A. File the attached Temporary Revision/Alerts in the Manual Supplement in ATA Chapter/Section/Subject/Page sequence

B. File this Control Page in front of the Chapter TRs/Alerts.

C. The following list shows active TRs/Alerts together with TRs/Alerts added by this control page.

Chapter Section Subject	Page	TR/Alert No.
78-11-04	604	* 78-618
78-31-00	601	78-536
78-31-23	602	78-539

D. Remove and Destroy the following TRs/Alerts:

* Indicates TRs/Alerts issued with this control page

TEMPORARY REVISION No. 78-618

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS ENGINEERING (TECHNICAL INFORMATION SERVICES, G2, TBA, S401, P. O. BOX 10, HEATHROW AIRPORT, HOUNSLOW, MIDDLESEX TW6 2JA).
CAA DESIGN APPROVAL No. DAI/8566/78.

Manual Reference 78-11-04 Page 604

REASON FOR REVISION

To add common nozzle assembly crack limits.

ACTION

TASK 78-11-04-226-001-R00
2. Common Nozzle Assembly (C.N.A.) Inspection (Fig. 601 and 602)

D. Common Nozzle Assembly Inspection Standards

(1) Outer duct, inner and outer skin (Fig. 601).

Ignore existing step (a) and read the following

(a) Cracks up to 3 inches are permitted subject to repair in accordance with FRS6203 within 200 hours.

Originator: N.FREEMAN
Reference: 5441
Workbook: ENG-444

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 78-539

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

For CHIEF ENGINEER QUALITY AND TRAINING

Manual Reference 78-31-23 Page 602

REASON FOR REVISION

To include additional repair criteria.

ACTION

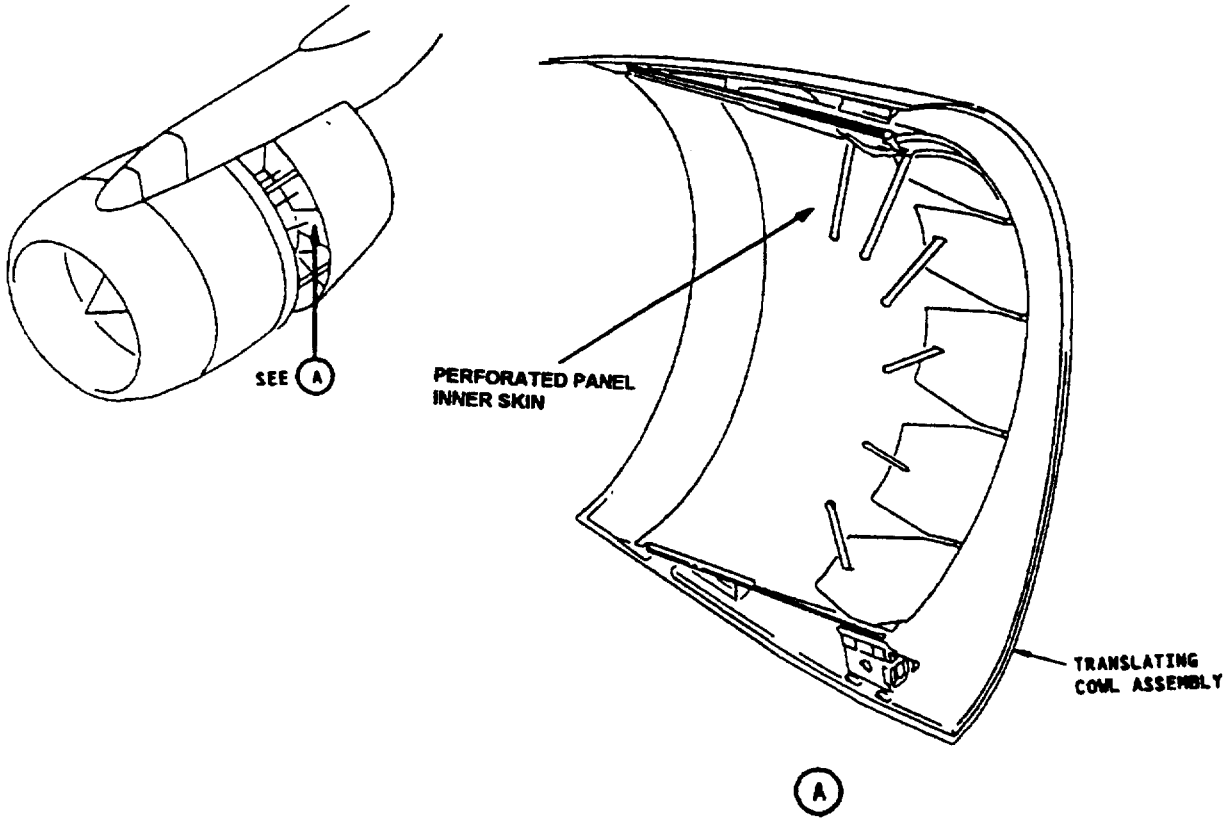
THRUST REVERSER TRANSLATING COWL - INSPECTION/CHECK

Ref Para 2.C.

Read the following additional step (8A)

(8A) Do an inspection of the inner skin of the perforated panel (see figure overleaf). Inspect for the following:
- (a) Cracks
  - 1) Not exceeding 76.2mm (3.0 inches) - Accept
  - 2) Exceeding 1) - Repair with FRS6063
- (b) Dents
  - 1) Not exceeding 50.8mm (2.0 inches) - Accept
  - 2) Exceeding 1) - Repair with FRS6063
- (c) Gouges
  - 1) Not exceeding 0.254mm (0.01 inches) in depth and 101.6mm (4.0 inches) in length - Accept
  - 2) Exceeding 1) - Repair with FRS6063
- (d) Nicks
  - 1) Not exceeding 0.254mm (0.01 inches) in depth and 101.6mm (4.0 inches) in length - Accept
  - 2) Exceeding 1) - Repair with FRS6063
- (e) Holes
  - 1) Not exceeding 12.7mm (0.5 inches) diameter and a minimum of 127mm (5 inches) from other damage - Accept
  - 2) Exceeding 1) - Repair with FRS6063

Originator: M.TIVEY
Reference: 000002530
Workbook: ENG-389


SEE A
PERFORATED PANEL
INNER SKIN
TRANSLATING
COWL ASSEMBLY
A

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 78-536

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

For CHIEF ENGINEER QUALITY AND TECHNICAL SERVICES.

Manual Reference 78-31-00 Page 601

REASON FOR REVISION

To include an additional inspection/check requirement (SB78-9568).

ACTION

Read the following additional requirement

C-DUCT REAR CASCADE SUPPORT RING

A. Inspection/Check

(1) Inspect LH and RH rear cascade support ring assemblies for cracks.

Procedure	Supplementary Information
(a) De-activate thrust reverser.	AMM 78-31-00/201
(b) Manually move thrust reverser sleeve to the fully deployed position.	AMM 78-31-00/201
(c) Clean rear support ring at each actuator cut-out.	See Figure 1. Use Trichloroethane.
(d) Inspect the rear side of the LH and RH rear cascade support rings at each actuator cut-out.	See Figure 2. Use a bright light and mirror.
(e) Inspect the area of the radius on the forward side of the ring, looking between the actuator fairing sides and the ring.	See Figure 2.

(2) If cracks are found remove adjacent cascades to facilitate a crack test and stop drilling (AMM 78-30-05/201).
(a) Fluorescent penetrant crack test.
(b) Measure and record length and location of crack.
(c) See acceptance standards.

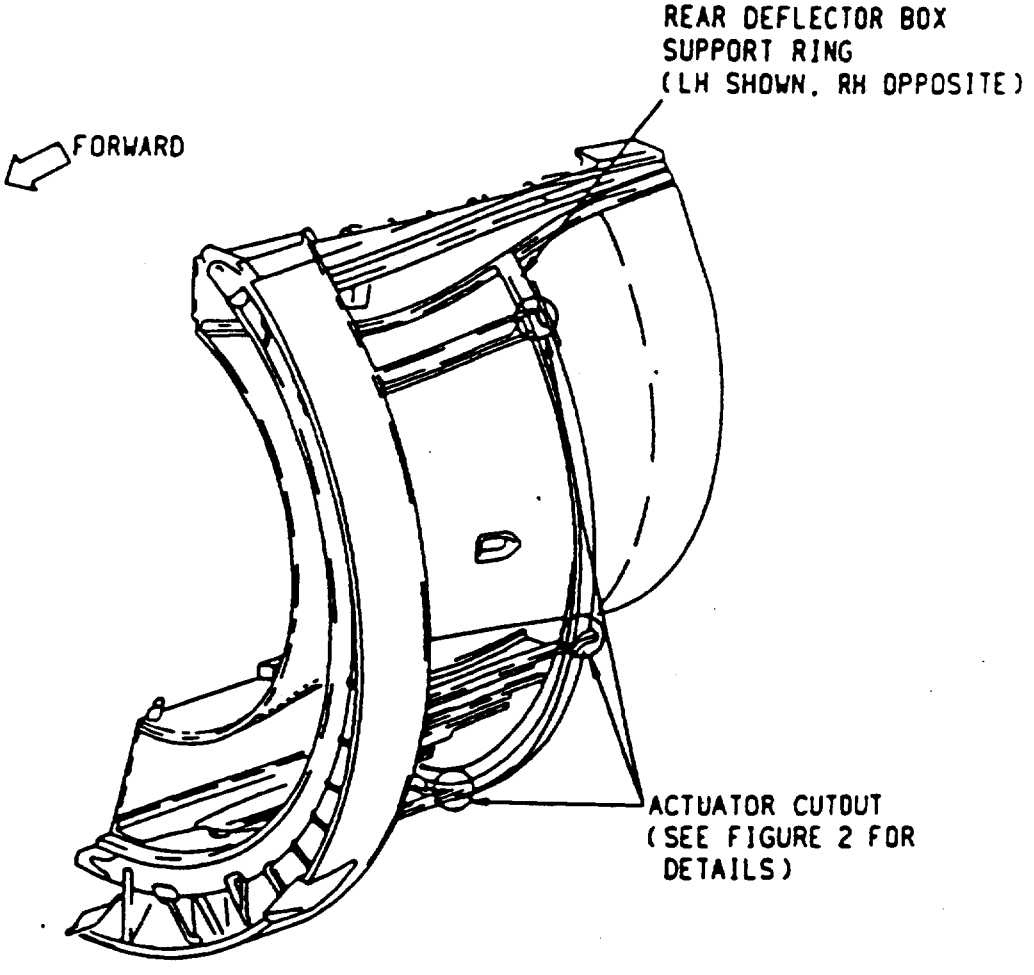
(3) If no cracks are found manually stow translating sleeve and re-activate reverser (AMM 78-31-00/201).

B. Acceptance Standards

(1) Cracks up to a maximum of 25.4 mm (1.0 inches) in length circumferentially and 7.6 mm (0.30 inches) radially and that do not extend into flange A are acceptable provided
(a) Cracks are stop drilled to FRS3255.
(b) A repeat visual inspection is carried out every 7 days.

(2) In excess of the above limits lock out the thrust reverser (AMM 78-30-00/201).

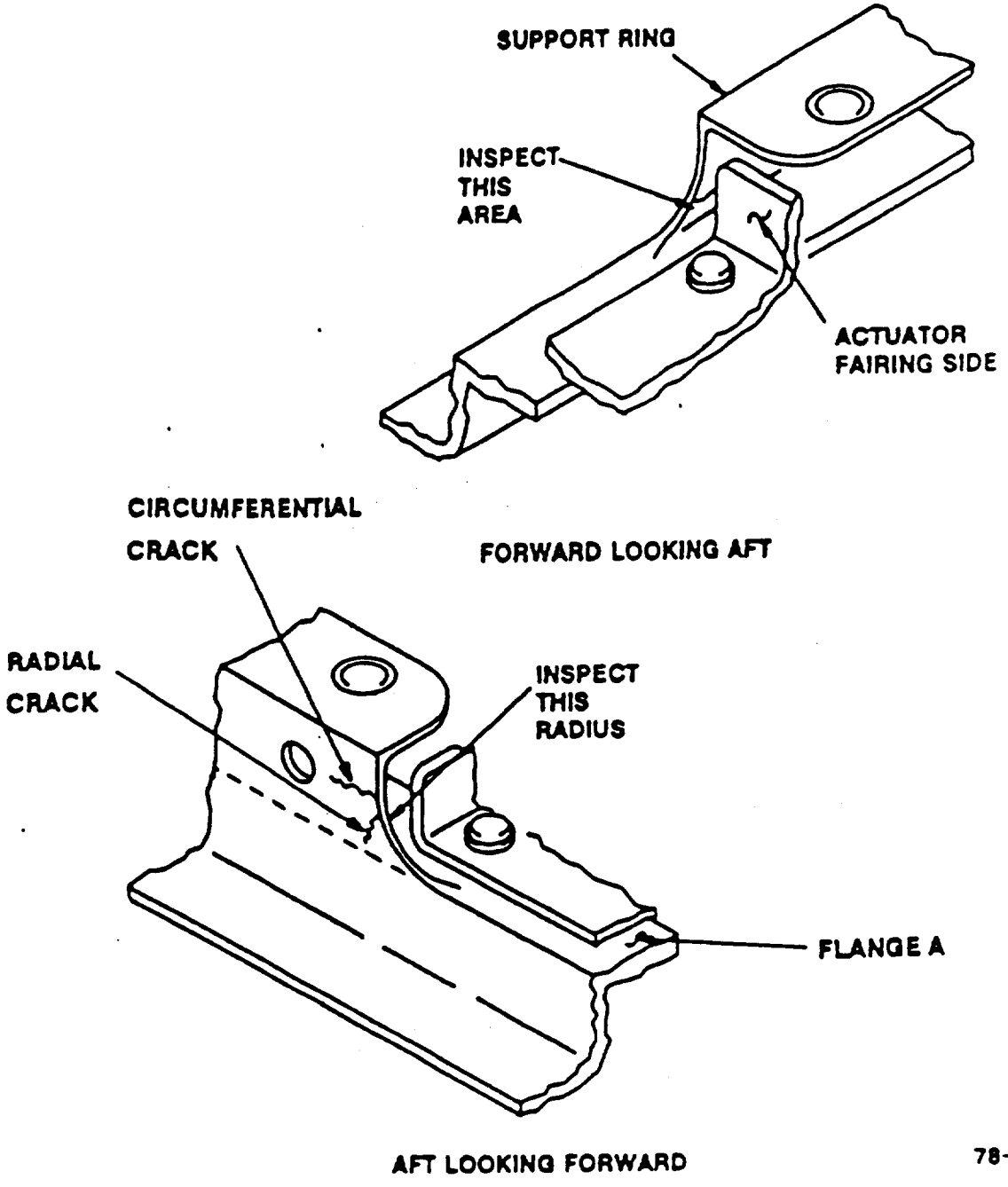
(3) Repair/replace aft cascade ring at earliest opportunity.
(a) Repair to Mod 78F138 (AMM 78-31-05/801).
(b) Replacement will require removal of C-duct.



NOTE: TRANSLATING SLEEVE AND DEFLECTOR BOXES OMITTED FOR CLARITY.

78-4000

View of C-duct thrust reverser structure showing rear cascade support ring
Fig.1



View of rear cascade support ring
Fig.2

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605	SEP 20/08	R01
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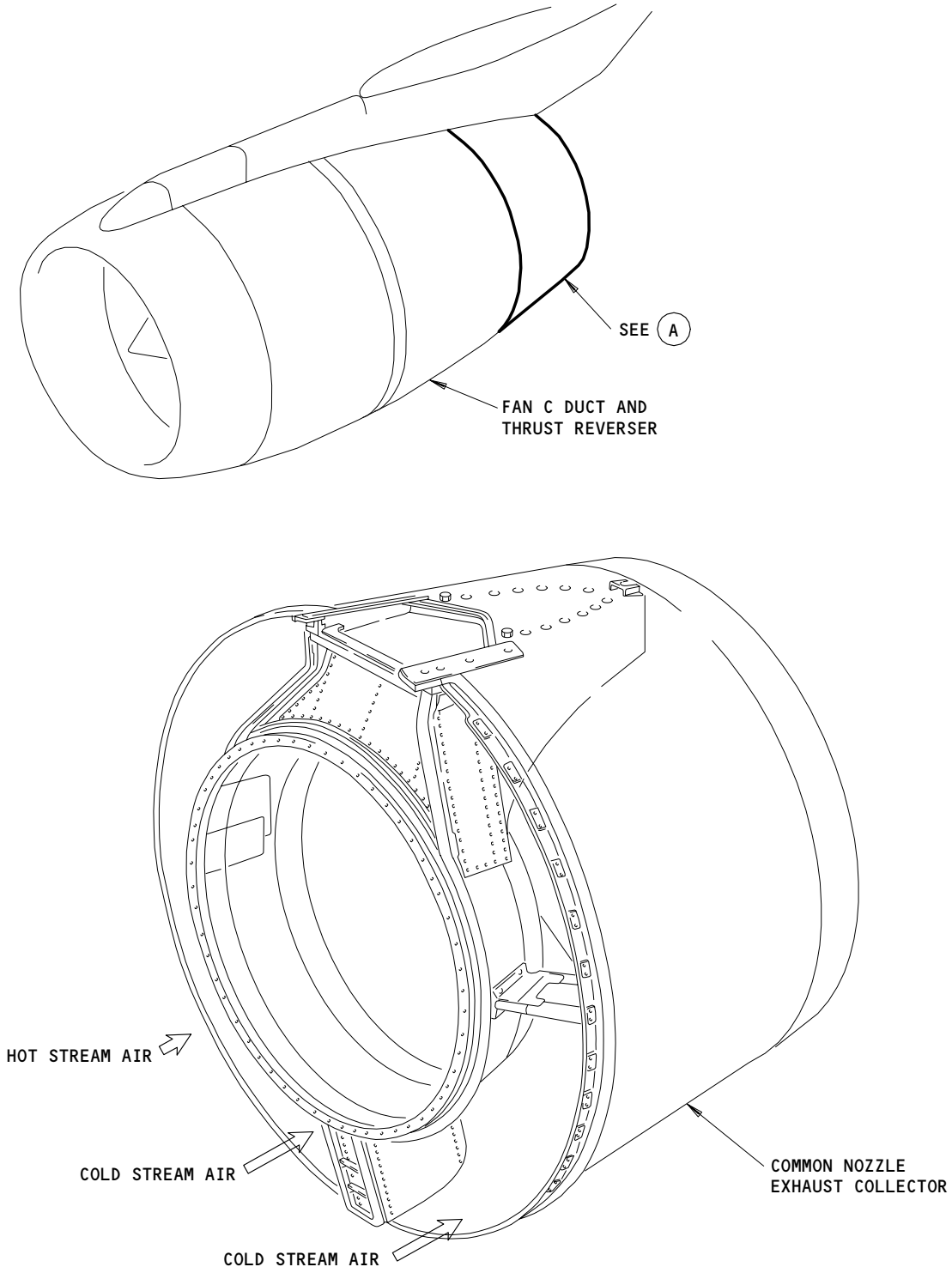
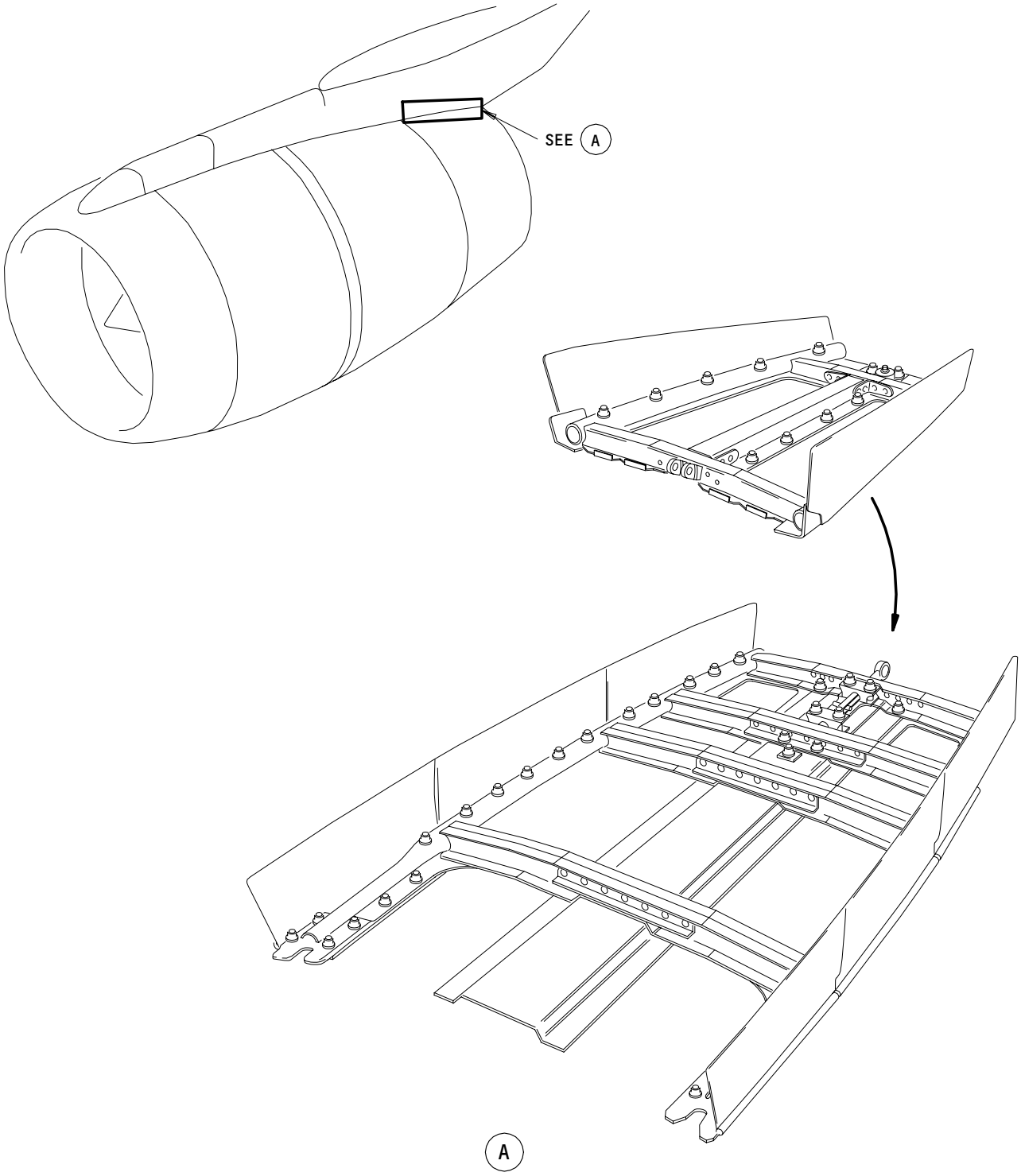
EXHAUST - DESCRIPTION AND OPERATION

1. General (Fig. 1, 2)
   A. The cold stream and hot stream gases are discharged to atmosphere through the engine exhaust system, at a velocity and in the required direction to provide the resulant thrust.
   B. The exhaust system accommodates two gas streams: the cold (fan) stream, ejecting from the low pressure compressor, and the hot gas stream ejecting from the turbines. The two streams are combined in an exhaust collector before being ejected through a common propelling nozzel.
   C. The fan stream exhaust is an integral part of the fan thrust reverser system and is described in (AMM 78-31-00/001). The hot stream (turbine) exhaust is described in (AMM 78-11-00/001).
   D. Fig. 1 and 2 illustrate the exhaust system in the normal, forward thrust, configurations.



Engine Exhaust System
Figure 1



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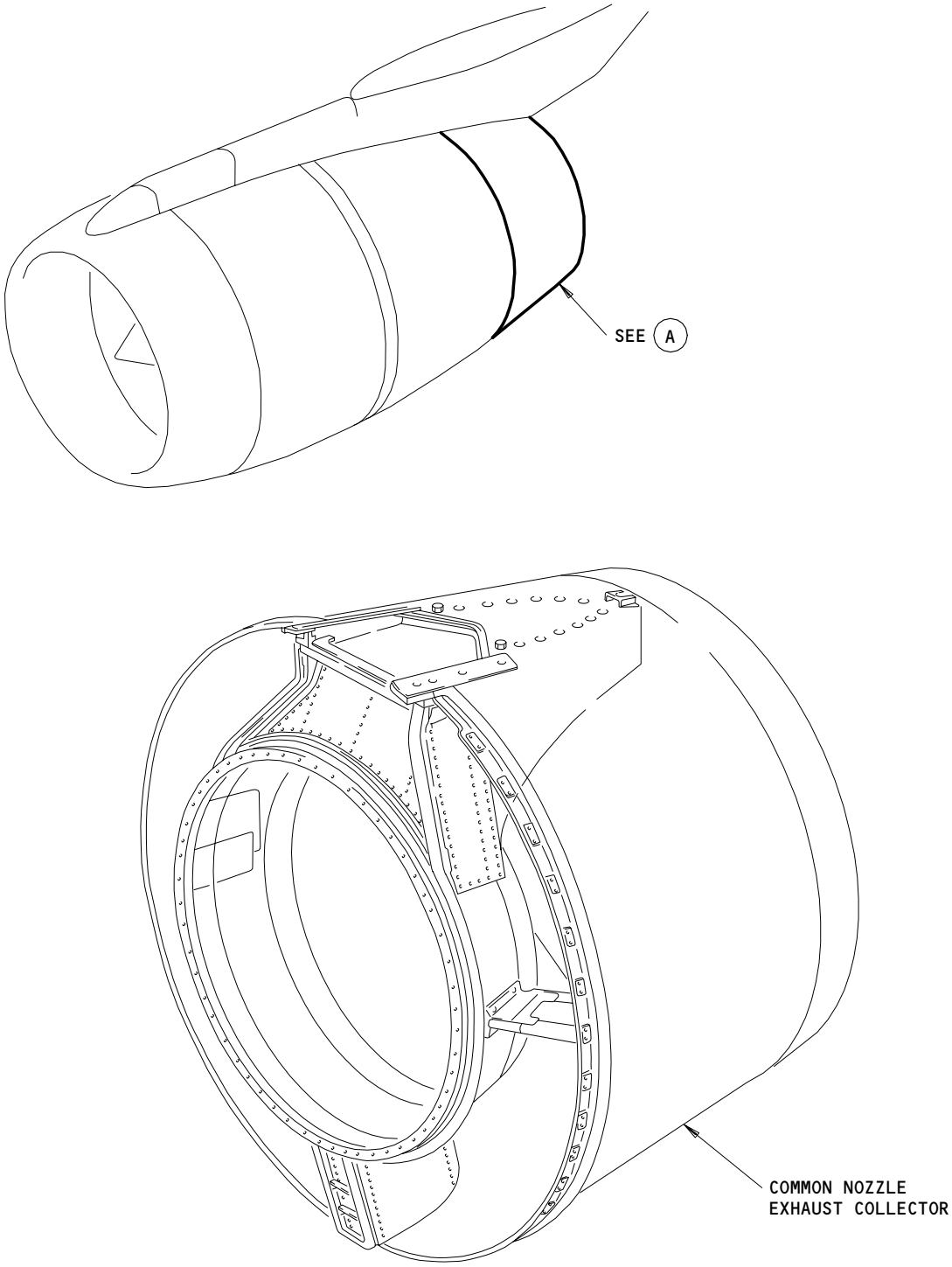
Strut to Afterbody Fairing Seal
Figure 2

TURBINE EXHAUST SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The turbine exhaust system collects the hot gas outflow from the turbines and directs it to atmosphere through a propelling nozzle. The nozzle is shaped to form a convergent duct, thus increasing the exit velocity of the jet outward flow.
   B. The system is comprised of a one-piece exhaust collector composed of an inner and outer duct which provides for mixing of cold and hot gas streams and a streamlined profile rearward of the turbine sections.
2. Component Detail (Fig. 1)
   A. Common Nozzle Exhaust Collector
      (1) The common nozzle exhaust collector, mounted on the rear flange of the gas generator turbine, is comprised of an inner duct with four radial struts supporting an outer duct.
      (2) The inner duct fits around the core engine outlet nozzle and is attached to the turbine outer case.
      (3) Four support struts, attached to the inner duct, provide support for the outer duct assembly.
      (4) A common nozzle fairing is secured between the inner and outer ducts to provide smooth cold stream air mixing.
      (5) The outer duct is sealed against the rear of the cold stream reverser case and is overlapped by the translating cowl trailing edge. The interface between the outer duct and the strut is sealed with a two-piece seal attached to the outer duct (Fig. 2).



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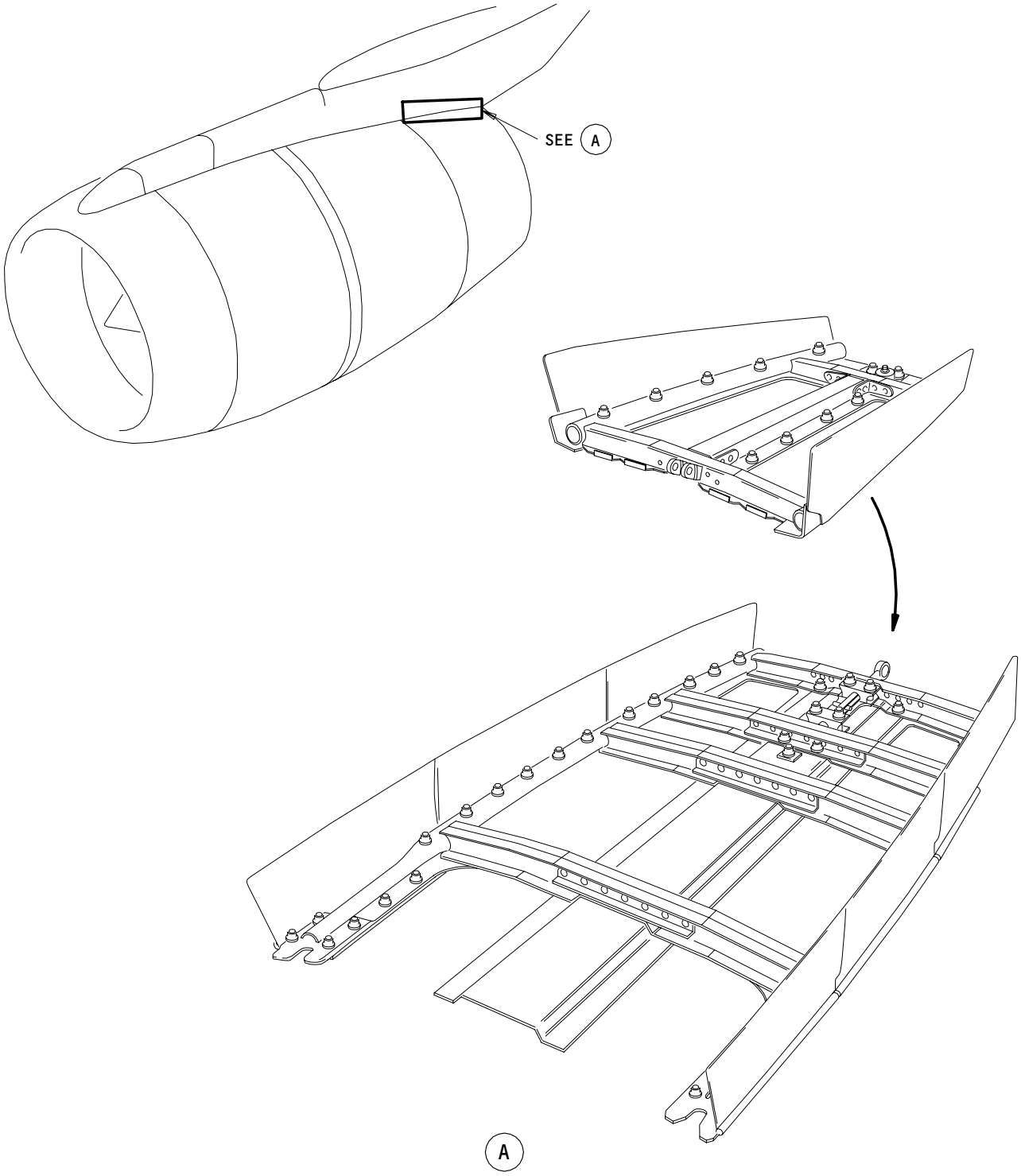
Engine Exhaust System
Figure 1



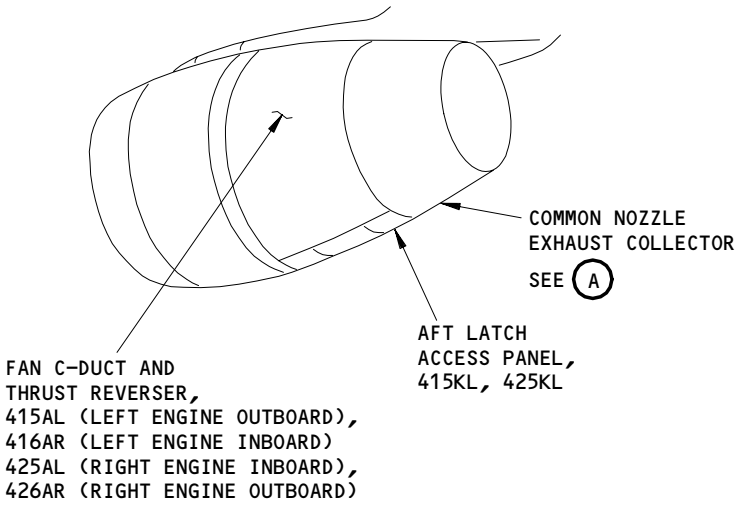
65372

Strut to Afterbody Fairing Seal
Figure 2

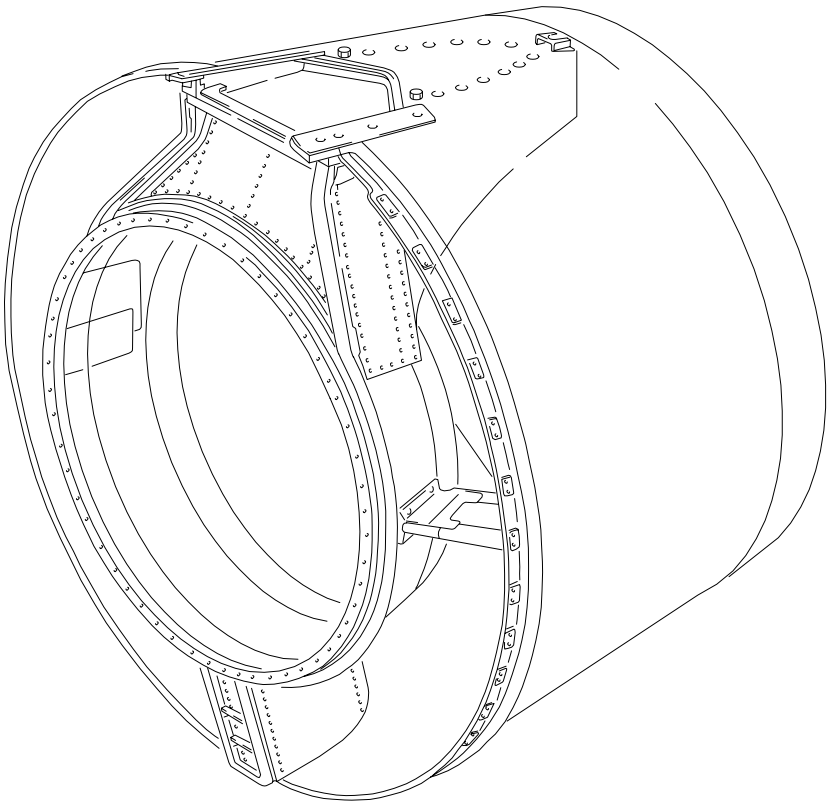
TURBINE EXHAUST SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
EXHAUST COLLECTOR - COMMON NOZZLE		2	415KL,425KL, AFT LATCH ACCESS PANEL	78-11-04

Turbine Ehaust System - Component Index
Figure 101



AFT LATCH ACCESS PANEL



COMMON NOZZLE EXHAUST COLLECTOR

(A)

Turbine Exhaust System - Component Location
Figure 102

COMMON NOZZLE EXHAUST COLLECTOR - REMOVAL/INSTALLATION

1. General
   A. This procedure removes and installs the exhaust collector of the common nozzle.

TASK 78-11-04-004-002-R00

2. Remove the Common Nozzle Exhaust Collector
   A. Equipment
      (1) Cradle - Exhaust Nozzle - B71033-25
      (2) Jack - Transmission, One Ton, Hein Werner Model 62 or equivalent
   B. References
      (1) AMM 54-52-01/401, Strut Fairings
      (2) AMM 71-11-07/401, Strut to Afterbody Fairing Seal
      (3) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          411/421 Engine

   D. Prepare to remove the exhaust collector of the common nozzle.

      S 014-001-R00
      (1) Remove the strut-to-afterbody fairing seal (AMM 71-11-07/401).

      S 014-003-R00
      (2) Remove the flex fairing from the strut (AMM 54-52-01/401).

      S 014-004-R00
      (3) Remove the exhaust seal assembly from the top of the common nozzle assembly adjacent to the strut.

      S 014-005-R00

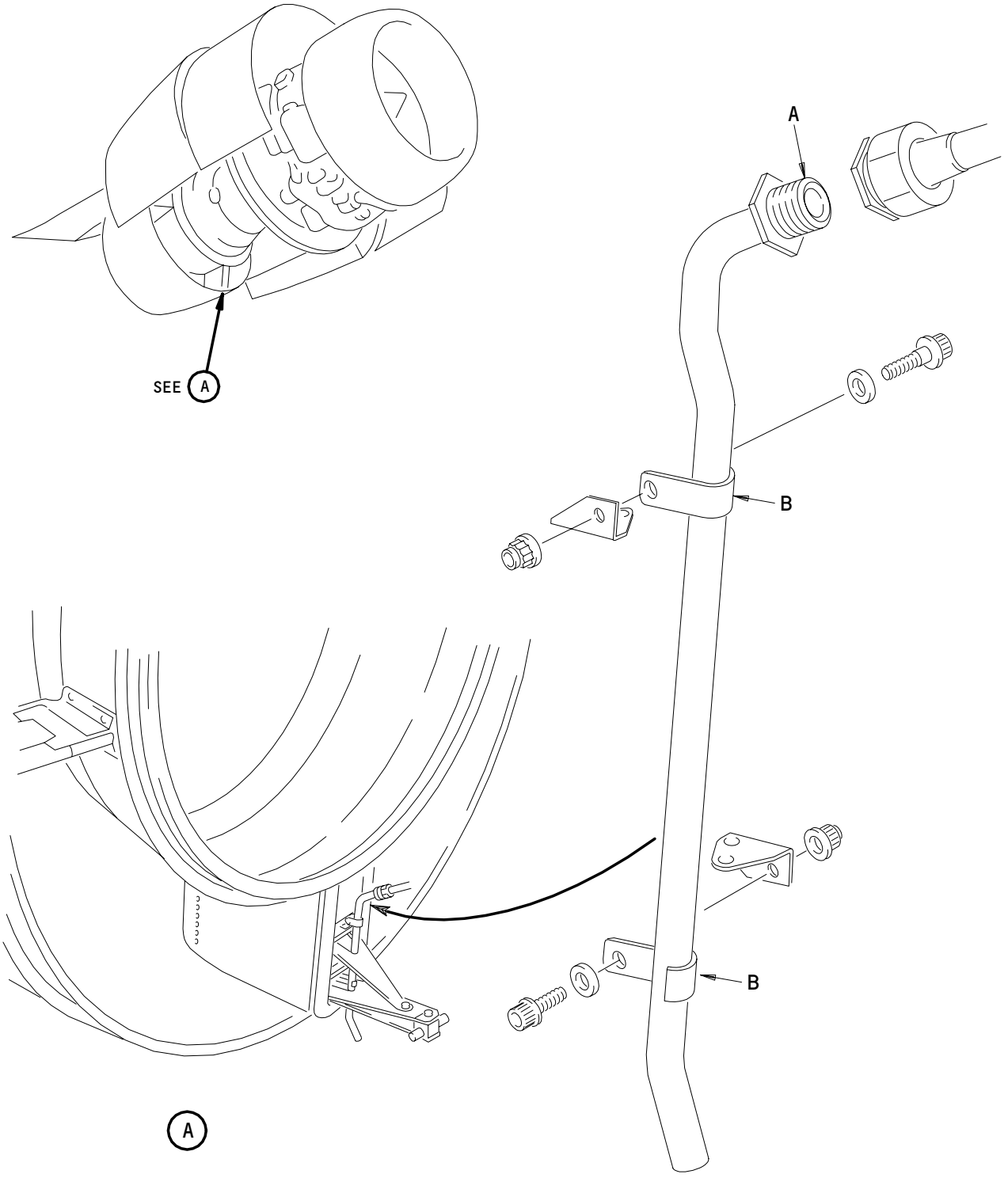
      WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS WHEN YOU OPEN THE THRUST REVERSERS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

      (4) Open the left and right thrust reversers (AMM 78-31-00/201).

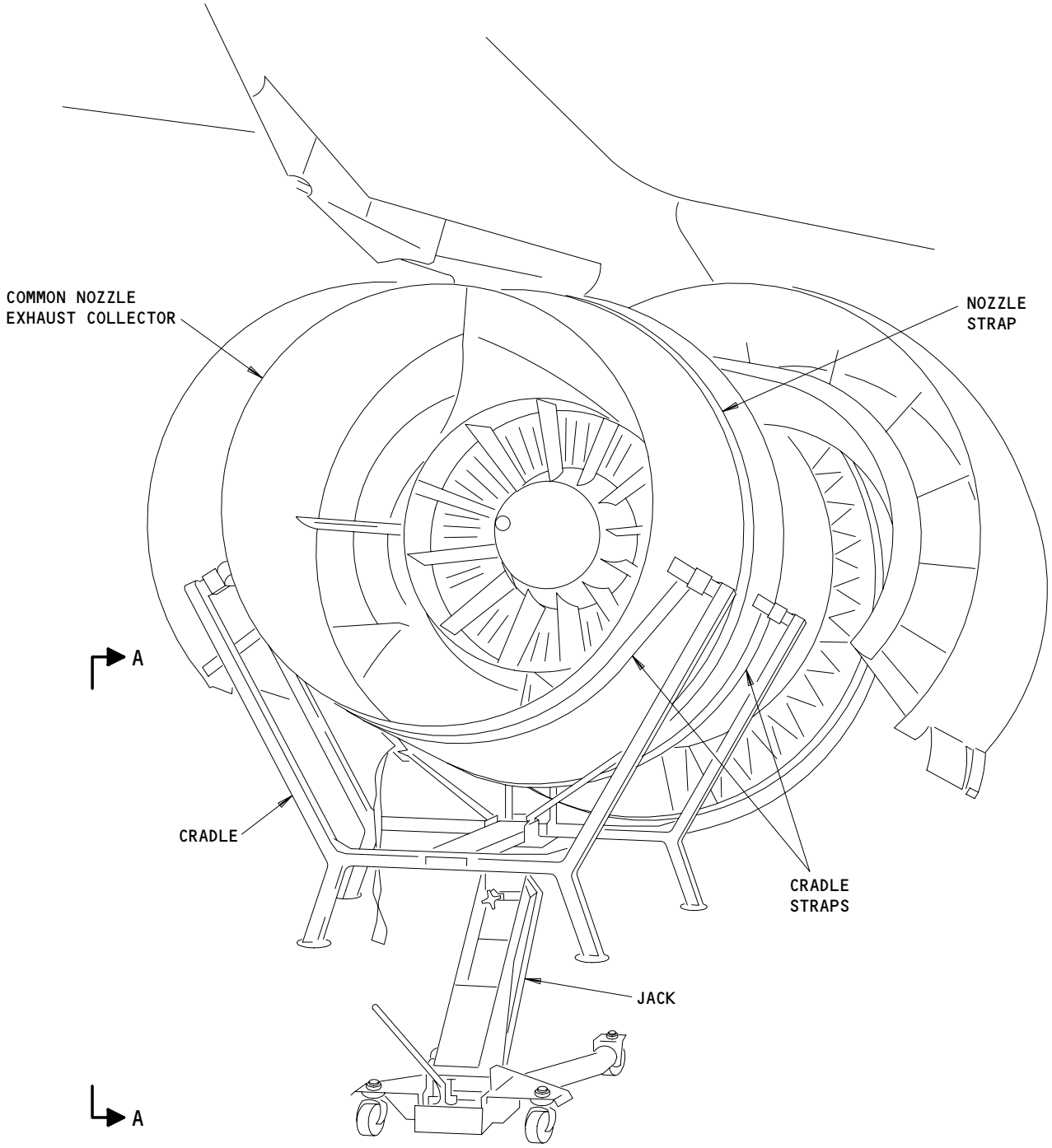
      S 014-006-R00
      (5) Remove the fuel drain tube of the LP turbine case (Fig. 401).

      S 034-007-R00
      (6) Release the fuel drain tube at the disconnect point A.

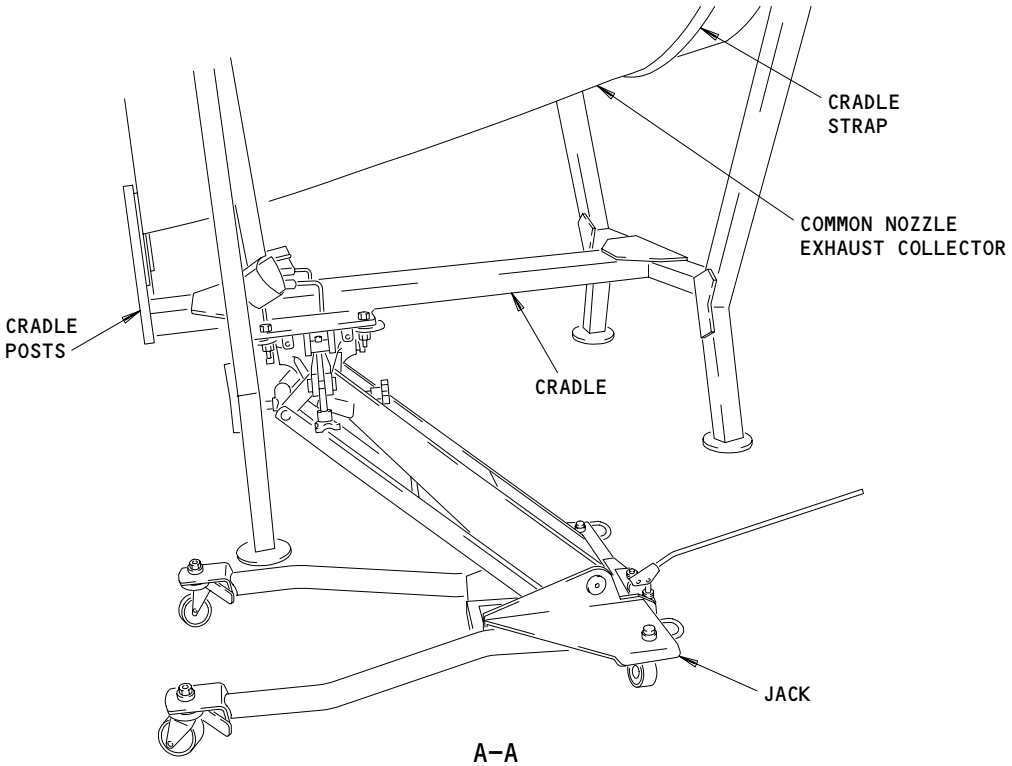
      S 034-008-R00
      (7) Remove the clamps, the brackets, and the bolts, washers, and nuts at the disconnect points B which attach the fuel drain tube. Remove the tube.



L.P. Turbine Case Fuel Drain Tube
Figure 401



Exhaust Nozzle Cradle
Figure 402 (Sheet 1)



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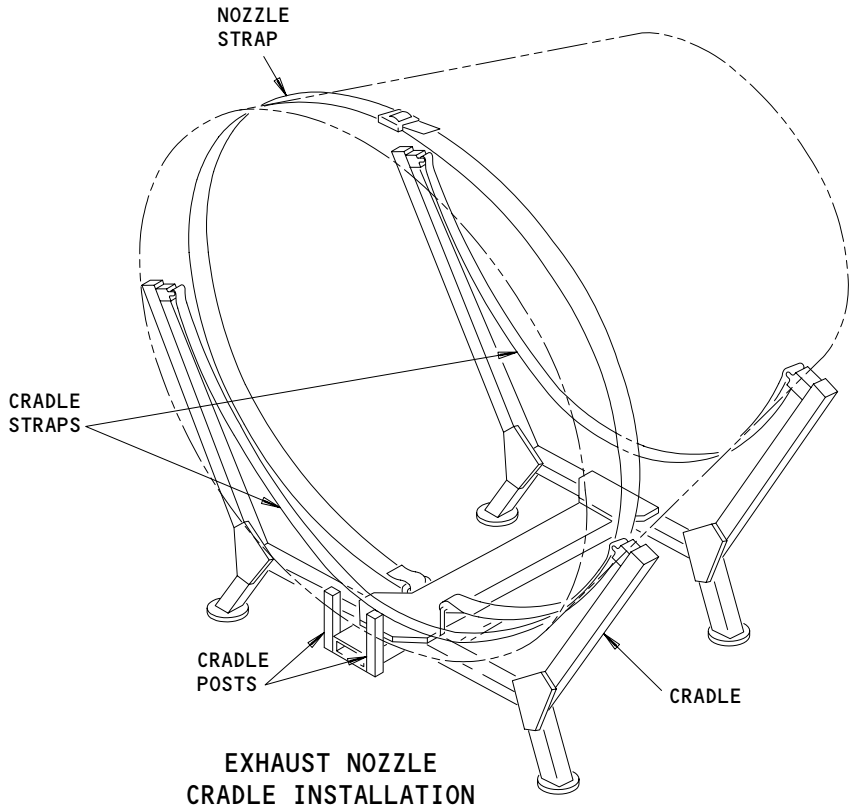
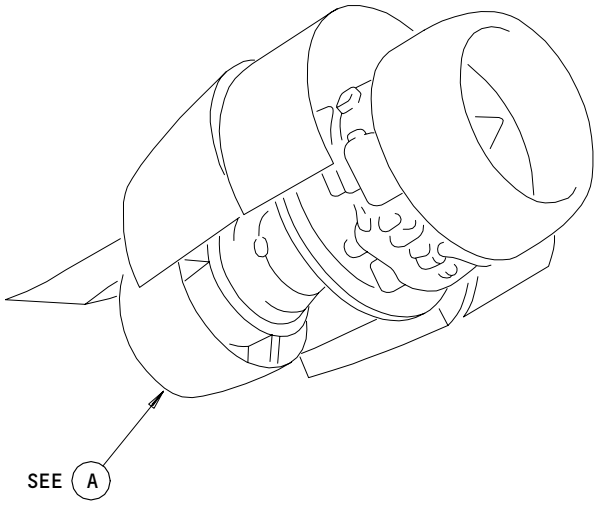
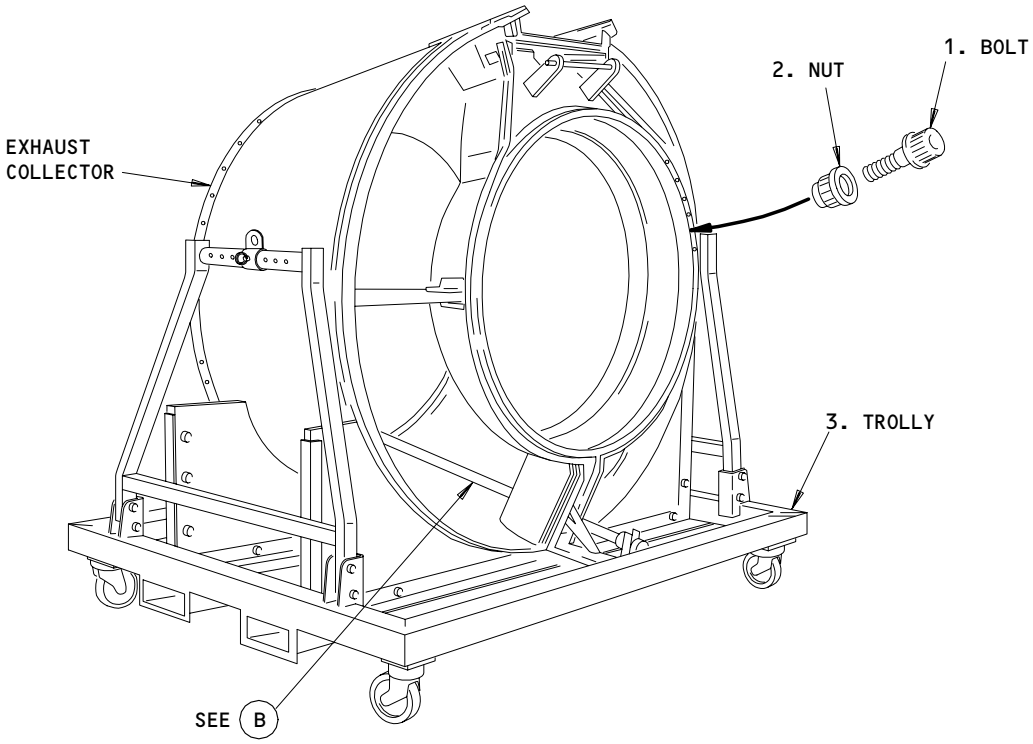


EXHAUST NOZZLE
CRADLE INSTALLATION

Exhaust Nozzle Cradle
Figure 402 (Sheet 2)





HANDLING TROLLEY

A

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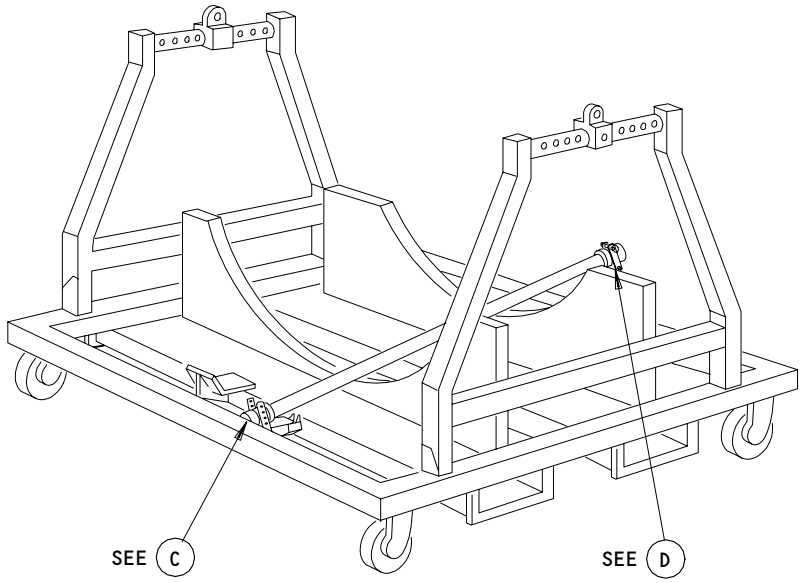
Common Nozzle Exhaust Collector
Figure 403 (Sheet 1)



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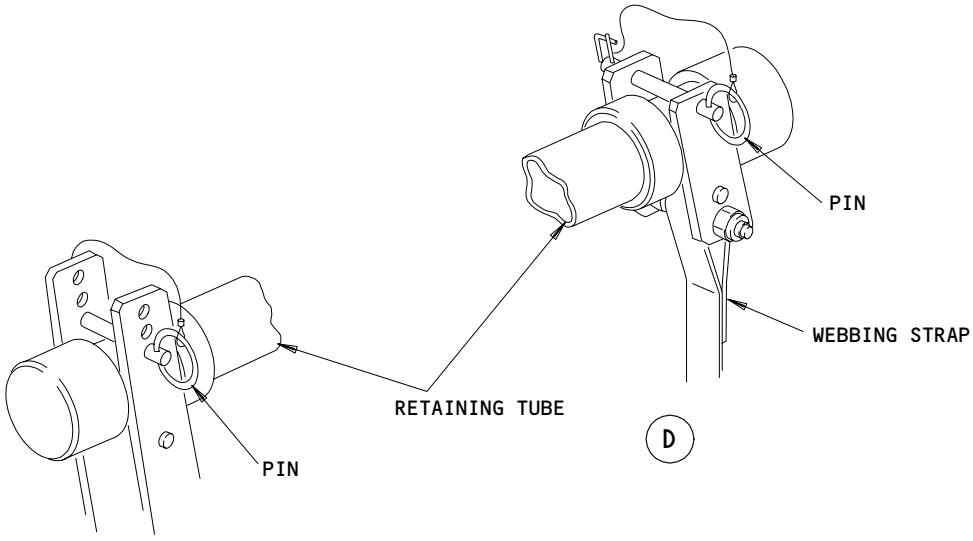


D

C

Common Nozzle Exhaust Collector
Figure 403 (Sheet 2)

E. Remove the exhaust collector of the common nozzle (Fig. 402)

S 494-009-R00
(1) Attach the cradle to the jack.

S 494-010-R00
(2) Put the cradle below the exhaust collector.

S 494-011-R00
(3) Lift the cradle until the two cradle straps hold the exhaust collector.
(a) Make sure the forward edge of the exhaust collector touches the cradle posts.

S 494-012-R00
(4) Attach the strap around the exhaust collector to make it stable while it stays on the cradle.

S 024-013-R00
(5) Remove the bolts and the nuts which attach the exhaust collector to the turbine bearing housing.

S 024-014-R00
(6) Move the exhaust collector rearward to clear the exhaust cone.

S 024-015-R00
(7) Lower the cradle with the exhaust collector.

TASK 78-11-04-404-025-R00

3. Install the Common Nozzle Exhaust Collector

A. Equipment
(1) Cradle - Exhaust Nozzle - B71033-25
(2) Jack - Transmission, One Ton, Hein Werner Model 62 or equivalent

B. References
(1) AMM 54-52-01/401, Strut Fairings
(2) AMM 70-51-00/201, Torque Tightening Technique
(3) AMM 71-11-07/401, Strut to Afterbody Fairing Seal
(4) AMM 78-31-00/201, Thrust Reverser System

C. Access
(1) Location Zones
411/421 Engine

D. Install the exhaust collector of the common nozzle

S 494-016-R00
(1) Put the exhaust collector on the cradle with the off-set bolt holes at the top.

S 494-017-R00
(2) Attach the strap around the exhaust collector.

S 424-018-R00

(3) Do these steps to put the exhaust nozzle in its position on the engine:

(a) Lift the exhaust collector and push the collector forward until it touches the rear flange of the turbine bearing housing.

NOTE: Make sure the exhaust nozzle is installed (AMM 72-51-02/401) before installing the exhaust collector.

(b) Make sure you align the off-set bolt holes at the top of the flange.

(c) Make sure the brackets which attach the oil tube are in the correct position.

(d) Install the bolts and nuts to attach the exhaust collector to the turbine bearing housing.

(e) Tighten the bolts (AMM 70-51-00/201).

S 434-019-R00

(4) Do these steps to install the drain fuel tube for the LP turbine case (Fig. 401):

(a) Put the tube on the engine and loosely attach the clamps at the position B.

(b) Connect the tube at the point A, and tighten the tube nut.

(c) Make sure you lockwire the tube nut.

(d) Tighten the clamps at position B.

S 094-020-R00

(5) Remove the cradle from the exhaust collector.

S 414-021-R00

(6) Install the exhaust seal assembly.

S 414-022-R00

(7) Install the flex fairing (AMM 54-52-01/401).

S 414-023-R00

(8) Install the strut-to-afterbody fairing seal (AMM 71-11-07/401).

S 414-024-R00

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

(9) Close the left and right thrust reversers (AMM 78-31-00/201).

COMMON NOZZLE EXHAUST COLLECTOR - INSPECTION/CHECK

1. General
   A. Use this inspection procedure to examine the common nozzle exhaust collector.

TASK 78-11-04-226-001-R00

2. Common Nozzle Assembly (C.N.A.) Inspection (Fig. 601 and 602)
   A. References
      (1) AMM 70-20-02/201, Removal of Carbon Particles from the UL11273 Fuel Drain Tube
      (2) AMM 70-42-11/201, Repair of Surfaces affected by Minor Damage (FRS 3253)
      (3) AMM 70-42-26/201, Acceptable Cracks - Stop Drilling (FRS 3255)
      (4) AMM 71-71-02/601, Engine Drain Tubes
      (5) AMM 78-11-04/401, Common Nozzle Exhaust Collector
      (6) AMM 78-11-04/801, Common Nozzle Exhaust Collector (FRS 6180, 6187, 6203, 6216, 6217, 6255)
   B. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

   C. Common Nozzle Assembly Inspection

      S 226-021-R00
      (1) Examine the outer duct inner and outer skin for cracks, dents, nicks, or scores, holes and areas of skin that are not fully connected.
          (a) Examine the outer duct seals and seal carriers.

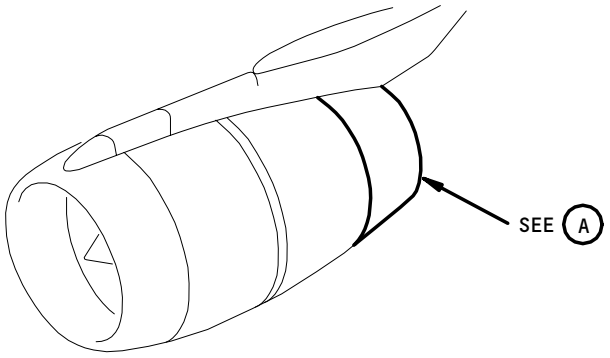
      S 226-002-R00
      (2) Examine the inner duct and common nozzle fairing for cracks, dents, nicks, or scores.

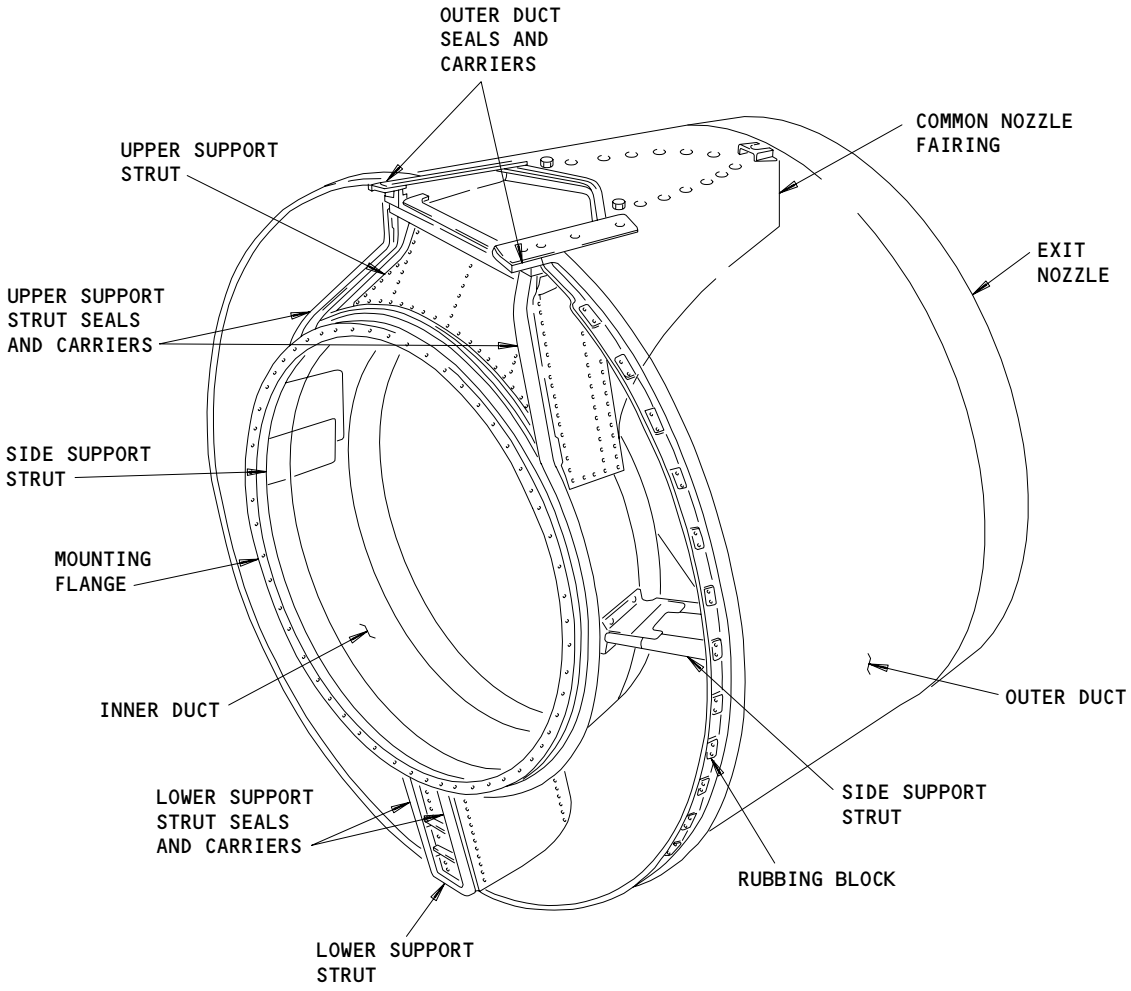
      S 226-003-R00
      (3) Examine the side support struts for cracks, dents, nicks, or scores.
          (a) Look for disconnected rivets and fully disconnected areas of skin.

      S 226-004-R00
      (4) Examine the mounting flange for cracks and distortion.

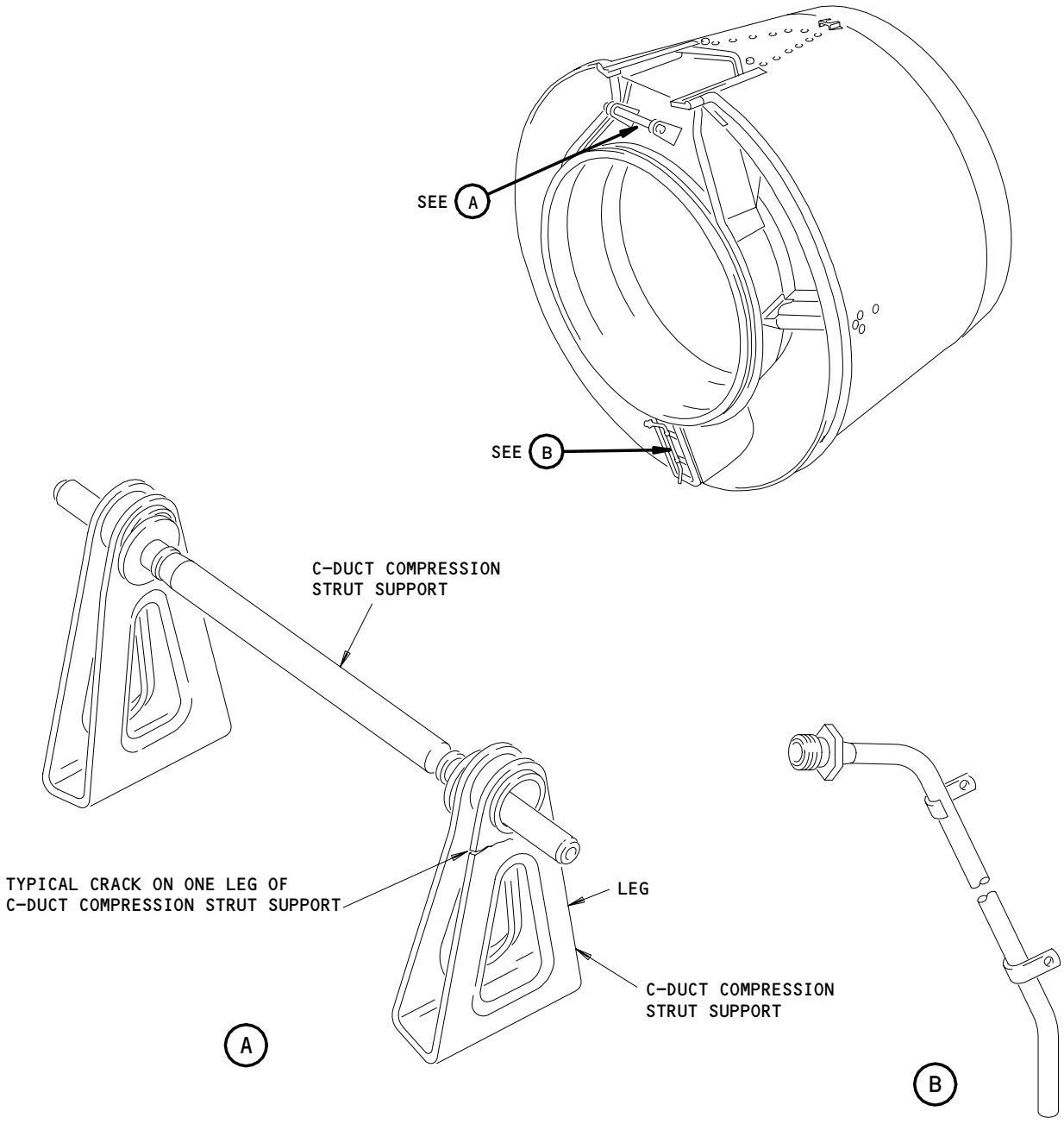
      S 226-005-R00
      (5) Examine the upper and lower support struts for dents, nicks, and scores.
          (a) Examine the upper and lower support strut seals and seal carriers.

      S 226-006-R00
      (6) Look for loose or fully disconnected rubbing blocks.





Common Nozzle Exhaust Collector - Inspection/Check
Figure 601



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C-Duct Compression Strut Support Assembly - Inspection/Check
Figure 602

S 226-007-R00
(7) Examine the 'C' duct compression strut support assembly for damage and cracks.

S 226-008-R00
(8) Examine the exit nozzle for lightning strike damage.

S 226-009-R00
(9) Examine the common nozzle assembly fuel drain tube for damage and cracks.

S 216-018-R00
(10) Examine the mounting brackets for the common nozzle assembly fuel drain tube for damage and cracks.

S 216-020-R00
(11) Examine the common nozzle assembly fuel drain tube for carbon particles.

S 216-023-R00
(12) Examine the exhaust nozzle for unwanted material.

D. Common Nozzle Assembly Inspection Standards

S 226-010-R00
(1) Outer duct, inner and outer skin (Fig. 601).
  (a) Cracks - Repair to FRS6203
  (b) Dents
    1) Accept smooth dents with a circular shape at the bottom, up to 0.080 inch (2.03 mm) in depth and 3.0 inches (76.2 mm) in diameter.
    2) Repair the dents that are more than the limits with FRS 6203 (AMM 78-11-04/801).
  (c) Nicks or Scores
    1) Accept nicks or scores up to 0.01 inch (0.25 mm) in depth and 2.0 inches (50.8 mm) in length and a minimum of 4.0 inches (101.6 mm) from all other damage.
    2) Repair the nicks or scores that are more than the limits with FRS 6203 (AMM 78-11-04/801).
  (d) Repair all the holes with FRS 6203 (AMM 78-11-04/801).
  (e) Repair the areas of skin that are not fully connected with FRS 6203 (AMM 78-11-04/801).
  (f) Repair the damaged carriers or disconnected seals with FRS 6217 (AMM 78-11-04/801).

S 226-011-R00
(2) Inner Duct and Common Nozzle Fairing (Fig. 601)
  (a) Reject all cracks.

(b) Dents
1) Accept smooth dents with a circular shape at the bottom, up to 0.06 inch (1.52 mm) in depth and 3.0 inches (76.2 mm) in diameter.
2) Reject dents that are more than the limits.
(c) Nicks or Scores
1) Accept nicks or scores up to 0.01 inch (0.25 mm) in depth and 2.0 inches (50.8 mm) in length that are a minimum of 4.0 inches (101.6 mm) from all other damage.
2) Reject nicks or scores that are more than the limits.

S 226-012-R00

(3) Side Support Struts (Fig. 601)
(a) Cracks
1) Stop drill cracks up to 2.0 inches (50.8 mm) in length with FRS 3255 (AMM 70-42-26/201).
2) Stop drill cracks at each end with FRS 3255 that are more than 2.0 inches (50.8 mm) in length and up to a maximum of 4.0 inches (101.6 mm) (AMM 70-42-26/201).
a) Make an inspection of the stop drilled cracks each 250 hours of engine operation.
3) Repair cracks that are more than 2) with FRS 6187 (AMM 78-11-04/801).
(b) Dents
1) Accept dents with a circular shape at the bottom up to 0.06 inch (1.52 mm) in depth and 2.0 inches (50.8 mm) in diameter.
2) Reject dents that are more than the limits.
(c) Nicks or Scores
1) Nicks or scores up to 0.005 inch (0.13 mm) in depth and 2.0 inches (50.8 mm) in length and a minimum of 4.0 inches (101.6 mm) from all other damage.
2) Reject nicks or scores that are more than the limits.
(d) Disconnected Rivets
1) If you see up to 10 loose or fully disconnected rivets, repair to FRS 6187 in less than 50 hours of engine operation.
2) Repair more than 10 loose or disconnected rivets with FRS 6187 (AMM 78-11-04/801).
(e) Fully disconnected areas of skin.
1) Repair the C.N.A. in less than 50 hours of engine operation, areas of fully disconnected skin on the leading and trailing edge, with FRS 6187 (AMM 78-11-04/801).
2) Repair the areas of skin in other locations that are fully disconnected with FRS 6187 (AMM 78-11-04/801).
(f) Mounting Flange (Fig. 601)
1) Reject cracks or distortion.

S 226-013-R00

(4) Upper and lower support struts (Fig. 601).

(a) Nicks or scores

1) Accept nicks or scores up to 0.005 inch (0.13 mm) in depth and 2.0 inches (50.8 mm) in length that are less than 4.0 inches (101.6 mm) from all other damage.

2) Reject nicks or scores that are more than the limits.

(b) Dents

1) Accept smooth dents with a circular shape at the bottom, up to 0.02 inch (0.51 mm) in depth and 3.0 inches (76.2 mm) in diameter.

(c) Reject dents that are more than the limits.

(d) Repair the upper and lower support strut seals and seal carriers that are damaged, not fully disconnected or fully disconnected with FRS 6216 (AMM 78-11-04/801).

S 226-014-R00

(5) Rubbing Blocks (Fig. 601)

(a) Replace to FRS 6180 the rubbing blocks if there is a large quantity of damage (AMM 78-11-04/801).

(b) Fully disconnected rubbing blocks:

1) Accept up to two rubbing blocks fully disconnected.

2) Replace to FRS 6180 the rubbing blocks that are more than the limits (AMM 78-11-04/801).

S 226-015-R00

(6) C-duct compression strut support assembly (Fig. 602).

(a) Reject too much damage that can be easily seen.

(b) Accept cracks on one leg of the assembly.

(c) Reject cracks on each leg of the assembly.

S 226-016-R00

(7) Exit Nozzle (Fig. 601)

(a) Repair to FRS 3253 if there are areas of lightning strike damage that are no more than 0.25 inch (6.35 mm) in depth and if the areas have a total circumferential length of no more than 8.0 inches (203.2 mm) (AMM 70-42-11/201).

(b) Reject damage that is more than the limits.

(c) Exit Nozzle Trailing Edge - missing fasteners.
1) Accept maximum of three consecutive fasteners missing and no more than five fasteners missing in total and at least five installed fasteners between any missing fasteners/fastener groups. Replacement of fasteners required at next "a" check.
2) Repair immediately both circumferential splice joints (3 and 9 o'clock positions), if the adjacent three fasteners are loose or missing.
(d) Reject damage greater than the limits above.

S 226-017-R00
(8) C.N.A. Turbine Fuel Drain Tube (Fig. 602)
(a) If you see carbon particles in the fuel drain tube, do the steps that follow:
1) Remove the fuel drain tube (AMM 78-11-04/401).
2) Clean the fuel drain tube (AMM 70-20-02/201).
3) Install the fuel drain tube (AMM 78-11-04/401).

S 216-019-R00
(9) Mounting brackets for the C.N.A. turbine fuel drain tube (Fig. 602)
(a) All damage and cracks to the fuel drain tube mounting brackets, repair to FRS 6255 (AMM 78-11-04/801).

NOTE: A limit of 700 flight hours maximum is permitted before repair of the above damage, provided one bracket has no damage or cracks.

(b) If one or all of the mounting clips on the drain tube are broken, replace the tube (AMM 78-11-04/401).
(c) Damage to the fuel drain tube (AMM 71-71-02/601).

S 216-024-R00
(10) Honeycomb seal material in the exhaust nozzle.
(a) If unwanted honeycomb material is found in the exhaust nozzle, do the following steps:
1) Inspect the material to determine if it has a honeycomb shape.
a) If the material is shaped like honeycomb - do the next inspection of the material.
b) If the material is not shaped like honeycomb - reject the engine.
2) Examine the honeycomb to determine if it contains filler.
a) If the honeycomb contains filler - do the Turbine Inspection (AMM 72-00-00/601) and Performance Test (AMM 71-00-00/501). If the tests are satifactory, return the engine to service.
b) If the honeycomb does not contain filler - send the unwanted material to a material laboratory to be identified.

1. If the material lab finds that the honeycomb is from the seal segment - do the Turbine inspection (AMM 72-00-00/601) and Performance Test (AMM 71-00-00/501). If the tests are satisfactory, return the engine to service.
2. If the material lab finds that the honeycomb is not from the seal segment - reject the engine.

COMMON NOZZLE EXHAUST COLLECTOR - APPROVED REPAIRS

1. General
   A. This procedure contains eight tasks:

Paragraph Number	Repair Number	Title
2	FRS6180	Exhaust Collector - Common Nozzle Front Fairing - Replace Worn or Damaged Rubbing blocks
3	FRS6203	Exhaust Collector - Common Nozzle Assembly (CNA) - Outer Duct Repair
4	FRS6216	Exhaust Collector - Common Nozzle Assembly (CNA) - Replacement of the Inner Duct Seal and Seal Retainers
5	FRS6217	Exhaust Collector - Common Nozzle Assembly (CNA) - Replacement of the Outer Duct Seal and Seal Retainers
6	FRS6255	Exhaust Collector - Common Nozzle Assembly (CNA) - Install a New Fuel Drain Tube Bracket
7	FRS6187	Exhaust Collector - Common Nozzle Assembly (CNA) - Install a New Side Strut
8	FRS6205	Exhaust Collector - Common Nozzle Assembly (CNA) - Replace or Repair Damaged Nozzle Extension
9	FRS6300	Exhaust Collector - Common Nozzle Assembly (CNA) - Replace Outer Duct Seal

TASK 78-11-04-308-001-R00

2. Exhaust Collector - Common Nozzle Front Fairing - Replace Worn or Damaged Rubbing Blocks
   A. General
      (1) The repair in this procedure is FRS6180.
      (2) This repair procedure replaces the rubbing blocks when they are worn or damaged. New rubbing blocks are installed to replace the damaged rubbing blocks.

(3) This repair procedure is used to replace rubbing blocks on RB211-535E4 and E4B engines. Replace the rubbing blocks that have the part number that follows:

UL13010 SB 78-7404
UL13012 SB 78-7684
UL13022
UL13023 SB 78-7614 pt1
UL13024 SB 78-7614 pt2
UL13027 SB 78-7745 pt1
UL13028 SB 78-7745 pt2
JP55201 SB 78-7968

B. Equipment
(1) Standard workshop tools
(2) Drills and drilling equipment
(3) Hand rivet equipment
(4) Clamps

C. Parts
(1) Rubbing block, LJ76102 or LJ6161 (Item No. 1)
(2) Rivet, MS 20426B4-6 (Item No. 2)
(3) Shim stock, laminated MIL-S-22499
COMP 1, type II - Class 2.
Shim size 093 in. (2.36 mm) thick -
2.000 in. (50.80 mm) x 3.000 in. (76.20 mm) (Item No. 3)

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150
or Isopropyl alcohol OMat No. 1/40,
or cleaning solvent Desoclean OMat No. 1/257
(2) Lint-free cloth - Local resource
(3) Clean, cotton gloves - Local resource

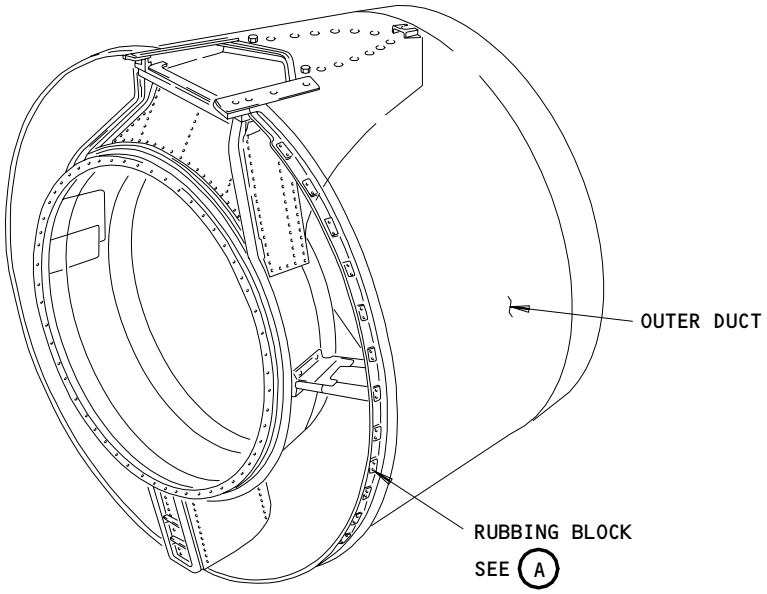
E. Replace a damaged or worn rubbing block on the fairing.

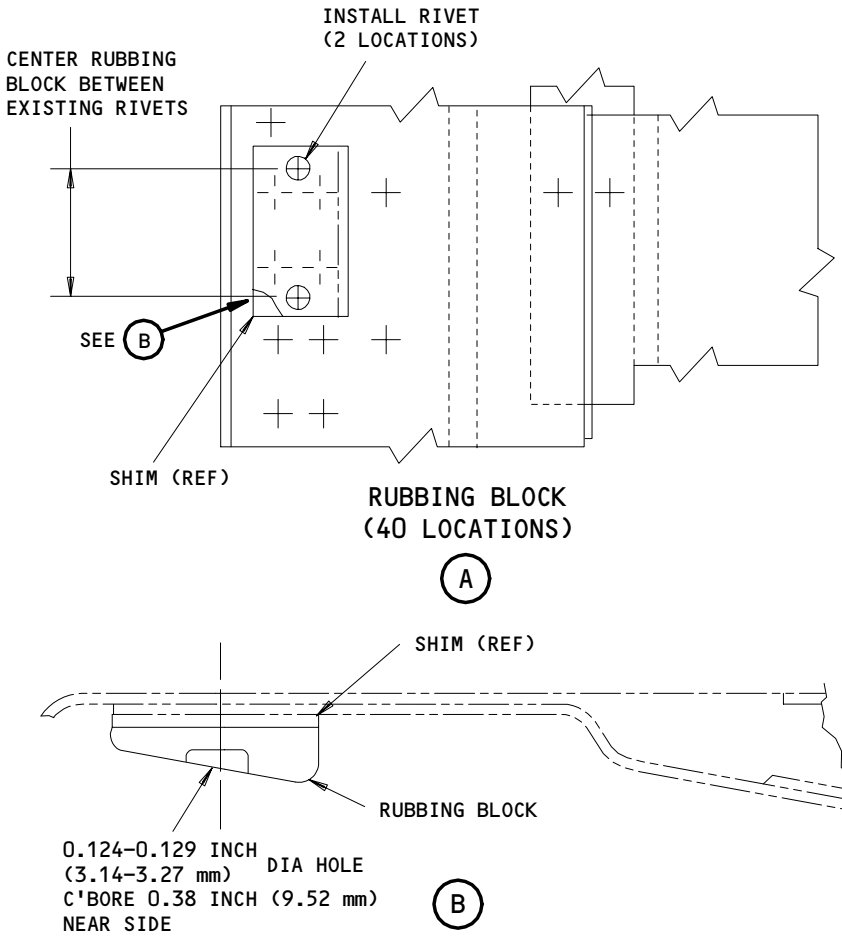
S 028-002-R00

(1) Remove the rubbing block that is damaged or worn (Fig. 801).
(a) Remove the rivets that keep the damaged rubbing block in position.

NOTE: Make sure the fairing surface is not damaged when the rivets are removed.

1) Use a drill and drilling equipment to remove the rivets.
(b) Keep the shim that is removed from the damaged rubbing block.
1) The shim that is kept can be used again.
(c) If the shim that is removed is damaged, make a new shim.
1) Use the laminated shim stock (Item 3).





Worn or Damaged Rubbing Block Replacement
Figure 801

S 428-003-R00

(2) Install a new rubbing block (Fig. 801).
  (a) Temporarily install the new rubbing block in the correct position on the fairing.
    1) Use clamps to keep the rubbing block in the correct position.
  (b) Drill rivet holes in the rubbing block.

    NOTE: Make sure the rivet holes in the fairing and the rubbing block align.

    1) Use drilling equipment and the correct drill for the rivet hole dimensions.
  (c) Remove the clamps and the rubbing block.
  (d) Counterbore the rivet holes in the rubbing block.
    1) Use the drilling equipment and a counterboring tool.
  (e) Degrease the repair area and the rubbing block.

    WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IMMEDIATELY IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

    1) Make a lint free cloth moist with degreasing fluid.
    2) Clean the repair area and the rubbing block.
      a) Make the repair area and the rubbing block dry before the fluid becomes a gas.
    3) Discard the dirty cloth.
  (f) Put the rubbing block (Item 1) in the correct position on the fairing.

    NOTE: Make sure all the rivet holes align.

  (g) Install the correct quantity of MS20426B4-6 rivets (Item 2) in the rivet holes.

    NOTE: Make sure the head of each rivet is .004 in. (0,12 mm) below the surface of the rubbing block.

    1) Use the hand riveting equipment.
  (h) Put back all the shims that were removed when the damaged rubbing block was removed.

S 218-004-R00

(3) Do a visual inspection of the rubbing block repair.
  (a) Do a visual inspection for loose rivets and irregular conditions on the repaired area.

S 938-005-R00

(4) Make a record of the repair.
  (a) Write FRS6180 adjacent to the part number.
    1) Use a permanent marker that can be easily seen on the surface adjacent to the part number.

TASK 78-11-04-308-006-R00

3. Exhaust Collector - Common Nozzle Assembly (CNA) - Outer Duct Repair

A. General

(1) The repair in this procedure is FRS6203.

(2) This procedure details the repair of the exhaust collector common nozzle assembly (CNA) outer duct.

(3) This procedure can be used to repair the CNA outer duct on RB211-535E4 and E4-B engines. Repair outer ducts which have the part numbers that follow:

LK88004	JP55201
LK88114	LK88065

(4) This approved repair has eleven procedures. The list of repair procedures are as follows:
  (a) Repair procedure 1 - Repair nick, scratch and gouge damage
  (b) Repair procedure 2 - Repair crack damage.
  (c) Repair procedure 3 - Repair dent, nick and rupture damage.
  (d) Repair procedure 4 - Repair an area of dents and gouges.
    1) The area of the group of dents and gouges must be less than 20 sq in. (130 sq cm) and be on one surface only.
    2) The damaged area that is not fully ruptured must be less than 2.000 sq in. (129.00 sq mm). Fully ruptured skins up to 1.600 in. (40.60 mm) in diameter can also be repaired.
  (e) Repair procedure 5 - Repair an area of dents and gouges.
    1) The area of the group of dents and gouges must be less than 20 sq in. (130 sq cm) and be on one surface only.
    2) The damaged area that is not fully ruptured must be larger than 2.000 sq in. (129.00 sq mm).
  (f) Repair procedure 6 - Repair large radius dents in the perforate skin.
  (g) Repair procedure 7 - Repair large radius dents in the solid skin.
  (h) Repair procedure 8 - Repair small areas of fully ruptured skin.
    1) Use this repair on ruptured skins where the damaged area is not more than 20 sq in. (130 sq cm). The ruptured area must have approximately equal damage to each skin surface.

(i) Repair procedure 9 - Repair small areas of fully ruptured skin.
1) The ruptured area must have damage that is not equal on each skin surface. Use this repair on ruptured skins where the damaged area is not more than 20 sq in. (130 sq cm).
(j) Repair procedure 10 - Repair the large areas of fully and not fully ruptured skin.
1) The ruptured area must have damage that is not equal on each skin surface. The damaged area must be more than 20 sq in. (130 sq cm) and more than 3.000 in. (76.00 mm) from all other repairs. The damage must be of an applicable area to permit the use of LJ76197 bond panel (Item 7) for the repair.
(k) Repair procedure 11 - Repair the large areas of fully ruptured skin where the two skins have approximately equal damage.
1) The damaged area must be more than 20 sq in. (130 sq cm) and more than 3.000 in. (76.00 mm) from all other repairs on the same surface.

B. Equipment
(1) Workshop tools.
(2) Drills and drilling equipment.
(3) Riveting equipment.
(4) Metal routing equipment.
(5) Portable grinding equipment and grinding discs.
(6) Hi-Lok tools.
(7) Metal cutters.
(8) Heat lamps (explosion proof).

C. Parts
(1) Rivet (RR101824)
CR3555-4-1
(2) Pin, Hi-Lok (RR1012846)
HL568-5-750
(3) Sleeve, Hi-Lok (RR1012823)
HC32-5-650
(4) Collar, Hi-Lik (RR1012822)
HL597-5
(5) Skin, perforated
LJ76195
(6) Core, titanium
LJ76196
(7) Panel, repair (Rohrbond)
LJ76197
(8) Rivet (RR1013866)
CR3555-4-2
(9) Rivet (RR1013867)
CR3555-4-3
(10) Rivet (RR1013868)
CR3556-4-1
(11) Rivet (RR1013869)
CR3552-4-1
(12) Titanium sheet alloy TI-6AL-4V per AMS4911, 0.020 in. (0.508 mm)

D. Consumable Materials
   (1) Degreasing fluid, Acetone OMat No. 150
       or Isopropyl alcohol OMat No. 1/40,
       or cleaning solvent Desoclean OMat No. 1/257
   (2) Adhesive, 2 pack
       British Spec/Ref - Hysol EA934NA
       OMat No. 8/52
   (3) Silicon carbide paper disc, waterproof
       grade 150 - OMat No. 5/82
   (4) Lint-free cloth - Local resources

E. Repair the Common Nozzle Assembly (CNA) Outer Duct (Nick, scratch and gouge damage)

   NOTE: This repair procedure is written in two parts. Part 1 details the repair of nick, scratch and gouge damage that is less than 0.010 in. (0.25 mm) in depth. Damage can be repaired up to 10.000 in. (254.00 mm) in length and 0.100 in. (2.50 mm) in width. Part 2 details the repair of scratches and gouges that are more than 0.010 in. (0.25 mm) in depth. Damage can be repaired up to 10.000 in. (254.00 mm) in length and 0.100 in. (2.54 mm) in width.

   S 328-007-R00

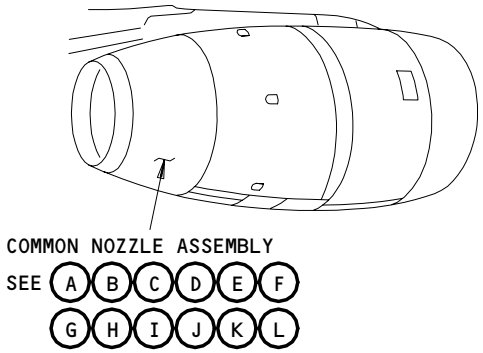
   (1) Part 1 - Repair nick and scratch damage.

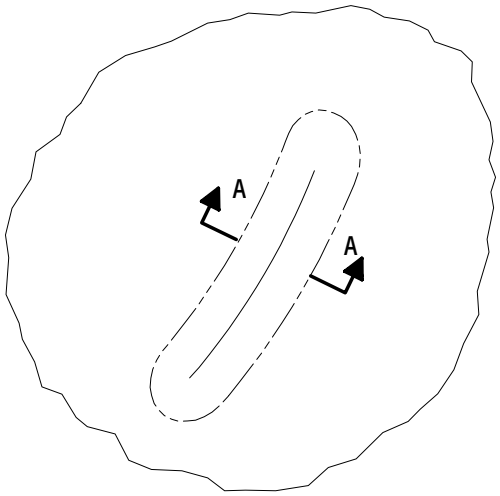
      CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

      ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

      IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

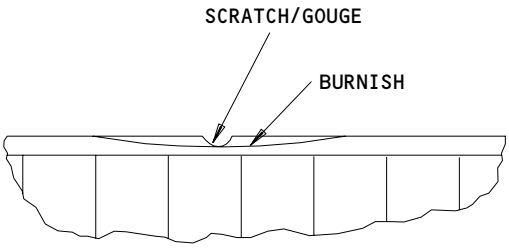
      (a) Use hand tools to polish the damaged area.
          1) Polish to a width that is equivalent to between 40 and 100 times the depth of the nick or scratch damage.





SCRATCH REPAIR

(A)



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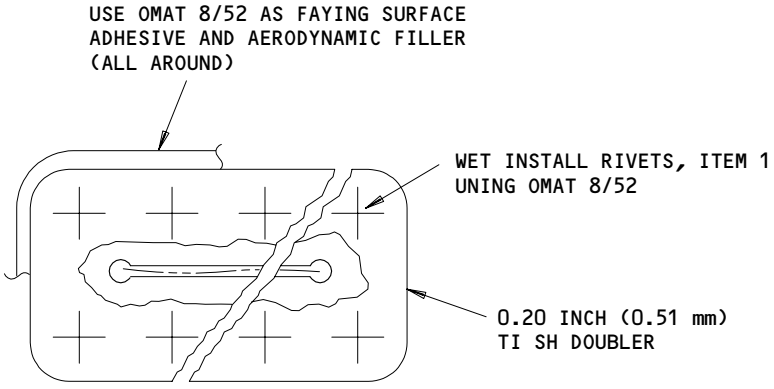

CRACK REPAIR

(B)

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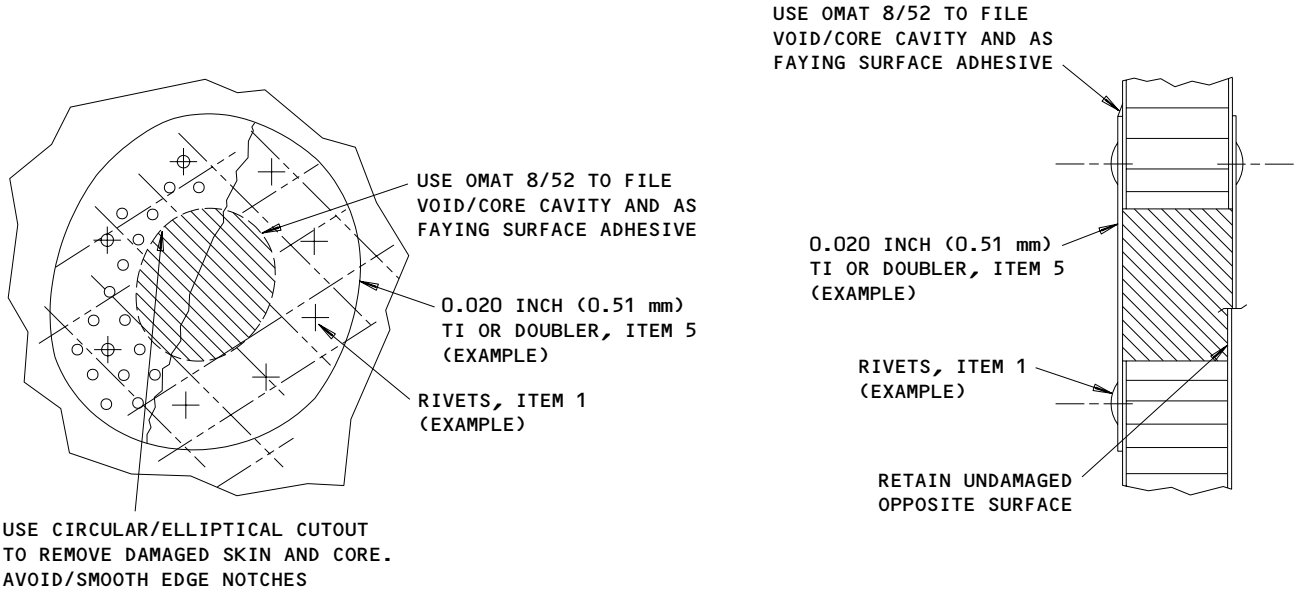
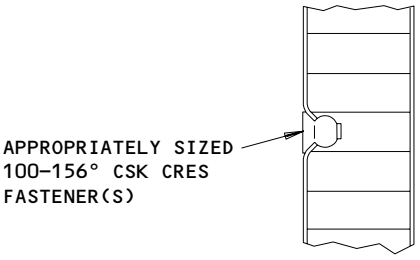
Common Nozzle Assembly – Outer Duct Repair
Figure 802 (Sheet 1)



FULL PENETRATION LIMIT: 1.6 INCHES (40.6 mm) MAXIMUM DAMAGE DIAMETER
PARTIAL PENETRATION LIMIT: 2.0 SQUARE INCHES (126 SQUARE mm) MAXIMUM AREA
SMALL AREA REPAIRS

(C)



(D)

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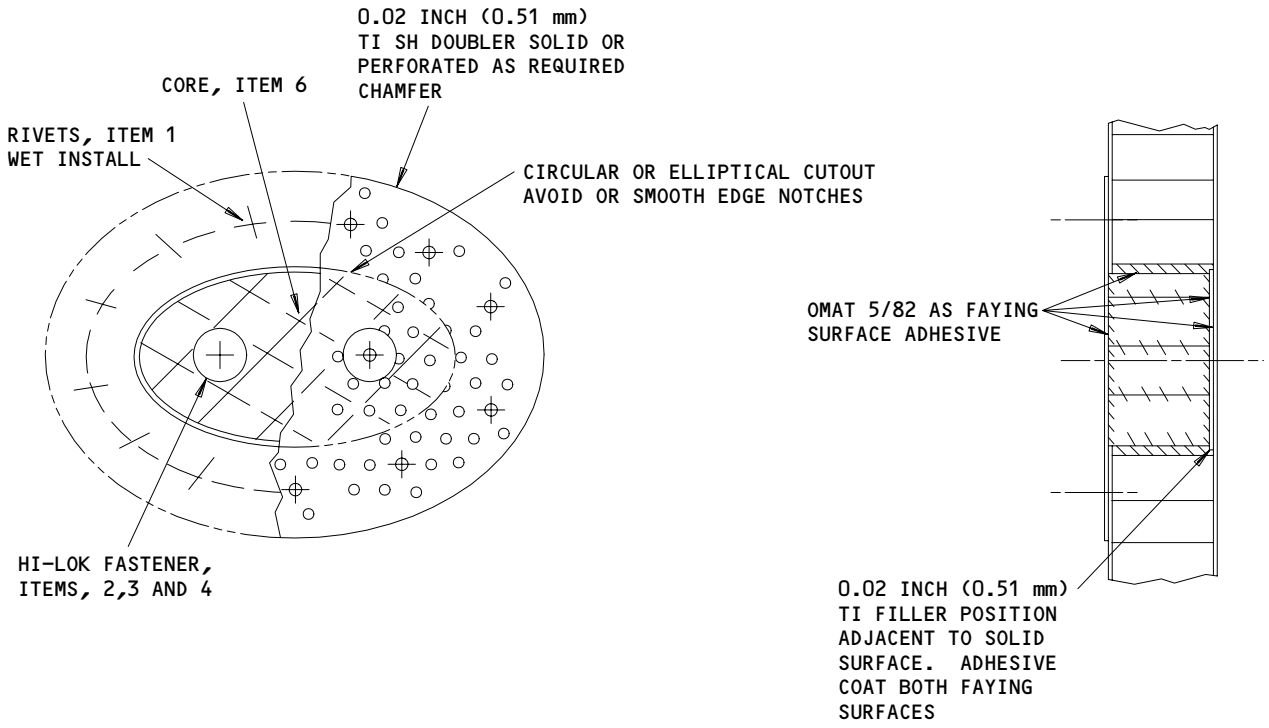
Common Nozzle Assembly - Outer Duct Repair
Figure 802 (Sheet 2)

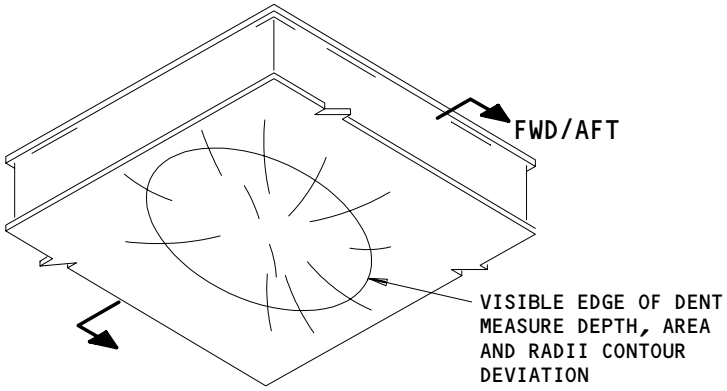


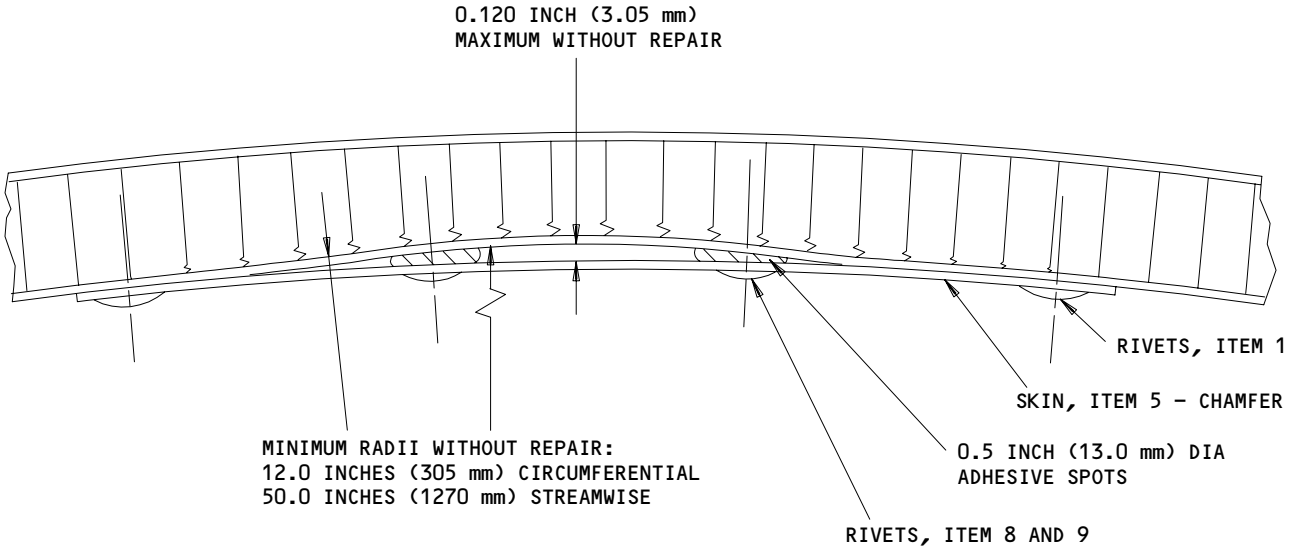
SMALL AREA PARTIAL PENETRATION REPAIR
PERFORATED OR SOLID SURFACES
LIMITED TO 20 SQUARE INCHES (1300 SQUARE mm) MAXIMIM DAMAGED AREA

(E)

62417

Common Nozzle Assembly - Outer Duct Repair
Figure 802 (Sheet 3)



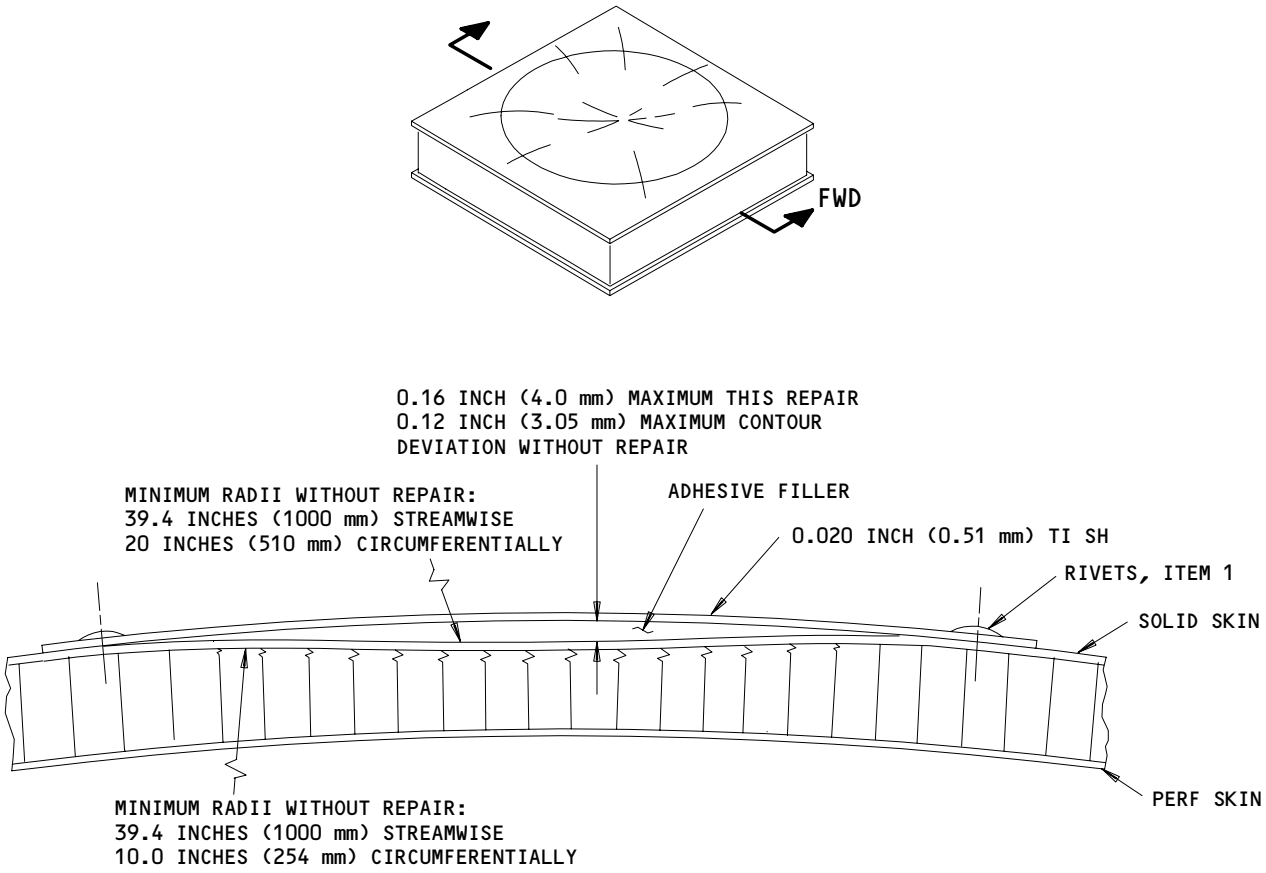


DENT INSPECTION AND REPAIR – PERFORATED SKIN

(F)

62418

Common Nozzle Assembly – Outer Duct Repair
Figure 802 (Sheet 4)

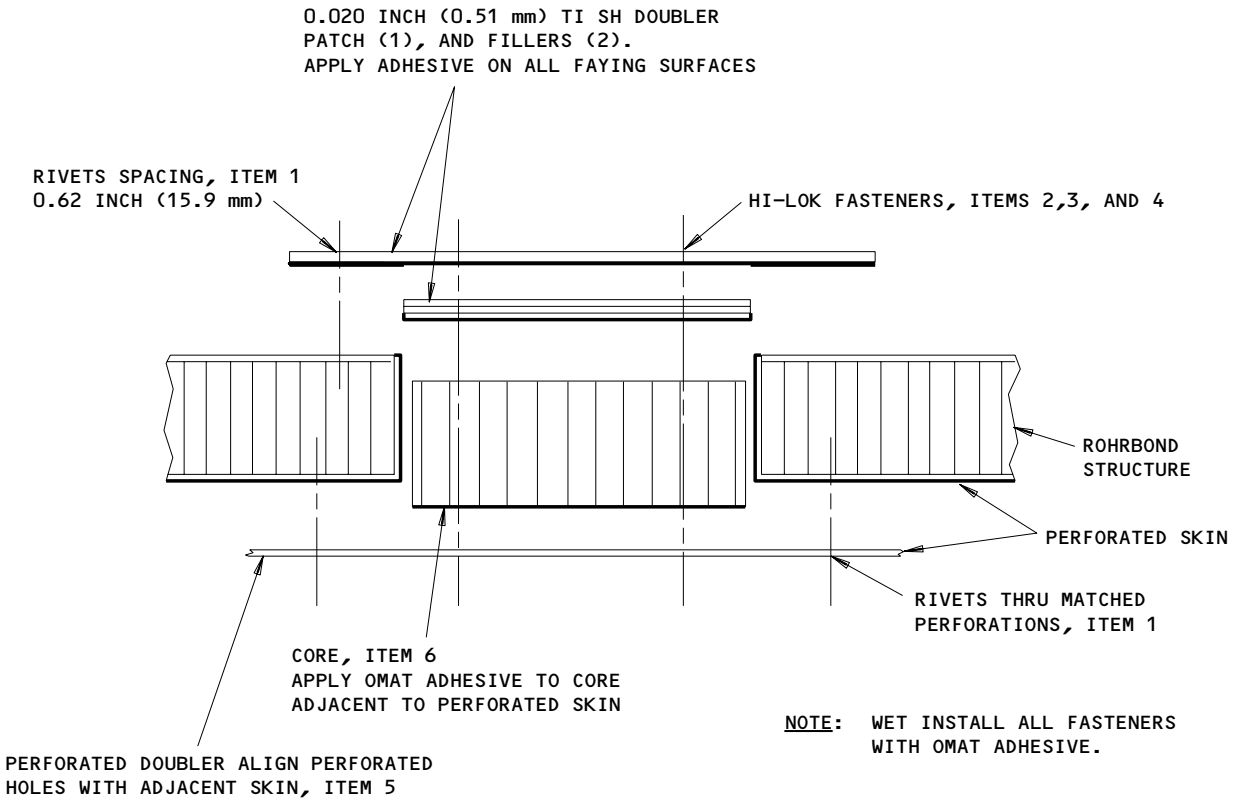


OUTER SURFACE DENT REPAIRS 50 SQUARE INCHES (3250 SQUARE mm) MAXIMUM DAMAGE AREA

(G)

62419

Common Nozzle Assembly – Outer Duct Repair
Figure 802 (Sheet 5)

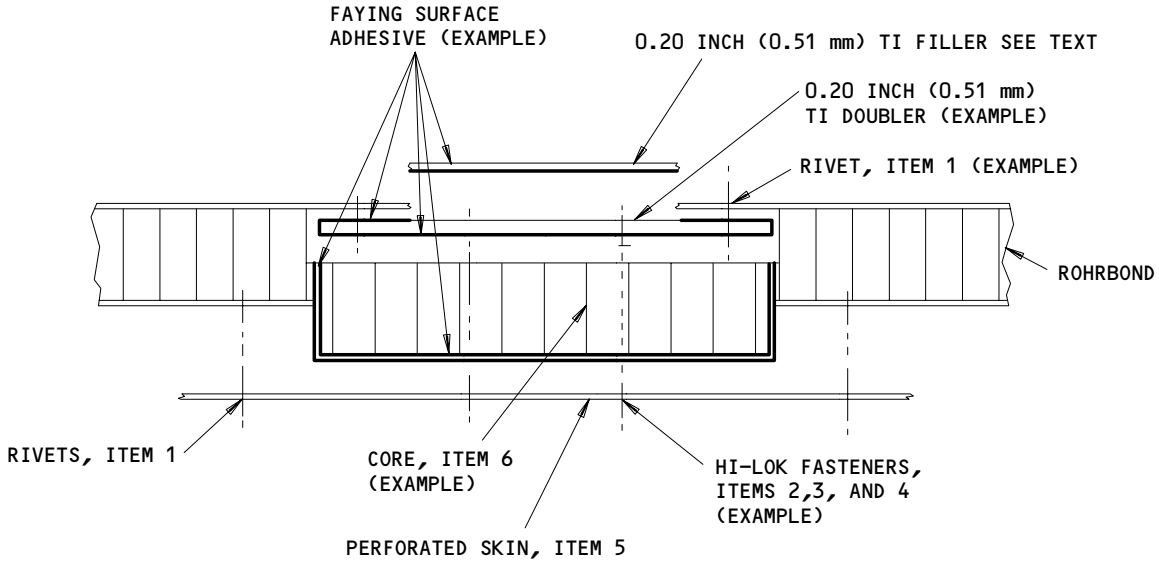


SMALL "FULL PENETRATION" REPAIR

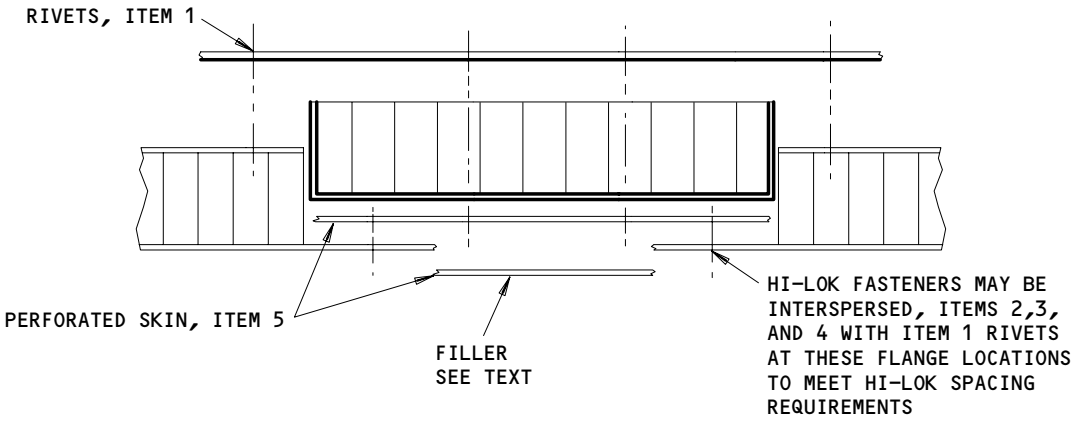
(H)

62383B

Common Nozzle Assembly - Outer Duct Repair
Figure 802 (Sheet 6)



NOTE: MAJOR DAMAGE TO INSIDE PERFORATED SURFACE.



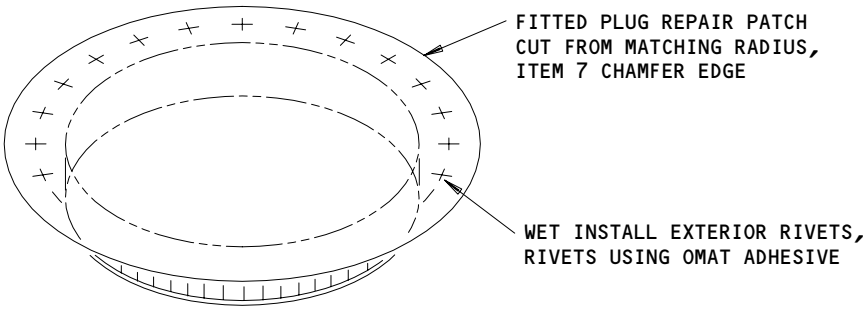
NOTE: MAJOR DAMAGE TO OUTER SOLID SKIN.

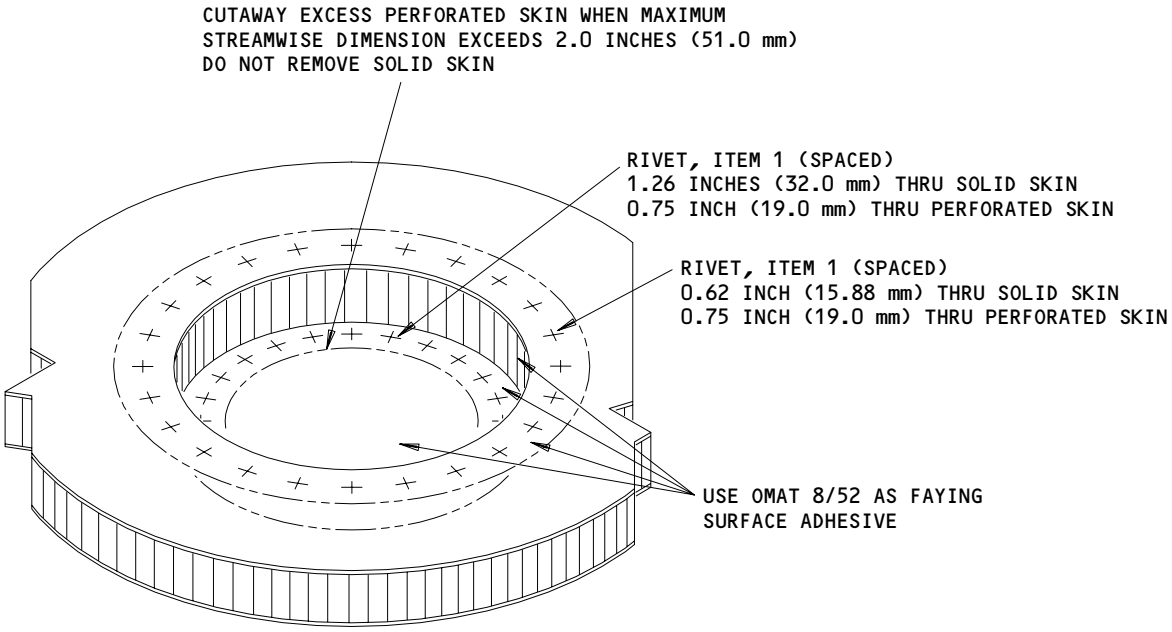
FULL PENETRATION DAMAGE REPAIRS FOR UNEQUAL SURFACE DAMAGE
APPROXIMATE 20 SQUARE INCHES (1300 SQUARE mm) MAXIMUM DAMAGE AREA

(I)

62420

Common Nozzle Assembly - Outer Duct Repair
Figure 802 (Sheet 7)



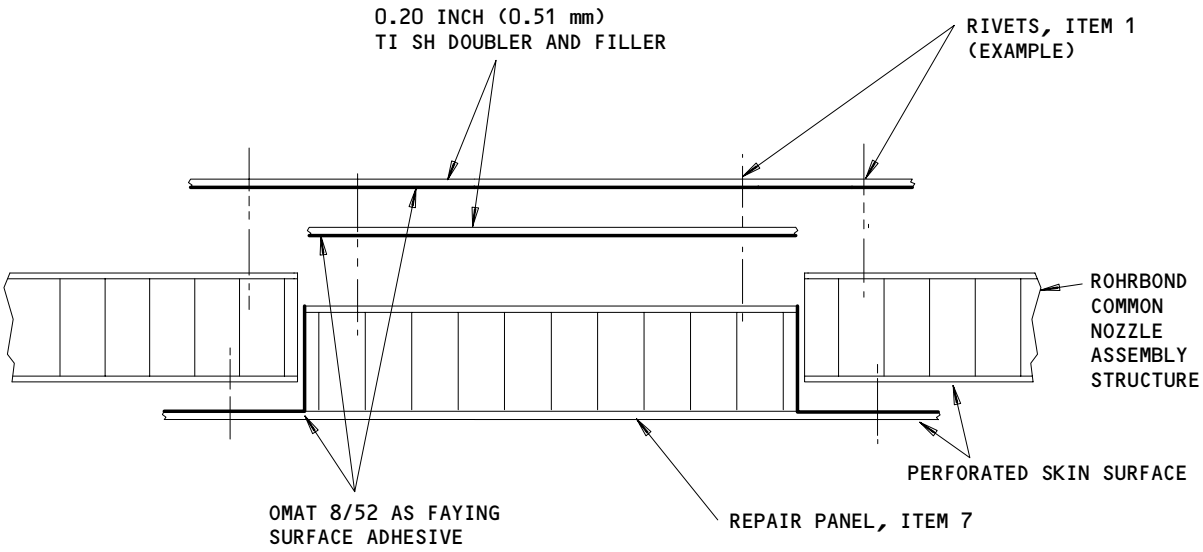


UNEQUAL SURFACE DAMAGE LARGE PENETRATION REPAIR

(J)

62382B

Common Nozzle Assembly – Outer Duct Repair
Figure 802 (Sheet 8)



K

62421

Common Nozzle Assembly – Outer Duct Repair
Figure 802 (Sheet 9)

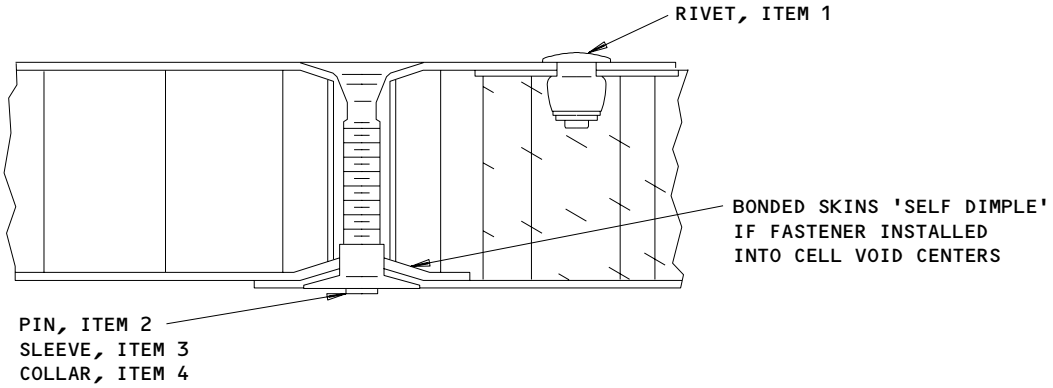
BLIND RIVET - "UNISINK", ITEM 1

	SOLID SKIN	PERFORATED SKIN
DRILL SIZE	0.143-0.146 INCH (3.63-3.71 mm)	SAME
COUNTERSINK DIA	0.163-0.168 INCH (4.14-4.27 mm) x 100°	SAME
SPACING RANGE	0.56-0.78 INCH (14.22-19.81 mm)	0.55-1.10 INCH (13.97-27.9 mm)
AVERAGE SPACING	0.625 INCH (15.75 mm)	0.75 INCH (19.05 mm)
EDGE DISTANCE	0.31-0.38 INCH (7.87-9.65 mm)	0.40-0.46 INCH (10.16-11.68 mm)

CHAMFER PATCH EDGES 0.010x0.060 INCH (0.25x1.52 mm)
WET INSTALL FASTENER HEADS.
SEAL EXTERNAL FAYING SURFACES, AND AERODYNAMICALLY SMOOTH ALL EDGES.

HI-LOK HONEYCOMB REPAIR ASSEMBLY

	SOLID SKIN	PERFORATED SKIN
DRILL SIZE	0.170-0.173 INCH (4.32-4.39 mm)	SAME
DIMPLE SIZE	0.434-0.460 INCH (11.02-11.68 mm) DIA x 156°	SAME
SPACING RANGE	1.18-2.52 INCH (30.00-64.00 mm) SEE TEXT	SAME
EDGE DISTANCE - MIN	0.40 INCH (10.16 mm)	SAME
COLLAR FLUSHNESS (TO SKIN)	+0.004 TO -0.006 INCH (+0.101 TO -0.152 mm)	
PIN END FLUSHNESS (TO COLLAR) (BEFORE STAKING)	-0.30 TO +0.10 INCH (-0.76 TO +0.25 mm)	



DIMPLE SKIN(S)
INSTALL PARTS WET WITH ADHESIVE
TORQUE COLLAR FLUSH TO SHEAROFF
STAKE THREADS STAKE DIMENSIONS: 0.125-0.140x0.040-0.060 INCH
(3.18-3.56x1.0-1.51 mm)

FASTENER AND PATCH INSTALLATION DATA
(UNLESS NOTED OTHERWISE)

(L)

62381A

Common Nozzle Assembly - Outer Duct Repair
Figure 802 (Sheet 10)

2) Do not change the depth of the nick or scratch (Fig. 802 Sheet 1).

(b) Do a visual inspection of the repaired area (Fig. 802 Sheet 1).

(c) Write the repair number FRS6203 next to the nameplate when this repair procedure is completed.

1) Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

S 328-008-R00

(2) Part 2 - Repair scratch and gouge damage

WARNING: THE GRINDING PROCEDURE MAKES DUST PARTICLES. YOU MUST WEAR A DUST MASK AND EYE PROTECTION WHEN YOU DO THIS PROCEDURE. DO NOT LET THE DUST PARTICLES GET IN YOUR LUNGS OR EYES. IF THIS INSTRUCTION IS NOT OBEYED, INJURY WILL OCCUR.

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(a) Identify the area where damage is more than 0.010 in. (0.25 mm) in depth.

(b) Use grinding equipment and grinding discs to polish the damaged area.

1) Polish to a width that is equivalent to between 40 and 100 times the depth of the scratch or gouge.

2) Make smooth the sides of the scratch or gouge that are inside the limit of the rivet holes.

3) Polish an area to the equivalent of a minimum of 10 times the depth of the scratch or gouge.

4) Smooth this area in to the scratch or gouge (Fig. 802 Sheet 1).

(c) Make a doubler to cover the prepared area.

1) Use a 0.020 in. (0.508 mm) titanium sheet (Item 12) and metal cutters to make the doubler (Fig. 802 Sheet 1).

(d) Put the doubler on the prepared area.

NOTE: When perforate skin is repaired, make the doubler rivet holes align with the holes in the skin.

1) Make sure the doubler is held tightly in position.

2) Make a mark to identify the rivet hole positions on the doubler.
3) The distance from the rivet hole positions to the edge of the prepared area must be a minimum of 0.210 in. (5.33 mm) (Fig. 802 (Sheets 1 and 10).

(e) Drill the rivet holes in the repair area (Fig. 802 Sheets 1 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

1) Get the correct quantity of CR3555-4-1 rivets (Item 1).
2) Get the correct drill for the rivet holes.
3) Drill and countersink the rivet holes in the correct positions with the drilling equipment.
4) Remove the doubler from the repair area.
5) Use hand tools to deburr the rivet holes.
6) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

7) Make a lint free cloth moist with degreasing fluid.
8) Swab degrease the repair area.
   a) Make the repair area dry before the liquid becomes a gas.
9) Discard the dirty cloth after use.

NOTE: If an external (solid skin) doubler repair is to be done, an adhesive must be used. It is important that the repair area is kept clean before the adhesive is applied.

(f) Prepare and apply the adhesive (Fig. 802 Sheet 1).

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

1) Get the two part adhesive.
   a) Mix the grey paste before it is weighed out.
2) Weigh out 100 parts of adhesive.
3) Weigh out 33 parts of amber liquid.
4) Mix the paste and liquid.

   NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

   a) Make sure the adhesive is mixed sufficiently.
5) Apply the adhesive to the repair area.
   a) The adhesive layer must be 0.005-0.024 inch (0.13-0.61 mm) thick.
   b) Apply the adhesive with a spatula or a palette knife.

(g) Install the doubler (Fig. 802 Sheets 1 and 10).
1) Put the doubler on the repair area. Make sure the rivet holes align correctly.
2) Install the CR3555-4-1 rivets (Item 1). Use the riveting equipment.
3) Use a lint free cloth to clean the area around the doubler. Make a small quantity of adhesive smooth around the edge of the doubler (Fig. 802 Sheet 1).

   NOTE: A small quantity of smooth adhesive around the doubler can be used to get a good airflow over the doubler.

(h) Cure the adhesive.
1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

(i) Do a visual inspection of the repaired area (Fig. 802 Sheets 1 and 10).

S 938-009-R00

(3) Record the repair.

(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

F. Repair the CNA Outer Duct - Repair procedure 2 (Crack damage)

S 238-151-R00

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(1) Do a test for cracks.

(a) Do a water washable fluorescent penetrant crack test to identify the length of the cracks in the duct surface.

S 358-011-R00

(2) Stop drill and rout the crack (Fig. 802 Sheet 1).

(a) Use the drilling equipment and a 0.177-0.197 in. (4.50-5.00 mm) diameter drill to stop drill each end of the crack.

(b) Use a routing tool that is 0.080-0.093 in. (2.03-2.36 mm) in diameter to rout the crack open. The routing tool must not go more than 0.100 in. (2.54 mm) in to the core material.

S 358-012-R00

(3) Make a doubler (Fig. 802 Sheet 1).

(a) Make a doubler to cover the repair area. Use 0.020 in. (0.508 mm) titanium sheet (Item 12) and metal cutters to make the doubler.

NOTE: For perforate skin repair, use LJ76195 perforate skin (Item 5) for the doubler.

S 358-013-R00

(4) Drill the rivet holes (Fig. 802 Sheets 1 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Put the doubler on the repair area. Make sure the doubler is held tightly in the correct position on the repair area.
(b) Make a mark to identify the positions of the rivet holes on the doubler. Refer to Fig. 802 Sheet 10 for the limits to which the rivet hole positions must be kept. Get the correct quantity of CR3555-4-1 rivets (Item 1).

NOTE: On perforate skin repairs, align the rivet hole positions with the holes in the skin and the spaces in the duct material.

(c) Use drilling equipment to drill the rivet holes. Refer to Fig. 802 Sheet 10 for the correct drill for the rivet holes.

S 358-014-R00

(5) Deburr the rivet holes.
(a) Remove the doubler from the repair area.
(b) Deburr the rivet holes in the doubler and duct surface.

S 118-015-R00

(6) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Swab degrease the repair area. Make the repair area dry before the liquid becomes a gas.

(c) Discard the dirty cloth after use.

NOTE: If an external (solid skin) doubler repair is to be done, an adhesive must be used. It is important that the repair area is kept clean before the adhesive is applied.

S 358-016-R00

(7) Prepare and apply the adhesive to external (solid skin) repairs only (Fig. 802 Sheets 1 and 10).

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of the grey paste. Weigh out 33 parts of amber liquid.
(c) Mix the paste and liquid. Make sure the compound is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

(d) Apply the adhesive to the external repair area only. The adhesive layer must be 0.005-0.024 in. (0.13-0.61 mm) thick. Apply the adhesive with a spatula or palette knife.

S 358-017-R00

(8) Install the doubler (Fig. 802 Sheets 1 and 10).
(a) Put the doubler on the repair area. Make sure the rivet holes in the duct surface and doubler align.
(b) Install the CR3555-4-1 rivets (Item 1). Use the riveting equipment.

(c) Use a lint free cloth to clean the area around the doubler. Make a small quantity of adhesive smooth around the edge of the doubler.

NOTE: A small quantity of smooth adhesive around the doubler can be used to get a good airflow over the doubler.

(d) Cure the adhesive.
1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.
Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

S 218-018-R00
(9) Do a visual inspection of the repaired area Fig. 802 Sheets 1 and 10).

S 938-019-R00
(10) Record the repair.
(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent maker that can be easily seen on the surface adjacent to the nameplate.

G. Repair the CNA Outer Duct - Repair procedure 3 (dent, nick and rupture damage)

NOTE: This procedure details the repair of small holes, dents and nicks to one surface only. The damage is filled with a rivet of an applicable dimension.

S 358-020-R00
(1) Prepare the repair area.

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Get a rivet that is the correct dimension to do the repair. Use one of the rivets that follow:

CR3555-4-1 (Item 1),
CR3556-4-1 (Item 10) or
CR3552-4-1 (Item 11)

(b) Get the correct drill for the applicable rivet. Use the drilling equipment to drill the rivet hole in the damaged area.

S 358-021-R00

(2) Install the rivet (Fig. 802 Sheet 2).

NOTE: If a repair to the external surface is to be done, an adhesive must be used.

(a) Prepare and apply the adhesive.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

1) Get the two part adhesive. Mix the grey paste before it is weighed out.
2) Weigh out 100 parts of grey paste. Weigh out 33 parts of the amber liquid.
3) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

4) Apply the adhesive to the repair area. Use a palette knife to apply the adhesive.

(b) Use riveting equipment to install the rivet in the prepared area.

S 218-022-R00

(3) Do a visual inspection of the repaired area (Fig. 802 Sheet 2).

S 938-023-R00

(4) Record the repair.

(a) Write FRS6203 adjacent to the nameplate when this repair procedure is completed. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

H. Repair the CNA Outer Duct - Repair procedure 4 Small areas of dents that have large depths, gouges and duct material that is not fully ruptured.

NOTE: This repair can be done on external (solid) or internal (perforate) duct materials. This repair procedure can also be used for fully ruptured skins up to 1.600 in. (40.60 mm) in diameter.

S 358-134-R00

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(1) Remove the damaged duct material (Fig. 802 Sheet 2).

(a) Use metal routing equipment and sawing equipment to remove the damaged area of the duct.

NOTE: Make sure the external edge of the repair area has no rough edges.

S 358-025-R00
(2) Make a doubler.

NOTE: If the doubler is for an external surface repair, use 0.020 in. (0.508 mm) titanium sheet (Item 12). If the doubler is for an internal surface repair, use LJ76195 perforate skin (Item 5).

(a) Make a doubler the correct dimension to sufficiently cover the repair area. Use metal cutters.

NOTE: If the doubler is made of LJ76195 perforate skin (Item 5), make the holes in the duct and doubler align.

(b) Chamfer the edges of the doubler.

S 358-026-R00
(3) Drill the rivet holes (Fig. 802 Sheets 2 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Put the doubler in the correct position on the repair area. Make sure the doubler is held tightly in position.
(b) Make a mark to identify the positions of the rivet holes on the doubler.
(c) Get the correct quantity of CR3555-4-1 rivets (Item 1). Get the correct drill for the rivet holes. Use the drilling equipment to drill the rivet holes.
(d) Remove the doubler and deburr the rivet holes. Use workshop tools.

S 118-027-R00
(4) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Swab degrease the repair area. Make the repair area dry before the liquid becomes a gas.
(c) Discard the dirty cloth after use.

NOTE: It is important that the repair area is kept clean before the adhesive is applied.

S 358-028-R00

(5) Prepare and apply the adhesive (Fig. 802 Sheet 2).

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.
(c) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept a 22°C (72°F), use in less than one hour.

(d) Apply the adhesive to the repair area.

NOTE: Use a palette knife to apply the adhesive to the prepared area of the outer duct surface.

Use the adhesive to fill the space in the duct below the doubler.

On perforate skin repairs, use the adhesive to fill the space in the duct. Do not get adhesive on the perforated skin.

S 358-029-R00

(6) Install the doubler (Fig. 802 Sheets 2 and 10).

(a) Put the doubler on the repair area. Make sure the rivet holes in the duct surface and doubler align.

(b) Install the correct quantity of CR3555-4-1 rivets (Item 1). Use the riveting equipment.

(c) Use a lint free cloth to clean the area around the doubler. Make a small quantity of adhesive smooth around the edge of the doubler.

NOTE: A small quantity of smooth adhesive around the doubler can be used to get a good airflow over the doubler.

(d) Cure the adhesive.

1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

S 218-030-R00

(7) Do a visual inspection of the repaired area (Fig. 802 Sheet 2).

S 938-031-R00

(8) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

I. Repair the CNA Outer Duct - Repair procedure 5 Small areas of dents that have large depths, gouges and duct material that is not fully ruptured.

NOTE: This repair can be done on external (solid) or internal (perforate) duct materials.

S 358-135-R00

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(1) Remove the damaged duct material (Fig. 802 Sheet 3).
  (a) Use metal routing and sawing equipment to remove the damaged duct material.

NOTE: Make sure the external edge of the repair area has no rough edges.

S 358-033-R00

(2) Remove the damaged core.
  (a) Remove the damaged core so that 0.010 in. (0.25 mm) of the metal bead remains.

NOTE: The bead material that remains will be attached to the opposite duct skin.

S 358-034-R00

(3) Make and install a filler (Fig. 802 Sheet 3).
  (a) Use 0.020 in. (0.508 mm) titanium sheet (Item 12) to make a filler. Make the filler to the correct dimensions to fit between the new core and the solid skin. Use metal cutters.
  (b) Temporarily install the filler.

S 358-035-R00

(4) Make and install a new core (Fig. 802 Sheet 3).
  (a) Use LJ76196 titanium core (Item 6) to make a new core to the shape that is required to do the repair. Use workshop tools.

(b) Install the new core temporarily.

S 358-036-R00

(5) Make a doubler (Fig. 802 Sheet 3).

NOTE: If the doubler is for an external surface repair, use 0.020 in. (0.508 mm) titanium sheet (Item 12). If the doubler is for an internal surface repair, use LJ76195 perforate skin (Item 5).

(a) Make the doubler the correct dimensions to sufficiently cover the repair area. Use metal cutters.

NOTE: If the doubler is made from LJ76195 perforate skin (Item 5), make the holes in the duct and doubler align.

(b) Chamfer the edges of the doubler.

S 358-037-R00

(6) Drill the rivet and Hi-Lok fastener holes (Fig. 802 Sheets 2, 3 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Put the repair doubler in the correct position on the repair area.
(b) Make a mark to identify the positions of the rivet holes on the doubler.
(c) Get the correct quantity of CR3555-4-1 rivets (Item 1). Get the correct drill for the rivet holes. Use the drilling equipment to drill the rivet holes.

(d) Make a mark to identify the positions of the Hi-Lok fastener holes. Make sure the positions of the Hi-Lok fastener holes align with the internal spaces in the duct structure.

NOTE: If the repair is on perforate skin, make the fastener hole positions align with the holes in the material surface. Also align the fastener hole positions with the internal spaces in the duct structure.

When it is necessary to use a large doubler, put the Hi-Lok fastener hole positions in the shape of a triangle.

If the width of the damage is more than 1.650 in. (42.00 mm), use one row of Hi-Lok fasteners. If the width of the damage is more than 2.800 in. (71.00 mm), use 2 rows of Hi-Lok fasteners. If the width of the damage is more than 4.000 in. (101.00 mm) use 3 rows of Hi-Lok fasteners.

(e) Get the correct quantity of HL568-5-750 Hi-Lok pins (Item 2), HC32-5-650 Hi-Lok sleeves (Item 3) and HL597-5 Hi-Lok collars (Item 4). Get the correct drill for the fastener holes. Use the drilling equipment to drill the Hi-Lok fastener holes.

NOTE: Make sure the holes go through the external and internal duct surfaces.

(f) Remvoe the doubler and use workshop tools to deburr the rivet and fastener holes in the doubler.

S 358-038-R00

(7) Recess the Hi-Lok fastener holes on each side of the duct skin and doubler (Fig. 802 Sheet 10).
(a) Make a small recess around each Hi-Lok fastener hole. The recess must be the correct shape to accept each end of the fastener.

S 358-039-R00

(8) Make a check of the fit between the Hi-Lok fasteners, doubler and the prepared area of the duct (Fig. 802 Sheet 10).
(a) Put the doubler in the correct position on the repair area. Make sure the doubler is held tightly in position.
(b) Install the HC32-5-650 Hi-Lok sleeves (Item 3). Use grinding equipment to grind the sleeves to the correct installation height.

(c) Remove the sleeves from the repair area. Remove the doubler from the repair area.

S 118-040-R00

(9) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Swab degrease the repair area. Make the repair area dry before the liquid becomes a gas.
(c) Discard the dirty cloth.

NOTE: It is important that the repair area is kept clean before the adhesive is applied.

S 358-041-R00

(10) Prepare and apply the adhesive (Fig. 802 Sheet 3).

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.

(c) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

(d) Apply adhesive to the repair area.

NOTE: Remove the new core and the filler from the repair area. Apply a thin layer of adhesive to each side of the filler. Put the filler in the correct position in the repair. Apply a thin layer of adhesive to the bottom face of the new core. Put the core in the correct position in the repair.

If perforate skin is used for the repair, do not apply adhesive to the surfaces of the perforate skin.

1) Put the adhesive in the space between the core and the outer duct material. Make sure the adhesive gets to the depth of the filler.
2) If the repair is done on the external skin, apply adhesive to the external repair area. Make sure it covers the external repair area. Use a palette knife.

S 358-042-R00

(11) Install the doubler (Fig. 802 Sheet 3 and 10).
(a) Put the doubler in the correct position on the repair area. Make sure all the holes align correctly.
(b) Install the Hi-Lok fasteners. Use Hi-Lok tools.
(c) Install the CR3555-4-1 rivets (Item 1). Use the riveting equipment.
(d) Use a lint free cloth to clean the area around the doubler. Make a small quantity of adhesive smooth around the edge of the doubler.

NOTE: A small quantity of smooth adhesive around the doubler can be used to get a good airflow over the doubler.

(e) Cure the adhesive.
1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

S 218-043-R00

(12) Do a visual inspection of the repaired area (Fig. 802 Sheets 3 and 10).

S 938-044-R00

(13) Record the repair.

(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

J. Repair the CNA Outer Duct - Repair procedure 6 (Large radius dents in the perforate skin)

NOTE: The limits of perforate skin damage are shown in Fig. 802 (Sheet 4). This repair can only be used to repair damage to these limits.

The dent area must not contain crack, gouge or other damage that has not had a repair done to it.

The damaged area must not be more than 50 sq in. (325 sq cm).

S 118-045-R00

(1) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.

(b) Swab degrease the repair area. Make the repair area dry before the liquid becomes a gas.
(c) Discard the dirty cloth.

S 358-046-R00
(2) Make a doubler (Fig. 802 Sheet 4 and 10).
(a) Use LJ76195 perforate skin (Item 5) to make the doubler. Use metal cutters.

NOTE: Make the small holes in the surface of the doubler and duct material align.

S 938-047-R00
(3) Make a mark to identify the positions of the outer rivet holes (Fig. 802 Sheets 4 and 10).
(a) Put the doubler in the correct position on the damaged area. Make sure the doubler is held tightly.
(b) Make a mark to identify the outer hole positions for the CR3555-4-1 rivets.

NOTE: The CR3555-4-1 rivets must engage in the duct material that is not damaged.

The rivet hole positions must be 0.750-0.940 in. (19.00-24.00 mm) apart. Make the rivet hole positions and the holes in the perforate skin align.

S 358-048-R00
(4) Drill and countersink the outer rivet holes (Fig. 802 Sheet 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Get the correct drill for the rivet holes. Use drilling equipment to drill the doubler and duct material. Countersink the doubler rivet holes.

S 938-049-R00

(5) Identify the positions of the inner rivet holes (Fig. 802 Sheets 4 and 10).

(a) Make a mark to identify the inner rivet hole positions on the doubler.

NOTE: Put the inner rivet hole positions in the shape of a triangle.

The inner rivet hole positions must be 1.200-2.000 in. (30.50-55.90 mm) apart.

(b) Remove the doubler from the repair area.

S 118-050-R00

(6) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Swab degrease the repair area. Make the repair area dry before the liquid becomes a gas.
(c) Discard the dirty cloth.

NOTE: It is important that the repair area is kept clean before the adhesive is applied.

S 358-051-R00

(7) Prepare and apply the adhesive (Fig. 802 Sheet 4).

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.
(c) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than on hour.

(d) Apply the adhesive to the damaged duct material (Fig. 802 Sheet 4).

NOTE: The inner rivet hole positions that are identified on the doubler and the adhesive on the duct must align.

The quantity of adhesive must be sufficient to touch the doubler when it is installed.

1) Apply the adhesive in circular shapes on the damaged duct. Each circular shape of adhesive must be approximately 0.510 in. (13.00 mm) in diameter.
2) Apply adhesive to a small area around each outer rivet hole in the duct.

S 358-052-R00

(8) Install the doubler (Fig. 802 Sheets 4 and 10).
(a) Put the doubler in the correct position on the repair area.
(b) Install the CR3555-4-1 rivets (Item 1) in the outer rivet holes. Use riveting equipment.

S 358-053-R00

(9) Cure the adhesive.

(a) Cure the adhesive between the inner rivet hole positions and the duct. Use heat lamps to make the cure time faster. Apply heat to the inner rivet hole positions. The heat will go through the doubler and cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

NOTE: The minimum cure time is one hour.

The adhesive will not cure if the temperature is less than 12°C (54°F).

If heat is used to make the cure time faster, monitor the temperature on the surface of the doubler.

S 358-054-R00

(10) Install the inner rivets (Fig. 802 Sheets 4 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Get the correct drill for CR3555-4-2 (Item 8) and CR3555-4-3 (Item 9) rivets.

(b) Use drilling equipment to drill the inner rivet holes.

NOTE: The rivet holes must go through the doubler, adhesive and the perforate skin.

(c) Use the drilling equipment to countersink the inner rivet holes.

(d) Install CR3555-4-2 (Item 8) and CR3555-4-3 (Item 9) rivets as required. Use riveting equipment.

S 218-055-R00

(11) Do a visual inspection of the repaired area (Fig. 802 Sheets 4 and 10).

S 938-056-R00

(12) Record the repair.

(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

K. Repair the CNA Outer Duct - Repair procedure 7 (Large radius dents in the external (solid) skin)

NOTE: The limits of damage to the outer duct solid skin are shown in Fig. 802 Sheet 5. This repair can be used to repair damage to these limits.

The dent area must not contain crack, gouge or other damage that has not had a repair done to it.

The damaged area must not be more than 50 sq in. (325 sq cm).

S 118-057-R00

(1) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.

(b) Swab degrease the repair area. Make the repair area dry before the liquid becomes gas.

(c) Discard the dirty cloth.

S 358-058-R00

(2) Make a doubler (Fig. 802 Sheet 5).

(a) Use 0.020 in. (0.508 mm) titanium sheet (Item 12) to make the doubler. Use metal cutters.

NOTE: The doubler must be a constant shape to cover the repair area.

S 938-059-R00

(3) Identify the rivet hole positions (Fig. 802 Sheets 5 and 10).

(a) Put the doubler in the correct position on the repair area. Make sure the doubler is held tightly in position.

(b) Make a mark to identify the rivet hole positions on the doubler.

NOTE: Put the rivet hole positions around the edge of the damaged area.

The rivet hole positions must be 0.750-0.940 in. (19.00-24.00 mm) apart.

If possible, make the rivet hole positions align with the spaces in the inner honeycomb structure of the duct.

Make the doubler the same contour as the outer duct.

S 358-060-R00

(4) Drill and countersink the rivet holes.

(a) Get the correct drill for the CR3555-4-1 rivets (Item 1).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(b) Use drilling equipment to drill the rivet holes that are identified. Countersink the rivet holes.

(c) Remove the doubler. Deburr the rivet holes and chamfer the edge of the doubler.

NOTE: The dimensions of the chamfer are 0.010 in. x 0.060 in. (0.25 mm x 1.50 mm).

S 118-061-R00

(5) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Swab degrease the repair area. Make the repair area dry before the liquid becomes a gas.
(c) Discard the dirty cloth.

NOTE: It is important that the repair area is kept clean before the adhesive is applied.

S 358-062-R00

(6) Prepare and apply the adhesive (Fig. 802 Sheet 5).

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.
(c) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the adhesive is kept at 22°C (72°F), use in less than on hour.

(d) Apply the adhesive to the repair area.

NOTE: Make sure the adhesive that is applied to the dent will touch the doubler when it is installed.

Make sure the area of the adhesive layer extends a short distance more than the repair area.

The doubler must be installed before the life of the adhesive has expired.

S 358-063-R00

(7) Install the doubler (Fig. 802 Sheets 5 and 10).

(a) Put the doubler in the correct position on the repair area. Make sure the doubler is held tightly in position.

(b) Install the CR3555-4-1 (Item 1) rivets. Use riveting equipment.

(c) Use a lint free cloth to clean the area around the doubler. Make a small quantity of adhesive smooth around the edge of the doubler.

NOTE: A small quantity of smooth adhesive around the doubler can be used to get a good airflow over the doubler.

(d) Cure the adhesive.

1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

2) Do a visual inspection of the repaired area (Fig. 802 Sheets 1 and 10).

S 218-064-R00

(8) Do a visual inspection of the repaired area (Fig. 802 Sheets 5 and 10).

S 938-065-R00

(9) Record the repair.

(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

L. Repair the CNA Outer Duct - Repair procedure 8 (Small full rupture damage to the skin that has equal damage on each surface)

S 358-139-R00

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(1) Remove the damaged area.

(a) Remove the damaged core and skin. Use workshop tools.

(b) Make a core. Use LJ76196 titanium core (Item 6) and workshop tools (Fig. 802 Sheet 6).

(c) Make two fillers the same surface shape as the repair core. Use 0.020 in. (0.508 mm) titanium sheet (Item 12) and metal cutters (Fig. 802 Sheet 6).

S 358-067-R00

(2) Make two doublers (Fig. 802 Sheet 6).

(a) Use 0.020 in. (0.020 in. (0.508 mm) titanium sheet (Item 12) and LJ76195 perforate skin (Item 5) to make two doublers. Make one doubler from each material. Use metal cutters.

NOTE: Make sure the doublers are the correct dimensions to cover the repair area.

The doubler made of 0.020 in. (0.508 mm) titanium sheet (Item 12) is to repair the external surface damage. The doubler made of LJ76195 perforate skin (Item 5) is to repair the internal surface damage.

Make the holes in the perforate skins align.

S 938-068-R00

(3) Identify the rivet and Hi-Lok fastener hole positions on the repair area.

(a) Temporarily install the perforate skin doubler to the internal repair area. Install the repair core in the correct position. Install the two fillers on to the core. Temporarily install the titanium doubler in the correct position on the external repair area.

(b) Make a mark to identify each rivet hole position on the external repair area. Use workshop tools and refer to Fig. 802 Sheets 6 and 10).

NOTE: The rivet hole positions must be 0.620 in. (15.90 mm) apart.

(c) Make a mark to identify each rivet hole position on the internal repair area. Use workshop tools and refer to Fig. 802 Sheets 6 and 10).

NOTE: Make the rivet hole positions align with the small holes in the perforate skin.

The rivet hole positions must be 0.750 in. (19.05 mm) apart.

(d) Make a mark to identify each Hi-Lok fastener hole position. Use workshop tools and refer to Fig. 802 Sheets 6 and 10).

NOTE: The Hi-Lok fastener hole positions must be 1.200-1.500 in. (30.00-38.00 mm) apart.

Make the Hi-Lok fastener hole positions align with the small holes in the perforate skin. Also make the fastener hole positions align with the spaces in the core.

On doublers which cover a larger area, put the Hi-Lok fastener hole positions in the shape of a triangle.

If the width of the damage is more than 1.650 in. (4 2.00 mm), use one row of Hi-Lok fasteners. If the width of the damage is more than 2.800 in. (71.00 mm), use two rows of Hi-Lok fasteners. If the width of the damage is more than 4.000 in. (101.00 mm), use three rows of Hi-Lok fasteners.

S 358-069-R00

(4) Drill the rivet and Hi-Lok fastener holes (Fig. 802 Sheets 6 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Get the correct drill for the CR3555-4-1 rivet holes. Get the correct quantity of CR3555-4-1 rivets (Item 1).
(b) Drill the rivet holes in the external doubler and solid skin. Countersink the external doubler. Use drilling equipment.
(c) Drill the rivet holes in the internal doubler and perforate skin. Countersink the internal doubler. Use drilling equipment.
(d) Get the correct drill for the Hi-Lok fastener holes. Get the correct quantity of HL568-5-750 Hi-Lok pins (Item 2), HC32-5-650 Hi-Lok sleeves (Item 3) and HL597-5 Hi-Lok collars (Item 4).
(e) Drill fastener holes in the doublers, fillers and the core. Use drilling equipment.

NOTE: Drill the external doubler, fillers, the core and internal doubler in one step.

(f) Remove the doublers, fillers and the core from the repair area. Deburr all the drilled holes. Use workshop tools.

S 118-070-R00

(5) Degrease the external repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.

(b) Swab degrease the external repair area. Make the repair area dry before the liquid becomes a gas.
(c) Discard the dirty cloth after use.

NOTE: It is important that the external repair area is kept clean before the adhesive is applied.

S 348-136-R00
(6) Prepare and apply the adhesive.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.
(c) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

(d) Apply the adhesive and install the repair parts.

NOTE: The steps that follow must be done before the life of the adhesive has expired.

1) Put the perforate skin (internal) doubler in the correct position on the internal repair area.
2) Install the correct quantity of CR3555-4-1 rivets (Item 1). Use the riveting equipment (Fig. 802 Sheet 6 and 10).
3) Apply a thin layer of adhesive to the core surface adjacent to the perforate skin doubler. Apply adhesive to the side of the core. Install the core in the correct position (Fig. 802 Sheet 6).
4) Apply a thin layer of adhesive to the upper face of the core. Install a filler. Apply a thin layer of adhesive to the upper face of the filler. Install the other filler (Fig. 802 Sheet 6).

5) Apply a thin layer of adhesive to the upper face of the filler and all the external repair area.

NOTE: Make sure the area of the adhesive layer extends a short distance more than the repair area.

6) Put the solid skin (external) doubler in the correct position on the repair area. Install the correct quantity of CR3555-4-1 rivets (Item 1). Use riveting equipment.

7) Install the correct quantity of HL568-5-750 H-Lok pins (Item 2), HC32-5-650 Hi-Lok sleeves (Item 3) and HL597-5 Hi-Lok collars (Item 4). Use Hi-Lok tools.

NOTE: Use a small quantity of adhesive on the Hi-Lok fasteners when they are assembled in the repair.

8) Make a small nick in the threads of the Hi-Lok pins. Use workshop tools and refer to Fig. 802 Sheet 10.

NOTE: The force with which the pin is hit must be sufficient to lightly damage the Hi-Lok threads.

This procedure is done to lock the Hi-Lok collar on to the Hi-Lok pin.

(e) Use a lint free cloth to clean the area around the doubler. Make a small quantity of adhesive smooth around the edge of the doubler.

NOTE: A small quantity of smooth adhesive around the doubler can be used to get a good airflow over the doubler.

(f) Cure the adhesive.

1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

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(7) Do a visual inspection of the repaired area (Fig. 802 Sheets 6 and 10).

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(8) Record the repair

(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

M. Repair the CNA Outer Duct - Repair procedure 9 (Small full rupture damage to the skin that is not equal on each surface)

NOTE: This repair procedure is written in two parts. Part 1 repairs the duct material when the perforate (internal) skin has more damage than the solid (external) skin.
Part 2 repairs the duct material when the solid (external) skin has more damage than the perforate (internal) skin.

S 358-073-R00

(1) Part 1 - Repair the outer duct when the perforate skin has more damage than the solid skin.

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(a) Cut out the damaged perforate skin and the damaged core. Cut away the damaged solid skin. Use hand tools and refer to Fig. 802 (Sheet 7).

NOTE: Keep sufficient solid skin to keep an overlap for the repair fasteners to attach to.

(b) Use grinding equipment and carbide grinding disc to remove all the core material that remains in the repair area.

(c) Get 0.020 in. (0.508 mm) titanium sheet (Item 12). Make a doubler that is the correct shape to fit in the empty core area. Use metal cutters and refer to Fig. 802 (Sheet 7).

NOTE: Make sure the doubler sufficiently covers the rupture in the solid skin.

(d) If the solid skin rupture is less than 3.000 in. (76.00 mm) in width in the direction of the airflow, make a filler (Fig. 802 Sheet 7). Make the filler as follows:
1) Get 0.020 in. (9.508 mm) titanium sheet (Item 12). Make a filler that is the correct shape to fit in the hole in the solid skin.

(e) Make a core (Fig. 802 Sheet 7).

(f) Temporarily install the doubler in the empty core.

(g) Make a core to fit the repair area. Use LJ76196 titanium core (Item 6) and metal cutters.

NOTE: Make sure the core fills the core space fully.

Damage that has a width less than 0.750 in. (19.00 mm) does not require a core.

When the core is made, keep the core and doubler in position in the repair.

(h) Make a perforate skin doubler and temporarily install the repair parts (Fig. 802 Sheet 7).
1) Use LJ76195 perforate skin (Item 5) to make a perforate skin doubler. Make sure the doubler sufficiently covers the damage in the perforate skin.

NOTE: Make sure the small holes in the doubler and duct surface align.

2) Make sure the solid skin doubler, core and perforate skin doubler are in the correct position to do the repair.
3) Temporarily install the solid skin filler.

NOTE: Make sure all the repair parts are held tightly in the correct position to do the repair.

(i) Identify the rivet and Hi-Lok fastener hole positions on the repair area (Fig. 802 Sheet 7 and 10).

1) Make a mark to identify each CR3555-4-1 rivet hole position on the external duct surface. Use workshop tools.

NOTE: The rivet hole positions must be 0.625 in. (15.75 mm) apart.

2) Make a mark to identify each CR3555-4-1 rivet hole position on the perforate skin (internal) doubler. Use workshop tools.

NOTE: The rivet hole positions must be 0.750 in. (19.05 mm) apart.

Make sure the rivet hole positions align with the small holes in the perforate skin.

3) Make a mark to identify each Hi-Lok fastener hole position on the perforate skin (internal) doubler. Use workshop tools.

NOTE: The Hi-Lok fastener hole positions must be 1.200-1.500 in. (30.00-38.00 mm) apart.

Make the Hi-Lok fastener hole positions align with the small holes in the perforate skin. Also make the holes align with the spaces in the core.

On doublers that cover a larger area, put the Hi-Lok fastener hole positions in the shape of a triangle.

If the width of the damage is more than 1.650 in. (42.00 mm), use one row of Hi-Lok fasteners. If the width of the damage is more than 2.800 in. (71.00 mm), use two rows of Hi-Lok fasteners. If the width of the damage is more than 4.000 in. (101.00 mm), use three rows of Hi-Lok fasteners.

(j) Drill and countersink the rivet and Hi-Lok fastener holes (Fig. 802 Sheets 7 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

1) Get the correct drill for the CR3555-4-1 rivet holes. Get the correct quantity of CR3555-4-1 rivets (Item 1).
2) Drill and countersink the CR3555-4-1 rivet holes in the perforate doubler.
3) Drill and countersink the CR3555-4-1 rivet holes in the external duct surface.

NOTE: Make sure the rivet hole goes through the solid skin doubler that cannot be seen. Make sure the rivet holes do not go fully in to the core.

4) Get the correct drill for the Hi-Lok fastener holes. Get the correct quantity of HL568-5-750 Hi-Lok pins (Item 2), HC32-5-650 Hi-Lok sleeves (Item 3) and HL597-5 Hi-Lok collars (Item 4).
5) Drill and countersink the Hi-Lok fasteners holes. Make sure the fastener holes go through the external and internal surfaces of the duct.
6) Remove the repair parts from the outer duct.

(k) Deburr and chamfer the doublers and filler (Fig. 802 Sheets 7 and 10).
1) Chamfer the edges of the perforate doubler.
2) Recess each end of the Hi-Lok fastener holes (Fig. 802 Sheet 10).

NOTE: The recess must be the correct shape to accept each end of the Hi-Lok fastener.

(l) Temporarily install the repair parts in the correct position to do the repair. Make sure the repair parts are held tightly (Fig. 802 Sheet 10).
1) Temporarily install the HC32-5-650 Hi-Lok sleeves (Item 3) in the fastener holes.
2) Use the grinding equipment to grind the sleeves to the correct installation height.
3) Remove the sleeves from the repair area. Remove the repair parts from the repair area.

(m) Degrease the repair area and repair parts.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

1) Make a lint free cloth moist with degreasing fluid.
2) Swab degrease the repair area and repair parts. Make the area and parts dry before the liquid becomes a gas.

NOTE: On the repair parts, degrease the surfaces to which adhesive will be applied (Fig. 802 Sheet 7).

3) Discard the dirty cloth after use.

(n) Prepare the adhesive.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

1) Get the two part adhesive. Mix the grey paste before it is weighed out.
2) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.
3) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

4) Apply the adhesive and install the repair parts (Fig. 802 Sheets 7 and 10).

NOTE: The steps that follow must be done before the life of the adhesive has expired.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

5) Get the solid skin doubler. Apply adhesive to each surface of the doubler. Put the doubler in the correct position in the empty core.
6) Get the CR3555-4-1 rivets (Item 1) and riveting equipment. Install the rivets through the solid skin and the doubler.
7) Get the core. Put the core in the correct position in the repair area. Apply adhesive between the repair core and the duct core material.

   NOTE: Make sure the Hi-Lok fastener holes in the core and solid skin doubler align.

8) Get the perforate skin doubler. Apply adhesive to the core surface. Put the perforate doubler in the correct position on the repair area.

   NOTE: Make sure all the rivet and Hi-Lok fastener holes align.

   Make sure the adhesive does not fill the perforate holes.

9) Get the riveting equipment. Install the CR3555-4-1 rivets (Item 1) in the correct positions.
10) Get the solid skin filler, if required. Apply adhesive to the inner surface of the filler. Put the filler in the correct position on the external duct surface.

    NOTE: Make sure the Hi-Lok fastener holes align.

11) Get the Hi-Lok tools. Install the Hi-Lok pins, sleeves and collars in the repair.

NOTE: Use a small quantity of adhesive to assemble the Hi-Lok fasteners.

12) Make a small nick in the threads of the Hi-Lok pins. The force with which the pin is hit must be sufficient to lightly damage the Hi-Lok pin threads. Use workshop tools and refer to Fig. 802 Sheet 10.

NOTE: The procedure is done to lock the Hi-Lok collar on to the Hi-Lok pin.

13) Use a lint free cloth to make the adhesive smooth around the filler area.

(o) Cure the adhesive.

1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

(p) Do a visual inspection of the repaired area (Fig. 802 Sheets 7 and 10).

(q) Record the repair.

1) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

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(2) Part 2 - Repair the outer duct when the solid skin has more damage than the perforate skin.

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(a) Cut out the damaged solid skin and damaged core. Cut out the damaged perforate skin. Use workshop tools and refer to Fig. 802 Sheet 7.

NOTE: Keep sufficient perforate skin to attach the rivets and fasteners to.

(b) Use grinding equipment and carbide grinding disc to remove all the core material that remains in the repair area.

(c) Get the LJ76195 perforate skin (Item 5). Make a doubler that is the correct shape to fit in the empty core. Use metal cutters and refer to Fig. 802 (Sheet 7).

NOTE: Make sure the doubler sufficiently covers the rupture in the perforate skin.

(d) If the perforate skin rupture is less than 2.000 in. (50.80 mm) in width in the direction of the airflow, make a filler (Fig. 802 Sheet 7). Make the filler as follows:

1) Get LJ76195 perforate skin (Item 5). Make a filler that is the correct shape to fit in the hole in the duct perforate skin.

(e) Make a core (Fig. 802 Sheet 7).

1) Temporarily install the perforate doubler in the empty core.
2) Make a core to fit the repair area. Use LJ76196 titanium core (Item 6) and metal cutters.

NOTE: Make sure the core fills the core space fully.

Damage with a width of less than 0.750 in. (19.00 mm) does not require a core.

When the core is made, keep the core and doubler in position in the repair.

(f) Make a solid skin doubler and temproarily install the repair parts (Fig. 802 Sheet 7).
   1) Use 0.020 in. (0.508 mm) titanium sheet (Item 12) to make a solid skin doubler. Make sure the doubler sufficiently covers the damage in the external surface of the duct.
   2) Make sure the perforate doubler, core and solid skin doubler are in the correct position to do the repair.
   3) Temporarily install the perforate filler.

      NOTE: Make sure all the repair parts are held in the correct position to do the repair.

(g) Identify the rivet and Hi-Lok fastener holes in the repair area (Fig. 802 Sheets 7 and 10).
   1) Make a mark to identify each CR3555-4-1 rivet hole position on the solid skin doubler. Use workshop tools.

      NOTE: The rivet hole positions must be 0.625 in. (15.75 mm) apart.

   2) Make a mark to identify each CR3555-4-1 rivet hole position on the internal (perforate) duct surface.

      NOTE: The rivet hole positions must be 0.75 in. (19.05 mm) apart.

      Make sure the rivet hole positions align with the small holes in the duct surface and doubler.

3) Make a mark to identify each Hi-Lok fastener hole position on the solid skin doubler. Use workshop tools.

NOTE: The Hi-Lok fastener hole positions must be 1.200-1.500 in. (30.00-38.00 mm) apart.

The Hi-Lok fastener hole positions can be mixed with the rivet hole positions on the perforate surface of the duct. Make sure the limits for the rivet and fastener hole spaces are obeyed.

Make the Hi-Lok fastener hole positions align with the small holes in the perforate skin. Also make the hole positions align with the spaces in the core.

On doublers which cover a larger area, put the Hi-Lok fastener hole positions in the shape of a triangle.

If the width of the damage is more than 1.650 in. (42.00 mm), use one row of Hi-Lok fasteners. If the width of the damage is more than 2.800 in. (71.00 mm), use two rows of Hi-Lok fasteners. If the width of the damage is more than 4.000 in. (101.00 mm), use three rows of Hi-Lok fasteners.

(h) Drill and countersink the rivet and Hi-Lok fastener holes (Fig. 802 Sheet 7 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

1) Get the correct drill for the CR3555-4-1 rivet holes. Get the correct quantity of CR3555-4-1 rivets (Item 1).
2) Drill and countersink the CR3555-4-1 rivet holes in the solid skin doubler.

3) Drill and countersink the CR3555-4-1 rivet holes in the internal surface of the duct.

NOTE: Make sure the rivet holes go through the perforate doubler that cannot be seen.

Make sure the rivet holes do not go into the core fully.

4) Get the correct drill for the Hi-Lok fastener holes. Get the correct quantity of HL568-5-750 Hi-Lok pins (Item 2), HC32-5-650 Hi-Lok sleeves (Item 3) and HL597-5 Hi-Lok collars (Item 4).
5) Drill and countersink the Hi-Lok fastener holes. Make sure the fastener holes go through the external and internal surfaces of the duct.
6) Remove the repair parts from the outer duct.

(i) Deburr and chamfer the doublers and the filler (Fig. 802 Sheets 7 and 10).
1) Chamfer the edges of the solid skin doubler.
2) Recess each end of the Hi-Lok fastener holes (Fig. 802 Sheet 10).

NOTE: The recess must be the correct shape to accept each end of the Hi-Lok fastener.

(j) Temporarily install the repair parts in the correct positions to do the repair. Make sure the repair parts are held tightly (Fig. 802 Sheet 10).
1) Temporarily install the HC32-5-650 Hi-Lok sleeves in the fastener holes.
2) Use grinding equipment to grind the sleeves to the correct installation height.
3) Remove the sleeves from the repair area. Remove the repair parts from the repair area.

(k) Degrease the repair area and repair parts.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

1) Make a lint free cloth moist with degreasing fluid.
2) Swab degrease the repair area and repair parts. Make the area and parts dry before the liquid becomes a gas.

NOTE: On the repair parts, degrease the surface to which adhesive will be applied (Fig. 802 Sheet 7).

3) Discard the dirty cloth.
4) Prepare the adhesive.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

5) Get the two part adhesive. Mix the grey paste before it is weighed out.
6) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.
7) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

(l) Apply the adhesive and install the repair parts (Fig. 802 Sheets 7 and 10).

NOTE: The steps that follow must be done before the life of the adhesive has expired.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

1) Get the perforate doubler. Put the doubler in the correct position in the empty core.
2) Get the CR3555-4-1 rivets (Item 1) and riveting equipment. Install the rivets through the perforate skin and the doubler.
3) Get the core. Apply adhesive to the surface of the core that will touch the perforate doubler. Put the core in the correct position in the repair area. Apply adhesive between the repair core and duct core material.

   NOTE: Make sure the Hi-Lok fastener holes in the core and perforate doubler align.

   Do not fill the perforate skin with adhesive.

4) Get the riveting equipment. Install the CR3555-4-1 rivets (Item 1) in the correct positions.
5) Get the perforate skin filler, if required. Put the filler in the correct position on the internal surface of the duct.

   NOTE: Make sure the Hi-Lok fastener holes align.

6) Get the Hi-Lok tolls. Install the Hi-Lok pins, sleeves and collars in the repair.

   NOTE: Use a small quantity of adhesive to assemble the Hi-Lok fasteners.

7) Make a small nick in the threads of the Hi-Lok pins. The force with which the pin is hit must be sufficient to lightly damage the pin threads. Use workshop tools and refer to (Fig. 802 Sheet 10).

NOTE: This procedure is done to lock the Hi-Lok collar on to the Hi-Lok pin.

8) Use a lint free cloth to clean the area around the external doubler. Make a small quantity of adhesive smooth around the edge of the doubler.

NOTE: A small quantity of smooth adhesive around the doubler can be used to get a good airflow over the doubler.

(m) Cure the adhesive.
1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.
Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

(n) Do a visual inspection of the repaired area (Fig. 802 Sheets 7 and 10).
(o) Record the repair.
1) Write FRS6203 adjacent to the nameplate when this part of the repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

N. Repair the CNA Outer Duct - Repair procedure 10 (Large full and not full rupture damage to the duct skin. Damage to the skin that is not equal on each surface)

NOTE: This repair can be done if the damage area is larger than 20 sq in. (130 sq cm) and more than 3.000 in. (76.00 mm) from all other damage.

S 358-137-R00

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(1) Cut out the damage from the duct. Use routing, cutting and sanding equipment (Fig. 802 Sheet 8).

NOTE: Make the cut out a consistant shape.

(a) Remove the damaged core material. Make sure 0.010 in. (0.25 mm) of the core material remains on the opposite surface of the duct.

NOTE: If the opposite surface of the duct is solid skin and is complete, make the repair surface clear of core material. If the opposite surface is not complete keep a flange. The flange must be 0.750-0.900 in. (19.00-23.00 mm) in width.

If the opposite surface of the duct is perforate skin and is complete, make the repair surface clear of core material. If the opposite surface is perforate skin and not complete, keep a flange. Make sure the rupture in the skin is not sufficiently large to prevent the use of rivets in the flange. The rivet hole positions from the edge of the rupture must be a minimum distance of 0.900-0.980 in. (23.00-25.00 mm).

S 358-076-R00

(2) Make a repair plug (Fig. 802 Sheet 8).

(a) Get LJ76197 repair panel (Item 7). Make the repair plug the correct shape to fit the repair. Use cutting equipment.

NOTE: Make the surface contour of the repair plug the same as the outer duct.

S 358-077-R00

(3) Chamfer the repair plug and repair area.
  (a) Chamfer the edges of the repair plug that are open to the airflow.
  (b) Chamfer the edges of the outer duct structure that are open to the airflow.

NOTE: The dimensions of the chamfers are 0.010 x 0.060 in. (0.25 x 1.50 mm).

S 938-078-R00

(4) Identify the rivet hole positions (Fig. 802 Sheets 8 and 10).
  (a) Temporarily install the repair plug in the correct position in the outer duct.

NOTE: Make sure the repair plug is held tightly in position.

  (b) Make a mark to identify the CR3555-4-1 rivet hole positions on the repair area (Fig. 802 Sheets 8 and 10).

NOTE: Make sure the limits for the rivet hole positions that are referred to in (Fig. 802 Sheets 8 and 10) are obeyed.

If possible, make the rivet hole positions align with the holes in the perforate skin.

S 358-079-R00

(5) Drill and countersink the rivet holes (Fig. 802 Sheet 8 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

  (a) Get the correct drill for the CR3555-4-1 rivet holes.
  (b) Drill and countersink the rivet holes in the repair area. Use drilling equipment.

S 358-080-R00

(6) Deburr the rivet holes.
  (a) Remove the repair plug from the repair area.

(b) Deburr the rivet holes in the repair plug and the outer duct. Use workshop tools.

S 118-081-R00

(7) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Swab degrease the repair plug and repair area. Make the surfaces dry before the liquid becomes a gas (Fig. 802 Sheet 8).

NOTE: Degrease the surfaces that will touch each other when the plug is assembled in the correct repair position.

S 358-082-R00

(8) Prepare the adhesive.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.

(c) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F) use in less than one hour.

S 358-083-R00

(9) Apply the adhesive and install the repair plug (Fig. 802 Sheets 8 and 10).

(a) Apply adhesive to the surfaces of the plug and duct that will touch when assembled.

NOTE: Apply a thin layer of adhesive to the perforated surfaces.

(b) Put the repair plug in the correct position to do the repair.

NOTE: Make sure the rivet holes in the plug and outer duct align.

(c) Get the correct quantity of CR3555-4-1 rivets (Item 1). Install the rivets in the repair area. Use riveting equipment.

NOTE: Use a small quantity of adhesive to install the rivets.

(d) Remove all adhesive from around the repair area.

NOTE: Do not fill adjacent perforate skin holes with adhesive.

(e) Cure the adhesive.

1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.

Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

S 218-084-R00

(10) Do a visual inspection of the repaired area (Fig. 802 Sheets 8 and 10).

S 938-085-R00

(11) Record the repair.

(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

O. Repair the CNA Outer Duct - Repair procedure 11 (Full rupture damage more than 20 sq in. (130 sq cm), which has approximately equal damage to each surface of the duct).

NOTE: This repair can be done if it is more than 3.000 in. (76.00 mm) from all other full rupture repairs.

S 358-138-R00

CAUTION: WHEELS, STONES AND ABRASIVE PAPERS THAT ARE USED TO DRESS, BLEND OR POLISH THE TITANIUM SURFACE MUST BE OF A SILICON CARBIDE TYPE.

ABRASIVE TYPES THAT CONTAIN ALUMINIUM OXIDE MUST NOT BE USED.

IF MECHANICAL CUTTERS ARE USED, LIGHT CUTS MUST BE TAKEN. THE TITANIUM WILL BECOME TOO HOT IF THIS INSTRUCTION IS NOT OBEYED.

(1) Cut out the damaged skin and core material. Use routing, cutting and sanding equipment (Fig. 802 Sheet 9).

NOTE: Make the cut out a constant shape.

If possible, keep sufficient solid skin on the opposite side to let rivets be used on assembly.

S 358-087-R00

(2) Make a repair plug (Fig. 802 Sheet 9).

(a) Get LJ76197 repair panel (Item 7). Make the repair plug the correct shape to fit the repair. Use cutting equipment.

NOTE: Make the perforate flange of the repair plug 0.900-0.980 in. (23.00-25.00 mm) in width.

Make the surface contour of the repair plug the same as the outer duct.

S 358-088-R00

(3) Make a solid skin doubler and filler (Fig. 802 Sheet 9).

(a) Get 0.020 in. (0.508 mm) titanium sheet (Item 12). Make a doubler to sufficiently cover the hole in the solid skin. Use metal cutters.

NOTE: Make sure the doubler is sufficiently large for the rivet hole edge distances that are required.

(b) Make a filler to fit in the hole in the solid skin. Use metal cutters.

S 358-089-R00

(4) Identify and drill the rivet holes in the repair area (Fig. 802 Sheets 9 and 10).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Temporarily install the repair parts in the correct positions to do the repair.

NOTE: Make sure the assembled repair parts are held tightly.

(b) Identify the CR3555-4-1 rivet hole positions on the repair area (Fig. 802 Sheet 9).

1) Make a mark to identify the CR3555-4-1 rivet hole positions on the flange of the repair plug. Use workshop tools.

NOTE: The rivet hole positions on the perforate skin must be 0.400-0.460 in. (10.16-11.68 mm) from the edge of the repair plug flange.

The rivet hole positions must be 0.750 in. (19.05 mm) apart.

Make sure the rivet hole positions in the flange align with the holes in the perforate skin.

2) Make a mark to identify the outer rivet hole positions on the solid skin doubler. Use workshop tools.

NOTE: The outer rivet hole positions on the doubler must be 0.310-0.380 in. (7.87-9.65 mm) from the edge of the doubler. Also make sure the rivet hole positions are at least the same distance from the edge of the damage.

The outer rivet hole positions must be 0.625 in. (15.75 mm) apart.

3) Make a mark to identify the inner rivet hole positions on the solid skin doubler. Use workshop tools.

NOTE: The inner rivet hole positions on the doubler must be 0.310-0.380 in. (7.87-9.65 mm) from the edge of the filler. Make sure the dimensions are obeyed because the filler can not be seen when in the correct repair position.

The inner rivet hole positions must be 0.980 in. (25.00 mm) apart.

(c) Get the correct drill for the CR3555-4-1 rivet holes. Get the correct quantity of CR3555-4-1 rivets (Item 1).
(d) Drill and countersink the rivet holes in the repair area. Use drilling equipment.
(e) Remove the repair parts from the repair area.

S 358-090-R00

(5) Deburr the rivet holes. Use workshop tools.

S 118-091-R00

(6) Degrease the repair area and repair plug.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Swab degrease the repair area and plug. Make the repair area and plug dry before the liquid becomes a gas.
(c) Discard the dirty cloth.

S 358-092-R00

(7) Prepare adhesive.

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

(a) Get the two part adhesive. Mix the grey paste before it is weighed out.
(b) Weigh out 100 parts of grey paste. Weigh out 33 parts of amber liquid.
(c) Mix the paste and liquid. Make sure the adhesive is mixed sufficiently.

NOTE: If the mixed adhesive is kept at 22°C (72°F), use in less than one hour.

S 358-093-R00

(8) Apply the adhesive and install the repair plug (Fig. 802 Sheets 9 and 10).

WARNING: DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET ADHESIVE IN YOUR MOUTH OR EYES.

DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Apply adhesive to the surfaces of the repair plug and duct that will touch when assembled in the correct repair position.

NOTE: Apply a thin layer of adhesive to the perforate surface.

(b) Put the repair plug in the correct position in the repair.

NOTE: Make sure the rivet holes align.

(c) Install the correct quantity of CR3555-4-1 rivets (Item 1) in the rivet holes in the perforate skin.

NOTE: Use a small quantity of adhesive when the rivets are installed.

(d) Apply adhesive to each side of the filler. Put the filler in the correct position to do the repair.

NOTE: Make sure the rivet holes align.

(e) Apply adhesive to the inner surface of the doubler. Puyt the doubler in the correct position to do the repair.

NOTE: Make sure all the rivet holes align.

(f) Install the CR3555-4-1 rivets (Item 1) in the solid skin doubler, filler and repair plug.
(g) Use a lint free cloth moist with degreasing fluid to remove all unwanted adhesive from around the repair

NOTE: Do not let adhesive get into the perforate holes.

Make a small quantity of adhesive smooth around the edge of the solid skin doubler.

(h) Cure the adhesive.
1) Use heat lamps to cure the adhesive. Refer to Table 1 for the cure times and temperatures.
Table 1

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - Deg.C	12	15	20	22	25	30	35	45	60
Deg.F	54	59	68	72	77	86	96	113	140

S 218-094-R00
(9) Do a visual inspection of the repaired area (Fig. 802 Sheets 9 and 10).

S 938-095-R00
(10) Record the repair.
(a) Write FRS6203 adjacent to the nameplate when this repair procedure is complete. Use a permanent marker that can be easily seen on the surface adjacent to the nameplate.

TASK 78-11-04-308-096-R00

4. Exhaust Collector - Common Nozzle Assembly (CNA) - Replacement of the Inner Duct Seal and Seal Retainers

A. General
(1) The repair in this procedure is FRS6216.
(2) This procedure details the repair of the CNA inner duct seal and seal retainers. The damaged seal and seal retainers are repaired by the replacement of the damaged parts.

(3) This procedure can be used to repair the CNA inner duct seal and seal retainers on the RB211-535E4 and E4-B engines. Use this procedure to repair ducts which have the part numbers that follow:

UL13010 SB 78-7404	UL13024 SB 78-7614 pt2
UL13012 SB 78-7684	UL13027 SB 78-7745 pt1
UL13022	UL13028 SB 78-7745 pt2
UL13023 SB 78-7614 pt1	JP55201 SB 78-7968

(4) The correct rivets to do the repair are given for an assembly with dimensions that are in the specified limits. It is possible that the collected tolerances of the components can make the rivet hold not sufficient. Measure the length of each rivet hole. Make sure the rivets are the correct length to do the repair.

B. Equipment
(1) Workshop tools.
(2) Drilling equipment.
(3) Riveting equipment.
(4) Putty knife.

C. Parts
(1) Seal, ARM845 (RR1502393) (Item No. 1)
(2) Plug, ARM847 (RR1502395) (Item No. 2)
(3) Seal, ARM877 (RR1502441) (Item No. 3)
(4) Plug, ARM874 (RR1502438) (Item No. 4)
(5) Corner seal, upper LH, ARM872 (RR1502436)(Item No. 5)
(6) Corner seal, upper RH, ARM873 (RR1502437) (Item No. 6)
(7) Corner seal, lower LH, ARM875 (RR1502439) (Item No. 7)
(8) Corner seal, lower RH, ARM876 (RR1502440)(Item No. 8)
(9) Seal retainer, lower LH, LJ76143 (Item No. 9)
(10) Seal retainer, lower RH, LJ76148 (Item No. 10)
(11) Retainer, spare, LJ76188 (Item No. 11)
(12) Spacer, NAS1056E4-006 (RR2308460) (Item No. 12)
(13) Rivet, NAS1398B4-3 (RR1012148) (Item No. 13)
(14) Rivet, NAS1398B4-4 (RR1012149) (Item No. 14)

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150
or Isopropyl alcohol OMat No. 1/40
or cleaning solvent Desoclean OMat No. 1/257

(2)	Primer base	Bostik 463-6-27	7/157
(3)	Curing solution	Bostik X-337	7/158
(4)	Thinner	TL52-66	7/159
(5)	Silicone rubber, cold bonding	Silastic 732	872F
(6)	Sealant, 2 pack, base and catalyst	Dow Corning DC90-006	8/138
(7)	Primer	DC1200	876C
(8)	Permanent marker pen - (local resource)		-
(9)	Lint free cloth - (local resource)		-

E. Replace the damaged seal and sela retainer

S 358-097-R00

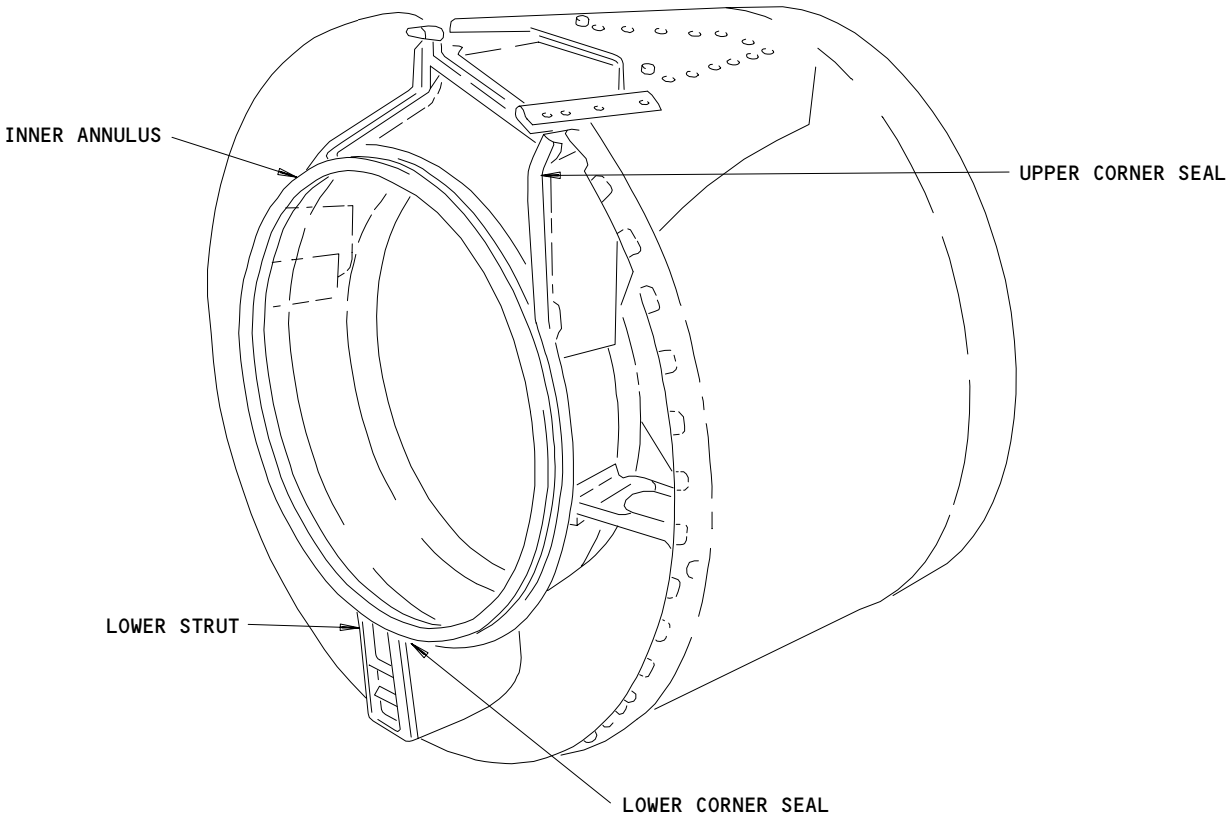
(1) Remove the damaged seal and seal retainer (Fig. 803 Sheets 1-5).
   (a) Remove the rivets that connect the seal retainer to the structure.

NOTE: Keep the parts that are serviceable. These parts can be used again.

Keep the damaged seal. The damaged seal can be used to make a new seal to the same length.

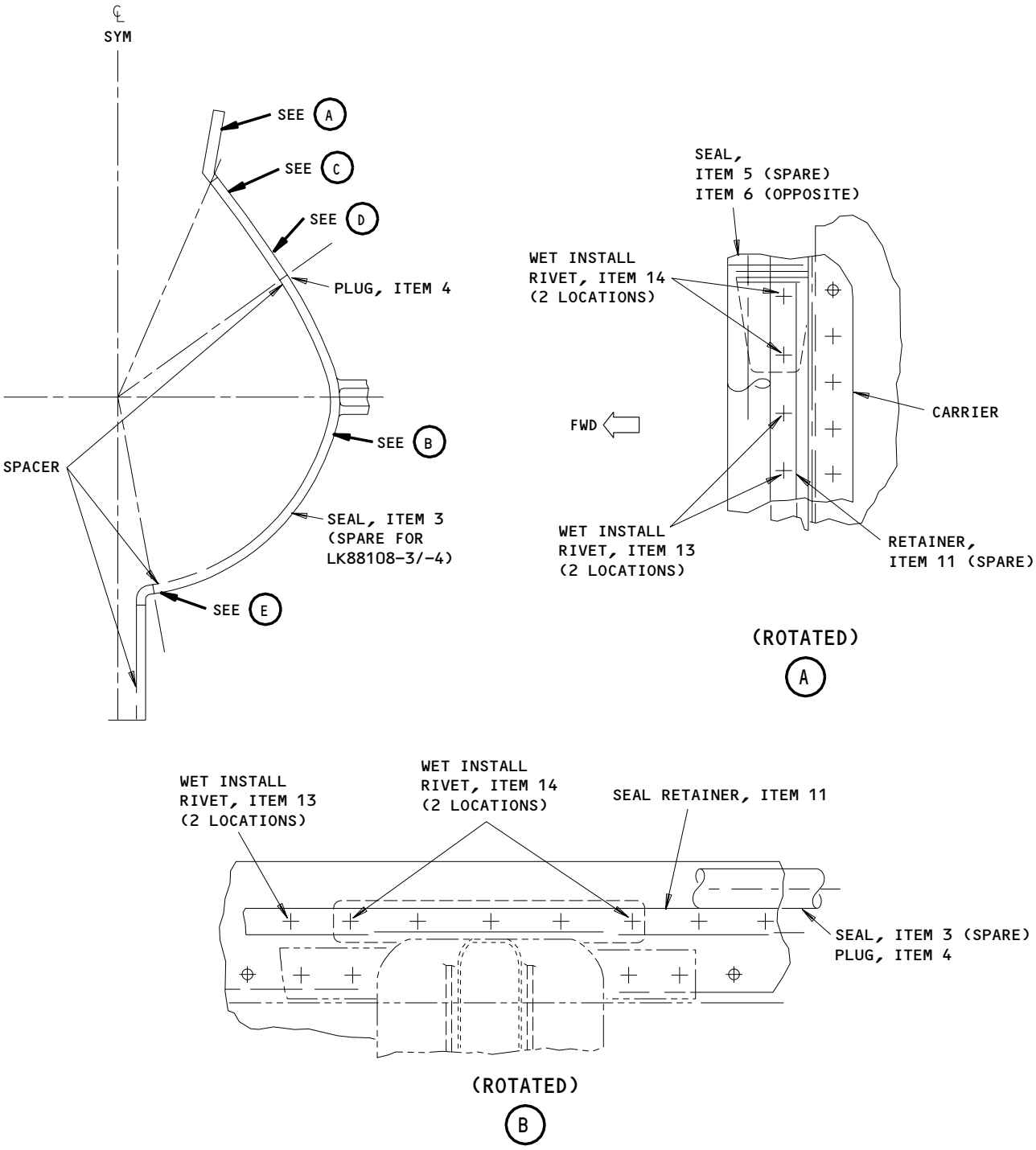
S 358-098-R00

(2) Cut a repair seal, plug and seal retainer to the correct dimensions to do the repair. Use Repair parts, Items 1 and 11 as applicable (Fig. 803 Sheets 1-5).



62351B

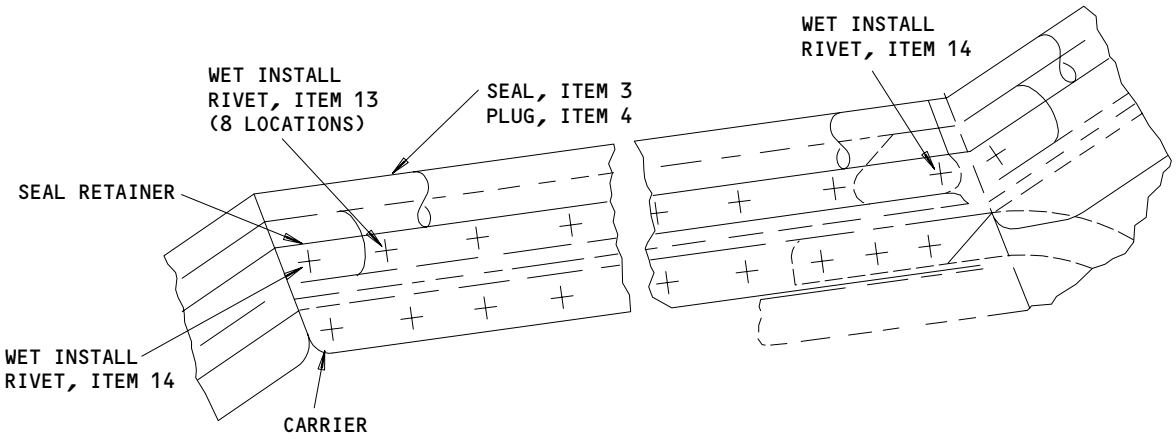
CNA Inner Duct Seal and Seal Retainers Replacement
Figure 803 (Sheet 1)



NOTE: SEALS, SEAL RETAINERS AND CARRIERS SHOWN. (EXAMPLE, BOTH SIDES)

62359B

CNA Inner Duct Seal and Seal Retainers Replacement
Figure 803 (Sheet 2)



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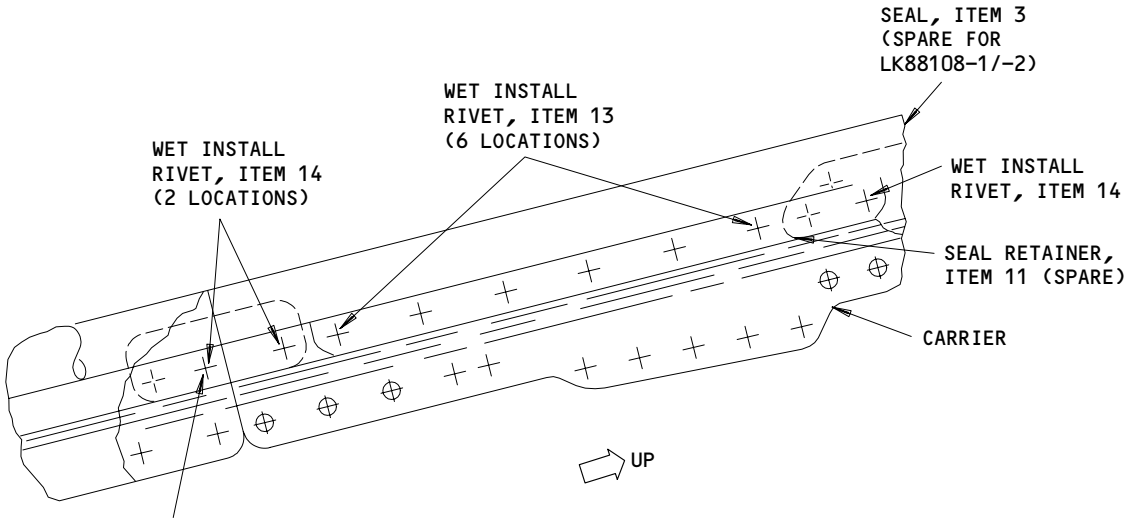

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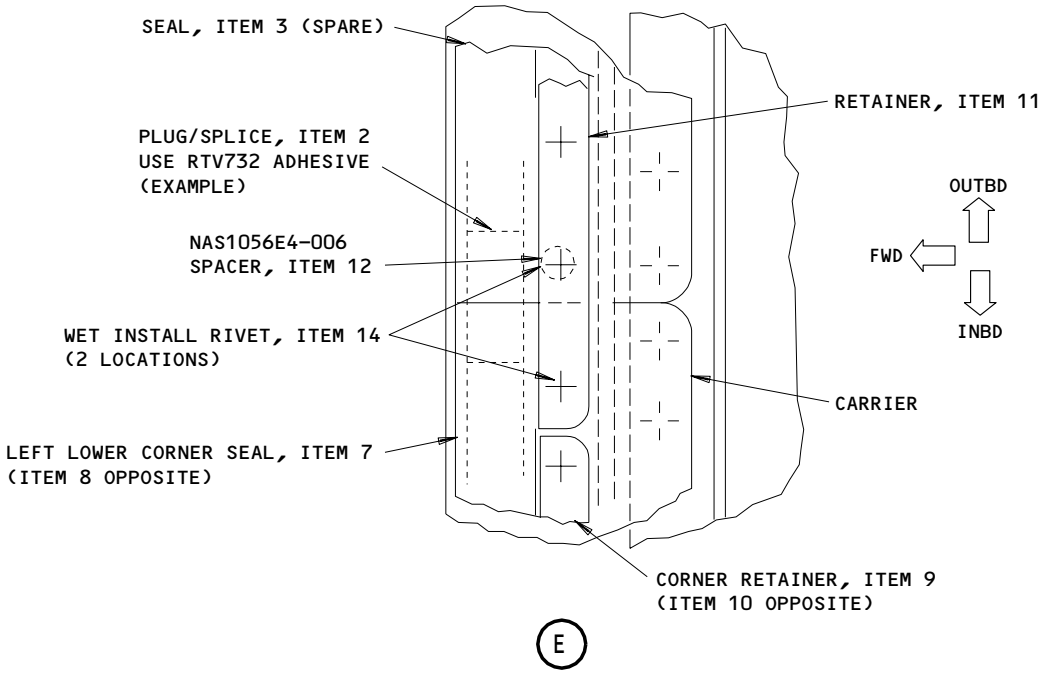
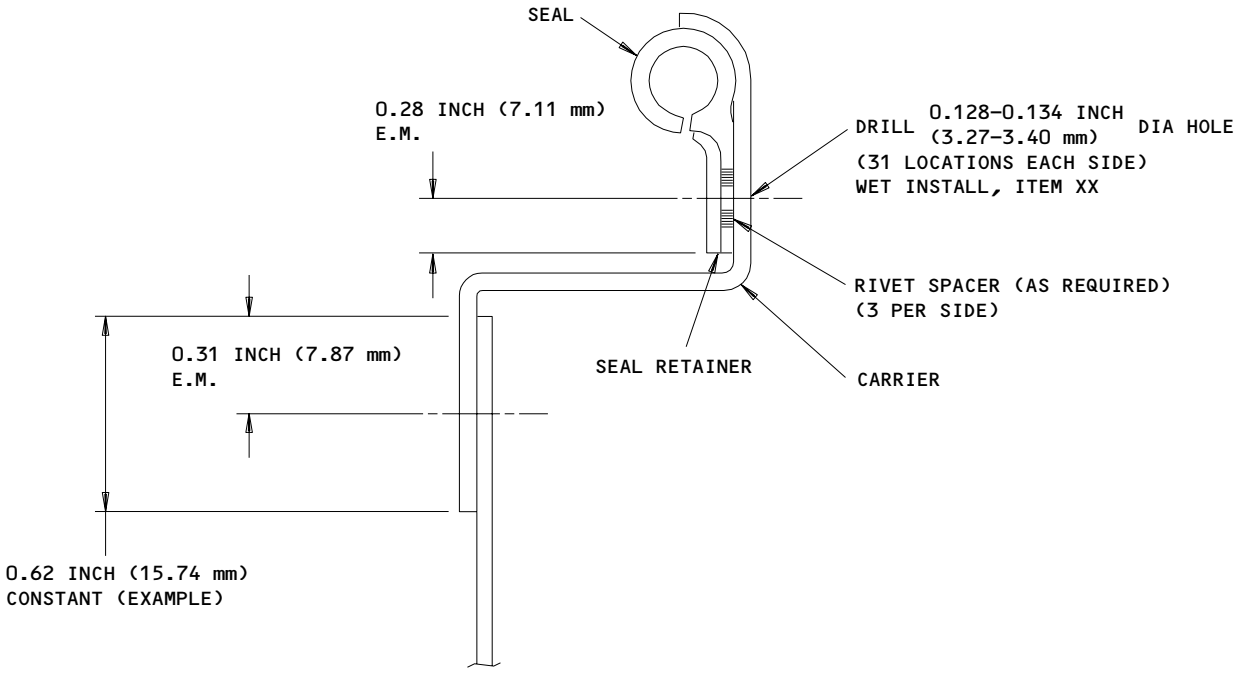
62360A

CNA Inner Duct Seal and Seal Retainers Replacement
Figure 803 (Sheet 3)

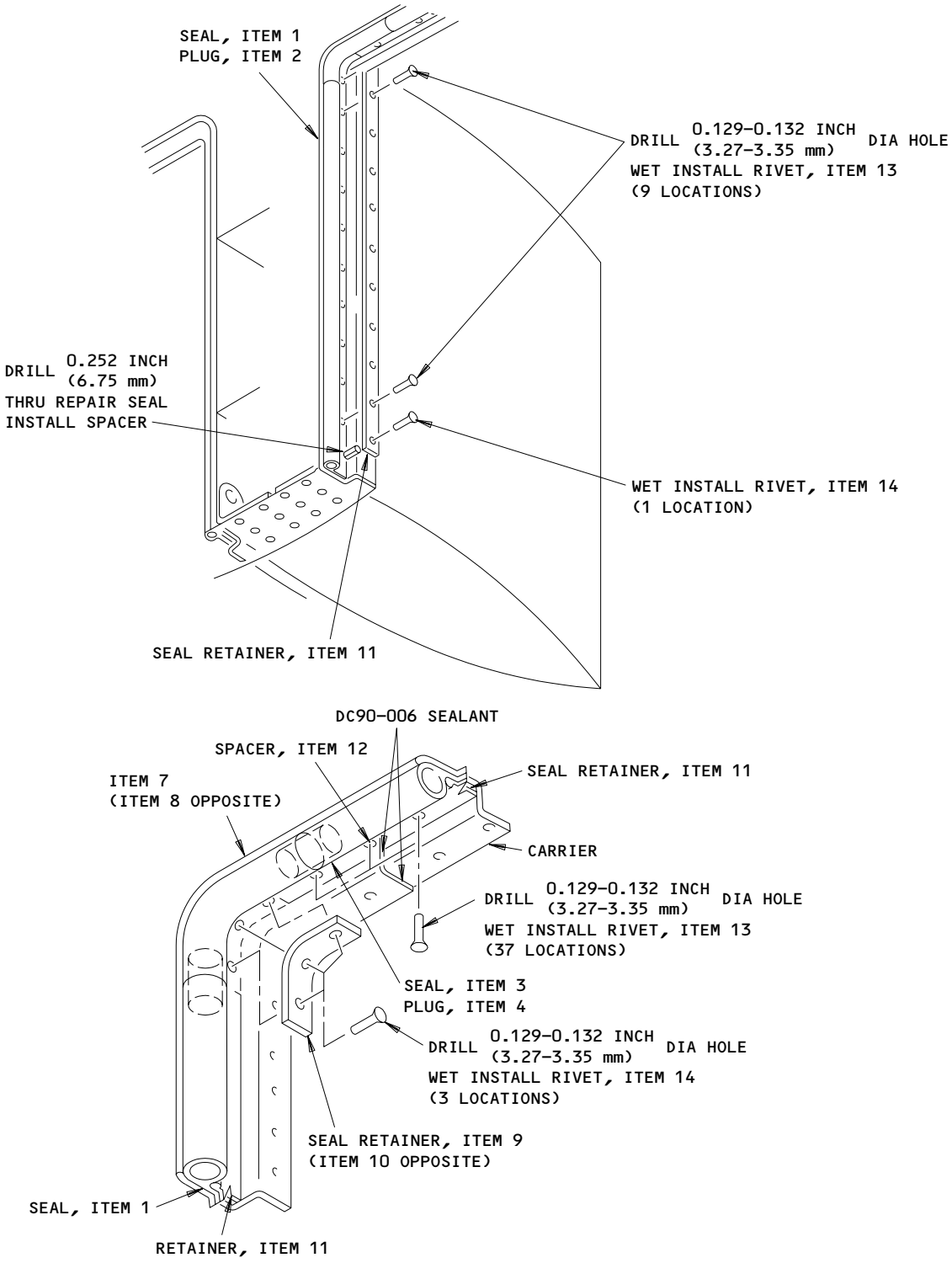




(EXAMPLE, FASTENER LOCATION AND HOLE DIAMETER EXCEPT AS NOTED)

62361A

CNA Inner Duct Seal and Seal Retainers Replacement
Figure 803 (Sheet 4)



CNA Inner Duct Seal and Seal Retainers Replacement
Figure 803 (Sheet 5)

NOTE: A clearance between the adjacent ends of the initial seal and the reapir seal must be kept. The maximum clearance must be 0.030 in. (0.75 mm).

The repair seal must have a minimum of 3 bleed holes.

The plug that fits in the initial seal and repair seal when installed must be 1.200 in. (30.00 mm) in length.

Each seal assembly must be replaced in one full length. Only RR1502441 seal (Item 3) can be installed in more than one length. If the seal is installed in more than one length, use a plug. The plug connects the two seals together and must be a minimum of 12.000 in. (305.00 mm) long (Fig. 803 Sheet 2).

The seal retainers can be made from LJ76188 spare retainer material (Item 11). Only the two corner retainers (Items 9 and 10) are made specially (Fig. 803 Sheet 5).

LJ76188 spare retainer material (Item 11) can be used to connect LK88107-7/8 retainer assembly and the LJ76188 retainer together. The LJ76188 s pare retainer material must be a minimum of 13.000 in. (330.00 mm) in length

S 358-099-R00

(3) Make the repair area clean.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Use a putty knife to remove all unwanted sealant from the seals and carrier faces.

(b) Make a lint free cloth moist with degreasing fluid. Degrease the repair area and repair parts. Make the area and parts dry before the liquid becomes a gas.
(c) Discard the dirty cloth.

S 358-100-R00

(4) Drill rivet holes in the repair seal and retainer (Fig. 803 Sheets 2-5).
(a) Put the repair seal and seal retainer in the correct position to do the repair.

NOTE: Make sure the retainer is held tightly in position.

(b) Make a mark to identify the rivet hole positions on the retainer. Make sure the rivet hole positions align with the rivet holes in the carrier.
(c) Get the correct drill for the rivet holes. Use drilling equipment to drill the rivet holes.
(d) Make the spacer rivet holes larger. Refer to the damaged seal for the spacer locations. Use drilling equipment or a hole punch to make the spacer rivet holes 0.250 in. (6.35 mm) in diameter.
(e) Remove the repair seal and seal retainer from the repair area. Deburr all the holes.

S 358-101-R00

(5) Apply primer to the seal retainer.

WARNING: DO NOT GET THE PRIMER ON YOUR SKIN, IN YOUR EYES OR IN YOUR MOUTH. YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. KEEP THE PRIMER AWAY FROM SPARKS, FLAME AND HEAT. KEEP PRIMER AWAY FROM IGNITION SOURCES. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY CAN OCCUR.

(a) Prepare the primer.
1) Get the primer base, curing solution and thinners. Mix the primer compound.

NOTE: Make sure the primer mix instructions are obeyed.

(b) Apply the primer compound to the rivet holes in the seal retainer. Apply the primer compound to the cut ends of the seal retainer.
(c) Cure the primer for one hour.

S 358-102-R00

(6) Apply primer (DC1200) to the repair seal (Fig. 803 Sheets 2-5).

WARNING: DO NOT GET THE PRIMER ON YOUR SKIN, IN YOUR EYES OR IN YOUR MOUTH. YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. KEEP THE PRIMER AWAY FROM SPARKS, FLAME AND HEAT. KEEP PRIMER AWAY FROM IGNITION SOURCES. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY CAN OCCUR.

(a) Get the primer. Apply primer to all areas of the repair seal and plugs that will touch when assembled. Apply primer to the cut ends of the repair seal. Let the primer cure for half an hour before the sealant is applied.

S 358-103-R00

(7) Apply sealant (DC90-006) to the carrier and corner gaps (Fig. 803 Sheets 2-5).

WARNING: DO NOT GET THE SEALANT ON YOUR SKIN. USE THE CORRECT HAND PROTECTION. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURY CAN OCCUR.

(a) Get the two part sealant. Mix the sealant.

NOTE: Make sure the sealant mix instructions are obeyed.

(b) Apply the sealant to the gaps between the seal retainer carriers and the gaps in the corners of the carriers.

S 358-104-R00

(8) Apply the silicone rubber compound (Fig. 803 Sheet 2-5).

(a) Mix the silicone rubber compound.

NOTE: Make sure the silicone rubber compound mix instructions are obeyed.

(b) Apply the compound to the repair seal and plugs. Install the repair seal and plugs in the correct position in the repair (Fig. 803 Sheets 2-5).

NOTE: Make sure the plugs are positioned equally in each repair seal.

Make the silicone rubber compound smooth on the seal joints.

The repair seal has bleed holes in its surface that are 0.100 in. (2.50 mm) in diameter. The bleed holes are 5.000 in. (127.00 mm) apart. If a bleed hole is blocked by a plug, drill a new bleed hole adjacent to the plug.

S 358-105-R00

(9) Install the repair seal and seal retainer (Fig. 803 Sheets 2-5).

(a) Put the seal retainer in the correct position on the repair.

(b) Get the applicable rivets (Items 13 and 14). Use riveting equipment to install the rivets in the correct positions.

NOTE: Use a small quantity of sealant (DC90-006) to install the rivets.

S 118-106-R00

(10) Clean the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Make clean the repair area. Remove all unwanted sealant. Make the repair area dry before the liquid becomes a gas.

S 358-107-R00

(11) Cure the sealant.
(a) Cure the sealant at 21-43°C (70-110°F) for 24 hours.

NOTE: The sealant must be cured before pressure is applied to the repair seal.

(b) If required, the cure time may be accelerated by heating the sealant at 140-160°F using a heat gun. A sheet metal sample coated to about the same thickness as the sealant application, and heated in the same manner, should be used to verify that the sealant is cured. The sealant should cure in 2-3 hours.

S 218-108-R00

(12) Do a visual inspection of the repaired area.

S 938-109-R00

(13) Record the repair.
(a) Write FSC6216 adjacent to the part number. Use a permanent marker that can be easily seen on the surface adjacent to the part number.

TASK 78-11-04-308-110-R00

5. Exhaust Collector - Common Nozzle Assembly (CNA) - Replacement of the Outer Duct Seal and Seal Retainers

A. General
(1) The repair in this procedure is FRS6217.
(2) This procedure details the repair of the CNA outer duct seal and seal retainers. The damaged seal and seal retainers are repaired by the replacement of the damaged parts.

(3) This procedure can be used to repair the CNA outer duct seal and seal retainers on the RB211-535E4 and E4-B engines. Use this procedure to repair ducts which have the part numbers that follow:

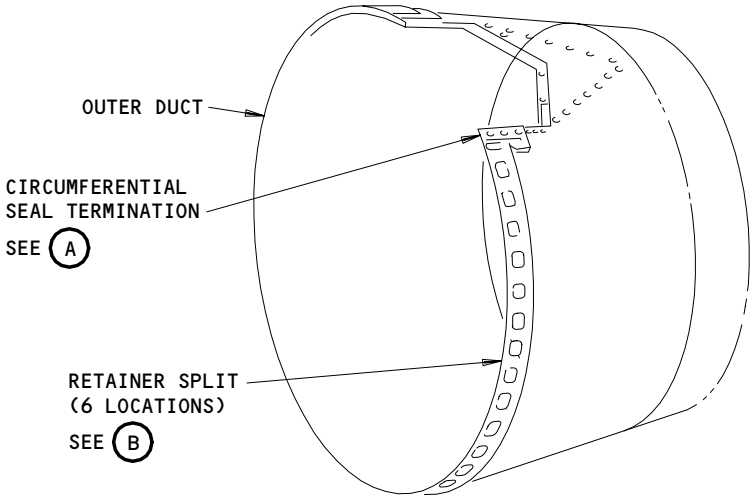
UL13026 SB 78-7614
UL13029 SB 78-7745
UL28311 SB 78-9172
UL15647
LK88113 SB 78-7983
LK88149 SB 78-9728

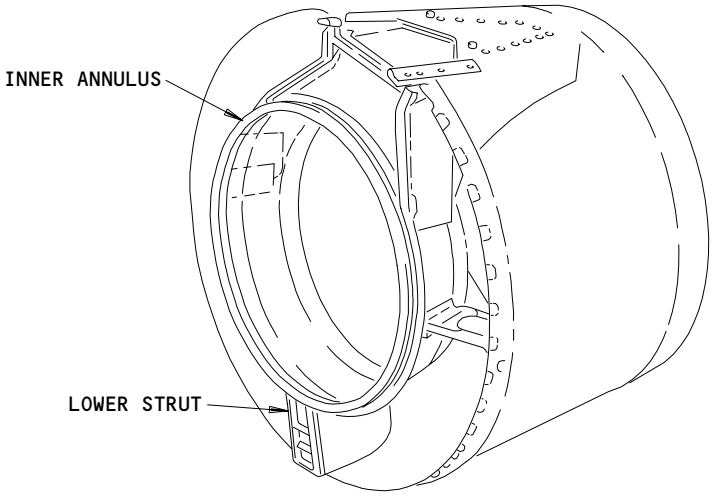
B. Equipment
(1) Workshop tools.
(2) Drilling equipment.
(3) Heat lamps (explosion proof)

C. Parts
(1) Seal, ARM835 (RR1502383) (Item No. 1)
(2) Seal plug, ARM834 (RR1502382) (Item No. 2)
(3) Retainer, LJ76184 (Item No. 3)
(4) Rivet, MS20426B4-3 (RR1012138) (Item No. 4)

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150
or Isopropyl alcohol OMat No. 1/40,
or cleaning solvent Desoclean OMat No. 1/257
(2) Primer base
British Spec/Ref - Bostik 463-6-27
OMat No. 7/157
(3) Curing solution
British Spec/Ref - Bostik X-337
OMat No. 7/158
(4) Thinner
British Spec/Ref - TL52-66
OMat No. 7/159
(5) Silicone rubber, cold bonding
British Spec/Ref - Silastic 732
OMat No. 872F
(6) Primer
British Spec/Ref - DC1200
OMat No. 876C
(7) Sealant, 2 part pack, base and catalyst
British Spec/Ref - Dow Corning DC93-006-1
OMat No. 8/143
(8) Permanent marker - Local resources
(9) Lint free cloth - Local resource
(10) Aluminium sheet clad 2024-T0, 0.032 in. X 1.000 in. (0.81 mm x 25.4 mm).

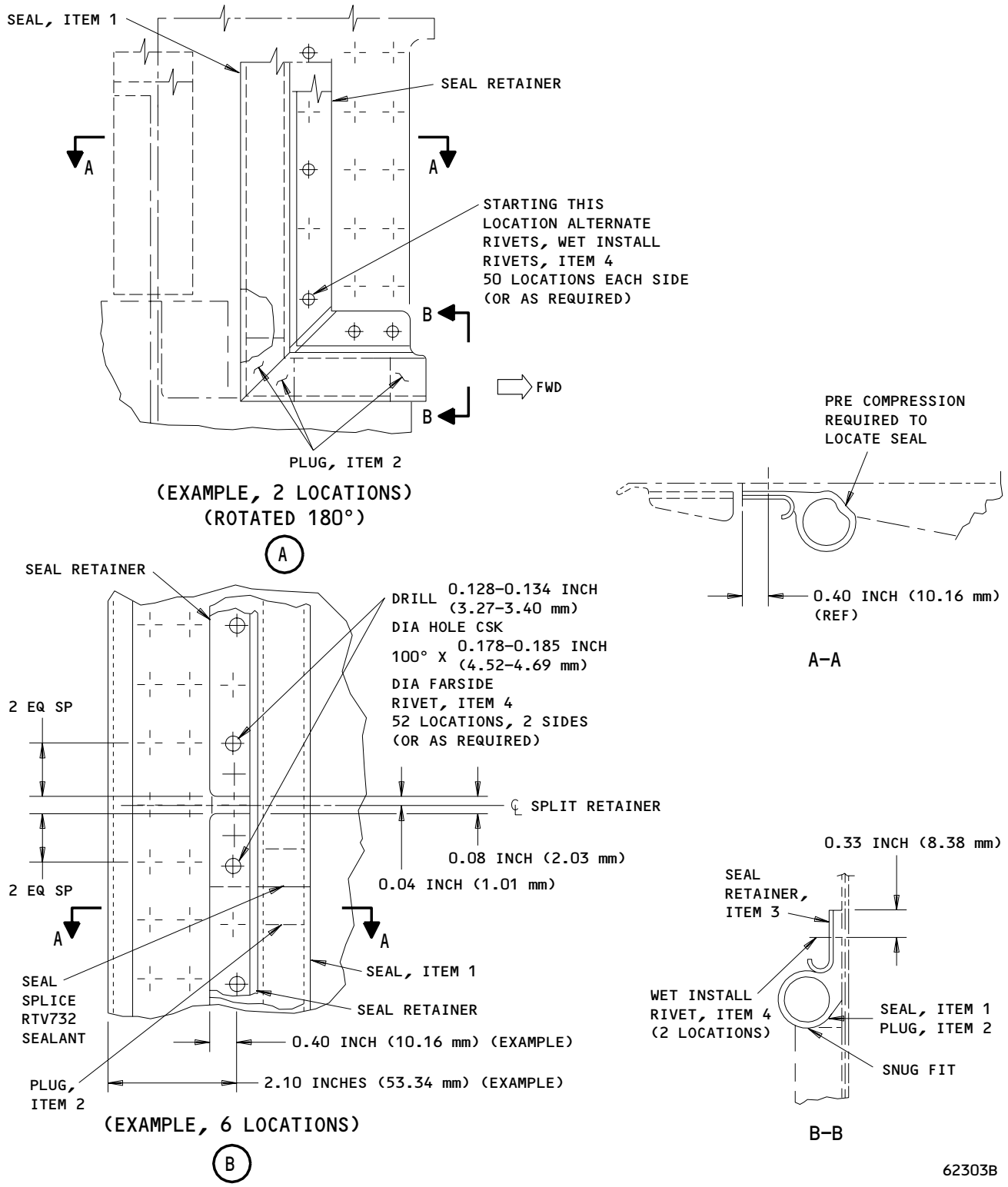
E. Replace the outer duct seal and seal retainer.





62351B

CNA Outer Duct Seal and Seal Retainer Replacement
Figure 804 (Sheet 1)



CNA Outer Duct Seal and Seal Retainer Replacement
Figure 804 (Sheet 2)

S 028-111-R00

(1) Remove the damaged seal and seal retainer (Fig. 804 Sheets 1 and 2).

(a) Identify the damage to the seal.

NOTE: Identify the damage to the seal so that the minimum number of retainers are removed.

(b) Make a mark to identify the edge of the seal. Use a marker that is not permanent.

(c) Remove the rivets from the applicable seal retainer. Remove the seal retainer. Cut the damaged seal and remove it from the duct. Use drilling equipment.

NOTE: The cut in the seal must be an equal distance between each retainer rivet.

Use a seal plug to connect the initial seal and the repair seal. The seal plugs must be a minimum distance of 12.000 in. (305.00 mm) apart.

When a seal plug is used to connect the seals, make sure the plug does not block the bleed holes in the seal. If a bleed hole is blocked, drill a 0.100 in. (2.50 mm) bleed hole adjacent to the seal plug.

The outer duct seal at the bottom of the CNA, below the lower strut bottom seal, must not contain bleed holes. If required, use silicon rubber compound to block all bleed holes in this area of the seal. Do this procedure on new seals only.

The width of the outer duct seal at the bottom of the CNA is approximately 5.000 in. (127.00 mm). A seal plug can be us.ed to connect lengths of seal in this area.

S 358-112-R00

(2) Prepare to install the repair seal and seal retainer (Fig. 804 Sheets 1 and 2).

(a) Make a repair seal (Item 1) and get an LJ76184 retainer (Item 3). Make the repair seal to the correct dimensions to do the repair.

NOTE: A retainer can be made of 0.032 in. (0.81 mm) 2024-T0 aluminium sheet. The retainer must be heat treated to a T42 condition after it is made.

(b) Put the repair seal and seal retainer in the correct position to do the repair. Make sure the repair parts are held tightly in position.

(c) Drill the rivet holes.

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

1) Identify the initial rivet hole positions. Use the correct drill to drill the rivet holes in the repair area. Use drilling equipment.

(d) Remove the repair seal and retainer from the repair area. Deburr all the rivet holes. Use workshop tools.

(e) Make two seal plugs for the seal joints. Use seal plug material (Item 2).

NOTE: The plug must be 1.000 in. (25.40 mm) long.

(f) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

1) Make a lint free cloth moist with degreasing fluid.

2) Make clean the repair surfaces. Make the repair surfaces dry before the liquid becomes a gas.
3) Discard the dirty cloth.

S 428-113-R00

(3) Install the repair seal and seal retainer.

(a) Prepare and apply primer.

WARNING: DO NOT GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES. FLUSH AWAY WITH WATER. GET MEDICAL AID IF YOU GET PRIMER IN YOUR MOUTH OR EYES. KEEP PRIMER AWAY FROM HEAT AND IGNITION SOURCES.

1) Get the primer base, curing solution and thinner. Mix the primer.

NOTE: Make sure the primer mix instructions are obeyed.

2) Apply the primer to all cut edges of the retainer.
3) Cure the primer for a minimum of one hour. Use heat lamps.
4) Get the primer (DC1200). Apply primer to all the areas of the repair seal and plug that will touch when assembled. Apply primer to the cut eands of the repair seal.
5) Let the primer cure for two hours before the sealant is applied.

(b) Apply silicone rubber sealant to the repair parts (Fig. 804 Sheet 2).

WARNING: DO NOT GET SEALANT ON YOUR SKIN. USE THE CORRECT PROTECTION. USE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT.

1) Get the silicon rubber sealant.

2) Apply the sealant to the surfaces of the repair seal and seal plug that will touch when assembled. Apply sealant to the end of each seal.

(c) Install the repair seal and seal retainer (Fig. 804 Sheet 2).

1) Put the seal plug in the correct position in the repair seal.

NOTE: Make sure an equal quantity of the plug is inside each seal when assembled.

2) Put the repair seal in the correct position on the repair area.

NOTE: If a seal plug blocks a bleed hole in the repair seal, drill a new bleed hole. The bleed hole must be 0.100 in. (2.50 mm) in diameter and adjacent to the internal seal plug.

Make the sealant smooth around the seal joint.

3) Install the seal retainer on the repair seal. Align the rivet holes correctly.

NOTE: Make sure the seal retainer is held tightly in the correct position.

4) Get the two part sealant. Mix the base and catalyst.

NOTE: Make sure the sealant mix instructions are obeyed.

5) Get the correct quantity of MS20426B4-3 rivets (Item). Install the rivets in the repair area. Use riveting equipment.

NOTE: Put a small quantity of sealant on the rivets before they are installed.

6) Let the sealant cure for 24 hours at 21-43°C (70-110°F).

NOTE: Cure the sealant before pressure is applied to the repair seal. Uncured sealant is permitted, but the seal joints can be damaged by adjacent surfaces.

(d) Do a visual inspection of the repaired area (Fig. 804 Sheet 2).
(e) Record the repair.
1) Write FSC6217 adjacent to the assembly number. Use a permanent marker that can be easily seen on the surface adjacent to the assembly number.

TASK 78-11-04-308-114-R00

6. Exhaust Collector - Common Nozzle Assembly (CNA) - Install a New Fuel Drain Tube Bracket

A. General
(1) The repair in this procedure is FRS6255.
(2) This procedure details the repair of the fuel drain tube bracket. The repair is done by the removal of the damaged bracket and the installation of a new bracket.
(3) This procedure can be used to repair the CNA fuel drain tube brackets on RB211-535E4 and E4-B engines. Use this procedure to the numbers that follow:

UL13022	UL13012 SB 78-7684
UL13010 SB 78-7404	UL13027 SB 78-7745 pt1
UL13023 SB 78-7614 pt1	UL13028 SB 78-7745 pt2
UL13024 SB 78-7614 pt2	JP55201 SB 78-7968

B. Equipment
(1) Workshop tools.
(2) Drills and drilling equipment.
(3) Riveting equipment.

C. Parts
(1) Rivet, MS20470D5-6 (RR1013540) (Item No. 1)
(2) Rivet, MS20470E5-6 (RR1013545) (alternative)(Item No. 1)

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150
or Isopropyl alcohol OMat No. 1/40,
or cleaning solvent Desoclean OMat No. 1/257
(2) Primer base
British Spec/Ref - Bostik 463-6-27
OMat No. 7/157

(3) Thinner
British Spec/Ref - TL52-66
OMat No. 7/159
(4) Curing solution
British Spec/Ref - Bostik X-337
OMat No. 7/158
(5) Lint free cloth - Local resources
(6) Permanent marker pen - Local resources
(7) Aluminium sheet 2024-T3, 0.040 in. X 1.600 in. (1.00 mm x 40.6 mm) - Cut to length

E. Replace the fuel drain tube bracket

S 028-115-R00
(1) Remove the damaged bracket

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Use workshop tools to remove the fuel drain tube.

NOTE: Keep the fasteners that have a thread. The fasteners can be used again.

(b) Make a mark to identify the position of the vertical leg of the damaged bracket.
(c) Use drilling equipment and a drill that is 0.128-0.132 in. (3.25-3.35 mm) diameter to remove the bracket fasteners.

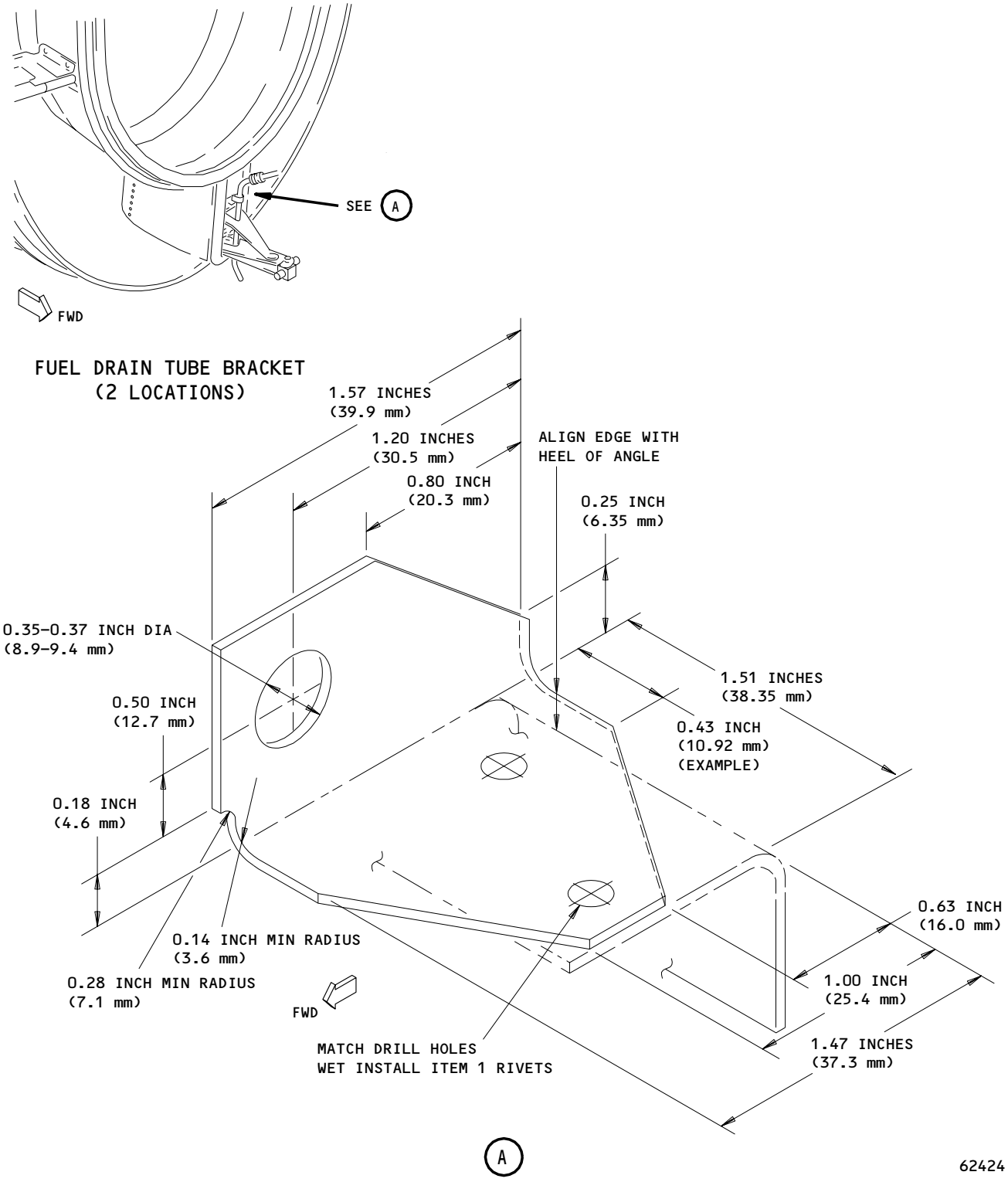
S 358-116-R00
(2) Make a fuel drain tube bracket (Fig. 805).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(a) Put the repair bracket in the correct position on the CNA lower strut.

NOTE: Align the rear edge of the repair bracket with the vertical leg of the bracket support. This will put the repair bracket in the correct position.

Make sure the repair bracket is held tightly in position.



Fuel Drain Tube Bracket Replacement
Figure 805

(b) Make a mark to identify the rivet hole positions on the repair bracket.

NOTE: Align the rivet hole positions with the rivet holes in the structure.

(c) Use drilling equipment and a drill that is 0.161-0.166 in. (4.09-4.21 mm) diameter to drill the rivet holes in the repair bracket.
(d) Remove the repair bracket from the CNA lower strut. Use workshop tools to deburr the rivet holes.

S 118-117-R00
(3) Degrease the repair surfaces.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Make clean the repair surfaces. Make the surfaces dry before the liquid becomes a gas.
(c) Discard the dirty cloth.

S 358-118-R00
(4) Prepare and apply the primer.

WARNING: DO NOT GET THE PRIMER ON YOUR SKIN. USE THE CORRECT HAND PROTECTION. USE THE PRIMER IN AN AREA THAT HAS A GOOD FOLW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER.

(a) Get the primer base and curing solution. Mix the primer base and curing solution. Make sure the primer mix instructions are obeyed.
(b) Apply primer to the surfaces of the repair bracket and bracket support that will touch when assembled. Apply primer to the cut edges of the repair bracket.

S 428-119-R00

(5) Install the repair bracket (Fig. 805).
  (a) Get the correct quantity of MS20470D5-6 rivets (Item 1).
  (b) Put the repair bracket in the correct position to do the repair.
  (c) Apply primer base to the rivets. Install the rivets in the repair area. Use riveting equipment.
  (d) Install the fuel drain tube. Use the fasteners that were kept.

S 218-120-R00

(6) Do a visual inspection of the repaired area.

S 938-121-R00

(7) Record the repair.
  (a) Write FRS6255 adjacent to the assembly number. Use a permanent marker that can be easily seen on the surface adjacent to the assembly number.

TASK 78-11-04-308-122-R00

7. Exhaust Collector, Common Nozzle Assembly (CNA) - Install a New Side Strut

A. General
  (1) The repair in this procedure is FRS6187.
  (2) This procedure details the repair of the side struts in the CNA. The repair is done by the removal of the damaged side strut and the installation of a new side strut.
  (3) Use LJ76195 repair side strut to replace a damaged side strut (LK88055) that is pre SB78-8552 standard. Use LJ76209 repair side strut to replace a damaged side strut (LK88155) that is to SB78-8552 standard.
  (4) This procedure can be used to repair CNA side struts on RB211-535E4 and E4-B engines. Use this procedure to repair a CNA that has the part number that follows:

JP55201 SB 78-7968

B. Equipment
  (1) Workshop tools.
  (2) Drills and drilling equipment.
  (3) Riveting equipment.
  (4) "C" clamps.
  (5) Degreasing equipment.
  (6) Heat lamps (explosion proof).

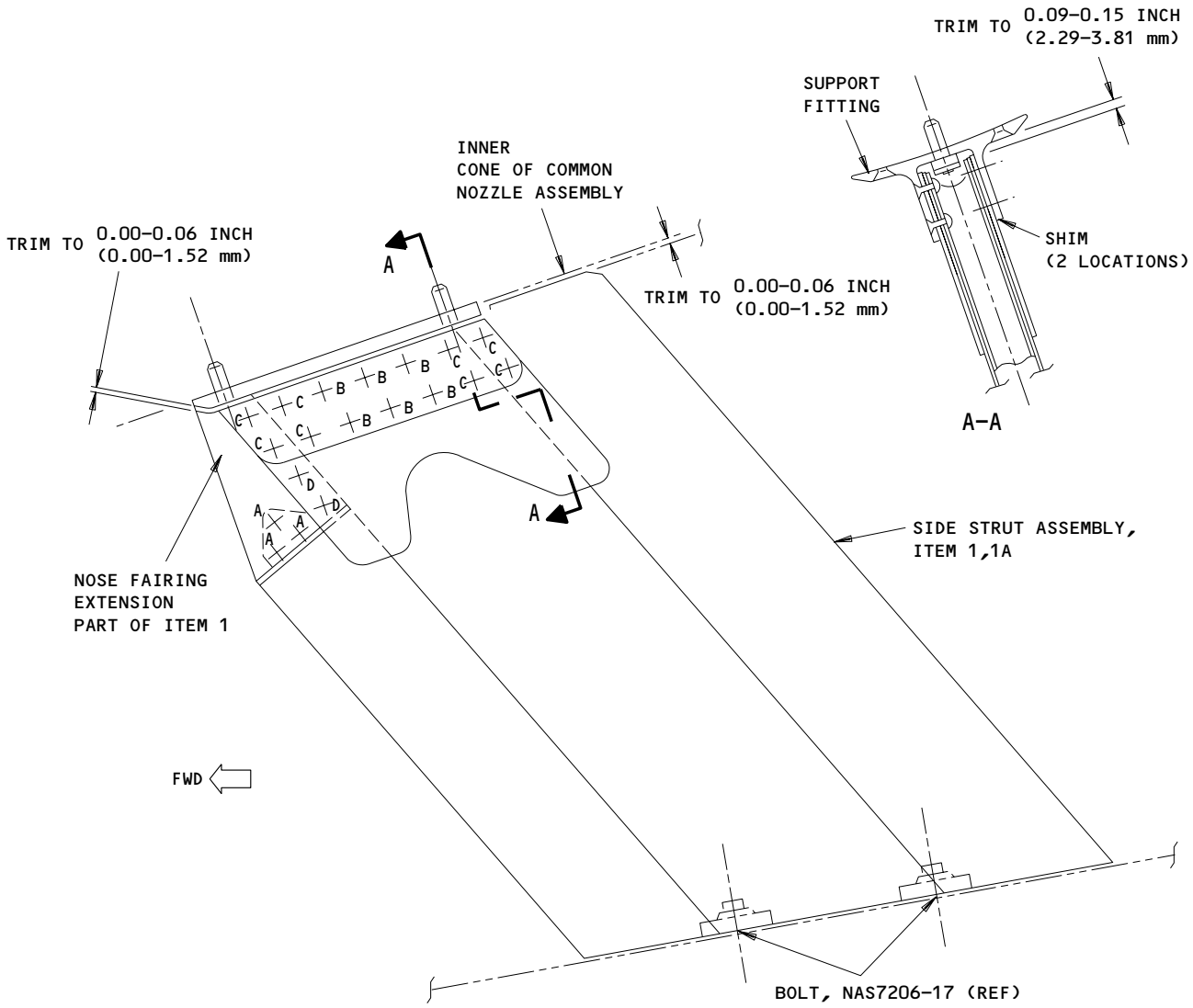
C. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150
or Isopropyl alcohol OMat No. 1/40,
or cleaning solvent Desoclean OMat No. 1/257
(2) Primer base
British Spec/Ref - Bostik 463-6-27
OMat No. 7/157
(3) Curing solution
British Spec/Ref - Bostik X-337
OMat No. 7/158
(4) Thinner
British Spec/Ref - TTL52-66
OMat No. 7/159
(5) Primer
British Spec/Ref - DC1200
OMat No. 876C
(6) Sealant, 2 parts, base and catalyst
British Spec/Ref - Dow Corning DC93-006-1
OMat No. 8/143
(7) Abrasive paper, aluminium oxide 180 grit
OMat No. 5/62
(8) Lint-free cloth - Local Resources
(9) Shim, 2024-T3 Aluminium sheet clad, 0.016 in. (0.406 mm) solid stock.
(10) Shim, 2024-T3 Aluminium sheet clad, 0.020 in. (0.508 mm) solid stock.
(11) Shim, 2024-T3 Aluminium sheet clad, 0.025 in. (0.635 mm) solid stock.
(12) Shim, 2024-T3 Aluminium sheet clad, 0.032 in. (0.813 mm) solid stock.
(13) Permanent marker pen - Local resources

D. Parts
(1) Side strut, LJ76195 (Optional to LJ76209) (Item No. 1)
(2) Side strut, LJ76209 (Optional to LJ76195) (Item No. 1)
(3) Blind rivet, NAS1399M4-3 (RR1011919) (Item No. 3)
(4) Blind rivet, MS21140-0605 (RR1012094) (Item No. 4)
(5) Blind rivet, MS21140-0606 (RR1011914) (Item No. 5)
(6) Blind rivet, MS21140-0504 (RR1012095)(Item No. 6)

E. Replace the damaged side strut

S 028-123-R00

(1) Remove the damaged side strut (Fig. 806).
(a) Drill out the rivets (14 off) from each side of the side strut support assembly. Use drilling equipment and an applicable drill.



REVET CODE	ITEM NUMBER	HOLE DIAMETER	100° CSK DIAMETER
A	3	0.132 INCH (3.35 mm) 0.129 INCH (3.28 mm)	0.228 INCH (5.79 mm) 0.222 INCH (5.64 mm)
B	4	0.204 INCH (5.18 mm) 0.200 INCH (5.08 mm)	0.390 INCH (9.91 mm) 0.384 INCH (9.75 mm)
C	5		
D	6	0.169 INCH (4.29 mm) 0.165 INCH (4.19 mm)	0.337 INCH (8.56 mm) 0.331 INCH (8.41 mm)

62340B

Side Strut Replacement
Figure 806

(b) Drill out the rivets (5 off) from each side of the nose fairing extension. Use drilling equipment and an applicable drill.
(c) Use workshop tools to remove the NAS7206-17 bolts (2 off) from the outer duct assembly. Keep the bolts. The bolts can be used again.
(d) Remove the damaged side strut from the rear of the CNA. Remove the shims from between the side strut and its support assembly. Identify the shim for position. Keep all the parts that are not damaged.

NOTE: Shim identification is done to make a record of which side of the strut the shim has come from.

S 428-124-R00

(2) Prepare to install the repair side strut (Item 1).
(a) Remove the nose fairing extension
1) Get the repair side strut (Item 1).
2) Use drilling equipment and an applicable drill to remove the nose fairing extension from the repair side strut assembly.

NOTE: The nose fairing extension is connected to the side strut assembly by rivets (5 off).

S 358-125-R00

(3) Temporarily install the repair side strut in the CNA.
(a) Temporarily install the repair side strut assembly from the rear of the CNA.

NOTE: Cut the repair side strut assembly to the correct length. Remove material from the inner end of the repair side strut assembly.

Make sure the repair side strut assembly is the correct length to fit the inner core support assembly.

(b) Loosely install the NAS7206-17 bolts (2 off) to engage the repair side strut assembly at the outer duct position.

S 358-126-R00

(4) Set the shims for the inner support assembly.
(a) Get the inner support shims that were used before.
(b) Make an inspection of the inner support shims. If the shims are serviceable, keep the shims to be used again, if required.

(c) Temporarily install shims between the repair side strut assembly and the inner support assembly to get the correct shim fit (2 positions).

NOTE: Adjust the repair side strut assembly in the limits of the loose outer duct bolts.

Do not put too much stress on the parts when the repair side strut assembly is adjusted.

If possible, get the top and bottom shim dimensions approximately equal.

Use a maximum of two shims on each side of the repair side strut assembly.

(d) Tighten the outer duct bolts. Make sure the shim dimensions are correct. Make sure the conditions that follow are obeyed:
1) The maximum gap between the shim and structure is not more than 0.002 in. (0.05 mm) before the assembly is riveted.
2) The difference between the shim dimensions must not be more than 0.020 in. (0.503 mm).

(e) Temporarily install the nose fairing extension.
1) Cut the nose fairing extension to fit in the correct position on the repair side strut assembly.
2) Use clamps to hole the nose fairing extension in the correct position.
3) Drill rivet holes in the repair side strut assembly (Fig. 806).

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(f) Use drilling equipment and an applicable drill to drill rivet holes (14 off) in the repair side strut assembly.

NOTE: Make sure the rivet holes go through all the applicable parts.

Make a mark on the shims to identify the contour of the inner support assembly.

(g) Remove the repair side strut assembly, shims and nose fairing extension from the repair area.

NOTE: Make sure the positions of the shims are identified.

(h) Cut the shims to the contour of the inner support assembly.
(i) Deburr the cut edges and rivet holes on the repair parts. Remove all unwanted material from the drilling procedure.

S 118-127-R00

(5) Degrease the repair parts.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(a) Make a lint free cloth moist with degreasing fluid.
(b) Make clean the cut edges of the repair parts.
(c) Make clean the surfaces of the repair parts that will touch when assembled.
(d) Discard the dirty cloth.

S 358-128-R00

(6) Apply primer to the repair parts.

WARNING: DO NOT GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER.

(a) Get the primer base and curing solution.
(b) Apply the primer base and curing solution to all cut edges of the repair parts. Also apply to the surfaces of the repair parts that do not have primer on them.
(c) Cure the primer at 82-93°C (180-200°F) for 15 minutes. Use heat lamps.

S 428-129-R00

(7) Install the repair side strut assembly (Fig. 806).
  (a) Put the repair side strut assembly in the correct position in the CNA.

    NOTE: Put the repair side strut assembly in position from the rear of the CNA.

  (b) Loosely install the NAS7206-17 bolts (2 off) to engage the repair side strut assembly at the outer duct position.
  (c) Put the shims in the correct positions.
  (d) Put the nose fairing extension in the correct position on the repair side strut assembly.
  (e) Tighten the NAS7206-17 bolts (2 off) at the outer duct position. Use clamps to hold the inner end of the repair side strut assembly in the correct position to install the rivets.
  (f) Install the rivets in the repair area (Fig. 806).
    1) Get NAS1399M4-3 (Item 3), MS21140-0605 (Item 4), MS21140-0606 (Item 5) and MS21140-0504 (Item 6) rivets as applicable.
    2) Apply primer base to the rivets. Use riveting equipment to install the rivets in the repair side strut assembly.

S 118-130-R00

(8) Degrease the repair area.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IF YOU GET FLUID IN YOUR MOUTH OR EYES. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

  (a) Make a lint free cloth moist with degreasing fluid.
  (b) Swab degrease the beads, gaps and the areas around the joints of the repair.
  (c) Make the areas dry before the liquid becomes a gas.
  (d) Discard the dirty cloth.

S 358-131-R00

(9) Apply sealant to the repair area.

WARNING: DO NOT GET THE SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT.

(a) Get the primer (DC1200).
(b) Apply the primer.
(c) Cure the primer.
    1) Let the primer cure in air for 2 hours at 20°C (68°F).
(d) Get the two part sealant. Mix the sealant.

    NOTE: Make sure the sealant mix instructions are obeyed.

(e) Apply sealant to the gaps, beads and areas around the repair joints. Remove unwanted sealant.

    NOTE: Apply an equal quantity of sealant to each side of the repair side strut assembly.

(f) Cure the sealant.

    NOTE: Cure sealant for 10 hours if there is a 30 percent related air condition.

    A minimum temperature of 18°C (65°F) must be kept.

S 218-132-R00

(10) Do a visual inspection of the repaired area (Fig. 806).

S 938-133-R00

(11) Record the repair.
    (a) Write FRS6187 adjacent to the assembly number. Use a permanent marker that can be easily seen on the surface adjacent to the assembly number.

TASK 78-11-04-308-150-R00

8. Exhaust Collector - Common Nozzle Assembly (CNA) - Replace or Repair Damaged Nozzle Extension.

A. General

(1) This procedure contains Rolls-Royce repair FRS6205.

(2) Use this procedure to replace or repair the nozzle extension on the CNA.

(3) This procedure contains two parts:

(a) The first part contains the data to repair or replace the outer skin of the nozzle extension.

(b) The second part contains the data to repair or replace the inner skin of the nozzle extension.

(4) Use this procedure on RB211-535E4 and E4B engines, to repair or replace the CNA nozzle extensions with these part numbers.

LK88113
UL13026
UL13029
UL15647

B. Equipment

(1) Heat lamps (explosion proof).

(2) Roundness template, local manufacture (Fig. 807)

C. Parts

(1) Repair parts for the outer skin of the CNA nozzle extension:

NOTE: This list contains Rolls-Royce part numbers.

(a) UL15637 - Circumferential buttstrap
(b) LJ76199 - Stiffener segment
(c) LJ76200 - Skin, outer segment
(d) RR1108252 (4032-0407) - Blind Rivet or
RR10100513 (NAS1399B4-2) or
RR1011346 (NAS1739M4-2)

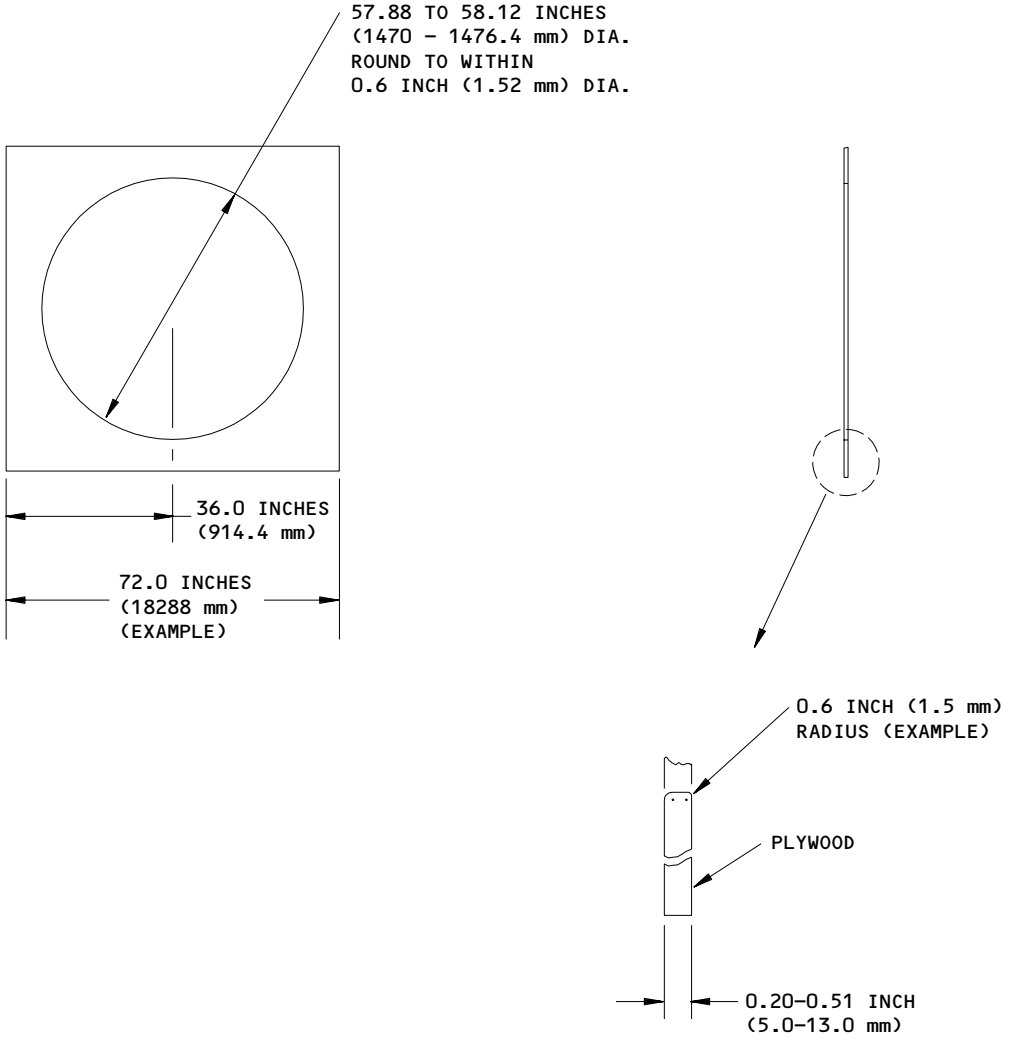
NOTE: The grip length of the rivets is nominal and are shown for guidance. The rivet length that you need can vary due to build up of the structure. For all rivets, measure the grip length that is necessary to complete repair.

(e) RR1010511 (MS20426AD4-5) - Solid Rivet or
RR1013613 (CR3212-4-2) - Blind Rivet
(f) RR1010512 (MS20426AD4-7) - Rivet
(g) RR2101165 (MS20426DD4-5) - Rivet

(2) Repair parts for the inner skin of the CNA nozzle extension:

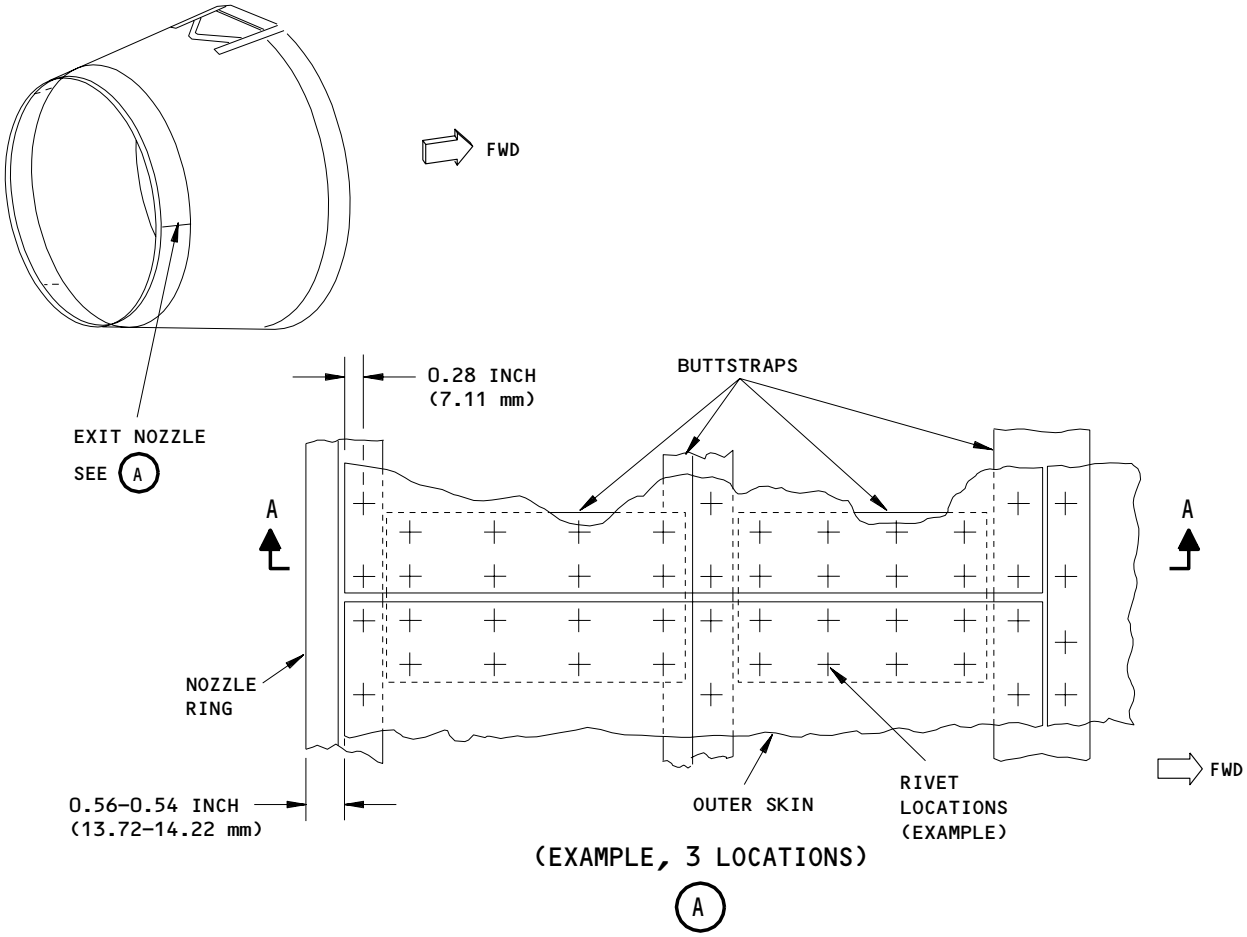
NOTE: This list contains Rolls-Royce part numbers.

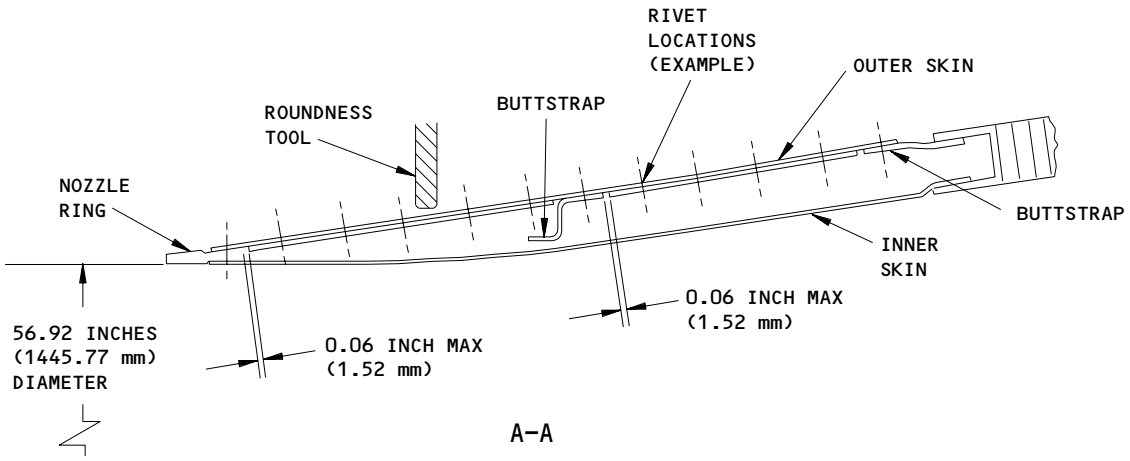
(a) UL15684 - Nozzle ring
(b) LJ76201 - Skin, inner segment



62389

Roundness Template
Figure 807

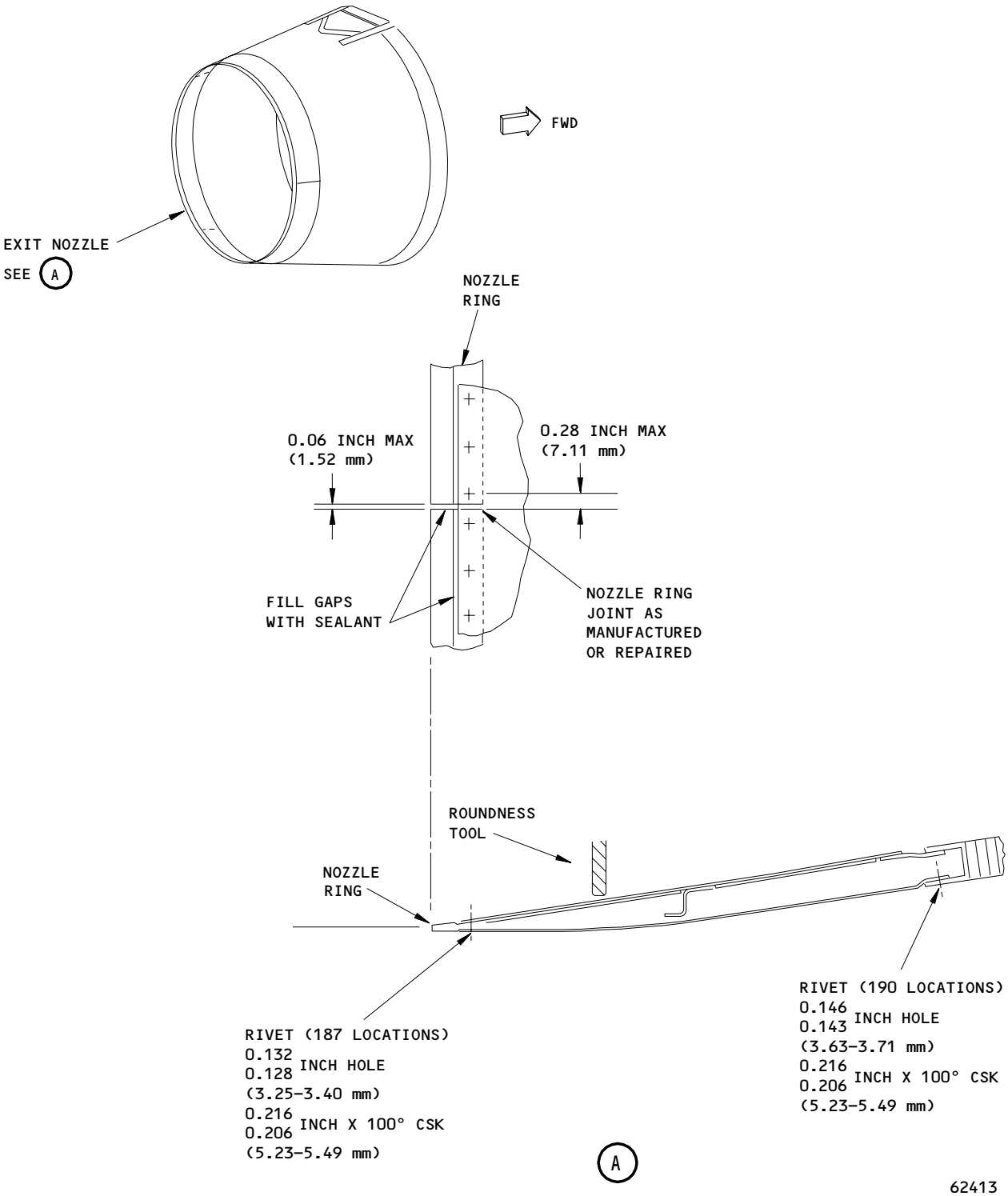




NOTE: ALL RIVETS;
0.128–0.132 INCH (3.25–3.40 mm) HOLE
0.206–0.216 INCH (5.23–5.49 mm) x 100° CSK.

62384B

Exit Nozzle Repairs
Figure 808



Exit Nozzle Extension Repairs
Figure 809

(c) RR2348437 (NAS1739M4-3) - Blind rivet

NOTE: The grip length of the rivets is nominal and are shown for guidance. The rivet length that you need can vary due to build up of the structure. For all rivets, measure the grip length that is necessary to complete repair.

(d) RR1010512 (MS20426AD4-7) - Rivet

D. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150
or Isopropyl alcohol OMat No. 1/40,
or cleaning solvent Desoclean OMat No. 1/257

(2) Primer - Dow Corning DC1200
OMat No. - 876C

(3) Sealant, 2-part pack (base and catalyst)
Dow Corning DC93-006-1
OMat No. - 8/143

(4) Lint Free Cloth
OMat No. - 2/101

(5) Aluminium sheet - 2024-T81, 0.050 X 14.0 X 64.0 inch
(1.27 X 105.0 X 1650.0 mm)

E. Repair or replace the outer skin of the CNA nozzle extension (Fig. 808).

S 218-142-R00

(1) Examine the section of the outer ring that must be replaced.

(a) Do this step if the applicable section of the outer ring goes across a splice in the inner ring of the CNA nozzle extension:

1) Use C-clamps to temporarily clamp a piece of sheet metal across the gap in the inner ring.

S 038-141-R00

(2) Remove the outer skin and the stiffeners.

WARNING: USE EYE PROTECTION WHEN YOU OPERATE DRILL EQUIPMENT. THE DRILL WILL MAKE METAL CHIPS. IF THE METAL CHIPS GET IN YOUR EYE, IT CAN CAUSE INJURIES.

(a) Use the drill to remove the rivets that hold the applicable section of the outer ring.

(b) Remove the applicable section of the outer ring.

(c) Examine the longitudinal buttstraps at the joints of the outer ring.

1) If a longitudinal buttstrap is damaged, replace it.

NOTE: Use the 2024-T81 aluminium sheet to make the new buttstrap. Use the damaged buttstrap as a pattern to make the new one.

(d) Examine the circumferential stiffener and the forward buttstrap.

(e) Remove the circumferential stiffener and the forward buttstrap if it is not in this limit:
1) Make sure that the forward buttstrap is long enough to hold a minimum of 4 fasteners in each rivet pattern with a minimum of 0.25 inch (6.35 mm) additional edge clearance.

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE DEGREASING FLUID IN AREA THAT HAS GOOD AIRFLOW. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES, FLUSH IT AWAY WITH WATER. IF YOU GET DEGREASING FLUID IN YOUR MOUTH OR IN YOUR EYES, GET IMMEDIATE MEDICAL AID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAMES, OR HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

(f) Clean the mating surface that remains:
1) Use a putty knife to remove the large pieces of the sealant.
(g) Use the Acetone or Isopropyl alcohol or cleaning solvent Desoclean and a clean lint free cloth to remove the sealant that remains.
(h) If it is necessary, install the new circumferential buttstrap and the stiffeners:
1) Put the new circumferential buttstrap and the stiffeners in their correct position.
a) If it is necessary, hold them in place with C-clamps.

WARNING: USE EYE PROTECTION WHEN YOU OPERATE DRILL EQUIPMENT. THE DRILL WILL MAKE METAL CHIPS. IF THE METAL CHIPS GET IN YOUR EYE, IT CAN CAUSE INJURIES.

2) Use the drill to put the same rivet hole pattern in the new parts that you find in the existing structure.
3) Remove the parts and deburr the new rivet holes

WARNING: DO NOT GET THE PRIME OR SEALANT ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE THE PRIMER AND SEALANT IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE PRIMEROR SEALANT. IF YOU GET PRIMER OR SEALANT ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES, FLUSH IT AWAY WITH WATER, IF YOU GET PRIMER OR SEALANT IN YOUR MOUTH OR IN YOUR EYES, GET IMMEDIATE MEDICAL AID. KEEP THE PRIMER AND SEALANT AWAY FROM SPARKS, FLAMES, OR HEAT. THE PRIMER AND SEALANT ARE A POISONOUS, FLAMMABLE SUBSTANCES THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

4) Put the primer on the mating surfaces of the circumferential buttstrap and the stiffeners.
   a) Let the primer dry for a minimum of 30 minutes.
5) Use the manufacturers instructions to mix the sealant.
6) Put the sealant on the mating surfaces of the circumferential buttstrap and the stiffeners.
   a) Make sure that you put the parts in their correct position before the sealant becomes dry.
7) Install the applicable rivets.
8) Use pneumatic rivet tools to tighten the rivets.
9) Use hand tools to make the end of the rivets smooth with the adjacent area.

S 438-142-R00

(3) Install the outer skin and the stiffeners.
   (a) Put the outer skin section in its correct position.
      1) If it is necessary, hold it in place with C-clamps.

WARNING: USE EYE PROTECTION WHEN YOU OPERATE DRILL EQUIPMENT. THE DRILL WILL MAKE METAL CHIPS. IF THE METAL CHIPS GET IN YOUR EYE, IT CAN CAUSE INJURIES.

   (b) Use the drill to put the same rivet hole pattern in the new parts that you find in the existing structure.
   (c) Remove the parts and deburr the new rivet holes

WARNING: DO NOT GET THE PRIME OR SEALANT ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE THE PRIMER AND SEALANT IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE PRIMEROR SEALANT. IF YOU GET PRIMER OR SEALANT ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES, FLUSH IT AWAY WITH WATER, IF YOU GET PRIMER OR SEALANT IN YOUR MOUTH OR IN YOUR EYES, GET IMMEDIATE MEDICAL AID. KEEP THE PRIMER AND SEALANT AWAY FROM SPARKS, FLAMES, OR HEAT. THE PRIMER AND SEALANT ARE A POISONOUS, FLAMMABLE SUBSTANCES THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

(d) Put the primer on the mating surfaces for the replacement outer skin section.
    1) Let the primer dry for a minimum of 30 minutes.
(e) Use the manufacturers instructions to mix the sealant.
(f) Put the sealant on the mating surfaces for the replacement outer skin section.
    1) Make sure that you put the parts in their correct position before the sealant becomes dry.
(g) Install the applicable rivets.
(h) Use cherrylock equipment and pneumatic rivet tools to tighten the rivets.
(i) Use hand tools to make the end of the rivets smooth with the adjacent area.
(j) Put sealant on all external gaps in the outer skin.
    1) Make the sealant smooth with the adjacent area.
(k) Let the sealant dry, at room temperature, for 24 hours.
    1) Do these steps to shorten the dry time:
        a) Let the sealant air dry at room temperature for 2 hours.
        b) Use explosion proof heat lamps to heat the repair area to a temperature of 200 degrees F (93 degrees C).
        c) Heat the area until the sealant is dry.

S 218-144-R00

(4) Examine the CNA nozzle extension:
    (a) Make sure that the rivets are all tight.
    (b) Use the roundness template to do a dimensional inspection of the internal diameter of the nozzle.

S 938-143-R00

(5) Use a vibro-engraver to write FRS6205/1 adjacent to the assembly part number.

F. Repair or replace the inner skin of the CNA nozzle extension (Fig. 808).

S 218-145-R00

(1) Examine the nozzle ring of the CNA extension nozzle:

NOTE: When you remove the inner skin of the CNA extension nozzle, the nozzle ring is disconnected in the areas were the skin is removed.

(a) Examine the nozzle ring to determine if all or part of it needs to be replaced.

NOTE: Use the old nozzle as a pattern to contruct the new nozzle, or parts of the new nozzle in your shop.

(b) Make sure that the end joints of the nozzle ring do not move from their original position while you do this procedure.

(c) If it is necessary, you can replace parts of the nozzle ring if the replacement is in these limits:

1) The length of the replacement nozzle ring section must be greater than 5.0 inch (127 mm).
2) A splice joint in the nozzle ring must be a minimum of 5.0 inch (127 mm) from the splice joints in the outer skin of the CNA extension ring.
3) The splice joint of the nozzle ring must be with in 0.06 inch (1.5 mm) of the center position of two adjacent rivets that hold the inner skin to the nozzle ring.

S 038-146-R00

(2) Remove the inner skin of the CNA extension nozzle:

WARNING: USE EYE PROTECTION WHEN YOU OPERATE DRILL EQUIPMENT. THE DRILL WILL MAKE METAL CHIPS. IF THE METAL CHIPS GET IN YOUR EYE, IT CAN CAUSE INJURIES.

(a) Use the drill equipment to remove the rivets that hold the inner skin section and the nozzle ring.

(b) Remove the applicable sections of the inner skin and the nozzle ring.

(c) Clean the repair area.

1) Use a putty knife to remove the sealant from the structure and the parts that you will use again.

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE DEGREASING FLUID IN AREA THAT HAS GOOD AIRFLOW. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES, FLUSH IT AWAY WITH WATER. IF YOU GET DEGREASING FLUID IN YOUR MOUTH OR IN YOUR EYES, GET IMMEDIATE MEDICAL AID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAMES, OR HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

(d) Use the Acetone or Isopropyl alcohol or cleaning solvent Desoclean and a clean lint free cloth to remove the sealant that remains.

S 438-147-R00

(3) Install the new inner skin section and if it is necessary the nozzle ring:

(a) Put the new inner shin section and the new nozzle ring section in their correct position.

(b) Use C-clamp to hold the parts so they do not move while you drill the holes.

(c) Put the roundness template in its correct position (Fig. 807).

NOTE: The template will make sure that the nozzle keeps its shape while you drill the holes.

WARNING: USE EYE PROTECTION WHEN YOU OPERATE DRILL EQUIPMENT. THE DRILL WILL MAKE METAL CHIPS. IF THE METAL CHIPS GET IN YOUR EYE, IT CAN CAUSE INJURIES.

(d) Use the drill equipment to make new rivet holes in the same hole pattern as the fixed structure.

(e) Make sufficient marks to show the correct position of the new parts with respect to the fixed structure.

NOTE: This make sure that the parts are in their correct position during the final installation.

(f) Remove the roundness template and parts.

(g) Use the drill equipment to countersink and deburr the new rivet holes.

(h) Clean the mating surfaces of the new parts and the fixed structure:

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE DEGREASING FLUID IN AREA THAT HAS GOOD AIRFLOW. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES, FLUSH IT AWAY WITH WATER. IF YOU GET DEGREASING FLUID IN YOUR MOUTH OR IN YOUR EYES, GET IMMEDIATE MEDICAL AID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAMES, OR HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

1) Use the Acetone or Isopropyl alcohol or cleaning solvent Desoclean to clean the mating surfaces.
2) Use the MEK and a clean, lint free cloth to clean the mating surfaces.
3) Use a clean, lint free cloth to remove the MEK before it becomes fumes.
4) Examine the parts to make sure that there are no unwanted drill chips and sealant on the parts.

WARNING: DO NOT GET THE PRIME OR SEALANT ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE THE PRIMER AND SEALANT IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE PRIMEROR SEALANT. IF YOU GET PRIMER OR SEALANT ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES, FLUSH IT AWAY WITH WATER, IF YOU GET PRIMER OR SEALANT IN YOUR MOUTH OR IN YOUR EYES, GET IMMEDIATE MEDICAL AID. KEEP THE PRIMER AND SEALANT AWAY FROM SPARKS, FLAMES, OR HEAT. THE PRIMER AND SEALANT ARE A POISONOUS, FLAMMABLE SUBSTANCES THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

(i) Put the primer on the mating surfaces for the replacement inner skin section and the nezzle.
    1) Let the primer dry for a minimum of 30 minutes.
(j) Use the manufacturers instructions to mix the sealant.
(k) Put the sealant on the forward mating surface for the replacement inner skin section.
(l) Put the inner skin section in its correct position.
(m) Install the rivets in the forward holes.
    1) Use the rivet equipment to tighten the forward rivets.
(n) Put the sealant on the mating surfaces for the replacement inner skin section and the nozzle ring.
(o) Put the nozzle ring (section) in its correct position.
    1) If you replace the whole nozzle ring, make sure that the end joint is in the same position as the original ring.
(p) Make sure that all of the end joints are correctly aligned.

(q) Put the roundness template in its correct position.

NOTE: This will make sure that the nozzle keeps its correct shape while you install the rivets.

(r) Install the rivets in their correct position.
1) Make sure that the sealant is wet when you install the rivets.
(s) Use the rivet equipment to tighten and doulbe countersink the rivets.
(t) Use hand tools to make the end of the rivets smooth with the adjacent area.
(u) Put sealant on all external gaps in the outer skin.
1) Make the sealant smooth with the adjacent area.
(v) Let the sealant dry, at room temperature, for 24 hours.
1) Do these steps to shorten the dry time:
a) Let the sealant air dry at room temperature for 2 hours.
b) Use explosion proof heat lamps to heat the repair area to a temperature of 200 degrees F (93 degrees C).
c) Heat the area until the sealant is dry.

S 218-148-R00

(4) Examine the CNA nozzle extension:
(a) Make sure that the rivets are all tight.
(b) Use the roundness template to do a dimensional inspection of the internal diameter of the nozzle.

S 938-149-R00

(5) Use a vibro-engraver to write FRS6205/2 adjacent to the assembly part number.

TASK 78-11-04-788-153-R00

9. Exhaust Collector - Common Nozzle Assembly (CNA) - Replace Outer Duct Seal

A. General

(1) The repair in this procedure is FRS6300.
(2) This procedure gives the information necessary to replace a section of the outer duct seal on the CNA.
(3) This repair can be used to repair the seal on RB211-535E4 and E4-B engines with the CNA part numbers that follow:

JP55201 SB 78-9728, Part 1

B. Equipment
(1) Workshop tools
C. Parts
(1) Repair Parts
(a) Plug, LK88152 (Item 1)
(b) Seal, LJ76459 (Item 2)

D. Consumable Materials

(1) Refer to the table that follows:

	BRITISH SPEC./REF.	AMERICAN SPEC./REF.	OMat ITEM NO.
Acetone Isopropyl alcohol Cleaning solvent Desoclean			150 1/40 1/257
Lint–Free Cloth	Superstrong 917	MIL–C–24671	2/101
Cold cure silicone rubber	Silastic 732		872F
Primer	DC1200		876C

E. Replace the damaged Section of the Seal.

S 358-154-R00

(1) Prepare the damaged area.
  (a) Cut and remove the damaged section of the seal.
  (b) Make the cut ends of the remaining seal square.

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. YOU MUST USE PROTECTIVE CLOTHING, GLOVES AND EYE PROTECTION. USE THE FLUID IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES, FLUSH IT AWAY WITH WATER AND GET MEDICAL HELP. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE MATERIAL THAT CAN CAUSE INJURY AND/OR DAMAGE.

  (c) Clean the seal retainer with Acetone (OMat 150) or Isopropyl alcohol (OMat 1/40) or cleaning solvent Desoclean (OMat 1/257).
  (d) Make the area dry before the solvent evaporates.

S 358-155-R00

(2) Prepare the repair section.
  (a) Cut a section of the new seal (Item 2) to the exact size of the repair area.

(b) Cut two seal plugs (Item 1), 2 in. (50.8 mm) in length.

NOTE: Make sure the repair seal can be installed into the repair area with no gaps between it and the existing seal faces.

S 358-156-R00

(3) Apply primer to the seal retainer.
   (a) Apply primer (OMat 876C) to the seal retainer and cure in air for 30 minutes.

S 358-157-R00

(4) Apply the adhesive.

WARNING: USE THE ADHESIVE ONLY IN AREAS WITH GOOD VENTILATION. MAKE SURE YOU DO NOT GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. INJURY TO PERSONS CAN OCCUR.

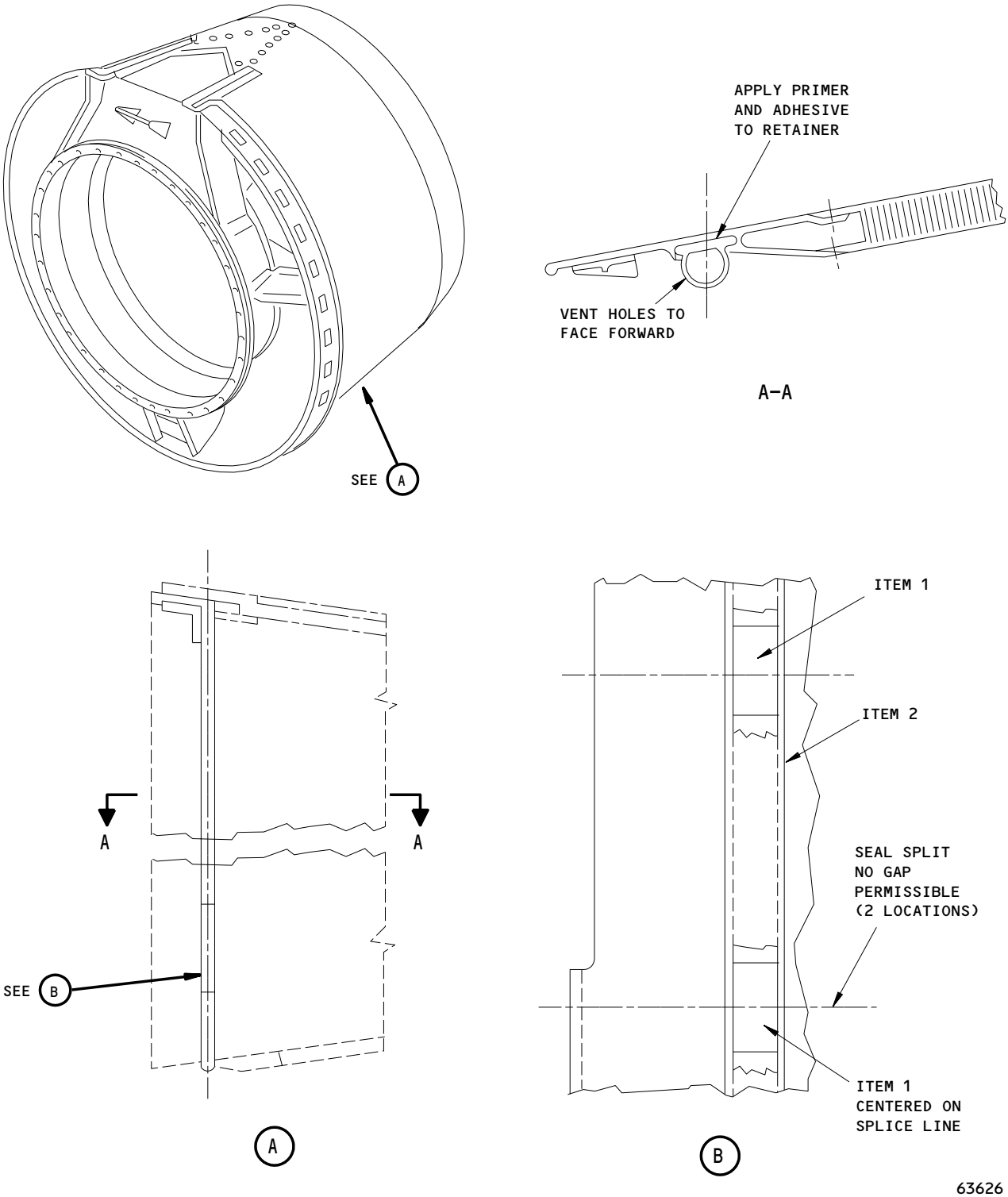
   (a) Apply the adhesive (OMat 872F) to the inside of the tube section of the repair seal (Item 2).
   (b) Install the plugs to a depth of 1.0 in. (25.4 mm) into the tube section of the repair seal.
   (c) Let the repair cure in air for 2 hours.
   (d) Apply the adhesive (OMat 872F) to the seal retainer and to the inside of the tube section of the existing seal.
   (e) Put the repair seal in position with one leg of the seal into the lip of the retainer.
   (f) At the same time, push the seal plugs (Item 1) into the tube section of the existing seal.
   (g) Make sure the vent holes in the repair seal face forward and the mating seal faces are flush and push the second leg of the seal into the lip of the retainer.
   (h) Let the repair cure in air for 2 hours.

S 218-158-R00

(5) Examine the Repair.
   (a) Examine the repair for correct installation and integrity.
   (b) Make sure there are no gaps in the seal splices.
   (c) Make sure the vent holes in the seal face forward.

S 358-159-R00

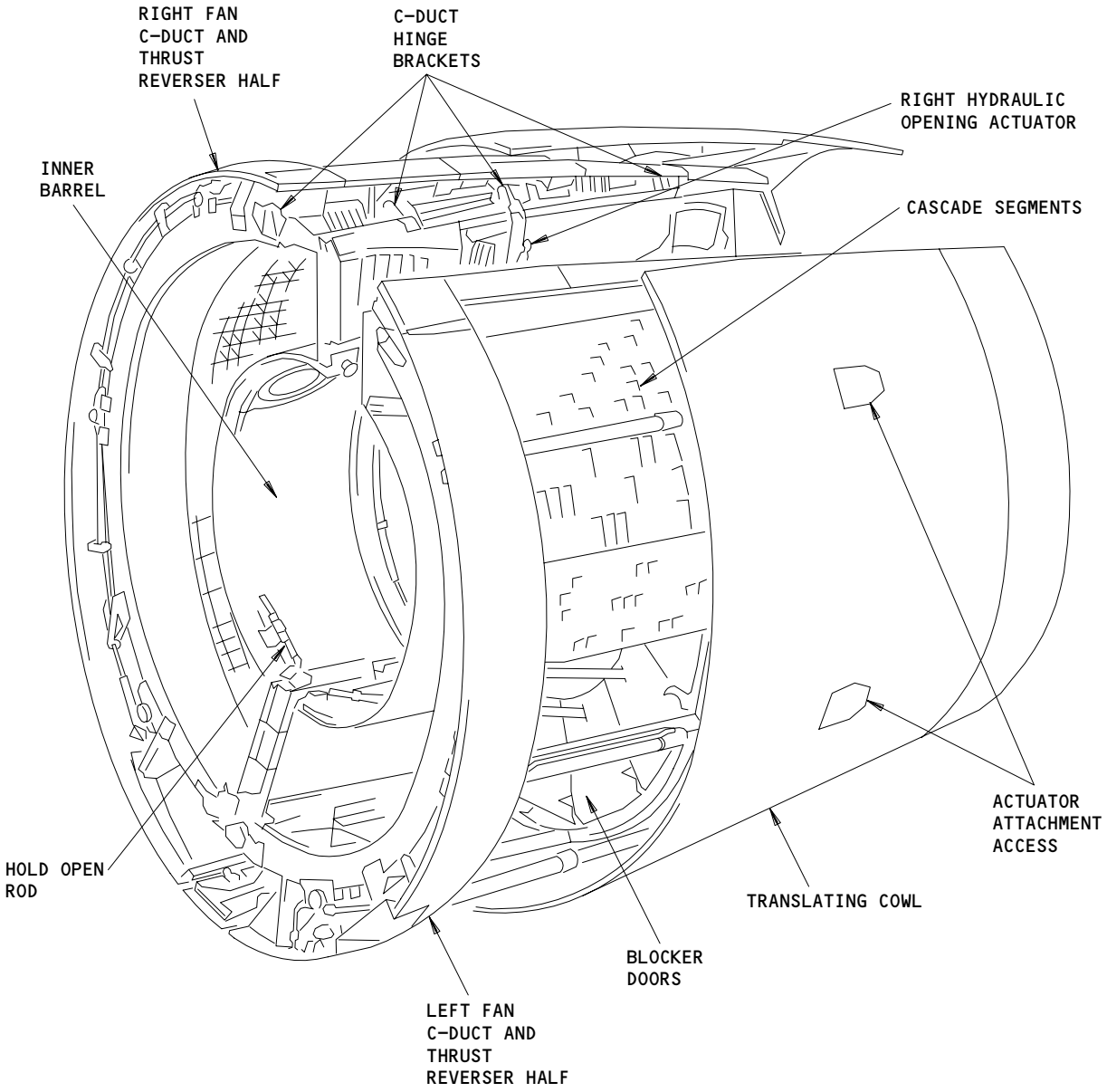
(6) Identify the Repair.
   (a) Use a marker pen to write FRS6300 adjacent to the assembly part number.



CNA Outer Duct Seal Repair
Figure 810

THRUST REVERSER - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. A thrust reverser is incorporated in the exhaust system of each engine to assist aircraft deceleration after landing. The thrust reverser utilizes engine power as a decelerating force by reversing the direction of the exhaust gas stream. On RB211-535 engines, where the cold (fan) stream constitutes the major proportion of the overall thrust of the engine, reverse thrust is provided entirely from the fan stream.
   B. The thrust reverser is an integral part of the fan stream duct and nozzle. The reverser is an annular outlet type with fixed deflector vanes (cascades), through which the gas flow is diverted in the reverse thrust mode. In forward thrust configuration the cascades are blocked off by a cowl, the outer sleeve of which forms the aerodynamic line of the propulsion system and the inner sleeve forms part of the outer wall of the fan stream duct.
   C. In reverse thrust configuration the cowl translates rearward to expose the cascades. Blocker doors, attached to the translating cowl inner sleeve, move with the translating cowl and fold inward to block the fan duct downstream, thus diverting the fan stream gas flow through the cascades.
   D. The thrust reverser comprises two C-shaped sections, hinged at the top to provide access to the core engine. The inner barrel of each C-duct forms the inner wall of the fan stream duct and provides a cowl for the gas generator. The outer wall of the duct is formed by the translating cowl inner sleeve. A hydraulic opening actuator on each C-duct, operated from an external source, provides the means of opening the duct.
   E. The fan thrust reverser is described in detail in 78-31-00, the control in 78-34-00 and indicating in 78-36-00.



50943

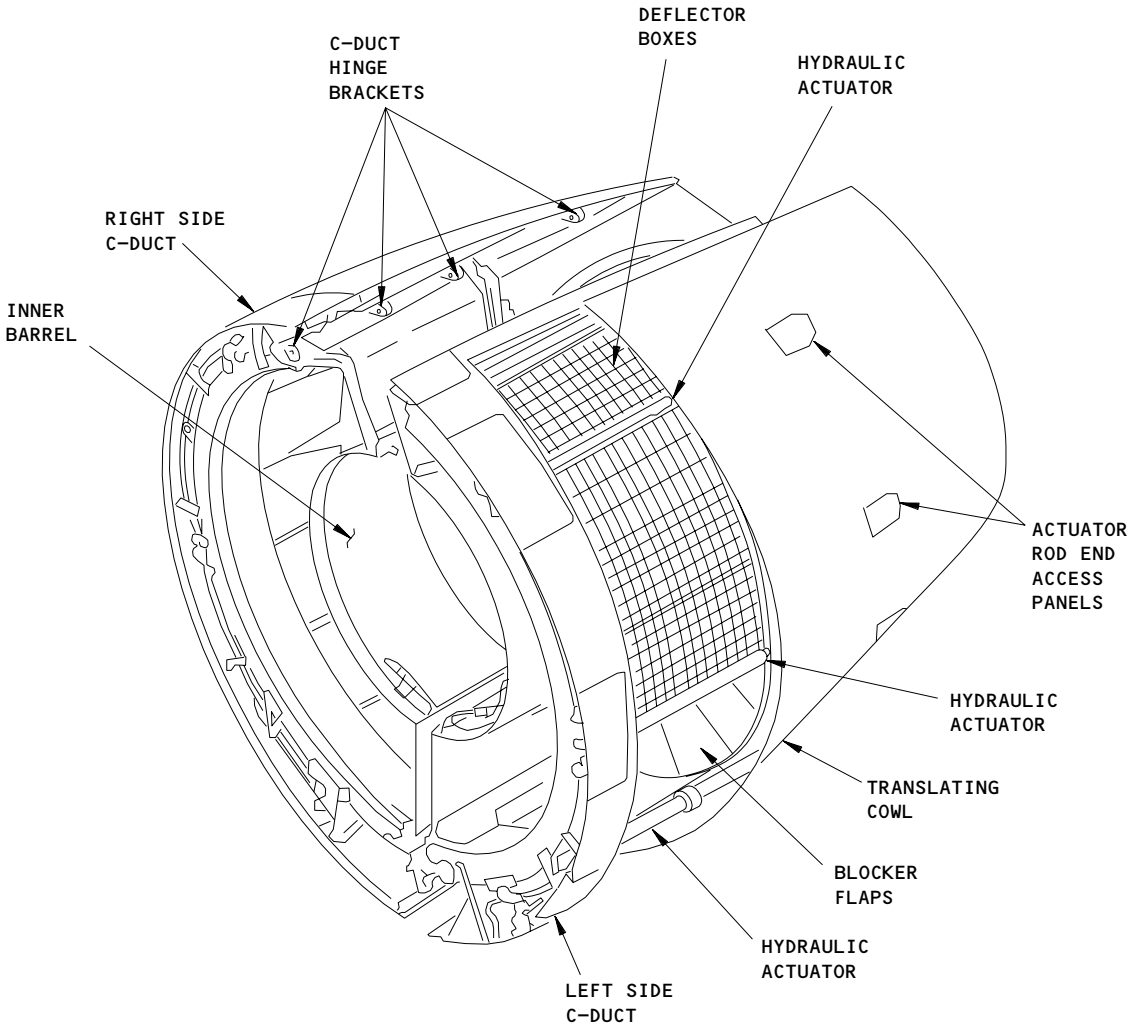
Thrust Reverser Units
Figure 1

THRUST REVERSER - ADJUSTMENT/TEST

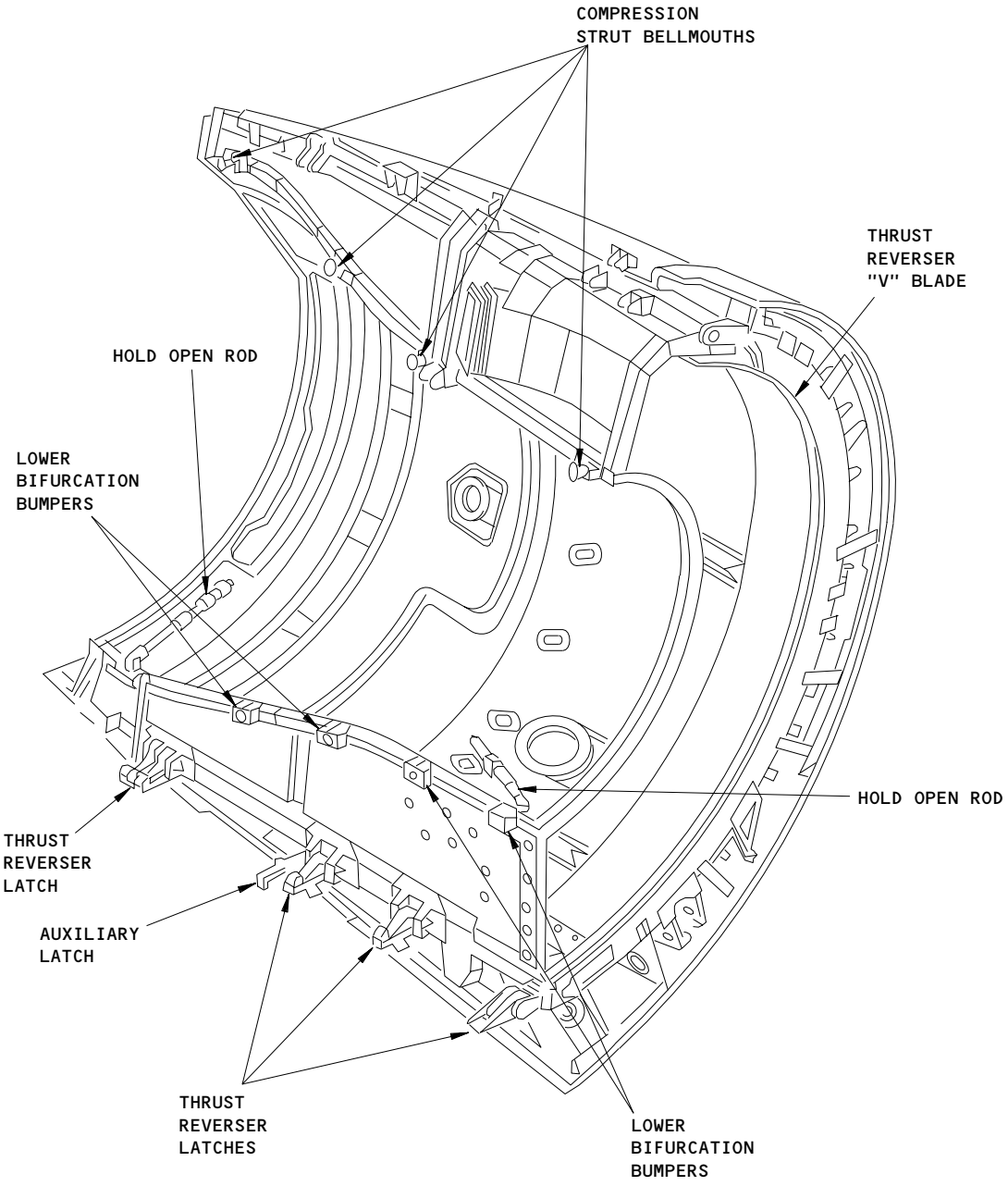
1. General
   A. This procedure contains the maintenance tasks that follow:
      - All the adjustment instructions for the thrust reverser system (This consists of 8 tasks)
      - An operational test of the thrust reverser system.
   B. The thrust reverser adjustment tasks given in this procedure are:
      - Thrust reverser latches and bumper adjustment
      - Translating cowl adjustment
      - Stow proximity sensor adjustment
      - Actuator lock visual indicator adjustment
      - Actuator lock proximity sensor adjustment
      - Deploy proximity sensor adjustment
      - Feedback system adjustment
      - Automatic hinge access door adjustment.

      The thrust reverser system is adjusted to synchronize the position of the left and right C-duct translating cowls and the hydraulic actuators. It is also adjusted to make sure the thrust reverser deploys and stows fully on command. Fig. 501 thru Fig. 504 give the thrust reverser components and their locations. For more information about the thrust reverser components and system functions, refer to the applicable descriptions and operations.

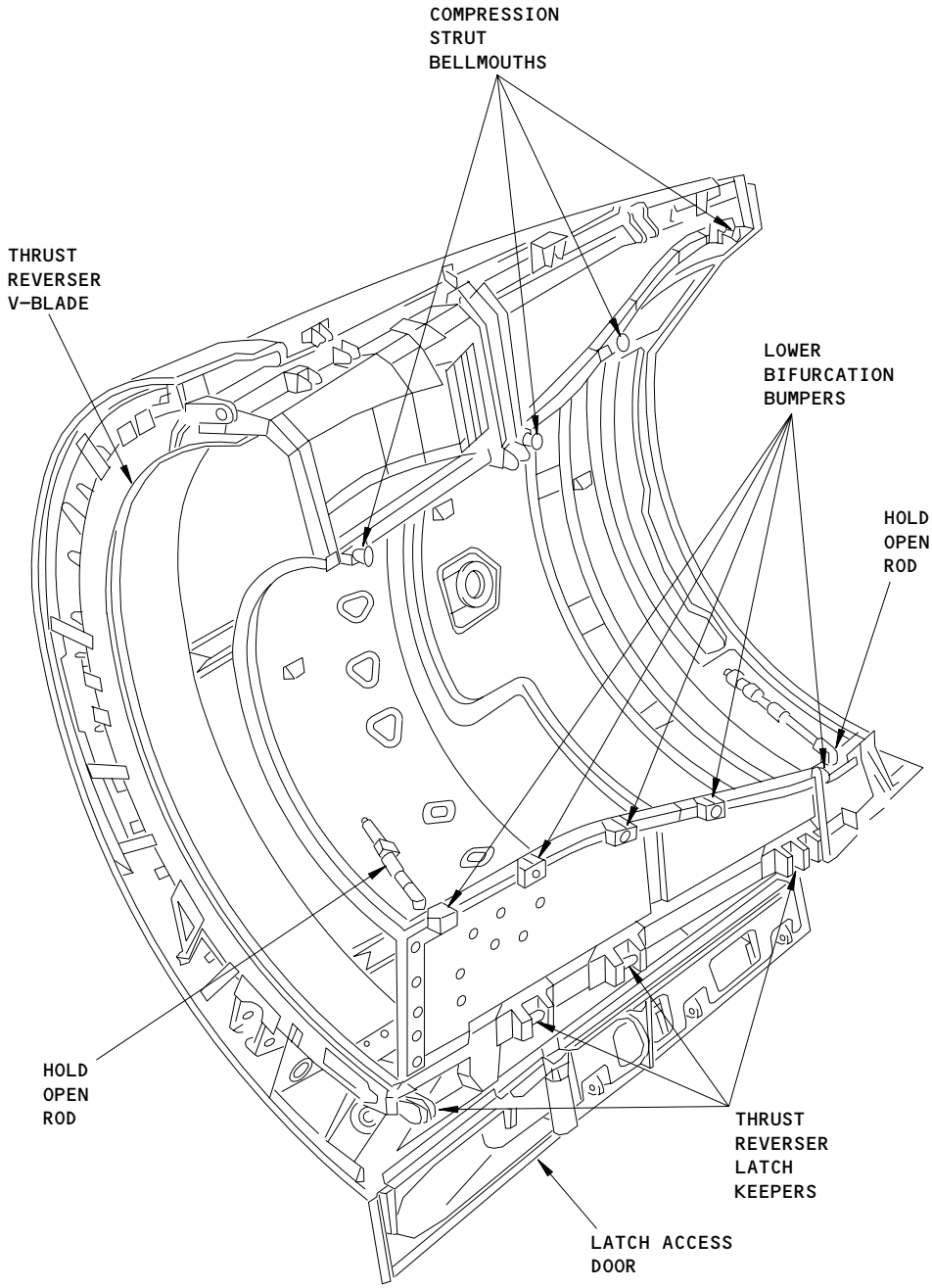
      You must do the thrust reverser adjustment in the sequence given because the adjustment of each component affects the rigging of other components in the system. You can not adjust the thrust reverser correctly if the thrust reverser latches and bumpers are not properly adjusted or the track liners are damaged or missing. You must examine and adjust the latches and bumpers and correct track liner defects before you adjust the other thrust reverser components. Incorrect thrust reverser rigging can result in incorrect status indication in the cockpit, damage to the thrust reverser system or reduction in the service life of the components.
   C. These maintenance actions and adjustments must be done after component replacement to make sure the system adjustment is not affected:



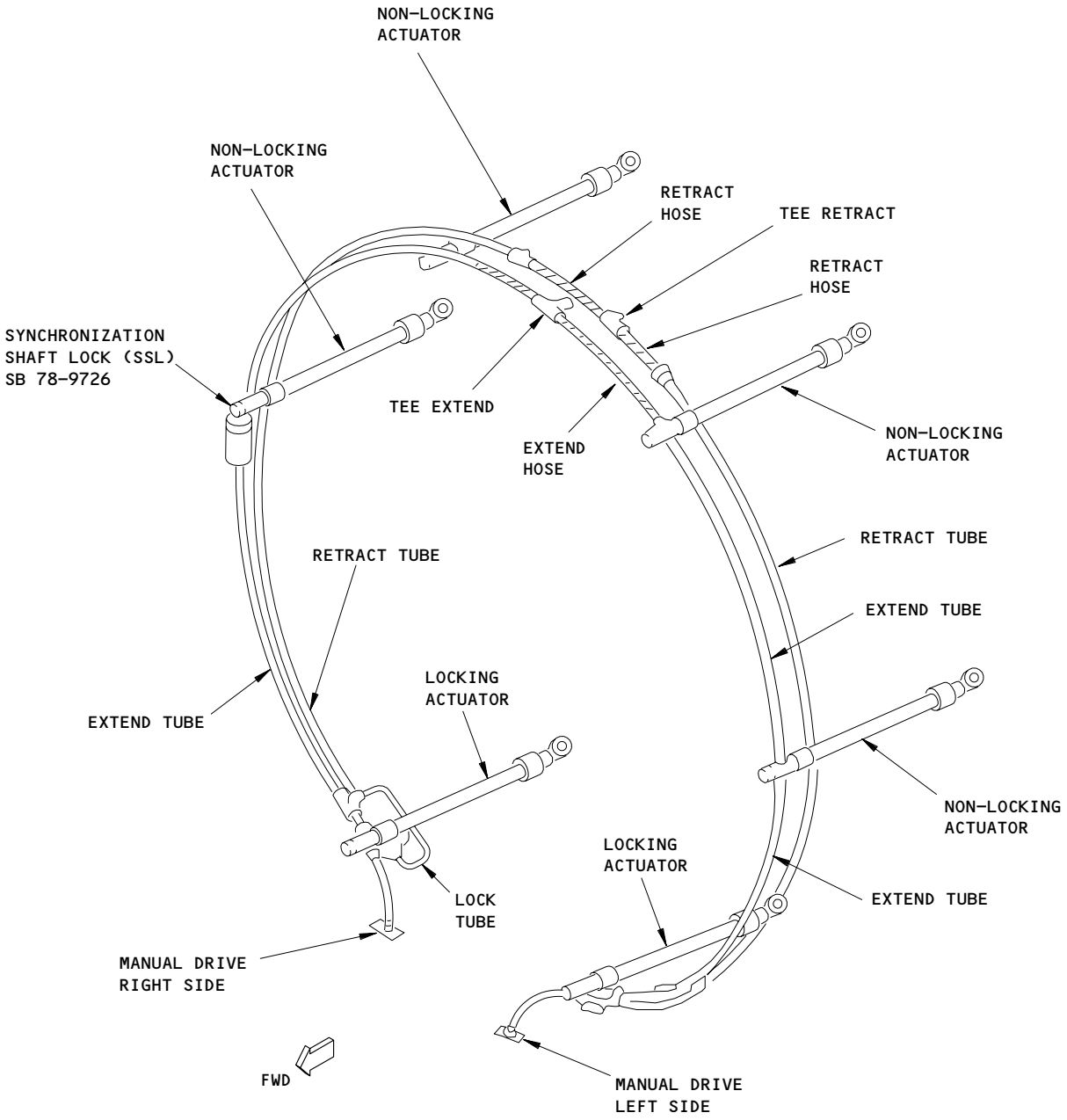
Thrust Reverser
Figure 501



Thrust Reverser C-Duct (Left Side)
Figure 502



Thrust Reverser C-Duct (Right Side)
Figure 503



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Thrust Reverser Actuation System
Figure 504

TABLE FOR ADJUSTMENT ACTIONS REQUIRED AFTER REPLACEMENT OF THRUST REVERSER COMPONENTS	
COMPONENTS	NECESSARY ADJUSTMENT
Engine Change	Latches and Bumpers
C-Duct Replacement	Latches and Bumpers, Automatic Access Hinge Door, Feedback System
Translating Cowl Replacement	Translating Cowl, Stow Proximity Sensor, Feedback System, Deploy Proximity Sensor
Replacement of Actuator, Flexible shaft Synchronization Shaft and Hydraulic Extend Tubes	Translating Cowl, Stow Proximity Sensor, Lock Indicator and Lock Proximity Sensor
Common nozzle assembly replacement	Latches and Bumpers
Track Liner Replacement	Translating Cowl, Stow Proximity Sensor
Lock Indicator Replacement	Lock Proximity Sensor Sensor, Feedback System, Deploy Proximity Sensor
Upper or Lower Feedback Cable Replacement	Feedback System

TASK 78-30-00-805-001-R00

2. Adjustment Procedure For The Latches and Bumpers

A. General

(1) This sections gives the procedure to adjust the thrust reverser latches and bumpers.

(2) It is important to adjust the latches and bumpers first, to make sure the C-duct structure and track/sliders align. The thrust reverser can not be adjusted correctly if the latches and bumpers are not first adjusted correctly.

B. Equipment

(1) Measuring Tool, Latch closing Force, HU21580

C. Consumable Materials
   (1) Lockwire,
       British Spec - 22SWG,
       American Spec - 21AWG,
       OMat No. 238
   (2) GO2020 Modelling Clay,
       OMat No. 249
   (3) DO0250 Petroleum Jelly,
       British Spec - DEF-STAN 91-38 Grade PX-7,
       American Spec - VV-P-236A,
       OMat No. 402
   (4) Release Agent,
       American Spec - DP.200/2,
       OMat No. 8/32
   (5) Locking Compound
       Loctite 242
       OMat No. 8/68

D. References
   (1) AMM 78-31-00/201, Thrust Reverser System
   (2) AMM 78-31-07/401, Thrust Reverser Pylon Mounted Extend/Retract Hydraulic components
   (3) AMM 78-31-20/801, Fan Cowl C-Duct and Thrust Reverser
   (4) AMM 78-31-26/401, Rotary Flex Shafts and Tubing.

E. Access
   (1) Location Zones
       415/425 Thrust Reverser, Left
       416/426 Thrust Reverser, Right

F. Procedure

   S 865-002-R00
   (1) Open the thrust reverser C-ducts (AMM 78-31-00/201).

   S 225-003-R00
   (2) Examine the latches and bumpers for correct adjustment.
       (a) Put a small amount of modelling clay, OMat No. 249, in the bottom of the bellmouth on one C-duct.
       (b) Apply release agent, OMat No. 8/32, to the mating ends of the compression struts (Fig. 505).
       (c) Put modelling clay, OMat No. 249, approximately 0.25 inch (6,35 mm) thick on:
           - The lower bifurcation bumpers at position B on one C-duct (Fig. 506)
           - The lower bifurcation bumpers at position A interface with the engine brackets.

(d) Put modelling clay on both lower bifurcation bumpers at position A (Fig. 506).
(e) Apply release agent, OMat No. 8/32, to the bumper mating faces at position B of the other C-duct and to the engine brackets.
(f) Lubricate the thrust reverser V-blade with petroleum jelly, OMat No. 402, or silicon spray (Fig. 502).
(g) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).
(h) Make sure the V-blade engages correctly with the engine V-groove.

NOTE: If the C-duct is replaced, open and close the C-duct several times to make sure the V-blade engages correctly.

(i) Do a check of the gap as shown in Figure 507. If the gaps are not correct, adjust the latches and bumpers (Refer to the applicable instructions in this procedure).
(j) Do a check of the gaps between the faces of the latch housings and the latch keeper housings at positions A, B and C (Fig. 509).
1) If the gaps are not 0.00 inch (0.00 mm) adjust the latches and bumpers.
(k) Open the thrust reverser C-ducts (AMM 78-31-00/201).
(l) Measure the depth of compression strut penetration into each of the bellmouths as shown in Figure 505.
1) If there is no penetration in the modelling clay, add an additional amount of modelling clay to the bellmouth and do the procedure again.
2) If the penetration in the modelling clay is not between 0.82 and 0.87 inch (20.82 and 22.09 mm), adjust the latches and bumpers.
(m) Measure the thickness of the modelling clay on the lower bifurcation bumpers.
1) If the thickness is not 0.002 to 0.020 inch (0.05 to 0.51 mm), adjust the latches and bumpers.
(n) Close the thrust reverser C-ducts (AMM 78-31-00/201).
(o) Measure and adjust the latch closing force (Fig. 508).
1) Check the latche closing force with the measuring tool:
- The closing force must be 45 to 55 pounds (200 to 240 N)
- Adjust keepers as necessary to get the correct closing force
- Make the closing force of the latches at position A as close to the same as possible.

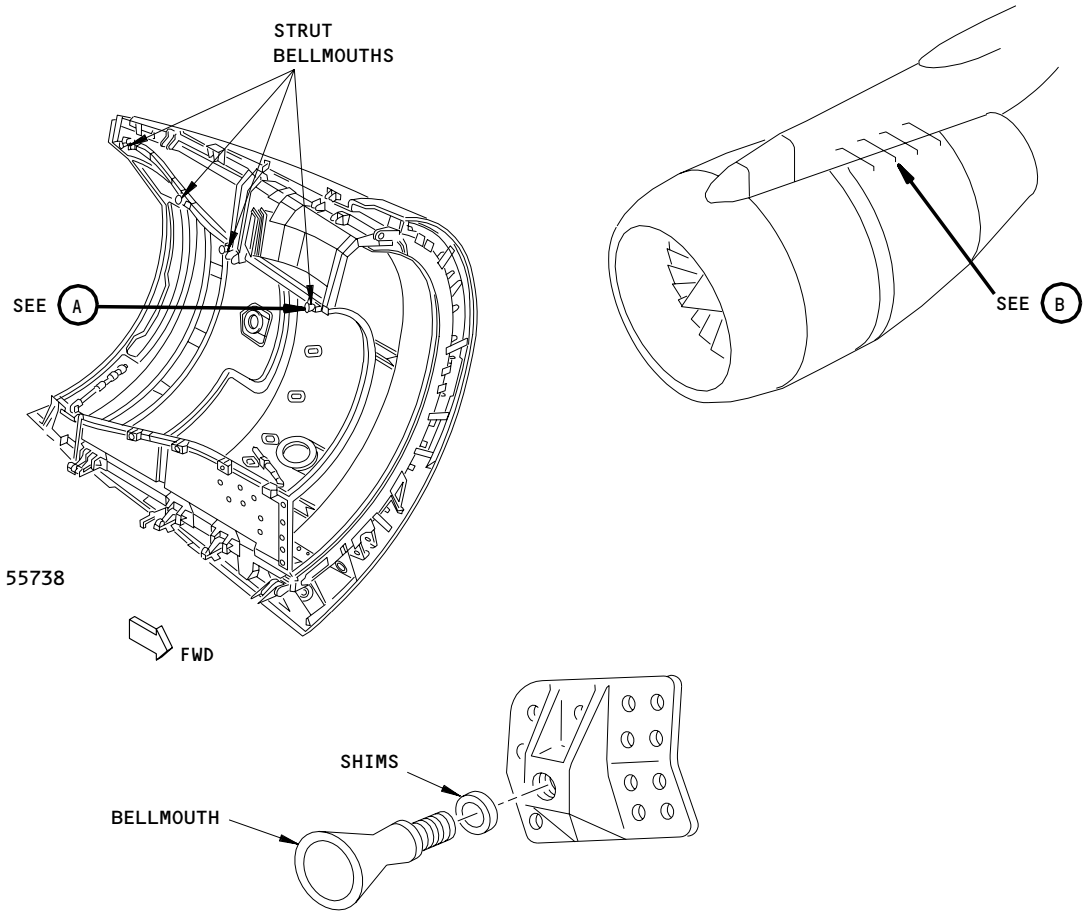
NOTE: The closing force must be measured at tip of the handle and with all other latches engaged with their final closing force.

S 835-004-R00

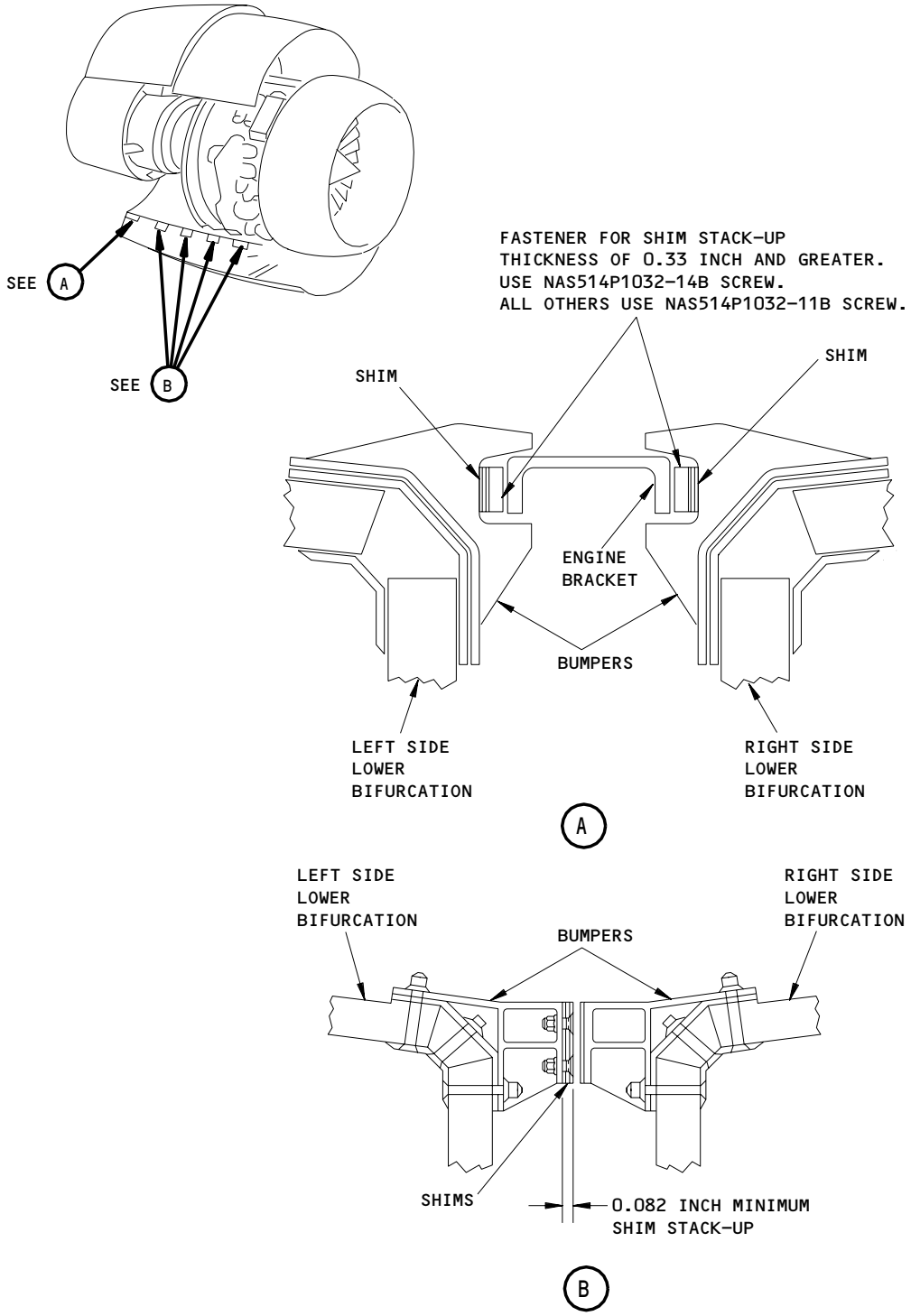
(3) Adjust the latches and bumpers.
  (a) Open the thrust reverser C-ducts (AMM 78-31-00/201).
  (b) Remove the shims from the latch keeper housings at positions A, B and C. Make a mark at the positions from which the shims are removed and Keep the shims (Fig. 509).
  (c) Remove the shims from lower bifurcation bumpers at position A and B (Fig. 510). Make a mark at the positions from which the shims are removed.

    NOTE: There are shims on both left and right C-ducts at position A.

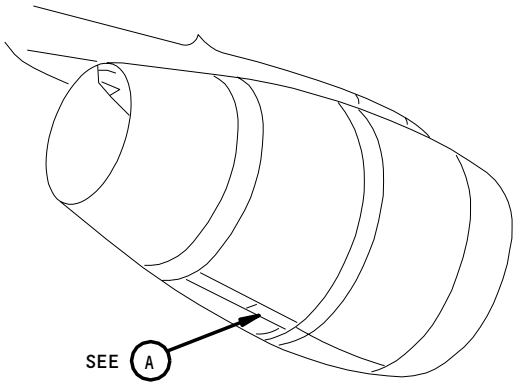
  (d) Remove the bellmouth and the shims from the upper bifurcation at position B (Fig. 505).
    1) Make a mark at the position from which they are removed.
    2) Install the bellmouth again up to their shoulders.
  (e) Adjust the latch keepers to the maximum extended position at all locations.
  (f) Lubricate the thrust reverser V-blades with petroleum jelly or silicone spray.
  (g) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201). Make sure the V-blade engages correctly with the engine V-groove.
  (h) Adjust the latches to get the gap shown in Figure 507. The gap between the faces of the latch housing and the latch-keeper housing at position C must be between 0.240 and 0.280 inch (6.09 and 7.01 mm) (Fig. 509).
  (i) Measure the gap between the faces of all latch-keeper housings and latch housings. Select shims to fill the gaps.
  (j) Open the thrust reverser C-ducts (AMM 78-31-00/201).
  (k) Install the shims you selected to fill the gaps at all positions.
  (l) Put a small amount of modelling clay in the bottom of the bellmouths on one C-duct.
  (m) Apply release agent to the mating ends of the compression struts (Fig. 505).
  (n) Put modelling clay approximately 0.25 inch (6.35 mm) thick on (Fig. 506):
    1) The lower bifurcation bumpers at position B on one C-duct

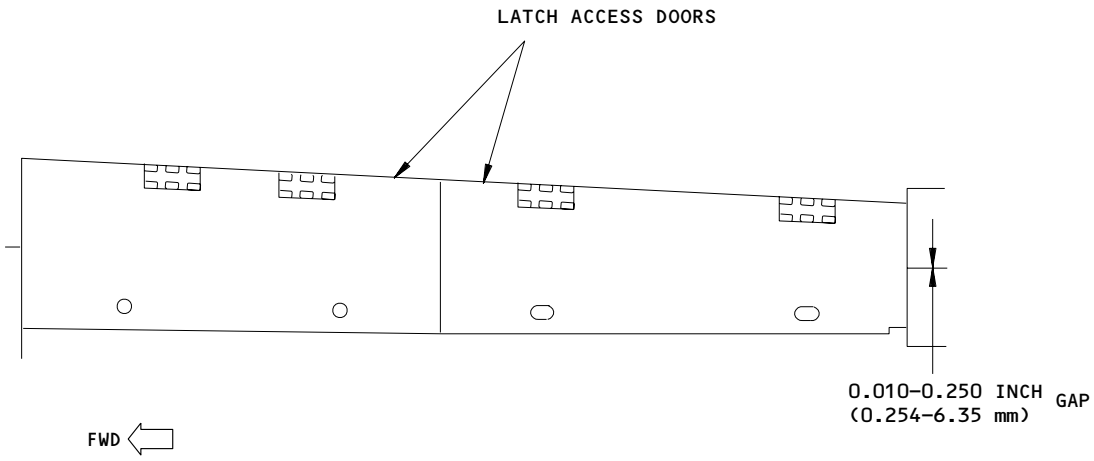


Upper Bifurcation Bumpers
Figure 505



Lower Bifurcation Bumpers
Figure 506

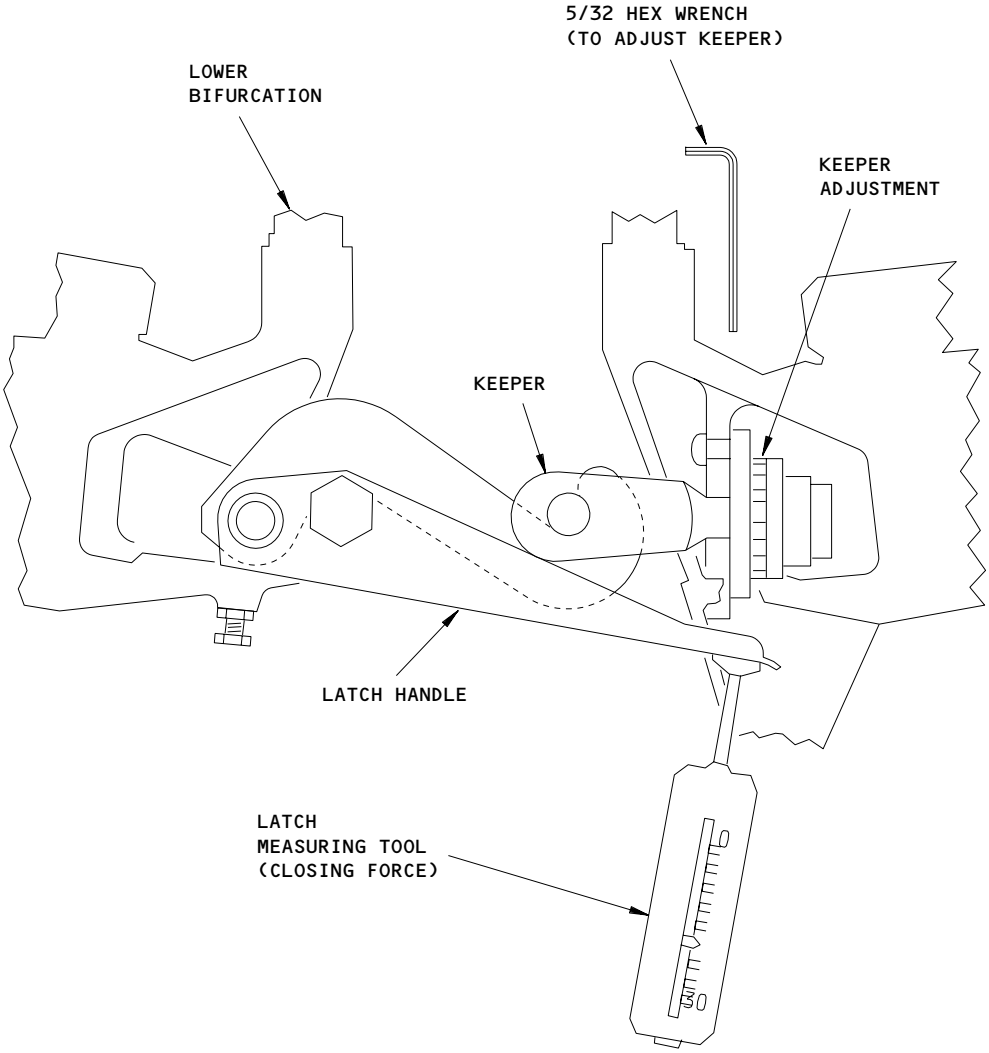




A

55710

C-Duct Aft Gap Limit
Figure 507



TYPICAL LATCH
(VIEW IN THE FORWARD DIRECTION)

55733

Force Measurement and Latch Adjustment
Figure 508

2) The lower bifurcation bumpers at position A (the interface with the engine brackets)
3) The two lower bifurcation bumpers at position A.

(o) Apply release agent to the bumper mating faces of the other C-duct at position B and to the engine brackets.

(p) Close and latch the thrust reverser C-duct, and then open it (AMM 78-31-00/201).

(q) Measure and record the thickness of the modelling clay that continues to stay on the lower bifurcation bumpers. Remove the modelling clay and clean the bumper faces.

(r) Install the shims to get a gap (dimensions S and T) of 0.002 to 0.020 inch (0.05 to 0.50 mm) at the lower bifurcation bumpers (Fig. 506). Add or remove shims to get the correct dimension (Fig. 510).

NOTE: Set the gap settings on the two C-ducts for the bumpers at position A.

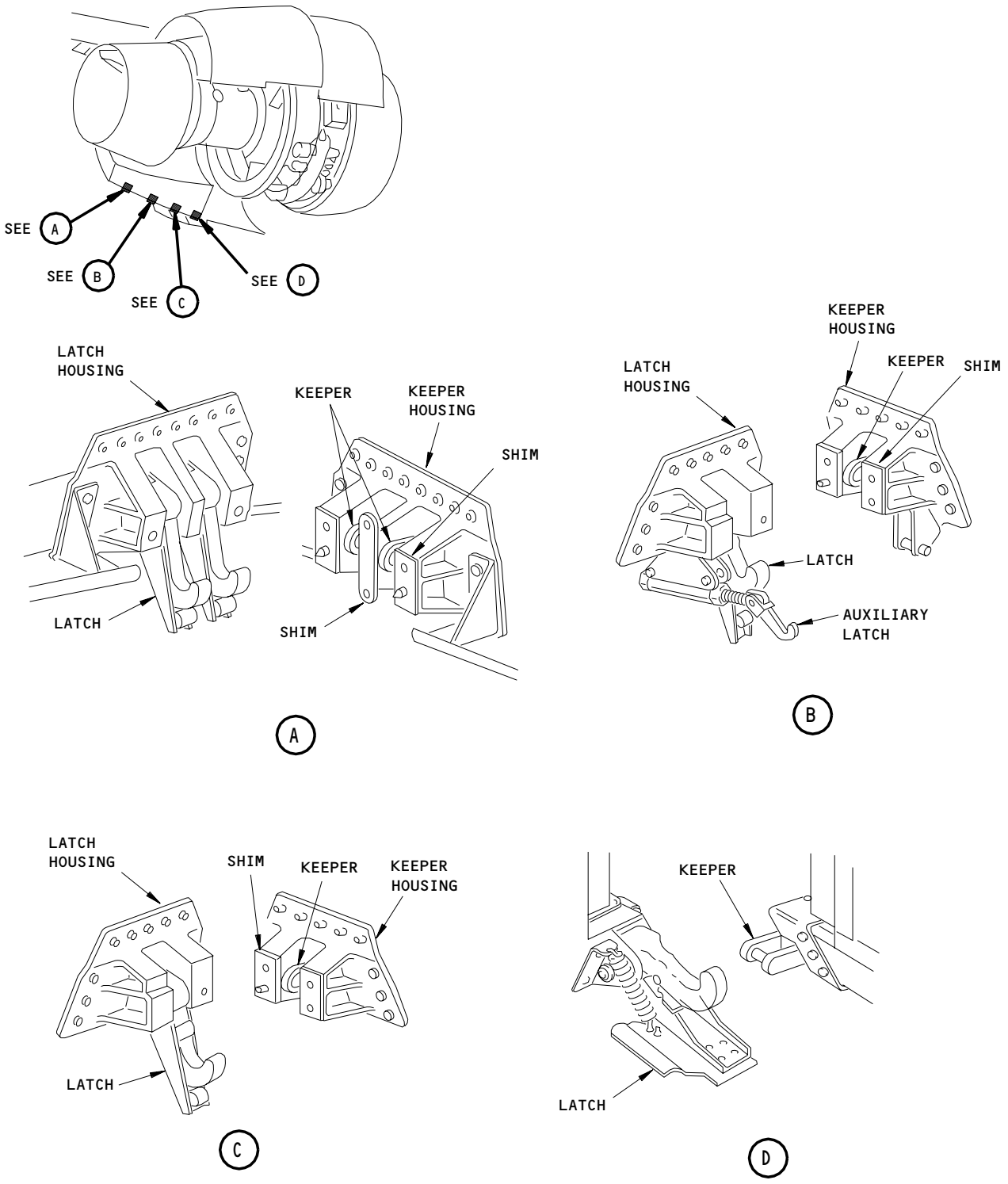
(s) Do the following steps when the last shim thickness has been found:
1) Measure and record the thickness of each shim.
a) At position A:
If the shim thickness is less than 0.33 inches (8.382 mm), use NAS514P1032-11B screws
If the shim thickness is 0.33 inches (8.382 mm) or more, use NAS514P1032-14B screws.
b) At position B:
The minimum shim thickness at position B (left hand thrust reverser only) is 0.082 inches (2.082 mm).
2) Apply Loctite 242 (OMat No. 8/68) to the bumper shim retaining screw threads at position A before the last assembly.

(t) Measure the depth of the compression strut penetration into each of the bellmouths as shown in Figure 505.
1) If there is no penetration into the modelling clay, add an additional amount of modelling clay to the bellmouth and do the last four steps again.

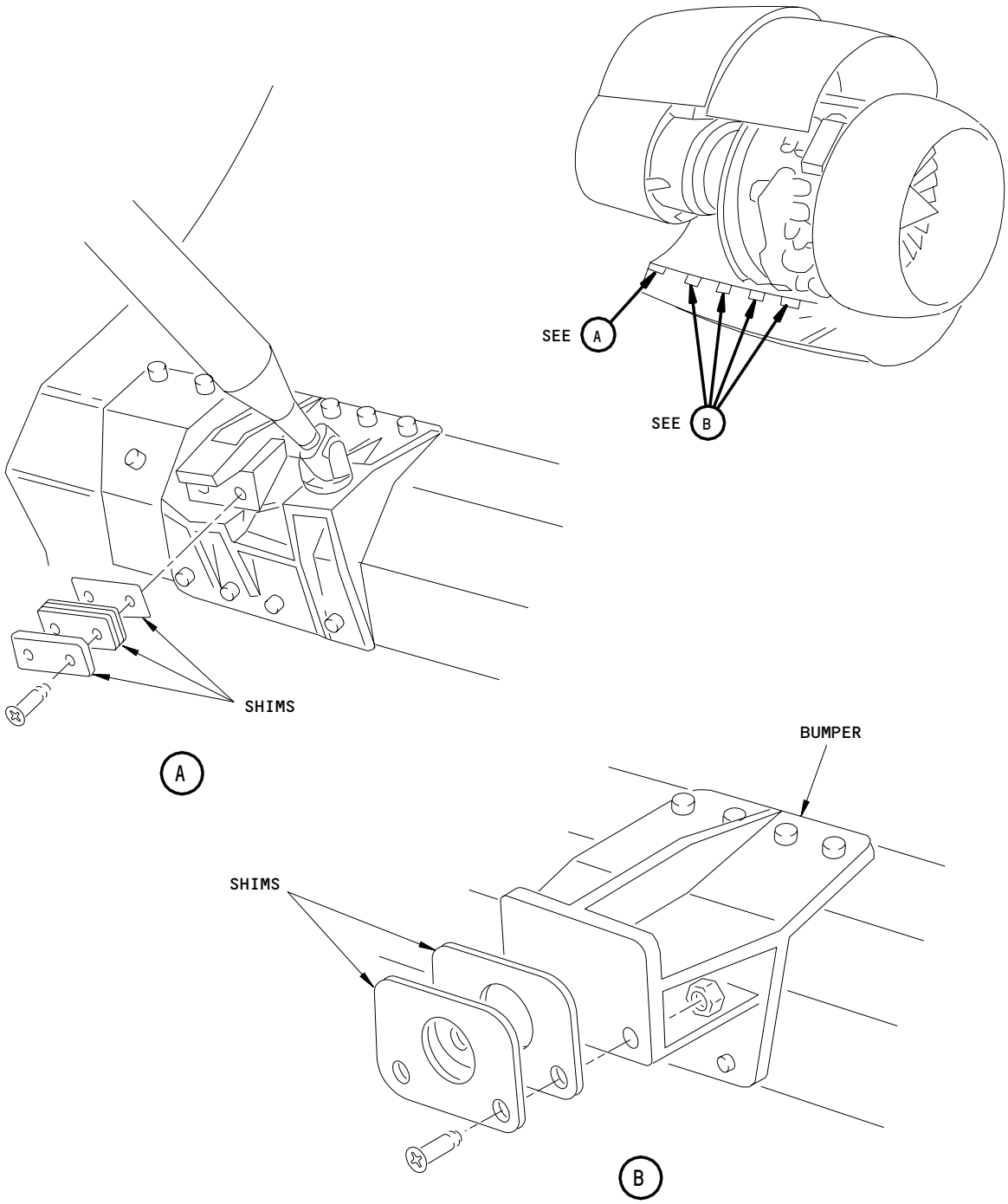
(u) Install shims to get a 0.82 to 0.87inch (20.82 to 22.09 mm) strut penetration depth into the bellmouths (Fig. 505).
1) Install an equal amount of shims behind the bellmouths on each C-duct at the affected positions.
2) Remove all unwanted modelling clay from the bellmouth and struts.

(v) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).

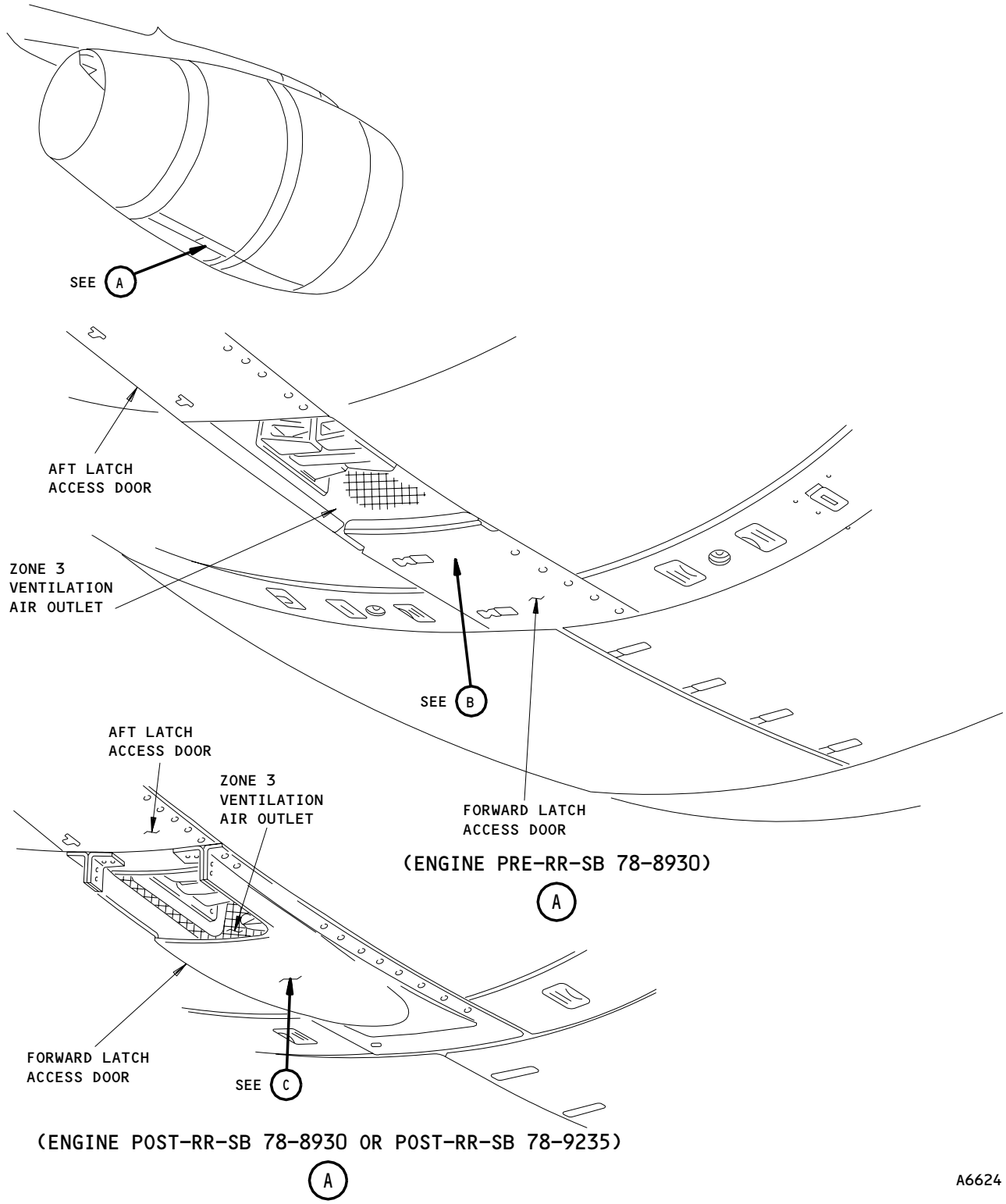
(w) Measure and adjust the latch closing force (Fig. 508)
1) Measure the latch closing force with the measuring tool and the closing force must be 45 to 55 pounds (200 to 240 N).
2) Adjust the keepers as necessary to get the correct closing force.
3) Make the closing force of the latches at position A as close to the same as possible.



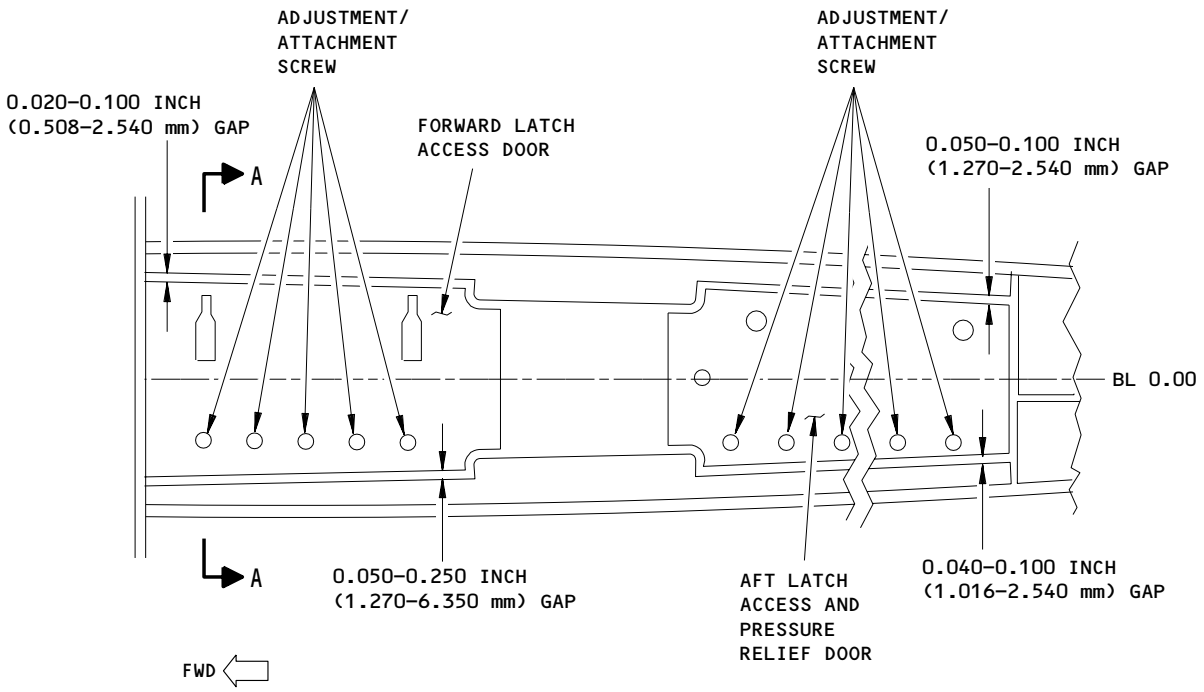
C-Duct Latches
Figure 509



Lower Bifurcation Bumpers
Figurte 510

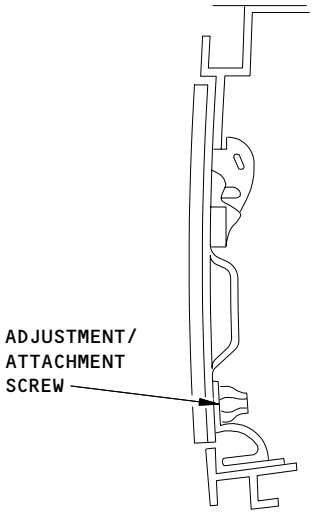


Latch Access Door
Figure 511 (Sheet 1)



(ENGINES PRE-RR-SB 78-8930)

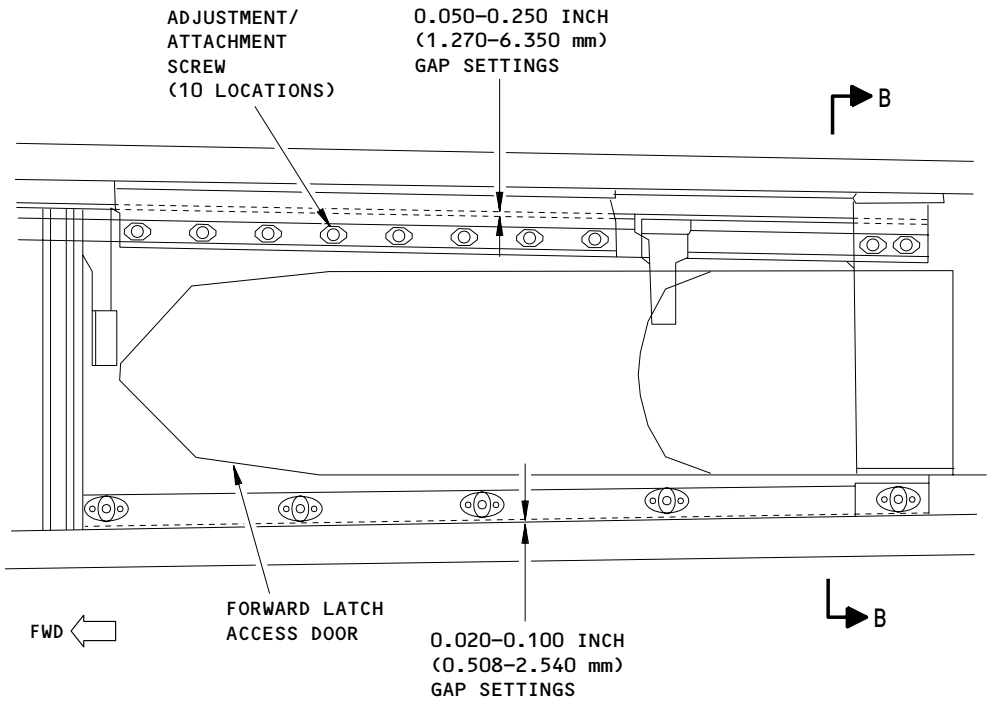
B



LATCH ACCESS DOOR
SEETING LIMITS
A-A

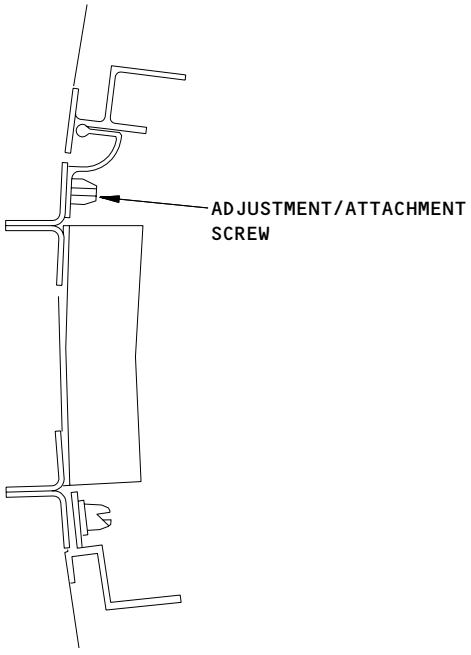
R55706-01

Latch Access Door
Figure 511 (Sheet 2)



(ENGINES POST-RR-SB 78-8930)

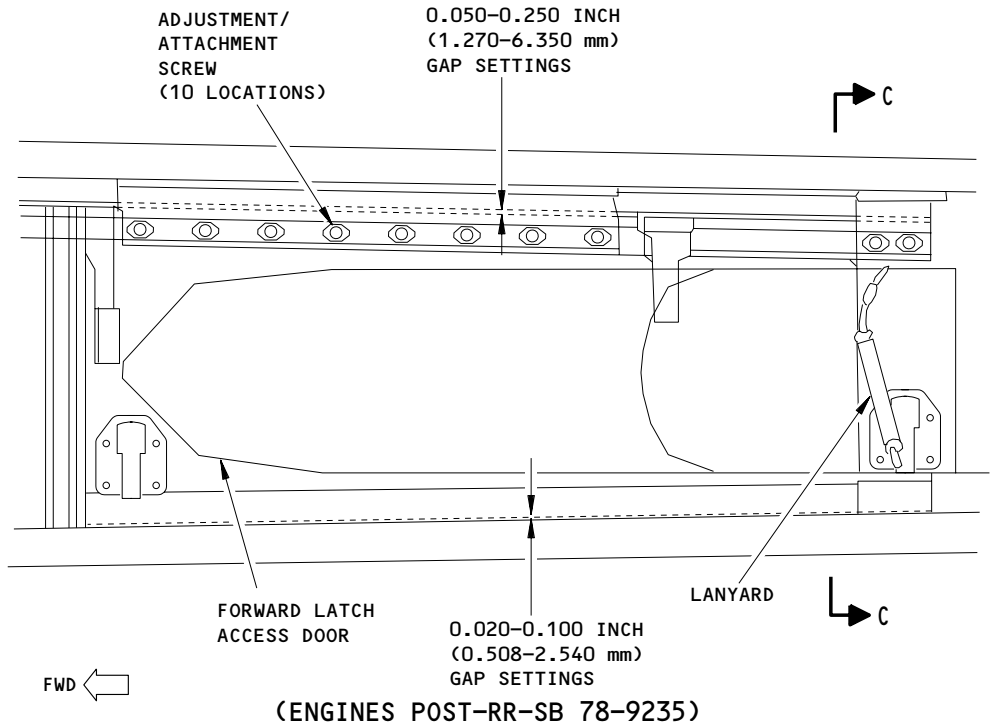
C



R55705-01

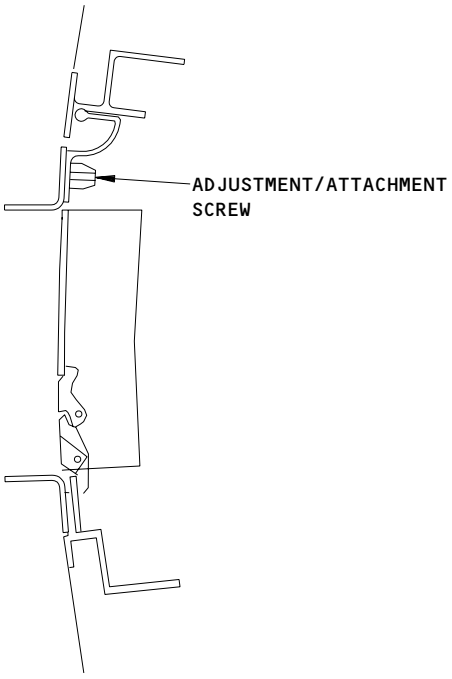
B-B

Latch Access Door
Figure 511 (Sheet 3)



(ENGINES POST-RR-SB 78-9235)

C



R55704-01

C–C

Latch Access Door
Figure 511 (Sheet 4)

NOTE: The closing force must be measured at tip of the handle and with all other latches engaged with their final closing force.

4) Install a new spring to the forward latch (position D) if the spring does not keep the latch in the horizontal position (Fig. 509).

CAUTION: MAKE SURE THAT THE FORWARD AND AFT LATCH ACCESS DOORS ARE RIGGED CORRECTLY (Fig. 511). IF THE LATCH ACCESS DOORS ARE NOT RIGGED CORRECTLY, THE LATCH ACCESS DOORS CAN OPEN DURING LANDING AND DAMAGE TO THE TRANSLATING SLEEVE CAN OCCUR WHEN THE THRUST REVERSER EXTENDS AND RETRACTS.

CAUTION: CLOSE AND LATCH THE FORWARD LATCH ACCESS DOOR BEFORE YOU CLOSE THE AFT LATCH ACCESS DOOR. IF THIS PROCEDURE IS NOT FOLLOWED, THE FORWARD LATCH ACCESS DOOR MAY NOT BE CORRECTLY LATCHED.

(x) Do a gap check between the forward and aft latch access doors and the translating cowl structure.
1) Adjust the forward latch access door to the smallest gap possible on the latch side of the access door. Keep the gap limits specifications (See Fig. 511). Make sure the door opens and closes freely.

TASK 78-30-00-835-005-R00

3. Do the Adjustment Procedure for the Translating Cowl

A. General

(1) This section gives the procedure to adjust the translating cowl. The two C-ducts are adjusted separately. The procedure is the same for the two C-ducts.

(2) The purpose of this procedure is:

(a) To synchronize the actuator stroke positions so that all actuators make contact with their stow stops at the same time. This is important to prevent increased loads to the flexible shaft and actuator synchronizing gears.

(b) To make sure the translating cowl is aligned with the C-duct tracks. Also to make sure that the gap between the C-ducts and the torque box fairing is correct when stowed.

(3) Adjustment of the translating cowl affects the adjustment of the stow proximity sensor, the deploy proximity sensor and the feedback system.

B. Procedure

S 225-006-R00

(1) Examine the translating cowl for correct adjustment

CAUTION: MAKE SURE MATING SURFACES OF EXTEND TUBE AND ACTUATORS ARE NOT DAMAGED BY THE FLEXIBLE SHAFT OR TOOLS DURING REMOVAL AND INSTALLATION OF THE FLEXIBLE SHAFT. DAMAGE WILL CAUSE LEAKS.

CAUTION: THE CROSSOVER FLEXIBLE SHAFT MUST BE INSTALLED AGAIN BEFORE THE AIRCRAFT IS PUT BACK TO SERVICE.

(a) Temporarily remove the crossover flexible shaft and install the crossover flexible shaft hose (AMM 78-31-26/401).
(b) Manually deploy the thrust reverser 2 to 3 inches (50.8 to 76.2 mm) from the fully stowed position (clear of the stow seals) (AMM 78-31-00/201).
(c) Remove the bolts and bushings from the clevis bracket on the translating cowl and the rod ends of the three actuators (AMM 78-31-26/401).
(d) Move the translating cowl aft until the rod ends are away from the translating cowl clevis brackets and you can reach the rod ends through the access openings.
(e) With your hand, turn the piston rod ends of all the actuators in the stow direction until they make contact with the internal stow stops.

NOTE: You will feel spring resistance in the locking actuator just before you touch the internal stow top and the locking actuator rod-end can spring back when released.

(f) Do a check of the alignment of the actuator rod ends with the translating cowl mounting brackets as follows (Fig. 512):
1) Turn the flexible shaft, with the manual drive, in the stow direction until :
- the center actuator rod end correctly aligns with the clevis bracket on the translating cowl and
- the adjustment key is outboard.

NOTE: You must hold the locking actuator piston against the internal stow stop until you begin to turn the manual drive.

NOTE: When you turn the manual drive flexible-shaft with the actuator pistons against their stow stops, the piston rods will turn.

CAUTION: DO NOT TURN THE ROD ENDS TO ALIGN THEM WITH THE TRANSLATING COWL CLEVIS BRACKETS. IF THEY ARE MORE THAN 5 DEGREES OUT OF ALIGNMENT, THIS ACTION WILL CAUSE THE ACTUATORS TO BE INCORRECTLY ADJUSTED.

2) With the upper and the lower actuators against their internal stow stops, make a check that the rod ends are aligned within 5 degrees with the clevis brackets. If they are aligned skip the next step. If they are not aligned do the next step.

NOTE: For each degree the rod end is not aligned, the actuator stroke synchronization will be incorrect by 0.002 inch (0.06 mm).

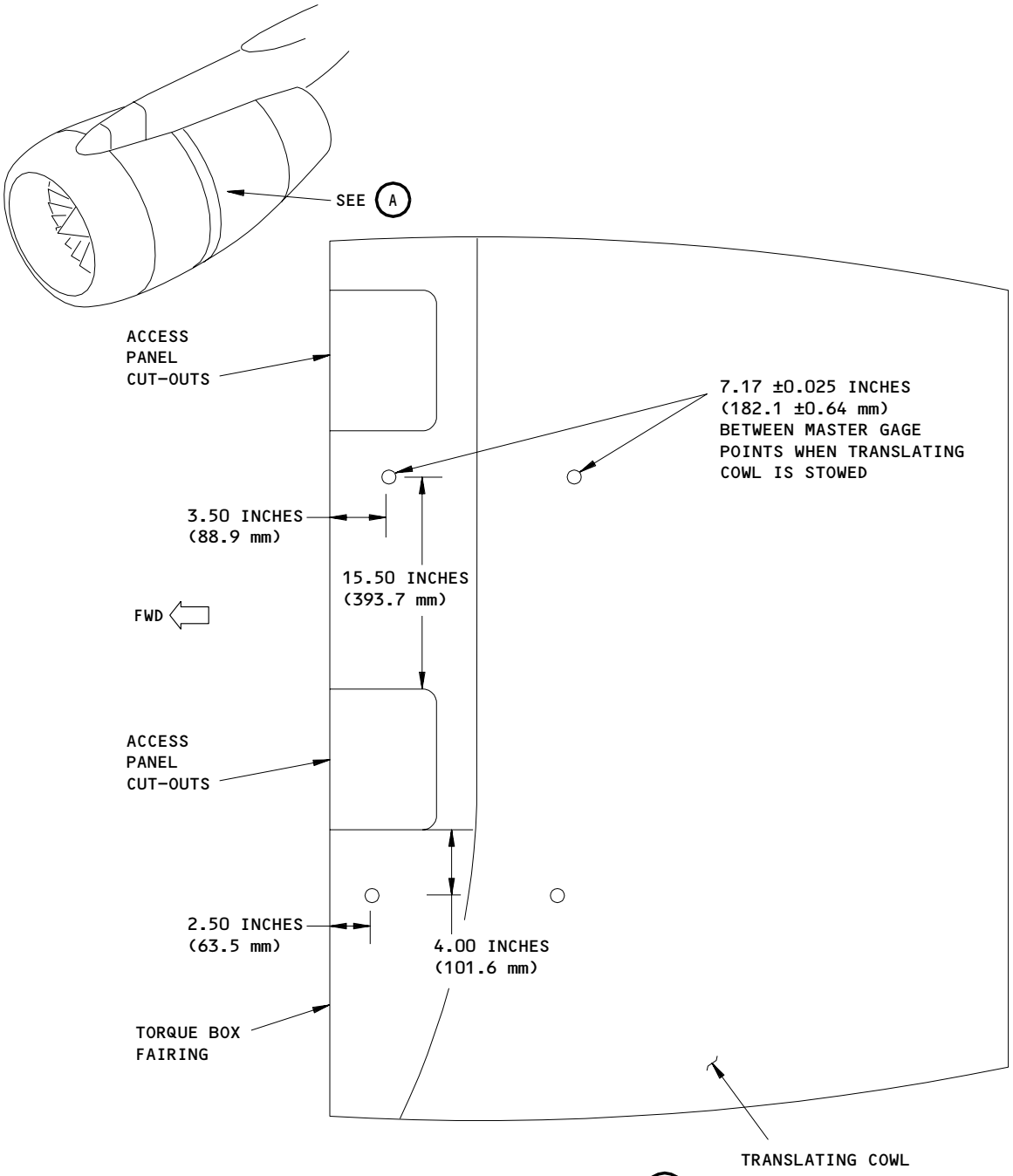
NOTE: One turn of the actuator worm drive gear equals 0.161 inch (4.09 mm) of actuator linear movement. To get the correct actuator stroke synchronization, you must not turn the flexible shaft or the worm drive more than one-sixteenth of a turn 0.010 inch (0.25 mm) of actuator movement while you install the flexible shaft.

S 835-007-R00

(2) Adjust the flexible shafts to synchronize actuator stroke

CAUTION: MAKE SURE MATING SURFACES OF EXTEND TUBES AND ACTUATORS ARE NOT DAMAGED BY THE FLEXIBLE SHAFT OR TOOLS DURING REMOVAL AND INSTALLATION OF THE FLEXIBLE SHAFT. DAMAGE WILL CAUSE LEAKS.

(a) Remove the center actuator sufficiently to disengage the upper and lower flexible shafts from the center actuator (AMM 78-31-26/401).
(b) With your hand, turn the piston rod ends of the three actuators in the stow direction. Do this until the piston rod ends touch the internal stow-stops and the rod ends align with the clevis bracket on the translating cowl.
(c) Engage the lower and upper flexible shafts into the center actuator and install the actuator again (AMM 78-31-26/401).
(d) With the manual drive, extend all three actuators 3.24 inches (82.3 mm) as follow:
    1) Make sure all the actuator ends are still aligned with their clevis brackets and they against their internal stow stops.

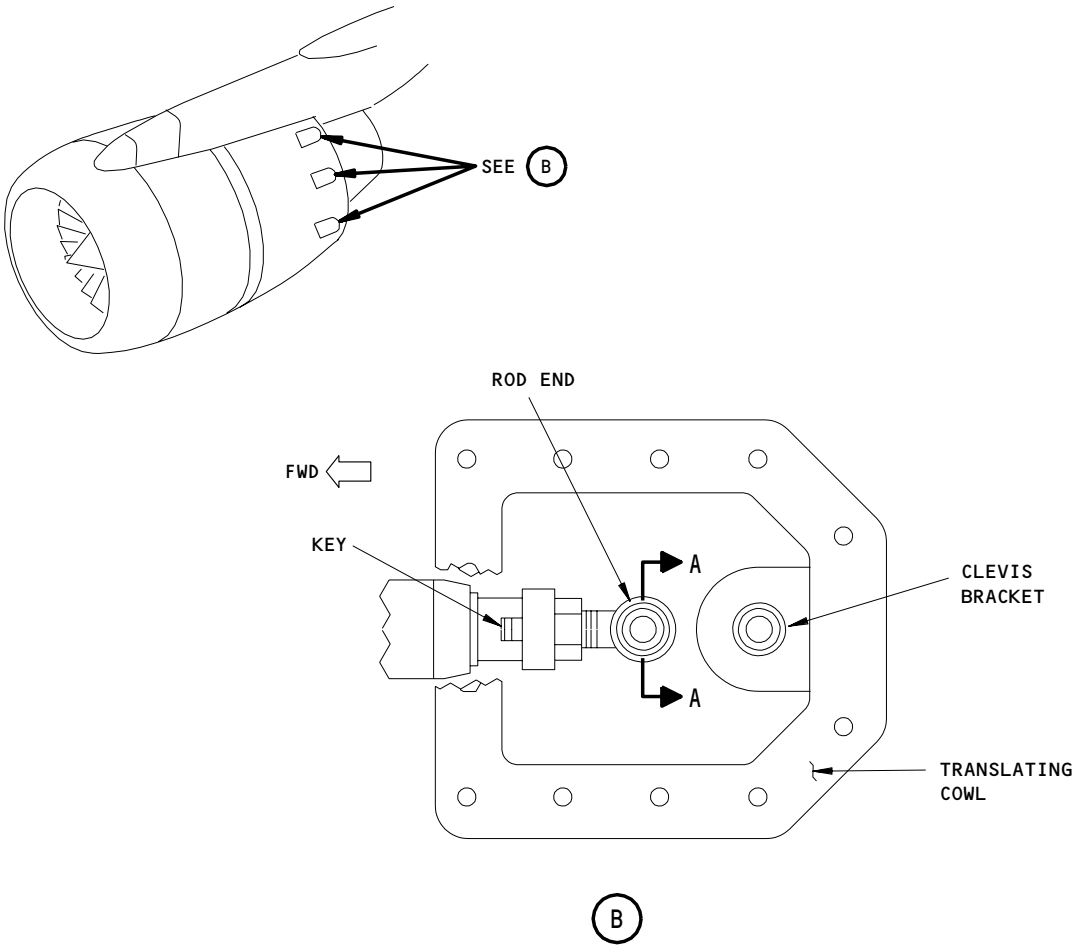


NOTE: MEASUREMENTS ARE MADE FROM FAIRING LEADING EDGE, AND FROM EDGE OF ACCESS PANEL CUT-OUT.

MEARSURMENTS ARE APPROXIMATE. MASTER GAGE POINTS ARE PRECISELY TOOL LOCATED AT MANUFACTURE. DO NOT DRILL HOLES BASED ON THESE DIMENSIONS.

55718

Translating Cowl to Torque Box Fairing Gap Check
Figure 512 (Sheet 1)



Translating Cowl to Torque Box Fairing Gap Check
Figure 512 (Sheet 2)

2) Hold the three actuator rod ends in approximate alignment with their clevis brackets and use the manual drive to extend the actuators 3.24 inches (82.3 mm) (20 turns of the manual drive).
3) Use a speed wrench in the manual drive to hold the locking actuator in place (against the internal stow stop) while you unlock the locking actuator. Because the piston will spring out when you unlock it (AMM 78-31-00/201).

S 825-008-R00

(3) Align the translating cowl with the C-duct tracks and adjust the gap between the translating cowl leading edge and the torque box fairing.

(a) With master gage points (Fig. 512)

NOTE: To do this procedure the thrust reverser master gage points must be available as shown in Fig. 512. The master gage points are through holes. If not visible, painted over or filled, they can be found from inside the translating cowl and torque box fairing at approximately the location shown in Fig. 512, sheet 1 and carefully extended through the surface. The master gage points are precisely tool-located at manufacture. Do not dril new master gage points, use the alternate method given in this task.

1) Install the center actuator bushings and bolts.
2) Move the aft ends of the translating cowl up or down until the distance between the two sets of master gage points is between 10.385 and 10.435 inches (263.76 and 265.04 mm) (Fig. 512). Hold in this position while you do the next step.
3) Adjust the upper and lower actuator rod ends so that you can install the bushings and bolt (AMM 78-31-26/401). Do not turn the actuators to adjust the rod ends.
4) With the bushing and bolts for all three actuators installed, do a check that the distance between both sets of the master gage points is between 10.385 and 10.435 inches (263.76 and 265.05 mm). Adjust the upper and lower actuator rod ends as necessary (AMM 78-31-26/401).

(b) Without master gage points (alternate method) (Fig. 512):
1) Install the center actuator bushing and bolt.
2) Apply pairs of tape pieces to the torque fairing ring and translating cowl adjacent to the upper and lower actuator locations (Fig. 512).

NOTE: These procedures are written for the C-duct on-wing. If the C-duct is off-wing and horizontal, it is necessary to first push the aft end of the translating cowl to one side as far as it will go and make the first set of marks and then push it as far as possible to the other side and make the second set of marks.

3) Make a mark on each piece of tape. Measure and record the distance between the marks on each pair of tape pieces.
4) Lift the aft end of the translating cowl up as far as possible and measure the distance between the marks on each pair of tape pieces again.
5) Calculate the difference between the first and second measurements for each pair of tape pieces and divide them by two.
6) Adjust the upper and lower actuator rod ends by the calculations. For each actuator, use the calculation from the adjacent pair of tape pieces. This makes sure the translating cowl is aligned with the C-duct tracks (AMM 78-31-26/401). Do not turn the actuator pistons to adjust the actuator length.

NOTE: One full turn of the rod end will change the actuator length approximately 0.050 inch (1.27 mm), or a half turn will change the actuator length approximately 0.025 inch (0.635 mm).

(c) Install the upper and lower actuator bolts and bushings.
(d) Stow the thrust reverser with power (AMM 78-31-00/201).
(e) Measure and record the gaps between the translating cowl leading edge and the torque box fairing at five locations (Fig. 512).
(f) Adjust the three actuator rod ends equally (AMM 78-31-26/401), to get one of these (do not turn the actuator piston to adjust the rod ends):
1) A gap of 0.060 to 0.190 inch (1.52 to 4.83 mm) between the translating cowl leading edge and the torque box fairing at each of the five locations (Fig. 512).
2) An average of the gap measurement (the sum of the measurements taken at five locations divided by five) between 0.100 and 0.150 inch (2.54 and 3.81 mm).

S 835-009-R00

(4) Do the adjustment procedure again for the opposite C-duct.

S 865-010-R00

(5) Stow the thrust reverser with power (AMM 78-31-00/201).

S 425-011-R00

CAUTION: MAKE SURE THE MATING SURFACES OF THE EXTEND TUBES AND ACTUATORS ARE NOT DAMAGED BY THE FLEXIBLE SHAFT OR TOOLS DURING THE REMOVAL AND INSTALLATION OF THE FLEXIBLE SHAFT. DAMAGE WILL CAUSE LEAKS.

(6) Install the crossover flexible shaft (AMM 78-31-26/401).

TASK 78-30-00-835-012-R00

4. Do the Adjustment Procedure for the Stow (Auto/Re-stow) Proximity Sensor

A. General

(1) This section gives the procedure to adjust the stow proximity sensor. The procedure is the same for the two C-ducts.

(2) The stow proximity sensor is installed on the fixed structure near the lower bifurcation track. The sensitivity plate (target) is installed near the lower forward corner of the thrust reverser translating cowl.

(3) The stow proximity sensor senses the location of the translating cowl. The stow proximity sensor keeps the isolation valve in the open position when the translating cowl is not fully stowed. The fault light REV ISLN can be related to the stow proximity sensor.

NOTE: Faults which are not continuous can not be repaired by cleaning the sensor and the sensitivity plate (target). If indication faults occur it is necessary to do a check adjustment of the stow proximity sensor.

NOTE: Open or short electrical circuits will cause proximity sensor fault indication. Loose wires cause faults that continue or faults which are not continuous. You must make sure the serviceability of the electrical circuit with the PSEU SENSOR test or by examination of the circuit.

B. Procedure

S 225-013-R00

(1) Examine the adjustment of the stow proximity sensor

NOTE: You must do the adjustment of the translating cowl before you do the adjustment of the stow proximity sensor if they are both to be adjusted at the same time.

(a) Deploy the thrust reverser (78-31-00/201).

(b) Put approximately 0.25 inch (6.35 mm) thick layer of modelling clay on the sensitized surface of each stow proximity sensor (Fig. 513).

(c) Apply petroleum jelly or release agent to the stow proximity sensor sensitivity plate (target) to prevent adhesion.

(d) Stow the thrust reverser and then deploy it with power (78-31-00/201).
(e) Do a check of the thickness of the compressed modelling clay. The thickness must be between 0.050 and 0.070 inch (1.27 and 1.77 mm). If it is not within this limit adjust the stow proximity sensor.

S 835-014-R00

(2) Adjust the stow proximity sensor
(a) Measure the gap between the stow proximity sensor and the sensitivity plate (target).
(b) Remove the stow proximity sensor and existing shim pack (AMM 78-34-07/401).
(c) Add or subtract shims to get a gap between 0.050 and 0.07 inch (1.27 and 1.77 mm).

NOTE: Each shim is 0.060 inch (1.52 mm) thick in 0.002 inch (0.051 mm) laminations.

(d) Install the stow proximity sensor (AMM 78-34-07/401).
(e) Clean the stow proximity sensors and the sensitivity plate (target).

S 865-015-R00

(3) Stow the thrust reverser (AMM 78-31-00/201).

TASK 78-30-00-835-016-R00

5. Do the Adjustment Procedure for the Lock Indicator

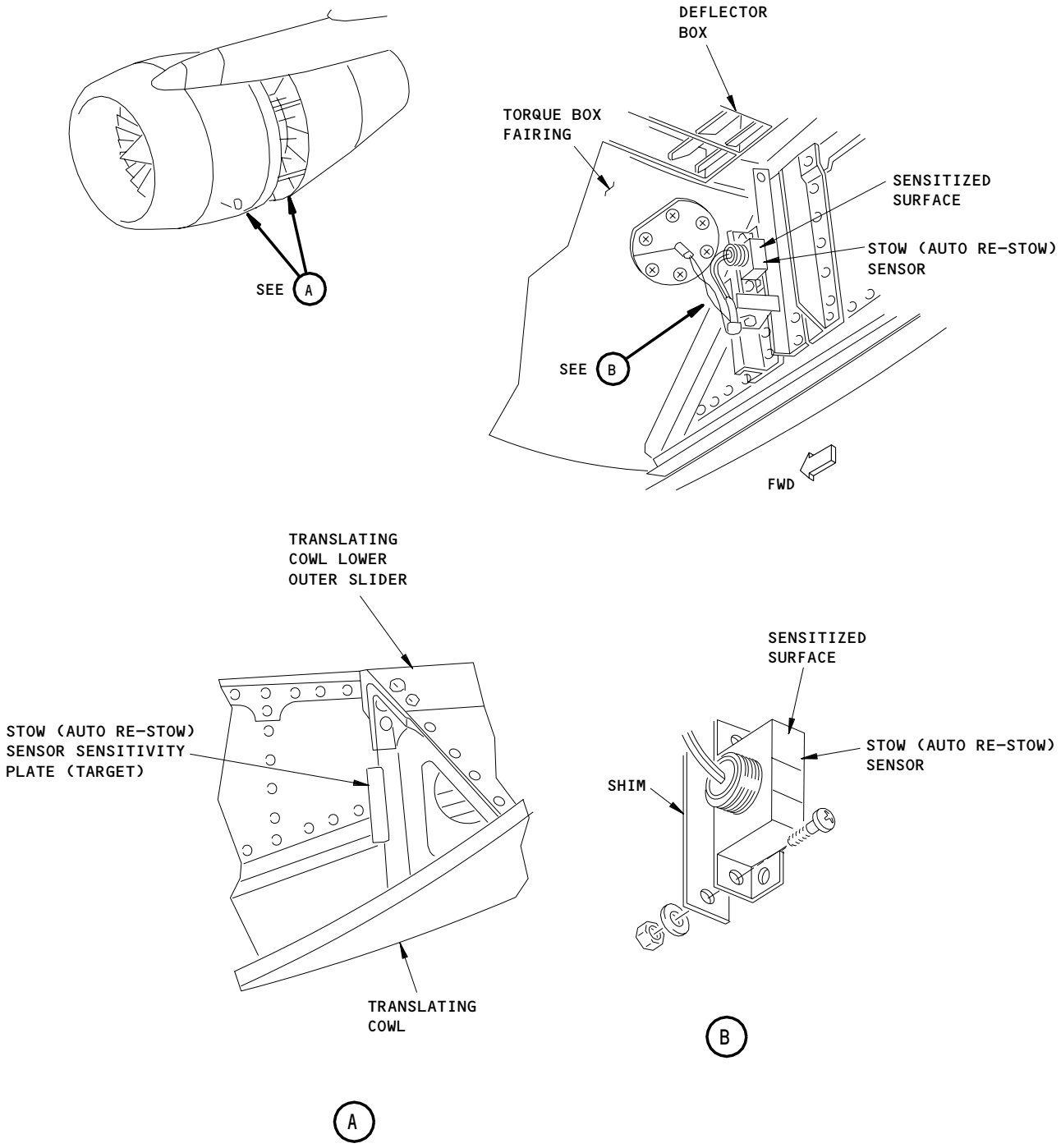
A. General

(1) This section gives the procedure to adjust the thrust reverser lock indicator. This procedure is the same for the two C-ducts.

NOTE: Adjustment of the lock indicator can affect the adjustment of the lock proximity sensor. If you change the lock indicator adjustment you must do a check of the lock proximity sensor adjustment.

NOTE: Do not lubricate the lock indicator. Lubricant can attract contaminants and cause incorrect operation.

(2) The lock indicator is installed on the torque box fairing near the lower actuator.



Stow (Auto Restow) Proximity Sensor
Figure 513

(3) The lock indicator gives visual indication of the locking actuator not-locked condition. It also is used to unlock the locking actuator. The lock indicator (flag) is above the torque box fairing approximately 0.75 inch (19.05 mm) when the locking actuator is hydraulically unlocked.

NOTE: The lock indicator will also be above the fairing if the lock mechanism is in a partially unlocked (tooth-on-tooth) condition. The amount the indicator is above the fairing will be less than when the lock is hydraulically locked. Apply stow torque through the manual drive to correct this condition.

B. Procedure

S 865-017-R00
(1) Stow the thrust reverser with power (AMM 78-31-00/201).

S 865-019-R00
(2) Open the thrust reverser C-ducts (AMM 78-31-00/201).

S 225-020-R00
(3) Examine the lock indicator for correct adjustment
(a) Make sure the locking actuator is locked (AMM 78-31-00/201)
1) AIRPLANES WITH SYNC-LOCK;
Hold the synchronization shaft lock (SSL) indicator in the unlocked position.
2) Hold the actuator lock indicator on the opposite C-duct in the unlocked position.

CAUTION: DO NOT USE MORE THAN 50 INCH-POUNDS (5.65 Nm) TORQUE IN THE DEPLOY DIRECTION.

3) With the manual drive, stow the thrust reverser and then deploy it (AMM 78-31-00/201). The thrust reverser will not deploy if the locking actuator is locked.

(b) Make sure the lock indicator is level to +0.020 inch (0.50 mm) with the outside surface of the torque box fairing.

NOTE: Usually, if the lock indicator is incorrectly adjusted adjusted or is worn it will not be level and the face of the indicator will not be parallel with the torque box fairing.

1) If the lock indicator is more than 0.020 inch (0.50 mm) above the surface of the torque box fairing:
   - Visually examine the lock indicator and the pivot attachment bolts and bushings for wear. Repair as necessary.
   - Adjust the lock indicator.
2) If the lock indicator is below the torque box fairing surface, adjust the lock indicator.

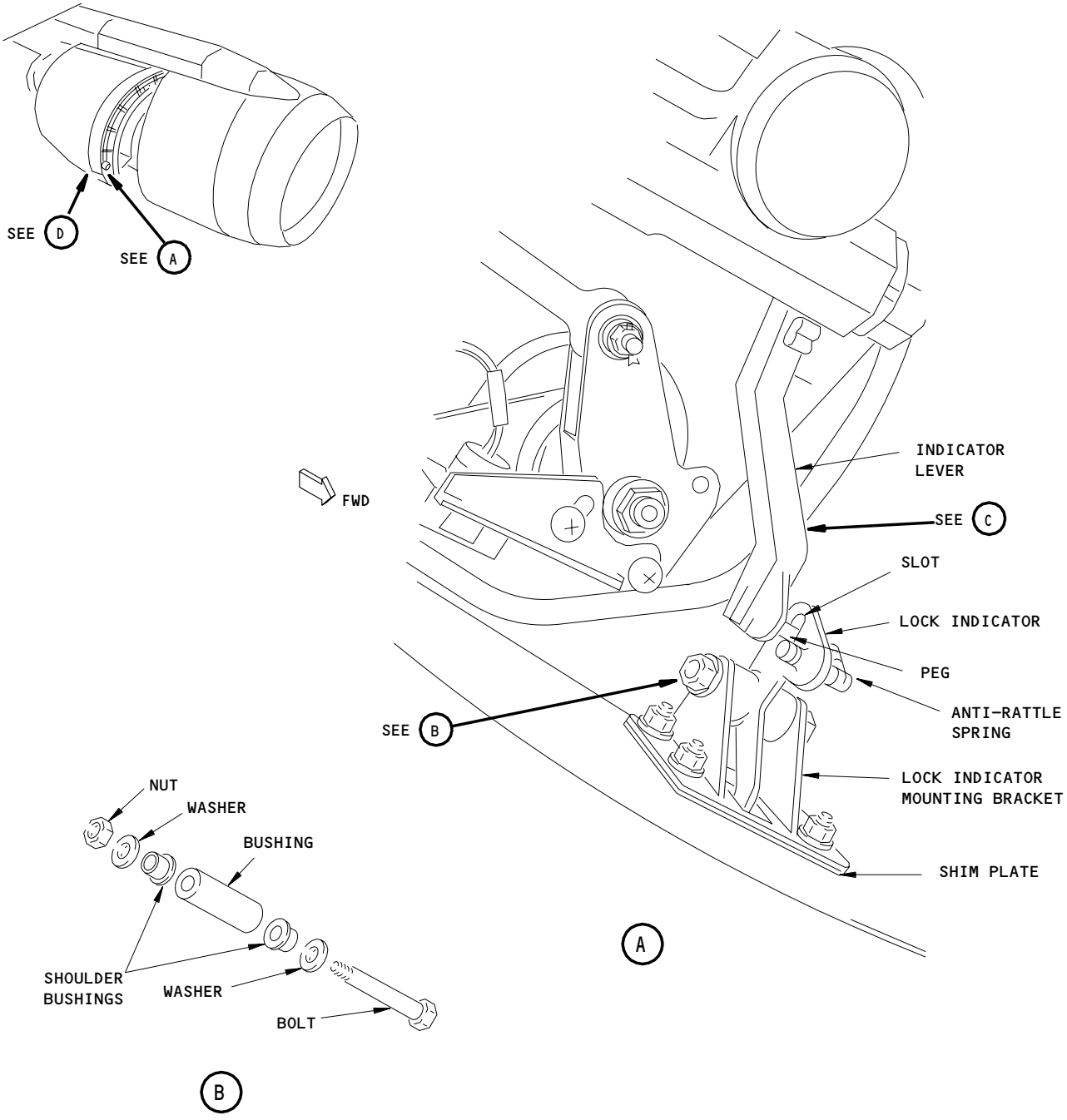
(c) Make sure the lock indicator does not prevent full lock engagement of the locking actuator (Fig. 514).
1) Remove the anti-rattle spring (this will help the adjustment).
2) Push on the lock indicator lever in the locked direction (to the rear) with a force of 7 to 10 lbf. (31.14 to 44.48 N).
3) The indicator must move slightly toward the locked position.
4) If there is no movement in the lock indicator mechanism at the lock indicator, adjust the lock indicator.
5) Install the anti-rattle spring again.

(d) Deploy the thrust reverser 2 to 3 inches (50.8 to 76.2 mm).

(e) Look at the lock indicator mechanism while you move the lock indicator from the locked to the unlocked position.
1) The mechanism must move freely with no signs of binding or interference.
2) If the peg on the indicator lever becomes caught against the ends of the slot in the lock indicator, adjust the lock indicator.
3) If the lock indicator touches the torque box fairing as it moves through the hole, adjust the lock indicator.
4) Make sure there is a clearance of 0.020 inch (0.050 mm) between the indicator and the torque box fairing when the indicator is in the locked position.

S 835-021-R00

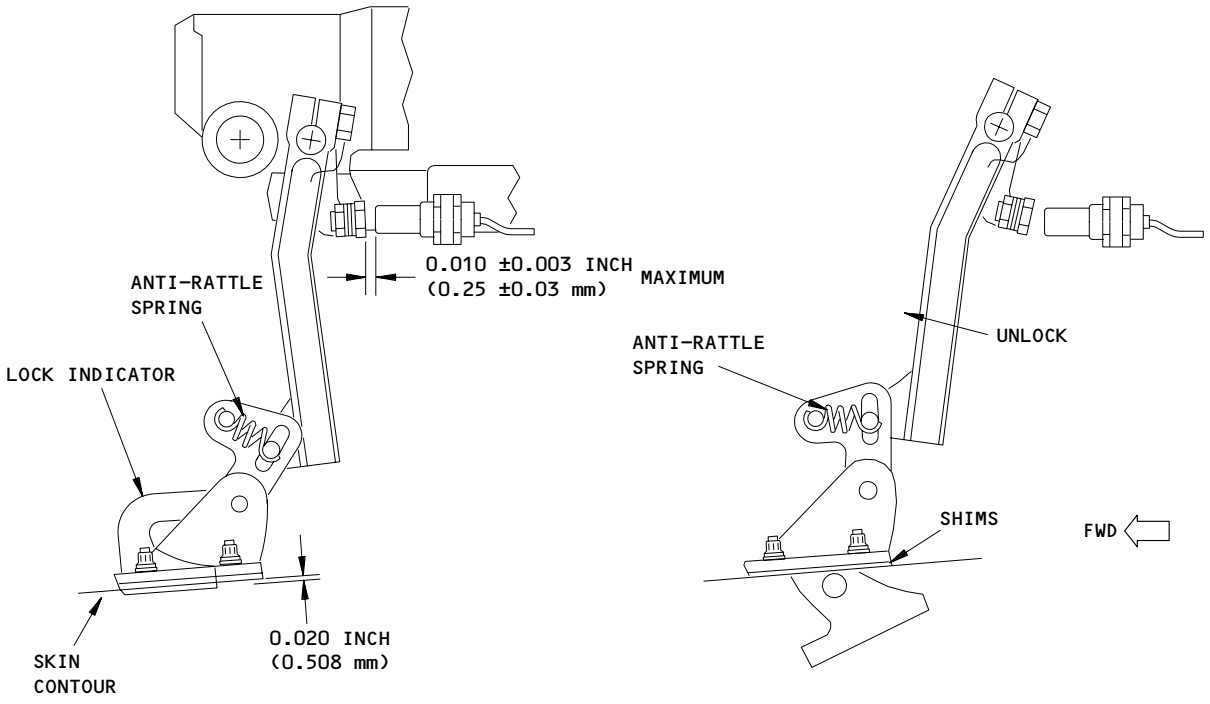
(4) Adjust the lock indicator
(a) Stow the thrust reverser (AMM 78-31-00/201).
(b) Open the thrust reverser C-ducts (AMM 78-31-00/201).



NOTE: RIGHT SIDE LOCK INDICATOR INSTALLATION IS SHOWN,
LEFT SIDE LOCK INDICATOR INSTALLATION IS OPPOSITE.

55701

Lock Indicator
Figure 514 (Sheet 1)



Lock Indicator
Figure 514 (Sheet 2)

(c) Make sure the locking actuator is locked.
1) ON AIRPLANES WITH SYNC-LOCK;
Hold the synchronization shaft lock (SSL) indicator in the unlocked position.
2) Hold the actuator lock indicator on the opposite C-duct in the unlocked position.

CAUTION: DO NOT USE MORE THAN 50 LBF.IN (5,65 NM) MAXIMUM TORQUE IN THE DEPLOY DIRECTION.

3) With the manual drive, stow the thrust reverser and then deploy it (AMM 78-31-00/201). The thrust reverser will not deploy if the locking actuator is locked.
(d) Loosen the attachment fastners of the mounting brackets of the lock indicator sufficiently to move it forward or aft until:
1) The lock indicator is level to +0.020 inch (0,50 mm) with the outside surface of the torque box fairing

NOTE: It can be necessary to add or subtract shims to get the lock indicator level with the torque box fairing. If the lock indicator is above the surface of the torque box fairing, increase the shims under the lock indicator bracket. If the lock indicator is below the surface of the torque box fairing, remove shims from below the lock indicator bracket.

2) When you push on the indicator lever in the lock direction (to the rear) with a force of 7 to 10 pounds (31.14 to 44.48 N) there must be some movement in the indicator mechanism at the lock indicator.
(e) Tighten the attachment fastners of the mounting brackets of the lock indicator.
(f) Make sure the two locking actuators are in the locked position.
(g) AIRPLANES WITH SYNC LOCK;
Make sure the synchronization shaft lock is in the locked position.

S 225-022-R00
(5) Do a check of the lock proximity sensor adjustment (refer to the adjustment procedure of the lock proximity sensor).

S 865-023-R00
(6) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).

TASK 78-30-00-835-024-R00

6. Do the Adjustment Procedure for the Lock Proximity Sensor

A. General

NOTE: Adjustment of the lock indicator can affect the adjustment of the lock proximity sensor. You must do a check/adjustment of the lock indicator before you adjust the lock proximity sensor.

(1) This section gives the procedure to adjust the lock proximity sensor. This procedure is the same for the adjustment of the two C-ducts.
(2) The lock proximity sensor and the sensitivity plate (target) are installed on the locking actuator.
(3) The lock proximity sensor transmits the locked/unlocked condition of the locking actuator to the flight compartment. The flight compartment indication for actuator unlocked is the REV amber light.

NOTE: Indication faults which are not continuous can not be repaired by cleaning the sensor or the sensitivity plate (target). If indication faults occur, it is necessary to do a check/adjustment of the lock proximity sensor.

NOTE: Open or short electrical circuits will cause proximity sensor fault indications. Loose wires or connectors in the proximity sensor circuits will cause faults that continue or faults that are not continuous. You must examine the serviceability of the electrical circuits with the PSEU SENSOR test or by examination of the electrical circuits.

B. Procedure

S 225-025-R00

(1) Examine the adjustment of the lock proximity sensor (Fig. 515)
  (a) Stow the thrust reverser with power (AMM 78-31-00/201).
  (b) Open the thrust reverser C-ducts (AMM 78-31-00/201).
  (c) Make sure the locking actuator is locked.
    1) AIRPLANES WITH SYNC-LOCK;
      Hold the synchronization shaft lock (SSL) indicator in the unlocked position.
    2) Hold the actuator lock indicator on the opposite C-duct in the unlocked position.

CAUTION: DO NOT USE MORE THAN 50 INCH-POUNDS (5.65 NM) MAXIMUM TORQUE IN THE DEPLOY DIRECTION.

3) With the manual drive, stow the thrust reverser and then deploy it (AMM 78-31-00/201). The thrust reverser will not deploy if the locking actuator is locked.

(d) Measure and record the gap between the lock proximity sensor and the sensitivity plate (target).
- If the gap is not between 0.007 and 0.013 inch (0.17 and 0.33 mm), adjust the lock proximity sensor.

(e) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).

S 835-026-R00

(2) Adjust the lock proximity sensor (Fig. 515)

(a) Measure the gap between the lock proximity sensor and the sensitivity plate (target).

CAUTION: THE THRUST REVERSER AUTOMATIC HINGE ACCESS DOOR (AHAD) MUST BE REMOVED BEFORE THE THRUST REVERSER IS DEPLOYED WHEN THE C-DUCTS ARE FULLY OPEN OR THE C-DUCTS ARE OPENED WHEN THE THRUST REVERSER IS DEPLOYED. THE TRANSLATING COWL AND THE AUTOMATIC HINGE ACCESS DOOR (AHAD) WILL BE DAMAGED IF THIS IS NOT DONE.

(b) Remove the thrust reverser hinge access door (AMM 78-31-10/401).

(c) Deploy the thrust reverser (AMM 78-31-00/201).

(d) Open the thrust reverser C-ducts (AMM 78-31-00/201).

(e) Remove the sensitivity plate (target) and the existing shim pack (AMM 78-36-01/401).

(f) Add or subtract shims to get 0.007 to 0.013 inch (0.17 to 0.33 mm) minimum gap between the lock proximity sensor and the sensitivity plate (target).

(g) Install the sensitivity plate (target) and shim pack (AMM 78-36-01/401).

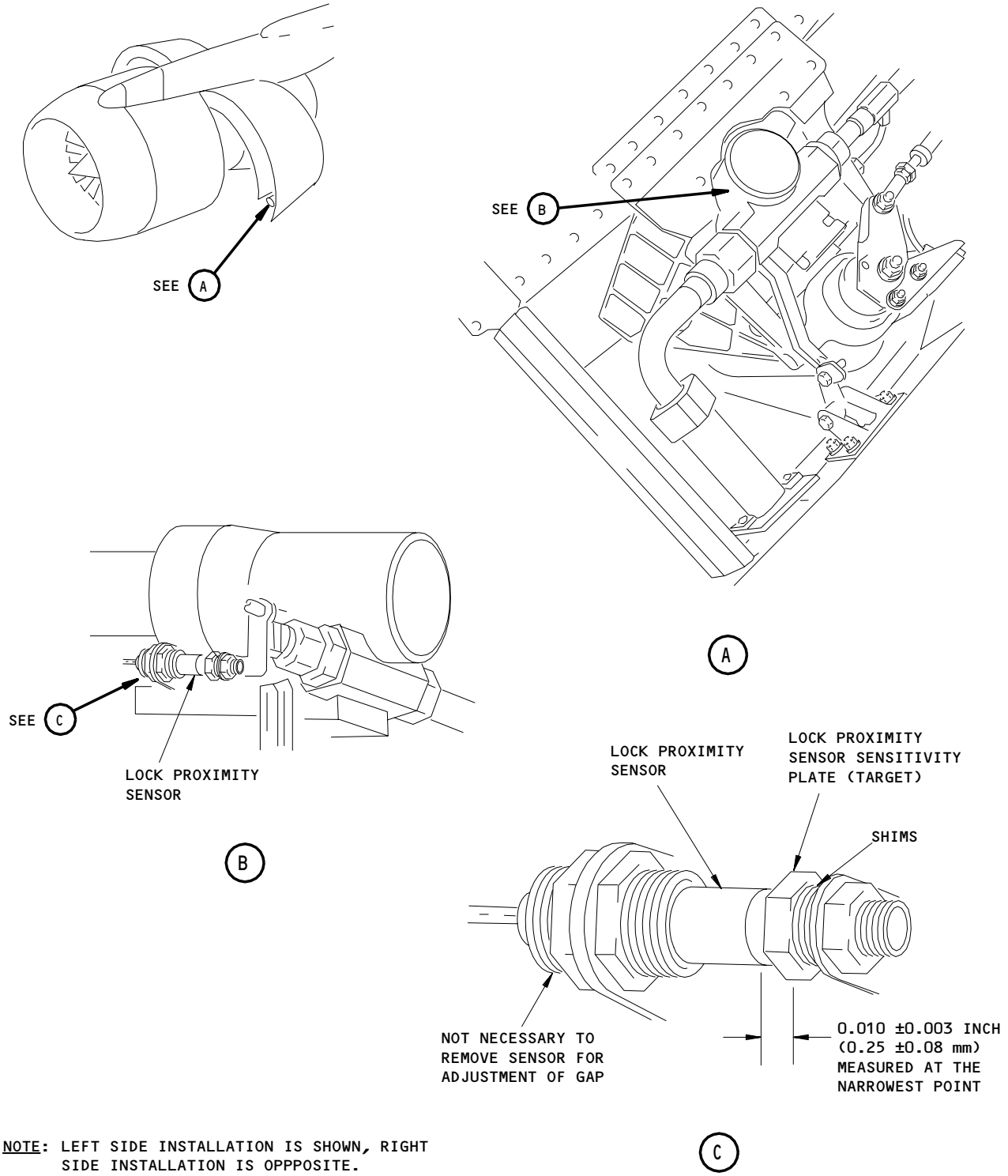
(h) Stow the thrust reverser (AMM 78-31-00/201).

(i) Make sure the two locking actuators are in the locked position.

(j) TO AIRPLANES WITH SYNC LOCK;
Make sure the synchronization shaft lock is in the locked position.

(k) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).

(l) Install the hinge access door (AMM 78-31-10/401).



NOTE: LEFT SIDE INSTALLATION IS SHOWN, RIGHT SIDE INSTALLATION IS OPPPOSITE.

55720

Lock Proximity Sensor
Figure 515

TASK 78-30-00-835-027-R00

7. Do the Adjustment Procedure for the Deploy Proximity Sensor

A. General

(1) This procedure gives adjustment instructions for the thrust reverser deploy proximity sensors. This procedure is the same for the two C-ducts.

(2) The deploy proximity sensor and the sensitivity plate (target) are installed on the feedback actuator.

(3) The deploy proximity sensor sends a signal to the flight compartment when the thrust reverser is deployed for 90 percent or more. The flight compartment indication for the deploy proximity sensor is REV green light.

NOTE: Indication faults which are not continuous can not be repaired by cleaning the sensor and the sensitivity plate (target). If indication faults occur it is necessary to check or adjust the deploy proximity sensor.

NOTE: Open or short electrical circuits will cause proximity sensor indication faults. Loose wired or connectors in the proximity sensor circuits will cause continuous faults or faults that are not continuous. You must examine the serviceability of the electrical circuits with the PSEU SENSOR test or by examination of the electrical circuits.

B. Procedure

S 225-028-R00

(1) Examine the adjustment of the deploy proximity sensor

(a) Stow the thrust reverser with power (AMM 78-31-00/201).

CAUTION: THE THRUST REVERSER AUTOMATIC HINGE ACCESS DOOR (AHAD) MUST BE REMOVED BEFORE THE THRUST REVERSER IS DEPLOYED WHEN THE C-DUCTS ARE FULLY OPEN OR THE C-DUCTS ARE OPENED WHEN THE THRUST REVERSER IS DEPLOYED. THE TRANSLATING COWL AND AHAD WILL BE DAMAGED IF THIS IS NOT DONE.

(b) Remove the thrust reverser hinge access door (AMM 78-31-10/401).

(c) Deploy the thrust reverser (AMM 78-31-00/201).

(d) Open the thrust reverser C-duct (AMM 78-31-00/201).

(e) Measure and record the gap between the sensitized surface of the deploy proximity sensor and the sensitivity plate (target) (Fig. 516).
- If the gap is not between 0.030 and 0.050 inch (0.77 and 1.27 mm), adjust the deploy proximity sensor.

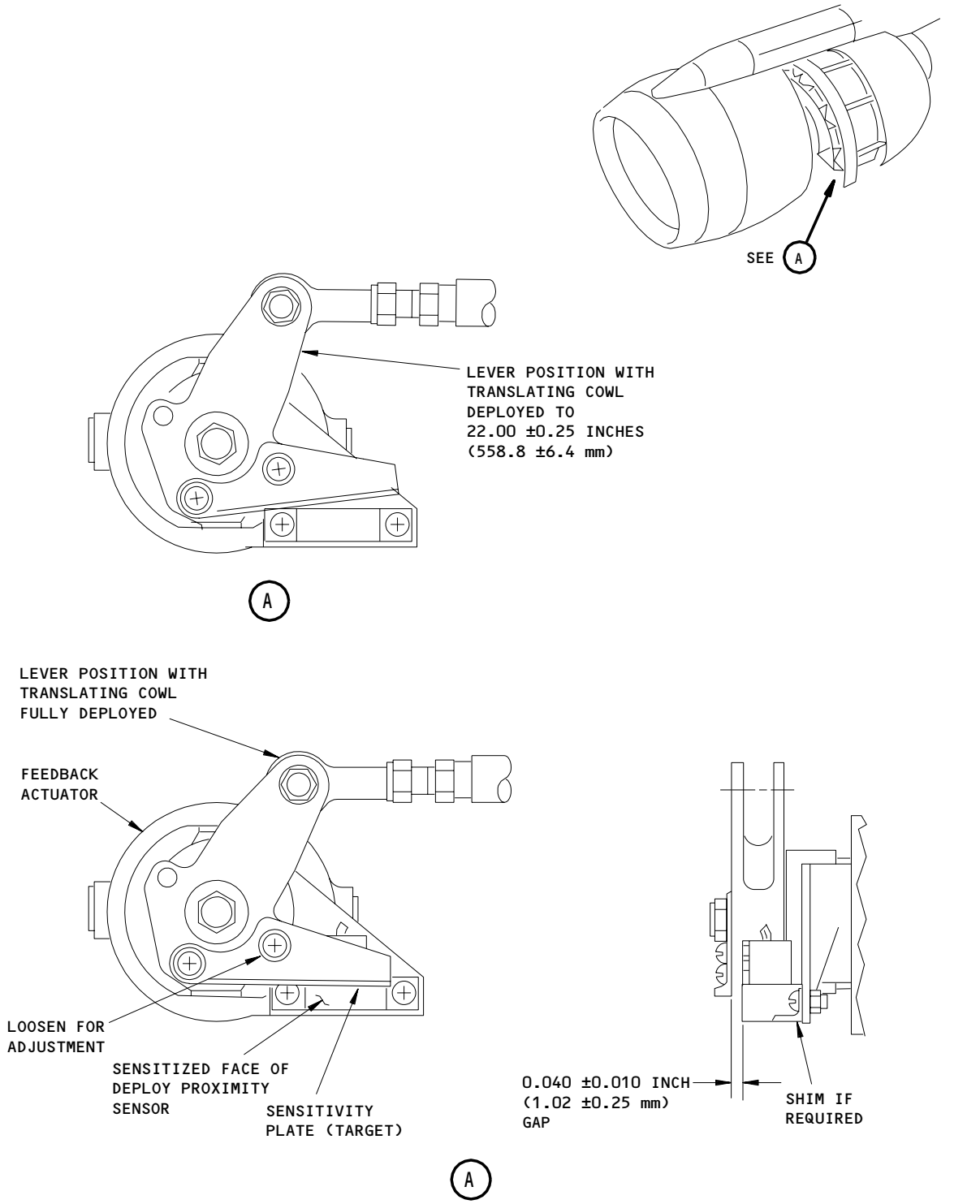
S 835-029-R00

(2) Adjust the deploy proximity sensor
(a) Measure the gap between the deploy proximity sensor and the sensitivity plate (target).
(b) adjust the deploy proximity sensor shims.
1) Remove the deploy proximity sensor (AMM 78-36-02/401).
2) Add or subtract shims to get 0.030 to 0.050 inch (0.77 to 1.27 mm) gap between the deploy proximity sensor and the sensitivity plate. Each shim is 0.060 inch (1.52 mm) thick in 0.002 inch (0.051 mm) thick laminations.
3) Install the deploy proximity sensor and the shim pack (AMM 78-36-02/401).
(c) Manually stow the thrust reverser 15 turns plus or minus one-half turn to get the translating cowl at 22.05 inches (560.07 mm) from fully stowed position (AMM 78-31-00/201). Do a check that the indication REV green light is on in the flight compartment.
1) If the REV green light is not on, loosen the sensitivity plate fastners and move the sensitivity plate (target) until the REV green light in the flight compartment comes on. Torque tighten the sensitivity plate fastners to between 20 and 25 lbf.in. (2.26 and 2.82 Nm).
2) If the REV green light indication is on, go to the next step.
(d) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).
(e) Stow the thrust reverser (AMM 78-31-00/201).
(f) Install the thrust reverser hinge access doors (AMM 78-31-10/401).

TASK 78-30-00-835-030-R00

8. Do the Adjustment Procedure for the Feedback System

A. General
(1) This section gives the procedure to adjust the feedback system. This procedure is the same for the two C-ducts.
(2) The feedback system has:
(a) Feedback actuator (one for each C-duct installed near the locking actuator).
(b) Lower feedback assembly (one for each C-duct installed on the torque box).



Deploy Proximity Sensor
Figure 516

(c) Upper feedback cable assembly (one for each C-duct, installed in the pylon).

(3) The feedback system makes sure that the engine power can not be increased above idle until the translating cowls have moved to the reverse thrust position.

(4) The feedback system also makes sure engine power is automatically reduced to idle if the translating cowls move to a position that does not agree with the position of the control in the flight compartment.

B. Equipment

(1) B20003-XX Rig Pin Set (AMM 20-10-24/201)

(a) Rig Pin RR2 - P/N B20003-29 or MS20392-4C87

C. Procedure

S 225-031-R00

(1) Examine the adjustment of the feedback system

(a) Examine the feedback system for too much backlash (AMM 78-34-03/601).

(b) Stow the thrust reverser with power (AMM 78-31-00/201).

(c) Open the thrust reverser C-ducts (AMM 78-31-00/201).

(d) Disconnect the lower feedback cable rod end from the feedback actuator lever (AMM 78-34-03/401).

(e) Move the throttle baulk levers in the pylon to the stowed position (counterclockwise) until the rigging holes align. Install the (RR2) rig pin (Fig. 517).

(f) Moderately tighten the lower feedback cable rod end. While you moderately turn the lever toward the cable, try to align the lower feedback cable rod-end and feedback actuator-lever bolt holes.

(g) If they do not align, adjust the feedback cable.

(h) If they do align, connect the rod end to the lever (AMM 78-34-03/401).

CAUTION: FAILURE TO REMOVE THE RIG PIN WILL CAUSE DAMAGE TO THE FEEDBACK SYSTEM COMPONENTS.

(i) Remove the rig pin if rigging is not necessary.

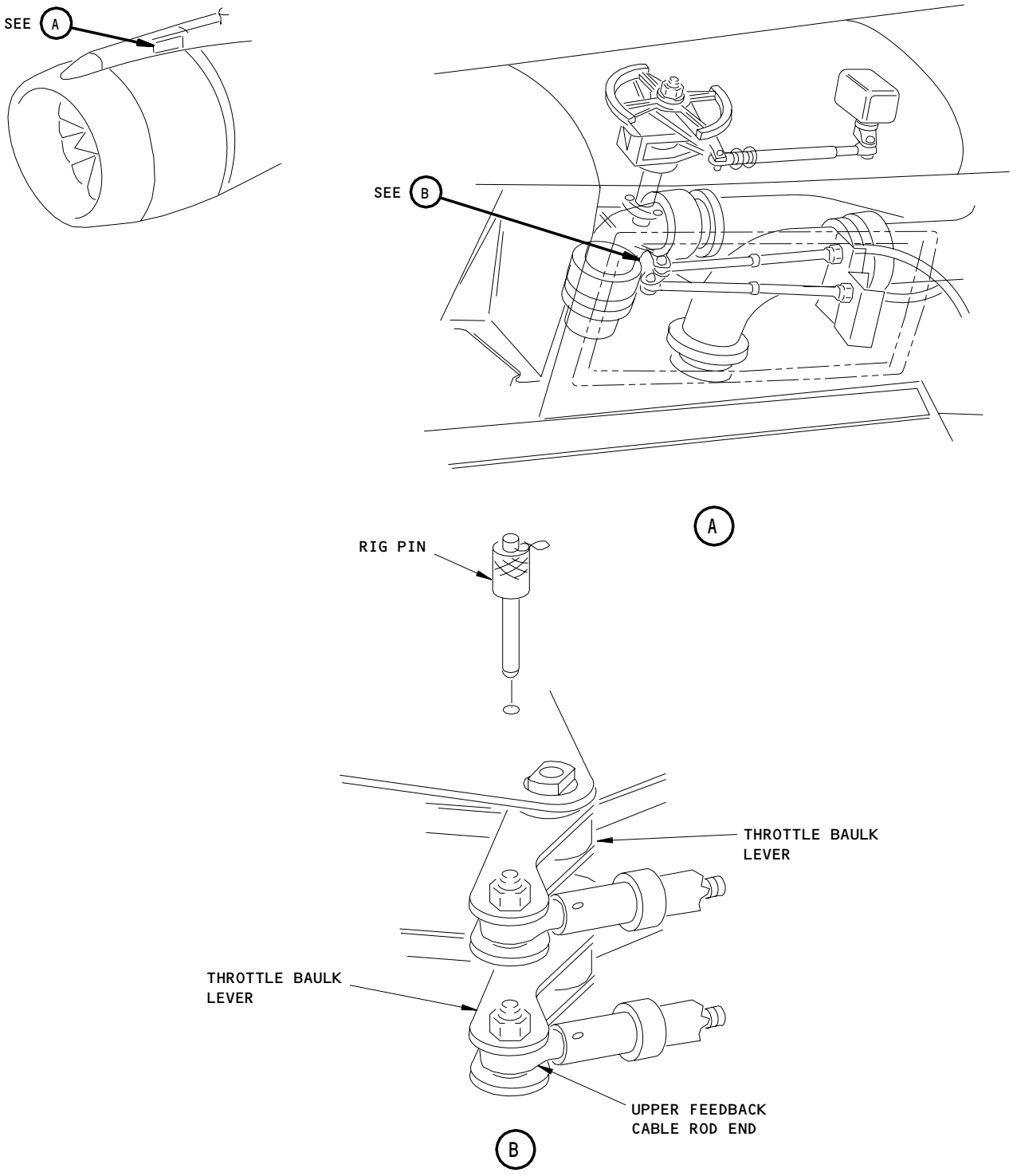
S 835-032-R00

(2) Adjust the feedback system

(a) Do a check of the feedback system adjustment.

(b) Tighten the cable and turn the lever at the same time, adjust the rod end until the lower feedback rod end aligns with the feedback actuator lever (Fig. 518).

(c) Connect the lower rod end of the feedback cable to the feedback actuator lever (AMM 78-34-03/401).



NOTE: ACCESS PANEL IS NOT SHOWN FOR CLARITY.

55731

Thrust Reverser Feedback Cables – Throttle Baulk Levers
Figure 517

CAUTION: FAILURE TO REMOVE THE RIG PIN WILL CAUSE DAMAGE TO THE FEEDBACK SYSTEM COMPONENTS.

(d) Remove the rig pin.
(e) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).

TASK 78-30-00-835-033-R00

9. Do the Adjustment Procedure for the Automatic Hinge Access Door (AHAD)

A. General

(1) This section gives the adjustment procedure for the automatic hinge access doors (AHAD). This procedure is the same for the two C-ducts.

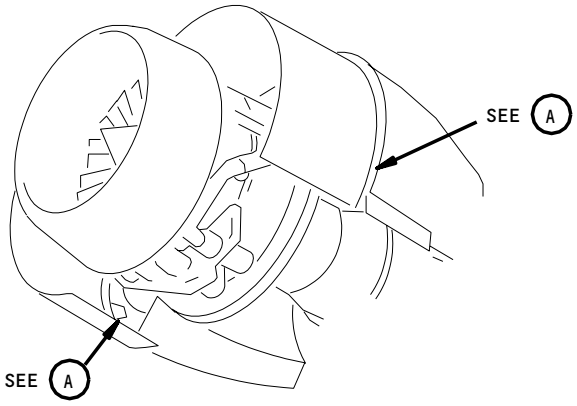
B. Procedure

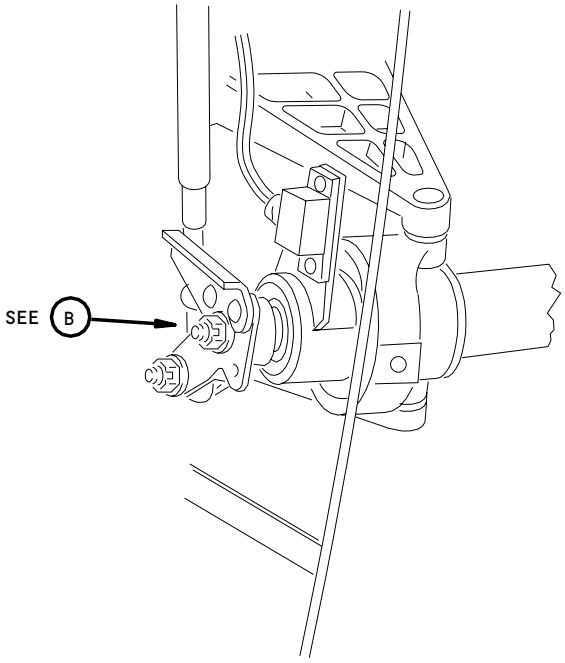
S 225-035-R00

(1) Examine the adjustment of the AHAD door
(a) Do a check of the contour (aerosmoothness check) and the function of the AHAD door.
1) Slowly open the thrust reverser C-duct and then close it (AMM 78-31-00/201).
2) Make sure the AHAD door opens and closes with C-ducts.
3) Do a check of the contours as shown in Figure 519 (aerosmoothness check).
4) If the contours are out of tolerance or the AHAD door does not open and close with the C-duct, adjust the AHAD door.

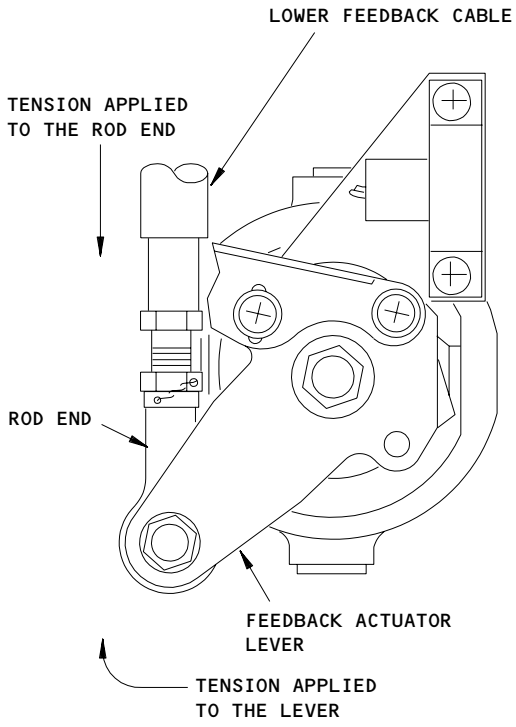
S 835-036-R00

(2) Adjust the AHAD door
(a) Stow the thrust reverser with power (AMM 78-31-00/201).
(b) Open the applicable thrust reverser C-duct (AMM 78-31-00/201).
(c) Remove the thrust reverser hinge access door (AMM 78-31-10/401).
(d) Adjust the AHAD door links.
1) Adjust the drive link to an approximate length of 4.8 inches (122 mm) between the eye bolt centers (Fig. 520).
2) Adjust links (1), (2) and (3) to the nominal dimension (between eyebolt centers) listed in table 501.
(e) Install the thrust reverser hinge access door (AMM 78-31-10/401).
(f) Do a check of the contour (aerosmoothness check) and function of the AHAD doors.
1) Slowly close the thrust reverser C-duct and then open it (AMM 78-31-00/201). Make sure that the AHAD door opens and closes with the C-duct.





A

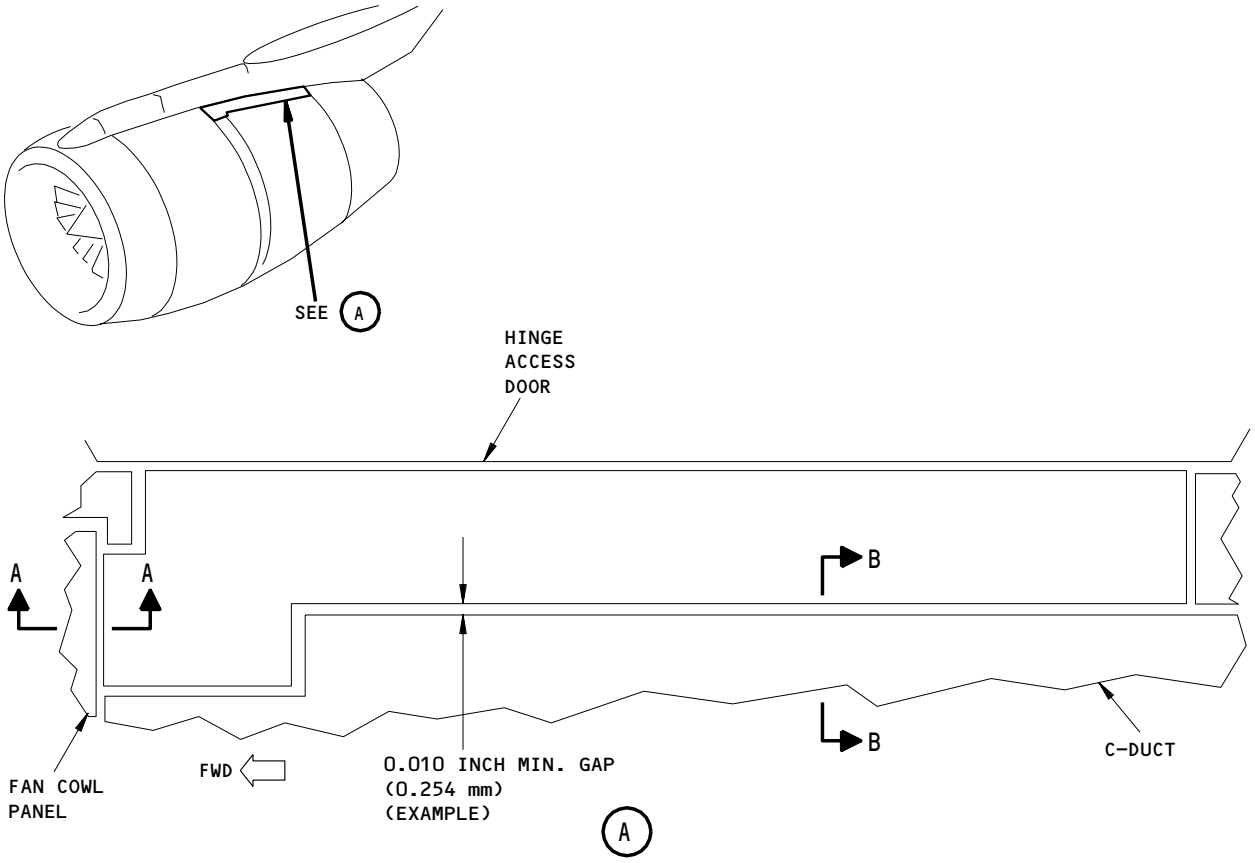


B

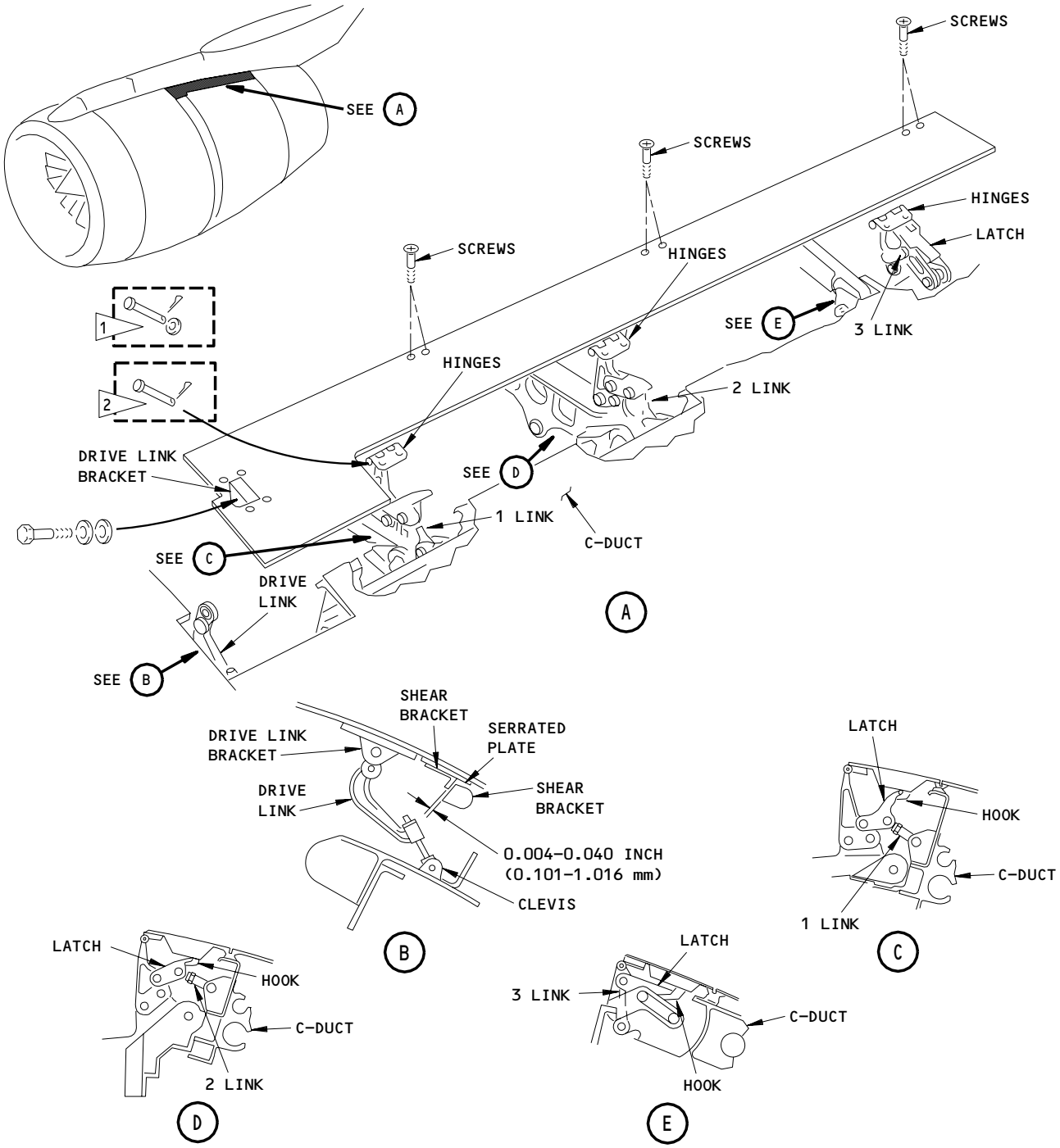
NOTE: LEFT SIDE INSTALLATION IS SHOWN, RIGHT SIDE INSTALLATION IS OPPOSITE.

55727

Thrust Reverser Feedback Cables
Figure 518



Hinge Access Door Aerosmoothness Contour Limits
Figure 519



NOTE: LEFT HINGE ACCESS DOOR IS SHOWN, RIGHT HINGE ACCESS DOOR IS OPPOSITE.

1 ENGINES PRE-RR-SB 78-8030

2 ENGINES POST-RR-SB 78-8030

55730

Hinge Access-Door Links and Shear-Brackets
Figure 520

2) Close and latch the thrust reverser C-duct (AMM 78-31-00/201).
3) Do a check of the contours as shown in Figure 519 (aerosmoothness check).
4) If the contours are out of tolerance or the automatic hinge access door (AHAD) does not close and open with the C-duct, adjust the AHAD door links until the function and contours are correct (Fig. 520).

NOTE: To shorten the door links (1), (2) and (3), turn clockwise. To lengthen the links, turn counterclockwise. Shorten the links (1) and (2) to lower the AHAD door to the C-duct, lengthen the links to raise the door. Shorten the link (3) to raise the AHAD door from the C-duct, lengthen the link to lower the door.

(g) Do a check of the shear bracket gap and adjust it (Fig. 520).
1) Open the thrust reverser C-ducts (AMM 78-31-00/201).
2) Put modelling clay on the shear bracket.
3) Close the thrust reverser C-ducts and then open it (AMM 78-31-00/201).
4) Examine the modelling clay thickness

- The thickness of the modelling clay should be between 0.004 and 0.040 inch (0.102 and 1.016 mm). If it is outside this limit, adjust the shear bracket.

(h) Remove the remaining modelling clay.
(i) Close and latch the thrust reverser C-ducts (AMM 78-31-00/201).

TABLE FOR AUTOMATIC HINGE ACCESS DOOR LINK DIMENSIONS TABLE 501	
ITEM	DIMENSION
Shear Bracket	Shear bracket should have 0.004 to 0.040in. (0.101 to 1.016 mm) gap between bearing surfaces. Adjustability: 0.036in. (0.914 mm) per serration
Drive Link	Drive link length = 4.787in. (121.59 mm) nominal. One full turn of link varies door contour at outboard edge 0.10in. (2.54 mm).
Link 1	Nominal link length = 1.804in. (45.822 mm) Minimum link length = 1.666in. (42.316 mm) Maximum link length = 1.906in. (48.412 mm) One half turn of link varies gap between latch and door hook 0.05in. (1.27 mm).
Link 2	Nominal link length = 1.828in. (46.431 mm) Minimum link length = 1.666in. (42.316 mm) Maximum link length = 1.906in. (48.412 mm) One half turn of link varies gap between latch and door hook 0.045in. (1.143 mm)
Link 3	Nominal link length = 1.828in. (46.431 mm) Minimum link length = 1.666in. (42.316 mm) Maximum link length = 1.906in. (48.412 mm) One half turn of link varies gap between latch and door hook 0.03in. (0.76 mm).

TASK 78-30-00-715-037-R00

10. Do an Operational Test of the Thrust Reverser System

A. General

(1) This test can be done with and without engine operation as given below:

(a) With engine operation, refer to the Test 12 of the thrust reverser as shown in the Power Plant Reference Table (AMM 71-00-00/501).

(b) With the engine stable and stopped, refer to this procedure as given below.

B. References
(1) AMM 29-11-00/201, Hydraulic Power
(2) AMM 24-22-00/201, Electrical Power

C. Access
(1) Location Zones
415/425 Thrust Reverser, Left
416/426 Thrust Reverser, Right

D. Do the Operational Test of the Thrust Reverser

S 865-038-R00

CAUTION: DO NOT USE THIS PROCEDURE WITH THE THRUST REVERSER OPEN. IF YOU DO THIS PROCEDURE WITH THE THRUST REVERSERS OPEN, DAMAGE TO THE THRUST REVERSERS CAN OCCUR.

(1) Make sure the thrust reversers are closed.

S 045-039-R00
(2) Do these steps to do the fuel system deactivation:
(a) For the left engine, open this circuit breaker on the P6 power distribution panel and attach a DO-NOT-CLOSE tag:
1) 6C1, FUEL COND CONT L
(b) For the right engine, open this circuit breaker on the P6 power distribution panel and attach a DO-NOT-CLOSE tag:
1) 6C2, FUEL COND CONT R

S 865-040-R00
(3) Make sure the forward thrust levers are at the forward idle position, and that the EICAS message, REV, is off.

S 865-041-R00
(4) Make sure the thrust reverser is clear of all unwanted objects.

S 865-042-R00

CAUTION: THE FORWARD AND AFT LATCH ACCESS DOORS MUST BE CLOSED BEFORE YOU OPERATE THE THRUST REVERSER. IF THE FORWARD AND AFT ACCESS DOORS ARE NOT CLOSED, DAMAGE TO THE THRUST REVERSER CAN OCCUR.

(5) Make sure the forward and the aft latch access doors are closed (Fig. 521).

S 215-043-R00

(6) Examine the lower actuator indicator position.
  (a) Make sure the thrust reverser lower actuator indicators are not above the fairing surface.

S 215-044-R00

(7) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS
OR AIRPLANES WITH RR SB 78-9613;
Examine the sync lock indicator position.
  (a) Make sure the sync-lock indicator is not above the fairing surface.

S 865-046-R00

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

S 865-047-R00

WARNING: MAKE SURE THE REVERSER POSITION AGREES WITH THE POSITION OF THE REVERSE THRUST LEVER. IF THE REVERSER POSITION DOES NOT AGREE WITH THE POSITION OF THE REVERSE THRUST LEVER, THE THRUST REVERSER WILL EXTEND WHEN YOU APPLY HYDRAULIC PRESSURE. THIS CAN CAUSE INJURIES TO PERSONS.

(9) Supply hydraulic pressure (AMM 29-11-00/201).

S 715-048-R00

WARNING: THE TRANSLATING COWL EXTENDS REARWARD IN APPROXIMATELY 2 SECONDS. MAKE SURE ALL PERSONS ARE CLEAR OF THE THRUST REVERSER OR INJURY TO PERSONS CAN OCCUR.

CAUTION: MAKE SURE THE THRUST REVERSER IS CLEAR OF EQUIPMENT, TOOLS, AND LOOSE OBJECTS. IF THESE EQUIPMENT, TOOLS, AND LOOSE OBJECTS ARE NOT REMOVED, THE THRUST REVERSER WILL BE DAMAGED WHEN THE THRUST REVERSER EXTENDS.

(10) Make sure persons and equipment are clear of the thrust reversers.

S 715-049-R00

(11) Do a check of the thrust reverser system during thrust reverser extension as follows:
  (a) Move the reverse thrust lever up and aft to the interlock position.
    1) While the thrust reverser is in rearward movement (approximately 2 seconds), make sure the EICAS message, REV, is amber.
  (b) When the thrust reverser is fully extended, make sure the EICAS message, REV, is green.
  (c) Examine the lower actuator indicator position.
    1) Make sure the thrust reverser lower actuator indicators are above the surface of the fairing (Fig. 521).

S 215-050-R00

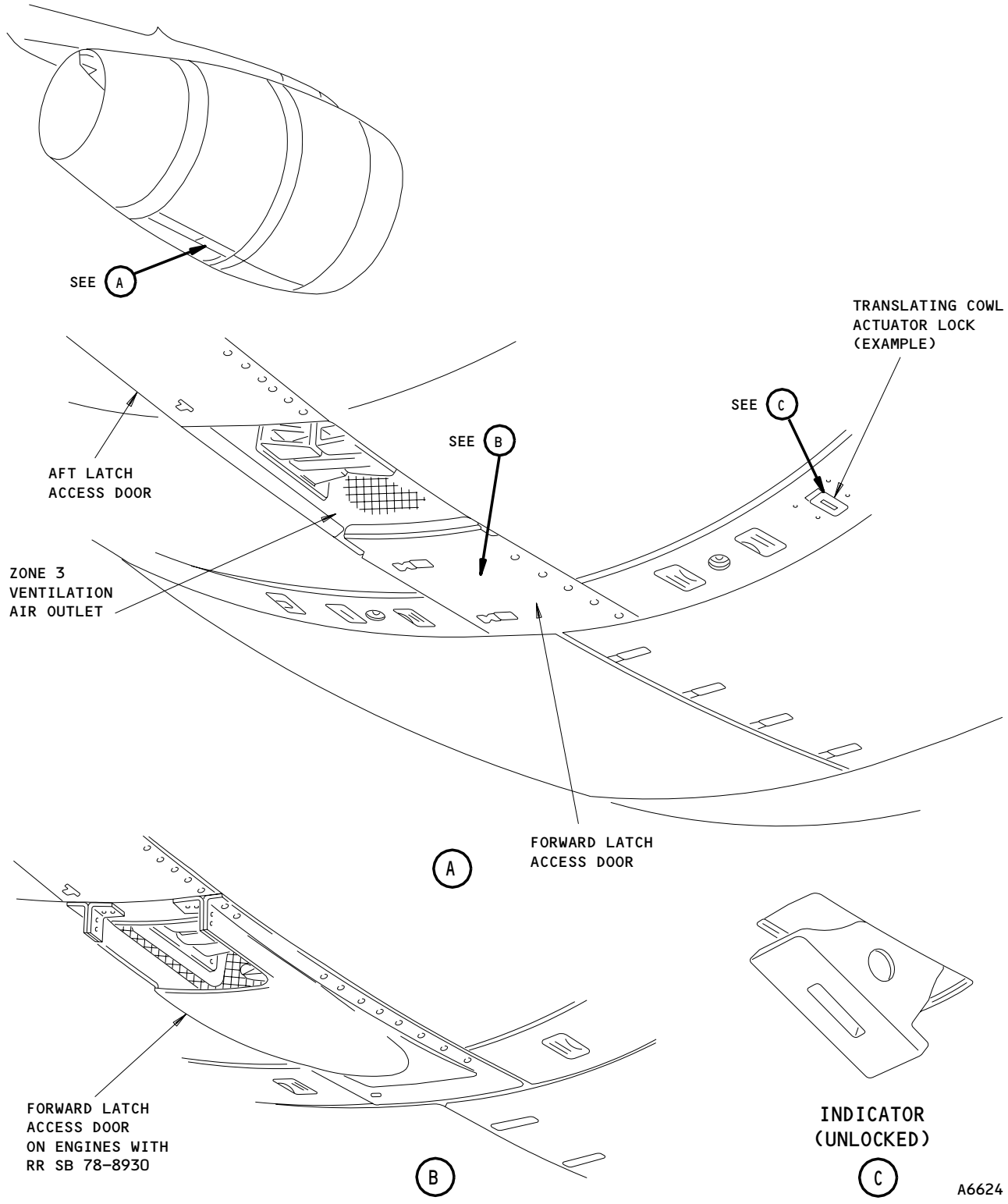
(12) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR AIRPLANES WITH RR SB 78-9613;
Examine the sync lock indicator position.
  (a) Make sure the sync-lock indicator is above the surface of the fairing (Fig. 522)
  (b) Move the reverse thrust lever to the maximum reverse thrust position to make sure the baulk mechanism is retracted.

S 715-052-R00

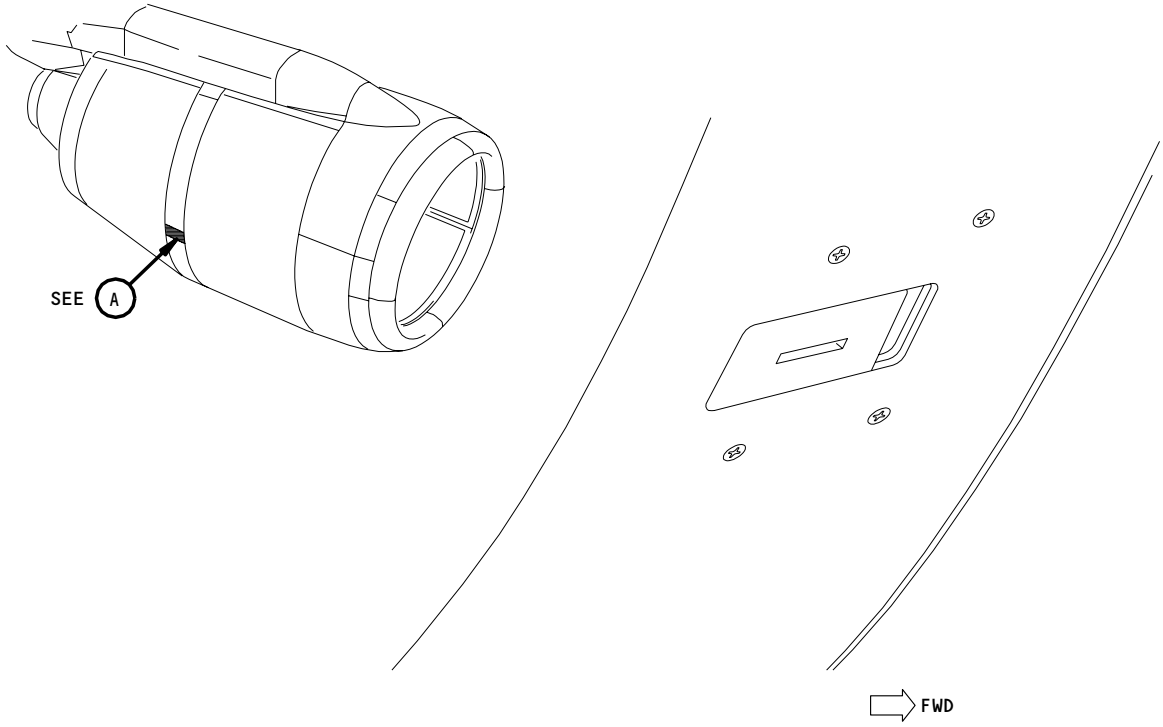
WARNING: THE TRANSLATING COWL MOVES FORWARD QUICKLY. MAKE SURE ALL PERSONS ARE CLEAR OF THE THRUST REVERSER, OR INJURY TO PERSONS CAN OCCUR.

CAUTION: MAKE SURE THE THRUST REVERSER IS CLEAR OF EQUIPMENT, TOOLS, AND LOOSE OBJECTS. IF THESE EQUIPMENT, TOOLS, AND LOOSE OBJECTS ARE NOT REMOVED, THE THRUST REVERSER WILL BE DAMAGED WHEN THE THRUST REVERSER EXTENDS.

(13) Do a check of the thrust reverser system during thrust reverser retraction as follows:
  (a) Move the reverse thrust lever forward and down to the idle position.
    1) While the thrust reverser is in forward movement (approximately 2 seconds), make sure the EICAS message, REV, changes from green to amber.
  (b) When the thrust reverser is fully retracted, make sure the EICAS message, REV, is off.

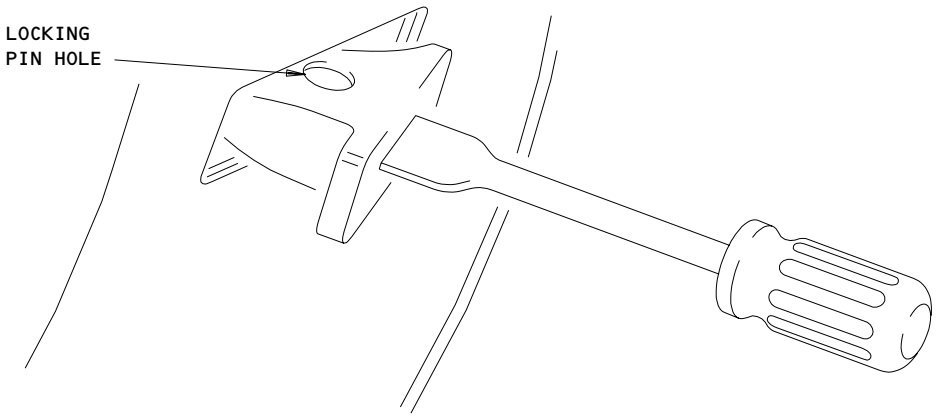


Thrust Reverser Lock Indicator and Latch Access Panel Location
Figure 521



SYNC–LOCK MANUAL UNLOCK INDICATOR
(LOCKED)

A



SYNC–LOCK MANUAL UNLOCK INDICATOR
(NOT LOCKED)

A

55616

Thrust Reverser Sync–Lock Manual Unlock Indicator
Figure 522

EFFECTIVITY
AIRPLANES WITH THRUST REVERSER
SYNC–LOCKS OR RR SB 78–9613

L95574

(c) Move the forward thrust lever to the maximum forward thrust position.
1) Make sure the movement of the forward thrust levers is free through its full range of movement.
(d) Put the lever in the idle position.

S 215-053-R00
(14) Examine the lower actuator indicator position.
(a) Make sure the thrust reverser lower actuator indicators are not above the fairing surface (Fig. 521).

S 215-054-R00
(15) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR AIRPLANES WITH RR SB 78-9613;
Examine the sync lock indicator position.
(a) Make sure the sync-lock indicator is not above the fairing surface (Fig. 522).

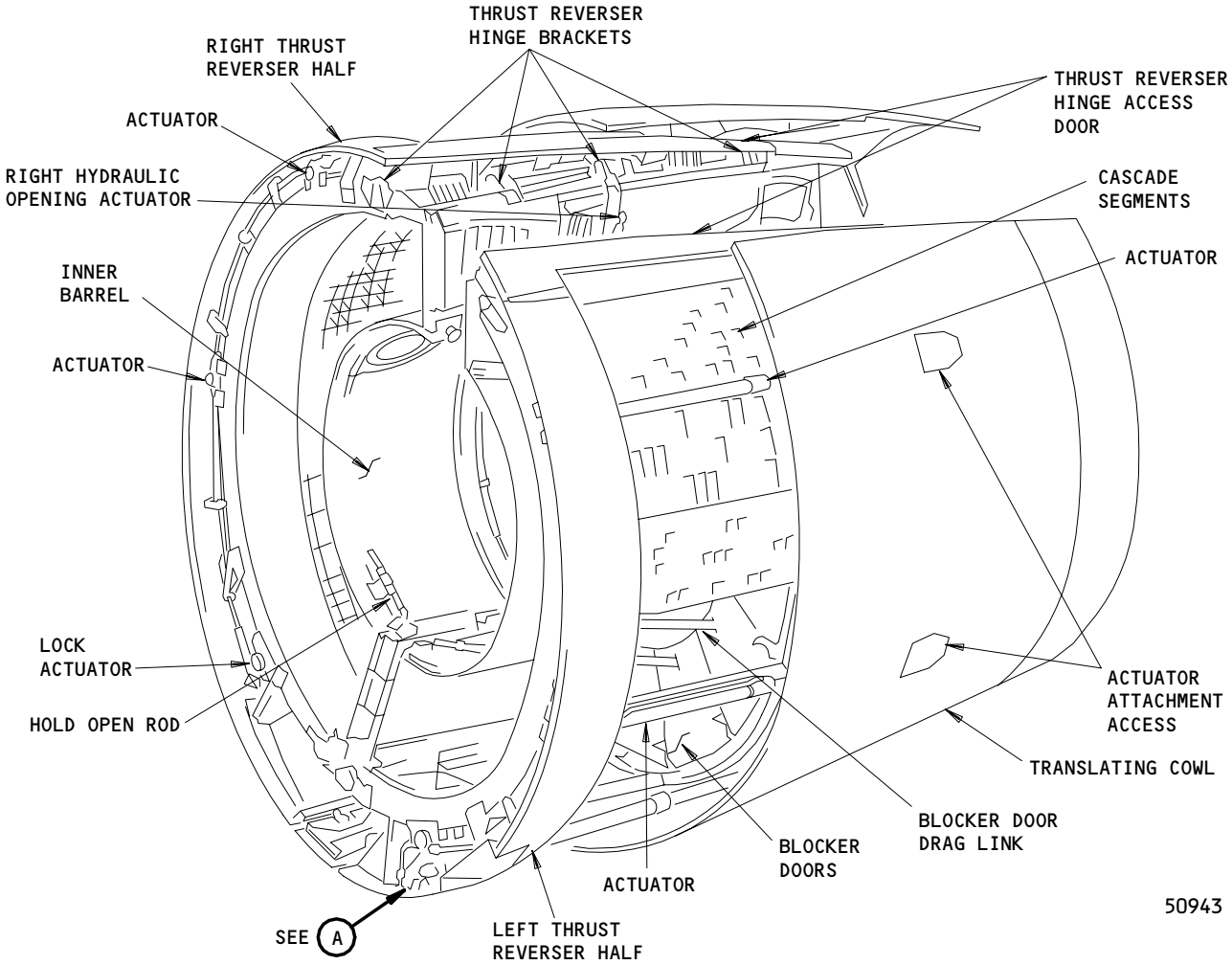
S 865-056-R00
(16) Remove the hydraulic power (AMM 29-11-00/201).

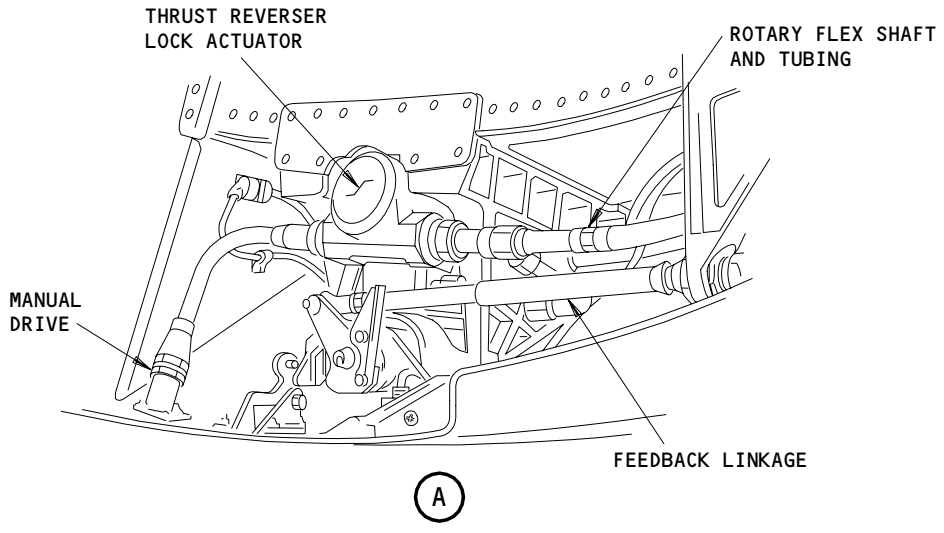
S 865-057-R00
(17) Remove the electrical power (AMM 24-22-00/201).

S 445-058-R00
(18) Do these steps to do the fuel system activation:
(a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 power distribution panel:
1) 6C1, FUEL COND CONT L
(b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P6 power distribution panel:
1) 6C2, FUEL COND CONT R

THRUST REVERSER SYSTEM - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. The fan thrust reverser system provides the means of diverting the fan airflow in a forward direction, resulting in reversal of the major thrust component. The reverser is mounted aft of the low pressure (LP) compressor (fan) case and is an integral part of the fan stream duct and nozzle.
   B. The fan thrust reverser is an annular outlet type with deflector boxes containing fixed cascade segments, through which the gas stream is diverted at the correct outward angle, depending on the installation, when the system is operating in the reverse thrust mode.
   C. In forward thrust configuration the deflector boxes are sandwiched between inner and outer sleeves of a cowl. In reverse thrust configuration the cowl translates rearward, exposing the cascades. Blocker doors, attached to the inner sleeve of the translating cowl, move with the cowl and fold inward, blocking the fan duct downstream and turning the fan flow outward into the cascade segments to produce reverse thrust.
   D. The thrust reverser is opened and closed by six hydraulic actuators and basic power for operation of the system is hydraulic fluid supplied from the aircraft system. Control is effected through a thrust reverser isolation valve, a directional control valve and a feedback system. These units are described in detail in (AMM 78-34-00/001).
   E. System selection and subsequent control is effected through a reverse thrust lever mounted on the engine forward thrust lever in the flight compartment. Selection can be made only when the forward thrust lever is in the idle position.
   F. The system is energized from an air/ground relay in the aircraft landing gear system (AMM 32-00-00/001) through a selector switch integral with the reverse thrust lever. This arrangement ensures that reverse thrust can be achieved only when the airplane is on the ground.
   G. An auto restow circuit maintains, an electrical supply to energize the thrust reverser isolation valve, and hold the valve open, whenever the translating cowl is unstowed. The system is described in detail in (AMM 78-34-00/001).

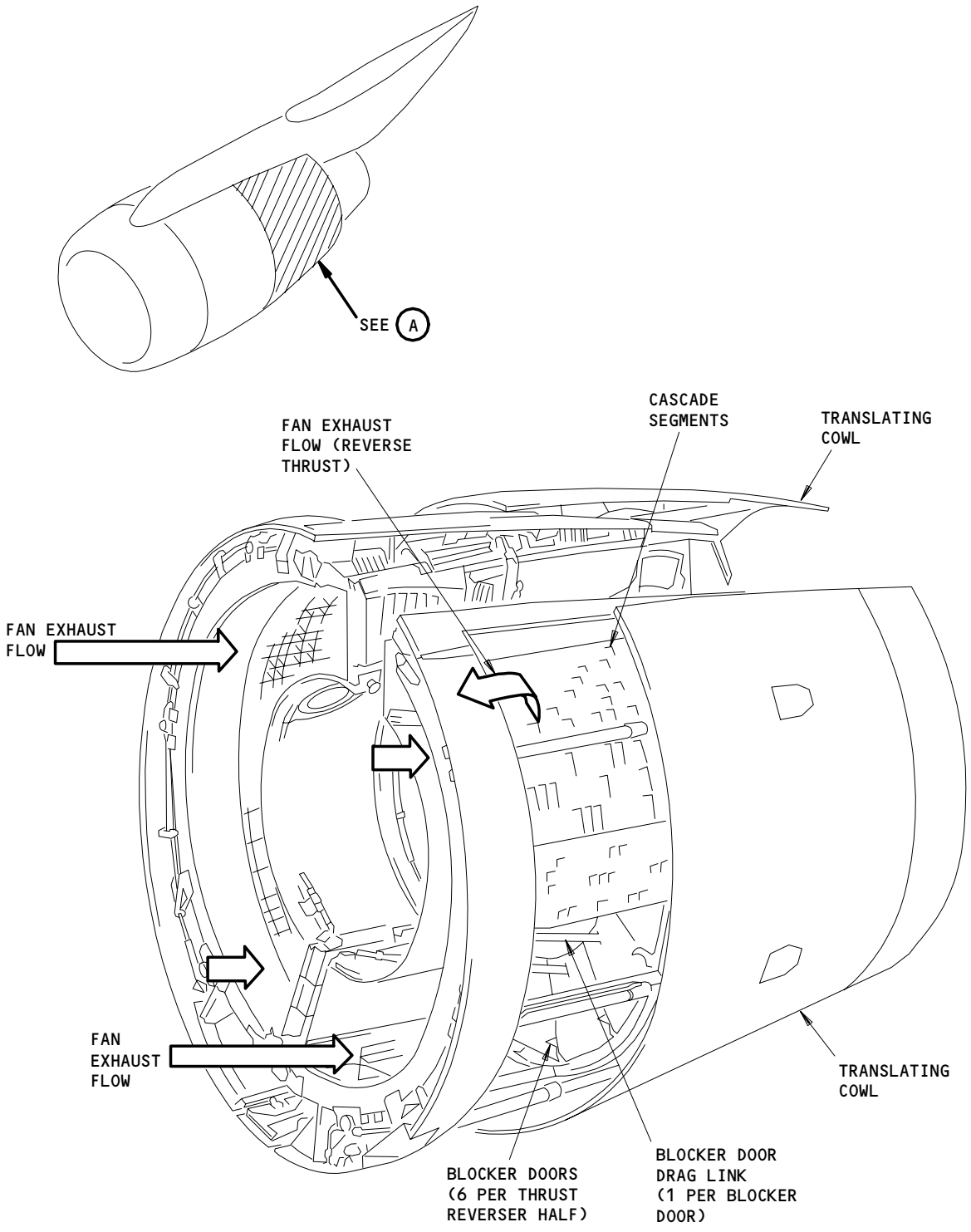




Thrust Reverser System Components
Figure 1

H. AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
The sync-lock system is described as follows:
(1) The sync-lock is attached to the lower side of the center hydraulic actuator on each right thrust reverser half.
(2) The sync-lock prevents the translating sleeves from accidental extension because of the failure of or accidental electrical signals to the hydraulic system. This is done by the use of locking elements that prevent the synchronizing flexible drive shafts being turned. The locking elements are almost the same as those used in the lower locking actuators.
(3) The sync-lock is electrically and hydraulically controlled and has a manual unlock feature. The sync-lock is usually in the locked position.
(4) The Rolls-Royce nomenclature for the sync-lock is the synchronization shaft lock.

2. Component Details
A. Thrust Reverser Cascade Segments
(1) Cascade segments direct the fan exhaust in a forward direction and at the correct outward angle, depending on circumferential position and installation. The segments are contained in rectangular deflector boxes and, during reverse thrust operation, are uncovered by the rearward movement of the translating cowl.
(2) There are 16 deflector boxes, eight in each C-duct, mounted circumferentially around the reverser case. Box positions are numbered clockwise when viewed from the rear of the engine, number one being top right position.
B. Fan C-Duct and Thrust Reverser
(1) The reverser case comprises two C shaped structures (C-ducts) attached to the aircraft strut by four hinge brackets mounted along the upper edge of each C-duct. The hinge brackets locate in three hinge beams and a fixed location bracket on the strut. Each C-duct comprises a fixed structure surrounded by an annular cowl that forms the thrust reverser translating cowl.
(2) The thrust reversers are attached with hinges to give access to the core engine. When the thrust reversers are closed, the two halves are held together at the lower edge with a toggle hook and with latch assemblies. The power necessary to open the thrust reversers is supplied by a hydraulic opening actuator which operates through a hydraulic hand pump.
(3) The function of the forward and rear latch access doors is to make the air flow over the latches smooth. The latch access doors also allow for access to the thrust reverser latches. Also, the rear latch access door operates as a pressure relief door for the zone 3 air. This function would be used if a duct breaks open or if air leaks occur.
(4) The fixed structure is a C shaped section with front and rear curved members joined by horizontal beams. The upper and lower beams incorporate trackways that locate slider rails attached to the translating cowl to provide smooth translation. The intermediate beams are channel sectioned to locate the hydraulic actuators of the actuating system.



THRUST REVERSER DEPLOYED

(A)

50943

Thrust Reverser Operation
Figure 2

(5) The front ring of the reverser case incorporates a honeycombed box sectioned (torque box) assembly, the leading edge of which incorporates a V shaped blade ring that locates in a flanged locating ring on the rear face of the LP compressor case when the C-duct closes. Seals around the locating ring prevent leakage of fan air.

(6) The outer ring of the torque box provides a mounting face for the reverser system hydraulic tubes and feedback mechanism. Mounting brackets on the torque box support the hydraulic actuator mounting gimbals, while a flange around the rear edge provides the front support for deflector box assemblies located between the front and rear rings and the horizontal beams. Rear support for the deflector boxes is provided by the reverser case rear ring.

(7) The inner barrel of each C-duct forms part of the fan stream duct inner wall and provides the combustion and turbine section gas generator fairing. The front ring of the inner barrel seals on a fireproof seal secured to a combustion fairing support ring around the core engine.

C. Thrust Reverser Translating Cowl

(1) The translating cowl is an annular duct extending around the reverser case. The cowl comprises outer and inner sleeves. In forward thrust configuration the outer sleeve forms the aerodynamic line of the propulsion system and the inner sleeve forms the fan duct outer wall. The inner sleeve joins the tapered outer sleeve at the nozzle area to provide a single skin exhaust nozzle. The translating cowl is in two halves, encircling the left and right sections respectively of the reverser case and forming part of the C-duct. A seal around the front of the inner sleeve prevents fan air leakage.

(2) In reverse thrust configuration the translating cowl slides rearward along sliders attached to the upper and lower edges of the inner and outer sleeves. The sliders locate in trackways on the reverser case.

D. Thrust Reverser Blocker Doors

(1) Twelve blocker doors block the fan stream duct downstream of the cascade segments during reverse thrust operation and directs the air flow into the cascade segments.

(2) The blocker doors are positioned circumferentially around the inside of the translating cowl and are hinged to the front of the sleeve. During forward thrust operation the doors are flush with the inside surface of the translating cowl.

E. Thrust Reverser Blocker Door Drag Links
(1) Each blocker door has a drag link. One end of the drag link is connected to the door and the other end is connected to the fan C-duct cowl of the thrust reverser.
(2) As the translating cowl moves rearward, the fixed end of the drag link on the fan duct cowl pulls the blocker door into the fan exhaust.

F. Fan C-Duct Hydraulic Opening Actuators
(1) The C-ducts are hinged to provide easy access to the core engine. Power for opening each C-duct is provided by a hydraulic opening actuator, operated through a hydraulic hand pump.
(2) The actuators are located between the top of the C-duct and a bracket in the airplane strut.

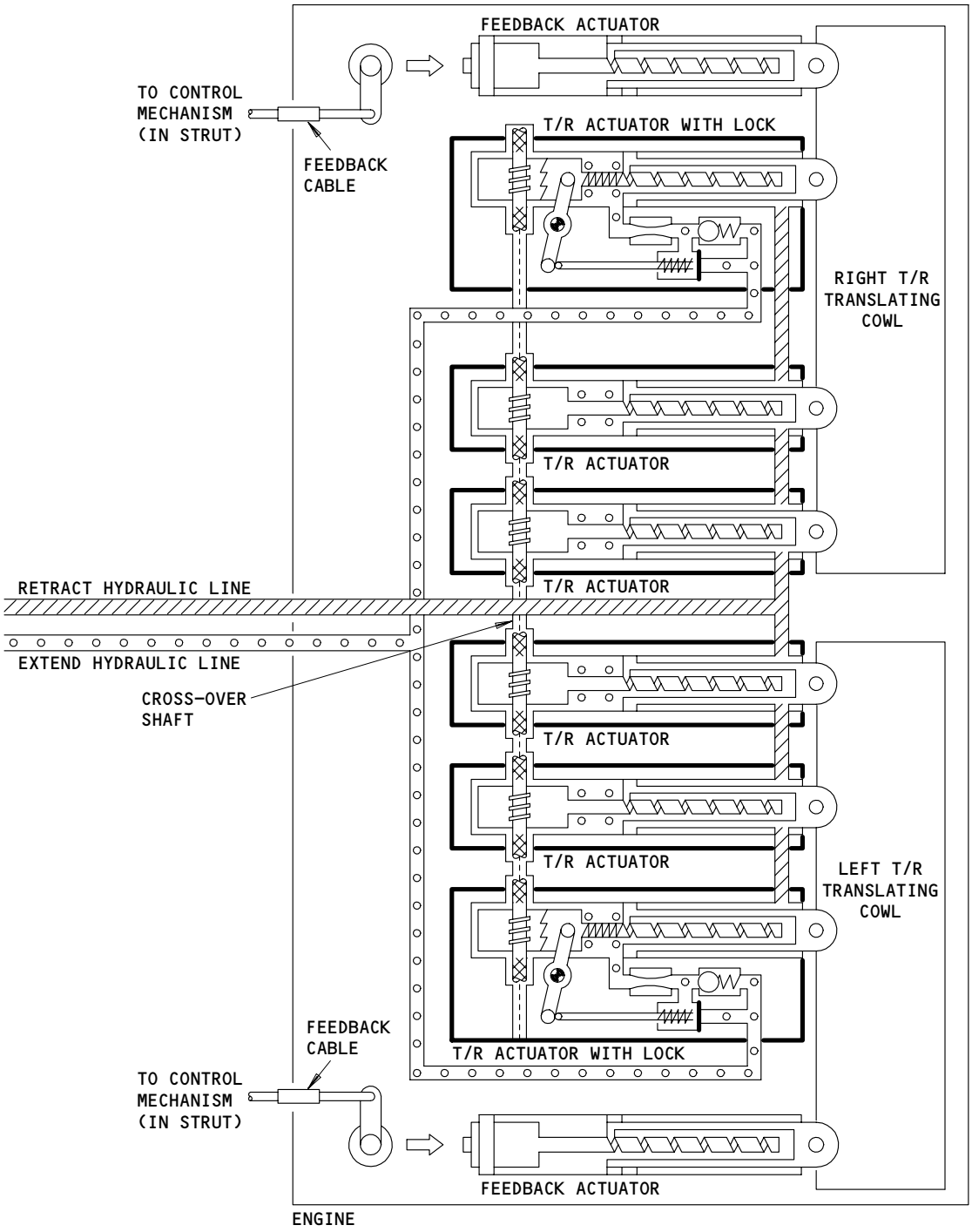
G. Fan C-Duct Hold Open Rods (POST-RR-SB 78-D268)
(1) The C-ducts are held in the open position by two hold open rods located along the lower edge of the C-duct. The forward hold open rod for the left hand C-duct is stowed on a mounting bracket on the forward latch access door. When the C-duct is opened the forward hold open rod is removed from its stowage location and attached to the inner fixed structure.

H. Thrust Reverser Hydraulic Actuators and Rotary Flex Shafts and Tubing
(1) Hydraulic Actuators (Fig. 3)
(a) Six hydraulic actuators, spaced at equal intervals around the thrust reverser move the two translating cowls on each thrust reverser to the reverse thrust position.
(b) The four non-locking actuators are identical. The non-locking actuators are installed at the top and center positions on the thrust reverser half.
(c) Two locking actuators provide positive locking when the thrust reverser is retracted. There are two non-locking actuators and one locking actuator on each thrust reverser half. The locking actuator is at the low position on the thrust reverser half.
(d) The actuators are similar in cylinder construction. The end housings of the lock actuator has the lock mechanisms. All actuators are hydraulically connected and mechanically connected with rotary flex shafts to provide synchronized operation of the translating cowl.
(e) The actuator front mounting is a gimbal ring attached to the end housing and secured to a bracket on the reverse case torque box. The gimbal ring gives flexibility in actuator alignment. The rear connection is an actuator rod end with a spherical bearing which is connected to a mounting bracket on the aft frame of the translating cowl.
(f) Each actuator has a piston, a nut with a acme screw thread, and a piston rod with an acme threaded screw shaft. A worm gear and shaft assembly transmits rotary movement of the piston rod to turn the synchronizing flexible drive shafts.

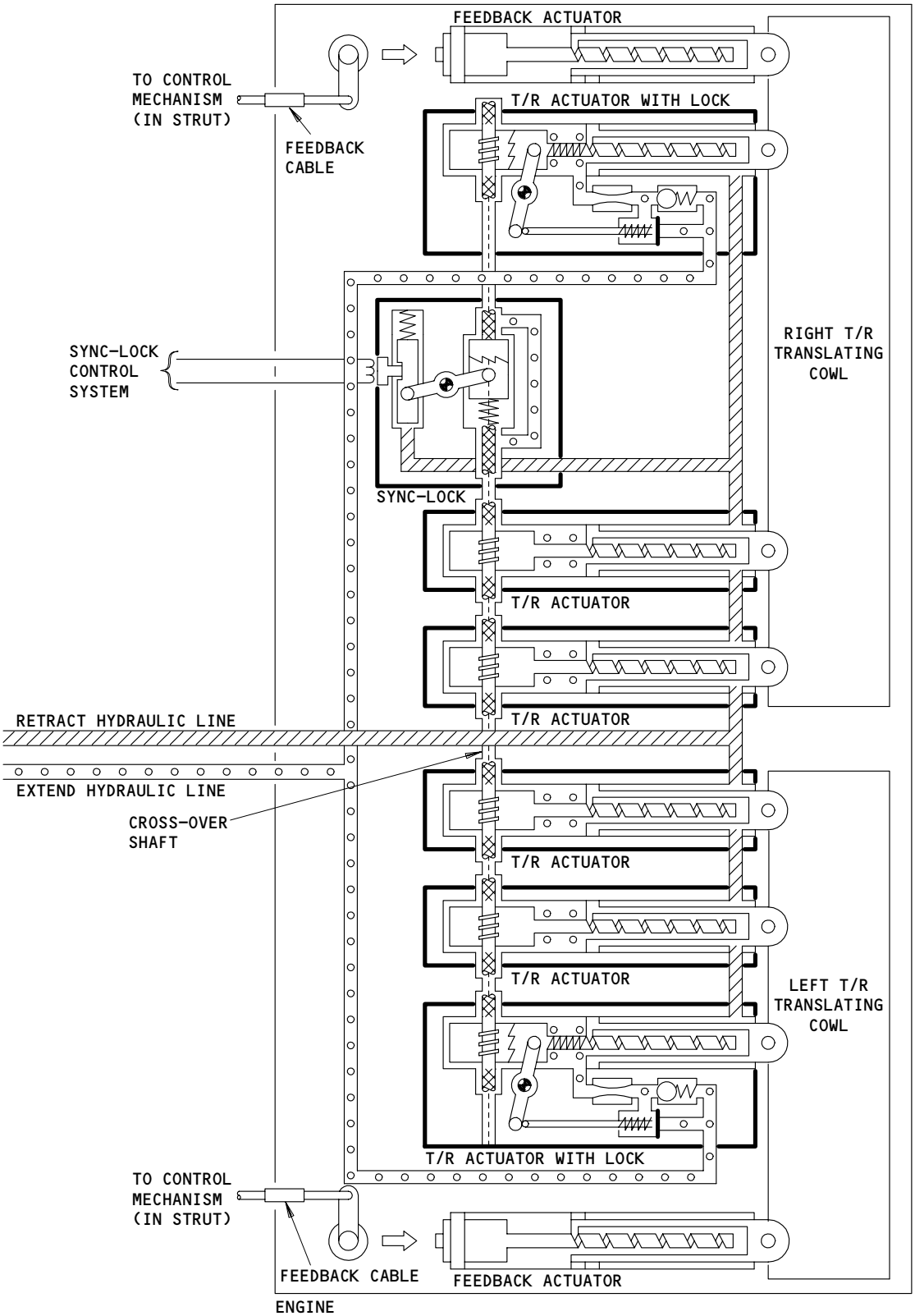
(g) The end housing of the non-locking actuators houses a piston stop to limit the retract stroke of the piston.
(h) The end housing of the lock actuator is a double assembly with a lock valve housing. The piston stop of the locking actuator is internally splined to locate a locking sleeve. This prevents rotation but permits linear movement. Serrations on the end of the sleeve mate with similar serrations on the actuator lock in the locked position.

(2) Rotary Flex Shafts and Hydraulic Tubing
(a) Hydraulic fluid is supplied to the thrust reverser hydraulic actuators through a series of rigid and flexible tubes.
(b) The flexible hoses connect the strut extend hydraulic lines to the top non-locking hydraulic actuators for each thrust reverser half.
(c) The rigid hydraulic tubes supply the hydraulic fluid at 3000 psi to the hydraulic actuators.
(d) There are extend and retract rigid tubes that connect all the hydraulic actuators.
(e) The extend hydraulic tubes contain the rotary flexible drive shafts (flex shafts) which synchronizes operation of the all the hydraulic actuators.
(f) There is a flexible drive shaft (cross-over shaft) that connects the two thrust reverser halves through the extend hydraulic line.

(3) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Sync-lock (Synchronization Shaft Lock)
(Fig. 4 and 5)
(a) The Rolls Royce nomenclature used for the sync-lock, is the Synchronization Shaft Lock.
(b) The sync-lock has several internal components. These are the piston, shaft, yoke, unlock indicator and linkage, the static and rotating discs, and solenoid pin.
(c) The sync-lock is similar to the lock mechanism of the locking actuators. The sync-lock prevents the rotation of the rotary flex shafts by engagement of a serrated static disc with a serrated disc that is connected to the rotary flex shafts.
(d) The teeth on the serrated discs ratchet when the rotary flex shaft turn in the retract direction when the thrust reverser is retracted.
(e) If the thrust reverser is not commanded to extend, the teeth on the serrated discs cannot ratchet and will remain locked together. The static disc is spring-loaded to the engaged position.
(f) The static disc is moved linearly to disengage the discs and unlock the sync-lock. The linear movement of the static disc is caused by the rotation of the shaft, or the linear movement of the piston. The shaft is attached the yoke. As the shaft and yoke turn together, the yoke disengages the static disc.



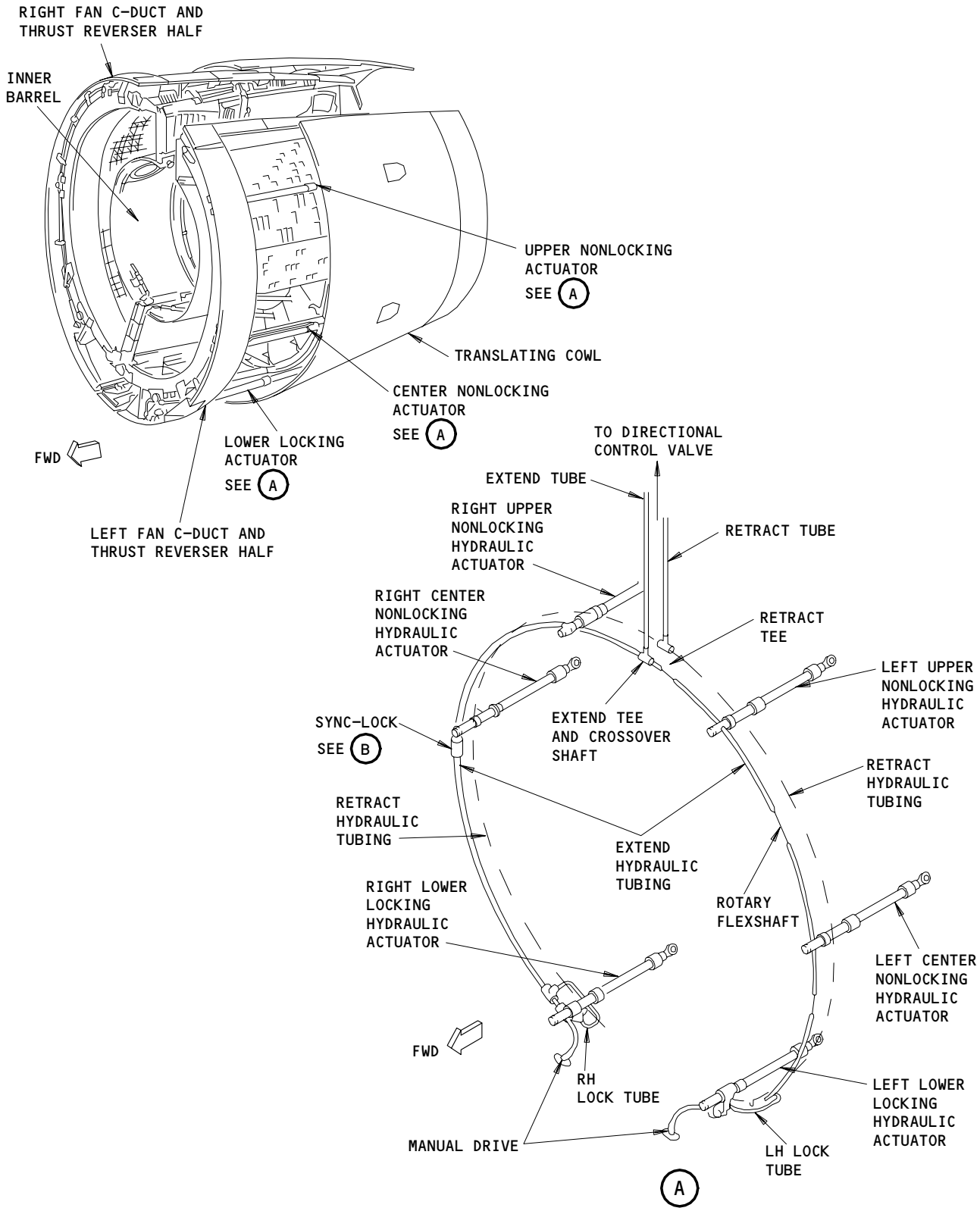
Thrust Reverser Hydraulic Actuator Schematic
Figure 3 (Sheet 1)



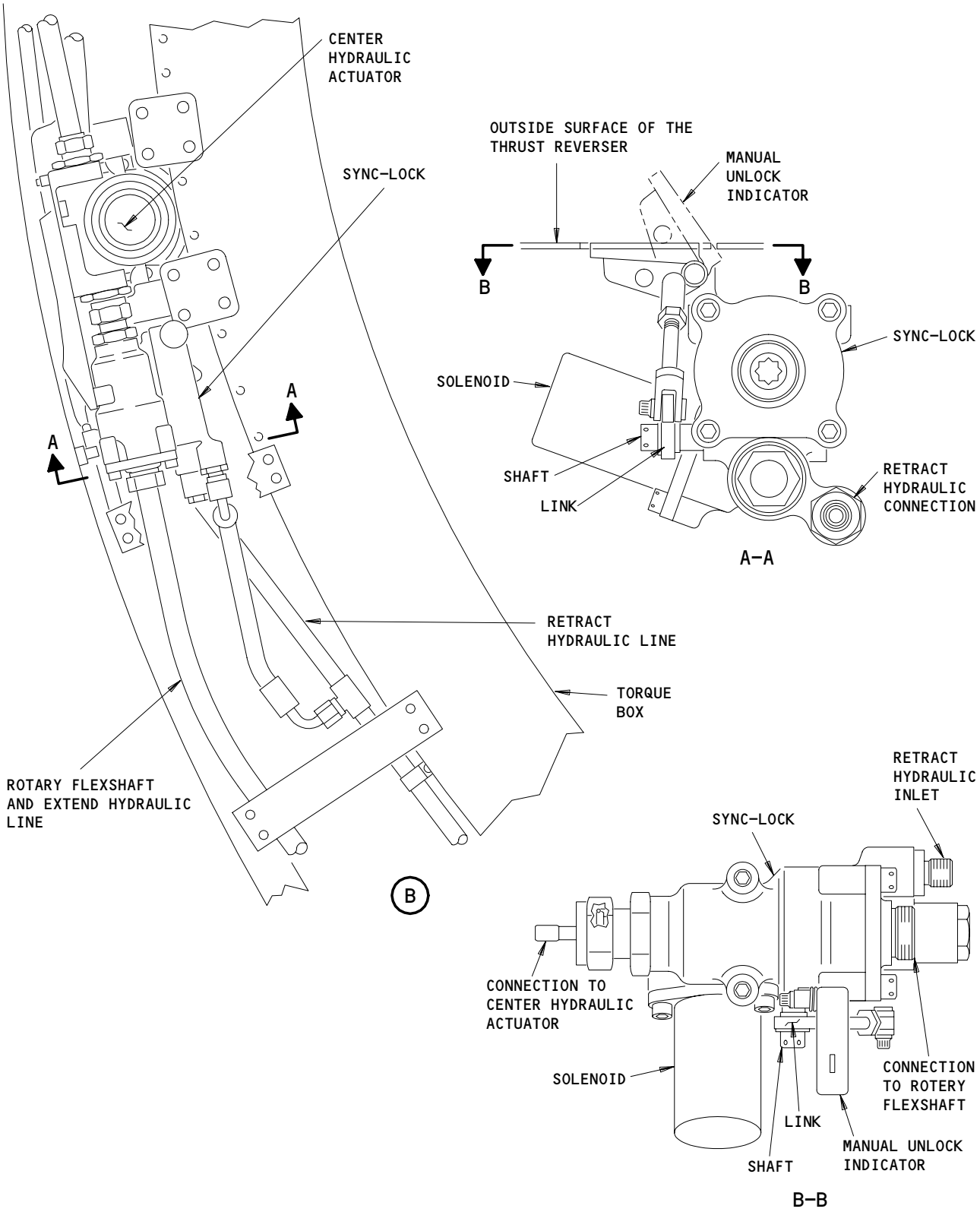
Thrust Reverser Hydraulic Actuator Schematic
Figure 3 (Sheet 2)

EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

A68133

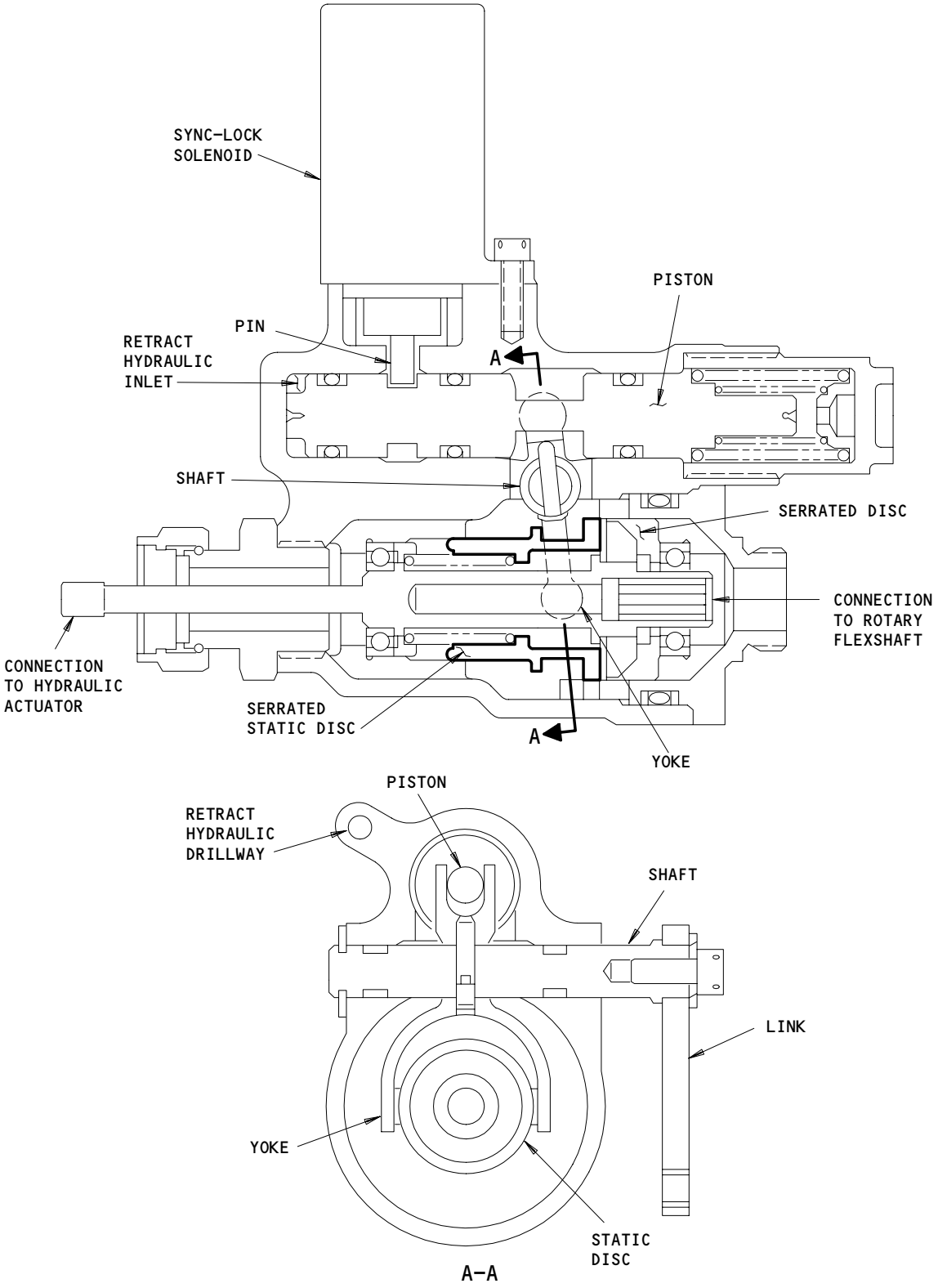


Thrust Reverser Sync-Lock
Figure 4 (Sheet 1)



Thrust Reverser Sync-Lock
Figure 4 (Sheet 2)

A68776



Thrust Reverser Sync-Lock Internal Parts
Figure 5

(g) The unlock shaft and yoke turn on the same axis. The yoke fits into a groove on the unlock piston, but is not attached to the piston. There is sufficient clearance in the groove, between the yoke and the piston to permit the yoke to turn with the piston locked by the solenoid. This clearance permits the sync-lock to be manually unlocked for ground maintenance.

(h) The unlock indicator is on the right thrust reverser half, near the center actuator. A screw driver is used to manually pull out the unlock indicator. This will move a linkage and cause the shaft to turn. The unlock shaft will cause the yoke to turn and disengage the static disc. The unlock indicator will extend from the surface of the thrust reverser.

(i) When hydraulic pressure is supplied, the linear movement of the piston in the sync-lock will turn the yoke and disengage the static disc. The rotation of the yoke will turn the shaft, and move the linkage for the unlock indicator. The unlock indicator will extend from the surface of the thrust reverser.

(j) The unlock indicator must be held in the unlock position with a pin and streamer. The pin is installed through a hole in the indicator and prevents the indicator from being pushed in.

(k) The piston is spring-loaded to the locked position. The piston is held in the locked position by a solenoid operated pin which engages a groove in the piston.

(l) The solenoid operated pin is spring loaded to the engaged position. When the solenoid is energized, the pin is moved out of the groove. This permits the unlock piston to move when hydraulic pressure is supplied from the stow hydraulic tube.

(m) The Thrust Reverser Control System - Description and Operation will describe the thrust reverser control system and the sync-lock control system (Ref 78-34-00/001).

3. Operation

A. Functional Description

(1) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS; Extension

(a) Reverse thrust is selected by moving the forward thrust lever to idle and moving the reverse thrust lever rearward to select reverse idle thrust. At first, movement of the reverse thrust lever further than reverse idle thrust is restricted by a baulk mechanism until the reverser translating cowl reaches the mid-travel position. Then, the baulk is removed which permits power to be increased. Further rearward movement of the reverse thrust lever increases the reverse thrust from idle thrust.

(b) Operation of the reverse thrust lever closes the control switch for the isolation valve. The control switch is in the reverse thrust lever.
(c) Operation of the reverse thrust lever closes contacts in the control switch. This completes a circuit through the fire switch, and the air/ground relay to energize the solenoid valve on the isolation valve. The solenoid valve opens the isolation valve to supply hydraulic pressure to the thrust reverser.
(d) The control system changes the position of the disagree relay and the hydraulic isol valve relay in the isolation valve fault indication circuit.
(e) The directional control valve is mechanically positioned by the first movement of the reverse thrust lever to direct the hydraulic fluid, at approximately 3000 psi, through the extend and retract hydraulic tubes to the two sides of the hydraulic actuator pistons.
(f) Hydraulic fluid is prevented from entering the extend cavity of the two lock actuators by a rotary pressure seal, until the spring load of the lock valve is overcome by hydraulic pressure. Movement of the lock valve opens a passage to the extend cavity and operates a lock lever to disengage the locking sleeve.
(g) The hydraulic pressure is equal on each side of the hydraulic actuator pistons. Because the area on the extend side of the piston is greater than the retract side, hydraulic pressure moves the actuator piston in the extend direction.
(h) As the actuator piston extends, the acme nut in the piston head rotates the acme screw shaft and worm gear to turn the rotary flexible shafts for synchronized operation. The actuator piston pushes the translating cowl rearward.
(i) As the translating cowl is moved rearward, the cascades that direct the fan exhaust can be seen.
(j) The blocker doors are pulled inward by the blocker door drag links to block the fan duct downstream and direct the gas flow through the cascades.
(k) The feedback actuators, attached to the translating cowl, extend as the cowl moves rearward. The spiral shaft turns the feedback arm. This movement, through the feedback cable, releases the baulk mechanism in the strut engine control linkage.
(l) As the translating cowl moves from the retracted position, the two auto-restow proximity sensors sense a target far condition. This causes a logic card in the proximity sensor electronic unit (PSEU) to open the stow circuit and de-energize the stow relay. The stow relay will supply the electrical power to the solenoid valve on the isolation valve until the thrust reverser is fully retracted and locked.

(2) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Retraction

(a) Forward thrust is selected by moving the reverse thrust lever forward and down. The baulk mechanism in the strut engine control will hold the forward thrust lever at idle until the thrust reverser has retracted approximately 62 per cent of its total travel. Forward thrust can then be increased.

(b) Forward movement of the reverse thrust lever opens the control switch contacts. The solenoid valve in the isolation valve remains energized through the stow relay. The isolation valve continues to supply hydraulic fluid at 3000 psi to the thrust reverser.

(c) The movement of the reverse thrust lever positions the directional control valve to the retract position. The extend hydraulic tubes are now connected to the hydraulic return line. The directional control valve continues to supply hydraulic fluid to the retract side of the hydraulic actuator pistons.

(d) Hydraulic pressure on the retract side of the actuator pistons causes the pistons to retract. The hydraulic fluid in the extend side of the actuator pistons and the extend hydraulic tubes goes to the hydraulic return line.

(e) As the actuator pistons retract, the acme nut in the piston head rotates the acme screw shaft and worm gear to turn the rotary flexible shafts for synchronized operation. The actuator piston pushes the translating cowl forward.

(f) The feedback actuators, attached to the translating cowl, retract as the cowl moves forward. The spiral shaft turns the feedback arm. This movement, through the feedback cable, releases the baulk mechanism in the strut engine control linkage.

(g) As the translating cowls reach the retracted position, auto-restow proximity sensors sense a target-near condition. The logic card in the PSEU closes the stow circuit 5 seconds after the two translating cowls reach the target near condition. The stow relay is energized which opens the stow circuit and removes the electrical power to the solenoid valve on the isolation valve. The isolation valve closes.

(h) As the hydraulic pressure decreases in the extend side of the hydraulic system, the lock valve in each of the lock actuators closes the fluid inlet port. A non-return valve opens to allow fluid in the extend cavity to escape. The piston of the lock actuator, near the end of the retract stroke, pushes the locking sleeve into engagement with the serrations on the lock. The sleeve will then ratchet until the piston bottoms in the fully retracted position.

(3) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Extension

(a) Reverse thrust is selected by moving the forward thrust lever to idle and moving the reverse thrust lever rearward to select reverse idle thrust. At first, movement of the reverse thrust lever further than reverse idle thrust is restricted by a baulk mechanism until the reverser translating cowl reaches the mid-travel position. Then, the baulk is removed which permits thrust to be increased. Further rearward movement of the reverse thrust lever increases the reverse thrust from idle thrust.

(b) Movement of the reverse thrust lever operates the sync-lock control switch in the reverse thrust lever. This completes the circuit that energizes the sync-lock relay to energize the sync-lock solenoid through the air/gnd relay. The solenoid removes the pin in the unlock piston in the sync-lock.

(c) Operation of the reverse thrust lever closes the control switch for the isolation valve. This control switch is in the autothrottle switch pack.

(d) This completes a circuit through the fire switch, the air/ground relay, and a 100 millisecond time delay, to energize the solenoid valve on the isolation valve.

(e) The time delay prevents the operation of the isolation valve before the sync-lock has unlocked. The solenoid valve opens the isolation valve to supply hydraulic pressure to the thrust reverser.

(f) The directional control valve is mechanically positioned by the first movement of the reverse thrust lever. The valve directs the hydraulic fluid, at approximately 3000 psi, through the extend and retract hydraulic tubes to the sync-lock and the two sides of all the hydraulic actuator pistons.

(g) During the operation to extend the thrust reverser, the sync-lock gets hydraulic pressure from the retract hydraulic tube. This moves the unlock piston which turns the yoke to disengage the static serrated disc. This unlocks the sync-lock and permits the rotary flexshafts to turn.

(h) Hydraulic fluid is prevented from entering the extend cavity of the two lock actuators by a rotary pressure seal, until the spring load of the lock valve is overcome by hydraulic pressure. Movement of the lock valve opens a passage to the extend cavity and operates a lock lever to disengage the locking sleeve.

(i) The hydraulic pressure is equal on each side of the hydraulic actuator pistons. Because the area on the extend side of the piston is greater than the retract side, hydraulic pressure moves the actuator piston in the extend direction.

(j) As the actuator piston extends, the acme nut in the piston head rotates the acme screw shaft and worm gear to turn the rotary flexible shafts for synchronized operation. The actuator piston pushes the translating cowl rearward.

(k) As the translating cowl is moved rearward, the cascades that direct the fan exhaust can be seen.

(l) The blocker doors are pulled inward by the blocker door drag links to block the fan duct downstream and direct the gas flow through the cascades.

(m) The feedback actuators, attached to the translating cowl, extend as the cowl moves rearward. The spiral shaft turns the feedback arm. This movement, through the feedback cable, releases the baulk mechanism in the strut engine control linkage.

(n) As the translating cowl moves from the retracted position, the two auto-restow proximity sensors sense a target far condition. This causes a logic card in the proximity sensor electronic unit (PSEU) to open the stow circuit and de-energize the stow relay. The stow relay will supply the electrical power to the solenoid valve on the isolation valve until the thrust reverser is fully retracted and locked.

(4) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Retraction

(a) Forward thrust is selected by moving the reverse thrust lever forward and down. The baulk mechanism in the strut engine control will hold the forward thrust lever at idle until the thrust reverser has retracted approximately 62 per cent of its total travel. Forward thrust can then be increased.

(b) Forward movement of the reverse thrust lever opens the control switch for the isolation valve. The solenoid valve in the isolation valve remains energized through the closed circuit of the stow relay. The isolation valve continues to supply hydraulic fluid at 3000 psi to the thrust reverser.

(c) The movement of the reverse thrust lever positions the directional control valve to the retract position. The extend hydraulic tubes are now connected to the hydraulic return line. The directional control valve continues to supply hydraulic fluid to the retract side of the hydraulic actuator pistons and the sync-locks.

(d) Forward movement of the reverse thrust levers also opens the circuit through the sync-lock control switch in the reverse thrust lever. This de-energizes the sync-lock solenoid. The solenoid pin cannot move back into the groove in the unlock piston. Hydraulic pressure from the retract hydraulic line prevents the piston movement to the lock position.

(e) Hydraulic pressure on the retract side of the actuator pistons causes the pistons to retract. The hydraulic fluid in the extend side of the actuator pistons and the extend hydraulic tubes goes to the hydraulic return line.

(f) As the actuator pistons retract, the acme nut in the piston head rotates the acme screw shaft and worm gear to turn the rotary flexible shafts for synchronized operation. The actuator piston pushes the translating cowl forward.

(g) The feedback actuators, attached to the translating cowl, retract as the cowl moves forward. The spiral shaft turns the feedback arm. This movement, through the feedback cable, releases the baulk mechanism in the strut engine control linkage.

(h) As the translating cowls reach the retracted position, auto-restow proximity sensors sense a target-near condition. The logic card in the PSEU closes the stow relay circuit 5 seconds after the two translating cowls reach the target near condition. The stow relay is energized which opens the stow circuit and removes the electrical power to the solenoid valve on the isolation valve. The isolation valve closes.

(i) As the hydraulic pressure decreases in the extend side of the hydraulic system, the lock valve in each of the lock actuators closes the fluid inlet port. A non-return valve opens to allow fluid in the extend cavity to escape. The piston of the lock actuator, near the end of the retract stroke, pushes the locking sleeve into engagement with the serrations on the lock. The sleeve will then ratchet until the piston bottoms in the fully retracted position.

(j) When the hydraulic pressure is removed when the isolation valve closes, the spring loaded unlock piston moves to the lock position. This turns the yoke which engages the serrated discs which lock the rotary flexshafts. The solenoid pin locks the unlock piston.

(5) Deactivation of Thrust Reverser for Flight Dispatch

(a) The thrust reversers must be hydraulically and mechanically deactivated for flight dispatch.

(b) Two deactivation pins per thrust reverser are stowed on both translating cowls. Replacing two plugs with deactivation pins mechanically deactivates the translating cowls of the thrust reverser.

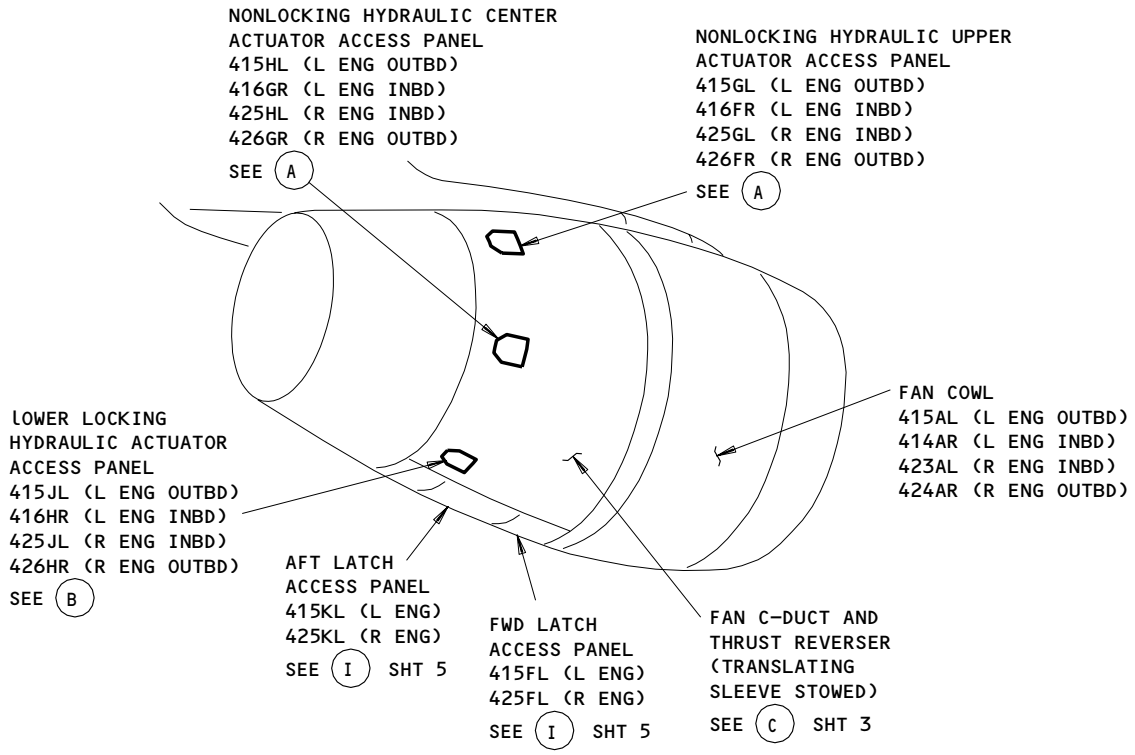
(c) Hydraulic deactivation requires inserting a pin into the manual lockout hole in the isolation valve and securing it with a cotter pin.

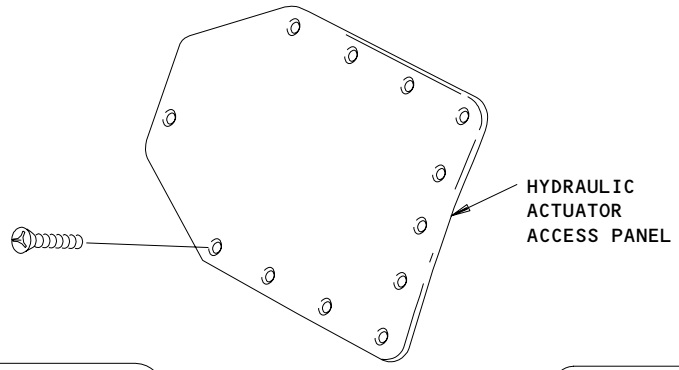
(d) The applicable reverse thrust lever is placed in the full forward position (thrust reverser stowed) and a REVERSER INOP tag is installed.

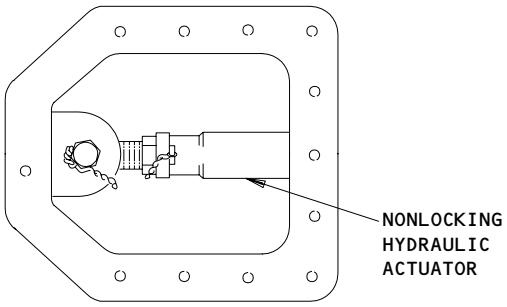
THRUST REVERSER SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
ACTUATOR - L ENGINE FAN C-DUCT HYDRAULIC OPENING	6	2	415AL,416AR, FAN C-DUCT AND THRUST REVERSER	78-31-25
ACTUATOR - R ENGINE FAN C-DUCT HYDRAULIC OPENING	6	2	425AL,426AR, FAN C-DUCT AND THRUST REVERSER	78-31-25
ACTUATOR - L ENGINE T/R HYDRAULIC LOCKING	3	2	415JL,416HR,415AL,416AR, FAN C-DUCT AND THRUST REVERSER	78-31-26
ACTUATOR - R ENGINE T/R HYDRAULIC LOCKING	3	2	425JL,426HR,425AL,426AR, FAN C-DUCT AND THRUST REVERSER	78-31-26
ACTUATOR - L ENGINE T/R HYDRAULIC NONLOCKING	3	4	415GL,415HL,416FR,416GR,415AL, 416AR, FAN C-DUCT AND THRUST REVERSER	78-31-26
ACTUATOR - R ENGINE T/R HYDRAULIC NONLOCKING	3	4	425AL,425GL,425HL,426AR,426FR, 426GR, FAN C-DUCT AND THRUST REVERSER	78-31-26
CASCADE SEGMENTS - L ENGINE	3	16	415AL,416AR, FAN C-DUCT AND THRUST REVERSER, TRANSLATE COWL	78-31-05
CASCADE SEGMENTS - R ENGINE	3	16	425AL,426AR, FAN C-DUCT AND THRUST REVERSER, TRANSLATE COWL	78-31-05
COWL - THRUST REVERSER TRANSLATING	3	2	415AL,416AR, FAN C-DUCT AND THRUST REVERSER, LEFT ENGINE	78-31-23
	3	2	425AL,426AR, FAN C-DUCT AND THRUST REVERSER, RIGHT ENGINE	78-31-23
DOORS - L ENGINE T/R BLOCKER	3	12	415AL,416AR, FAN C-DUCT AND THRUST REVERSER	78-31-24
DOORS - R ENGINE T/R BLOCKER	3	12	425AL,426AR, FAN C-DUCT AND THRUST REVERSER	78-31-24
LATCH - L ENGINE, FAN C-DUCT	3	5	415KL, T/R ACCESS DOOR	78-31-00
LATCH - R ENGINE, FAN C-DUCT	3	5	425KL, T/R ACCESS DOOR	78-31-00
LINKS - DRAG, L ENGINE BLOCKER DOOR	3	12	415AL,416AR, FAN C-DUCT AND THRUST REVERSER	78-31-27
LINKS - DRAG, R ENGINE BLOCKER DOOR	3	12	425AL,425AR, FAN C-DUCT AND THRUST REVERSER	78-31-27
REVERSER - FAN C-DUCT AND THRUST (HALVES)	3	2	LEFT ENGINE	78-31-20
	3	2	RIGHT ENGINE	78-31-20
TUBING - L ENGINE T/R ROTARY FLEX SHAFT AND	3	4	415AL,416AR, FAN C-DUCT AND THRUST REVERSER	78-31-26
TUBING - R ENGINE T/R ROTARY FLEX SHAFT AND	3	4	425AL,426AR, FAN C-DUCT AND THRUST REVERSER	78-31-26

Component Index
Figure 101

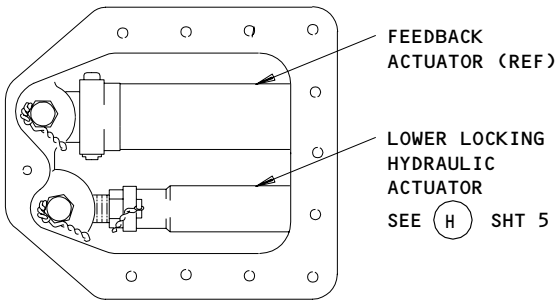






CENTER AND UPPER NONLOCKING HYDRAULIC ACTUATOR DISCONNECT INTERFACE

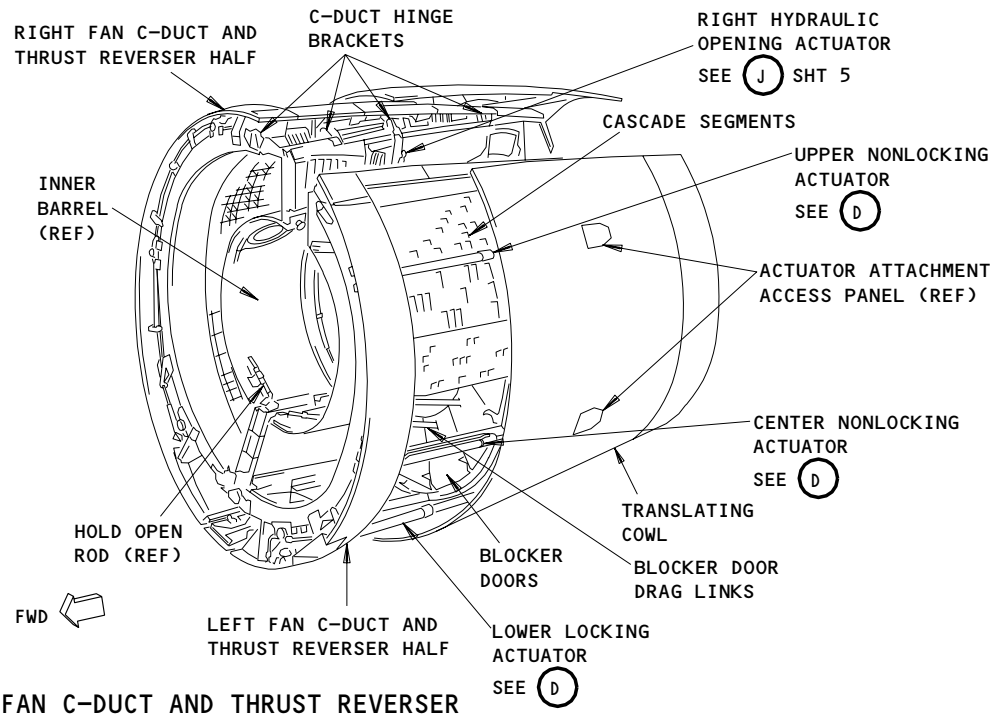
A



LOWER LOCKING HYDRAULIC ACTUATOR DISCONNECT INTERFACE

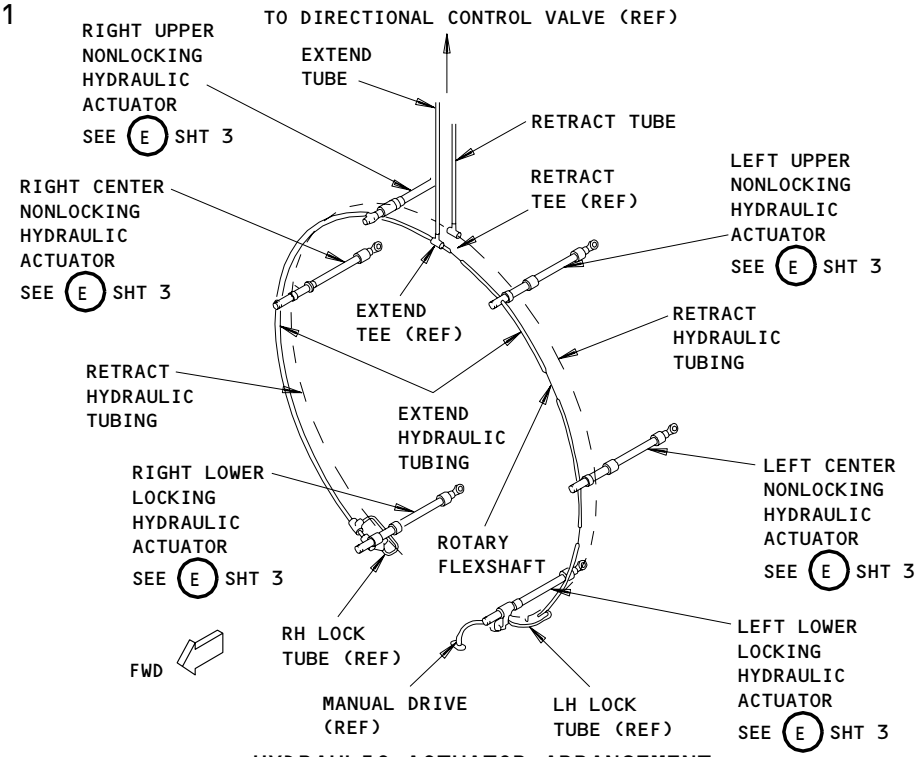
B

Component Location
Figure 102 (Sheet 1)



FAN C–DUCT AND THRUST REVERSER
(TRANSATING COWL DEPLOYED)

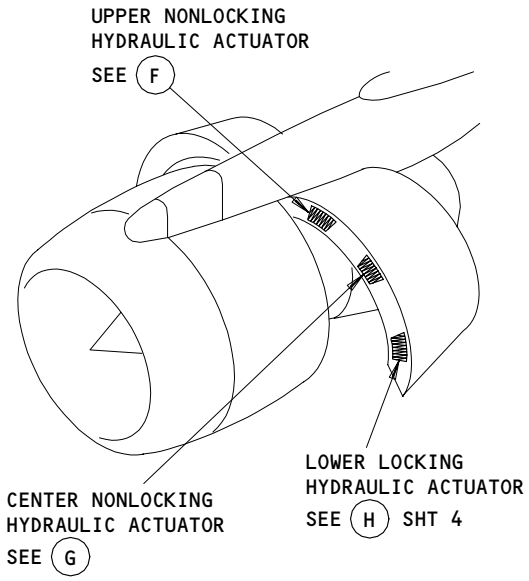
(C) FROM SHT 1

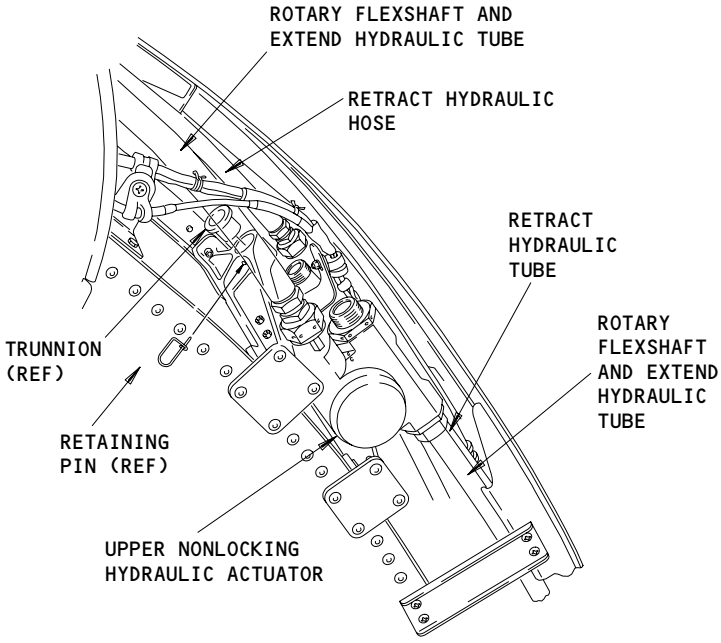


HYDRAULIC ACTUATOR ARRANGEMENT

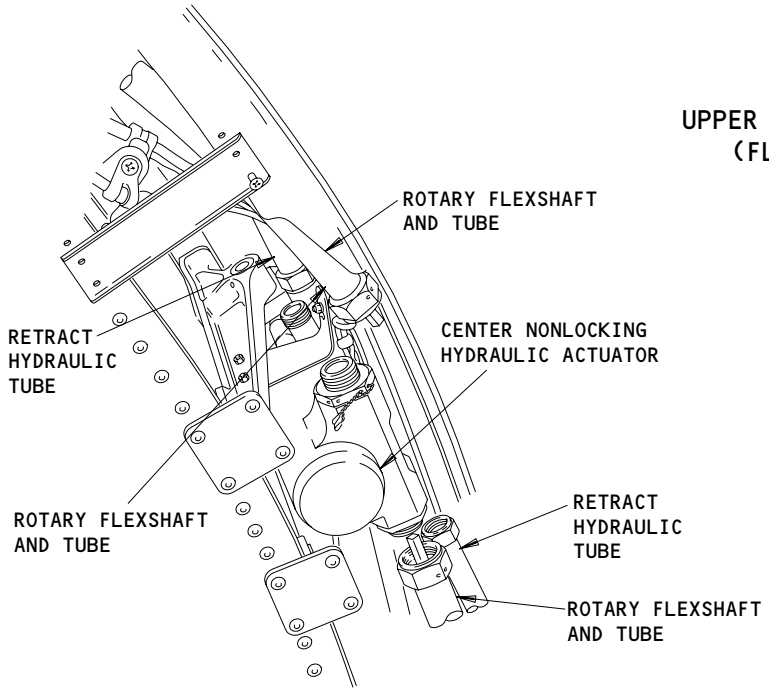
(D)

Component Location
Figure 102 (Sheet 2)



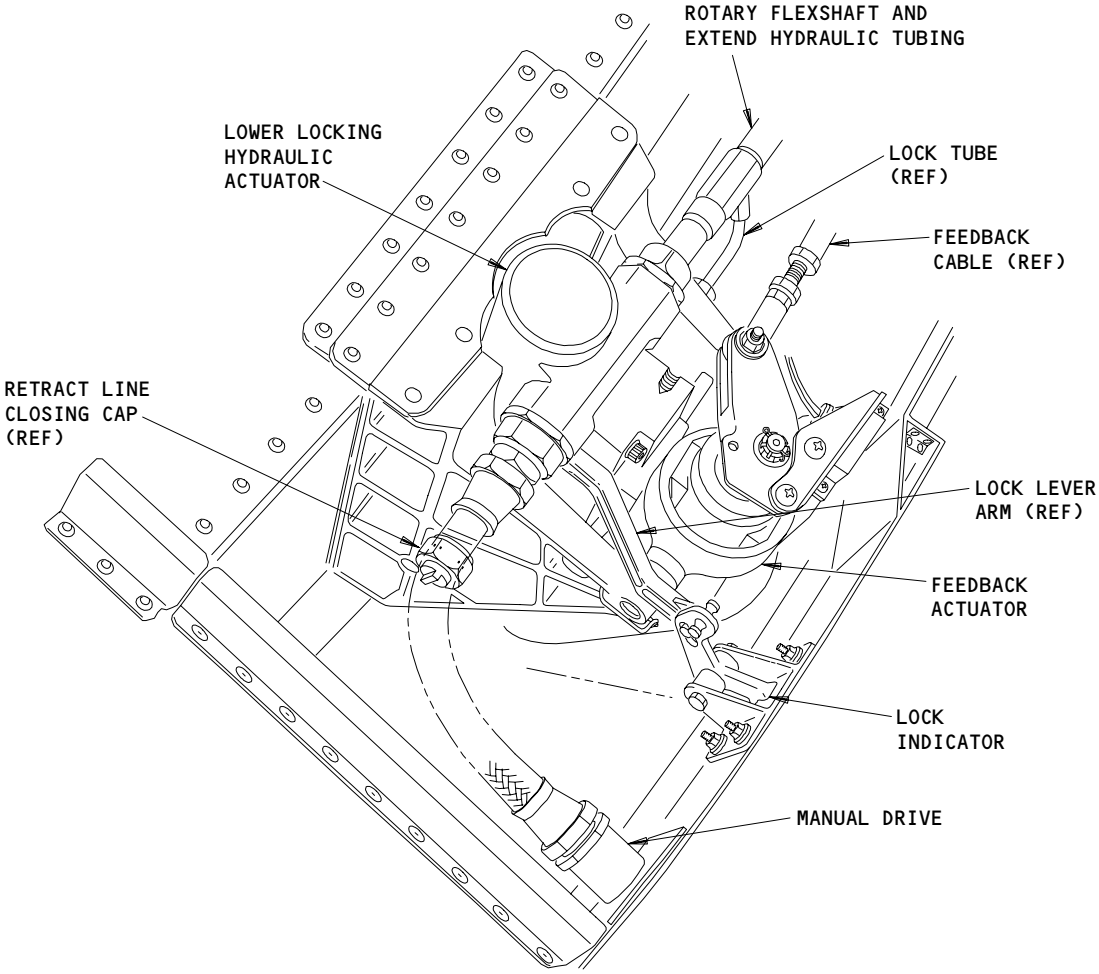


UPPER NONLOCKING HYDRAULIC ACTUATOR
(FLEXSHAFT SHOWN DISCONNECTED)
F



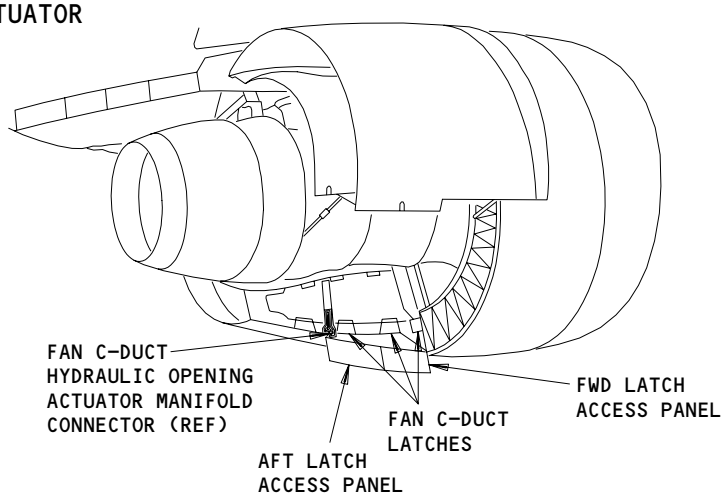
CENTER NONLOCKING HYDRAULIC ACTUATOR
(FLEXSHAFT SHOWN DISCONNECTED)
G

Component Location
Figure 102 (Sheet 3)



LOWER LOCKING HYDRAULIC ACTUATOR

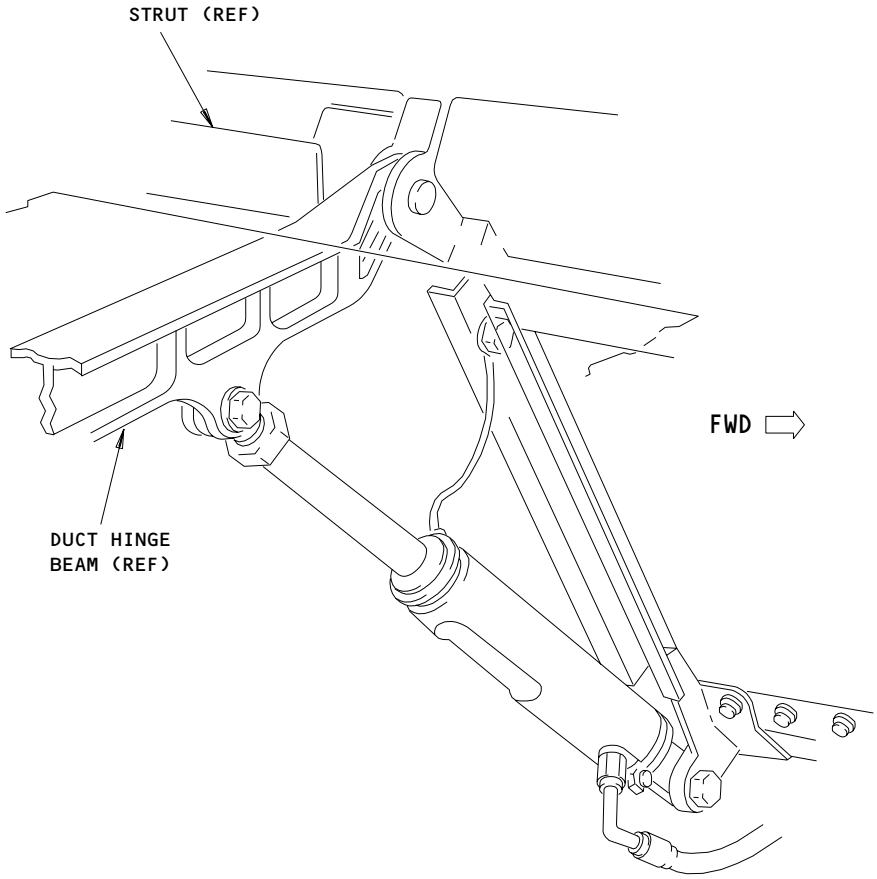
(H) FROM SHT 3



FAN C–DUCT (UNDERSIDE)

(I) FROM SHT 1

Component Location
Figure 102 (Sheet 4)



FAN C–DUCT OPENING ACTUATOR

(J) FROM SHT 2

Component Location
Figure 102 (Sheet 5)

THRUST REVERSER SYSTEM - MAINTENANCE PRACTICES

1. General
   A. This section has nine tasks:

Paragraph Number	Title
2	Thrust Reverser Deactivation for Ground Maintenance
3	Thrust Reverser Activation for Ground Maintenance
4	Open the Thrust Reverser
5	Close the Thrust Reverser
6	Manually Extend (Deploy) the Thrust Reverser
7	Manually Retract (Stow) the Thrust Reverser
8	Extend the Thrust Reverser with Hydraulic Power
9	Retract the Thrust Reverser with Hydraulic Power

TASK 78-31-00-912-001-R00

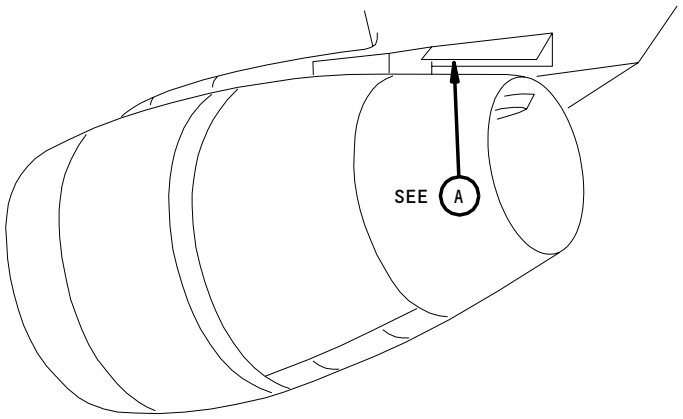
2. Thrust Reverser Deactivation For Ground Maintenance
   A. General
      (1) Deactivation for ground maintenance will prevent the operation of the thrust reverser with hydraulic power. The thrust reverser can be manually extended and retracted when deactivated.
      (2) Deactivation for ground maintenance removes the electrical power to the thrust reverser control system and mechanically locks the isolation valve in a closed position.
   B. Equipment
      (1) Thrust Reverser Lock Assembly B78001-1 or B78001-8
   C. References
      (1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
   D. Access
      (1) Location Zones

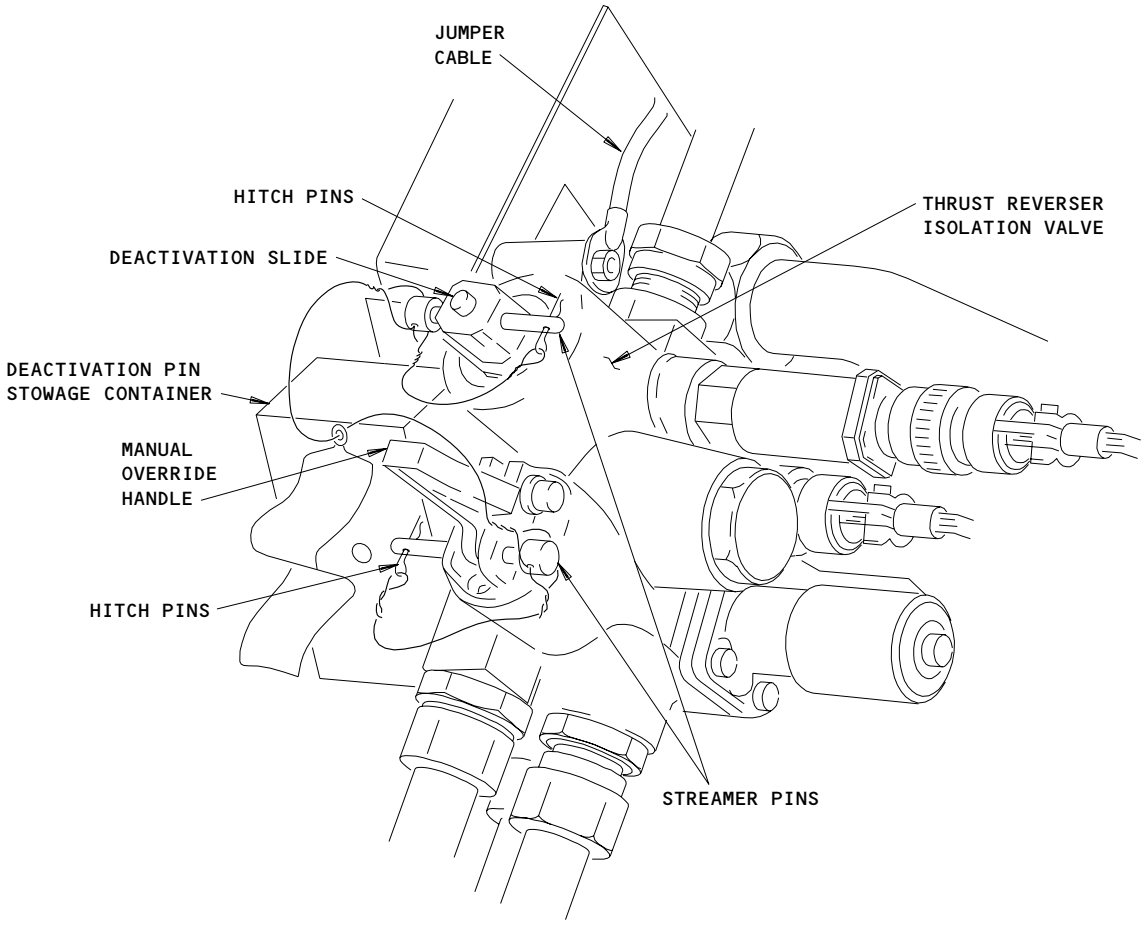
210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - aft-structure

      (2) Access Panels

434AL/444AL	Nacelle Strut - Aft Fairing

   E. Do the Thrust Reverser Deactivation for Ground Maintenance (Fig. 201).





Thrust Reverser Isolation Valve Deactivation (For Ground Maintenance)
Figure 201

S 862-002-R00

CAUTION: DO NOT USE THIS PROCEDURE FOR FLIGHT DISPATCH: THRUST REVERSER DEACTIVATION PROCEDURE FOR GROUND MAINTENANCE. THE THRUST REVERSER DEACTIVATION PROCEDURE FOR FLIGHT DISPATCH IS IIN THE DISPATCH DEVIATION GUIDE. DAMAGE TO THE EQUIPMENT COULD OCCUR.

(1) Make sure you do not use this procedure for thrust reverser deactivation for flight dispatch.

NOTE: The procedure for the thrust reverser deactivation for flight dispatch is in the Dispatch Deviation Guide.

S 862-016-R00

(2) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Open these circuit breakers and attach the DO-NOT-CLOSE tags:
(a) On the overhead equipment panel, P11:
1) For the left engine:
a) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B30, ENGINE RIGHT T/R CONT

S 862-017-R00

(3) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
Open these circuit breakers and attach the DO-NOT-CLOSE tags:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, T/R IND L
b) 11D12, T/R CONT L
2) For the right engine:
a) 11B29, T/R IND R
b) 11B30, T/R CONT-ALTN-R
c) 11K33, T/R CONT R

S 012-019-R00

(4) Open the access panels 434AL(444AL) (AMM 6-43-00/201).

S 492-020-R00

(5) Do these steps to install the lock assembly in the activation valve:

NOTE: The lock assembly contains 2 streamered pins and 2 hitch pins which are all connected to a streamer.

(a) If the deactivation slide is not fully in the housing, push the slide in the housing.

(b) Install the streamered pin to keep the deactivation slide in the ground deactivation position.

NOTE: The lock assembly is found in the stowage container on the forward surface of the isolation valve.

S 492-021-R00

(6) Push in the manual override lever and install the streamered pin in the lever.

NOTE: This will keep the lever in the ground deactivation position.

S 492-022-R00

(7) Install the hitch pins in the ends of the streamered pins.

TASK 78-31-00-912-023-R00

3. Thrust Reverser Activation for Ground Maintenance

A. General

(1) Activation for ground maintenance will restore the operation of the thrust reverser with hydraulic power. The mechanical lock at the isolation valve is removed and electrical power is supplied to the thrust reverser control system.

NOTE: Following all thrust reverser manual deploy, stow or activation procedures, a functional (hydraulic) thrust reverser deployment (extend) and stow (retract) cycle is required.

B. Equipment

(1) Thrust Reverser Lock Assembly B78001-1 or B78001-8

C. References

(1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels

D. Access

(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - Aft Structure

(2) Access Panels

434AL/444AL	Nacelle Strut - Aft Fairing

E. Do the Thrust Reverser Activation for Ground Maintenance (Fig. 201).

S 442-024-R00

(1) Do these steps to do the thrust reverser activation:

NOTE: Following all thrust reverser manual deploy, stow or activation procedures, a functional (hydraulic) thrust reverser deployment (extend) and stow (retract) cycle is required.

(a) Remove the hitch pins from the streamered pins.
(b) Remove the two streamered pins.

NOTE: put the lock assembly in the stowage container on the forward surface of the isolation valve.

S 412-025-R00

(2) els 434AL (444AL) (AMM 06-43-00/201).

S 862-039-R00

(3) AIRPLANES WITHOUT THRUST REVERSER SYNC LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) On the overhead equipment panel, P11:
1) For the left engine:
a) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B30, ENGINE RIGHT T/R CONT

S 862-040-R00

(4) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, T/R IND L

b) 11D12, T/R CONT L
2) For the right engine:
a) 11B29, T/R IND R
b) 11B30, T/R CONT-ALTN-R
c) 11K33, T/R CONT R

TASK 78-31-00-912-042-R00

4. Open the Thrust Reverser

A. General
(1) You can use this procedure for the left and right thrust reverser.

B. Equipment
(1) Boeing B54001-11 - Hydraulic Hand Pump
(2) High pressure hose with correct end fittings for the pump and the actuator manifold connector.
(3) Thrust reverser actuator ram blocker strut - CP30538/1 (Rolls-Royce) or B71009-9

C. References
(1) AMM 12-13-01/301, Engine
(2) AMM 78-31-10/401, Thrust Reverser Hinge Access Doors

D. Access
(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - Aft Structure

(2) Access Panels

415FL/425FL	Thrust Reverser - Forward Latch Access
415KL/425KL	Thrust Reverser - Rear Latch Access/Zone 3 Pressure Relief Doors
434AL/444AL	Nacelle Strut - Aft Fairing

E. Consumables
(1) D00068 Turbine Engine Oil, MIL-L-23699

F. Open the thrust reverser

S 862-108-R00

CAUTION: DO NOT OPEN AN INBOARD THRUST REVERSER IF THE LEADING EDGE SLATS ARE EXTENDED. DAMAGE TO THE THRUST REVERSER, THE LEADING EDGE SLATS AND THE WING CAN OCCUR.

CAUTION: DO NOT OPEN A THRUST REVERSER IF IT IS EXTENDED MORE THAN FOUR INCHES FROM THE FULLY RETRACTED POSITION. DAMAGE TO THE TRANSLATING COWL AND THE HINGE ACCESS DOORS CAN OCCUR.

IF YOU MUST OPEN THE THRUST REVERSER WHEN IT IS EXTENDED MORE THAN 4 INCHES, FIRST REMOVE THE HINGE ACCESS DOORS (AMM 78-31-10-401).

CAUTION: MAKE SURE YOU CORRECTLY CONNECT THE HAND PUMP HOSE TO THE ACTUATOR MANIFOLD. DAMAGE TO THE EQUIPMENT CAN OCCUR IF THE HOSE IS NOT CORRECTLY INSTALLED.

(1) Make sure you know the position of the thrust reverser.

S 862-043-R00

WARNING: IT IS IMPORTANT THAT YOU OBEY THESE INSTRUCTIONS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, THE THRUST REVERSER COULD CLOSE SUDDENLY. THIS COULD CAUSE INJURIES TO PERSONS WHO ARE BETWEEN THE ENGINE AND THE THRUST REVERSER.

DO NOT OPEN THRUST REVERSER IF THE WIND SPEED IS MORE THAN 40 KNOTS.

WHEN THE THRUST REVERSERS ARE HELD OPEN WITH THE HOLD OPEN RODS, THEY SHOULD NOT STAY OPEN IF THE WIND SPEED IS MORE THAN 65 KNOTS.

WHEN YOU OPEN THE THRUST REVERSER, MAKE SURE YOU ENGAGE THE SCREWLATCH BEFORE YOU OPEN OTHER LATCHES. IF THE SCREWLATCH IS NOT ENGAGED, THE THRUST REVERSER COULD OPEN SUDDENLY AND COULD CAUSE INJURIES TO PERSONS.

(2) Make sure the wind speed is in the limits before you open the thrust reverser.

S 862-110-R00

(3) Retract the leading edge slats if it is necessary (AMM 27-81-00/201).

S 862-045-R00

(4) Deactivate the leading edge slats (AMM 27-81-00/201).

S 022-111-R00
(5) Remove the hinge access doors if it is necessary (AMM 78-31-10/401).

S 042-047-R00
(6) Do the thrust reverser deactivation for ground maintenance.

S 012-106-R00

CAUTION: MAKE AN INSPECTION OF THE THRUST REVERSER HEATSHIELDS AND THE ZONE 3 AREA IF THE ACCESS DOOR, 415KL (425KL) COMES OPEN FREQUENTLY. FIND AND REPAIR THE AIR LEAKAGE. IF YOU DO NOT REPAIR THE AIR LEAKAGE, DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Open the access panels 415FL (425FL) and 415KL (425KL) (Fig. 202).

S 012-049-R00

CAUTION: TO OPEN THE THRUST REVERSER LATCHES, PUSH THE RELEASE TANG OF THE LATCH HANDLE WITH YOUR THUMB. DO NOT USE TOOLS TO OPEN THE RELEASE TANG, BECAUSE THE TOOLS CAN CAUSE DAMAGE TO THE TANG.

WHEN YOU OPEN THE THRUST REVERSER, MAKE SURE YOU ENGAGE THE SCREWLATCH BEFORE YOU OPEN THE OTHER LATCHES. IF THE SCREWLATCH IS NOT ENGAGED, THE THRUST REVERSER COULD OPEN SUDDENLY AND COULD CAUSE INJURIES TO PERSONS.

(8) Open the latches at locations B, C, D, and E, (Fig. 203).

S 492-050-R00

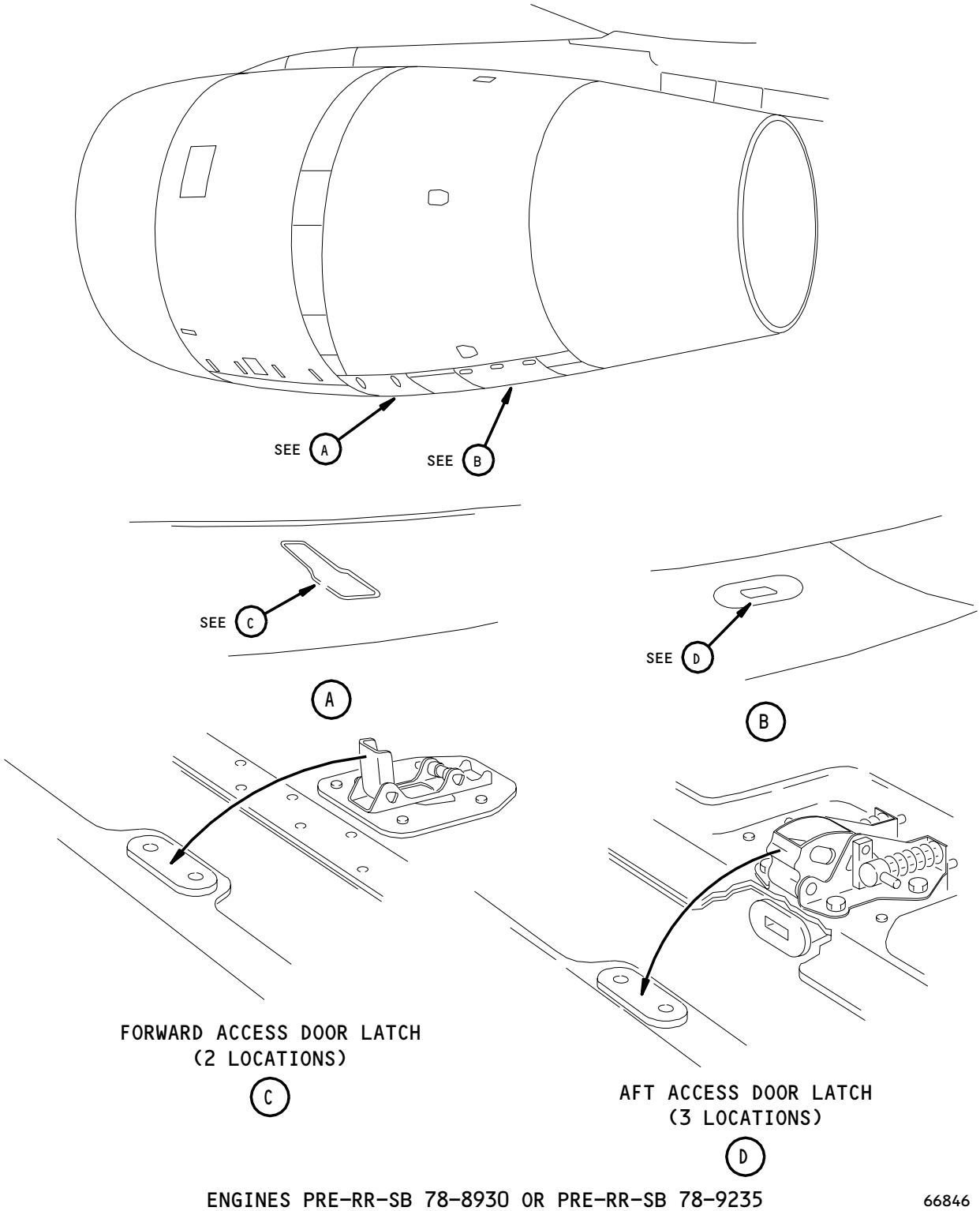
CAUTION: MAKE SURE YOU CORRECTLY CONNECT THE HAND PUMP HOSE TO THE ACTUATOR MANIFOLD. DAMAGE TO EQUIPMENT CAN OCCUR IF THE HOSE IS NOT CORRECTLY INSTALLED.

(9) Install the hose to the manifold connector (1, Fig. 204).

S 612-051-R00
(10) Add engine oil to the hand pump if it is necessary (AMM 12-13-01/301).
(a) Make sure you use only approved engine oil in the hand pump.

S 862-052-R00
(11) Close the valve (3) on the hand pump.

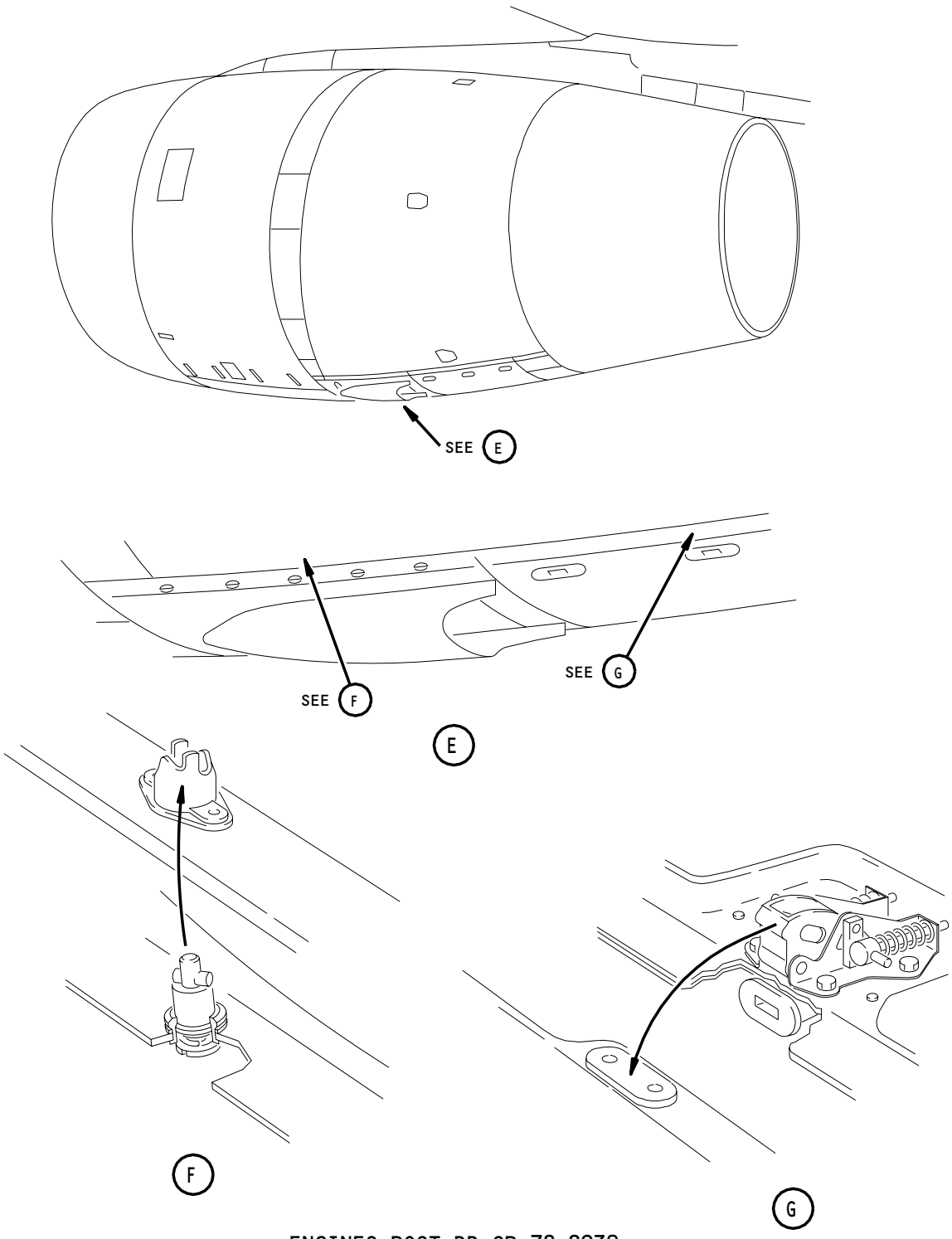
S 862-053-R00
(12) Operate the hand pump until the thrust reverser is in the fully open position (Fig. 204).



ENGINES PRE-RR-SB 78-8930 OR PRE-RR-SB 78-9235

66846

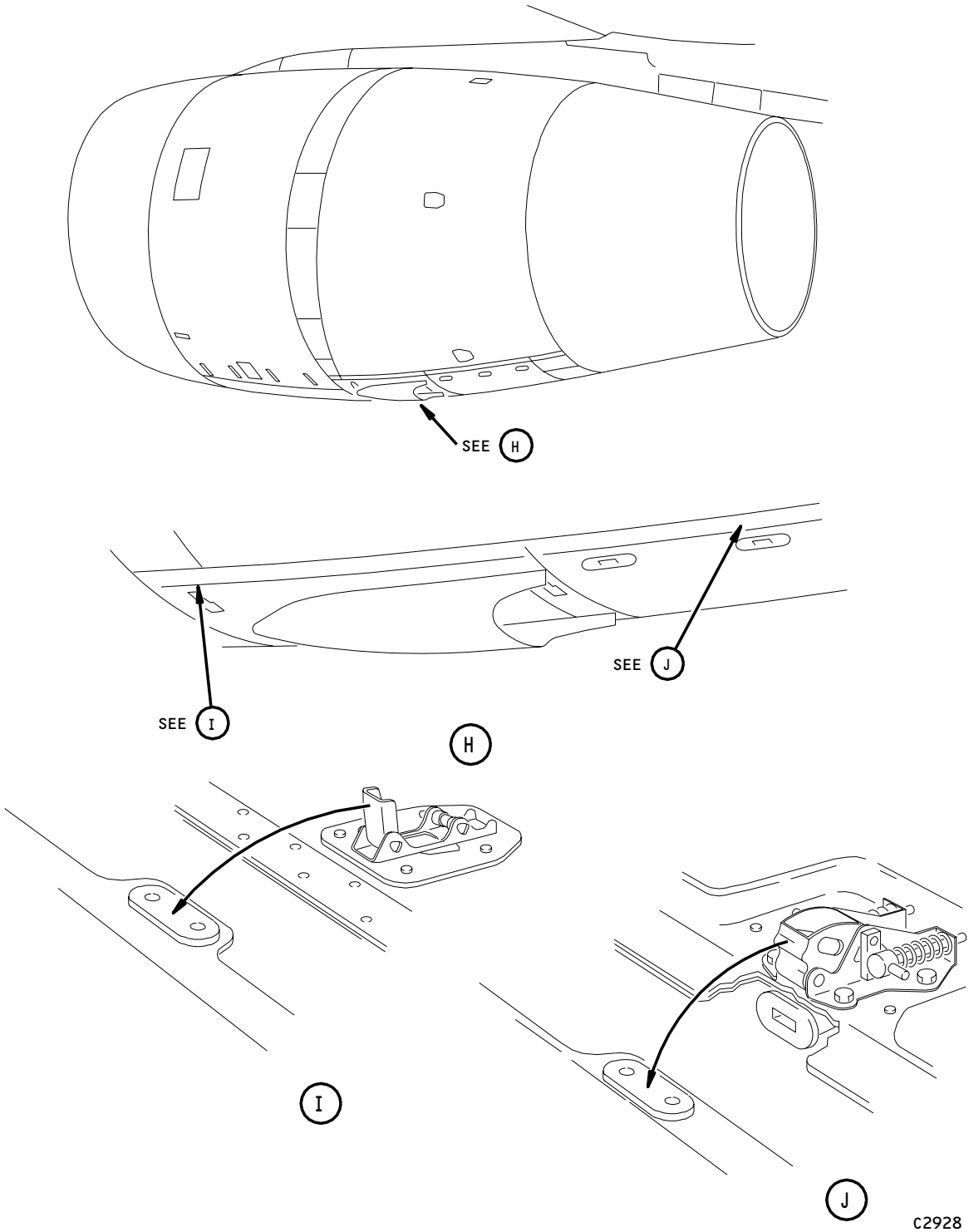
Fan C-Duct and Thrust Reverser Latch Access Panels
Figure 202 (Sheet 1)



ENGINES POST-RR-SB 78-8930

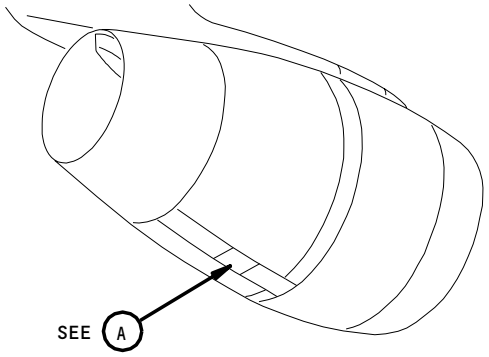
C2927

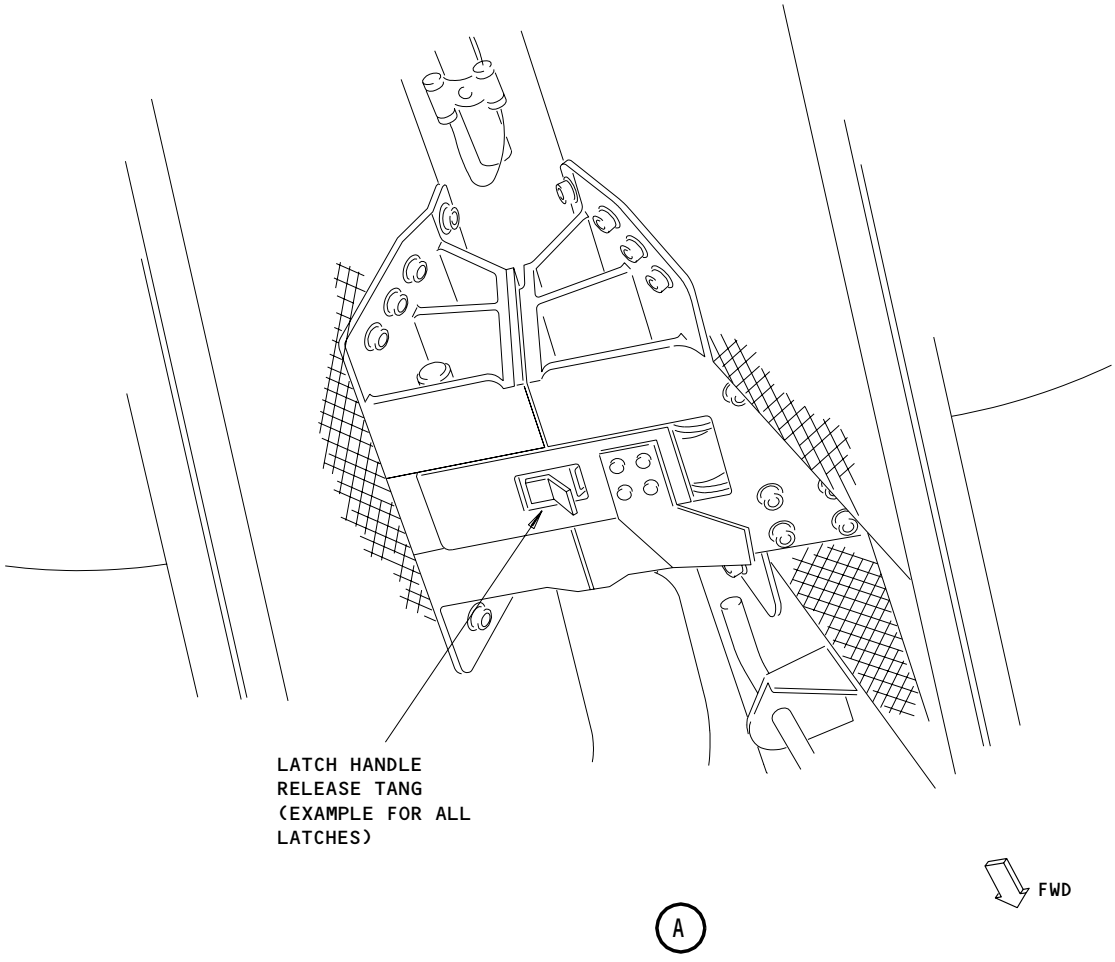
Fan C-Duct and Thrust Reverser Latch Access Panels
Figure 202 (Sheet 2)



ENGINES POST-RR-SB 78-9235

Fan C-Duct and Thrust Reverser Latch Access Panels
Figure 202 (Sheet 3)

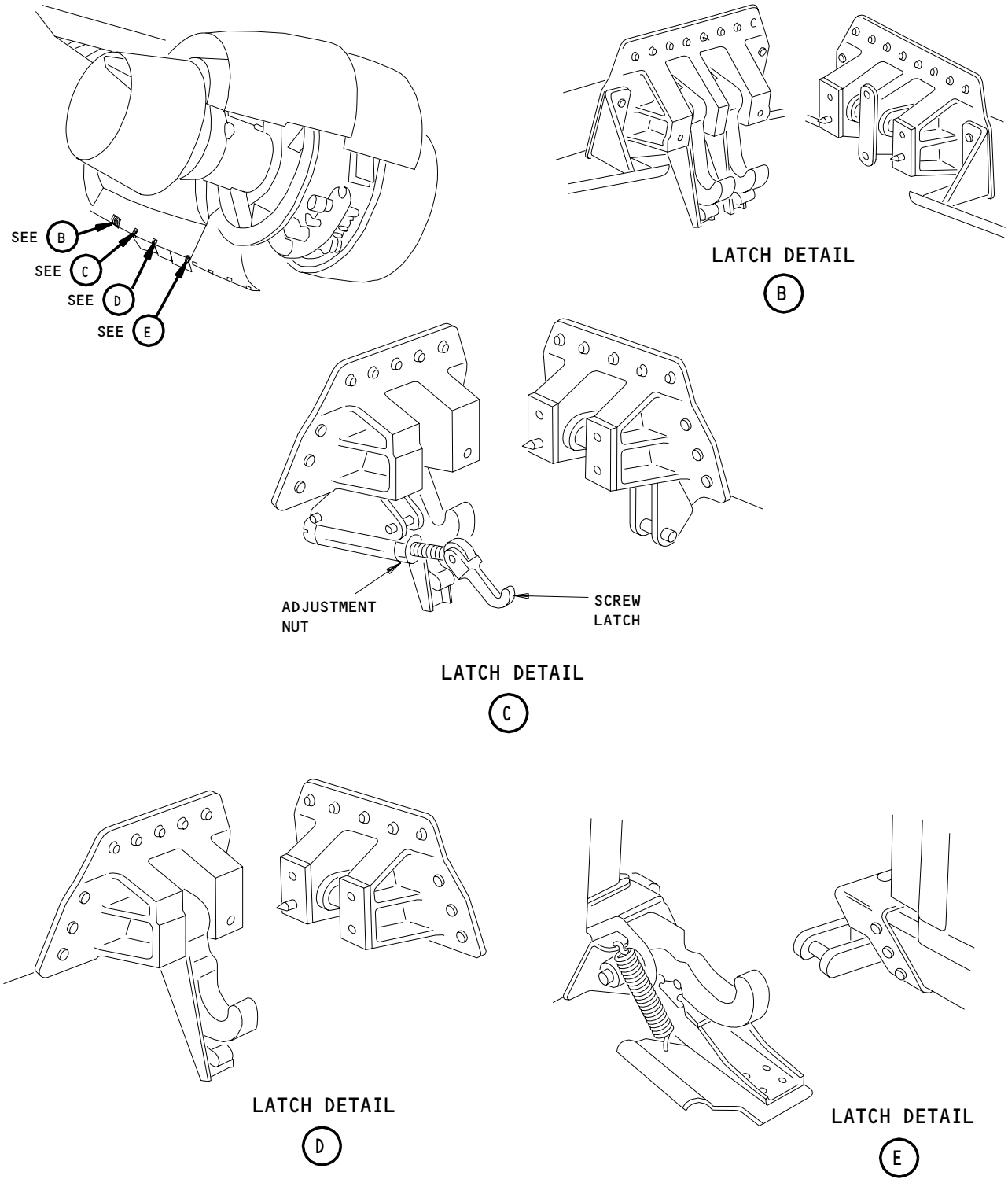




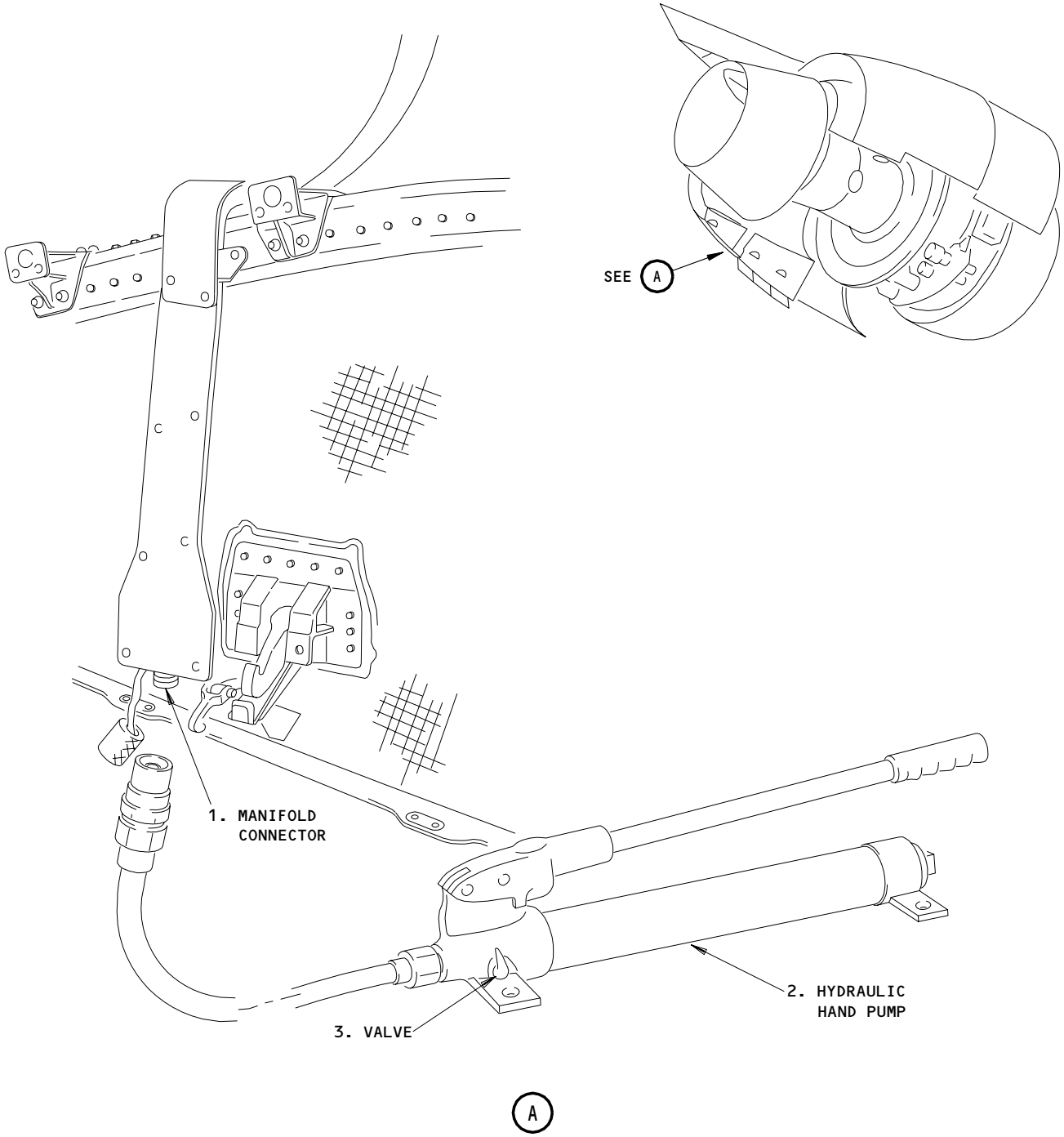
NOTE: TO OPEN THE LATCH, PUSH THE HANDLE RELEASE TANG TO THE RIGHT.

A7456

Thrust Reverser Latch Opening
Figure 203 (Sheet 1)



Fan C-Duct and Thrust Reverser Latch Opening
Figure 203 (Sheet 2)



Fan C-Duct and Thrust Reverser Hand Pump Connection
Figure 204

S 012-097-R00

CAUTION: BEFORE YOU OPEN THE THRUST REVERSERS, DO A CHECK OF THE CONTOUR AND OPERATION OF THE AHAD. MAKE SURE THE HINGE ACCESS DOOR IS ALIGNED WITH THE TOP OF THE C-DUCT. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE AHAD AND C-DUCT CAN OCCUR.

(13) Do these steps to extend the rear hold-open rods:
  (a) Move the collar (5) inboard.
  (b) Release the rear hold-open rod from the rod stowage bracket (3) (Fig. 205).
  (c) Push the locking arm (2) and fully extend the hold-open rod.
  (d) Release the locking arm (2) and make sure the hold-open rod is locked in the fully extended position.

S 862-055-R00

(14) Do these steps to engage the rear hold-open rods:
  (a) Slowly open the valve (3) on the hand pump.
    1) Let the thrust reverser lower until the rod end fitting (1) can be engaged in the rod anchoring bracket (4).
  (b) Close the hand pump valve.

S 862-056-R00

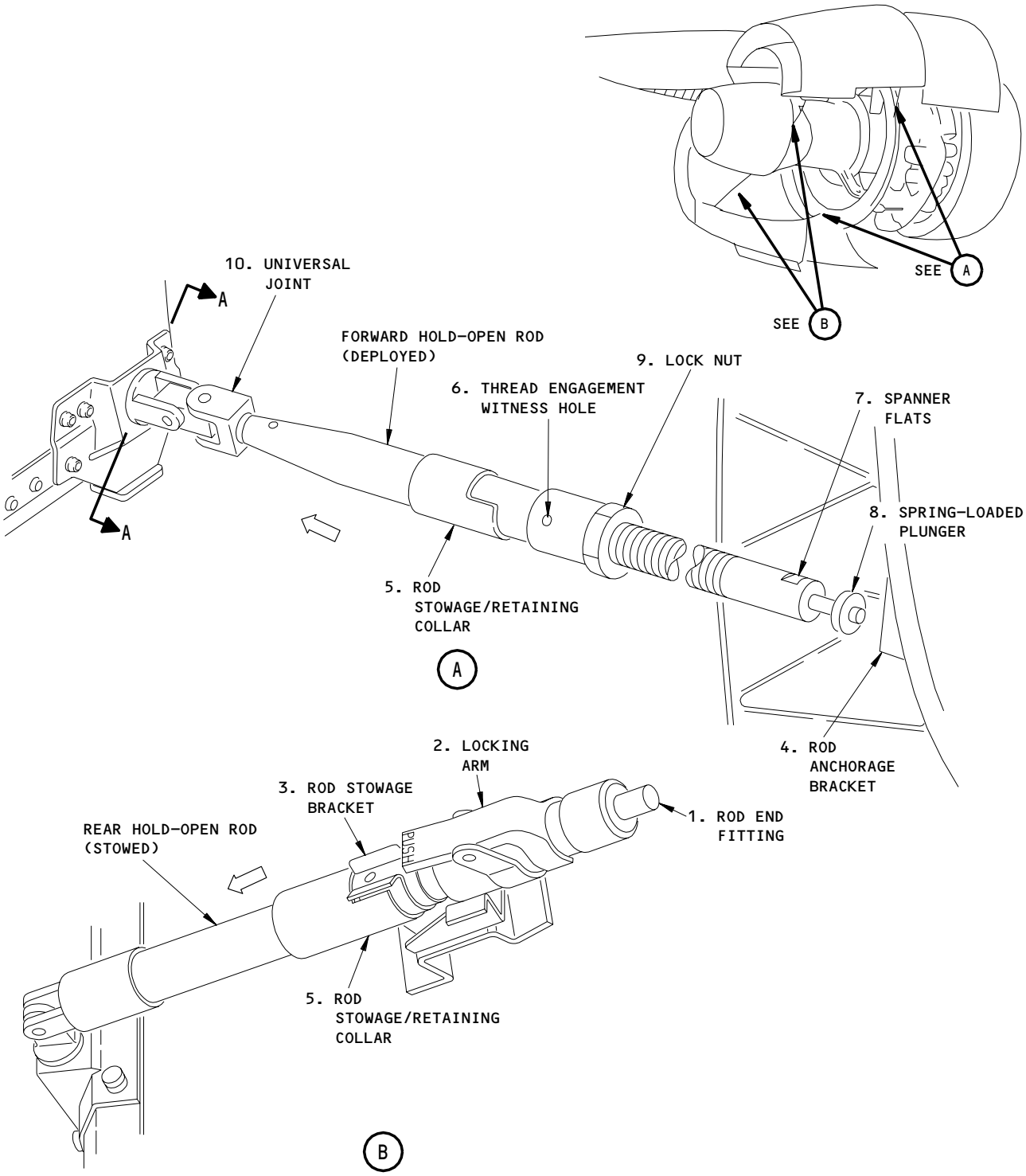
(15) Do these steps to extend the forward hold-open rods:
  (a) With the hand pump valve (3, Fig. 204) closed, operate the hand pump to remove the load from the rear hold-open rods.

    NOTE: The rear hold-open rods must not be fully disengaged from the anchoring bracket.

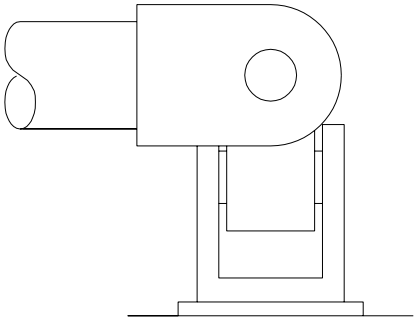
  (b) Move the collar (5) inboard to release the forward hold-open rod from the rod stowage bracket (3) (Fig. 205).

S 862-057-R00

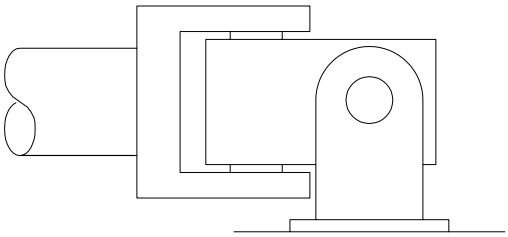
(16) Do these steps to engage the forward hold-open rods:
  (a) Push in the plunger and put the plunger in the rod anchoring bracket (4, Fig. 205).



Fan C-Duct and Thrust Reverser Hold-Open Rods Installation
Figure 205 (Sheet 1)



FORWARD HOLD–OPEN ROD FIXED ATTACHMENT
(FEATURE CORRECTLY STOWED)
A–A



FORWARD HOLD–OPEN ROD FIXED ATTACHMENT
(FEATURE INCORRECTLY STOWED)
A–A

Fan C–Duct and Thrust Reverser Hold–Open Rods Installation
Figure 205 (Sheet 2)

(b) Release the plunger.

NOTE: If the plunger does not engage satisfactorily because the rod is too short or too long, do the rigging procedure for the forward hold-open rods.

(c) Open the hand pump valve (3, Fig. 205) and let the thrust reverser slowly close until the hold-open rods hold the weight of the thrust reverser (Fig. 204).
(d) Make sure the plungers of the forward hold-open rods are fully compressed.
(e) Make sure the weight of the thrust reverser is applied equally to the hold-open rods.
(f) If the installation of the forward hold-open rods is not satisfactory, do the rigging procedure for the forward hold-open rods.

S 832-058-R00

(17) Do the rigging procedure for the forward hold-open rods as follows (Fig. 205):

NOTE: Rigging of the forward hold-open rod is necessary only in these conditions:
- when a replacement hold-open rod is installed.
- when the rigging has been changed.

(a) Install the ram blocker strut for the opening actuator.
(b) If the forward hold-open rod does not engage satisfactorily in the rod anchoring bracket, do these steps:
1) Release the lock nut (9).
2) If it is necessary, use a spanner to turn the spanner flats (7) and make the rod longer or shorter.
3) Engage the plunger (8) in the anchoring bracket (4).
(c) With the two hold-open rods engaged, open the hand pump valve (3, Fig. 204).
(d) Let the thrust reverser slowly close until the hold-open rods hold the weight of the thrust reverser.
(e) Adjust the length of the forward hold-open rod until the rod starts to hold the weight of the thrust reverser.
(f) Turn the rod by two turn to make the rod longer.
(g) Do a check of the adjusting screw thread as follows:
1) Try to install a lockwire through the witness hole (6, Fig. 205).
2) If you can not install the lockwire, then the adjusting screw thread is safetied.
(h) Tighten the locknut (9) (AMM 70-51-00/201).
(i) Close the hand pump valve (3, Fig. 204) and operate the hand pump until the thrust reverser is in the fully open position.
(j) Remove the ram blocker strut of the opening actuator.

(k) Open the hand pump valve (3).
1) Let the thrust reverser slowly close until the hold-open rods hold the weight of the thrust reverser.

S 092-059-R00

(18) Disconnect the hose from the actuator manifold connector.

TASK 78-31-00-912-060-R00

5. Close the Thrust Reverser

A. General
(1) You can use this procedure for the left and right thrust reversers.

B. Equipment
(1) High pressure hose with the correct end fittings for the pump and the actuator manifold connector.
(2) Boeing B54001-11 - Hydraulic Hand Pump
(3) Thrust reverser actuator ram blocker strut - CP30538/1 (Rolls-Royce) or B71009-9
(4) Tool, open-end wrench

C. References
(1) AMM 12-13-01/301, Engine
(2) AMM 78-31-10/401, Fan Thrust Reverser Hinge Access Doors

D. Access
(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - Aft Structure

(2) Access Panels

415BL/425BL	Thrust Reverser - Hinge Access Door (Left)
416BR/426BR	Thrust Reverser - Hinge Access Door (Right)
415FL/425FL	Thrust Reverser - Forward Latch Access
415KL/425KL	Thrust Reverser - Rear Latch Access/Zone 3 Pressure Relief Doors
434AL/444AL	Nacelle Strut - Aft Fairing

E. Consumables
(1) D00068 Turbine Engine Oil, MIL-L-23699

F. Close the thrust reverser

S 042-061-R00

WARNING: MAKE SURE THAT YOU OBEY THESE INSTRUCTIONS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, THE THRUST REVERSER COULD CLOSE SUDDENLY. THIS COULD CAUSE INJURIES TO PERSONS WHO ARE BETWEEN THE ENGINE AND THE THRUST REVERSER.

CLOSE THE THRUST REVERSER IF THE WIND SPEED IS MORE THAN 40 KNOTS.

WHEN THE THRUST REVERSERS ARE HELD OPEN WITH THE HOLD OPEN RODS, THEY SHOULD NOT STAY OPEN IF THE WIND SPEED IS MORE THAN 65 KNOTS.

WHEN YOU OPEN THE THRUST REVERSER, MAKE SURE YOU ENGAGE THE SCREWLATCH BEFORE YOU OPEN OTHER LATCHES. IF THE SCREWLATCH IS NOT ENGAGED, THE THRUST REVERSER COULD OPEN SUDDENLY AND COULD CAUSE INJURIES TO PERSONS.

(1) Make sure the thrust reverser deactivation for ground maintenance is done.

S 412-062-R00

CAUTION: BEFORE YOU CLOSE THE THRUST REVERSER, EXAMINE THE SEAL-PLATES FOR THE HP3 BLEED VALVE. THEY MUST BE SPRING LOADED FULLY OUT TO MAKE SURE THAT THE MATING BLEED VALVE OUTLET ON THE INNER SURFACE OF THE THRUST REVERSER IS COMPLETELY SEALED. DAMAGE TO EQUIPMENT CAN OCCUR IF THE INNER SURFACE IS NOT SEALED.

(2) Examine the seal plates on the HP3 bleed valve.

S 942-063-R00

CAUTION: MAKE SURE THE AREA AROUND THE THRUST REVERSER IS FREE OF TOOLS AND EQUIPMENT BEFORE YOU CLOSE THE THRUST REVERSER. IF THE AREA IS NOT FREE OF TOOLS AND EQUIPMENT, DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Make sure no tools or equipment remain between the engine and the inside cowl of the thrust reverser.

S 982-064-R00

(4) Do these steps to close the thrust reverser.

CAUTION: MAKE SURE YOU CORRECTLY CONNECT THE HYDRAULIC HAND PUMP TO THE MANIFOLD CONNECTOR OF THE THRUST REVERSER. IF THE HAND PUMP IS NOT CORRECTLY CONNECTED TO THE MANIFOLD CONNECTOR, THE ACTUATOR WILL NOT HOLD THE WEIGHT OF THE THRUST REVERSER. THIS COULD CAUSE DAMAGE TO EQUIPMENT.

(a) Attach the hose to the actuator manifold connector (1, Fig. 204).
(b) Add engine oil in the hand pump if it is necessary (AMM 12-13-01/301).
    1) Use only approved engine oil in the hand pump.
(c) Operate the hand pump to open the thrust reverser and let the hold-open rods disengage from the rod anchoring brackets.

CAUTION: YOU MUST PUT THE LEFT HOLD-OPEN ROD IN ITS STOWAGE WITH THE UNIVERSAL JOINT IN THE CORRECT POSITION. IF YOU DO NOT DO THIS, YOU CAN CAUSE DAMAGE TO THE NO. 14 FUEL SUPPLY TUBE.

(d) Put the forward hold-open rod in the rod stowage bracket (3).
    1) RB211-535E4/-535E4-B ENGINES PRE-RR-SB 72-C230;
       The left hold-open rod can be in its stowage with the universal joint in one of the two positions (Fig. 205, View A-A).
    2) RB211-535E4-C ENGINES POST-RR-SB 72-C230;
       RB211-535E4/-535E4-B ENGINES POST-RR-SB 72-C230;
       The left hold-open rod must be in its stowage with the universal joint (10) in the correct position (Fig. 205, View A-A).
    3) The right hold-open rod can be in its stowage with the universal joint in one of the two positions (Fig. 205 Sheet 2).
(e) Lock the forward hold-open rod to the rod stowage bracket (3) with the collar (5) (Fig. 205 Sheet 1).
(f) Push the locking arm (2) on the rear hold-open rod and retract the rod.
(g) Release the locking arm (2).
(h) Put the rear hold-open rod in the rod stowage bracket (3).
(i) Lock the rear hold-open rod to the rod stowage bracket (3) with the collar (5) (Fig. 205 Sheet 1).

CAUTION: MAKE SURE THE FRONT LATCH IS LOCKED WHEN YOU CLOSE THE LEFT THRUST REVERSER. IF THE FRONT LATCH IS NOT LOCKED, DAMAGE CAN OCCUR TO THE THRUST REVERSER

(j) Slowly open the valve (3) on the hand pump and let the thrust reverser close (Fig. 204).

CAUTION: YOU MUST SLOWLY CLOSE THE C-DUCT. MAKE SURE THE HINGE ACCESS DOOR OPERATES CORRECTLY AFTER THE LATCH IS ENGAGED. MAKE SURE THE HINGE ACCESS DOOR IS ALIGNED WITH THE TOP OF THE C-DUCT. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE FAN COWL, THE FAN C-DUCT AND THE THRUST REVERSER CAN OCCUR.

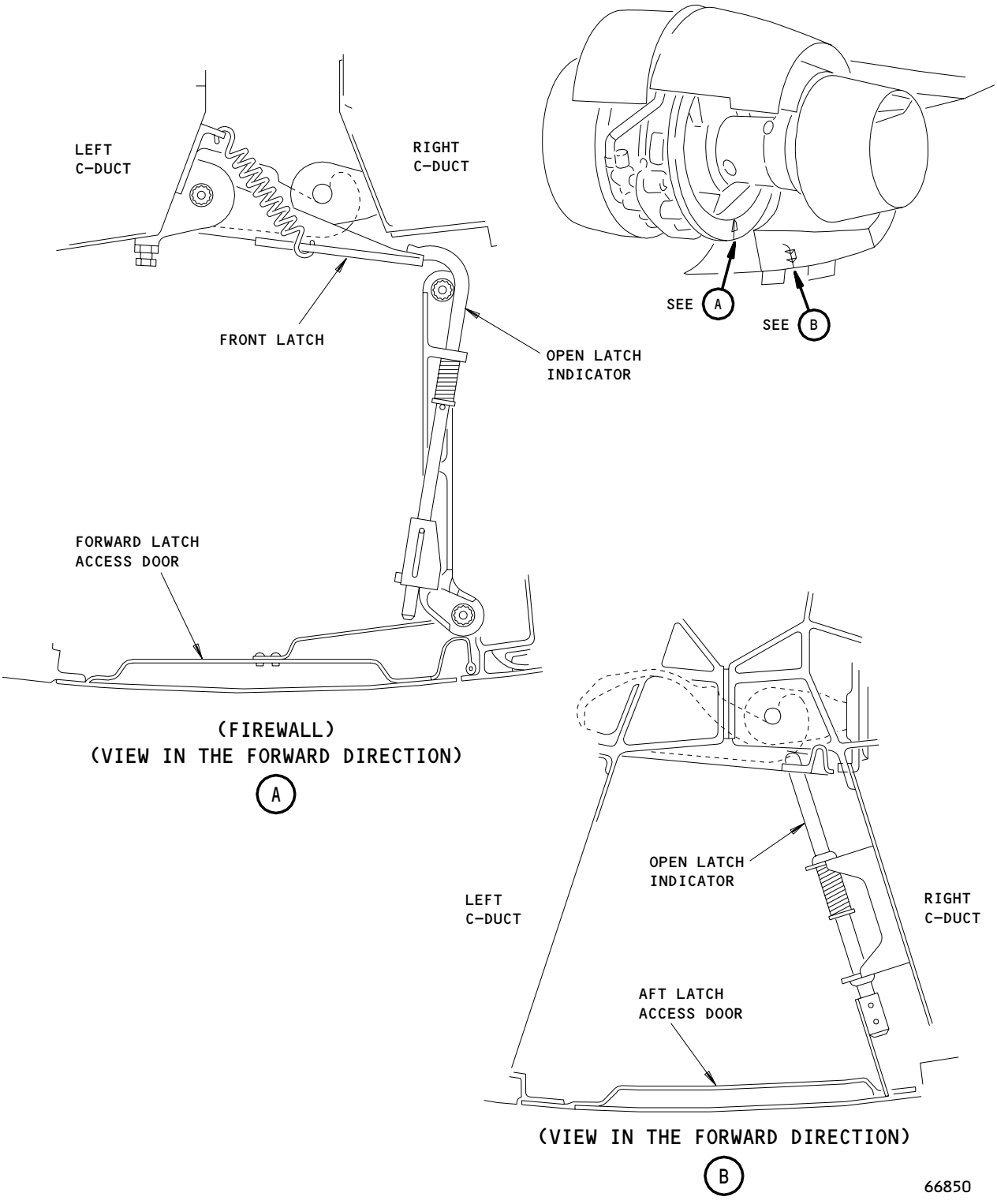
(k) Make sure you align the hinge access door, 415BL (425BL) or 416BR (426BR) with the top of the thrust reverser (AMM 78-31-10/401).
(l) Engage the latch assembly at position E (Fig. 203).
    1) Make sure you install the latch assembly correctly against the open latch indicator.
(m) Disconnect and remove the hose connector from the actuator manifold connector (1, Fig. 204).
(n) Engage the screw latch at position C (Fig. 203).
    1) Use an open-end wrench to adjust the length of the screw latch to pull the thrust reversers together.
        a) Loosen the adjustment nut first to adjust the screw latch.
        b) Once the screw latch is adjusted out to fit in the pin, use the open-end wrench (on the screw latch) to pull the reverser half closer until adjacent latches can be latched.
(o) Engage and lock the thrust reverser latch at position B (Fig. 203).
(p) Engage and lock the thrust reverser latch at position D.
(q) Engage and lock the thrust reverser latches at positions C and E.
(r) Make sure you disengage the screw latch (Fig. 203).

NOTE: The hook of the screw latch must be disengaged from the pin on the opposite C-duct completely and hang down.

S 412-107-R00

CAUTION: DO AN INSPECTION OF THE THRUST REVERSER HEATSHIELDS AND THE ZONE 3 AREA IF THE ACCESS DOOR, 415KL (425KL) COMES OPEN FREQUENTLY. FIND AND REPAIR THE AIR LEAKAGE. IF YOU DO NOT REPAIR THE AIR LEAKAGE, DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Do these steps to close the access panels 415FL (425FL) and 415KL (425KL) (Fig. 206):
    (a) Make sure the open latch indicator is correctly set.
    (b) Close the access panels (Fig. 206).



Thrust Reverser - Open Latch Indicators
Figure 206

(c) Look at the right side of the thrust reverser to make sure that the latch indicators for the access panels show the closed position.

S 442-066-R00

(6) Do the thrust reverser activation procedure.

TASK 78-31-00-912-067-R00

6. Manually Deploy (Extend) the Thrust Reverser

A. General

(1) The left and right thrust reverser halves are connected by a crossover shaft at the top of the thrust reverser. To manually deploy (extend) or stow (retract) the thrust reverser, the two locking actuators must be unlocked. If the thrust reverser has a sync-lock, the sync-lock must be unlocked too.

B. Access

(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - Aft Structure

C. Manually Deploy (Extend) the Thrust Reverser (Fig. 207)

S 042-068-R00

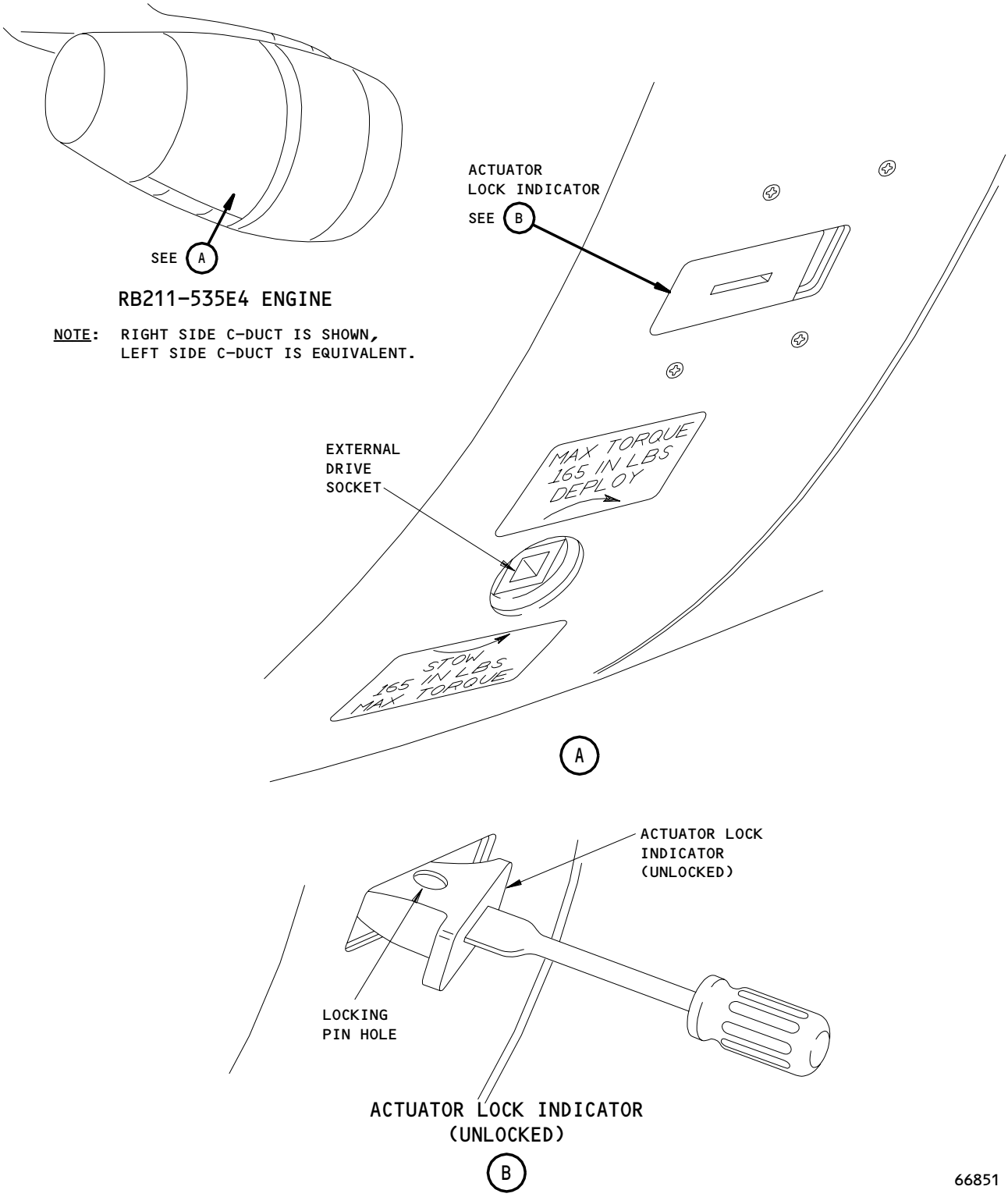
(1) Do the deactivation procedure for the thrust reverser for ground maintenance.

S 032-069-R00

CAUTION: DO NOT OPEN A THRUST REVERSER IF IT IS EXTENDED MORE THAN FOUR INCHES FROM THE FULLY RETRACTED POSITION. DAMAGE TO THE TRANSLATING COWL AND THE HINGE ACCESS DOORS CAN OCCUR.

IF YOU MUST OPEN THE THRUST REVERSER WHEN IT IS EXTENDED MORE THAN 4 INCHES, FIRST REMOVE THE HINGE ACCESS DOORS (AMM 78-31-10/401).

(2) Remove the hinge access doors if it is necessary (AMM 78-31-10/401).



Thrust Reverser Actuator Manual Lock and Crank Locations
Figure 207

S 982-102-R00

(3) If the sync-locks are locked, do these steps to unlock the sync-locks on the right C-duct center actuator (Fig. 207):
  (a) Put a screwdriver blade in the slot in the actuator lock indicator.
  (b) Pull the lock indicator out and install a lockpin in the locking pin hole to keep the indicator in the unlocked position.
  (c) Attach a warning streamer to show the lockpin is installed.
  (d) Do the above steps again for the opposite thrust reverser on the other half.

S 982-098-R00

(4) If the sync-locks are unlocked, then continue.

S 422-099-R00

(5) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR POST-RR-SB 78-9613; Do these steps to manually deploy (extend) the thrust reverser (Fig. 209).

CAUTION: THE MAXIMUM TORQUE PERMITTED WHEN YOU RETRACT THE THRUST REVERSER IS 165 INCH-POUNDS (18.6 NEWTON-METERS).

CAUTION: DO NOT USE POWER TOOLS WHEN YOU DEPLOY (EXTEND) THE THRUST REVERSER. THE LARGE TORQUE MADE BY THESE TOOLS CAN CAUSE DAMAGE TO THE TRANSLATING MECHANISM.

  (a) Install a 0.375 inch square drive in the manual drive socket of the translating cowl.
  (b) Push in the square drive to engage the internal drive, and turn the drive clockwise to deploy (extend) the thrust reverser.
  (c) Remove the square drive.

S 982-100-R00

(6) Do these steps to lock the sync-locks on the right C-duct center actuator (Fig. 207):
  (a) Put a screwdriver blade in the slot in the actuator lock indicator.
  (b) Pull the lock indicator out to relieve tension on the lockpin.
  (c) Remove the lockpin and the streamer.
  (d) Push the lock indicator in and put the lock indicator in the locked position.

S 862-109-R00

(7) Do the Thrust Reverser Activation for Ground Maintenance
  (a) Make sure that the sync-lock indicator is not above the fairing surface.

TASK 78-31-00-912-071-R00

7. Manually Stow (Retract) the Thrust Reverser

A. General

(1) This procedure provides the information required to manually stow (retract) the thrust reverser.

B. Access

(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - Aft Structure

C. Manually Stow (Retract) the Thrust Reverser (Fig. 207)

S 042-072-R00

(1) Make sure that the thrust reverser deactivation for Ground Maintenance task is done.

S 982-101-R00

(2) If the sync-locks are locked, then do these steps to unlock the sync-locks on the right C-duct center actuator (Fig. 207):

(a) Put the screwdriver blade in the slot in the actuator lock indicator.

(b) Pull the lock indicator out and install a lockpin in the locking pin hole to keep the indicator in the unlocked position.

(c) Attach a warning streamer to show the lockpin is installed.

(d) Do the above steps again for the opposite thrust reverser on the other half.

S 982-104-R00

(3) If the sync-locks are unlocked, then continue.

S 042-103-R00

(4) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR POST-RR-SB 78-9613; Do these steps to manually stow (retract) the thrust reverser (Fig. 209).

CAUTION: THE MAXIMUM TORQUE PERMITTED WHEN YOU RETRACT THE THRUST REVERSER IS 165 INCH-POUNDS (18.6 NEWTON-METERS).

CAUTION: DO NOT USE POWER TOOLS WHEN YOU STOW (RETRACT) THE THRUST REVERSER. THE LARGE TORQUE MADE BY THESE TOOLS CAN CAUSE DAMAGE TO THE TRANSLATING MECHANISM.

(a) Install a 0.375 inch square drive in the manual drive socket of the translating cowl.

(b) Push in the square drive to engage the internal drive, and turn the drive mechanism counterclockwise to stow (retract) the thrust reverser.

NOTE: If the opposite translating cowl does not fully stow (retract), use the manual drive mechanism in that thrust reverser to stow (retract) it fully.

(c) Remove the square drive.

S 442-105-R00

(5) Do these steps to lock the sync-lock on the right C-duct center actuator (Fig. 207):
(a) Put the screwdriver blade in the slot in the sync-lock indicator.
(b) Pull the lock indicator out to relieve tension on the lockpin.
(c) Remove the lockpin and the streamer.
(d) Push the lock indicator in and put the lock indicator in the locked position.
(e) Make sure that the sync-lock indicator is not above the fairing surface.

S 442-074-R00

(6) Do the activation procedure for the thrust reverser.

TASK 78-31-00-912-075-R00

8. Extend (Deploy) the Thrust Reverser with Hydraulic Power

A. General
(1) This task provides the information required to power deploy (extend) the thrust reverser. This task requires the hydraulic system to be pressurized.

B. References
(1) AMM 24-22-00/201, Electrical Power
(2) AMM 29-11-00/201, Hydraulic Power

C. Access
(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - Aft Structure

(2) Access Panels

413BL/423BL	Start Air Valve
415FL/425FL	Thrust Reverser - Forward Latch Access
415KL/425KL	Thrust Reverser - Rear Latch Access/Zone 3 Pressure Relief Doors
434AL/444AL	Nacelle Strut - Aft Fairing

D. Extend the Thrust Reverser with Hydraulic Power.

S 862-076-R00

CAUTION: DO NOT EXTEND THE THRUST REVERSER WITH THE THRUST REVERSER OPEN. DAMAGE TO THE THRUST REVERSER AND THE WING CAN OCCUR IF THE THRUST REVERSER IS OPEN.

(1) Close the thrust reverser if it is necessary.

S 942-077-R00

CAUTION: REMOVE ALL EQUIPMENT, TOOLS, AND UNWANTED OBJECTS THAT ARE ON THE OUTSIDE OF THE THRUST REVERSER OR INSIDE THE FAN DUCT OF THE THRUST REVERSER. DAMAGE TO THE THRUST REVERSER WILL OCCUR WHEN THE THRUST REVERSER EXTENDS REARWARD.

(2) Make sure there are no tools, equipment, or unwanted objects on the outside or the inside the thrust reverser.

S 412-078-R00

CAUTION: YOU MUST CLOSE THE ACCESS PANELS 415FL(425FL) AND 415KL(425KL) BEFORE YOU OPERATE THE THRUST REVERSER. DAMAGE TO THE THRUST REVERSER CAN OCCUR IF THE THRUST REVERSERS ARE OPEN.

(3) Make sure the access panels 415FL(425FL) and 415KL(425KL) are closed (Fig. 208).

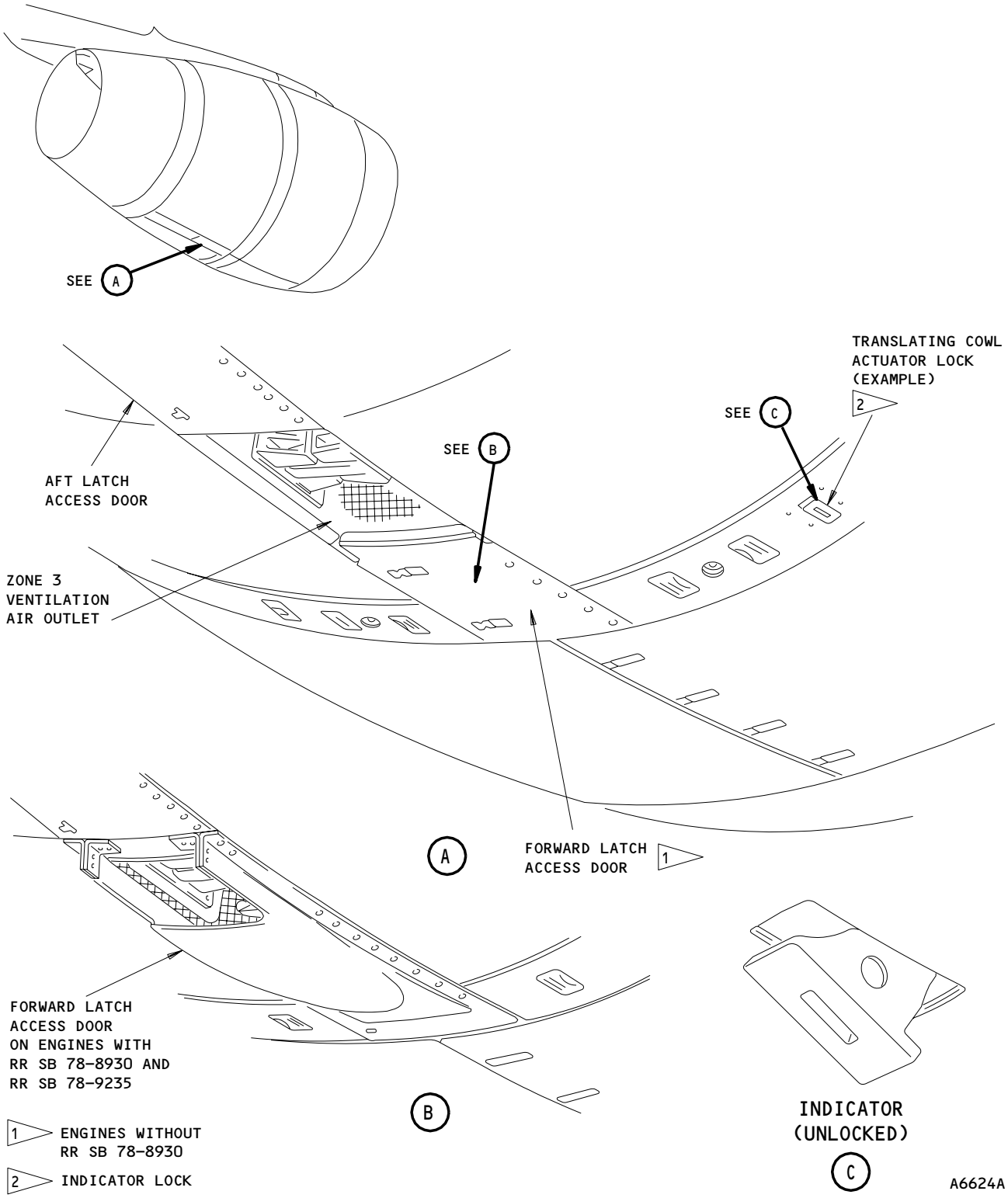
S 862-079-R00

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

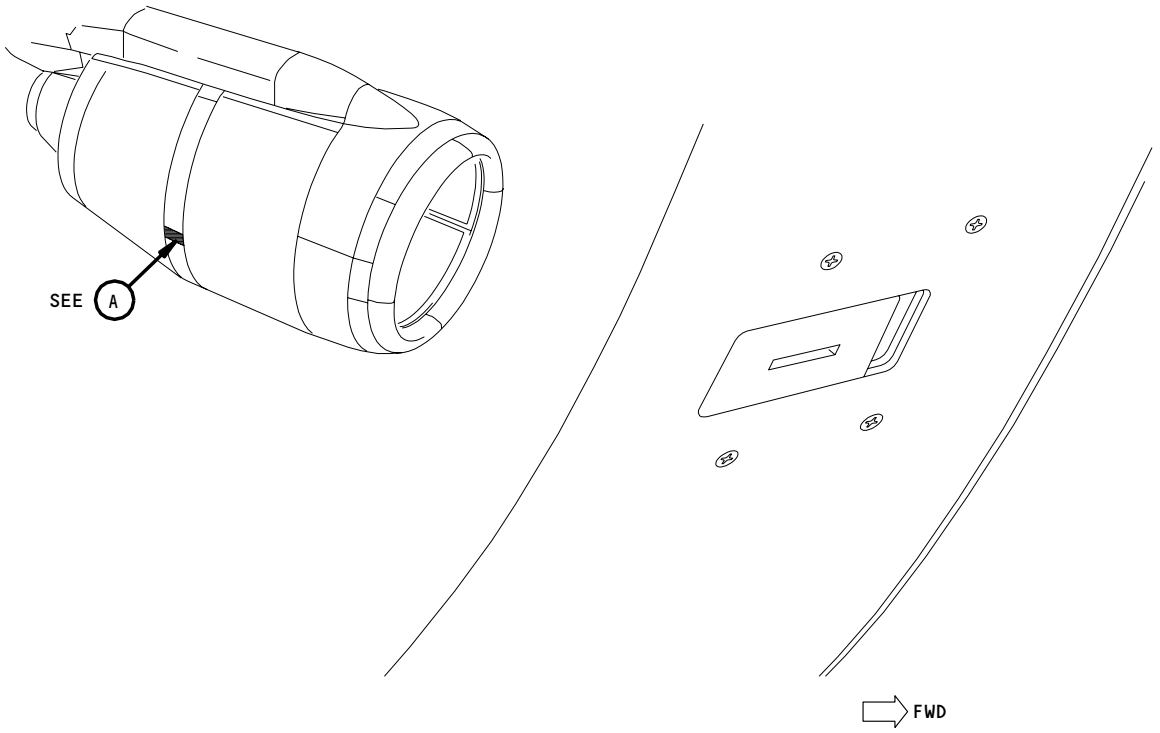
S 862-080-R00

WARNING: MAKE SURE THE THRUST REVERSER POSITION AGREES WITH THE POSITION OF THE REVERSE THRUST LEVER. IF THEY DO NOT AGREE, THE THRUST REVERSER WILL EXTEND WHEN YOU APPLY THE HYDRAULIC PRESSURE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Make sure the forward thrust levers are at the aft position and the reverse thrust levers are in the forward and down position.

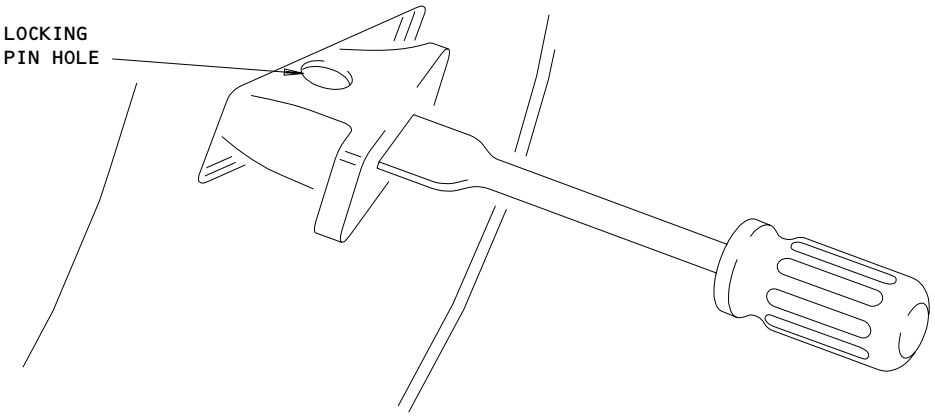


Thrust Reverser Lock Indicator and Latch Access Panel Location
Figure 208



SYNC-LOCK MANUAL UNLOCK INDICATOR
(LOCKED)

A



SYNC-LOCK MANUAL UNLOCK INDICATOR
(NOT LOCKED)

A

55616

Thrust Reverser Sync-Lock Manual Unlock Indicator
Figure 209

S 862-081-R00

(6) Supply the hydraulic pressure (AMM 29-11-00/201).

S 862-082-R00

WARNING: MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AFT OF THE THRUST REVERSER. BECAUSE THE THRUST REVERSER EXTENDS REARWARD IN APPROXIMATELY 2 SECONDS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR IF THE AREA IS NOT CLEAR.

(7) Pull the reverse thrust lever aft to the reverse idle detent position.
(a) The thrust reverser will fully extend.

S 942-083-R00

(8) Attach a DO-NOT-OPERATE tag to the thrust levers.

S 862-084-R00

(9) Remove the hydraulic pressure supply from the thrust reverser system (AMM 29-11-00/201).

S 862-085-R00

(10) Remove the electrical power (AMM 24-22-00/201).

TASK 78-31-00-912-086-R00

9. Retract (Stow) the Thrust Reverser with Hydraulic Power

A. General
(1) This task provides the information required to power stow (retract) the thrust reverser. This task requires the hydraulic system to be pressurized.

B. References
(1) AMM 24-22-00/201, Electrical Power
(2) AMM 29-11-00/201, Hydraulic Power

C. Access
(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
434/444	Nacelle strut - Aft Structure

(2) Access Panels

413BL/423BL	Start Air Valve
415FL/425FL	Thrust Reverser - Forward Latch Access
415KL/425KL	Thrust Reverser - Rear Latch Access/Zone 3 Pressure Relief Doors
434AL/444AL	Nacelle Strut - Aft Fairing

D. Retract the Thrust Reverser with Hydraulic Power.

S 942-112-R00

CAUTION: DO NOT USE THIS PROCEDURE WITH THE THRUST REVERSER OPEN. DAMAGE TO THE THRUST REVERSER CAN OCCUR.

CAUTION: REMOVE ALL EQUIPMENT, TOOLS, AND UNWANTED OBJECTS THAT ARE ON THE OUTSIDE OF THE THRUST REVERSER OR INSIDE THE FAN DUCT OF THE THRUST REVERSER. DAMAGE TO THE THRUST REVERSER WILL OCCUR WHEN THE THRUST REVERSER RETRACTS FORWARD.

(1) Make sure the thrust reverser is free of unwanted objects.

S 412-088-R00

CAUTION: THE ACCESS PANELS 415FL(425FL) AND 415KL(425KL) MUST BE CLOSED BEFORE YOU OPERATE THE THRUST REVERSER. DAMAGE TO THE THRUST REVERSER CAN OCCUR IF THE THRUST REVERSERS ARE OPEN.

(2) Make sure the access panels 415FL(425FL) and 415KL(425KL) are closed (Fig. 208).

S 862-089-R00

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

S 942-090-R00

(4) Remove the DO-NOT-OPERATE tags from the reverse thrust levers.

S 862-091-R00

WARNING: MAKE SURE THE THRUST REVERSER POSITION AGREES WITH THE POSITION OF THE REVERSE THRUST LEVER. IF THEY DO NOT AGREE, THE THRUST REVERSER WILL RETRACT WHEN YOU APPLY THE HYDRAULIC PRESSURE. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Make sure the reverse thrust levers are in the reverse idle detent position.

S 862-092-R00

(6) Supply the hydraulic pressure (AMM 29-11-00/201).

S 862-093-R00

WARNING: MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE AREA AROUND THE THRUST REVERSER. BECAUSE THE THRUST REVERSER RETRACTS FORWARD IN APPROXIMATELY 2 SECONDS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR IF THE AREA IS NOT CLEAR.

(7) Push the reverse thrust lever forward and down.
  (a) The thrust reverser will fully retract.

(b) Do not move the forward thrust levers from the idle position.

S 822-094-R00

(8) Do a check of the lock indicators to make sure they are smooth with the cowl (Fig. 208).

S 862-095-R00

(9) Remove the hydraulic pressure (AMM 29-11-00/201).

S 862-096-R00

(10) Remove the electrical power (AMM 24-22-00/201).

THRUST REVERSER SYSTEM - ADJUSTMENT/TEST

1. General
   A. These procedures will prepare the thrust reverser system for operation:
      - Usual Operations Test
      - Air/Ground Logic and Fire Shutoff Test
      - Auto-Restow and Sync-lock Test
      - Actuator Lock, Cross-over Shaft, and Sync-lock Integrity Test
   B. Each procedure can be used for the right and left thrust reversers.
   C. The Thrust Reverser Test Reference Table gives the minimum tests you must do after you repair or replace the thrust reverser parts in the table.

THRUST REVERSER TEST REFERENCE TABLE	
COMPONENTS	NECESSARY TESTS
Thrust Reverser Translating Cowl	Usual Operations Test Auto-Restow Test Actuator Lock, Cross-over Shaft, and Sync-lock Test
Isolation Valve	Usual Operations Test Auto-Restow Test
Hydraulic Actuators, Sync-lock, Rotary Flexshafts, and Tubes	Usual Operations Test Actuator Lock, Cross-over Shaft, and Sync-lock Test
Directional Control Valve Thrust Reverser Lock Proximity Sensor Thrust Reverser Deploy Proximity Sensor	Usual Operations Test
Auto-Restow Proximity Sensor	Auto-Restow Test
Thrust Reverser Electrical Control System - Wires, Switches, Relays	Air/Ground and Fire Shutoff Test Usual Operations Test

TASK 78-31-00-715-201-R01

2. Thrust Reverser - Prepare for the System Test

A. References

(1) AMM 27-61-00/201, Spoiler/Speedbrake Control System

B. Access

(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right

(2) Access Panels

434AL/444AL	Nacells Strut - Aft Fairing
415FL/425FL	Thrust Reverser - Forward Latch Access
415KL/425KL	Thrust Reverser - Rear Latch Access/Zone 3 Pressure Relief Doors

C. Prepare to Test the Thrust Reverser.

S 865-202-R01

WARNING: BE CAREFUL WHEN YOU WORK NEAR THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure the thrust levers are aligned as follows:
  (a) Make sure the forward thrust levers are at the rear idle stop position.
  (b) Make sure the reverse thrust levers are at the forward and down position.

S 045-203-R01

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the spoilers.

S 865-204-R01

(3) Make sure these circuit breakers are closed:
  (a) 11A33, INDICATOR LIGHTS 2
  (b) 11A34, INDICATOR LIGHTS 3
  (c) 11C30, LANDING GEAR POS SYS 1

(d) 11J2, EICAS CMPTR LEFT
(e) 11J3, EICAS UPPER IND
(f) 11J29, EICAS CMPTR RIGHT
(g) 11J30, EICAS LOWER IND
(h) 11J31, EICAS DISPLAY SW
(i) 11J32, EICAS PILOTS DSP
(j) 11S15, AIR/GND SYS 1
(k) 11S19, AIR/GND SYS 2
(l) 11S23, LANDING GEAR POS SYS 2
(m) 11C19, LANDING GEAR POS SYS 2-ALTN

S 865-205-R01
(4) For the left engine, make sure these circuit breakers are closed.
(a) On the overhead equipment panel P11:
1) 11D11, T/R IND L
2) 11D12, T/R CONT L
(b) On the power distribution panel P6:
1) 6C12, L ENG SYNC LOCK

S 865-206-R01
(5) For the right engine, make sure these circuit breakers are closed.
(a) On the overhead equipment panel P11:
1) 11B29, T/R IND R
2) 11B30, T/R CONT R
3) 11K32, R ENG SYNC LOCK
4) 11K33, T/R CONT R
(b) On the power distribution panel P6:
1) 6D12, R ENG SYNC LOCK ALTN

S 865-207-R01
(6) Make sure the thrust reversers are retracted and locked.

S 865-208-R01
(7) Open the access panel 434AL (444AL) for the main hydraulic bay in the strut.

S 865-209-R01
(8) Make sure the isolation valve is in the usual (not bypass) condition.

S 865-210-R01
(9) Make sure the thrust reverser is free of foreign objects.

S 865-211-R01

CAUTION: MAKE SURE THE THRUST REVERSER, THE HINGE ACCESS DOORS AND THE LATCH ACCESS PANELS ON THE THRUST REVERSER ARE CLOSED BEFORE YOU OPERATE THE THRUST REVERSER. DAMAGE TO THE THRUST REVERSER OR THE HINGE ACCESS DOORS CAN OCCUR IF THE THRUST REVERSER IS OPEN AND EXTENDED.

(10) Close the thrust reverser, if it is necessary (AMM 78-31-00/201).

NOTE: The hinge access doors are the access panels 415BL, 425BL, 415BR, and 425BL and the latch access panels are 415FL, 425FL, 415KL, and 425KL.

TASK 78-31-00-715-216-R01

3. Usual Operations Test

A. General

(1) It is necessary to use hydraulic power when you do this test. You can supply the hydraulic power with a ground cart or with the hydraulic pumps on the airplane.

B. Equipment

(1) Stopwatch

(2) Hydraulic Service Cart
(Capacity of 16 gpm at 3000 psi).

C. References

(1) 24-22-00/201, Electrical Power - Control

(2) 29-11-00/201, Main Hydraulic System

D. Access

(1) Location Zones

210	Control Cabin
413/423	Fan Cowl Panel, Left
414/424	Fan Cowl Panel, Right

E. Do the Usual Operations Test.

S 865-217-R01

(1) Do this procedure: Prepare for the System Test of the Thrust Reverser.

S 865-218-R01

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

S 865-219-R01

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEM PUMPS MORE THAN 2 MINUTES UNLESS THE FUEL TANKS CONTAIN MORE THAN 600 GALLONS. THE HYDRAULIC SYSTEM FLUID IS COOLED BY FUEL THROUGH THE HEAT EXCHANGERS IN THE FUEL TANKS. IF YOU OPERATE THE PUMPS FOR MORE THAN 2 MINUTES WITH LESS THAN 600 GALLONS IN THE FUEL TANKS, STOP THE TEST AND LET THE HYDRAULIC RESERVOIR COOL TO AMBIENT TEMPERATURE BEFORE YOU START THE TEST AGAIN.

(3) Supply the hydraulic power (AMM 29-11-00/201).

NOTE: Pressurize the hydraulic systems with the airplane pumps, or a hydraulic cart set at 2850 - 3150 psig. The left hydraulic system supplies the left thrust reverser. The right hydraulic system supplies the right thrust reverser.

(a) Supply hydraulic power with the hydraulic service cart; or
(b) Supply the hydraulic power with the airplane AC motor pumps.

S 715-220-R01

(4) Do these steps to measure the time for the thrust reverser to extend.
(a) Make sure that no REV message is shown on the EICAS display.
(b) Make sure that no (L,R) REV ISLN VAL advisory message is shown on the EICAS display.
(c) Monitor the REV EICAS message to measure the time the thrust reverser takes to extend.

NOTE: When the thrust reverser is fully retracted, there is no REV message on the EICAS display. As the thrust reverser extends, an amber REV message will be shown on the EICAS display. When the thrust reverser is fully extended, the REV message will change color from amber to green.

(d) Move the reverse thrust lever rearward to the reverse thrust position.

(e) Measure the time from the initial movement of the reverse thrust lever until the EICAS message, REV, changes from amber to green.

NOTE: This time must not be more than 2 seconds when you use a hydraulics cart, or 6 seconds when you use the pumps of the hydraulic system.

(f) Make sure that the advisory EICAS message, (L,R) REV ISLN VAL, is not shown on the EICAS display.
(g) Make sure the sync-lock visual indicator/manual unlock lever on the right sleeve of the thrust reverser is extended.

NOTE: The sync-lock visual indicator is located on the right half, near the center non-locking actuator.

S 715-221-R01
(5) Do these steps to measure the time for the thrust reverser to retract.
(a) Monitor the REV EICAS message to measure the time the thrust reverser takes to retract.

NOTE: When the thrust reverser is fully extended, there is a green REV message on the EICAS display. As the thrust reverser retracts, the REV message will change color from green to amber. When the thrust reverser is fully retracted, the REV message will go out on the EICAS display.

(b) Move the reverse thrust lever to the forward and down position.
(c) Measure the time from the initial movement of the reverse thrust lever until the amber REV message goes out.

NOTE: This time must not be more than 5 seconds when you use a hydraulic cart, or 15 seconds when you use the pumps of the hydraulic system.

(d) Make sure that the EICAS message, REV is not shown on the EICAS display.
(e) Make sure that the advisory EICAS message, (L,R) REV ISLN VAL, is not shown on the EICAS display.
(f) Make sure the sync-lock visual indicator/manual unlock lever on the right sleeve of the thrust reverser is retracted.

S 715-222-R01

(6) Test the power sense relay for the right thrust reverser.

NOTE: The right electrical bus or the battery bus can supply the electrical power for the right thrust reverser. A power sense relay completes the circuit to supply the electrical power from the right electrical bus. The coil of the power sense relay is energized by the right electrical bus. When the right electrical bus loses power, the power sense relay de-energizes and the electrical power is supplied from the battery bus to the right thrust reverser. The left thrust reverser is only supplied from the standby bus.

(a) Open these circuit breakers on the overhead circuit breaker panel, P11.
1) 11K33, R ENG T/R CONT
2) 11K32, R ENG SYNC-LOCK

(b) Move the right reverse thrust lever rearward to the extend position.

(c) Make sure the right thrust reverser fully extends.

(d) Move the right reverse thrust lever to the forward and down position.

(e) Make sure the right thrust reverser fully retracts.

(f) Close these circuit breakers on the overhead circuit breaker panel, P11.
1) 11K33, R ENG T/R CONT
2) 11K32, R ENG SYNC-LOCK

S 865-223-R01

(7) Remove the hydraulic power (AMM 29-11-00/201).

S 865-224-R01

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

TASK 78-31-00-715-226-R01

4. Thrust Reverser - Air/Ground Logic and Fire Shutoff Test

A. Equipment

(1) Hydraulic Service Cart
(Capacity of 16 gpm at 3000 psi).

B. References

(1) AMM 24-22-00/201, Electrical Power - Control

(2) AMM 29-11-00/201, Main Hydraulic System

C. Access
(1) Location Zones
210 Control Cabin
410 Left Power Plant Nacellee
420 Right Power Plant Nacelle

D. Do the Air/Ground Logic and Fire Shutoff Test

S 865-227-R01
(1) Do this procedure: Prepare for the System Test of the Thrust Reverser.

S 865-228-R01
(2) Supply the electrical power (AMM 24-22-00/201).

S 865-229-R01

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEM PUMPS MORE THAN 2 MINUTES UNLESS THE FUEL TANKS CONTAIN MORE THAN 600 GALLONS. THE HYDRAULIC SYSTEM FLUID IS COOLED BY FUEL THROUGH THE HEAT EXCHANGERS IN THE FUEL TANKS. IF YOU OPERATE THE PUMPS FOR MORE THAN 2 MINUTES WITH LESS THAN 600 GALLONS OF FUEL IN THE FUEL TANKS, STOP THE TEST AND LET THE HYDRAULIC RESERVOIR COOL TO AMBIENT TEMPERATURE BEFORE YOU START THE TEST AGAIN.

(3) Supply the hydraulic power (AMM 29-11-00/201).

S 865-231-R01
(4) Make sure that the EICAS advisory message, (L,R) REV ISLN VAL is not on.

S 865-232-R01
(5) Do these steps to put the air/ground system in the air mode.
(a) For the left engine, open this circuit breaker on the P11 overhead panel and attach a DO-NOT-CLOSE tag:
1) 11C30 LANDING GEAR POS SYS 1
(b) For the right engine, open this circuit breaker on the P11 overhead panel and attach a DO-NOT-CLOSE tag:
1) 11S23, LANDING GEAR POS SYS 2
2) 11C19, LANDING GEAR POS SYS 2 ALTN

S 865-233-R01
(6) Move the reverse thrust lever rearward to the reverse idle thrust position.

S 215-234-R01
(7) Make sure the thrust reversers do not extend.

S 215-235-R01
(8) Make sure the visual indicator/manual unlock lever for the sync-lock on the right thrust reverser half is not extended.

NOTE: The locked position is indicated when the lever is smooth with the outside surface of the thrust reverser.

S 215-236-R01
(9) Make sure the visual indicator/manual unlock lever for the two locking actuators are not extended.

NOTE: The locked position is indicated when the lever is smooth with the outside surface of the thrust reverser.

S 865-237-R01
(10) Move the reverse thrust lever to the forward and down position.

S 215-238-R01
(11) Make sure that the EICAS messages, REV and (L,R) REV ISLN VAL, do not come on.

S 865-239-R01
(12) Do these steps to put the air/ground system in the ground mode.
(a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 overhead panel:
1) 11C30, LANDING GEAR POS SYS 1
(b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 overhead panel:
1) 11S23, LANDING GEAR POS SYS 2
2) 11C19, LANDING GEAR POS SYS 2 ALTN

S 865-240-R01
(13) Do these steps to disarm the engine fire extinguishing systems:
(a) For the left engine, open these circuit breakers on the P6 power distribution panel and attach DO-NOT-CLOSE tags:
1) 6H1, FIRE EXTINGUISHING L BTL 1
2) 6H2, FIRE EXTINGUISHING L BTL 2
(b) For the right engine, open these circuit breakers on the P6 power distribution panel and attach DO-NOT-CLOSE tags:
1) 6H3, FIRE EXTINGUISHING R BTL 1

2) 6H4, FIRE EXTINGUISHING R BTL 2

S 865-241-R01
(14) Pull the fire handle up.

NOTE: Do not turn the fire handle.

S 865-242-R01
(15) Move the reverse thrust lever rearward to the reverse idle thrust position.

S 215-243-R01
(16) Make sure that the thrust reverser does not extend.

S 865-244-R01
(17) Move the reverse thrust lever to the forward and down position.

S 415-245-R01
(18) Push the fire handle down.

S 865-246-R01
(19) Do these steps to arm the engine fire extinquishing systems:
(a) For the left engine, remove the DO-NOT CLOSE tag and close this circuit breaker on the P6 power distribution panel:
1) 6H1, FIRE EXTINGUISHING L BTL 1
2) 6H2, FIRE EXTINGUISHING L BTL 2
(b) For the right engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 power distribution panel:
1) 6H3, FIRE EXTINGUISHING R BTL 1
2) 6H4, FIRE EXTINGUISHING R BTL 2

S 865-250-R01
(20) Remove the hydraulic power (Ref 29-11-00/201).

TASK 78-31-00-715-252-R01
5. Thrust Reverser - Auto Restow and Sync-lock Test
A. Equipment
(1) Hydraulic Service Cart
(Capacity of 16 gpm at 3000 psi).

B. References
(1) AMM 24-22-00/201, Electrical Power - Control
(2) AMM 29-11-00/201, Main Hydraulic System

C. Access
(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser, Left
416/426	Thrust Reverser, Right

D. The Auto-Restow and Sync-lock Test

S 865-253-R01
(1) Do this procedure: Prepare for the System Test of the Thrust Reverser.

S 015-254-R01
(2) Open the access door 119AL for the main electronics bay.

S 865-255-R01
(3) Supply the electrical power (AMM 24-22-00/201).

S 215-256-R01
(4) Make sure that the applicable thrust reverser is fully retracted.

S 865-257-R01

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE THRUST REVERSER, THE FLIGHT CONTROL SURFACES, AND THE LANDING GEAR. THE THRUST REVERSER, THE FLIGHT CONTROL SURFACES AND THE LANDING GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRALIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION: MAKE SURE YOU DO NOT OPERATE THE HYDRAULIC SYSTEM PUMPS MORE THAN 2 MINUTES UNLESS THE FUEL TANKS CONTAIN MORE THAN 600 GALLONS. THE HYDRAULIC SYSTEM FLUID IS COOLED BY FUEL THROUGH THE HEAT EXCHANGERS IN THE FUEL TANKS. IF YOU OPERATE THE PUMPS FOR MORE THAN 2 MINUTES, LET THE HYDRAULIC RESERVOIR COOL TO AMBIENT TEMPERATURE BEFORE YOU START THE TEST AGAIN.

(5) Supply the hydraulic power (AMM 29-11-00/201).

S 865-258-R01
(6) Do these steps to make sure the sync-lock is locked and operates correctly:
(a) Push the PRESS/TEST switch on the Proximity Switch Electronic Unit (PSEU).
(b) Make sure the number 888 and the five indicator lights come on.

(c) Use the SENSOR CHANNEL SELECT thumb switches to set the PSEU code for the auto-restow proximity sensor.
  1) AIRPLANES WITH PSEU (-17 OR -24);
     The left engine PSEU codes are 433.
  2) AIRPLANES WITH PSEU (-16);
     The left engine PSEU codes are 105.
  3) The right engine PSEU codes are 099.

(d) Push the TARGET TEST switch on the PSEU and hold for one second.
  1) Make sure the sensor number is shown on the LED display.
  2) Make sure the TARGET NEAR light comes on after four seconds.
  3) Make sure that the EICAS message L(R) REV ISLN VAL shows for approximately 3 seconds and then does not show.
  4) Make sure that the sync-lock manual unlock lever on the right sleeve of the thrust reverser does not extend.

(e) Push and release the RESET switch on the PSEU for each sensor target test.

(f) For the left engine, open these circuit breakers.

NOTE: The breakout box (A78025-77) can be used to make connections to the pins referenced in this task.

  1) On the power distribution panel P6:
     a) 6C12, L ENG SYNC LOCK

(g) For the right engine, open these circuit breakers.

NOTE: The breakout box (A78025 -77) can be used to make connections to the pins referenced in this task.

  1) On the overhead equipment panel P11:
     a) 11K32, R ENG SYNC LOCK
  2) On the power distribution panel P6:
     a) 6D12, R ENG SYNC LOCK-ALTN

(h) Move the left (right) reverser thrust lever up and aft to the reverse thrust position.
  1) Make sure the thrust reverser does not move to the extended position.

(i) Move the left (right) reverser thrust lever forward and down to the retracted position.

(j) For the left engine, close these circuit breakers.
  1) On the power distribution panel P6:
     a) 6C12, L ENG SYNC LOCK

(k) For the right engine, close these circuit breakers.
  1) On the overhead equipment panel P11:
     a) 11K32, R ENG SYNC LOCK
  2) On the power distribution panel P6:
     a) 6D12, R ENG SYNC LOCK-ALTN

(l) Move the left (right) reverser thrust lever up and aft to the reverse thrust position.
  1) Make sure the thrust reverser moves to the extended position.
(m) For the left engine, open this circuit breaker.
  1) On the overhead equipment panel P11:
    a) 11C30, LANDING GEAR POS SYS 1
(n) For the right engine, open these circuit breakers.
  1) On the overhead equipment panel P11:
    a) 11S23, LANDING GEAR POS SYS 2
    b) 11C19, LANDING GEAR POS SYS 2 ALTN
(o) Remove the hydraulic power (AMM 29-11-00/201).
  1) Make sure you let the system pressure decrease to a maximum of 125 psig.
  2) Make sure that the sync-lock manual unlock lever on the right thrust reverser sleeve retracts.

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE THRUST REVERSER, THE FLIGHT CONTROL SURFACES, AND THE LANDING GEAR. THE THRUST REVERSER, THE FLIGHT CONTROL SURFACES AND THE LANDING GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRALIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION: MAKE SURE YOU DO NOT OPERATE THE HYDRAULIC SYSTEM PUMPS MORE THAN 2 MINUTES UNLESS THE FUEL TANKS CONTAIN MORE THAN 600 GALLONS. THE HYDRAULIC SYSTEM FLUID IS COOLED BY FUEL THROUGH THE HEAT EXCHANGERS IN THE FUEL TANKS. IF YOU OPERATE THE PUMPS FOR MORE THAN 2 MINUTES, LET THE HYDRAULIC RESERVOIR COOL TO AMBIENT TEMPERATURE BEFORE YOU START THE TEST AGAIN.

(p) Supply the hydraulic power (AMM 29-11-00/201).
  1) Make sure that the sync-lock manual unlock lever on the right thrust reverser sleeve does not extend.
(q) Remove the hydraulic power (AMM 29-11-00/201).
  1) Make sure you let the system pressure decrease to a maximum of 125 psig.
(r) For the left engine, close these circuit breakers.
  1) On the overhead equipment panel P11:
    a) 11C30, LANDING GEAR POS SYS 1
(s) For the right engine, close these circuit breakers.
  1) On the overhead equipment panel P11:
    a) 11S23, LANDING GEAR POS SYS 2
    b) 11C19, LANDING GEAR POS SYS 2 ALTN

S 745-259-R01

(7) Do these steps to make sure the auto-restow proximity sensors operate correctly:

(a) Manually unlock the thrust reverser sync lock.

1) Install the pin through the manual unlock indicator.

(b) Push the PRESS/TEST switch on the Proximity Switch Electronic Unit (PSEU).

(c) Make sure the number 888 and the five indicator lights come on.

(d) Use the SENSOR CHANNEL SELECT thumb switches to set the PSEU code for the auto-restow proximity sensor.

1) AIRPLANES WITH PSEU (-17 OR -24);
The left engine PSEU codes are 433 (left half), and 434 (right half).

2) AIRPLANES WITH PSEU (-16);
The left engine PSEU codes are 105 (left half), and 108 (right half).

3) The right engine PSEU codes are 099 (left half), and 102 (right half).

(e) Push the TARGET TEST switch on the PSEU and hold for one second.

1) Make sure the sensor number is shown on the LED display.

2) Make sure the TARGET FAR light comes on after four seconds.

(f) Push and release the RESET switch on the PSEU for each sensor target test.

(g) Do the steps again for the second thrust reverser sleeve on the applicable engine.

(h) Move the left (right) reverse thrust lever forward and down to the retracted position.

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE THRUST REVERSER, THE FLIGHT CONTROL SURFACES, AND THE LANDING GEAR. THE THRUST REVERSER WILL IMMEDIATELY MOVE WHEN YOU SUPPLY HYDRALIC POWER. THE FLIGHT CONTROL SURFACES AND THE LANDING GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRALIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

(i) Supply the hydraulic power (AMM 29-11-00/201).

1) Make sure that thrust reverser retracts fully and locks.

(j) Remove the pin and streamer from the manual unlock indicator of the sync lock.

S 865-260-R01

(8) Put the Airplane Back to Its Usual Condition.

(a) Erase the L(R) REV ISLN VAL message on the ECS/MSG page of the EICAS display.

(b) Remove the hydraulic power (AMM 29-11-00/201).
(c) Remove the electrical power (AMM 24-22-00/201).
(d) Close the access door 119AL.

TASK 78-31-00-715-262-R01

6. Actuator Lock, Crossover Shaft Integrity Test

A. General
(1) This tasks also performs an integrity check of the sync-lock.

B. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-26/401, Thrust Reverser Hydraulic Actuators, Rotary Flexshafts and Tubing

C. Do the Integrity Test

S 045-263-R01

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 the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 865-264-R01

(2) Manually unlock the lower locking actuator on the right thrust reverser half (AMM 78-31-00/201).
(a) Install the pin and streamer through the indicator.

S 865-265-R01

(3) Manually unlock the sync-lock on the right thrust reverser half (AMM 78-31-00/201).
(a) Install the pin and streamer through the indicator.

S 985-266-R01

CAUTION: DO NOT APPLY MORE THAN 165 POUND-INCHES (18.6 NM) OF TORQUE WHEN YOU EXTEND THE THRUST REVERSER. DAMAGE TO THE ACTUATORS AND ROTARY FLEX SHAFTS CAN OCCUR.

(4) Try to manually extend the thrust reverser at the external drive socket on the left thrust reverser half (AMM 78-31-00/201).
(a) Make sure that the two translating cowls do not move more than 0.06 inches (1.52 mm) aft.

(b) If the cowls extend, replace the L.H. lower actuator (AMM 78-31-26/401) and repeat the check.

S 865-267-R01

(5) Remove the pin and streamer and manually lock the lower locking actuator on the right thrust reverser half (AMM 78-31-00/201).

S 865-268-R01

(6) Manually unlock the lower locking actuator on the left thrust reverser half (AMM 78-31-00/201).
(a) Install the pin and streamer through the indicator.

S 985-269-R01

CAUTION: DO NOT APPLY MORE THAN 165 POUND-INCHES (18.6 NM) OF TORQUE WHEN YOU EXTEND THE THRUST REVERSER. DAMAGE TO THE ACTUATORS AND ROTARY FLEX SHAFTS CAN OCCUR.

(7) Try to manually extend the thrust reverser at the external drive socket on the left thrust reverser half (AMM 78-31-00/201).
(a) Make sure that the two translating cowls do not move more than 0.75 inches (19 mm) aft.
(b) If the L.H. cowl extends, replace the flexible crossover shaft (AMM 78-31-26/401) and repeat the check.
(c) If both cowls extend, replace the R.H. lower actuator (AMM 78-31-26/401) and repeat the check.

S 865-270-R01

(8) Manually unlock the lower locking actuator on the right thrust reverser half (AMM 78-31-00/201).
(a) Install the pin and streamer through the indicator.

S 865-271-R01

(9) Remove the pin and streamer and manually lock the sync-lock on the right thrust reverser half (AMM 78-31-00/201).

S 985-272-R01

CAUTION: DO NOT APPLY MORE THAN 165 POUND-INCHES (18.6 NM) OF TORQUE WHEN YOU EXTEND THE THRUST REVERSER. DAMAGE TO THE ACTUATORS AND ROTARY FLEX SHAFTS CAN OCCUR.

(10) Try to manually extend the thrust reverser at the external drive socket on the left thrust reverser half (AMM 78-31-00/201).
  (a) Make sure that the two translating cowls do not move more than 0.75 inches (19 mm) aft.

    NOTE: The cowls may move slightly as the sync-lock fully engages.

  (b) If the cowls extend, replace the sync lock (AMM 78-31-26/401), and repeat the check.

S 865-273-R01
(11) Remove the pins and streamers and manually lock the left and right lower actuators (AMM 78-31-00/201).

S 865-287-R01
(12) Make sure the sync-lock on the right thrust reverser half is locked (AMM 78-31-00/201).

S 445-274-R01
(13) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 865-275-R01
(14) Make sure the two translating cowls are fully retracted and the manual unlock indicators are smooth with the surface of the fairing.

S 715-276-R01
(15) Do the Usual Operations Test of the thrust reverser (AMM 78-31-00/501).

TASK 78-31-00-845-277-R01

7. Put the Airplane Back To Its Usual Condition

A. Procedure

S 865-278-R01
(1) Remove the messages from the ECS/MSG page of the EICAS display.

S 445-279-R01
(2) Do the activation procedure for the spoilers if you did the deactivation procedure (AMM 27-61-00/201).

S 865-283-R01
(3) Make sure hydraulic power is removed (AMM 29-11-00/201).

THRUST REVERSER SYSTEM - ADJUSTMENT/TEST

1. General
   A. These procedures will prepare the thrust reverser system for operation:
      - Thrust Reverser Extension/Retraction and Indication Test
      - Air/Ground Logic and Fire Shutoff Test
      - Auto-Restow Test
      - Actuator Lock and Cross-over Shaft Integrity Test
      - Hydraulic Pressure Switch Test
   B. Each procedure can be used for the right and left thrust reversers.
   C. The Thrust Reverser Test Reference Table gives the minimum tests you must do after you repair or replace the thrust reverser parts in the table.

THRUST REVERSER TEST REFERENCE TABLE	
COMPONENTS	NECESSARY TESTS
Thrust Reverser Translating Cowl Isolation Valve	T/R Extension/Retraction and Indication Test Auto-Restow Test
Hydraulic Actuators, Rotary Flexshaft, and Tubes	T/R Extension/Retraction and Indication Test Actuator Lock and Cross-over Shaft Integrity Test
Directional Control Valve Thrust Reverser Lock Proximity Sensor Thrust Reverser Deploy Proximity Sensor	T/R Extension/Retraction and Indication Test
Auto-Restow Proximity Sensor	Auto-Restow Test
Thrust Reverser Electrical Control System - Wires, Switches, Relays	Air/Ground and Fire Shutoff Test T/R Extension/Retraction and Indication Test

TASK 78-31-00-715-001-R02

2. Thrust Reverser - Prepare for the System Test

A. References

(1) AMM 27-61-00/201, Spoiler/Speedbrake Control System

B. Access

(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right

(2) Access Panels

434AL/444AL	Nacells Strut - Aft Fairing
415FL/425FL	Thrust Reverser - Forward Latch Access
415KL/425KL	Thrust Reverser - Rear Latch Access/Zone 3 Pressure Relief Doors

C. Prepare to Test the Thrust Reverser.

S 865-002-R02

WARNING: BE CAREFUL WHEN YOU WORK NEAR THE THRUST REVERSER ON ENGINES WITHOUT THE OVERRIDE SWITCH. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure the thrust levers and the thrust reversers are aligned as follows:
   (a) Make sure the forward thrust levers are at the idle position.
   (b) Make sure the reverse thrust levers are at the forward thrust position.
   (c) Make sure the thrust reversers are retracted and locked.

S 045-003-R02

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE SPOILERS OR MOVE ALL PERSONS AND EQUIPMENT AWAY FROM THE SPOILERS. THE SPOILERS CAN RETRACT QUICKLY AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do the deactivation procedure for the spoilers (AMM 27-61-00/201) or move all persons and equipment away from the spoilers.

S 865-004-R02

(3) Open the access panel 434AL(444AL) and make sure the isolation valve is in the usual (not bypass) condition.

S 865-005-R02
(4) Make sure the thrust reverser is free of foreign objects.

S 865-006-R02

CAUTION: YOU MUST CLOSE THE ACCESS PANELS 415FL(425FL) AND 415KL(425KL) BEFORE YOU OPERATE THE THRUST REVERSER. DAMAGE TO THE THRUST REVERSER CAN OCCUR IF THE THRUST REVERSERS ARE OPEN.

(5) Make sure the access panels 415FL(425FL) and 415KL(425KL) are closed.

S 865-007-R02
(6) Make sure you close these circuit breakers on the P11 overhead panel:
(a) 11A33, INDICATOR LIGHTS 2
(b) 11A34, INDICATOR LIGHTS 3
(c) 11C30, LANDING GEAR POS SYS 1
(d) 11J2, EICAS CMPTR LEFT
(e) 11J3, EICAS UPPER IND
(f) 11J29, EICAS CMPTR RIGHT
(g) 11J30, EICAS LOWER IND
(h) 11J31, EICAS DISPLAY SW
(i) 11J32, EICAS PILOTS DSP
(j) 11S15, AIR/GND SYS 1
(k) 11S19, AIR/GND SYS 2
(l) 11S23, POS SYS 2

S 865-029-R02
(7) Make sure these circuit breakers are closed:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, ENGINE LEFT T/R IND
b) 11D12, ENGINE LEFT T/R CONT

2) For the right engine:
   a) 11B29, ENGINES RIGHT T/R IND
   b) 11B30, ENGINES RIGHT T/R CONT

TASK 78-31-00-715-030-R02

3. Thrust Reverser Extension/Retraction and Indication Test

A. General
   (1) It is necessary to use hydraulic power when you do this test. You can supply the hydraulic power with a ground cart or with the AC motor driven pumps from the airplane.

B. Equipment
   (1) Hydraulic Service Cart
   (Capacity of 16 gpm at 3000 psi).

C. References
   (1) 24-22-00/201, Electrical Power - Control
   (2) 29-11-00/201, Main Hydraulic System

D. Access
   (1) Location Zones
   210 Control Cabin
   413/423 Fan Cowl Panel, Left
   414/424 Fan Cowl Panel, Right

E. Do the Thrust Reverser Extension/Retraction and Indication Test.

S 865-031-R02

(1) Do this procedure: Prepare for the System Test of the Thrust Reverser.

S 865-032-R02

(2) Supply the electrical power (Ref 24-22-00/201).

S 865-033-R02

CAUTION: MAKE SURE YOU DO NOT OPERATE THE HYDRAULIC SYSTEM PUMPS MORE THAN 2 MINUTES UNLESS THE FUEL TANKS CONTAIN MORE THAN 600 GALLONS. THE HYDRAULIC SYSTEM FLUID IS COOLED BY FUEL THROUGH THE HEAT EXCHANGERS IN THE FUEL TANKS. IF YOU OPERATE THE PUMPS FOR MORE THAN 2 MINUTES, DAMAGE TO THE HYDRAULIC SYSTEM PUMPS COULD OCCUR.

(3) Supply the hydraulic power with a ground cart or the AC motor driven pumps on the airplane (Ref 29-11-00/201).

S 715-034-R02

(4) Do these steps to measure the time for the thrust reverser extension:
   (a) Make sure the REV ISLN light is off.
   (b) Make sure that no REV or L(R) REV ISLN VAL message shows on the EICAS display.

(c) Move the reverse thrust lever to the reverse thrust position.

NOTE: As the thrust reverser moves rearward, an amber message, REV, will show on the EICAS display. When the thrust reverser is fully extended, the EICAS message, REV, will change in color from amber to green.

(d) Measure the time from the initial movement of the reverse thrust lever until the EICAS message, REV, changes from amber to green.

NOTE: This time should not be more than 2 seconds when you use a hydraulics cart, or 6 seconds when you use the motor driven pumps from the hydraulic system of the airplane.

(e) Make sure that the EICAS message, L(R) REV ISLN VAL, does not show on the EICAS display.

(f) Make sure the REV ISLN light does not come on.

S 715-035-R02

(5) Use the EICAS display to measure the time for thrust reverser retraction.

(a) Move the reverse thrust lever to the forward thrust position.

(b) Measure the time that is necessary for the thrust reverser to move to the forward thrust position.

NOTE: The EICAS message, REV, will change to amber as the thrust reverser starts to move to the forward thrust position. The message stays amber until the thrust reverser is fully retracted and locked. The message will then go out. This time must not be more than 5 seconds when you use a hydraulic cart, or 15 seconds when you use the motor driven pumps of the airplane.

S 215-036-R02

(6) Make sure that the EICAS message, REV or L(R) REV ISLN VAL, does not show on the EICAS display.

S 215-037-R02

(7) Make sure that the REV ISLN light does not come on.

S 865-038-R02

(8) Remove the hydraulic power (Ref 29-11-00/201).

TASK 78-31-00-715-039-R02

4. Thrust Reverser Air/Ground Logic and Fire Shutoff Test

A. Equipment

(1) Hydraulic Service Cart
(Capacity of 16 gpm at 3000 psi).

B. References
(1) 24-22-00/201, Electrical Power - Control
(2) 29-11-00/201, Main Hydraulic System

C. Access
(1) Location Zones
210 Control Cabin
410 Left Power Plant Nacellee
420 Right Power Plant Nacelle

D. Do the Air/Ground Logic and Fire Shutoff Test

S 865-040-R02
(1) Do this procedure: Prepare for the System Test of the Thrust Reverser.

S 865-041-R02
(2) Supply the electrical power (Ref 24-22-00/201).

S 865-042-R02

CAUTION: MAKE SURE YOU DO NOT OPERATE THE HYDRAULIC SYSTEM PUMPS MORE THAN 2 MINUTES UNLESS THE FUEL TANKS CONTAIN MORE THAN 600 GALLONS. THE HYDRAULIC SYSTEM FLUID IS COOLED BY FUEL THROUGH THE HEAT EXCHANGERS IN THE FUEL TANKS. IF YOU OPERATE THE PUMPS FOR MORE THAN 2 MINUTES, DAMAGE TO THE HYDRAULIC SYSTEM PUMPS COULD OCCUR.

(3) Supply the hydraulic power (Ref 29-11-00/201).

S 865-063-R02
(4) Open the applicable circuit breaker:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B30, ENGINE RIGHT T/R CONT

S 735-067-R02
(5) Make sure that the EICAS advisory message, L(R) REV ISLN VAL comes on.

S 735-068-R02
(6) Make sure that the REV ISLN light on the control stand comes on.

S 865-090-R02
(7) Close the applicable circuit breaker:
  (a) On the overhead equipment panel P11:
    1) For the left engine:
      a) 11D12, ENGINE LEFT T/R CONT
    2) For the right engine:
      a) 11B30, ENGINE RIGHT T/R CONT

S 735-091-R02
(8) Make sure that the EICAS advisory message, L(R) REV ISLN VAL goes off.

S 735-092-R02
(9) Make sure that the REV ISLN light on the control stand goes off.

S 735-093-R02
(10) Do these steps to put the air/ground system in the air mode:
  (a) For the left engine, open this circuit breaker on the P11 overhead panel and attach a DO-NOT-CLOSE tag:
    1) 11C30, LANDING GEAR POSITION SYS 1
  (b) For the right engine, open this circuit breaker on the P11 overhead panel and attach a DO-NOT-CLOSE tag:
    1) 11S19, AIR/GND SYS

S 865-094-R02
(11) Move the reverse thrust lever to the reverse thrust position.

S 215-095-R02
(12) Make sure the thrust reversers do not move more than .06 inches (1.52 mm) aft.

S 215-096-R02
(13) Make sure the EICAS messages, REV does not come on.

S 865-097-R02
(14) Make sure the EICAS messages, (L,R) REV ISLN VAL, does not come on.

S 215-098-R02
(15) Make sure the REV ISLN light on the control stand does not come on.

S 865-099-R02
(16) Move the reverse thrust lever to the forward thrust position.

S 215-100-R02
(17) Make sure that the EICAS messages, REV does not come on.

S 865-101-R02
(18) Make sure that the EICAS messages, (L,R) REV ISLN VAL, does not come on.

S 215-102-R02
(19) Make sure that the REV ISLN light on the control stand does not come on.

S 865-103-R02
(20) Do these steps to put the air/ground system in the ground mode.
(a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 overhead panel:
1) 11C30, LANDING GEAR POSITION SYS 1
(b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 overhead panel:
1) 11S19, AIR/GND SYS 2

S 865-104-R02
(21) Do these steps to disarm the engine fire extinguishing systems:
(a) For the left engine, open these circuit breakers on the P6 power distribution panel and attach DO-NOT-CLOSE tags:
1) 6H1, FIRE EXTINGUISHING L BTL 1
2) 6H2, FIRE EXTINGUISHING L BTL 2
(b) For the right engine, open these circuit breakers on the P6 power distribution panel and attach DO-NOT-CLOSE tags:
1) 6H3, FIRE EXTINGUISHING R BTL 1
2) 6H4, FIRE EXTINGUISHING R BTL 2

S 865-105-R02
(22) Pull the fire handle.

NOTE: Do not turn the fire handle.

S 865-106-R02
(23) Move the reverse thrust lever to the reverse thrust position.

S 215-107-R02
(24) Make sure that the thrust reverser does not extend.

S 865-108-R02
(25) Move the thrust lever to the forward thrust position.

S 415-109-R02
(26) Close the fire handle.

S 865-110-R02

(27) Do these steps to arm the engine fire extinquishing systems:

(a) For the left engine, remove the DO-NOT CLOSE tag and close this circuit breaker on the P6 power distribution panel:

1) 6H1, FIRE EXTINGUISHING L BTL 1

2) 6H2, FIRE EXTINGUISHING L BTL 2

(b) For the right engine, remove the DO-NOT-CLOSE tags and close these circuit breakers on the P6 power distribution panel:

1) 6H3, FIRE EXTINGUISHING R BTL 1

2) 6H4, FIRE EXTINGUISHING R BTL 2

S 865-114-R02

(28) Remove the hydraulic power (Ref 29-11-00/201).

TASK 78-31-00-715-118-R02

5. Thrust Reverser - Auto Restow Test

A. Equipment

(1) Hydraulic Service Cart
(Capacity of 16 gpm at 3000 psi).

B. References

(1) 24-22-00/201, Electrical Power - Control

(2) 29-11-00/201, Main Hydraulic System

C. Access

(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser, Left
416/426	Thrust Reverser, Right

D. Do the Auto-Restow Test

S 865-119-R02

(1) Do this procedure: Prepare for the System Test of the Thrust Reverser.

S 015-120-R02

(2) Open the main electronics bay access door 119AL.

S 865-121-R02

(3) Supply the electrical power (Ref 24-22-00/201).

S 865-122-R02

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEM PUMPS MORE THAN 2 MINUTES UNLESS THE FUEL TANKS CONTAIN MORE THAN 600 GALLONS. THE HYDRAULIC SYSTEM FLUID IS COOLED BY FUEL THROUGH THE HEAT EXCHANGERS IN THE FUEL TANKS. IF YOU OPERATE THE PUMPS FOR MORE THAN 2 MINUTES, DAMAGE TO THE HYDRAULIC SYSTEM PUMPS COULD OCCUR.

(4) Supply the hydraulic power (Ref 29-11-00/201).

S 865-126-R02

WARNING: MAKE SURE ALL PERSONS ARE CLEAR OF THE AREA. BECAUSE THE THRUST REVERSER EXTENDS REARWARD IN APPROXIMATELY 2 SECONDS, INJURIES TO PERSONS CAN OCCUR IF THE AREA IS NOT CLEAR OF ALL PERSONS.

CAUTION: MAKE SURE THE THRUST REVERSER IS FREE OF EQUIPMENT, TOOLS, AND LOOSE OBJECTS. IF YOU DO NOT REMOVE THEM, DAMAGE WILL OCCUR TO THE REVERSER WHEN IT EXTENDS REARWARD.

(5) Move the reverse thrust lever to the reverse thrust position.

S 215-127-R02

(6) Make sure that the thrust reverser extends fully.

S 215-128-R02

(7) Make sure the EICAS message, REV, is green when the thrust reverser is fully extended.

S 745-129-R02

(8) Do these steps to make sure the auto-restow proximity sensors operate correctly:
   (a) Push the PRESS/TEST switch on the Proximity Switch Electronic Unit (PSEU).
   (b) Make sure the number 888 and the five indicator lights come on.
   (c) Use the SENSOR CHANNEL SELECT thumb switches to set the PSEU code for the auto-restow proximity sensor.
      1) AIRPLANES WITH PSEU (-17 OR -24);
         The left engine PSEU codes are 433 (left half), and 434 (right half).
      2) AIRPLANES WITH PSEU (-16);
         The left engine PSEU codes are 105 (left half), and 108 (right half).

3) The right engine PSEU codes are 099 (left half), and 102 (right half).

(d) Push the TARGET TEST switch on the PSEU and hold for one second.

(e) Make sure the sensor number is shown on the LED display.

(f) Make sure the TARGET FAR light comes on after four seconds.

(g) Push and release the RESET switch on the PSEU for each sensor target test.

S 865-130-R02

(9) Do these steps to put the air/gnd system in the air mode:

(a) For the left engine, open this circuit breaker on the P11 overhead panel and attach a DO-NOT-CLOSE tag:

1) 11C30, LANDING GEAR POS SYS 1

(b) For the right engine, open this circuit breaker on the P11 overhead panel and attach a DO-NOT-CLOSE tag:

1) 11S19, AIR/GND SYS 2

S 215-131-R02

(10) Make sure the REV ISLN light on the control stand comes on.

S 215-132-R02

(11) Make sure the (L,R) REV ISLN VAL advisory message is shown on the EICAS display.

S 215-133-R02

(12) Make sure the (L,R) REV ISLN VAL message shows on the ECS/MSG page on the EICAS display.

S 865-134-R02

(13) Move the reverse thrust lever to the forward thrust position.

S 215-135-R02

(14) Make sure that thrust reverser retracts fully and locks.

S 215-136-R02

(15) Make sure the REV ISLN light on the control stand goes off approximately 5 seconds after the thrust reverser retracts and locks.

S 865-137-R02

(16) Do these steps to put the air/ground system in the ground mode:

(a) For the left engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 overhead panel:

1) 11C30, LANDING GEAR POS SYS 1

(b) For the right engine, remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 overhead panel:
1) 11S19, AIR/GND SYS 2

S 215-138-R02

(17) Make sure that (L,R) REV ISLN VAL message shows on the ECS/MSG page on the EICAS display.

S 415-139-R02

(18) Close the access door 119AL.

E. Put the Airplane Back To Its Usual Condition.

S 865-140-R02

(1) Remove the messages from the ECS/MSG page of the EICAS display.

S 865-144-R02

(2) Remove the hydraulic power (Ref 29-11-00/201).

TASK 78-31-00-715-148-R02

6. Actuator Lock, and Crossover Shaft Integrity Test

A. References

(1) AMM 78-31-00/201, Thrust Reverser System

(2) AMM 78-31-26/401, Thrust Reverser Hydraulic Actuators, Rotary Flexshafts and Tubing

B. Do the Integrity Test

S 045-149-R02

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 the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 865-150-R02

(2) Manually unlock the lower locking actuator on the right thrust reverser half (AMM 78-31-00/201).

(a) Install the pin and streamer through the indicator.

S 865-288-R02

(3) Manually unlock the sync-lock on the right thrust reverser half (AMM 78-31-00/201).
   (a) Install the pin and streamer through the indicator.

S 985-151-R02

CAUTION: DO NOT APPLY MORE THAN 165 POUND-INCHES (18.6 NM) OF TORQUE WHEN YOU EXTEND THE THRUST REVERSER. DAMAGE TO THE ACTUATORS AND ROTARY FLEX SHAFTS CAN OCCUR.

(4) Try to manually extend the thrust reverser at the external drive socket on the left thrust reverser half (AMM 78-31-00/201).
   (a) Make sure that the two translating cowls do not move more than 0.06 inches (1.52 mm) aft.

      NOTE: The cowls may move slightly as the sync-lock fully engages.

   (b) If the cowls extend, replace the L.H. lower actuator (AMM 78-31-26/401) and repeat the check.

S 865-152-R02

(5) Remove the pin and streamer and manually lock the lower locking actuator on the right thrust reverser half (AMM 78-31-00/201).

S 865-153-R02

(6) Manually unlock the lower locking actuator on the left thrust reverser half (AMM 78-31-00/201).
   (a) Install the pin and streamer through the indicator.

S 985-154-R02

CAUTION: DO NOT APPLY MORE THAN 165 POUND-INCHES (18.6 NM) OF TORQUE WHEN YOU EXTEND THE THRUST REVERSER. DAMAGE TO THE ACTUATORS AND ROTARY FLEX SHAFTS CAN OCCUR.

(7) Try to manually extend the thrust reverser at the external drive socket on the left thrust reverser half (AMM 78-31-00/201).
   (a) Make sure that the two translating cowls do not move more than 0.75 inches (19 mm) aft.

      NOTE: The cowls may move slightly as the sync-lock fully engages.

   (b) If the L.H. cowl extends, replace the flexible crossover shaft (AMM 78-31-26/401) and repeat the check.
   (c) If both cowls extend, replace the R.H. lower actuator (AMM 78-31-26/401) and repeat the check.

S 865-290-R02

(8) Manually unlock the lower locking actuator on the right thrust reverser half (AMM 78-31-00/201).
(a) Install the pin and streamer through the indicator.

S 865-291-R02

(9) Remove the pin and streamer and manually lock the sync-lock on the right thrust reverser half (AMM 78-31-00/201).

S 985-292-R02

CAUTION: DO NOT APPLY MORE THAN 165 POUND-INCHES (18.6 NM) OF TORQUE WHEN YOU EXTEND THE THRUST REVERSER. DAMAGE TO THE ACTUATORS AND ROTARY FLEX SHAFTS CAN OCCUR.

(10) Try to manually extend the thrust reverser at the external drive socket on the left thrust reverser half (AMM 78-31-00/201).
(a) Make sure that the two translating cowls do not move more than 0.75 inches (19 mm) aft.

NOTE: The cowls may move slightly as the sync-lock fully engages.

(b) If the cowls extend, replace the sync lock (AMM 78-31-26/401), and repeat the check.

S 865-155-R02

(11) Remove the pins and streamers and manually lock the left and right lower actuators (AMM 78-31-00/201).

S 865-289-R02

(12) Make sure the sync-lock on the right thrust reverser is locked (AMM 78-31-00/201).

S 445-156-R02

(13) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 865-157-R02

(14) Make sure the two translating cowls are fully retracted and the manual unlock indicators are smooth with the surface of the fairing.
(a) Do the Usual Operations Test of the Thrust Reverser (AMM 78-31-00/501).

TASK 78-31-00-715-158-R02

7. Thrust Reverser - Hydraulic Pressure Switch Test

A. Equipment

(1) Hydraulic Service Cart
(Capacity of 16 gpm at 3000 psi).

(2) Breakout Box, Thrust Reverser - A78025-77 (for connector contacts)

B. References
(1) 24-22-00/201, Electrical Power - Control
(2) 29-11-00/201, Main Hydraulic System
(3) 54-53-02/401, Aft Fairing Access Door
(4) 78-31-00/201, Thrust Reverser System

C. Access
(1) Location Zones

210	Control Cabin
413/423	Fan Cowl Panel, Left
414 424	Fan Cowl Panel, Right

D. Do the Hydraulic Pressure Switch Test

S 865-160-R02
(1) Do this procedure: Prepare for the System Test of the Thrust Reverser.

S 865-161-R02
(2) Supply the electrical power (Ref 24-22-00/201).

S 865-162-R02
(3) Make sure that the hydraulic power is not supplied (Ref 29-11-00/201).

S 865-166-R02
(4) Move the reverse thrust lever rearward to the reverse thrust position.

S 215-167-R02
(5) Make sure the thrust reverser does not extend.

S 215-168-R02
(6) Make sure the REV ISLN light on the control stand comes on.

S 215-169-R02
(7) Make sure the EICAS message, (L,R) REV ISLN VAL, shows on the EICAS display.

S 865-170-R02
(8) Move the reverse thrust lever to the forward thrust position.

S 215-171-R02
(9) Make sure the REV ISLN light on the control stand goes out.

S 015-172-R02
(10) Disconnect the electrical connector for the applicable engine:

NOTE: The breakout box (A78025-77) can be used to make connections to the pins referenced in this task.

(a) For the left engine, disconnect the electrical connector D2900 from the hydraulic pressure switch S330 on the left isolation valve.
(b) For the right engine, disconnect electrical connector D2830 from the hydraulic pressure switch S331 on the right isolation valve.

S 735-173-R02
(11) Make sure that the REV ISLN light comes on.

S 735-174-R02
(12) Make sure that the EICAS advisory message, (L,R) REV ISLN VAL, comes on.

S 865-175-R02
(13) Open the applicable circuit breakers on the P11 overhead panel to put the air/ground relay system in the air mode:
(a) For the left engine:
1) 11C30, LANDING GEAR POS SYS 1
(b) For the right engine:
1) 11S19, AIR/GND SYS 2

S 735-176-R02
(14) Make sure that the REV ISLN light stays on.

S 735-177-R02
(15) Make sure that the EICAS advisory message, (L,R) REV ISLN VAL, stays on.

S 865-178-R02
(16) Close the applicable circuit breaker on the P11 overhead panel to put the air/ground relay system in the ground mode:
(a) For the left engine:
1) 11C30, LANDING GEAR POS SYS 1
(b) For the right engine:
1) 11S19 AIR/GND SYS 2

S 415-179-R02
(17) Connect the electrical connector for the applicable engine:
(a) For the left engine, connect the electrical connector D2900 for the hydraulic pressure switch S330 on the left isolation valve.
(b) For the right engine, connect electrical connector D2830 for the hydraulic pressure switch S331 on the right isolation valve.

S 735-180-R02
(18) Make sure that the REV ISLN light goes out.

S 735-181-R02
(19) Make sure that the EICAS advisory message, L(R) REV ISLN VAL, goes out.

S 865-182-R02
(20) Supply the hydraulic power (Ref 29-11-00/201).

S 865-183-R02
(21) Move the reverse thrust lever to the reverse thrust position.

S 735-184-R02
(22) Make sure that the thrust reverser extends.

S 735-185-R02
(23) Make sure that the REV ISLN light on the control stand does not come on.

S 735-186-R02
(24) Make sure that the EICAS message, (L,R) ISLN VAL does not come on.

S 865-187-R02
(25) Move the reverse thrust lever to the forward thrust position.

S 735-188-R02
(26) Make sure that the thrust reverser retracts.

E. Put the Airplane Back to Its Usual Condition

S 865-195-R02
(1) Erase the EICAS message, (L,R) REV ISLN VAL, from the EICAS display.

S 865-196-R02
(2) Remove the hydraulic power (Ref 29-11-00/201).

S 865-197-R02
(3) Do the activation procedure for the thrust reverser (Ref 78-31-00/201).

THRUST REVERSER SYSTEM - INSPECTION/CHECK

1. General
   A. This task does the inspection of the thrust reverser system.

TASK 78-31-00-216-031-R00

2. Do the Fan Thrust Reverser System Inspection/Check
   A. Equipment
      (1) Lock, Thrust Reverser CP30512
   B. References
      (1) 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          415/425 Thrust Reverser, Left
          416/426 Thrust Reverser, Right

   D. Examine the Thrust Reverser System.

      S 016-002-R00
      (1) Fully extend the thrust reverser and install the maintenance safety lock (Ref 78-31-00/201).

      S 216-003-R00
      (2) Examine the condition of the outer structure of the thrust reverser system.

      S 216-030-R00
      (3) Examine the thrust reverser tracks, liners and sliders for wear, galling or contamination.

      S 216-004-R00
      (4) Look for track-liner retaining screws which are loose or not there.

      S 216-005-R00
      (5) Look at the cascade segments for vanes or fasteners which are not there, loose, or damaged.

      S 216-006-R00
      (6) Look for blocker door and drag link fasteners which are loose or not there.

      S 216-007-R00
      (7) Do a visual check of the inner kevlar fairing of the thrust reverser for material which has cracks or is not there.

      S 416-008-R00
      (8) Remove the maintenance safety lock and manually retract the thrust reverser, but do not fully retract it (Ref 78-31-00/201).

S 216-009-R00

(9) Examine the translating-cowl seal assemblies for material which is gouged or not there.

S 216-035-R00

(10) Examine the hydraulic actuator wire retaining ring for security (Fig. 601).

S 416-010-R00

(11) Retract the thrust reverser (Ref 78-31-00/201).

S 216-011-R00

(12) Examine the blocker doors for material which has cracks, dents, or is not there.

S 216-012-R00

(13) Look for access panel fasteners which are loose or not there.

S 216-013-R00

(14) Do a visual check of the translating-cowl inner wall.

S 216-015-R00

(15) Examine the condition of the outer kevlar fairing of the thrust reverser.

S 216-016-R00

(16) Examine the condition of the cold-stream exhaust nozzle.

S 216-017-R00

(17) Examine the condition of the hinge and latch access panels of the thrust reverser.

S 016-032-R00

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

(18) Open the thrust reverser (Ref 78-31-00/201).

S 216-019-R00

(19) Examine the condition of the hydraulic tubing of the thrust reverser. Make sure all components are installed correctly.

S 216-029-R00
(20) Examine the condition of the thrust reverser hinges of the adjacent structure. Make sure all components are installed correctly.

S 216-021-R00
(21) Examine the condition of the V-groove system of the front hinge beam and also the related latch and firewall ribs. Make sure all components are attached correctly.

S 216-022-R00
(22) Examine the condition of the opening actuators and attach points of the thrust reverser. Make sure all components are attached correctly and no leakage occurs.

S 216-023-R00
(23) Examine the condition of the cowl latches, inner barrel latch and adjacent structure. Make sure all components are installed corectly.

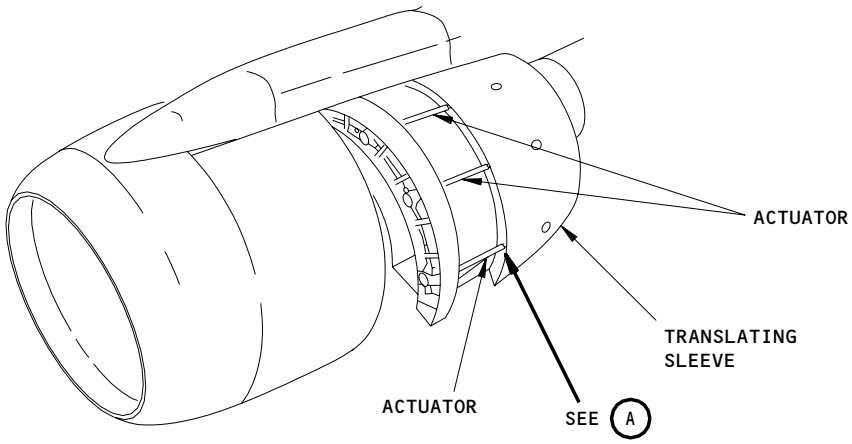
S 216-024-R00
(24) Visually examine the condition of the mounted zone seals on the thrust reverser. Make sure all components are installed correctly.

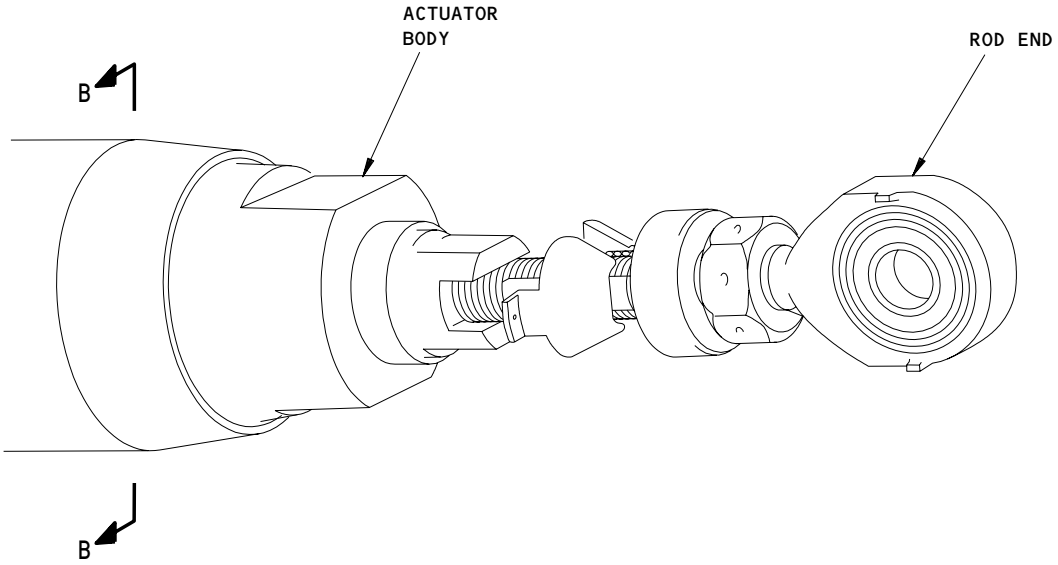
S 216-025-R00
(25) Examine the condition of the translating cowl insulation and seals of the thrust reverser. Make sure all components are installed correctly.

S 216-026-R00
(26) Examine the condition of the hold open rods and the locking mechanism of the thrust reverser. Make sure all components are installed correctly.

S 216-036-R00
(27) Examine the condition of the latch access panels of the thrust reverser.
(a) Make sure all components are installed correctly.
(b) If the forward latch access door is damaged, temporary repair FRS6316 can be applied (AMM 78-31-20/801).

NOTE: It is permitted to fly-on for ten days with FRS6316 embodied.

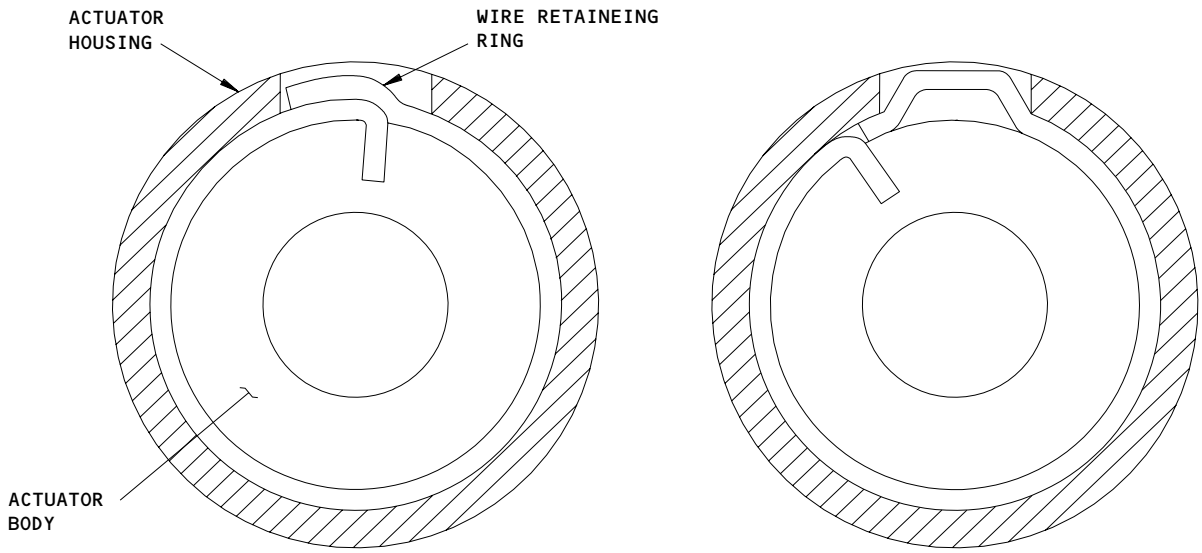




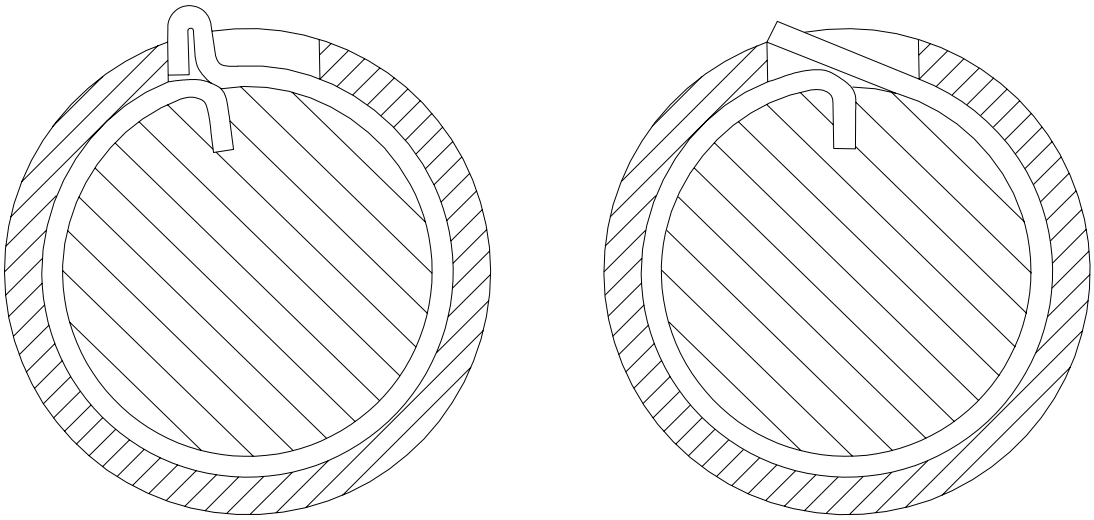
ACTUATOR SHOWN RETRACTED
(TRANSLATING SLEEVE NOT SHOWN FOR CLARITY)

(A)

Actuator Locations
Figure 601 (Sheet 1)



EXAMPLES OF ACCEPTABLE WIRE RETAINING RING CONFIGURATIONS
(WIRE RETAINING RING IS BELOW THE OUTER SURFACE OF THE ACTUATOR HOUSING)
B-B



EXAMPLE OF UNACCEPTABLE WIRE RETAINING RING CONFIGURATIONS
(WIRE RETAINING RING EXTENDS ABOVE THE OUTER SURFACE OF THE ACTUATOR HOUSING)
B-B

Example Of Wire Retaining Ring Configurations
Figure 601 (Sheet 2)

S 416-033-R00

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

(28) Close the thrust reverser (Ref 78-31-00/201).

THRUST REVERSER CASCADE SEGMENTS - REMOVAL/INSTALLATION

1. General
   A. The thrust reverser uses cascade segments and blank segments to change the direction of the air flow through the thrust reverser. The segments are identified clockwise with numbers when you view the thrust reverser from the rear, (Fig. 402). The part number and identification plate, which gives the position of the segment, are located on the front face of the segment, (Fig. 401).

      NOTE: The left and right halves of the thrust reverser are interchangeble between the left and right engines. The cascade segments must be installed in the correct locations for the left or right engine.

   B. You must close the thrust reverser when you remove or install the cascade segments.
   C. Use the procedures in (AMM 70-51-00/201) to tighten the fasteners. Tighten the fasteners to the torque values in (AMM 70-51-00/201) unless a torque value is specified in this task.

   TASK 78-31-05-004-011-R00

2. Remove the Thrust Reverser Cascade Segments
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser
   B. Access
      (1) Location Zones
          415/425 Thrust Reverser (Left)
          416/426 Thrust Reverser (Right)

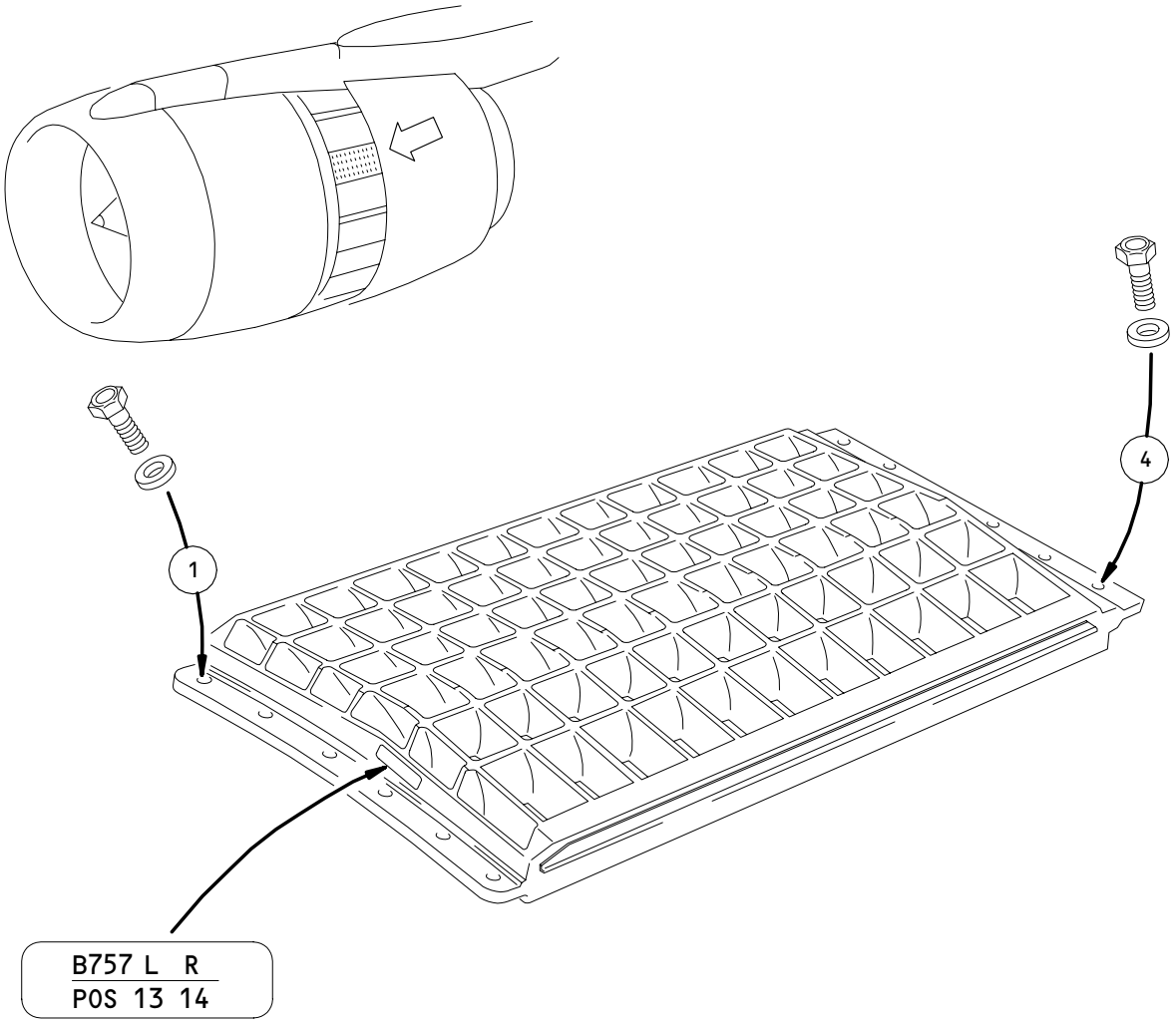
   C. Remove the Cascade Segments (Fig. 401)

      S 044-007-R00

      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 INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

      (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

      S 984-008-R00
      (2) Manually extend the thrust reverser (AMM 78-31-00/201).



SECTIONAL VIEW OF CASCADE SEGMENT ATTACHMENT

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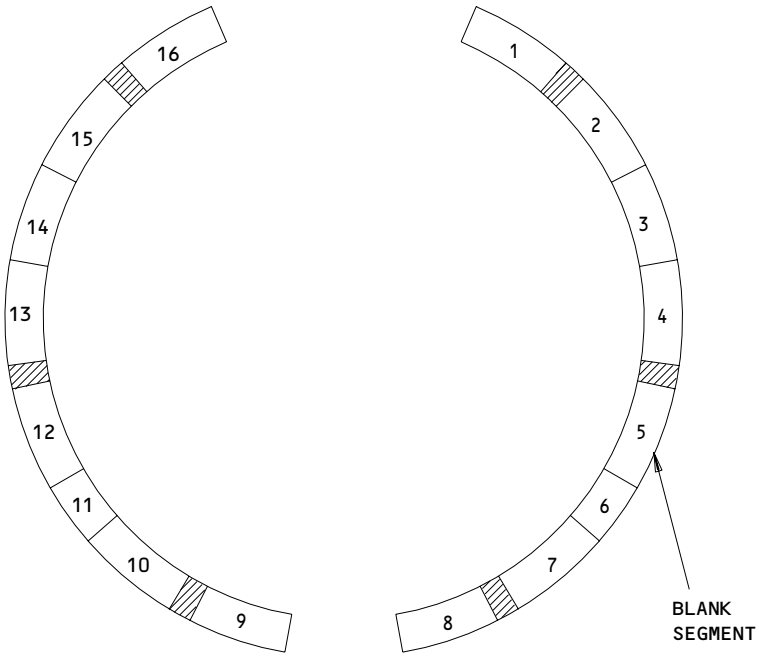
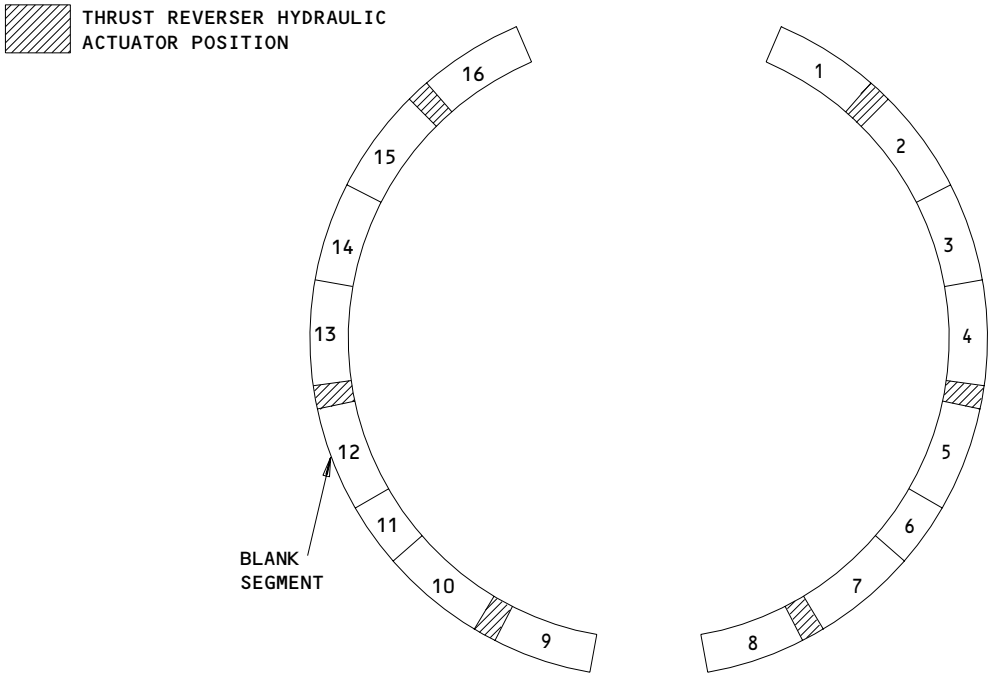
Thrust Reverser Cascade Segments Installation
Figure 401



LEFT ENGINE
(VIEW IN THE FORWARD DIRECTION)



RIGHT ENGINE
(VIEW IN THE FORWARD DIRECTION)

77598

Cascade and Blank Segment Positions
Figure 402

S 024-017-R00

CAUTION: THE LEFT AND RIGHT THRUST REVERSER HALVES CAN BE CHANGED BETWEEN THE LEFT AND RIGHT ENGINES. THE CASCADE SEGMENTS MUST BE INSTALLED IN THE CORRECT POSITION ON THE THRUST REVERSER FOR THE LEFT AND RIGHT ENGINE. DAMAGE TO THE AIRPLANE CAN OCCUR IF THE CASCADE SEGMENTS ARE NOT CORRECTLY INSTALLED.

(3) Remove the cascade segment or blank segments.
(a) Remove the bolts (1) and washers (4).

TASK 78-31-05-404-012-R00

3. Install the Thrust Reverser Cascade Segments

A. General
(1) This task contains two installations as follows:
(a) The first topic gives the data for the installation of the cascade segments.
(b) The second topic gives the data for the installation of the blank segments.

NOTE: The left and right halves of the thrust reverser are interchangeble between the left and right engines. The cascade segments must be installed in the correct locations for the left or right engine.

B. Equipment
(1) Brush, Clean

C. Consumable Materials
(1) Solvent, Methylethylketone (M.E.K.), B.S.1940:1968, U.S. TT-M-261, Omat 125
or
(2) Inhibited 1.1.1. Trichloroethane, B.S.4487:1969, Omat 1/21A
(3) Sealant, Omat 8/138

D. References
(1) AMM 78-31-00/201, Thrust Reverser

E. Access
(1) Location Zone
415/425 Thrust Reverser (Left)
416/426 Thrust Reverser (Right)

F. Install the Cascade Segments (Fig. 401)

S 424-016-R00

CAUTION: THE LEFT AND RIGHT THRUST REVERSER HALVES CAN BE CHANGED BETWEEN THE LEFT AND RIGHT ENGINES. THE CASCADE SEGMENTS MUST BE INSTALLED IN THE CORRECT POSITION ON THE THRUST REVERSER FOR THE LEFT AND RIGHT ENGINE. DAMAGE TO THE AIRPLANE CAN OCCUR IF THE CASCADE SEGMENTS ARE NOT CORRECTLY INSTALLED.

(1) Do these steps to install the cascade segments:
   (a) Make sure the mating surfaces are clean and not damaged.
   (b) Identify the cascade segment and its correct position (Fig. 402).
   (c) Install the aft face of the cascade segment face first into its correct position on the thrust reverser.
   (d) Install the washers (1) and the bolts (4).

NOTE: The washers have a radius to make sure the bolts install correctly. Make sure the washers are installed with the radius face out.

NOTE: ENGINES POST-RR-SB 78-9787 AND POST-RR-SB 78-9788; Do not use the washer at the fitting counterbore locations for deflector box positions 9, 10, 12, 13, 15, and 16.

G. Install the Blank Segments

S 424-015-R00

CAUTION: THE LEFT AND RIGHT THRUST REVERSER HALVES CAN BE CHANGED BETWEEN THE LEFT AND RIGHT ENGINES. THE CASCADE SEGMENTS MUST BE INSTALLED IN THE CORRECT POSITION ON THE THRUST REVERSER FOR THE LEFT AND RIGHT ENGINE. DAMAGE TO THE AIRPLANE CAN OCCUR IF THE CASCADE SEGMENTS ARE NOT CORRECTLY INSTALLED.

(1) Do these steps to install the blank segments:

NOTE: The left and right halves of the thrust reverser are interchangeble between the left and right engines. The cascade segments must be installed in the correct locations for the left or right engine.

WARNING: DO NOT GET METHYL ETHYL KETONE (MEK) IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM MEK. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE MEK. KEEP MEK AWAY FROM SPARKS, FLAME AND HEAT. MEK IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Use MEK to remove the grease from the bolts, the washers and the mating surfaces of the blank segment.
(b) Clean the surfaces with a clean cloth before the MEK becomes a gas.
(c) Apply the sealant with a brush to the bolts, the washers and the mating surfaces of the segment.
(d) Install the blank segment into the correct position on the thrust reverser.
(e) Install the washers (1) and the bolts (4).

NOTE: ENGINES POST-RR-SB 78-9787 AND POST-RR-SB 78-9788; Do not use the washer at the fitting counterbore locations for deflector box positions 9, 10, 12, 13, 15, and 16.

(f) Permit the sealant to dry.

H. Put the Airplane back to Its Usual Condition

S 984-005-R00

(1) Manually retract the thrust reverser (AMM 78-31-00/201).

S 934-014-R00

(2) If the cascade segments were changed for the engine location, 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.

S 444-006-R00

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

THRUST REVERSER CASCADE SEGMENTS - INSPECTION/CHECK

1. General
   A. This task gives the data necessary when you make an inspection of the cascade segments for cracks, corrosion, dents, nicks and gouges.

TASK 78-31-05-216-001-R00

2. Thrust Reverser Cascade Segments - Inspection/Check
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-31-05/801, Thrust Reverser Cascade Segments
   B. Access
      (1) Location Zones
          415/425 Thrust Reverser (Left)
          416/426 Thrust Reverser (Right)

   C. Do an Inspection of the Cascade Segments of the Thrust Reverser

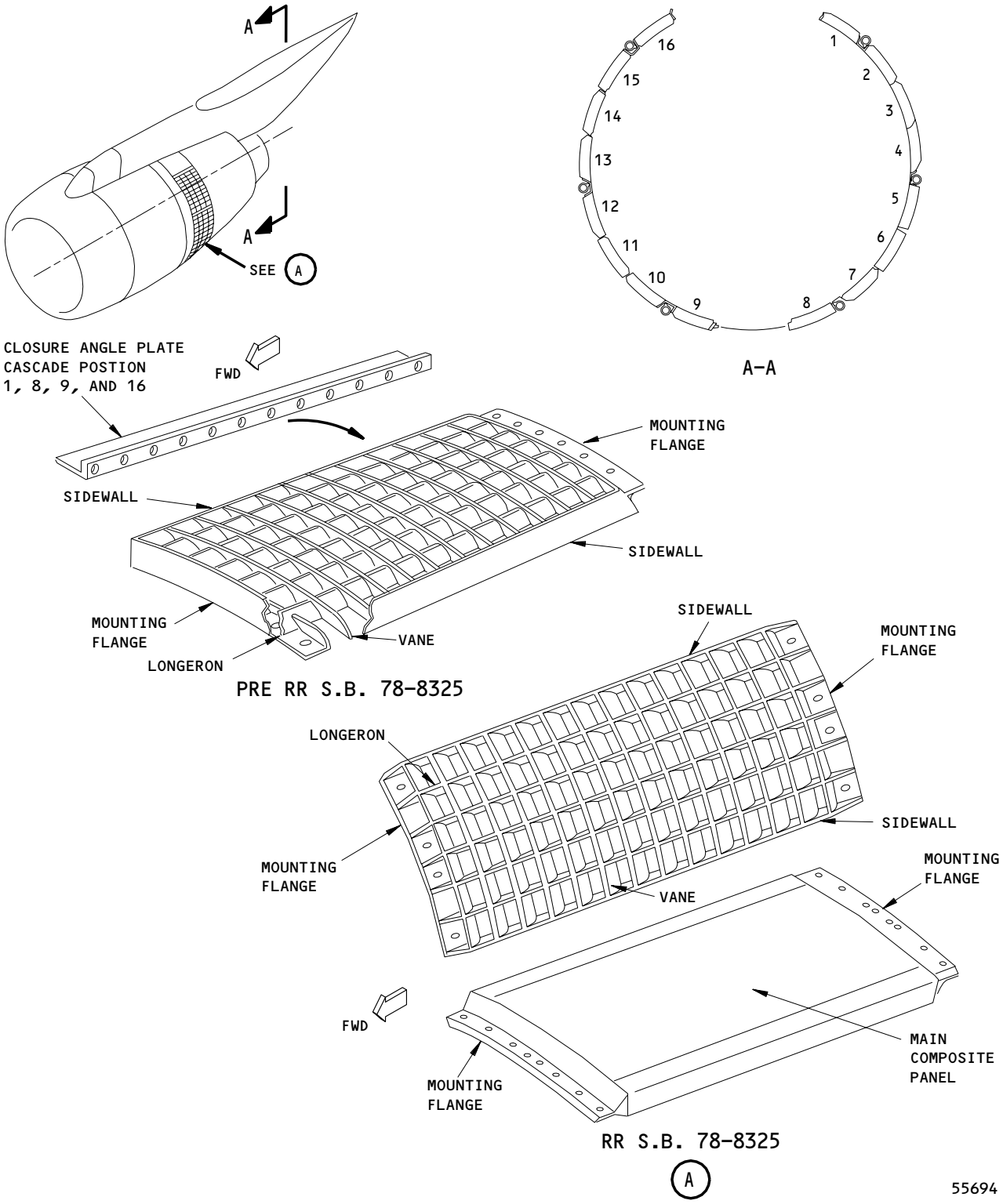
      S 866-002-R00
      (1) Manually extend the thrust reverser (Ref 78-31-00/201).

      S 046-010-R00

      WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE WHEN YOU DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER FOR GROUND MAINTENANCE. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT COULD OCCUR.

      (2) Do the deactivation procedure for the thrust reverser for ground maintenance (Ref 78-31-00/201).

      S 216-004-R00
      (3) Do an inspection of the thrust reverser segments as follows:
          (a) Look for cracks.
              1) AIRPLANES PRE-RR-SB 78-8325;
                 Do the steps that follow:
                 a) Use the Repair procedure FRS5373 to examine and repair cracks in the blade edge (AMM 78-31-05/801).



Thrust Reverser Cascade Segments - Inspection
Figure 601

b) Use the Repair procedure FRS5373 to examine and repair the cracks in the mounting flange (AMM 78-31-05/801).

2) AIRPLANES POST-RR-SB 78-8325;
Do the steps that follow:
a) If the crack or delamination on the composite deflector box vanes is less than 1.00 inch (25,4 mm) in length, repair with FRS6286 (AMM 78-31-05/801).
b) If the crack or delamination on the composite deflector box vanes is more than 1.00 inch (25,4 mm) in length, repair with FRS6287 (AMM 78-31-05/801).

3) If the crack in the blank cascade segment of the mounting flange is more than the limits that follow, repair with FRS6009 (AMM 78-31-05/801).
a) More than 0.010 inch (0,254 mm) in depth.
b) More than 0.125 inch (3,175 mm) in length.

4) AIRPLANES POST-RR-SB 78-8325;
If you find a crack or delamination in the mounting flange, reject the part.

5) If you find a crack in the closure angle plates on the cascades 1, 8, 9, or 16, reject the part.

(b) AIRPLANES PRE-RR-SB 78-8325;
Look for corrosion on the mounting flanges.

1) If you find corrosion on the mounting flange, reject the part.

(c) Look for dents.

1) AIRPLANES PRE-RR-SB-78 8325;
Use the data that follows:
a) If the dent in the cascade vanes is more than 0.040 inch (1,0 mm) in depth, reject the part.
b) If the dent in the cascade longerons is more than 0.040 inch (1,0 mm) in depth, reject the part.

2) If the dents in the closure angle plates on the cascades 1, 8, 9 or 16 are more than 0.050 inch (1,27 mm) in depth and are not smooth rounded, reject the part.

3) If the dents in the blank cascade segment do not have smooth rounded bottom and the diameter is more than 2.00 inch (50,8 mm), reject the part.

4) Repair a dent in the blank cascade segments of the mounting flanges with FRS6009 (AMM 78-31-05/801), if:
a) The dent does not have a smooth rounded bottom
b) The dent has a crack

c) The diameter of the dent is more than 0.125 inch (3,18 mm).

(d) Look for nicks and gouges.

1) AIRPLANES PRE-RR-SB-78-8325;
Use the Repair procedure FRS5373 to look for nicks and gouges in the cascade vanes (AMM 78-31-05/801). If it is more than the limit, reject the part.

2) On the closure angle plates on cascades 1, 8, 9 or 16, if you find nicks and gouges with more than 0.025 inch (0,635 mm) in depth, reject the part.

3) If the nicks and gouges in the blank cascade segments (composite) are more than 0.020 inch (0,508 mm) in depth, reject the part.

4) AIRPLANES POST-RR-SB 78-8325;
If the nicks and gouges on the deflector box vanes are less than these limits, repair with FRS6009 (AMM 78-31-05/801):
a) 0.02 inch (0,51 mm) in depth.
b) 0.75 inch (19,1 mm) in length.
c) If the nicks and gouges are more than these limits, repair with FRS6286.

5) AIRPLANES POST-RR-SB 78-8325;
If the nicks and gouges on the cascade mounting flange are less than these limits, repair with FRS6009 (AMM 78-31-05/801):
a) 0.05 inch (1,27 mm) in depth.
b) 1.00 inch (25,4 mm) in length.
c) If the nicks and gouges are more than these limits, reject the part.

6) If the nicks and gouges in the blank cascade segments of the mounting flanges are more than the limits which follow, repair with FRS6009 (AMM 78-31-05/801):
a) The depth is more than 0.010 inch (0,254 mm)
b) The length is more than 2.00 inch (50,4 mm).
c) The distance is less than 5.00 inch (50,4 mm) from other damage.

d) AIRPLANES PRE-RR-SB 78-8325;
If you find nicks or gouges on the mounting flange, reject the part.

7) It is not permitted to have nicks and gouges on the edge of the segment.

(e) AIRPLANES PRE-RR-SB 78-8325;
Look for twisted vanes.

1) If the vanes are twisted more than 0.040 inch (1,0 mm) from the original contour, reject the part.

(f) AIRPLANES POST-RR-SB 78-8325;
Look for erosion of the composite deflector box vanes

1) If you find erosion on the composite deflector box vanes, repair with FRS6009 (AMM 78-31-05/801).

S 446-005-R00

(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 866-006-R00

(5) Manually retract the thrust reverser (AMM 78-31-00/201).

THRUST-REVERSER CASCADE SEGMENTS - APPROVED REPAIRS

1. General
   A. This task contains five repairs. These repairs are:
      (1) FRS.6009 - Repair the Damage on the Thrust-Reverser Deflector Box and Blank.
      (2) FRS.5357 - Repair and Dress the Thrust-Reverser Deflector Box.
      (3) FRS.6109 - Install Damping Material to the Lockout Blade on the LH C-Duct of the Thrust Reverser.
      (4) FRS.6286 - Repair Minor Damage to Vanes on the Deflector Boxes.
      (5) FRS.6287 - Remove cracked Vane(s) from the Deflector Boxes.

TASK 78-31-05-308-001-R00

2. Thrust-Reverser Deflector Box and Blank - Damage Repair
   A. General
      (1) The repair given in this procedure is FRS6009.
      (2) The procedure tells you how to repair surface damage on a thrust reverser deflector box or blank.
      (3) You can do this repair on RB211-535E4 thrust reverser deflector boxes and blanks that have the part numbers that follow:

LJ75489	LJ75606	LJ75607	LJ75608
LJ75609	LJ75610	LJ75611	LJ75612
LJ75613	LJ75614	J75615	LJ75616
LJ75617	LJ75618	LJ75619	LJ75681
LJ75981	LJ75982	LJ75985	LJ75986
LJ75987	LJ75988	LJ75989	LJ75990
LJ75991	LJ75992	LJ75993	LJ75994
LJ75995	LJ75996	LJ75997	LJ75998
LJ75999	LJ76000	LJ76001	LJ76079

   B. Equipment
      (1) Standard work tools
      (2) Heat lamp - resistant to explosion
   C. Consumable Materials
      (1) Acetone OMat No. 150 or
          Isopropyl alcohol OMat No. 1/40 or
          Cleaning solvent Desoclean OMat No. 1/257
      (2) Absorbent cloth, lint free,
          OMat Item No. 2/101
      (3) Abrasive paper, 320 grit,
          OMat Item No. 5/33
      (4) Abrasive paper, 240 grit,
          OMat Item No. 5/35
      (5) Epoxy adhesive EA9390,
          OMat Item No. 8/160

(6) Epoxy adhesive EA956,
OMat Item No. 8/117

D. References
(1) AMM 78-31-05/401, Fan Thrust Reverser Cascade Segments
(2) AMM 78-31-00/201, Thrust Reverser System - Maintenance Practices

E. Repair the damaged thrust reverser cascade segments

S 868-002-R00

(1) Manually deploy the thrust reverser (AMM 78-31-00/201).

S 018-003-R00

(2) Remove the damaged cascade segments (AMM 78-31-05/401).

S 128-004-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(3) Use the abrasive paper, OMat 5/35 to remove the loose material from the damaged area.
(a) Make the damaged area smooth.

S 118-005-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE DEGRASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Use the cleaning fluid acetone OMat No. 150 or Isopropyl alcohol OMat 1/40 or cleaning solvent Desoclean 1/257 to remove the dirt and abrasive material from the damaged area.
(a) Use another clean cloth to make the damaged area dry.

S 398-006-R00

WARNING: ADHESIVES ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVES BECAUSE THEY ARE POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(5) Seal the area with the adhesive OMat 8/160 or OMat 8/117.
  (a) Prepare the adhesive with the manufacturers instructions.
  (b) Apply a thin layer of adhesive to the repair area.
  (c) Use the heat lamp to cure the adhesive, OMat 8/160 for 220 minutes at 93°C (200°F).
  (d) Use the heat lamp to cure the adhesive, OMat 8/117 for 60 minutes at 93°C (200°F).

  WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

  (e) If the repair area is in the airflow, use the abrasive paper OMat 5/33 to make the adhesive smooth.

S 218-007-R00
(6) Do an inspection to make sure that all of the damaged area is correctly sealed with the adhesive.

S 938-008-R00
(7) Use a permanent marker pen to write "FRS6009" adjacent to the part number.

S 418-009-R00
(8) Install the cascade segment (AMM 78-31-05/401).

S 868-010-R00
(9) Move the thrust reverser to the stowed postion (AMM 78-31-00/201).

TASK 78-31-05-308-011-R00

3. Thrust-Reverser Deflector Box Segments - Repair Damage By Dressing

A. General

(1) The repair in this procedure is FRS5357.

(2) This procedure gives the repair of damage to the thrust reverser deflector box segments. The procedure can be used for the left or right halves of the thrust reverser C ducts.

(3) This repair procedure can be used on deflector box segments which have the part numbers that follow:

LJ36234, LJ36133, LJ36236, LJ36571, LJ36574, LJ36572, LJ36233, LJ36122, LJ36134, LJ36132, LJ36568, LJ76543, LJ36580, LJ36582, LJ36576, LJ36556, LJ36131, LJ36117, LJ36121, LJ36234, LJ36235, LJ36556

Part numbers with RR SB 78-7628:
LJ36685, LJ36686

Part numbers with RR SB 78-7717:
LJ36841, LJ36843, LJ36845, LJ36844, LJ36842, LJ36841, LJ36846

Part numbers with RR SB 78-7392:
LJ36584

B. Equipment

(1) Standard workshop tools

(2) Vibro-engraving equipment

C. Consumable Materials

(1) Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257

(2) Polishing Buff,
OMat No. 508

(3) Rotary cutters,
Omat No. 503

(4) Dressing Mop,
OMat No. 5/104

(5) Two-pack epoxy primer and catalyst, (Strontium Chromate),
OMat No. 766

(6) Two-pack epoxy finishes, thinners,
OMat No. 793

(7) Two-pack epoxy finish and catalyst,
OMat No. 788

(8) Lint free absorbent cloth,
OMat No. 2/101

(9) Chemical coating, Alocrom 1200, OMat No. 175

D. References
(1) AMM 70-20-04/201, Fluorecent Penetrant Inspection
(2) AMM 78-31-05/401, Thrust Reverser Cascade Segments
(3) AMM 78-31-00/201, Thrust Reverser System - Maintenance and Practices

E. Repair the damaged deflector box

S 868-012-R00
(1) Manually deploy the thrust reverser (AMM 78-31-00/201).

S 028-013-R00
(2) Remove the damaged deflector box segment (AMM 78-31-05/401).

S 238-014-R00
(3) Examine the damaged deflector box for cracks with the fluorescent penetrant crack-test (AMM 70-20-04/201).

S 328-015-R00
(4) Dress out the damage and blend the dressed area
(a) Dress the part to remove damage and cracks with rotary cutters OMat No. 503, polishing buff OMat No. 508 and standard workshop tools (Fig. 801).
(b) Blend the dressed areas and polish out the dressing scores with dressing mop, OMat No. 5/104.

S 228-016-R00
(5) Examine the part and make sure the dimensions are correct (Fig. 801).

S 238-017-R00
(6) Use the fluorescent-penetrant crack-test to examine the part for cracks (AMM 70-20-04/201).

S 118-018-R00
(7) Clean the repair area

WARNING: DO NOT GET SURFACE PROTECTION MATERIAL ON YOUR SKIN. MAKE SURE SKIN THAT IS OPEN TO POSSIBLE CONTAMINATION HAS SUFFICIENT PROTECTION.
USE SURFACE PROTECTION MATERIAL IN AREAS WHICH HAVE GOOD AIR MOVEMENT.

(a) Make the absorbent lint-free cloth, OMat No. 2/101, moist with Acetone OMat No. 150 or Isopropyl alcohol OMat No. 1/40 or cleaning solvent Desoclean OMat No. 1/257.

(b) Clean the repair area with the moist lint-free cloth, OMat No. 2/101. Dry the area immediately.

S 358-019-R00

(8) Repair the chromate film

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

CHROMATE CONVERSION FOR ALUMINUM MUST BE DONE IN AREAS WHICH HAVE GOOD AIR MOVEMENT. THE MATERIALS USED TO REMOVE THE CONVERSION SOLUTION MUST NOT DRY OUT. YOU MUST FIRST WASH THEM IN COLD WATER BEFORE YOU DISCARD THEM OTHERWISE THEY WILL CAUSE A FIRE HAZARD.

(a) Apply chromating touch-up with a brush to the dressed areas.

S 368-020-R00

(9) Apply primer and finish

WARNING: DO NOT GET SURFACE PROTECTION MATERIAL ON YOUR SKIN. MAKE SURE SKIN THAT IS OPEN TO POSSIBLE CONTAMINATION HAS SUFFICIENT PROTECTION.
USE SURFACE PROTECTION MATERIAL IN AREAS WHICH HAVE GOOD AIR MOVEMENT.

(a) Apply two-pack epoxy primer and catalyst, OMat No. 766, and thinners for two-pack epoxy finish, OMat No. 793, to the damaged area.
(b) Apply a finishing coat to the primed surfaces with the two-pack black epoxy-finish and catalyst, OMat No. 788.

S 218-021-R00

(10) Examine the repair visually and make sure that all the damaged areas are covered.

S 938-022-R00

(11) Use a vibro-engraving equipment to write the identification number "FRS5373" adjacent to the assembly part number.

S 118-023-R00

(12) Clean the area with absorbent lint-free cloth, OMat No. 2/101, moist with Acetone OMat No. 150 or Isopropyl alcohol No. 1/40 or cleaning solvent Desoclean OMat No. 1/257.

S 378-024-R00

(13) Apply primer and finish to the engraved area

WARNING: DO NOT GET EPOXY COMPOUND MATERIAL ON YOUR SKIN. MAKE SURE SKIN THAT IS OPEN TO POSSIBLE CONTAMINATION HAS SUFFICIENT PROTECTION.
USE THE MATERIAL IN AREAS WHICH HAVE GOOD AIR MOVEMENT.

(a) Apply two-pack epoxy primer and catalyst, OMat No. 766, and thinners for the two-pack epoxy finishes, OMat No. 793 to the area.
(b) Apply a finishing coat to the primed surface with two-pack black epoxy finish and catalyst, OMat No. 788.

S 868-025-R00

(14) Move the thrust reverser to the stowed position (AMM 78-31-00/201).

TASK 78-31-05-308-026-R00

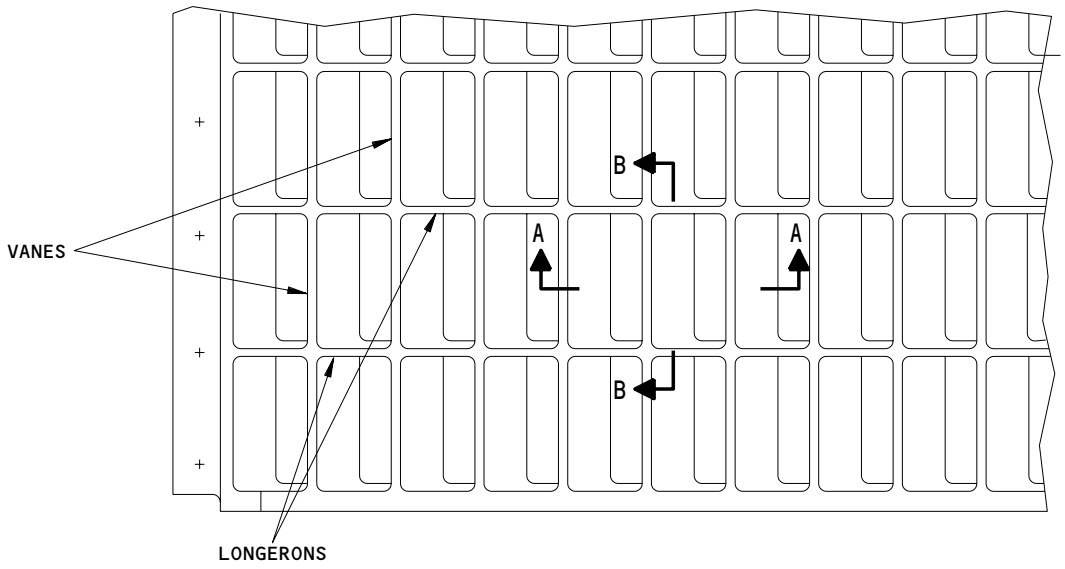
4. Thrust Reverser - Installation of Damping Materials to the Lockout Blade

A. General
(1) The repair in this procedure is FRS6109.
(2) This repair procedure is applicable to the left hand C-duct of the thrust reverser.
(3) This procedure tells you how to install damping materials on the lockout blade to prevent vibration.
(4) You can do this repair procedure on thrust-reverser cascade segments which have the part numbers that follow:

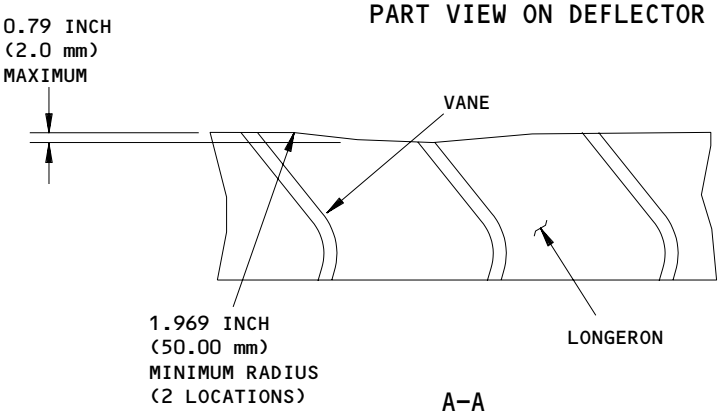
LJ75005, LJ75006

B. Equipment
(1) Standard workshop tools
(2) Heat lamp - resistant to explosion
(3) Permanent marker (local resources)

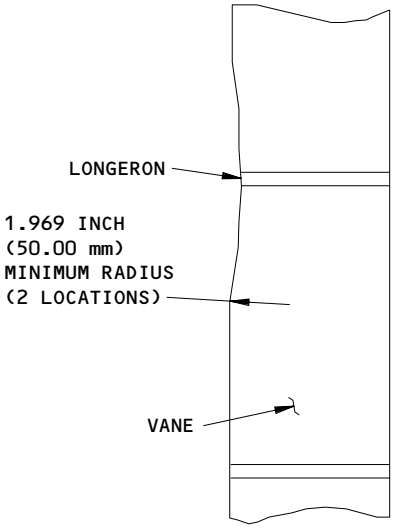
C. Consumable Materials
(1) Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257
(2) Waterproof silicone carbide,
OMat No. 5/33



PART VIEW ON DEFLECTOR BOX



A–A

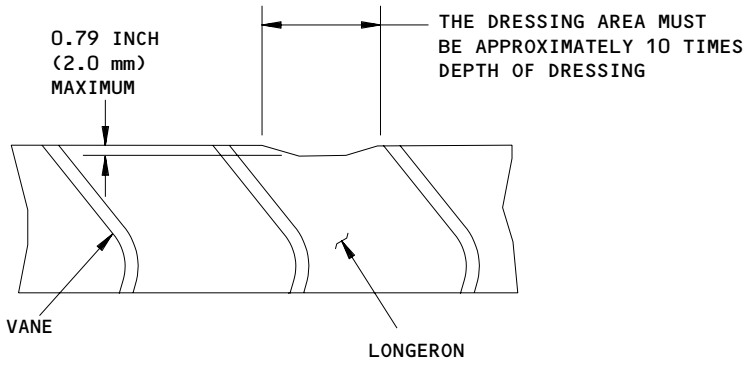


B–B

NOTE: DO ONLY ONE OF THIS TYPE OF DRESSING PER BOX. ANY OTHER TYPE OF DRESSING MUST BE SEPARATED BY A MINIMUM OF TWO VANES PITCHES. BLEND THE DRESSED AREA EVENLY OVER THE SURROUNDING VANES AND LONGERONS. DRESSING SHALL OCCUR ON ONE EDGE ONLY. DRESSED AREA MUST NOT HAVE SHARP CORNERS. GEOMETRIC SYMBOLS CONFORM TO I.S.O. R1101–1969. SURFACE TEXTURE OF DRESSED AREAS MUST NOT BE MORE THAN 125 MICROINCHES (3.2 micrometers)

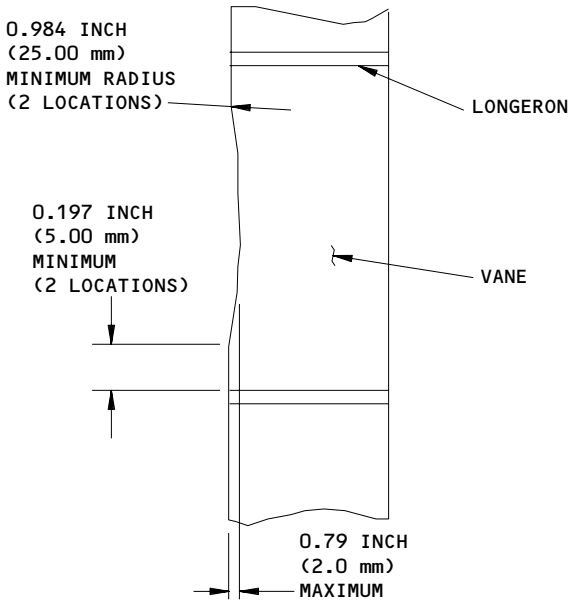
90266

Repair Dimensions
Fig 801 (Sheet 1)



LONGERON EDGE DRESSING
A-A

NOTE: IT IS NOT PERMITTED TO DO MORE THAN:
- 10 REPAIRS PER BOX
- 3 REPAIRS PER LONGERON.
DRESSING TO BE CARRIED OUT ON ONE EDGE ONLY.
BLEND THE DRESSING AREA SMOOTHLY WITH NO
SUDDEN CHANGES IN SHAPE OR RADIUS.

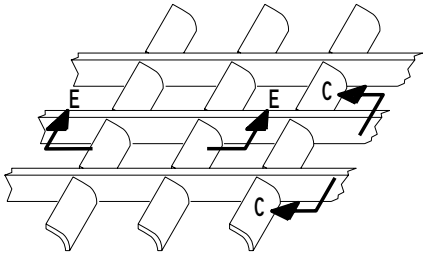


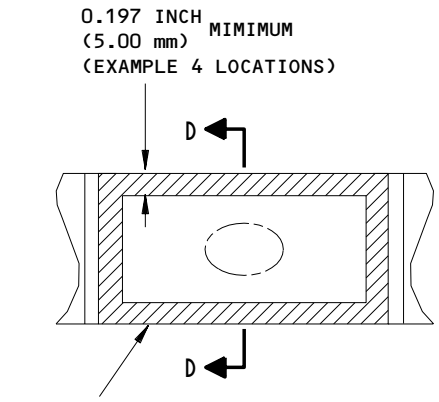
VANE EDGE DRESSING
B-B

NOTE: A MAXIMUM OF 25% OF VANES CAN BE DRESSED PER BOX, BUT NO TWO ADJACENT VANES ACROSS THE BOX CAN BE DRESSED IN THIS MANER.
BLEND THE DRESSING AREA SMOOTHLY WITH NO SHARP CORNERS.

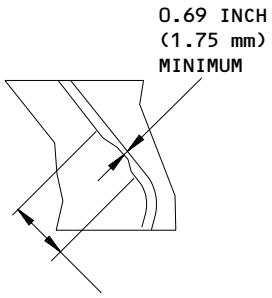
90267

Repair Dimensions
Fig 801 (Sheet 2)



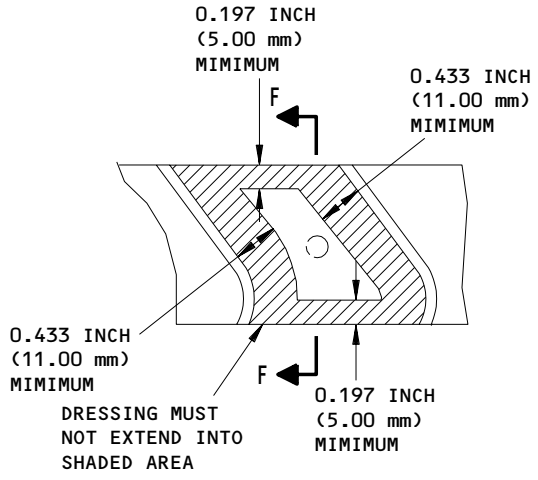


VANE BODY DRESSING
C–C

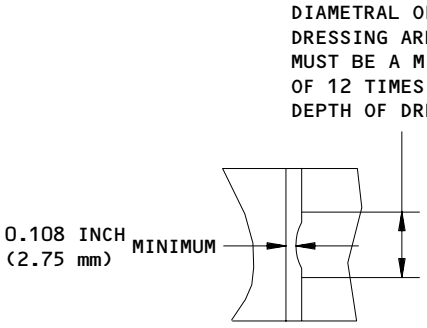


D–D

NOTE: BLEND THE DRESSING AREA SMOOTHLY WITH NO SUDDEN CHANGES IN SHAPE OR DEPTH. ONLY ONE DRESSED AREA PER VANE IS PERMITTED. A MAXIMUM OF 5 VANES CAN BE DRESSED PER BOX, BUT NO TWO ADJACENT VANES ACROSS THE BOX CAN BE DRESSED IN THIS MANNER.



LONGERON BODY DRESSING
E–E



F–F

NOTE: BLEND THE DRESSING AREA WITH NO SUDDEN CHANGES IN SHAPE OR DEPTH. ONLY ONE DRESSED AREA PER VANE IS PERMITTED. A MAXIMUM OF 5 BAY AREAS CAN BE DRESSED PER BOX, BUT NO TWO ADJACENT BAYS CAN BE DRESSED IN THIS MANNER.

90268

Repair Dimensions
Figure 801 (Sheet 3)

(3) Absorbent lint-free cloth, OMat No. 2/101
(4) Polysulphide sealant OMat No. 8/120.

D. References
(1) AMM 78-31-05/401, Thrust Reverser Cascade Segments
(2) AMM 78-31-00/201, Thrust Reverser System - Maintenance Practices

E. Prepare the repair area

S 868-027-R00
(1) Move the thrust reverser to the deployed position (AMM 78-31-00/201).

S 028-028-R00
(2) Remove two deflector boxes below and a deflector box above the lockout blade (AMM 78-31-05/401). Keep the removed parts for installation (Fig. 802).

S 358-029-R00
(3) Abrade the lockout blade
(a) Lightly, abrade the lockout blade and the adjacent deflector boxes with waterproof silicone carbide, OMat No. 5/33.
(b) Remove the loose rubber bumper pads.

S 118-030-R00
(4) Clean the repair area

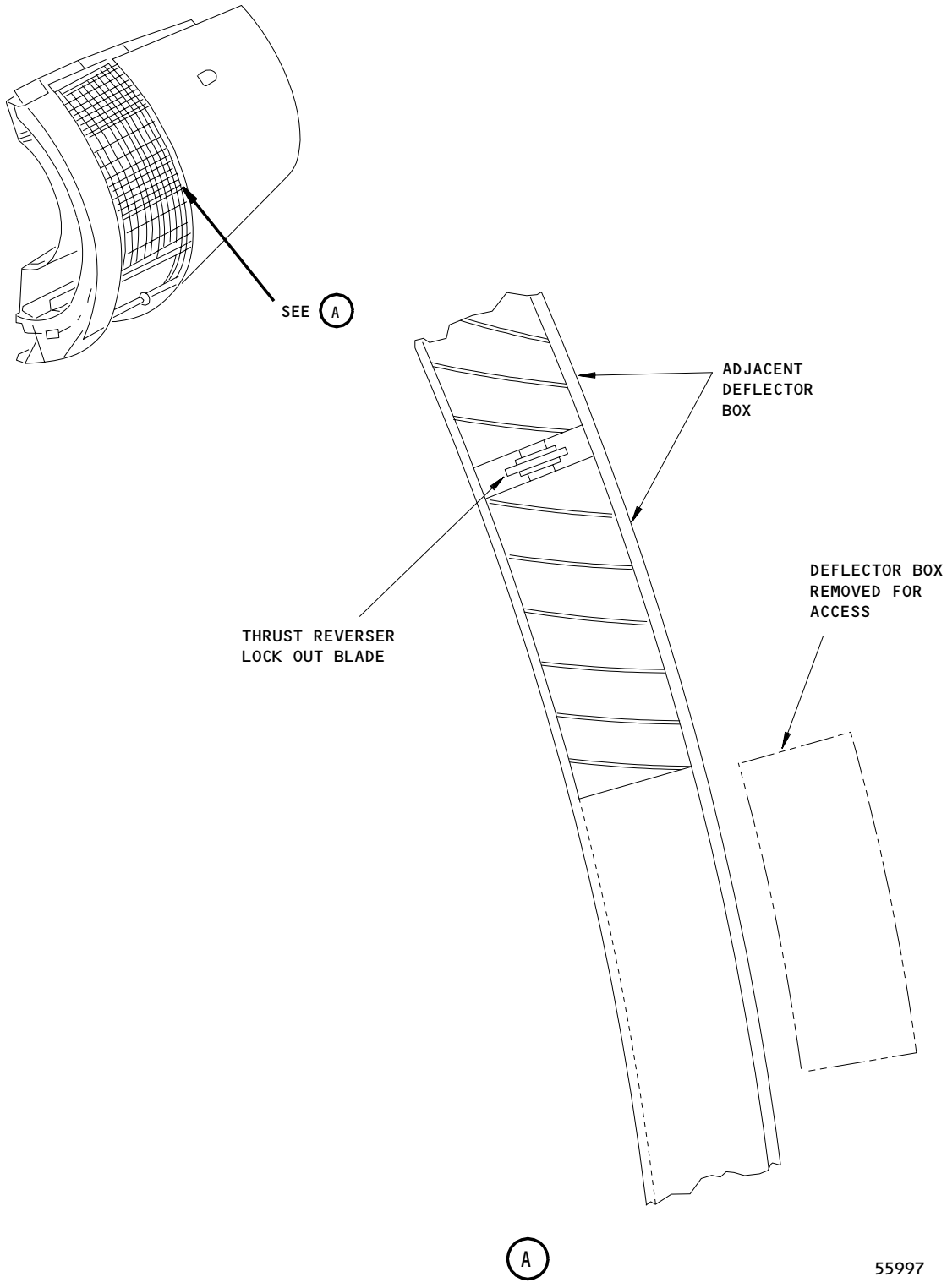
WARNING: PUT ON PROTECTIVE GLOVES WHEN YOU USE DEGREASER MATERIAL. KEEP THE MATERIAL AWAY FROM SPARKS, FLAME AND HEAT. USE ONLY IN AREAS WITH GOOD VENTILATION.

(a) Make the absorbent lint-free cloth, OMat No. 2/101, moist with Acetone OMat No. 150, or Isopropyl alcohol OMat No. 1/40 or cleaning solvent Desoclean OMat No. 1/257.

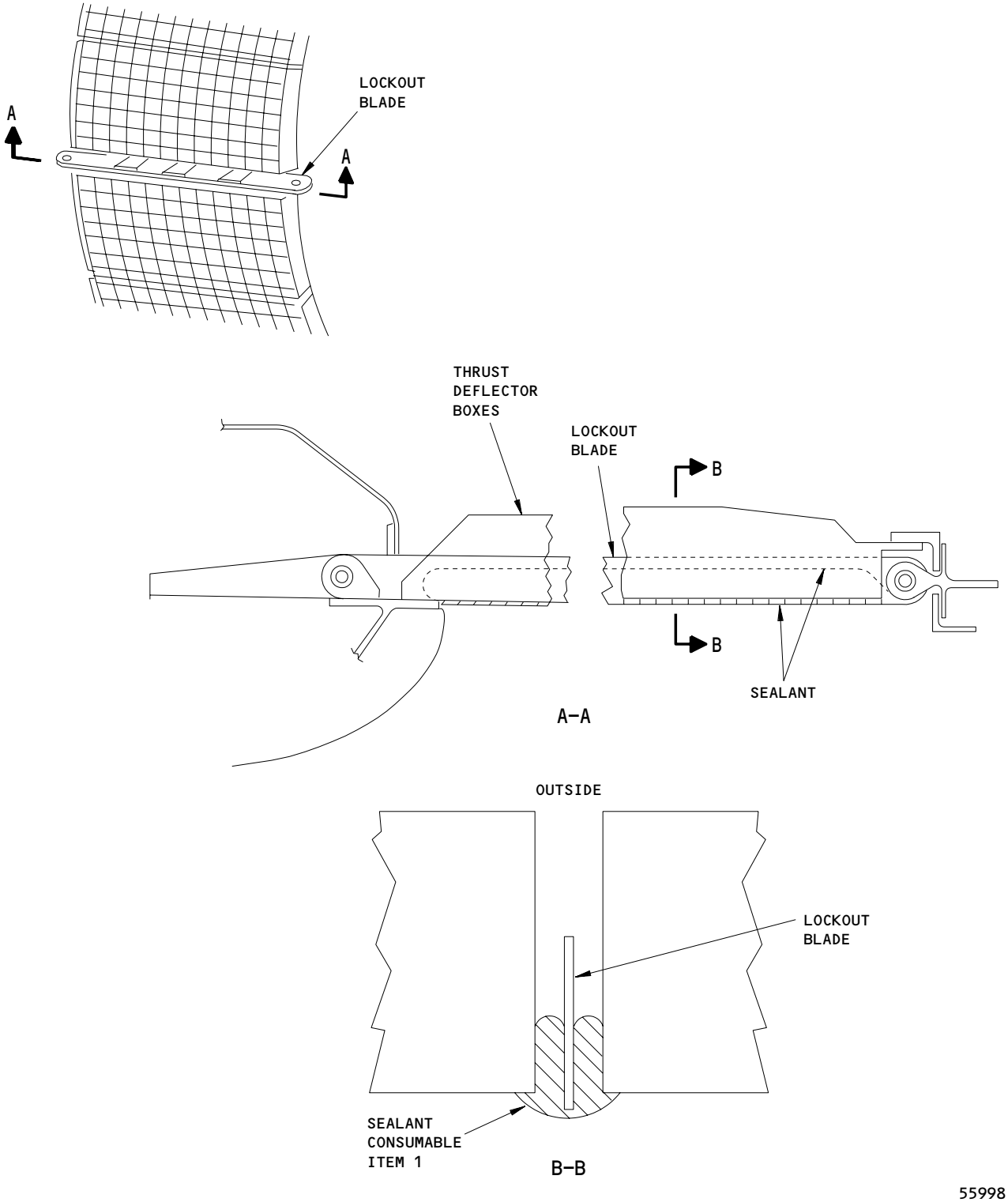
(b) Clean the repair area with the moist lint-free cloth and dry the area immediately.

S 168-031-R00
(5) Remove the old sealant
(a) Cut away the old sealant from the repair area.

NOTE: It is permitted to leave a film of sealant on the components if it is clean and firmly bonded.



Repair Details
Figure 802



Repair Details
Figure 803

S 398-032-R00

(6) Apply sealant to the lockout blade
  (a) Install the two deflector boxes adjacent to the lockout blade with the standard workshop tools (AMM 78-31-05/401).
  (b) Apply the sealant

WARNING: DO NOT GET EPOXY COMPOUND MATERIAL ON YOUR SKIN. MAKE SURE SKIN THAT IS OPEN TO POSSIBLE CONTAMINATION HAS SUFFICIENT PROTECTION.

USE THE MATERIAL IN AREAS WHICH HAVE GOOD AIR MOVEMENT.

1) Mix the polysulphide sealant, OMat No. 8/120, per instructions of the manufacturer.
2) Apply the sealant to the inside gap between the deflector boxes and the lockout blade (Fig. 803).

NOTE: Seen from outside, the gap between the deflector boxes and the lockout blade must be fully filled with sealant. Make sure that you can see the outer edge of the lockblade fully (Fig. 803).

3) Cure the sealant at room temperature for four hours or at 82 deg. C (180 deg. F) for two hours with explosion resistant heat lamps.

S 218-033-R00

(7) Do a visual inspection of the repair (Fig. 803).

S 428-034-R00

(8) Install the deflector boxes and record the repair (AMM 78-31-05/401)
  (a) Install the lower deflector box with standard workshop tools (Fig. 802).
  (b) Write "FRS6109" adjacent to the assembly part number with a permanent marker pen.

S 868-035-R00

(9) Move the thrust reverser to the stowed position (AMM 78-31-00/201).

TASK 78-31-05-308-036-R00

5. Thrust-Reverser Deflector Boxes Minor Damage To Vanes - Repair

A. General
  (1) The repair in this procedure is FRS6286.
  (2) This procedure tells you how to repair damage to the vanes and longerones.

(3) You can do this repair procedure on thrust-reverser cascade segments which have the part numbers that follow:

LJ75991 SB78-8325	LJ75996 SB78-8325
LJ76000 SB78-8325	LJ76001 SB78-8325
LJ75996 SB78-8325	LJ76079 SB78-9116
LJ75995 SB78-8325	LJ75988 SB78-8325
LJ75986 SB78-8325	LJ75997 SB78-8325
LJ75993 SB78-8325	LJ75994 SB78-8325
LJ75990 SB78-8325	LJ75999 SB78-8325
LJ75981 SB78-8325	LJ75993 SB78-8325
LJ75992 SB78-8325	LJ75989 SB78-8325
LJ75985 SB78-8325	LJ76543 SB78-9680
LJ75998 SB78-8325	LJ76543 SB78-8325
LJ75982 SB78-8325	

B. Equipment
(1) Standard workshop tools
(2) Routing tool
(3) Heat lamp - resistant to explosion
(4) Permanent marker (local resources)

C. Consumable Materials
(1) Lint-free absorbent cloth, OMat No. 2/101
(2) B50009 - Acetone, OMat No. 150
(3) B50018 - Isopropyl alcohol, OMat No. 1/40
(4) B00713 - Degreaser, OMat No. 1/257
(5) Waterproof silicon carbide (320 grit), OMat No. 5/33
(6) Waterproof silicon carbide (240 grft), OMat No. 5/35
(7) Epoxy adhesive, OMat No. 8/160
(8) Adhesive, OMat No. 8/117

D. References
(1) AMM 78-31-05/401, Thrust Reverser Cascade Segments
(2) AMM 78-31-00/201, Thrust Reverser System - Maintenance Practices

E. Repair the thrust-reverser deflector box

S 868-037-R00
(1) Manually deploy the thrust reverser (AMM 78-31-00/201).

S 358-038-R00
(2) Repair cracks, delaminations, nicks and gouges
(a) Remove the damaged deflector box segment (AMM 78-31-05/401).

WARNING: PUT ON PROTECTIVE CLOTHES, GLOVES, DUST MASK, AND SAFETY GLASSES. WHEN YOU CUT OR SAND COMPOSITE MATERIAL IT PRODUCES DUST AND FLYING PARTICLES WHICH CAN CAUSE HEALTH PROBLEMS. DO NOT GET THE MATERIALS ON YOUR SKIN FOR PROLONGED TIME.

(b) Use the routing tool to blend out the damaged area with a minimum radius of 1.00 inch (25,4 mm) and to a ratio of 10 to 1 (Fig. 804).

NOTE: If you can not remove the damage in the limits given in this procedure, then use the repair FRS6287 to repair the damage.

(c) Use the waterproof silicone carbide, OMat No. 5/35, to make the edges smooth.

S 118-039-R00

(3) Clean the repair area

WARNING: DO NOT GET DEGREASING FLUID, IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON PROTECTIVE SPLASH GOGGLES, AND GLOVES WHEN YOU USE THE DEGREASING FLUID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. THE DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION: DO NOT LET THE DEGREASING FLUID TOUCH THE KEVLAR. THE KEVLAR WILL ABSORB THE FLUID.

(a) Make a clean, dry, lint-free cloth moist with degreasing fluid (Acetone, OMat No. 150 or Isopropyl Alcohol, OMat No. 1/40 or Degreaser, OMat No. 1/257).
1) Use this cloth to clean the area to be repaired.

2) Let the surface dry fully.

S 358-040-R00

(4) Apply the adhesive
(a) Mix the epoxy adhesive, OMat No. 8/160, per instructions of the manufacturer.
(b) Apply a surface coat of the adhesive to the area you repaired.
(c) Cure the adhesive with explosion-resistant heat lamps for 220 minutes at 93 deg. C (200 deg. F).
(d) If the repair area is in the airflow, make the adhesive smooth with waterproof silicone carbide, OMat No. 5/33.

S 218-041-R00

(5) Do a visual inspection of the repair area to make sure you did the repair correctly.

S 938-042-R00

(6) Write "FRS6286" adjacent to the assembly part number with a permanent marker pen.

S 868-043-R00

(7) Move the thrust reverser to the stowed position (AMM 78-31-00/201).

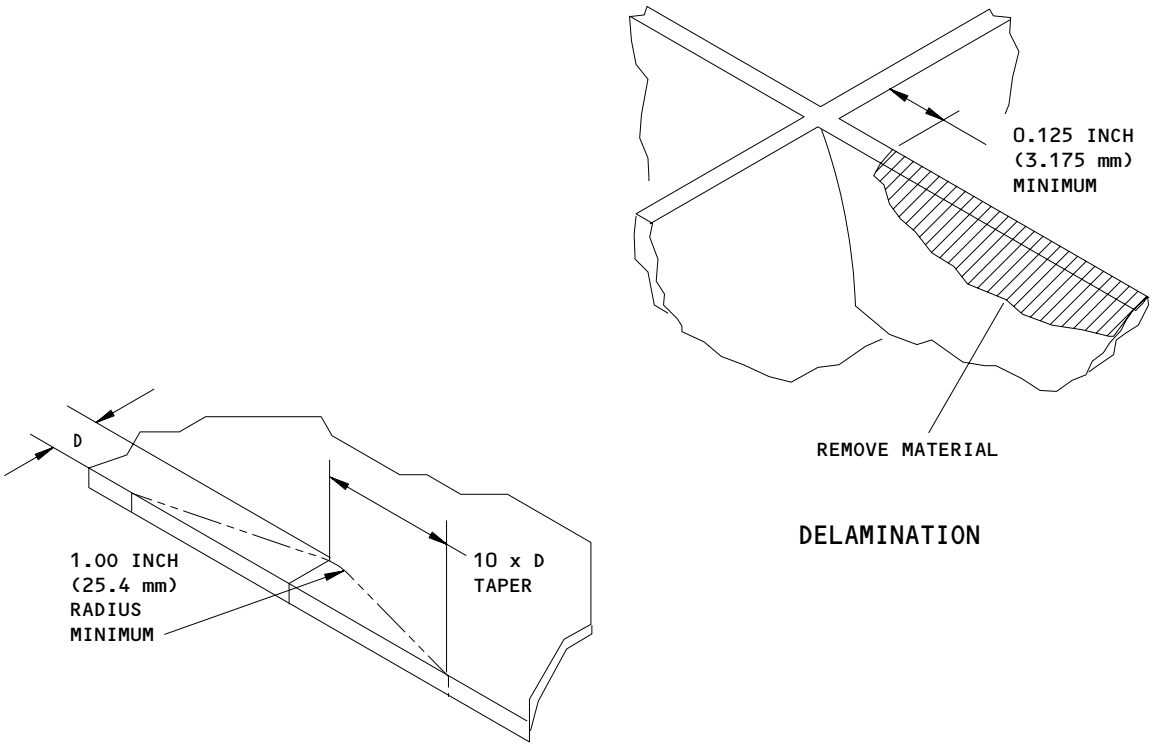
TASK 78-31-05-308-044-R00

6. Thrust-Reverser Deflector Boxes - Remove Cracked Vanes - Repair

A. General

(1) The repair in this procedure is FRS6287.
(2) This procedure tells you how to remove cracked vanes and seal the edges.
(3) You can do this repair procedure on thrust-reverser cascade segments which have the part numbers that follow:

LJ75991 SB78-8325	LJ75996 SB78-8325
LJ76000 SB78-8325	LJ76001 SB78-8325
LJ75996 SB78-8325	LJ76079 SB78-9116
LJ75995 SB78-8325	LJ75988 SB78-8325
LJ75986 SB78-8325	LJ75997 SB78-8325
LJ75993 SB78-8325	LJ75994 SB78-8325
LJ75990 SB78-8325	LJ75999 SB78-8325
LJ75981 SB78-8325	LJ75993 SB78-8325
LJ75992 SB78-8325	LJ75989 SB78-8325
LJ75998 SB78-8325	LJ75987 SB78-8325
LJ75985 SB78-8325	LJ76543 SB78-9680
LJ75983 SB78-8325	



LEGEND:

D = DEPTH OF DAMAGE
T = MATERIAL THICKNESS

62529

Repair Details and Dimensions
Figure 804

B. Equipment
   (1) Standard workshop tools
   (2) Routing tool
   (3) Heat lamp - resistant to explosion
   (4) Permanent marker (local resource)

C. Consumable Materials
   (1) Lint-free absorbent cloth,
       OMat No. 2/101
   (2) B50009 - Acetone, OMat No. 150
   (3) B50018 - Isopropyl alcohol, OMat No. 1/40
   (4) B00713 - Degreaser, OMat No. 1/257
   (5) Waterproof silicon carbide (320 grit),
       OMat No. 5/33
   (6) Waterproof silicon carbide (240 grft),
       OMat No. 5/35
   (7) Epoxy adhesive,
       OMat No. 8/160
   (8) Adhesive,
       OMat No. 8/117

D. References
   (1) AMM 78-31-05/401, Thrust Reverser Cascade Segments
   (2) AMM 78-31-00/201, Thrust Reverser System - Maintenance Practices

E. Remove the cracked vane(s)

   S 868-045-R00
   (1) Manually deploy the thrust reverser (AMM 78-31-00/201).

   S 038-046-R00
   (2) Remove the damaged deflector-box segment (AMM 78-31-05/401).

   S 358-047-R00

   WARNING: PUT ON PROTECTIVE CLOTHES, GLOVES, DUST MASK, AND SAFETY GLASSES. WHEN YOU CUT OR SAND COMPOSITE MATERIAL IT PRODUCES DUST AND FLYING PARTICLES WHICH CAN CAUSE HEALTH PROBLEMS. DO NOT GET THE MATERIALS ON YOUR SKIN FOR PROLONGED TIME.

   CAUTION: DO NOT REMOVE TWO VANES THAT ARE ADJACENT TO EACH OTHER. IT IS PERMITTED TO HAVE UP TO FOUR MISSING VANES IN TOTAL.

   (3) Rout out the cracked vane with the routing tool. Remove the cracked vane. Keep a minimum of 0.125 inch (3,175 mm) distance from the nodes (Fig. 805 and Fig. 806).

   S 328-048-R00
   (4) Use waterproof silicone carbide, OMat No. 5/35, to make all the edges smooth.

   NOTE: It is not permitted to remove two vanes adjacent to each other. It is permitted to have four vanes not there.

S 118-049-R00
(5) Clean the repair area

WARNING: DO NOT GET DEGREASING FLUID, IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON PROTECTIVE SPLASH GOGGLES, AND GLOVES WHEN YOU USE THE DEGREASING FLUID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. THE DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION: DO NOT LET THE DEGREASING FLUID TOUCH THE KEVLAR. THE KEVLAR WILL ABSORB THE FLUID.

(a) Make a clean, dry, lint-free cloth moist with degreasing fluid (Acetone, OMat No. 150 or Isopropyl Alcohol, OMat No. 1/40 or Degreaser, OMat No. 1/257).
1) Use this cloth to clean the area to be repaired.
2) Let the surface dry fully.

S 358-050-R00
(6) Apply adhesive to the repair area

WARNING: DO NOT GET EPOXY COMPOUND MATERIAL ON YOUR SKIN. MAKE SURE SKIN THAT IS OPEN TO POSSIBLE CONTAMINATION HAS SUFFICIENT PROTECTION.

USE THE MATERIAL IN AREAS WHICH HAVE GOOD AIR MOVEMENT.

(a) Mix the epoxy adhesive, OMat No. 8/160, per instructions of the manufacturer.
(b) Apply a surface of coat of adhesive to all the repair area.
(c) Cure the adhesive with explosion-resistant heat lamps. Cure the adhesive for 220 minutes at 93 deg. C (200 deg. F).

S 358-051-R00
(7) Make the repair area smooth

WARNING: PUT ON PROTECTIVE CLOTHES, GLOVES, DUST MASK, AND SAFETY GLASSES. WHEN YOU CUT OR SAND COMPOSITE MATERIAL IT PRODUCES DUST AND FLYING PARTICLES WHICH CAN CAUSE HEALTH PROBLEMS. DO NOT GET THE MATERIALS ON YOUR SKIN FOR PROLONGED TIME.

(a) If the repair area is in the airflow, use the waterproof silicone carbide, OMat No. 5/33, to make the repair area smooth.

S 218-052-R00

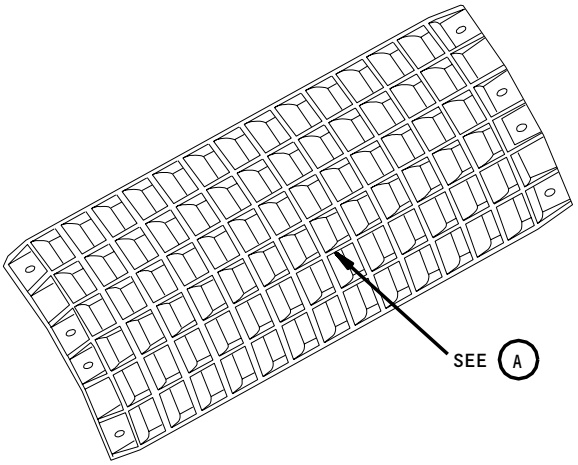
(8) Do a visual inspection of the repair area to make sure that you did the repair correctly.

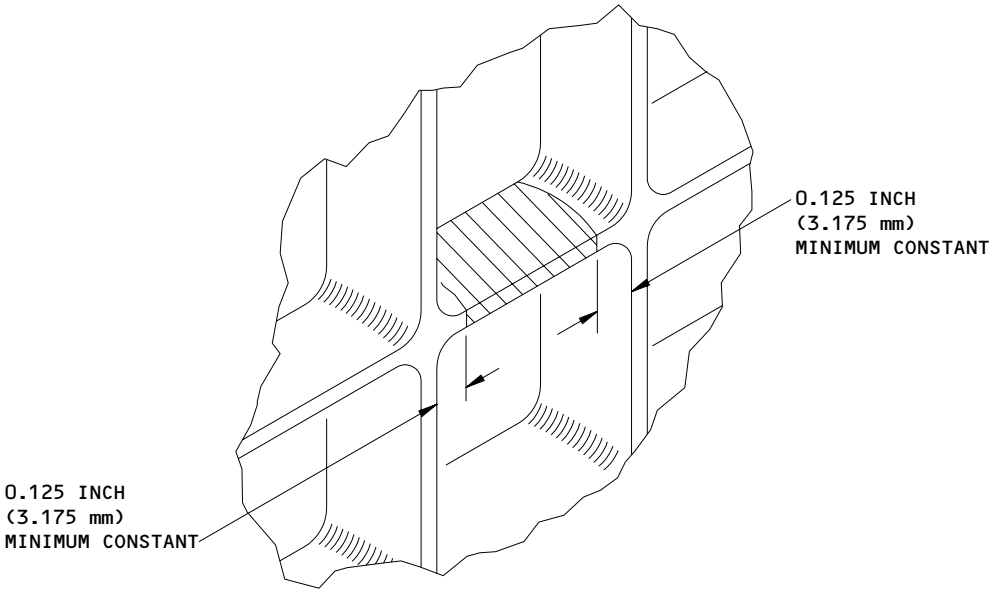
S 938-053-R00

(9) Write "FRS6287" adjacent to the assembly part number with a permanent marker pen.

S 868-054-R00

(10) Move the thrust reverser to the stowed position (AMM 78-31-00/201).



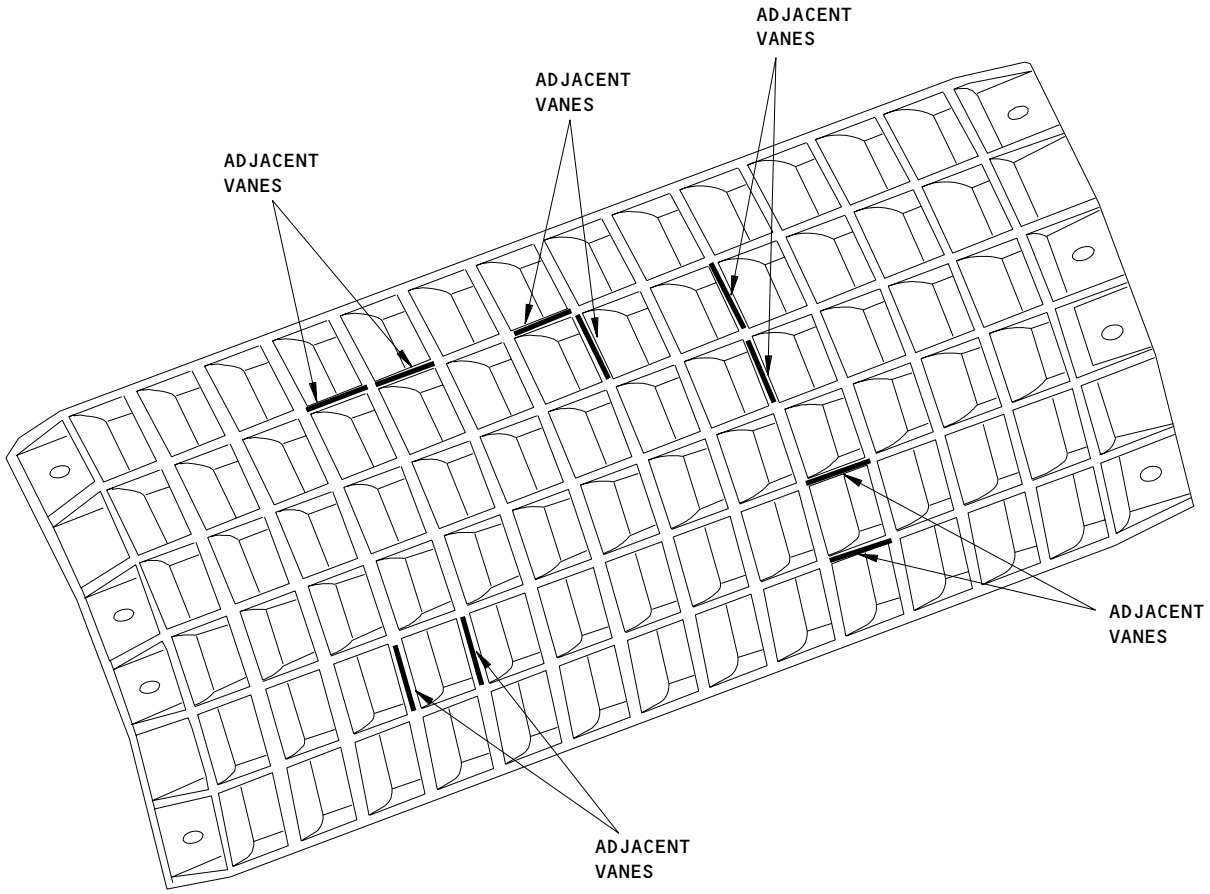


SHOWING A VANE REMOVAL
(EXAMPLE)

A

62530

Repair Details and Dimensions
Figure 805



DEFINITION OF REPAIR AREAS

NOTE: A MAXIMUM OF FOUR VANES MAY BE MISSING/REMOVED.
NO TWO MISSING/REMOVED VANES ARE ADJACENT.

62532

Repair Details
Figure 806

THRUST REVERSER STRUT-MOUNTED EXTEND/RETRACT HYDRAULIC COMPONENTS - REMOVAL/INSTALLATION

1. General
   A. You can use this procedure when the thrust reversers are installed or removed from the engine. Ignore those steps which refer to the thrust reverser when it is not installed on the engine.

TASK 78-31-07-004-001-R00

2. Thrust Reverser Strut-Mounted Extend/Retract Hydraulic Components Removal
   A. Equipment
      (1) Standard workshop tools
   B. Consumable Materials
      (1) Lint-free cloth (Local resources)
   C. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-31-20/401, Thrust Reverser
   D. Access
      (1) Location Zones

210	Control Cabin
415/425	Thrust Reverser, Left
416/426	Thrust Reverser, Right

      (2) Access Panels

415BL/425BL	Hinge Access Doors, Left
416BR/426BR	Hinge Access Doors, Right
415CL/425CL	Translating Cowl Actuator Ram, Left
416CR/426CR	Translating Cowl Actuator Ram, Right

   E. Remove the Components for the Extend/Retract Hydraulic System of the Thrust Reverser on the Strut

S 044-002-R00

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 AND DAMAGE TO EQUIPMENT.

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 014-003-R00

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

(2) Open the left (right) thrust reverser (AMM 78-31-00/201).

S 024-004-R00

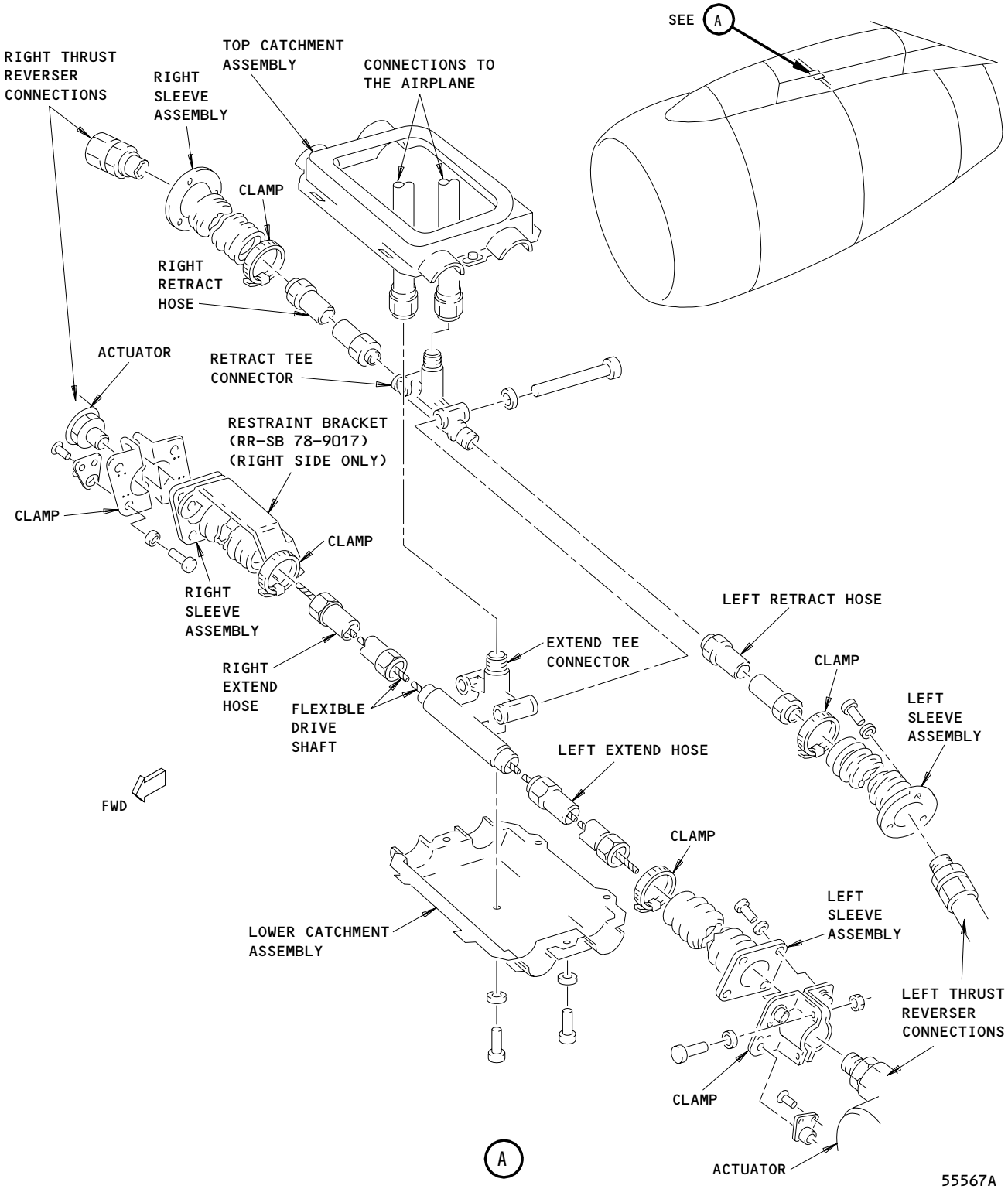
WARNING: DO NOT GET HYDRAULIC FLUID ON YOUR SKIN, IN YOUR EYES OR IN YOUR MOUTH. HYDRAULIC FLUID IS POISONOUS AND CAN GO THROUGH YOUR SKIN AND INTO YOUR BODY. FLUSH HYDRAULIC FLUID FROM YOUR EYES, MOUTH OR SKIN WITH WATER. GET MEDICAL AID IF YOU GET HYDRAULIC FLUID IN YOUR EYES OR MOUTH.

CAUTION: DO NOT LET HYDRAULIC FLUID FALL ON THE ENGINE. YOU MUST REMOVE ALL UNWANTED HYDRAULIC FLUID IMMEDIATELY WITH A LINT-FREE CLOTH. THE FLUID CAN CAUSE DAMAGE TO THE SURFACE PROTECTION AND TO PARTS.

(3) Remove the components for the extend/retract hydraulic system (Fig. 401).
   (a) Remove the access panels 415BL(425BL) and 416BR(426BR) (AMM 78-31-10/401).
   (b) Remove the access panel 415CL(425CL) and 416CR(426CR) (AMM 78-31-20/401).

   CAUTION: MAKE SURE YOU REMOVE THE LOCKPIN FROM THE MANUAL BYPASS VALVE ON THE ISOLATION VALVE BEFORE YOU DRAIN THE HYDRAULIC SYSTEM OF THE THRUST REVERSER. THE AIRPLANE HYDRAULIC SYSTEM WILL DRAIN IF YOU DO NOT REMOVE THE LOCKPIN.

   (c) Make sure the lockpin is removed from the manual bypass valve (AMM 78-31-00/201).
   (d) Loosen the clamps that attach the extend and retract hose sleeves to the skydrol containment assembly.
      1) Remove the sleeves from the assembly.
   (e) Remove the bolts and washers that attach the lower catchment assembly to the top catchment assembly.



Thrust Reverser Strut Mounted Hydraulic Components - Removal/Installation
Figure 401

CAUTION: BE CAREFUL WHEN YOU REMOVE THE LOWER HOUSING BECAUSE IT CAN CONTAIN HYDRAULIC FLUID. DAMAGE TO EQUIPMENT AND TO PARTS CAN OCCUR.

(f) Remove the bolt and washer that attach the lower catchment assembly to the extend tee connector.
(g) Move the tangs from the slots of the top catchment assembly to remove the lower catchment assembly.
(h) Disconnect the right extend hose and the left extend hose from the top actuator connections on the thrust reverser.
    1) Let a small amount of hydraulic fluid drain, then remove the flexible drive shaft and keep it in a clean place.
(i) Loosen the bolts on the rear of the clamps and remove the extend hydraulic hoses.
(j) ENGINES PRE-SB 78-9017;
Remove the bolts and washers that attach the extend hose sleeve to the clamps.
(k) ENGINES POST-SB 78-9017;
Do these steps:
    1) Remove the bolts and washers that attach the left sleeve assembly to the clamp.
    2) Remove the bolts and washers that attach the right sleeve assembly and the restraint bracket to the clamp.
    3) Remove the restraint bracket.
(l) Disconnect the right and left extend hoses from the extend tee connector.
(m) Remove the hose assemblies, sleeve assemblies and clamps from the strut.
(n) Remove the bolts and washers that attach the sleeve assembly to the bulkhead.
(o) Remove the sleeve assemblies.
(p) Disconnect the right retract hose and the left retract hose from the bulkhead adapter.

NOTE: Hold the adapter with a spanner. If you do not use a spanner to hold the adapter, the adapter can turn.

(q) Let a small quantity of hydraulic fluid drain.
(r) Disconnect the airplane connections from the extend tee connector and the retract tee connector.
(s) Disconnect the retract hoses from the retract tee connector.
(t) Remove the retract hoses, sleeve assemblies and clamps from the strut.
(u) Remove the bolts and washers that attach the retract and extend assemblies to the strut bracket.

(v) Remove the extend and retract tee connectors and the top catchment assembly from the strut.
(w) Install the end caps on all the openings.

TASK 78-31-07-404-005-R00

3. Strut-Mounted Thrust Reverser Extend/Retract Hydraulic System Components Installation

A. Equipment
(1) Standard workshop tools

B. Consumable Materials
(1) Isopropyl Alcohol
OMat No. - 1/40
(2) Sealant, 2 part pack comprising:
Base RTV90-006, Catalyst RTV90-006-2
OMat No. - 8/138
(3) Lockwire
British Spec - 22 S.W.G.
American Spec - 21 A.W.G.
OMat No. - 238
(4) Sealant BMS5-63
(5) Lint-free cloth - Local resources

C. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-20/401, Thrust Reverser

D. Access
(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser, Left
416/426	Thrust Reverser, Right

(2) Access Panels

415BL/425BL	Hinge Access Doors, Left
416BR/426BR	Hinge Access Doors, Right
415CL/425CL	Translating Cowl Actuator Ram, Left
416CR/426CR	Translating Cowl Actuator Ram, Right

E. Install the extend/retract system components (Fig. 401).

S 424-006-R00
(1) Do these steps to install the components for the extend/retract system.
(a) Install the retract tee connector to the extend tee connector with the washers and bolts.

(b) Put the top catchment assembly above the tee connectors.

NOTE: Make sure the attachment slots for the lower catchment assembly face forward and the flanges align with the tee ports.

(c) Put the tee connectors on the strut-mounting bracket and attach with the washers and bolts.
(d) Tighten the bolts and apply a lockwire.
(e) Connect the airplane connections to the retract and extend tee connections and tighten.

CAUTION: BEFORE INSTALLATION, MAKE SURE THE FLEX SHAFT AND HOSE ARE THE SAME SERVICE BULLETIN STANDARD. INTERMIXING PRE-SB AND POST-SB 78-9017 PARTS WILL HAVE A DETRIMENTAL EFFECT ON THE SERVICE LIFE OF THE COMPONENTS AND COULD LEAD TO LOSS OF SYNCHRONIZING SHAFT CONTINUITY BETWEEN THE TWO C-DUCTS.

(f) Move the right extend hose and the left extend hose through the thrust reverser bulkhead.
  1) Connect the hose to its applicable upper actuator.
  2) Do not connect the hose at this time.
(g) ENGINES PRE-SB 78-9017;
  Put the left sleeve assembly on the left extend hose.
  1) Put the right sleeve assembly on the right extend hose.
  2) Attach the sleeve assemblies to the clamps with the washers and bolts.
  3) Tighten the bolts to 20-25 pound-inches (2.30-2.80 Newton meters).
(h) ENGINES POST-SB 78-9017;
  Put the left sleeve assembly on the left extend hose.
  1) Attach the left sleeve assembly to the clamp with the washers and bolts.
  2) Tighten the bolts to 20-25 pound-inches (2.30-2.80 Newton meters).
  3) Put the right sleeve assembly on the right extend hose.
  4) Put the restraint bracket on the sleeve assembly.
  5) Attach the bracket to the bulkhead support clamp with the washers and bolts.
  6) Tighten the bolts to 20-25 pound-inches (2.30-2.80 Newton meters).
(i) Put the clamps on the extend hoses at the tee connector end.
(j) Connect the extend hoses to the extend tee connector.
(k) Tighten the connector to 500-600 pound-inches (56.5-67.8 Newton meters).
(l) Attach the extend hose connectors to the top actuator receptacle on the left and right thrust reversers.
(m) Attach and tighten the clamp with the washers and bolts.
(n) Connect the left retract hose and the right retract hose to the applicable bulkhead adapter.

(o) Tighten the union nut.

NOTE: Hold the adapter with a spanner. If you do not use a spanner, the adapter could turn.

(p) Put the sleeves assemblies on the hoses and attach to the bulkhead adapter with the washers and bolts.
(q) Tighten the bolts to 20-25 pound-inches (2.30-2.80 Newton meters).
(r) Put the clamps on the sleeve assemblies at the tee connector end.
(s) Connect the left and right retract hoses to the retract tee connector.
(t) Tighten the connectors to 500-600 pound-inches (56.5-67.8 Newton meters) and apply a lockwire.

S 414-007-R00

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

(2) Close the thrust reverser (AMM 78-31-00/201).

S 444-008-R00
(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 724-009-R00
(4) Do the thrust reverser synchronization procedure (AMM 78-31-20/401).

S 424-010-R00
(5) Install the flexible shaft of the extend hydraulic tube (AMM 78-31-20/401).

S 874-011-R00
(6) Bleed the thrust reverser system (AMM 78-31-20/401).

S 044-012-R00

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 AND DAMAGE TO EQUIPMENT.

(7) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 014-013-R00

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

(8) Open the thrust reverser (AMM 78-31-00/201).

S 794-014-R00

(9) Examine all moved hydraulic connections and components for leaks.

S 024-015-R00

(10) Do these steps to attach the top and lower housing of the catchment assembly:
   (a) Clean the seal area of the lower catchment assembly with isopropyl alcohol.
   (b) Apply a 0.187-0.250 inch (4.76-6.35 mm) layer of sealant, BMS5-63, to all the lower housing seal area.
   (c) Apply a two part pack sealant to all the flange and tube area of the top housing that touches the lower housing seal area.
   (d) Attach the lower catchment assembly to the top catchment assembly and the extend tee connector with washers and bolts.
   (e) Attach the extend and retract hose assemblies to the catchment box flanges with clamps and tighten.

S 414-016-R00

(11) Install all the access panels (AMM 78-31-20/401).

S 414-017-R00

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

(12) Close the thrust reversers (AMM 78-31-00/201).

S 444-018-R00

(13) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

THRUST REVERSER STRUT MOUNTED EXTEND/RETRACT COMPONENTS - INSPECTION/CHECK

1. General
   A. This procedure makes an inspection of the components of the extend/retract hydraulic system which are mounted on the strut.

TASK 78-31-07-216-001-R00

2. Thrust Reverser Strut Mounted Extend/Retract Components - Inspection/Check
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-31-20/401, Thrust Reverser
   B. Access
      (1) Location Zones

415/425	Thrust Reverser (Left)
416/426	Thrust Reverser (Right)
413/423	Fan Cowl Panel (Left)
414/424	Fan Cowl Panel (Right)

      (2) Access Panels

415CL/425CL	Top Thrust Reverser Actuator, Left
416CR/426CR	Top Thrust Reverser Actuator. Right

   C. Make an inspection of the Extend/Retract Hydraulic Components on the Strut

S 016-010-R00

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

(1) Open the left (right) fan cowl panel (AMM 71-11-04/201).

S 016-002-R00

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

(2) Open the left (right) thrust reverser (AMM 78-31-00/201).

S 016-003-R00

(3) Remove the access panels 415CL/425CL (416CR/426CR) (AMM 78-31-20/401).

S 216-004-R00

(4) Make an inspection of these items and replace if they are defective:

(a) Examine the extend and retract assemblies.

1) Make sure there are no signs of corrosion or leakage.

(b) Examine the fluid catchment assembly.

1) Make sure it is serviceable and attached correctly.

2) Make sure there is no leakage or discolorization.

(c) Examine the hose sleeve assemblies.

1) Make sure it is serviceable and attached correctly.

2) Make sure the material is not damaged.

3) Make sure there are no hydraulic fluid stains.

4) Make sure there are no kinks in the sleeve.

(d) Examine the extend and retract hydraulic hoses where you can see them.

1) Make sure they are serviceable and attached correctly.

2) Make sure the hoses are free of kinks, bulges, soft areas, chafing, and signs of leakage.

(e) Examine the bulkhead clamps, seals and connectors.

1) Make sure they are serviceable and attached correctly.

(f) Examine the electrical harnesses and connectors.

1) Make sure they are serviceable and attached correctly.

(g) Examine the feedback cables and the cable clamps.

1) Make sure they are serviceable and attached correctly.

(h) Examine the flexible drive shaft and if you find one or more of these items, replace the drive shaft.

NOTE: To examine the flexible drive shaft, you must move the shaft from the extend hoses and tee assembly at the two extend hose connections for the top actuator. You can do this at one of the two thrust reversers.

1) Permanent deformation.

2) Weld fractures.

3) Loose or frayed wires.

4) Separation of the outer wire.

5) Nicks.

6) Flat areas in the round section.

S 416-006-R00

(5) Install the access panels 415CL/425CL (416CR/426CR) (AMM 78-31-20/401).

S 416-005-R00

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

(6) Close the left (right) thrust reverser (AMM 78-31-00/201).

S 416-009-R00

CAUTION: OBEY THE PRECAUTIONS FOR THE KEVLAR WRAPPING WHEN YOU OPEN THE FAN COWL PANEL. DAMAGE TO THE KEVLAR WRAPPING CAN OCCUR.

(7) Close the left (right) fan cowl panel (AMM 71-11-04/201).

THRUST REVERSER HINGE ACCESS DOORS - REMOVAL/INSTALLATION

1. General
   A. You can use this procedure for the left and right hinge access door of the thrust reverser.

TASK 78-31-10-004-002-R00

2. Remove the Hinge Access Door
   A. Equipment
      (1) Thrust Reverser Lock Assembly B78001-1 or B78001-8
   B. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-30-00/501, Thrust Reverser Adjustment
   C. Access
      (1) Location Zones

210	Control Cabin
415/425	Thrust Reverser - Left
416/426	Thrust Reverser - Right
434/444	Nacelle Strut - Aft Fairing

      (2) Access Panels

415BL/425BL	Thrust Reverser Hinge Access - Left
416BR/426BR	Thrust Reverser Hinge Access - Right
434GR/444GL	Nacelle Strut - Aft Fairing

   D. Remove the Hinge Access Door (Fig. 401)

S 044-003-R00

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 AND DAMAGE TO EQUIPMENT.

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

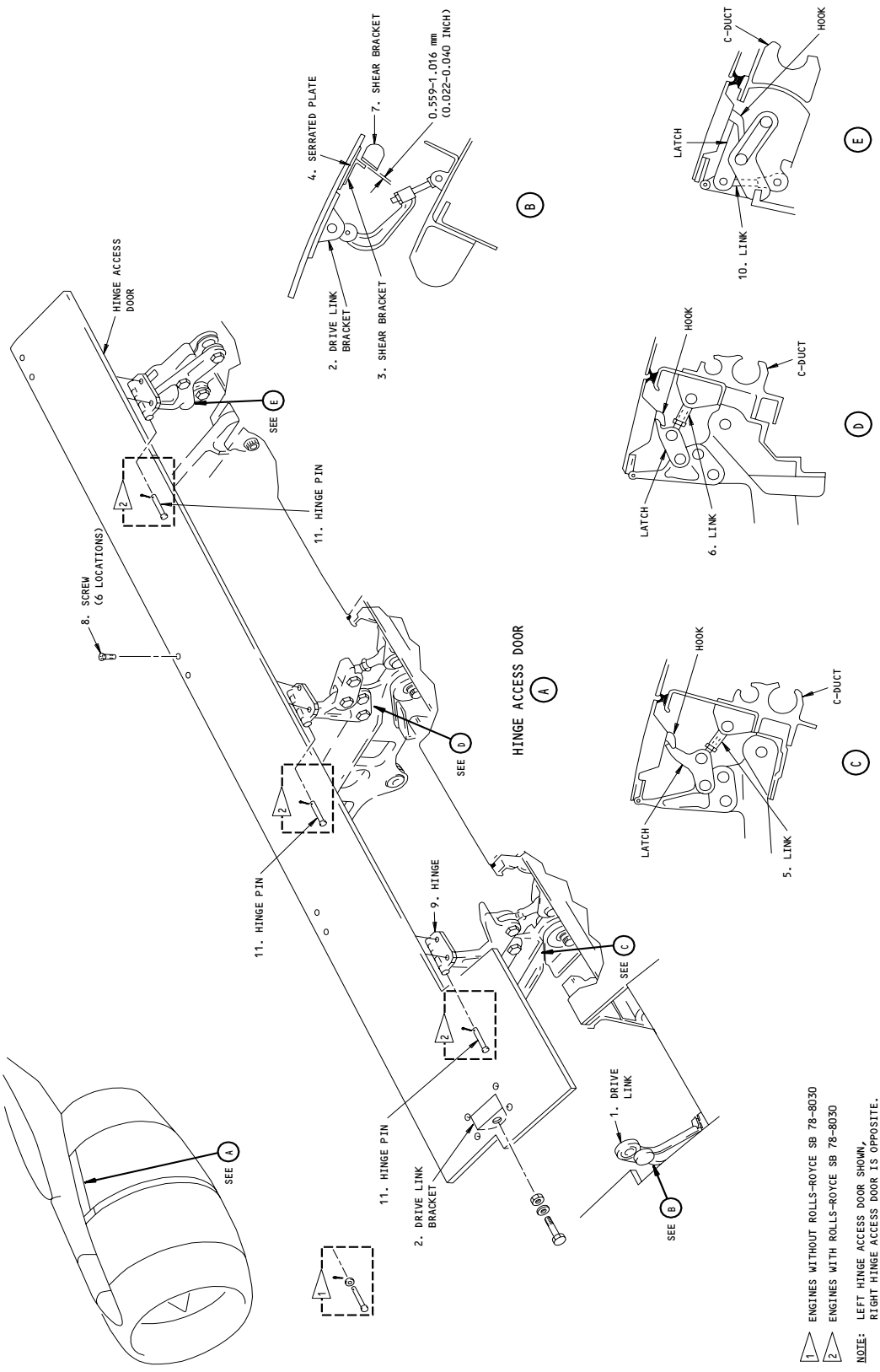
S 014-004-R00

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

(2) Open the thrust reverser (AMM 78-31-00/201).

S 034-005-R00

(3) Disconnect the drive link (1) from the drive link bracket (2) (Fig. 401).



Hinge Access Door Installation
Figure 401

217512

S 034-006-R00

(4) Remove the screws (8) which attach the hinge access door to the hinges (9) and remove the access door.

S 034-007-R00

(5) To remove the hinges (9), remove the hinge pins (11).

NOTE: If the hinges will not be removed, you must apply a tape to the plates when they are in the vertical position. The hinge and the latch must not touch when you open the thrust reverser.

TASK 78-31-10-404-001-R00

3. Install the Hinge Access Door

A. General

(1) This task gives information to install the hinge access door and also to adjust the door to make sure it is installed correctly.

B. Equipment

(1) Thrust Reverser Lock Assembly B78001-1 or B78001-8

C. Consumable Materials

(1) Plasticine (Modelling Clay)
OMat No. - 249

D. References

(1) AMM 78-31-00/201, Thrust Reverser System

E. Access

(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser - Left
416/426	Thrust Reverser - Right
434/444	Nacelle Strut - Aft Fairing

(2) Access Panels

415BL/425BL	Thrust Reverser Hinge Access - Left
416BR/426BR	Thrust Reverser Hinge Access - Right
434GR/444GL	Nacelle Strut - Aft Fairing

F. Install the Hinge Access Door (Fig. 401)

S 824-010-R00

(1) Do these steps to adjust the length of the links:

NOTE: This adjustment of the links increases the distance between the hooks and the latches when the hinge access doors and the thrust reverser are closed. This gives you an accurate datum point when you do the rigging procedure.

(a) Release the locknuts on the links (5), (6) and (10).
(b) Increase the length of the link (5) (measured between the eyebolt centers) to 1.804 inch (45.822 mm).
(c) Increase the length of the link (6) (measured between the eyebolt centers) to 1.828 inch (46.431 mm).
(d) Decrease the length of the link (10) (measured between the eyebolt centers) to 1.828 inch (46.431 mm).
1) Tighten the locknut on the links (5), (6) and (10).

S 824-011-R00
(2) Do these steps to adjust the length of the drive link (1):
(a) Measure the drive link (1) between the eyebolt centers.
(b) Release the locknut.
(c) Adjust the drive link (1) until you get a length of 4.787 inch (121.59 mm).
1) Tighten the locknut on the drive link (1).

S 434-015-R00
(3) Put the hinges (9) on the hook/latch assemblies and attach with the hinge pins (11).

S 434-012-R00
(4) Put the hinge access door on the engine.

S 434-013-R00
(5) Install the screws (8) to attach the hinge access door to the hinge (9).

S 434-014-R00
(6) Install the bolt, washer and nut to attach the drive link (1) to the link bracket (2).

S 824-049-R00
(7) Do the adjustment of the hinge access door (AMM 78-30-00/501).

S 444-040-R00
(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

THRUST REVERSER HINGE ACCESS DOORS - INSPECTION/CHECK

1. General
   A. This procedure is for the hinge access doors on the left and the right fan thrust reverser halves.

TASK 78-31-10-206-001-R00

2. Hinge Access Doors Inspection (Fig. 601 and 602)
   A. References
      (1) 70-42-11/201, Repair Surfaces Affected by Minor Damage (FRS3253)
      (2) 78-31-00/201, Thrust Reverser System
      (3) 78-31-10/401, Thrust Reverser Hinge Access Doors
      (4) 78-31-10/801, Thrust Reverser Hinge Access Doors
   B. Access
      (1) Location Zones

210	Control Cabin
415/425	Thrust Reverser - Left
416/426	Thrust Reverser - Right
434/444	Nacelle Strut - Aft Fairing

      (2) Access Panels

415BL/425BL	Thrust Reverser Hinge Access - Left
416BR/426BR	Thrust Reverser Hinge Access - Right

   C. Inspection Procedure

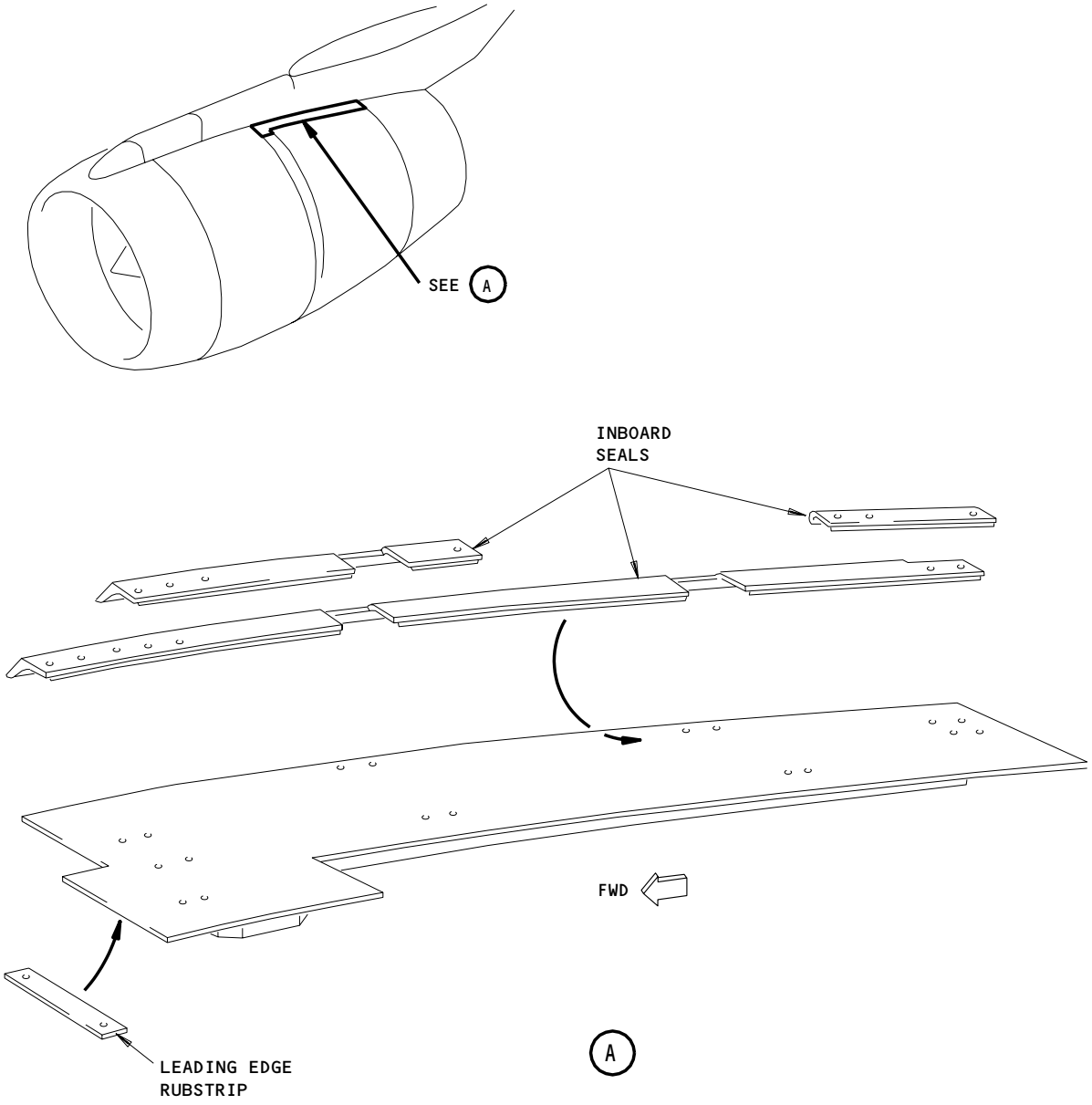
S 016-002-R00

WARNING: YOU MUST OBEY THE INSTRUCTIONS IN AMM 78-31-00/201. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO THE FAN COWL, THE FAN C-DUCT AND THE THRUST REVERSER CAN OCCUR.

(1) Open the left and the right thrust reverser C-duct halves (Ref 78-31-00/201).

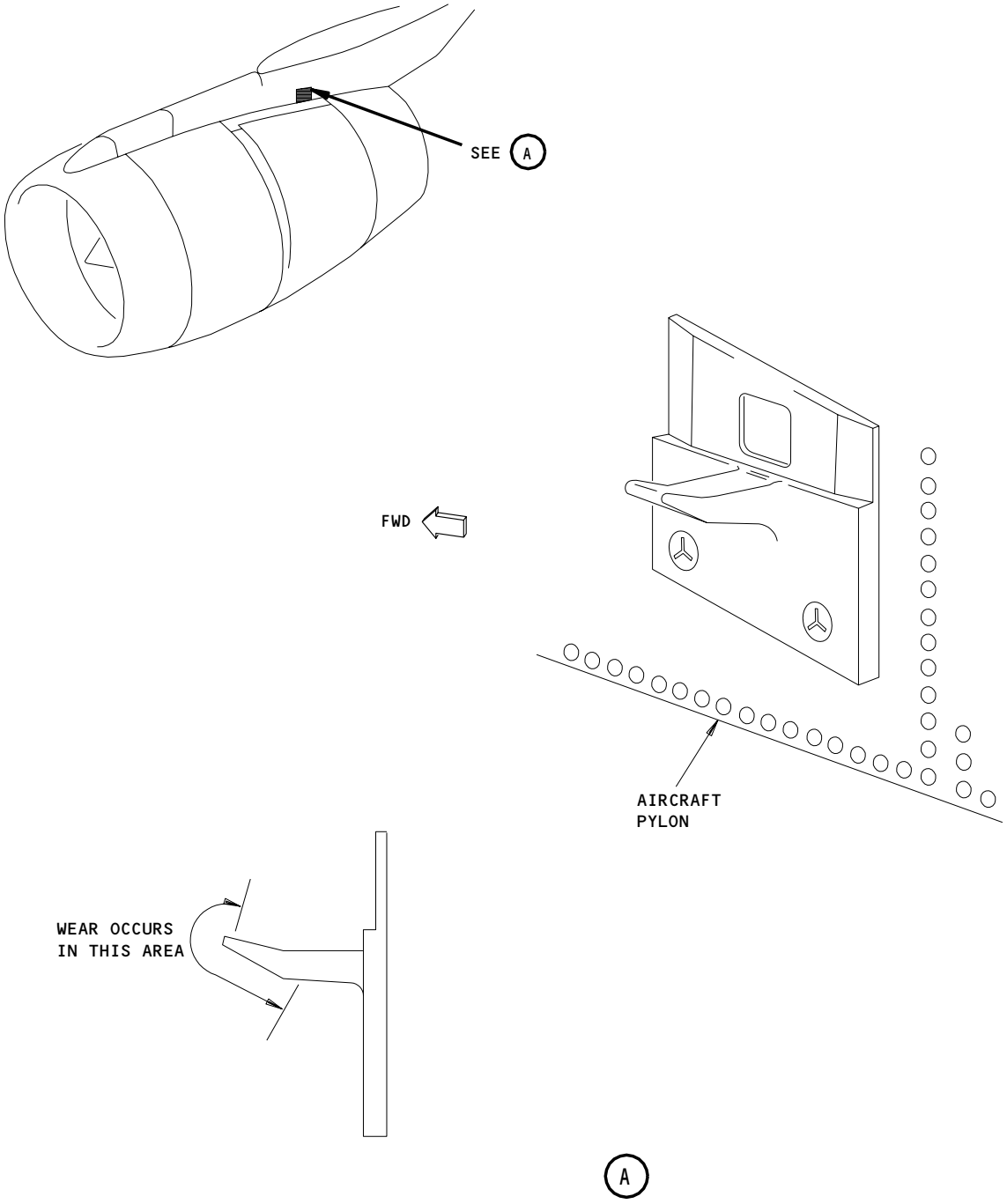
S 226-003-R00

(2) Examine the hinge access door inboard seal carriers for the conditions that follow:
   (a) Too much damage that can be easily seen.
   (b) Inboard seal carriers that are disengaged from the access doors.
   (c) Inboard seal carriers that have gone away.
   (d) Nicks and gouges that are not more than 0.040 inch (1.01 mm) in depth.
   (e) Nicks and gouges more than 0.040 inch (1.01 mm) in depth.



NOTE : LEFT SIDE HINGE ACCESS DOOR SHOWN,
RIGHT SIDE HINGE ACCESS DOOR OPPOSITE.

Hinge Access Door Inboard Seals and Leading Edge Rubstrip
Figure 601



NOTE : LEFT SIDE RESTRAINT HOOK SHOWN,
RIGHT SIDE RESTRAINT HOOK OPPOSITE.

Hinge Access Door Restraint Hook - Inspection Details
Figure 602

S 226-004-R00

(3) Examine the hinge access door inboard seals for the conditions that follow:
   (a) Too much damage that can be easily seen.
   (b) Inboard seals that are disengaged from the access door.
   (c) Tears in the seal material.
   (d) Inboard seals that have gone away.
   (e) Permanent damage to the seals that do not let them seal correctly with the pylon.
   (f) Nicks, scores, and damage by friction that are not more than 0.020 inch (0.51 mm) in depth.
   (g) Nicks, scores, and damage by friction more than 0.020 inch (0.51 mm) in depth.

S 226-005-R00

(4) Examine the hinge access door leading edge rubstrips for the conditions that follow:
   (a) Too much damage that can be easily seen.
   (b) Rubstrips that are disengaged from the access doors.
   (c) Rubstrips that have gone away.
   (d) Nicks and gouges that are not more than 0.020 inch (0.51 mm) in depth.
   (e) Nicks and gouges more than 0.020 inch (0.51 mm) in depth.

S 216-013-R00

(5) Examine the latch assembly of the hinge access door for these conditions:
   (a) Latch assemblies that are missing.

   (b) Damage that you can see easily.
   (c) Holes or cracks in the door structure where the latch assemblies are attached.

S 216-014-R00

(6) Examine the hinges of the hinge access door for these conditions:
   (a) Make sure that the hinges are not missing.

(b) Damage that you can see easily.
(c) Cracks in the door structure where the hinges are attached.

D. Inspection Standards

S 226-007-R00

(1) Hinge access door inboard seal carriers.
(a) Too much damage that can be easily seen.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(b) Inboard seal carriers that are disengaged.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(c) Inboard seal carriers that have gone away.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(d) Nicks and gouges that are not more than 0.040 inch (1.01 mm) in depth are permitted.
(e) Nicks and gouges more than 0.040 inch (1.01 mm) in depth.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).

S 226-008-R00

(2) Hinge access door inboard seals.
(a) Too much damage that can be easily seen.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(b) Inboard seals that are disengaged.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(c) Tears in the inboard seal material.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(d) Inboard seals that have gone away.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(e) Permanent damage to the inboard seals.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(f) Nicks, scores, and damage by friction that is not more than 0.020 inch (0.51 mm) in depth is permitted.
(g) Nicks, scores, and damage by friction more than 0.020 inch (0.51 mm) in depth.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).

S 226-009-R00

(3) Hinge access door leading edge rubstrips.
(a) Too much damage that can be easily seen.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).

(b) Rubstrips that are disengaged.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(c) Rubstrips that have gone away.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).
(d) Nicks and gouges that are not more than 0.020 inch (0.51 mm) in depth are permitted.
(e) Nicks and gouges that are more than 0.020 inch (0.51 mm) in depth.
1) Repair to FRS6249 (LH)/FRS6250 (RH) (Ref 78-31-10/801).

S 216-015-R00

(4) The latch assemblies of the hinge access door.
(a) If the latch assembly is missing, do the repair FRS6188 (AMM 78-31-10/801).
(b) Damage that you can easily see, do the repair FRS6188 (AMM 78-31-10/801).
(c) Holes in the door structure, in the area of the latch attachment points are permitted if they obey these limits:
1) The holes must less than 1.00 square inches (25.40 sq mm) in total area.
a) Holes that are greater than the limit must be repaired to FRS6278 (AMM 78-31-10/801).
2) The honeycomb must not be crushed or damaged.
3) The damaged area must be repaired, to FRS6278, before the engine is operated an additional 300 hours (AMM 78-31-10/801).
(d) Cracks in the door structure, in the area of the latch attachment points are permitted if they obey these limits:
1) The cracks must less than 3.00 inch (76.20 mm) in length.
a) Cracks that are greater than the limit must be repaired to FRS6278 (AMM 78-31-10/801).
2) The damaged area must be repaired, to FRS6278, before the engine is operated an additional 300 hours (AMM 78-31-10/801).

S 216-016-R00

(5) The hinge assemblies of the hinge access door.
(a) If the hinge assembly is missing, do the repair FRS6276 (AMM 78-31-10/801).

(b) Damage that you can easily see, do the repair FRS6276 (AMM 78-31-10/801).

(c) Cracks in the door structure, in the area of the hinge attachment points are permitted if they obey these limits:

1) The cracks must less than 3.00 inch (76.20 mm) in length.

a) Cracks that are greater than the limit must be repaired to FRS6276 (AMM 78-31-10/801).

2) The damaged area must be repaired, to FRS6276, before the engine is operated an additional 300 hours (AMM 78-31-10/801).

S 416-011-R00

CAUTION: YOU MUST SLOWLY CLOSE THE C-DUCT. MAKE SURE THE HINGE ACCESS DOOR OPERATES CORRECTLY AFTER THE LATCH IS ENGAGED. MAKE SURE THE HINGE ACCESS DOOR IS ALIGNED WITH THE TOP OF THE C-DUCT. IF YOU DO NOT OBEY THESE INSTRUCTIONS, DAMAGE TO THE FAN COWL, THE FAN C-DUCT AND THE THRUST REVERSER CAN OCCUR.

(6) Close the left and the right thrust reverser C-duct halves (Ref 78-31-00/201).

THRUST REVERSER HINGE ACCESS DOORS - APPROVED REPAIRS

1. General
   A. List of Repairs
      (1) This procedure contains these repairs:

	Repair Number	Title
1	FRS.6249 FRS.6250	Repair the Left and Right Thrust Reverser Hinge Access Door Assembly - Seal and Rubstrip
2	FRS.6278	Repair the Left and Right Thrust Reverser Hinge Access Door Assembly - Door Edge and Latch Fitting Attachment Repair
3	FRS.6276	Repair the Left and Right Thrust Reverser Hinge Access Door Assembly - Door Hinge Attachment Repair
4	FRS.6188	Repair the Left and Right Thrust Reverser Hinge Access Door Assembly - Latch Assembly and Substructure Repair

TASK 78-31-10-308-050-R00

2. Left and Right Thrust-Reverser Hinge Access-Door Assembly - Seal and Rubstrip Repair
   A. General
      (1) The repairs given in this procedure are:

- FRS6249 for the left thrust reverser hinge access door assembly
- FRS6250 for the right thrust reverser hinge access door assembly.

      (2) The procedure tells you how to repair or replace damaged rubber seals and rubstrips on the thrust-reverser hinged access-doors.
      (3) You can do this repair on thrust-reverser hinged access-door assemblies that have the part numbers that follow:

RB211-535E4 - LJ75857, LJ75858, LJ75079, LJ75080

      (4) The assemblies LJ75079/LJ75080 have a continuous seal (units 1 to 12) or seal segments (units 13 to 52). All repairs (except for less important damage) are made by the replacement of the damaged parts of the seal.

(5) The assemblies LJ75857/LJ75858 (units 53 and on) have a seven part seal. All repairs (except for less important damage) are made by the replacement of the damaged parts.

B. Equipment
(1) Standard workshop tools
(2) Drills and drilling equipment
(3) Heat lamps (resistant to explosion)
(4) Riveting equipment
(5) Putty knife or spatula

C. Consumable Materials
(1) Acetone
OMat 150
or
(2) Isopropyl Alcohol
OMat 1/40
or
(3) Cleaning Solvent
OMat 1/257
(4) Clean cotton cloth
OMat No. - 2/101
(5) White spirit
British Spec - BS245
OMat No. - 102
(6) Masking tape (Sellotape 2595)
OMat No. - 2/40
(7) Abrasive paper, 150 grit
OMat No. - 5/63
(8) Sealant, 2 part
OMat No. - 8/138
(9) Primer, DC1200
OMat No. - 876C
(10) Adhesive, EA9309-3NA
OMat No. -8/150
(11) Mushroom sanding disc, 2 in. (50 mm) diameter, 150 grit
(12) Paint brush
(13) White cotton gloves
(14) Plastic release film or Teflon tape

D. Parts
(1) Rubstrip, LJ71676 (Item 1)
(2) Rubstrip, LJ75943 (Item 2)
(3) Bulk seal, LJ76206 (Item 3)
(4) Bulk seal, LJ76207 (Item 4)
(5) Seal-forward hinge, LJ75939 (Item 5)
(6) Seal-middle hinge, LJ75940 (Item 6)
(7) Seal-aft hinge, LJ75941-left, LJ75942-right (Item 7)
(8) Rivet, MS20426B6-5 (RR1013440) (Item 8)
(9) Blind rivet, NAS1739M4-3 (RR2308437) (Item 9)
(10) Blind rivet, NAS1739M4-4 (RR1013036) (Item 10)
(11) Blind rivet, NAS1739M5-3 (RR2308292) (Item 11)
(12) Titanium steel - 0.022in. thick, CU59158 (Item 12)

E. References
(1) AMM 78-31-10/401, Thrust-Reverser Hinge Access-Doors
(2) AMM 78-31-20/801, Fan C Duct and Thrust Reverser

F. Replace the damaged rubstrip (Fig. 801).

S 038-049-R00
(1) Remove the applicable hinge access-door (AMM 78-31-10/401).

S 358-051-R00
(2) Use the drilling equipment to drill out the fasteners that attach the rubstrip to the access-door assembly.

S 028-051-R00
(3) Remove the rubstrip from the access door assembly.

S 348-052-R00

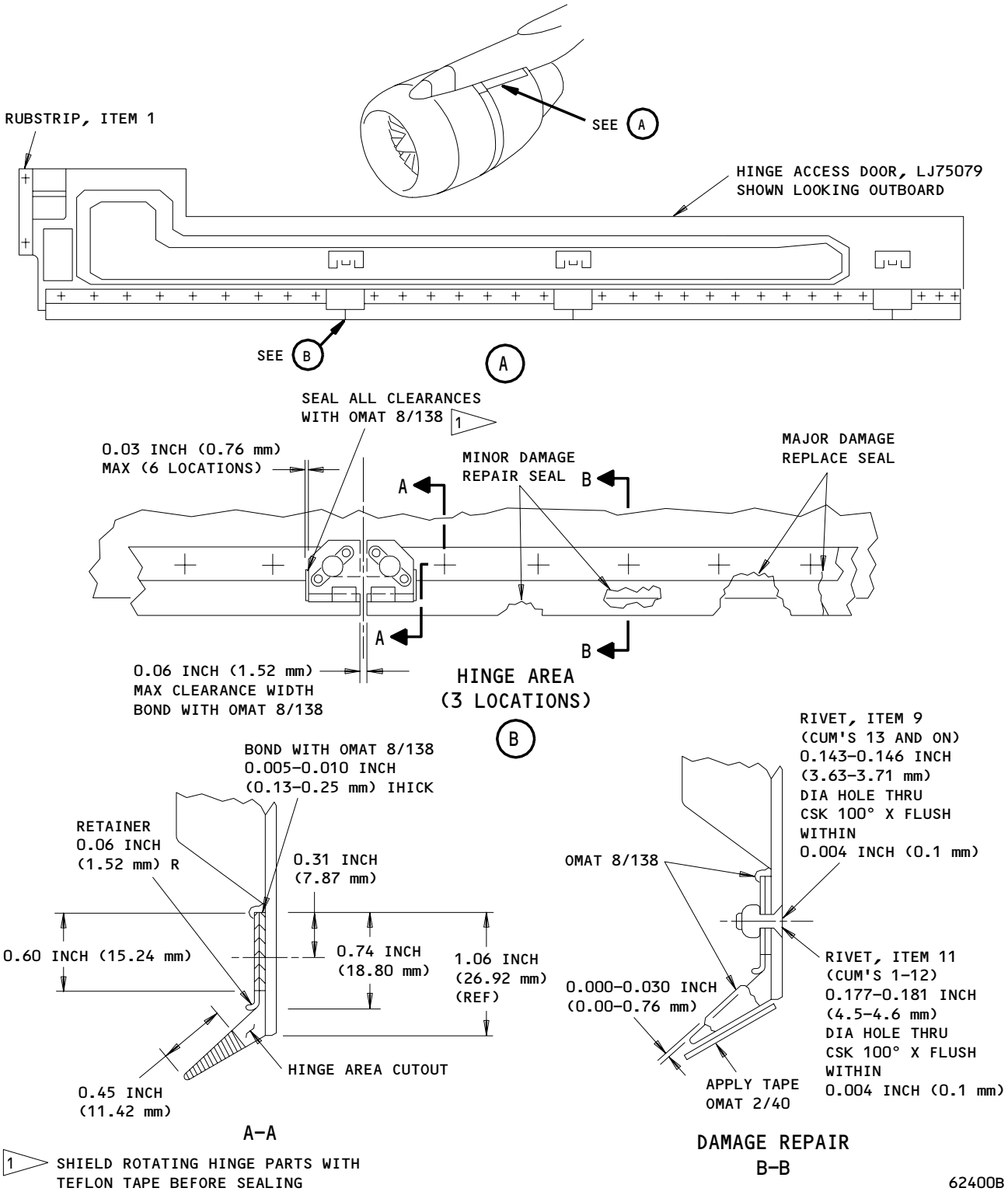
WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOU SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(4) Prepare the mating faces for the adhesive
(a) Use the mushroom sanding disc to remove remaining pieces of rubstrip and old adhesive.
(b) Use the abrasive paper to make rough the mating faces of the applicable replacement rubstrip (Item 1 or 2) and the access door assembly.

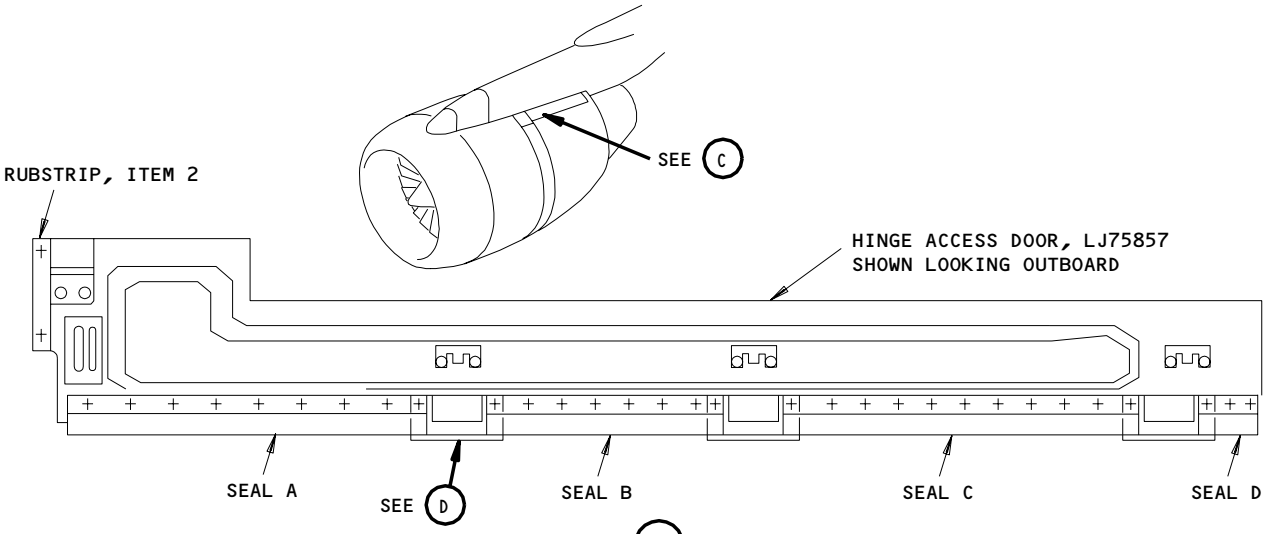
WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(c) Use the cleaning fluid and the clean cloth to clean the mating faces of the applicable replacement rubstrip (Item 1 or 2, as applicable) and the access door assembly.
(d) Use another clean cloth to dry the mating faces.



Thrust Reverser Hinge Access Door – Seal and Rubstrip Repair
Figure 801 (Sheet 1)



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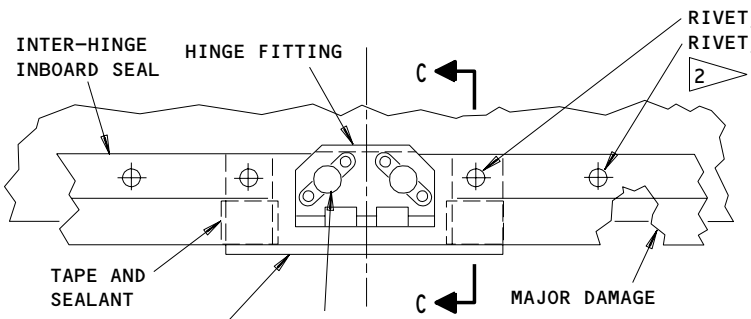
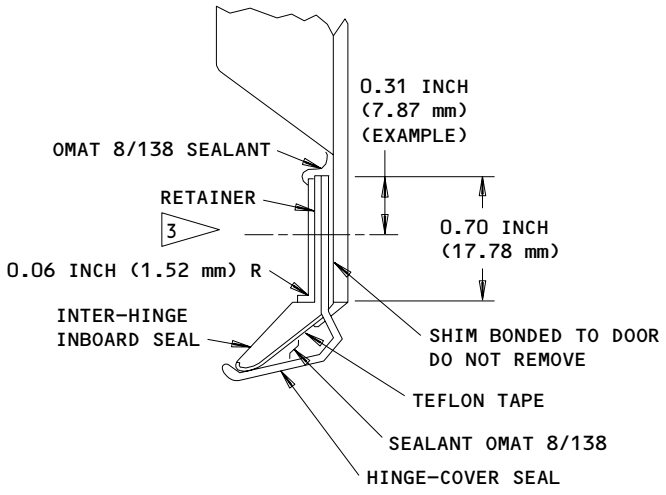


HINGE AREA
(3 LOCATIONS)

D



C-C
(6 LOCATIONS)

TABLE 1

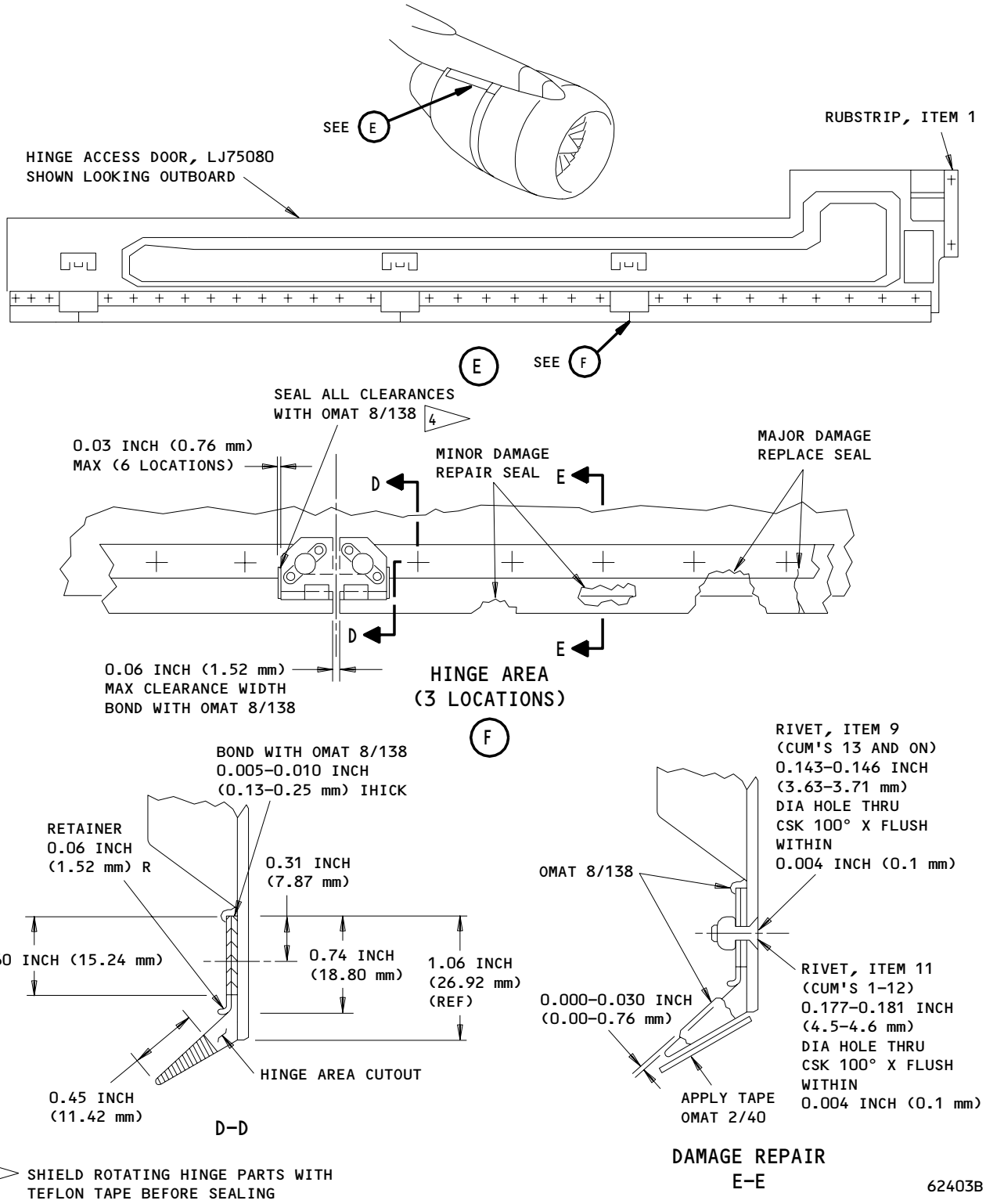
INBOARD SEAL	SEAL LENGTH INCH (mm)	FASTENER QUANTITY, TOTAL
A	14.3 (363.2)	8
B	12.5 (317.3)	7
C	20.6 (523.2)	11
D	4.0 (101.6)	3

2 WET INSTALL WITH OMAT 8/138 SEALANT

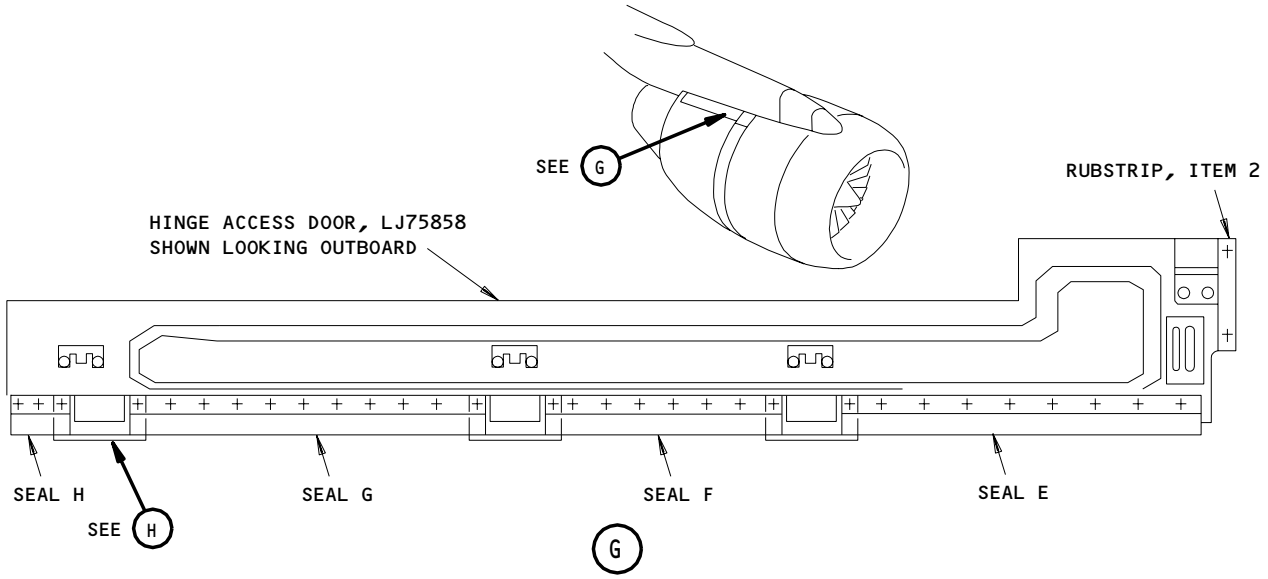
3 BOND TO SEAL WITH OMAT 8/46 ADHESIVE

62401A

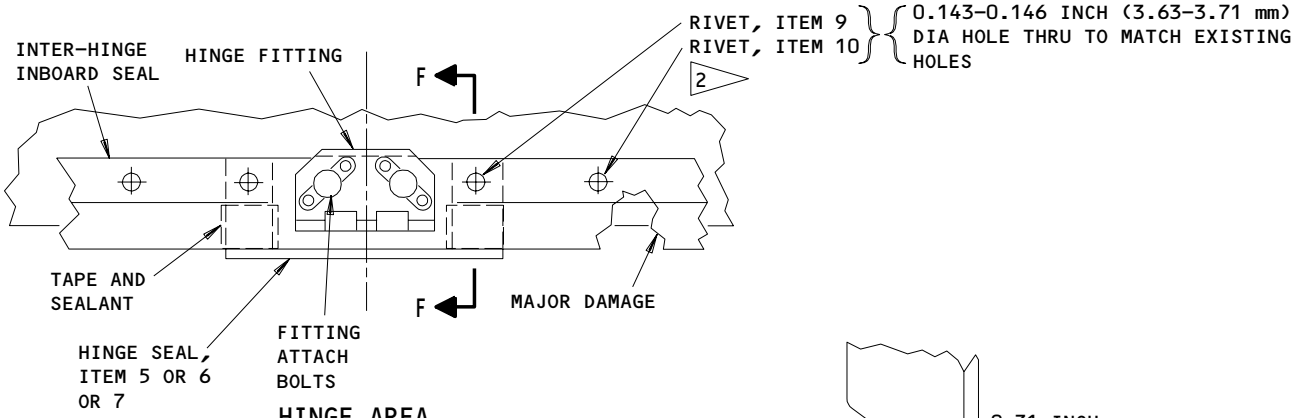
Thrust Reverser Hinge Access Door - Seal and Rubstrip Repair
Figure 801 (Sheet 2)



Thrust Reverser Hinge Access Door - Seal and Rubstrip Repair
Figure 801 (Sheet 3)



G

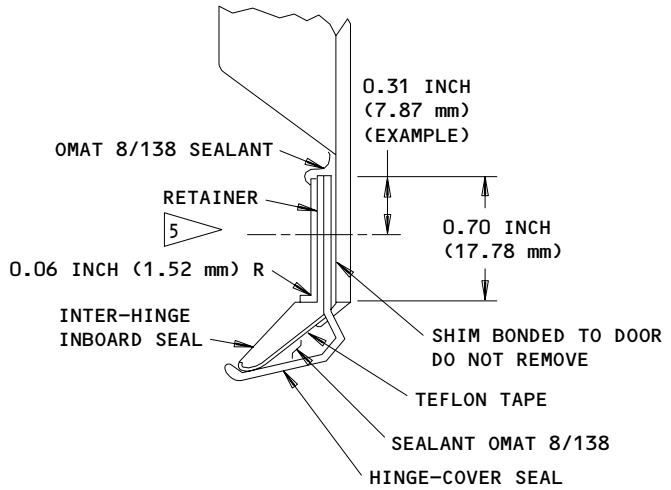


HINGE AREA
(3 LOCATIONS)

H

TABLE 1

INBOARD SEAL	SEAL LENGTH INCH (mm)	FASTENER QUANTITY, TOTAL
E	14.3 (363.2)	8
F	12.5 (317.3)	7
G	20.6 (523.2)	11
H	4.0 (101.6)	3

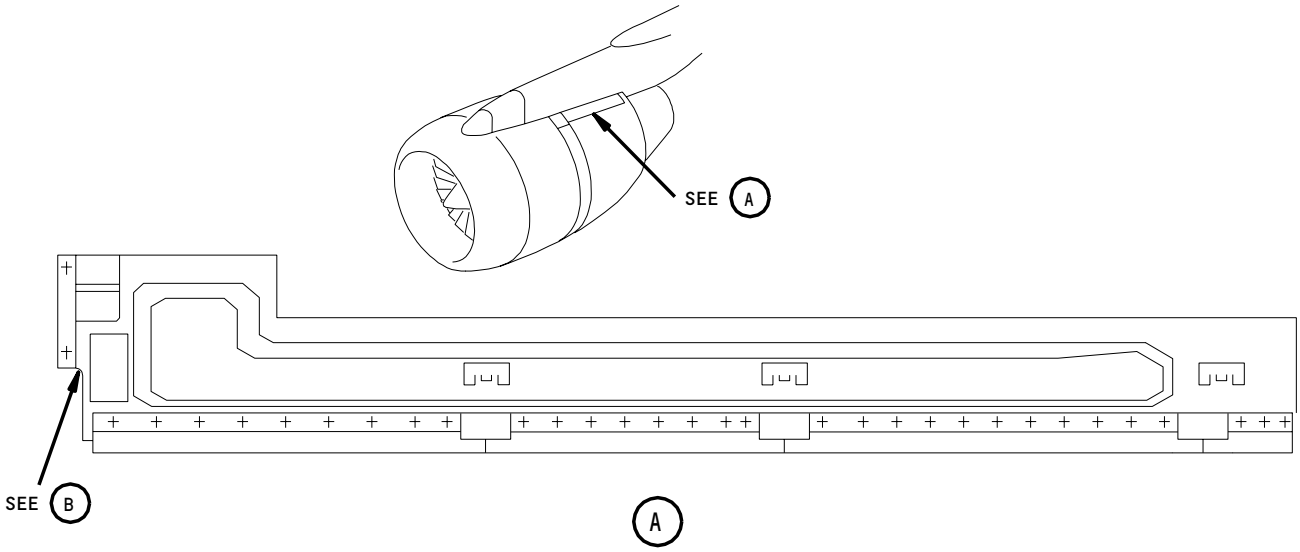


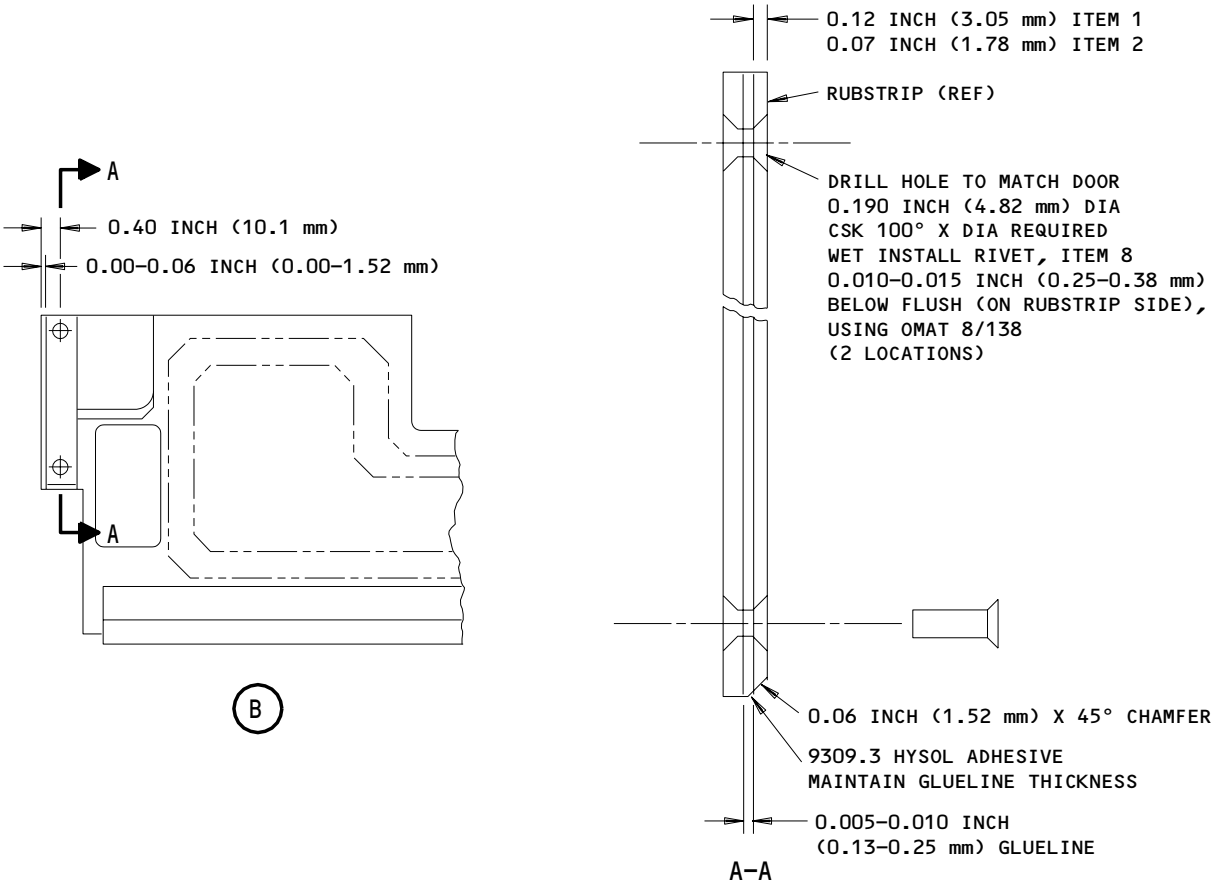
F-F
(6 LOCATIONS)

5 BOND TO SEAL USING OMAT 8/138 ADHESIVE

62404A

Thrust Reverser Hinge Access Door - Seal and Rubstrip Repair
Figure 801 (Sheet 4)

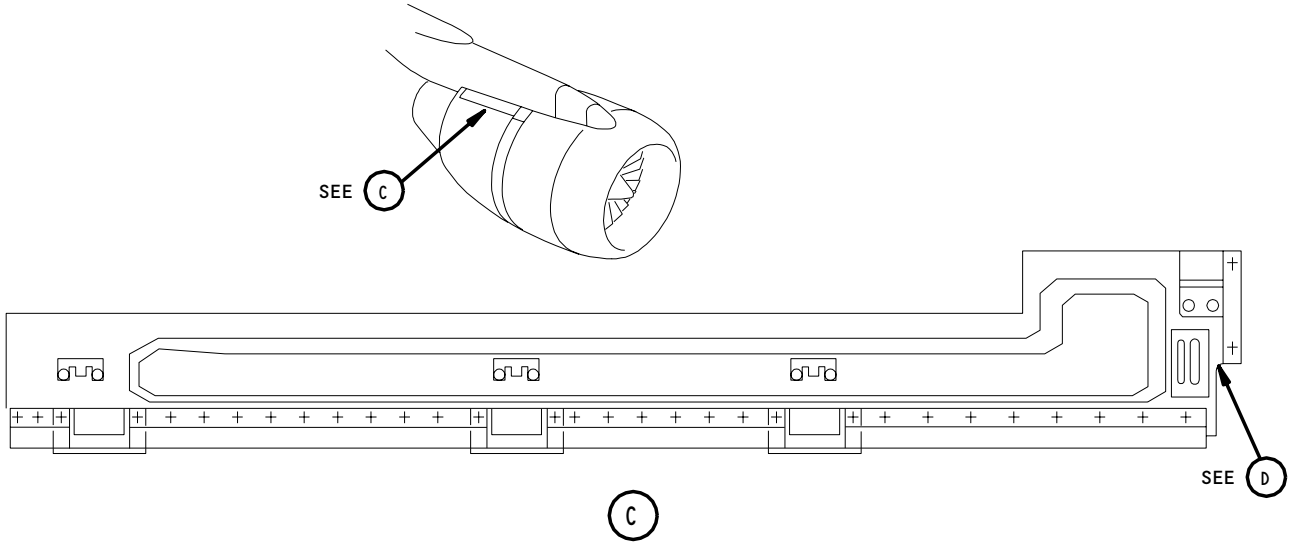


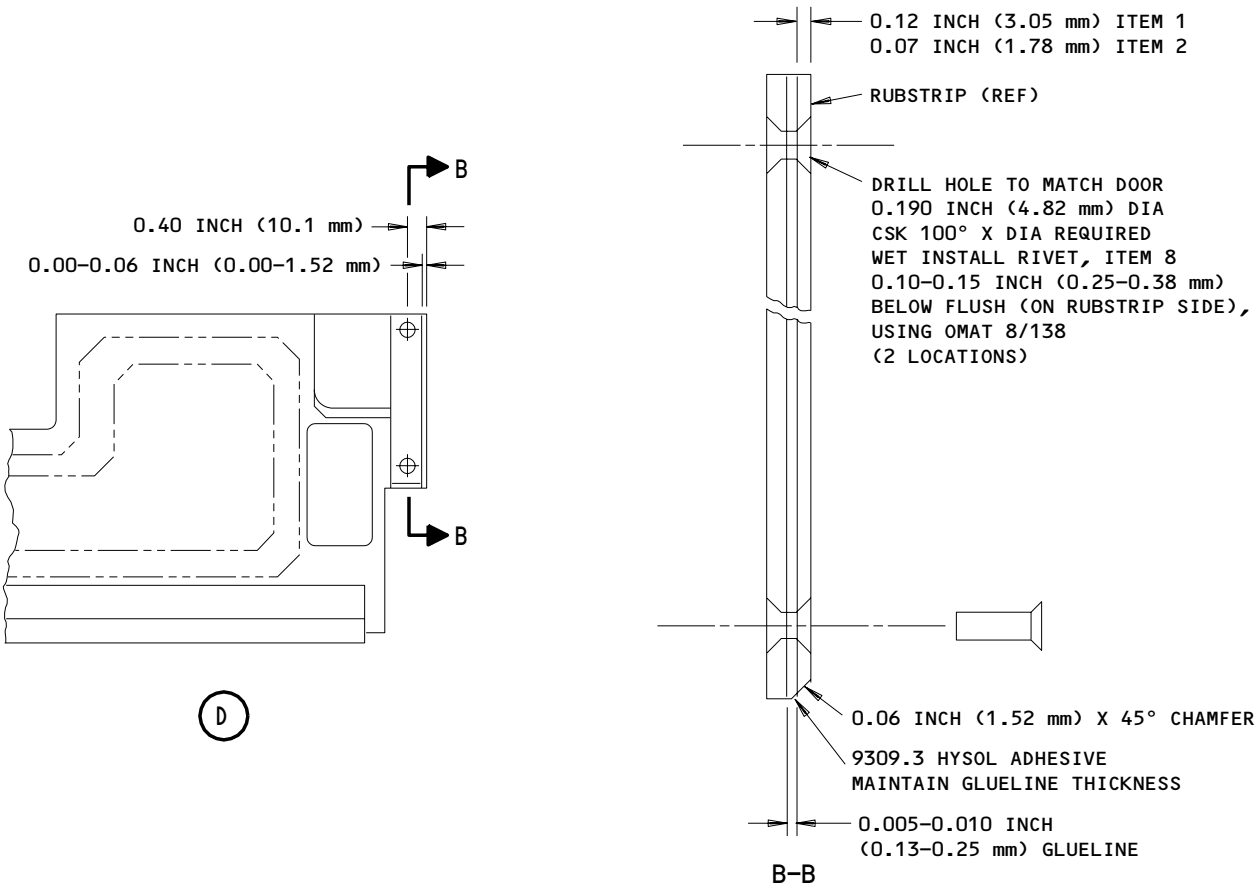


LEFT THRUST REVERSER

62402A

Thrust Reverser Hinge Access Door – Rubstrip Repair
Figure 802 (Sheet 1)





RIGHT THRUST REVERSER

62405

Thrust Reverser Hinge Access Door – Rubstrip Repair
Figure 802 (Sheet 2)

S 348-053-R00

WARNING: ADHESIVES ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVES BECAUSE THEY ARE POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(5) Mix and apply the adhesive
  (a) Mix the adhesive, OMat 8/150.

    NOTE: Refer to the makers instructions.

  (b) Apply a thin layer of adhesive to the mating faces of the applicable replacement rubstrip and the access door assembly.

S 348-054-R00
(6) Put the replacement rubstrip into position on the access door assembly (Fig. 802).

S 348-055-R00
(7) Use a clamp to hold the rubstrip on the access door assembly.
  (a) Get the glueline thickness shown on Fig. 802.

S 348-056-R00
(8) Let the adhesive cure for 2 hours at room temperature.
  (a) Use the heat lamp to cure the adhesive for 90 minutes more at 60 to 82°C (140 to 180°F).

S 358-057-R00
(9) Use the drilling equipment to drill and countersink the rubstrip at the positions shown on Fig. 802.

S 358-058-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(10) Use the riveting equipment and wet install the rivets (Item 8) with the sealant, OMat 8/138.
   (a) The rivet head must be 0.010 - 0.015 inch (0.25 - 0.28 mm) below the surface of the rubstrip.

S 358-137-R00

(11) Remove material from the rivet until it is no more than 0.004 inch (0.10 mm) above the external side of the access-door.

S 378-059-R00

(12) Do FRS6400 if the surface protection on the external surface of the access-door is damaged (Ref 78-31-20/801).

S 938-060-R00

(13) Use a permanent marker pen to write FRS6249 (left assembly) or FRS6250 (right assembly) adjacent to the assembly number.

S 428-061-R00

(14) Install the hinge access-door assembly (Ref 78-31-10/401).

G. Repair of minor damage on the inboard rubber seals (Fig. 801).

S 028-062-R00

(1) Remove the applicable hinge access-door (Ref 78-31-10/401).

S 358-063-R00

(2) Remove the unwanted material from the rubber seal.

S 128-064-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(3) Use the abrasive paper to make rough the damaged area on the seal.

S 118-065-R00

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(4) Use Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257 to clean the damaged area on the seal.

S 168-065-R00

(5) Use another clean cloth to dry the damaged area.

S 958-066-R00

(6) Apply the masking tape as necessary to contain the seal repair.

S 398-067-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(7) Mix and apply the sealant
  (a) Mix the sealant, OMat 8/138.

    NOTE: Refer to the markers instructions.

  (b) Apply the sealant to the damaged area.

S 398-068-R00

(8) Let the sealant cure for 2 hours at room temperature.
  (a) Use the heat lamp to cure the sealant for 2 hours more at 71 - 93°C (160 - 200°F).

S 958-069-R00

(9) Remove the masking tape.

S 938-070-R00

(10) Use a permanent marker pen to write FRS6249 (left assembly) or FRS6250 (right assembly) adjacent to the assembly number.

S 428-071-R00

(11) Install the hinge access door-assembly (Ref 78-31-10/801).

H. Repair the LJ75079/LJ75080 door seal segment (Fig. 801)

NOTE: Units 1 thru 12 have a continuous length of rubber seal and retainer. Units 13 thru 52 have rubber seal and retainer segments. This repair replaces the damaged seal segments.

For units 1 thru 12, the continuous seal must be cut at the same position as the segments on units 13 thru 52.

S 358-072-R00

(1) For units 1 thru 12, cut the rubber seal and retainer at the applicable positions.

S 358-073-R00

(2) Use a putty knife or spatula to remove the sealant.

S 028-074-R00

(3) Remove the damaged seal segment
  (a) Remove the bolts that attach the hinge fitting(s).
  (b) Remove the hinge fitting(s).
  (c) Use the drilling equipment to drill out the fasteners that attach the seal retainer.
  (d) Keep the seal retainer to use again (or make a new retainer from the titanium steel, CU59158 (Item 12)).

S 118-075-R00

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(4) Clean the retainer.
  (a) Use the cleaning fluid and the clean cotton cloth to clean the retainer.

(b) Use another clean cotton cloth to dry the retainer.

S 378-076-R00

WARNING: THE PRIMER IS FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE THE PRIMER BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(5) Apply primer to the retainer.
(a) Prepare the primer, OMat 876C.

NOTE: Refer to the makers instructions.

(b) Use the paint brush to apply the primer to the retainer.
(c) Let the primer cure for 30 minutes at room temperature and 50 percent (or more) relative humidity.

S 398-077-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(6) Mix and apply the sealant
(a) Mix the sealant, OMat 8/138 with the makers instructions.
(b) Apply the sealant to the mating faces of the retainer and the rubber seal (Item 3).

(c) Use a clamp to hold the seal on the retainer.
(d) Get the glueline thickness shown on Fig. 801.
(e) Let the sealant cure for 2 hours at room temperature.
1) Use the heat lamp to cure the sealant for 2 hours more at 71 - 93°C (160 - 200°F).

S 358-079-R00

(7) Put the seal repair part into position on the hinge access-door.
(a) Use clamps to hold the seal repair part.

S 358-081-R00

(8) Use the drilling equipment to drill holes in the retainer at the positions of the holes in the hinge access-door.

S 398-082-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(9) Mix the sealant, OMat 8/138 with the makers instructions.

S 358-083-R00

(10) Use the riveting equipment and wet install the rivets (Item 11) with the sealant.

S 428-084-R00

(11) Install the hinge fitting(s).

S 128-085-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOU SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(12) Use the abrasive paper and lightly make rough the areas around the ends of the replacement seal assembly.

S 118-086-R00

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(13) Use the white spirit and the clean cotton cloth to clean the rough areas at the ends of the replacement seal assembly.

S 118-087-R00

(14) Use another clean cloth to dry the rough areas.

S 378-088-R00

WARNING: THE PRIMER IS FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE THE PRIMER BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(15) Apply the primer, OMat 876C, to the rough area around the ends of the replacement seal.
   (a) Let the primer cure for a minimum of 30 minutes at room temperature and 50 percent relative humidity.

S 398-090-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(16) Mix and apply the sealant
   (a) Mix the sealant, OMat 8/138 with the makers instructions.

(b) Apply the sealant to the ends of the replacement seal assembly (Fig. 801).
(c) Let the sealant cure for 24 hours at room temperature.

NOTE: The sealant is satisfactory for flight after 2 hours at room temperature.

1) You can reduce the cure time if (after 2 hours at room temperature) you apply heat up to 93°C (200°F).

S 938-092-R00
(17) Use a permanent marker pen to write FRS6249 (left assembly) or FRS6250 (right assembly) adjacent to the assembly number.

S 428-093-R00
(18) Install the hinge access-door assembly (Ref 78-31-10/801).

I. Repair the LJ75857/LJ75858 door seal segments (Fig. 801).

NOTE: For minor damage repair of the door seal segments, do step F.

S 358-094-R00
(1) Use the drilling equipment to drill out the fasteners that attach the seal retainer.

S 148-095-R00
(2) Use the putty knife or spatula to remove the sealant between the rubber inter-hinge seal and the metal hinge seal(s).

S 148-096-R00
(3) Use the putty knife or spatula to remove the sealant between the seal segment and the access door assembly.

S 028-097-R00
(4) Remove the seal assembly from the access-door assembly.

S 148-098-R00
(5) Use a sharp blade to remove the rubber seal from the metal retainer.
(a) Keep the retainer to use again.

S 118-099-R00

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(6) Use the cleaning fluid and the clean cotton cloth to clean the retainer.

S 118-100-R00

(7) Use another clean cotton cloth to dry the retainer.

S 378-101-R00

WARNING: THE PRIMER IS FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE THE PRIMER BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(8) Use a small paint brush to apply the primer, OMat 876C, to the seal retainer.
   (a) Let the primer cure for 30 minutes minimum at room temperature and 50 percent (or more) relative humidity.

S 358-103-R00

(9) Use a sharp blade to cut the seal (Item 4) to fit the retainer.

S 398-104-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(10) Mix and apply the sealant
  (a) Mix the sealant, OMat 8/138. Refer to the makers instructions.
  (b) Apply the sealant to the mating faces of the rubber seal and the retainer.

S 358-105-R00

(11) Put the rubber seal into position on the metal retainer.
  (a) Use a clamp to hold the seal on the retainer.
  (b) Get a glueline thickness of between 0.005 - 0.010 inch (0.13 - 0.25 mm).
  (c) Let the sealant cure for 2 hours at room temperature.
    1) Use the heat lamp to cure the sealant for 2 hours more at 71 - 93°C (160 - 200°F).

S 358-106-R00

(12) Put the seal repair part into position on the hinge access-door.
  (a) Use clamps to hold the repair part.

S 358-107-R00

(13) Use the drilling equipment to drill holes in the repair part at the positions of the holes in the access-door.

S 398-108-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(14) Mix the sealant, OMat 8/138, with the makers instructions.

S 358-109-R00

(15) Use the riveting equipment and wet install the rivets (Items 9 and 10, as necessary with the sealant.

S 128-110-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(16) Use the abrasive paper and lightly make rough the areas around the ends of the replacement seal assembly.

S 118-111-R00

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(17) Use the white spirit and the clean cotton cloth to clean the rough areas at the ends of the replacement seal assembly.
(a) Use another clean cloth to dry the rough areas.

S 378-112-R00

WARNING: THE PRIMER IS FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE THE PRIMER BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(18) Apply the primer, OMat 876C, to the rough areas around the ends of the replacement seal.
(a) Let the primer cure for a minimum of 30 minutes at room temperature and 50 percent (or more) relative humidity.

S 398-113-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(19) Mix and apply the sealant
  (a) Mix the sealant, OMat 8/138 with the makers instructions.
  (b) Apply the sealant to the ends of the replacement seal assembly (Fig. 801).
  (c) Let the sealant cure for 24 hours at room temperature.

    NOTE: The sealant is satisfactory for flight after 2 hours at room temperature.

  (d) You can reduce the cure time if (after 2 hours at room temperature) you apply heat up to 93°C (200°F).

S 938-114-R00
(20) Use a permanent marker pen to write FRS6249 (left assembly) or FRS6250 (right assembly) adjacent to the assembly number.

S 428-115-R00
(21) Install the hinge access-door assembly (AMM 78-31-10/401).

J. Repair the hinge seal segments (Fig. 801)

S 028-116-R00
(1) Remove the applicable hinge access-door (Ref 78-31-10/401).

S 358-117-R00
(2) Use the drilling equipment to drill out the blind rivets that attach the metal hinge seal and the rubber/metal inter-hinge seal.

S 038-118-R00
(3) Remove the two bolts that attach the seal and hinge to the access-door assembly.
  (a) Keep the bolts to use again.

S 148-119-R00
(4) Use the putty knife or spatula to remove the sealant between the seal/hinge and the access-door.

S 378-120-R00

WARNING: THE PRIMER IS FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE THE PRIMER BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(5) Use a small paint brush to apply the primer, OMat 8/142, to the new metal seal where the sealant will be applies.

S 398-121-R00

(6) Apply the plastic release film or Teflon tape to the rubber seal adjacent to where the seal will be formed.

S 438-122-R00

(7) Put the replacement seal into position. Use Items 5, 6 and 7, as necessary.

S 358-123-R00

(8) Use the drilling equipment to drill the fastener holes at the positions shown in Fig. 801.

S 358-124-R00

(9) Temporarily install rivet clamps and the bolts.

S 398-125-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(10) Mix and apply the sealant
  (a) Mix the sealant, OMat 8/138 with the makers instructions.
  (b) Put the sealant into the clearance between the metal hinge seal and the rubber seal.

(c) Let the sealant cure for 24 hours at room temperature.

NOTE: The sealant is satisfactory for flight after 2 hours at room temperature.

1) You can reduce the cure time if (after 2 hours at room temperature) you apply heat up to 93°C (200° F).

S 358-126-R00

(11) Remove the rivet clamps and loosen the bolts.

S 358-127-R00

(12) Remove the plastic release film or Teflon tape.

S 438-128-R00

(13) Put the hinge seal into position.

S 398-129-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(14) Mix the sealant, OMat 8/138 with the makers instructions.

S 358-130-R00

(15) Use the riveting equipment and wet install the rivets (Item 9) with the sealant.

S 358-131-R00

(16) Tighten the bolts.

S 398-132-R00

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANTS IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(17) Apply the sealant, OMat 8/138, as shown in Fig. 801.
(a) Let the sealant cure for 24 hours at room temperature.

NOTE: The sealant is satisfactory for flight after 2 hours at room temperature.

S 938-133-R00

(18) Use a permanent marker pen to write FRS6249 (left assembly or FRS6250 (right assembly) adjacent to the assembly number.

S 428-134-R00

(19) Install the hinge access-door assembly.

TASK 78-31-10-308-001-R00

3. Fan Thrust Reverser Hinge Access Doors - Door Edge and Latch Fitting Attachment Crack Repair

A. General

(1) The Rolls-Royce repair in this procedure is FRS6278.
(2) This procedure can be used to repair the left and the right hinge access doors.
(3) You must do all of the repairs that you find necessary when you do this procedure. This procedure can make one or more of these repairs necessary:
RB211-535E4: FRS6188, FRS6249, FRS6250, FRS6276

(4) Cracks in the door structure where the latches are attached can be repaired if the skin fibers of the graphite doubler are in their initial condition.
(5) Small cracks that are connected to each other and can be repaired with the correct filler. Small skin defect can be repaired with the correct filler.
(6) These materials are used to make the hinge access doors:

The inner and outer skins - graphite
The core of the doors - aluminum

(7) Use this procedure to repair the hinge access doors with these part numbers:
RB211-535E4 - LJ75079, LJ75857, LJ75080, LJ75858

B. Equipment
(1) Riveting equipment
(2) Composite saw
(3) Composite router
(4) Heat blankets

C. Consumable Materials
(1) Acetone
OMat 150
or
(2) Isopropyl Alcohol
OMat 1/40
or
(3) Cleaning Solvent
OMat 1/257
(4) Carbon Fiber fabric (five end section weave)
British Spec - A0009/000 Fiber type T300
Omat No. - 8/151
(5) Fiberglass cloth
British Spec - Tyglass Y383/205-T5
OMat No. -884
(6) Epoxy adhesive, two part pack
British Spec - EA9390, Part A tan, Part B violet
OMat No. - 8/160
(7) Abrasive paper, silicon carbibe, 150 grit
OMat No. - 5/38
(8) Release agent
British Spec - DP200
Omat No. - 8/32

(9) Vacuum bag
British Spec - Capran sheeting
OMat No. - 2/31
(10) Lint free cloth - Local supply

D. Repair damage to the skin at the edge of the hinge access door.

S 038-002-R00
(1) Remove the door latch assembly and its seal.
(a) Make sure that you do not move the shim that is under the latch assembly.

S 218-003-R00
(2) Use a 10X magnifying glass and a coin to examine the damaged area:
(a) Use the magnifying glass to look for damage on the surface of the door.
(b) Use the coin to lightly hit the surface of the door.

NOTE: The sound that the coin makes will tell you if the graphite skin has disconnected from the core material.

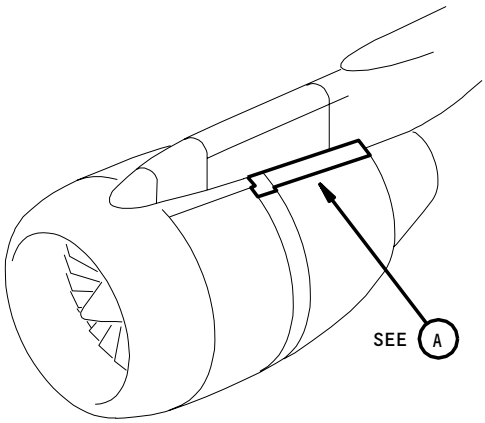
S 038-004-R00
(3) Remove the door skin that is damaged (Fig. 803):

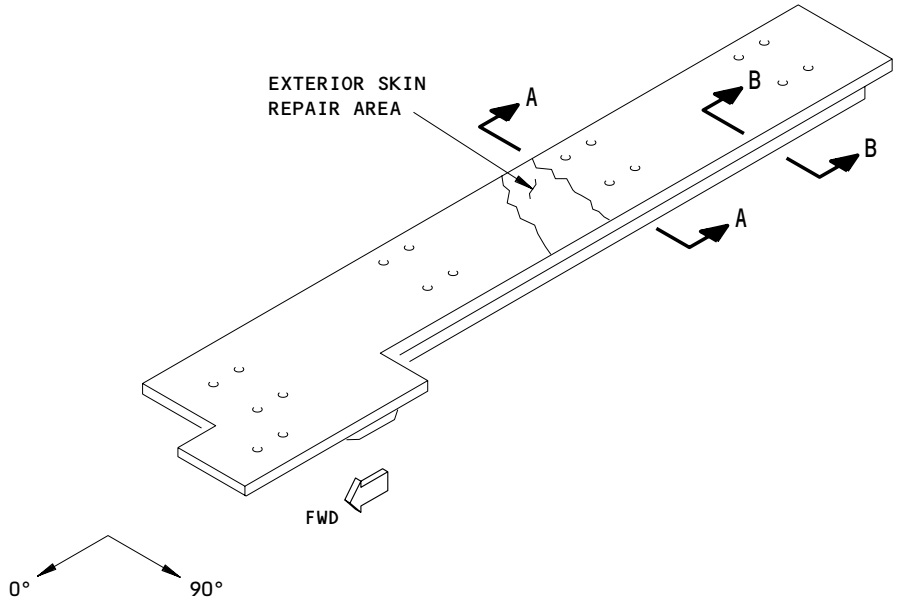
WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTCLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(a) Use the composite saw and the router to remove the damaged area of the skin.

NOTE: When you remove the damage, if is best to cut a regular shape. It is easier to repair a regular shape than an irregular one.

1) Make sure that you do not cut into the graphite doubler and the honeycomb core.





REPAIR PLY ORIENTATION

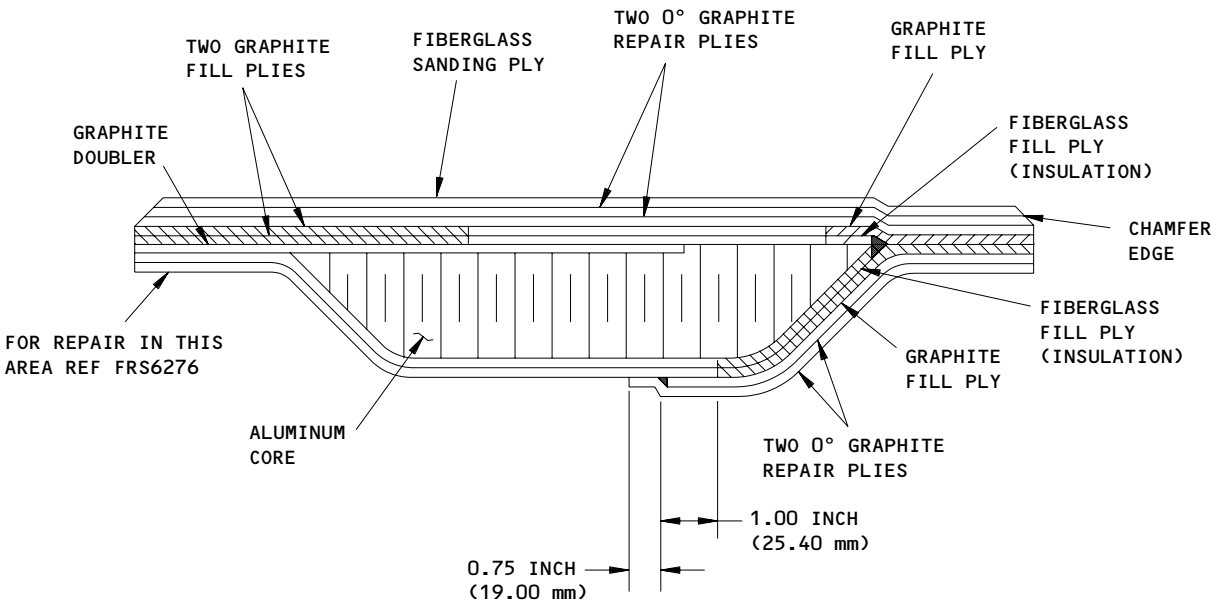
T/R HINGE ACCESS DOOR
(LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE)

A

EXTERIOR SKIN REPAIR AREA

62526

Thrust Reverser Hinge Access Door – Door Edge Repair
Figure 803 (Sheet 1)

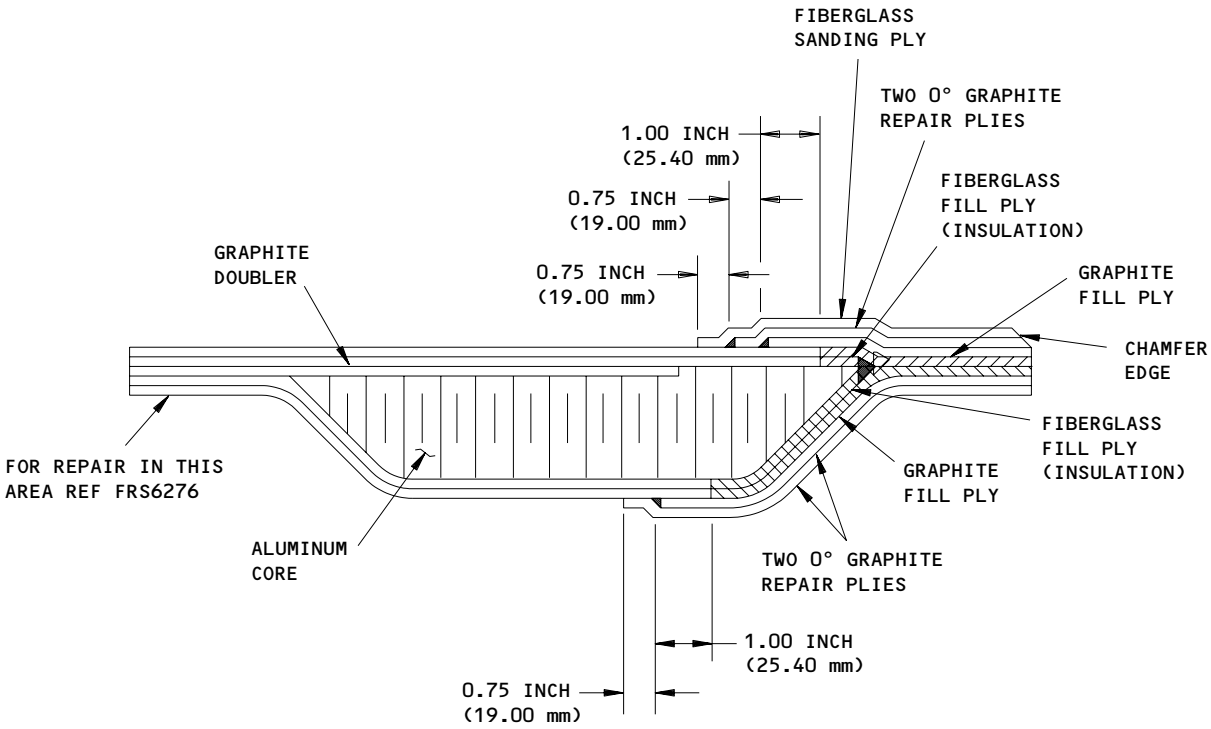


REPAIR PLY INSTALLATION
(EXAMPLE ACROSS DOOR EXTERIOR SKIN)
A-A

EXTERIOR SKIN ACROSS DOOR REPAIR

62527

Thrust Reverser Hinge Access Door - Door Edge Repair
Figure 803 (Sheet 2)



REPAIR PLY INSTALLATION
(EXAMPLE AT EDGE OF DOOR)
B-B

EXTERIOR SKIN DOOR EDGE REPAIR

62528

Thrust Reverser Hinge Access Door - Door Edge Repair
Figure 803 (Sheet 3)

S 218-005-R00

(4) Examine the inner graphite doubler:
  (a) Make sure that the doubler is not cracked.
  (b) Make sure that the doubler has not disconnected from the core.
    1) Replace the door if the doubler is cracked or if it is not connected to the core (Ref 78-31-10/401).

S 128-006-R00

WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTCLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(5) Abrade the surface of the repair area with the abrasive paper.
  (a) Make sure that you do not abrade the more than 2.50 inch (63.50 mm) from the edge of the repair area.

S 118-008-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, OR IN YOUR EYS, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT PROTECTIVE SPLASH GOGGLES AND GLOVES ON WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT

(6) Use Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257 to remove grease from the repair area.
  (a) Make a lint free cloth moist with Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257.
  (b) Make sure that you dry the repair area before the Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257 becomes dry.
  (c) Use a heat lamp to dry the repair area at 230° to 250° F (110° to 120° C) for 1 hour.

S 348-009-R00

(7) Cut the composite material that you will use to fill the repair area (Fig. 808):

WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTCLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(a) If you can see the aluminum core, cut one piece of fiberglass material to fit the repair area.
(b) Cut two, 0 degree, pieces of the graphite material to fit the repair area.

S 348-010-R00

(8) Cut the composite material that you will use to repair the surface of the area (Fig. 808):
(a) Cut one (0 degree) piece of the graphite material so that it overlaps the repair area by approximately 1.00 inch (25.40 mm).
(b) Cut one (0 degree) piece of the graphite material so that it overlaps the first piece by approximately 0.75 inch (19.05 mm).
(c) FOR REPAIRS ON THE OUTSIDE SURFACE OF THE DOOR;
Cut one piece of the fiberglass sanding material so that it overlaps the second piece of the graphite material by approximately 0.75 inch (19.05 mm).

S 348-011-R00

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(9) Prepare the adhesive:

WARNING: MAKE SURE THAT YOU OBEY THE ADHESIVE MANUFACTURERS INSTRUCTIONS. DO NOT MIX MORE THAN 250 GRAMS OF THE ADHESIVE AT ONE TIME. IF YOU MIX MORE THAN 250 GRAMS, THE ADHESIVE CAN MAKE TOO MUCH HEAT. THE HEAT CAN CAUSE TOXIC FUMES TO COME OUT OF THE ADHESIVE. THE TOXIC FUMES CAN CAUSE INJURIES.

(a) Mix the adhesive.

NOTE: Use the instructions supplied by the adhesive manufacturer to mix the adhesive.

S 348-012-R00

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(10) Apply the adhesive:
(a) Put the adhesive on the material that you will use to fill the repair area.

NOTE: If you can see the aluminum core, you must also saturate the fiberglass fill material with the adhesive.

(b) Put the adhesive on the material that you will use to repair the surface of the area.
(c) FOR REPAIRS ON THE OUTSIDE SURFACE OF THE DOOR;
Put the adhesive on the fiberglass sanding material that you will use to repair the surface of the area.

(d) Make sure that the composite material is completely saturated with the adhesive.

S 348-013-R00

(11) Install the composite material in the repair area:

(a) Install the two pieces of graphite material to fill the repair area.

NOTE: If you can see the aluminum core, you must install the fiberglass fill ply first.

1) Make sure that the composite material correctly fills the repair area.

(b) Install the graphite material that will repair the surface of the repair area:

1) Install the piece that overlaps the repair area by 1.00 inch (25.40 mm) first.

2) Install the piece that overlaps the first piece by 0.75 inch (19.05 mm) second.

3) FOR REPAIRS ON THE OUTSIDE SURFACE OF THE DOOR; Install the fiberglass sanding ply over the repair plys.

(c) Install the thermocouples to the outer surface of the repair area.

(d) Put the heat blanket over the repair area.

(e) Put the door in a vacuum bag.

S 348-014-R00

(12) Cure the adhesive:

(a) Connect the vacuum pump to the vacuum bag.

(b) Operate the vacuum pump until you have 22 inches of mercury vacuum.

1) Make sure that you keep the vacuum for the total cure process.

(c) Cure the adhesive at 190° to 210° F (88° to 90° C) for 220 minutes (3 hours, 40 minutes).

(d) Use abrasive paper to smooth the surface of the repair.
1) Smooth the edge of the repair.

E. Repair cracks in the latch fitting attachment.

S 218-015-R00

(1) Examine the door for damage:
(a) Remove the latch assembly.
1) Keep the latch assembly for the subsequent installation.
(b) Examine the area of the door where the latch is installed.
(c) If the cracks are in these limits, you can repair them with filler:
1) The fibers of the graphite doubler are connected.
2) The defects in the surface are small.
3) The cracks are small and are connected to each other.
(d) If the damage is not in these limits, you must do the repair damage to the skin at the edge of the hinge access door procedure.

S 348-045-R00

(2) Degrease the repair area.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, OR EYES, OR ON SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT PROTECTIVE SPLASH GOGGLES AND GLOVES ON WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT

(a) Use a lint-free cloth that is moist with Acetone 0Mat 150, or Isopropyl Alcohol 0Mat 1/40, or Cleaning Solvent 0mat 1/257 to remove grease from the repair area.

S 348-016-R00

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(3) Prepare the adhesive:

WARNING: MAKE SURE THAT YOU OBEY THE ADHESIVE MANUFACTURERS INSTRUCTIONS. DO NOT MIX MORE THAN 250 GRAMS OF THE ADHESIVE AT ONE TIME. IF YOU MIX MORE THAN 250 GRAMS, THE ADHESIVE CAN MAKE TOO MUCH HEAT. THE HEAT CAN CAUSE TOXIC FUMES TO COME OUT OF THE ADHESIVE. THE TOXIC FUMES CAN CAUSE INJURIES.

(a) Mix the adhesive.

NOTE: Use the instructions supplied by the adhesive manufacturer to mix the adhesive.

S 348-046-R00

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(4) Apply the adhesive:
  (a) Apply the adhesive to the damaged area.
  (b) Make sure that the adhesive covers all of the defects in the skin.
  (c) Make sure that the adhesive is smooth and matches the contours of the skin.

S 348-047-R00

(5) Cure the adhesive:
  (a) Use the heat lamps to cure the adhesive at 190° to 210° F (88° to 90° C) for 220 minutes (3 hours, 40 minutes).

F. Put the airplane in a serviceable condition.

S 218-017-R00

(1) Inspect the repair to make sure that it is complete and correct.

S 438-018-R00

(2) Install the latch for the hinge access door (AMM 78-31-10/801).

NOTE: You can use these repairs to install the latch: use FRS6188, FRS6249, or FRS6250.

S 938-019-R00

(3) Identify the repair area:
  (a) Use a permanent marker to write FRS6278 adjacent to the repair area.
    1) Make sure that you can be easily see the identification.

S 438-020-R00

(4) Close and latch the hinge access door.

TASK 78-31-10-308-021-R00

4. Fan Thrust Reverser Hinge Access Doors - Door Hinge Attachment Repair

A. General

(1) The Rolls-Royce repair in this procedure is FRS6276.

(2) This procedure can be used to repair the left and the right hinge access doors.

(3) You must do all of the repairs that you find necessary when you do this procedure. This procedure can make one or more of these repairs necessary:

RB211-535E4 - FRS6249, FRS6250

(4) Cracks in the door structure where the hinges are attached can be repaired if the grapite doubler is not cracked and is not delaminated.

(5) It is recommended that only one hinge position is repaired at a time. This permits the hinge alignment fixture to operate at the two remaining hinge positions.

(6) These materials are used to make the hinge access doors:

The inner and outer skins - graphite
The core of the doors - aluminum

(7) Use this procedure to repair the hinge access doors with these part numbers:
RB211-535E4 - LJ75079, LJ75857, LJ75080, LJ75858

B. Equipment

(1) Riveting equipment
(2) Composite saw
(3) Composite router
(4) Heat blankets
(5) Tool steel rod, 0.125 inch (3.175 mm) diameter, 48.00 inch (121.92 mm) long

C. Consumable Materials

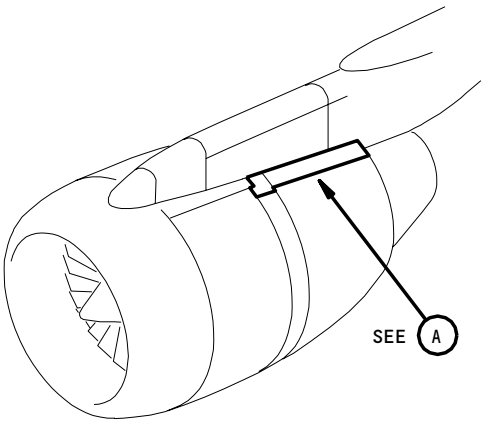
(1) Acetone
OMat 150
or

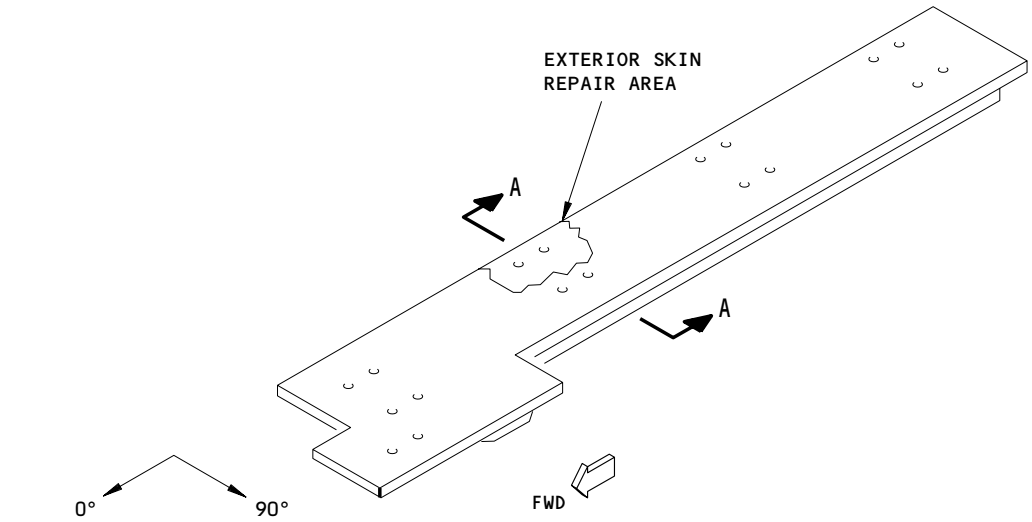
(2) Isopropyl Alcohol
OMat 1/40
or
(3) Cleaning Solvent
OMat 1/257
(4) Carbon Fiber fabric (five end section weave)
British Spec - A0009/000 (Fiber type T300)
OMat No. - 8/151
(5) Fiberglass cloth
British Spec - Tyglass Y383/205-T5
OMat No. - 884
(6) Adhesive, two part pack
British Spec - Hysol EA934NA
OMat No. - 8/52
(7) Adhesive, two part polysulfide
British Spec - Pro-Seal 870A-2
OMat No. - 8/106C
(8) Adhesive, two part pack
British Spec - Scotch Weld EC-22168/A
Omat No. - 8/162
(9) Epoxy adhesive, two part pack
British Spec - EA9390, Part A tan, Part B violet
OMat No. - 8/160
(10) Abrasive paper, silicon carbibe, 150 grit
OMat No. - 5/38
(11) Release agent
British Spec - DP200
OMat No. - 8/32
(12) Vacuum bag
British Spec - Capran sheeting
OMat No. - 2/31
(13) Lint free cloth - Local supply

D. Procedure

S 218-022-R00

(1) Examine the hinge area of the access door for damage (Fig. 804):
(a) Remove the hinges from the door.
1) Keep the hinges and screws for the subsequent installation.
(b) Remove the graphite hinge spacers.
1) Keep the spacers for the subsequent installation.
(c) Remove the seal that is adjacent to the hinge area that is damaged.
(d) Use a 10X magnifying glass and a coin to identify the area that is damaged:
1) Use the 10X magnifying glass to examine the surface of the door for damage.





REPAIR PLY ORIENTATION

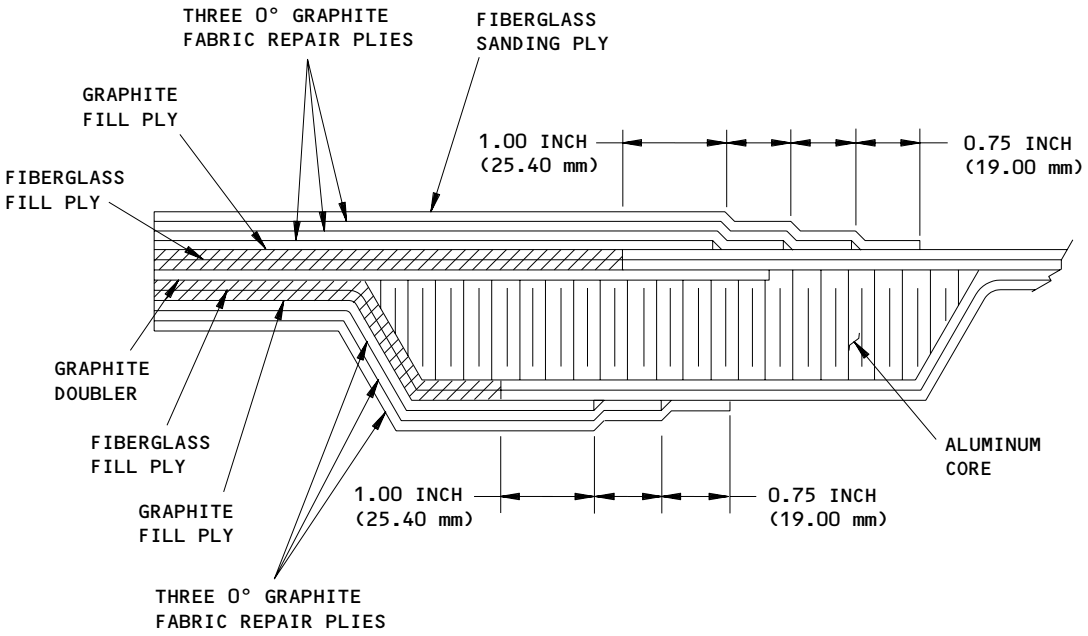
T/R HINGE ACCESS DOOR
(LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE)

A

EXTERIOR SKIN REPAIR

62524

Thrust Reverser Hinge Access Door - Hinge Repair
Figure 804 (Sheet 1)



REPAIR PLY INSTALLATION
(EXAMPLE AT EACH POSITION)
A–A

62525

Thrust Reverser Hinge Access Door – Hinge Repair
Figure 804 (Sheet 2)

2) Use the coin to lightly hit the surface of the door.

NOTE: The sound that the coin makes will tell you if the graphite skin has disconnected from the core material.

3) Make a note of the damaged area.

S 828-023-R00

(2) Use the tool steel rod as a fixture to keep the hinges aligned:
(a) Temporarily install the hinges and their shims to the access door.
(b) Put the rod through the hinges.
(c) Make sure that the rod turns freely in the hinges.
1) If the rod does not turn freely, install shims until the rod turns freely.
(d) Make a mark on the rod to show the correct position for the hinges.

NOTE: You will use the rod and these marks for the subsequent installation of the hinges for the hinge access door.

S 348-024-R00

(3) Remove the damaged area:

WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTCLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(a) Use the composite saw and the router to remove the damaged area.

NOTE: When you remove the damage, if is best to cut a regular shape. It is easier to repair a regular shape than an irregular one.

(b) Make sure that you do not cut the graphite doubler or the honeycomb core.

S 218-025-R00

(4) Use the coin and the magnifying glass to examine the inner graphite doubler:
(a) Make sure that the doubler is not cracked.
(b) Make sure that the doubler is not disconnected from the core.
1) Replace the door if the doubler is cracked or if it is not connected to the core (Ref 78-31-10/401).

S 348-026-R00

WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTCLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(5) Abrade the surface of the repair area with the abrasive paper.
   (a) Make sure that you do not abrade the more than 2.50 inch (63.50 mm) from the edge of the repair area.

S 348-048-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH OR EYES OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT PROTECTIVE SPLASH GOGGLES AND GLOVES ON WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT

(6) Use Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257 to remove the grease from the repair area.
   (a) Make a lint free cloth moist with Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257.
   (b) Make sure that you dry the repair area before the Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257 becomes dry.
   (c) Use a heat lamp to dry the repair area at 230° to 250° F (110° to 120° C) for 1 hour.

S 348-027-R00

(7) Cut the composite material that you will use to fill the repair area (Fig. 809):

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   (a) Cut one piece of fiberglass material to fit the repair area.

NOTE: The fiberglass material is installed adjacent to the aluminum core.

   (b) Cut one, 0 degree, piece of the graphite material to fit the repair area.

S 348-028-R00

(8) Cut the composite material that you will use to repair the surface of the area (Fig. 809):

(a) Cut one (0 degree) piece of the graphite material so that it overlaps the repair area by approximately 1.00 inch (25.40 mm).

(b) Cut second (0 degree) piece of the graphite material so that it overlaps the first piece by approximately 0.75 inch (19.05 mm).

(c) Cut third (0 degree) piece of the graphite material so that it overlaps the second piece by approximately 0.75 inch (19.05 mm).

(d) FOR REPAIRS ON THE OUTSIDE SURFACE OF THE DOOR;
Cut one piece of the fiberglass sanding material so that it overlaps the third piece of the graphite material by approximately 0.75 inch (19.05 mm).

S 348-029-R00

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(9) Prepare the adhesive:

WARNING: MAKE SURE THAT YOU OBEY THE ADHESIVE MANUFACTURERS INSTRUCTIONS. DO NOT MIX MORE THAN 250 GRAMS OF THE ADHESIVE AT ONE TIME. IF YOU MIX MORE THAN 250 GRAMS, THE ADHESIVE CAN MAKE TOO MUCH HEAT. THE HEAT CAN CAUSE TOXIC FUMES TO COME OUT OF THE ADHESIVE. THE TOXIC FUMES CAN CAUSE INJURIES.

(a) Mix the adhesive.

NOTE: Use the instructions supplied by the adhesive manufacturer to mix the adhesive.

S 348-030-R00

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(10) Apply the adhesive:
  (a) Put the adhesive on the material that you will use to fill the repair area.
  (b) Put the adhesive on the material that you will use to repair the surface of the area.
  (c) FOR REPAIRS ON THE OUTSIDE SURFACE OF THE DOOR;
  Put the adhesive on the fiberglass sanding material that you will use to repair the surface of the area.
  (d) Make sure that the composite material is completely saturated with the adhesive.

S 348-031-R00

(11) Install the composite material in the repair area:
  (a) Install the fiberglass and the graphite material to fill the repair area.

    NOTE: Install the fiberglass fill ply first, adjacent to the core.

    1) Make sure that the composite material correctly fills the repair area.
  (b) Install the graphite material that will repair the surface of the repair area:
    1) Install the piece that overlaps the repair area by 1.00 inch (25.40 mm) first.
    2) Install the piece that overlaps the first piece by 0.75 inch (19.05 mm) second.
    3) Install the piece that overlaps the second piece by 0.75 inch (19.05 mm) third.
    4) FOR REPAIRS ON THE OUTSIDE SURFACE OF THE DOOR;
    Install the fiberglass sanding ply over the repair plys.
  (c) Install the thermocouples to the outer surface of the repair area.
  (d) Put the heat blanket over the repair area.
  (e) Put the door in a vacuum bag.

S 348-032-R00

(12) Cure the adhesive:
  (a) Connect the vacuum pump to the vacuum bag.
  (b) Operate the vacuum pump until you have 22 inches of mercury vacuum.

(c) Make sure that you keep the vacuum for the total cure process.
(d) Cure the adhesive at 190° to 210° F (88° to 90° C) for 220 minutes (3 hours, 40 minutes).
(e) Use abrasive paper to smooth the surface of the repair.
1) Smooth the edge of the repair.

S 438-033-R00

(13) Install the hinges:
(a) Install the .250 inch steel rod in the two hinges that are on the door.
(b) Make sure that the mark that you made earlier align with the two hinges.
(c) Put the third hinge on the rod.
(d) Move the hinge to make sure that it aligns correctly with its marks.

NOTE: Be careful to align the hinge correctly.

(e) Put the graphite spacer, that you removed earlier, under the hinge.
(f) When you are sure that the hinge and the hinge spacer are in their correct position, drill the holes for the hinge mount bolts.
1) Drill four 0.250 to 0.261 inch (6.35 to 6.62 mm) holes in the repair area.

NOTE: Use the hinge and hinge spacer to align the drill bit.

(g) Remove the hinge spacer and the hinge from the 0.250 inch rod.
(h) Countersink the hole on the outer surface of the door.
1) Use a 100 degree X 0.520 inch (13.20 mm) countersink.
2) Make sure that the bolts heads are even (flush) with the outer surface of the door.

S 228-034-R00

(14) Measure the hinge shim clearance:
(a) Put the hinge on the 0.250 inch rod.
(b) Make sure that the hinge is located in its correct position on the door.
(c) Put the graphite spacer, that you removed earlier, under the hinge.
(d) Measure the shim clearance under the hinge spacer.
1) Make sure that the rod turns freely in the hinges.

WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTCLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(e) If the hinge spacer is to large, grind the spacer to the correct dimension.

(f) If the hinge spacer is too thin, do these steps to apply a liquid shim to the spacer:

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1) Put the release agent on the hinge and the hinge bolts.

WARNING: MAKE SURE THAT YOU OBEY THE ADHESIVE MANUFACTURERS INSTRUCTIONS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

2) Use the manufacturers instruction to prepare the adhesive.
3) Put the adhesive on the mating surfaces of the hinge and the hinge spacer.
4) Install the hinge and the hinge spacer in their correct position on the rod and on the door.
5) Put pressure on the hinge and spacer assembly.

NOTE: The pressure should be sufficient to remove the air that can be caught in the adhesive.

6) Use the heat blanket to cure the adhesive at 140° F (60° C) for one hour.
7) Remove the unwanted adhesive for the holes.

S 438-035-R00

(15) Install the hinge:

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(a) Prepare the epoxy adhesive.

WARNING: MAKE SURE THAT YOU OBEY THE ADHESIVE MANUFACTURERS INSTRUCTIONS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

1) Use the manufacturers instruction to mix the epoxy adhesive.

(b) Put the epoxy adhesive on the mating surfaces of the hinge spacer and the door.

(c) Install the hinge and the hinge spacer assembly in its correct position on the rod and on the door.

(d) Install the hinge mount bolts.

(e) Make sure that the rod turns freely in the hinges and the hinge aligns correctly with the marks on the rod.
1) Make sure that the hinge bolts are tight.

(f) Install the door seal (AMM 78-31-10/801).

NOTE: You can use these Rolls-Royce repair procedures: FRS6249, FRS6250

(g) Examine the repair area.
1) Make sure that the repair is complete and correct.

(h) Use a permenant marker to identify the repair.
1) Write FRS6276 adjacent to the part number of the door assembly.

S 918-036-R00

(16) Close and latch the door.

TASK 78-31-10-308-037-R00

5. Fan Thrust Reverser Hinge Access Doors - Latch Assembly and Substructure Repair

A. General

(1) The Rolls-Royce repair in this procedure is FRS6188.

(2) This procedure can be used to repair the left and the right hinge access doors for the RB211-535E4 engines.

(3) Use this procedure to repair the hinge access doors with these part numbers:
RB211-535E4 - LJ75079, LJ75857, LJ75080, LJ75858

(4) These are the materials that the repair part are made from:

Latch Assembly	15-5 CRES steel
Hi-Lok pins	6A1-4V titanium
Hi-Lok collar	2024T6 aluminum

B. Equipment

(1) Drilling equipment

(2) Drill bits

(3) Hi-Lok installation tools

(4) Heat lamps (explosion proof)

C. Consumable Materials
(1) Acetone
OMat 150
or
(2) Isopropyl Alcohol
OMat 1/40
or
(3) Cleaning Solvent
OMat 1/257
(4) Adhesive, two part pack
British Spec - Hysol EA934NA
OMat No. - 8/52
(5) Release agent
British Spec - DP200
OMat No. - 8/32
(6) Abrasive paper, silicon carbibe, 150 grit
OMat No. -5/38
(7) Lint free cloth - Local supply
(8) Masking Tape - Local supply

D. Parts
(1) Latch Assembly, LJ76211
(2) Latch Assembly, LJ76212
(3) Hi-Lok pin, HL13V6-10 (RR1013614)
(4) Hi-Lok pin, HL13V6-12 (RR1013615)
(5) Hi-Lok pin, HL13V6-17 (RR1013616)
(6) Hi-Lok collar, HL70-6 (RR3408507)
(7) Washer, dimpled, NAS1169C10 or NAS1169T10 (RR 1013629 or 1013630)

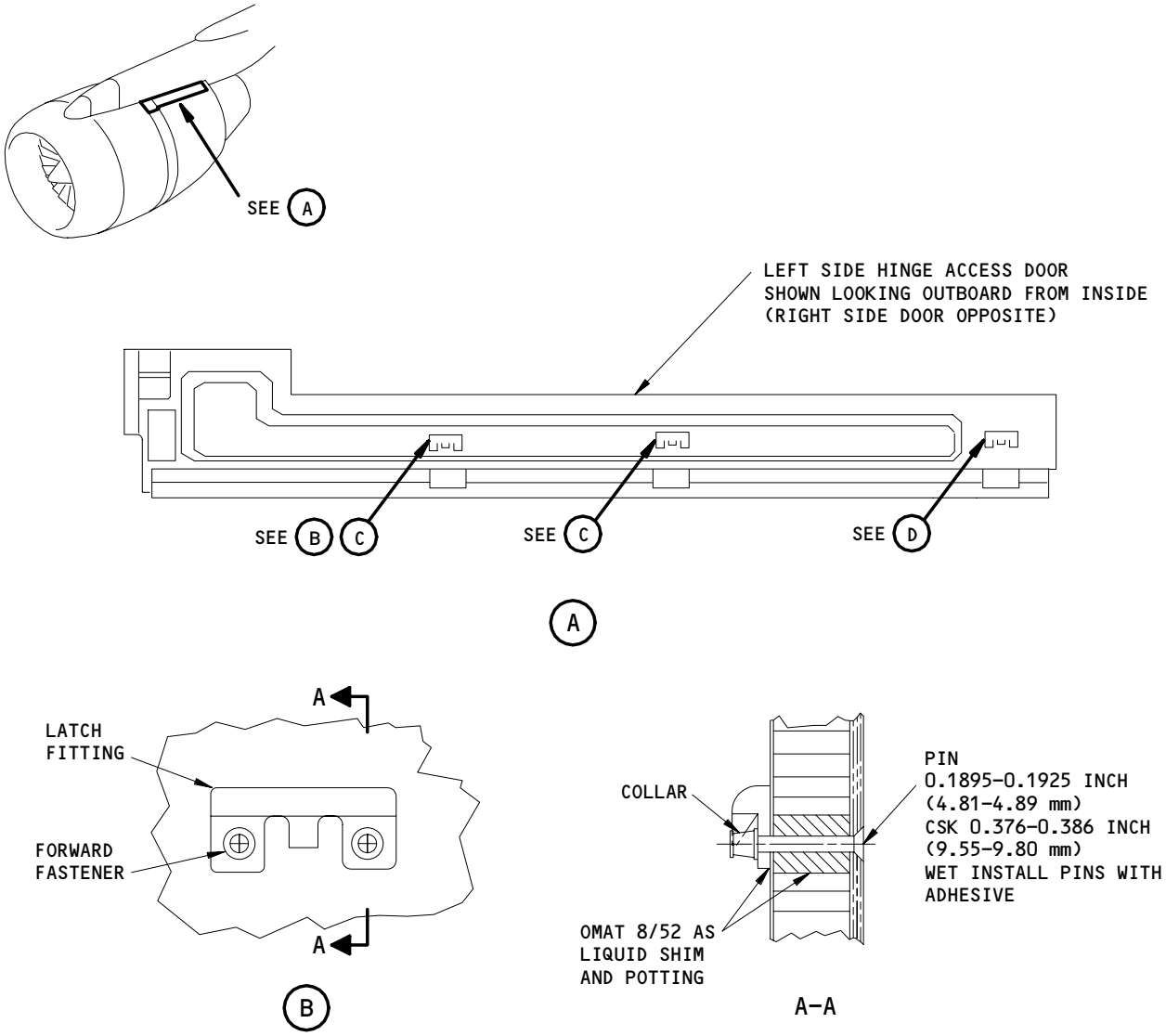
E. Procedure

S 028-038-R00
(1) Remove the latch assembly that is damaged (Fig. 805):
(a) Use a scribe to make a light mark in the paint around the latch assembly.
(b) Put masking tape on the door, around the latch assembly.
1) Make sure that the mark that you made is aligned with the masking tape.
(c) Remove the fasteners (Hi-Lok pins and collars) from the damaged latch.
(d) Remove the latch.

S 168-039-R00
(2) Clean the substructure of the door below the latch:

WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTICLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(a) Remove the potting compound from the repair area.

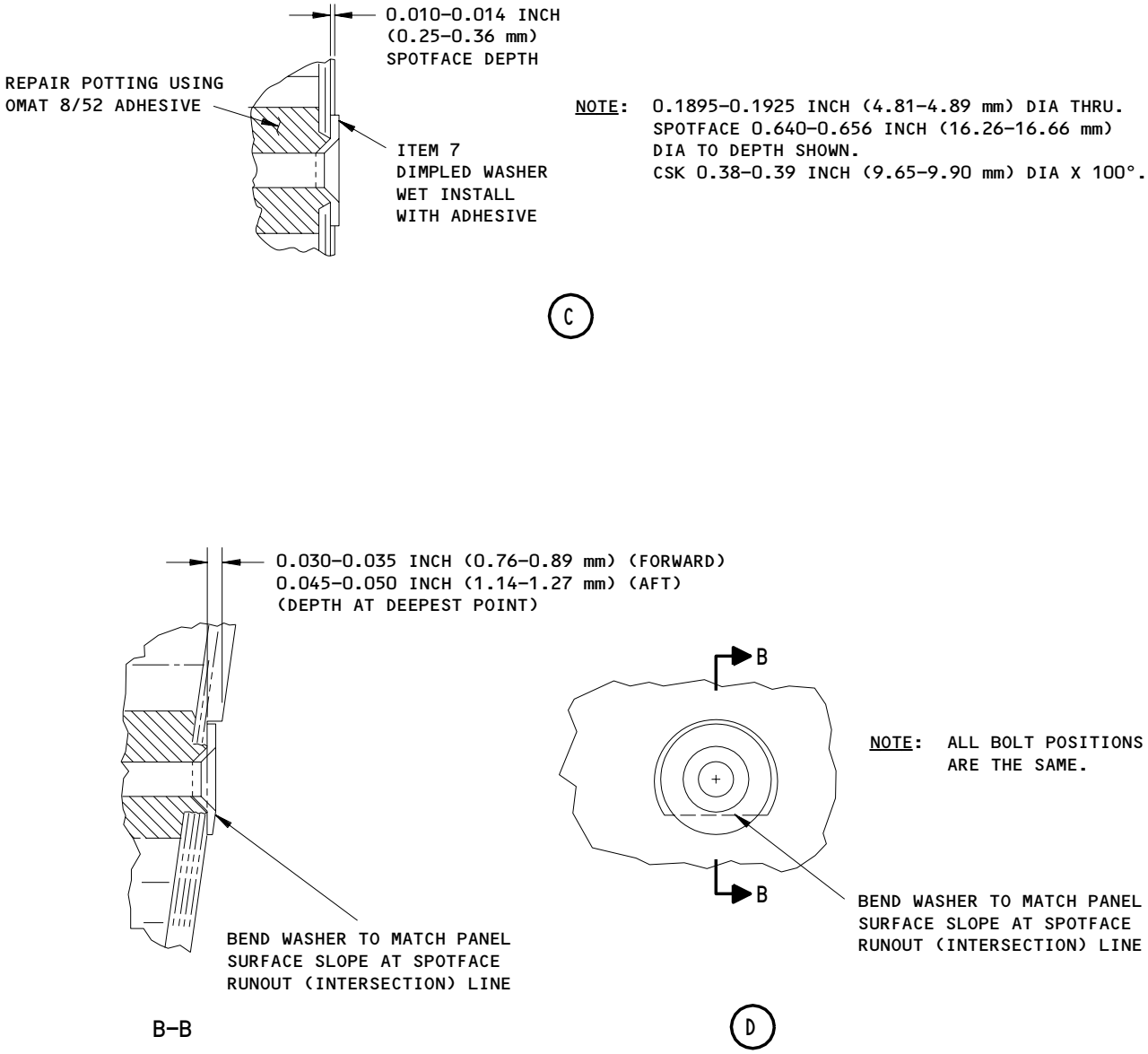


POSITION	ITEM NO.			
	LATCH FITTING	FORWARD PIN	AFT PIN	HI-LOK COLLAR
B, C	1	5	5	6
D	2	4	3	6

EXAMPLE LATCH FITTING INSTALLATION REPAIR

62411A

Thrust Reverser Hinge Access Door - Latch Attachment Repair
Figure 805 (Sheet 1)



DOOR PANEL REPAIR FOR FASTENER HEAD PULLTHROUGH

62434A

Thrust Reverser Hinge Access Door – Latch Attachment Repair
Figure 805 (Sheet 2)

(b) Abrade the surface of the repair area with the abrasive paper.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID PUT PROTECTIVE SPLASH GOGGLES AND GLOVES ON WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT

(c) Use the Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257 to remove the grease from the repair area.
1) Make a lint free cloth moist with Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257.

(d) Make sure that you dry the repair area before the Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257 beomes dry.

S 348-040-R00

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(3) Prepare the adhesive/potting compound:

WARNING: MAKE SURE THAT YOU OBEY THE ADHESIVE MANUFACTURERS INSTRUCTIONS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

(a) Use the manufacturers instruction to mix the adhesive/potting compound.

S 348-041-R00

(4) Apply the adhesive/potting compound on the repair area:
(a) Use the masking tape to cover the surface of the door.
1) Make sure that the tape seals the edge of the repair area.
(b) Put the adhesive/potting compound on the repair area.
1) Make sure that the compound fills the repair area.
(c) Use the heat lamp to cure the adhesive/potting compound at 140° F (60° C) for one hour.
(d) Use the abrasive paper to smooth the repair area.
1) Make sure that the contour of the repair matches the door.

S 848-042-R00

(5) Prepare the door and the new latch for the installation:

(a) Use a clamp to hold the old latch assembly in its correct position.

1) Make sure that the latch assembly aligns with the lines that were scribed in the door earlier.

2) Make sure that the latch assembly is securely held in its correct position.

WARNING: WHEN YOU CUT OR ABRADE COMPOSITE MATERIALS, YOU MUST WEAR HIGH-NECKED OVERALLS, GLOVES, FACE MASK, AND SAFETY GLASSES WHEN YOU CUT COMPOSITES. DO NOT BREATHE THE DUST OR LET THE PARTICLES GET ON YOUR SKIN. THE DUST AND PARTCLES FROM COMPOSITE MATERIALS CAN CAUSE INJURIES TO PERSONNEL.

(b) Drill the fastener holes:

1) Use the holes in the latch assembly to align the drill and drill the holes in the door.

2) Countersink the fastener hole in the external skin.

(c) Remove the latch assembly.

(d) Do these steps if the latch fasteners have gone through the door skin:

1) Spot face and countersink the fastener holes.

2) Put the dimple washers in their correct position on the door.

3) Make sure that the dimple washers fit in the countersink.

4) Make sure that the dimple washers match the contour of the door.

NOTE: You can bend the washer until the contour is the same.

(e) Use a clamp to hold the new latch assembly in its correct position.

1) Make sure that the latch assembly aligns with the lines that were scribed in the door earlier.

2) Make sure that the latch assembly is securely held in its correct position.

(f) Drill the holes in the latch:

1) Use the holes in the door to align the drill and drill the holes in the latch.

2) Remove the latch assembly.

3) Remove the burrs from the hole in the latch.

(g) Put the release agent on the latch assembly:

1) Put the release agent on the surface of the latch that mates with the door.

2) Put the release agent on the edges of the latch.

3) Put the release agent on the Hi-Lok fastener pins.

(h) Let the release agent cure at a minimum of 68 ° F (20° C) for 30 minutes.

S 428-043-R00

(6) Install the new latch:

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM ADHESIVE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ADHESIVE. KEEP THE ADHESIVE AWAY FROM SPARKS, FLAMES, AND HEAT. ADHESIVE IS A POISONOUS AND FLAMMABLE THAT CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT

(a) Prepare the liquid shim adhesive:

WARNING: MAKE SURE THAT YOU OBEY THE ADHESIVE MANUFACTURERS INSTRUCTIONS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES AND DAMAGE TO THE EQUIPMENT.

1) Use the manufacturers instructions to mix the liquid shim adhesive.

(b) Put the liquid shim adhesive on the mating surfaces of the latch and the door.
1) Make sure that the liquid shim adhesive is less than 0.024 inch (0.61 mm) thick.

(c) If it is necessary to use the dimple washers, put the liquid shim adhesive on the washers.

(d) If it is necessary, put the dimple washers in their correct position.

(e) Put the latch assembly in its correct position.

(f) Use the Hi-Lok installation tool to install the Hi-Lok pins and the Hi-Lok collars.

(g) Use the Hi-Lok installation tool to slowly tighten the Hi-Lok fasteners.

(h) Use a lint free cloth to remove the unwanted liquid shim adhesive from the repair area.

(i) Use the heat lamps to cure the liquid shim adhesive at 140 ° F (60 ° C) for one hour.

(j) Examine the repair area.
1) Make sure that the repair is complete and correct.

(k) Use a permenant marker to identify the repair.
1) Write FRS6188 adjacent to the part number of the door assembly.

S 428-044-R00

(7) Close and latch the door.
(a) Make sure that the door closes and latches correctly.

THRUST REVERSER - MAINTENANCE PRACTICES

1. General
   A. This procedure gives steps to find the cause for a defective thrust reverser in the retracted position.
   B. Use the procedure in (AMM 70-51-00/201) to tighten the fasteners. Tighten the fasteners to the torque values in (AMM 70-51-00/201) unless a torque value is given in this procedure.

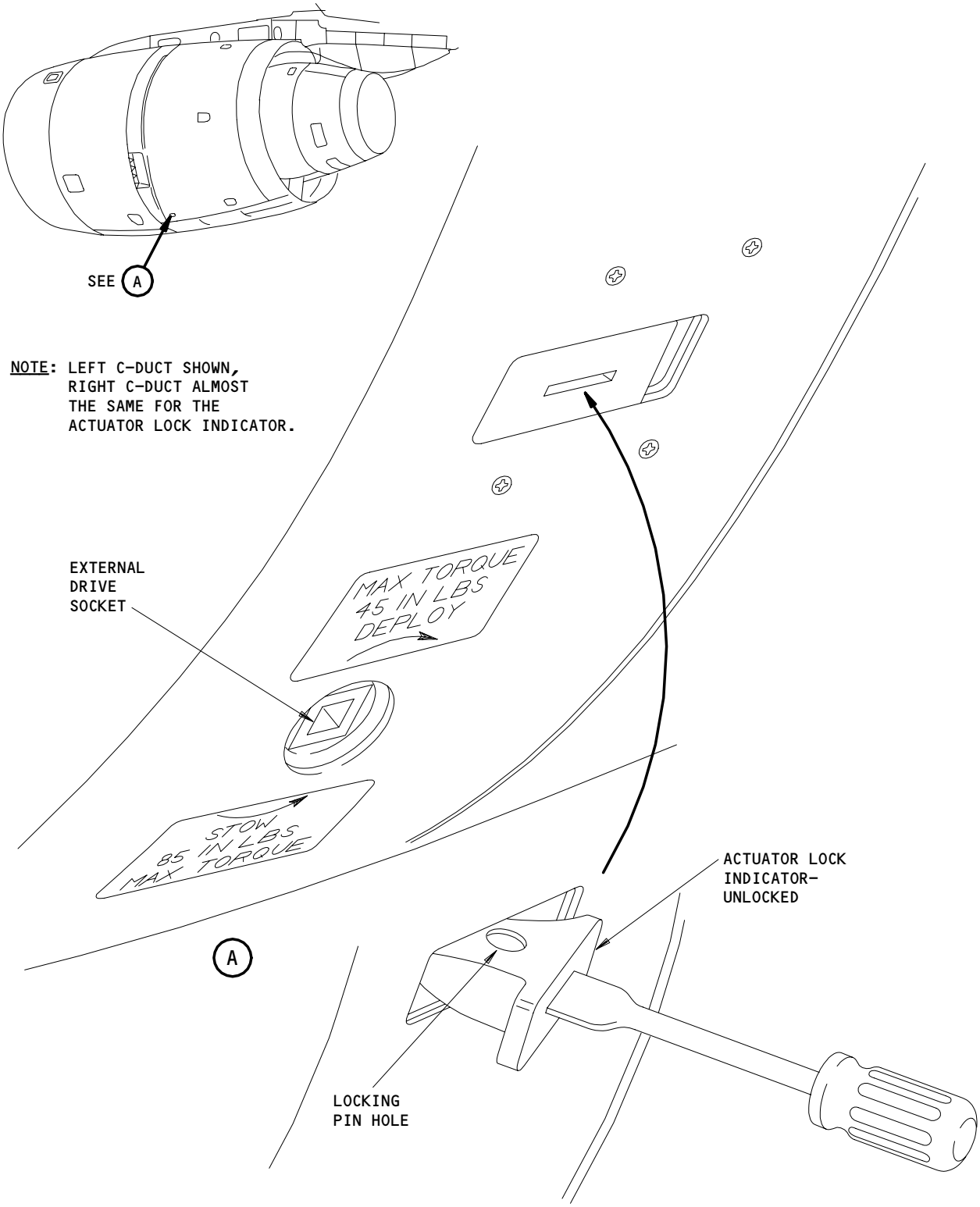
TASK 78-31-20-712-001-R00

2. Maintenance Procedure for the Fan C Duct and Thrust Reverser
   A. Equipment
      (1) Clean container - minimum capacity
          1.6 U.S Gallons, 2 Imperial Gallons, or
          9 Litres
   B. Consumable Materials
      (1) Lockwire
          British Spec - 22 S.W.G.
          American Spec - 21 A.W.G.
          OMat No. - 238
   C. References
      (1) AMM 12-12-01/301, Hydraulic Systems
      (2) AMM 78-31-00/201, Fan Thrust Reverser System
      (3) AMM 78-31-20/401, Fan C Duct and Thrust Reverser
      (4) AMM 78-31-26/401, Thrust Reverser Hydraulic Actuators, Rotary Flex Shafts and Tubing
   D. Access
      (1) Location Zones

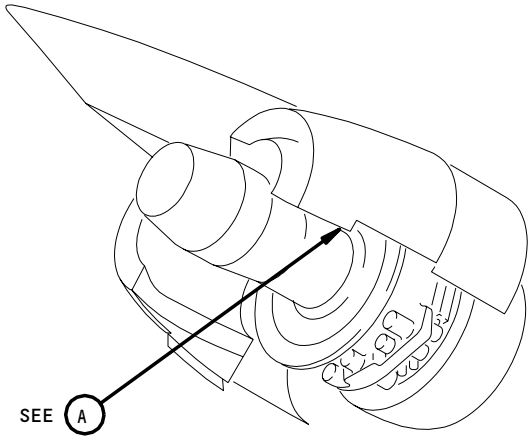
410	No. 1 Engine (Left)
420	No. 2 Engine (Right)

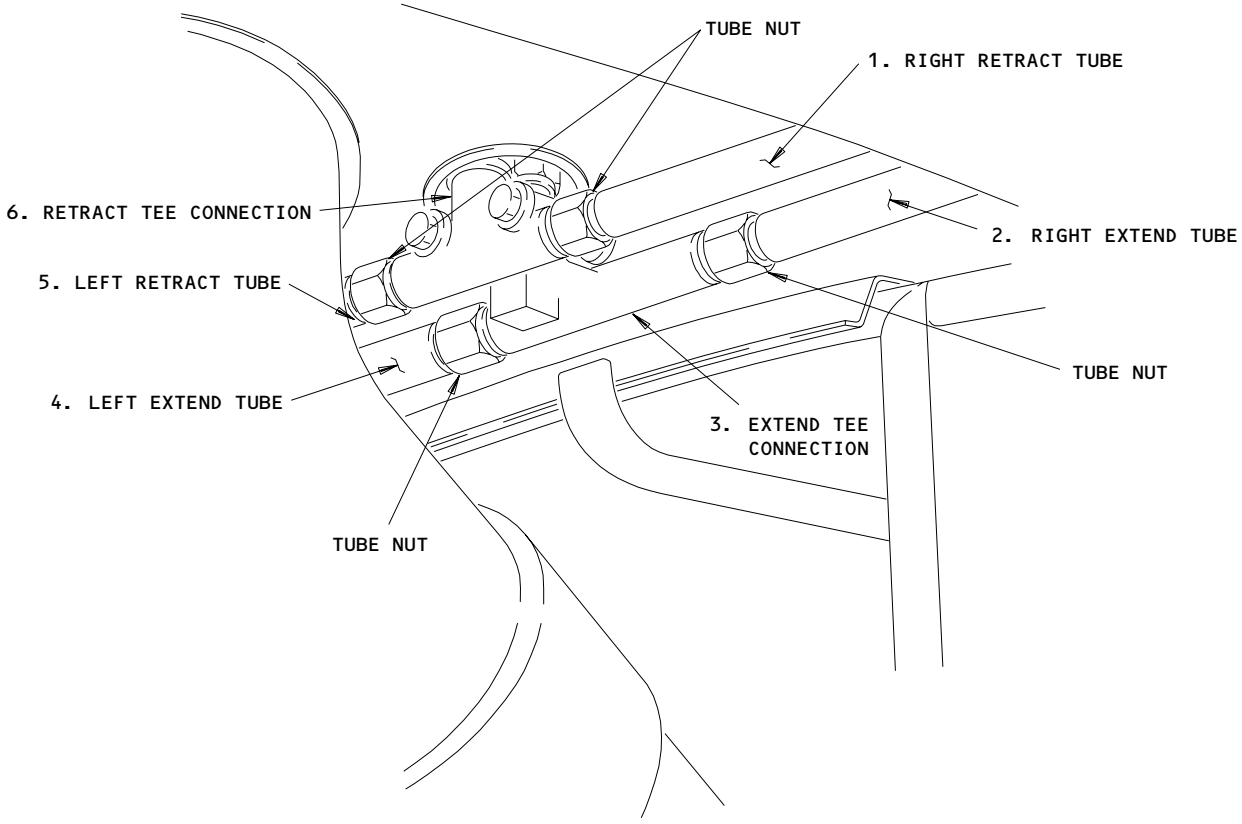
      (2) Access Panels

413AL	Fan Cowl Panel (Left)
414AR	Fan Cowl Panel (Right)
415AL	Thrust Reverser (Left)
416AR	Thrust Reverser (Right)
423AL	Fan Cowl Panel (Left)
424AR	Fan Cowl Panel (Right)
425AL	Thrust Reverser (Left)
426AR	Thrust Reverser (Right)

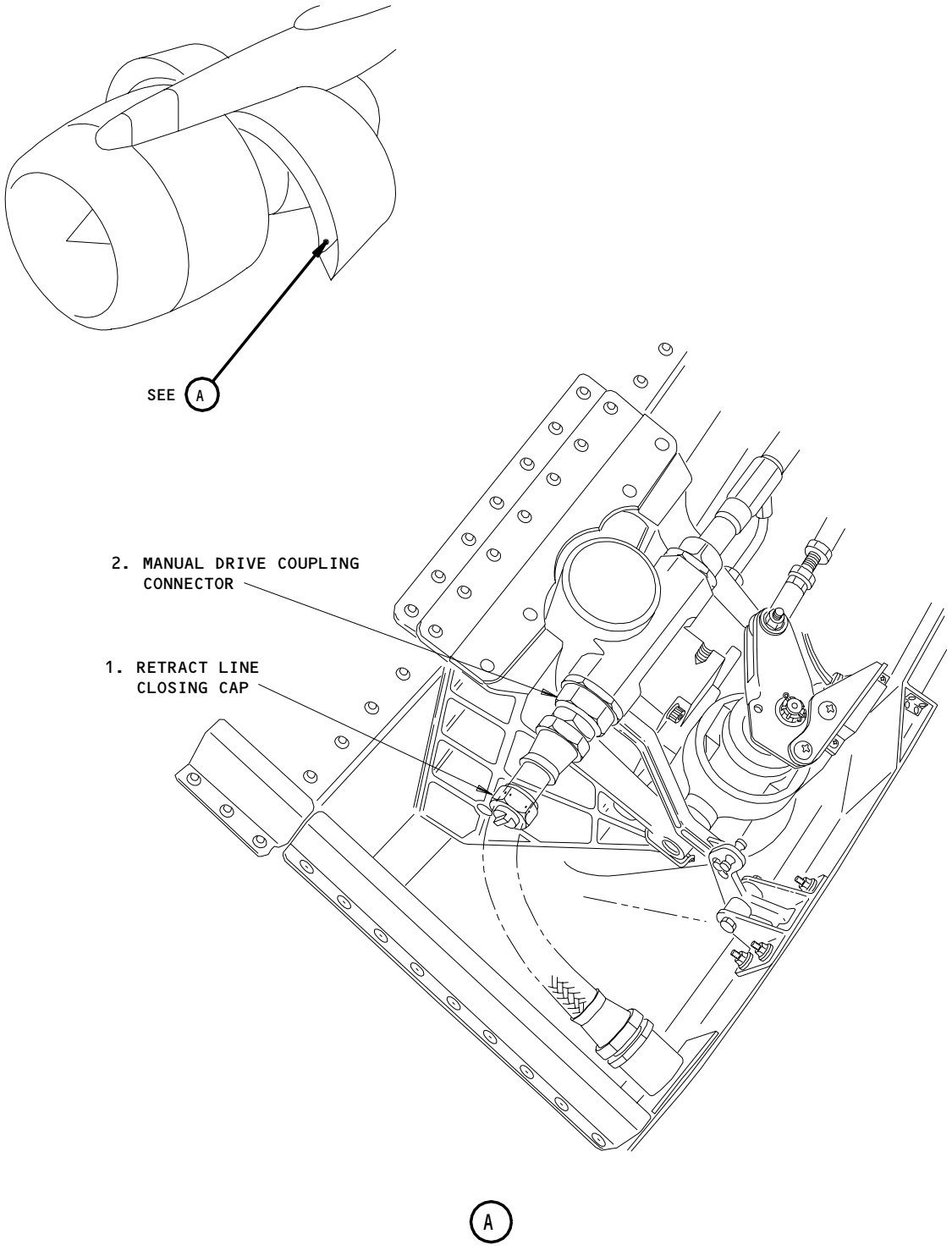


Thrust Reverser Actuator Manual Lock and Crank Locations
Figure 201

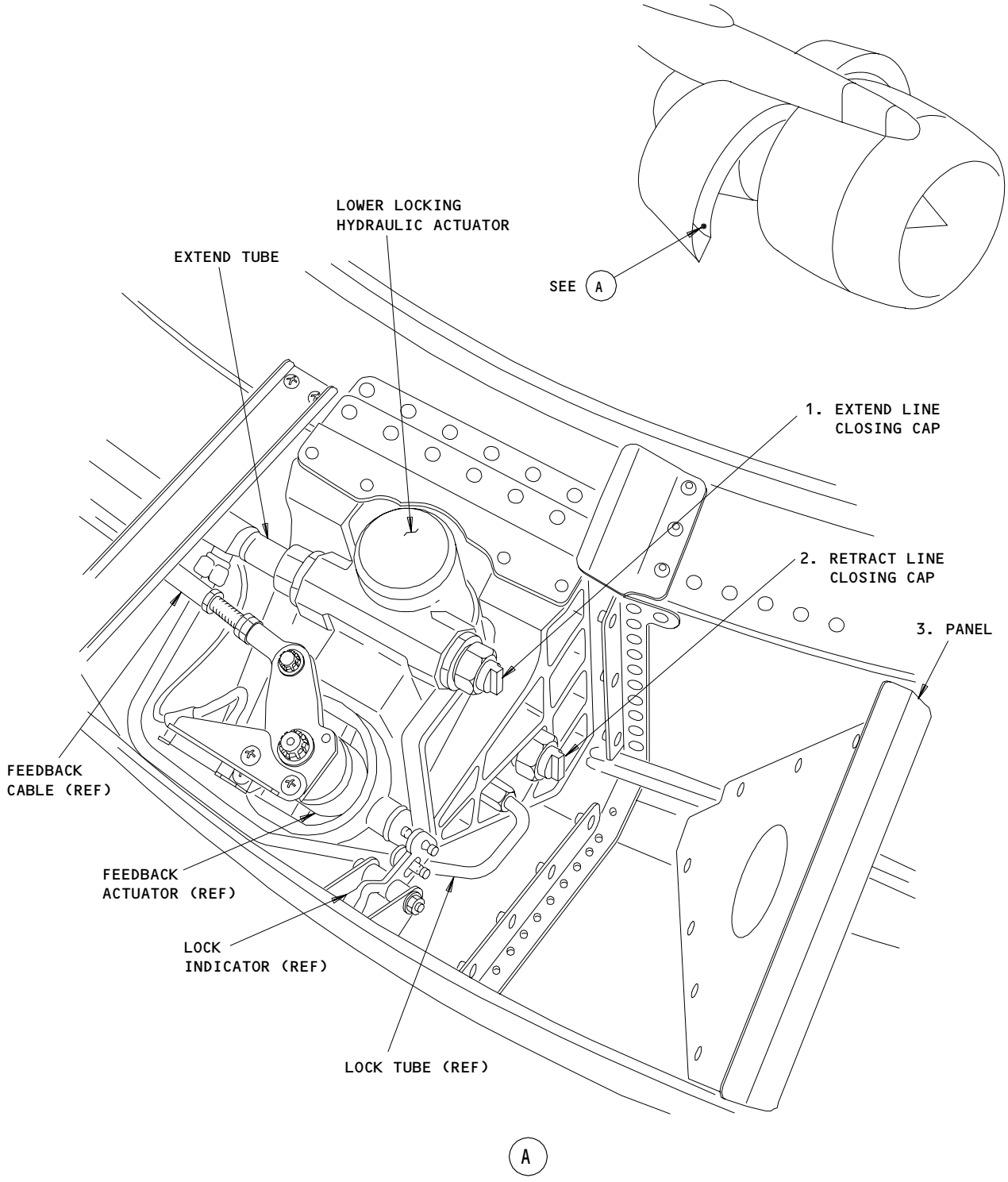




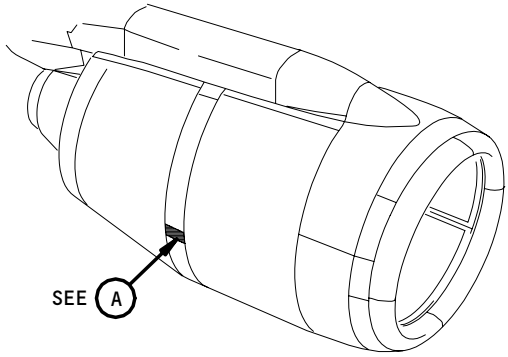
Extend and Retract Flexible Hydraulic Tube Disconnect Points
Figure 202

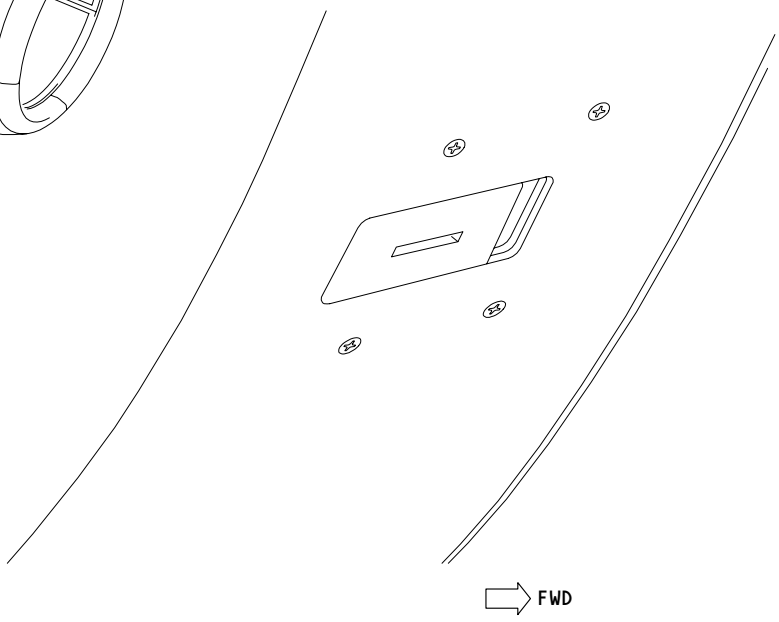


Hydraulic Actuator Systems Drain Points
Figure 203



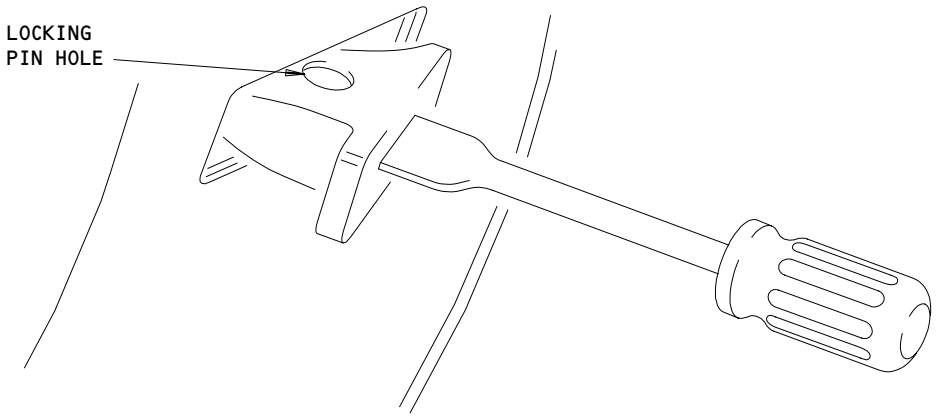
Hydraulic Actuator System Drain Points
Figure 204





SYNC-LOCK MANUAL UNLOCK INDICATOR
(LOCKED)

A



SYNC-LOCK MANUAL UNLOCK INDICATOR
(NOT LOCKED)

A

55616

Thrust Reverser Sync-Lock Manual Unlock Indicator
Figure 205

A67594

E. Prepare to Find the Cause of the Defective Thrust Reverser.

S 042-019-R00

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 OR DAMAGE TO THE EQUIPMENT.

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 012-002-R00

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

(2) Open the thrust reverser (AMM 78-31-00/201).

S 862-003-R00

(3) Manually release the left and the right actuator locks in the thrust reverser (Fig. 201).
   (a) Put a screwdriver blade into the slot in the lock indicator.
   (b) Move the lock indicator out.
   (c) Install a pin and identify it with a placard/label in the lock pin hole to keep the indicator in the released position.

S 422-027-R00

(4) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR RR SB 78-9613;
Unlock the sync-lock on the right C-duct center actuator (Fig. 205).
   (a) Put the screwdriver blade into the slot in the sync-lock indicator.
   (b) Move the lock indicator out and put a lock pin in the locking pin hole.

NOTE: This will keep the indicator in the "unlocked" position.

(c) Attach a warning banner to show the lock pin is in position.

S 682-005-R00

(5) Drain the hydraulic fluid from the actuator system.

CAUTION: REMOVE THE DEACTIVATION PIN IN THE MANUAL OVERRIDE LEVER ON THE ISOLATION VALVE BEFORE YOU DRAIN THE HYDRAULIC SYSTEM OF THE THRUST REVERSER. IF YOU DO NOT REMOVE THE PIN YOU WILL CAUSE THE HYDRAULIC FLUID IN THE AIRPLANE SYSTEM TO DRAIN.

(a) Remove the pin from the manual override lever on the isolation valve if it is necessary.
(b) Loosen but do not disconnect the extend flexible hydraulic and synchronisation tubes (2 and 4) from the Tee connector (3), (Fig. 202).
(c) Loosen but do not disconnect the retract flexible hydraulic tubes (1 and 5) from the Tee connector (6), (Fig. 202).
(d) Remove the panel (3) to get access to the drain points on the right side (Fig. 204).

WARNING: DO NOT LET THE HYDRAULIC FLUID TOUCH YOUR SKIN OR GET INTO YOUR EYES. IF YOU DO NOT CLEAN THE FLUID OFF, THE FLUID CAN CAUSE INJURY TO PERSONS. IF YOU GET FLUID IN YOUR EYES, CLEAN YOUR EYES WITH WATER AND GET MEDICAL AID.

(e) Drain the hydraulic fluid from the thrust reverser.
    1) On the left half of the thrust reverser, remove the retract line cap (1) and the manual drive coupling connector (2) (Fig. 203).
    2) On the right half of the thrust reverser, remove the retract line cap (1) and the extend line cap (2) (Fig. 204).
    3) Let the hydraulic fluid drain into a container.
(f) Install the manual drive coupling connector.
    1) Tighten to 500-600 pound-inches.
(g) Install the three line caps.
(h) Install a lockwire on the connector and line caps.
(i) Install the access panel (3) (Fig. 204).

S 032-013-R00

(6) Disconnect the extend flexible hydraulic and synchronisation tubes (2 and 4) from the Tee connector (3), (Fig. 202).

F. Do the Procedure to Find the Cause of the Defective Thrust Reverser

S 712-014-R00

CAUTION: MANUALLY EXTEND AND RETRACT THE THRUST REVERSER. DO NOT USE AN ELECTRIC OR PNEUMATIC DRIVEN WRENCH TO EXTEND OR RETRACT THE THRUST REVERSER ACTUATION SYSTEM. TOO MUCH TORQUE CAN CAUSE DAMAGE TO THE SYSTEM.

CAUTION: DO NOT EXTEND THE TRANSLATING COWL MORE THAN 4.0 INCHES (101.0 mm) WITH THE THRUST REVERSER OPEN. YOU WILL DAMAGE THE HINGE ACCESS PANELS. REMOVE THE HINGE ACCESS PANELS WITH THE THRUST REVERSER IN THE RETRACT POSITION TO PREVENT DAMAGE.

(1) Attach a standard 3/8 inch (9,525 mm.) socket and drive to each synchronization cable.

S 712-021-R00

(2) Extend the two translating cowls to find the translating cowl that will not operate.

S 022-022-R00

(3) If you find a translating cowl that cannot operate, do these steps to repair the thrust reverser or replace the thrust reverser:
   (a) Procedure 1 to Repair the Defective Thrust Reverser.
      1) Replace the defective half of the thrust reverser (AMM 78-31-20/401).
   (b) Procedure 2 to Repair the Defective Thrust Reverser.
      1) Remove the center actuator (AMM 78-31-26/401).
      2) Put a standard 3/8 inch (9.,525 mm) square drive into each of the three actuators and try to extend the actuator.
      3) Replace the defective actuator(s) (AMM 78-31-26/401).
      4) If you did not find a defective actuator, replace the defective thrust reverser (AMM 78-31-20/401).

G. Put the Airplane Back to Its Usual Condition

S 432-019-R00

(1) Connect the extend flexible hydraulic and synchronisation tubes (2 and 4) to the Tee connector (3) (Fig. 202).
   (a) Tighten the tube nuts to 500-600 pound-inches.
   (b) Install the lockwire on the tube nuts to the Tee connectors.

S 862-020-R00

(2) Manually retract the thrust reverser (AMM 78-31-00/201).

S 862-021-R00

(3) Manually lock the two actuator locks in the thrust reverser (Fig. 201).
   (a) Put a screwdriver blade into the slot in the lock indicator.
   (b) Move the lock indictor out and remove the pin.

(c) Release the lock indicator and make sure the lock engages fully.
1) Turn the manual crank if it is necessary.

S 422-028-R00

(4) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR RR SB 78-9613;
Lock the sync-lock on the right C-duct center actuator (Fig. 205).
(a) Put the screwdriver blade into the slot in the sync-lock indicator.
(b) Move the lock indicator out and remove the lock pin and the warning pennant.
(c) Put the lock indicator to the locked position.
(d) Make sure the sync-lock indicator is not above the fairing surface.

S 412-023-R00

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

(5) Close the thrust reverser (AMM 78-31-00/201).

S 842-032-R00

(6) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 612-024-R00

(7) Do the procedure for the hydraulic system (AMM 12-12-01/301).

THRUST REVERSER - REMOVAL/INSTALLATION

1. General
   A. Use this procedure for the left and right halves of the thrust reverser.
   B. The thrust reverser may be removed with different frame equipment. This permits the use of overwing and underwing procedures. Use of the hold open device is the same for the two procedures.
   C. This procedure contains two tasks. The first task is to remove the thrust reverser. The second task, installation of the thrust reverser, contains two topics. The first topic is the installation of the thrust reverser. The second topic is the adjustment of the upper and lower bifurcation bumpers of the thrust reverser.

TASK 78-31-20-024-001-R00

2. Remove the Thrust Reverser
   A. Equipment
      (1) C-Duct Installation and Trolley, Rolls-Royce CP 30523
      (2) C-Duct Handling Frame, Rolls-Royce CP30522/2 (Alternate to B71042-154)
      (3) C-Duct Handling Frame Equipment, B71042-154
      (4) C-Duct Handling Frame Equipment, B71014-132 (Alternate to B71042-154)
          (a) Frame Assembly, Hoist - B71014-134 (Part of B71014-132)
          (b) Frame Assembly, C-duct - B71014-99 (Part of B71014-132)
          (c) Frame Assembly, Hoist - B71014-6 (Part of B71014-132)
      (5) Hoist Transporter, B71016-1
      (6) B71029, Hoist Equipment
      (7) Fan C-Duct Hold Open Device B71006-79
          (a) Bracket Assembly, B71006-9
          (b) Pad Assembly, B71006-77, -78
          (c) Arch Assembly, B71006-4
          (d) Brace Assembly, B71006-5
          (e) Support Assembly, B71006-3
          (f) Strap Assembly, B71006-52
      (8) Removal/Installation Tool Set - B78002-36
      (9) Rig Pin Set B20003-XX (AMM 20-10-24/201)
          (a) Rig Pin RR-2 - B20003-29

(10) Floating Beam GSE Pins, B71005-10
(Part of B78002-26).
(11) Fishpole Hoist - Supplied by P.F. Industries,
9320 15th Ave. So., Seattle, WA 98108
(12) Tool, Measuring, Latch Closing Force,
Rolls Royce HU21580
(13) Belt Sling, Rolls Royce CP27118
(14) Tool, Torque Adapter, 1014246

B. Consumable Materials
(1) D00013 Lubricant
British Spec - DTD 5598
American Spec - MIL-PRF-23827 (Supersedes MIL-G-23827)
OMat No. - 401C
(2) Silicone compound, cold curing
British Spec - RTV106
OMat No. - 872A
(3) D00046 Grease, Silicone
British Spec - DEF. STAN 59-10/2,
American Spec - MIL-S-8660B
OMat No. - 418

C. References
(1) AMM 54-53-01/401, Strut Access Doors and Panels
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 70-51-00/201, Torque Tightening Technique
(4) AMM 78-31-00/201, Thrust Reverser System
(5) AMM 78-31-10/401, Thrust Reverser Hinge Access Doors
(6) AMM 78-31-25/801, Thrust Reverser Hydraulic Opening Actuators
(7) AMM 78-30-00/501, Thrust Reverser Adjustment
(8) AMM 78-31-20/801, Fan C-Duct and Thrust Reverser

D. Access
(1) Location Zones

210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
433/443	Nacelle strut - mid-structure

(2) Access Panels

415BL/416BR	Thrust Reverser Hydraulic and C-Duct Hinge
425BL/426BR	Thrust Reverser Hydraulic and C-Duct Hinge
415FL/425FL	Thrust Reverser Access Panels
415KL/425KL	Thrust Reverser Access Panels
433GR/443GL	Thrust Reverser Access and Pressure Relief Door
433GR/443GL	Thrust Reverser Access and Pressure Relief Door

E. Remove the Thrust Reverser

S 864-002-R00

(1) Make sure that the forward thrust lever is in the idle position and that the reverse thrust lever is fully forward.
(a) Attach the DO-NOT-OPERATE tags to both levers.

S 864-003-R00

(2) AIRPLANES WITHOUT THRUST REVERSER SYNC LOCKS;
Open these circuit breakers and attach the DO-NOT-CLOSE tags:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, ENGINE LEFT T/R IND
b) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B29, ENGINES RIGHT T/R IND
b) 11B30, ENGINES RIGHT T/R CONT

S 864-005-R00

(3) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
Open these circuit breakers and attach the DO-NOT-CLOSE tags:
(a) For the left engine:
1) On the overhead equipment panel P11:
a) 11D11 T/R IND L
b) 11D12 T/R CONT L
2) On the power distribution panel P6:
a) 6C12 L ENG SYNC LOCK
(b) For the right engine:
1) On the overhead equipment panel P11:
a) 11B29 T/R IND R
b) 11B30 T/R CONT-ALTN-R
c) 11K32 R ENG SYNC LOCK
d) 11K33 T/R CONT R
2) On the power distribution panel P6:
a) 6D12 R ENG SYNC LOCK-ALTN

S 864-007-R00

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

(4) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 014-008-R00

CAUTION: OBEY THE INSTRUCTIONS IN AMM 78-31-10/401 WHEN YOU REMOVE THE HINGE ACCESS DOORS. IF YOU DO NOT OBEY THE INSTRUCTIONS, DAMAGE TO THE HINGE ACCESS DOOR CAN OCCUR.

(5) Remove the hinge access door (AMM 78-31-10/401).

NOTE: If the hinge access door hinges are not removed, tape must be applied to the plates in the vertical position. The hinge and latch must not touch when the thrust reverser is opened.

S 034-009-R00

(6) Disconnect the hinges from the hinge access door (Fig. 401).
  (a) Disconnect the links (1, 2 and 3).
  (b) Temporarily attach the hinges in the vertical positions to prevent damage.

S 214-010-R00

(7) Do an inspection of the C-duct lower attachment hoist point nut plates.
  (a) If there are nut plates that have gone away then replace to FRS.6214 or FRS.6215 as applicable before the C-duct is removed.

S 014-011-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

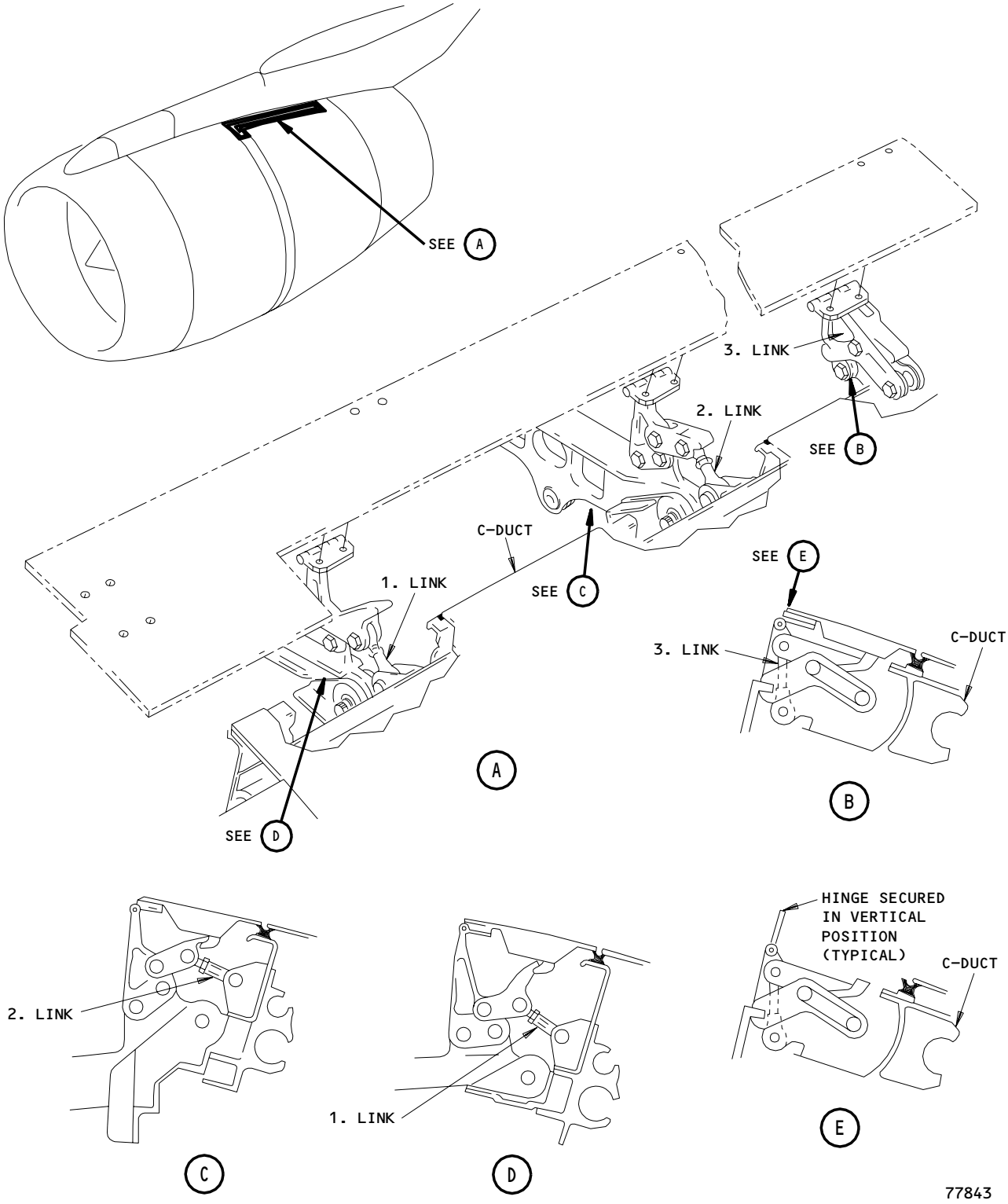
(8) Open the thrust reverser (AMM 78-31-00/201).

S 224-012-R00

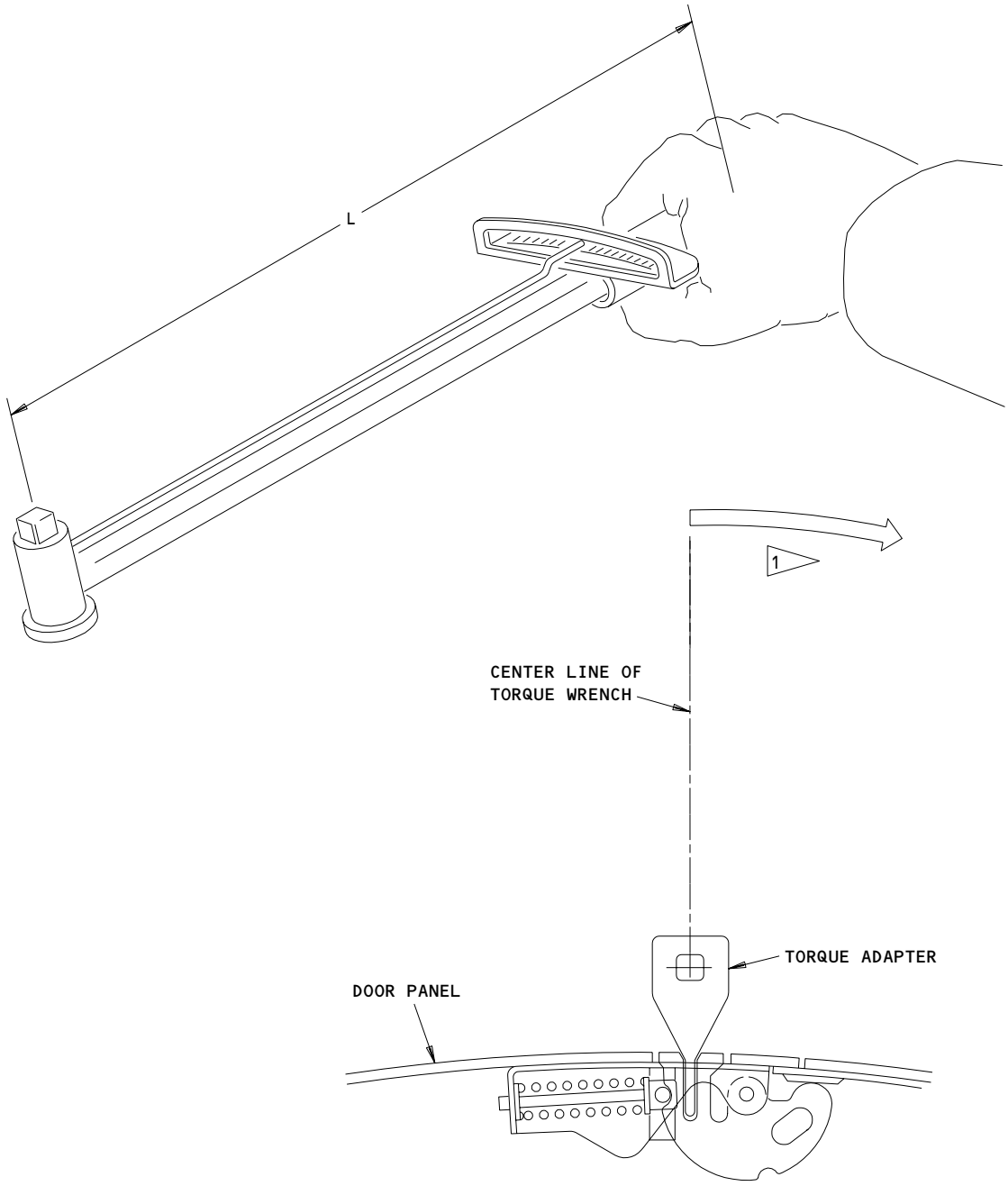
(9) Do a check of the load that is required to open the latches on the rear latch access panel (Fig 401A).
  (a) Get a torque adapter and a torque wrench to do the check.

NOTE: When you check the latch load, the latch access panel must be in the open position.

  (b) Make sure that the latch is in the closed position before you do the check.



Hinge Access Door Removal/Installation
Figure 401



1 PUSH THE TORQUE WRENCH SLOWLY AND CONTINUOUSLY IN THE DIRECTION OF THE ARROW TO RELEASE THE LATCH.

C3042

Rear Latch Access Panel – Latch Release Loads
Figure 401A

(c) Put the torque adapter on the torque wrench.
(d) Put the torque adaptor into the screwdriver slot in the external surface of the access panel.

NOTE: The torque on the torque adapter is at the same angle as the latch screwdriver slot. Make sure that you put the torque adapter in the latch screwdriver slot correctly.

(e) Slowly and continuously move the torque wrench until the latch opens.
(f) Write the torque value that is required to open the latch.
(g) Put the latch back in the closed position.
(h) Do the last three steps two more times.
(i) With the torque value that occurred the most times, calculate the load that is required to open the latch as follows:

1) The load required to open the latch (lbf) = $\frac{\text{(Torque Wrench Value)(L + 1.5)}}{0.53L}$

NOTE: The torque wrench value is in pound-inches (lb-in). The value L is the length of the torque wrench in inches.

(j) The limits for the loads that are required to open the latches are as follows:

NOTE: All the values for the latch loads are in pounds-force (lbf).

LATCH	MIN	MAX
Front and rear latches (H2884-11)(RR3408685)	75	105
Center latch (H2884-13)(RR3408686)	123	153

(k) Latches that require loads that are out of the limits specified must be replaced to FRS 6182 (AMM 78-31-20/801).

S 494-013-R00

(10) Install the Floating Beam GSE Pins to attach the Floating Beam to the strut bracket when the thrust reverser is removed.

S 034-014-R00

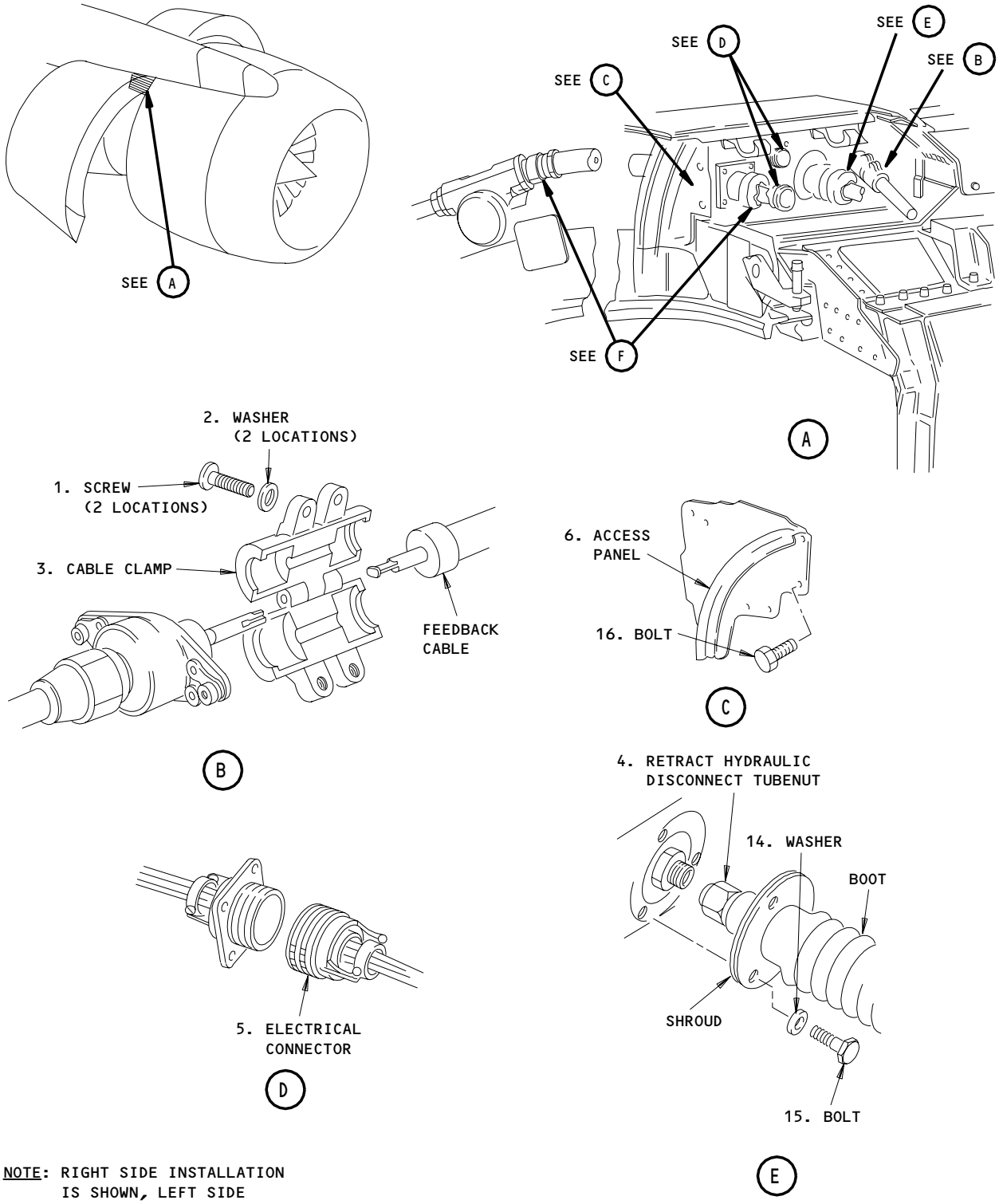
WARNING: THE HYDRAULIC FLUID CONTAINED IN THIS SYSTEM CAN CAUSE INJURY TO YOU. IT IS POISONOUS WHEN IT IS ABSORBED INTO THE SKIN AND WHEN IT PASSES THROUGH THE BODY. IN CASE THE FLUID TOUCHES THE EYE, FLUSH THE EYES WITH WATER AND GET MEDICAL HELP.

CAUTION: THE HYDRAULIC FLUID WILL CAUSE DAMAGE TO AIRCRAFT SURFACES WHERE THE HYDRAULIC FLUID DOES NOT USUALLY TOUCH. REMOVE ANY FLUID WHICH HAS LEAKED IMMEDIALTELY WITH A DRY CLOTH. WASH THE AREA TO REMOVE THE CONTAMINATION.

(11) Do these steps to disconnect the thrust reverser from all other systems (Fig. 402).
  (a) Remove the side access panel (6).
  (b) Remove the access panel of the hydraulic actuator (Fig. 403).

  CAUTION: MAKE SURE THE LOCKING PIN IS REMOVED FROM THE MANUAL BYPASS VALVE BEFORE YOU DRAIN THE HYDRAULIC SYSTEM OF THE THRUST REVERSER. IF THE LOCKING PIN IS NOT REMOVED, THE HYDRAULIC SYSTEM OF THE AIRPLANE WILL DRAIN.

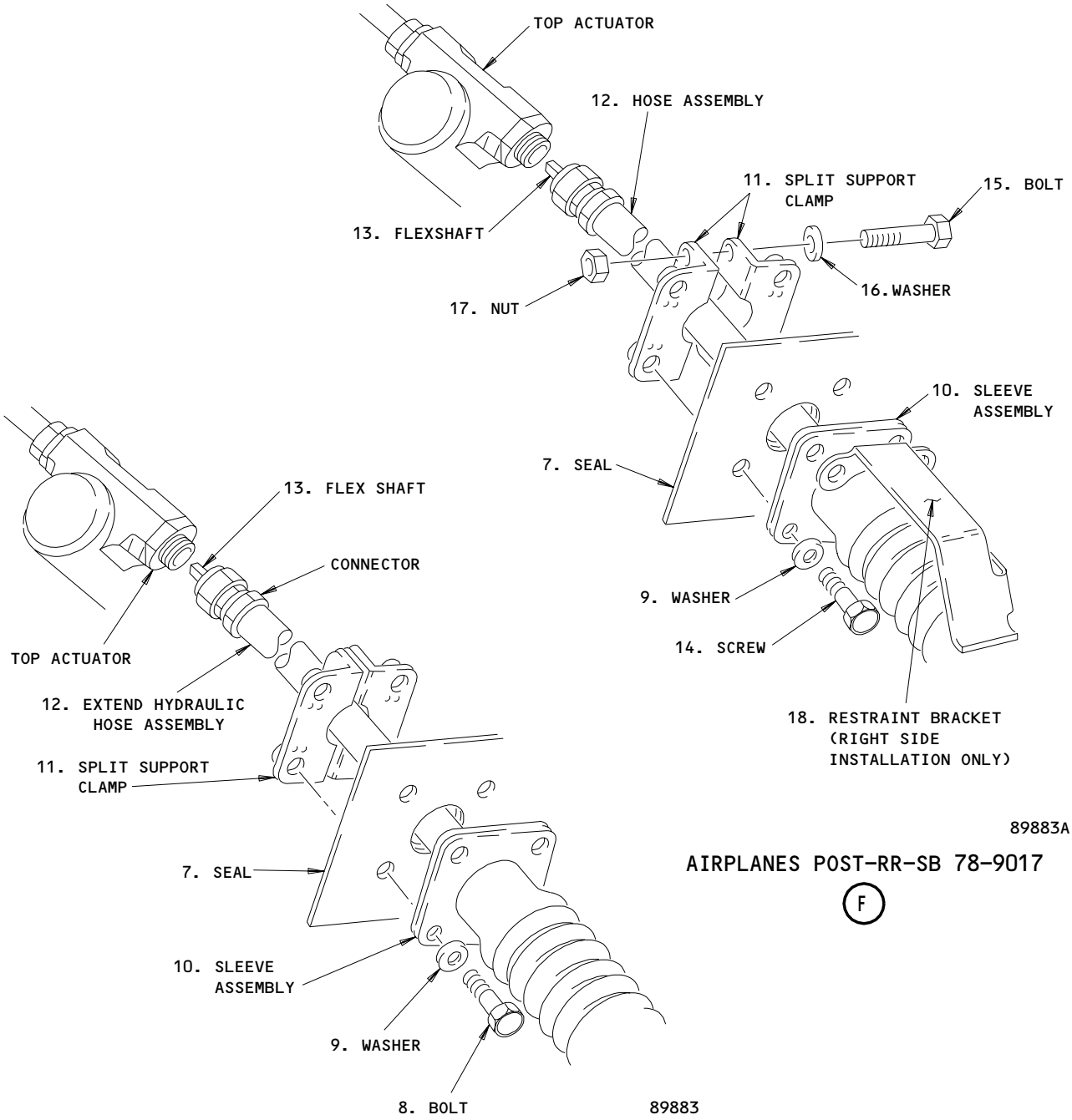
  (c) Remove the locking pin from the manual bypass valve on the isolation valve of the thrust reverser.
  (d) Remove the boot from the retract-hydraulic tube assembly.
  (e) Do these steps to disconnect the retract-hydraulic tube nut (4) from the bulkhead adaptor.
    1) When you remove the tube nut (4), use a spanner to make sure the bulkhead adapter does not rotate.
    2) Permit the hydraulic fluid which is in the tube to drain into a container (Fig. 402).
  (f) Remove the bolts (1) and washers (2) which attach the feedback cable bracket (3).
    1) Remove the feedback cable bracket (3).
  (g) Disconnect the feedback cable ends at the arrowhead connection. Attach the free end of the cable with a lanyard.
  (h) Do these steps to disconnect the extend hose assembly (12).
    1) Disconnect the extend hose assembly (12) from the top actuator.
    2) Permit the hydraulic fluid to drain.
    3) Remove the flex shaft (13) from the top actuator.



NOTE: RIGHT SIDE INSTALLATION IS SHOWN, LEFT SIDE INSTALLATION IS OPPOSITE.

89883

Thrust Reverser Accessories Disconnect Points
Figure 402 (Sheet 1)



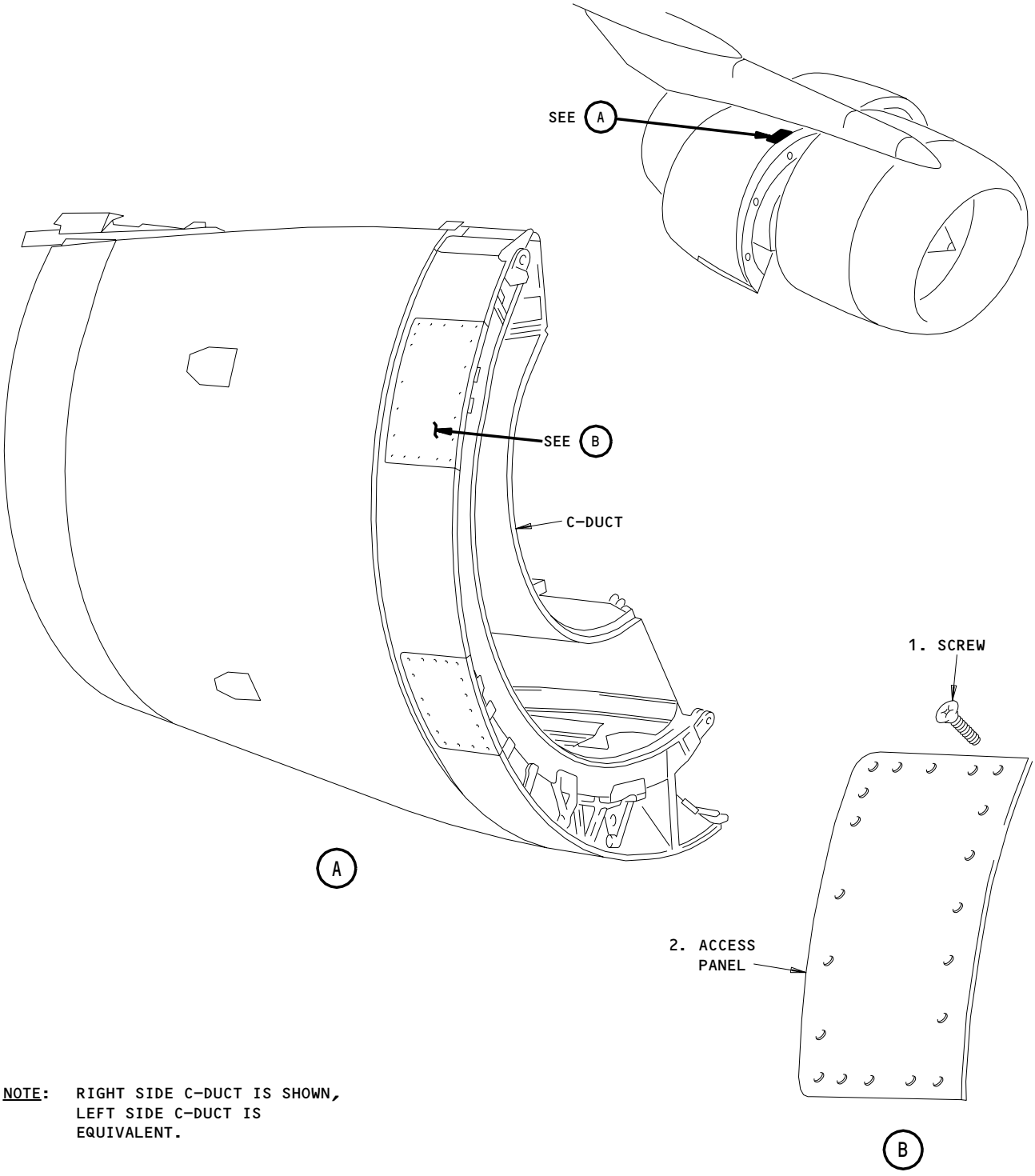
AIRPLANES POST-RR-SB 78-9017

(F)

AIRPLANES PRE-RR-SB 78-9017

(F)

Thrust Reverser Accessories Disconnect Points
Figure 402 (Sheet 2)



NOTE: RIGHT SIDE C-DUCT IS SHOWN, LEFT SIDE C-DUCT IS EQUIVALENT.

Upper Actuator Acccess Panel
Figure 403

(i) ENGINES PRE-RR SB 78-9017;
Remove the bolts (8) and washers (9) which holds the sleeve assembly (10) and the split support clamp (11).
1) Remove the sleeve assembly (10) and the clamp (11) from the firewall.

(j) ENGINES POST-RR SB 78-9017;
Remove the bolts (14) and the washers (9) which holds the sleeve assembly (10), the restraint bracket, and the split support clamp (11).
1) Remove the split support clamp from the firewall.
2) Remove the bolts (15), the washers (16) and the nuts (17) which holds the split support clamp (11).
a) Keep the clamp so that it can be installed again.

(k) Remove the flex shaft (13) from the hose assembly (12).
1) Put the flex shaft in a clean location.

(l) Disconnect the electrical connectors (5).

(m) Put dust caps on all the open hoses and connectors.

S 414-015-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(12) Close, but do not latch, the thrust reverser (AMM 78-31-00/201).

S 494-017-R00

(13) Install the Hold Open Device (Fig. 404).

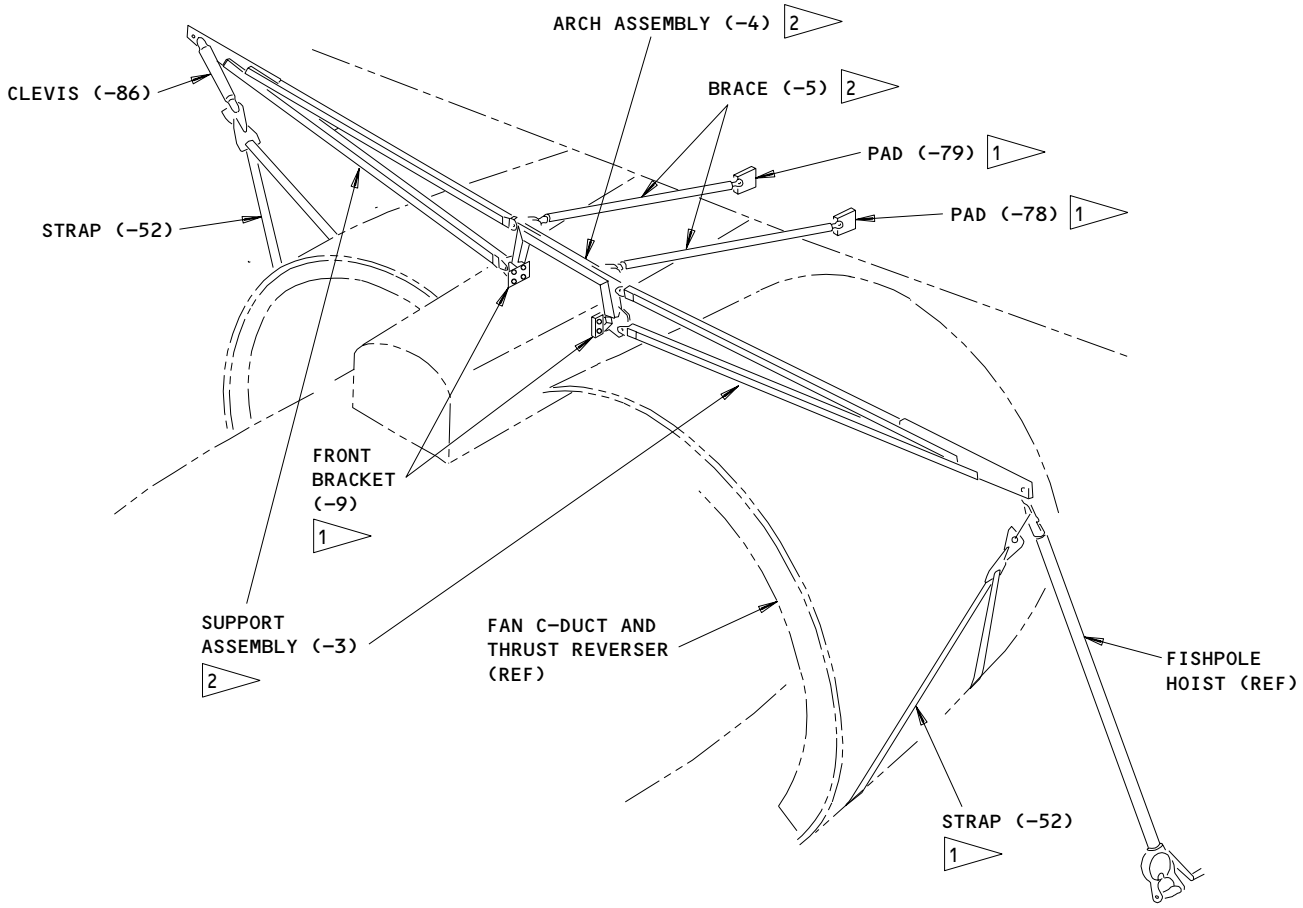
(a) Attach the front bracket (-9) to the mid bootstrap support on the two sides of strut.
1) Use the attach bolts which are kept with the assembly.

(b) Attach the pad (-77, -78) to the rear bootstrap support on the right and left sides of the strut.
1) Use the bolt and washer which are kept on the assembly.

(c) Attach the arch (-4) to the front brackets.
1) Use the lower ball lock pins which are kept with the arch.

(d) Attach the brace (-5) to the arch assembly and the pad on the two sides of the strut.
1) Use the ball lock pins which are kept on the brace and the arch.

(e) Attach the support (-3) to the arch on the side of the strut from which the thrust reverser is removed.
1) Use the ball lock pins which are kept with the support.



1 ATTACH BOLTS STOWED ON ASSEMBLY

2 BALL LOCK PINS STOWED WITH ASSEMBLY

Fan C-Duct Hold Open Device Installation
Figure 404

S 014-018-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(14) Open the thrust reverser (AMM 78-31-00/201).
  (a) Examine the hydraulic opening actuator lanyard.
  (b) If the lanyard is broken, temporarily hold the actuator to the upper bifurcation when you remove the thrust reverser.

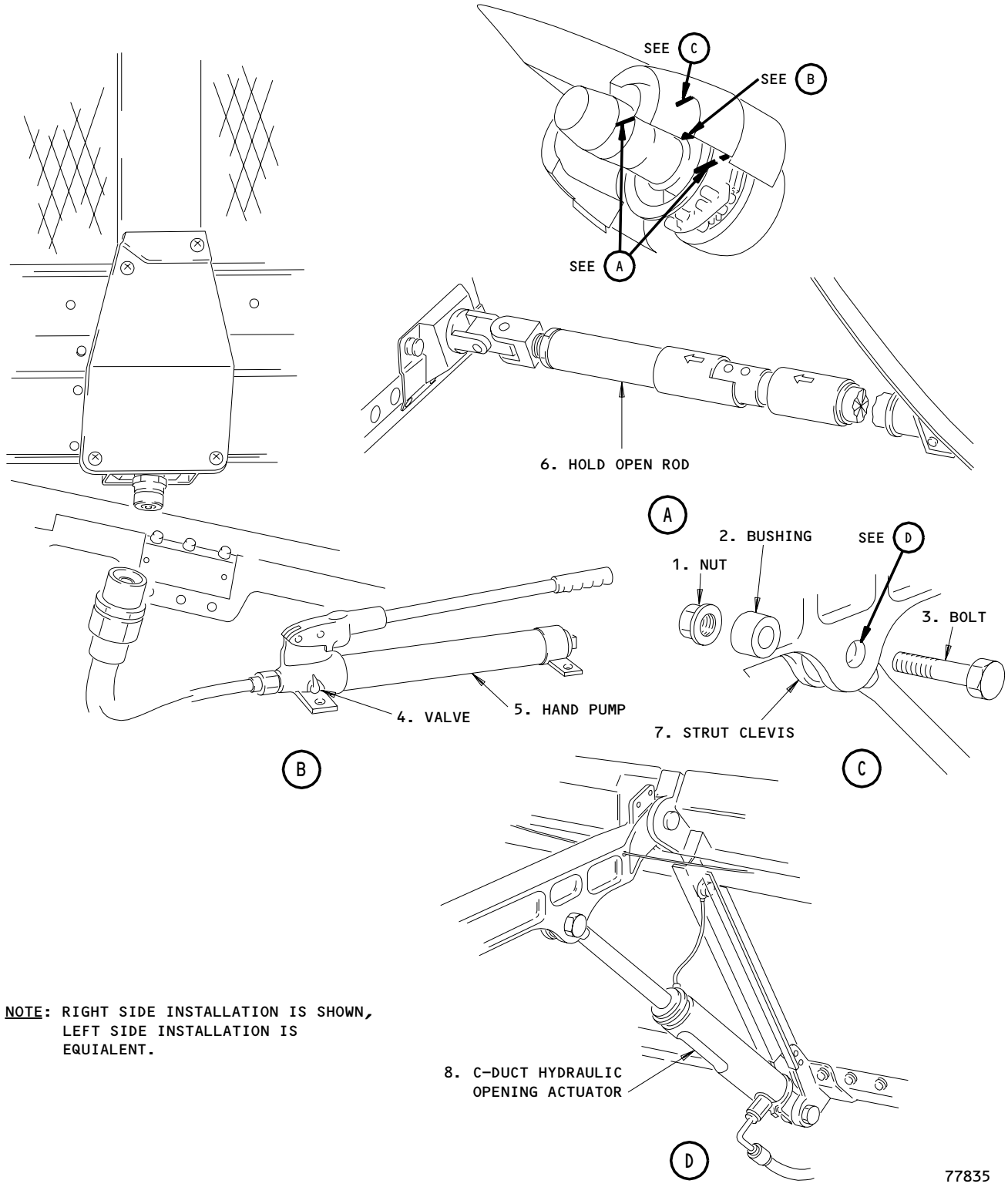
NOTE: Broken lanyards should be repaired to FRS6199/1 and FRS6200/1 after the thrust reverser is removed (AMM 78-31-25/801).

WARNING: WHEN THE OPENING ACTUATOR OF THE THRUST REVERSER IS REMOVED, MAKE SURE THAT THE RESTRAINING CABLE ASSEMBLY IS NOT BROKEN. IF THE RESTRAINING LANYARD IS BROKEN, THE ACTUATOR COULD FALL. THIS COULD RESULT IN INJURY TO PERSONS.

  (c) Remove the bolt (3, Fig. 405) to disconnect the hydraulic opening actuator.
  (d) Move the actuator arm to the closed position. Keep the actuator.

S 494-019-R00
(15) Attach the fishpole hoist to the support assembly (Fig. 404).

S 494-020-R00
(16) Attach the strap (-52) to the fishpole hoist and the bottom of the thrust reverser at two locations.
  (a) Use the four bolts which are kept with the strap attach fittings.



NOTE: RIGHT SIDE INSTALLATION IS SHOWN, LEFT SIDE INSTALLATION IS EQUIALENT.

Fan C-Duct Hydraulic Opening Actuator Disconnect Points
Figure 405

S 824-021-R00

WARNING: DO A TEST OF THE HOLD OPEN EQUIPMENT. MAKE SURE THE HOLD OPEN EQUIPMENT CAN SUPPORT THE THRUST REVERSER BEFORE YOU REMOVE THE HOLD OPEN RODS. IF YOU DO NOT DO A TEST OF THE HOLD OPEN EQUIPMENT, THE THRUST REVERSER COULD CLOSE SUDDENLY. THIS COULD CAUSE INJURY TO YOU AND DAMAGE TO EQUIPMENT.

(17) Use the fishpole hoist to lift the thrust reverser with an upward force equal to the weight of the thrust reverser (6, Fig. 405).

S 824-022-R00

(18) Use the fishpole hoist to close the thrust reverser.

S 094-023-R00

(19) Remove the strap (-52) from the bottom of the thrust reverser and from the fishpole hoist.

S 094-024-R00

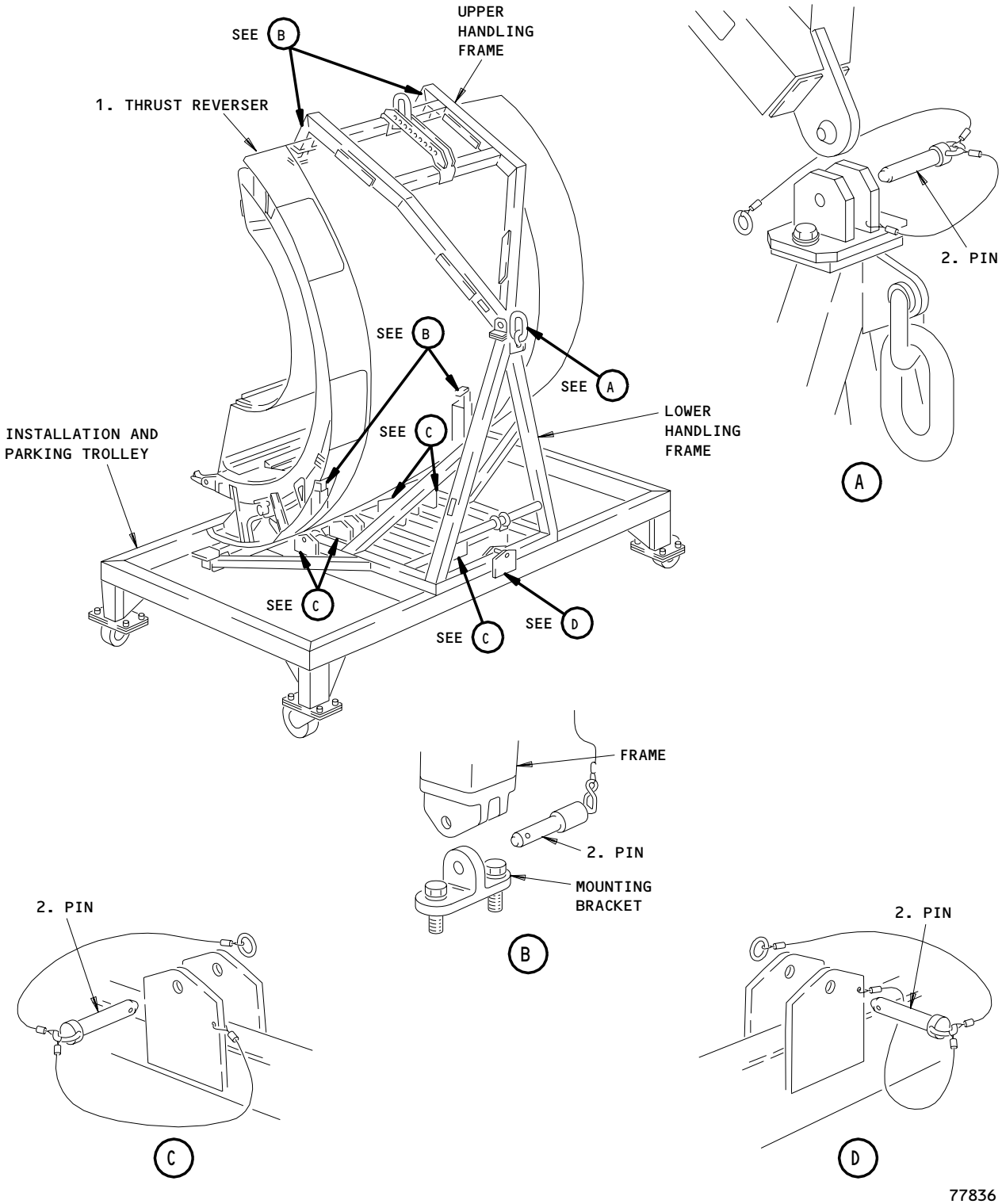
(20) Remove the fishpole hoist from the support assembly.

S 094-025-R00

(21) Remove the support assembly (-3) from the arch.

S 494-026-R00

(22) Do the steps to install the handling equipment of the thrust reverser.
  (a) Install the Rolls-Royce handling equipment (Fig. 406), if available.
    1) Attach the support brackets of the handling frame to the top structure of the thrust reverser.
      a) Use the bolts which are kept on the brackets.
    2) Attach the support brackets to the bottom of the thrust reverser.
    3) Put the handling frame and the trolley below the thrust reverser.



Thrust Reverser Handling Equipment (Rolls-Royce) Installation
Figure 406

4) Do these steps to attach the hoist to the thrust reverser.

NOTE: When the inboard thrust reverser is removed or installed, attach a belt sling to the installation frame. This is necessary so that the leading edge of the wing is not damaged. Attach the belt sling to the hole which is found on the handling frame. Make sure there is a 10° angle between the thrust reverser and the engine.

a) Attach the hoist to the handling frame.
b) Lift the handling frame with a force equal to its weight.
c) Release the clamp which holds the frame to the trolley.
d) Carefully lift the frame into position on the thrust reverser.

5) Attach the installation frame to the support brackets with pins.

(b) Install the Boeing handling equipment, B71042 (Fig. 407, 408), if available.

1) Assemble the handling frame.
a) Install the -228 C-post attach assy and the -230 fwd post attach assy in the correct location on the frame assembly.

2) Attach the hoist frame and the ballast or hanger to the thrust reverser frame.

NOTE: The ballast is used for above-the-wing removal, and the hanger is used for the below-the-wing removal.

3) Attach the support brackets to the top and bottom of the thrust reverser structure.

4) Use the hoist transporter, B71016 if available,
a) Attach the hoist transporter to the handling frame.
1. Use the hoist transporter to lift the handling frame with a force equal to the weight of the handling frame.
b) Use the hoist transporter to carefully lift the handling frame into position.
c) Attach the handling frame to the support brackets with ball lock pins.
d) Use the hoist to apply a force equal to the weight of the frame and the thrust reverser.

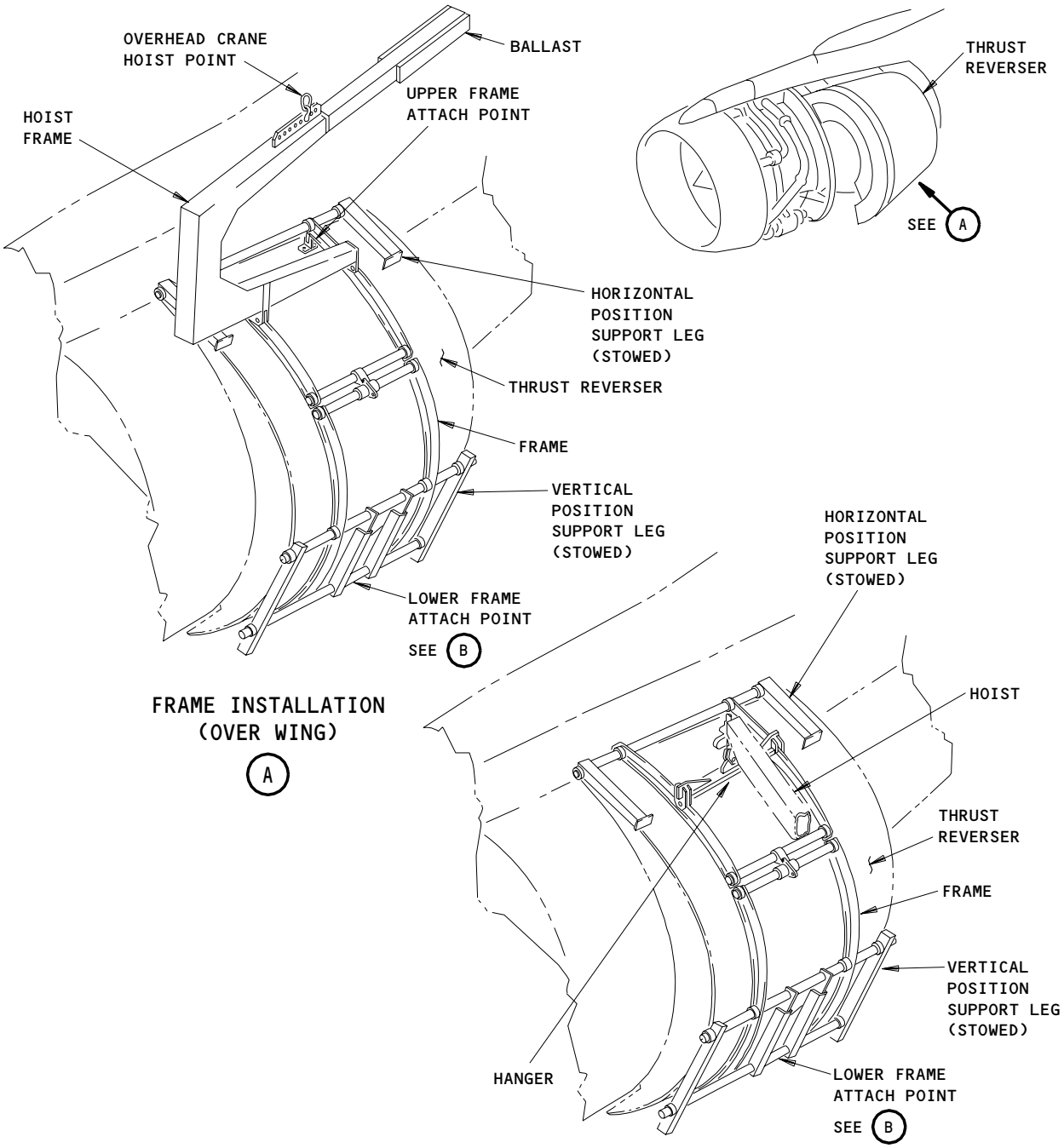
5) Use the hoist equipment, B71029, and overhead hoist if available.

NOTE: The hoist equipment B71029 allows for greater rotation of the thrust reverser during the removal, installation, and storage. Shorten the applicable chain to rotate the reverser.

a) Attach the hoist equipment, B71029 to the overhead hoist.
b) Attach the hoist equipment, B71029 to the handling frame.
c) Use the hoist to carefully lift the handling frame into position.
d) Attach the handling frame to the support brackets with ball lock pins.
e) Use the hoist to apply a force equal to the weight of the frame and the thrust reverser.

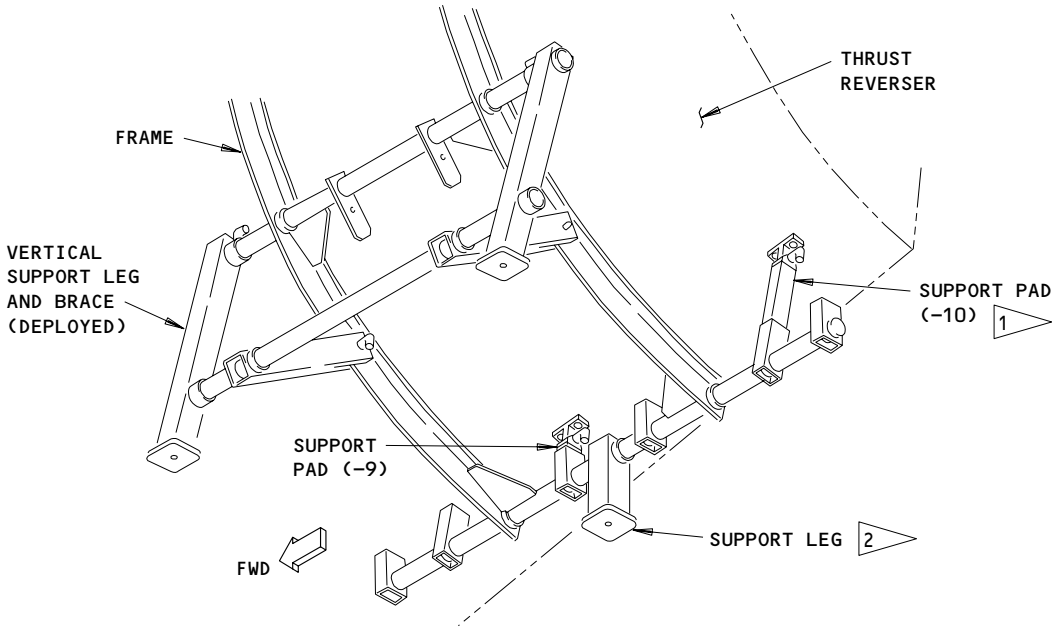
(c) Install the Boeing handling equipment, B71014 (Fig. 407, 408), if available.

1) Assemble the handling frame.
a) Install the support (-9) and (-10) on the applicable thrust reverser.
2) Attach the hoist frame and the ballast or hanger to the thrust reverser frame.
a) The ballast is used for above-the-wing removal, and the hanger is used for the below-the-wing removal.
3) Attach the support brackets to the top and bottom of the thrust reverser structure.
4) Use the hoist transporter, B71016 if available,
a) Attach the hoist transporter to the handling frame.
b) Use the hoist transporter to lift the handling frame with a force equal to the weight of the handling frame.
c) Use the hoist transporter to carefully lift the thrust reverser frame into position.
d) Attach the hoist transporter to the support brackets with ball lock pins.
e) Use the hoist to apply a force equal to the weight of the frame and the thrust reverser.



BOEING HANDLING EQUIPMENT, B71014

Thrust Reverser Frame Installation
Figure 407 (Sheet 1)

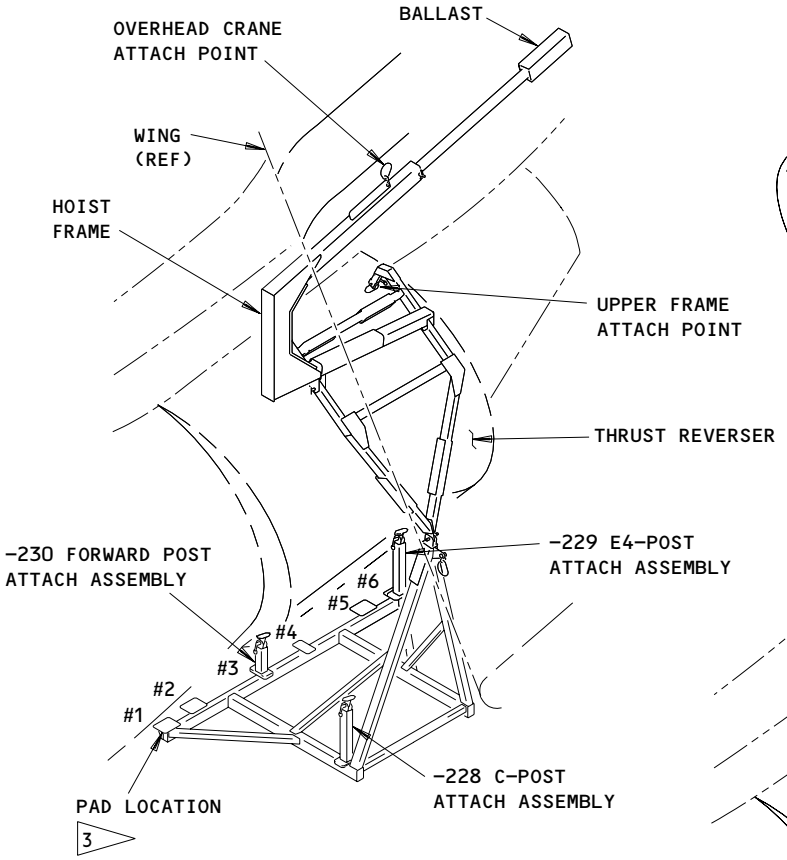


INSTALLATION FOR LEFT SIDE THRUST REVERSER
(RIGHT SIDE IS OPPOSITE)
B

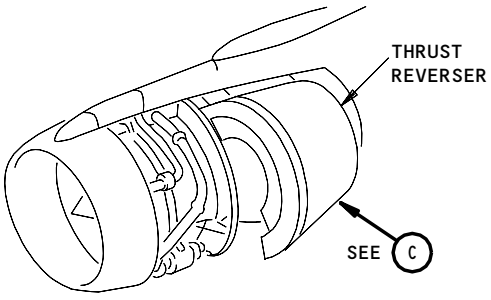
1 INSTALL SUPPORT PAD (-10)
2 SUPPORT LEG ADJUSTS FOR HORIZONTAL OR VERTICAL FRAME ORIENTATION

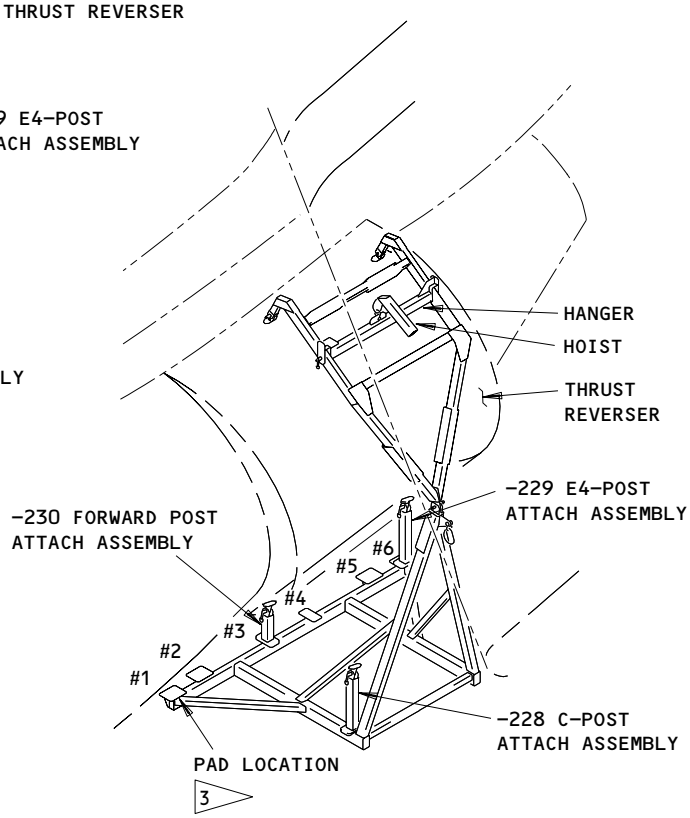
BOEING HANDLING EQUIPMENT, B71014

Thrust Reverser Frame Installation
Figure 407 (Sheet 2)



FRAME INSTALLATION
(OVER WING)
C





FRAME INSTALLATION
(UNDER WING)
C

3 LS − FOR LEFT SIDE APPLICATION
RS − FOR RIGHT SIDE APPLICATION

	PAD LOCATION					
	#1	#2	#3	#4	#5	#6
−230 FORWARD POST ATTACH ASSEMBY			LS	RS		
−229 E4−POST ATTACH ASSEBLY	RS					LS

BOEING HANDLING EQUIPMENT, B71042

Thrust Reverser Frame Installation
Figure 407 (Sheet 3)

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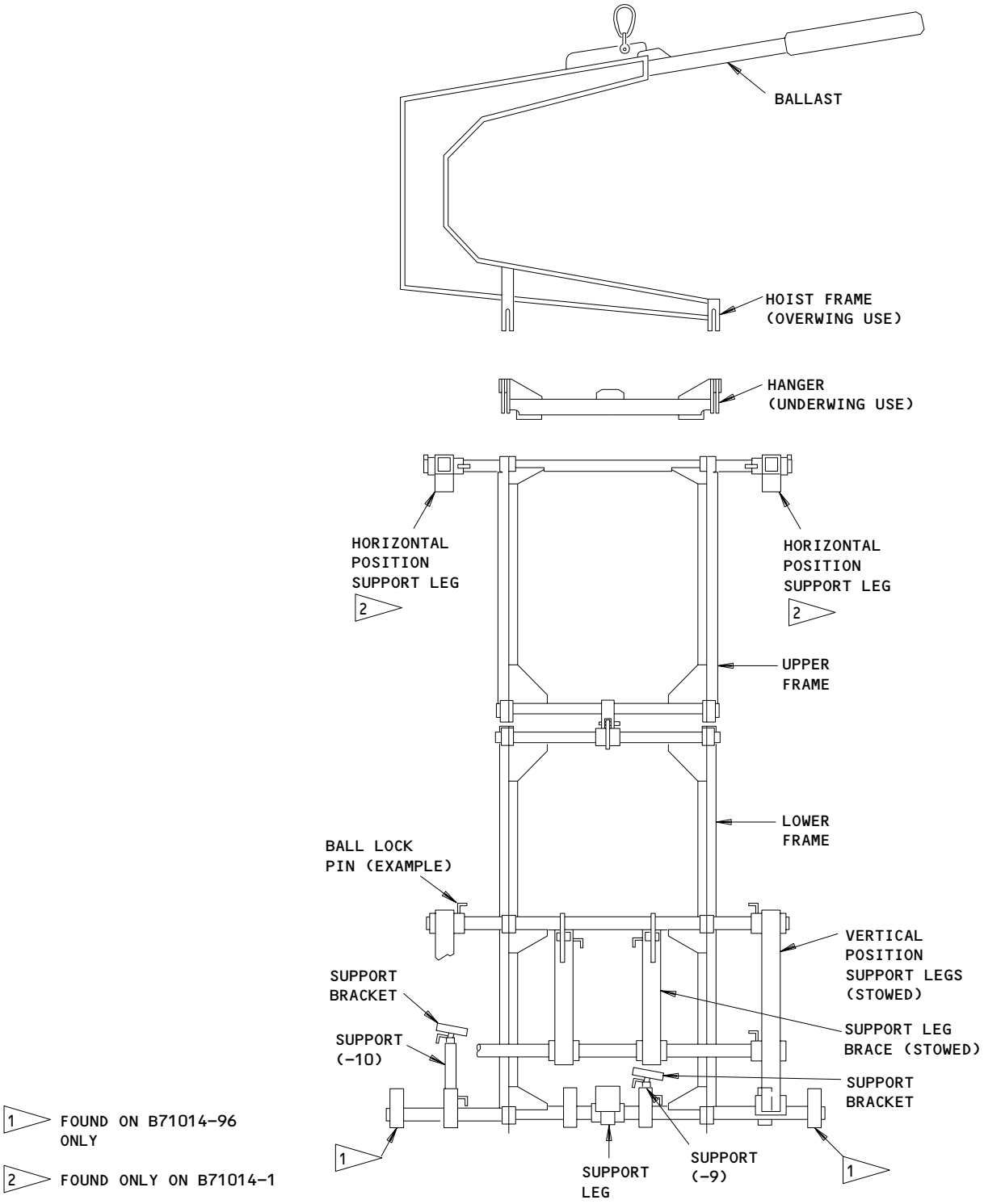
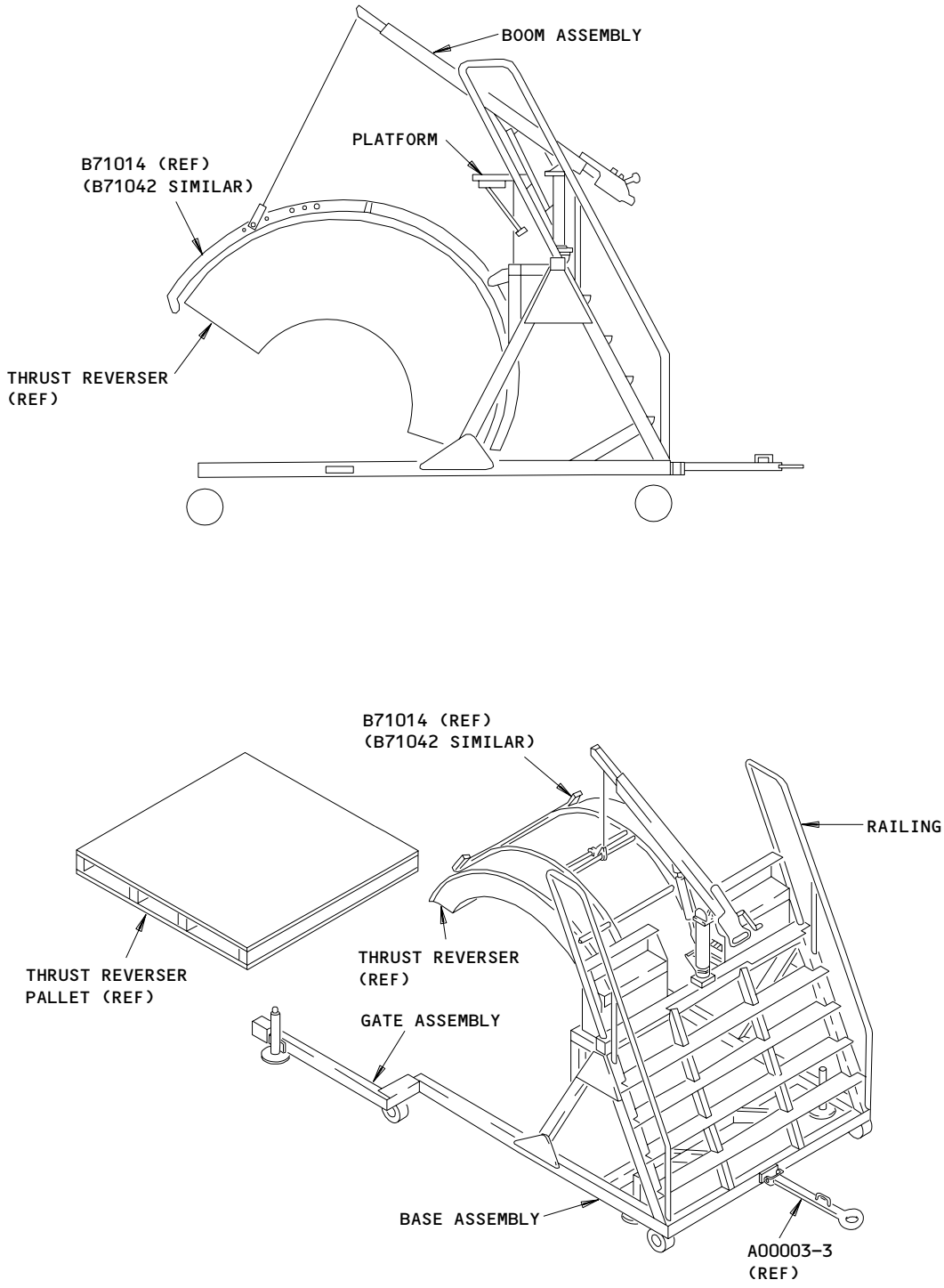


BOEING HANDLING EQUIPMENT, B71014

Thrust Reverser Overwing and Underwing Handling Equipment
Figure 408 (Sheet 1)



BOEING HANDLING EQUIPMENT, B71014 AND B71042

Thrust Reverser Overwing and Underwing Handling Equipment
Figure 408 (Sheet 2)

5) Use the hoist equipment, B71029, and overhead hoist if available.

NOTE: The hoist equipment B71029 allows for greater rotation of the thrust reverser during the removal, installation, and storage. Shorten the applicable chain to rotate the reverser.

a) Attach the hoist equipment, B71029 to the overhead hoist.
b) Attach the hoist equipment, B71029 to the handling frame.
c) Use the hoist to carefully lift the handling frame into position.
d) Attach the handling frame to the support brackets with ball lock pins.
e) Use the hoist to apply a force equal to the weight of the frame and the thrust reverser.

S 024-027-R00

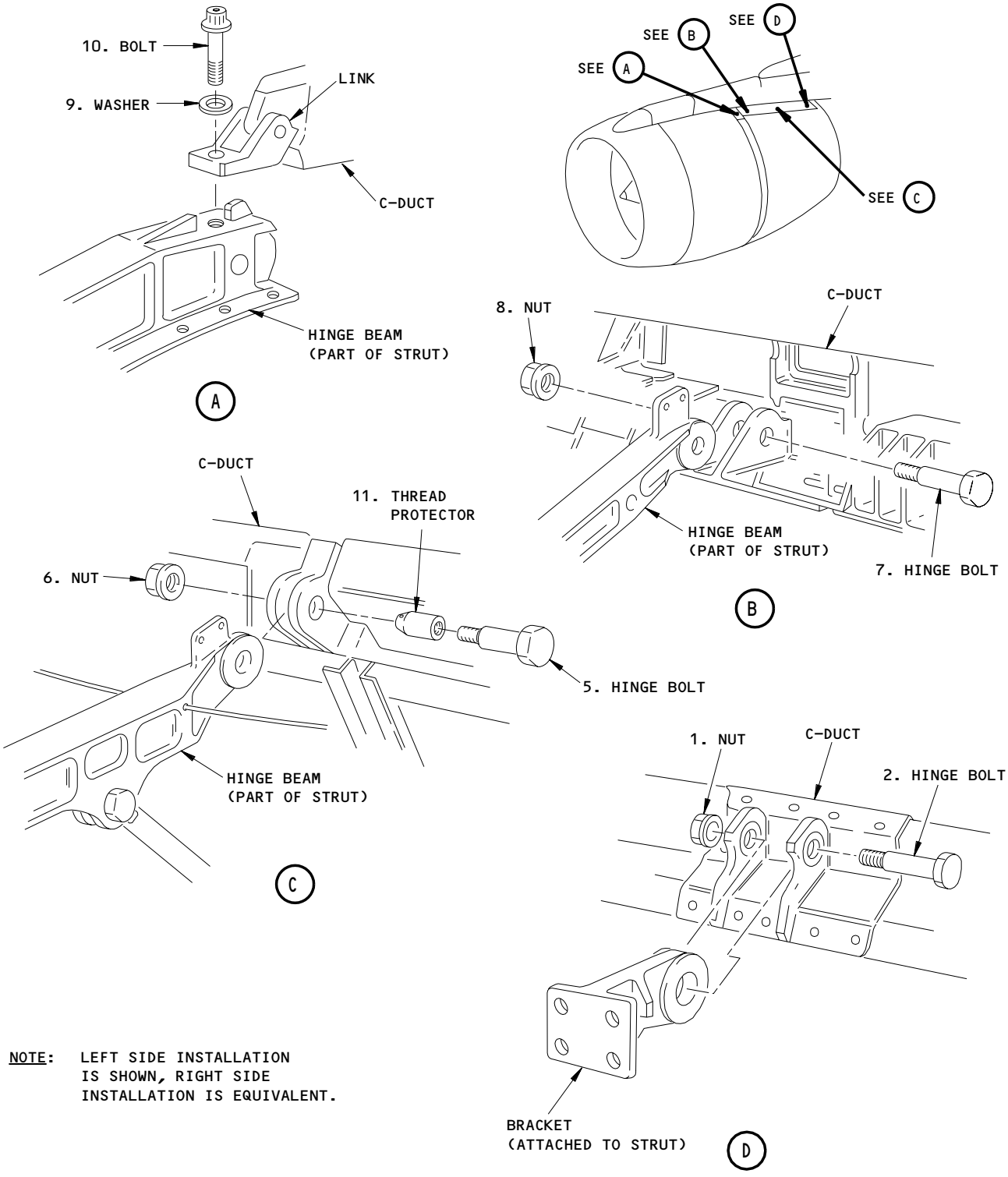
(23) Remove the thrust reverser.

WARNING: DO NOT STAND UNDER OR NEAR THE THRUST REVERSER WHEN THE THRUST REVERSER IS LIFTED. PERSONS COULD BE INJURED IF THE THRUST REVERSER FALLS OR MOVES LATERALLY.

CAUTION: CONTROL THE MOVEMENT OF THE THRUST REVERSER WITH TAG LINES. MOVE THE THRUST REVERSER CAREFULLY TO MAKE SURE THE THRUST REVERSER DOES NOT HIT THE STRUT, THE ENGINE, OR THE GROUND EQUIPMENT.

(a) Remove the nuts and the washers from the hinge bolts (4, 5 and 7).
(b) Install the thread protectors (11) on the bolts.
(c) Remove the hinge bolts (4, 5 and 7, Fig. 409).
(d) Remove the radial attach bolt (10) and washer (9).
(e) Carefully remove the thrust reverser horizontally away from the nacelle, the clearing hinge fittings and the feeding hose assembly (12, Fig. 402).
(f) Lower and attach the thrust reverser to the pallet.
(g) Remove the lifting equipment (Fig. 408).

NOTE: Do a visual (zonal) inspection after you remove the thrust reverser.



NOTE: LEFT SIDE INSTALLATION IS SHOWN, RIGHT SIDE INSTALLATION IS EQUIVALENT.

Fan C-Duct Hinge Details
Figure 409

TASK 78-31-20-424-028-R00

3. Install the Thrust Reverser

A. Equipment

(1) C-Duct Installation and Trolley, Rolls-Royce CP 30523

(2) C-Duct Handling Frame, Rolls-Royce CP30522/2 (Alternate to B71042-154)

(3) C-Duct Handling Frame Equipment, B71042-154

(4) C-Duct Handling Frame Equipment, B71014-132 (Alternate to B71042-154)

(a) Frame Assembly, Hoist - B71014-134 (Part of B71014-132)

(b) Frame Assembly, C-duct - B71014-99 (Part of B71014-132)

(c) Frame Assembly, Hoist - B71014-6 (Part of B71014-132)

(5) Hoist Transporter, B71016-1

(6) B71029, Hoist Equipment

(7) Fan C-Duct Hold Open Device B71006-79

(a) Bracket Assembly, B71006-9

(b) Pad Assembly, B71006-77, -78

(c) Arch Assembly, B71006-4

(d) Brace Assembly, B71006-5

(e) Support Assembly, B71006-3

(f) Strap Assembly, B71006-52

(8) Removal/Installation Tool Set - B78002-36

(9) Rig Pin Set B20003-XX (AMM 20-10-24/201)

(a) Rig Pin RR-2 - B20003-29

(10) Floating Beam GSE Pins, B71005-10 (Part of B78002-36)

(11) Fishpole Hoist (2 Preferred) - Supplied by P.F. Industries, 9320 15th Ave. So., Seattle, WA 98108

(12) Tool, measuring, Latch Closing Force, Rolls-Royce HU21850

(13) Belt Sling, Rolls Royce CP27118

B. Consumable Materials

(1) D00013 Lubricant
British Spec - DTD 5598
American Spec - MIL-PRF-23827 (Supersedes MIL-G-23827)
OMat No. - 401C

(2) Silicone compound, cold curing
British Spec - RTV106
OMat No. - 872A

(3) Lint-free Cloth
(4) Petroleum jelly
(5) Release Agent
OMat No. - 8/32
(6) DOO046 Grease, Silicone
British Spec - DEF. STAN 59-10/2, DC.4 (M54)
American Spec - MIL-S-8660B
OMat No. - 418
(7) Retaining Compound
American Spec - MIL-R-46086, 18-30 N/sq mm

C. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
402	1	Screw	78-34-03	01	45
	2	Washer			50
	3	Cable Clamp Assy - Feedback Cable			40
	7	Bracket	78-31-01	01	
	8	Screw			155
	9	Washer			160
	10	Sleeve Assembly			198
	11	Support Clamp			175
	12	Hose Assembly			185,190
	13	Flex Shaft			195
	14	Screw			
	15	Screw			
	16	Washer			
	17	Nut			
405	1	Nut			290
	2	Bushing			295
	3	Bolt			285
406	1	C-Duct and Thrust Reverser			305,310
409	1	Nut	78-31-01	01	270
	2	Washer			268
	3	Sleeve			272
	4	Hinge Bolt			265
	5	Hinge Bolt			275
	6	Nut			280
	7	Hinge Bolt			275
	8	Nut			280
	9	Washer			245
	10	Bolt			240
410	1	Cotter Pin	78-34-03	01	65
	2	Nut			80
	3	Washer			75
	4	Bolt			70

D. References
(1) AMM 54-53-01/401, Strut Access Doors and Panels
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 70-51-00/201, Torque Tightening Technique
(4) AMM 78-31-00/201, Thrust Reverser System
(5) AMM 78-31-10/401, Thrust Reverser Hinge Access Doors
(6) AMM 78-31-25/801, Thrust Reverser Hydraulic Opening Actuators
(7) AMM 78-30-00/501, Thrust Reverser Adjustment

E. Access
(1) Location Zones

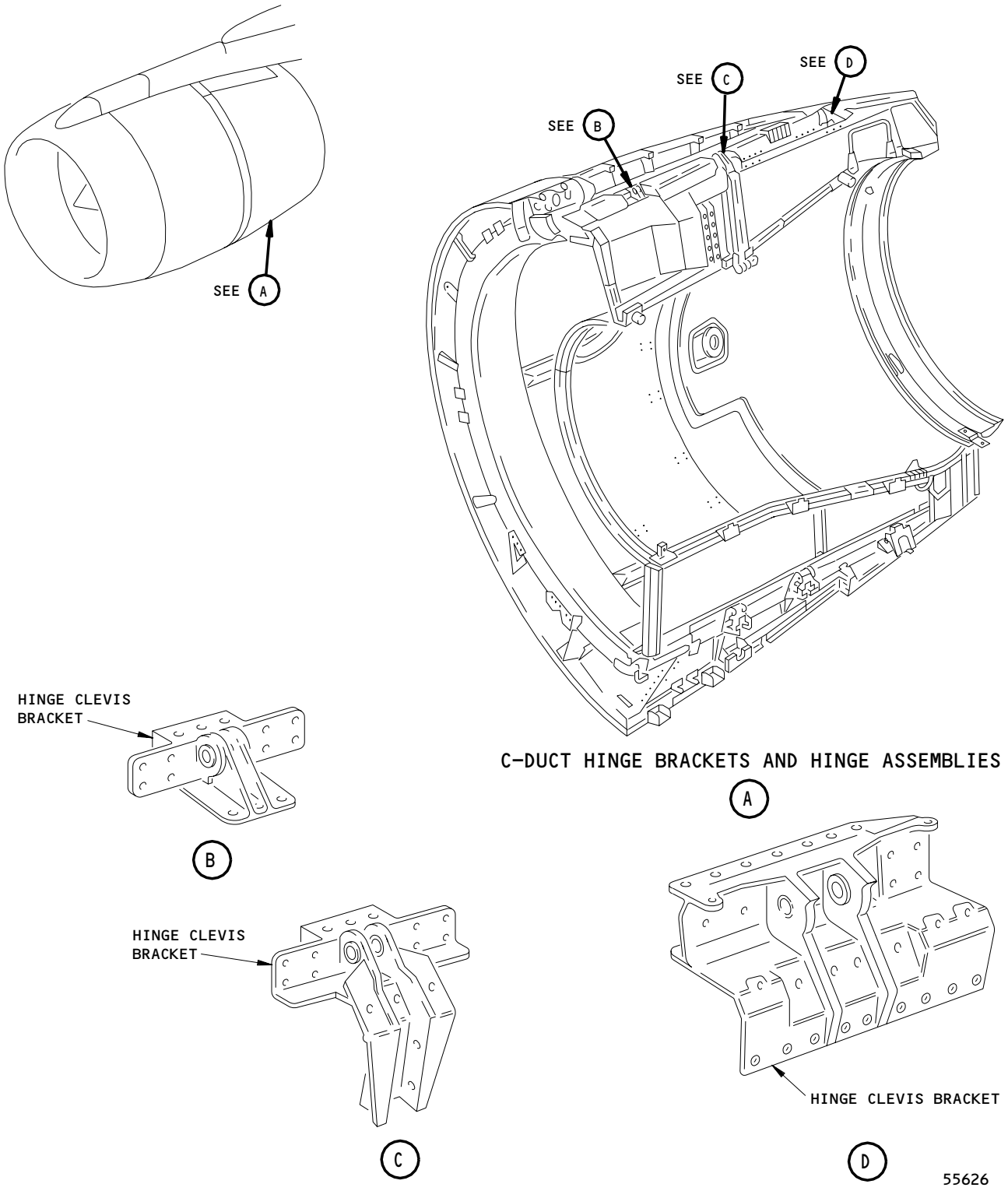
210	Control Cabin
415/425	Thrust Reverser Left
416/426	Thrust Reverser Right
433/443	Nacelle strut - mid-structure

(2) Access Panels

415BL/416BR	Thrust Reverser Hydraulic and C-Duct Hinge
425BL/426BR	Thrust Reverser Hydraulic and C-Duct Hinge
425FL/425KL	Thrust Reverser Access Panels
415FL/415KL	Thrust Reverser Access Panels
433GR/443GL	Thrust Reverser Access and Pressure Relief Door
433GR/443GL	Thrust Reverser Access and Pressure Relief Door

F. Prepare for the procedure.

S 214-030-R00
(1) Examine the C-duct hinge clevis bracket and the hinge assembly for the C-duct that you will install (Fig. 409 and 409A):
(a) Replace the hinge bracket if you see a crack.
(b) Replace the hinge if you see wear in the lugbore.
(c) Replace the hinge if the hinge bushing is loose.
(d) Examine the hinge bushing for wear on its outer diameter.
1) Repair the damage that you find (AMM 78-31-20/801; FRS6218 or FRS6219).
(e) Examine the bore of the hinge bushing, accept the wear that you find if it is in these limits:
1) The bore of the front hinge bushing must have a diameter that is less than 0.458 inch (11.63 mm).
2) The bore of the center hinge bushing must have a diameter that is less than 0.458 inch (11.63 mm).
3) The bore of the rear hinge bushing must have a diameter that is less than 0.770 inch (19.55 mm).
4) Repair the damage to the front and center hinge that is not in the limits (AMM 78-31-20/801; FRS6209).
(f) Repair the damage to the rear hinge that is not in the limits (AMM 78-31-20/801; FRS6218 or FRS6219).



C-DUCT HINGE BRACKETS AND HINGE ASSEMBLIES

Fan C-Duct Hinge Inspection
Figure 409A

G. Install the Thrust Reverser.

S 014-032-R00
(1) Remove the screws (1) and remove the actuator access panel (2) (Fig. 403).

S 014-033-R00
(2) If installed, remove the side access panel (6, Fig. 402).

S 214-034-R00
(3) Make sure the hinges of the hinge access door are attached in the vertical position (Fig. 401).

S 214-035-R00
(4) Make sure the opening actuator is retracted.

S 644-036-R00
(5) Apply the silicone grease to all the open closing seals, the engine mating faces and the V-groove system.

S 034-037-R00
(6) Release the lower feedback cable rod end (5) from the feedback actuator lever (6) (Fig. 410).

NOTE: Do a check of the bolt which attaches the feedback rod end bolt. If it is attached with the bolt head rearward, it will be necessary to manually retract the thrust reverser (Ref 78-31-00). Retract the thrust reverser approximately 4.0 inches (101.6 mm) so that the bolt can be removed.

S 494-038-R00
(7) Install the Rolls Royce handling equipment (Fig. 406), if available.

CAUTION: WHEN THE INDOARD THRUST REVERSER IS REMOVED, A BELT SLING MUST BE ATTACHED TO THE INSTALLATION FRAME. IF THE BELT SLING IS NOT INSTALLED, DAMAGE TO THE LEADING EDGE OF THE WING MAY OCCUR.

(a) Put the thrust reverser next to the engine.
(b) Attach the hoist to the installation frame.
(c) Use the hoist to lift the frame and the thrust reverser with a force equal to its weigh.
(d) Remove the clamps and the adjuster.

S 494-039-R00

(8) Install the Boeing handling equipment, B71042 (Fig. 407, 408), if available.

(a) Assemble the handling frame.

1) Install the -228 C-post attach assy and the -230 fwd post attach assy in the correct location on the frame assembly.

(b) Attach the hoist frame and the ballast or hanger to the thrust reverser frame.

NOTE: The ballast is used for above-the-wing removal, and the hanger is used for the below-the-wing removal.

(c) Attach the support brackets to the top and bottom of the thrust reverser structure.

(d) Use the hoist transporter, B71016 if available,

1) Attach the hoist transporter to the handling frame.

a) Use the hoist transporter to lift the handling frame with a force equal to the weight of the handling frame.

2) Use the hoist transporter to carefully lift the handling frame into position.

3) Attach the hoist transporter to the support brackets with ball lock pins.

4) Use the hoist to apply a force equal to the weight of the frame and the thrust reverser.

(e) Use the hoist equipment, B71029, and overhead hoist if available.

NOTE: The hoist equipment B71029 allows for greater rotation of the thrust reverser during the removal, installation, and storage. Shorten the applicable chain to rotate the reverser.

1) Attach the hoist equipment, B71029 to the overhead hoist.

2) Attach the hoist equipment, B71029 to the handling frame.

3) Use the hoist to carefully lift the handling frame into position.

4) Attach the handling frame to the support brackets with ball lock pins.

5) Use the hoist to apply a force equal to the weight of the frame and the thrust reverser.

S 494-040-R00

(9) Install the Boeing handling equipment, B71014 (Fig. 407, 408), if available.

(a) Attach the support brackets to thrust reverser structure.

(b) Lift the handling frame into position on the thrust reverser and attach the ball lock pins to the support brackets.
(c) Use the hoist to lift the frame and the thrust reverser with a force equal to the weight of the frame and the thrust reverser.

S 424-041-R00

(10) Install the thrust reverser (Fig. 409).

WARNING: MAKE SURE ALL THE WEIGHT OF THE THRUST REVERSER IS HELD BY THE HOLD OPEN DEVICE. DO NOT STAND BETWEEN THE THRUST REVERSER AND THE ENGINE. THE THRUST REVERSER COULD CLOSE SUDDENLY AND INJURE PERSONS.

CAUTION: MAKE SURE TO CHECK THE RUN-ON TORQUE OF THE THRUST REVERSER HINGE BOLTS. MAKE SURE THE NUT IS TORQUED PROPERLY TO KEEP THE BOLT AND/OR BUSHING FROM BECOMING LOOSE AND MIGRATING.

(a) Use the hoist to carefully lift the thrust reverser into position.
(b) Align the thrust reverser at all hinge positions.
(c) Install the thread protectors (11) on the aft (location D) and center (location C) hinge bolts (4) and (5).

NOTE: Thread protectors are included in the (P/N B78002) tool set. They are referred to as nose-lead in parts in the (P/N B78002) tool set.

(d) Apply a thin layer of lubricant to the hinge bolts (4, 5 and 7).
(e) Install the hinge bolt (4) first with the bushing (3) and washer (2), then install the hinge bolts (5 and 7).
(f) Make sure the flanged bushing is installed on the aft hinge bracket.
(g) Remove the thread protectors (11) from the center (location C) and aft (location D) hinge bolts (5) and (4).
(h) Install the washer (2) and the nut (1) to the aft hinge bolt (4).
    1) Check to make sure that the run-on torque for the nut is not less than 14 pound-inches.
    2) Tighten the nut on the aft hinge bolt to 250-350 pound-inches.
(i) Install the nuts (6 and 8) on the center and forward hinge bolts (5 and 7).
    1) Check to make sure the run-on torque for the nut is not less than 9.5 pound-inches.

2) Tighten the nuts on the center and forward hinge bolts to 160-240 pound-inches.

CAUTION: YOU MUST MAKE SURE THE LINK IS CORRECTLY POSITIONED BEFORE AND DURING INSTALLATION OF THE THRUST REVERSER. IF THE LINK IS NOT CORRECTLY POSITIONED, DAMAGE TO THE C-DUCT AND THRUST REVERSER CAN OCCUR.

(j) Install the radial attach bolt (10) with the washer (9) to the link at the location A (AMM 70-51-00/201).
(k) Make sure the link is correctly positioned on the hinge beam.

S 094-042-R00
(11) Remove the handling equipment (Fig. 406, 407, and 408).

S 494-045-R00
(12) Attach the support assembly to arch (Fig. 401).

S 494-046-R00
(13) Attach the fishpole hoist to the support assembly.

S 494-047-R00
(14) Attach the sling to the brackets which are found on the bottom of the thrust reverser.

S 494-048-R00
(15) Attach the sling to the fishpole hoist.

S 984-049-R00
(16) Use the fishpole hoist to open the thrust reverser.

S 034-050-R00
(17) Install the hold open rods (Fig. 404).

S 214-051-R00
(18) Make sure the translating sleeve is in the fully retracted position:
(a) Left thrust reverser half - use manual retract procedure (AMM 78-31-00/201).

CAUTION: THE MAXIMUM CRANK TORQUE IS 100 POUND-INCHES (11.29 NEWTON-METERS). DO NOT APPLY A TORQUE WHICH IS MORE THAN THIS LIMIT. DAMAGE TO THE ACTUATOR COULD RESULT. THE DRIVE MUST BE INSTALLED CORRECTLY. IF THE DRIVE IS NOT INSTALLED CORRECTLY, SIDE LOADING COULD DAMAGE THE ACTUATOR.

(b) Right thrust reverser half - install a 0.25 inch (6.35 mm) square drive.
(c) Turn the crank clockwise until the translating sleeve is fully retracted.

S 014-052-R00
(19) Open the strut pressure relief door (Fig. 411) (AMM 54-53-01/401).

S 824-053-R00
(20) Turn the feedback cam (1) to the retracted position and install the rig pin RR-2.

S 424-090-R00
(21) Connect the feedback cable (3) with the cable clamp assembly (5), the screws (9) and the washers (10).

S 824-054-R00
(22) Align the lower feedback cable rod end (5, Fig. 410) with the actuator lever (6).

NOTE: If cable rod end does not align, loosen the locknut (7) and adjust the rod end as necessary.

(a) Apply a light load to remove the slack in the feedback cable.

S 424-055-R00
(23) Install the lower cable rod end (5) in the actuator (6) with the bolt (4), the washer (3), and the nut (2).
(a) Tighten to 100-140 pound-inches (11.3-15.8 newton meters).
(b) Install a cotter pin (1).

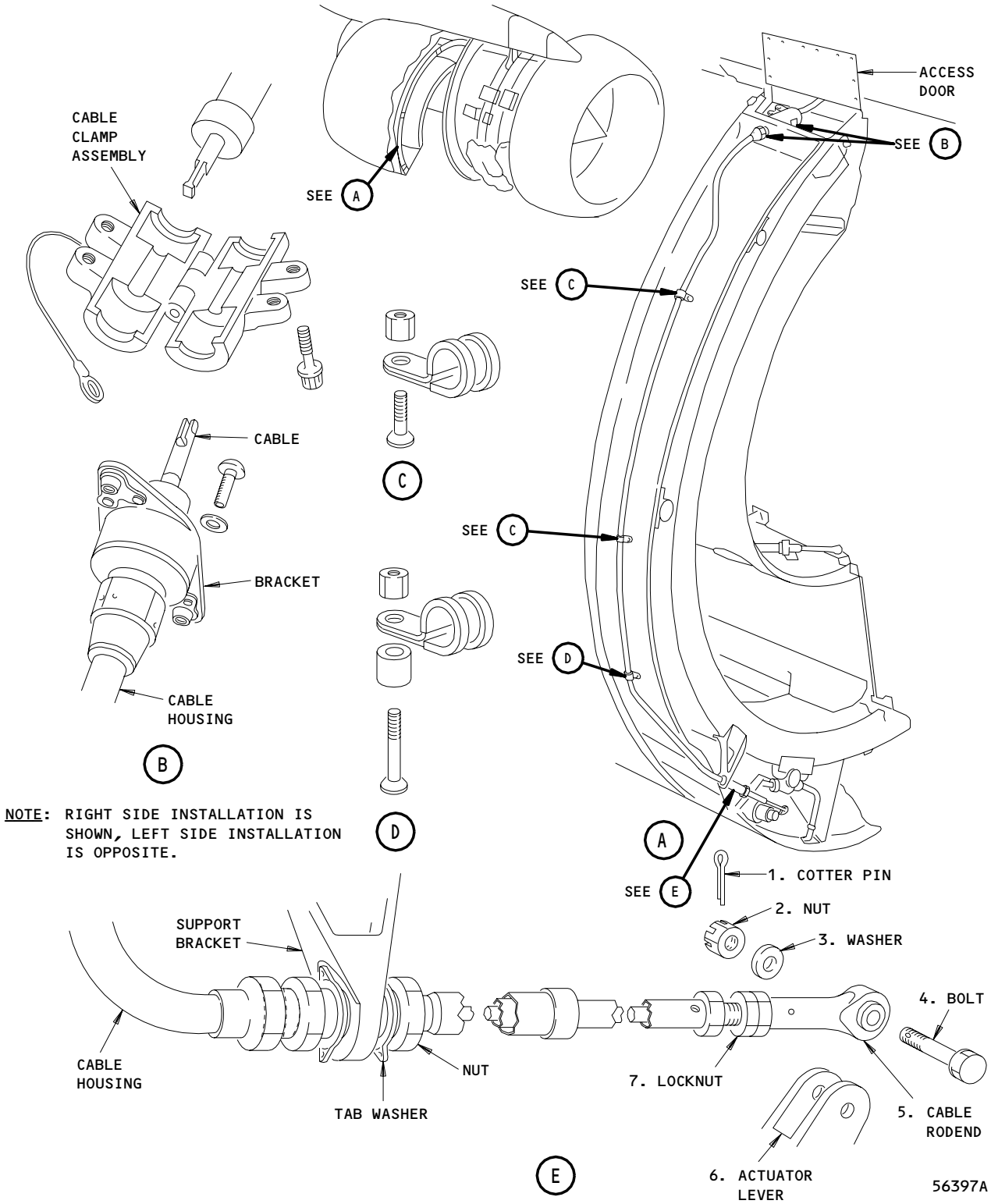
S 434-056-R00
(24) Tighten the locknut (7) of the lower feedback cable to 60-85 pound-inches (6.78-9.60 newton meters).

S 414-057-R00
(25) Remove the rig pin (RR-2) (Fig. 411) from the feedback cam and close the strut pressure relief door.

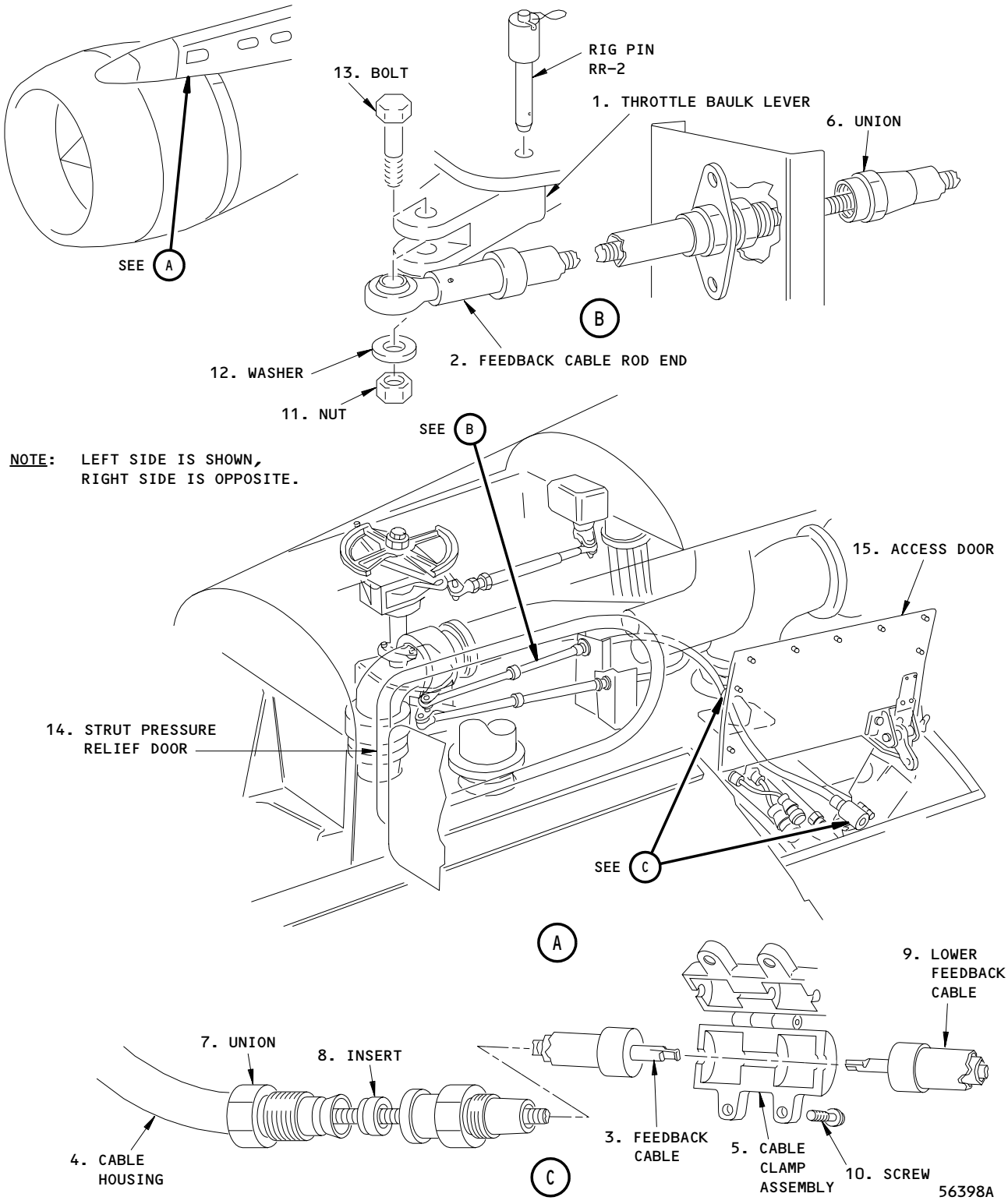
S 094-058-R00

WARNING: MAKE SURE THE THRUST REVERSER IS HELD BY THE HOLD-OPEN RODS. IF THE HOLD OPEN RODS DO NOT HOLD THE THRUST REVERSERS, THE THRUST REVERSER COULD CLOSE SUDDENLY WHEN THE HOIST IS REMOVED. THIS COULD CAUSING INJURY TO PERSONS.

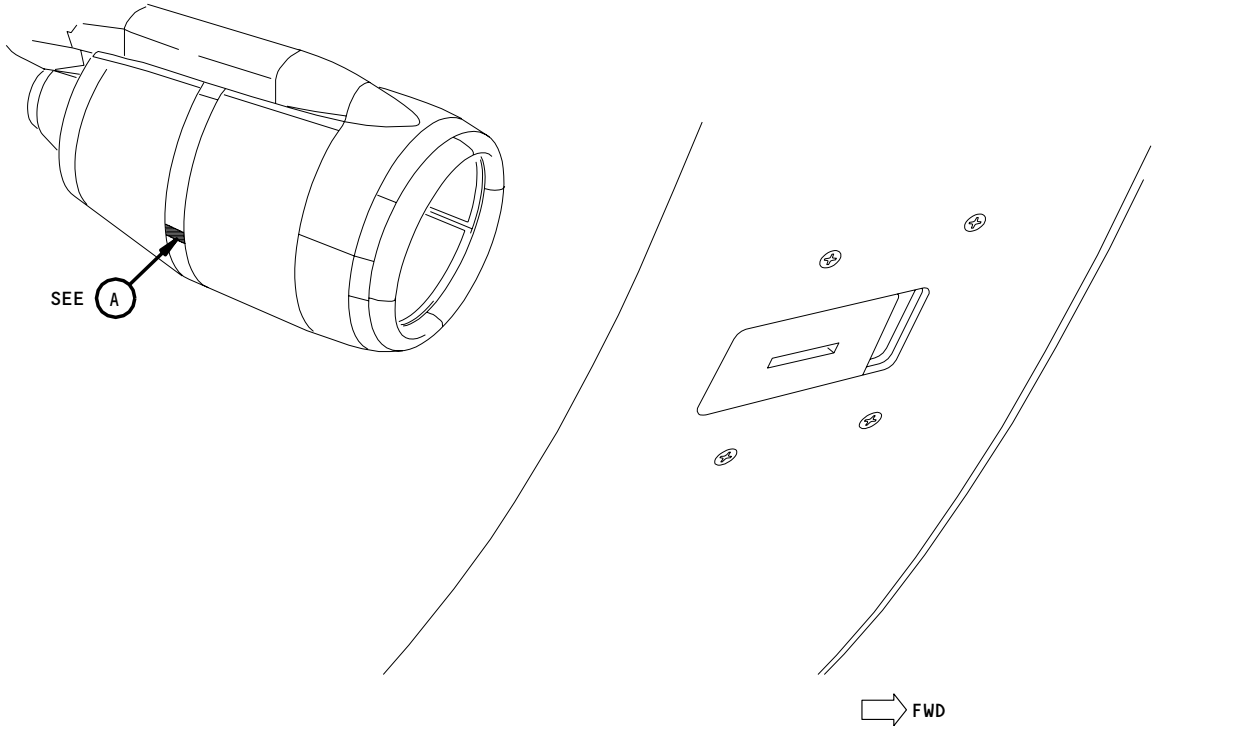
(26) Release some of the load on the fishpole hoist.
(a) Let the hold open rods to hold some of the weight of the thrust reverser.



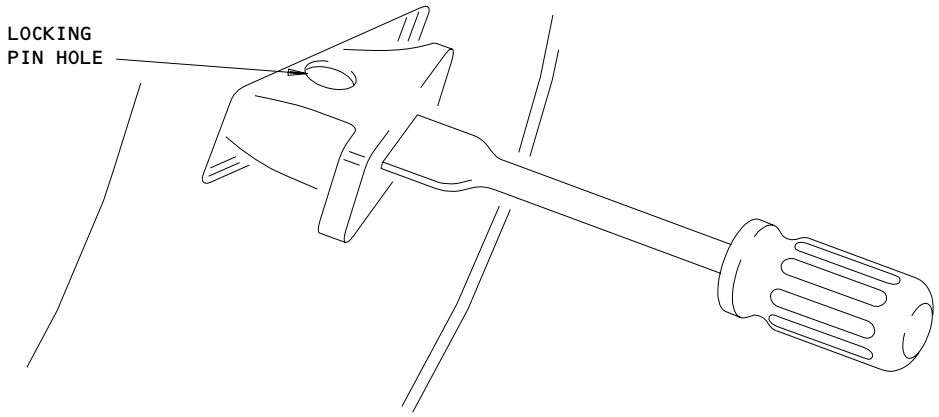
Thrust Reverser Lower Feedback Cable Rigging
Figure 410



Thrust Reverser Upper Feedback Cable Rigging
Figure 411



SYNC-LOCK MANUAL UNLOCK INDICATOR
(LOCKED)
A



SYNC-LOCK MANUAL UNLOCK INDICATOR
(NOT LOCKED)
A

55616

Thrust Reverser Sync-Lock Manual Unlock Indicator
Figure 411A

EFFECTIVITY
AIRPLANES WITH THRUST REVERSER
SYNC-LOCKS OR RR SB 78-9613

L95813

S 494-059-R00
(27) Connect the hand pump (5, Fig. 405) to the thrust reverser.

S 824-060-R00
(28) Use the hand pump to slowly extend the actuator rod end to the strut clevis.

S 434-061-R00
(29) Install the bolt (3), the washers (2) and the nut (1) which attaches the actuator rod end to the strut clevis (AMM 70-51-00/201).

S 034-062-R00
(30) Remove the GSE Pins from the Floating Beam.

S 434-063-R00
(31) Do the steps that follow to connect the airplane systems (Fig. 402).
(a) Remove the dust caps from all open hoses and connectors.
(b) Connect the electrical connectors (5).
(c) Attach the shroud to the retract hydraulic tube.
(d) Connect the retract hydraulic tube nut (4) (Fig. 402).
1) To make sure the tube nut does not rotate, hold the bulkhead adapter with an open-end wrench.
2) Tighten the tubenut (Ref 70-51-00).
(e) Attach the shroud with the bolts (5) and the washers (4).
(f) Install the shroud to the extend hydraulic hose assembly (12).
(g) Carefully install the extend hydraulic hose assembly (12) through the thrust reverser bulkhead.

S 824-064-R00
(32) Do these steps to do the thrust reverser synchronization procedure.

NOTE: Thrust reverser synchronization is not necessary if the replacement thrust reverser was hydraulically retracted in the shop. These thrust reversers should be identified with a label. It is also not necessary if the thrust reverser was hydraulically retracted on the wing and was not opened. Also, the remaining thrust reverser half must operate correctly and be hydraulically retracted. If these conditions do not occur, then the synchronizing procedure must be done.

CAUTION: MAKE SURE THE THRUST REVERSER IS ADJUSTED CORRECTLY. IF THE THRUST REVERSER IS NOT ADJUSTED CORRECTLY, THE ACTUATION SYSTEM OF THE THRUST REVERSER COULD BE DAMAGED.

(a) Connect the extend hydraulic hose (12, Fig. 402), but do not install the flex shaft.
(b) Close the thrust reverser (AMM 78-31-00/201).
(c) Do this procedure: Thrust Reverser Activation for Ground Maintenance (Ref 78-31-00).
(d) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
1) On the overhead equipment panel P11:
a) For the left engine:
1. 11D11, ENGINE LEFT T/R IND
2. 11D12, ENGINE LEFT T/R CONT
b) For the right engine:
1. 11B29, ENGINES RIGHT T/R IND
2. 11B30, ENGINES RIGHT T/R CONT
(e) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
1) For the left engine:
a) On the overhead equipment panel P11:
1. 11D11, T/R IND L
2. 11D12, T/R CONT L
b) On the power distribution panel P6:
1. 6C12, L ENG SYNC LOCK
2) For the right engine:
a) On the overhead equipment panel P11:
1. 11B29, T/R IND R
2. 11B30, T/R CONT-ALTN-R
3. 11K32, R ENG SYNC LOCK
4. 11K33, T/R CONT R
b) On the power distribution panel P6:
1. 6D12, R ENG SYNC LOCK-ALTN

(f) Use a screwdriver to move the actuator lock indicator out.
(g) Put the pins into the locking pin hole to keep the actuator in the unlocked position (Fig. 411) and attach a warning streamer.
(h) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR RR SB 78-9613; Unlock the sync-lock on the right C-duct center actuator (Fig. 411A).
    1) Put the screwdriver blade into the slot in the sync-lock indicator.
    2) Move the lock indicator out and put a lock pin in the lockout pin hole.

        NOTE: This will keep the indicator in the unlocked position.

    3) Attach a warning banner to show the lock pin is in position.
(i) Do this procedure one time: Thrust Reverser Power Deploy/Stow (Ref 78-31-00).
(j) Remove the locking pins from the actuator lock indicators.

    NOTE: This will engage the actuator locks.

(k) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR RR SB 78-9613; Lock the sync-lock on the right C-duct center actuator (Fig. 411A).
    1) Put the screwdriver blade into the slot in the sync-lock indicator.
    2) Move the lock indicator out and remove the lock pin and the warning pennant.
    3) Put the lock indicator to the locked position.
    4) Make sure that the sync-lock indicator is not above the fairing surface.
(l) Do this procedure two times: Thrust Reverser Power Deploy/Stow (Ref 78-31-00).
(m) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).
    1) Make sure that locking pin for the manual bypass valve is removed.
(n) Open the thrust reverser half which has been removed (AMM 78-31-00/201).
(o) Disconnect the extend hydraulic tube (8, Fig. 401).
(p) Let a small quantity of the hydraulic fluid drain.

(q) Connect the flex synchronizing shaft which connects the extend hydraulic tube (Fig. 402).
1) Clean the flex shaft (13) with a clean, lint-free cloth.
2) Put the flex shaft into the extend hydraulic tube.
3) Turn the flex shaft to engage it with the opposite thrust reverser actuator.
4) Engage the flex shaft with the top actuator.
5) Connect the extend hydraulic hose to the top actuator.
6) Tighten the connector to 500-600 pound-inches (56.7-67.8 newton meters) and install a lockwire.

(r) Close the thrust reverser (AMM 78-31-00/201).

(s) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
1) On the overhead equipment panel P11:
a) For the left engine:
1. 11D11, ENGINE LEFT T/R IND
2. 11D12, ENGINE LEFT T/R CONT
b) For the right engine:
1. 11B29, ENGINES RIGHT T/R IND
2. 11B30, ENGINES RIGHT T/R CONT

(t) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
1) For the left engine:
a) On the overhead equipment panel P11:
1. 11D11, T/R IND L
2. 11D12, T/R CONT L
b) On the power distribution panel P6:
1. 6C12, L ENG SYNC LOCK
2) For the right engine:
a) On the overhead equipment panel P11:
1. 11B29, T/R IND R
2. 11B30, T/R CONT-ALTN-R
3. 11K32, R ENG SYNC LOCK
4. 11K33, T/R CONT R
b) On the power distribution panel P6:
1. 6D12, R ENG SYNC LOCK-ALTN

S 434-065-R00

(33) Continue to connect the airplane systems (Fig. 402).
(a) Clean the flex shaft (13) with a clean, lint-free cloth (Fig. 402).
(b) Install the flex shaft (13) into the hose assembly (12).
(c) Turn the shaft to engage the shaft with the opposite top hydraulic actuator.
(d) Put the flex shaft (13) into the top actuator.

(e) Install the extend hydraulic hose assembly (12) (AMM 70-51-00/201).

NOTE: Do not bend the shaft (13) more than 22.5 degrees.

1) Tighten the connector to 500-600 pound-inches (56.5-67.8 newton meters) and install a lockwire.

(f) ENGINES PRE-RR SB 78-9017;
Put the sleeve assembly (10) and the split support clamp (11) on the firewall.
1) Attach the sleeve assembly and support clamp with bolts (8) and washers (9) (AMM 70-51-00/201).

(g) ENGINES POST-RR SB 78-9017;
Do these steps:
1) Put the sleeve assembly (10), the restraint bracket (7) and the split support bracket (11) on the firewall.
2) Attach with the bolts (14) and the washers (9) (AMM 70-51-00/201).
3) Attach the clamp (11) to the hose (12) with the bolts (15) the washers (16) and the nuts (17) (AMM 70-51-00/201).

S 414-066-R00

(34) Install the side access panel (6).
(a) Apply a bead of the silicone compound to the edge of the access panel (6).
(b) Attach the access panel (6) to the thrust reverser.
(c) Install the hydraulic actuator access panel (2, Fig. 403) with the screws (1).

S 214-067-R00

(35) Do a check of the bellows of the precooler fan air intake for damage.

S 214-068-R00

(36) Do a check of the bellow seals for damage.

S 824-069-R00

(37) Open the valve (4, Fig. 405) on the hand pump (5).

S 824-070-R00

(38) Use the fishpole hoist to lift the thrust reverser with a force equal to its weight.

S 824-071-R00

(39) Disconnect the hold open rods (Fig. 404).

S 824-072-R00
(40) Use a fishpole hoist to lower the thrust reverser to the closed position.

S 094-073-R00
(41) Remove the sling from the bottom of the thrust reverser and from the fishpole hoist.

S 874-074-R00

CAUTION: THE STEPS THAT FOLLOW MUST BE DONE TO MAKE SURE THAT ALL THE AIR WHICH REMAINS IN THE HYDRAULIC SYSTEM IS BLED. IF YOU DO NOT, AIR WHICH REMAINS IN THE SYSTEM CAN CAUSE THE THRUST REVERSER TO CLOSE IRREGULARLY.

(42) Bleed the hydraulic opening system of the thrust reverser.
  (a) Remove the fishpole hoist.
  (b) Remove the support brackets from the top and the bottom of the thrust reverser.
  (c) Close the valve (4) on the hand pump (5) and open the thrust reverser to approximately 25 degrees.
  (d) Lower the thrust reverser slowly.
  (e) Open the thrust reverser to the fully open position and then close slowly.
    1) Repeat this two more times until the thrust reverser closes in ten seconds or more and the movement is smooth when the valve (4) is fully open.

S 724-075-R00
(43) Do this procedure: Thrust Reverser Lock Proximity Sensor - Adjustment/Test (AMM 78-30-00/501).

S 424-076-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO THE FAN COWL AND THE THRUST REVERSER CAN OCCUR.

(44) Close the thrust reverser (AMM 78-31-00/201).

S 094-077-R00
(45) Remove the support assembly both the braces, the arch, the two pads, and the two front brackets (Fig. 404).

S 224-078-R00
(46) Do this procedure: Thrust Reverser Upper and Lower Bifurcation Bumper and Latch Adjustment (AMM 78-30-00/501).

S 424-079-R00
(47) Attach the hinge access door hinges to the thrust reverser (Fig. 401).

S 424-080-R00
(48) Install the hinge access door (AMM 78-31-10/401).

S 864-082-R00
(49) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, ENGINE LEFT T/R IND
b) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B29, ENGINES RIGHT T/R IND
b) 11B30, ENGINES RIGHT T/R CONT

S 864-083-R00
(50) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) For the left engine:
1) On the overhead equipment panel P11:
a) 11D11 T/R IND L
b) 11D12 T/R CONT L
2) On the power distribution panel P6:
a) 6C12 L ENG SYNC LOCK
(b) For the right engine:
1) On the overhead equipment panel P11:
a) 11B29 T/R IND R
b) 11B30 T/R CONT-ALTN-R
c) 11K32 R ENG SYNC LOCK
d) 11K33 T/R CONT R
2) On the power distribution panel P6:
a) 6D12 R ENG SYNC LOCK-ALTN

S 874-085-R00
(51) Bleed the hydraulic system of the thrust reverser.

NOTE: This procedure will make sure all the unwanted air is bled from the system. If the air is not bled from the system, the thrust reverser may not operate satisfactorily.

(a) Use a screwdriver to move the actuator lock indicator out.
(b) Put the pins into the locking pin hole to keep the actuator in the unlocked position (Fig. 412).
(c) Attach the warning streamers to show that the lockpins in the correct position.
(d) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR RR SB 78-9613; Unlock the sync-lock on the right C-duct center actuator (Fig. 411A).
1) Put the screwdriver blade into the slot in the sync-lock indicator.
2) Move the lock indicator out and put a lock pin in the locking pin hole.

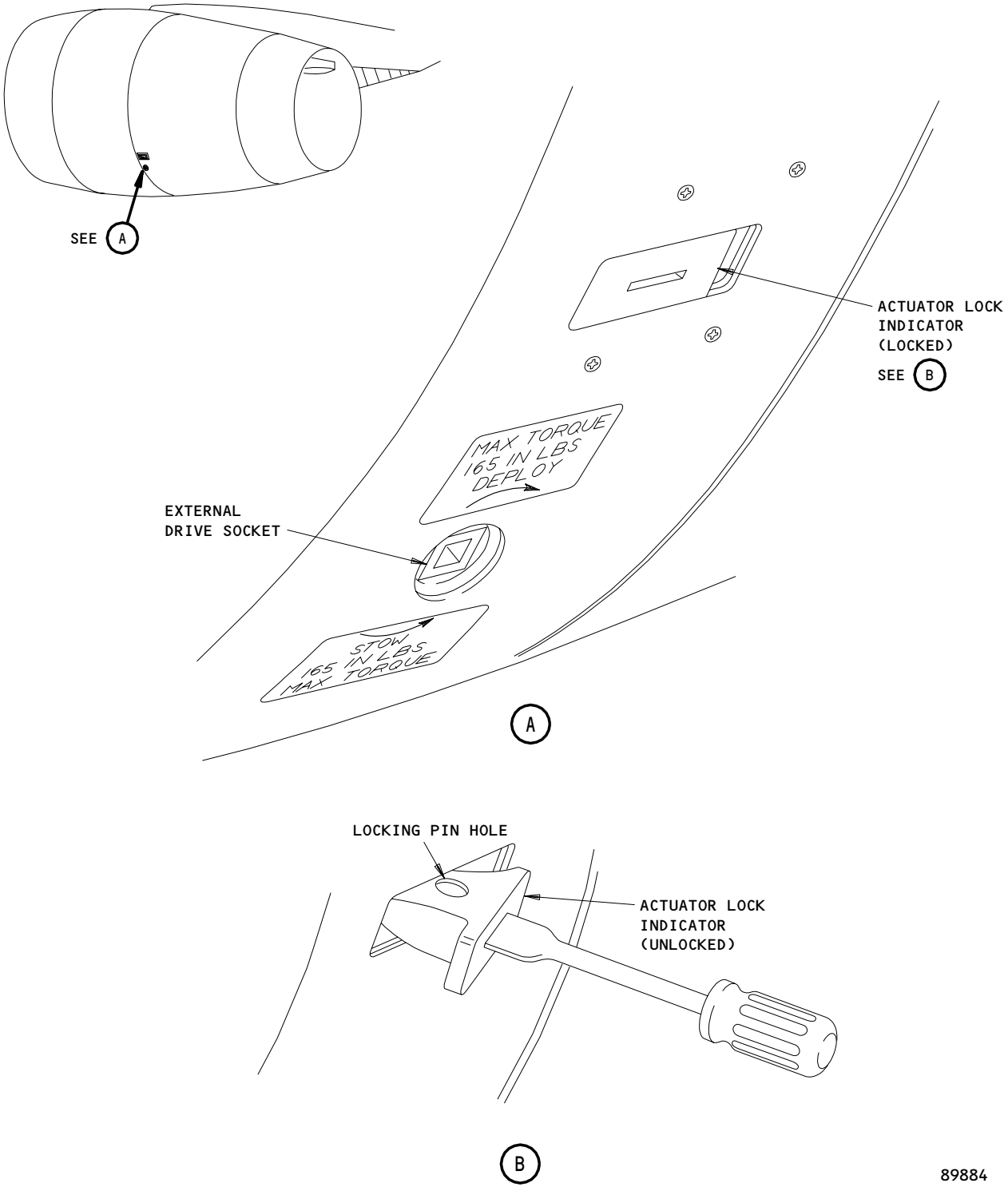
NOTE: This will keep the indicator in the unlocked position.

3) Attach a warning banner to show the lock pin is in position.
(e) Do this procedure two times, Thrust Reverser Power Deploy/Stow (AMM 78-31-00/201).
(f) Remove the locking pins from the actuator lock indicators.

NOTE: This will engage the actuator locks.

(g) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS OR RR SB 78-9613; Lock the sync-lock on the right C-duct center actuator (Fig. 411A).
1) Put the screwdriver blade into the slot in the sync-lock indicator.
2) Move the lock indicator out and remove the lock pin and the warning pennant.
3) Put the lock indicator to the locked position.
4) Make sure the sync-lock indicator is not above the fairing surface.

S 724-086-R00
(52) Do the thrust reverser tests that are listed in the test reference table (AMM 78-31-00/501).



Fan C-Duct and Thrust Reverser Actuator Manual Lock Location
Figure 412

S 214-087-R00
(53) Do a check of all the hydraulic connections which have been opened to look for leakage.

S 824-088-R00
(54) Do a check of the adjustment of the upper and lower bifurcation bumpers and latches (AMM 78-30-00/501).

S 224-089-R00
(55) After the first engine ground run or 25 flight hours, do these steps.
(a) Do a check to make sure the force necessary to close the five thrust reverser latches is 45-55 pounds (200-240 Newtons).
(b) Do a check of the distance between the upper and lower bifurcation bumpers.

NOTE: The initial clearance is to be set at 0.002-0.020 inch (0.05-0.50 mm); however, after the reverser is opened and closed the clearance will be maintained at 0.002-0.048 inch (0.05-1.2 mm).

THRUST REVERSER - INSPECTION/CHECK

1. General
   A. This procedure has these tasks:
      (1) The inspection of the fixed duct assembly of the thrust reverser.
      (2) The inspection of the thrust reverser latch access door.
   B. This procedure can be used with the left and right thrust reversers.

TASK 78-31-20-216-003-R00

2. Thrust Reverser Fixed Duct Assembly Inspection
   A. References
      (1) AMM 70-42-11/201, Repair of Surfaces Affected By Minor Damage
      (2) AMM 70-42-22/201, Seal Exposed Fibers
      (3) AMM 70-42-26/201, Acceptable Cracks, Stop Drilling (FRS3255)
      (4) AMM 78-31-00/201, Thrust Reverser System
      (5) AMM 78-31-20/801, Thrust Reverser
   B. Consumable Materials
      (1) Sealant (DC90-006)
          OMat No. - 8/138
   C. Access
      (1) Location Zones

210	Control Cabin
415/425	Thrust Reverser, Left
416/426	Thrust Reverser, Right

   D. Procedure

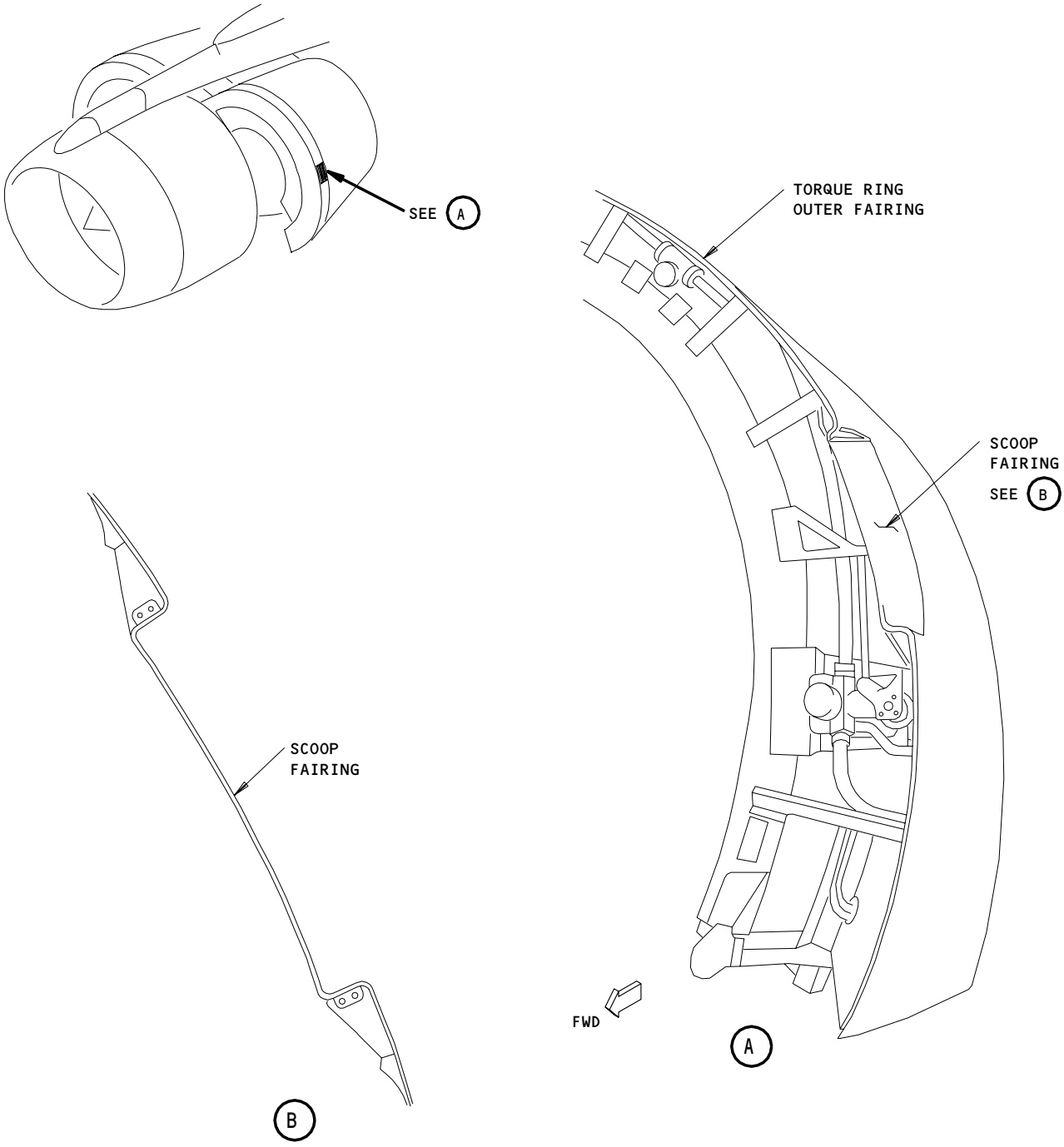
S 866-025-R00

WARNING: YOU MUST OBEY THE INSTRUCTIONS IN AMM 78-31-00/201. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO THE FAN COWL AND THRUST REVERSER CAN OCCUR.

(1) Open the left (right) thrust reversers (AMM 78-31-00/201).

S 216-002-R00

(2) Make an inspection of the outer fairing for the torque ring on the fixed duct assembly (Fig. 601).
   (a) Look for delaminations on the leading edge.
      1) If the delamination are not more than 0.256 inch (6.5 mm) in length and moves in a rearward direction, repair with FRS3254 (AMM 70-42-22/201).
      2) If the delamination is more than the limit, reject the part.



NOTE: LEFT SIDE THRUST REVERSER SHOWN,
RIGHT SIDE THRUST REVERSER SIMILAR.

92835

Thrust Reverser Fixed Duct Assembly
Torgue Ring and Outer Fairing
Figure 601

S 216-001-R00

(3) Make an inspection of the scoop fairing and look for cracks on the outer surface (Fig. 601).

(a) It is permitted to have cracks that are not more than 1.00 inch (25.4 mm) in length for each area.

NOTE: Cracks on the outer surface usually stay on the arerodynamic filler and paint. They do not usually extend to the composite structure of the fairing.

(b) It is permitted to have cracks which are more than the limit if you examine the inner surface as follows:

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

1) Open the left (right) thrust reverser (AMM 78-31-00/201).
2) Examine the inner surface of the scoop fairing and look for cracks (Fig. 601)
3) It is permitted to have cracks which are not more than 1.00 inch (25.4 mm) in length for each area.
4) If the cracks are more than the limit, repair with FRS6031 (AMM 78-31-20/801).

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

(c) If more inspections are not necessary, close the left (right) thrust reverser (AMM 78-31-00/201).

S 216-004-R00

(4) Do a check of the left and right torque box fairings for disconnected radial straps.

(a) As many as 3 radial straps can become disconnected if the straps are within the conditions that follow:
1) No more than 2 adjacent radial straps can are disconnected.
2) The contour of the torque box fairing is less than the airflow limits that follow:
a) The opening for the integrated drive generator (IDG) must not go into the airflow more than 0.025 in. (0.63 mm).

b) The clearance from the torque box fairing to the engine firewall must not be more than 0.010 in. (0.25 mm).

(b) If one or all of the conditions are more than the specified limits, repair to FRS.6261 (AMM 78-31-20/801).

S 216-005-R00

(5) Do a check of the bellows in the left and right half of each thrust reverser (Fig. 602).

CAUTION: DO NOT TRY TO FORCE OPEN THE AREA OF THE BELLOWS THAT IS USUALLY COMPRESSED. DAMAGE TO THE BELLOWS CAN OCCUR.

(a) Do a check for cracks in the area of the bellows that is compressed when the thrust reverser is in its normal position.

NOTE: Use a bright light and an inspection mirror to do the inspection.

1) Crack damage to the bellows must be less than the conditions that follow:
   a) Cracks must be less than 6.0 in. (152.4 mm) in length.
   b) Each flexible part must have no more than three cracks.

      NOTE: The area of the bellows that is compressed is made of a number of parts that are flexible.

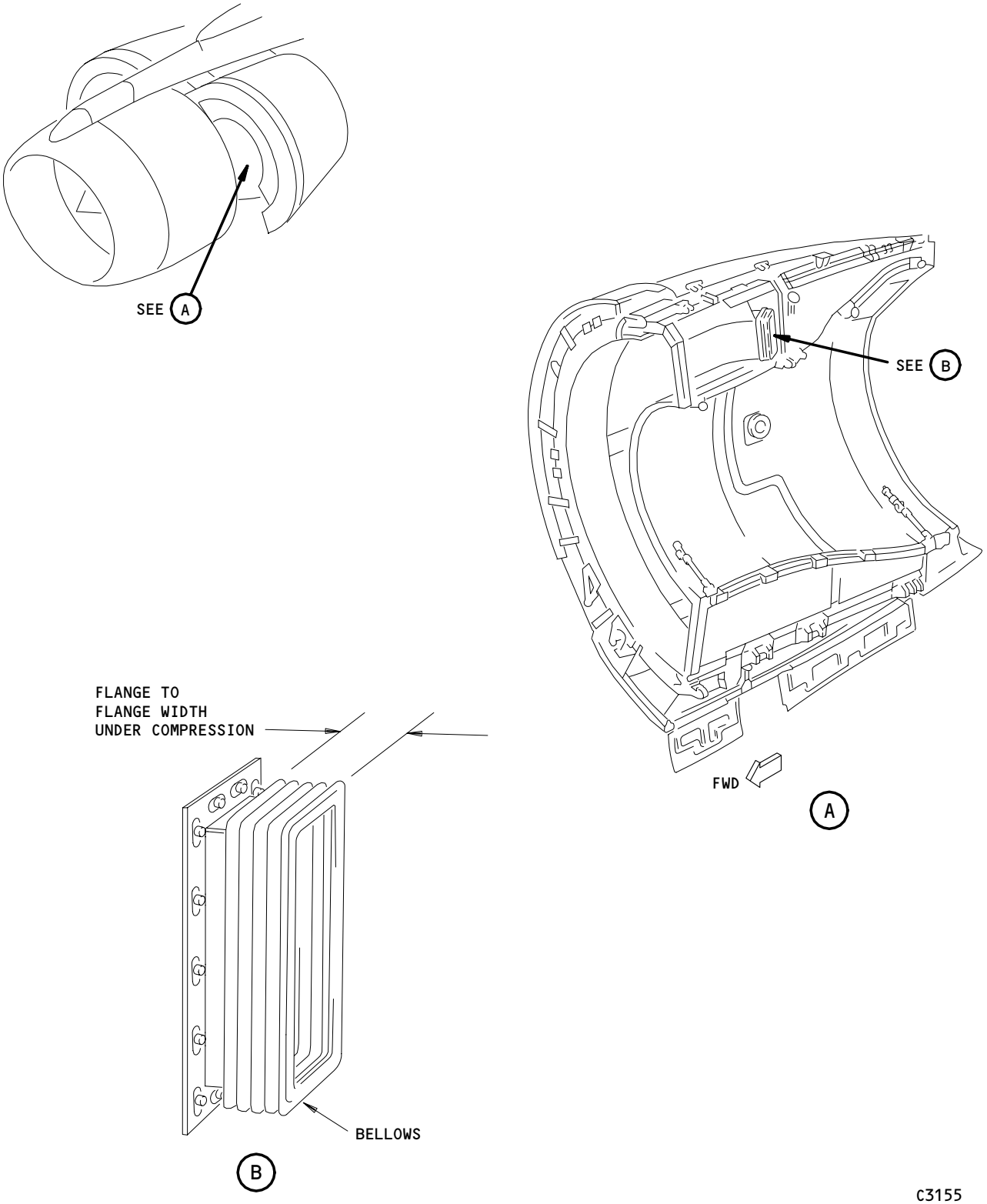
   c) There must be a minimum of 3.0 in. (76.2 mm) between cracks on the same flexible part.
2) Surface of the flange on the fan air bellows (Fig. 602).

   NOTE: Use a flat edge to compress the fan air bellows so that the dimension between each flange is approximately 1.80 inch (45.72 mm).

   a) If the flatness of the flange surface is not more than 0.015 inch (0.40 mm), accept it.
   b) If the flatness of the flange surface is more than above, reject it.
   c) If up to 75 percent of the teflon layer remains on the surface of the flange, accept it.
   d) If more than 75 percent of the teflon layer has gone, reject it.

S 226-094-R00

(6) Do a check of the rear pandowns on the left and right thrust reverser inner barrel for cracks.
   (a) Cracks that are not more than 6.0 inches (152.4 mm) long can be accepted if you do the steps that follow:
      1) Do FRS3255 to stop drill the crack to prevent crack propagation (AMM 70-42-26/201).



Thrust Reverser Fan Air Bellows
Figure 602

2) Seal the crack with sealant (DC90-006) to make sure there is continued fire protection.

(b) Cracks that are more than the limits in given above are not permitted.

S 286-095-R00

(7) Do a check to make sure that all the shims are fitted on the lower bifurcation bumpers.

(a) If the shims are not all fitted, do the procedure FRS6052 to replace the shims (AMM 78-31-20/801).

S 216-026-R00

(8) Examine the rear upper heatshield for holes, fractures, tears and discoloration.

S 216-027-R00

(9) Examine the middle upper heatshield for holes, fractures, tears and discoloration.

S 216-028-R00

(10) Examine the front upper heatshield for holes, fractures, tears and discoloration.

S 216-029-R00

(11) Examine the lower heatshield for holes, fractures, tears and discoloration.

S 216-031-R00

(12) Examine the fixed structure for front cascade fastener nutplates that are defective.

S 216-032-R00

(13) Visually examine the lockout blade for damage you can easily see.

S 216-033-R00

(14) Examine the lockout blade rear support brackets to make sure they are attached satisfactorily and are not damaged.

S 216-034-R00

(15) Examine the lockout blade shock absorber material for a smooth, continous surface that does not have holes that go through it.

S 216-037-R00
(16) Examine the cap angle filler on the thrust reverser inner barrel, upper and lower bifurcations for cracks and filler that is loose or is missing.

S 216-038-R00
(17) Examine the filler that is around the HP3 bleed valve opening for cracks or filler that is loose or missing.

S 216-039-R00
(18) Examine the inner barrel cap angles on the upper and lower bifurcations for cracks and nicks and gouges.

S 216-042-R00
(19) Examine each of the thrust reverser latch assemblies for the condition of the latch handle release tang.

S 216-045-R00
(20) Examine the fixed duct assembly inner seals for splits, tears, distortion and brittle material.

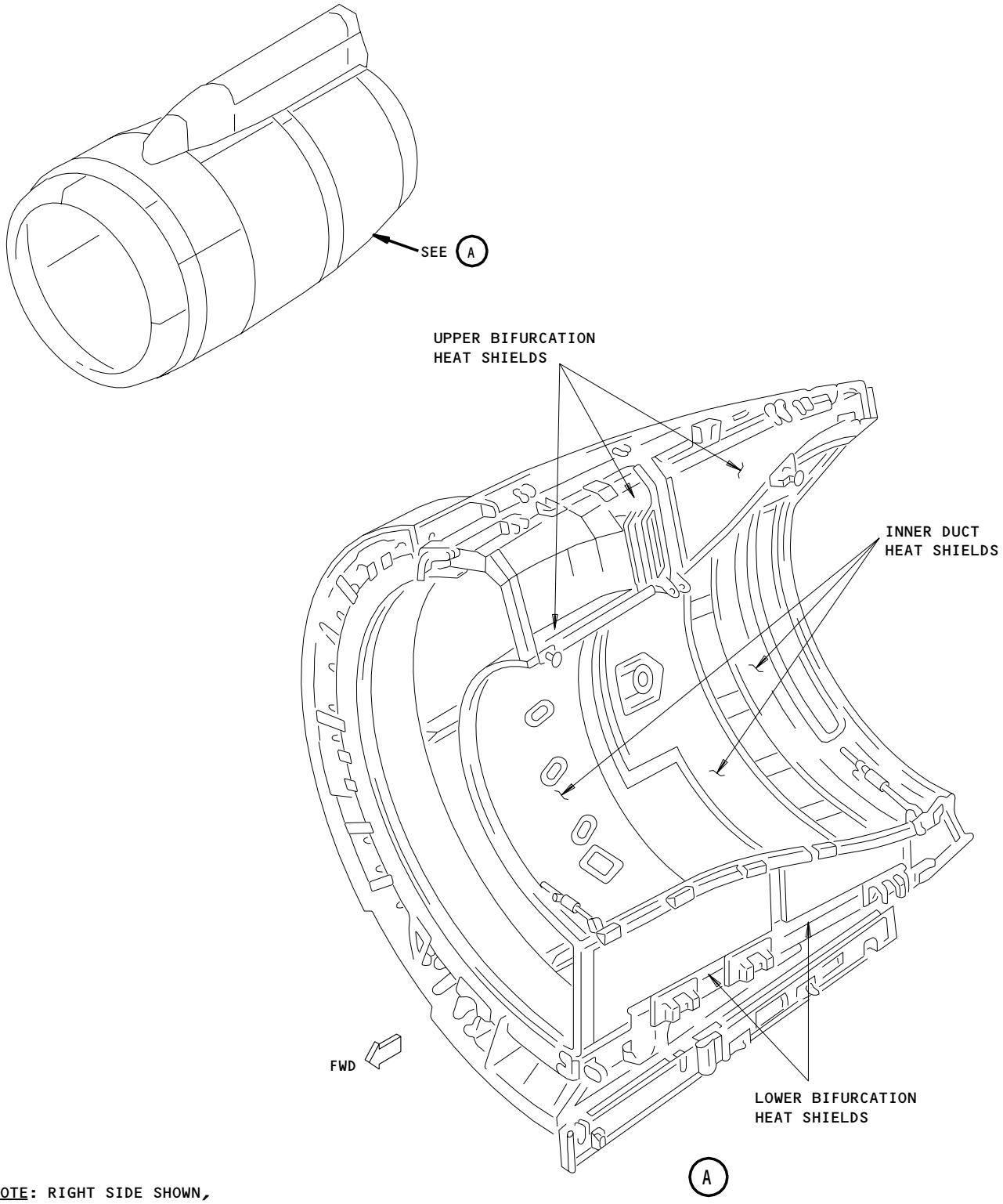
S 216-046-R00
(21) Examine the left hinge access door forward seal for splits, tears, distortion and brittle material.

S 216-050-R00
(22) Examine the left and the right fixed duct assembly for painted surfaces that are damaged.

S 216-116-R00
(23) Examine the left and right fixed duct assembly for movement of the bushings in the aft hinge flanges (Fig. 616).
(a) No movement - Accept
(b) Movement - Repair to FRS.6320 (AMM 78-31-20/801).

S 226-052-R00
(24) Rear upper heatshield (Fig. 603).

NOTE: If the heatshield has holes in it or is fractured or torn, it must be repaired immediately.



NOTE: RIGHT SIDE SHOWN,
LEFT SIDE IS OPPOSITE.

Thrust Reverser Bifurcation Heatshield Location Areas
Figure 603

(a) Holes
1) Holes that are 0.5 inch (12.7 mm) in diameter or less, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).
2) Holes that are more than 0.5 inch (12.7 mm) but not more than 6.0 inch (152.4 mm) in diameter, repair to FRS6175 (AMM 78-31-20/801).
3) Rear upper heatshields that have holes that are more than 6.0 inch (152.4 mm), repair to FRS6145 (LH) or FRS6146 (RH) (AMM 78-31-20/801).

(b) Fractures and tears
1) Fractures and tears up to 0.5 inch (12.7 mm) in length, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).
2) Fractures and tears that are more than 0.5 inch (12.7 mm) but less than 8.0 inch (203.2 mm) in length, repair to FRS6175 (AMM 78-31-20/801).
3) Rear upper heatshields that have fractures or tears that are more than 8.0 inch (203.2 mm), repair to FRS6145 (LH) or FRS6146 (RH) (AMM 78-31-20/801).

(c) Discoloration
1) Examine the areas of bad discoloration to see if the heatshield will be easily broken.
a) If the heatshield will be easily broken, use the applicable repair procedure to repair the type of damage that you see.

S 226-053-R00

(25) Middle upper heatshield (Fig. 603).

NOTE: If the heatshield has holes in it or is fractured or torn, it must be repaired immediately.

(a) Holes
1) Holes that are 0.5 inch (12.7 mm) in diameter or less, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).

2) Middle upper heatshields that have holes that are more than 0.5 inch (12.7 mm), repair to FRS6192 (RH) or FRS6193 (LH) (AMM 78-31-20/801).

(b) Fractures and tears

1) Fractures and tears up to 0.5 inch (12.7 mm) in length, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).

2) Middle upper heatshields that have fractures or tears that are more than 0.5 inch (12.7 mm), repair to FRS6192 (RH) or FRS6193 (LH) (AMM 78-31-20/801).

(c) Discoloration

1) Examine the areas of bad discoloration to see if the heatshield will be easily broken.

a) If the heatshield will be easily broken, use the applicable repair procedure to repair the type of damage that you see.

S 226-054-R00

(26) Front upper heatshield (Fig. 603).

NOTE: If the heatshield has holes in it or is fractured or torn, it must be repaired immediately.

(a) Holes

1) Holes that are 0.5 inch (12.7 mm) in diameter or less, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).

2) Holes that are more than 0.5 inch (12.7 mm), but not more than 6.0 inch (152.4 mm) in diameter, repair to FRS6175 (AMM 78-31-20/801).

3) Front upper heatshields that have holes that are more than 6.0 inch (152.4 mm), repair to FRS6194 (RH) or FRS6195 (LH) (AMM 78-31-20/801).

(b) Fractures and tears

1) Fractures and tears up to 0.5 inch (12.7 mm) in length, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).

2) Fractures and tears that are more than 0.5 inch (12.7 mm) but not more than 8.0 inch (203.2 mm) in length, repair to FRS6175 (AMM 78-31-20/801).

3) Front upper heatshields that have fractures or tears that are more than 8.0 inch (203.2 mm), repair to FRS6194 (RH) or FRS6195 (LH) (AMM 78-31-20/801).

(c) Discoloration

1) Examine the areas of bad discoloration to see if the heatshield will be easily broken.

a) If the heatshield will be easily broken, use the applicable repair procedure to repair the type of damage that you see.

S 226-055-R00

(27) Lower heatshield (Fig. 603).

NOTE: If the heatshield has holes in it or is fractured or torn, it must be repaired before 250 hours of engine operation is completed.

(a) Holes

1) Holes that are 0.5 inch (12.7 mm) in diameter or less, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).

2) Holes that are more than 0.5 inch (12.7 mm) but not more than 6.0 inch (152.4 mm) in diameter, repair to FRS6175 (AMM 78-31-20/801).

(b) Fractures and tears

1) Fractures and tears up to 0.5 inch (12.7 mm) in length, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).

2) Fractures and tears that are more than 0.5 inch (12.7 mm) but not more than 8.0 inch (203.2 mm) in length, repair to FRS6175 (AMM 78-31-20/801).

3) Front upper heatshields that have fractures or tears that are more than 8.0 inches (203.2 mm), repair to FRS6194 (RH) or FRS6195 (LH) (AMM 78-31-20/801).

(c) Discoloration

1) Examine the areas of bad discoloration to see if the heatshield will be easily broken.

a) If the heatshield will be easily broken, use the applicable repair procedure to repair the type of damage in the specified time.

S 226-140-R00

(28) Front and rear inner duct heat shields (Fig. 603).

NOTE: If the inner duct heat shields have holes in them or are fractured or torn, they must be repaired. A repair must be done before 250 hours of engine operation are completed.

(a) Holes
  1) Holes that are 0.5 inch (12.7 mm) in diameter or less, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).
  2) Holes that are more than 0.5 inch (12.7 mm) but not more than 6.0 inch (152.4 mm) in diameter, repair to FRS6175 (AMM 78-31-20/801).
  3) Inner duct heatshields that have holes that are more than 6.0 inch (152.4 mm), repair to FRS6168 (LH) or FRS6169 (RH) (AMM 78-31-20/801).

(b) Fractures and tears
  1) Fractures and tears up to 0.5 inch (12.7 mm) in length, repair to FRS6045/2 (LH) or FRS6046/2 (RH) (AMM 78-31-20/801).
  2) Fractures and tears that are more than 0.5 inch (12.7 mm) but not more than 8.00 inch (203.2 mm) in length, repair to FRS6175 (AMM 78-31-20/801).
  3) Inner duct heatshields that have fractures or tears that are more than 8.0 inch (203.2 mm), repair to FRS6168 (LH) or FRS6169 (RH) (AMM 78-31-20/801).

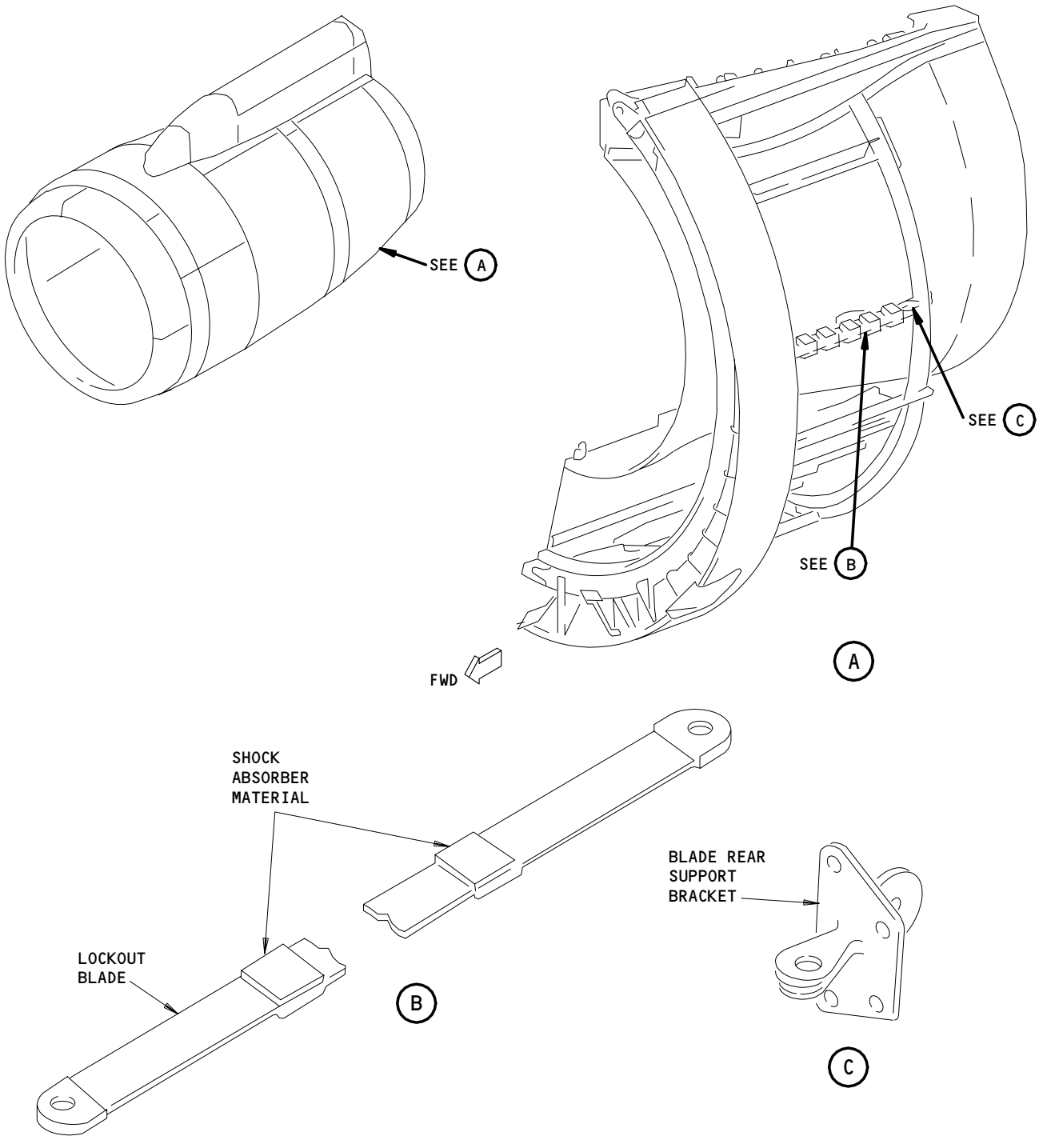
(c) Discoloration
  1) Examine the areas of bad discoloration to see if the heatshield will be easily broken.
    a) If the heatshield will be easily broken, use the applicable repair procedure to repair the damage in the specified time.

S 216-057-R00

(29) Front cascade fastener nutplates.
  (a) Front cascade fastener nutplates that are defective, repair to FRS6001 (LH) or FRS6025 (RH) (AMM 78-31-20/801).

S 216-058-R00

(30) Lockout blade (Fig. 604).
  (a) Too much damage that can be easily seen, repair to FRS6047 (LH) or FRS6048 (RH) (AMM 78-31-20/801).



NOTE: LEFT SIDE INSTALLATION SHOWN,
RIGHT SIDE INSTALLATION IS OPPOSITE.

55579A

Thrust Reverser Lockout Blade Inspection Details
Figure 604

(b) Broken, repair to FRS6047 (LH) to FRS6048 (RH) (AMM 78-31-20/801).

S 216-059-R00

(31) Lockout blade rear support brackets (Fig. 604).
(a) If the lockout blade rear support brackets are not attached satisfactorily, repair to FRS6047 (LH) or FRS6048 (RH) (AMM 78-31-20/801).
(b) Too much damage that can be easily seen, repair to FRS6047 (LH) or F1S6048 (RH) (AMM 78-31-20/801).

S 216-060-R00

(32) Lockout blade shock absorber material (Fig. 604).
(a) If the surface of the shock absorber material is smooth and continuous and does not have holes that go through it, accept it.
(b) If the surface of the shock absorber material is not smooth and continuous, or has holes that go through it, repair to FRS6109 (AMM 78-31-20/801).

S 216-085-R00

(33) Thrust reverser inner barrel cap angle filler (Fig. 605).
(a) If cracks are seen in the filler, accept it.
(b) If the filler is loose, accept it.
(c) If the filler has gone, accept it.

S 216-064-R00

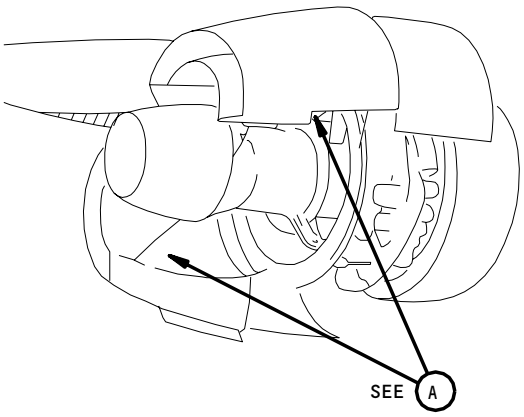
(34) Filler that is around the HP3 bleed valve opening.
(a) If cracks are seen in the filler, accept it.
(b) If the filler is loose, accept it.
(c) If the filler has gone, accept it.

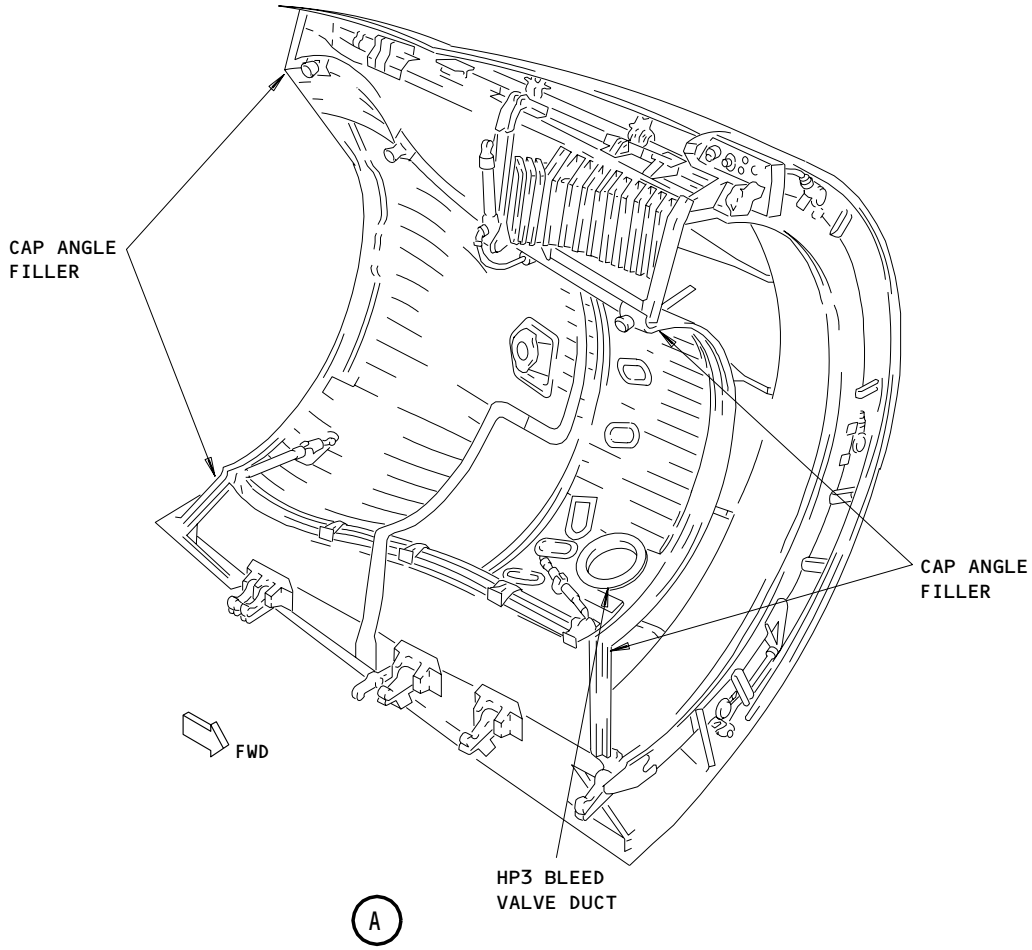
S 226-086-R00

(35) Inner barrel cap angles, upper and lower bifurcations (Fig. 606).
(a) Cracks are not permitted.
(b) Nicks and gouges that are not more than 0.01 inch (0.25 mm) in depth and 1.0 inch (25.4 mm) in length are permitted if:

- the damage is more than 5.0 inch (127.0 mm) from all other damage.

- all the sharp edges and sharp corners are made smooth to FRS3253 (AMM 70-42-11/201).

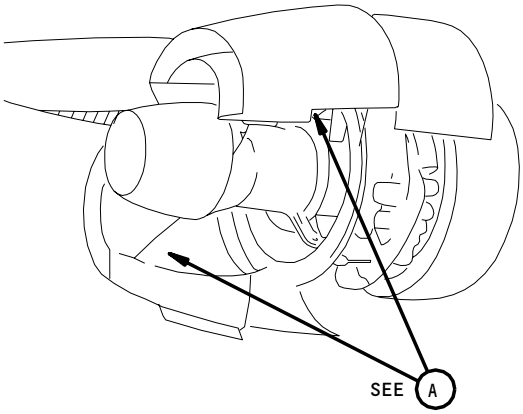


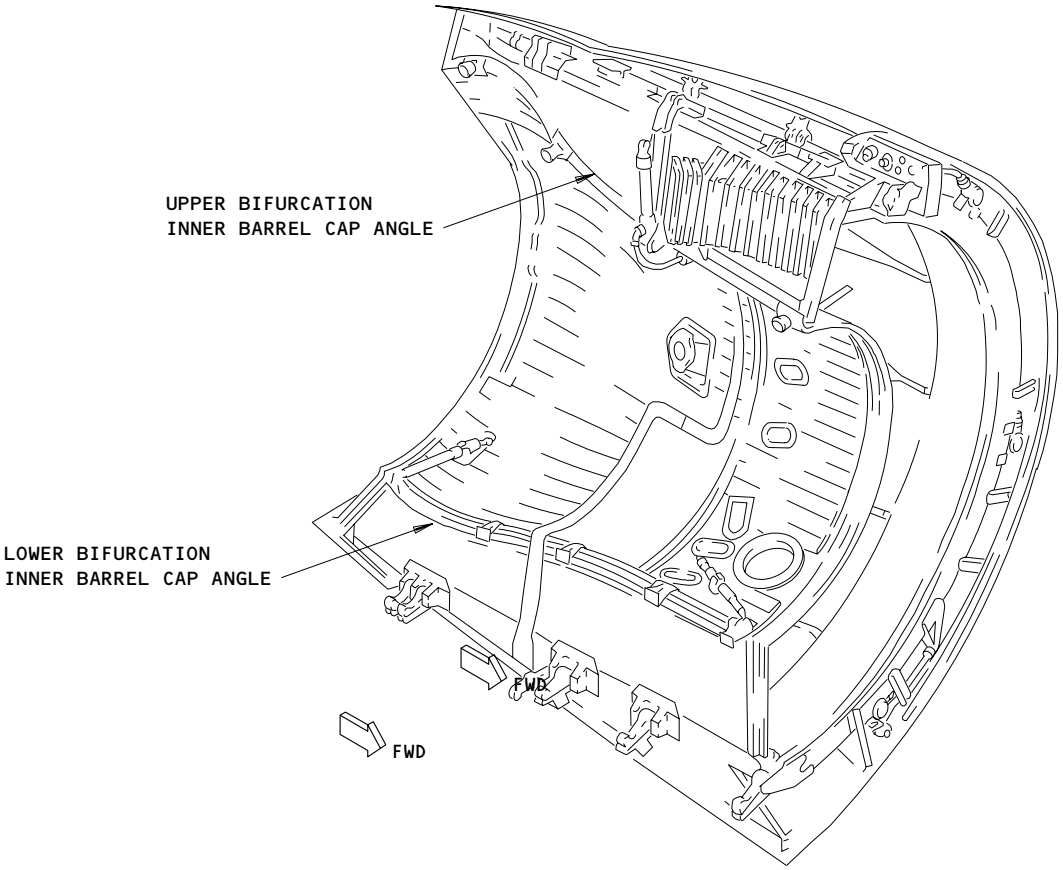


NOTE: LEFT SIDE SHOWN,
RIGHT SIDE IS OPPOSITE.

C3156

Thrust Reverser Inner Bifurcation Inspection Details
Figure 605





NOTE: LEFT SIDE SHOWN,
RIGHT SIDE IS OPPOSITE.

C3157

Thrust Reverser Bifurcation Inspection Details
Figure 606

(c) If you see nicks and gouges that are more than the above limits, reject it.
(d) One local area of frettage between the forward and the center bumper pads that is not more than 0.080 inch (2.03 mm) in depth is permitted if:

- all sharp edges are made smooth to FRS3253 (AMM 70-42-11/201).

(e) If you see damage that is more than the above limits, reject it.

S 216-068-R00

(36) Thrust reverser latch assemblies (Fig. 607).
(a) Latch handle release tang.
1) If the latch handle release tang has gone, accept it.

S 216-089-R00

(37) Fixed duct assembly inner seal (Fig. 608).

NOTE: If the inner seals are damaged a repair must be done before 500 hours of engine operation is completed.

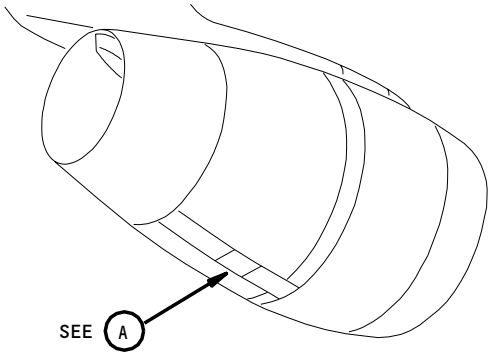
(a) If seal distortion is seen, repair to FRS6161 (AMM 78-31-20/801).
(b) If tears can be seen in the seal, repair to FRS6161 (AMM 78-31-20/801).
(c) If the seal is split, repair to FRS6161 (AMM 78-31-20/801).
(d) If the seal has become brittle, repair to FRS6161 (AMM 78-31-20/801).

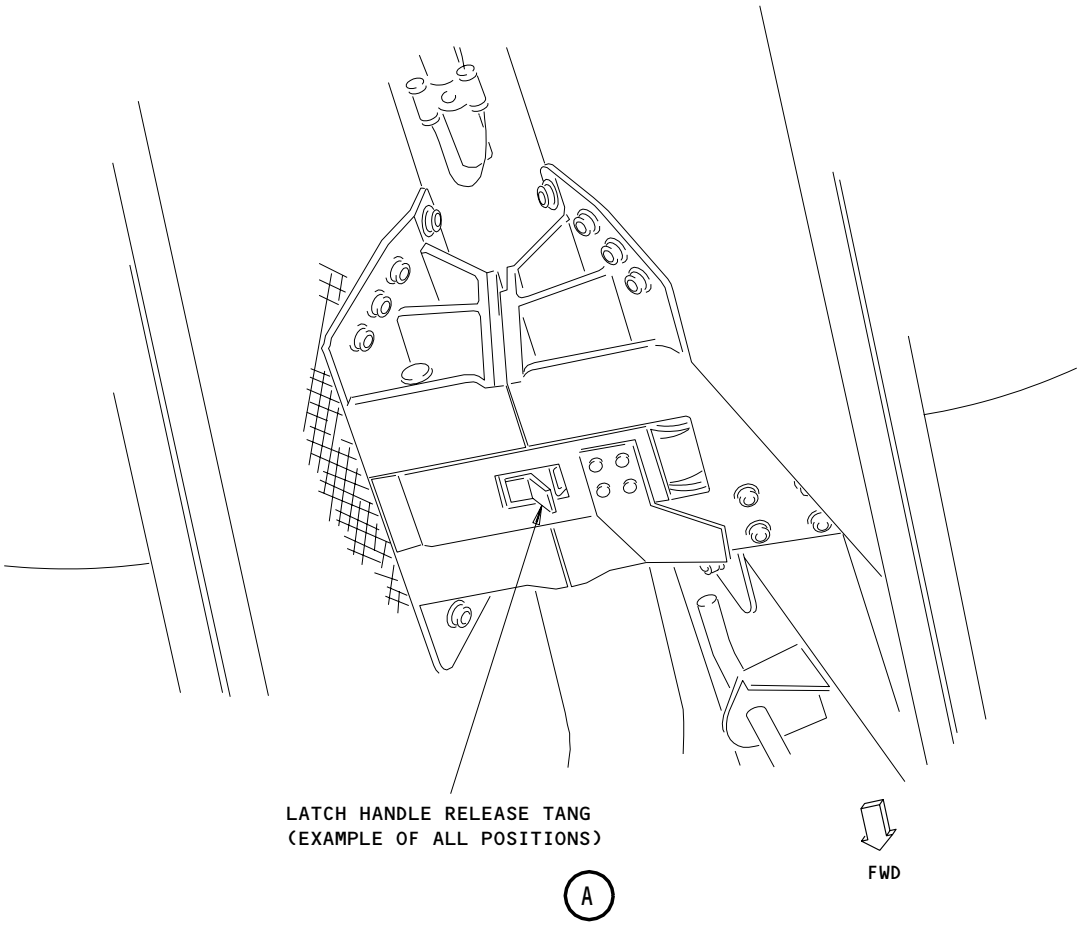
S 216-093-R00

(38) Left hinge access door forward seal (Fig. 609).

NOTE: If the forward seal is damaged a repair must be done before 500 hours of engine operation is completed.

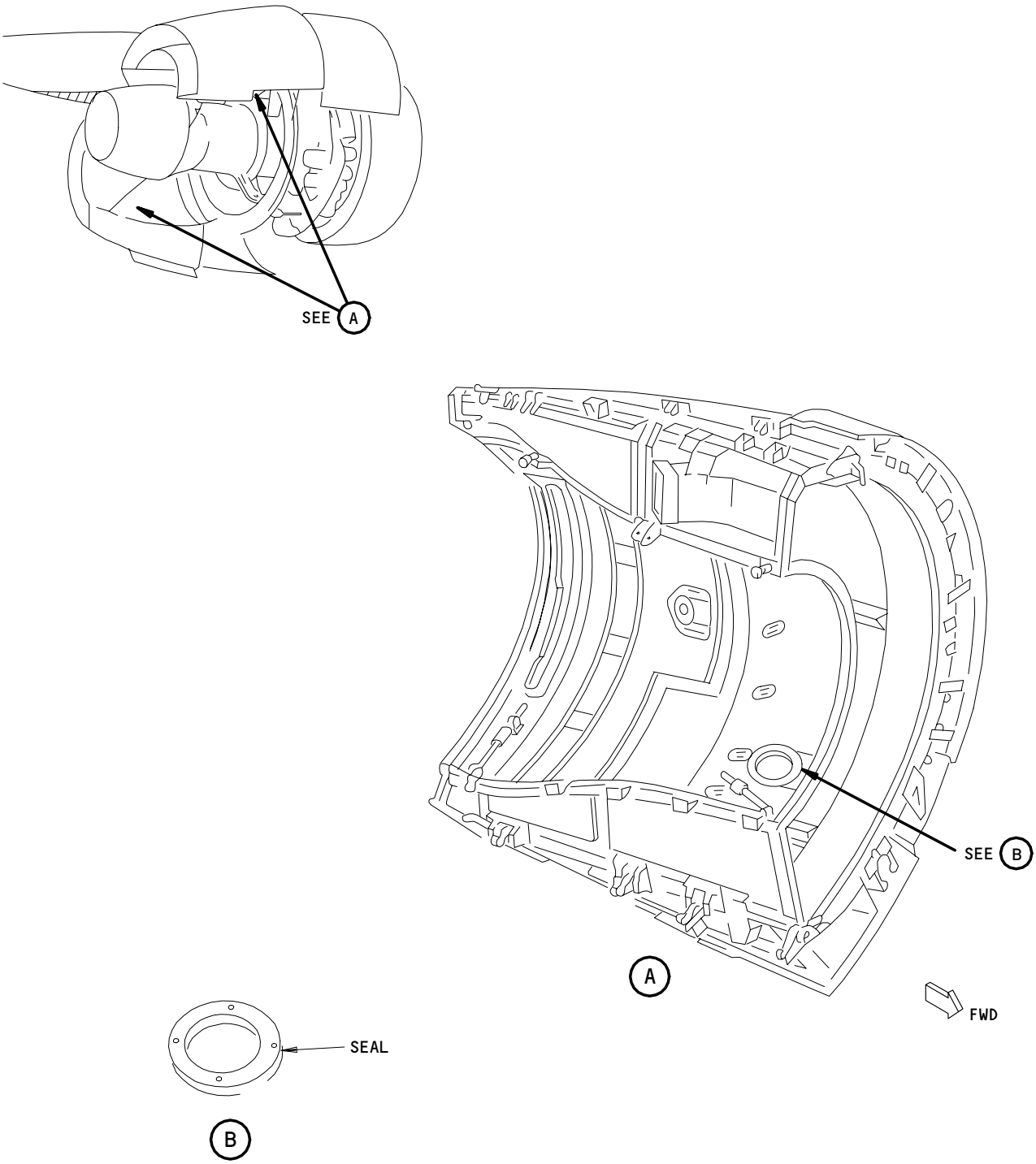
(a) If the seal is distorted, repair to FRS6142 (AMM 78-31-20/801).





A8127

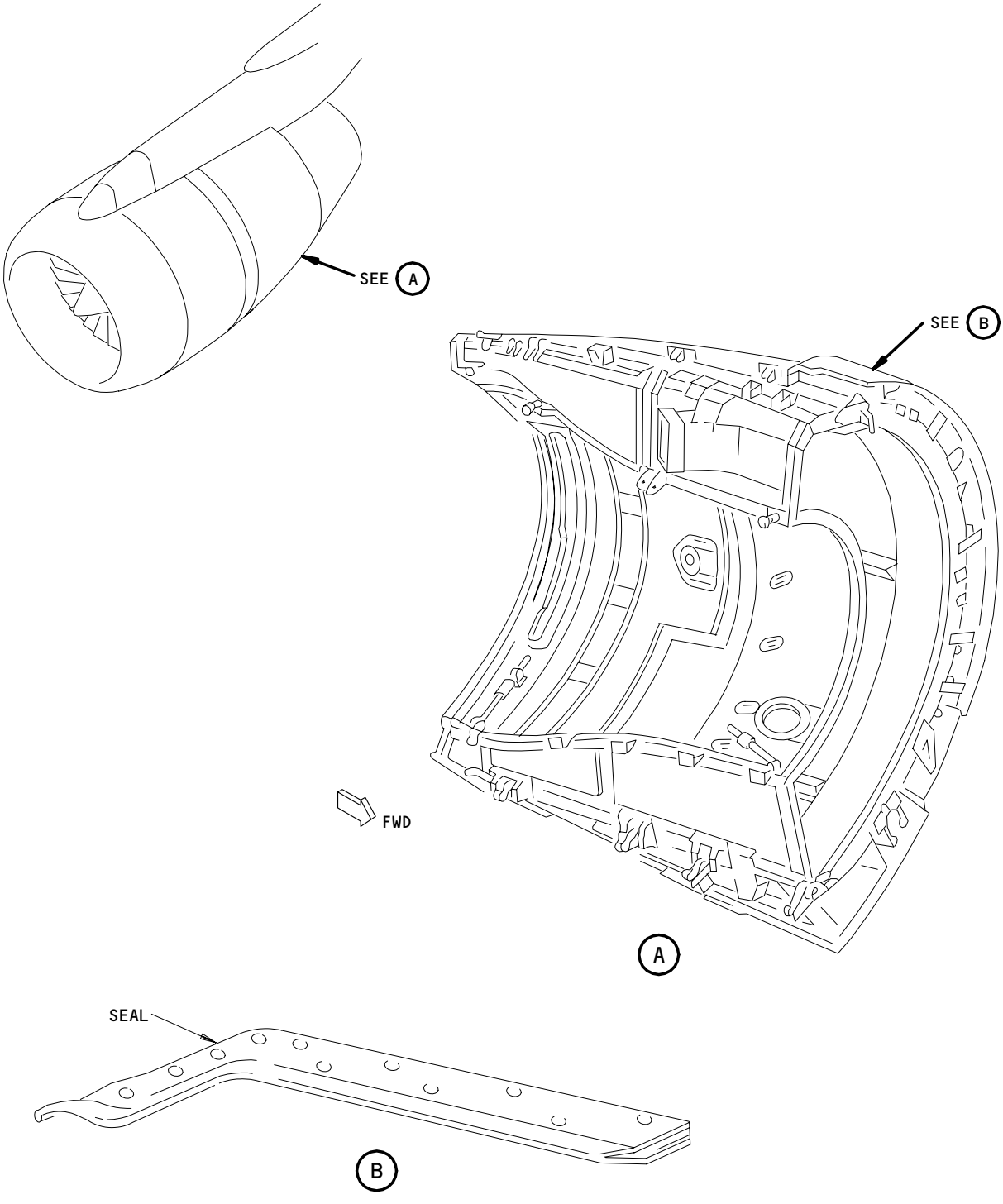
Thrust Reverser Latch Handle Release Tang
Figure 607



NOTE: LEFT SIDE INSTALLATION SHOWN,
RIGHT SIDE INSTALLATION SEAL
IS LOCATED IN THE UPPER QUADRANT.

55592

Thrust Reverser Fixed Duct Asembly Inner Seal
Figure 608



Thrust Reverser Left Hinge Access Door Forward Seal
Figure 609

(b) If tears can be seen in the seal, repair to FRS6142 (AMM 78-31-20/801).
(c) If the seal is split, repair to FRS6142 (AMM 78-31-20/801).
(d) If the seal has become brittle, repair to FRS6142 (AMM 78-31-20/801).

S 216-076-R00

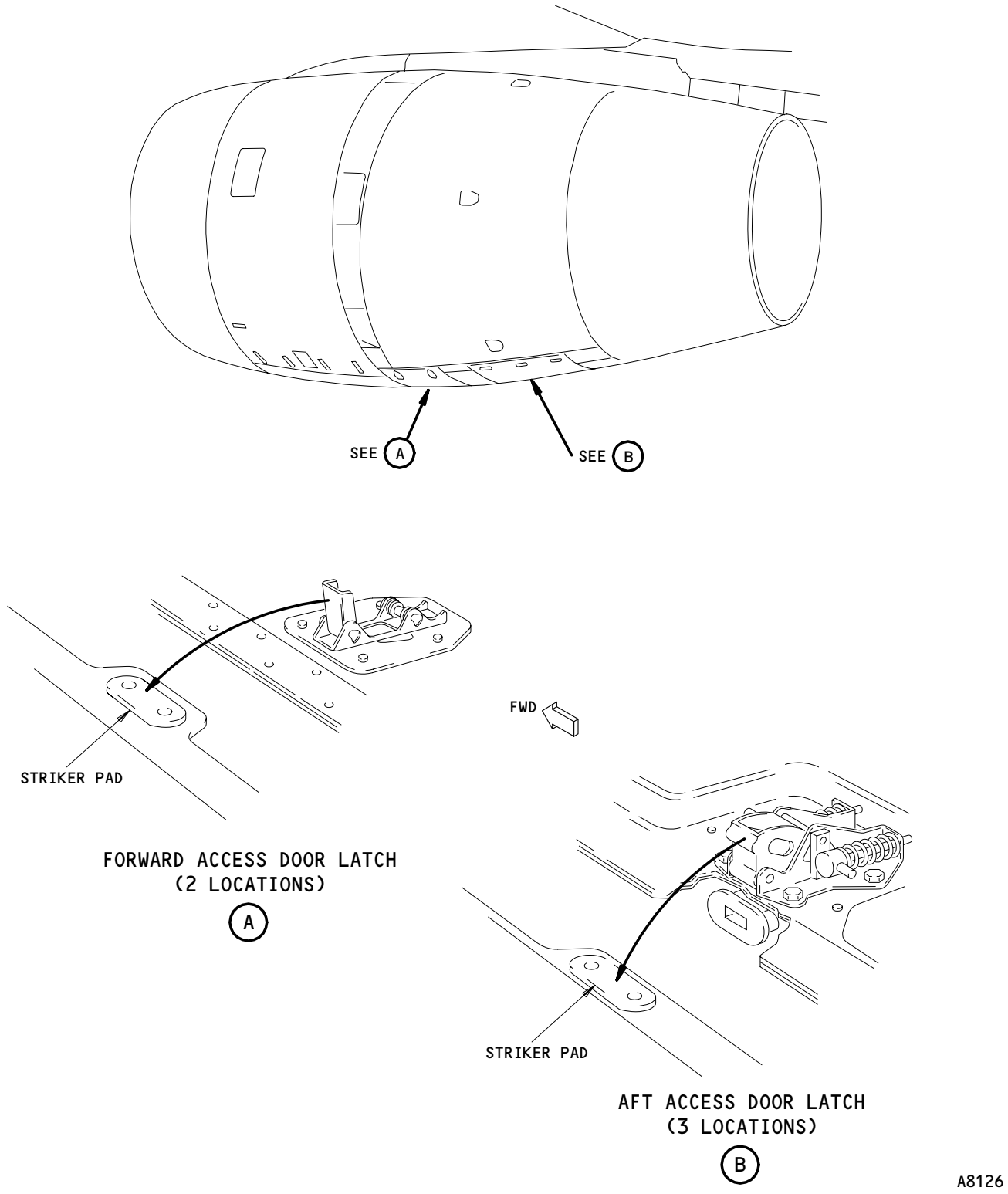
(39) Painted surfaces on the left and right fixed duct assembly.
(a) Painted surfaces that are damaged, repair to FRS6400 (AMM 78-31-20/801).

S 216-096-R00

(40) Do an inspection of the striker plates of the thrust reverser latch access panel for wear (Fig 610).
(a) The limits are as follows:
1) ENGINES PRE-RR-SB 78-8930 AND PRE-RR-SB 78-9235; Examine 5 striker plates.
2) ENGINES POST-RR-SB 78-8930; Examine 3 striker plates.
3) ENGINES POST-RR-SB 78-9235; Examine 5 striker plates.
4) If you see wear not more than 0.020 inch (0.51 mm) in depth, accept it.
5) Wear that is more than above, repair to FRS6262 (AMM 78-31-20/801).
6) If you see splits, repair to FRS6262 (AMM 78-31-20/801).

S 216-092-R00

(41) Do an inspection of the front hinge beam/thrust reverser torque box interfaces (Fig 611).
(a) If you see cracks on the area of interface between the hinge beam and the torque box, reject it.
(b) Frettage on the interface of the hinge beam and torque box is permitted if you do the step that follows:
1) Remove all the sharp edges to FRS3253 (AMM 70-42-11/201).



Thrust Reverser Latch Access Panel Striker Plates
Figure 610

S 216-091-R00

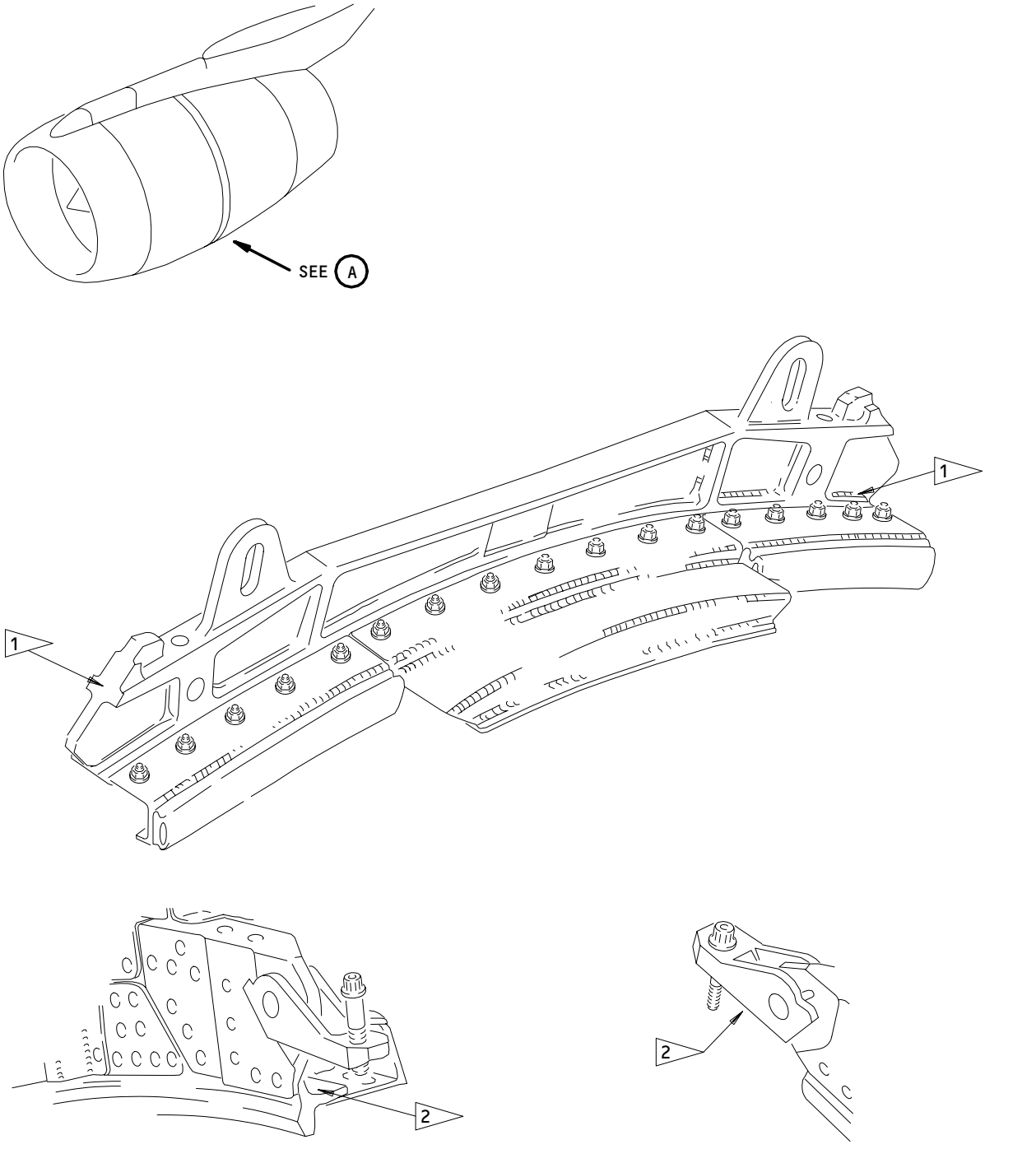
(42) Examine the left lower aft bifurcation on the thrust reverser for rubstrips that are missing (Fig 612).
  (a) If one horizontal rubstrip and/or one vertical rubstrip is missing, accept it.
  (b) If the number of rubstrips that are missing is more than above, repair to FRS6053 (AMM 78-31-20/801).

S 226-087-R00

(43) Examine the fixed duct assembly outer fairing for cracks, nicks, gouges, dents, delamination, and small holes (Fig 613).
  (a) Cracks
    1) Cracks are permitted if:

      - the cracks are not more than 0.125 inch (3.175 mm) in length for each square foot of area.

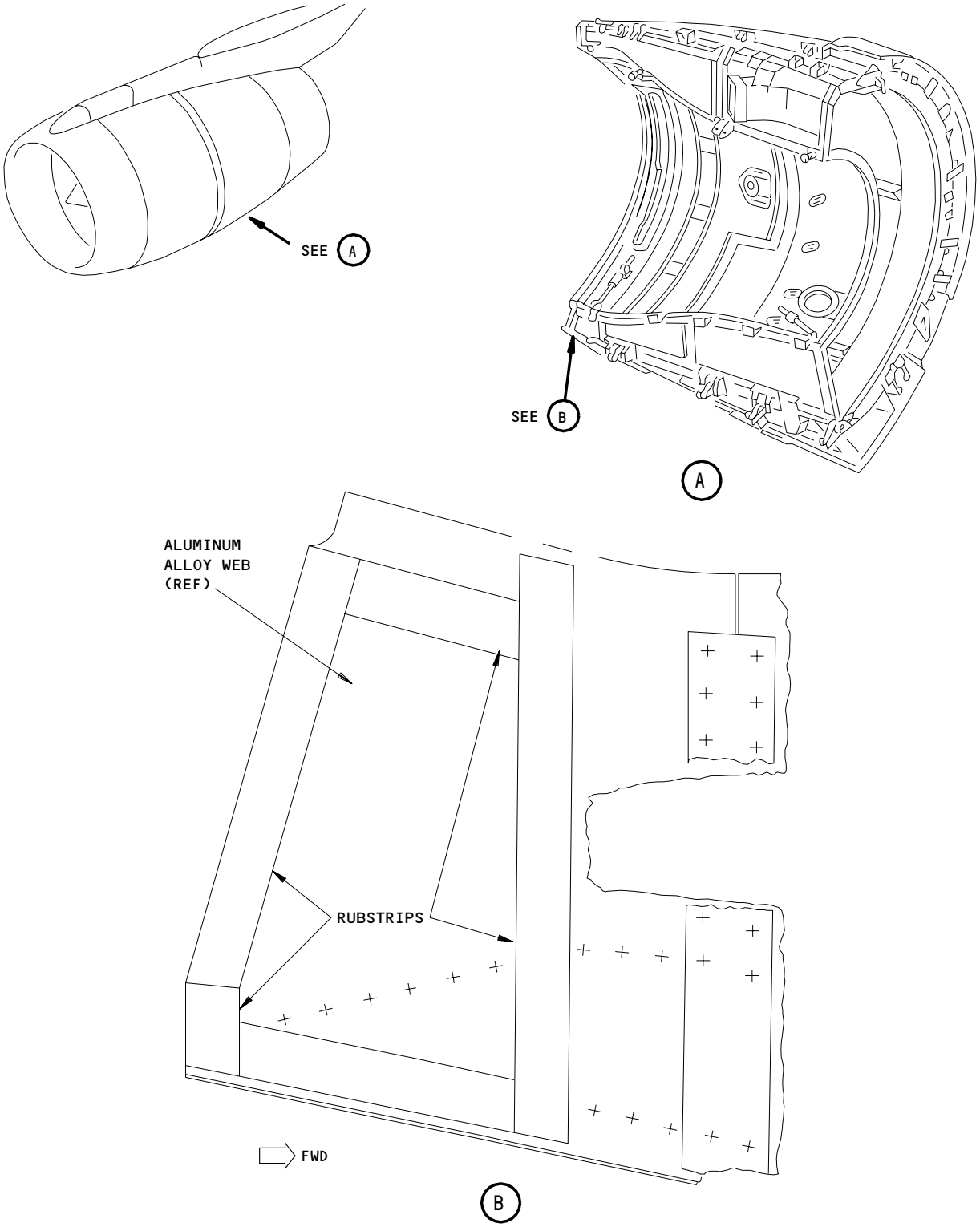
      - the cracks are more than 10.0 inches (254.0 mm) from all other damage
  (b) Nicks
    1) Nicks that are not more than 0.015 inch (0.38 mm) in depth and not more than 5.0 inches 127.0 mm) in length are permitted.
    2) Nicks that are more than above, repair to FRS6032(RH) or FRS6037(LH) (AMM 78-31-20/801).
  (c) Gouges
    1) Gouges that are not more than 0.015 inch (0.38 mm) in depth and not more than 5.0 inches (127.0 mm) in length are permitted.
    2) Gouges that are more than above, repair to FRS6032(RH) or FRS6037(LH) (AMM 78-31-20/801).
  (d) Dents
    1) Dents that are not more than 1.0 inch (25.4 mm) in diameter and are smooth and have no cracks are permitted.
    2) Dents that are more than above, repair to FRS6032(RH) or FRS6037(LH) (AMM 78-31-20/801).
  (e) Delamination
    1) Delamination that is not more than 1.0 inch (25.4 mm) in diameter is permitted.
    2) Delamination that is more than above, repair to FRS6032(RH) or FRS6037(LH) (AMM 78-31-20/801).



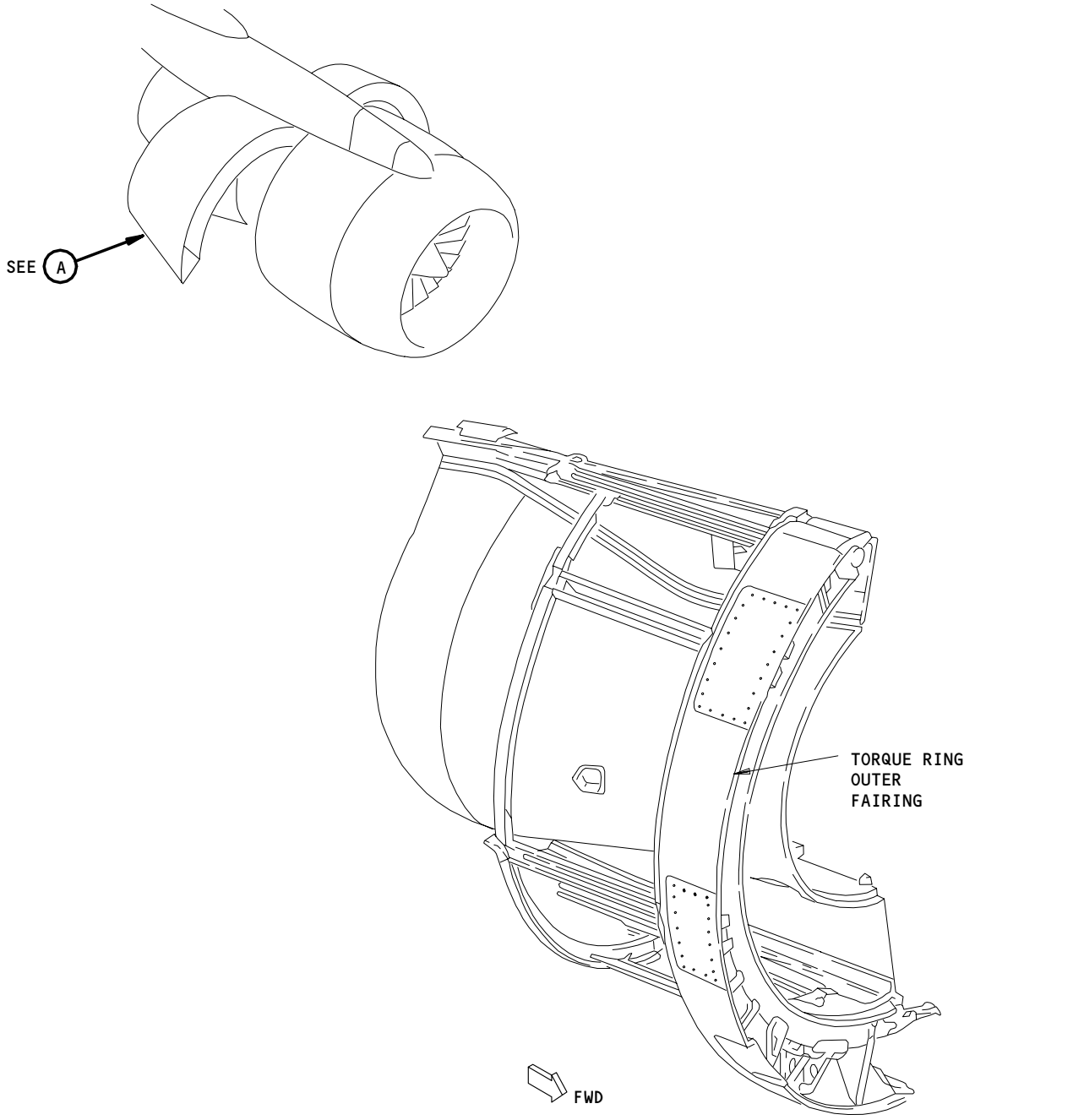
1 AREAS OF WEAR ON THE FRONT HINGE BEAM

2 AREAS OF WEAR ON THE THRUST REVERSER TORQUE RING

Thrust Reverser Front Hinge Beam/Torque Box Interfaces
Figure 611



Thrust Reverser Left Lower Aft Bifurcation Rubstrips
Figure 612



NOTE: RIGHT SIDE INSTALLATION SHOWN,
LEFT SIDE INSTALLATION OPPOSITE.

Thrust Reverser Torque Ring Outer Fairing
Figure 613

(f) Small holes

1) Small holes that are not more than 0.250 inch (6.35 mm) in diameter are permitted if:

- they are more than 10.0 inches (254.0 mm) from other damage or the edge of the material.

2) Small holes that are more than above, repair to FRS6032(RH) or FRS6037(LH) (AMM 78-31-20/801).

S 226-090-R00

(44) Examine the fixed duct assembly torque ring inner fairing for cracks, nicks, gouges, dents, delamination, small holes, and batter damage (Fig 614).

(a) Cracks

1) Cracks are permitted if:

- the cracks are not more than 0.125 inch (3.17 mm) in length for each square foot of area.

- the cracks are more than 10.0 inches (254.0 mm) from all other damage.

2) Cracks that are more than above, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).

(b) Nicks

1) Nicks that are not more than 0.015 inch (0.38 mm) in depth and not more than 5.0 inches (127 mm) in length are permitted.

2) Nicks that are more than above, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).

(c) Gouges

1) Gouges that are not more than 0.015 inch (0.38 mm) in depth and not more than 5.0 inches (127.0 mm) in lenght are permitted.

2) Gouges that are more than above, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).

(d) Dents

1) Dents that are more than 1.0 inch (25.4 mm) in diameter and are smooth with no cracks are permitted.

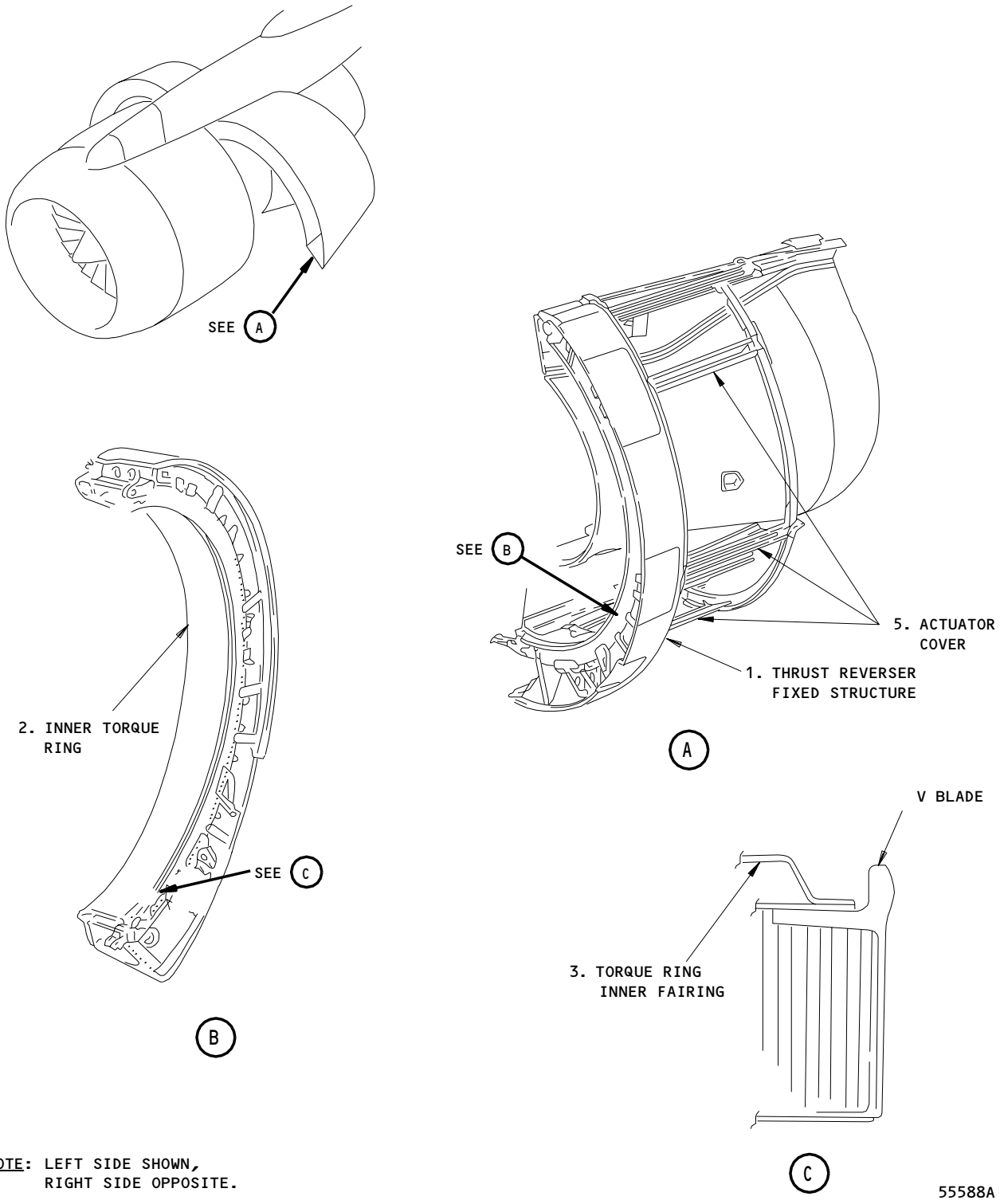
2) Dents that are more than above, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).

(e) Small holes

1) Small holes that are not more than 0.250 inch (6.35 mm) in diameter are permitted if:

- they are more than 10.0 inches (254.0 mm) from other damage or the edge of the material.

2) Small holes that are more than above, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).



NOTE: LEFT SIDE SHOWN,
RIGHT SIDE OPPOSITE.

Thrust Reverser Torque Ring Inner Fairing
Figure 614

(f) Delamination
1) Delamination that is not more than 1.0 inch (25.4 mm) in diameter is permitted.
2) Delamination that is more than above, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).
3) Delamination that is more than 0.100 inch (2.54 mm) from the edge of the material is permitted.
4) Delamination that is not more than 0.100 inch (2.54 mm) from the edge of the material, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).

(g) Batter damage
1) Material that has batter damage, repair to FRS6061(LH) or FRS6062(RH) (AMM 78-31-20/801).

S 216-024-R00

(45) Do a check of the thrust reverser thermal blanket for holes, splits, tears, cracks, damage, discoloration, or a balloon effect.

S 216-109-R00

(46) AIRPLANES WITH RB211-535E4 AND ENGINES POST-RR-SB 78-9722;
Examine the Integrated Drive Generator (IDG) scoop area of the left hand thrust reverser for cracks.
(a) If there are cracks in the area defined in Fig. 615, do the repair FRS6299 (AMM 78-31-20/801).

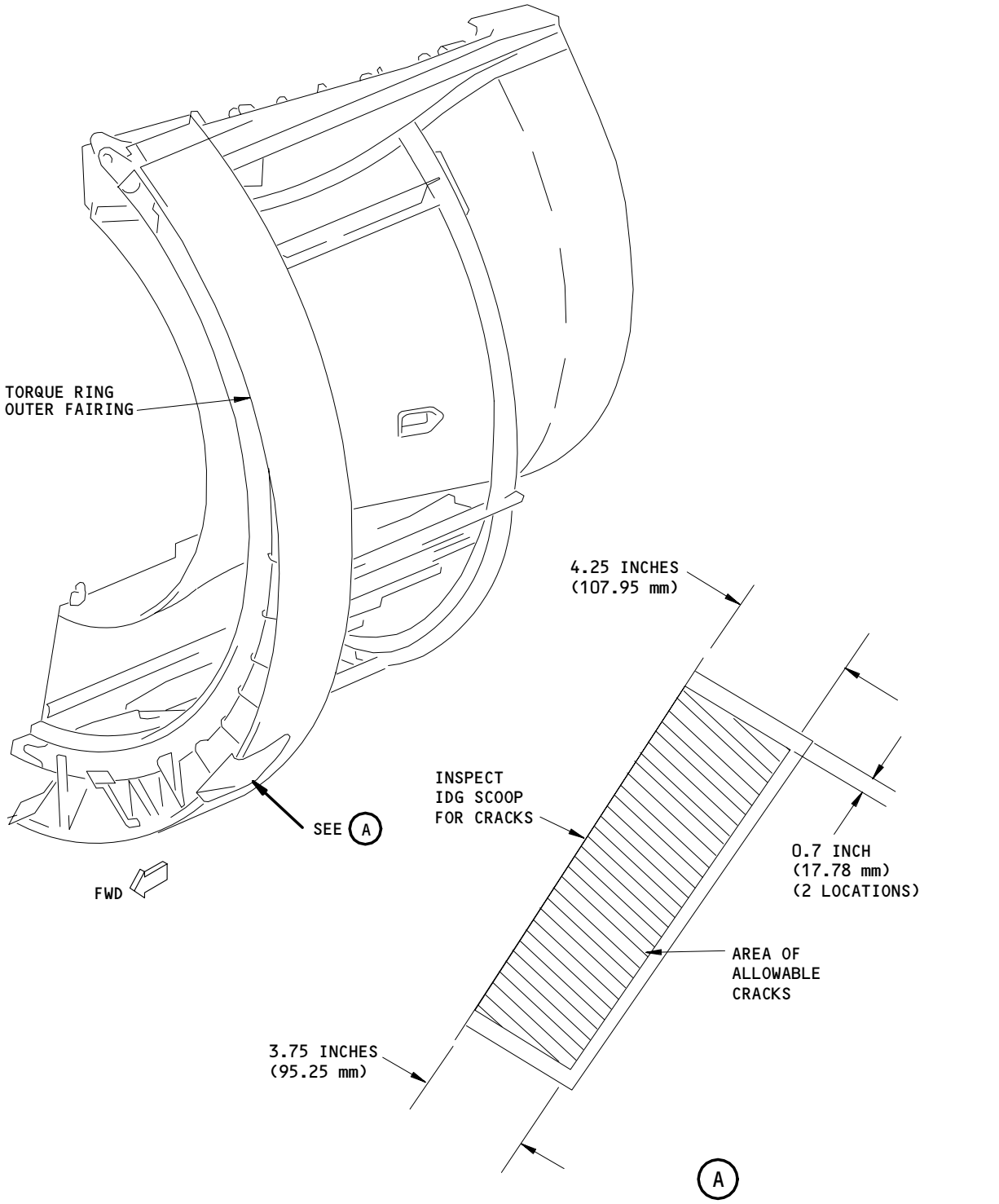
S 946-097-R00

WARNING: YOU MUST OBEY THE INSTRUCTIONS IN (AMM 78-31-00/201). IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND/OR DAMAGE TO THE FAN COWL AND THRUST REVERSER CAN OCCUR.

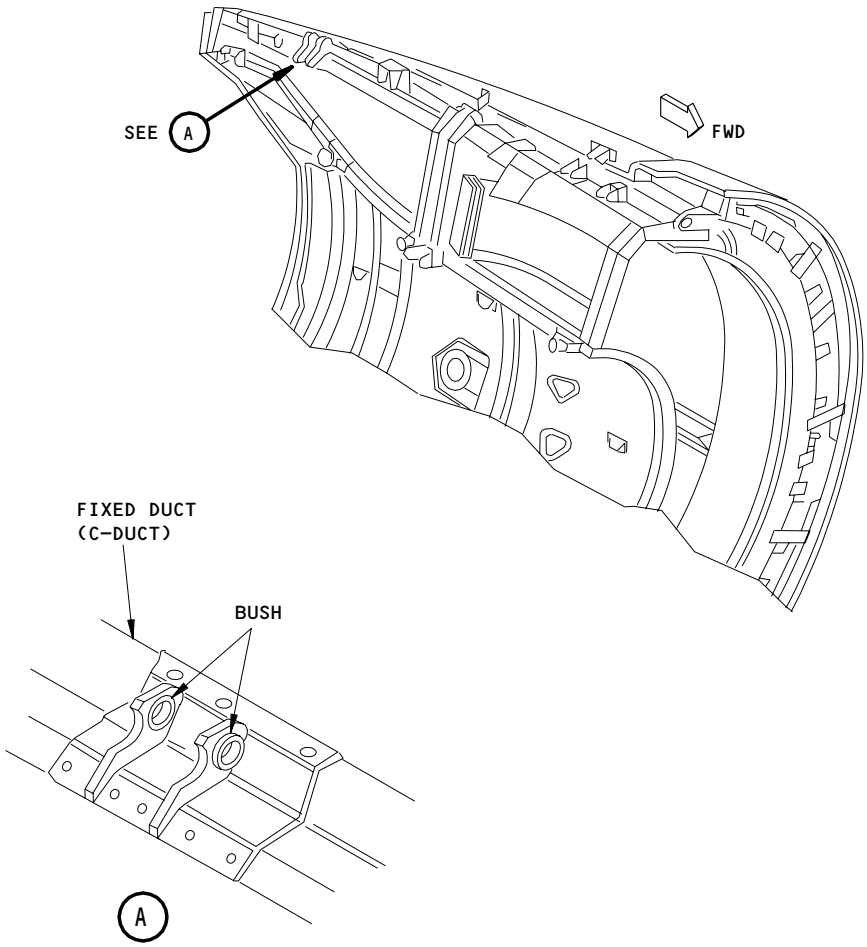
(47) The left and the right actuator covers (Fig. 614):
(a) Galling caused by hydraulic fittings is acceptable.
(b) If you want to remove the galling, blend the cover until the galling is removed, (AMM 70-42-11/201) repair FRS 3253.

S 986-113-R00

(48) Close the left (right) thrust reverser (AMM 78-31-00/201).



Left Thrust Reverser Fixed Structure
Torque Ring Aluminum Outer Fairing IDG Scoop
Figure 615



NOTE: LEFT-HAND INSTALLATION SHOWN
RIGHT-HAND INSTALLATION IS OPPOSITE HANDED

DEE0002802

Thrust Reverser C-Duct Aft Hinge Bushing
Figure 616

TASK 78-31-20-206-144-R00

3. Thrust Reverser Forward Latch Access Door Inspection

A. References

(1) AMM 78-31-00/201, Thrust Reverser System

(2) AMM 78-31-20/801, Thrust Reverser System

B. Access

(1) Location Zones

415/425	Thrust Reverser, Left
416/426	Thrust Reverser, Right

C. Procedure

S 016-141-R00

(1) Open the left (right) thrust reverser (AMM 78-31-00/201).

S 216-142-R00

(2) Visually examine the forward latch access door, use the limits that follow:

(a) Excessive damage, repair FRS6181 or FRS6316 (AMM 78-31-20/801).

(b) Cracked, repair FRS6316 or FRS6181 (AMM 78-31-20/801).

(c) Missing, repair FRS6316 or FRS6181 (AMM 78-31-20/801).

S 416-143-R00

(3) Close the left (right) thrust reverser (AMM 78-31-00/201).

THRUST REVERSER - APPROVED REPAIRS

1. General
   A. List of Repairs
      (1) These repairs are used in this procedure:
      (2) FRS.6031, LH Torque Ring Outer Fairing - Replacement
      (3) FRS.6047/6048, Replace Lockout Blade and Support Bracket
      (4) FRS.6109, Installation of Lockout Blade Damping Material
      (5) FRS.6001/6025, Replace Forward Cascade Fasteners
      (6) FRS.6043/6044, Repair Fretting Damage on Perforated Skin
      (7) FRS.6400, Restoration of Surface Protection
      (8) FRS.6052, Right Lower Bifurcation - Bumper Shim Renewal
      (9) FRS.6041/6042, Repair Honeycomb Preforated Skin
      (10) FRS.6061/6062, Torque Ring Inner Fairing - Fairing Replacement
      (11) FRS.6032/6037, Thrust Reverser Fixed Duct Assembly - Outer Fairing Repair
      (12) FRS.6161, Thrust Reverser Fixed Duct Assembly - Inner Seal Repair
      (13) FRS.6142, Left T/R - Hinge Access Door - Forward Seal Repair
      (14) FRS.6316, Forward Latch Access Door Temporary Repair
      (15) FRS.6145/6146, Upper Bifurcation - Fire Shield LJ 75559/ LJ 75948 Renewal
      (16) FRS.6175, Liner Barrel Fire Shield - Repair of Damaged Fire Shield
      (17) FRS.6002/6028, Replace Blocker Door Pivot Fitting
      (18) FRS.6045-2/6046-2, Thrust Reverser Assembly - Fire Shield - Repair of Small Holes
      (19) FRS.6192/6193, Upper Bifurcation - Fire Shield LJ 75567 or LJ 76167/LJ 755668 or LJ 76168 Renewal
      (20) FRS.6194/6195, Upper Bifurcation - Fire Shield LJ75565 or LJ 76169/ LJ 75566 or LJ 76166 Renewal
      (21) FRS.6181, Fixed Structure, Latch Access Doors - Replacement of Hinge/Door Assembly
      (22) FRS.6182/2, Fixed Structure, Latch Access Doors - Replacement of Latch
      (23) FRS.6209, C-Duct Hinges - Replacement of Bushing
      (24) FRS.6211, L.H. Fixed Structure - Repair of Inner Barrel Leading Edge

(25) FRS.6214, L.H. C-Duct Fixed Structure, Lower Attachment Hoist Points - Replacement of Nutplates
(26) FRS.6215, R.H. C-Duct Fixed Structure, Lower Attachment Hoist Points - Replacement of Nutplates
(27) FRS.6218/6219, L.H. and R.H. C-Duct Hinges - Replacement of Bushing
(28) FRS.6262, C-Duct Assembly - Replacement of Latch Access Door Striker Pad
(29) FRS.6261, Fan Thrust Reverser Torque Ring - Repair of the Outer Fairing Support Structure
(30) FRS.6222/6223, Left and Right T/R Fixed Structure Assembly - Forward Upper Bifurcation and Hinge - Beam Seals Repair
(31) FRS.6229/6230, Left and Right T/R Fixed Structure Assembly - Lower Bifurcation Seal Block Repair
(32) FRS.6233, T/R Fixed Structure Assembly - Forward Cap Angle Sealing
(33) FRS.6068/6069, Left and Right Thrust Reverser Fixed Structure Assembly - Torque Ring Inner Fairing Replacement
(34) FRS.6288, Thrust Reverser - Replace the Forward Latch Access Door Hinge
(35) FRS.6299, Left Hand Thrust Reverser Fixed Structure Torque Ring Aluminum Outer Fairing IDG Scoop Crack Repair.
(36) FRS.6320, Left and Right Thrust Reverser Fixed Structure Assembly - Re-Install the Aft Hinge Bushing.
(37) FRS.6168/6169, R.H. and L.H. Thrust Reverser Fixed Structure Inner Duct, Replace Heat Shield.
(38) FRS.6329, Thrust Reverser Fixed Structure Upper Bifurcation Seal Support Web Damage Repair (Right).
(39) FRS.6328, Thrust Reverser Fixed Structure Upper Bifurcation Seal Support Web Damage Repair (Left).

TASK 78-31-20-308-001-R00

2. LH Torque Ring Outer Fairing - Replacement

A. General
(1) This procedure, FRS. 6031, can be applied to the LH thrust reverser. It details the procedure for the replacement of LH thrust reverser fixed duct assembly torque ring outer fairings with the following part number:
(a) LJ75089

B. Equipment
(1) Heater Blankets (Tayco Engineering, Inc., Long Beach, CA)
(2) Heat Lamps - Explosionproof

C. Consumable Materials
(1) Sealant, PR-1432-GB-2 (Products Research and Chemical Corp., Glendale, CA) - Omat 8.107A (AMM 20-30-01)
(2) Grit abrasive paper (Grade 180) - Omat 5/62 (AMM 20-30-02)
(3) Adhesive, EA 956, Parts A and B (Hysol Division, Pittsburg, CA) Omat 8/117 (AMM 20-30-01)
(4) Degreasing fluid, Acetone OMat No. 150 or Isopropyl alcohol OMat No. 1/40 or Cleaning solvent (Desoclean) OMat No. 1/257
(5) Primer base, 513X329 (Desoto Inc., Berkeley, CA) (AMM 20-30-03)

(6) Top coat, catalyst X-310A (Bostik, Torrance, CA) (AMM 20-30-03)
(7) Adhesive, EA934 (Hysol Division, Pittsburg, CA) - Omat 8/52 (AMM 20-30-01)
(8) Primer, 463-6-27 (Bostik, Torrance, CA) - Omat 7/157 (AMM 20-30-03)
(9) Pro-Seal, 899B-1/2 (Essex Chemical Corp., Compton, CA) (AMM 20-30-01)
(10) Top coat base, 643-3-9 (Bostik, Torrance, CA) (AMM 20-30-03)

D. Parts

(1) Rivet - Rolls-Royce MS 20426AD5 (Local Resources)
(2) Rivet - Pre-Rolls-Royce SB 78-7466 - MS 20426AD4, Rolls-Royce SB 78-7466 - MS 20427M4-6 (Local Resources)
(3) Rivet - Pre-Rolls-Royce SB 78-7466 - MS 20470AD4, Rolls-Royce SB 78-7466 - MS 20615M4-4 (Local Resources)
(4) Fairing Scoop - LJ76108
(5) Blind Rivet, NAS1739M5 (Local Resources)
(6) Washer, AN960C8 (Local Resources)
(7) Radial strap - Rolls-Royce LJ71842
(8) Stiffener - Pre-Rolls-Royce SB 78-7466 - LJ71843 Rolls-Royce SB 78-7466 - LJ71890
(9) Bracket - Pre-Rolls-Royce SB 78-7466 - LJ71844, Rolls-Royce SB 78-7466 - LJ71887
(10) Bracket - Pre-Rolls-Royce SB 78-7466 - LJ71845, Rolls-Royce SB 78-7466 - LJ71888
(11) Angle - Pre-Rolls-Royce SB 78-7466 - LJ71846, Rolls-Royce SB 78-7466 - LJ71889

(12) Fastener - Rolls-Royce CA 3105-1032-8 or BACS12N10-8
(13) Self-locking nut - Rolls-Royce MS 21042L3

E. References
(1) AMM 78-31-00/201, Thrust Reverser System

F. Prepare for Repair

S 048-003-R00

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

(1) Do the procedure to deactivate for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 018-002-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

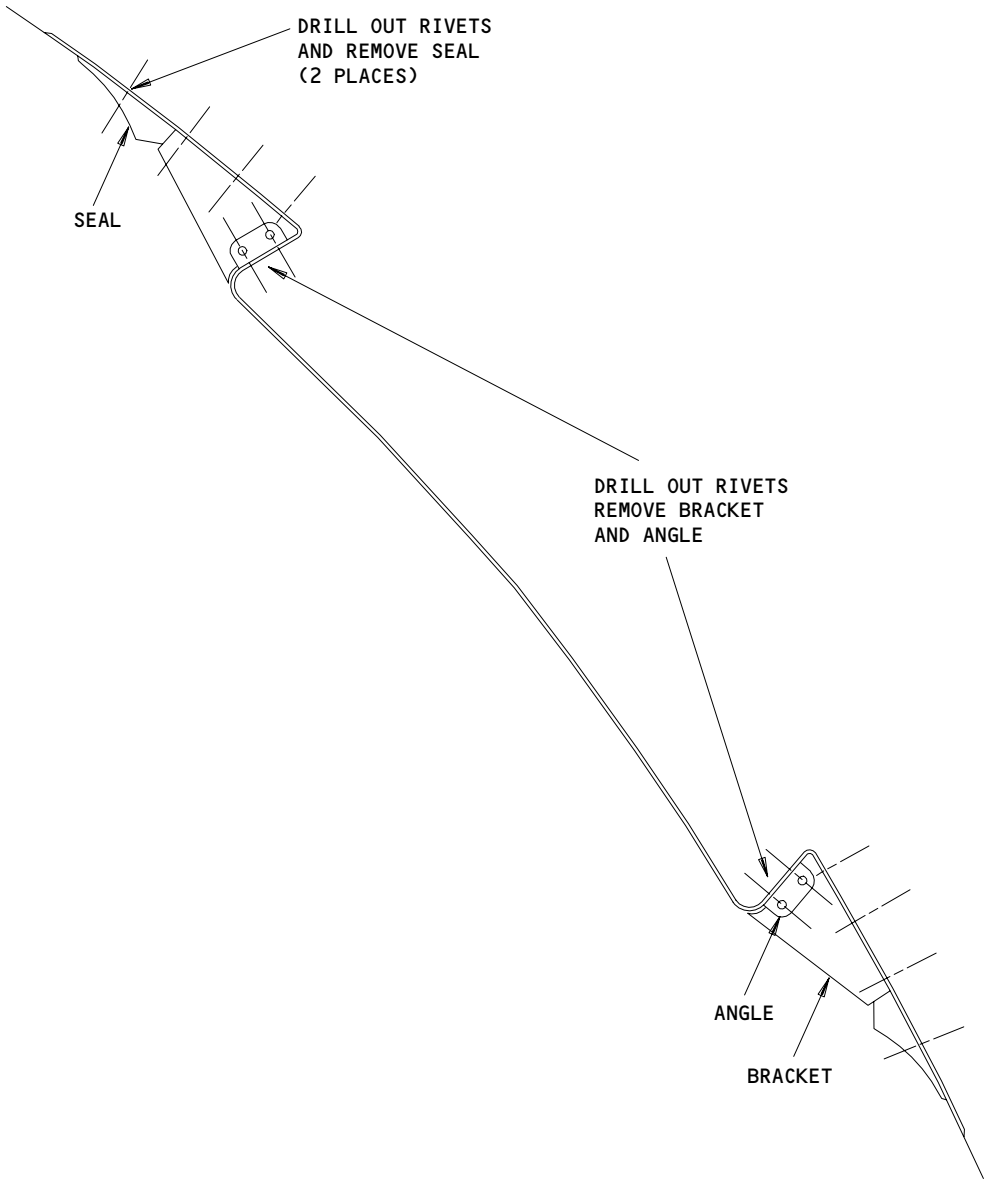
(2) Open the left thrust reverser (AMM 78-31-00/201).

S 038-004-R00
(3) Drill out rivets securing seals and remove seals (Fig. 801).

S 988-004-R00
(4) Drill out rivets securing brackets and angles. Remove brackets and angles.

S 218-005-R00
(5) Examine brackets for damage around fastener holes and if undamaged proceed to step (h).

S 218-006-R00
(6) Examine angles for damage around fastener holes and if undamaged proceed to step (h).



55823

Remove Brackets, Angles and Seals
Figure 801

S 988-007-R00
(7) Drill rivet holes in replacement bracket(s):

NOTE: Engine without RR SB78-7466, use LJ71844 or LJ71845. Engines with RR SB78-7466, use LJ71887 or LJ71888.

(a) Drill rivet holes in replacement angle(s) using the rejected bracket to match drill fastener hole pattern.

NOTE: Engines without RR SB78-7466, use LJ71846. Engines with RR SB78-7466, use LJ71889.

S 038-008-R00
(8) Remove fasteners securing radial strap(s)and remove strap(s) (Fig. 802).

NOTE: The number of radial straps fastened to scoop area of fairing may be 1, 2 or 3. Remove all radial straps.

S 218-009-R00
(9) Examine radial straps for damage around fastener holes and if undamaged proceed to step (k).

S 988-010-R00
(10) Fabricate new radial straps (Rolls Royce LJ71842) using rejected strap to match drill fastener hole pattern.
(a) Trim both ends to match rejected strap (Fig. 803).

S 378-011-R00

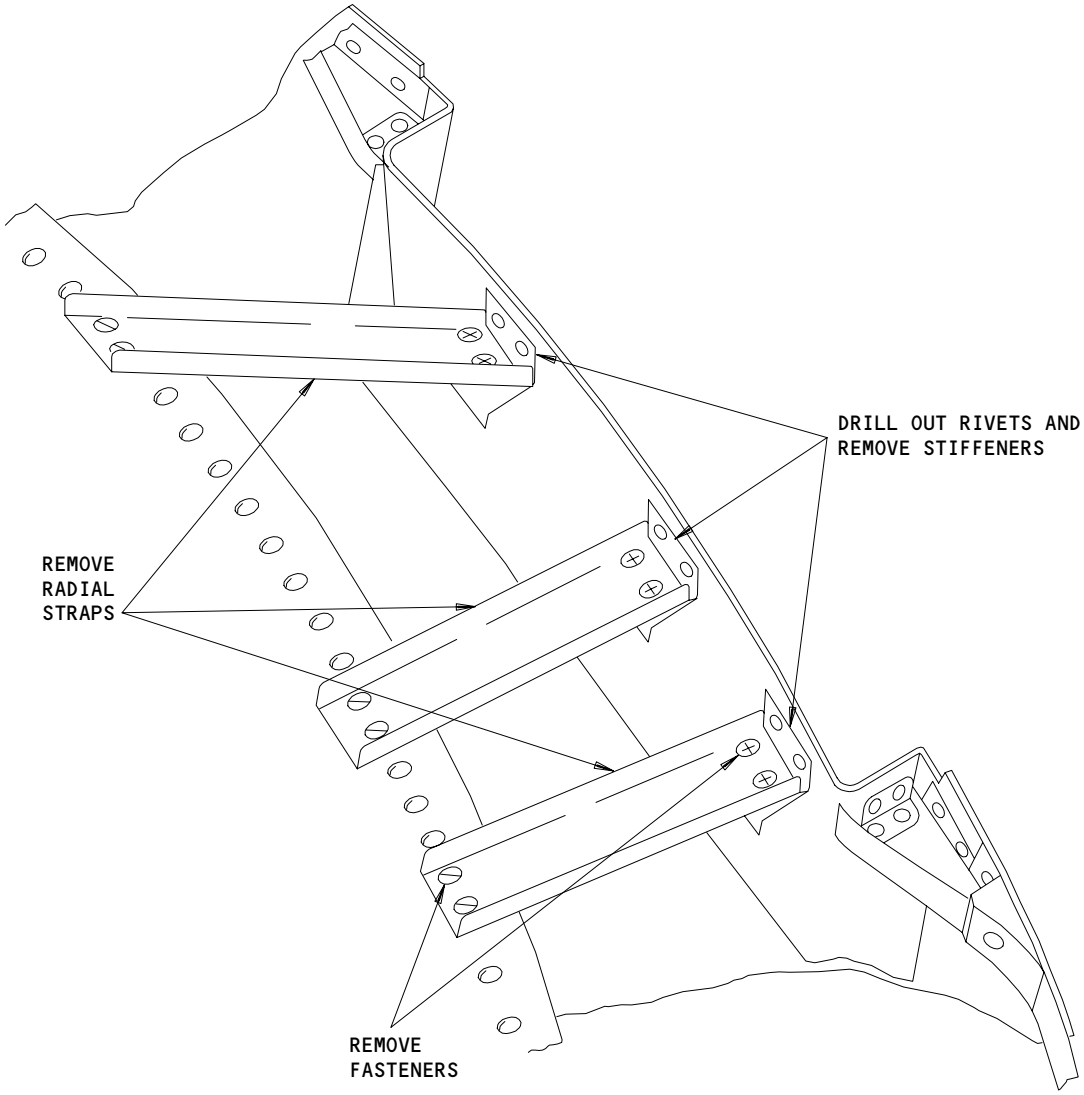
WARNING: THE AREA WHERE THE PAINTS ARE MIXED AND APPLIED MUST BE WELL VENTILATED AND EFFICIENT FUME EXTRACTION MUST BE AVAILABLE AND FLAME PROOF EQUIPMENT MUST BE USED.

(11) Prepare primer using vendor instructions.

S 378-012-R00
(12) Apply primer, using brush (1.0 inch) to touch up trimmed areas on radial straps.
(a) Allow two hours air drying time at room temperature for primer to cure.

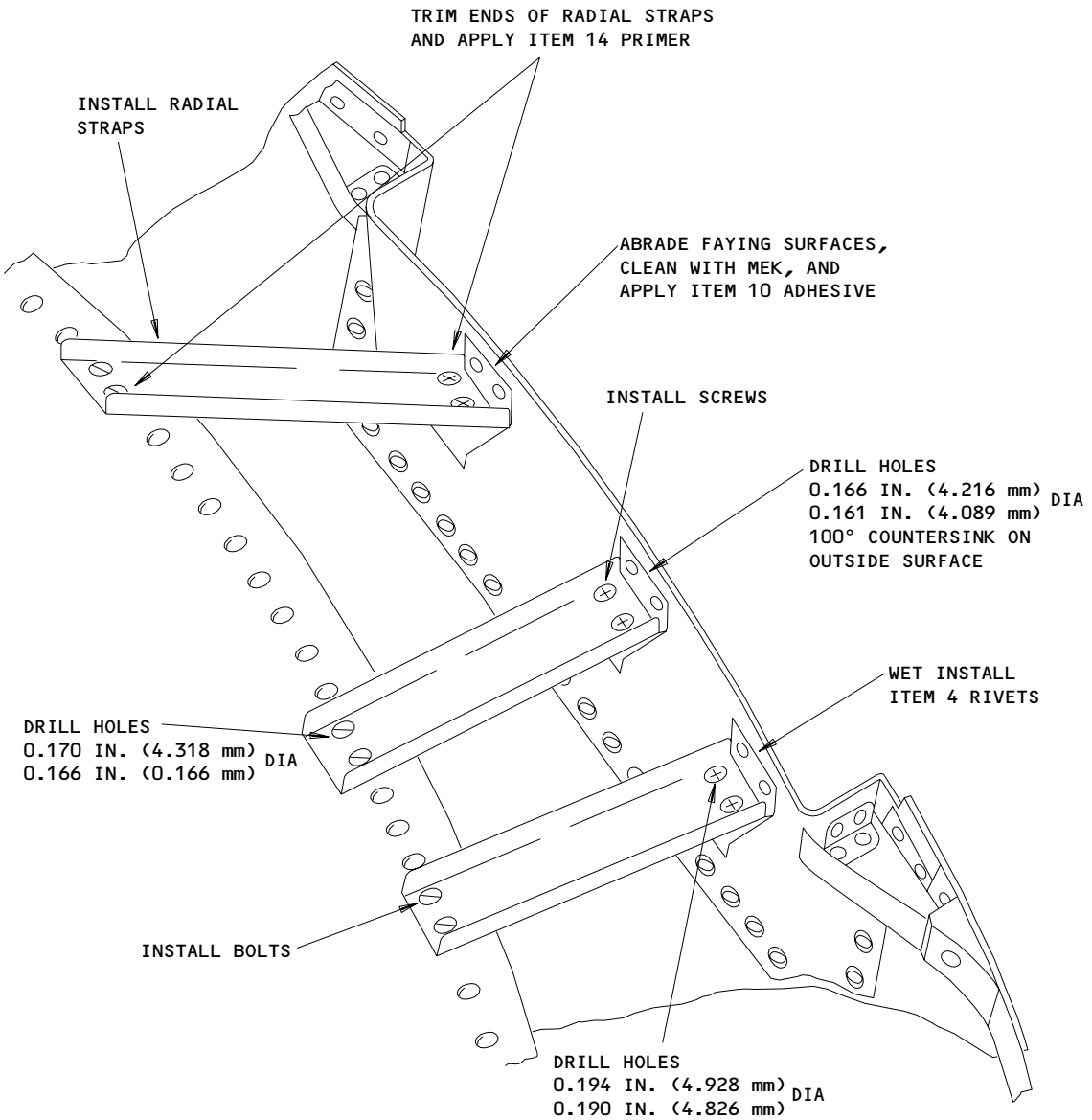
S 988-013-R00
(13) Drill out rivets securing stiffeners and remove stiffeners.

NOTE: Cooling with dry ice (solid Co2) may facilitate removal of stiffeners.



55824

Remove Radial Straps and Stiffeners
Figure 802



Install Radial Straps and Stiffeners
Figure 803

S 218-014-R00

(14) Examine stiffeners for damage around fastener holes and if undamaged proceed to step (q).

S 988-015-R00

(15) Drill rivet holes in new stiffeners using rejected stiffener to match drill hole pattern.

NOTE: Engines without RR SB 78-7466, use LJ71843. Engines with RR SB 78-7466, use LJ71890.

S 988-016-R00

WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASK, AND SAFETY GLASSES. AVOID BREATHING OF DUST OR PROLONGED CONTACT WITH SKIN.

(16) Cut out the scoop area of fairing (Fig. 804).

G. Prepare the Bonding Surfaces

S 848-017-R00

(1) Prepare the bonding surface:

WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASK, AND SAFETY GLASSES. AVOID BREATHING OF DUST OR PROLONGED CONTACT WITH SKIN.

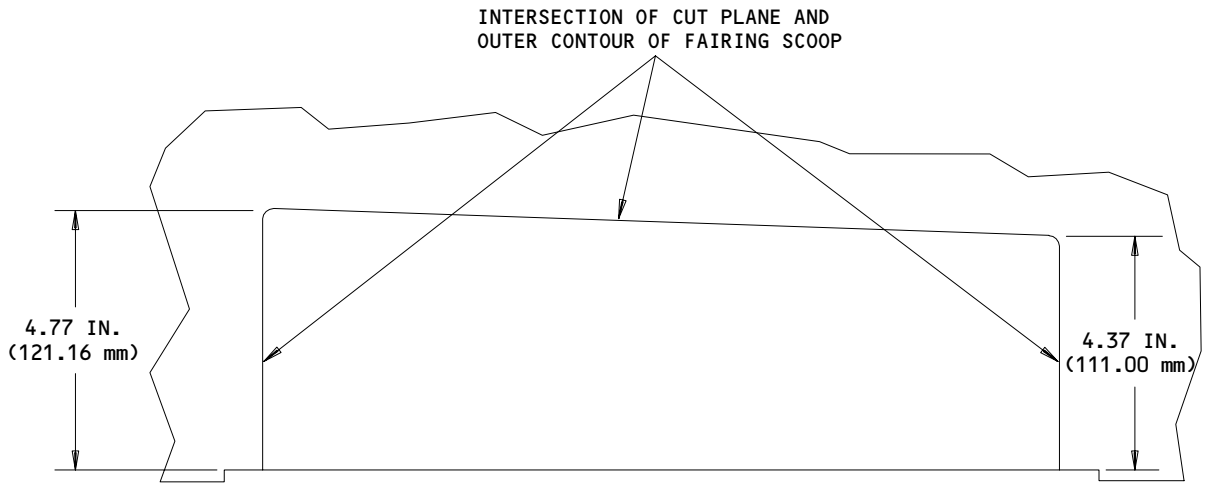
SOLVENTS AND DEGREASING FLUIDS ARE HIGHLY FLAMMABLE AND TOXIC, THEREFORE, ENSURE ADEQUATE VENTILATION, AVOID SKIN CONTACT AND INHALING OF VAPOR.

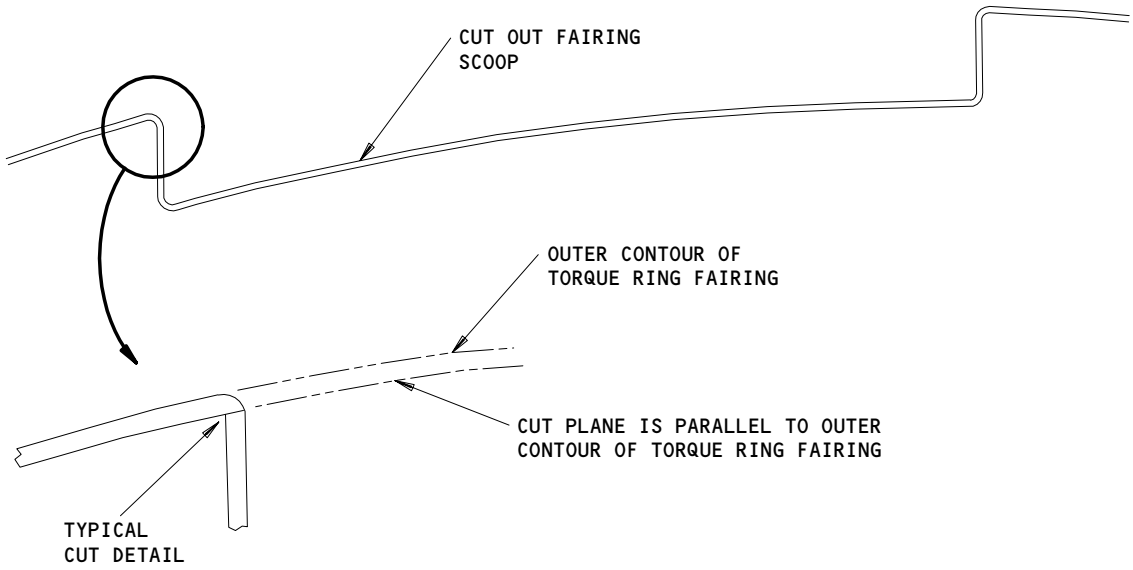
(a) Drill fastener holes (Fig. 805) using clamps to secure fairing scoop in position while drilling.
(b) Lightly abrade torque ring fairing and fairing scoop faying surfaces using abrasive paper (Grade 180).
(c) Clean torque ring fairing and fairing scoop, faying surfaces, using cheesecloth saturated with degreasing fluid.
(d) Wipe surfaces dry before degreasing fluid evaporates.

H. Install IDG Fairing Scoop (Fig. 805)

S 038-018-R00

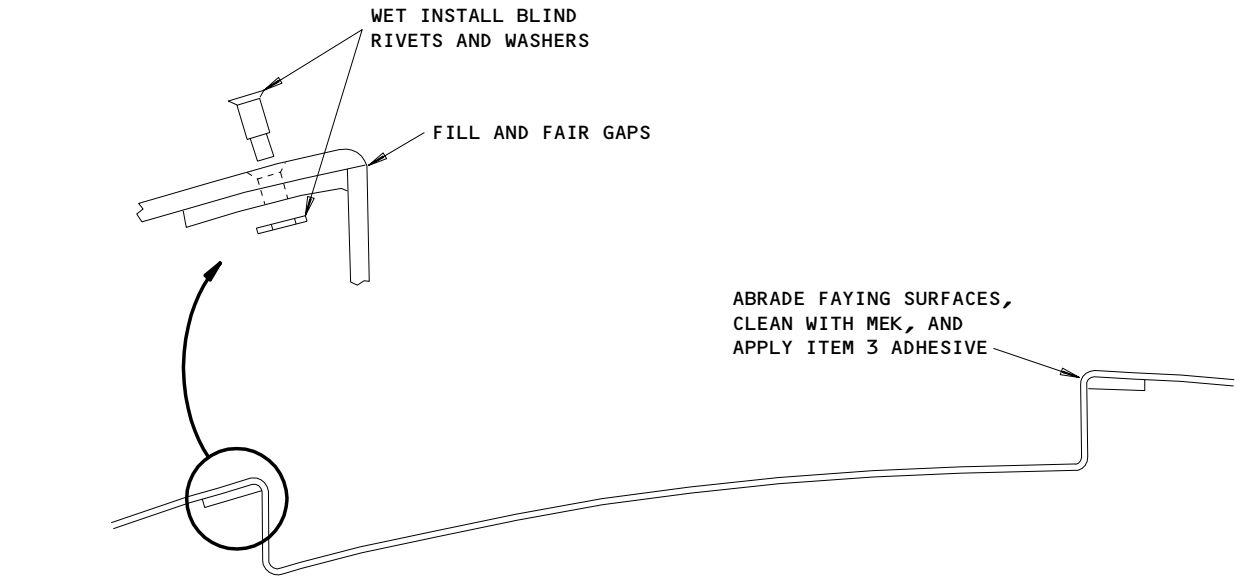
(1) Do these steps to install IDG Fairing Scoop:

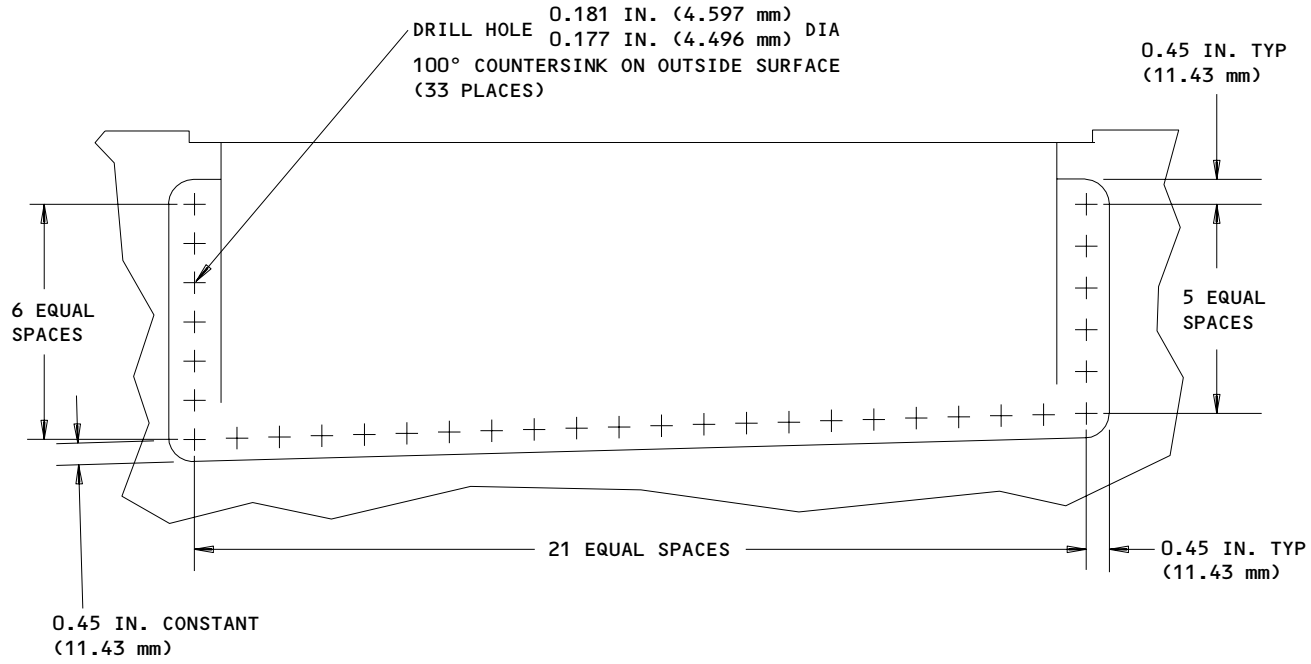




55825

Cut Out Scoop Area of Fairing
Figure 804





55826

Install Fairing Scoop
Figure 805

WARNING: ADHESIVE CAN CAUSE SKIN SENSITIZATION. USE ONLY IN AREAS WITH GOOD VENTILATION. PREVENT ALL CONTACT WITH SKIN. IF CONTACT OCCURS, WASH IMMEDIATELY WITH SOAP AND WATER.

(a) Apply adhesive (EA956), using short bristle paint brush, to torque ring fairing and fairing scoop faying surfaces.

NOTE: Clean white cotton, lintless gloves should be worn when handling adhesive.

(b) Position fairing scoop on torque ring fairing, secure in position using clamps.
(c) Install blind rivets:
1) Position washer under upset head of each blind rivet.
2) Wet install washers and blind rivets with sealant.
3) Install blind rivets flush to 0.004 inches (0.103 mm) low. Rivet shaving is not allowed.
(d) Cure adhesive using heater blanket to apply local heat at 180°F (82°C) for one hour.

NOTE: Refer to heater blanket manufacturer's instructions for method of use.

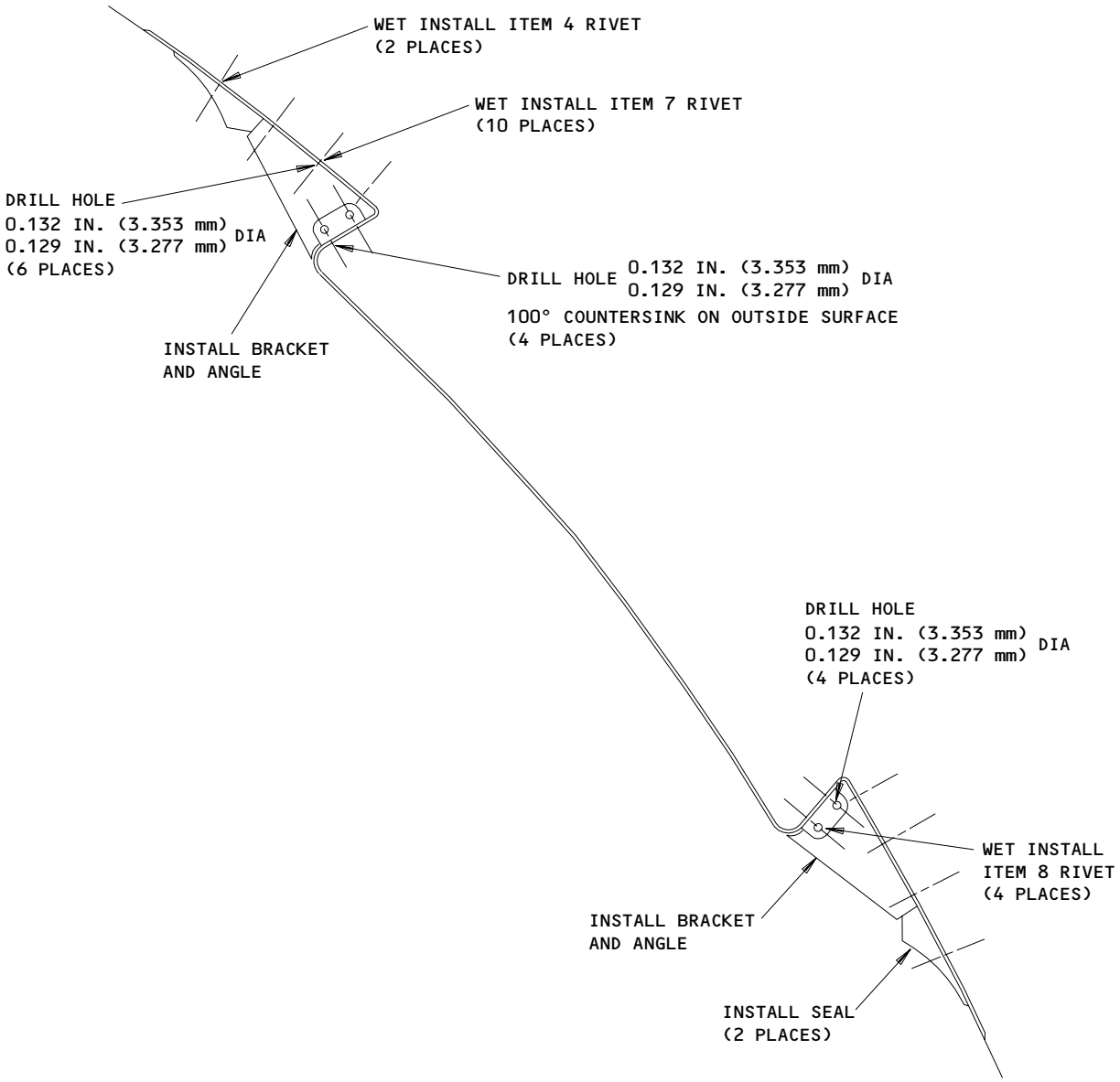
I. Install disassembled parts removed for access to rework area.

S 018-019-R00
(1) Install brackets and angles (Fig. 806).
(a) Wet install rivets with sealant.
(b) Install rivets flush to 0.004 inches (0.103 mm) low.

NOTE: Rivet shaving is not permitted.

S 018-020-R00
(2) Install seals.
(a) Wet install rivets with sealant.
(b) Install rivets flush to 0.004 inches (0.103 mm) low.

NOTE: Rivet shaving is not permitted.



55827

Install Brackets, Angles and Seals
Figure 806

WARNING: ADHESIVE CONTAINS ASBESTOS FIBERS. USE GOOD VENTILATION AND REGULATORY AGENCY APPROVED FACE MASK PARTICULARLY IF HEATED OR SPRAYED.

AVOID CREATING DUST AND INHALATION OF ASBESTOS FUMES, BREATHING IT CAN CAUSE SERIOUS BODILY HARM.

ADHESIVE CAN CAUSE SKIN SENSITIZATION. PREVENT ALL CONTACT WITH SKIN. IF CONTACT OCCURS, WASH IMMEDIATELY WITH SOAP AND WATER.

(c) Clean cured adhesive off stiffeners using abrasive paper (grade 180).

S 038-023-R00

(3) Install radial straps (Fig. 803).
   (a) Attach stiffeners to radial straps with screws to locate fastener holes on fairing scoop.
   (b) Drill fastener holes in fairing scoop, match drill existing hole pattern on stiffeners.
      1) Do not shim between stiffeners and fairing.
   (c) Remove stiffeners.

WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASK, AND SAFETY GLASSES. AVOID BREATHING OF DUST OR PROLONGED CONTACT WITH SKIN.

(d) Lightly abraid fairing scoop and stiffeners faying surfaces using abrasive paper 180.

WARNING: SOLVENTS AND DEGREASING FLUIDS ARE HIGHLY INFLAMMABLE AND TOXIC, THEREFORE, ENSURE ADEQUATE VENTILATION, AVOID SKIN CONTACT AND INHALING OF VAPOR.

(e) Clean fairing scoop and stiffeners faying surfaces using cheesecloths saturated with degreasing fluid.
   1) Wipe surfaces dry before degreasing fluid evaporates.

WARNING: ADHESIVE CONTAINS ASBESTOS FIBERS. USE GOOD VENTILATION AND REGULATORY AGENCY APPROVED FACE MASK PARTICULARLY IF HEATED OR SPRAYED.

AVOID CREATING DUST AND INHALATION OF ASBESTOS FUMES, BREATHING IT CAN CAUSE SERIOUS BODILY HARM.

ADHESIVE CAN CAUSE SKIN SENSITIZATION. PREVENT ALL CONTACT WITH SKIN. IF CONTACT OCCURS, WASH IMMEDIATELY WITH SOAP AND WATER.

(f) Apply adhesive (EA934) using short bristle paint brush to fairing scoop and stiffeners faying surfaces.

NOTE: Clean white cotton, lintless gloves shall be worn when handling adhesive.

(g) Position stiffeners on fairing scoop and secure in position using clamps.

S 038-021-R00

(4) Install rivets.
(a) Wet install rivets (MS20426AD5) with sealant (PR-1431-GB-2).
(b) Install rivets flush to 0.004 inches (0.103 mm) low. Rivet shaving is not allowed.

S 348-416-R00

(5) Cure adhesive using heater blanket to apply local heat at 180 - 200°F (82 - 93°C) for one hour.

NOTE: Refer to heater blanket manufacturer's instructions for method of use.

S 038-024-R00

(6) Attach stiffeners to radial straps with screws.
(a) Scoop may require flexing to align fasteners.

S 218-025-R00

(7) Visually inspect repair checking for irregularities in contour and loose rivets.

J. Apply finishes.

S 378-026-R00

(1) Do these steps to put the finish on the surface:

WARNING: SEALANT CAN CAUSE SKIN SENSITIZATION. USE GOOD VENTILATION. PREVENT ALL CONTACT WITH SKIN. IF CONTACT OCCURS, WASH IMMEDIATELY WITH SOAP AND WATER.

(a) Fill and fair gaps using sealant Pro-Seal as filler (Fig. 805).
(b) Cure filler using heater blanket to apply local heat at 140°F (60°C) for one hour.

NOTE: Refer to heater blanket manufacturer's instructions for method of use.

WARNING: WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASK AND SAFETY GLASSES. AVOID BREATHING OF DUST OR PROLONGED CONTACT WITH SKIN.

(c) Using abrasive paper (Grade 180) to smooth filler to contour.

WARNING: SOLVENTS AND DEGREASING FLUIDS ARE HIGHLY INFLAMMABLE AND TOXIC, THEREFORE, ENSURE ADEQUATE VENTILATION, AVOID SKIN CONTACT AND INHALING OF VAPOR.

(d) Clean faying surfaces using cheesecloths saturated with degreasing fluid.
1) Wipe surfaces dry before degreasing fluid evaporates.

WARNING: THE AREA WHERE THE PAINTS ARE MIXED AND APPLIED MUST BE WELL VENTILATED AND EFFICIENT FUME EXTRACTION MUST BE AVAILABLE AND FLAMEPROOF EQUIPMENT MUST BE USED.

(e) Prepare primer by mixing primer base, with primer catalyst.

NOTE: Refer to paint vendor's instructions for mixing.

(f) Spray apply primer, masking off adjacent areas to prevent overspray.
(g) Cure primer for two hours at room temperature.

WARNING: SOME OF THE ENAMELS USED FOR THE TOP COAT OF PAINT HAVE FLASH POINTS BELOW 73°F (23°C) AND ARE HIGHLY FLAMMABLE: SUCH ENAMELS ARE CLEARLY MARKED ON THE SUPPLIERS LABELS.

THE AREA WHERE THE PAINTS ARE MIXED AND APPLIED MUST BE WELL VENTILATED AND EFFICIENT FUME EXTRACTION MUST BE AVAILABLE AND FLAMEPROOF EQUIPMENT MUST BE USED.

(h) Prepare top coat of paint by mixing top coat base with top coat catalyst.

NOTE: Refer to paint vendor's instructions for mixing.

(i) Spray apply top coat of paint, masking off adjacent areas to prevent overspray.
(j) Cure top coat of paint for 30 minutes at room temperature then use heat lamps to apply local heat at 160 - 180°F (71 - 82°C) for 30 minutes.

S 218-028-R00

(2) Visually inspect finish.

S 938-029-R00

(3) Mark FRS.6031 adjacent to the assembly number using permanent marker pen of contrasting color.

S 418-031-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Close the left thrust reverser (AMM 78-31-00/201).

S 868-030-R00

(5) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-968-032-R00

3. Replace Lockout Blade and Support Bracket

A. General

(1) The repair procedure covered in this topic is FRS.6047 (for LH C-duct) and FRS.6048 (for RH C-duct).
(2) The procedure gives details for the replacement of the thrust reverser lockout blade and blade support bracket.
(3) The repair may be affected by:
(a) Replacing the defective lockout blade, par. 7; or
(b) Replacing the defective thrust reverser support bracket, par. (8); or
(c) May include both the previous procedures.

(4) The procedures can be applied to thrust reverser C-ducts with the following part numbers:
(a) LH fixed structure assembly - LJ75089
RH fixed structure assembly - LJ75090
LH fixed structure assembly - LJ76376 SB78-9235
LH fixed structure assembly - LJ76497 SB78-9722
LH fixed structure assembly - LJ77111 SB78-D518
RH fixed structure assembly - LJ75090
RH fixed structure assembly - LJ76377 SB78-9235
RH fixed structure assembly - LJ76554 SB78-9627
RH fixed structure assembly - LJ76690 SB78-9627
RH fixed structure assembly - LJ76498 SB78-9722

B. Parts
(1) Thrust Reverser Lockout Blade (Item 1)
Rolls-Royce LJ75214
(2) Thrust Reverser Blade Support Bracket
(Rolls-Royce LJ75359)
(3) Laminated shim (Rolls-Royce LJ70793)
(4) Hi-Lok pin (RR3408542, HL19PB5-5) (Local resources)
(5) Hi-Lok collar (RR3408526, HL86-5) (Local resources)
(6) Pin - MS9845-06 (Local Resources)
(7) Washer - AN960KD416L (RR 1205622, Local Resources)
(8) Washer - AN960KD416 (Local Resources)
(9) Cotter Pin - MS9245-25 (Local Resources)

C. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-05/401, Thrust Reverser Cascade Segments
(3) AMM 78-31-10/401, Hinge Access Doors

D. Replace thrust reverser lockout blade

S 868-033-R00

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

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 018-457-R00

WARNING: DO THE HINGE ACCESS DOOR REMOVAL PROCEDURE BEFORE OPENING THE THRUST REVERSER. FAILURE TO REMOVE THE HINGE ACCESS DOOR BEFORE OPENING THE THRUST REVERSER COULD RESULT IN DAMAGE TO THE TRANSLATING SLEEVE AND HINGE ACCESS DOOR.

(2) Remove hinge access doors (AMM 78-31-10/401).

S 988-035-R00
(3) Manually deploy thrust reverser (AMM 78-31-00/201).

S 868-454-R00
(4) Open the thrust reverser (AMM 78-31-00/201).

S 018-036-R00
(5) Remove deflector box (cascade) (AMM 78-31-05/401), immediately above and below the thrust reverser lockout blade (Fig. 807).

S 038-037-R00
(6) Remove Hi-lock fasteners securing each end of lockout blade, then remove blade (Fig. 808).

S 218-038-R00
(7) Visually check lockout blade for cracks.
(a) If any cracks are visible reject and install new lockout blade.

S 438-038-R00
(8) Install lockout blade.

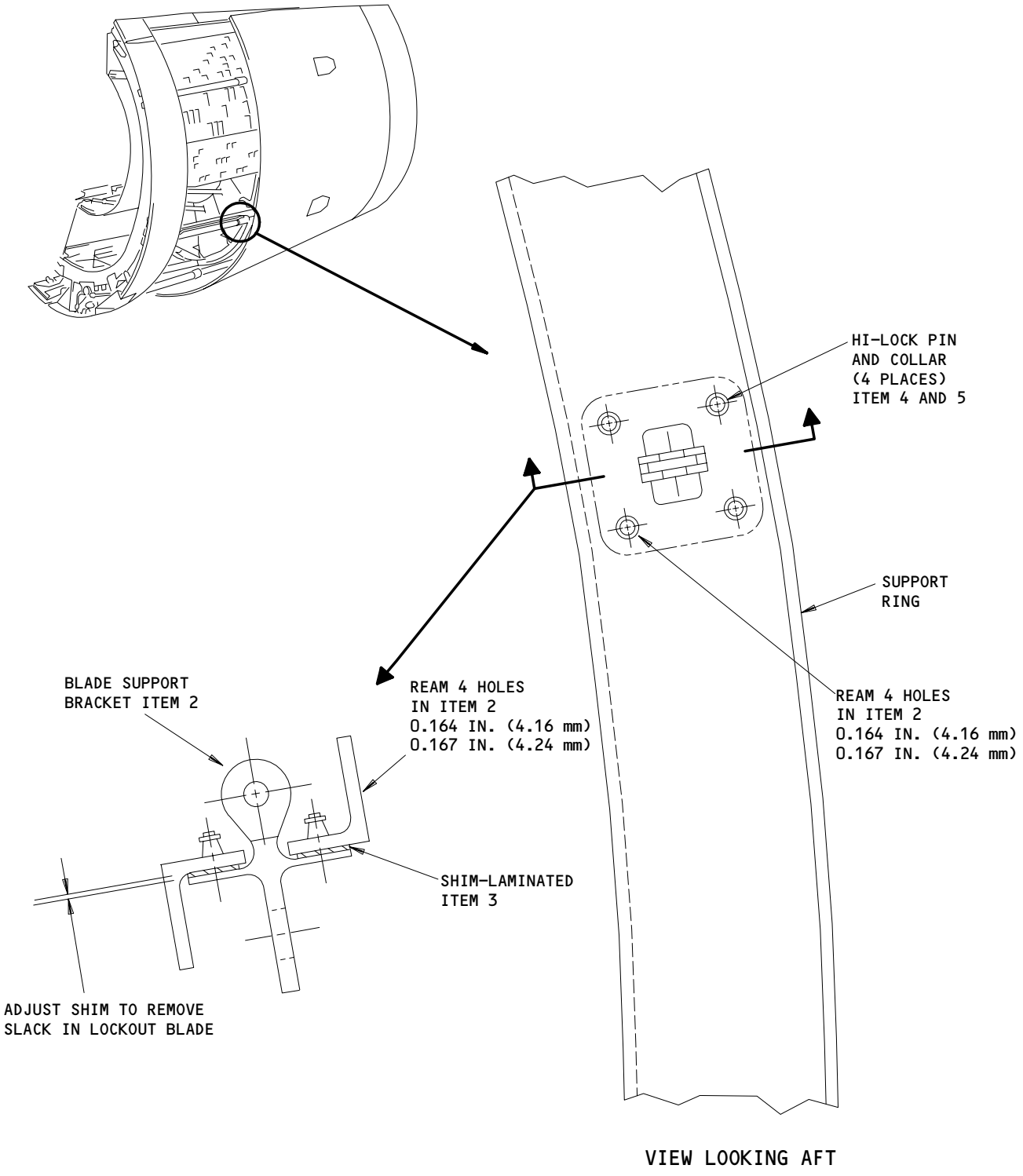
S 228-039-R00
(9) Check replacement blade hole sizes (Fig. 809).
(a) Enlarge holes to dimensions shown.
(b) Position lockout blade on thrust reverser and install pins (MS9845-06) to hold in position.
1) If pins cannot be freely installed remove Hi-lock pins and collars securing blade support bracket to support ring (Fig. 807) and using laminated shims adjust as necessary.
2) Install pins and collars.
(c) Install washers (RR1205622, AN960KD416) and cotter pin (MS9245-25) to secure ends of lockout blade.

S 418-040-R00
(10) Install deflector boxes (cascades) (AMM 78-31-05/401).

S 938-041-R00
(11) Mark the repair number adjacent to C-duct fixed structure assembly number, using a permanent marker pen of contrasting color.

NOTE: Use FRS.6047 for the LH C-duct and FRS.6048 for the RH C-duct.

S 868-455-R00
(12) Close the thrust reverser (AMM 78-31-00/201).



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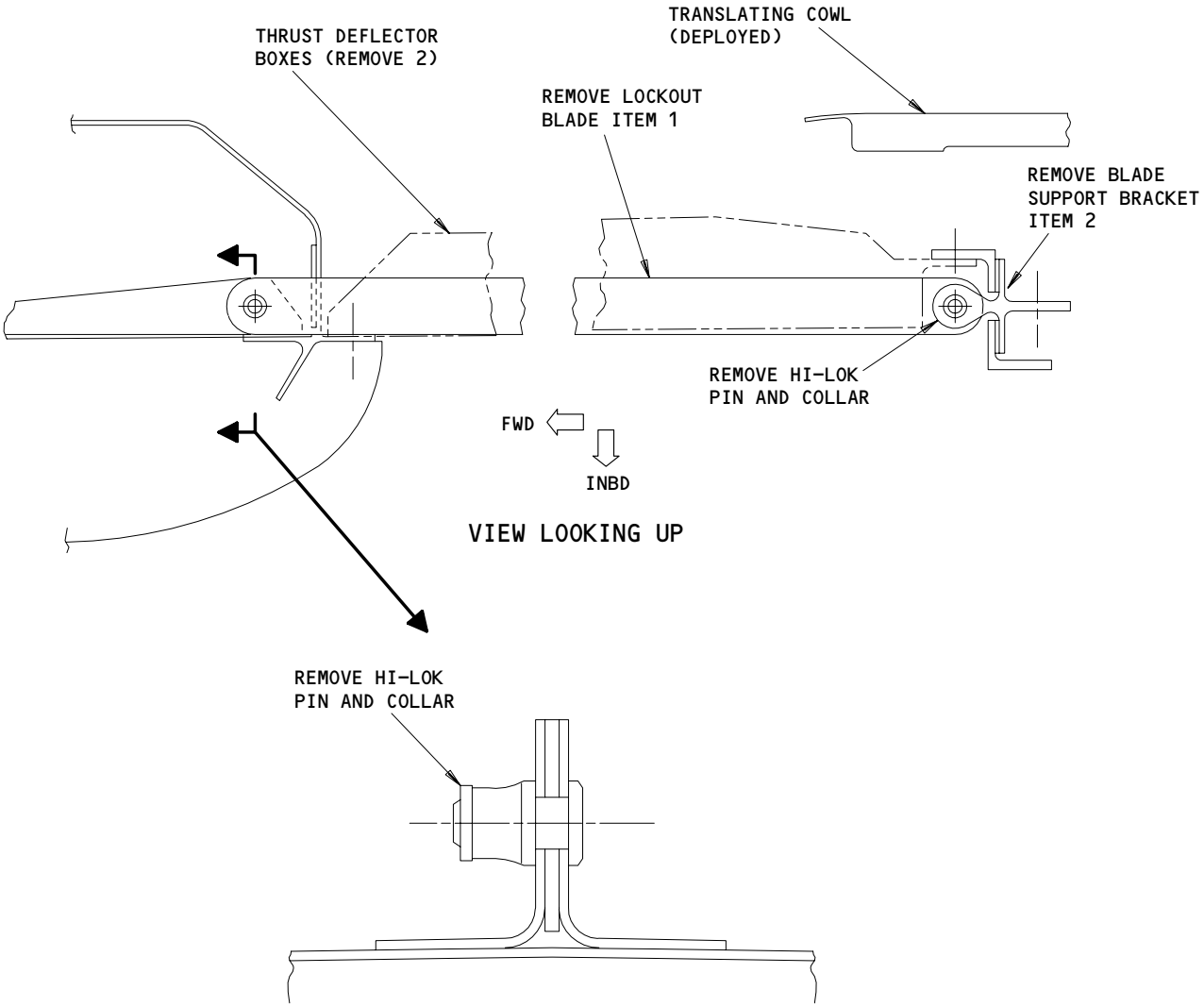
Lockout Blade Laminate Shim - Adjustment
Figure 807



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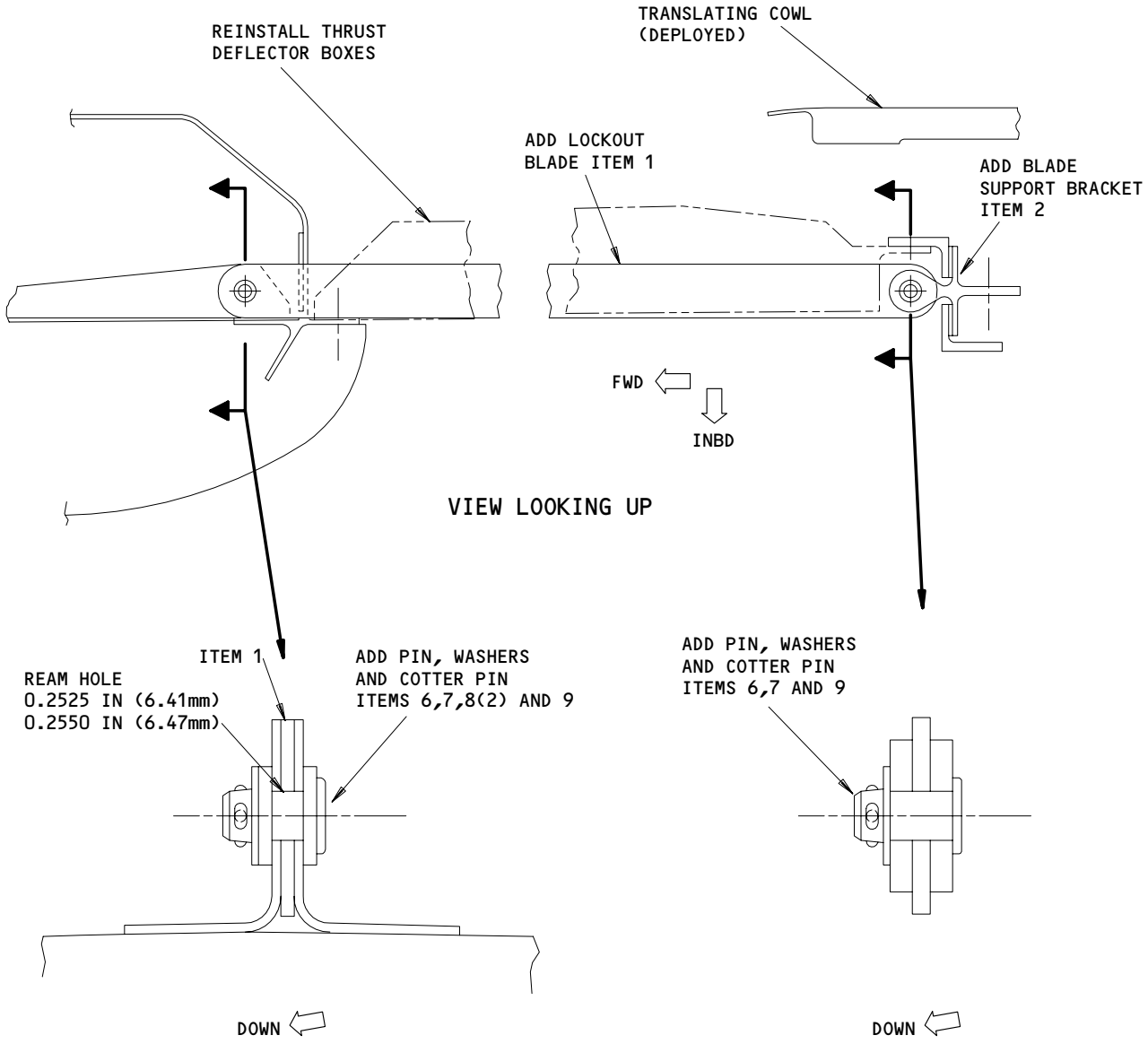
Thrust Reverser Lockout Blade - Removal
Figure 808



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Thrust Reverser Lockout Blade - Installation
Figure 809

S 988-042-R00
(13) Manually stow thrust reverser (AMM 78-31-00/201).

S 418-456-R00
(14) Install the hinge access door (AMM 78-31-10/401).

E. Replace blade support bracket

S 038-043-R00
(1) Do these steps to remove the blade bracket:
(a) Remove lockout blade as in 1.c.(7), (a), (b) and (c).
(b) Remove blade support bracket by removing the four Hi-Loc pins and collars.
(c) Visually check support bracket for cracks.
1) If any cracks are visible reject and install new support bracket.
(d) Check hole sizes in replacement bracket.
1) Enlarge holes to dimensions shown.
(e) Position shims between support bracket and support ring then install Hi-lock pins and collars to secure bracket.
(f) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).
(g) Perform operations in par. 1.c.(7), (f), (g) and (h).

TASK 78-31-20-968-044-R00

4. Installation of Lockout Blade Damping Material

A. General
(1) This procedure (FRS.6109) applies to the thrust reverser. It details the procedure for applying sealant to the thrust reverser lockout blade to reduce vibration.
(2) This procedure can be applied to thrust reverser halves with the following part numbers:
(a) Left thrust reverser C-duct - Rolls-Royce LJ75005
(b) Right thrust reverser C-duct - Rolls-Royce LJ75006

B. Equipment
(1) Heat Lamps - Explosion Proof

C. Consumable Materials
(1) Sealant - PR1750
(Products Research and Chan Corp., Glendale, Ca 92109)
OMat No. - 8/120A, OMat No. - 8/120B
(2) Degreasing Fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(3) Silicon carbide abrasive paper - 320 grade
OMat No. - 5/33
(4) Lint free cloth - local resources

D. References
(1) AMM 78-31-00/201, Fan Thrust Reverser System

(2) AMM 78-31-05/401, Fan Thrust Reverser Cascade Segments

E. Sealing Lockout Blade in Installed Location

S 868-045-R00

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT 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 of the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 988-046-R00

(2) Manually deploy thrust reverser (AMM 78-31-00/201).

S 358-047-R00

(3) Do these steps to seal the lockout blade in its installed position:
   (a) Remove deflector boxes (Fig. 810) (cascade segments) (AMM 78-31-05/401) adjacent lockout blade and (for access) next lower deflector box.
   (b) Remove any loose rubber bumper pads from lockout blade.
   (c) Using abrasive paper, lightly abrade lockout blade and adjacent deflector boxes abutment faces.

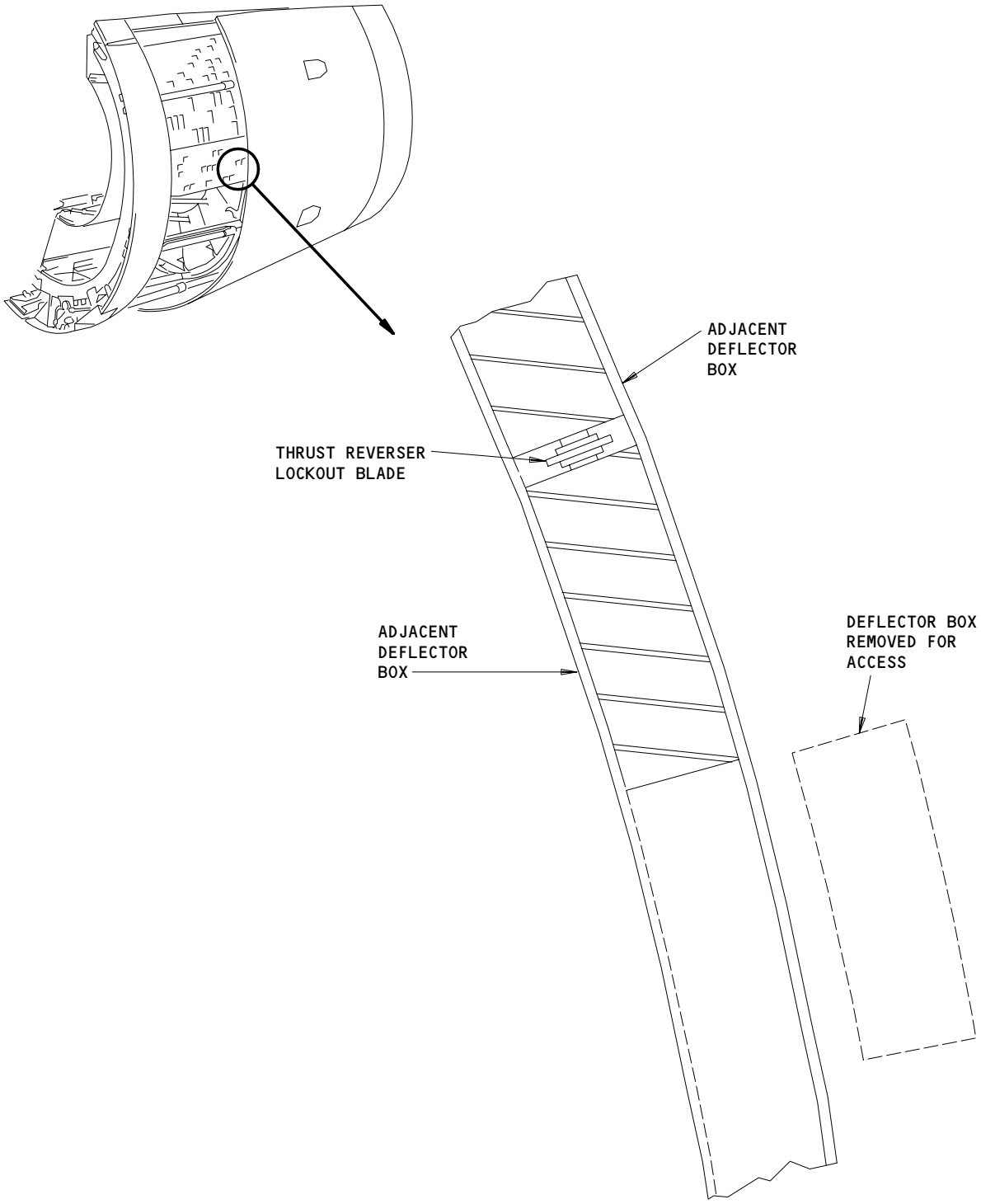
WARNING: SOLVENTS AND DEGREASING FLUIDS ARE HIGHLY INFLAMMABLE AND TOXIC, THEREFORE, ENSURE ADEQUATE VENTILATION, AVOID SKIN CONTACT AND INHALING OF VAPOR.

CAUTION: WHEN USING DEGREASING FLUID CARE MUST BE TAKEN AS SURFACE PROTECTION WILL BE AFFECTED. ANY AFFECTED AREA MUST BE REPROTECTED IN ACCORDANCE WITH AMM 70-42-12/201.

   (d) Using degreasing fluid, clean area abraded.
   (e) Cut away any previously applied sealant.

NOTE: It is permissable to leave a film of sealant on the components provided it is firmly bonded and in a clean condition.

   (f) Install two deflector boxes adjacent lockout blade removed in par. 1D.(6)(b) (AMM 78-31-05/401).



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Removal/Installatio of Deflector Boxes
(Left C-duct Shown - Right C-duct Similar)
Figure 810

WARNING: TAKE PRECAUTIONS TO PREVENT SEALANT COMPOUND FROM COMING IN TO CONTACT WITH THE SKIN.

(g) Working through access provided by removed lower deflector box and using sealant compound, seal gap on inside between deflector boxes that enclose lockout blade (Fig. 811).

NOTE: When viewed from outside, gap should be completely filled but lockout blade outer edge should be visible for its entire length.

1) Allow to air dry at room temperature for a minimum period of 4 hours.

S 218-048-R00

(4) Visually inspect sealant compound for smoothness and to ensure gap is completely filled.

S 938-049-R00

(5) Using permanent marker pen of contrasting color mark FRS.6109 adjacent deflector box part number.

S 418-050-R00

(6) Refer to Fig. 810, install deflector box removed for access (AMM 78-31-05/401).

S 988-051-R00

(7) Manually stow thrust reverser (AMM 78-31-00/201).

S 868-052-R00

(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

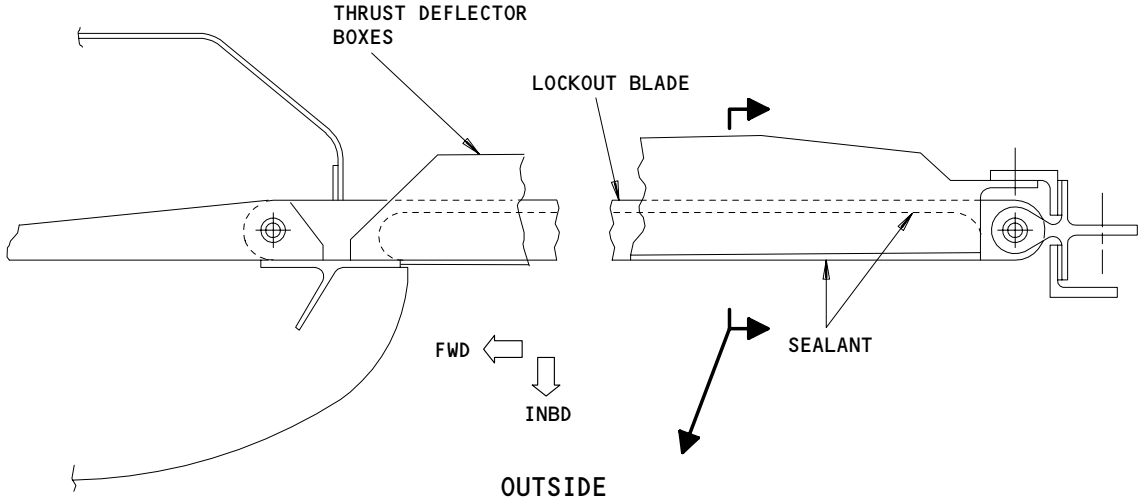
TASK 78-31-20-968-053-R00

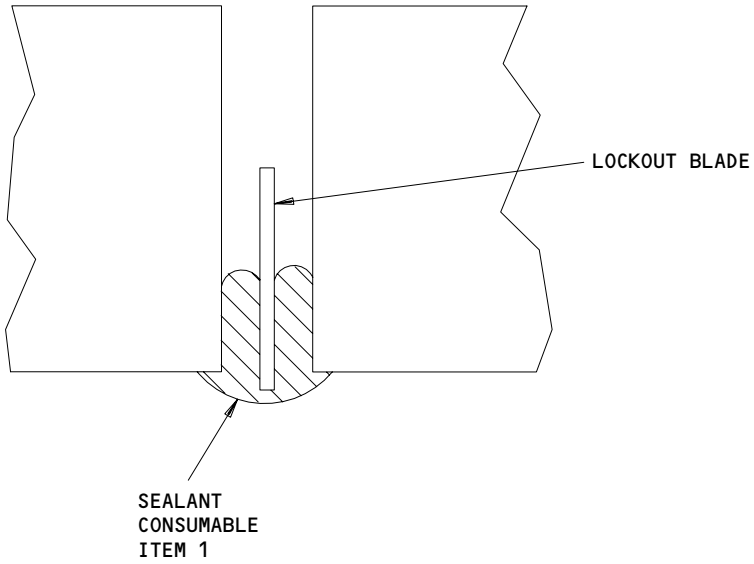
5. Replace Forward Cascade Fasteners

A. General

(1) The repair procedure covered in this topic is FRS.6001 (for LH fixed structure assembly) and FRS.6025 (for RH fixed structure assembly) with the following part numbers:

(a) LH assembly - Rolls-Royce LJ75089
RH assembly - Rolls-Royce LJ75090
RH assembly - Rolls-Royce LJ76377
RH assembly - Rolls-Royce LJ76554
RH assembly - Rolls-Royce LJ76690
RH assembly - Rolls-Royce LJ76498





55998

Sealant Compound Application
Figure 811

(2) The procedure gives details for replacing defective nut plates with blind nut assemblies and the renewal of blind nut assemblies.

B. Equipment

(1) Blind nut assembly installation tools comprising:

(a) Air-hydraulic portable power unit No. BH245-25.
or alternate tool
Hand pump and case assembly No. BH25A.

(b) Anvil - A28-428

(c) Chuck C2-12.

(d) Mandrel M2-5-12.

NOTE: The above items are available from Hi-Shear Corp, Torrance, CA.

C. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

D. Parts

(1) Expander - BB341-12 (Hi-Shear Corp)

(2) Sleeve - BN517-428-4 (Hi-Shear Corp)

E. References

(1) AMM 78-31-00/201, Thrust Reverser System

F. Replace defective cascade fastener.

S 868-054-R00

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT 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 (AMM 78-31-00/201).

S 018-056-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Open the thrust reverser (AMM 78-31-00/201).

S 018-057-R00

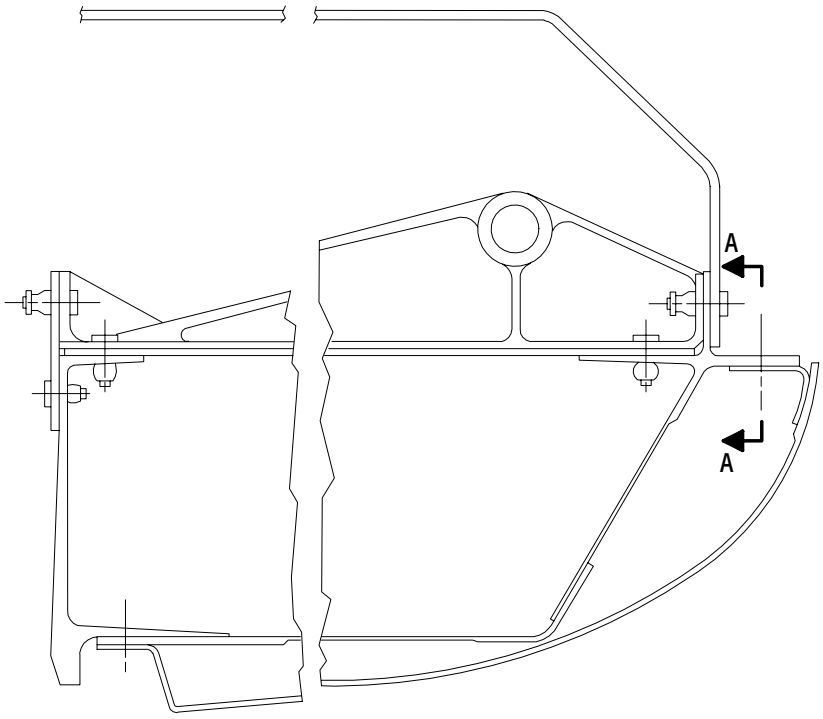
(3) Remove nut plate if installed (Fig. 812, 813).

(a) Using hand tools remove nut plate by drilling out attaching rivets, allow nut plate and rivets to fall into blind area.

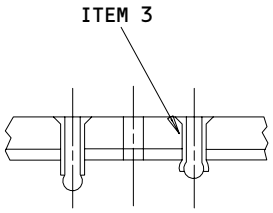
NOTE: Retrieval is not necessary.

(b) Install flush blind rivets in drilled out rivet holes.

(c) Drill out and countersink blind nut hole.



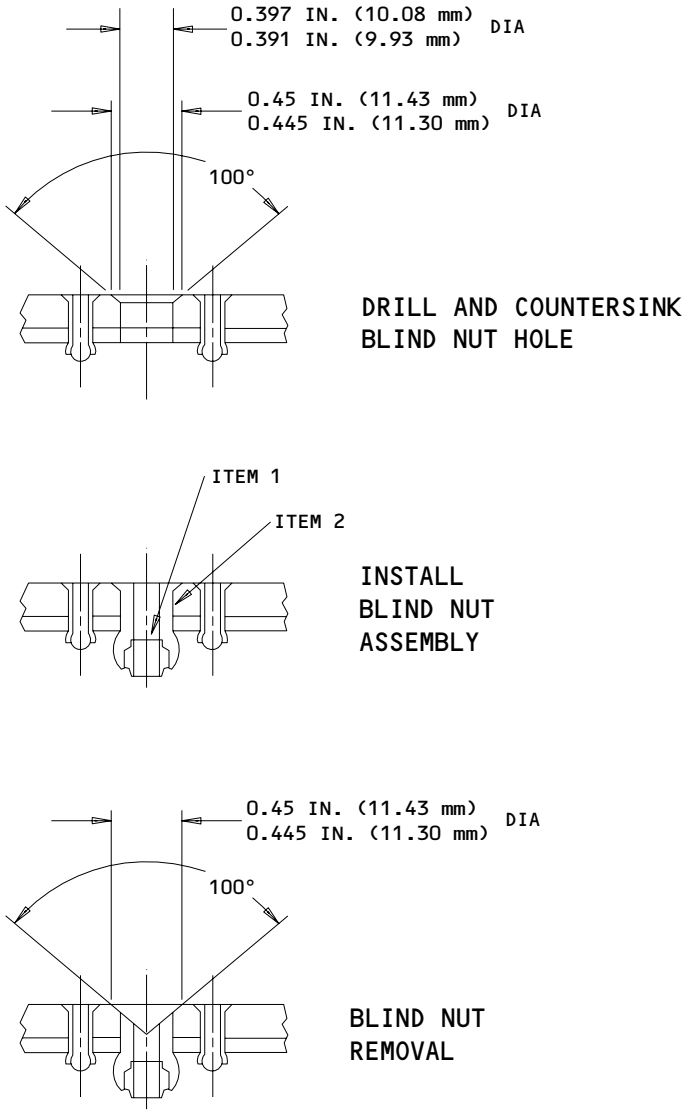
TYPICAL SECTION THROUGH
FRONT RING



INSTALL
BLIND RIVET
A-A

65422

Repair Details - Thrust Reverser
Figure 812



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Repair Details - Thrust Reverser
Figure 813

S 038-058-R00

CAUTION: CARE MUST BE TAKEN NOT TO DAMAGE HOLE WHEN REMOVING BLIND NUT. ANY DAMAGE WILL AFFECT SECURITY OF REPLACEMENT BLIND NUT.

(4) Remove blind nut if installed (Fig. 813)
  (a) Using hand tools drill blind nut shank sleeve to remove conical end ensuring not to remove any metal from structure.
  (b) Tap entire blind nut assembly through hole into blind area. Retrieval of debris is not necessary.

S 438-059-R00

(5) Install replacement blind nut assembly (Fig. 813) using blind nut assembly installation tools.

S 218-060-R00

(6) Inspect the repair:
  (a) Swab degrease surfaces to remove deposits.
  (b) Visually inspect repair area.

S 938-061-R00

(7) Mark the repair number adjacent to C-duct fixed structure assembly number, using a permanent marker pen of contrasting color.

NOTE: Use FRS.6001 for the LH C-duct and FRS.6025 for the RH C-duct.

S 418-063-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Close the thrust reverser (AMM 78-31-00/201).

S 868-062-R00

(9) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-064-R00

6. Repair Fretting Damage on Perforated Skin

A. General

(1) The repair procedure covered in this topic is FRS.6043 (for LH Thrust Reverser Fixed Duct Assembly) and FRS.6044 (for RH Thrust Reverser Fixed Duct Assembly) with these part numbers:
  (a) LH assembly Rolls-Royce LJ75089
  RH assembly Rolls-Royce LJ75090

(2) This procedure gives details to repair damage on the inner barrel, upper and lower bifurcation and the honeycomb panel perforated skin.
(3) Damage that includes the honeycomb core and edge of any structure other than the honeycomb panel is not covered by this repair.
(4) Gouges or frettage is permitted, if the span is not more than a total length in these areas.
  (a) inner barrel - 24.0 inch (609.6 mm)
  (b) upper bifurcation - 4.0 inch (101.6 mm)
  (c) lower bifurcation - 3.0 inch (76.2 mm)
(5) One or more of these repairs can be used to repair the acoustic panel of the C-duct.
  (a) FRS6041, FRS6042, FRS6043, FRS6044, FRS6063, FRS6064 and
  (b) FRS6079, FRS6134, FRS6135.
  (c) The repair area of the C-duct honeycomb panel (both sides) must not be more than 1.2 square feet (0.11 sq.m).
  (d) The decrease in the acoustic panel area because of this repair is specified as the area of patch or area of honeycomb filled with the adhesive.

B. Consumable Materials
(1) Adhesive, Hysol E.A. 934 NA (2-pack), Omat 8/52 (AMM 20-30-01)
(2) Degreasing fluid, Acetone OMat No. 150 or Isopropyl alcohol OMat No. 1/40 or Cleaning solvent (Desoclean) OMat No. 1/257
(3) Aluminum oxide abrasive paper (Grade 180), Omat 5/62 (AMM 20-30-02)

C. References
(1) AMM 78-31-00/201, Thrust Reverser System

D. Repair Damaged Perforated Skin (Fig. 814, 815 and 816)

S 868-065-R00

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT 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 (AMM 78-31-00/201).

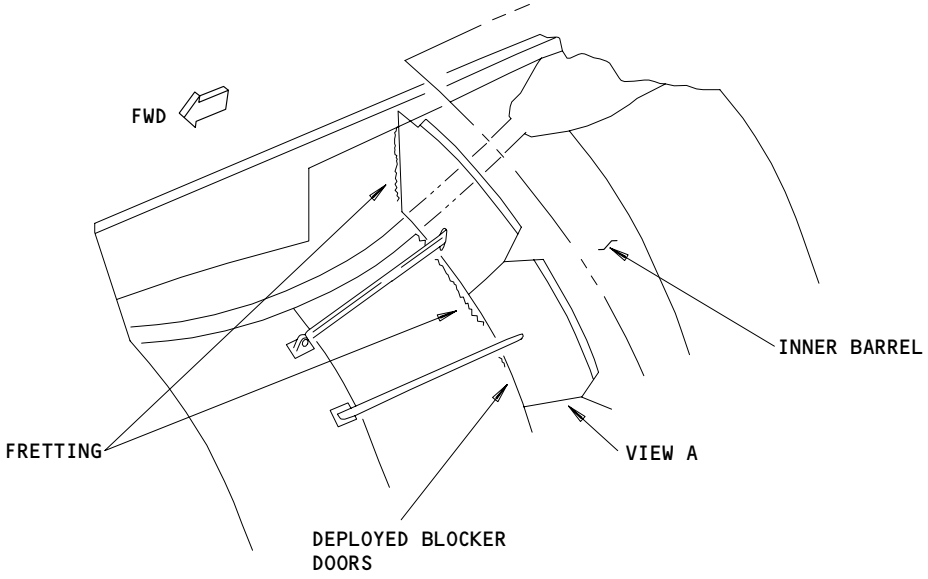
S 018-066-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

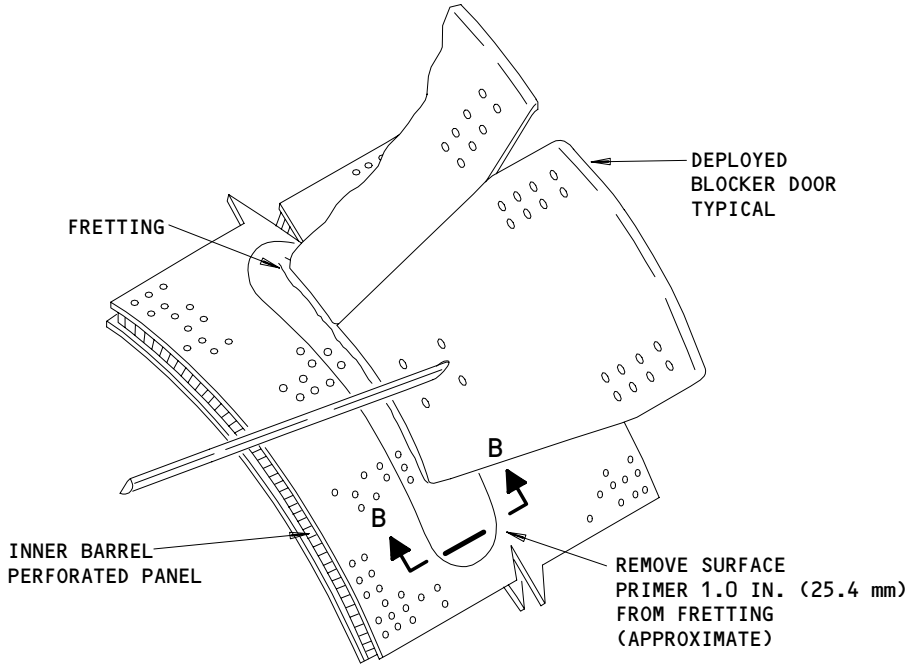
(2) Open the left reverser (AMM 78-31-00/201).

S 358-067-R00

(3) Repair fretting damage on perforated skin:



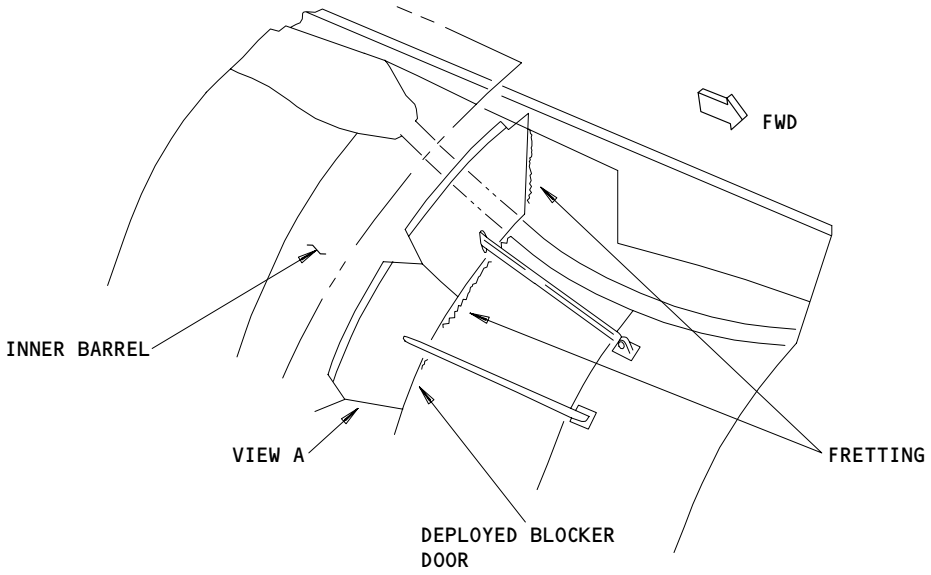
VIEW OF LEFT THRUST REVERSER FIXED
DUCT ASSY AND BLOCKER DOORS



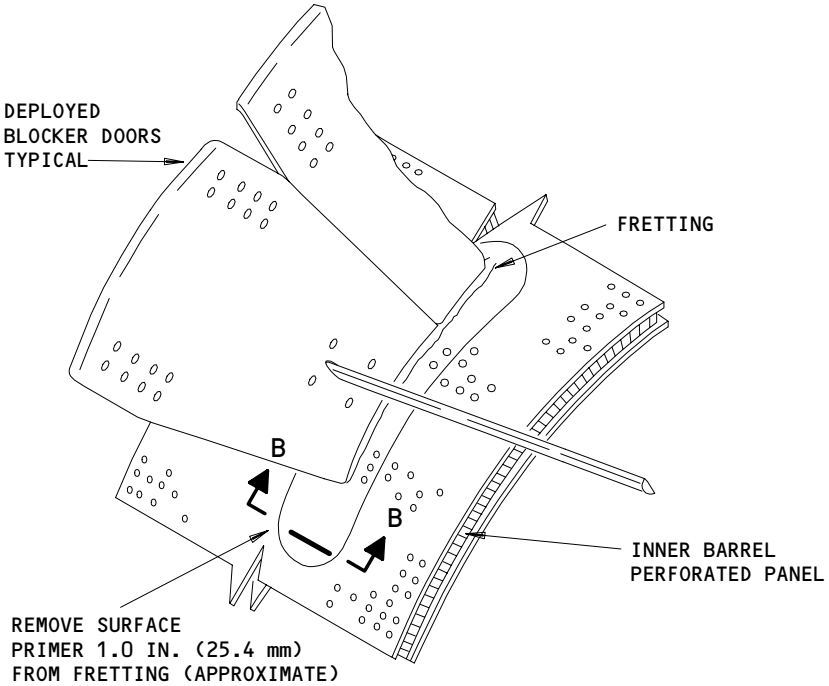
VIEW A – SHOWING DEPLOYED
BLOCKER DOOR DAMAGE

62044

Repair Details and Dimensions
Figure 814



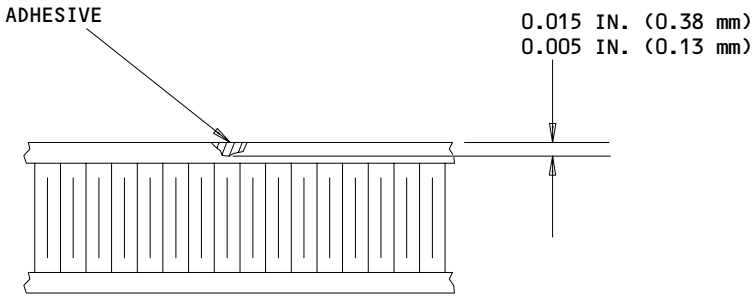
VIEW OF RIGHT THRUST REVERSER FIXED
DUCT ASSY AND BLOCKER DOORS



VIEW A – SHOWING DEPLOYED
BLOCKER DOOR DAMAGE

62046

Repair Details and Diminsions
Figure 815



FRETTING IN PERFORATED PANEL
PARTIAL PENETRATION
B-B

62045

Repair Details and Dimensions
Figure 816

WARNING: USE ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

SANDING, GRINDING, OR CUTTING CREATES DUST. BREATHING THE DUST CAN CAUSE SERIOUS BODILY HARM. WEAR DUST MASK.

(a) Deburr edges of damage using aluminum oxide abrasive paper.
(b) Remove surface primer using the abrasive paper.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(c) Clean repair area using clean cotton cloth and Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
    1) Use a clean cotton cloth to remove the solvent before the solvent evaporates.
(d) Apply the adhesive to the repair area.
    1) Apply adhesive to manufacturers instructions, into repair area flush with surrounding area.
    2) Cure adhesive using heat lamps, for 2 hours at 149-203°F (65-95°C).

WARNING: USE ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

SANDING, GRINDING, OR CUTTING CREATES DUST. BREATHING THE DUST CAN CAUSE SERIOUS BODILY HARM, WEAR DUST MASK.

(e) Abrade cured adhesive flush with surrounding area using the abrasive paper.

WARNING: SOLVENTS AND DEGREASING FLUIDS ARE HIGHLY INFLAMMABLE AND TOXIC, THEREFORE, ENSURE ADEQUATE VENTILATION, AVOID SKIN CONTACT AND INHALING OF VAPOR.

(f) Clean repair area using cotton cloth and Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
    1) Remove the solvent with a clean cotton cloth before the solvent evaporates.

S 378-068-R00
(4) Apply surface protection.
(a) Restore surface protection to repair and surrounding area (AMM 78-31-20/801, FRS.6400).

S 218-069-R00
(5) Visually inspect surface protection and repair area.

S 938-070-R00
(6) Make a record of the repair number adjacent to C-duct fixed structure assembly number, using a permanent marker pen.
(a) Use FRS.6043 for the LH C-duct.
(b) Use FRS.6044 for the RH C-duct.

S 418-072-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Close the thrust reverser (AMM 78-31-00/201).

S 868-071-R00
(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-073-R00

7. Restoration of Surface Protection

A. General
(1) The repair FRS.6400 procedure is applicable to the following components:
(a) Inlet Cowl
(b) Fan Cowl Panels
(c) Thrust Reverser

B. References
(1) AMM 71-11-01/801, Restoration of Surface Protection

C. Restore the surface protection.

S 378-074-R00
(1) Do the steps in AMM 71-11-01/801 to restore the surface protection.

TASK 78-31-20-308-096-R00

8. Right T/R, Lower Bifurcation - Bumper Shim Repair

A. General
(1) Repair procedure FRS.6052 is for RH thrust reverser C-duct lower bifurcation with the following part number:
(a) Rolls-Royce LJ75064
Rolls-Royce LJ76504 SB78-9722

(2) This procedure details replacement of defective bumper shim.

B. Equipment
   (1) Heat lamp - (explosionproof)
C. Consumable Materials
   (1) Adhesive, Hysol E.A.934 NA (2 Pack), Omat 8/52 (AMM 20-30-01)
   (2) Degreasing fluid, Acetone OMat No. 150 or
       Isopropyl alcohol OMat No. 1/40 or
       cleaning solvent (Desoclean) OMat No. 1/257
   (3) 180 Grit Abrasive paper, Omat 5/62 (AMM 20-30-02)
   (4) Grit Abrasive Paper, Omat 5/66 (AMM 20-30-02)
   (5) Clean cotton cloth, Commercially available
D. Parts
   (1) Rivet - CR2564M5-3 (Item 1)
   (2) Shim - LJ71748 (Item 2)
   (3) Shim - LJ75697 (Item 3)
E. Remove bumper shim (Fig. 817)

   S 038-097-R00
   (1) Remove the bumper skin:

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

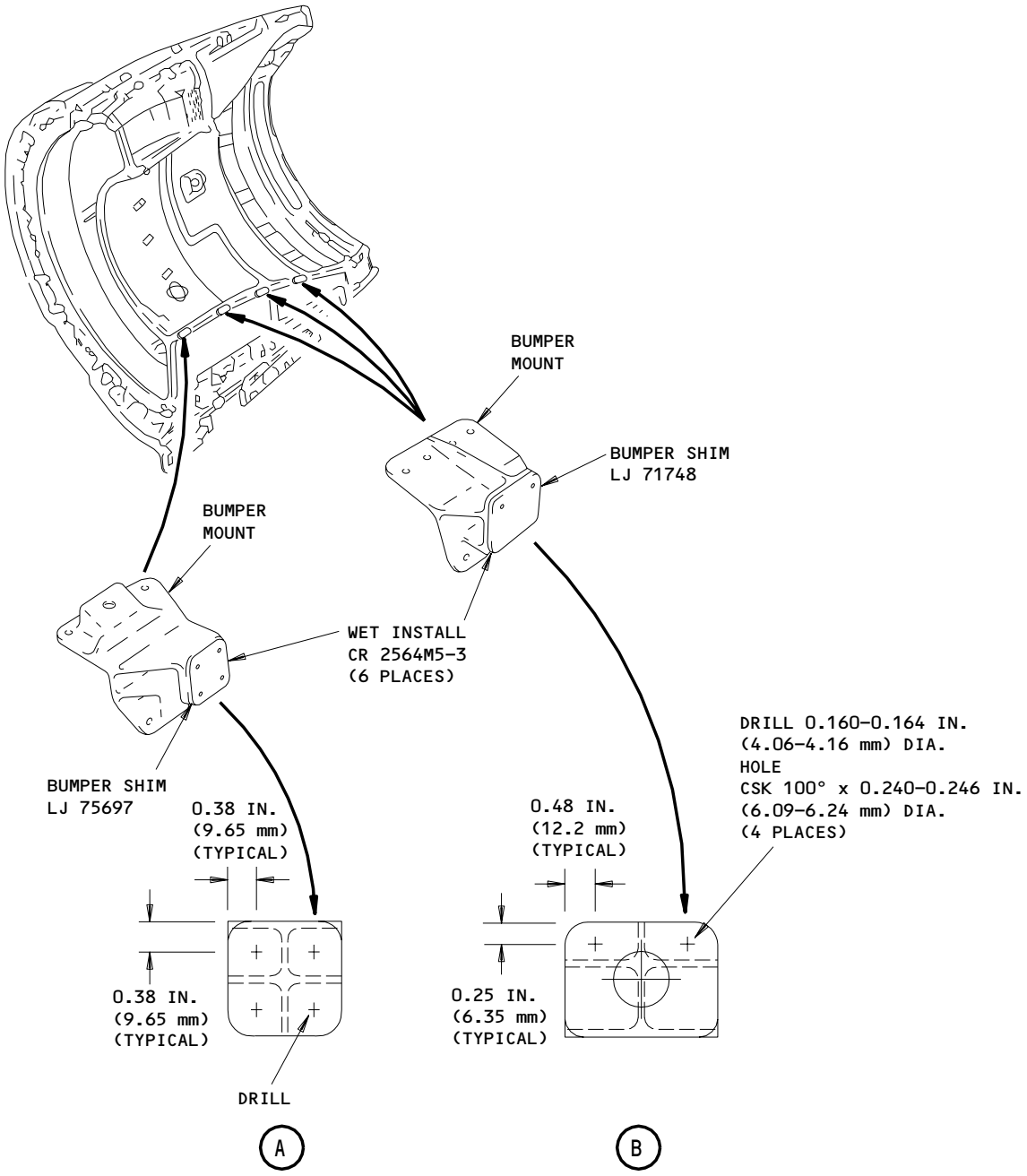
   (a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

   WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

   (b) Open the right thrust reverser (AMM 78-31-00/201).

   WARNING: THIS PRODUCT CONTAINS ASBESTOS FIBER. SANDING, GRINDING, OR CUTTING CREATES DUST. BREATHING THE DUST CAN CAUSE SERIOUS BODILY HARM. WEAR DUST MASK.

   (c) Drill out rivets securing bumper shim.
   (d) Remove shim and hand abrade with 80 grit paper to remove adhesive.
   (e) Position replacement bumper shims and drill fastener holes to match existing holes in bumper mount.
   (f) Hand abrade bonding surface with 180 grit abrasive paper.



Bumper Shim Repair
Figure 817

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(g) Do these steps to clean the bonding surfaces:

1) Remove shims and clean all bonding surfaces using a clean cotton cloth saturated with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

2) Wipe dry before cleaning fluid Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean) evaporates.

F. Install bumper shim (Fig. 817)

S 438-099-R00

(1) Install the bumper shim:

WARNING: USE ADHESIVE ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(a) Mix two part adhesive to the manufactures instructions, in the these proportions by weight:

100 parts of A to 33 parts of B.

NOTE: Pot life is approximately 90 minutes after mixing.

WARNING: USE ADHESIVE ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(b) Apply adhesive to both bonding surfaces.

NOTE: Use LJ71748 or LJ75697 as required.

(c) Wet install rivets, using adhesive, to secure bumper shim. Rivets should be flush to 0.020 in. (0.55 mm) underflush.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOUR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE; KEEP AWAY FROM IGNITION SOURCES.

(d) Wipe off excess adhesive using a clean cheesecloth saturated in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cheesecloth is used for each separate operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

(e) Cure at 190-210°F (88-93°C) for one hour.

NOTE: Maintain firm pressure during cure time.

S 218-103-R00

(2) Examine the repair:
(a) Check for good adhesion of shims to bumper.

S 938-102-R00

(3) Mark repair number FRS.6052 adjacent to assembly number, using a permanent marker pen of contrasting color.

S 418-100-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Close the right thrust reverser (AMM 78-31-00/201).

S 868-101-R00

(5) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-117-R00

9. Repair Honeycomb Panel Perforated Skin

A. General

(1) This procedure applies to both left-hand thrust reverser fixed duct assembly (FRS.6041) and right-hand thrust reverser (FRS.6042) with the following part numbers:

(a) LJ75089, LJ75090, LJ71960, LJ70089, LJ76377, LJ76376, LJ76498 LJ76497, LJ76554

(2) When you repair the honeycomb panel perforated skin on the thrust reverser fixed duct assembly, obey the instructions that follow:

(a) If the damage to the perforated skin is not more than 0.694 inch (17.60 mm) in length, do these steps:

1) Cut the perforated skin to remove the surface defect.

2) Fill the honeycomb core with the 0Mat 8/52 adhesive.

(b) If the damage to the perforated skin is more than the above limits but not more than 2.000 inch (50.8 mm) in length, do these steps:

1) Drill a hole in the perforated skin to remove the surface defect.

2) Fill the honeycomb core with the adhesive and install a patch (Item 3).

(c) If the damage to the inner barrel or bifurcation is less than 3.0 inches (76.00 mm) from where they connect, use the patch repair.

(d) Repairs that touch the deployed blocker doors are permitted, if you obey these steps.

1) The repairs are not more than 1.0 inch (25.40 mm) in diameter.

2) The surfaces are smooth.

a) Four smooth repairs are permitted on the inner barrel.

(e) A maximum of 12 repairs is permitted on the inner barrel.

(f) The maximum area of acoustic panel in the C-ducts that can be replaced by repairs is:
- 1.2 sq. ft.

1) The repaired area of the acoustic panel is identified by the honeycomb area that is filled with potting compound.

(3) The procedure details repair of honeycomb panel perforated skin as follows:
  (a) Small repairs up to 0.69 in. (17.63 mm) diameter - par. (10).
  (b) Repairs 2.00 in. (50.3 mm) diameter - par. (11).
  (c) Flush repairs
    1) Repairs that interfere with deployed blocker doors, must be flush with faying surface and less than 1.0 in. (25.4 mm) diameter.
    2) A maximum of four flush repairs are permitted on the inner barrel.
(4) Damage that includes the edge of any structure other than the honeycomb panel is not covered by this repair.
(5) Repairs on inner barrel or bifurcation falling within 3.0 in. (76.0 mm) of intersection of bifurcation and inner barrel must be of overlapping plate type.

B. Equipment
(1) Drills and Drilling equipment
(2) Heat Lamps (explosion proof)
(3) Riveting equipment

C. Consumable Materials
(1) Adhesive, EA934NA (2 pack)
OMat No. - 8/52
(2) Gloves, cotton
(3) Cloth - cotton
OMat No. - 290
(4) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
cleaning solvent (Desoclean) OMat No. 1/257
(5) Abrasive paper - aluminum oxide (Grit size 180)
OMat No. - 5/62
(6) Adhesive tape, paper heat resistant masking
OMat No. - 2/40
(7) Primer, base 463-6-27
OMat No. - 7/157
(8) Curing solution, X-337
OMat No. - 7/158
(9) Thinner, TL52-66
OMat No. - 7/159
(10) Micro balloons, 135 micron phrenolic

D. Parts
(1) Rivet (Item 1) - MS20426AD12-16 (RR1012248)

(2) Blind rivet (Item 3) - NAS1738E4-2 (RR2308483)
(3) Fabricated plate (Item 2 and 4)
(Bare aluminum sheet 2024-0 or 2024-T3, 0.040 in. (1.02 mm thick).

E. References
(1) AMM 78-31-00/201, Thrust Reverser System

F. Procedure

S 348-119-R00

(1) Repair the small defects in the honeycomb panel perforated skin (not more than 0.694 inch (17.63 mm) in length) (Fig. 818).

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

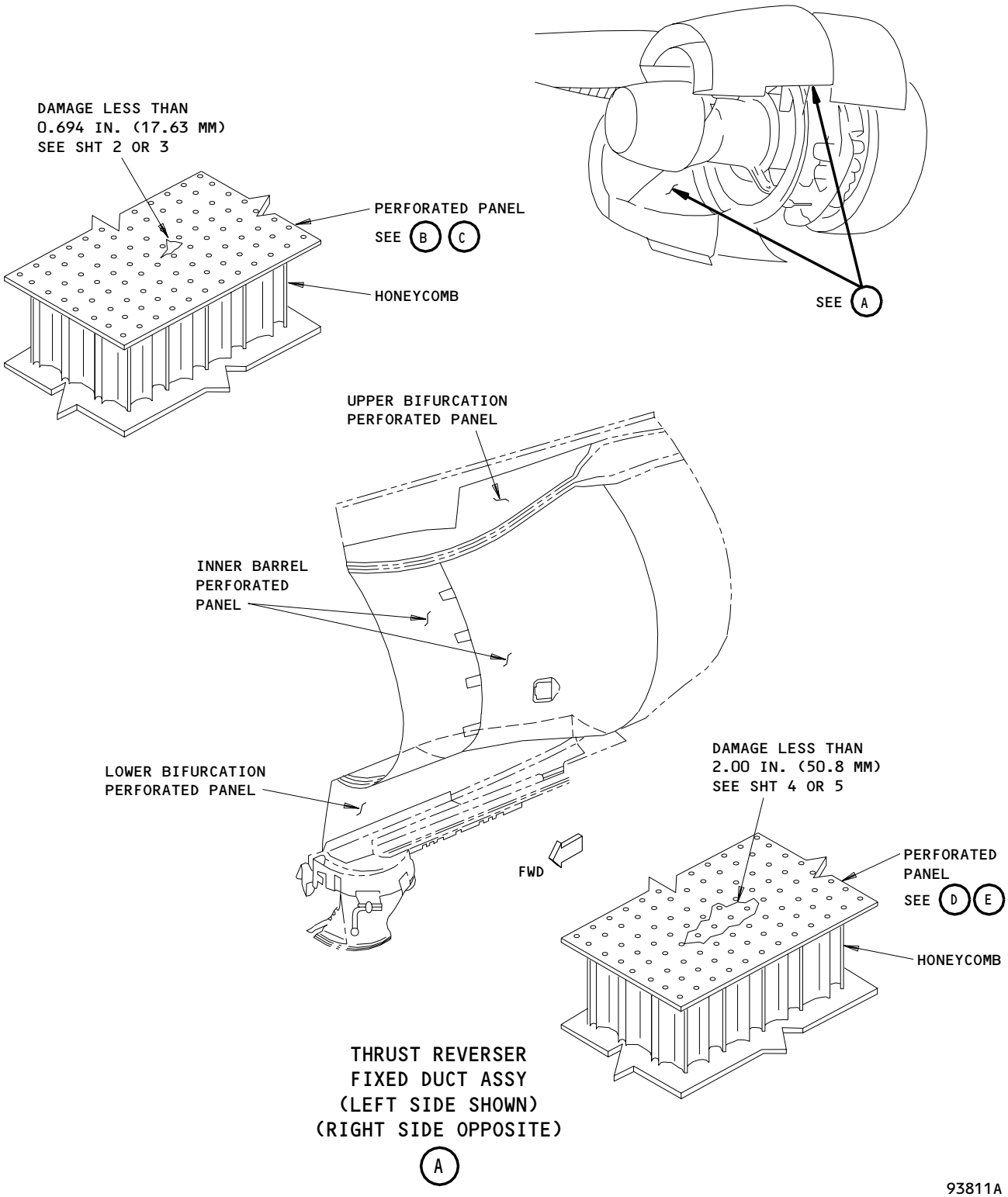
(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTION IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

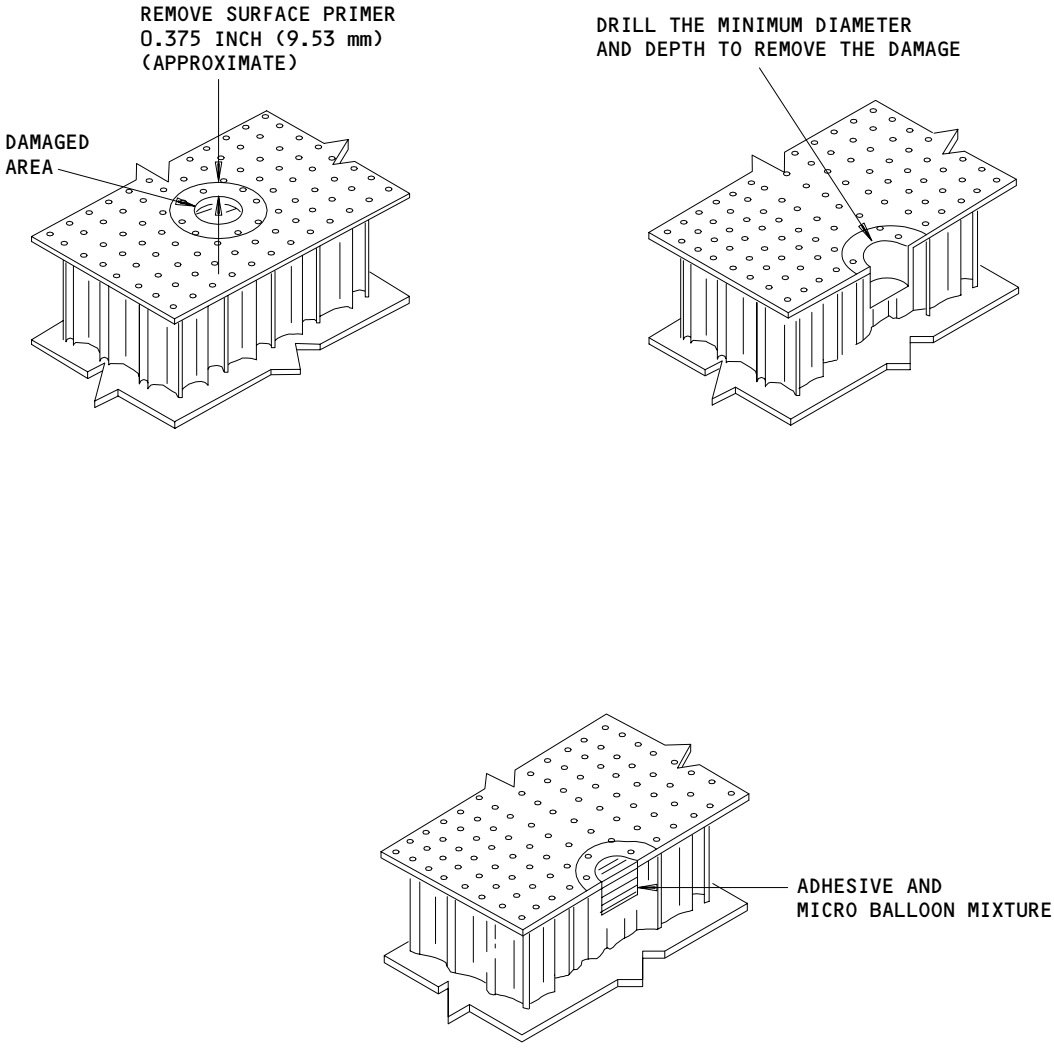
(b) Open the thrust reverser (AMM 78-31-00/201).
(c) Cut the hole in the skin and remove damaged area.

CAUTION: DEBURRING AROUND CUTOUTS IN THIN GAUGE ALUMINIUM MUST BE DONE WITH EXTREME CAUTION OR A FEATHERED EDGE MAY RESULT.

(d) Deburr the edges of the hole and remove surface primer with abrasive paper.



Fixed Duct – Honeycomb Panel Perforated Skin Repair
Figure 818 (Sheet 1)

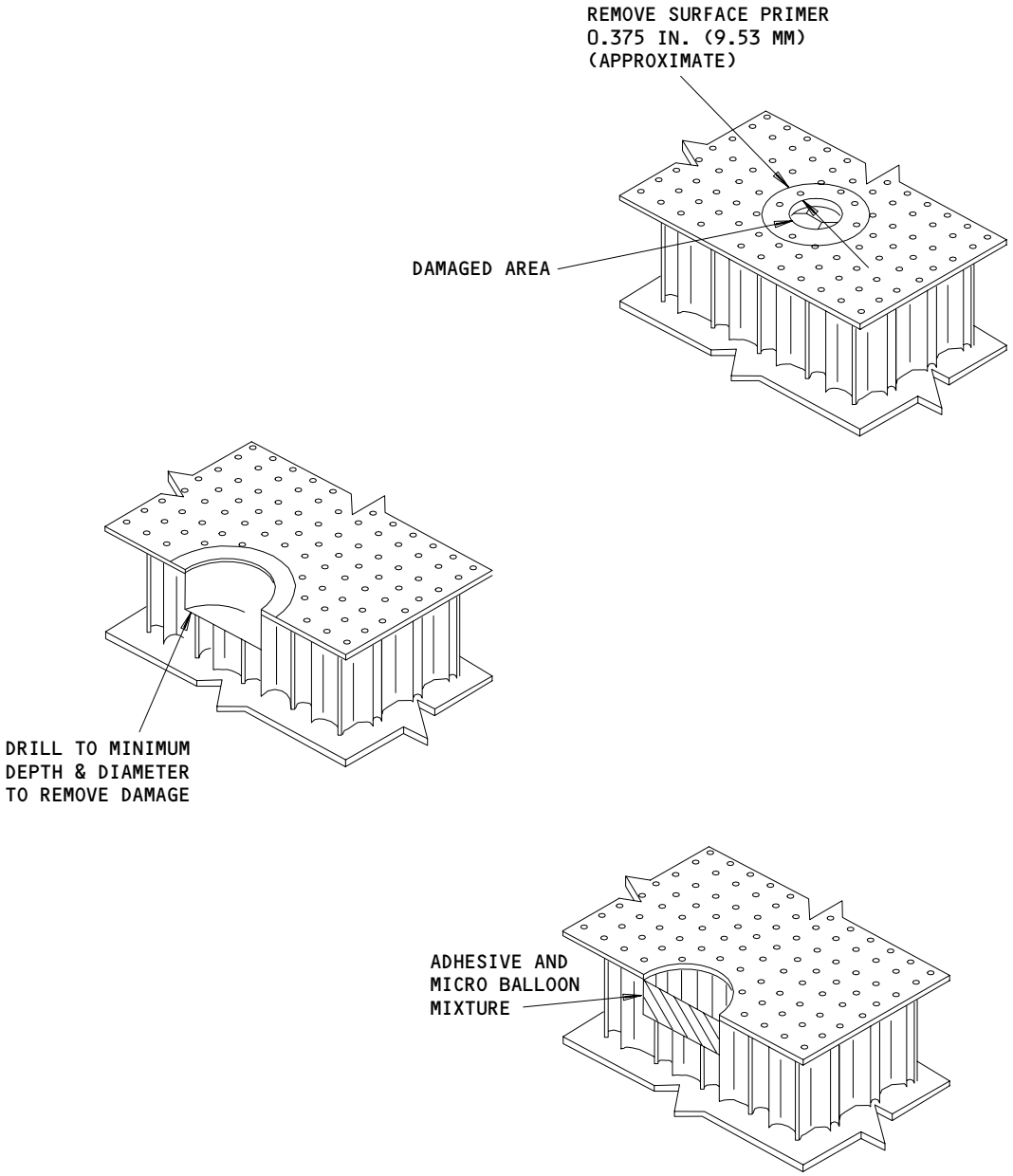


SURFACE DAMAGE - LESS THAN
0.694 INCH (17.63 mm) IN LENGTH
LEFT SIDE

(B)

62254B

Fixed Duct - Honeycomb Panel Perforated Skin Repair
Figure 818 (Sheet 2)

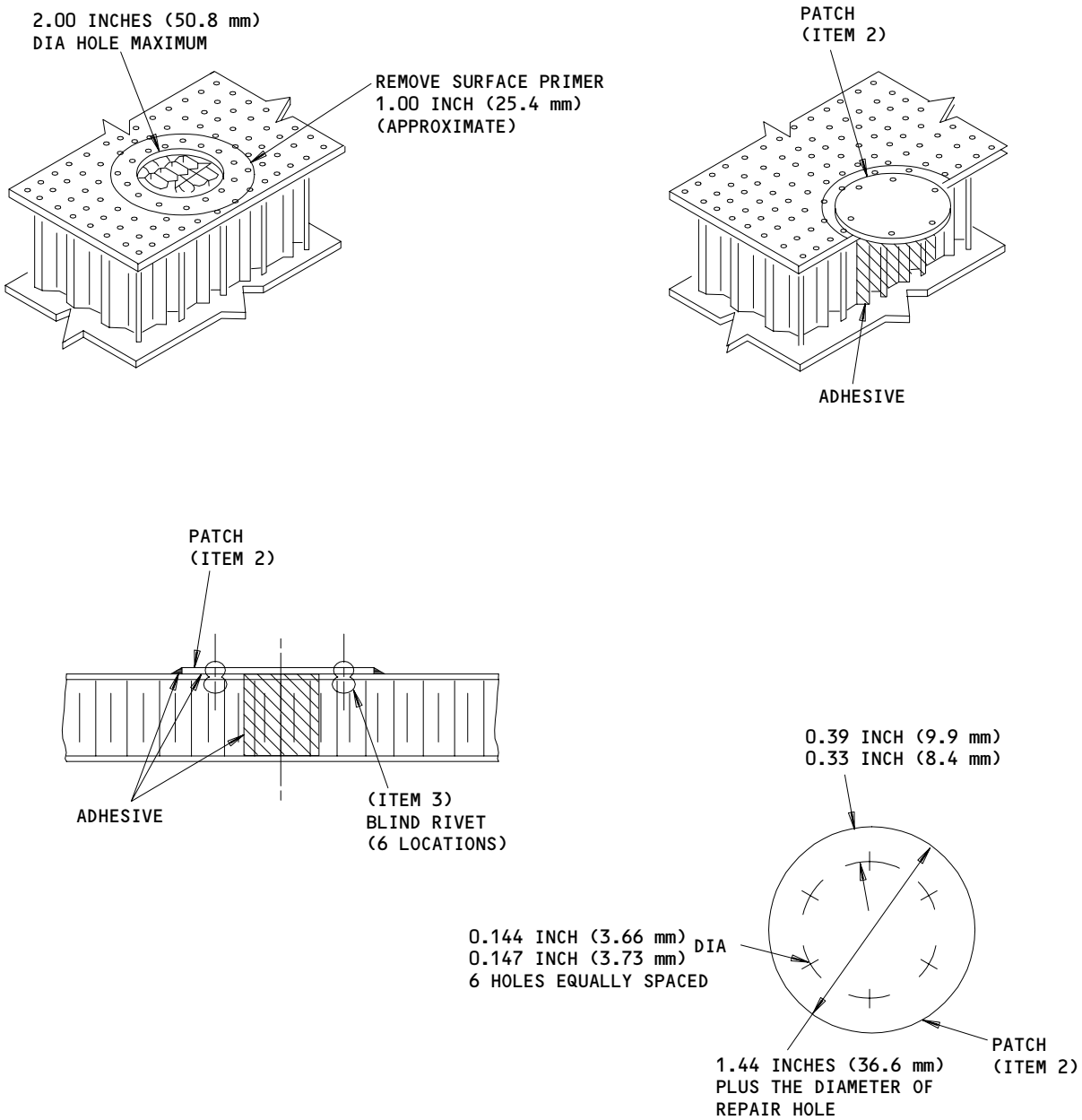


SURFACE DAMAGE - LESS THAN
0.694 IN. (17.63 mm) IN LENGTH
RIGHT SIDE

(C)

62258A

Fixed Duct - Honeycomb Panel Perforated Skin Repair
Figure 818 (Sheet 3)

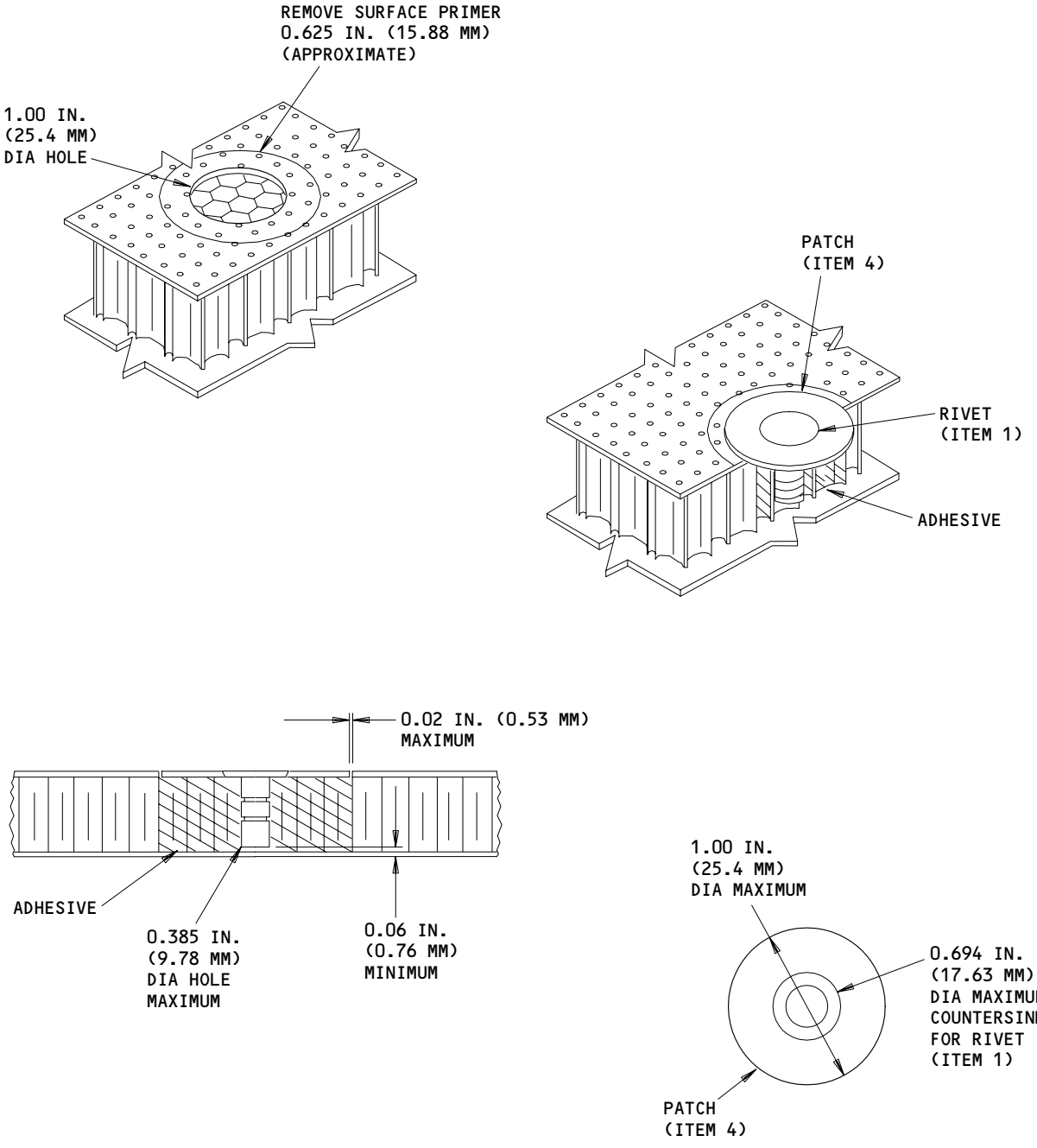


SURFACE DAMAGE – LESS THAN
2.00 INCHES (50.8 mm) IN LENGTH

(D)

62255B

Fixed Duct – Honeycomb Panel Perforated Skin Repair
Figure 818 (Sheet 4)



SURFACE DAMAGE – LESS THAN
1.00 IN. (25.4 MM) IN LENGTH

(E)

62256

Fixed Duct – Honeycomb Panel Perforated Skin Repair
Figure 818 (Sheet 5)

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE ONLY IN AREAS WITH GOOD VENTILATION.

VERY FLAMMABLE: KEEP AWAY FROM IGNITION SOURCES.

(e) Clean the repair hole and faying surfaces using clean lint-free cloth moistened in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

1) Wipe dry with clean cotton cloth before fluid evaporates.
2) Discard the soiled cloth after use.

WARNING: USE ADHESIVE FILLER ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT ADHESIVE FILLER COMING INTO CONTACT WITH THE SKIN.

(f) Mix adhesive filler to manufacturers instructions with an addition of 5 percent microballoons by weight.

NOTE: Working life is one hour at 72° F (22° C) after mixing.

(g) Apply adhesive into the repair hole to completely fill the cavity.

(h) Cure the adhesive for the time and temperature shown in Cure Data Chart below.

NOTE: The minimum cure time is one hour.
The adhesive will not cure below 54°F. (12°C.).
The temperature at the bond line must be monitored by thermocouples on other convenient method when cure times are accelerated by the application of heat.

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - °F.	54	59	68	72	77	86	96	113	140
Temp - °C.	12	15	20	22	25	30	35	45	60

Cure Data Chart

(i) Abrade the adhesive with abrasive paper to get a smooth contour.

(j) Apply primer base and primer converter to repair and surrounding area, use thinners as required.

S 218-120-R00

(2) Examine the repair area.

S 938-121-R00

(3) Make a record of the repair number adjacent to the thrust reverser fixed duct assembly number, using a permanent marker.

NOTE: Use FRS6041 for the left-hand thrust reverser and FRS6042 for the right-hand thrust reverser.

S 348-122-R00

(4) Repair the defects in honeycomb panel perforated skin up to 2.00 in. (50.0 mm) in length.

(a) Cut a hole in the skin to remove damaged area make sure not to remove any honeycomb.

CAUTION: DEBURRING AROUND CUTOUTS IN THIN GAUGE ALUMINATION MUST BE DONE WITH EXTREME CAUTION OR A FEATHERED EDGE MAY RESULT.

(b) Deburr the edges of the hole and remove surface primer with abrasive paper.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(c) Clean repair hole and faying surfaces using clean lint-free cloth moistened in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

1) Wipe dry with clean cotton cloth before fluid evaporates.

2) Discard the soiled cloth after use.

CAUTION: IF THE DRYING TIME IS OMITTED CORROSION CAN RESULT FROM THE BREAKDOWN OF ANY RESIDUAL SOLVENT TRAPPED IN A RESTRICTED SPACE.

(d) Allow parts that have internal pockets or passage ways to dry for at least one hour after degreasing before they are used as part of an assembly or placed in a package.
(e) Make the patch plate (Item 2) from the aluminium sheet.

NOTE: If the contour of the repair patch has three dimensions use aluminium sheet 2024-O. Heat treat the sheet to 2024-T3 when it is the correct shape.

CAUTION: DRILLING THE THIN GAUGE ALUMINIUM MUST BE DONE WITH CARE OR TEARS IN PANEL SKIN CAN RESULT.

(f) Put the patch in position and drill rivet holes in the patch plate and perforated panel.

CAUTION: DEBURRING RIVETS HOLES IN THIN GAUGE ALUMINIUM MUST BE DONE WITH EXTREME CAUTION OR A FEATHERED EDGE MAY RESULT.

(g) Remove the patch plate and deburr the rivet holes.

WARNING: USE ONLY IN AREAS WITH GOOD VENTILATION.
TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(h) Mix adhesive to manufacturers instructions.

NOTE: Working life is one hour at 72°F. (22°C.) after mixing.

(i) Apply the adhesive into the repair hole in the honeycomb panel and on faying surfaces, make sure cavity is completely filled.
(j) Install the patch plate with the blind rivets (Item 3).
(k) Apply a bead of adhesive between the plate edge and panel surface.

WARNING: PROTECTIVE GLOVE MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(l) Remove the excess adhesive before it cures with a cotton cloth and Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
1) Do not remove the bead of adhesive.

(m) Cure the adhesive for the time and temperature shown in Cure Date Chart below.

NOTE: The minimum cure time is one hour.
The adhesive will not cure below 54°F. (12°C.).
The temperature at the bond line must be monitored by thermocouples or other convenient method when cure times are accelerated by the application of heat.

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - °F.	54	59	68	72	77	86	96	113	140
Temp - °C.	12	15	20	22	25	30	35	45	60

Cure Data Chart

(n) Apply primer base and primer converter to repair and surrounding area, use thinners as it is necessary.
(o) Examine the repair area.
(p) Make a record of the repair number adjacent to thrust reverser fixed duct assembly number, using a permanent marker pen.

NOTE: Use FRS6041 for the left-hand thrust reverser and FRS6042 for the right-hand thrust reverser.

(q) Installation of a flush repair.
(r) Cut maximum 1.0 in. (25.4 mm) diameter hole in skin to remove all of the damage.

CAUTION: DEBURRING AROUND CUTOUTS IN THIN GAUGE ALUMINIUM MUST BE DONE WITH EXTREME CAUTION OR A FEATHERED EDGE MAY RESULT.

(s) Deburr the edges and remove surface primer with abrasive paper.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM INGITION SOURCES.

(t) Clean repair hole and faying surfaces using clean lint-free cloth moistened in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

1) Wipe dry with clean cotton cloth before fluid evaporates.
2) Discard the soiled cloth after use.

(u) Make the patch plate (Item 4) from aluminium sheet.

(v) Cut grooves around the outside of the rivet shank (Item 1).

(w) The grooves must be 0.010 inch (0.25 mm) in depth and have a width of 0.040 inch (1.02 mm).

1) Cut the rivets to the correct length.

WARNING: USE ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(x) Mix adhesive to manufacturers instructions.

NOTE: Working life is one hour at 72°F. (22°C.).

(y) Apply adhesive into the repair hole in honeycomb panel, make sure cavity is completely filled.

(z) Install the patch plate (Item 4) and rivet (Item 1), turn the rivet during installation into hole.

1) Make sure the rivet head and patch plate are flush with surrounding panel surface.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE; KEEP AWAY FROM IGNITION SOURCES.

(aa) Remove the excess adhesive with a clean cotton cloth and Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
(ab) Apply adhesive tape to hold the rivet (Item 1) in place.
(ac) Cure the adhesive for the time and temperature shown in Cure Data Chart below.

NOTE: The minimum cure time is one hour.
The adhesive will not cure below 54°F. (12°C.).
The temperature at the bond line must be monitored by thermocouples or other convenient method when cure times are accelerated by the application of heat.

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - °F.	54	59	68	72	77	86	96	113	140
Temp - °C.	12	15	20	22	25	30	35	45	60

Cure Data Chart

(ad) Remove the adhesive tape.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH FOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE; KEEP AWAY FROM IGNITION SOURCES.

(ae) Clean repair area with lint-free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

CAUTION: IF THE DRYING TIME IS OMITTED CORROSION CAN RESULT FROM THE BREAKDOWN OF ANY RESIDUAL SOLVENT TRAPPED IN A RESTRICTED SPACE.

(af) Allow parts that have internal pockets or passage ways to dry for at least one hour after degreasing before they are used as part of an assembly or placed in a package.
(ag) Apply primer base and primer converter to repair and surrounding area, use thinners as it is necessary.

S 218-123-R00
(5) Examine the repair area.

S 938-124-R00
(6) Make a record of the repair number adjacent to thrust reverser fixed duct assembly number, using a permanent marker pen.

NOTE: Use FRS6041 for the left-hand thrust reverser and FRS6042 for the right-hand thrust reverser.

S 418-126-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Close the thrust reverser (AMM 78-31-00/201).

S 868-125-R00
(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-908-127-R00

10. Torque Ring Inner Fairing - Fairing Replacement

A. General

(1) This procedure applies to both left-hand thrust reverser fixed duct assembly (FRS.6061) and right-hand thrust reverser fixed duct assembly (FRS.6062).
(2) This procedure details replacement of a damaged inner torque ring fairing with the following part numbers:

(a) LJ75089
LJ75090

(3) This repair may be effected by cutting out the damaged fairing area and splicing a fairing repair part into place on the contoured surfaces and edges as required.
(4) Reprotection to repair area to be applied in accordance with FRS.6400 (AMM 78-31-20/801).

B. Equipment
   (1) Heat lamps (explosionproof)
   (2) Paint spraying equipment
   (3) Heater blankets
       (Tayco Engineering Inc., Long Beach, CA)

C. Consumable Materials
   (1) Degreasing Fluid, Acetone OMat No. 150 or
       Isopropyl alcohol OMat No. 1/40 or
       cleaning solvent (Desoclean) OMat No. 1/257
   (2) Abrasive paper, Grit size 180
       OMat No. - 5/62
   (3) Adhesive, Hysol E.A. 956 (two part)
       OMat No. - 8/117
   (4) Bleached cheesecloth, 4-ply (Local resources)
       OMat No. - 290
   (5) Sealant, PR-1431-GB-2
       Product Reasearch and Chemical Corp., Glendale, CA.
       OMat No. - 8/107
   (6) Aluminum Sheet 2024-T3
       0.025 inch (0.64 mm) thick,
       Local resources
   (7) Paint brush, short bristle, 2.0 inch (50 mm)
       Local resources
   (8) White cotton gloves
   (9) Sealant, Pro-seal 899
       Essex Chemical Corporation, Compton, CA

D. Parts
   (1) Fairing - LJ76104
   (2) Blind rivet - NAS1739M4 (Local resources)
   (3) Tack rivet - NAS1097AD (Local resources)
   (4) Blind rivet - NAS1399D5 (Local resources)

E. References
   (1) AMM 78-31-00/201, Thrust Reverser System
   (2) AMM 78-31-20/801, Surface Protection - Restore (FRS.6400)

F. Procedure

   S 848-129-R00

   (1) Prepare damaged fairing area for repair (Fig. 819).

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

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser (AMM 78-31-00/201).

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

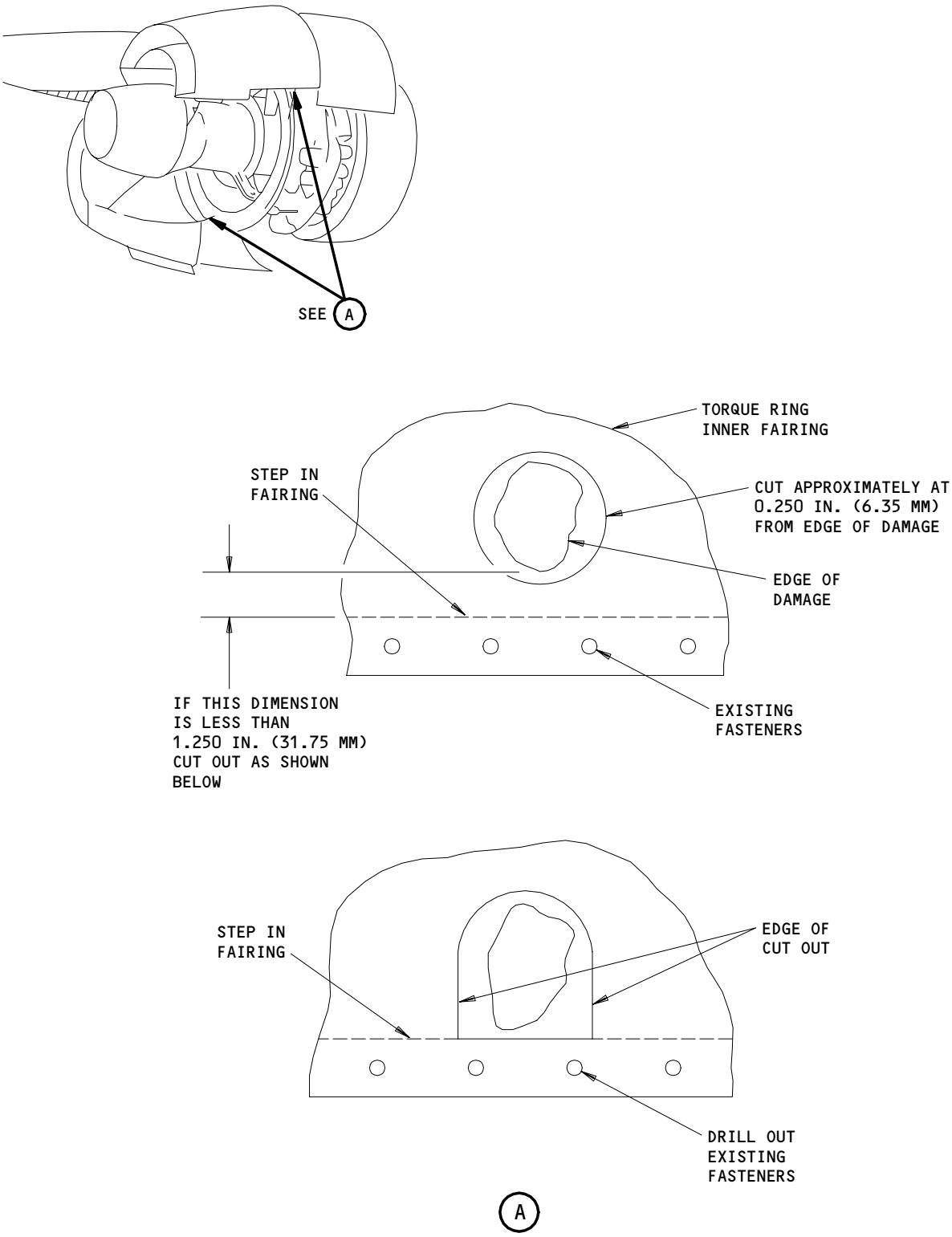
(c) Clean around damaged area using a bleached cheescloth saturated with degreasing fluid.

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

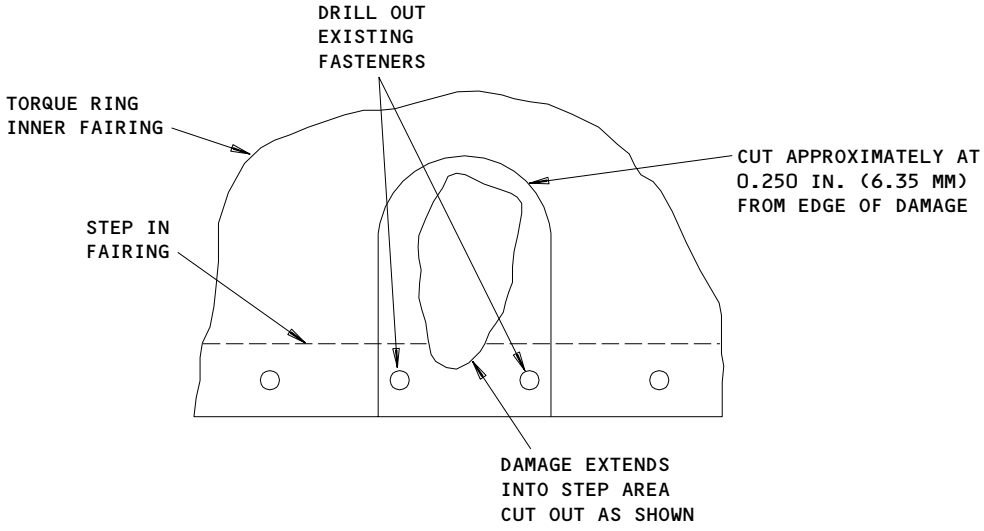
1) Wipe dry before degreasing fluid

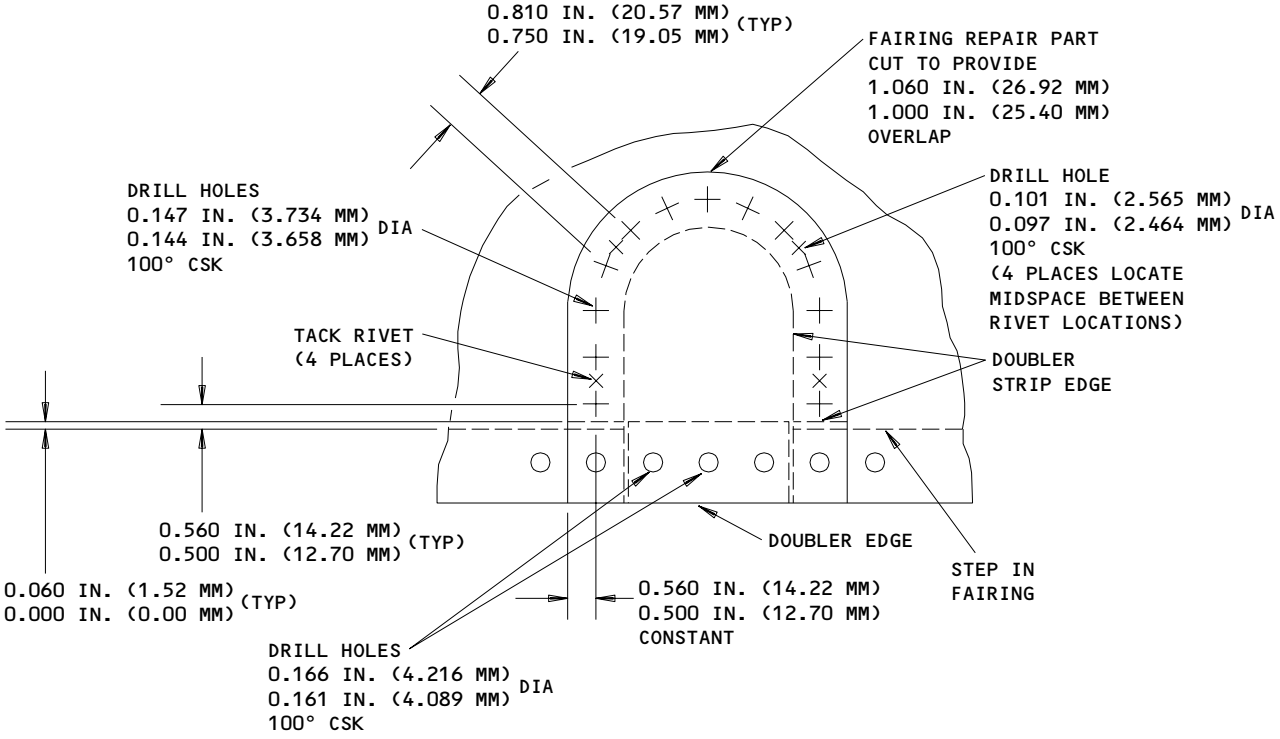
WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASKS AND SAFETY GLASSES. AVOID BREATHING DUST AND PROLONGED CONTACT OF DUST ON THE SKIN.

(d) Cut out damaged fairing area.



Fixed Duct Inner Torque Ring Fairing Replacement
Figure 819 (Sheet 1)





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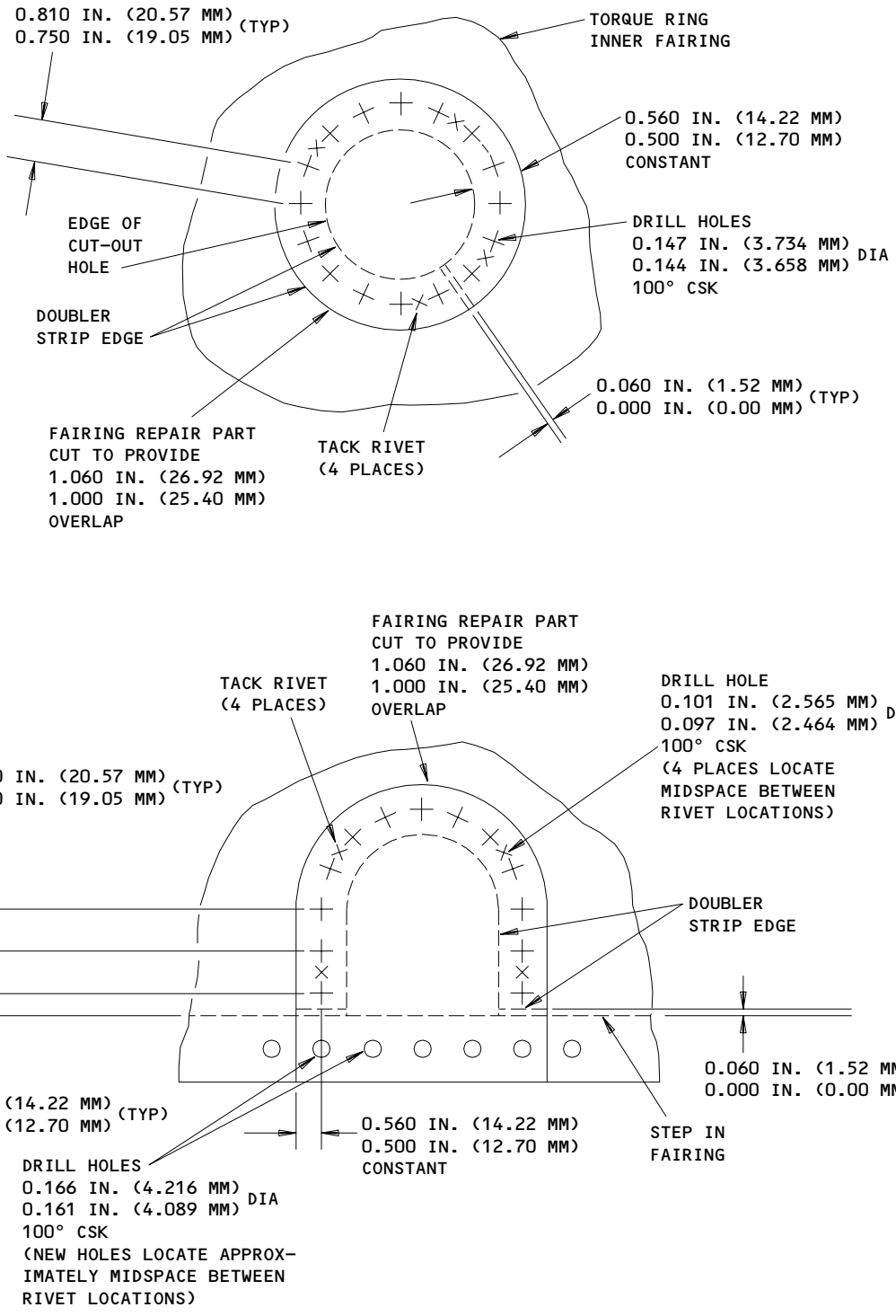
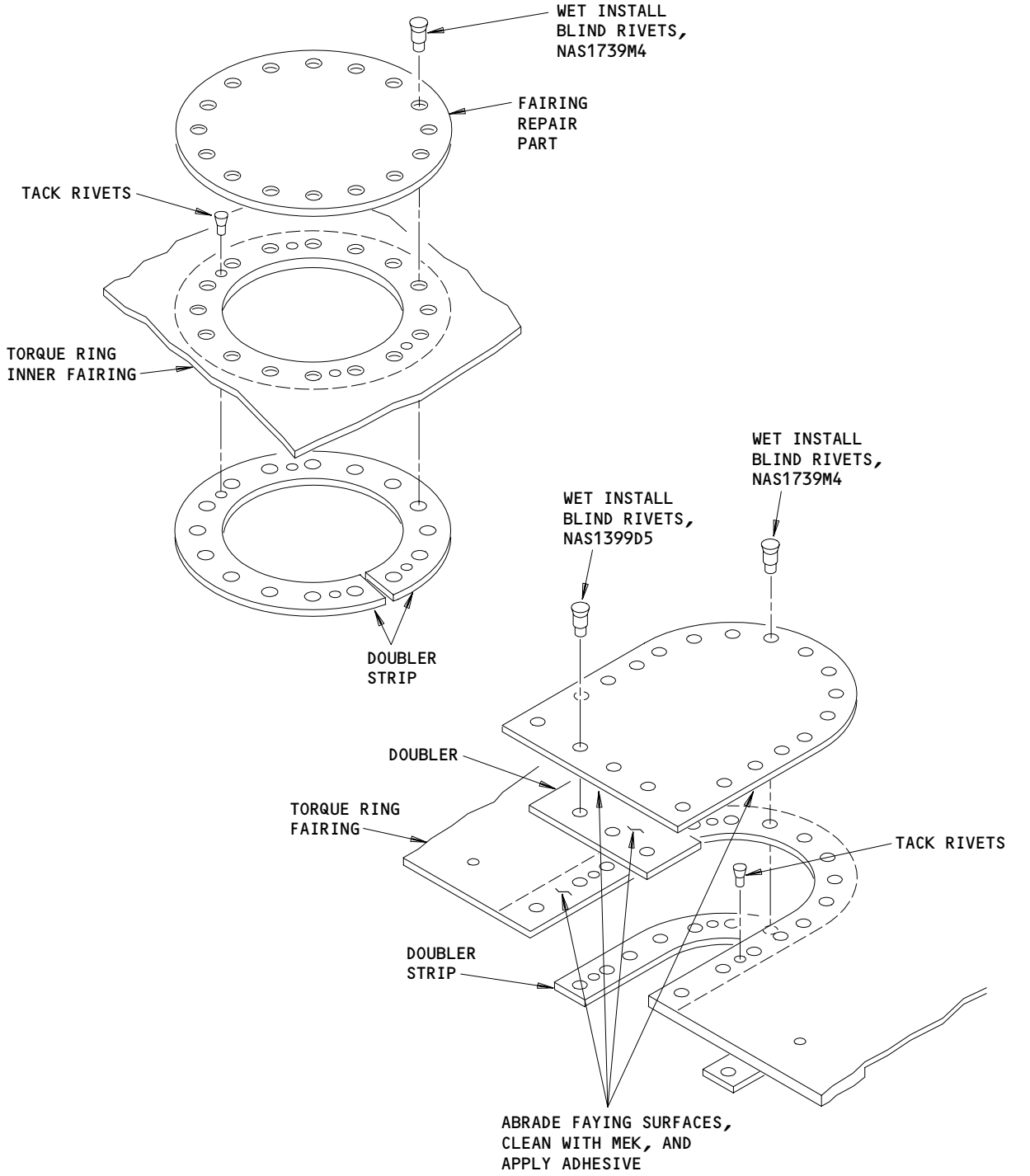
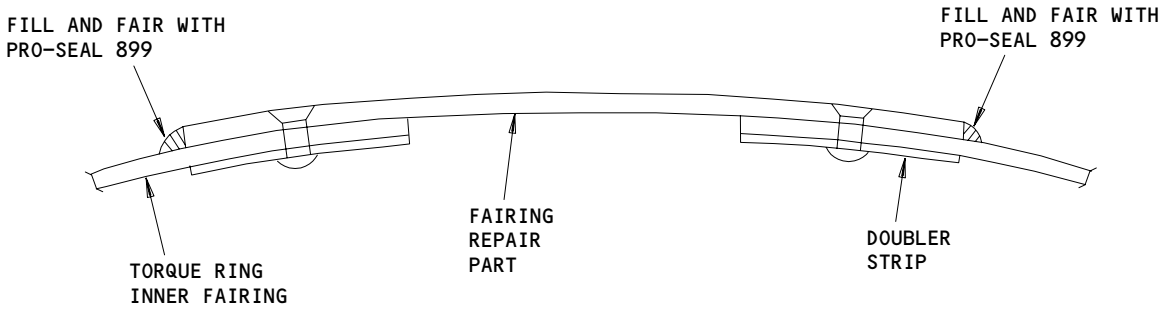
Fixed Duct Inner Torque Ring Fairing Replacement
Figure 819 (Sheet 2)



Fixed Duct Inner Torque Ring Fairing Replacement
Figure 819 (Sheet 3)



Fixed Duct Inner Torque Ring Fairing Replacement
Figure 819 (Sheet 4)



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Fixed Duct Inner Torque Ring Fairing Replacement
Figure 819 (Sheet 5)

(e) Fabricate fairing repair part and doubler strip from aluminium sheet.

S 348-131-R00

(2) Repair damaged fairing area (Fig. 819, Sheets 2 and 3).

(a) Install doubler strip.

1) Position doubler strip on inside surface of fairing.
2) Drill and countersink holes for tack rivets.
3) Wet assemble tack rivets using adhesives and ensure rivets are flush to 0.004 in. (0.103 mm) underflush.
a) Rivet shaving is not permitted.

(b) Temporarily position fairing repair part (Fig. 819, Sheet 2 and 3).

1) Position fairing repair part and if adjacent to an edge also position a doubler then countersink drill fastener holes.

WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASKS AND SAFETY GLASSES. AVOID BREATHING DUST OR PROLONGED CONTACT OF DUST ON THE SKIN.

2) Remove fairing repair part, and doubler repair part if necessary, and slightly abrade faying surfaces.

(c) Clean and install repair parts.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE; KEEP AWAY FROM IGNITION SOURCES.

1) Clean faying surfaces using a bleached cheesecloth saturated with degreasing fluid.

NOTE: It is important that a clean lint-free cheese-cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

a) Wipe dry before degreasing fluid evaporates.

WARNING: USE ADHESIVE ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT ADHESIVE FROM COMING INTO CONTACT WITH THE SKIN.

(d) Prepare adhesive to the manufacturer's instructions.
(e) Apply adhesive to faying surfaces using a paint brush.
(f) Position fairing repair part and if adjacent to an edge also position a doubler.
(g) Wet assemble blind rivets using adhesive ensuring rivets are flush to 0.004 in. (0.103 mm) underflush.
1) Rivet shaving is not permitted.
(h) Cure adhesive using heater blankets and apply local heat at 180 to 200°F (82 to 93°C.) for one hour.

S 218-132-R00

(3) Inspect repair area.
(a) Make a visually inspection of the repair area.
1) Make a check for irregularitites in contour and for loose rivets.

WARNING: USE FILLER ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(b) Fill in gaps around repair area (Fig. 819, Sheet 5).
1) Fill and fair steps using filler.
(c) Cure filler using heater blankets and apply local heat at 140°F (60°C) for one hour.

WARNING: WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASK AND SAFETY GLASSES. AVOID BREATHING DUST OR PROLONGED CONTACT WITH SKIN.

(d) Abrade filler to fair in and reduce irregularities using abrasive paper.

S 378-133-R00

(4) Apply protective coatings.
(a) Apply two pack epoxy paint to repair area (Ref FRS.6400).

S 218-134-R00

(5) Visually inspect finished repair.

S 938-135-R00

(6) Mark the repair number next to assembly part number with a permanent marker pen of contrasting color.

NOTE: Use FRS6061 for the left-hand thrust reverser and FRS6062 for right-hand thrust reverser.

S 418-137-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Close the thrust reverser (AMM 78-31-00/201).

S 868-136-R00

(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-155-R00

11. Thrust Reverser Fixed Duct Assembly - Outer Fairing Repair

A. General

(1) This procedure applies to both left-hand (FRS.6037) and right-hand (FRS.6032) thrust reverser fixed duct assemblies with the following part numbers:

(a) LJ750089
LJ750090

B. Equipment

(1) Riveting tools
(2) Heat lamps (explosionproof)

C. Consumable Materials

(1) Sealant, two-part polysulphide (brushable), PR-1436G-A2 (Product Research and Chemical Corp., Glendale, CA), MIL-S-81733, Omat 8/106A
(2) Abrasive paper, (Grit size 180), Omat 5/62
(3) Adhesive, EA956 (Hysol Division, Pittsburgh, CA), Omat 8/117
(4) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol Omat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(5) Lint Free Cloth, Omat 2/101

(6) Gloves, Lint Free Cloth, Omat 2/114
(7) Paint brush, Short bristle 1.0 in. (25 mm), Omat 212
(8) Fiberglass Cloth, Omat 8/884
(9) Adhesive, EA934NA, Omat 8/52
(10) Filler, Glass Fiber, Omat 8/130
(11) Adhesive, EA9309.3 (Dexter Corp., Hysol Division, Pittsburg, CA), Omat 8/150

D. Parts
(1) Fairing - LJ76103
(2) Blind rivet - NAS1739M4-3 (RR2308437)
(3) Washer - AN960C4 (RR1205508)
(4) Washer - AN960C4 (RR1205508)
(5) Rub strip - LJ70871

E. References
(1) AMM 78-31-20/801, Thrust Reverser Fixed Duct - Surface Protection - Restore (FRS.6400)

F. Procedure

S 848-156-R00

(1) Prepare damaged area for repair.

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

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser (AMM 78-31-00/201).
(c) Remove metal parts which are closer than 1.25 in. (31.75 mm) from edge of damaged area by drilling out fasteners.
1) Keep the parts for the installation.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOUR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE; KEEP AWAY FROM IGNITION SOURCES.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(d) Clean around damaged area using a cheesecloth saturated with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

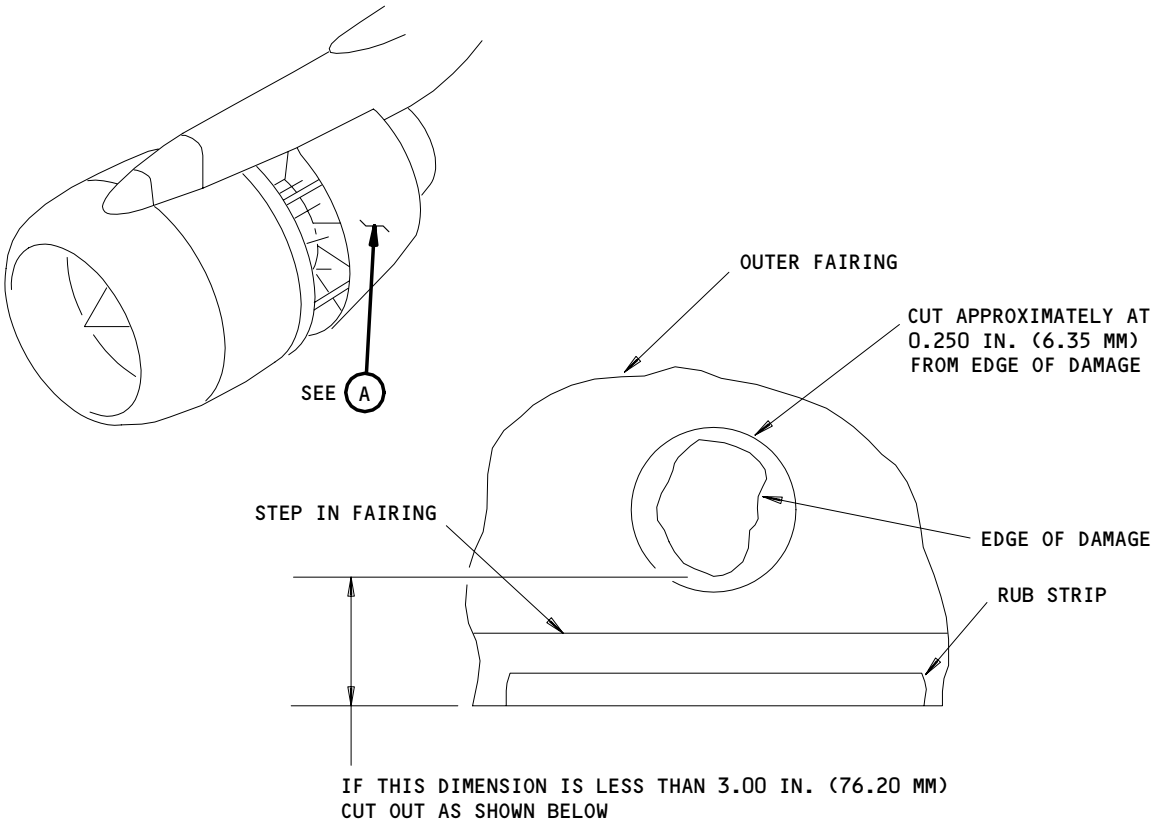
1) Wipe dry before the solvent evaporates.

(e) Cut away damaged fairing.

NOTE: If required, peel down edge reinforcing plys in area of fairing repair part.

WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASKS AND SAFETY GLASSES. AVOID BREATHING DUST AND PROLONGED CONTACT OF DUST ON THE SKIN.

(f) Cut as required from fairing repair part, and rub strip.



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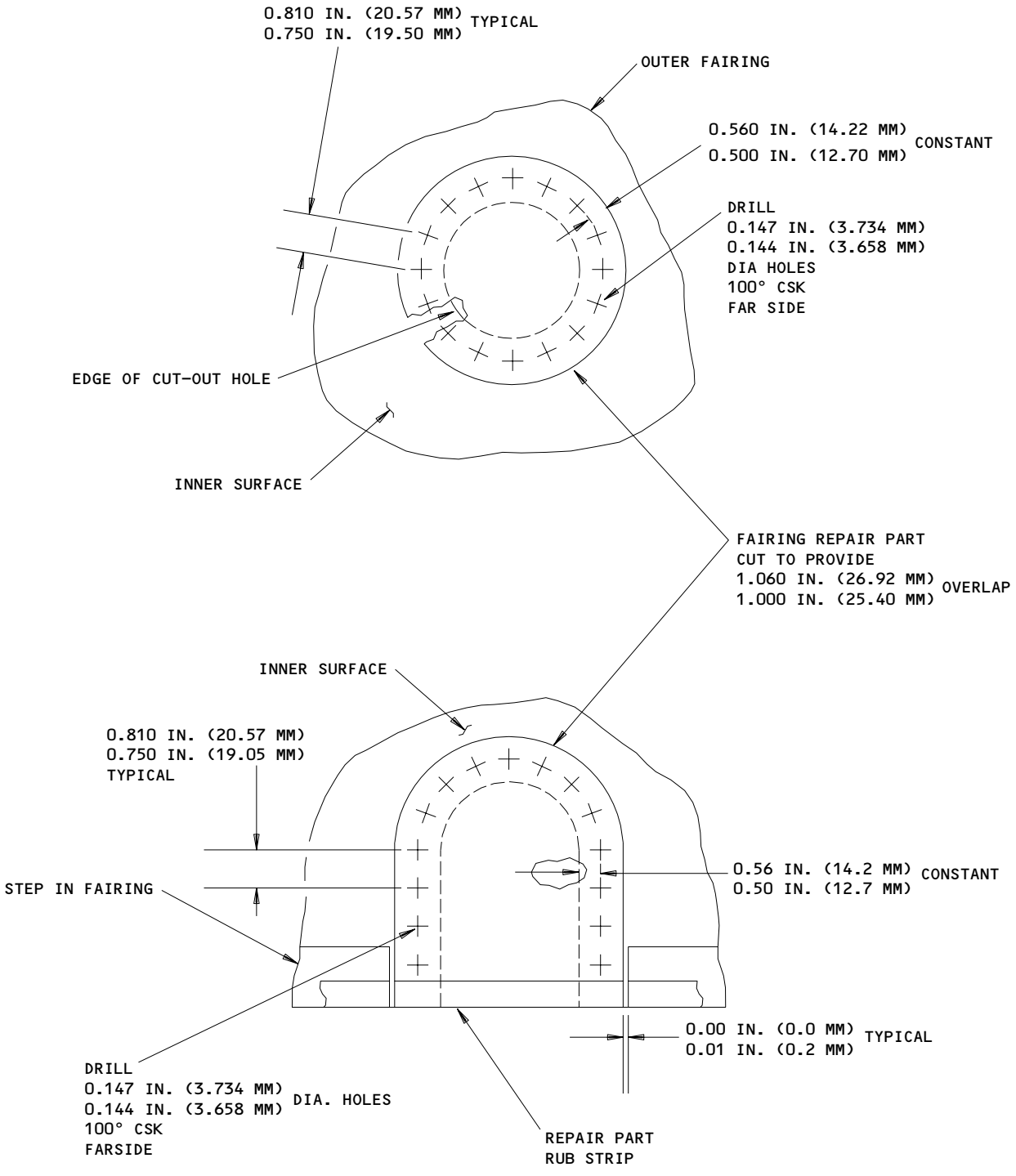
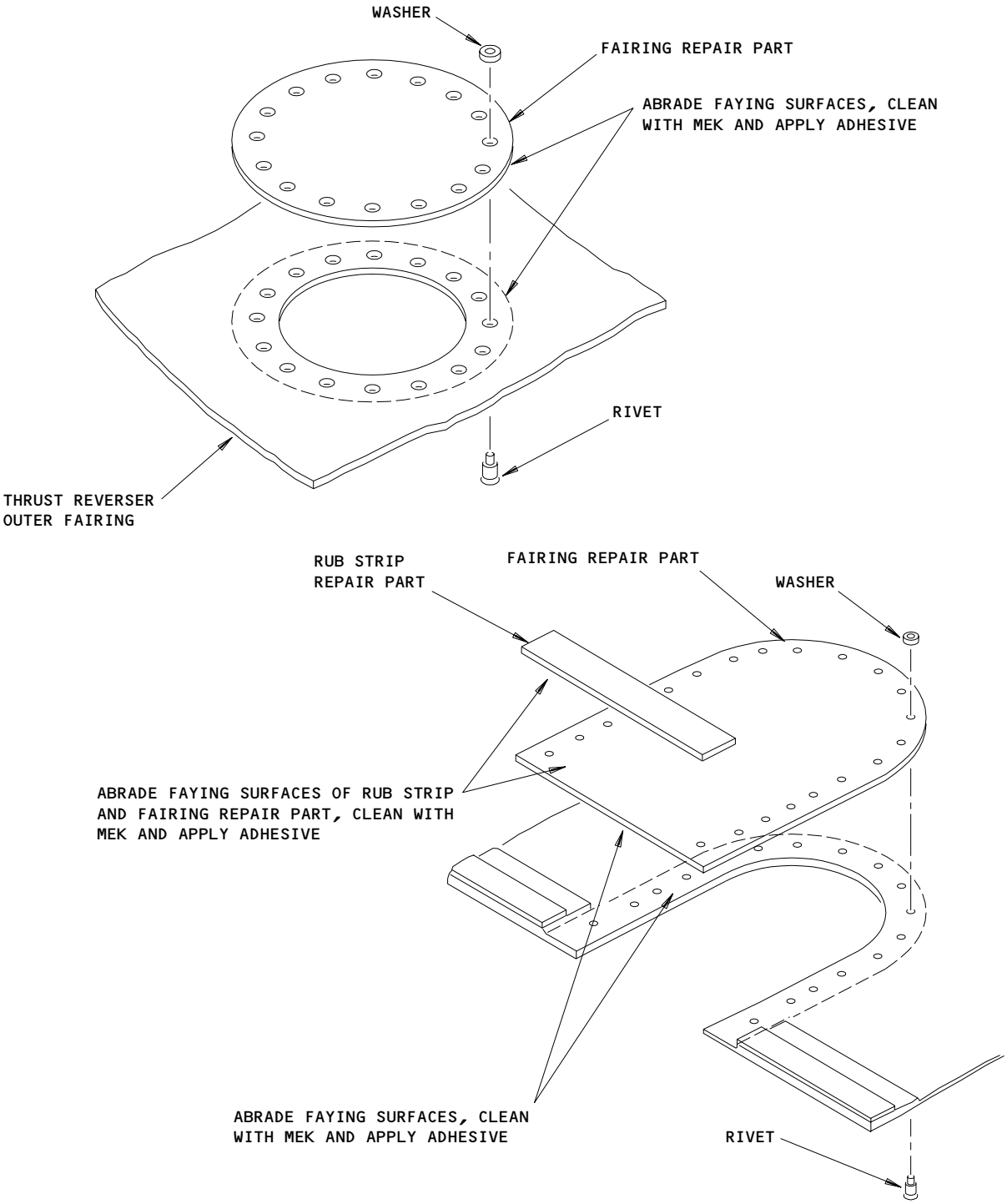
Thrust Reverser Outer Fairing Repair
Figure 820 (Sheet 1)



Thrust Reverser Outer Fairing Repair
Figure 820 (Sheet 2)



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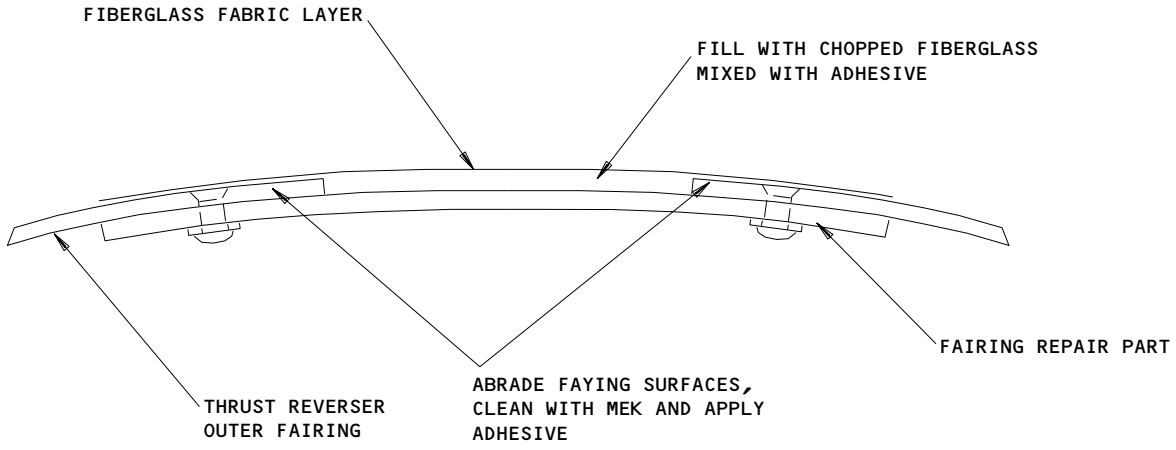
Thrust Reverser Outer Fairing Repair
Figure 820 (Sheet 3)



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Thrust Reverser Outer Fairing Repair
Figure 820 (Sheet 4)

(g) Position fairing repair part and drill fastener holes.
(h) Abrade faying surface of repair part using abrasive paper.

NOTE: Abrading must be done with a back and forth motion until a matt appearance is obtained.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION. DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(i) Clean faying surfaces using a cheesecloth saturated with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

1) Wipe dry before the solvent evaporates.

S 438-159-R00

(2) Install repair parts (Fig. 820).

WARNING: USE ADHESIVE ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(a) Prepare adhesive, EA956, per manufacturer's instructions.
(b) Apply adhesive EA956, using a brush, on faying surfaces of repair area and faying repair part.

(c) Position and clamp fairing repair part on inner surface of torque ring fairing.
(d) Install blind rivets.
1) Place washer under upset head of each rivet.
2) Wet install washers and blind rivets with sealant.
a) Install the rivets flush to 0.004 inch (0.0103 mm) underflush.

NOTE: Rivet shaving is not permitted.

(e) Cure adhesive using heat lamps for one hour at 180 to 280° F (82 to 138° C).

WARNING: USE ADHESIVE ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(f) Prepare adhesive, EA9309, per manufacturer's instructions.
(g) Apply adhesive, EA9309.3, using a brush, to fairing repair part and abraded side of rub strip.
(h) Position and clamp rub strip whilst maintaining 0.005 to 0.010 in. (0.13 to 0.25 mm) glueline thickness.
(i) Cure adhesive at room temperature for two hours then, using heat lamps, apply local heat at 170 to 180°F. (77 to 88°C) for 60 to 90 minutes.

S 418-160-R00
(3) Install disassembled parts
(a) Clean remaining adhesive off metal parts, using abrasive paper.

WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASKS AND SAFETY GLASSES. AVOID BREATHING DUST AND PROLONGED CONTACT OF DUST ON THE SKIN.

(b) Slightly abrade faying surfaces of torque ring outer fairing using abrasive paper.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(c) Clean faying surfaces using a cheesecloth saturated in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

1) Wipe dry before the solvent evaporates.

WARNING: USE ADHESIVES ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(d) Prepare adhesive, EA934NA, per manufacturer's instructions.
(e) Apply adhesive, using a brush, to faying surfaces.
(f) Position and clamp metal parts on torque ring outer fairing.

(g) Wet install blind rivets with sealant.
1) Install rivets flush to 0.004 in. (0.103 mm) underflush.

NOTE: Rivet shaving is not permitted.

(h) Cure adhesive using heat lamps for one hour at 180 to 280°F (82 to 138°C).

S 378-161-R00

(4) Prepare surface for finish.

WARNING: SANDING OR CUTTING OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASKS AND SAFETY GLASSES. AVOID BREATHING DUST AND PROLONGED CONTACT OF DUST ON THE SKIN.

(a) Slightly abrade faying surfaces using abrasive paper.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(b) Clean faying surfaces using a cheesecloth saturated in Acetonel, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

1) Wipe dry before the solvent evaporates.

S 378-162-R00

(5) Apply finishing materials.

WARNING: USE ADHESIVE ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(a) Prepare adhesive, EA956, per manufacturer's instructions.

WARNING: MIXING OF CHOPPED COMPOSITE MATERIALS PRODUCE DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTECTIVE CLOTHING, GLOVES, DUST MASKS AND SAFETY GLASSES. AVOID BREATHING DUST AND PROLONGED CONTACT OF DUST ON THE SKIN.

(b) Prepare filler.
1) Add 15 to 20 percent of chopped fiberglass, by weight, to prepared adhesive.
2) Mix until a paste consistency is achieved.
(c) Cut a piece of fiberglass fabric to the same size as fairing repair part.

S 378-018-R00

WARNING: USE MATERIALS ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(6) Apply finishing materials to repair area.
(a) Fill and fair void area.
(b) Brush apply adhesive to faying surfaces.
(c) Lay up fiberglass fabric layer.
1) Press the adhesive through the fabric layer by working over it with a brush to impregnate fabric layer and to remove entrapped air.

NOTE: Fabric layer must be completely wetted by the adhesive.

(d) Cure adhesive by air drying at room temperature for two hours, to gell the filler, then use heater lamps for one hour at 180 to 280°F. (82 to 138°C).

WARNING: SANDING OR CUTTING. OF COMPOSITE MATERIALS PRODUCES DUST AND FLYING PARTICLES WHICH ARE POTENTIAL HEALTH HAZARDS. WEAR PROTEDTIVE CLOTHING, GLOVES, DUST MASKS AND SAFETY GLASSES. AVOID BREATHING DUST AND PROLONGED CONTACT OF DUST ON THE SKIN.

(e) Abrade outside surface of repaired area to contour using abrasive paper.
(f) Visually inspect repair, checking for contour irregularities and loose rivets.
(g) Reprotect repair area (AMM 78-31-20/801, FRS.6400).

S 938-165-R00

(7) Mark the repair number adjacent to the assembly number, with a permanent marker pen of contrasting colour.

NOTE: Use FRS.6037 for the left-hand thrust reverser and FRS.6032 for the right-hand thrust reverser.

S 418-451-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Close the thrust reverser (AMM 78-31-00/201).

S 868-166-R00

(9) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-168-R00

12. Thrust Reverser Fixed Duct Assembly - Inner Seal Repair

A. General

(1) This procedure (FRS.6161) applies to both left-hand and right-hand thrust reverser inner fixed duct assemblies with the following part numbers:

(a) LJ75089
LJ75090
LJ76376 SB78-9235
LJ76497 SB78-9722
LJ77111 SB78-D518
LJ76377 SB78-9235
LJ76554 SB78-9627
LJ76690 SB78-9627
LJ76498 SB78-9722

(2) This procedure details the repair, by replacement, of a damaged seal.

B. Equipment

(1) Standard workshop tools.

C. Consumable Materials

(1) Sealant, RTV102, Omat 872B
(2) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(3) Clean cotton cloth, Omat 290
(4) Paint brush, Omat 2/12
(5) Primer, Silooset OP1, Omat 876

D. Parts
   (1) Seal, LJ71743
   (2) Blind rivet, CCR264CS-3-3

E. Procedure

S 038-170-R00

(1) Remove damaged seal (Fig. 821).

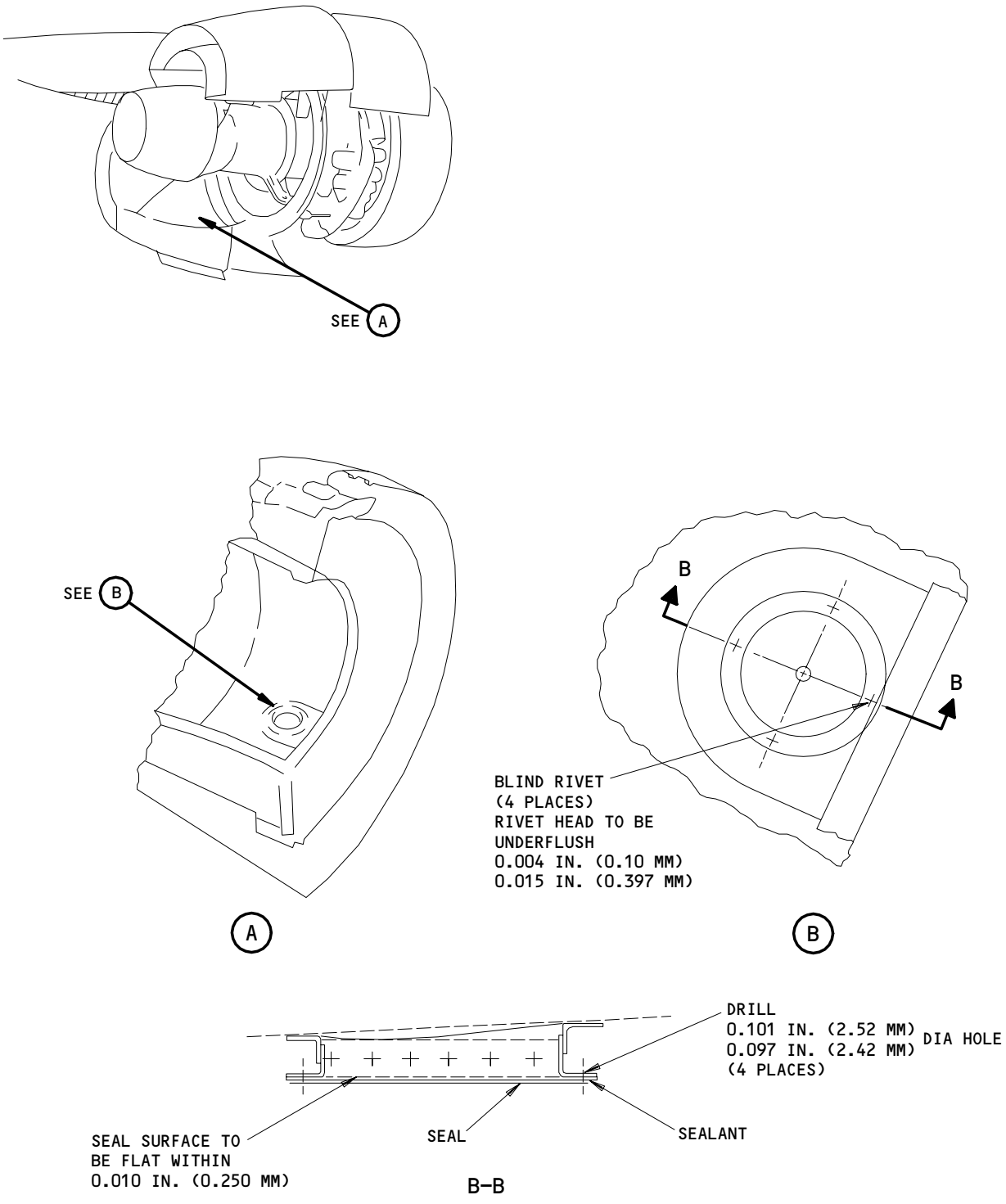
WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser (AMM 78-31-00/201).
(c) Drill out attaching rivets.

NOTE: Seal is located in upper quadrant within right-hand C-duct.



Thrust Reverser Inner Seal Repair
Figure 821

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. DEEP AWAY FROM IGNITION SOURCES.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(d) Remove sealant, using a putty knife, and clean the surface using a clean cloth saturated in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

1) Wipe dry before the solvent evaporates.

S 438-171-R00

(2) Install the new seal.

(a) Drill holes in seal to match existing holes in structure.

WARNING: AVOID PROLONGED OR REPEATED SKIN CONTACT WITH PRIMER. USE PRIMER ONLY IN AREAS WITH GOOD VENTILATION. PRIMER IS VERY FLAMMABLE;KEEP AWAY FROM IGNITION SOURCES.

(b) Apply primer to faying surfaces and allow to dry for 30 minutes at room temperature.

WARNING: USE SEALANT ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(c) Apply sealant, using a paint brush, to faying surfaces.

(d) Position seal in structure and clamp in place.

(e) Cure sealant for six hours at room temperature.

NOTE: The uncured sealant is sructurally and functionally acceptable for flight. Hence under maintenance conditions curing the sealant can be eliminated. Avoid handling the repair area under these conditions.

(f) Install blind rivets.

S 218-172-R00

(3) Visually inspect repair for contour irregularities and loose rivets.

S 938-173-R00

(4) Mark FRS.6161 adjacent to seal part number, using a permanent marker pen of contrasting color.

S 418-175-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Close the thrust reverser (AMM 78-31-00/201).

S 868-174-R00

(6) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-176-R00

13. Left T/R - Hinge Access Door - Forward Seal Repair

A. General

(1) This procedure (FRS.6142) applies to left-hand thrust reversers with the following part number:

(a) LJ75089

B. Equipment

(1) Standard workshop tools
(2) Rivet squeezer
(3) Heat lamps (explosionproof)

C. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(2) Clean cotton cloth, (Local resources)
(3) Abrasive paper, (Grit size 180), Omat 5/62
(4) Primer, Dow 1200 (Dow Corning, Midland, MI), Omat 8/142
(5) Sealant, Dow 93- 006 (Dow Corning, Midland, MI), Omat 8/143
(6) Acetone, Omat 150
(7) White cotton gloves, (Local resources)

D. Parts

(1) Seal - LJ75533

(2) Blind rivet - NAS1399M4-3 (Local resources)
(3) Rivet - MS20427M4-5 (RR2308394)

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-20/801, Thrust Reverser Fixed Duct - Surface Protection - Restore (FRS.6400)

F. Procedure

S 038-177-R00

(1) Remove damaged seal

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

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser (AMM 78-31-00/201).
(c) Drill out attaching rivets and remove damaged seal.

NOTE: Due to expansion of rivets in seal flange, drill out rivets from airstream side of outer fairing.

(d) Remove residual sealant from torque box fairing, using a putty knife and/or abrasive paper.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE; KEEP AWAY FROM IGNITION SOURCES.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(e) Clean repair area using a clean cotton cloth saturated in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

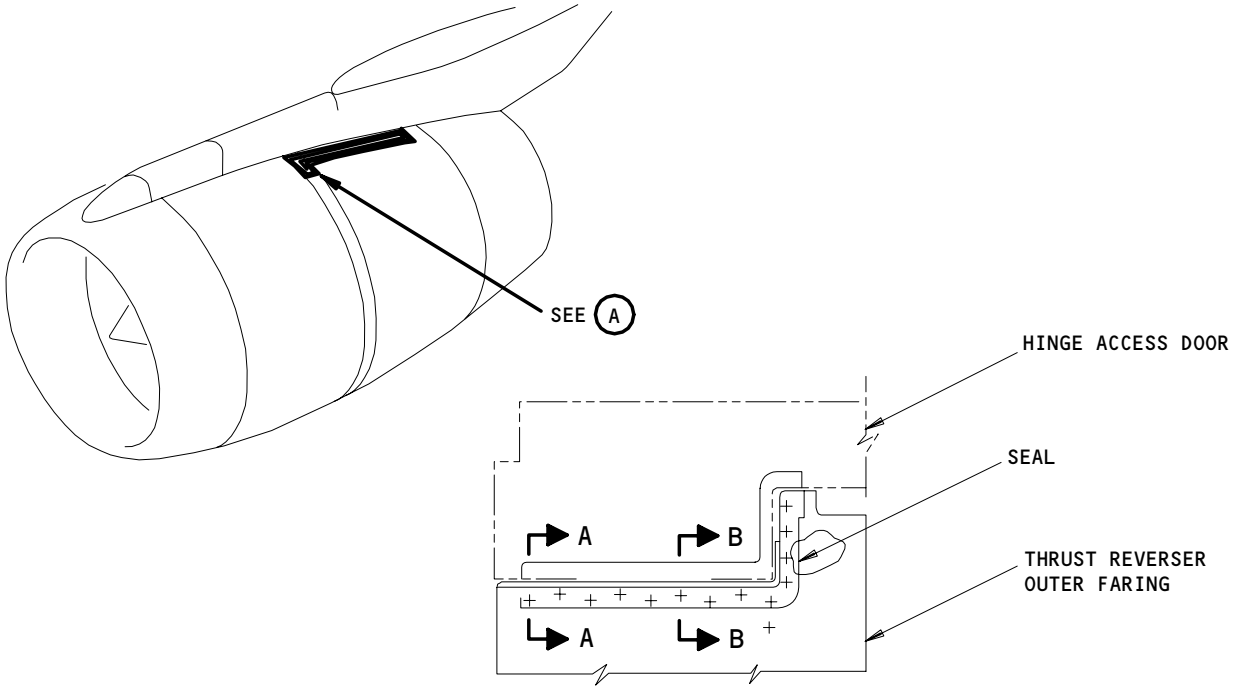
1) Wipe dry before the solvent evaporates.

S 438-179-R00

(2) Replace damage seal (Fig. 822).

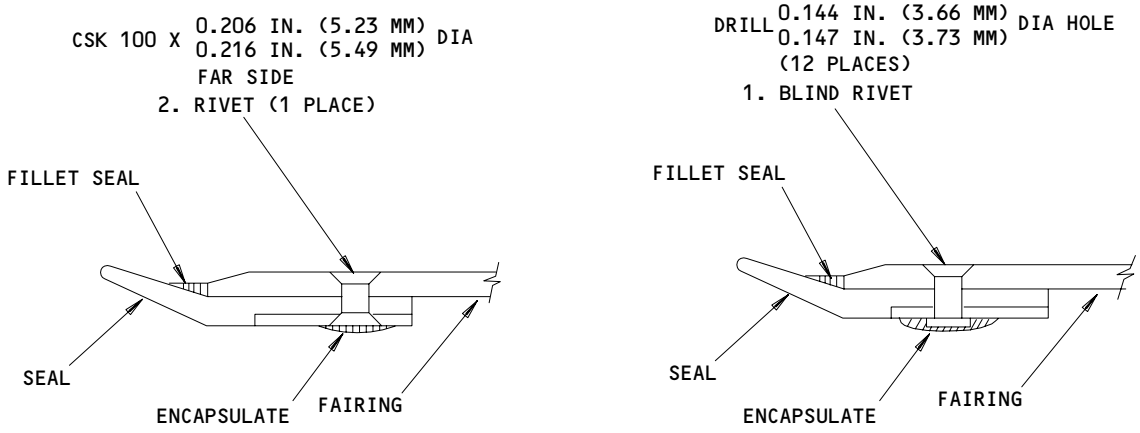
(a) Drill holes in seal to match existing holes in structure.

NOTE: Seal has an imbedded 0.032in. (0.81 mm.) thick 321 CRES retainer.



FORWARD SEAL–HINGE ACCESS DOOR

A



A–A

B–B

1. BLIND RIVET,
2. RIVET,

62184

Left Thrust Reverser Hinge Access Door Forward Seal Repair
Figure 822

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(b) Clean seal using a clean cotton cloth dampened with Acetone, Isopropyl alcohol, or cleaning fluid (Desoclean).
1) Handle cleaned seal with gloves.

WARNING: AVOID PROLONGED OR REPEATED SKIN CONTACT WITH PRIMER.

USE PRIMER ONLY IN AREAS WITH GOOD VENTILATION.

PRIMER IS VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(c) Apply primer to edge of fairing in area of fillet seal.
(d) Cure primer for one hour at room temperature.

WARNING: USE SEALANT ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(e) Prepare sealant according to manufacturer's instructions.
(f) Install seal using rivets (1) (12 off) (2) (1 off).

NOTE: Rivets must be squeeze fitted and not bucked.

1) Encapsulate all upset rivet heads and apply a continuous fillet seal, using sealant.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS, AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(g) Remove excess adhesive with a clean cloth dampened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
1) Wipe dry before the solvent evaporates.
(h) Cure sealant for eight hours at 176° F. (80° C.) using heat lamps.

NOTE: The uncured sealant is structurally and functionally acceptable for flight. Hence under maintenance conditions curing the sealant can be eliminated. Avoid handling the repair area under these conditions.

S 218-180-R00
(3) Visually inspect repair.
(a) Refinish repair area (Ref FRS.6400).

S 938-181-R00
(4) Mark FRS.6142 adjacent to part number using a permanent marker pen of contrasting color.

S 418-183-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Close the left thrust reverser (AMM 78-31-00/201).

S 868-182-R00
(6) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-184-R00

14. Upper Bifurcation - Fire Shield Renewal

A. General

(1) This procedure applies to both left-hand (LH) (FRS.6145) and right-hand (RH) (FRS.6146) thrust reverser assemblies with the following part numbers:

(a) LJ75089
LJ75090
LJ76376 SB78-9235
LJ76497 SB78-9722
LJ77111 SB78-D518
LJ76377 SB78-9235
LJ76554 SB78-9627
LJ76690 SB78-9627
LJ76498 SB78-9722

(2) The procedure details the removal of a damaged fire shield and replacing it with a new fire shield.

B. Equipment

(1) Drills and drilling equipment
(2) Riveting equipment
(3) Hi-Lok equipment

C. Consumable Materials

(1) Sealant, RTV90- 006 Dow- Corning Corp PO BOX 592 Midland, MI, Omat 8/138
(2) Catalyst, RTV90-006- 002 Dow- Corning Corp PO Box 592 Midland, MI, Omat 8/138
(3) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) Omat No. 1/257
(4) Cotton cloth
(5) Primer, (pink) DC1200, Omat 8/142

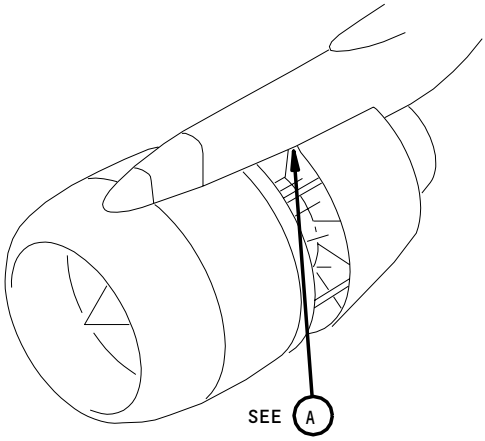
D. Parts

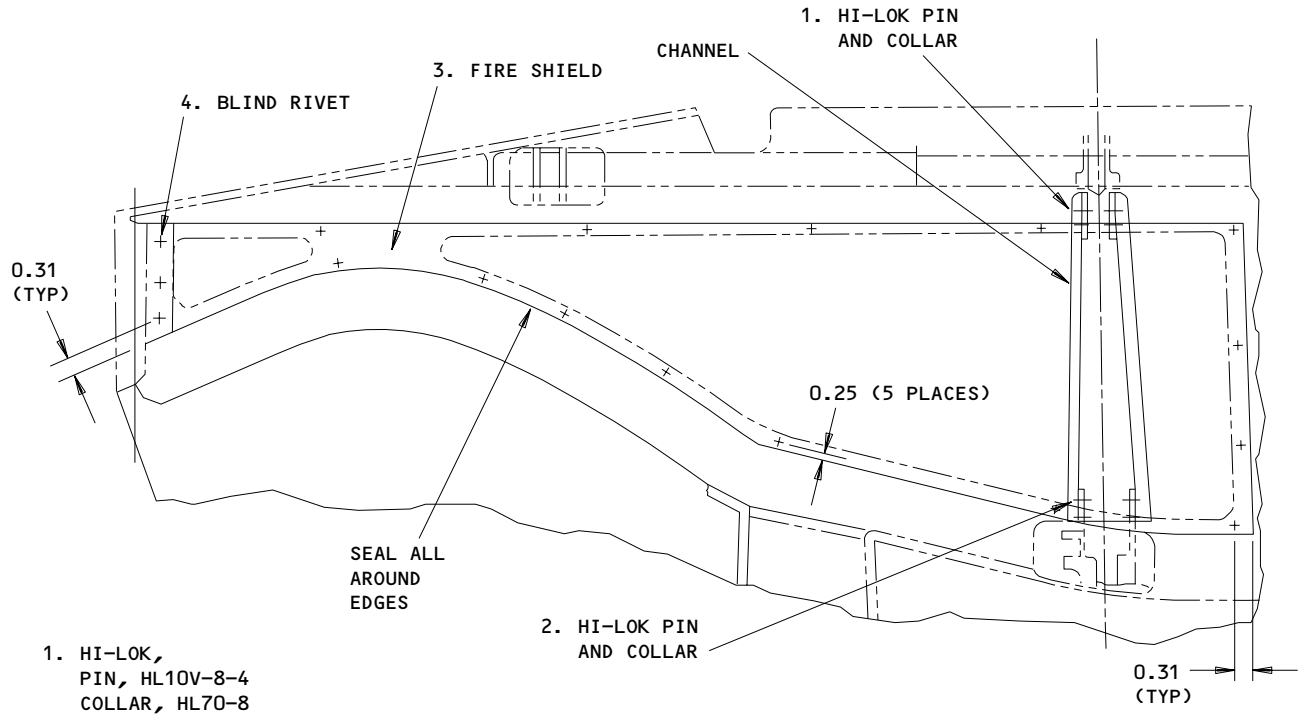
(1) Hi-Lok Pin - HL10V-8-4 (RR1011714)
(2) Hi-Lok collar HL70-8 (RR3408582)
(3) Rivet - NAS1738M4-2 (RR2308258)
(4) Fire Shield - LH LJ76061, RH LJ76062
(5) Hi-Lok pin - HL10V-8-6 (RR1011713)

E. Procedure

S 038-186-R00

(1) Removal of fire shield (Fig. 823).





1. HI-LOK,
   PIN, HL10V-8-4
   COLLAR, HL70-8
2. HI-LOK,
   PIN, HL10V-8-6
   COLLAR, HL70-8
3. FIRE SHIELD,
   LH LJ 75559 OR LJ 75947
   RH LJ 75948
4. BLIND RIVET, NAS 1738M4-2

94066
94067

Thrust Reverser Upper Bifurcation Fire Seal Repair
Figure 823

(a) Remove the Hi-Lok fasteners.
(b) Remove channel to clear the work area.
(c) Remove fasteners from fire shield using drills and drilling equipment.
(d) Remove the fire shield.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(e) Remove and clean remaining sealant.
1) Use a putty knife to scrape the sealant off and use clean cotton cloth and solvent.
2) Use a clean cotton cloth and solvent to clean the remaining sealant.

NOTE: It is important that a clean cotton cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on the the cloth, thereby avoiding contamination of the bulk liquid.

a) Wipe dry with clean cotton cloth before solvent evaporates.

S 438-188-R00

(2) Install fire shield (Fig. 823).
(a) Locate the replacement fire shield and drill fastener holes.

NOTE: Drill to match existing holes in structure using drills and drilling equipment.

(b) Install rivets (4) using riveting equipment.

WARNING: AVOID PROLONGED OR REPEATED SKIN CONTACT WITH PRIMER. USE ONLY INAREAS WITH GOOD VENTILATION. VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(c) Apply sealant primer (DC1200) to fire shield.
1) Apply primer literally to repair rivets (4) and area surrounding repair fire shield.
2) Apply primer to edges of repair fire shield where sealant is to be applied.

3) Allow primer to dry.

NOTE: Drying time at 68°F. (20°C.) approximately 30 minutes.

WARNING: USE SEALANT ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL COMING INTO CONTACT WITH THE SKIN.

(d) Apply sealant to fire shield.
1) Mix sealant and catalyst to manufacturer's instructions.
2) Apply sealant and encapsulate repair rivet (4).
3) Apply sealant over edges of repair fire shield.

(e) Cure sealant at 72°F. (22°C.) for 24 hours.

NOTE: The uncured sealant is sructurally and functionally acceptable for flight. Hence under maintenance conditions curing the sealant can be eliminated. Avoid handling the repair area under these conditions.

(f) Install the channel to original position and secure in position using Hi-Lok pins and collars using Hi-Lok equipment.

S 938-189-R00

(3) Mark the repair number adjacent to fire shield part number with a permanent marker pen of contrasting color.

NOTE: Use FRS.6145 for the LH thrust reverser and FRS.6146 for the RH thrust reverser.

TASK 78-31-20-308-190-R00

15. Liner Barrel Fire Shield - Repair Fire Shield

A. General

(1) This procedure, FRS.6175, applies to both left-hand (LH) and right-hand (RH) thrust reverser assemblies with the following part numbers:

(a) LJ75089
LJ75090

(2) The repair may be effected by installing a patch over cracks and holes.

B. Equipment

(1) Drills and drilling equipment
(2) Riveting equipment
(3) Heat lamps (explosionproof)

C. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 140 or
Cleaning solvent (Desoclean) OMat No. 1/257

(2) Gloves, white cotton
(3) Cheese cloth, Bleached
(4) Primer, (pink) DC1200, Omat 8/142
(5) Corrosion Resistant Steel (Cres) Sheet Type 321 (0.016 (0.406 mm))
(6) Sealant, RTV90-006 Dow Corning Corp., P.O. Box 592 Midland, MI, Omat 8/138
(7) Catalyst, RTV90-006-2 Dow Corning Corp., P.O. Box 592, Midland, MI, Omat 8/138
(8) Fiber filler (Cermanic Fiber Batt), TMS0814-2092 (0.125 in (3.17 mm)) - 12 pound density TIG-HITCO, 2302 Marietta Blvd. NW, Atlanta, GA
(9) Fiber filler (Cermanic Fiber Batt), TMS0814-2092 (0.50 in (13.0 mm)) - 8 pound density TIG-HITCO, 2302 Marietta Blvd. NW, Atlanta, GA
(10) Masking tape

D. Parts
(1) Blind rivet - NAS1738C4-1 (RR2308550)
(2) Washer - AN960C3

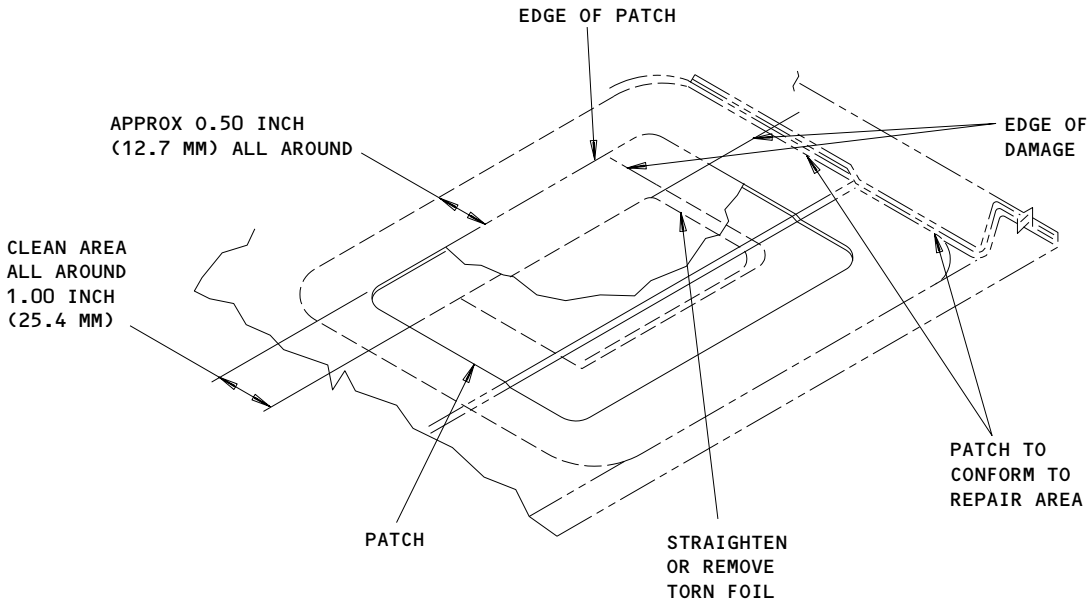
E. Procedure

S 848-192-R00

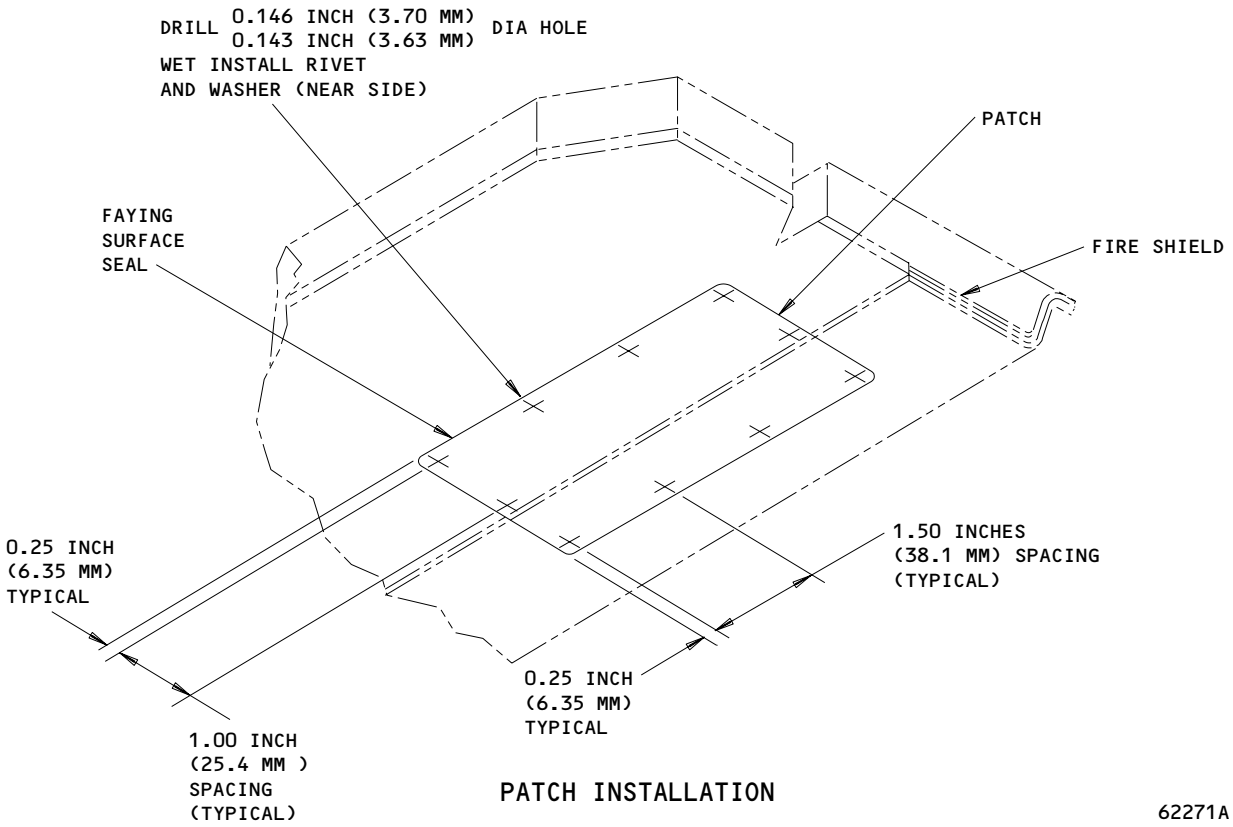
(1) Prepare damaged area for repair (Fig. 824).
(a) Cut away torn skin remnants.
(b) Determine size and amount of material required to effect repair.
(c) Layout configuration of patch using damaged area of fire shield as basic pattern.
1) Manufacture a patch from CRES sheet 0.016 inch (0.406 mm).
(d) Cut out patch to above configuration.
(e) Drill rivet holes.
(f) Locate patch on fire shield and temporarily secure with masking tape.

CAUTION: TAKE CARE TO ENSURE THAT THE INNER SKIN OF THE FIRE SHIELD AND THE NON_PERFORATE SKIN OF THE INNER BARREL ARE NOT DAMAGED DURING THIS OPERATION.

(g) Drill rivet holes in fire shield outer skin.



PREPARATION



PATCH INSTALLATION

62271A

Thrust Reverser Liner Barrel Fire Shield Repair
Figure 824

(h) Remove the patch.

WARNING: PROTECTIVE GLOVES SHOULD BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.
USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.
DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(i) Make the faying surfaces clean.
1) Use a clean cotton cloth and solvent.

NOTE: It is important that a clean cotton cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk solvent.

2) Wipe dry before the solvent evaporates.

S 348-194-R00

(2) Install Patch over Damaged Area (Fig. 824).
(a) Re-arrange glass fiber filler or replace as required using fiber fillers.

WARNING: AVOID PROLONGED OR REPEATED SKIN CONTACT WITH PRIMER.
USE ONLY IN AREAS WITH GOOD VENTILATION.
VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(b) Apply primer over faying surfaces.
1) Apply primer where sealant is to be applied.
2) Allow primer to dry.

NOTE: Drying time at 68 degrees F. (20 degrees C.) approximately 30 minutes.

WARNING: USE SEALANT ONLY IN AREAS WITH GOOD VENTILATION.
TAKE PRECAUTION TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(c) Prepare sealant
1) Mix sealant and catalyst to manufacturer's instructions.
(d) Apply sealant into crecks on fire shield and on to faying surfaces.
(e) Position patch over repair area and align rivet holes.
(f) Wet install rivets and washers using sealant.
(g) Fit and close rivets using riveting equipment.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.
USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.
DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(h) Clean repair area.
(i) Use clean cotton cloth and solvent to remove any excess sealant.

NOTE: Excess sealant should be removed prior to curing.

(j) Apply sealant
1) Mix sealant and catalyst to manufacturer's instructions.
2) Apply sealant to edges of repair area.
(k) Cure sealant at 72°F. (22°C) for 24 hours.

NOTE: The uncured sealant is structurally and functionally acceptable for flight. Hence under maintenance conditions curing the sealant can be eliminated. Avoid handling the repair area under these conditions.

S 218-195-R00
(3) Visually inspect repair area checking for irregularities in contour or loose rivets and edges of patches are fully sealed.

S 938-196-R00
(4) Mark FRS.6175 adjacent to assembly number using permanent marker pen of contrasting color.

TASK 78-31-20-308-197-R00

16. Replace Blocker Door Pivot Fitting

A. General

(1) The repair procedure covered in this topic is FRS.6002 (for left-hand (LH) thrust reverser blocker door and FRS.6028 (for right-hand (RH) thrust reverser blocker door with the following assembly numbers:

(a) L.H. assembly LJ75089
R.H. assembly LJ75090
L.H. assembly LJ76376 SB78-9235
L.H. assembly LJ76497 SB78-9722
L.H. assembly LJ77111 SB78-D518
R.H. assembly LJ76377 SB78-9235
R.H. assembly LJ76554 SB78-9627
R.H. assembly LJ76690 SB78-9627
R.H. assembly LJ76498 SB78-9722

(2) The procedure gives details for the replacement of thrust reverser blocker door pivot fitting.

B. References

(1) AMM 78-31-27/401, Fan Thrust Reverser Blocker Door Drag Links

C. Equipment

(1) Drill jig bush .0980-(S)-12-8

D. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

E. Parts

(1) Collar, HL70-6 (RR3408507)
(2) Pin, HL11V6-13 (RR3408511)
(3) Pivot fitting, LJ71800
(4) Pin, LJ70500
(5) Cotter pin, MS9245-23 (RR2204723)
(6) Washer, W0242-0065 (RR3506753)
(7) Washer, AN960-10L (RR1205617)
(8) Laminated shim, LJ71830

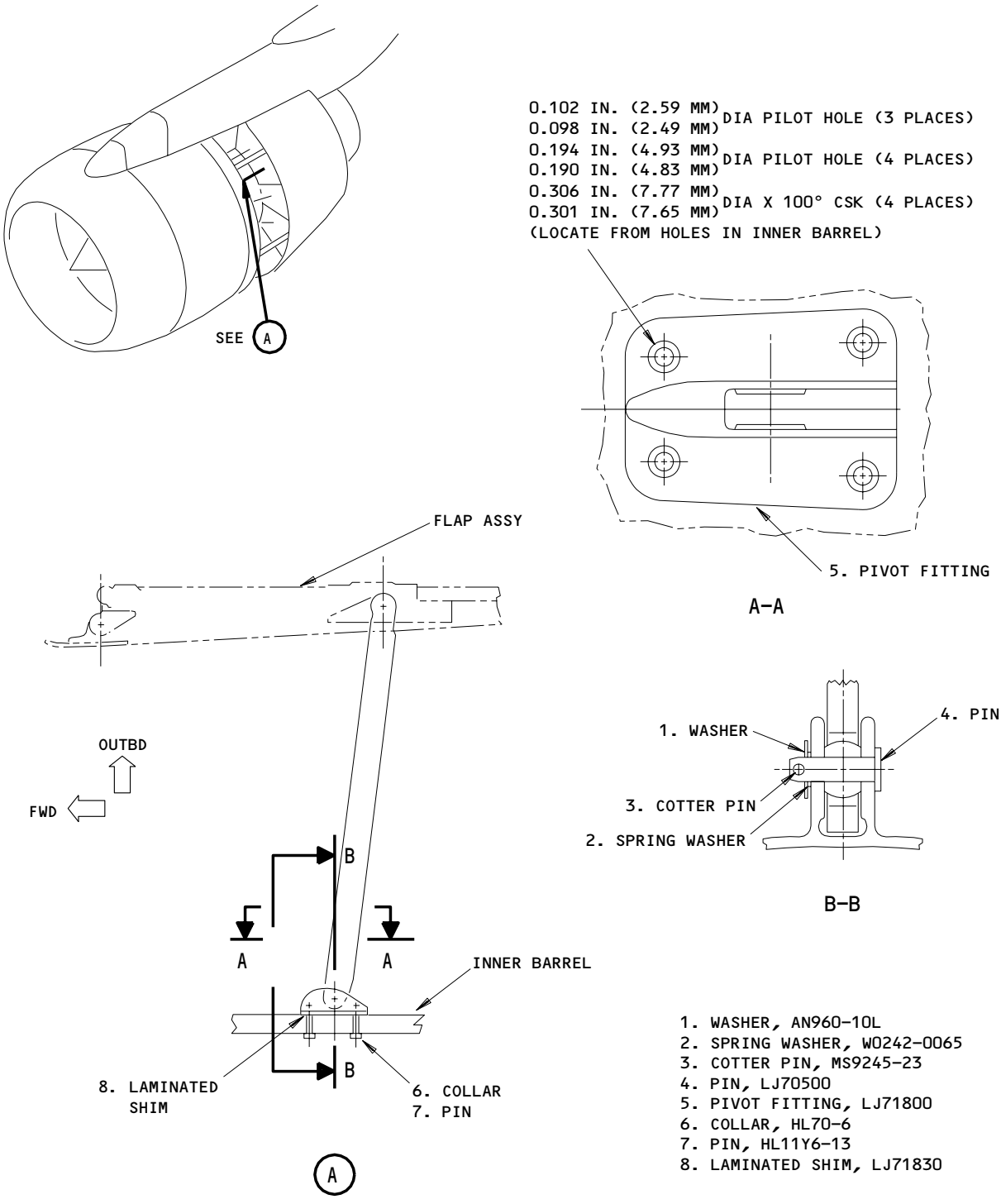
F. Procedure

S 968-199-R00

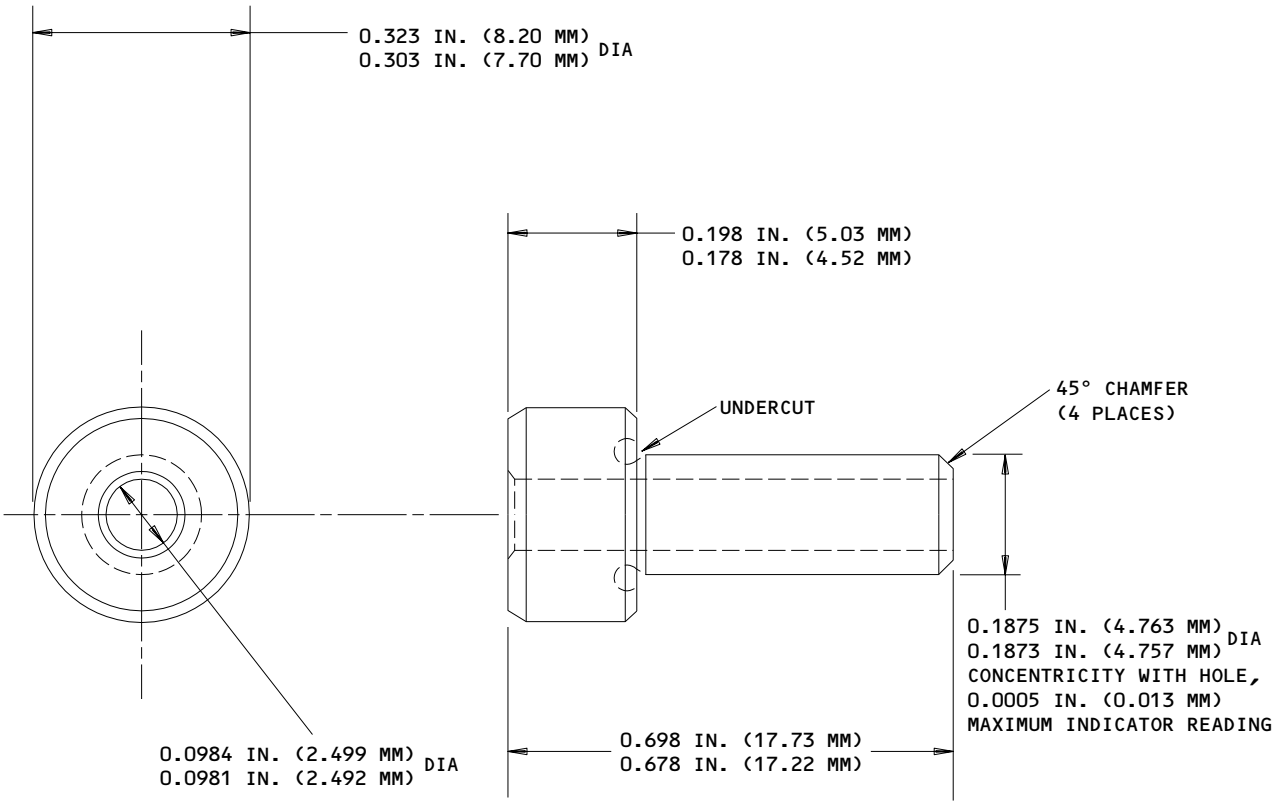
(1) Replace Blocker Door Defective Pivot Fitting (Fig. 825).

(a) Remove damaged pivot fitting (AMM 78-31-27/401).

1) Remove Hi-Lok collars and pins from pivot fitting.
2) Remove defective pivot fitting.
3) Remove laminated shim, if fitted: measure thickness and record.



Thrust Reverser Blocker Door Pivot Fitting Replacement
Figure 825 (Sheet 1)



SPECIAL DRILL JIG BUSHING

Thrust Reverser Blocker Door Pivot Fitting Replacement
Figure 825 (Sheet 2) 55924

4) Remove cotter pin, pin, washer and spring washer then, separate pivot fitting from actuator link.

NOTE: Pin and washer may be retained for reuse if undamaged or worn.

(b) Install new pivot fitting
1) Locate new pivot fitting (5) on inner barrel.
2) Temporarily secure in position using a small nut and bolt or similar temporary fastener.

NOTE: Ensure the four holes of inner barrel are symetric to the edges of the pivot fitting.

3) Back drill pilot holes in pivot fitting with jig drill bush fitted in existing holes of inner barrel.
4) Remove pivot fitting and drill pilot holes to size and countersink the four holes.
5) Deburr holes in pivot fitting.
6) If new shim (8) required drill four matching holes.
7) Peel shim down to dimension recorded during removal.
8) Reassemble pivot fitting
9) Temporarily install pivot fitting and new correct size shim (if required) using nut and bolts or similar temporary fasteners.
10) Attach link to pivot fitting (1), (2), (3), and (4).
11) Check for clearance between shim and attaching parts of pivot fitting and link.
12) Remove shim if trimming is required.
13) Trim shim as required to accommodate attaching parts.
14) Install laminated shim only if previously removed.
15) Install four Hi-Lok fasteners.

WARNING: PROTECTIVE GLOVES ARE TO BE WORN WHEN USING DEGREASERS.

SMOKING IS NOT ALLOWED AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE ONLY IN AREAS WITH GOOD VENTILATION.

VERY FLAMMABLE, KEEP AWAY FROM IGNITION SOURCES.

16) Clean surfaces with cleaning fluid using a clean cloth.

NOTE: It is important that a clean lint-free cheesecloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

WARNING: IF THE DRYING TIME IS OMITTED, CORROSION CAN RESULT FROM THE BREAKDOWN OF ANY RESIDUAL SOLVENT TRAPPED IN A RESTRICTED SPACE.

17) Allow parts which have internal pockets or passage ways to dry for at least one hour after degreasing before they are used as part of an assembly or placed in a package.

S 218-200-R00

(2) Visually check installation.

S 938-201-R00

(3) Mark the repair number adjacent thrust reverser blocker flap assembly number, using a permanent marker pen of contrasting color.

NOTE: Use FRS.6028 for the LH thrust reverser blocker flap and FRS6002 for the RH thrust reverser blocker flap).

TASK 78-31-20-308-005-R00

17. Fire Shield - Repair of Small Holes

A. General

(1) This procedure applies to both the left-hand (LH) (FRS.6045-2) and right-hand (RH) (FRS.6046-2) thrust reverser assemblies with the following part numbers:

(a) L.H. assembly LJ75089
R.H. assembly LJ75090

(2) The procedure details the repair of minor damage punctures less than 0.50 inches (12.7 mm) in diameter and tears or cracks less than 0.50 inches (12.7 mm) long by application of a silicone sealant compound.

B. Equipment
   (1) Palette knife
C. Consumable Materials
   (1) Sealant 2-part pack base and catalyst (Preferred)
       DC 90-006
       OMat No. 8/138
   (2) Sealant, (Alternate)
       RTV133
   (3) Sealant, (Alternate)
       RTV560
   (4) Silicone carbide paper, 240 grit
       OMat No. - 5/35
   (5) Degreasing fluid, Acetone OMat No. 150 or
       Isopropyl alcohol OMat No. 1/40 or
       Cleaning solvent (Desoclean) OMat No. 1/257

   (6) Cloth, lint-free
       British Spec - local purchase
       American Spec - MIL-C-24671A
       OMat No. - 2/101
D. Procedure

       S 308-006-R00
   (1) Repair minor damage
       (a) Examine rework area to determine the size and amount of material required.
       (b) Align edges of the damaged skin to provide surface.
       (c) Abrade area lightly using silicone carbide paper.

       WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

       (d) Clean repair surface using a lint free cloth or cheescloth soaked with Acetone, Ispropyl alcohol or cleaning solvent (Desoclean)

           NOTE: It is important that a clean lint-free cloth or cheesecloth be used for each separate degreasing operation and that the cloth is soaked by means of a suitable dispenser so that the liquid runs on to the cloth, thereby avoiding contamination of the bulk of the liquid.

           1) Wipe Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean) before the cleaning fluid drys.

WARNING: USE SEALANT IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL COMING INTO CONTACT WITH THE SKIN.

(e) Mix sealant and catalyst to the manufacturer's instructions.

NOTE: Curing the silicone sealant can be eliminated under repair conditions. The uncured silicone sealant is structurally and functionally acceptable.

1) Cure mixed sealant at 72 degrees F (22 degrees C) for two hours before handling.

(f) Apply cured silicone sealant to repair area.

1) Allow 24 hours cure time before subjecting repair area to operational conditions.

S 218-007-R00

(2) Visually inspect repair.

(a) Check the repair area for sealant serviceablity.

(b) Check the fire shield for contour.

S 938-008-R00

(3) Identify the Repair

(a) Mark the repair number FRS6045-2 (LH) and FRS6046-2 (RH) adjacent to the fire shield assembly number with a permanent marker pen of contrasting color.

TASK 78-31-20-308-202-R00

18. FRS.6192/6193 Upper Bifurcation - Fire Shield

A. General

(1) This procedure applies to both right-hand (RH) (FRS.6192) and left-hand (LH) (FRS.6193) thrust reverse assemblies with the following part numbers:

(a) LH LJ75089
RH LJ75090
RH LJ76377 SB78-9235
RH LJ76554 SB78-9627
RH LJ76690 SB78-9627
RH LJ76498 SB78-9722
LH LJ76376 SB78-9235
LH LJ76497 SB78-9722
LH LJ77111 SB78-D518

(2) The procedure details the removal of a damaged fire shield and replacing it with a new fire shield.

B. Equipment

(1) Standard workshop tools:

(2) Drills and drilling equipment.

(3) Riveting equipment.

C. Consumable Materials
(1) Sealant 2-part pack base and catalyst (Preferred)
DC 90-006
OMat No. 8/138
(2) Sealant, (Alternate)
RTV 133
(3) Sealant, (Alternate)
RTV 560
(4) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(5) Cotton Cloth
(6) Primer, (pink) DC 1200, Omat 8/142

D. Parts
(1) Fire Shield (Item 1),
L.H. assembly: LJ76071 (or LJ75567 or LJ76167)

R.H. assembly: LJ76072 (or LJ75568 or LJ76168)
(2) Rivet, NAS1738M4-2 (RR2308258) (Item 2)

E. Procedure

S 038-204-R00
(1) Removal of Fire Shield, (Fig. 826).
(a) Remove fasteners from fire shield using drills and drilling equipment.
(b) Remove the fire shield.

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

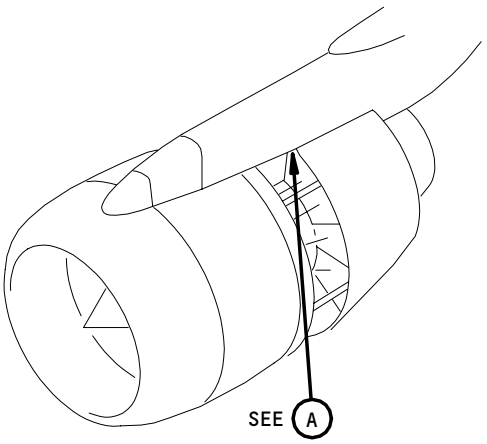
SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

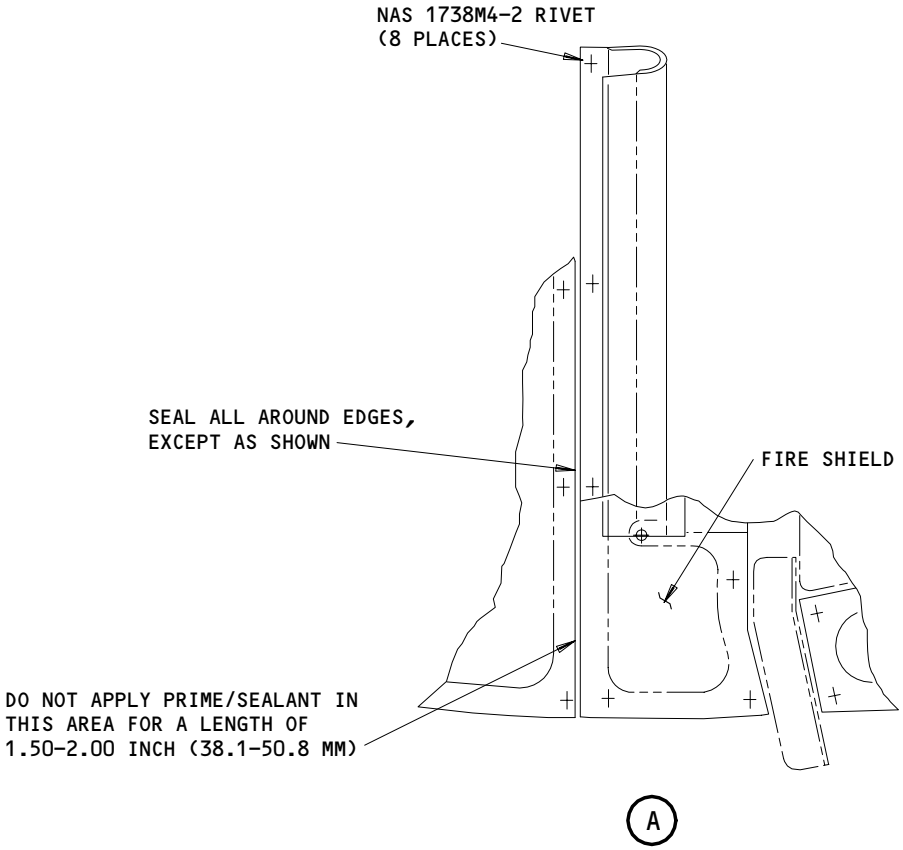
USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(c) Remove and clean remaining sealant. Use a putty knife to scrape the sealant off and use clean cotton cloth and solvent. Wipe dry with clean cotton cloth before solvent evaporates.

NOTE: It is important that a clean cotton cloth is used for each separate degreasing operation and that the cloth is moistened by means of a suitable dispenser so that the liquid runs on to the cloth, therby avoiding contamination of the liquid.





LH SHOWN
RH OPPOSITE

62337
62338

FRS 6192/6193 Upper Bifurcation - Fireshield Renewal
Figure 826

S 438-206-R00

(2) Install Fire Shield, (Fig. 826).

(a) Locate replacement fire shield and drill fastener holes. Drill to match existing holes in structure using drills and drilling equipment.

(b) Install rivets using riveting equipment.

WARNING: AVOID PROLONGED OR REPEATED SKING CONTACT WITH PRIMER.

USE ONLY IN AREAS WITH GOOD VENTILATION.

VERY FLAMMABLE: KEEP AWAY FROM IGNITION SOURCES.

(c) Apply sealant primer to fire shield.

1) Apply primer liberally to repair rivets and area surrounding repair fire shield.
2) Apply primer to edges of repair fire shield where sealant is to be applied, except for 1.5-2.00 in. (38.1-50.8 mm) length.
3) Allow primer to dry.

NOTE: Drying time at 68°F (20°C) approximately 30 minutes.

WARNING: USE SEALANT ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL COMING INTO CONTACT WITH THE SKIN.

(d) Apply sealant to fire shield.

1) Mix sealant and catalyst to manufacturer's instructions.
2) Apply sealant and encapsulate repair rivet.
3) Apply sealant over edges of repair fire shield, except for 1.5-2.0 in. (38.1-50.8 mm) length to allow air to escape.
4) Bend the unsealed edge of fire shield to provide a gap of 0.03-0.08 in. (0.76-2.03 mm) over a minimum length of 1.0 in. (25.4 mm).

(e) Cure sealant at 72°F (22°C) for 24 hours.

NOTE: The uncured sealant is sructurally and functionally acceptable for flight. Hence under maintenance conditions curing the sealant can be eliminated. Avoid handling the repair area under these conditions.

S 218-207-R00

(3) Visually check fire shield installation.

S 938-208-R00

(4) Mark FRS.6192 (RH reverser)/FRS.6193 (LH reverser) adjacent to fire shield number using permanent marker pen of contrasting color.

TASK 78-31-20-308-209-R00

19. FRS.6194/6195 Upper Bifurcation - Fire Shield

A. General

(1) This procedure applies to both right-hand (RH) (FRS.6194) and left-hand (LH) (FRS.6195) thrust reverse assemblies with the following part numbers:

(2) The procedure details the removal of a damaged fire shield and replacing it with a new fire shield.

B. Equipment

(1) Standard workshop tools:

(2) Drills and drilling equipment.

(3) Riveting equipment.

C. Parts

(1) Fire shield,
L.H. assembly: LJ76069 (or LJ75565 or LJ76169)

R.H. assembly: LJ76070 (or LJ75566 or LJ76166)

(2) Rivet, NAS1738M4-2 (RR2308258)

D. Consumable Materials

(1) Sealant 2-part pack base and catalyst (Preferred)
DC 90-006
OMat No. 8/138

(2) Sealant, (Alternate)
RTV 133

(3) Sealant, (Alternate)
RTV 560

(4) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

(5) Cotton Cloth

(6) Primer, (pink) DC 1200, Omat 8/142

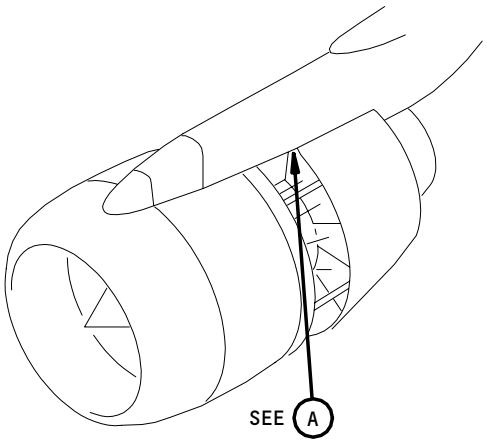
E. Procedure

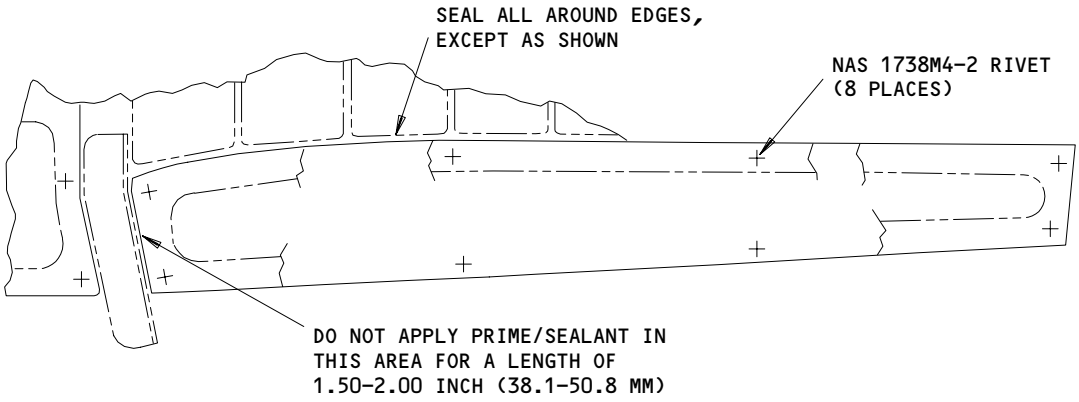
S 038-211-R00

(1) Removal of Fire Shield, (Fig. 827).

(a) Remove fasteners from fire shield using drills and drilling equipment.

(b) Remove the fire shield.





LH SHOWN
RH OPPOSITE

62338
62339

FRS 6194/6195 Upper Bifurcation - Fireshield Renewal
Figure 827

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.

SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.

DEGREASERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(c) Remove and clean remaining sealant.

NOTE: It is important that a clean cotton cloth is used for each separate degreasing operation. The cloth should be moistened with a suitable dispenser so that the liquid runs on to the cloth, to prevent the contamination of the liquid.

1) Use a putty knife to scrape the sealant off.
2) Use a clean cotton cloth and solvent to clean the surface.
3) Wipe dry with clean cotton cloth before solvent evaporates.

S 438-213-R00

(2) Install Fire Shield, (Fig. 827).

(a) Locate the replacement fire shield and drill fastener holes.

1) Drill to match existing holes in structure using drills and drilling equipment.

(b) Install rivets using riveting equipment.

WARNING: AVOID PROLONGED OR REPEATED SKING CONTACT WITH PRIMER.

USE ONLY IN AREAS WITH GOOD VENTILATION.

VERY FLAMMABLE: KEEP AWAY FROM IGNITION SOURCES.

(c) Apply sealant primer to fire shield.

1) Apply primer liberally to repair rivets and area surrounding repair fire shield.
2) Apply primer to edges of repair fire shield where sealant is to be applied, except for 1.5 2.00 in. (38.1-50.8 mm) length.
3) Allow primer to dry.

NOTE: Drying time at 68°F (20°C) approximately 30 minutes.

WARNING: USE SEALANT ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL COMING INTO CONTACT WITH THE SKIN.

(d) Apply sealant to fire shield.
1) Mix sealant and catalyst to manufacturer's instructions.
2) Apply sealant and encapsulate repair rivet.
3) Apply sealant over edges of repair fire shield, except for 1.5-2.0 in. (38.1-50.8 mm.) length to allow air to escape.
4) Bend the unsealed edge of fire shield to provide a gap of 0.03-0.08 in. (0.76-2.03 mm) over a minimum length of 1.0 in. (25.4 mm).

(e) Cure sealant at 72°F (22°C) for 24 hours.

NOTE: The uncured sealant is structurally and functionally acceptable for flight. Hence under maintenance conditions curing the sealant can be eliminated. Avoid handling the repair area under these conditions.

S 218-214-R00

(3) Do a visual check of the fire shield installation.

S 938-215-R00

(4) Mark the repair number adjacent to fire shield number using a permanent marker pen of contrasting color.

NOTE: Use FRS.6194 for the RH thrust reverser and FRS.6195 for the LH thrust reverser.

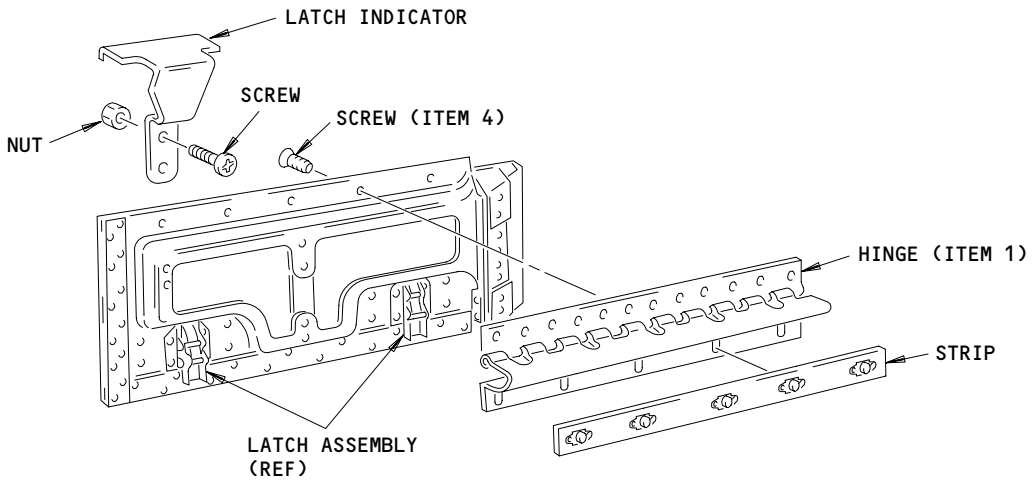
TASK 78-31-20-308-249-R00

20. Thrust Reverser Fixed Structure, Latch Access Doors - Replacement of Hinge/Replacement of Door Assembly (Fig. 828)

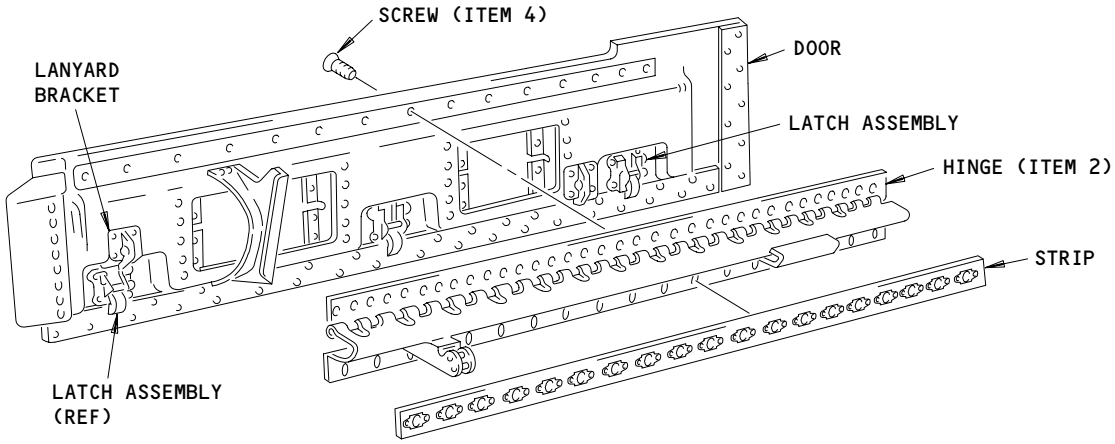
A. General
(1) The repair covered in this procedure is FRS6181.
(2) The procedure gives details for:
(a) Replacement of hinge on latch access doors.
(b) Replacement of latch access door assembly.
(3) The repair can be applied to the thrust reverser C-ducts with following part numbers:

LJ75006

B. Equipment
(1) Standard workshop tools
(2) Drills and drilling equipment
(3) Riveting equipment
(4) C-Clamp



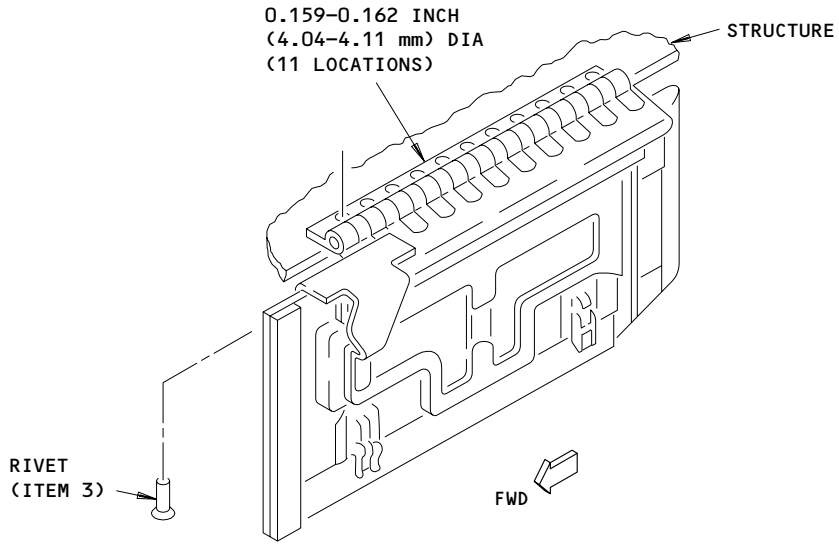
FORWARD LATCH ACCESS DOOR ASSEMBLY



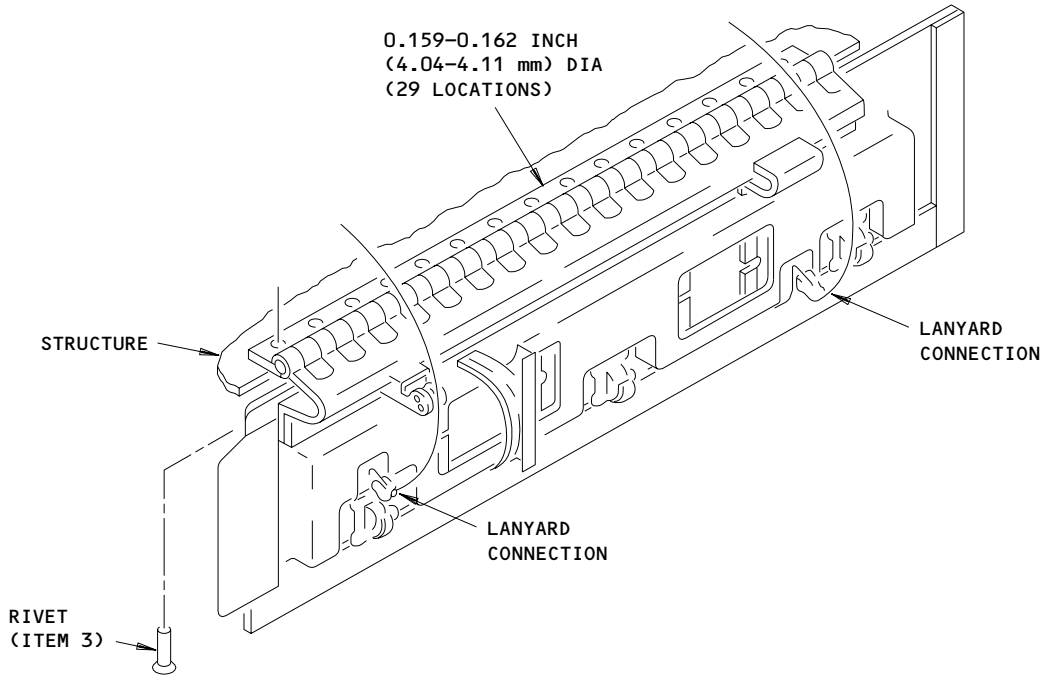
AFT LATCH ACCESS DOOR ASSEMBLY

62332A

Latch Access Doors, Hinge - Replacement Details
Figure 828 (Sheet 1)



FORWARD LATCH ACCESS DOOR ASSEMBLY



AFT LATCH ACCESS DOOR ASSEMBLY

62331A

Latch Access Doors, Hinge – Replacement Details
Figure 828 (Sheet 2)

C. Parts
(1) Hinge - forward door, (Item 1)
LJ76159
(2) Hinge - aft door, (Item 2)
LJ76160
(3) Rivet, (Item 3)
CR2564M5-3 (RR1101381)
(4) Screw, (Item 4)
NAS7604U3 (RR2308367)
(5) Latch access door assembly - forward, (Item 5)
LJ75732
(6) Latch access door assembly - aft, (Item 6)
LJ75036

NOTE: Due to variation of assembly structure thickness it is recommended that assembly is gauged to ensure that correct length fasteners are fitted.

D. Consumable Materials
(1) Abrasive paper (Grit size 180), Omat 5/37
(2) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(3) Lint free cloth
(4) Primer base, (463-6-27), Omat 7/157
(5) Curing solution, (X-337), Omat 7/158
(6) Thinner, (TL52-66), Omat 7/159

E. References
(1) AMM 78-31-20/401, Fan C-Duct and Thrust Reverser

F. Procedure

S 358-250-R00
(1) Replace Damaged Hinge
(a) Disconnect lanyards from latch access door, as required.
(b) Use a non-permanent marker pen of contrasting colour, to mark outline of damaged hinge on fixed structure and latch access door.
(c) Remove screws and remove latch access door assembly from hinge.
1) Keep the nutplate strip and latch access door for the subsequent installation.
(d) Drill out rivets and remove hinge from fixed structure.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(e) Clean mating surfaces of fixed structure and latch access door with lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
1) Wipe areas dry with lint free cloth before solvent evaporates.
(f) Trial install replacement hinge (Item 1 or 2) with sufficient screws (Item 4) to clamp to latch access door, in outlined poistion of original hinge.
(g) Position hinge onto fixed structure in outlined position of original hinge and clamp in place.
1) Close the door and make a check of the contour and clearances (AMM 78-31-20/401).
(h) Use a 0.159 to 0.162 inch (4.04 to 4.11 mm) size drill to back drill rivet holes in hinge.
(i) Remove clamps and deburr hinge.
(j) Prepare primer in accordance with manufacturer's instructions.
(k) Reposition hinge and wet install rivets (Item 3) with primer, flush to 0.004 inch (0.10 mm) underflush.

NOTE: Install rivets up to 1/64 inch (0.40 mm) oversize if necessary.

(l) Wet install screws (Item 4) with primer to install latch access door.
(m) Close door and check gaps (AMM 78-31-20/401).
(n) Attach lanyards to latch access door, as required.

S 288-251-R00

(2) Check latch loads (AMM 78-31-20/401).

S 218-252-R00

(3) Make a visual check of the repair area.
(a) Look for the irregularities in contour, loose fasteners, steps and gaps.
(b) Restore surface finish to FRS6400 (Ref 78-31-20/801).

S 938-253-R00

(4) Mark FRS6181/2 adjacent to assembly number with a permanent marker pen of contrasting colour.

S 968-254-R00

(5) Replace Damaged Latch Access Door Assembly

(a) Disconnect lanyards from latch access door, as required.

(b) Use a non-permanent marker pen of contrasting colour to mark outline of damaged access door hinge on fixed structure.

(c) Drill out rivets from hinge and remove damaged latch access door assembly.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(d) Clean mating surface of fixed structure and latch access door with lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

1) Wipe area dry with lint free cloth before solvent evaporates.

(e) Position replacement latch access door assembly (Item 5 or 6) to outlined position on fixed structure of original door assembly.

(f) Clamp in place.

(g) Close the door assembly and make a check of the contour and clearances (AMM 78-31-20/401).

(h) Use a 0.159 to 0.162 inch (4.04 to 4.11 mm) size drill to back drill rivet holes in hinge.

(i) Remove door assembly and deburr holes.

(j) Prepare primer in accordance with manufacturer's instructions.

(k) Reposition door assembly and wet install rivets (Item 3) with primer, flush to 0.004 inch (0.10 mm) underflush.

NOTE: Install rivets up to 1/64 inch (0.40 mm) oversize if necessary.

(l) Close door and check gaps (AMM 78-31-20/401).
(m) Attach lanyards to latch access door, as required.

S 288-255-R00
(6) Check latch loads (AMM 78-31-20/401).

S 218-256-R00
(7) Make a visual check of the repair area.
(a) Look for the irregularities in contour, loose fasteners, steps and gaps.
(b) Restore surface finish to FRS6400 (AMM 78-31-20/801).

S 938-257-R00
(8) Mark the repair number FRS6181/4 adjacent to the assembly number with a permanent marker pen of contrasting colour.

TASK 78-31-20-308-262-R00

21. Right-Hand Thrust Reverser Fixed Structure, Latch Access Doors - Replacement of Latch (Fig. 829)

A. General
(1) The repair covered in this procedure is FRS6182/2.
(2) The procedure gives details for replacement of damaged latch on thrust reverser forward and aft latch access doors.
(3) The repair can be applied to the thrust reverser C-ducts with the following assembly numbers:

LJ75006

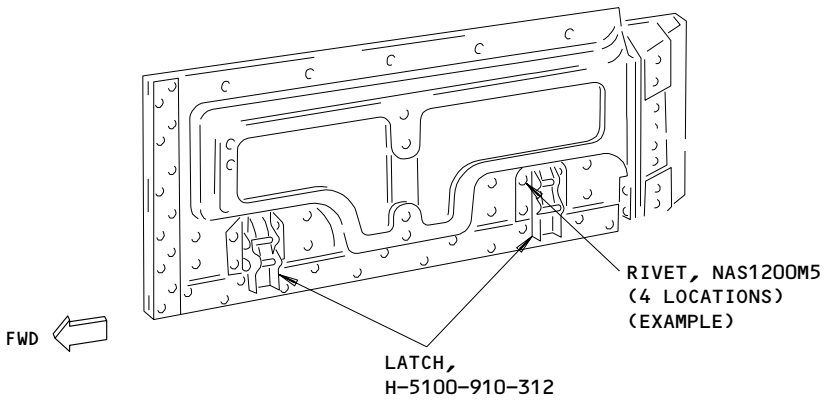
B. References
(1) AMM 78-31-00/201, Thrust Reverser System

C. Equipment
(1) Standard workshop tools
(2) Drills and drilling equipment
(3) Riveting equipment

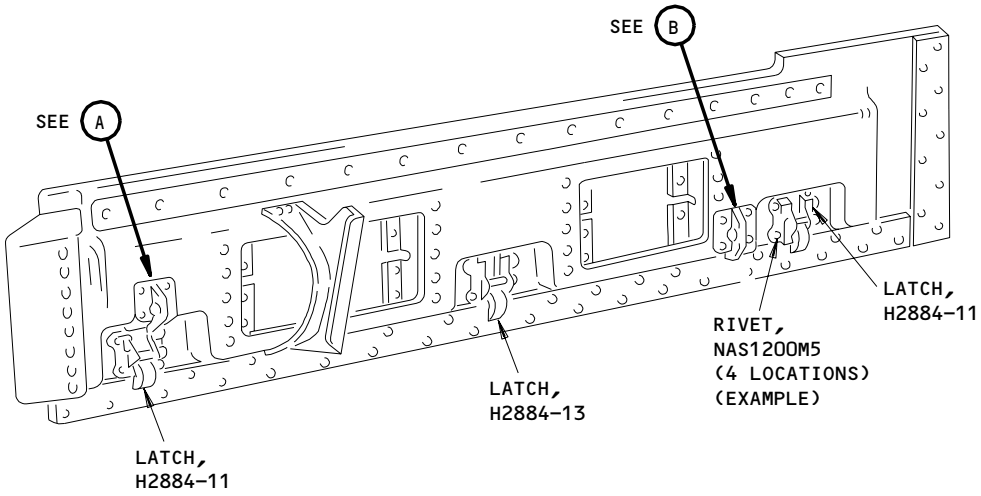
D. Parts
(1) Latch - forward, (Item 1)
H-5100-091-312 (RR3408684)
(2) Latch - aft, (Item 2)
H2884-11 (RR3408685)
(3) Latch - aft, (Item 3)
H2884-13 (RR3408686)
(4) Rivet, (Item 4)
NAS1200M5-6

NOTE: Due to variation of assembly structure thickness it is recommended that assembly is gauged to ensure that correct length of fasteners are fitted.

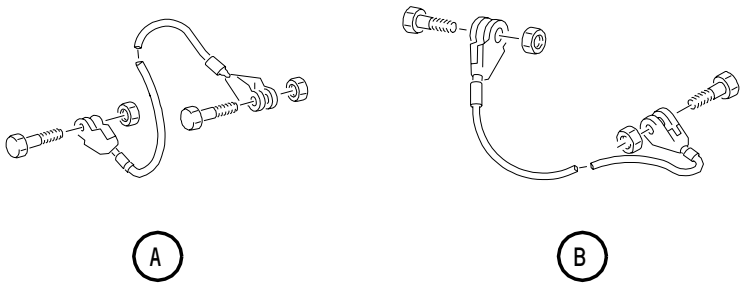
E. Consumable Materials
(1) Abrasive paper, (Grit size 180), Omat 5/37



FORWARD LATCH ACCESS DOOR



AFT LATCH ACCESS DOOR



62341A

Latch Access Door, Latch - Replacement Details
Figure 829

(2) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(3) Lint free cloth
(4) Primer base, (463-6-27), Omat 7/157

F. Procedure

S 968-264-R00

(1) Replace Damaged Latch

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 the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).
(b) Drill out rivets and remove damaged latch.
(c) Use abrasive paper to abrade mating surface of door assembly.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(d) Clean mating surfaces of door and replacement latch with lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning fluid (Desoclean).
1) Wipe areas dry with lint free cloth before solvent evaporates.
(e) Position replacement latch (Item 1, 2 or 3) and clamp in place.
(f) Wet install rivets (Item 4) flush to 0.004 inch (0.10 mm) under-flush with primer base.

S 218-265-R00

(2) Make a visual check of the repair area.
(a) Look for irregularities in contour, loose fasteners, steps and gaps.

S 938-266-R00

(3) Mark the repair number FRS6182/2 adjacent to the assembly number with a permanent marker pen of contrasting color.

TASK 78-31-20-308-276-R00

22. Fan Thrust Reverser, C-Duct Hinges - Replacement of Bushing (Fig. 830)

A. General

(1) The repair covered in this procedure is FRS6209.

(2) The procedure gives details for replacement of damaged or missing bushing in fan thrust reverser forward and middle C-duct hinges.

NOTE: For replacement of aft hinge bushing see FRS6218/6219.

(3) The repair can be applied to the fan thrust reverser fixed structures with the following assembly numbers:

L.H. LJ75089	R.H. LJ75090
L.H. LJ76376 SB78-9235	R.H. LJ76377 SB78-9235
L.H. LJ76497 SB78-9722	R.H. LJ76554 SB78-9627
L.H. LJ77111 SB78-D518	R.H. LJ76690 SB78-9627
L.H. LJ70089	R.H. LJ76498 SB78-9722

B. Equipment

(1) Standard workshop tools

(2) Infra-red heater lamps (explosion proof)

C. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isoproplyl alcohol OMat No, 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

(2) Lint free cloth

(3) Adhesive, EA934NA, Hysol Div-Dexter Corp., P.O. Box 132, Pittsburg, Ca., Omat 8/52

(4) Temporary rust preventative (DEF 2331A) or Rustban 392 (Exxon) or equivalent corrosion inhibitor, AMS 3065, Omat 1005

D. Parts

(1) Bushing, (Item 1)
NAS538-7P025 (RR1012887)

E. Procedure

S 968-278-R00

(1) Replace Damaged Bushing

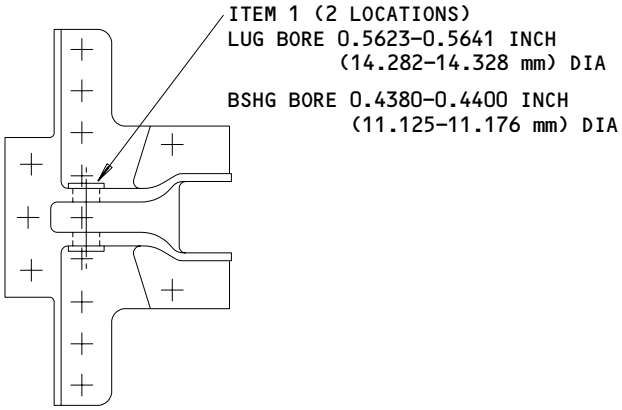
(a) Remove damaged bushing

1) Carefully press damaged bushing out of lug bore, taking care to avoid damage to lug bore.

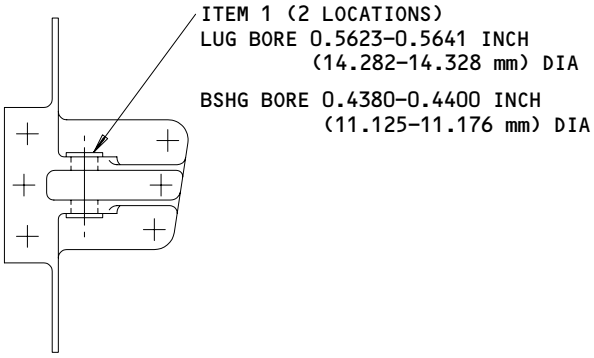
NOTE: Machining is not normally required.

(b) Carefully remove any burrs or foreign material from mating faces of hinge lug bore.

1) Do not make the bore larger.



MIDDLE HINGE FITTING
(LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE)



FORWARD HINGE FITTING
(LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE)

62380A

Fan Thrust Reverser C-Duct Hinges - Bushing Replacement Details
Figure 830

(c) Measure lug bore to ensure within specified dimensions
1) Make sure the bushing (Item 1) will provide 0.0003 inch to 0.0019 inch interference fit in the lug bore.
(d) Use reamer or hone to open inner diameter of bushing to specified dimensions.
(e) Apply light coat of temporary rust preventative to inner bore of bushing.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(f) Clean mating faces of bushing and hinge lug with lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
1) Wipe areas dry with lint free cloth before solvent evaporates.

WARNING: USE EPOXY COMPOUNDS ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT EPOXY COMPOUNDS FROM COMING INTO CONTACT WITH SKIN.

(g) Prepare adhesive in accordance with manufacturer's instructions.
(h) Apply adhesive to bore of hinge lug.
(i) Press bushing into lug bore until flange seats against lug.
(j) Use infra-red heater lamps to cure adhesive for 1 hour at 82 deg.C. (180 deg.F.) to 93 deg.C. (200 deg.F.).

S 218-279-R00
(2) Make a visual check of the repair area.

S 628-280-R00
(3) Apply coat of temporary rust preventative to inner bore of bushing.

S 938-281-R00
(4) Mark the repair number, FRS6209, adjacent to the part number with a permanent marker pen of contrasting color.

TASK 78-31-20-308-286-R00

23. Thrust Reverser, Left-Hand (L.H.) Fixed Structure - Repair of Inner Barrel Leading Edge (Fig. 831)

A. General

(1) The repair covered in this procedure is FRS6211.

(2) The procedure gives details for repair of dents, gouges, holes or frettage damage to leading edge of L.H. fixed structure of inner barrel.

(3) The repair can be applied to the thrust reverser fixed structures with the following assembly numbers:

LJ75089

B. Equipment

(1) Standard workshop tools

(2) Infra-red heater lamps (explosion proof)

C. Consumable Materials

(1) Teflon tape, Omat 299

(2) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

(3) Lint free cloth, Local resources

(4) Garnet paper (Grit size 150), Omat 5/94

(5) Primer base (463-6-27), Omat 7/157

(6) Curing solution (x-337), Omat 7/158

(7) Thinner, (TL52-66), Omat 7/159

(8) Adhesive, EA934NA, Hysol Div-Dexter Corp., P.O. Box 132, Pittsburg, Ca., Omat 8/52

D. References

(1) AMM 78-31-00/201, Thrust Reverser System

E. Procedure

S 358-288-R00

(1) Repair Damaged Area

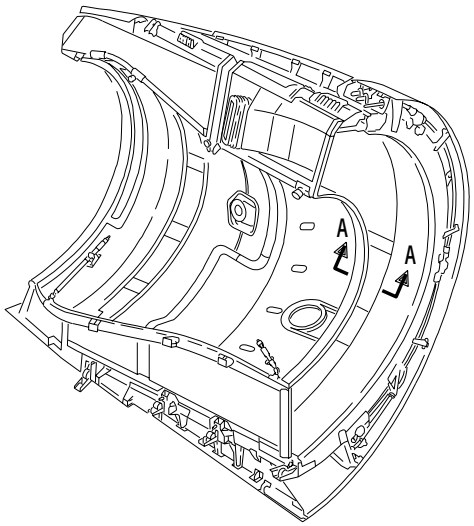
WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE FAN C-DUCT. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

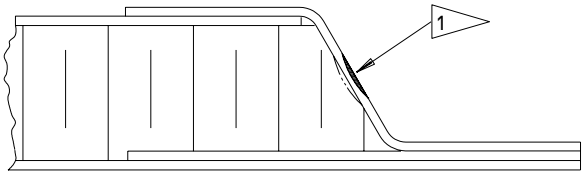
(a) Open fan C-duct (AMM 78-31-00/201).

(b) Apply the teflon tape to mask off the repair area.

1) Permit a minimum clearance of 0.5 inch (12.7 mm) from the edge of the damage.

(c) Lightly abrade repair area within tape using garnet paper.





ROTATED CCW APPROXIMATELY 30°
A-A

1 FILL WITH ADHESIVE/FILLER AND MAKE IT SMOOTH WITH THE AREA AROUND IT

62445

Left Fixed Structure, Inner Barrel Leading Edge - Repair Details
Figure 831

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(d) Clean repair area with lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
1) Wipe area dry with lint free cloth before solvent evaporates.

WARNING: USE EPOXY COMPOUNDS ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT THE MATERIAL FROM COMING INTO CONTACT WITH YOUR SKIN.

(e) Prepare adhesive in accordance with manufacturer's instructions.
(f) Apply adhesive to entire repair area and finish flush with original contour.
(g) Cure adhesive for time and temperature shown in Cure Data Chart below.

NOTE: The minimum cure time is 1 hour.

NOTE: The adhesive will not cure below 12 deg.C. (54 deg.F.).

NOTE: The temperature at the bond line must be monitored by thermocouples or other convenient method when cure times are accelerated by the application of heat.

Time - Hours	168	96	40	16	8	4	2	1
Temp - deg.C.	12	15	20	25	30	35	45	60
deg.F.	54	59	68	77	86	96	113	140

Hysol EA934NA Cure Data Chart

(h) Restore surface protection of repair area using primer base, curing solution and thinner, as required.

S 218-289-R00

(2) Make a visual check of the repair area to make sure the contour is flush with the surrounding area.

S 938-290-R00

(3) Mark the repair number, FRS6211, adjacent to the C-duct nameplate with a permanent marker pen of contrasting color.

TASK 78-31-20-308-291-R00

24. Thrust Reverser, Left-Hand (L.H.) C-Duct Fixed Structure, Lower Attachment Hoist Points - Replacement of Nutplates (Fig. 832)

A. General

(1) The repair covered in this procedure is FRS6214/1.

(2) The procedure gives details for replacement of demaged or missing nutplates for lower attachment forward and aft hoist points.

(3) The repair can be applied to the thrust reverser fixed structures with the following assembly numbers:

L.H. LJ75089	R.H. LJ75063
L.H. LJ76376 SB78-9235	

B. Equipment

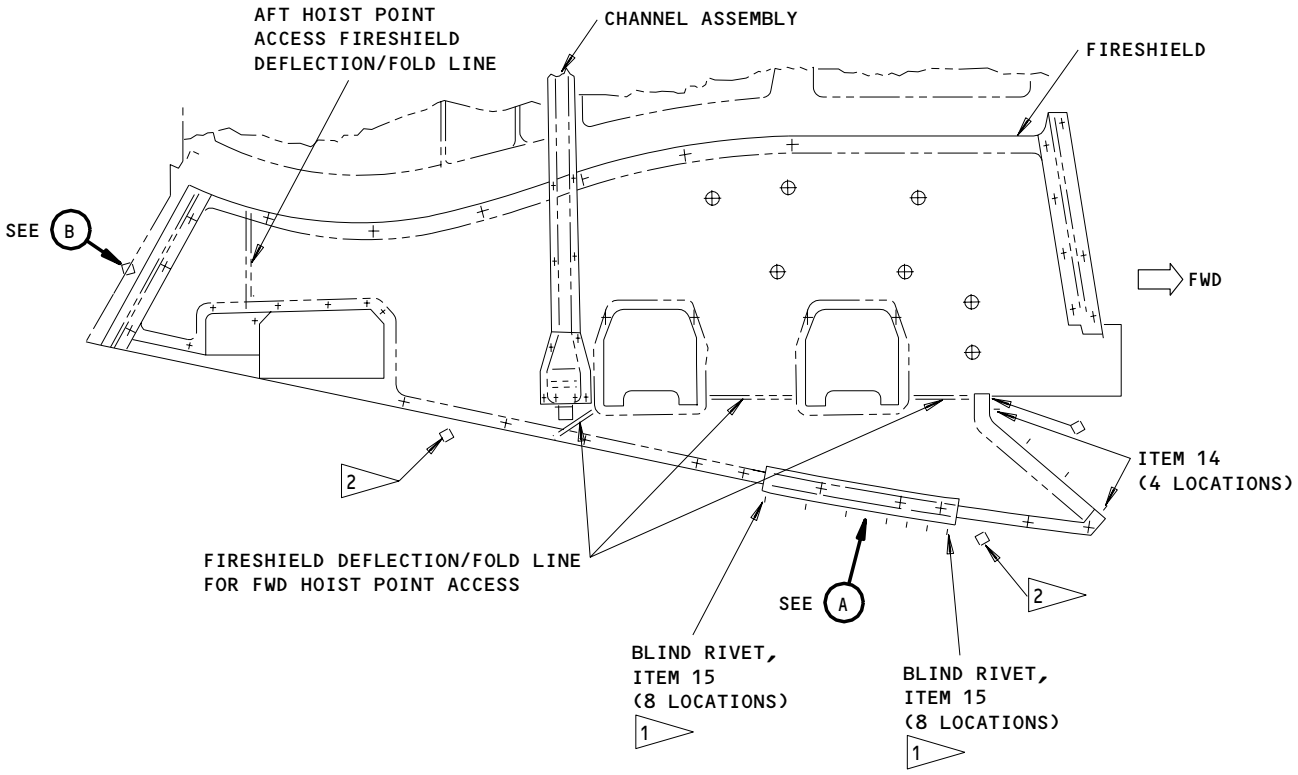
(1) Standard workshop tools
(2) Drills and Drilling Equipment
(3) Riveting Equipment
(4) Putty Knife
(5) Hi-Lok Installation Equipment
(6) Huck blind bolt installation equipment

C. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isoprpyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(2) Lint free cloth
(3) Primer base, (463-6-27), Omat 7/157
(4) Curing, (X-337), Omat 7/158
(5) Sealant 2-part pack base and catalyst (Preferred)
DC 90-006
OMat No. 8/138
(6) Primer, (pink) (DC1200), Omat 8/142
(7) Sealant, (DC03-006-1), Omat 8/143

D. Parts

(1) Repair parts
(a) Blind rivet, (Item 1) - CCR264CS3-6 (RR1012805)



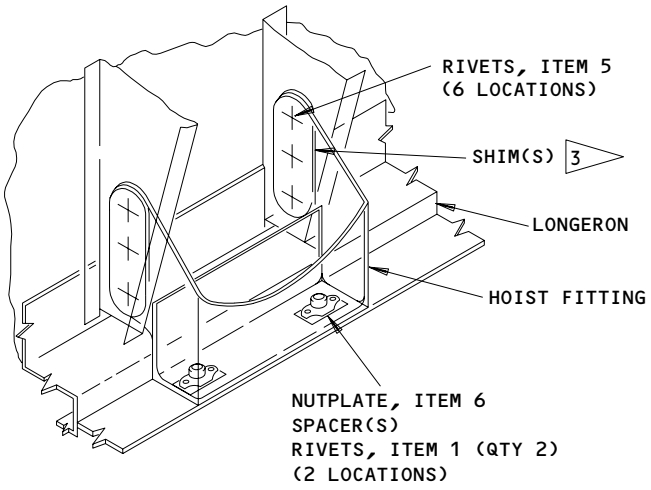
NOTE: 1. ALL BLIND RIVETS ARE ITEM 13
EXCEPT AS NOTED.
2. SEE FRS6184/6185 FOR FIRESHIELD RENEWAL.

1 INSTALL FILLER

2 NO SEALANT IN THE LOCATIONS
MARKED ◇ AND BOTTOM EDGE

62356A

C-Duct Lower Attachment Hoist Points, Nutplates - Replacement Details
Figure 832 (Sheet 1)



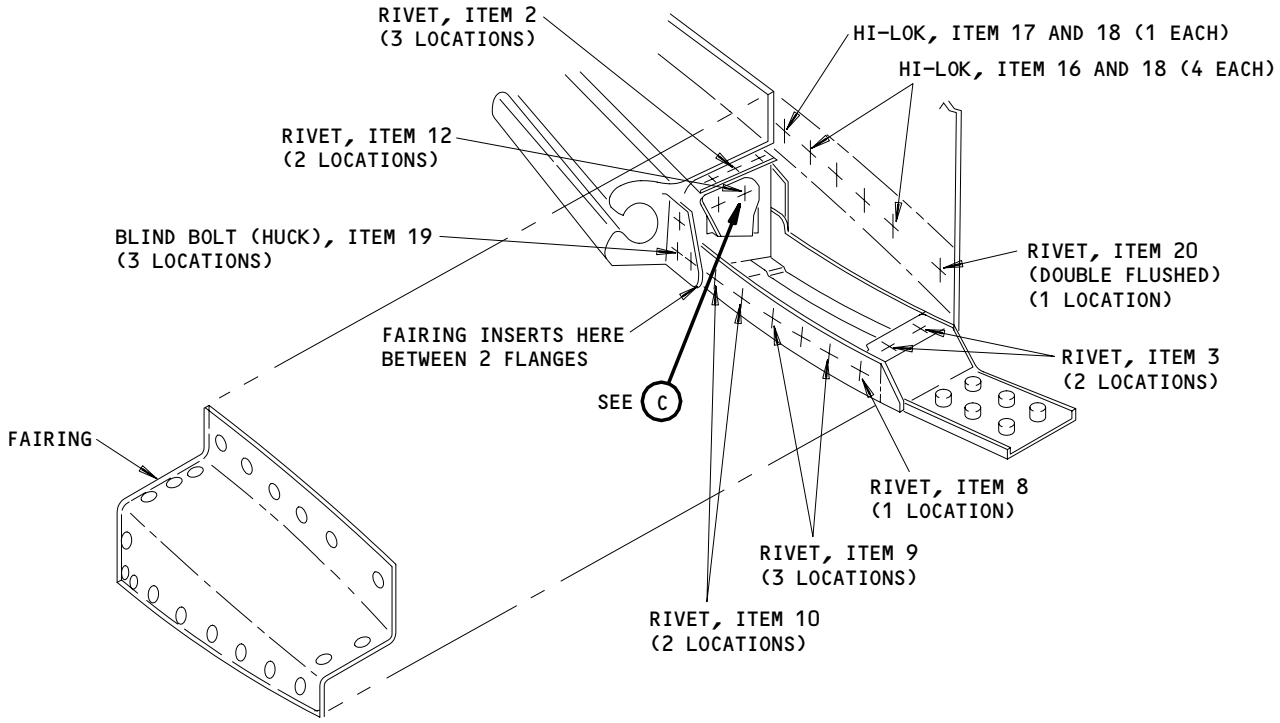
FORWARD HOIST POINT INSTALLATION

A

3 INSTALL THE SAME SHIMS IN THE SAME LOCATIONS

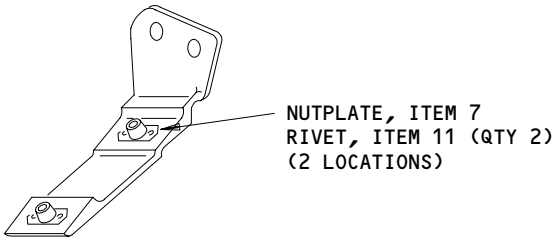
62355A

C-Duct Lower Attachment Hoist Points, Nutplates - Replacement Details
Figure 832 (Sheet 2)



AFT HOIST POINT NUTPLATE REPAIR

B



NUT ASSEMBLY
(ROTATED)

C

62357B

C-Duct Lower Attachment Hoist Points, Nutplates - Replacement Details
Figure 832 (Sheet 3)

(b) Blind rivet, (Item 2) - CR3222-4-2 (RR1012806)
(c) Blind rivet, (Item 3) - CR3524-5-2 (RR1012807)
(d) Rivet, (Item 5) - MS20615-6M7 (RR1012794)
(e) Nutplate, (Item 6) - MS21075L4 (RR2308135)
(f) Nutplate, (Item 7) - MS21076-4 (RR2206980)
(g) Rivet, (Item 8) - MS21141-0502 (RR1012802)
(h) Rivet, (Item 9) - MS21141-0503 (RR1012803)
(i) Rivet, (Item 10) - MS21141-0504 (RR1012804)
(j) Rivet, (Item 11) - NAS1199-3-6 (RR1012797)
(k) Blind rivet, (Item 12) - NAS 1398C6-3 (RR1012798)
(l) Blind rivet, (Item 13) - NAS1738M4-2 (RR2308258)
(m) Blind rivet, (Item 14) - NAS1738M4-3 (RR2308259)
(n) Blind rivet, (Item 15) - NAS1739M4-5 (RR1011347)
(o) Hi-Lok pin, (Item 16) - HL10V5-16 (RR1012799)
(p) Hi-Lok pin, (Item 17) - HL10V5-17 (RR1012800)
(q) Hi-Lok collar, (Item 18) - HL70-5 (RR3408506)
(r) Blind bolt, (Item 19) - S7B100T06-05 (RR1012847)
(s) Rivet, (Item 20) - NAS1200M5-6 (RR1012697)

NOTE: Due to variation of assembly structure thickness it is recommended that assembly is gauged to ensure that correct length fasteners are fitted.

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-23/401, Thrust Reverser Translating Cowl
(3) AMM 78-31-20/401, Fan C-Duct and Thrust Reverser
(4) AMM 78-31-20/801, Fan C-Duct and Thrust Reverser

F. Replace Nutplate

S 968-297-R00

(1) Replace the nutplate

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE FAN C-DUCT. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Open fan C-duct (AMM 78-31-00/201).

(b) Remove fireshield
1) Remove the fireshield fasteners and sealant in the repair area.
a) Loosen and bend the fireshield to get access to the repair area.
(c) Replace forward hoist point nutplate
1) Remove the rivets and carefully remove the hoist fitting.
a) Mark the position of the shims and keep the shims for the installation.
2) Remove the fasteners to remove the nutplate from the hoist fitting.
3) Keep the spacer for the installation.
4) Position replacement nutplate (Item 6) with spacer on hoist fitting and clamp in place.
5) Install the nutplate with blind rivets (Item 1).
a) Wet install the blind rivets with primer base (463-6-27) and curing solution (X-337) prepared in accordance with manufacturer's instructions.
6) Position hoist fitting with shims and clamp in place.
7) Install the hoist fitting with rivets (Item 5).
a) Wet install the rivets with primer base and curing solution, prepared in accordance with manufacturer's instructions.
(d) Replace aft hoist point nutplate (Fig. 834 sheets 1 and 3)
1) Remove thrust reverser translating cowl for access (AMM 78-31-23/401).
2) Remove the fasteners to remove the fairing.
a) Keep the fairing for the installation.
3) Remove rivets to remove nut assembly.
4) Use 0.098 to 0.106 inch (2.49 to 2.69 mm) diameter drill to remove rivets retaining nutplate to nut assembly.
5) Install the replacement nutplate (Item 7) with the rivets

(Item 11) on the nut assembly.
a) Wet install the rivets with primer base (463-6-27) and the curing solution (X-337) prepared in accordance with manufacturer's instructions.

6) Position nut assembly and clamp in place.
7) Install the aft hoist point bolts to make sure the nut assembly is in the correct position.

NOTE: The aft hoist point bolts are the C-duct handling frame (CP30522/2) mounting bracket bolts, NAS1204-15 and NAS1204-20 (AMM 78-31-20/401).

8) Install the nut assembly with rivets (Item 12).
a) Wet install the rivets with primer base.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

9) Remove old sealant from repair area with putty knife and lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
10) Wipe area dry with lint free cloth before solvent evaporates.

WARNING: USE SEALANTS ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH SKIN.

(e) Apply sealant (DC93-006-1) to fairing and mating surfaces.
(f) Position fairing and clamp in place.
(g) Wet install fasteners using primer base and curing solution prepared in accordance with manufacturer's instructions.
(h) Refit fireshield

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(i) Remove the old sealant from the fireshield and structure with putty knife and lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
1) Wipe areas dry with lint free cloth before solvent evaporates.

WARNING: AVOID PROLONGED OR REPEATED SKIN CONTACT WITH PRIMERS.

USE ONLY IN AREAS WITH GOOD VENTILATION.

PRIMERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION SOURCES.

(j) Prepare primer (DC1200) in accordance with manufacturer's instructions.
(k) Apply primer to surfaces to be bonded.
(l) Allow primer to dry for 30 minutes at room temperature, 21 deg.C. (70 deg.F.) to 43 deg.C. (110 deg.F.).
(m) Return the fireshield to the original position and clamp in place.
1) Install the fasteners.

WARNING: USE SEALANTS ONLY IN AREAS WITH GOOD VENTILATION.

TAKE PRECAUTIONS TO PREVENT THE MATERIAL FROM COMING INTO CONTACT WITH YOUR SKIN.

(n) Prepare sealant (DC90-006) in accordance with manufacturer's instructions.
(o) Apply sealant as per illustration.
(p) Cure sealant for 24 hours at room temperature.

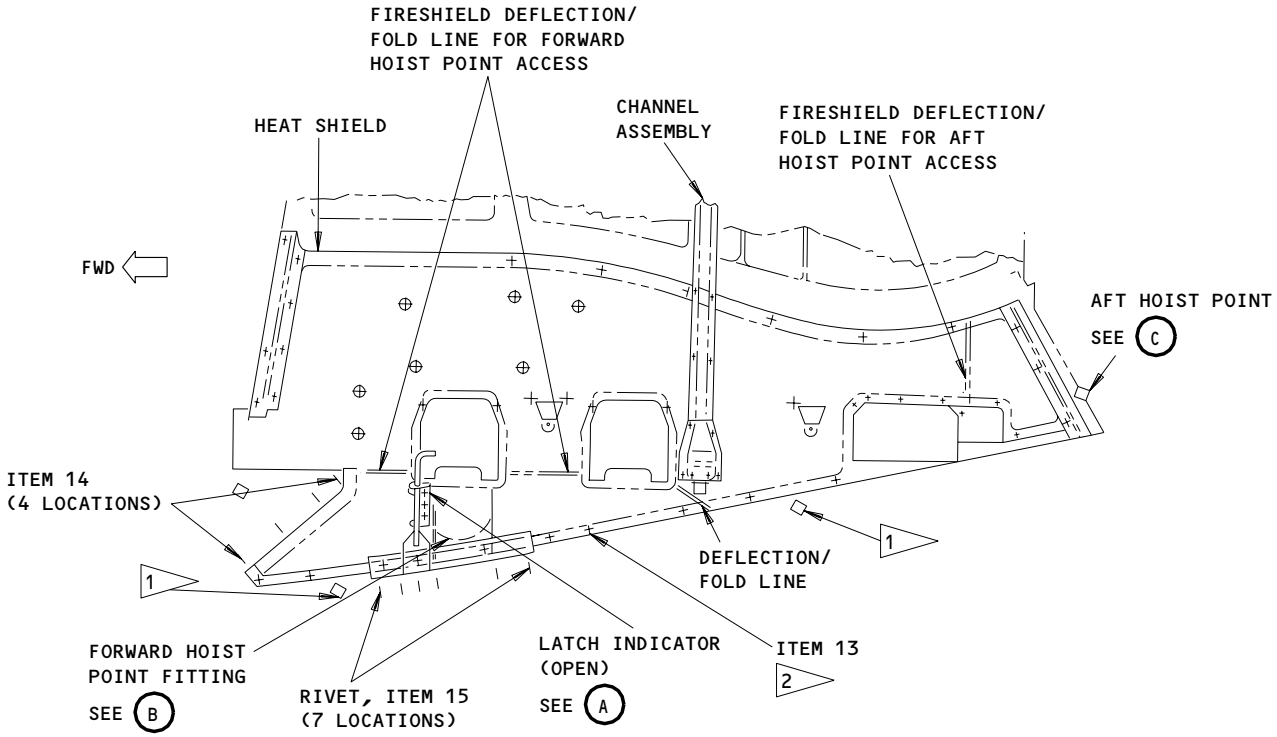
NOTE: Uncured sealant is structurally and functionally acceptable for flight.

S 218-295-R00
(2) Make a visual check of the repair area.

S 938-296-R00
(3) Mark the repair number, FRS6214/1, adjacent to the assembly number with a permanent marker pen of contrasting color.

TASK 78-31-20-308-301-R00

25. Thrust Reverser, Right-Hand (R.H.) C-Duct Fixed Structure, Lower Attachment Hoist Points - Replacement of Nutplates (Fig. 833)



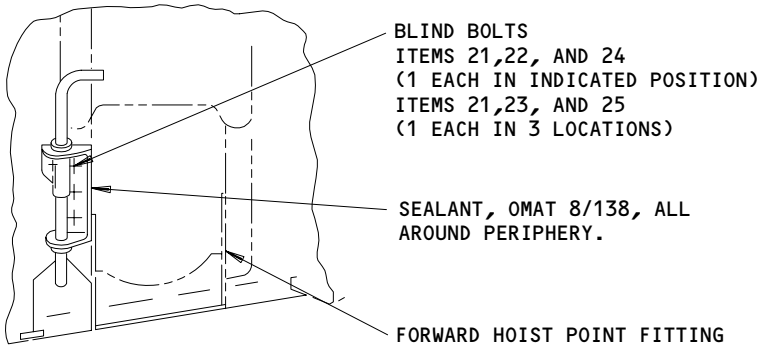
SEE FRS 6184/6185 FOR FIRESHIELD RENEWAL

1 NO SEALANT ON THE LOCATIONS MARKED <> AND THE BOTTOM EDGE

2 ALL FASTENERS ARE ITEM 13 EXCEPT AS NOTED

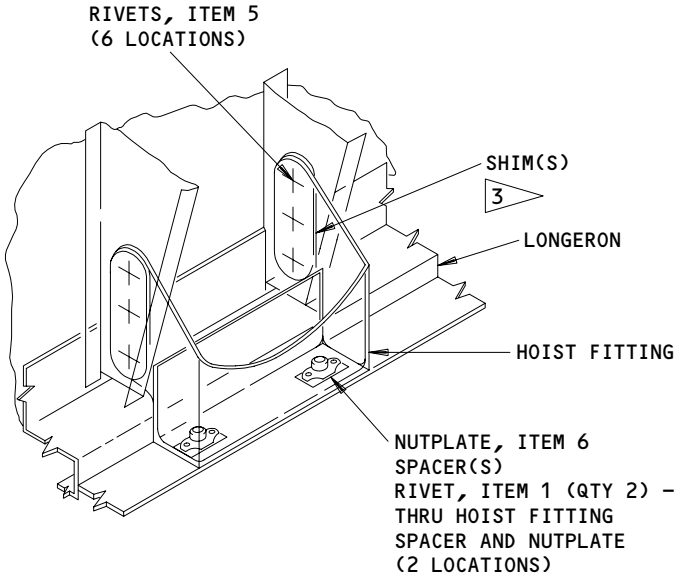
62368A

C-Duct Lower Attachment Hoist Points, Nutplates - Replacement Details
Figure 833 (Sheet 1)



OPEN LATCH INDICATOR INSTALLATION

(A)



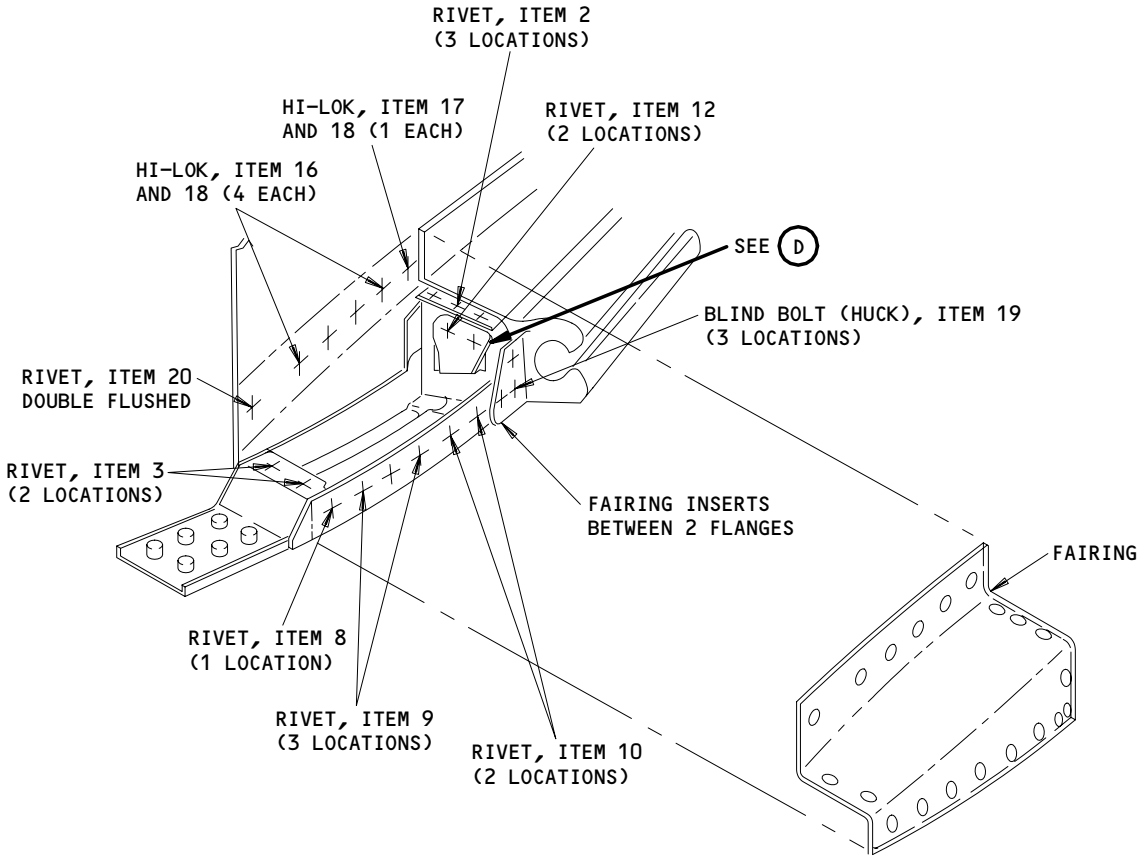
FORWARD HOIST POINT INSTALLATION

(B)

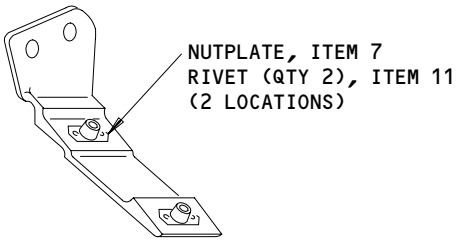
3 USE THE SHIM(S) AGAIN IN THE SAME LOCATION

62367A

C-Duct Lower Attachment Hoist Points, Nutplates - Replacement Details
Figure 833 (Sheet 2)



C



NUT ASSEMBLY
(ROTATED)

D

62369A

C-Duct Lower Attachment Hoist Points, Nutplates - Replacement Details
Figure 833 (Sheet 3)

A. General
   (1) The repair covered in this procedure is FRS6215/1.
   (2) The procedure gives details for replacement of damaged or missing nutplates for lower attachment forward and aft hoist points.
   (3) The repairs can be applied to thrust reverser fixed structures and lower bifurcat ion assemblies with the following assembly numbers:

       LJ75090
       LJ75064
       LJ76377 SB78-9235
       LJ76554 SB78-9627
       LJ76690 SB78-9627

B. References
   (1) AMM 78-31-00/201, Thrust Reverser System
   (2) AMM 78-31-23/401, Thrust Reverser Translating Cowl
   (3) AMM 78-31-20/401, Fan C-Duct and Thrust Reverser
   (4) AMM 78-31-20/801, Fan C-Duct and Thrust Reverser

C. Equipment
   (1) Standard workshop tools
   (2) Drills and Drilling Equipment
   (3) Riveting Equipment
   (4) Putty Knife
   (5) Hi-Lok Installation Equipment
   (6) Huck blind bolt installation equipment

D. Parts
   (1) Repair Parts
       (a) Blind rivet, (Item 1) - CCR264CS3-6 (RR1012805)
       (b) Blind rivet, (Item 2) - CR3222-4-2 (RR1012806)
       (c) Blind rivet, (Item 3) - CR3524-5-2 (RR1012807)
       (d) Rivet, (Item 5) - MS20615-6M7 (RR1012794)
       (e) Nutplate, (Item 6) - MS21075L4 (RR2308135)
       (f) Nutplate, (Item 7) - MS21076-4 (RR2206980)
       (g) Rivet, (Item 8) - MS21141-0502 (RR1012802)
       (h) Rivet, (Item 9) - MS21141-0503 (RR1012803)
       (i) Rivet, (Item 10) - MS21141-0504 (RR1012804)
       (j) Rivet, (Item 11) - NAS119903-6 (RR1012797)
       (k) Blind rivet, (Item 12) - NAS 1398C6-3 (RR1012798)
       (l) Blind rivet, (Item 13) - NAS1738M4-2 (RR2308258)

(m) Blind rivet, (Item 14) - NAS 1738M4-3 (RR2308259)
(n) Blind rivet, (Item 15) - NAS 1739M4-5 (RR1011347)
(o) Hi-Lok pin, (Item 16) - HL10V5-16 (RR1012799)
(p) Hi-Lok pin, (Item 17) - HL10V5-17 (RR1012800)
(q) Hi-Lok collar, (Item 18) - HL70-5 (RR3408506)
(r) Blind bolt, (Item 19) - S7B100T06-05 (RR1012847)
(s) Rivet, (Item 20) - NAS 1200M5-6 (RR1012697)
(t) Expander, (Item 21) - BB341-5 (RR1012837)
(u) Sleeve, (Item 22) - BB322-5-4 (RR1012838)
(v) Sleeve, (Item 23) - BB322-5-3 (RR1012839)
(w) Bolt, (Item 24) - BB302-5-4 (RR1012840)
(x) Bolt, (Item 25) - BB302-5-3 (RR1012841)

NOTE: Due to variation of assembly structure thickness it is recommended that assembly is gauged to ensure that correct length fasteners are fitted.

E. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(2) Lint free cloth
(3) Primer base, (463-6-27), Omat 7/157
(4) Curing solution, (X-337), Omat 7/158
(5) Sealant 2-part pack base and catalyst (Preferred)
DC 90-006
OMat No. 8/138
(6) Primer, (pink) (DC1200), Omat 8/142
(7) Sealant, (DC93-006-1), Omat 8/143

F. Replace Nutplate

S 968-304-R00
(1) Replace the nutplate.

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE FAN C-DUCT. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Open fan C-duct (AMM 78-31-00/201).

(b) Remove fireshield
  1) For forward hoist point nutplate replacement:
  2) Remove blind bolts securing open latch indicator.
  3) Remove open latch indicator and retain for installation.
  4) Remove the fireshield fasteners and sealant in the repair area.
  5) Loosen and bend fireshield to gain access to rapair area.

(c) Replace forward hoist point nutplate
  1) Remove rivets and carefully remove hoist fitting.
  2) Mark position of shims and retain for installation.
  3) Remove fasteners to remove nutplate from hoist fitting.
  4) Keep the spacer for the installation.
  5) Position replacement nutplate (Item 6) with spacer on hoist fitting and clamp in place.
  6) Install the nutplate with the blind rivets (Item 1).
  7) Wet install the blind rivets with primer base (463-6-27) and curing solution (X-337) prepared in accordance with manufacturer's instructions.
  8) Position hoist fitting with shims and clamp in place.
  9) Install the hoist fitting with rivets (Item 5).
  10) Wet install the rivets with primer base.

(d) Replace aft hoist point nutplate
  1) Remove thrust reverser translating cowl for access (AMM 78-31-23/401).
  2) Remove the fasteners to remove the fairing.
  3) Keep the fairing for the installation.
  4) Remove the rivets to remove the nut assembly.
  5) Use a 0.098 to 0.106 inch (2.49 to 2.69 mm) diameter drill to remove the rivets that hold the nutplate to the nut assembly.
  6) Install the replacement nutplate (Item 7) with rivets (Item 11) on the nut assembly.
  7) Wet install rivets using primer base (463-6-27) and curing solution (X-337) prepared in accordance with manufacturer's instructions.

8) Position nut assembly and clamp in place.
9) Install the aft hoist point bolts to make sure you have the correct position of the nut assembly.
10) Use the C-duct handling frame (CP30522/2) mounting bracket bolts, NAS1204-15 and NAS1204-20 (AMM 78-31-20/401).
11) Install the nut assembly with the rivets (Item 12).
12) Wet install the rivets with primer base.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

13) Remove the old sealant from the repair area with a putty knife and lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
14) Wipe the area dry with a lint free cloth before solvent evaporates.

WARNING: USE SEALANTS ONLY IN AREAS WITH GOOD VENTILATION.

WARNING: TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH SKIN.

15) Apply sealant (DC93-006-1) to the fairing and mating surfaces.
16) Position fairing and clamp in place.
17) Wet install fasteners using primer base and curing solution prepared in accordance with manufacturer's instructions.

(e) Refit fireshield

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

1) Remove the old sealant from the open latch indicator, the fireshield and the structure with a putty knife and a lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

2) Wipe areas dry with a lint free cloth before the solvent evaporates.

WARNING: AVOID PROLONGED OR REPEATED SKIN CONTACT WITH PRIMER.

USE ONLY IN AREAS WITH GOOD VENTILATION.

PRIMERS ARE VERY FLAMMABLE. KEEP AWAY FROM IGNITION KEEP AWAY FROM IGNITION SOURCES.

3) Prepare primer (DC1200) in accordance with manufacturer's instructions.
4) Apply primer to the surfaces to be bonded.
5) Permit the primer to dry for 30 minutes at room temperature,
21 deg.C. (70 deg.F.) to 43 deg.C. (110 deg.F.).
6) Return fireshield to original position and clamp in place.
7) Install the fasteners.
8) For forward hoist point nutplate replacement:
9) Install open latch indicator with blind bolts (Items 21, 22, 23, 24 and 25) as per illustration.

WARNING: USE SEALANTS ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH SKIN.

10) Prepare sealant (DC90-006) in accordance with manufacturer's instructions.
11) Apply sealant as per illustration (Fig. 835 sheet 1).
12) Cure sealant for 24 hours at room temperature.

NOTE: Uncured sealant is structurally and functionally acceptable for flight.

S 218-305-R00

(2) Visually inspect repair area.

S 938-306-R00

(3) Mark FRS6215/1 adjacent to assembly number with a permanent marker pen of contrasting color.

TASK 78-31-20-308-313-R00

26. Left-Hand (L.H.) and Right (R.H.) Fan Thrust Reverser, C-Duct Hinges - Replacement of Bushing (Fig. 834)

A. General

(1) The repairs covered in this procedure are FRS6218 and FRS6219. Repairs apply to L.H. fan thrust reverser C-ducts (FRS6219) and R.H. fan thrust reverser C-ducts (FRS6218).

(2) The procedure gives details for replacement of damaged or missing bushing for fan thrust reverser C-duct aft hinges.

(3) The repair can be applied to fan thrust reverser upper bifurcation assemblies with the following assembly numbers:

RB211-535E4

L.H. - LJ75065
L.H. - LJ76501
R.H. - LJ75066
R.H. - LJ76502

B. References

(1) AMM-78-31-20-024-001-R02 Remove the Thrust Reverser.
(2) AMM 78-31-20-424-002-R02 Install the Thrust Reverser.

C. Equipment

(1) Standard Workshop Tools
(2) Torque Wrench (for 80 lbf.ft.)
(3) Torque Wrench (for 17 lbf.ft.)
(4) Ultra-Violet Lamps
(5) Swaging Tool (RSE1162)
(6) Reamer (RSE1205)
(7) Countersink tool (TS60-3)

D. Parts

(1) Repair parts

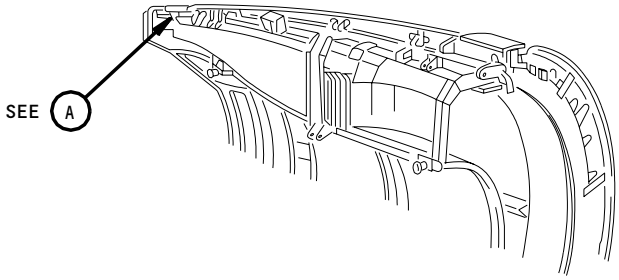
(a) Bushing, aft hinge (Item 1)
LJ76190

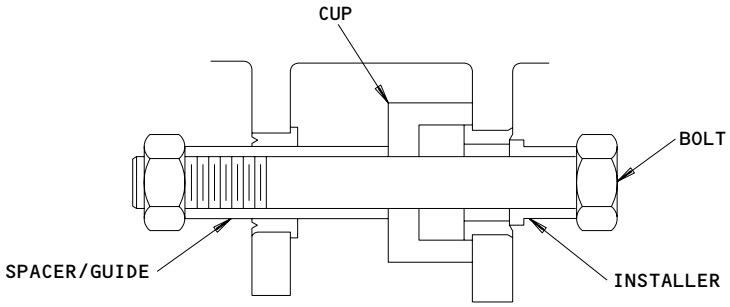
(b) Bushing, repair (Item 2)
LJ76189

(c) Bushing, repair - oversize (Item 3)
LJ76210

E. Consumable Materials

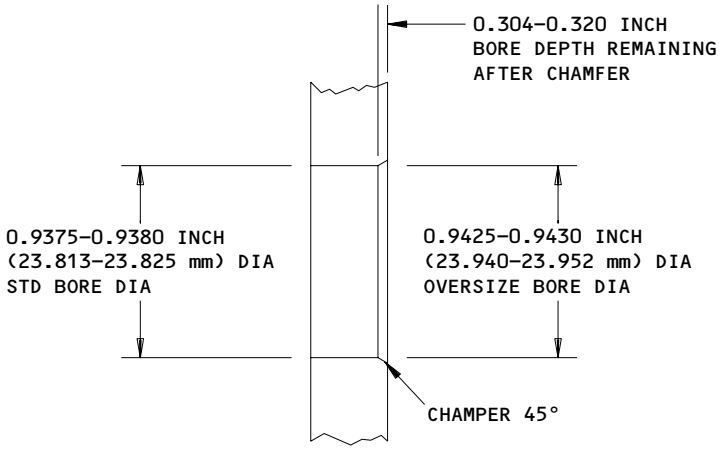
(1) Acetone, OMaT 150
or





TO REMOVE BUSHING

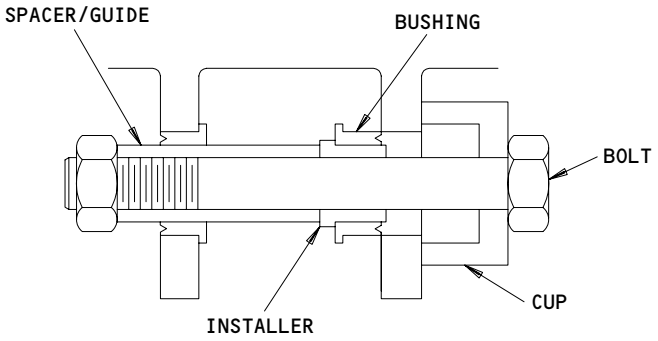
A



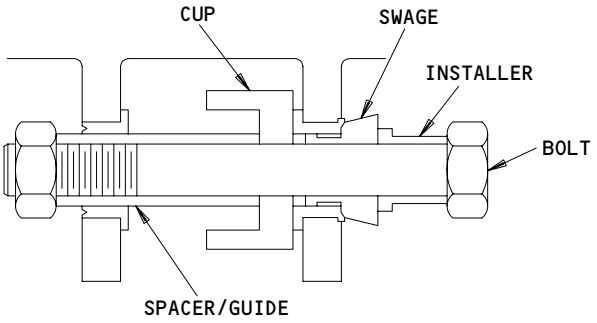
EXAMPLE SECTION THRU LUG BORE

62352A

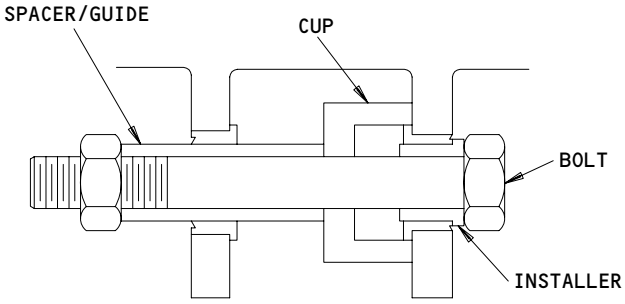
Fan Thrust Reverser C-Duct Hinges – Bushing Replacement Details
Figure 834 (Sheet 1)



INSTALL BUSHING



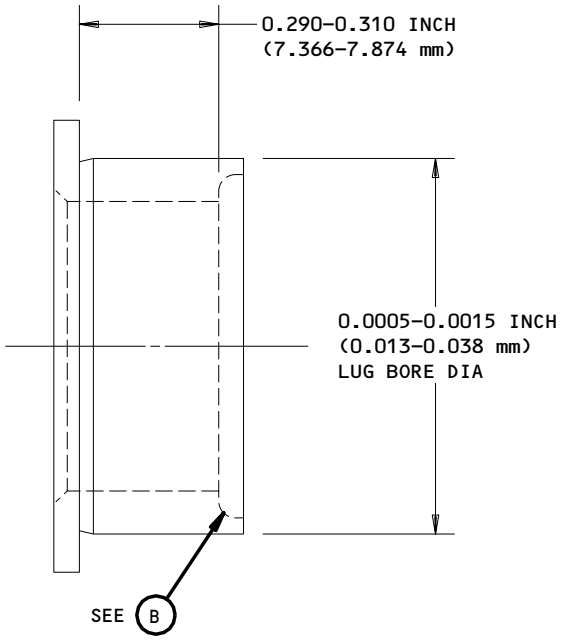
SWAGE BUSHING

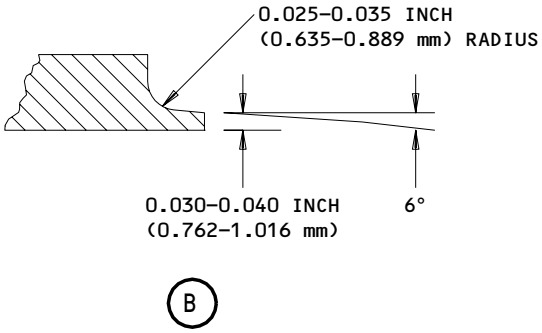


VERIFY SWAGE

62353A

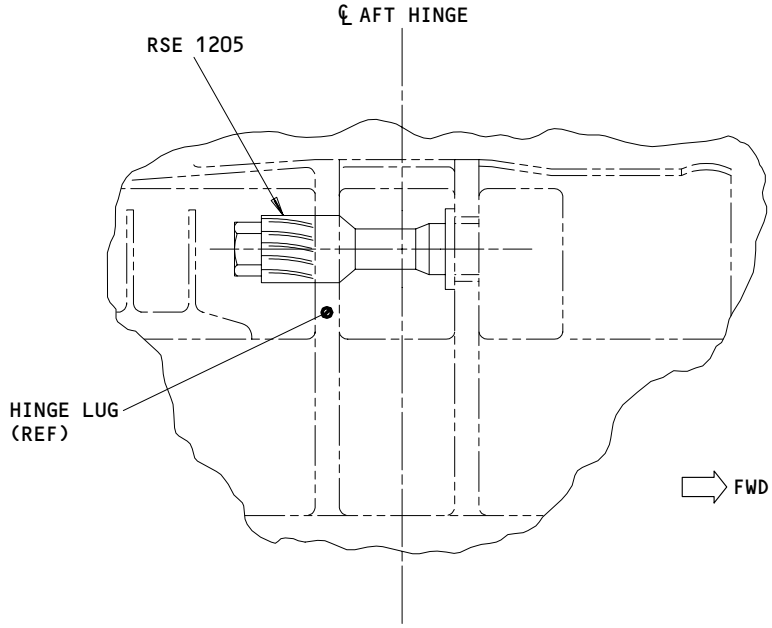
Fan Thrust Reverser C-Duct Hinges - Bushing Replacement Details
Figure 834 (Sheet 2)





62412

Fan Thrust Reverser C-Duct Hinges – Bushing Replacement Details
Figure 834 (Sheet 3)



RSE 1205 USAGE DIAGRAM

62474

Fan Thrust Reverser C-Duct Hinges - Bushing Replacement Details
Figure 834 (Sheet 4)

(2) Isopropyl Alcohol, OMat 1/40
or
(3) Cleaning Solvent, OMat 1/257
(4) Lint free cloth
(5) Fluorescent penetrant, Omat 653
(6) Fluorescent penetrant developer power, Omat 606
(7) Solvent penetrant remover, Omat 616

F. Procedure

S 028-458-R00
(1) Remove the C-duct (AMM 78-31-20/401).

S 968-315-R00
(2) Replace Damaged Bushing
(a) Remove damaged bushing
1) Assemble swaging tool (RSE1162) to press bushing out of lug bore, taking care to avoid damage to lug bore.

NOTE: Machining is not normally required.

(b) Carefully remove any burrs or foreign material from mating faces of hinge lug.
1) Avoid enlargement of bore.
(c) Measure lug bore.
(d) If bore size out of tolerance, use reamer (RSE 1205) to hand ream (in line) to 0.9425 inch (23.940 mm) to 0.9430 inch (23.952 mm) diamete. Use countersink tool (TS60-3) to re-chamfer.
(e) If bore size within original specified tolerances (0.9375 inch (23.813 mm) to 0.9380 inch (23.825 mm)) continue with the dye penetrate inspection.
(f) For lug bore in excess of above and within 0.9380 inch (23.825 mm) to 0.9820 inch (24.953 mm) diameter, use bushing (Item 3).

NOTE: Use countersink tool (TS60-3) to re-chamfer the lug bore as shown.

(g) Machine bushing (Item 3) to provide 0.0005 inch (0.013 mm) to 0.0015 inch (0.038 mm) interference fit in lug bore.

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(h) Clean the mating surfaces of the hinge and the bushing.
  1) Make a clean lint-free cloth moist with OMat 150 Acetone or OMat 1/40 Isopropyl Alchohol or Omat 1/257 Cleaning Solvent.
  2) Wipe the surface dry before the solvent evaporates.
(i) Determine which replacement bushing is required.
  1) For standard size hinge bore, use Item 1.
  2) For 1st oversize hinge bore, use Item 2.
  3) For 2nd oversize hinge bore, use Item 3.
(j) Assemble swaging tool (RSE1162) and press bushing into hinge lug bore until bushing flange is in contact with lug surface.
(k) Assemble swaging tool (RSE1162) to swage configuration and torque tighten nut to 80 lbf.ft. (109 Nm.)
(l) Assemble swaging tool to verification configuration and tighten the nut to 17 lbf.ft. (23 Nm.).
  1) Make sure the bushing flange remains firmly in contact with hinge lug inner surface.

S 218-316-R00

(3) Visually inspect repair area.

S 288-317-R00

(4) Do the penetrate inspection to make sure that the parts were not damaged in assembly.
  (a) Locally apply penetrant by brush or spray.
    1) Allow minimum contact time of 10 minutes.
  (b) Remove excess penetrant with dry lint free cloth.
  (c) Clean area with lint free cloth moistened with water or solvent penetrant remover.

    NOTE: It is preferable that this operation is carried out in a darkened area illuminated with ultra-violet light, to check that all of surface penetrant has been removed just sufficient to give a suitable background.

  (d) Dry area with dry lint free cloth.
  (e) Apply fluorescent penetrant developer powder by blow dispenser or dusting.
    1) Allow minimum contact time of 10 minutes.

(f) Remove excess powder by blowing with clean, dry, compressed air, up to a maximum pressure of 30 p.s.i. (210 kPa).

NOTE: The velocity of air at surface of assembly should not exceed 5 p.s.i. (35 kPa).

(g) Visually inspect the area under ultra-violet light.
1) If there are crack indications, examine under X10 magnification.
(h) Repeat inspection of crack indications at X15 to X30 magnification under white light.
(i) Remove all remaining developer powder using clean, dry, compressed air.

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(j) Clean the mating surfaces of the hinge and the bushing.
1) Make a clean lint free cloth moist with OMat 150 Acetone or OMat 1/40 Isoprpyl Alchohol or OMat 1/257 cleaning Solvent.
2) Wipe the surface dry before the before solvent evaporates.

S 628-318-R00

(5) Apply coating of temporary rust preventative to inner bore of bushing.

S 938-319-R00

(6) Mark the repair number adjacent to the part number with a permanent marker pen of contrasting color.
(a) Use FRS6219 for the LH fan thrust reverser C-duct or FRS6218 for the RH fan thrust reverser C-duct.

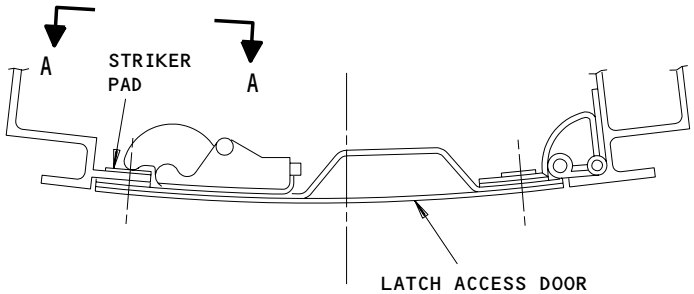
S 428-459-R00

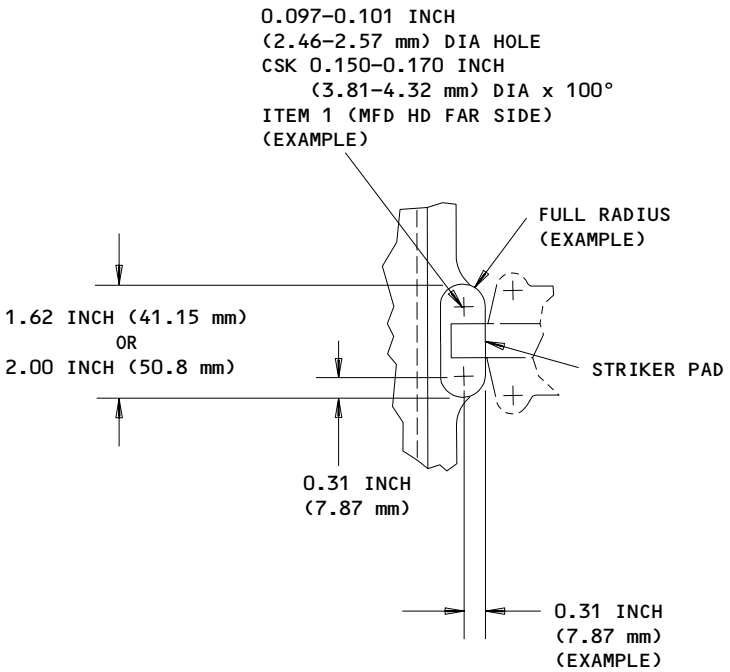
(7) Install the C-duct (AMM 78-31-20/401).

TASK 78-31-20-308-331-R00

27. Fan Thrust Reverser C-Duct Assembly - Replacement of Latch Access Door Striker Pad (Fig. 835)

A. General
(1) The repair covered in this procedure is FRS6262.
(2) The procedure gives details for replacement of damaged striker pad for latch access door latch.





A–A

62433A

C–Duct Latch Access Door, Striker Pad – Replacement Details
Figure 835

(3) The repair can be applied to left-hand C-duct lower bifurcation assemblies with the following assembly numbers:

LJ75063
LJ76503
LJ75089
LJ76376
LJ76497
LJ77111

B. References
(1) AMM 78-31-00/201, Thrust Reverser System
C. Equipment
(1) Standard Workshop Tools
(2) Drills and Drilling Equipment
(3) Riveting Equipment
D. Consumable Materials
(1) Rivet, (Item 1)
MS20427M3-6 (RR1011317)
(2) Primer base, (463-6-27), Omat 7/157
(3) Curing solution, (X-337), Omat 7/158
(4) Thinner, (TL52-66), Omat 7/159
(5) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(6) Lint free cloth
(7) CRES sheet type 321 0.032 inch (0.8 mm) thick x 1.0 inch (25.4 mm) wide x 2.0 inch (50.8 mm) long
E. Procedure

S 848-333-R00
(1) Prepare to replace the damaged striker pad.

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

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser halves (AMM 78-31-00/201).

S 968-334-R00

(2) Replace the damaged striker pad.

(a) Use CRES (type 321) to fabricate replacement striker pad.

NOTE: There are two versions of striker pad: early fan thrust reversers have striker pads 1.62 inch (41.2 mm) long and later issues have striker pads 2.00 inch (50.8 mm) long.

NOTE: Do not drill attachment holes at this time.

(b) Carefully drill out rivets and remove damaged striker pad.

(c) Use a sharp knife to remove old filler or adhesive.

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(d) Clean mating faces with lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean). Wipe area dry with lint free cloth before solvent evaporates.

(e) Position replacement striker pad and clamp in place.

(f) Pick up existing holes and drill holes for rivets in striker pad.

(g) Remove striker pad. Deburr holes in striker pad and remove all swarf from area.

(h) Prepare primer in accordance with manufacturer's instructions.

(i) Wet assemble striker pad with rivets (Item 1) using primer.

S 218-335-R00

(3) Visually inspect completed repair.

(a) Make sure that the latches and striker pads operate correctly.

S 938-336-R00

(4) Mark FRS6262 adjacent to C-duct nameplate with a permanent marker pen of contrasting color.

MAINTENANCE

TASK 78-31-20-308-346-R00

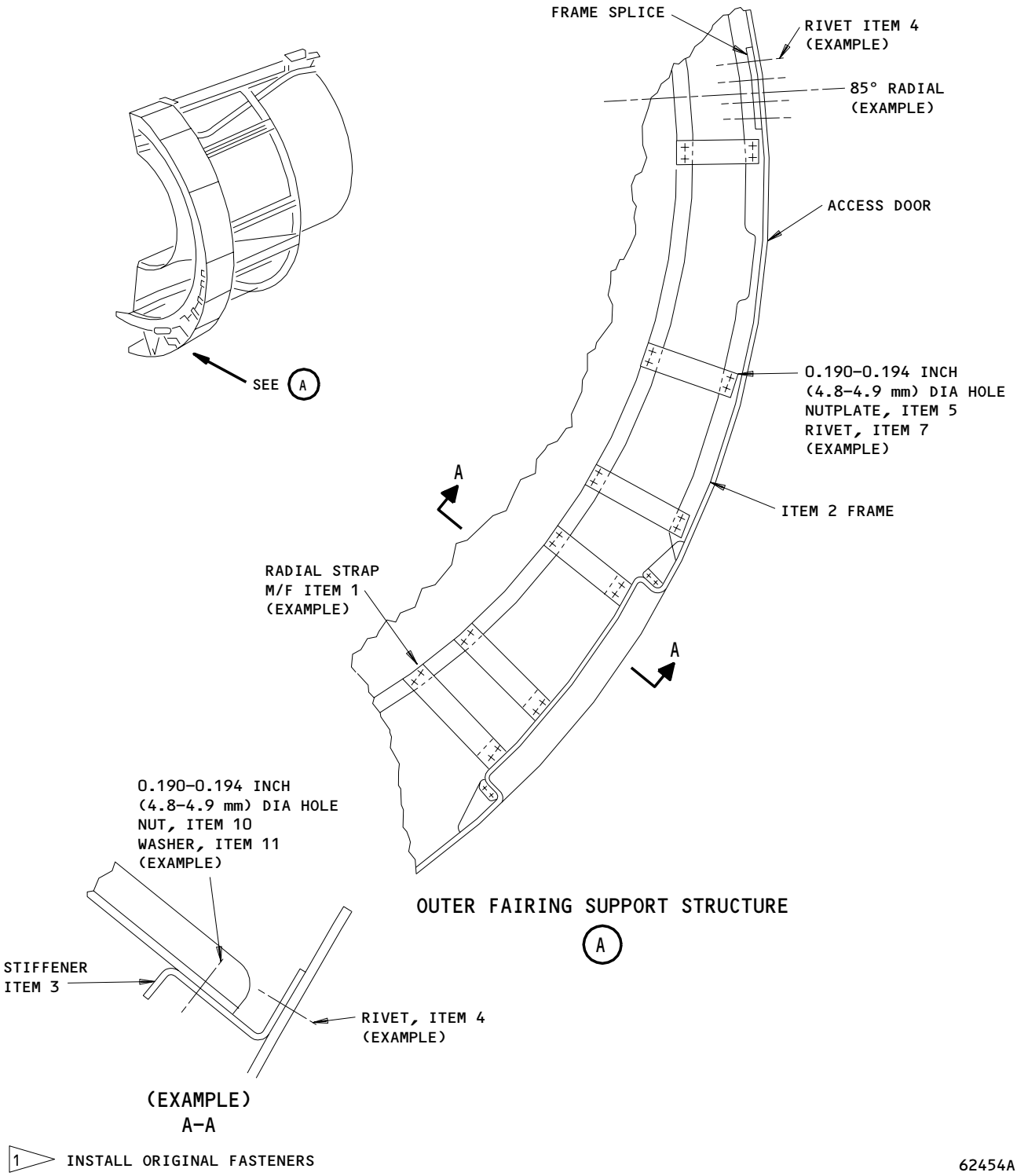
28. Fan Thurst Reverser Torque Ring - Repair of the Outer Fairing Support Structure (Fig. 836)

A. General

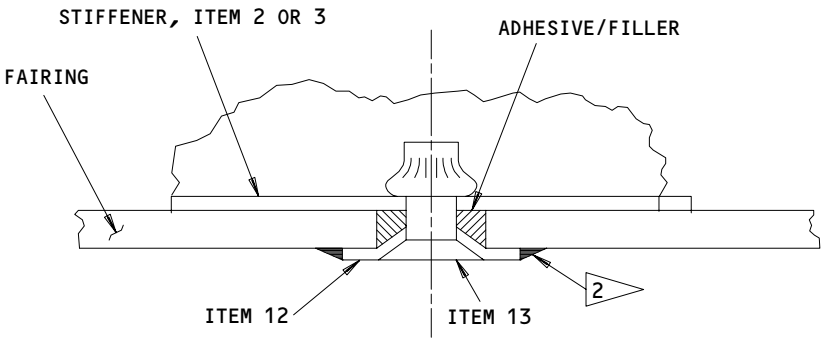
(1) The repair in this procedure is FRS6261.

(2) This repair procedure details the replacement of damaged radial straps, frame and frame stiffeners.

(a) Also a repair to damaged rivets that have gone through the composite skin can be done.



Repair of the Outer Fairing Support Structure
Figure 836 (Sheet 1)



REPAIR
(EXAMPLE)
(FASTENER HEAD PULLED THROUGH FAIRING)

2 FAIRING WITH ADHESIVE

62472

Repair of the Outer Fairing Support Structure
Figure 836 (Sheet 2)

(3) The radial straps hold the thrust ring outer fairing in the correct position.
  (a) The correct position must be kept so that the aerodynamic limits for the thrust ring outer fairing are obeyed.
(4) This repair procedure is written in three parts. The parts of the repair and their paragraphs are as follows:
  (a) Part 1 - Repair the frame and stiffeners on the outer fairing support structure
  (b) Part 2 - Repair the radial straps on the outer fairing support structure
  (c) Part 3 - Repair damaged rivets that have gone through the composite skin adjacent to the radial strap positions
(5) This repair procedure can be used to repair outer fairing support structures on RB211-535E4 and E4-B engines.
  (a) Repair outer fairing support structures that have the part numbers that follow:

    LJ75089
    LJ75090

B. References
  (1) AMM 78-31-20/801, Restoration of Surface Protection.
C. Equipment
  (1) Workshop tools
  (2) Drills and drilling equipment
  (3) Riveting tools
  (4) Heat lamps (explosion proof)
D. Parts
  (1) Repair parts

	Item No.
(a) Radial straps, LJ71842	1
(b) Frame, LJ76226	2
(c) Stiffener, LJ71890	3
(d) Rivet, solid monel MS20427M5-7 (RR2308242)	4

(e) Nutplate, MS21072L3 5
(RR2308543)
(f) Nutplate, MS21075L4 6
(RR2308135)
(g) Rivet, MS20426AD3-4 7
(RR1013922)
(h) Rivet, MS20427M3-4 8
(RR2308244)
(i) Screw, NAS623-3-2 9
(RR2308150)
(j) Nut, MS21042L3 10
(RR2308016)
(k) Washer, AN960C3 11
(RR2308154)
(l) Washer, dimpled NAS1169C8 12
(RR1014015)
(m) Fastener, blind MS21140-0502P 13
(RR1014016)

E. Consumable Materials
(1) Degreasing fluid. Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent OMat No. 1/257
(2) Primer base, Bostik, 463-6-27, Omat- 7/157
(3) Curing solution, Bostik X-337, Omat 7/158
(4) Thinner, TL52-66, Omat 7/159
(5) Abrasive paper, 180 grit, Omat 5/37
(6) Abrasive paper, 80 grit, Omat 5/97
(7) Adhesive, 2 part pack, EA934NA, Hysol, Omat 8/52
(8) Lint free cloth - local resource -
(9) Aluminium alloy sheet (clad), 2024T3, 0.080in. (2.03 mm.) thick.
(10) Permanent marker - local resource

F. Procedure to Repair the frame and stiffeners on the outer fairing support structure

S 948-348-R00

(1) Prepare to repair the frame and stiffeners on the outer fairing support structure
(a) Remove the damaged parts.

(b) Remove the actuator access door as necessary.
(c) Remove the area of the frame that is damaged.
1) Remove all the radial straps necessary to let the damaged frame be removed.
2) Cut out the damaged area.

NOTE: Make cuts in the damaged frame that are an equal distance between two rivet positions.

3) Remove all the loose rivets that attach the fairing to the frame.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(d) Make a lint free cloth moist with degreasing fluid.
(e) Make the damaged area clean.
1) Make the damaged area dry before the liquid becomes a gas.
2) Discard the dirty cloth.

S 358-349-R00
(2) Repair the damaged frame.

CAUTION: THE COMPRESSION STRUT, CONES AND BUMPERS MUST BE CORRECTLY ADJUSTED BEFORE REPAIR PARTS ARE INSTALLED.

(a) Get an LJ76226 repair frame (Item 2).
1) Cut the repair frame to the correct dimensions to fit the damaged area.

NOTE: Remove unwanted material from the end of the repair frame that will be connected by the doubler.

(b) Make a doubler.
1) Use aluminium alloy sheet clad 2024T3, 0.080in. (2.03 mm.) thick to make a doubler for the repair frame installation.

NOTE: Make the contour of the doubler the same as the contour of the frame.

(c) Drill rivet holes in the doubler and repair frame.

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

1) Drill four rivet holes in the doubler.

NOTE: Use drilling equipment and an applicable drill for the rivet (Item 4) dimension.

The rivet holes in the doubler must align with the rivet holes that are in the fairing.

There must be two rivet holes each side of the frame joint position.

2) Drill two rivet holes in the repair frame.

NOTE: Use drilling equipment and an applicable drill for the rivet (Item 4) dimension.

Two rivet holes at one end of the doubler must align with two rivet holes in one end of the frame.

When assembled, the rivet holes in the doubler and the repair frame must align with rivet holes that are in the fairing.

3) Temporarily install the doubler and the repair frame in the correct position in the fairing with clamps.

NOTE: Make sure the rivet holes in the repair parts align.

Make sure the repair parts are held tightly in position.

Make sure the contour of the fairing is correct.

(d) Do a check of the fairing contour.
1) Make sure the front edge of the fairing and the fan cowl door align.

(e) Measure the difference between the front edge of the fairing and the fan cowl door.
  1) Make sure that the measurements are in these limits:
    a) The gap between the front edge of the fairing and the fan cowl door must be 0.010 - 0.130in. (0.254 - 3.302 mm.).
    b) The front edge of the fairing must not be more than 0.025 in. (0.635 mm.) into the airflow.
    c) The front edge of the fairing must not be more than 0.050 in. (1.27 mm.) out of the airflow.

(f) Identify the fairing rivet holes on the repair frame.
  1) Make a mark on the repair frame to identify the rivet holes that are in the fairing.

    NOTE: Make sure the fairing is in the correct position.

  2) Drill the rivet holes in the repair frame.

  WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

  3) Get the correct drill to drill holes for the rivets (Item 4).
  4) Drill the rivet holes in the repair frame with drilling equipment.

    NOTE: Drill rivet holes in the repair frame through the rivet holes that are in the fairing.

  5) Remove the repair frame and doubler from the repair area.
  6) Deburr the rivet holes in the repair parts.

WARNING: DO NOT GET ADHESIVE ON YOUR SKIN. USE THE CORRECT HAND PROTECTION AND BARRIER CREAM. AT THE END OF WORK OR CONTAMINATION, CLEAN YOUR HANDS WITH A CREAM THAT REMOVES RESIN.

WARNING: DO NOT SMOKE OR EAT WHEN THE ADHESIVE IS USED. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. USE THE CORRECT FACE MASK. IF YOU BREATHE IN THE GAS FROM THE ADHESIVE, INJURY TO YOUR LUNGS CAN OCCUR.

(g) Prepare the adhesive.
  1) Get the two part adhesive.

2) Mix the grey paste before it is weighed out.
3) Weigh out 100 parts of grey paste.
4) Weigh out 33 parts of amber liquid.
5) Mix the grey paste and the amber liquid together.

NOTE: If the adhesive is kept at 22 deg.C. (72 deg.F.) after it is mixed, use in less than one hour.

NOTE: The steps that follow must be completed before the life of the adhesive has expired.

(h) Degrease the repair frame, fairing and doubler.

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOOGLE AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID FROM SPARKS, FLAME OR HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

1) Make a lint free cloth moist with degreasing fluid.
2) Clean the repair area and repair parts.

(i) Make the repair area and parts dry before the liquid becomes a gas.
1) Discard the dirty cloth.

NOTE: Install the repair frame immediately the degreasing procedure is completed.

(j) Install the repair frame.
1) Apply a thin layer of adhesive to the surfaces of the repair frame and fairing that will touch when assembled.
2) Apply a thin layer of adhesive to the surface of the doubler that will touch the repair frame when assembled.
3) Put the repair frame and the doubler in the correct position on the fairing to do the repair.

NOTE: Make sure all the rivet holes align correctly.

4) Get the correct quantity of MS20427M5-7 solid monel rivets (Item 4).
a) Apply a small quantity of adhesive to the rivets.

5) Install the rivets (Item 4) in the correct positions. Use riveting tools.

NOTE: Rivets that are installed in composite materials must be moved slowly and continuously through the rivet holes.

NOTE: Do not hit the rivet to make it go through the rivet hole.

6) Use heat lamps to cure the adhesive.

NOTE: The temperature must be kept at 82 - 93 deg.C. (180 - 200 deg.F.) for one hour.

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

(k) Install the LJ71890 stiffener (Item 3).
1) Temporarily install the stiffener on the fairing in the correct position to do the repair.
2) Make a mark through the rivet holes in the fairing to identify the rivet hole positions on the stiffener.
3) Remove the stiffener from the fairing.
4) Get a drill that is the correct dimension to drill the holes for the rivets (Item 4).
5) Use drilling equipment to drill the rivet holes in the stiffener.
6) Deburr the rivet holes in the stiffener with workshop tools.
7) Get the correct quantity of MS20427M5-7 solid monel rivets (Item 4).

8) Apply a small quantity of adhesive to the rivets.
9) Install the rivets in the correct positions with riveting tools.

NOTE: Rivets that are installed in composite materials must be moved slowly and continuously through the rivet holes.

Do not hit the rivet to make it go through the rivet hole.

(l) Install nutplates on the repair frame at the radial strap location points.
1) Temporarily install the MS21072L3 nutplates (Item 5) in the correct position on the repair frame.

NOTE: Make sure the nutplates are held tightly in position.

2) Get the correct drill to drill holes for the MS20426AD3-4 rivets (Item 7).
3) Drill rivet holes in the nutplate and the repair frame.
4) Remove the nutplates from the repair frame. Deburr the rivet holes with workshop tools.
5) Install the nutplates in the correct position on the repair frame with MS20426AD3-4 rivets (Item 7) and riveting tools.

(m) Install the actuator access door.
1) Put the actuator access door in the correct position in the fairing.

NOTE: Remove material from the fairing to let the door fit correctly.

Make sure the actuaor access door is held in the correct position.

2) Make a mark on the repair frame to identify each fastener hole position in the access door.

NOTE: Make the marks through the fastener holes that are in the access door.

3) Remove the actuator access door.
4) Drill rivet holes in the repair frame.

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

5) Put the MS21075L4 nutplates (Item 6) in the correct positions on the repair frame.

NOTE: The nutplates must align with the fastener hole positions. When the fasteners are put in the holes in the access door, they must fit correctly in the nutplates.

NOTE: Make sure the nutplates are held tightly in position.

6) Get the correct drill to drill holes for the MS20427M3-4 rivets (Item 8).
7) Drill rivet holes in the nutplates and the repair frame with drilling equipment.
8) Remove the nutplates.
9) Deburr the rivet holes with workshop tools.
10) Install the nutplates on the repair frame with MS20427M3-4 rivets (Item 8) and riveting tools.

S 218-350-R00

(3) Do a visual inspection of the repaired area.
(a) Make sure the aerodynamic limits for the fairing are obeyed.

S 938-351-R00

(4) Write FRS6261 adjacent to the nameplate to identify the repair.

NOTE: Use a permanent marker that can be easily seen on the area adjacent to the nameplate.

G. Procedure to repair the radial straps on the outer fairing support structure.

S 358-352-R00

(1) Repair the radial straps on the outer fairing support structure.

CAUTION: THE COMPRESSION STRUT, CONES AND BUMPERS MUST BE CORRECTLY ADJUSTED BEFORE THE REPAIR PARTS ARE INSTALLED.

(a) Remove all the radial straps that are damaged.
1) Remove the screws that hold the damaged radial straps to the support structure.
a) Keep the screws that are removed from the support structure for the subsequent installation.

(b) Make the correct quantity of test radial straps to do the repair with 0.080in. (2.00 mm.) thick aluminium sheet.
1) Make sure that the test radial straps are sufficiently long to let slots be cut in one end.

NOTE: The slots in the test radial straps are for the adjustment of the strap lengths.

2) Apply red paint to the test radial straps.

NOTE: The red paint identifies the test radial straps.

(c) Put the test radial straps in the correct position to do the repair.
1) Use the initial screws to hold the test radial straps in position.
2) Tighten the screws.

(d) Close the thrust reverser assembly.

NOTE: This part of the repair can be done when an overhaul to the thrust reverser assembly is done.

NOTE: The test radial straps must be kept in position on the support structure.

NOTE: When the thrust reverser assembly is installed on the aircraft, the repair radial straps will be installed.

NOTE: When this procedure is done, this part of the repair is complete.

(e) Put a straight edge on the fairing at the IDG oil cooler exit position.
1) Make sure the straight surface shows the difference between the fairing and the IDG oil cooler exit.

(f) Measure the difference in the fairing surface and the IDG oil cooler exit.

NOTE: Make sure the surface differences that are measured are in the limits that follow:

1) The IDG oil cooler exit must not be more than 0.025 in. (0.635 mm.) in to the airflow.
2) The IDG oil cooler exit must not be more than 0.050 in. (1.27 mm.) out of the airflow.

(g) Do a check of the gap between the fairing and the engine bulkhead. The gap must be 0.005 in. to 0.010in. (0.127 mm. to 0.254 mm.) at all the radial strap positions.

NOTE: The thrust reverser assembly must be kept in the closed position when a check of the fairing contour is to be done.

NOTE: The fan cowl door must be open when the gap between the fairing and the engine bulkhead is measured.

NOTE: Make a record of the strap positions that require adjustment. Adjust the test radial straps as necessary to get the correct gap dimensions.

NOTE: Make sure the fairing contour limits at the IDG oil cooler exit are obeyed. If the limits are not obeyed, do par. (4) again.

(h) Measure the test radial straps.
1) Open the thrust reverser assembly.
2) Measure the dimensions between the inboard and outboard positions of the test radial strap location points.
3) Make a record of the dimensions.

(i) Make the repair radial straps.

WARNING: YOU MUST USE THE CORRECT EYE PROTECTION WHEN YOU DO THE DRILLING PROCEDURE. THE DRILLING PROCEDURE MAKES METAL SWARF. IF THE METAL SWARF GETS IN YOUR EYES, INJURY WILL OCCUR.

1) Use LJ71842 repair strap (Item 1) to make the repair radial straps.
2) Use the dimensions from (6), (b) to identify the fastener holes in the repair radial straps.
3) Use drilling equipment and an applicable drill to drill the fastener holes in the repair radial straps.
4) Deburr all the fastener holes in the repair radial straps.
5) Cut the repair radial straps to the correct length to do the repair.

NOTE: Make sure the fastener holes in the repair radial straps are a minimum of two times the diameter of the fastener hole from the end of the straps.

NOTE: Do not make slots from the fastener holes in the repair radial straps.

(j) Remove the test radial straps from the support structure.

S 358-355-R00

(2) Use the initial NAS623-3-2 screws (Item 9), MS21042L3 nuts (Item 10) and AN960C3 washers (Item 11) to install the repair radial straps.
  (a) Measure the difference between the front edge of the fairing and the fan cowl door.
  (b) Make sure the differences that are measured are in these limits:
    1) The gap between the front edge of the fairing and the fan cowl door must be 0.010in. - 0.130in. (0.254 mm. - 3.302 mm.).
    2) The front edge of the fairing must not be more than 0.025in. (0.635 mm.) in to the airflow.
    3) The front edge of the fairing must not be more than 0.050in. (1.27 mm.) out of the airflow.

S 218-356-R00

(3) Do a visual inspection of the repaired area. Make sure the aerodynamic limits for the fairing are obeyed.

S 938-357-R00

(4) Write FRS6261 adjacent to the nameplate to identify the repair.
  (a) Use a permanent marker that can be easily seen on the area adjacent to the nameplate.

H. Procedure to repair the damaged fasteners that have gone through the fairing adjacent to the radial strap positions.

S 358-358-R00

(1) Repair the damaged fasteners that have gone through the fairing adjacent to the radial strap positions.
  (a) Remove the damaged fasteners that have gone through the fairing.

WARNING: DO NOT GET ADHESIVE ON YOUR SKIN. USE THE CORRECT HAND PROTECTION AND BARRIER CREAM. AT THE END OF WORK OR CONTAMINATION, CLEAN YOUR HANDS WITH A CREAM THAT REMOVES RESIN.

WARNING: DO NOT SMOKE OR EAT WHEN THE ADHESIVE IS USED. USE THE CORRECT FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. IF YOU BREATHE IN THE GAS FROM THE ADHESIVE, INJURY TO YOUR LUNGS CAN OCCUR.

  (b) Prepare the adhesive.
    1) Mix the grey paste before it is weighed out.

2) Weigh out 100 parts of grey paste.
3) Weigh out 33 parts of amber liquid.
4) Mix the grey paste and the amber liquid together.

NOTE: If the adhesive is kept at 22 deg.C. (72 deg.F.), you must use it in less than one hour.

(c) Install the fasteners.

WARNING: DO NOT GET ADHESIVE ON YOUR SKIN. USE THE CORRECT HAND PROTECTION AND BARRIER CREAM. AT THE END OF WORK OR CONTAMINATION, CLEAN YOUR HANDS WITH A CREAM THAT REMOVES RESIN.

DO NOT SMOKE OR EAT WHEN THE ADHESIVE IS USED. USE THE CORRECT FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. IF YOU BREATHE IN THE GAS FROM THE ADHESIVE, INJURY TO YOUR LUNGS CAN OCCUR.

1) Get a NAS1169C8 washer (Item 12) and MS21140-0502P blind fastener (Item 13).
2) Apply adhesive to the surfaces of the washer and fastener that will touch when assembled.
3) Apply adhesive to the surfaces of the washer that will touch the fairing when assembled.
4) Apply adhesive to the damaged fastener hole.
5) Install the washer and the blind fastener in the correct position with riveting equipment.

S 218-359-R00

(2) Do a visual inspection of the repaired area to make sure the aerodynamic limits of the fairing and fan cowl door are obeyed.

NOTE: The thrust reverser assembly and the fan cowl door must be in the closed position to measure the aerodynamic limits.

(a) Measure the difference between the front edge of the fairing and the fan cowl door.
1) Make sure the differences that are measured are in the limits that follow:
a) The gap between the front edge of the fairing and the fan cowl door must be 0.010in. - 0.130in. (0.254 mm. - 3.302 mm.).
b) The front edge of the fairing must not be more than 0.025in. (0.635 mm.) in to the airflow.
c) The front edge of the fairing must not be more than 0.050in. (1.27 mm.) out of the airflow.

S 378-360-R00

(3) Apply surface protection.

(a) Refer to FRS6400 (AMM 78-31-20/801) for the procedure to apply surface protection to the repaired area.

S 938-361-R00

(4) Write FRS6261 adjacent to the nameplate to identify the repair.

(a) Use a permanent marker that can be easily seen on the area adjacent to the nameplate.

TASK 78-31-20-308-372-R00

29. Left and Right Thrust Reverser Fixed Structure Assembly - Forward Upper Bifurcation and Hinge - Beam Seals Repair/Replacement

A. General

(1) The repairs given in this procedures are FRS6223 and FRS6222. The repair FRS6223 is used for the left thrust reverser fixed structure assembly.

(2) These repairs can be used for the thrust reverser fixed structure assemblies, which have the assembly numbers that follow:

RB211-535E4: Left - LJ75089, Right - LJ75090

(3) There are two types of repair that can be done with the forward vee seal (Item 1) of the thrust reverser hinge beam. These are:

- Repair the damge on the vee seal
- Replace the vee seal.

(4) The repairs to the other seals are with seal replacement.

B. Equipment

(1) Standard workshop tools

(2) Drills and drilling equipment

(3) Infra-red heater lamps (explosion resistant)

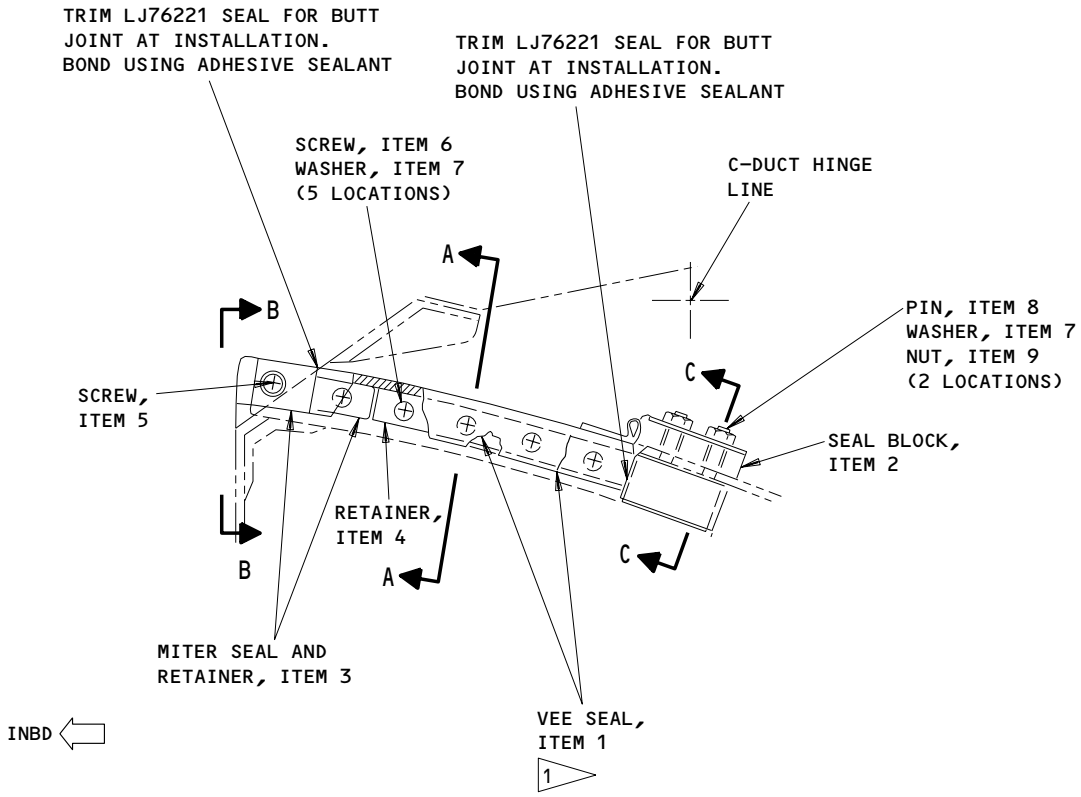
C. Parts

(1) Vee seal (Item 1)
LJ76221

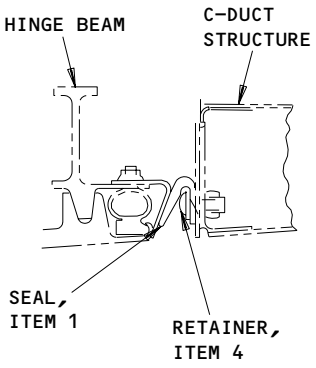
(2) Seal block (Item 2)
LJ75769 - Left fixed structure assembly
LJ75770 - Right fixed structure assembly

(3) Miter seal (Item 3)
LJ76039 - Left fixed structure assembly
LJ76040 - Right fixed structure assembly

(4) Retainer (Item 4)
LJ75774



VIEW IN THE AFT DIRECTION, LEFT SIDE



A-A

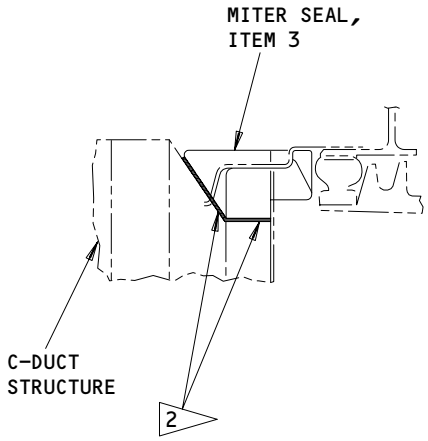
1 REPAIR MINOR DAMAGE USING ADHESIVE SEALANT

62435A

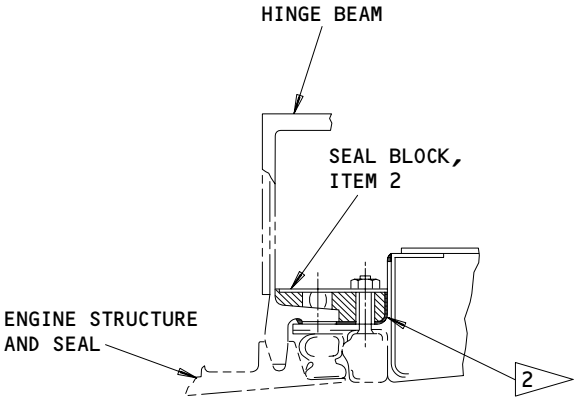
Thrust Reverser Fixed Structure Assembly - Forward Upper Bifurcation and Hinge Beam Seals Repair
Figure 837 (Sheet 1)

EFFECTIVITY
ALL

A15421



B–B

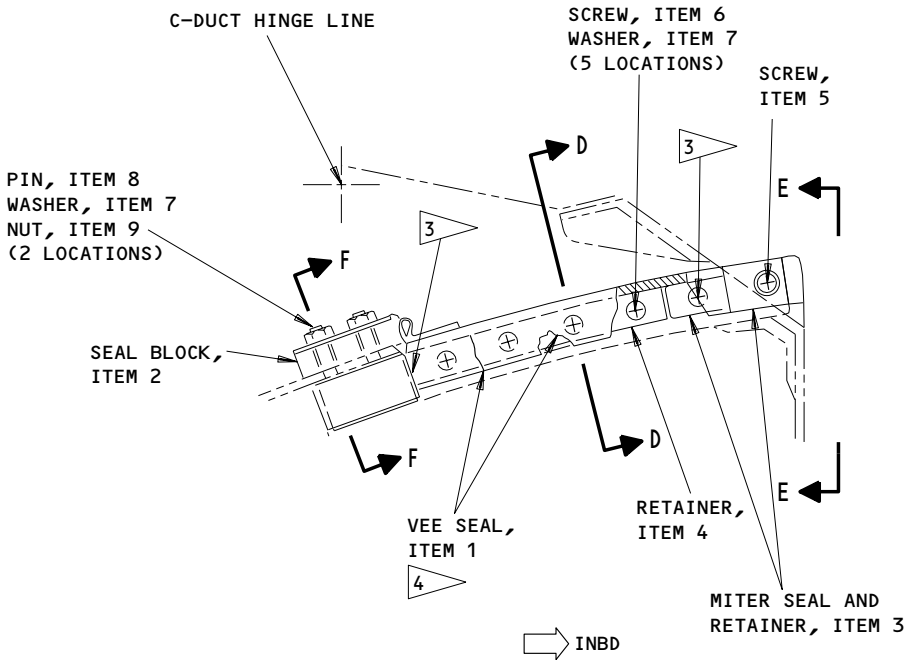


C–C

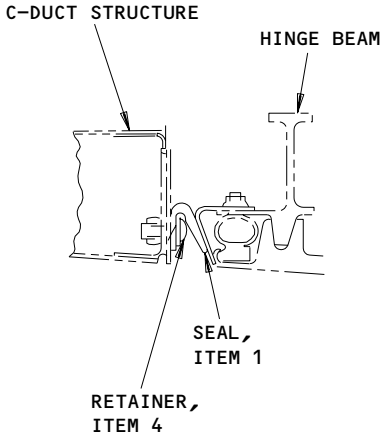
2 BOND SEAL TO STRUCTURE USING ADHESIVE SEALANT

62436A

Thrust Reverser Fixed Structure Assembly – Forward Upper Bifurcation and Hinge Beam Seals Repair
Figure 837 (Sheet 2)



VIEW IN THE AFT DIRECTION, RIGHT SIDE



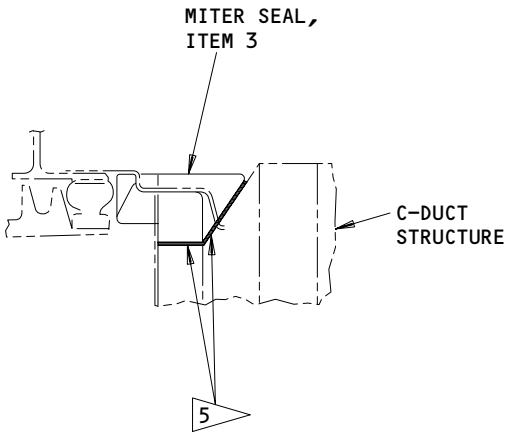
D-D

3 TRIM SEAL FOR THE BUTT JOINT AT INSTALLATION. BOND USING ADHESIVE SEALANT

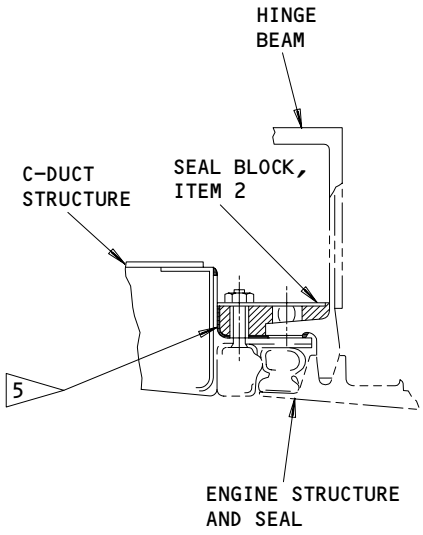
4 REPAIR MINOR DAMAGE USING ADHESIVE SEALANT

62467

Thrust Reverser Fixed Structure Assembly - Forward Upper Bifurcation and Hinge Beam Seals Repair
Figure 837 (Sheet 3)



E-E



F-F

5 BOND SEAL TO STRUCTURE
USING ADHESIVE SEALANT

62436A

Thrust Reverser Fixed Structure Assembly - Forward Upper
Bifurcation and Hinge Beam Seals Repair
Figure 837 (Sheet 4)

(5) Screw (Item 5)
NAS623-3-1 (RR1014210)
(6) Screw (Item 6)
NAS1096-3-12 (RR2308161)
(7) Washer (Item 7)
AN960C10L (RR1205517)
(8) Pin (Item 8)
HL41-6-16 (RR3408818)
(9) Nut (Item 9)
MS21043-3 (RR2308091)

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(2) Lint-free cloth
(3) Abrasive Paper, Aluminium oxide, (Grade 150), Omat 5/63
(4) Primer base, 463-6-27, Omat 7/157
(5) Curing solution, (X-337), Omat 7/158
(6) Masking tape, Omat 298
(7) Thinners, TL52-66, Omat 7/159
(8) Sealant 2-part pack base and catalyst (Preferred)
DC 90-006
OMat No. 8/138
(9) Primer, DC1200, Omat 876C
(10) Aluminium alloy sheet, clad, 2024-T3 per QQ-A-250/5, 1.00 mm (.040in.) thick, Omat 8/138

E. References
(1) AMM 70-51-00/201, Torque Tightening Techniques
(2) AMM 78-31-00/201, Thrust Reverser System

F. Procedure

S 848-373-R00
(1) Prepare to repair the damage on the vee seal (Item 1).
(a) Make sure that the damage on the vee seal is in these limits:
1) Repair the seal if the total area of damage on the vee seal is less than 1.00 x 1.00 inch (25 x 25 mm).
2) Replace the seal if the total area of damage on the vee seal is more than 1.00 x 1.00 inch (25 mm x 25 mm).

3) Repalce the seal if the damage on the vee seal is as far as the retainer (Item 4).

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

(b) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Open the thrust reverser (AMM 78-31-00/201).
1) Open the left thrust reverser to get access to the left fixed structure assembly.
2) Open the right thrust reverser to get access to the right fixed structure assembly.
(d) Remove unwanted material from the vee seal.
(e) Make rough the damaged area with abrasive paper, Omat 5/63.

WARNING: CLEANING FLUIDS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET THE FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(f) Clean the damaged area with a clean lint-free cloth made moist with the Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
(g) Quickly dry the damage area with a clean, dry lint-free cloth.
(h) Apply the masking tape, OMat 298 around the damaged area.

S 358-374-R00

(2) Repair the damage on the vee seal (Item 1).

WARNING: SEALANTS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANT BEACUASE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET THE SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. FLUSH WITH WATER, THEN GET MEDICAL AID.

(a) Refer to the makers instructions and prepare the sealant.
(b) Apply a smooth layer of sealant to the damage area on the vee seal.
(c) Let the sealant cure for a minimum of 60 minutes at 21°C. (70°F.).
(d) Use the intra-red heater lamps to cure the sealant for a minimum of 120 minutes at 71.1°C. (160°F.) to 93.3°C. (200°F.).
(e) Remove the masking tape from around the repaired area.

S 218-375-R00

(3) Do a visual inspection of the repair.

S 938-376-R00

(4) Use a marker pen of permanent color to identify that the repair has been completed.
(a) For a repair to the left fixed structure assembly, write FRS6223 adjacent to the assembly number LJ75089.
(b) For a repair to the right fixed structure assembly, write FRS6222 adjacent to the assembly number LJ75090.

G. Procedure to replace the seals

S 968-377-R00

(1) Replace the seals

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

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser (AMM 78-31-00/201).
1) Open the left thrust reverser half to get access to the left fixed structure assembly.

2) Open the right thrust reverser half to get access to the right fixed structure assembly.

(c) Remove the screws and keep them to use again.

(d) Remove the retainer(s) and keep to use again.

(e) Remove the damaged seal.

(f) Remove the remaining sealant with a putty knife or a spatula and sharp blades.

(g) If the retainer is damaged, make a new retainer with the 2024-T3 clad aluminum.

1) Use the damaged retainer to give the hole positions and the hole size then drill the new retainer.

WARNING: PRIMERS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE PRIMERS BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(h) Prepare to mix and apply the primer, OMat 7/157 and the curing solution, OMat 7/158.

1) Refer to the makers instructions and mix the primer, OMat 7/157 and the curing solution, OMat 7/158.

2) Apply the primer to the retainer.

(i) Let the primer cure for a minimum of 30 minutes at 21°C (70°F).

(j) Temporarily install the vee seal (Item 1).

(k) If it is necessary, cut the vee seal to give the correct fit between the adjacent seals.

(l) Mark the hole positions on the vee seal through the holes in the fixed structure.

(m) Use a hollow punch 0.218 in. (5.54 mm) to 0.253 in. (6.43 mm) to make the holes through one side of the vee seal.

WARNING: CLEANING FLUIDS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET THE FLUID ON YOU SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(n) Clean the repair area with a clean lint-free cloth made moist with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

(o) Quickly dry the area with a clean, dry lint-free cloth.

WARNING: PRIMERS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE PRIMERS BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AIR.

(p) Apply the primer, OMat 876C to the retainer (Item 4) and the mating surfaces of the fixed structure.
(q) Do not apply the primer to the surfaces made of rubber.
(r) Let the primer cure for a minimum of 30 minutes at 21°C (70°F).

WARNING: SEALANTS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES. YE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM TYHE SEALANT. IF YOU GET THE SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(s) Bond the vee seal to the retainer (do the steps that follow in less than 5 minutes)
(t) Apply the thin layer of sealant, OMat 8/138 to each mating surface.
(u) Use clamps to attach the retainer to the seal.
(v) Make sure that the thickness of sealant between the mating surfaces is between 0.005 in. (0.13 mm) and 0.010 in. (0.25 mm).

(w) Remove the unwanted sealant with a clean, dry lint-free cloth.

WARNING: SEALANTS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET THE SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(x) Install the seal assembly (do the steps that follow in less than 5 minutes)
   1) Apply a thin layer of sealant, OMat 8/138 to the mating surfaces of the seal and the fixed structure.
   2) Apply a thin layer of sealant to the seal ends to bond the seal to the adjacent seals.

   CAUTION: DO NOT FULLY TIGHTEN THE SCREWS UNTIL THE SEALANT HAS CURED. IF YOU DO FULLY TIGHTEN THE SCREWS. THE SEALANT WILL BE PUSHED OUT OF THE JOINT. THIS WILL MAKE AS UNSATISFACTORY JOINT.

   3) Install the seal to the fixed structure with the screws.
   4) Tighten the screws until the thickness of the sealant between the mating surfaces is between 0.005 in. (0.13 mm) and 0.010 in. (0.25 mm).
   5) Remove the unwanted sealant with a clean, dry lint-free cloth.

(y) Let the sealant cure for a minimum of 60 minutes at 21°C (70°F).

(z) Use the infra-red heater lamps to cure the sealant for a minimum of 120 minutes at 71.1°C (160°F) to 93.3°C (200°F).

(aa) Tighten the screws (Ref 70-51-00).

S 218-378-R00
(2) Do a visual inspection of the area.

S 938-379-R00
(3) Use a marker pen of permanent color to identify that the repair has been completed.
(a) For a repair to the left fixed structure assembly, write FRS6223 adjacent to the assembly number LJ75089.
(b) For a repair to the right fixed structure assembly, write FR6222 adjacent to the assembly number LJ75090.

TASK 78-31-20-308-380-R00

30. Left and Right Thrust Reverser Fixed Structure Assembly - Lower Bifurcation Seal Block Repair/Replacement

A. General
(1) The repairs given in this procedure are FRS6229 and FRS6230. The repair FRS6229 is used for the left thrust reverser fixed structure assembly (Fig. 842). The repair FRS6230 is used for the right thrust reverser fixed structure assembly (Fig. 842).
(2) These repairs can be used for the thrust reverser fixed structure assemblies, which have the assembly numbers that follow:

RB211-535E4

Left - LJ75089
Right - LJ75090

(3) Repairs to the seal block (Item 1) are as follows:

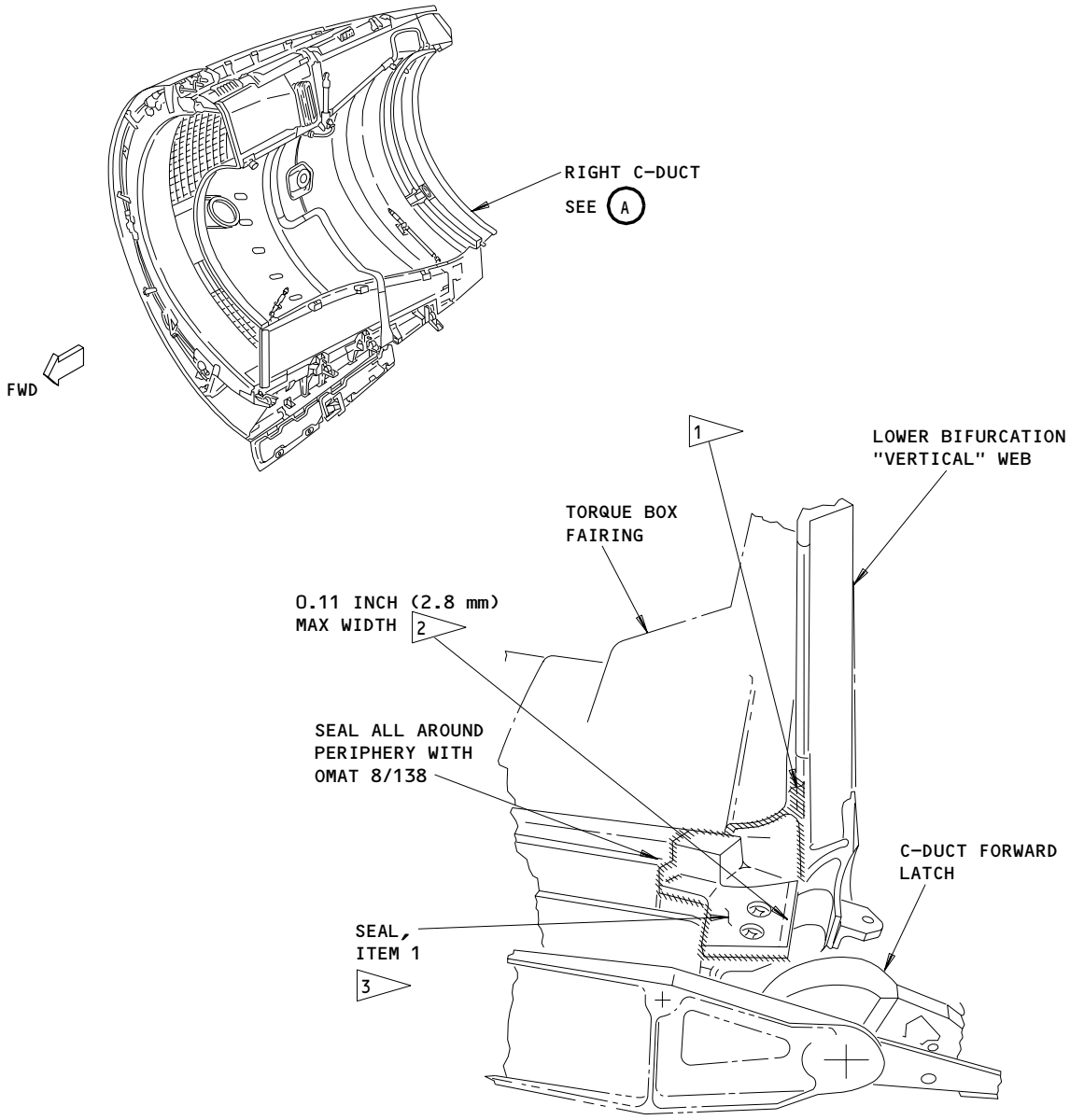
- To apply sealant between the mating surfaces that have come apart
- Replacement of the seal block.

B. Equipment
(1) Standard workshop tools
(2) Infra-red heater lamps (explosion resistant)

C. Parts
(1) Seal block (Item 1)

LJ75965 - Left fixed structure assembly
LJ75966 - Right fixed structure assembly

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(2) Lint-free cloth
(3) Abrasive Paper, Aluminium oxide, (Grade 150), Omat 5/63
(4) Sealant 2-part pack base and catalyst (Preferred)
DC 90-006
OMat No. 8/138
(5) Primer, DC1200, Omat 876C



1 SOME UNITS USE ALTERNATE SEALANTS IN THIS AREA

2 TRIM MAY BE REQUIRED ON EARLY UNITS BEFORE UNIT NO. 121. TRIM SPARINGLY.

3 SAVE AND REUSE EXISTING FASTENERS

VIEW IN THE AFT DIRECTION, RIGHT SIDE

A

62466

Lower Bifurcation Seal Block Repair
Figure 838

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 70-51-00/201, Torque Tightening Techniques

F. Procedure

S 968-381-R00

(1) Repair/Replace Seal block (Item 1)

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

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser (AMM 78-31-00/201).
1) Open the left thrust reverser half to get access to the left fixed structure assembly.
2) Open the right thrust reverser half to get access to the right fixed structure assembly.

(c) Repair the seal block (Item 1)
1) Repairs can be done without the removal of the seal block if the seal block is not damaged.
2) If small areas of the seal block are not bonded correctly to the fixed structure, or have tears, they must be bonded again.

NOTE: This is done with the use of OMat 8/138.

(d) Remove the fasteners and keep to use again.
(e) Remove the seal block with the use of sharp blades to cut the sealant from the mating surfaces.
(f) Remove the remaining sealant with putty knifes, spatula and sharp blade.
(g) Install the replacement seal block temporarily.

NOTE: On units before CUM121 cut the seal block to give the correct fit.

WARNING: CLEANING FLUIDS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET THE FLUID ON YOU SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(h) Clean the repair area with a clean lint-free cloth made moist with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
(i) Quickly dry the area with a clean, dry lint-free cloth.

WARNING: PRIMERS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE PRIMERS BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AIR.

(j) Apply the primer 0Mat 876C to the mating surfaces, but not to the surfaces made of rubber.
(k) Let the primer cure for a minimum of 30 minutes at 21°C (70°F).

WARNING: SEALANTS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM TYHE SEALANT. IF YOU GET THE SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(l) Install and bond the seal assembly (do steps that follow in less than 5 minutes).
    1) Apply a thin layer of sealant 0Mat 8/138 to each mating surface.

CAUTION: DO NOT FULLY TIGHTEN THE FASTENERS UNTIL THE SEALANT HAS CURED. IF YOU DO FULLY TIGHTEN THE FASTENERS. THE SEALANT WILL BE PUSHED OUT OF THE JOINT. THIS WILL MAKE AN UNSATISFACTORY JOINT.

2) Install the seal block to the fixed structure with the fasteners.
3) Tighten the fasteners until the thickness of sealant between the mating surface is between 0.005 - 0.010 inch (0.13 - 0.25 mm).
4) Apply the sealant OMat 8/138 around the edge of the seal block.
5) Remove the unwanted sealant with a clean dry lint-free cloth.

(m) Let the sealant cure for a minimum of 60 minutes at 21°C (70°F).
(n) Use the infra-red heat lamps to cure the sealant for a minimum of 120 minutes at 71.1°C. (160°F) to 93.3°C (200°F).
(o) Tighten the fasteners (AMM 70-51-00/201).

S 218-382-R00

(2) Do a visual inspection of the area.

S 938-383-R00

(3) Use a marker pen of permanent color to identify that the repair has been completed.
(a) For a repair to the left fixed structure assembly, write FRS6229 adjacent to the assembly number LJ75089.
(b) For a repair to the right fixed structure assembly, write FRS6230 adjacent to the assembly number LJ75090.

TASK 78-31-20-308-384-R00

31. Thrust Reverser Fixed Structure Assembly Forward Cap Angle Sealing

A. General

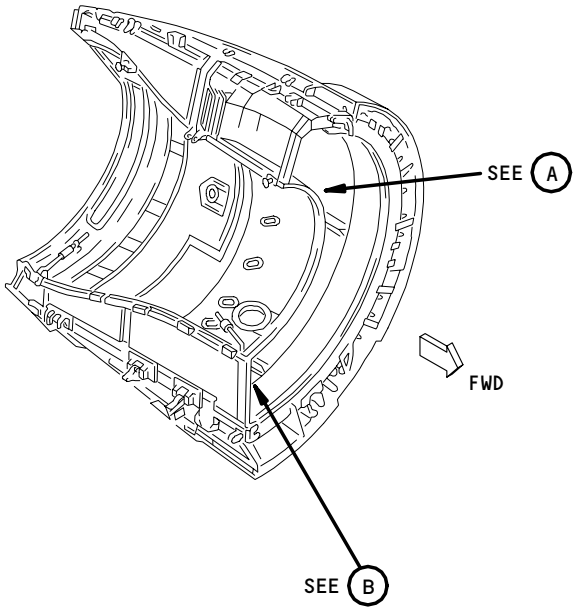
(1) The repair given in this procedure is FRS6233. This repair is used for the left and right thrust reverser fixed structure assembly (Fig. 843).
(2) This repair can be used for the thrust reverser fixed structure assemblies, which have the assembly numbers that follow:

Left - LJ75089
Right - LJ75090

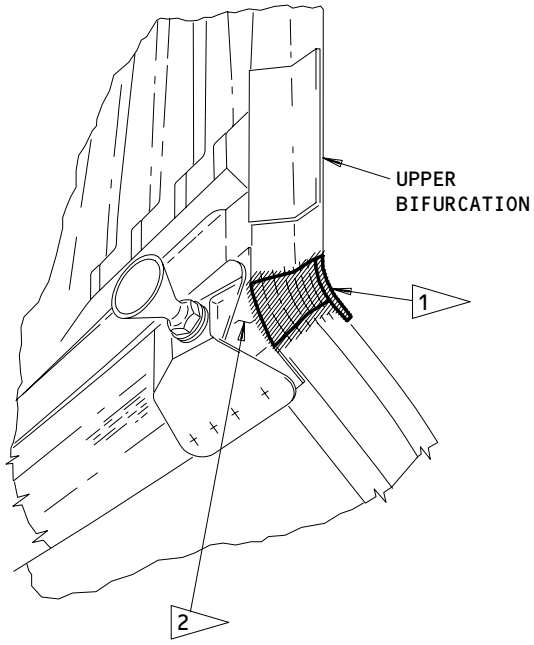
(3) Repairs to the forward cap angle adhesive are made with the replacement of the damaged adhesive.
(4) This FRS6233 can be used to repair the RB211-535E4 thrust reversers.

B. Equipment

(1) Standard workshop tools
(2) Portable dressing equipment
(3) Infra-red heater lamps (explosion resistant)



LEFT C-DUCT SHOWN
(RIGHT C-DUCT OPPOSITE)



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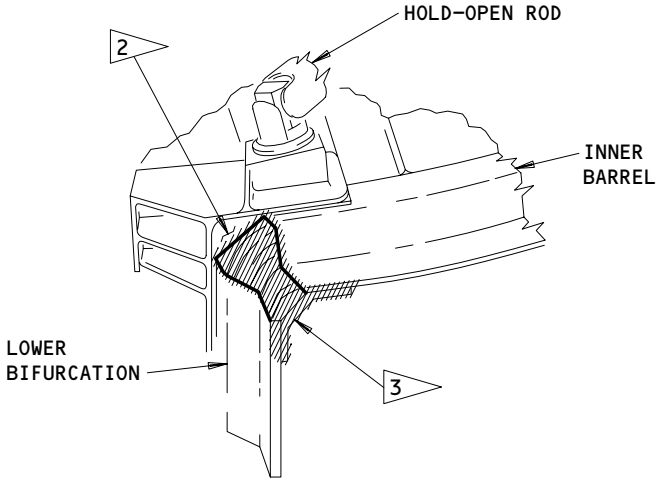


B

1 FILL AND SEAL. ROUND SURFACE(S) TO LARGEST RADIUS WHICH BLENDS WITH ADJACENT SURFACE(S)

2 DO NOT FILL VOID(S) BENEATH BUMPER(S)

3 FILL, SEAL AND SMOOTH WITH OMAT 8/52

62453

Forward Cap Angle Seal
Figure 839

C. Consumable Materials
   (1) Degreasing fluid, Acetone OMat No. 150 or
       Isopropyl alcohol OMat No. 1/40 or
       Cleaning solvent (Desoclean) OMat No. 1/257
   (2) Lint-free cloth
   (3) Abrasive Paper, Aluminium oxide (Grade 150), Omat 5/63
   (4) Adhesive, (two-part), E.A.934NA, Omat 8/52
D. References
   (1) AMM 78-31-00/201, Thrust Reverser System
   (2) AMM 78-31-20/801, Fan C-Duct and Thrust Reverser
E. Procedure

S 348-385-R00

(1) Repair the forward cap angle adhesive

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

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser (AMM 78-31-00/201).
   1) Open the left thrust reverser to get access to the left fixed structure assembly.
   2) Open the right thrust reverser to get access to the right fixed structure assembly.

(c) Remove all the loose adhesive.

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES. EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(d) Make rough the repair area with abrasive paper OMat 5/63.

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES. EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET THE FLUID ON YOU SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(e) Clean the repair area with a clean lint-free cloth made moist with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
(f) Quickly dry the area with a clean, dry lint-free cloth.

WARNING: ADHESIVES ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES. EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVES BECAUSE THEY ARE POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(g) Refer to the adhesive makers instructions and prepare the adhesive.

NOTE: The adhesive must be used in less than 60 minutes from when it was mixed.

(h) Apply the adhesive to give a smooth surface that seals against the engines bulb seal.
(i) Use the infra-red heater lamps to cure the adhesive for 60 minutes at 60°C (140°F).

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN. IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES. EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN. REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(j) Make the surface of the adhesive smooth with sanding discs and/or the abrasive paper, OMat 5/63.

S 378-386-R00

(2) Apply surface protection as FRS6400 (AMM 78-31-20/801).

S 218-387-R00

(3) Do a visual inspection of the repair.

S 938-388-R00

(4) Use a marker pen of permanent color to identify that the repair has been completed.

(a) For a repair to the left fixed structure assembly, write FRS6233 adjacent to the assembly number LJ5089.

(b) For a repair to the right fixed structure assembly, write FRS6233 adjacent to the assembly number LJ75090.

TASK 78-31-20-308-396-R00

32. Left and Right Thrust Reverser Fixed Structure Assembly - Torque Ring Inner Fairing Replacement

A. General

(1) The repairs given in this procedure are FRS6069 and FRS6068. The repair FRS6069 is used for the left fixed structure assembly. The repair FRS6068 is used for the right fixed structure assembly.

(2) These repairs can be used for the thrust reverser fixed structure assemblies which have the assembly numbers that follow:

L.H. LJ75089
R.H. LJ75090
L.H. LJ76376 SB78-9235
R.H. LJ76377 SB78-9235
R.H. LJ76554 SB78-9627
R.H. LJ76690 SB78-9627

(3) The repairs can be done with the removal of the damaged torque ring inner fairing and the replacement with a new inner fairing. If the clearance between the translating cowl and the inner fairing is incorrect: Do the procedure to apply fiberglass fabric layers on the inner fairing to get the correct clearance. The surface protection of a replacement inner fairing is to be applied as FRS6400 (AMM 78-31-20/801).

B. References

(1) AMM 70-51-00/201, Torque Tightening Technique
(2) AMM 78-31-00/201, Thrust Reverser System
(3) AMM 78-31-20/801, Fan C-Duct and Thrust Reverser
(4) AMM 78-31-23/401, Fan Thrust Reverser Translating Cowl

C. Equipment

(1) Standard workshop tools
(2) Drills and drilling equipment
(3) Riveting tools
(4) Infra-red heater lamps (explosion proof)
(5) Template RSE1055

D. Parts

(1) Repair parts.

(a) Inner fairing (item 1A) LJ76158

(b) Blind rivet (item 2A) NAS1739M5-3 (RR2308292)
(c) Bolt (item 3A) NAS1221-3E3 (RR1013643)
(d) Blind rivet (item 4A) CR2545-5-2 (RR1012450)
(e) Blind rivet (item 5A) NAS1738M5-3 (RR2308341)
(f) Seal assembly (Item 6) LJ70727
(g) Seal assembly (item 7) LJ70728
(h) Lower track support fairing (item 8A)
Left - LJ75261
Right - LJ75262
(i) Blind rivet (item 9A) NAS1739M5-4 (RR2308206)
(j) Blind rivet (item 10A) NAS1739M5-5 (RR2308390)
(k) Blind rivet (item 11A) NAS1738M5-2 (RR2308283)
(l) Blind rivet (item 12A) CR2545-5-3 (RR1012451)
(m) Blind rivet (item 13A) CR2545-5-4 (RR1012452)
(n) Blind rivet (item 14A) CR2545-5-5 (RR1012453)
(o) Blind rivet (item 15A) CR2545-5-6 (RR1012454)
(p) Pin (item 16A) ASpFFDT6-5 (RR1013665)
(q) Sleeve (item 17A) ASpFSDT6 (RR3408593)
(r) Lock collar (item 18A) ASpLC2AC6 (RR3408594)

E. Consumable Materials
(1) Sealant, two part polysulphide, PR 1436G B2, Omat 8/107A
(2) Abrasive Paper, Aluminum Oxide, (Grade 180), Omat 5/62
(3) Adhesive, 2 part pack, EA956, Hysol, Omat 8/117
(4) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

(5) Lint-free cloth
(6) Gloves (white cotton)
(7) Paint brush short bristle 1.00 in. (25.4 mm.)
(8) Abrasive Paper, Aluminum Oxide, (Grade 100), Omat 5/65
(9) Cleaning fluid, white spirit, B.S.245, Omat 102
(10) Style 181 fiberglass fabric

F. Procedure

S 038-398-R00

(1) Removal of the damaged inner fairing (Fig. 840).

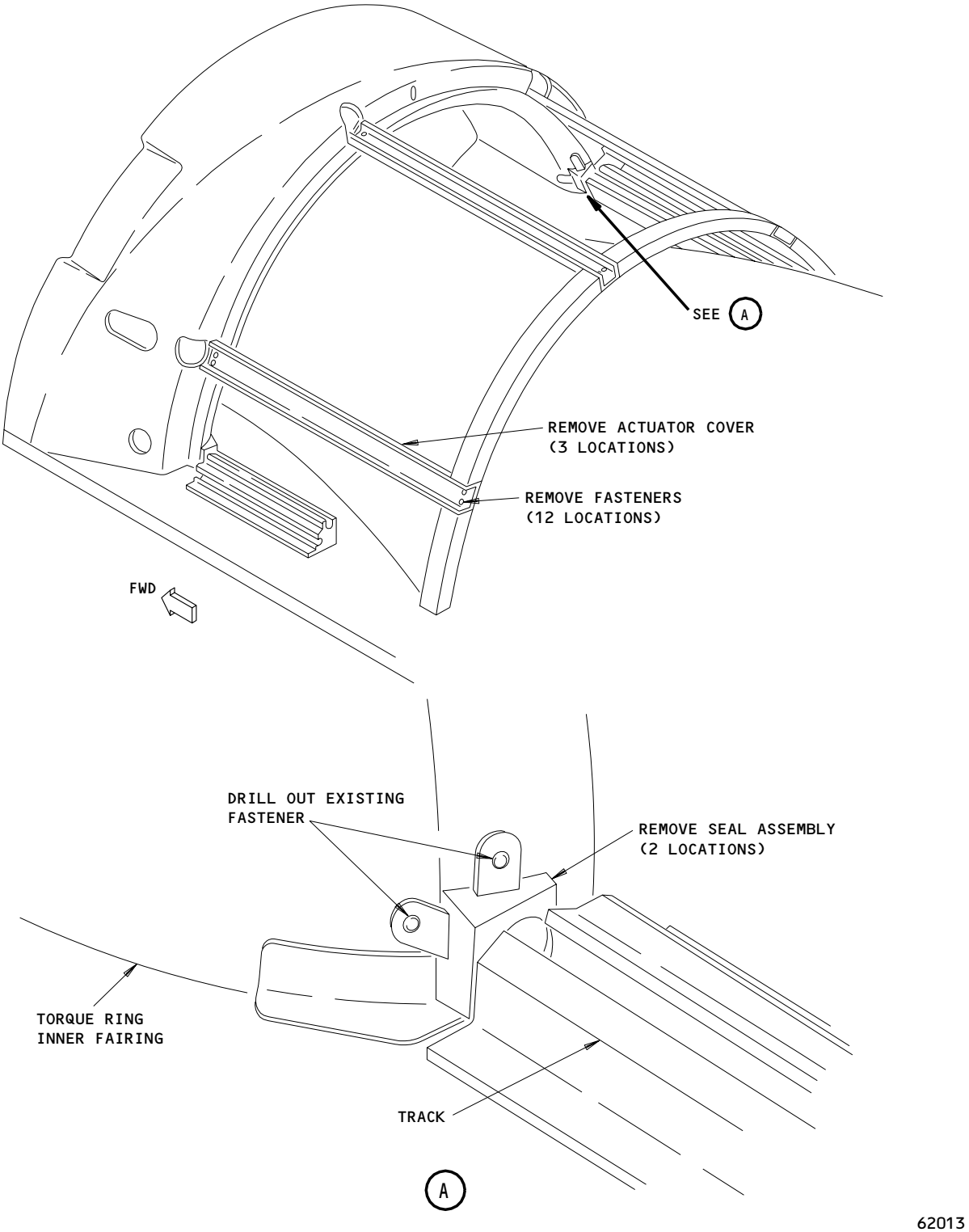
WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT ACCIDENTAL OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

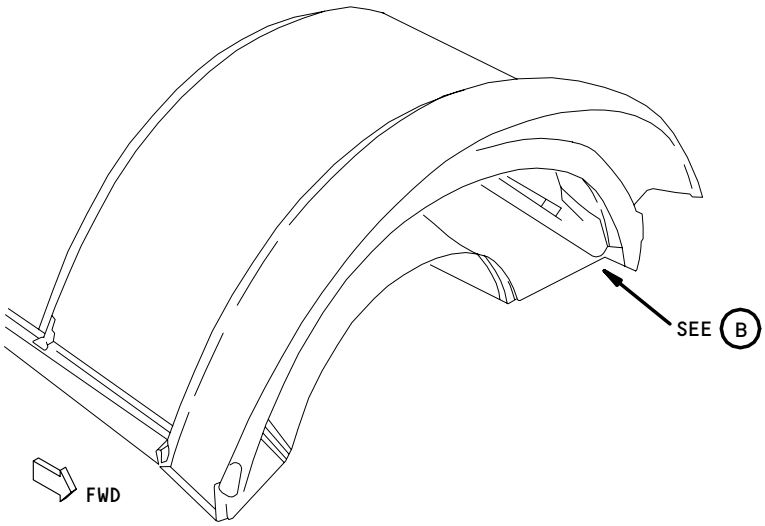
WARNING: YOU MUST REMOVE THE THRUST REVERSER TRANSLATING COWL BEFORE THIS REPAIR IS ATTEMPTED (AMM 78-31-23/401). IF YOU DO NOT OBEY THESE INSTRUCTIONS, INJURY TO PERSONS AND/OR DAMAGE TO EQUIPMENT WILL OCCUR.

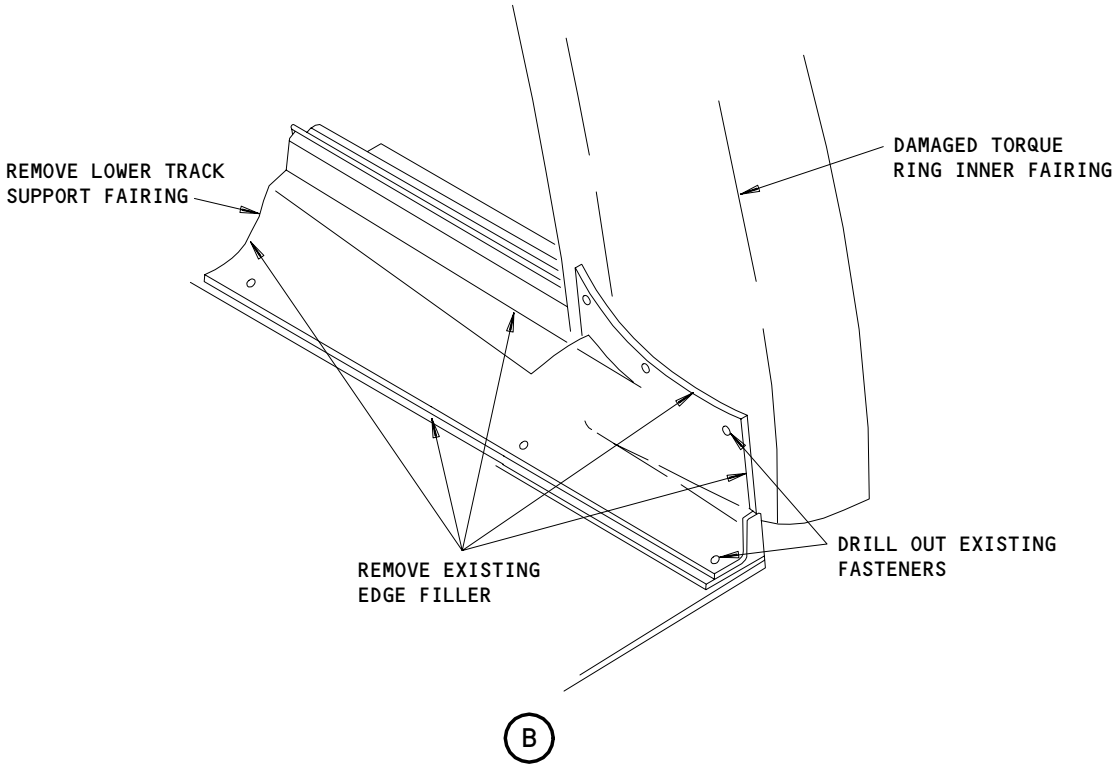
OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE THRUST REVERSER C-DUCTS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Open the thrust reverser C-ducts (AMM 78-31-00/201) to get access to the applicable fixed structure assembly.
(c) Remove the fasteners and the actuator covers and keep them to use again.
(d) Remove the seal assembly at the upper track location.
1) Remove the rivets with the drills and the drilling equipment.
(e) Remove the seal assembly at the lower track location.
1) Remove the rivet with the drills and the drilling equipment.
(f) Remove the edge sealant with a putty knife.
(g) Remove the lower track support fairing and keep it to use again.
1) Remove the rivets with the drills and the drilling equipment.



Damaged Inner Fairing Removal
Figure 840 (Sheet 1)





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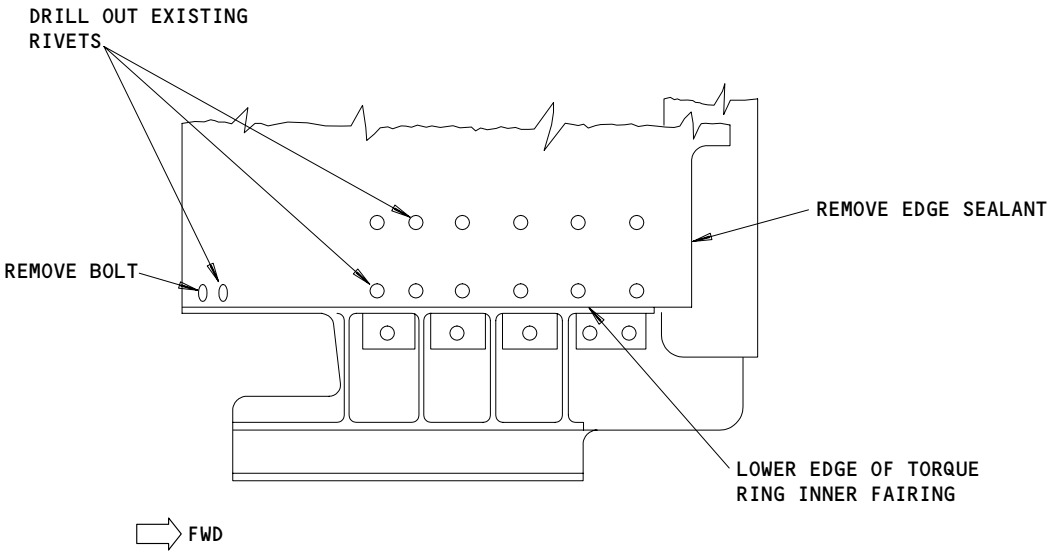
Damaged Inner Fairing Removal
Figure 840 (Sheet 2)



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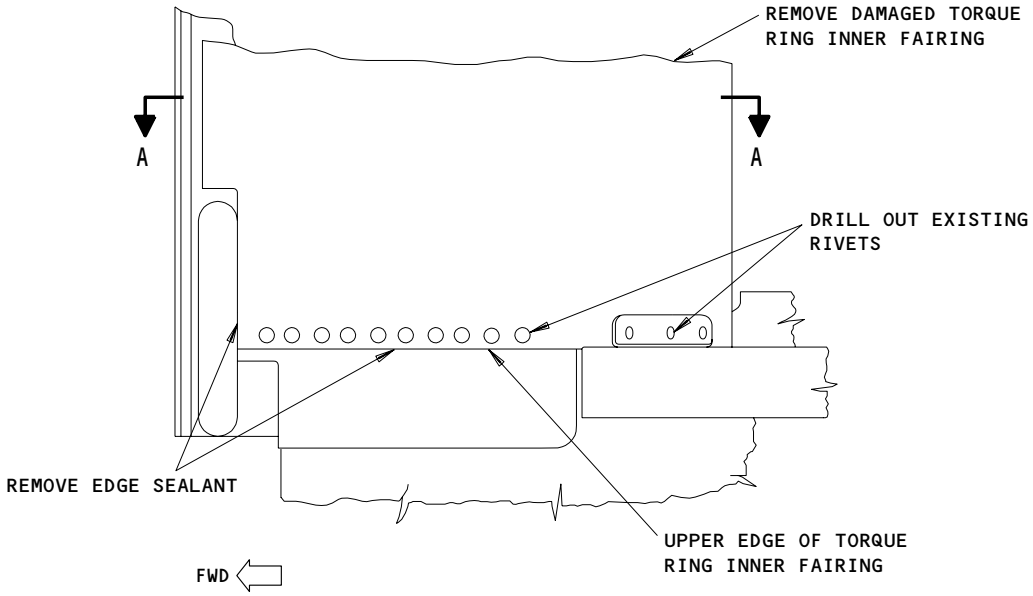
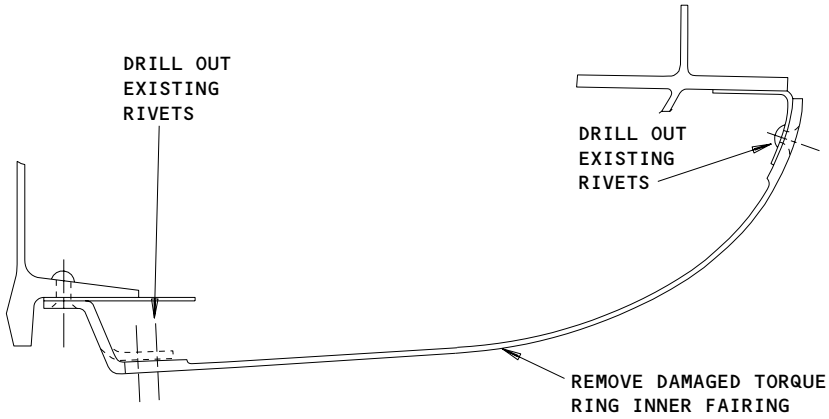
Damaged Inner Fairing Removal
Figure 840 (Sheet 3)





A-A

62016A

Damaged Inner Fairing Removal
Figure 840 (Sheet 4)

2) Then remove the ASp fastener.

(h) Remove the bolt from the damaged inner fairing.
1) Remove the rivets with the drills and the drilling equipment.

(i) Insert a putty knife below the inner fairing and use it to help remove the inner fairing.

S 848-028-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. THIS MATERIAL CONTAINS ASBESTOS FIBERS. THESE FIBERS ARE DANGEROUS TO YOUR HEALTH AND OTHER PERSONS HEALTH IN THE AREA. IF YOU CUT, DRILL, GRIND OR SAND THE MATERIAL, THE ASBESTOS FIBERS WILL BE RELEASED INTO THE AIR. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

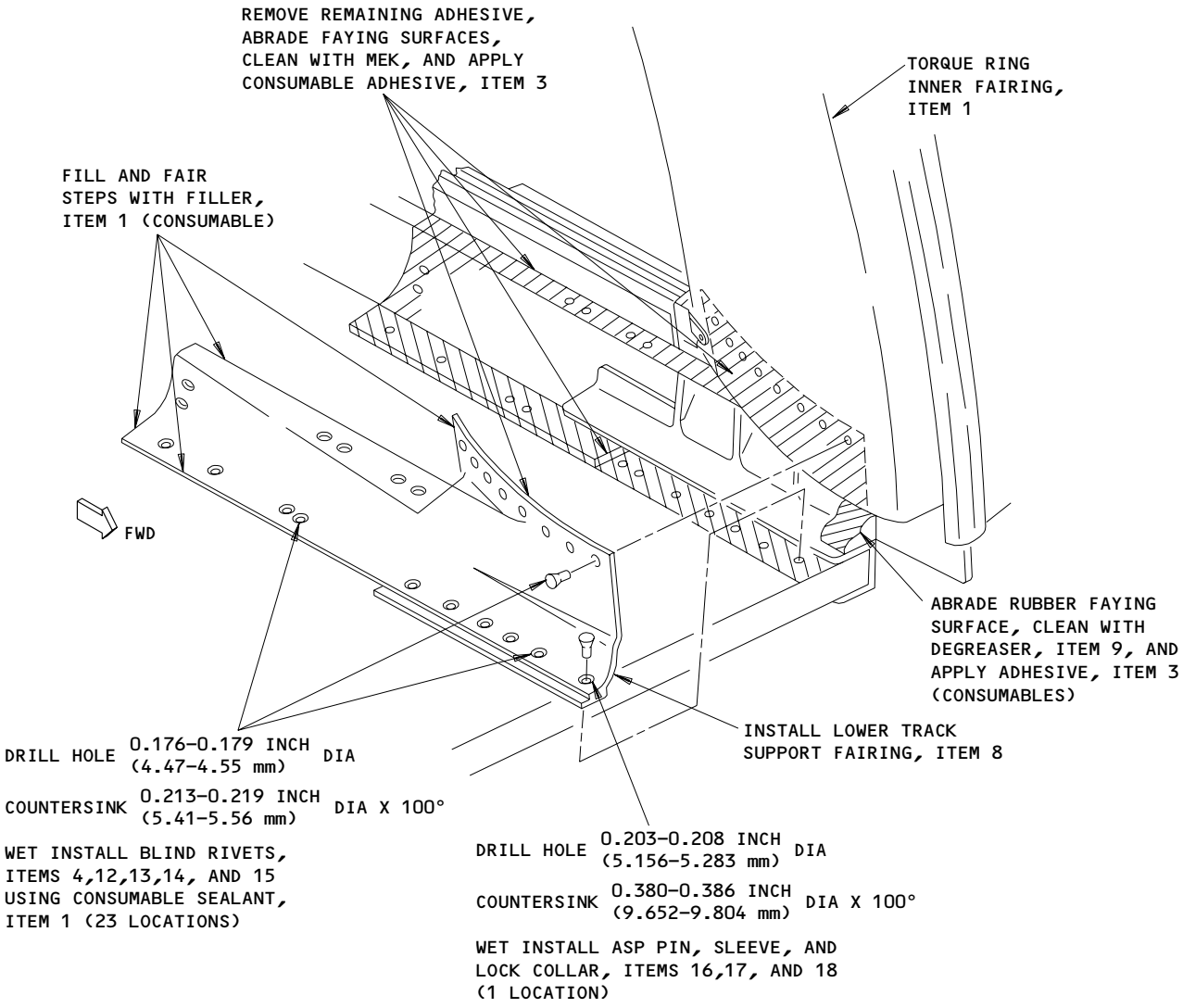
(2) Prepare the repair parts (Fig. 841).
(a) Remove the remaining adhesive from the fixed structure assembly with the abrasive paper OMat 5/65.
(b) Cut or grind the replacement inner fairing LJ76158 (item 1A).
1) Install the upper end first.
2) If the lower end is too long, cut or grind some material until you get the correct fit.
(c) Remove the replacement inner fairing.

S 038-402-R00

(3) Install the repair parts (Fig. 841 and 842).
(a) Put the replacement inner fairing LJ76158 (item 1A) in the correct position on the torque ring.

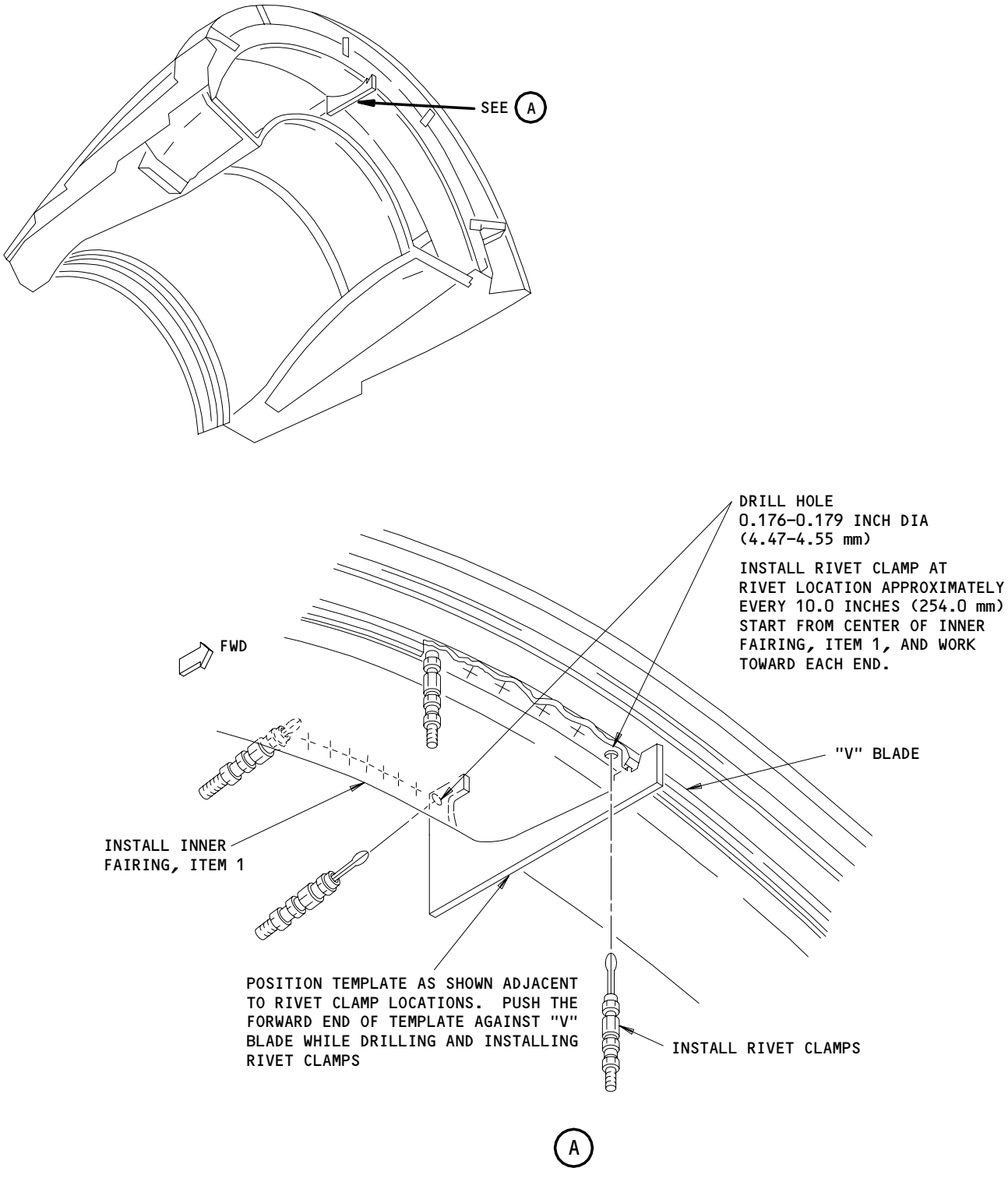
WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(b) Drill and countersink the repair parts.
1) Drill the holes in the replacement inner fairing to align with the holes in the mating parts.



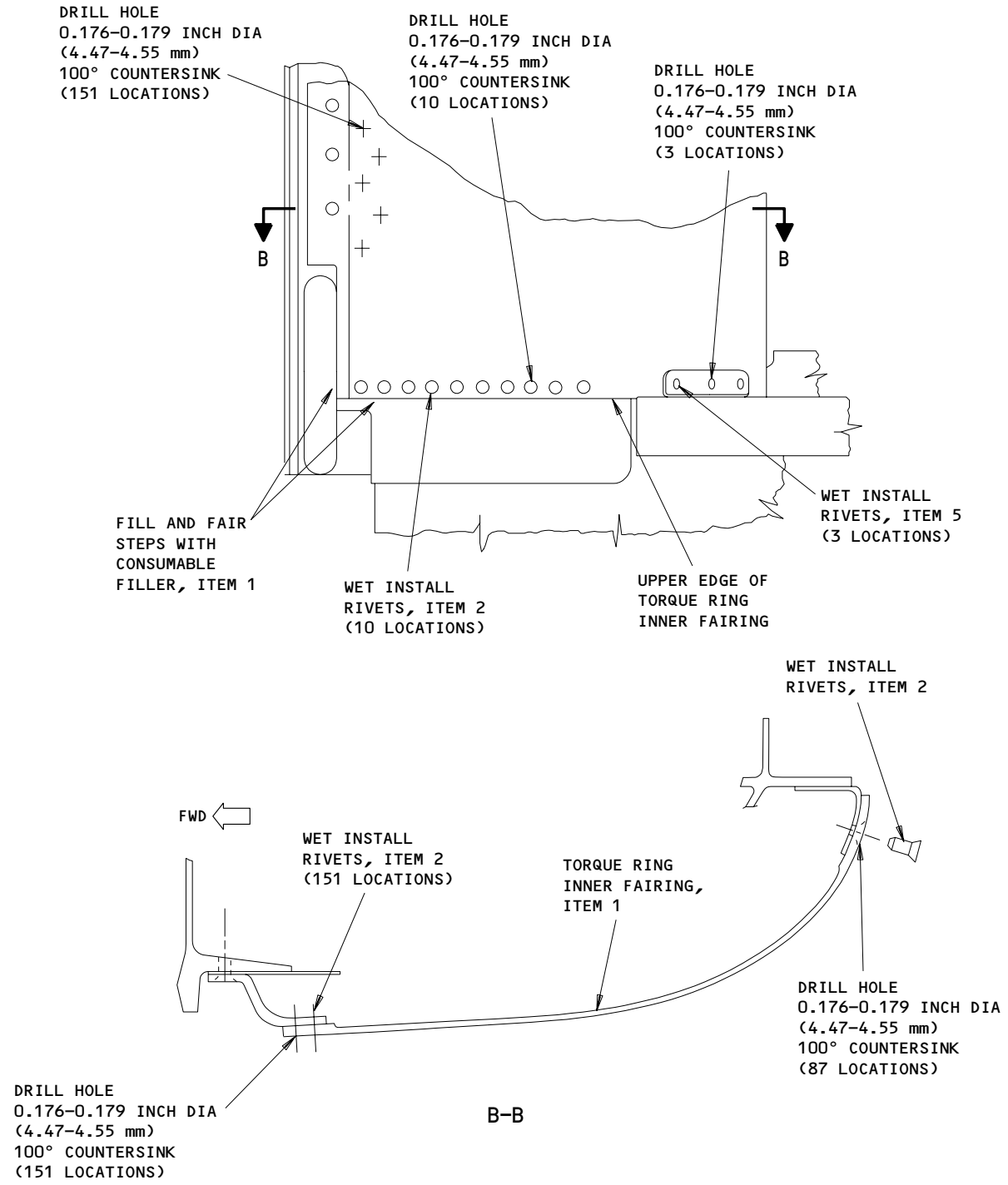
62321A

Inner Fairing Repair Parts Preparation
Figure 841

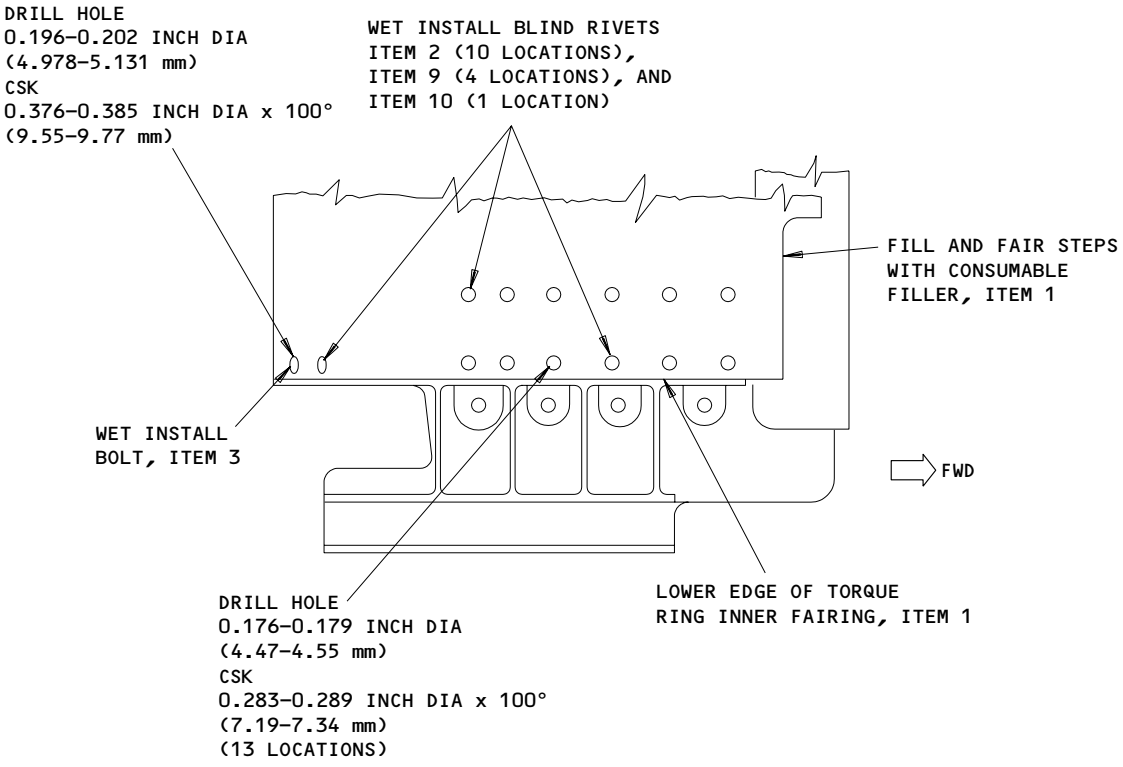


62017B

Inner Fairing Repair Parts Installation
Figure 842 (Sheet 1)



Inner Fairing Repair Parts Installation
Figure 842 (Sheet 2)



Inner Fairing Repair Parts Installation
Figure 842 (Sheet 3)

2) Use the special tool template (RSE1055) to hold the inner fairing when you drill the inner fairing.
3) Install a rivet clamp at every 10.00 inches (254.0 mm).
4) Start to drill the inner fairing at the center and work to each end of the inner fairing.

(c) Drill and countersink the rivet holes along the forward and aft edge of the inner fairing.
1) Drill the holes between the clamps to align with the holes in the mating parts.

(d) Drill the fastener holes at the upper edge of the inner fairing.
1) Drill the holes to align with the holes in the mating surface.

(e) Drill the fastener holes at the lower edge of the inner fairing.
1) Drill the holes to align with the holes in the mating surface.

(f) Remove the clamps.

(g) Drill and countersink the fastener holes at the locations where the clamps were installed.

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(h) Wet install the fasteners.
1) Refer to the manufacturers instructions and mix the sealant OMat 8/107A.
2) Wet install the rivets and bolts with the sealant.

3) The rivet head must be installed between the level with the surface and 0.004 inch (0.103 mm) below the surface of the inner fairing.
4) Do not shave the rivets.
5) Install the rivets to a maximum of 0.0313 inch (0.79 mm) larger than specified if and where necessary.

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(i) Drill the fastener holes for the lower track support fairing.
1) Drill the holes to align with the holes in the mating surfaces.
2) Countersink the holes if a new fairing is to be installed.

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(j) Lightly make rough the mating surfaces with the abrasive paper OMat 5/65.

WARNING:. CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(k) Clean the rubber mating surfaces (Fig. 841).
1) Clean the rubber mating surfaces with a clean lint-free cloth made moist with the cleaning fluid OMat 102.

2) Quickly dry the rubber mating surfaces with a clean, dry, lint-free cloth.

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(l) Clean the mating surfaces of the fixed structure and the lower track support fairing (Fig. 841).
1) Clean the mating surfaces with a clean lint-free cloth made moist with the cleaning fluid OMat 135.
2) Quickly dry the area with a clean, dry, lint-free cloth.

WARNING: ADHESIVES ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVES BECAUSE THEY ARE POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(m) Bond and install the lower track support fairing to the fixed structure assembly (Fig. 841).
1) Refer to the adhesive makers instructions and mix the adhesive OMat 8/117.

2) Apply the adhesive with a short bristle brush to the mating surfaces.
3) Put the lower track support fairing into position on the thrust reverser.
4) Use the lower track support fairing which has been removed.
5) Refer to the sealant makers instructions and mix the sealant OMat 8/107A.
6) Wet install the rivets and the ASp fastener with the sealant.
7) The rivet head must be installed between level with the surface and 0.004 inch (0.103 mm) below the surface.
8) Do not shave the rivets.
9) Install the rivets to a maximum of 0.0313 inch (0.79 mm) larger than specified if and where necessary.

(n) Use the infra-red heater lamps to cure the adhesive OMat 8/117 for 60 minutes at 82°C (180°F) to 138°C (280°F).

(o) Install the seal assembly (item 6) at the upper track location (Fig. 843).

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

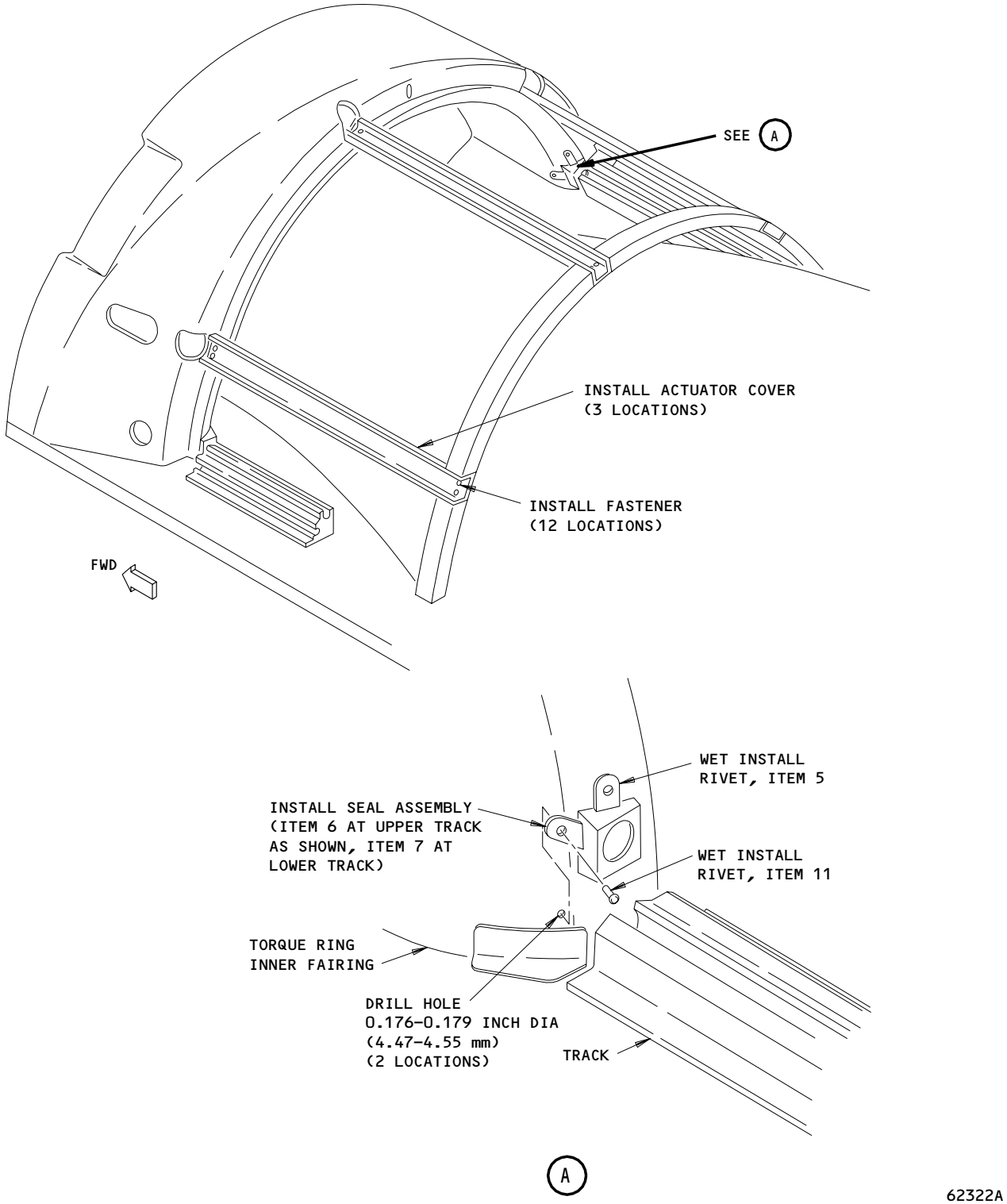
(p) Put the seal assembly (item 6) in position at the upper track location on the thrust reverser and drill the fastener holes.

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(q) Wet install the rivets.
1) Refer to the manufacturers instructions and mix the sealant OMat 8/107A.
2) Wet install the rivets NAS1738M5-3 and NAS1738M5-2 with the sealant.

(r) Install the seal assembly (item 7) at the lower track location (Fig. 843).



Lower Track Support Fairing Installation
Figure 843

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(s) Put the seal assembly (item 7) in position at the lower track location on the thrust reverser and drill the fastener holes.

WARNING: SEALANTS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE SEALANTS BECAUSE THEY ARE POISONOUS. USE THE SEALANT IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE SEALANT. IF YOU GET SEALANT ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(t) Wet install the rivets.
  1) Refer to the manufacturers instructions and prepare the sealant OMat 8/107A.
  2) Wet install the rivets NAS1738M5-3 and NAS1738M5-2 with the sealant.

(u) Put the actuator covers on the thrust reverser and install the fasteners (AMM 70-51-00/201).

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(v) Apply the sealant to the edges around the fairing (Fig. 841 and 842).
  1) Refer to the manufacturers instructions and mix the sealant OMat 8/107A.

2) Apply the sealant to the edges of the fairing.

(w) Use the infra-red heater lamps to cure the sealant for 60 minutes at 60°C (140°F) to 116°C (240°F).

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(x) Remove the unwanted sealant with the abrasive paper 0Mat 5/65 to get a smooth surface.

S 218-403-R00

(4) Do a visual inspection of the repair.

(a) Inspect for loose rivets and for irregular contours.

S 418-404-R00

(5) Install the translating cowl (AMM 78-31-23/401) and move it to the stowed position.

(a) Inspect the clearance (Fig. 844).

(b) If the clearance is correct: Apply the surface protection as FRS6400 (AMM 78-31-20/801).

(c) If the clearance is incorrect do the steps that follow:

- Remove and install the translating cowl (AMM 78-31-23/401)
- Move the translating cowl to the stowed position (AMM 78-31-00/201)
- Inspect the clearance.

(d) If the clearance is still incorrect (too large), prepare the repair surfaces and apply the fiberglass fabric layers to the inner fairing.

S 848-406-R00

(6) Prepare to apply the fiberglass fabric to the inner fairing (Fig. 844).

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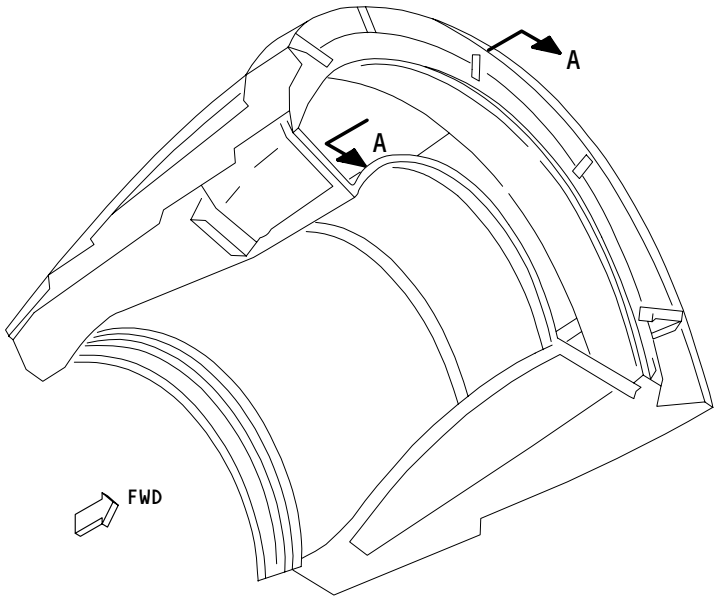
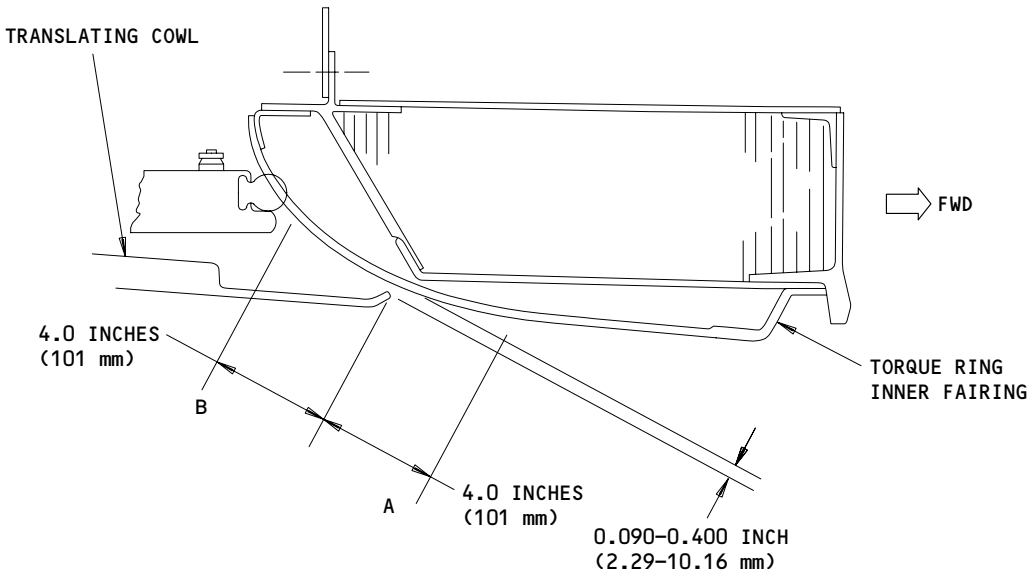
(a) Make rough the fairing surface repair area with the abrasive paper 0Mat 5/65.





A–A

62327A

Seal Assembly Installation
Figure 844

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(b) Clean the surface of the fairing.
  1) Clean the repair area with a clean, lint-free cloth made moist with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
  2) Quickly dry the repair area with a clean, dry, lint-free cloth.

(c) If the clearance is more than 0.400 inch (10.16 mm), cut at least one fiberglass fabric patch.

NOTE: Each layer is approximately 0.015 inch (0.38 mm) in thickness.

(d) Cut the patches to different dimensions.

NOTE: This helps to give the correct contour when the patches are applied across each other in layers.

S 348-029-R00

WARNING: ADHESIVES ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVES BECAUSE THEY ARE POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER. THEN GET MEDICAL AID.

(7) Apply the fiberglass fabric to the inner fairing (Fig. 844).
  (a) Refer to the manufacturers instructions and mix the adhesive OMat 8/117.

(b) Apply the adhesive with a short bristle brush to the surface of the fairing between the locations A and B.
(c) Put the patches on the fairing between the locations A and B.
(d) Press the adhesive through each patch with the short bristled brush.

NOTE: This removes the air caught between the patches and the fairing and soaks the patches with the adhesive. Each patch must be completely soaked with adhesive and have no air bubbles caught between the layers.

(e) Apply more adhesive and patches as necessary to get the correct clearance.
(f) Use the infra-red heater lamps to cure the adhesive for 60 minutes at 82°C (180°F) to 138°C (280°F).

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(g) Remove the material from the outer surface of the repair area until you get the correct contour and clearance.
1) Use the abrasive paper 0Mat 5/62.

S 218-410-R00
(8) Do a visual inspection of the repair for irregular contour (Fig. 844).

S 378-411-R00
(9) Apply surface protection as FRS6400 (AMM 78-31-20/801).

S 218-412-R00
(10) Do a visual inspection of the completed repair.

S 938-413-R00

(11) Use a marker pen of permanent color to identify that the repair has been completed.

(a) For a repair to the left fixed structure assembly, write FRS6069 adjacent to the assembly number LJ75089.

(b) For a repair to the right fixed structure assembly, write FRS6068 adjacent to the assembly number LJ75090.

TASK 78-31-20-308-017-R00

33. Thrust Reverser - Replace the Forward Latch Access Door Hinges

A. General

(1) This procedure contains Rolls-Royce repair FRS6288.

(2) This procedure contains the data to replace the forward latch access door or its hinges on the the thrust reverser. If you use the original forward latch access door, the original fittings may be used. If the door is replaced, the new fittings may be used.

NOTE: A new forward latch access door is supplied with new screws, and a new nutplate assembly.

(3) Use this procedure to replace the access door or hinges on RB211-535E4 and E4B engines. Use the procedure to repair thrust reversers with these part numbers.

LJ75006	
LJ76326	SB 78-8930
LJ76365	SB 78-9235
LJ76570	SB 78-9613
LJ76570	SB 78-9627
LJ76606	SB 78-9722

B. Equipment

(1) Workshop tools

(2) Drills and drilling equipment

(3) C-Clamp

(4) Riveting equipment

C. Parts
(1) LJ76673 - Forward Latch Access Door, Hartwell Latches
(2) LJ76418 - Forward Latch Access Door, Camlocs
(3) LJ76274 - Hinge Assembly
(4) LJ76275 - Hinge Assembly
(5) NAS76O4U5 - Screw
(6) NAS1739M5-3 - Rivet
(7) LJ76293 - Nutplate Assembly
(8) LJ76296 - Nutplate Assembly

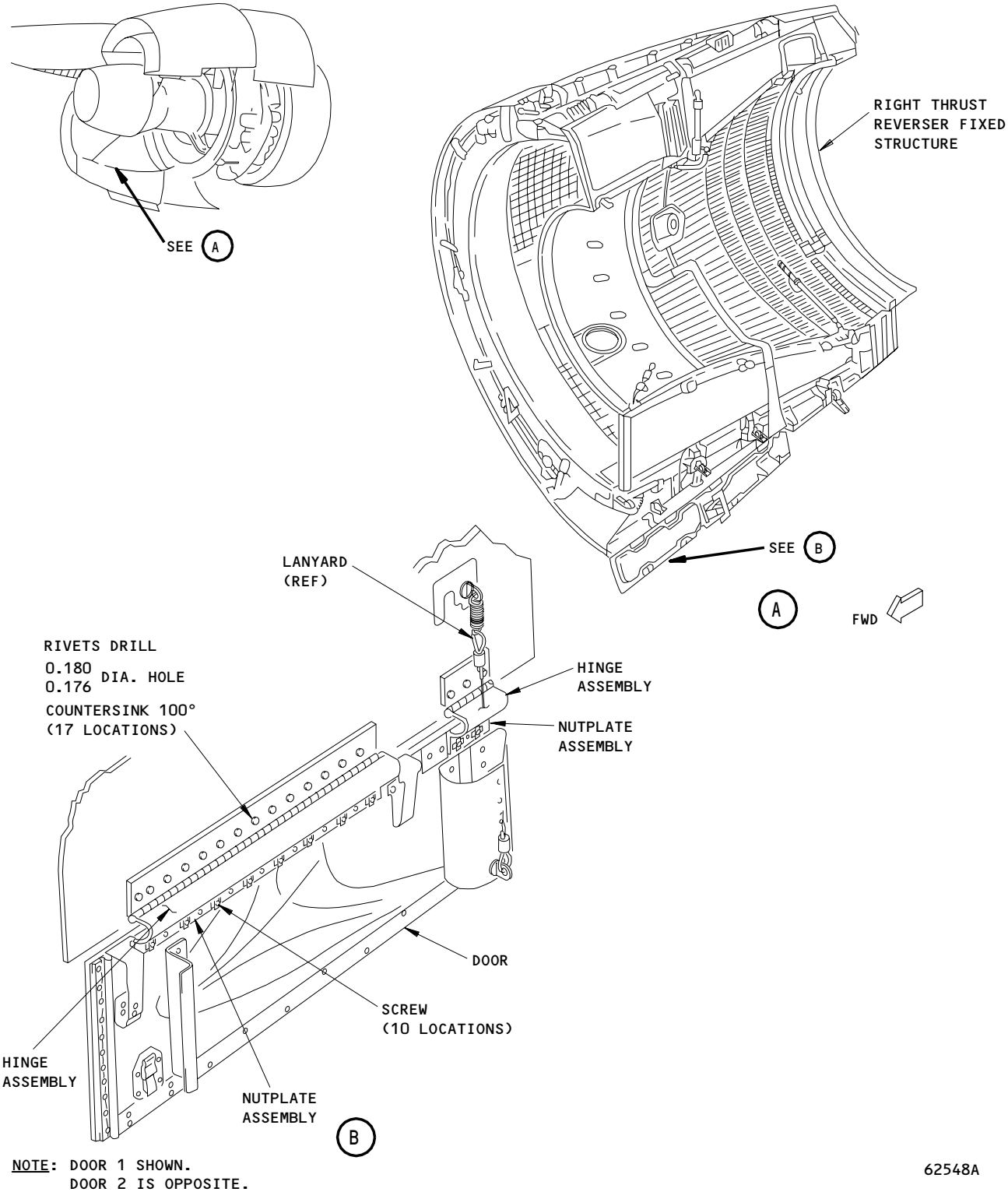
D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 15O or
Isopropyl alcohol OMat No. 1/4O or
Cleaning solvent (Desoclean) OMat No. 1/257
(2) Primer Base
British Spec - Bostik 643-6-27
OMat No. - 1/157
(3) Curing solution
British Spec - Bostik X337
OMat No. - 7/158
(4) Thinner
British Spec - TL52-66
OMat No. - 7/159
(5) Abrasive Paper, waterproof silicone carbide, 18O Grit
British Spec - A-A-1047A
OMat No. - 5/37
(6) Lint Free Cloth
British Spec - Superstrong 917
American Spec - MIL-C-24671A
OMat No. - 2/101

E. References
(1) AMM 78-31-2O/401, Thrust Reverser
(2) AMM 78-31-2O/801, Thrust Reverser

F. Remove the forward latch access door and the hinge assembly.

S O38-O16-ROO
(1) Remove the forward latch access door from the hinge (Fig. 845):
(a) Remove the lanyard fittings and the lanyard.
1) Keep the parts for the subsequent installation.
(b) Remove the screws that hold the hinge to the access door.
1) Keep the parts for the subsequent installation.

S O38-O1O-ROO
(2) Remove the hinge from the fixed structure:
(a) Use a non-permanent marker pen to identify the outline of the hinge on the fixed structure.



Replace the Forward Latch Access Door or Hinge
Figure 845

CAUTION: USE EYE PROTECTION WHEN YOU USE THE DRILL. THE DRILL WILL MAKE METAL CHIPS (SWARFS). IF THE METAL CHIPS (SWARFS) GET IN YOUR EYES, IT CAN CAUSE INJURIES.

(b) Use the drill to remove the rivets that hold the hinge to the fixed structure.
(c) Remove the hinge.

S 108-011-R00

(3) Clean the mating surface of the fixed structure:
(a) Use the abrasive paper to make the mating surface rough.

WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE THE DEGREASING FLUID IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. IF YOU GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES FLUSH IT AWAY WITH WATER. IF YOU GET THE DEGREASING FLUID IN YOUR MOUTH OR EYES, GET MEDICAL AID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES.

(b) Use the lint free cloth and the Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean) to clean the mating surface of the fixed structure.
1) Use a clean dry lint free cloth to dry the area before the Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean) becomes fumes.

G. Install the forward latch access door and the hinge assembly.

S 438-012-R00

(1) Install the hinge to the fixed structure:
(a) Put the hinge in its correct position on the fixed structure.
(b) Use a C-clamp to hold the hinge in its correct position.

NOTE: The C-clamp will make sure the hinge does not move while you drill the holes to attach it.

(c) Use the holes in the fixed structure to align the new holes in the hinge.

CAUTION: USE EYE PROTECTION WHEN YOU USE THE DRILL. THE DRILL WILL MAKE METAL CHIPS (SWARFS). IF THE METAL CHIPS (SWARFS) GET IN YOUR EYES, IT CAN CAUSE INJURIES.

(d) Drill the holes in the hinge.
(e) Remove the C-clamp and the hinge.
(f) Use the drill to deburr and countersink the holes.

WARNING: DO NOT GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE THE PRIMER IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES FLUSH IT AWAY WITH WATER. IF YOU GET THE PRIMER IN YOUR MOUTH OR EYES, GET MEDICAL AID. KEEP THE PRIMER AWAY FROM SPARKS, FLAMES, AND HEAT. PRIMER IS A POISONIOUS, FLAMMABLE FLUID THAT CAN CAUSE INJURIES.

(g) Use the manufacturers instructions to mix the primer base and the curing solution.

NOTE: The thinner can also be used.

(h) Put the hinge in its correct position on the fixed structure.
(i) Use the primer mixture to wet install the rivets in the hinge and fixed structure.
(j) Use riveting equipment to tighten the rivets.

S 438-013-R00

(2) Connect the forward latch access door to the hinge:
(a) Use the screws and the nutplate assemblies to connect the access door to the hinge.
(b) Tighten the screws with you fingers.
(c) Close the door and adjust the gaps if it is necessary (AMM 78-31-20/401).
(d) Open the door and tighten the screws to a torque of 20 to 25 pound inch (2.26 to 2.82 Nm).
(e) Install the lanyard fittings and the lanyard on the door and the fixed structure.

S 208-014-R00

(3) Examine the repair area:
(a) Make sure that the rivets are tight.
(b) Make sure that the access door fits smoothly with the contours of the fixed structure.
(c) Examine the surface of the door and the fixed structure.
1) If it is necessary use FRS6400 to repair the surface of the door and the fixed structure (AMM 78-31-20/801).
(d) Examine the gap around the access door (AMM 78-31-20/401).

S 938-015-R00

(4) Use a permanent marker to write FRS6288 adjacent to the assembly part number.

TASK 78-31-20-308-024-R00

34. Left Hand Thrust Reverser Fixed Structure Torque Ring Aluminum Outer Fairing IDG Scoop Crack Repair

A. General

(1) The repair in this procedure is FRS6299.

(2) This procedure gives the information to repair the cracks in the IDG scoop of the aluminum torque ring outer fairing of engines with SB 78-9722.

(3) Use the procedure to repair thrust reversers that have these part numbers: RB211-535E4/E4B, LJ76605.

(4) Repair Parts

(a) Rivet (Item 1) MS20426AD5-6

(b) Rivet (Item 2) NAS1097AD5-6 (Alternate to MS20426AD5-6)

(c) Blind Rivet (Item 3) CR3222-5-3 (Alternate to MS20426AD5-6)

(d) Blind Rivet (Item 4) NAS1399B-5-3 (Alternate to MS20426AD5-6)

(e) Rivet (Item 5) NAS1200M5-7

(f) Rivet (Item 6) MS20427M5-7 (Alternate to NAS1200M5-7)

B. Equipment

(1) Standard workshop tools

(2) Drill and Drilling equipment

(3) Riveting Tools

(4) Temporary fasteners

(5) Heater Lamps - Explosion proof

(6) Rivet hole finder

C. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

(2) Adhesive EA9321
OMat No. - 8/156

(3) Chromate Conversion coating for aluminium
OMat No. - 175A

(4) Paint brush
OMat No. - 2/12

(5) Lint Free Cloth
OMat No. - 2/101

(6) Waterproof silicon carbide abrasive paper (180 grit)
OMat No. - 5/37

(7) Primer base 463-6-27
OMat No. - 766C

(8) Primer Catalyst X-337
OMat No. - 766C

(9) Thinner TL52-66
OMat No. - 7/159

(10) Aluminum Alloy Sheet, clad 2024-T3, 1.6 mm (0.063 inch) thick

D. References

(1) AMM 78-31-00/201, Thrust Reverser System

(2) AMM 78-31-20/801, Thrust Reverser

E. Procedure

S 048-452-R00

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

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM78-31-00/201).

S 018-027-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Open the thrust reverser (AMM 78-31-00/201).

S 848-020-R00

(3) Prepare the damaged area (Fig. 846).
   (a) Remove the screws that attach the radial straps and remove the straps.
   (b) Remove the rivets that attach the radial strap brackets and remove the brackets.
   (c) Use the abrasive paper (OMat 5/37) to remove the paint and any fiberglass plies from the scoop in an area approximately 14.0 inch by 4.65 inch (356 mm by 117 mm).

   WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS. SMOKING MUST NOT BE ALLOWED WHEN USING DEGREASERS AS THE VAPOR DECOMPOSES TO FORM PRODUCTS WHICH ARE EXTREMELY TOXIC.

   USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION. DEGREASERS ARE VERY FLAMMABLE; KEEP AWAY FROM IGNITION SOURCES.

   (d) Clean the repair surfaces with lint free cloth (OMat 2/101) that is moist with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
   (e) Wipe the area dry with the lint free cloth before the solvent evaporates.
   (f) Stop drill the crack ends with a 0.098 - 0.120 inch (2.49 - 3.05 mm) drill bit.
   (g) Rout the cracks to 0.10 inch (2.54 mm).

S 348-021-R00

(4) Make the doubler.
   (a) Make the doubler from 0.063 inch (1.6 mm) thick 2024-T3 clad aluminium to the dimensions shown in Fig. 846.

(b) Make sure the doubler conforms to the scoop contour with light finger pressure.
(c) Position the doubler on the scoop and clamp it in place.
    1) Use a hole finder to find the rivet holes of the radial strap bracket.
(d) Drill 0.160 - 0.164 inch (4.064 - 4.165 mm) holes into the doubler through the rivet holes in the radial strap brackets.
    1) Countersink the rivet holes 100 degrees.

WARNING: USE THE CHROMATE CONVERSION SOLUTIONS ONLY IN AREAS WITH A GOOD VENTILATION. DO NOT BREATH THE FUMES.

WEAR PROTECTIVE CLOTHING, GLOVES AND SAFETY GLASSES WHEN YOU USE CHROMATE CONVERSION SOLUTIONS.

IF THE CHROMATE CONVERSION POWDER OF SOLUTION COMES INTO CONTACT WITH YOUR SKIN, WASH THE AREA IMMEDIATELY WITH LARGE AMOUNTS OF WATER.

IF THE CHROMATE SOLUTION CONTACTS YOUR EYES, WASH YOUR EYES WITH WATER FOR A MINIMUM OF 15 MINUTES. GET MEDICAL ATTENTION IMMEDIATELY.

MATERIALS USED TO APPLY OR REMOVE THE CHROMATE CONVERSION SOLUTION MUST NOT BE ALLOWED TO DRY OUT OR THEY WILL BE A FIRE HAZARD. COMPLETELY WASH THE MATERIALS IN COLD WATER BEFORE YOU DISCARD THEM.

(e) Apply the chromate conversion coating (OMat 175A) to the clean doubler surface with a paint brush (OMat 2/12) or lint free cloth (OMat 2/101).
    1) Keep the surface wet, especially the drilled holes and bare edges, with fresh solution for 2 - 5 minutes.
    2) Do not let the solution to dry on the surface.
    3) Rinse the doubler with demineralized water and dry.

WARNING: PRIMERS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE PRIMERS BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(f) Use the manufacturer's instructions to mix the primer base (OMat 766C), primer catalyst (OMat 766C) and thinner (OMat 7/159).
    1) Let the primer mix rest for 15 minutes.
(g) Apply the primer mix to all surfaces of the doubler.

(h) Use the manufacturer's instructions to cure the primer mix until tack free.

S 348-415-R00

(5) Install the doubler.

WARNING: DO NOT GET THE ADHESIVE IN YOUR MOUTH, OR IN YOUR EYES, OR ON YOUR SKIN. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND FACE MASK. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR YOUR EYES, FLUSH IT AWAY WITH WATER. GET MEDICAL AID IMMEDIATELY IF YOU GET THE ADHESIVE IN YOUR MOUTH OR EYES.

(a) Use the manufacturer's instructions to mix the adhesive (Omat 8/156).
(b) Apply the adhesive to the mating surfaces of the doubler.

WARNING: PRIMERS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE PRIMERS BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

CAUTION: INSTALL THE RADIAL STRAPS IN THE DIRECTED SEQUENCE TO AVOID PRELOAD.

(c) Put the doubler and radial strap brackets into position and wet install the rivets (Item 5) with the primer mix.
(d) Install the radial straps with screws.
(e) Drill the 0.160 - 0.164 inch (4.064 - 4.165 mm) doubler attach holes (Fig. 846).
    1) Countersink the rivet holes 100 degrees.
    2) Countersink leading edge rivet holes on the back side of the fairing skin 100 degrees.

WARNING: PRIMERS ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE PRIMERS BECAUSE THEY ARE POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(f) Wet install the doubler attach rivets (Item 1) with the primer mix.
  1) Install the rivets along the scoop leading edge double flush.
  2) If access does not allow the installation of driven rivets, install the radial straps with the alternate blind fasteners (Item 2, 3, or 4).
  3) Remove the excess primer mix.
(g) Cure the adhesive at 175 - 185 degrees C (79 - 85 degrees F) for 60 minutes.
(h) Refer to FRS6400 for the procedure to apply surface protection to the repair area (AMM 78-31-20/801).
(i) Do a visual inspection of the completed repair.
(j) Write the repair number FRS6299 next to the nameplate.
  1) Use a permanent marker that can be easily seen on the area next to the name plate.

S 418-026-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Close the thrust reverser (AMM 78-31-00/201).

S 448-453-R00

(7) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 78-31-20-308-418-R00

35. Thrust Reverser - Left and Right Fixed Structure Assembly
Re-Install the Aft Hinge Bushing

A. General

(1) This procedure contains Rolls-Royce repair FRS6320.

(2) This procedure gives instructions to re-install a bushing which has moved from its initial position in the aft hinge bracket.

(3) Regular in-service examination of the bushings is necessary after the repair is finished.

(4) If swaged bushing repair FRS.6218 (R.H.) FRS.6219 (L.H.) is done, in-service examination of the bushings is not necessary.

(5) Use this procedure to repair RB211-535E4 and E4-B thrust reverser fixed structures with these part numbers.

LJ75065	LJ75066
LJ76501	LJ76502

B. Equipment

(1) Workshop tools

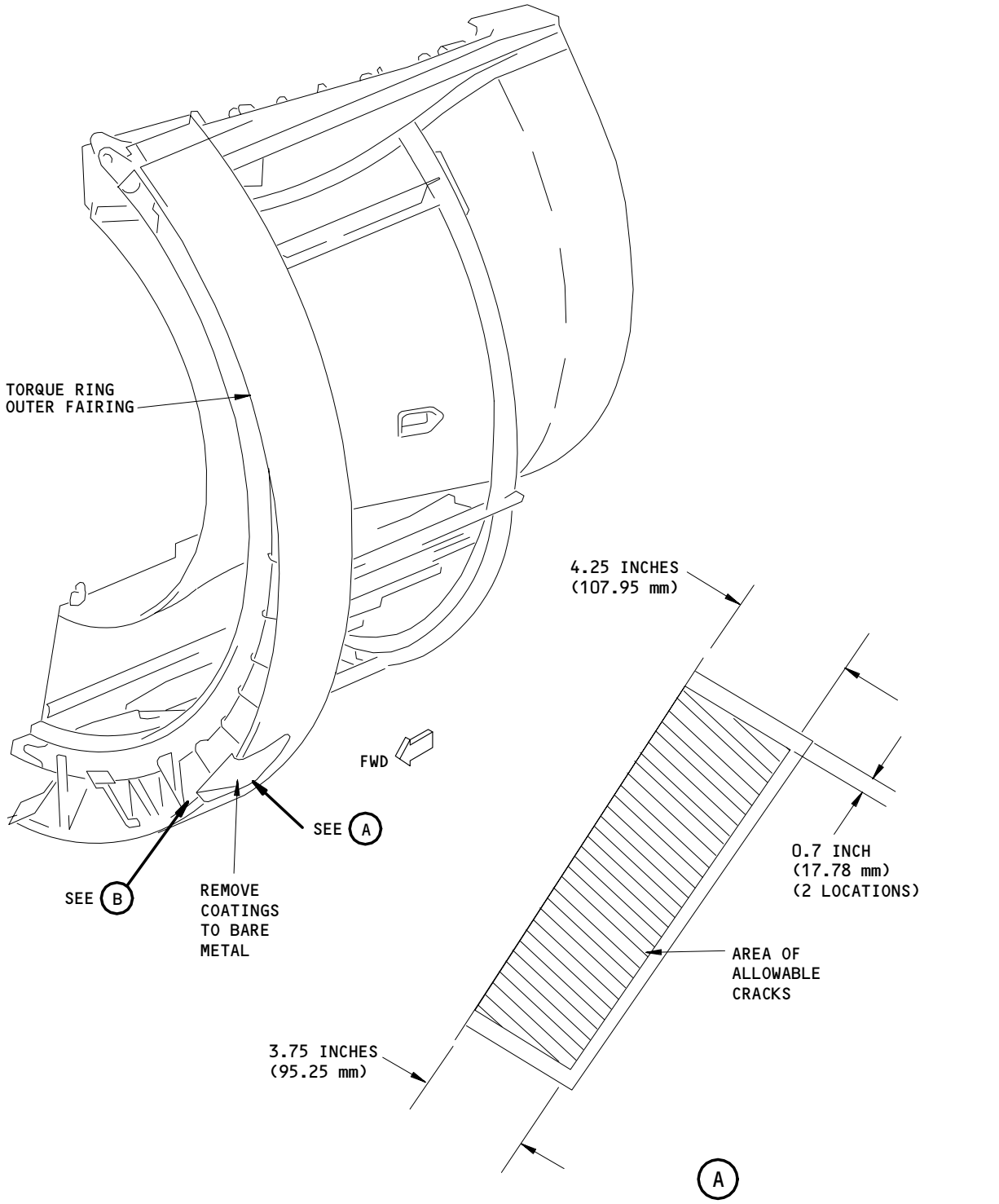
C. Consumable Materials

(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257

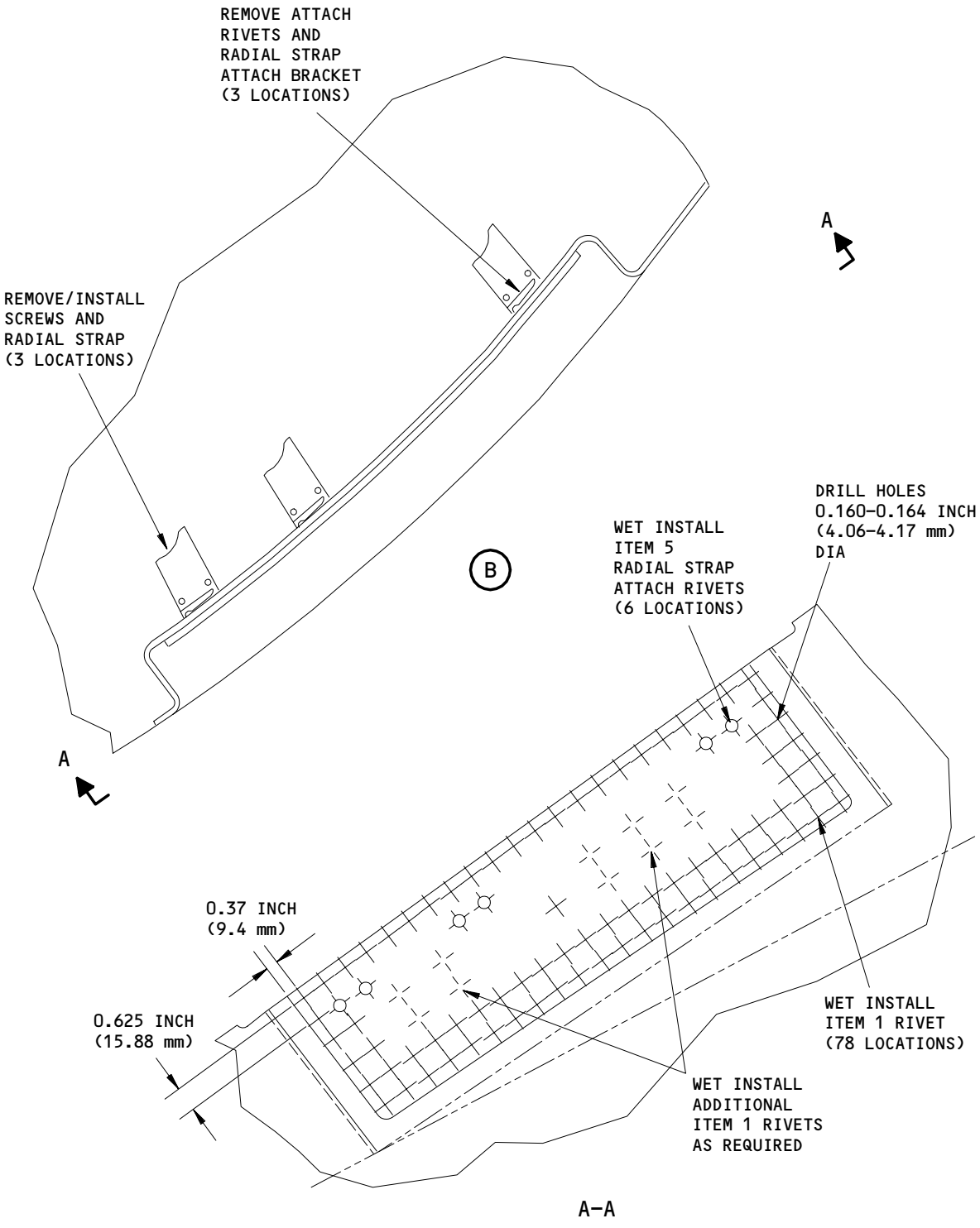
(2) Primer 'T' for Loctite
OMat No. 8/80

(3) Rust Preservative
OMat No. 1005

(4) Loctite 642
(Recommended)
OMat No. 8/77



Left Thrust Reverser Fixed Structure
Torque Ring Aluminum Outer Fairing IDG Scoop Crack Repair
Figure 846 (Sheet 1)



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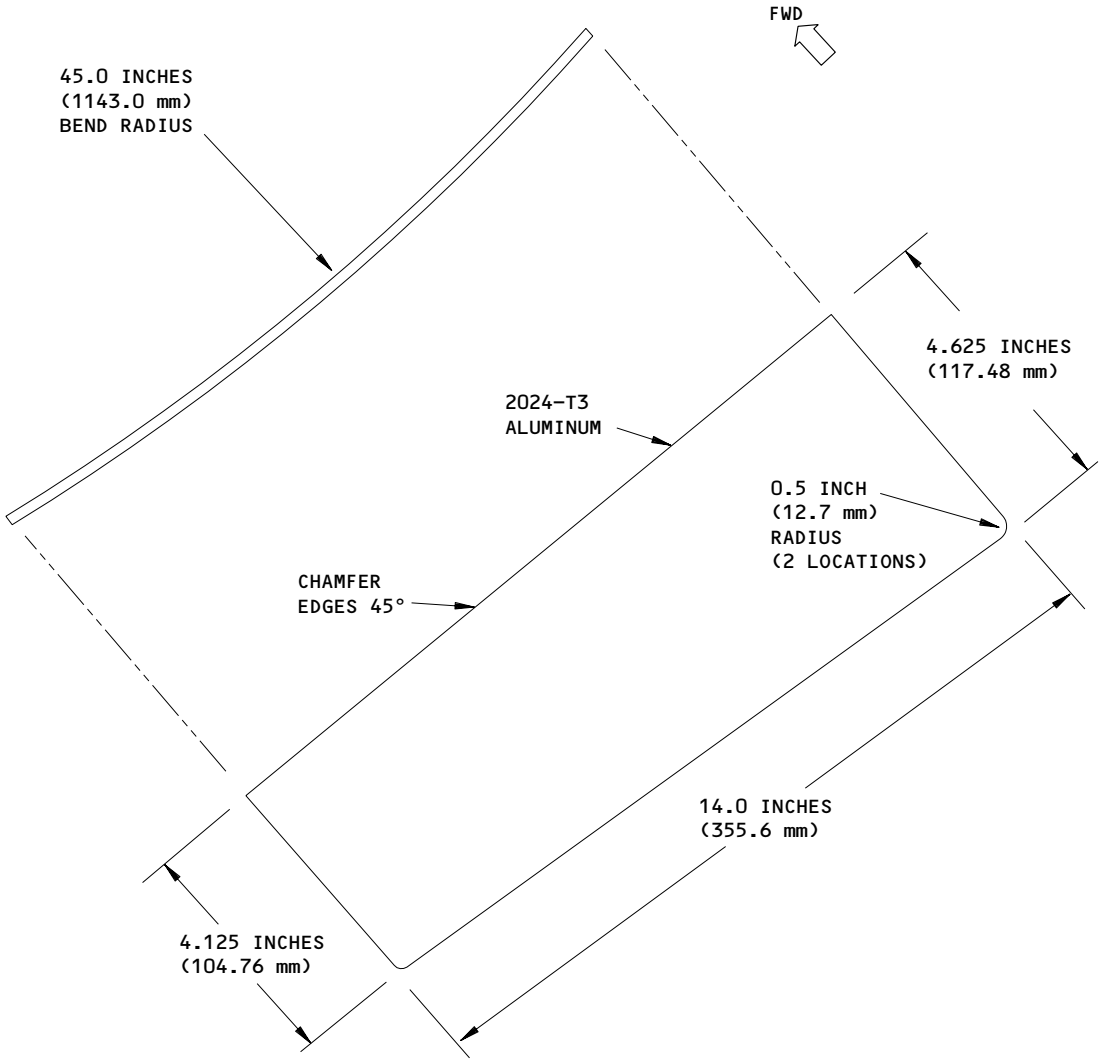
Left Thrust Reverser Fixed Structure
Torque Ring Aluminum Outer Fairing IDG Scoop Crack Repair
Figure 846 (Sheet 2)



Left Thrust Reverser Fixed Structure
Torque Ring Aluminum Outer Fairing IDG Scoop Crack Repair
Figure 846 (Sheet 3)

(5) Loctite 640
(Alternative)
OMat No. 8/79
(6) Heat Resistant Marking Paint
OMat No. 7/110c
(7) Clean Cotton Cloth
OMat No. 290

D. References
(1) AMM 78-31-20/401, Thrust Reverser

E. Re-Install the Aft Hinge Bushing.

S 118-429-R00

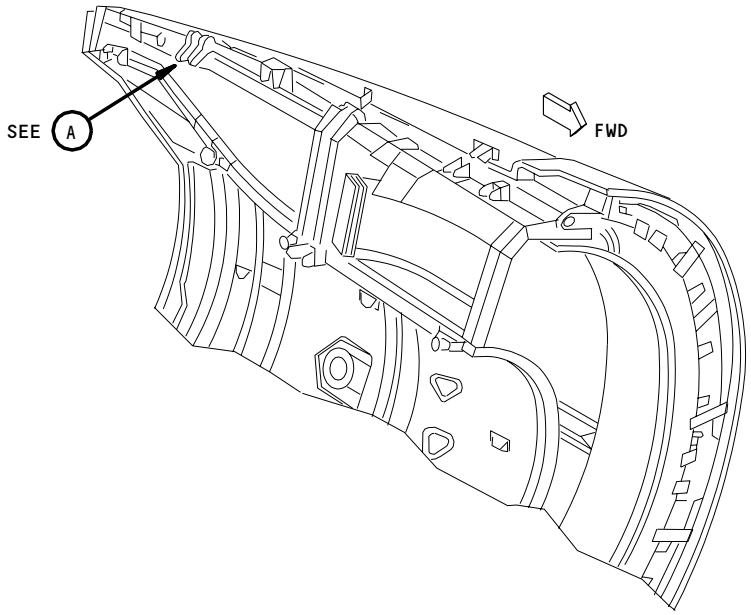
(1) Prepare for the repair (Fig. 847).

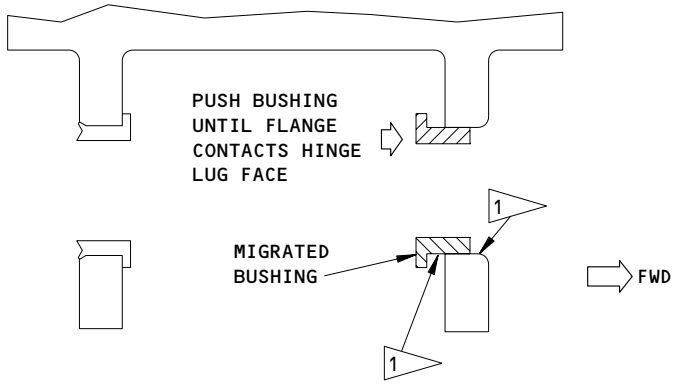
WARNING: DO NOT GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE THE DEGREASING FLUID IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. IF YOU GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES FLUSH IT AWAY WITH WATER. IF YOU GET THE DEGREASING FLUID IN YOUR MOUTH OR EYES, GET MEDICAL AID. KEEP THE DEGREASING FLUID AWAY AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES.

(a) Clean the mating surfaces (which can be seen) of the bushing and the hinge lug bore using a cloth (OMat No. 290) soaked in Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).

(b) Do an examination of the bushings for signs of galling caused by rotation of the bushing in the lug. Very small amounts of galling is permitted.
(c) Apply the Primer 'T' (OMat No. 8/80) to the mating surfaces of the bushing and the hinge bore.
1) Make sure the primer is allowed to dry at room temperature for at least 5 minutes.
(d) Apply the Loctite compound (OMat No. 8/77 or 8/79) to the mating surfaces (which can be seen) of the bushing and the hinge bore.

NOTE: Make sure you use these compounds in areas with good ventilation. Do not let the compounds touch your skin.





A

1 APPLY PRIMER ANDADHESIVE IN ACCORDANCE WITH INSTRUCTIONS.

RH00002797

Thrust Reverser C-Duct Aft Hinge Bushing Repair
Figure 847

S 428-430-R00

(2) Re-Install the bushings.

(a) Use a drift pin or a screwdriver to push the bushing back into the hinge bore.

1) Make sure the bushing flange contacts the hinge lug.

(b) Use the marking paint (OMat No. 7/110C) to apply FRS.6320 next to the part number on the fixed structure.

S 218-431-R00

(3) Inspect the repair area at regular intervals.

(a) Do an inspection of the aft hinge bushes at every 'A' check.

1) Make sure that the bushing flange is in contact with the hinge lug.

2) If any bushing has moved, re-install using this procedure again.

a) If the bushing has moved more than once, you must do a permanent repair (FRS.6218 or FRS.6219) at the next aircraft maintenance opportunity.

(b) Do an inspection at every 'C' check to make sure that the bushing flange is in contact with the hinge lug.

1) If the bushings have moved they must be permanently repaired (FRS.6218 or FRS.6219).

2) If the bushings have not moved, no more checks are required.

TASK 78-31-20-308-449-R00

36. Thrust Reverser, Left-Hand (L.H.) and Right-Hand (R.H.) Fixed Structure Inner Duct, Replace Heat Shield.

A. General

(1) The repair covered in this procedure is FRS6168 (L.H.) and FRS6169 (R.H.).

(2) The procedure gives details to replace the heatshield for the L.H. and R.H. fixed structure inner duct.

(3) The repair can be applied to the thrust reverser fixed structure with the following assembly numbers:

RB211-535E4 AND RB211-535E4-B

LEFT	RIGHT
LJ75089	LJ75090
LJ75089 SB 78-7677	LJ75090 SB 78-8188
LJ75089 SB 78-8821	LJ75089 SB 78-8268
LJ76376 SB 78-9235	LJ75090 SB 78-8821
LJ76497 SB 78-9722	LJ76377 SB 78-9235
LJ77111 SB 78-D518	LJ76498
	LJ76554 SB 78-9627
	LJ76690 SB 78-9627
	LJ76498 SB 78-9722

(4) Heatshields post RR SB 78-7787 have rivet pins. Remove the rivet pins and plug the holes with rivets and washers wet assembled with adhesive. Any areas of delamination around rivet pin holes must be repaired by FRS6166.

B. Equipment
(1) Standard Workshop Tools
(2) Drills and Drilling Equipment
(3) Putty Knife
(4) Clamping Tools
(5) Riveting Equipment
(6) Heat lamps (Explosion Proof)
(7) Permanent Marker Pens

C. Parts
(1) Use the following tables to choose the correct heatshield replacement parts:

L.H. INNER DUCT FORWARD HEATSHIELD (ITEM 1)	
Damaged Part No.	Replacement Part No.
LJ75561	LJ75561 or LJ75961
LJ75811	LJ75961
LJ75961	LJ76077 Post RR SB 78-8821
LJ76077	LJ76077

R.H. INNER DUCT FORWARD HEATSHIELD (ITEM 1)	
Damaged Part No.	Replacement Part No.
LJ75562	LJ75562 or LJ75962
LJ75812	LJ75962 Post RR SB 78-7677
LJ75962	LJ76962 or LJ75078 Post RR SB 78-8821
LJ75078	LJ75078

L.H. INNER DUCT AFT HEATSHIELD (ITEM 2)	
Damaged Part No.	Replacement Part No.
LJ75555	LJ75945
LJ75585	LJ76342 Post RR SB 78-8821
LJ75937	LJ76075 Post RR SB 78-8821
LJ75945	LJ76075
LJT6075	LJT6075

R.H. INNER DUCT AFT HEATSHIELD (ITEM 2)	
Damaged Part No.	Replacement Part No.
LJ75556	LJ76946
LJ75938	LJ76946
LJ75946	LJ75946
LJ76003	LJ76018 Post RR SB 78-8286
LJ76018	LJ76339, LJ76340, LJ76018 or LJ76076
LJ76076	LJ76076
LJ76337	LJ76337
LJ76338	LJ76338 or LJ76076 Post RR SB 78-8286
LJ76339	LJ76339
LJ76340	LJ76340 or LJ76076 Post RR SB 78-8286
LJ76341	LJ76341 or LJ76076

(2) Rivet, (Item 3)
NAS1738M4-2 (RR2308258)
(3) Rivet, (Item 4)
NAS1738M4-6 (RR2308594)
(4) Rivet, (Item 5)
NAS1399D5-3 (RR2308274)
(5) Rivet, (Item 6)
MS20427M4-7 (RR1010552)
(6) Rivet, (Item 7)
MS20426AD5-7 (RR1012550)
(7) Screw, (Item 8)
NAS623-3-2 (RR2308150)
(8) Washer, (Item 9)
AN960KD5 (RR1012255)

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent (Desoclean) OMat No. 1/257
(2) Absorbent cloth, lint free
OMat No. 2/101
(3) Gloves, Lint Free
OMat No. 2/114

(4) Primer
OMat No. 876C
(5) Adhesive
OMat No. 8/52
(6) Sealant 2-part pack base and catalyst (Preferred)
DC 90-006
OMat No. 8/138

E. References
(1) AMM 78-31-00/201, Thrust Reverser System

F. Procedure

S 018-439-R00

(1) Remove the inner duct aft healshield.
(a) Remove the L.H. (R.H.) Fan C-Duct Opening Assembly.

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

1) Open the thrust reverser (AMM 78-31-00/201).
2) Remove all of the screws, washers and nuts attaching the heatshield cover plates to the channels.
a) Remove cover plates and retain with hardware for installation.
3) Remove screws, washers and clamps that attach the hydraulic tube and channels to the inner barrel structure.
a) Keep all of the parts for installation.
4) Disconnect the hydraulic tube from the hose and the manifold.
a) Remove the hydraulic tube, grommet and the channels and keep the parts for installation.

(b) Remove the aft hold-open rod bracket.
1) Remove the four screws attaching the bracket.
a) Remove the bracket and keep for installation.

(c) Remove the pan type closure plates and the turbine duct fitting.
1) Drill out and remove the 28 rivets which attach the turbine duct to the heatshield.
2) Remove the pan-type closure plates and the turbine duct fitting from the inner duct and the inner surface of the heatshield.
a) Keep the parts for installation.

(d) Remove the aft closure plate.
1) Drill out and remove the 41 rivets attaching the aft closure plate to the inner duct.

(e) Remove the upper, lower and forward rivets.
1) Drill out and remove the 27 rivets attaching the upper, lower and forward edges of the heatshield to the inner duct.

(f) Remove the rivet pins.

NOTE: Some heatshields do not have rivet pins.

1) Drill out and remove the 28 rivet pin heads.
2) Remove the spacers and push the rivet bulb ends into the honeycomb panel.

(g) Remove the inner duct aft heatshield.
(h) Remove the remaining sealant from the structure with a putty knife.
(i) Inspect the inner duct rivet pin holes.
1) Any holes with disbonded skin must be repaired with FRS.6166.

S 018-440-R00

(2) Remove the inner duct forward heatshield.
(a) Remove the forward hold-open rod bracket.
1) Remove the 4 screws and remove the bracket.
a) Keep the bracket for installation.
(b) Remove the forward closure plate.
1) Drill out and remove the 14 rivets which attach the forward closure plate to the inner duct.
2) Remove the closure plate.
a) Keep the forward closure plate for installation.
(c) Remove the pan down closure plates.
1) Drill out and remove the 36 rivets which attach the closure plates to the inner duct.
2) Remove the 7 pan down closure plates from the structure and the heatshield.
a) Keep the plates for installation.
(d) Remove the upper, lower and forward rivets.
1) Drill out and remove the 27 rivets which attach the upper, lower and forward edges of the heatshield to the inner duct.
(e) Remove the rivet pins.
1) Drill out and remove the 15 rivet pin heads.
2) Remove the spacers and push the rivet bulb ends into the honeycomb.
(f) Remove the inner duct forward heatshield.
(g) Remove the remaining sealant from the inner duct.
1) Use a putty knife to remove the sealant.
(h) Inspect the rivet pin holes in the inner duct.
1) Any holes with disbonded skin must be repaired to FRS6166.

S 358-441-R00

(3) Fill the rivet pin holes.

WARNING: USE ADHESIVE COMPOUNDS ONLY IN AREAS WITH GOOD VENTILATION. YOU MUST WEAR PROTECTIVE GLOVES TO PREVENT ADHESIVE FROM CONTACTING THE SKIN.

AVOID LONG OR REPEATED SKIN CONTACT WITH PRIMER AND SEALANTS. USE PRIMER AND SEALANTS ONLY IN AREAS WITH GOOD VENTILATION. PRIMER IS VERY FLAMMABLE, KEEP IT AWAY FROM IGNITION SOURCES.

(a) Apply adhesive to the rivet holes.
  1) Mix the OMat No. 8/52 adhesive according to the manufacturers instructions.
  2) Apply the adhesive to all rivet pin holes in the honeycomb panel.
(b) Install the rivets and washers.
  1) Wet assemble the rivets (Item 3) and washers (Item 9) using the adhesive mix into the rivet pin holes.
(c) Cure the adhesive.
  1) Cure the adhesive at 82 to 93 deg.C (180 to 200 deg.F) for one hour using the heat lamps.
(d) Apply the primer.
  1) Mix the OMat No. 876C primer using the manufacturers instructions.
  2) Apply the primer to all of the rivet heads.
  3) Allow the primer to air dry for 30 minutes.
(e) Apply the sealant.
  1) Apply the OMat No. 8/138 sealant, 2 part pack, to all rivet heads.
  2) Make sure the all rivet heads are completely covered by the sealant.
(f) Cure the sealant for one hour at room temperature.

S 118-442-R00

(4) Clean the repair area.

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE DEGREASING FLUID IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. IF YOU GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES FLUSH IT RIGHT AWAY WITH WATER. IF YOU GET THE DEGREASING FLUID IN YOUR MOUTH OR EYES GET MEDICAL AID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES.

(a) Clean the mating surfaces of inner barrel structure and heatshield with a lint free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent (Desoclean).
  1) Wipe areas dry with lint free cloth before solvent evaporates.

S 428-443-R00

(5) Install the inner duct aft heatshield.
  (a) Install the inner duct aft heatshield.
    1) Use clamps to put the aft heatshield (Item 2) in position on the inner duct.
    2) Make holes in the heatshield to align with existing holes in the duct structure.
  (b) Mix the sealant.
    1) Mix the OMat No. 8/138 sealant using the manufacturers instructions.

NOTE: Wet install all rivets in the following steps with OMat No. 8/138 sealant.

  (c) Install the turbine duct fitting.
    1) Attach the turbine duct fitting to the duct structure and exterior surface of the heatshield.
    2) Attach the pan type closure plate over the turbine duct and surface of the heatshield.
    3) Attach the parts with rivets (Items 3,5 and 7).
  (d) Install the aft closure plate.
    1) Attach the aft closure plate to the inner duct and heatshield edge.
    2) Use 41 rivets (Item 3) to attach the aft closure plate to the inner duct and heatshield edge.
  (e) Install the rivets to the upper, lower and forward heatshield edges.
    1) Use 27 rivets (Item 3) to attach the upper, lower and forward edges of the heatshield to the inner duct.
  (f) Install the aft hold open rod bracket.
    1) Install the aft hold open rod bracket with 4 screws (Item 8).

(g) Install C-Duct opening mechanism.
1) Remove protective covers from the actuator hose, hydraulic tube and manifold.
2) Position channels, hydraulic tube and grommet on the inner barrel structure.
3) Connect the hydraulic tube to the manifold and hose.
a) Tighten the couplings to 135 to 150 lbf.in. (15.3 to 16.9 Nm).
4) Fit the hydraulic tube to the channels and the channels to the inner barrel structure with screws, washers and clamps.
a) Tighten the screws to 20 to 25 lbf.in. (2.3 to 2.8 Nm).
5) Fit the heatshield covers to the channels with screws, washers and nuts.
a) Tighten the nuts to 20 to 25 lbf.in. (2.3 to 2.8 Nm).
(h) Allow the sealant to cure at room temperature for one hour.

S 428-444-R00
(6) Install the inner duct forward heatshield.

WARNING: AVOID LONG OR REPEATED SKIN CONTACT WITH SEALANT. USE SEALANT ONLY IN AREAS WITH GOOD VENTILATION. SEALANT IS VERY FLAMMABLE, KEEP OT AWAY FROM IGNITION SOURCES.

(a) Install the forward heatshield.
1) Use clamps to hold the forward heatshield (Item 1) in place on the inner duct.
2) Make holes in the blanket to align with the holes in the duct structure.
(b) Mix the OMat No. 8/138 sealant using the manufacturers instructions.

NOTE: Wet install all rivets in the following operations using OMat No. 8/138 sealant, two part pack, base and catalyst.

(c) Install the rivets.
1) Install 27 rivets (Item 3), through the heat shield at upper, lower, aft and forward edges into the duct structure.
(d) Install four upper pan down closure plates with 24 rivets (Item 3).
(e) Install three pan down closure plates with 12 rivets (Item 4).
(f) Install the forward closure plate.
1) Install the 7 rivets (Item 3) through the aft flange of the closure plate and the inner duct.
2) Install 7 rivets (Item 6) through the forward flange of the closure plate and the inner duct.
(g) Install the forward hold open rod bracket with four screws (Item 8).
(h) Allow the sealant to cure for 24 hours.

S 118-445-R00
(7) Clean the repair area.

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES. USE GLOVES, EYE PROTECTION, AND A FACE MASK. USE THE DEGREASING FLUID IN AN AREA THAT HAS GOOD AIR FLOW. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. IF YOU GET THE DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH, OR IN YOUR EYES FLUSH IT AWAY WITH WATER. IF YOU GET THE DEGREASING FLUID IN YOUR MOUTH OR EYES GET MEDICAL AID. KEEP THE DEGREASING FLUID AWAY FROM SPARKS, FLAMES, AND HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT THAT CAN CAUSE INJURIES.

(a) Clean mating surfaces of the inner barrel structure and heatshield with a lint free cloth moistened with Acetone, isopropyl alcohol, or cleaning solvent (Desoclean).
1) Wipe areas dry with lint free cloth before solvent evaporates.

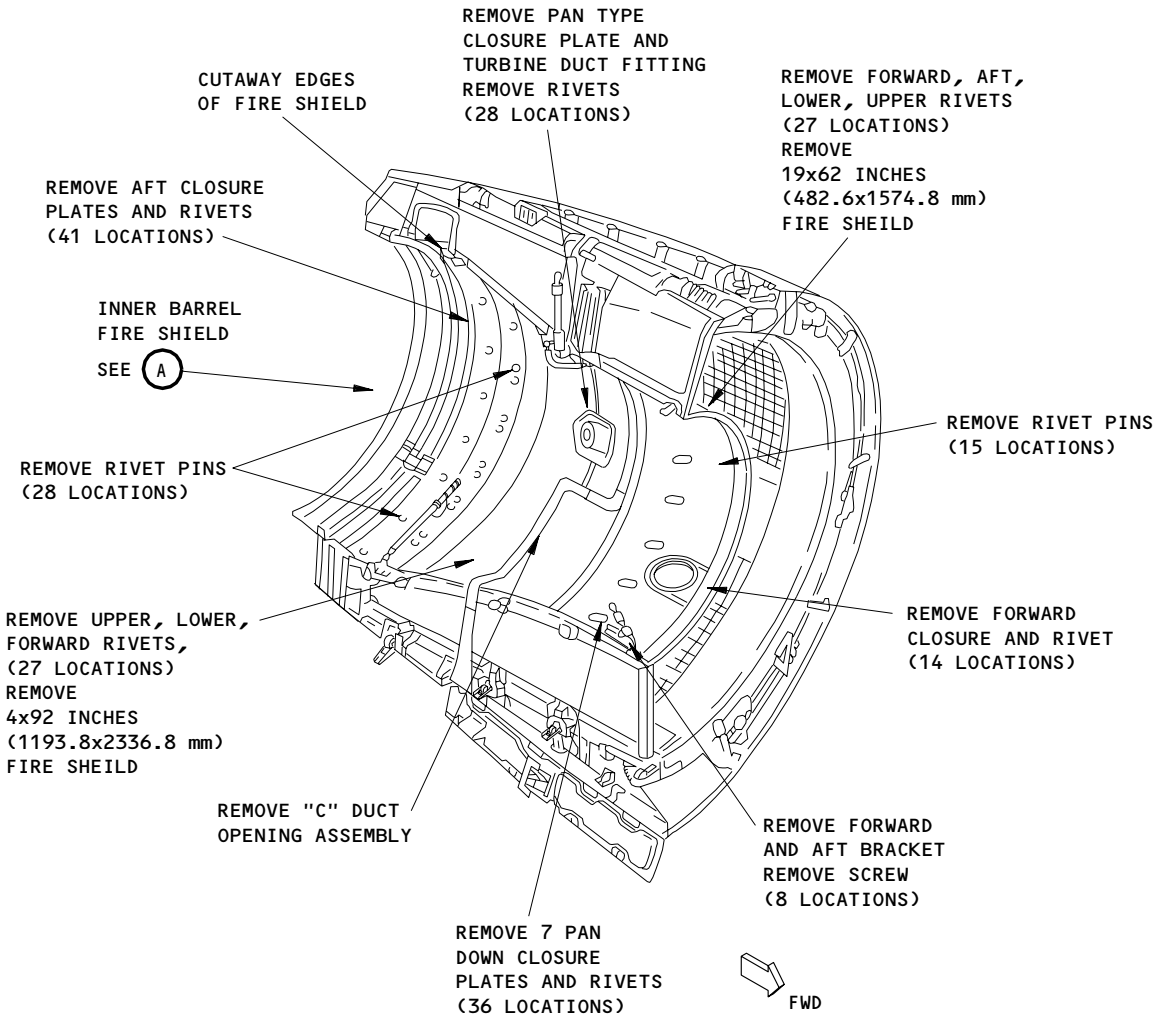
S 398-446-R00
(8) Seal the edges of the heatshield.

WARNING: AVOID LONG OR REPEATED SKIN CONTACT WITH SEALANT AND PRIMER. USE SEALANT AND PRIMER ONLY IN AREAS WITH GOOD VENTILATION. PRIMER AND SEALANT ARE VERY FLAMMABLE, KEEP AWAY FROM SPARKS, FLAME AND HEAT.

(a) Apply OMat No. 876C primer to edges and surfaces to be sealed.
1) Allow the primer to cure for 30 minutes.
(b) Mix the Omat No. 8/138 sealant, 2 part pack, base and catalyst according to the manufacturers instructions.
(c) Apply the sealant to the heatshield.
1) Seal the gaps on the forward, aft and upper sides of the heatshield and all rivet heads.
2) Make sure you keep the vents at the lower edge of the heatshield (Fig. 848).
(d) Cure the sealant.
1) Cure for one hour at room temperature followed by one hour at 71 to 93 deg.C. (160 to 200 deg.F.) with the heat lamps.

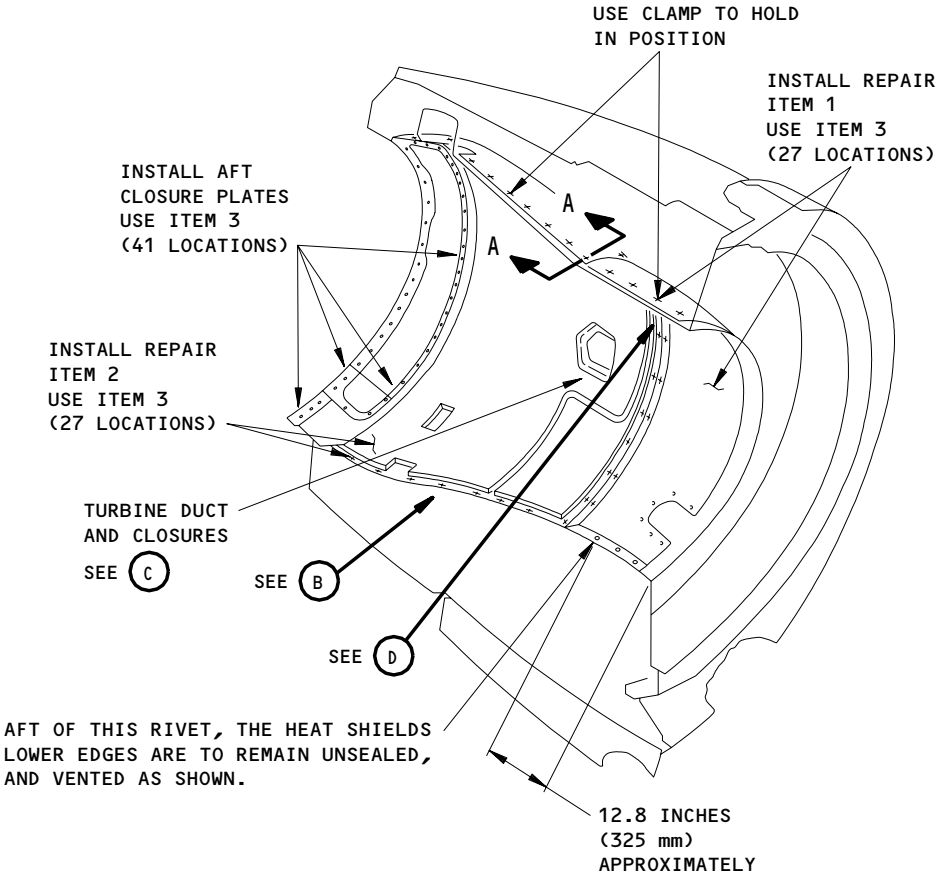
S 218-447-R00
(9) Inspect the completed repair.
(a) Make sure all requirements of the repair procedure are completed.

S 938-448-R00
(10) Mark the repair number, FRS6168 (FRS6169), adjacent to the fan C-duct nameplate with a permanent marker pen of contrasting color.



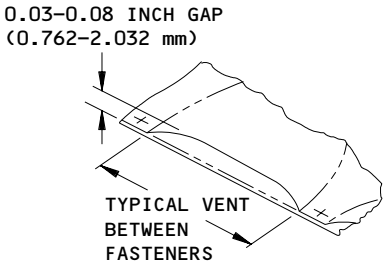
62226

Heatshield Replacement
Figure 848 (Sheet 1)



INNER BARREL FIRE SHIELD
(LEFT SIDE INSTALLATION)

A

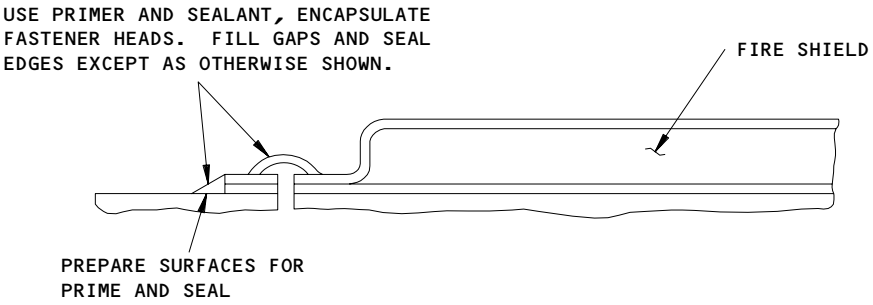


(TYPICAL UNSEALED AREA)

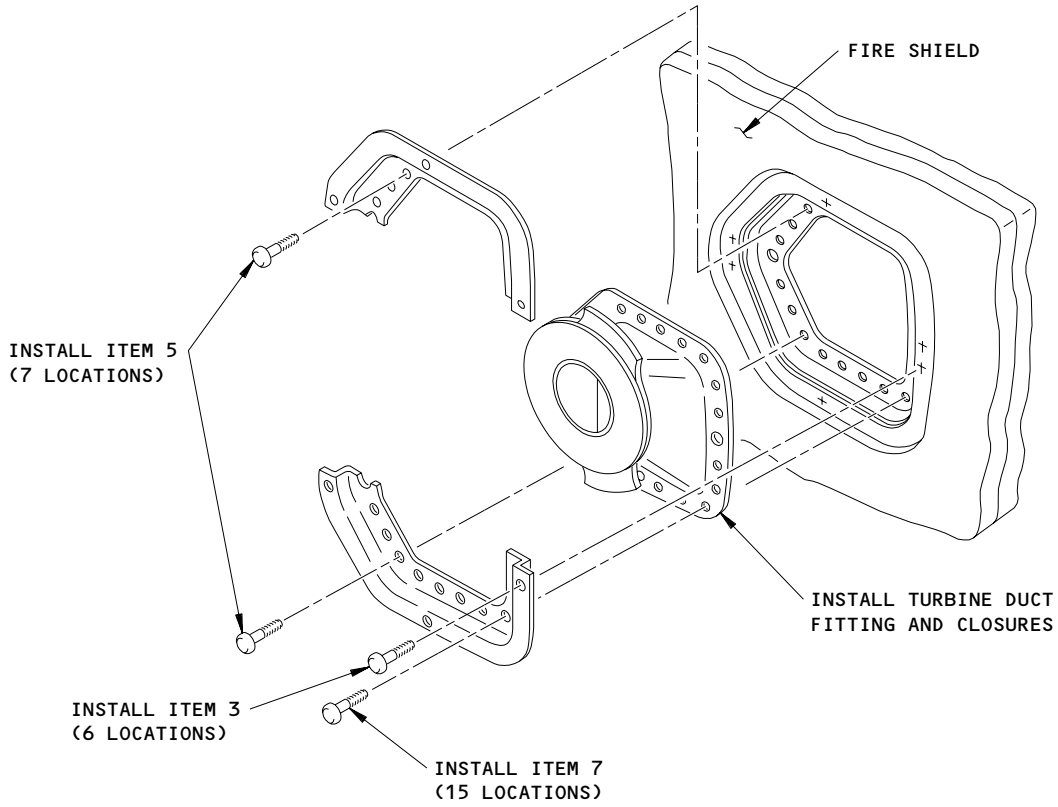
B

62227A

Heatshield Replacement
Figure 848 (Sheet 2)



ENCAPSULATION AND EDGE SEAL TREATMENT
(TYPICAL)
A-A

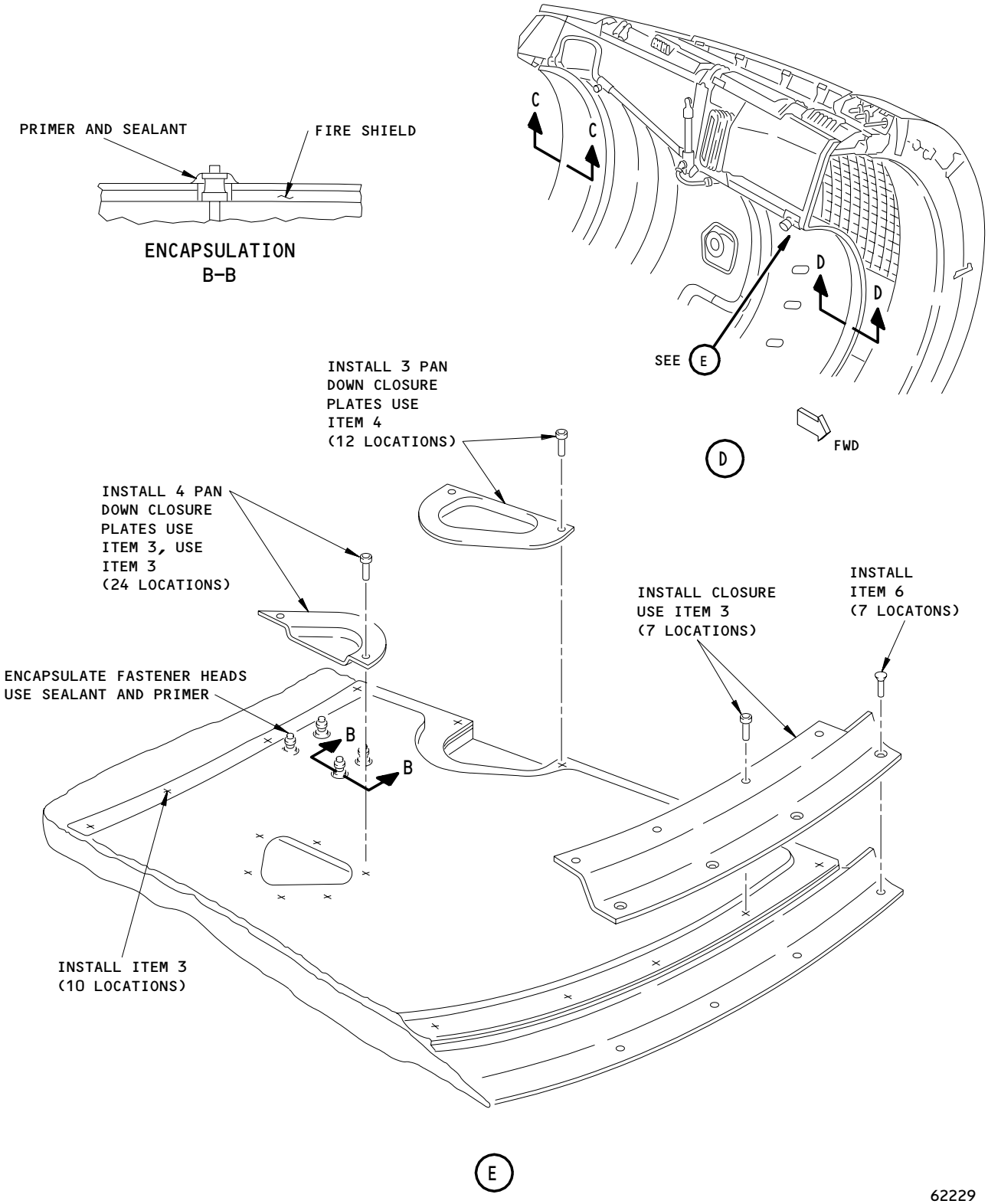


TURBINE DUCT AND CLOSURES

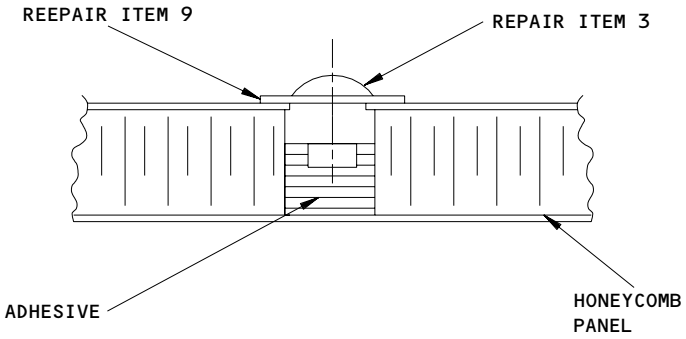
(C)

62228A

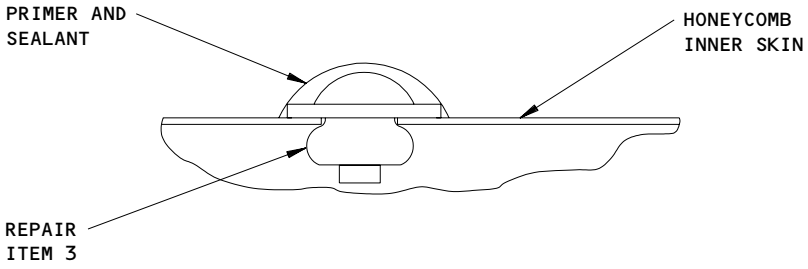
Heatshield Replacement
Figure 848 (Sheet 3)



Heatshield Replacement
Figure 848 (Sheet 4)



RIVET PIN HOLES
(TYPICAL REPAIR)
C–C



FASTENER HEADS AND WASHERS
(TYPICAL ENCAPSULATION)
D–D

62239

Heatshield Replacement
Figure 848 (Sheet 5)

TASK 78-31-20-788-484-R00

37. Thrust Reverser - Forward Latch Access Door Temporary Repair (FRS.6316)

A. General

(1) This procedure gives details to do a temporary repair of the front latch access door.

(2) If the latch access door has opened damage to the translating cowl and is to be repaired, refer to FRS6285 (AMM 78-31-23/801).

(3) This repair is time limited. The repair plate must be replaced in less than 10 days from when the temporary repair is done.

(4) This repair is applicable to all thrust reversers POST-SB 78-9235.

(5) Inspect the temporary repair one time each day.

(6) The repair can be applied to Thrust Reversers with the part numbers that follow:

LJ75090
LJ75089

B. Consumable Materials

(1) Acetone OMat No. 150
or
Isopropyl alcohol OMat. No. 1/40
or
Cleaning solvent Desoclean OMat No. 1/257

(2) Clean cotton OMat No. 2/101

(3) Tape, 3mm Scotch 425
AL. foil tape 150 mm (6 in) wide OMat No. 298
or
3m, Y436, 150 mm (6 in) OMat No. 2/115

(4) Abrasive paper OMat No. 5/32

C. Consumable Materials

(1) AL, SHT, 2024-T3, 1.60 mm (0.063 in. thick)

(2) NAS601-8P screws (Quantity 4) or equivalent, if the hinge is used

(3) MS21042-06 nut (Quantity 4) or equivalent, if the hinge is used

D. References

(1) AMM 78-31-23/801, FRS6285

E. Procedure

S 218-485-R00

(1) Do an inspection of the Translating Sleeve.
(a) If damage is found, repair to FRS6285 (AMM 78-31-23/801).

F. Prepare damaged area (Fig. 853)

S 018-486-R00

(1) Remove the lanyard or remaining lanyard pieces.

S 018-487-R00

(2) If the door/or parts of the door are attached, remove the screws that attach the hinges to the door and remove the door.

S 218-488-R00

(3) Examine the hinge.
  (a) If the hinge is intact and not distorted or bent, it will be attached to the repair plate.
  (b) If the hinge is bent or distorted, speed tape the hinge/hinges to the adjacent structure.
  (c) Discard damaged door.

G. Fabricate repair plate (Fig. 853)

S 358-489-R00

(1) Fabricate a repair plate from 2024-T3 AL, 1.60 mm (0.063 in.) thick.
  (a) The length is to be 406.4 mm (16.0 in.) long
  (b) Form the plate to fit the contour and the open area.
  (c) The width is to be trimmed to fit the open area as shown in Figure 853.

S 728-490-R00

(2) Put the plate in the open area and check the fit:
  (a) The repair plate must agree to the contour with light finger pressure only.
  (b) If necessary reform the door plate to fit the contour of the translating sleeve.

H. Abrade and clean (Fig. 853)

S 358-501-R00

WARNING: PROTECTIVE GLOVES MUST BE WORN WHEN USING DEGREASERS.
SMOKING IS NOT PERMITTED WHEN USING DEGREASERS.
USE DEGREASERS ONLY IN AREAS WITH GOOD VENTILATION.
DEGREASERS ARE VERY FLAMMABLE, KEEP AWAY FROM IGNITION SOURCES.

IF YOU DO NOT OBEY THIS, INJURY TO PERSONS OR DAMAGE TO THE ENGINE CAN OCCUR.

(1) Make sure that you take precautions when you use the degreasers.

S 128-491-R00

(2) Use Abrasive paper, OMat 5/35 to roughen the surface where tape is to be applied.

S 118-492-R00

(3) Use clean cotton cloth OMat 2/101 saturated with Acetone OMat 150 or Isopropyl alcohol OMat 1/40 or cleaning solvent Desoclean OMat 1/257 to remove oils and loosen debris.
  (a) Wipe area dry with cotton cloth before solvent evaporates.

I. Lockout the thrust reverser

S 048-493-R00

(1) Do the deactivation procedure of the thrust reverser (AMM 78-31-00/201).

J. Install the repair plate (Fig. 853)

S 418-494-R00

(1) Gain access through the open area to both sides of the repair plate installation.
   (a) If the hinge is not bent or distorted attach the hinge to the repair plate with NAS7604US screws and MS21042-06 nuts. Use hinge/door screw holes. Drill in the repair plate as necessary.

S 428-495-R00

(2) Attach the repair plate to the translating sleeve with speed tape, 3M scotch 425 0Mat No. 298 or 3M, Y436, 150 mm 0Mat No. 2/115. Refer to Figure 853 to install the speed tape.

S 428-496-R00

(3) Install two layers of speed tape 3M scotch 425 0Mat No. 298 or 3M, Y436, 150 mm 0Mat No. 2/115 along the forward edge of the repair plate.
   (a) Make sure the gaps between the repair plate and torque box are sealed.

K. Examine the repair

S 718-497-R00

(1) Visually inspect the repair for wrinkles or tears in the tape. No wrinkles or tears are permitted.

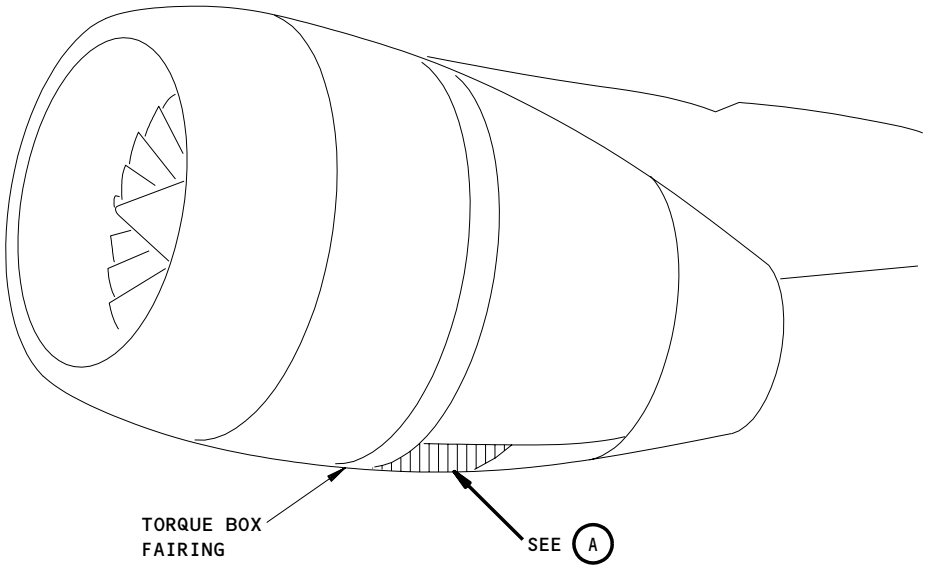
S 718-498-R00

(2) Visuall inspect the speed tape integrity on time each day.

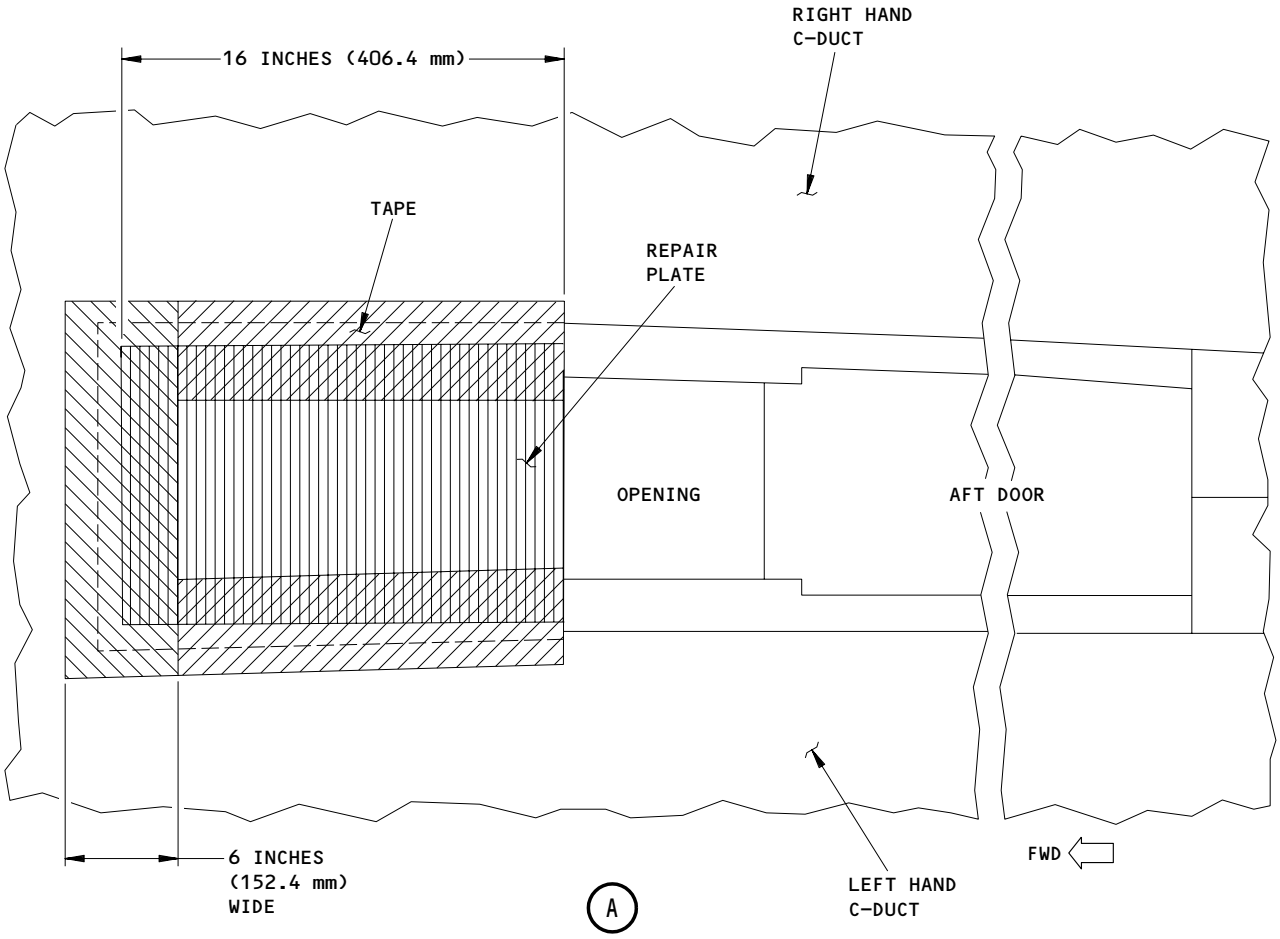
L. Identify the repair

S 938-499-R00

(1) Mark FRS6316 adjacent to the assembly part number with a permanent marker.



LATCH ACCESS DOOR



Forward Latch Access Door Temporary Repair
Figure 849 (Sheet 1)

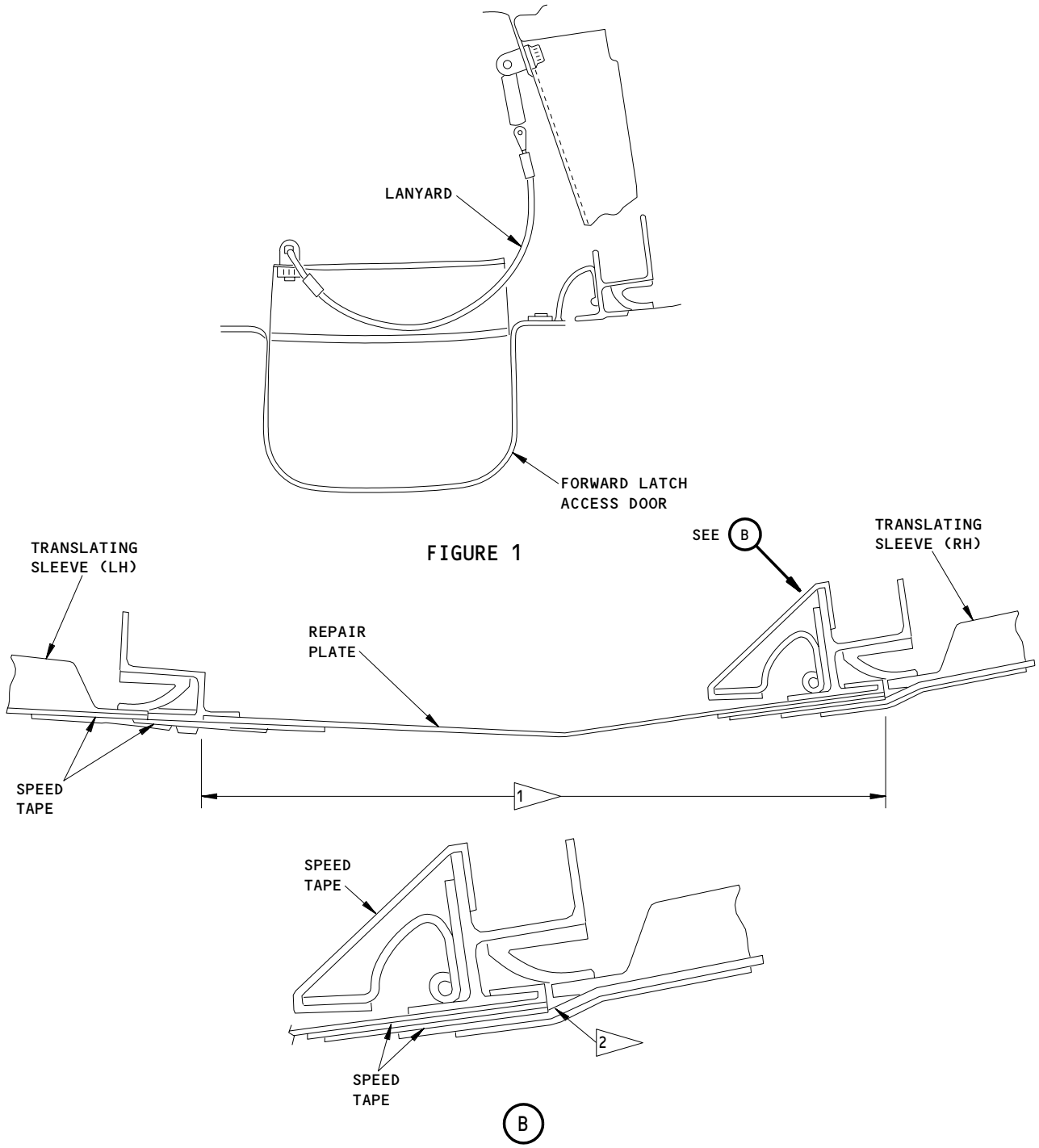


FIGURE 1

1 WIDTH OF REPAIR TAPERS CONSTANTLY FROM FORWARD END TO AFT END. THE WIDTH OF THE DOOR MAY VARY ±0.25 INCHES (±6.35 mm).

2 MISMATCH TO THE THRUST REVERSER STRUCTURE IS ACCEPTABLE.

Forward Latch Access Door Temporary Repair
Figure 849 (Sheet 2)

TASK 78-31-20-308-502-R00

38. Thrust Reverser Fixed Structure - Upper Bifurcation Seal Support Web Damage Repair (Right)

A. General

(1) The repair in this procedure is FRS.6329.

(2) This procedure tells you how to repair puncture damage to the upper bifurcation seal support web at the forward hinge position on the thrust reverser right fixed structure.

(3) The maximum size of damage that you can repair when you use this procedure is 1 inch x 1 inch (25.4 x 25.2 mm). The profile of must match the mating surface on the firewall. The doubler must overlap the damage area by a minimum of 0.20 inch (5.1 mm).

(4) You can use this repair for these part numbers:

(a) LJ75090
(b) LJ76377
(c) LJ76554
(d) LJ76690
(e) LJ76498

B. Equipment

(1) Drilling equipment
(2) Penetrant crack test equipment
(3) Permanent marker pen

C. Parts

PART NO.	PART IDENT	QTY
AMS4911	Titanium sheet 0.032 in.(0.82 mm) thick (Item 2)	
CR3523-5-1	Blind Rivet (Item 1)	8

D. Consumable Materials

(1) Solvent Acetone
OMat No. - 150

(2) Isopropyl Alcohol
OMat No. - 1/40

(3) Cleaning Solvent
OMat No. - 1/257

(4) Lint Free Cloth
OMat No. - 2/101

(5) Temporary marker felt/fiber tip
OMat No. - 262

(6) Waterproof silicon carbide
OMat No. - 5/31

(7) Fluorescent penetrant
OMat No. - 653

(8) Firewall sealant
OMat No. - 8/101

(9) Sealant
OMat No. - 8/143

(10) Adhesive
OMat No. - 6/52

E. Procedure

S 118-503-R00

CAUTION: TITANIUM COMPONENTS: WHEELS, STONES AND ABRASIVE PAPERS USED FOR DRESSING, BLENDING OR POLISHING MUST BE OF THE SILICON CARBIDE TYPE. ALUMINUM OXIDE TYPES MUST NOT BE USED. IF MECHANICAL CUTTERS ARE USED, MAKE ONLY LIGHT CUTS TO AVOID OVERHEATING. MAKE SURE THAT THE DRILL FEED IS KEPT CONSTANT TO PREVENT DRILL BIT DWELL THAT CAUSE WORK HARDENING OF THE TITANIUM MATERIAL. DURING BLENDING OR POLISHING, IF THE MATERIAL IS DISCOLORED DUE TO HEATING TO DARKER THAN A LIGHT STRAW COLOR, REJECT THE COMPONENT.

(1) Clean the repair area (Fig. 850).
(a) Apply Acetone, OMat 150 or Isopropyl Alcohol, OMat 1/40, or Cleaning solvent, OMat 1/257 to the area with a clean lint-free cloth, OMat 2/101.

NOTE: To prevent contamination of the solvent in the container, pour the solvent on to the cloth. Do not dip the cloth in the container.

(b) Do the cleaning again until all grease is removed.
1) Use a clean cloth for each cleaning operation.
(c) Wipe the area dry before the solvent evaporates.

S 238-504-R00
(2) Do a penetrant crack test of the repair area.
(a) Use OMat 653 fluorescent penetrant and penetrant crack test equipment.
(b) Mark all cracks in the repair area.
1) Use an OMat 262 temporary marker felt/fiber tip.

S 358-505-R00
(3) Remove the damage from the repair area.
(a) Mark cut lines on the repair area to include all of the damage.
(b) Make sure that the area to be removed is not more than the maximum size that you can repair.
1) Remove the damage and remove all sharp edges with OMat 5/31 waterproof silicon carbide.

S 838-506-R00

(4) Make the doubler.

(a) Use a AMS4911 titanium sheet 0.032 in. thick (Item 2) to make the doubler.

NOTE: When the doubler is in position, it must be centralized over the damage so that there is an equal overlap in the fore and aft direction.

(b) Shape the upper edge of the doubler to agree with the contour of the firewall.

1) Make sure that the profile of the doubler agrees with the profile of the mating surface.

S 358-507-R00

(5) Drill fastener holes in the doubler and the firewall.

(a) Use a OMat 262 temporary marker felt/fiber tip or similar marker to mark the position of the fastener holes on the doubler.

1) Make sure that there are 4 rivet locations at each side of the damage area.

(b) Put the doubler in position on the firewall.

(c) At the positions marked on the doubler, drill 0.160 to 0.160 in. (4.06 to 4.16 mm) diameter holes through the doubler and the firewall.

(d) Remove all burrs from the cut edges and the drilled holes.

1) Use OMat 5/31 waterproof silicon carbide.

S 238-508-R00

(6) Do a penetrant crack test of the repair area.

(a) Use OMat 653 fluorescent penetrant and penetrant crack test equipment.

(b) Make sure that there are no cracks in the doubler.

(c) Make sure that there are no cracks around the trimmed area of the firewall.

(d) Reject if cracks are found.

S 118-509-R00

(7) Clean the mating surfaces of the doubler and the firewall.

(a) Apply Acetone, OMat 150 or Isopropyl Alcohol, OMat 1/40, or Cleaning solvent, OMat 1/257 to the area with a clean lint-free cloth, OMat 2/101.

NOTE: To prevent contamination of the solvent in the container, pour the solvent on to the cloth. Do not dip the cloth in the container.

(b) Do the cleaning again until all grease is removed.

1) Use a clean cloth for each cleaning operation.

(c) Wipe the area dry before the solvent evaporates.

S 428-510-R00

(8) Install the doubler.

(a) Apply OMat 8/143 sealant to the mating surfaces of the doubler and the firewall.

NOTE: Refer to the manufacturer's instructions for mixing and application instructions.

(b) Put the doubler in position on the firewall.

1) Make sure that the fastener holes in the doubler and the firewall are correctly aligned.

(c) Wet install the fasteners.

1) Use CR3523-5-1 Blind rivets (Item 1).

(d) Let the sealant cure.

1) Let the OMat 8/143 sealant cure in accordance with the manufacturer's instructions.

S 838-511-R00

(9) Fill the repair area.

(a) Fill the cut out area in the firewall with OMat 8/52 adhesive.

NOTE: The work life of the adhesive is approximately 1 hour.

1) Fill the area so that the adhesive is level with the surrounding structure.

2) Cure the adhesive for the time and temperature shown:

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - °F	54	59	68	72	77	86	96	113	140
Temp - °C	12	15	20	22	25	30	35	45	50

Cure Data Chart

(b) When the adhesive is cured, blend the adhesive smooth with the surrounding structure.

1) Use OMat 5/31 waterproof silicon carbide.

S 398-512-R00

(10) Apply OMat 8/101 sealant around the edges of the doubler.

(a) Make sure that there are no gaps.

NOTE: Refer to the manufacturer's instructions for mixing and application instructions.

(b) Let the sealant cure per the manufacturer's instructions.

S 288-513-R00

(11) Do an inspection of the repair.

S 978-514-R00

(12) Identify the repair.

(a) Mark FRS6329 adjacent to the existing assembly number.

TASK 78-31-20-308-515-R00

39. Thrust Reverser Fixed Structure - Upper Bifurcation Seal Support Web Damage Repair (Left)

A. General

(1) The repair in this procedure is FRS.6328.

(2) This procedure tells you how to repair puncture damage to the upper bifurcation seal support web at the forward hinge position on the thrust reverser left fixed structure.

(3) The maximum size of damage that you can repair when you use this procedure is 1 inch x 1 inch (25.4 x 25.2 mm). The profile of must match the mating surface on the firewall. The doubler must overlap the damage area by a minimum of 0.20 inch (5.1 mm).

(4) You can use this repair for these part numbers:

(a) LJ75090

(b) LJ76377

(c) LJ76554

(d) LJ76690

(e) LJ76498

B. Equipment

(1) Drilling equipment

(2) Penetrant crack test equipment

(3) Permanent marker pen

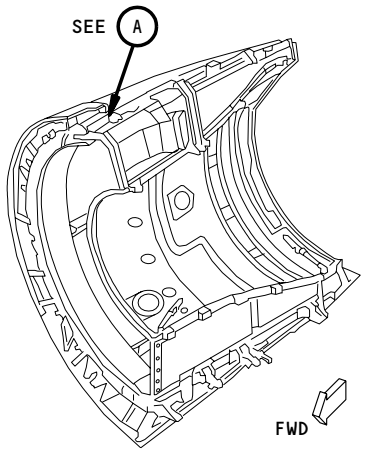
C. Parts

PART NO.	PART IDENT	QTY
AMS4911	Titanium sheet 0.032 in.(0.82 mm) thick (Item 2)	
CR3523-5-1	Blind Rivet (Item 1)	8

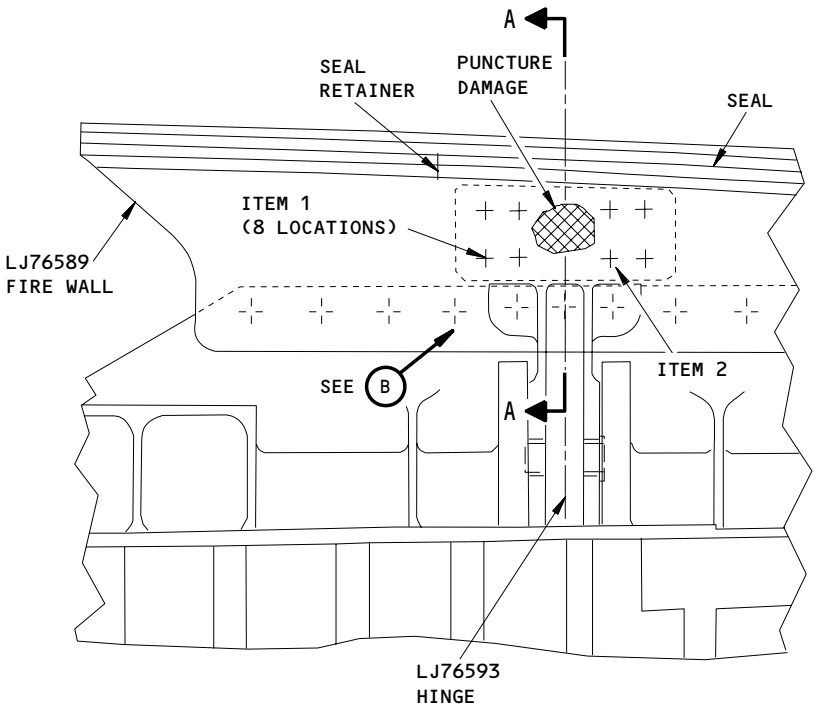
D. Consumable Materials

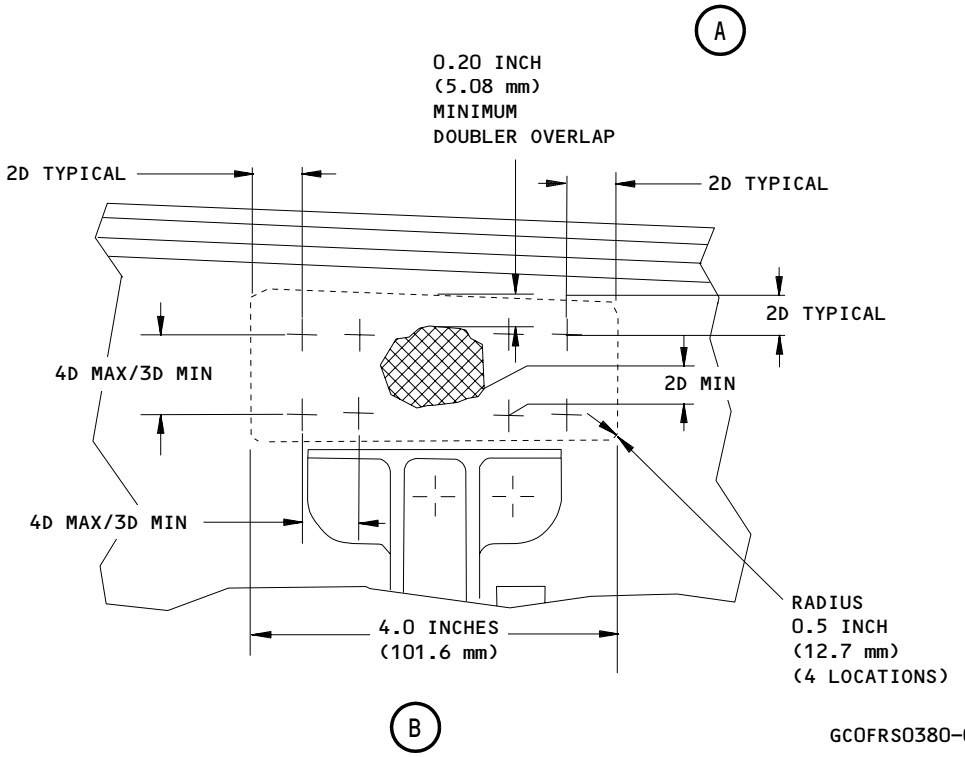
(1) Solvent Acetone

0Mat No. - 150

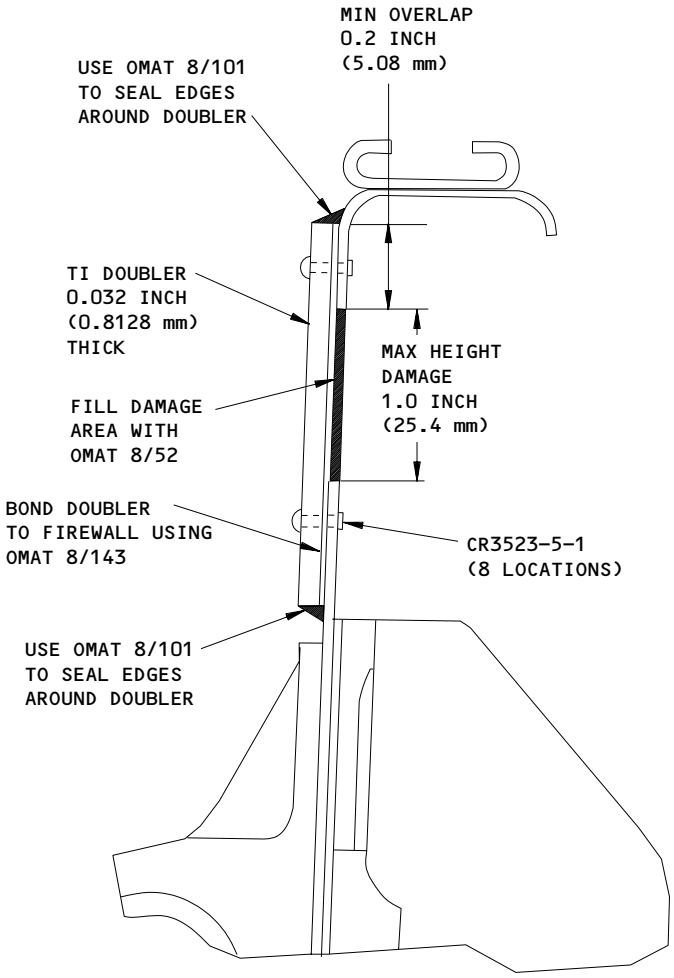


VIEW FROM INSIDE
THRUST REVERSER
RIGHT SIDE C-DUCT





Repair Details and Dimensions
Figure 850 (Sheet 1)



(VIEW IN THE FORWARD DIRECTION)
A-A

GCOFRS082-01

Repair Details and Dimensions
Figure 850 (Sheet 2)

(2) Isopropyl Alcohol
OMat No. - 1/40
(3) Cleaning Solvent
OMat No. - 1/257
(4) Lint Free Cloth
OMat No. - 2/101
(5) Temporary marker felt/fiber tip
OMat No. - 262
(6) Waterproof silicon carbide
OMat No. - 5/31
(7) Fluorescent penetrant
OMat No. - 653
(8) Firewall sealant
OMat No. - 8/101
(9) Sealant
OMat No. - 8/143
(10) Adhesive
OMat No. - 6/52

E. Procedure

S 118-516-R00

CAUTION: TITANIUM COMPONENTS: WHEELS, STONES AND ABRASIVE PAPERS USED FOR DRESSING, BLENDING OR POLISHING MUST BE OF THE SILICON CARBIDE TYPE. ALUMINUM OXIDE TYPES MUST NOT BE USED. IF MECHANICAL CUTTERS ARE USED, MAKE ONLY LIGHT CUTS TO AVOID OVERHEATING. MAKE SURE THAT THE DRILL FEED IS KEPT CONSTANT TO PREVENT DRILL BIT DWELL THAT CAUSE WORK HARDENING OF THE TITANIUM MATERIAL. DURING BLENDING OR POLISHING, IF THE MATERIAL IS DISCOLORED DUE TO HEATING TO DARKER THAN A LIGHT STRAW COLOR, REJECT THE COMPONENT.

(1) Clean the repair area (Fig. 851).
(a) Apply Acetone, OMat 150 or Isopropyl Alcohol, OMat 1/40, or Cleaning solvent, OMat 1/257 to the area with a clean lint-free cloth, OMat 2/101.

NOTE: To prevent contamination of the solvent in the container, pour the solvent on to the cloth. Do not dip the cloth in the container.

(b) Do the cleaning again until all grease is removed.
1) Use a clean cloth for each cleaning operation.
(c) Wipe the area dry before the solvent evaporates.

S 238-517-R00
(2) Do a penetrant crack test of the repair area.
(a) Use OMat 653 fluorescent penetrant and penetrant crack test equipment.
(b) Mark all cracks in the repair area.
1) Use an OMat 262 temporary marker felt/fiber tip.

S 358-518-R00
(3) Remove the damage from the repair area.
(a) Mark cut lines on the repair area to include all of the damage.
(b) Make sure that the area to be removed is not more than the maximum size that you can repair.
1) Remove the damage and remove all sharp edges with OMat 5/31 waterproof silicon carbide.

S 838-519-R00
(4) Make the doubler.
(a) Use a AMS4911 titanium sheet 0.032 in. thick (Item 2) to make the doubler.

NOTE: When the doubler is in position, it must be centralized over the damage so that there is an equal overlap in the fore and aft direction.

(b) Shape the upper edge of the doubler to agree with the contour of the firewall.
1) Make sure that the profile of the doubler agrees with the profile of the mating surface.

S 358-520-R00
(5) Drill fastener holes in the doubler and the firewall.
(a) Use a OMat 262 temporary marker felt/fiber tip or similar marker to mark the position of the fastener holes on the doubler.
1) Make sure that there are 4 rivet locations at each side of the damage area.

(b) Put the doubler in position on the firewall.
(c) At the positions marked on the doubler, drill 0.160 to 0.160 in. (4.06 to 4.16 mm) diameter holes through the doubler and the firewall.
(d) Remove all burrs from the cut edges and the drilled holes.
1) Use OMat 5/31 waterproof silicon carbide.

S 238-521-R00
(6) Do a penetrant crack test of the repair area.
(a) Use OMat 653 fluorescent penetrant and penetrant crack test equipment.
(b) Make sure that there are no cracks in the doubler.
(c) Make sure that there are no cracks around the trimmed area of the firewall.
(d) Reject if cracks are found.

S 118-522-R00
(7) Clean the mating surfaces of the doubler and the firewall.
(a) Apply Acetone, OMat 150 or Isopropyl Alcohol, OMat 1/40, or Cleaning solvent, OMat 1/257 to the area with a clean lint-free cloth, OMat 2/101.

NOTE: To prevent contamination of the solvent in the container, pour the solvent on to the cloth. Do not dip the cloth in the container.

(b) Do the cleaning again until all grease is removed.
1) Use a clean cloth for each cleaning operation.
(c) Wipe the area dry before the solvent evaporates.

S 428-523-R00
(8) Install the doubler.
(a) Apply OMat 8/143 sealant to the mating surfaces of the doubler and the firewall.

NOTE: Refer to the manufacturer's instructions for mixing and application instructions.

(b) Put the doubler in position on the firewall.
1) Make sure that the fastener holes in the doubler and the firewall are correctly aligned.
(c) Wet install the fasteners.
1) Use CR3523-5-1 Blind rivets (Item 1).
(d) Let the sealant cure.
1) Let the OMat 8/143 sealant cure in accordance with the manufacturer's instructions.

S 838-524-R00

(9) Fill the repair area.
(a) Fill the cut out area in the firewall with OMat 8/52 adhesive.

NOTE: The work life of the adhesive is approximately 1 hour.

1) Fill the area so that the adhesive is level with the surrounding structure.
2) Cure the adhesive for the time and temperature shown:

Time - Hours	168	96	40	24	16	8	4	2	1
Temp - °F	54	59	68	72	77	86	96	113	140
Temp - °C	12	15	20	22	25	30	35	45	50

Cure Data Chart

(b) When the adhesive is cured, blend the adhesive smooth with the surrounding structure.
1) Use OMat 5/31 waterproof silicon carbide.

S 398-525-R00

(10) Apply OMat 8/101 sealant around the edges of the doubler.
(a) Make sure that there are no gaps.

NOTE: Refer to the manufacturer's instructions for mixing and application instructions.

(b) Let the sealant cure per the manufacturer's instructions.

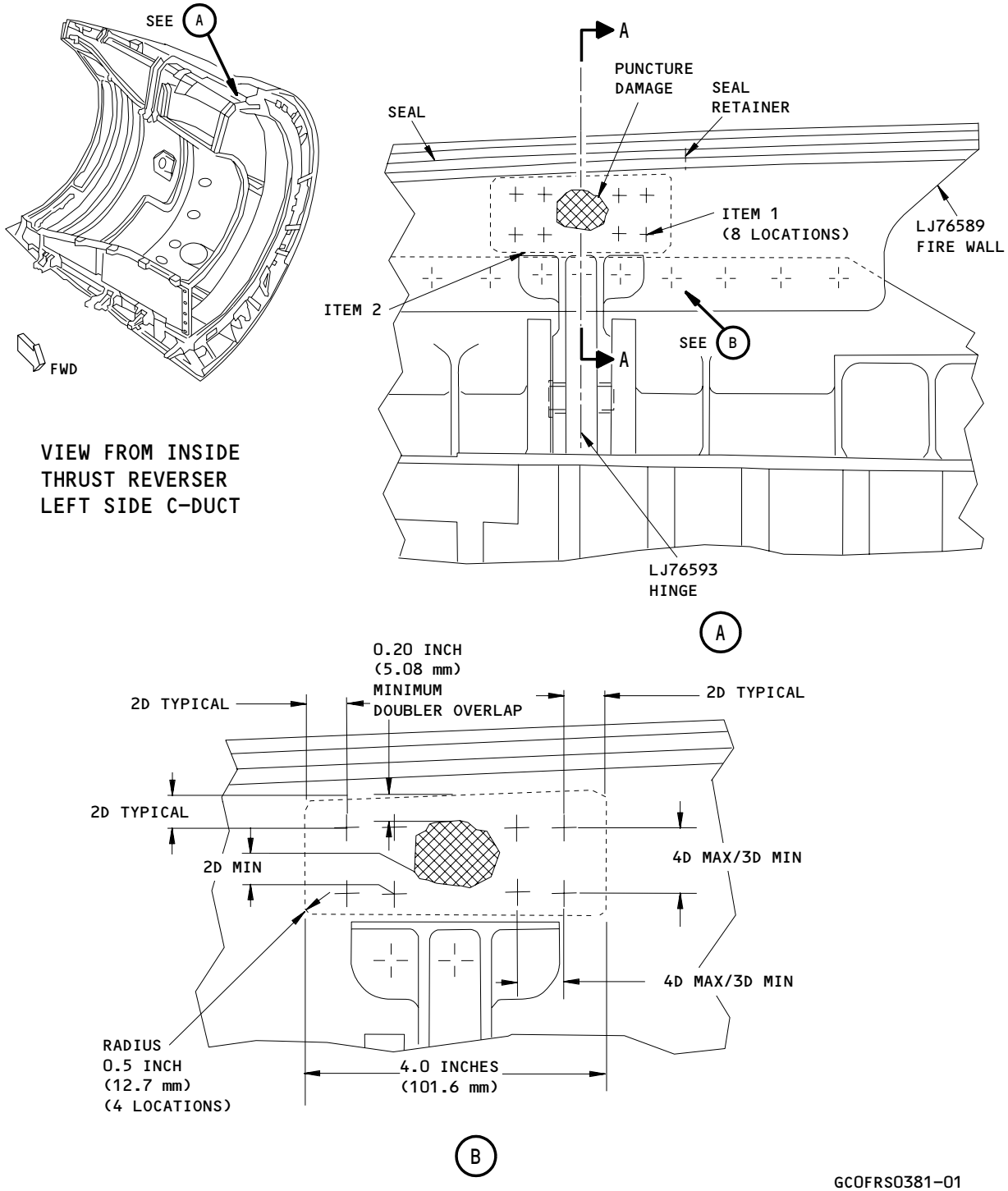
S 288-526-R00

(11) Do an inspection of the repair.

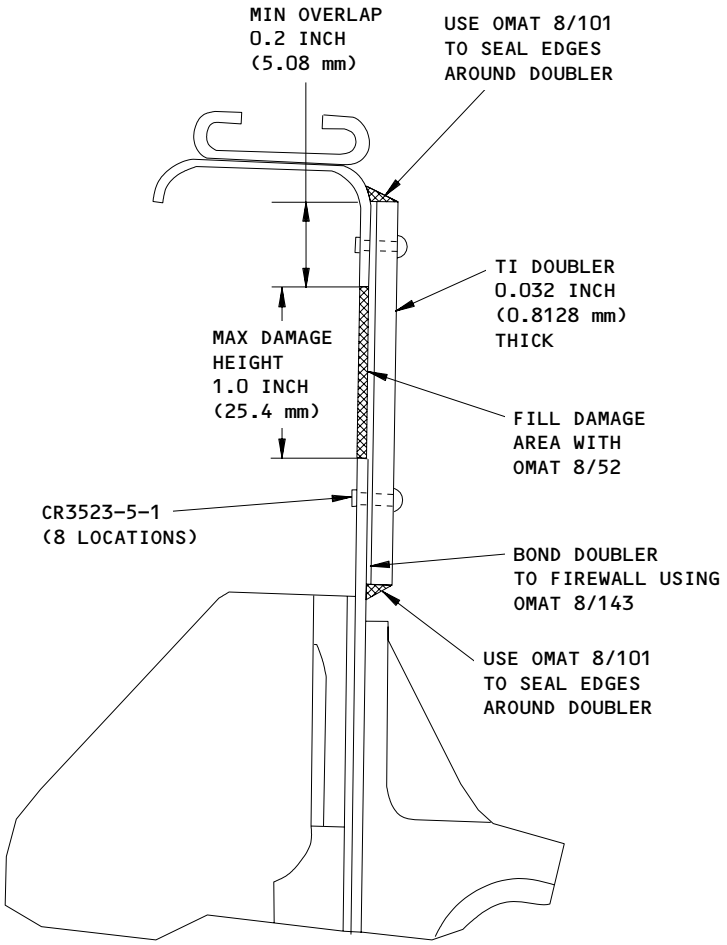
S 978-527-R00

(12) Identify the repair.

(a) Mark FRS6329 adjacent to the existing assembly number.



Repair Details and Dimensions
Figure 851 (Sheet 1)



(VIEW IN THE FORWARD DIRECTION)
A-A

GCOFRS0383-01

Repair Details and Dimensions
Figure 851 (Sheet 2)

THRUST REVERSER TRANSLATING COWL - REMOVAL/INSTALLATION

1. General
   A. This procedure contains four tasks:
      (1) The thrust reverser translating cowl removal.
      (2) Examine the translating sleeve sliders.
      (3) The thrust reverser translating cowl installation.
   B. Use the procedures given in AMM 70-51-00/201 to tighten fasteners. Tighten the fasteners to the torque values given in AMM 70-51-00/201 unless a torque value is specified in this procedure.

TASK 78-31-23-004-001-R00

2. Remove the Thrust Reverser Translating Cowl
   A. Equipment
      (1) Installation Frame - Rolls-Royce CP30459/1
      (2) Installation Trolley - Rolls-Royce CP30523
      (3) Lifting Sling - Rolls-Royce CP30447
   B. Consumable Materials
      (1) G02354 Lockwire, British Spec - DTD.189A: 22SWG, American Spec - 21 AWG, OMat No. 238
      (2) G02129 Tape, Adhesive - Vinyl, General Purpose (Permacel P-29)
   C. References
      (1) AMM 27-81-00/201, Leading Edge Slat System
      (2) AMM 70-42-11/201, Repair of Surfaces Affected By Minor Damage
      (3) AMM 78-31-00/201, Thrust Reverser System
      (4) AMM 78-31-20/801, Fan C-duct and Thrust Reverser
      (5) AMM 78-31-23/801, Thrust Reverser Translating Cowl
   D. Access
      (1) Location Zones
          410 Left Engine
          420 Right Engine

   E. Remove the Translating Cowl

      S 044-002-R00

      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 YOU OR DAMAGE TO EQUIPMENT.

      (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 864-034-R00

CAUTION: MAKE SURE THE LEADING EDGE SLATS ARE RETRACTED BEFORE YOU OPEN THE THRUST REVERSERS. IF THE LEADING EDGE SLATS ARE NOT RETRACTED, DAMAGE TO THE THRUST REVERSER, LEADING EDGE SLATS, AND THE WING COULD OCCUR.

(2) Make sure the leading edge slats are fully retracted (AMM 27-81-00/201).

S 044-035-R00

(3) Do the procedure to deactivate the leading edge slats (AMM 27-81-00/201).

S 934-003-R00

(4) Make the actuator datums (Fig. 403).
   (a) Remove the actuator access panels (4) from the translating cowl.
   (b) Make sure that the translating cowl is fully retracted.
   (c) Clean the actuator pistons.
   (d) Apply adhesive tape against the actuator body.
      1) This operation makes the fully stowed datum.
   (e) Manually extend the translating cowl approximately 3.0 inches (7.7 cm) (AMM 78-31-00/201).
   (f) Examine the translating cowl forward seal for damage that follows:
      1) If the seal is torn or frayed or you can see deterioration in the seal, repair to FRS.6081 (AMM 78-31-23/801).
      2) If the seal is not there, repair to FRS.6081 (AMM 78-31-23/801).
   (g) Clean the actuator pistons.
   (h) Apply adhesive tape against the actuator body.
      1) This operation makes a datum for the connection of the actuators during the installation task.

S 864-026-R00

(5) Manually extend the translating cowl approximately 10.0 inches (25.4 cm) (AMM 78-31-00/201).

S 034-004-R00

(6) Disconnect the drag links (Fig. 402)
   (a) Remove the securing details at the drag link attachment (3) and disconnect drag link (2).
   (b) Temporarily attach the blocker doors (1) in the stowed position.
   (c) Temporarily attach the drag links to the inner sleeve of the thrust reverser.

S 034-005-R00

(7) Disconnect the actuators (Fig. 403)
  (a) Release and remove the bolts and bushes (3) that attach all three actuators (1).
    1) Do not turn the actuator rod ends.
  (b) Release and remove the bolt that attaches the feedback actuator (2).

S 484-032-R00

(8) Install the installation frame (4) on the translating cowl (Fig. 404).
  (a) Remove the blanking screws from the attachment points for the cowl installation frame.
  (b) Install the upper (1) and lower (2) attachment brackets to the translating cowl.

    NOTE: The attachment brackets (1) and (2) can be installed in four different locations. Use the location that is correct for the engine position on the aircraft and the side of the thrust reverser the cowl is located.

  (c) Position the installation frame (4) upper cowl hoist point link on the translating cowl.

    NOTE: The hoist point link can be located in two different positions. The location is determined by which side of the thrust reverser the cowl is installed.

  (d) Rotate the attachment bar so the longer leg is on the aft side.
  (e) Remove the two disconnect pins, rotate the attachment bar aft and replace the two disconnect pins.
  (f) Attach an overhead hoist to the hoist locator with a clevis and quick disconnect pin.
  (g) Hoist the installation frame (4) into position and attach it to the thrust reverser cowl hoist points with the PIP pins (5).

S 024-033-R00

(9) Remove the translating cowl (Fig. 404).

(a) Do these steps to remove the cowl using the CP30459/1 Frame (4) and CP30523 Trolley (3).

1) Lift the installation frame (4) and translating cowl to reduce the weight of the cowl on the tracks.
2) Move the overhead hoist aft while manually moving the installation frame (4) aft until it is removed from the thrust reverser.
3) Move the overhead hoist aft while manually moving the translating cowl installation frame (4) aft.
4) After the translating cowl is removed from the thrust reverser, position the installation frame (4) and translating cowl on the installation trolley (3).
5) Attach the installation frame (4) to the trolley with the quick disconnect pins.

NOTE: The installation trolley (3) can be used for the thrust reverser cowl and C-duct. Use the correct atttachment points.

(b) Do these steps to remove the cowl using the CP30447 Lifting Sling (3) (Fig. 404A).

1) Attach a hoist point attachment fitting bracket (1) to the thrust reverser translating cowl top hoist point only.
2) Add protective material approximately 12 to 18 inches (304 to 457 mm) on each side of the hoist point.
3) Attach a hoist to the lifting sling (3).

CAUTION: THE WING SLATS MUST BE RETRACTED BEFORE YOU PUT THE LIFTING SLING ABOVE THE ENGINE. IF YOU DO NOT DO THIS, DAMAGE TO EQUIPMENT CAN RESULT.

4) Lift the installation sling (3) with the overhead hoist and put it around the leading edge of the wing.
5) Attach the installation sling to the hoist point attachment fitting (1) with the PIP pin (2).
6) Lift the installation sling (3) with the hoist to remove the weight of the translating cowl from the thrust reverser tracks.
7) Move the overhead hoist aft while manually moving the installation sling (3) aft.
8) After the cowl is removed from the thrust reverser, place the cowl in a suitable fixture.

S 224-025-R00

(10) Do an inspection of the cascade rear support ring (Fig 401A).

(a) Examine the cascade rear support rings for cracks, frettage and excessive visible damage (Fig. 401A).

1) Obvious excessive damage is not permitted.

2) Cracks are not permitted.

NOTE: PAY PARTICULAR ATTENTION AROUND THE UPPER AND LOWER SUPPORT BRACKETS.

3) Frettage at the hydraulic actuator locations on the rear edge of the ring is permitted as follows:

a) The frettage is not more than 0.100 inch (2.54 mm) in depth.

b) The maximum circumferential length of the area that is repaired must obey the limits that follow:

1. At the top and the center actuator positions the length of the repaired area must not be more than 2.400 inches (60.96 mm).

2. At the bottom actuator position the length of the repaired area must not be more than 4.400 inches (111.76 mm).

c) All frettage is repaired to FRS3253 (AMM 70-42-11/201).

d) Frettage greater than the above limits, reject it.

(b) Examine the cascade rear support bracket for frettage and much damage that can be easily seen.

1) If you see frettage on one or all of the chamfers, accept it (Fig 401A).

(c) Examine the thrust reverser lockout brackets for frettage and too much damage that can be easily seen (Fig 401A).

1) Too much damage that can be easily seen, repair to FRS6047(LH) or FRS6048(RH) (AMM 78-31-20/801).

2) If you see frettage on the bracket location area, the minimum dimension (x) must not be less than 0.150 inch (3.81 mm).

a) Frettage to the minimum dimension is permitted if all the sharp edges are removed to FRS3253 (AMM 70-42-11/201).

3) If you see damage that is more than above, reject it.

S 034-008-R00

(11) Remove the blocker flaps (Fig. 402)

(a) Make a temporary mark at each blocker flap position to use during the installation task.

(b) Remove the securing details at the blocker flap hinge assemblies (5) and remove the blocker flaps (1).

TASK 78-31-23-204-027-R00

3. Examine the Translating Sleeve Sliders (Fig. 405)

A. References

(1) AMM 70-42-11/201, Repair Surfaces Affected by Minor Damage

B. Access

(1) Location Zones

410 Left Engine

420 Right Engine

C. Procedure

S 214-028-R00

(1) Examine the translating sleeve sliders:

(a) Look for these problems with the slider:

1) Cracks

2) Nicks

3) Gouges

4) The hard surface layer of the slider that is missing.

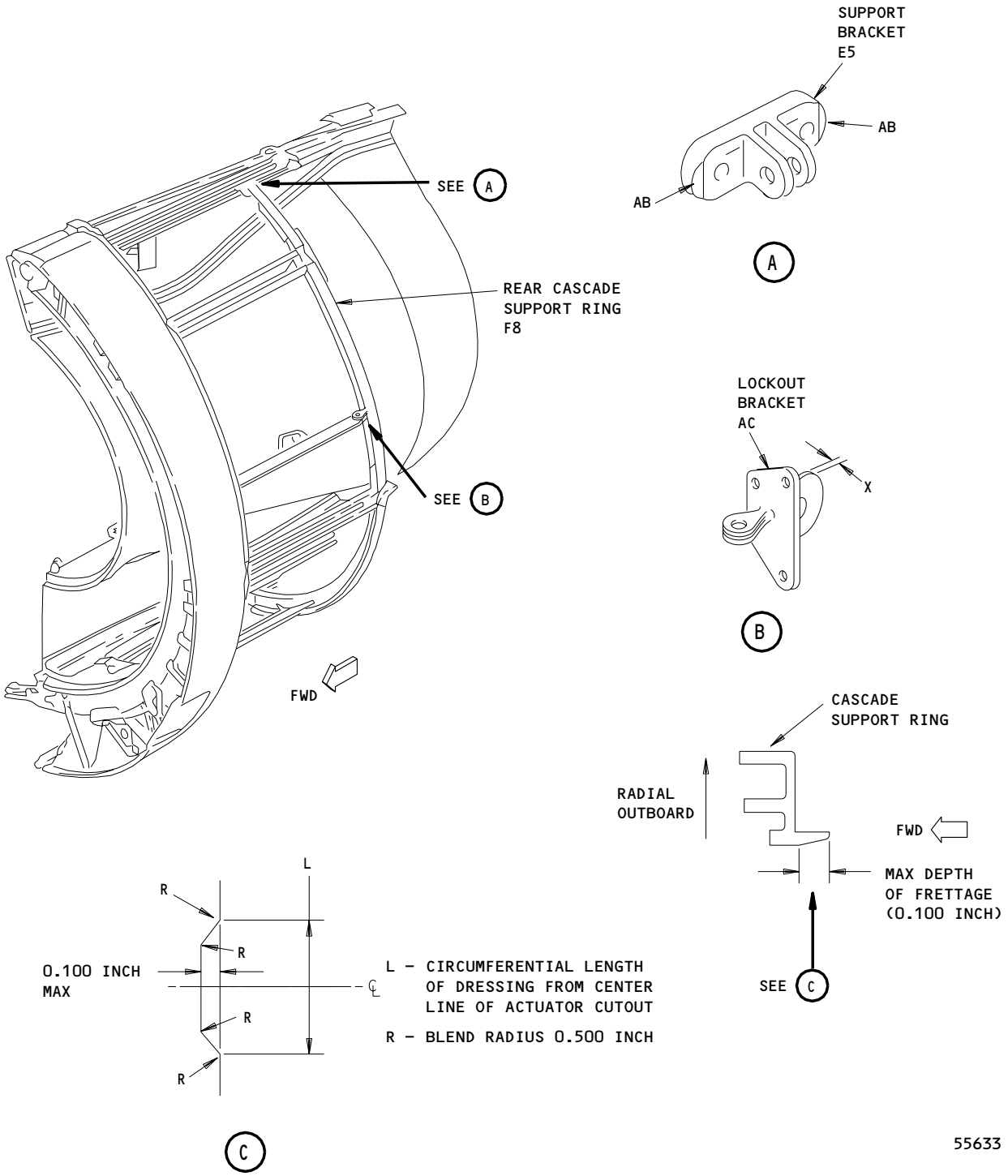
S 214-029-R00

(2) Make sure that the damage that you find is in these limits:

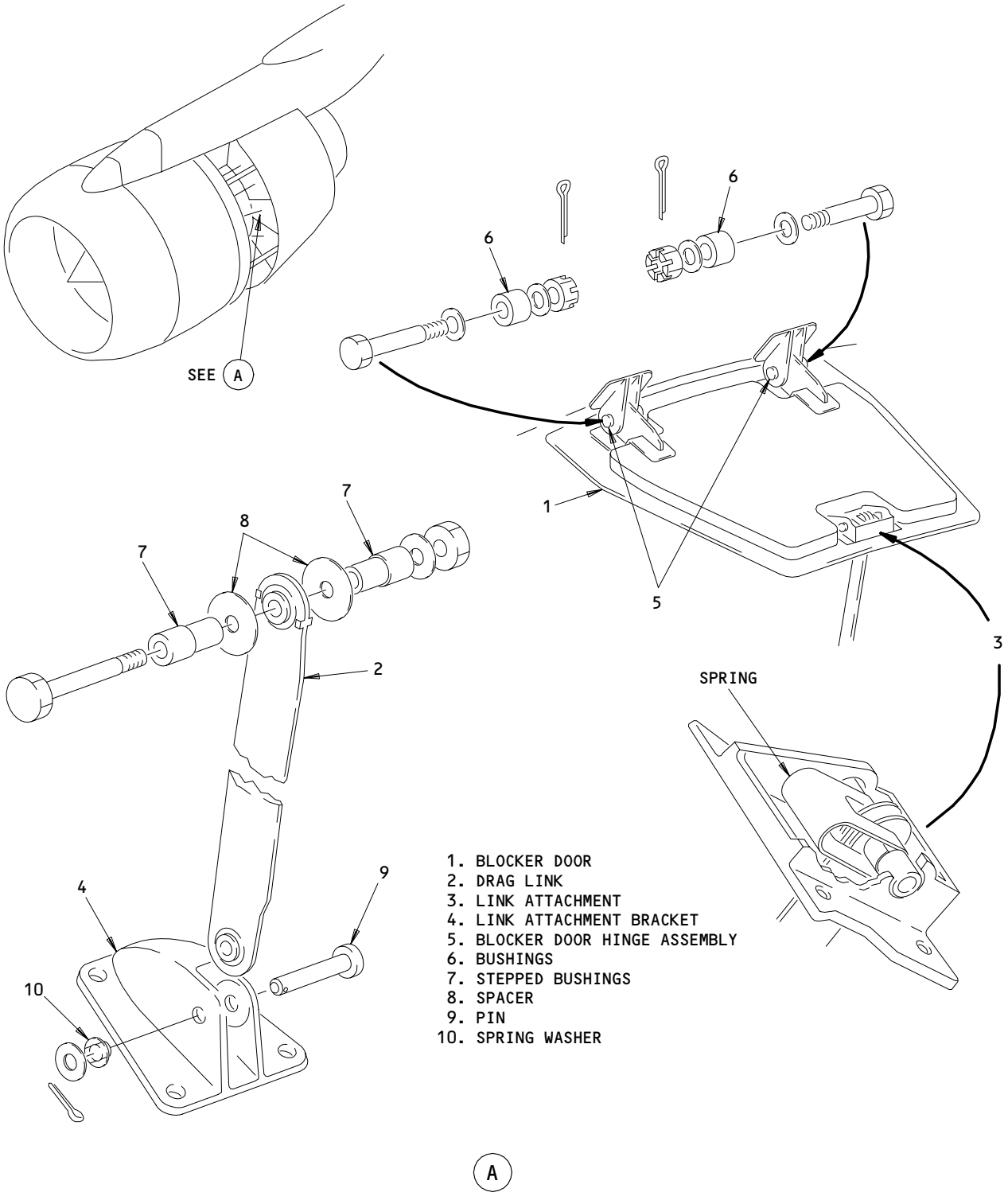
(a) Cracks are not allowed, replace the damaged part.

(b) Nick and gouges are acceptable if they are less than 0.040 inch (1.02 mm) in depth and 3.00 inch (76.20 mm) in length.

1) If the nicks or gouges have sharp edges, smooth the surface to FRS3253 (AMM 70-42-11/201).



Cascade Rear Support Ring – Inspection Details
Figure 401A



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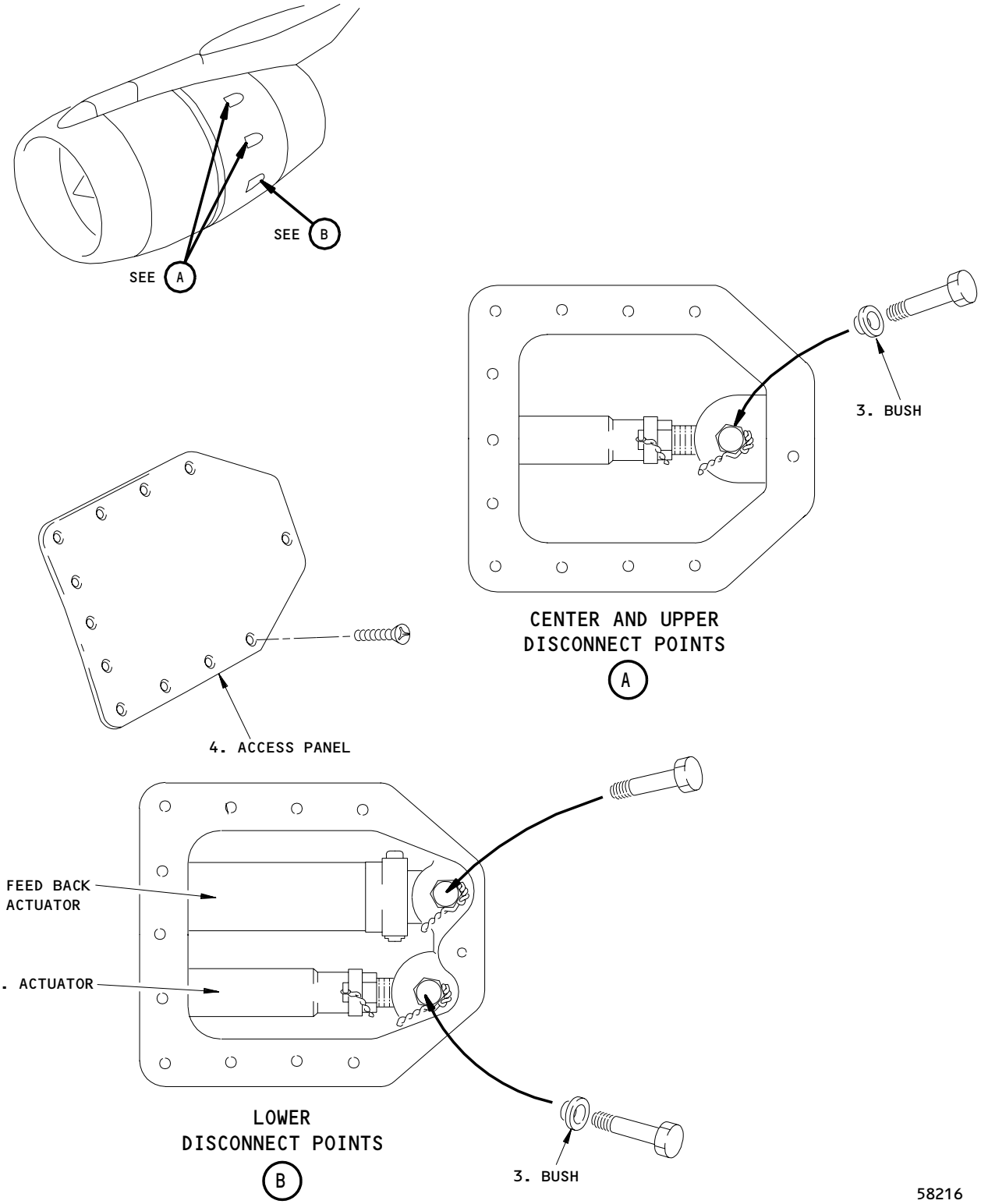
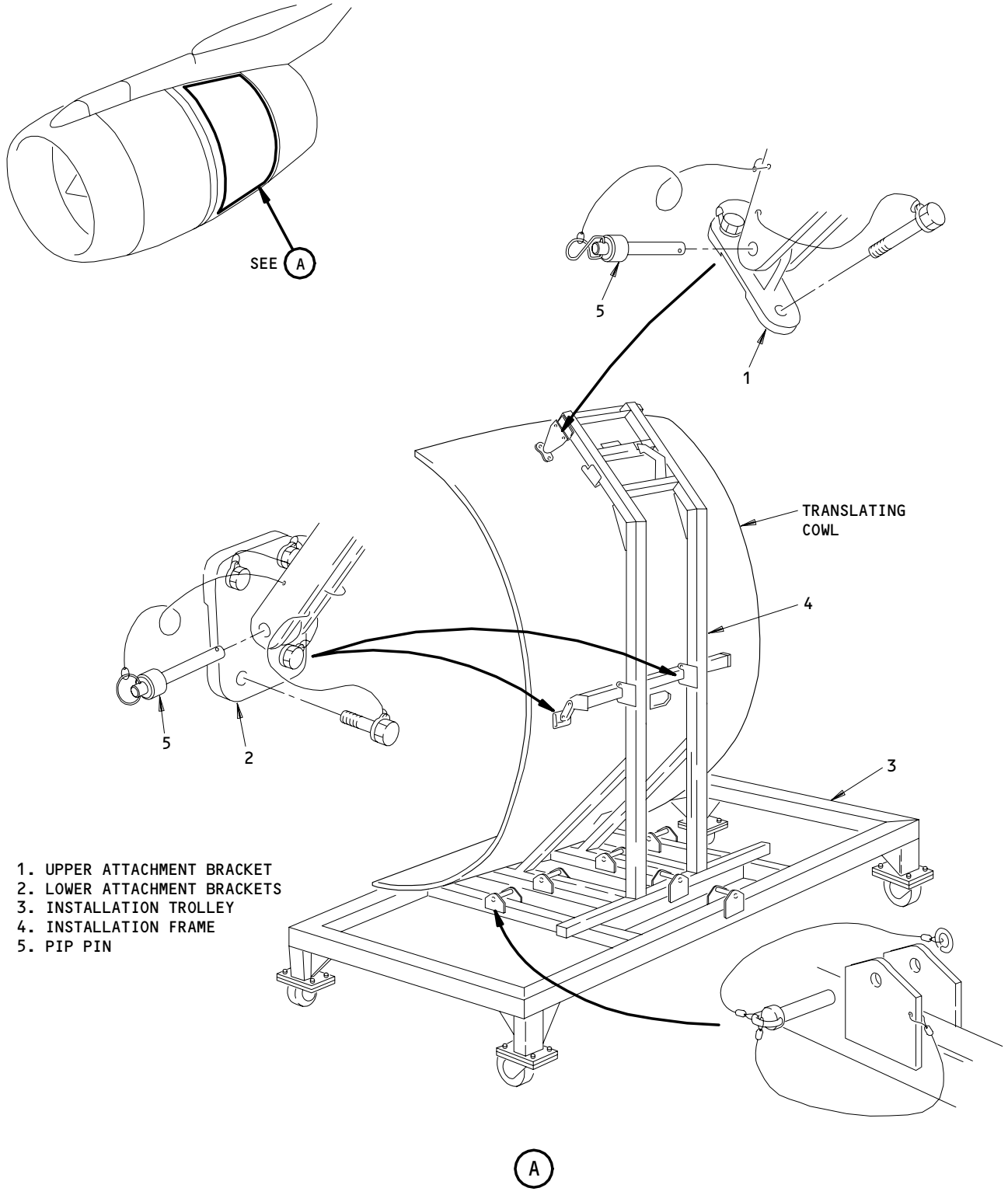
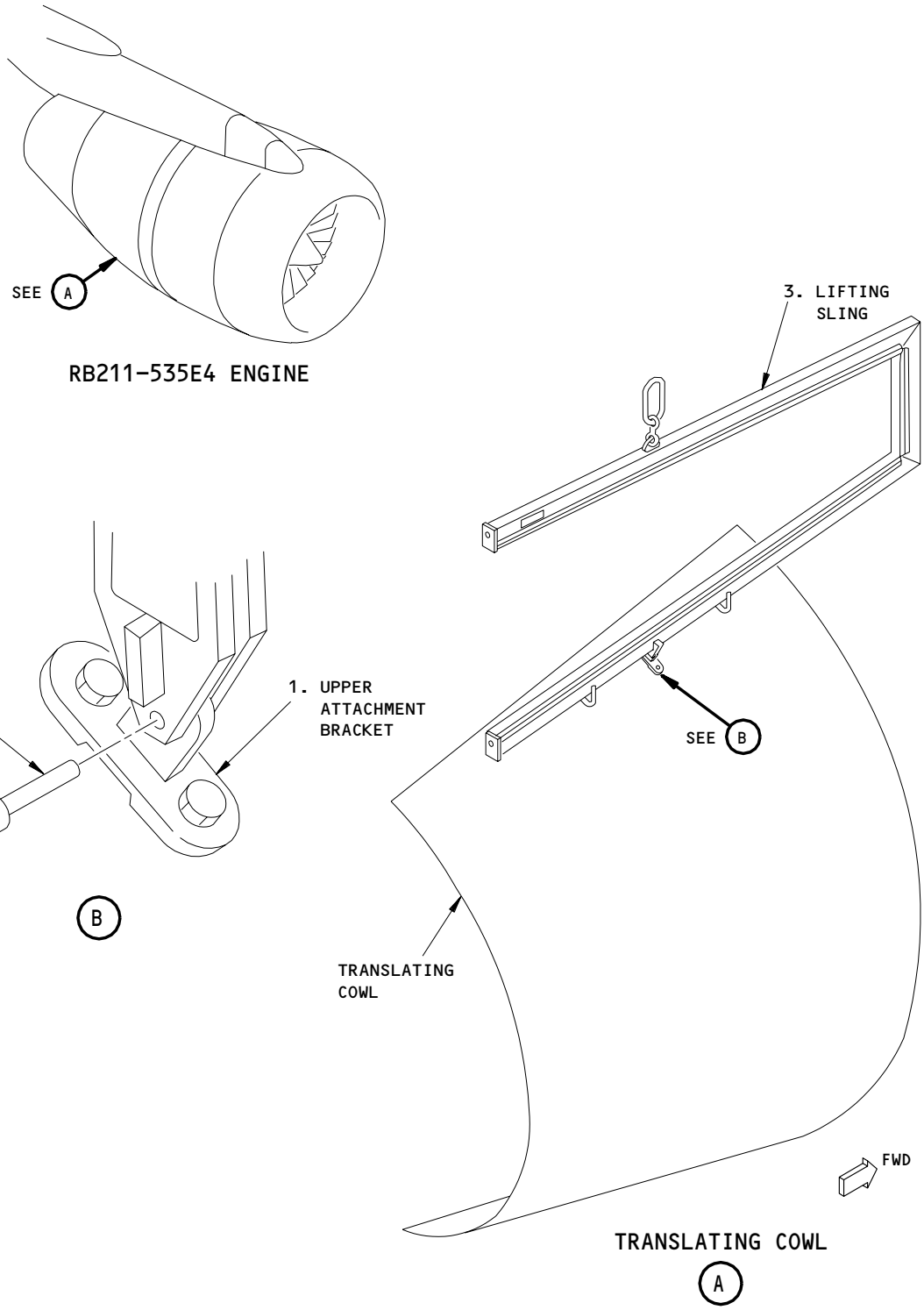
Blocker Door and Drag Link Installation
Figure 402



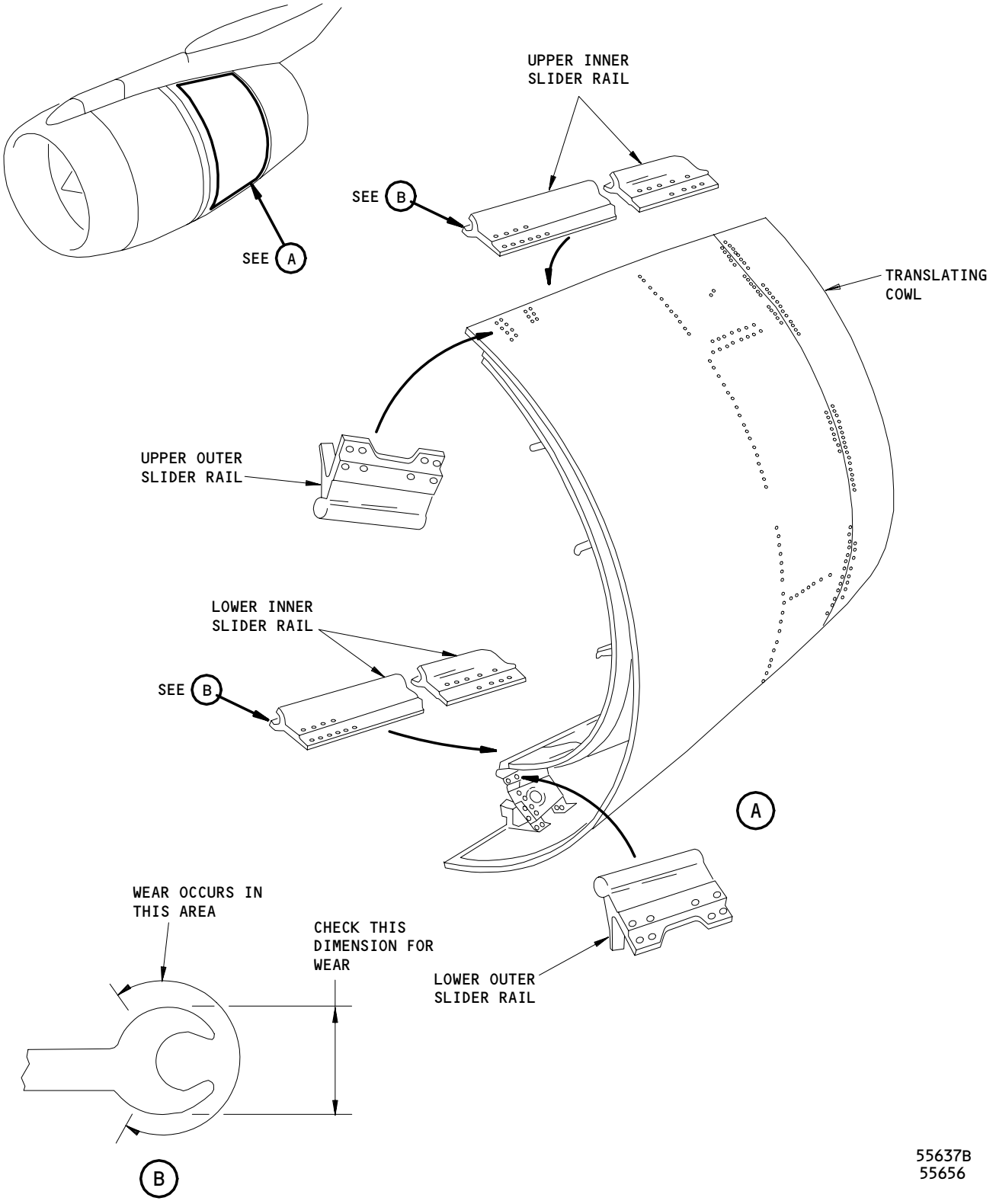
Actuator Disconnect Points
Figure 403



Translating Cowl - Installation
Figure 404



Translating Cowl Installation
Figure 404A



Translating Cowl – Slider Rail Installation
Figure 405

(c) The hard surface layer of the slider that is missing is acceptable.

S 214-030-R00

(3) Examine the diameter of the slide rails:
(a) Make sure that the diameter of the outer slide rail is 0.600 inch (15.24 mm) or greater.
1) If the rail is not in the limits, replace it.
(b) Make sure that the diameter of the inner slide rail is 0.956 inch (24.51 mm) or greater.
1) If the rail is not in the limits, replace it.

TASK 78-31-23-404-010-R00

4. Install the Thrust Reverser Translating Cowl

A. Equipment
(1) Installation Frame - Rolls-Royce CP30459/1
(2) Installation Trolley - Rolls-Royce CP30523
(3) Lifting Sling - Rolls-Royce CP30447

B. Consumable Materials
(1) GO2354 Lockwire, British Spec - DTD.189A: 22SWG, American Spec - 21 AWG, OMat No. 238
(2) GO2129 Tape, Adhesive - Vinyl, General Purpose (Permacel P-29)

C. References
(1) AMM 27-81-00/201, Leading Edge Slat System
(2) AMM 70-51-00/201, Torque Tightening Technique - Maintenance Practices
(3) AMM 78-30-00/501, Thrust Reverser Adjustment.
(4) AMM 78-31-00/201, Thrust Reverser System
(5) AMM 78-31-00/501, Thrust Reverser System
(6) AMM 78-34-07/401, Thrust Reverser Auto Restow Proximity Sensor

D. Access
(1) Location Zones
410 Left Engine
420 Right Engine

E. Procedure

S 434-011-R00

CAUTION: DO NOT USE LUBRICANTS ON THE THREADS DURING THE ASSEMBLY PROCEDURES IN THIS SECTION. STANDARD OR NON-STANDARD TORQUE LOAD VALUES ARE FOR DRY THREAD ASSEMBLY PROCEDURES. IF YOU USE LUBRICANTS, YOU CAN TIGHTEN THE ASSEMBLY TOO MUCH.

(1) Install the blocker flaps (Fig. 402)
(a) Install the blocker flap (1) in the translating cowl and attach with the securing details at the hinge assemblies (5).

(b) Tighten the nuts.
1) Install the cotter pins.
(c) Temporarily attach each blocker flap in the stowed position.
(d) Remove the auto restow proximity sensor (AMM 78-34-07/401).
1) Keep the shims for the installation.
2) Temporarily attach the sensor clear of the translating cowl location.

S 434-012-R00
(2) Make sure you install each actuator against the connection datum marker (AMM 78-30-00/501).

S 424-037-R00
(3) Install the translating cowl.
(a) Do these steps to install the translating cowl using the CP30459/1 Frame (4) and CP30523 Trolley (3) (Fig. 404).
1) Position the Trolley (3) with the translating cowl and installation frame (4) to the rear of the thrust reverser.
2) Attach an overhead hoist to the hoist locator on the installation frame (4).
3) Engage the translating cowl on the thrust reverser slider rails.
4) Move the translating cowl forward while you make sure that each actuator rod end engages its translating cowl mounting bracket.
(b) Do these steps to install the translating cowl using the CP30447 Lifting Sling (3).
1) Attach an overhead hoist to the Lifting Sling (3).

CAUTION: THE WING SLATS MUST BE RETRACTED BEFORE YOU POSITION THE LIFTING SLING ABOVE THE ENGINE. IF YOU DO NOT DO THIS, DAMAGE TO EQUIPMENT CAN RESULT.

2) Position the lifting sling (3) around the leading edge of the wing with the cowl at the rear of the thrust reverser.

3) Engage the translating cowl on the thrust reverser slider rails.
4) Move the translating cowl forward while you make sure that each actuator rod end engages its cowl mounting bracket.

S 084-038-R00

(4) Remove the lifting equipment.
(a) Do these steps to remove the CP30459/1 Frame (4) and CP30523 Installation Trolley (3) (Fig. 404).
1) Remove the PIP pins (5) from the upper attachment bracket (1) and the lower attachment brackets (2).
2) Move the installation trolley (3) and installation frame (4) clear of the engine.
3) Remove the attachment brackets (1) and (2) from the translating cowl.
4) Install the blanking screws at the attachment points.
(b) Do these steps to remove the CP30447 Lifting Sling (3) (Fig. 404A).
1) Remove the PIP pins (2).
2) Remove the attachment bracket (1) from the translating cowl.
3) Install the blanking screws at the attachment points.

S 434-015-R00

(5) Connect the actuators (Fig. 403)
(a) Install the bushes (3) and bolts to all three actuators (1).
1) Tighten the bolts (AMM 70-51-00/201).
(b) Install the bolt to the feedback actuator (2).
1) Tighten the bolt (AMM 70-51-00/201).

S 824-016-R00

(6) Adjust the translating cowl (AMM 78-30-00/501).
(a) Manually extend the thrust reverser to the reverse thrust position (AMM 78-31-00/201).

(b) Install the auto restow proximity sensor (AMM 78-34-07/401).
(c) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).
(d) Use the hydraulic system to move the translating cowl to the fully retracted position.

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 YOU OR DAMAGE TO EQUIPMENT.

(e) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).
(f) Do the adjustment procedure for the translating cowl (AMM 78-30-00/501).
(g) Install the access panels (3).

S 434-017-R00

(7) Connect the drag links (Fig. 402).
(a) Manually move the translating cowl approximately 3.0 inches (7.7 cm) (AMM 78-31-00/201).
(b) Remove the temporary securing details from the blocker flap.
(c) Remove the temporary securing details from the drag link.
(d) Put the drag link (2) in the blocker flap link attachment.
(e) Install the fit spacers (8) and attach the assembly with the bolt, washer and nut.
1) Make sure the stepped bushes (7) are in the correct positions in the blocker door spring and housing slot.
2) Tighten the nut.

S 864-023-R00

(8) Manually move the translating translate cowl to the fully retracted position (AMM 78-31-00/201).

S 444-022-R00

(9) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 444-036-R00

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

S 714-024-R00

(11) Do the thrust reverser tests that are listed in the test reference table (AMM 78-31-00/501).

(a) Measure the auto restow proximity sensor gap (AMM 78-30-00/501).

THRUST REVERSER TRANSLATING COWL - INSPECTION/CHECK

1. General
   A. Use the procedure that follows to examine the hydraulic opening actuators on the left and right sides of the thrust reversers.

TASK 78-31-23-206-002-R00

2. Inspection of the Translating Cowl of the Thrust Reverser
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-31-23/801, Thrust Reverser Translating Cowl
   B. Access
      (1) Location Zones
          415/425 Thrust Reverser, Left
          416/426 Thrust Reverser, Right

   C. Do the Inspection of the Translating Cowl of the Thrust Reverser (Fig. 601).

      S 216-013-R00

      CAUTION: DO NOT DO THIS PROCEDURE IF THE THRUST REVERSERS ARE OPEN. DAMAGE TO THE THRUST REVERSER COULD OCCUR IF THE THRUST REVERSERS ARE OPEN.

      (1) Make sure the thrust reversers are closed.

      S 986-016-R00
      (2) Manually extend the thrust reverser (AMM 78-31-00/201).

      S 216-012-R00
      (3) Do an inspection on the clevis brackets for the hinge fittings of the blocker flaps.
          (a) Look for cracks and surfaces which are worn.
          (b) If the maximum internal diameter of the pivot hole is not more than 0.417 inch (10.59 mm), the bracket can continue in operation.
          (c) If the inner diameter is more than 0.417 inch (10.59 mm), use the repairs FRS6011/FRS6026 or FRS6144 to replace the bracket (AMM 78-31-23/801).
          (d) If you find cracks, use the repairs FRS6011/FRS6026 or FRS6144 to replace the bracket (AMM 78-31-23/801).

S 216-011-R00

(4) Do an inspection of the flanged bushings for the hinge fittings of the blocker flaps.
   (a) Look for surfaces which are worn.
   (b) If the maximum inner diameter of the bushing is not more than 0.270 inch (6.858 mm), the bushing can be continued in operation.
   (c) If the minimum outer diameter is not less than 0.356 inch (9.042 mm), the bushing can continue in operation.
   (d) If the inner diameter is more than 0.270 inch (6.858 mm), or the minimum outer diameter is less than 0.356 inch (9.042 mm), reject the bushing.

S 216-015-R00

(5) Do an inspection for the inserts of the lockout pins.
   (a) Look for inserts which are damaged or missing.
   (b) If the inserts are missing, use the repair FRS6105 for the left thrust reverser and FRS6106 for the right thrust reverser to replace the inserts (AMM 78-31-23/801).

S 216-010-R00

(6) Do an inspection for the blocker flap bumpers.
   (a) Look for bumpers which are missing.
   (b) If the bumpers are missing, use these repairs to replace the bumpers: FRS6012 for the left thrust reverser and FRS6027 for the right thrust reverser (AMM 78-31-23/801).

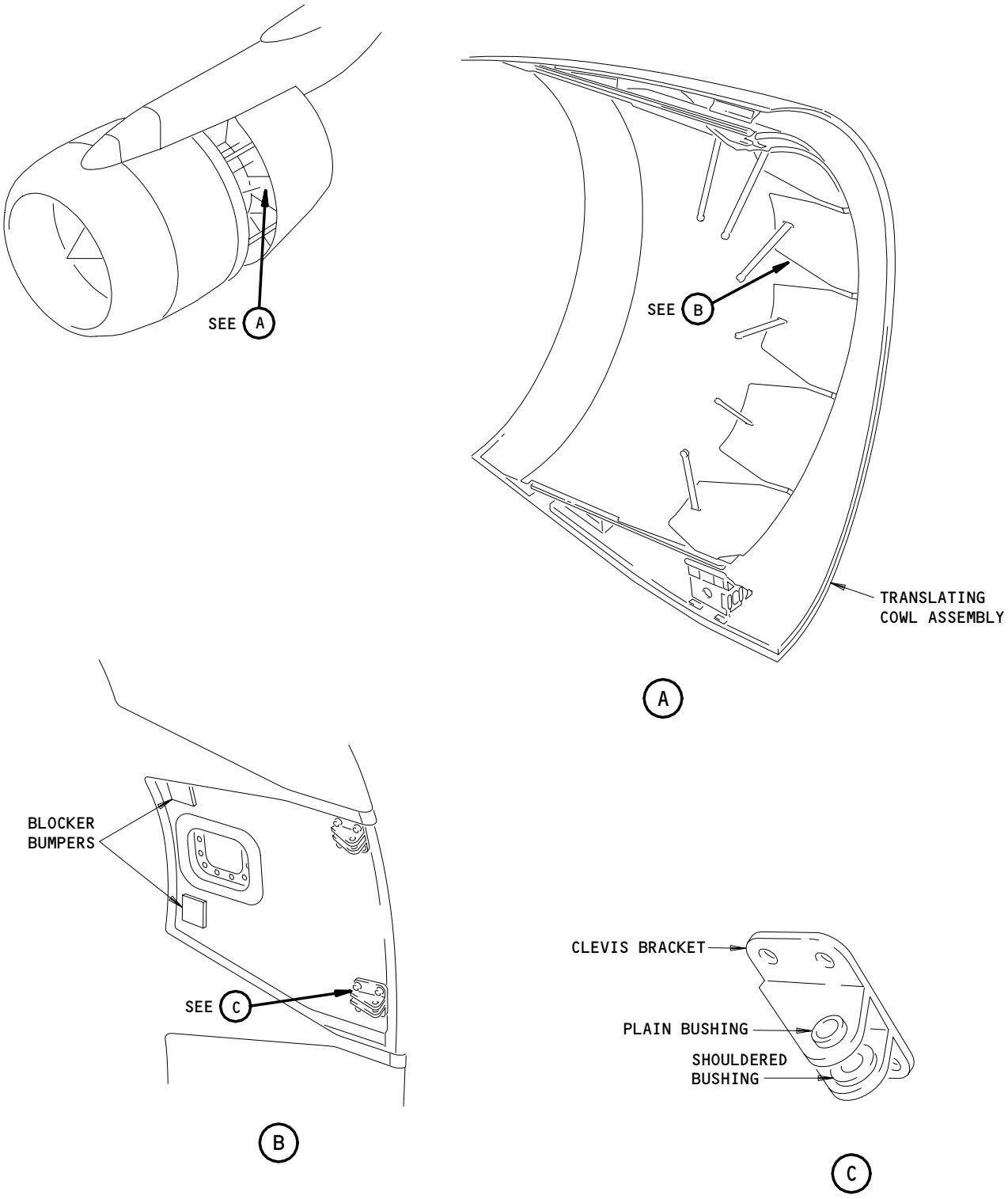
S 216-007-R00

(7) Do an inspection of the nut, plug, and collar of the lockout pin.
   (a) Look for parts which are missing.
   (b) If the parts are missing, use the repair FRS6103 for the left thrust reverser and FRS6104 for the right thrust reverser to replace the parts (AMM 78-31-23/801).

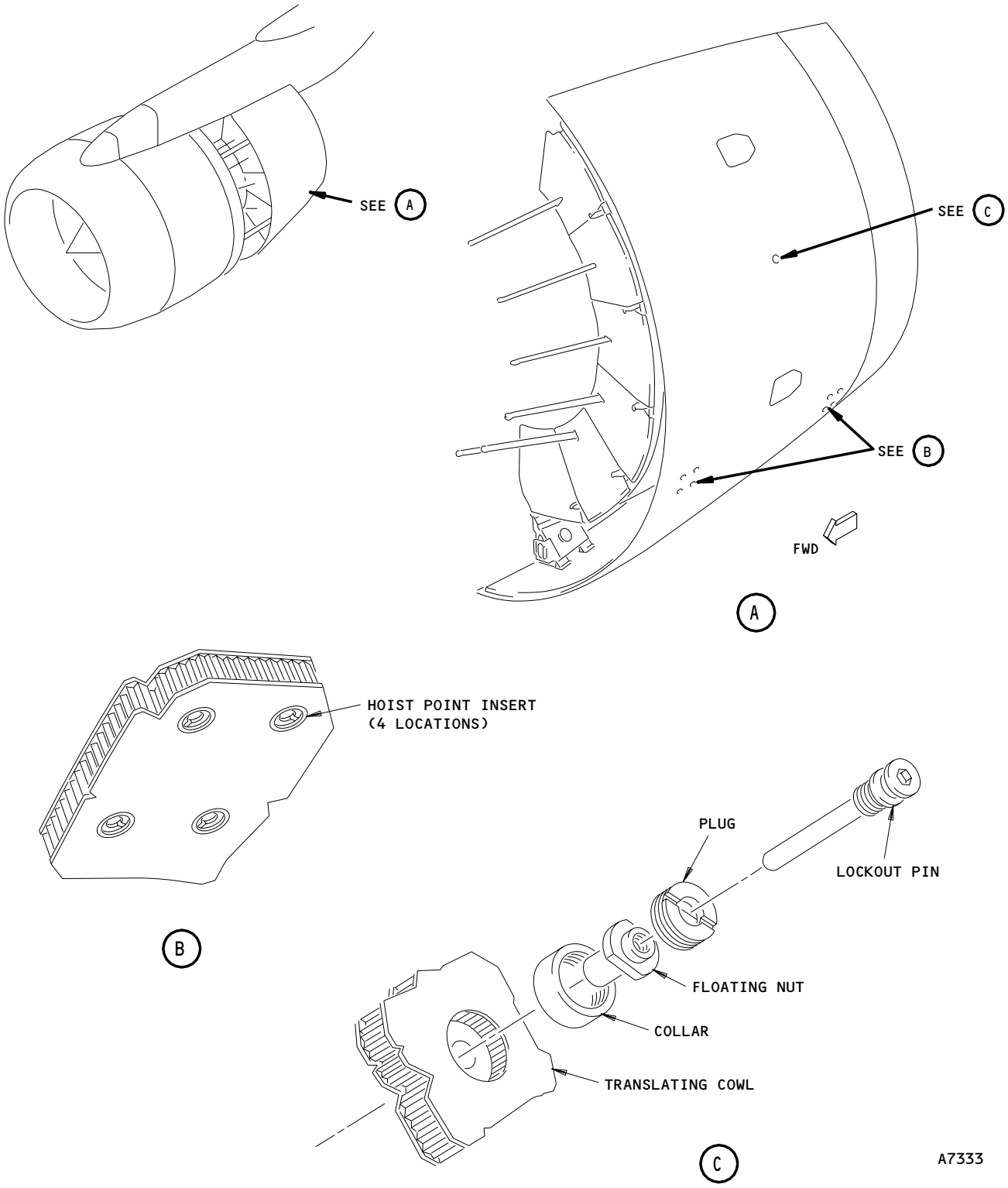
S 216-008-R00

(8) Do an inspection of the leading edge of the perforated panel.
   (a) Examine the triangular fairing and the strengthening rib below the fairing.

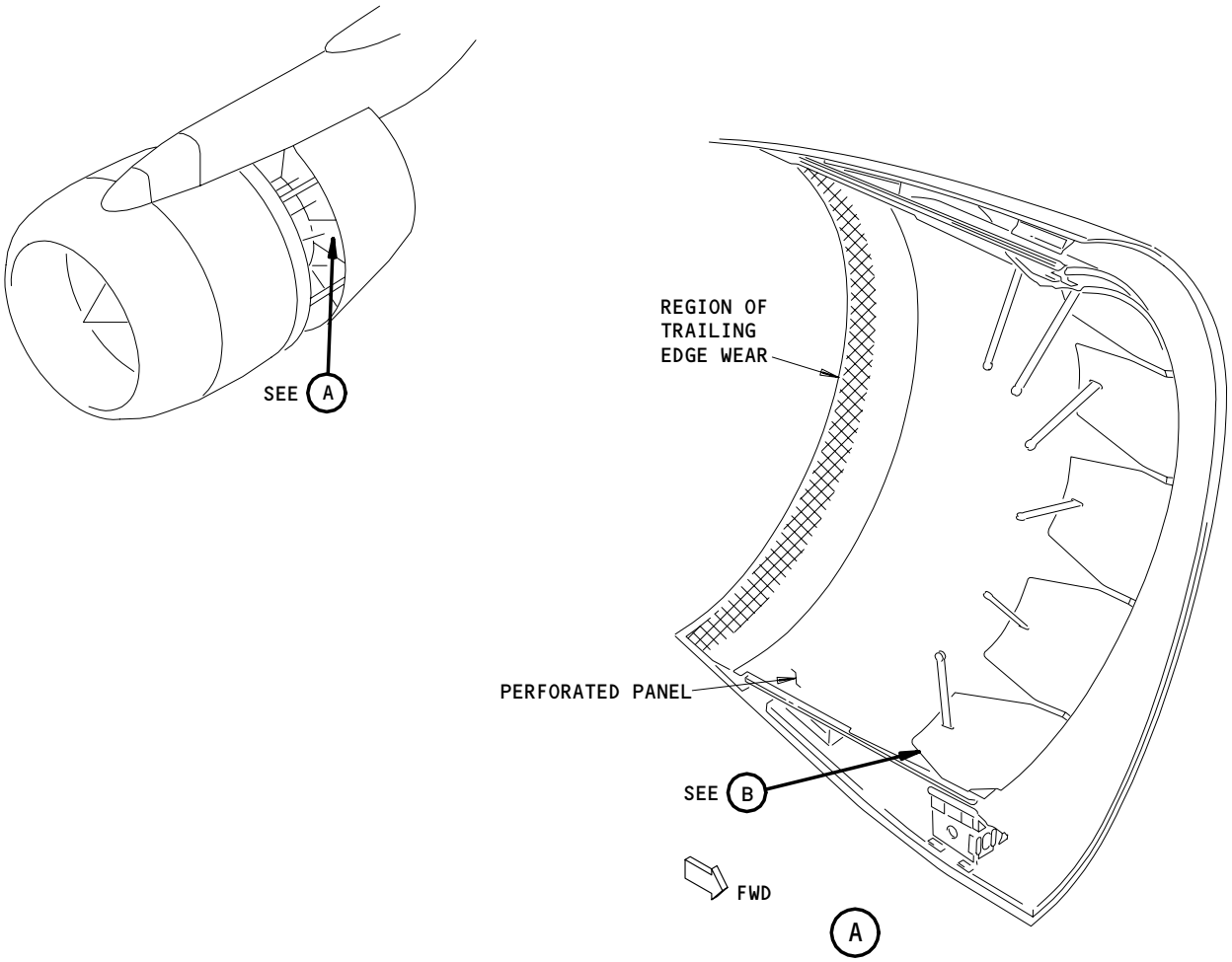
      NOTE: These are found between the top and lower blocker flaps and the bifurcation.



Translating Cowl - Inspection/Check
Figure 601



Translating Cowl - Inspection/Check
Figure 602



NOTE: TYPICAL AT FOUR POSITIONS.

Translating Cowl - Inspection/Check
Figure 603

(b) Look for cracks, other damage, and parts which are missimg.
(c) If damage is found, repair with FRS6257 (AMM 78-31-23/801).
(d) If cracks are found, repair with FRS6257 (AMM 78-31-23/801).
(e) If a piece of the end is missing, repair with FRS6257 (AMM 78-31-23/801).

S 226-022-R00

(9) Do an inspection of the perforated panel (Fig. 601) for the following damage:

NOTE: Use repair procedure FRS.6041/6042 (AMM 78-31-20/801) to repair the perforated panel.

(a) Examine the panel for cracks.
  1) Cracks that are not more than 3.0 inch (76.2 mm) along the circumference of the panel - Accept
  2) Cracks that are not more than 1.0 inch (25.4 mm) along the length of the panel - Accept.
  3) Cracks that are less than 3.0 inch (76.2 mm) from the edge of the panel - Reject.
  4) The distance between the cracks must be more than 10.0 inch (254 mm).
(b) Examine the panel for dents and dents with cracks.
  1) Dents that are not more than 2.0 inch (50.8 mm) in diameter and 0.10 inch (2.5 mm) in depth - Accept.
  2) The distance between the cracks must be more than 10.0 inch (254.0 mm).
  3) The length of the crack must not be more than 0.5 inch (12.7 mm).
(c) Examine the panel for holes.
  1) Holes that are not more than 0.5 inch (12.7 mm) in diameter - Accept.
  2) The distance between the holes must be more than 10.0 inch (254.0 mm).
(d) Examine the panel for nicks and gouges.
  1) Gouges or nicks not more than 4.0 inch (101.6 mm) in length, 0.05 inch (1.3 mm) wide and 0.010 inch (0.254 mm) in depth - Accept.

S 226-021-R00

(10) Do an inspection of the outer panel outer skin for debonding and delaminations.
  (a) Debond not more than 3.0 inch (76.2 mm) in length - Accept.
  (b) Areas of debond must be more than 10.0 inch (254.0 mm) from other debond or damage and more than 3.5 inch (89.0 mm) from edges, pandowns and built up areas.
  (c) A maximum of 5 debonds on each panel is permitted.
  (d) Debonds and delaminations must be examined at every "A" check.
  (e) Debonds and delaminations that extend and are more than the limits above must be repaired at the next "C" check.

S 216-006-R00

(11) Do an inspection of the hoist points.
  (a) Look for hoist point inserts and grub screws which are damaged or missing.
    1) It is permitted to have inserts which are damaged or missing.

      NOTE: Make a record to do the repairs FRS6259 for the left thrust reverser and FRS6258 for the right thrust reverser (AMM 78-31-23/801). You can do these repairs subsequently. But, make sure the repairs are done before the translating cowl is removed again.

    2) It is permitted to have grub screws which are damaged or missing.

S 216-005-R00

(12) Do an inspection of the trailing edge of the inner skin.
  (a) Look at the area where the filler touches the rub blocks of the common nozzle assembly.
    1) It is permitted to have worn areas on the surface of the filler.

(b) Examine the trailing edge filler.
1) Look for damage to the structure below the filler.
a) It is permitted to have damage which is not more that 0.008 inch (0.203 mm) in depth.
(c) Damage to the structure below the filler which is not more than the limits below can be repaired with FRS6410 (AMM 78-31-23/801).
1) Damage which is between 0.008 inch (0.203 mm) and 0.025 inch (0.635 mm) in depth.
2) Damage which is between 0.025 inch (0.635 mm) and 0.035 inch (0.890 mm) in depth in a maximum of three adjacent locations
3) Damage which is between 0.035 inch (0.890 mm) and 0.040 inch (1.01 mm) in depth in one rub location. But, only if the damage to the adjacent locations are not more than 0.025 inch (0.635 mm) in depth.
(d) Damage to the surface which is more than these limits is not permitted.

S 986-017-R00

(13) Manually retract the thrust reverser (AMM 78-31-00/201).

THRUST REVERSER TRANSLATING COWL - APPROVED REPAIRS

1. General
   A. This procedure contains these tasks:

Repair Number	Title
FRS6011/6026	Translating Cowl - Replacement of Damaged Blocker Door Cowl Hinge
FRS6144	Translating Cowl - Replacement of Damaged Blocker Door Cowl Hinge
FRS6081/6082	Translating Cowl - Replacement of the Forward Seal
FRS6105/6106	Translating Cowl - Replacement of Lockout-Pin Insert
FRS6012/6027	Translating Cowl - Replacement of Blocker Door Bumper
FRS6103/6104	Translating Cowl - Replacement of Lockout-Pin Nut, Plug, and Collar
FRS6256/6257	Translating Cowl - Repair of Perforated Panel Leading Edge
FRS6259/6258	Translating Cowl - Replacement of Hoist Point Insert Assembly
FRS6385	Translating Cowl - Outer Panel Edge/crack Repair
FRS6410	Translating Cowl - Repair of Frettage Damage

TASK 78-31-23-908-067-R00

2. Replacement of the Blocker Door Cowl Hinge for the Thrust Reverser
   A. General
      (1) The repairs in this task are FRS6011 and FRS6026. The repair FRS6011 applies to the left thrust reverser and the repairs FRS6026 applies to the right thrust reverser.
      (2) This task gives instructions for the replacement of blocker door cowl hinge to these Rolls Royce assembly numbers:
         (a) LJ75009 - Pre RR SB 78-7739 for Assembly A - RR SB 78-7739 for Assembly B
         LJ76875 RR SB 78-C208
         LJ77079 RR SB 78-D617

(b) LJ75010 - Pre RR SB 78-7739 for Assembly A - RR SB 78-7739 for Assembly B
LJ76876 RR SB 78-C208
LJ77080 RR SB 78-D617

B. Equipment
(1) Hi-Lok installation equipment

C. Parts
(1) Hinge fitting - Rolls Royce LJ71831 or LJ71832 - Assembly A, Rolls Royce LJ76100 or LJ76101 - Assembly B
(2) Laminated shim - Rolls Royce LJ70375
(3) Pin - HL10V5-5 (Hi-Lok Products) (RR3408477)
(4) Nut - MS21042-08 (Local Resources) (RR2308500)
(5) Washer - AN960-8L (Local Resources) (RR2308499)
(6) Bushing - (Local Resources) NAS75-4-006 (RR2206892) - Assembly A, S700B0116-4D014 - Assembly B
(7) Bolt - (Local Resources) NAS6404-12D - Assembly A, NAS6404U11 - Assembly B
(8) Nut - AN310-4 (RR2206975) - Assembly A, MS21043-4 - Assembly B
(9) Washer - AN960-416L (2 off) (Local Resources)
(10) Cotter Pin - MS24665-172 - Assembly A (Brass 0.063 in. Dia X 0.748 in. long) (RR2206981)
(11) Pin - LGPL9SP - V05A23AC (RR3408658)
(12) Pin - LGPL9SP - V05A22AC (RR3408657)
(13) Pin - LGPL9SP - V05A20AC (RR3408783)
(14) Collar - SLFCA - 005
(15) Bushing - S700B0116 - 4D012 - Assembly B
(16) Washer - Rolls Royce LJ75790 - Assembly B

D. Consumable Materials
(1) Primer, Bostik, 463-6-27
OMat No. - 7/157
(2) Cure solution, Bostik, X-354
(3) Adhesive, 2 part, EA956
Dexter Corp., Pittsburg, CA
OMat No. - 8/117

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-24/401, Thrust Reverser Blocker Doors

F. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

G. Procedure

S 868-005-R00

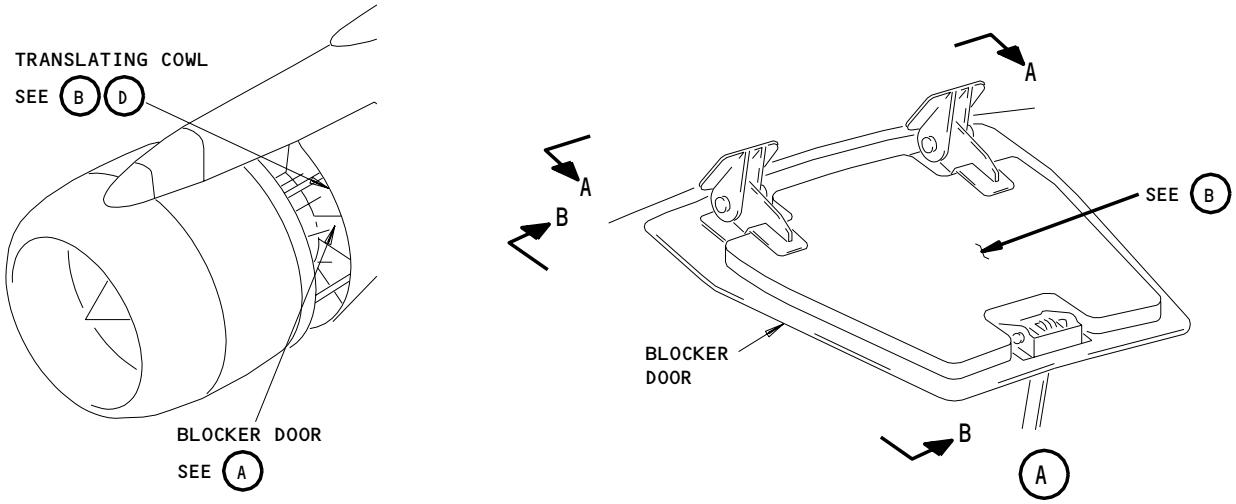
WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

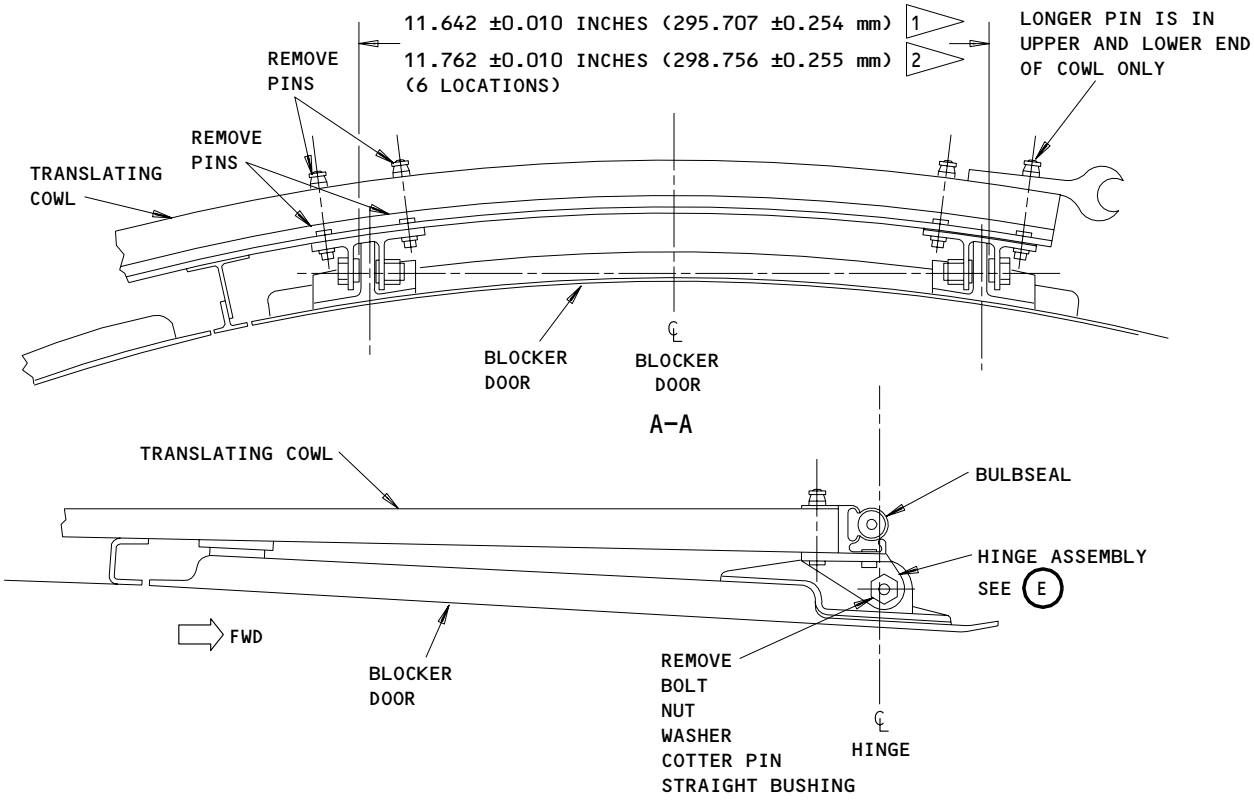
(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 868-002-R00
(2) Manually extend the thrust reverser (AMM 78-31-00/201).

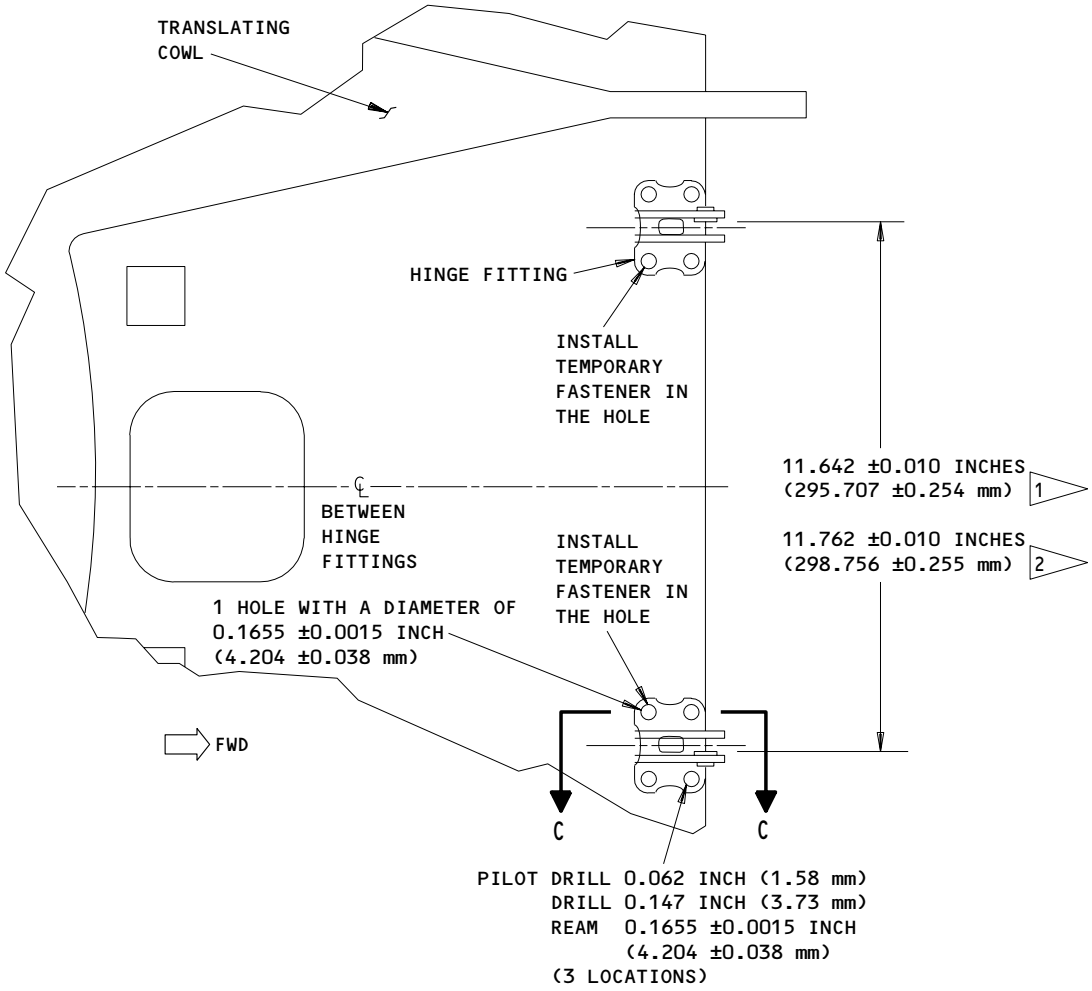
S 028-003-R00
(3) Remove the damaged hinge assembly (Fig. 801):
(a) Remove and discard the cotter pin, nut, bolt, washers, and bushing at two locations to disconnect the blocker door from the hinge assembly.
(b) Carefully remove the rubber bulb seal from the retainer. Keep the seal if it is serviceable.
(c) Remove the Hi-Lok pins.
(d) Discard the damaged hinge assembly.

S 428-004-R00
(4) Install the new hinge assembly (Fig. 801):
(a) Laminate the shim of the new hinge assembly.



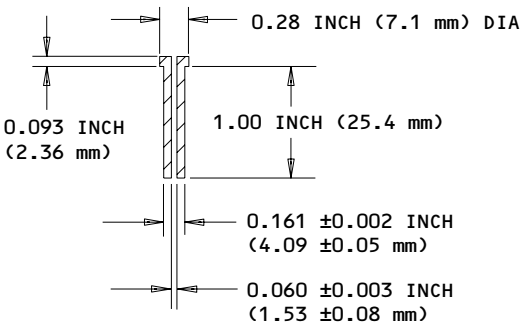


Blocker Door Hinge Assembly - Repair Details
Figure 801 (Sheet 1)



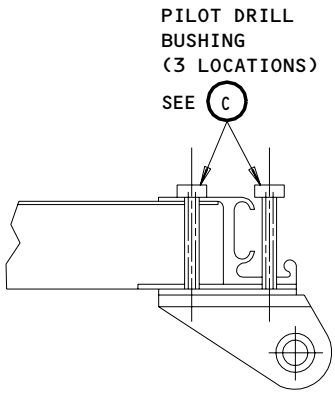
TRANSLATING COWL WITHOUT HINGE ASSEMBLIES INSTALLED

B



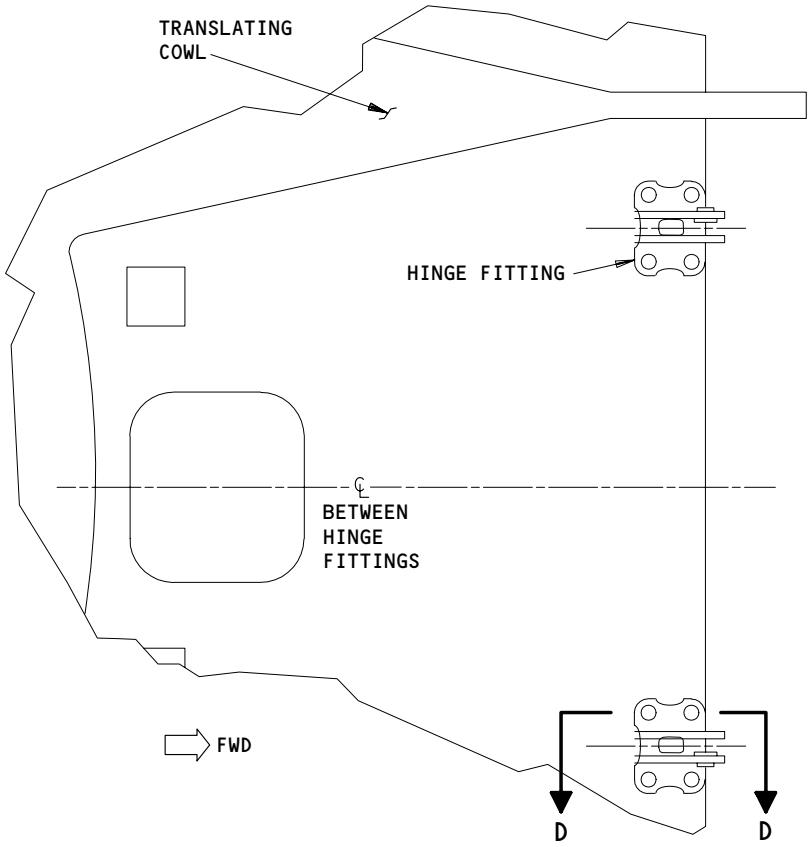
DETAIL OF PILOT DRILL BUSHING

C



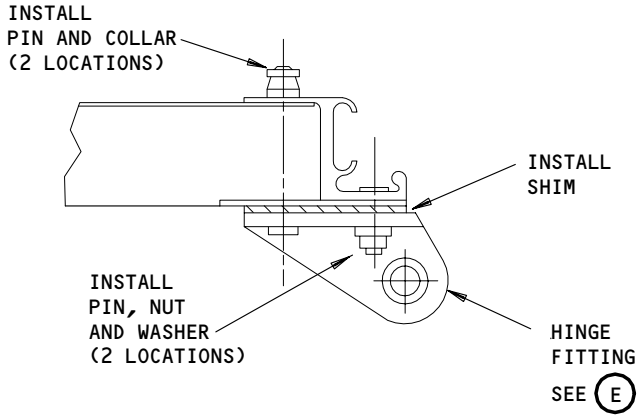
C–C

Blocker Door Hinge Assembly – Repair Details
Figure 801 (Sheet 2)



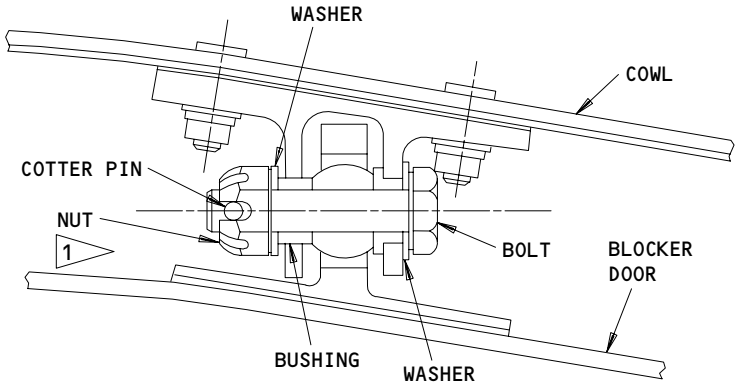
TRANSLATING COWL WITH HINGE ASSEMBLIES INSTALLED

(D)



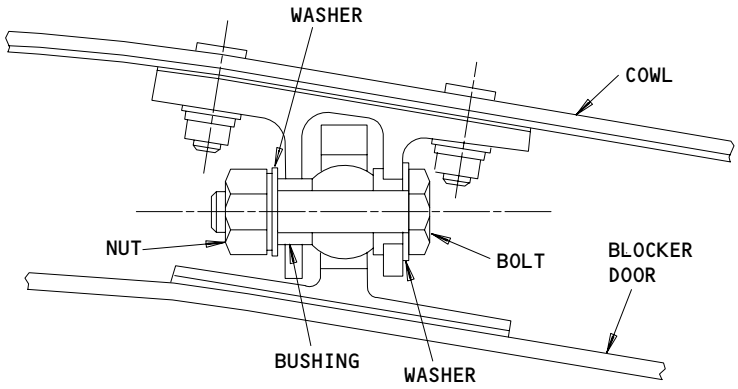
D–D

Blocker Door Hinge Assembly – Repair Details
Figure 801 (Sheet 3)



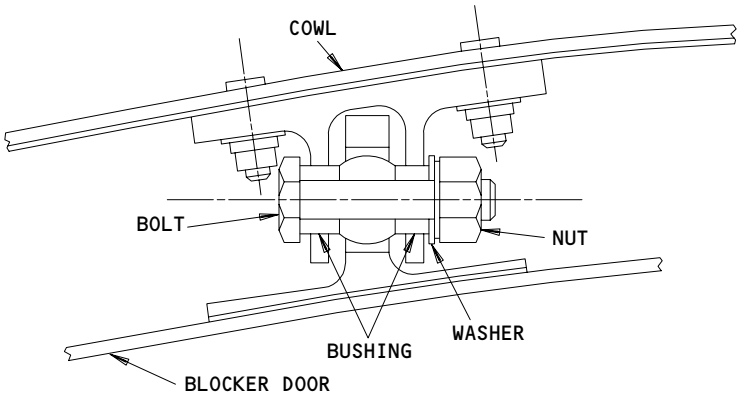
(LEFT SHOWN, RIGHT OPPOSITE)

E 1



FLOATING HINGE

E 2



NON-FLOATING HINGE

E 2

Blocker Door Hinge Assembly - Repair Details
Figure 801 (Sheet 4)

(b) Temporarily install the hinge assembly and shim in position with a pin and nut through the drilled hole.
1) Tighten the nut lightly.
(c) Install the blocker door to the hinge assembly with the bushings, bolts, nut, and washers.
1) Tighten the nut lightly.
(d) Make sure that the clearance on all around the blocker door in the closed position is equal.
(e) Back drill and ream the diagonally opposite hole with the drilling bushing and pilot drill.
(f) Install the hi-lok pin, the nut, and the washer.
1) Tighten the nut lightly.
(g) Remove the blocker door (AMM 78-31-24/401).
(h) Back drill and ream the remaining two holes through the translating cowl with the drilling bushing and pilot drill.
(i) Remove the hi-lok fasteners that you fitted and deburr before.
(j) Remove the sharp edges of the three holes drilled in the hinge fitting.

S 428-063-R00

(5) Install the hinge assembly again:

CAUTION: YOU MUST INSTALL THE FASTENERS AS DETAILED. THIS CAN PREVENT DAMAGE TO THE HINGE ASSEMBLY.

(a) Install the hinge assembly and shim.
(b) Wet install the pins, collar, nut, and washers with the adhesive (Fig. 801).

NOTE: Use the pin HL10V22 in position of pin HL10V-18 on upper and lower blocker door hinge assemblies on the translating cowl.

1) Tighten the nut to 12.0-15.0 lb-in (1.35-1.69 Nm).
(c) Install the blocker door to the hinge assembly with the bolt, bushing, washers, and nut (AMM 78-31-24/401) (Fig. 801).
1) Tighten the nut to 12.0-15.0 lb-in (1.35-1.69 Nm).

(d) Install the cotter pin to lock the nut.
(e) Examine the clearance between the fasteners and the hinge assemblies with the blocker door in the closed and extended positions (AMM 78-31-24/401).
(f) Examine the operation of the blocker door from the closed position to the extended position.
1) Make sure it is a smooth firm pivoting with no binding, axial, or radial free motion.
(g) Install the old or new bulb seal (Refer to Step (3)(b)).
(h) Apply primer and curing solution with a brush as necessary.
(i) Cure at room temperature 68 degree F (20 degree C) for 30 minutes for no tacky condition and 24 hours to fully cure.

S 868-006-R00

(6) Manually retract the thrust reverser (AMM 78-31-00/201).

S 868-008-R00

(7) Write the repair number adjacent to the thrust reverser nameplate.

NOTE: Repair number FRS6011 is for left thrust reverser and the repair number FRS6026 is for right thrust reverser.

(a) Use a permanent ink pen with a color that can be easily seen.

S 868-007-R00

(8) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-968-070-R00

3. Replacement of the Damaged Blocker Door Hinge for the Thrust Reverser

A. General

(1) The repair in this task is FRS6144. The repair number FRS6144 applies to the thrust reverser with these Rolls Royce assembly numbers:
(a) LJ75009 or LJ75010 - Pre RR SB 78-7739 - Assembly A
(b) LJ75009 or LJ75010 - RR SB 78-7739 - Assembly B

B. Equipment

(1) Hi-lok installation equipment

C. Parts
(1) Hinge fitting - Rolls Royce LJ70171 or LJ70172 for Assembly A, Rolls Royce LJ76100 or LJ76101 for Assembly B
(2) Pin - HL10V5-18 (Hi-Lok Products) (RR3408478)
(3) Laminated shim - Rolls Royce LJ70375
(4) Pin - HL10V5-5 (Hi-Lok Products) (RR3408477)
(5) Collar - HL70-5 (Hi-Lok Products) (RR3408506)
(6) Nut - MS21042-08 (Local Resources) (RR2308500)
(7) Washer - AN960-8L (Local Resources) (RR2308499)
(8) Bushing - NAS75-4-4-006 (RR2206982) - Assembly A, S700B0116-4D014 - Assembly B
(9) Bolt - NAS6404-12D (RR2206985) - Assembly A, NAS6404U11 - Assembly B
(10) Nut - AN310-4 (RR2206975) - Assembly A, MS21043-4 - Assembly B
(11) Washer - AN960-416L (2 off) (Local Resources)
(12) Cotter Pin - MS24665-172 (RR2206981) (Brass, 0.063 in. dia. X 0.748 in. long)

D. Consumable Materials
(1) Primer, Bostik, 463-6-27
OMat No. - 7/157
(2) Cure solution, Bostik X-354
(3) Adhesive - 2 part, EA956
Dexter Corp., Pittsburg, CA
OMat No. - 8/117

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-24/401, Thrust Reverser Blocker Doors

F. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

G. Procedure

S 868-009-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

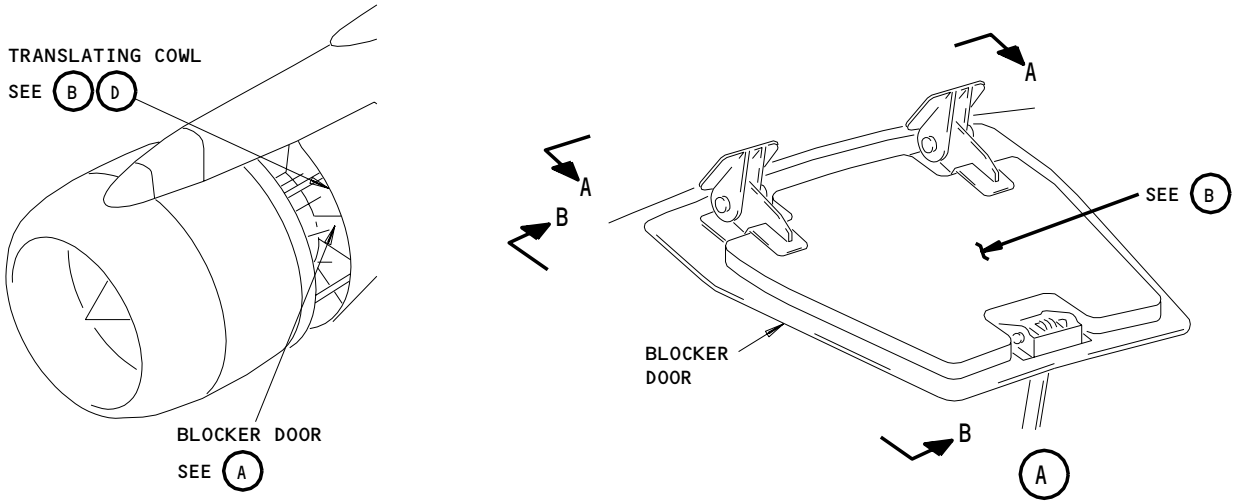
S 868-010-R00
(2) Manually extend the thrust reverser (AMM 78-31-00/201).

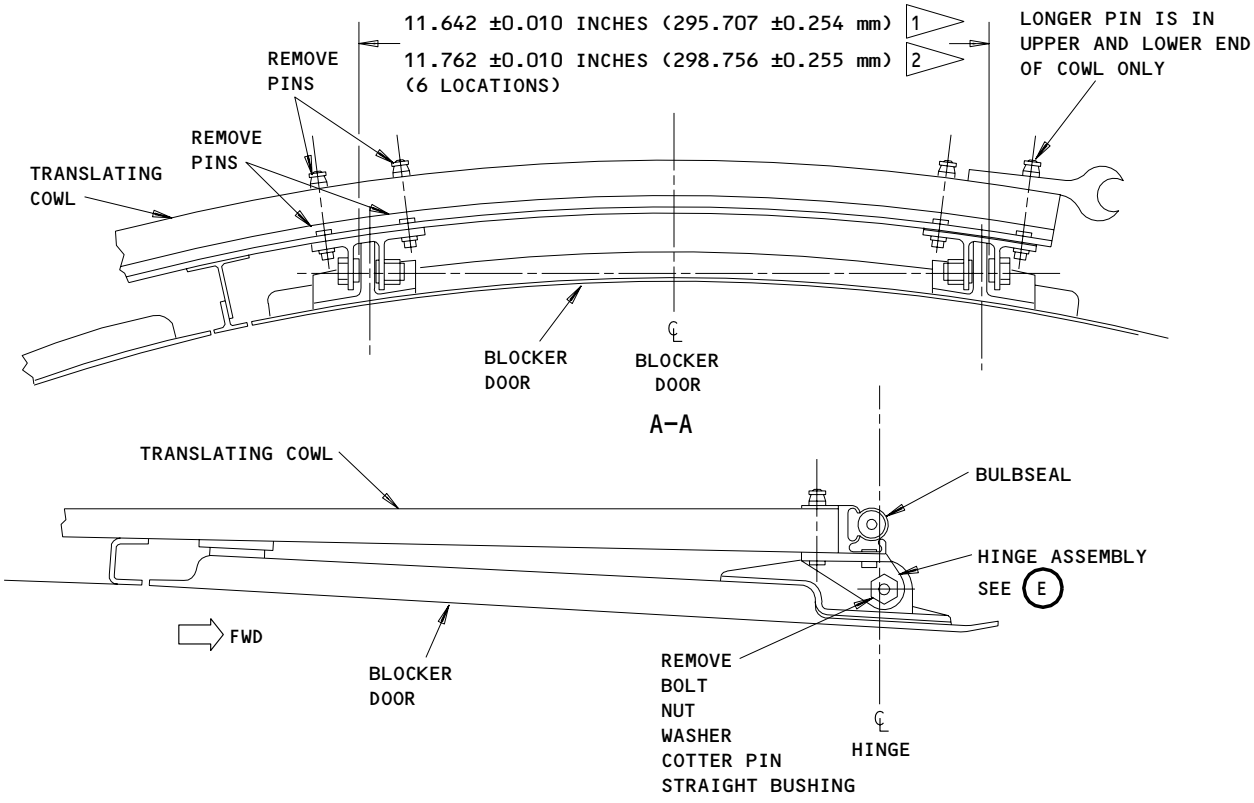
S 028-011-R00
(3) Remove the damaged hinge assembly (Fig. 802):
  (a) Remove and discard the cotter pin, nut, washers, and bushings at two locations to disconnect the blocker door from the hinge assembly.
  (b) Carefully remove the rubber bulb seal from the retainer. Keep the seal if it is serviceable.
  (c) Remove the Hi-Lok pins (4 off).
  (d) Discard the damaged hinge assembly.

S 428-012-R00
(4) Install the new hinge assembly (Fig. 802):
  (a) Examine the bushing in the new hinge assembly:

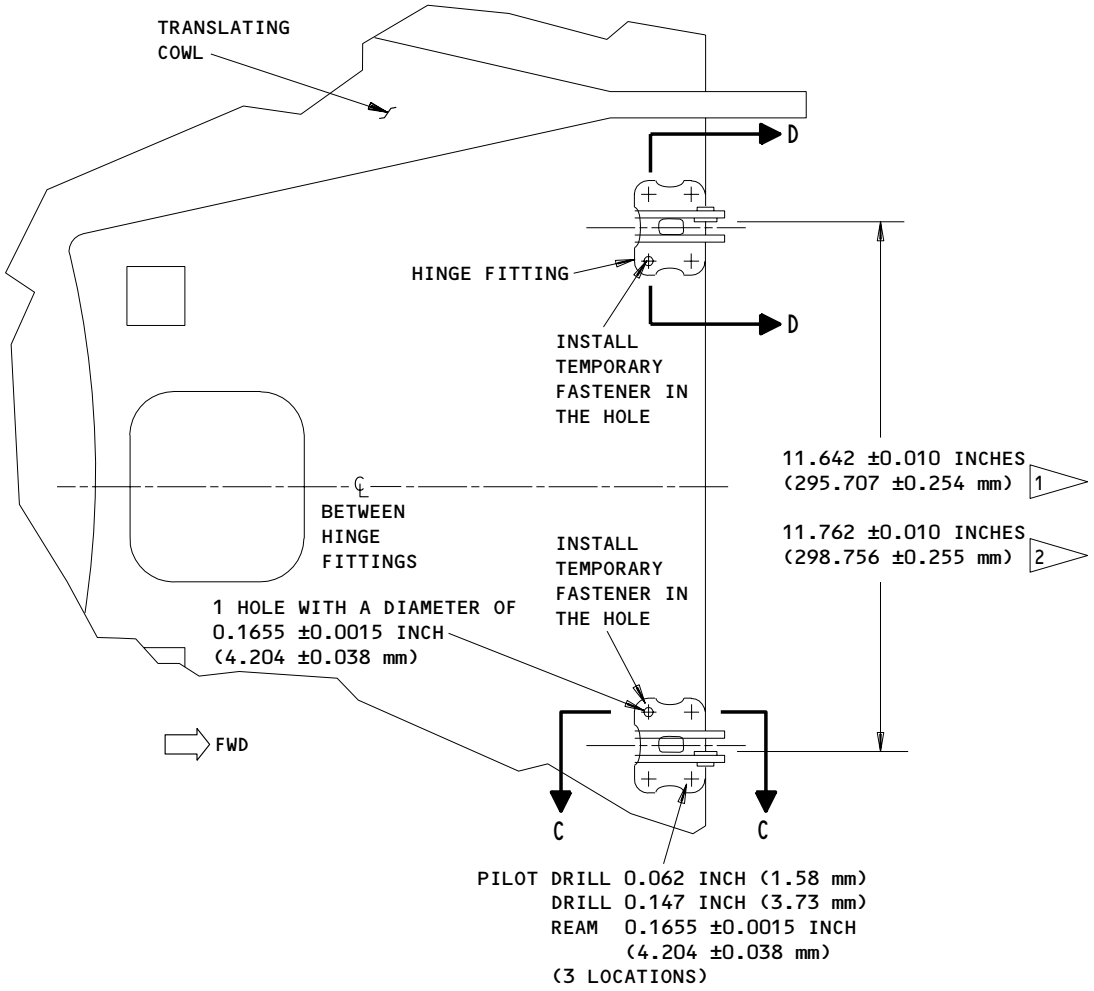
    NOTE: Use the hinge assembly Rolls Royce LJ70171 (or Rolls Royce LJ70172) for the Assembly A or Assembly B.

    1) If the bushing is proud, machine the bushing to underflush. Use the
  (b) Drill and ream the hole in the new hinge assembly.
  (c) Put the new hinge assembly in position with a pin and nut through the drilled hole.
    1) Tighten the shim.
  (d) Temporarily install the assembly hinge with pin and nut through the drilled hole.
    1) Tighten the nut lightly.
  (e) Put the blocker door to the hinge assembly.
  (f) Install the blocker door to the hinge assembly with the bushing, bolt, nut, and washers.
    1) Tighten the nuts lightly.
  (g) Make sure that the clearance of all around the blocker door in the closed position is equal.

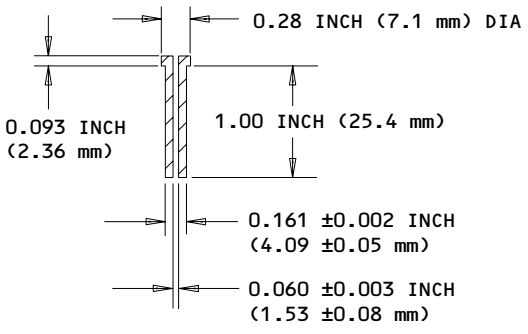




Blocker Door Hinge Assembly - Repair Details
Figure 802 (Sheet 1)

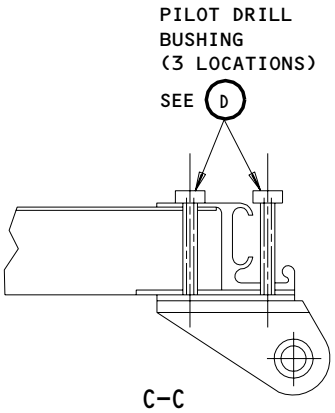


TRANSLATING COWL WITHOUT HINGE ASSEMBLIES INSTALLED

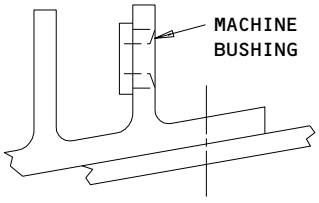


DETAIL OF PILOT DRILL BUSHING

C

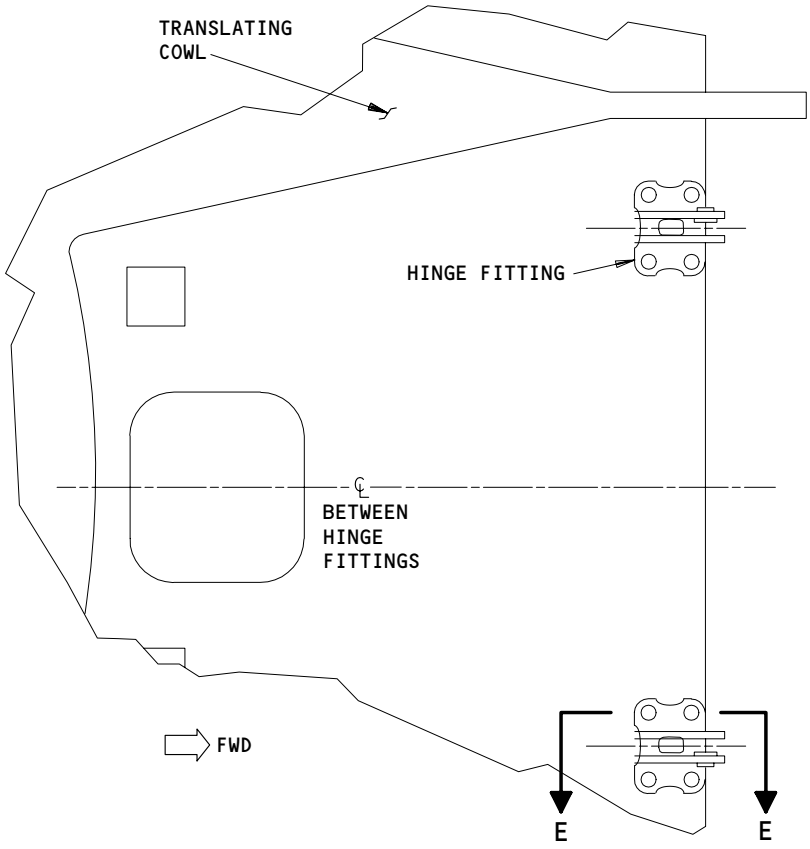


C–C



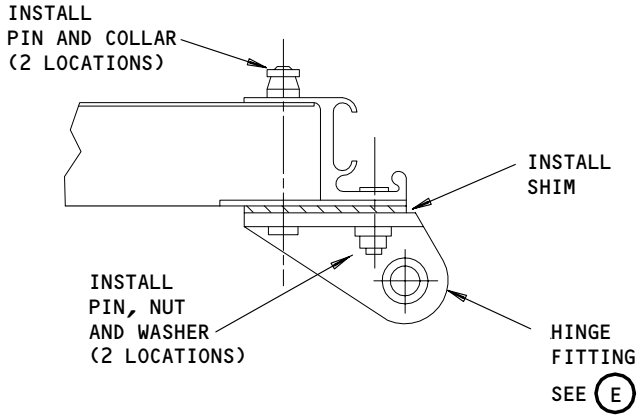
D–D

Blocker Door Hinge Assembly – Repair Details
Figure 802 (Sheet 2)



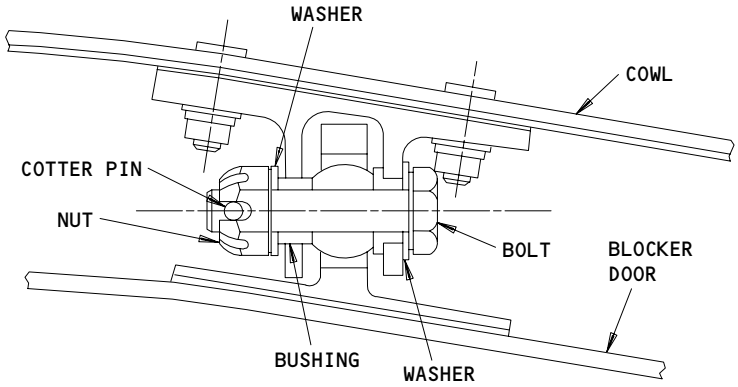
TRANSLATING COWL WITH HINGE ASSEMBLIES INSTALLED

(D)



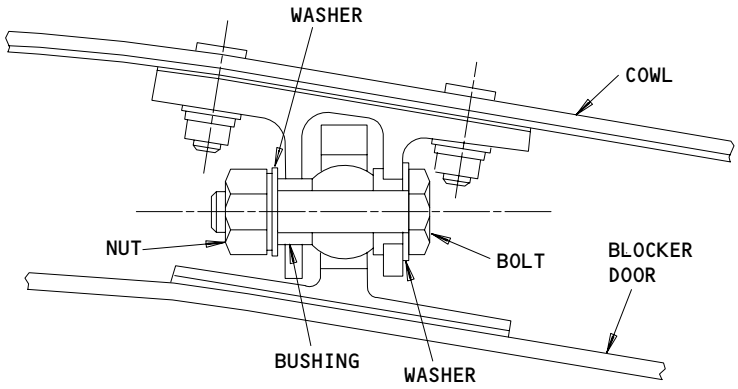
E-E

Blocker Door Hinge Assembly - Repair Details
Figure 802 (Sheet 3)



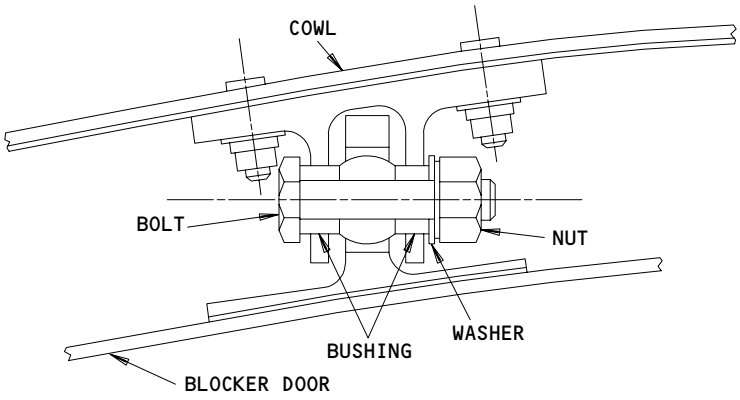
(LEFT SHOWN, RIGHT OPPOSITE)

E 1



FLOATING HINGE

E 2



NON-FLOATING HINGE

E 2

Blocker Door Hinge Assembly - Repair Details
Figure 802 (Sheet 4)

(h) Back drill and ream the diagonally opposite hole with the drilling bushing and pilot drill.
(i) Install the Hi-Lok pin, nut, and washer.
1) Tighten the nut lightly.
(j) Remove the blocker door (AMM 78-31-24/401).
(k) Back drill and ream the remaining two holes in the hinge assembly from the translating cowl with the drilling bushing and pilot drill.
(l) Remove the two Hi-Lok fasteners that you fitted and deburr before.
(m) Remove the sharp edges of the holes drilled in the hinge fittings.

S 428-069-R00

(5) Install the hinge assembly again:

CAUTION: YOU MUST INSTALL THE FASTENERS AS DETAILED. THIS CAN PREVENT DAMAGE TO THE HINGE ASSEMBLY.

(a) Install the hinge assembly and shim.
(b) Wet install the pins, collars, nut, and washers with the EA956 adhesive (Fig. 802).

NOTE: Use the pin HL10V-22 in position of pin HL10V-18 on the upper and lower hinge assembly of the blocker door.

1) Tighten the nut to 12.0-15.0 lb-in (1.35-1.68 Nm)
(c) Install the blocker door to the hinge assembly with the bolt, bushing, washers, and nut (AMM 78-31-24/401).
1) Tighten the nut to 12.0-15.0 lb-in (1.35-1.69 Nm).
(d) Install the cotter pin to lock nut.
(e) Examine the clearance between the fasteners and the hinge assemblies with the blocker door in the closed and extended positions (AMM 78-31-00/201).
(f) Examine the operation of the blocker door from the closed position to the extended position.
1) Make sure it is a smooth firm pivoting with no binding, axial or radial free motion (AMM 78-31-24/401).

(g) Install the old or new bulb seal (Par.)
(h) Apply the primer and curing solution with a brush as necessary.
(i) Cure at room temperature 68 degree F (20 degree C) for 30 minutes for a tacky condition and 24 hours to full cure.

S 868-064-R00

(6) Manually extend the thrust reverser (AMM 78-31-00/201).

S 868-065-R00

(7) Write the repair number FRS6144 adjacent to the translating cowl of the thrust reverser.
(a) Use the permanent marker pen with a color that can be easily seen.

S 868-066-R00

(8) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-908-019-R00

4. Replacement of Forward Seal for the Thrust Reverser

A. General

(1) The repairs in this task are FRS.6081 and FRS.6082. The repair FRS.6081 applies to the left thrust reverser, and the repair FRS.6082 applies to the right thrust reverser.
(2) This task gives the instructions for the replacement of the forward seal for these assembly numbers:
(a) LJ75009
LJ76875 RR SB 78-C208
LJ77079 RR SB 78-D617
(b) LJ75010
LJ76875 RR SB 78-C208
LJ77079 RR SB 78-D617

B. Parts

(1) Seal - Rolls Royce LJ71851 (Item 1) (Preferred Part) or Rolls Royce LJ71118
(2) Insert - Rolls Royce LJ71852 (Item 2) (Preferred Part) or Rolls Royce LJ17589
(3) Plug - Rolls Royce LJ71853 (Item 3) (Preferred Part) or RR3408750

C. Consumable Materials
(1) GO2098 Grit abrasive paper (Grade 180)
OMat No. - 5/62
(2) Adhesive RTV560 Silicon Rubber (4 hour curing time)
(use with Curing Agent ST0 or Dow 94-002, Corning, Midland, MI)
(24 hours minimum, curing time)
(3) Curing agent ST0 (Use with RTV560)
(4) Cleaning fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257

D. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-24/401, Thrust Reverser Blocker Doors

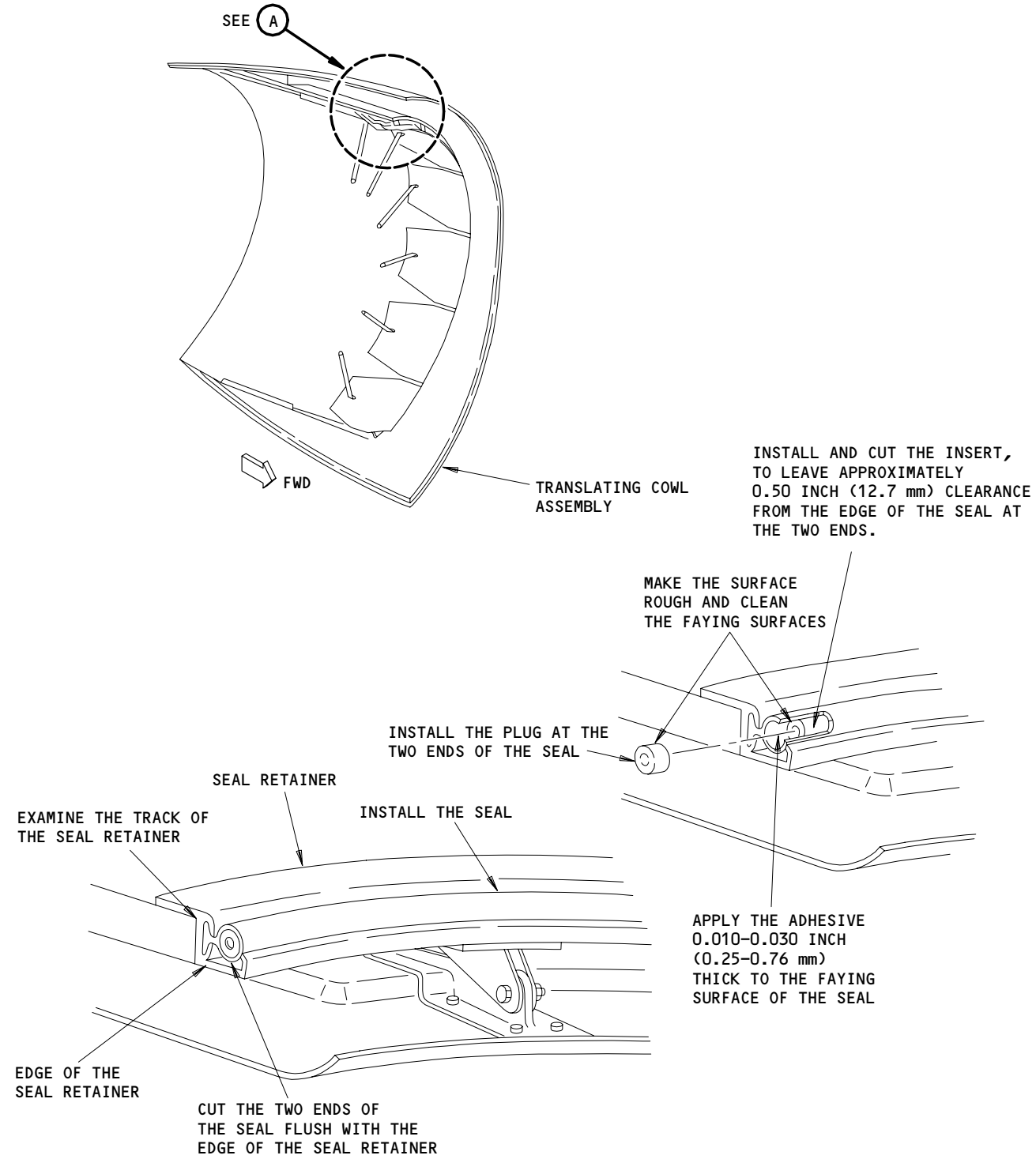
E. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

F. Procedure

S 868-120-R00
(1) Do this procedure: Thrust Reverser - Opening (AMM 78-31-00/201).

S 868-015-R00
(2) Manually extend the thrust reverser not more than 4 inches (100 mm) (AMM 78-31-00/201).

S 908-020-R00
(3) Replace the forward seal (Fig. 803):
(a) Remove the damaged seal.
(b) Clean the seal retainer with an abrasive felt mop to remove all the foreign material.
(c) Install the new seal (Item 1).
(d) Cut the new seal to the correct size.
(e) Install the new insert (Item 2) and cut to the correct size.
(f) Make the faying surfaces of the inner ends of the seal lightly rough with a grit abrasive paper.

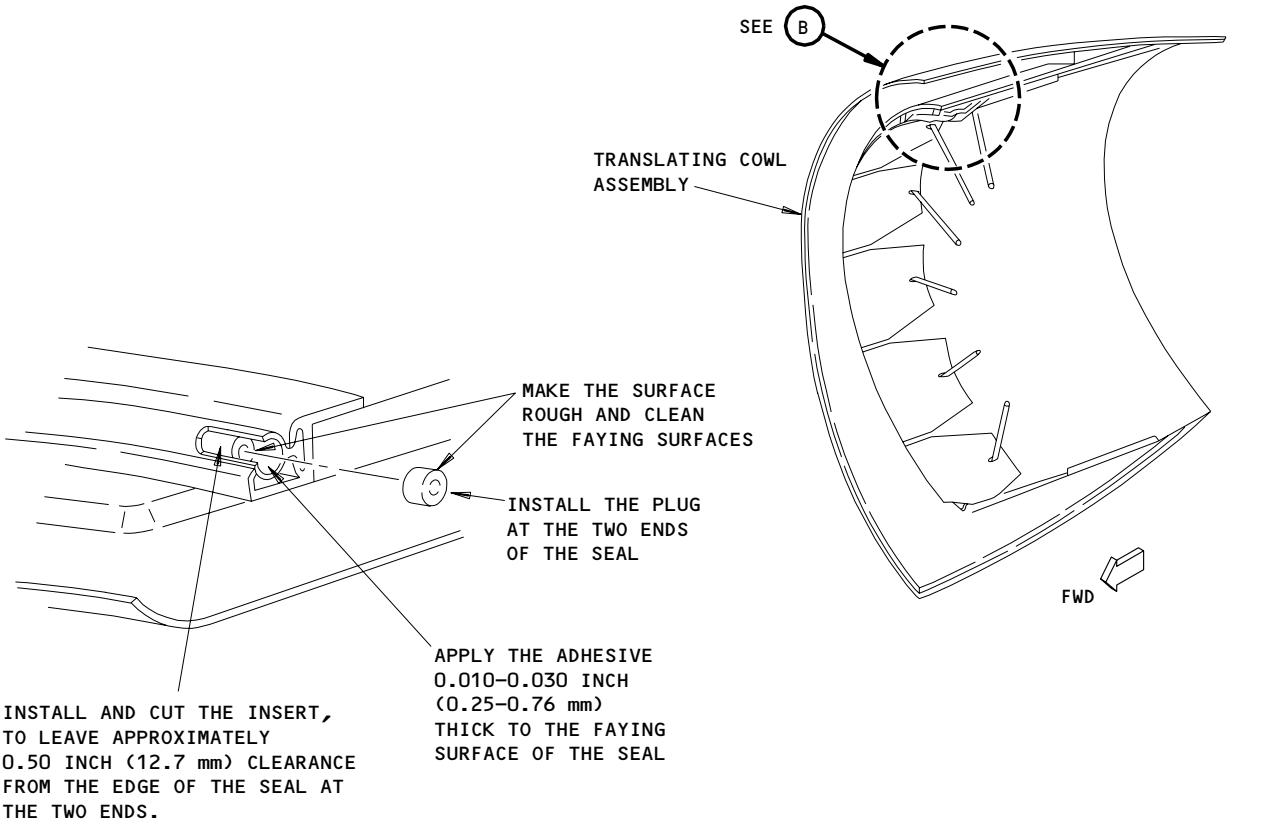


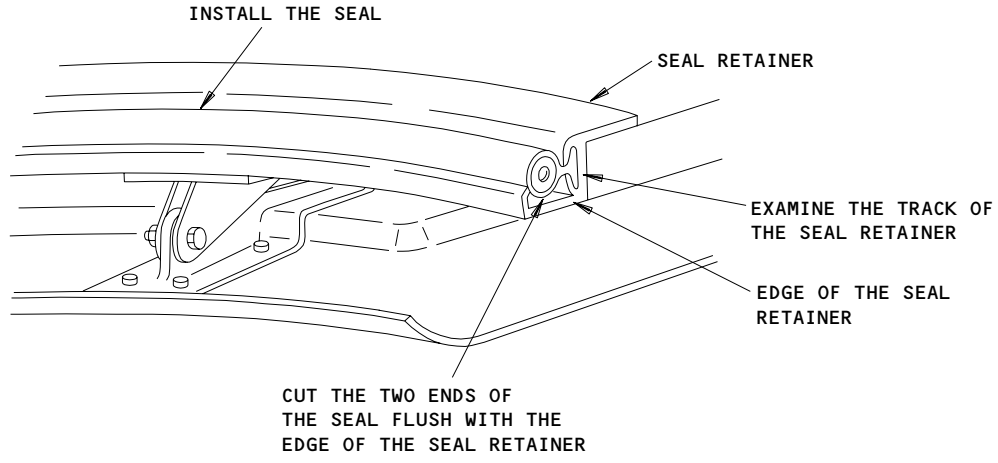
LEFT TRANSLATING COWL

A

62125A

Seal Repair Details – Thrust Reverser Translating Cowl
Figure 803 (Sheet 1)





RIGHT TRANSLATING COWL

B

62126A

Seal Repair Details – Thrust Reverser Translating Cowl
Figure 803 (Sheet 2)

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

(g) Clean the faying surfaces with Acetone or Isopropyl alcohol or cleaning solvent Desoclean.
   1) Make the faying surfaces dry with a lint-free cloth before the fluid becomes gas.

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(h) Prepare the silicone adhesive with ST0 curing agent to the manufacturer's instructions.

NOTE: You can also use Dow 94-002 adhesive as an option. If you use the adhesive Dow 94-002, permit a minimum of 24 hours to cure.

(i) Apply a coating of 0.010-0.03 in (0.25-0.76 mm thick) of the adhesive to the faying surface of the two ends of the seal with a brush.
(j) Install the plugs (Item 3):
   1) Carefully put the parts in position with sufficient pressure to make sure it connects correctly.
   2) Remove the unwanted adhesive with a cleaning fluid on a clean lint-free cloth.
(k) Cure the adhesive.

NOTE: If RTV560 Silicone Rubber adhesive, with ST0 Curing Agent is used, permit a minimum of 4 hours to cure. If Dow 94-002 adhesive is used, permit a minimum of 24 hours to cure.

(l) Examine the seal for irregular contour or loose plugs.

S 868-016-R00

(4) Manually retract the thrust reverser (AMM 78-31-00/201).

S 868-017-R00

(5) Write the repair number adjacent to the thrust reverser nameplate.

NOTE: Repair number FRS.6081 applies to left thrust reverser and repair number FRS.6082 applies to the right thrust reverser.

(a) Use a permanent ink pen with a color that can be easily seen.

S 868-018-R00

(6) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-908-021-R00

5. Replacement of Lockout-Pin Insert Assembly for the Thrust Reverser

A. General

(1) The repair numbers in this task are FRS6105 and FRS6106. Repair number FRS6105 applies to the left thrust reverser and the repair number FRS6106 applies to the right thrust reverser.

(2) This task gives instructions of the replacement of a lockout-pin insert assembly for this assembly numbers:

(a) RB211-535E4-C Engines

LJ75009	LJ75010
LJ76875	LJ76876
LJ77079	LJ77080

B. Equipment

(1) Heat lamps (explosionproof)

C. Parts

(1) Insert assembly - D18ORF865-650 (RR3408793)

D. Consumable Materials

(1) Bleached cheesecloth - Local resources

(2) Glue brush - Local resources

(3) Adhesive, EA934NA, Hysol
OMat No. - 8/52

(4) White cotton gloves - Local resources

(5) Abrasive paper, Grit size 100
OMat No. - 5/65
(6) Masking tape
OMat No. - 2/40
(7) Retaining compound, Loctite 242
OMat No. - 8/68
(8) Acetone OMat No.150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-20/801, Thrust Reverser Fixed Duct-Surface Protection Restore (FRS6400)

F. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

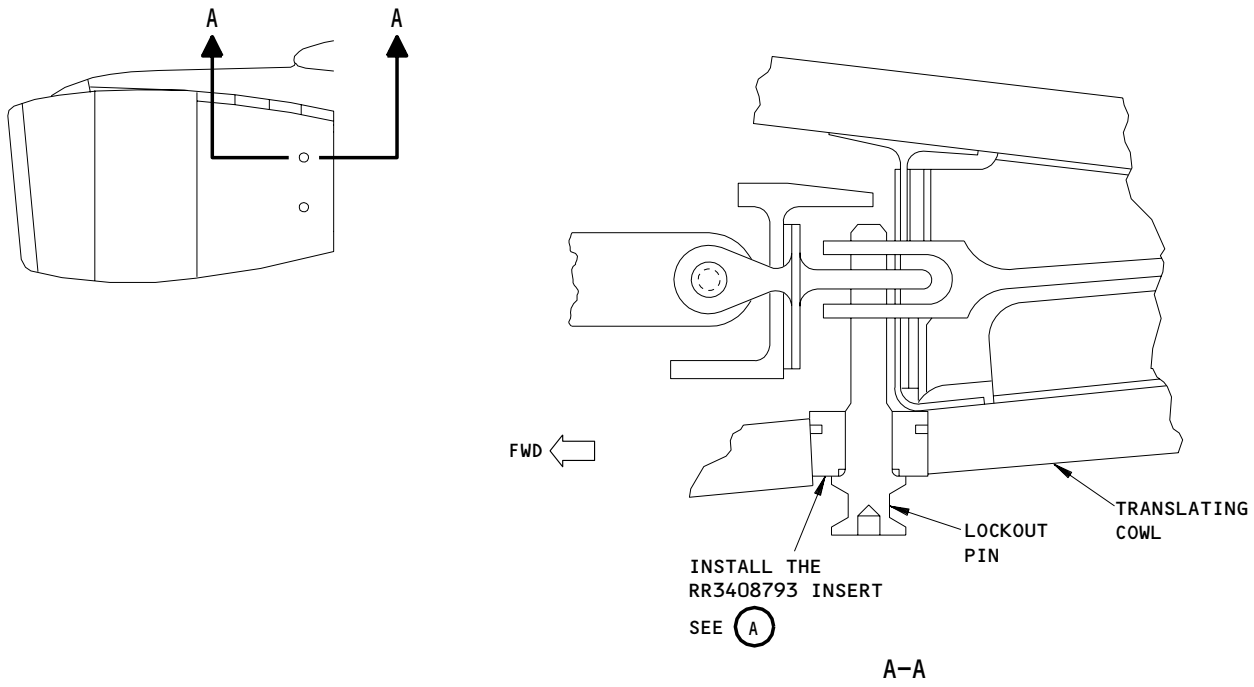
G. Procedure

S 048-022-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 908-024-R00
(2) Replace the lockout-pin insert assembly (Fig. 804):
(a) Make the outside surface of the insert assembly and inside surface of the hole lightly rough with an abrasive paper.
(b) Remove the plug from the insert assembly.



62062
62025

Lockout Pin Insert Assembly Replacement
Figure 804

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

(c) Clean the abraded areas, plugs, and threaded portion of the collar with Acetone or Isopropyl alcohol or cleaning solvent Desoclean.

NOTE: It is necessary to use clean cotton gloves to touch the parts and a clean lint-free cloth for each time you use the degreasing fluid. It is also necessary to use the correct dispenser for the fluid to prevent Contamination of the bulk container.

1) Make the collar dry with a lint-free cloth before the solvent becomes gas.

CAUTION: PERMIT THE PARTS THAT HAVE INTERNAL POCKETS OR PASSAGE WAYS TO DRY. THIS CAN PREVENT CORROSION FROM THE BREAKDOWN OF THE RESIDUAL SOLVENT WHICH STAY IN A RESTRICTED AREA.

(d) Permit the parts to dry for at least 4 hours before you use as part of an assembly or put in a package.
(e) Apply the retaining compound on the threaded portion of the plug.
(f) Install the plug flush with collar.
(g) Remove the lockout-pin from the stored location.

NOTE: The lockout-pin has a red color identification.

(h) Install the lockout-pin in the insert assembly.
(i) Manually put the translating cowl to fully closed position but do not activate the thrust reverser (AMM 78-31-00/201).
(j) Visually examine the holes in the brackets which you will install the lockout-pin.

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(k) Prepare the adhesive to manufacturer's instructions.
(l) Apply adhesive on the inside surface of the hole and outside surface of the insert assembly.
(m) Install the lockout-pin and insert assembly.
(n) Remove the unwanted adhesive.
(o) Install the masking tape to hold the insert assembly in position.
(p) Cure the adhesive with the heat lamps for one hour at 60 degree C (140 degree F).
(q) Remove the masking tape and lockout-pin.
(r) Install the lockout-pin in the stored position.
(s) Paint the damage area on the exterior surface of the thrust reverser FRS6400 (AMM 78-31-20/801).
(t) Visually examine the parts after the replacement is completed.

S 868-025-R00

(3) Write the repair number FRS6105 adjacent to the thrust reverser nameplate.
(a) Use a permanent marker pen with a color that can be easily seen.

S 868-026-R00

(4) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-908-027-R00

6. Replacement of the Blocker Door Bumper for the Thrust Reverser

A. General

(1) The thrust reverser must be in the closed position before you do this task.

(2) The repairs in this task are FRS6012 and FRS6027. The repair number FRS6012 applies to the left thrust reverser and the repair number FRS6027 applies to the right thrust reverser.
(3) This task gives instructions for replacement of the blocker door bumpers for these assembly numbers:
(a) LH assembly LJ75009
LJ76875 RR SB 78-C208
LJ77079 RR SB 78-D617
(b) RH assembly LJ75010
LJ76876 RR SB 78-C208
LJ77080 RR SB 78-D617

B. Equipment
(1) Heat Lamps - Explosion proof

C. Parts
(1) Rubber bumper, Rolls-Royce LJ71828

D. Consumable Materials
(1) Degreasing Fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257
(2) Grit abrasive paper - Grade 180
OMat No. - 5/62
(3) Grit abrasive paper - Grade 100
OMat No. - 5/65
(4) Cleaning solution, Naphtha solvent
OMat No. - 1/4
(5) Cheesecloth - Local resources
(6) Glue brush - Local Resources
(7) Adhesive, EC-1300L
3M Company St. Paul, MN,

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-24/401, Thrust Reverser Blocker Door

F. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

G. Procedure

S 868-029-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 868-030-R00

(2) Manually extend the thrust reverser (AMM 78-31-00/201).

S 868-031-R00

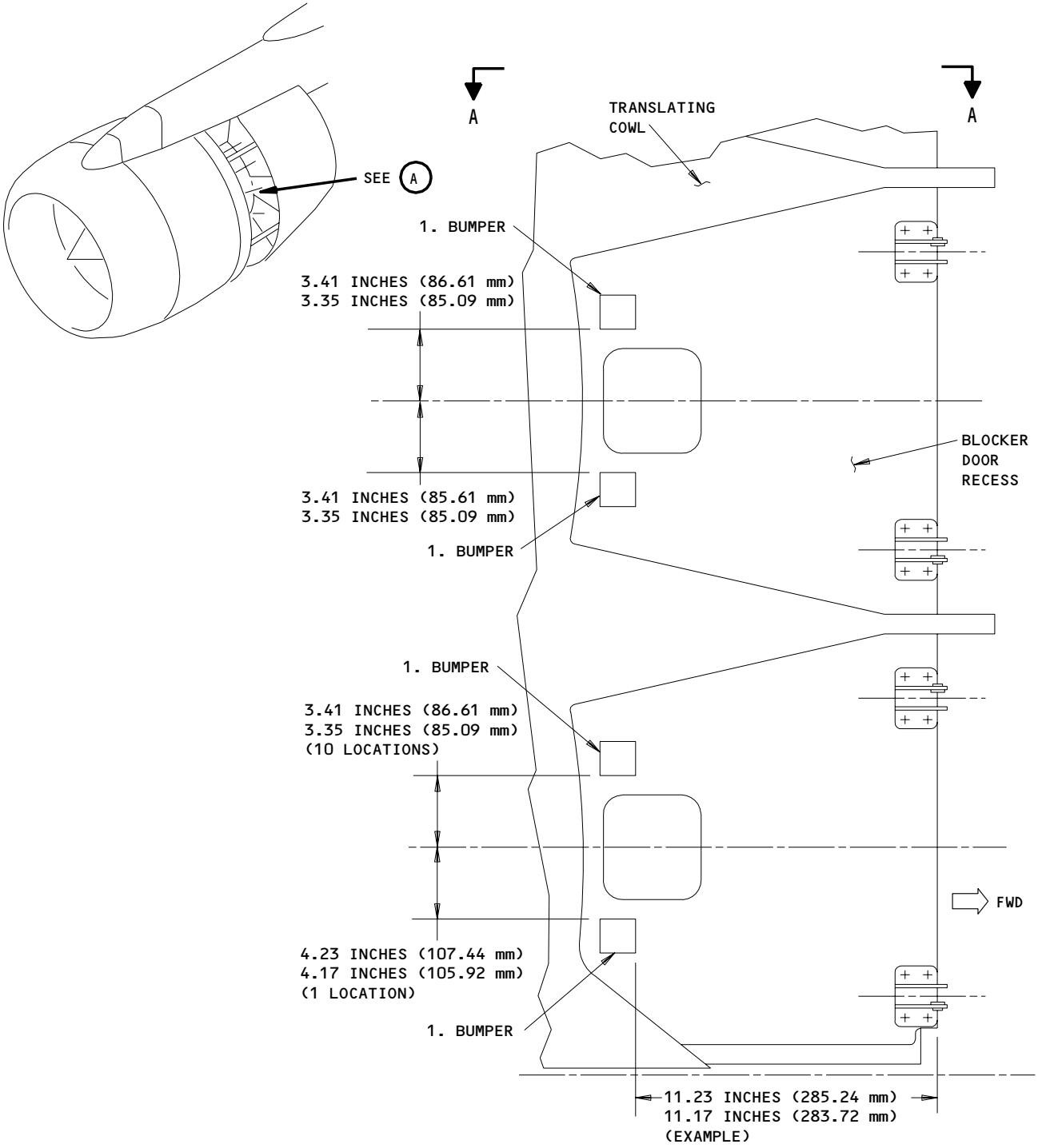
(3) Prepare the bonding surfaces:

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

(a) Remove the remaining adhesive on the faying surfaces with abrasive paper grade 100.
(b) Make the faying surface lightly rough with an abrasive paper grade 180.
(c) Clean the faying surfaces with Acetone or Isopropyl alcohol or Cleaning solvent Desoclean on a clean lint-free cloth.
    1) Make the faying surfaces dry with a clean lint-free cloth before the solvent becomes gas.

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(d) Apply approximately a coating 0.005-0.010 in (0.13-0.25 mm) of the adhesive with a glue brush to the faying surfaces.

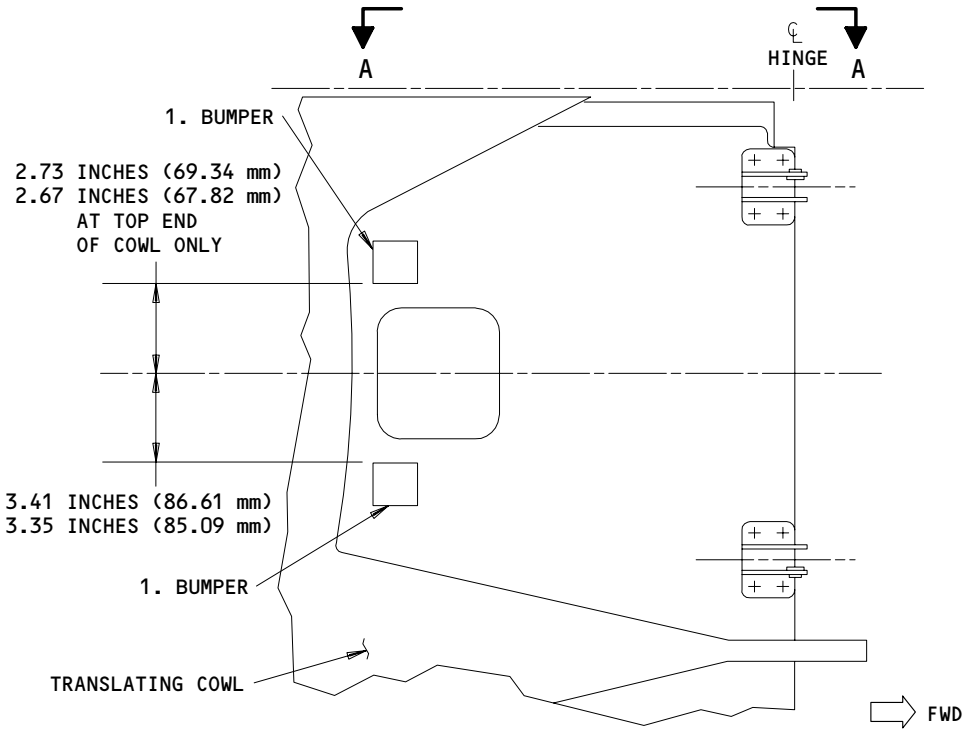


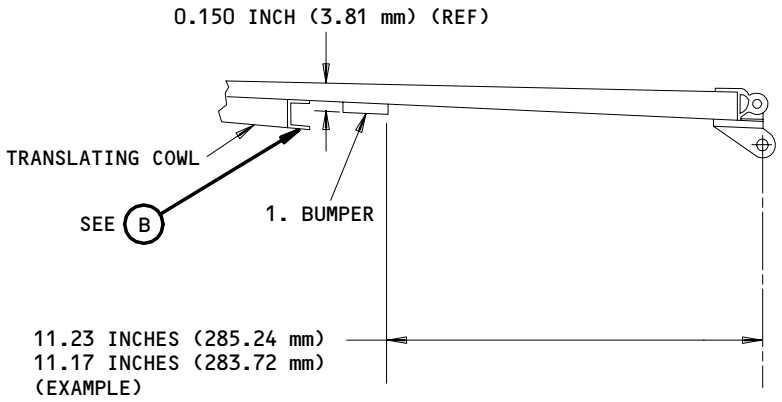
MID POSITION BLOCKER DOOR ASSEMBLIES
(LEFT SHOWN, RIGHT OPPOSITE)

LH 55892
RH 55898

(A)

Blocker Door Bumper Replacement
Figure 805 (Sheet 1)





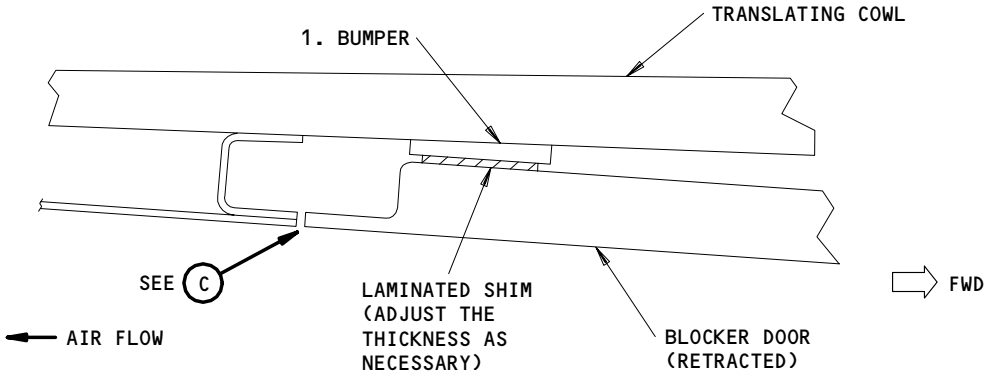
A–A

TOP AND LOWER BLOCKER DOOR ASSEMBLIES
(LEFT SHOWN, RIGHT OPPOSITE)

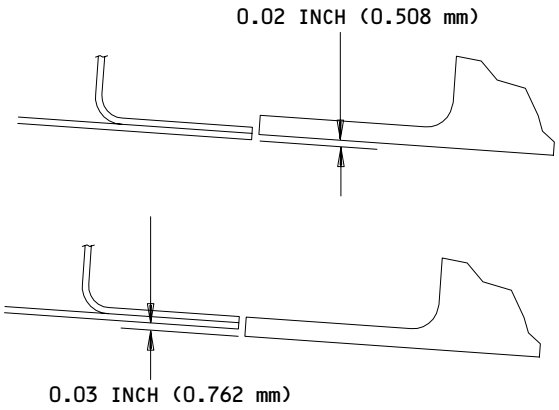
A

LH 55893
RH 55899

Blocker Door Bumper Replacement
Figure 805 (Sheet 2)



B



POSITIVE AND NEGATIVE STEPS
MAXIMUM TOLERANCE

C

55894

Blocker Door Bumper Replacement
Figure 805 (Sheet 3)

(e) Dry the adhesive on the faying surfaces with air.

NOTE: Dry the adhesive until it feels tacky when you touch it with you knuckle but does not bond to the knuckle.

S 428-032-R00

(4) Install the blocker door bumper (Fig. 805):
(a) Put the bumper in position with sufficient pressure to make sure it connects correctly.
(b) Dry the bumper with air for 8 hours at the room temperature 20 degree C (68 degree F).
(c) Visually examine and adjust the aft edge of the blocker door. Make sure it is in the tolerance (AMM 78-31-24/401).

S 868-033-R00

(5) Manually retract the thrust reverser (AMM 78-31-00/201).

S 868-034-R00

(6) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-908-068-R00

7. Replacement of the Lockout-Pin Nut and Collar for the Thrust Reverser

A. General
(1) The repairs in this task are FRS6103 and FRS6104. The repair number FRS6103 apply to the left thrust reverser and the repair number FRS6104 applies to the right thrust reverser.
(2) This task gives instructions for the replacement of the lockout-pin and collar for these assembly numbers:
(a) LH assembly LJ75009
LJ76875 RR SB 78-C208
LJ77079 RR SB 78-D617
(b) RH assembly LJ75010
LJ76876 RR SB 78-C208
LJ77080 RR SB 78-D617

B. Equipment
(1) Heat lamps (explosionproof)

C. Parts
(1) Collar D180SC863 (RR3408794)

(2) Nut, D28ORTN865 (RR34O8796)
(3) Plug, D18OSP863 (RR34O8795)

D. Consumable Materials
(1) Grit abrasive paper (Grade 15O)
OMat No. - 5/63
(2) Degreasing Fluid, Acetone OMat No. 15O or
Isopropyl alcohol OMat No. 1/4O or
Cleaning solvent Desoclean OMat No. 1/257
(3) Cheesecloth bleached - Local resources
(4) White cotton gloves - Local resources
(5) Adhesive, EA934NA Hysol
OMat No. - 8/52
(6) Glue brush - Local resources
(7) Retaining compound, Loctite 242
OMat No. - 8/68

E. Reference
(1) AMM 78-31-OO/201, Thrust Reverser System

F. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

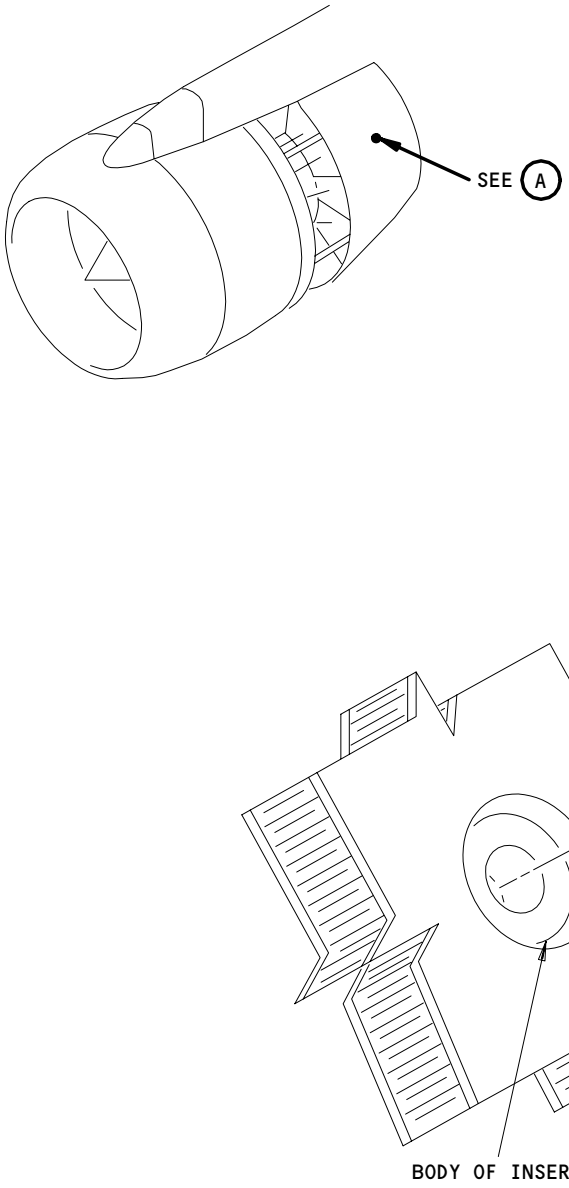
G. Procedure

S 868-O35-ROO

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

(1) Do this procedure: Thrust Reverser Deactivation (AMM 78-31-OO/201).

S 9O8-O36-ROO
(2) Replace the lockout-pin nut, plug, and collar (Fig. 8O6):
(a) Make the outside surface of the collar and inner surface of the body of the insert lightly rough with a grit abrasive paper.



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Lockout Pin, Plug and Collar Replacement
Figure 806

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY.

(b) Clean the body of the insert and collar, nut, and plug with Acetone or Isopropyl alcohol or cleaning solvent Desoclean.

NOTE: Use a clean cotton gloves to touch the replacement parts after you clean the areas.

1) Make the areas dry with a clean lint-free cloth before the solvent becomes air.

WARNING: USE EPOXY COMPOUNDS ONLY IN AREAS WITH GOOD VENTILATION. TAKE PRECAUTIONS TO PREVENT MATERIAL FROM COMING INTO CONTACT WITH THE SKIN.

(c) Prepare the adhesive to the manufacturer's instructions.
(d) Apply the adhesive to the insert and replacement collar with a glue brush.
1) Make sure you apply the adhesive to the threaded portion of the insert body and outside surface of the collar.
(e) Install the collar.
(f) Remove the unwanted adhesive.
(g) Cure the adhesive for 1 hour at 60 degree C (140 degree F) with an explosion proof heat lamp.
(h) Install the replacement nut.
(i) Apply the retaining compound to the plug threads.
(j) Install the plug.
(k) Visually examine the area after the replacement is completed.
(l) Write the repair number on the thrust reverser nameplate.

NOTE: The repair number FRS6103 applies to the left thrust reverser and the repair number FRS6104 applies to the right thrust reverser.

1) Use a permanent ink pen with a color that can be easily seen.

S 868-037-R00
(3) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-358-039-R00

8. Repair of the Leading Edge of the Perforated Panel for the Thrust Reverser

A. General
(1) The repair in this task is FRS6257. This repair applies to the right and the left translating cowl of the thrust reverser.
(2) This procedure gives the data for the repair of damage to the leading edge of the perforated panel. It does not gives the repairs to replace a fairing which is gone around the blocker doors.
(3) This repair gives instructions for the repair of the perforated panel for these assembly numbers:
(a) LH assembly LJ75039
(b) RH assembly LJ75040

B. Equipment
(1) Lamps, Infra-red heater (explosion proof)

C. Parts
(1) Rivet, Blind NAS1738E4-2 (Rolls-Royce RR2308483)

D. Consumable Materials
(1) A00253 Adhesive - Hysol (EA934NA)
OMat No. - 8/52
(2) Degreasing Fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257
(3) G00381 Abrasive Paper, Aluminum Oxide (Grade 180)
OMat No. - 5/62
(4) C00812 Primer base, 463-6-27
OMat No. - 7/157
(5) C00813 Curing Solution, (X-337)
OMat No. - 7/158
(6) G01163 Cloth Lint free
(7) Clean cotton gloves

E. References
(1) AMM 78-31-00/201, Thrust Reverser System

F. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

G. Procedure

S 868-040-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

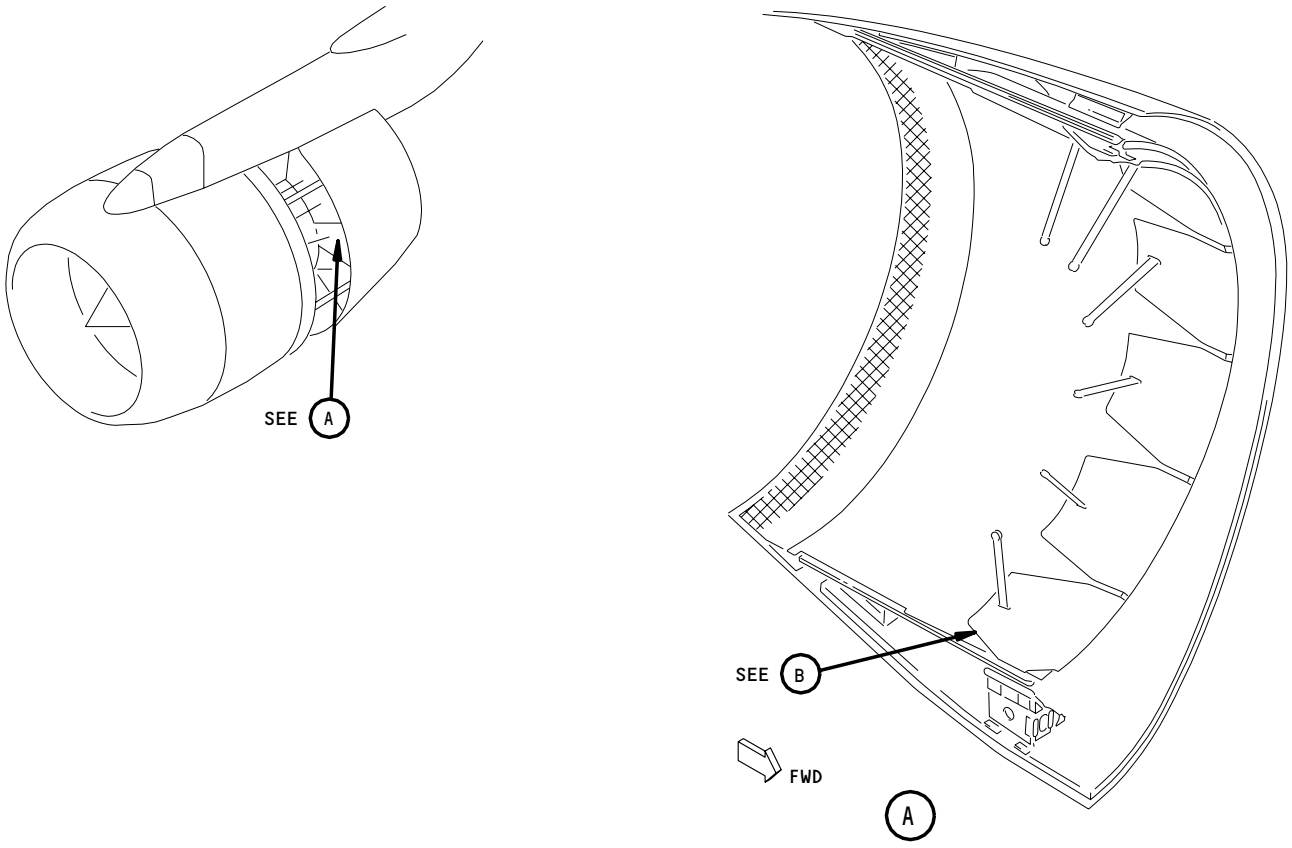
S 358-038-R00
(2) Repair the damaged perforated panel (Fig. 807):
(a) Cut around the damaged area to remove all cracks and sharp edges.
1) Make sure that no honeycomb core is removed.

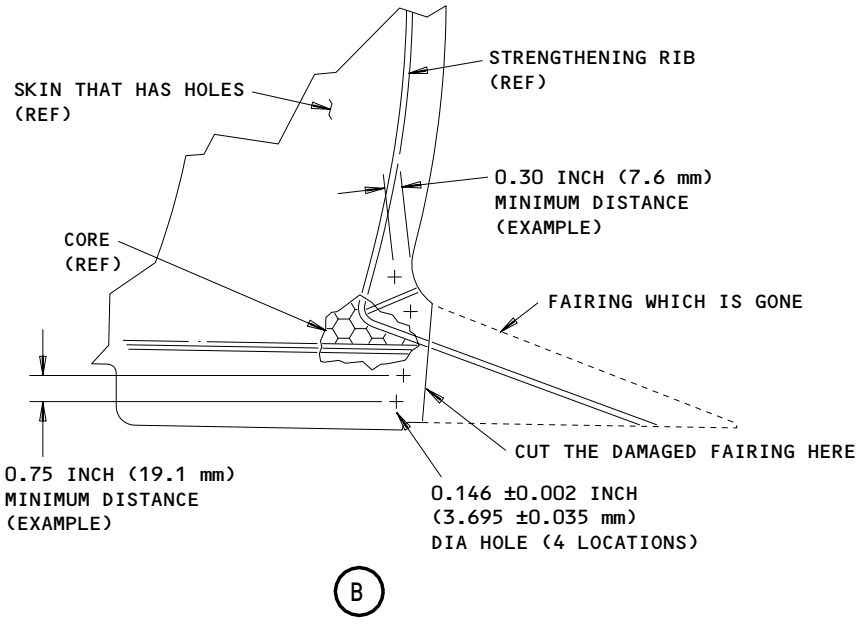
CAUTION: USE CAUTION WHEN YOU DEBURR THE DAMAGED AREA OR A FEATHERED EDGE COULD RESULT.

(b) Deburr the edges of the damaged area with an abrasive paper.
1) Make sure the surface primer is also removed.
(c) Drill the rivet holes through the perforated panel and the structure below.
1) Deburr the holes.

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

(d) Clean the area with Acetone or Isopropyl alcohol or cleaning solvent Desoclean on a lint-free cloth.
1) Make the area dry with a lint-free cloth before the solvent becomes gas.





Translating Cowl Leading Edge Repair
Figure 807

(e) If the honeycomb core is seen, do the repair that follows:

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. KEEP THE COMPOUND AWAY FROM YOUR SKIN.

1) Prepare the adhesive.
2) Fill the honeycomb cells with the adhesive until the hole makes a continuous surface with the structure surface.

(f) Install and close the blind rivets.
(g) Cure the adhesive for 1 hour at 180-200°F (82-93°C) with the infra-red heater lamps.
(h) Paint the area which has been repaired with the primer, curing solution, and thinner.
(i) When the repair is completed, visually examine the area.

S 868-041-R00

(3) Write the repair number FRS6257 adjacent to the thrust reverser nameplate.
(a) Use a permanent ink marker pen with a color that can be easily seen.

S 868-044-R00

(4) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-908-045-R00

9. Replacement of the Hoist Point Insert Assembly for the Thrust Reverser

A. General

(1) The repairs in this task e are FRS56259 and FRS6258. The repair FRS6259 applies to the left thrust reverser, and the repair FRS6258 applies to the right thrust reverser.
(2) This task gives instructions for the replacement of the hoist point insert assembly for these assemble numbers:

NOTE: If it is only necessary to replace the grub screws, the floating nut, and the plug, refer to steps (8) to (12).

(a) LH assembly LJ75039
LJ76425
LJ76877 RR SB 78-C208
LJ77077 RR SB 78-D617

(b) RH assembly LJ75040
LJ76426
LJ76878 RR SB 78-C208
LJ77078 RR SB 78-D617

B. Equipment
(1) Lamps, Infra-red heater (explosion proof)

C. Consumable Materials
(1) A00253 Adhesive - Hysol EA934NA
OMat No. - 8/52
(2) Degreasing Fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257
(3) Abrasive paper - Grade 100
OMat No. - 5/40
(4) G00270 Masking tape
OMat No. - 2/40
(5) G01163 Cloth, Lint free - Local resources
(6) Gloves, White cotton - Local resources
(7) Glue brush - Local Resources

D. Parts
(1) Insert Assembly, D17ORF465-10 (Rolls-Royce RR1013567)
(2) Grub screw, NAS1081C4A8 (Rolls-Royce RR1013566)

E. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-20/801, Thrust Reverser

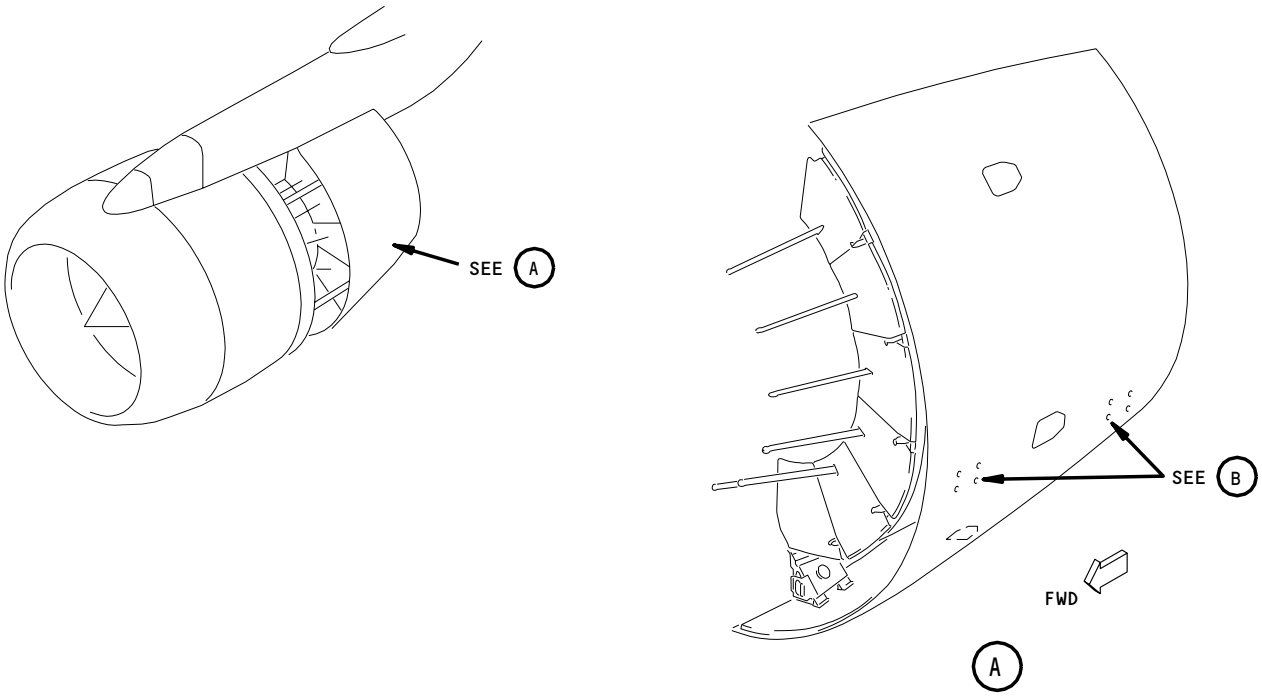
F. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

G. Procedure

S 048-046-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).



Translating Cowl Hoist Point Insert Assembly Replacement
Figure 808

S 868-048-R00

(2) Prepare for replacement the insert assembly (Fig. 808):
  (a) Make the inner surface of the hole rough with an abrasive paper.
  (b) Remove all the loose particles with the compressed air.
    1) Make sure the compressed air is dry and clean.
  (c) Make the outer surface of the replacement insert assembly lightly rough.

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

  (d) Clean the area with Acetone or Isopropyl alcohol or cleaning solvent Desoclean on a clean lint-free cloth.
    1) Make the area dry with a lint-free cloth before the solvent becomes gas.

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. KEEP THE COMPOUND AWAY FROM YOUR SKIN.

  (e) Prepare the adhesive.

S 428-049-R00

(3) Install the insert assembly (Fig. 808):
  (a) Apply the adhesive to the inner surface of the hole.
    1) Use a piece of wire to break and release the bubbles.
  (b) Apply the adhesive to the collar and body of the insert assembly with a glue brush.
    1) Make sure the adhesive fills the groove in the insert.

(c) Push the insert into position.
(d) Remove the unwanted adhesive with Acetone or Isopropyl alcohol or cleaning solvent Desoclean on a lint-free cloth.
(e) Cure the adhesive for 1 hour at 180-200°F (82-93°C) with the infra-red heater lamps.
(f) Install the floating nut into the insert assembly.

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(g) Apply a small quantity of adhesive to the threads of the plug.
(h) Install the plug.
1) Make sure the top of the plug is not more than 0.01 inch (0.25 mm) above the surface of the collar.
(i) Remove the unwanted adhesive.
(j) Install the grub screws.
(k) Use FRS6400 to put the outer surface of the translating cowl to its usual condition (AMM 78-31-20/801).
(l) When the repair is completed, visually examine the area.
1) Make sure the top of the plug is not more than 0.01 inch (0.25 mm) above the surface of the collar.

S 868-050-R00

(4) Write the repair number (FRS6259 for the left thrust reverser, FRS6258 for the right) adjacent to the thrust reverser nameplate.
(a) Use a permanent ink marker pen with a color that can be easily seen.

S 868-051-R00

(5) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-358-052-R00

10. Repair of Frettage Damage for the Thrust Reverser

A. General
(1) The repair in this procedure is FRS56410.

(2) This task gives instructions for the repair of frettage damage to the inner surface for this assembly numbers:
(a) LH assembly LJ75039
(b) RH assembly LJ75040

B. Equipment
(1) Spatula
(2) Paint brush

C. Consumable Materials
(1) Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257
(2) AOO253 Adhesive, Hysol EA934NA
OMat No. - 8/52
(3) GOO381 Abrasive paper, Grade 180
Omat No. - 5/62
(4) GO1163 Cloth, Lint free - Local Resources

D. References
(1) AMM 78-31-00/201, Thrust Reverser System
(2) AMM 78-31-20/801, Thrust Reverser

E. Access
(1) Location Zones
415/425 Thrust Reverser Left
416/426 Thrust Reverser Right

F. Procedure

S 868-053-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 358-054-R00

(2) Repair the frettage damage to inner skin:

(a) Make the repair surface rough with an abrasive paper.

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

(b) Clean the area with Acetone or Isopropyl alcohol or cleaning solvent Desoclean on a lint-free cloth.

1) Make the area dry with a lint free cloth before the solvent becomes gas.

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(c) Prepare the adhesive.

(d) Apply the adhesive to the damaged area.

(e) Cure the adhesive for the time and temperature which is given below:

NOTE: The minimum cure time is one hour.

NOTE: The adhesive will not cure if the temperature is below 54 degrees F (12 degrees C).

NOTE: If heat is added to speed the cure time, thermocouples or other temperature sensors must be used to monitor the temperature at the surface of the bond.

Table 1 Hysol EA934NA Cure Data Chart									
Time — Hours	1	2	4	8	16	24	40	96	168
Temp. — °F	140	113	96	86	77	72	68	59	54
Temp. — °C	60	45	35	30	25	22	20	15	12

(f) Remove the unwanted adhesive to make the surface smooth with the surface around the repair.

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS. DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS. USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY. DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

(g) Clean the area with Acetone or Isopropyl alcohol or cleaning solvent Desoclean on a lint-free cloth.
1) Make the area dry with a lint free cloth before the solvent becomes a gas.

(h) Use FRS6400 to put the outer surface of the translating cowl to its usual condition (AMM 78-31-20/801).

(i) When the repair is completed, visually examine the area.

S 868-055-R00

(3) Write the repair number FRS6410 adjacent to the thrust reverser nameplate.
(a) Use a permanent ink marker pen with a color that can be easily seen.

S 868-061-R00

(4) Do this procedure: Thrust Reverser Activation (AMM 78-31-00/201).

TASK 78-31-23-358-106-R00

11. Translating Cowl - Outer Panel Edge/Crack Repair

A. General

(1) The repair in this procedure is FRS6285.

(2) This procedure gives the information necessary to repair the translating cowl outer-panel.

(3) This is procedure has three parts. The three parts are as follows:
- Repair of outer and inner skin edge (FRS6285/1)
- Repair of inner skin with disbonded outer skin (FRS6285/2)
- Repair of cracks in the outer skin between fastener holes (FRS6285/3).

(4) This procedure can be used to repair translating cowls that have the part numbers that follow:
- LJ75009
- LJ75010

B. Equipment

(1) Standard shop tools
(2) Riveting equipment
(3) Composite sawing and routing equipment
(4) Vacuum equipment
(5) Heater lamps
(6) Hi-Lok installation equipment

C. Consumable Materials

(1) Degreasing Fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257

(2) Vacuum Bag Material,
OMat No. - 2/31

(3) Absorbent Cloth, Lint Free,
OMat No. - 2/101

(4) Gloves, Lint Free,
Omat No. - 2/114

(5) Waterproof Silicon Carbide,
British Spec/Ref. - Grit size 150,
American Spec/Ref. - A-A-1047,
OMat No. - 5/38.
(6) Fiberglass Cloth,
British Spec/Ref. - Tyglas YO383/205-T5 0.010 inch (0.254 mm),
American Spec/Ref. - MSRR9048,
OMat No. - 884.
(7) Release Agent,
British Spec/Ref. - Frekote 33,
OMat No. - 8/32A.
(8) Adhesive,
British Spec/Ref. - Hysol EA93NA,
(Part A grey paste and Part B amber liquid)
American Spec/Ref. - MSRR9328,
OMat No. - 8/52.
(9) Epoxy Adhesive,
British Spec/Ref. - EA9390 (Part A tan and Part B violet)
OMat No. - 8/160
(10) Graphite Fabric,
British Spec/Ref. - AH-370-5H
(5 harness, 11X11,6000 end yarn. 370g/m2 0.014 in nom. cured thickness)
OMat No. - 8/171
(11) Aluminum Sheet, 2024-T3 0.032 inch (0.813 mm)
(12) Repair parts, for the lower/upper forward edge inner and outer skin repair.
(a) Pin, hi-lok, HL41-6-14 (RR1018268) (Item 1)
(b) Collar, Hi-Lok, HL94LP6 (RR1018667) (Item 2)

D. Repair the outer and inner skin edge (FRS6285/1).
(Fig. 809, 810 and 811)

S 218-072-R00

(1) Use magnification and tab-test to know the extent of disbond of the inner and outer skins from the graphite doubler and the core. Make a mark around the repair area.

NOTE: Graphite doubler is in slider fitting area.

S 038-117-R00

CAUTION: DO NOT DISBOND THE TRACK FITTING FROM THE INNER SKIN.

(2) Remove the blind bolts that attach the lower edge of the slider fittings to the bond panel as necessary.

S 328-108-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND FACE MASK. DO NOT BREATH THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

CAUTION: DO NOT CUT INTO ALUMINUM HONEYCOMB CORE OR GRAPHITE DOUBLER.

(3) Cut the damaged areas.
   (a) Cut and remove the outer damaged skin in a regular shape to get access to the inner graphite doubler and the honeycomb core.
   (b) Cut and remove the damaged and disbonded skin only.

S 168-121-R00

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE DEGREASING FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH IT AWAY WITH WATER AND GET MEDICAL AID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(4) Abrade and clean the damaged area.
   (a) Lightly abrade 2.5 inch (63.5 mm) around the skin cutout. Remove all loose particles.
   (b) Flush the repair area with Acetone or Isopropyl alcohol or cleaning solvent Desoclean.
   (c) Dry the repair area at 110-121 degree C (230-250 degree F) for one hour to remove all moisture from the repair area.

S 348-077-R00

(5) Make the repair plies.
   (a) Make the caul plate from 0.032 inch (0.813 mm) aluminum sheet. Put the sheet on top of the surface in the damaged area. Bend as required to fit contour of surface and radius of leading edge.
   (b) Use release agent on caul plate and lay up two layers of graphite fabric soaked with adhesive, 0 degree ply orientation. Make the skin-patch larger than the damaged area to allow for a trim fit.
   (c) Vacuum-bag the skin-patch with vacuum bagging material and equipment.
   (d) Cure the skin-patch at 93 degree C (200 degree F) for 220 minutes, while you apply 22 inches of mercury vacuum pressure.

(e) Trim the skin-patch to fit repair area.

NOTE: To prevent edge fraying add 0.5 inch (12.5 mm) all around to all repair and sanding plies. Trim to final size after you soak the plies with adhesive and before you install them.

(f) Cut one fiberglass insulation ply from fiberglass cloth to use it as an insulator between the pre-cured outer skin and the core.
(g) Cut three 0 degree repair plies from graphite fabric. First ply is to overlap the cutout by 0.1 inch (25.4 mm). The remaining plies are to overlap by 0.75 inch (19.05 mm).
(h) Cut the fiberglass sanding ply from fiberglass cloth to overlap the last repair ply by 0.75 inch (19.05 mm).
(i) Cut three 0 degree repair plies from graphic fabric. Trim the repair plies to go around the lower track fitting.

S 348-110-R00

WARNING: ADHESIVES ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVE BECAUSE IT IS POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUME FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER AND THEN GET MEDICAL AID.

(6) Apply adhesive to the repair area.
(a) Mix the adhesive per the manufacturer's instructions.
(b) Fill the core through the outer skin cutout with adhesive.
(c) Cure the filled core for one hour at 93 degree C (200 degree F) with heater lamps.

WARNING: EPOXY ADHESIVES ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVE BECAUSE IT IS POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUME FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER AND THEN GET MEDICAL AID.

(d) Mix the epoxy adhesive per manufacturer's instructions.

NOTE: The weight of the adhesive necessary will be approximately the same weight of the carbon and glass fabric.

(e) Soak the repair, insulation and sanding plies with epoxy adhesive.

(f) Install one insulation ply between the core and the skin-patch. Bond the skin-patch to the core with adhesive. Install the pre-cured outer skin-patch, repair, sanding plies and inner skin repair plies.

NOTE: Install fiberglass isolation plies between the aluminum core and the graphite plies.

S 348-107-R00

(7) Vacuum-bag the repair with vacuum bagging material and equipment.

S 348-079-R00

(8) Cure the repair at 93 degree C (200 degree F) for 220 minutes, while you apply 22 inches of mercury vacuum pressure.

S 328-080-R00

(9) Back drill holes through fitting on the inner skin side. Counter sink on the outer skin.

S 438-081-R00

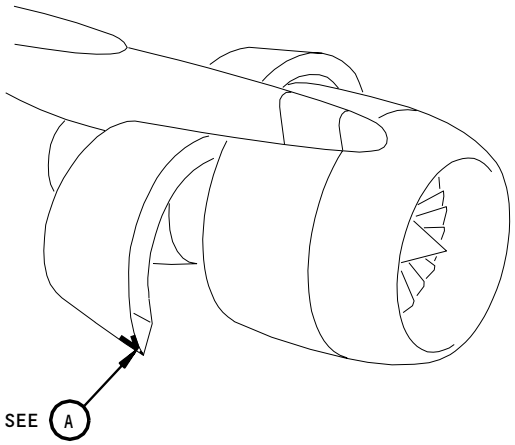
(10) Install the fasteners with Hi-Lok installation equipment

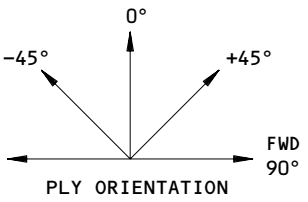
S 288-082-R00

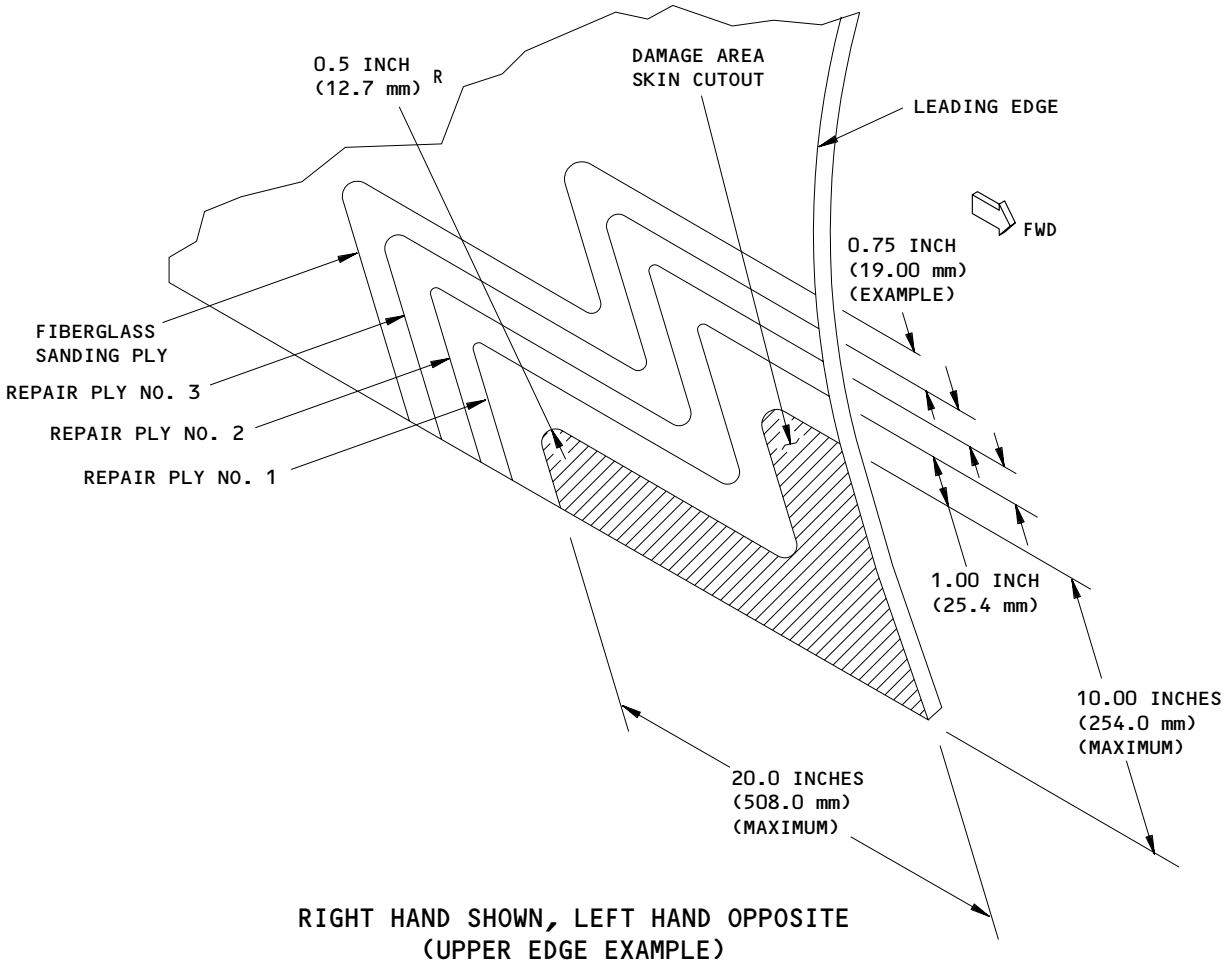
(11) Do an inspection of the repair with applicable nondestructive inspection methods to make sure the repair is done correctly.

S 938-083-R00

(12) Write FRS6285/1 adjacent to the assembly number with a permanent marker pen of a color that has good contrast.





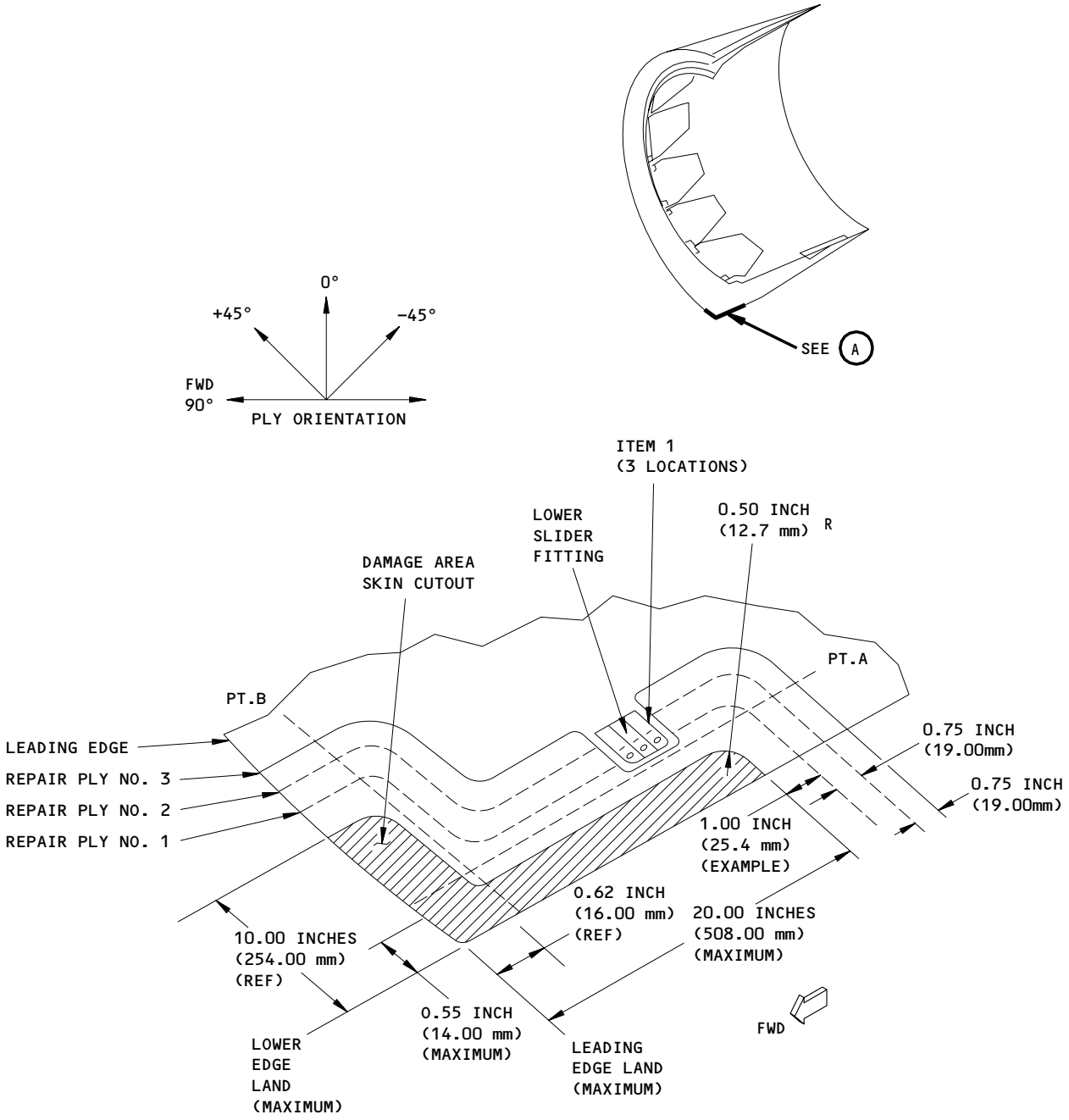


RIGHT HAND SHOWN, LEFT HAND OPPOSITE
(UPPER EDGE EXAMPLE)

A

62519A

Outer Skin Damage and Repair Lay-out
Figure 809

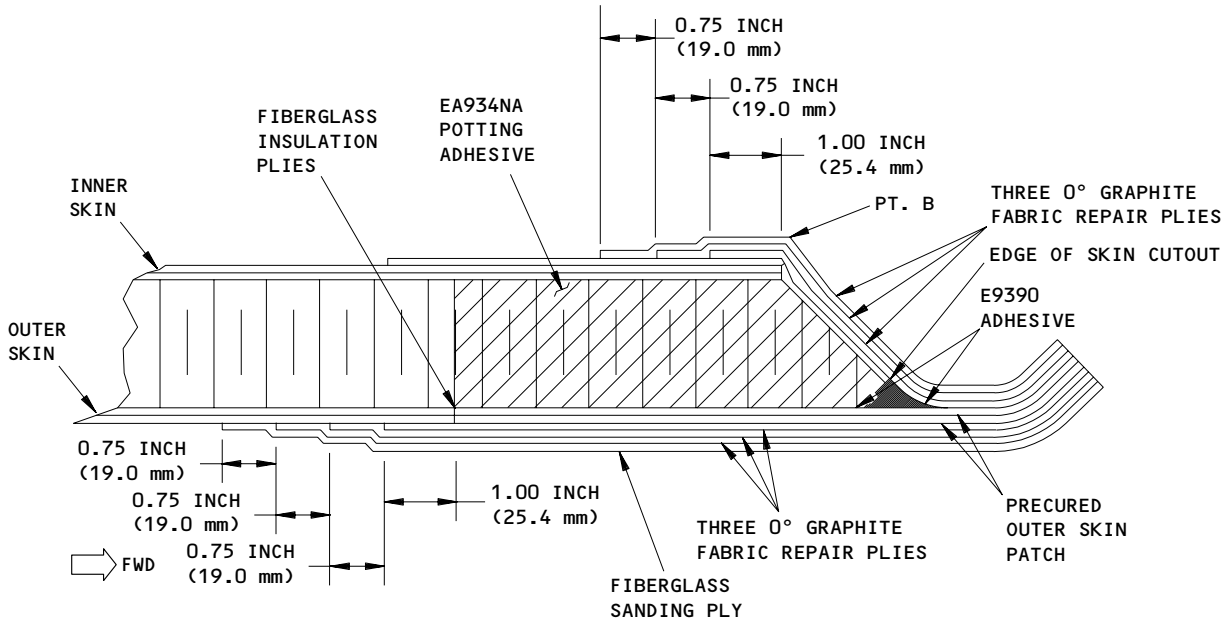


RIGHT HAND SHOWN LEFT HAND OPPOSITE
(UPPER EDGE EXAMPLE)

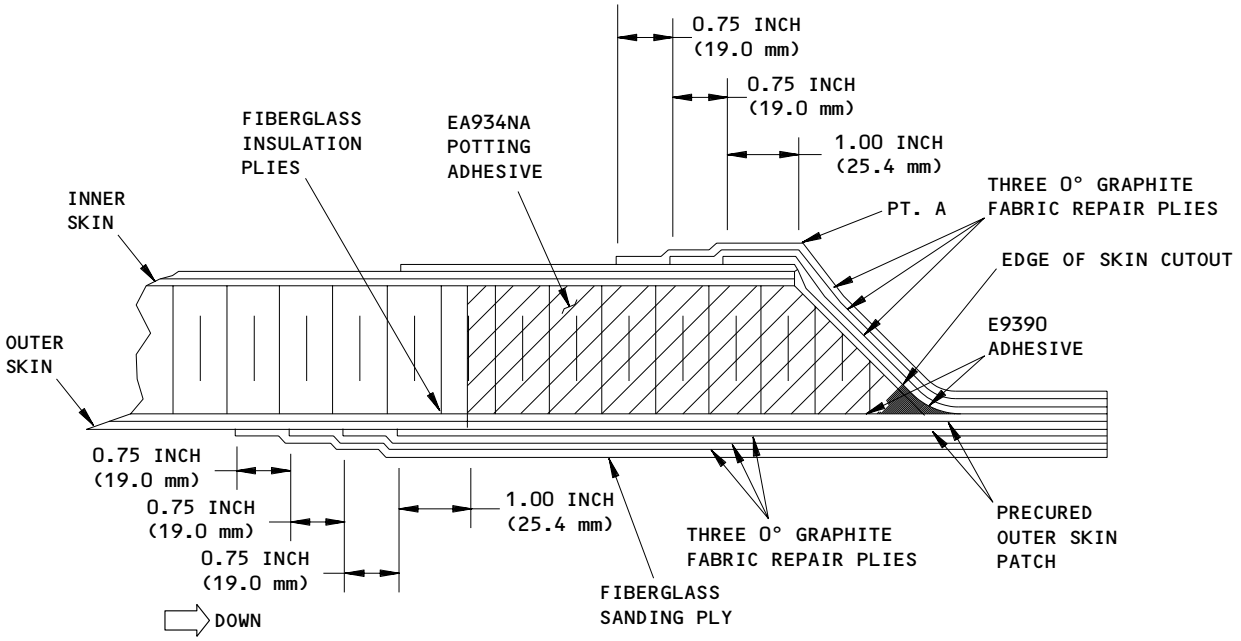
A

62520A

Inner Skin Damage and Repair Layout
Figure 810



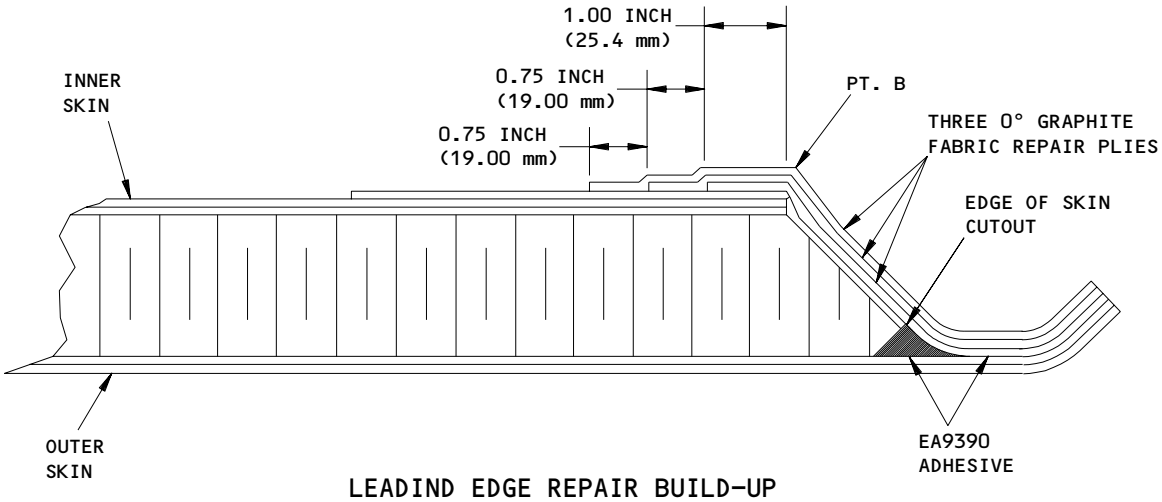
LEADING EDGE REPAIR BUILD-UP



LOWER EDGE REPAIR BUILD-UP
(UPPER EDGE EXAMPLE)

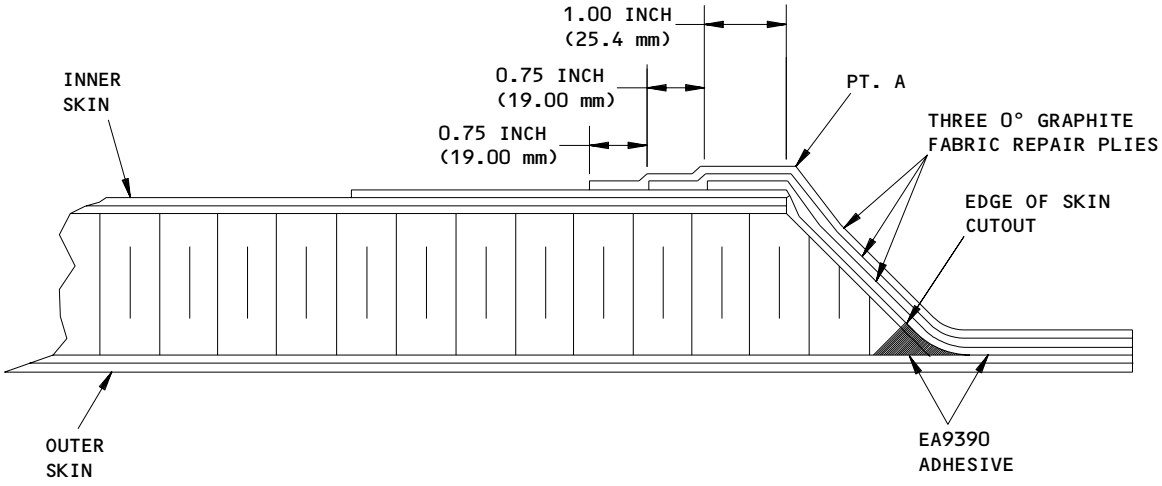
62521A

Inner and Outer Skin Edge Repair Build-Up
Figure 811



LEADIND EDGE REPAIR BUILD-UP
OUTER SKIN INTACT

FWD



DOWN

LOWER EDGE REPAIR BUILD-UP
OUTER SKIN INTACT
(UPPER EDGE EXAMPLE)

62522A

Inner Skin Edge Repair Build-Up
Figure 812

E. Repair the inner skin with disbonded outer skin (FRS6285/2). (Fig. 810 and 812)

S 218-084-R00

(1) Use magnification and tab-test to know the extent of disbond of the outer and inner skins from the core.

NOTE: Do not cut or remove disbonded outer skin.

S 328-111-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND FACE MASK. DO NOT BREATH THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(2) Cut and remove the damaged and disbonded inner skin only.

S 168-122-R00

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE DEGREASING FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH IT AWAY WITH WATER AND GET MEDICAL AID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(3) Abrade and clean the damaged area.
   (a) Lightly abrade 2.5 inch (63.5 mm) around the skin cutout.

   NOTE: To prevent edge fraying, add 0.5 inch (12.7 mm) all to all repair plies. Trim to final size after you soak the plies with adhesive and before you install them.

   (b) Apply moderate pressure to the corner of disbonded outer skin to push it away from the core and provide clearance to clean.
   (c) Flush the inner skin cutout and between the outer skin and core with MEK OMat No. 153.
   (d) Dry at 110-121 degree C (230-250 degree F) for one hour to remove all moisture from the repair area.

S 328-087-R00

(4) Cut three 0 degree inner skin repair-plies from graphite fabric. Trim the repair plies to go around the lower track fitting.

S 348-113-R00

WARNING: EPOXY ADHESIVES ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVE BECAUSE IT IS POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUME FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER AND THEN GET MEDICAL AID.

(5) Apply adhesive to the repair area.
   (a) Mix the epoxy adhesive per the manufacturer's instructions.

      NOTE: The weight of the adhesive necessary will be approximately the same weight of the carbon and glass fabric.

   (b) Put epoxy adhesive between the outer skin and the core. Make sure that sufficient amount of epoxy adhesive is used. Push the skin against the core and hold firmly in position with clamps.
   (c) Soak the plies with epoxy adhesive.
   (d) Apply the epoxy adhesive to the repair area and fill exposed portion of the core.

S 348-089-R00

(6) Install the inner skin repair plies.

S 348-090-R00

(7) Vacuum-bag the repair with vacuum bagging material and equipment.

S 348-091-R00

(8) Cure the repair at 93 degree C (200 degree F) for 220 minutes, while you apply 22 inches of mercury pressure.

S 288-092-R00

(9) Do an inspection of the repair with the applicable nondestructive inspection methods to make sure the damage is repaired correctly.

S 938-093-R00

(10) Write FRS6285/2 adjacent to the assembly number with a permanent marker pen that has good color contrast.

F. Repair the crack in the outer skin between fastener holes (FRS6285/3) (Fig. 813).

S 038-114-R00

CAUTION: DO NOT DISBOND SLIDER FITTING FROM INNER SKIN.

(1) Remove the three blind bolts that attach the lower edge of the track to the bond panel that has the crack.

NOTE: Crack is limited to outer ply only (one graphite layer).

S 118-115-R00

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND FACE MASK. DO NOT BREATH THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

WARNING: DO NOT GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. YOU MUST USE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. USE THE DEGREASING FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. IF YOU GET DEGREASING FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH IT AWAY WITH WATER AND GET MEDICAL AID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS, FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY AND/OR DAMAGE.

(2) Abrade and clean the repair area.
   (a) Lightly abrade an area of 4.25 X 10.50 inch (108 X 266.7 mm) around the crack until paint is completely removed and graphite skin is seen.
   (b) Flush repair area with Acetone, or Isopropyl alcohol, or cleaning solvent Desoclean.
   (c) Dry at 110-121 degree C (230-250 degree F) for one hour to completely remove moisture from repair area.

S 348-096-R00

(3) Find the end of crack and remove one layer of graphite skin around the crack to remove the crack completely.

NOTE: To prevent edge fraying add 0.5 inch (12.7 mm) all around to all fill, repair and sanding plies. Trim to final size after you soak the plies with adhesive and before you install them.

S 348-097-R00

(4) Cut the repair plies.
   (a) Cut one 0 degree fill ply from graphite fabric to fit in the skin cutout smooth with adjacent structure.
   (b) Cut two 0 degree outer skin repair plies from graphite fabric. First ply is to overlap the crack by 1.0 inch (25.4 mm). The second ply to overlap by 0.75 inch (19.05 mm).
   (c) Cut the sanding ply (exterior only) from fiberglass cloth to overlap last repair ply by 0.75 inch (19.05 mm).

S 348-116-R00

WARNING: EPOXY ADHESIVES ARE FLAMMABLE, KEEP THEM AWAY FROM SPARKS, FLAMES AND HEAT.

YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE ADHESIVE BECAUSE IT IS POISONOUS. USE THE ADHESIVE IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUME FROM THE ADHESIVE. IF YOU GET THE ADHESIVE ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER AND THEN GET MEDICAL AID.

(5) Apply the adhesive to the repair area.
   (a) Mix the epoxy adhesive per the manufacturer's instructions.

   NOTE: The weight of the adhesive necessary will be approximately the same weight of the carbon and glass fabric

   (b) Soak the repair, fill and sanding plies with epoxy adhesive.
   (c) Install the outer skin fill, repair and sanding plies.

S 348-099-R00

(6) Vacuum-bag the repair with vacuum bagging material and equipment.

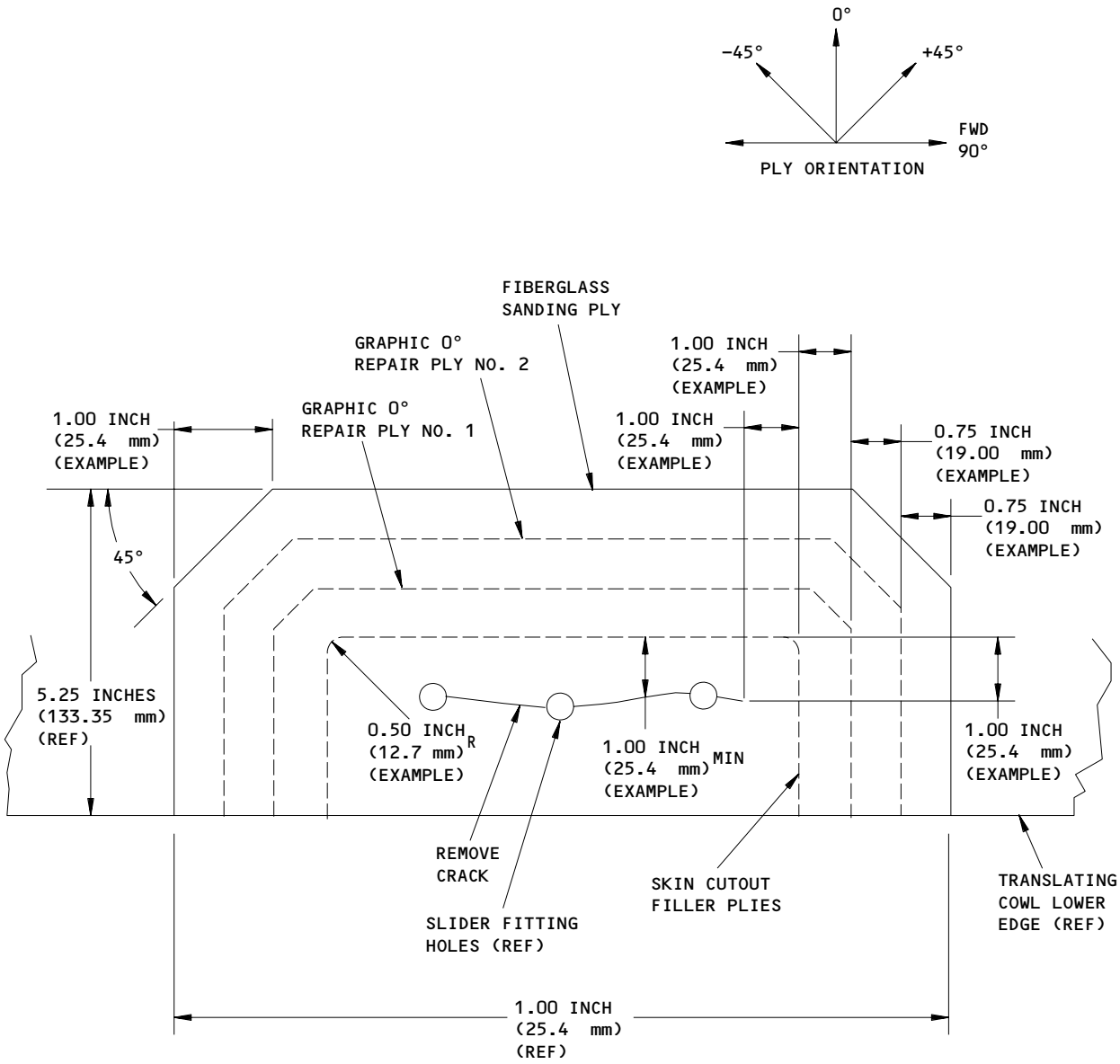
S 348-100-R00
(7) Cure the repair at 93 degree C (200 degree F) for 220 minutes while you apply 22 inches of mercury vacuum pressure.

S 328-101-R00
(8) Back-drill holes through the fitting on the inner skin side. Counter sink on the outer skin.

S 438-102-R00
(9) Install the fasteners with Hi-Lok installation equipment.

S 288-103-R00
(10) Do an inspection of the repair with the applicable nondestructive inspection methods to make sure the repair is done correctly.

S 938-104-R00
(11) Write FRS6285/3 adjacent to the assembly number with a permanent marker pen that has a good color contrast.



(UPPER EDGE EXAMPLE)

62523A

Outer Skin Crack Repair Lay-out
Figure 813

THRUST REVERSER BLOCKER DOORS - REMOVAL/INSTALLATION

1. General
   A. This procedure contains the data for the removal and installation of the thrust reverser blocker doors (referred to as the blocker doors).
   B. Use the procedures in AMM 70-51-00/201 to tighten the fasteners. Tighten the fasteners to the torque values in AMM 70-51-00/201 unless a torque value is given in this procedure.

TASK 78-31-24-004-001-R00

2. Remove the Thrust Reverser Blocker Doors (Fig. 401)
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

      (2) Access Panels
          415AL Thrust Reverser, Left Engine
          416AR Thrust Reverser, Left Engine
          425AL Thrust Reverser, Right Engine
          426AR Thrust Reverser, Right Engine

   C. Procedure

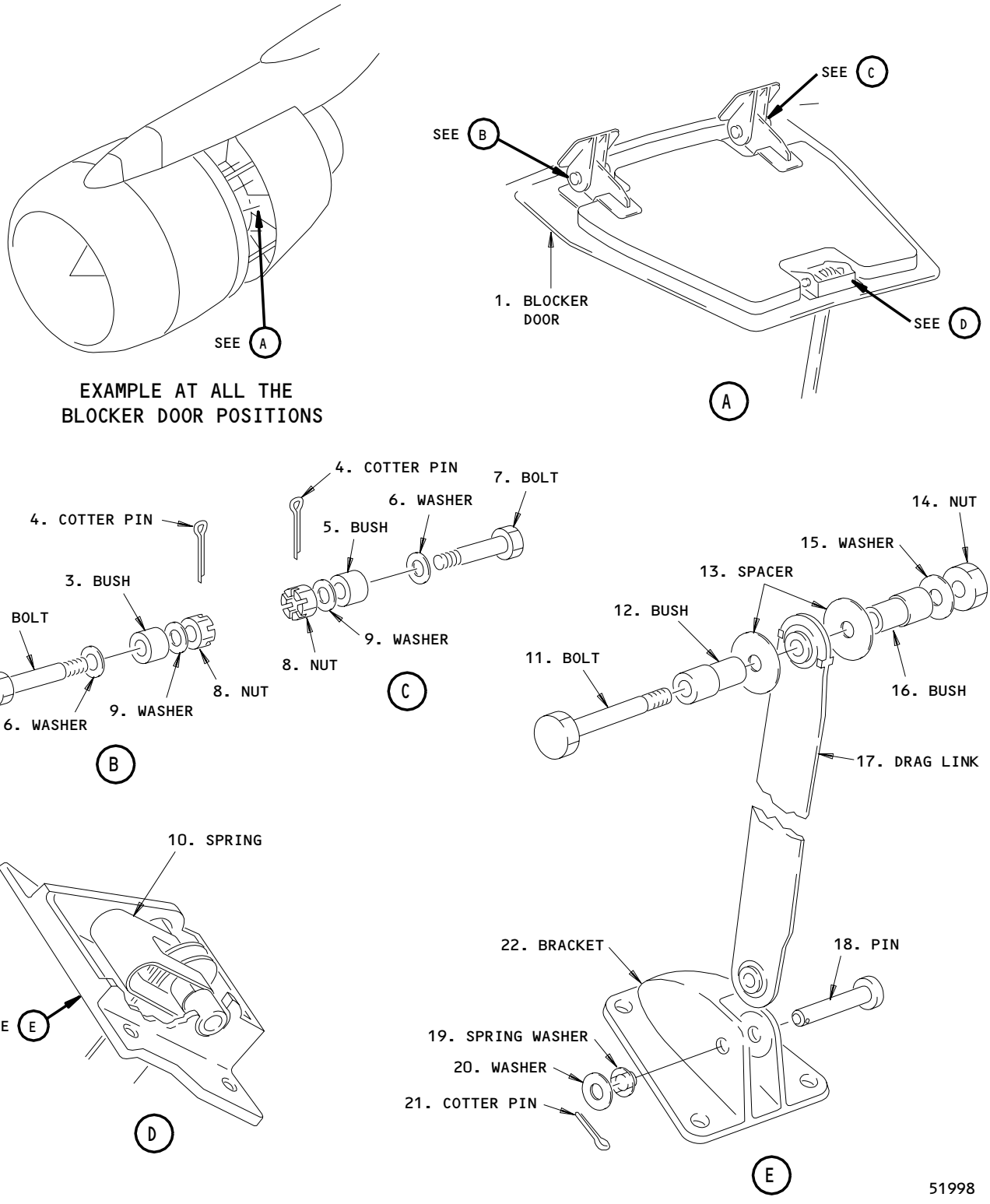
      S 014-002-R00

      WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

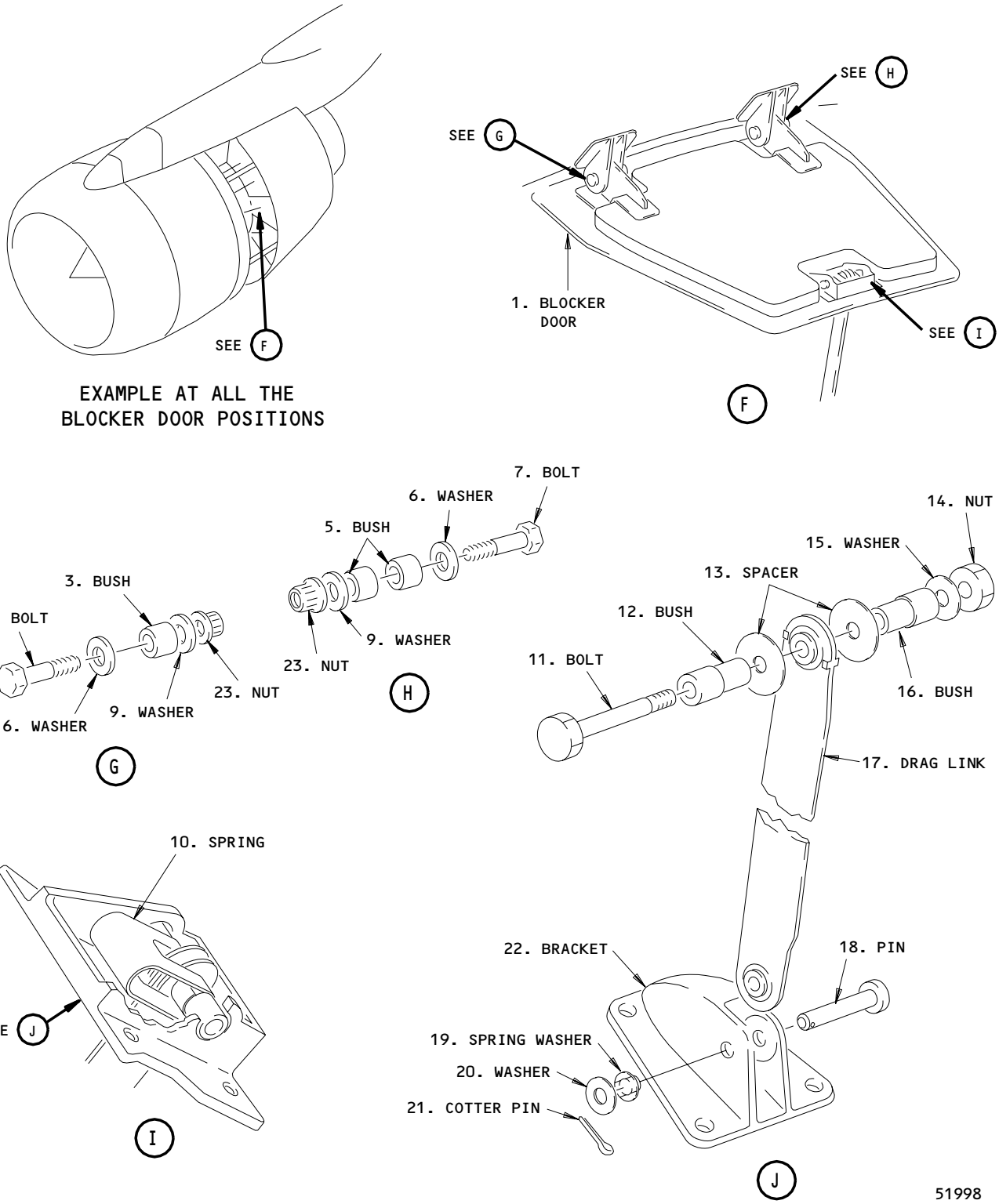
      (1) Open the left (right) thrust reverser (AMM 78-31-00/201).

      S 984-008-R00
      (2) Manually extend the thrust reverser approximately 3 inches (77 mm) (AMM 78-31-00/201).

      S 024-003-R00
      (3) Do the steps that follow to remove the blocker doors:
          (a) Remove the pin (18), spring washer (19), washer (20), and the cotter pin (21) from the bracket (22).



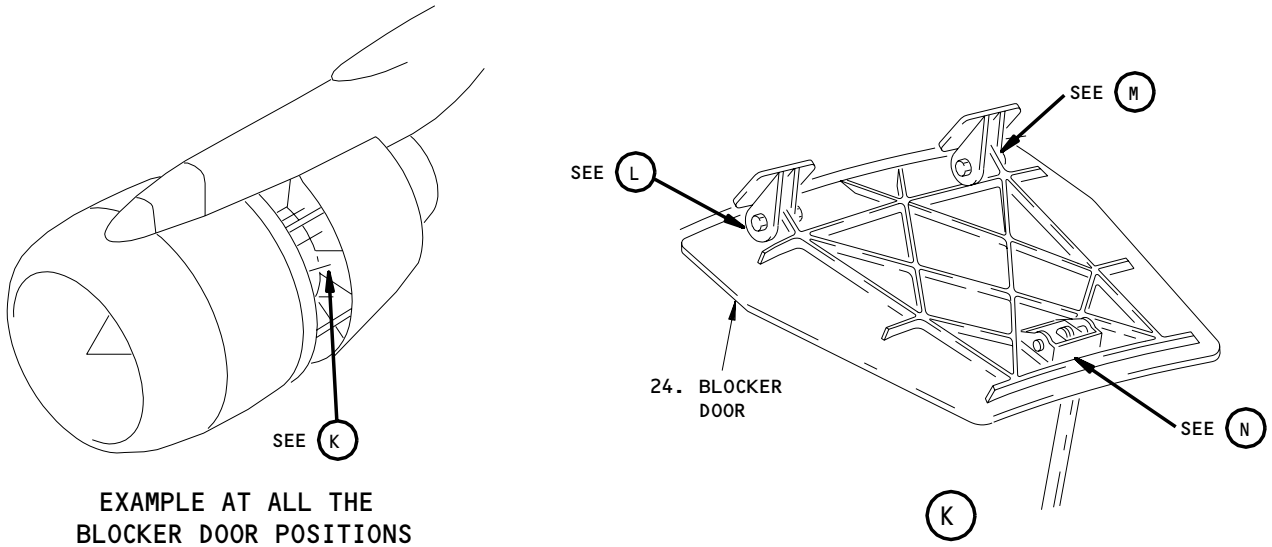
Thrust Reverser Blocker Door Installation
Figure 401 (Sheet 1)



Thrust Reverser Blocker Door Installation
Figure 401 (Sheet 2)

EFFECTIVITY
ENGINES POST-RR SB 78-7739
AND PRE-RR-SB 78-9326

C24164



Thrust Reverser Blocker Door Installation
Figure 401 (Sheet 3)

(b) Remove the bolts (2 and 7), washers (6), bushings (3 and 5), washers (9), and the nuts (8).
(c) Remove the blocker door (1) and the drag link assembly (17) from the thrust reverser.
(d) Remove the bolt (11), bushings (12 and 16), spacers (13), washer (15), spring (10), and the nut (14) from the blocker door (1).

TASK 78-31-24-404-004-R00

3. Install the Thrust Reverser Blocker Doors (Fig. 401)
A. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	1	Blocker Flap	78-31-24	01	20,125
					130
					135
					140
	2	Bolt			35
	3	Bush			45
	4	Cotter Pin			30
	5	Bush			45
	6	Washer			40
	7	Bolt			35
	8	Nut			50
	9	Washer			40
	10	Spring			110
	11	Bolt	78-31-27	01	15
	12	Bush			20
	13	Spacer			25
	14	Nut			35
	15	Washer			30
	16	Bush			20
	17	Drag Link			70
	18	Pin			60
	19	Spring Washer			55
	20	Washer			50
	21	Cotter Pin			45
	22	Bracket			65

B. References
(1) AMM 78-31-00/201, Thrust Reverser System

C. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
415AL Thrust Reverser, Left Enbine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

D. Procedure

S 424-005-R00
(1) Do the steps that follow to install the blocker doors:

CAUTION: YOU MUST INSTALL THE BLOCKER DOOR DRAG LINK IN THE CORRECT DIRECTION. THE CORRECT DIRECTION IS WITH THE ANTI-EROSION STRIP AT THE FRONT OF THE LINK. MAKE SURE THAT THE TAPERED EDGE IS AT THE INBOARD END OF THE DRAG LINK. IF THE BLOCKER DOOR DRAG LINK IS NOT INSTALLED IN THE CORRECT DIRECTION, DAMAGE TO THE DRAG LINK CAN OCCUR (FIG. 402).

(a) Attach the drag link (17) to the blocker door (1):
1) Install the bushings (12 and 16) in the blocker door spring (10) and the housing slot.
a) Make sure the bushings are in the correct position.
2) Install the spacers (13).
3) Attach the assembly with the bolt (11), the bushings (12 and 16), the washers (13 and 15), and the nut (14).
4) Tighten the nut (14).
(b) Install the blocker door (1) and the drag link assembly (17).
1) Install the bolts (2 and 7), washers (6), bushings (3 and 5), washers (9) and the nuts (8).
2) ON ENGINES WITH RR SB 78-7739 AND RB211-535E4 ENGINES WITH RR SB 78-9326;
Make sure that the head of each bolt is installed adjacent to the anti-rotation feature on the bracket.
3) Tighten the nuts (8).
4) ON ENGINES WITHOUT RR SB 78-7739 AND RB211-535E4 ENGINES WITHOUT RR SB 78-9326;
Install the cotter pins.
(c) Put the drag link in the bracket (22).
1) Install the pin (18).
2) Install the spring washer (19), the spacer (20) and the cotter pin (21).
(d) Manually extend the thrust reverser fully forward (AMM 78-31-00/201).

(e) Do a check of the clearance between the blocker doors and the translating cowl (Fig. 403).
(f) If it is necessary, adjust the aft edge of the blocker door.

E. Put the Airplane Back to Its Usual Condition

S 414-006-R00

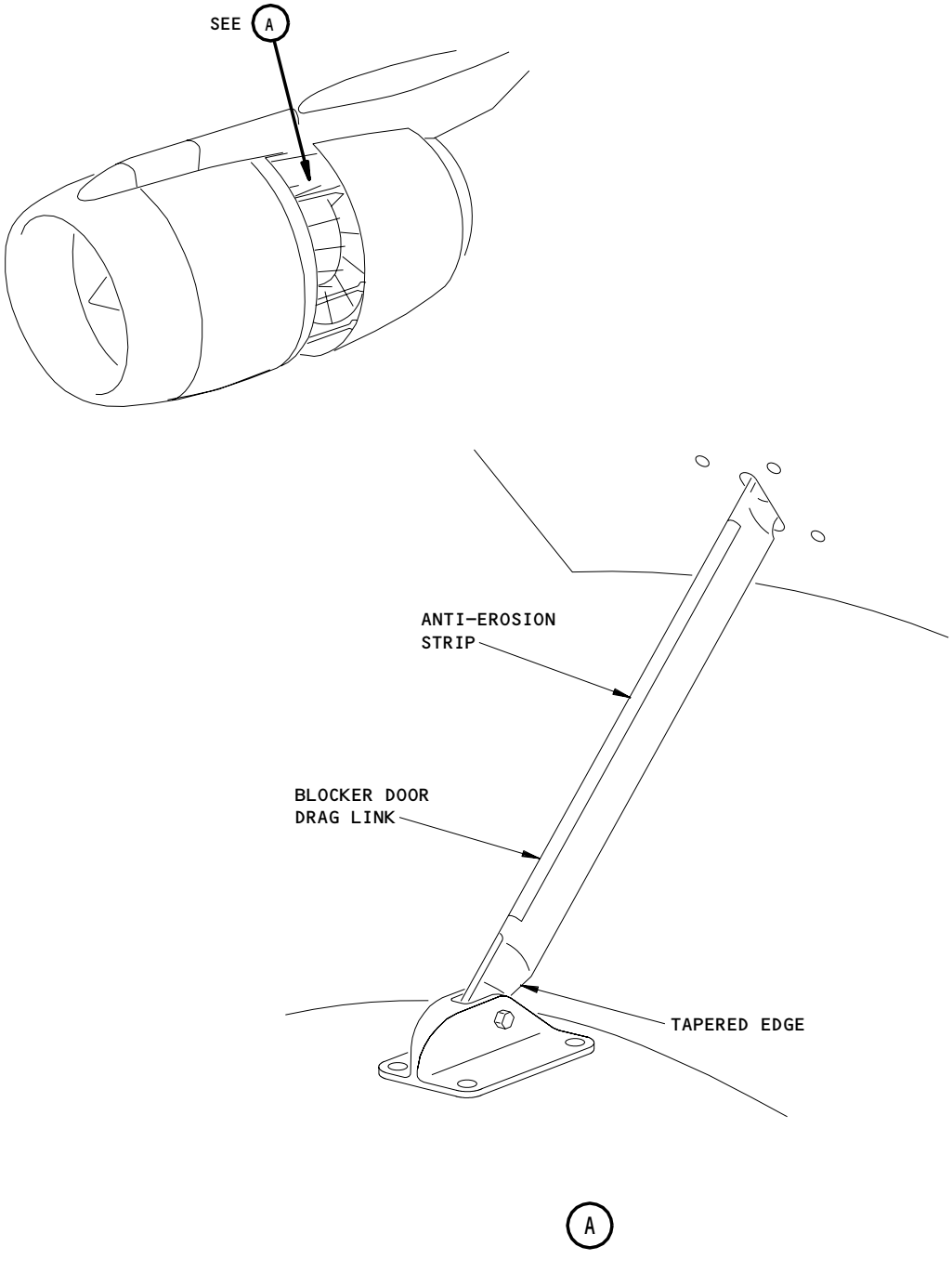
WARNING: OBEY THE INSTRUCTIONS AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Close the left (right) thrust reverser (AMM 78-31-00/201).

S 214-010-R00

CAUTION: FAILURE TO CHECK FOR CLEARANCE OF THE BLOCKER DOORS COULD RESULT IN DAMAGE TO THE INNER BARREL OF THE THRUST REVERSER UPON OPERATION.

(2) Do a check for the installation of the blocker door as follows:
(a) Manually extend the thrust reverser rearward (AMM 78-31-00/201).
(b) Look at the door while it moves rearward.
(c) Make sure that there is 0.040 inch (1.01 mm) minimum clearance between the blocker door and the adjacent doors.
(d) Make sure that there is 0.070 inch (1.78 mm) minimum clearance between the blocker door and the inner barrel of the thrust reverser.
(e) Make sure that there is 0.070 inch (1.78 mm) minimum clearance between the blocker door and the upper bifurcation panel of the thrust reverser (if applicable).
(f) Make sure that there is 0.070 inch (1.78 mm) minimum clearance between the blocker door and the lower bifurcation panel of the thrust reverser (if applicable).
(g) Adjust the edges of the blocker door if required to provide sufficient clearance:
1) PRE-SB 78-9326 (COMPOSITE BLOCKER DOORS);
Trim edges of the blocker door a minimum amount to provide minimum clearances per FRS6102.



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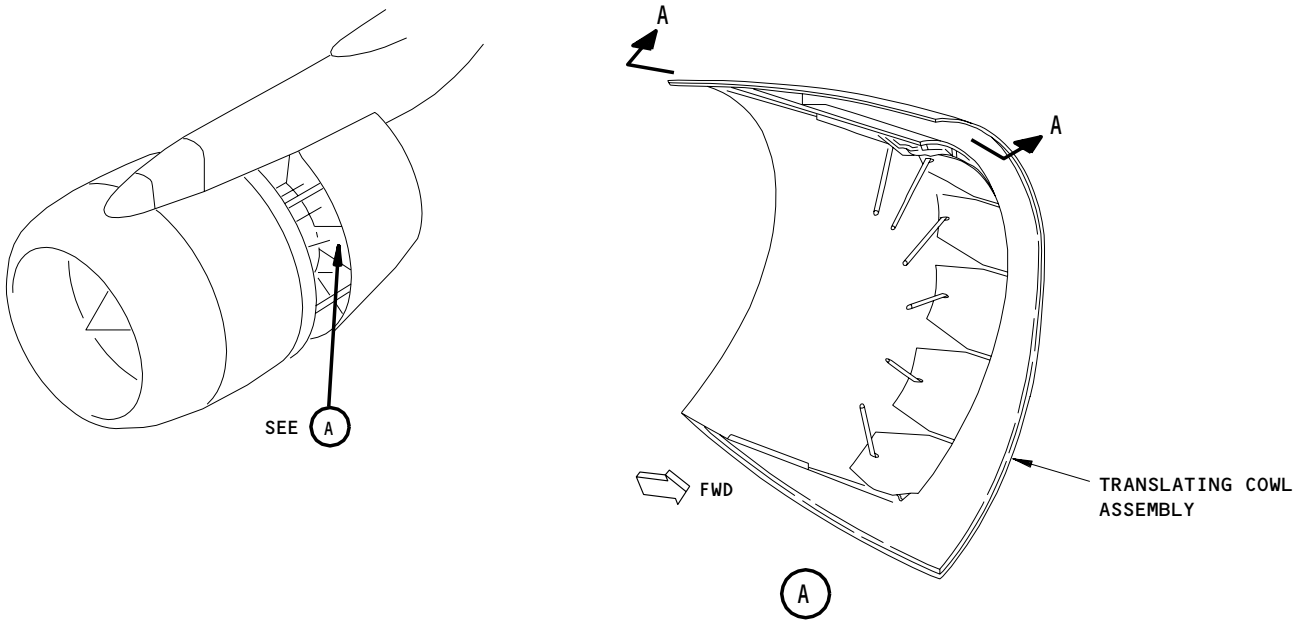
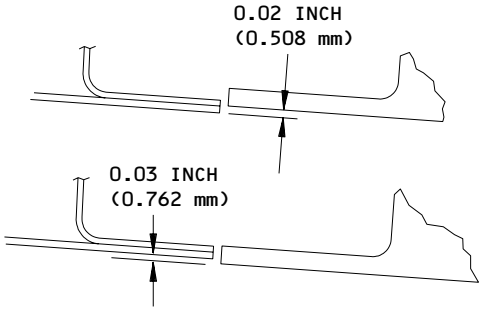
Blocker Door Drag Link
Figure 402



(LEFT SIDE IS SHOWN,
RIGHT SIDE IS OPPOSITE)
A-A



MAXIMUM LIMITS FOR
POSITIVE AND NEGATIVE STEPS
B

55894

Thrust Reverser Blocker Door Installation
Figure 403

2) POST-SB 78-9326 (SINGLE PIECE ALUMINUM FORGED BLOCKER DOORS);
Trim edges of the blocker door a minimum amount to provide minimum clearances per FRS3253.

(h) Manually retract the thrust reverser fully forward (AMM 78-31-00/201).

THRUST REVERSER BLOCKER DOORS - INSPECTION/CHECK

1. General
   A. Use the procedure that follows to examine the flap assemblies of the blocker doors. These blocker doors are found on the left and right thrust reverser.

TASK 78-31-24-216-001-R00

2. Inspection of the Blocker Doors of the Thrust Reverser
   A. References
      (1) AMM 70-42-11/201, Surfaces Affected By Minor Damage
      (2) AMM 78-31-00/201, Thrust Reverser System
      (3) AMM 78-31-23/801, Thrust Reverser Translating Cowl
      (4) AMM 78-31-24/801, Thrust Reverser Blocker Doors
      (5) AMM 78-31-27-401, Fan Thrust Reverser Blocker Door Drag Links
   B. Access
      (1) Location Zones
          415/425 Thrust Reverser, Left
          416/426 Thrust Reverser, Right

   C. Do an Inspection of the Blocker Doors of the Thrust Reverser (Fig. 601)

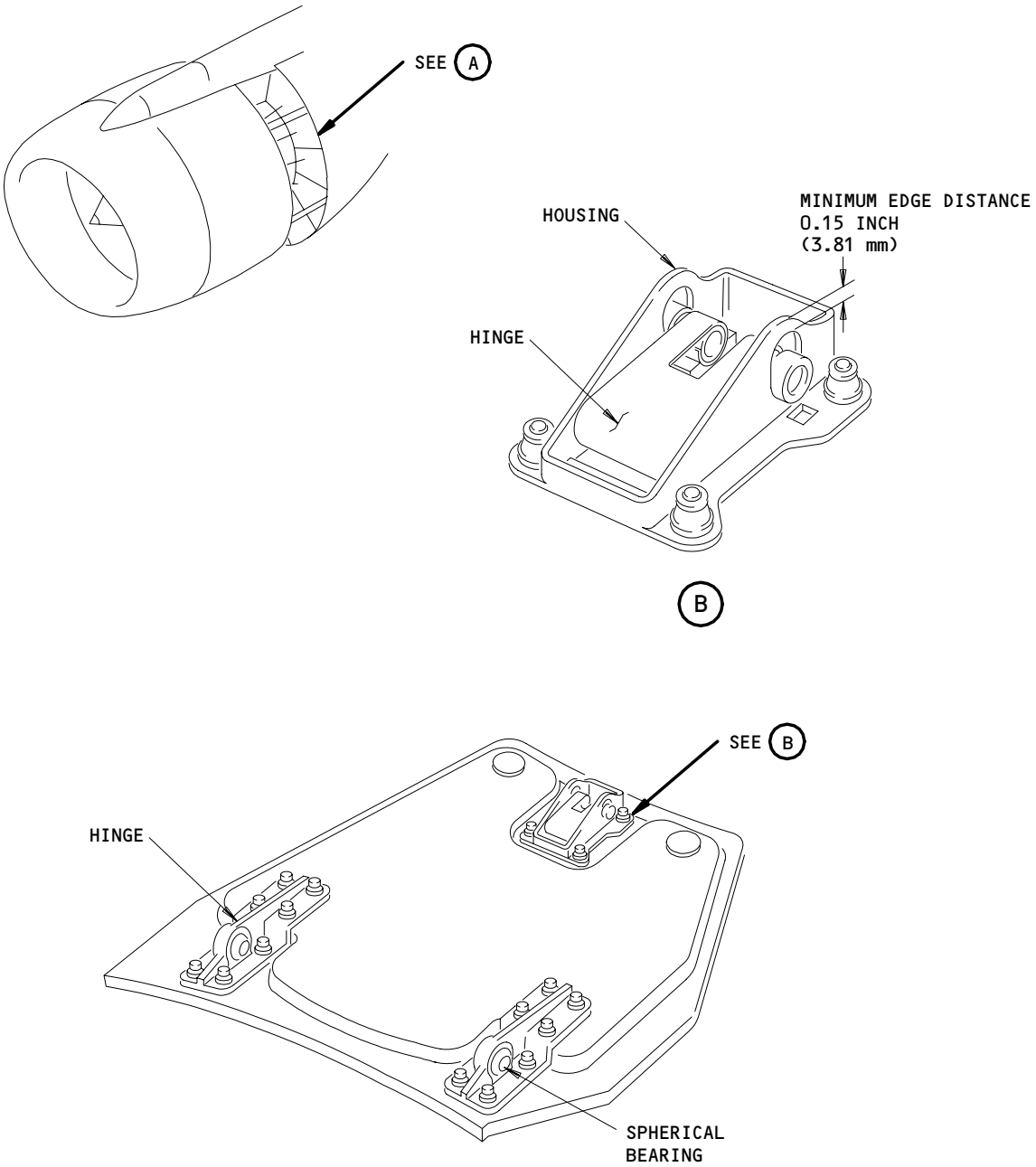
      S 046-002-R00

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

      (1) Manually extend the thrust reversers approximately 3.0 in. (77.0 mm) (AMM 78-31-00/201).

      S 216-003-R00
      (2) Make a visual inspection of the blocker flaps for damage.

      S 216-004-R00
      (3) Make an inspection of the blocker flap edge as follows:
          (a) Look for areas which have cracks.
              1) If the crack is not more than 0.25 in. (6.3 mm) in length when measured from the flap edge, repair the crack with FRS6102/2 (AMM 78-31-24/801).
              2) If the crack is not more than 0.5 in. (12.7 mm) in length when measured from the flap edge, repair the crack to FRS6102/1 (AMM 78-31-24/801).
              3) If the crack is more than the limits, reject the part.
          (b) Look for areas with gouges.
              1) If the gouge is not more than 0.25 in. (6.3 mm) in length when measured from the flap edge, repair with FRS6102/2 (AMM 78-31-24/801).
              2) If the gouge is more than the limits, reject the part.



SIMILAR AT ALL BLOCKER DOOR LOCATIONS

A

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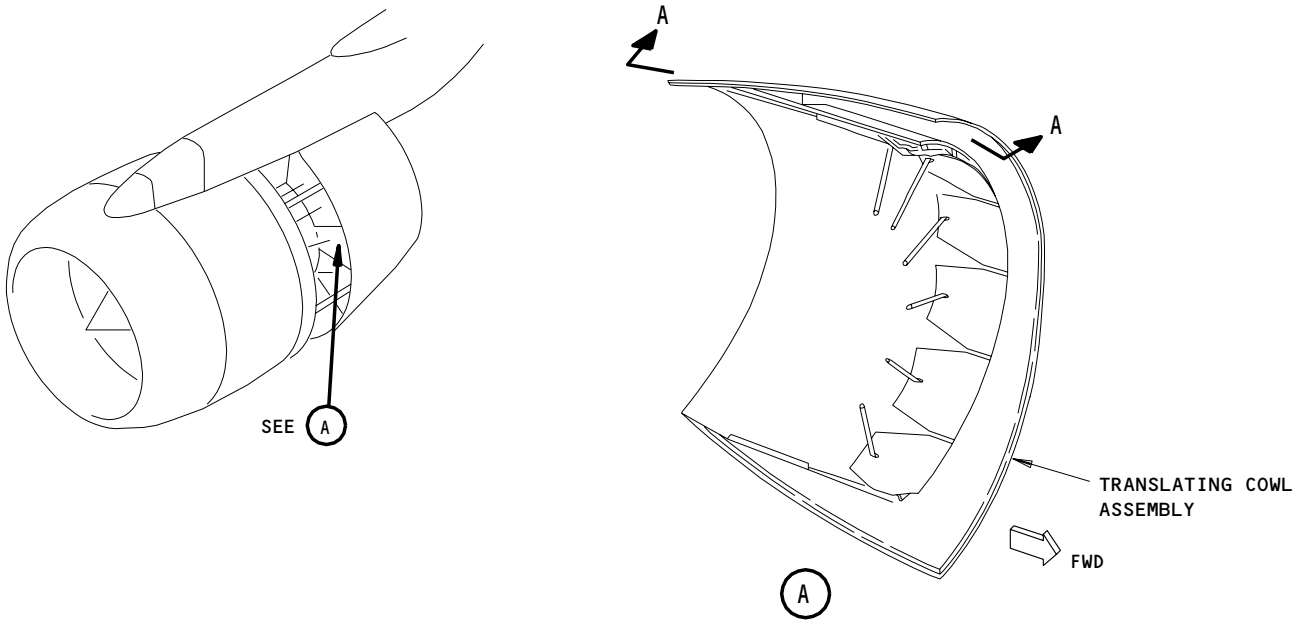
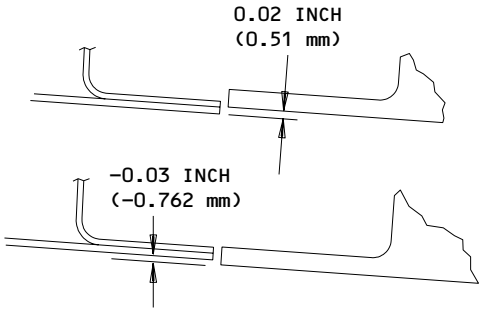
Blocker Flap - Inspection/Check
Fig 601



LEFT SIDE SHOWN
(RIGHT SIDE IS OPPOSITE)
A-A



MAXIMUM LIMITS FOR
POSITIVE AND NEGATIVE STEPS
B

55894A

Blocker Door/Translating Cowl Inner Surface - Inspection Details
Figure 602

(c) Look for areas which have nicks.
1) If the nick is not more than 0.25 in. (6.3 mm) in length when measured from the flap edge, repair with FRS6102/2 (AMM 78-31-24/801).
2) If the nick is more than the limits, reject the part.
(d) Look for surfaces which have delaminations.
1) Single delaminations not more than 1.0 in. (25.4 mm) in length, repair with FRS6102/3 (AMM 78-31-24/801).
2) If the total delamination length is not more than 50 percent of a blocker flap edge, repair with FRS6102/3 (AMM 78-31-24/801).
3) If the delamination is more than the limits, reject the part.

S 216-005-R00

(4) Make an inspection of the laminated shims of the blocker doors as follows:
(a) Look for laminated shims which are gone.
(b) If laminated shims are gone, use FRS6080 to replace the shims (AMM 78-31-24/801).

S 216-006-R00

(5) Make an inspection of the perforated skin of the blocker flap as follows:
(a) Look at the perforated skin for signs of nicks.
1) If the nick is not more than 2.0 in. (50.8 mm) in length and 0.01 in. (0.254 mm) in depth, repair with FRS6079 (AMM 78-31-24/801).
2) If the dimensions of the nick are more than the limits, reject the part.
(b) Look for signs of cracks.
1) It is permitted to have cracks in the facesheets or at the flap edges which are not more than 0.25 in. (6.35 mm) in length.
2) Cracks which are more than these limits must be repaired with FRS6079 (AMM 78-31-24/801).
(c) Look at the perforated skin for dents.
1) It is permitted to have dents which are smooth, free of cracks and not more than 2.0 in. (50.8 mm) in diameter.
2) If the dent is more than the given limits in (1), reject the part.
3) It is permitted to have dents which are not more than 0.5 in. (12.7 mm) in diameter and with cracks not more than 0.125 in. (3.175 mm) in length.
4) If the dents are larger than the given limits in (3), use the repair FRS6079 (AMM 78-31-24/801).
(d) Look at the perforated skin for holes.
1) It is permitted to have holes which are not more than 0.5 in. (12.7 mm) in diameter and a minimum or 5.0 in. (127.0 mm) from other damage.

2) Holes which are more than these limits must be repaired with FRS6079 (AMM 78-31-24/801).

S 216-007-R00

(6) Make an inspection of the drag link spring and the housing of the blocker flap as follows:
   (a) Make an inspection of the spring for damage and cracks.
      1) If you find damage, repair the spring with the repair FRS6183 (AMM 78-31-24/801).
      2) If the spring has cracks, repair the spring with the repair FRS6183 (AMM 78-31-24/801).
   (b) Make an inspection of the housing for damage,
      1) If you find damage, repair the housing with the repair FRS6183 (AMM 78-31-24/801).
   (c) Make an inspection of the housing for worn areas on the sidewalls and the pivot pin holes.
      1) It is permitted to have fretted areas on the inner sidewalls which are not more than 0.01 in. (0.25 mm).

         NOTE: Make sure you make all sharp edges smooth. Use the repair FRS3253 (AMM 70-42-11/201).

      2) If the damage to the sidewalls is more than the given limits, repair the area with FRS6183 (AMM 78-31-24/801).
      3) It is permitted to have damage to the pivot pin holes if the distance to the edge is more than 0.15 in. (3.81 mm).
      4) If the distance to the edge is less than 0.15 in.(3.81 mm), repair the part with FRS6183 (AMM 78-31-24/801).

S 216-008-R00

(7) Make an inspection of the spherical bearings of the blocker flap hinges as follows:
   (a) Examine the bearings for clearance and play.
      1) If the bearing housing is loose in the hinge bracket, you must make a record to do the repair FRS6213 (AMM 78-31-24/801). This will make sure that the repair is done when the blocker flap is removed for maintenance.
      2) It is permitted to have a clearance between the ball and the outer race of no more than 0.004 in. (0.1 mm).
      3) If the clearance is more than 0.004 in. (0.1 mm), you must make a record to do the repair FRS6213 (AMM 78-31-24/801). This will make sure that the repair is done when the blocker flap is removed for maintenance.

S 216-009-R00

(8) Make an inspection of the blocker flap hinges as follows:
   (a) Make sure the hinges are attached correctly.
   (b) It is permitted to have movement in the hinge if this movement is not more than 0.009 in. (2.28 mm).

(c) If the movement is more than 0.009 in. (2.28 mm), repair the part with FRS6266 (RB211-535C engines) or FRS6267 (RB211-535E4 engines) (AMM 78-31-24/801).

S 446-010-R00

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

(9) Manually retract the thrust reverser (AMM 78-31-00/201).

S 216-012-R00

(10) If the translating cowl is repaired to FRS6012(LH) or FRS6027(RH), examine the blocker doors and the translating cowl inner surface to make sure they are correctly aligned (Fig. 602).

NOTE: Make sure the thrust reverser is put back to the retracted position before you do this part of the inspection procedure (AMM 78-31-00/201).

(a) If the translating cowl inner surface is not more than 0.020 inch (0.51 mm) into the airflow, accept it.
(b) If the translating cowl inner surface is not more than 0.030 inch (0.76 mm) out of the airflow, accept it.
(c) If the limits in the steps above are not obeyed, do the steps that follow:
    1) Remove the pivot pin that attaches the blocker door drag link to the inner barrel attachment bracket (AMM 78-31-27/401).
    2) Adjust the thickness of the laminated shim to get the blocker door and the cowl inner surface to align correctly (AMM 78-31-23/801).
        a) Use FRS6012 for the left cowl.
        b) Use FRS6027 for the right cowl.

3) Install the blocker door drag link (AMM 78-31-27/401).

THRUST REVERSER BLOCKER DOORS - APPROVED REPAIRS

1. General
   A. The repairs in this procedure are as follows:

Paragraph Number	Repair Number	Title
2	FRS6080	Thrust Reverser Blocker Door Assembly Replacement of Laminated Shim
3	FRS6079	Thrust Reverser Blocker Door Assembly Repair of Perforated Skin
4	FRS6183	Thrust Reverser Blocker Door Assembly Replacement of Spring and Spring Housing
5	FRS6213	Thrust Reverser Blocker Door Assembly Replacement of Hinge Bearing
6	FRS6267	Thrust Reverser Blocker Door Assembly Replacement of Hinge Assembly
7	FRS6200/ FRS6199	Thrust Reverser Opening Actuator Lanyard Replacement

TASK 78-31-24-338-022-R00

2. Thrust Reverser Blocker Doors - Replace Laminated Shims
   A. General
      (1) This procedure is FRS6080 and contains instructions when you replace the laminated shims of the blocker doors of the translating cowl.
      (2) This repair can be used if the blocker doors of the thrust reverser have one of these assembly numbers:

LH assemblies	RH assemblies
LJ71677	LJ71678
LJ71253	LJ71254
LJ71679	LJ71680
LJ76047	LJ76048
LJ76055	LJ76422
LJ76421	LJ76087
LJ76087	LJ76085
LJ76085	LJ76427
LJ76427	LJ76050
LJ76049	LJ76058
LJ76057	LJ76424
LJ76423	

B. Parts
(1) Laminated Shims (LJ70425)
C. References
(1) AMM 78-31-24/401, Thrust Reverser Blocker Doors
D. Access
(1) Location Zones
415/425 Thrust Reverser, Left
416/426 Thrust Reverser, Right

E. Replace the Laminated Shim (Fig. 804)

S 128-203-R00
(1) Use grit abrasive paper to make the mating surfaces rough.

S 188-183-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
(a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 378-025-R00

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY.

WARNING: KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(3) Mix the adhesive. Follow the manufacturer's instructions.

S 348-026-R00
(4) Apply the adhesive on the mating surfaces to a thickness of 0.005 in. (0.13 mm) on the two surfaces.

S 428-027-R00
(5) Install the shim.
(a) The new shim can be installed on the surface or to a second shim.

S 828-028-R00
(6) Apply pressure to the shim. This will make sure the shim is installed correctly.

Not Used
Figure 801

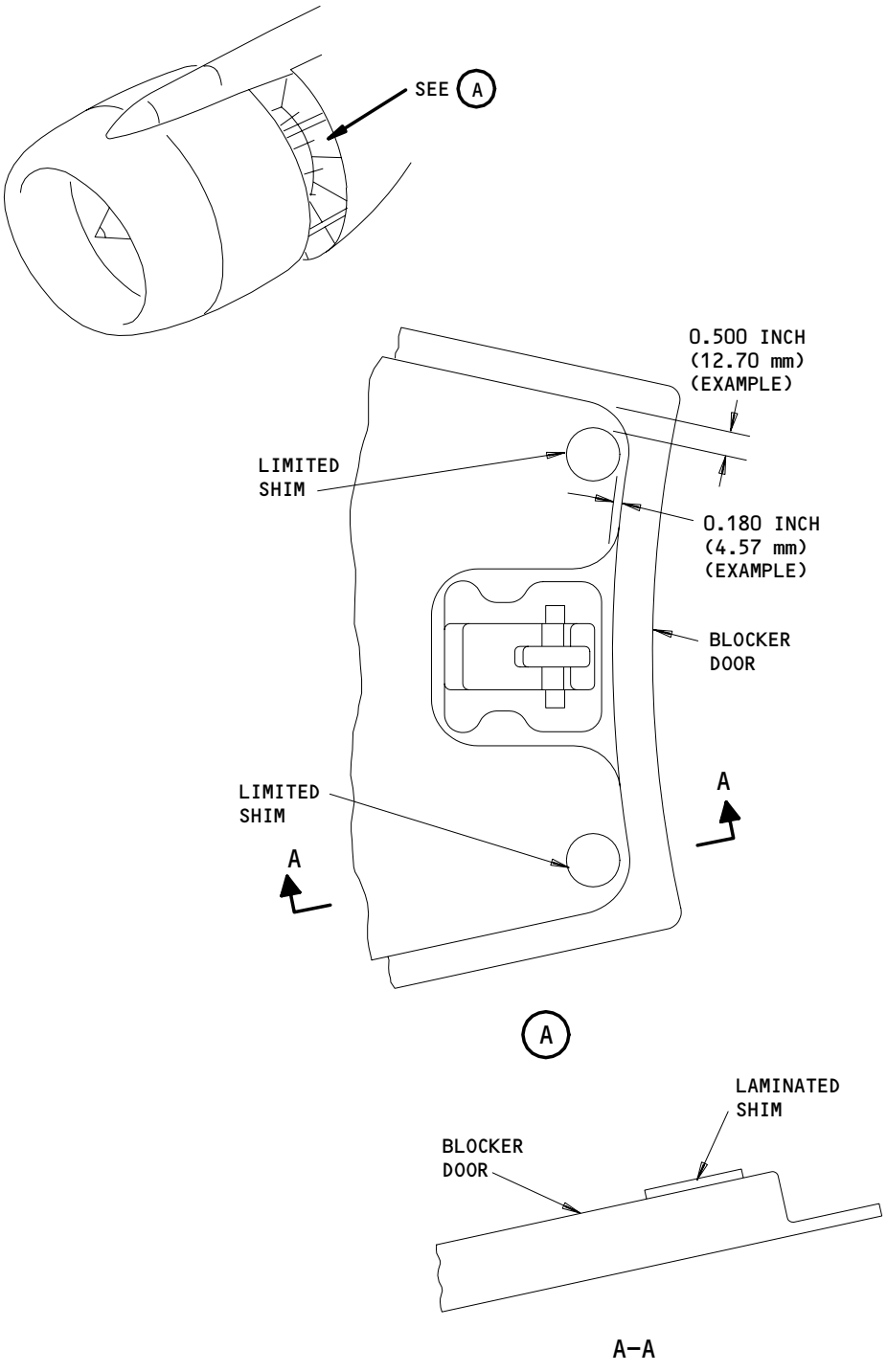
862475

Not Used
Figure 802

L27646

Not Used
Figure 803

L27648



Blocker Door - Laminated Shim Repair
Figure 804

S 348-029-R00

(7) Use heat lamps to cure the adhesive for 1 hour at 180-200°F (82-148°C). Make sure you keep pressure on the shim.

S 218-030-R00

(8) Make a visual and dimensional check of the rear edge of the blocker door (AMM 78-31-24/401).

S 228-031-R00

(9) Do a check of the step tolerance of the blocker door (AMM 78-31-24/401).

S 938-032-R00

(10) Write the repair number FRS6080 adjacent to the assembly number of the blocker door. Use a permanent ink marker pen with a color that can be easily seen.

TASK 78-31-24-338-033-R00

3. Thrust Reverser Blocker Door - Repair of Perforated Skin

A. General

(1) The repair in this procedure is FRS6079.

(2) This procedure gives instructions to repair the perforated skin of the thrust reverser blocker door when:

(a) the damage is not more than 0.50 in. (12.7 mm) in diameter. See paragraph F.

(b) the damage is not more than 2.00 in. (50.8 mm) in diameter. See paragraph G.

(3) No more than one repair for each blocker door is permitted.

(4) The acoustic panel area which is gone due to this repair is specified as the area which the patch covers.

(5) The maximum quantity of acoustic panel which can be gone from either the left or the right thrust reverser from all repairs is 1.2 sq.ft.

(6) This repair can be used if the blocker doors of the thrust reverser have one of these assembly numbers:

LH assemblies	RH assemblies
LJ71900	LJ71678
LJ71677	LJ71680
LJ71679	

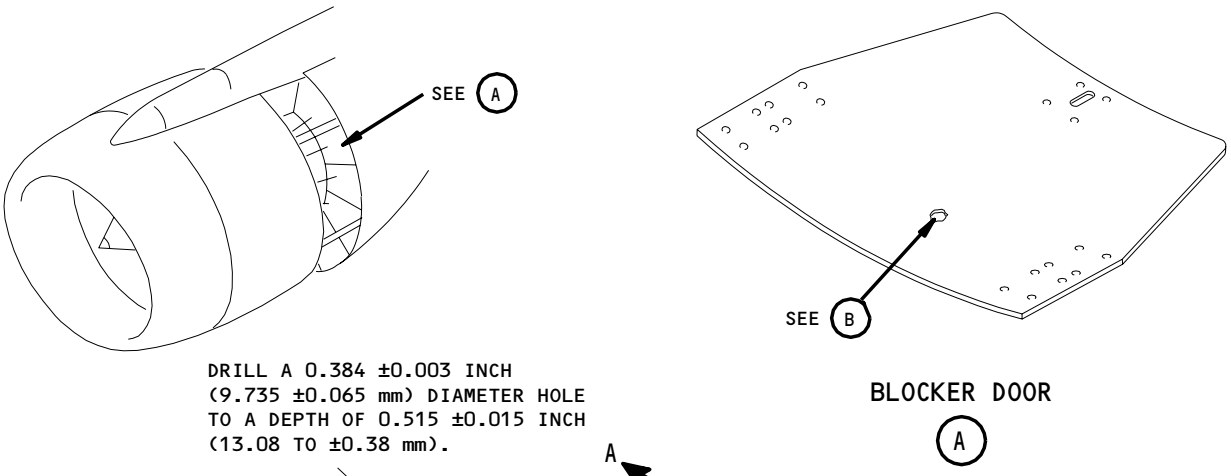
B. Equipment
   (1) Standard workshop tools
   (2) Drills and drilling equipment
   (3) Riveting equipment
C. Parts
   (1) Rivet (MS20426AD12-20)
   (2) Blind Rivet (NAS1738E4-2)
D. Consumable Materials
   (1) A00253 Adhesive Type II, Class II (EA934NA)
       OMat No. - 8/52
   (2) Degreasing fluid, Acetone OMat No. 150 or
                         Isopropyl alcohol OMat No. 1/40 or
                         Cleaning solvent Desoclean OMat No. 1/257
   (3) C00812 Primer 463-6-27
       OMat No. - 7/157
   (4) C00813 Curing Solution (X-337)
       OMat No. - 7/158
   (5) G01277 Tape, masking High heat resistant paper
       OMat No. - 2/40
   (6) G02202 Aluminum Oxide abrasive paper (Grade 180)
       OMat No. - 5/62
   (7) Thinners (TL52-66)
       OMat No. - 7/159
   (8) Aluminum sheet 2024-T3,
       0.04 in. (1.02 mm) thick - Local Resources
   (9) G01306 Gloves, White Cotton - Local Resources
   (10) G01163 Cloth, Lint-free - Local Resources
E. Access
   (1) Location Zones
       415/425 Thrust Reverser, Left
       416/426 Thrust Reverser, Right

F. Repair of Damage Which Is Not More Than 0.50 in. (12.7 mm) (Fig. 805)

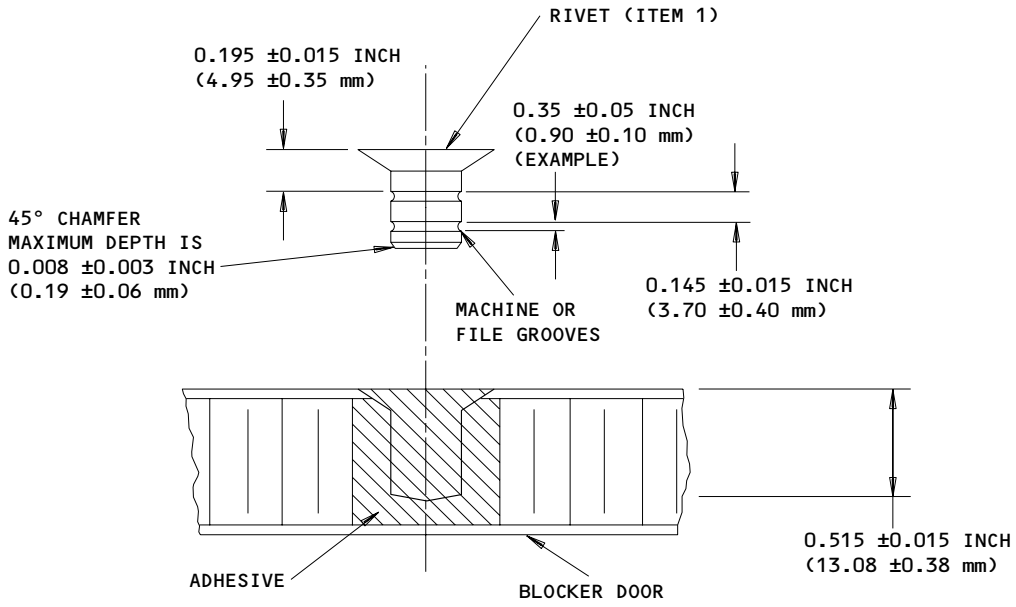
S 188-184-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

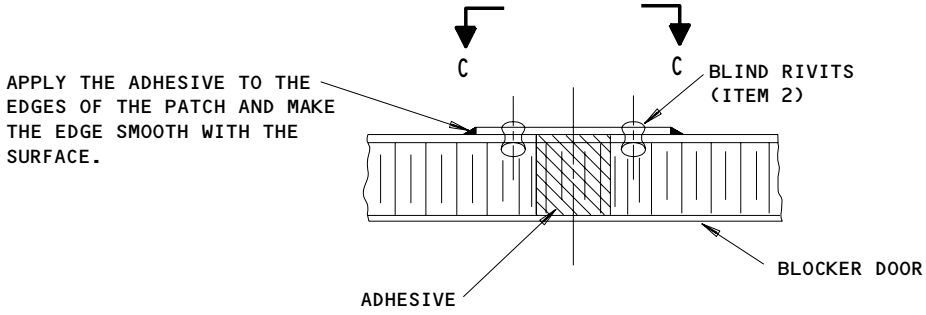
(1) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.



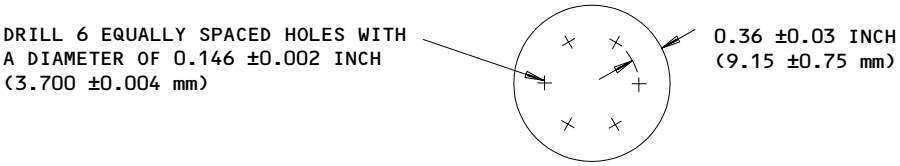
Blocker Door - Perforated Skin Repair
Figure 805 (Sheet 1)



A–A



B–B



C–C

NOTE: THE PATCH MUST GIVE A MINIMUM OVERLAP ON THE BLOCKER DOOR OF 0.72 ±0.03 INCH (18.3 ±0.80 mm)

55983A

Blocker Door – Perforated Skin Repair
Figure 805 (Sheet 2)

S 348-035-R00

(2) Drill and countersink the area to remove the damaged material.

S 358-036-R00

CAUTION: USE EXTREME CAUTION WHEN YOU REMOVE THE BURR FRON THE THIN GAUGE ALUMINUM. IF YOU DO NOT USE EXTREME CAUTION, YOU COULD REMOVE TOO MUCH OF THE ALUMINUM FROM THE SURFACE AROUND THE HOLE.

(3) Use abrasive paper to remove the burr around the hole.

S 188-171-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 328-038-R00

(5) Make grooves in the shank of the rivet (Fig. 805, Sheet 2).

S 378-039-R00

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY.

WARNING: KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(6) Mix the adhesive. Follow the manufacturer's instructions.

S 398-040-R00
(7) Fill the hole with the adhesive.

S 348-041-R00
(8) Install the rivet in the hole
  (a) Make sure you turn the rivet while you install it.
  (b) The top of the rivet must be smooth with the surface around the hole.

S 188-172-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
  (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 958-042-R00
(10) Use masking tape to hold the rivet in position.

S 348-043-R00
(11) Cure the adhesive for the time and temperature which is given below:

NOTE: The minimum cure time is one hour.

NOTE: The adhesive will not cure if the temperature is below 54 degrees F (12 degrees C).

NOTE: If heat is added to speed the cure time, thermocouples or other temperature sensors must be used to monitor the temperature at the surface of the bond.

Time — Hours	1	2	4	8	16	40	96	168
Temp. — °F	140	113	96	86	77	68	59	54
— °C	60	45	35	30	25	20	15	12

Hysol EA934NA Cure Data Chart
Table 1

S 378-045-R00
(12) Prepare the primer. Follow the manufacturer's instructions.

S 378-046-R00
(13) Apply the primer to the repair area.

G. Repair of Damage Which Is Not More Than 2.00 in. (50.8 mm) (Fig. 805)

S 348-047-R00
(1) Cut and removed the damaged area of the skin.

S 358-048-R00

CAUTION: USE EXTREME CAUTION WHEN YOU REMOVE THE BURR FRON THE THIN GAUGE ALUMINUM. IF YOU DO NOT USE EXTREME CAUTION, YOU COULD REMOVE TOO MUCH OF THE ALUMINUM FROM THE SURFACE AROUND THE HOLE.

(2) Use abrasive paper to remove the burr and the primer around the hole.

S 348-049-R00
(3) Use the aluminum sheet to make a patch plate.

S 348-050-R00
(4) Put the patch on the repair area and drill the fastener holes.

S 348-051-R00

(5) Remove the patch and remove the burrs from the rivet holes.

S 188-173-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 378-053-R00

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY.

WARNING: KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(7) Mix the adhesive. Follow the manufacturer's instructions.

S 348-054-R00

(8) Fill the hole with the adhesive and apply the adhesive around the hole.

S 348-055-R00

(9) Put the patch on the panel and install the blind rivets.

S 348-056-R00

(10) Fill the area between the patch and the panel surface with the adhesive.

S 188-174-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(11) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 348-058-R00

(12) Cure the adhesive for the time and temperature which is given below:

NOTE: The minimum cure time is one hour.

NOTE: The adhesive will not cure if the temperature is below 54 degrees F (12 degrees C).

NOTE: If heat is added to speed the cure time, thermocouples or other temperature sensors must be used to monitor the temperature at the surface of the bond.

Time — Hours	1	2	4	8	16	40	96	168
Temp. — °F	140	113	96	86	77	68	59	54
— °C	60	45	35	30	25	20	15	12

Hysol EA934NA Cure Data Chart
Table 1

S 378-059-R00
(13) Prepare the primer. Follow the manufacturer's instructions.

S 378-060-R00
(14) Apply the primer to the repair area.

S 218-130-R00
(15) Make an inspection of the repair area.
(a) Visually examine the repair area for rivets which are loose and surfaces which are not smooth.

S 938-062-R00
(16) Write the repair number FRS6079 adjacent to the assembly number. Use a permanent ink marker pen with a color that can be easily seen.

TASK 78-31-24-348-063-R00

4. Thrust Reverser Blocker Door Assembly - Replacement of Spring and Spring Housing

A. General

(1) The repair given in the procedure is FRS6183.

(2) This procedures gives information when you replace a damaged or worn spring and the spring housing on the blocker door of the thrust reverser.

(3) This repair can be used if the thrust reverser has one of these assembly numbers:

LJ71677			LJ71253		
LJ76047	SB 78-8336		LJ76087	SB 78-8686	
LJ76055	SB 78-8336		LJ76805	SB 78-8686	
LJ76421	SB 78-9300		LJ76427	SB 78-9300	
LJ76349	SB 78-9326		LJ71679		
LJ76351	SB 78-9326		LJ76057	SB 78-8336	
LJ76049	SB 78-8336		LJ76353	SB 78-9326	
LJ76423	SB 78-9300		LJ76048	SB 78-8336	
LJ71678			LJ76348	SB 78-9326	
LJ76442	SB 78-9300		LJ71254		
LJ77005	SB 78-C423		LJ76085	SB 78-8686	
LJ76807	SB 78-8686		LJ76351	SB 78-9326	
LJ76427	SB 78-9300		LJ76050	SB 78-8336	
LJ71680			LJ76424	SB 78-9300	
LJ76058	SB 78-8336				
LJ76354	SB 78-9326				

B. Equipment
   (1) Standard tools.
   (2) Drills and drilling equipment
   (3) Hi-Lok installation tools
   (4) Infra-red heater lamps (explosion proof)

C. Parts
   (1) Housing - spring, LJ76107 (Item 1)
   (2) Spring, LJ70170 (Item 2)
   (3) Pin, LGPL9SCV06A07AC (Rolls Royce RR3408637) (Item 3)
   (4) Collar, SLFCAC06 (Rolls Royce RR3408674) (Item 4)

D. Consumable Materials
   (1) Degreasing fluid, Acetone OMat No. 150 or
       Isopropyl alcohol OMat No. 1/40 or
       Cleaning solvent Desoclean OMat No. 1/257
   (2) A00253 Adhesive Type II, Class II (EA934NA)
       OMat No/ - 8/52
   (3) G01163 Cloth, Lint-free - Local Resources
   (4) G02202 Gloves, Clean Cotton - Local Resources

E. Access
   (1) Location Zones
       415/425 Thrust Reverser, Left
       416/426 Thrust Reverser, Right

F. Replace the Damaged Housing and Spring

   S 028-064-R00
   (1) Remove the nut, the bolt, and other hardware to disconnect the actuator link from the housing.
       (a) Keep the serviceable parts for use in the installation.

   S 028-065-R00
   (2) Remove the Hi-Lok fasteners.

   S 028-066-R00
   (3) Remove the damaged housing and the spring.

S 188-175-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 428-068-R00

(5) Temporarily attach the housing and the spring to the center line of the blocker door. Attach the housing and the spring in position with a clamp.

S 348-069-R00

(6) Drill the holes for the fasteners (Fig. 806).

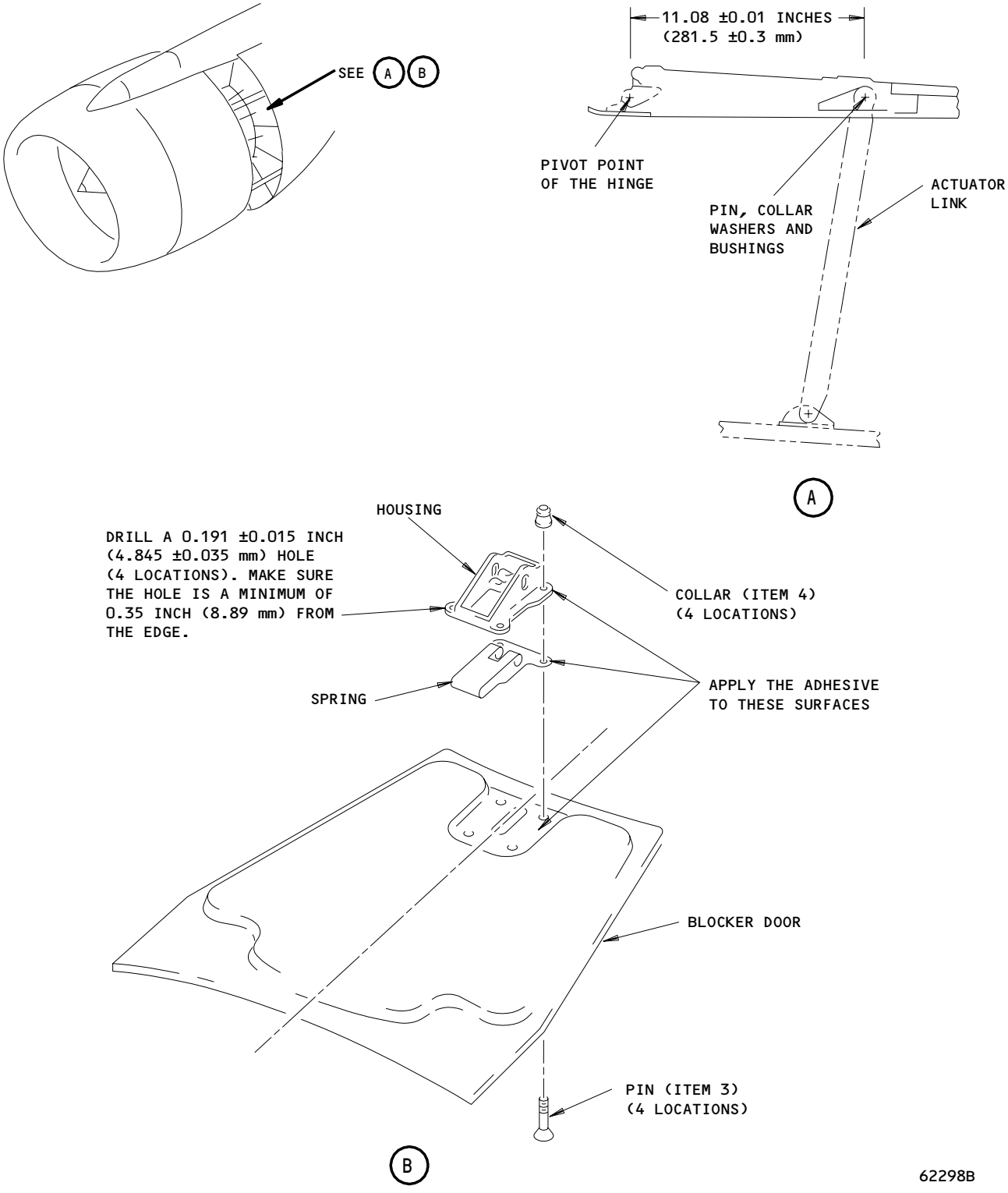
S 098-070-R00

(7) Remove the clamp and the assembly.
   (a) Remove the burrs from the holes.

S 188-176-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(8) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.



Blocker Door – Spring Housing and Spring Repair
Figure 806

S 378-072-R00

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY.

WARNING: KEEP THE COMPOUND AWAY FROM YOUR SKIN.

(9) Mix the adhesive. Follow the manufacturer's instructions.

S 348-073-R00

(10) Apply the adhesive to the mating surfaces of the housing, the spring, and the blocker door.
   (a) The maximum thickness of the adhesive can not be more than 0.03 in. (0.762 mm).

S 428-074-R00

(11) Install the housing and the spring on the blocker door and install the fasteners wet with the adhesive.

S 188-177-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(12) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 348-076-R00

(13) Cure the adhesive for the time and temperature which is given below:

NOTE: The minimum cure time is one hour.

NOTE: The adhesive will not cure if the temperature is below 54 degrees F (12 degrees C).

NOTE: If heat is added to speed the cure time, thermocouples or other temperature sensors must be used to monitor the temperature at the surface of the bond.

Time — Hours	1	2	4	8	16	40	96	168
Temp. — °F	140	113	96	86	77	68	59	54
— °C	60	45	35	30	25	20	15	12

Hysol EA934NA Cure Data Chart
Table 1

S 428-077-R00

(14) Install the actuator link with the serviceable hardware.

S 218-078-R00

(15) Make a visual inspection for the correct fit and operation of the blocker door.
   (a) The blocker door must turn from the retracted to the extended position smoothly and tightly.
   (b) The blocker door must move freely and not have axial or radial free movement.

S 938-079-R00

(16) Write the repair number FRS6183 adjacent to the assembly number. Use a permanent ink marker pen with a color that can be easily seen.

TASK 78-31-24-358-080-R00

5. Thrust Reverser Blocker Door Assembly - Replacement of Hinge Bearing

A. General

(1) The repairs in this procedure is FRS6213.

(2) This procedure gives the data for the replacement of the worn hinge bearing in the blocker door assembly.

(3) The repair allows the replacement of the discrepant bearing with a preswaged bearing. The new bearing is easier to install and provides a slotted entry for the ball. The slotted entry allows the replacement of the ball without the removal of the race from the hinge fitting or blocker door.

(4) You must do this repair when the blocker door has been removed.

(5) This repair can be used if the translating cowl and the blocker doors have one of these assembly numbers:

LJ75009
LJ75010

B. Equipment
(1) Standard tools.
(2) Roller swaging tool, RST2472,

NOTE: The tool is available from:
Rexnord Bearing Div.
2400 Curtiss St.
Downers Grove, Il, USA,
60515-0722

(3) Rotary cutting tool
(4) Coned shaped rotary file

C. Parts
(1) Bearings, spherical, preswaged slot entry (Item 1) P25000
(Rolls-Royce RR1019379)

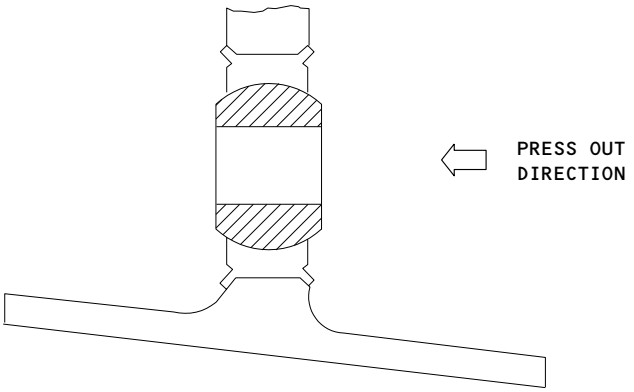
D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257
(2) COO812 Primer 463-6-27
OMat No. - 7/157
(3) COO813 Curing Solution (X-337)
OMat No. - 7/158
(4) Thinners (TL52-66)
OMat No. - 7/159
(5) GO1163 Cloth, Lint-free - Local Resources

E. Access
(1) Location Zones
415/425 Thrust Reverser, Left
416/426 Thrust Reverser, Right

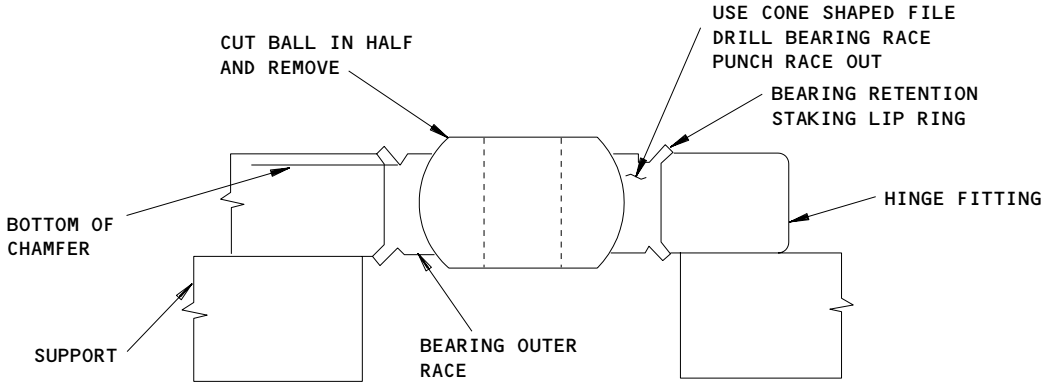
F. Remove the Worn Bearing (Fig. 807)

S 038-146-ROO
(1) If it is possible, do this step:
(a) If the hinge fitting can be removed, remove it from the blocker door before you replace the bearing.

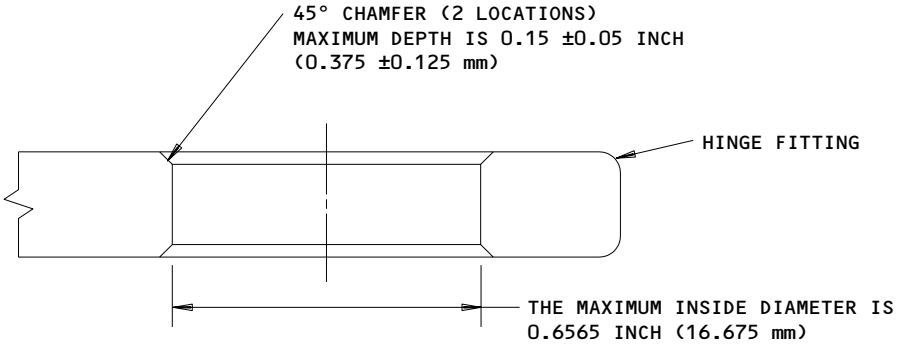
NOTE: The hinge fitting is part of the forging on the blocker doors that have SB 78-9326.



BLOCKER DOOR (EXAMPLE)
(SECTION THROUGH HINGE FITTING SHOWN)



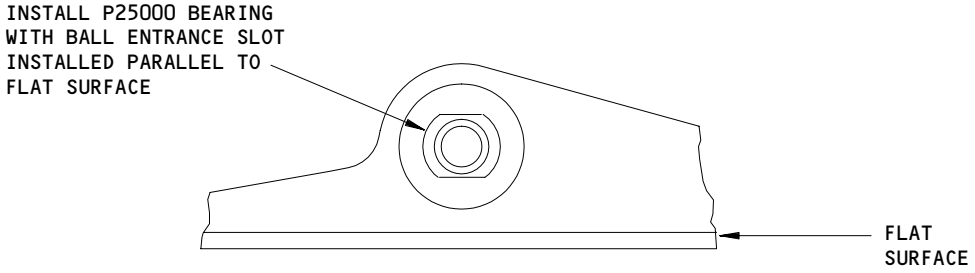
REMOVE THE BEARING STAKING RING



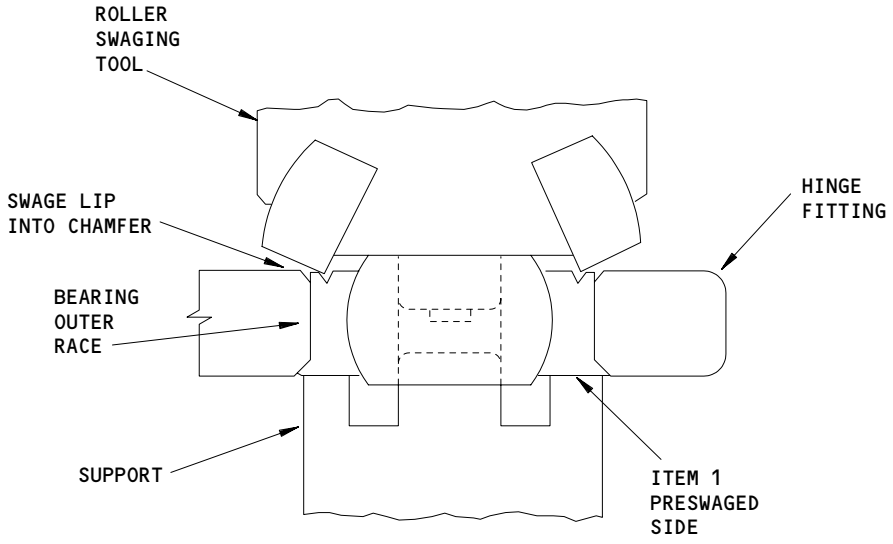
DO A DIMENSIONAL CHECK OF THE HINGE FITTING BORE

62371A

Blocker Door – Hinge Bearing Repair
Figure 807 (Sheet 1)



ORIENTATION OF SLOT IN BEARING



INSTALL AND SWAGE BEARING

62372A

Blocker Door – Hinge Bearing Repair
Figure 807 (Sheet 2)

S 918-147-R00
(2) Turn the ball 90 degrees to the bearing outer race.

S 358-081-R00

CAUTION: DO NOT PERMIT THE TOOL USED TO CUT THE GROOVE TO TOUCH THE FITTING. DAMAGE TO THE FITTING CAN OCCUR. THE OUTER DIAMETER OF THE BEARING RACE IS 0.656 IN. (16.67 MM).

(3) Cut the ball in half:
  (a) Make sure that you do not cut into the fitting.
  (b) Hold the fitting or the blocker door.
  (c) Use the rotary tool to cut the ball in half.
  (d) Let the pieces of the ball fall out of the fitting.

S 358-082-R00
(4) Do these steps to remove the outer bearing race:
  (a) Use the cone shaped rotary file to drill into the center of the outer bearing race.
  (b) Use the cone shaped rotary file to remove the swaged chamfer and make the metal thickness thin.
  (c) Bend the swaged chamfer towards the center and push out the outer bearing race.

S 188-178-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
  (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 218-085-R00
(6) Make an inspection of the hinge fitting bore.
  (a) The maximum bore diameter is 0.656 in. (16.675 mm).
  (b) The two edges of the bore must have a chamfer of 45 degrees by 0.02 in. (0.5 mm) / 0.01 in. (0.25 mm).
  (c) Nicks are not permitted. Remove the nicks with a very fine abrasive paper.

S 018-185-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(7) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
  (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.
  (b) Do the penetrant test to look for cracks.
    1) If you find a crack, reject the hinge.

G. Install the Replacement Bearing (Fig. 807)

S 428-086-R00

(1) Install the preswaged bearing into the hinge bore.
  (a) Make sure that the ball entrance slot in the bearing race is aligned parallel to the flat surface of the hinge fitting.

S 378-089-R00

WARNING: DO NOT GET THE PRIMER, THE CURING SOLUTION, OR THE THINNERS (PRIMER PRODUCTS) IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM PRIMER PRODUCTS. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE PRIMER PRODUCTS. KEEP PRIMER PRODUCTS AWAY FROM SPARKS, FLAME AND HEAT. PRIMER PRODUCTS ARE POISONOUS AND FLAMMABLE FLUIDS THAT CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Use the manufacturers instructions to mix the primer.

S 378-090-R00

(3) Put the primer on the mating surfaces of the hinge fitting and the bearing race.

S 218-092-R00
(4) Make sure that the primer does not get on the race of the bearing or the ball.

S 428-091-R00
(5) Install the bearing into the hinge fitting while the primer is wet.

S 118-099-R00
(6) Remove the unwanted primer with a lint free cloth.

S 218-097-R00
(7) Make sure that the preswaged side of the bearing is on the inboard side of the hinge fitting.

S 918-093-R00
(8) Hold the preswaged side of the bearing on a support.

S 358-100-R00
(9) Use the roller swaging tool to swage the lip of the outer race of the bearing.

S 218-098-R00
(10) Make sure the ball moves freely in the race.

S 218-096-R00
(11) Make sure the there is no movement between the outer race and the hinge fitting.

S 788-094-R00
(12) Do the steps that follow to do a check for the movement between the outer race and the fitting.
  (a) Hold the hinge fitting or the blocker door in position.
  (b) Apply an axial force of 1100 lb (498 kg) on the outer race of the bearing.

(c) It is not permitted to have a movement between the outer race and the fitting.
(d) If it is necessary, swage the lip on the outer race to make it tight.

S 938-095-R00

(13) Use a permanent ink marker pen with a color that can be easily seen to write the repair number FRS6213 on the hinge assembly.

TASK 78-31-24-358-113-R00

6. Thrust Reverser Blocker Door Assembly - Replacement of the Hinge Assembly

A. General

(1) The repairs in this procedure is FRS6267.
(2) This procedure gives the data for the replacement of the damaged hinge assembly for the blocker door.

(3) This repair can be used if the blocker doors have one of these assembly numbers:

L.H. LJ71677 (Pre SB 78-7827)
L.H. LJ71903 (Post SB 78-7827)
L.H. LJ76047 (Post SB 78-8336 Pt. 1)
L.H. LJ76055 (Post SB 78-8336 Pt. 2)
L.H. LJ6421 (Post SB 78-9300 Pt. 3)
L.H. LJ76055 (Post SB 78-9300 Pt. 2)
L.H. LJ71253

L.H. LJ71591 (Pre SB 78-7827)
L.H. LJ71900 (Post SB 78-7827)
L.H. LJ76085 (Post SB 78-8336 Pt. 1)
L.H. LJ76087 (Post SB 78-8336 Pt. 2)

L.H. LJ71679 (Pre SB 78-7827)
L.H. LJ75757 (Post SB 78-7827)
L.H. LJ76427 (Post SB 78-9300 Pt. 3)
L.H. LJ76288 (Post SB 78-9300 Pt. 2)
L.H. LJ76423 (Post SB 78-9300 Pt. 3)
L.H. LJ76285 (Post SB 78-9300 Pt. 2)

L.H. LJ76049 (Post SB 78-8336 Pt. 1)
L.H. LJ76057 (Post SB 78-8336 Pt. 2)

R.H. LJ71678 (Pre SB 78-7827)
R.H. LJ71904 (Post SB 78-7827)
R.H. LJ76048 (Post SB 78-8336 Pt. 1)
R.H. LJ76056 (Post SB 78-8336 Pt. 2)
R.H. LJ76284 (Post SB 78-9300 Pt. 2)
R.H. LJ76422 (Post SB 78-9300 Pt. 3)

R.H. LJ71591 (Pre SB 78-7827)
R.H. LJ71900 (Post SB 78-7827)
R.H. LJ76085 (Post SB 78-8336 Pt. 1)
R.H. LJ76087 (Post SB 78-8336 Pt. 2)
R.H. LJ76288 (Post SB 78-9300 Pt. 2)
R.H. LJ76427 (Post SB 78-9300 Pt. 3)

R.H. LJ71680 (Pre SB 78-7827)
R.H. LJ75758 (Post SB 78-7827)
R.H. LJ76050 (Post SB 78-8336 Pt. 1)
R.H. LJ76058 (Post SB 78-8336 Pt. 2)
R.H. LJ76286 (Post SB 78-9300 Pt. 2)
R.H. LJ76424 (Post SB 78-9300 Pt. 3)

B. Equipment
(1) Standard tools.
(2) Drills and drilling equipment

(3) Infra-red heater lamps (explosion proof)
(4) Huck installation equipment
(5) Pilot hole drill bushings (Optional)

C. Parts
(1) Hinge Assembly, L.H. LJ71819 (Item 1).
(2) Hinge Assembly, R.H. LJ71820 (Item 1a).
(3) Pin, Huck, LGPL9SC-V0603AC (Rolls Royce RR3408636) (Item 2).
(4) Hi-Lok pin, HL19PB-6-3 (Rolls Royce RR1013839) (Item 2a - Optional)
(5) Pin, Huck, LGPL9SC-V06A12AC (Rolls Royce RR3408638) (Item 3).
(6) Hi-Lok pin, HL19PB-6-12 (Rolls Royce RR3408687) (Item 3a - Optional)
(7) Collar, Huck, SLFCA-C06 (Rolls Royce RR3408674) (Item 4)
(8) Nut, MS21042L3 (Rolls Royce RR2308016) (Item 5)
(9) Washer, AN960C10 (Rolls Royce RR2206957) (Item 6)
(10) Shim, LJ70423 (Item 7)
(11) Shim, LJ70424 (Item 8)

D. Consumable Materials
(1) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257
(2) C00812 Primer 463-6-27
OMat No. - 7/157
(3) C00813 Curing Solution (X-337)
OMat No. - 7/158
(4) Adhesive (EA956)
OMat No. - 8/117
(5) G01163 Cloth, Lint-free - Local Resources

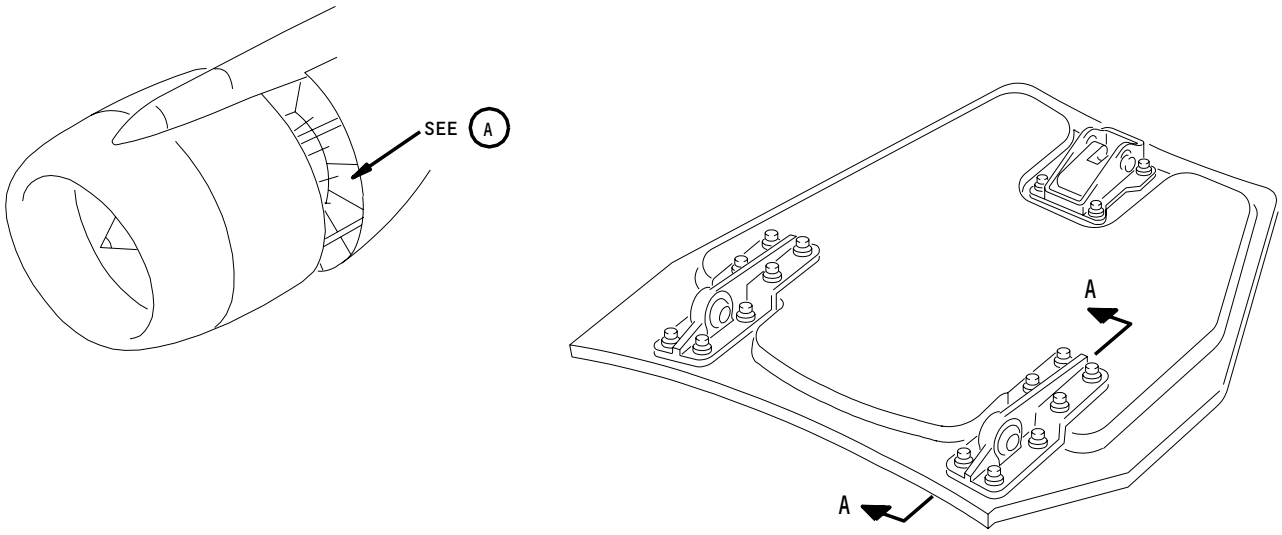
E. Access
(1) Location Zones
415/425 Thrust Reverser, Left
416/426 Thrust Reverser, Right

F. Replace the Damaged Hinge Assembly (Fig. 809).

S 028-114-R00
(1) Remove the hardware and remove the damaged hinge assembly.

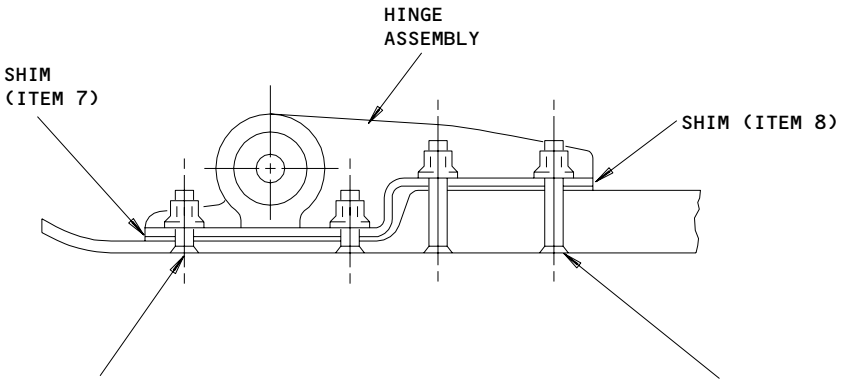
FIG. 808 NOT USED

Blocker Door - Hinge Assembly Repair
Figure 808



BLOCKER DOOR ASSEMBLY – MID

A



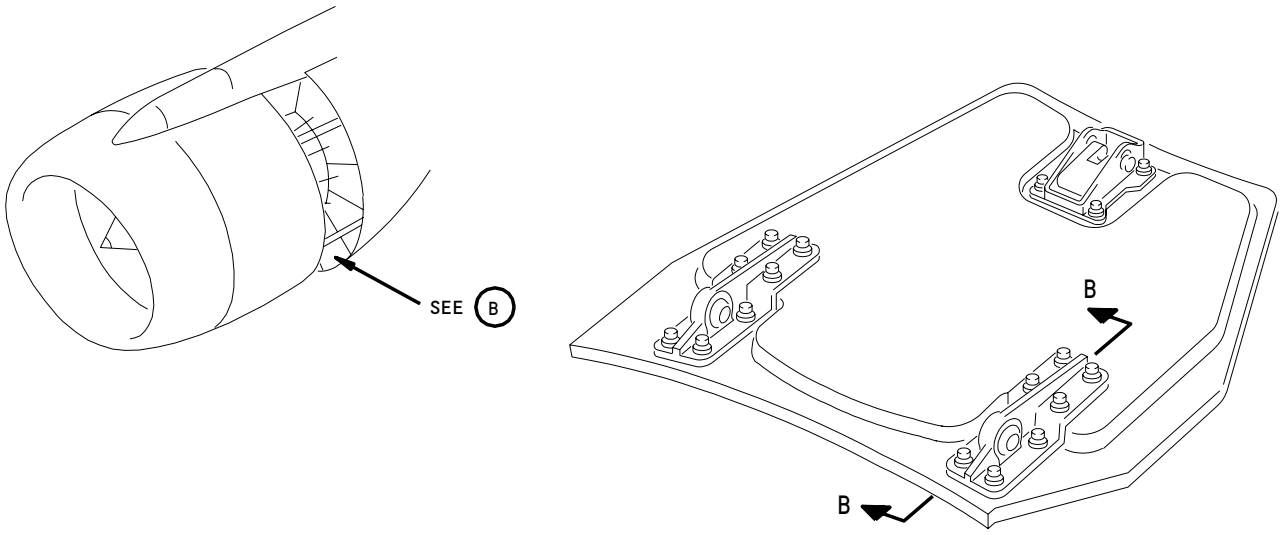
1. THE HOLE SIZE IS 0.1915 ±0.0015 INCH (4.865 ±0.035 mm) IN DIAMETER.
2. COUNTERSINK THE HOLE AT 100 DEGREES TO A MINIMUM DIAMETER OF 0.310 INCH (7.87 mm).
3. USE A PIN (ITEM 2 OR 2A), A COLLAR (ITEM 4) OR WASHER (ITEM 6), AND A NUT (ITEM 5) (4 LOCATIONS).

1. THE HOLE SIZE IS 0.1915 ±0.0015 INCH (4.865 ±0.035 mm) IN DIAMETER.
2. COUNTERSINK THE HO9LE AT 100 DEGREES TO A MAXIMUM DIAMETER OF 0.310 INCH (7.87 mm)
3. USE A PIN (ITEM 3 OR 3A), A COLLAR (ITEM 4) OR WASHER (ITEM 6), AND A NUT (ITEM 5) (4 LOCATIONS)

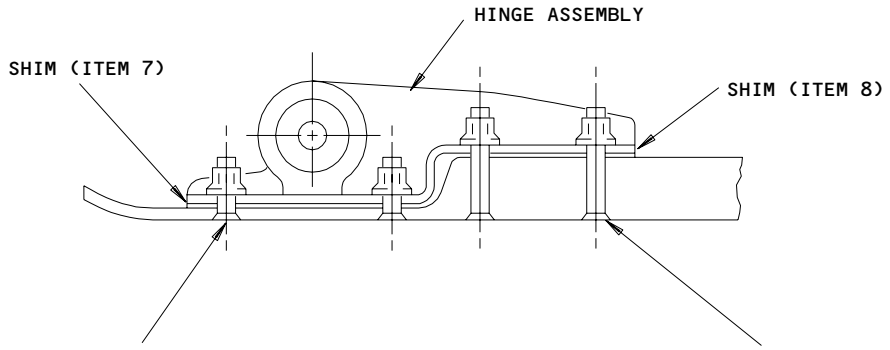
(EXAMPLE)
A–A

62459A

Blocker Door – Hinge Assembly Repair
Figure 809 (Sheet 1)



BLOCKER DOOR ASSEMBLY – LOWER
B



1. THE HOLE SIZE IS 0.1915 ±0.0015 INCH (4.865 ±0.035 mm) IN DIAMETER.
2. COUNTERSINK THE HOLE AT 100 DEGREES TO A MINIMUM DIAMETER OF 0.310 INCH (7.87 mm).
3. USE A PIN (ITEM 2 OR 2A), A COLLAR (ITEM 4) OR WASHER (ITEM 6), AND A NUT (ITEM 5) (4 LOCATIONS).

1. THE HOLE SIZE IS 0.1915 ±0.0015 INCH (4.865 ±0.035 mm) IN DIAMETER.
2. COUNTERSINK THE HOLE AT 100 DEGREES TO A MAXIMUM DIAMETER OF 0.310 INCH (7.87 mm).
3. USE A PIN (ITEM 3 OR 3A), A COLLAR (ITEM 4) OR WASHER (ITEM 6), AND A NUT (ITEM 5) (4 LOCATIONS)

(EXAMPLE FOR TOP AND LOWER BLOCKER DOOR ASSEMBLIES)
B-B

62460A

Blocker Door – Hinge Assembly Repair
Figure 809 (Sheet 2)

S 188-186-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Clean the repair area with a lint-free cloth which is moist with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.
   (a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

S 428-116-R00

(3) Attach the new hinge assembly (Item 1 or 1a) to the hinge fitting on the translating cowl.
   (a) Use a temporary clevis bolt and a nut.
   (b) Tighten the bolts with your hand.

S 428-117-R00

(4) Put the blocker door on the translating cowl.
   (a) Make sure the clearance is the same on the two sides.

S 428-118-R00

(5) Install the shims (Items 7 and 8) (Fig. 809).
   (a) If it necessary, remove the laminations to make sure the shims are smooth with the translating cowl.
   (b) Attach the hinge assembly and the shims to the blocker door with a clamp.

S 358-119-R00

CAUTION: MAKE SURE THE DISTANCE TO THE EDGE IS CORRECT BEFORE YOU DRILL THE HOLES.

(6) Use a pilot drill with a pilot drill bushing to back drill and ream two diagonally opposite holes in the hinge assembly.

S 428-120-R00

(7) Temporarily install the fasteners in the two opposite holes.

NOTE: There are two types of blocker door assemblies. One uses Huck fasteners to attach the hinge assembly to the door. The other uses Hi-Lok fasteners. Make sure you install the same type of fasteners as before when you replace the hinge.

S 358-121-R00
(8) Use the pilot drill with the pilot drill bushing to back drill and ream the other holes in the hinge assembly.

S 028-122-R00
(9) Disassemble the hinge assembly and remove the burrs from the holes in the hinge fittings and the shims.

S 378-123-R00

WARNING: USE THE EPOXY COMPOUNDS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY.

WARNING: KEEP THE COMPOUND AWAY FROM YOUR SKIN.

WARNING: THIS MATERIAL CONTAINS ASBESTOS FIBERS. WHEN YOU SAND, GRIND, OR CUT THIS MATERIAL, YOU MUST WEAR A DUST MASK. IF YOU DO NOT WEAR A DUST MASK, YOU CAN BREATHE THE ASBESTOS DUST, WHICH CAN BE VERY DANGEROUS TO YOU.

(10) Mix the adhesive. Follow the manufacturer's instructions.

S 428-124-R00
(11) Wet install the hinge fittings and the shims. Use the adhesive and the fasteners (Fig. 809).

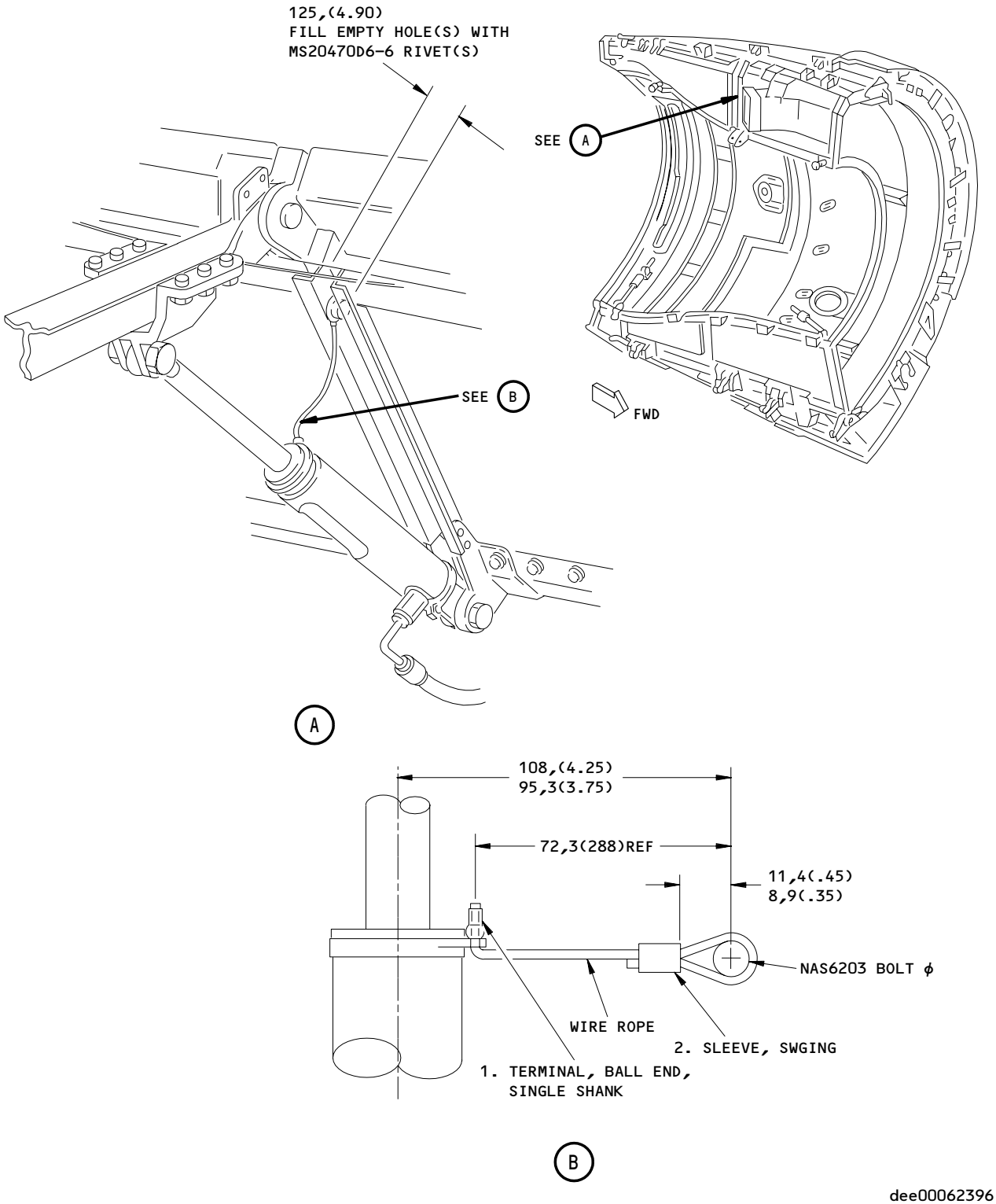
S 358-125-R00
(12) Use the infra-red heater lamps to cure the adhesive for 1 hour at 180-200°F (82-93°C).

S 378-126-R00
(13) Mix the primer. Follow the manufacturer's instructions.

S 378-127-R00
(14) Apply the primer to the repair area.

S 218-128-R00
(15) Visually examine the repair area.
  (a) Do a check of the clearances of the fasteners to the hinge fittings. Do this check with the blocker doors in the retracted and extended positions.
  (b) The blocker door must turn from the retracted to the extended position smoothly and tightly.
  (c) The blocker door must not have free movement in the radial or the axial direction.

S 938-129-R00
(16) Write the repair number FRS6267 adjacent to the assembly number. Use a permanent ink marker pen with a color that can be easily seen.



Thrust Reverser Opening Actuator Lanyard Replacement
Figure 810

TASK 78-31-24-028-201-R00

7. Thrust Reverser Opening Actuator - Replacement of Lanyard

A. General

(1) The repairs covered in this procedure are FRS6200 (Right) and FRS6199 (Left).

(2) This procedure gives details for the repacement of a damaged or worn lanyard on the thrust reverser opening actuator.

B. Equipment

(1) Standard workshop tools

(2) Riveting equipment

(3) Swaging equipment

C. Parts

(1) Repair Parts

(2) Rivet, MS20470AD6-6

(3) Sleeve, swaging MS51844-63

(4) Terminal, ball end, single shank MS20664C3

D. Consumable Materials

(1) Primer Base, OMat No. 7/157

(2) Curing solution, OMat No. 7/158

(3) Permanent marker pen, Commercially available

(4) MIL-W-83420, 2.35 mm (0.094 in) wire rope, Commercially Available

(5) Cloth, lint-free, Commercially available

(6) Degreasing fluid, Acetone OMat No. 150 or
Isopropyl alcohol OMat No. 1/40 or
Cleaning solvent Desoclean OMat No. 1/257

E. Repair the Damaged Lanyard

S 038-198-R00

(1) Cut the lanyard at the actuator.

S 028-189-R00

(2) Remove the fastener that attaches the lanyard to the channel.

S 028-199-R00

(3) Remove the lanyard.

S 028-188-R00

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DEGREASING FLUID. PUT ON A PROTECTIVE SPLASH GOGGLE WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME, AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Clean the lanyard attachment points with a lint-free cloth moistened with Acetone, Isopropyl alcohol, or cleaning solvent Desoclean.

(a) Make the area dry with a lint-free cloth before the solvent becomes a gas.

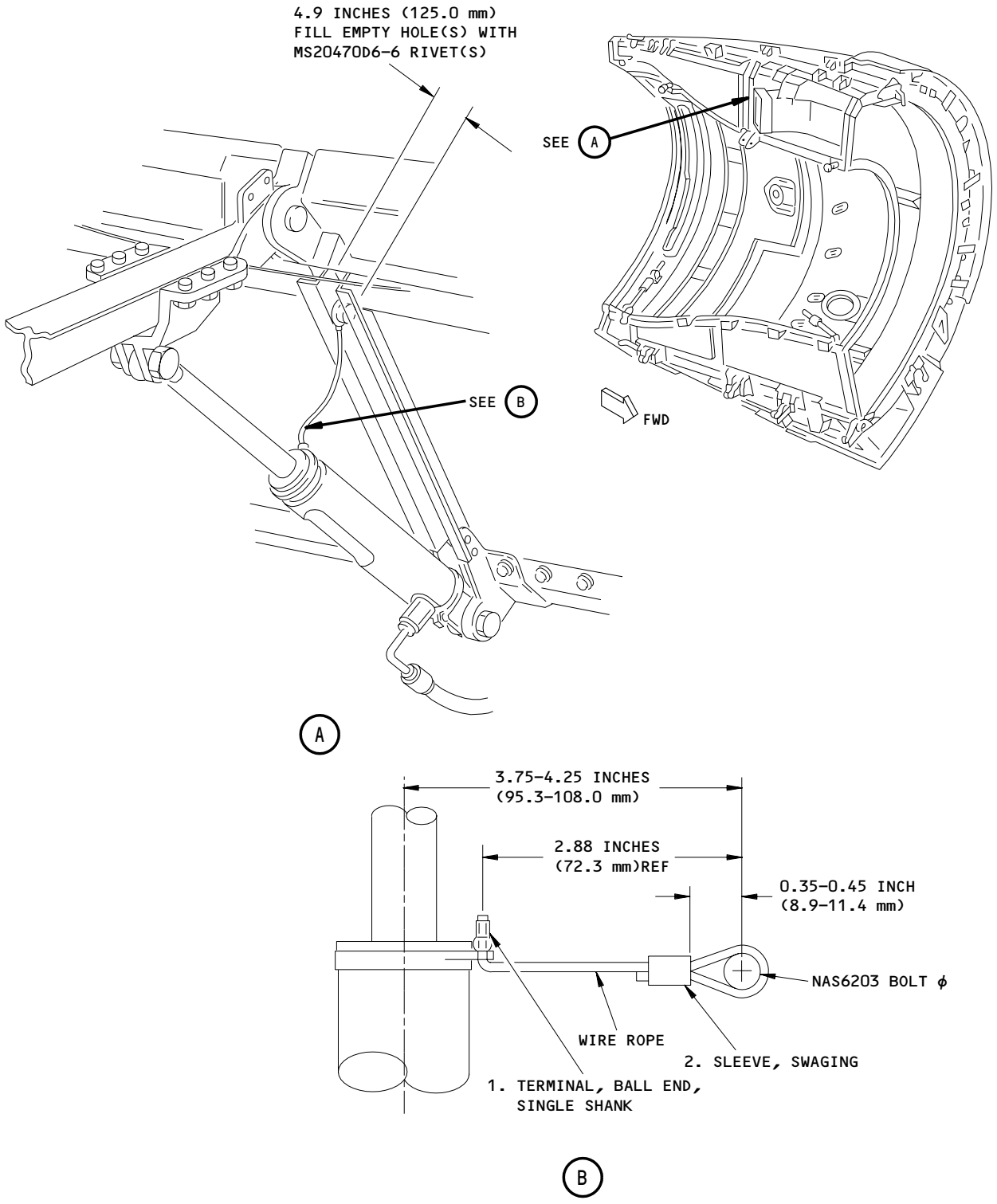
S 418-195-R00
(5) Make the lanyard and attach to the actuator (Fig 811).

S 418-196-R00
(6) Attach the lanyard to the channel.

S 428-191-R00
(7) Wet install the rivet into the empty hole.

S 218-193-R00
(8) Do a visual inspection of the repaired area to make sure the lanyard is installed correctly.

S 428-197-R00
(9) Mark FRS6199 (left) or FRS 6200 (right) next to the C-duct name plate with a permanent ink marker that can be easily seen.



Thrust Reverser Opening Actuator Lanyard Replacement
Figure 811

THRUST REVERSER HYDRAULIC OPENING ACTUATORS - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the data to remove and install the hydraulic opening actuators of the thrust reverser.
   B. The hydraulic opening actuators are found at the top of the left and right thrust reversers. To get access, you must open the thrust reverser.

TASK 78-31-25-004-001-R00

2. Remove the Hydraulic Opening Actuator of the Thrust Reverser
   A. Equipment
      (1) Boeing B54001-1 - hydraulic hand pump
      (2) Clean receptacle - minimum capacity

          1 U.S. gallon
          1 Imperial gallon
          4 Liters
   B. References
      (1) 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          415/425 Thrust Reverser, Left
          416/426 Thrust Reverser, Right

   D. Remove the Hydraulic Opening Actuator (4), (Fig. 401)

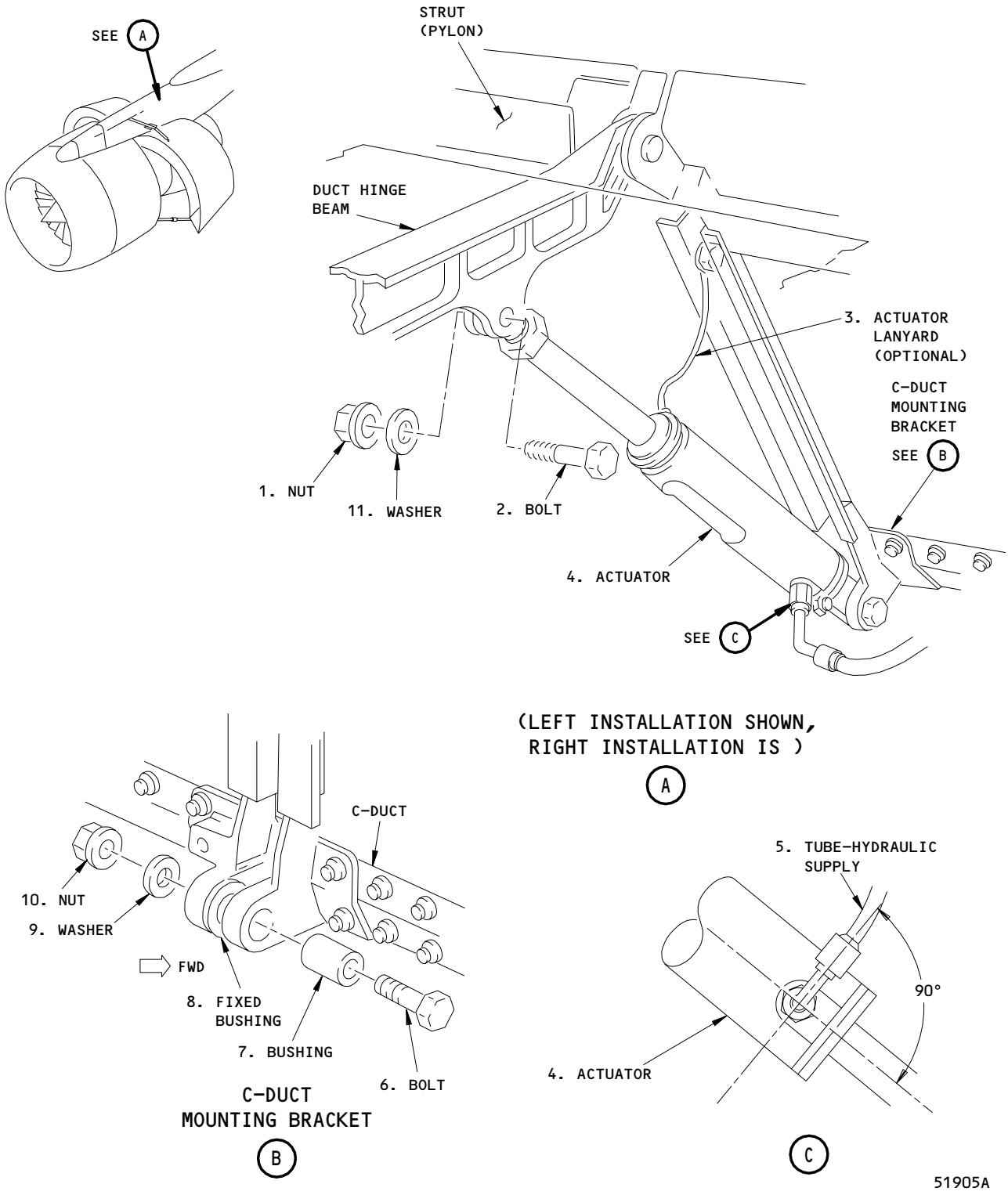
      S 014-002-R00

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

      (1) Open the left (right) thrust reverser (AMM 78-31-00/201).
          (a) Keep the hydraulic hand pump attached to the thrust reverser.

      S 024-003-R00
      (2) Disconnect the actuator lanyard (3).

          NOTE: The actuator lanyard is optional. It is possible that the lanyard is not installed.



Fan C-Duct Hydraulic Opening Actuator Installation
Figure 401

S 034-004-R00

(3) Do these steps when you disconnect the tube (5) from the hand pump:
  (a) Open the return valve.
  (b) Make sure the pressure has decreased.
  (c) Disconnect the tube (5).
  (d) Collect the hydraulic fluid leakage in a container.

S 024-005-R00

(4) Remove the actuator (4).
  (a) Hold the actuator (4) and remove the nut (10), washer (9) , bushing (7) and bolt (6).
  (b) Hold the actuator (4) and remove the bolt (2), nut (1) and washer (11).

TASK 78-31-25-404-006-R00

3. Install Thrust Reverser Hydraulic Opening Actuator

A. Equipment
  (1) Rolls Royce CP30468/1 Sling webbing
  (2) Boeing B54001-1 - hydraulic hand pump
  (3) Clean receptacle - minimum capacity

  1 U.S. gallon
  1 Imperial gallon
  4 Liters

B. Consumable Material
  (1) Refer to the table that follows:

	British Spec./Ref.	American Spec./Ref.	OMat Item No.
Lockwire	DTD.189A 22 S.W.G.	21 A.W.G.	238

C. References
  (1) 70-51-00/201, Torque Tightening Techniques
  (2) 78-31-00/201, Thrust Reverser System

D. Access
  (1) Location Zones
    415/425 Thrust Reverser, Left
    416/426 Thrust Reverser, Right

E. Install the Hydraulic Opening Actuator (4), (Fig. 401)

S 424-007-R00

(1) Do these steps to install the actuator (4) to the strut:
  (a) Install the actuator (4) to the duct hinge beam with the bolt (2), washer (11) and nut (1).
  (b) Tighten the bolt (2) (AMM 70-51-00/201).

S 424-008-R00

(2) Do these steps to install the actuator (4) to the thrust reverser:
  (a) Manually extend or retract the actuator to install it to the bracket which is found on the thrust reverser.
  (b) Install the bolt (6), bushing (7), washer (9) and nut (10). Tighten the bolt (6) (AMM 70-51-00/201).

S 424-009-R00

(3) Do these steps to install the hydraulic tube:
  (a) When you connect the hydraulic tube (5), make sure you install it at an angle of 90 degrees to the axis of the actuator (4).
  (b) Tighten the connector (AMM 70-51-00/201).

S 424-010-R00

(4) Install the actuator lanyard (3).

NOTE: The actuator lanyard (3) is optional. It is possible that the lanyard is not installed.

S 424-011-R00

(5) Install the webbing sling to the thrust reverser.

S 824-012-R00

(6) Do these steps to retract the hold open rods:
  (a) Make sure the weight of the thrust reverser is held by the webbing sling.
  (b) Retract the hold open rods (AMM 78-31-00/201).

S 824-013-R00

(7) Slowly lower the thrust reverser until it is closed.

S 494-014-R00

(8) Remove the webbing sling from the thrust reverser.

S 874-015-R00

(9) Do these steps to bleed the system:
  (a) Open the opposite thrust reverser.
  (b) Put a container under the hydraulic tube connector at the lower end of the opening actuator.
  (c) Loosen the hydraulic tube connector.

CAUTION: WHEN YOU BLEED THE AIR, MAKE SURE ALL THE UNWANTED AIR IS REMOVED. IF ALL THE AIR IS NOT REMOVED, THE DOOR COULD CLOSE AT A DANGEROUS RATE.

  (d) Connect the hydraulic hand pump.
  (e) Apply pressure until you see that the fluid which comes out of the loose hydraulic tube connector is clear and free of bubbles.

(f) Tighten the hydraulic tube connector (AMM 70-51-00/201).

NOTE: Make sure the hydraulic tube (5) is at an angle of 90 degrees to the axis of the actuator.

(g) Open the thrust reverser fully.
(h) Open the return valve on the hand pump a small amount and permit the thrust reverser to close.
(i) Repeat the last two steps again until the thrust reverser closes smoothly with the return valve of the hand pump fully open.
(j) Fully open the thrust reverser and hold the it with a sling.
(k) Open the hand pump valve and permit the sling to hold the weight of the thrust reverser.
(l) Disconnect the hydraulic hand pump after a minimum of 30 seconds.
(m) Measure and make a record of the distance between the forward lower edge of the thrust reverser and a reference point on the engine (dimension "X").
(n) Close the thrust reverser until the movement stops and the sling is loose.
(o) Measure the dimension "X" again. The difference between the two dimensions should not be more than 24 in. (588 mm).
(p) If the distance is more than 24 in. (588 mm), do the procedure to bleed the hydraulic system again.

S 414-016-R00

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

(10) Do these steps when you close the left (right) thrust reverser:
(a) Connect the hydraulic hand pump to the thrust reverser.
(b) Close the thrust reverser (AMM 78-31-00/201).
(c) Wait for a nimimum of 30 seconds, then disconnect the hydraulic hand pump.

THRUST REVERSER HYDRAULIC OPENING ACTUATORS - INSPECTION/CHECK

1. General
   A. Use the procedure which follows to examine the hydraulic opening actuators on the left and right sides of the thrust reversers.

TASK 78-31-25-206-002-R00

2. Inspection of the Hydraulic Opening Actuators of the Thrust Reverser
   A. References
      (1) 78-31-00/201, Thrust Reverser System
      (2) 70-42-11/201, Repair of Surfaces Affected by Minor Damage
   B. Access
      (1) Location Zones
          415/425 Thrust Reverser, Left
          416/426 Thrust Reverser, Right

   C. Do the inspection of the hydraulic opening actuators (Fig. 601).

S 016-001-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Open the thrust reversers (Ref 78-31-00).

S 216-004-R00

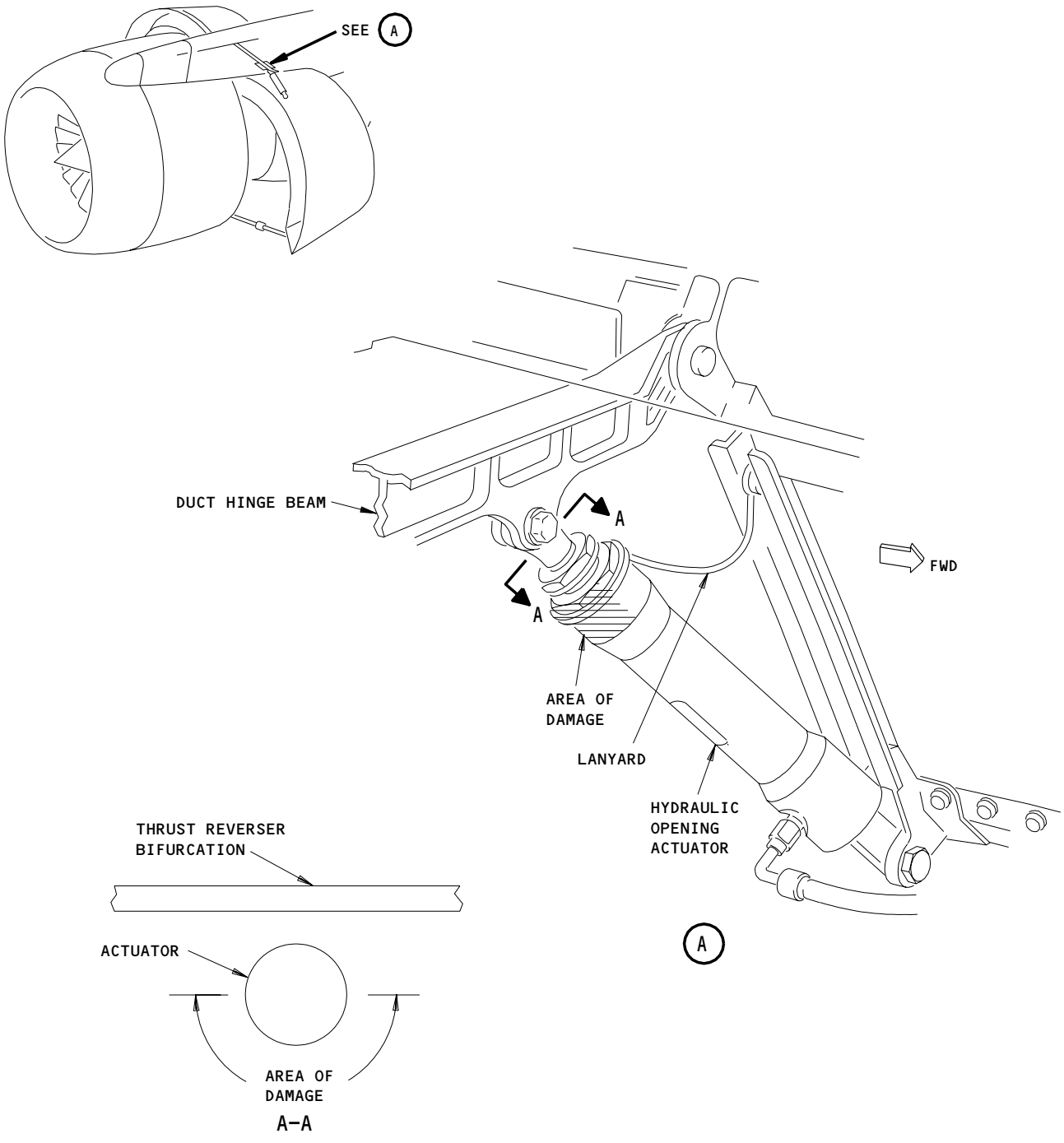
(2) Make an inspection of the primary component of the actuator. Look for cracks and surfaces which are worn.
   (a) Look for damage to the top end cap of the actuator, in the area around the half of the circumference and away from the bifurcation wall.
      1) If the damage is not more than 0.05 inch (1.27 mm) in depth and 0.75 inch (19.0 mm) in length, repair the actuator. Refer to FRS3253 (Ref 70-42-11).
      2) If the damage is more than these limits, reject the actuator.
      3) If you find cracks, reject the actuator.

S 216-005-R00

(3) Make an inspection of the actuator lanyard. Examine the lanyard to make sure it is attached correctly.

NOTE: The actuator lanyard is an optional item. It is possible that the lanyard is not installed.

(a) If the lanyard is broken, remove the loose ends.



NOTE: LEFT HAND INSTALLATION SHOWN, RIGHT SIDE IS OPPOSITE.

Thrust Reverser Hydraulic Opening Actuator Inspection
Figure 601

S 416-003-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Close the thrust reverser (Ref 78-31-00).

THRUST REVERSER HYDRAULIC OPENING ACTUATORS - APPROVED REPAIRS

1. General
   A. The repairs in this procedure are given below as follows:
      (1) FRS6199/1: Left Hand and Right Hand Thrust
      (2) FRS6200/1: Reverser Fixed Structure, Thrust Reverser Opening Actuators - Replacement of Lanyard

TASK 78-31-25-358-001-R00

2. Left and Right Thrust Reverser Fixed Structure - Replacement of the Lanyard
   A. General
      (1) The repairs in this procedure are FRS6199/1 and FRS6200/1. The repair FRS6199/1 applies to the left opening actuator of the thrust reverser. The repair FRS6200/1 applies to the right opening actuator.
      (2) This procedure replaces the damaged lanyard of the opening actuator

          NOTE: The lanyard does not operate in flight. It is only used to hold the opening actuator when the thrust reverser in not installed on the strut. The use of the actuator lanyard is optional.

          (a) Left Thrust Reverser - LJ75089
          (b) Right Thrust Reverser - LJ75090

   B. Equipment
      (1) Swaging equipment (used for small cables and fittings)
      (2) Riveting equipment
   C. Parts
      (1) Terminal (ball end, single shank), MS20664C3 (Rolls Royce RR1013459)
      (2) Sleeve (swaging), MS51844-63 (Rolls-Royce RR1013461)
      (3) Rivet, MS20470AD6-6 (Rolls-Royce RR1013460)
      (4) Wire rope, 3/32 inch dia, type 1, comp B, (uncoated, CRES), 7 x 19, MIL-W-83420
   D. Consumable Materials
      (1) Acetone
          OMat 150
          or
      (2) Isopropyl Alcohol
          OMat 1/40
          or

(3) Cleaning Solvent
OMat 1/257
(4) Two Pack Epoxy Primer and Catalyst
OMat No. 766C
(5) GO1163 Cloth, Lint free
OMat No. 2/101

E. Access
(1) Location Zones
415/425 Thrust Reverser, Left
416/426 Thrust Reverser, Right

F. Replace the Opening Actuator Lanyard

NOTE: The use of the actuator lanyard is optional. Do the steps that follow if the actuator lanyard is in use.

S 028-002-R00
(1) Remove the damaged lanyard.
(a) Cut the lanyard at the damaged end.
(b) Remove and keep the hardware which attaches the lanyard to the upper bifurcation of the thrust reverser.

S 118-003-R00

WARNING: YOU MUST USE PROTECTIVE GLOVES WHEN YOU USE THE DEGREASERS.

WARNING: DO NOT SMOKE WHEN YOU USE THE DEGREASERS. THE SMOKE BREAKS DOWN AND BECOMES VERY POISONOUS WHEN IT MIXES WITH THE GASES RELEASED FROM THE DEGREASERS.

WARNING: USE DEGREASERS ONLY IN AREAS WITH A SUFFICIENT AIR SUPPLY.

WARNING: DEGREASERS ARE VERY FLAMMABLE. KEEP ALL IGNITION SOURCES AWAY FROM THE DEGREASERS.

(2) Clean the area with a lint free cloth which is moist with Acetone OMat 150, or Isopropyl Alcohol OMat 1/40, or Cleaning Solvent OMat 1/257.
(a) Make the area dry with a lint free cloth before the solvent becomes a gas.

S 428-004-R00
(3) Do these steps to make a new lanyard.

NOTE: Refer to Fig. 801 for the dimensions of the lanyard.

(a) Install the wire rope through the hole in the actuator.
(b) Attach the terminal (3) and the sleeve (2) to the wire.

S 428-005-R00

(4) Do these steps to install the lanyard (Fig. 801).
   (a) Use the hardware which was removed before and install the lanyard.

      NOTE: When you install the bolt, make sure there are washers on both sides of the lanyard loop.

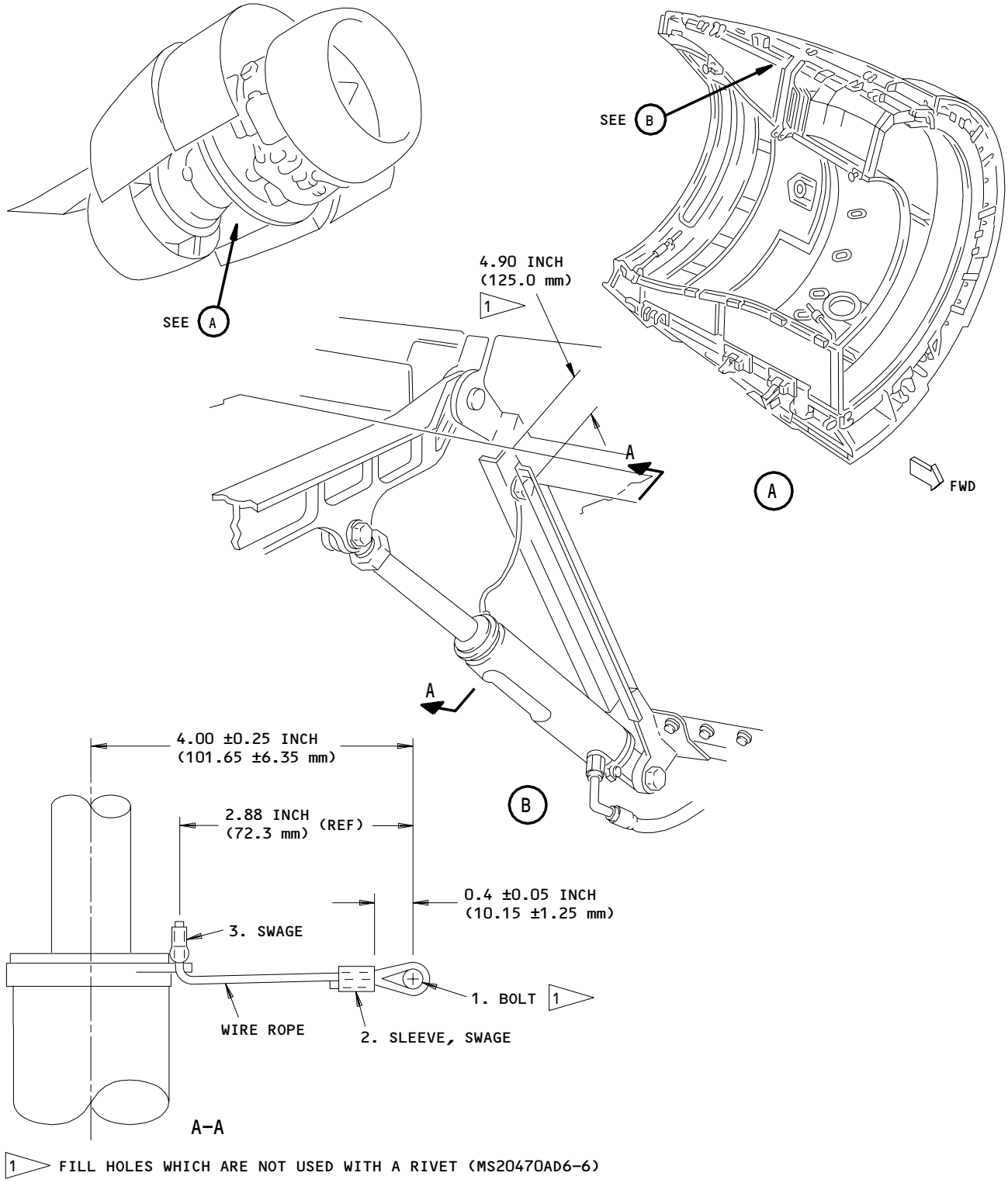
   (b) Prepare the primer with the manufacturers instructions.
   (c) If there are holes which are not used, install a rivet with primer in the hole.

S 218-006-R00

(5) Make a visual inspection of the repair area.

S 938-007-R00

(6) Write the repair number, FRS6199/1 for the left thrust reverser, or FRS6200/1 for the right thrust reverser, adjacent to the thrust reverser nameplate.
   (a) Use a permanent ink marker pen with a color that can be easily seen.



Thrust Reverser Opening Actuator Lanyard - Replacement Details
Figure 801

THRUST REVERSER HYDRAULIC ACTUATORS
ROTARY FLEX SHAFTS AND TUBING - REMOVAL/INSTALLATION

1. General
   A. This procedure contains ten tasks:
      (1) Prepare to Replace the Actuators
      (2) Remove the Lower Actuator.
      (3) Install the Lower Actuator.
      (4) Remove the Left Center Actuator.
      (5) Install the Left Center Actuator.
      (6) Remove the Right Center Actuator.
          (a) This includes the sync-lock removal.
      (7) Install the Right Center Actuator.
          (a) This includes the sync-lock installation.
      (8) Remove the Top Actuator.
      (9) Install the Top Actuator.
      (10) Put the Airplane in a Serviceable Condition
   B. This procedure contains the data for the removal and installation of the thrust reverser hydraulic actuators, the sync-lock, the rotary flex shafts and the tubing.
   C. Use the procedures in AMM 70-51-00/201 to tighten the fasteners. Tighten the fasteners to the torque values in AMM 70-51-00/201 unless a torque value is given in this procedure.
   D. There are three hydraulic actuators for the thrust reverser half. They are the lower, center, and the top. The removal and the installation procedures are different for each of the actuators.
   E. There is only one sync-lock for each thrust reverser. The sync-lock is mounted to the right center actuator.
   F. The Rolls-Royce name for the sync-lock is the synchronization shaft lock.
   G. Rolls-Royce Service Bulletins referred to in this procedure.
      (1) 78-9613 - Thrust Reverser Actuation System; Introduction of an additional thrust reverser lock (RB211-535E4).
      (2) 78-9627 - Introduction of parts compatible with an additional thrust reverser lock (RB211-535E4).

TASK 78-31-26-804-001-R00

2. Prepare to Replace the Actuators

A. General

(1) Do this task for the replacement of any of the six actuators on either of the two engines.

B. Equipment

(1) Clean container, minimum capacity:

5 U.S. Gallons
4 Imperial Gallons
18 Litres

C. References

(1) AMM 29-11-00/201, Main Hydraulic Systems
(2) AMM 78-31-00/201, Thrust Reverser System
(3) AMM 78-34-06/401, Thrust Reverser Feedback Actuators

D. Access

(1) Location Zones

411 Left Engine
421 Right Engine

(2) Access Panels

415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

E. Prepare to Remove the Actuators

S 904-002-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 844-015-R00

(2) Release the pressure on the hydraulic system (AMM 29-11-00/201).

S 024-087-R00

CAUTION: YOU MUST REMOVE THE HINGE ACCESS DOORS BEFORE OPENING THE THRUST REVERSER. DAMAGE TO THE TRANSLATING COWL AND THE HINGE ACCESS DOORS CAN OCCUR.

(3) Remove the hinge access doors (AMM 78-31-10/401).

S 904-016-R00

(4) Manually extend the thrust reverser (AMM 78-31-00/201) approximately 5 inches (101.2 mm).

S 904-003-R00

WARNING: OBEY THE INSTRUCTIONS IN THE AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(5) Open the left (right) thrust reverser (AMM 78-31-00/201).

S 044-004-R00

CAUTION: REMOVE THE LOCKING PIN FROM THE MANUAL BYPASS VALVE BEFORE YOU DRAIN THE HYDRAULIC SYSTEM OF THE THRUST REVERSER. IF THE LOCKING PIN IS NOT REMOVED, THE AIRPLANE HYDRAULIC SYSTEM WILL DRAIN.

(6) Remove the lock pin from the manual bypass valve on the thrust reverser isolation valve.

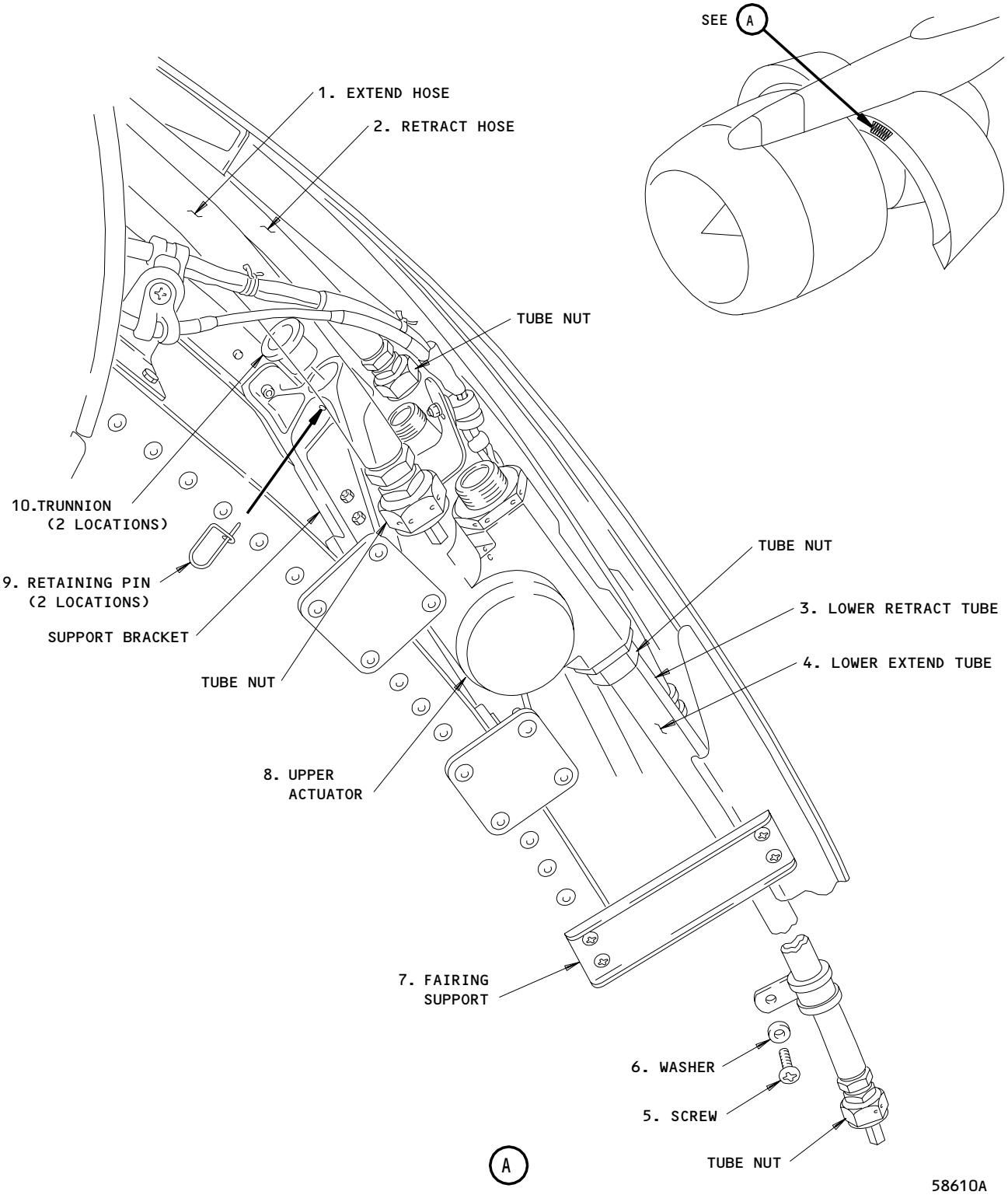
S 684-099-R00

WARNING: THE HYDRAULIC FLUID IS INJURIOUS TO HEALTH AND IS TOXIC THROUGH ABSORPTION AND INGESTION. IN CASE OF EYE CONTACT, FLUSH EYES WITH WATER AND GET MEDICAL AID.

CAUTION: HYDRAULIC FLUID WILL CAUSE DAMAGE TO AIRPLANE SURFACES AND MATERIALS NOT USUALLY IN CONTACT WITH IT. REMOVE SPILLED FLUID IMMEDIATELY WITH A DRY CLOTH AND WASH THE CONTAMINATED AREA.

DO NOT USE HYDRAULIC FLUID DRAINED FROM THE HYDRAULIC SYSTEM AGAIN. HYDRAULIC FLUID MUST NOT BECOME CONTAMINATED.

(7) Drain the hydraulic fluid from the actuator system.
   (a) Disconnect the extend hose (1) and the retract hose (2) from the applicable top actuator (Fig. 401).



Upper Actuator Installation
Figure 401

1) Put protective caps on the extend and retract hoses.

(b) Disconnect the applicable manual drive coupling and remove the retract line closing cap from the lower actuator (Figure 402).
1) Let the fluid drain into the container.
2) Install the retract line cap.

(c) Remove the panel (3).

S 864-024-R00

(8) Install blanks to all open hydraulic connections.

S 864-085-R00

CAUTION: DO NOT PUT THE DRAINED HYDRAULIC FLUID BACK IN THE HYDRAULIC SYSTEM. THE DRAINED HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE HYDRAULIC SYSTEM.

(9) Discard the drained hydraulic fluid.

TASK 78-31-26-004-002-R00

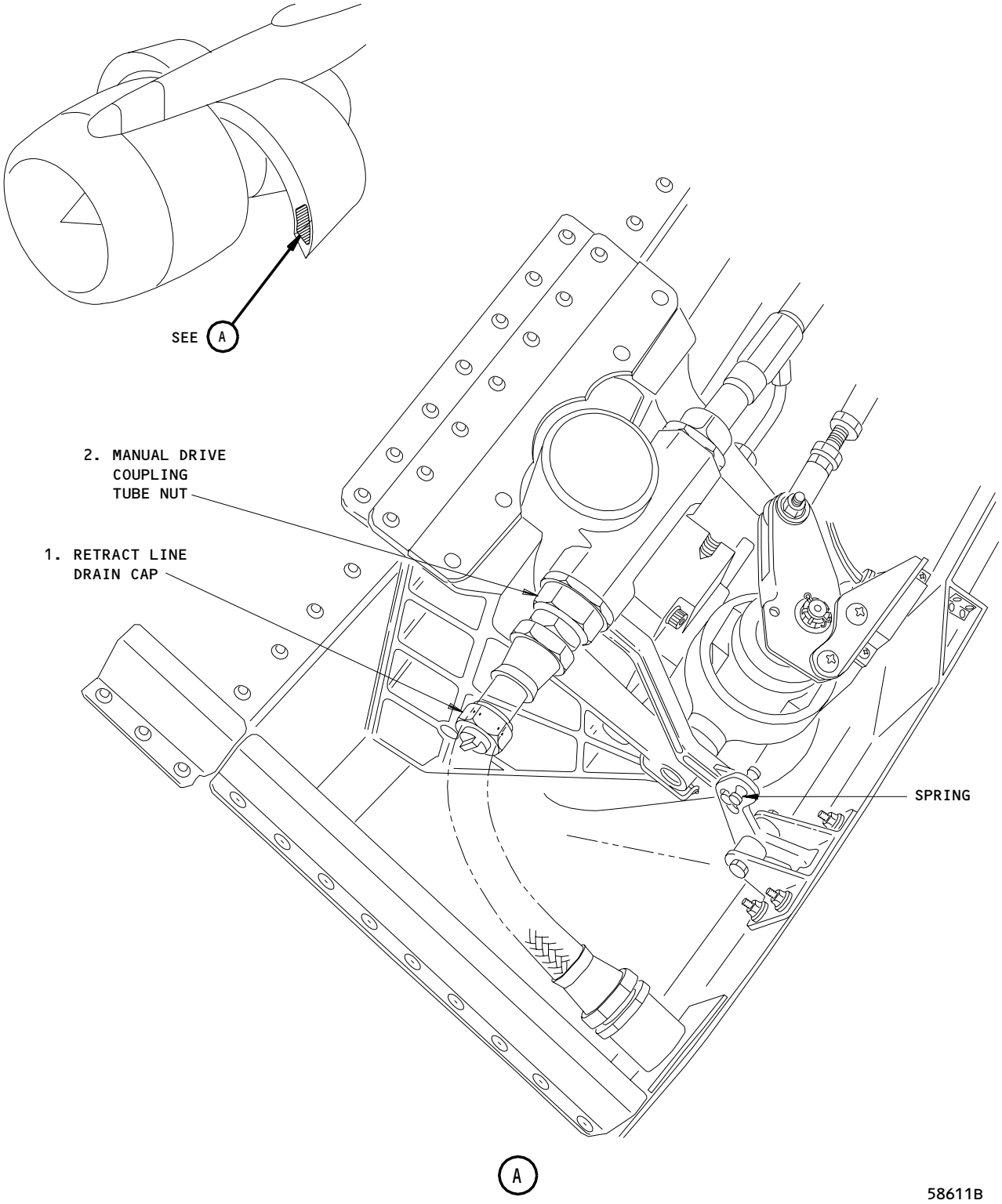
3. Remove the Lower Actuators

A. General
(1) Use this task for the left and the right lower actuators.
(2) Do not let the actuator piston turn during the actuator removal or installation. If the actuator piston turns, you must do the adjustment procedure in AMM 78-31-26/501.

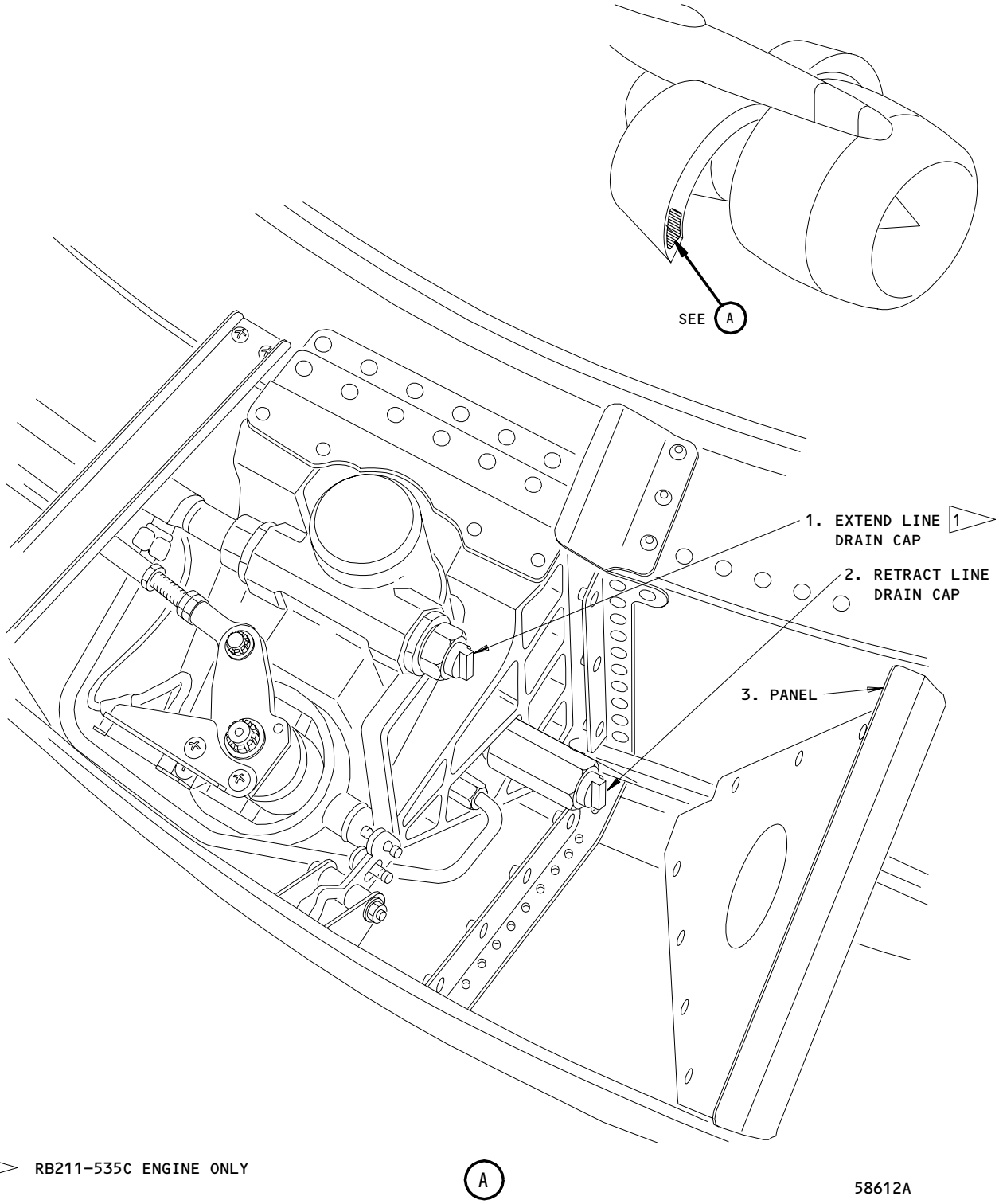
B. Equipment
(1) Clean container, minimum capacity:

5 U.S. Gallons
4 Imperial Gallons
18 Litres

C. References
(1) AMM 29-11-00/201, Main Hydraulic Systems



Hydraulic Actuator System, Left Side Drain Points
Figure 402



Hydraulic Actuator System, Right Side Drain Points
Figure 403

(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-34-06/401, Thrust Reverser Feedback Actuators

D. Access

(1) Location Zones

411 Left Engine
421 Right Engine

(2) Access Panels

415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

E. Remove the Lower Actuator

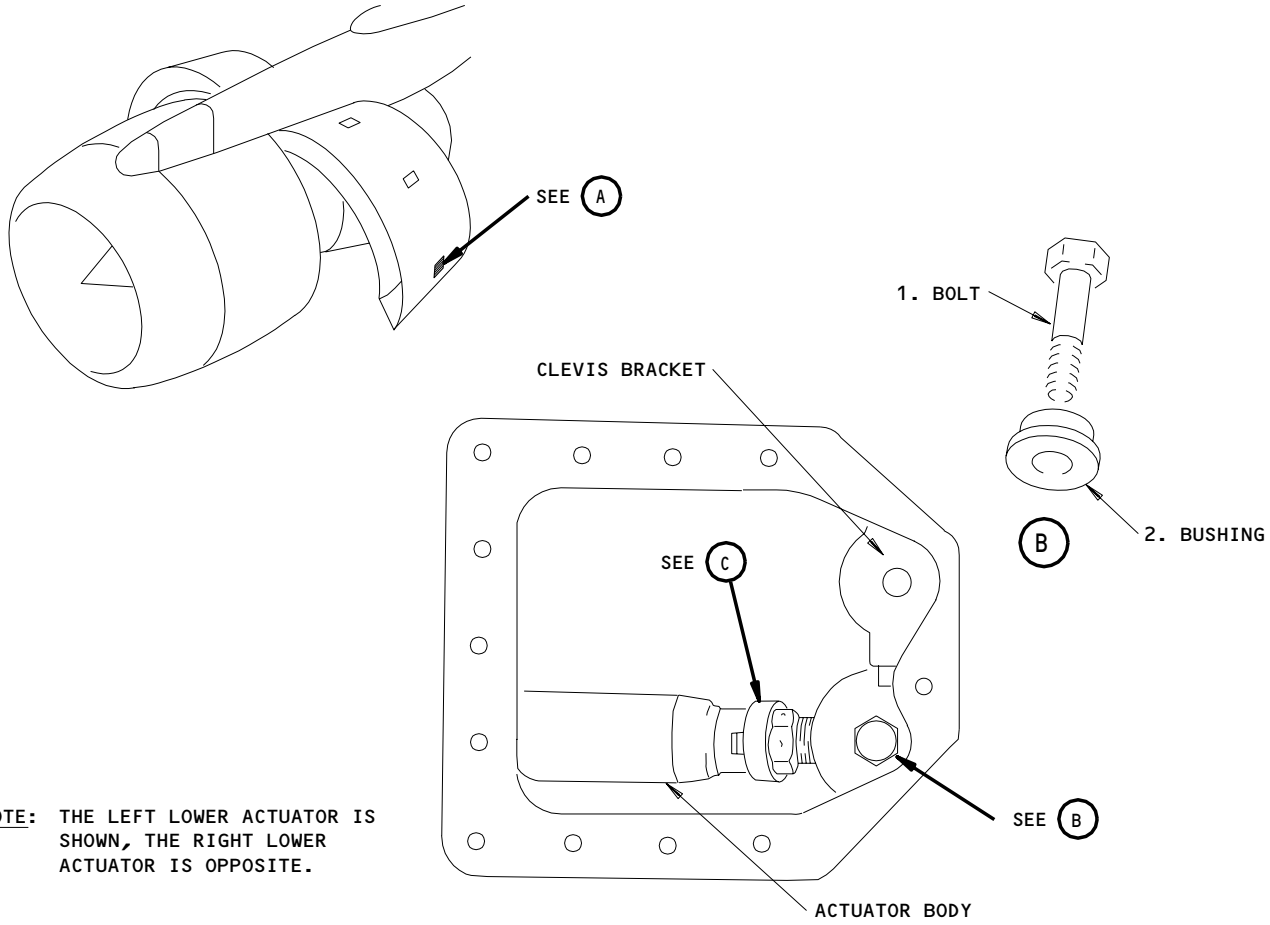
S 034-006-R00
(1) Remove the access panels for the center and lower actuators.

S 034-007-R00
(2) Remove the applicable fairing supports (Fig. 406).

NOTE: Remove the fairing supports that are necessary to get access to the lower and center actuators and their connections.

S 034-047-R00
(3) Remove the thrust reverser feedback actuator (AMM 78-34-06/401).

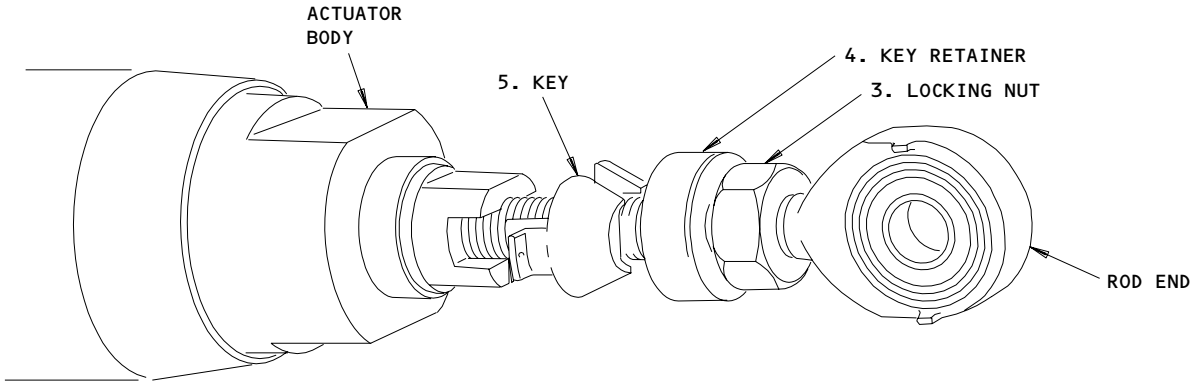
S 034-048-R00
(4) Disconnect the actuator rod end from the thrust reverser sleeve (Fig. 404).
(a) Remove the screws and the access panel for the lower actuator.
(b) Remove the bolt (1) and the bushing (2) that attach the lower actuator to the clevis.
1) Do not let the actuator piston turn.



NOTE: THE LEFT LOWER ACTUATOR IS SHOWN, THE RIGHT LOWER ACTUATOR IS OPPOSITE.

LEFT LOWER ACTUATOR

A



ACTUATOR ROD END DETAILS

C

58613

Lower Actuator Rod End Connection
Figure 404

S 034-046-R00

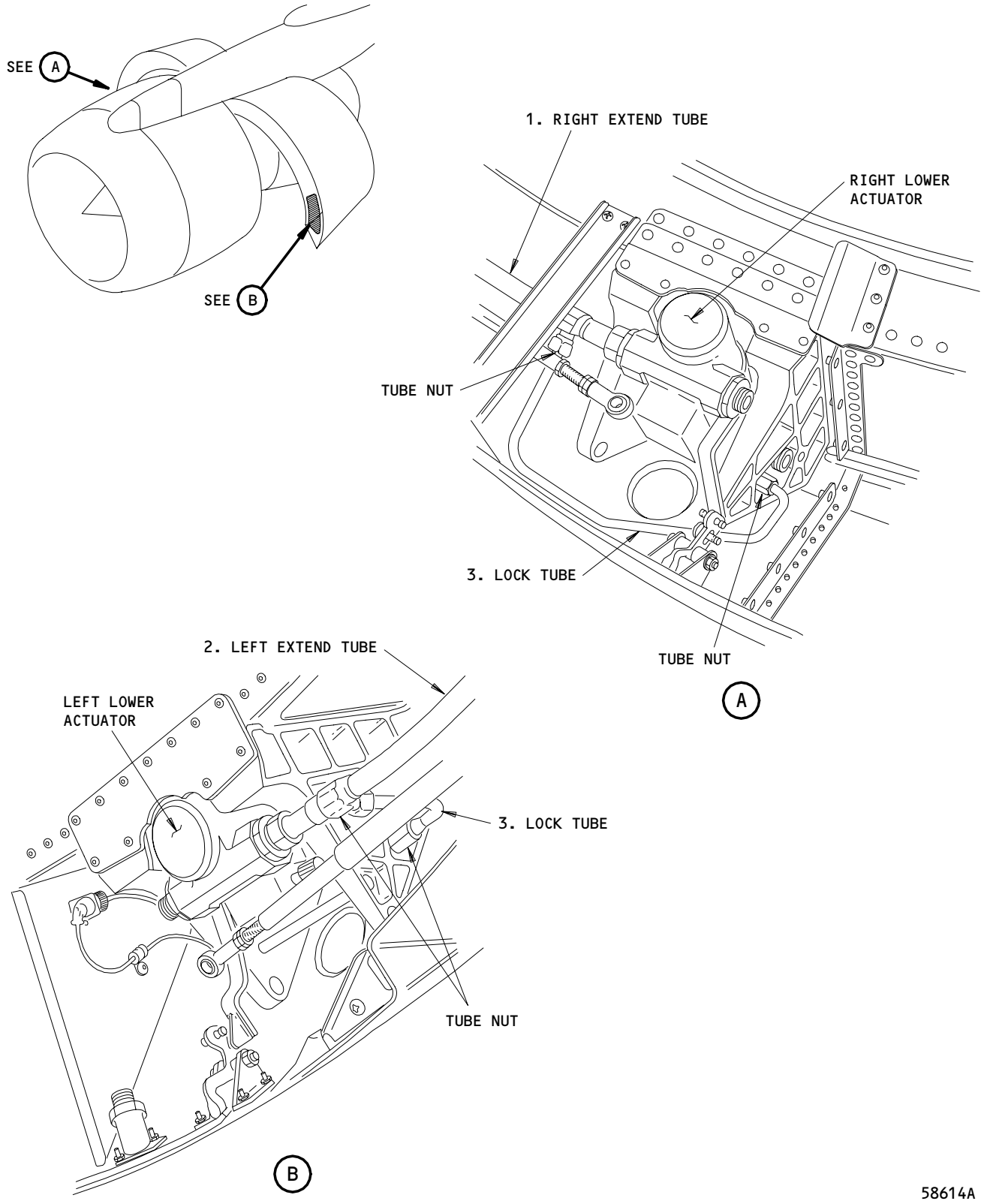
(5) Remove the actuator lock tube (3) (Fig. 405).
  (a) Loosen the tube nut to disconnect the lock tube (3) from the lower extend tube.
  (b) Loosen the tube nut to disconnect the lock tube (3) from the lower actuator.
  (c) Remove the lock tube (3).

S 034-030-R00

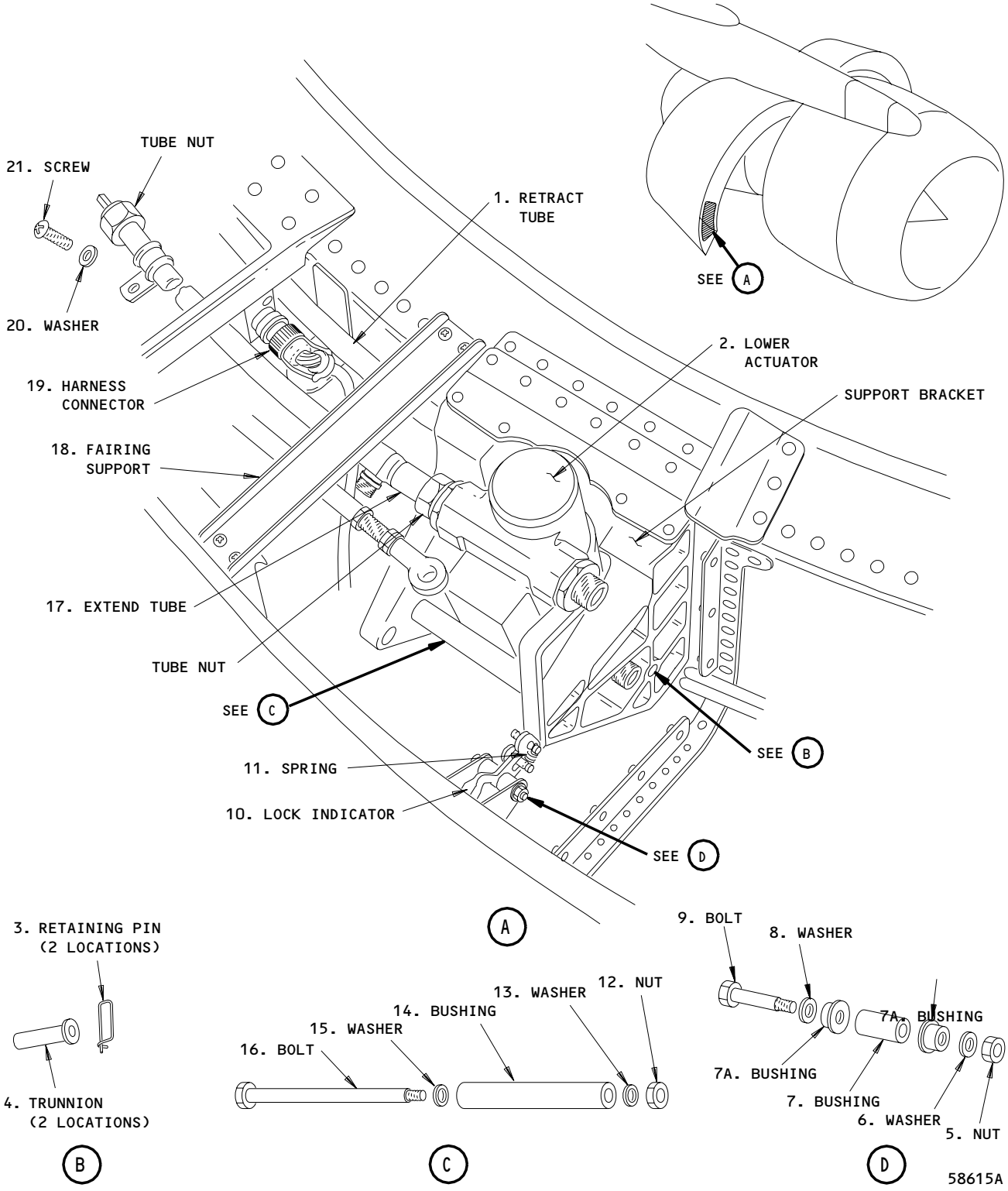
(6) Remove the manual drive assembly.
  (a) Disconnect the manual drive connector from the lower actuator.
  (b) Remove the two screws that hold the manual drive assembly to the fairing.
    1) Do not remove the lockwire from the manual drive assembly.
  (c) Remove the manual drive assembly.

S 024-049-R00

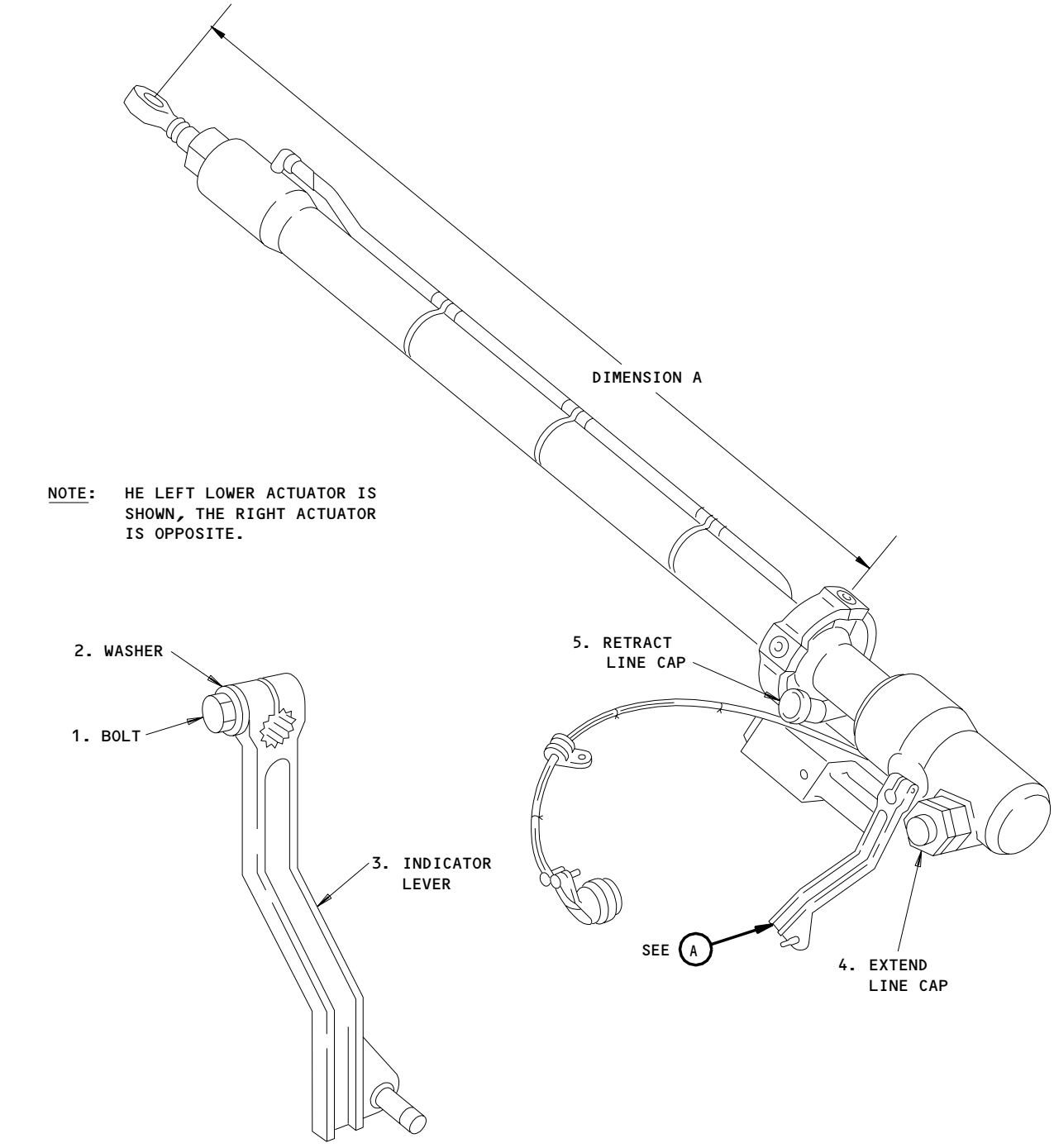
(7) Do the steps that follow to remove the actuator (Fig. 406):
  (a) Remove the spring (11), then release the indicator lever from the lock indicator (10).
    1) Remove the nut (5), the washers (6, 8), the bushing (7,7A), and the bolt (9) from the lock indicator (10).
    2) Remove the lock indicator.
  (b) Disconnect the harness connector (19).
    1) Disconnect the harness clamps as necessary to get access to the actuator.
  (c) Remove the retract line closing cap from the lower actuator (2).
    1) Install a cap on the opening.
  (d) Remove the washers and screws from the clamps that hold the lower extend tube to the support bracket.
  (e) Remove the washers and screws from the clamps that hold the retract tube to the torque box.
    1) Make a note of the location of the spacers.



Lock Tube Installation
Figure 405



Lower Actuator Installation
Figure 406



Preparation of Lower Actuator for Installation
Figure 407

2) Do not remove the clamps from the tube.

(f) Remove the lockwire and disconnect the tube nut on the extend tube (17) from the lower and the center actuators.

(g) Remove the lower retract tube:
1) Hold the retract tube at one end and lightly pull it inboard.
2) Put the other hand below the center of the tube.
3) Lightly flex the tube outboard to disengage the retract tube from the actuator.

(h) Remove the trunnion (4) and the retaining pin (3) from each side of the actuator.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATORS ARE NOT DAMAGED BY THE TOOLS WHEN YOU REMOVE THE FLEX SHAFTS. IF THE MATING SURFACES ARE DAMAGED, A HYDRAULIC LEAK CAN OCCUR.

(i) Lift and pull the actuator forward approximately 3 to 5 inch (76.2 to 127.0 mm) to disengage the two flex shafts.
1) Make sure that you do not damage the wire harness.
2) Do not let the actuator piston turn.

(j) Remove the extend tubes and the flex shafts.
1) Put the tubes and the flex shafts on a clean work surface.

(k) Remove the actuator.
1) Do not let the actuator piston turn.
2) Put the actuator on a clean work surface.
3) Keep the flex shaft inside of the extend tube and put it on a clean work surface.
4) Do not damage the wire harness.

(l) Install protective caps on all the openings and the connections.

TASK 78-31-26-404-003-R00

4. Install the Lower Actuators

A. General

(1) Use this task for the left and the right lower actuators.

(2) Do not let the actuator piston turn during the actuator removal or installation. If the actuator piston turns, you must do the adjustment in AMM 78-31-26/501.

B. Consumable Materials

(1) Lockwire
British Spec - DTD 189A 22 S.W.G.
American Spec - 21 A.W.G.
OMat No. - 238

C. Parts

(1) Refer to the Illustrated Parts Catalog for the part numbers and the effectivities of the items in these tables:

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	4	Lower Extend Tube	78-31-26	01	105
	5	Screw			55
	6	Washer			60
	8	Upper Actuator	78-31-26	01	135
	9	Retaining Pin			145
	10	Trunnion			150
404	1	Bolt	78-31-26	01	120
	2	Bushing			125
405	1	RH Extend Tube	78-31-26	01	90
	2	LH Extend Tube			85
	3	Lock Tube			80
406	2	Lower Actuator	78-31-26	01	140
	3	Retaining Pin			145
	4	Trunnion			155
	5	Nut	78-36-55	01	65
	6	Washer			55
	7	Bushing			60
	8	Washer			55
	9	Bolt			50
	10	Lock Indicator			45
	11	Spring			25
	12	Nut	78-31-26	01	25
	13	Washer			15
	14	Bushing			10
	15	Washer			15
	16	Bolt			5
	17	Extend Tube			90
	20	Washer			60
	21	Screw			55
407	1	Bolt	78-31-26	01	11,35
	2	Washer			20,40
	3	Indicator Lever			10,30

D. References
(1) AMM 70-50-02/201, Connection of Electrical Plugs
(2) AMM 78-31-00/201, Thrust Reverser System
(3) AMM 78-34-06/401, Thrust Reverser Feedback Actuators
(4) AMM 78-30-00/501, Thrust Reverser

E. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

F. Install the Lower Actuator

S 824-008-R00

CAUTION: MAKE SURE THAT THE ACTUATOR ROD END DOES NOT TURN DURING THE ENTIRE INSTALLATION OPERATION. MAKE SURE THAT THE ROD END STAYS IN THE SAME ORIENTATION DURING THE ADJUSTMENT AND INSTALLATION OPERATION. IF THE ROD END TURNS, IT CAN CAUSE THE ACTUATOR TO OPERATE INCORRECTLY. IF THE ACTUATOR OPERATES INCORRECTLY, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

(1) Adjust the replacement actuator (Fig. 404, 407).
(a) Make sure the actuator you removed is fully retracted.
1) Use a 1/4 square drive ratchet and extension or a speed handle to retract the actuator.
2) Do not let the actuator piston turn as you retract the actuator.
3) Make sure that the actuator rod end does not move from the position it was in when you removed it.

(b) Measure the dimension 'A' (Fig. 407) between the center of the gimbal ring and the center of the rod end of the removed actuator (Fig. 407).
1) Make a record of the dimension 'A' that you find.
(c) Put the replacement actuator on the work surface.
(d) Align the rod end the same as the removed actuator.
(e) Manually turn the replacement actuator with a 1/4 inch square ratchet and an extension or a speed handle until it is fully retracted.
1) Do not let the actuator piston turn while you retract the actuator.
(f) Adjust the rod end of the replacement actuator to within +/- 0.025 inches (0.635 mm.) of the dimension 'A' that you noted above.
1) Loosen the lock nut (5) and the key retainer (4).
2) Remove the keys (7).
3) Adjust the rod end to the specified limit.
a) One full turn of the rod end will change the actuator length +/- 0.050 inch (1.27mm).
b) One half turn will change the actuator length +/- 0.025 inch (0.635 mm).

NOTE: The lock mechanism in the lower actuator will ratchet during the last 0.25 inch (6.35 mm) of its stroke, before it gets to the fully retracted position.

4) Install the keys (7) and the key retainer (6).
5) ACTUATOR P/N 2189000;
Tighten the lock nut (5) to 220-240 pound-inches.
6) ACTUATOR P/N 1616000;
Tighten the lock nut (5) to 336-384 pound-inches.
7) Install a lockwire to the lock nut and to the key.

S 434-019-R00

CAUTION: MAKE SURE THAT THE ACTUATOR ROD END DOES NOT TURN DURING THE ENTIRE INSTALLATION OPERATION. IF THE ROD END TURNS, IT CAN CAUSE THE ACTUATOR TO OPERATE INCORRECTLY. IF THE ACTUATOR OPERATES INCORRECTLY, IT CAN CAUSE DAMAGE TO THE EQUIPMENT.

(2) Prepare to install the lower actuator (Fig. 407).
(a) Move the indicator lever (3) from the removed actuator to the replacement actuator.
1) The lever must be at the same position it was removed from to make sure of the correct alignment of the actuator shaft alignment groove and bolt.
2) Install the bolt (1) to attach the indicator lever.
a) Tighten the bolt to 63-70 pound-inches.

b) Install a lockwire to the bolt.

(b) Move the retract line cap (5) from the removed actuator to the replacement actuator.
1) Tighten the cap (AMM 70-51-00/201).
2) Install the lockwire.

(c) Examine the proximity sensor on the actuator, while the actuator is fully retracted and locked:
1) Use your hand to put a light torque in the extend direction, on the actuator rod end.
2) Make sure that the proximity sensor to target gap is 0.007 to 0.013 inch (0.178 to 0.330 mm).
3) Make a note of the gap that you find.
4) If the gap is not in the limits, adjust the proximity sensor (AMM 78-30-00/501).
a) If the proximity sensor is adjusted, measure the sensor target gap again.
b) Make a note of the gap that you find.

S 424-100-R00

CAUTION: YOU MUST NOT USE LUBRICANTS ON THE THREADS DURING THE ASSEMBLY PROCEDURES IN THIS SECTION. ALL THE STANDARD OR NON-STANDARD TORQUE LOADS ARE FOR DRY THREAD ASSEMBLY PROCEDURES.

(3) Install the lower actuator.

CAUTION: HYDRAULIC CONNECTION MUST BE TIGHTENED BY HAND TO GET FULL THREAD ENGAGEMENT BEFORE CONNECTIONS ARE TIGHTENED. THIS WILL MAKE SURE THAT THE CONNECTIONS ARE CORRECTLY ALIGNED AND PREVENT DAMAGE TO THE THREADS.

(a) Put the replacement actuator on the thrust reverser without extend or retract tubes and install the trunnions.
1) Do not damage the wire harness.

(b) Manually turn the actuator with a 1/4 inch ratchet wrench to align the rod end and the clevis hole.
1) Do not let the actuator piston turn.

(c) Remove the trunions.

(d) Pull the actuator forward 3 to 4 inches (76.2 - 101.6 mm).
1) Do not damage the wire harness.

2) Do not allow the actuator piston to turn.

S 424-017-R00

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBE AND THE ACTUATOR ARE NOT DAMAGED BY THE TOOLS WHILE YOU INSTALL THE FLEX SHAFTS. FOR EASE OF INSTALLATION, MAKE SURE THAT YOU HAVE 4 TO 8 INCHES OF CLEARANCE TO ALIGN THE FLEX SHAFTS. IF YOU DAMAGE THE MATING SURFACES, THE ACTUATOR WILL LEAK.

DO NOT USE TOOLS TO INSERT THE FLEX SHAFTS. DAMAGE TO THE FLEX SHAFTS CAN OCCUR.

(4) RB211-535E4 ENGINES PRE RR SB 78-9613 AND 78-9627;
Do the steps that follow to install the lower actuator (Fig. 406):
(a) Install the flex shaft from the lower extend tube into the center actuator.
1) Align the lower extend tube with the center actuator.
(b) Install the flex shaft from the lower extend tube with the lower actuator.
1) Align the lower extend tube with the lower actuator.
(c) Do not turn the flex shaft more than one-sixteenth of a turn with one end of the actuator connected.

S 424-023-R00

(5) RB211-535E4 ENGINES POST RR SB 78-9613 AND 78-9627;
Do the steps that follow to install the lower actuator (Fig. 406 and Fig. 411):
(a) Install the flex shaft from the lower extend tube into the sync-lock shaft on the center actuator.
1) Align the lower extend tube with the sync-lock.
(b) Install the flex shaft from the lower extend tube into the lower actuator.
(c) Align the lower extend tube with the lower actuator.
(d) Do not turn the flex shaft more than one-sixteenth of a turn with one end of the actuator connected.

S 424-002-R00

(6) Connect the actuator:
(a) Move the actuator aft.
1) Make sure the actuator piston does not turn.
(b) Carefully install the harness connector (19) through the support bracket as you put the actuator in its position (Fig. 406).
(c) Put the rod end into the clevis bracket (Fig. 404).
1) Make sure that the flex shafts are correct engaged with the actuators.
2) Make sure that the tube stay aligned with their connectors.
(d) Install the trunnions (4) and the retaining pins (3) to attach the actuator to the support bracket (Fig. 406).

(e) Install the bushing (2) and the bolt (1) to attach the rod end to the clevis bracket (Fig. 404).

NOTE: The bushing (2) is not used on RB211-535E4 engines.

1) Tighten the bolt to 60-80 pound-inches.

CAUTION: USE YOUR HAND TO INSTALL AND TIGHTEN THE HYDRAULIC CONNECTIONS BEFORE YOU TIGHTEN THEM WITH A WRENCH. MAKE SURE THAT YOU HAVE FULL THREAD ENGAGEMENT BEFORE YOU TIGHTEN THE CONNECTORS WITH THE WRENCH. IF THE HYDRAULIC CONNECTORS ARE NOT CORRECTLY ALIGNED, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(f) Handtighten the extend tube hydraulic connectors to full thread engagement on the lower and cnter actuators.

(g) Use your hand to connect the retract tube (1) to the lower and center actuators (Fig. 406 and Fig. 409).

NOTE: To engage the retract tube, connect one end of the tube. Put a hand below the center of the tube and the other hand on the end that is not connected. Lightly flex the tube inboard until it engages.

(h) Install the lock tube (3) on the lower extend tube and the lower actuator (Fig. 405).
1) Use your hand to tighten the tube.

(i) Install the washer (20) and the screw (21) to attach the clamp for the extend tube (17) (Fig. 406).
1) Tighten the screw with your hand.

(j) Install the retract tube clamp to the torque box.
1) Use your hand to tighten the bolt.

(k) Tighten the tube nuts on the extend and retract tubes to a torque of 500-600 pound-inches (56.5 to 67.8 Nm).
1) Install lockwire on the extend tube connectors.

(l) Tighten the tube nuts on the lock tube to a torque of 215-245 pound-inches (Fig. 405).

(m) Make sure that all of the clamps for the extend and retract tubes are correctly connected (Fig. 406).
1) Tighten the bolts on each of the clamps that hold the tubes (AMM 70-51-00/201).

(n) Install the retract line closing cap on the lower actuator.
1) Tighten the closing cap to a torque of 500-600 pound-inches (56.5 to 67.8 Nm).

CAUTION: MAKE SURE THAT THE HYDRAULIC TUBES AND THE WIRE BUNDLES CANNOT HIT THE LOCK LEVER ARM OR THE LOCK INDICATOR WHEN THE ACTUATOR OPERATES. IF THE TUBES OR THE WIRE BUNDLES HIT THE LOCK LEVER ARM OR THE LOCK INDICATOR, THE THRUST REVERSER WILL NOT LOCK CORRECTLY.

(o) Attach the lock indicator (10) to the thrust reverser with the bolt (9), washers (6 and 8), bushing (7), and nut (5) (Fig. 406).
  1) Tighten the nut (5) to 30-40 pound-inches (3.4-4.5 Newton meters).
  2) Make sure the lock indicator moves freely.
(p) Install the spring (11) to connect the lock indicator (10) to the indicator lever (Fig. 406).
(q) Install the bolt (16), washers (13 and 15), bushing (14), and nut (12) to the support bracket (Fig. 406).
(r) Connect the harness connector (19) (Ref 70-50-02/201) (Fig. 406).
  1) Install the harness clamps that you removed to get access for the procedure.
(s) Install the fairing supports (18) (Fig. 406).

S 424-031-R00

(7) Install the thrust reverser feedback actuator (AMM 78-34-06/401).

S 434-032-R00

(8) Connect the manual drive assembly to the lower actuator.
  (a) Connect the manual drive coupling to the lower actuator.
    1) Hand tighten the connector.
  (b) Install but do not tighten the screws that hold the manual drive assembly to the fairing.
  (c) Tighten the connector to 500-600 pound-inches (56.5 - 67.8 Nm).
  (d) Tighten the screws that hold the manual drive to the fairing to a torque of 50 to 70 pounds-inch (5.65 to 7.91 Nm).

S 434-035-R00

(9) Connect the extend hose and the retract hose to the top actuator (Fig. 401).
  (a) Remove the cap and connect the retract hose (2) to the top actuator.
    1) Tighten the tube nut to 500-600 pound-inch (56.5 to 67.8 Nm).
  (b) Remove the cap and connect the extend hose (1) to the top actuator.
    1) Tighten the tube nut to 500-600 pound-inches.
    2) Install lockwire on the connector.

S 434-009-R00
(10) Install the panels, that you removed, to the thrust reverser (Fig. 403).

S 844-010-R00
(11) Manually move the thrust reverser to the fully retracted and locked position.

S 214-003-R00
(12) Examine the actuator proximity sensor:
  (a) Make sure that the thrust reverser is in the fully retracted position.
  (b) Measure the lower actuator proximity sensor gap (AMM 78-36-01/401).
  (c) Make sure that the sensor target gap is the same as the gap that was noted in the earlier step (prior to the actuator installation).
    1) Make sure that the proximity sensor to target gap of 0.007 to 0.013 inch (0.178 to 0.330 mm) is met.
  (d) If the gap is not in the limit, adjust the sensor target gap (AMM 78-30-00/501).

S 214-004-R00
(13) Examine the lock indicator (AMM 78-30-00/501).

S 214-022-R00
(14) Make sure that the access panel that you removed for the procedure, are installed in their correct locations.

S 434-020-R00
(15) Install the applicable fairing supports (AMM 70-51-00/201).

S 714-026-R00
(16) Do the steps to put the airplane back to the usual condition.

TASK 78-31-26-004-003-R00

5. Remove the Left Center Actuator

A. Equipment

(1) Clean container, minimum capacity:

5 U.S. Gallons
4 Imperial Gallons
18 Litres

B. References

(1) AMM 29-11-00/201, Main Hydraulic Systems
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-34-06/401, Thrust Reverser Feedback Actuators

C. Access

(1) Location Zones

411 Left Engine
421 Right Engine

(2) Access Panels

415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

D. Remove the left center actuator.

S 824-018-R00

(1) Make sure you follow these instructions or you must adjust the thrust reverser system.
(a) Make a note of the position of the actuator rod end and the translating sleeve clevis bracket. Make sure you know how they are aligned.
(b) You must keep the actuator rod end aligned with the translating sleeve clevis bracket.

(c) You must not permit the actuator piston to turn.
(d) If you do not keep tract of the actuator alignment or let the rod end turn, you must do the thrust reverser system adjustment (AMM 78-31-26/501).

S 024-050-R00

(2) Disconnect the actuator rod end from the thrust reverser sleeve (Fig. 408).
(a) Remove the screws (1) and the access panel (2).
(b) Remove the bolt (4) and the bushing (3) that attach the center actuator to the clevis bracket.

NOTE: The bushing (3) is not used on RB211-535E4 engines.

1) Do not permit the actuator piston to turn.

S 034-051-R00

(3) Remove the actuator lock tube (Fig. 405).
(a) Disconnect the tube nut that connects the lock tube (3) to the extend tube (Fig. 405).
(b) Disconnect the tube nut that connects the lock tube (3) to the lower actuator.
(c) Remove the lock tube.

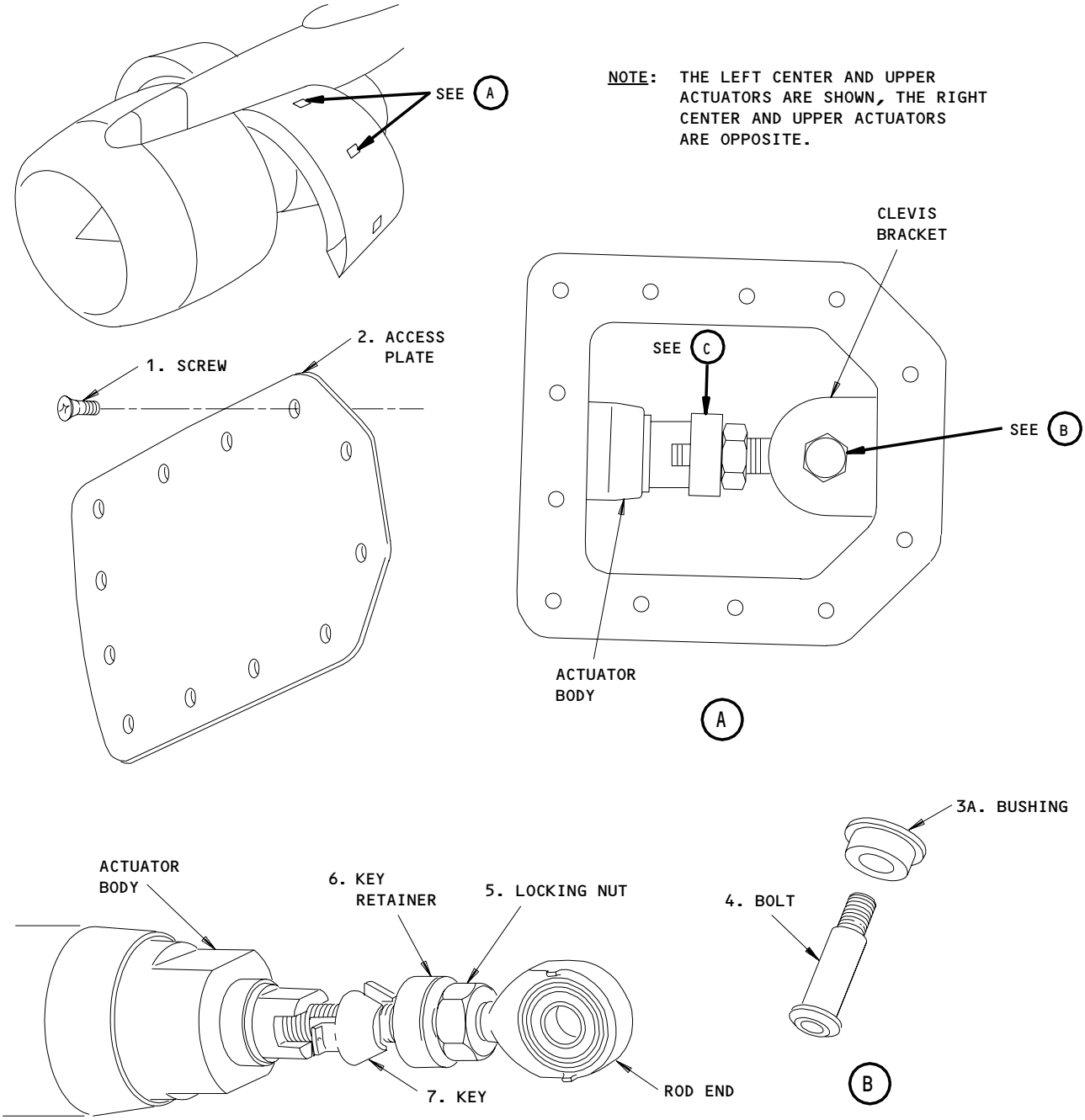
S 024-052-R00

(4) Do these steps to remove the left center actuator (Fig. 409):
(a) Remove the actuator access panels.

NOTE: For maximum access to the actuator, remove all of the access panels.

(b) Remove the fairing supports (1).

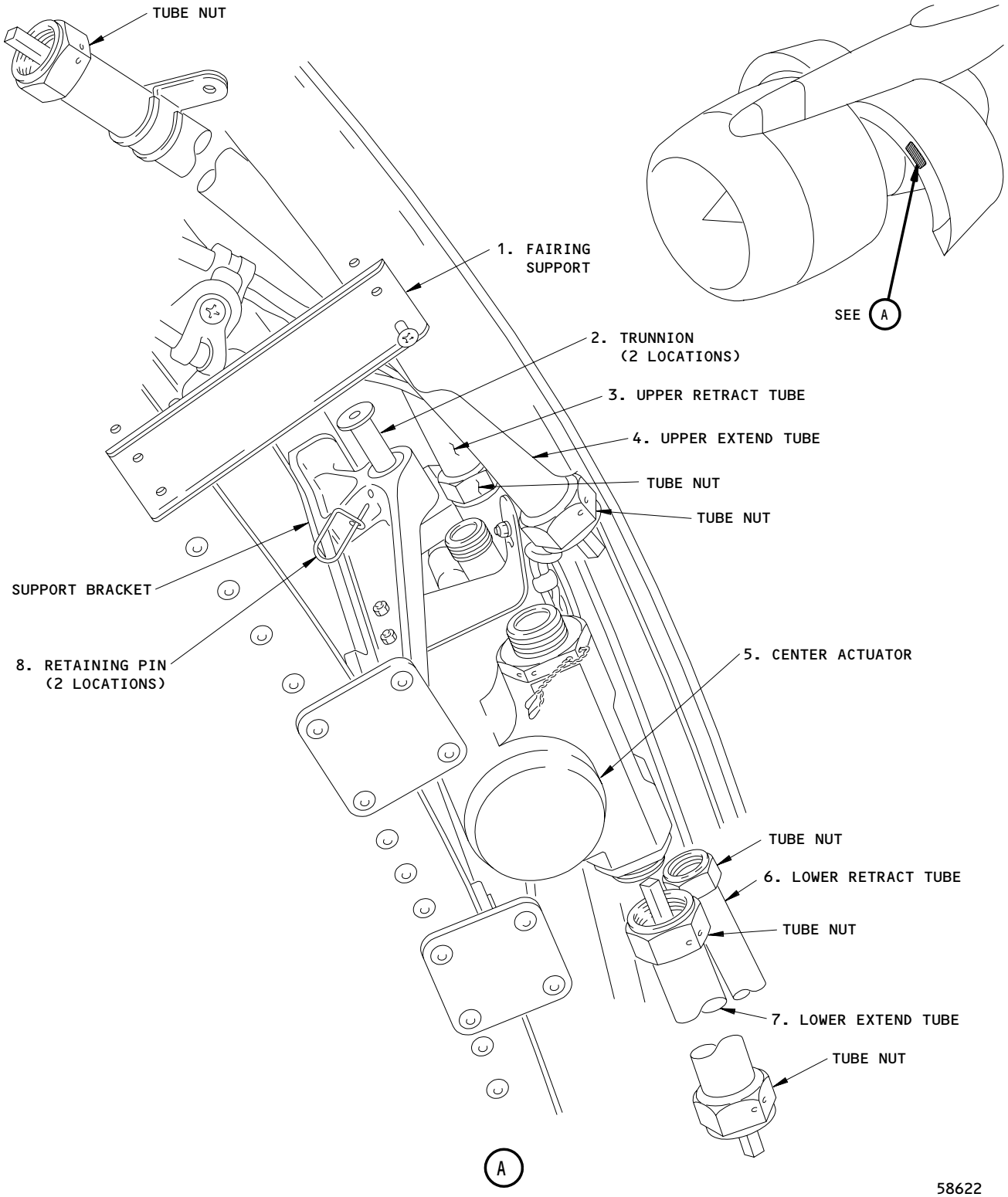
NOTE: For maximum access to the actuator, remove all of the fairing supports.



ACTUATOR ROD END DETAILS
(EXAMPLE FOR EACH ACTUATOR)
C

58617B

Center and Upper Actuator Rod End Connection
Figure 408



Left Center Actuator Installation
Figure 409

(c) Disconnect the clamps that hold the upper and lower retract tubes to the torque box.

NOTE: Do not remove the clamps from the retract tubes. Make a note of the position of the clamps and their connectors for the subsequent installation.

1) Keep the clamps with the tubes.

(d) Disconnect the tube nuts for the upper retract tube from the center and upper actuator.

(e) Disconnect the tube nuts for the lower retract tube from the center and lower actuator.

(f) Remove the upper and lower retract tubes.
1) Hold the retract tube at one end and pull inboard lightly.
2) With your other hand below the center of the tube, flex the tube outboard to disengage the retract tube from the actuators.

(g) Remove the lockwire from the tube nuts on the upper and lower extend tubes.

(h) Disconnect the clamp, screw and washer that attaches the lower extend tube to the bracket on the torque box.

NOTE: Do not remove the clamps from the extend tube. Make a note of the position of the clamps and their connectors for the subsequent installation.

(i) Disconnect the clamp, screw and washer that attaches the upper extend tube to the bracket on the torque box.

NOTE: Do not remove the clamps from the extend tube. Make a note of the position of the clamps and their connectors for the subsequent installation.

(j) Disconnect the tube nuts on the upper extend tube from the center and upper actuators.

(k) Disconnect the tube nuts on the lower extend tube from the lower and center actuators.
(l) Disconnect the clamps that attach the wire harness as necessary for access.
(m) Remove the two retaining pins (8) and trunnions (2) that attach the actuator to the support bracket.
    1) Temporarily install a 10/32 bolt into the end of the trunnion to aid in the removal of the trunnion.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATORS ARE NOT DAMAGED BY THE TOOLS WHEN YOU REMOVE THE FLEX SHAFTS. IF THE MATING SURFACES ARE DAMAGED, A HYDRAULIC LEAK CAN OCCUR.

(n) Lift and pull the actuator forward approximately 3-5 inches (76.2-127.0 mm) and disengage the two flexshafts.

    NOTE: Do not damage the wire harness. Do not permit the actuator piston to turn.

    1) Move the rod end of the actuator up or down to move the head end away from the lower or upper actuator.

        NOTE: This helps the removal of the flexshafts.

    2) Remove the extend tubes and flexshafts.

        NOTE: Put them on a clean work surface so that you do not cause contamination before the subsequent installation.

(o) Remove the actuator and put it on a clean work surface.

    NOTE: Do not damage the wire harness. Do not permit the actuator piston to turn.

    1) You can move the feedback cable conduit outboard to get sufficient clearance to remove the actuator.
    2) Install caps on all openings.
    3) Make sure that the rod end does not turn.

4) Keep the flex shafts inside the extend tubes and put them on a clean work surface.

TASK 78-31-26-404-004-R00

6. Install the Left Center Actuator

A. Consumable Materials

(1) Lockwire
British Spec - DTD 189A 22 S.W.G.
American Spec - 21 A.W.G.
OMat No. - 238

B. Parts

(1) Refer to the Illustrated Parts Catalog for the part numbers and the effectivities of the items in these tables:

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
405	1	RH Extend Tube	78-31-26	01	90
	2	LH Extend Tube			85
	3	Lock Tube			80
408	1	Screw	78-31-23	01	485
	2	Access Panel			470
	3	Bushing	78-31-26	01	125
	4	Bolt			120
	7	Key			
409	1	Fairing Support			
	2	Trunnion	78-31-26	01	150
	4	Upper Extend Tube			105
	5	Center Actuator			135
	7	Lower Extend Tube			85
	8	Retaining Pin			145

C. References
(1) AMM 29-11-00/201, Main Hydraulic Systems
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-34-06/401, Thrust Reverser Feedback Actuators
(5) AMM 78-30-00/501, Thrust Reverser

D. Access
(1) Access Panels
415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

E. Install the Left Center Actuator

S 994-083-R00

CAUTION: YOU MUST NOT USE LUBRICANTS ON THREADS DURING THE ASSEMBLY PROCEDURES IN THIS SECTION. ALL THE STANDARD AND NON-STANDARD TORQUE LOADS ARE FOR DRY THREAD ASSEMBLY PROCEDURES.

(1) Make sure you follow these instructions or you must adjust the thrust reverser system (AMM 78-30-00/501).
(a) You must make a note of the position of the actuator rod end and the translating sleeve clevis bracket. Make sure you know how they are aligned.
(b) You must keep the actuator rod end aligned with the translating sleeve clevis bracket.
(c) You must not permit the actuator piston to turn.

S 824-063-R00
(2) Adjust the replacement left center actuator (Fig. 407, 408).
(a) Manually turn the removed actuator to the fully retracted position.

NOTE: Use a 1/4 inch square ratchet and extension or a speed handle.

1) Hold the rod end so the actuator piston will not turn.

2) Make sure the rod end stays in the same position it was when you removed it from the clevis bracket.

(b) Put the replacement actuator on the work surface.

(c) Measure dimension 'A' (Fig. 407) between the center of the gimbal ring and the center of the rod end of the removed actuator (Fig. 407).
1) Align the rod end the same as the actuator you have removed.
2) Manually turn the replacement actuator to the fully retracted position.
a) Use a 1/4 inch square ratchet and extension or a speed handle.
b) Do not permit the actuator piston to turn while you retract the actuator.

(d) Adjust the rod end of the replacement actuator until it is in a range of +/- 0.025 inches (0.635 mm) of the dimension 'A' of the removed actuator.
1) Release the locking nut and key retainer.
2) Remove the keys and adjust the rod end as necessary.
3) Make sure the rod end is in the same position as the actuator you have removed.
4) Install the keys (7) and the key retainer (6).
5) ACTUATOR P/N 2189000;
Tighten the lock nut (5) to 220-240 pound-inches.
6) ACTUATOR P/N 1616000;
Tighten the locking nut to 336-384 pound-inches.
7) Lockwire the locking nut to the key.

S 424-064-R00

(3) Install the left center actuator.

CAUTION: USE YOUR HAND TO INSTALL AND TIGHTEN THE HYDRAULIC CONNECTIONS BEFORE YOU TIGHTEN THEM WITH A WRENCH. MAKE SURE THAT YOU HAVE FULL THREAD ENGAGEMENT BEFORE YOU TIGHTEN THE CONNECTORS WITH THE WRENCH. IF THE HYDRAULIC CONNECTORS ARE NOT CORRECTLY ALIGNED, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(a) Put the replacement actuator on the reverser without the extend or retract tubes and install the trunnions.
1) Do not damage the wire harness.

(b) Manually turn the actuator until the rod end and the clevis holes are aligned.
  1) Use a 1/4 inch square ratchet and extension or a speed handle.
  2) Do not permit the actuator piston to turn while you retract the actuator.

(c) Remove the trunnions and pull the actuator forward 3 to 4 inches (76.2 - 101.6 mm).
  1) Do not damage the wire harness.
  2) Do not permit the actuator piston to turn.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATOR ARE NOT DAMAGED DURING THE FLEX SHAFT INSTALLATION. TO INSTALL THE FLEX SHAFT YOU WILL FIND IF NECESSARY TO HAVE 4 TO 8 INCH (101 TO 203 mm) OF CLEARANCE TO ALIGN AND INSTALL THE FLEX SHAFT. IF THE MATING SURFACES ARE DAMAGE, THE ACTUATOR CAN LEAK.

(d) Put the flexshaft into and align the upper extend tube with the center actuator and then the upper actuator (Fig. 409).

  NOTE: Do not turn the flexshaft more than 1/16th turn when one end of the flex shaft is engaged.

(e) Put the flexshaft into and align the lower extend tube with the lower actuator and then the center actuator (Fig 409).

  NOTE: Do not turn the flexshaft more than 1/16th turn when one end is engaged.

(f) Move the center actuator aft.
  1) Do not damage the wire harness.
  2) Keep the rod end aligned with the clevis bracket.
  3) Do not permit the actuator piston to turn.
  4) Make sure that the flex shafts are correctly aligned.

5) Make sure that the necessary connections remain aligned as you move the actuator.

(g) Install the two trunnions and the retaining pins that attach the actuator to the support bracket (Fig. 409).

(h) Install the bushing (3) and the bolt (4) that attach the rod end to the clevis bracket (Fig. 408).
1) Tighten the bolt to 60-80 pound-inches.

CAUTION: USE YOUR HAND TO INSTALL AND TIGHTEN THE HYDRAULIC CONNECTIONS BEFORE YOU TIGHTEN THEM WITH A WRENCH. MAKE SURE THAT YOU HAVE FULL THREAD ENGAGEMENT BEFORE YOU TIGHTEN THE CONNECTORS WITH THE WRENCH. IF THE HYDRAULIC CONNECTORS ARE NOT CORRECTLY ALIGNED, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(i) Connect the end connectors of the upper and lower extend tubes for the lower, center and upper actuators (Fig. 409).
1) Use your hand to tighten the connectors to full thread engagement.

(j) Install and connect the end connectors of the upper and lower retract tubes to the upper, center and lower actuators (Fig. 409).
1) Use your hand to tighten the connectors.
2) Engage the retract tube at one end.
3) Put one hand below the center of the tube and the other hand at the end that is not engaged.
4) Flex the tube inboard to engage it in the other actuator.

(k) Install the lock tube on the extend tube and the lower actuator (Fig. 405).
1) Use your hand to tighten the connectors.

(l) Install the upper and lower extend tubes clamps to the brackets on the torque box.
1) Tighten the bolts with your hand.

(m) Install the clamps on the upper and lower retract tubes.
1) Tighten the bolts with your hand.

(n) Tighten the tube nut connectors on the upper and lower retract tubes to a torque of 500 - 600 inch-pounds (Fig. 409).
(o) Tighten the tube nut connectors on the upper and lower extend tubes to a torque of 500 - 600 inch-pounds (Fig. 409).
1) Install lockwire on the connectors.
(p) Tighten the end connector of the lock tube to the extend tube and the actuator to a torque of 215-245 pound-inches (Fig. 405).
1) Install lockwire on the connectors.
(q) Tighten the clamp bolts that attach the upper and lower extend and retract tubes to the torque box (AMM 70-51-00/201).
(r) Install and tighten the clamps on the wire harness (AMM 70-51-00/201).
(s) Install the fairing supports that were removed for access (Fig. 411) (AMM 70-51-00/201).

S 434-065-R00
(4) Install the retract line closing cap.
(a) Tighten the cap to 500-600 pound-inches (56.5 - 67.8 Nm).

S 434-016-R00
(5) Connect and tighten the extend and retract hoses to the upper actuator (Fig. 401).
(a) Tighten the connector to 500-600 pound-inches (56.5 - 67.8 Nm).
(b) Install lockwire on the extend hose coupling.

S 434-066-R00
(6) Connect the manual drive coupling to the lower actuator.
(a) Tighten the connector to 500-600 pound-inches (56.5 - 67.8 Nm).
(b) Tighten the cap to 500-600 pound-inches (56.5 - 67.8 Nm).

S 434-067-R00
(7) Install the panels that were removed from the C-duct.
(a) Tighten the screws that hold the panels (AMM 70-51-00/201).

S 414-068-R00
(8) Close the applicable thrust reverser C-duct (AMM 78-31-00/201).

S 864-029-R00

(9) Do the procedure to return the airplane to service.

TASK 78-31-26-004-004-R00

7. Remove the Right Center Actuator

A. Equipment

(1) Clean container, minimum capacity:

5 U.S. Gallons
4 Imperial Gallons
18 Litres

B. References

(1) AMM 29-11-00/201, Main Hydraulic Systems
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-34-06/401, Thrust Reverser Feedback Actuators
(5) AMM 78-30-00/501, Thrust reverser

C. Access

(1) Location Zones

411 Left Engine
421 Right Engine

(2) Access Panels

415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

D. Remove the Right Center Actuator.

S 994-082-R00

CAUTION: YOU MUST NOT USE LUBRICANT ON THE THREADS DURING THE ASSEMBLY PROCEDURES IN THIS SECTION. ALL STANDARD OR NON-STANDARD TORQUE LOADS ARE FOR DRY THREAD ASSEMBLY PROCEDURES.

(1) Make sure you follow these instructions or you must adjust the thrust reverser system (AMM 78-30-00/501).

(a) You must make a note of the position of the actuator rod end and the translating sleeve clevis bracket. Make sure you know how they are aligned.

(b) You must keep the actuator rod end aligned with the translating sleeve clevis bracket.
(c) You must not permit the actuator piston to turn.
(d) If you do not keep tract of the actuator alignment or let the rod end turn, you must do the thrust reverser system adjustment (AMM 78-31-26/501).

S 024-058-R00

(2) Disconnect the actuator rod end (Fig. 408).
(a) Release and remove the screws that attach the access panel then remove the panel.
(b) Release and remove the bolt (4) and bushing (3) that attach the center actuator to the clevis bracket.
1) Do not permit the actuator piston to turn.

S 034-059-R00

(3) Remove the actuator lock tube (Fig. 405).
(a) Disconnect the end connector of the lock tube from the lower extend tube.
(b) Disconnect the end connector of the lock tube from the lower actuator.
(c) Remove the lock tube.

S 024-060-R00

(4) Do these steps to remove the right center actuator.
(a) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS,
OR AIRPLANES PRE RR SB 78-9627 AND 78-9613;
Remove the actuator access panels (Fig. 411).

NOTE: For the best access, remove all three of the access panels.

(b) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS,
OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Do these steps:
1) Remove the actuator access panels, panel support and splice brackets (Fig. 412).

2) Disconnect the synchronization shaft lock electrical connector and remove the clamps from the connector wire (Fig. 411).
3) Disconnect the end connectors on the synchronization shaft lock stow pressure hose and remove it (Fig. 411).

(c) Remove the applicable fairing supports.

NOTE: For the best access, remove all of the fairing supports.

(d) Disconnect the clamps that hold the upper and lower retract tubes to the torque box.

NOTE: Do not remove the clamps from the tubes.

1) Make a note of the position and location of the clamps and the spacers as you disconnect them.

(e) Disconnect the end connectors on the upper retract tube from the center and upper actuators.

(f) Disconnect the end connectors on the lower retract tube from the center and lower actuators.

(g) Remove the upper and lower retract tubes.
1) Hold the retract tube at one end and pull inboard lightly.
2) With your other hand below the center of the tube, bend it outboard to disengage the retract tube from the actuators.

(h) Remove the lockwire from the end connectors on the upper and lower extend tubes.

(i) Disconnect the clamp that attach the lower extend tube to the bracket of the torque box (Fig. 406).

NOTE: Do not remove the clamps from the tubes.

(j) Disconnect the clamp that attaches the upper extend tube to the bracket on the torque box.

NOTE: Do not remove the clamps from the tubes.

1) Make a note of the position and location of the clamps and the spacers as you disconnect them.

(k) Disconnect the end connectors on the upper extend tube from the center and upper actuators.
(l) Disconnect the end connectors on the lower extend tube from the center and lower actuators.
(m) Disconnect the clamps that attach the wire harness as necessary for access.
(n) Remove the two retaining pins and trunnions that attach the actuator to the support bracket.
    1) Temporarily install a 10/32 bolt into the end of the trunnion to aid in the removal of the trunnion.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATORS ARE NOT DAMAGED BY THE TOOLS WHEN YOU REMOVE THE FLEX SHAFTS. IF THE MATING SURFACES ARE DAMAGED, A HYDRAULIC LEAK CAN OCCUR.

(o) Lift and pull the actuator forward approximately 3-5 inches (76.2-127.0 mm) and disengage the two flexshafts.

    NOTE: Do not damage the wire harness. Do not permit the actuator piston to turn.

    1) Remove the extend tubes and flex shafts and put on a clean work surface.
    2) Move the rod end of the actuator up or down to move the head end away from the lower or upper actuator.

        NOTE: This helps the removal of the flexshaft.

(p) If it is necessary, move the feedback cable conduit outboard to get the necessary clearance to remove the actuator.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATOR AND (SYNC-LOCK IF INSTALLED) ARE NOT DAMAGED DURING THE REMOVAL. IF THE MATING SURFACES ARE DAMAGED, A HYDRAULIC LEAK CAN OCCUR.

(q) Remove the actuator and put it on a clean work surface.

    NOTE: Do not damage the wire harness. Do not permit the actuator piston to turn.

    1) Put caps on all open ends.
    2) Keep the flex shafts inside the extend tubes and put them on a clean work surface.

S 024-061-R00

(5) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS, OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Remove the sync-lock (synchronization shaft lock) (Fig. 412).
(a) Remove the two bolts and washers that attach the support bracket to the sync-lock.
(b) Remove the four nuts, washers and bolts that attach the support bracket assemblies to the right center actuator.
(c) Loosen the coupling nut on the sync-lock which attaches to the right center actuator and remove the sync-lock.
(d) Install covers on all open connection points.

TASK 78-31-26-404-021-R00

8. Install the Right Center Actuator

A. General
(1) Do not use lubricants on the threads during the actuator installation. The torque values used in this procedure were for dry threads.

B. Consumable Materials
(1) Lockwire
British Spec - DTD 189A 22 S.W.G.
American Spec - 21 A.W.G.
OMat No. - 238

C. Parts
(1) Refer to the Illustrated Parts Catalog for the part numbers and the effectivities of the items in these tables:

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
405	1	RH Extend Tube	78-31-26	01	90
	2	LH Extend Tube			85
	3	Lock Tube			80
408	1	Screw	78-31-23	01	485
	2	Access Panel			470
	3	Bushing	78-31-26	01	125
	4	Bolt			120
	7	Key			

D. References
(1) AMM 29-11-00/201, Main Hydraulic Systems
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-34-06/401, Thrust Reverser Feedback Actuators
(5) AMM 78-30-00/501, Thrust Reverser

E. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

F. Install the Right Center Actuator.

S 994-084-R00

CAUTION: YOU MUST NOT USE LUBRICANTS ON THREADS DURING THE ASSEMBLY PROCEDURES IN THIS SECTION. ALL THE STANDARD OR NON-STANDARD TORQUE LOADS ARE FOR DRY THREAD ASSEMBLY PROCEDURES.

(1) If you do not do one of these three notes, you must adjust the thrust reverser system.
(a) Make a note of the position of the actuator, the rod end and the translating sleeve clevis bracket.
1) Make sure you know how they are aligned.
(b) You must keep the rod end of the actuator aligned with the clevis bracket of the translating cowl.
(c) You must not permit the actuator piston to turn.
(d) If you do not keep track of the actuator alignment or let the rod end turn, you must do the thrust reverser system adjustment (AMM 78-30-00/501).

S 824-070-R00

(2) Adjust the replacement right center actuator (Fig. 407, 408).
  (a) Manually turn the removed actuator to the fully retracted position with a 1/4 inch square ratchet and extension or a speed handle.
    1) Do not permit the actuator piston to turn while you retract the actuator.
    2) Make sure the rod end is in the same position it was when you removed it from the clevis bracket.
  (b) On the removed actuator, measure the dimension 'A' (Fig. 407) between the center of the gimbal ring and the center of the rod end (Fig. 407).
    1) Make a note of the measurement 'A'.
  (c) Put the replacement actuator on the work surface and align it with the actuator that was removed.
  (d) Align the rod end the same as the old actuator and manually turn it to the fully retracted position.
    1) Use a 1/4 inch square ratchet and extension or a speed handle.
    2) Do not permit the actuator piston to turn while you retract the actuator.
  (e) Adjust the rod end of the replacement actuator to within + 0.025 inch (0.635 mm) of dimension 'A'.
  (f) Release the locking nut and key retainer.
  (g) Remove the keys and adjust the rod end as necessary.

    NOTE: One full turn of the rod end will change the actuator length by 0.050 inch (1.27 mm). One half turn will change the length by 0.025 inch (0.635 mm).

    1) Make sure the rod end is in the same position as the old actuator.
  (h) Install the key (7) and key retainer (6).
  (i) ACTUATOR P/N 2189000;
  Tighten the lock nut (5) to 220-240 pound-inches.

(j) ACTUATOR P/N 1616000;
Tighten the lock nut (5) to 336-384 pound-inches.
(k) Lockwire the lock nut to the key.

S 434-005-R00

CAUTION: MAKE SURE THAT YOU DO THESE STEP IN THE ORDER THAT THEY SHOW. IF YOU DO NOT DO THE STEPS IN THE CORRECT ORDER, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(3) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS, OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Install the sync-lock (synchronization shaft lock) on the right center actuator (Fig. 412).
(a) Put the sync-lock drive into the right center actuator on the lower side.
1) Use your hand to tighten the coupling nut.
(b) Install the support bracket assemblies on the sync-lock and right center actuator (Fig. 412).
1) Lightly tighten but do not torque the nuts and bolts.
(c) Tighten the sync-lock coupling nut to 500-600 pound-inches.
1) Install the lockwire to the nut.
(d) Tighten the two bolts that attach the support bracket to the synchronization shaft lock.
1) Tighten the bolts to 50-70 pound-inches.
(e) Tighten the four nuts that attach the support bracket assemblies to the right center actuator.
1) Tighten the bolts to 50-70 pound-inches.

S 424-072-R00
(4) Install the right center actuator.

CAUTION: TIGHTEN THE HYDRAULIC CONNECTIONS WITH YOUR HANDS TO GET FULL THREAD ENGAGEMENT BEFORE THE CONNECTIONS ARE TIGHTENED TO THE NECESSARY TORQUE VALUE. THIS WILL PREVENT DAMAGE TO THE THREADS AND MAKE SURE THE HYDRAULIC CONNECTIONS ARE CORRECTLY ALIGNED.

(a) Put the replacement actuator on the reverser without the extend or retract tube.
1) Install the trunnions.

NOTE: Do not damage the wire harness.

(b) Manually turn the actuator until the rod end and the clevis holes are aligned.
1) Use a 1/4 inch ratchet and extension or a speed handle.
2) Do not permit the actuator piston to turn.
(c) Remove the trunnions and pull the actuator forward 3 to 4 inches.
1) Do not damage the wire harness.

2) Do not permit the actuator piston to turn.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATOR ARE NOT DAMAGED DURING THE FLEX SHAFT INSTALLATION. TO INSTALL THE FLEX SHAFT YOU WILL FIND IF NECESSARY TO HAVE 4 TO 8 INCH (101 TO 203 mm) OF CLEARANCE TO ALIGN AND INSTALL THE FLEX SHAFT. IF THE MATING SURFACES ARE DAMAGE, THE ACTUATOR CAN LEAK.

(d) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS,
OR AIRPLANES PRE RR SB 78-9627 AND 78-9613;
Put the flexshaft into and align the lower extend tube with the lower actuator and then the center actuator (Fig. 411).

NOTE: Do not turn the flexshaft more than 1/16th turn when one end is engaged.

1) Tighten the connectors with your hand.

(e) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS,
OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Put the flexshaft into and align the lower extend tube with the synchronization shaft lock and then the lower actuator (Fig. 411).

NOTE: Do not turn the flexshaft more than 1/16th turn when one end is engaged.

1) Tighten the connectors with your hand.

(f) Put the flexshaft into and align the upper extend tube with the upper actuator and then the center actuator (Fig. 411).

NOTE: Do not turn the flexshaft more than 1/16th turn when one end is engaged.

(g) Move the center actuator aft.

NOTE: Make sure the flex shafts are correctly engaged with the actuators. Make sure the surfaces that connect are aligned with one another.

1) Do not damage the wire harness.
2) Keep the rod end aligned with the clevis bracket.
3) Do not permit the actuator piston to turn.

CAUTION: THE FEEDBACK CABLE CONDUIT MAY NEED TO BE ADJUSTED AFT TO CLEAR THE SYNC-LOCK LOCK FLAG.

(h) Install the two trunnions and the retaining pins that attach the actuator to the support bracket (Fig. 411).
   1) Make sure that the flex shafts and tubes remain correctly aligned.
(i) Install the bushing (3A) and the bolt (4) that attach the rod end to the clevis bracket (Fig. 408).
   1) Tighten the bolt to 54-76 pound-inches.
   2) Install lockwire to the bolt.
(j) Connect the extend tubes to the upper, center, and lower actuators.
   1) Use your hand to tighten the connectors.
(k) Connect the end connectors of the upper and lower retract tubes (Fig. 411).
   1) Tighten the connectors with your hand.
   2) Engage the retract tube at one end.
   3) Put one hand below the center of the tube and the other hand at the end that is not engaged.
   4) Lightly flex the tube inboard to engage it in the other actuator.
(l) Install the clamps on the upper and lower retract tubes.
(m) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS, OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Connect the end connectors of the sync-lock stow pressure hose assembly.
   1) Tighten the connector with your hand.
(n) Connect the end connector of the lock tube to the lower extend tube and the lower actuator (Fig. 405).
   1) Tighten the connector with your hand.
(o) Install the clamps on the upper and lower extend tubes that attach the the tubes to the brackets on the torque box (AMM 70-51-00/201).
   1) Hand tighten the bolts.

(p) Tighten the connectors on the upper and lower retract tubes to a torque of 500 - 600 inch-pounds (Fig. 409).
(q) Tighten the connectors on the upper and lower extend tubes to a torque of 500 - 600 inch-pounds (Fig. 409).
1) Install lockwire on the extend tube connectors..
(r) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS,
OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Tighten the connectors on the synchroniazation shaft lock stow pressure hose to a torque of 110 - 125 inch-pounds (Fig. 411).
(s) Tighten the connectors on the lock tube to a torque of 215 - 245 inch-pounds.
(t) Make sure that the bolts that hold the clamps are all tight (AMM 70-51-00/201).
(u) Install and tighten the clamps on the wire harness.
(v) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS,
OR AIRPLANES PRE RR SB 78-9627 AND 78-9613;
Put the access panel on the torque box fairing, then install the screws (AMM 70-51-00/201).
(w) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS,
OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Put the splice bracket, panel support and the access panel on the translating sleeve then install the screws that attach it (Fig. 412) (AMM 70-51-00/201).
(x) Install any fairing supports removed for access (Fig. 411) (AMM 70-51-00/201).

S 434-073-R00
(5) Install the retract line closing cap.
(a) Tighten the cap to 500-600 pound-inches.

S 434-074-R00
(6) Connect the manual drive coupling or the extend line closing cap to the lower actuator.
(a) Tighten the manual drive coupling or the extend line closing cap to 500-600 pound-inches.

S 424-005-R00
(7) Install the panel to the C-duct (AMM 70-51-00/201).

S 424-006-R00
(8) Close the applicable thrust reverser C-duct (AMM 78-31-00/201).

TASK 78-31-26-004-028-R00

9. Remove the Top Actuator

A. Equipment

(1) Clean container, minimum capacity:

5 U.S. Gallons
4 Imperial Gallons
18 Litres

B. References

(1) AMM 29-11-00/201, Main Hydraulic Systems
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-34-06/401, Thrust Reverser Feedback Actuators

C. Access

(1) Location Zones

411 Left Engine
421 Right Engine

(2) Access Panels

415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

D. Remove the Top Actuator

S 034-053-R00

(1) Disconnect the actuator rod end from the thrust reverser sleeve (Fig. 408).
(a) Remove the screws (1) and the access panel (2).

NOTE: For maximum access on the RB211-535E4, remove the access panels for the top and center actuators.

(b) Remove the bolt (4) and the bushing (3) that attach the top actuator to the clevis bracket.

NOTE: The bushing (3) is not used on RB211-535E4 engines.

S 024-054-R00

(2) Do the steps that follow to remove the actuator (Fig. 401):
(a) Remove the fairing supports (7).
(b) Disconnect and remove the retract hose connector from the upper actuator (Fig. 401).
(c) Put a cover on the openings.
(d) Disconnect and remove the extend hose connector from the upper actuator (Fig. 401).
1) Put a cover on the opening.

NOTE: Make sure that the crossover shaft in the extend tube is kept in place with the cover.

(e) Remove the screw and washer that hold the retract tube clamp to the torque box.

NOTE: Keep the clamp with the tube.

1) Make a note of the clamp positions and the spacer locations.
(f) Disconnect the tube nut for the upper retract tube from the top and center actuators.
(g) Remove the upper and lower retract tubes.
1) Hold the retract tube at one end and lightly pull it inboard.
2) Place your other hand below the center of the tube and lightly flex it outboard to disengage the tube from the actuator.
(h) Remove the screw and the washer from the clamp that holds the upper extend tube to the torque box.

NOTE: Keep the clamp with the tube.

1) Make a note of the clamp positions and the spacer locations.

(i) Disconnect the extend tube from the top and center actuators.
(j) Disconnect the clamps that hold the wire harness.

NOTE: Keep the clamps with the wire harness.

(k) Remove the two retaining pins (9) and the trunnions (10) attached to the top actuator.
1) Temporarily install a 10/32 bolt into the end of the trunnion to aid in the removal of the trunnion.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATORS ARE NOT DAMAGED BY THE TOOLS WHEN YOU REMOVE THE FLEX SHAFTS. IF THE MATING SURFACES ARE DAMAGED, A HYDRAULIC LEAK CAN OCCUR.

(l) Lift and pull the actuator forward 3 to 5 inch (76.2 to 127.0 mm).
(m) Disconnect the two flex shafts from the actuator.
1) Do not damage the wire harness.
2) Do not let the actuator piston turn.
(n) Remove the extend tubes and the flex shafts.
1) Move the rod end of the actuator up or down, to move the heaed end away from the top or lower actuator.

NOTE: This will help you remove the flex shafts.

2) Put the tubes and the flex shafts on a clean work surface.

NOTE: This will help prevent contamination before the subsequent installation.

(o) Remove the actuator to a clean work surface.
(p) Install covers on all of the openings.

TASK 78-31-26-404-029-R00

10. Install the Top Actuator

A. General
(1) Do not use lubricants on the threads during the actuator installation. The torque values used in this procedure were for dry threads.

B. Consumable Materials
(1) Lockwire
American Spec - DTD 189A 22 S.W.G.
British Spec - 21 A.W.G.
OMat No. - 238

C. Parts
(1) Refer to the Illustrated Parts Catalog for the part numbers and the effectivities of the items in these tables:

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	4	Lower Extend Tube	78-31-26	01	105
	5	Screw			55
	6	Washer			60
	7	Fairing Support			
	8	Upper Actuator	78-31-26	01	135
	9	Retaining Pin			145
	10	Trunnion			150
402	1	Retract Line Closing Cap			
403	1	Extend Line Closing Cap	78-31-01	02	
	2	Retract Line Closing Cap			
	3	Panel			
408	1	Screw	78-31-23	01	485
	2	Access Panel			470
	3	Bushing	78-31-26	01	125
	4	Bolt			120
	7	Key			

D. References
(1) AMM 29-11-00/201, Main Hydraulic Systems
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-34-06/401, Thrust Reverser Feedback Actuators

E. Access
(1) Location Zones
411 Left Engine
421 Right Engine

(2) Access Panels
415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

F. Install the Top Actuator

S 824-041-R00

(1) Adjust the replacement actuator (Fig. 407, 408).
  (a) Use a 1/4 inch drive rachet or speed wrench to fully retract the removed actuator.
    1) Do not let the actuator piston turn as you retract it.
    2) Make sure that the rod end is in the same orientation as it was when it was removed from the clevis bracket.
  (b) Make sure that the rod end remains alligned with the actuator gimbal.
  (c) Measure the dimension 'A' (Fig. 407) between the center of the gimbal ring and the center of the rod end of the removed actuator (Fig. 407).
    1) Make a note of dimension 'A'.
  (d) Use a 1/4 inch drive rachet or speed wrench to fully retract the replacement actuator.
  (e) Adjust the rod end of the replacement actuator until it is within 0.025 inches (0.635 mm.) of the dimension A.

    NOTE: One full turn of the rod end will change the length of the actuator 0.050 inch (1.27 mm). One half turn of the rod end will change the length of the actuator 0.025 inch (0.635 mm).

    1) Loosen the lock nut (5) and the key retainer (6).
    2) Remove the keys (7) and adjust the rod end.
    3) Install the keys (7) and the key retainer (6).
    4) ACTUATOR P/N 2189000;
      Tighten the lock nut (5) to 220-240 pound-inches.
    5) ACTUATOR P/N 1616000;
      Tighten the lock nut (5) to 336-384 pound-inches.
    6) Install a lockwire to connect the lock nut to the key.

S 424-042-R00

(2) Do these steps to install the top actuator:
  (a) Remove the covers from the retract hose and the extend hose connectors on the actuator.
  (b) Put the replacement actuator on the reverser.
    1) Do not damage the wire harness.

2) Do not let the actuator piston turn.
3) Make sure the rod end stays aligned with the actuator gimbal.

(c) Install the trunnions.

(d) Put the actuator rod end in the clevis bracket (Fig. 408).
1) If it is necessary, use a 1/4 inch ratchet and extension to manually turn the actuator until the rod end and the clevis holes are aligned.
2) Do not let the actuator piston turn.

(e) Remove the trunnion and move the actuator forward 3 to 4 inch.
1) Make sure that the piston does not turn.

CAUTION: MAKE SURE THAT THE MATING SURFACES OF THE EXTEND TUBES AND THE ACTUATOR ARE NOT DAMAGED DURING THE FLEX SHAFT INSTALLATION. TO INSTALL THE FLEX SHAFT YOU WILL FIND IF NECESSARY TO HAVE 4 TO 8 INCH (101 TO 203 mm) OF CLEARANCE TO ALIGN AND INSTALL THE FLEX SHAFT. IF THE MATING SURFACES ARE DAMAGE, THE ACTUATOR CAN LEAK.

(f) Attach the upper extend tube (4) and the flexible drive to the center actuator and then into the top actuators (Fig. 401).

NOTE: Do not tighten the extend tube (4) and the flexible drive to the actuators.

1) Do not let the flex shaft turn move than 1/16 of a turn as you install it in the actuator.

(g) Attach the upper extend tube and the crossover flexible drive into the top actuators (Fig. 401).

NOTE: Do not tighten the extend tube and the flexible drive to the actuators.

1) Do not let the flex shaft turn move than 1/16 of a turn as you install it in the actuator.

(h) Move the actuator aft.
    1) Do not damage the wire harness.
    2) Keep the rod end aligned with the clevis bracket.
    3) Do not let the rod end turn.
(i) Install the two trunnions (10) and the retaining pins (9) to attach the actuator to the support bracket (Fig. 401).
(j) Install the bushing (3) and the bolt (4) to attach the rod end to the clevis bracket.

    NOTE: The bushing (3) is not used on RB211-535E4 engines.

    1) Tighten the bolt to 54-76 pound-inches.
    2) Install lockwire if it is necessary.
(k) Attach the lower extend tube (4) to the center and top actuators (Fig. 401).
    1) Tighten the connectors with your hand.
(l) Attach the extend hose (1) to the center and the top actuators (Fig. 401).
    1) Tighten the connectors with your hand.
(m) Install the lower retract tube (3) to the top and center actuators (Fig. 401).
    1) Connect one end of the tube.
    2) Put one hand below the center of the tube and the other hand on the end that is not connected.
    3) Lightly flex the tube inboard to engage it on the actuator.
    4) Tighten the connectors with your hand.
(n) Connect the retract hose (2) to the top actuator (Fig. 401).
    1) Tighten the connectors with you hand.
(o) Install the clamps that hold the upper extend tubes to the torque box.
    1) Tighten the bolts with your hand.
(p) Install the clamps that hold the upper retract tubes to the torque box.
    1) Tighten the bolts with your hand.
(q) Tighten the tube nuts on the upper and lower retract tube to a torque of 500-600 pound-inches (Fig. 401).
(r) Tighten the tube nuts on the extend tube to 500-600 pound-inches and install a lockwire (Fig. 401).
(s) Tighten the tube nuts on the extend hose to a torque of 500-600 pound-inches (Fig. 401).
(t) Tighten the bolts in all of the clamps that hold the tubes (AMM 70-51-00/201).
(u) Install and tighten the clamps for the wire harness.
(v) Install the fairing supports (7) that were removed for access.

(w) Install and tighten the access panels that were removed.
(x) Close the thrust reverser halves.

TASK 78-31-26-804-027-R00

11. Put the Airplane in a Serviceable Condition

A. Equipment
(1) Clean container, minimum capacity:

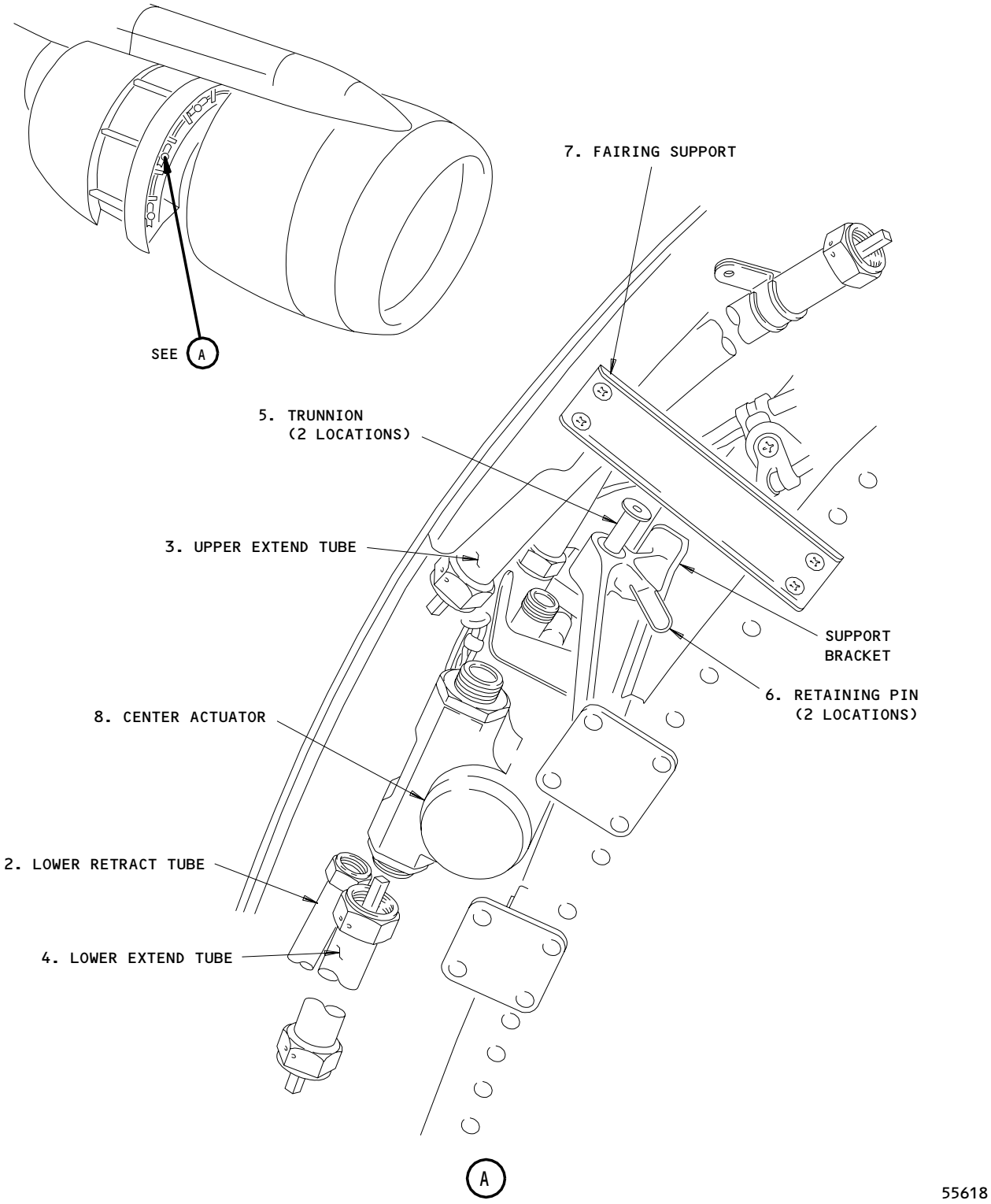
5 U.S. Gallons
4 Imperial Gallons
18 Litres

B. Consumable Materials
(1) Lockwire
British Spec - DTD 189A 22 S.W.G.
American Spec - 21 A.W.G.
OMat No. - 238

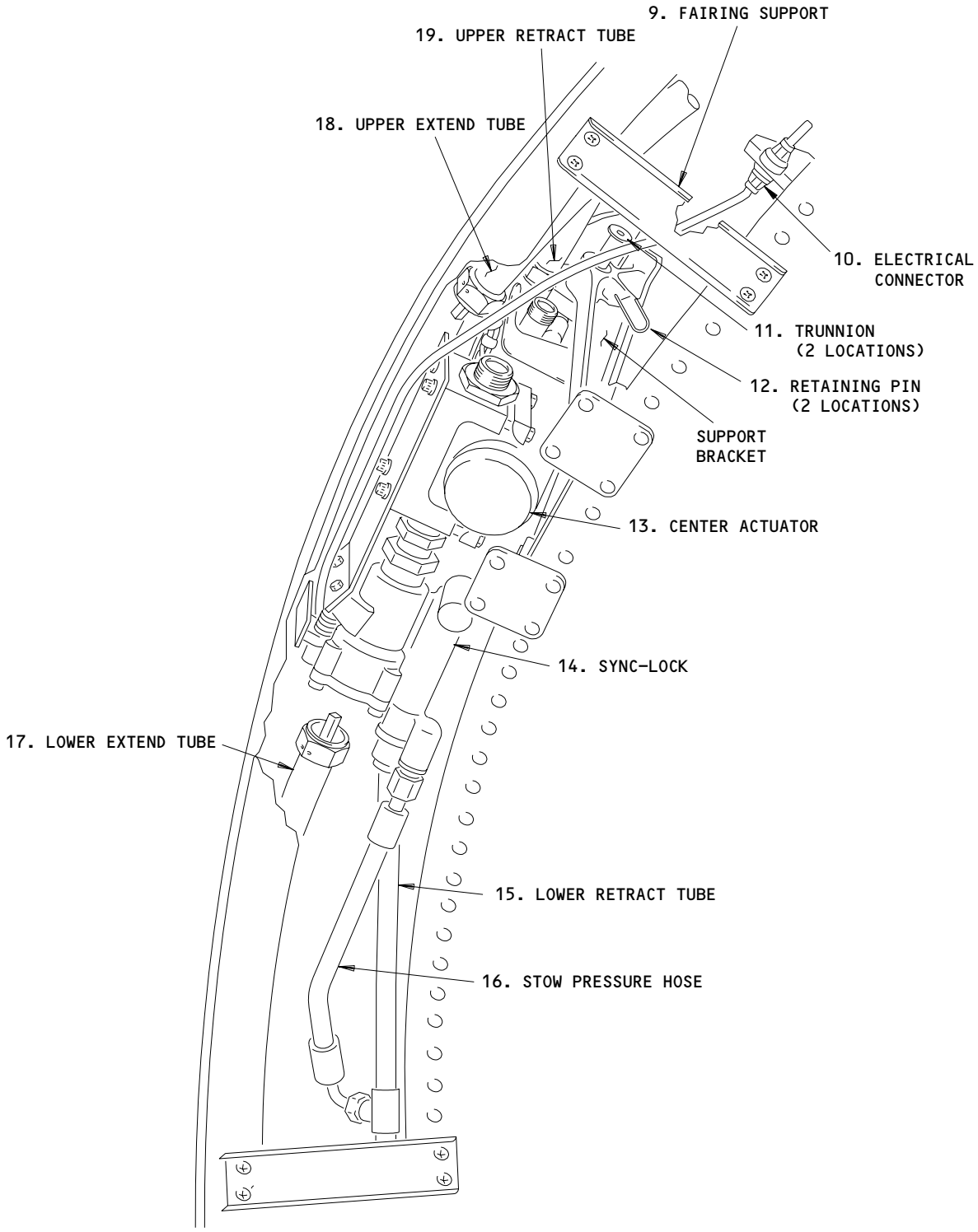
C. References
(1) AMM 12-12-01/301, Hydraulic Systems
(2) AMM 70-50-02/201, Connection of Electrical Plugs
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-31-00/501, Thrust Reverser System
(5) AMM 78-34-06/401, Thrust Reverser Feedback Actuators
(6) AMM 78-30-00/501, Thrust Reverser Adjustment

D. Access
(1) Location Zones
411 Left Engine
421 Right Engine

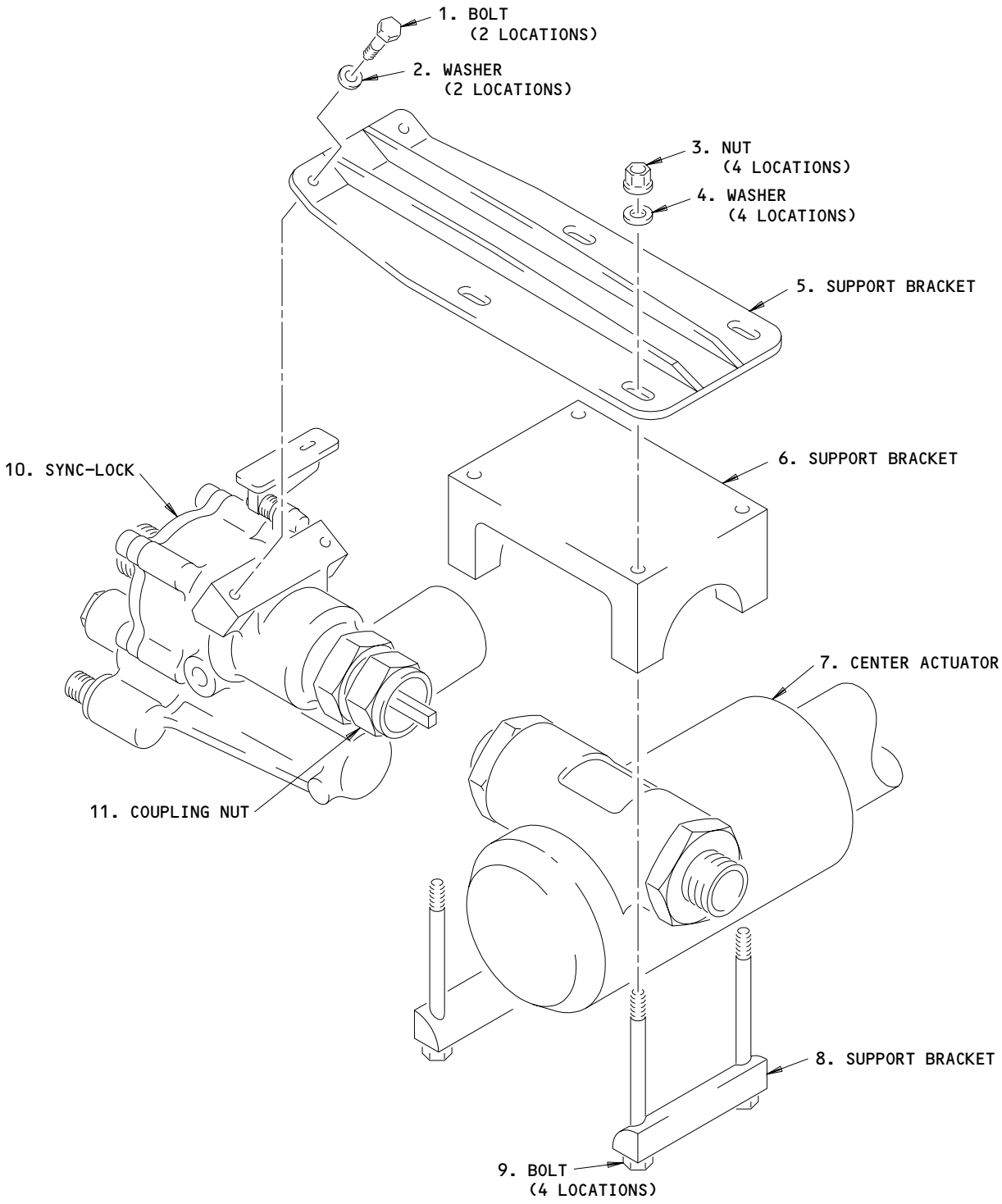
(2) Access Panels
415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine



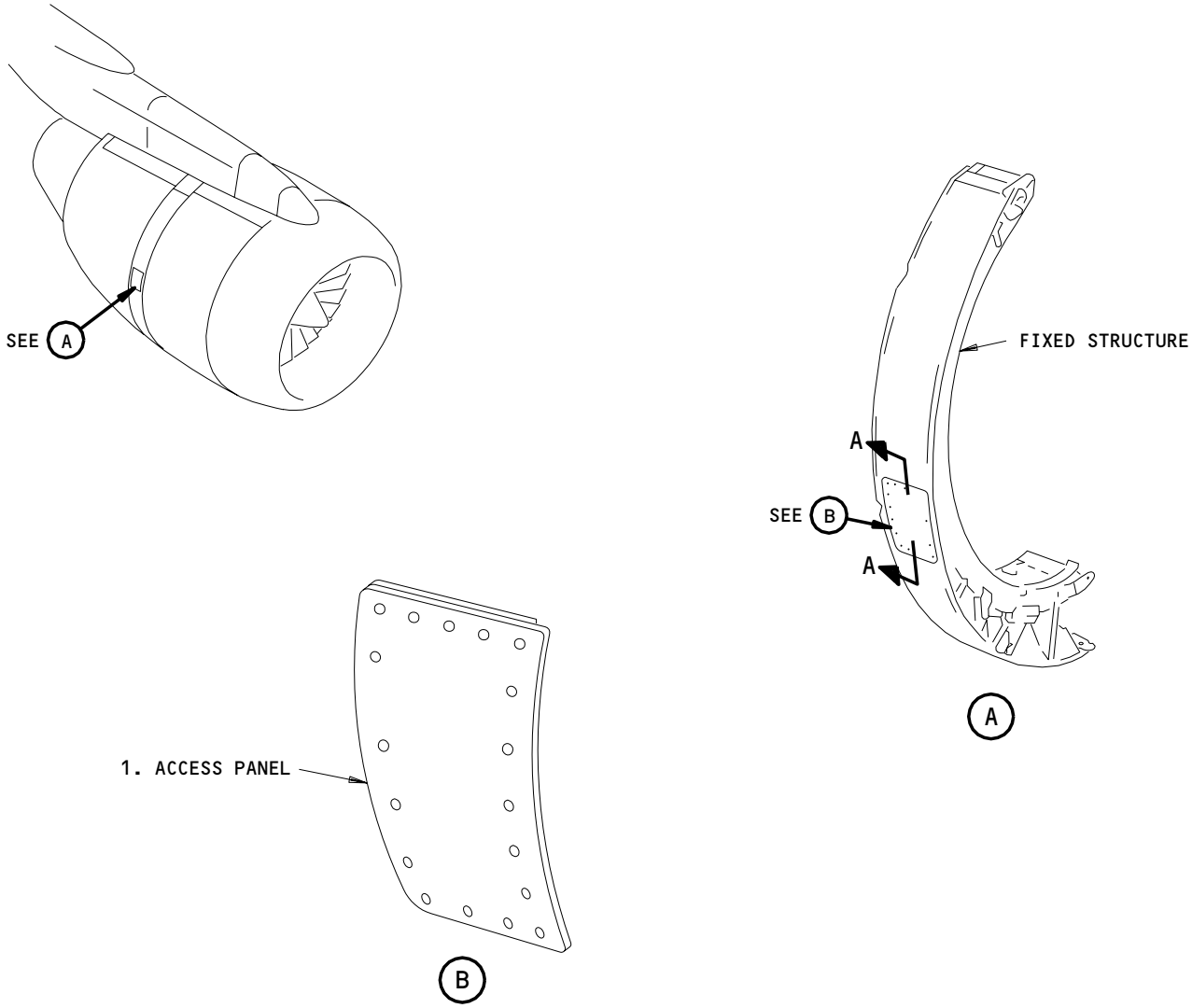
Right Center Actuator - Installation
Figure 410 (Sheet 1)



Right Center Actuator - Installation
Figure 410 (Sheet 2)



Synchronization Shaft Lock - Assembly
Figure 411



Access Panels Installation
Figure 412

E. Put the Airplane in a Serviceable Condition

S 424-089-R00

(1) Do these steps (Fig. 402):
   (a) Install and tighten the retract line closing cap (AMM 70-51-00/201).
   (b) Install the manual drive coupling to the lower actuator.
   (c) Tighten the coupling to a torque of 500 - 600 inch-pounds (56.5 - 67.8 newton-meters).
   (d) Put sealant on the screws that hold the manual drive to the fairing.
   (e) Install the screws through the manual drive and into the fairing.
   (f) Tighten the screws to a torque of 50 - 70 inch-pounds (5.65 - 7.91 Nm).

S 414-014-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Make sure that the thrust reverser is closed (AMM 78-31-00/201).

S 824-043-R00

(3) Make sure the actuator lock indicator (1) is smooth with the surface of the forward fairing (Fig. 410).
   (a) If the actuator lock indicator is not smooth, release the four screws to adjust the lock indicator bracket (2) as necessary.
   (b) Tighten the screws that attach the lock indicator bracket.

S 874-014-R00

CAUTION: DO NOT PUT THE DRAINED HYDRAULIC FLUID BACK IN THE HYDRAULIC SYSTEM. THE DRAINED HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE HYDRAULIC SYSTEM.

(4) Fill and bleed the hydraulic system (AMM 12-12-01/301).

S 724-056-R00

(5) Do this procedure: Thrust Reverser Lock Proximity Sensor Adjustment/Test (AMM 78-30-00/501).

S 714-078-R00

(6) Do the thrust reverser tests that are listed in the test reference table (AMM 78-31-00/501).

THRUST REVERSER HYDRAULIC ACTUATORS,
ROTARY FLEX SHAFTS AND TUBES - ADJUSTMENT/TEST

TASK 78-31-26-285-001-R00

1. Thrust Reverser Actuator Adjustment

A. General

(1) This procedure contains the adjustment checks for the actuators, rotary flex shafts, and the tubes. The procedure will examine the alignment of the actuator and make sure that the piston is in its correct position.

(2) During a replacement procedure, an actuator may accidentally become misaligned (rod end to clevis bracket alignment) or the actuator piston may turn from the correctly adjusted position.

(3) This procedure can be used for all thrust reverser actuators.

B. Consumable Materials

(1) Tape

C. References

(1) AMM 78-31-00/201, Thrust Reverser System

(2) AMM 78-31-07/401, Thrust Reverser Strut-Mounted, Extend/Retract Hydraulic Components.

(3) AMM 78-31-10/401, Thrust Reverser Hinge Access Doors

(4) AMM 78-31-26/401, Thrust Reverser Hydraulic Actuators, Rotary Shafts and Tubes

D. Access

(1) Location Zones

411 Left Engine
421 Right Engine

(2) Access Panels

415AL Thrust Reverser, Left Engine
416AR Thrust Reverser, Left Engine
425AL Thrust Reverser, Right Engine
426AR Thrust Reverser, Right Engine

E. Examine the actuator system.

S 045-014-R00

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

(1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

S 035-018-R00

(2) Remove the hinge access doors before you open the thrust reverser (AMM 78-31-10/401).

NOTE: The thrust reverser translating cowl must be extended more than 4 inches in this procedure; damage to the doors can occur.

S 865-016-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Open the left (right) thrust reverser (AMM 78-31-00/201).

S 865-002-R00

(4) Manually extend the thrust reverser translating cowl 2 to 3 inch (50.8 to 76.2 mm) to clear the stow seals (AMM 78-31-00/201).

S 035-003-R00

(5) Remove the crossover flex shaft (AMM 78-31-07/401).

S 015-004-R00

(6) Remove the rod end mounting bolts from the three actuators (AMM 78-31-26/401).

S 015-005-R00

(7) Pull the translating cowl aft to clear the rod ends from the clevis brackets.

S 825-006-R00

(8) Use your hand to turn the actuator piston rods (three locations) until the stow stop touches.

NOTE: The lower (locking) actuators will engage a seal spring tension before they reach the fully stowed position. Turn the actuator in the stow direction to overcome the spring resistance. Make sure the lower actuators are fully stowed.

S 825-007-R00

(9) Use the manual drive or the actuator worm drive to turn the flex shaft in the retract direction.

NOTE: When the actuator stow stop touches and the flex shaft turns, the piston rod will turn.

(a) Turn the flex shaft until the center actuator rod end aligns vertically with the center clevis bracket.

S 215-008-R00

(10) Make sure that the two other actuator rod ends align within 5 degrees with their clevis bracket.

NOTE: For each degree that the rod ends do not align, the actuator is out of alignment a linear distance of 0.002 inch (0.059 mm).

One turn of the actuator worm drive gear equals 0.161 inch (4.089 mm). To get the correct adjustment, you must adjust to one-sixteenth of a turn (0.010 inch (0.254 mm)) of actuator rod travel length.

(a) If the actuator rod ends are in the limits, do the procedure to return the airplane to a serviceable condition.

(b) If the actuator rod ends are not in the limits, do the procedure to adjust the actuator system.

NOTE: If the rod ends are not correctly aligned, the flex shafts must be adjusted again.

F. Adjust the actuator system.

S 825-009-R00

(1) The flex shaft adjustment.

(a) Remove the center actuator as much as it is necessary to disconnect the upper and the lower flex shafts from the center actuator (AMM 78-31-26/401).

(b) Turn the three actuator rods, in the retract direction, until the actuators touch their stops.

1) Make sure that the rod ends vertically align with their clevis bracket.

(c) Connect and tighten the upper and lower flex shafts to the center actuator.

NOTE: Be careful to make sure that the actuator rod ends remain aligned with the clevis brackets.

(d) Install the center actuator (AMM 78-31-26/401).
1) Do not connect the actuator rod ends to the translating cowl at this time.

S 215-010-R00
(2) Make sure that the actuator rod ends vertically align with their clevis bracket and the actuators touch their stops.
(a) If the actuators and the actuator rod ends are not in the limits, do the adjust the actuator system procedure again.

G. Put the airplane in a serviceable condition.

S 985-012-R00
(1) Use one of these methods to extend the actuators 2 to 3 inch (50.8 to 76.2 mm) to clear the seals:
(a) Method 1:
1) Make sure that the actuator rods do not turn.
2) Turn the manual drive or the actuator worm drive until you get the necessary clearance.
(b) Method 2:
1) Make sure that the actuator worm drive does not turn.
2) Use your hand to turn each of the three actuator rods, an equal number of turns, until you get the necessary clearance.
(c) Push the translating cowl forward to align the holes in the actuator rod ends with the holes in the clevis bracket.
1) If it is necessary, adjust the actuator rod lengths to align the holes.

CAUTION: WHEN YOU TURN THE LOCK NUT ON THE ROD END, DO NOT TURN THE PISTON RODS. PUT TAPE ON THE PISTON ROD AND THE ACTUATOR HOUSING. MAKE MARKS ON THE TAPE TO SHOW WHERE THE HOUSING AND THE PISTON ROD MUST ALIGN. MAKE SURE THAT THE LOCK KEYS FOR THE ROD ENDS DO NOT FALL INTO THE THRUST REVERSER COWL. IF YOU DO NOT OBEY THESE INSTRUCTIONS, YOU CAN CAUSE DAMAGE TO THE EQUIPMENT.

(d) Install the bolts that connect the actuators to the translating cowls.
1) Tighten the bolts to a torque of 54 to 76 inch pounds (6.1 to 8.2 Nm).

S 435-018-R00
(2) Install the crossover flex shaft (AMM 78-31-07/401).

S 865-017-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Close the left (right) thrust reverser (AMM 78-31-00/201).

S 435-017-R00

(4) Install the hinge access doors (AMM 78-31-10/401).

S 445-013-R00

(5) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 725-011-R00

(6) Do the thrust reverser operational test (AMM 78-30-00/501).

THRUST REVERSER BLOCKER FLAP DRAG LINKS - REMOVAL/INSTALLATION

1. General
   A. This procedure contains the data for the removal and installation of the thrust reverser blocker flap drag links (referred to as the drag links).
   B. Use the procedures in 70-51-00/201 to tighten the fasteners. Tighten the fasteners to the torque values in 70-51-00/201 unless a torque value is given in this procedure.

TASK 78-31-27-004-001-R00

2. Remove the Thrust Reverser Blocker Flap Drag Link (Fig. 401)
   A. References
      (1) 78-31-00/201, Thrust Reverser
   B. Access
      (1) Location Zones
          411 No. 1 Engine (Left)
          421 No. 2 Engine (Right)

      (2) Access Panels
          415AL Thrust Reverser (Left)
          416AR Thrust Reverser (Right)
          425AL Thrust Reverser (Left)
          426AR Thrust Reverser (Right)

   C. Procedure

      S 014-003-R00

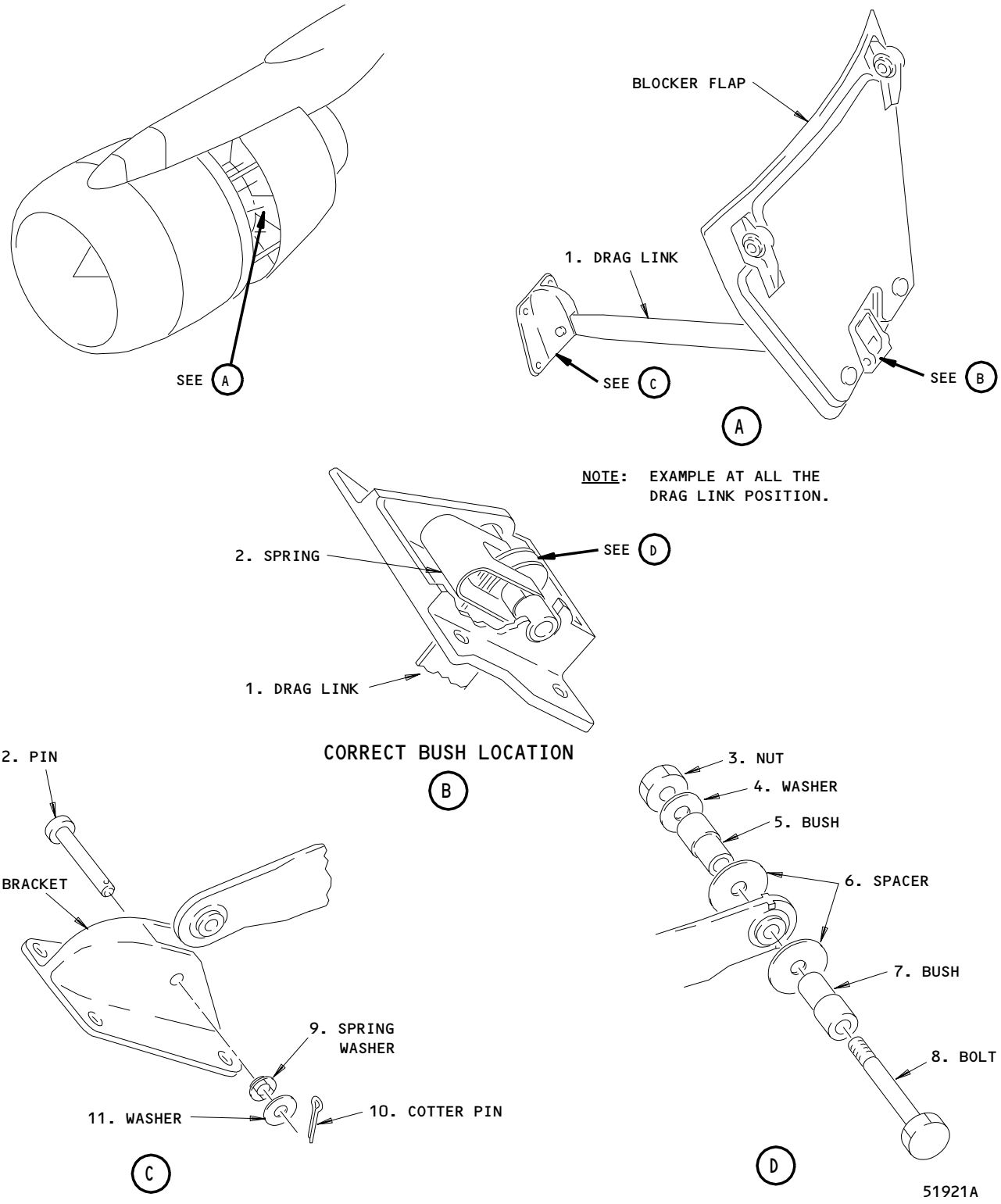
      WARNING: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS WHEN YOU OPEN THE THRUST REVERSERS, INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

      (1) Open the left (right) thrust reverser (Ref 78-31-00/201).

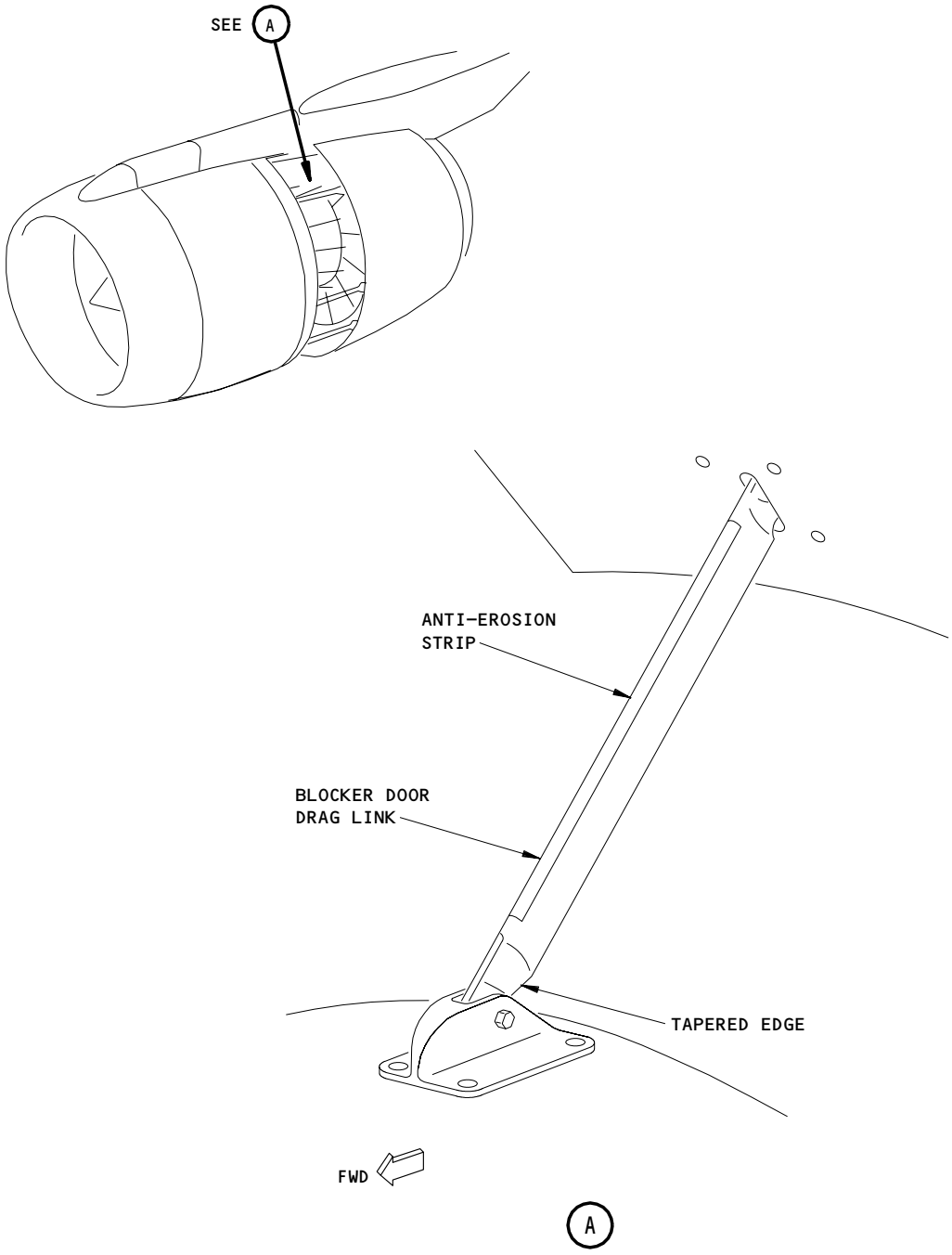
      S 024-004-R00
      (2) Do the steps that follow to remove the drag links:
          (a) Manually extend the thrust reverser (Ref 78-31-00/201) approximately 3 inches (77 mm) from the fully retracted position.

              NOTE: This will give maximum access.

          (b) Remove the pin (12), spring washer (9), washer (11) and the cotter pin (10).
          (c) Remove the bolt (8), bushes (5 and 7), spacers (6), washer (4), spring (2), and the nut (3).



Thrust Reverser Blocker Flap Drag Links Installation
Figure 401



DEE0005025

Blocker Door Drag Link
Figure 402

(d) Remove the drag link (1).

TASK 78-31-27-404-002-R00

3. Install the Thrust Reverser Blocker Flap Drag Link (Fig. 401)

A. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Drag Link	78-31-27	01	70
	2	Spring	78-31-24	01	110
	3	Nut	78-31-27	01	35
	4	Washer			30
	5	Bush			20
	6	Spacer			25
	7	Bush			20
	8	Bolt			15
	9	Spring Washer			55
	10	Cotter Pin			45
	11	Washer			50
	12	Pin			12

B. References

(1) 78-31-00/201, Thrust Reverser

C. Access

(1) Location Zones

411 No. 1 Engine (Left)
421 No. 2 Engine (Right)

(2) Access Panels

415AL Thrust Reverser (Left)
416AR Thrust Reverser (Right)
425AL Thrust Reverser (Left)
426AR Thrust Reverser (Right)

D. Procedure

S 424-005-R00

(1) Do the steps that follow to install the drag links:

CAUTION: YOU MUST INSTALL THE BLOCKER DOOR DRAG LINK IN THE CORRECT DIRECTION. THE CORRECT DIRECTION IS WITH THE ANTI-EROSION STRIP AT THE FRONT OF THE LINK. MAKE SURE THAT THE TAPERED EDGE IS AT THE INBOARD END OF THE DRAG LINK. IF THE BLOCKER DOOR DRAG LINK IS NOT INSTALLED IN THE CORRECT DIRECTION, DAMAGE TO THE DRAG LINK CAN OCCUR (FIG. 402).

(a) Install the drag link (1) on the blocker door.
(b) Attach the bushes (5 and 7) in the blocker door spring (2) and the housing slots.
(c) Attach the spacer (6) with the bolt (8), washer (4) and the nut (3).
(d) Tighten the nut (3).
(e) Put the drag link (1) in the bracket.
1) Connect the drag link to the bracket with the pin (12).
(f) Attach the spring washer (9), washer (11) and the cotter-pin (10) to pin (12).
(g) Manually move the thrust reverser to the fully retracted position (Ref 78-31-00/201).

E. Put the Airplane Back to its Usual Condition

S 414-006-R00

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

(1) Close the left (right) thrust reverser (Ref 78-31-00/201).

THRUST REVERSER BLOCKER FLAP DRAG LINKS - INSPECTION/CHECK

1. General
   A. This procedure provides inspections details for the blocker flap drag link and pivot assembly.

TASK 78-31-27-206-001-R00

2. Blocker Flap Drag Link and Pivot Assembly Inspection (Fig. 601)
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-31-20/801, Thrust Reverser
   B. Access
      (1) Location Zones

411	No. 1 Engine (Left)
421	No. 2 Engine (Right)

      (2) Access Panels

415AL	Thrust Reverser (Left)
416AR	Thrust Reverser (Right)
425AL	Thrust Reverser (Left)
426AR	Thrust Reverser (Right)

   C. Prepare for the Inspection

S 016-002-R00

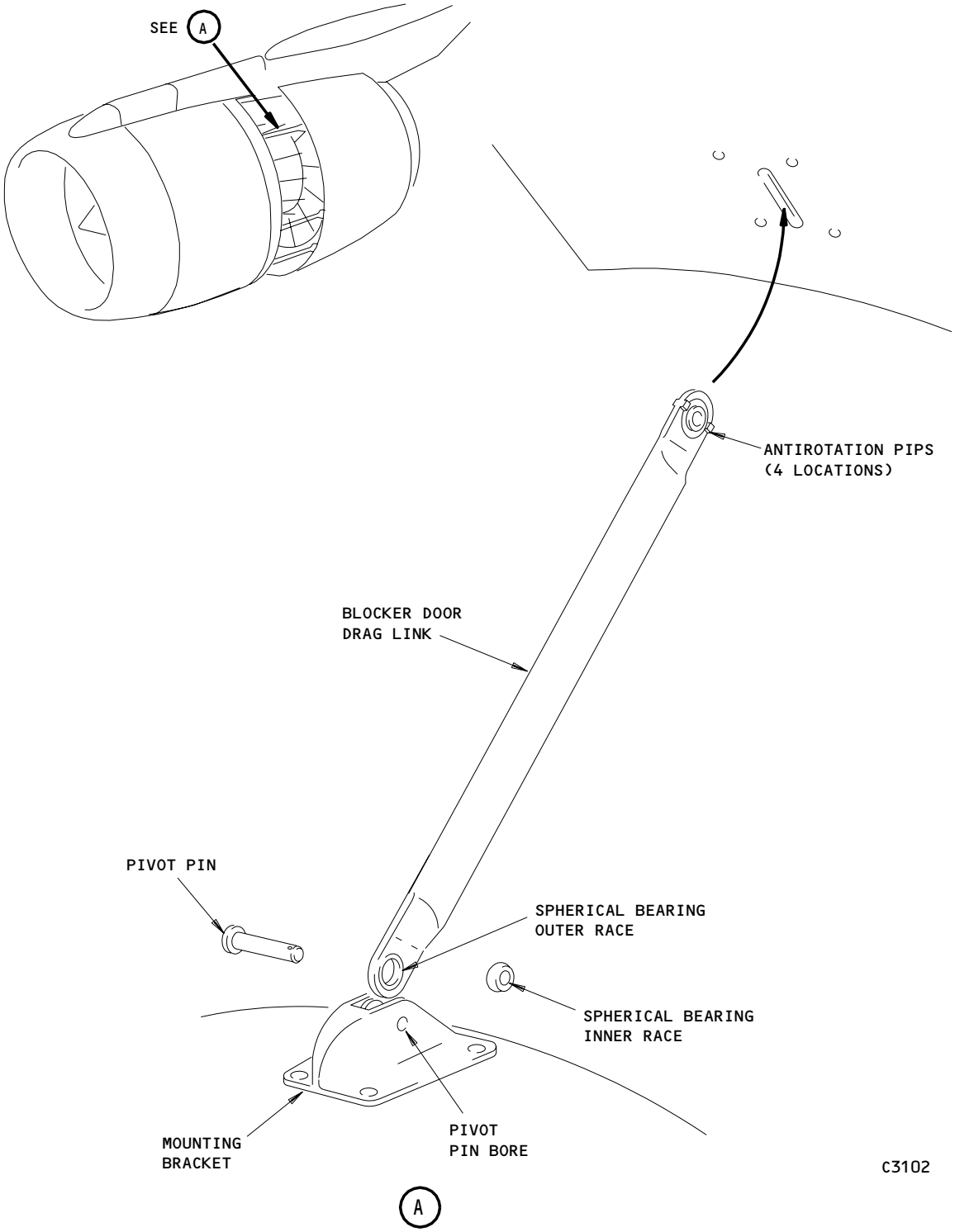
WARNING: YOU MUST OBEY THE INSTRUCTIONS IN THE THRUST REVERSER SYSTEM MAINTENANCE PRACTICES (AMM 78-31-00/201). IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO THE FAN COWL, FAN C-DUCT AND THRUST REVERSER CAN OCCUR.

      (1) Open the thrust reverser (AMM 78-31-00/201).
   D. Inspection Procedure

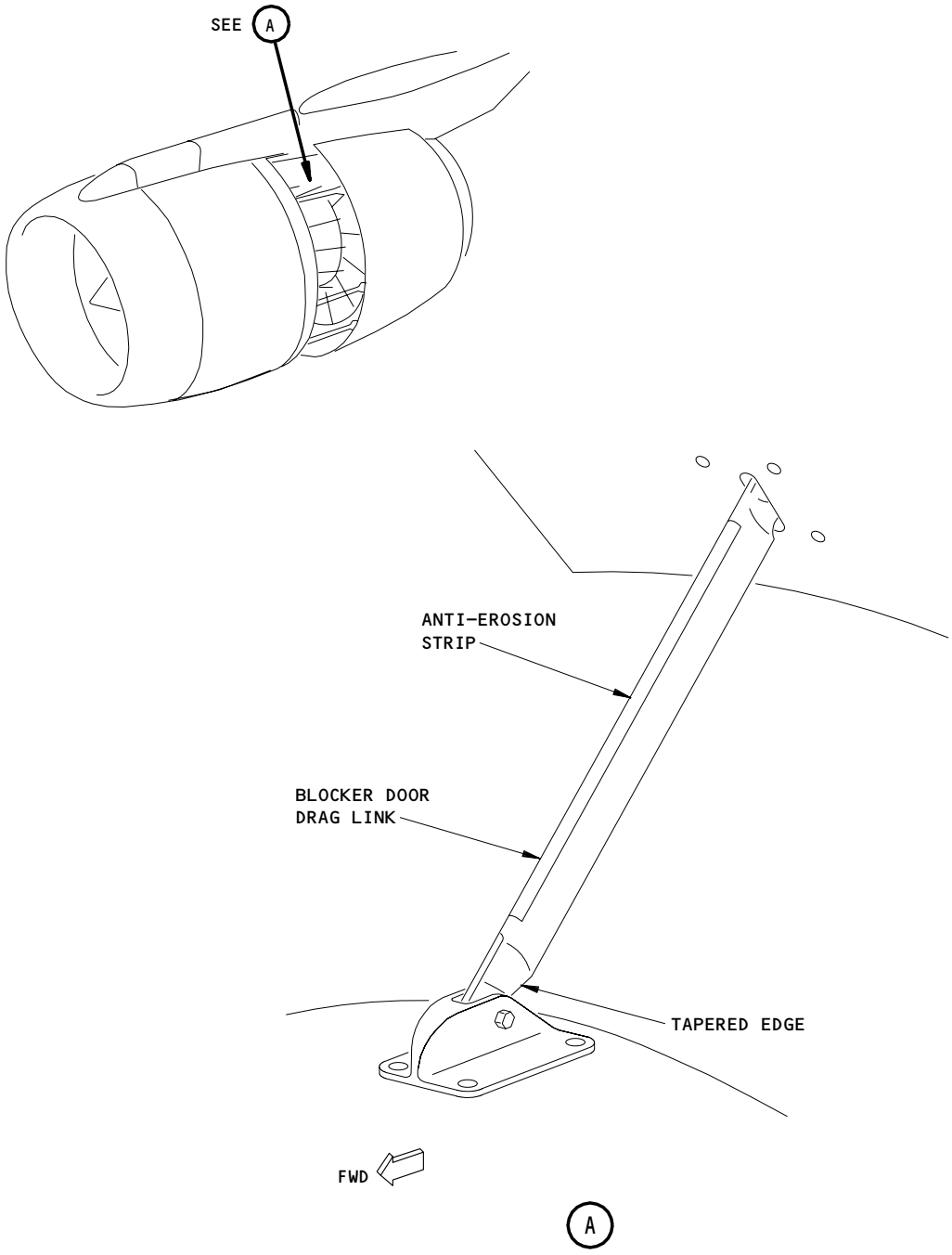
S 226-003-R00

      (1) Examine the blocker flap drag link/mounting bracket pivot assembly for too much movement.

NOTE: Manually extend the translating cowl so that it is approximately 4.0 inches (101.6 mm) from its retracted position (AMM 78-31-00/201). When this part of the inspection procedure is complete, put the translating cowl back to its usual position.



Blocker Door Drag Link - Inspection Details
Figure 601



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Blocker Door Drag Link
Figure 602

S 226-004-R00
(2) Examine the blocker flap drag link for crack damage and too much damage that can be easily seen.

S 226-005-R00
(3) Examine the blocker flap drag link spherical bearing inner bore for wear.

S 226-006-R00
(4) Examine the blocker flap drag link spherical bearing inner race for free movement.

S 226-007-R00
(5) Examine the blocker flap drag link spherical bearing outer race for looseness in the drag link.

S 226-008-R00
(6) Examine the blocker flap drag link spherical bearing for clearance between the ball and the outer race.

S 226-009-R00
(7) Examine the blocker flap drag link anti-rotation pips for wear.

S 226-010-R00
(8) Examine the blocker flap drag link pivot pin for wear.

S 226-011-R00
(9) Examine the blocker flap drag link mounting bracket for cracks and wear to the pivot pin bores.

E. Inspection Standards (Fig 601)

S 226-012-R00
(1) Blocker flap drag link/mounting bracket pivot assembly.
(a) If there is movement in the drag link/mounting bracket pivot assembly that is approximately 0.080 inch (2.03 mm) or less, accept it.
(b) If the movement in the drag link/mounting bracket pivot assembly is more than above, examine each component of the pivot assembly.
1) Replace worn components as necessary.

S 426-024-R00

CAUTION: YOU MUST INSTALL THE BLOCKER DOOR DRAG LINK IN THE CORRECT DIRECTION. THE CORRECT DIRECTION IS WITH THE ANTI-EROSION STRIP AT THE FRONT OF THE LINK. MAKE SURE THAT THE TAPERED EDGE IS AT THE INBOARD END OF THE DRAG LINK. IF THE BLOCKER DOOR DRAG LINK IS NOT INSTALLED IN THE CORRECT DIRECTION, DAMAGE TO THE DRAG LINK CAN OCCUR (FIG. 602).

(2) Blocker flap drag link.
  (a) Too much damage that can be easily seen, reject it.
  (b) If there are cracks in the blocker flap drag link, reject it.

S 226-014-R00

(3) Blocker flap drag link spherical bearing inner bore.
  (a) Wear up to 0.010 inch (0.25 mm) in the bore of the spherical bearing, accept it.
  (b) Wear that is more than above, repair to FRS6191 (AMM 78-31-20/801).

S 226-015-R00

(4) Blocker flap drag link spherical bearing inner race.
  (a) The inner race must turn freely or it must turn with less than 25 pound-inches of force.
  (b) If the inner race does not turn or it is necessary to use more than 25 pound inches of force to turn it, reject the inner race.

S 216-016-R00

(5) Blocker flap drag link spherical bearing outer race.
  (a) If the bearing outer race is loose in the drag link, repair to FRS6191 (AMM 78-31-20/801).

S 226-017-R00

(6) Blocker flap drag link spherical bearing outer race clearance.
  (a) If the radial clearance between the ball and the outer race is not more than 0.004 inch (0.10 mm), accept it.

(b) If the radial clearance is more than above, repair to FRS6191 (AMM 78-31-20/201).

S 226-018-R00

(7) Blocker flap drag link anti-rotation pips.
(a) If the height of each of the drag link anti-rotation pips is 0.010 inch (0.25 mm) or more, accept it.
(b) If the height of any of the drag link anti-rotation pips is less than above, reject it.

S 226-019-R00

(8) Blocker flap drag link pivot pin.
(a) If the diameter of the pivot pin is 0.154 inch (3.9 mm) or more, accept it.
(b) If the diameter of the pivot pin is less than above, reject it.

S 226-020-R00

(9) Blocker flap drag link mounting bracket.
(a) If you see cracks in the bracket, repair to FRS6002 (RH) or FRS6028 (LH) (AMM 78-31-20/801).
(b) If the diameter of the pivot pin bores are 0.199 inch (5.05 mm) or less, accept it.
(c) If the diameter of the pivot pin bores are more than above, repair to FRS6002 (RH) or FRS6028 (LH) (AMM 78-31-20/801).

F. Put the Engine Back to its Usual Condition

S 416-022-R00

WARNING: YOU MUST OBEY THE INSTRUCTIONS IN THRUST REVERSER - APPROVED REPAIRS (AMM 78-31-20/801). IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO THE FAN COWL, FAN C-DUCT AND THRUST REVERSER CAN OCCUR.

(1) Close the thrust reverser (AMM 78-31-00/201).

FAN THRUST REVERSER BLOCKER FLAP DRAG LINKS - APPROVED REPAIRS

1. General
   A. The repairs given in this procedure are as follows:
      (1) FRS6191 - Blocker-Flap Drag-Link, Replace the Spherical Bearing

TASK 78-31-27-308-004-R00

2. Blocker-Flap Drag-Link - Replace the Spherical Bearings
   A. General
      (1) The repair given in this procedure is FRS6191.
      (2) The procedure tells you how to replace the spherical bearings in the blocker-flap drag-links.
      (3) You can do this repair on blocker-flap drag-links that have the part numbers that follow:

(a) LH Assembly	RH Assembly
LJ76305 SB 78-9077	LJ76305 SB 78-9077
LJ71549 SB 78-8140	LJ71549 SB 78-8140
LJ70472	LJ70472

   B. Equipment
      (1) Standard workshop tools
      (2) Cutting tool
      (3) Roller staking tool
      (4) Bearing insertion tool with pilot (local manufacture)
      (5) Arbor press
   C. Parts
      (1) Spherical bearing (Item 1)
          03-825-04E005 (RR3506619)
          or MS14101-4
      (2) Spherical bearing (Item 2)
          HT3V (RR3506759)
          or MS14101-3
   D. Consumable Materials
      (1) Two-part Epoxy Primer
          OMat No. 766C
      (2) Cleaning fluid, Acetone OMat No. 150, or Isopropyl alcohol OMat No. 1/40, or Cleaning solvent Desoclean OMat No. 1/257.
      (3) Clean cotton cloth,
          OMat No. - 2/101
      (4) Grease,
          OMat No. - 401A

E. References
(1) AMM 78-31-27/401, Fan Thrust-Reverser Blocker-Flap Drag-Links.
F. Procedure

S 968-001-R00
(1) Replace the spherical bearings on the blocker-flap drag-link.
(a) Remove the damaged blocker-flap drag-link (AMM 78-31-27/401).
(b) Put the drag link on an applicable support (Fig. 801).

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

CAUTION: YOU MUST NOT LET THE CUTTING TOOL CUT THE DRAG LINK OR DAMAGE WILL OCCUR.

(c) Use the cutting tool to cut a groove in the bearing outer-race staking-lip (Fig. 801).
1) Do not let the cutting tool cut the drag link.

CAUTION: YOU MUST REMOVE ALL OF THE STAKING LIP BEFORE YOU PUSH THE BEARING OUT OF THE LINK. IF SOME OF THE STAKING LIP IS REMAINING, DAMAGE TO THE LINK BORE WILL OCCUR.

(d) Make sure that all of the staking lip has been removed.
1) Use the arbor press to push the bearing out of the link (Fig. 801).

WARNING: CLEANING FLUIDS ARE FLAMMABLE. KEEP THEM AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE CLEANING FLUIDS BECAUSE THEY ARE POISONOUS. USE THE FLUID IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE FLUID. IF YOU GET THE FLUID ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

(e) Use Acetone or Isopropyl alcohol or cleaning solvent Desoclean and a clean cloth to clean the link bore and faces.
(f) Use another clean cloth to dry the link bore and faces.

(g) Do a visual inspection of the link bore and chamfers.
    1) Look for nicks and damage.

WARNING: YOU MUST NOT GET PARTICLES OF THE MATERIAL ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES. USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK. DO NOT BREATHE THE PARTICLES. IF YOU GET THE PARTICLES ON YOUR SKIN, REMOVE THEM WITH SOAP AND WATER. GET MEDICAL AID IF YOU GET THE PARTICLES IN YOUR MOUTH OR EYES.

(h) Use abrasive paper to remove nicks and damage from the link bore and chamfers.
(i) Use Acetone or Isopropyl alcohol or cleaning solvent Desoclean and a clean cloth to clean the link bore and faces.
(j) Use another clean cloth to dry the link bore and faces.
(k) Do a dimensional inspection of the link bore:
    1) Location for item 1, 0.6565 in. (16,675 mm) maximum diameter.
    2) Location for item 2, 0.5628 in. (14,295 mm) maximum diameter.
(l) Put the replacement bearing onto the bearing insertion tool.

WARNING: THE PRIMER IS FLAMMABLE. KEEP IT AWAY FROM SPARKS, FLAME AND HEAT.

WARNING: YOU MUST USE THE APPLICABLE GLOVES, EYE PROTECTION AND A FACE MASK WHEN YOU USE THE PRIMER BECAUSE IT IS POISONOUS. USE THE PRIMER IN AN AREA THAT HAS A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES FROM THE PRIMER. IF YOU GET THE PRIMER ON YOUR SKIN, IN YOUR MOUTH OR IN YOUR EYES, FLUSH WITH WATER, THEN GET MEDICAL AID.

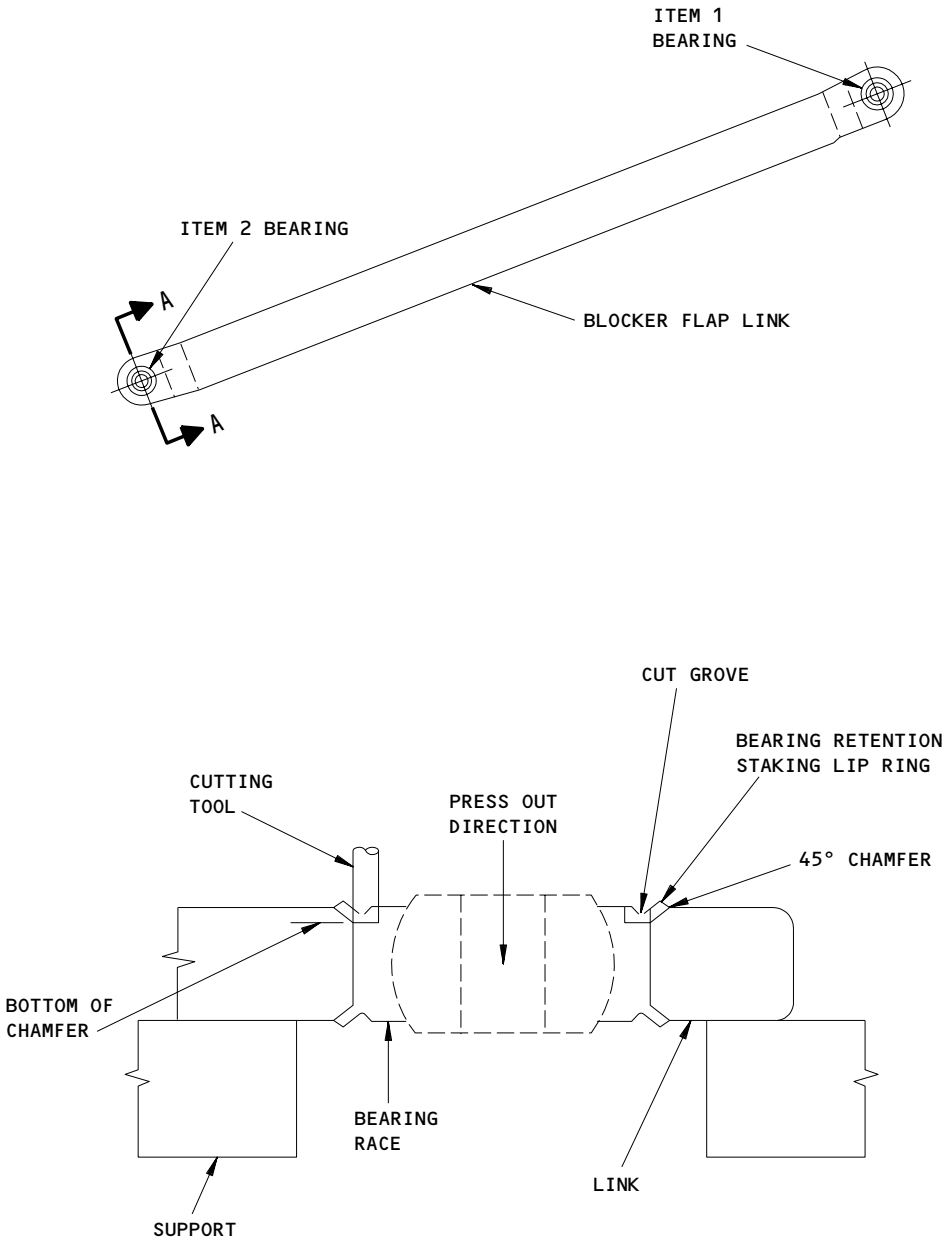
(m) Mix the Omat No. 766C two-part epoxy primer.

    NOTE: Refer to the manufacturer's instructions.

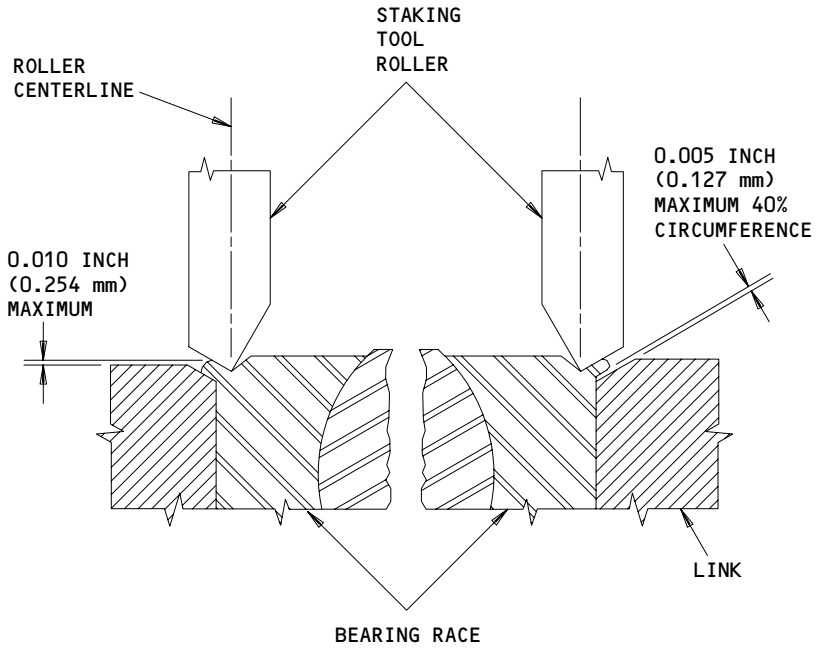
(n) Apply a thin layer of primer mixture to the mating surface of the replacement bearing.
(o) Put the drag link on an applicable support (Fig. 801).

CAUTION: YOU MUST NOT PRESS ON THE BALL OF THE BEARING WHEN YOU INSTALL IT IN THE DRAG LINK. DAMAGE TO THE BEARING WILL OCCUR.

(p) Install the replacement bearing into the bore of the drag link.
    1) Use the bearing insertion tool and the arbor press.



Bearing Staking Ring Removal
Figure 801



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Roller Stake Bearing
Figure 802

2) Do not press on the ball of the bearing.

(q) Make sure the bearing is centered in the link.

(r) Make sure the surfaces of the bearing are not more than 0.010 inch (0.25 mm) above the surfaces of the link.

(s) Use the clean cotton cloth to remove unwanted primer from the drag link.

(t) Stake the bearing on one side of the drag link.

1) Install the roller staking tool in an applicable press.

NOTE: The roller staking tool can be made locally.

2) Lubricate the staking tool roller with the grease, OMat 401A.

NOTE: Do not use an alternative grease to OMat 401A.

3) Make sure that the drag link is on an applicable support (Fig. 801).

4) Put the staking tool rollers into position on the outer race of the bearing (Fig. 802).

5) Apply a slow and continuous pressure with the staking tool until a staking lip is made that:

a) Touches the drag link chamfer (Fig. 802).

b) Touches the drag link chamfer on 60 percent of the circumference, with a clearance of 0.005 in. (0.127 mm) maximum on the remaining 40 percent (Fig. 802).

(u) Turn the drag link over to stake the opposite side of the bearing.

1) Install the roller staking tool in an applicable press.

NOTE: The roller staking tool can be made locally.

2) Lubricate the staking tool roller with the grease, OMat 401A.

NOTE: Do not use an alternative grease to OMat 401A.

3) Make sure that the drag link is on an applicable support (Fig. 801).

4) Put the staking tool rollers into position on the outer race of the bearing (Fig. 802).

5) Apply a slow and continuous pressure with the staking tool until a staking lip is made that:

a) Touches the drag link chamfer (Fig. 802).

b) Touches the drag link chamfer on 60 percent of the circumference, with a clearance of 0.005 in. (0.127 mm) maximum on the remaining 40 percent (Fig. 802).

(v) Do a visual inspection to make sure that:

1) There is free movement of the bearing in the race.

2) There is no movement of the race in the link.

CAUTION: YOU MUST NOT PRESS ON THE BALL OF THE BEARING WHEN YOU DO THE LOAD CHECK. DAMAGE TO THE BEARING WILL OCCUR.

(w) Support the drag link and apply an axial load to the bearing race:
1) Apply the load to both sides of the bearing race.
a) For 03-825-04E005 (Item 1), 525 lbs.
b) For HT3V (Item 2), 450 lbs.
(x) Reject the assembly if there is movement between the bearing race and the drag link.

S 938-002-R00
(2) Use a permanent marker pen to write 'FRS6191' adjacent to the drag link part number.

S 418-003-R00
(3) Install the blocker-flap drag-link (AMM 78-31-27/401).

THRUST REVERSER CASCADE REAR SUPPORT RING - REMOVAL/INSTALLATION

1. General
   A. This procedure has the two tasks to remove and install the rear support ring of the thrust reverser cascade (deflector box).
      (1) In this procedure the rear support ring assembly is referred to as the support ring.
      (2) The thrust reverser cascade (deflector box) assemblies are supported at their rear by the support ring.
   B. You must close the thrust reverser when you remove and install the support ring.

TASK 78-31-28-004-001-R00

2. Remove the Support Ring
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-31-05/401, Thrust Reverser Cascade Segments
      (3) AMM 78-31-26/401, Thrust Reverser Hydraulic Actuators
      (4) AMM 78-31-27/401, Thrust Reverser Blocker Door Drag Links
      (5) AMM 78-34-06/401, Thrust Reverser Feedback Actuator
   B. Access
      (1) Location Zones
          415/425 Thrust Reverser (Left)
          416/426 Thrust Reverser (Right)

   C. Prepare to Remove the Support Ring

      S 044-002-R00

      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 INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

      (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).

      S 984-003-R00
      (2) Manually extend the thrust reverser (AMM 78-31-00/201).

      S 034-004-R00
      (3) Remove the cascade segments (AMM 78-31-05/401).

S 034-005-R00

(4) Disconnect the blocker door drag links from the link attachment brackets on the C-duct inner barrel (AMM 78-31-27/401).

S 034-006-R00

(5) Disconnect the three hydraulic actuators at the rod end only (AMM 78-31-26/401).

S 034-007-R00

(6) Disconnect the feedback actuator at the rod end only (AMM 78-34-06/401).

D. Support Ring Removal (Fig. 401)

S 984-008-R00

(1) Manually extend the thrust reverser to get access to the support ring bolts (AMM 78-31-00/201).

S 034-009-R00

(2) Remove the inflight lockout strip.
  (a) Remove the cotter pin, washer and pin from the inflight lockout strip and support ring.

S 034-010-R00

(3) Remove the three actuator covers.
  (a) Remove the nuts, washers and the screws that attach the actuator covers to the support ring.

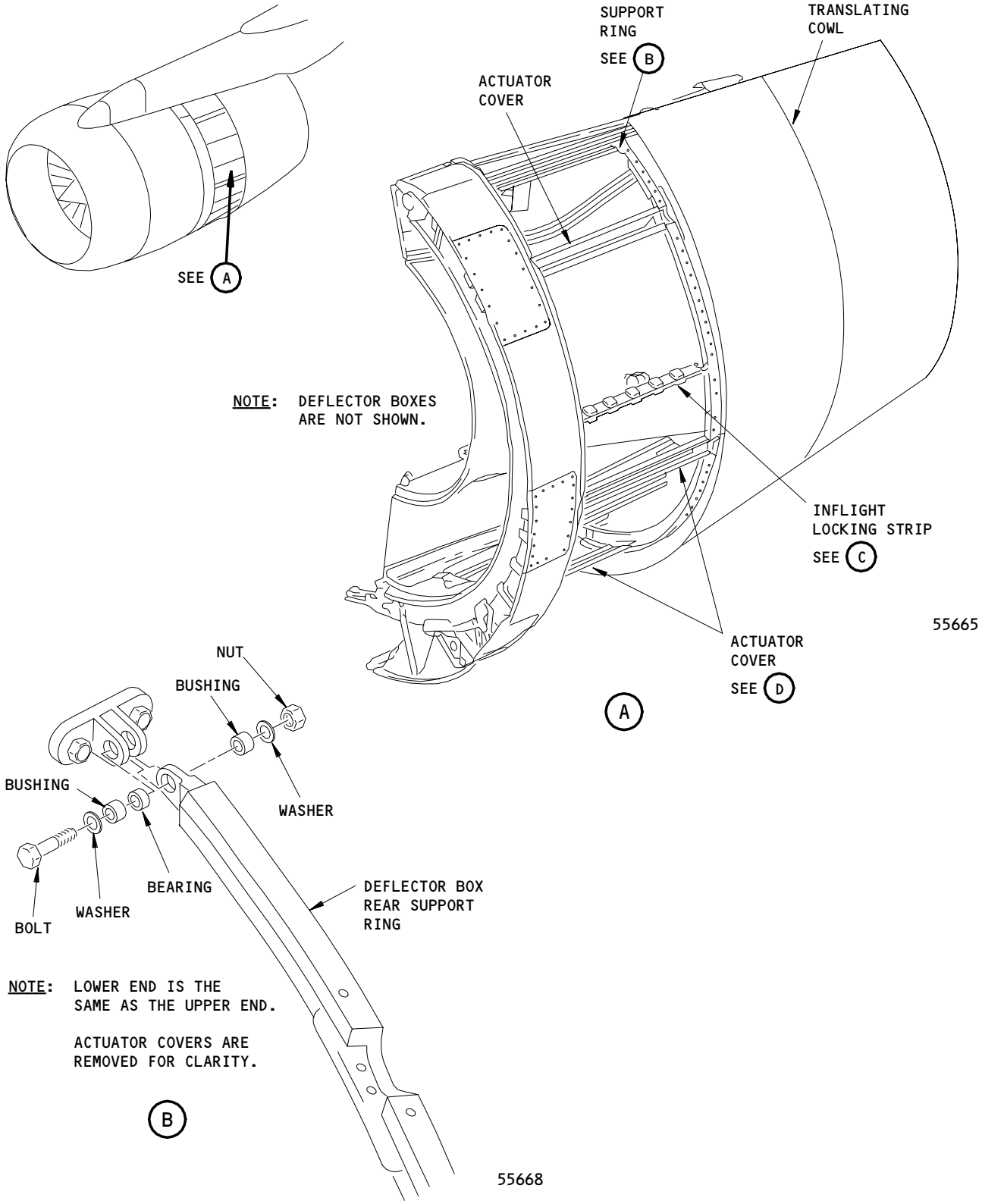
S 024-013-R00

(4) Do these steps to remove the suport ring from the thrust reverser.
  (a) Remove the nut, washers, bushings, bearing and the bolt that attach the top of the support ring to the thrust reverser.
  (b) Remove the nut, washers, bushings, bearing and the bolt that attach the bottom of the support ring to the thrust reverser.
  (c) Remove the support ring.

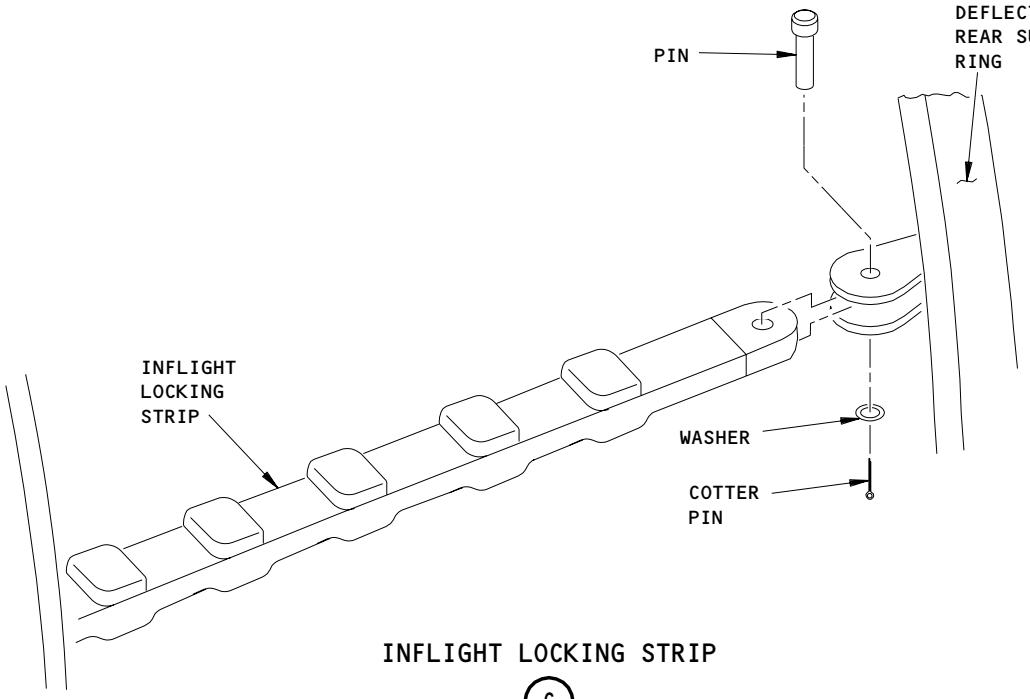
TASK 78-31-28-404-014-R00

3. Install the Support Ring

A. References
  (1) AMM 70-51-00/201, Torque Tightening
  (2) AMM 78-31-00/201, Thrust Reverser System
  (3) AMM 78-31-05/401, Thrust Reverser Cascade Segments
  (4) AMM 78-31-26/401, Thrust Reverser Hydraulic Actuators
  (5) AMM 78-31-27/401, Thrust Reverser Blocker Door Drag Links
  (6) AMM 78-34-06/401, Thrust Reverser Feedback Actuator



Support Ring Installation
Figure 401 (Sheet 1)



INFLIGHT LOCKING STRIP

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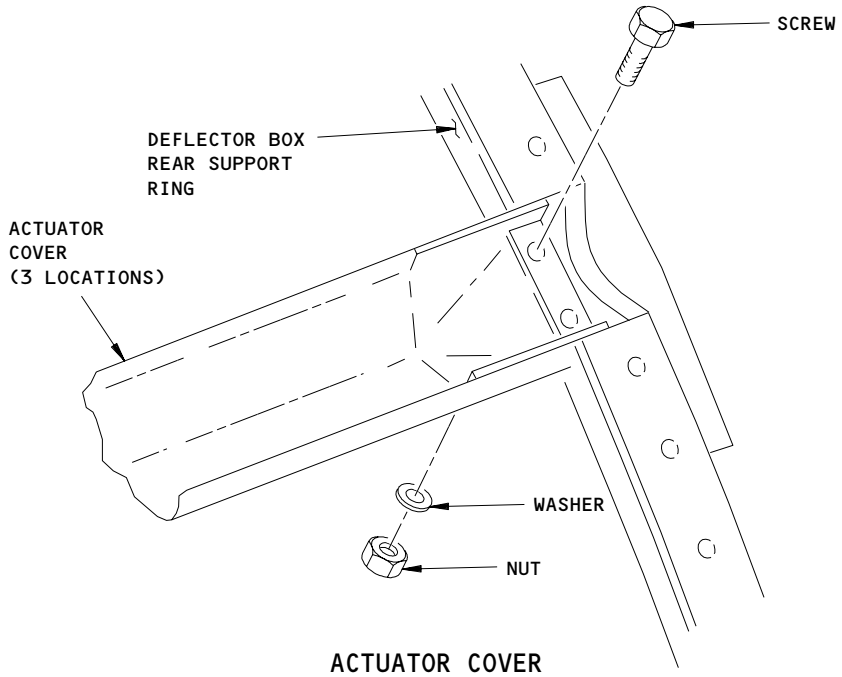
C



ACTUATOR COVER

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D

NOTE: ACTUATOR IS NOT SHOWN.

Support Ring Installation
Figure 401 (Sheet 2)

B. Access
(1) Location Zones
415/425 Thrust Reverser (Left)
416/426 Thrust Reverser (Right)

C. Support Ring Installation (Fig. 401)

S 214-015-R00
(1) Make sure the mating surfaces of the support ring and thrust reverser are clean and not damaged.

S 424-018-R00
(2) Do these steps to install the support ring on the thrust reverser.
(a) Put the support ring onto the thrust reverser.
(b) Install the nut, washers, bushings, bearing and the bolt that attach the top of the support ring to the thrust reverser.
1) Tighten the nut with your hand.
(c) Install the nut, washers, bushings, bearing and the bolt that attach the bottom of the support ring to the thrust reverser.
1) Tighten the nut with your hand.
(d) Tighten the top and bottom nuts (AMM 70-51-00/201).

S 434-019-R00
(3) Install the three actuator covers.
(a) Install the nuts, washers and the screws that attach the actuator covers to the support ring.
(b) Tighten the nuts (AMM 70-51-00/201).

S 434-020-R00
(4) Install the inflight lockout strip.
(a) Install the pin, washer and cotter pin that attach the inflight lockout strip to the support ring.

D. Put the Engine Back to its Usual Condition

S 984-021-R00
(1) Manually retract the thrust reverser to permit connection of the actuators (AMM 78-31-00/201).

S 434-024-R00
(2) Connect the feedback actuator rod end (AMM 78-34-06/401).

S 434-025-R00
(3) Connect the three hydraulic actuator rod ends (AMM 78-31-26/401).

S 434-026-R00
(4) Connect the blocker door drag links to the C-duct inner barrel (AMM 78-31-27/401).

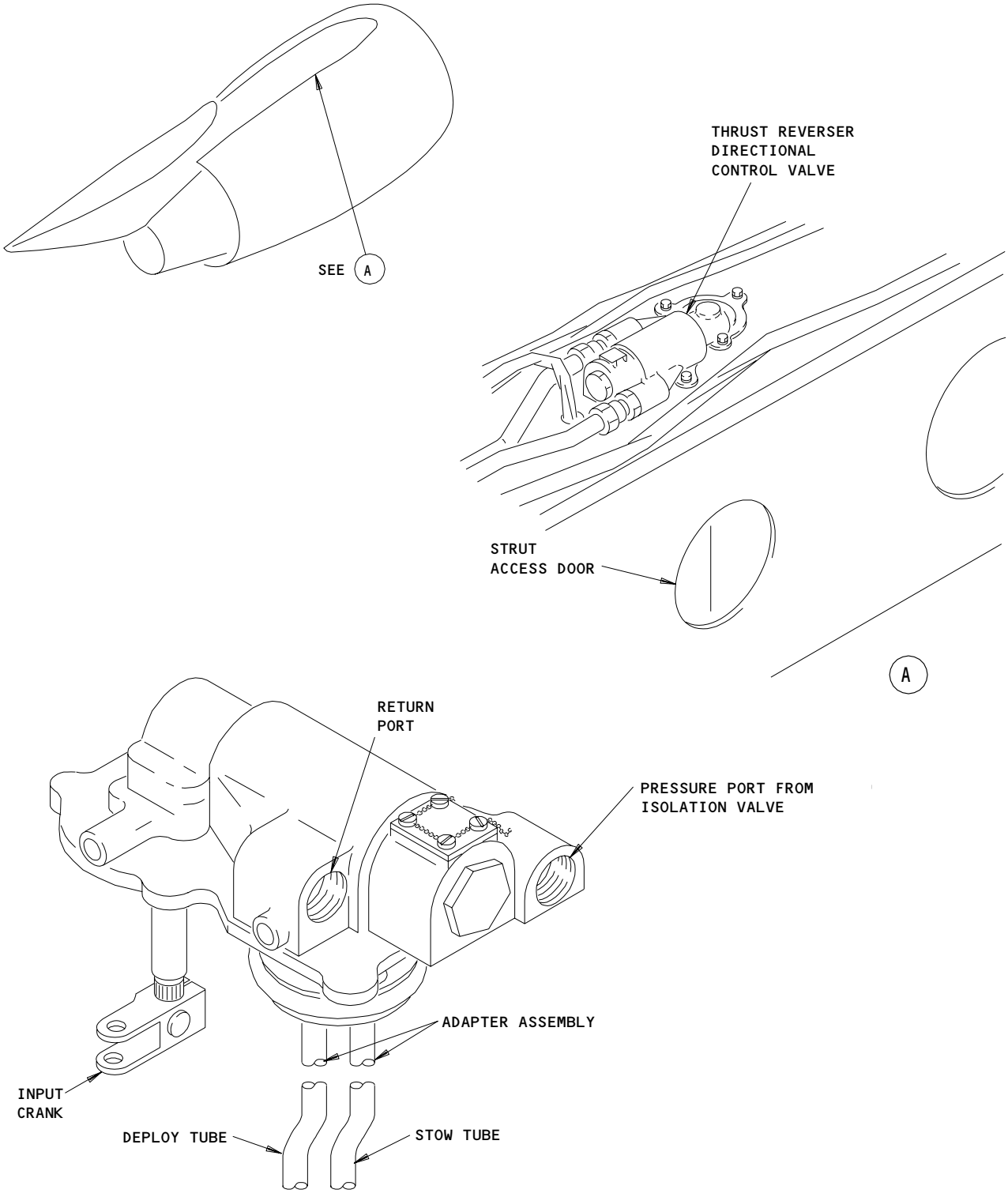
S 434-022-R00
(5) Install the cascade segments (AMM 78-31-05/401).

S 984-027-R00
(6) Manually retract the thrust reverser (AMM 78-31-00/201).

S 444-023-R00
(7) Do the activation procedure for the thrust reverser (AMM 78-31-00/201)

THRUST REVERSER CONTROL SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The thrust reverser control system controls hydraulic supply for operation of the fan thrust reverser system (AMM 78-31-00/001), directional control of the supply in accordance with selected position and the means of limiting downstream flow rate.
   B. A feedback system transmits reverser position to a baulk mechanism in the control linkage (AMM 76-11-00/001), that limits forward or reverse power lever movement until the reverser system has completed a percentage of its travel.
   C. Provision is made to automatically restow the reverser in the event of unscheduled translation.
   D. Thrust reverser control is effected through the following units:
      (1) Thrust reverser isolation valve
      (2) Thrust reverser flow control valve
      (3) Thrust reverser directional control valve
      (4) Thrust reverser feedback actuators
      (5) Thrust reverser feedback cables
      (6) Thrust reverser auto restow proximity sensor.
   E. The description and operation of the referenced units is detailed in this section. For a description and operation of associated systems refer to AMM 78-31-00/001, Thrust Reverser System and AMM 78-36-00/001, Thrust Reverser Position Indication System.
2. Component Details
   A. Thrust Reverser Directional Control Valve (Fig. 1)
      (1) The directional control valve directs the hydraulic supply to the thrust reverser actuators when the thrust reverser is in the extend cycle, or vents the actuator extend cavity to hydraulic return during a retract cycle.
      (2) The unit is located in the airplane strut. The valve is connected to, and mechanically operated by, the thrust reverser control cam on the throttle control shaft.
   B. Thrust Reverser Flow Control Valve
      (1) The flow control valve controls flow rate of hydraulic fluid to the thrust reverser actuators. The valve is located in the hydraulic pressure supply line between the isolation valve and the directional control valve (Fig. 9). The replacement of the valve requires the removal of a panel of the aft fairing. After the panel is removed the valve may be removed by loosening the fitting on either end and removing the valve. The locations of the flow control valve and the fairing to be removed are provided in Figure 9.



Thrust Reverser Directional Control Valve
Figure 1

(2) The valve operates on a differential pressure across a control orifice in a spring-loaded piston. Any increase in differential pressure moves the piston and controls the area of metering holes in the piston body, thus flow is regulated to the amount that can pass through the metering holes.

C. Thrust Reverser Feedback Actuators (Fig. 2)

(1) Two feedback actuators transmit the position of the thrust reverser, through a push-pull cable assembly, to a baulk mechanism on the engine control strut drum. The baulk mechanism prevents increasing the engine power from idle until the thrust reverser has extended.

(2) The feedback actuators, one on each C-duct are located at the bottom of the C-duct, near the lower hydraulic actuators with locks. The front mount is a gimbal assembly that is attached to the same bracket as the lock actuator. A rear gimbal mount connects the actuator to a mounting bracket on the translating cowl aft frame.

(3) The feedback actuator comprises a housing, with a sliding inner sleeve to which the rear gimbal mounting is attached. A square threaded helical shaft inside the inner sleeve is supported in a bearing housing at the front of the actuator, and at the rear by a screw support that slides in the inner sleeve.

(4) A square nut bushing, fitted internally in the front of the inner sleeve, fits over the helical shaft. As the translating cowl moves, carrying the inner sleeve, the square nut slides along the helical shaft causing the shaft to rotate.

(5) Attached externally to the front of the shaft is a lever, that rotates with the shaft over a 90-degree range, between stow and deploy position.

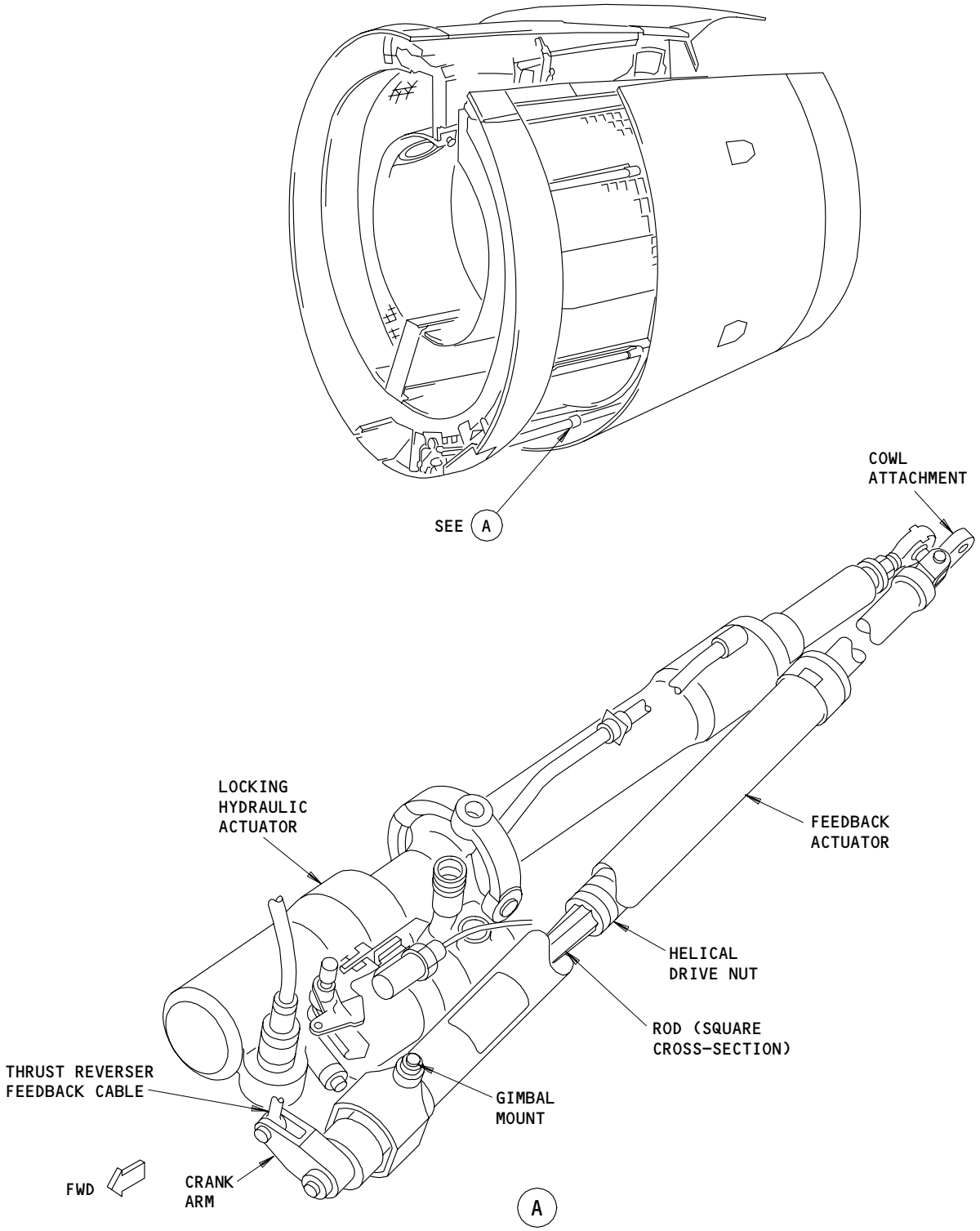
(6) A sensitivity plate is attached to, and rotates with, the lever. In the deployed position the plate is in close proximity to a proximity sensor, to provide flight compartment indication of reverser position (AMM 78-36-00/001).

D. Thrust Reverser Feedback Cables

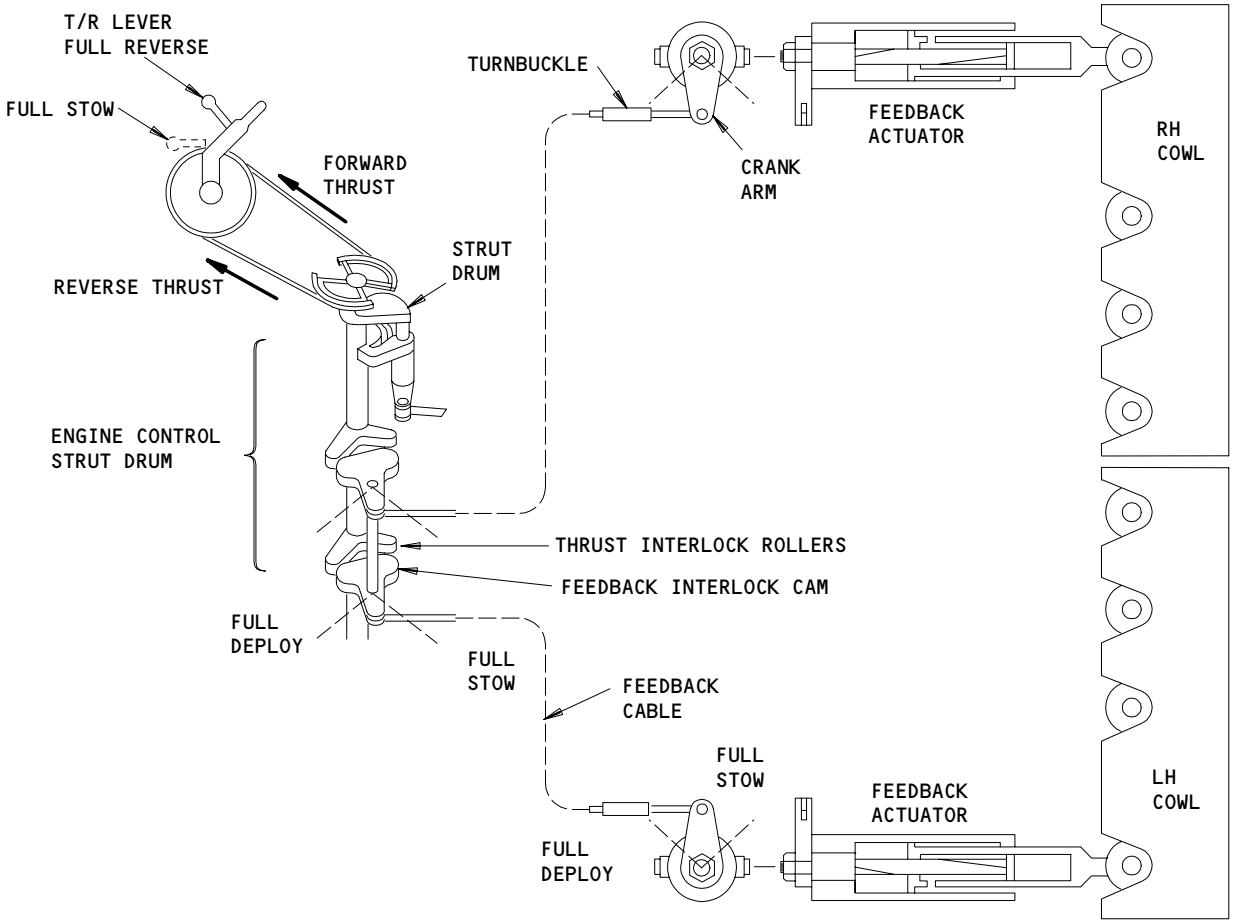
(1) Movement of each feedback actuator is transmitted to the engine control box through a cable assembly.

(2) Each cable comprises upper and lower assemblies, interconnected through a cable clamp. Each assembly comprises a rigid outer casing with an inner sliding cable. End fittings attached to the sliding cable, connect the upper cable to a feedback cam on the engine control strut drum in the airplane strut, and the lower cable to the output lever on the feedback actuator.

E. Thrust Reverser Isolation Valve (Fig. 3)



Thrust Reverser Feedback System
Figure 2 (Sheet 1)



Thrust Reverser Feedback System
Figure 2 (Sheet 2)

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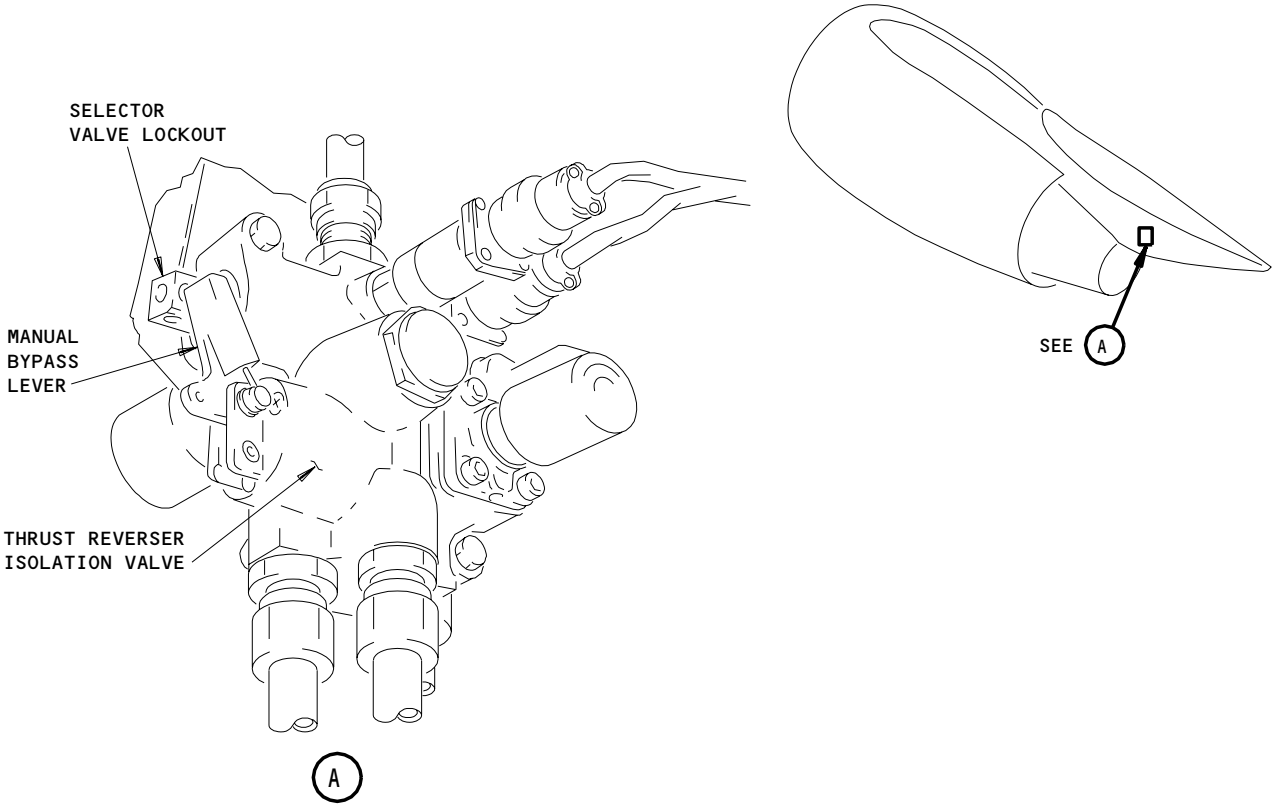
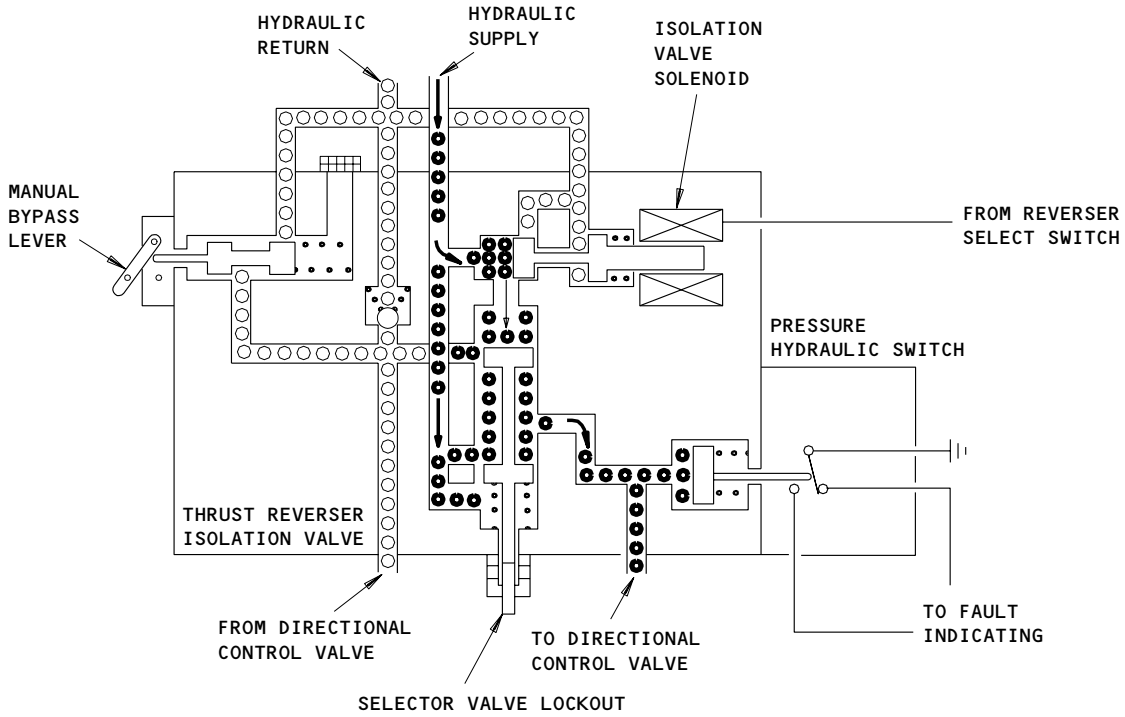


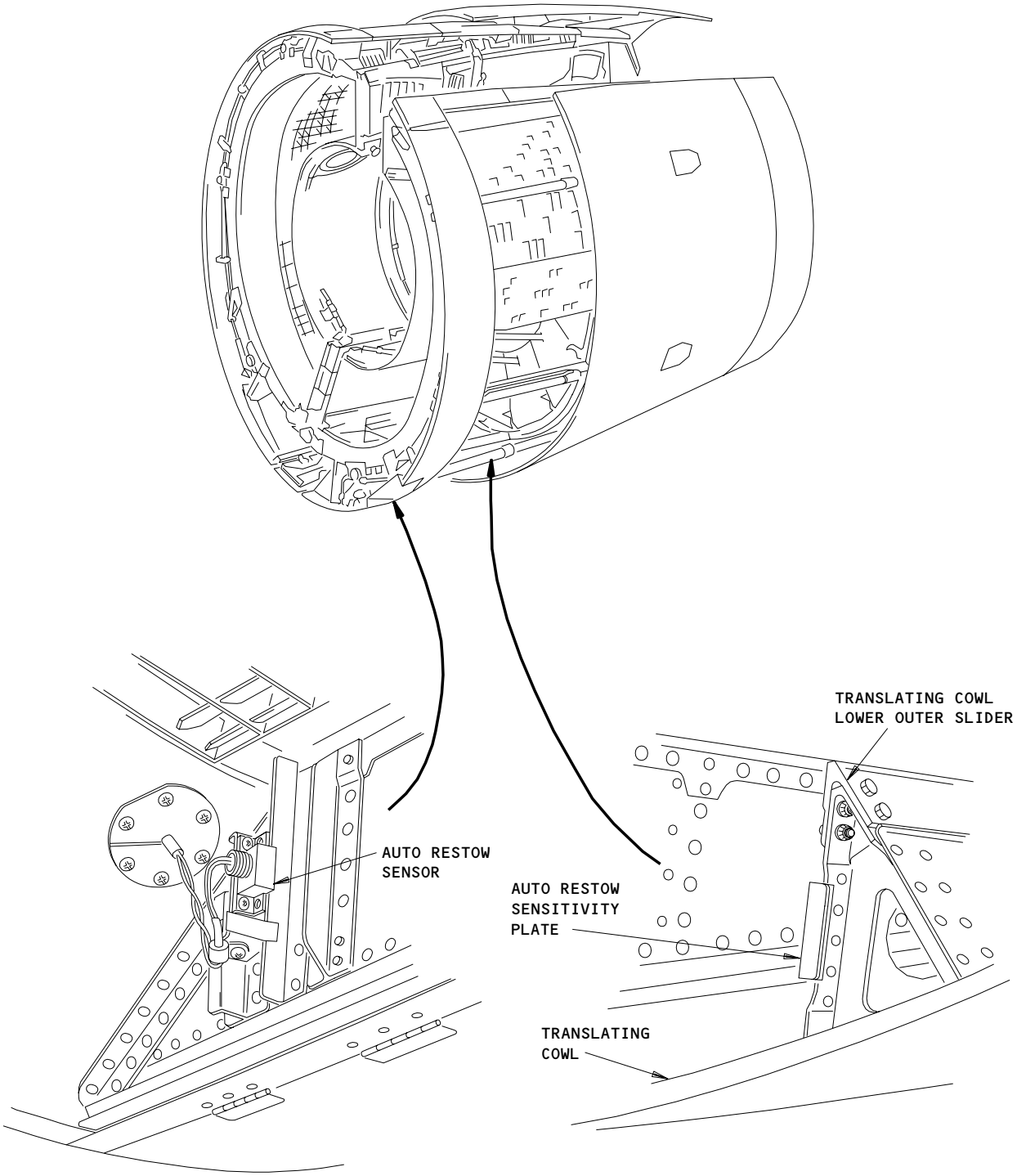


Thrust Reverser Isolation Valve
Figure 3

(1) The isolation valve provides hydraulic pressure to actuate the thrust reverser. The valve is controlled by a solenoid and energized through the thrust reverser electrical circuit described in AMM 78-31-00/001.
(2) The unit is located in the under wing sailboat area of the airplane and comprises:
    (a) Solenoid pilot valve - when energized ports hydraulic supply to selector valve spool.
    (b) Selector valve - provides hydraulic pressure to the reverser actuators.
    (c) Pressure switch - senses hydraulic pressure downstream of selector valve.
    (d) Check valve - permits thermal expansion and provides hydraulic circuit isolation for ground servicing.
    (e) Bypass Valve - when locked in bypass position, provides freedom of fluid flow to and from actuators for manual cycling during ground servicing.
(3) Provision is made for locking the selector valve spool in the closed position to permit airplane dispatch with an inoperative thrust reverser. This locking facility is also used in conjunction with bypass valve lockout for manual cycling.
(4) The purpose of the isolation valve is to provide hydraulic pressure, on command, to the thrust reverser system. The isolation valve consists of a 2-stage solenoid operated valve (arming spool and pilot valve), check valve, bypass valve, and pressure switch.
(5) The isolation valve is also used to isolate the thrust reverser system from any accidental flight compartment actuation during ground maintenance or during flights with the thrust reverser deactivated for flight dispatch. A manual lockout is used for this purpose.
(6) The isolation valve is a hydraulic servo valve with an arming spool actuated by a solenoid operated pilot valve. With the solenoid de-energized, the arming spool is spring biased to the closed position where the PRESS port is blocked and the CYLINDER port is connected to RETURN port.
(7) When the solenoid is energized, the pilot valve is opened and fluid is ported to one end of the arming spool, shifting it to the open position. The PRESS port is connected to the CYLINDER port. Return flow to the hydraulic power system is ported continuously from the CONT port to the RETURN port, independent of solenoid operation. A check valve is in this return path to prevent pressure surges from going back into the reverser's return system.
(8) Isolation Valve Deactivation
    (a) The arming valve is locked in the closed position by inserting a deactivation pin. This pin prevents hydraulic supply through the arming valve spool to the thrust reverser actuators. In this mode, the PRESS port is blocked and fluid flow from CONT port to CYLINDER port is made.

(9) Ground Maintenance
  (a) The isolation valve must be locked in the manual bypass to prevent hydraulic lock from stopping the manual operation of the thrust reverser. The bypass valve permits fluid flow from the RETURN to the CONT ports.
  (b) Manual bypass is accomplished by pressing the bypass valve lever down and inserting a deactivation pin with a "remove before flight" streamer through the lever holes.
  (c) A second deactivation pin on the streamer assembly is inserted through the holes for the arming valve to prevent accidental hydraulic operation. The streamers provides ground indication that the valve is locked in the manually deactivated mode.

F. Thrust Reverser Auto Restow Proximity Switch (Fig. 4)
  (1) The auto restow sensor provides an electronic signal to an auto restow logic card, whenever the translating cowl is unstowed. The logic card completes an electrical circuit and energizes the isolation valve solenoid to open the isolation valve and feed hydraulic fluid to the actuators.
  (2) There are two auto restow proximity sensors, one on each section of the translating cowl, located on the front lower bifurcation of the reverser fixed structure. The associated sensitivity plate, through which the electrical circuit to the auto restow logic card is energized or de-energized, is located on the front edge of the translating cowl lower outer slider mounting bracket.
  (3) The proximity sensor is driven by a periodic pulse, generated by the auto restow logic card. This pulse measures the inductance of the sensor as the sensitivity plate moves nearer to or away from the sensor. The inductance measured changes the logic card state.
  (4) During normal reverser operation, the auto restow system ensures that the reverser isolation valve remains energized throughout the reverser operating cycle, when the system is restowed.
  (5) The result of one or both sections of the translating cowl becoming unstowed at any time is a decrease in sensor inductance, producing a zero signal to an AND logic gate in the logic card. This zero signal results in a stow relay becoming de-energized, causing the relay contacts to close thus rerouting the electrical supply and energizing the isolation valve solenoid.



LEFT HAND ILLUSTRATED RIGHT HAND SIMILAR

51945

Thrust Reverser Auto Restow Proximity Switch and Sensitivity Plate
Figure 4

G. AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Control System
(1) The control system to extend the thrust reverser goes through the fire switch, an air/ground relay, has a control switch in the reverse thrust lever, and a solenoid valve on the isolation valve.
(2) The control system keeps the isolation valve open to retract the thrust reverser through the thrust reverser stow relay, the auto restow proximity sensors, and the proximity switch electronic unit (PSEU).
(3) The control system gives an input to the isolation valve fault indication system through the disagree relay and the hydraulic isolation valve relay. The position of the disagree relay changes if the airplane is on the ground. The position of the hydraulic isolation valve relay changes if the thrust reverser control switch is closed.

H. AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Control System
(1) The control system to extend the thrust reverser goes through the fire switch, an air/ground relay, has a control switch in the microswitch pack, a 100 millisecond time delay, and a solenoid valve on the isolation valve.
(2) The control system keeps the isolation valve open to retract the thrust reverser through the thrust reverser stow relay, the auto restow proximity sensors, and the proximity switch electronic unit (PSEU).
(3) This control system does not give an input to the isolation valve fault indication system.

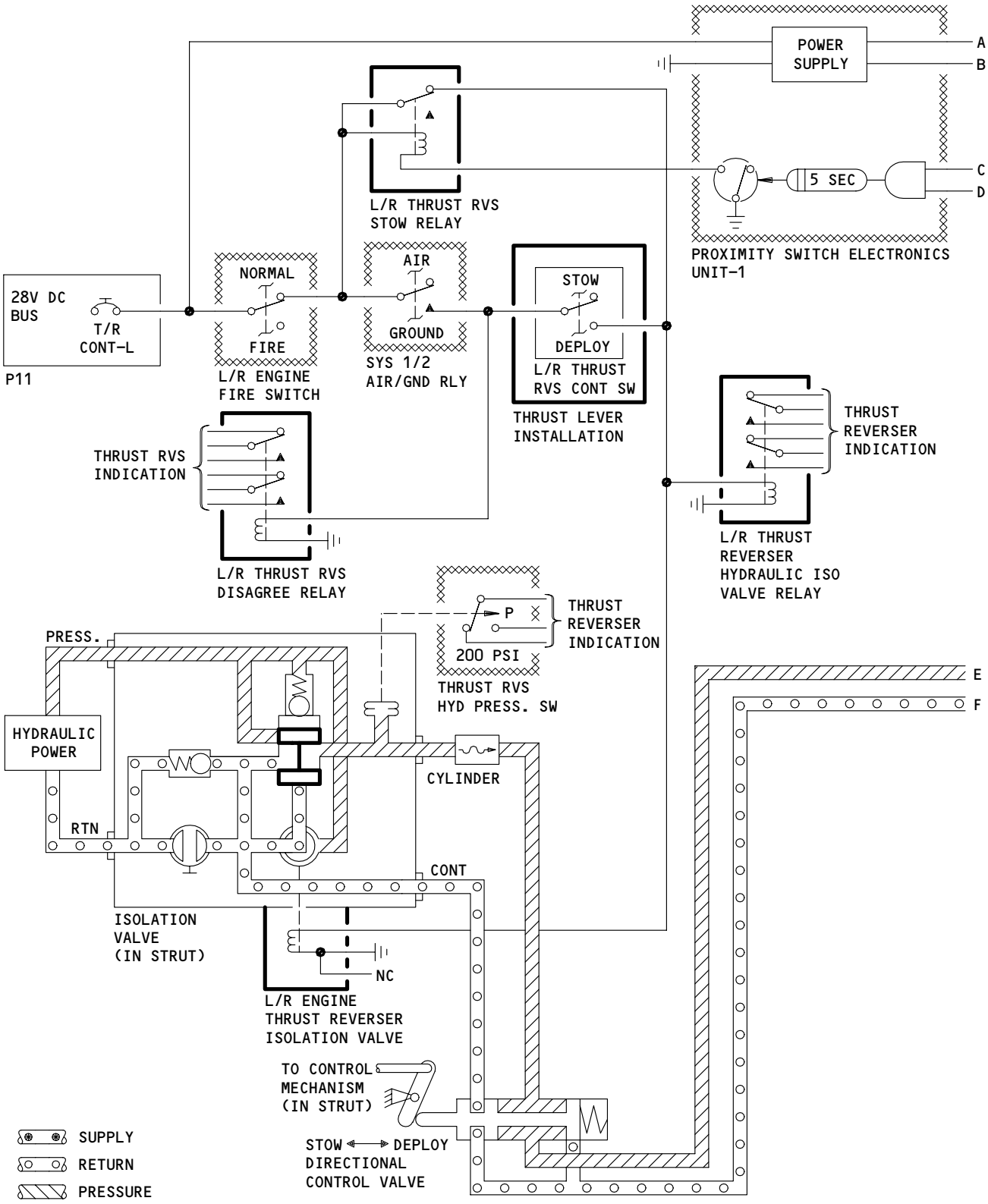
I. AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Sync-lock Control System
(1) The control system for the sync-lock has a control switch in the reverse thrust lever, an air/ground relay, a sync-lock relay, and the solenoid of the sync-lock.

3. Operation
A. Functional Description (Fig. 5)
(1) Thrust Reverser Isolation Valve
(a) With reverse thrust selected and the isolation valve solenoid energized, the pilot valve ports hydraulic supply pressure to the head of the selector valve. This action moves the selector valve to port hydraulic pressure to the directional control valve and the thrust reverser actuators.
(b) The hydraulic pressure switch senses downstream pressure, compatible with the energized isolation valve solenoid. In the event of incompatibility of these conditions, a disagree relay will energize to send a message to the upper Engine Indication and Crew Alerting System (EICAS) display in the flight compartment (AMM 78-36-00/001).
(2) Thrust Reverser Flow Control Valve
(a) As downstream flow increases, the differential pressure increases across the control orifice in the head of the piston. The piston moves against spring pressure and meters flow through the holes in the piston body, thus regulating flow.

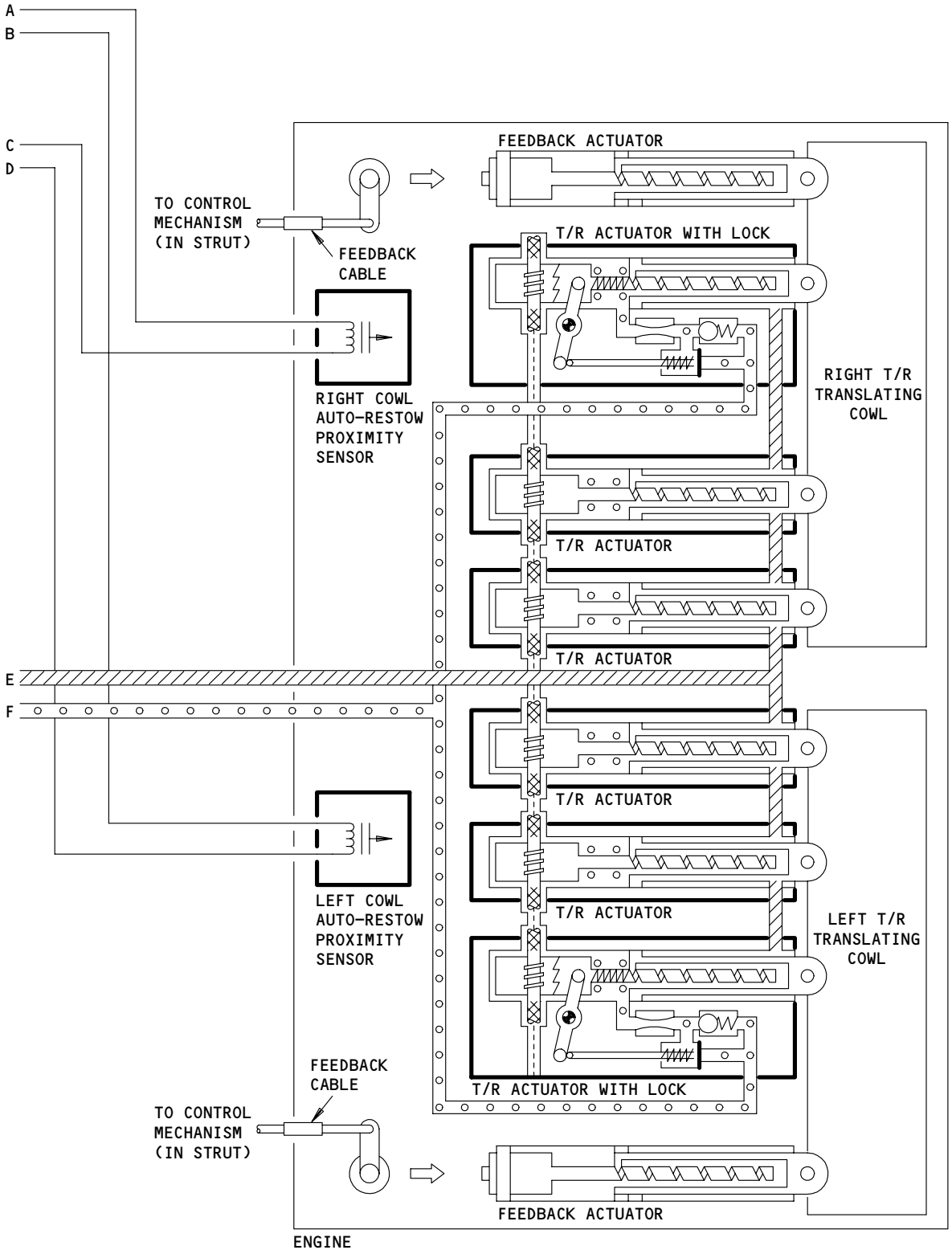
(3) Thrust Reverser Directional Control Valve
  (a) When reverse thrust is selected, the directional control valve directs the hydraulic supply to the extend and the retract sides of the actuator pistons.
  (b) When reverse thrust is cancelled, the directional control valve vents the extend side to hydraulic return and maintains the hydraulic supply to the retract side of the actuator pistons.

(4) Thrust Reverser Feedback Actuators and Cables
  (a) As the translating cowl moves to extend the thrust reverser, the inner sleeves of the feedback actuators are drawn rearward rotating the helical sleeves and the output levers.
  (b) Output lever movement is transmitted by the feedback cables to the baulk mechanism on the engine control strut drum.
  (c) The baulk mechanism in the engine control system prevents the increase in thrust from idle until the thrust reverser is extended.
  (d) AIRPLANES WITHOUT THRUST REVERSER SYNC LOCKS;
  If the reverser deploys (uncommanded) with the thrust lever advanced, the baulk mechanism moves the thrust lever to the idle position.

(5) Thrust Reverser Auto Restow Proximity Switch (Fig. 4)
  (a) With the translating cowl moving rearwards, the sensitivity plates move away from the proximity sensors. This action produces a decrease in sensor inductance, resulting in transmission of a zero signal to the auto restow logic card.
  (b) The zero signal produces a zero output from an AND logic gate, which de-energizes an auto restow relay and, in consequence, a stow relay. This action causes the stow relay contacts to close, completing a circuit to provide an alternative circuit to the hydraulic isolation valve.
  (c) When the translating cowl returns to the stow position, the sensitivity plate produces an increase in sensor inductance, with an input to the auto restow AND logic gate. The restow relay energizes and the relay contacts close, with a 5-second time delay. This action energizes the stow relay, resulting in the relay contacts opening and de-energizing the isolation valve solenoid.
  (d) An unscheduled extension of one or two translating cowls, will result in energizing of the hydraulic isolation valve through the auto restow proximity sensors and the PSEU. Because the directional control valve is in the retract position, the isolation valve ports hydraulic pressure to the retract side of the actuators, the extend side being vented to hydraulic return through the directional control valve. This will return the translating cowl to the retracted position.

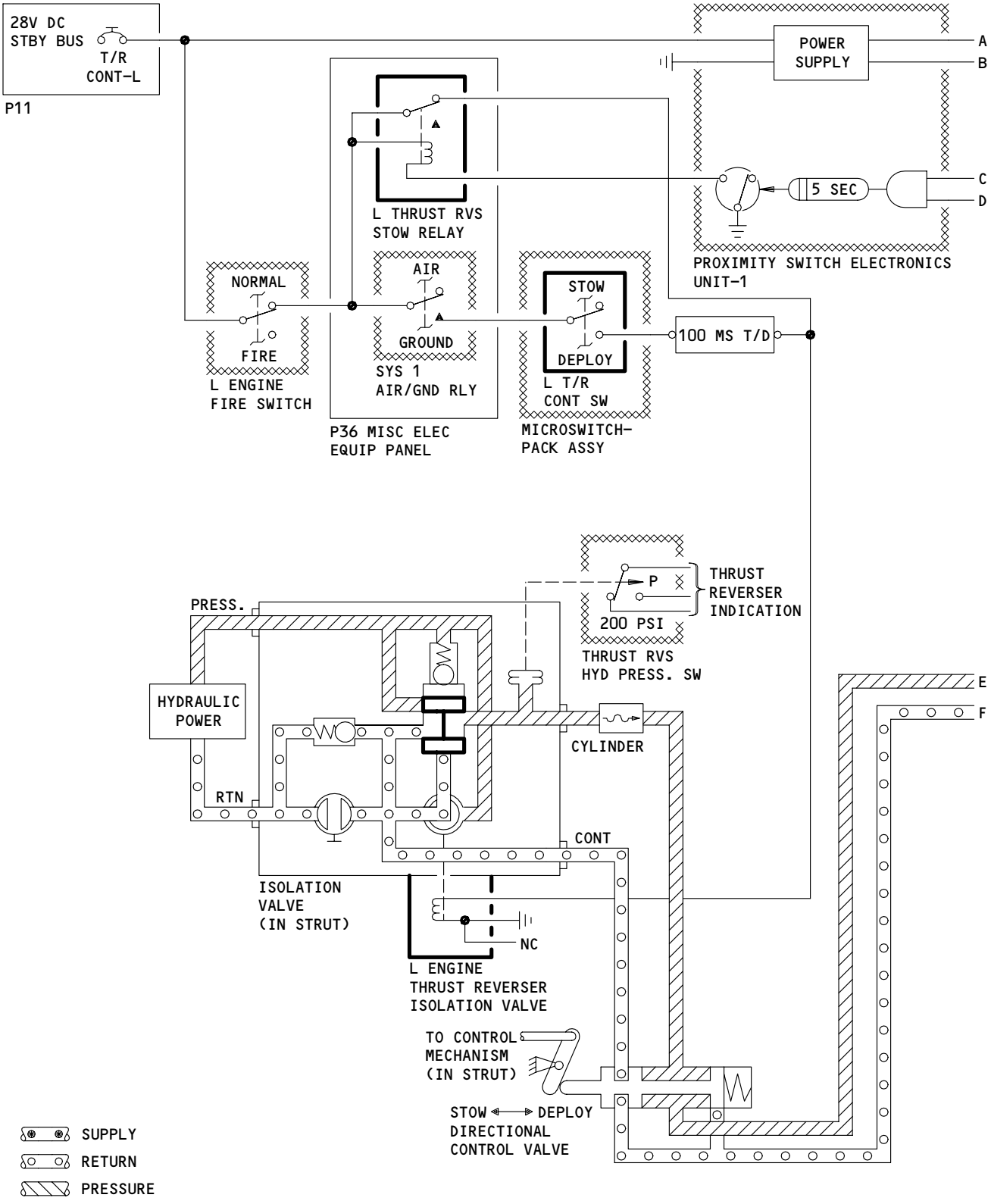


Thrust Reverser Control Schematics
Figure 5 (Sheet 1)

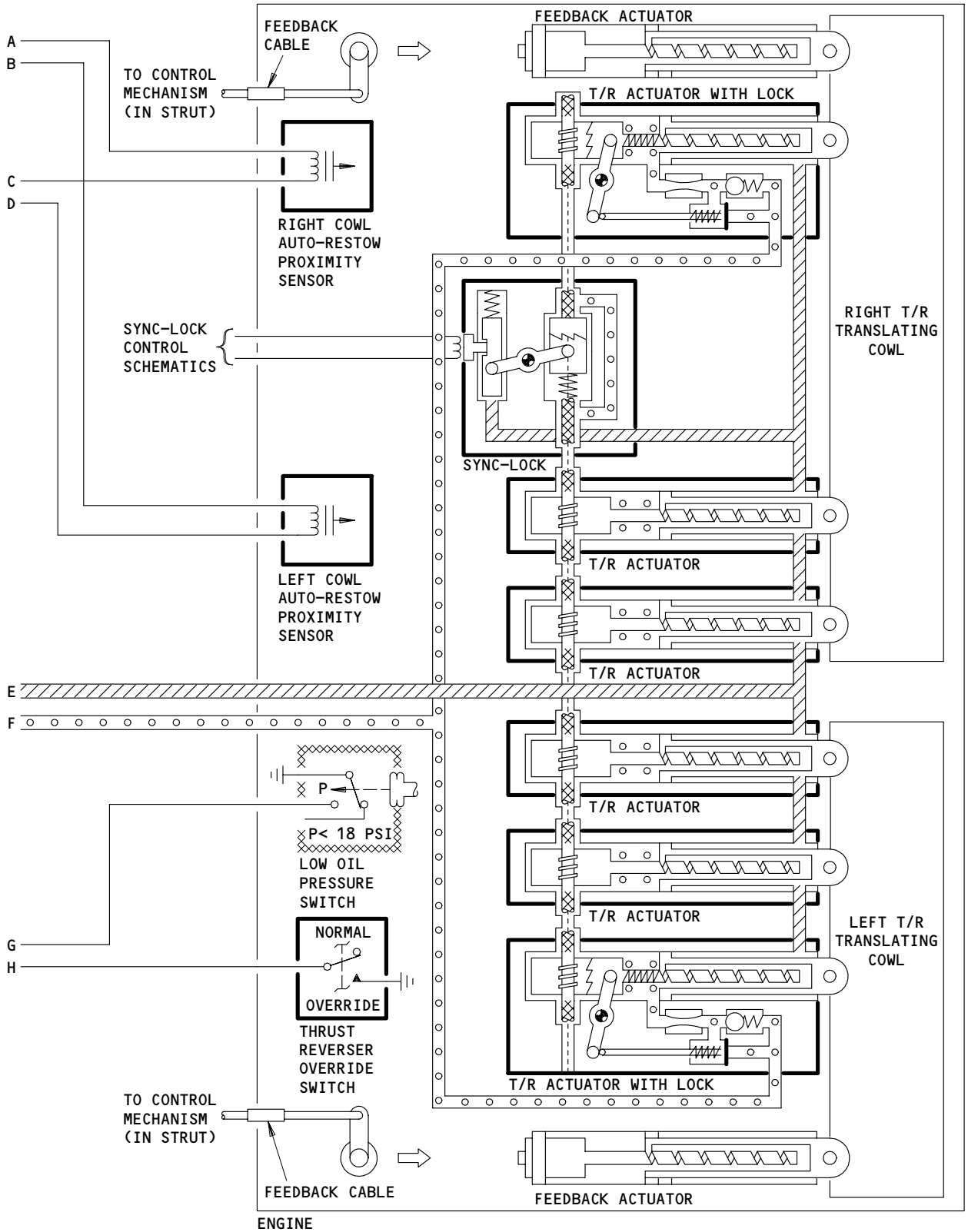


Thrust Reverser Control Schematics
Figure 5 (Sheet 2)

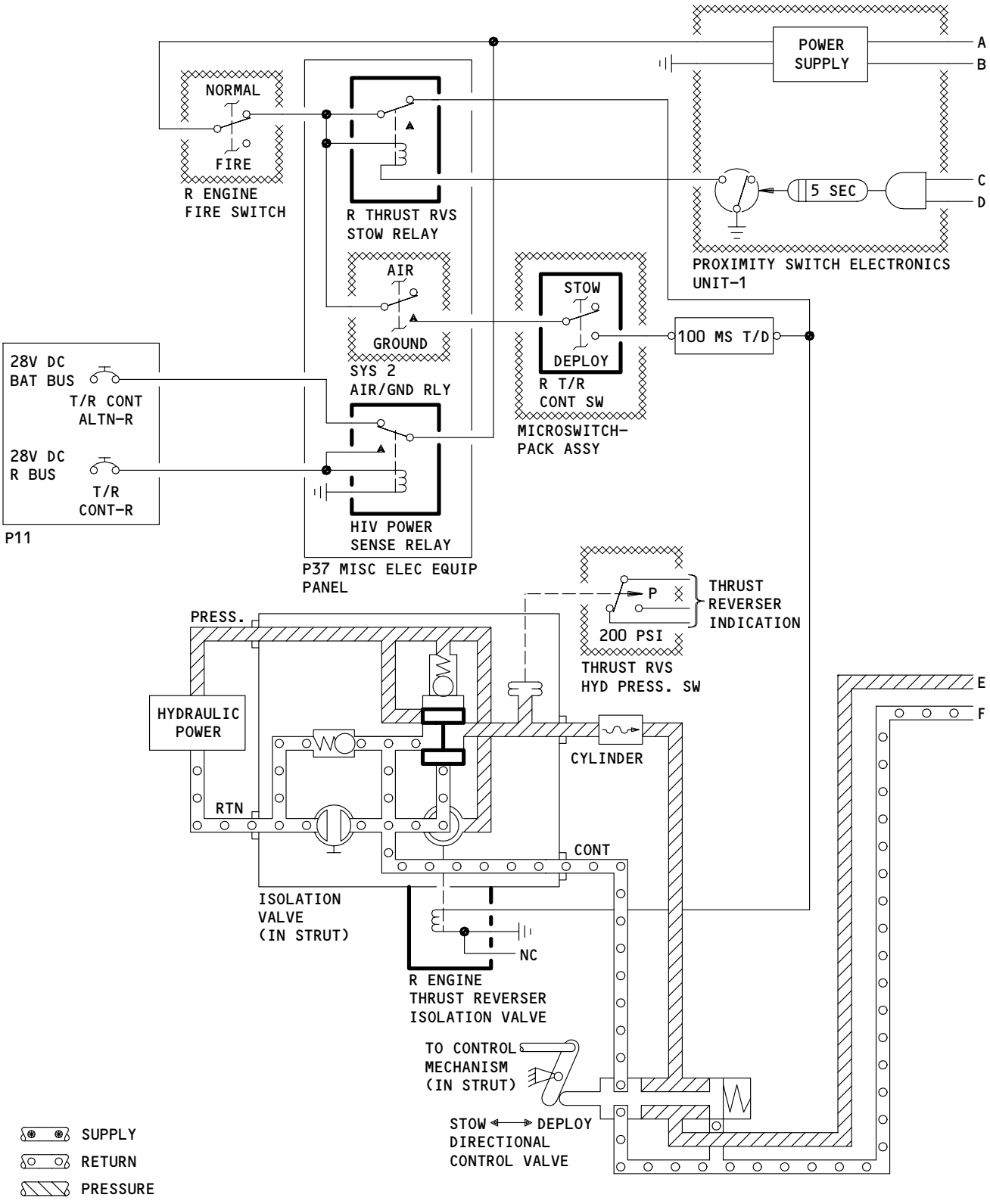
A67653



Left Engine Thrust Reverser Control Schematic
Figure 6 (Sheet 1)

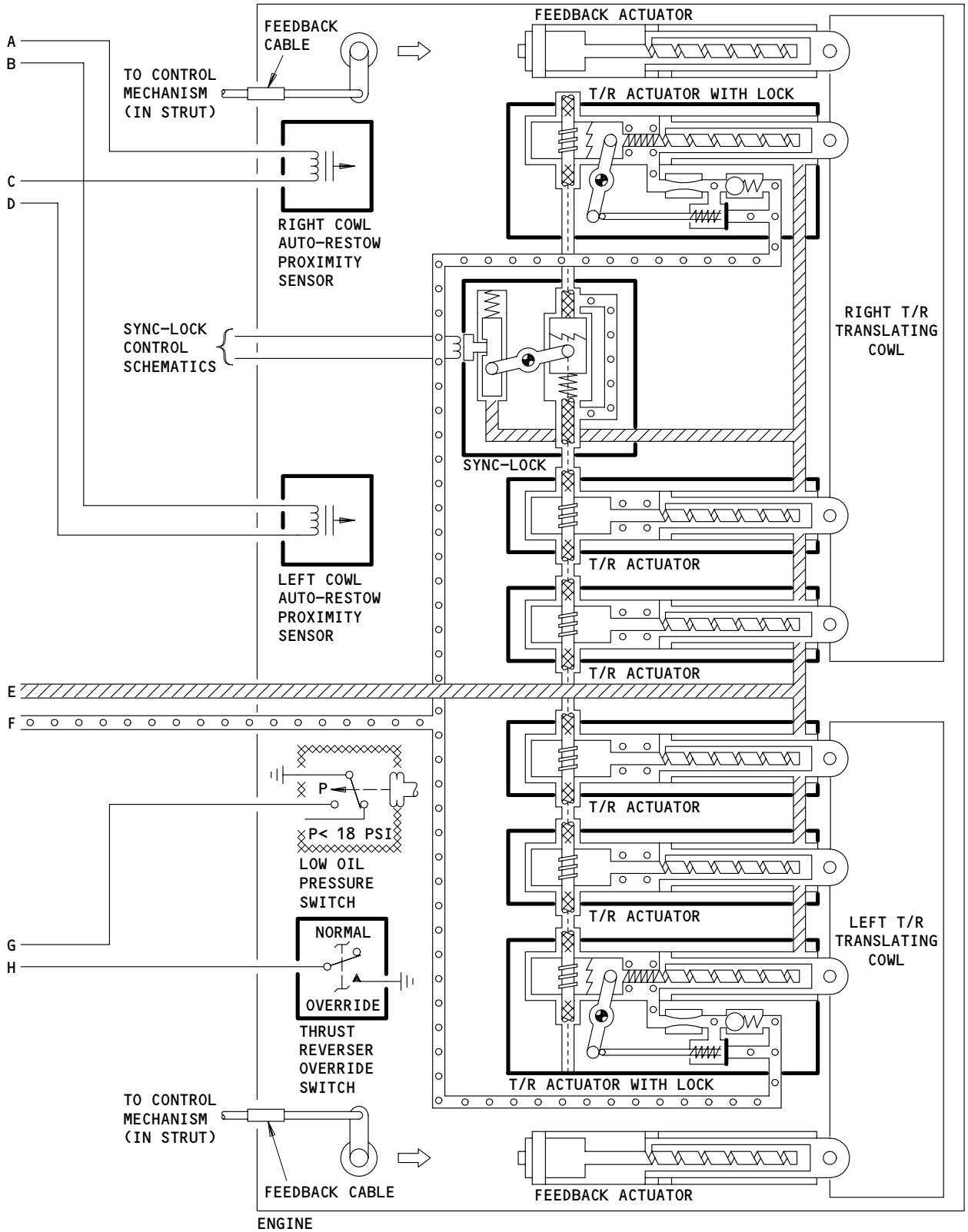


Left Engine Thrust Reverser Control Schematic
Figure 6 (Sheet 2)



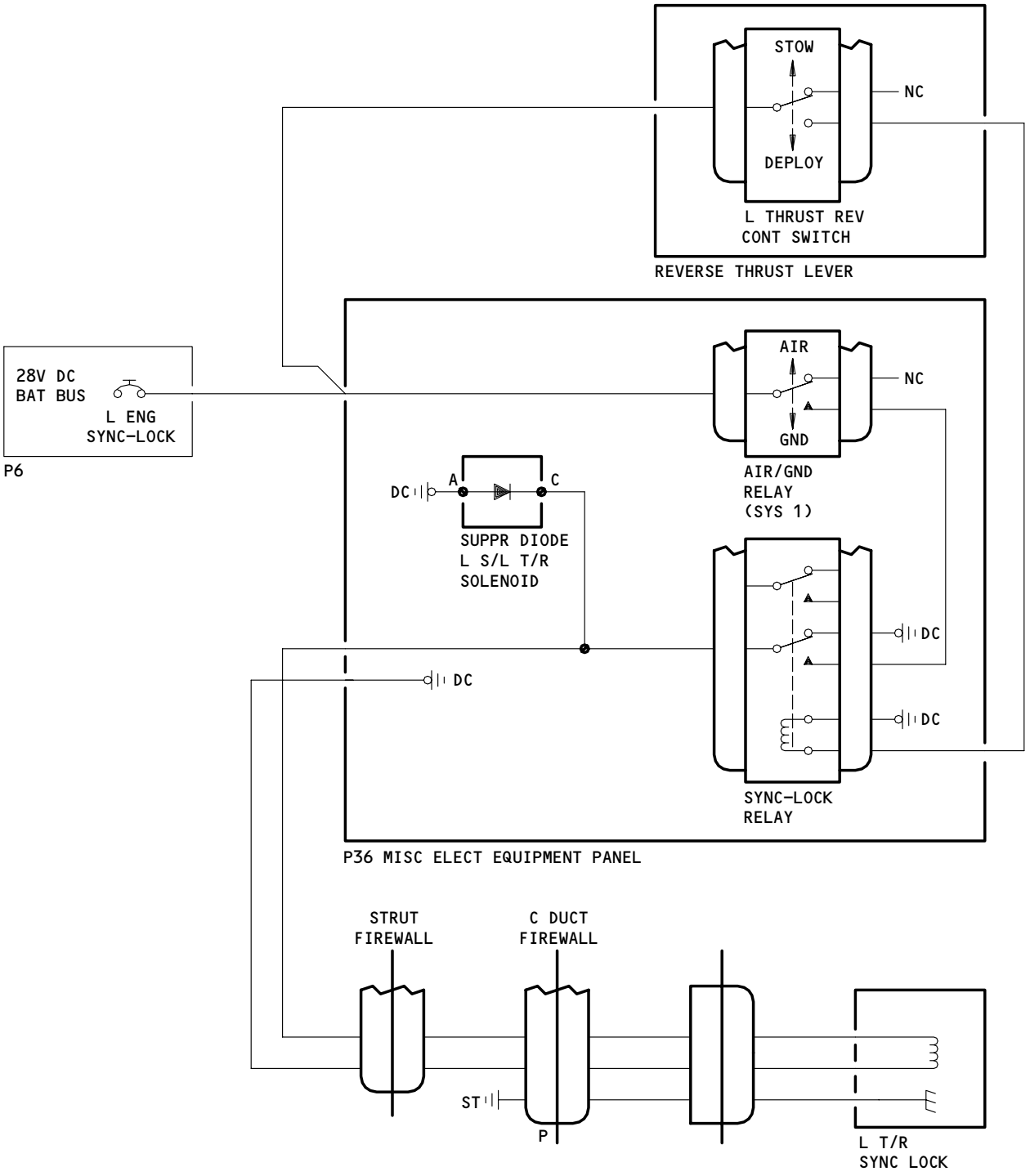
Right Engine Thrust Reverser Control Schematic
Figure 7 (Sheet 1)

A64779



Right Engine Thrust Reverser Control Schematic
Figure 7 (Sheet 2)

A67830

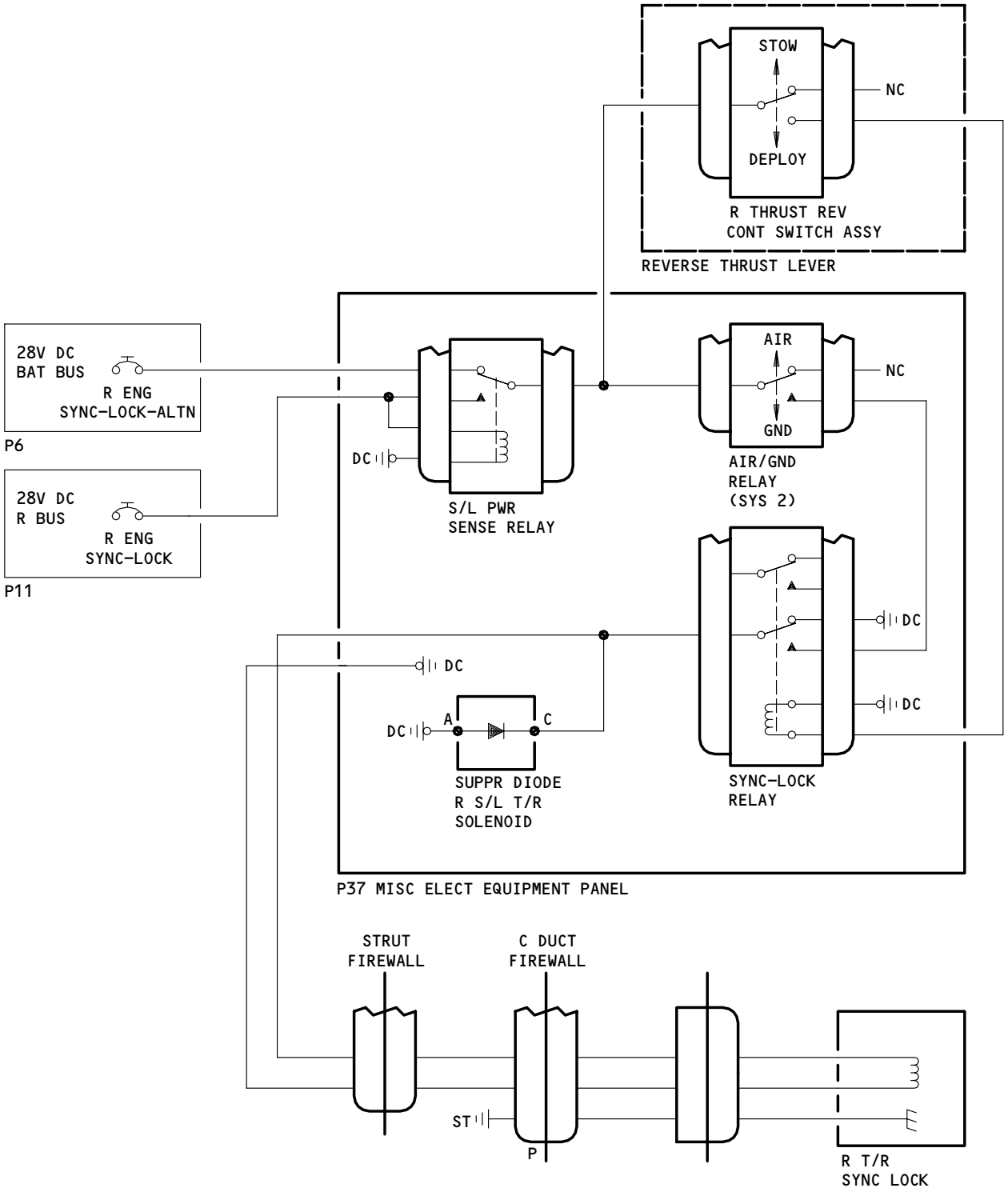


LEFT ENGINE

Thrust Reverser Sync-Lock Control System Schematic
Figure 8 (Sheet 1)

EFFECTIVITY
AIRPLANES WITH THRUST REVERSER
SYNC-LOCKS

A64461

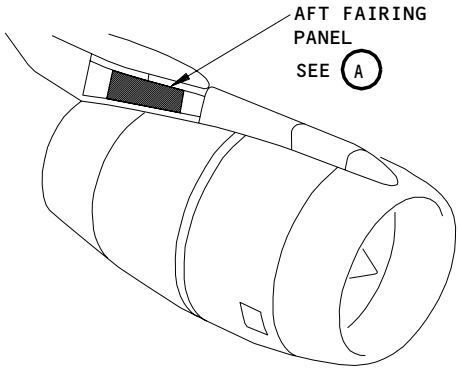


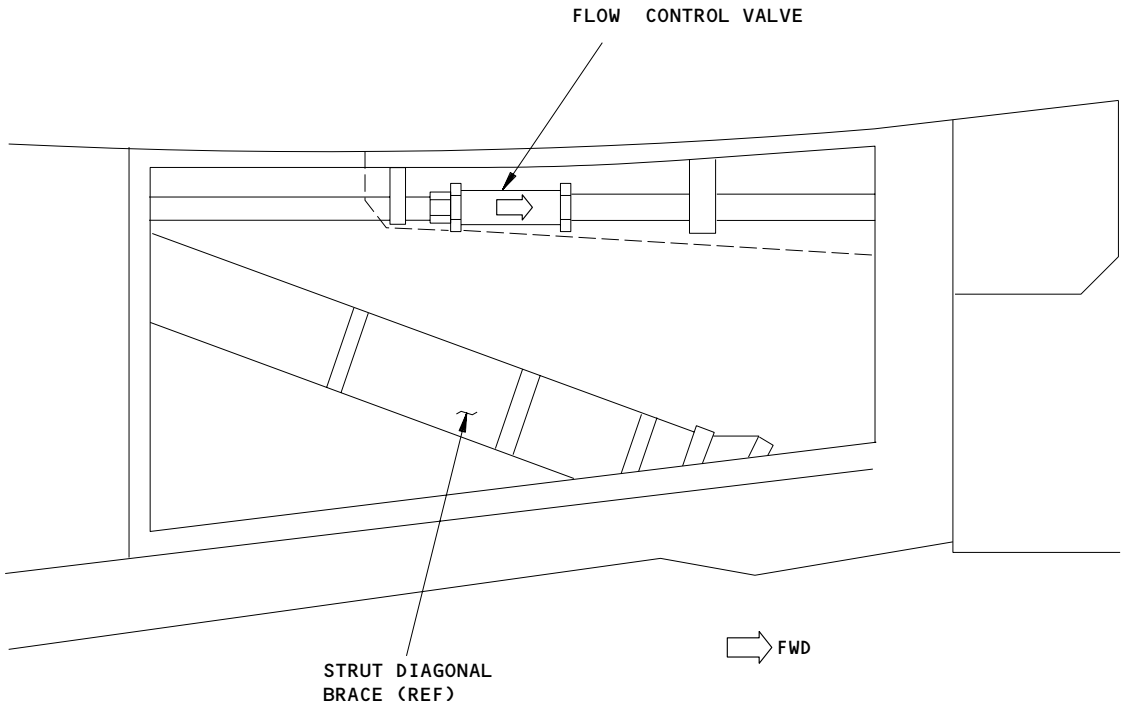
RIGHT ENGINE

Thrust Reverser Sync-Lock Control System Schematic
Figure 8 (Sheet 2)

EFFECTIVITY
AIRPLANES WITH THRUST REVERSER
SYNC-LOCKS

A64511





FLOW CONTROL VALVE LOCATION
A

Flow Control Valve Location
Figure 9

THRUST REVERSER CONTROL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
ACTUATOR – L ENGINE, THRUST REVERSER FEEDBACK	3	2	415AL,416AR, AT THRUST REVERSER LOCKING ACTUATOR	78-34-06
ACTUATOR – R ENGINE, THRUST REVERSER FEEDBACK	3	2	425AL,426AR, AT THRUST REVERSER LOCKING ACTUATOR	78-34-06
CABLE – L ENGINE THRUST REVERSER FEEDBACK	4	2	433AL, STRUT CONTROL DRUM ACCESS, 415AL,416AR, FAN C-DUCT AND THRUST REVERSER	78-34-03
CABLE – R ENGINE THRUST REVERSER FEEDBACK	4	2	STRUT CONTROL DRUM ACCESS, 443AL, STRUT CONTROL DRUM ACCESS, 425AL, 426AR, STRUT CONTROL DRUM ACCESS	78-34-03
CIRCUIT BREAKER –	5		FLT COMPT, P11	
L ENGINE T/R CONT, C1482		1	11D12	*
R ENGINE T/R CONT, C1483		1	11B30	*
LEVER – (FIM 76-11-00/101)				
THRUST, M985				
RELAY – (FIM 31-01-36/101)				
SYS NO. 1 AIR/GND, K199				
L ENG T/R STOW, K26		1		*
L T/R DISAGREE, K10234		1		*
L T/R HYD ISLN VALVE, K10236		1		*
RELAY – (FIM 31-01-37/101)				
SYS NO. 2 AIR/GND, K203				
R ENG T/R STOW, K27		1		*
R T/R DISAGREE, K10235		1		*
R T/R HYD ISLN VALVE, K10237		1		*
SENSOR – L ENGINE, L T/R AUTO RESTOW PROXIMITY, S10105	1	1	415AL, LEFT FORWARD BULKHEAD, AT LH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SENSOR – L ENGINE, R T/R AUTO RESTOW PROXIMITY, S10108	1	1	416AR, RIGHT FORWARD BULKHEAD, AT RH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SENSOR – R ENGINE, L T/R AUTO RESTOW PROXIMITY, S10105	1	1	425AL, LEFT FORWARD BULKHEAD, AT LH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SENSOR – R ENGINE, R T/R AUTO RESTOW PROXIMITY, S10108	1	1	426AR, RIGHT FORWARD BULKHEAD, AT RH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SENSOR – (FIM 78-36-00/101)				
L ENGINE, LH SLEEVE DEPLOY PROX, S166				
L ENGINE, RH SLEEVE DEPLOY PROX, S167				
R ENGINE, LH SLEEVE DEPLOY PROX, S166				
R ENGINE, RH SLEEVE DEPLOY PROX, S167				
SWITCH – (FIM 26-21-00/101)				
L ENGINE FIRE, S37				
R ENGINE FIRE, S38				
SWITCH – L T/R CONT, S134	5	1	FLT COMPT, P10, THRUST LEVER ASSY M985	*

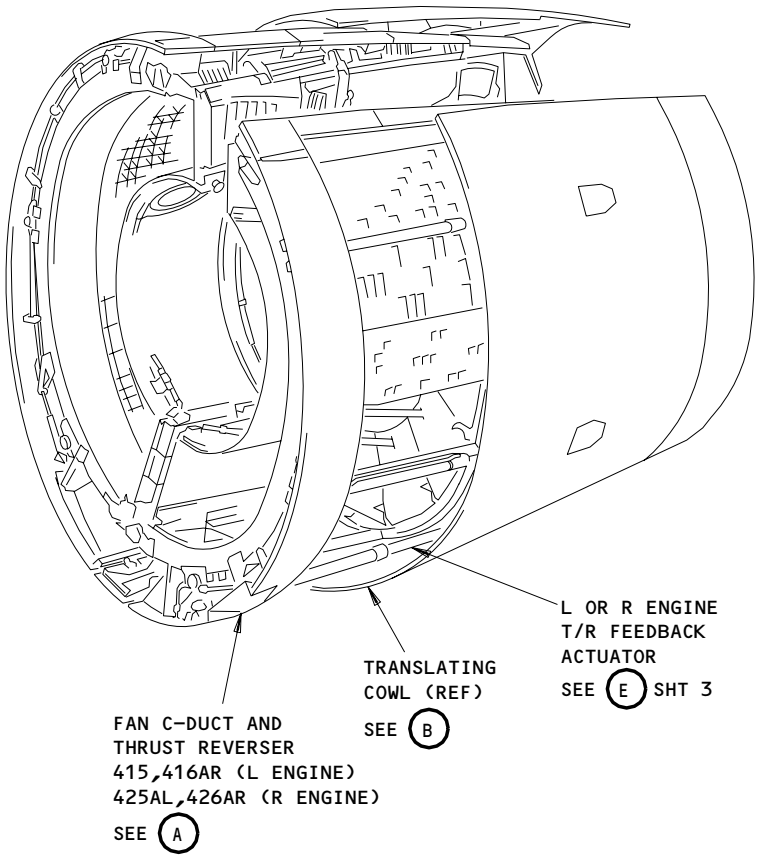
* SEE WDM EQUIPMENT LIST

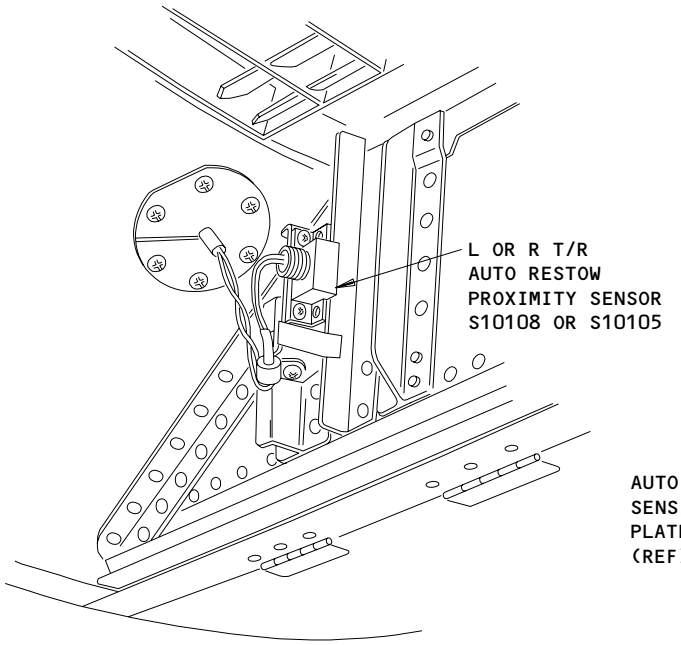
Thrust Reverser Control System – Component Index
Figure 101 (Sheet 1)

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
SOLENOID – L ENG T/R ISOLATION VALVE	2	1	434AL, ISOLATION VALVE V106	*
SOLENOID – R ENG T/R ISOLATION VALVE	2	1	444AL, ISOLATION VALVE V107	*
SWITCH – (FIM 78-36-00/101) L T/R HYD PRESS, S330 R T/R HYD PRESS, S331				
SWITCH – R T/R CONT, S135	5	1	FLT COMPT, P10, THRUST LEVER M985	*
UNIT 1 – (FIM 32-09-00/101) PROXIMITY SWITCH ELECTRONICS, M162				
VALVE – L ENGINE, THRUST REVERSER DIRECTIONAL CONTROL	3	1	432AL	78-34-01
VALVE – L ENGINE, T/R ISOLATION, V106	2	1	434AL	78-34-05
VALVE – R ENGINE, T/R ISOLATION, V107	2	1	444AL	78-34-05
VALVE – R ENGINE, THRUST REVERSER DIRECTIONAL CONTROL	3	1	442AL	78-34-01

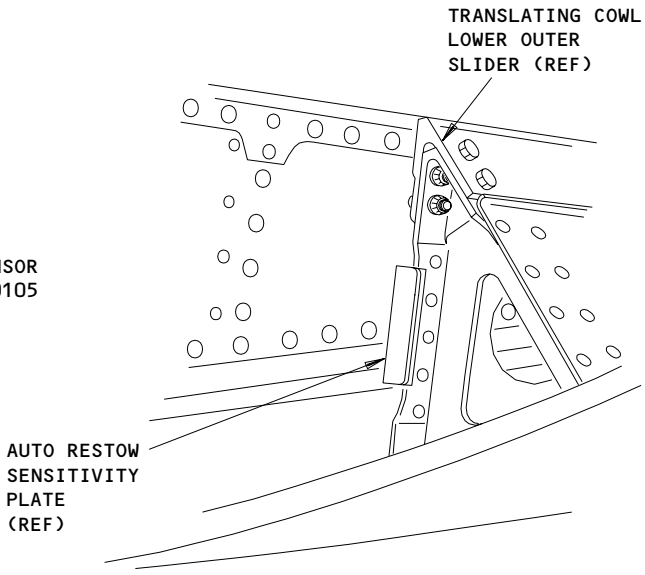
* SEE WM EQUIPMENT LIST

Thrust Reverser Control System –Component Index
Figure 101 (Sheet 2)





FAN C-DUCT AND THRUST REVERSER
A



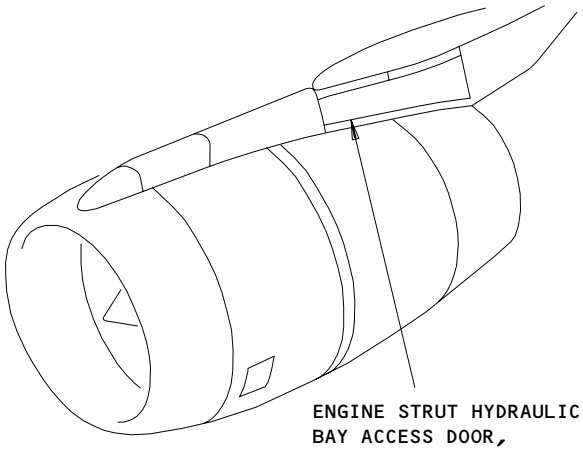
TRANSLATING COWL (REF)
B

51945

Component Location
Figure 102 (Sheet 1)

EFFECTIVITY
AIRPLANES WITHOUT SYNC-LOCKS

H64280

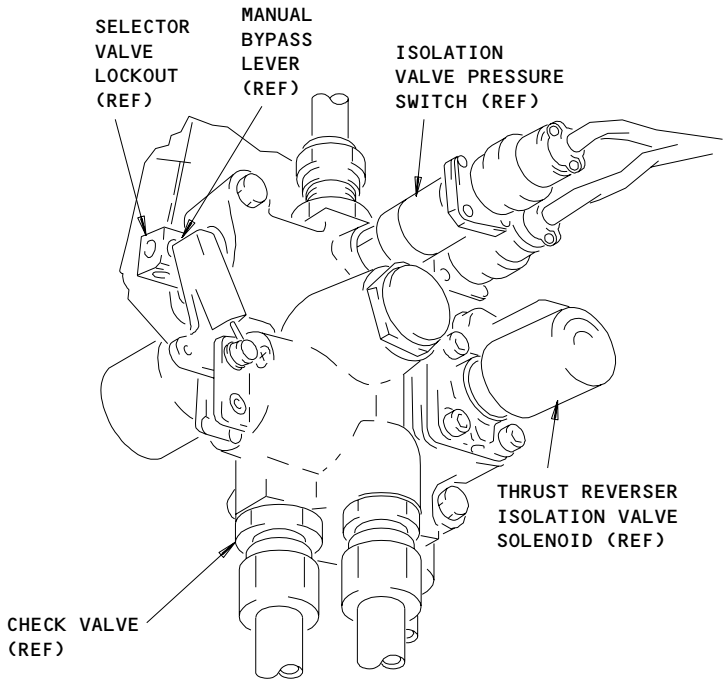


ENGINE STRUT HYDRAULIC BAY ACCESS DOOR, 434AL (LEFT ENGINE), 444AL (RIGHT ENGINE)

SEE (D)

NOT USED

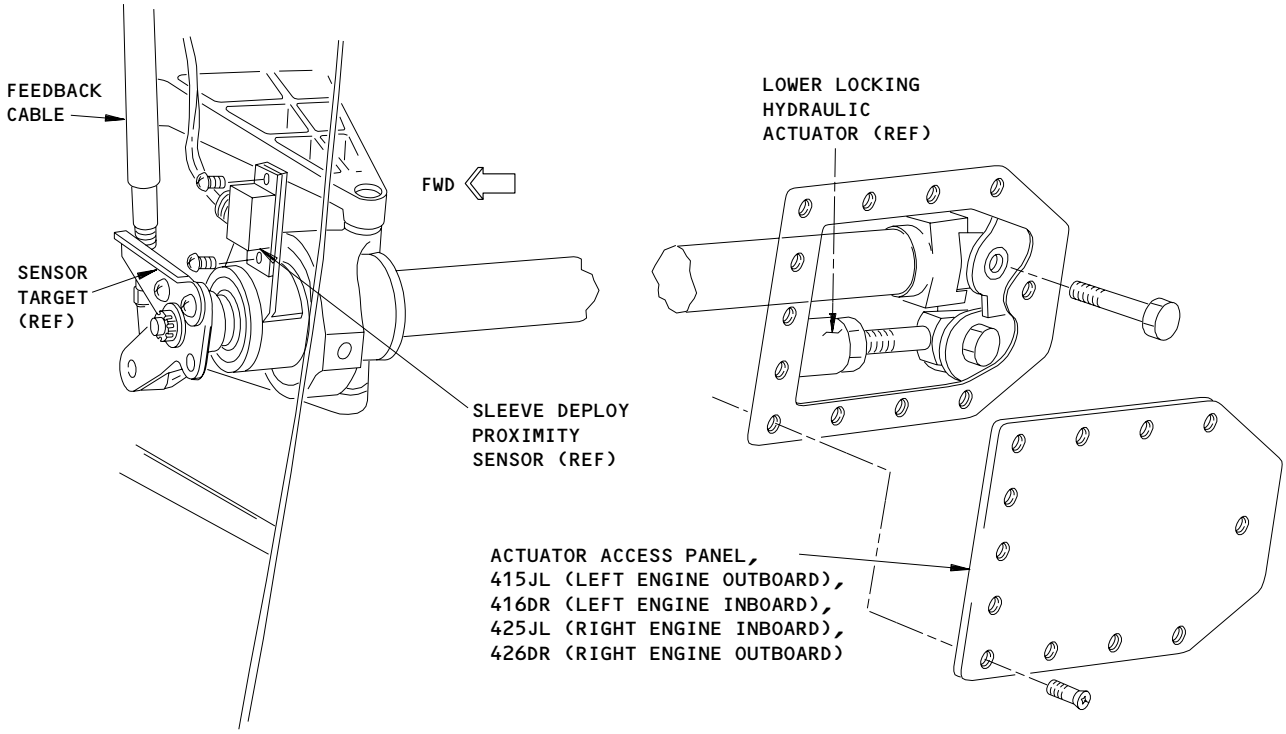
(C)



LEFT OR RIGHT ENGINE T/R ISOLATION VALVE

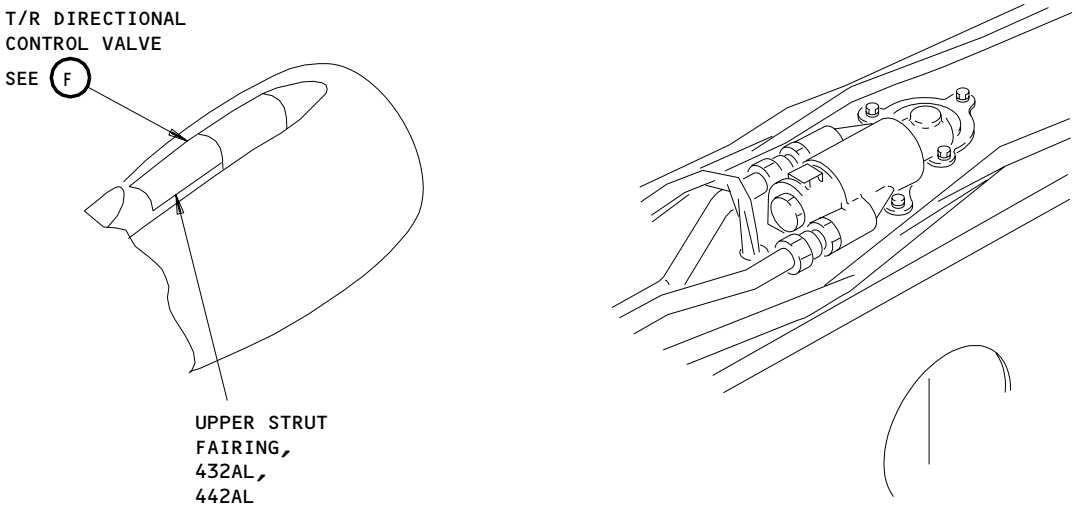
(D)

Thrust Reverser Control System – Component Location
Figure 102 (Sheet 2)



LEFT OR RIGHT ENGINE T/R FEEDBACK ACTUATOR HYDRAULIC

(E) FROM SHT 1



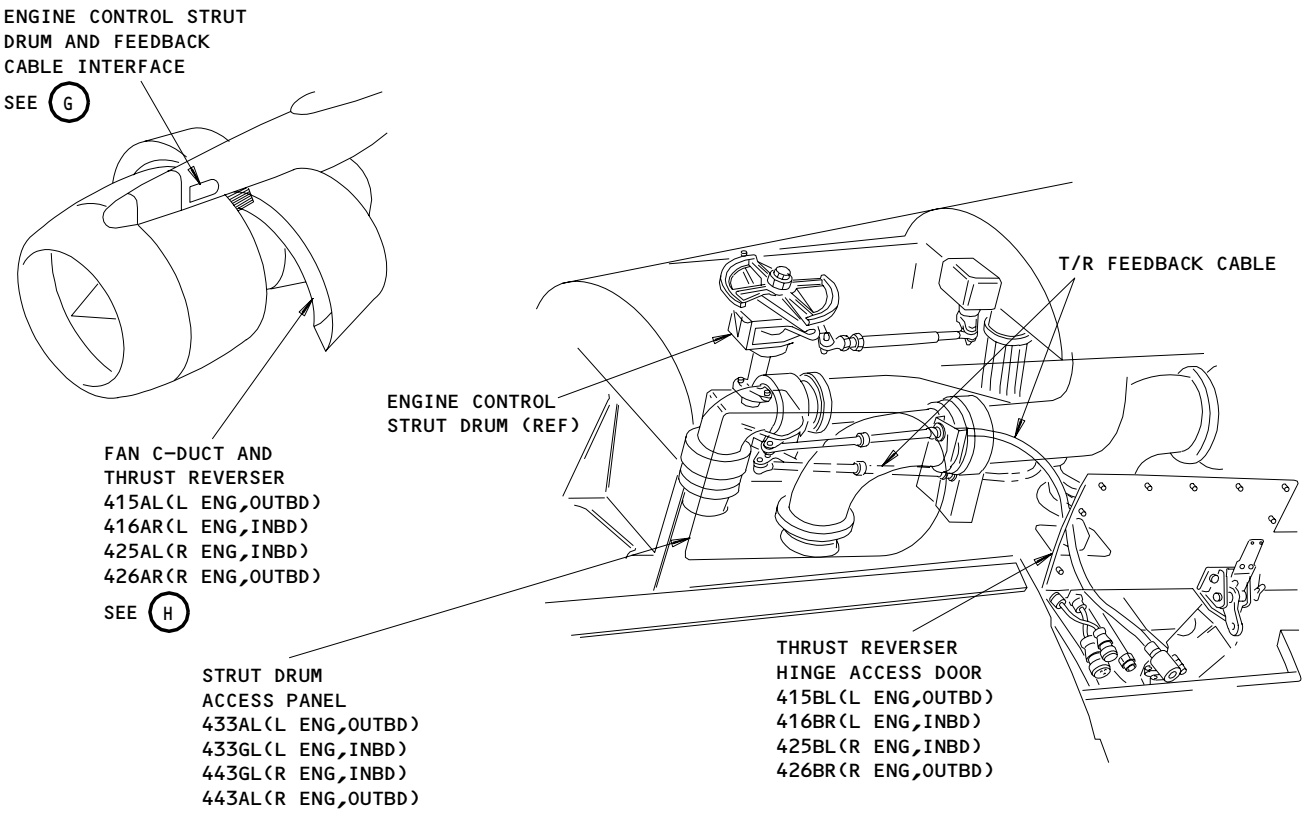
LEFT OR RIGHT ENGINE T/R DIRECTIONAL CONTROL VALVE

(F)

Thrust Reverser Control System – Component Location
Figure 102 (Sheet 3)

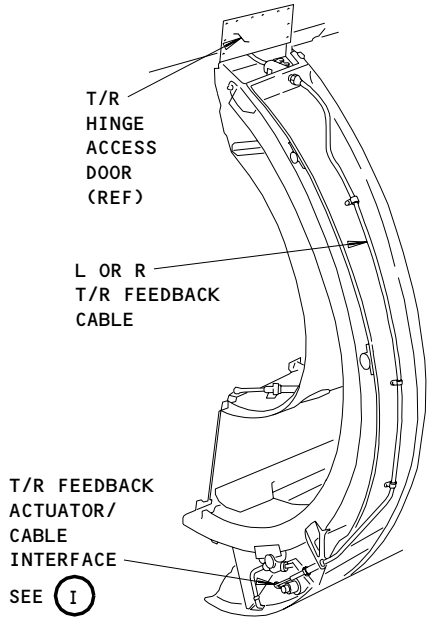
EFFECTIVITY
AIRPLANES WITHOUT SYNC-LOCKS

H64474



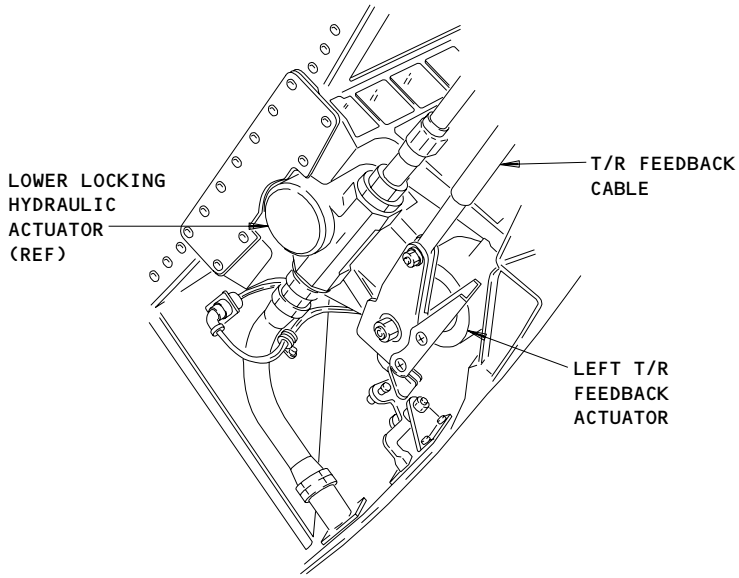
ENGINE CONTROL STRUT DRUM AND FEEDBACK CABLE INTERFACE

G



FAN C–DUCT AND THRUST REVERSER

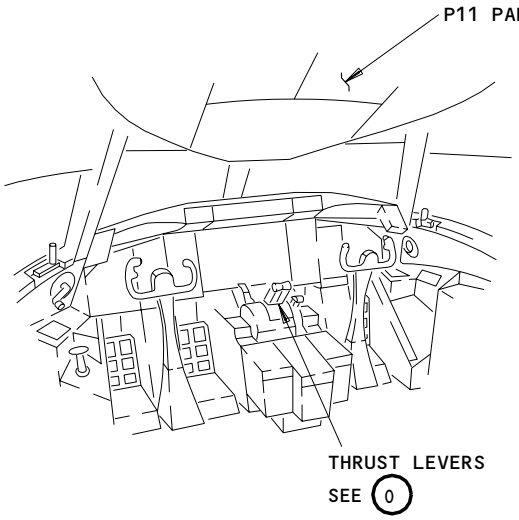
H



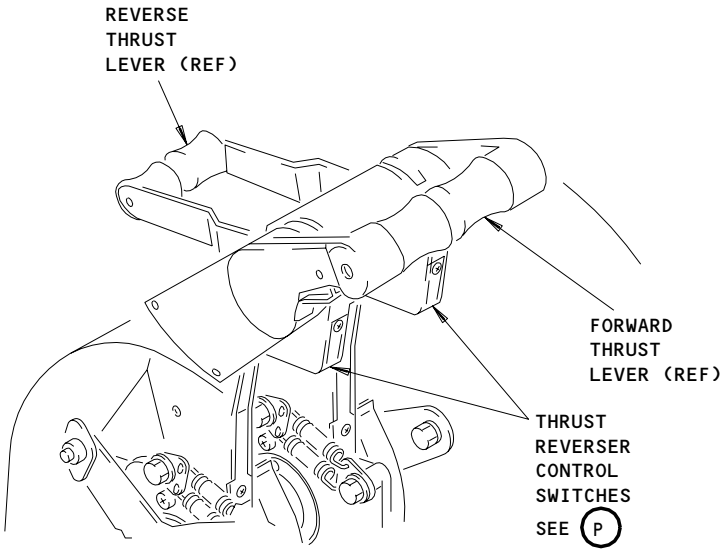
T/R FEEDBACK ACTUATOR/CABLE INTERFACE

I

Component Location
Figure 102 (Sheet 4)

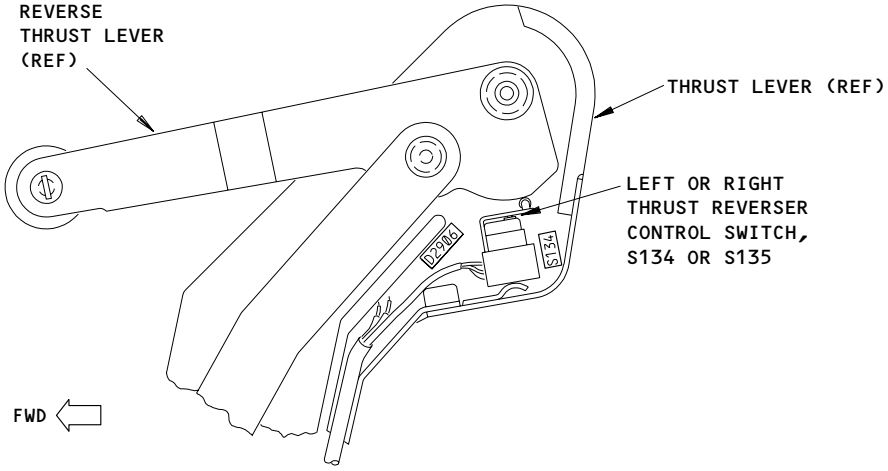


FLIGHT COMPARTMENT



THRUST LEVERS

0



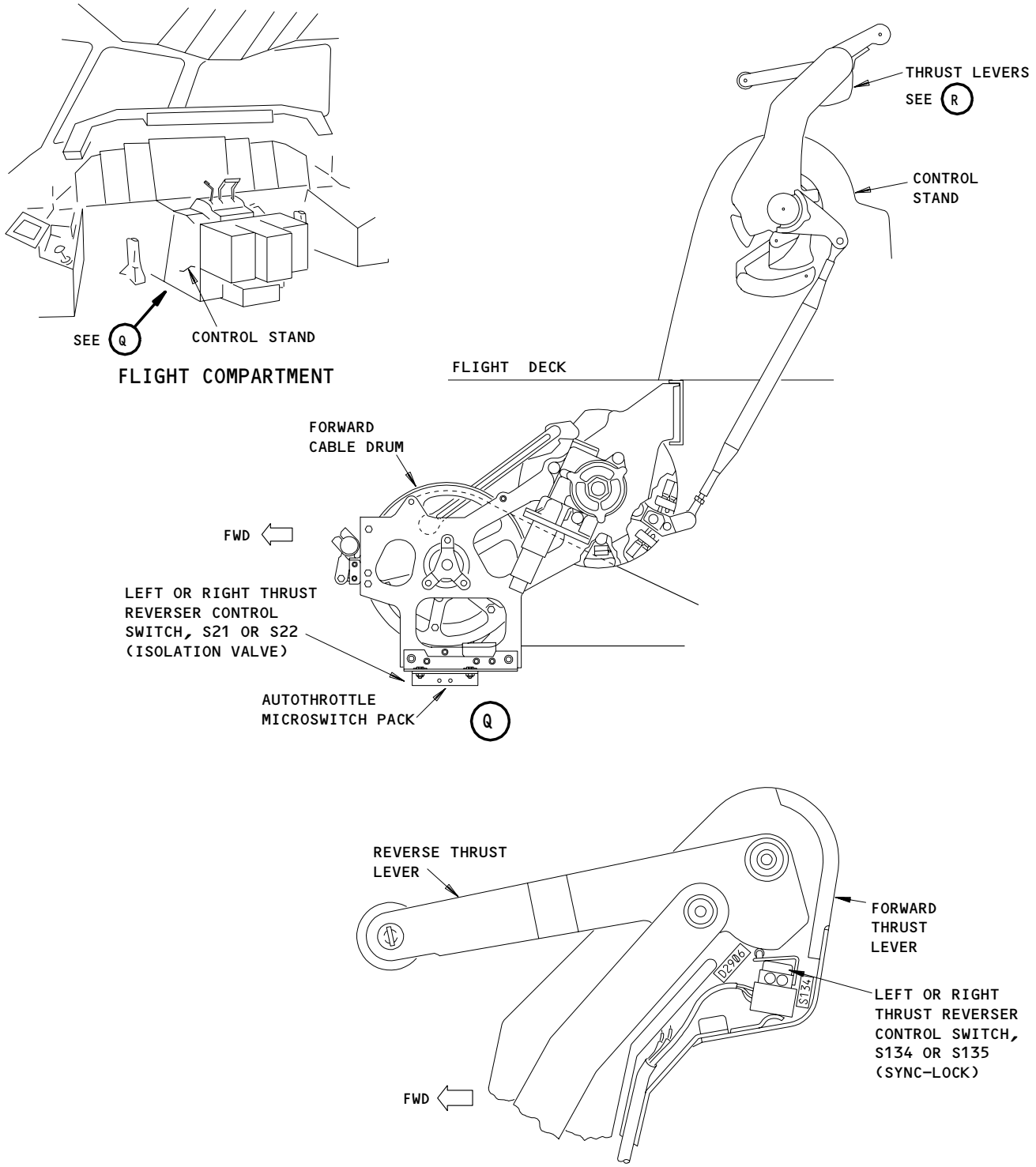
AIRPLANES WITH TITANIUM THRUST LEVERS

P

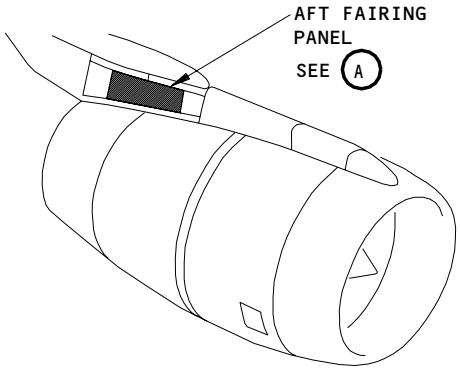
Component Location
Figure 102 (Sheet 5)

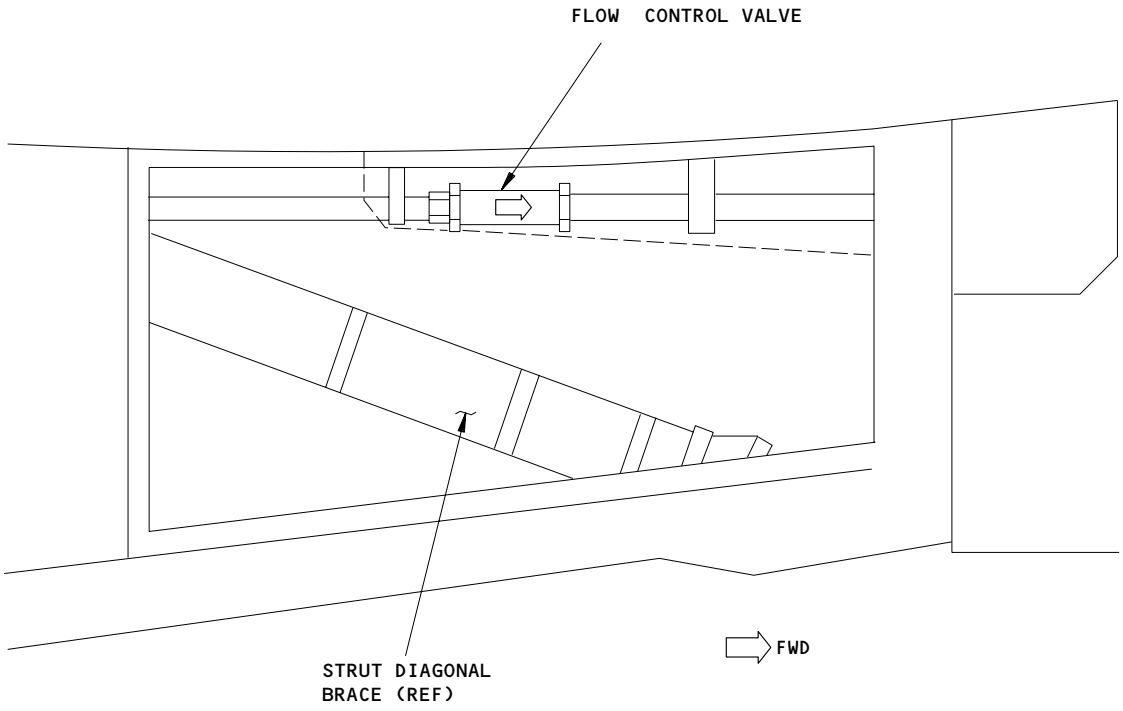
EFFECTIVITY
AIRPLANES WITHOUT SYNC-LOCKS

H64542



Component Location
Figure 102 (Sheet 6)





FLOW CONTROL VALVE LOCATION
A

Flow Control Valve Location
Figure 102 (Sheet 7)

THRUST REVERSER CONTROL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
ACTUATOR – L ENGINE, THRUST REVERSER FEEDBACK	3	2	415AL,416AR, AT THRUST REVERSER LOCKING ACTUATOR	78-34-06
ACTUATOR – R ENGINE, THRUST REVERSER FEEDBACK	3	2	425AL,426AR, AT THRUST REVERSER LOCKING ACTUATOR	78-34-06
CABLE – L ENGINE THRUST REVERSER FEEDBACK	4	2	433AL, STRUT CONTROL DRUM ACCESS, 415AL,416AR, FAN C-DUCT AND THRUST REVERSER	78-34-03
CABLE – R ENGINE THRUST REVERSER FEEDBACK	4	2	STRUT CONTROL DRUM ACCESS, 443AL, STRUT CONTROL DRUM ACCESS, 425AL, 426AR, STRUT CONTROL DRUM ACCESS	78-34-03
CIRCUIT BREAKER –	5		FLT COMPT, P6	
L ENG SYNC-LOCK, C4472		1	6C12	*
R ENG SYNC-LOCK ALTN, C4474		1	6D12	*
CIRCUIT BREAKER –			FLT COMPT, P11	
R ENG SYNC-LOCK, C4470		1	11K32	*
T/R CONT ALTN R, C1483		1	11D12	*
T/R CONT L, C1482		1	11K33	*
T/R CONT R, C4471		1	11B30	*
DIODE (FIM 31-01-36/101)				
SUPPR, R10398				*
DIODE (FIM 31-01-37/101)				
SUPPR, R10399				*
LEVER – (FIM 76-11-00/101)				
THRUST, M985				
MODULE – (FIM 31-01-36/101)		1		*
TIME DELAY, M10004				
MODULE – (FIM 31-01-37/101)		1		*
TIME DELAY, M10010				
RELAY – (FIM 31-01-36/101)				
L ENG T/R STOW, K26		1		*
SYNC-LOCK, K10725		1		*
SYS NO. 1 AIR/GND, K167		1		*
SYS NO. 1 AIR/GND, K199				
RELAY – (FIM 31-01-37/101)				
HIV PWR SENSE, K10724		1		*
R ENG T/R STOW, K27		1		*
SYNC-LOCK, K10726		1		*
SYNC-LOCK PWR SENSE, K10723		1		*
SYS NO. 1 AIR/GND, K10201		1		*
SYS NO. 2 AIR/GND, K203				

* SEE THE WDM EQUIPMENT LIST

Thrust Reverser Control System – Component Index
Figure 101 (Sheet 1)

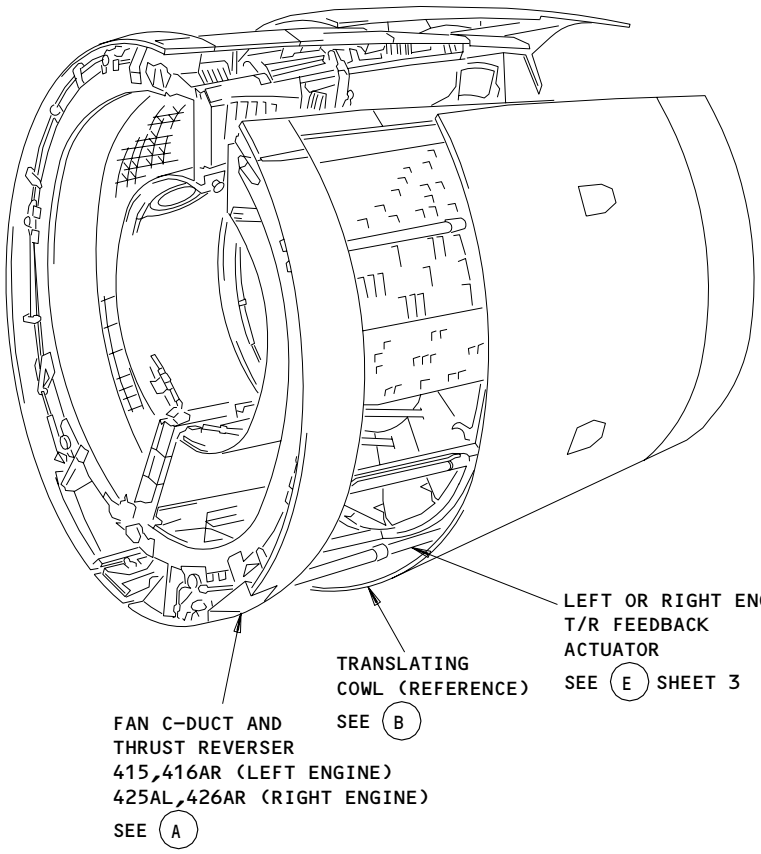
EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

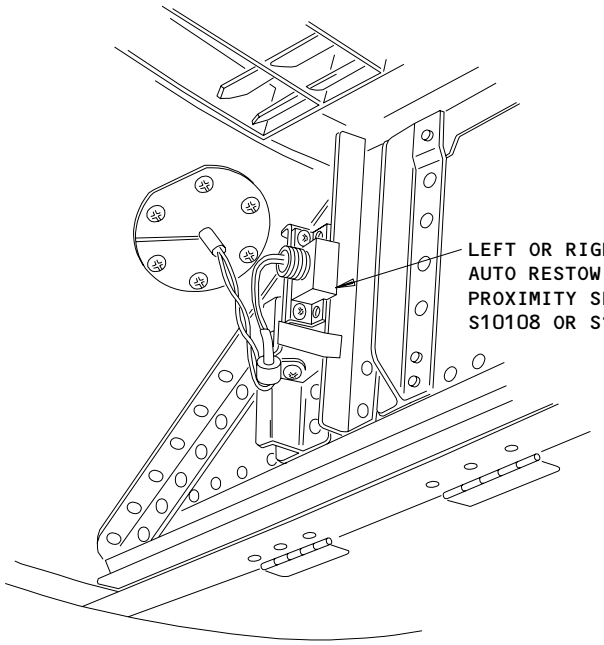
H59915

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
SENSOR – (FIM 78-36-00/101) L ENGINE, LH SLEEVE DEPLOY PROX, S166 L ENGINE, RH SLEEVE DEPLOY PROX, S167 R ENGINE, LH SLEEVE DEPLOY PROX, S166 R ENGINE, RH SLEEVE DEPLOY PROX, S167				
SENSOR – L ENGINE, L T/R AUTO RESTOW PROXIMITY, S10105	1	1	415AL, LEFT FORWARD BULKHEAD, AT LH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SENSOR – L ENGINE, R T/R AUTO RESTOW PROXIMITY, S10108	1	1	416AR, RIGHT FORWARD BULKHEAD, AT RH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SENSOR – R ENGINE, L T/R AUTO RESTOW PROXIMITY, S10105	1	1	425AL, LEFT FORWARD BULKHEAD, AT LH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SENSOR – R ENGINE, R T/R AUTO RESTOW PROXIMITY, S10108	1	1	426AR, RIGHT FORWARD BULKHEAD, AT RH THRUST REVERSER LOCKING ACTUATOR	78-34-07
SOLENOID – L ENG T/R ISOLATION VALVE	2	1	434AL, ISOLATION VALVE V106	*
SOLENOID – R ENG T/R ISOLATION VALVE	2	1	444AL, ISOLATION VALVE V107	*
SWITCH – L T/R CONT, S134 (SYNC-LOCK)	5	1	FLT COMPT, P10, THRUST LEVER ASSY, M985	
SWITCH – R T/R CONT, S135 (SYNC-LOCK)	5	1	FLT COMPT, P10, THRUST LEVER ASSY, M985	
SWITCHES – (FIM 22-32-00/101) L T/R CONT, S21 (ISOLATION VALVE) R T/R CONT, S22 (ISOLATION VALVE)				
SWITCHES – (FIM 26-21-00/101) L ENGINE FIRE, S37 R ENGINE FIRE, S38				
SWITCHES – (FIM 78-36-00/101) L T/R HYD PRESS, S330 R T/R HYD PRESS, S331				
SYNC-LOCK, L ENGINE THRUST REVERSER	6	1	416AR	78-31-26
SYNC-LOCK, R ENGINE THRUST REVERSER	6	1	426AR	78-31-26
UNIT 1 – (FIM 32-09-00/101) PROXIMITY SWITCH ELECTRONICS, M162				
VALVE – L ENGINE, THRUST REVERSER DIRECTIONAL CONTROL	3	1	432AL	78-34-01
VALVE – R ENGINE, THRUST REVERSER DIRECTIONAL CONTROL	3	1	442AL	78-34-01
VALVE – L ENGINE, T/R ISOLATION, V106	2	1	434AL	78-34-05
VALVE – R ENGINE, T/R ISOLATION, V107	2	1	444AL	78-34-05

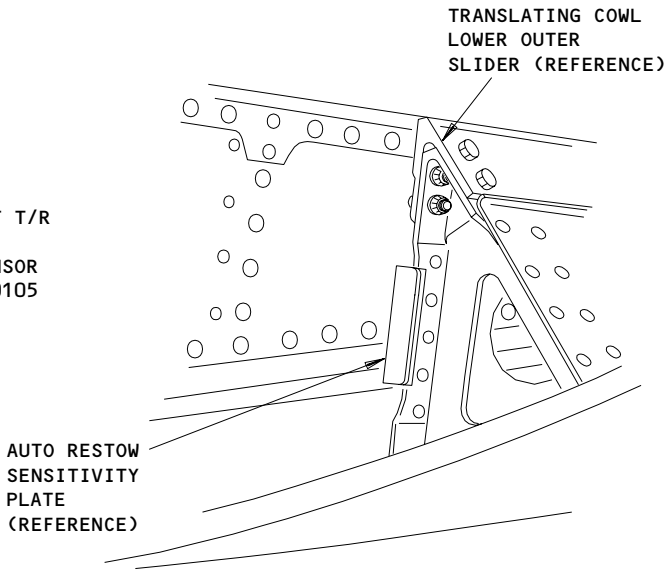
* SEE THE WDM EQUIPMENT LIST

Thrust Reverser Control System – Component Index
Figure 101 (Sheet 2)





FAN C-DUCT AND THRUST REVERSER
A



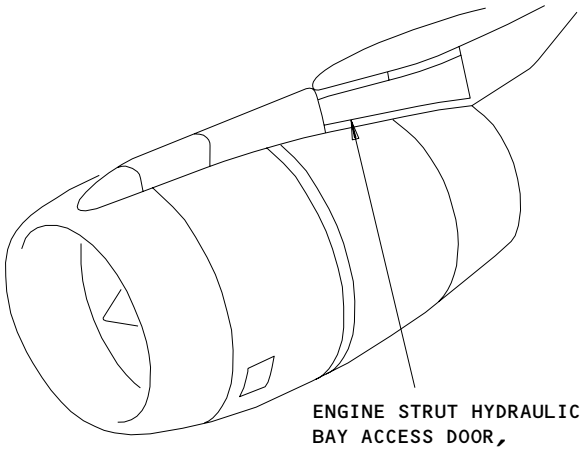
TRANSLATING COWL (REFERENCE)
B

51945

Component Location
Figure 102 (Sheet 1)

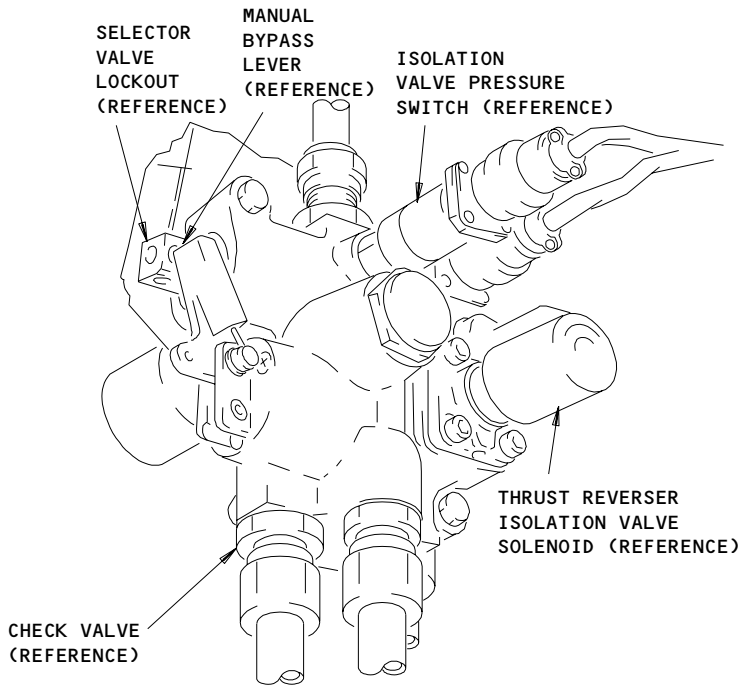
EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

H59929



NOT USED

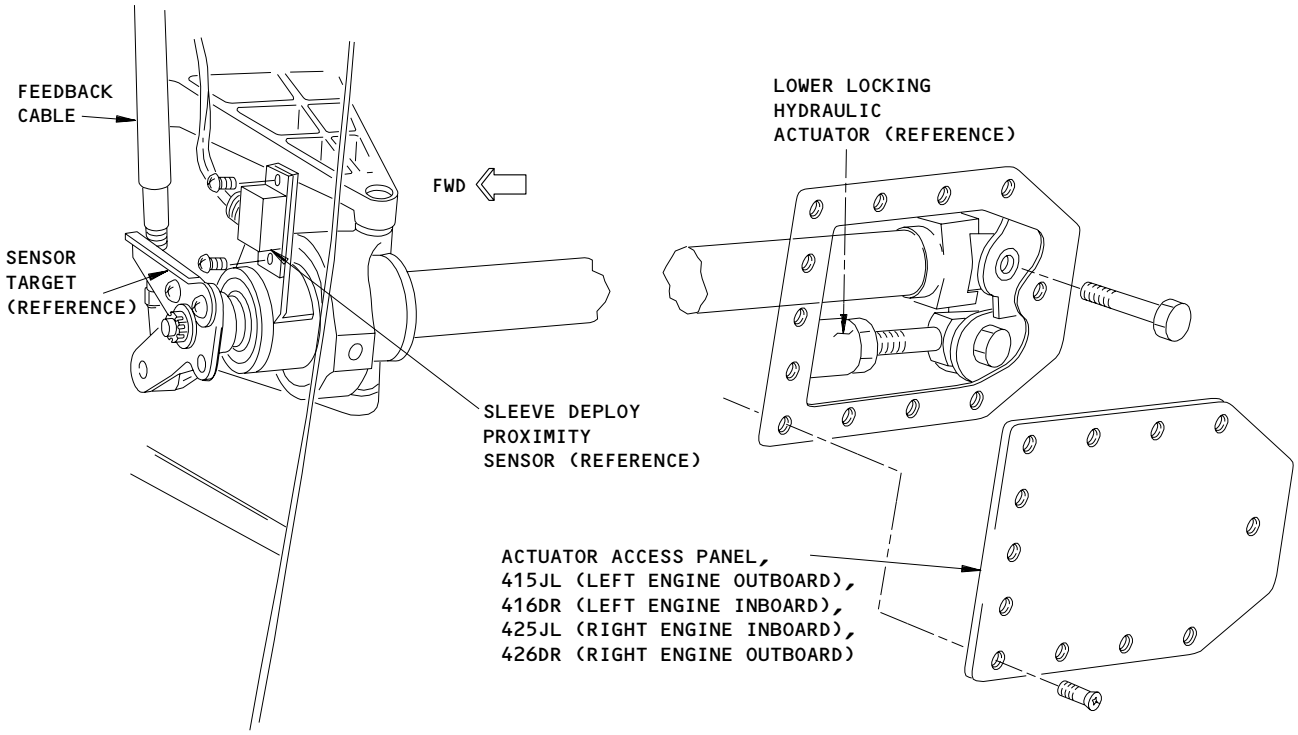
C



LEFT OR RIGHT ENGINE T/R ISOLATION VALVE

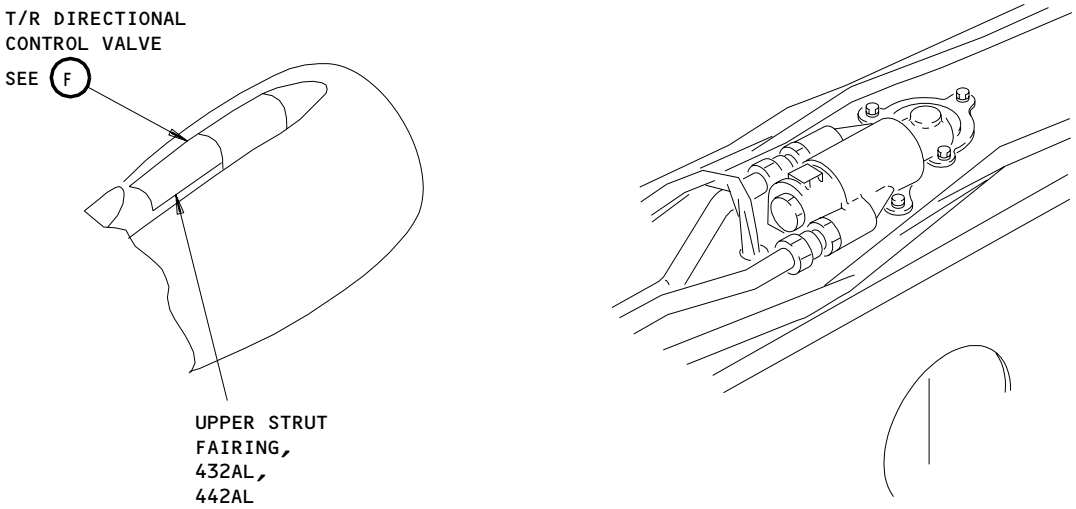
D

Thrust Reverser Control System – Component Location
Figure 102 (Sheet 2)



LEFT OR RIGHT ENGINE T/R FEEDBACK ACTUATOR HYDRAULIC

(E) FROM SHT 1



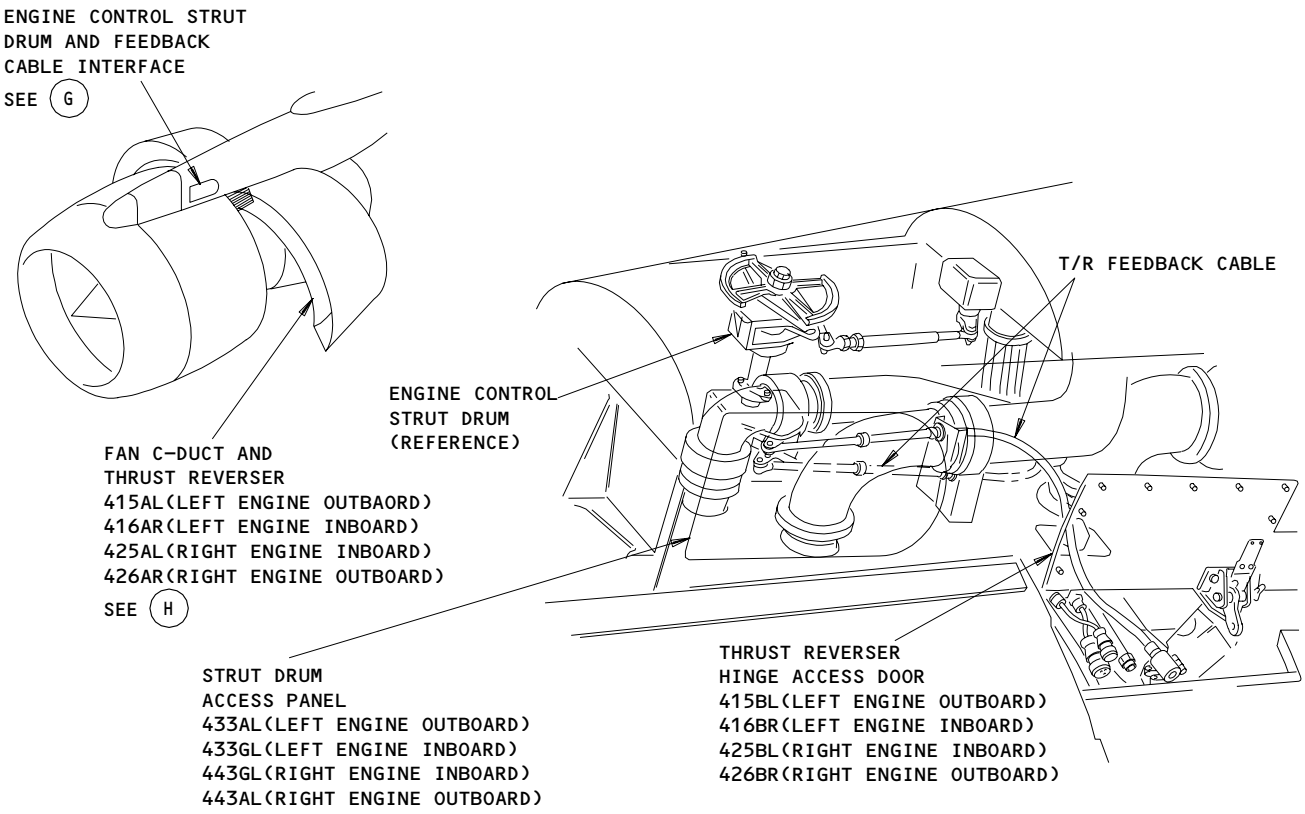
LEFT OR RIGHT ENGINE T/R DIRECTIONAL CONTROL VALVE

(F)

Thrust Reverser Control System – Component Location
Figure 102 (Sheet 3)

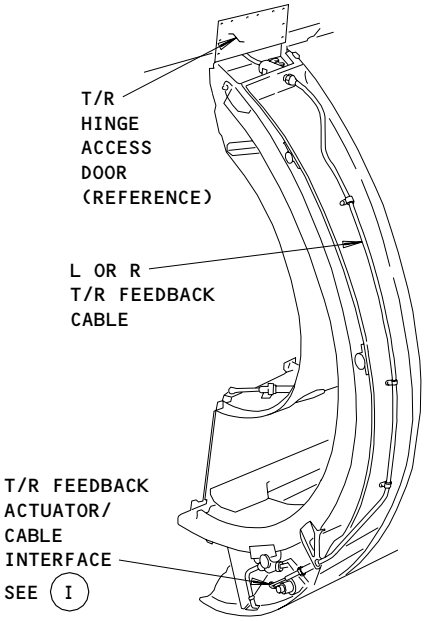
EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

H60017



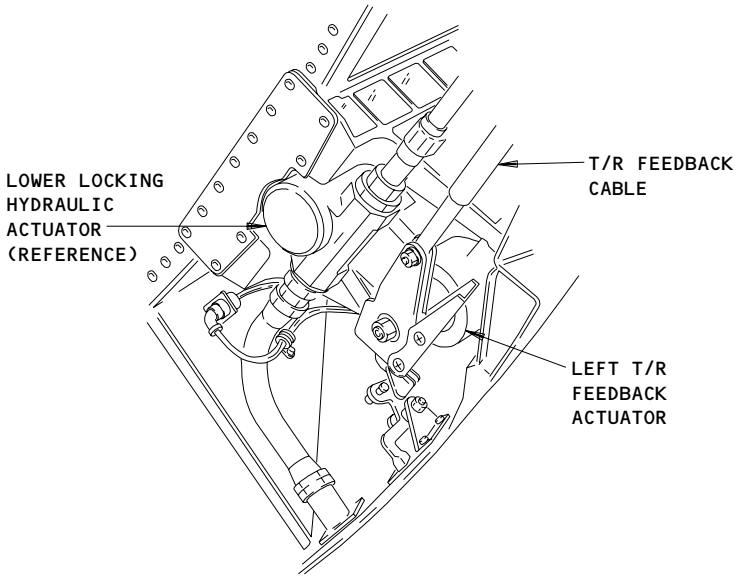
ENGINE CONTROL STRUT DRUM AND FEEDBACK CABLE INTERFACE

G



FAN C–DUCT AND THRUST REVERSER

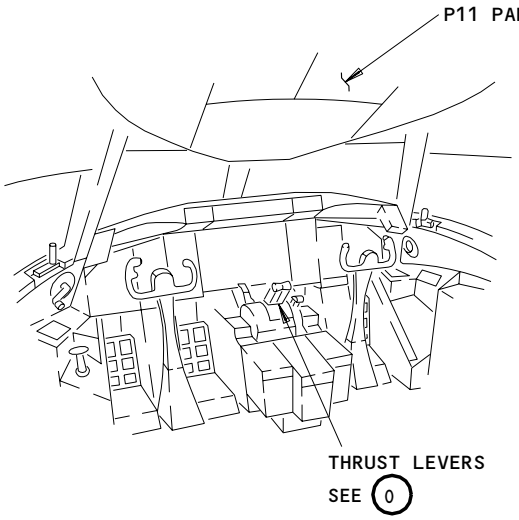
H



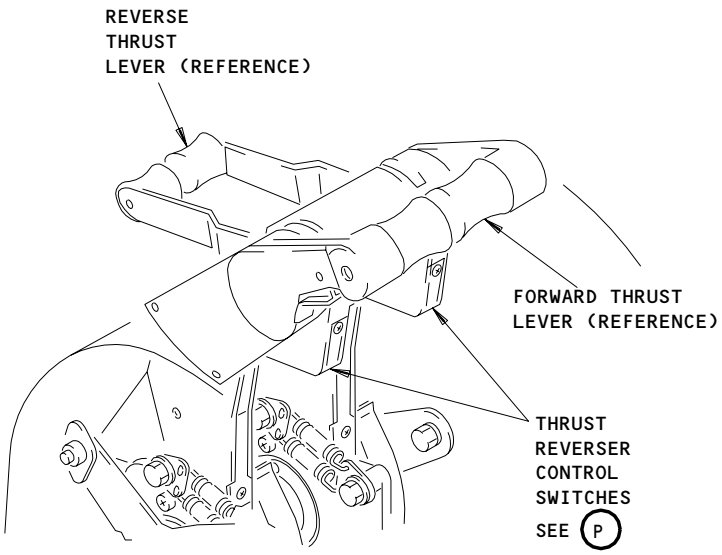
T/R FEEDBACK ACTUATOR/CABLE INTERFACE

I

Component Location
Figure 102 (Sheet 4)

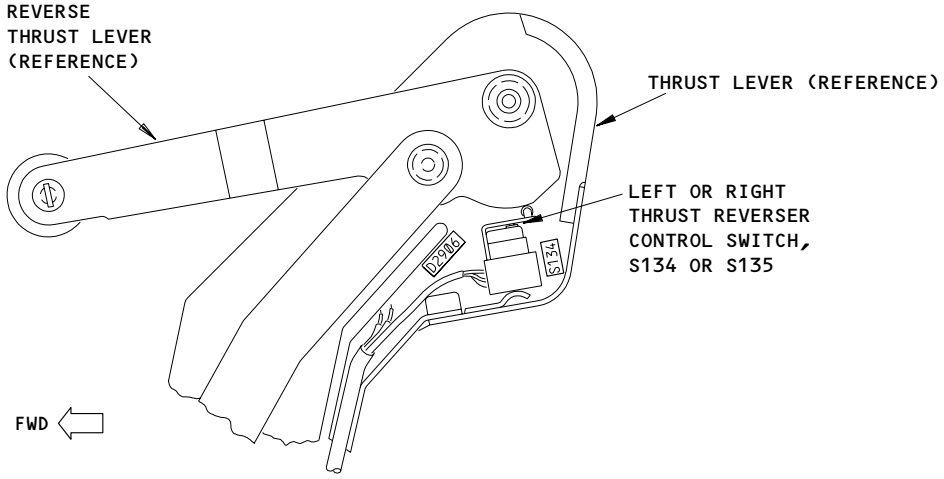


FLIGHT COMPARTMENT



THRUST LEVERS

0



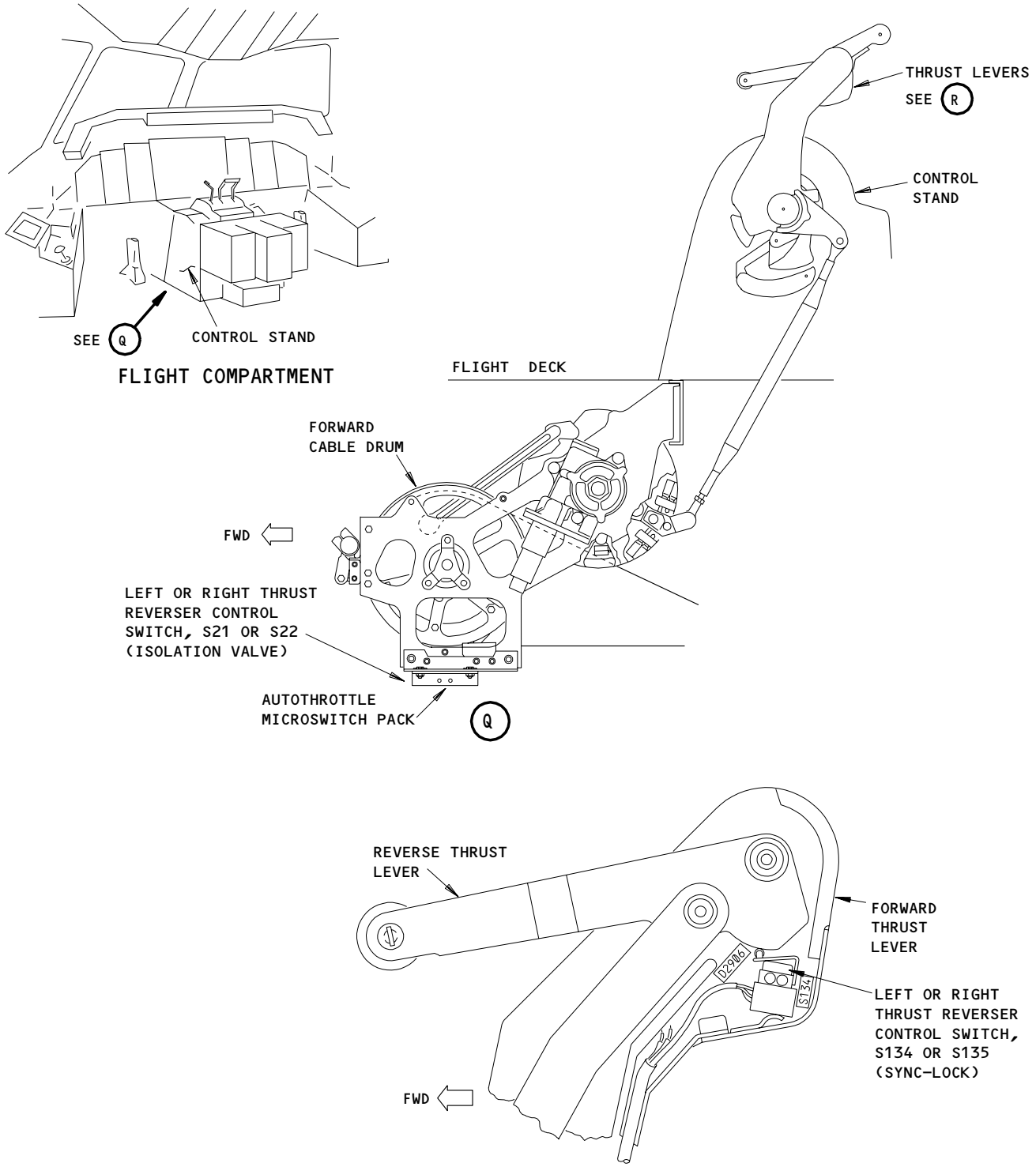
AIRPLANES WITH TITANIUM THRUST LEVERS

P

Component Location
Figure 102 (Sheet 5)

EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

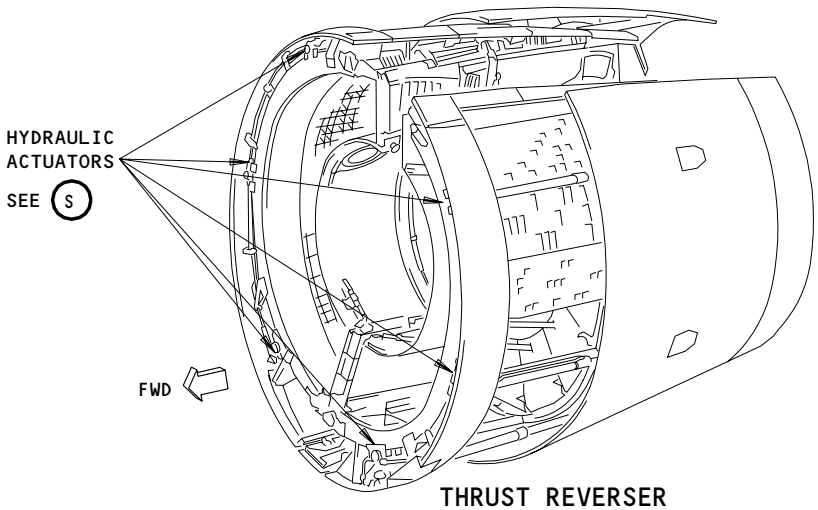
H60071



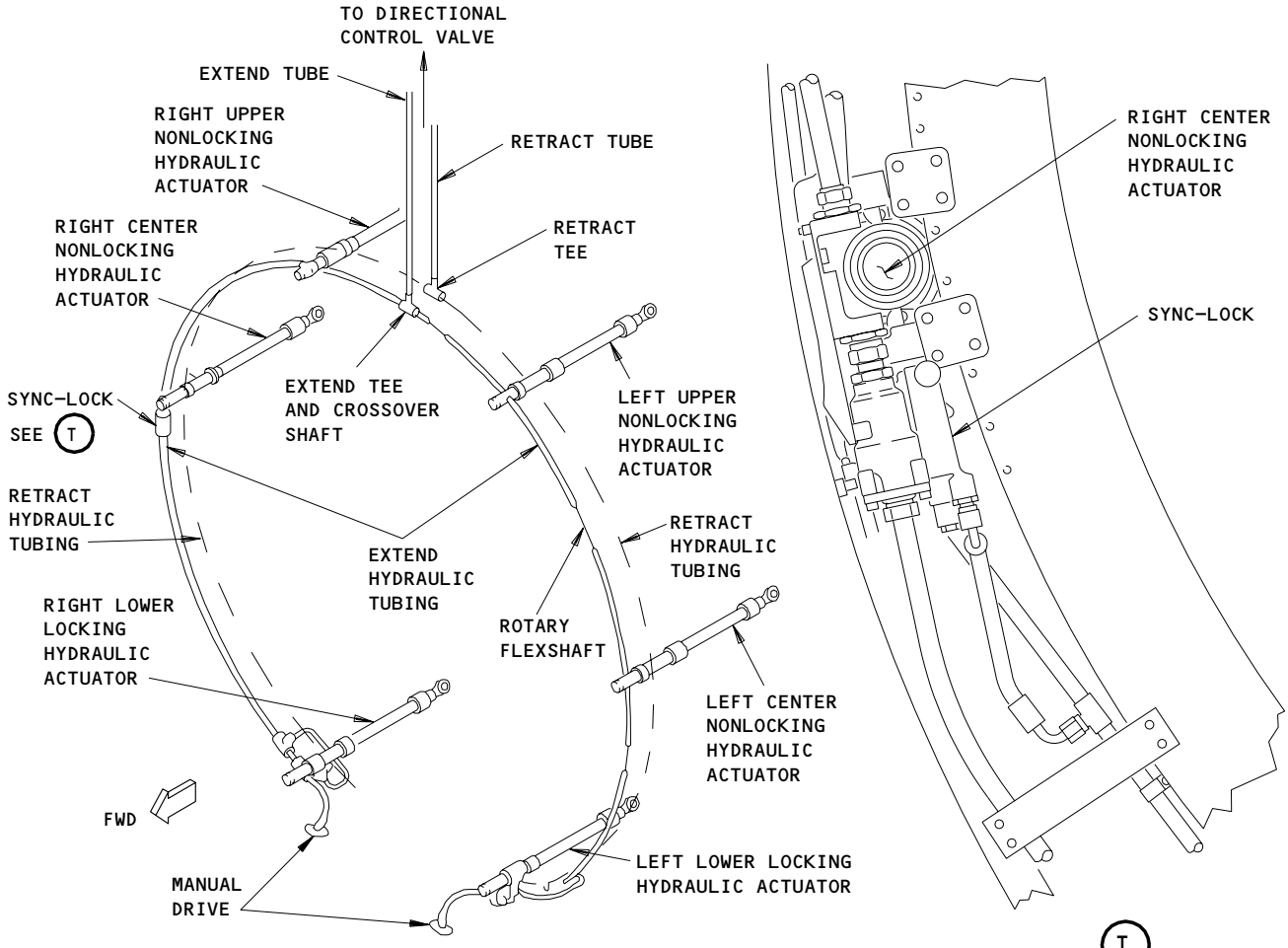
Component Location
Figure 102 (Sheet 6)

EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

H60085



THRUST REVERSER

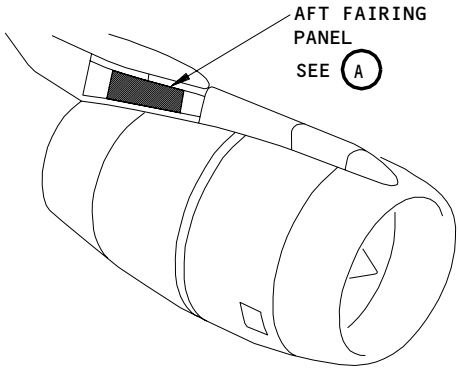


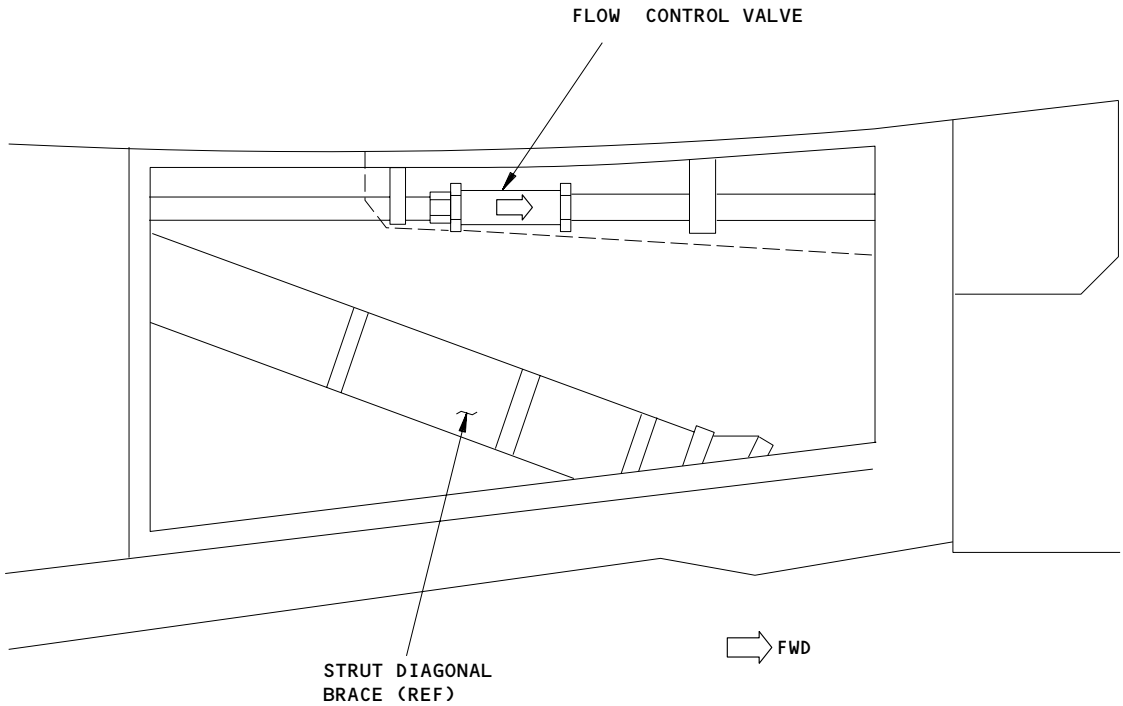
HYDRAULIC ACTUATORS
(S)

Thrust Reverser Control System - Component Location
Figure 102 (Sheet 7)

EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

H60102





FLOW CONTROL VALVE LOCATION
A

Flow Control Valve Location
Figure 102 (Sheet 8)

THRUST REVERSER CONTROL SYSTEM - INSPECTION/CHECK

1. General
   A. This procedure makes an inspection of the control system of the thrust reverser.
   B. You can use this procedure on the left and right thrust reverser.

TASK 78-34-00-216-001-R00

2. Thrust Reverser Control System Inspection
   A. References
      (1) AMM 54-52-01/401, Strut Fairings
      (2) AMM 54-53-01/401, Strut Access Doors
      (3) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones

415/425	Thrust Reverser - Left
416/426	Thrust Reverser - Right
431/441	Forward Nacelle Strut Fairing
433/443	Nacelle Strut - Mid Structure
434/433	Nacelle Strut - Aft Fairing

      (2) Access Panels

431AL/441AL	Forward Fairing - Top Section
433AL/443AL	Forward Pressure Relief Doors - Left
433GR/443AR	Forward Pressure Relief Doors - Right
433BL/443HL	Forward Pressure Relief Doors - Left
433HR/443BR	Forward Pressure Relief Doors - Right
434CL/444CL	Trailing Edge Fairing

   C. Make an Inspection of the Control System of the Thrust Reverser

S 016-015-R00

CAUTION: OBEY THE INSTRUCTIONS IN THE PROCEDURE WHEN YOU OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Open the left (right) thrust reverser (AMM 78-31-00/201).

S 216-003-R00

(2) Make an inspection of these items to make sure they are serviceable and attached correctly:
   (a) Feedback actuators.

(b) Feedback cables.
(c) Feedback cams.

S 216-004-R00
(3) Make an inspection of the proximity sensors for the auto restow function and its wire bundle to make sure they are serviceable and attached correctly.

NOTE: Examine the parts of the proximity sensors and the wire bundle that you can see.

S 416-014-R00

CAUTION: OBEY THE INSTRUCTIONS IN THE PROCEDURE WHEN YOU CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Close the left (right) thrust reverser (AMM 78-31-00/201).

S 016-006-R00
(5) Remove the access panels 431AL(441AL) (AMM 54-52-01/401).

S 016-007-R00
(6) Remove these access panels: 433AL(443AL), 433GR(443AR), 433BL(443HL), and 433HR)443BR) (AMM 54-53-01/401).

S 216-008-R00
(7) Make an inspection of these items to make sure they are serviceable and attached correctly:
(a) Directional control valve.
(b) Input control rod.

S 416-009-R00
(8) Install these access panels: 433AL(443AL), 433GR(443AR), 433BL(443HL), and 433HR)443BR) (AMM 54-53-01/401).

S 416-010-R00
(9) Install the access panels 431AL(441AL) (AMM 54-52-01/401).

S 016-011-R00
(10) Remove the access panels 434CL(444CL) (AMM 54-52-01/401).

S 216-012-R00

(11) Make an inspection of the wire bundle for the isolation valve to make sure they are serviceable and attached correctly.

NOTE: Examine the parts of the wire bundle for the isolation valve that you can see.

S 416-013-R00

(12) Install the access panels 434CL(444CL) (AMM 54-52-01/401).

THRUST REVERSER DIRECTIONAL CONTROL VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure has a task to remove and a task to install the directional control valve for the thrust reverser system. The directional control valve is installed in the strut area.

TASK 78-34-01-004-008-R00

2. Thrust Reverser Directional Control Valve Removal (Fig. 401)
   A. References

      (1) AMM 54-52-01/401, Strut Fairing
      (2) AMM 54-53-01/401, Strut Access Doors

   B. Access
      (1) Location Zones
          430 Left Engine Strut
          440 Right Engine Strut

   C. Procedure

      S 044-024-R00

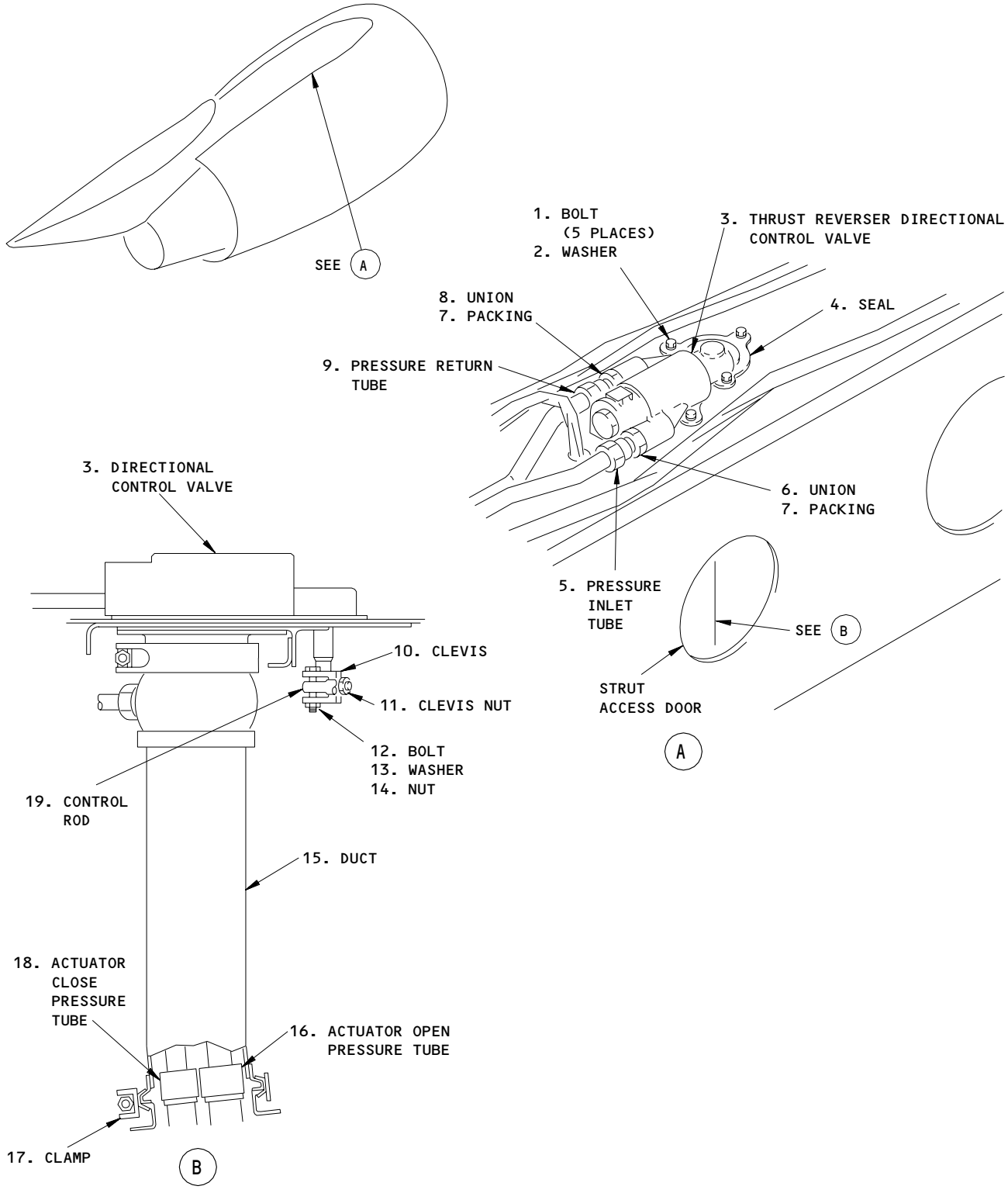
      WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO THE EQUIPMENT.

      (1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

      S 864-001-R00
      (2) Make sure the forward thrust lever is fully aft and the reverse thrust lever is fully forward.
          (a) Attach DO-NOT-OPERATE tags to the thrust levers.

      S 014-003-R00
      (3) Remove the upper fairing (AMM 54-52-01/401).

      S 014-004-R00
      (4) Remove the strut access door (AMM 54-53-01/401).



Thrust Reverser Directional Control Valve Installation
Figure 401

S 034-013-R00

CAUTION: BE PREPARED TO CATCH HYDRAULIC FLUID. IMMEDIATELY CLEAN ALL THE HYDRAULIC FLUID THAT FALLS. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE PARTS.

(5) Disconnect the hydraulic tubes from the directional control valve:
  (a) Disconnect the pressure inlet tube (5) and the pressure return tube (9) from the directional control valve.
    1) Install protective caps on the two tubes and on the directional control valve.
  (b) Remove the clamp (17).
  (c) Move the duct up to get access to the actuator open and the actuator close pressure tubes (16 and 18).
  (d) Disconnect the actuator open pressure tube (16) and the actuator close pressure tube (18).
    1) Install protective caps on the pressure tubes (16 and 18) and on the directional control valve.

S 024-012-R00

(6) Do these steps to remove the directional control valve:
  (a) Remove the bolt (12), the washer (13), and the nut (14) to disconnect the control rod (19) from the directional control valve.
  (b) Loosen the clevis nut (11) to remove the clevis (10) from the valve shaft.
  (c) Remove the bolts (1) that attach the directional control valve to the strut.
  (d) Remove the directional control valve (3) and the seal (4).

S 034-011-R00

(7) If you will replace the directional control valve (3), remove the unions (6 and 8) and the packings (7).

TASK 78-34-01-404-009-R00

3. Thrust Reverser Directional Control Valve Installation (Fig. 401)

A. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Bolt	78-34-01	01	145
	2	Washer			150
	3	Directional Control Valve			155
	4	Seal			160
	6	Union			5
	7	Packing			10
	8	Union			7, 9
	10	Clevis			
	12	Bolt	76-11-04	01	310
	13	Washer			315
	14	Nut			320
	17	Clamp	78-34-01	01	130

B. References

(1) AMM 54-52-01/401, Strut Fairing
(2) AMM 54-53-01/401, Strut Access Doors
(3) AMM 78-31-00/201, Thrust Reverser
(4) AMM 78-31-00/501, Thrust Reverser

C. Access

(1) Location Zones
430 Left Engine Strut
440 Right Engine Strut

D. Procedure

S 434-010-R00

(1) If you will install a new directional control valve (3), do these steps:
(a) Install the union (6) and the packing (7) into the pressure inlet port on the directional control valve.
(b) Install the union (8) and the packing (7) into the pressure outlet port on the directional control valve.

S 424-014-R00

(2) Do these steps to install the directional control valve:
(a) Attach the valve (3) and the seal (4) to the strut with the bolts (1) and washers (2).
(b) Install the clevis (10) on the valve shaft and tighten the clevis nut (11).
(c) Install the bolt (12), the washer (13), and the nut (14) to attach the control rod (19) to the clevis.

S 434-015-R00
(3) Do these steps to connect the hydraulic tubes to the directional control valve:
  (a) Move the duct up to get access to the connectors for the actuator open and close pressure tubes (16 and 18).
  (b) Connect the actuator open pressure tube (16).
  (c) Connect the actuator close pressure tube (18).
  (d) Move the duct (15) down and install the clamp (7).
  (e) Connect the pressure return tube (9).
  (f) Connect the pressure inlet tube (5).

S 444-025-R00
(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-017-R00
(5) Remove the DO-NOT-OPERATE tags from the thrust levers.

S 714-026-R00
(6) Do the tests that are given in the test reference table for the thrust reverser (AMM 78-31-00/501).

S 214-019-R00
(7) Examine the directional control valve for hydraulic leakage.

S 414-020-R00
(8) Install the strut access door (AMM 54-53-01/401).

S 414-021-R00
(9) Install the upper fairing (AMM 54-52-01/401).

THRUST REVERSER FEEDBACK CABLES - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the tasks to remove and install the left or right feedback cables. Each cable is divided into a lower and upper half. The tasks are:
      (1) Remove the Thrust Reverser Feedback Cables
          (a) Prepare to remove the feedback cables.
          (b) Remove the upper feedback cable.
          (c) Remove the lower feedback cable.
      (2) Install the Thrust Reverser Feedback Cables.
          (a) Install the upper feedback cable.
          (b) Install the lower feedback cable.
          (c) Put the airplane back to the usual condition.

   TASK 78-34-03-024-001-R00

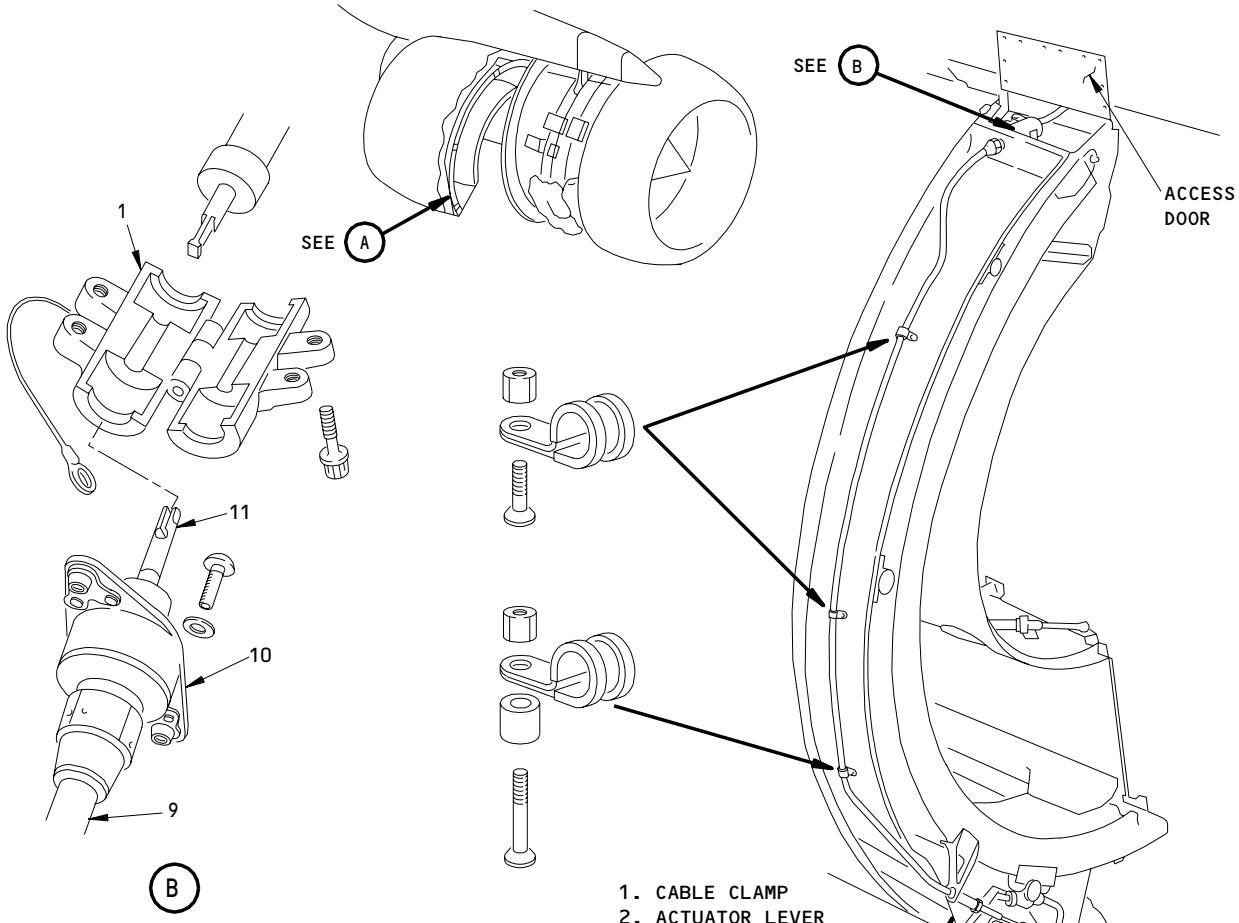
2. Remove the Thrust Reverser Feedback Cables
   A. Consumable Materials
      (1) Lockwire
          British Spec/Ref - 22 S.W.G.
          American Spec/Ref - 21 A.W.G.
          OMat No. 238
   B. References
      (1) AMM 70-51-00/201, Torque Tightening Technique
      (2) AMM 78-31-00/201, Thrust Reverser System
   C. Access
      (1) Location Zones
          410 Left Power Plant Nacelle
          420 Right Power Plant Nacelle

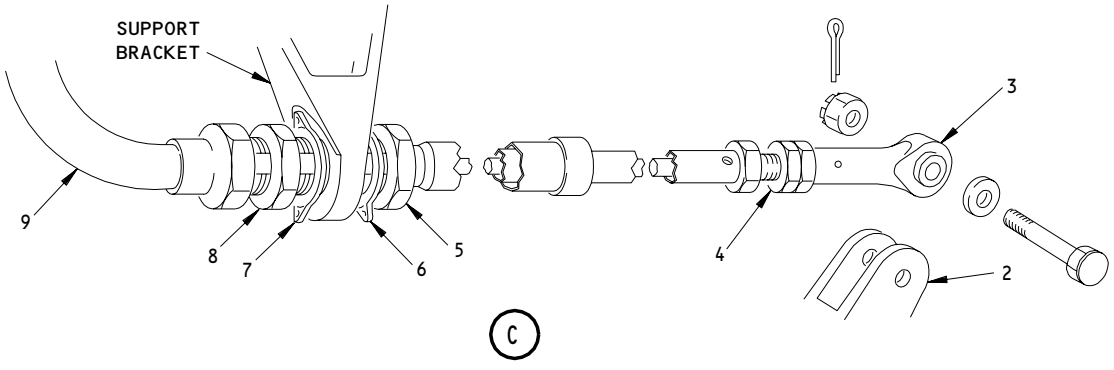
   D. Prepare to Remove the Feedback Cables.

      S 044-021-R00

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

      (1) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).





Lower Thrust Reverser Feedback Cable Installation
Figure 401

S 014-020-R00

(2) Open the strut pressure relief door (14) to get access to the rod end on the upper feedback cable.

S 014-009-R00

(3) Open the strut access panel (15) to disconnect the upper feedback cable from the lower feedback cable.

S 014-007-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Open the thrust reverser (AMM 78-31-00/201).

NOTE: You must open the thrust reverser to get access to the rod end on the lower feedback cable.

S 984-008-R00

(5) Manually extend the thrust reverser approximately 3.0 inches (76.2 mm) (AMM 78-31-00/201).

NOTE: This operation is necessary to remove the bolt, washer and nut which attaches the cable rod end to the feedback actuator.

E. Remove the Lower Feedback Cable.

S 024-002-R00

(1) Do these steps to remove the lower feedback cable of the thrust reverser (Fig. 401).
   (a) Remove the cotter pin, bolt, washer and nut which attaches the cable rod end (3) to the actuator lever (2).
   (b) Remove the cable rod end (3) from the actuator lever (2).
   (c) Open the cable clamp assembly (1) and disconnect the feedback cable (11).
   (d) Remove the feedback cable (11) from the cable housing (9).
   (e) Remove the two screws and washers which secure the bracket assembly (10).
   (f) Remove the nut (5) and the tab washer (6).
   (g) Remove the support clips for the cable housing and remove the housing (9).

F. Remove the Upper Feedback Cable.

S 024-003-R00

(1) Do the steps that follow to remove the upper feedback cable of the thrust reverser (Fig. 402).
  (a) Remove the bolt (13), washer (12) and nut (11) which hold the cable rod end (2) to the throttle baulk lever (1).
  (b) Remove the cable rod end (2) from the throttle baulk lever (1).
  (c) Open the cable clamp assembly (5) and disconnect the feedback cable (3).
  (d) Remove the feedback cable (3) from the cable housing (4).
  (e) Remove the lockwire and loosen the unions (6) and (7) and remove the insert (8).
  (f) Remove the flange on the forward cable housing from the cutout in the structure.
    1) Remove the nuts (18), washers (17) and the bolts (16).
  (g) Remove the cable housing (4) from the aircraft strut.

TASK 78-34-03-424-004-R00

3. Install the Thrust Reverser Feedback Cables

A. Equipment
  (1) B20003-XX Rig Pin Set (AMM 20-10-24/201)
    (a) RR2 - P/N B20003-29 or MS20392-4C87

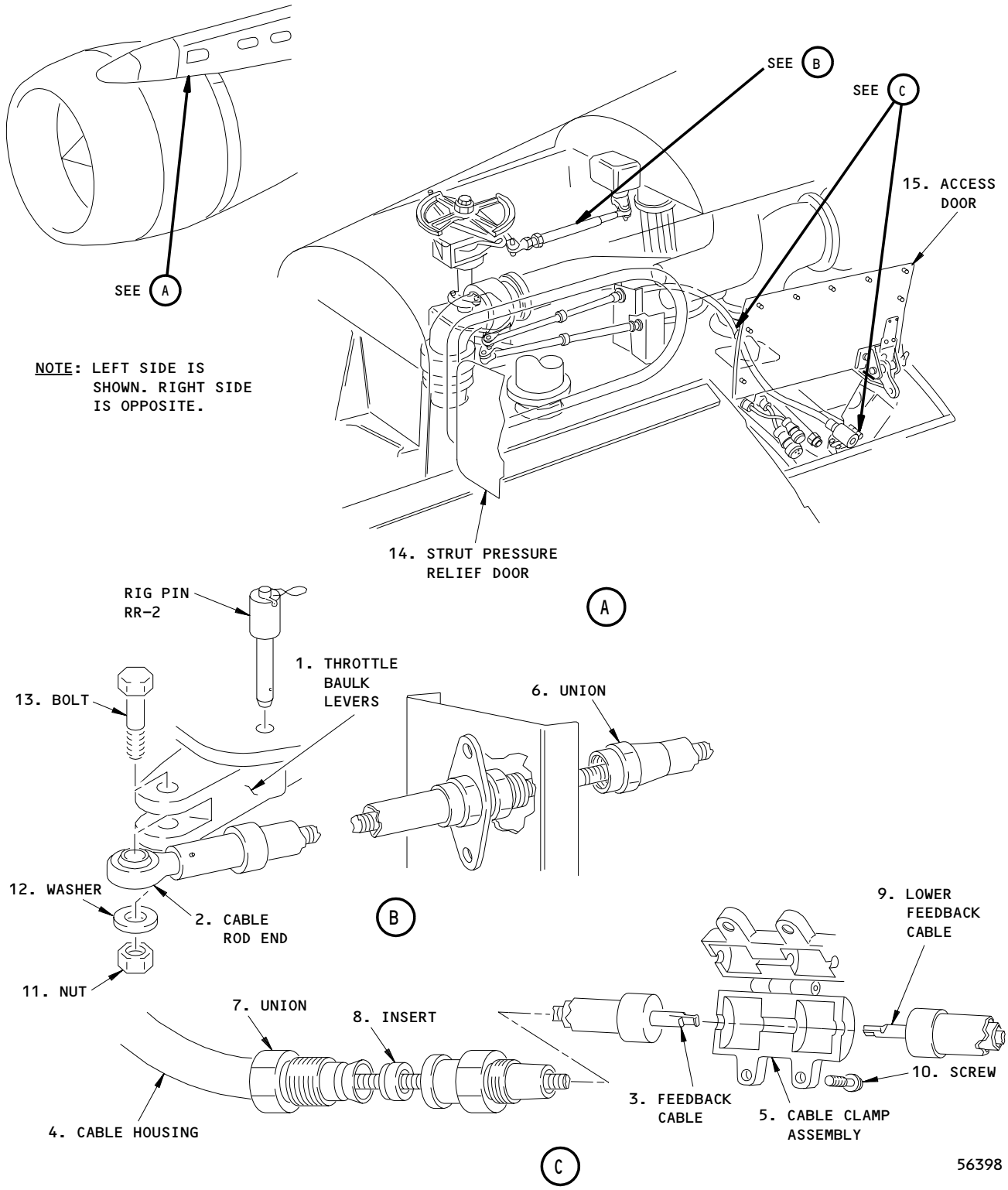
B. Consumable Materials
  (1) Lockwire
    British Spec/Ref - 22 S.W.G.
    American Spec/Ref - 21 A.W.G.
    OMat No. 238

C. Parts

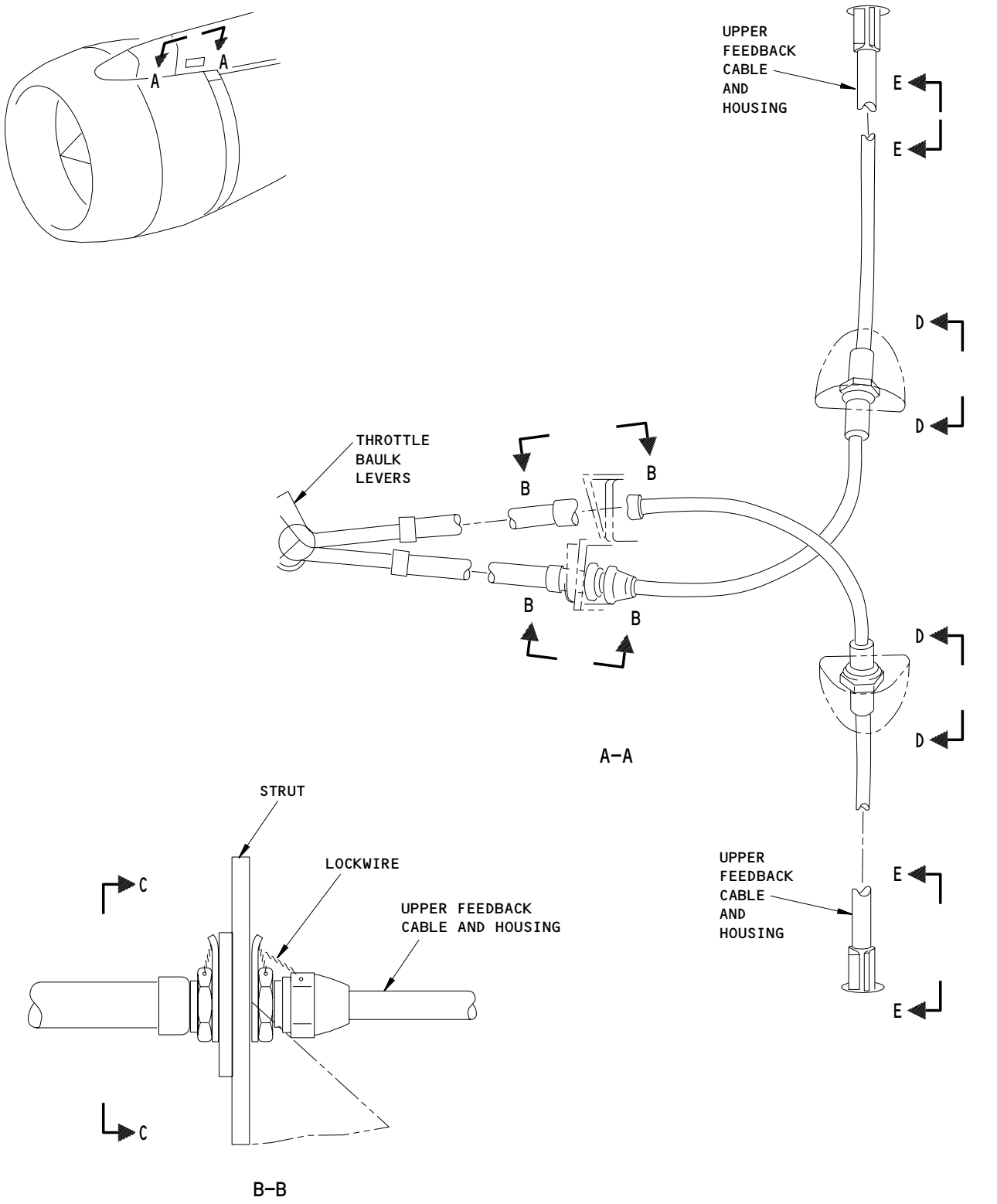
AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	11	Cable, Lower	78-34-03	01	85 87
402	3	Cable, Upper	78-31-01	01 01A	135 70

D. References
  (1) AMM 70-51-00/201, Torque Tightening Technique
  (2) AMM 78-31-00/201, Thrust Reverser System
  (3) AMM 78-30-00/501, Thrust Reverser

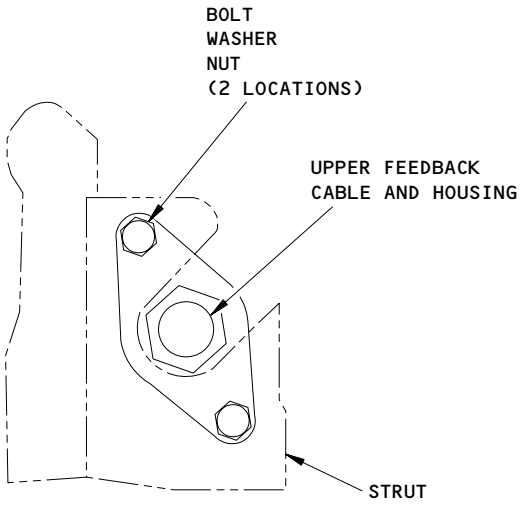
E. Access
  (1) Location Zones
    410 Left Power Plant Nacelle
    420 Right Power Plant Nacelle



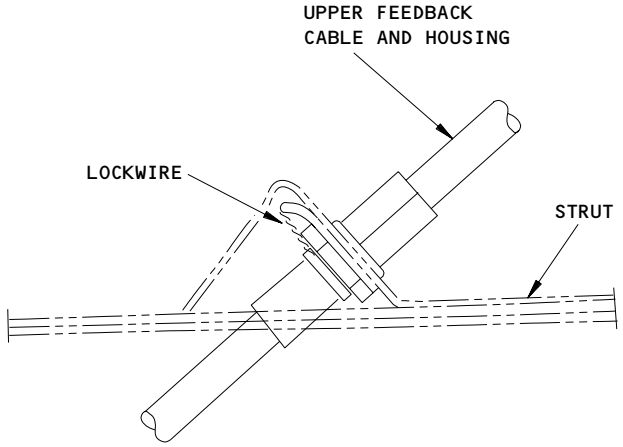
Upper Thrust Reverser Feedback Cable Installation
Figure 402 (Sheet 1)



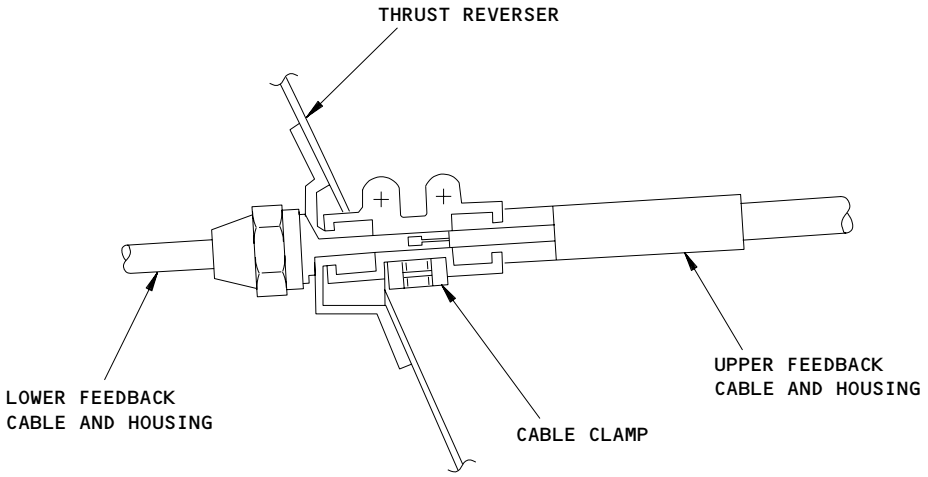
Upper Thrust Reverser Feedback Cable Installation
Figure 402 (Sheet 2)



C–C



D–D



E–E

Upper Thrust Reverser Feedback Cable Installation
Figure 402 (Sheet 3)

F. Install the Lower Feedback Cables.

S 424-005-R00

(1) Do these steps to install the lower feedback cable of the thrust reverser (Fig. 401).
  (a) Manually retract the thrust reverser fully (AMM 78-31-00/201).
  (b) Position the cable housing (9) to the thrust reverser and pull the cable housing (9) through the support bracket.
  (c) Adjust the tab washer (7) and the nut (8) so that the support bracket is aligned with the screw head.
  (d) Install the tab washer (6) and the nut (5).
    1) Tighten the nut and install the lockwire (AMM 70-51-00/201).
  (e) Install the support clips of the cable housing.
  (f) Install and tighten the two screws and washers to secure the bracket assembly (10).
  (g) Connect the lower feedback cable (11) to the upper feedback cable.
  (h) Install the cable clamp assembly (1) to the upper and lower cable and secure with two screws.

S 834-017-R00

(2) Adjust the lower feedback cable.
  (a) Move the throttle balk levers to the stowed position (counterclockwise) until the rigging holes are aligned.
  (b) Make sure that the (RR2) rig pins are installed correctly through both balk levers and the upper and lower brackets (Fig. 402).
  (c) Apply a tension moderately on the rod end of the lower cable (3), to align the lower rod end with the actuator lever (2) (Fig. 401).
    1) If adjustment is necessary, do the steps that follow.
      a) Loosen the locknut of the cable rod end (4) and adjust the rod end (3) until the bolt goes through the rod end (3) and the lever (2).

        NOTE: Do not keep the bolt installed.

      b) Tighten the locknut (4) and install the lockwire (AMM 70-51-00/201).
  (d) Remove the rig pins and manually extend the thrust reverser approximately three inches (AMM 78-31-00/201).

    NOTE: This operation is necessary to attach the bolt, washer and nut which attaches the cable rod end.

  (e) Position the cable rod end (3) to the actuator lever (2) with a bolt, a washer and a nut.
  (f) Tighten the bolt and nut and install a new cotter pin (AMM 70-51-00/201).

S 864-011-R00

(3) Put the airplane back to the usual condition.

G. Install the Upper Feedback Cable.

S 424-006-R00

(1) Do these steps to install the upper thrust reverser feedback cable (Fig. 402).
  (a) Put the cable housing (4) in the strut.
  (b) Install the aft cable housing through the bottom of the strut.
  (c) Install the forward cable housing in the cutout in the structure.
    1) Install two bolts (16) through the cable housing flange and the structure around the cutout.
    2) Install a washer (17) under the nut (18) on each bolt (16) and tighten.
  (d) Secure the cable housing (4) to the aircraft strut.
  (e) Attach the unions (6) and (7) (AMM 70-51-00/201).
    1) Make sure the insert (8) is installed correctly.
    2) Install lockwire on the unions as shown.
  (f) Put the cable (3) through the housing (4) and connect the upper and lower feedback cables.
  (g) Position cable clamp assembly (5) to the upper and lower cable connection and secure with screws (10) (AMM 70-51-00/201).
  (h) Install the forward rod end into the throttle baulk lever.
    1) Install a bolt (13), washer (12) and nut (11) through the throttle baulk lever (1) and the cable rod end (2) and tighten.

S 834-018-R00

(2) Adjust the upper feedback cable (AMM 78-30-00/501).

H. Put the Airplane Back To the Usual Condition.

S 984-016-R00

(1) Manually retract the thrust reverser fully (AMM 78-31-00/201).

S 414-014-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Close the thrust reverser (AMM 78-31-00/201).

S 414-015-R00

(3) Attach the strut access panel (15).

S 414-023-R00

(4) Close the strut pressure relief door (14).

S 444-022-R00

(5) Activate the thrust reverser (AMM 78-31-00/201).

THRUST REVERSER FEEDBACK CABLES - INSPECTION/CHECK

1. General
   A. Use the procedure that follows to do an examination of the feedback cables. This procedure is applicable to the left and right thrust reverser feedback cables. Each left and right thrust reverser cable has a lower and upper half.

   TASK 78-34-03-226-001-R00

2. Examine Feedback System Movement
   A. Equipment
      (1) Compression and Extension Spring Balance - Range 0 to 35 lb (0 to 16 kg) approximately.
      (2) Thrust Reverser Feedback Cable Rig Pin, (RR-2)
   B. References
      (1) AMM 70-12-04/201, Locking Techniques for Threaded Parts
      (2) AMM 70-51-00/201, Torque Tightening Techniques
      (3) AMM 78-31-00/201, Thrust Reverser System
      (4) AMM 78-31-10/401, Thrust Reverser Hinge Access Doors
      (5) AMM 78-34-03/401, Thrust Reverser Feedback Cables
      (6) AMM 78-34-06/401, Thrust Reverser Feedback Actuators
   C. Consumable Materials
      (1) B00669 - Degreasing fluid, MEK (0Mat 135) or as an alternative,
      (2) B50009 - Degreasing Fluid - Acetone (0Mat 150)
      (3) B50018 - Degreasing Fluid - Alcohol (0Mat 1/40)
      (4) D00126 - High Temperature Grease, Silicone Based (0Mat 440A), Aeroshell 15
      (5) G02383 - Absorbent, lint-free cloth (0Mat 2/101)
   D. Access
      (1) Location Zones
          410 Left Engine
          420 Right Engine

      (2) Access Panels
          415AL/416AR Thrust Reverser, Left Engine
          425AL/426AR Thrust Reverser, Right Engine

   E. Prepare to examine the Thrust Reverser Upper and Lower Feedback Cables.

      S 046-025-R00

      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 the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 016-022-R00

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

(2) Open the thrust reverser C-ducts (AMM 78-31-00/201).

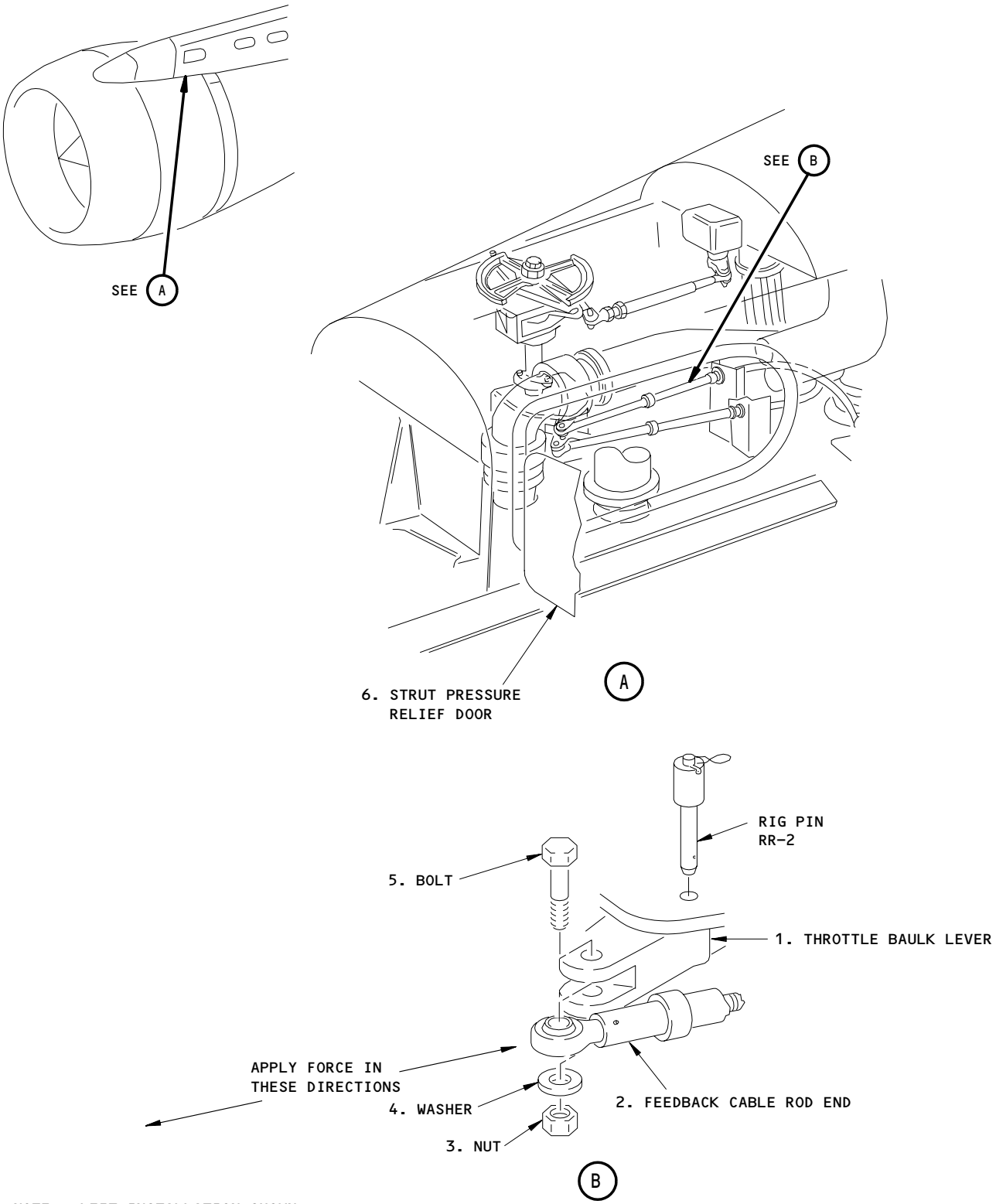
S 846-002-R00

(3) For the thrust reverser upper feedback cables:
  (a) Remove the hinge access door (AMM 78-31-10/401).
  (b) Open the strut pressure relief door (Fig. 601).
  (c) Disconnect the feedback cable rod end from the throttle baulk lever (Fig. 601).
    1) Remove the nut (3), the bolt (5), and the washer (4).
    2) Move the feedback cable rod end (2) away from the throttle baulk lever (1).
  (d) Remove the feedback cable from the feedback actuator as follows (Fig. 603):
    1) Remove the pin (2), nut (3), washer (5) and bolt (1).
    2) Discard the pin (2).
    3) Move the feedback cable rod end away from the feedback actuator lever.

F. Examine the Thrust Reverser Upper Feedback Cable for Galling.

S 216-027-R00

(1) Examine the upper feedback cable for galling.
  (a) Pull the upper assembly rod end to the fully extended position. This will show the telescoping tube.
  (b) Visually inspect the tube for galling.
    1) If there is no galling present - accept.
    2) Galling that does not restrict the tube movement - It is permitted to fly-on for not more than 200 hours until a new feedback cable is available.
    3) Tube seized or movement stiff - Replace the upper feedback cable (AMM 78-34-03/401).



NOTE: LEFT INSTALLATION SHOWN,
RIGHT INSTALLATION IS OPPOSITE.

C3728

Thrust Reverser Feedback Cables – Upper Feedback Cable Disconnect Points
Figure 601

WARNING: DO NOT GET DEGREASING FLUID IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM DEGREASING FLUID. PUT ON PROTECTIVE GOGGLES AND GLOVES WHEN YOU USE DEGREASING FLUID. KEEP DEGREASING FLUID AWAY FROM SPARKS, FLAME AND HEAT. DEGREASING FLUID IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(c) Clean the tube with degreasing fluid and a lint-free cloth.
(d) Make sure you wipe the tube clean before the degreasing fluid dries.
(e) Use the high temperature grease to lightly lubricate the telescopic tube surface.

G. Examine the Upper Feedback Cable Rod End Bearing for Stiffness.

S 216-028-R00

(1) Examine the upper feedback cable rod end bearing for stiffness.
(a) Rotate and twist the rod end bearing using finger pressure.
1) If the bearing ball is free to rotate and twist - Accept.
2) If the bearing ball is not free to rotate or twist - Replace the upper cable (AMM 78-34-03/401).

NOTE: Before installing the replacement cable inspect the rod end bearing for stiffness. If the bearing is stiff but the tube is not galled, it is permitted to fly-on for not more than 200 hours until a new feedback cable is available.

H. Examine the Feedback Cables for Stiffness.

S 226-046-R00

(1) Examine the feedback cables for stiffness (Fig. 604).
(a) Install the spring balance to the feedback actuator rod end (5).
(b) Use the spring balance to move the cable through its full range of movement.
(c) Measure the force necessary to move the cable.
1) If the force necessary to move the cable is not more than 30 lbs. (13.62 kg) - Accept.
2) If the force necessary to move the cable is more than 30 lbs (13.62 kg) - Do the following procedures:
a) Examine the upper feedback cable for stiffness (AMM 78-34-03/601).

b) Examine the lower feedback cable for stiffness (AMM 78-34-03/601).

I. Examine the Upper Feedback Cable for Stiffness.

S 846-031-R00

(1) Prepare to examine the upper feedback cable for stiffness (Fig. 604).
   (a) If necessary, remove the hinge access door (AMM 78-31-10/401).
   (b) Remove the bolts (2).
   (c) Open the clamp assembly (3).
   (d) Disconnect the upper feedback cable (1) from the lower feedback cable (4).

S 226-043-R00

(2) Examine the upper feedback cable for stiffness (Fig. 601).
   (a) Install the spring balance to the feedback rod end (2).
   (b) Use the spring balance to move the cable through its full range of movement.
   (c) Measure the force necessary to move the cable.
      1) If the force necessary to move the upper feedback cable is not more than 18 lbs. (8.17 kg) - Accept.
      2) If the force necessary to move the upper feedback cable is more than 18 lbs. (8.17 kg) - Replace the upper feedback cable (AMM 78-34-03/401).

J. Examine the Lower Feedback Cable for Stiffness.

S 226-033-R00

(1) Examine the lower feedback cable for stiffness (Fig. 604).
   (a) Install the spring balance to the rod end.
   (b) Use the spring balance to move the cable through its full range of movement.
   (c) Measure the force necessary to move the cable.
      1) If the force necessary to move the lower feedback cable is not more than 12 lbs. (5.45 kg) - Accept.
      2) If the force necessary to move the lower feedback cable is more than 12 lbs. (5.45 kg) - Replace the lower feedback cable (AMM 78-34-03/401).

K. Examine the Backlash in the Thrust Reverser Feedback System.

S 226-039-R00

(1) Examine the backlash in the thrust reverser feedback system (Fig. 601).
   (a) Use the spring balance to pull the feedback cable rod end (2) with a force of 30 lbs. (13.62 kg).

(b) Use the spring balance to push the feedback cable rod end (2) with a force of 30 lbs. (13.62 kg).
(c) Measure the total movement of the feedback cable rod end.
1) If the movement of the rod end is not more than 0.400 in. (10.16 mm) - Accept.
2) If the movement of the rod end is more than 0.400 in. (10.16 mm) - Reject and do the following procedures:
a) Examine the backlash in the feedback cables (AMM 78-34-03/601).
b) Examine the backlash in the feedback actuator (AMM 78-34-03/601).

L. Examine the Backlash in the Feedback Cables.

S 846-035-R00

(1) Prepare to examine the backlash in the feedback cables.
(a) Do the procedure to manually extend the thrust reverser (AMM 78-31-00/201) approximately 3.00 in. (76.2 mm) in the aft direction.
(b) If necessary, do the steps to disconnect the feedback cable rod end from the feedback actuator lever (Fig. 603):
1) Remove the pin (2), nut (3), washer (5) and bolt (1).
2) Discard the pin (2).
3) Move the feedback cable rod end (4) away from the feedback actuator lever.
(c) Do the procedure to manually stow the thrust reverser (AMM 78-31-00/201) back to the fully stowed position.
(d) If necessary, do the steps to install the feedback cable rod end to the throttle baulk lever (Fig. 601).
1) Install the feedback cable rod end (2) to the throttle baulk lever (1).
2) Install and tighten the bolt (5), washer (4) and nut (3) to the standard load (AMM 70-51-00/201).
(e) Install the rig pin (RR-2) into the throttle baulk lever (Fig. 601).

S 226-036-R00

(2) Examine the backlash in the feedback cable (Fig. 604).
(a) Use the spring balance to pull the feedback cable rod end (5) with a force of 30 lbs. (13.62 kg).

(b) Use the spring balance to push the feedback cable rod end (5) with a force of 30 lbs. (13.62 kg).
(c) Measure the movement of the feedback cable.
1) If the total movement of the feedback cable is not more than 0.150 in. (3.81 mm) - Accept.

2) If the movement of the feedback cable is more than 0.150 in. (3.81 mm) - Replace the feedback cable (AMM 78-34-03/401).

(d) Remove the rig pin from the throttle baulk lever (1) (Fig. 601).

M. Examine the Backlash in the Feedback Actuator.

S 846-044-R00

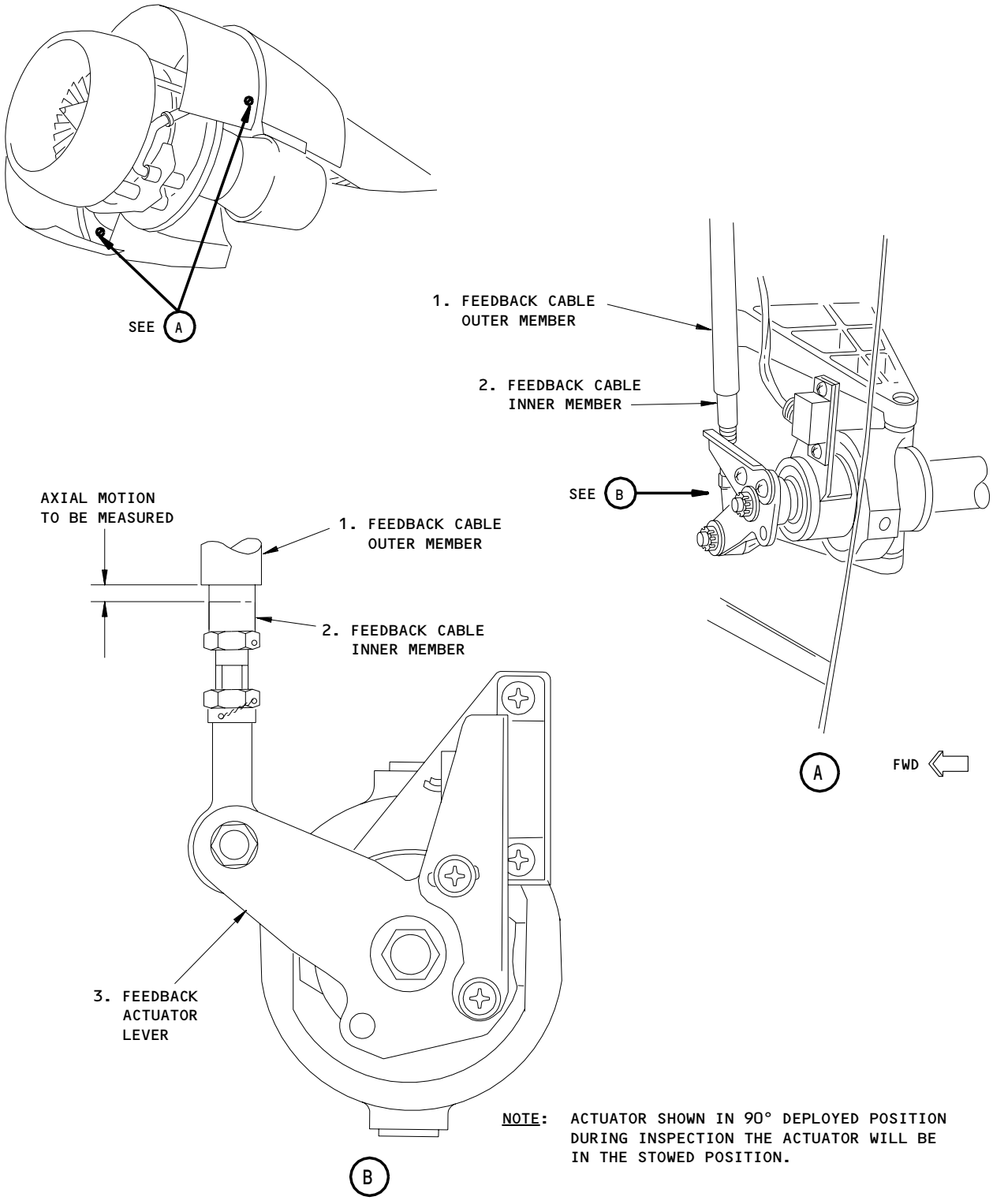
(1) Prepare to examine the backlash in the feedback actuator (Fig. 602).
(a) Make sure the feedback cable rod end (2) is disconnected from the throttle baulk lever (1).
1) If necessary, do these steps to disconnect the cable rod end:
a) Remove the nut (3), washer (4) and bolt (5).
b) Move the feedback cable rod end (2) away from the throttle baulk lever (1).
(b) Make sure the thrust reverser is in the fully stowed position (AMM 78-31-00/201).

S 226-037-R00

(2) Examine the backlash in the feedback actuator (Fig. 602).
(a) Turn the feedback actuator lever in the C-duct clockwise (counterclockwise) and hold.

NOTE: The directions for the right C-duct are opposite those for the left C-duct. The right C-duct directions will be given in parentheses following the left C-duct directions.

1) Make sure you use enough force to remove all free play from the actuator.



NOTE: ACTUATOR SHOWN IN 90° DEPLOYED POSITION DURING INSPECTION THE ACTUATOR WILL BE IN THE STOWED POSITION.

NOTE: LEFT INSTALLATION SHOWN, RIGHT INSTALLATION IS OPPOSITE.

C3729

Thrust Reverser Feedback Cables – Feedback Actuator Movement Measurement
Figure 602

(b) Make a temporary mark on the feedback cable inner member (2) below the outer member (1).
1) Make sure the lever (3) is held in the clockwise (counterclockwise) position.
(c) Turn the feedback actuator lever (3) counterclockwise (clockwise) and hold.
1) Make sure you use enough force to remove all free play.
(d) Measure the distance from the outer member (1) to the temporary mark.
1) If the movement of the feedback cable inner member (2) is not more than 0.250 in. (6.35 mm) - Accept.

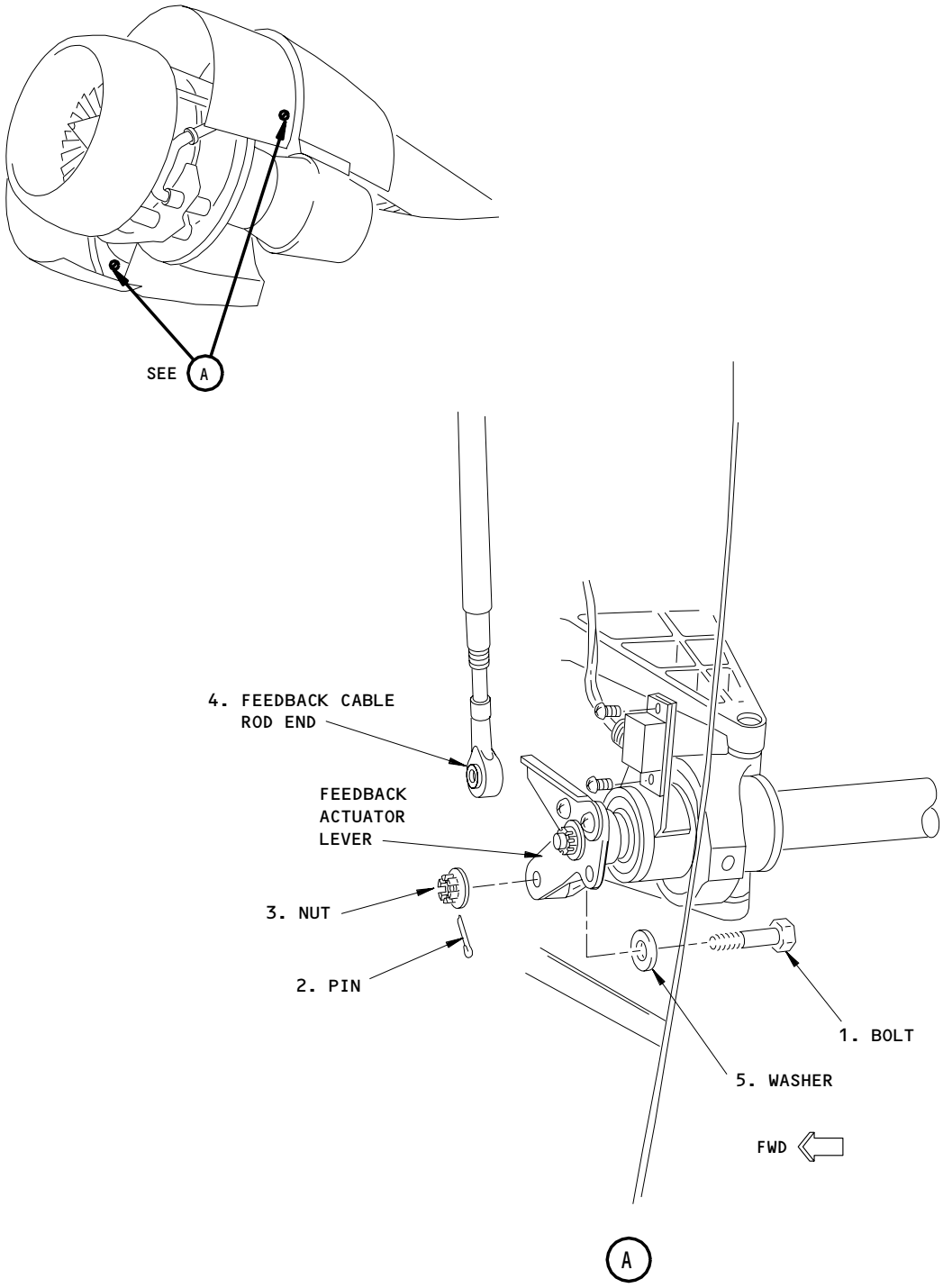
2) If the movement of the feedback cable inner member (2) is more than 0.250 in. (6.35 mm) - Replace the feedback actuator (AMM 78-34-06/401).

N. Put the Airplane back to its Usual Condition.

S 436-015-R00
(1) Connect upper feedback cable to lower feedback cable (Fig. 604).
(a) Put the upper and lower feedback cables in the cable clamp assembly (3).
(b) Close the cable clamp assembly (3) and install bolts (2).
(c) Tighten the bolts to the standard load (AMM 70-51-00/201).

S 436-016-R00
(2) Connect the lower feedback cable rod end to the feedback actuator lever (Fig. 603).
(a) Install the bolt (1) washer (5) and nut (3).
(b) Tighten to the standard load (AMM 70-51-00/201).
(c) Install a new pin (2) (AMM 70-12-04/201).

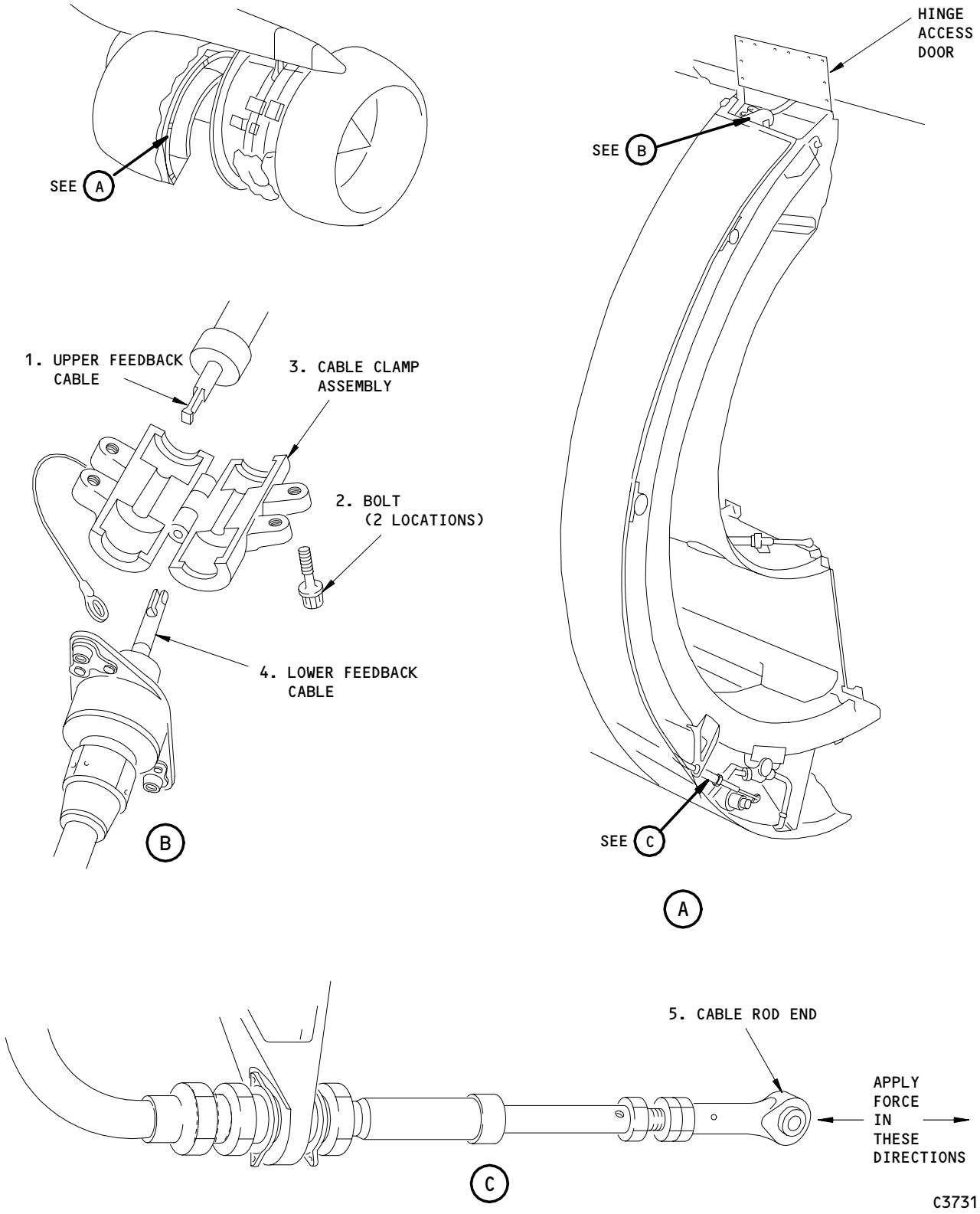
S 436-017-R00
(3) Connect the rod end of the upper feedback cable to the throttle baulk lever (Fig. 601).
(a) Put the rod end (2) in the throttle baulk lever (1).



C3730

NOTE: LEFT INSTALLATION SHOWN,
RIGHT INSTALLATION IS OPPOSITE.

Thrust Reverser Feedback Cables – Feedback Actuator
Figure 603



Thrust Reverser Feedback Cables – Lower Feedback Cable Disconnect Points
Figure 604

(b) Install the bolt (5), the washer (4), and the nut (3).
(c) Tighten to the standard load (AMM 70-51-00/201).
(d) Do this procedure: Adjust the Upper and Lower Feedback Cables (AMM 78-34-03/401).

S 436-018-R00

(4) Close the strut pressure relief door (Fig. 601).

S 436-019-R00

(5) Install the hinge access door (AMM 78-31-10/401).

S 416-024-R00

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.

(6) Close the thrust reverser (AMM 78-31-00/201).

S 446-021-R00

(7) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

THRUST REVERSER ISOLATION VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure has a task to remove and a task to install the isolation valve for the thrust reverser system. The isolation valve is installed in the trailing edge fairing of the strut.

TASK 78-34-05-004-001-R00

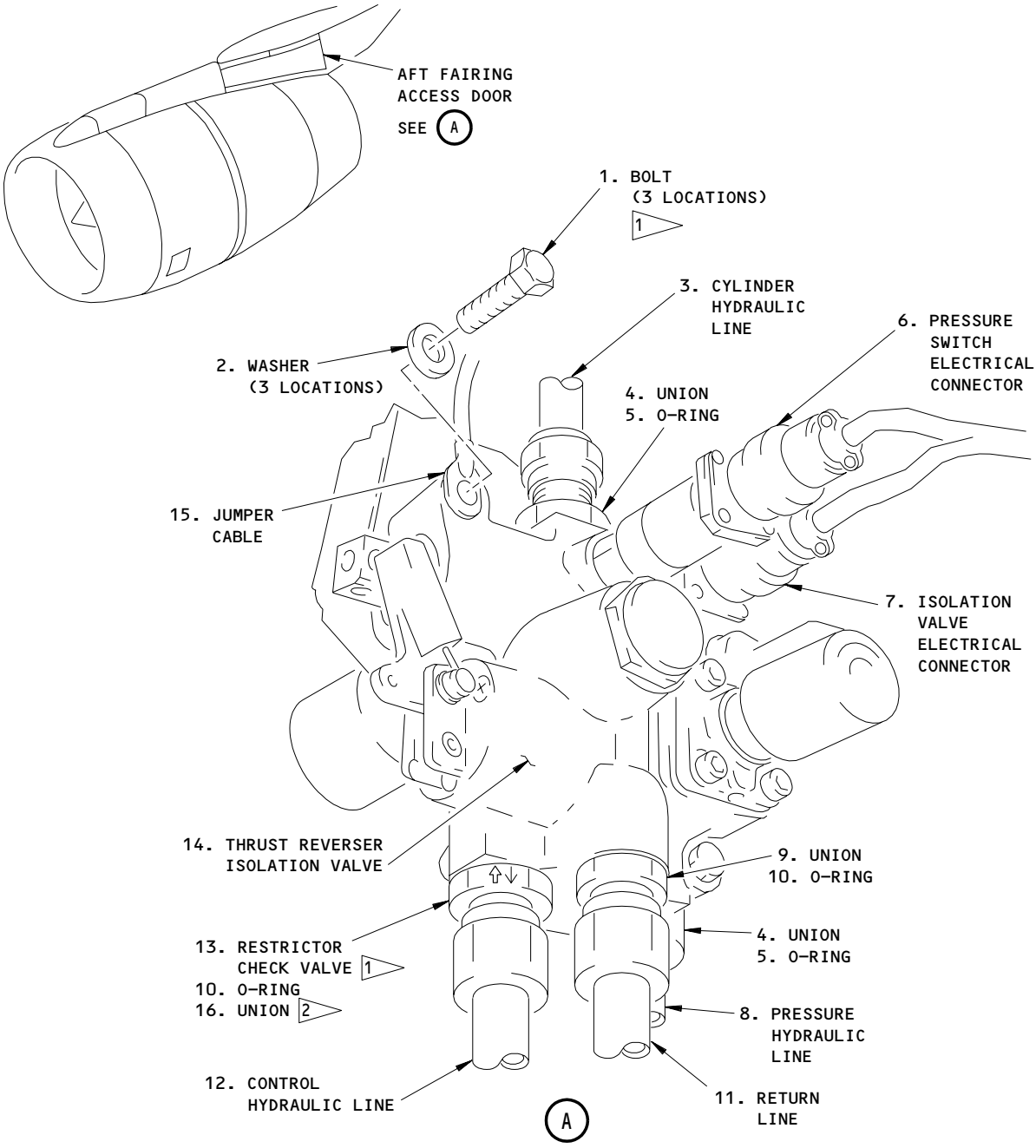
2. Thrust Reverser Isolation Valve Removal (Fig. 401)
   A. References
      (1) AMM 29-11-00/201, Main Hydraulic Systems
   B. Access
      (1) Location Zones
          430 Left Engine Strut
          440 Right Engine Strut

   C. Prepare to Remove the Isolation Valve.

      S 864-002-R00
      (1) Remove the pressure from the hydraulic system (AMM 29-11-00/201).

      S 864-132-R00
      (2) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
      Open these circuit breakers and attach the DO-NOT-CLOSE tags:
      (a) On the overhead equipment panel P11:
          1) For the left engine:
             a) 11D11, ENGINE LEFT T/R IND
             b) 11D12, ENGINE LEFT T/R CONT
          2) For the right engine:
             a) 11B29, ENGINES RIGHT T/R IND
             b) 11B30, ENGINES RIGHT T/R CONT

      S 864-105-R00
      (3) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
      Open these circuit breakers and attach the DO-NOT-CLOSE tags:
      (a) On the overhead equipment panel P11:
          1) For the left engine:
             a) 11D11 T/R IND L



1 AIRPLANES POST-SB 78-8, 78-45, 78-46
TO PREVENT HYDRAULIC PRESSURE SURGES, WHICH COULD CAUSE THE LOCKING ACTUATORS TO UNLOCK IN FLIGHT, MAKE SURE THE CHECK VALVE IS INSTALLED IN THE CONTROL LINE PORT ON THE ISOLATION VALVE. THE BOLD OUTLINED ARROW ON THE CHECK VALVE MUST POINT TO THE ISOLATION VALVE.

2 AIRPLANES PRE-SB 78-8, 78-45, 78-46
THE BOLD OUTLINED ARROW ON THE UNION MUST POINT TO THE ISOLATION VALVE.

Thrust Reverser Isolation Valve Installation
Figure 401

b) 11D12 T/R CONT L
2) For the right engine:
a) 11B29 T/R IND R
b) 11B30 T/R CONT-ALTN-R
c) 11K33 T/R CONT R

S 014-047-R00
(4) Push the latch trigger on the aft fairing access door to release the latches and open the access door.

D. Remove the Isolation Valve.

S 034-048-R00
(1) Disconnect the electrical connectors (4 and 5), and install protective caps on the electrical connectors.

S 034-049-R00

CAUTION: BE PREPARED TO CATCH ALL THE HYDRAULIC FLUID THAT FALLS WHEN YOU DISCONNECT THE HYDRAULIC LINES. IMMEDIATELY CLEAN FLUID THAT FALLS. THE HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE AIRPLANE.

(2) Disconnect the hydraulic lines from the unions (4 locations), and install protective caps on the lines and unions.

S 024-050-R00
(3) Remove the bolts (1) and washers (2) to remove the isolation valve (10) from the strut.
(a) Make sure the bonding jumper (15) stays attached to the strut.

S 034-051-R00
(4) AIRPLANES POST-SB 78-8; SB 78-45, SB 78-46;
Remove the unions (4 and 9), the restrictor check valve (13), and the O-rings (5 and 10) from the isolation valve (14).

S 034-164-R00
(5) AIRPLANES PRE-SB 78-8; SB 78-45, SB 78-46;
Remove the unions (4, 9, and 16) and the O-rings (5, 10, and 17) from the isolation valve (14).
(a) Discard the O-rings.
(b) Install protective plugs on the open hydraulic ports of the isolation valve (14).

TASK 78-34-05-404-053-R00

3. Thrust Reverser Isolation Valve Installation (Fig. 401)
A. Consumable Materials
(1) C00259 Primer - BMS 10-11, Type 1
(2) C00308 Compound, Corrosion Preventive - MIL-C-11796, Class 3
(3) D00153 Hydraulic Fluid - BMS 3-11 (Type IV, Class 1)

(4) D00054 Lubricant, Hydraulic System - MCS 352B

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Bolt	78-34-05	01	30
	2	Washer			35
	4	Union			135
	5	O-ring			155
	9	Union			115
	10	O-ring			150
	13	Restrictor Check Valve			140
	14	Isolation Valve			40
	16	Union			110

C. References
(1) AMM 29-11-00/201, Main Hydraulic System
(2) AMM 78-31-00/201, Thrust Reverser System
(3) AMM 78-31-00/501, Thrust Reverser System

D. Access
(1) Location Zones
430 Left Engine Strut
440 Right Engine Strut

E. Install the Isolation Valve.

S 434-054-R00

(1) Do these steps to install all the unions in the isolation valve:
(a) Remove all the protective caps from the isolation valve (14).
(b) Lubricate the unions and the O-rings with the hydraulic fluid or the hydraulic system lubricant.
(c) Install the unions (4) and the O-rings (5) on the isolation valve (14) at the pressure and cylinder ports.
(d) Install the union (9) and the O-ring (10) at the return port.

S 434-165-R00

(2) AIRPLANES PRE-SB 78-8; SB 78-45, SB 78-46;
Install the O-ring (10) and the union (16) at the control port.
(a) Make sure there are protective caps on all ports of the unions on the isolation valve.

S 434-167-R00

CAUTION: MAKE SURE THE LARGE BOLD ARROW WITH AN OUTLINE PATTERN ON THE RESTRICTOR CHECK VALVE POINTS TO THE ISOLATION VALVE. IF THE RESTRICTOR VALVE IS NOT INSTALLED CORRECTLY, THE THRUST REVERSER WILL RETRACT SLOWLY.

(3) AIRPLANES POST-SB 78-8; SB 78-45, SB 78-46;
Install the O-ring (10) and the restrictor check valve (13) at the control port.

(a) Make sure the large bold arrow on the restrictor check valve (13) points to the isolation valve.

NOTE: The restrictor check valve has two arrows on it: One arrow is large and has a bold outline, the other arrow is small and is less visible. Make sure the large bold arrow points to the isolation valve.

(b) Make sure there are protective caps on all ports of the unions and restrictor valve on the isolation valve.

S 424-055-R00

(4) Do these steps to install the isolation valve (14):

(a) Apply the primer to the bolt holes in the valve (14), and let the primer dry.

(b) Apply the corrosion preventive compound to the bolt holes in the valve (14) and to the mounting bracket in the strut.

(c) Put the isolation valve (14) in its position in the strut and attach the valve with the bolts (1) and washers (2).

1) Make sure you connect the bonding jumper (15) with the bolt (1) and washer (2).

(d) Remove the protective caps and connect the hydraulic lines (3, 8, 11, and 12) to the isolation valve (14).

(e) Connect the electrical connectors (6 and 7) to the isolation valve (14).

(f) Make sure the resistance from the isolation valve case to a ground is not more than 0.0025 ohms.

F. Put the Airplane Back to its Usual Condition.

S 864-056-R00

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

S 864-156-R00
(2) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers.
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, ENGINE LEFT T/R IND
b) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B29, ENGINES RIGHT T/R IND
b) 11B30, ENGINES RIGHT T/R CONT

S 864-107-R00
(3) AIRPLANES WITH THRUST REVERSER SYNC LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11 T/R IND L
b) 11D12 T/R CONT L
2) For the right engine:
a) 11B29 T/R IND R
b) 11B30 T/R CONT-ALTN-R
c) 11K33 T/R CONT R

S 864-101-R00
(4) Extend and retract the thrust reverser with hydraulic power (AMM 78-31-00/201).

S 214-102-R00
(5) Examine the isolation valve for leaks.

S 414-103-R00
(6) Close the aft fairing access door.

S 714-104-R00
(7) Do the thrust reverser tests that are given in the test reference table (AMM 78-31-00/501).

THRUST REVERSER FEEDBACK ACTUATORS - REMOVAL/INSTALLATION

1. General
   A. This procedure has a task to remove and a task to install the feedback actuators for the thrust reverser system.
   B. Use the procedures in AMM 70-51-00/201 to tighten the fasteners. Tighten the fasteners to the torque values in AMM 70-51-00/201 unless a torque value is specified in this procedure.

TASK 78-34-06-004-001-R00

2. Thrust Reverser Feedback Actuator Removal (Fig. 401)
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          410 Left Engine
          420 Right Engine

      (2) Access Panels
          415AL/416AR Thrust Reverser, Left Engine
          425AL/426AR Thrust Reverser, Right Engine

   C. Procedure

S 014-002-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Open the thrust reversers (AMM 78-31-00/201).

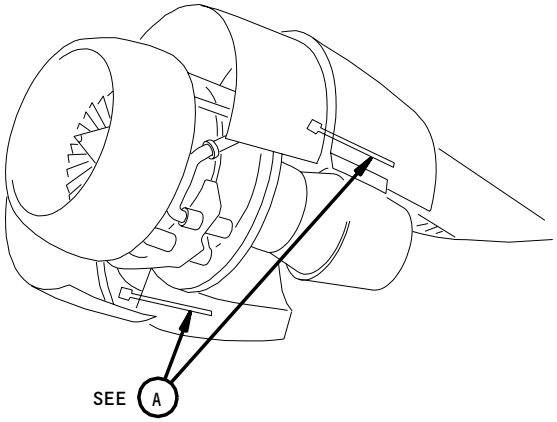
S 014-003-R00

(2) Manually extend the thrust reverser approximately three inches (AMM 78-31-00/201).

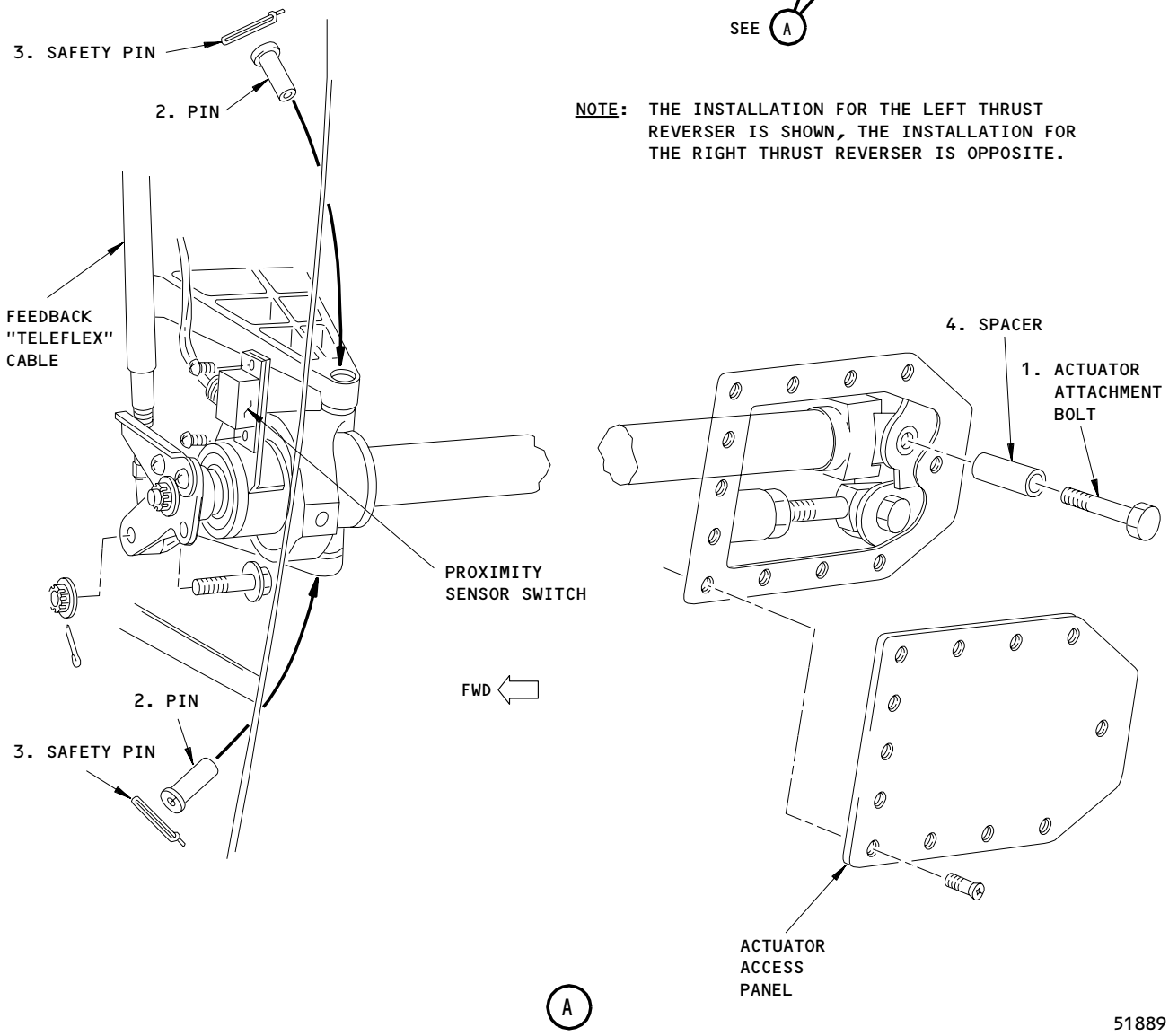
NOTE: It is necessary to extend the thrust reverser to make it easier to disconnect the feedback cable from the actuator.

S 014-004-R00

(3) Remove the actuator access panel from the thrust reverser sleeve.



NOTE: THE INSTALLATION FOR THE LEFT THRUST REVERSER IS SHOWN, THE INSTALLATION FOR THE RIGHT THRUST REVERSER IS OPPOSITE.



Thrust Reverser Feedback Actuator Installation
Figure 401

S 024-005-R00

(4) Do these steps to remove the feedback actuator:
  (a) Remove the bolt (1) and the spacer (4) that attaches the actuator.
  (b) Remove the two screws that attach the proximity sensor to the actuator.
  (c) Remove the cotter pin and the nut that attaches the feedback cable to the actuator.
    1) Discard the cotter pin.
  (d) Remove the safety pins (3) and the pins (2) that attach the actuator to the gimbal assembly.
  (e) Carefully remove the feedback actuator.

TASK 78-34-06-404-006-R00

3. Thrust Reverser Feedback Actuator Installation (Fig. 401)

A. Consumable Materials

(1) Lockwire
British Spec./Ref - 22 S.W.G.
American Spec./Ref - 21 A.W.G.
OMat Item No. - 238

B. References

(1) AMM 78-30-00/501, Thrust Reverser
(2) AMM 78-31-00/201, Thrust Reverser System

C. Access

(1) Location Zones
410 Left Engine
420 Right Engine

(2) Access Panels
415AL/416AR Thrust Reverser, Left Engine
425AL/426AR Thrust Reverser, Right Engine

D. Procedure

S 864-007-R00

(1) Manually retract the thrust reverser (AMM 78-31-00/201).

S 424-008-R00

(2) Do these steps to install the feedback actuator:
  (a) Put the feedback actuator in its position.
  (b) Align the actuator in the gimbal assembly and in the bracket on the thrust reverser sleeve.
  (c) Install the spacer (4) and the attachment bolt (1).
    1) Tighten the bolt and install a lockwire.
  (d) Install the pins (2) and the safety pins (3) to attach the actuator to the gimbal assembly.

(e) Moderately tension the lower cable rod end and at the same time moderately load the feedback actuator lever (to load the lever turn it in the direction of the cable rod end).

NOTE: This removes too much play from the lever.

S 834-012-R00

(3) Align the feedback cable with the actuator rod end, and do these steps if it is necessary to adjust the feedback cable.
(a) Loosen the locknut on the cable rod end and adjust the end until the feedback bolt installs freely.
(b) Tighten the locknut and install a lockwire.

S 864-010-R00

(4) Manually extend the thrust reverser approximately three inches (AMM 78-31-00/201).

S 434-011-R00

(5) Connect the feedback cable to the actuator with the nut and bolt.
(a) Tighten the nut and install a new cotter pin.

S 434-013-R00

(6) Attach the proximity sensor to the actuator with the two screws.

S 414-014-R00

(7) Install the actuator access panel.

S 414-015-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(8) Close the thrust reversers (AMM 78-31-00/201).

S 864-016-R00

(9) Retract the thrust reverser (AMM 78-31-00/201).

S 824-017-R00

(10) Adjust the deploy proximity sensor (AMM 78-30-00/501).

THRUST REVERSER AUTO RESTOW PROXIMITY SENSOR - REMOVAL/INSTALLATION

TASK 78-34-07-784-082-R00

1. Sensor - Thrust Reverser Auto Restow Proximity
   A. General
      (1) This procedure contains two tasks. The first task is for the removal of the thrust reverser auto restow proximity sensor. The second task is for the installation of the thrust reverser auto restow proximity sensor.
      (2) There is one thrust reverser auto restow proximity sensor on each half of the thrust reverser. The procedure is the same for the left side sensor, and the right side sensor (Fig. 401).

TASK 78-34-07-024-001-R00

2. Thrust Reverser Auto Restow Proximity Sensor Removal
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          410 Left Engine
          420 Right Engine

      (2) Access Panels
          415AL/416AR Thrust Reverser, Left Engine
          425AL/426AR Thrust Reverser, Right Engine

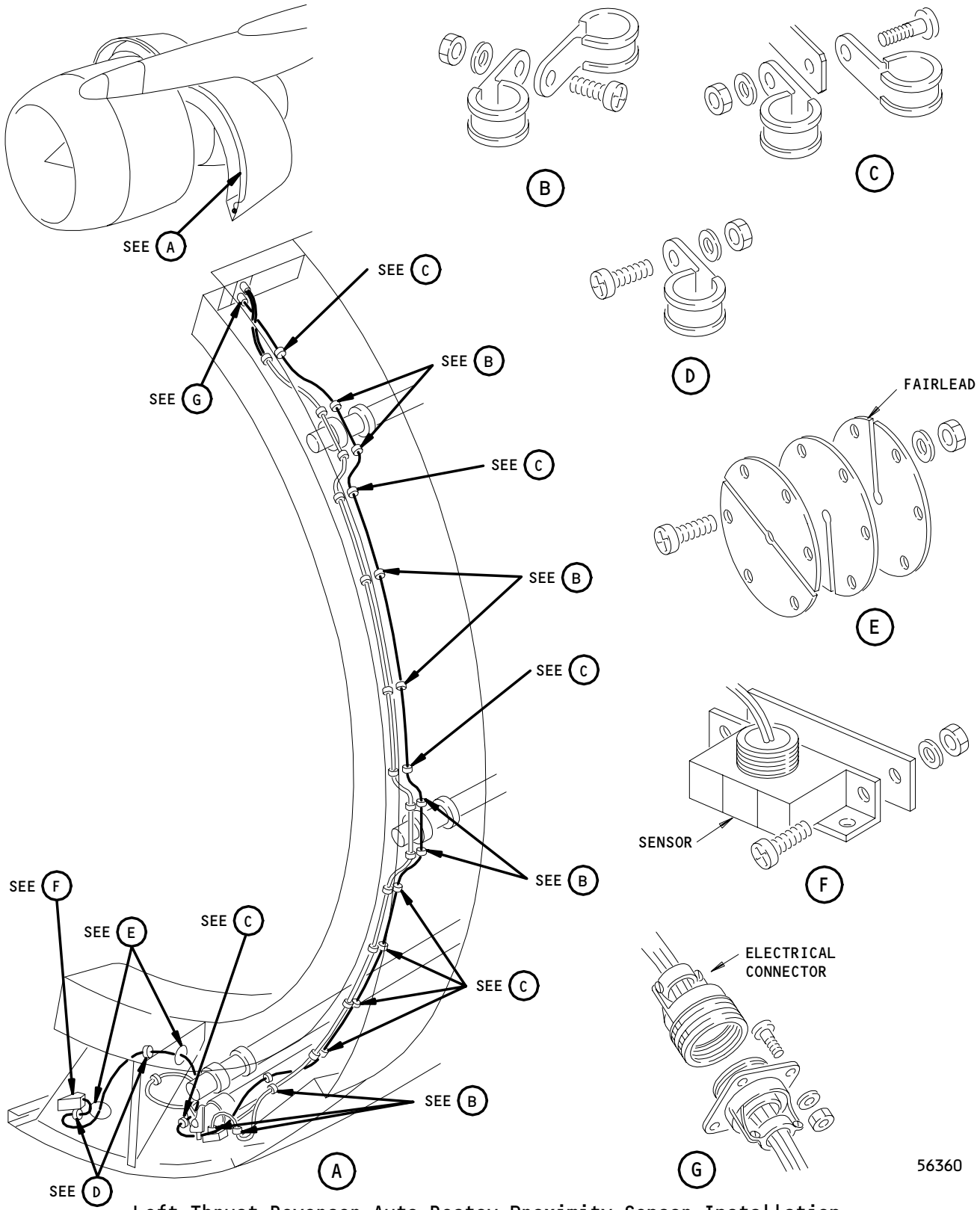
   C. Procedure (Fig. 401 and 402)

      S 864-075-R00
      (1) Open these circuit breakers and attach the DO-NOT-CLOSE tags:
          (a) On the overhead equipment panel P11:
              1) For the left engine:
                  a) 11D11, ENG LEFT T/R IND
              2) For the right engine:
                  a) 11B29, ENG RIGHT T/R IND

      S 044-018-R00

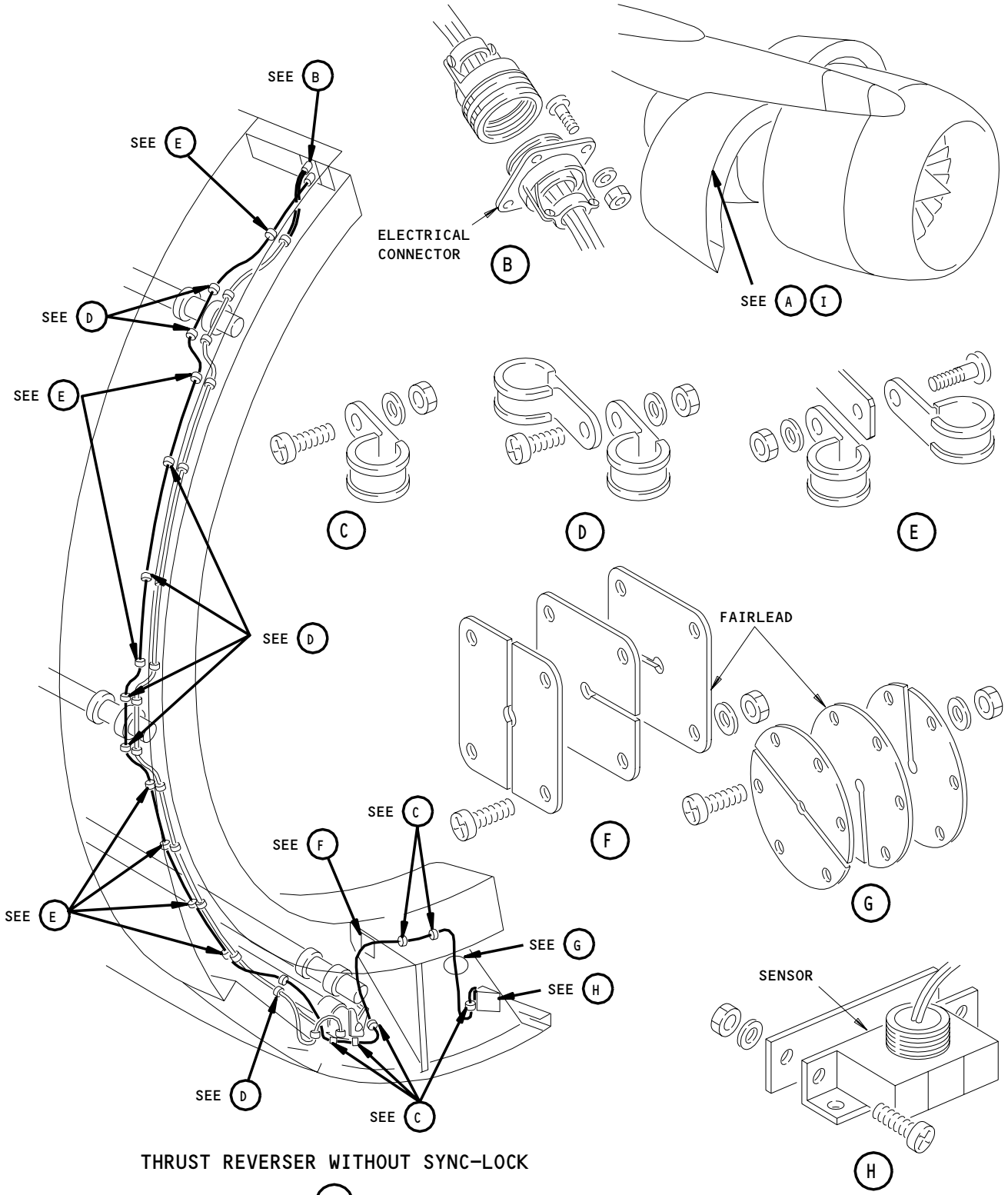
      WARNING: DO THE THRUST REVERSER DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO THE EQUIPMENT.

      (2) Do this procedure: Thrust Reverser Deactivation for Ground Maintenance (AMM 78-31-00/201).



Left Thrust Reverser Auto Restow Proximity Sensor Installation
Figure 401

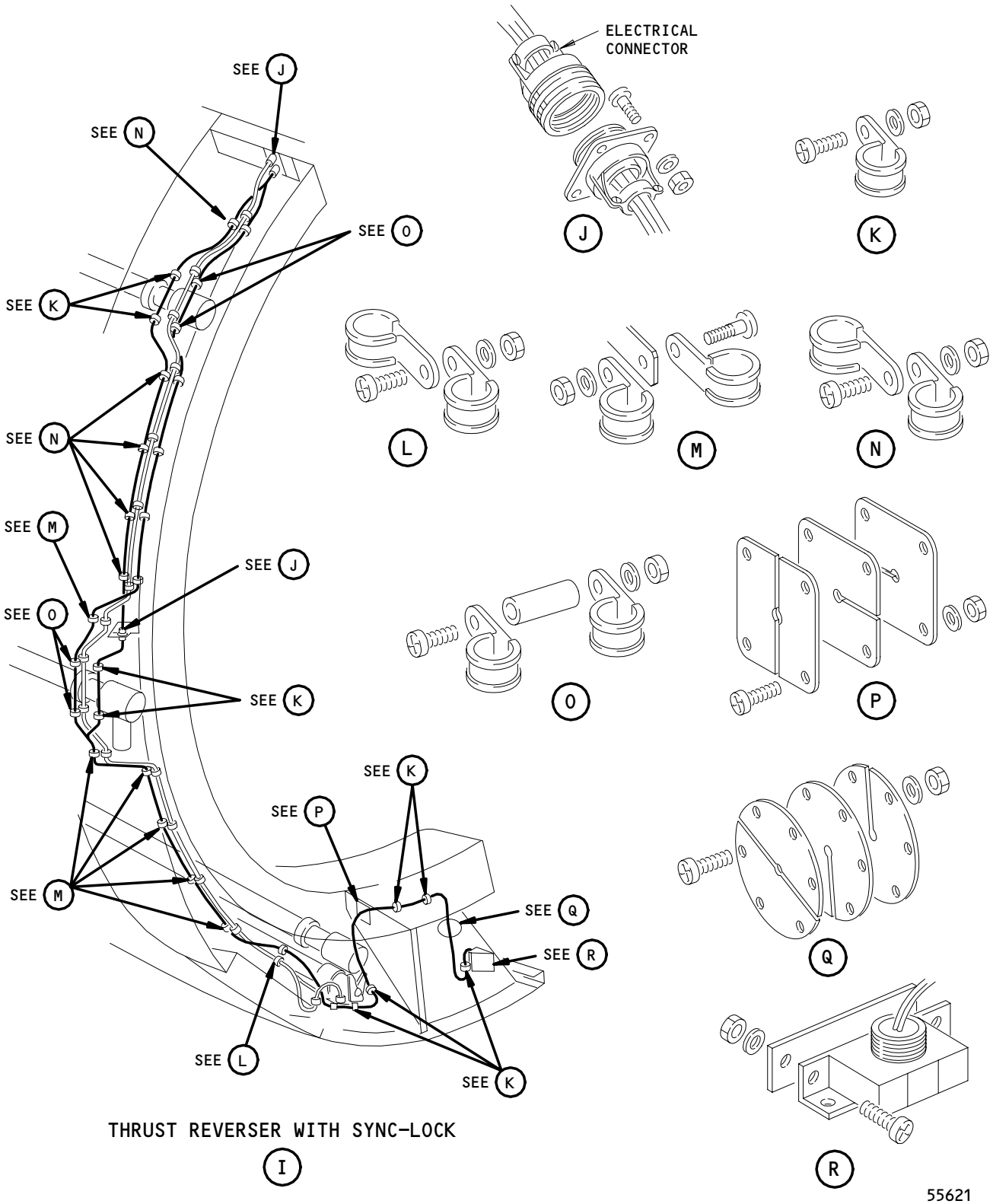
53391



Right Thrust Reverser Auto Restow Proximity Sensor Installation
Figure 402 (Sheet 1)

EFFECTIVITY
AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS, OR AIRPLANES PRE RR SB 78-9627 AND 78-9613

53398



Right Thrust Reverser Auto Restow Proximity Sensor Installation
Figure 402 (Sheet 2)

EFFECTIVITY
AIRPLANES WITH THRUST REVERSER SYNC-LOCKS, OR AIRPLANES POST RR SB 78-9627 AND 78-9613

A68349

S 014-002-R00

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

(3) Open the left (right) thrust reverser (AMM 78-31-00/201).

S 984-004-R00

(4) Manually extend the thrust reverser approximately 12 inches (305 mm) to the reverse thrust position (AMM 78-31-00/201).
(a) Install the safety locks.

S 034-005-R00

(5) Remove the screws, washers, and nut that attached the fairlead panels.
(a) Remove the fairlead panels from the harness.

S 034-006-R00

(6) Release the harness support clips.

S 034-023-R00

(7) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS
OR AIRPLANES PRE RR SB 78-9627 AND 78-9613;
Disconnect the electrical plug at the upper bulkhead and remove the connector from the bulkhead.

S 034-021-R00

(8) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS
OR AIRPLANES POST RR SB 78-9627 AND 78-9613;
Do the steps that follow:
(a) Disconnect the electrical plug of the synchronization shaft lock at the bracket on the upper side of the right center actuator (Fig. 402).

(b) Disconnect the electrical plug at the upper bulkhead (Fig. 402).
(c) Remove the harness connectors from the bracket and the upper bulkhead (Fig. 402).

S 034-008-R00

(9) Remove the sensor and the harness:
(a) Remove the two screws, washers and nuts on the sensor.
(b) Remove the sensor and the harness.
(c) Make sure that the shims (between the sensor and the structure of the thrust reverser) stay on the structure of the thrust reverser.
(d) Remove the harness support clips.

TASK 78-34-07-424-009-R00

3. Thrust Reverser Auto Restow Proximity Sensor Installation

A. Consumable Materials
(1) Compound, Sealing - OMat No. 8/138

B. References
(1) AMM 70-50-02/201, Connection of Electrical Plugs.
(2) AMM 70-51-00/201, Torque Tightening Technique
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-31-00/501, Thrust Reverser System
(5) AMM 78-30-00/501, Thrust Reverser

C. Access
(1) Location Zones
410 Left Engine
420 Right Engine

(2) Access Panels
415AL/416AR Thrust Reverser, Left Engine
425AL/426AR Thrust Reverser, Right Engine

D. Procedure (Fig. 401 and 402)

S 424-010-R00

(1) Install the sensor with 2 nuts, washers and screws (AMM 70-51-00/201).
(a) Make sure that the shims on the structure of the thrust reverser are in the correct position before you install the sensor.

S 434-011-R00
(2) Install the harness from the sensor.

S 434-025-R00
(3) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS
OR AIRPLANES PRE RR SB 78-9627 AND 78-9613;
Do the step that follows:
(a) Install the electrical connector to the bulkhead (AMM 70-51-00/201).
(b) Connect the electrical plug to the electrical connector (AMM 70-50-02/201).

S 434-026-R00
(4) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS
OR AIRPLANES POST RR SB 78-9627 AND RR SB 78-9613;
Do the steps that follow:
(a) Install the electrical connectors to the bulkhead and the bracket on the upper side of the right center actuator (AMM 70-50-02/201).
(b) Connect the electrical plugs at the bracket on the upper side of the center actuator and the bulkhead (AMM 70-50-02/201).

S 434-012-R00
(5) Install the fairlead panels to the harness with nuts, washers and screws (AMM 70-51-00/201).
(a) Seal the cable at the fairlead panels with the sealing compound.

S 434-013-R00
(6) Install the harness support clips with nuts, washers and screws (AMM 70-51-00/201).

S 434-017-R00
(7) Put the harness support clips in the position:

S 094-014-R00
(8) Remove the safety locks.

S 984-015-R00
(9) Manually retract the thrust reverser to the forward thrust position (AMM 78-31-00/201).

S 414-016-R00

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

(10) Close the left (right) thrust reverser (AMM 78-31-00/201).

S 824-078-R00

(11) Do the adjustment procedure of the auto restow proximity sensor of the thrust reverser (AMM 78-30-00/501).

S 444-019-R00

(12) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-074-R00

(13) Remove the DO-NOT-CLOSE tags and close these circuit breakers:
  (a) On the overhead equipment panel P11:
    1) For the left engine:
      a) 11D11, ENG LEFT T/R IND
    2) For the right engine:
      a) 11B29, ENG RIGHT T/R IND

S 714-033-R00

(14) Do the thrust reverser tests that are given in the test reference table (AMM 78-31-00/501).

THRUST REVERSER CONTROL SWITCHES - REMOVAL/INSTALLATION

1. General
   A. The thrust reverser control switches are found in the reverse thrust levers. Each switch is operated independently by its reverse thrust lever.
   B. AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
      This control switch controls the isolation valve.
   C. AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
      This control switch controls the sync-lock. The isolation valve is now controlled by the control switches in the autothrottle microswitch pack.

TASK 78-34-09-004-001-R00

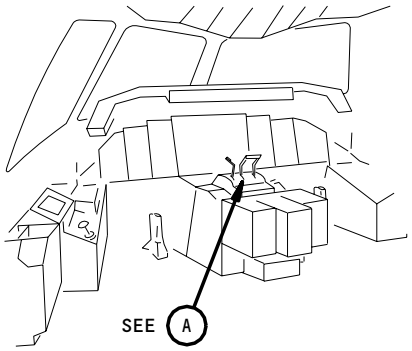
2. Remove the Thrust Reverser Control Switches
   A. References
      (1) AMM 20-10-26/201, Heat Guns, Soldering Guns, Soldering Irons
      (2) AMM 24-22-00/201, Electrical Power - Control
      (3) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          210 Control Cabin

   C. Prepare for the Procedure

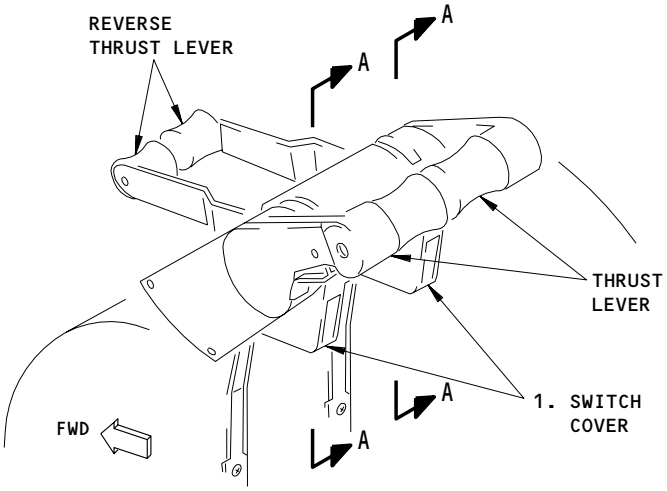
      S 864-002-R00
      (1) Open this circuit breaker on the P11 overhead panel and attach a DO-NOT-CLOSE tag:
          (a) 11G11, AUTO SPEEDBRAKE

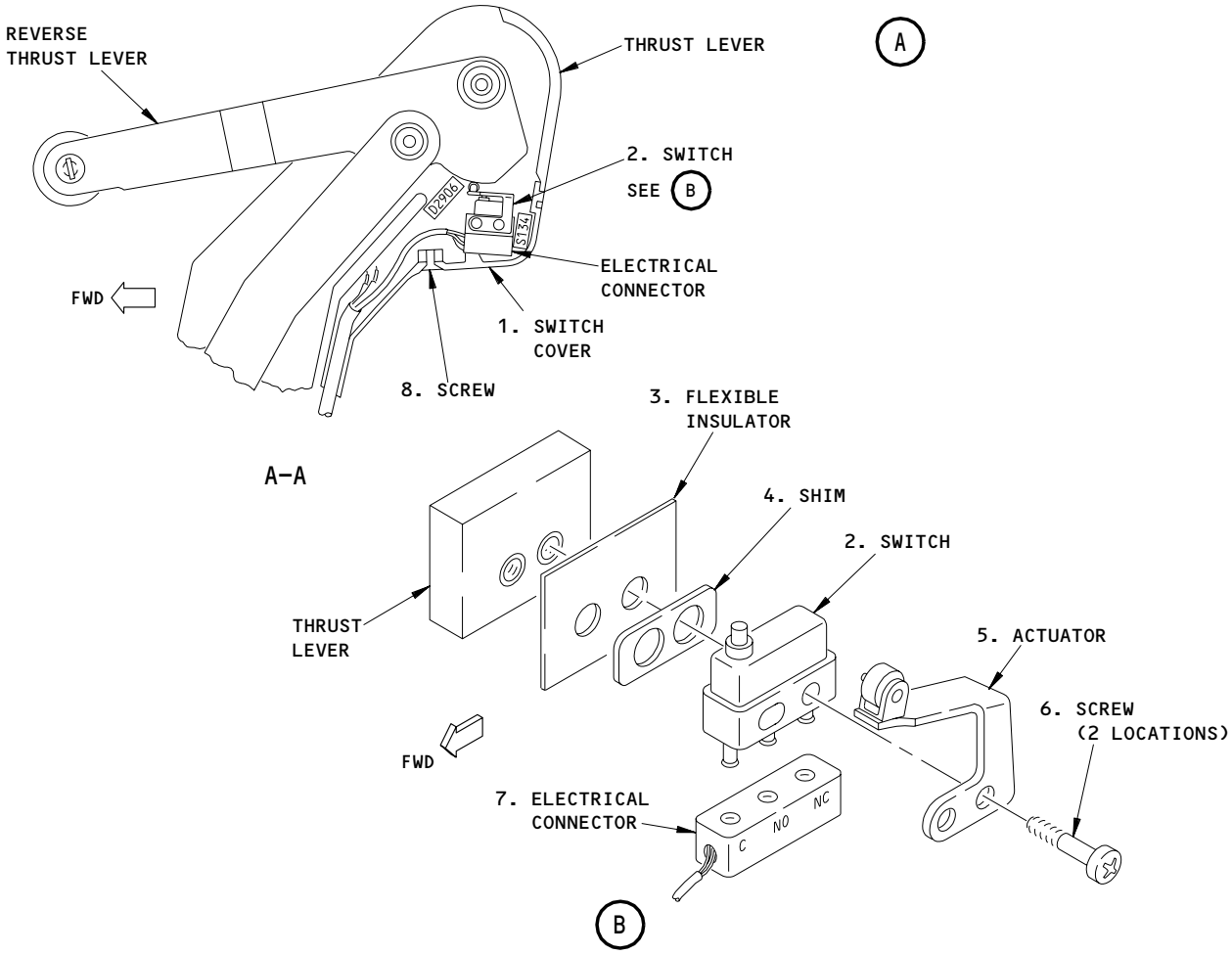
      S 864-006-R00
      (2) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
          Open these circuit breakers and attach a DO-NOT-CLOSE tag:
          (a) On the overhead equipment panel P11:
              1) For the left engine:
                  a) 11D12, ENGINE LEFT T/R CONT
              2) For the right engine:
                  a) 11B30, ENGINE RIGHT T/R CONT

      S 864-033-R00
      (3) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
          Open these circuit breakers and attach the DO-NOT-CLOSE tags:
          (a) On the overhead equipment panel P11:
              1) For the left engine:
                  a) 11D12, T/R CONT L

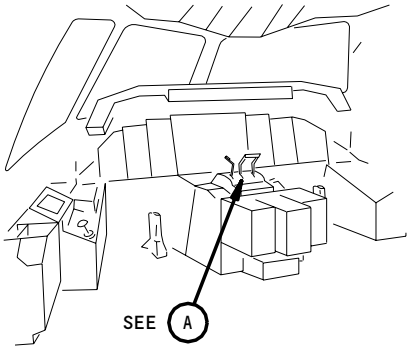


FLIGHT COMPARTMENT

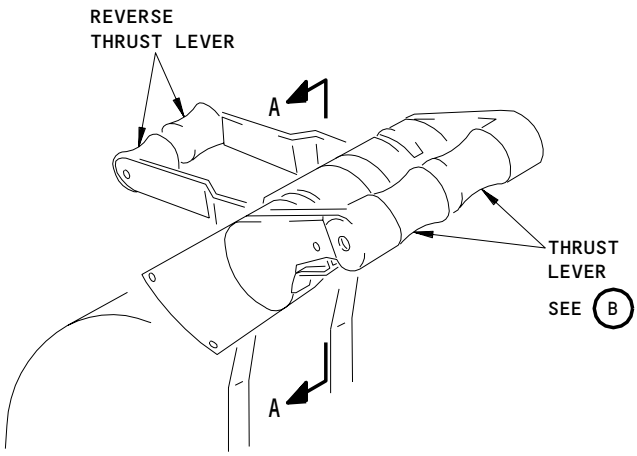


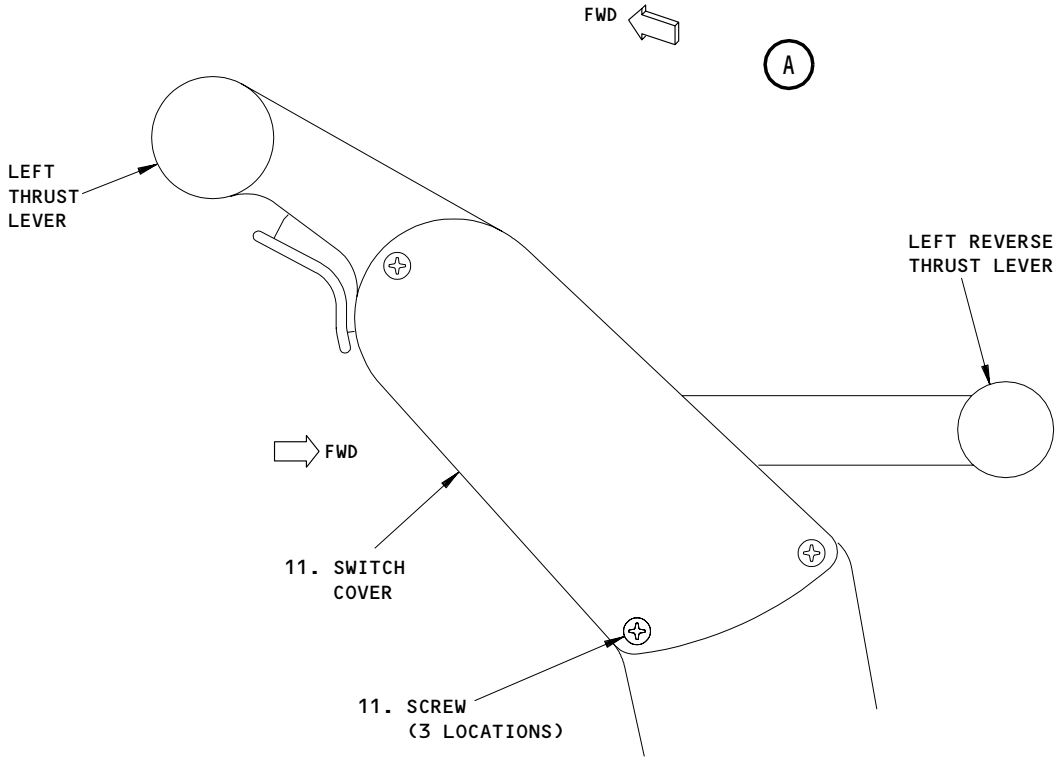


Thrust Reverser Control Switches Installation
Figure 401A



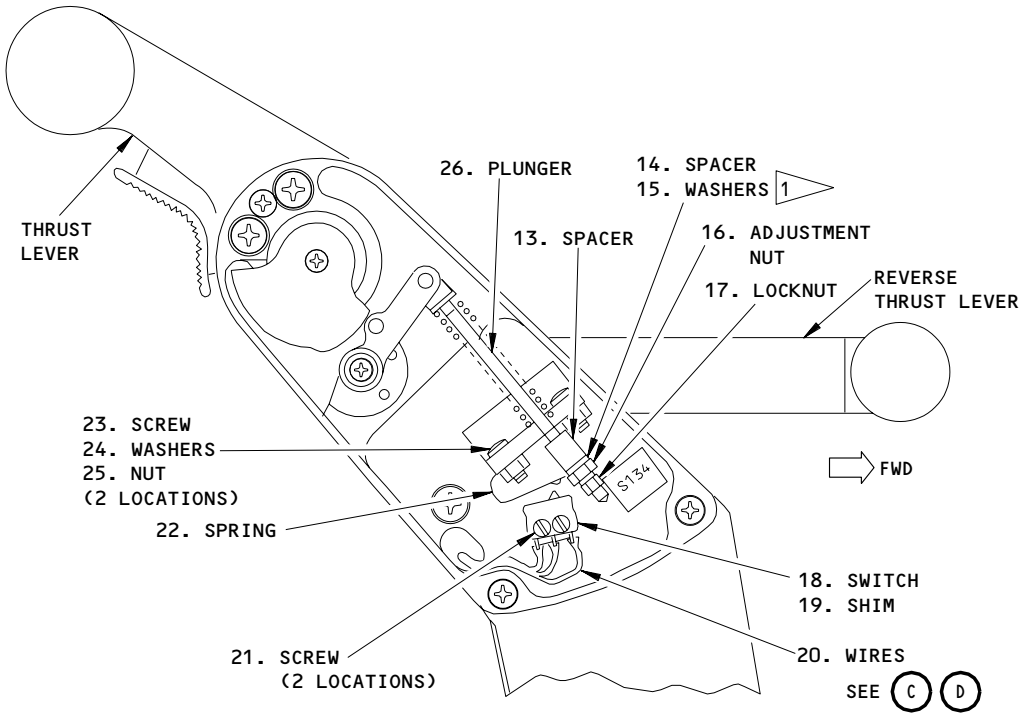
FLIGHT COMPARTMENT





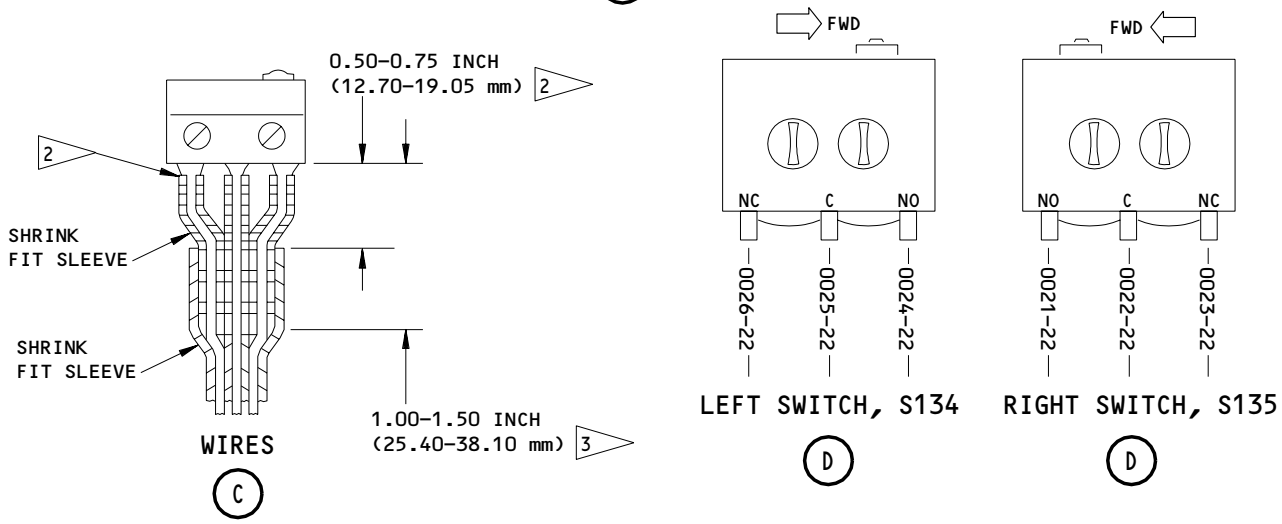
A–A
(LEFT SWITCH COVER IS SHOWN,
RIGHT SWITCH COVER IS OPPOSITE)

Thrust Reverser Control Switches Installation
Figure 401B (Sheet 1)



(LEFT SWITCH COVER IS SHOWN,
RIGHT SWITCH COVER IS OPPOSITE)

B



1 ADJUST SWITCH ACTUATION POINT WITH 1 TO 8 WASHERS MAXIMUM OR 1 SPACER AND 4 WASHERS MAXIMUM; WASHERS/SPACER INSTALLED BETWEEN THE SPRING AND ADJUSTMENT NUT

2 SOLDER CONNECTIONS, SHRINK FIT SLEEVE TO COVER ALL CONNECTIONS OVER THIS LENGTH

3 SHRINK FIT SLEEVE 100 PERCENT OVER THIS LENGTH

Thrust Reverser Control Switches Installation
Figure 401B (Sheet 2)

2) For the right engine:
a) 11K33, T/R CONT R
b) 11B30, T/R CONT ALTN R

D. Remove the Control Switch for the Thrust Reverser

S 014-011-R00
(1) AIRPLANES WITH TITANIUM THRUST LEVERS;
Remove the control switch.
(a) Remove the screws (8) and the cover (1) on the rear of the thrust lever to get access to the switch (2).
(b) Remove the two screws (5) that hold the switch (2) in the thrust lever.
(c) Remove the switch (2), the actuator (4) and shim (7).
(d) Examine the direction of the actuator arm on the switch.
1) Make a record that the actuator arm is installed with the arm at the aft side of the switch (Fig. 401A).
(e) Disconnect the electrical connector (6) from the switch (2).

S 024-078-R00
(2) AIRPLANES WITH ALUMINUM THRUST LEVERS;
Remove the control switch.
(a) Remove the screws (12) and the cover (11) on the side of the thrust lever to get access to the switch (18) (Fig. 401B).
(b) Remove the two screws (21) that hold the switch (18) in the thrust lever.
(c) Remove the switch (18) and the shim (19).
(d) Make a record of the wire connections (20) on the switch (18).
(e) Remove the heat shrink sleeve.
(f) Use a soldering tool to disconnect the wires (20) from the control switch (18) (AMM 20-10-26/201).

TASK 78-34-09-404-016-R00

3. Install the Thrust Reverser Control Switches

A. Equipment
(1) A27021-30 Protractor
(2) A27097-1 Adapter
(3) Heat gun
(4) Soldering Iron

B. Consumable Materials
(1) G02104 Heat Shrink Tubing - RT786 color yellow, Raychem Corp., Menlo Park, CA, USA

C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401A	2	Switch	76-11-01	15	320
401B	18	Switch	76-11-01	16	300

D. References
(1) AMM 20-10-26/201, Heat Guns, Soldering Guns, Soldering Irons
(2) AMM 24-22-00/201, Electrical Power - Control
(3) AMM 78-31-00/201, Thrust Reverser System

E. Access
(1) Location Zones
210 Control Cabin

F. Install the Control Switch for the Thrust Reverser

S 214-081-R00
(1) Make sure the reverse thrust lever is at the retracted position.

S 424-082-R00
(2) AIRPLANES WITH TITANIUM THRUST LEVERS;
Install the control switch.
(a) Connect the electrical connector (6) to the switch (2).

(b) Find the direction the switch was installed from the record.
(c) Put the switch (2), the actuator (4) and the shim (7) in the thrust lever in the correct direction.
(d) Install the screws (5) that hold the switch (2) in the thrust lever.
1) Tighten the screws (5) until the screws loosely hold the switch.

NOTE: Do not fully tighten the screws because the switch must be adjusted. The cover (1) will be installed after the switch adjustment.

S 424-084-R00

(3) AIRPLANES WITH TITANIUM THRUST LEVERS;
Adjust the switch.

(a) Attach the protractor to the reverse thrust lever (Fig. 402).
  1) Attach the protractor to the adapter with two screws.
  2) Loosen the knurled wheel on the J-bolt.
  3) Put the adapter on the reverse thrust lever.
  4) Adjust the position of the adapter to prevent the interference of the J-bolt with the angled part of the lever.
  5) Tighten the knurled wheel to hold the adapter to the reverse thrust lever.
  6) Set the protractor to zero degrees.
  7) Slowly move the reverse thrust lever rearward from the retracted position.
  8) Listen for a click sound.
  9) Stop the movement of the reverse thrust lever when you hear the click sound.

(b) Measure the angle that the reverse thrust lever moved when you heard the click sound.
  1) The angle must be 10-26 degrees.
  2) If the angle is not correct, do the steps that follow:
    a) Adjust the switch by moving it on the mounting screws.
    b) Measure the switch engagement angle again.
    c) Do these steps again until the switch operates at the correct angle.

(c) Remove the protractor and the adapter from the reverse thrust lever.

(d) Tighten the screws (5).

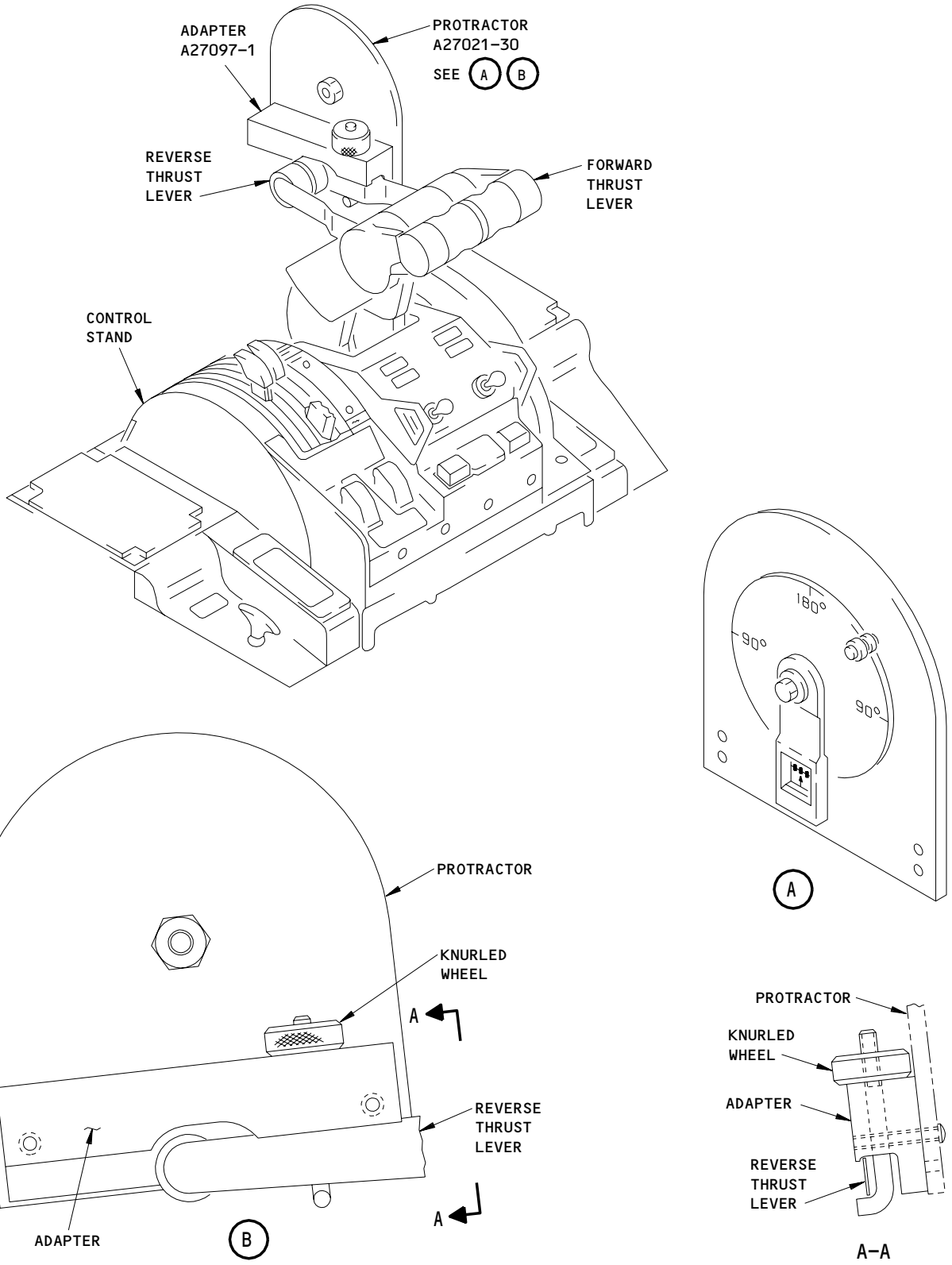
(e) Make sure the actuator roller moves smoothly on the cam surface of the reverse thrust lever.

(f) Install the cover (1) on the thrust lever with the two screws (8).

S 424-095-R00

(4) AIRPLANES WITH ALUMINUM THRUST LEVERS;
Install the control switch (Fig. 401B).

(a) Attach the wires (20) to the switch (18):
  1) Make the same connections that you recorded.



Reverse Thrust Lever Protractor Adapter
Figure 402

2) Put the heat shrink sleeve on the wires (20).
3) Solder the wires (20) to the new switch (18) (AMM 20-10-26/201).
4) Slide the heat shrink sleeve over the connection and use the heat gun to make the sleeve smaller (AMM 20-10-26/201).

(b) Put the switch (18) and shim (19) in the correct direction in the thrust lever.

(c) Install the screws (21) that hold the switch (18) in the thrust lever.
1) Tighten the screws.

S 424-087-R00

(5) AIRPLANES WITH ALUMINUM THRUST LEVERS;
Adjust the switch:

(a) Attach the protractor to the reverse thrust lever (Fig. 402).
1) Attach the protractor to the adapter with two screws.
2) Loosen the knurled wheel on the J-bolt.
3) Put the adapter on the reverse thrust lever.
4) Adjust the position of the adapter to prevent the interference of the J-bolt withthe angled part of the lever.
5) Tighten the knurled wheel to hold the adapter to the reverse thrust lever.
6) Set the protractor to zero degrees.

(b) Measure the angle to activate the switch.
1) Slowly move the reverse thrust lever rearward from the retracted position.
2) Listen for a click sound.
3) Stop the movement of the reverse thrust lever when you hear the click sound.
4) Measure the angle that the reverse thrust lever moved when you heard the click sound.
5) The angle must be 10-26 degrees.

(c) If the angle is not correct, do the steps that follow:
1) Loosen the locknut (17) on the bellcrank plunger (26).
2) Advance the adjustment nut (16) to decrease the rigging angle.
3) Retract the adjustment nut (16) to increase the rigging angle.
4) Tighten the locknut (17) on the bellcrank plunger (26).

(d) Measure the switch engagment angle again.

(e) If the angle is not correct, add or remove washers (15) and spacer (14) that are installed between the spring (22) and the adjustment nut (16).
1) Remove the lockout nut (17) and the adjustment nut (16).
2) Remove the installed washers (15) and/or spacer (14).
3) Remove the installed washers (15) and/or spacer (14).
4) If the spring (22) is damaged, do these steps:
a) Remove the two screws (23), washers (24), and the nuts (25).
b) Remove the spring (22) and spacer (13).
c) Install spacer (13) on the plunger (26) and the put the spring (22) in position under the spacer (13).
d) Install the two screws (23), washers (24), and the nuts (25).
5) Use a minimum of one washer (15) to a maximum of eight washers (15) to adjust the switch actuation point.

NOTE: The washers (15) and spacer (14) that are installed on the rod (26) between the spring (22) and the adjustment nut (16).

6) It is optional to use one spacer (14) with a maximum of four washers (15) to adjust the switch actuation point.

NOTE: Spacer (14) part number is NAS43DD1-12FC.

7) Install the adjustment nut (16) and locknut (17).
(f) Do the steps to check to operation of the switch again.
1) Make sure the angle is between 10-26 degrees.
(g) Continue to do the steps to adjust the number of washer (15) and/or spacer (14) until the switch actuation point is correct.
(h) Remove the protractor and the adapter from the reverse thrust lever.
(i) Install the cover (11) on the thrust lever with two screws (12).

G. Put the Airplane Back to Its Usual Condition

S 864-021-R00
(1) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 overhead panel:
(a) 11G11, AUTO SPEEDBRAKE

S 864-031-R00
(2) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tag and close this circuit breaker:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B30, ENGINES RIGHT T/R CONT

S 864-032-R00
(3) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tag and close this circuit breaker:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D12, T/R CONT L
2) For the right engine:
a) 11K33, T/R CONT R
b) 11B30, T/R CONT ALTN R

S 714-028-R00
(4) Do this procedure: Thrust Reverser Power Deploy/Stow
(AMM 78-31-00/201).

S 864-029-R00
(5) Remove the electrical power if it is no longer required
(AMM 24-22-00/201).

THRUST REVERSER ISOLATION VALVE PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General
   A. The thrust reverser isolation valve pressure switch (referred to as the pressure switch) is installed on the isolation valve of the thrust reverser. The isolation valve is installed in the trailing edge fairing of the strut.
   B. This procedure gives the instructions to do these tasks:
      (1) Remove the Thrust Reverser Isolation Valve Pressure Switch.
      (2) Install the Thrust Reverser Isolation Valve Pressure Switch.

TASK 78-34-10-004-017-R00

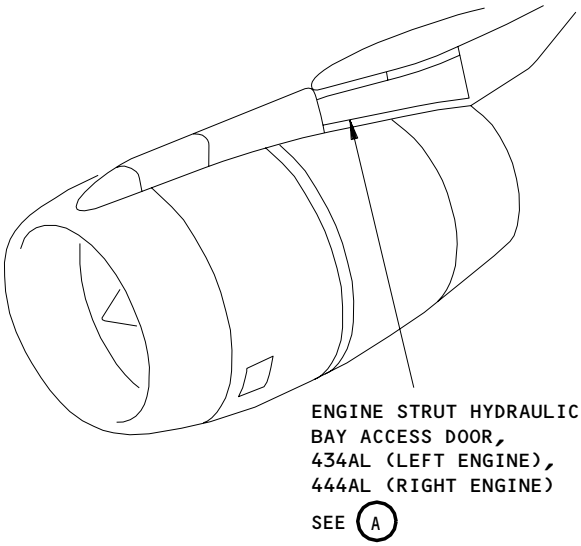
2. Remove the Thrust Reverser Isolation Valve Pressure Switch (Fig.401)
   A. References
      (1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
      (2) AMM 29-11-00/201, Main (Left, Right and Center) Hydraulic Systems
   B. Access
      (1) Location Zones
          430 Left Engine Strut
          440 Right Engine Strut
   C. Prepare to Remove the Pressure Switch

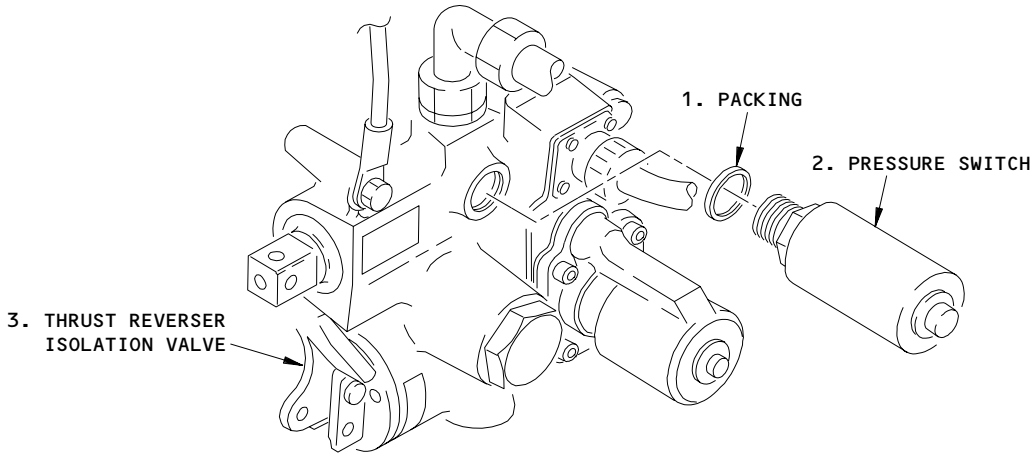
      S 044-018-R00
      (1) Remove the pressure from the hydraulic system (AMM 29-11-00/201).

      S 044-002-R00
      (2) For the left engine, open these circuit breakers and attach DO-NOT-CLOSE tags:
          (a) Overhead Equipment Panel, P11:
              1) 11K5 or 11D11, T/R IND L
              2) 11K6 or 11D12, T/R CONT L

      S 044-003-R00
      (3) For the right engine, open these circuit breakers and attach DO-NOT-CLOSE tags:
          (a) P11 Panel:
              1) 11K32 or 11B29, T/R IND R
              2) 11B30, T/R CONT R
              3) 11K33, T/R CONT-ALTN-R
   D. Remove the Pressure Switch

      S 014-004-R00
      (1) Push the latch trigger on the aft fairing access door (AMM 06-43-00/201) to release the latches and open the access door.





Thrust Reverser Isolation Valve Pressure Switch Installation
Figure 401

S 024-005-R00
(2) Disconnect the electrical connector from the pressure switch.

S 024-006-R00
(3) Remove the lockwire from the pressure switch (2).

S 024-007-R00

CAUTION: USE AN APPROVED CONTAINER TO CATCH THE HYDRAULIC FLUID. YOU MUST CLEAN ALL HYDRAULIC LEAKAGE IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO THE EQUIPMENT.

(4) Remove the pressure switch (2) from the isolation valve (3).
(a) Remove and discard the packing (1).

TASK 78-34-10-404-019-R00

3. Install the Thrust Reverser Isolation Valve Pressure Switch (Fig. 401)
A. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Packing	29-11-06	01	77
	2	Switch - Pressure			75
	3	Thrust Reverser Isolation Valve			70

B. References
(1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
(2) AMM 29-11-00/201, Main (Left, Right and Center) Hydraulic systems
(3) AMM 78-31-00/201, Thrust Reverser System
C. Access
(1) Location Zones
430 Left Engine Strut
440 Right Engine Strut
D. Install the Pressure Switch

S 424-008-R00
(1) Install the packing (1) on the pressure switch (2).

S 424-009-R00
(2) Install the pressure switch (2) on the isolation valve (3).
(a) Install the lockwire on the pressure switch.

S 424-010-R00
(3) Connect the electrical connector to the pressure switch.

S 444-011-R00
(4) Pressurize the left or right hydraulic system (AMM 29-11-00/201).

S 214-012-R00
(5) Examine the hydraulic system for leaks.

E. Put the Airplane Back to Its Usual Condition

S 414-013-R00
(1) Close the aft fairing access door (AMM 06-43-00/201).

S 444-014-R00
(2) For the left engine, close these circuit breakers and remove the DO-NOT-CLOSE tags:
(a) P11 Panel:
1) 11K5 or 11D11, T/R IND L
2) 11K6 or 11D12, T/R CONT L

S 444-015-R00
(3) For the right engine, close these circuit breakers and remove the DO-NOT-CLOSE tags:
(a) P11 Panel:
1) 11K32 or 11B29, T/R IND R
2) 11B30, T/R CONT R
3) 11K33, T/R CONT-ALTN-R

S 714-016-R00
(4) Do the required tests (AMM 78-31-00/501).

THRUST REVERSER ISOLATION VALVE SOLENOID VALVE - REMOVAL/INSTALLATION

1. General
   A. The thrust reverser isolation valve solenoid valve (referred to as the solenoid valve) is installed on the isolation valve of the thrust reverser. The isolation valve is installed in the trailing edge fairing of the strut.
   B. This procedure gives the instructions to do these tasks:
      (1) Remove the Thrust Reverser Isolation Valve Solenoid Valve.
      (2) Install the Thrust Reverser Isolation Valve Solenoid Valve.

TASK 78-34-11-004-001-R00

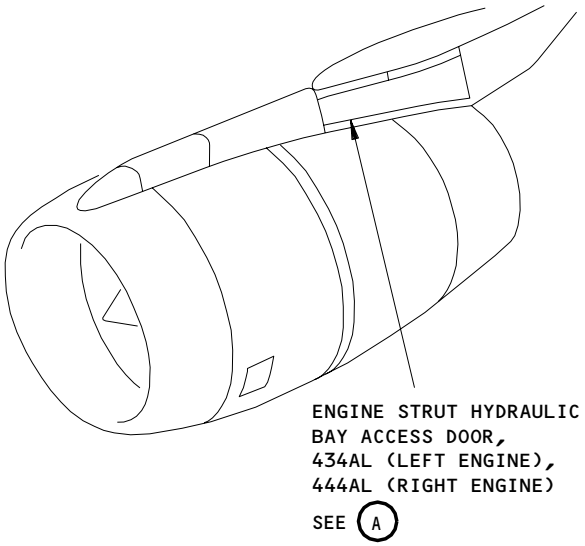
2. Remove the Thrust Reverser Isolation Valve Solenoid Valve (Fig. 401)
   A. References
      (1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
      (2) AMM 29-11-00/201, Main (Left, Right and Center) Hydraulic Systems
   B. Access
      (1) Location Zones
          430 Left Engine Strut
          440 Right Engine Strut
   C. Prepare the Remove the Pressure Switch

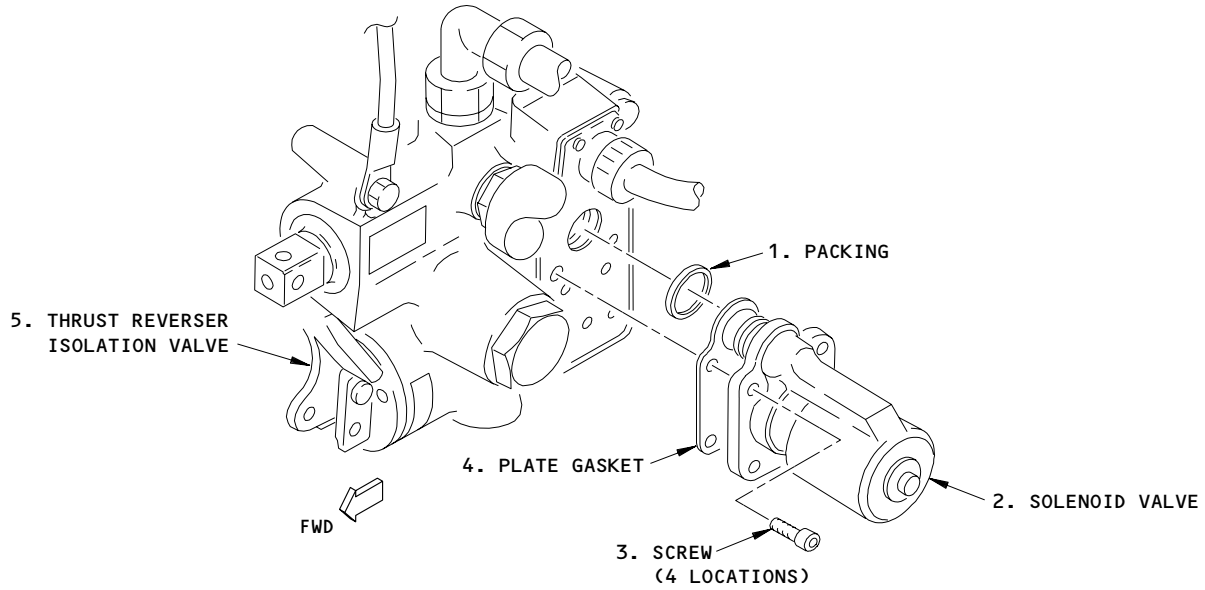
      S 044-002-R00
      (1) Remove the pressure from the hydraulic system (AMM 29-11-00/201).

      S 044-003-R00
      (2) For the left engine, open these circuit breakers and attach DO-NOT-CLOSE tags:
          (a) Overhead Equipment Panel, P11:
              1) 11K5 or 11D11, T/R IND L
              2) 11K6 or 11D12, T/R CONT L

      S 044-004-R00
      (3) For the right engine, open these circuit breakers and attach DO-NOT-CLOSE tags:
          (a) P11 Panel:
              1) 11K32 or 11B29, T/R IND R
              2) 11B30, T/R CONT R
              3) 11K33, T/R CONT-ALTN-R
   D. Remove the Solenoid Valve

      S 014-005-R00
      (1) Push the latch trigger on the aft fairing access door (AMM 06-43-00/201) to release the latches and open the access door.





Thrust Reverser Isolation Valve Solenoid Valve Installation
Figure 401

L17855

S 024-006-R00
(2) Disconnect the electrical connector from the solenoid valve.

S 024-007-R00

CAUTION: USE AN APPLICABLE CONTAINER TO CATCH THE HYDRAULIC FLUID. YOU MUST CLEAN ALL HYDRAULIC FLUID LEAKAGE IMMEDIATELY. HYDRAULIC FLUID CAN CAUSE DAMAGE TO EQUIPMENT.

(3) Remove the screws (3) which attach the solenoid valve (2).

S 024-008-R00
(4) Remove the solenoid valve (2) from the isolation valve (5).

S 024-009-R00
(5) Remove the packing (1) and the plate gasket (4) from the solenoid valve (2).

TASK 78-34-11-404-019-R00

3. Install the Thrust Reverser Isolation Valve Solenoid Valve (Fig. 401)

A. Parts

AMM			AIPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	1	Packing	78-34-05	01	70
	2	Valve - Solenoid			60
	3	Screw			55
	4	Plate - Gasket			65
	5	Valve Assembly - Thrust Reverser Isolation Module			40

B. References
(1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
(2) AMM 29-11-00/201, Main (Left, Right and Center) Hydraulic Systems
(3) AMM 78-31-00/501, Thrust Reverser System

C. Access
(1) Location Zones
430 Left Engine Strut
440 Right Engine Strut

D. Install the Thrust Reverser Isolation Valve Solenoid Valve.

S 424-010-R00
(1) Install the plate gasket (4) and the packing (1) on the solenoid valve (2).

S 424-011-R00
(2) Install the solenoid valve (2) on the isolation valve (5) with the screws (3).

S 424-012-R00
(3) Connect the electrical connector to the solenoid valve (2).

E. Put the Airplane Back to Its Ususal Condition

S 444-013-R00
(1) Pressurize the hydraulic system for the applicable engine (AMM 29-11-00/201).

S 214-014-R00
(2) Examine the hydraulic system for leaks.

S 414-015-R00
(3) Close the aft fairing access door (AMM 06-43-00/201).

S 444-016-R00
(4) For the left engine, close these circuit breakers and remove the DO-NOT-CLOSE tags:
(a) P11 Panel:
1) 11K5 or 11D11, T/R IND L
2) 11K6 or 11D12, T/R CONT L

S 444-017-R00
(5) For the right engine, close these circuit breakers and remove the DO-NOT-CLOSE tags:
(a) P11 Panel:
1) 11K32 or 11B29, T/R IND R
2) 11B30, T/R CONT R
3) 11K33, T/R CONT-ALTN-R

S 714-018-R00
(6) Do the required tests (AMM 78-31-00/501)

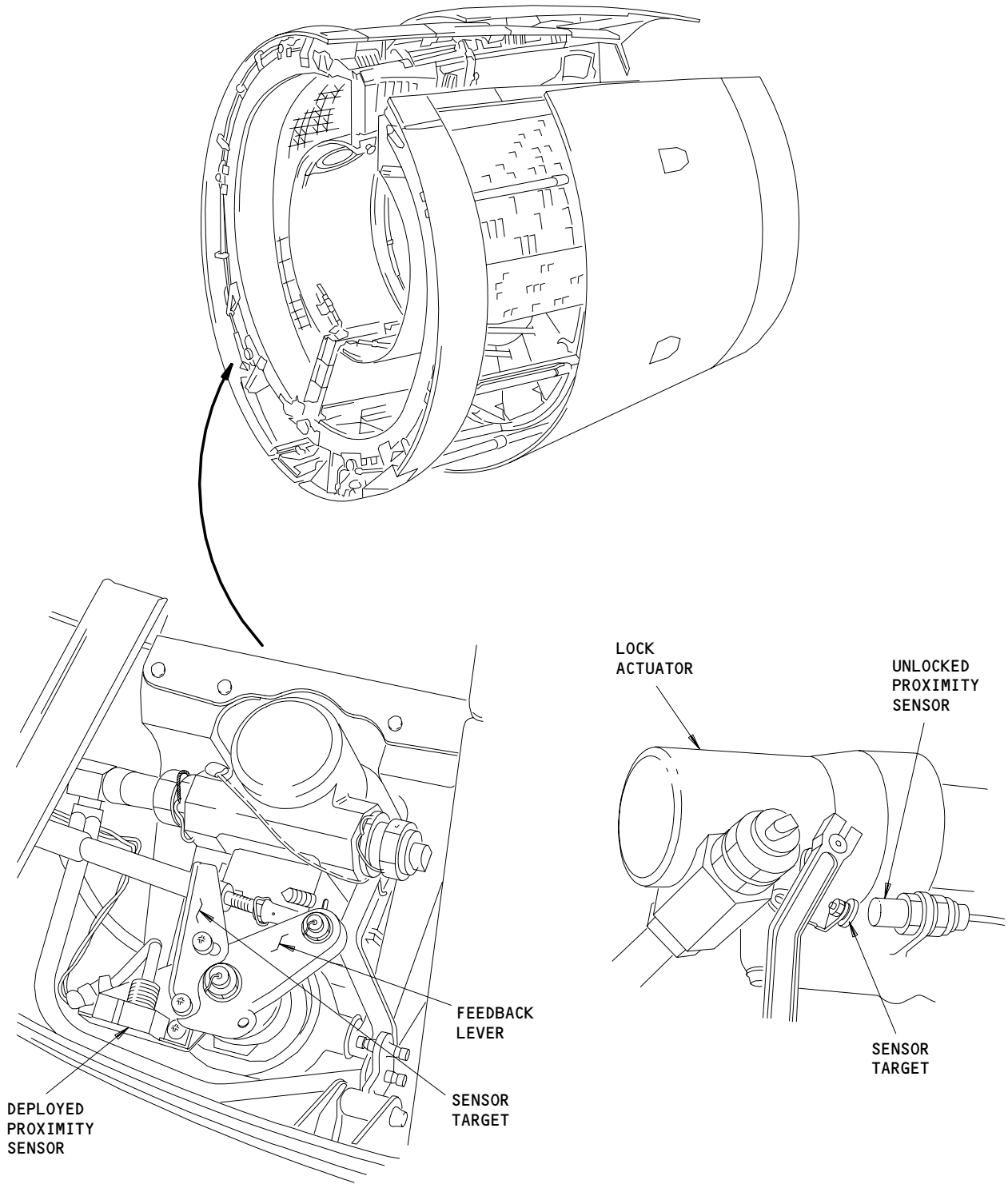
THRUST REVERSER POSITION INDICATING SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The thrust reverser position indicating system provides the flight crew with visual indication of operation and position of the thrust reverser, and indication of a fault occurring in the thrust reverser control system (AMM 78-34-00/001).
   B. Indication is provided for reverser unlocked and reverser deployed by a single REV display on the upper Engine Indication and Crew Alerting System (EICAS) display in the flight compartment. The REV display is colored amber when the locks are disengaged and the system is in transit, and changes to green when the system reaches the fully deployed position.
   C. AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
      A problem in the thrust reverser control system, gives a REV ISLN light on the pilot's control stand P10 and a (L,R) REV ISLN VAL advisory message on the upper EICAS display in the flight compartment.

      NOTE: On airplanes with -105 EICAS computers, the cautionary EICAS message REV ISLN VAL and maintenance message L/R REV ISLN VAL are inhibited by EICAS message L or R AC BUS OFF.

      (1) The problems that could cause a REV ISLN indication are the position of the isolation valve does not match the commanded position of the valve, an air/ground relay is failed, a problem in the isolation valve fault indication system, a stow relay failed closed, a auto-restow proximity sensor problem, or a locking actuator which permits the translating cowls to extend.
   D. AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
      A problem in the thrust reverser control system, gives a (L,R) REV ISLN VAL advisory message on the upper EICAS display in the flight compartment.
      (1) The problems that could cause a REV ISLN VAL indication are the position of the isolation valve does not match the commanded position of the valve, a stow relay failed closed, a auto-restow proximity sensor problem, or a locking actuator which permits a translating cowl to extend.
2. Component Details
   A. Thrust Reverser Position Indication
      (1) Two sensor assemblies on each C-duct, signal thrust reverser actuation and position to the upper EICAS display in the flight compartment.

(2) Thrust Reverser Lock Proximity Sensor
  (a) The thrust reverser system is locked in the stowed position by locking mechanisms on the left and right lower actuators. Lock disengagement is sensed by a proximity sensor (Fig. 1) attached to the end housing of each lock actuator.
  (b) A sensor target is attached to an arm on each actuator lock lever. When actuated by the lock valve (AMM 78-31-00/001), the lock lever arms move the targets away from the sensors.
(3) Thrust Reverser Deployed Proximity Sensor
  (a) A deployed proximity sensor (Fig. 1) is mounted on a bracket attached to the feedback actuator of each C-duct. The associated sensor target is attached to the feedback lever and operated by the feedback actuator when reverse thrust is selected (AMM 78-34-00/001).
  (b) System in transit and deployed operations are sensed by detector units in a proximity switch electronics unit (PSEU) (Fig. 2), and processed through a series of logic gates to the upper EICAS display in the flight compartment.
(4) AIRPLANES WITH SB 78-39;
  The EICAS REV amber indication circuit was changed.
  (a) The EICAS REV amber indication signal from the PSEU must pass through these relays that follow:
    1) For the left system, the L THRUST RVS STOW RELAY (K26) and the AIR/GND RELAY SYSTEM 1 (K10108).
    2) For the right system, R THRUST RVS STOW RELAY (K27) and the AIR/GND RLY SYSTEM 2 (K219).
  (b) The EICAS REV amber indication will only occur in-flight when these relays are in agreement. The thrust reverser control system must detect sleeve movement to energize the auto-restow circuit. This will cause the stow relay to move to the not-stowed position. The circuit path is complete with the air/gnd relay in the air position and a REV amber indication will be displayed.
  (c) The EICAS REV amber indication will be displayed as usual during normal thrust reverser extension and retraction because the circuit path only goes through the air/gnd relay when the airplane is on the ground.



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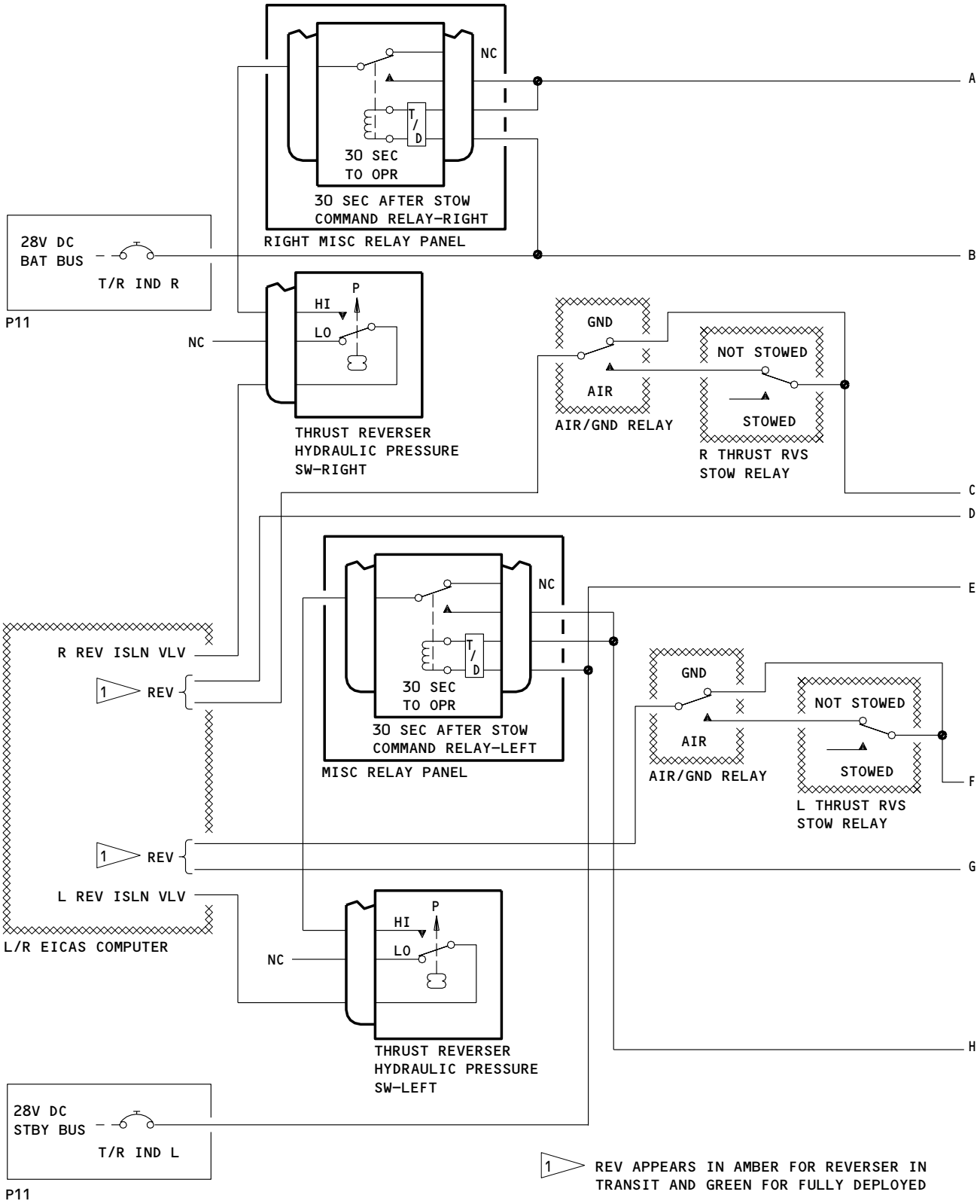
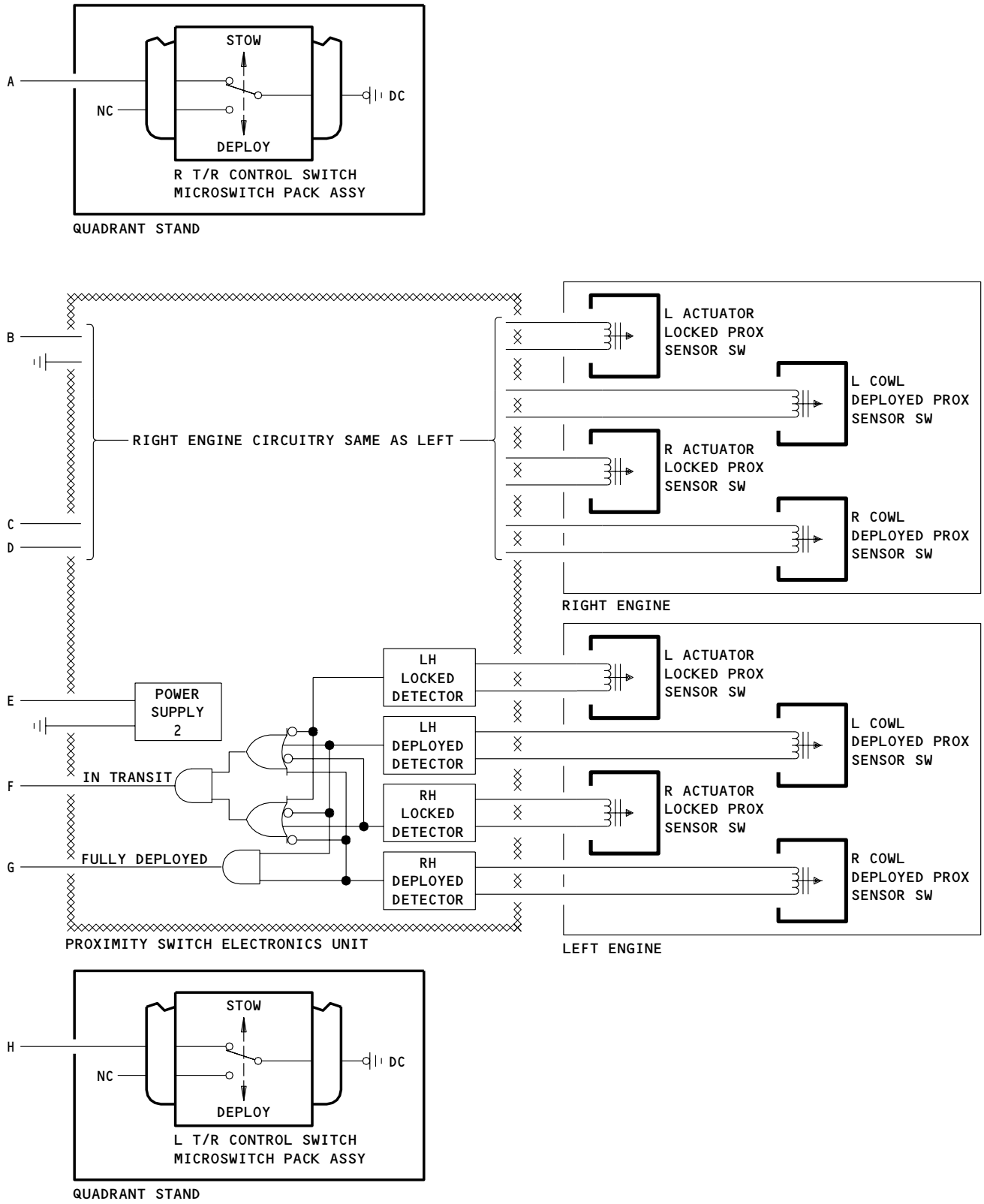
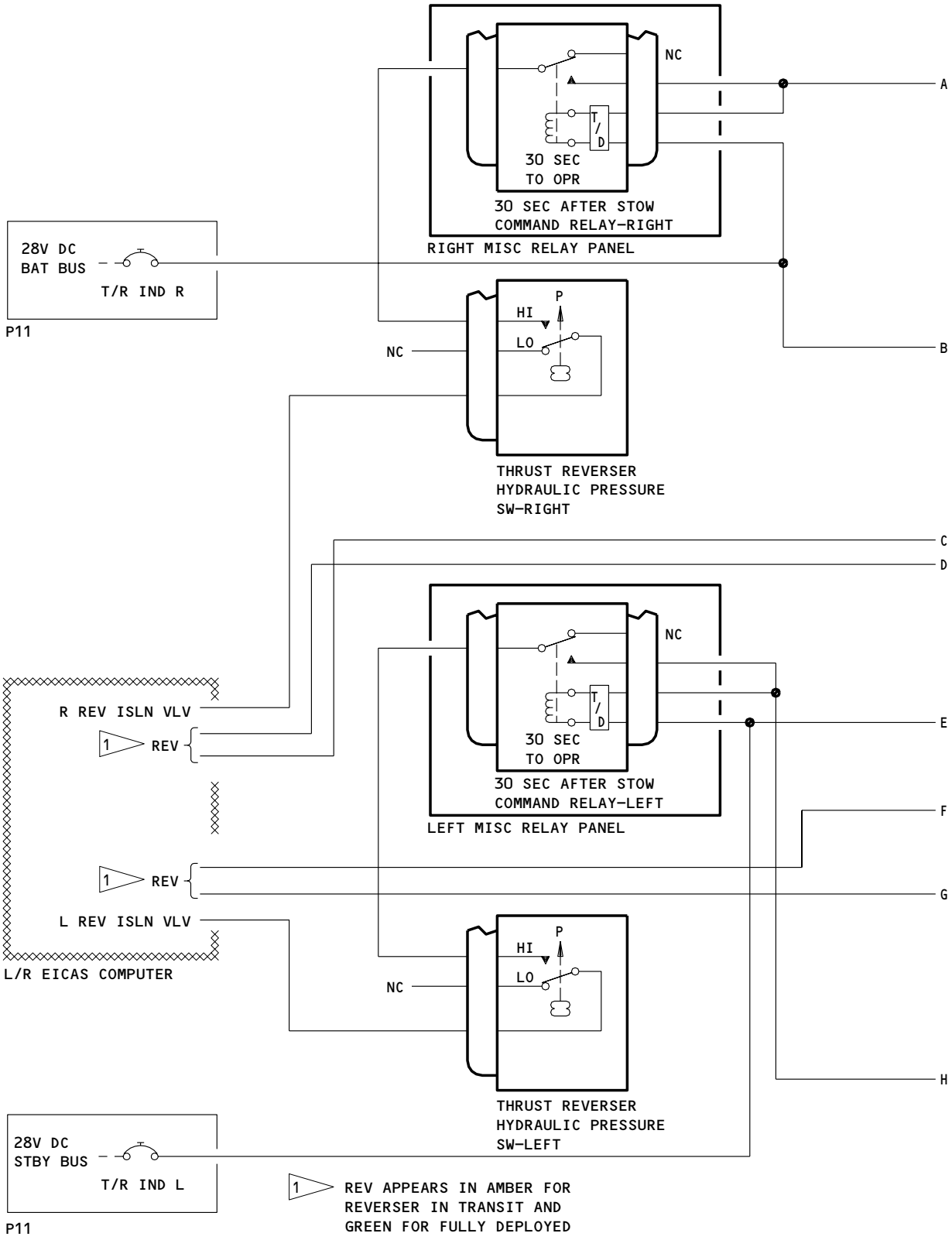
Thrust Reverser Indicating Proximity Sensors
Figure 1



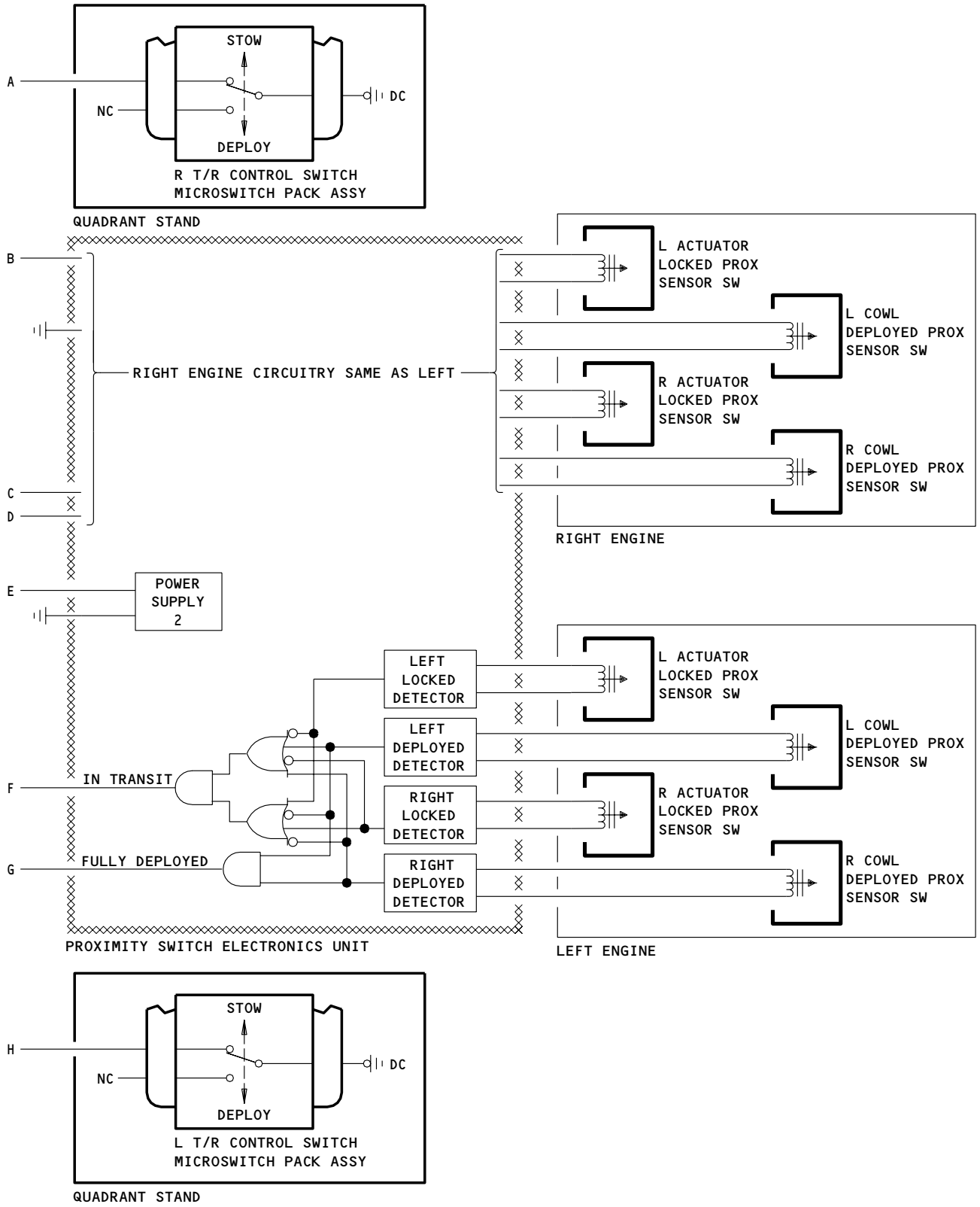
Thrust Reverser Indication System Schematic
Figure 2 (Sheet 1)



Thrust Reverser Indication System Schematic
Figure 2 (Sheet 2)



Thrust Reverser Indication System Schematic
Figure 2A (Sheet 1)



Thrust Reverser Indication System Schematic
Figure 2A (Sheet 2)

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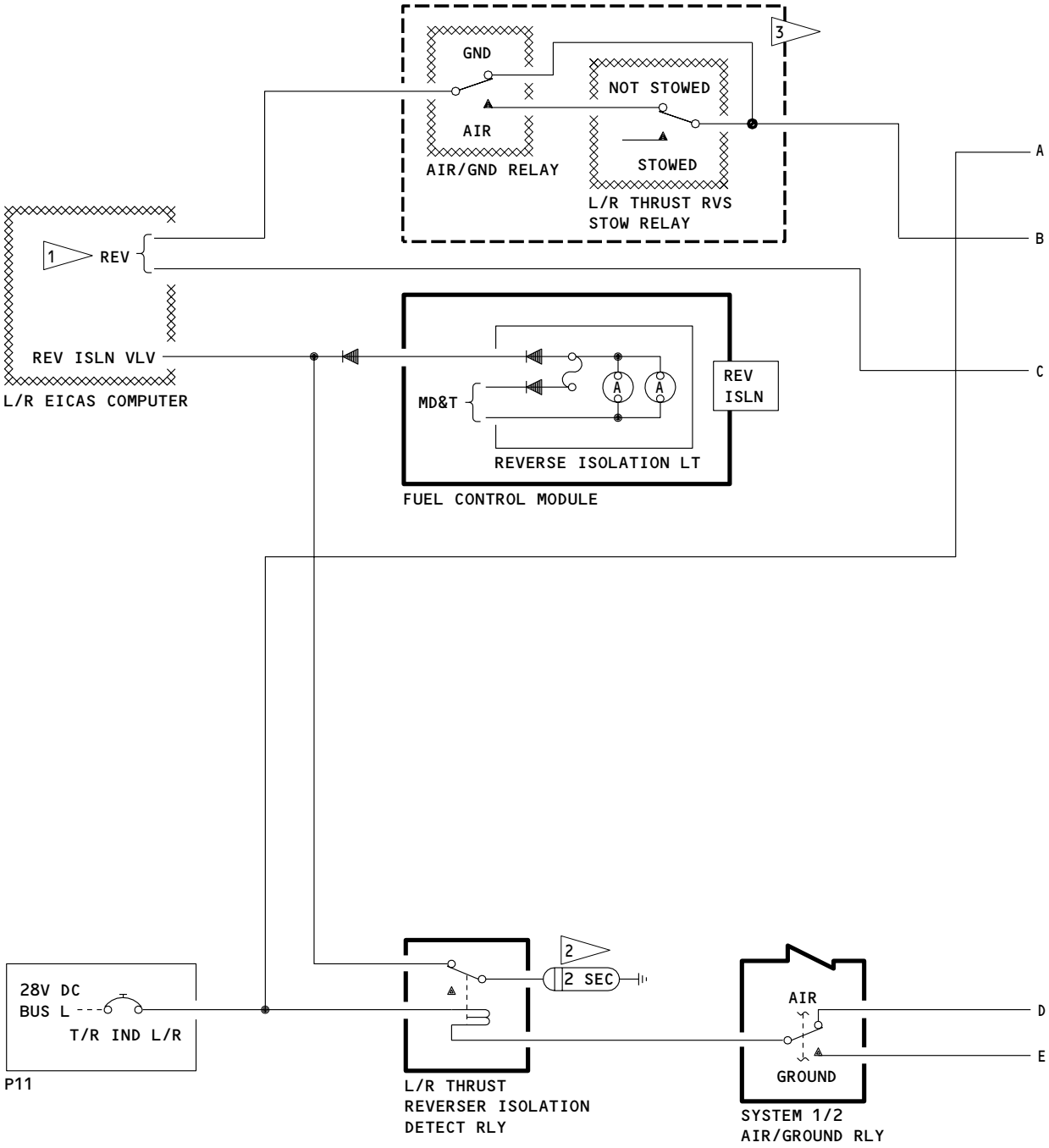
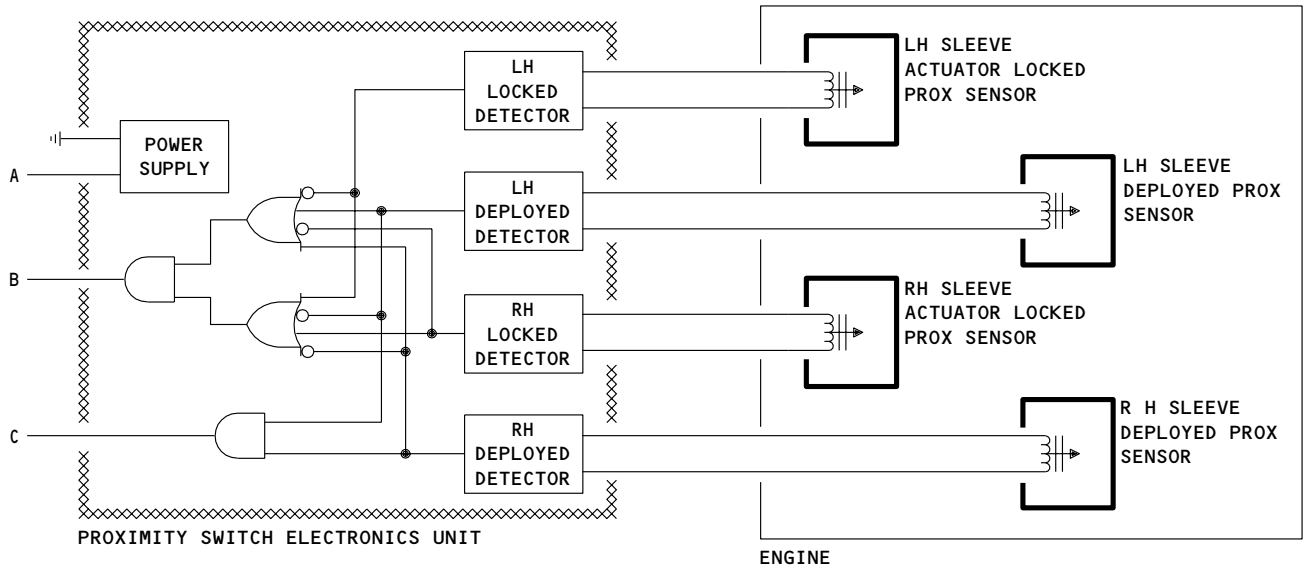


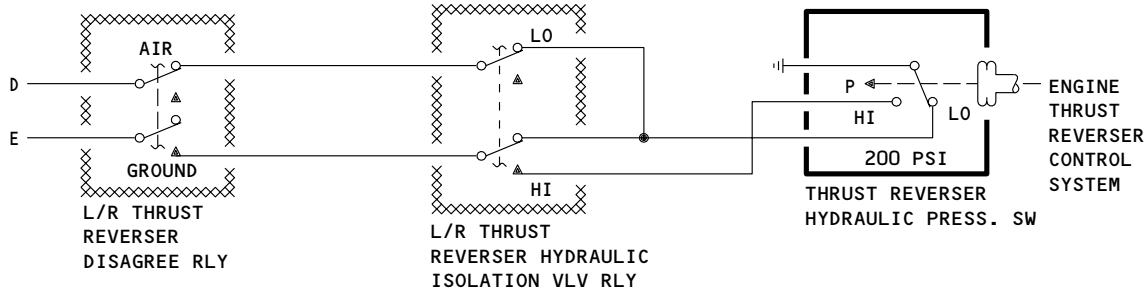
1 REV APPEARS IN AMBER FOR REVERSER IN TRANSIT AND GREEN FOR FULLY DEPLOYED

2 ON AIRPLANES WITH SERVICE LETTER 757-SL-78-9; THE TIME DELAY IS 15 SECONDS

3 AIRPLANES WITH SB 78-39

Thrust Reverser Position Indication System Schematic
Figure 3 (Sheet 1)





Thrust Reverser Position Indication System Schematic
Figure 3 (Sheet 2)

A68142

(d) This change to the thrust reverser position indication circuit will reduce the intermittent REV amber indications in-flight.

(5) Each sensor is driven by a periodic pulse, generated in the detector unit. The pulse is used to measure the inductance of the sensor such that, with the target near the inductance increases and target away the inductance decreases.

(6) When a specific inductance is measured by the detector, the detector output changes state. The output is a rational representation of:
(a) Target near, equals logic one (1)
(b) Target away, equals logic zero (0).

(7) The detector output is processed through OR gates, supplying a normal or reverse logic to an AND gate. An AND logic 1 output generates an EICAS display.

B. AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Isolation Valve Fault Indication

(1) The isolation valve fault circuit has four functions:
(a) To provide an indication if hydraulic pressure is sensed downstream of the isolation valve when reverse thrust is not selected.
(b) To provide an indication if hydraulic pressure is not sensed when reverse thrust is selected.
(c) To provide an indication of air/ground relay malfunctions in the thrust reverser control circuit.
(d) To provide an indication if the isolation valve is pressurized in the air, indicating possible malfunction of the auto stow relay, actuator locks, or proximity sensors indicating reverser not stowed.

(2) The circuit is routed through a miscellaneous relay panel comprising; an isolation detect relay, air/ground relay, reverser disagree relay and an isolation valve relay. The circuit is completed by the hydraulic pressure switch.

(3) The isolation detect relay is energized during engine operation to maintain an open circuit to the REV ISLN light and REV ISLN VAL EICAS message. If at any time the hydraulic pressure switch position disagrees with the selected mode, the isol detect relay de-energizes and grounds the flight compartment indicator circuit to provide indications on the pilot's control stand P10 and the upper EICAS display.

C. AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Isolation Valve Fault Indication System

(1) The isolation valve fault circuit provides a REV ISLN VAL indication on the upper EICAS display in the flight compartment if hydraulic pressure is sensed downstream of the isolation valve when reverse thrust is not selected.

(2) The circuit is routed through a control switch in the autothrottle microswitch pack to the "30 second after stow command" relay, which has a 30-second time delay and is located in a miscellaneous relay panel. The circuit to the EICAS computer is completed through the hydraulic pressure switch on the isolation valve.

3. Operation

A. Functional Description

(1) Thrust Reverser Position Indication

(a) With reverse thrust selected, hydraulic pressure is applied to the actuators (AMM 78-31-00/001) and the locks on the lower actuators disengage. This action moves the sensor targets away from the locked proximity sensors.

(b) Sensor inductance decreases and is measured by the left and right locked detectors (Fig. 2). The detector outputs change to logic 0 with the reduced inductance and each is fed to two OR gates.

(c) One leg of each output is fed into a normal OR logic channel, a second leg is fed into a reverse logic channel.

(d) Output from the two deployed detectors at this stage is also logic 0, and this is fed to the two OR gates similar to the locked detector outputs.

(e) Thus, each OR gate has four logic 0 inputs, two normal logic and two reverse logic. The output of the normal channel retains the logic of its input, logic 0. The output of the reverse logic channel, however, reverses the logic of its input, to logic 1.

(f) By reference to Fig. 2, the output, therefore, of each OR gate is logic 1. These logics are fed through an AND gate to produce a logic 1 output, resulting in an amber REV display on the upper EICAS display in the flight compartment.

(g) When full deployment is reached, the sensor targets move in toward the deployment proximity sensors. This action produces an increase in sensor inductance that changes deployed detector output, and hence OR gate input, to logic 1. The locked detector logic remains unchanged at logic 0.

(h) The change in input to the OR gates results in a 0:1 input to the AND gate and cancellation of the EICAS amber REV display.

(i) The output from each deployed actuator is also fed to a second AND gate. The deployed logic at this stage is logic 1; the output from the AND gate therefore, is logic 1, with the result that EICAS REV display is changed to green.

(2) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Isolation Valve Fault Indication System.

(a) This system will give an indication there is a disagreement between the commanded position of the isolation valve and the control switch position in the reverse thrust lever when the airplane is in flight, on the ground, and when the thrust reverser is commanded to reverse thrust.

(b) This system has three circuits from the circuit breaker, through the Isol Detect relay, the Air/Gnd relay, the Disagree relay, the Isol Vlv relay and through the Hydraulic Pressure switch to the electrical ground.

(c) The isolation valve fault indication system will automatically change to the correct circuit as the conditions on the airplane change.
1) The first circuit is the usual circuit when the airplane is in flight, the thrust reverser is commanded to the retracted position, and the hydraulic pressure switch is at the low pressure position.
2) The second circuit is the usual circuit when the airplane is on the ground, the thrust reverser is commanded to the retracted position, and the hydraulic pressure switch is at the low pressure position.
3) The third circuit is the usual circuit when the airplane is on the ground, the thrust reverser is commanded to the extended position, and the hydraulic pressure switch is at the high pressure position.

(d) If each circuit remains continous through the hydraulic pressure switch to the electrical ground, the isol detect relay will remain energized and prevent the REV ISLN light and the REV ISLN VAL EICAS message.

(e) If a circuit is opened, the isol detect relay will de-energized and permit the REV ISLN light and the REV ISLN VAL EICAS message.
1) An open circuit can occur when high pressure is sensed from the isolation valve when the valve was not commanded to open.
2) An open circuit can occur if the isolation valve was commanded to open and the valve did not open.
3) An open circuit can occur if the air/gnd relay, the disagree relay or the hyd isol val relay is not in the correct position.
4) An open circuit can occur if the wiring is broken.

(3) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Thrust Reverser Isolation Valve Fault Indication System.

(a) This system will give an indication there is a disagreement between the commanded position of the isolation valve and the control switch position when the thrust reverser is commanded to the retracted position but not when the thrust reverser is commanded to reverse thrust.

(b) Forward Thrust
1) During operation in forward thrust, the control switch in the autothrottle microswitch pack is in the stow position. This gives a ground to energize the "30 second after stow command" relay in the miscellaneous relay panel.
2) With the "30 second after stow command" relay energized, electrical power is given to the high pressure position of the hydraulic pressure switch on the isolation valve.
3) If the hydraulic pressure switch senses high pressure downstream of the isolation valve, the hydraulic pressure switch moves to the high pressure position to complete the circuit that causes the REV ISLN VAL message on the EICAS display.

(c) Reverse Thrust

1) During operation in reverse thrust, the control switch is opened and the "30 second after stow command" relay is deenergized to open the circuit to the hydraulic pressure switch on the isolation valve. The REV ISLN VAL EICAS message will not be shown during thrust reverser extension and reverse thrust.

2) When the reverse thrust lever is moved forward and down, the control switch is closed and the "30 second after stow command" relay becomes energized 30 seconds after the retract command. The REV ISLN VAL EICAS message will not be shown as the thrust reverser retracts and locks.

THRUST REVERSER POSITION INDICATING SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CIRCUIT BREAKER –	1		FLT COMPT, P11	
L ENG T/R IND, C1480		1	11D11	*
R ENG T/R IND, C1481		1	11B29	*
COMPUTER – (FIM 31-41-00/101)				
L EICAS, M10181				
R EICAS, M10182				
DIODE – (FIM 31-01-36/101)				
L T/R INDICATION, R10117				
DIODE – (FIM 31-01-37/101)				
R T/R INDICATION, R10118				
LIGHT – THRUST REVERSER ISOLATION, L5	1	1	FLT COMPT, P10 FUEL CONT PNL M73	*
PANEL – (FIM 76-11-00/101)				
FUEL CONTROL, M73				
RELAY – (FIM 31-01-36/101)				
L T/R DISAGREE RELAY, K10234				
L T/R HYD ISOL VLV RELAY, K10236				
L T/R ISOL DETECT RELAY, K10358				
SYSTEM 1 AIR/GND RELAY, K148				
SYSTEM 1 AIR/GND RELAY, K199				
RELAY – (FIM 31-01-37/101)				
R T/R DISAGREE RELAY, K10235				
R T/R HYD ISOL VLV RELAY, K10237				
R T/R ISOL DETECT RELAY, K10359				
SYSTEM 2 AIR/GND RELAY, K203				
SYSTEM 2 AIR/GND RELAY, K263				
SENSOR – L ENGINE, LH SLEEVE ACTUATOR LOCK PROXIMITY, S164	2	1	415AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – L ENGINE, LH SLEEVE DEPLOY PROX, S166	2	1	415AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – L ENGINE, RH SLEEVE ACTUATOR LOCK PROXIMITY, S165	2	1	416AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – L ENGINE, RH SLEEVE DEPLOY PROX, S167	2	1	416AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, LH SLEEVE ACTUATOR LOCK PROXIMITY, S164	2	1	425AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, LH SLEEVE DEPLOY PROX, S166	2	1	425AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, RH SLEEVE ACTUATOR LOCK PROXIMITY, S165	2	1	426AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, RH SLEEVE DEPLOY PROX, S167	2	1	426AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SWITCH – L T/R HYD PRESS, S330	2	1	434AL, L T/R ISOLATION VALVE	*
SWITCH – R T/R HYD PRESS, S331	2	1	444AL, R T/R ISOLATION VALVE	*
TIME DELAY – (FIM 31-01-36/101)				
L T/R ISLN VLV, M10440				
TIME DELAY – (FIM 31-01-37/101)				
R T/R ISLN VLV, M10439				
UNIT – (FIM 32-09-00/101)				
PROX SW ELEX, M162				

* SEE THE WDM EQUIPMENT LIST

Thrust Reverser Position Indicating System – Component Index
Figure 101

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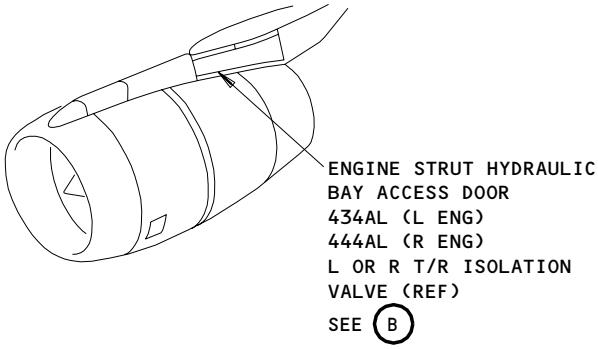
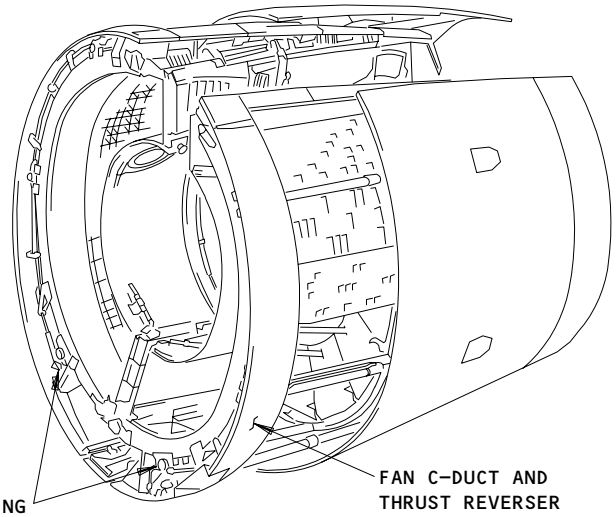
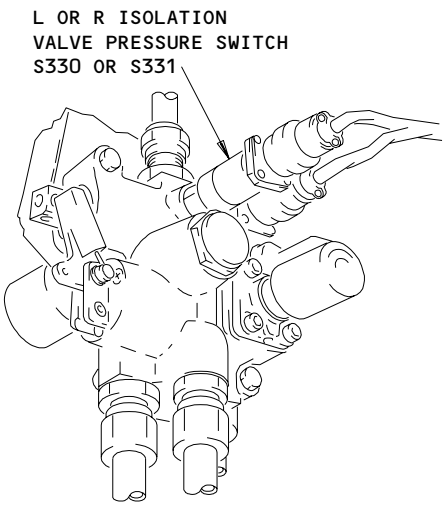
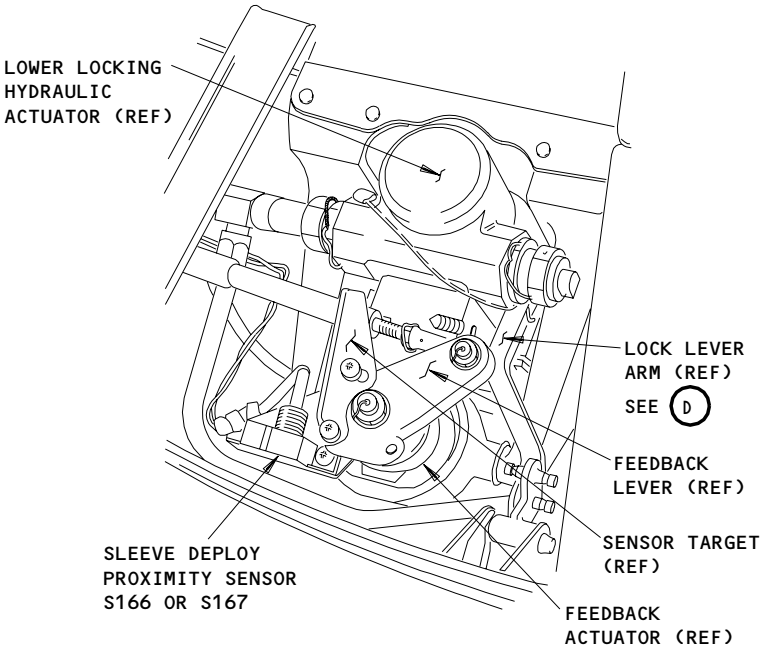






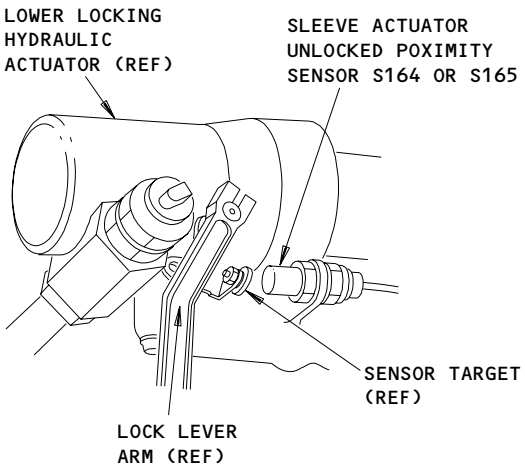
L OR R T/R ISOLATION VALVE (REF)

B



LH LOWER LOCKING HYDRAULIC
ACTUATOR (RH SIMILAR)

C



LOCK LEVER ARM

D

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Component Location
Figure 102 (Sheet 2)

EFFECTIVITY
AIRPLANES WITHOUT SYNC-LOCKS

H67783

THRUST REVERSER CONTROL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
CIRCUIT BREAKER –	1		FLT COMPT, P11	
L ENG T/R IND, C1480		1	11D11	*
R ENG T/R IND, C1481		1	11B29	*
COMPUTER – (FIM 31-41-00/101)				
L EICAS, M10181				
R EICAS, M10182				
RELAY – (FIM 31-01-36/101)				
L 30 SEC AFTER STOW COMMAND, K10712				
RELAY – (FIM 31-01-37/101)				
R 30 SEC AFTER STOW COMMAND, K10713				
SENSOR – L ENGINE, LH SLEEVE ACTUATOR LOCK PROXIMITY, S164	2	1	415AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – L ENGINE, LH SLEEVE DEPLOY PROX, S166	2	1	415AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – L ENGINE, RH SLEEVE ACTUATOR LOCK PROXIMITY, S165	2	1	416AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – L ENGINE, RH SLEEVE DEPLOY PROX, S167	2	1	416AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, LH SLEEVE ACTUATOR LOCK PROXIMITY, S164	2	1	425AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, LH SLEEVE DEPLOY PROX, S166	2	1	425AL, LH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, RH SLEEVE ACTUATOR LOCK PROXIMITY, S165	2	1	426AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SENSOR – R ENGINE, RH SLEEVE DEPLOY PROX, S167	2	1	426AR, RH THRUST REVERSER LOCKING ACTUATOR	*
SWITCH – (FIM 22-32-00/101)				
L T/R CONT, S23 (INDICATION)				
R T/R CONT, S24 (INDICATION)				
SWITCH – L T/R HYD PRESS, S330	2	1	434AL, L T/R ISOLATION VALVE	*
SWITCH – R T/R HYD PRESS, S331	2	1	444AL, R T/R ISOLATION VALVE	*
TIME DELAY – (FIM 31-01-36/101)				
L T/R ISLN VLV, M10440				
TIME DELAY – (FIM 31-01-37/101)				
R T/R ISLN VLV, M10439				
UNIT – (FIM 32-09-00/101)				
PROX SW ELEX, M162				

* SEE THE WDM EQUIPMENT LIST

Thrust Reverser Position Indicating System – Component Index
Figure 101

EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

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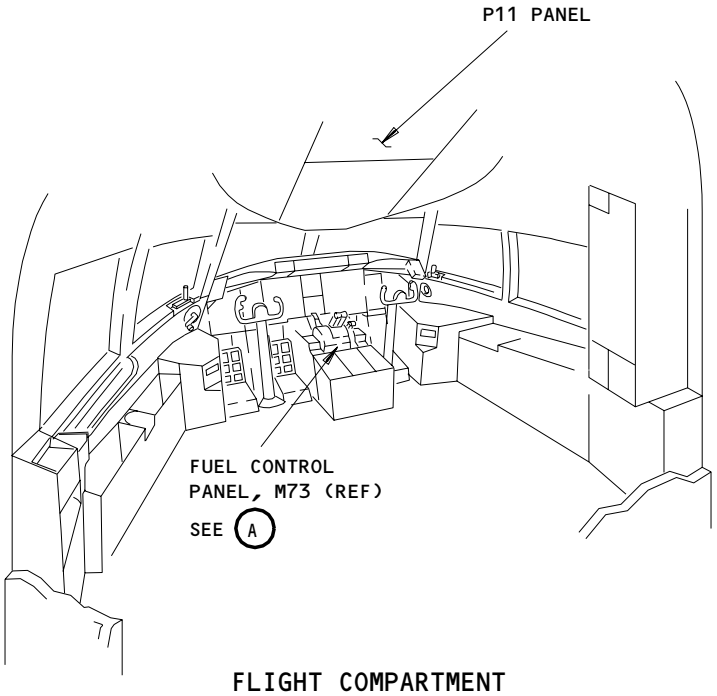
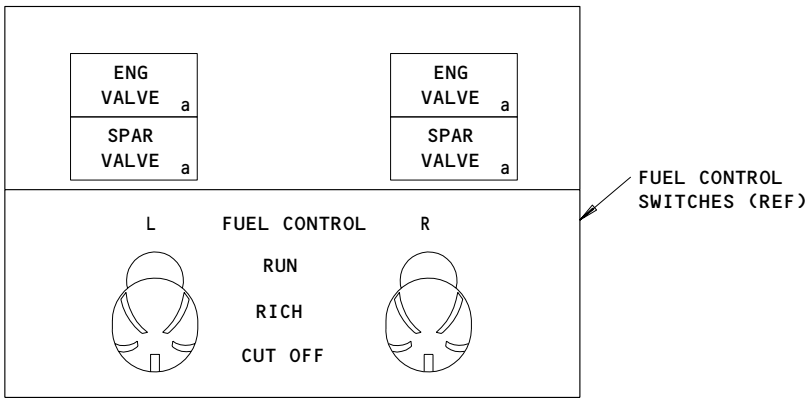


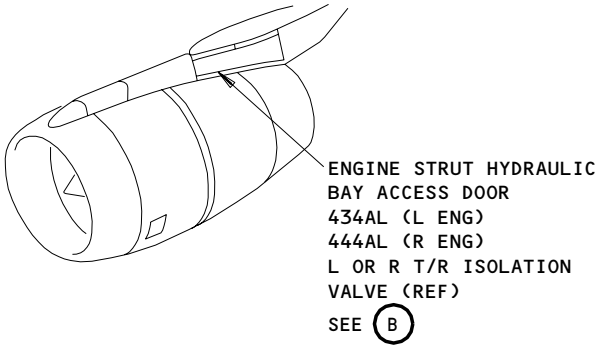
FLIGHT COMPARTMENT

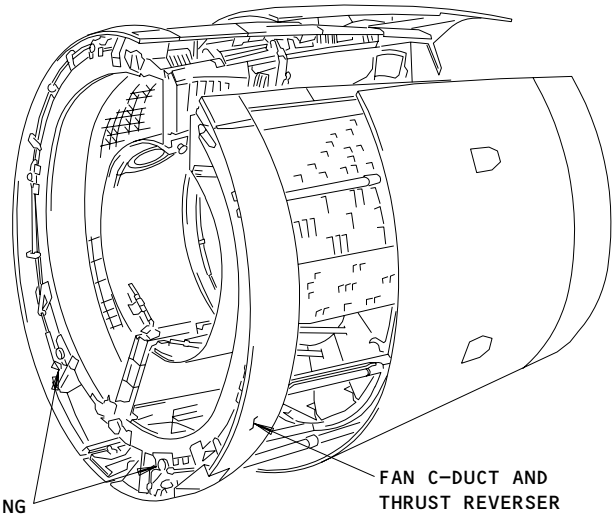


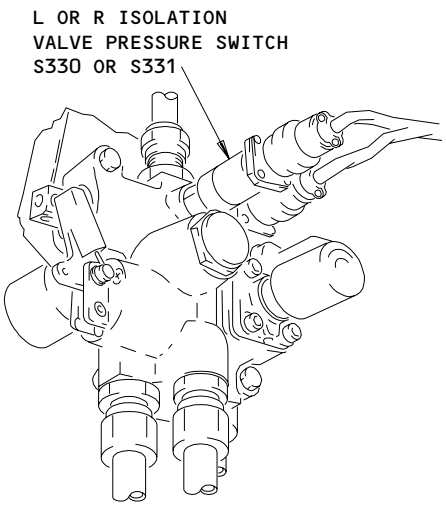
FUEL CONTROL PANEL, M73 (REF)

A

Component Location
Figure 102 (Sheet 1)

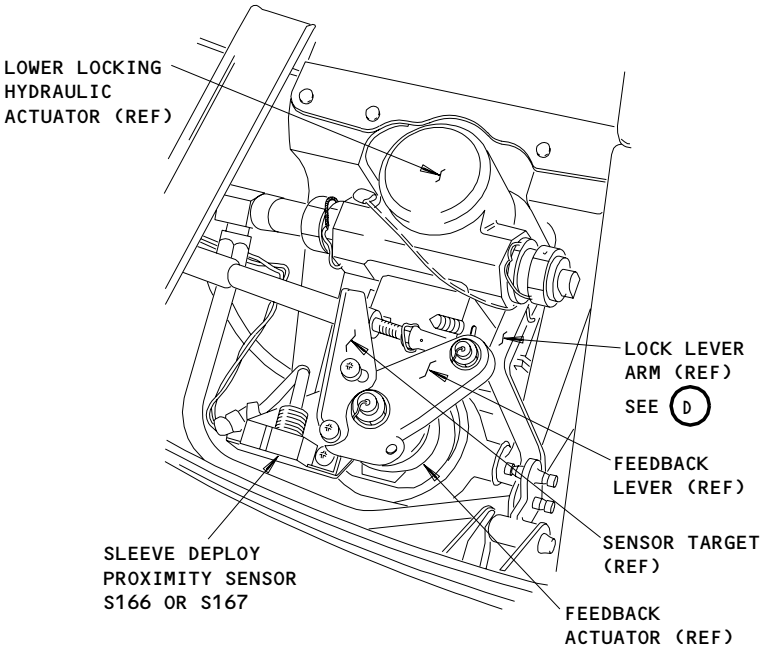






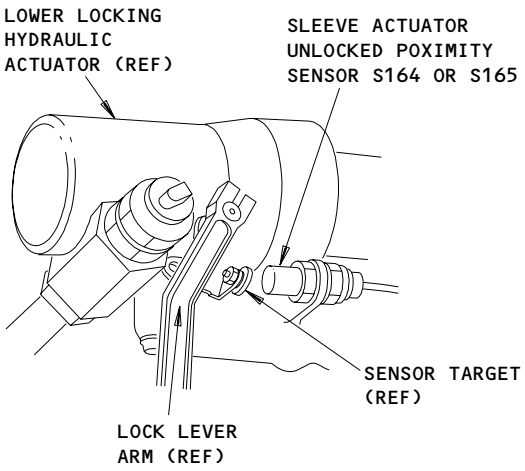
L OR R T/R ISOLATION VALVE (REF)

B



LH LOWER LOCKING HYDRAULIC
ACTUATOR (RH SIMILAR)

C



LOCK LEVER ARM

D

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Component Location
Figure 102 (Sheet 2)

EFFECTIVITY
AIRPLANES WITH SYNC-LOCKS

H67803

AMBER REV REMAINED DISPLAYED AFTER FULL REVERSE WAS REACHED

PREREQUISITES

MAKE SURE THESE CIRCUIT BREAKERS ARE CLOSED:
11B29, 11B30, 11D11, 11D12

MAKE SURE THE AIRPLANE IS IN THIS CONFIGURATION:
ELECTRICAL POWER IS ON (AMM 24-22-00/201)

1 DO THIS PROCEDURE: PSEU BITE PROCEDURE (FIM 32-09-03/101, FIG. 103).
WAS A PROBLEM INDICATED?

YES → 61 DO THE INDICATED CORRECTIVE ACTION.

NO → 62 ADJUST THE DEPLOY PROXIMITY SENSOR (AMM 78-30-00/501).

Amber REV Remained Displayed After Full Reverse Was Reached
Figure 103

THRUST REVERSER POSITION INDICATING SYSTEM - INSPECTION/CHECK

TASK 78-36-00-216-001-R00

1. Inspection of the Thrust Reverser Position Indicating System

A. References

(1) AMM 71-11-04/201, Fan Cowl Panels

(2) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

413	Fan cowl panel (Left)
414	Fan cowl panel (Right)
415	Thrust reverser (Left)
416	Thrust reverser (Right)
423	Fan cowl panel (Left)
424	Fan cowl panel (Right)
425	Thrust reverser (Left)
426	Thrust reverser (Right)

(2) Access Panels

413AL	Fan cowl panel (Left)
414AR	Fan cowl panel (Right)
415AL	Thrust reverser (Left)
416AR	Thrust reverser (Right)
423AL	Fan cowl panel (Left)
424AR	Fan cowl panel (Right)
425AL	Thrust reverser (Left)
426AR	Thrust reverser (Right)

C. Procedure

S 016-002-R00

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

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

S 016-003-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Open the thrust reversers (AMM 78-31-00/201).

S 216-004-R00

(3) Do the steps that follow to make an inspection of the deploy proximity sensor and the unlocked proximity sensor:
   (a) Make sure the deploy proximity sensors and the wires to the sensor are installed correctly.
   (b) Make sure the unlocked proximity sensors and the wires for the sensor are installed correctly.

S 416-005-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Close the thrust reversers (AMM 78-31-00/201).

S 416-006-R00

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

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

THRUST REVERSER LOCK PROXIMITY SENSOR - REMOVAL/INSTALLATION

1. General
   A. There is a lock proximity sensor on each half of the thrust reverser. This procedure can be used for the two sensors. The right sensor is on Fig. 401 and the left sensor is on Fig. 402.

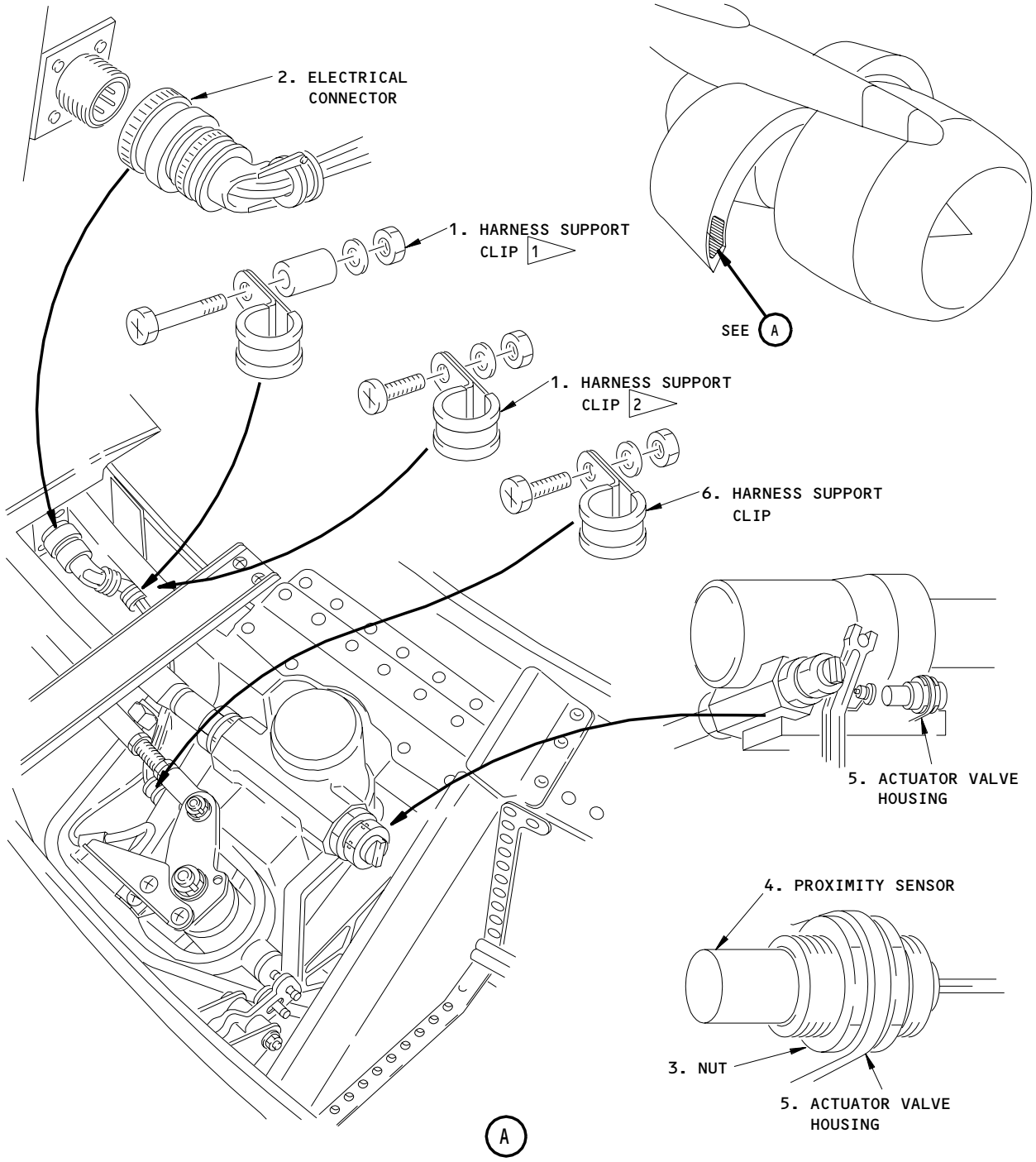
TASK 78-36-01-004-001-R00

2. Remove the Lock Proximity Sensor of the Thrust Reverser
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
      (2) AMM 78-31-26/401, Fan Thrust Reverser Hydraulic Actuators, Rotary Flex Shafts and Tubing
   B. Access
      (1) Location Zones
          415/425 Thrust Reverser, Left
          416/426 Thrust Reverser, Right

   C. Remove the Lock Proximity Sensor of the Thrust Reverser (Fig. 401 or 402).

      S 864-005-R00
      (1) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
      Open these circuit breakers and attach the DO-NOT-CLOSE tags:
      (a) On the overhead equipment panel P11:
          1) For the left engine:
             a) 11D11, ENGINE LEFT T/R IND
             b) 11D12, ENGINE LEFT T/R CONT
          2) For the right engine:
             a) 11B29, ENGINES RIGHT T/R IND
             b) 11B30, ENGINES RIGHT T/R CONT

      S 864-033-R00
      (2) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
      Open these circuit breakers and attach the DO-NOT-CLOSE tags:
      (a) On the overhead equipment panel P11:
          1) For the left engine:
             a) 11D11, T/R IND L

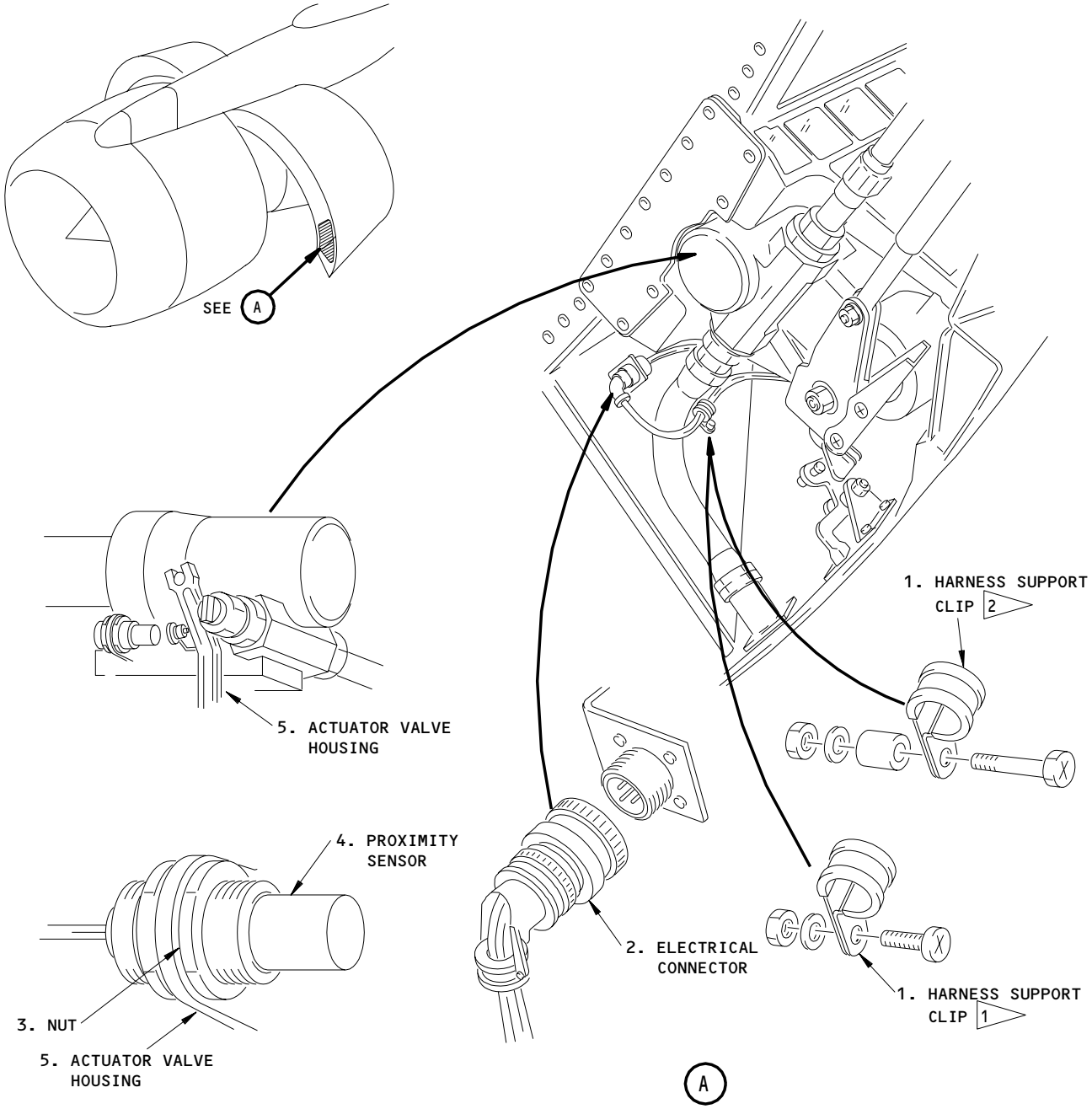


1 ENGINES WITH RR SB 78-7646 INCORPORATED
ENGINES WITHOUT RR SB 78-7740 INCORPORATED

2 ENGINES WITHOUT RR SB 78-7646 INCORPORATED

59969A

Right Thrust Reverser Lock Proximity Sensor Installation
Figure 401



1 ENGINES WITH RR SB 78-7646 INCORPORATED
ENGINES WITHOUT RR SB 78-7740 INCORPORATED

2 ENGINES WITHOUT RR SB 78-7646 INCORPORATED

59981A

Left Thrust Reverser Lock Proximity Sensor Installation
Figure 402

b) 11D12, T/R CONT L
2) For the right engine:
a) 11B29, T/R IND R
b) 11B30, T/R CONT R

S 014-008-R00

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

(3) Open the thrust reverser (AMM 78-31-00/201).

S 984-009-R00
(4) Manually extend the thrust reverser approximately 12.00 in. (304.80 mm).

S 024-010-R00
(5) Disconnect and remove the lower actuator.
(a) This will permit the electrical connector to go through the hole in the support bracket (AMM 78-31-26/401).

S 024-011-R00
(6) Disconnect the harness support clips (1).

S 024-012-R00
(7) Disconnect the electrical connector (2)
(a) Put the electrical connector through the hole in the support bracket.

S 024-013-R00
(8) Remove the nut (3) and remove the sensor with the harness and the support clips (1).

S 434-030-R00
(9) Remove the support clips.
(a) Keep the clips. They will be used when the proximity switch is installed.

TASK 78-36-01-404-014-R00

3. Install the Lock Proximity Sensor of the Thrust Reverser

A. Consumable Materials

(1) Lockwire
British Spec - 22 SWG
American Spec - 21 AWG
OMat No. - 238

B. References

(1) AMM 70-50-02/201, Connection of Electrical Plugs
(2) AMM 70-51-00/201, Torque Tightening Technique
(3) AMM 78-31-00/201, Thrust Reverser System
(4) AMM 78-31-00/501, Thrust Reverser System
(5) AMM 78-31-26/401, Fan Thrust Reverser Hydraulic Actuators, Rotary Flex Shafts and Tubing
(6) AMM 78-30-00/501, Thrust Reverser

C. Access

(1) Location Zones
415/425 Thrust Reverser, Left
416/426 Thrust Reverser, Right

D. Install the Lock Proximity Switches of the Thrust Reverser (Fig. 401 and 402).

S 424-015-R00

(1) Put the sensor on the actuator valve housing (5) and attach with a nut (3).
(a) Tighten the nut (AMM 70-51-00/201).
(b) Install a lockwire.

S 424-016-R00

(2) Put the electrical harness through the support bracket and connect the electrical connector (2) (AMM 70-50-02/201).

S 424-017-R00

(3) Install the lower actuator (AMM 78-31-26/401).

S 434-026-R00
(4) Put the support clips (1) on the harness (AMM 70-51-00/201).

S 984-027-R00
(5) Retract the thrust reverser (AMM 78-31-00/201).

S 414-028-R00

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

(6) Close the left (right) thrust reverser (AMM 78-31-00/201).

S 864-078-R00
(7) AIRPLANES WITHOUT THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, ENGINE LEFT T/R IND
b) 11D12, ENGINE LEFT T/R CONT
2) For the right engine:
a) 11B29, ENGINES RIGHT T/R IND
b) 11B30, ENGINES RIGHT T/R CONT

S 864-081-R00
(8) AIRPLANES WITH THRUST REVERSER SYNC-LOCKS;
Remove the DO-NOT-CLOSE tags and close these circuit breakers:
(a) On the overhead equipment panel P11:
1) For the left engine:
a) 11D11, T/R IND L
b) 11D12, T/R CONT L
2) For the right engine:
a) 11B29, T/R IND R

b) 11B30, T/R CONT R

S 714-029-R00

(9) Do the adjustment procedure of the thrust reverser proximity sensor (AMM 78-30-00/501).

S 714-082-R00

(10) Do the thrust reverser tests that are given in the test reference table (AMM 78-31-00/501).

THRUST REVERSER DEPLOY PROXIMITY SENSOR - REMOVAL/INSTALLATION

1. General
   A. This procedure has a task to remove and a task to install the deploy proximity sensors on the thrust reversers.
      (1) The installation task includes steps to rig the deploy proximity sensor.
   B. Use the procedures in AMM 70-51-00/201 to tighten the fasteners. Tighten the fasteners to the torque values in AMM 70-51-00/201 unless a torque value is specified in this procedure.

TASK 78-36-02-024-000-R00

2. Thrust Reverser Deploy Proximity Sensor Removal (Fig. 401)
   A. References
      (1) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          410 Left Engine
          420 Right Engine

      (2) Access Panels
          415AL/416AR Thrust Reverser, Left Engine
          425AL/426AR Thrust Reverser, Right Engine

   C. Procedure

      S 044-006-R00

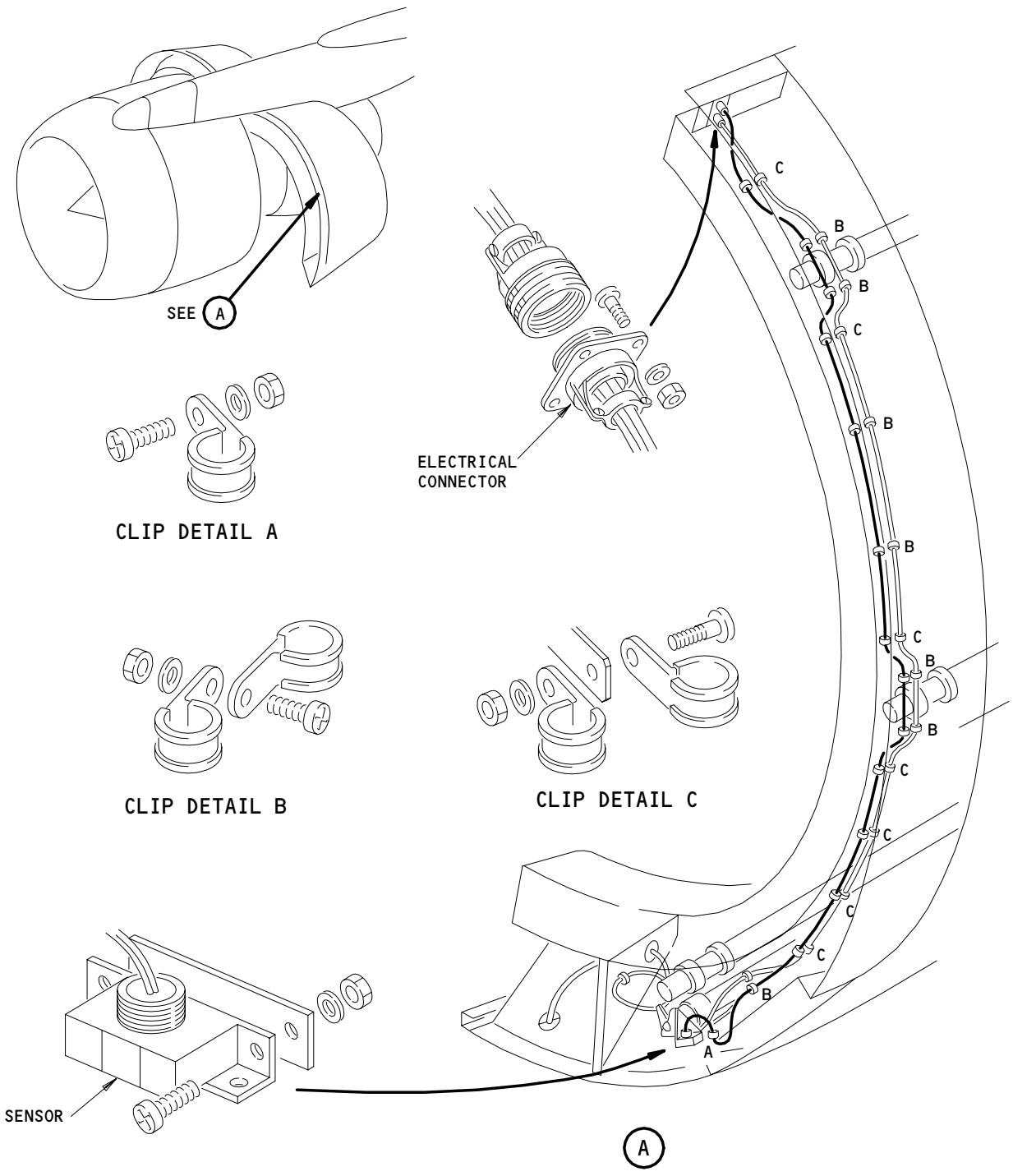
      WARNING: MAKE SURE YOU FOLLOW AMM 78-31-00/201 TO DEACTIVATE THE THRUST REVERSER FOR GROUND MAINTENANCE. INADVERTENT OPERATION OF THE THRUST REVERSER COULD CAUSE INJURY AND DAMAGE.

      (1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

      S 014-002-R00

      WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

      (2) Open the applicable thrust reverser (AMM 78-31-00/201).



NOTE: THE INSTALLATION FOR THE LEFT THRUST REVERSER IS SHOWN, THE INSTALLATION FOR THE RIGHT THRUST REVERSER IS OPPOSITE.

56262

Thrust Reverser Deploy Proximity Sensor Installation
Figure 401

S 024-003-R00

(3) Do these steps to remove the deploy proximity sensor:
   (a) Disconnect the harness clips from the thrust reverser.
   (b) Disconnect the electrical connector at the upper bulkhead.
   (c) Remove the screws, washers, and nuts that attach the sensor to the thrust reverser.
   (d) Remove the sensor, but make sure the shims stay attached to the mounting surface on the thrust reverser.
   (e) Remove the harness clips from the harness and keep the clips for the installation procedure.

TASK 78-36-02-424-004-R00

3. Thrust Reverser Deploy Proximity Sensor Installation (Fig. 401)

A. References
   (1) AMM 70-50-02/201, Connection of Electrical Plugs
   (2) AMM 78-31-00/201, Thrust Reverser System
   (3) AMM 78-30-00/501, Thrust Reverser System

B. Access
   (1) Location Zones
      410 Left Engine
      420 Right Engine

   (2) Access Panels
      415AL/416AR Thrust Reverser, Left Engine
      425AL/426AR Thrust Reverser, Right Engine

C. Procedure

S 044-005-R00

WARNING: MAKE SURE YOU FOLLOW AMM 78-31-00/201 TO DEACTIVATE THE THRUST REVERSER FOR GROUND MAINTENANCE. INADVERTENT OPERATION OF THE THRUST REVERSER COULD CAUSE INJURY AND DAMAGE.

(1) Make sure that the thrust reverser is deactivated for ground maintenance (AMM 78-31-00/201).

S 424-005-R00

(2) Do these steps to install the deploy proximity sensor.
  (a) Make sure the shims are on the mounting surface, and put the sensor in its position.
  (b) Attach the sensor to the thrust reverser with the nuts, washers, and screws.
  (c) Put the harness along the forward edge of the thrust reverser and connect the electrical connector at the bulkhead (AMM 70-50-02/201).
  (d) Install the harness clips with the nuts, washers, and screws to attach the harness to the thrust reverser.

S 414-006-R00

WARNING: OBEY THE INSTRUCTIONS IN AMM 78-31-00/201 WHEN YOU CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, YOU CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Close the applicable thrust reverser (AMM 78-31-00/201).

S 714-007-R00

(4) Adjust the deploy proximity sensor (AMM 78-30-00/501).

THRUST REVERSER HYDRAULIC ACTUATORS
VISUAL LOCK INDICATORS - INSPECTION/CHECK

1. General
   A. This procedure is the visual inspection of the thrust reverser hydraulic actuators visual lock indicator.
   B. Service Bulletins referred to:

      SB 78-8526: To incorporate an improved visual lock indicator mechanism.

TASK 78-36-06-206-001-R00

2. Thrust Reverser Hydraulic Actuators Visual Lock Indicators Inspection

   A. References
      (1) AMM 78-30-00/501, Thrust Reverser
      (2) AMM 78-31-00/201, Thrust Reverser System
      (3) AMM 78-31-26/401, Fan Thrust Reverser Hydraulic Actuators, Rotary Flex Shafts and Tubing

   B. Access
      (1) Location Zones
          411 Left Engine
          421 Right Engine

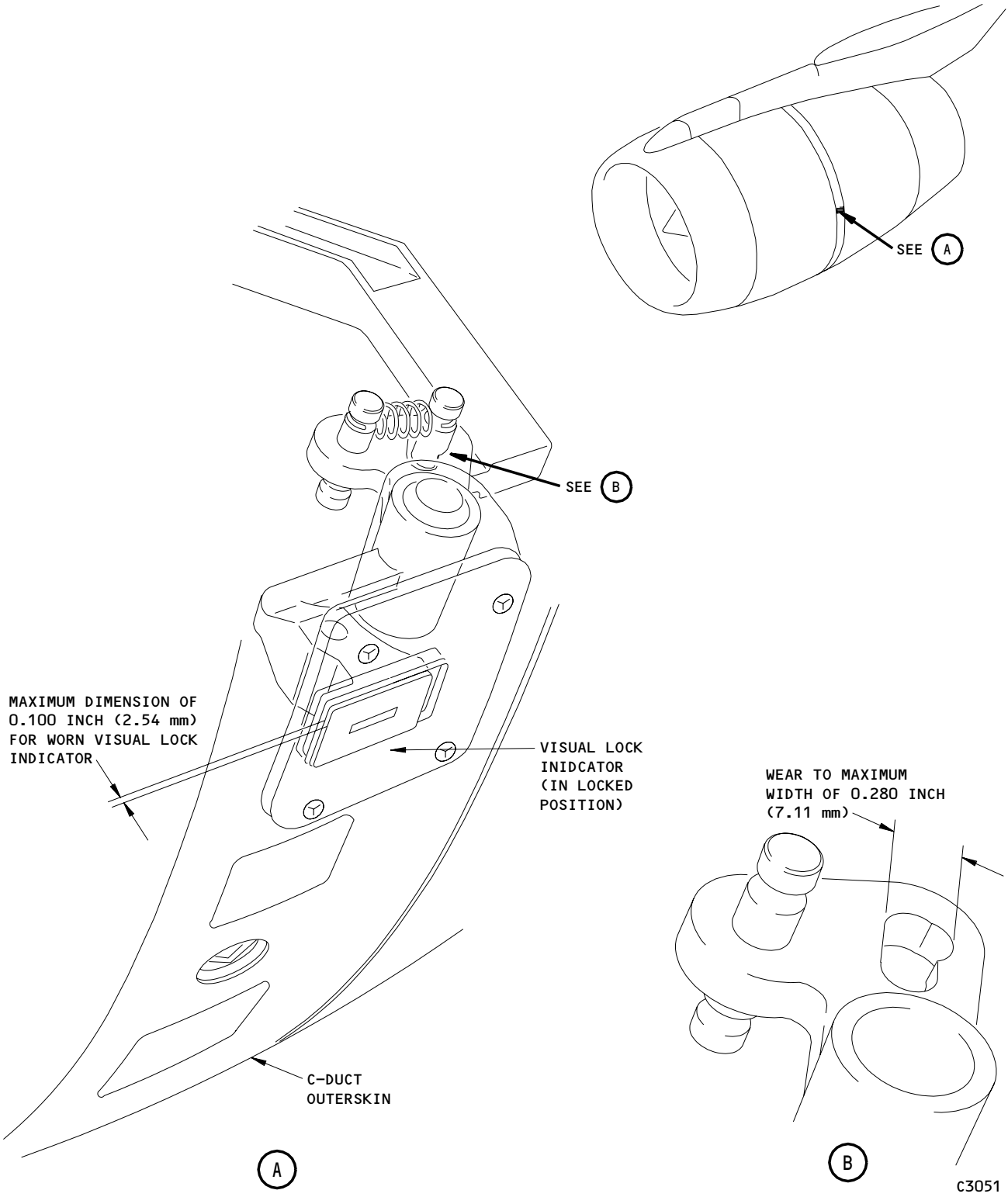
   C. Procedure

      S 016-002-R00
      (1) Prepare to examine the visual lock indicators.

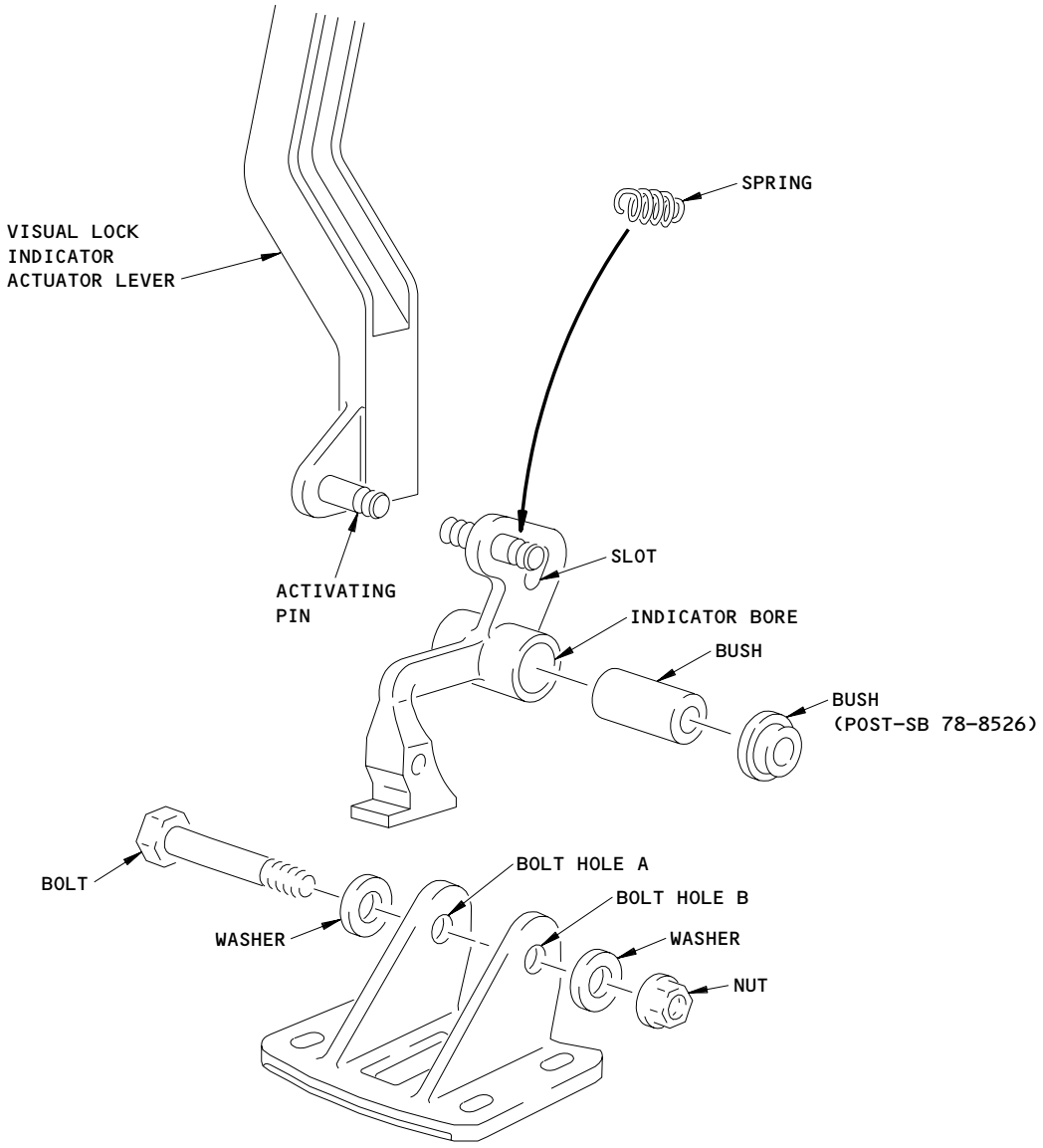
      WARNING: YOU MUST OBEY THE INSTRUCTIONS IN AMM 78-31-00/201. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO THE FAN COWL AND THRUST REVERSER CAN OCCUR.

      (a) Open the thrust reverser system (AMM 78-31-00/201).

      S 226-003-R00
      (2) Do these steps to do an inspection of the visual lock indicators (Fig. 601 and 602):
          (a) Examine the visual lock indicator mechanism.
          (b) Examine the position of the visual lock indicator in relation to the outer surface of the cowl.
          (c) Examine the visual lock indicator actuator lever.



Visual Lock Indicator - Wear Limits
Figure 601



Visual Lock Indicator Mechanism
Figure 602

S 226-004-R00

(3) Inspection Standards:

(a) Visual lock indicator mechanism

1) Too much damage that can be easily seen, reject it.

(b) Visual lock indicator in relation to the outer surface of the cowl (Fig. 601).

NOTE: The visual lock indicator must be in the lock position to do a check of the wear in the mechanism.

1) If the visual lock indicator is up to 0.10 inch (2.54 mm) above the outer surface of the cowl, accept it.
2) If the position of the visual lock indicator is more than 0.10 inch (2.54 mm), do the step that follows:
   a) Adjust the lock indicator mounting bracket until the visual lock indicator is in the serviceable limit (AMM 78-30-00/501).

      NOTE: If the mounting bracket can not be adjusted sufficiently to let the indicator be in the limit, disassemble the indicator mechanism.

3) Do an inspection of the individual components of the lock indicator mechanism (Fig. 602).

   NOTE: The possible areas of wear and the dimensions that let them operate correctly are as follows:

   a) Visual lock indicator bore (maximum diameter) - 0.410 inch (10.41 mm).
   b) Bolt shank (minimum diameter) - 0.2285 inch (5.80 mm).
   c) Bolt location holes (maximum diameter):
      Hole A - 0.410 inch (10.41 mm)
      Hole B - 0.274 inch (6.95 mm)
   d) Bush bore (maximium diameter) - 0.317 inch (8.05 mm)
   e) Bush bore (SB 78-8526) (maximum diameter) - 0.317 inch (8.05 mm)
   f) Bush outer diameter (minumum diameter) - 0.345 inch (8.76 mm)
   g) Indicator slot (maximum width) - 0.280 inch (7.11 mm)
   h) Spring that is missing - Replace.
4) Replace the components that do not agree with the dimensions above.
5) Assemble the visual lock indicator mechanism.

(c) Visual lock indicator actuator lever (Fig. 602).
1) Accept the activating pin if it is not less than 0.219 inch (5.56 mm) in diameter.
2) If the activating pin diameter is less than 0.219 inch (5.56 mm), reject it.

S 416-005-R00

(4) Put the engine back to its usual condition.

WARNING: YOU MUST OBEY THE INSTRUCTIONS IN AMM 78-31-00/201. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURY TO PERSONS AND DAMAGE TO THE FAN COWL THRUST REVERSER CAN OCCUR.

(a) Install the visual lock indicator mechanism and the actuator lever in the correct position in the thrust reverser (AMM 78-31-26/401).
1) Close the thrust reverser system (AMM 78-31-00/201).