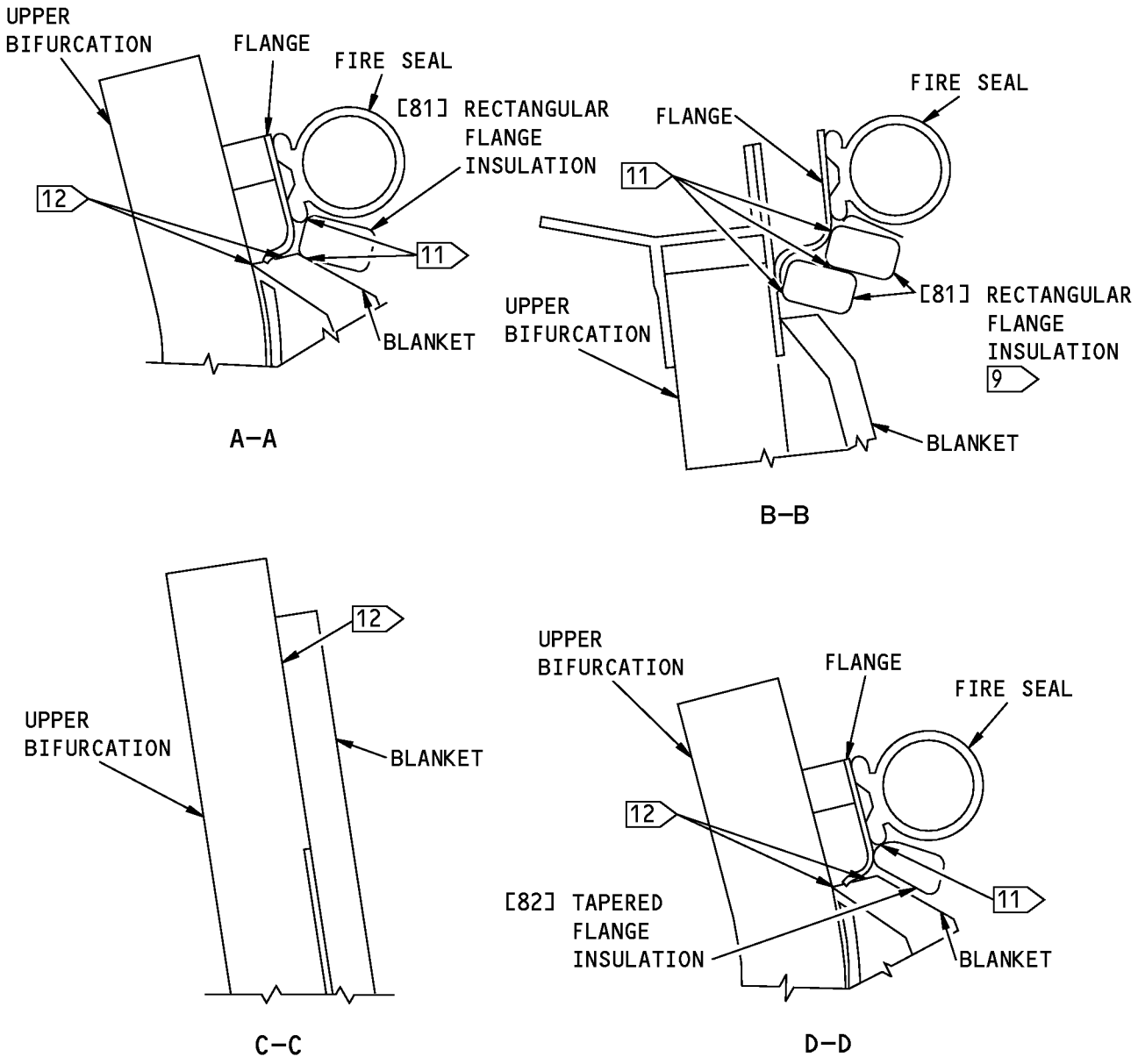


1381067 S0000251396_V3

Insulation Blanket Sealant Application
Figure 601 (Sheet 5 of 8)/78-31-13-990-811-F00



Insulation Blanket Sealant Application
Figure 601 (Sheet 6 of 8)/78-31-13-990-811-F00

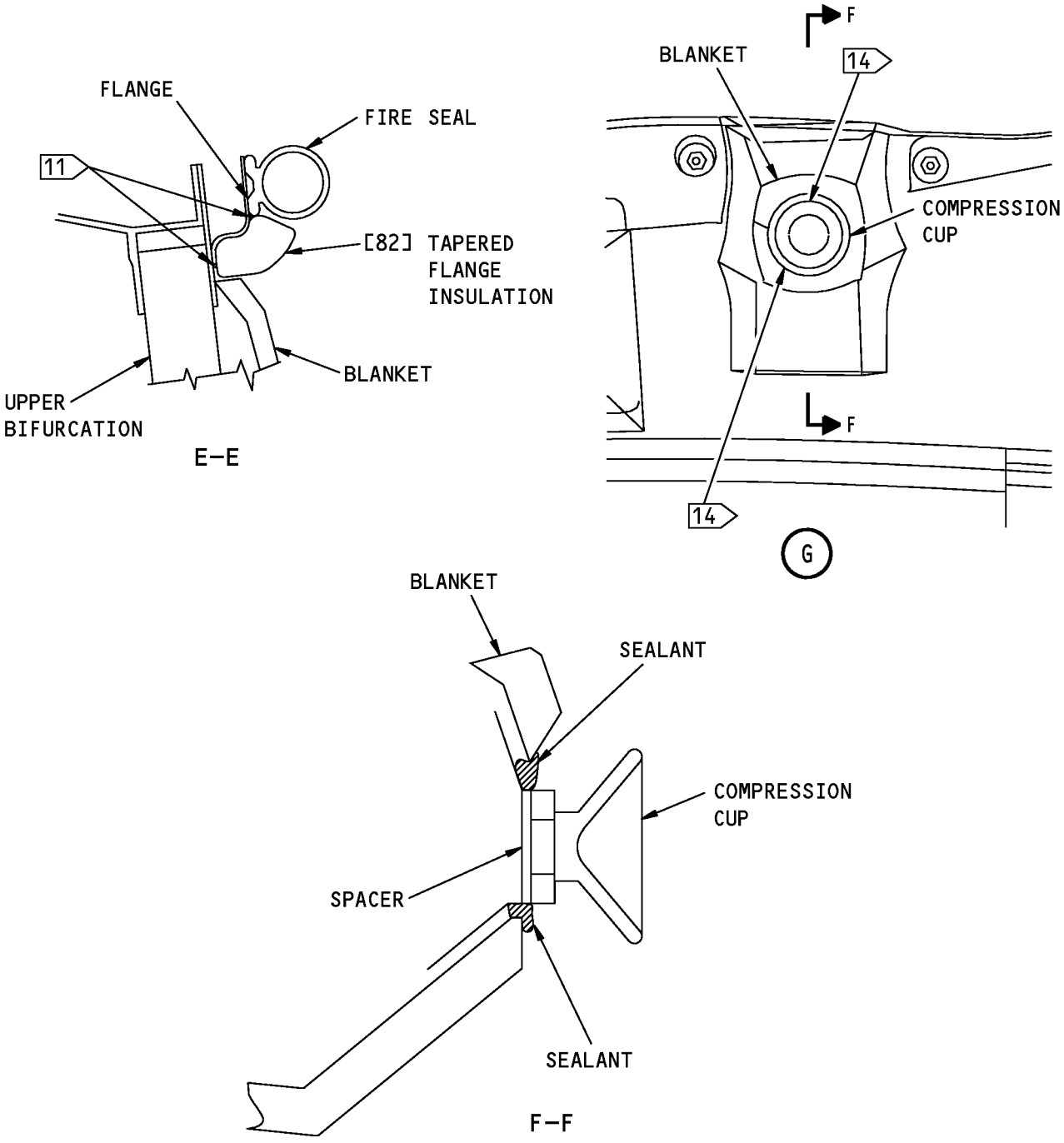


12> FILLET SEAL BETWEEN BLANKET AND INNER WALL; USE BMS 5-63.

13> SEALANT APPLIED FROM UPPER EDGE OF BLANKET TO UPPER EDGE OF UPPER V-BLADE.

1381153 S0000251415_V2

Insulation Blanket Sealant Application
Figure 601 (Sheet 7 of 8)/78-31-13-990-811-F00



14 FILLET SEAL BETWEEN BLANKET AND SPACER/COMPRESSION FITTING.

1381159 S0000251416_V3

Insulation Blanket Sealant Application
Figure 601 (Sheet 8 of 8)/78-31-13-990-811-F00

INSULATION BLANKET - REPAIRS

1. General

A. This procedure has one task:

(1) The temporary repair of the insulation blankets on the thrust reverser.

TASK 78-31-13-300-801-F00

2. Insulation Blanket Repair

(Figure 801)

A. General

(1) This task is for the temporary repair of the insulation blanket on the left and right thrust reverser on an engine.

(2) There are two insulation blankets installed on the left thrust reverser and two on the right thrust reverser.

(3) Special Consumable Materials

(a) Foil - AISI 321/347, Corrosion resistant steel (CRES), 0.002 - 0.003 inch (0.051-0.076 mm) thick or

(b) Foil - Corrosion resistant steel (CRES), Part Number 1A-10012-M.

(4) The cold side of the insulation blanket is against the inner wall of duct and will be referred to as the inner metal sheet.

(5) The hot side of the insulation blanket is adjacent to the engine and will be referred to as the outer metal sheet.

(6) The insulant that is between the inner and outer metal sheets will be referred to as the insulation material.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

D. Consumable Materials

Reference	Description	Specification
A00081	Adhesive - Silicone Rubber - RTV 106	BAC5010, Type 74
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
C00954	Primer - Adhesive Bonding (General Electric SS4004P)	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00744	Cloth - Emery	
G01306	Gloves - Lint-free	

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Damage Limits

SUBTASK 78-31-13-800-001-F00

(1) If the damage to the insulation blanket is in these limits, you can repair the insulation blanket on the airplane:

(a) There is no missing insulation material and the insulation material is not wet.

(b) A hole in the outer metal sheet is not more than 0.25 inch (6.4 mm) in diameter.

(c) A tear in the outer metal sheet is not longer than 4 inches (102 mm).

(d) Around each damaged area in all directions, there is a minimum surface distance that is not damaged of not less than 0.5 inch (13 mm).

(e) The damaged area is not less than 0.5 inch (13 mm) from a grommet, sharp bend, attaching parts or edge.

G. Prepare for the Temporary Repair

SUBTASK 78-31-13-010-002-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

H. Temporary Insulation Blanket Repair

SUBTASK 78-31-13-860-001-F00

(1) This temporary repair must be replaced in not more than 500 hours with another temporary repair or a permanent repair.

(a) To do the permanent repair, remove the blanket and do the repair per 737-SL 78-050.

SUBTASK 78-31-13-390-002-F00

(2) Do these steps to repair the damaged area of the outer metal sheet:

(a) Make sure that the damaged area is in the limits.

WARNING: USE PROTECTION WHEN YOU REMOVE THE SHARP METAL EDGES FROM THE DAMAGED AREA OF THE OUTER METAL SHEET. SHARP METAL EDGES CAN CAUSE INJURY TO PERSONS.

(b) Remove the sharp metal edges and loose materials from the damaged area.

1) Deburr the edges of the damaged area of the outer metal sheet with a emery cloth, G00744 or equivalent.

2) Use a sharp object to pierce a 1/16 inch (0.06 inch) (1.8 mm) diameter stop-hole in the outer metal sheet approximately 1/16 inch (0.06 inch) (1.8 mm) from each end of the crack or tear.

NOTE: The damaged area will not extend farther than the stop-holes.

(c) Cut a piece of 0.002-0.003 inch (0.051-0.076 mm) thick CRES (AISI 321/347 corrosion-resistant steel) foil that will overlap the surface area in all directions around the damaged area by not less than 0.5 inch (13 mm).

1) Cut the corners to make a rounded edge that has a radius of 0.25 inch (6.4 mm).

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

CAUTION: DO NOT GET SOLVENTS ON THE INSULATION MATERIAL. SOLVENT AND OTHER FLUIDS WILL DECREASE THE PERFORMANCE AND MATERIAL PROPERTIES OF THE INSULATION BLANKET.

(d) Clean the damaged area and a minimum of 0.5 inch (13 mm) in all directions around the damaged area with solvent, B00062, and a cotton wiper, G00034.

(e) Clean the surface again with a clean cloth that is moist with solvent and wipe dry with another clean dry cloth while the surface is still moist.

NOTE: If used, the SS4004 RTV primer, C00954, must be applied in less than four hours after the area is cleaned.

(f) Do the above steps again to clean the patch.

(g) Make sure that the cleaned bonding surface and patch are kept clean. Use lint-free gloves, G01306, when you touch the cleaned bonding surface or patch.

(h) For RTV 106, use a clean piece of cotton wiper, G00034, to apply a thin layer of SS4004 RTV primer, C00954, to the cleaned bonding surface of the outer metal sheet and the patch.

1) Let the primer dry for no less than 30 minutes, but for no more than 72 hours at 65-100 degrees F.

(i) Make sure that the bonding surface and patch are kept clean. Use lint-free gloves, G01306, when you touch the bonding surface or patch.

(j) Use a hardwood or plastic fillet smoothing spatula, STD-810 to apply a continuous layer of RTV 106 adhesive, A00081, or sealant, A00160, Type II to the primed bonding surface of the outer metal sheet.

1) Make sure that the sealant is a maximum of 1/8 inch thick and extends in all directions from the damaged area a minimum of 0.5 inch (13 mm).

2) Make sure that the sealant is smooth.

3) Make sure that the patch is installed immediately after the adhesive is applied.

NOTE: Immediately after the adhesive is applied, it will begin to cure and within a few minutes a skin will form on the adhesive. The patch will not adhere properly if a skin has formed on the adhesive.

(k) Put the metal patch in the correct position over the damaged area.

1) Make sure that too much pressure is not used when the patch is applied.

NOTE: Too much adhesive will squeeze out when more pressure is applied to the patch.

(l) Remove all unwanted adhesive from the outer metal sheet with a cotton wiper, G00034.

(m) Apply pressure to the patch as the adhesive dries.

(n) For RTV 106, let the adhesive dry for a minimum of 24 hours at a minimum of 65 degrees F.

(o) For BMS5-63 Type II, let the sealant dry for a minimum of 24 hours (Class B-4) or two hours (Class B-1/2) at a minimum of 65 degrees F.

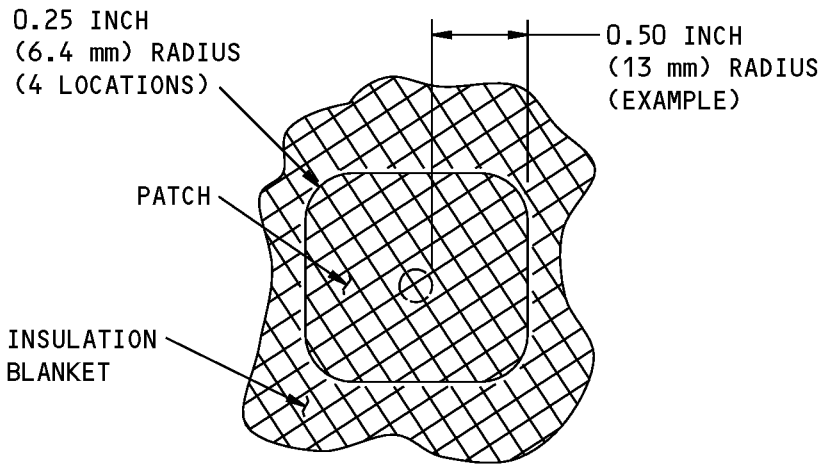
I. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-13-410-002-F00

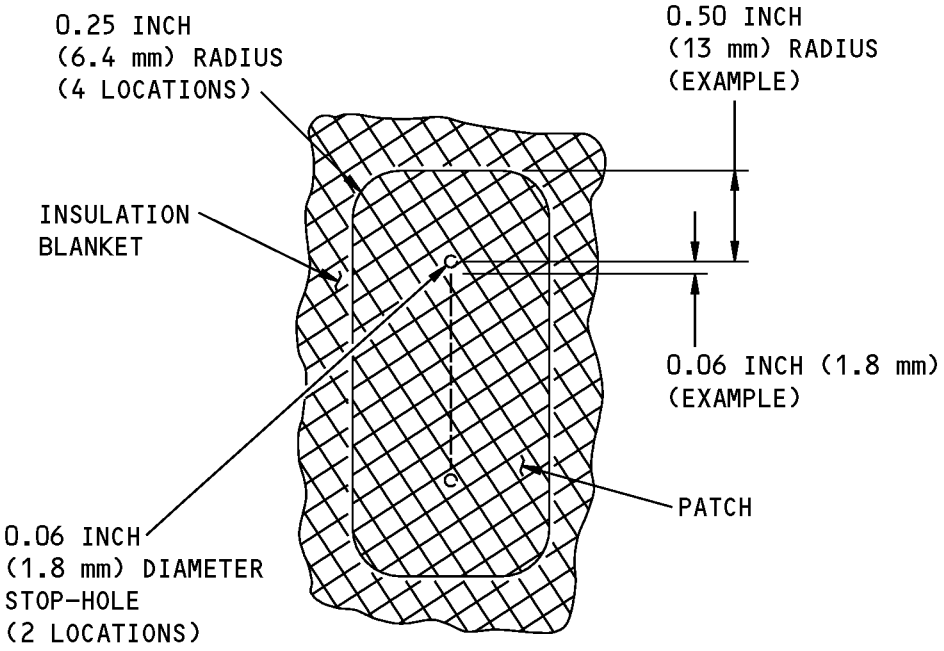
WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

——————— END OF TASK ———————



PATCH OVER HOLE



PATCH OVER TEAR OR CRACK

Temporary Insulation Blanket Repair
Figure 801/78-31-13-990-803-F00

BULLNOSE SEAL - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser bullnose seal.

(2) The installation of the thrust reverser bullnose seal.

TASK 78-31-23-000-801-F00

2. Bullnose Seal Removal

(Figure 401)

A. General

(1) This task is for the removal of the bullnose seal from the left or right thrust reverser on an engine.

(2) The thrust reverser bullnose seal compresses against the bullnose fairing when the thrust reverser is in the stow position. This keeps the fan air exhaust airflow from the inner part of the translating sleeve.

(3) To get access to the bullnose seal, you must remove the thrust reverser translating sleeve.

B. References

Reference	Title
78-31-02-000-802-F00	Translating Sleeve Removal (P/B 401)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-23-010-001-F00

WARNING: OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Translating Sleeve Removal, TASK 78-31-02-000-802-F00.

E. Bullnose Seal Removal

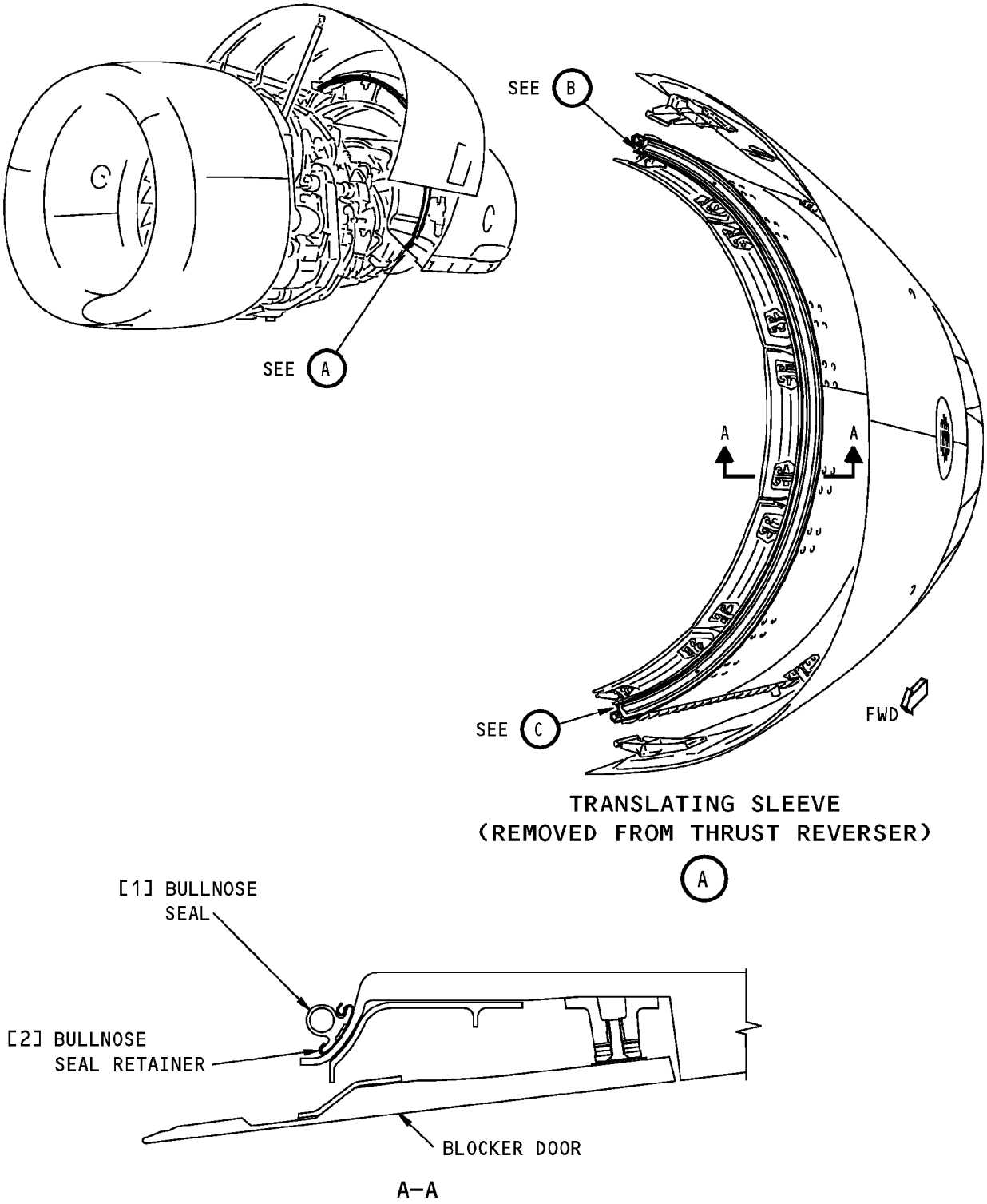
SUBTASK 78-31-23-020-001-F00

(1) Do these steps to remove the bullnose seal [1] from the applicable translating sleeve:

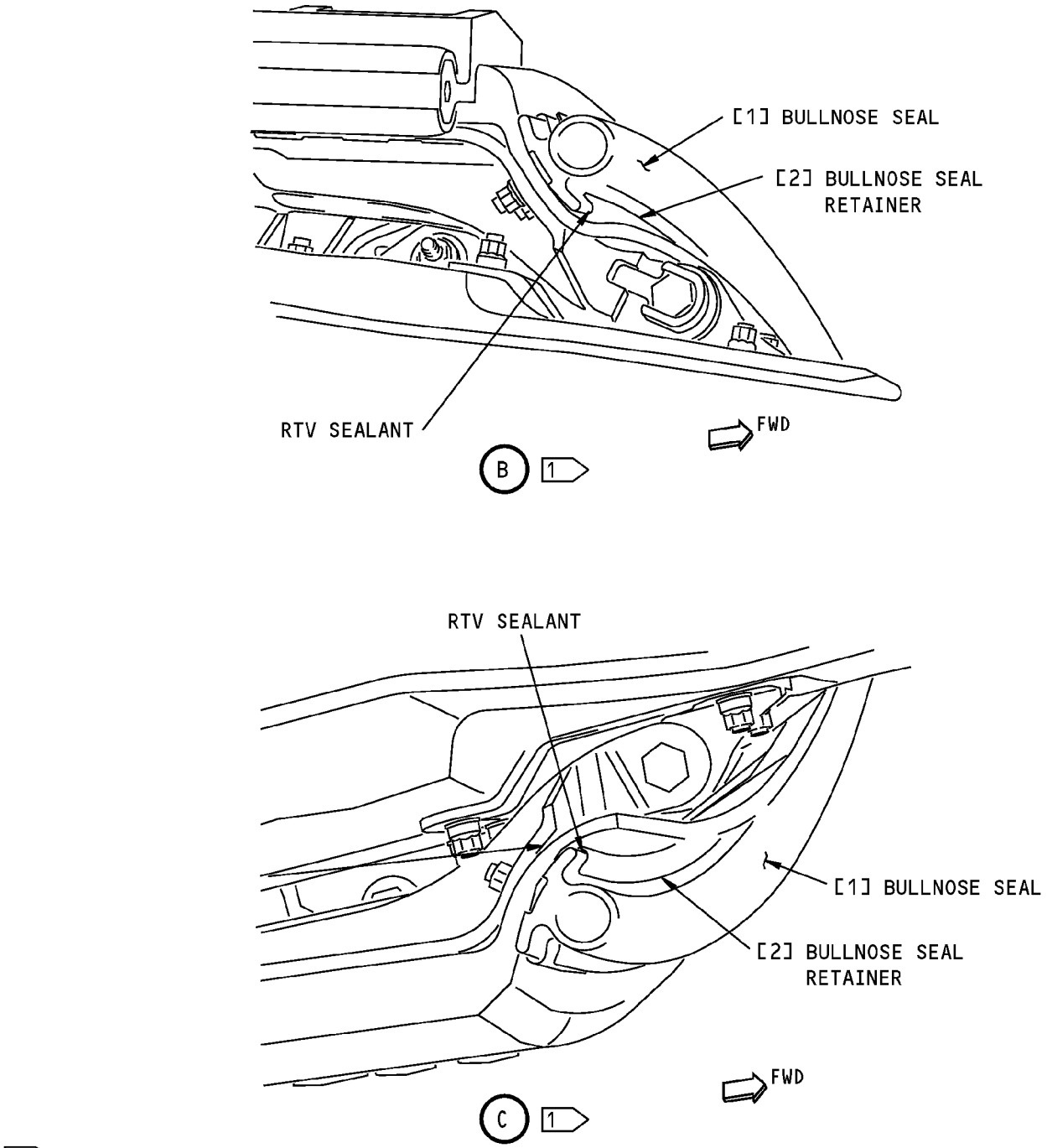
(a) Carefully remove the sealant from the two ends of the bullnose seal [1] that holds it in the retainer [2].

(b) Slide the bullnose seal [1] out of the retainer [2].

END OF TASK



Bullnose Seal Installation
Figure 401 (Sheet 1 of 2)/78-31-23-990-802-F00



Bullnose Seal Installation
Figure 401 (Sheet 2 of 2)/78-31-23-990-802-F00

TASK 78-31-23-400-801-F00

3. Bullnose Seal Installation

(Figure 401)

A. General

(1) This task is for the installation of the bullnose seal on the left or right translating sleeve on an engine.

B. References

Reference	Title
78-31-02-400-802-F00	Translating Sleeve Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A00027	Adhesive - Silicone Rubber, 1 Part, RTV	BAC5010, Type 60
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Bullnose Seal Installation

SUBTASK 78-31-23-020-002-F00

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT

CAUTION: DO NOT PULL OR BEND THE BULLNOSE SEAL. IF YOU PULL OR BEND THE BULLNOSE SEAL, YOU CAN CAUSE DAMAGE TO THE BULLNOSE SEAL.

(1) Do these steps to install the bullnose seal [1] on the applicable translating sleeve:

(a) Clean all of the sealant residue from the retainer [2] with solvent, B00062.

(b) Prepare a liquid-detergent (hand soap) water solution to use as a lubricant on the bullnose seal [1] for easy installation.

(c) Apply the liquid-detergent water solution to the bullnose seal [1] and retainer [2].

(d) Slide the bullnose seal [1] into the retainer [2].

(e) Put the bullnose seal so that the dimension from each end of the bullnose seal to the edge of the acoustic panel is equal.

(f) Apply adhesive, A00027 at the two ends of the bullnose seal [1]:

1) Apply the sealant to the last 2.0 inches (51 mm) of the bullnose seal [1], and around the upper and lower edges where it contacts the retainer [2].
2) Fill the open space between the bullnose seal [1], the bullnose retainer [2] and the acoustic panel.
3) Let the adhesive, A00027 cure a minimum of 24 hours at 65-100 degrees F (18-38 C).

F. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-23-410-001-F00

WARNING: MAKE SURE THAT YOU OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. THIS WILL PREVENT INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Translating Sleeve Installation, TASK 78-31-02-400-802-F00.

——————— END OF TASK ———————

BULLNOSE SEAL - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has one task:

(1) A visual check of the bullnose seal and retainer.

TASK 78-31-23-200-801-F00

2. Bullnose Seal Inspection (Visual)

(Figure 601)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This is a scheduled maintenance task to do a visual check of the bullnose seal and retainer.

(3) You must extend the thrust reverser sleeve to see the bullnose seal and retainer.

(4) The bullnose seal is installed along the full length of the inner wall of the translating sleeve, radially out from the forward edge of the blocker doors and radially in from the cascade segments.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)
78-31-23-000-801-F00	Bullnose Seal Removal (P/B 401)
78-31-23-400-801-F00	Bullnose Seal Installation (P/B 401)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Inspection

SUBTASK 78-31-23-010-002-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-23-980-002-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES. MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE THRUST REVERSER SLEEVE AS IT IS EXTENDED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Do these steps to expose the bullnose seal:

NOTE: The sleeve must be partially extended to expose the bullnose seal.

(a) For the inboard thrust reverser sleeve, do these steps to manually extend the thrust reverser sleeve:

1) Make sure that the leading edge flaps are completely retracted.

NOTE: Without hydraulics to hold the flaps in the retract position, the weight of the flaps can cause them to extend a small amount.

2) Monitor the position of the thrust reverser sleeve as it is extended to make sure that it does not touch the leading edge of the wing.

3) Manually extend the thrust reverser sleeve no more than 10.0 inches (254.0 mm) from the forward edge of the torque box.

4) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

(b) For the outboard thrust reverser sleeve, manually extend the thrust reverser sleeve approximately 10.0 inches (254.0 mm).

NOTE: The outboard thrust reverser sleeve will not touch the leading edge of the wing.

1) Do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

E. Procedure

SUBTASK 78-31-23-210-001-F00

(1) Look through the forward end of the thrust reverser to examine the bullnose seal for damage:

(a) Missing material, cuts, gouges, and holes that extend through the bullnose seal.

1) Not serviceable - Replace the bullnose seal.

These are the tasks:

- Bullnose Seal Removal, TASK 78-31-23-000-801-F00
- Bullnose Seal Installation, TASK 78-31-23-400-801-F00.

SUBTASK 78-31-23-210-002-F00

(2) Examine the bullnose seal retainer for damage:

(a) Missing metal or distortion.

1) Not serviceable - Replace the retainer (CMM 78-31-24).

SUBTASK 78-31-23-210-003-F00

(3) Do a check for missing or loose nuts that hold the retainer and blocker door hinge in their position.

(a) Missing or loose nuts

1) Not Serviceable - Replace or tighten the nuts that attach the blocker door hinge and the retainer.

a) Tighten the nuts to 20-30 pound-inches (2.3-3.4 Newton meters).

2) Replace or tighten the nuts that attach only the retainer.

a) Tighten the nuts to 20-30 pound-inches (2.3-3.4 Newton meters).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 78-31-23-840-001-F00

(1) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

(a) Make sure that you do all of the steps in the referenced procedure to unlock the sync locks and do the thrust reverser activation.

NOTE: If the sync locks do not unlock, the thrust reverser sleeve will not retract.

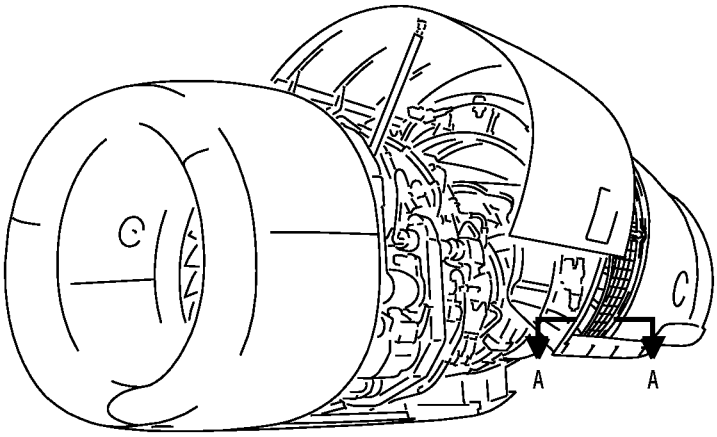
SUBTASK 78-31-23-410-002-F00

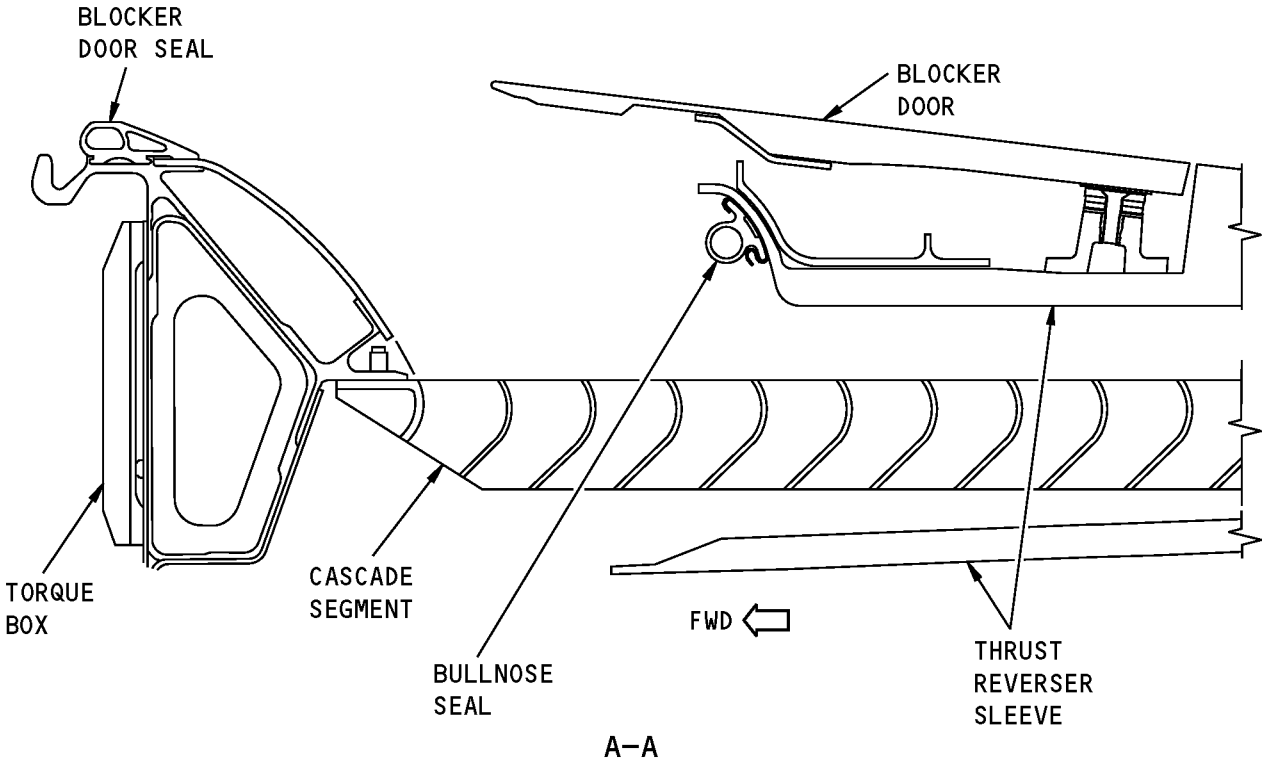
WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS, BUT DO NOT DO THE THRUST REVERSER ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Close the thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00; but do not do the thrust reverser activation at this time.

NOTE: The thrust reverser activation will be done in the power retract procedure.

——————— END OF TASK ———————





Bullnose Seal Inspection
Figure 601/78-31-23-990-801-F00

AERO BLOCKER DOOR SEAL - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the aero blocker door seal.

(2) The installation of the aero blocker door seal.

TASK 78-31-24-000-801-F00

2. Aero Blocker Door Seal Removal

(Figure 401)

A. General

(1) This task is for the removal of the aero blocker door seal from the left or right thrust reverser on an engine.

(2) The aero blocker door seal is compressed by the engine extension ring to seal the bypass fan duct. It is also compressed by the blocker doors to provide a partial seal of the bypass fan duct and dampen blocker door vibration.

(3) For this procedure, the aero blocker door seal will be referred to as the aero seal.

B. References

Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-31-24-010-001-F00

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSERS (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 78-31-24-980-003-F00

CAUTION: DO NOT MANUALLY EXTEND THE INBOARD THRUST REVERSER SLEEVE MORE THAN 10.0 INCHES. MAKE SURE THAT THE LEADING EDGE FLAPS ARE COMPLETELY RETRACTED AND MONITOR THE POSITION OF THE THRUST REVERSER SLEEVE AS IT IS EXTENDED SO THAT IT WILL NOT TOUCH THE LEADING EDGE OF THE WING. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(2) Manually extend the thrust reverser approximately 5 inches (120 mm), do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

E. Aero Seal Removal

SUBTASK 78-31-24-020-001-F00

(1) Do these steps to remove the aero seal [1] or aero seal [2] from the applicable thrust reverser:

NOTE: If the aero seal is to be used again, use care when you remove the sealant to prevent damage to the aero seal.

(a) Remove the sealant from the area at the upper end of the aero seal [1] or [2], which holds the aero seal in its position (View B).

(b) Do these steps to remove the block seal [3] or [4] (View D) from the aero seal and fire seal at the latch beam:

1) Carefully remove the sealant from the area where the block seal [3] or [4] is inserted into the lower fireseal.

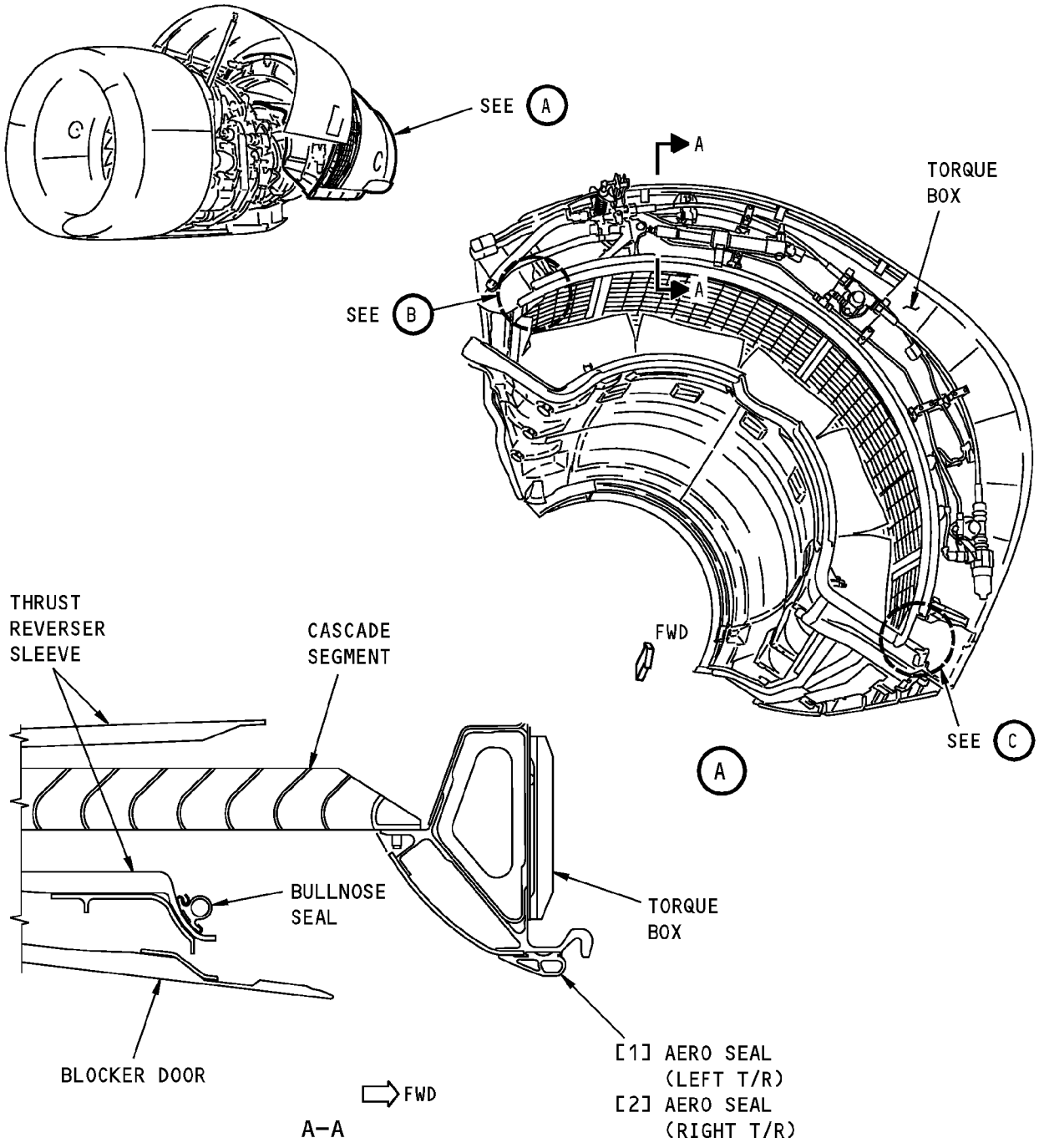
2) Carefully remove the sealant from the block seal joint (View C).

3) Slide the block seal [3] or [4] out of the block seal retainer.

(c) To remove the aero seal [1] or [2], slide it out of the retainer groove from the latch beam end.

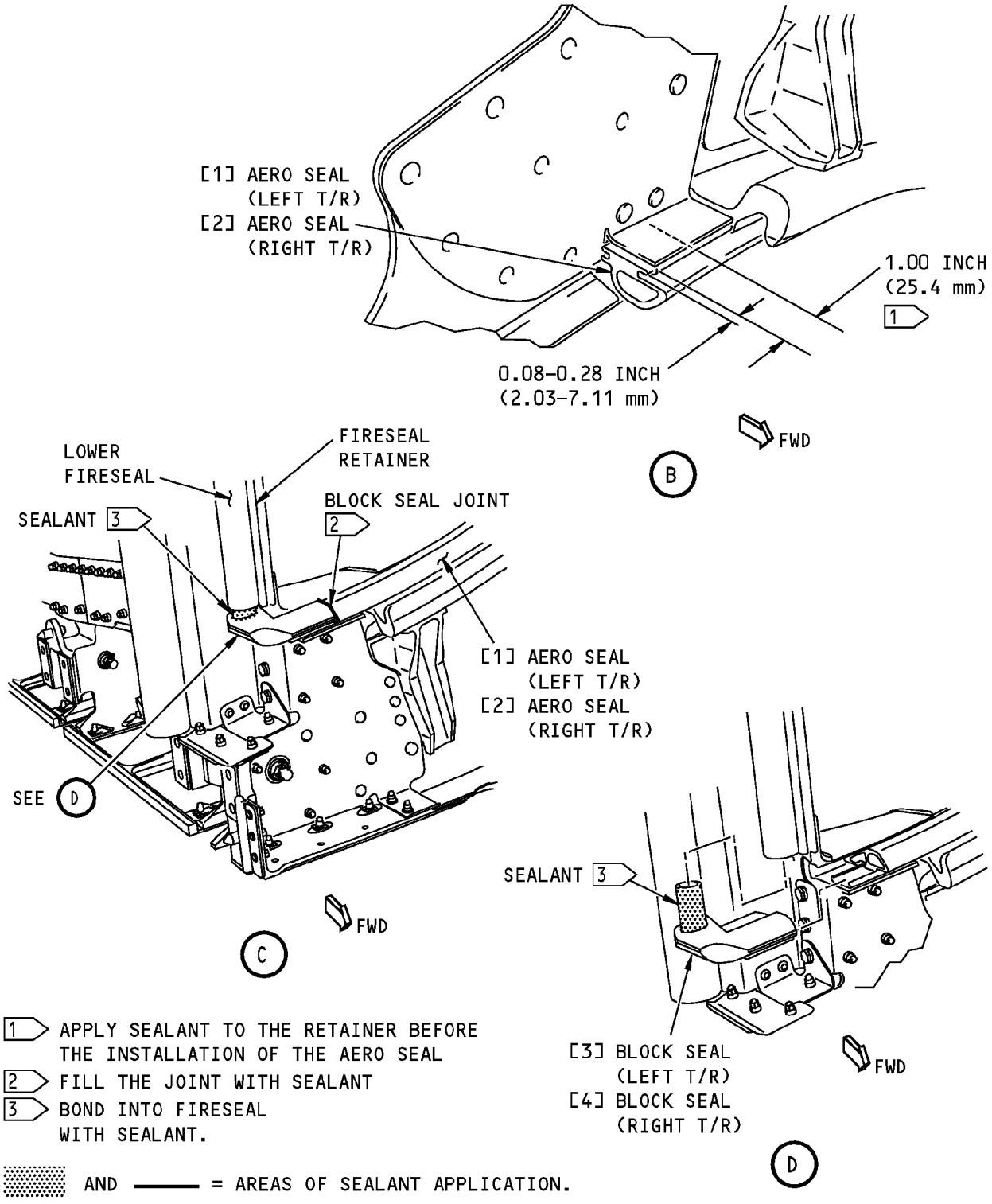
NOTE: If the aero seal is to be used again, use care when you remove it from the retainer groove to prevent damage to the foot of the aero seal.

——————— END OF TASK ———————



NOTE: LEFT THRUST REVERSER IS SHOWN, RIGHT THRUST REVERSER IS THE SAME EXCEPT THE DIFFERENCES THAT ARE NOTED.

Aero Blocker Door Seal Installation
Figure 401 (Sheet 1 of 2)/78-31-24-990-801-F00



Aero Blocker Door Seal Installation
Figure 401 (Sheet 2 of 2)/78-31-24-990-801-F00

TASK 78-31-24-400-801-F00

3. Aero Blocker Door Seal Installation

(Figure 401)

A. General

(1) This task is for the installation of the aero seal on the left or right thrust reverser on an engine.

B. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Aero seal	78-31-24-05-035	HAP ALL
2	Aero seal	78-31-24-05-040	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Aero Seal Installation

SUBTASK 78-31-24-020-002-F00

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT

CAUTION: DO NOT USE PETROLEUM OR SILICONE BASE LUBRICANTS. THE AERO SEAL CAN SLIDE OUT OF POSITION IF YOU USE PETROLEUM OR SILICONE BASE LUBRICANTS. DAMAGE TO THE AERO SEAL CAN OCCUR.

CAUTION: DO NOT PULL OR BEND THE AERO SEAL. THIS WILL PREVENT DAMAGE TO THE AERO SEAL.

(1) Do these steps to install the aero seal [1] or aero seal [2] on the applicable thrust reverser:

(a) Clean all of the sealant residue from the retainer groove with solvent, B00062.

(b) Prepare a liquid detergent (hand soap) water solution to use as a lubricant on the aero seal [1] or [2] for easy installation.

(c) Apply the liquid detergent water solution to the aero seal and the retainer groove.

(d) Slide the aero seal [1] or aero seal [2] into the retainer groove from the latch beam end. Stop the installation when the aero seal is approximately 2.0 inches (50.8 mm) from the end of the retainer groove.

NOTE: Do not slide the aero seal to the end of the retainer groove. leave approximately 2.0 inches (50.8 mm) from the end of the retainer groove at the hinge beam end for the application of the sealant.

(e) Apply sealant, A00160, to the last 1.0 inch (25.4 mm) of the retainer groove at the hinge beam end.

(f) Slide the aero seal through the sealant and beyond the end of the retainer groove by 0.08-0.28 inch (2.03-7.11 mm) at the hinge beam end.

NOTE: The aero seal will be 0.99-1.19 inches (25.15-30.23 mm) from the end of the retainer groove at the latch beam end.

(g) Do these steps to install the block seal [3] or [4] (View D):

1) Apply sealant, A00160 on the circular plug of the block seal [3] or [4].

2) Insert the circular plug into the lower fireseal.

3) Slide the block seal [3] or [4] into the block seal retainer.

4) Apply sealant, A00160 along the block seal [3] or [4] where it touches the block seal retainer.

5) Apply sealant, A00160 to the block seal joint.

SUBTASK 78-31-24-390-001-F00

(2) Let the sealant, A00160 cure at 72-82 degrees F (22-28 C) for these Types and minimum times:

(a) (Type I) 48 hours

(b) (Type II, Class -1/2) 4 hours.

G. Put the Airplane Back to its Usual Condition

SUBTASK 78-31-24-410-001-F00

WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER, BUT DO NOT DO THE THRUST REVERSER ACTIVATION. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Close the thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00; but do not do the thrust reverser activation at this time.

NOTE: The thrust reverser activation will be done in the power retract procedure.

SUBTASK 78-31-24-860-001-F00

(2) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

(a) Make sure that you do all of the steps in the referenced procedure to unlock the sync locks and do the thrust reverser activation.

NOTE: If the sync locks do not unlock, the thrust reverser sleeve will not retract.

——————— END OF TASK ———————

THRUST REVERSER CONTROL VALVE MODULE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser control valve module.

(2) The installation of the thrust reverser control valve module.

TASK 78-34-01-000-801-F00

2. Control Valve Module Removal

(Figure 401)

A. General

(1) There are two control valve modules that control hydraulic power to the thrust reverser hydraulic actuators.

(2) The control valve modules are in the main gear wheel well on the keel beam.

(a) The control valve module for the Engine 1 thrust reverser is on the left side of the keel beam.

(b) The control valve module for the Engine 2 thrust reverser is on the right side of the keel beam.

(3) After you install the control valve module, you must do the Thrust Reverser Normal Operation Test.

(4) For this procedure, the thrust reverser control valve module will be referred to as the control valve module.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Prepare for the Removal

SUBTASK 78-34-01-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

SUBTASK 78-34-01-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-01-860-003-F00

(3) Make sure that the forward thrust lever is in the idle position.

(a) Install a DO-NOT-OPERATE tag.

SUBTASK 78-34-01-860-004-F00

(4) Make sure that the reverse thrust lever is in the stow position (fully forward and down).

(a) Install a DO-NOT-OPERATE tag.

SUBTASK 78-34-01-860-005-F00

(5) Remove power from the hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 78-34-01-860-006-F00

(6) Remove power from the standby hydraulic power, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 78-34-01-860-007-F00

(7) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

F. Control Valve Module Removal

SUBTASK 78-34-01-010-001-F00

(1) Disconnect the electrical connectors from the applicable control valve module [5]:

(a) For Engine 1, disconnect the electrical connectors, D3052 and D3054.

(b) For Engine 2, disconnect the electrical connectors, D3056 and D3058.

SUBTASK 78-34-01-010-002-F00

WARNING: MAKE SURE THAT YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE OPEN PORTS OF THE COMPONENT OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE FITTING, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND FITTINGS CAN OCCUR.

(2) Do these steps to disconnect the hydraulic lines from the control valve module.

(a) Use a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 to catch the hydraulic fluid.

(b) For Engine 1 control valve module, disconnect the hydraulic power transfer unit return line (referred to as return hydraulic line) from the tee branch at the return port R.

(c) For Engine 2 control valve module, disconnect the four hydraulic lines from the control valve module [5].

(d) Install protective covers on the hydraulic lines.

SUBTASK 78-34-01-020-004-F00

(3) If the replacement control valve module [5] does not have the two unions [3] and [6] or the restrictor check valve [8], do these steps:

NOTE: The replacement control valve module should have the union installed in the pressure port P.

(a) Remove the restrictor check valve [8] and the two unions [3] and [6] from the control valve module that was removed.

1) Keep the restrictor check valve and the two unions for installation on the replacement control valve module.

2) Remove and discard the packings from each fitting.

(b) Install protective covers on the four hydraulic ports on the control valve module [5].

(c) Install the protective covers on the control valve module [5].

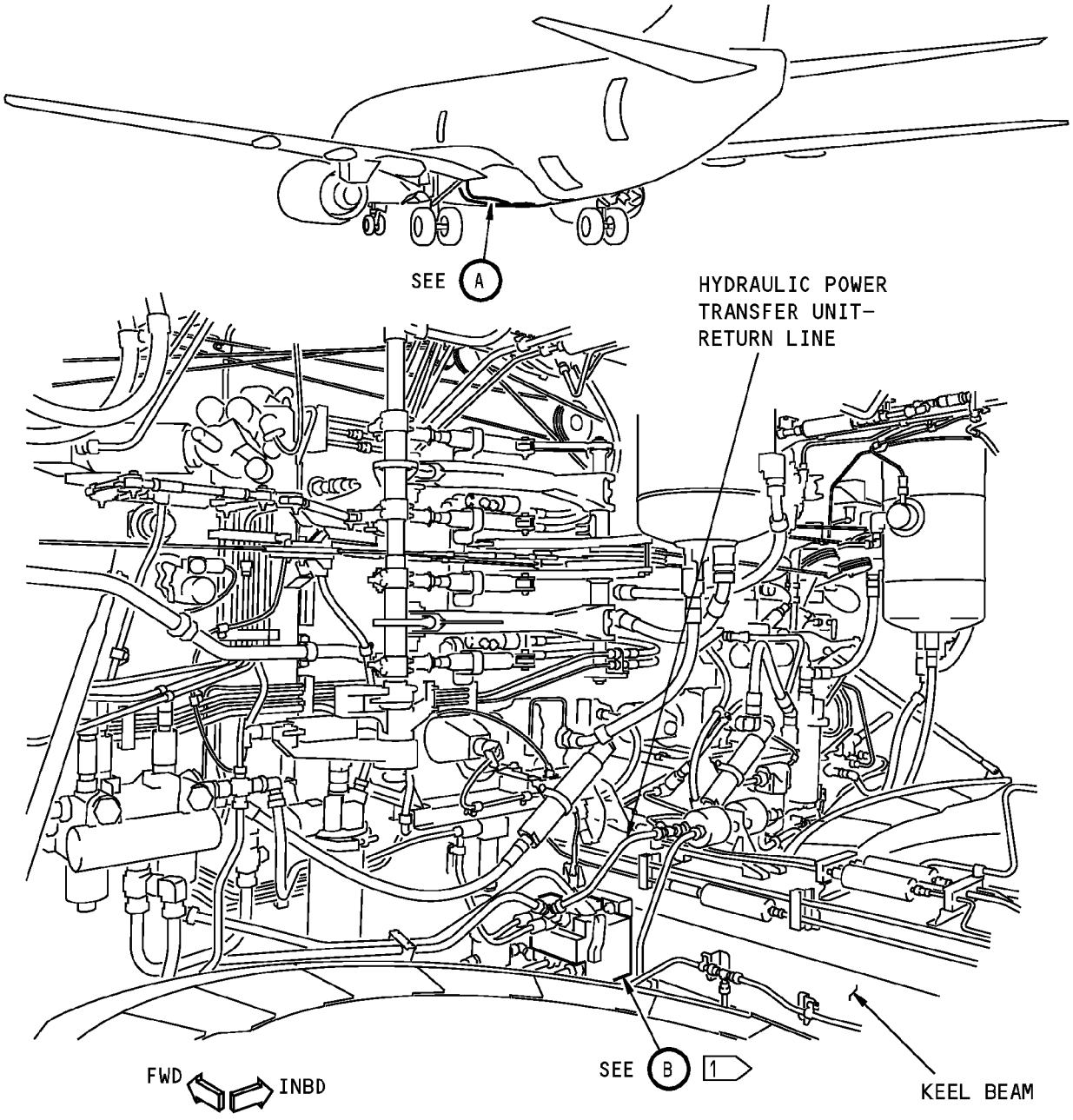
SUBTASK 78-34-01-020-001-F00

(4) Remove the four bolts [1] and washers [2] that attach the control valve module [5] to the attachment bracket on the keel beam.

SUBTASK 78-34-01-020-002-F00

(5) Remove the control valve module [5].

——————— END OF TASK ———————

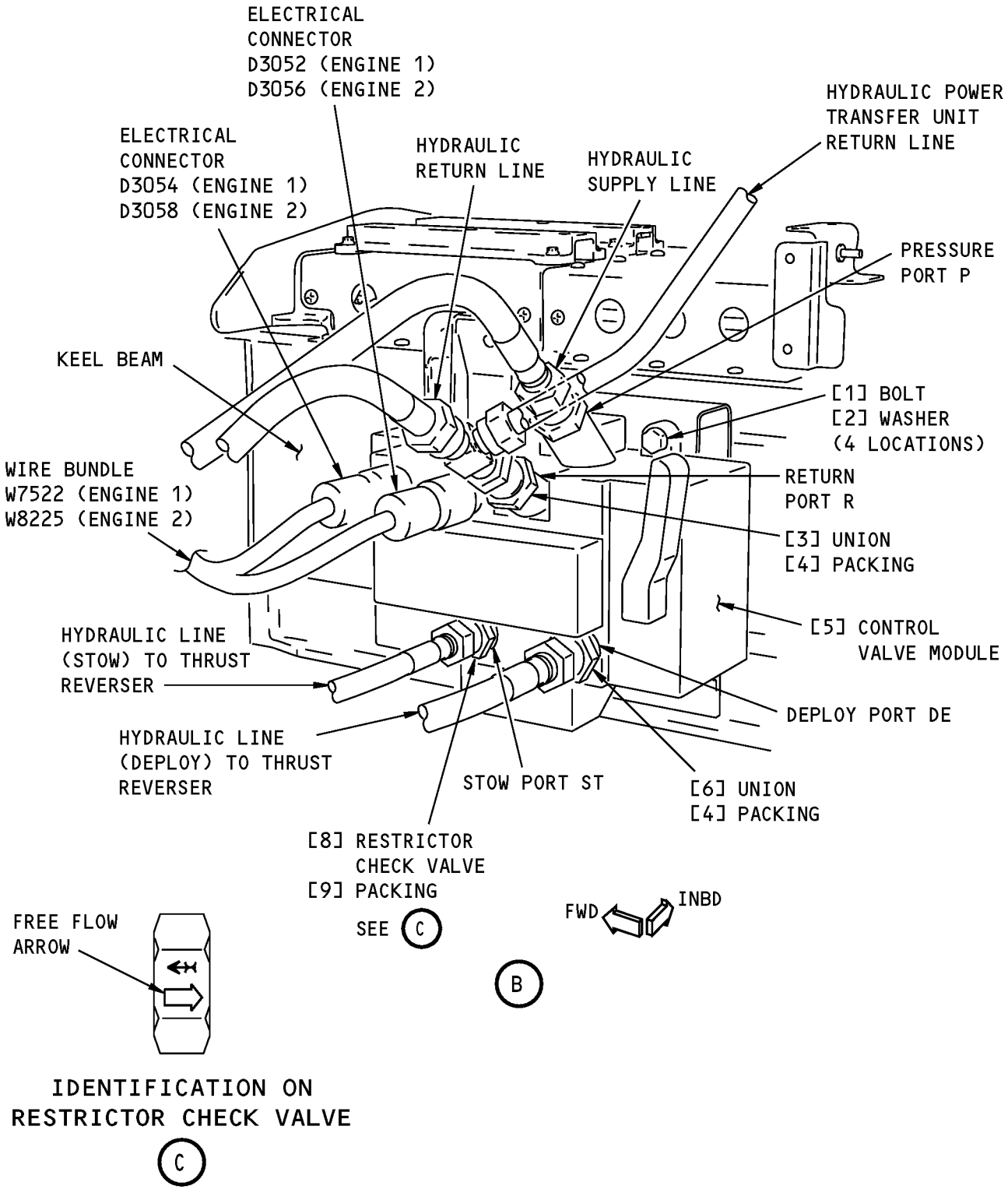


MAIN LANDING GEAR WHEEL WELL

A

1 ENGINE 1 CONTROL VALVE MODULE IS SHOWN,
ENGINE 2 CONTROL VALVE MODULE IS ON THE RIGHT SIDE OF THE KEEL BEAM
AND IS SIMILIAR TO ENGINE 1.

Thrust Reverser Control Valve Module Installation
Figure 401 (Sheet 1 of 2)/78-34-01-990-801-F00



Thrust Reverser Control Valve Module Installation
Figure 401 (Sheet 2 of 2)/78-34-01-990-801-F00

TASK 78-34-01-400-801-F00

3. Control Valve Module Installation

(Figure 401)

A. References

Reference	Title
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

B. Tools/Equipment

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

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Packing	78-34-01-02-040	HAP ALL
5	Module	78-34-01-02-055	HAP ALL
9	Packing	78-34-01-02-050	HAP ALL

E. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

F. Control Valve Module Installation

SUBTASK 78-34-01-420-002-F00

(1) Do these steps to install the control valve module [5]:

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Clean the sealant residue and the attachment surfaces on the control valve module [5] and the mounting bracket with solvent, B00062.

(b) Put the control valve module [5] in the correct position.

(c) Install the four washers [2] and the four bolts [1].

1) Hand tighten the bolts at this time.

(d) Remove the protective covers from the hydraulic lines and the control valve module.

(e) If the replacement control valve module [5] does not have the two unions [3] and [6] or the restrictor check valve [8], do these steps:

1) Use the two unions and the restrictor check valve from the control valve module [5] that was removed.

2) Remove the protective covers from the replacement control valve module [5].

3) Lubricate the packing [9] and the two packings [4] with fluid, D00153 or MCS 352B fluid, D00054.

4) Install the packing [9] on the restrictor check valve [8].

5) Install a packing [4] on the unions [3] and [6].

6) Lubricate the threads of the restrictor check valve [8] and the unions [3] and [6] with fluid, D00153 or MCS 352B fluid, D00054.

7) Install the union [6] in the deploy port DE.

a) Tighten the union to 665-735 pound-inches (75.1-83.0 Newton meters).

8) Install the union [3] in the return port R.

NOTE: This is an aluminum alloy union.

a) Tighten the union to 342-378 pound-inches (38.6-42.7 Newton meters).

9) Install the restrictor check valve [8] in the stow port ST.

a) Make sure that the large free flow arrow on the restrictor check valve points toward the control valve module [5].

b) Tighten the restrictor check valve to 475-525 pound-inches (53.7-59.3 Newton meters).

(f) Loosen the four bolts [1].

(g) For Engine 1 and Engine 2 control valve module, loosely connect the four hydraulic lines to the control valve module [5].

(h) For Engine 1 control valve module, loosely connect the return hydraulic line for the hydraulic power transfer unit to the tee at the return port R.

(i) Tighten the four bolts [1] to 135-165 pound-inches (15.3-18.6 Newton meters).

(j) Do a check of the electrical resistance through the bracket that the control valve module is attached to.

1) With the bonding meter, COM-1550, do a check of the electrical resistance between the control valve module and the structure where the attachment bracket attaches.

2) Make sure that the resistance is no more than 0.0025 ohm.

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE FITTING, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBES AND FITTINGS CAN OCCUR.

(k) For Engine 1 and Engine 2 control valve module, tighten the hydraulic lines on the control valve module [5] as follows:

1) Tighten the coupling nut at the deploy port DE to 665-735 pound-inches (75.1-83.0 Newton meters).

2) Tighten the coupling nut at the stow port ST to 475-525 pound-inches (53.7-59.3 Newton meters).

3) Tighten the coupling nut at the return port R to 342-378 pound-inches (38.6-42.7 Newton meters).

4) Tighten the coupling nut at the pressure port P to 665-735 pound-inches (75.1-83.0 Newton meters).

(l) For Engine 1 control valve module, tighten the coupling nut at the return port R tee branch to 475-525 pound-inches (53.7-59.3 Newton meters).

SUBTASK 78-34-01-390-001-F00

(2) Fillet seal around the bolt flange on the control valve module and the attach bracket with sealant, A00247 or sealant, A02315.

SUBTASK 78-34-01-410-001-F00

(3) Connect the electrical connectors to the applicable control valve module receptacles:

(a) For Engine 1, connect the electrical connectors, D3052 and D3054.

(b) For Engine 2, connect the electrical connectors, D3056 and D3058.

G. Control Valve Module Installation Test

SUBTASK 78-34-01-440-001-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, System A.

(b) For Engine 2, System B.

SUBTASK 78-34-01-860-008-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	5	C00276	ENGINE 1 THRUST REVERSER CONT

SUBTASK 78-34-01-860-009-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	7	C00277	ENGINE 2 THRUST REVERSER CONT
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-01-860-010-F00

(4) Remove the DO-NOT-OPERATE tag from the thrust levers.

SUBTASK 78-34-01-860-011-F00

(5) Remove the DO-NOT-OPERATE tag from the reverse thrust levers.

SUBTASK 78-34-01-710-001-F00

(6) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Operate the thrust reverser through the deploy and stow cycle until all of the air is bled from the system and the thrust reverser sleeves move smoothly.

(b) Do a check of the control valve module and hydraulic lines for hydraulic leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

——————— END OF TASK ———————

THRUST REVERSER SLEEVE STOW PROXIMITY SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser sleeve stow proximity sensor and wire leads.

(2) The installation of the thrust reverser sleeve stow proximity sensor and wire leads.

TASK 78-34-02-000-801-F00

2. Thrust Reverser Sleeve Stow Proximity Sensor Removal

(Figure 401)

A. General

(1) This task is for the removal of the thrust reverser sleeve stow proximity sensor and wire leads from the left or right thrust reverser on an engine.

(a) The stow sensor is a component of the wire bundle on the thrust reverser.

HAP 001-007 PRE SB 737-73-1015

(b) The stow sensor and wire leads can be removed when the three pins are removed from the electrical connector at the strut and the shield termination is removed from the connector backshell.

HAP ALL

(c) The thrust reverser sleeve stow proximity sensor supplies a signal to the engine accessory unit (EAU). If the wire leads are spliced into the wire bundle, the EAU can receive incorrect indications and nuisance fault messages can occur.

(2) For this procedure, the thrust reverser sleeve stow proximity sensor will be referred to as the stow sensor.

(3) The stow sensor equipment number for the left thrust reverser on an engine is S831 and the wire bundle number is W1080.

(4) The stow sensor equipment number for the right thrust reverser on an engine is S832 and the wire bundle number is W1086.

(5) The stow sensor is electrically bonded to the bracket flange that is adjacent to the sensor target.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
SWPM Ch 20	Standard Wiring Practices Manual

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-34-02-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-02-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-02-040-001-F00

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

(3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-34-02-010-001-F00

(4) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-34-02-980-002-F00

(5) Manually extend the thrust reverser a minimum of one inch (26 mm), do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

E. Stow Sensor Removal

SUBTASK 78-34-02-010-002-F00

(1) Do these steps to disconnect the electrical connectors from the applicable thrust reverser on an engine Figure 401:

(a) For the left thrust reverser, do these steps:

1) Disconnect the electrical connector, D30002, from the strut receptacle.

2) Disconnect the electrical connector, D30072, the LVDT receptacle.

(b) For the right thrust reverser, do these steps:

1) Disconnect the electrical connector, D30006 from the strut receptacle.

2) Disconnect the electrical connector, D30074 from the LVDT receptacle.

SUBTASK 78-34-02-020-001-F00

(2) Do these steps to remove the stow sensor [1]:

(a) Use a knife to break the sealant bond around the jamnut [2] adjacent to the sensor target.

(b) Remove the jamnut [2] from the stow sensor [1].

NOTE: To remove the stow sensor, it is necessary to remove only the jamnut that is adjacent to the sensor target.

(c) Remove the stow sensor [1] and keywasher [3] from the bracket.

(d) Remove the four clamps that attach the wire bundle to the torque box from the stow sensor to the electrical connector at the strut.

HAP 001-007 PRE SB 737-73-1015

CAUTION: DO NOT SPLICE THE STOW SENSOR INTO THE WIRE BUNDLE. IF THE STOW SENSOR IS SPLICED INTO THE WIRE BUNDLE, THE EAU CAN RECEIVE INCORRECT INDICATIONS. NUISANCE FAULT MESSAGES CAN OCCUR.

(e) To remove the stow sensor and wire leads, do these steps:

1) Remove the pins from the electrical connector, D30002 (Left T/R) or D30006 (right T/R) SWPM Ch 20.

a) Remove pin 1, pin 7, and pin 8 from the electrical connector (View C).

2) Remove the wire leads from the wire bundle SWPM Ch 20.

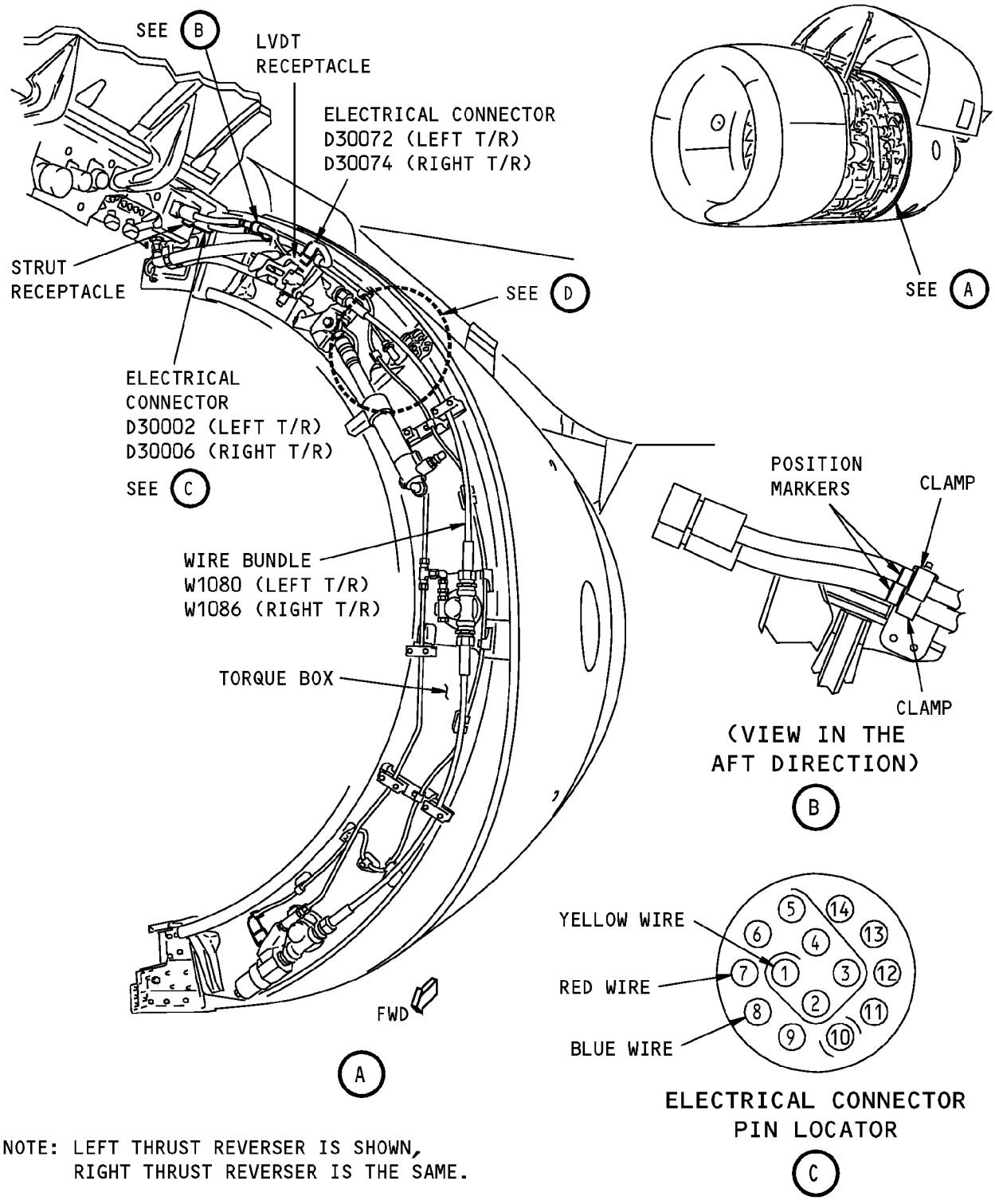
3) Remove the stow sensor [1] and wire leads.

HAP 008-013, 015-026, 028-054, 101-999; HAP 001-007 POST SB 737-73-1015

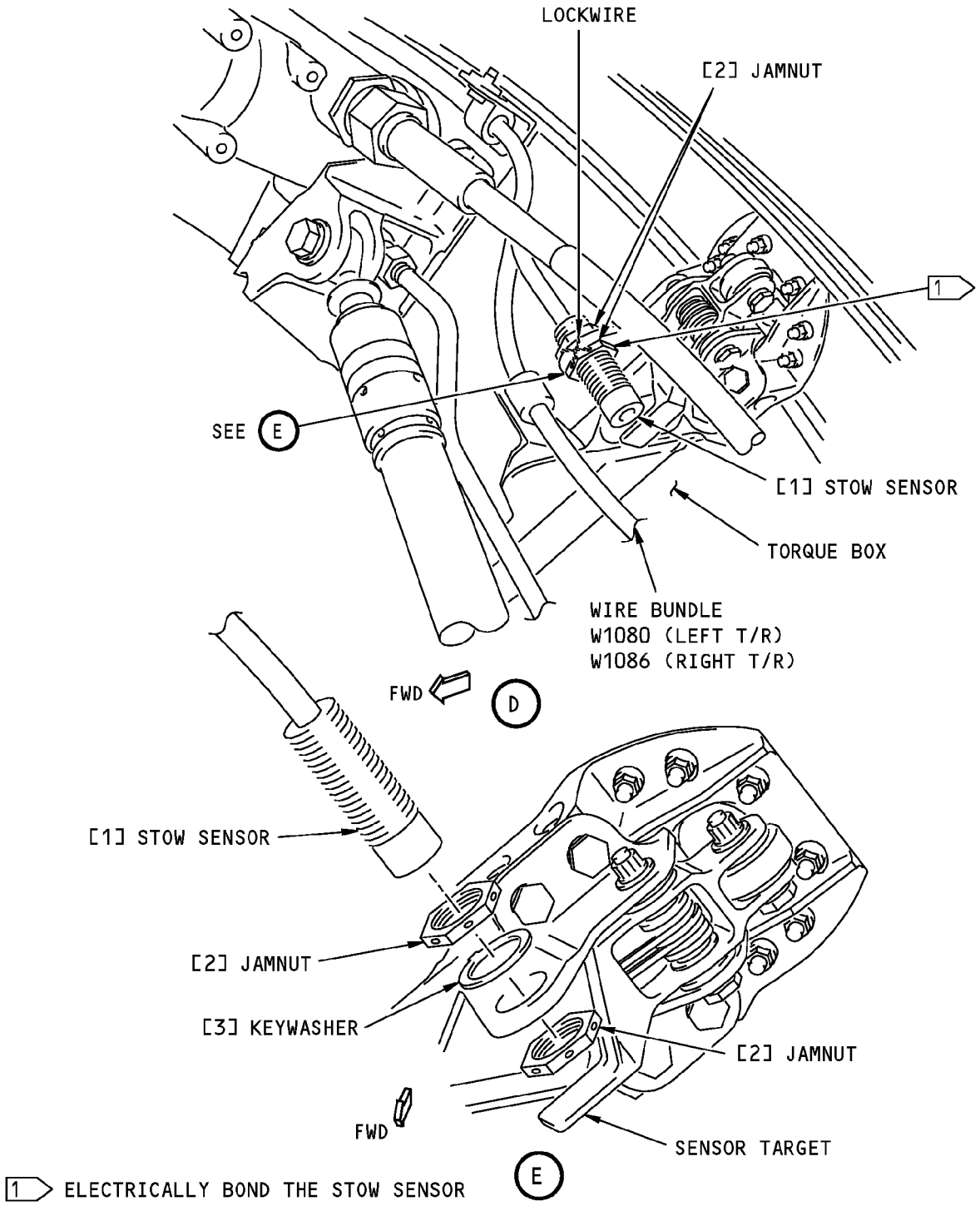
(f) Remove the stow sensor [1] and wire leads.

HAP ALL

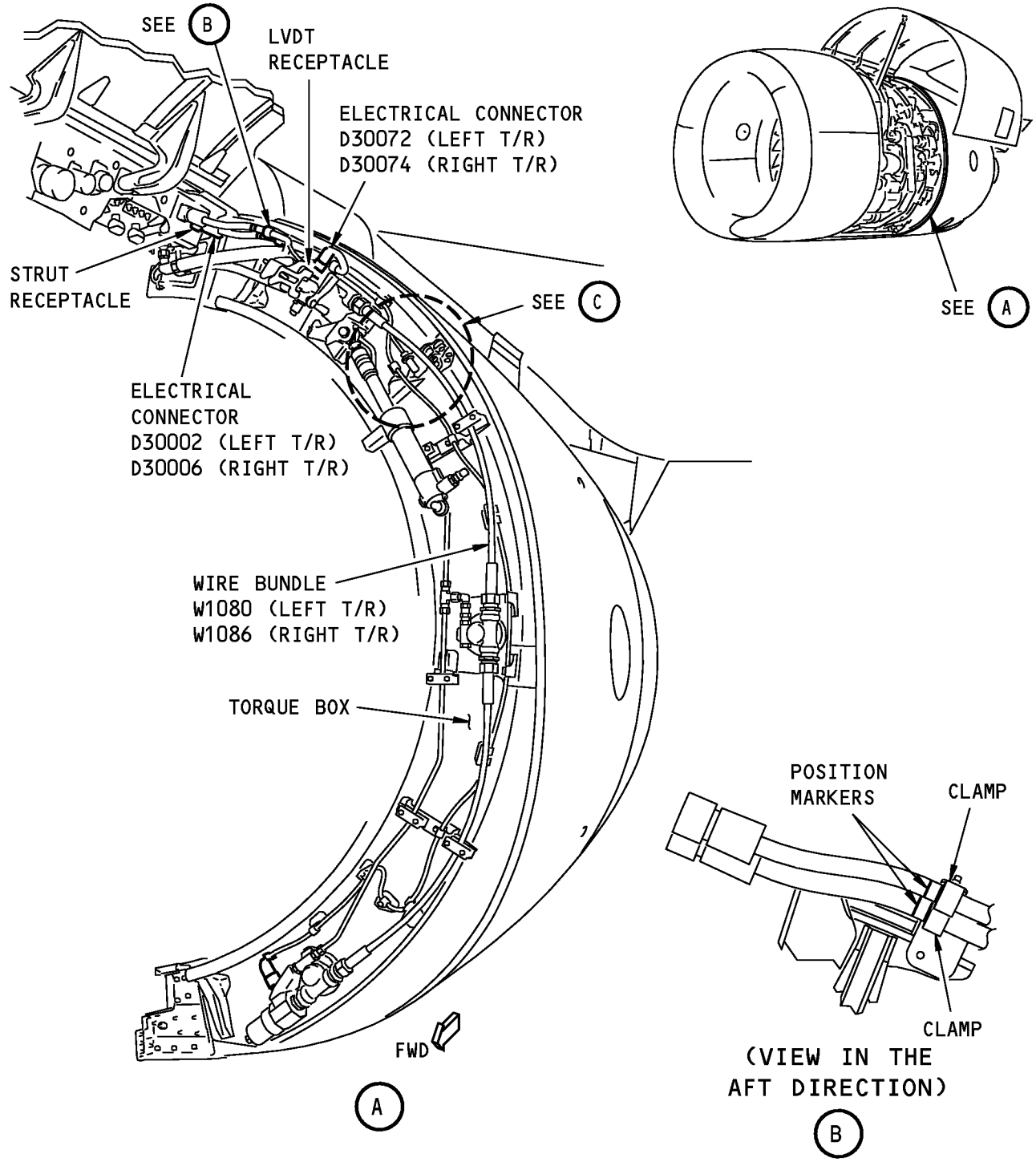
——————— END OF TASK ———————



Thrust Reverser Sleeve Stow Proximity Sensor Installation
Figure 401 (Sheet 1 of 4)/78-34-02-990-801-F00

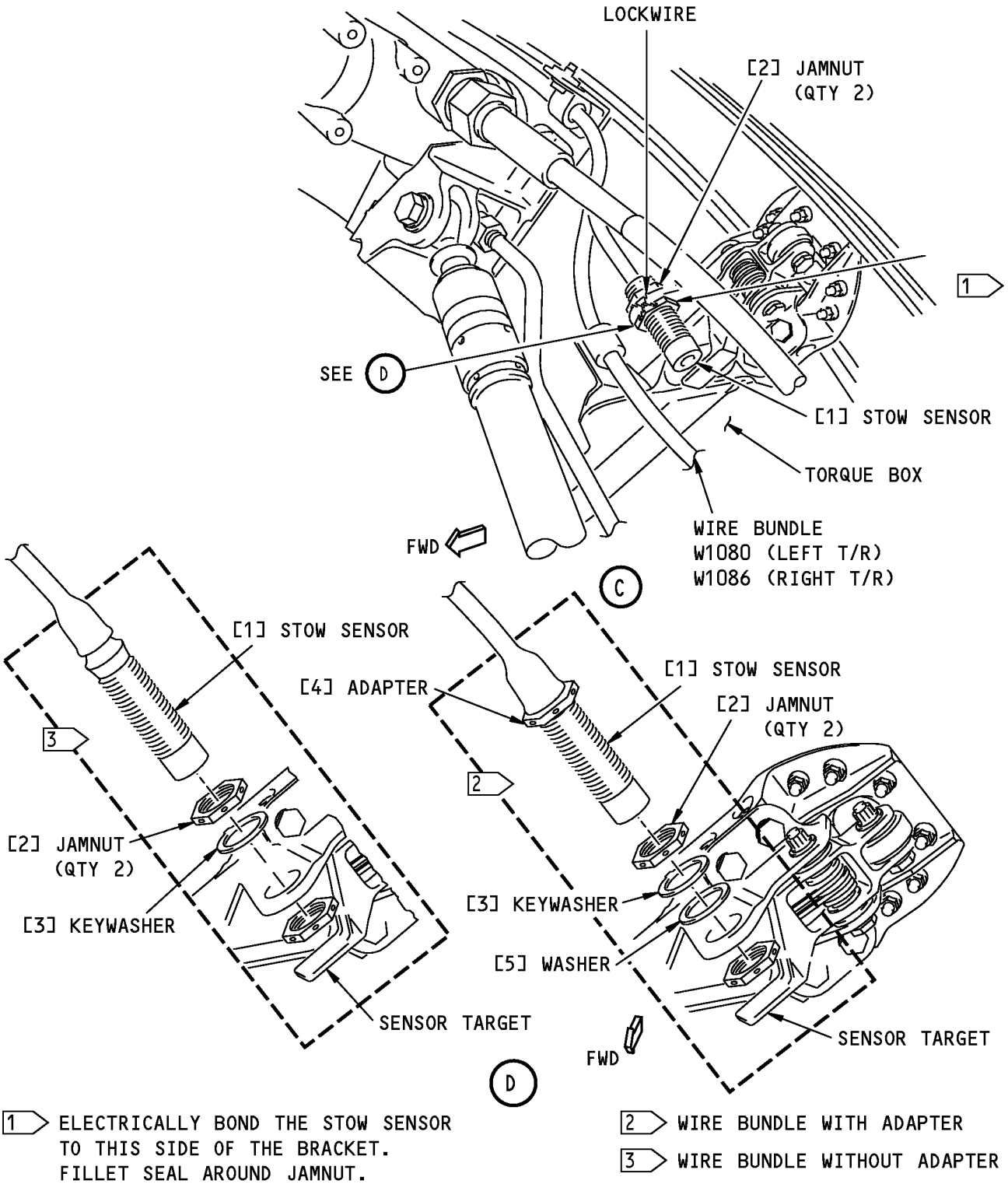


Thrust Reverser Sleeve Stow Proximity Sensor Installation
Figure 401 (Sheet 2 of 4)/78-34-02-990-801-F00



NOTE: LEFT THRUST REVERSER IS SHOWN,
RIGHT THRUST REVERSER IS THE SAME.

Thrust Reverser Sleeve Stow Proximity Sensor Installation
Figure 401 (Sheet 3 of 4)/78-34-02-990-801-F00



Thrust Reverser Sleeve Stow Proximity Sensor Installation
Figure 401 (Sheet 4 of 4)/78-34-02-990-801-F00

TASK 78-34-02-400-801-F00

3. Thrust Reverser Sleeve Stow Proximity Sensor Installation

(Figure 401)

A. General

(1) This task is for the installation of the stow sensor for the left or right thrust reverser on an engine.

(2) The stow sensor is electrically bonded to the bracket flange that is adjacent to the sensor target.

B. References

Reference	Title
73-21-00-700-804-F00	EEC TEST (P/B 501)
78-34-02-700-801-F00	Stow Sensor Adjustment (P/B 501)
SWPM Ch 20	Standard Wiring Practices Manual

C. Consumable Materials

Reference	Description	Specification
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Stow Sensor Installation

SUBTASK 78-34-02-420-001-F00

CAUTION: DO NOT SPLICE THE STOW SENSOR INTO THE WIRE BUNDLE. IF THE STOW SENSOR IS SPLICED INTO THE WIRE BUNDLE, THE EAU CAN RECEIVE INCORRECT INDICATIONS. NUISANCE FAULT MESSAGES CAN OCCUR.

(1) Do these steps to install the stow sensor [1] and wire leads:

HAP 001-007 PRE SB 737-73-1015

(a) Do these steps to install the stow sensor into the wire bundle:

1) Install the pins in the connector SWPM Ch 20.

a) Install the yellow wire to pin 1, the red wire to pin 7, and the blue wire to pin 8 (View C).

2) Install the wire leads in the wire bundle SWPM Ch 20.

HAP ALL

(b) Install the four clamps that were removed.

1) Make sure that the pink position markers on the upper end of the wire bundle is less than 0.50 inch (12.7 mm) from the upper edge of the upper clamps (View B).

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(c) To prepare the surface for the electrical bonding of the stow sensor, clean the jamnuts [2], keywasher [3], and the bracket flange that is adjacent to the sensor target with solvent, B00062.

HAP 001-007 PRE SB 737-73-1015

(d) Do these steps to install the stow sensor [1] into the bracket flange:

1) Install the stow sensor [1] with one of the jamnuts [2] and the keywasher [3].
2) Align the keywasher [3] with the index hole in the bracket.

NOTE: The key washer can be on one side or the other of the bracket.

3) Install the other jamnut [2].
4) Put the stow sensor [1] against the sensor target.
5) Hand tighten the jamnuts [2] at this time.

NOTE: This is a temporary installation only, the jamnuts will be tightened and sealant applied after the final adjustment of the stow sensor.

HAP 001-007 POST SB 737-73-1015; AIRPLANES WITH A WIRE BUNDLE WITHOUT AN ADAPTER

(e) Do these steps to install the stow sensor [1] into the bracket flange:

1) Install the stow sensor [1] with one of the jamnuts [2] and the keywasher [3].
2) Align the keywasher [3] with the index hole in the bracket.

NOTE: The key washer can be on one side or the other of the bracket.

3) Install the other jamnut [2].
4) Put the stow sensor [1] against the sensor target.
5) Hand tighten the jamnuts [2] at this time.

NOTE: This is a temporary installation only, the jamnuts will be tightened and sealant applied after the final adjustment of the stow sensor.

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

(f) Do these steps to install the stow sensor [1] into the bracket flange:

1) Install the stow sensor [1] with one of the jamnuts [2], the key washer [3] and washer [5].
   a) Make sure that the jamnut [2] is adjacent to the adapter [4].
2) Install the key washer and washer on the side of the bracket away from the sensor target.
   a) Align the key washer [3] with the index hole in the bracket.
3) Install the other jamnut [2].
4) Put the stow sensor [1] against the sensor target.

5) Hand tighten the jamnuts [2] at this time.

NOTE: This is a temporary installation only, the jamnuts will be tightened and sealant applied after the final adjustment of the stow sensor.

HAP ALL

SUBTASK 78-34-02-410-001-F00

(2) Do these steps to connect the electrical connectors:

(a) For the left thrust reverser, do these steps:

1) Connect the electrical connector, D30002 to the strut receptacle.

2) Connect the electrical connector, D30072 to the LVDT receptacle.

(b) For the right thrust reverser, do these steps:

1) Connect the electrical connector, D30006 to the strut receptacle.

2) Connect the electrical connector, D30074 to the LVDT receptacle.

SUBTASK 78-34-02-860-003-F00

(3) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-02-860-004-F00

(4) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-02-820-001-F00

(5) Do this task: Stow Sensor Adjustment, TASK 78-34-02-700-801-F00.

SUBTASK 78-34-02-710-003-F00

(6) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

NOTE: This check will make sure that the electrical connections for the LVDT's are correct.

(a) Make sure that no LVDT maintenance messages show.

1) If a maintenance message shows, do the applicable fault isolation task in the Fault Isolation Manual for that maintenance message.

2) If no maintenance messages show, the electrical connections for the LVDT's are correct.

END OF TASK

THRUST REVERSER SLEEVE STOW PROXIMITY SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has one task:

(1) The adjustment of the thrust reverser sleeve stow proximity sensor.

TASK 78-34-02-700-801-F00

2. Stow Sensor Adjustment

(Figure 501)

A. General

(1) This procedure has the instructions for the adjustment of the thrust reverser sleeve stow proximity sensor.

(2) The thrust reverser sleeve stow proximity sensor supplies a signal to the engine accessory unit (EAU) when the thrust reverser sleeve is out of the stow position.

(3) The thrust reverser sleeve must be extended a minimum of one inch (26 mm) to do the adjustment.

(4) The Thrust Reverser Normal Operation Test must be done after the thrust reverser sleeve stow proximity sensor is installed.

(5) For this procedure, the thrust reverser sleeve stow proximity sensor will be referred to as the stow sensor.

(6) The stow sensor is electrically bonded to the bracket flange that is adjacent to the sensor target.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

(Continued)

Reference	Description	Specification
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Prepare for the Adjustment

SUBTASK 78-34-02-040-002-F00

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-34-02-010-003-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-34-02-980-001-F00

(3) Manually extend the thrust reverser a minimum of one inch (26 mm), do this task: Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

G. Stow Sensor Adjustment

SUBTASK 78-34-02-820-002-F00

(1) Do these steps to adjust the stow sensor [1]:

(a) If there is sealant around the jamnut adjacent to the sensor target, use a knife to break the sealant bond.

(b) Loosen the two jamnuts [3].

1) Make sure that the key washer tab does not come out of the index hole in the bracket.

HAP 001-007 PRE SB 737-73-1015

a) The key washer [2] is installed with the tab in the index hole in the bracket. The key washer can be on one side or the other of the attach fitting.

HAP 001-007 POST SB 737-73-1015; AIRPLANES WITH A WIRE BUNDLE WITHOUT AN ADAPTER

b) The key washer [2] is installed with the tab in the index hole in the bracket. The key washer can be on one side or the other of the attach fitting.

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

c) The key washer [2] is installed with the tab in the index hole in the bracket. The key washer and washers are installed on the side of the bracket away from the target.

HAP ALL

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THESE MATERIALS. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(c) Clean the sealant residue from the jamnut [3] with solvent, B00062.

(d) Adjust the jamnuts [3] to set the stow sensor [1] in the correct position.

1) Use a feeler gage to measure the distance between the end face of the stow sensor and the sensor target [4].

2) Make sure that the distance is 0.035 ±0.010 inch (0.0889 ±0.254 mm).

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

3) If it is necessary, adjust the number of washers.

HAP ALL

(e) Tighten the two jamnuts [3] to 45-55 inch-pounds (5.1-6.2 Newton-meters).

(f) Check the distance again between the end face of the stow sensor and the sensor target [4] to make sure that it is 0.035 ±0.010 inch (0.889 ±0.254 mm).

(g) With a bonding meter, COM-1550, do a check of the electrical resistance between the bracket and the stow sensor.

1) Make sure that the resistance is not more than 0.003 ohms.

2) If the resistance is more than 0.003 ohms, do the steps that follow:

a) Loosen the two jamnuts.

b) Do the steps above to loosen the jamnuts, clean the mating surfaces and tighten the jamnuts.

c) Do a check again of the resistance between the bracket and the stow sensor.

(h) Install lockwire, G01048 on the jamnuts as shown in view C.

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

(i) If it is necessary, install lockwire, G01048 on the adapter and adjacent jamnut.

HAP ALL

(j) Fillet seal around the jamnut [3] adjacent to the sensor target with sealant, A00160.

H. Stow Sensor Adjustment Test

SUBTASK 78-34-02-440-001-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-34-02-860-005-F00

(2) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

SUBTASK 78-34-02-710-001-F00

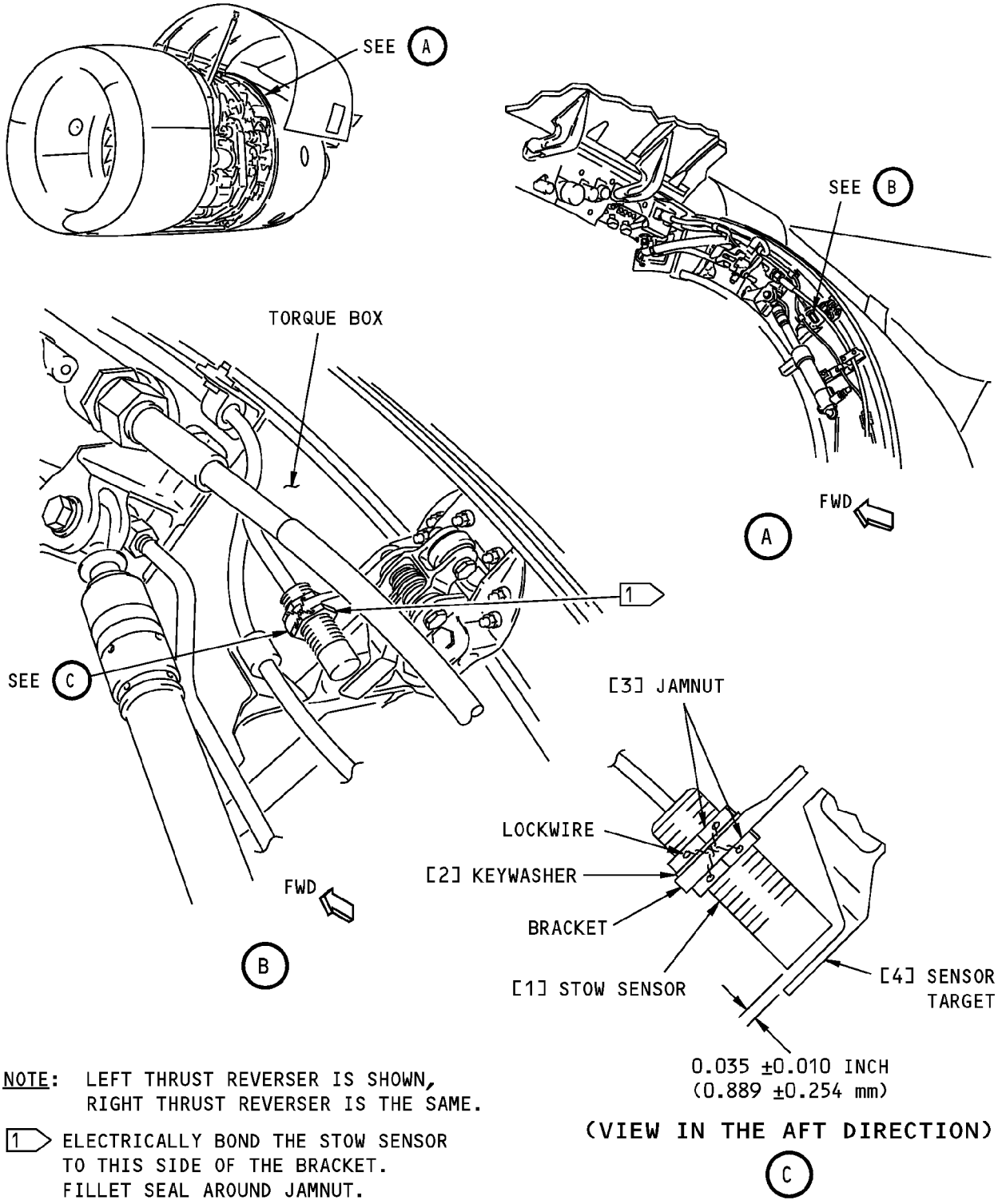
(3) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-02-410-002-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

———————— END OF TASK ————————



NOTE: LEFT THRUST REVERSER IS SHOWN, RIGHT THRUST REVERSER IS THE SAME.

1 ELECTRICALLY BOND THE STOW SENSOR TO THIS SIDE OF THE BRACKET. FILLET SEAL AROUND JAMNUT.

Thrust Reverser Sleeve Stow Proximity Sensor Adjustment
Figure 501/78-34-02-990-802-F00

THRUST REVERSER SLEEVE LOCK PROXIMITY SENSOR - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser sleeve lock proximity sensor.

(2) The installation of the thrust reverser sleeve lock proximity sensor.

TASK 78-34-03-000-801-F00

2. Thrust Reverser Sleeve Lock Proximity Sensor Removal

(Figure 401)

A. General

(1) This task is for the removal of the thrust reverser sleeve lock proximity sensor and wire leads from the left or right thrust reverser on an engine.

(a) The lock sensor is a component of the wire bundle on the thrust reverser.

HAP 001-007 PRE SB 737-73-1015

(b) The lock sensor and wire leads can be removed when the three pins are removed from the electrical connector at the strut and the shield termination is removed from the connector backshell.

HAP ALL

(c) The thrust reverser sleeve lock proximity sensor supplies a signal to the engine accessory unit (EAU). If the wire leads are spliced into the wire bundle, the EAU can receive incorrect indications and nuisance fault messages can occur.

(2) For this procedure, the thrust reverser sleeve lock proximity sensor will be referred to as the lock sensor.

(3) The lock sensor equipment number for the left thrust reverser on an engine is S835 and the wire bundle number is W1082.

(4) The lock sensor equipment number for the right thrust reverser on an engine is S836 and the wire bundle number is W1084.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
SWPM Ch 20	Standard Wiring Practices Manual

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Prepare for the Removal

SUBTASK 78-34-03-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-03-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-03-040-001-F00

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

(3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-34-03-010-001-F00

(4) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

E. Lock Sensor Removal

SUBTASK 78-34-03-010-002-F00

(1) Do these steps to disconnect the electrical connectors from the applicable thrust reverser on an engine:

(a) For the left thrust reverser, disconnect these electrical connectors:

1) Disconnect the electrical connector, D30008, from the strut receptacle.

2) Disconnect the electrical connector, D30076, from the LVDT receptacle.

(b) For the right thrust reverser, disconnect these electrical connectors:

1) Disconnect the electrical connector, D30010, from the strut receptacle.

2) Disconnect the electrical connector, D30078, from the LVDT receptacle.

SUBTASK 78-34-03-020-001-F00

(2) Do these steps to remove the lock sensor [1]:

(a) Remove the jamnut [2] from the lock sensor.

NOTE: To remove the lock sensor, it is necessary to remove only the jamnut that is adjacent to the sensor target.

(b) Remove the lock sensor [1] and keywasher [3] from the locking actuator.

(c) Remove the one clamp that attaches the wire bundle to the torque box from the lock sensor to the electrical connector at the strut.

HAP 001-007 PRE SB 737-73-1015

CAUTION: DO NOT SPLICE THE LOCK SENSOR INTO THE WIRE BUNDLE. IF THE LOCK SENSOR IS SPLICED INTO THE WIRE BUNDLE, THE EAU CAN RECEIVE INCORRECT INDICATIONS. NUISANCE FAULT MESSAGES CAN OCCUR.

(d) To remove the lock sensor and wire leads, do these steps:

1) Remove the pins from the electrical connector, D30008 (left T/R) or D30010 (right T/R) SWPM Ch 20.

a) Remove pin 1, pin 4, and pin 5 from the electrical connector (View C).

2) Remove the wire leads from the wire bundle SWPM Ch 20.

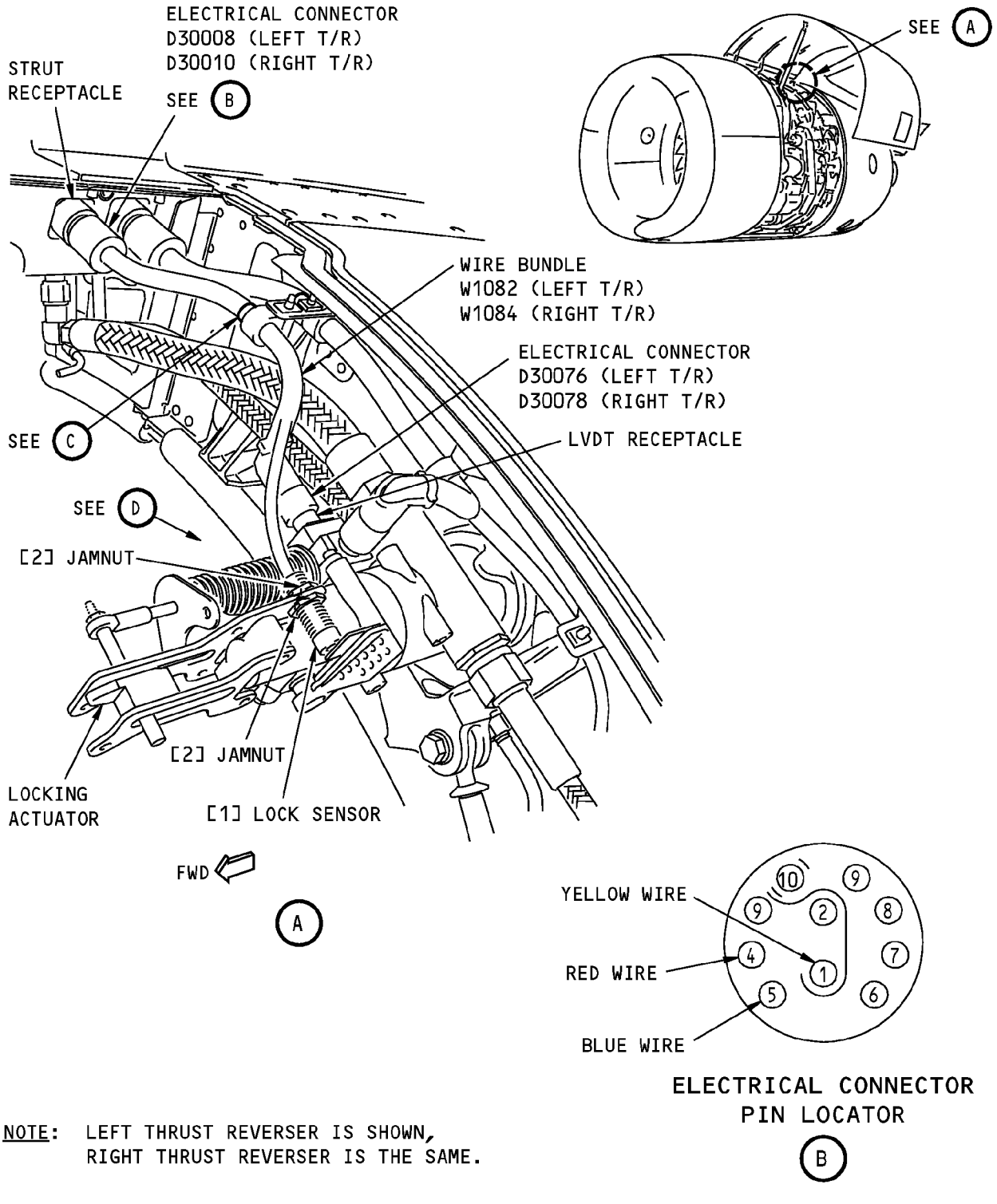
3) Remove the lock sensor [1] and wire leads.

HAP 008-013, 015-026, 028-054, 101-999; HAP 001-007 POST SB 737-73-1015

(e) Remove the lock sensor [1] and wire leads.

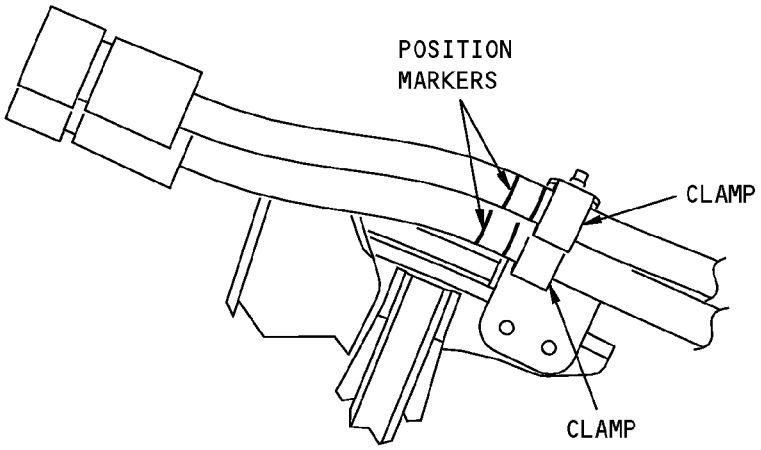
HAP ALL

END OF TASK



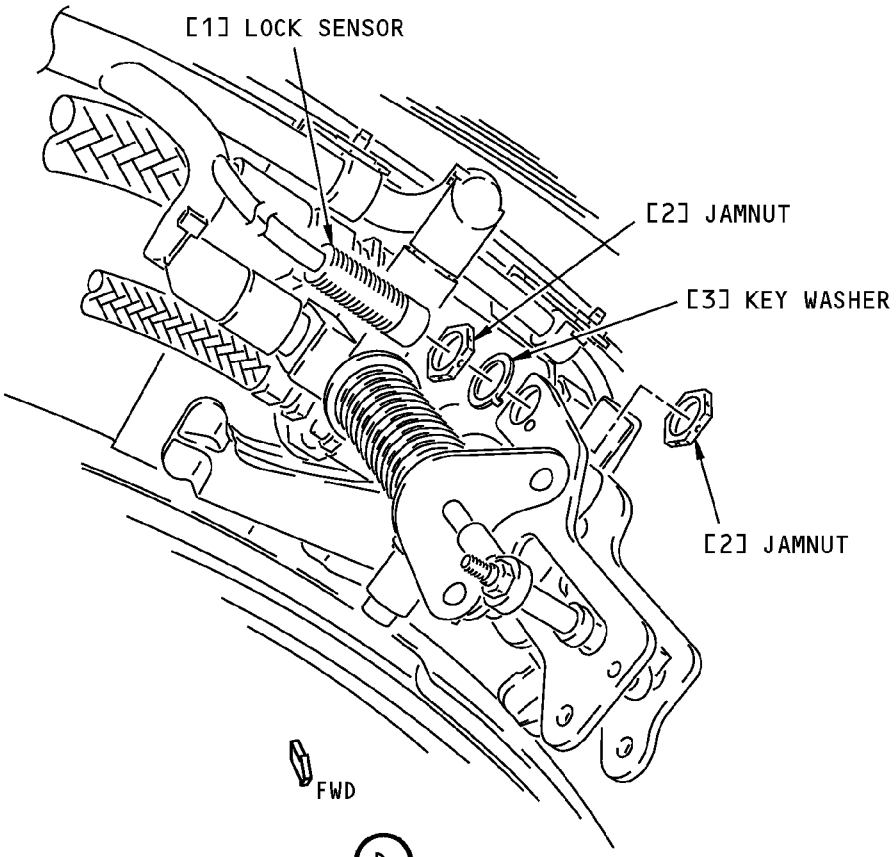
NOTE: LEFT THRUST REVERSER IS SHOWN,
RIGHT THRUST REVERSER IS THE SAME.

Thrust Reverser Sleeve Lock Proximity Sensor Installation
Figure 401 (Sheet 1 of 4)/78-34-03-990-801-F00



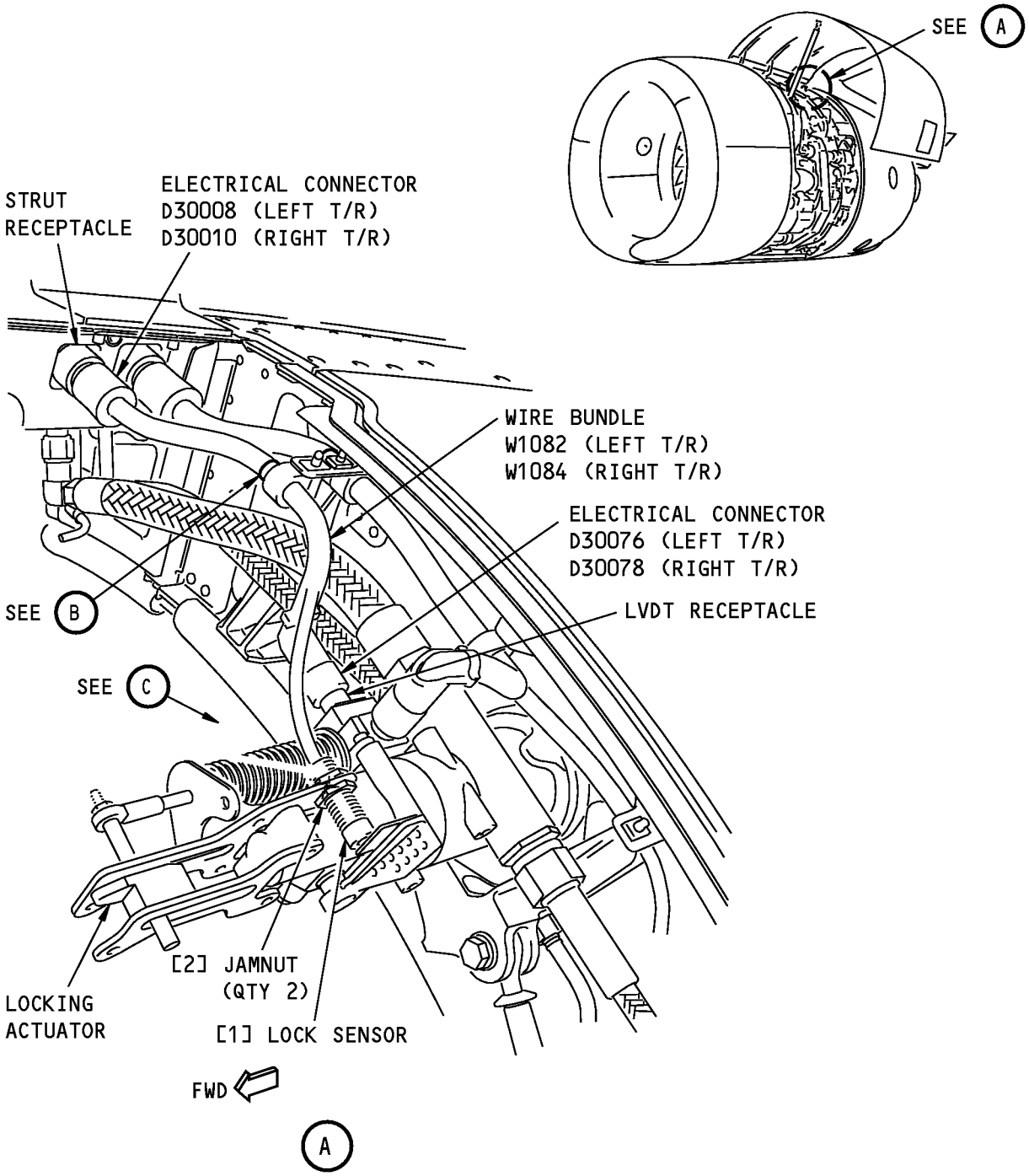
(VIEW IN THE AFT DIRECTION)

C



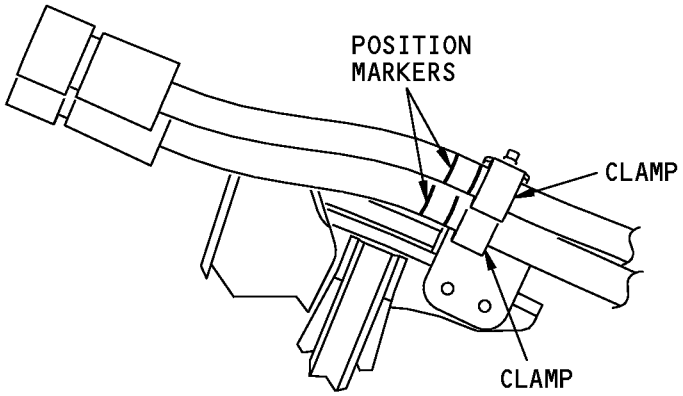
D

Thrust Reverser Sleeve Lock Proximity Sensor Installation
Figure 401 (Sheet 2 of 4)/78-34-03-990-801-F00



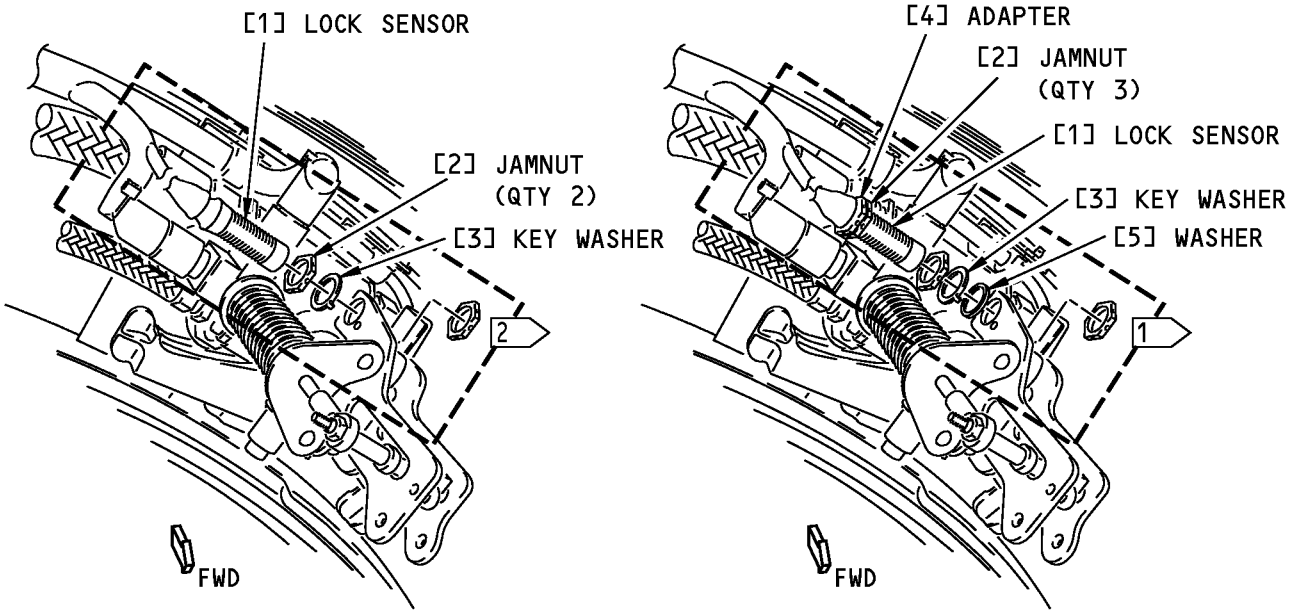
NOTE: LEFT THRUST REVERSER IS SHOWN, RIGHT THRUST REVERSER IS THE SAME.

Thrust Reverser Sleeve Lock Proximity Sensor Installation
Figure 401 (Sheet 3 of 4)/78-34-03-990-801-F00



(VIEW IN THE AFT DIRECTION)

B



C

1 > WIRE BUNDLE WITH ADAPTER

2 > WIRE BUNDLE WITHOUT ADAPTER

Thrust Reverser Sleeve Lock Proximity Sensor Installation
Figure 401 (Sheet 4 of 4)/78-34-03-990-801-F00

TASK 78-34-03-400-801-F00

3. Thrust Reverser Sleeve Lock Proximity Sensor Installation

(Figure 401)

A. General

(1) This task is for the installation of the lock sensor for the left or right thrust reverser on an engine.

B. References

Reference	Title
73-21-00-700-804-F00	EEC TEST (P/B 501)
78-34-03-800-801-F00	Sleeve Lock Proximity Sensor Adjustment (P/B 501)
SWPM Ch 20	Standard Wiring Practices Manual

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Lock Sensor Installation

SUBTASK 78-34-03-420-001-F00

CAUTION: DO NOT SPLICE THE LOCK SENSOR INTO THE WIRE BUNDLE. IF THE LOCK SENSOR IS SPLICED INTO THE WIRE BUNDLE, THE EAU CAN RECEIVE INCORRECT INDICATIONS. NUISANCE FAULT MESSAGES CAN OCCUR.

(1) Do these steps to install the lock sensor [1] and wire leads:

HAP 001-007 PRE SB 737-73-1015

(a) Do these steps to install the lock sensor into the wire bundle:

1) Install the pins in the connector SWPM Ch 20.

a) Install the yellow wire to pin 1, the red wire to pin 4, and the blue wire to pin 5 (View C).

2) Install the wire leads in the wire bundle SWPM Ch 20.

HAP ALL

(b) Install the clamp that was removed.

1) Make sure that the pink position marker on the upper end of the wire bundle is less than 0.50 inch (12.7 mm) from the upper edge of the clamp (View B).

HAP 001-007 PRE SB 737-73-1015

(c) Do these steps to install the lock sensor [1] into the bracket.

1) Install the lock sensor [1] with one of the jamnuts [2] and the keywasher [3]

2) Align the keywasher [3] with the index hole in the bracket.

NOTE: The key washer can be on one side or the other of the bracket.

3) Install the other jamnut [2].

4) Put the lock sensor [1] against the sensor target.

HAP 001-007 PRE SB 737-73-1015 (Continued)

5) Hand tighten the jamnuts [2] at this time.

NOTE: This is a temporary installation only, the jamnuts will be tighten after the final adjustment of the lock sensor.

HAP 001-007 POST SB 737-73-1015; AIRPLANES WITH A WIRE BUNDLE WITHOUT AN ADAPTER

(d) Do these steps to install the lock sensor [1] into the bracket.

1) Install the lock sensor [1] with one of the jamnuts [2] and the keywasher [3]
2) Align the keywasher [3] with the index hole in the bracket.

NOTE: The key washer can be on one side or the other of the bracket.

3) Install the other jamnut [2].
4) Put the lock sensor [1] against the sensor target.
5) Hand tighten the jamnuts [2] at this time.

NOTE: This is a temporary installation only, the jamnuts will be tighten after the final adjustment of the lock sensor.

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

(e) Do these steps to install the lock sensor [1] into the bracket.

1) Install the lock sensor [1] with two of the jamnuts [2] , the key washer [3] and washers [5]
   a) Make sure that the two jamnuts [2] are adjacent to the adapter [4].
2) Install the key washer and washer on the side of the bracket away from the sensor target.
   a) Align the key washer [3] with the index hole in the bracket.
3) Install the other jamnut [2].
4) Put the lock sensor [1] against the sensor target.
5) Hand tighten the jamnuts [2] at this time.

NOTE: This is a temporary installation only, the jamnuts will be tighten after the final adjustment of the lock sensor.

HAP ALL

SUBTASK 78-34-03-860-003-F00

(2) Do these steps to connect the electrical connectors:

(a) For the left thrust reverser, connect these electrical connectors:

1) Connect the electrical connector, D30008 to the strut receptacle.
2) Connect the electrical connector, D30076 to the LVDT receptacle.

(b) For the right thrust reverser, connect these electrical connectors:

1) Connect the electrical connector, D30010 to the strut receptacle.
2) Connect the electrical connector, D30078 to the LVDT receptacle.

SUBTASK 78-34-03-860-004-F00

(3) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-03-860-005-F00

(4) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-03-820-001-F00

(5) Do this task: Sleeve Lock Proximity Sensor Adjustment, TASK 78-34-03-800-801-F00.

SUBTASK 78-34-03-710-003-F00

(6) Do this task: EEC TEST, TASK 73-21-00-700-804-F00.

NOTE: This check will make sure that the electrical connections for the LVDT's are correct.

(a) Make sure that no LVDT maintenance messages show.

1) If a maintenance message shows, do the applicable fault isolation task in the Fault Isolation Manual for that maintenance message.

2) If no maintenance messages show, the electrical connections for the LVDT's are correct.

——————— END OF TASK ———————

THRUST REVERSER SLEEVE LOCK PROXIMITY SENSOR - ADJUSTMENT/TEST

1. General

A. This procedure has one task:

(1) The adjustment of the thrust reverser sleeve lock proximity sensor.

TASK 78-34-03-800-801-F00

2. Sleeve Lock Proximity Sensor Adjustment

(Figure 501)

A. General

(1) This procedure has the instructions for the adjustment of the thrust reverser sleeve lock proximity sensor.

(2) The thrust reverser sleeve lock proximity sensor supplies a signal to the engine accessory unit (EAU) when the locking actuator is not in the locked position.

(3) The manual unlock lever on the locking actuator must be in the unlock position to do the adjustment test.

(4) The Thrust Reverser Normal Operation Test must be done after the thrust reverser sleeve lock proximity sensor is adjusted.

(5) For this procedure, the thrust reverser sleeve lock proximity sensor will be referred to as the lock sensor.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

C. Consumable Materials

Reference	Description	Specification
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995˜ C32

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Adjustment

SUBTASK 78-34-03-040-002-F00

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-34-03-010-003-F00

(2) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-34-03-980-001-F00

(3) Do these steps to manually unlock the locking actuator:

(a) Move the manual unlock lever forward.

(b) Hold the manual unlock lever in the forward position as you push the detent pin in.

(c) Release the manual unlock lever.

F. Lock Sensor Adjustment

SUBTASK 78-34-03-820-002-F00

(1) Do the steps that follow to adjust the lock sensor [3]:

(a) Loosen the two jamnuts [1].

1) Make sure that the key washer tab does not come out of the index hole in the attach fitting.

HAP 001-007 PRE SB 737-73-1015

a) The key washer [2] is installed with the tab in the index hole in the bracket The key washer can be on one side or the other of the bracket.

HAP 001-007 POST SB 737-73-1015; AIRPLANES WITH A WIRE BUNDLE WITHOUT AN ADAPTER

b) The key washer [2] is installed with the tab in the index hole in the bracket. The key washer can be on one side or the other of the bracket.

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

c) The key washer [2] is installed with the tab in the index hole in the bracket. The key washer and washers are installed on the side of the bracket away from the target.

HAP ALL

(b) Adjust the jamnuts [1] to set the lock sensor [3] in the correct position.

1) Use a feeler gage to measure the distance between the end face of the lock sensor and the sensor target [4].

2) Make sure that the distance is 0.035 ±0.010 inch (0.889 ±0.254 mm).

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

3) If it is necessary, adjust the number of washers.

HAP ALL

(c) Tighten the two jamnuts to 45-55 pound-inches (5.1-6.2 Newton meters).

(d) Do a check of the distance again between the end face of the lock sensor and the sensor target [4] to make sure that it is 0.035 ±0.010 inch (0.889 ±0.254 mm).

(e) Install lockwire, G01048 on the jamnuts [1] as shown in view B.

HAP 008-013, 015-026, 028-054, 101-999; AIRPLANES WITH A WIRE BUNDLE WITH AN ADAPTER

(f) If it is necessary, install lockwire, G01048 on the adapter and adajcent jamnut.

HAP ALL

(g) Do these steps to lock the locking actuator:

1) Move the manual unlock lever forward.

NOTE: The detent pin will move out of the locked position.

2) Release the manual unlock lever.

G. Lock Sensor Adjustment Test

SUBTASK 78-34-03-440-001-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-34-03-710-001-F00

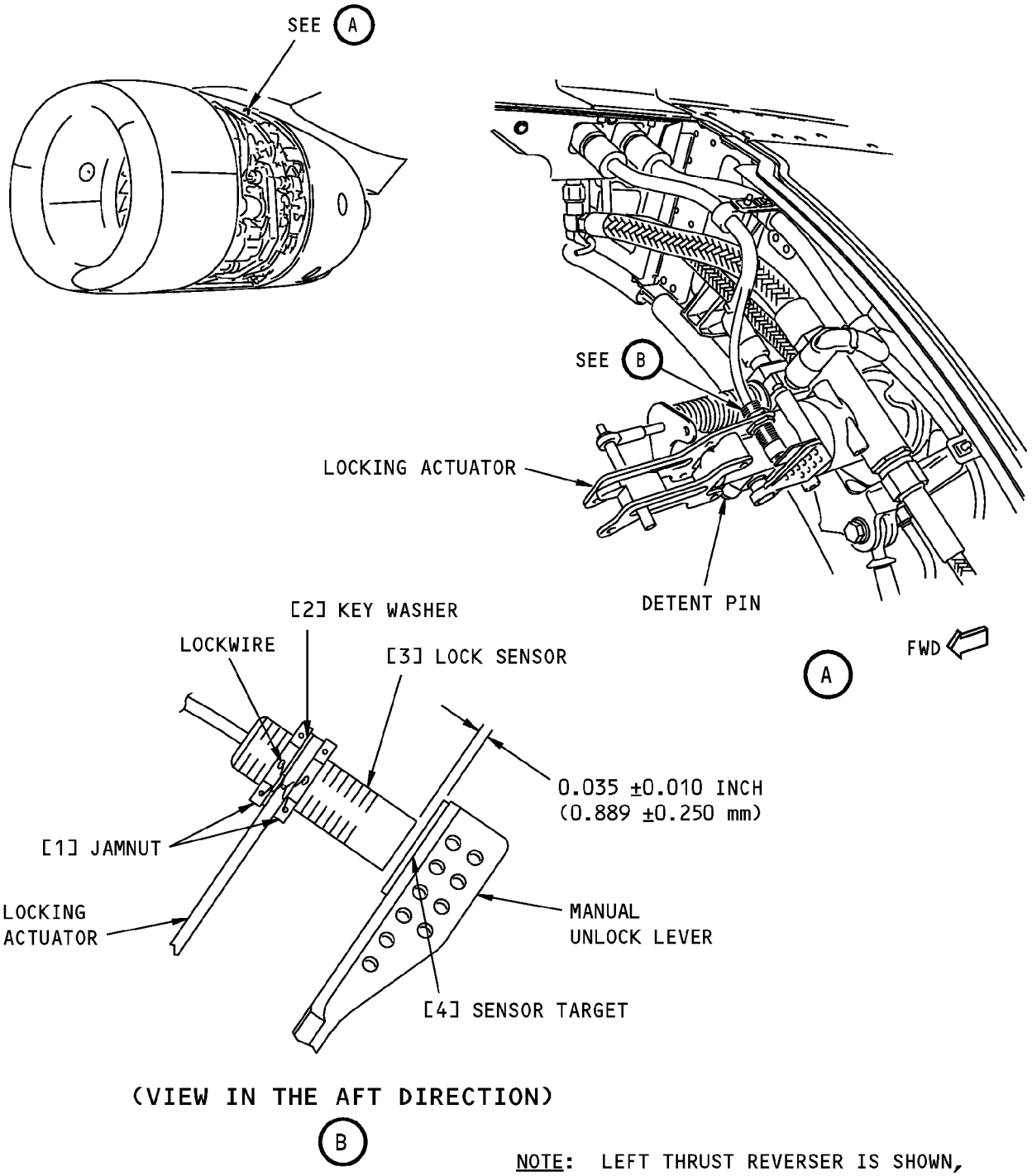
(2) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-03-410-001-F00

(1) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

END OF TASK



NOTE: LEFT THRUST REVERSER IS SHOWN, RIGHT THRUST REVERSER IS THE SAME.

Thrust Reverser Sleeve Lock Proximity Sensor Adjustment
Figure 501/78-34-03-990-802-F00

THRUST REVERSER CONTROL SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser control switch.

(2) The installation of the thrust reverser control switch.

TASK 78-34-04-000-801-F00

2. Control Switch Removal

(Figure 401)

A. General

(1) This task is for the removal of the thrust reverser control switch.

(2) For this task, the thrust reverser control switch will be referred to as the control switch.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-805-F00	Thrust Reverser Operation - Extend (Power Procedure) (P/B 201)
SWPM Ch 20	Standard Wiring Practices Manual

C. Location Zones

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

D. Prepare for the Removal

SUBTASK 78-34-04-860-015-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-34-04-860-016-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-34-04-860-018-F00

(3) For the applicable engine, make sure that the start lever is in the CUTOFF position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-34-04-860-040-F00

(4) Make sure that the applicable thrust lever is in the idle position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-34-04-860-041-F00

(5) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

SUBTASK 78-34-04-860-043-F00

(6) For the applicable engine, move the ENGINE START switch on the forward overhead P5 panel to the CONT position.

NOTE: This supplies power to the EEC which is necessary for the interlock to release.

SUBTASK 78-34-04-860-056-F00

(7) If the thrust reverser will power extend (deploy), do these steps:

NOTE: For the adjustment of the control switch, you must have movement through the full range of the reverse thrust lever. When the interlock releases and the thrust reverser is extended, the reverse thrust lever can move through its entire range.

(a) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.

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

(b) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-34-04-980-007-F00

(8) If the thrust reverser will not power extend (deploy), do these steps:

NOTE: For the adjustment of the control switch, you must have movement through the full range of the reverse thrust lever. When the interlock releases and the thrust reverser is extended, the reverse thrust lever can move through its entire range.

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

(a) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

(b) Manually extend the thrust reverser Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

E. Control Switch Removal

SUBTASK 78-34-04-020-001-F00

(1) Do these steps to remove the control switch [1] from the applicable thrust lever:

(a) To get access to the applicable thrust lever cover, move the other thrust lever to the fully forward position.

(b) ALUMINUM THRUST LEVERS;

Remove the five screws [4] that attach the cover to the inboard side of the thrust lever.

HAP 001, 006, 007

(c) CORROSION RESISTANT STEEL (CRES) THRUST LEVERS;

Remove the four screws [4] that attach the cover to the inboard side of the thrust lever.

HAP ALL

(d) Remove the cover from the thrust lever.

(e) Remove the two screws [3] that attach the control switch to the thrust lever.

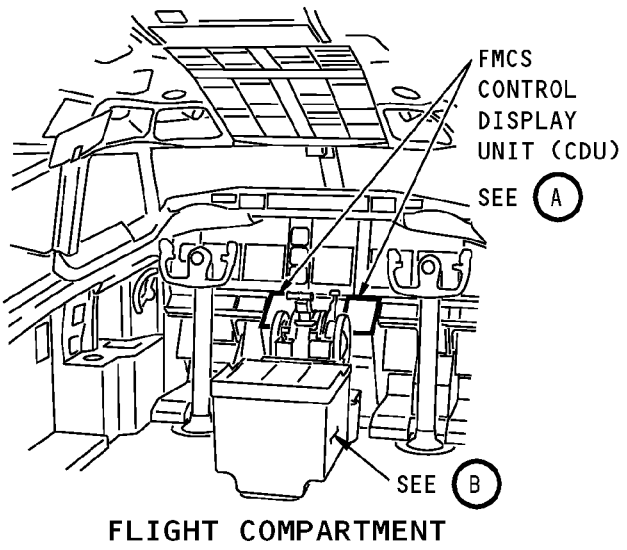
(f) Remove the two switch plates [2] and the control switch [1].

NOTE: Some configurations of the control switch do not use switch plates.

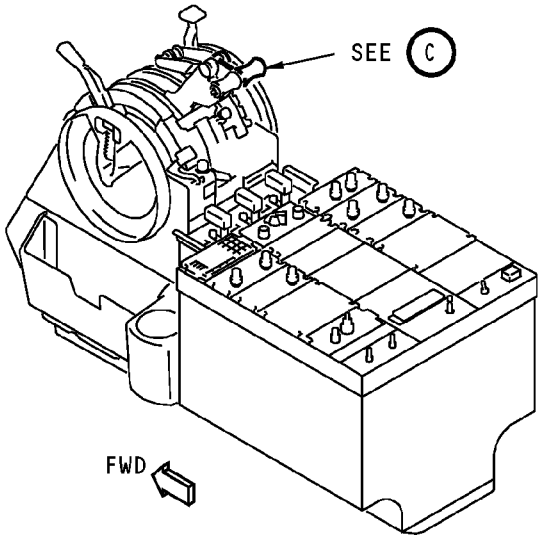
1) Keep the two switch plates for the subsequent installation of the new control switch.

(g) Do the applicable tasks to disconnect the three wire socket contacts from the control switch [1] SWPM Ch 20.

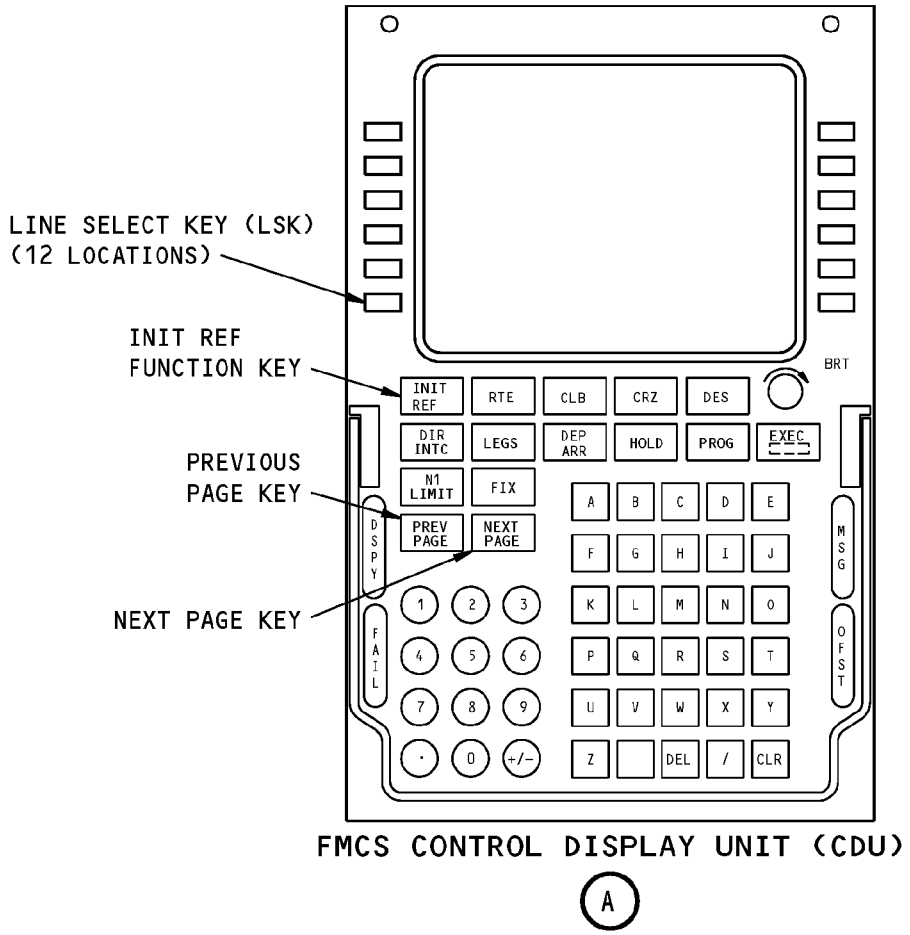
———————— END OF TASK ————————



FLIGHT COMPARTMENT

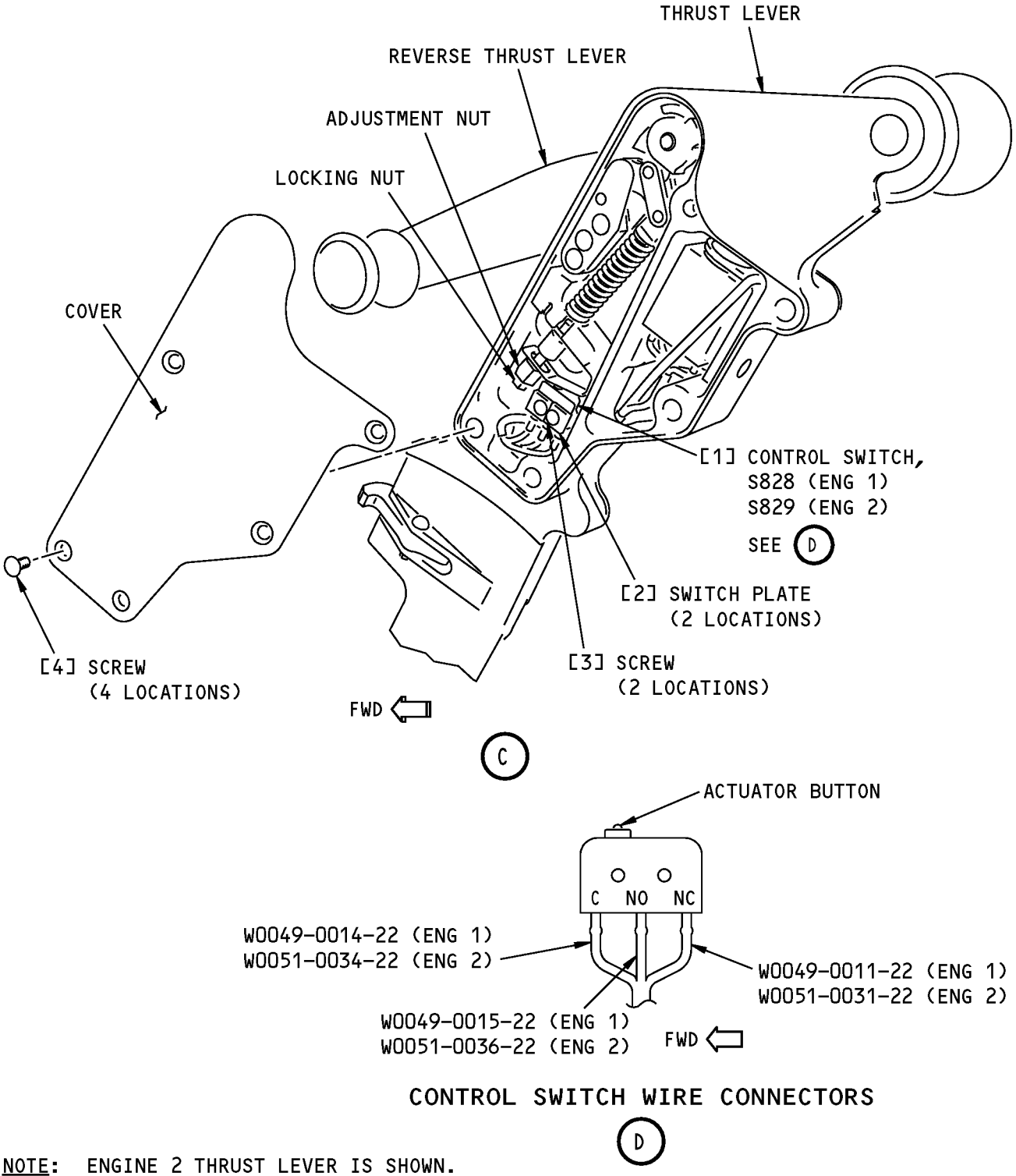


CONTROL STAND
B



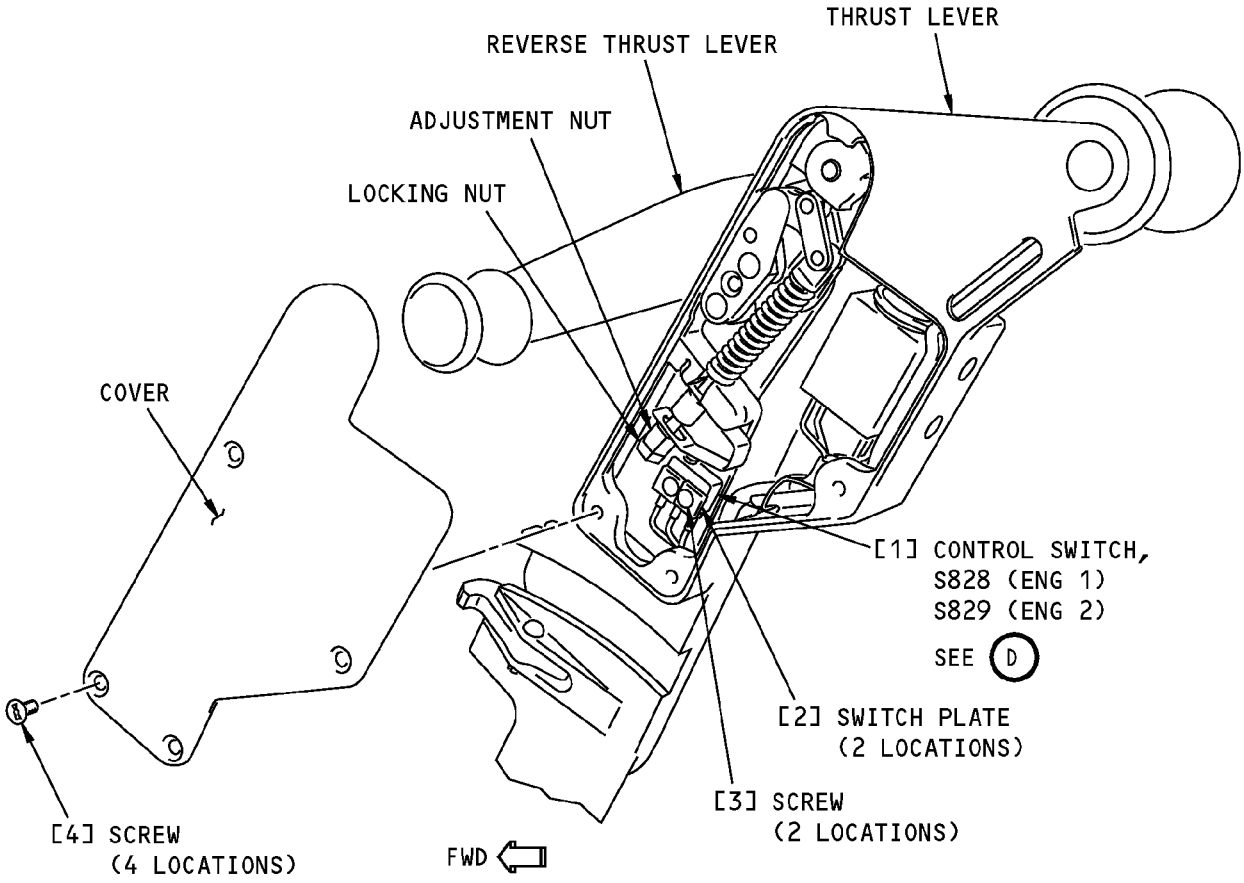
FMCS CONTROL DISPLAY UNIT (CDU)
A

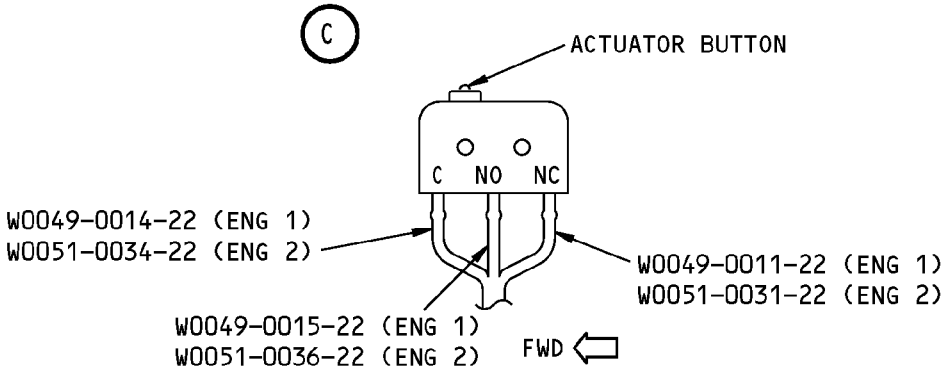
Thrust Reverser Control Switch Installation
Figure 401 (Sheet 1 of 3)/78-34-04-990-802-F00



NOTE: ENGINE 2 THRUST LEVER IS SHOWN.
ENGINE 1 THRUST LEVER IS OPPOSITE.

Thrust Reverser Control Switch Installation
Figure 401 (Sheet 2 of 3)/78-34-04-990-802-F00





CONTROL SWITCH WIRE CONNECTORS

D

NOTE: ENGINE 2 THRUST LEVER IS SHOWN.
ENGINE 1 THRUST LEVER IS OPPOSITE.

Thrust Reverser Control Switch Installation
Figure 401 (Sheet 3 of 3)/78-34-04-990-802-F00

TASK 78-34-04-400-801-F00

3. Control Switch Installation

(Figure 401)

A. General

(1) This task is for the installation of the thrust reverser control switch.

(2) For this task, the thrust reverser control switch will be referred to as the control switch.

(3) The TRA (thrust lever resolver angle) values on the FMCS (flight management computer system) CDU (common display unit) will be used to adjust the control switch.

B. References

Reference	Title
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)
78-34-04-700-801-F00	Control Switch Adjustment/Test (P/B 501)

C. Tools/Equipment

Reference	Description
STD-442	Gun - Heat, 180° F (82° C) Maximum Output Temperature
STD-1231	Multimeter - Standard

D. Consumable Materials

Reference	Description	Specification
G01148	Sleeve - Insulation, Electrical, Heat Shrinkable - RT-876	

E. Location Zones

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

F. Control Switch Installation

SUBTASK 78-34-04-420-001-F00

(1) Do these steps to install the control switch [1]:

(a) Put the control switch [1] in its correct position.

1) Make sure that the actuator button is in the correct position.

(b) Install the two switch plates [2] on the control switch [1].

NOTE: Some configurations of the control switch do not use switch plates.

(c) Install the two screws [3] that attach the switch plates [2] and the control switch [1] to the thrust lever.

NOTE: The wire socket contacts are connected after the adjustment of the control switch.

G. Control Switch Test

SUBTASK 78-34-04-860-044-F00

(1) Make sure that the reverse thrust lever is fully forward and down in the retracted (stowed) position.

SUBTASK 78-34-04-720-003-F00

(2) To test the control switch [1], use the FMCS CDU in the flight compartment to show the TRA (thrust lever resolver angle) position values:

NOTE: The relationship between RLA (actual reverse thrust lever angle as measured by a protractor) and TRA is also given in the task.

(a) Push the INIT REF key to show the PERF INIT screen on the CDU.

(b) Push the INDEX key to show the INIT/REF INDEX screen on the CDU.

(c) Push these line select keys (LSK) on the CDU:

1) MAINT.

NOTE: This causes the MAINT BITE INDEX screen to show.

2) ENGINE.

NOTE: This causes the ENGINE/EXCEED BITE INDEX screen to show.

3) Applicable ENGINE X, (X = 1 or 2).

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The CDU will show INITIALIZING EEC X, for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

4) INPUT MONITORING.

NOTE: This causes the ENGINE X BITE TEST INPUT MONITORING menu to show. This is a warning screen in which you can continue or go back.

5) CONTINUE.

NOTE: This causes the ENGINE X BITE TEST INPUT MONITORING menu to show.

6) CONTROL LOOPS.

NOTE: This causes screen 1 of the CONTROL LOOPS to show.

7) Push the NEXT PAGE key on the CDU.

NOTE: This causes screen 2 of the CONTROL LOOPS to show.

8) Push the NEXT PAGE key on the CDU again.

NOTE: This causes screen 3 of the CONTROL LOOPS to show.

9) Push the TRA line select key (LSK).

NOTE: This causes the TRA SELECTION screen to show.

NOTE: The channel that is in control will be shown first.

(d) Use a multimeter, STD-1231 to do this continuity check:

1) Make sure that there is an open circuit between terminal C and terminal NO at 36 ±0.25 degrees TRA position value.

NOTE: This TRA position value is the same as 0 degrees RLA.

(e) As you slowly move the reverse thrust lever toward the extend (deploy) position, do these continuity checks:

NOTE: There is a two second delay between the movement of the reverse thrust lever and the value that is displayed on the FMCS CDU.

1) Make sure, that as the reverse thrust lever is moved, there is continuity between terminal C and terminal NC between a TRA position value of 36 ±0.25 degrees and 35.50 degrees.

NOTE: This range of TRA position values is the same as 0 to 16 degrees RLA.

2) Stop the movement of the reverse thrust lever when terminal NC to terminal C goes open.
   a) Wait for at least 2 seconds.
   b) Make sure that the TRA position value is between 35.50 degrees and 35.10 degrees.

NOTE: This range of TRA position values is the same as 16 to 19 degrees RLA.

3) Do a check between terminal C and terminal NO of the control switch:
   a) Continue to slowly move the reverse thrust lever until the reverse thrust lever is at the extend (deploy) position.
   b) Make sure that the continuity between terminal C and terminal NO is kept during the movement.
4) If the continuity check is not in the limits, do the steps that follow to adjust the control switch.
5) If the continuity check is in the limits, the control switch is serviceable.

H. Control Switch Adjustment

SUBTASK 78-34-04-820-002-F00

(1) Do the adjustment on the control switch [1], do this task: Control Switch Adjustment/Test, TASK 78-34-04-700-801-F00.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-04-860-045-F00

(1) Do these steps at the FMCS CDU:
   (a) Push the INIT REF key on the CDU.

NOTE: This causes the MAINT BITE INDEX screen to show.

   (b) Push the INIT REF key on the CDU again.

NOTE: This causes the PERF INIT screen to show.

SUBTASK 78-34-04-860-019-F00

(2) For the Engine 1 thrust reverser, do these steps to connect the wire socket contacts to the control switch:
   (a) Slide a piece of heat shrinkable RT-876 sleeve, G01148, that is approximately 0.60 inch (15.2 mm) over each of the three wire socket contacts.
   (b) Connect the W0049-0014-22 socket contact to the C contact.
   (c) Connect the W0049-0011-22 socket contact to the NC contact.
   (d) Connect the W0049-0015-22 socket contact to the NO contact.
   (e) Put the heat shrinkable RT-876 sleeve, G01148, in the correct position over the socket contact and wire.

NOTE: The sleeve must cover the entire socket contact and approximately 0.25 inch (6.4 mm) of the wire.

1) Use a 180° F (82° C) maximum output temperature heat gun, STD-442 to make the heat shrink sleeve become tight on the socket contact.

SUBTASK 78-34-04-860-020-F00

(3) For the Engine 2 thrust reverser, do these steps to connect the wire socket contacts to the control switch:

(a) Slide a piece of heat shrinkable RT-876 sleeve, G01148, that is approximately 0.60 inch (15.2 mm) over each of the three wire socket contacts.

(b) Connect the W0051-0034-22 socket contact to the C contact.

(c) Connect the W0051-0031-22 socket contact to the NC contact.

(d) Connect the W0051-0036-22 socket contact to the NO contact.

(e) Put the heat shrinkable RT-876 sleeve, G01148, in the correct position over the socket contact and wire.

NOTE: The sleeve must cover the entire socket contact and approximately 0.25 inch (6.4) of the wire.

1) Use a 180° F (82° C) maximum output temperature heat gun, STD-442 to make the heat shrink sleeve become tight on the socket contact.

SUBTASK 78-34-04-860-021-F00

(4) Install the cover on the thrust lever.

(a) ALUMINUM THRUST LEVERS;

Install the five screws [4] that attach the cover.

HAP 001, 006, 007

(b) CORROSION RESISTANT STEEL (CRES) THRUST LEVERS;

Install the four screws [4] that attach the cover.

HAP ALL

SUBTASK 78-34-04-860-022-F00

(5) Make sure that the thrust levers are in the idle position.

SUBTASK 78-34-04-860-023-F00

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE AREA OF THE THRUST REVERSER. IF THERE ARE PERSONS OR EQUIPMENT IN THE AREA WHEN THE THRUST REVERSER MOVES, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Do these steps to retract (stow) the thrust reverser:

(a) Move the reverse thrust lever up and aft to the extended (deployed) position.

NOTE: The reverse thrust lever must be in the extended (deployed) position to unlock the sync locks. The sync locks will unlock and the thrust reverser will move as soon as the thrust reverser is activated.

(b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

(c) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

SUBTASK 78-34-04-710-004-F00

(7) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

SUBTASK 78-34-04-860-051-F00

(8) If not already done, move the ENGINE START switch to the OFF position.

SUBTASK 78-34-04-860-052-F00

(9) If not already done, remove the DO-NOT-OPERATE tag from the thrust lever.

SUBTASK 78-34-04-860-053-F00

(10) If not already done, remove the DO-NOT-OPERATE tag from the start lever.

SUBTASK 78-34-04-860-054-F00

(11) For Engine 1, if not already done, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-34-04-860-055-F00

(12) For Engine 2, if not already done, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

——————— END OF TASK ———————

THRUST REVERSER CONTROL SWITCH - ADJUSTMENT/TEST

1. General

A. This procedure has one task:

(1) The adjustment and test instructions for the thrust reverser control switch.

TASK 78-34-04-700-801-F00

2. Control Switch Adjustment/Test

(Figure 501)

A. General

(1) This task is a check and adjustment of the thrust reverser control switch.

(2) For this task, the thrust reverser control switch will be referred to as the control switch.

B. References

Reference	Title
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-980-803-F00	Thrust Reverser Operation - Extend (Manual Procedure) (P/B 201)
78-31-00-980-805-F00	Thrust Reverser Operation - Extend (Power Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)
78-34-04-000-801-F00	Control Switch Removal (P/B 401)
78-34-04-400-801-F00	Control Switch Installation (P/B 401)
SWPM Ch 20	Standard Wiring Practices Manual

C. Tools/Equipment

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

Reference	Description
SPL-706	Protractor - Thrust Reverser Levers, Digital Readout (Part #: G76002-15, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-442	Gun - Heat, 180° F (82° C) Maximum Output Temperature
STD-1231	Multimeter - Standard

D. Consumable Materials

Reference	Description	Specification
G01148	Sleeve - Insulation, Electrical, Heat Shrinkable - RT-876	

E. Location Zones

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

F. Prepare for the Procedure

SUBTASK 78-34-04-860-001-F00

(1) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-34-04-860-002-F00

(2) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-34-04-860-029-F00

(3) For the applicable engine, make sure that the start lever is in the CUTOFF position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-34-04-860-030-F00

(4) Make sure that the applicable thrust lever is in the idle position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-34-04-860-031-F00

(5) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

SUBTASK 78-34-04-860-033-F00

(6) For the applicable engine, move the ENGINE START switch on the forward overhead P5 panel to the CONT position.

NOTE: This supplies power to the EEC which is necessary for the interlock to release.

SUBTASK 78-34-04-860-057-F00

(7) If the thrust reverser will power extend (deploy), do these steps:

NOTE: For the adjustment of the control switch, you must have movement through the full range of the reverse thrust lever. When the interlock releases and the thrust reverser is extended, the reverse thrust lever can move through its entire range.

(a) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.

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

(b) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-34-04-980-005-F00

(8) If the thrust reverser will not power extend (deploy), do these steps:

NOTE: For the adjustment of the control switch, you must have movement through the full range of the reverse thrust lever. When the interlock releases and the thrust reverser is extended, the reverse thrust lever can move through its entire range.

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

(a) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

(b) Manually extend the thrust reverser Thrust Reverser Operation - Extend (Manual Procedure), TASK 78-31-00-980-803-F00.

SUBTASK 78-34-04-720-001-F00

(9) Do these steps to get access to the control switch [1] in the applicable thrust lever:

(a) To get access to the applicable thrust lever cover, move the opposite thrust lever to the fully forward position.

(b) ALUMINUM THRUST LEVERS;

Remove the five screws [4] that attach the cover to the inboard side of the thrust lever.

HAP 001, 006, 007

(c) CORROSION RESISTANT STEEL (CRES) THRUST LEVERS;

Remove the four screws [4] that attach the cover to the inboard side of the thrust lever.

HAP ALL

(d) Remove the cover from the thrust lever.

(e) Do the applicable tasks to disconnect the three wire socket contacts from the control switch SWPM Ch 20.

SUBTASK 78-34-04-480-001-F00

(10) Install the thrust reverser levers, digital readout protractor, SPL-706 on the reverse thrust lever.

(a) Adjust the protractor to show zero degrees with the reverse thrust lever fully forward and down, in the retracted (stowed) position.

G. Control Switch Test

SUBTASK 78-34-04-860-034-F00

(1) Make sure that the reverse thrust lever is fully forward and down in the retracted (stowed) position.

SUBTASK 78-34-04-720-002-F00

(2) Use a multimeter, STD-1231 to do these continuity checks:

(a) Make sure that there is an open circuit between the C and NO terminals and a closed circuit between C and NC terminals of the control switch.

1) If you do not find the open circuit, then do the steps below to adjust the control switch.

2) If you find the open circuit, then continue.

(b) As you slowly move the reverse thrust lever toward the extend (deploy) position, make sure that the circuit between C and NO closes with a protractor angle of 16 to 19 degrees.

1) If the circuit does not close in the limits, then do the steps below to adjust the control switch.

2) If the circuit closes in the limits, then continue.

(c) Make sure that the reverse thrust lever is fully forward and down in the retracted (stowed) position.

(d) Move the reverse thrust lever to 19 degrees protractor angle.

1) Make sure that there is an closed circuit between the C and NO terminals and a open circuit between C and NC terminals of the control switch.

(e) Slowly move the reverse thrust lever from 19 degrees to the fully extended (109 ± 2 degrees protractor angle) position, make sure that the circuit between C and NO stays closed (continuity) through the full range of movement.

(f) Slowly move the reverse thrust lever from 109 ± 2 degrees to 46 to 50 degrees protractor angle, make sure that the circuit between C and NO stays closed (continuity) through the full range of movement.

1) If the continuity is not in the limits, then do the steps below to adjust the control switch.

2) If the continuity is in the limits, then continue.

(g) Move the reverse thrust lever to 19 degrees protractor angle.

(h) Slowly move the reverse thrust lever from 19 degrees to the fully extended (109 ± 2 degrees protractor angle) position, make sure that the circuit between C and NC stays open the full range of movement.

(i) Slowly move the reverse thrust lever from 109 ± 2 degrees to 46 to 50 degrees protractor angle, make sure that the circuit between C and NC stays open (continuity) through the full range of movement.

1) If the continuity is not in the limits, then do the steps below to adjust the control switch.

2) If the continuity is in the limits, then do the step below to put the airplane in its usual condition.

H. Adjust the Control Switch

SUBTASK 78-34-04-820-001-F00

(1) Do these steps to adjust the control switch [1]:

(a) Make sure that the reverse thrust lever is in the stow position (fully forward and down).

(b) Loosen the lock nut at the adjustment nut.

(c) Do the Test above again and turn the adjustment nut until the continuity checks are in the limits.

1) If you cannot adjust the control switch to operate in the limits, replace the control switch.

These are the tasks:

- Control Switch Removal, TASK 78-34-04-000-801-F00
- Control Switch Installation, TASK 78-34-04-400-801-F00.

(d) Tighten the lock nut to 6.0-8.0 pound-inches (0.68-0.90 Newton meters).

(e) Do the Test again to make sure that the adjustment did not change.

1) If the continuity check is in the limits, the control switch is serviceable.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-04-080-001-F00

(1) Remove the thrust reverser levers, digital readout protractor, SPL-706 from the reverse thrust lever.

(a) Disconnect the multimeter, STD-1231 from the control switch.

SUBTASK 78-34-04-860-005-F00

(2) For the Engine 1 thrust reverser, do these steps to connect the wire socket contacts to the control switch:

(a) Slide a piece of heat shrinkable RT-876 sleeve, G01148, that is approximately 0.60 inch (15.2 mm) over each of the three wire socket contacts.

(b) Connect the W0049-0014-22 socket contact to the C contact.

(c) Connect the W0049-0011-22 socket contact to the NC contact.

(d) Connect the W0049-0015-22 socket contact to the NO contact.

(e) Put the heat shrinkable RT-876 sleeve, G01148, in the correct position over the socket contact and wire.

NOTE: The sleeve must cover the entire socket contact and approximately 0.25 inch (6.4 mm) of the wire.

1) Use a 180° F (82° C) maximum output temperature heat gun, STD-442 to make the heat shrink sleeve become tight on the socket contact.

SUBTASK 78-34-04-860-006-F00

(3) For the Engine 2 thrust reverser, do these steps to connect the wire socket contacts to the control switch:

(a) Slide a piece of heat shrinkable RT-876 sleeve, G01148, that is approximately 0.60 inch (15.2 mm) over each of the three wire socket contacts.

(b) Connect the W0051-0034-22 socket contact to the C contact.

(c) Connect the W0051-0031-22 socket contact to the NC contact.

(d) Connect the W0051-0036-22 socket contact to the NO contact.

(e) Put the heat shrinkable RT-876 sleeve, G01148, in the correct position over the socket contact and wire.

NOTE: The sleeve must cover the entire socket contact and approximately 0.25 inch (6.4) of the wire.

1) Use a 180° F (82° C) maximum output temperature heat gun, STD-442 to make the heat shrink sleeve become tight on the socket contact.

SUBTASK 78-34-04-860-007-F00

(4) Install the cover on the thrust lever.

(a) ALUMINUM THRUST LEVERS;

Install the five screws [4] that attach the cover.

HAP 001, 006, 007

(b) CORROSION RESISTANT STEEL (CRES) THRUST LEVERS;

Install the four screws [4] that attach the cover.

HAP ALL

SUBTASK 78-34-04-860-008-F00

(5) Make sure that the thrust levers are in the idle position.

(a) Remove the DO-NOT-OPERATE tags.

SUBTASK 78-34-04-860-058-F00

(6) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-34-04-860-059-F00

(7) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-34-04-860-036-F00

WARNING: MAKE SURE THAT THERE ARE NO PERSONS OR EQUIPMENT IN THE AREA OF THE THRUST REVERSER. IF THERE ARE PERSONS OR EQUIPMENT IN THE AREA WHEN THE THRUST REVERSER MOVES, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Do these steps to retract (stow) the thrust reverser:

(a) Move the reverse thrust lever up and aft to the extended (deployed) position.

NOTE: The reverse thrust lever must be in the extended (deployed) position to unlock the sync locks. The sync locks will unlock and the thrust reverser will move as soon as the thrust reverser is activated.

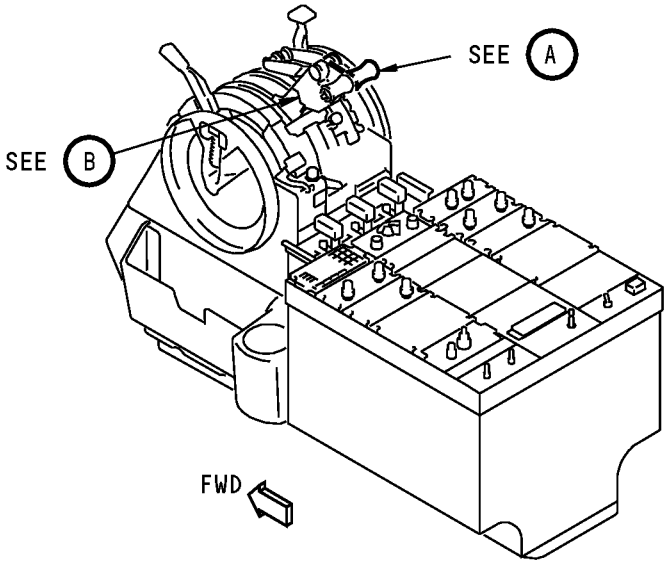
(b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

(c) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

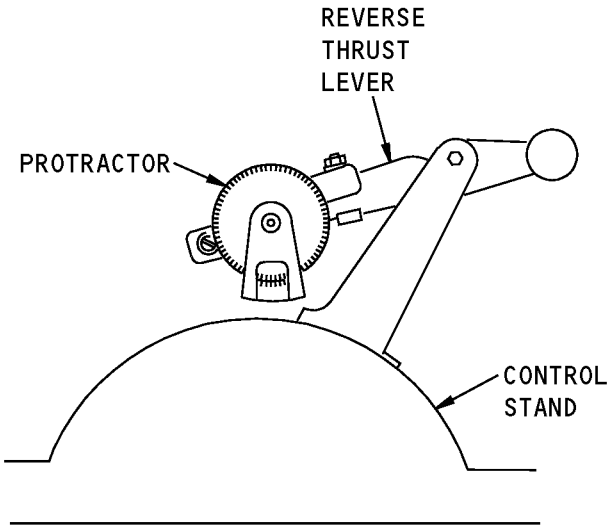
SUBTASK 78-34-04-710-003-F00

(9) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

END OF TASK

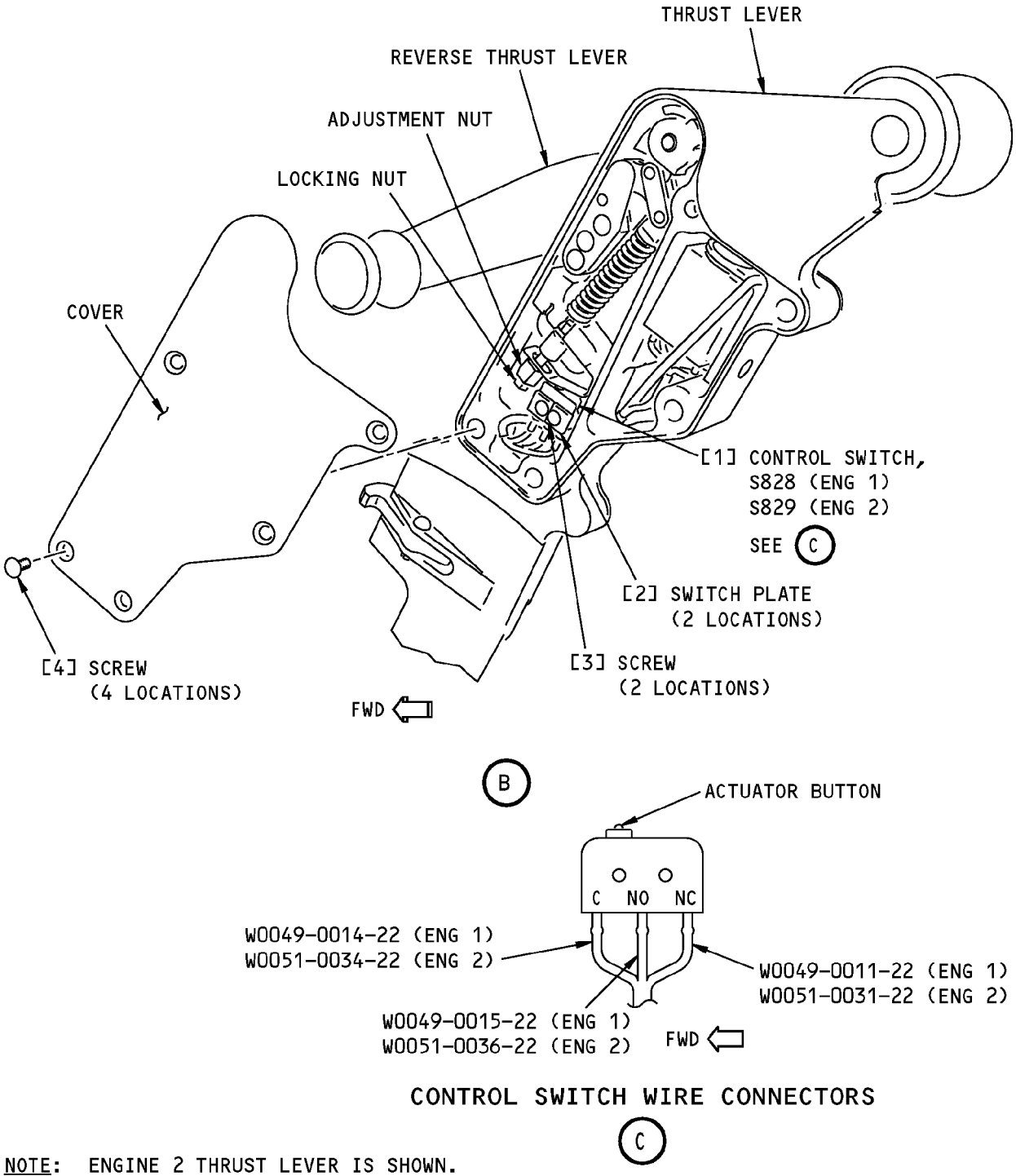


CONTROL STAND



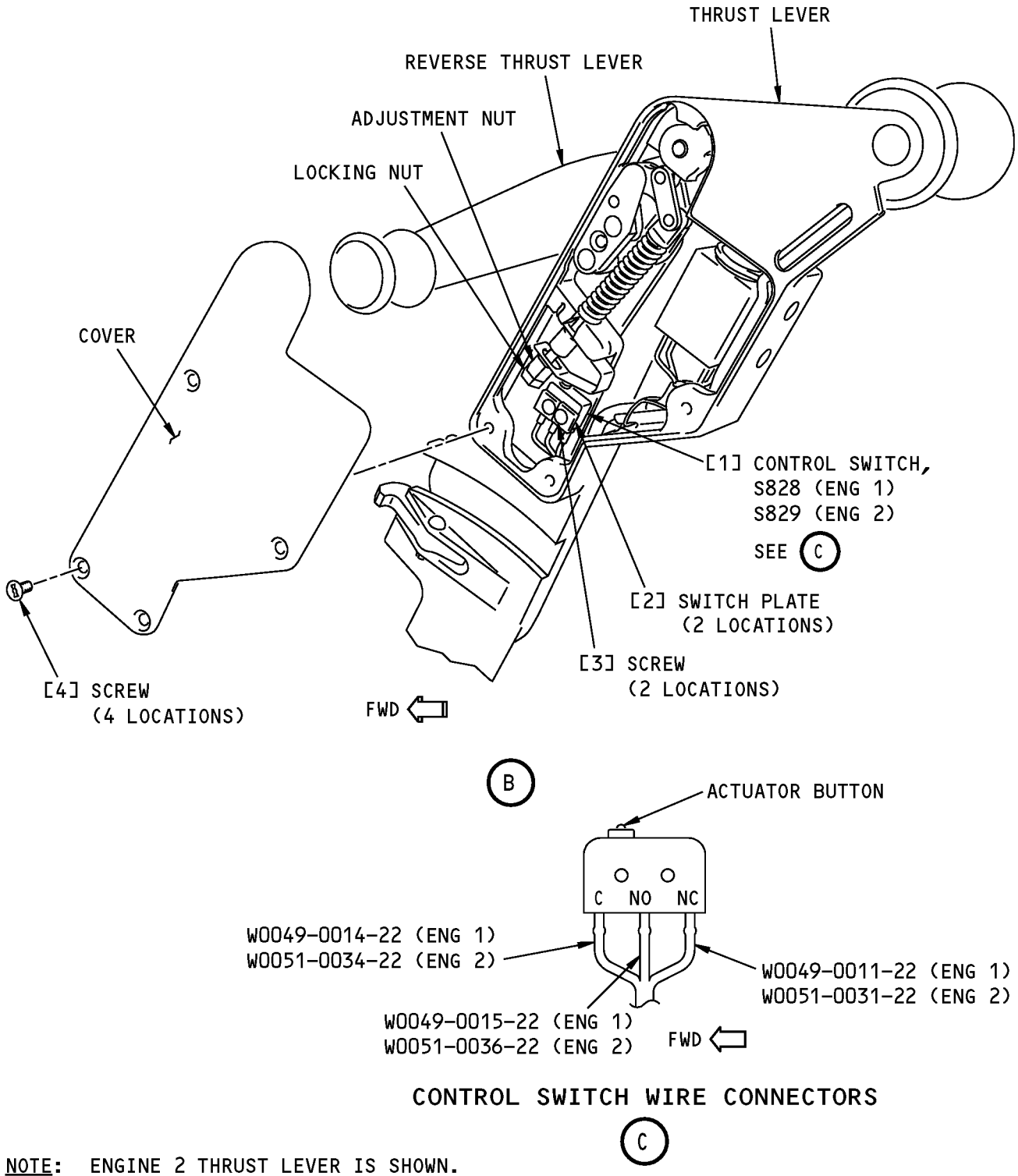
A

Thrust Reverser Control Switch Adjustment
Figure 501 (Sheet 1 of 3)/78-34-04-990-801-F00



NOTE: ENGINE 2 THRUST LEVER IS SHOWN.
ENGINE 1 THRUST LEVER IS OPPOSITE.

Thrust Reverser Control Switch Adjustment
Figure 501 (Sheet 2 of 3)/78-34-04-990-801-F00



NOTE: ENGINE 2 THRUST LEVER IS SHOWN.
ENGINE 1 THRUST LEVER IS OPPOSITE.

Thrust Reverser Control Switch Adjustment
Figure 501 (Sheet 3 of 3)/78-34-04-990-801-F00

THRUST REVERSER ARM, STOW AND SYNC LOCK SWITCHES - REMOVAL/INSTALLATION

1. General

A. The thrust reverser arm, stow and sync lock switches are on the autothrottle switchpack.

TASK 78-34-05-000-801-F00

2. Thrust Reverser Arm, Stow and Sync Lock Switches Removal

A. General

(1) The switches for Engine 1 are on the left switchpack and the switches for Engine 2 are on the right switchpack.

(2) For Engine 1 and Engine 2, the switch identification numbers are as follows:

(a) The sync lock switch identification number is S4.

(b) The arm switch identification number is S5.

(c) The stow switch identification number is S6.

(3) After the installation of the thrust reverser arm, stow or sync lock switches, a Thrust Reverser Normal Operation Test must be done Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

B. References

Reference	Title
76-11-07-020-801-F00	Switch Removal (P/B 401)
76-11-07-400-801-F00	Switch Installation (P/B 401)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

C. Location Zones

Zone	Area
112	Area Forward of Nose Landing Gear Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 78-34-05-900-001-F00

(1) For the removal and installation procedures for the thrust reverser arm, stow and sync lock switches, refer to these tasks:

(a) Do this task: Switch Removal, TASK 76-11-07-020-801-F00.

(b) Do this task: Switch Installation, TASK 76-11-07-400-801-F00.

END OF TASK

ENGINE ACCESSORY UNIT - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser engine accessory unit.

(2) The installation of the thrust reverser engine accessory unit.

TASK 78-34-06-000-801-F00

2. Engine Accessory Unit Removal

(Figure 401)

A. General

(1) When you remove the engine accessory unit (EAU), do not supply electrical power to the EAU system.

(2) The EAU is in the Electric Electronic (EE) compartment on the E3-2 shelf.

(3) The equipment number for the EAU is M528.

B. References

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 201)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. EAU Removal

SUBTASK 78-34-06-860-001-F00

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

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	5	C00276	ENGINE 1 THRUST REVERSER CONT
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	7	C00277	ENGINE 2 THRUST REVERSER CONT
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-06-010-001-F00

(2) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 78-34-06-020-001-F00

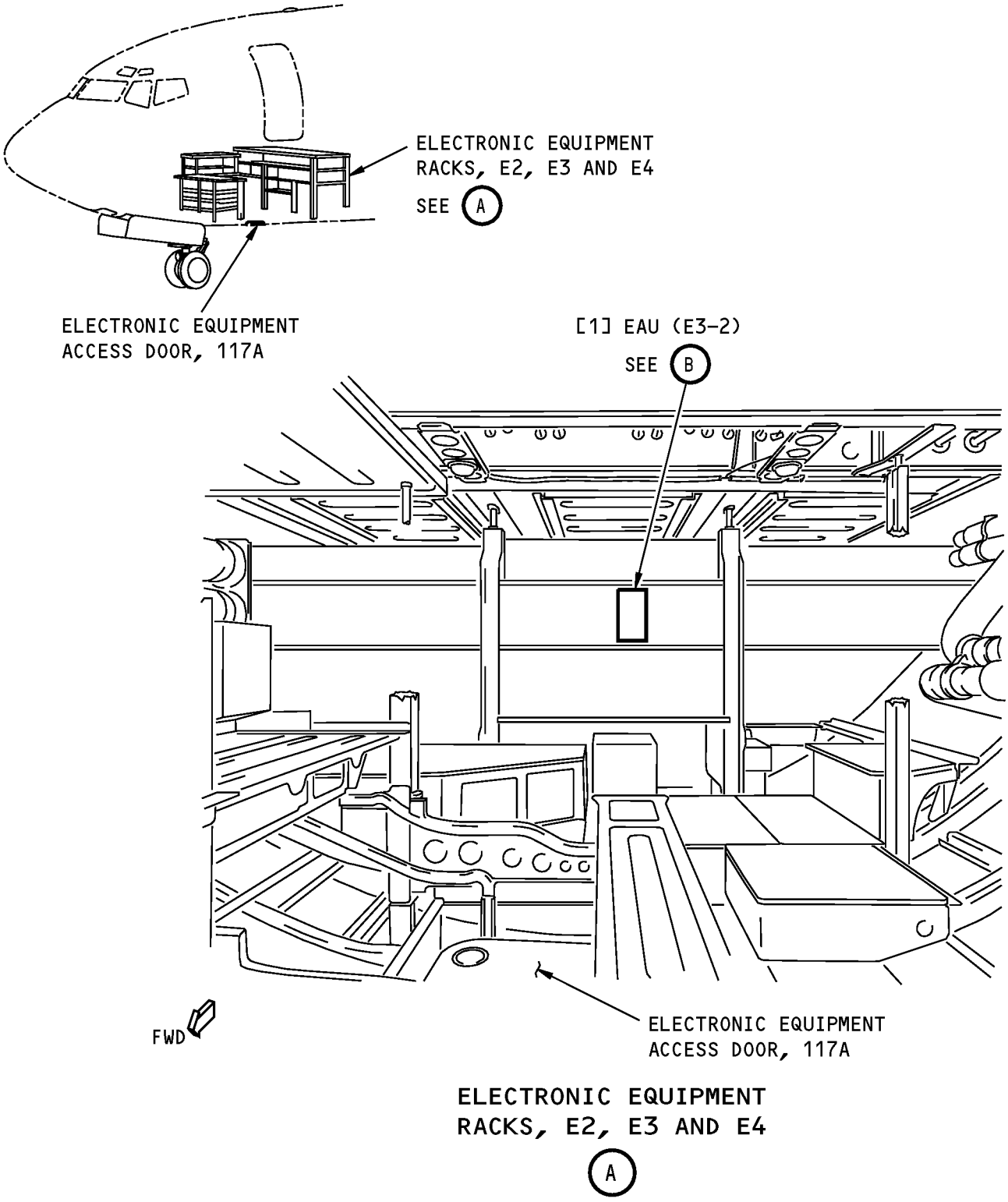
CAUTION: DO NOT TOUCH THE CONNECTOR ON THE BACK OF THE EAU BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE EAU.

(3) To remove a device that is sensitive to electrostatic discharge (ESDS), do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

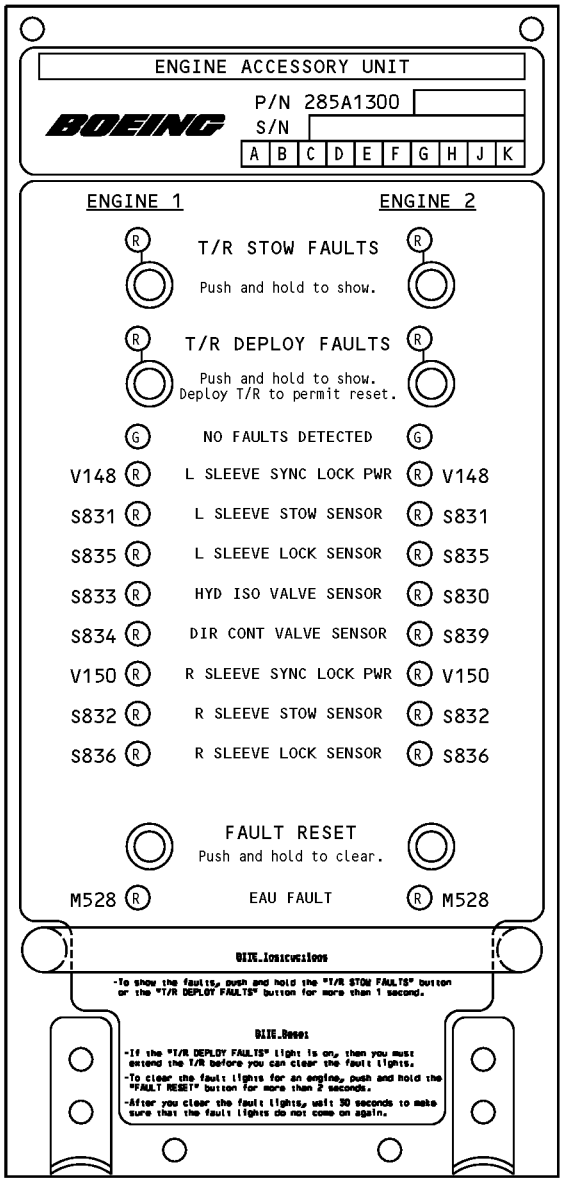
SUBTASK 78-34-06-020-002-F00

(4) To remove the EAU [1] from the E3-2 shelf, do this task: E/E Box Removal, TASK 20-10-07-000-801.

——————— END OF TASK ———————



Engine Accessory Unit (EAU) Installation
Figure 401 (Sheet 1 of 2)/78-34-06-990-801-F00



ENGINE ACCESSORY UNIT

B

Engine Accessory Unit (EAU) Installation
Figure 401 (Sheet 2 of 2)/78-34-06-990-801-F00

TASK 78-34-06-400-801-F00

3. Engine Accessory Unit Installation

(Figure 401)

A. General

(1) You must do the Thrust Reverser Normal Operational Test before you do the BITE procedure for the EAU.

B. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 201)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	EAU	78-34-06-01-005	HAP 001-013, 015-026, 028-043, 101
		78-34-06-02-005	HAP 044-054, 102-999

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. EAU Installation

SUBTASK 78-34-06-420-001-F00

CAUTION: DO NOT TOUCH THE CONNECTOR ON THE BACK OF THE EAU BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE EAU.

(1) To install a device that is sensitive to electrostatic discharge (ESDS), do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 78-34-06-860-002-F00

(2) To install the EAU [1] on the E3-2 shelf, do this task: E/E Box Installation, TASK 20-10-07-400-801.

SUBTASK 78-34-06-020-003-F00

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

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	4	C01003	ENGINE 1 THRUST REVERSER IND
B	5	C00276	ENGINE 1 THRUST REVERSER CONT
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK
C	7	C00277	ENGINE 2 THRUST REVERSER CONT
C	8	C01004	ENGINE 2 THRUST REVERSER IND

SUBTASK 78-34-06-710-001-F00

(4) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

SUBTASK 78-34-06-810-001-F00

(5) Do these steps to do the BITE procedure for the EAU:

(a) Push and hold the T/R STOW FAULTS or the T/R DEPLOY FAULTS switch on the EAU for each engine.

NOTE: All the lights will come on for one second. After one second, all the lights will go out but the lights that indicate a fault, a combination of faults or no faults detected.

(b) If the red lights go out and the green NO FAULTS DETECTED light comes on, then the BITE test passed for the EAU.

(c) If the red EAU FAULT light stays on, then the BITE test failed and the EAU should be replaced.

1) If other fault lights stay on, go to the task table in the BITE procedure in the Fault Isolation Manual.

(d) Release the T/R STOW FAULTS or the T/R DEPLOY FAULTS switch.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-06-410-001-F00

(1) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

END OF TASK

VOLUMETRIC HYDRAULIC FUSES - REMOVAL/INSTALLATION

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks:

(1) Thrust reverser volumetric hydraulic fuse removal (selection).

(2) Thrust reverser volumetric hydraulic fuse installation (selection).

(3) The standby system volumetric hydraulic fuse removal.

(4) The standby system volumetric hydraulic fuse installation.

(5) The system A volumetric hydraulic fuse removal.

(6) The system A volumetric hydraulic fuse installation.

C. If a leak occurs, the volumetric hydraulic fuses close and stop hydraulic fluid flow to prevent a complete loss of system hydraulic fluid.

D. Two of the volumetric hydraulic fuses are in the supply lines from the hydraulic standby system and are in the main gear wheel well on the keel beam.

(1) The left fuse is in the supply line to the Engine 1 thrust reverser and the right fuse is in the supply line to the Engine 2 thrust reverser.

(2) For this procedure, the volumetric hydraulic fuses for the standby system will be referred to as the left fuse and the right fuse.

E. The third volumetric hydraulic fuse is in the supply line from system A to the Engine 1 thrust reverser.

(1) There is no volumetric hydraulic fuse in the supply line from system B.

(2) The third fuse is in the main gear wheel well on the left hand side of the forward bulkhead.

(3) For this procedure, the third volumetric hydraulic fuse will be referred to as the system A fuse.

F. There is no on-airplane test for the volumetric hydraulic fuses for the thrust reversers.

(1) The volumetric hydraulic fuses may be tested after removal from the airplane to find if the fuses are functional. Use the functional test procedures contained in the vendor component maintenance instructions.

TASK 78-34-07-000-801-F00

2. Volumetric Hydraulic Fuse Removal (Selection)

A. Procedure

SUBTASK 78-34-07-000-001-F00

(1) Do one of these tasks to remove the applicable hydraulic fuse:

(a) Do this task: Standby System Volumetric Hydraulic Fuse Removal, TASK 78-34-07-000-802-F00.

(b) Do this task: System A Volumetric Hydraulic Fuse Removal, TASK 78-34-07-000-803-F00.

——————— END OF TASK ———————

TASK 78-34-07-400-801-F00

3. Volumetric Hydraulic Fuse Installation (Selection)

A. Procedure

SUBTASK 78-34-07-400-001-F00

(1) Do one of these tasks to install the applicable hydraulic fuse.

(a) Do this task: Standby System Volumetric Hydraulic Fuse Installation, TASK 78-34-07-400-802-F00.

(b) Do this task: System A Volumetric Hydraulic Fuse Installation, TASK 78-34-07-400-803-F00.

——————— END OF TASK ———————

TASK 78-34-07-000-802-F00

4. Standby System Volumetric Hydraulic Fuse Removal

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This task contains these topics:

(a) The removal of the standby system left fuse and the right fuse.

(b) The off-wing functional test of the fuses.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Prepare for the Removal

SUBTASK 78-34-07-864-005-F00

(1) Remove power from the A and B reservoirs.

(a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 78-34-07-864-001-F00

(2) Remove power from the standby reservoirs.

(a) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 78-34-07-864-002-F00

(3) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

F. Standby System Left or Right Fuse Removal

SUBTASK 78-34-07-020-003-F00

WARNING: DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. PUT ON EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION) AND GLOVES WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

(1) Do these steps to remove the left or right fuse [5] from the standby pressure system.

(a) Remove the four screws [2], the four washers [3], the four spacers [4], the two channels [1], the clampblock [6] and the clampblock [7] from the ends of the fuse.

(b) Use a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 to catch the hydraulic fluid.

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO LOOSEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(c) Disconnect the coupling nuts at each end of the applicable fuse [5].

(d) Remove the fuse assembly [5].

(e) Install protective covers on the hydraulic lines and the fuse [5].

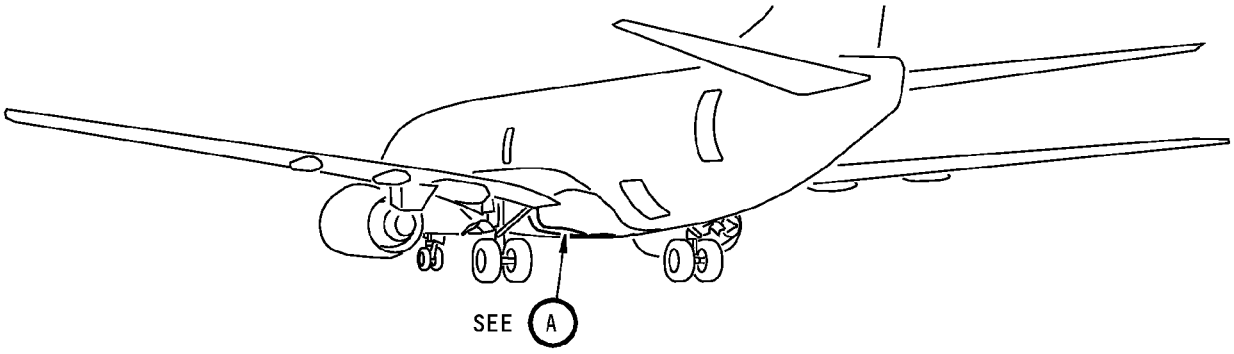
G. Test the Volumetric Hydraulic Fuses

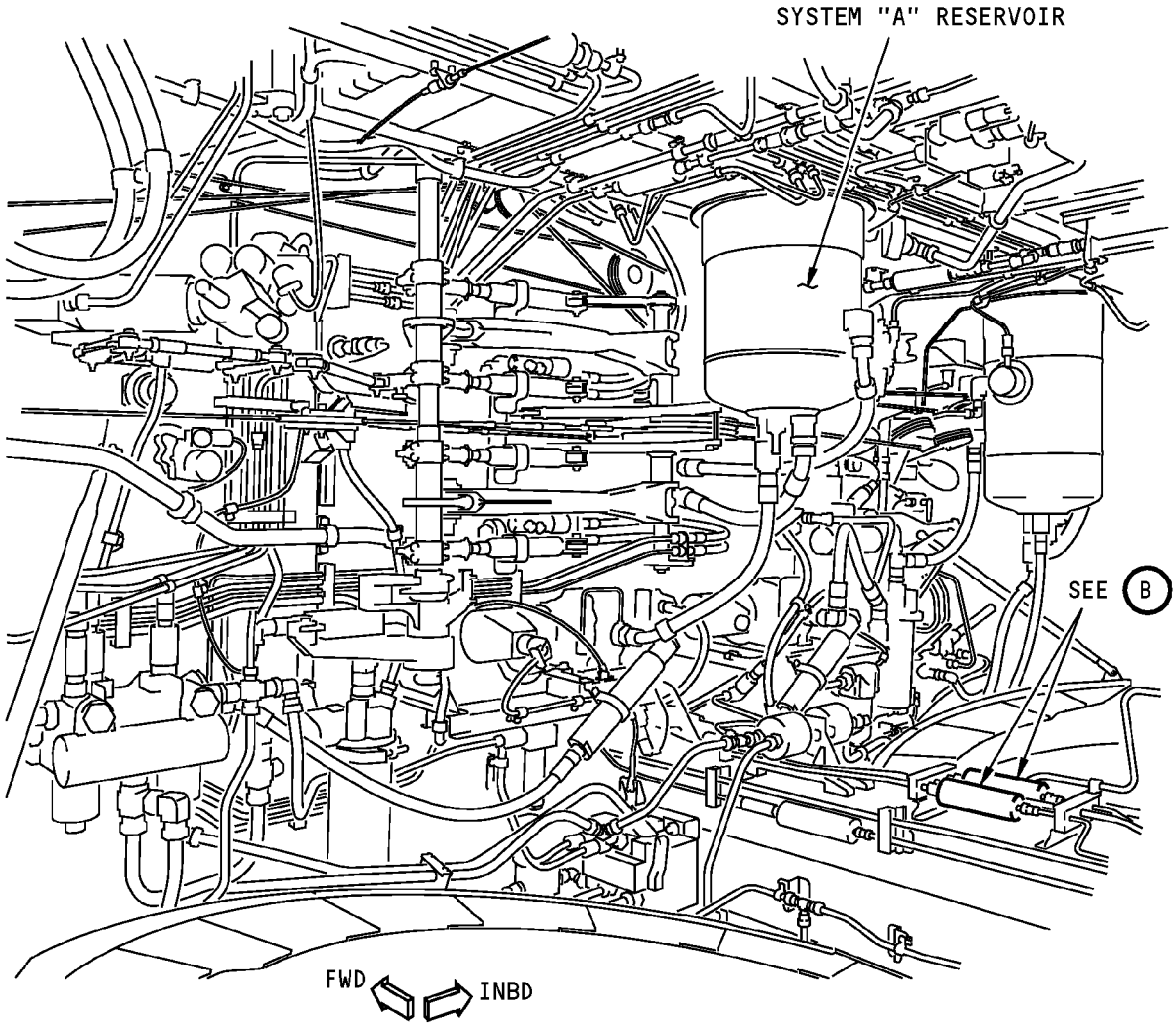
SUBTASK 78-34-07-720-002-F00

(1) Do the functional test of the volumetric hydraulic fuses with the suppliers recommended component maintenance test instructions and test equipment.

NOTE: The suppliers instructions give a reverse flow test, internal leakage test, pressure drop test, volumetric capacity test and reset test for the fuses. This is an off-wing bench test.

END OF TASK

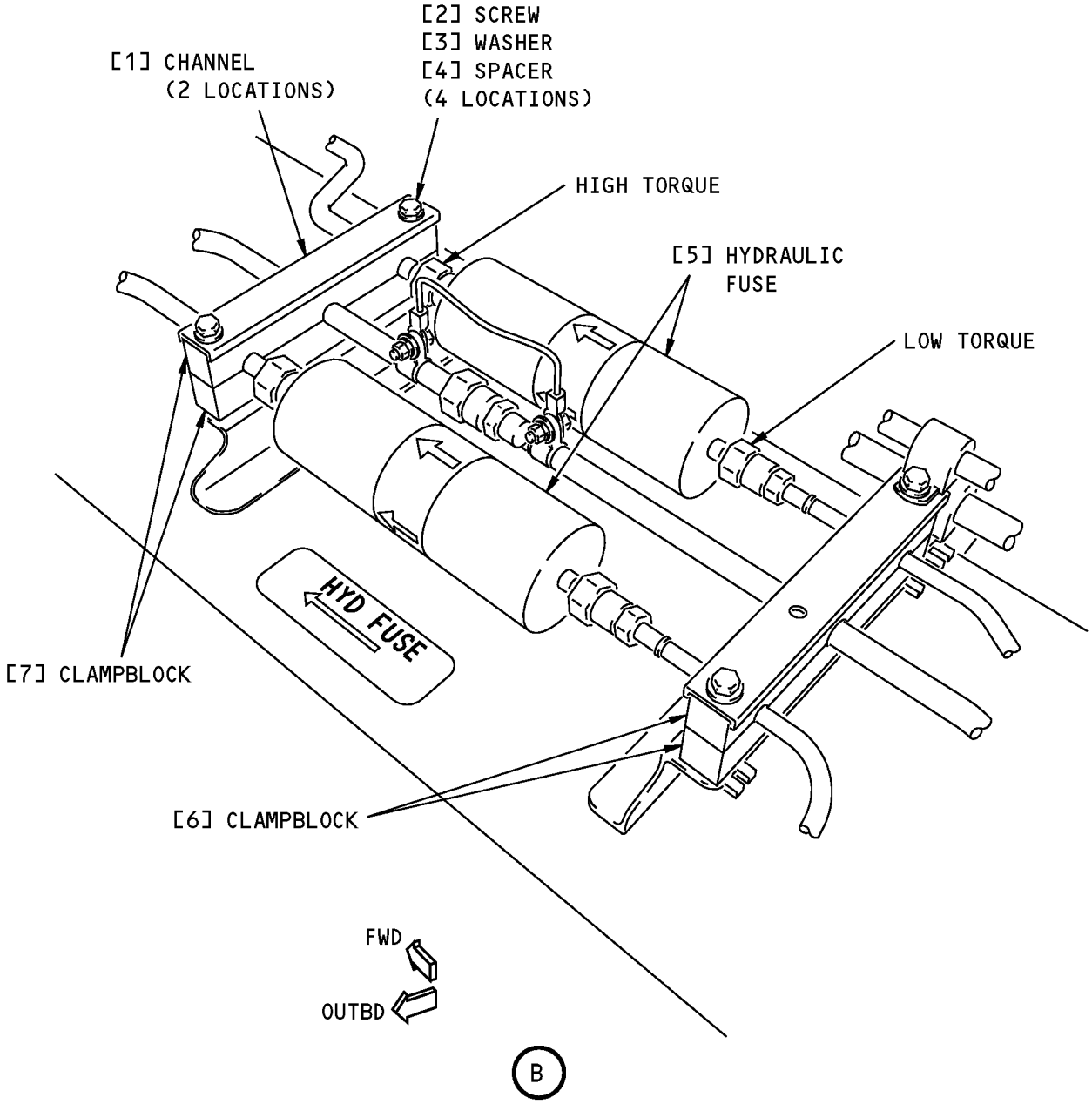




MAIN LANDING GEAR WHEEL WELL

A

Standby System Left and Right Volumetric Hydraulic Fuses Installation
Figure 401 (Sheet 1 of 2)/78-34-07-990-803-F00



Standby System Left and Right Volumetric Hydraulic Fuses Installation
Figure 401 (Sheet 2 of 2)/78-34-07-990-803-F00

TASK 78-34-07-400-802-F00

5. Standby System Volumetric Hydraulic Fuse Installation

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This task contains the installation of the standby system left and right fuse.

B. References

Reference	Title
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
78-31-00-700-802-F00	Thrust Reverser Operation Test (Standby Hydraulic System) (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Fuse assembly	29-11-52-15-005	HAP ALL
		78-34-07-02-005	HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Standby System Left and Right Fuse Installation

SUBTASK 78-34-07-420-003-F00

WARNING: DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. PUT ON EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION) AND GLOVES WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Do these steps to install the left or right fuse [5] :

(a) Remove the protective covers from the hydraulic lines and the fuse [5].

(b) Put the applicable fuse assembly [5] in the correct position.

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO TIGHTEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(c) Connect the tube coupling nut at the forward end of the fuse.

1) Tighten the coupling nut to 257-284 pound-inches (28.9-32.0 Newton meters).

(d) Connect the tube coupling nut at the aft end of the fuse.

1) Tighten the coupling nut to 133-147 pound-inches (15.0-16.6 Newton meters).

(e) Install the clampblock assembly at the forward end of the fuse.

1) Install the two screws [2], the two washers [3], the two spacers [4], the channel [1] and the clampblock [7].

a) Tighten the screws to 25-35 pound-inches (2.8-3.9 Newton meters).

(f) Install the clampblock assembly at the aft end of the fuse.

1) Install the two screws [2], the two washers [3], the two spacers [4], the channel [1] and the clampblock [6].

a) Tighten the screws to 25-35 pound-inches (2.8-3.9 Newton meters).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-07-863-001-F00

WARNING: MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(1) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) Do a check of the fuses and hydraulic lines for hydraulic leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-34-07-710-003-F00

(2) Do this task: Thrust Reverser Operation Test (Standby Hydraulic System), TASK 78-31-00-700-802-F00.

(a) Operate the thrust reverser a minimum of three cycles.

(b) Do a check of the fuses and hydraulic lines for hydraulic leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

——————— END OF TASK ———————

TASK 78-34-07-000-803-F00

6. System A Volumetric Hydraulic Fuse Removal

(Figure 402)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This task contains these topics:

(a) The removal of the system A fuse.

(b) The off-wing functional test of the fuses.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Prepare for the Removal

SUBTASK 78-34-07-864-003-F00

(1) Remove power from the A and B reservoirs.

(a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 78-34-07-864-004-F00

(2) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

F. System A Fuse Removal

SUBTASK 78-34-07-020-004-F00

WARNING: DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. PUT ON EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION) AND GLOVES WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Do these steps to remove the system A fuse [24] :

(a) Remove the screw [21] and the washer [22] from the loop clamp [23] at two locations.

(b) Use a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 to catch the hydraulic fluid.

(c) Disconnect the tube coupling nuts at each end of the fuse [24].

(d) Remove the fuse [24].

(e) Install protective covers on the hydraulic lines and the fuse [24].

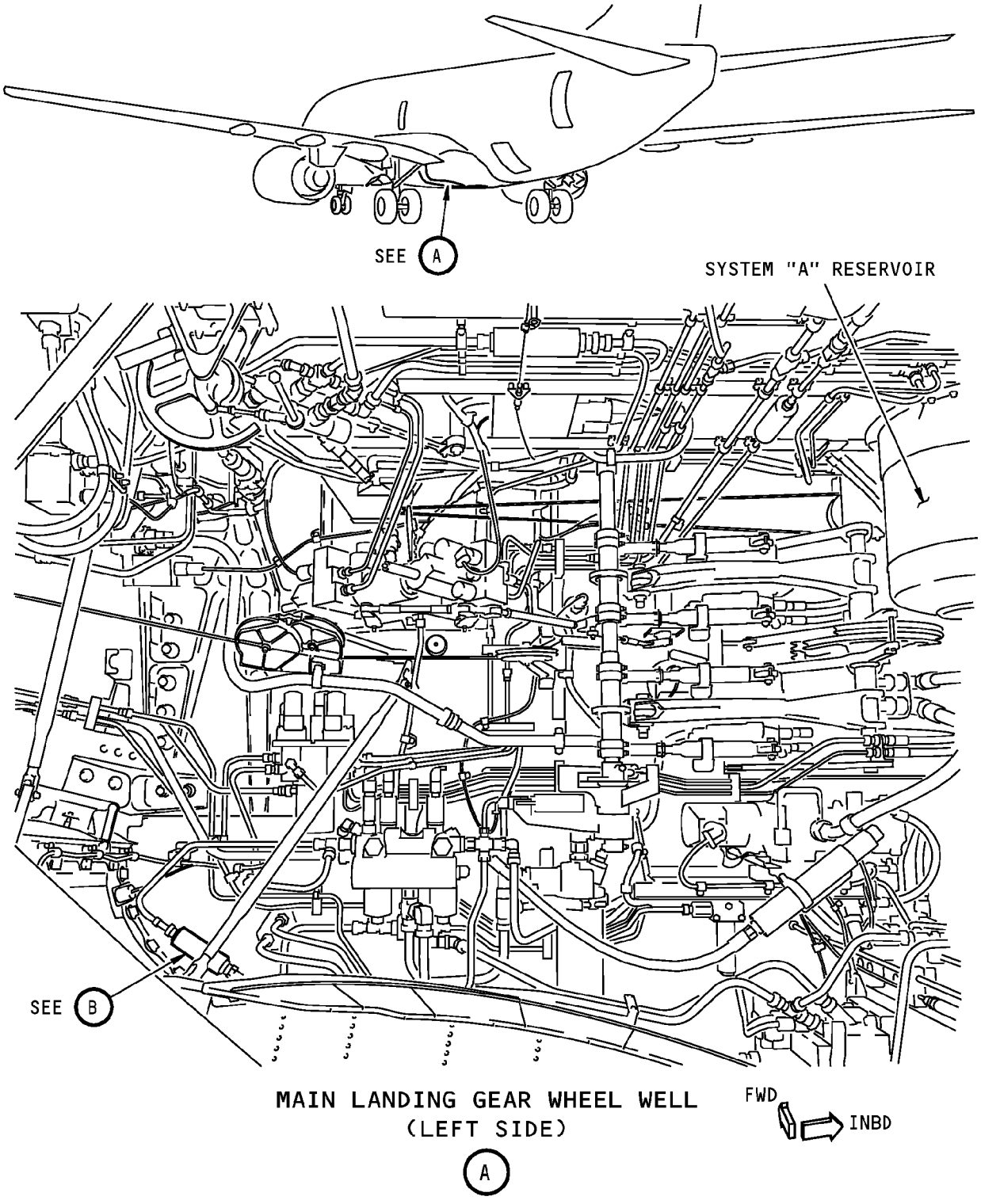
G. Test the Volumetric Hydraulic Fuses

SUBTASK 78-34-07-720-003-F00

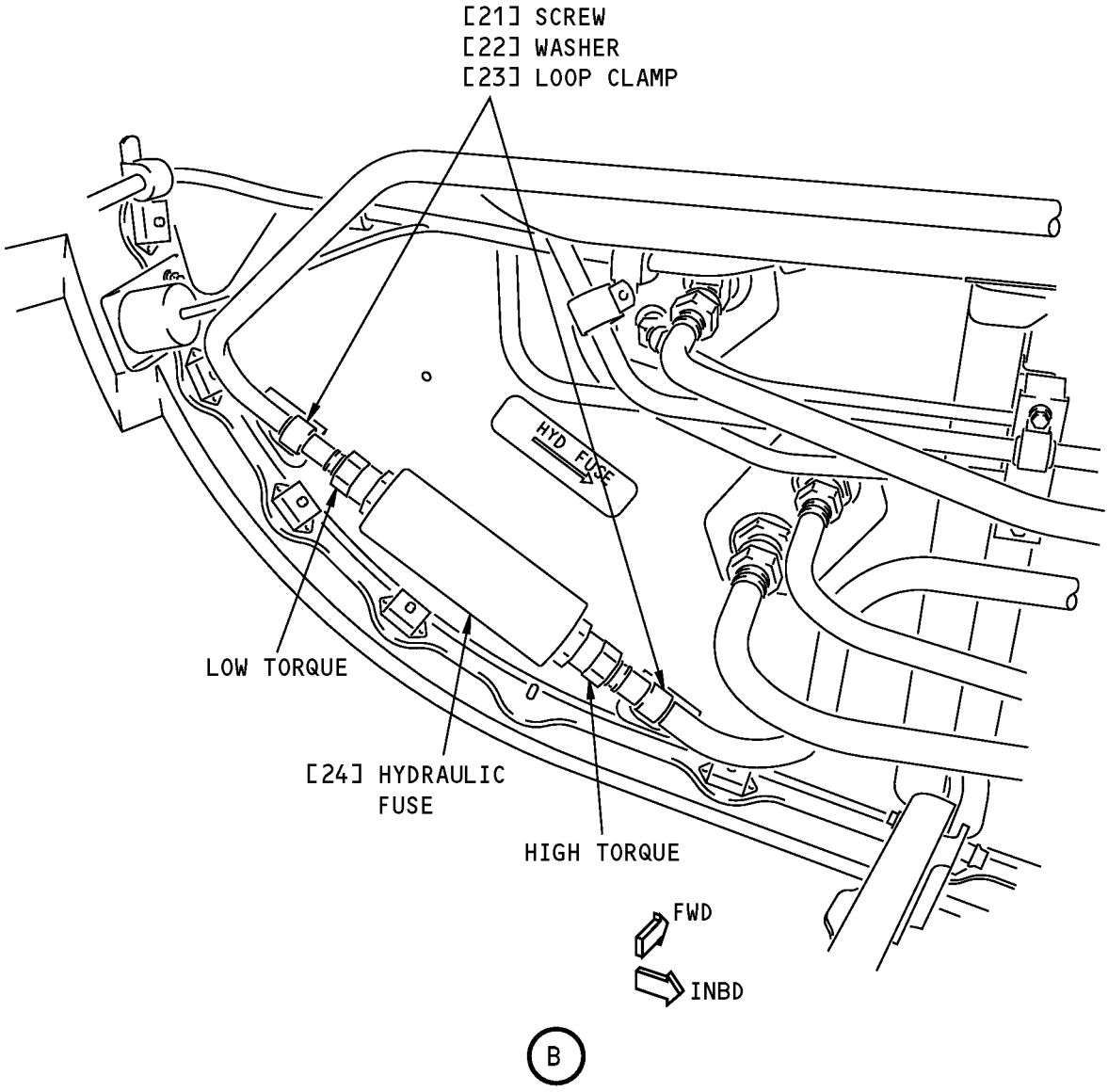
(1) Do the functional test of the volumetric hydraulic fuses with the suppliers recommended component maintenance test instructions and test equipment.

NOTE: The suppliers instructions give a reverse flow test, internal leakage test, pressure drop test, volumetric capacity test and reset test for the fuses. This is an off-wing bench test.

END OF TASK



System "A" Volumetric Hydraulic Fuse Installation
Figure 402 (Sheet 1 of 2)/78-34-07-990-804-F00



System "A" Volumetric Hydraulic Fuse Installation
Figure 402 (Sheet 2 of 2)/78-34-07-990-804-F00

TASK 78-34-07-400-803-F00

7. System A Volumetric Hydraulic Fuse Installation

(Figure 402)

A. General

(1) This procedure is a scheduled maintenance task.

(2) This task contains the installation of the system A fuse.

B. References

Reference	Title
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. System A Fuse Installation

SUBTASK 78-34-07-420-004-F00

WARNING: DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. PUT ON EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION) AND GLOVES WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Do these steps to install the system A fuse [24] :

(a) Remove the protective covers from the hydraulic lines and the system A fuse [24].

(b) Put the system A in the correct position.

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO TIGHTEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

(c) Connect the tube coupling nut at the inboard end of the system A fuse.

1) Tighten the coupling nut to 665-735 pound-inches (75.1-83.0 Newton meters).

(d) Connect the tube coupling nut at the outboard end of the fuse.

1) Tighten the coupling nut to 475-525 pound-inches (53.7-59.3 Newton meters).

(e) Install the two loop clamps [23] with the two washers [22] and the two screws [21].

1) Tighten the screws to 25-35 pound-inches (2.8-3.9 Newton meters).

E. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-07-863-002-F00

WARNING: MAKE SURE THAT PERSONNEL AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(1) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) Do a check of the fuses and hydraulic lines for hydraulic leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-34-07-710-004-F00

(2) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Operate the thrust reverser a minimum of three cycles.

(b) Do a check of the fuses and hydraulic lines for hydraulic leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

——————— END OF TASK ———————

THRUST REVERSER SHUTTLE VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser shuttle valves.

(2) The installation of the thrust reverser shuttle valves.

TASK 78-34-08-000-801-F00

2. Thrust Reverser Shuttle Valve Removal

(Figure 401), (Figure 402)

A. General

(1) This task is for the removal of the thrust reverser shuttle valves.

(2) If the primary hydraulic system pressure goes low, the shuttle valve changes the thrust reverser hydraulic operating pressure supply to the standby system.

(3) The shuttle valves are in the main gear wheel well on the forward bulkhead. The shuttle valve for the Engine 1 thrust reverser is on the left side and the Engine 2 thrust reverser shuttle valve is on the right side.

(4) For this procedure, the shuttle valve for the Engine 1 thrust reverser will be referred to as the left shuttle valve and the shuttle valve for the Engine 2 thrust reverser will be referred to as the right shuttle valve.

(5) The left and right shuttle valves are not interchangeable.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Prepare for the Removal

SUBTASK 78-34-08-860-001-F00

(1) Remove power from the hydraulic systems A and B Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 78-34-08-860-002-F00

(2) Remove power from the standby hydraulic system Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 78-34-08-860-003-F00

(3) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

F. Left Shuttle Valve Removal

SUBTASK 78-34-08-020-001-F00

WARNING: MAKE SURE THAT YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID CAN LEAK FROM THE OPEN PORTS OF THE COMPONENT OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do these steps to remove the left shuttle valve [1] from the left side of the forward bulkhead in the main gear wheel well (Figure 401):

(a) Use a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 to catch the hydraulic fluid.

(b) Disconnect the three hydraulic lines from the shuttle valve [1].

1) Disconnect the hydraulic line from the IN B port.

2) Disconnect the hydraulic line from the OUT port.

3) Disconnect the hydraulic line from the IN A port.

(c) Remove the two bolts [2] and the two washers [3] that attach the shuttle valve [1].

(d) Remove the shuttle valve [1].

G. Right Shuttle Valve Removal

SUBTASK 78-34-08-020-003-F00

WARNING: MAKE SURE THAT YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID COULD LEAK FROM THE OPEN PORTS OF THE COMPONENT OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT COULD OCCUR.

(1) Do these steps to remove the right shuttle valve [23] from the right side of the forward bulkhead in the main gear wheel well (Figure 402):

(a) Use a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 to catch the hydraulic fluid.

(b) Disconnect the three hydraulic lines from the shuttle valve [23].

1) Disconnect the hydraulic line from the IN A port.

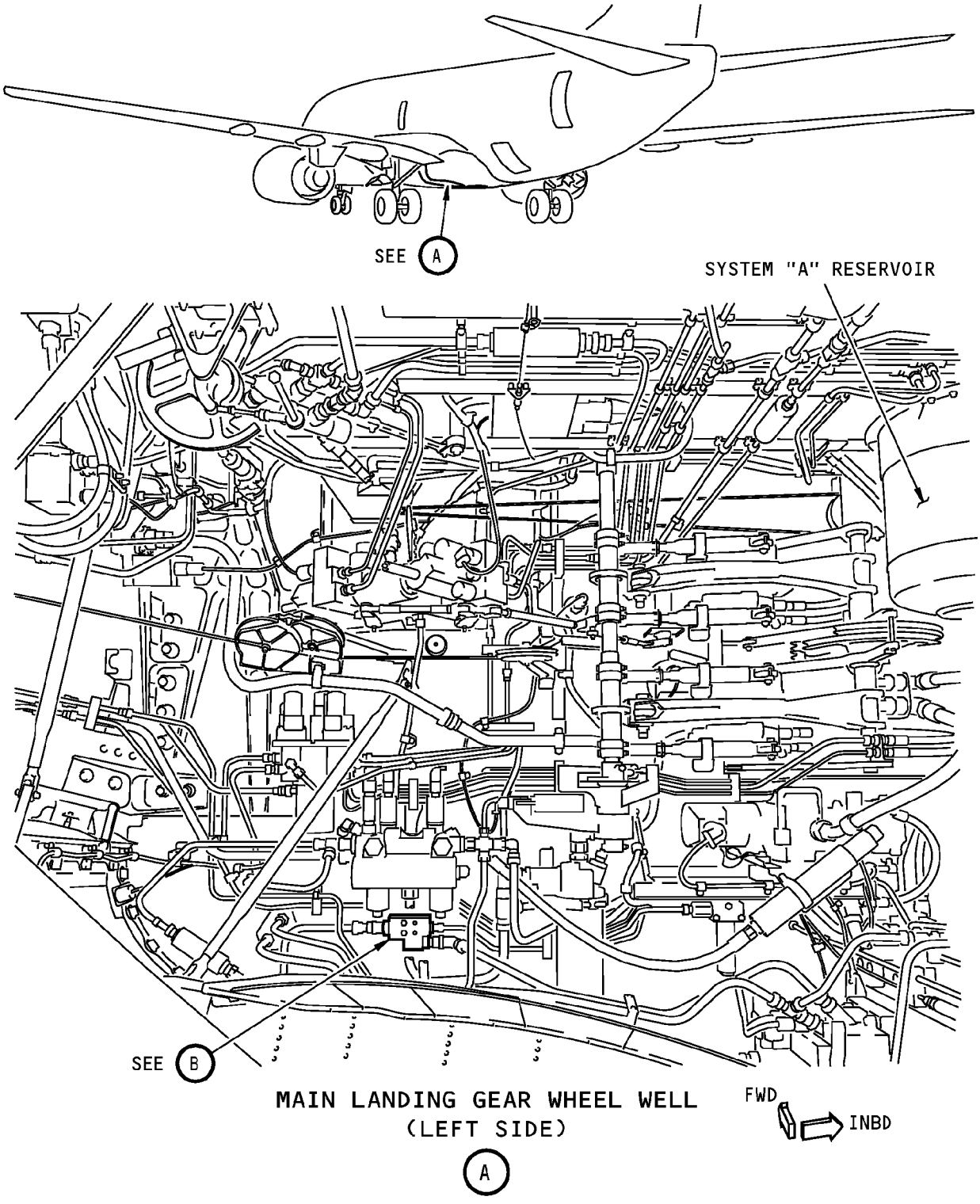
2) Disconnect the hydraulic line from the OUT port.

3) Disconnect the hydraulic line from the IN B port.

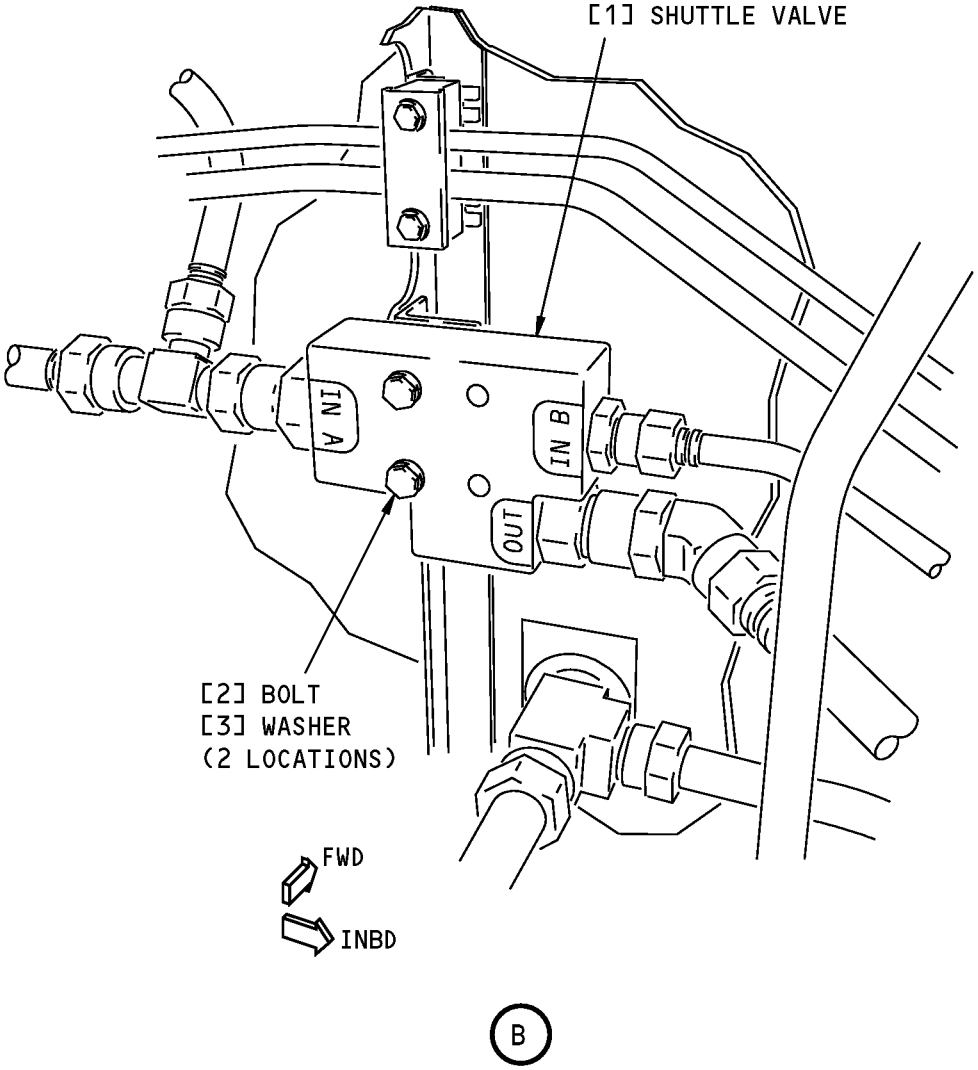
(c) Remove the two bolts [21] and the two washers [22] that attach the shuttle valve [23].

(d) Remove the shuttle valve [23].

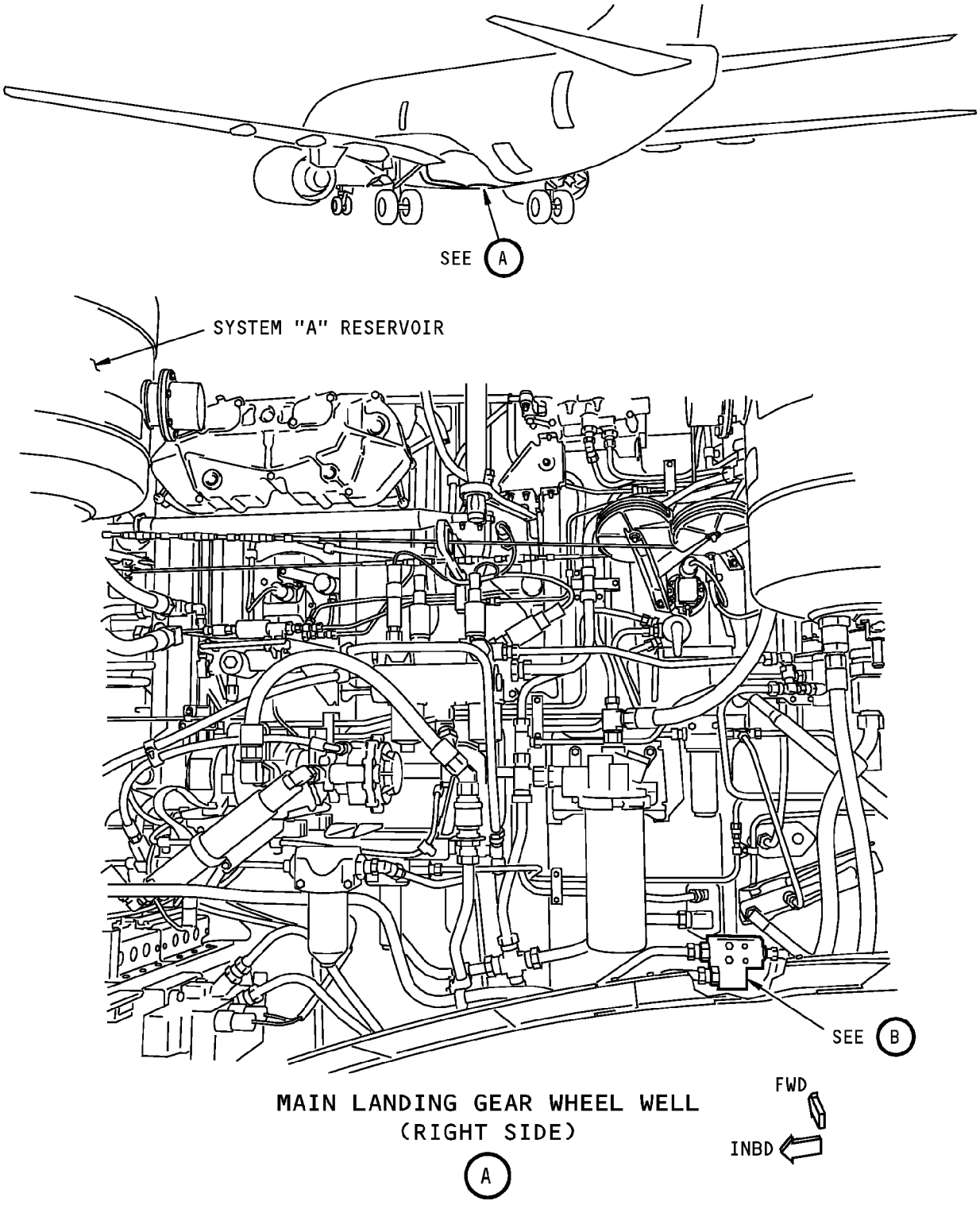
——————— END OF TASK ———————



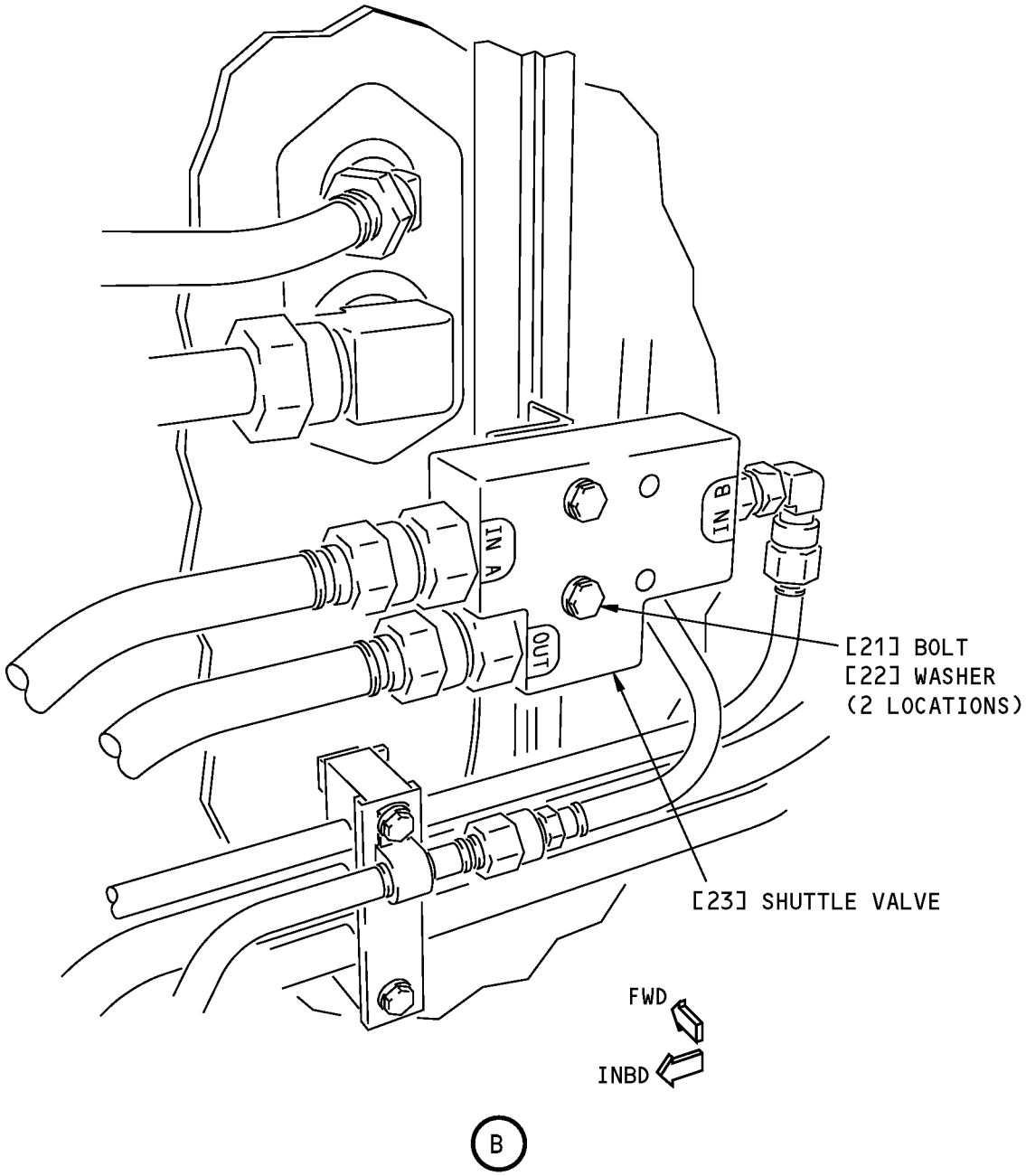
Shuttle Valve (Left Side) Installation
Figure 401 (Sheet 1 of 2)/78-34-08-990-801-F00



Shuttle Valve (Left Side) Installation
Figure 401 (Sheet 2 of 2)/78-34-08-990-801-F00



Shuttle Valve (Right Side) Installation
Figure 402 (Sheet 1 of 2)/78-34-08-990-802-F00



Shuttle Valve (Right Side) Installation
Figure 402 (Sheet 2 of 2)/78-34-08-990-802-F00

TASK 78-34-08-400-801-F00

3. Thrust Reverser Shuttle Valve Installation

(Figure 401), (Figure 402)

A. General

(1) This task is for the installation of the left shuttle valve and the right shuttle valve.

(2) The left and right shuttle valves are not interchangeable.

B. References

Reference	Title
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-700-802-F00	Thrust Reverser Operation Test (Standby Hydraulic System) (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve	78-34-08-01-010	HAP ALL
23	Valve	78-34-08-02-010	HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Left Shuttle Valve Installation

SUBTASK 78-34-08-420-002-F00

(1) Do these steps to install the left shuttle valve [1] on the left side of the forward bulkhead in the main gear wheel well:

(a) Put the left shuttle valve [1] in the correct position.

(b) Install the two washers [3] and the two bolts [2] that attach the left shuttle valve [1] to the forward bulkhead.

1) Tighten the bolts to 72-88 pound-inches (8.13-9.97 Newton meters).

SUBTASK 78-34-08-410-001-F00

(2) Do these steps to connect the hydraulic lines to the left shuttle valve [1]:

(a) Remove the protective covers from the hydraulic lines.

(b) Connect the hydraulic line at the OUT port of the left shuttle valve [1].

1) Tighten the coupling nut to 655-735 pound-inches (75.1-83.0 Newton meters).

(c) Connect the hydraulic line at the IN B port of the left shuttle valve [1].

1) Tighten the coupling nut to 257-283 pound-inches (28.9-32.0 Newton meters).

(d) Connect the hydraulic line at the IN A port of the left shuttle valve [1].

1) Tighten the coupling nut to 655-735 pound-inches (75.1-83.0 Newton meters).

F. Right Shuttle Valve Installation

SUBTASK 78-34-08-420-004-F00

(1) Do these steps to install the right shuttle valve [23] on the right side of the forward bulkhead:

(a) Put the right shuttle valve [23] in the correct position.

(b) Install the two washers [22] and the two bolts [21] that attach the right shuttle valve [23] to the forward bulkhead.

1) Tighten the bolts to 72-88 pound-inches (8.13-9.97 Newton meters).

SUBTASK 78-34-08-410-002-F00

(2) Do these steps to connect the hydraulic lines to the right shuttle valve [23]:

(a) Remove the protective covers from the hydraulic lines.

(b) Connect the hydraulic line at the OUT port of the right shuttle valve [23].

1) Tighten the coupling nut to 655-735 pound-inches (75.1-83.0 Newton meters).

(c) Connect the hydraulic line at the IN B port of the right shuttle valve [23].

1) Tighten the coupling nut to 257-283 pound-inches (28.9-32.0 Newton meters).

(d) Connect the hydraulic line at the IN A port of the right shuttle valve [23].

1) Tighten the coupling nut to 655-735 pound-inches (75.1-83.0 Newton meters).

SUBTASK 78-34-08-860-004-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Supply system A hydraulic power for the left shuttle valve or system B hydraulic power for the right shuttle valve Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) Do a check of the hydraulic lines and connections for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-34-08-710-001-F00

(4) Do this task: Thrust Reverser Operation Test (Standby Hydraulic System), TASK 78-31-00-700-802-F00.

(a) Do a check of the hydraulic lines and connections for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-34-08-710-002-F00

(5) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

END OF TASK

THRUST REVERSER SYNC LOCK - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the thrust reverser sync lock.

(2) The installation of the thrust reverser sync lock.

TASK 78-34-10-000-801-F00

2. Thrust Reverser Sync Lock Removal

(Figure 401)

A. General

(1) This task is for the removal of the sync locks from the left or right thrust reverser on the applicable engine.

(2) There is a sync lock on the left and right thrust reversers on each engine.

(a) The sync locks are installed on the lower actuators.

(3) The sync locks are interchangeable between the left and right thrust reversers.

(4) For this procedure the thrust reverser sync lock will be referred to as the sync lock and the sync lock bracket will be referred to as the bracket.

B. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Removal

SUBTASK 78-34-10-860-001-F00

(1) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-10-860-002-F00

(2) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-10-040-001-F00

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

(3) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-34-10-040-002-F00

(4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 78-34-10-010-001-F00

(5) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Sync Lock Removal

SUBTASK 78-34-10-020-001-F00

(1) Disconnect the electrical connector from the sync lock [1]:

(a) For the left thrust reverser, disconnect the electrical connector D1008 from the sync lock receptacle.

(b) For the right thrust reverser, disconnect the electrical connector D1016 from the sync lock receptacle.

SUBTASK 78-34-10-020-002-F00

(2) Do these steps to remove the sync lock [1] and the bracket [5]:

(a) Put a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 below the sync lock to catch the hydraulic fluid.

WARNING: MAKE SURE YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU DO WORK ON THE HYDRAULIC SYSTEM. HYDRAULIC FLUID COULD LEAK FROM THE OPEN PORTS OF THE COMPONENT OR FROM THE HYDRAULIC LINES. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: USE TWO WRENCHES TO LOOSEN THE COUPLING NUT. USE ONE TO HOLD THE SYNC LOCK, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(b) Loosen the coupling nut on the sync lock [1].

NOTE: Wrap cloth around the sync lock and wrench to catch the hydraulic spray.

1) Let the hydraulic fluid drain into the container.

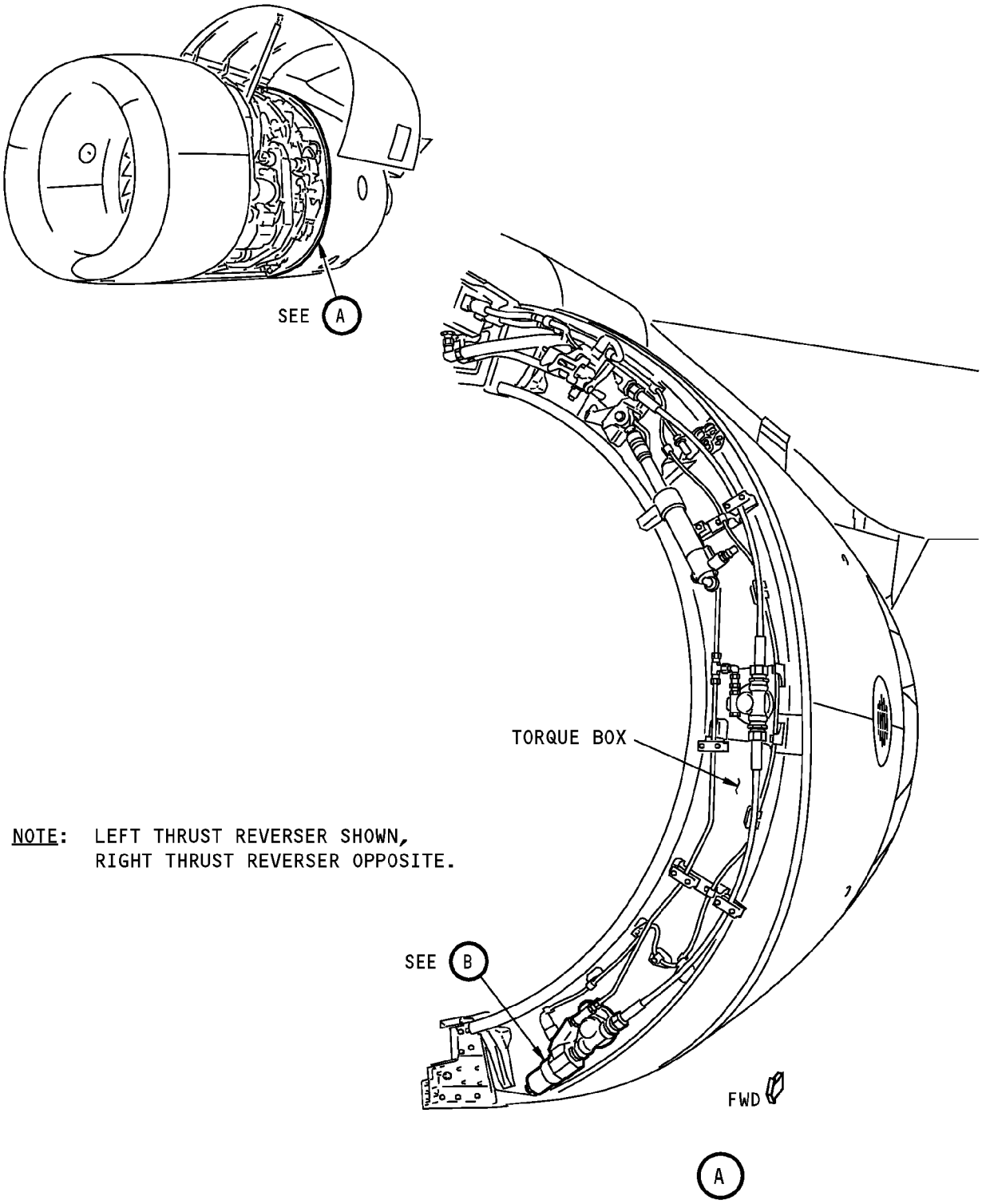
(c) Remove the nut [2] and the washer [3] that attach the bracket [5] to the adapter plug [4].

(d) Remove the sync lock [1] and the bracket [5].

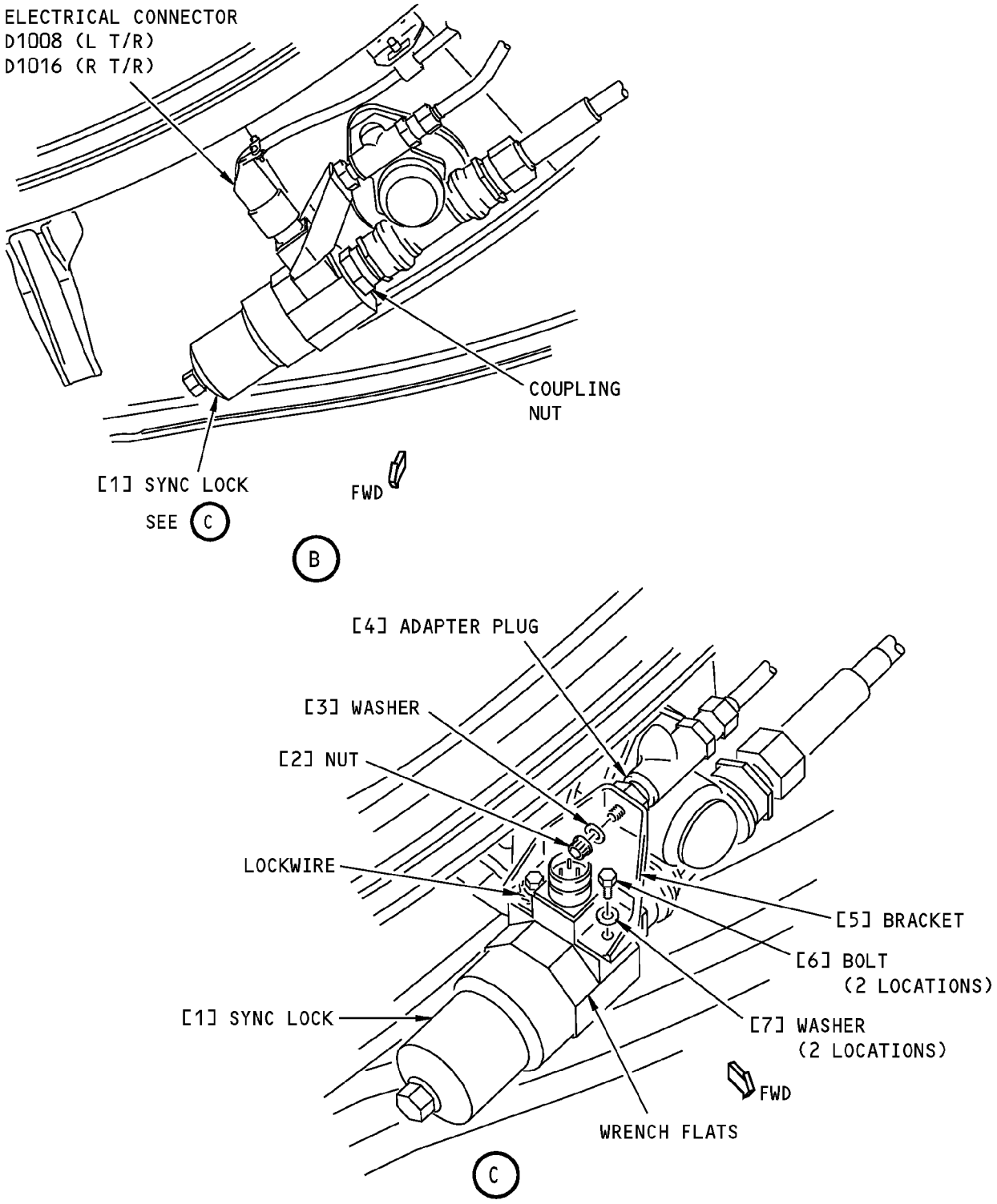
(e) Remove the two bolts [6] and the two washers [7] that attach the bracket [5] to the sync lock [1].

(f) Install protective covers on the ports of the sync lock [1] and the hydraulic actuator.

END OF TASK



Thrust Reverser Sync Lock Installation
Figure 401 (Sheet 1 of 2)/78-34-10-990-801-F00



Thrust Reverser Sync Lock Installation
Figure 401 (Sheet 2 of 2)/78-34-10-990-801-F00

TASK 78-34-10-400-801-F00

3. Thrust Reverser Sync Lock Installation

(Figure 401)

A. General

(1) After you install the sync lock, you must do the Thrust Reverser Normal Operation Test and Sync Lock Operational Test.

(2) The left and the right sync locks are identical and interchangeable.

B. References

Reference	Title
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-440-803-F00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)
78-31-00-700-803-F00	Sync Lock Operational Test (P/B 501)

C. Consumable Materials

Reference	Description	Specification
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~ C32 (QQ-N-281)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Lock	78-34-10-01-025	HAP ALL

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

F. Prepare for the Installation

SUBTASK 78-34-10-420-001-F00

(1) Do these steps to install the bracket [5] on the sync lock [1]:

(a) Align the fastener holes.

(b) Install the two washers [7] and the two bolts [6].

1) Tighten the two bolts to 30-35 pound-inches (3.4-4.0 Newton meters).

2) Install the lockwire, G01912.

G. Sync Lock Installation

SUBTASK 78-34-10-420-002-F00

(1) Do these steps to install the sync lock [1]:

(a) Remove the protective covers from the sync lock [1] and the hydraulic actuator.

(b) Put the sync lock [1] in the correct position.

1) Make sure the fastener hole in the bracket [5] aligns with the stud on the adapter plug [4].

(c) Hand tighten the coupling nut on the sync lock [1].

(d) Install the washer [3] and the nut [2] that connect the bracket [5] to the adapter plug stud.

1) Tighten the nut [2] to 65-100 pound-inches (7.3-11.3 Newton-meters).

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE SYNC LOCK, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(e) Do these steps to tighten the coupling nut:

1) Tighten the coupling nut to 855-945 pound-inches (96.6-106.7 Newton-meters).

2) Loosen the coupling nut.

3) Tighten the coupling nut again to 855-945 pound-inches (96.6-106.7 Newton-meters).

SUBTASK 78-34-10-420-003-F00

(2) Connect the electrical connectors to the sync lock receptacle:

(a) For the left thrust reverser, connect the electrical connector, D1008, to the sync lock receptacle.

(b) For the right thrust reverser, connect the electrical connector, D1016, to the sync lock receptacle.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 78-34-10-440-001-F00

(1) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-803-F00.

SUBTASK 78-34-10-860-004-F00

(2) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	7	C01266	ENGINE 1 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-10-860-005-F00

(3) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	5	C01267	ENGINE 2 THRUST REVERSER SYNC LOCK

SUBTASK 78-34-10-860-006-F00

(4) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 78-34-10-710-001-F00

WARNING: OBEY ALL OF THE WARNINGS AND CAUTIONS IN THE REFERENCED PROCEDURE. IF YOU DO NOT OBEY THE WARNINGS AND CAUTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Do this task: Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00.

(a) Operate the thrust reverser through the extend (deploy) and retract (stow) cycle until the sleeves move smoothly.

(b) Examine the thrust reverser area for hydraulic fluid leaks.

1) If you find leaks, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

NOTE: Refer to the Tube Connections, Static Seals, and Other Dynamic Seals sections of the procedure for the leakage limits.

SUBTASK 78-34-10-710-002-F00

(6) Do this task: Sync Lock Operational Test, TASK 78-31-00-700-803-F00.

SUBTASK 78-34-10-410-001-F00

(7) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

END OF TASK

THRUST REVERSER SYNC LOCK - ADJUSTMENT/TEST

1. General

A. This task does a manual test of the mechanical function of the sync lock from each thrust reverser sleeve when hydraulic power is not available.

TASK 78-34-10-700-801-F00

2. Sync Lock Manual Integrity Test When Hydraulic Power Is Not Available

A. General

(1) This task does a manual test of the mechanical function of the sync lock from each thrust reverser sleeve when hydraulic power is not available for all sync locks.

(2) The manual test is used when the thrust reverser is being deactivated for flight and there is hydraulic line leakage or a broken hydraulic actuator. Without hydraulic power, you cannot check the mechanical integrity of the sync lock. The manual mechanical integrity test will find if the sync lock can be returned to service. You can not do a check of the lock integrity on all sync locks with the manual drive.

(3) For Boeing P/N S315N370-1/-2 (Supplier P/N TY1878-20/-21) sync lock, you can do a check the lock integrity with the manual drive. You can push the 5/8 inch external bronze nut into the sync lock body. This engages the internal shaft on the rotor but does not disengage the lock plungers. When you turn the 5/8 inch external nut with a 5/8 inch socket wrench and the lock plungers are engaged, the input torque is limited to approximately 50 inch-pounds (5.6 newton-meters).

(4) For Boeing P/N S315N370-3 (Supplier P/N TY1878-22) sync lock, you can not do a check the lock integrity with the manual drive. You can not push the 5/8 inch external bronze nut into the sync lock body because the internal parts were changed. If you insert the 3/8 inch square drive into the center of the external bronze nut, this will push in the shaft to engage the rotor and disengage the lock plungers.

B. References

Reference	Title
78-34-10-000-801-F00	Thrust Reverser Sync Lock Removal (P/B 401)
78-34-10-400-801-F00	Thrust Reverser Sync Lock Installation (P/B 401)

C. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

D. Sync Lock Manual Integrity Test When Hydraulic Power Is Not Available

SUBTASK 78-34-10-020-003-F00

(1) Remove the sync lock from the lower hydraulic actuator (TASK 78-34-10-000-801-F00).

SUBTASK 78-34-10-720-001-F00

(2) Do not use the manual drive to do a mechanical integrity test of the sync lock.

SUBTASK 78-34-10-720-002-F00

(3) Manually hold the sync lock and put an wrench or 8 point socket wrench on the 0.2 in. (5.1 mm) square shaft of the rotor.

NOTE: The rotor is the part of the sync lock that fits into the sync shaft in the lower hydraulic actuator. The rotor has a point on the end of the shaft.

(a) Try to turn the sync lock rotor; do not apply more than 50 in-lb (5.6 N·m) of torque.

(b) If the sync lock rotor moves more than 180 degrees, the sync lock is not serviceable and must be replaced.

SUBTASK 78-34-10-420-004-F00

(4) Install the serviceable or replacement sync lock on the lower hydraulic actuator (TASK 78-34-10-400-801-F00).

END OF TASK

LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT) - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) The removal of the linear variable differential transformer (LVDT).

(2) The installation of the linear variable differential transformer (LVDT).

TASK 78-36-02-000-801-F00

2. LVDT Removal

(Figure 401)

A. General

(1) There is one linear variable differential transformer (LVDT) on each of the upper locking actuators on the torque box of the left and right thrust reversers on an engine.

B. References

Reference	Title
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the removal

SUBTASK 78-36-02-010-001-F00

(1) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 78-36-02-040-001-F00

WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-36-02-860-001-F00

(3) For Engine 1, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK

SUBTASK 78-36-02-860-002-F00

(4) For Engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK

F. LVDT Removal

SUBTASK 78-36-02-020-001-F00

(1) Disconnect the two electrical connectors from the LVDT [5] on the applicable engine:

(a) For the left thrust reverser, disconnect the electrical connectors, D30072 and D30076.

(b) For the right thrust reverser, disconnect the electrical connectors, D30074 and D30078.

SUBTASK 78-36-02-020-002-F00

(2) Do these steps to remove the LVDT [5]:

(a) Remove the nut [2] and washer [1] that attaches the LVDT rod end to the actuator feedback spindle.

(b) Remove the two lockbolts [8], washers [4] and collars [3] that attach the LVDT [5] to the bracket [8B].

(c) Remove the three screws [6] and the washers [7] that attach the LVDT [5] to the actuator.

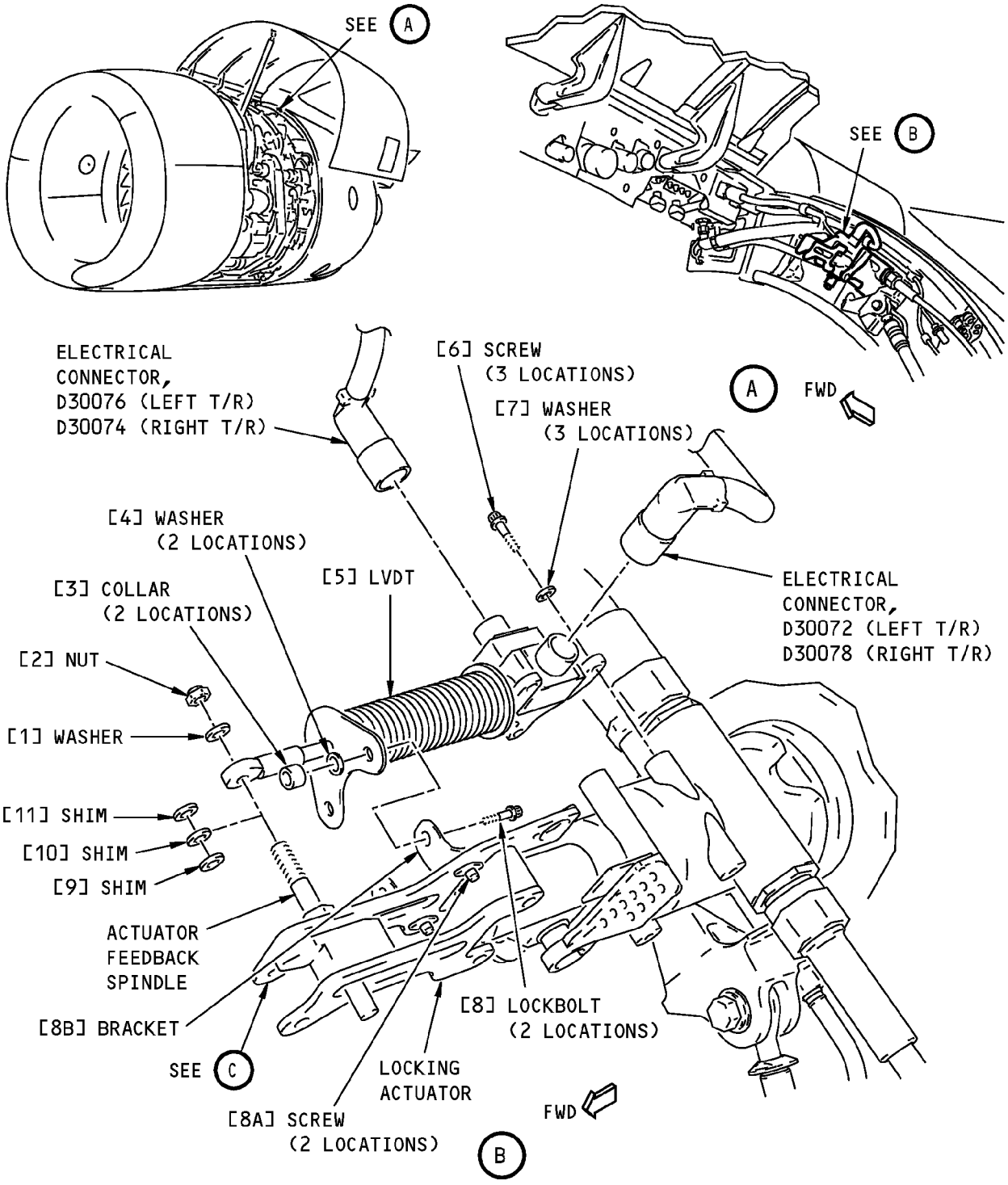
(d) Remove the LVDT [5] from the actuator.

(e) Remove the shims [9], [10] or [11] from the actuator feedback spindle.

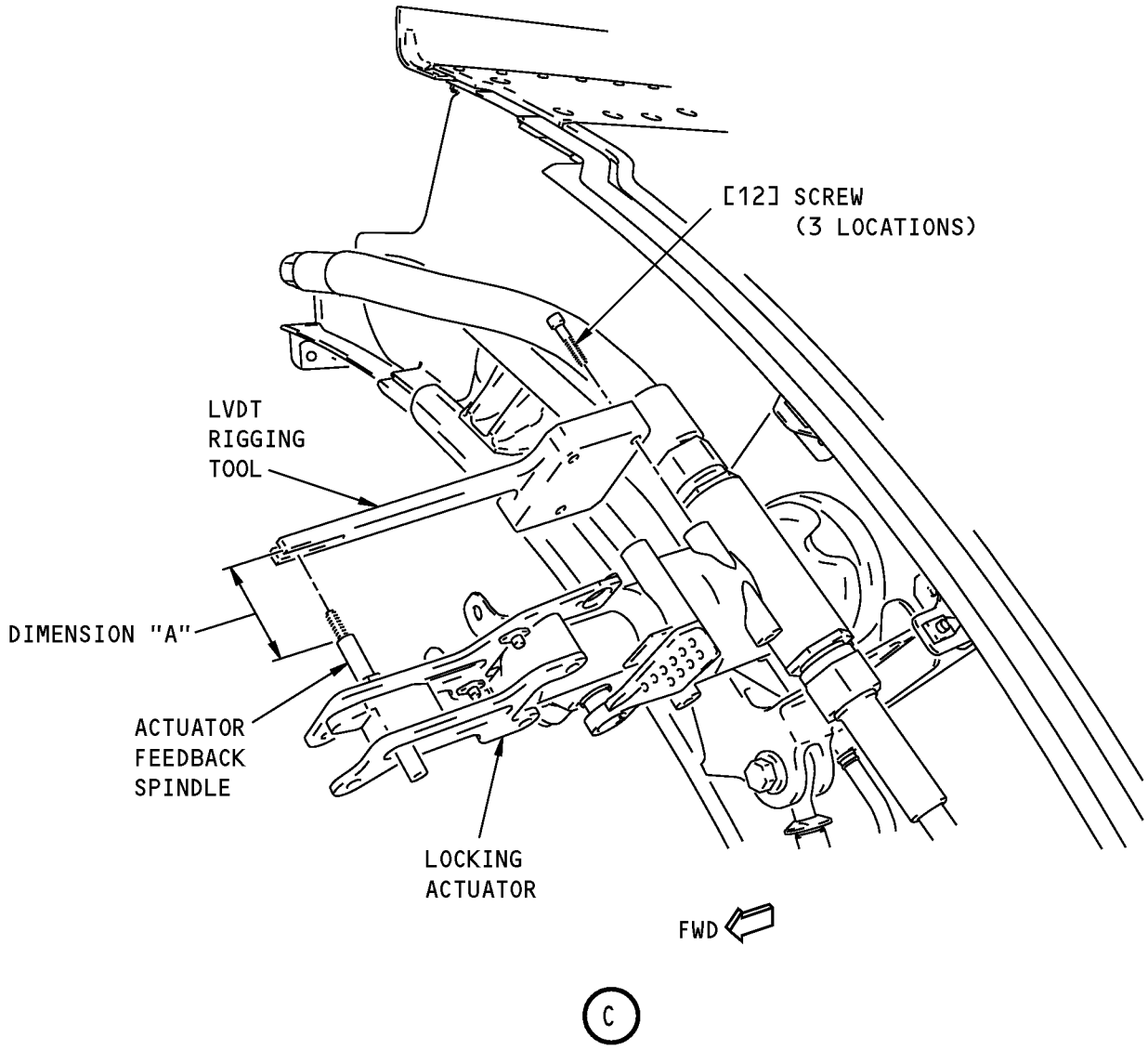
NOTE: It is important to note the quantity and the configuration of the shims for the subsequent installation.

(f) Clean all the remaining sealant off the bracket [8B] with solvent, B00062.

END OF TASK



Thrust Reverser LVDT Installation
Figure 401 (Sheet 1 of 2)/78-36-02-990-801-F00



Thrust Reverser LVDT Installation
Figure 401 (Sheet 2 of 2)/78-36-02-990-801-F00

TASK 78-36-02-400-801-F00

3. LVDT Installation

(Figure 401)

A. References

Reference	Title
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)
78-31-00-040-802-F00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-700-806-F00	Thrust Reverser Linear Variable Differential Transformer (LVDT) Test (P/B 501)

B. Tools/Equipment

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

Reference	Description
SPL-7480	Rigging Bar - Thrust Reverser, Position Feedback LVDT (Part #: B78006-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995˜ C32

D. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Installation

SUBTASK 78-36-02-420-001-F00

(1) Do these steps to find the correct thickness of the shims to be installed on the actuator feedback spindle:

(a) Install the LVDT rigging bar, SPL-7480, on the actuator using three 10-32 X 1 inch screws [12].

(b) Examine the actuator feedback spindle for axial free-play.

1) If free-play exists, set the actuator feedback spindle at the approximate middle position of the free-play.

(c) Measure the distance between the shoulder of the actuator feedback spindle and the rigging tool with a feeler gauge to get dimension A.

(d) Record dimension A that you measured.

NOTE: This dimension will be used to calculate the correct shim thickness.

(e) Remove the three screws [12] and the B78006-1 rigging tool.

F. LVDT Installation

SUBTASK 78-36-02-390-001-F00

(1) Do these steps to install the LVDT [5]:

(a) To prepare the area for the sealant, clean the bracket [8B] and LVDT flange areas, that will touch when you install the LVDT, with solvent, B00062.

(b) Apply sealant, A00247 to the area that was cleaned.

(c) Identify the quantity and configuration of shims [9], [10], and [11] that will equal dimension A ±0.002 inch (0.051 mm) that you recorded above.

NOTE: The [8] shim is 0.010 inch (0.254 mm) thick, the [9] is 0.005 inch (0.127 mm) thick and the [10] is 0.003 inch (0.076 mm) thick.

1) If the thickness of the shims [9], [10], or [11] that you removed during the removal task equals dimension A ±0.002 inch (0.051 mm), use the shims.

2) If the removed shims do not give the correct thickness, use the minimum quantity and configuration of shims that is necessary to give a thickness that is equal to dimension A ±0.002 inch (0.051 mm).

(d) Install the shims [9], [10] or [11] on the actuator feedback spindle.

CAUTION: WHEN YOU INSTALL THE LVDT, MAKE SURE THAT YOU DO NOT BEND THE LVDT ROD END OR SHAFT. IF YOU BEND THE ROD END OR SHAFT, AN INCORRECT INDICATION OR DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Install the LVDT [5] on the locking actuator with the rod end on the actuator feedback spindle.

(f) Install the washers [7] and screws [6] in the three locations at the aft end of the LVDT [5].

1) Tighten the screws to 27-33 pound-inches (3.0-3.7 Newton meters).

2) Install lockwire, G01048.

(g) Push the bracket to make sure that the flange on the LVDT [5] is firmly against the bracket [8B].

1) If the flange is not firmly against the bracket [8B], loosen the two screws [8A] and move the bracket.

2) Re-tighten the two screws [8A] to 27-33 pound-inches (3.0-3.7 Newton meters).

(h) Install the washers [4], lockbolts [8], and collars [3] in two locations to attach the bracket to the LVDT flange.

NOTE: One extra washer can be used under each collar if it is necessary to adjust the grip length of the lockbolts.

1) Remove the unwanted sealant from the bracket.

(i) Install the washer [1] and the nut [2] to attach the LVDT rod end to the actuator feedback spindle.

1) Tighten the nut to 20-30 pound-inches (2.3-3.4 Newton meters).

SUBTASK 78-36-02-420-002-F00

(2) Connect the two electrical connectors to the LVDT receptacles.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 78-36-02-440-001-F00

(1) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-802-F00.

SUBTASK 78-36-02-860-003-F00

(2) For Engine 1, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
B	6	C01412	ENGINE 1 THRUST REVERSER INTLK

SUBTASK 78-36-02-860-004-F00

(3) For Engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	6	C01413	ENGINE 2 THRUST REVERSER INTLK

SUBTASK 78-36-02-710-001-F00

(4) Do this task: Thrust Reverser Linear Variable Differential Transformer (LVDT) Test, TASK 78-31-00-700-806-F00.

SUBTASK 78-36-02-410-001-F00

(5) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

——————— END OF TASK ———————

LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT) - ADJUSTMENT/TEST

1. General

A. This procedure has one task:

(1) The adjustment of the thrust reverser linear variable differential transformer (LVDT).

TASK 78-36-02-820-801-F00

2. Linear Variable Differential Transformer (LVDT) - Adjustment/Test

(Figure 501), (Figure 502)

A. General

(1) This task is for the adjustment of the thrust reverser linear variable differential transformer (LVDT).

(2) There is one LVDT on each of the upper locking actuators on the torque box of the left and right thrust reversers on an engine.

(3) Use the display values on the Flight Management Computer Control Display Unit (FMCS CDU) in the flight compartment to adjust the LVDT's one at a time.

B. References

Reference	Title
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995˜ C32

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
415	Engine 1 - Thrust Reverser, Left
416	Engine 1 - Thrust Reverser, Right
425	Engine 2 - Thrust Reverser, Left
426	Engine 2 - Thrust Reverser, Right

E. Prepare for the Adjustment

SUBTASK 78-36-02-860-019-F00

CAUTION: DO NOT OPERATE THE THRUST REVERSER WHEN ELECTRICAL POWER INTERRUPTIONS (FOR MORE THAN A NORMAL BUS TRANSFER) CAN OCCUR. IF THERE IS A LOSS OF ELECTRICAL POWER WHEN THE THRUST REVERSER IS IN TRANSIT, DAMAGE TO THE SYNC LOCKS CAN OCCUR AND THE SYNC LOCK OPERATIONAL TEST MUST BE DONE.

(1) Do not operate the thrust reverser if there will be electrical power interruptions (for more than a normal bus transfer) while the thrust reverser is in transit.

SUBTASK 78-36-02-860-005-F00

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS AND THE THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) To pressurize the applicable hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

(a) For Engine 1, pressurize hydraulic system A.

(b) For Engine 2, pressurize hydraulic system B.

SUBTASK 78-36-02-860-006-F00

(3) For Engine 1, open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-36-02-860-007-F00

(4) For Engine 2, open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-36-02-860-020-F00

(5) For the applicable engine, make sure that the ENGINE START switch on the forward overhead P5 panel is in the OFF position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-36-02-860-009-F00

(6) For the applicable engine, make sure that the start lever is in the CUTOFF position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-36-02-860-010-F00

(7) Make sure that the applicable thrust lever is in the idle position.

(a) Attach a DO-NOT-OPERATE tag.

SUBTASK 78-36-02-860-012-F00

(8) Make sure that the applicable reverse thrust lever is forward and down in the retract (stow) position.

(a) Make sure that the thrust reverser is in the retracted (stowed) position.

SUBTASK 78-36-02-010-002-F00

(9) Do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. LVDT Adjustment

SUBTASK 78-36-02-710-002-F00

(1) Do these steps at the Flight Management Computer Control Display Unit (FMCS CDU) in the flight compartment to see the LVDT position values in the retracted (stowed) position:

(a) Push the INIT REF key to show the PERF INIT screen on the FMCS CDU.

(b) Push the INDEX key to show the INIT/REF INDEX screen on the FMCS CDU.

(c) Push these line select keys (LSK) on the FMCS CDU:

1) MAINT.

NOTE: This causes the MAINT BITE INDEX screen to show.

2) ENGINE.

NOTE: This causes the ENGINE/EXCEED BITE INDEX screen to show.

3) Applicable ENGINE X, (X = 1 or 2)

NOTE: This LSK causes the ENGINE X BITE TEST MAIN MENU to show. Also, the ENGINE X LSK automatically applies power to the EEC and causes the EEC to initialize. The FMCS CDU will show INITIALIZING EEC X, for a short time, just before the ENGINE X BITE TEST MAIN MENU shows.

4) INPUT MONITORING.

NOTE: This causes the ENGINE X BITE TEST INPUT MONITORING menu to show.

NOTE: This is a warning screen in which you can continue or go back.

5) CONTINUE.

NOTE: This causes the ENGINE X BITE TEST INPUT MONITORING menu to show.

6) CONTROL LOOPS.

NOTE: This causes screen 1 of the CONTROL LOOPS to show.

7) Push the NEXT PAGE key on the FMCS CDU.

NOTE: This causes screen 2 of the CONTROL LOOPS to show.

8) Push the NEXT PAGE key on the FMCS CDU again.

NOTE: This causes screen 3 of the CONTROL LOOPS to show.

9) Push the REV line select key (LSK).

NOTE: This causes the L REVERSER SLEEVE POSITION screen to show.

NOTE: The channel that is in control will be shown first.

10) To show the position values for the right thrust reverser, push the NEXT PAGE key on the FMCS CDU.

NOTE: This causes the R REVERSER SLEEVE POSITION screen to show.

NOTE: The channel that is in control will be shown first.

(d) Make sure that the position values that are shown for the applicable thrust reverser sleeve are in the limits that follow:

NOTE: The range limit is -5.0% to 112.0%. If the indication is out of range, less than -5.0% or greater than 112.0%, the field will be filled with "----".

1) The POSITION CH A limit, is 0.0 ±4%.

2) The POSITION CH B limit, is 0.0 ±4%.

(e) If the position values are not in the limits, do the steps that follow to adjust the LVDT in the retracted (stowed) position.

(f) If the position values are in the limits, continue at the steps below to do a check of the position values with the thrust reverser in the extended (deployed) position.

SUBTASK 78-36-02-820-001-F00

(2) Do these steps to adjust the LVDT on the applicable thrust reverser in the retracted (stowed) position:

(a) Loosen the jamnut [2] on the LVDT transducer.

(b) Turn the rod a small amount in one direction or the other to get the correct value.

NOTE: After the rod is turned, the new value will show on the FMCS CDU in approximately two seconds.

1) Wait for approximately two seconds.

2) Make sure that the POSITION CH A limit, for the applicable thrust reverser sleeve, is 0.0 ±4%.

3) Make sure that the POSITION CH B limit, for the applicable thrust reverser sleeve, is 0.0 ±4%.

(c) If the position values are not in the limits, continue to turn the rod until the values are correct.

(d) If the position values are in the limits, tighten the jamnut [2] to 20.0-30.0 pound-inches (2.3-3.4 Newton meters).

1) Make sure that the position values are still in the limits.

SUBTASK 78-36-02-710-003-F00

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AFT OF THE APPLICABLE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION: DO NOT EXTEND THE THRUST REVERSER WHEN THE THRUST REVERSER IS OPEN. IF YOU DO NOT OBEY THIS INSTRUCTION, DAMAGE TO THE EQUIPMENT CAN OCCUR.

(3) Do these steps to do a check of the LVDT position values with the thrust reverser in the extended (deployed) position:

(a) Move the applicable reverse thrust lever up and aft to the extended (deployed) position.

(b) Make sure that the REV light turns amber when the thrust reverser sleeves are in transit and then turns green when the thrust reverser is fully extended.

(c) Make sure that the position values that are shown for the left and right thrust reversers are in the limits that follow:

NOTE: The range limit is -5.0% to 112.0%. If the indication is out of range, less than -5.0% or greater than 112.0%, the field will be filled with "----".

NOTE: If the R REVERSER SLEEVE POSITION screen shows, push the PREV PAGE key to show the left sleeve position values.

NOTE: If the L REVERSER SLEEVE POSITION screen shows, push the NEXT PAGE key to show the right sleeve position values.

1) Make sure that the POSITION CH A limit, is 100.0 ±5%.

2) Make sure that the POSITION CH B limit, is 100.0 ±5%.

(d) If the position values are in the limits, continue at the steps below to do a check that the position values are still in the limits in the retracted (stowed) position.

(e) If the position values are not in the limits, do the steps that follow to adjust the LVDT in the extended (deployed) position.

SUBTASK 78-36-02-710-004-F00

(4) Do these steps to adjust the LVDT on the applicable thrust reverser in the extended (deployed) position:

(a) Loosen the jamnut [2] on the LVDT transducer.

(b) Turn the rod a small amount in one direction or the other to get the correct value.

NOTE: After the rod is turned, the new value will show on the FMCS CDU in approximately two seconds.

1) Wait for approximately two seconds.

2) Make sure that the POSITION CH A limit, is 100.0 ±5%.

3) Make sure that the POSITION CH B limit, is 100.0 ±5%.

(c) If the position values are not in the limits, continue to turn the rod until the values are correct.

(d) If the thrust reverser sleeve is in the limits, tighten the jamnut to 20.0-30.0 pound-inches (2.3-3.4 Newton meters).

1) Make sure that the position values are still in the limits.

SUBTASK 78-36-02-820-002-F00

(5) Do these steps to make sure that the position values for the applicable thrust reverser sleeve are still in the limits in the retracted (stowed) position:

(a) Move the reverse thrust lever forward and down to retract (stow) the thrust reverser.

(b) Make sure that the POSITION CH A limit, is 0.0 ±4%.

(c) Make sure that the POSITION CH B limit, is 0.0 ±4%.

(d) If the position values are not in the limits, do the adjustments at the retracted (stowed) and extended (deployed) positions again.

(e) If the position values are in the limits, install lockwire, G01048 as shown (Figure 502) (View B).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 78-36-02-860-013-F00

(1) Do these steps at the FMCS CDU in the flight compartment:

(a) Push the INIT REF key on the FMCS CDU.

NOTE: This causes the MAINT BITE INDEX screen to show.

(b) Push the INIT REF key on the FMCS CDU again.

NOTE: This causes the PERF INIT sreen to show.

SUBTASK 78-36-02-860-014-F00

(2) For Engine 1, remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	8	C01103	ENGINE 1 START VALVE

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE

SUBTASK 78-36-02-860-015-F00

(3) For Engine 2, remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	9	C00440	FLIGHT CONTROL AUTO SPEED BRAKE
C	4	C00154	ENGINE 2 START VALVE
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

SUBTASK 78-36-02-860-016-F00

(4) Remove the DO-NOT-OPERATE tag from the applicable thrust lever.

SUBTASK 78-36-02-860-017-F00

(5) Remove the DO-NOT-OPERATE tag from the applicable ENGINE START switch.

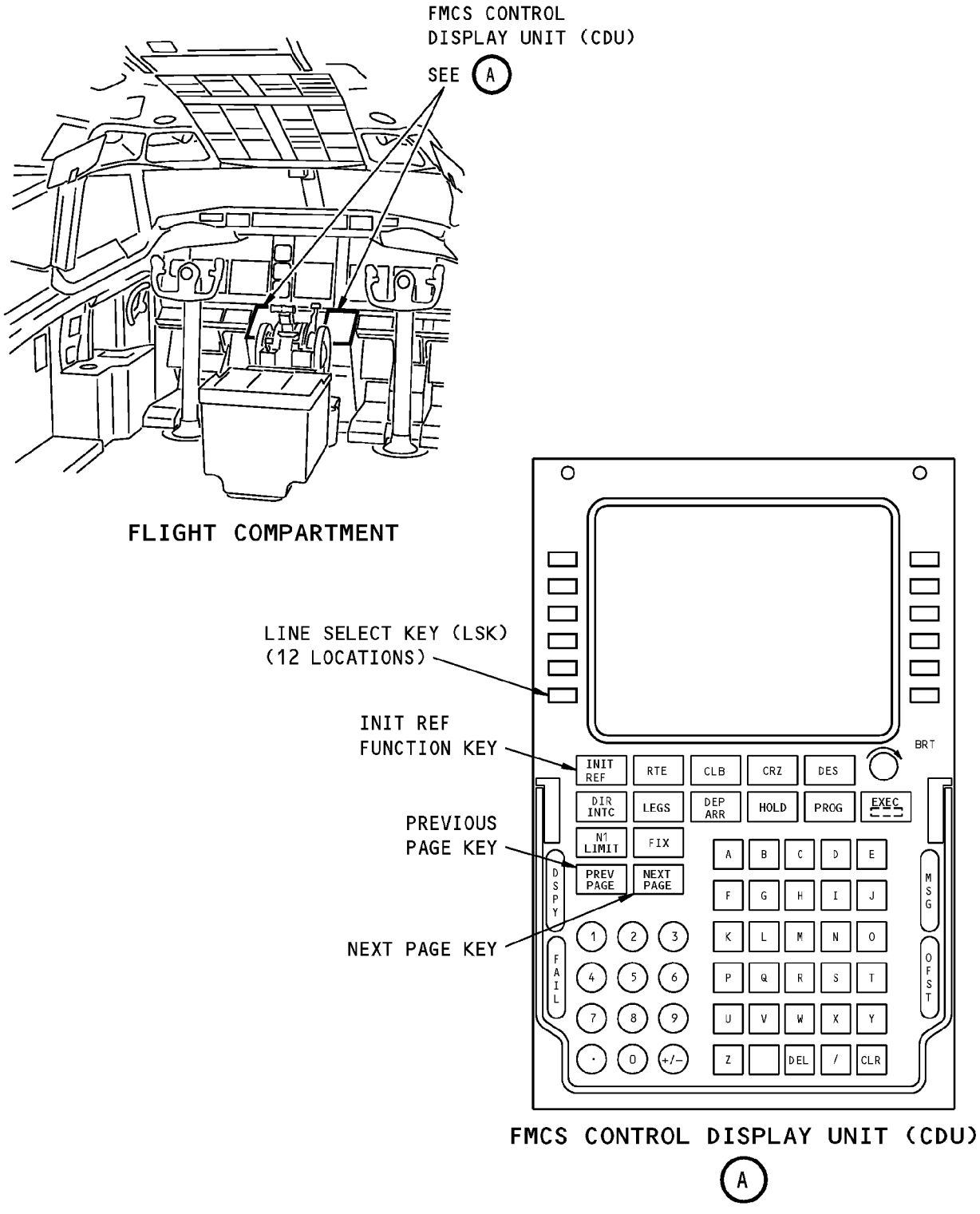
SUBTASK 78-36-02-860-018-F00

(6) Remove the DO-NOT-OPERATE tag from the applicable start lever.

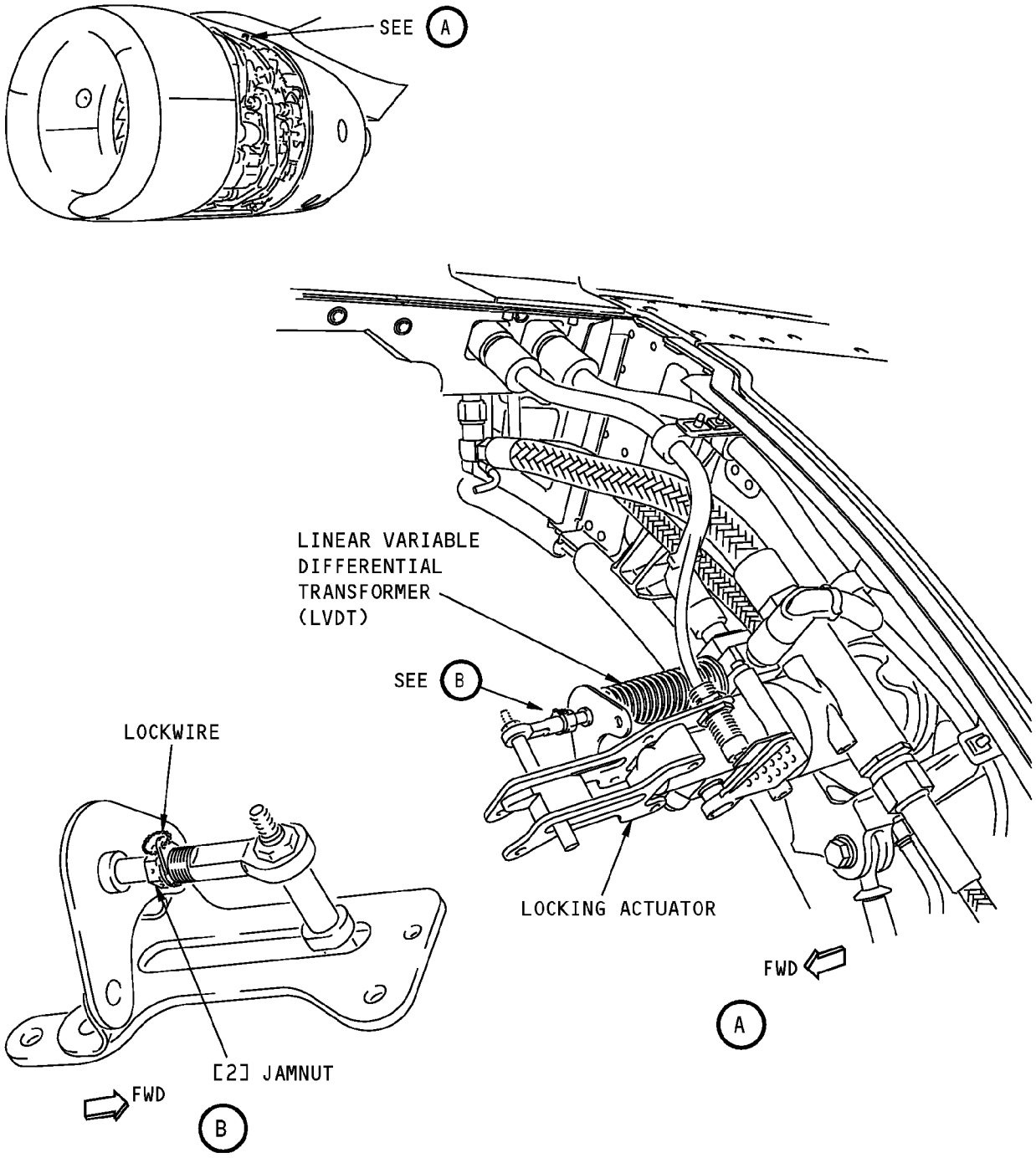
SUBTASK 78-36-02-410-003-F00

(7) Do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

———————— END OF TASK ————————



Flight Management Computer - Control Display Unit
Figure 501/78-36-02-990-802-F00



NOTE: LEFT SIDE IS SHOWN,
RIGHT SIDE IS OPPOSITE.

Linear Variable Differential Transformer Adjustment
Figure 502/78-36-02-990-803-F00