CHAPTER

54

NACELLES/PYLONS

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A = Added, R = Revised, O = Overflow, D = Deleted

54-EFFECTIVE PAGES

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GENERAL - ACOUSTIC PANEL AREA LOSS LIMITS

1. Applicability

A. This general subject gives the loss limits (the maximum amount of acoustic panel area that can be made non-acoustic) for the acoustic panels of the CFM56-7 engine nacelle.

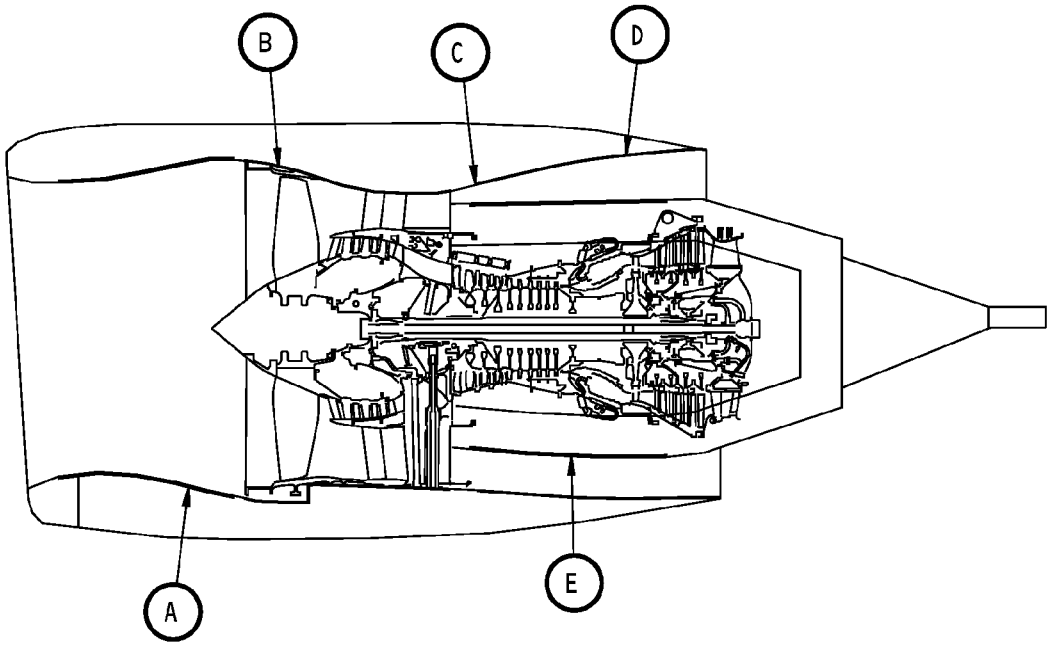
NOTE: The acoustic panel area loss limits are related to the maximum estimated increase in noise of 0.1 Effective Perceived Noise, Decibels (EPNdB). This limit on the increase in noise is necessary to agree with the noise certification regulations in the United States. It is possible that the noise certification regulations in other countries are different.

2. General

A. Most acoustic panel repairs are made with potting compound and doublers which cause a blockage of the holes of the perforated facesheet and cells of the core. These materials can cause a decrease in the acoustic panel area which absorbs the engine noise.

B. Refer to Acoustic Panel Area Loss Limits - CFM56-7 Engine Nacelle, Figure 1/GENERAL for the maximum area of the acoustic panels that can have a blockage because of the repairs.

C. Refer to the applicable Chapter 54 subject for the repairs available for the inlet cowl and thrust reverser acoustic panels.



REPAIR AREA	DESCRIPTION	MAXIMUM PERMITTED LOSS OF AREA ON EACH PART (SQUARE INCHES) 1
A	Inlet Acoustic Panels, Upper and Lower	380
B	Engine Fan Frame Acoustic Panels	1215
C	Fan Thrust Reverser, Outer Wall Double Layer	1215
D	Fan Thrust Reverser Sleeve Outer Wall Single Layer	1215
E	Fan Duct Inner Wall and Bifurcations	1215

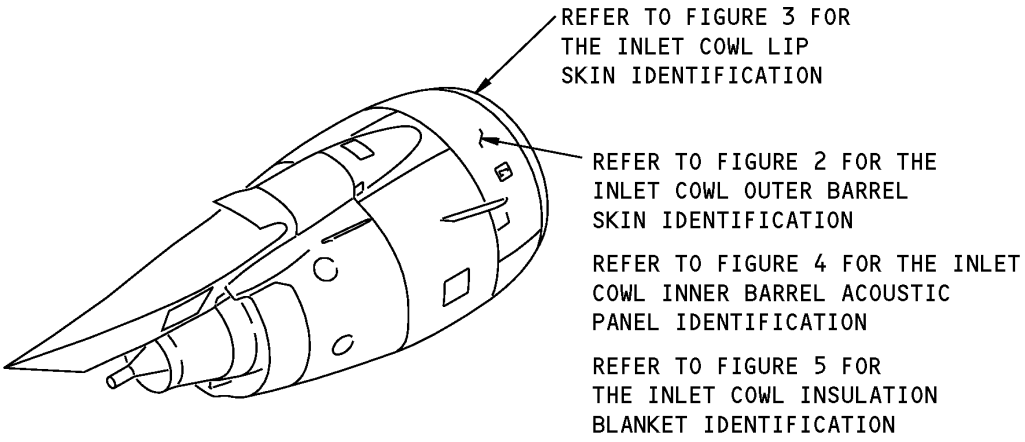
NOTES

1 THE TOTAL LOSS OF ACOUSTIC PANEL AREA MUST ALSO AGREE WITH THE RELATION THAT FOLLOWS:

$$\frac{A}{380} + \frac{B}{1215} + \frac{C}{1215} + \frac{D}{1215} + \frac{E}{1215} < 1.0$$

Acoustic Panel Area Loss Limits - CFM56-7 Engine Nacelle
Figure 1

IDENTIFICATION 1 - ENGINE INLET COWL SKIN

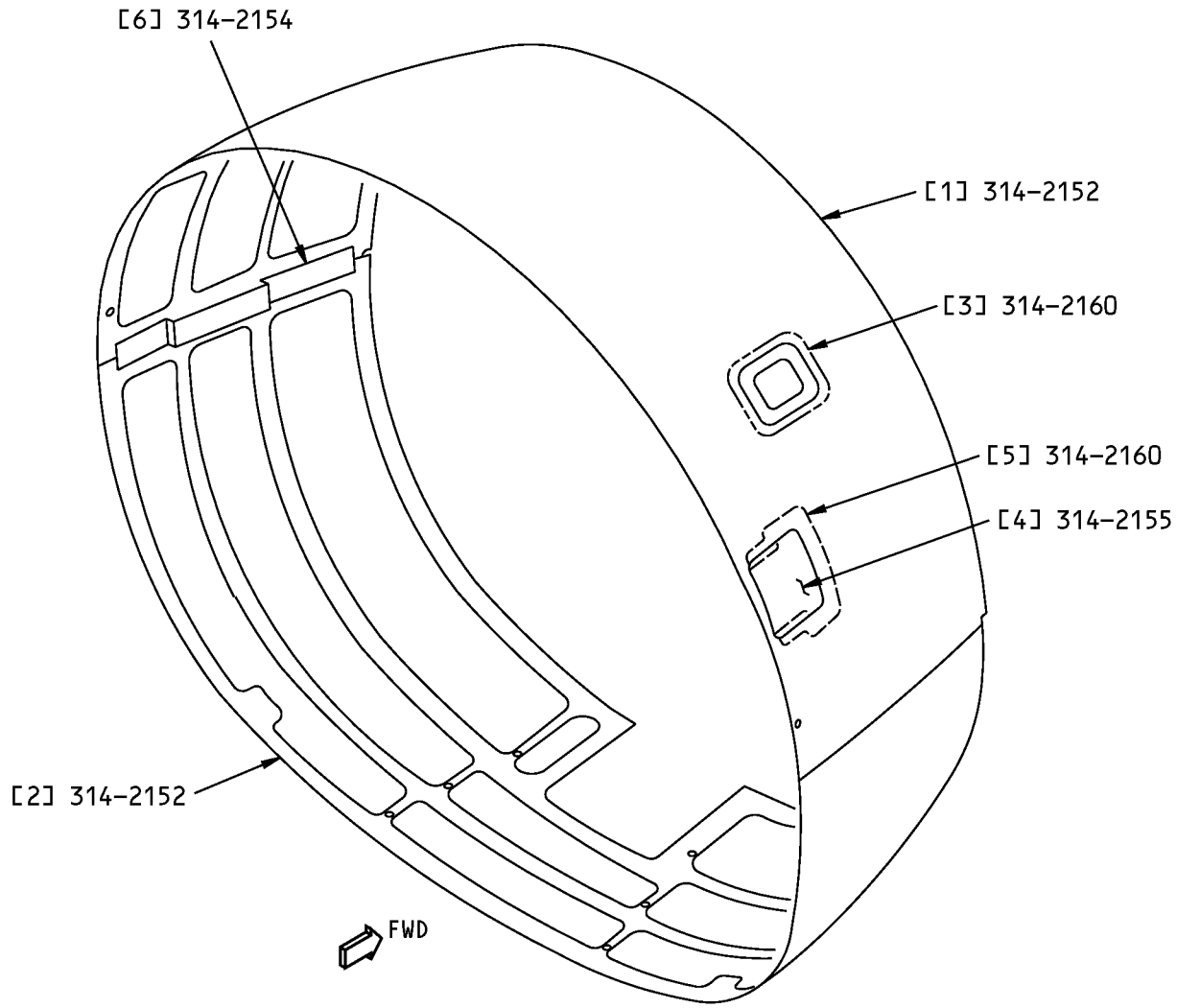


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Inlet Cowl Skin Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
314-2100	Cowl Assembly - Inlet
314-2121	Panel Assembly - Inner Acoustic, Upper Inlet (Aluminum Bond Assembly)
314-2122	Panel Assembly - Inner Acoustic, Lower Inlet (Aluminum Bond Assembly)
314-2152	Skin - Upper and Lower Panels, Outer Barrel
314-2155	Door Assembly - Pressure Relief and T-12



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

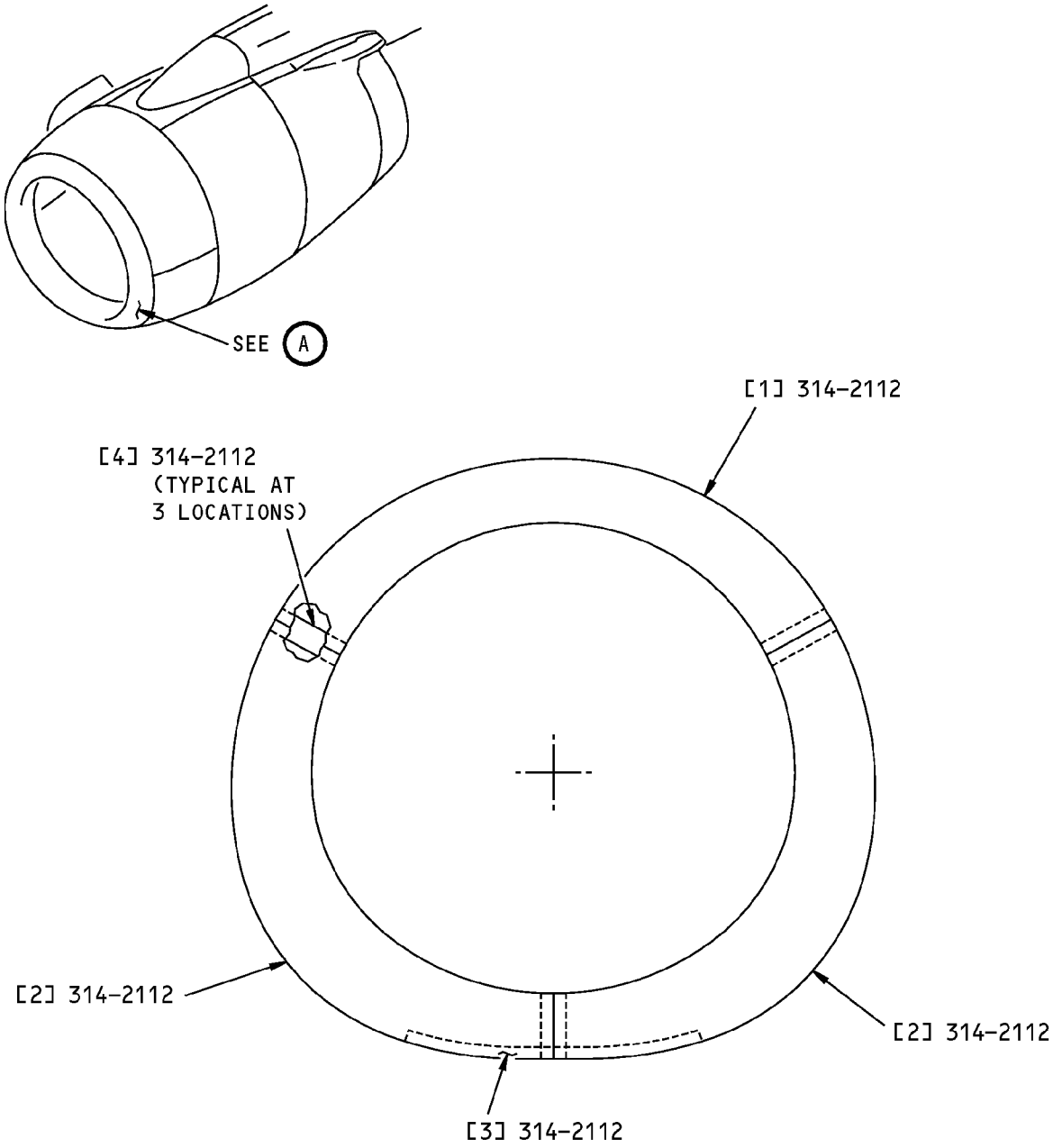
BR-026

Inlet Cowl Outer Barrel Skin Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Upper Outer Skin	0.071 (1.80)	2024-T62 sheet, chem-milled to 0.050 (1.27)	
[2]	Lower Outer Skin	0.071 (1.80)	2024-T62 sheet, chem-milled to 0.045 (1.14)	
[3]	Scoop Doubler	0.071 (1.80)	2024-T3 sheet	
[4]	Pressure Relief Door Assembly	0.125 (3.17)	2024-T62 sheet, chem-milled to between 0.105 and 0.071 (2.67 and 1.80)	
[5]	Pressure Relief Door Doubler	0.063 (1.60)	2024-T3 sheet	
[6]	Outer Barrel Splice	0.071 (1.80)	2024-T62 plate	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

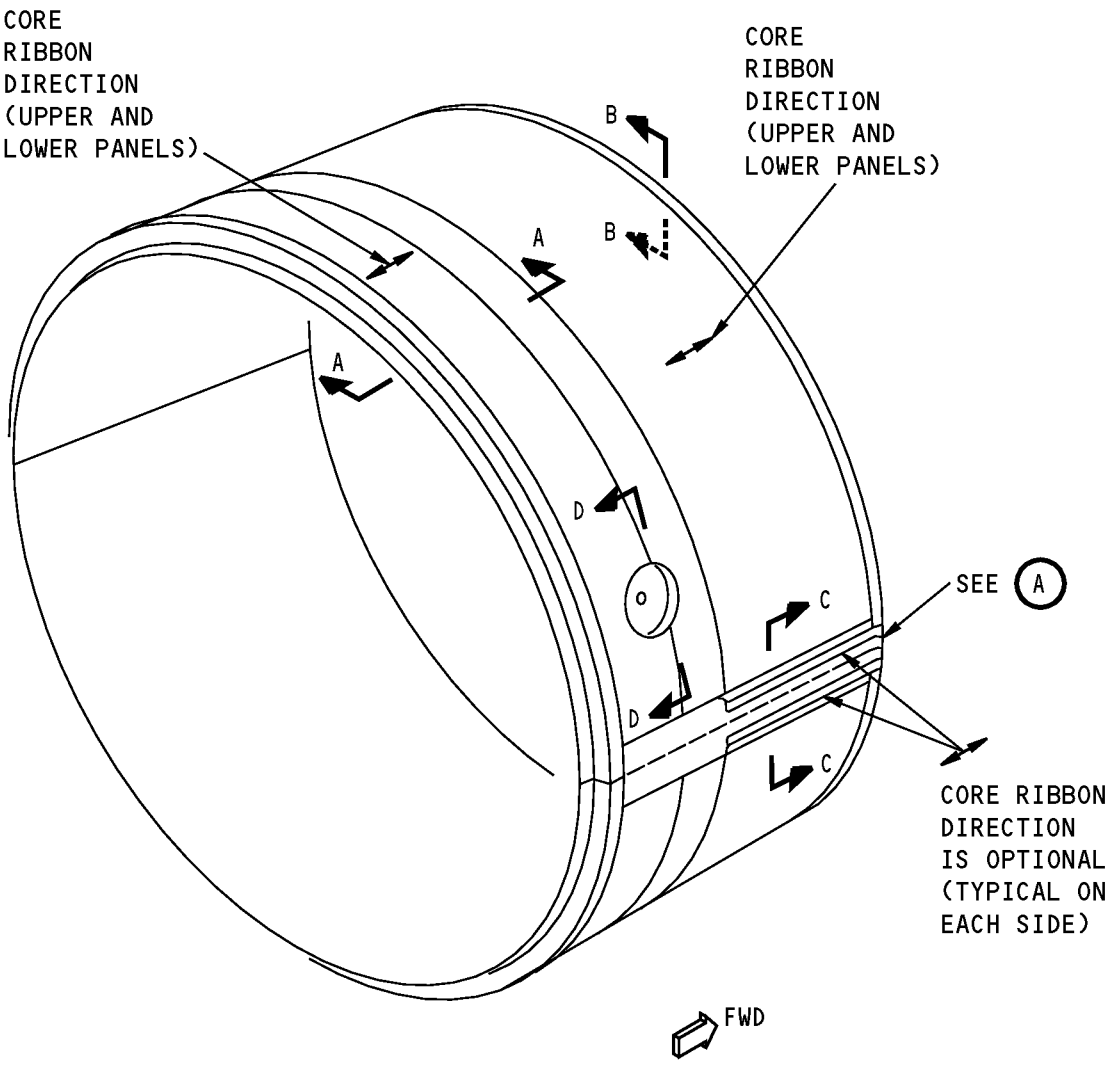
BR-003

Inlet Cowl Lip Skin Identification
Figure 3

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Upper Inlet Lip	0.090 (2.29)	2219-T62 sheet formed to 0.079 (2.00)	
[2]	Lower Inlet Lip	0.090 (2.29)	2219-T62 sheet formed to 0.079 (2.00)	
[3]	Skin Doubler	0.050 (1.27)	2219-T62 sheet	
[4]	Skin Splice Doubler	0.071 (1.80)	2219-T62 plate	

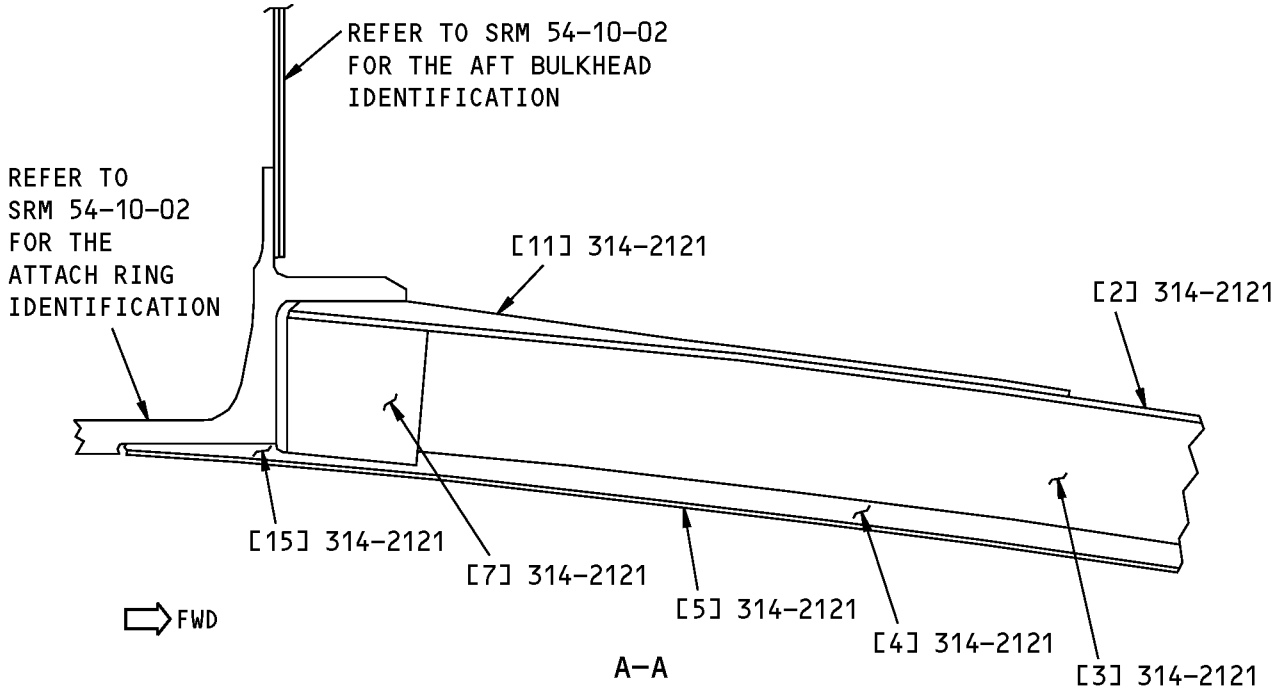
*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



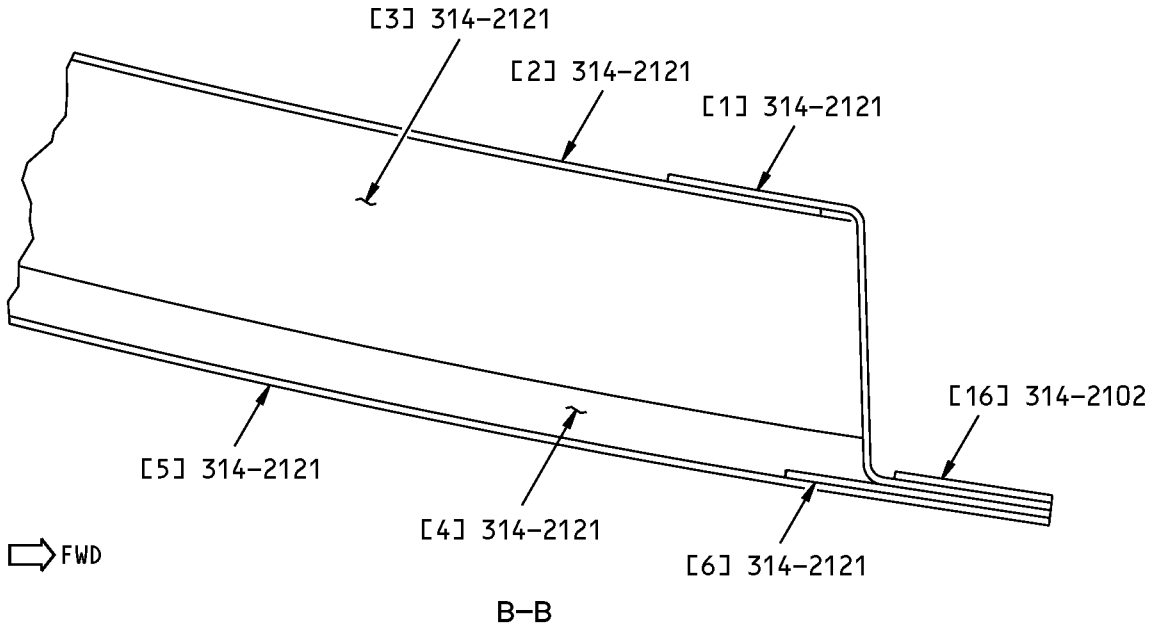
NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

BR-007A

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 1 of 5)

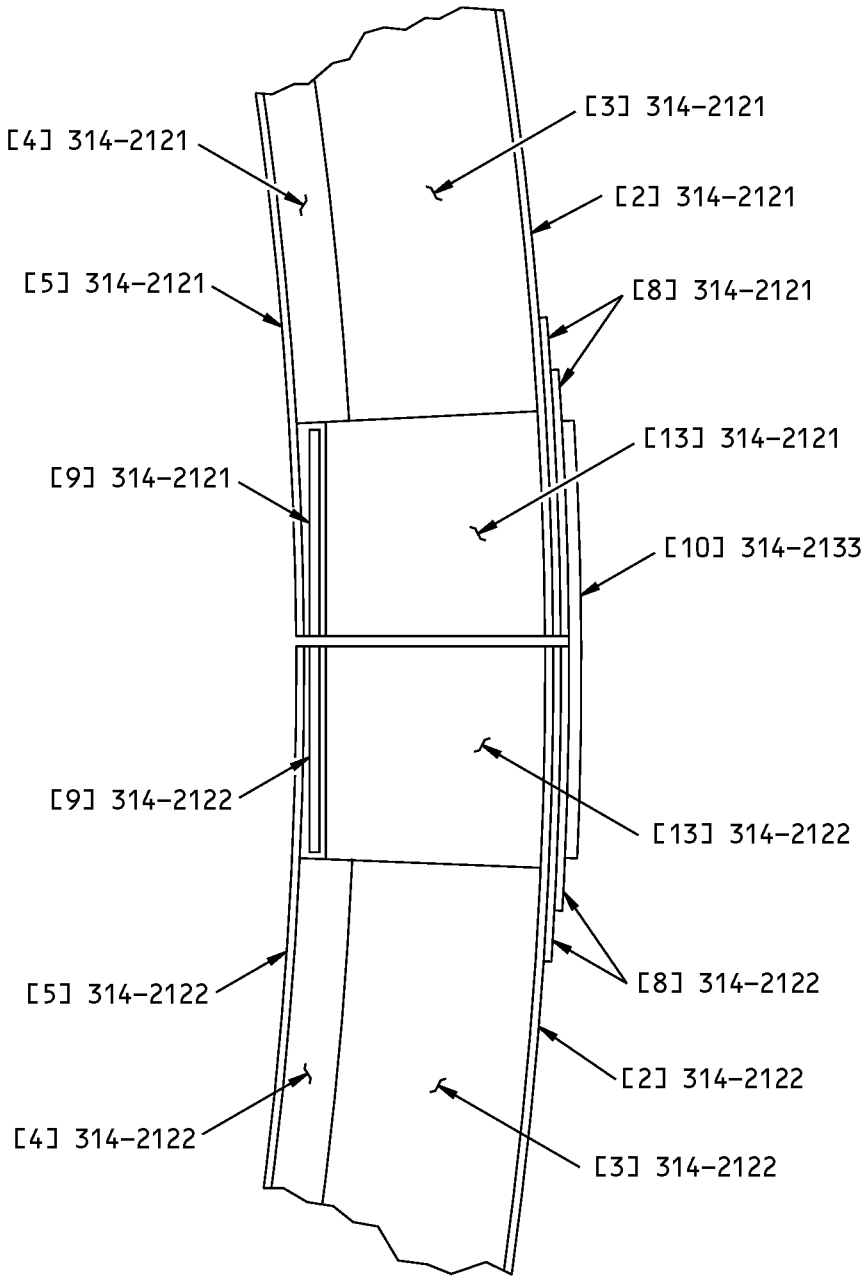


TYPICAL FOR LOWER PANEL

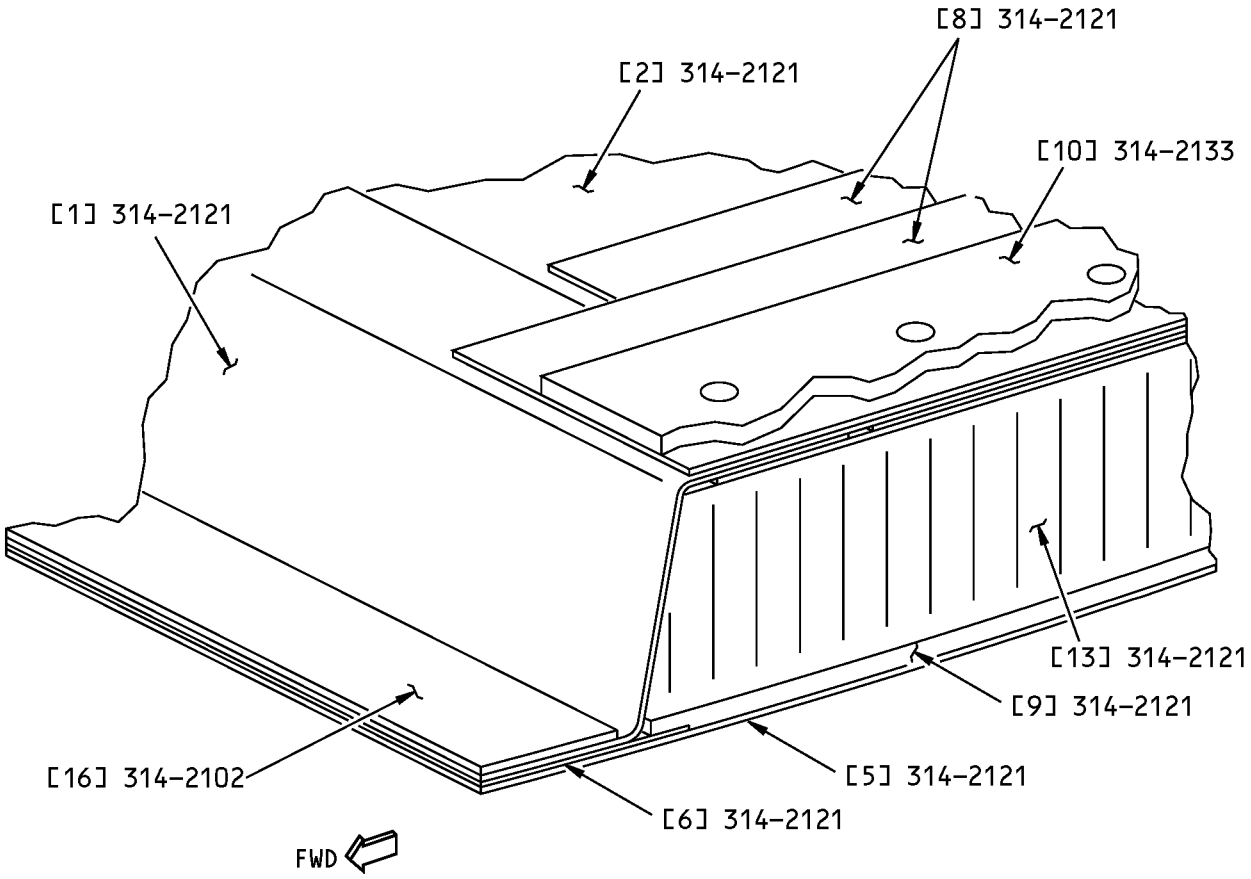


BR-010A

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 2 of 5)



Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 3 of 5)

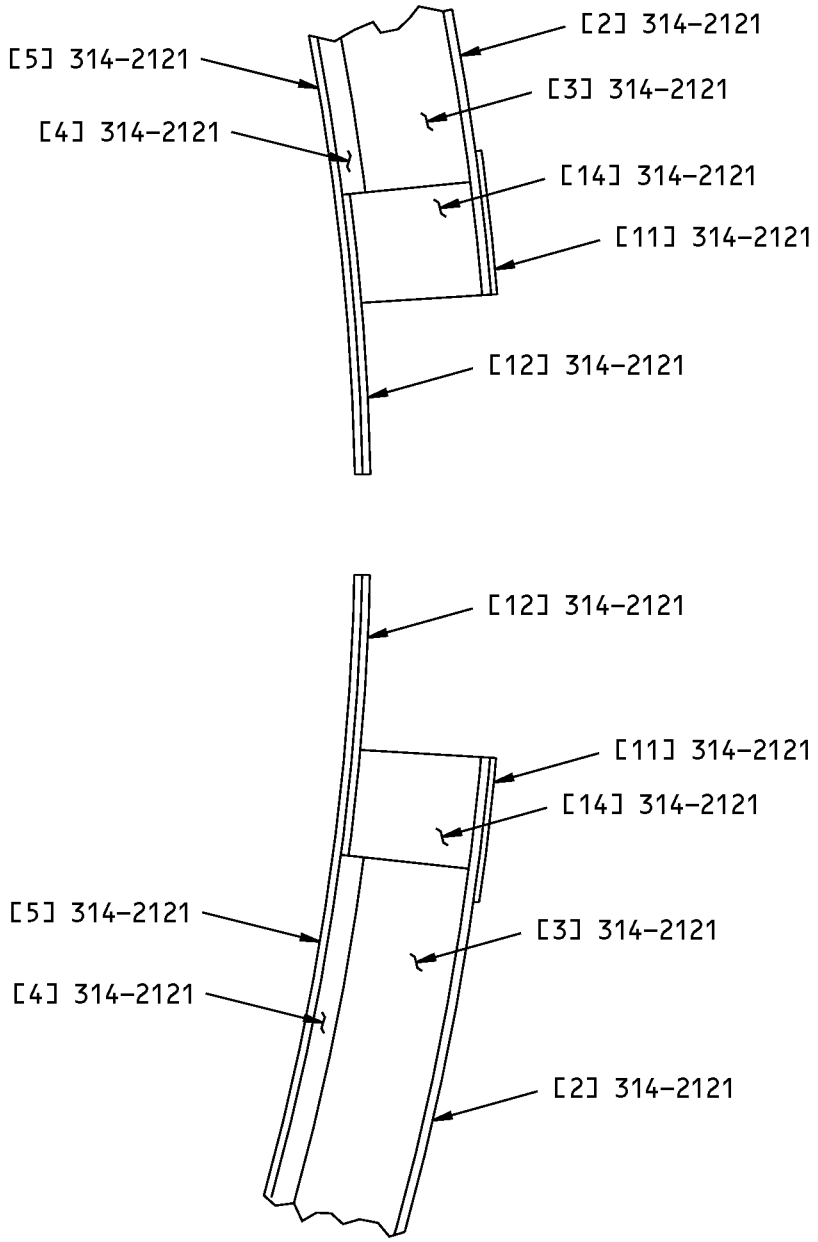


FORWARD CORNER

A

BR-009A

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 4 of 5)



VIEW WHEN YOU LOOK FORWARD
D-D

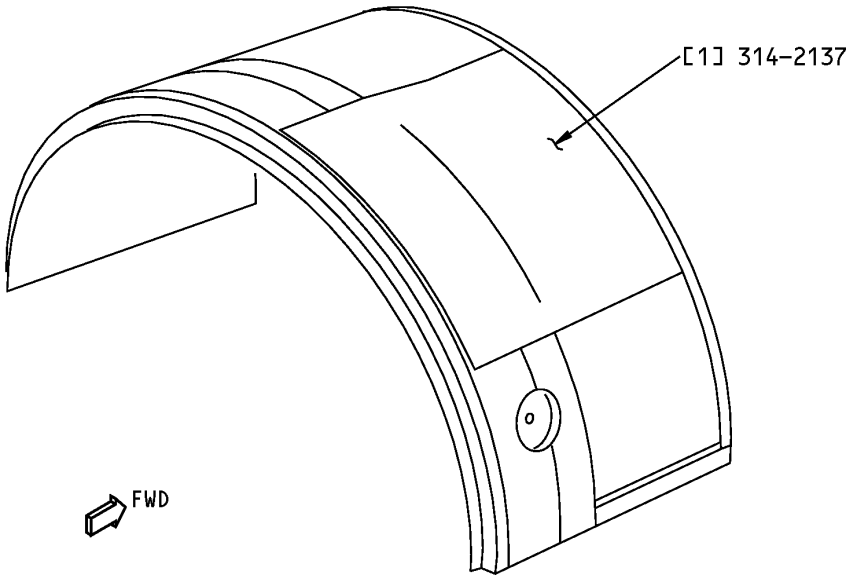
BR-024

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 5 of 5)

Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Forward Closure	0.020 (0.51)	2024-T62	
[2]	Back Skin	0.025 (0.64)	2024-T62	
[3]	Outer Core	1.240 (31.5)	5052 PAA 3.7 PCF field core 3/8 inch (9.53) cell	
[4]	Inner Core	0.260 (6.60)	5052 PAA 3.7 PCF field core 3/8 inch (9.53) cell	
[5]	Perforated Skin	0.032 (0.81)	2024-T42 sheet	
[6]	Inner Forward Doubler	0.032 (0.81)	2024-T62 sheet, chem-milled to between 0.020 and 0.010 (0.51 and (0.25)	
[7]	Aft Core	1.405 (35.69)	5052 PAA 12 PCF, 1/8 inch (3.18) cell	
[8]	Outer Radial Doubler	0.032 (0.81)	2024-T3 sheet	
[9]	Inner Radial Doubler	0.090 (2.29)	2024-T3 sheet	
[10]	Radial Splice	0.110 (2.79)	Ti-6Al-4V titanium sheet, annealed, as given in AMS 4911	
[11]	Aft Outer Doubler	0.250 (6.35)	2024-T62 plate, 0.190 inch (4.82) thickness tapers to 0.080 inch (2.03)	
[12]	T12 Inner Doubler	0.063 (1.60)	2024-T62 sheet	
[13]	Radial Core	1.415 (35.94)	5052 PAA 8.1 PCF 1/8 inch (3.18) cell	
[14]	T12 Support Core	1.432 (36.37)	5052 PAA 8.1 PCF 1/8 inch (3.18) cell	
[15]	Inner Aft Doubler	0.190 (4.82)	2024-T42 plate, machined to 0.090 inch (2.29)	
[16]	Shim		Laminated aluminum shim as given in MIL-S-22499, alloy 1, Type 1, Class 2	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 5 FOR THE LIST OF MATERIALS.

BR-040

Inlet Cowl Upper Inner Acoustic Panel Insulation Blanket Identification
Figure 5

Table 5:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Insulation Blanket		CRES foil, 112 fiberglass cloth, 4 PCF Fiberfrax Lo-Con felt	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - INLET COWL SKINS

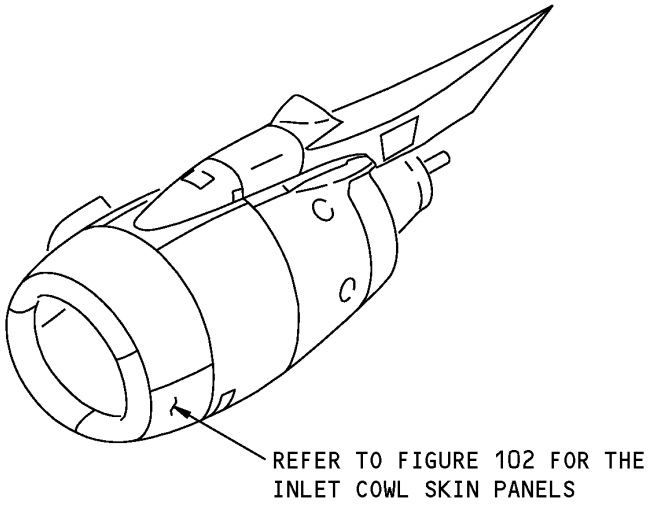
1. Applicability

A. This subject gives the allowable damage limits for the parts shown in Inlet Cowl Skin Panel Location, Figure 101/ALLOWABLE DAMAGE 1 as follows:

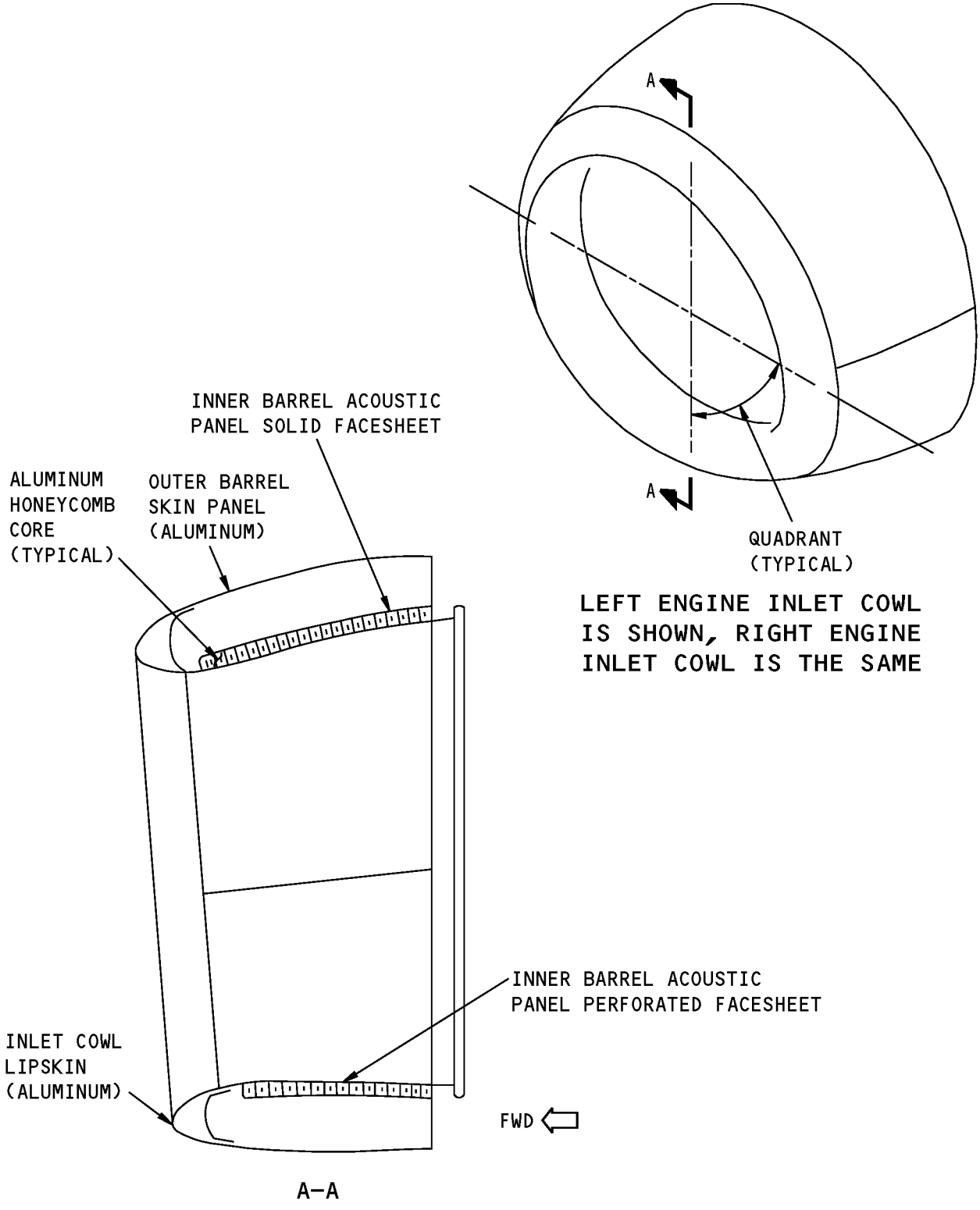
(1) The Inlet Cowl Lip Skin segments

(2) The Inlet Cowl Outer Barrel Skin panels

(3) The Inlet Cowl Inner Barrel Acoustic Skin panels.



Inlet Cowl Skin Panel Location
Figure 101



Inlet Cowl Skin
Figure 102

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

B. After you remove the damage, do as follows:

(1) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.

(2) Apply two layers of BMS 10-79, Type III primer on the outer barrel and inner barrel acoustic skin only as given in SOPM 20-44-04.

(3) Apply a finish to the reworked areas of the outer barrel and inner barrel skins as given in AMM 51-21-00/701.

C. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits of the inlet cowl skin parts.

D. These Allowable Damage Limits have FAA approval only if the inspections given in this subject are completed at the specified times.

Table 101:

PARAGRAPH REFERENCES OF THE ALLOWABLE DAMAGE LIMITS	
INLET COWL SKIN PARTS	**PARAGRAPH**
Nose Lip Segments	4.A
Outer Barrel	4.B
Inner Barrel Acoustic Panel - Perforated and Solid Face Sheets	4.C

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-20-08	EROSION PROTECTION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Nose Lip Skin

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

NOTE: Do not fill the dents.

(4) Holes and Punctures up to a maximum diameter of 0.25 inch (6.35 mm) are permitted if:

(a) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the part

(b) You install an NAS1398D blind rivet wet with BMS 5-63 sealant.

(5) Erosion damage is permitted as shown in Inlet Cowl Lip Skin Erosion Damage, Figure 104/ALLOWABLE DAMAGE 1.

CAUTION: DO NOT USE TAPE FOR EROSION PROTECTION. IF YOU DO NOT OBEY, THE TAPE CAN BECOME LOOSE AND ENTER THE ENGINE.

(a) Apply or remove erosion coatings as given in 51-20-08.

B. Outer Barrel Skin Panels

(1) Cracks:

(a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(b) Surface cracks up to a maximum length of 1.00 inch (25.4 mm) are permitted if:

1) You stop drill 0.25 inch (6.35 mm) diameter holes at each end of the crack

2) The damage is a minimum of 3.00 inches (76.2 mm) away from the edge of the panel

3) The damage is a minimum of 8.00 inches (203.2 mm) from adjacent cracks

4) There are not more than 3 cracks in a quadrant as shown in Inlet Cowl Skin, Figure 102/ALLOWABLE DAMAGE 1

5) You make an inspection of the damage at each 25 flight cycles

6) You make a permanent repair if the damage becomes larger.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

NOTE: Do not fill the dents.

(4) Holes and Punctures up to a maximum diameter of 0.25 inch (6.35 mm) are permitted if:

(a) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the panel

(b) You install an NAS1398D blind rivet wet with BMS 5-63 sealant.

C. Inner Barrel Acoustic Panels (Perforated and Solid Face Sheets)

(1) Cracks:

(a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(b) Surface cracks up to a maximum length of 2.00 inches (50.8 mm) are permitted if:

1) You stop drill 0.25 inch (6.35 mm) diameter holes at each end of the crack

2) You apply BMS 5-95 sealant to the stop holes as given in 51-20-05

3) The damage is a minimum of 3.30 inches (83.8 mm) away from the edge of the panel.

4) The damage is a minimum of 8.00 inches (203.2 mm) from other damage:

a) That is caused by cracks, dents, holes, punctures or delaminations

b) That is not repaired.

5) There are not more than 3 cracks in a quadrant as shown in Inlet Cowl Skin, Figure 102/ALLOWABLE DAMAGE 1

6) You make an inspection of the damage at each 25 flight cycles

7) You make a permanent repair if the crack becomes larger in length.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

NOTE: Do not fill the dents.

NOTE: Make an inspection for a disbond between the face sheet and the core. If you find a disbond, then use the limits given for delaminations.

(4) Holes and Punctures up to a maximum diameter of 0.50 inch (12.7 mm) are permitted if:

(a) The center of the damage is a minimum of 3.30 inch (83.8 mm) from the edge of the panel

(b) The damage is a minimum of 8.00 inches (203.2 mm) from other damage:

1) That is caused by cracks, dents, holes, punctures or delaminations

2) That is not repaired.

(c) You seal the hole with BMS 5-95 as given in 51-20-05

(d) There are not more than 2 holes in a quadrant as shown in Inlet Cowl Skin, Figure 102/ALLOWABLE DAMAGE 1

(e) You make an inspection of the damage at each 25 flight cycles

(f) You make a permanent repair if:

1) The hole or puncture becomes larger in diameter, or

2) If the facesheets have cracks or delaminations.

(5) Delaminations up to a maximum diameter of 2.00 inches (50.8 mm) are permitted if:

(a) The edge of the damage is a minimum of 3.30 inch (83.8 mm) from the edge of the panel

(b) The damage is a minimum of 8.00 inches (203.2 mm) from other damage:

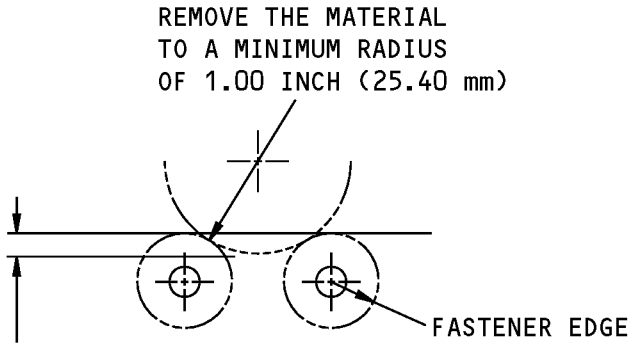
1) That is caused by cracks, dents, holes, punctures or delaminations

2) That is not repaired.

(c) There are not more than 2 delaminations in a quadrant as shown in Inlet Cowl Skin, Figure 102/ALLOWABLE DAMAGE 1

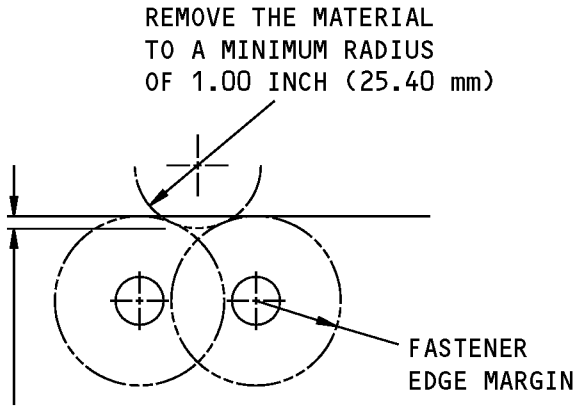
(d) You make an inspection of the damage at each 25 flight cycles

(e) You make a permanent repair not later than 100 flight cycles if the damage becomes larger in diameter.



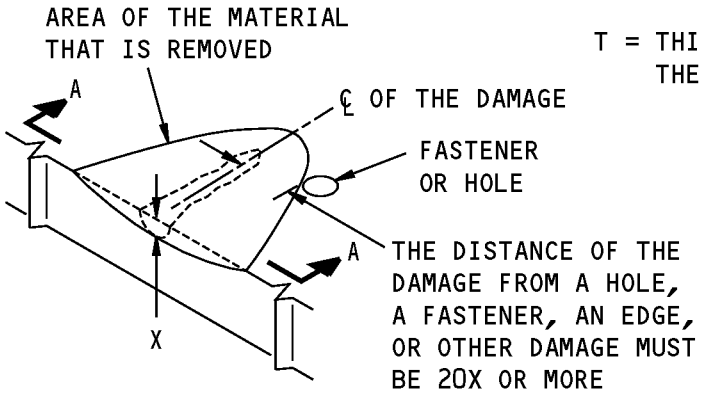
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

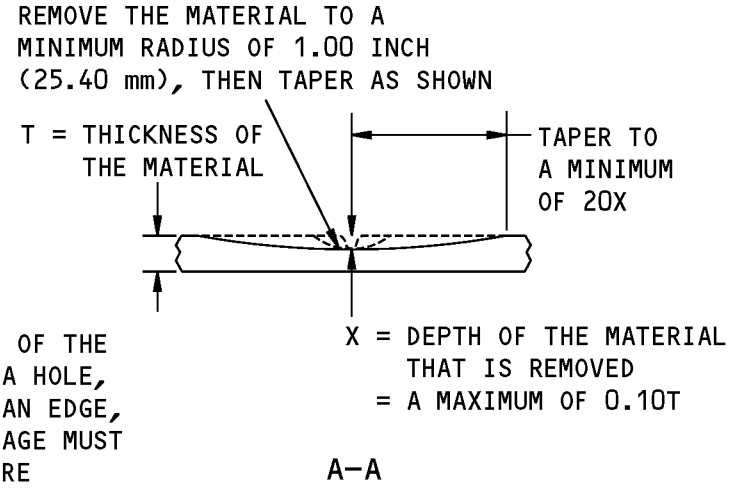
A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

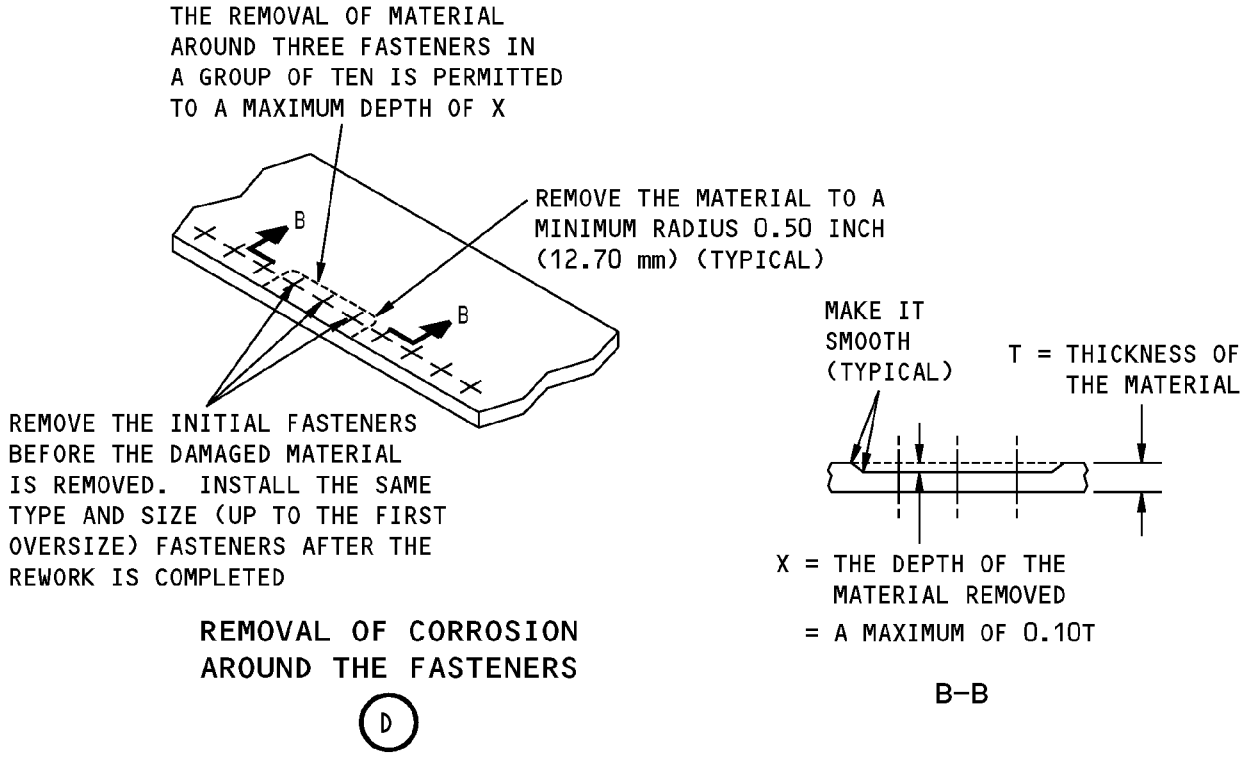


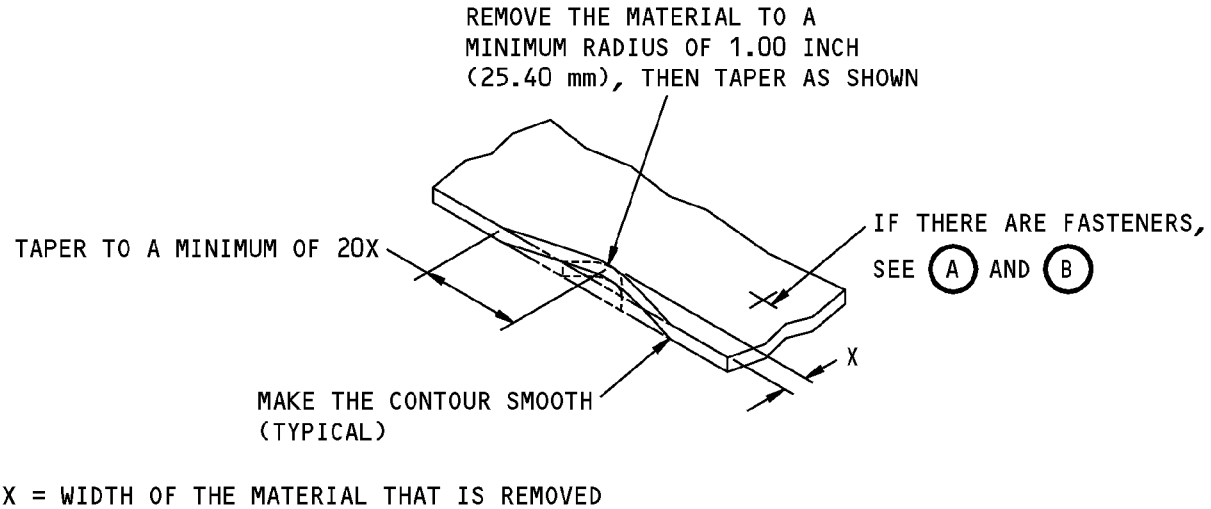


REMOVAL OF DAMAGED MATERIAL ON A SURFACE

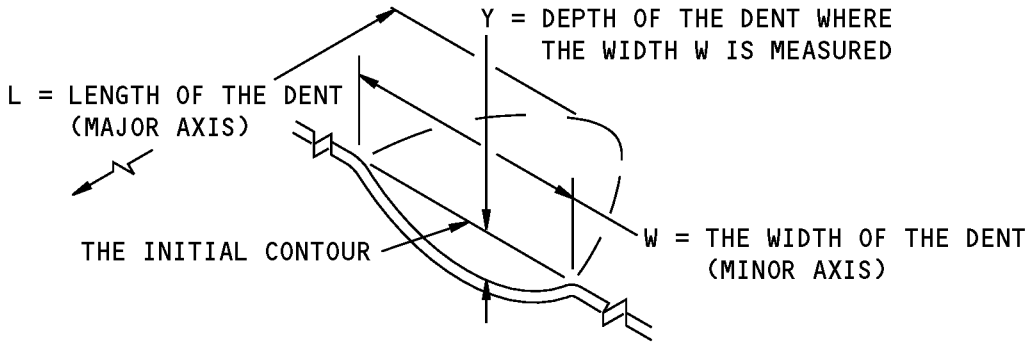
C

Allowable Damage Limits
Figure 103 (Sheet 1 of 4)





Allowable Damage Limits
Figure 103 (Sheet 2 of 4)



A. DENTS ARE PERMITTED IF:

(1) THEY ARE SMOOTH AND HAVE NO CREASES, GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.

(2) THERE IS A MAXIMUM OF TWO DENTS IN A QUADRANT AS SHOWN IN FIGURE 102.

(3) THERE IS A MINIMUM OF 15.0 INCHES (381.0 mm) BETWEEN THE EDGES OF THE DENTS.

(4) $\frac{W}{Y}$ IS 30 OR MORE AT ALL LOCATIONS ALONG THE DENT WHERE:

Y = A MAXIMUM OF 0.125 INCH (3.18 mm) AND
W = A MAXIMUM OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS
L = A MAXIMUM LENGTH OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS

OR Y = A MAXIMUM OF 0.050 INCH (1.27 mm) AND
W = A MAXIMUM OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS
L = A MAXIMUM LENGTH OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS

DENT THAT IS PERMITTED (CONTINUED ON SHEET 4)

F

Allowable Damage Limits
Figure 103 (Sheet 3 of 4)

B. DENTS THAT ARE LARGER THAN THE LIMITS GIVEN ABOVE ARE PERMITTED FOR A MAXIMUM OF 2 FLIGHT CYCLES IF:

(1) THEY ARE SMOOTH AND HAVE NO GOUGES OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.

(2) THE LENGTH OF A CREASE IN THE DENT IS A MAXIMUM OF 3.00 INCHES (76.2 mm) IN LENGTH.

(3) THERE ARE A MAXIMUM OF TWO DENTS IN A QUADRANT AS SHOWN IN FIGURE 102.

(4) THERE IS A MINIMUM OF 15.0 INCHES (381.0 mm) BETWEEN THE EDGES OF THE DENTS.

(5) Y = A MAXIMUM OF 0.25 INCH (6.35 mm) AND
W = A MAXIMUM OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS
L = A MAXIMUM LENGTH OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS

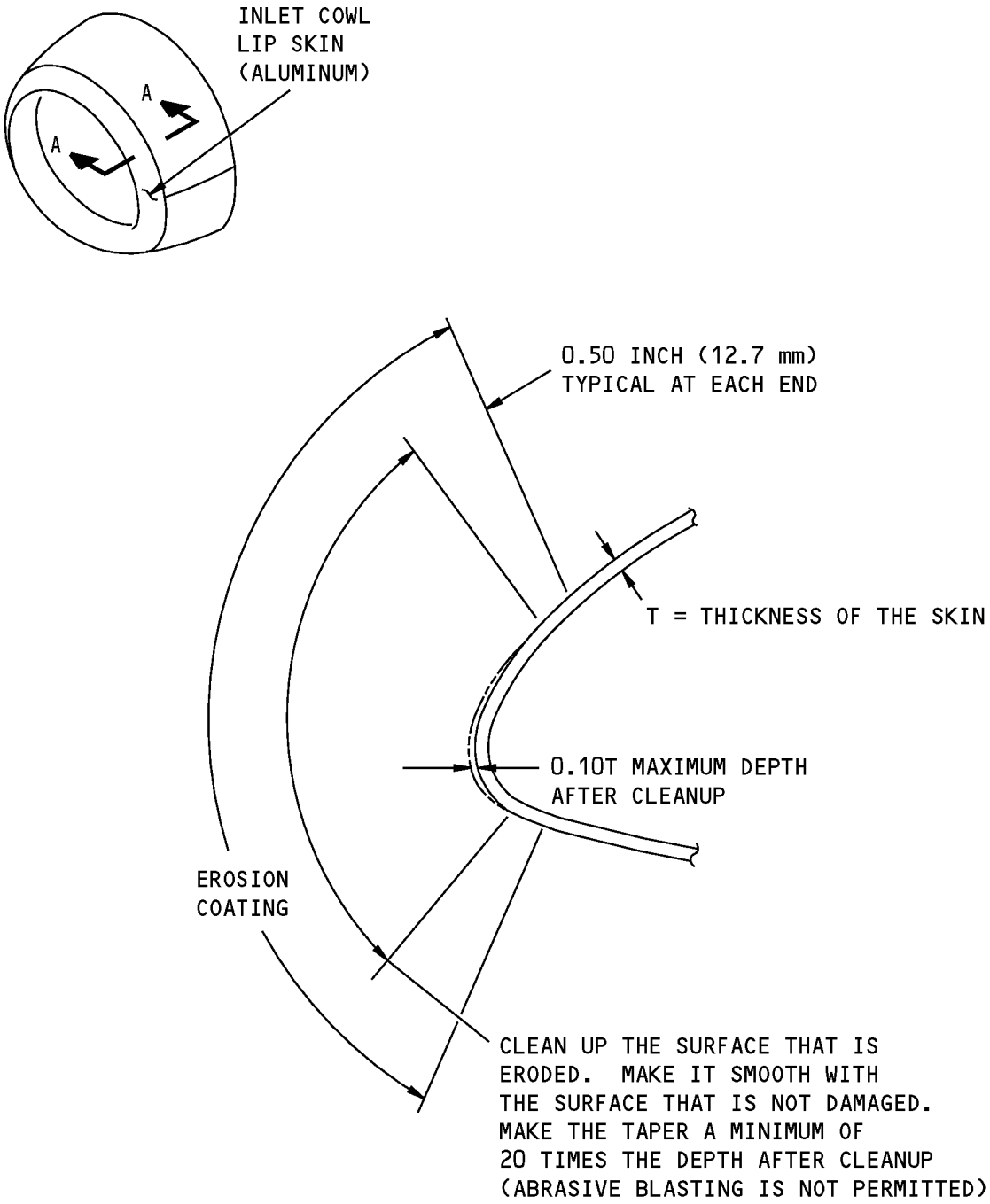
OR

Y = A MAXIMUM OF 0.10 INCH (2.54 mm) AND
W = A MAXIMUM OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS
L = A MAXIMUM LENGTH OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS

DENT THAT IS PERMITTED (CONTINUED FROM SHEET 3)

F

Allowable Damage Limits
Figure 103 (Sheet 4 of 4)



NOTE: REFER TO SRM 51-20-08 FOR APPLICATION AND REMOVAL OF EROSION COATINGS.

Inlet Cowl Lip Skin Erosion Damage
Figure 104

REPAIR 1 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR IN THE FIELD AREA

1. Applicability

A. Repair 1 is applicable to damage that is:

(1) On the Inlet Cowl Outer Barrel Skin in the field area

(2) 1.25 inches (31.75 mm) or less in diameter.

B. Repair 1 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

A. Repair 1 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

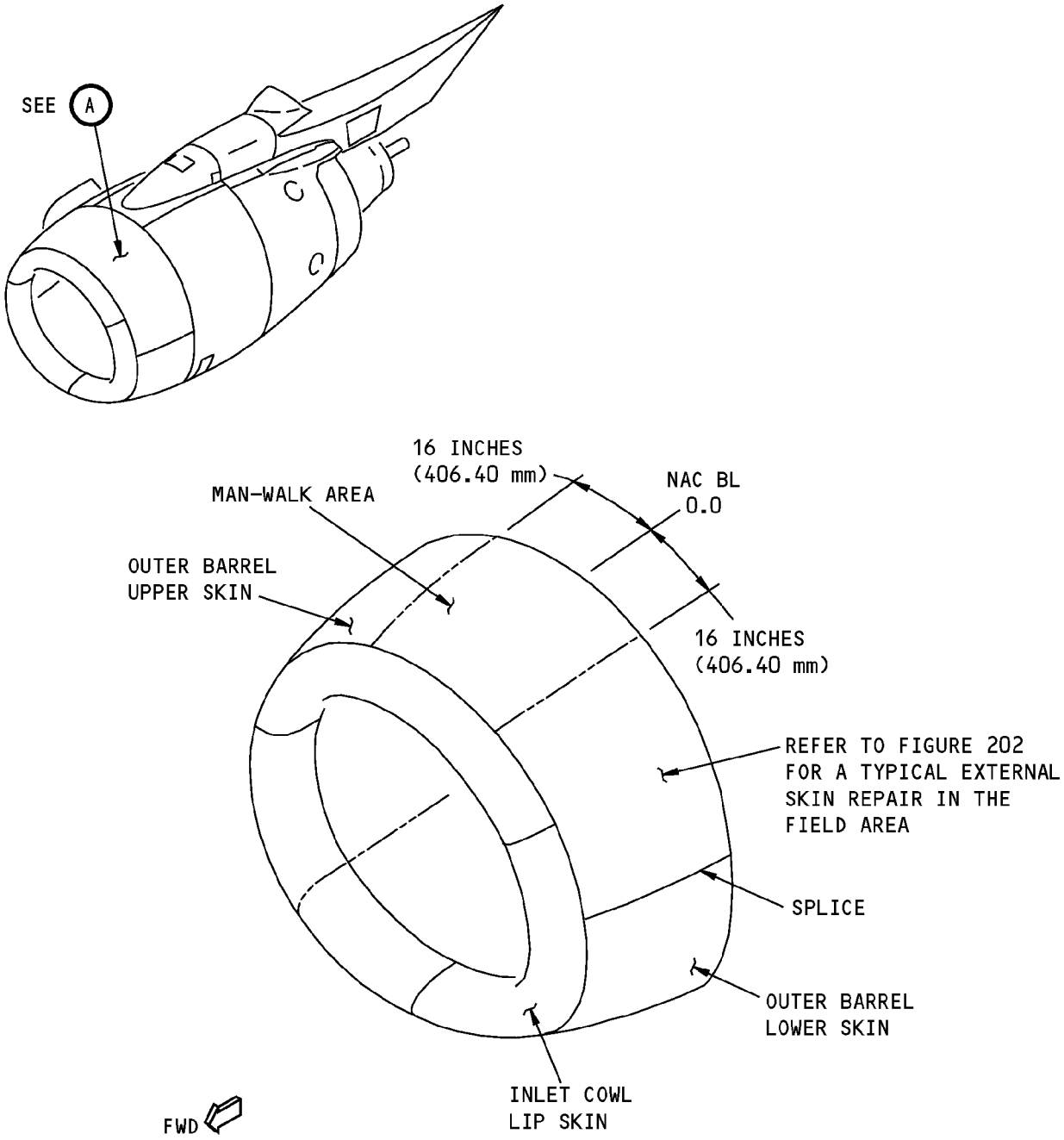
B. The edge of the repair doubler must be:

(1) A minimum of 10.00 inches (254.0 mm) from the leading edge of the inlet cowl lip

(2) A minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.

C. The use of this repair causes an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds (4.09 kg) to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.

D. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Repair
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to drill a stop hole.

C. Cut and remove the damaged skin in a circular shape to a maximum diameter of 1.25 inches (31.75 mm). Refer to Layout of the Repair Parts, Figure 202/REPAIR 1.

(1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step

(d) A fore/aft splice.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to NDT, Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the part [1] doubler to the same contour as the inlet cowl outer barrel skin. Refer to Table 201/REPAIR 1 for the materials.

F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 1.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 1. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the part [1] doubler.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for the upper skin man-walk zones

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges of the doubler and the initial skin as given in BAC 5300.

K. Apply a chemical conversion coating to the part [1] doubler and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the part [1] doubler.

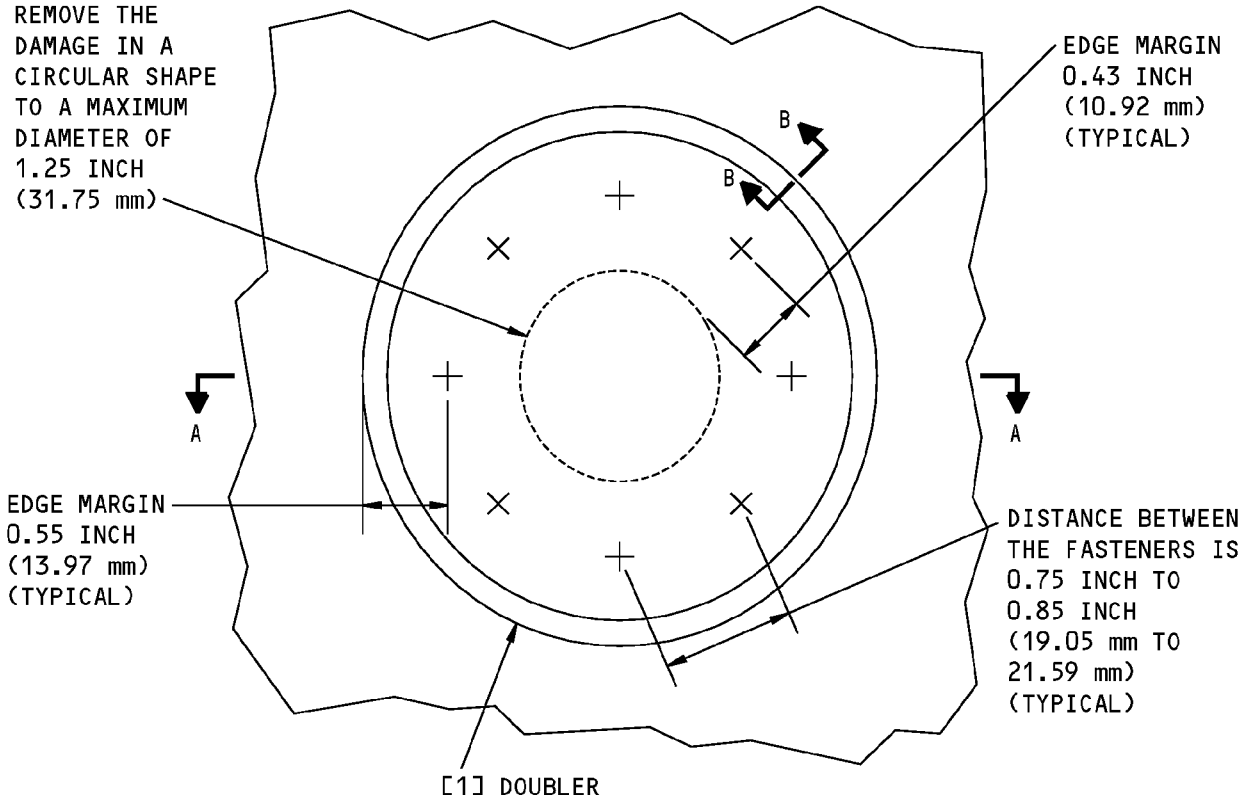
M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners wet with BMS 5-95 sealant.

O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

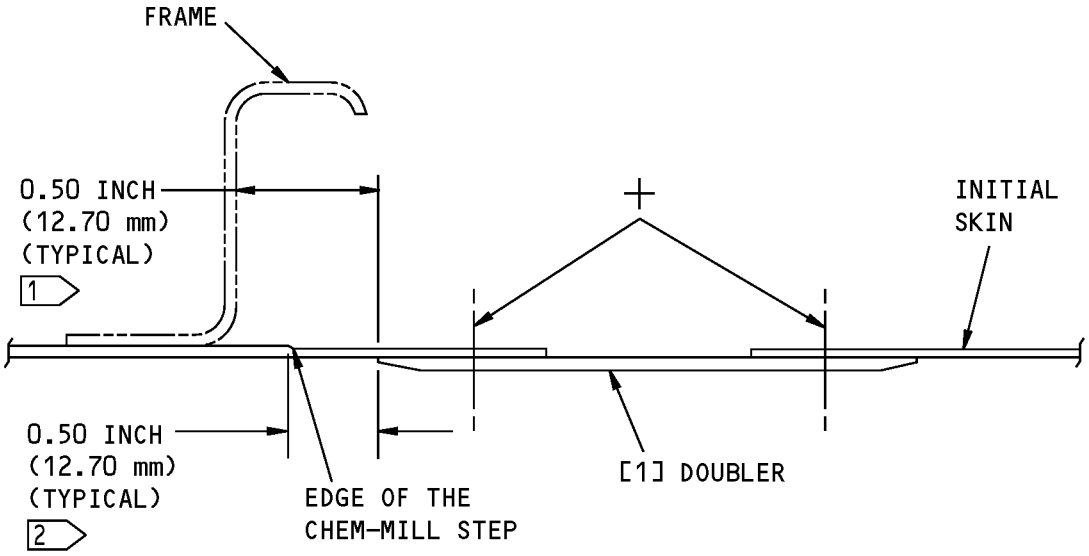
Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.



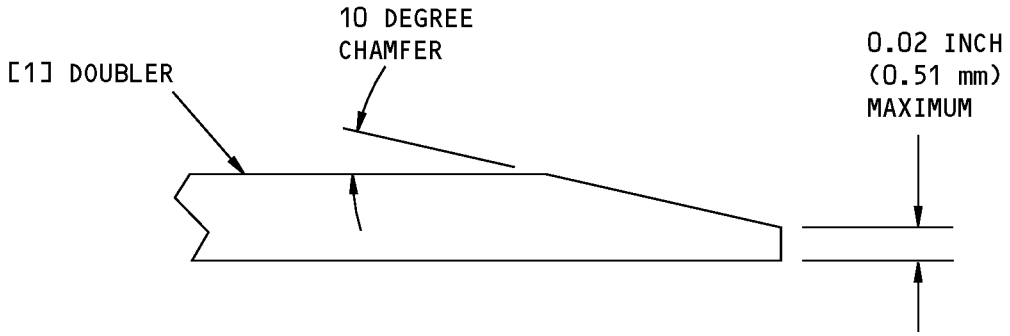
FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A-A



B-B

NOTES

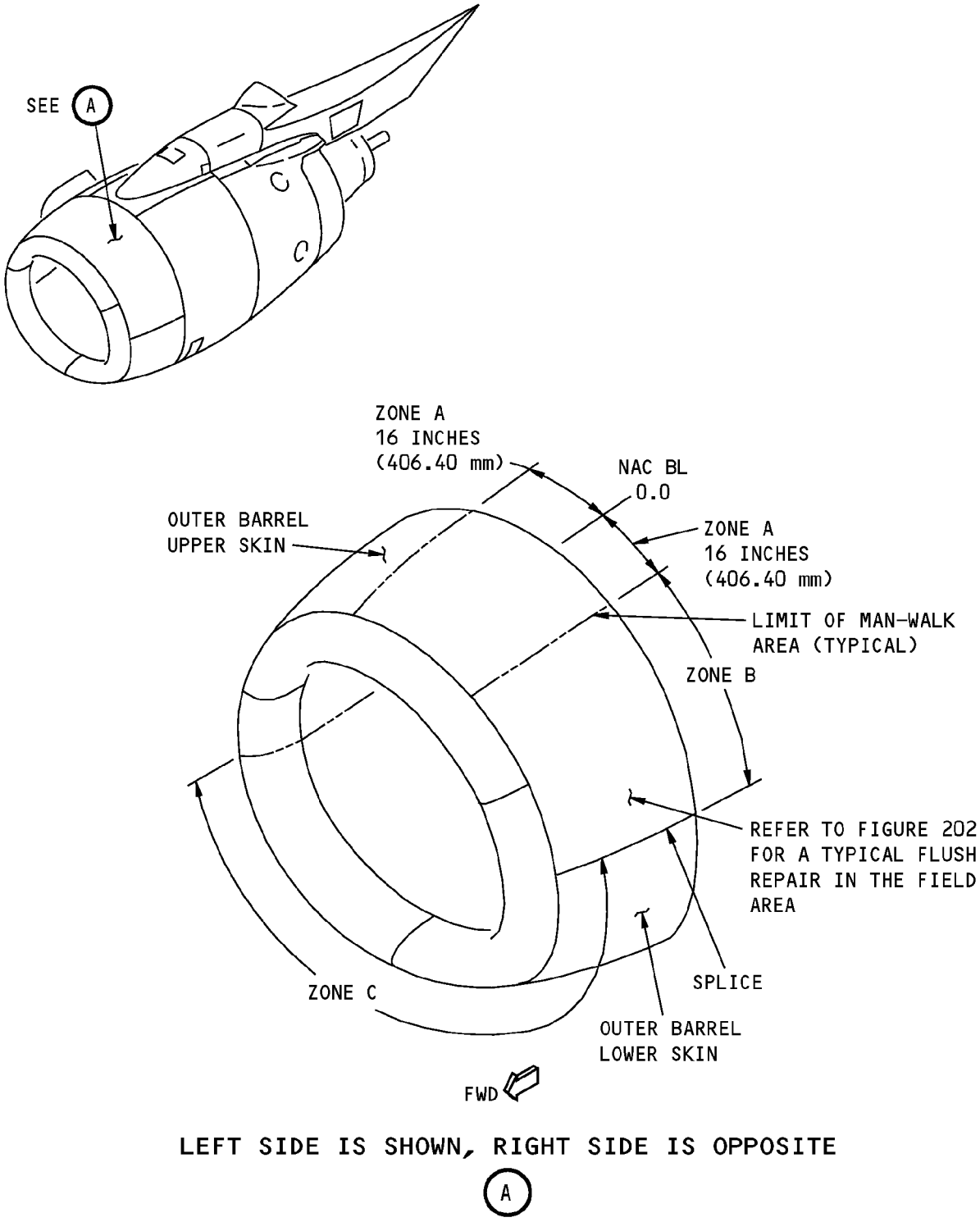
1 APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.

2 APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 2 - INLET COWL OUTER BARREL SKIN FLUSH REPAIR IN THE FIELD AREA

1. **Applicability**
   A. Repair 2 is applicable to damage that occurs to the inlet cowl outer barrel skin in the field area as shown in Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 2.
   B. The edge of the damage must be a minimum of 1.9 inch (48.26 mm) from a frame, doubler, splice, or chem-mill step.
2. **General**
   A. Repair 1 is a Category A repair.
   B. Refer to 51-00-06 to find the definitions of the different categories of repairs.
   C. Make sure the aerodynamic smoothness of the repair is satisfactory or there can be a decrease in the economic performance of the airplane.



Inlet Cowl Outer Barrel Skin Zones
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. Drill a 0.25 inch (6.35 mm) stop hole at the ends of the crack in the damaged skin. Refer to Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2.

C. Cut out the damaged skin.

NOTE: The edge of the cutout must be a minimum of 1.9 inches (48.26 mm) from a frame, doubler, splice, or chem-mill step.

(1) Make a radius at the corners of the cutout a minimum of 0.50 inch (12.70 mm).

(2) Do not cause damage to the adjacent internal structure.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 2 for the materials.

F. Assemble the repair parts as shown in Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2.

G. Drill the fastener holes as shown in Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, gouges, burrs from the repair parts and the initial skin, and break the sharp edges 0.015 inch to 0.030 inch (0.38 mm to 0.76 mm). Refer to 51-10-02.

J. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

K. Apply one layer of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the [1] doubler and [2] repair skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet in Zone A Use 0.050 inch (1.27 mm) thick 2024-T3 sheet in Zone B Use 0.045 inch (1.14 mm) thick 2024-T3 sheet in Zone C
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet in Zone A Use 0.050 inch (1.27 mm) thick 2024-T3 sheet in Zone B Use 0.045 inch (1.14 mm) thick 2024-T3 sheet in Zone C

L. Apply BMS 5-95 sealant between the mating surfaces of the part [1] doubler and the initial skin. Refer to 51-20-05.

M. Install the repair parts. Refer to Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2 and Table 202.

(1) For a repair in Zone A, install the NAS1097AD6 or BACR15CE6AD rivets without sealant.

(2) For a repair in Zones B or C, install the MS20470AD6 rivets without sealant.

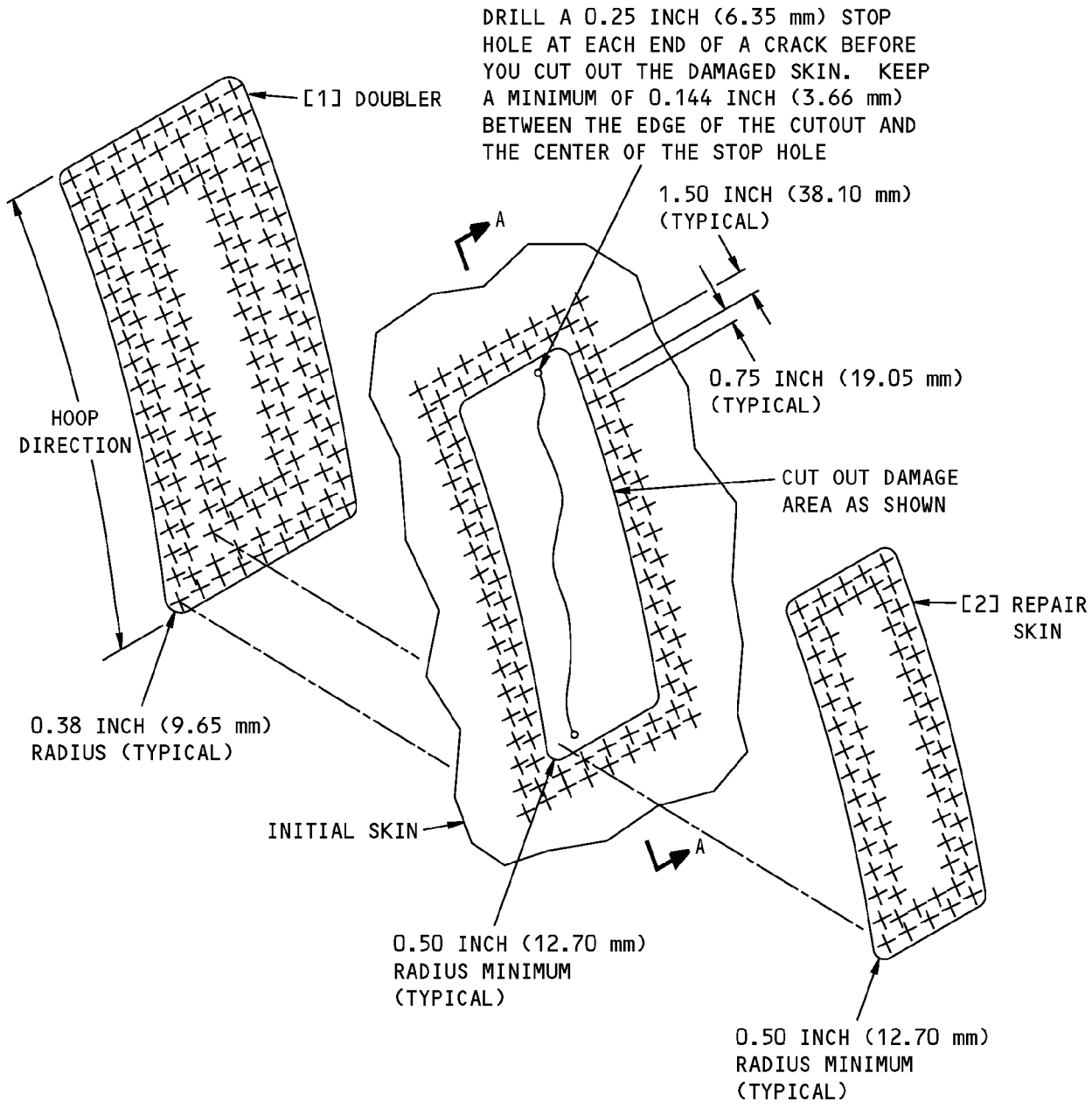
N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Fill the space between the part [1] repair skin and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

P. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

Table 202:

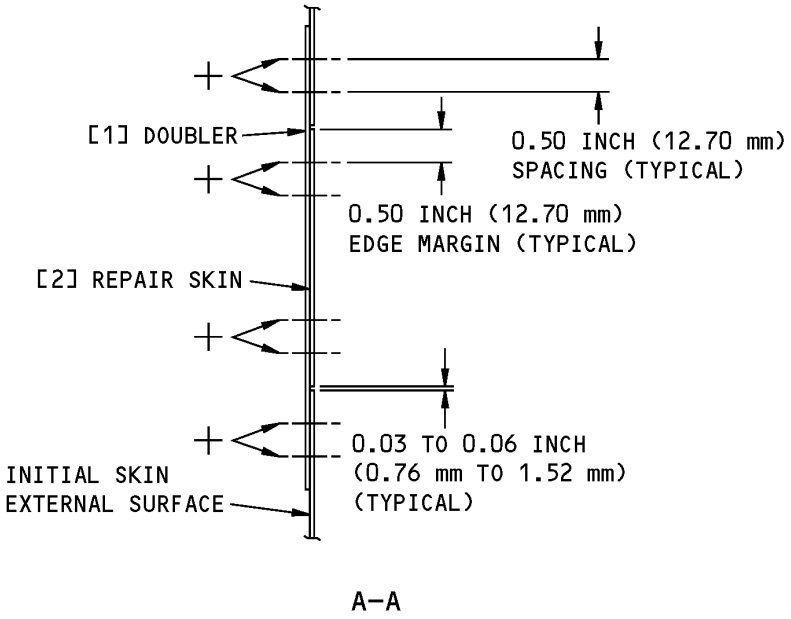
SOLID RIVET FASTENER LOCATION, TYPE AND SIZE	
ZONE	REPAIR FASTENER TYPE AND SIZE
ZONE A	NAS1097AD6 or BACR15CE6AD
ZONE B	MS20470AD6
ZONE C	MS20470AD6



FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. REFER TO TABLE 202 FOR THE FASTENERS.

Inlet Cowl Outer Barrel Flush Repair in the Field Area
Figure 202 (Sheet 1 of 2)



Inlet Cowl Outer Barrel Flush Repair in the Field Area
Figure 202 (Sheet 2 of 2)

REPAIR 3 - INLET COWL OUTER BARREL SKIN EXTERNAL REPAIR BETWEEN TWO FRAMES

1. Applicability

A. Repair 3 is applicable to damage that is: (Refer to Inlet Cowl Outer Barrel Skin Repair Between Frames in the Field Area, Figure 201/REPAIR 3.)

(1) On the Inlet Cowl Outer Barrel Skin between two frames

(2) More than 1.25 inches (31.75 mm) in diameter.

B. Repair 3 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

A. Repair 3 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).

C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).

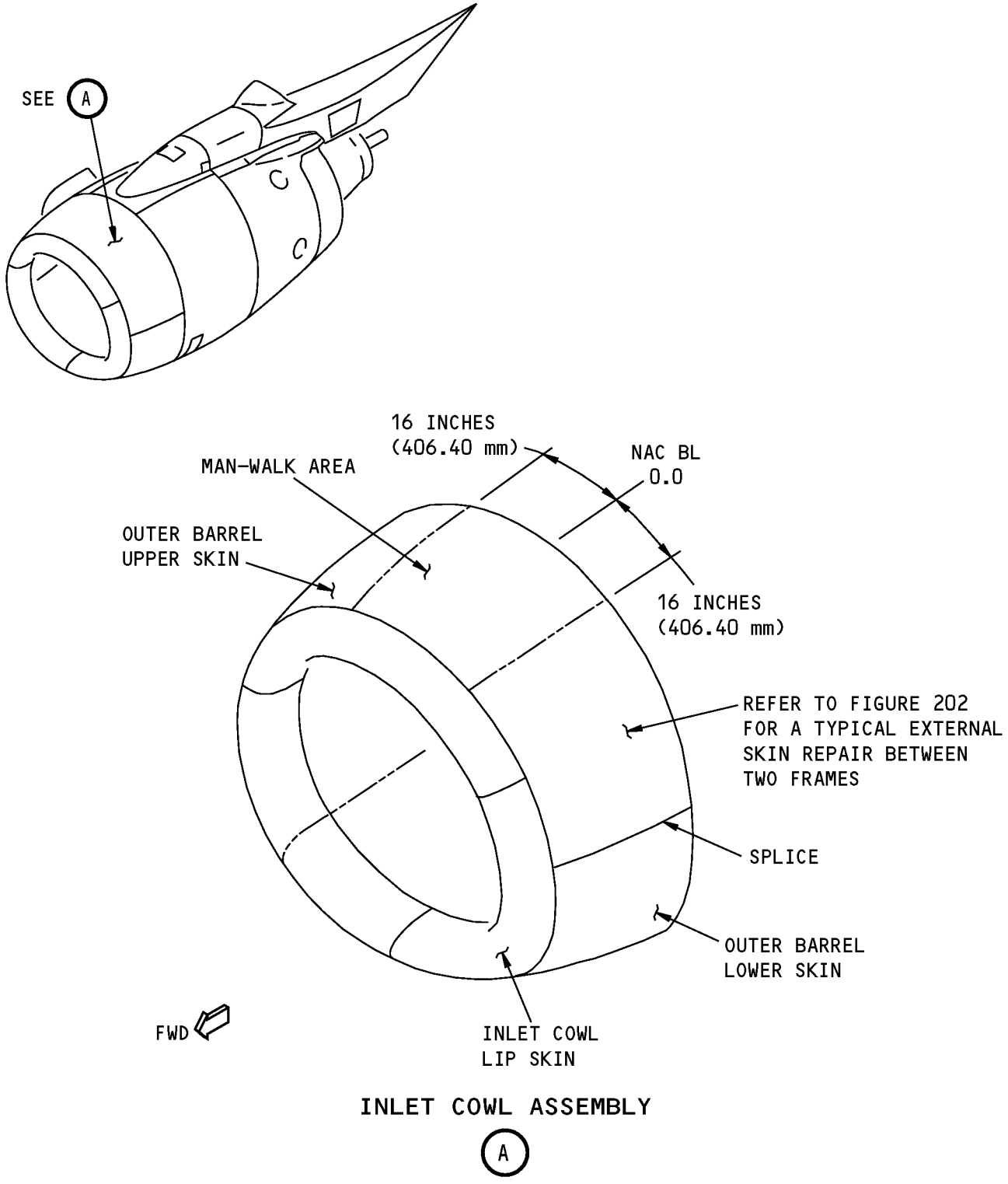
D. The repair doublers must be a minimum of 10.00 inches (254.0 mm) away from the leading edge of the inlet cowl lip.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

E. The edge of the repair doubler must be a minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.

F. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.

G. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Repair Between Frames in the Field Area
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step

(d) A fore/aft splice.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the part [1] doubler to the same contour as the initial skin. Refer to Table 201/REPAIR 3 for the materials.

F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 3.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 3. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the part [1] doubler.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the part [1] doubler and the initial skin. Refer to BAC 5300.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for the upper skin man-walk zones

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)
   (1) The bare external surfaces of the initial skin
   (2) The internal and external surfaces of the part [1] doubler.

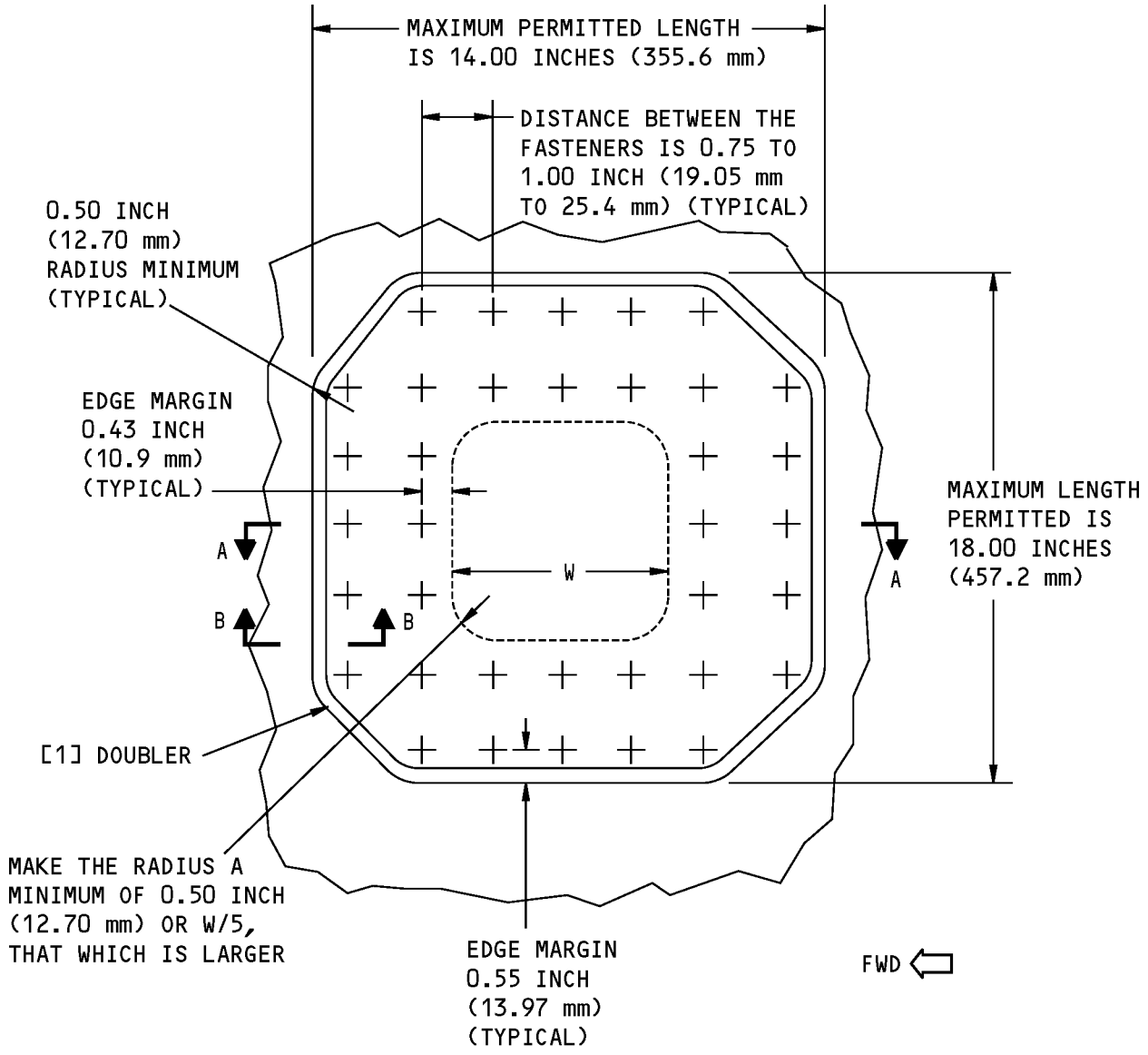
M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners wet with BMS 5-95 sealant.

O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

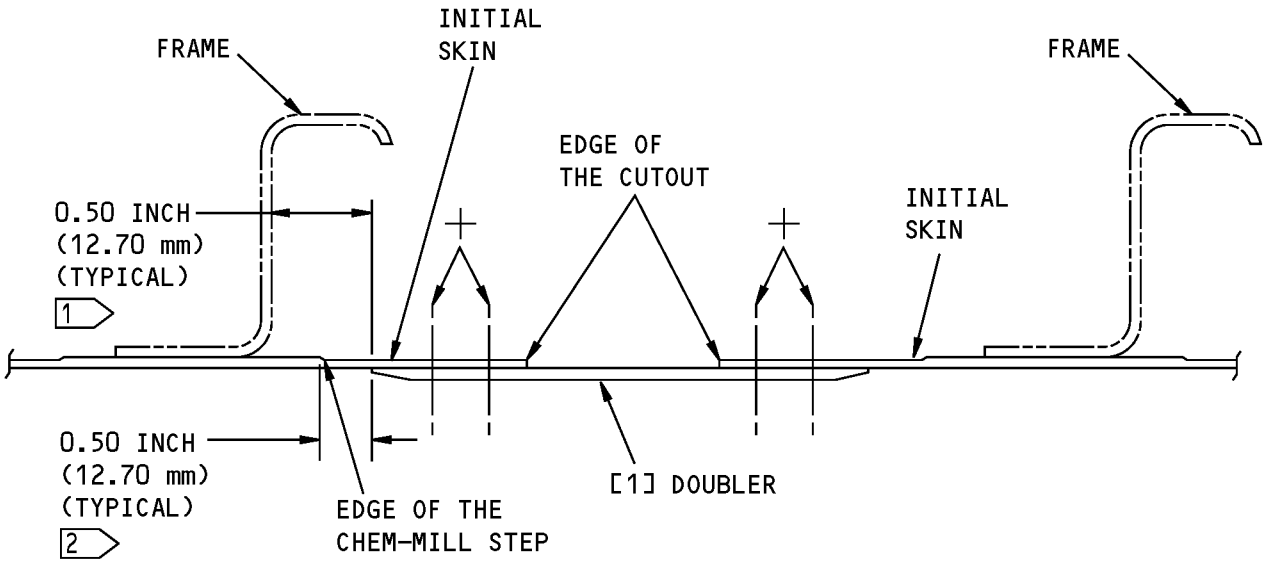
Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.



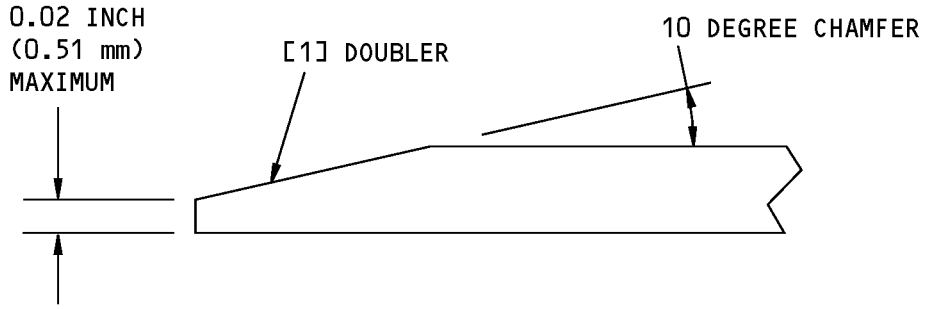
FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A-A



B-B
(TYPICAL)

NOTES

1 APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.

2 APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 4 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR AT A FRAME

1. Applicability

A. Repair 4 is applicable to damage that is:

(1) On the Inlet Cowl Outer Barrel Skin at a frame

(2) More than 1.25 inches (31.75 mm) in diameter.

B. Repair 4 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

A. Repair 4 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).

C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).

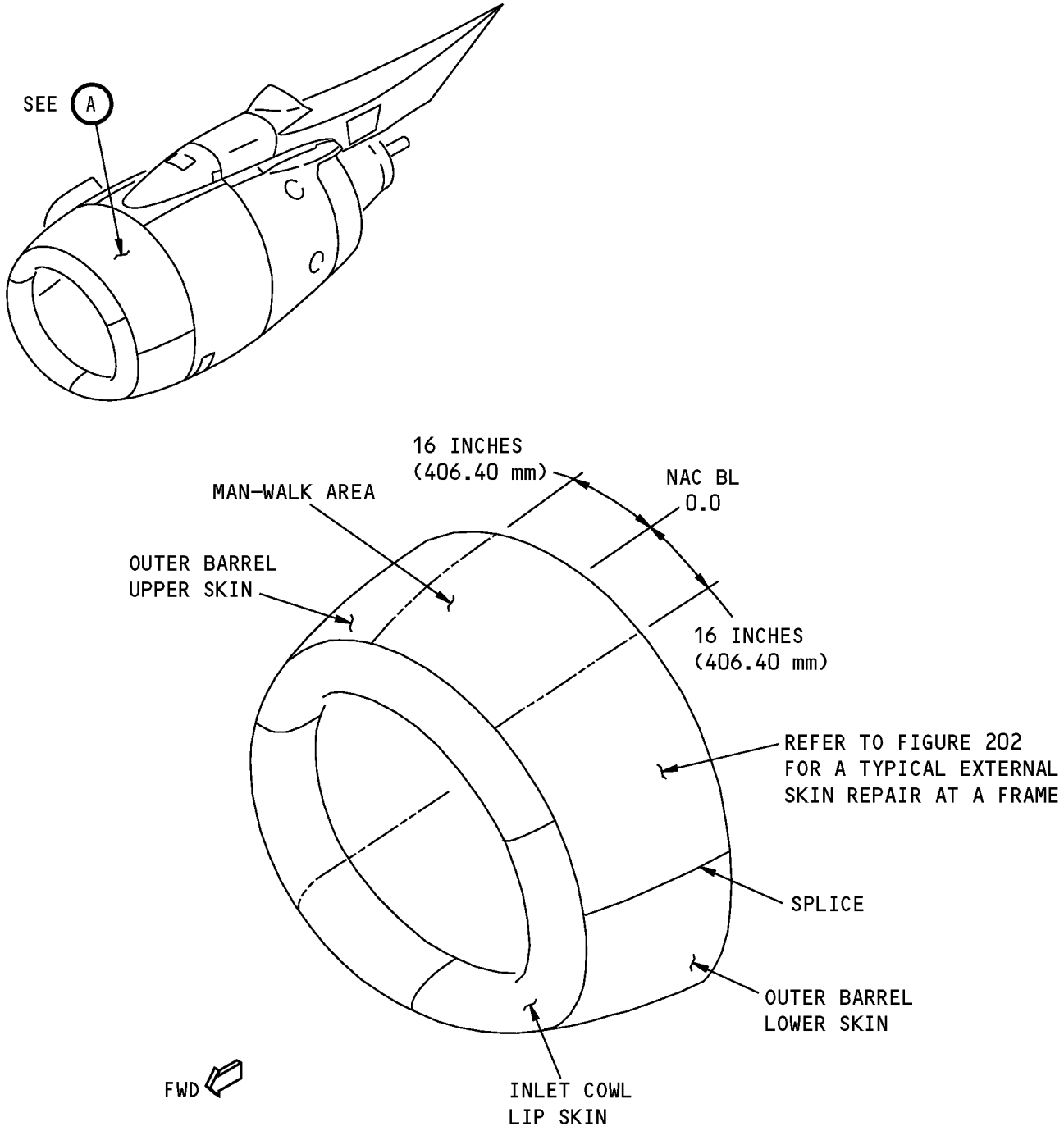
D. The repair doublers must be a minimum of 10.00 inches (254.0 mm) away from the leading edge of the inlet cowl lip.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

E. The edge of the repair doubler must be a minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.

F. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.

G. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Repair at a Frame
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is adjacent to a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the repair Doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:

(a) A frame,

(b) A Doubler,

(c) A chem-mill step,

(d) A fore/aft splice.

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the part [1] doubler to the same contour as the initial skin. Refer to Table 201/REPAIR 4 for the materials.

F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 4.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 4. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the part [1] doubler.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the part [1] doubler and the initial skin. Refer to BAC 5300.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the part [1] doubler.

M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

Table 201:

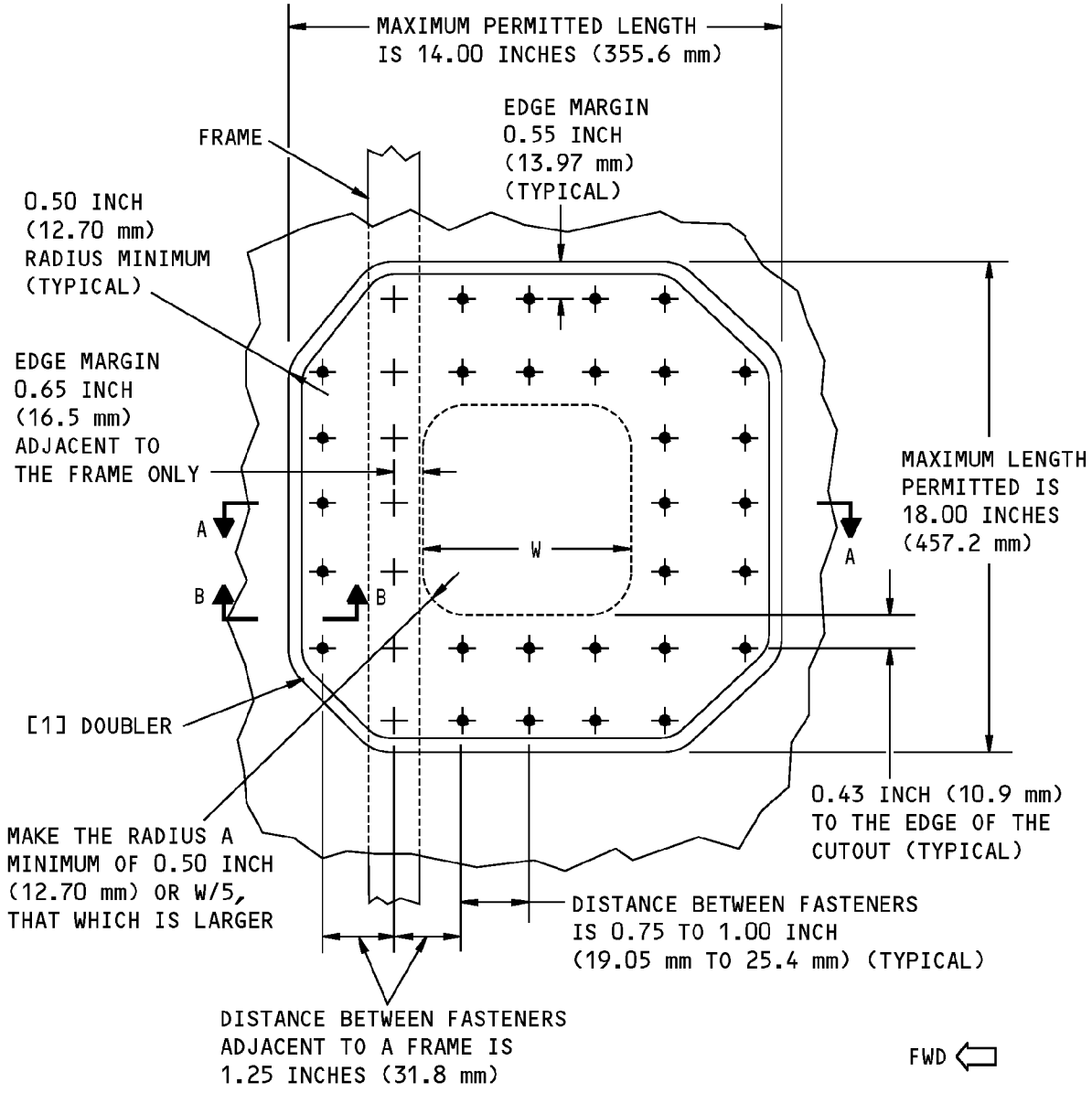
REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for the upper skin man-walk zones

N. Install the fasteners with BMS 5-95 sealant.

O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

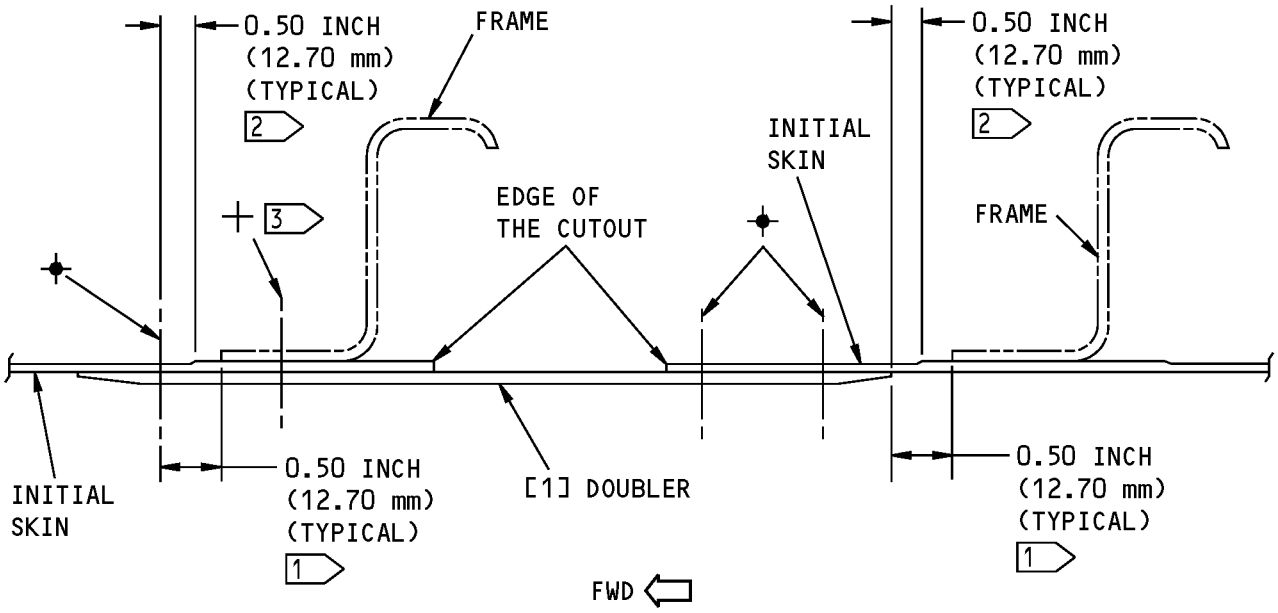
Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.



FASTENER SYMBOLS

- INITIAL FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.
- REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



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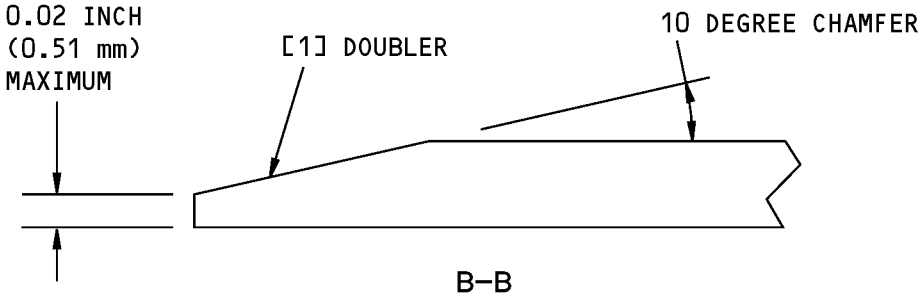


B–B
(TYPICAL)

NOTES

1 APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.

2 APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.

3 INSTALL A COUNTERSINK WASHER BETWEEN THE INITIAL SKIN AND THE PART [1] DOUBLER.

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 5 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR AT TWO FRAMES

1. Applicability

A. Repair 5 is applicable to damage that is:

(1) On the Inlet Cowl Outer Barrel Skin at two frames

(2) More than 1.25 inches (31.75 mm) in diameter.

B. Repair 5 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

A. Repair 5 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).

C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).

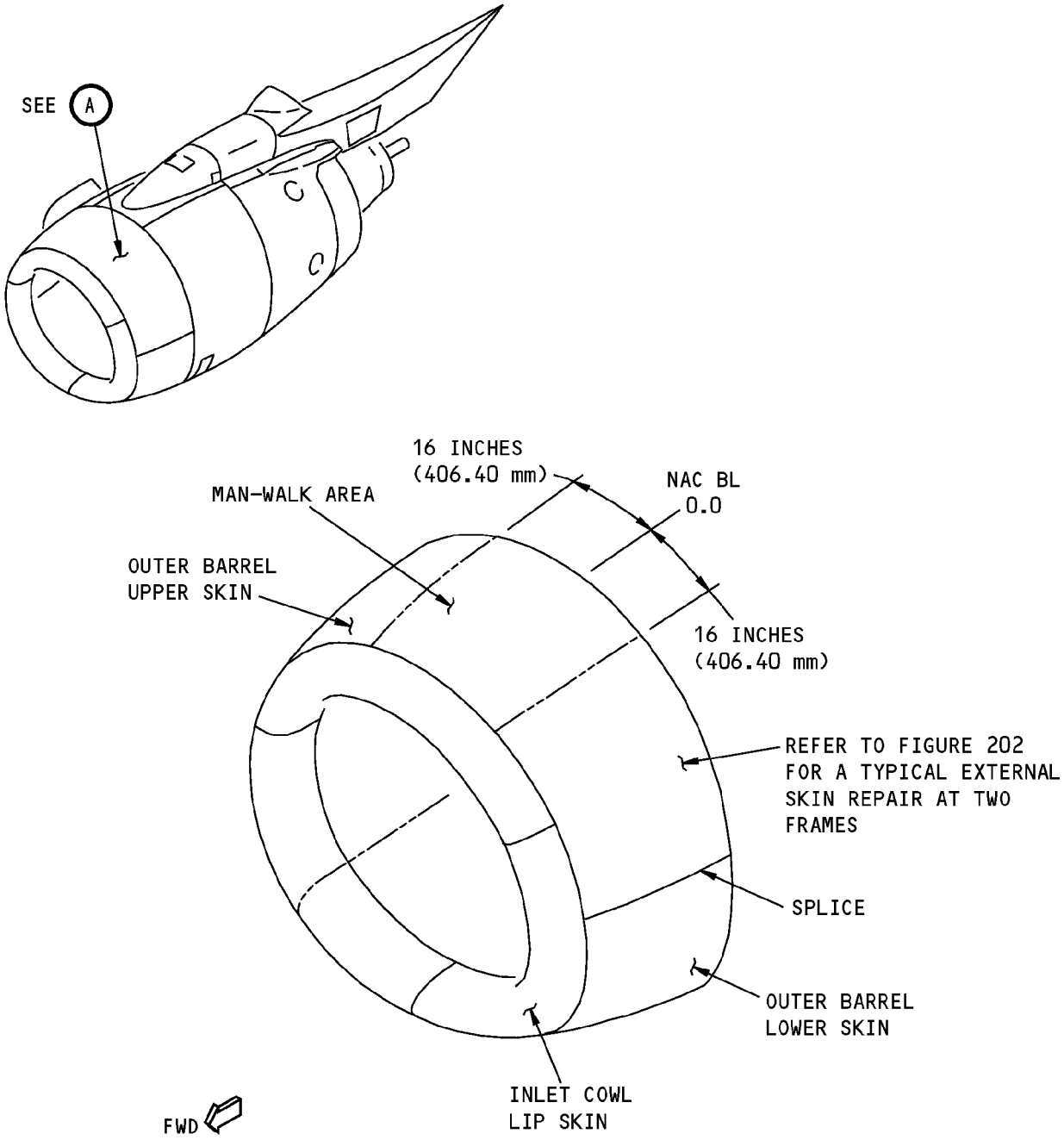
D. The repair doublers must be a minimum of 10.00 inches (254.0 mm) away from the leading edge of the inlet cowl lip.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

E. The edge of the repair doubler must be a minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.

F. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.

G. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Repair at Two Frames
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is adjacent to a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step

(d) A fore/aft splice.

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the part [1] doubler to the same contour as the initial skin. Refer to Table 201/REPAIR 5 for the materials.

F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 5.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 5. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the part [1] doubler.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the part [1] doubler and the initial skin. Refer to BAC 5300.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the part [1] doubler.

M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

Table 201:

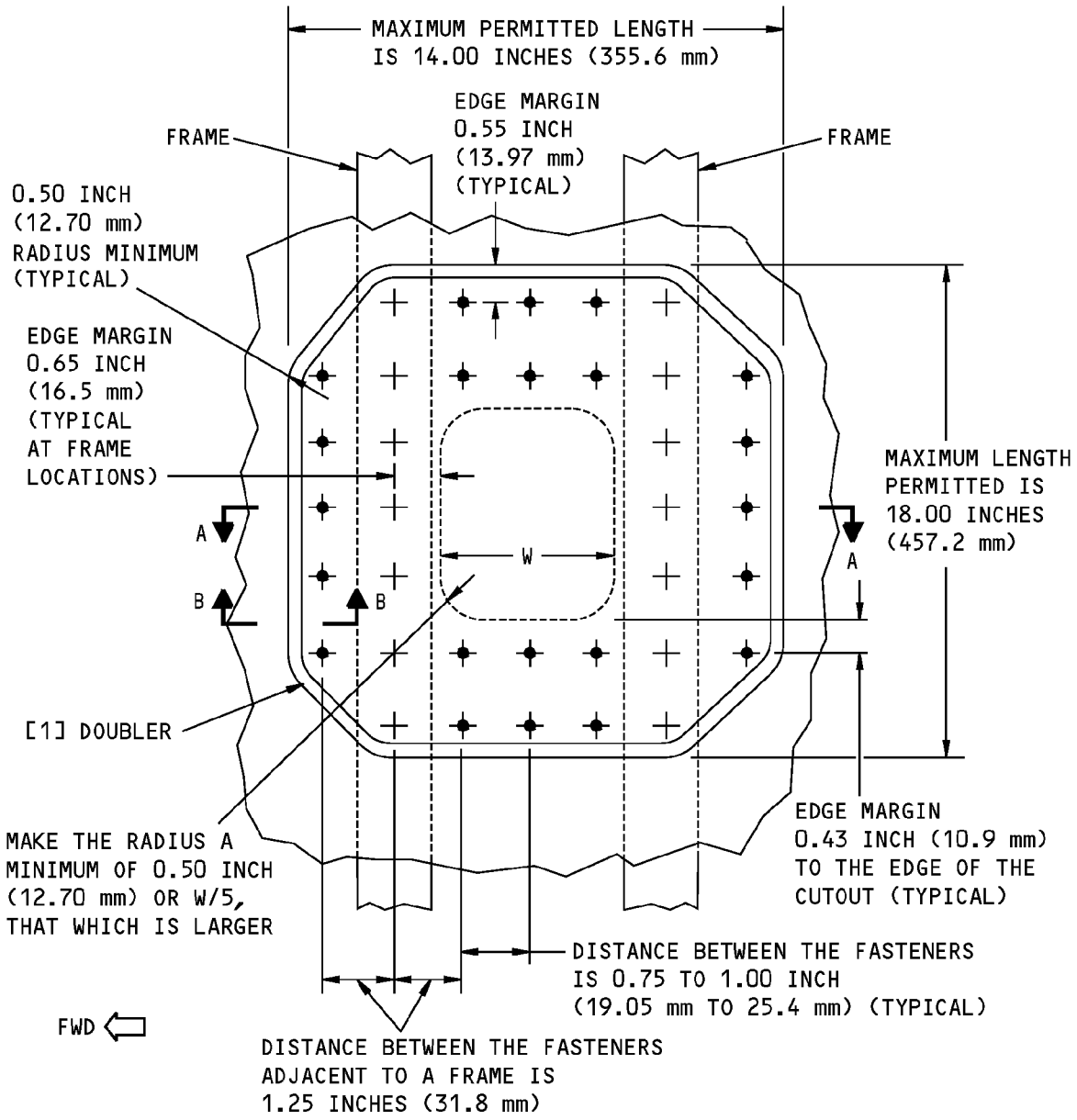
REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for the upper skin man-walk zones

N. Install the fasteners wet with BMS 5-95 sealant.

O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

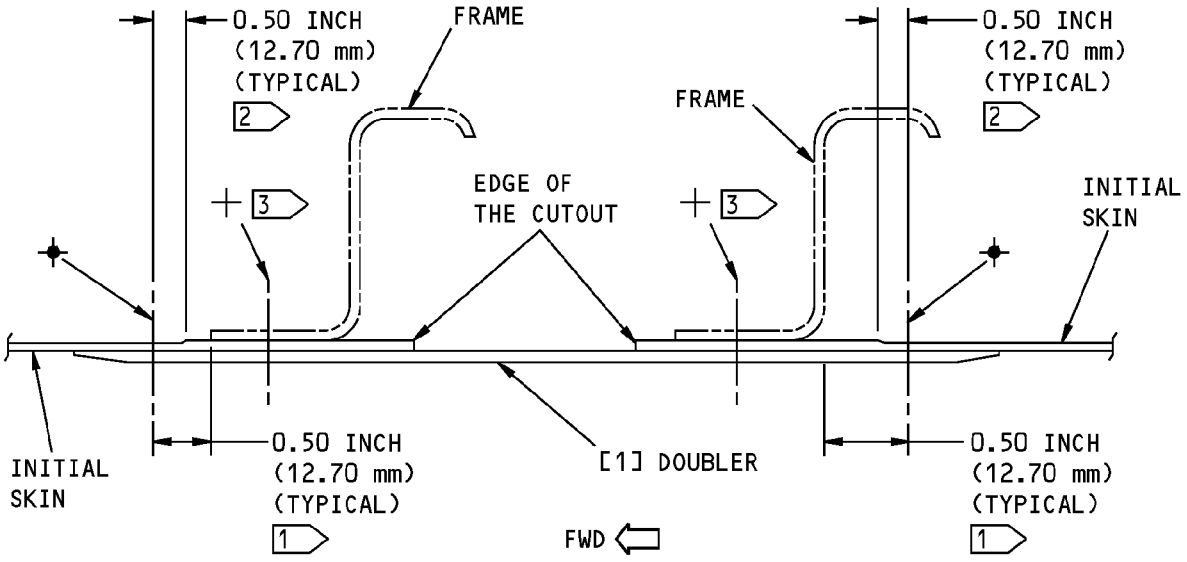
Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.



FASTENER SYMBOLS

- INITIAL FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.
- REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



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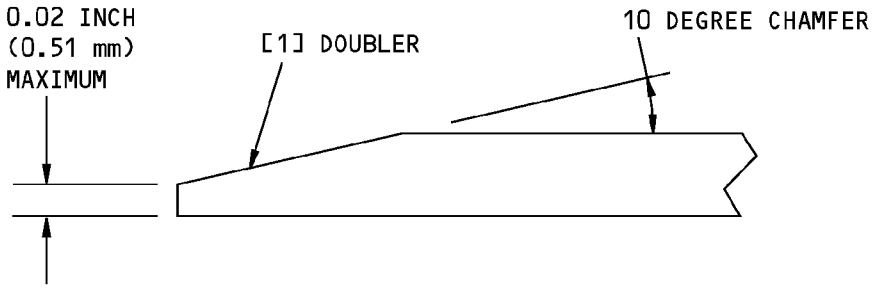


B–B
(TYPICAL)

NOTES

1 APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.

2 APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.

3 INSTALL A COUNTERSINK WASHER BETWEEN THE [1] DOUBLER AND THE INITIAL SKIN.

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 6 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR AT A FRAME

1. Applicability

A. Repair 6 is applicable to damage that is on the Inlet Cowl Outer Barrel Skin shown in Inlet Cowl Outer Barrel Skin Repair at a Frame, Figure 201/REPAIR 6 that is:

(1) At a frame

(2) 1.25 inches (31.75 mm) or more in diameter.

B. Repair 6 is not applicable to damage at the forward or aft edges of the inlet cowl.

2. General

A. Repair 6 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. This repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches are the equivalent of adding 9 pounds of weight to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.

C. The dimensions of the repair doubler used in Repair 6 are:

(1) A maximum width of 18.00 inches around the circumference of the inlet cowl

(2) A maximum length of 14.00 inches in the fore and aft direction.

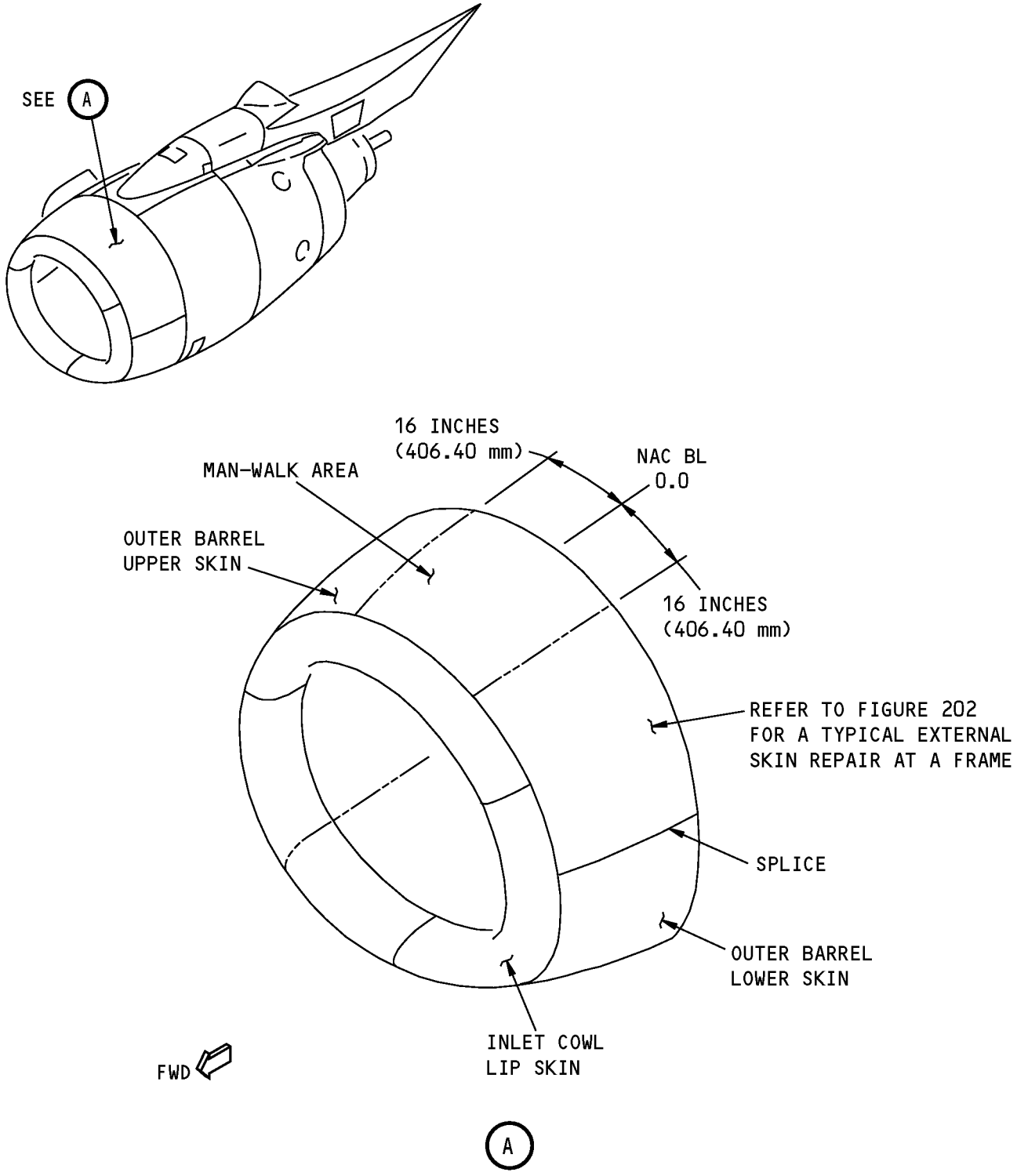
CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

D. The repair doubler used in Repair 6 must be put in position as follows:

(1) A minimum of 10.00 inches (254.0 mm) from the leading edge of the inlet cowl lip

(2) A minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Repair at a Frame
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame or adjacent to it, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:

(a) A frame,

(b) A Doubler,

(c) A chem-mill step,

(d) A fore/aft splice.

(2) Do not cause damage to the frame.

(3) Put the skin that is around the damage cutout back to the initial contour.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to NDT, Part 6, 53-00-06.

NOTE: The dye penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin panel. Refer to Table 201/REPAIR 6 for the materials.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 6.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 6. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin as given in BAC 5300, Section 11.2.3.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for the upper and lower skins Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for the upper skin man-walk zones
[2]	Filler Plate	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

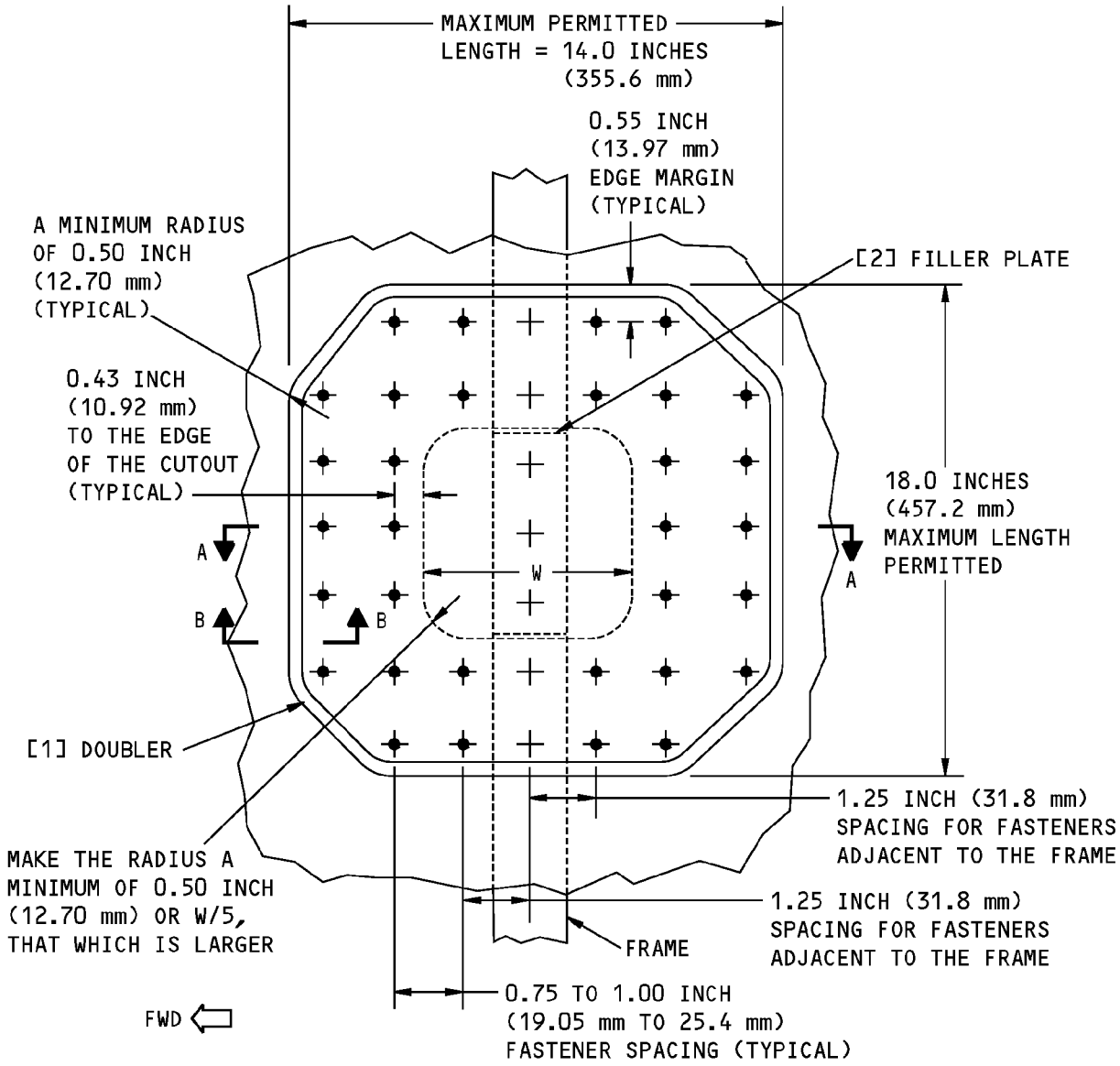
(1) Use countersink washers between the part [1] doubler and the initial skin at the initial fastener holes. Refer to 51-40-08.

N. Install the fasteners wet with BMS 5-95 sealant.

O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

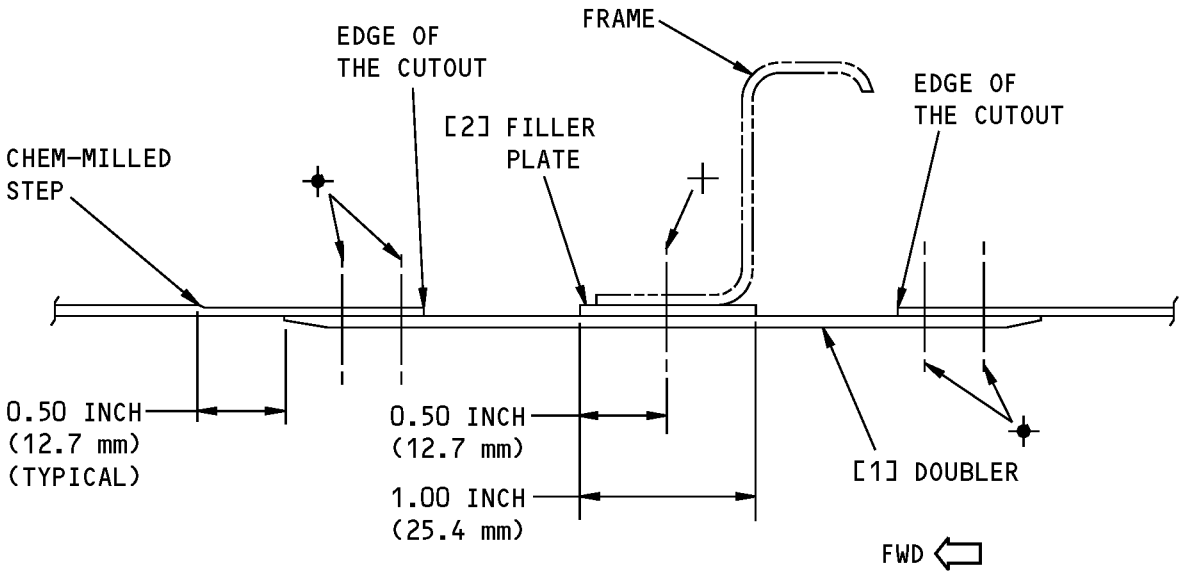
Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



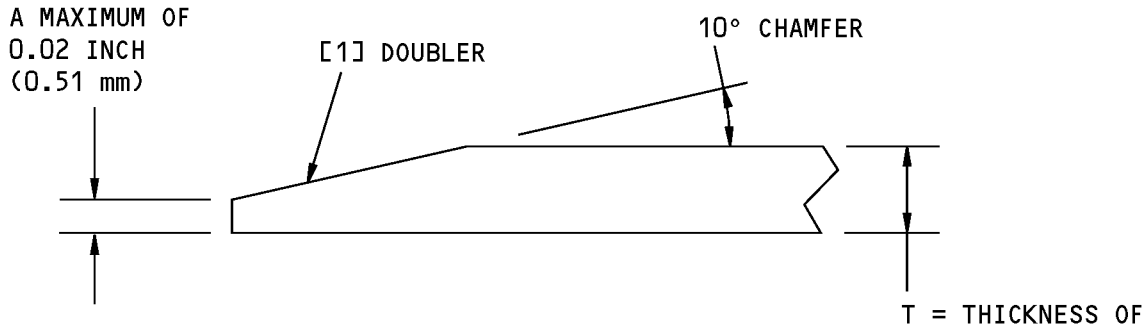
FASTENER SYMBOLS

- INITIAL FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.
- REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A-A



B-B
(TYPICAL)

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 7 - INLET COWL INNER BARREL ACOUSTIC PANEL DAMAGE THAT IS 3.00 INCHES (76.2 MM) OR LESS IN DIAMETER

1. Applicability

A. Repair 7 is applicable to damage to the Inlet Cowl Inner Barrel Acoustic Panel shown in Inlet Cowl Inner Barrel Acoustic Panel Location, Figure 201/REPAIR 7 that is:

(1) A maximum diameter of 3.00 inches (76.2 mm)

(2) A minimum of 3.3 inches (83.8 mm) from a doubler or the edge of the acoustic panel.

2. General

A. Repair 7 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. This repair will cause a loss in acoustic panel area. Refer to 54-00-01 for the acoustic loss limits for the inlet cowl.

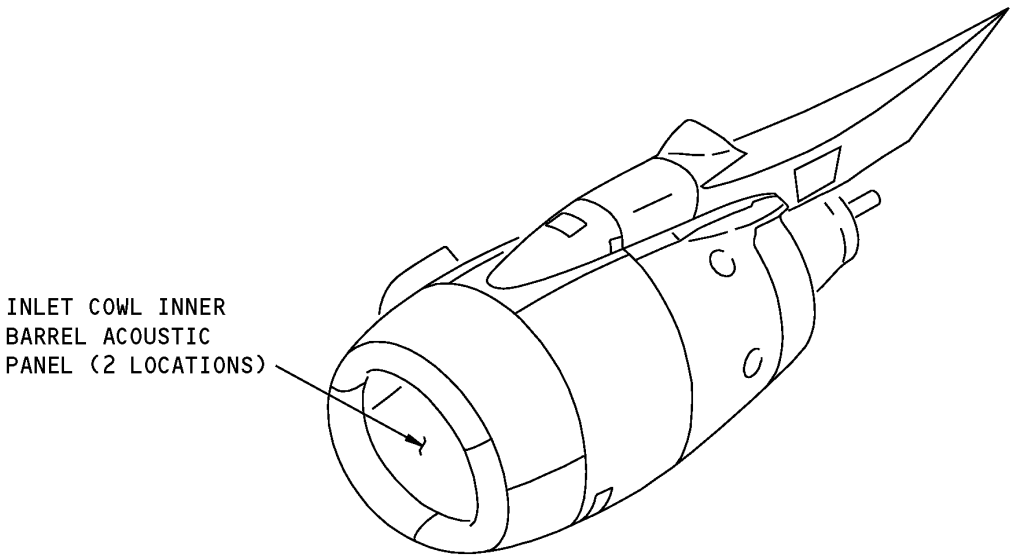
C. Get access to the damaged area.

D. Use a Non-Destructive Test (NDT) procedure to find the length, and width of the damage. Refer to 737 NDT Part 1, 51-01-02.

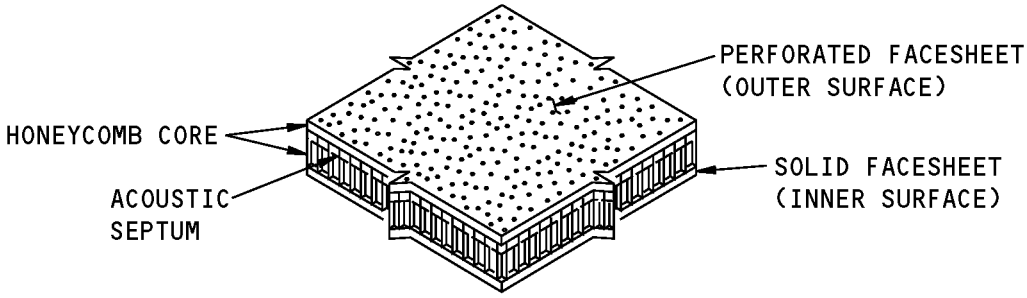
(1) Refer to Definitions of the Facesheets, Figure 202/REPAIR 7 for the definitions of the perforated facesheet and the solid facesheet of the honeycomb core area.

E. Do the repair as given in Paragraph 4./REPAIR 7

F. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Inner Barrel Acoustic Panel Location
Figure 201



Definitions of the Facesheets
Figure 202

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
54-00-01	NACELLES/PYLONS - GENERAL
SOPM 20-30-03	Standard Overhaul Practices Manual
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

NOTE: Keep the mating surfaces of the repair part and the repair area clean with methyl isobutyl ketone (MIBK) or acetone during the repair procedure. Refer to SOPM 20-30-03 for the general cleaning procedures. Clean the surfaces again if they become contaminated. Use clean lint-free gloves when you touch the repair parts and the repair area.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES, OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE WORK AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, SKIN IRRITATION OR INJURY TO PERSONS CAN OCCUR. DO NOT USE EQUIPMENT THAT CAUSES AN ELECTRICAL ARC OR SPARK IN AN AREA WHERE THE IGNITION OF THE SOLVENT IS POSSIBLE. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PERMIT THE PAINT STRIPPER TO GET INTO THE INTERNAL AREAS OF THE ALUMINUM PANEL. IF YOU DO NOT OBEY, DAMAGE TO THE ADHESIVE SYSTEM WILL OCCUR.

A. Remove the damage as shown in Layout of the Repair Parts, Figure 203/REPAIR 7.

(1) Cut and remove the damaged perforated skin to a circular shape.

(2) Cut and remove the damaged honeycomb core to a circular shape.

(a) Cut away the core and the septum material below the perforated skin a minimum of 0.40 inch (10.2 mm) larger all around than the skin cutout.

NOTE: Make sure that the edge of the core cutout is a minimum of 3.3 inches (83.82 mm) from a doubler or the edge of the panel.

(b) Cut the core to a sufficient depth to make sure that all of the damaged core is removed.

(3) Remove all unwanted material from the repair area.

B. Fill the space in the honeycomb core area below the skin cutout with BMS 5-28, Type 3 potting compound. Refer to Potting Compound Cure Times, Figure 204/REPAIR 7, Table A for the cure times.

(1) Fill the core flush with the surface of the perforated skin.

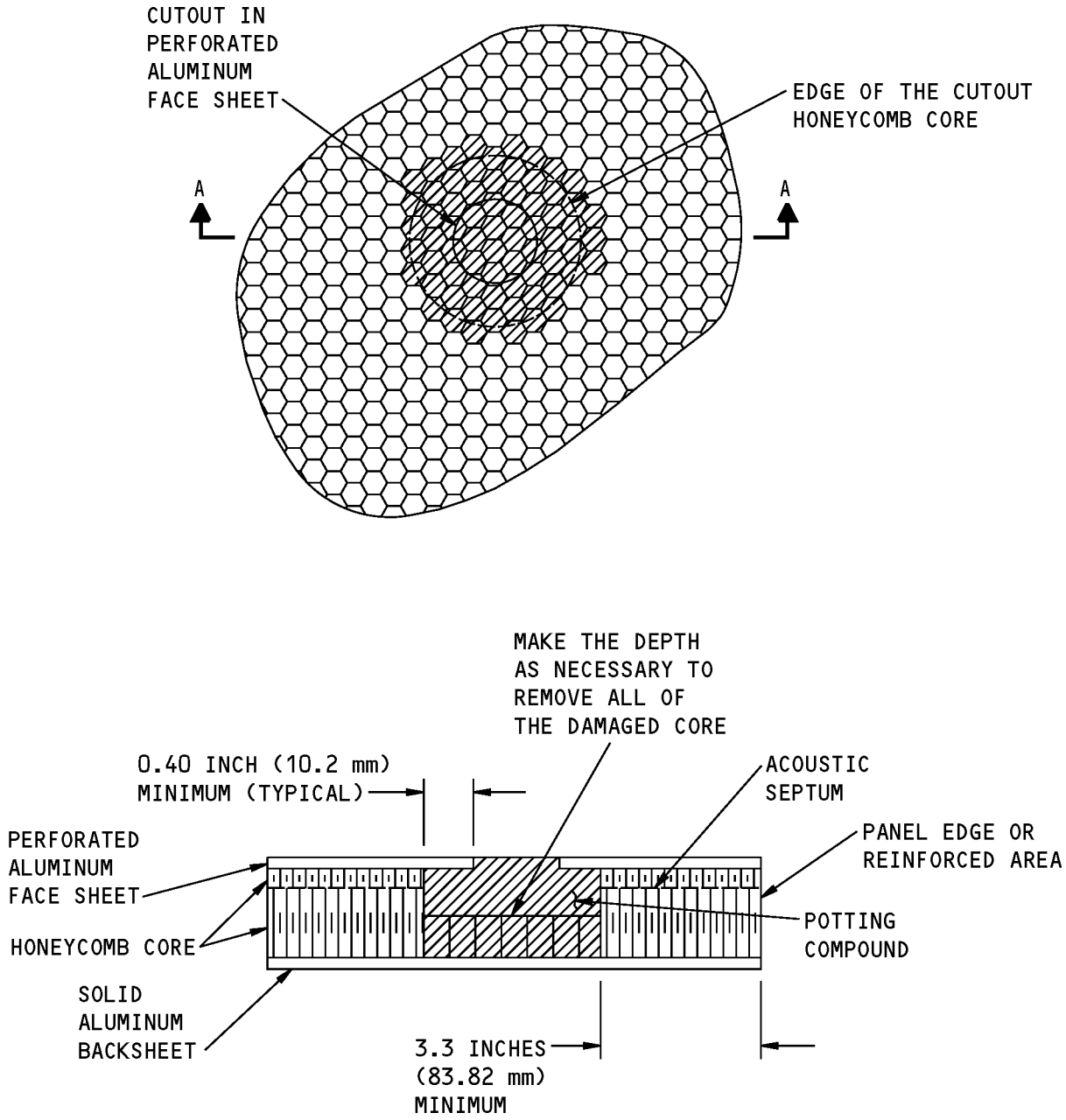
(2) Put a caul plate made from 0.016 inch (0.40 mm) thick aluminum sheet over the repair area and use masking tape to hold it in position.

C. Cure the potting compound. Refer to Potting Compound Cure Times, Figure 204/REPAIR 7, Table A .

D. Remove the caul plate.

E. Remove the unwanted potting compound with abrasive paper so that the repair is flush with the surface of the perforated skin.

F. Apply a layer of aluminized epoxy primer (Base 463-6-4, Catalyst X-306, and Thinner TL-52) to the surfaces of the repair part and the initial perforated skin around the repair.



Layout of the Repair Parts
Figure 203

POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME 1
BMS 5-28, TYPE 3 POTTING COMPOUND 2 3	EPOCAST 1511A/B	4	20 MINUTES	7 DAYS AT 77° ±10°F 5 HOURS AT 125° ±10°F
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND 5	PR-957 PRO SEAL 840	4	8 HOURS	90 MINUTES AT 260°F ±10°F

TABLE A

NOTES

1 APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 5°F TO 7°F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.

2 THE PASTE IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE 1 YEAR AFTER STORAGE AT 40°F TO 80°F (5°C TO 27°C).

3 BMS 5-28, TYPE 14, CLASS 2 IS AN ALTERNATIVE TO BMS 5-28, TYPE 3.

4 MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.

5 THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTHS AFTER STORAGE AT 0°F (-18°C) OR LOWER TEMPERATURE.

Potting Compound Cure Times
Figure 204

REPAIR 8 - INLET COWL INNER BARREL ACOUSTIC PANEL SKIN WITH CRACK DAMAGE

1. Applicability

A. Repair 8 is applicable to crack damage on the Inlet Cowl Inner Barrel Acoustic panel shown in Inlet Cowl Inner Barrel Acoustic Panel Location, Figure 201/REPAIR 8 that is:

(1) Between 3.00 inches and 6.00 inches (76.2 mm and 152.4 mm) in length

(2) A minimum of 3.3 inches (83.8 mm) from a doubler or the edge of the acoustic panel.

B. Repair 8 is not applicable to an acoustic panel with honeycomb core damage.

2. General

A. Repair 8 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. This repair will cause a loss in acoustic panel area. Refer to 54-00-01 for the acoustic loss limits for the inlet cowl.

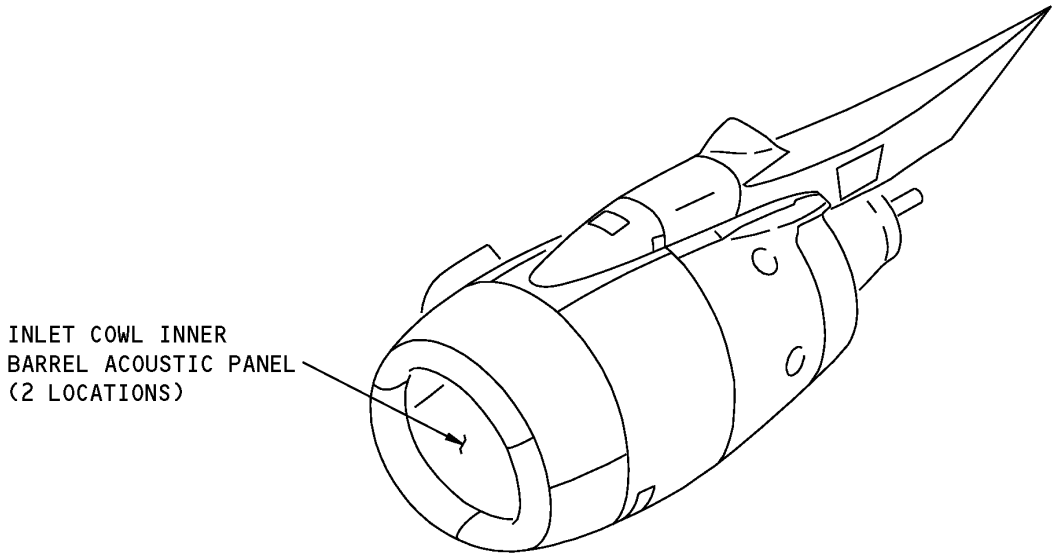
C. Get access to the damaged area.

D. Use a Non-Destructive Test (NDT) procedure to find the length, and width of the damage. Refer to 737 NDT Part 1, 51-01-02.

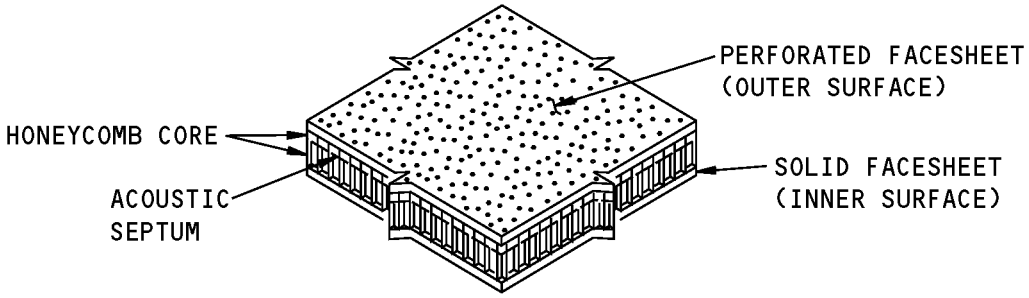
E. Refer to Definitions of the Facesheets, Figure 202/REPAIR 8 for the definitions of the perforated face sheet and the solid face sheet of the honeycomb core area.

F. Do the repair as given in Paragraph 4./REPAIR 8

G. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Inner Barrel Acoustic Panel Location
Figure 201



Definitions of the Facesheets
Figure 202

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
51-70-10	ALUMINUM HONEYCOMB STRUCTURE REPAIR PROCEDURES
54-00-01	NACELLES/PYLONS - GENERAL
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-30	Cleaning Procedures
SOPM 20-30-30	Standard Overhaul Practices Manual
SOPM 20-41-04	Application of Interior Decorative Finishes
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

NOTE: Keep the mating surfaces of the repair part and the repair area clean with methyl isobutyl ketone (MIBK) or acetone during the repair procedure. Refer to SOPM 20-30-30 for the general cleaning procedures. Clean the surfaces again if they become contaminated. Use clean lint-free gloves when you touch the repair parts and the repair area.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES, OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE WORK AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, SKIN IRRITATION OR INJURY TO PERSONS CAN OCCUR. DO NOT USE EQUIPMENT THAT CAUSES AN ELECTRICAL ARC OR SPARK IN AN AREA WHERE THE IGNITION OF THE SOLVENT IS POSSIBLE. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONS.

(WARNING PRECEDES)

CAUTION: DO NOT PERMIT THE PAINT STRIPPER TO GET INTO THE INTERNAL AREAS OF THE ALUMINUM PANEL. IF YOU DO NOT OBEY, DAMAGE TO THE ADHESIVE SYSTEM WILL OCCUR.

A. Drill a 0.25 inch (6.35 mm) diameter stop hole at the ends of the crack. Refer to 51-10-02 for the procedures.

B. Make the part [1] repair doubler to the same contour as the acoustic panel skin. Refer to Table 201/REPAIR 8.

C. Make the fastener hole pattern on the part [1] repair doubler. Refer to Layout of the Repair Parts, Figure 203/REPAIR 8.

(1) Assemble the part [1] repair doubler on the perforated face sheet.

(2) Mark the fastener pattern on the part [1] repair doubler.

(3) Put a mark on the perforated face sheet around the edges of the part [1] repair doubler to put it in position again later.

(4) Drill the pilot holes through the part [1] repair doubler and the perforated face sheet with a 0.161 inch diameter drill. Refer to Layout of the Repair Parts, Figure 203/REPAIR 8.

NOTE: Two rows of fasteners are necessary on each side of the crack and parallel to it.

(5) Remove the part [1] repair doubler.

Table 201:

REPAIR MATERIAL			
ITEM	**PART**	**QUANTITY**	**MATERIAL**
[1]	Repair Doubler	1	2024-T3 sheet, 0.071 inch (1.80 mm) thick

D. Prepare the honeycomb core for the repair.

(1) Cut out the honeycomb core below the perforated face skin at each fastener hole as shown in Layout of the Repair Parts, Figure 203/REPAIR 8.

(2) Fill the spaces in the honeycomb core at each fastener hole with BMS 5-28, Type 7 potting compound.

NOTE: As an alternative to BMS 5-28, Type 7, you can use BMS 5-28, Type 14. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A .

(3) Cure the potting compound. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A for the cure times and 51-70-10 for the cure procedures.

(4) After the potting compound has cured, remove the unwanted resin that protrudes from the perforated face sheet.

(a) Make the surface of the potting compound smooth with the surface of the skin.

(5) Assemble the part [1] repair doubler on the perforated face sheet as shown in Layout of the Repair Parts, Figure 203/REPAIR 8.

(a) Make sure the fastener holes are aligned.

(6) Drill the fastener holes through the acoustic panel with a 0.161 inch diameter drill.

(7) Remove the part [1] repair doubler.

(8) Remove the nicks, gouges, scratches, and sharp corners from the initial acoustic panel skin. Refer to 51-10-02.

(9) Remove the sharp edges on the doubler and the initial skin as given in BAC 5300, Sonic Edge Finish.

(10) Apply a chemical conversion coating to the bare surfaces of the part [1] repair doubler and the acoustic panel skins. Refer to 51-20-01.

(11) Apply Courtaulds 513-707 (or 515-346) corrosion inhibiting primer to the mating surfaces of the part [1] repair doubler and the acoustic panel skins. Refer to 51-70-09.

E. Install the part [1] repair doubler as shown in Layout of the Repair Parts, Figure 203/REPAIR 8.

(1) Apply BMS 5-109, Type II, Class 2 adhesive paste to the mating surface of the part [1] repair doubler.

NOTE: As an alternative to BMS 5-109, Type II, Class 2, you can use BMS 5-92, Type 1. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A .

(a) Make the thickness of the adhesive paste 0.010 inch (0.25 mm).

(2) Put the part [1] repair doubler on the perforated face sheet and install temporary washers and fasteners to hold it in position.

NOTE: Install FEP parting film above the surface of the part [1] repair doubler at the washer locations. This will make it easier to remove the washers and temporary fasteners after the potting compound is cured.

(3) Install the vacuum bag equipment on the repair as shown in Vacuum Bag Installation, Figure 205/REPAIR 8. Refer to 51-70-10 for the vacuum bag procedures.

(4) Cure the layup. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A and S RM 51-70-10.

(5) Remove the vacuum bag equipment and the temporary fasteners.

(6) Drill the permanent fastener holes. Refer to SRM 51-4-0-05 .

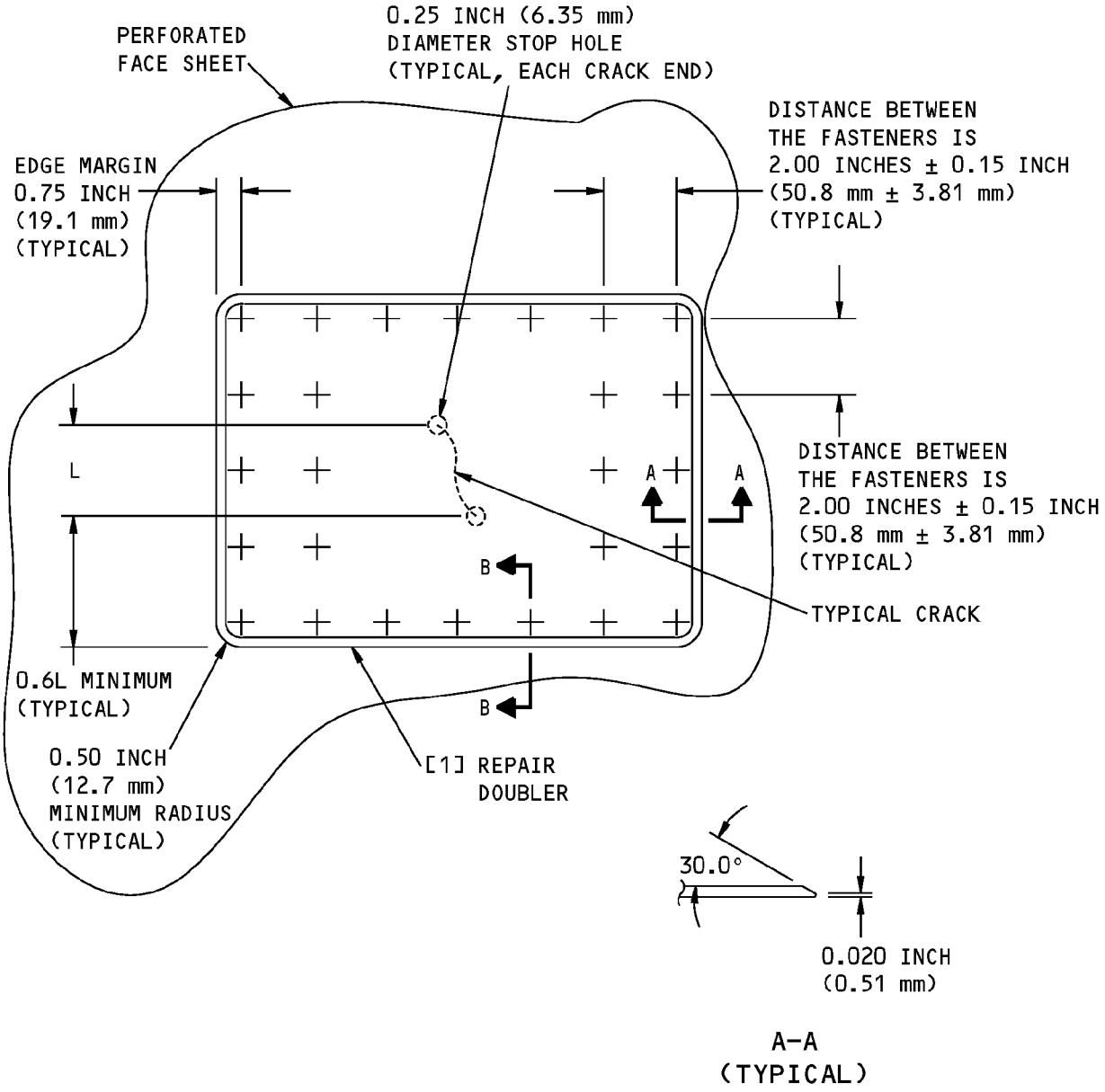
(7) Countersink the fastener holes. Refer to 51-40-08.

(8) Apply a chemical conversion coating to the bare surfaces of the holes in the part [1] repair doubler and the acoustic panel skins. Refer to 51-20-01.

(9) Install the permanent fasteners wet with BMS 5-95 sealant. Refer to 51-40-02.

(a) Use a torque that is between 25 and 35 pound inches.

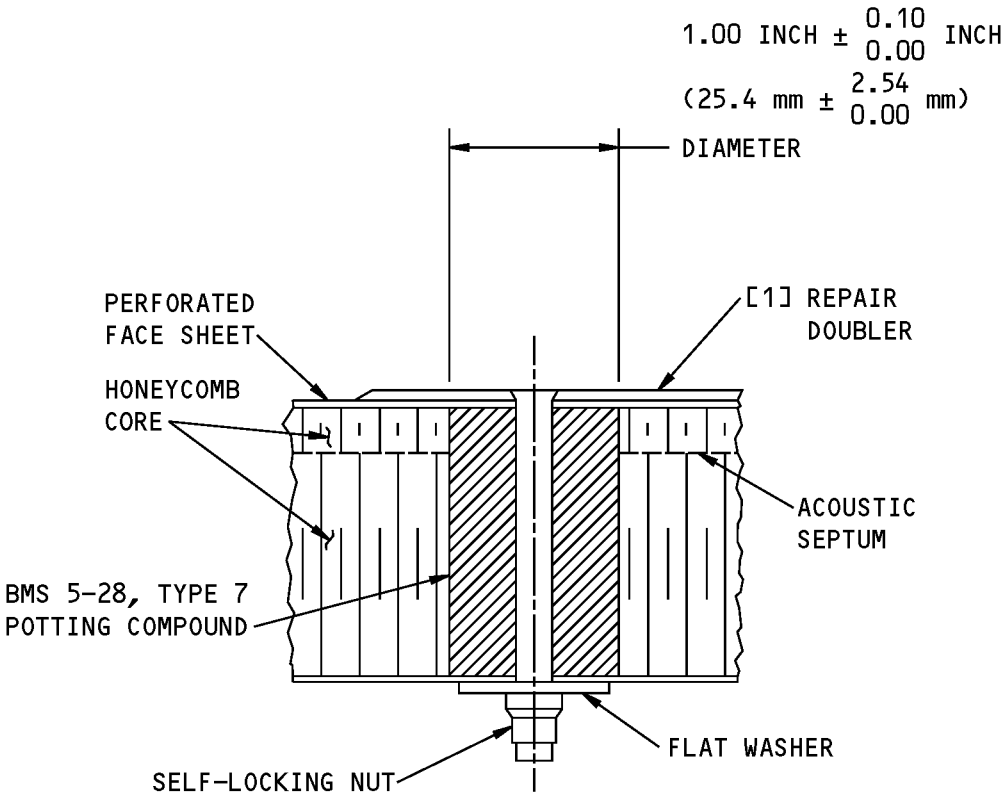
(10) Apply one layer of aluminized epoxy primer (Base 463-6-4, Catalyst X-306, and Thinner TL-52) to the surface of the part [1] repair doubler. Refer to SOPM 20-41-04.



FASTENER SYMBOLS

┼ REPAIR FASTENER LOCATION. INSTALL A BACB30NW6K HEX-DRIVE BOLT WITH A BACN10JC3CD NUT AND AN AN970-3 WASHER AS NECESSARY.

Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)



B–B
(TYPICAL AT EACH BOLT INSTALLATION)

Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

ADHESIVE OR POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME [1]
BMS 5-28, TYPE 7 POTTING COMPOUND [2] [3]	EPOCAST 8414A/B CG-1305 FR 7162A/B	[4]	60 MINUTES	7 DAYS AT 77° ±10°F 90 MIN AT 260° ±10°F
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND [8]	PR-957 PRO SEAL 840	[4]	8 HOURS	90 MINUTES AT 260°F ±10°F
BMS 5-109, TYPE 2, CLASS II, ADHESIVE [5]	EA 934 EA 934NA	[6]	30 MINUTES [7]	1 HOUR AT 200° ±10°F 9 HOURS AT 160° ±10°F 25 HOURS AT 120° ±10°F 7 DAYS AT 77° ±10°F
BMS 5-92, TYPE 1 ADHESIVE	EC2216 A/B	[9]	120 MINUTES	60 MINUTES AT 250° ±10°F 130 MINUTES AT 160° ±10°F 180 MINUTES AT 120° ±10°F 24 HOURS AT 77° ±10°F

TABLE A

NOTES

[1] APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 5°F TO 7°F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.

[2] THE LIQUID IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE ONE YEAR AFTER STORAGE AT 40°F TO 80°F (5°C TO 27°C).

[3] BMS 5-28, TYPE 14, CLASS 2 IS AN ALTERNATIVE TO BMS 5-28, TYPE 7.

[4] MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.

[5] BMS 5-92, TYPE 1 ADHESIVE IS AN ALTERNATIVE TO BMS 5-109, TYPE 2, CLASS 2 IN REPAIRS WHERE A LONGER WORK TIME IS NECESSARY.

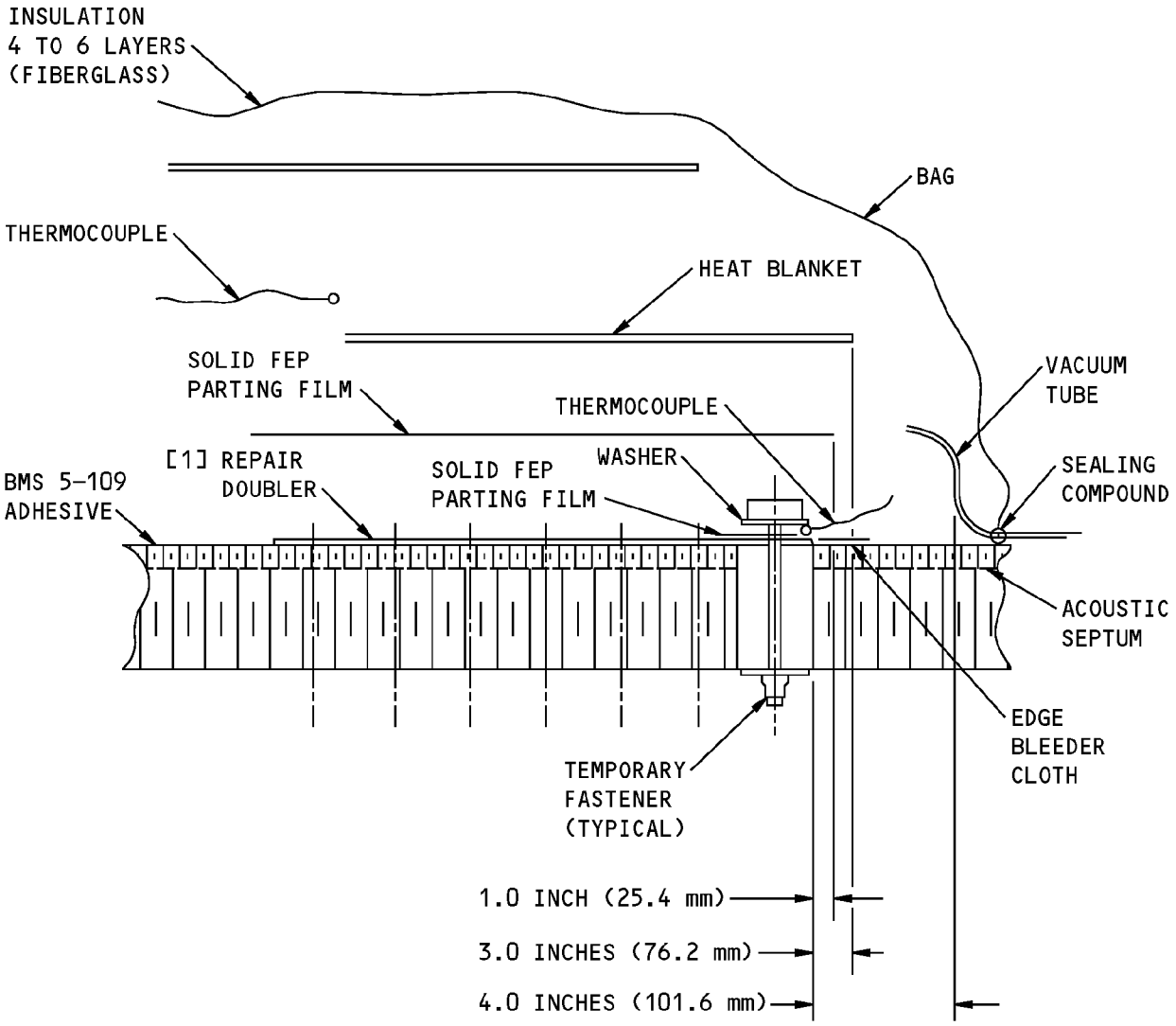
[6] MIX A RATIO OF 32-34 PARTS HARDENER (PART B) TO 100 PARTS RESIN (PART A) BY WEIGHT.

[7] YOU MUST DO THE REPAIR BEFORE THE END OF THE TIME GIVEN.

[8] THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTHS AFTER STORAGE AT 0°F (-18°C) OR LOWER TEMPERATURE.

[9] MIX A RATIO OF 100 PARTS HARDENER (PART B) TO 140 PARTS RESIN (PART A) BY WEIGHT.

Potting Compound And Adhesive Cure Times
Figure 204



NOTE: REFER TO SRM 51-70-10 FOR THE VACUUM BAG INSTALLATION PROCEDURES.

Vacuum Bag Installation
Figure 205

REPAIR 9 - INLET COWL INNER BARREL ACOUSTIC PANEL SKIN WITH DISBONDS

1. Applicability

A. Repair 9 is applicable to disbond damage on the Inlet Cowl Inner Barrel Acoustic panel shown in Inlet Cowl Inner Barrel Acoustic Panel Location, Figure 201/REPAIR 9 that is:

(1) Between 3.00 inches and 7.00 inches (76.2 mm and 177.8 mm) in diameter.

(2) A minimum of 3.3 inches (83.8 mm) from a doubler or the edge of the acoustic panel.

2. General

A. Repair 9 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. This repair will cause a loss in acoustic panel area. Refer to 54-00-01 for the acoustic loss limits for the inlet cowl.

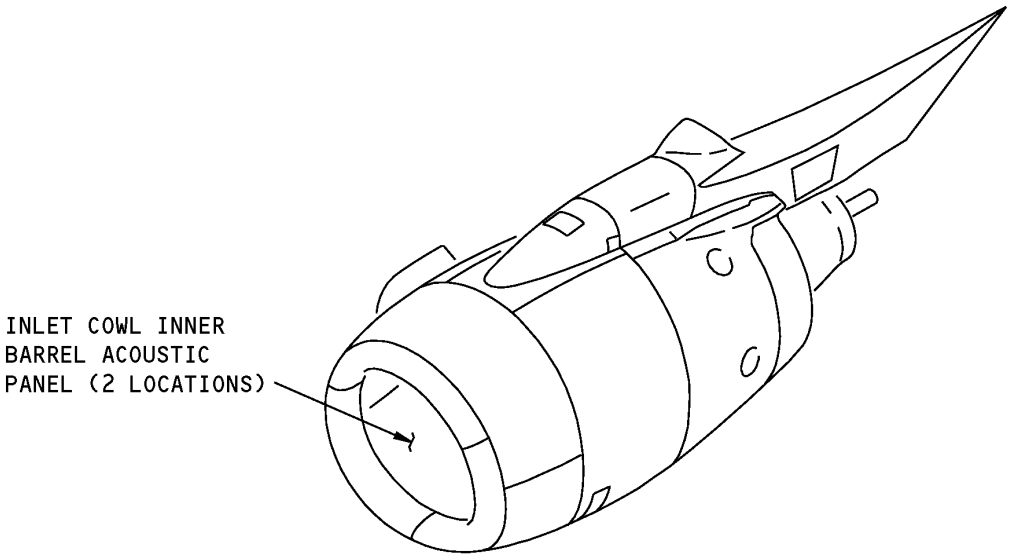
C. Get access to the damaged area.

D. Use a Non-Destructive Test (NDT) procedure to find the length, and width of the disbond. Refer to 737 NDT Part 1, 51-01-02.

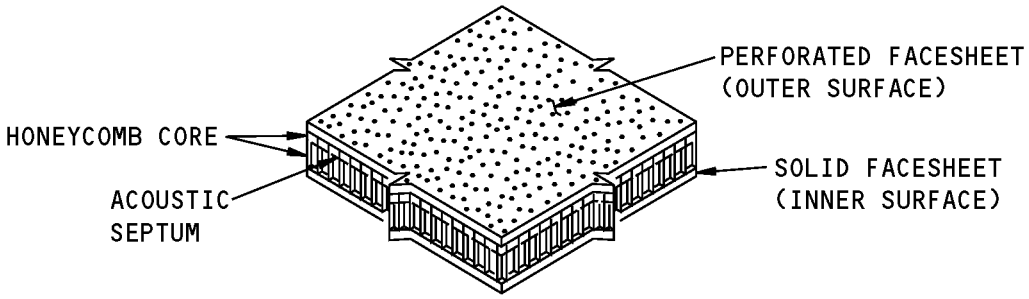
(1) Refer to Definitions of the Facesheets, Figure 202/REPAIR 9 for the definitions of the perforated face sheet and the solid face sheet of the honeycomb core area.

E. Do the repair as given in Paragraph 4./REPAIR 9

F. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Inner Barrel Acoustic Panel Location
Figure 201



Definitions of the Facesheets
Figure 202

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
51-70-10	ALUMINUM HONEYCOMB STRUCTURE REPAIR PROCEDURES
54-00-01	NACELLES/PYLONS - GENERAL
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-30	Cleaning Procedures
SOPM 20-30-03	Standard Overhaul Practices Manual
SOPM 20-41-04	Application of Interior Decorative Finishes
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

NOTE: Keep the mating surfaces of the repair part and the repair area clean with methyl isobutyl ketone (MIBK) or acetone during the repair procedure. Refer to SOPM 20-30-03 for the general cleaning procedures. Clean the surfaces again if they become contaminated. Use clean lint-free gloves when you touch the repair parts and the repair area.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES, OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE WORK AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, SKIN IRRITATION OR INJURY TO PERSONS CAN OCCUR. DO NOT USE EQUIPMENT THAT CAUSES AN ELECTRICAL ARC OR SPARK IN AN AREA WHERE THE IGNITION OF THE SOLVENT IS POSSIBLE. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONS.

(WARNING PRECEDES)

CAUTION: DO NOT PERMIT THE PAINT STRIPPER TO GET INTO THE INTERNAL AREAS OF THE ALUMINUM PANEL. IF YOU DO NOT OBEY, DAMAGE TO THE ADHESIVE SYSTEM WILL OCCUR.

A. Make the part [1] Repair Doubler to the same contour as the acoustic panel. Refer to Table 201/REPAIR 9.

B. Make the fastener hole pattern on the part [1] Repair Doubler. Refer to Layout of the Repair Parts, Figure 203/REPAIR 9.

(1) Assemble the part [1] Repair Doubler on the perforated face sheet.

(2) Mark the fastener pattern on the part [1] Repair Doubler.

(3) Put a mark on the perforated face sheet around the edges of the part [1] Repair Doubler to put it in position again later.

(4) Drill the pilot holes through the part [1] Repair Doubler and the perforated face sheet with a 0.161 inch diameter drill. Refer to Layout of the Repair Parts, Figure 203/REPAIR 9.

(5) Remove the part [1] Repair Doubler.

Table 201:

REPAIR MATERIAL			
ITEM	**PART**	**QUANTITY**	**MATERIAL**
[1]	Repair Doubler	1	2024-T3 sheet, 0.071 inch (1.80 mm) thick

C. Prepare the honeycomb core for the repair.

(1) Cut out the honeycomb core below the perforated face skin at each fastener hole as shown in Layout of the Repair Parts, Figure 203/REPAIR 9.

(2) Fill the spaces in the honeycomb core at each fastener hole with BMS 5-28, Type 7 potting compound.

NOTE: As an alternative to BMS 5-28, Type 7 you can use BMS 5-28, Type 14. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A .

(3) Cure the potting compound. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A for the cure times and 51-70-10 for the cure procedures.

(4) After the potting compound has cured, remove the unwanted resin that protrudes from the perforated face sheet flush with the surface of the skin.

(5) Assemble the part [1] Repair Doubler on the perforated face sheet again as shown in Layout of the Repair Parts, Figure 203/REPAIR 9. Make sure the fastener holes are aligned.

(6) Drill the fastener holes through the acoustic panel with a 0.161 inch diameter drill.

(7) Remove the part [1] Repair Doubler.

(8) Remove the nicks, gouges, scratches, from the initial acoustic panel skin. Refer to 51-10-02.

(9) Remove the sharp edges from the doubler and the initial skin as given in BAC 5300, Sonic Edge Finish.

(10) Apply a chemical conversion coating to the bare surfaces of the part [1] Repair Doubler and the acoustic panel skins. Refer to 51-20-01.

(11) Apply Courtaulds 513-707 (or 515-346) corrosion inhibiting primer to the mating surfaces of the part [1] Repair Doubler and the acoustic panel skins. Refer to 51-70-09.

D. Install the part [1] Repair Doubler as shown in Layout of the Repair Parts, Figure 203/REPAIR 9.

(1) Apply BMS 5-109, Type II, Class 2 adhesive paste on the mating surface of the part [1] Repair Doubler.

NOTE: As an alternative to BMS 5-109, Type II, Class 2 you can use BMS 5-92, Type 1. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A .

(a) Make the thickness of the adhesive paste 0.010 inch (0.25 mm).

(2) Put the part [1] Repair Doubler on the perforated face sheet and install temporary washers and fasteners to hold it in position.

NOTE: Install FEP parting film above the surface of the part [1] Repair Doubler at the washer locations. This will make it easier to remove the washers and temporary fasteners after the potting compound is cured.

(3) Install the vacuum bag equipment on the repair as shown in Vacuum Bag Installation, Figure 205/REPAIR 9. Refer to 51-70-10 for the vacuum bag procedures.

(4) Cure the layup. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A and S RM 51-70-10.

(5) Remove the vacuum bag equipment and the temporary fasteners.

(6) Drill the permanent fastener holes. Refer to 51-40-05.

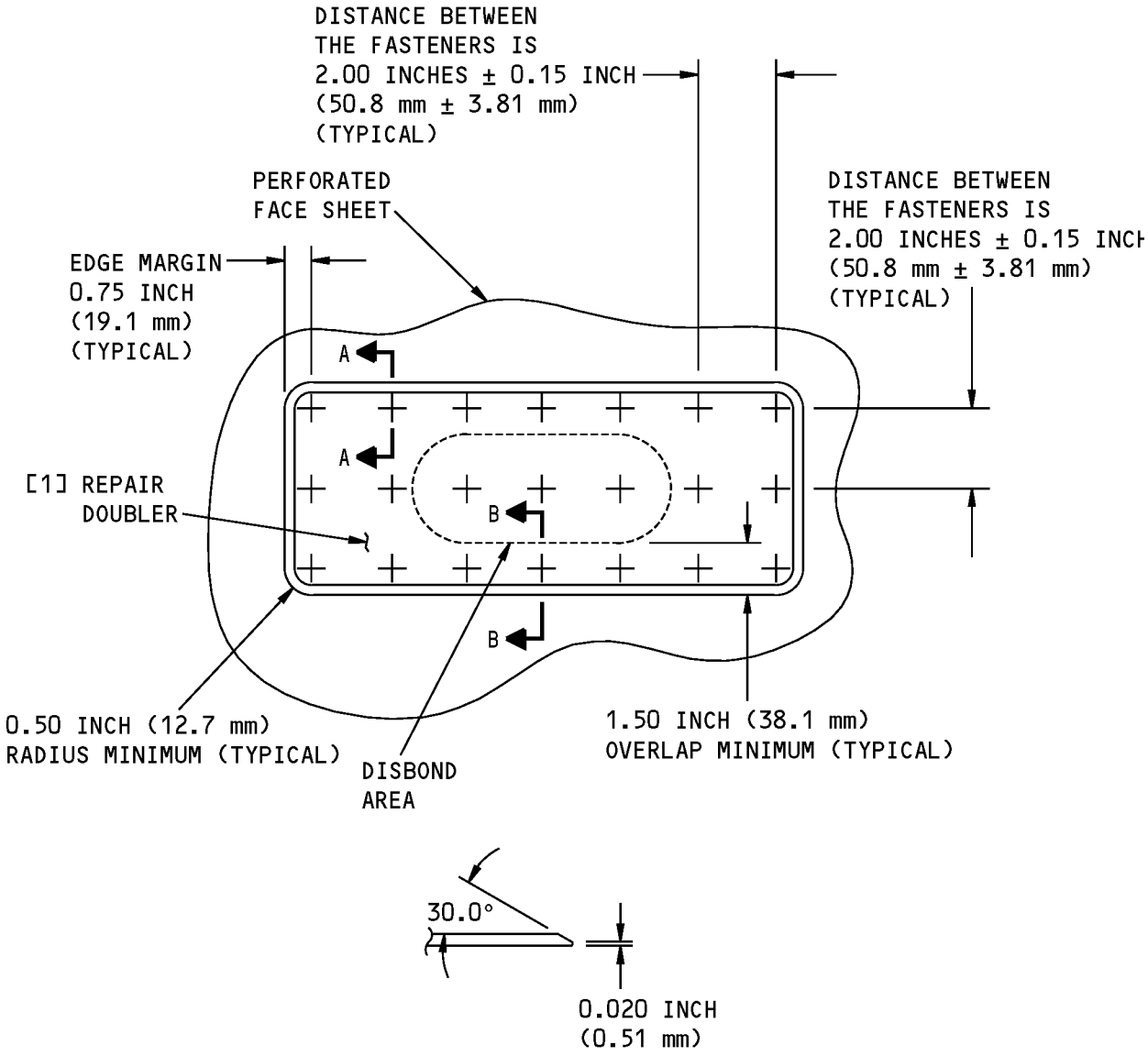
(7) Countersink the fastener holes. Refer to 51-40-08.

(8) Apply a chemical conversion coating to the bare surfaces of the holes in the part [1] Repair Doubler and the acoustic panel skins. Refer to 51-20-01.

(9) Install the permanent fasteners wet with BMS 5-95 sealant. Refer to 51-40-02.

(a) Use a torque that is between 25 and 35 pound inches.

(10) Apply one layer of aluminized epoxy primer (Base 463-6-4, Catalyst X-306, and Thinner TL-52) to the surface of the part [1] Repair Doubler. Refer to SOPM 20-41-04.

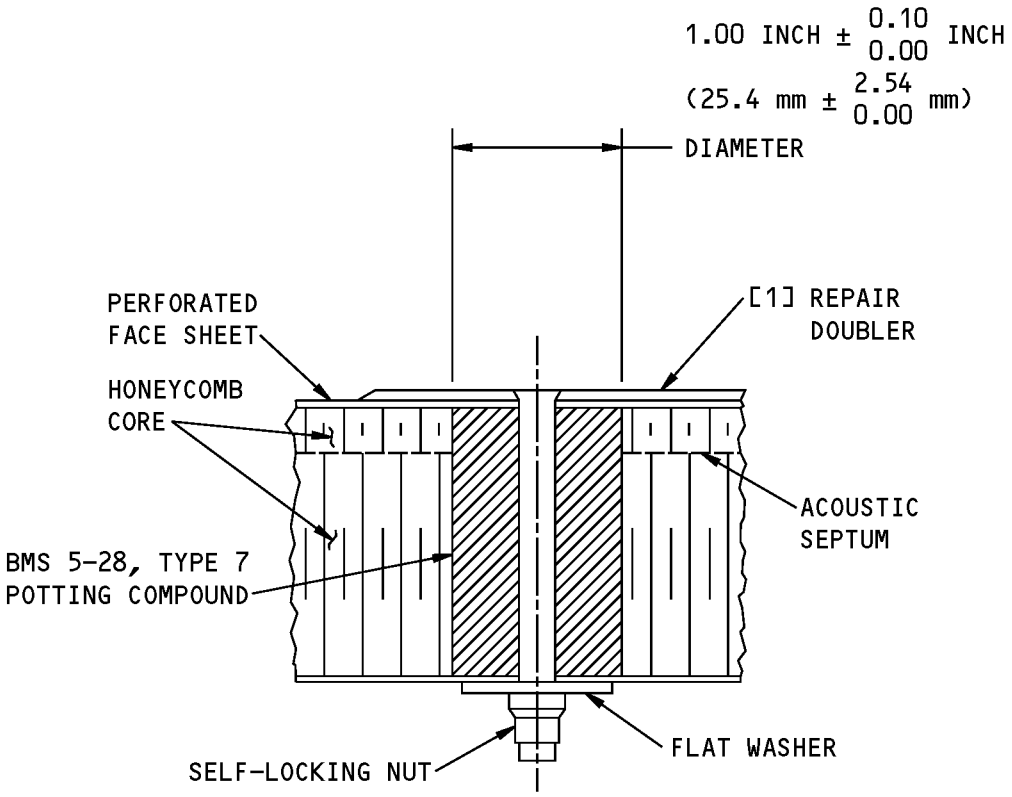


A–A

FASTENER SYMBOLS

┼ REPAIR FASTENER LOCATION. INSTALL A BACB30NW6K HEX-DRIVE BOLT WITH A BACN10JC3CD NUT AND AN AN970-3 WASHER AS NECESSARY.

Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)



B–B
(TYPICAL AT EACH BOLT INSTALLATION)

Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

ADHESIVE OR POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME [1]
BMS 5-28, TYPE 7 POTTING COMPOUND [2] [3]	EPOCAST 8414A/B CG-1305 FR 7162A/B	[4]	60 MINUTES	7 DAYS AT 77° ±10°F 90 MIN AT 260° ±10°F
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND [8]	PR-957 PRO SEAL 840	[4]	8 HOURS	90 MINUTES AT 260°F ±10°F
BMS 5-109, TYPE 2, CLASS II, ADHESIVE [5]	EA 934 EA 934NA	[6]	30 MINUTES [7]	1 HOUR AT 200° ±10°F 9 HOURS AT 160° ±10°F 25 HOURS AT 120° ±10°F 7 DAYS AT 77° ±10°F
BMS 5-92, TYPE 1 ADHESIVE	EC2216 A/B	[9]	120 MINUTES	60 MINUTES AT 250° ±10°F 130 MINUTES AT 160° ±10°F 180 MINUTES AT 120° ±10°F 24 HOURS AT 77° ±10°F

TABLE A

NOTES

[1] APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 5°F TO 7°F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.

[2] THE LIQUID IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE ONE YEAR AFTER STORAGE AT 40°F TO 80°F (5°C TO 27°C).

[3] BMS 5-28, TYPE 14, CLASS 2 IS AN ALTERNATIVE TO BMS 5-28, TYPE 7.

[4] MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.

[5] BMS 5-92, TYPE 1 ADHESIVE IS AN ALTERNATIVE TO BMS 5-109, TYPE 2, CLASS 2 IN REPAIRS WHERE A LONGER WORK TIME IS NECESSARY.

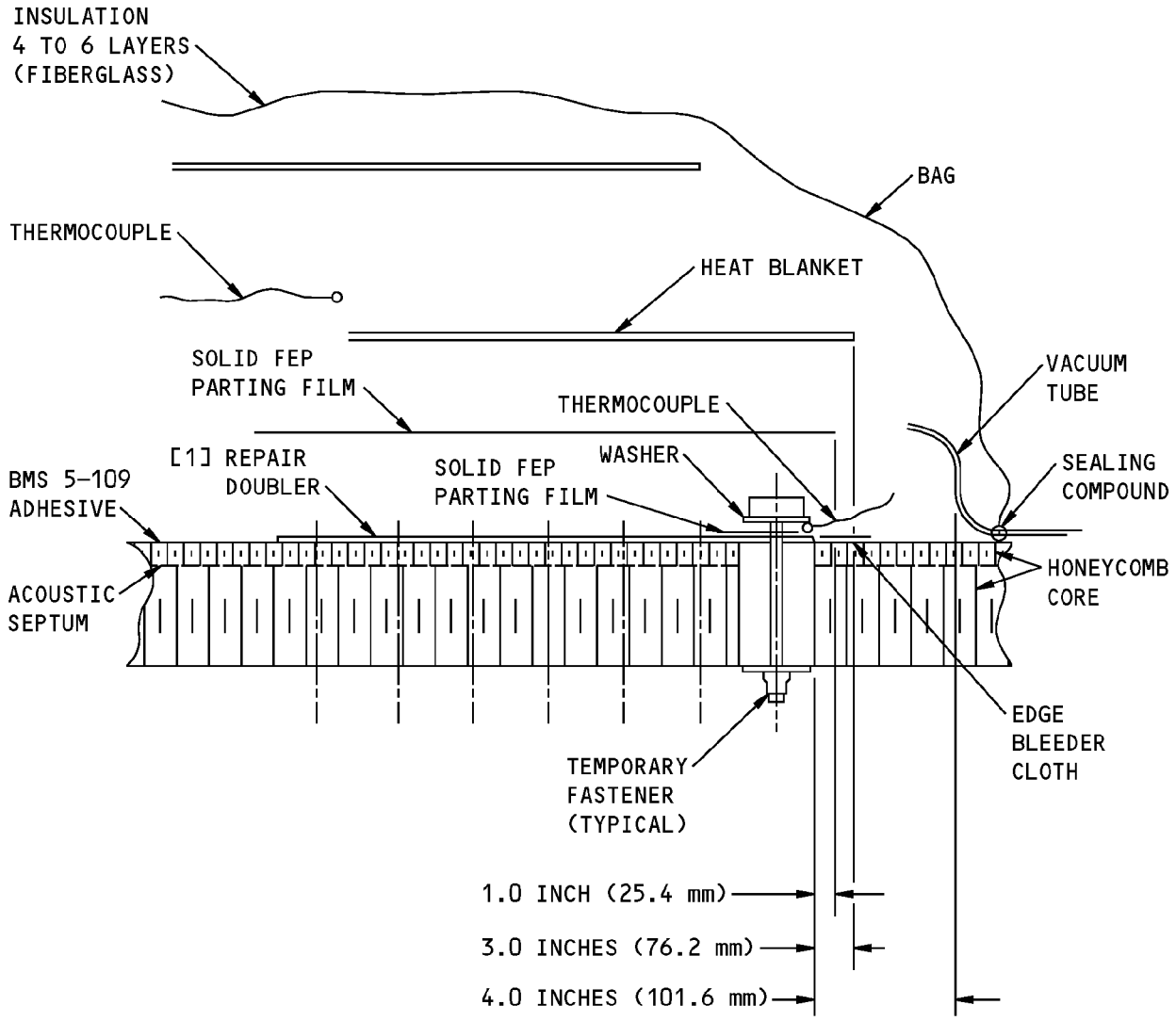
[6] MIX A RATIO OF 32-34 PARTS HARDENER (PART B) TO 100 PARTS RESIN (PART A) BY WEIGHT.

[7] YOU MUST DO THE REPAIR BEFORE THE END OF THE TIME GIVEN.

[8] THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTHS AFTER STORAGE AT 0°F (-18°C) OR LOWER TEMPERATURE.

[9] MIX A RATIO OF 100 PARTS HARDENER (PART B) TO 140 PARTS RESIN (PART A) BY WEIGHT.

Potting Compound And Adhesive Cure Times
Figure 204



NOTE: REFER TO SRM 51-70-10 FOR THE VACUUM BAG INSTALLATION PROCEDURES.

Vacuum Bag Installation
Figure 205

REPAIR 10 - INLET COWL LIP SKIN

1. Applicability

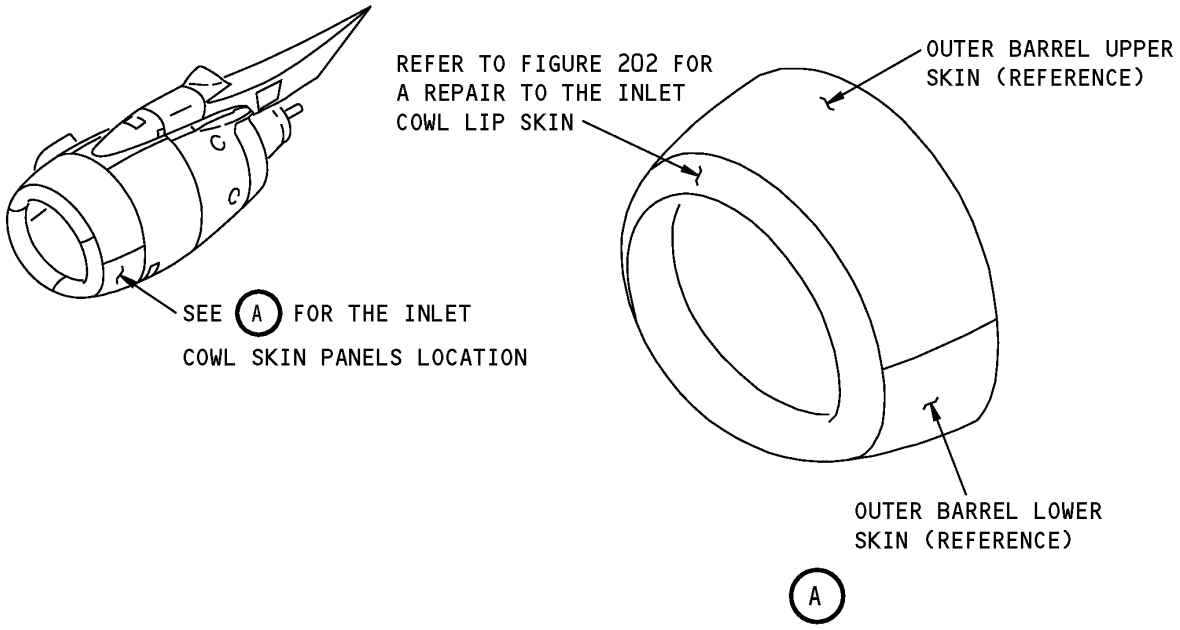
A. Repair 10 is applicable to damage that is:

(1) On the lip skin of the inlet cowl (Refer to Inlet Cowl Skin Panels Location, Figure 201/REPAIR 10)

(2) A minimum of 1.75 inches (44.45 mm) from the nearest skin or repair splice

(3) A minimum of 2.85 inches (72.39 mm) from the edge of the lip skin

(4) Not more than 30 inches (762.0 mm) in the circumferential direction.



Inlet Cowl Skin Panels Location
Figure 201

2. General

A. Repair 10 is a Category A or B repair.

(1) Refer to 51-00-06 to find the definitions of the different categories of repairs.

(2) This is a Category A repair if you use the nutplates and countersink bolts as given in Figure 202/REPAIR 10. This is a Category B repair if you use blind bolts. Refer to Paragraph 5./REPAIR 10 for the inspection instructions.

B. Make sure the aerodynamic smoothness is satisfactory or there can be a decrease in the performance of the airplane. Refer to 51-10-01.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS

(Continued)

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300,	Forming, Straightening, and Fitting Metal Parts Blanking Sonic Area Edges
SOPM 20-20-02	Penetrant Methods of Inspection
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

CAUTION: MAKE SURE THAT YOU DO NOT CAUSE DAMAGE TO THE STRUCTURE ADJACENT TO THE LEADING EDGE SKINS.

A. Cut and remove the damaged part of the inlet cowl skin as shown in Layout of the Repair Parts, Figure 202/REPAIR 10. Refer to 51-10-02 for the removal of damage.

(1) Drill a 0.25 inch (6.35 mm) stop hole at each end of a crack to make sure that all of the crack damage is removed.

(2) Cut out the skin in the shape of a rectangle.

(3) Make the corner radii of the cut a minimum of 0.50 inch (12.7 mm).

B. Put the skin around the cut back to the initial contour.

C. Do a high frequency eddy current (HFEC) inspection of the damaged area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the HFEC inspection procedures.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

D. Repeat steps 4.A through 4.C until all the damage is removed. If all the damage is removed, continue with step 4.E.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 10 and Figure 202/REPAIR 10.

F. Put the repair parts in place as shown in Layout of the Repair Parts, Figure 202/REPAIR 10.

G. Drill and countersink the necessary fastener holes. Refer 51-40-02, 51-40-05 and 51-40-08.

NOTE: Do not countersink more than 70 percent of the skin thickness to prevent a knife-edge condition in the skin.

H. Remove all the nicks, scratches, burrs, gouges, and sharp edges from the repair parts and the bare surfaces of the skin.

I. Break the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, for the sonic edge finish.

J. Apply a chemical conversion coating to the repair parts and the bare surfaces of the initial skin. Refer to 51-20-01.

K. Apply one layer of BAC 5710, Type 51 (Desoto Hi-Temp) primer (Refer to AMM PAGEBLOCK 51-21-99/701) to:

(1) The internal and mating surfaces of the repair parts

(2) The bare surfaces of the internal surface of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	**PART**	**QUANTITY**	**MATERIAL**
[1]	Doubler	2	Use 2219-0 sheet that is 0.09 inch (2.28 mm) thick. Heat treat to T62 after forming. (Optional: Make from 2219-T62 sheet that is 0.09 inch (2.28 mm) thick) (Optional: Make from 2024-0 clad sheet that is 0.10 inch (2.54 mm) thick. Heat treat to T62 (Preferred) or T42 after forming)
[2]	Doubler Splice	2	Use 2219-T62 sheet that is 0.09 inch (2.28 mm) thick (Optional: Make from 2024-0 clad sheet that is 0.10 inch (2.54 mm) thick. Heat treat to T62 (Preferrred) or T42 after forming)
[3]	Repair Plate	1	Use 2219-0 sheet that is 0.08 inch (2.03 mm) thick. Heat treat to T62 after forming. (Optional: Cut the part from a spare lip skin or an undamaged part of a lip skin) (Optional: Make from 2024-0 clad sheet that is 0.080 inch (2.03 mm) thick. Heat treat to T62 (Preferred) or T42 after forming)

L. Install the part [1] doublers and part [2] doubler splices.

(1) Install the doublers and the doubler splices through the rectangular hole.

(2) Install the fasteners wet with BAC 5710, Type 51 (Desoto Hi-Temp) primer. Refer to Layout of the Repair Parts, Figure 202/REPAIR 10.

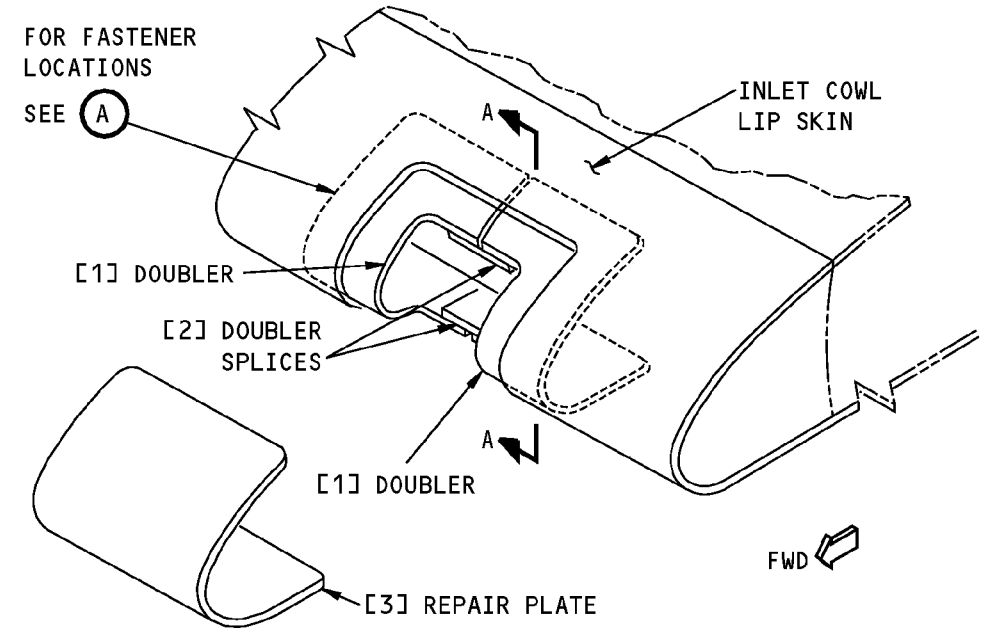
M. Install the part [3] repair plate.

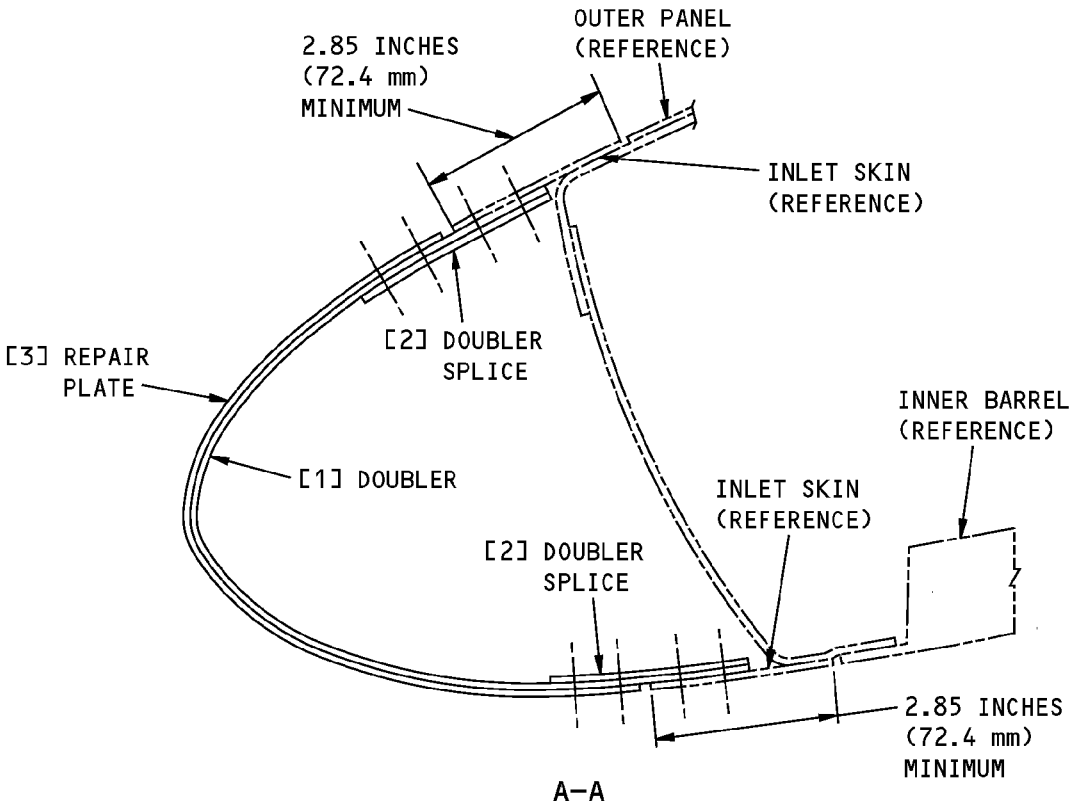
(1) Install the repair plate.

(2) Install the fasteners wet with BAC 5710, Type 51 (Desoto Hi-Temp) primer. Refer to Layout of the Repair Parts, Figure 202/REPAIR 10.

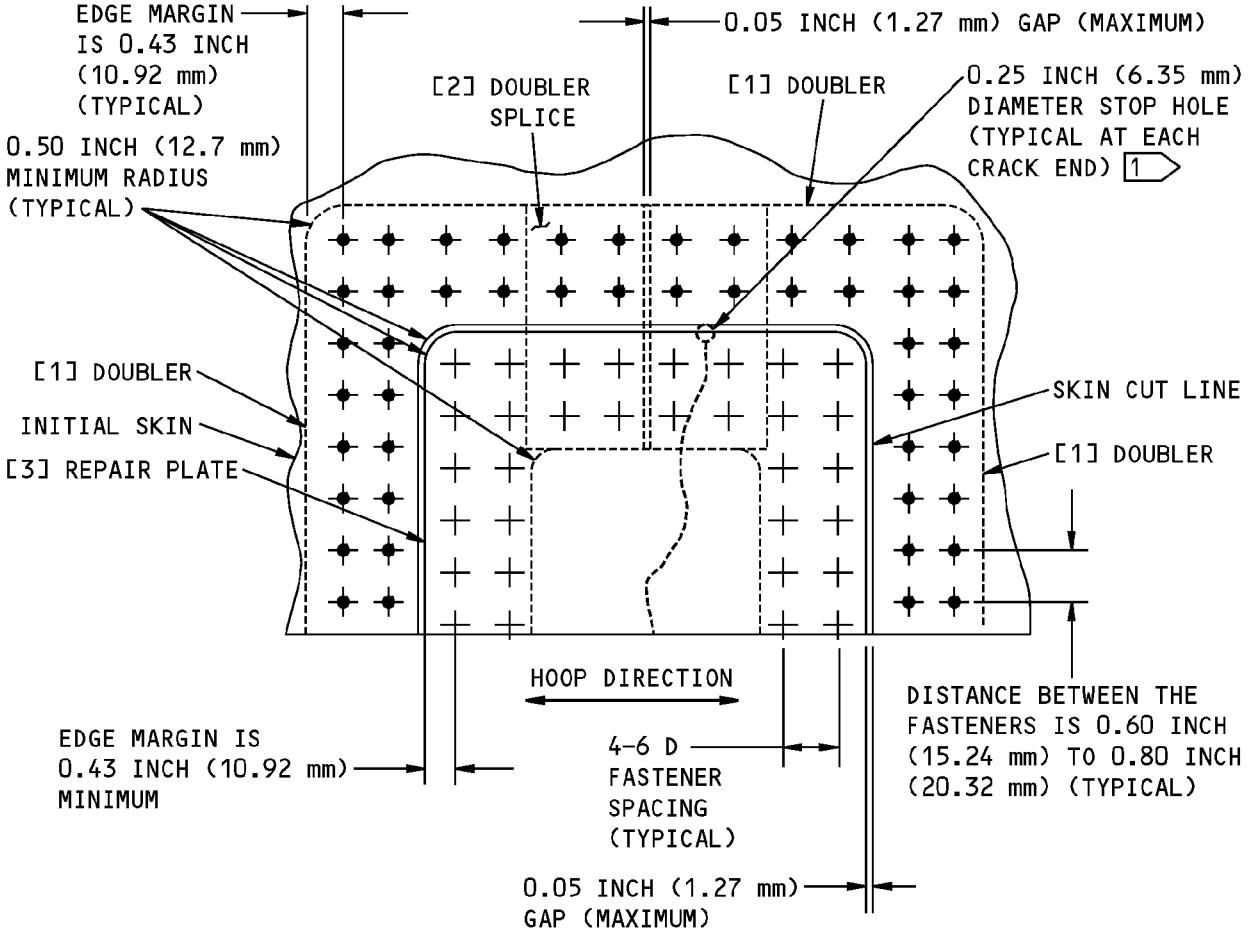
N. Fill the space between the part [3] repair plate and the initial skin with BMS 5-63 aerodynamic smoother. Refer to 51-20-05.

O. Apply the finish to the repair area as given in AMM 51-21-00/701.





Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



PLAN VIEW

A

NOTES

1 THE STOP HOLES PREVENT THE DAMAGE FROM BECOMING LARGER WHEN YOU CUT THE DAMAGED SKIN AWAY.

FASTENER SYMBOLS

✦ REPAIR FASTENER LOCATION. INSTALL AN NAS1097E5 RIVET

┼ REPAIR FASTENER LOCATION. INSTALL A BACN10JP3CCM NUTPLATES WITH BACR15GF3() RIVETS. USE BACB30VF3K() COUNTERSINK BOLTS. AS AN ALTERNATIVE, YOU CAN INSTALL AN NAS1399MW5 BLIND RIVET AND INSPECT AS GIVEN PARGRAPH 5.

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

5. Inspection Instructions

A. If you are using blind fasteners as given in Figure 202/REPAIR 10 then do an inspection of the repair at each 500 flight hour interval.

CAUTION: MAKE SURE THERE ARE NO LOOSE FASTENERS. IF YOU DO NOT OBEY, THE FASTENERS CAN ENTER THE ENGINE AND CAUSE DAMAGE.

(1) Inspect all the blind rivets in the repair area.

(2) Blind rivets that are loose, missing, or damaged must be replaced.

B. Make sure that you replace the blind fasteners with permanent fasteners as given in Figure 202/REPAIR 10 before 3000 flight cycles have ocurred.

REPAIR 11 - INLET COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE A

1. Applicability

A. Repair 11 is applicable to damage to the Inlet Cowl Outer Barrel Skin at a frame in Zone A (Man-Walk-Area). Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 11.

B. Repair 11 is not applicable to damage over the forward or aft bulkheads.

C. For repairs that overlap into Zone B, refer to 54-10-01, Repair 12. Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 11 for the locations of the repair zones.

2. General

A. Repair 11 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).

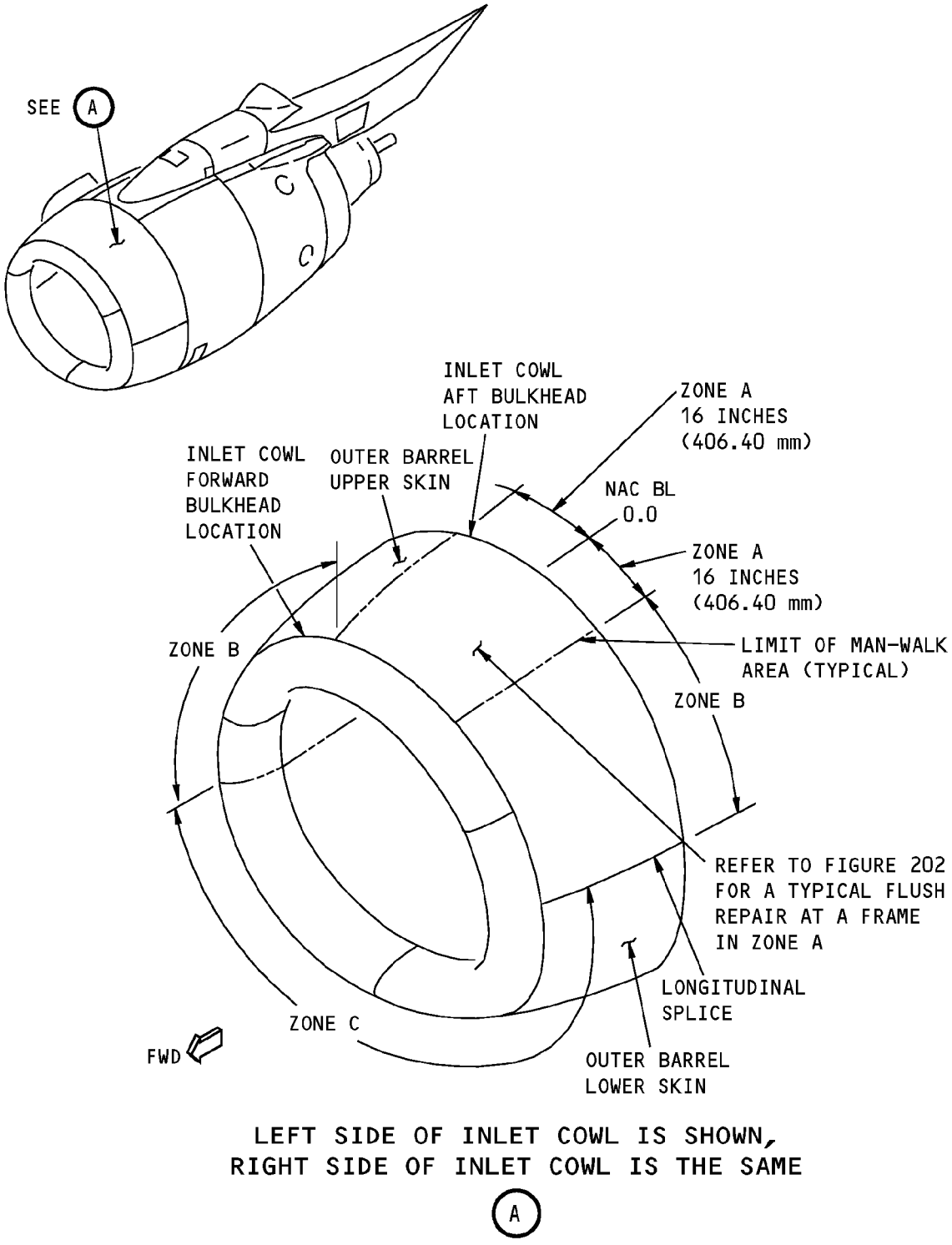
C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).

D. The edges of the initial skin cutout must be a minimum of 2.50 inches (63.5 mm) from:

(1) Another repair doubler

(2) A chem-mill step

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Zones
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
54-10-01	INLET COWL SKIN
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make the radii of the corners of the cutout a minimum of 0.50 inch (12.7 mm).

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is an alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 11 for the materials.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[3]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 11.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 11. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, Sonic Edge Finish.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners with BMS 5-95 sealant.

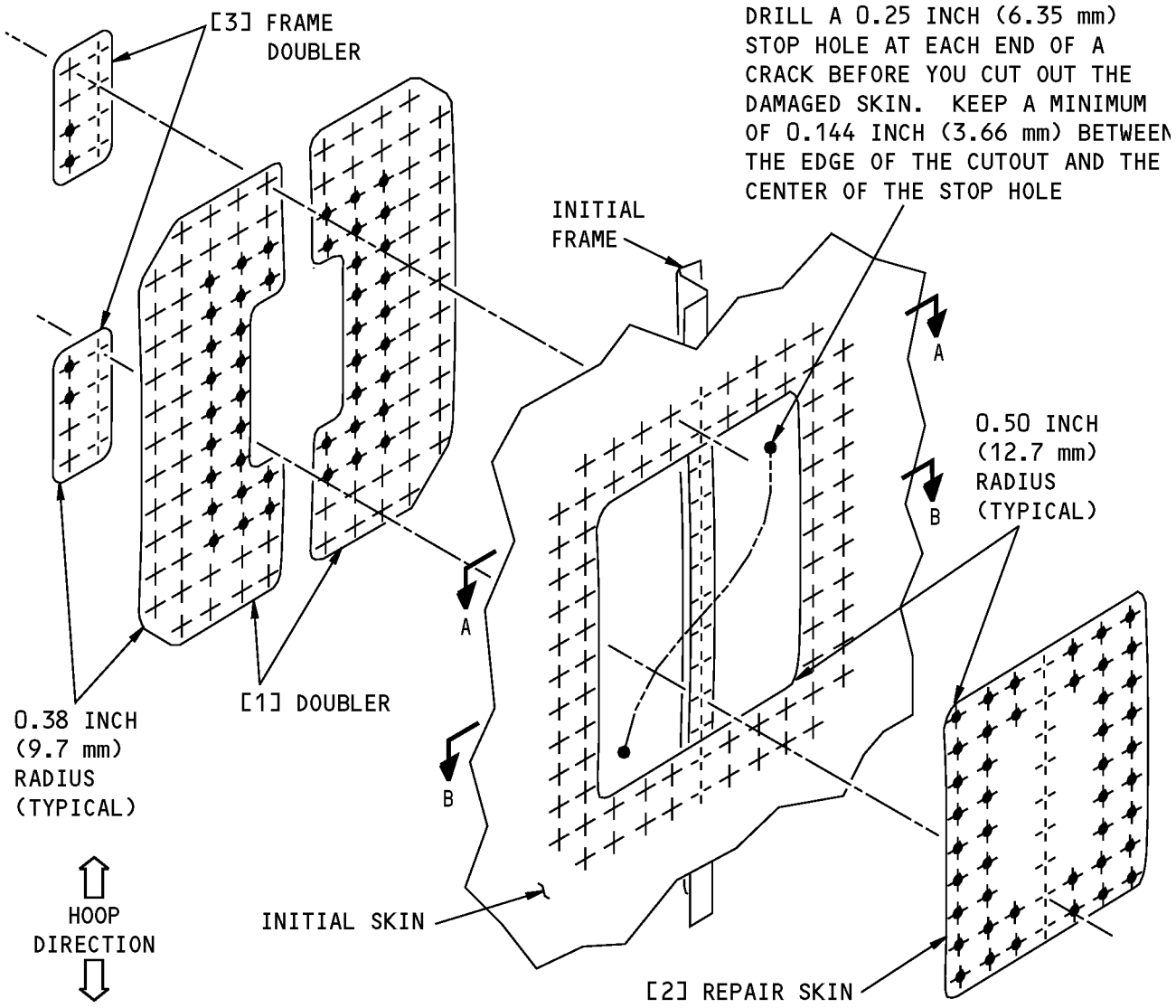
O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):

(1) Around the edge of the part [1] doubler

(2) The space between the part [2] repair skin and the initial skin.

Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



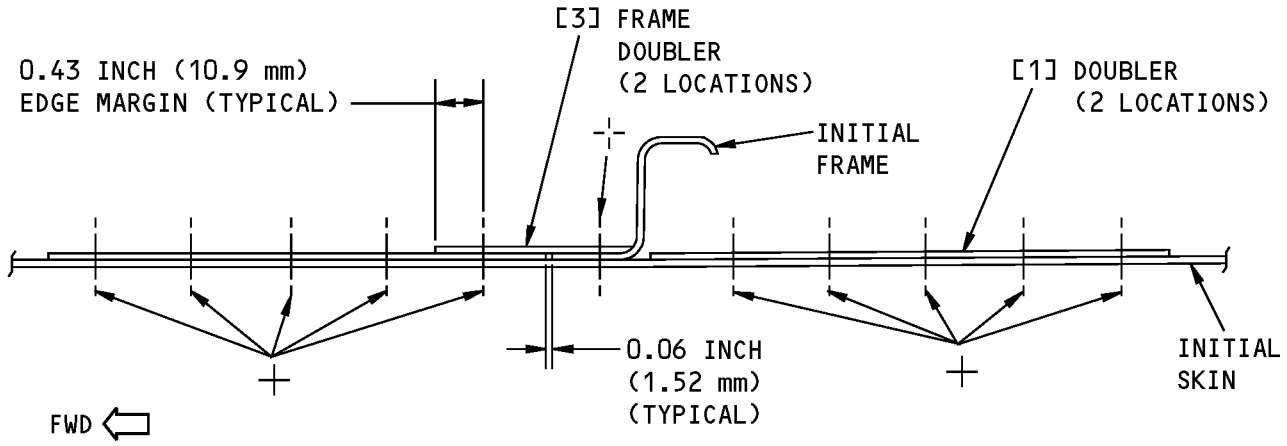
FASTENER SYMBOLS

-⊹- INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.

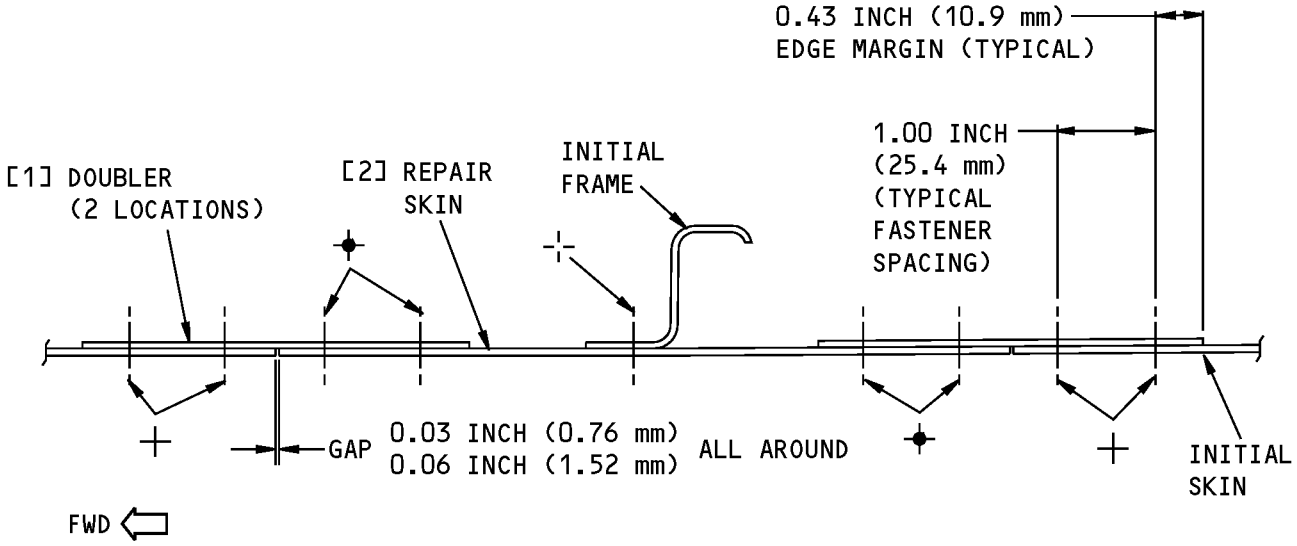
-✦- REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

-┼- REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



B–B

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 12 - INLET COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE B

1. Applicability

A. Repair 12 is applicable to damage to the Inlet Cowl Outer Barrel Skin at a frame in Zone B. Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 12.

B. Repair 12 is not applicable to damage over the forward or aft bulkheads.

C. Repair 12 is not applicable to damage adjacent to ground support equipment (GSE) attachment points.

2. General

A. Repair 12 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).

C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).

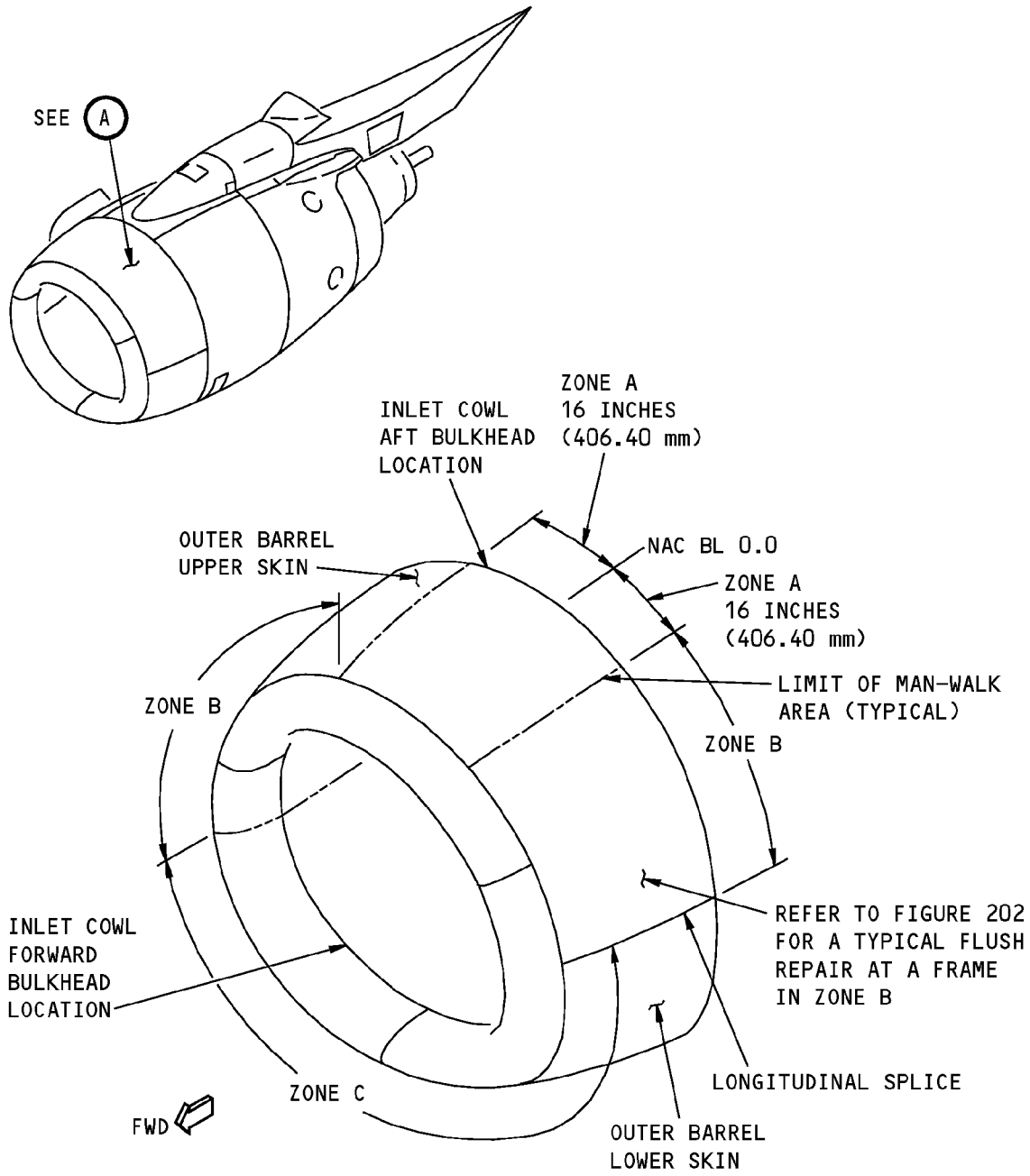
D. The edges of the initial skin cutout must be a minimum of 2.50 inches (63.5 mm) from:

(1) Another repair doubler

(2) A chem-mill step

(3) A fore/aft skin splice.

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Zones
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make the radii of the corners of the cutout a minimum of 0.50 inch (12.7 mm).

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is an alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 12 for the materials.

NOTE: If the part [3] fillers extend into Zone A, cut them where they overlap the chem-mill step of the skin. Discard the part of the fillers that overlap the thicker skin in Zone A.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

REPAIR MATERIAL			
[3]	Filler	2	Use 0.020 inch (0.51 mm) thick 2024-T3 sheet
[4]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 12.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 12. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, Sonic Edge Finish.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners with BMS 5-95 sealant.

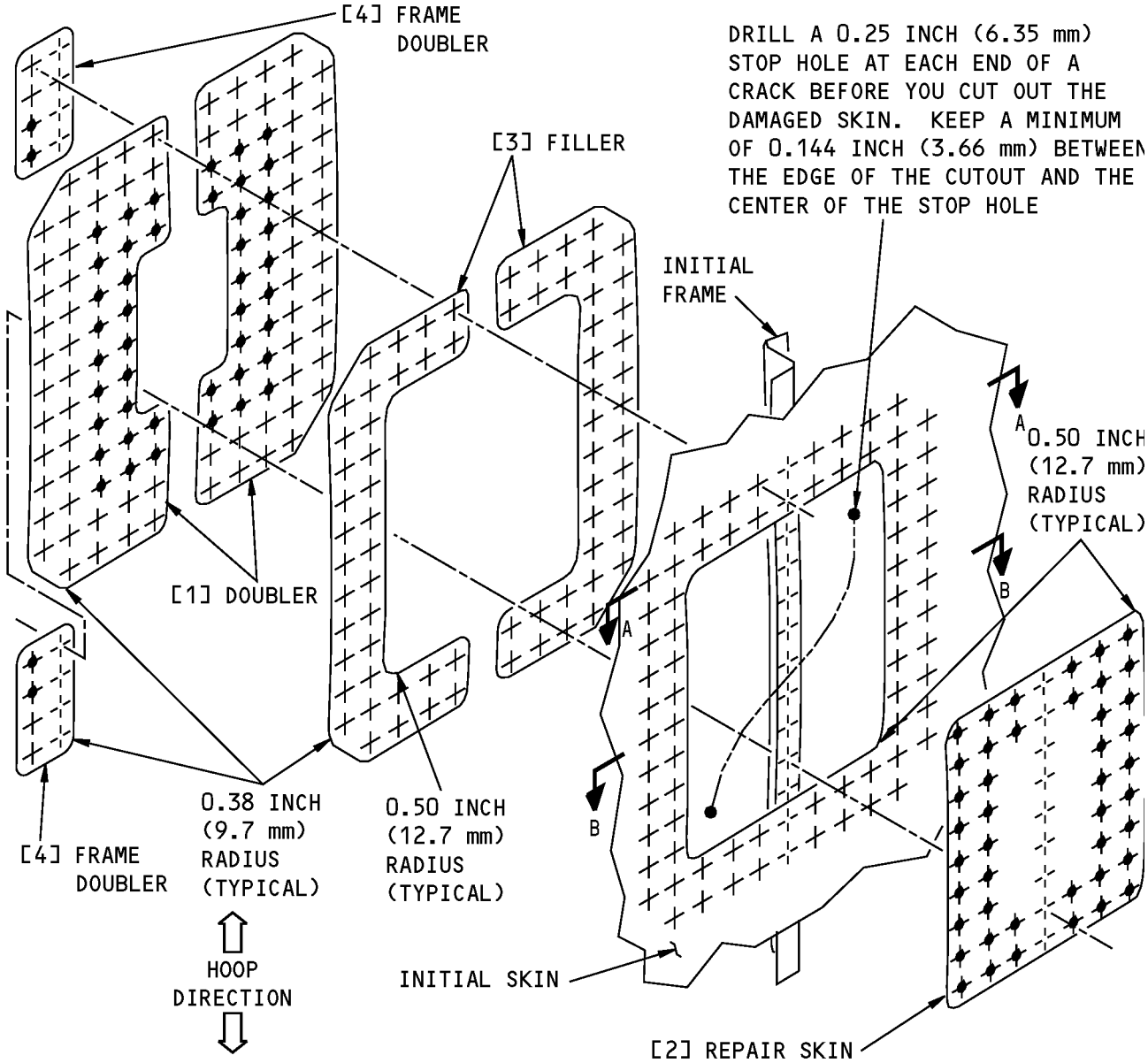
O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):

(1) Around the edge of the part [1] doubler

(2) The space between the part [2] repair skin and the initial skin.

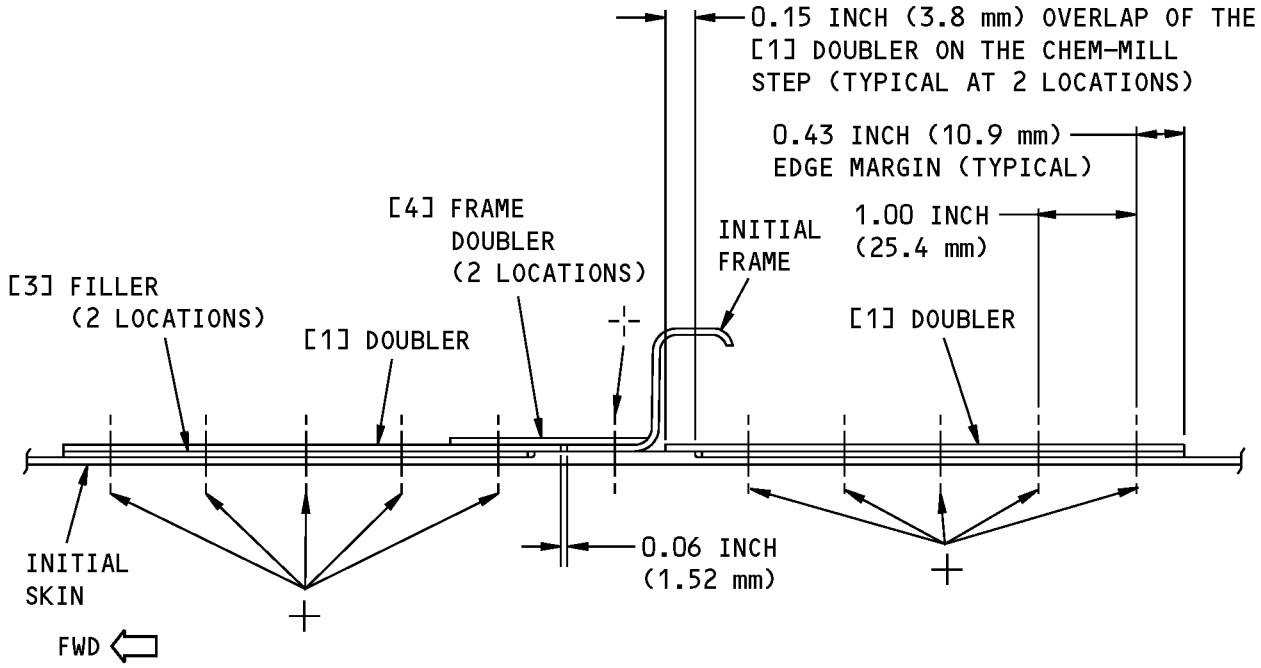
Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



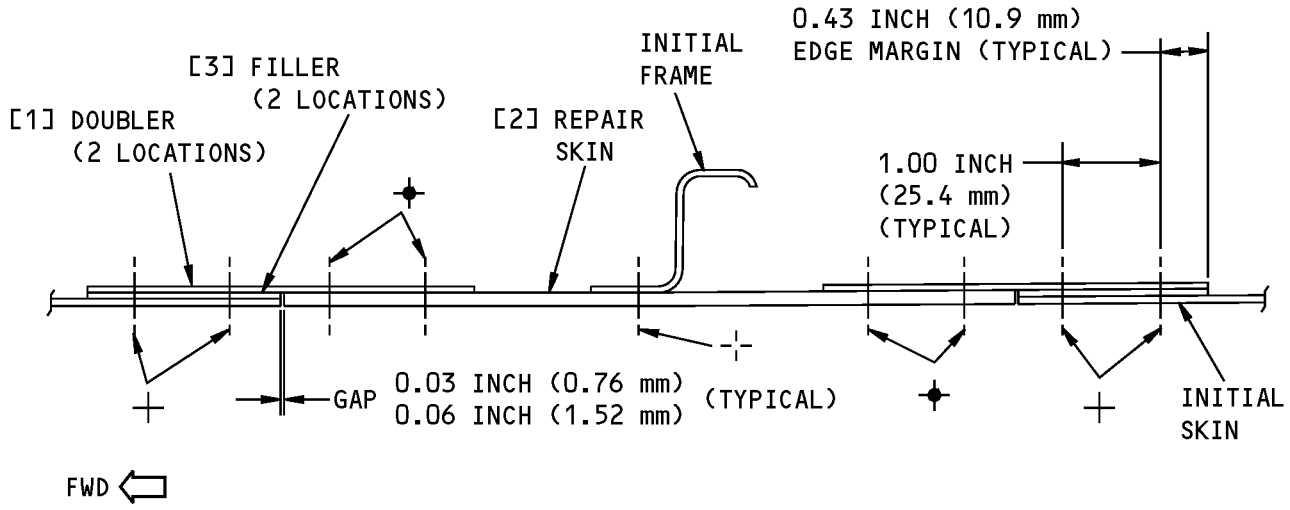
FASTENER SYMBOLS

- INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



B–B

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 13 - INLET COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE C

1. Applicability

A. Repair 13 is applicable to damage to the Inlet Cowl Outer Barrel Skin at a frame in Zone C. Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 13.

B. Repair 13 is not applicable to damage over the forward or aft bulkheads.

C. Repair 13 is not applicable to damage adjacent to drain holes, lower access panels, or ground support equipment (GSE) attachment points.

2. General

A. Repair 13 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).

C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).

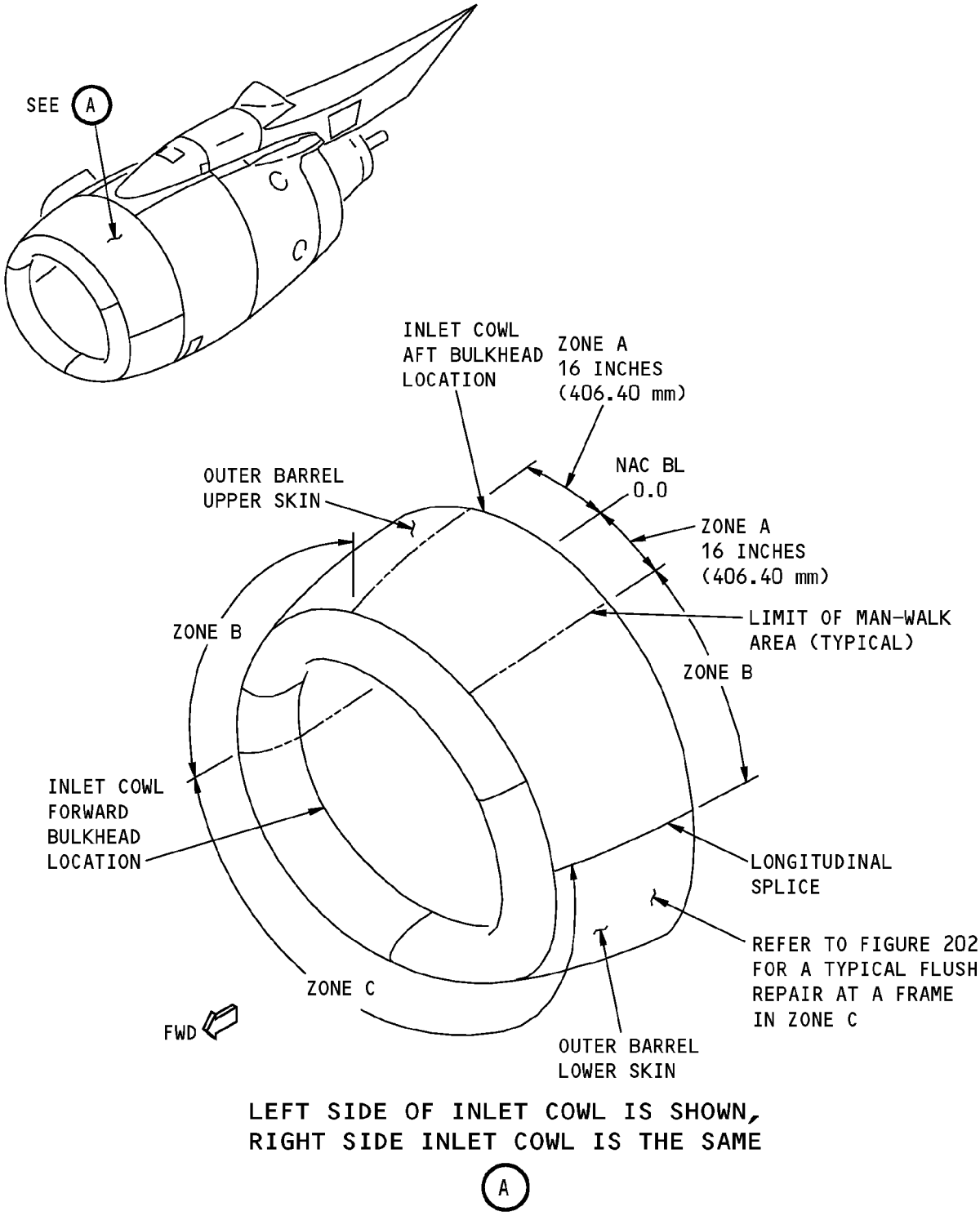
D. The edges of the initial skin cutout must be a minimum of 2.50 inches (63.5 mm) from:

(1) Another repair doubler

(2) A chem-mill step

(3) A fore/aft skin splice.

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Inlet Cowl Outer Barrel Skin Zones
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make the radii of the corners of the cutout a minimum of 0.50 inch (12.7 mm).

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is an alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 13 for the materials.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[3]	Filler	2	Use 0.025 inch (0.64 mm) thick 2024-T3 sheet
[4]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 13.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 13. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Remove the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, Sonic Edge Finish.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners with BMS 5-95 sealant.

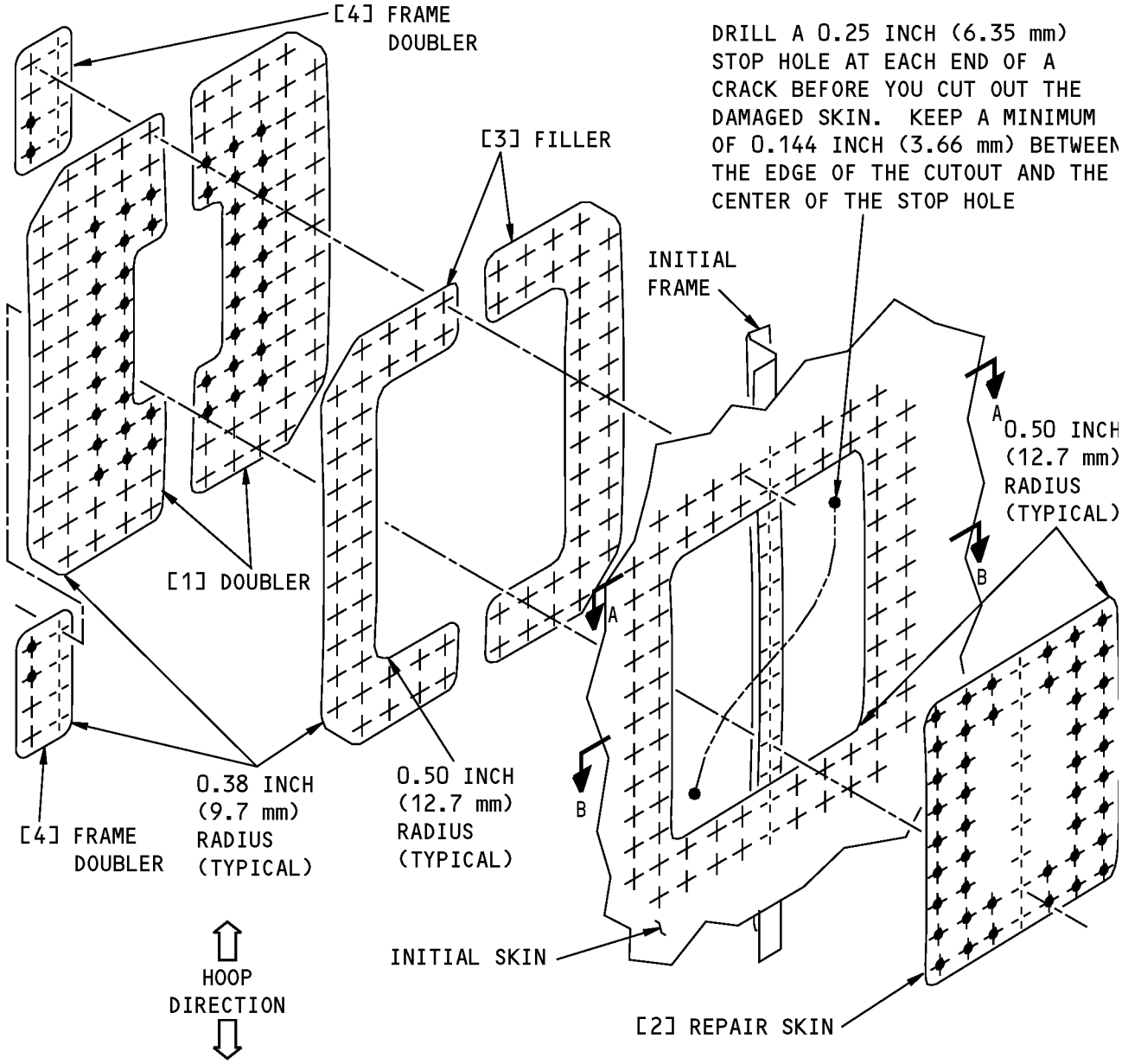
O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):

(1) Around the edge of the part [1] doubler

(2) The space between the part [2] repair skin and the initial skin.

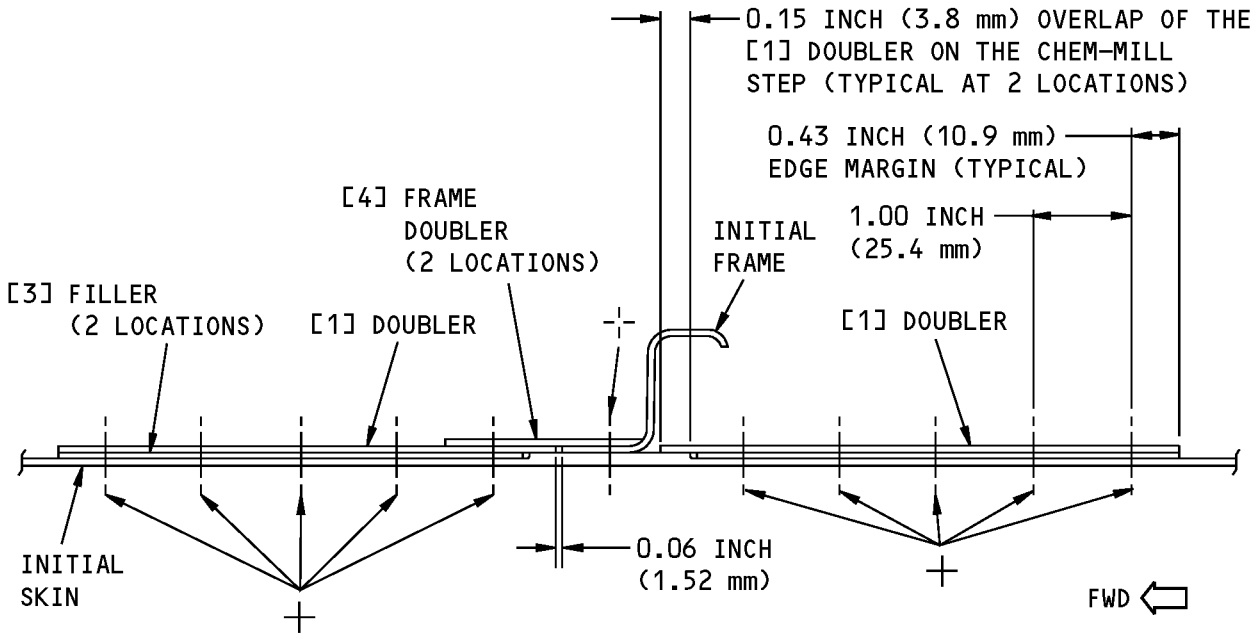
Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



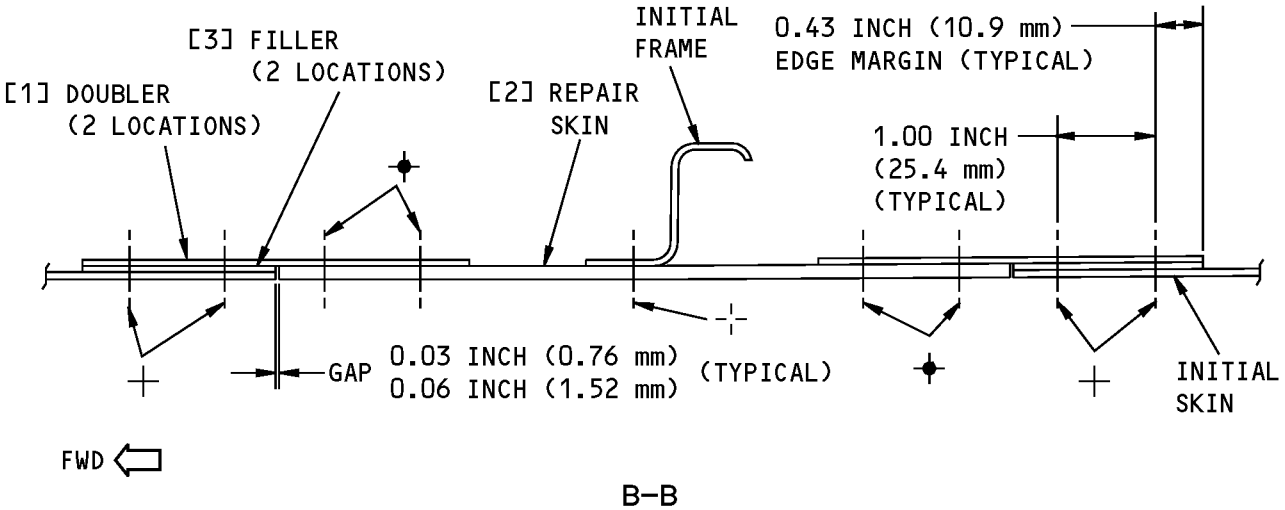
FASTENER SYMBOLS

- INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



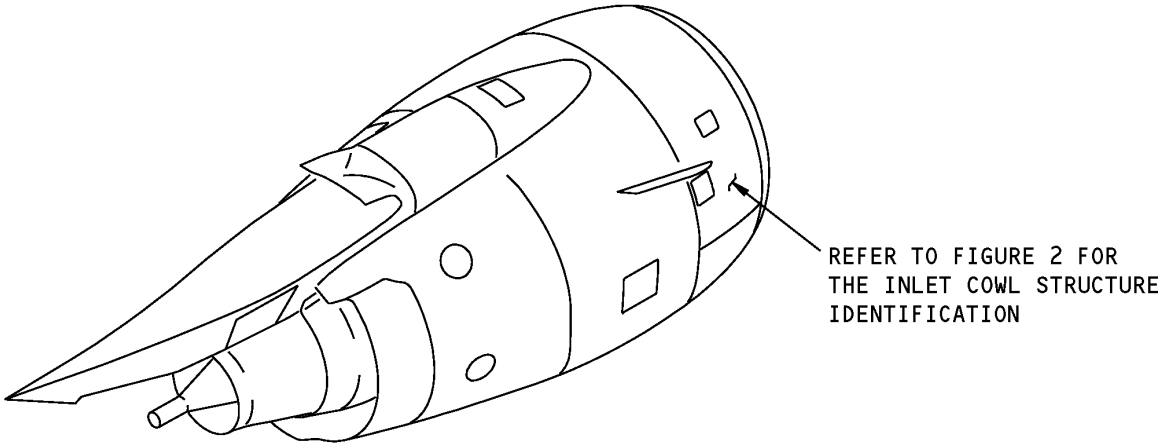
A–A



B–B

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

IDENTIFICATION 1 - INLET COWL STRUCTURE

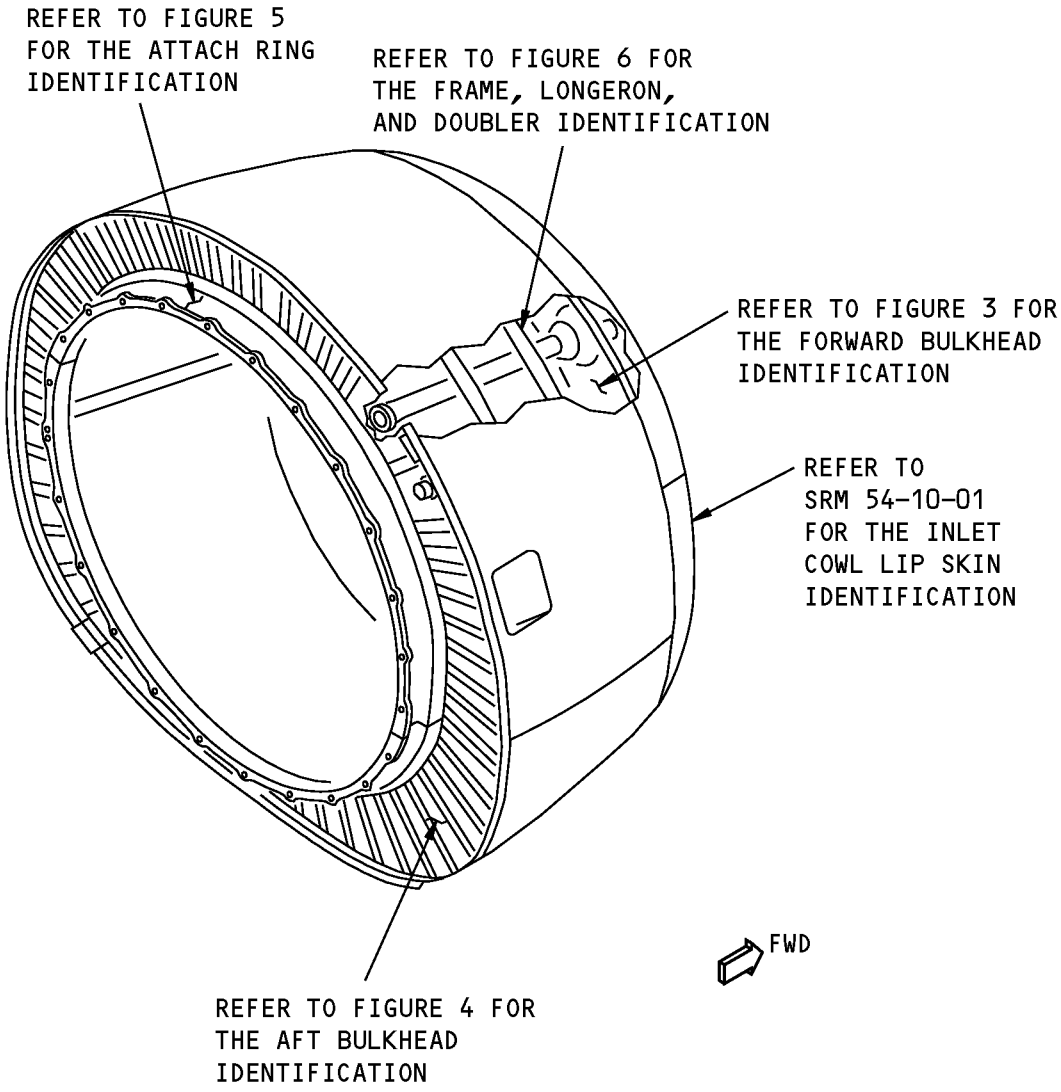


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

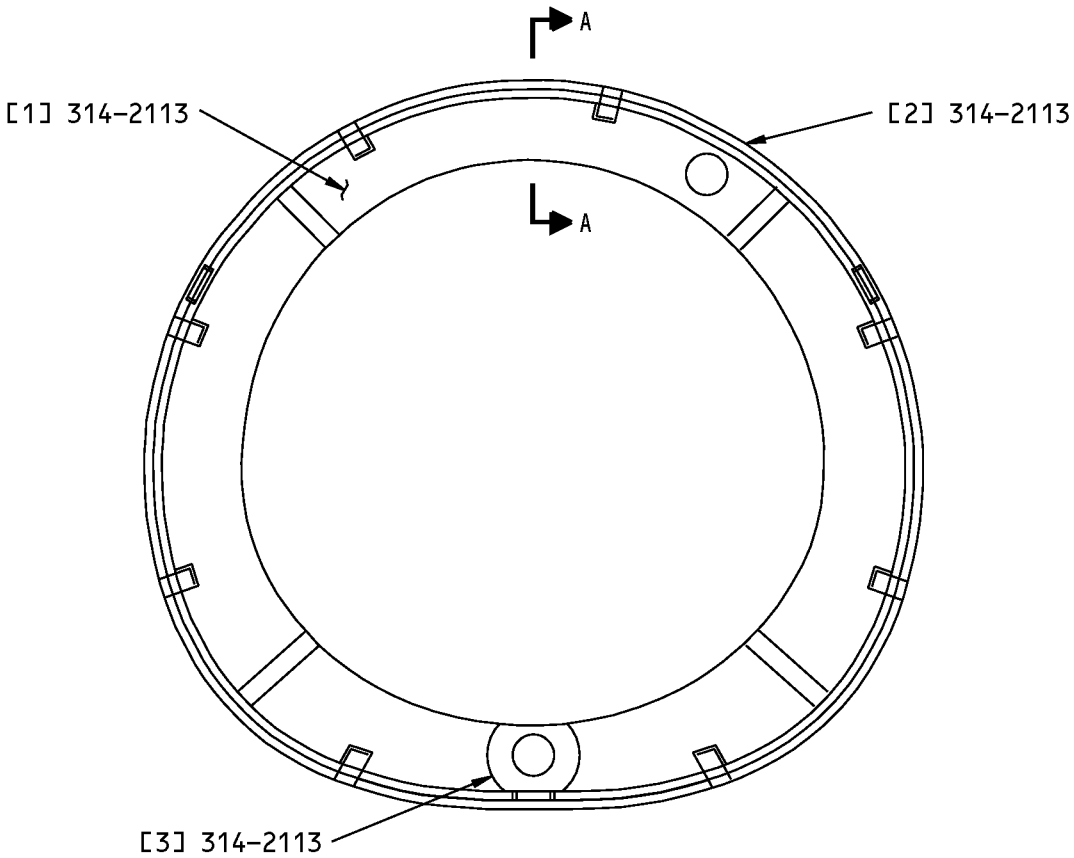
Inlet Cowl Structure Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
314-2100	Cowl Assembly - Inlet
314-2103	Shim - Inlet Cowl
314-2113	Forward Bulkhead
314-2134	Inlet Cowl Attach Ring
314-2140	Aft Bulkhead
314-2153	Frame and Longeron - Upper and Lower Panels, Outer Barrel
314-2162	Frame - Outer, Aft Bulkhead



Inlet Cowl Structure Identification
Figure 2

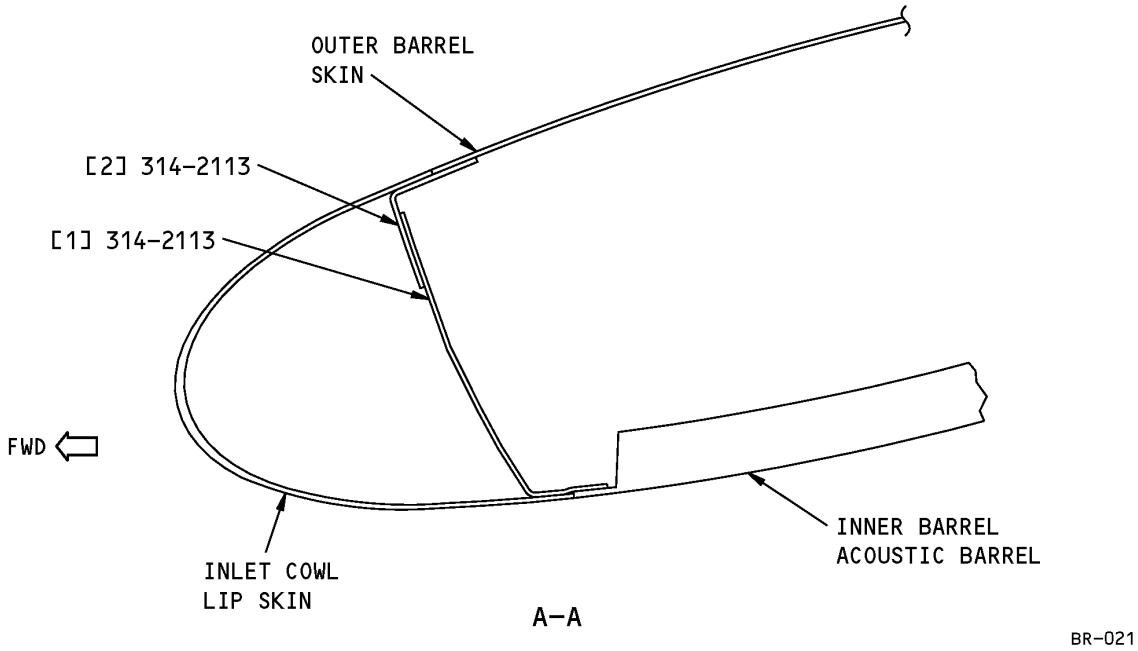


VIEW WHEN YOU LOOK FORWARD

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

BR-004A

Inlet Cowl Forward Bulkhead Identification
Figure 3 (Sheet 1 of 2)

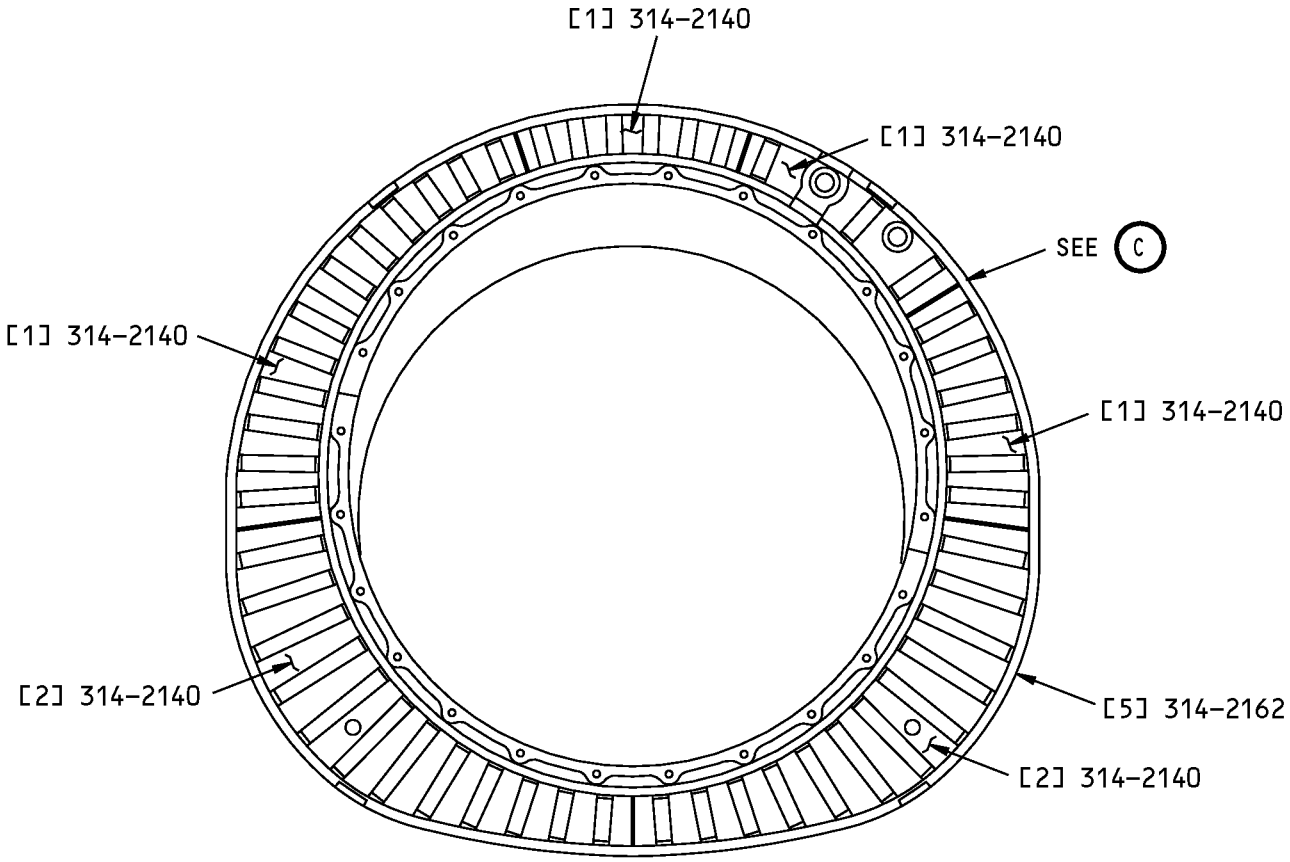


Inlet Cowl Forward Bulkhead Identification
Figure 3 (Sheet 2 of 2)

Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Inner Cap	0.090 (2.29)	Ti-6Al-4V titanium, formed to 0.060 (1.52)	
[2]	Outer Cap	0.090 (2.29)	Ti-6Al-4V titanium, formed to 0.060 (1.52)	
[3]	Exhaust Duct Doubler	0.080 (2.03)	Ti-6Al-4V titanium, formed to 0.060 (1.52)	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



VIEW WHEN YOU LOOK FORWARD

ONE-PIECE BULKHEAD AND STIFFENER ASSEMBLY

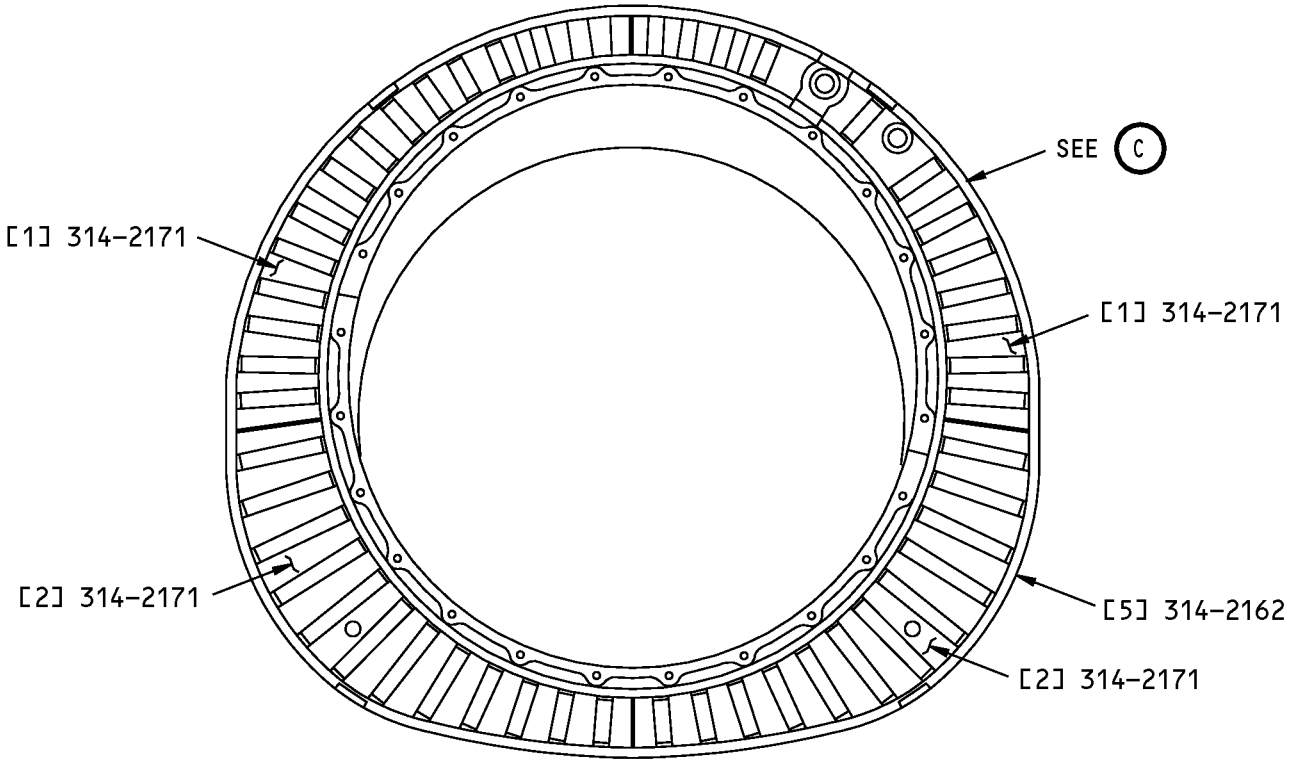
A

NOTES

- REFER TO TABLE 3 FOR THE LIST OF MATERIALS.
- SEE DETAIL B FOR THE BUILT-UP BULKHEAD AND STIFFENER ASSEMBLY

BR-005

Inlet Cowl Aft Bulkhead Identification
Figure 4 (Sheet 1 of 3)



VIEW WHEN YOU LOOK FORWARD

BUILT-UP BULKHEAD AND STIFFENER ASSEMBLY

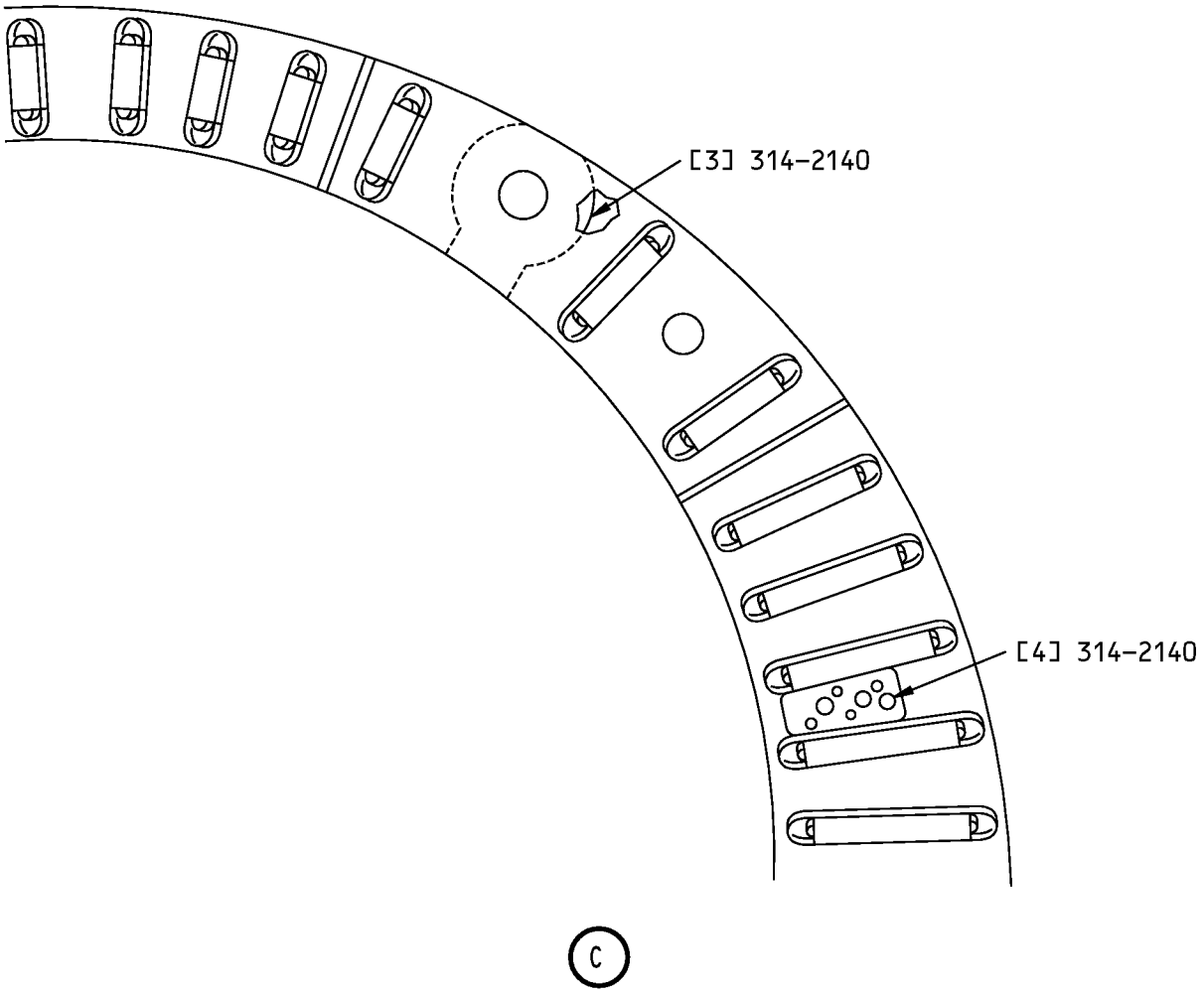
B

NOTES

- REFER TO TABLE 3 FOR THE LIST OF MATERIALS.
- SEE DETAIL A FOR THE ONE-PIECE BULKHEAD AND STIFFENER ASSEMBLY

BR-005

Inlet Cowl Aft Bulkhead Identification
Figure 4 (Sheet 2 of 3)

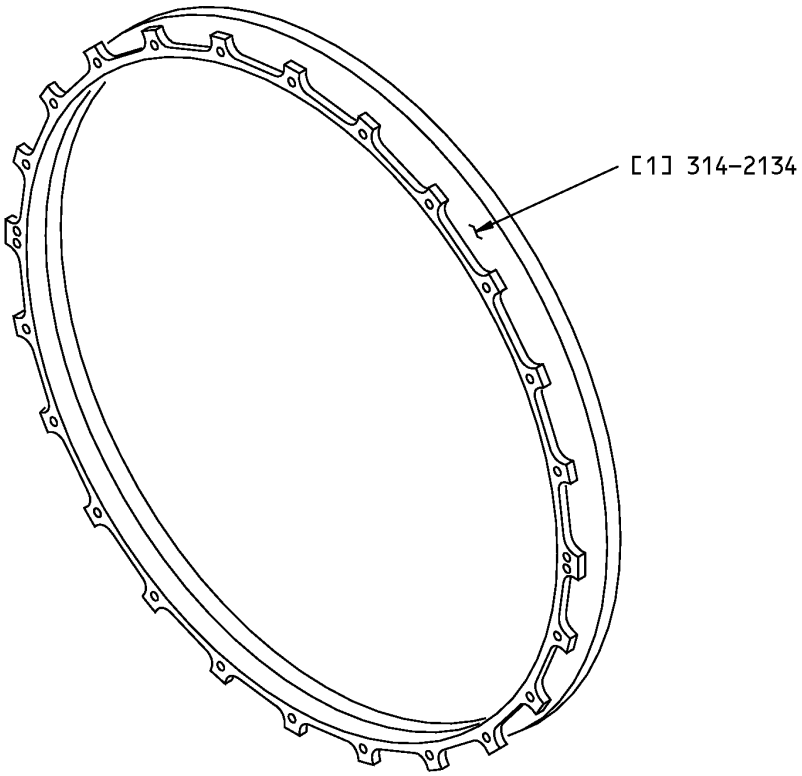


Inlet Cowl Aft Bulkhead Identification
Figure 4 (Sheet 3 of 3)

Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Aft Bulkhead Upper Five Segments	0.063 (1.60)	Ti-6Al-4V titanium sheet as given in AMS 4911, annealed, formed to 0.060 (1.52)	For One-Piece Bulkhead and Stiffeners
	Aft Bulkhead Upper Two Segments	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in AMS 4911, annealed	For Built-Up Bulkhead and Stiffener Assembly
[2]	Aft Bulkhead Lower Two Segments	0.080 (2.03)	Ti-6Al-4V titanium sheet as given in AMS 4911, annealed, formed to 0.060 (1.52)	For One-Piece Bulkhead and Stiffeners
	Aft Bulkhead Lower Two Segments	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in AMS 4911, annealed,	For Built-Up Bulkhead and Stiffener Assembly
[3]	TAI Duct, Mating Doubler	0.050 (2.54)	Ti-6Al-4V titanium sheet as given in AMS 4911, annealed	
[4]	T-12 Connector Doubler	0.063 (1.60)	Ti-6Al-4V titanium sheet as given in AMS 4911, annealed	
[5]	Frame, Outer Aft Bulkhead	0.100 (2.54)	2024-T3 extrusion as given in QQ-A-200/3	
[6]	Stiffener (34)	0.080 (2.03)	2024-T3 tee extrusion as given in QQ-A-200/3	For Built-Up Bulkhead and Stiffener Assembly only

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

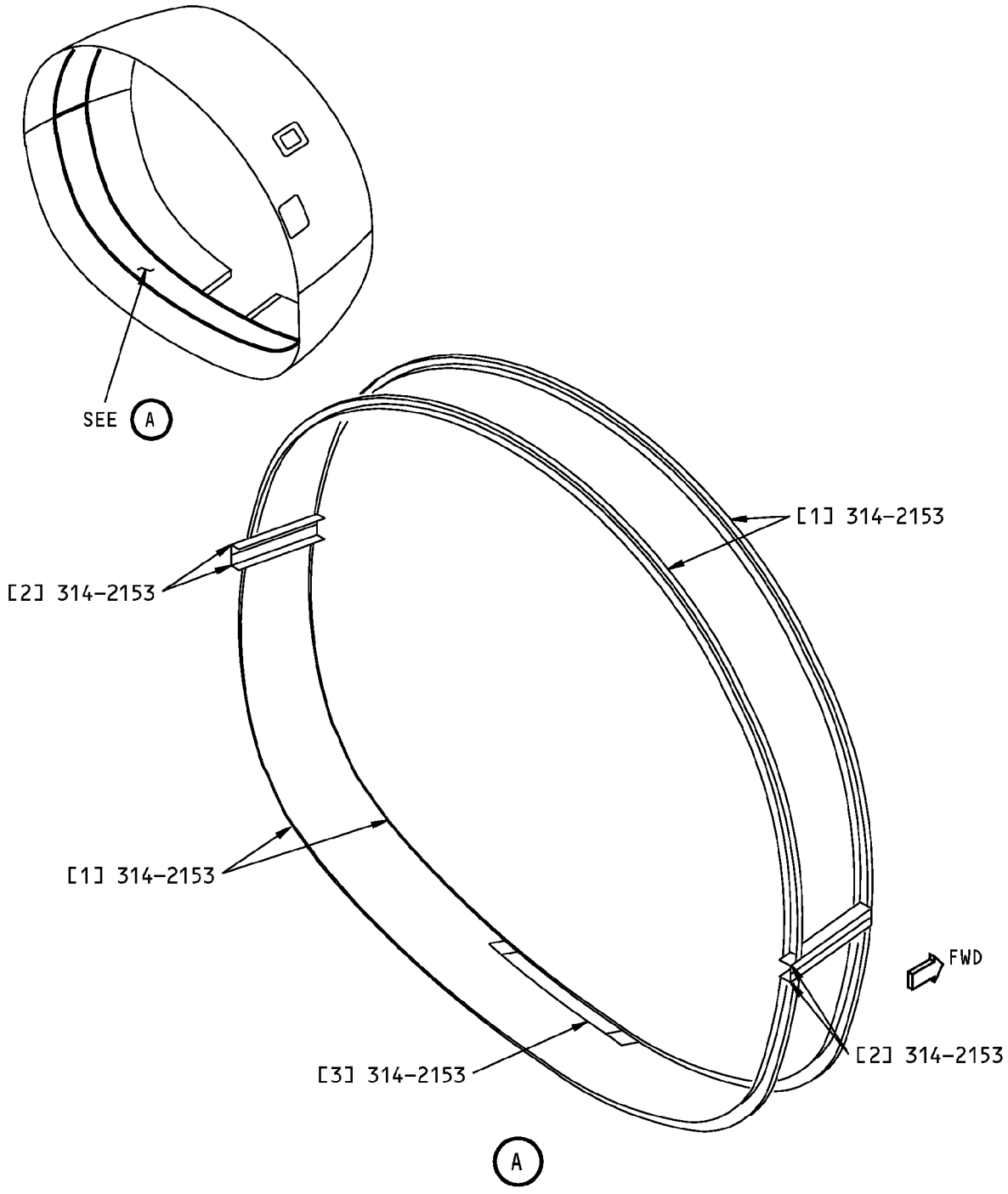
BR027

Inlet Attach Ring Identification
Figure 5

Table 4:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Inlet Attach Ring		7075-T7351 forging	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 5 FOR THE LIST OF MATERIALS.

BE-025

Inlet Cowl Frame and Longeron Identification
Figure 6

Table 5:

LIST OF MATERIALS FOR FIGURE 6				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Upper Frame	0.063 (1.60)	2024-T62	
[2]	Longeron	0.063 (1.60)	2024-T62	
[3]	Angle Frame Doubler	0.063 (1.60)	2024-T62	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - INLET COWL STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the structure of the inlet cowl shown in Inlet Cowl Structure Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

B. After you remove the damage, do as follows:

(1) Apply the finishes that follow to the reworked aluminum parts:

(a) Apply a chemical conversion coating as given in 51-20-01.

(b) Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04.

(2) Apply the finishes that follow to the reworked titanium parts:

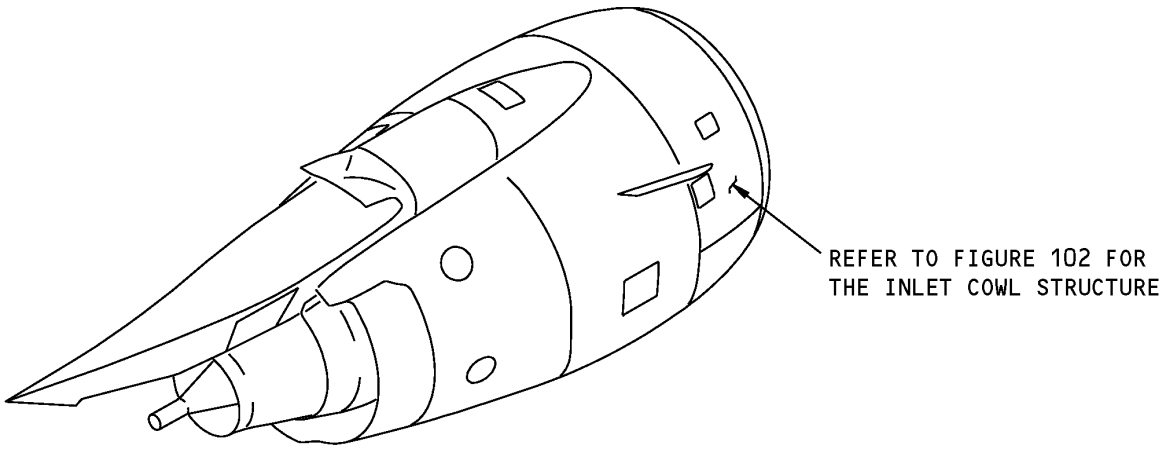
(a) Apply two layers of BAC 5710, Type 51 (DeSoto high temperature primer).

(3) Apply a finish to the reworked areas as given AMM 51-20-00/701.

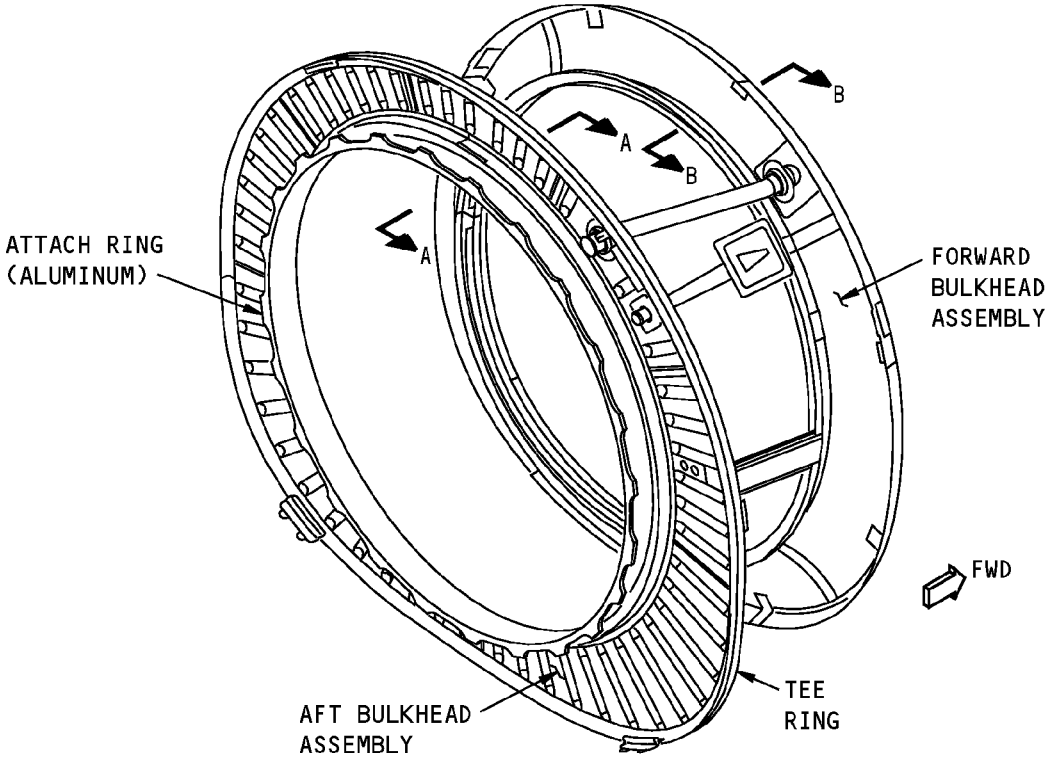
(4) Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits for the different components.

Table 101:

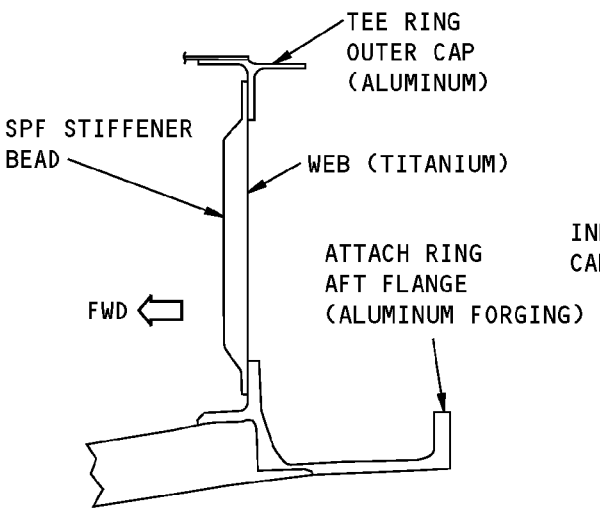
PARAGRAPH REFERENCES OF THE ALLOWABLE DAMAGE LIMITS	
COMPONENT	**PARAGRAPH**
Forward Bulkhead - Inner and Outer Caps	4.A
Aft Bulkhead Web	4.B
Tee Ring	4.C
Attach Ring	4.D
Outer Barrel Frames and Longerons	4.E



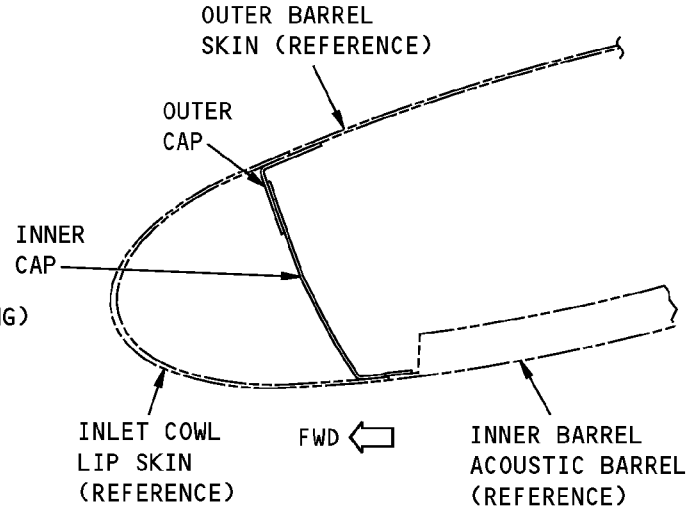
Inlet Cowl Structure Location
Figure 101



LEFT ENGINE INLET COWL STRUCTURE IS SHOWN,
RIGHT ENGINE INLET COWL STRUCTURE IS THE SAME

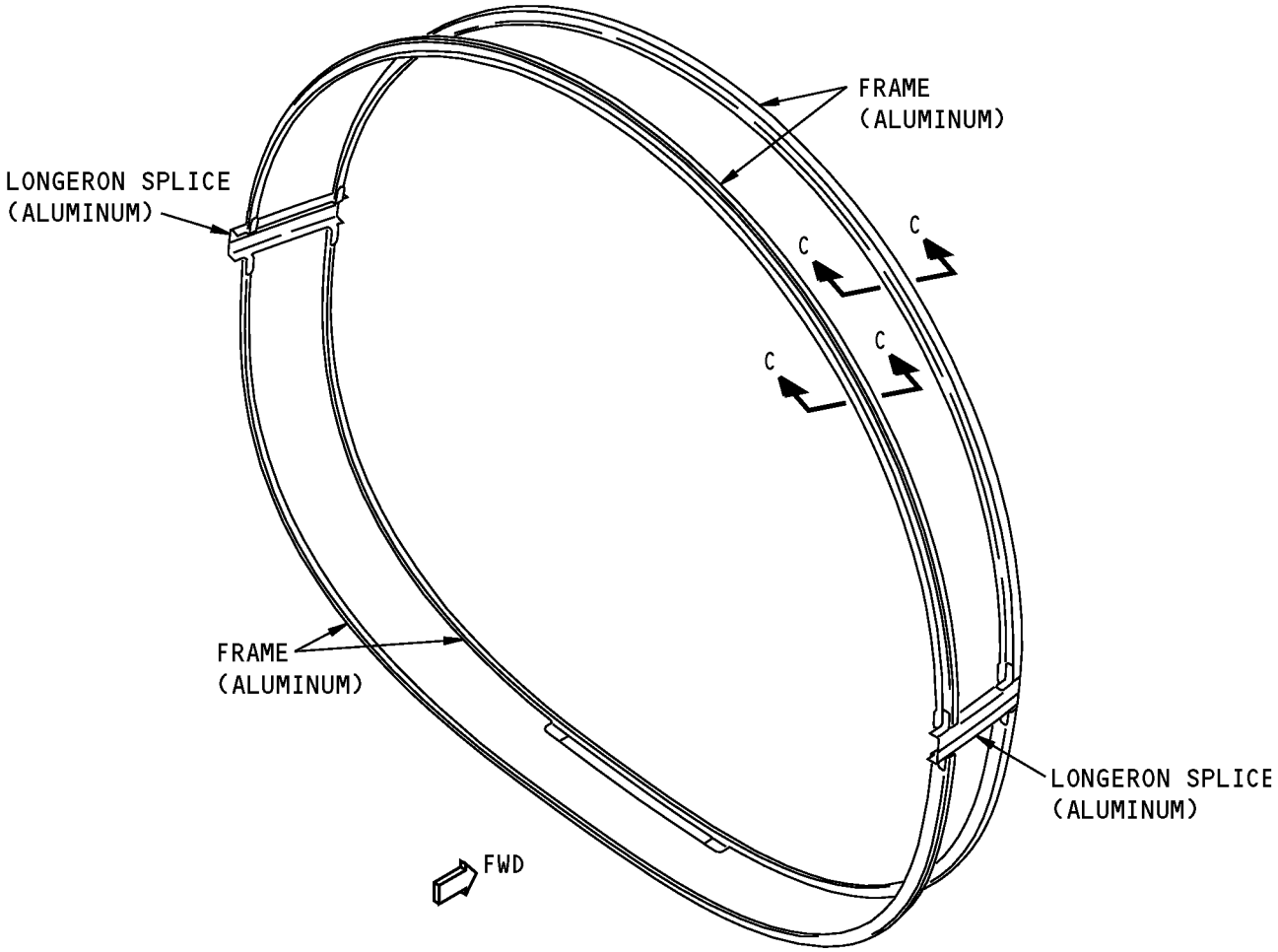


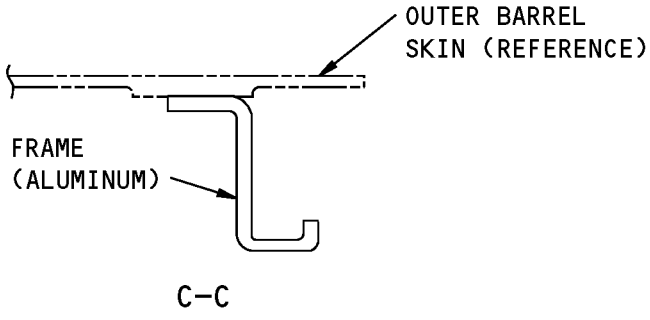
AFT BULKHEAD ASSEMBLY
A–A



FORWARD BULKHEAD ASSEMBLY
B–B

Inlet Cowl Structure
Figure 102 (Sheet 1 of 2)





Inlet Cowl Structure
Figure 102 (Sheet 2 of 2)

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
AMM 51-20-00/701	Decorative Exterior Paint System - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Forward Bulkhead - Inner and Outer Caps:

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

B. Aft Bulkhead Web:

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

(4) Holes and Punctures are permitted if:

(a) They are a maximum diameter of 0.25 inch (6.35 mm) after cleanup

(b) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the part

(c) You install an NAS1398M blind rivet wet with BMS 5-63 sealant.

1) The head of the repair rivet must not touch the bend radius of a web stiffener bead.

C. Tee Ring:

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

D. Attach Ring:

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) For all areas but the attach flange:

1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(b) Aft Flange:

1) Damage is not permitted.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

E. Outer Barrel Frames and Longerons:

(1) Cracks:

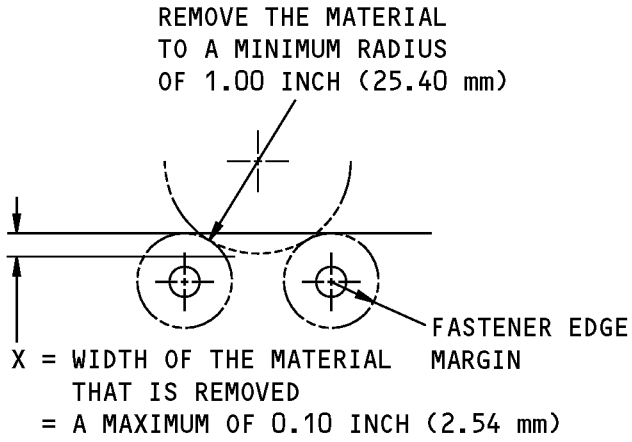
(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

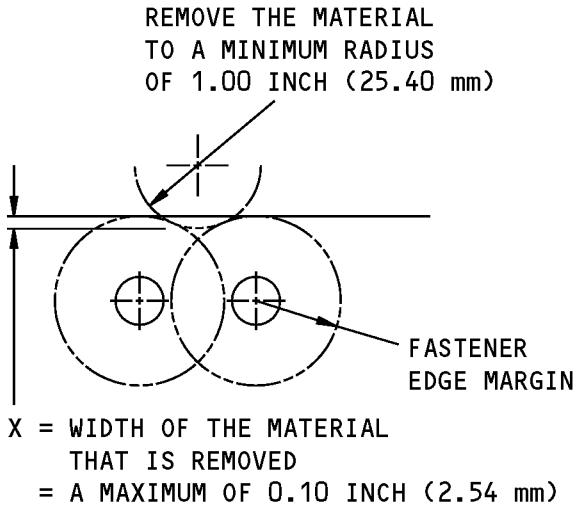
(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.



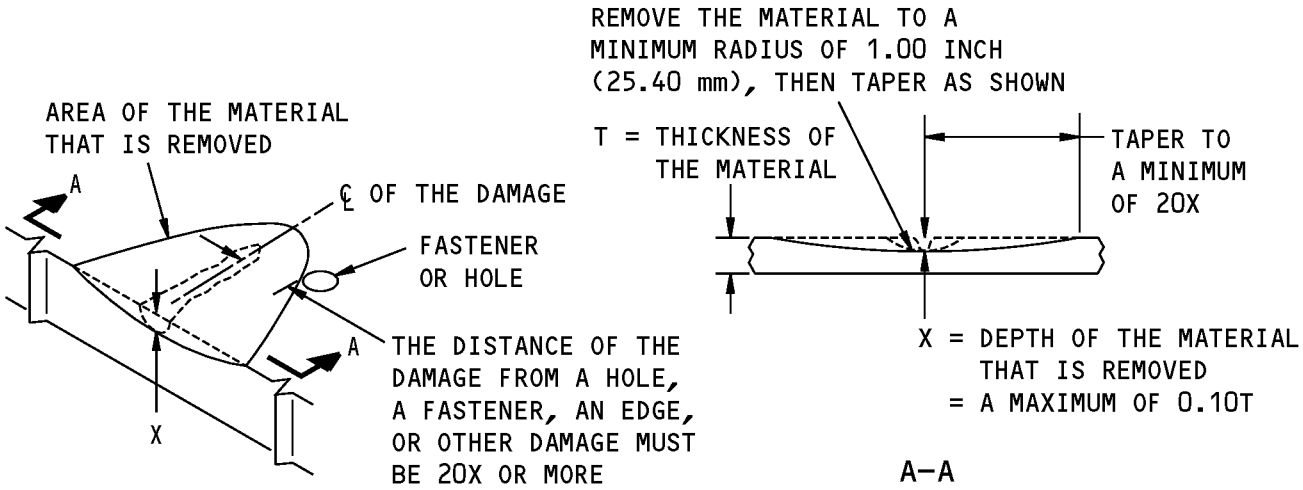
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

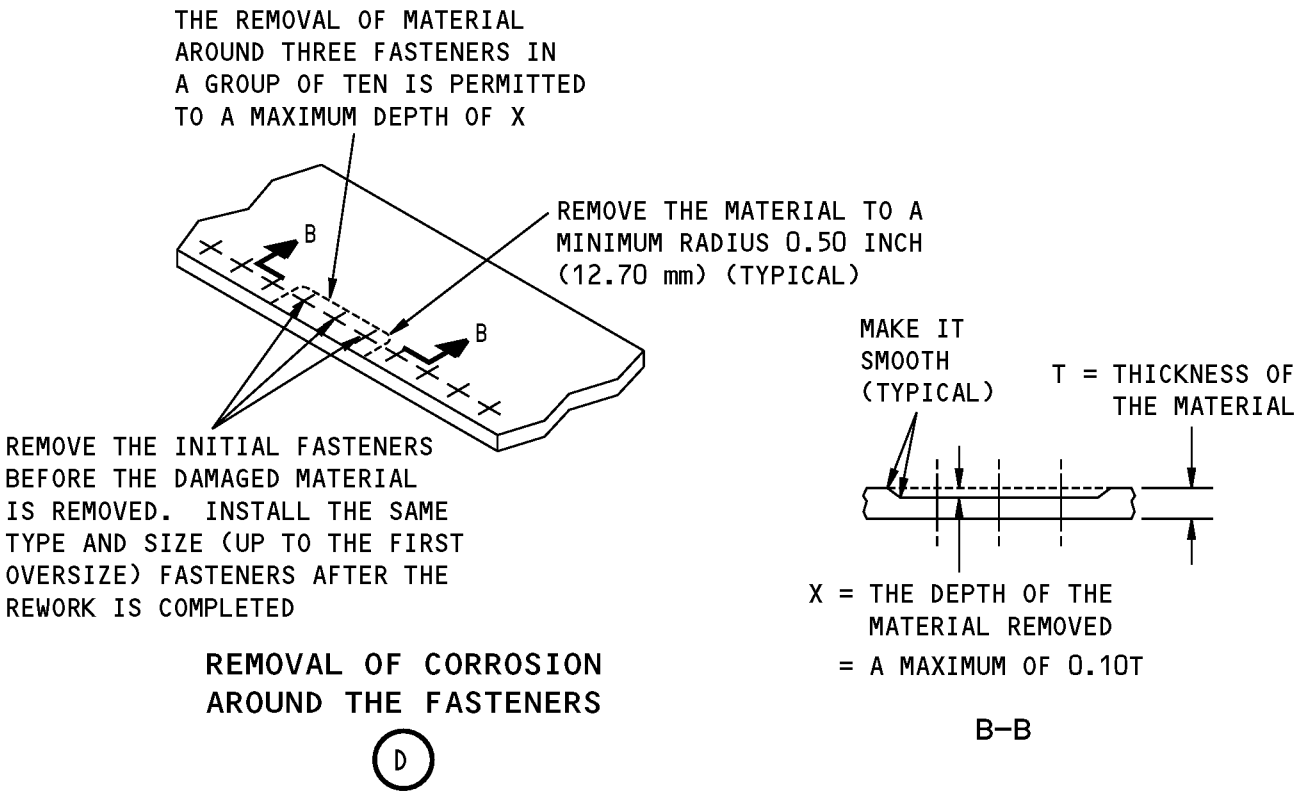
B

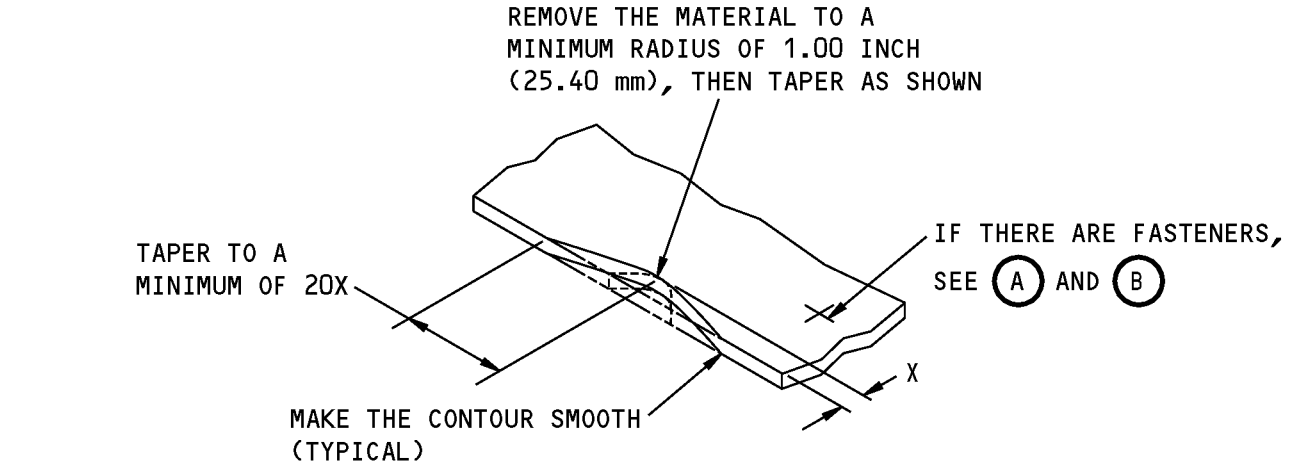


REMOVAL OF DAMAGED MATERIAL ON A SURFACE

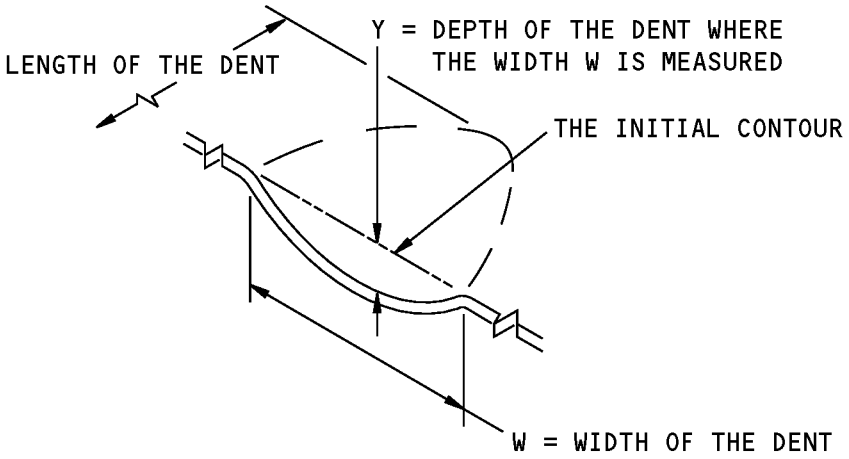
C

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)





Allowable Damage Limits
Figure 103 (Sheet 2 of 3)



A. DENTS ARE PERMITTED IF:

(1) THEY ARE SMOOTH AND HAVE NO SHARP CREASES, GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.

(2) $\frac{W}{Y}$ IS MORE THAN 30 AT ALL LOCATIONS ALONG THE DENT WHERE:
Y = A MAXIMUM OF 0.125 INCH (3.2 mm) AND
THE SUM OF THE LENGTH AND WIDTH OF THE DENT IS 4.00 INCHES (101.6 mm) OR LESS.

B. IF THE DAMAGE DOES NOT AGREE WITH THE CONDITIONS ABOVE, THEN THE DAMAGE IS PERMITTED FOR A MAXIMUM OF 25 FLIGHT HOURS IF:

(1) THE DENT HAS A CREASE LESS THAN 3.00 INCHES (76.2 mm)

(2) Y IS LESS THAN 1.00 INCH (25.4 mm)

(3) THE SUM OF THE LENGTH AND THE WIDTH OF THE DENT IS 7.00 INCHES (177.8 mm) OR LESS.

(4) YOU MUST REPAIR THE DAMAGE AFTER 25 FLIGHT HOURS OR LESS.

DENT THAT IS PERMITTED

F

Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

REPAIR 1 - INLET COWL OUTER BARREL FRAMES

1. Applicability

A. Repair 1 is applicable to damage to a Frame of the Inlet Cowl Outer Barrel. Refer to Inlet Cowl Outer Barrel Frame, Figure 201/REPAIR 1.

2. General

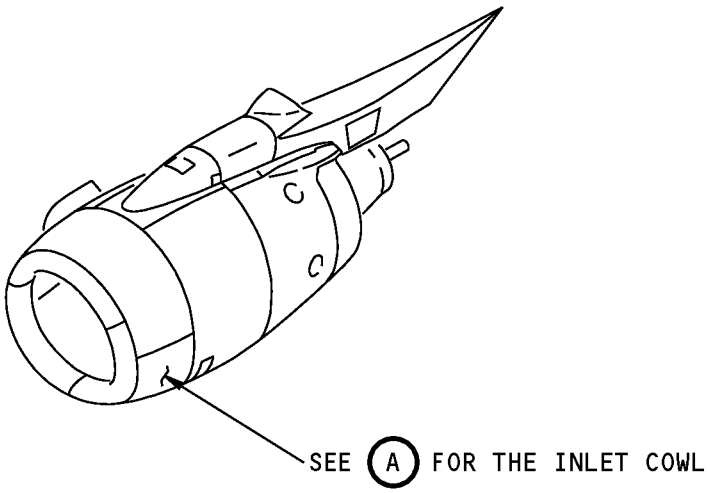
A. Repair 1 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

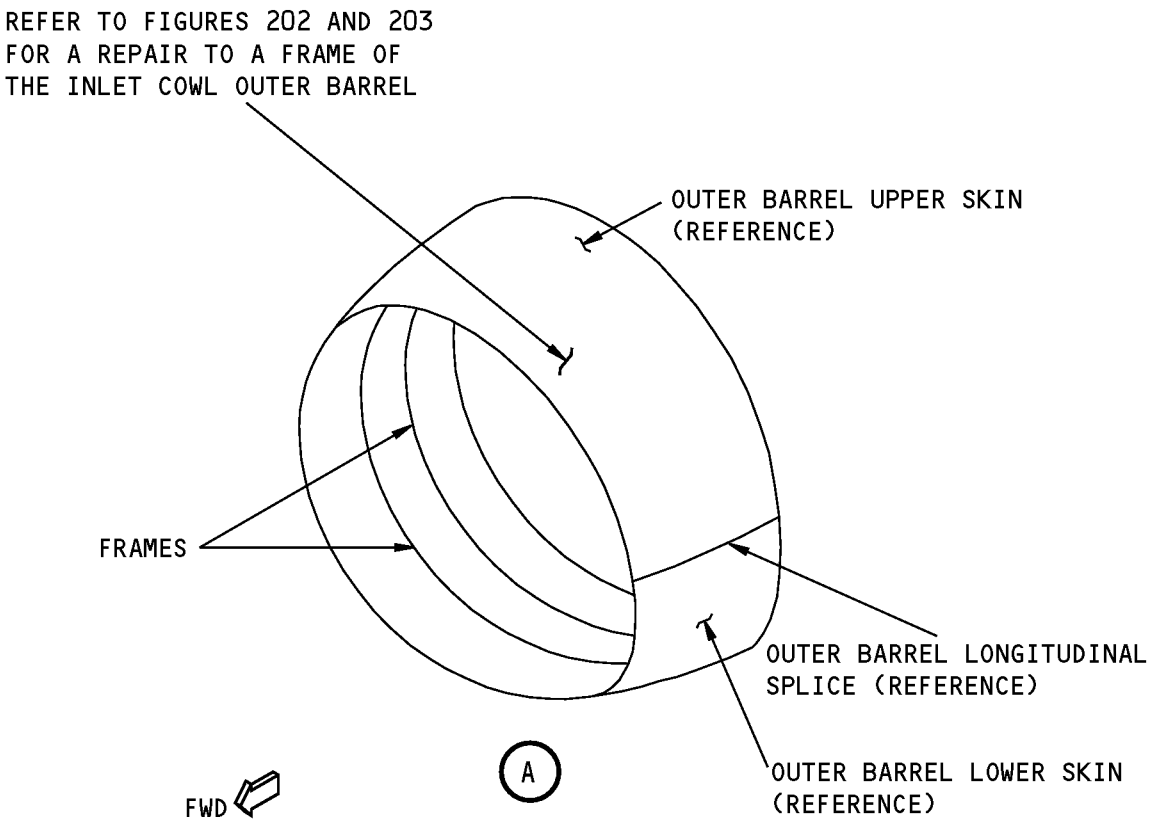
B. The edge of the damage must be a minimum of 4.00 inches (101.6 mm) away from:

(1) The longitudinal splice of the outer barrel

(2) The repair parts of other frame repairs.

C. The length of the frame that is removed must not be more than 12.00 inches (304.8 mm).





Inlet Cowl Outer Barrel Frame
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. Remove the damaged part of the frame. Refer to 51-10-02.

C. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

D. Make the repair parts to the same contour as the initial frame. Refer to Table 201/REPAIR 1 for the materials. Refer to Splice Dimensions, Figure 202/REPAIR 1 for the dimensions of the part [2] and the part [3] splices.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Filler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Splice	1	Use 0.040 inch (1.02 mm) thick 625 nickel alloy
[3]	Splice	1	Use 0.040 inch (1.02 mm) thick 625 nickel alloy

E. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 203/REPAIR 1.

F. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 203/REPAIR 1. Refer to 51-40-05 and 51-40-06.

G. Disassemble the repair parts.

H. Remove the nicks, scratches, and gouges from the initial parts. Refer to 51-10-02.

I. Remove the sharp edges from the initial and repair parts. Refer to BAC 5300, Sonic Edge Finish

J. Apply a chemical conversion coating to the part [1] filler and to the bare surfaces of the initial parts. Refer to 51-20-01.

K. Apply two layers of BMS 10-79, Type III primer to the bare surfaces and edges of the initial and repair parts. Refer to SOPM 20-44-04.

L. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

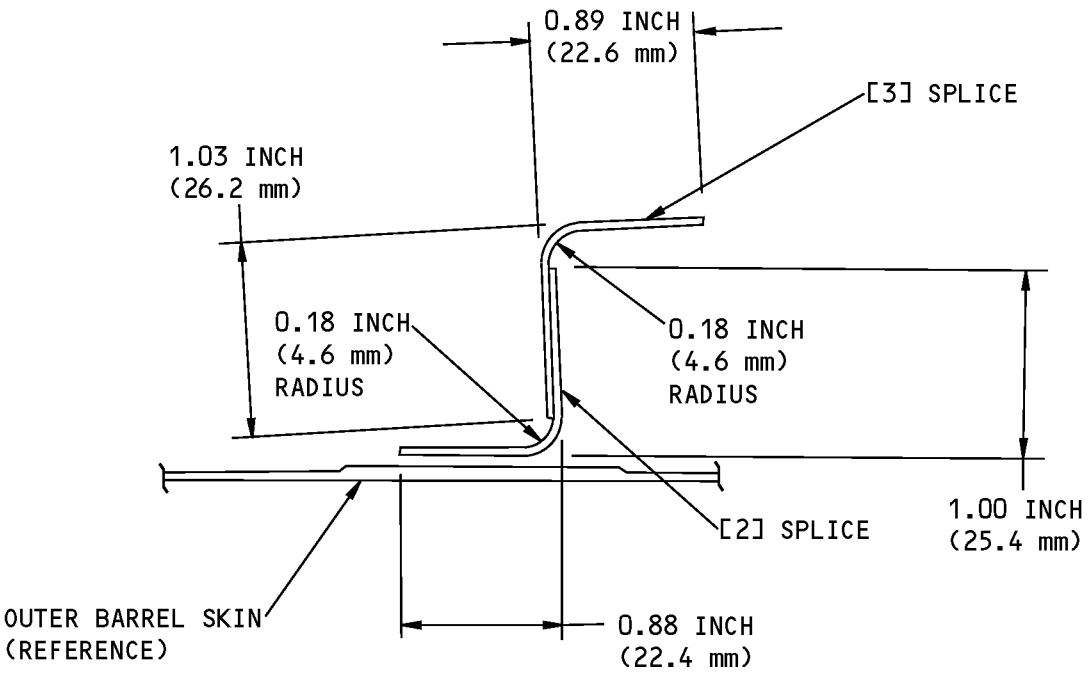
(1) Install the part [1] filler and the part [2] splice on the inlet cowl outer barrel skin.

(2) Install the part [3] splice on the frame.

M. Install the fasteners with BMS 5-95 sealant.

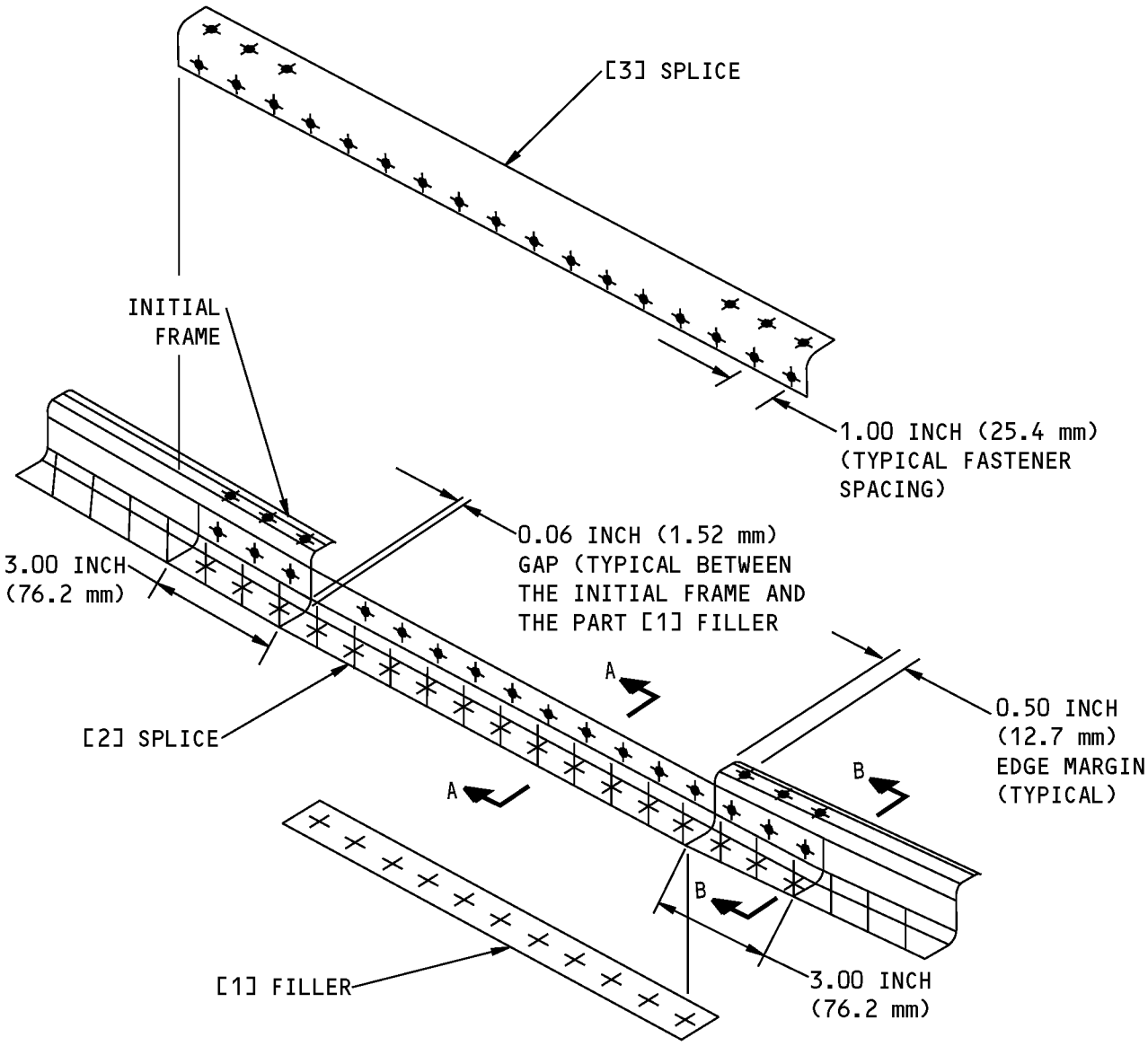
N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



NOTE: MAKE THE LENGTH OF THE SPLICES SUFFICIENT TO GIVE A MINIMUM OF 3 FASTENERS ON BOTH ENDS OF THE REPAIR. REFER TO FIGURE 203.

Splice Dimensions
Figure 202

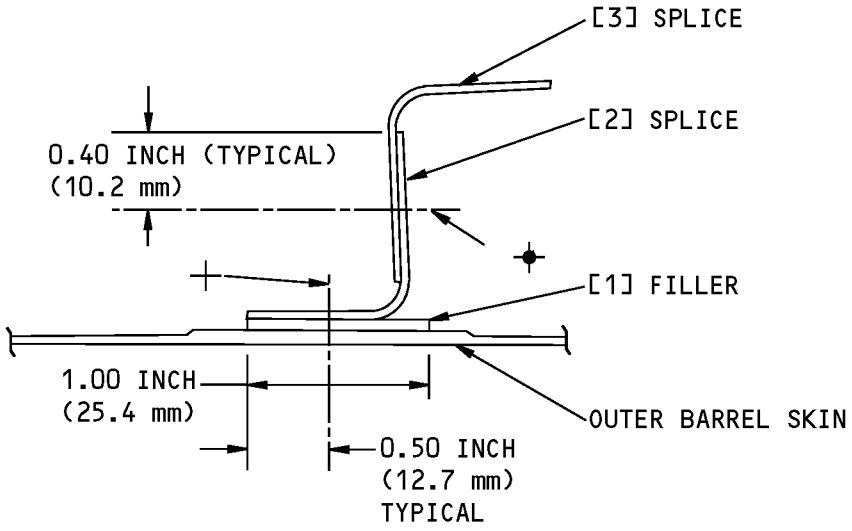


FASTENER SYMBOLS

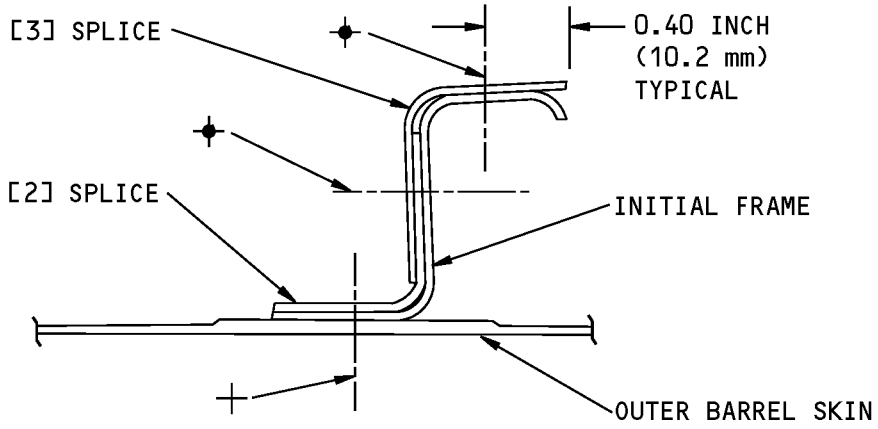
┼ INITIAL FASTENER LOCATION. INSTALL A NAS1200M6-()P RIVET

✦ REPAIR FASTENER LOCATION. INSTALL A MS20615-6MP RIVET.

Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)



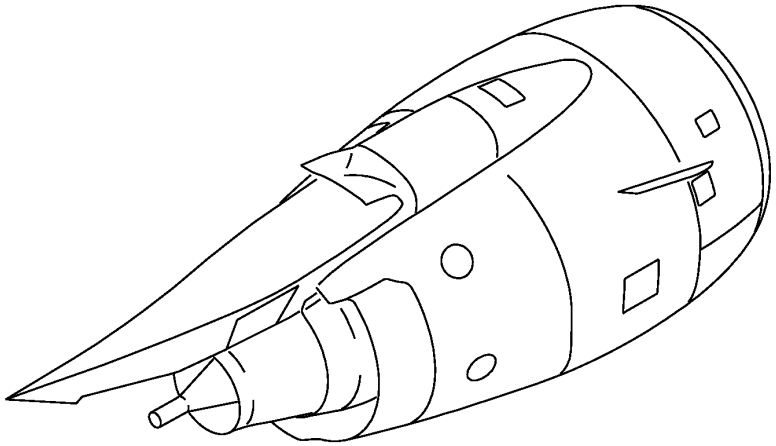
A – A



B – B

Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

IDENTIFICATION 1 - INLET COWL FITTINGS

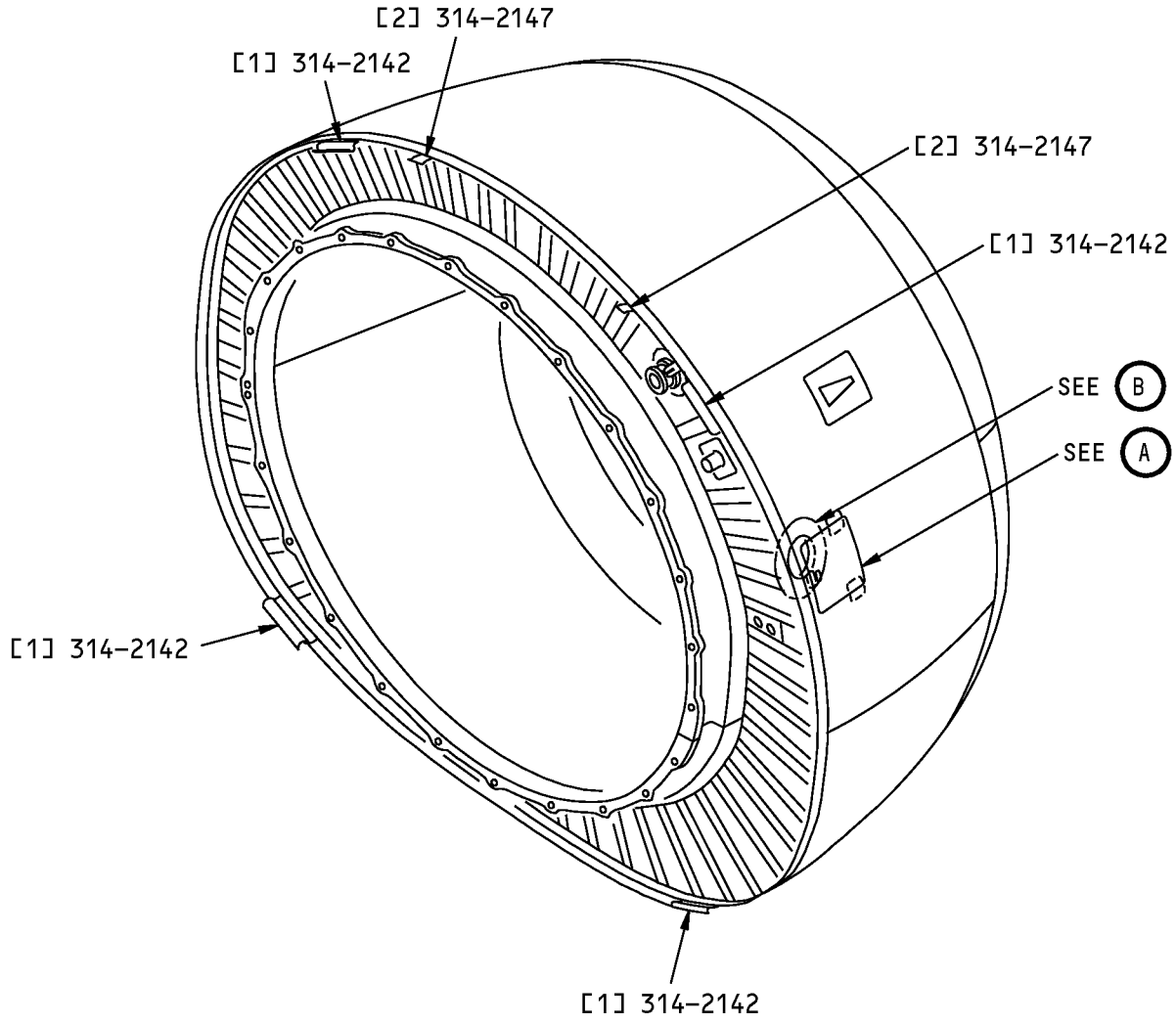


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

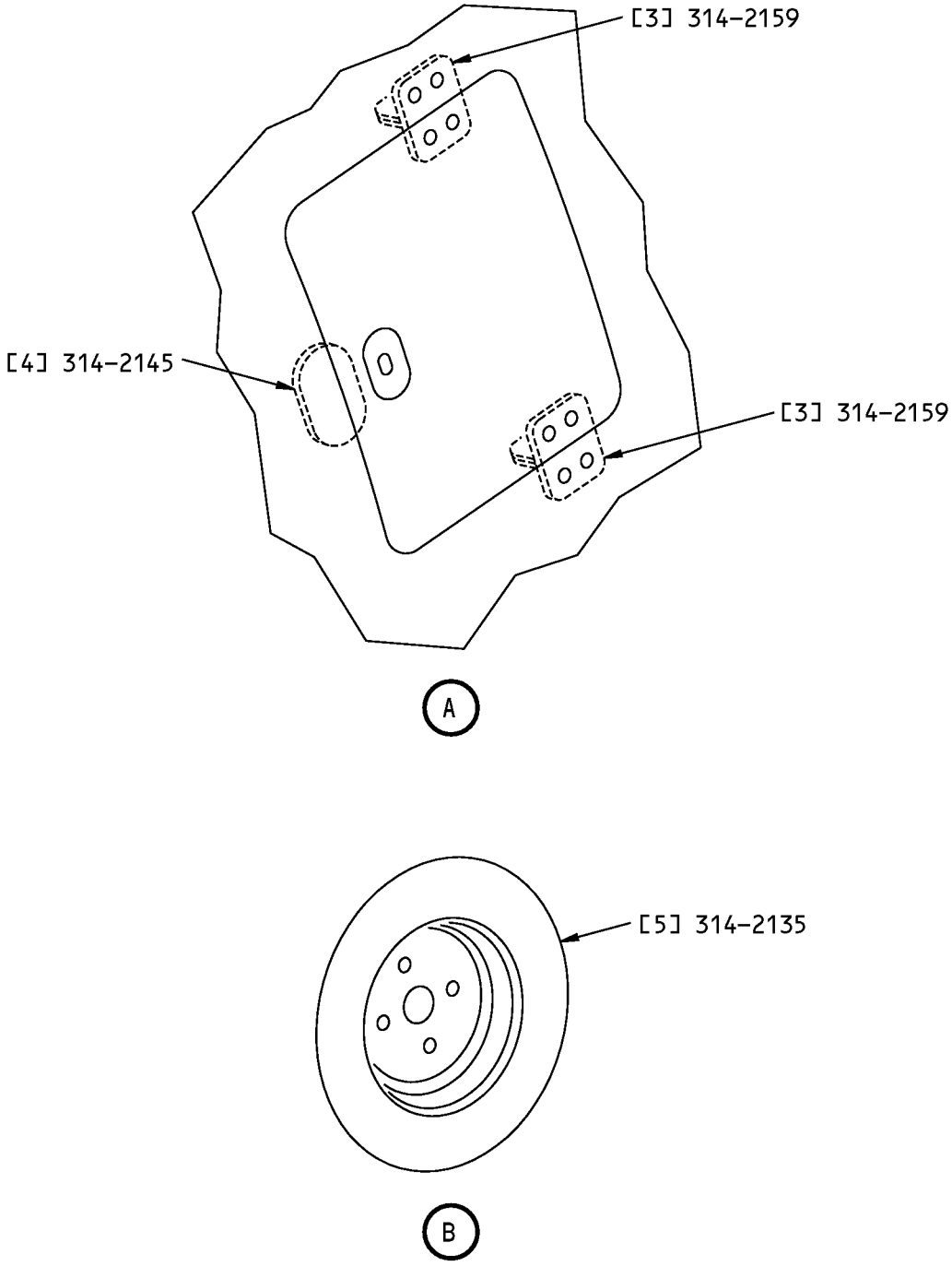
Inlet Cowl Fittings Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
314-2135	Pan Assembly - Support, T12 Sensor
314-2142	Clip, Locators - Inlet
314-2145	Plate, Strike
314-2147	Seal - Spring, Inlet
314-2159	Bracket Assembly - Stop, Pressure Relief Door, Inlet



Inlet Cowl Fittings Identification
Figure 2 (Sheet 1 of 2)



Inlet Cowl Fittings Identification
Figure 2 (Sheet 2 of 2)

Table 2:

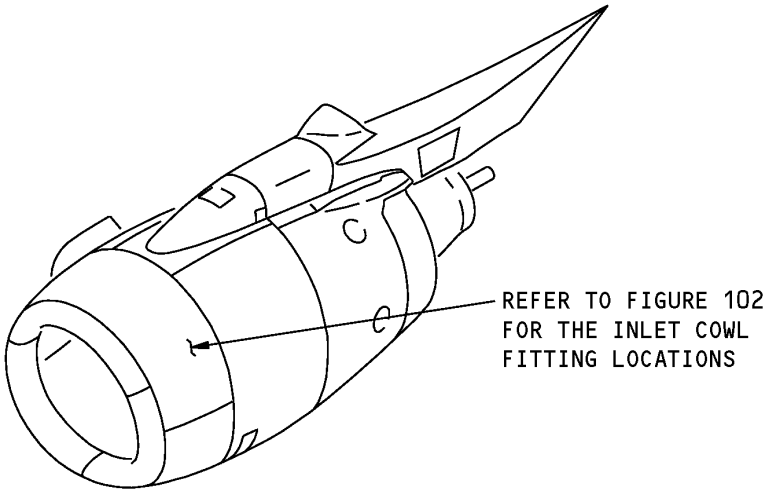
LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Locator Clip		17-4PH CRES casting, H1100 as given in AMS 5342	
[2]	Spring Seal	0.020 (0.51)	301 CRES sheet, 1/4 H as given in AMS 5517	
[3]	Pressure Relief Door Stop Bracket Assembly		2024-T8511 extrusion as given in QQ-A-200/3	
[4]	Strike Plate	0.040 (1.02)	321 CRES sheet, annealed, as given in AMS 5510	
[5]	T12 Sensor Support Pan Assembly	0.050 (1.27)	302 CRES sheet, annealed, as given in AMS 5516	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

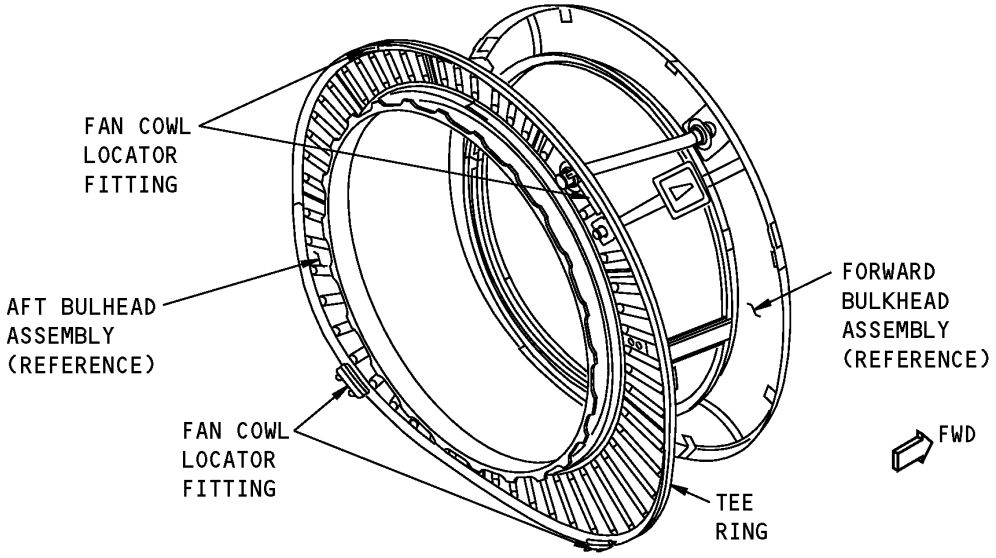
ALLOWABLE DAMAGE 1 - INLET COWL FITTINGS

1. Applicability

A. This subject gives the allowable damage limits for the inlet cowl fittings shown in Inlet Cowl Location, Figure 101/ALLOWABLE DAMAGE 1.



Inlet Cowl Location
Figure 101



LEFT ENGINE INLET COWL STRUCTURE IS SHOWN,
RIGHT ENGINE INLET COWL STRUCTURE IS THE SAME

Inlet Cowl Fitting Locations
Figure 102

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

B. After you remove the damage, do as follows:

(1) Apply two layers of BMS 10-79, Type III primer to the reworked areas as given in SOPM 20-44-04.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Fan Cowl Locator Fittings

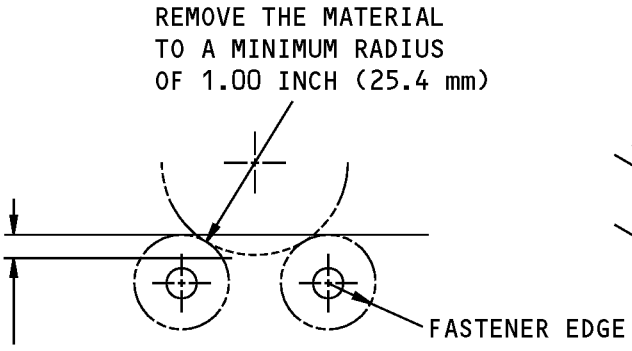
(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits - Inlet Cowl Fittings, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and C .

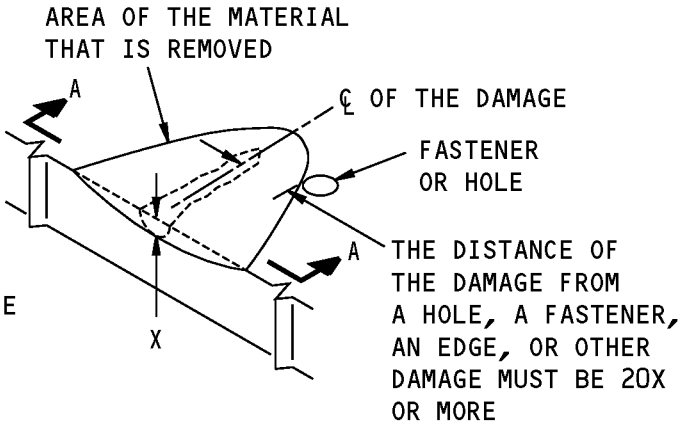
(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.



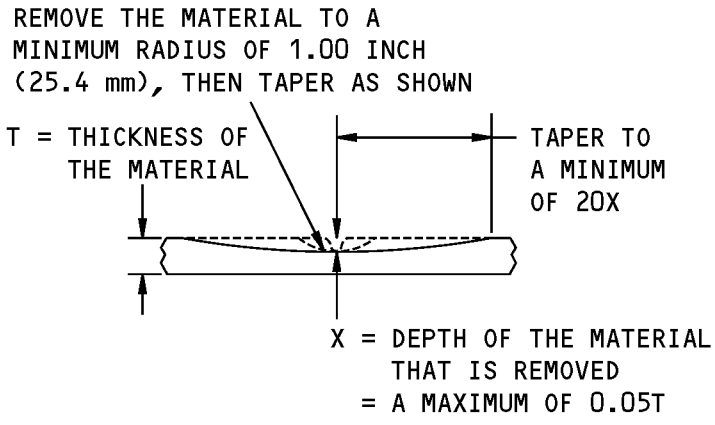
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



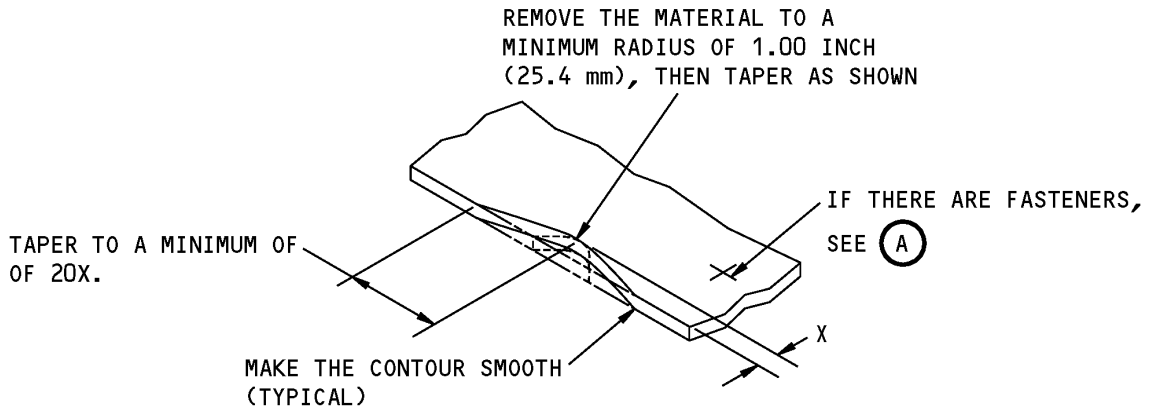
REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(B)



A–A

Allowable Damage Limits - Inlet Cowl Fittings
Figure 103 (Sheet 1 of 2)



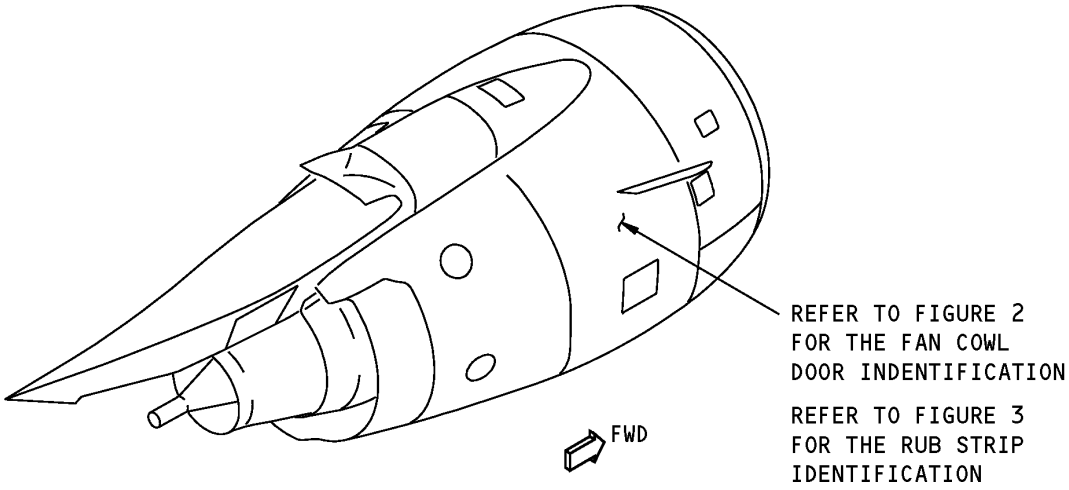
X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

C

Allowable Damage Limits - Inlet Cowl Fittings
Figure 103 (Sheet 2 of 2)

IDENTIFICATION 1 - FAN COWL DOOR SKIN

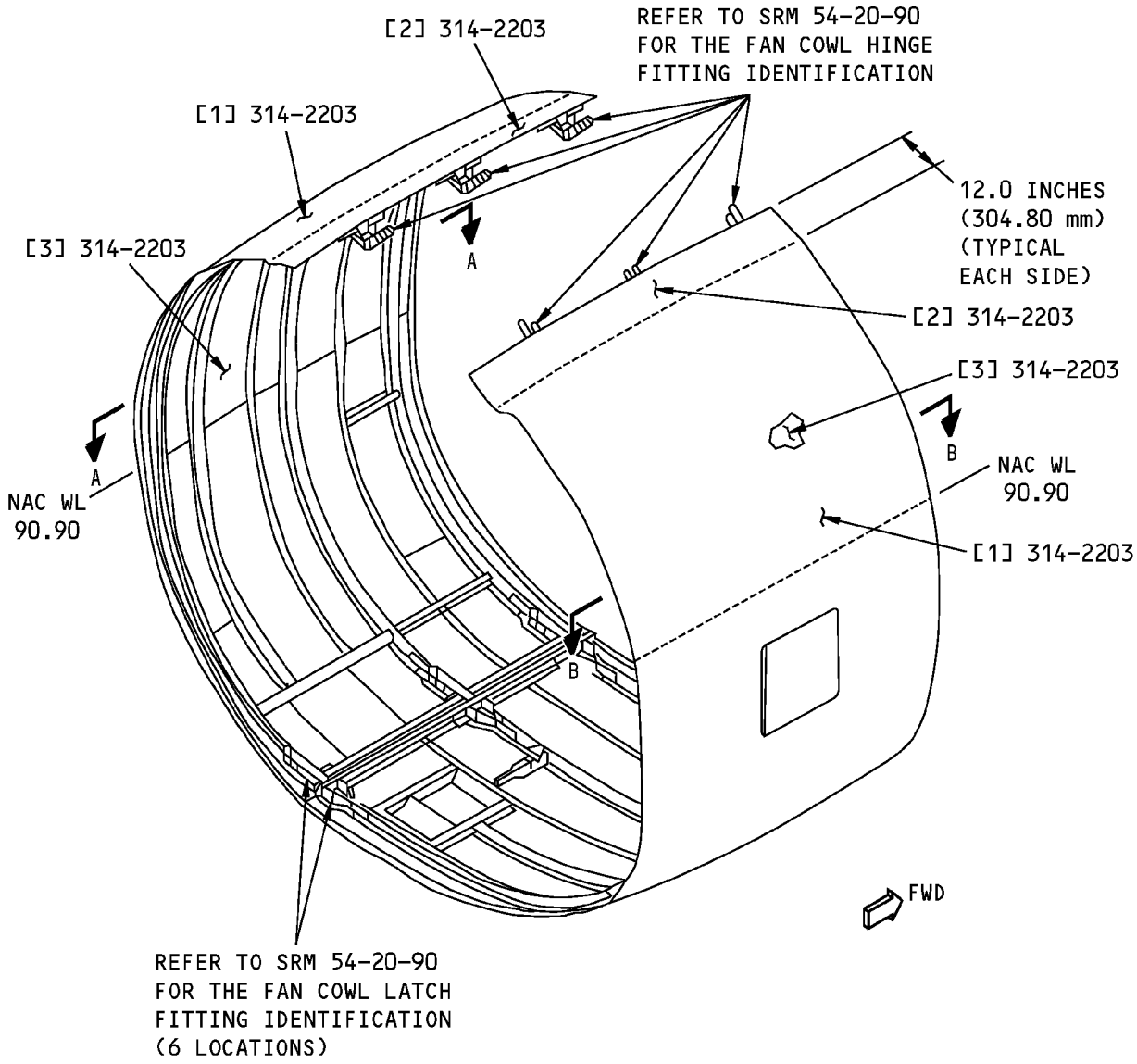


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Fan Cowl Door Skin Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
314-2200	Cowl Assembly - Fan, Left and Right
314-2203	Skin Assembly - Left and Right, Fan Cowl
314-2209	Rub Strip - Fan Cowl

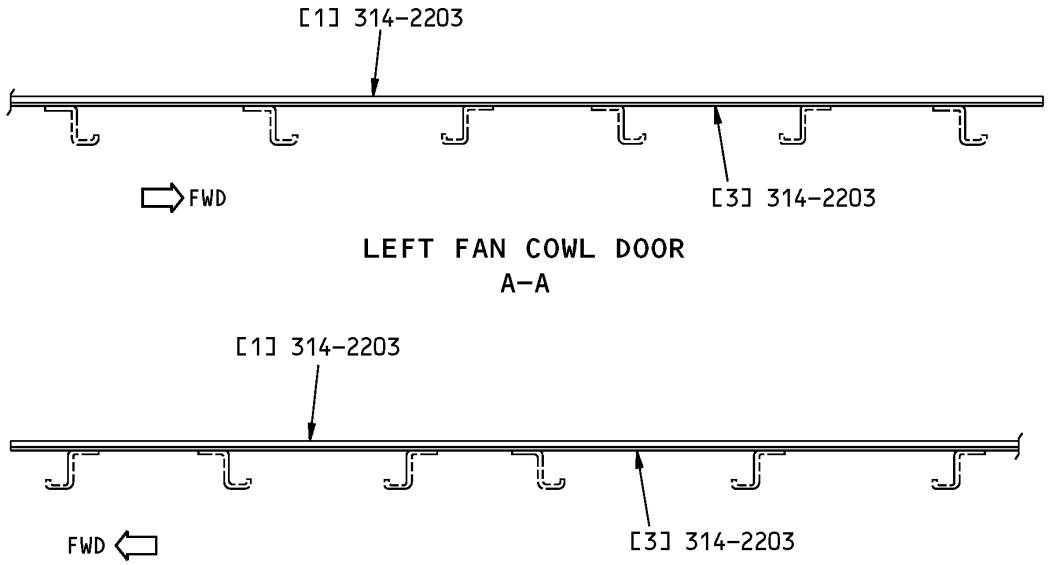


NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

BR-017

Engine Fan Cowl Door Skin Identification
Figure 2 (Sheet 1 of 2)

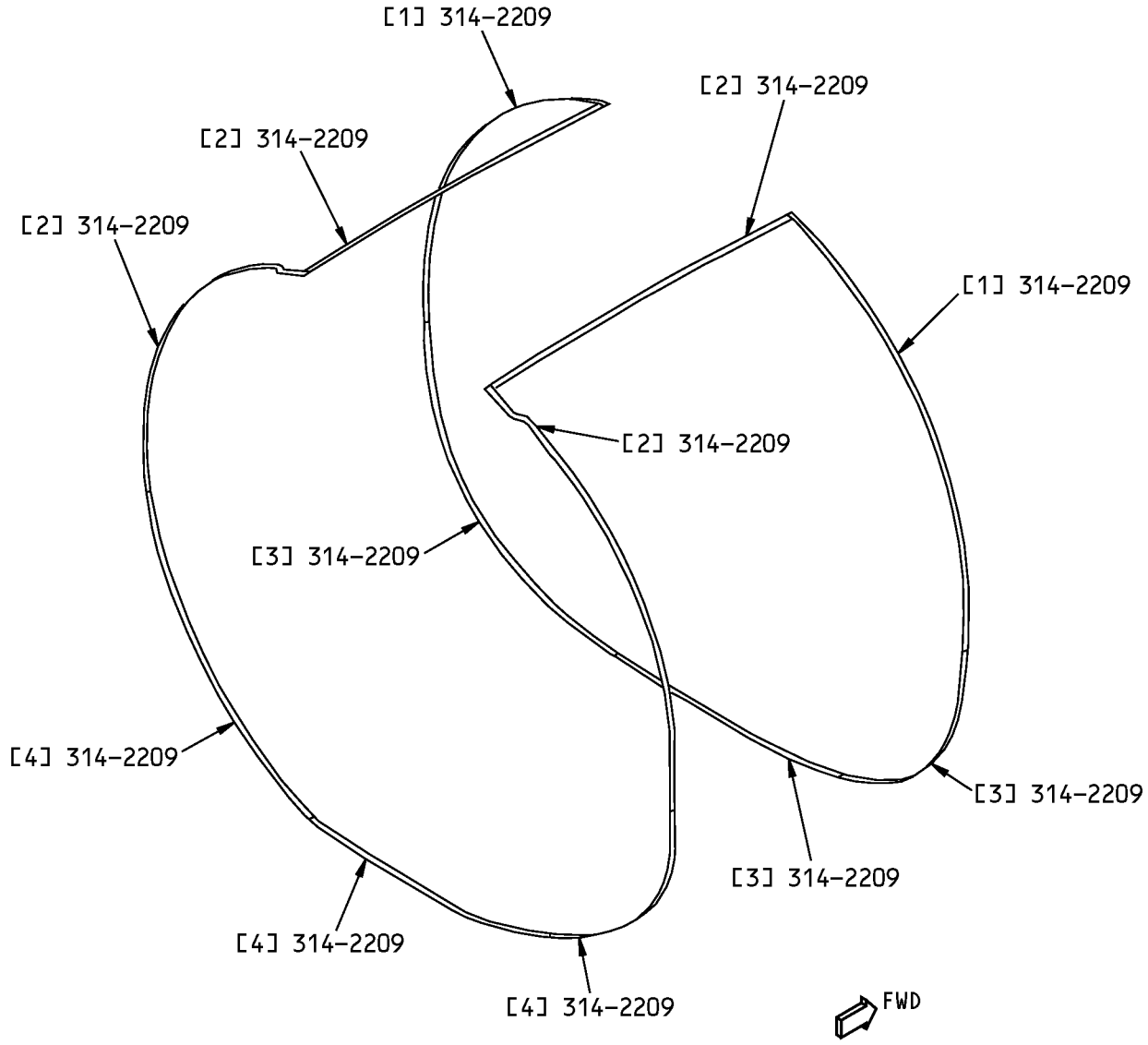


Engine Fan Cowl Door Skin Identification
Figure 2 (Sheet 2 of 2)

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Fan Cowl Door Skin	0.071 (1.80)	2024-T62 sheet, chem-milled to 0.045 (1.14)	
[2]	Fan Cowl Door Skin, Man-Walk Area	0.071 (1.80)	2024-T62 sheet (not chem- milled in this area)	
[3]	Bonded Fireshield (Nacelle Waterline 91.38 and above)	0.005 (0.13)	CRES 321 sheet	Cum Line 1 and 2
		0.005 to 0.020 (0.13 to 0.25)	Nextel, DC90-006	Cum Line 3 to Cum Line 1539
			Fiberglass, 3731/DAPCO 2900, Style 7532, 3732, or 1671	Cum Line 1540 and on

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

Engine Fan Cowl Door Skin Rub Strip Identification
Figure 3

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Rub Strip	0.050 (1.27)	2024-T3 bar, anodized, with a layer of Teflon	
[2]	Rub Strip	0.040 (1.02)	CRES 302 annealed with one layer of tungsten carbide and cobalt plating	
[3]	Rub Strip	0.071 (1.80)	2024-T3 bar, anodized, with a layer of Teflon	
[4]	Rub Strip	0.050 (1.27)	CRES 302 annealed with one layer of tungsten carbide and cobalt plating	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - FAN COWL DOOR SKIN

1. Applicability

A. This subject gives the allowable damage limits for the fan cowl door skin shown in Fan Cowl Skin Locations, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. These Allowable Damage Limits have FAA approval only if the inspections given in this subject are completed at the specified times.

B. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

C. After you remove the damage, do as follows:

(1) Apply a chemical conversion coating to the reworked aluminum areas. Refer to 51-20-01.

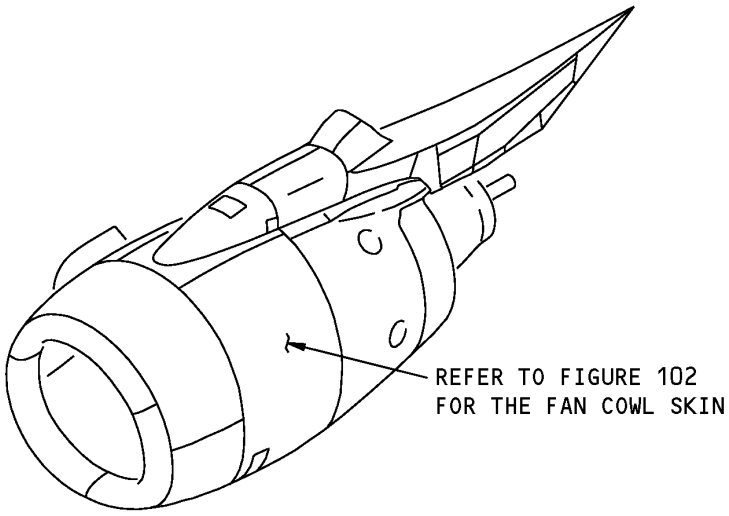
(2) Apply two layers of BMS 10-79, Type III primer on the reworked areas of the CRES fireshield and aluminum skins as given in SOPM 20-44-04.

(3) Apply a finish to the reworked areas of the fan cowl skin panels as given in AMM 51-21-00/701.

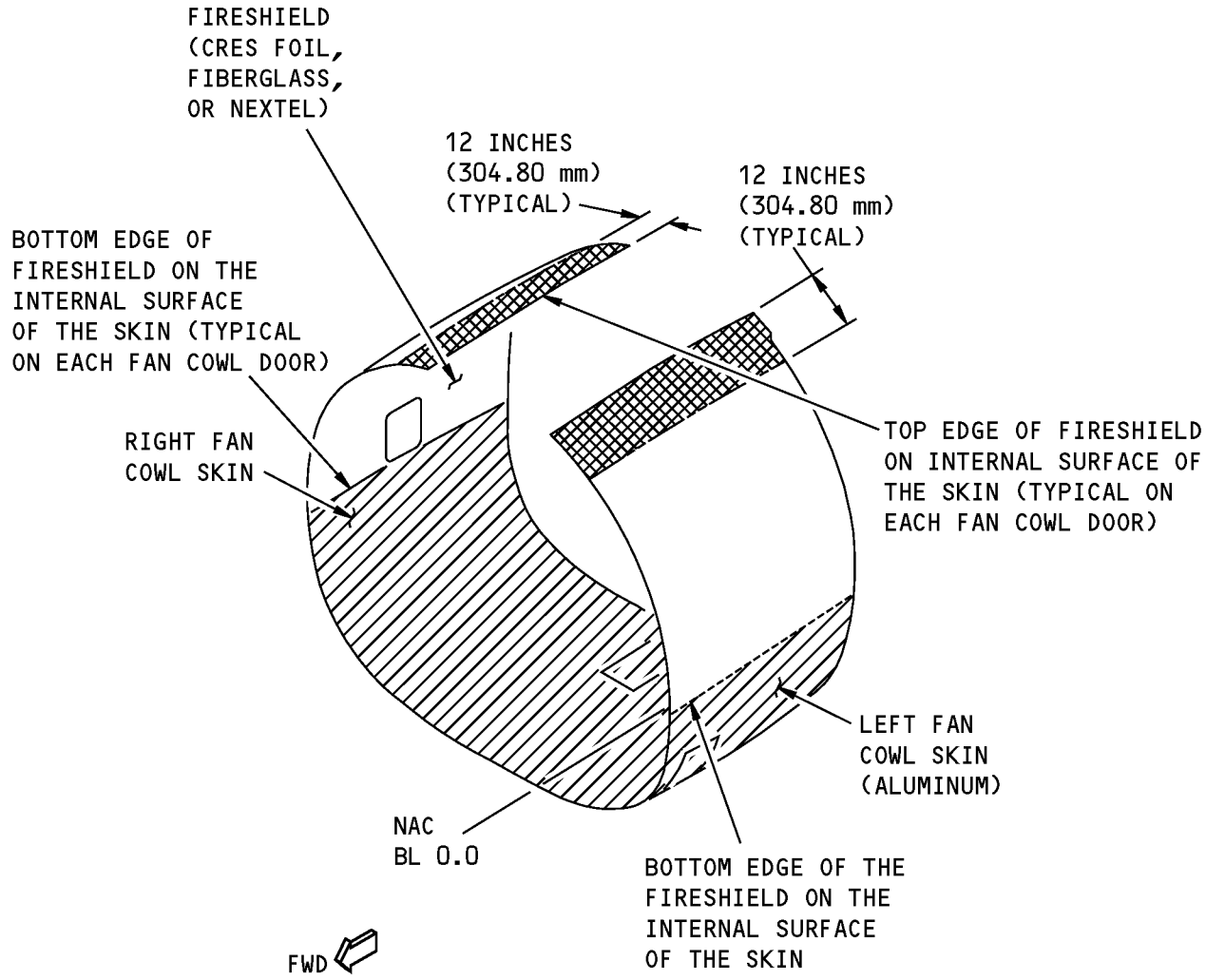
D. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits for the fan cowl door parts.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS	
FAN COWL DOOR SKIN	**PARAGRAPH**
Skin (Aluminum)	4.A
Fireshield (CRES Foil)	4.B
Fireshield (Nextel or Fiberglass)	4.C



Fan Cowl Skin Locations
Figure 101



ZONE A – MAN-WALK AREA

ZONE B – AREA BETWEEN THE BOTTOM EDGE OF THE MAN-WALK AREA AND THE BOTTOM EDGE OF THE FIRESHIELD

ZONE C – AREA BELOW THE FIRESHIELD AND NAC BL 0.0 FOR EACH FAN COWL DOOR

LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

Fan Cowl Door Skin Zones
Figure 102

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Fan Cowl Skin

(1) Cracks:

(a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(b) Surface cracks up to a maximum of 1.00 inch (25.4 mm) in length are permitted if:

1) You stop drill 0.19 inch (4.83 mm) diameter holes at each end of the crack

2) The damage is a minimum of 6.00 inches (152.4 mm) away from a hinge or a latch fitting

3) The damage is a minimum of 3.00 inches (76.2 mm) away from an access door cutout, the chine, or the edge of the skin

4) There are not more than 6 cracks on one fan cowl door skin

5) The damage is a minimum of 8.00 inches (203.2 mm) from adjacent cracks

6) You make an inspection of the damage at each 25 flight cycles.

7) You make a permanent repair if the crack becomes larger in length.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

NOTE: Do not fill the dents.

(4) Holes and Punctures up to a maximum diameter of 0.25 inch (6.35 mm) are permitted if:

(a) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the panel

(b) You install rivets in the holes wet with BMS 5-63 sealant.

1) Install NAS1200M or MS20615-()MP rivets in Zone A.

2) Install MS20615-()MP rivets in Zones B and C.

B. Fireshield (CRES Foil)

(1) Cracks:

(a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(b) Surface cracks up to a maximum of 1.00 inch (25.4 mm) in length are permitted if:

1) You stop drill 0.19 inch (4.83 mm) diameter holes at each end of the crack

2) The damage is a minimum of 6.00 inches (152.4 mm) away from a hinge or a latch fitting

3) The damage is a minimum of 3.00 inches (76.2 mm) away from an access door cutout, the chine, or the edge of the foil

4) There are not more than 6 cracks on one fan cowl door skin

5) The damage is a minimum of 8.00 inches (203.2 mm) from adjacent cracks

6) You make an inspection of the damage at each 25 flight cycles.

7) You make a permanent repair if the crack becomes larger in length.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Nicks, Gouges, Scratches that do not go completely through the foil are permitted.

(b) Remove corrosion damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details C and D .

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

NOTE: Do not fill the dents.

(4) Holes and Punctures up to a maximum diameter of 0.25 inch (6.35 mm) are permitted if:

(a) You install rivets in the holes wet with BMS 5-63 sealant.

1) Install NAS1200M or MS20615-()MP rivets in Zone A.

2) Install MS20615-()MP rivets in Zone B.

(5) Delamination of the foil from the fan cowl skin is not permitted.

C. Fireshield (Nextel or fiberglass)

(1) Holes or Tears:

(a) Damage that opens the fan cowl door skin to the air is permitted if:

1) The total width of all the damage is not more than 0.125 inch (3.18 mm)

2) The damage is a maximum of 5.00 inches (127.0 mm) in length.

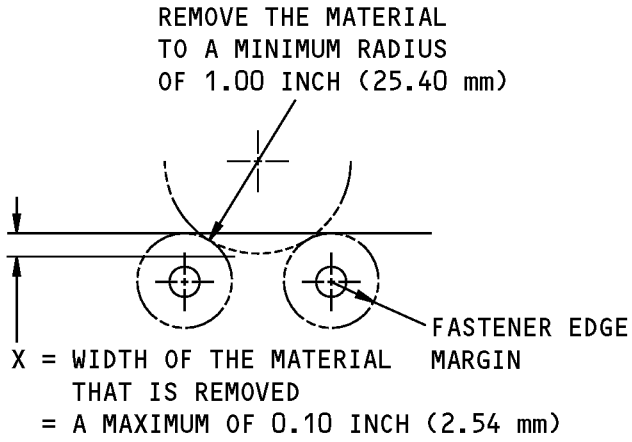
a) Example 1: Two adjacent tears that each measure 5.00 inches (127.0 mm) in length by 0.06 inch (1.52 mm) in width are permitted. Example 2: One tear that measures 5.00 inches (127.0 mm) in length by 0.125 inches (3.18 mm) in width is also permitted.

3) The edge of the damage must be a minimum of 8.00 inches (203.2 mm) away from other hole or tear damage.

4) The total damaged area in each cowl must not be more than 1.50 square inches (6.45 cm^2).

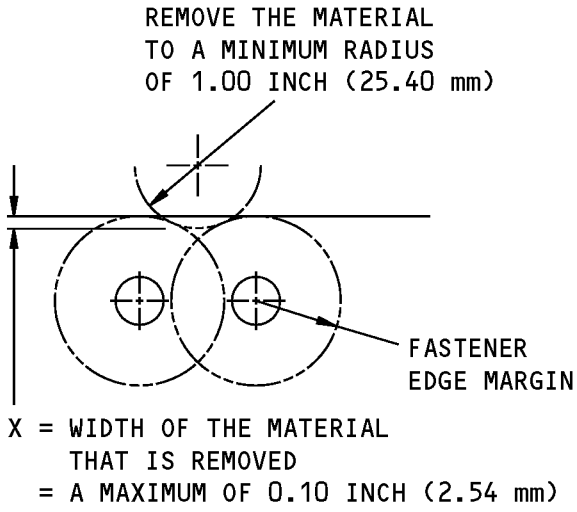
(2) Dents are permitted if there is no delamination of the fireshield from the fan cowl skin.

(3) Delamination of the fireshield from the fan cowl skin is not permitted.



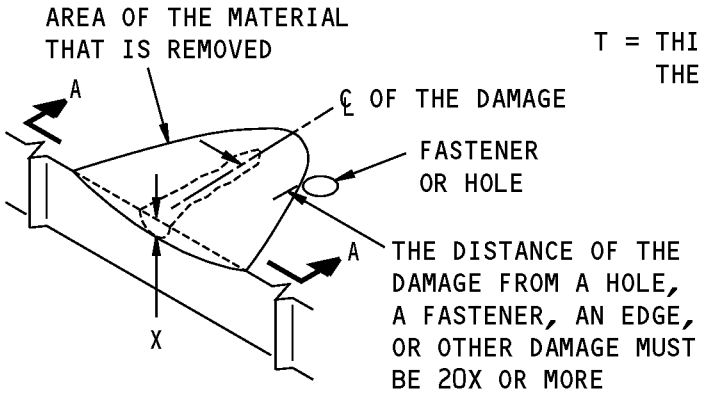
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

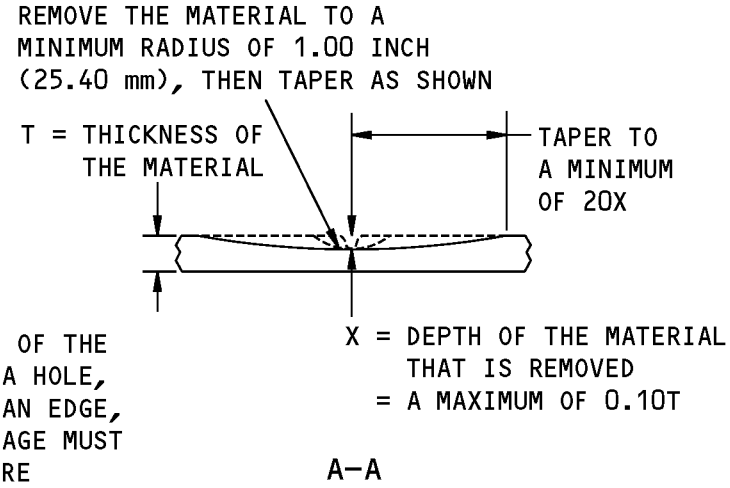
A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

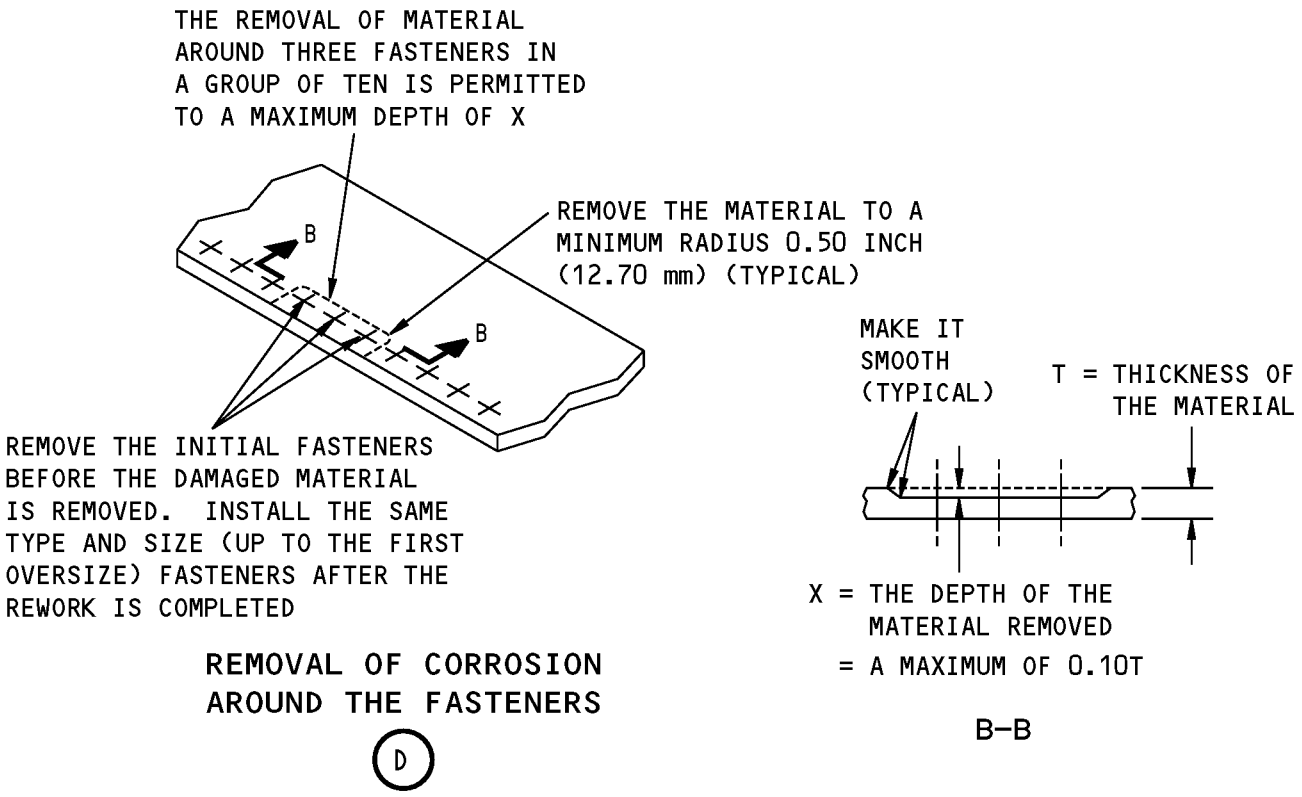




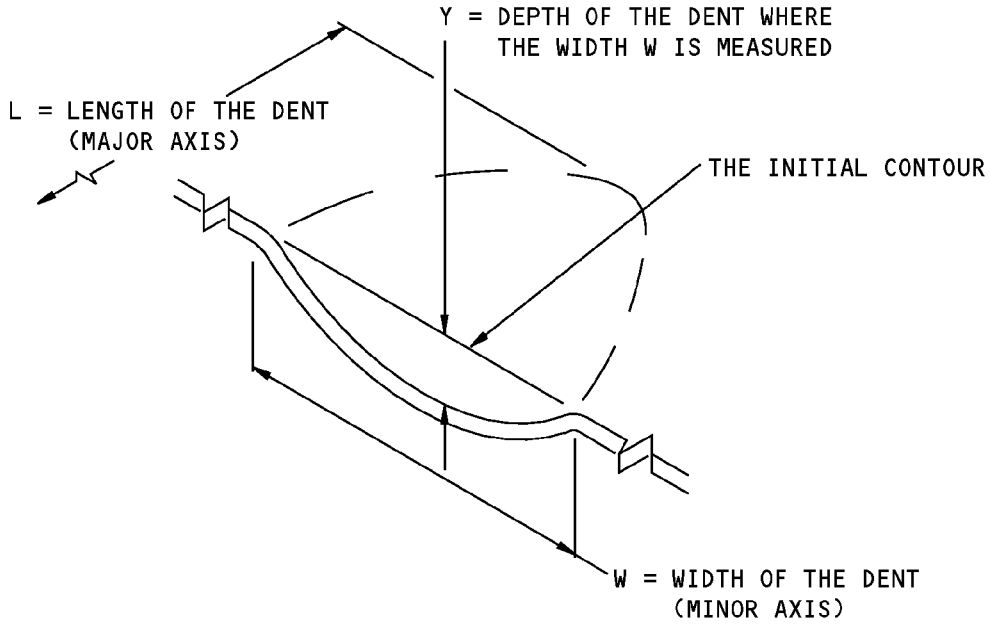
REMOVAL OF DAMAGED MATERIAL ON A SURFACE

C

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)



Allowable Damage Limits
Figure 103 (Sheet 2 of 3)



A. DENTS ARE PERMITTED IF:

(1) THEY ARE SMOOTH AND HAVE NO SHARP CREASES, GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.

(2) $\frac{W}{Y}$ IS MORE THAN 30 AT ALL LOCATIONS ALONG THE DENT WHERE:
Y = A MAXIMUM OF 0.125 INCH (3.18 mm) AND
W = A MAXIMUM OF 4.00 INCHES (101.6 mm)
L = A MAXIMUM OF 4.00 INCHES (101.6 mm)

(3) THERE IS A MAXIMUM OF EIGHT DENTS IN A FAN COWL DOOR AND THERE IS A MINIMUM OF 10.00 INCHES (254.0 mm) BETWEEN THE EDGES OF THE DENTS

B. DENTS THAT ARE MORE THAN THE LIMITS GIVEN IN A. ARE PERMITTED FOR A MAXIMUM OF TWO FLIGHT CYCLES IF:

(1) THEY ARE SMOOTH AND HAVE NO GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.

(2) Y = A MAXIMUM OF 0.25 INCH (6.35 mm) AND
W = A MAXIMUM OF 4.00 INCHES (101.6 mm)
L = A MAXIMUM OF 4.00 INCHES (101.6 mm)

(3) THE DENT HAS A CREASE LENGTH LESS THAN 3.00 INCHES (76.2 mm) IN LENGTH

(4) THERE IS A MAXIMUM OF EIGHT DENTS IN A FAN COWL DOOR AND THERE IS A MINIMUM OF 10.00 INCHES (254.0 mm) BETWEEN THE EDGES OF THE DENTS

DENT THAT IS PERMITTED

F

Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

REPAIR 1 - FAN COWL DOOR SKIN FLUSH REPAIR IN THE FIELD AREA

1. Applicability

A. Repair 1 is applicable to damage that occurs to the skin in the field area of the fan cowl of the engine nacelle. Refer to Fan Cowl Skin Zones, Figure 201/REPAIR 1.

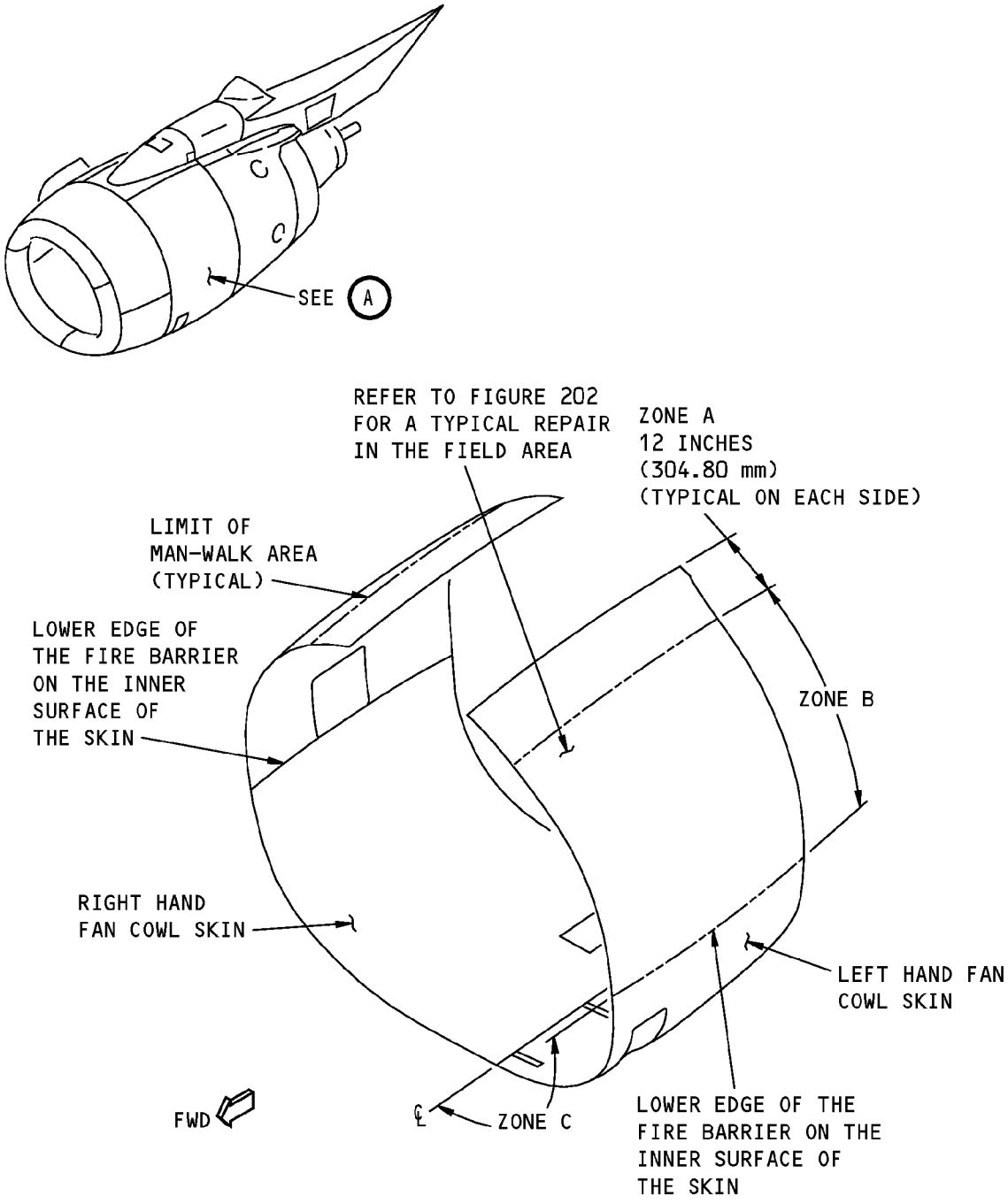
B. The edge of the damage must be a minimum of 1.9 inches (48.26 mm) from a frame, doubler, or chem-mill step.

2. General

A. Repair 1 is a Category A damage tolerant repair.

B. Refer to 51-00-06 to find the definitions of the different categories of repairs.

C. Make sure the aerodynamic smoothness of the repair is satisfactory or there can be a decrease in the economic performance of the airplane.



Fan Cowl Skin Zones
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. Drill a 0.25 inch (6.35 mm) stop hole at the ends of the crack in the damaged skin.

NOTE: The edge of the stop hole must be a minimum of 1.9 inches (48.26 mm) from a frame, doubler, or chem-mill step.

C. Cut out the damaged skin.

(1) Make a radius at the corners of the cutout a minimum of 0.50 inch (12.70 mm).

(2) Do not cause damage to the adjacent internal structure.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 1.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 1.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 1 . Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, gouges, and burrs from the repair parts and the initial skin, and break the sharp edges 0.015 inch to 0.030 inch (0.38 mm to 0.76 mm). Refer to 51-10-02.

J. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

Table 201:

REPAIR MATERIAL			
ITEM	**PART**	**QUANTITY**	**MATERIAL**
[1]	Doubler	1	Use 2024-T3 sheet that is 0.071 inch (1.80 mm) thick
[2]	Repair Skin	1	For Zone A, use 2024-T3 sheet that is 0.071 inch (1.80 mm) thick For Zones B and C use 2024-T3 sheet that is 0.045 inch (1.14 mm) thick
[3]	Foil	1	For Zones A and B, use 0.005 inch (0.13 mm) thick 321 CRES sheet. The foil is not necessary for repairs in Zone C

K. Apply one layer of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)

NOTE: Two layers of primer are necessary for all parts used in Zones A and B.

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the part [1] doubler and the part [2] repair skin

(3) The internal and external surfaces of the part [3] foil in Zones A and B.

L. Install the repair parts. Refer to Table 202/REPAIR 1 for the fasteners you can use.

(1) Install the non-aluminum fasteners in Zones A and B wet with BMS 10-79, Type III primer.

(2) Install the aluminum fasteners in Zone C without sealant.

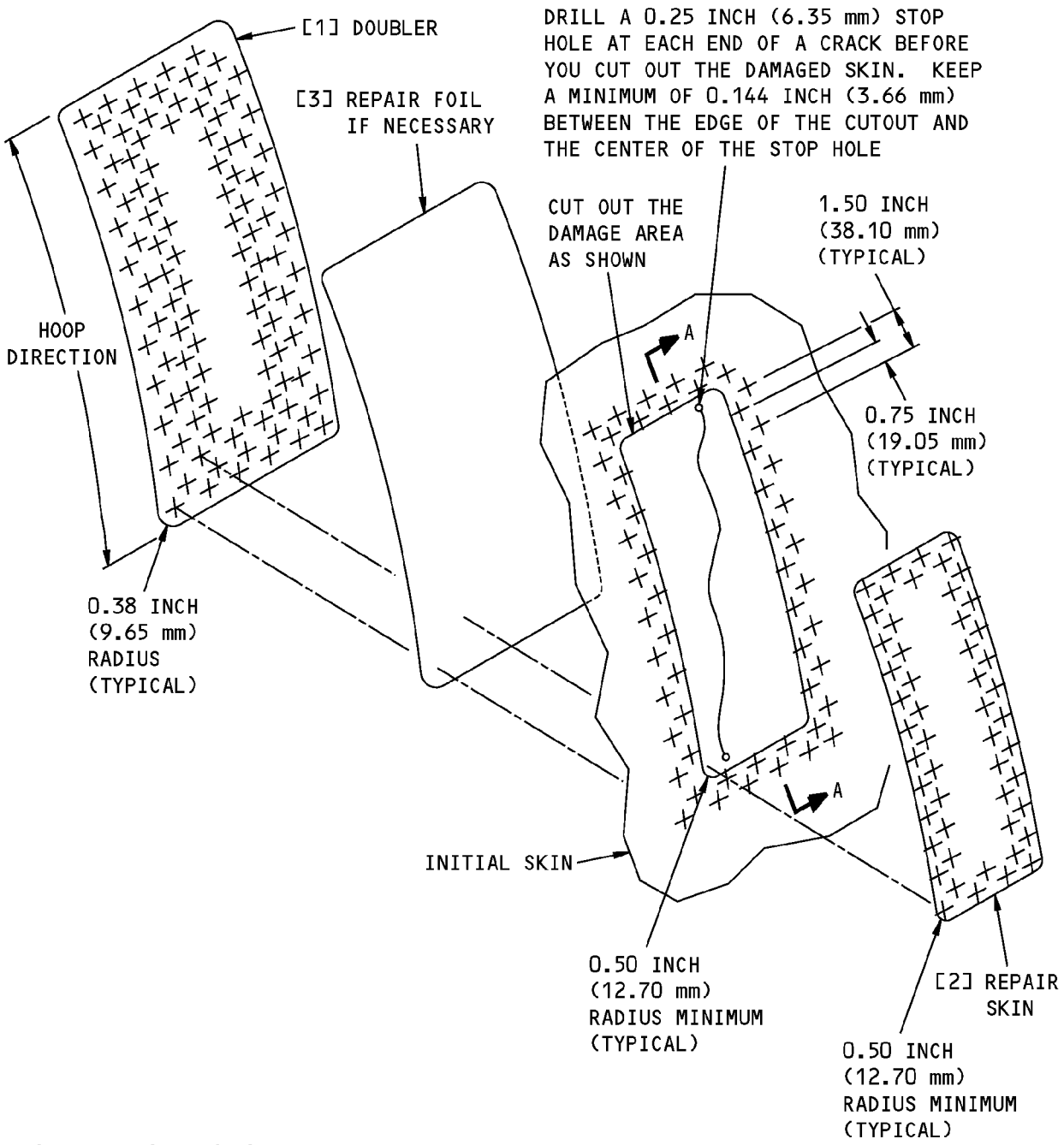
M. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

N. Fill the space between the part [2] repair skin and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

O. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

Table 202:

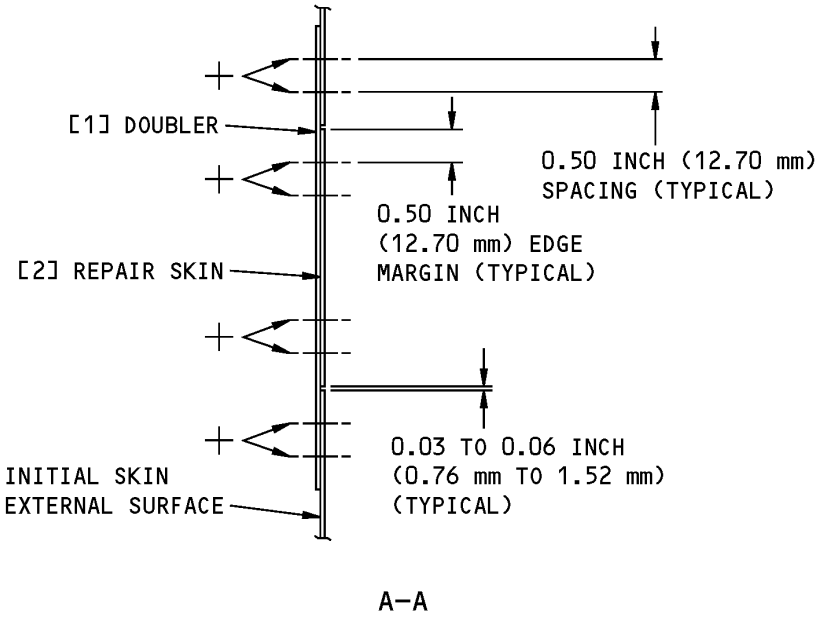
SOLID RIVET FASTENER LOCATION, TYPE AND SIZE	
ZONE	REPAIR FASTENER TYPE AND SIZE
A	NAS1200M6()P (Optional: MS20615-6MP)
B	MS20615-6MP
C	MS20470AD6 (Optional: NAS1097AD6 or BACR15CE6AD for use in 0.071 inch (1.80 mm) thick areas only)



FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. REFER TO TABLE 202 FOR THE FASTENERS.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 2 - FAN COWL SKIN EXTERNAL REPAIR IN THE FIELD AREA

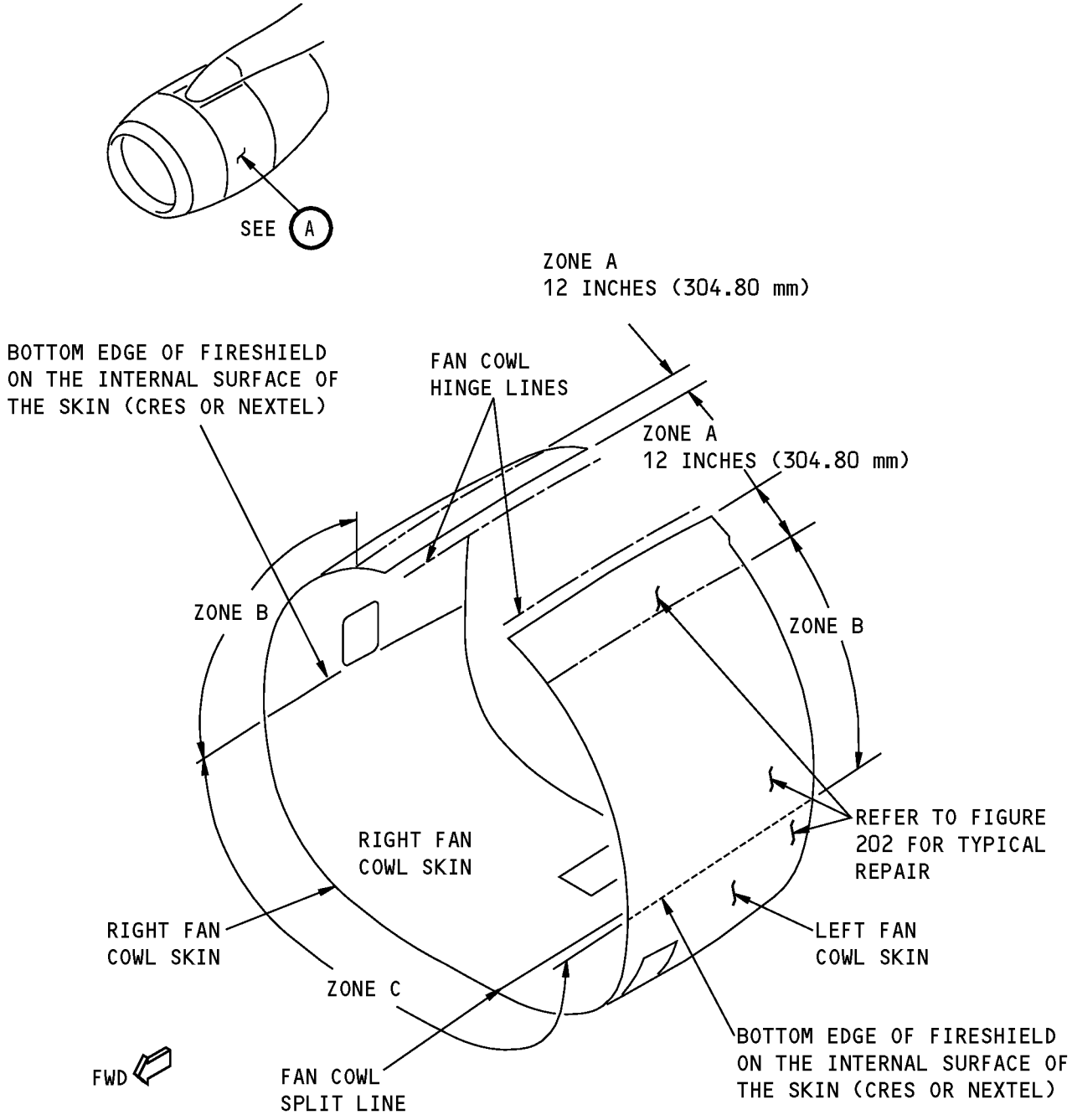
1. Applicability

A. Repair 2 is applicable to damage that is:

(1) On the Fan Cowl External Skin in the field area

(2) Not more than 1.25 inches (31.75 mm) in diameter.

B. Repair 2 is not applicable to damage at the forward or aft edges of the fan cowl skin.



LEFT ENGINE FAN COWL DOORS ARE SHOWN
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

A

Engine Fan Cowl Skin Location
Figure 201

2. General

A. Repair 2 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum doubler diameter is 3.21 inches (81.53 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

C. The edge of the repair doubler must be:

(1) A minimum of 0.50 inch (12.70 mm) from a frame, doubler or chem-mill step.

(2) A minimum of 2.00 inches (50.80 mm) away from the chine (Vortex Control Device)

(3) A minimum of 1.50 inches (38.10 mm) away from zee frames at the fitting attach fastener locations of the fan cowl hinges (forward and aft directions)

(4) A minimum of 3.00 inches (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the cowl hinge line

(5) A minimum of 3.00 inches (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.

D. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 inches (660.40 mm) is equivalent to adding 9 pounds (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gallons (378.53 l) in a year.

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

C. Cut and remove the damaged skin in the shape of a circle with a maximum diameter of 1.25 inches (31.75 mm). Refer to Layout of the Repair Parts, Figure 202/REPAIR 2.

(1) Make sure that the edge of part [1] doubler, when installed, will be a minimum of 0.50 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 2 and Figure 202.

(1) Make the part [2] foil for repairs in zones A and B to the same dimensions as the part [1] doubler.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for Zone A Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for Zones B and C
[2]	Foil	1	Use 0.005 inch (0.13 mm) thick 321 CRES sheet for Zones A and B

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 2.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 2. Refer to 51-40-05 and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.

K. Apply a chemical conversion coating to the part [1] doubler and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 2.

(1) Apply BMS 5-95 sealant between the part [1] doubler and the part [2] foil (Zones A and B). Refer to 51-20-05.

(2) Install fasteners wet with BMS 5-95 sealant.

(a) For a repair in Zone A or B, install NAS1200M6()P or BACR15CE6M rivets.

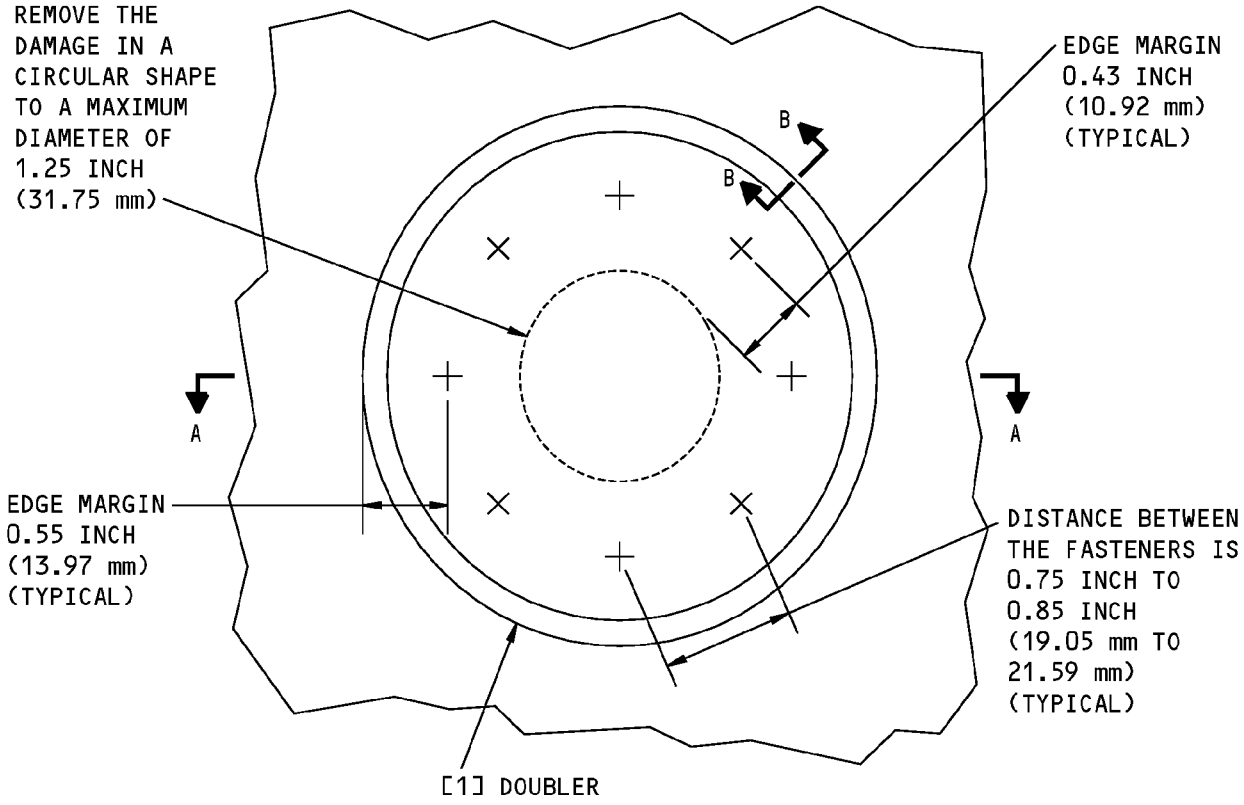
NOTE: Monel rivets in aluminum structure must be cadmium plated. Cadmium plate BACR15CE6M rivets as given in QQ-P-416, Type 1, Class III (0.0002 to 0.0004 inches (0.0051 to 0.0102 mm) thick) prior to installation.

(b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

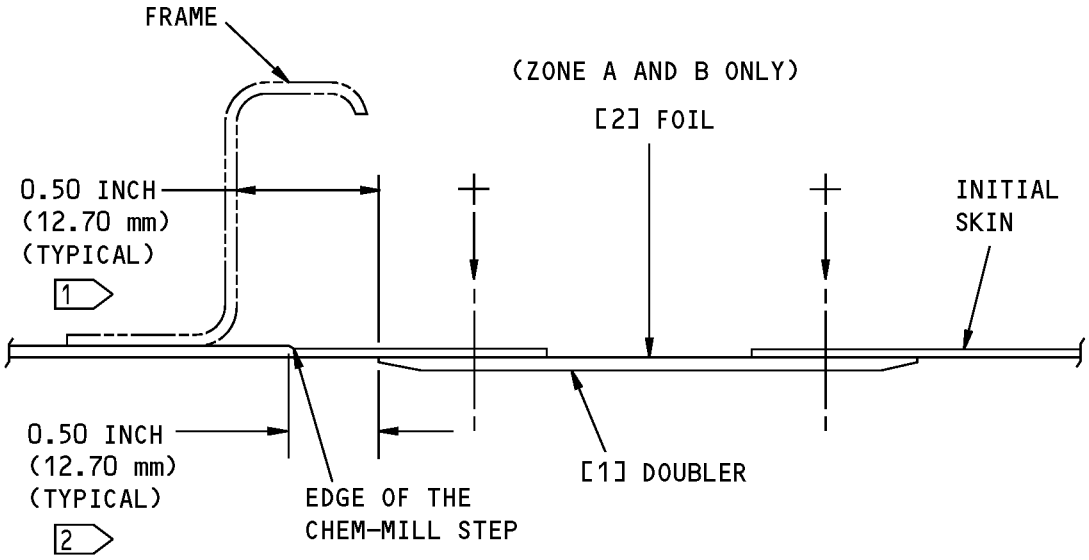
P. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.



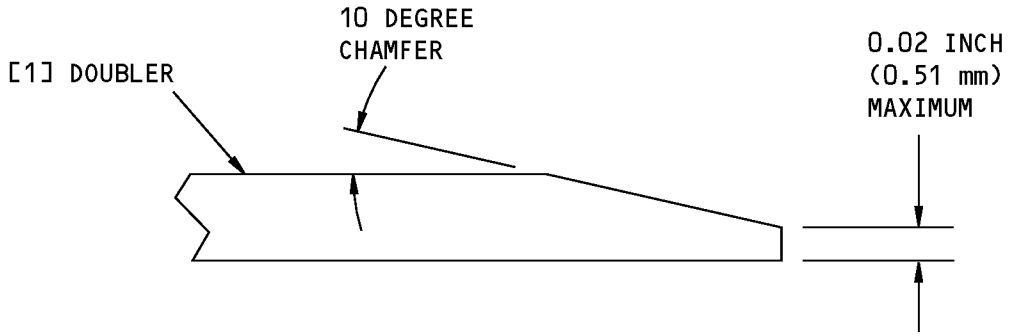
FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR BACR15CE6M (CADIUM PLATED) FLUSH HEADED RIVET, FOR ZONES A AND B. FOR ZONE C INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A-A



B-B

NOTES

1 APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS

2 APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 3 - EXTERNAL REPAIR OF THE FAN COWL DOOR SKIN IN THE FIELD AREA

1. Applicability

A. Repair 3 is applicable to damage that occurs to the skin in the field area of the fan cowl as shown in Engine Fan Cowl Skin Location, Figure 201/REPAIR 3.

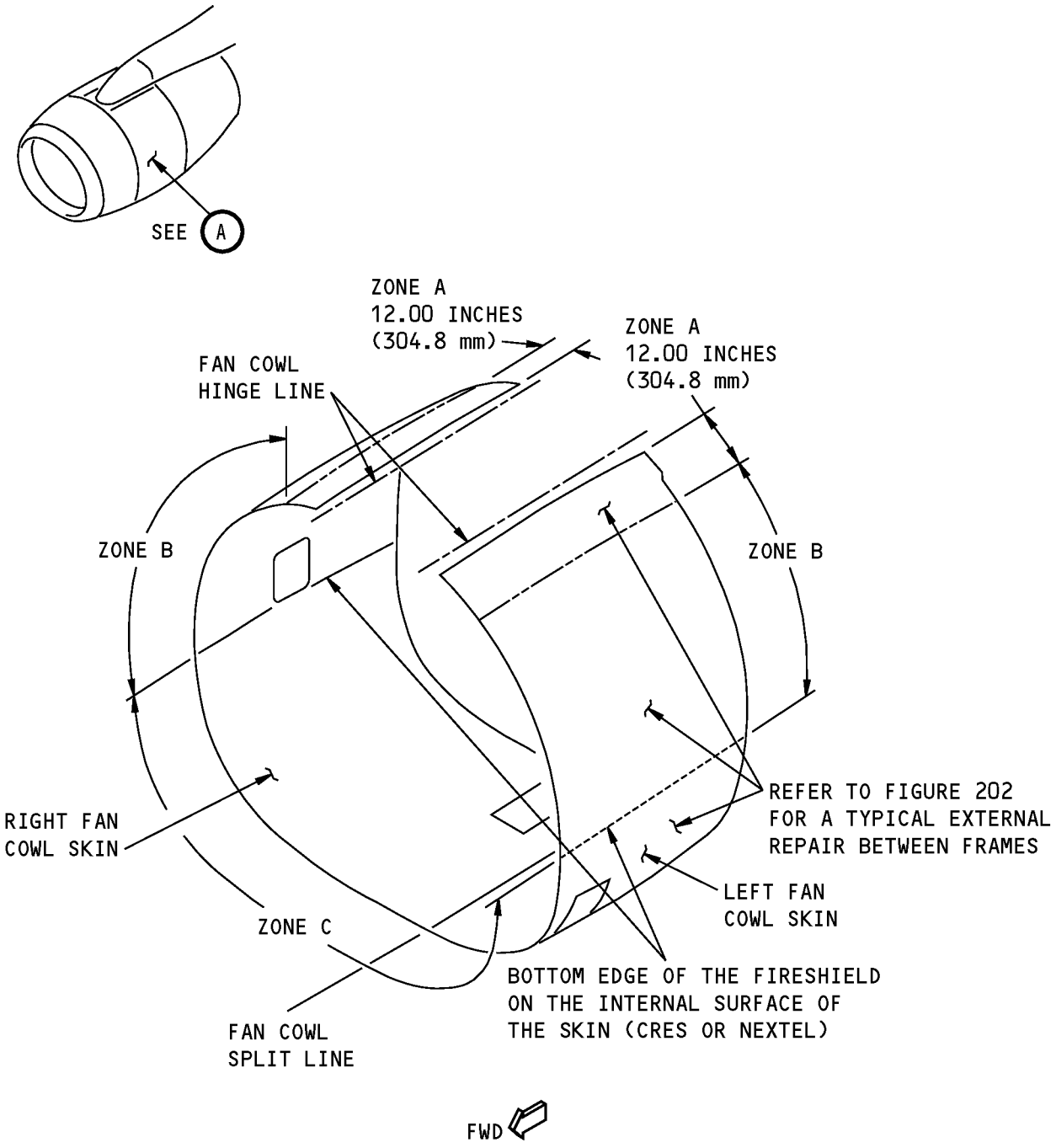
2. General

A. Repair 3 is a Category A damage tolerant repair.

B. Refer to 51-00-06 to find the definitions of the different categories of repairs.

C. The edge of the damage must be a minimum of 1.9 inches (48.26 mm) from a frame, doubler, splice, or chem-mill step.

D. Make sure the aerodynamic smoothness of the repair is satisfactory or there can be a decrease in the economic performance of the airplane.



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. Drill a 0.25 inch (6.35 mm) stop hole at the ends of the crack in the damaged skin. Refer to Layout of the Repair Parts, Figure 202/REPAIR 3.

C. Cut out the damaged skin.

NOTE: The edge of the cutout must be a minimum of 1.9 inches (48.26 mm) from a frame, doubler, splice, or chem-mill step.

(1) Make a radius at the corners of the cutout a minimum of 0.50 inch (12.70 mm).

(2) Do not cause damage to the adjacent internal structure.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 3 for the materials.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 3.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 3. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, gouges, and burrs from the repair parts and the initial skin, and break the sharp edges 0.015 inch to 0.030 inch (0.38 mm to 0.76 mm). Refer to 51-10-02.

J. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

K. Apply two layers of BMS 10-79, Type III primer in Zones A and B to: (Refer to SOPM 20-44-04)

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the part [1] doubler and the part [2] foil if used.

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)

(1) The bare external surfaces of the initial skin in Zone C.

(2) The internal and external surfaces of the part [1] doubler.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 inch (2.03 mm) thick 2024-T3 sheet in Zone A Use 0.063 inch (1.60 mm) thick 2024-T3 sheet in Zones B and C
[2]	Foil	1	Use 0.005 inch (0.13 mm) thick 321 CRES sheet

M. Install the repair parts. Refer to Layout of the Repair Parts, Figure 202/REPAIR 3.

(1) Install non-aluminum fasteners wet with BMS 10-79, Type III primer in Zones A and B.

(2) For a repair in Zone A, install NAS1200M6()P rivets or, as an option, install MS20615-6MP rivets.

(3) For a repair in Zone B, install MS20615-6MP rivets.

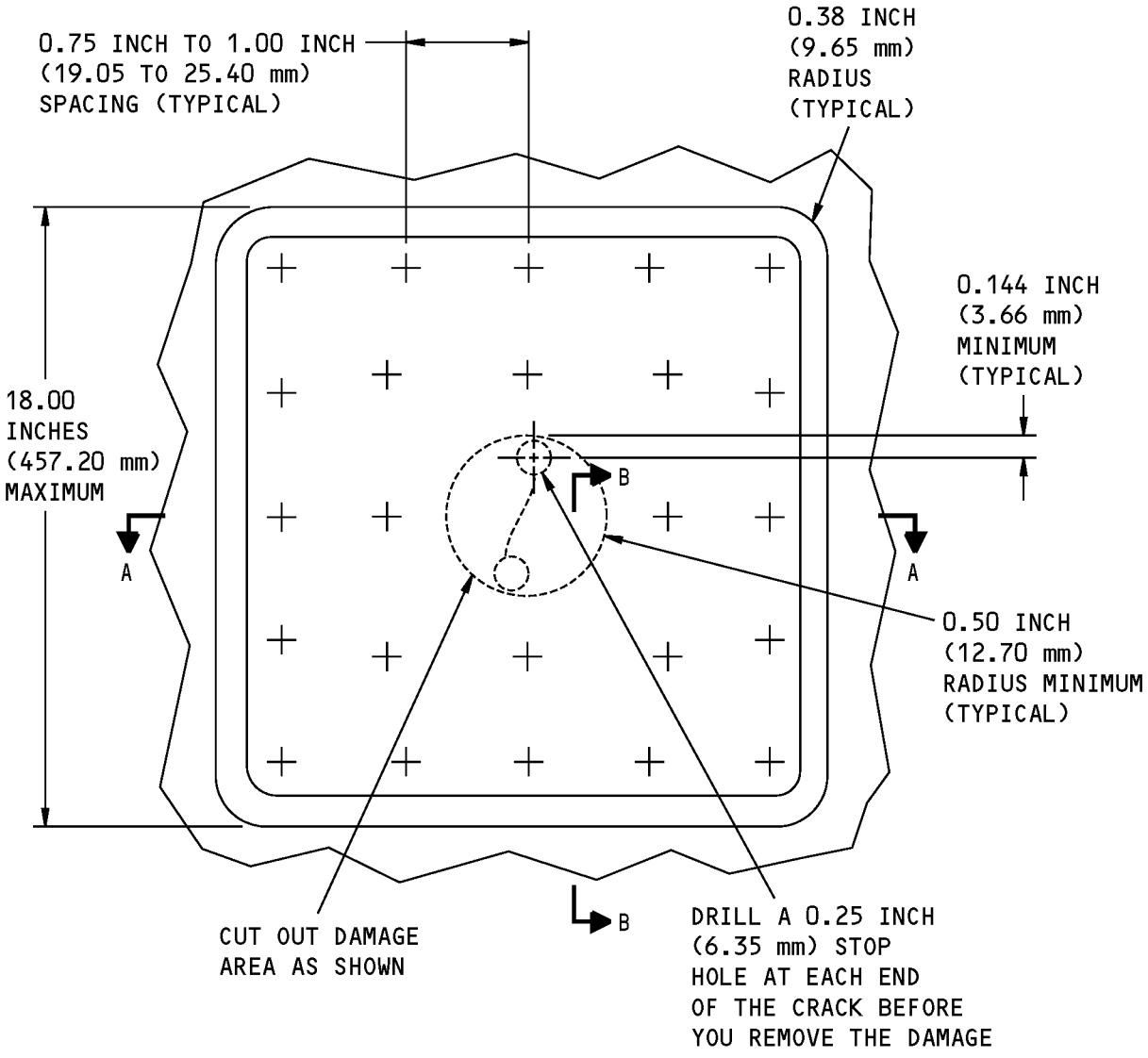
(4) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

N. Apply two layers of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a fillet seal around the part [1] doubler and the part [2] foil with BMS 5-95 sealant. Refer to 51-20-05.

P. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

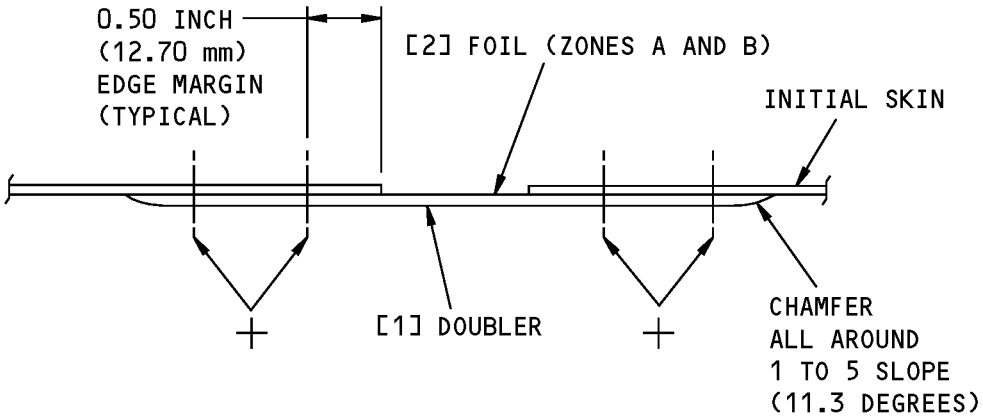
Q. Apply a layer of BMS 3-23 corrosion inhibiting compound to all of the interior structure of the repair area.



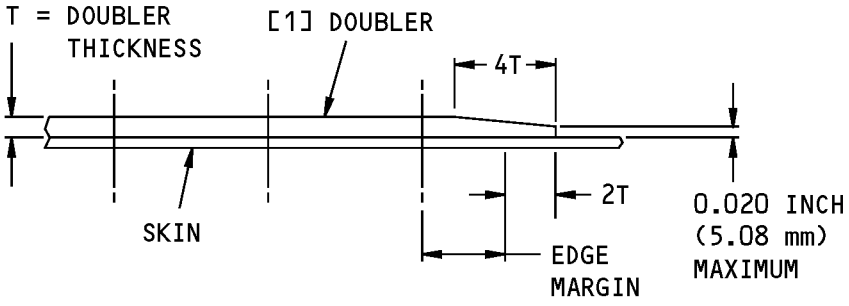
FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. INSTALL A NAS1200M6()P OR MS20615-6MP RIVET FOR REPAIRS IN ZONES A AND B. INSTALL A NAS1097AD6 OR BACR15CE6AD RIVET FOR REPAIRS IN ZONE C.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



VIEW IS ROTATED 90° COUNTERCLOCKWISE

B–B
(TYPICAL)

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 4 - FAN COWL SKIN EXTERNAL REPAIR AT A FRAME

1. Applicability

A. Repair 4 is applicable to damage that is:

(1) On the Fan Cowl Skin at a frame (Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 4)

(2) More than 1.25 inches (31.75 mm) in diameter.

B. Repair 4 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

A. Repair 4 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).

C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

D. The edge of the repair doubler must be:

(1) A minimum of 0.50 inch (12.70 mm) from a frame, doubler or chem-mill step

(2) A minimum of 2.00 inches (50.80 mm) away from the Chine (Vortex Control Device)

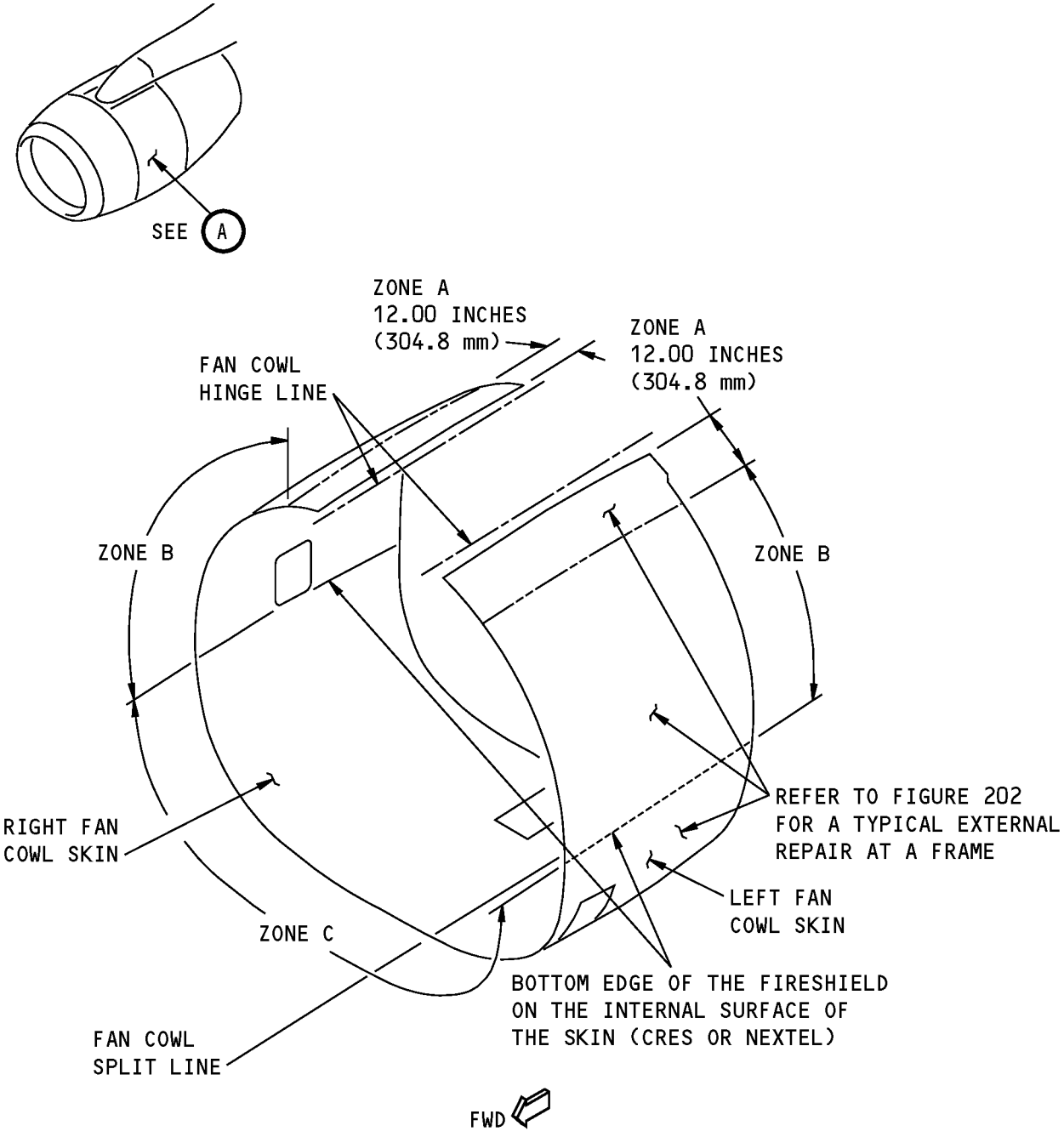
(3) A minimum of 1.50 inches (38.10 mm) away from the zee frames at the fitting attach fastener locations of the fan cowl hinges (forward and aft directions)

(4) A minimum of 3.00 inches (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line

(5) A minimum of 3.00 inches (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.

E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 inches (660.40 mm) is equivalent to adding 9 pounds (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gallons (378.53 l) in a year.

F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

A

Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step.

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 4 and Figure 202.

(1) Make the part [1] doubler.

(2) Make the part [2] foil to the same dimensions as the part [1] doubler.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 4.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 4. Refer to 51-40-05 and 51-40-08.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for Zone A Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for Zones B and C
[2]	Foil	1	Use 0.005 inch (0.13 mm) thick 321 CRES for Zones A and B

H. Disassemble the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300, Sonic Edge Finish.

K. Apply a chemical conversion coating to the part [1] doubler and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 4.

(1) Apply BMS 5-95 sealant between part [1] doubler and part [2] foil (Zones A and B). Refer to 51-20-05.

(2) Install the fasteners wet with BMS 5-95 sealant.

(a) For a repair in Zone A or B, install NAS1200M6()P or BACR15CE6M rivets.

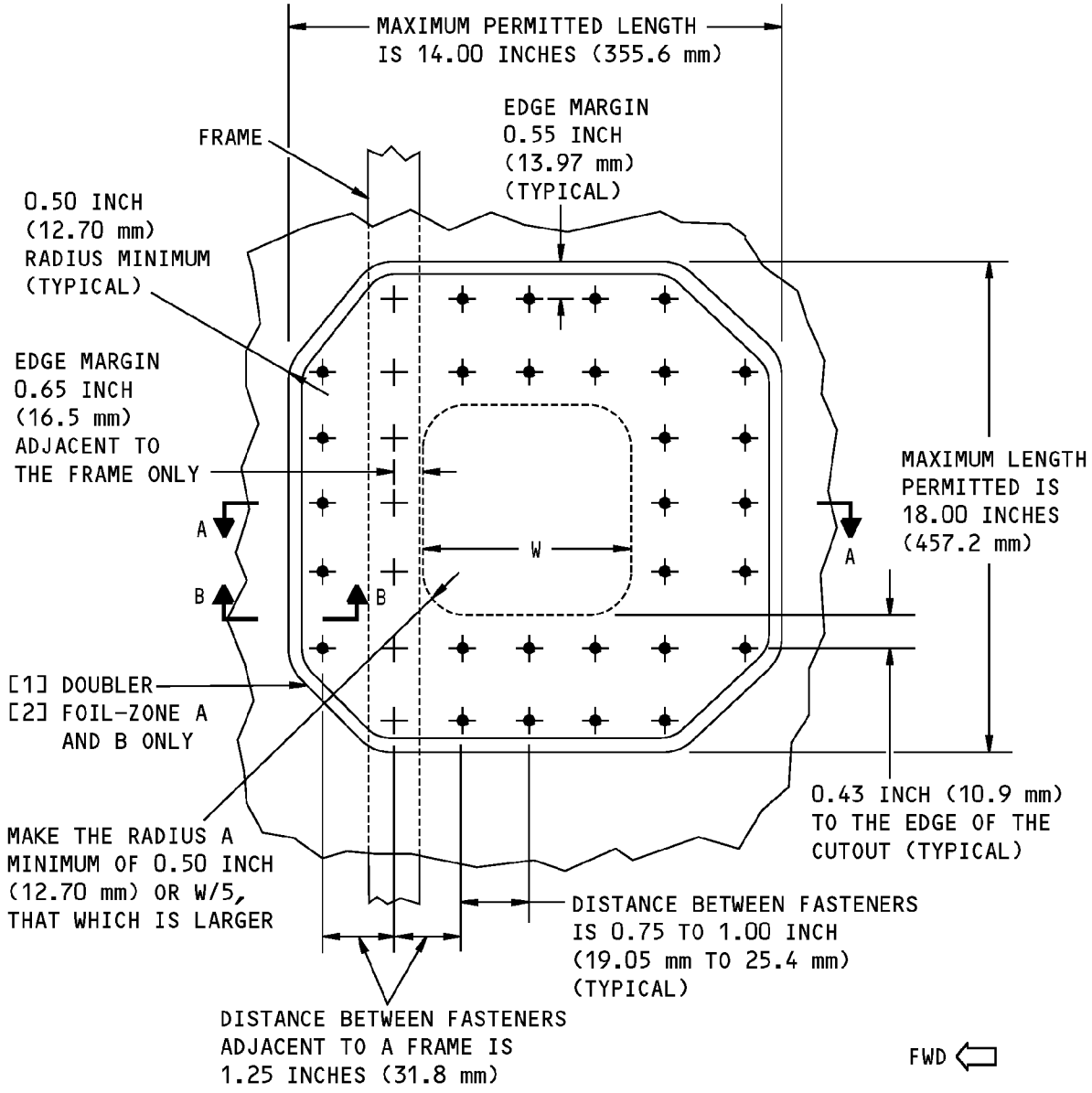
NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install BACR15CE6M rivets, apply the cadmium plate as given in QQ-P-416, Type 1, Class III, to a thickness of 0.0002 to 0.0004 inch (0.005 mm to 0.010 mm).

(b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

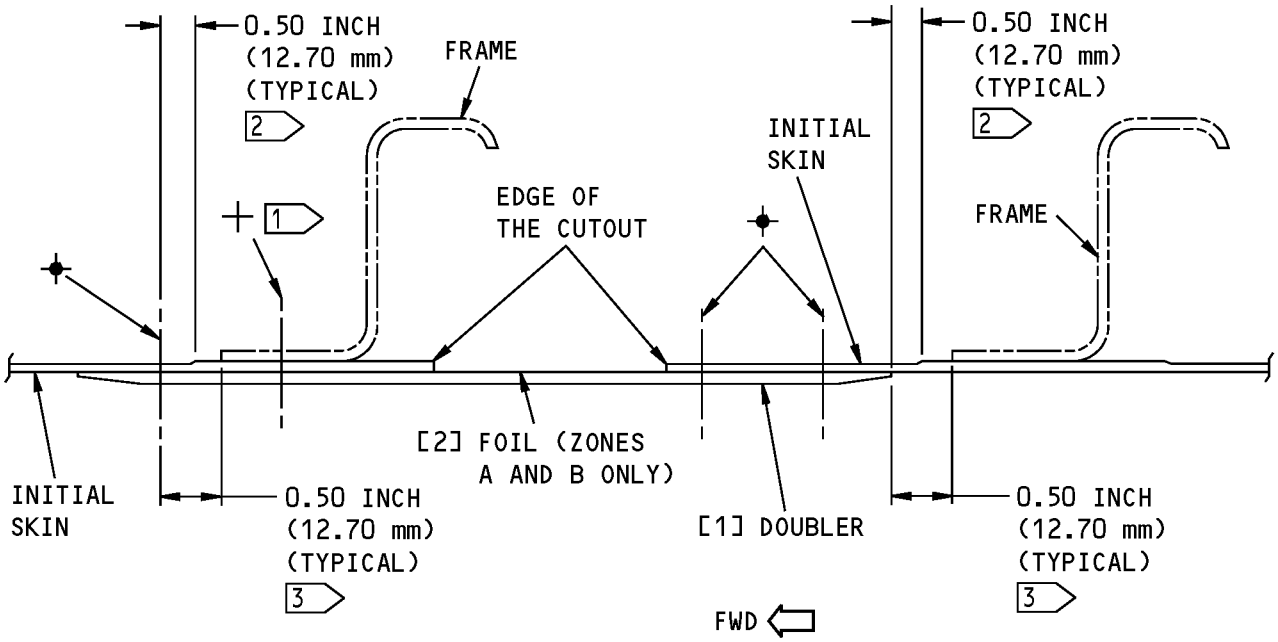


FASTENER SYMBOLS

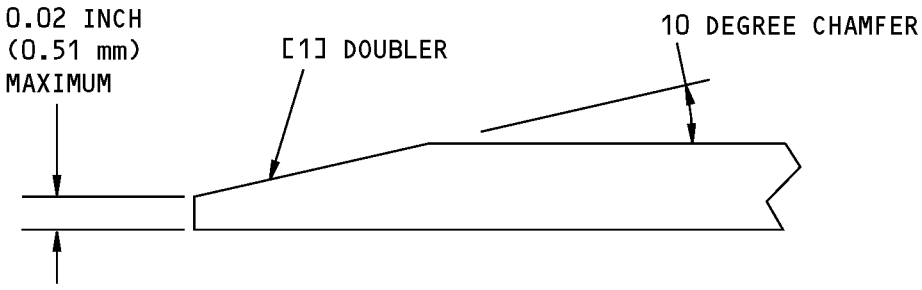
┼ INITIAL FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

✦ REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR A BACR15CE6AD RIVET FOR ZONE C.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



B–B
(TYPICAL)

NOTES

1 INSTALL A COUNTERSINK WASHER BETWEEN THE INITIAL SKIN AND THE PART [1] DOUBLER.

2 APPLICABLE ONLY TO AREAS WITH CHEM-MILL STEPS.

3 APPLICABLE ONLY TO AREAS WITH NO CHEM-MILL STEPS.

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 5 - FAN COWL SKIN EXTERNAL REPAIR AT TWO FRAMES

1. Applicability

A. Repair 5 is applicable to damage that is:

(1) On the Fan Cowl Skin at two frames (Refer to Fan Cowl Skins Location, Figure 201/REPAIR 5)

(2) More than 1.25 inches (31.75 mm) in diameter.

B. Repair 5 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

A. Repair 5 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).

C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

D. The edge of the repair doubler must be:

(1) A minimum of 0.50 inch (12.70 mm) from a frame, doubler or chem-mill step

(2) A minimum of 2.00 inches (50.80 mm) away from the Chine (Vortex Control Device)

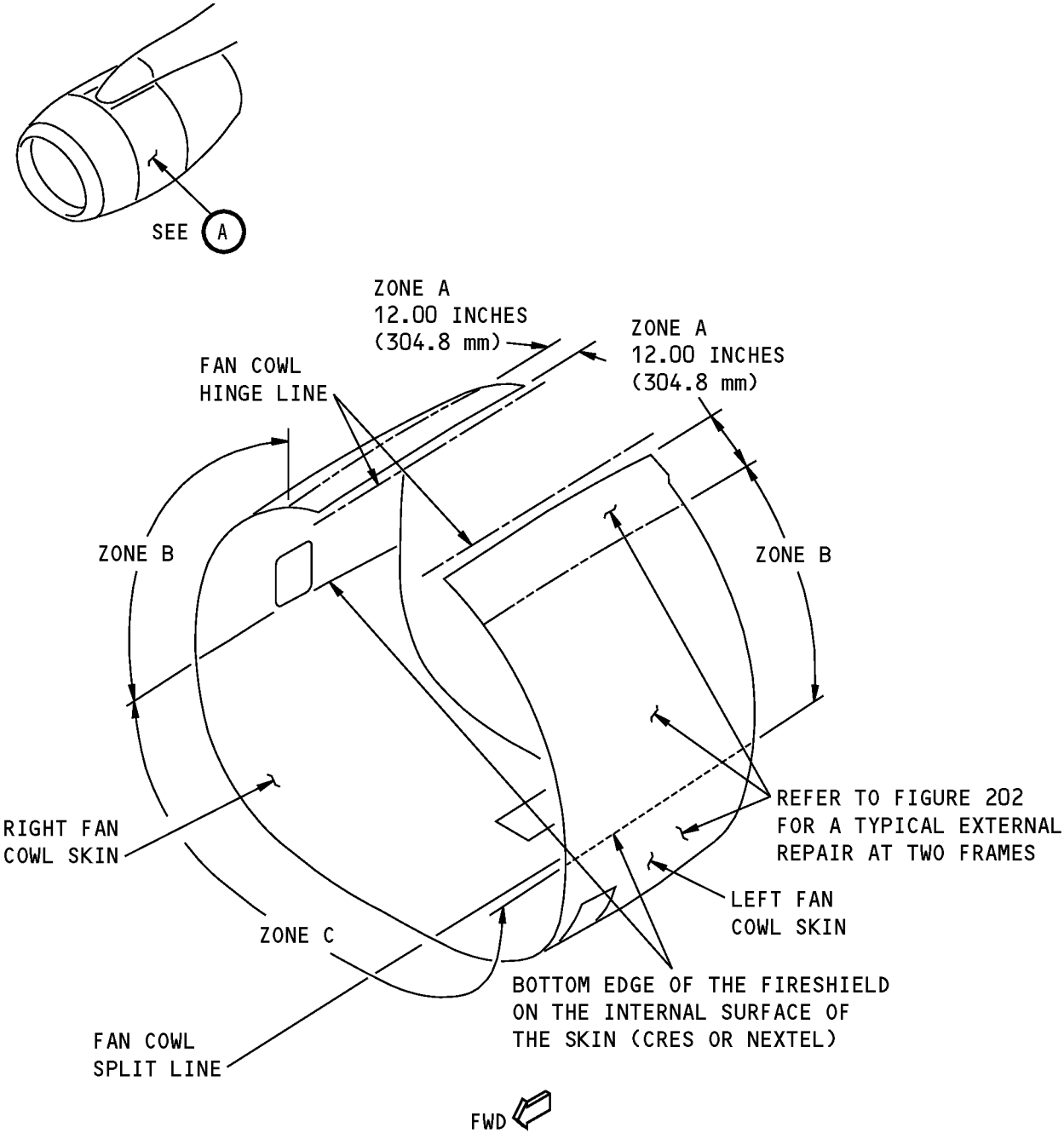
(3) A minimum of 1.50 inches (38.10 mm) away (forward and aft directions) from the zee frames at the attach fastener locations of the fan cowl hinge fittings

(4) A minimum of 3.00 inches (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line

(5) A minimum of 3.00 inches (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.

E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 inches (660.40 mm) is equivalent to adding 9 pounds (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gallons (378.53 l) in a year.

F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

A

Fan Cowl Skins Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step.

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 5 and Figure 202.

(1) Make the part [1] doubler.

(2) Make the part [2] foil for repairs in Zones A and B to the same dimensions as the part [1] doubler.

F. Assemble the repair parts as shown in Fan Cowl Skin External Repair, Figure 202/REPAIR 5.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 inch (2.03 mm) thick 2024-T3 sheet in Zone A Use 0.063 inch (1.60 mm) thick 2024-T3 sheet in Zones B and C
[2]	Foil	1	Use 0.005 inch (0.13 mm) thick 321 CRES for Zones A and B

G. Drill the fastener holes as shown in Fan Cowl Skin External Repair, Figure 202/REPAIR 5. Refer to 51-40-05 and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.

K. Apply a chemical conversion coating to the part [1] doubler and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to Fan Cowl Skin External Repair, Figure 202/REPAIR 5.

(1) Use countersink washers between the part [1] doubler and the initial skin at the initial fastener holes. Refer to 51-40-08.

(2) Apply BMS 5 -95 sealant between the part [1] doubler and the part [2] foil (Zones A and B). Refer to 51-20-05.

(3) Install the fasteners wet with BMS 5-95 sealant.

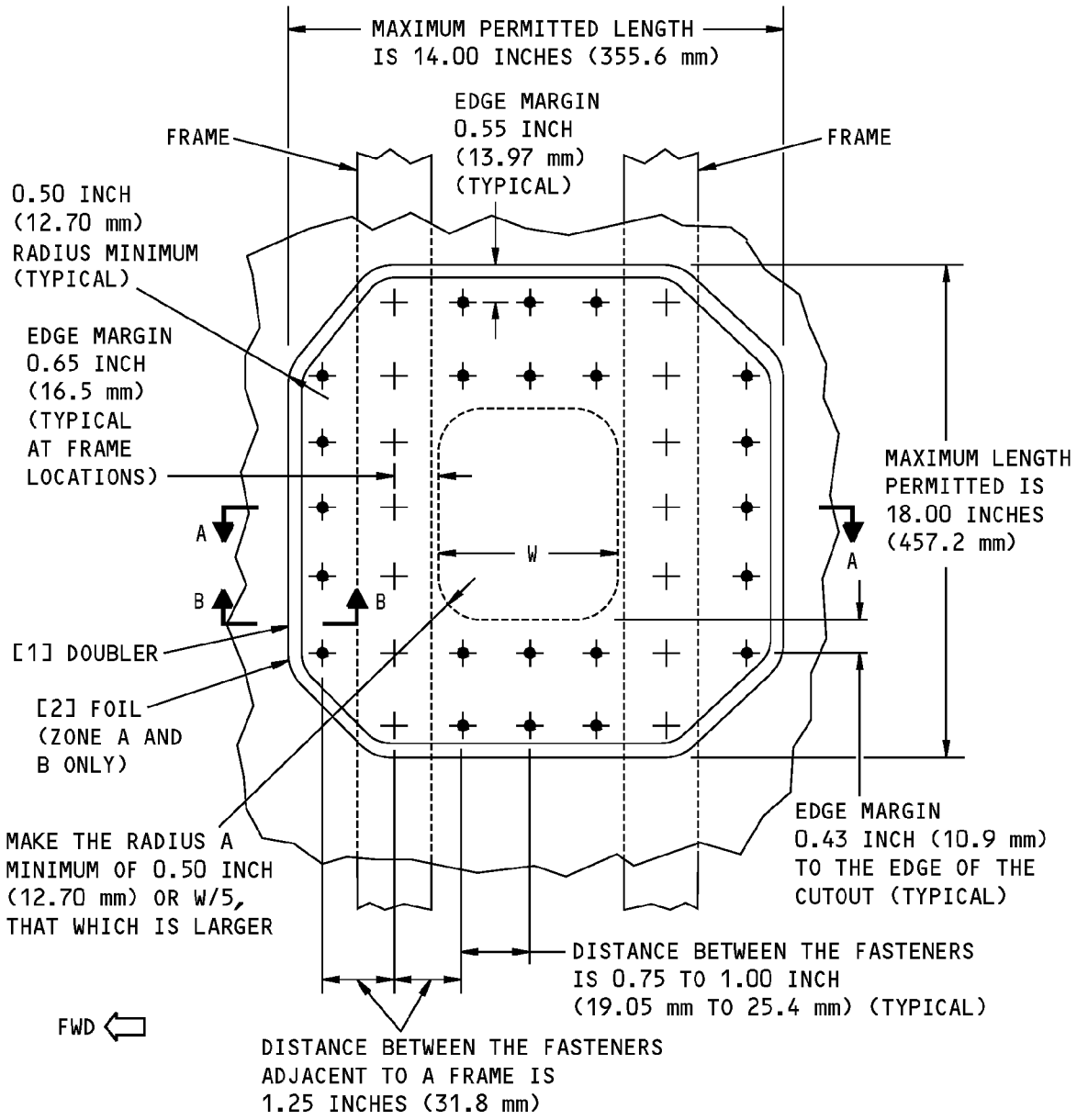
(a) For a repair in Zone A or B, install NAS1200M6()P or BACR15CE6M rivets.

NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install BACR15CE6M rivets, apply the cadmium plate as given in QQ-P-416, Type 1, Class III, to a thickness of 0.0002 to 0.0004 inch (0.005 mm to 0.010 mm).

(b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

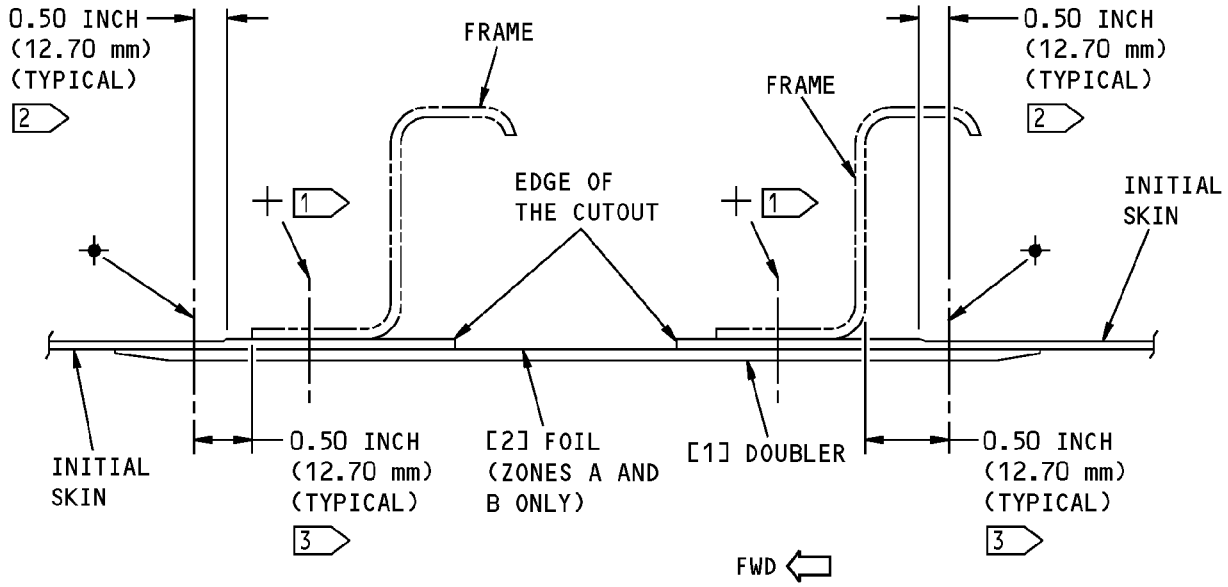


FASTENER SYMBOLS

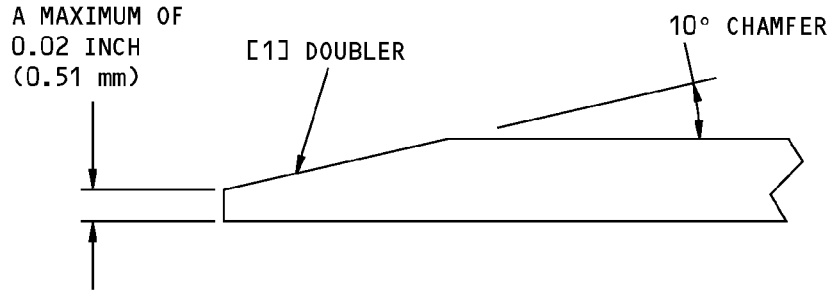
┼ INITIAL FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

✦ REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

Fan Cowl Skin External Repair
Figure 202 (Sheet 1 of 2)



A–A



B–B
(TYPICAL)

NOTES

1. INSTALL A COUNTERSINK WASHER BETWEEN THE [1] DOUBLER AND THE INITIAL SKIN.
2. APPLICABLE TO AREAS WITH CHEM-MILL STEPS
3. APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS

Fan Cowl Skin External Repair
Figure 202 (Sheet 2 of 2)

REPAIR 6 - FAN COWL SKIN EXTERNAL REPAIR AT A FRAME

1. Applicability

A. Repair 6 is applicable to damage that is:

(1) On the Fan Cowl Skin at a frame. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 6.

(2) More than 1.25 inches (31.75 mm) in diameter.

B. Repair 6 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

A. Repair 6 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).

C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

D. The edge of the repair doubler must be a minimum of:

(1) 0.50 inch (12.70 mm) from a frame, doubler, or chem-mill step

(2) 2.00 inches (50.80 mm) away from the Chine (Vortex Control Device)

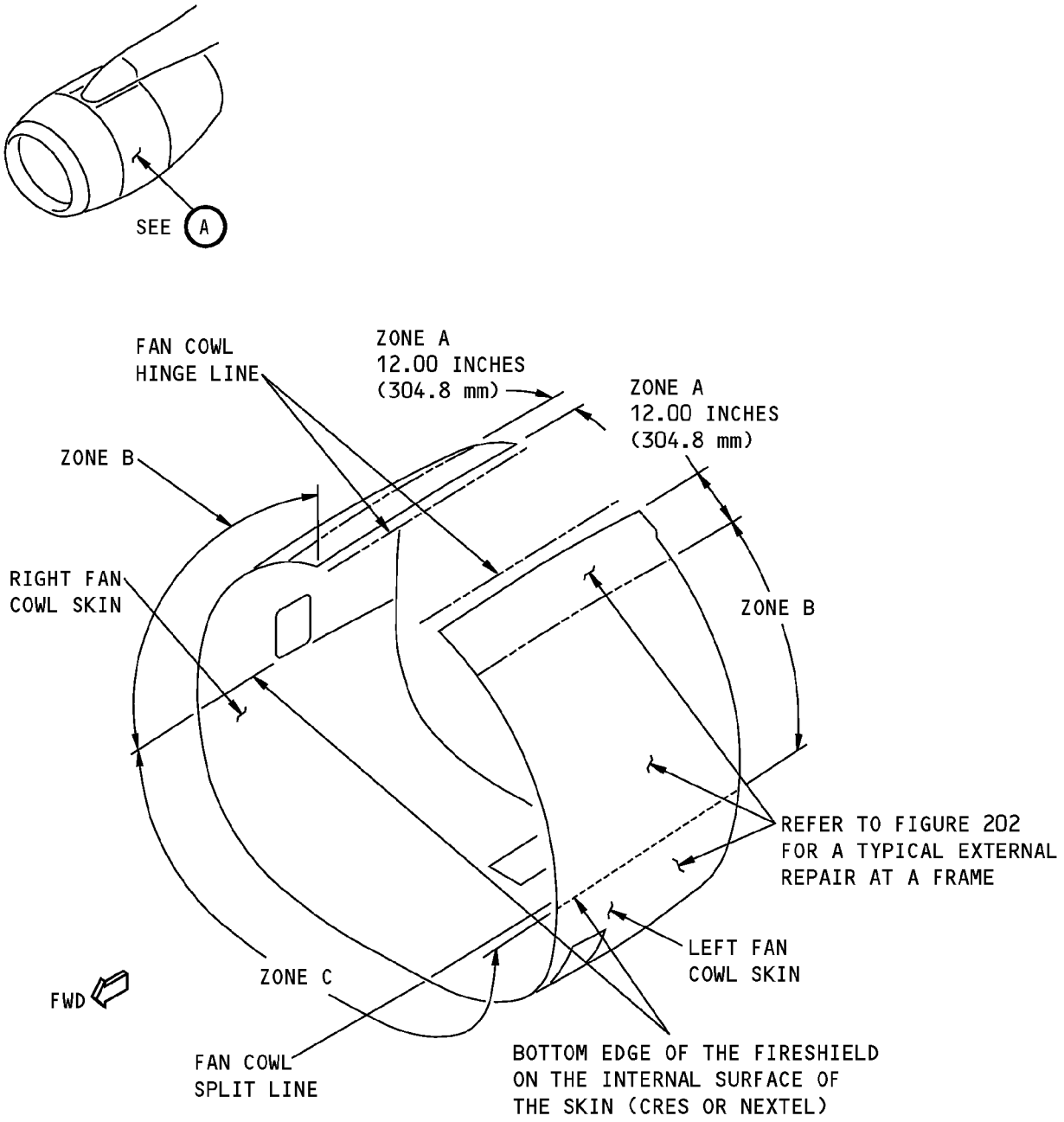
(3) 1.50 inches (38.10 mm) away from the zee frames at the fitting attach fastener locations of the fan cowl hinges (forward and aft directions)

(4) 3.00 inches (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line

(5) 3.00 inches (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.

E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 inches (660.40 mm) is equivalent to adding 9 pounds (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gallons (378.53 l) in a year.

F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 6 and Figure 202.

(1) Make the part [1] doubler.

(2) Make the part [3] filler plate.

(3) Make the part [2] foil for repairs in Zone A and B to the same dimensions as the part [1] doubler.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 6.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 6. Refer to 51-40-05 and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.

K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for Zone A Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for Zones B and C
[2]	Foil	1	Use 0.005 inch (0.13 mm) thick 321 CRES for Zones A and B
[3]	Filler Plate	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 6.

(1) Use countersink washers between the part [1] doubler and the initial skin at the initial fastener holes. Refer to 51-40-08.

(2) Apply BMS 5-95 sealant between the part [1] doubler and part [2] foil (Zones A and B). Refer to 51-20-05.

(3) Install the fasteners wet with BMS 5-95 sealant.

(a) For a repair in Zones A and B, install NAS1200M6()P or BACR15CE6M rivets.

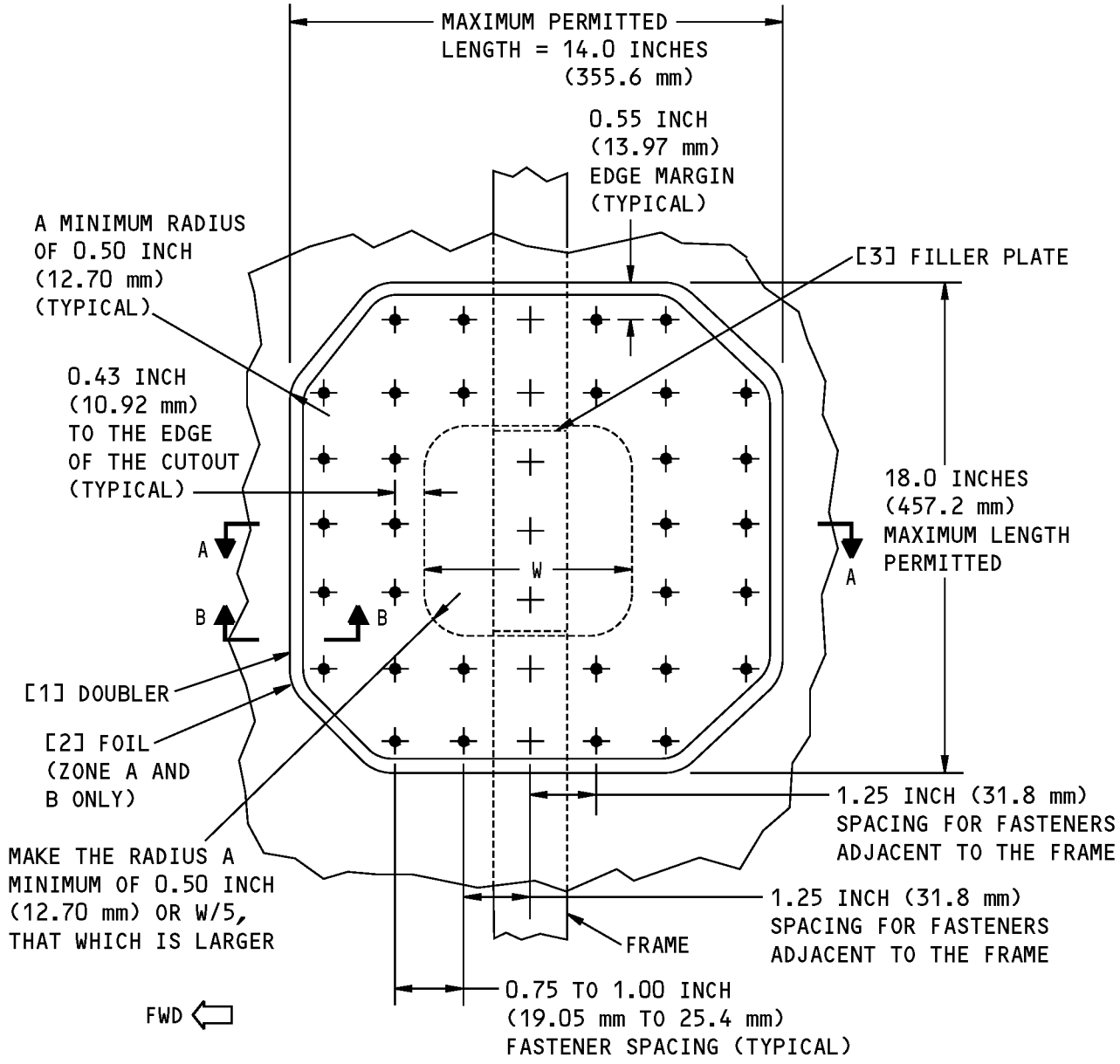
NOTE: Monel rivets in aluminum structure must be cadmium plated. Cadmium plate BACR15CE6M rivets as given in QQ-P-416, Type 1, Class III, 0.0002 to 0.0004 inch (0.005 mm to 0.010 mm) thick, before you install them.

(b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

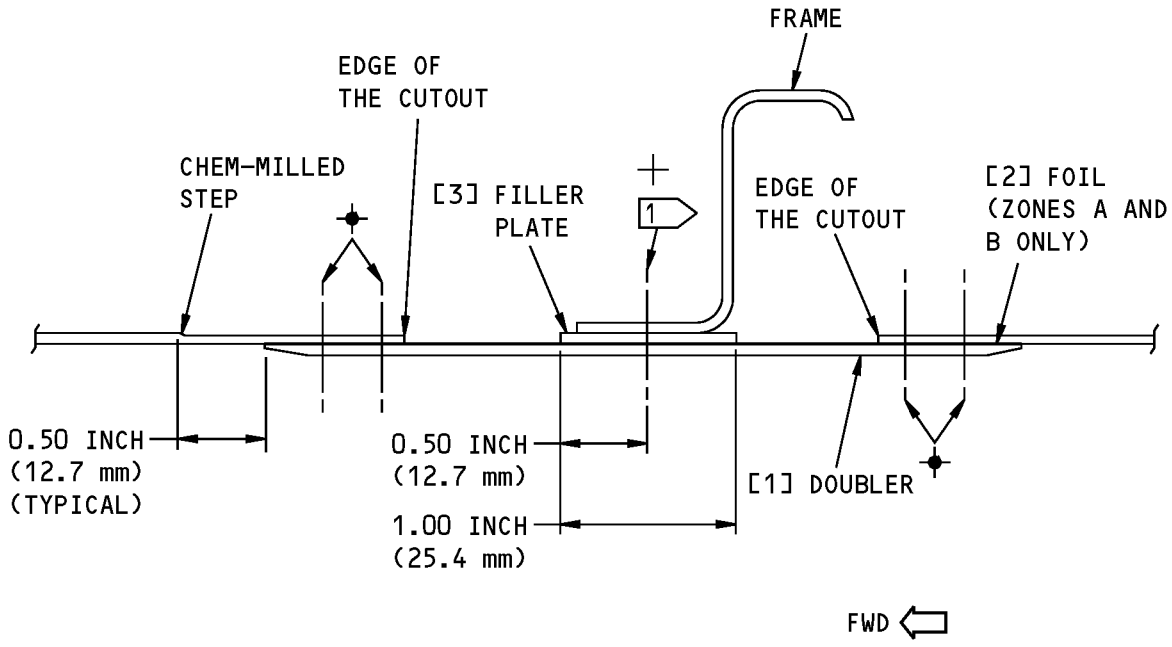


FASTENER SYMBOLS

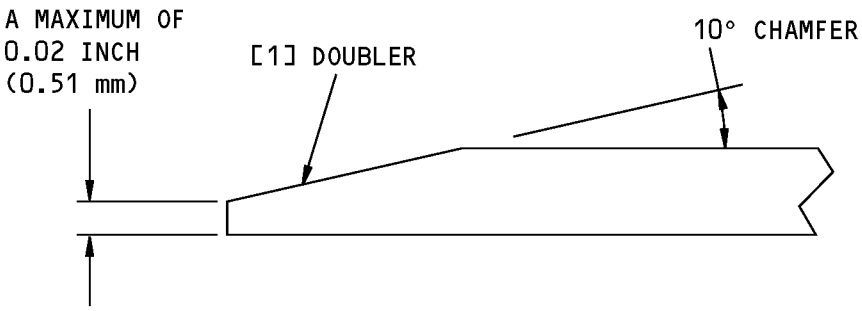
┼ INITIAL FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET FOR ZONES A AND B. INSTALL NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

✦ REPAIR FASTENER LOCATION. INSTALL A NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET FOR ZONES A AND B. INSTALL NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



B–B
(TYPICAL)

NOTES

1 INSTALL A COUNTERSINK WASHER BETWEEN THE [1] DOUBLER AND THE INITIAL SKIN.

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 7 - FAN COWL SKIN EXTERNAL REPAIR BETWEEN TWO FRAMES

1. Applicability

A. Repair 7 is applicable to damage that is:

(1) On the Fan Cowl Skin between two frames. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 7.

(2) More than 1.25 inches (31.75 mm) in diameter.

B. Repair 7 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

A. Repair 7 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).

C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

D. The edge of the repair doubler must be:

(1) A minimum of 0.50 inch (12.70 mm) from a frame, doubler, or a chem-mill step

(2) A minimum of 2.00 inches (54.80 mm) away from the Chine (Vortex Control Device)

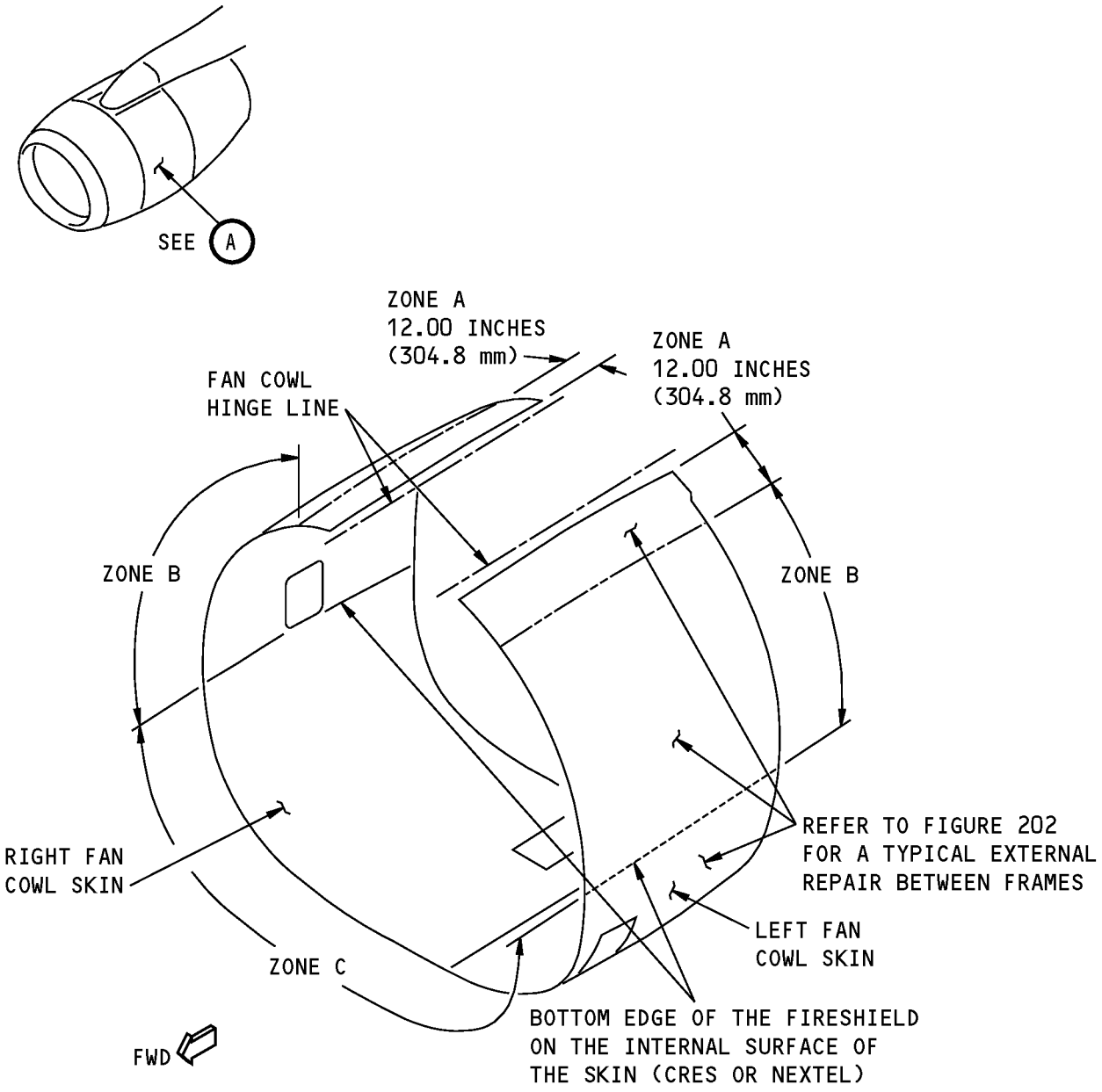
(3) A minimum of 1.50 inches (38.10 mm) away from the zee frames at the fitting attach fastener locations of the fan cowl hinge (forward and aft directions)

(4) A minimum of 3.00 inches (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line

(5) A minimum of 3.00 inches (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.

E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 inches (660.40 mm) is equivalent to adding 9 pounds (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gallons (378.53 l) in a year.

F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 inch (12.70 mm) from:

(a) A frame

(b) A doubler

(c) A chem-mill step

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 7 and Figure 202.

(1) Make the part [2] foil for repairs in Zones A and B to the same dimensions as the part [1] doubler.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 inch (2.03 mm) thick 2024-T3 sheet for Zone A Use 0.063 inch (1.60 mm) thick 2024-T3 sheet for Zones B and C
[2]	Foil	1	Use 0.005 inch (0.13 mm) thick 321 CRES for Zones A and B

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 7.

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 7. Refer to 51-40-05 and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.

K. Apply a chemical conversion coating to the part [1] doubler and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 7.

(1) Apply BMS 5-95 sealant between the part [1] doubler and the part [2] foil (Zones A and B). Refer to 51-20-05.

(2) Install the fasteners wet with BMS 5-95 sealant.

(a) For a repair in Zone A or B, install NAS1200M6()P or BACR15CE6M rivets.

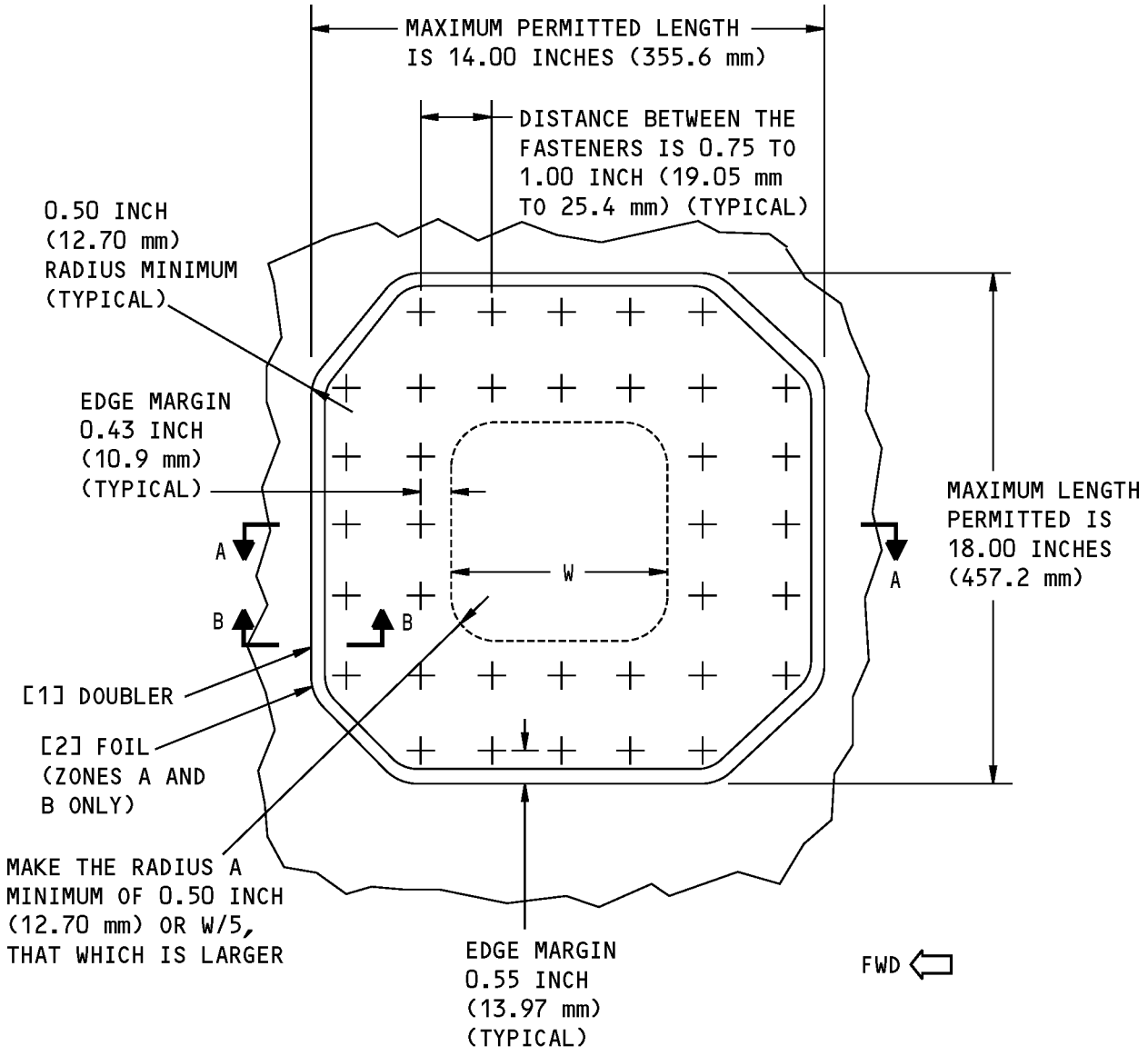
NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install monel rivets, apply a 0.0002 to 0.0004 inch (0.0051 mm to 0.0102 mm) thick cadmium plate to BACR15CE6M rivets as given in QQ-P-416, Type 1, Class III.

(b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.

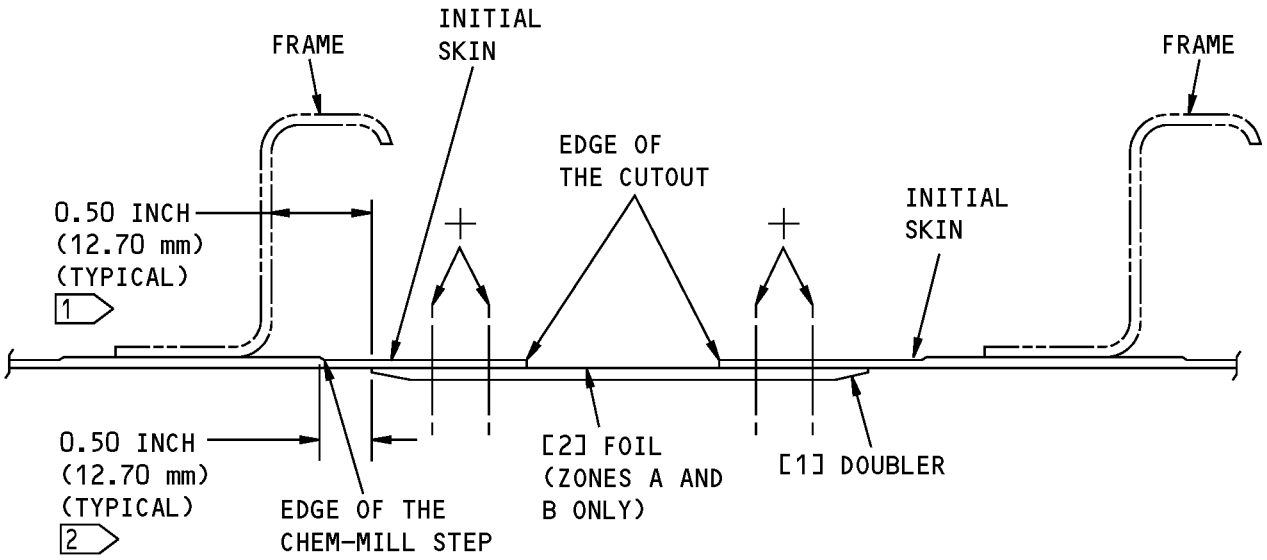
P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



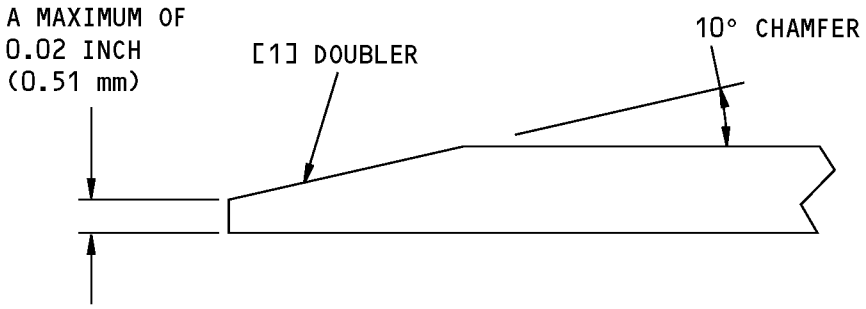
FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



B–B
(TYPICAL)

NOTES

1 APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS

2 APPLICABLE TO AREAS WITH CHEM-MILL STEPS

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 8 - FAN COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE A

1. Applicability

A. Repair 8 is applicable to damage to the Fan Cowl Skin at a frame in Zone A (Man-Walk Area). Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 8.

B. Repair 8 is not applicable to damage at the forward or aft edges of the fan cowl.

C. For repairs that have an overlap of Zone B, shown in Engine Fan Cowl Skin Location, Figure 201/REPAIR 8, refer to 54-20-01, Repair 9.

2. General

A. Repair 8 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

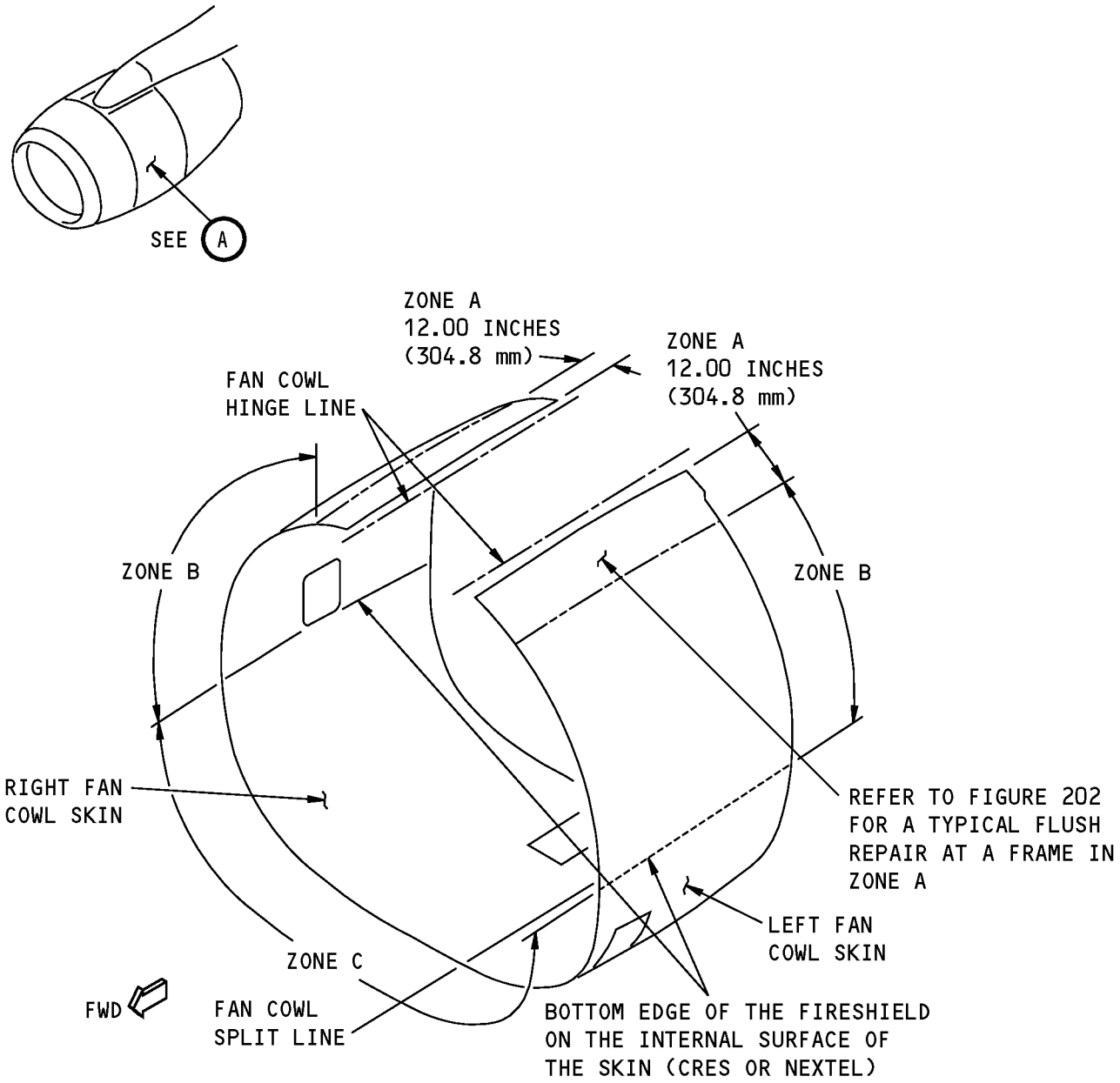
B. The maximum circumferential length of the damage cutout is 6.00 inches (152.4 mm).

C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).

D. The top edges of the repair doublers must be a minimum of 3.00 inches (76.2 mm) below (measured circumferentially):

(1) The hinge fitting-to-cowl attach fastener furthest from the fan cowl hinge line.

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

A

Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
54-20-01	FAN COWL DOOR SKIN
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make the radii of the corners of the cutout a minimum of 0.50 inches (12.7 mm).

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 8 for the materials.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 8.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet

REPAIR MATERIAL			
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[3]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[4]	Repair Foil	1	Use 0.005 inch (0.13 mm) thick CRES sheet

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 8. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.

K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners with BMS 5-95 sealant.

NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install monel rivets, apply a cadmium plate to BACR15CE6M rivets as given in QQ-P-416, Type 1, Class III, to a thickness between 0.0002 inch and 0.0004 inch (0.0051 mm and 0.0102 mm).

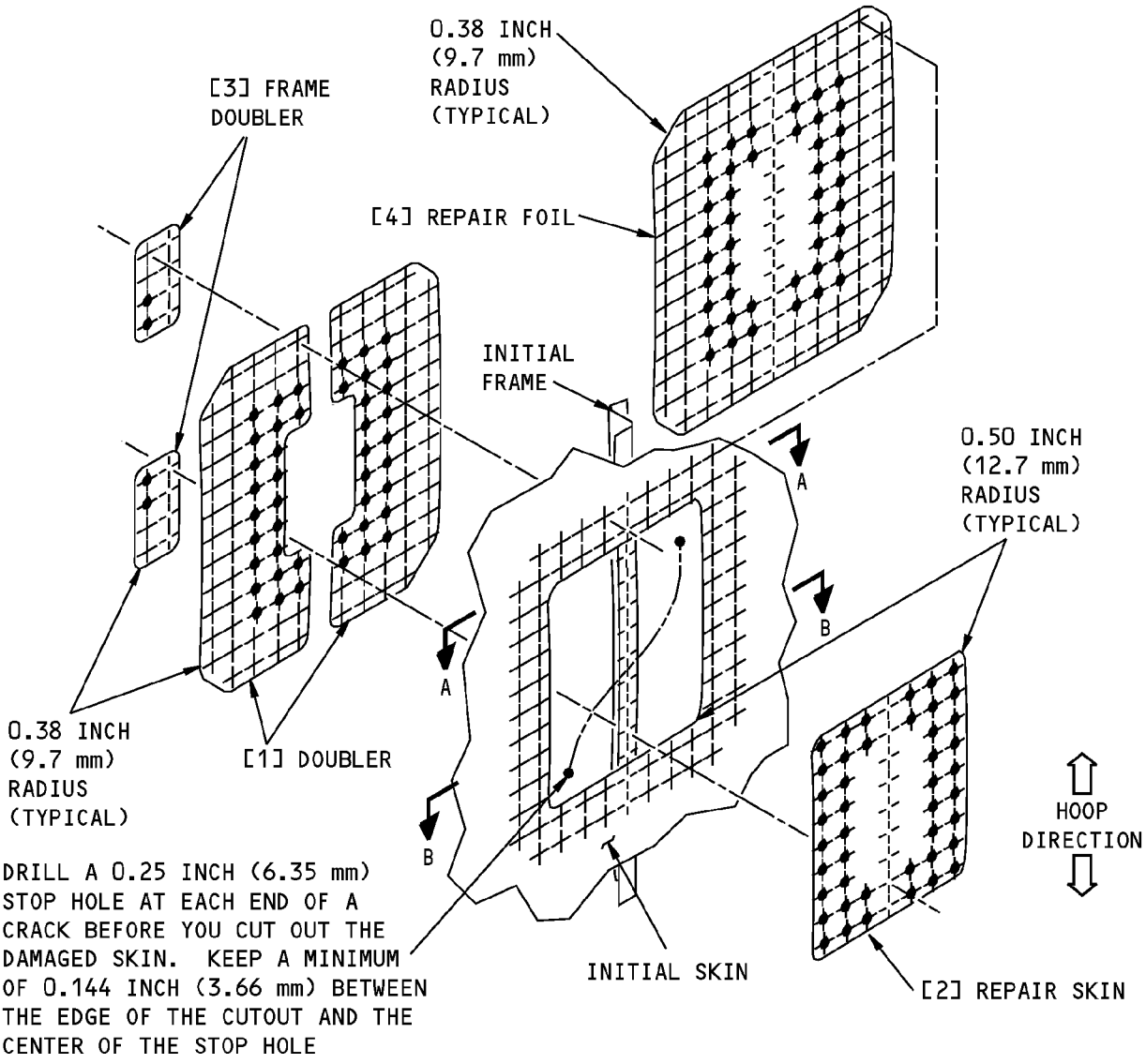
O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):

(1) Around the edge of the part [1] Doubler

(2) The space between the part [2] Repair Skin and the initial skin.

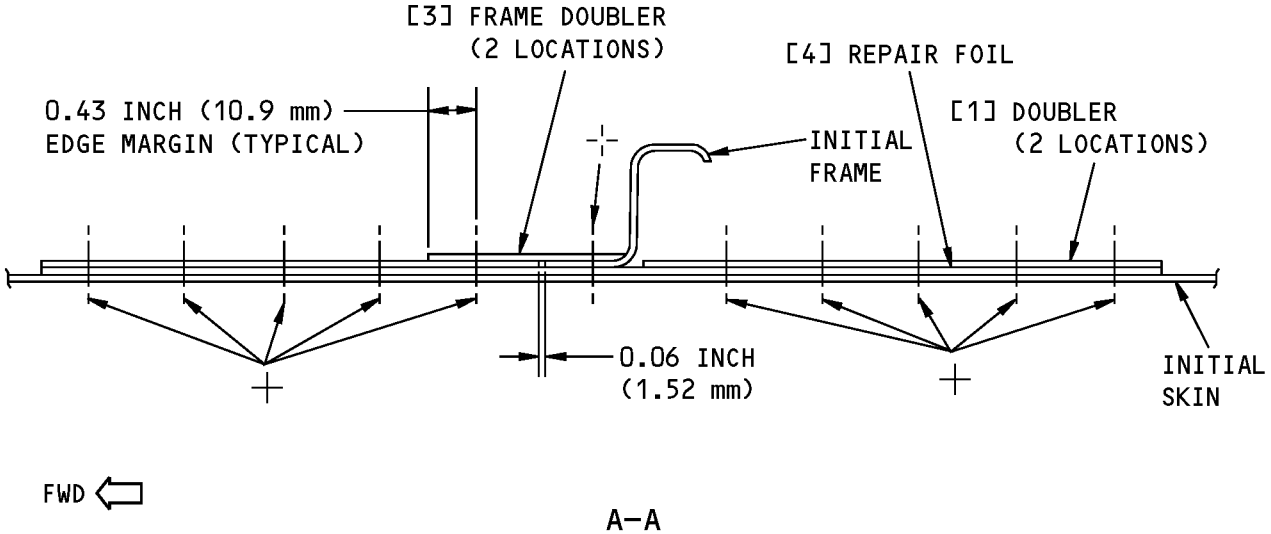
Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

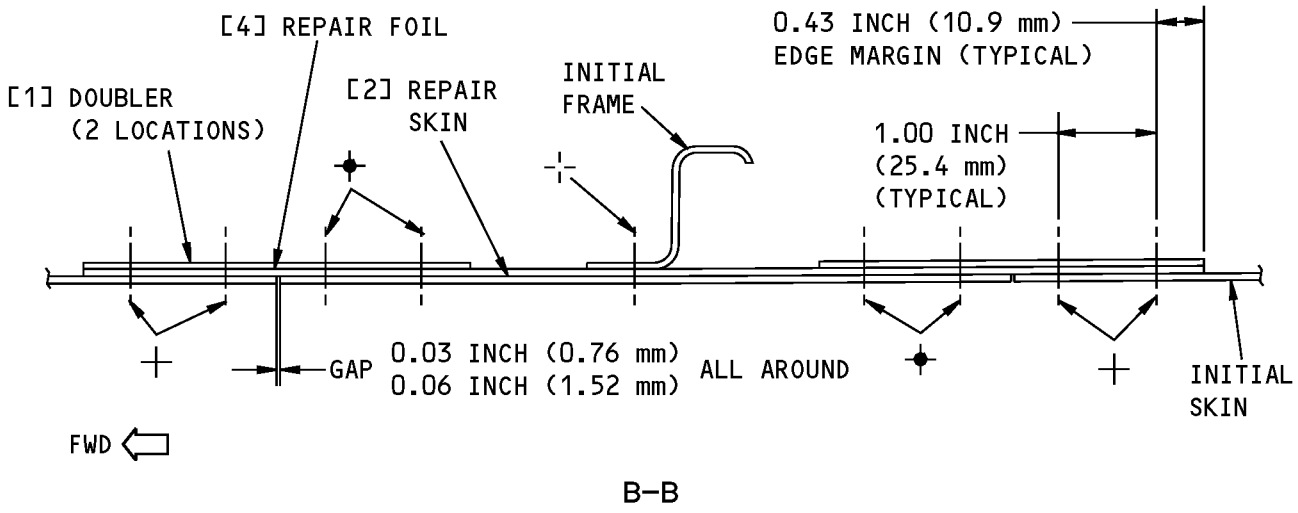


FASTENER SYMBOLS

- INITIAL FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)





Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 9 - FAN COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE B

1. Applicability

A. Repair 9 is applicable to damage to the Fan Cowl Skin at a frame in Zone B. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 9.

B. Repair 9 is not applicable to damage at the forward or aft edges.

C. Repair 9 is not applicable to damage adjacent to drain holes, access panels, or ground support equipment (GSE) attachment points.

2. General

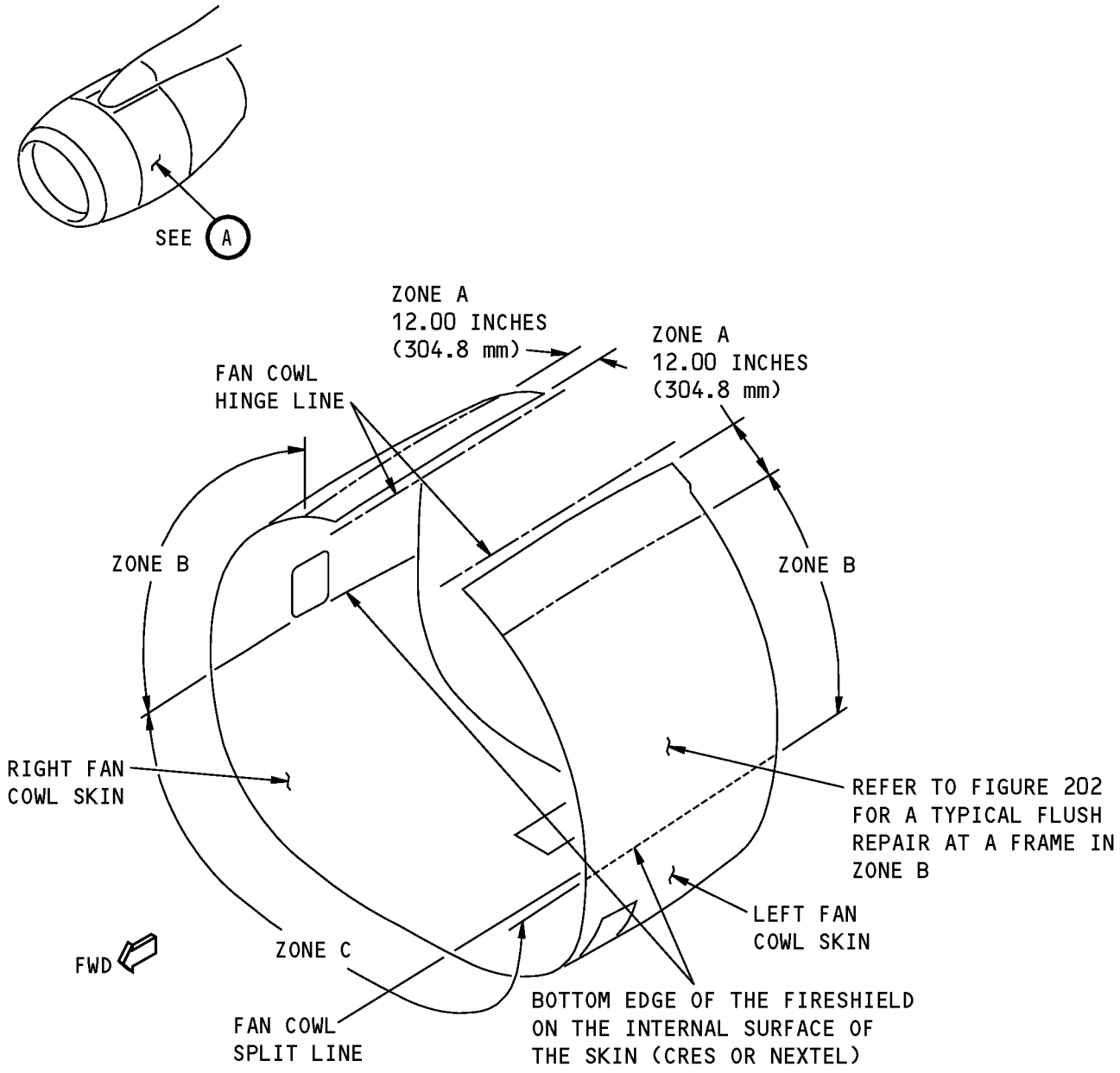
A. Repair 9 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).

C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).

D. The edges of the repair doublers must be a minimum of 2.00 inches (50.8 mm) from the chine (vortex control device).

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

A

Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make the radii of the corners of the cutout a minimum of 0.50 inches (12.7 mm).

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The dye penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 9 for the materials.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 9.

NOTE: If the part [3] Fillers extend into Zone A, cut them where they overlap the chem-mill step of the skin. Discard the part of the fillers that overlap the thicker skin in Zone A. If the part [5] Foil extends into Zone C, cut it even with the bottom edge of the fireshield (CRES or Nextel). Discard the part of the foil that overlaps the skin in Zone C.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[3]	Filler	2	Use 0.025 inch (0.64 mm) thick 2024-T3 sheet
[4]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[5]	Repair Foil	1	Use 0.005 inch (0.13 mm) thick CRES 321 sheet

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 9. Refer to 51-40-05 and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.

K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners with BMS 5-95 sealant.

NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install monel rivets, apply a cadmium plate to BACR15CE6M rivets as given in QQ-P-416, Type 1, Class III to a thickness between 0.0002 inch and 0.0004 inch (0.0051 mm and 0.0102 mm).

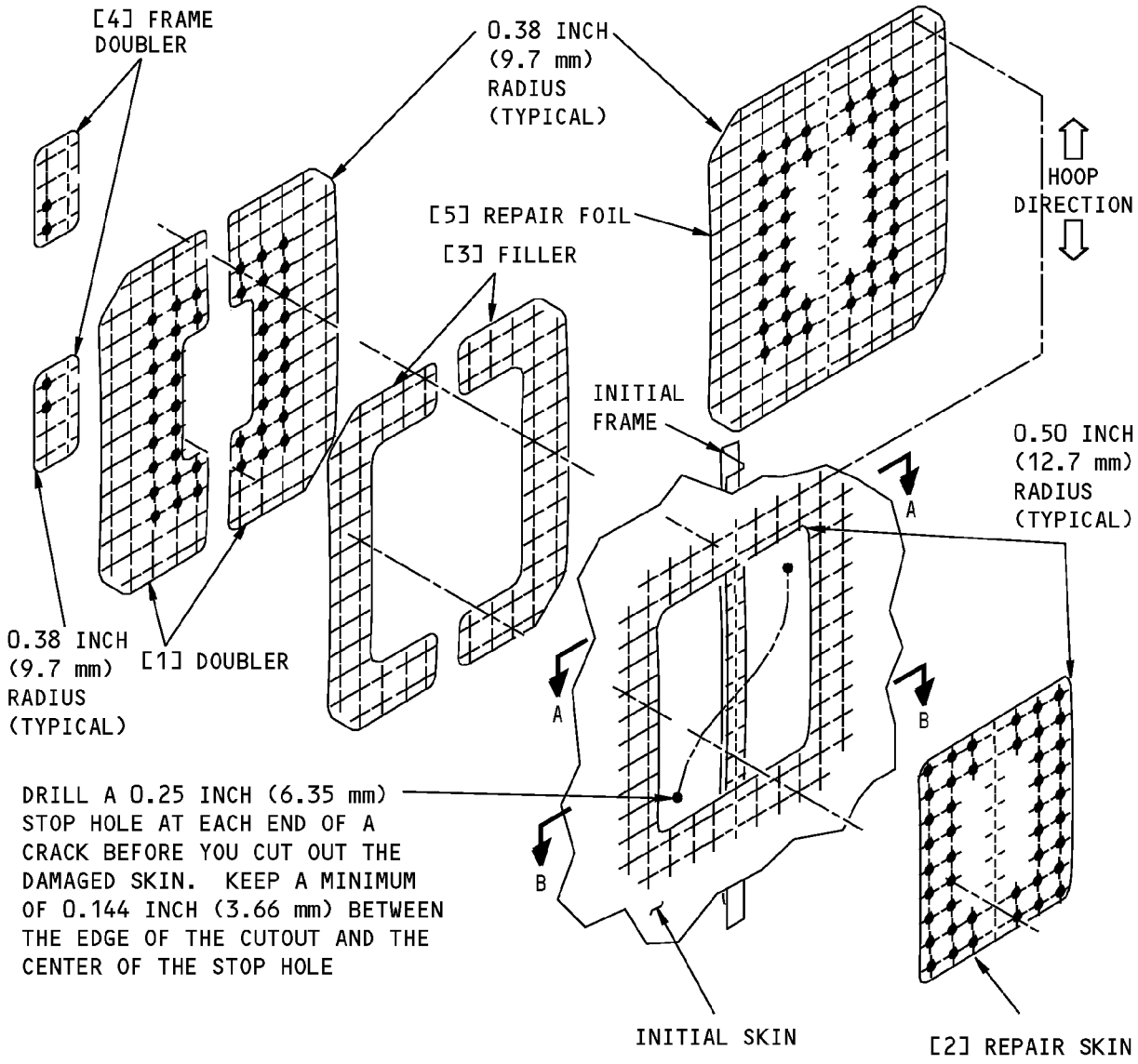
O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow: Refer to 51-20-05.

(1) Around the edge of the part [1] Doubler

(2) The space between the part [2] Repair Skin and the initial skin.

Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



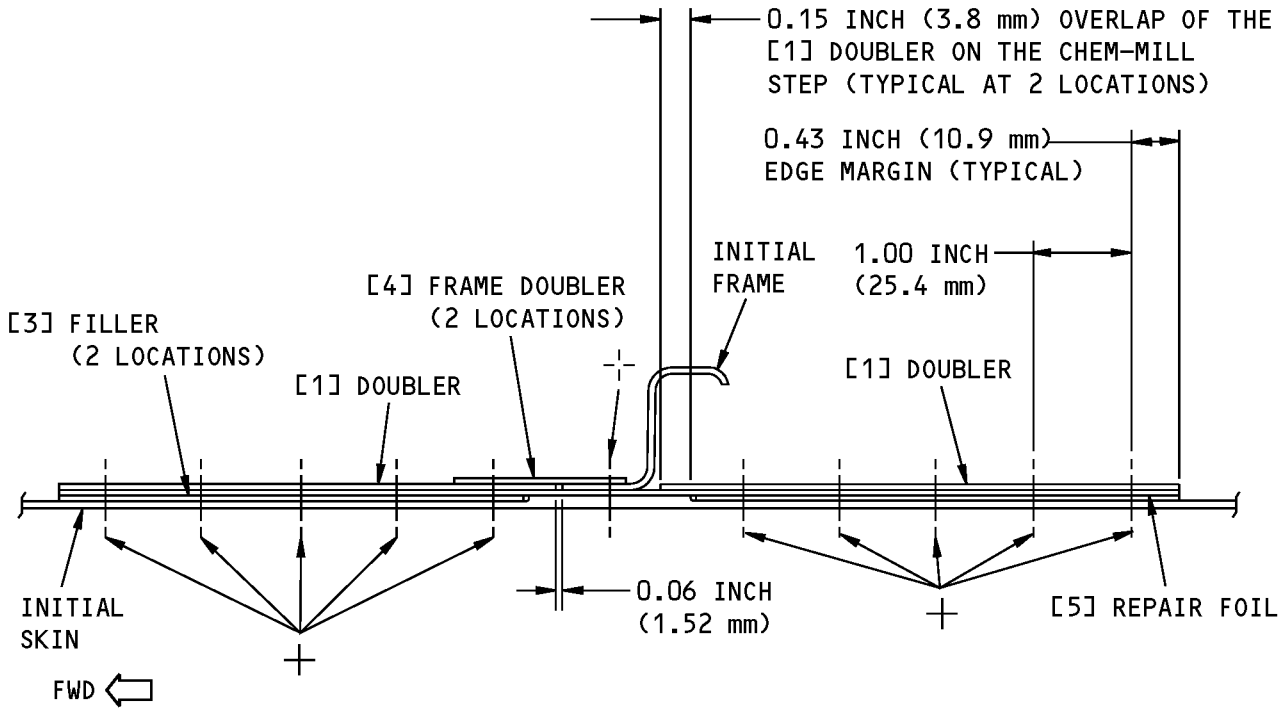
FASTENER SYMBOLS

-⊹- INITIAL FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS.

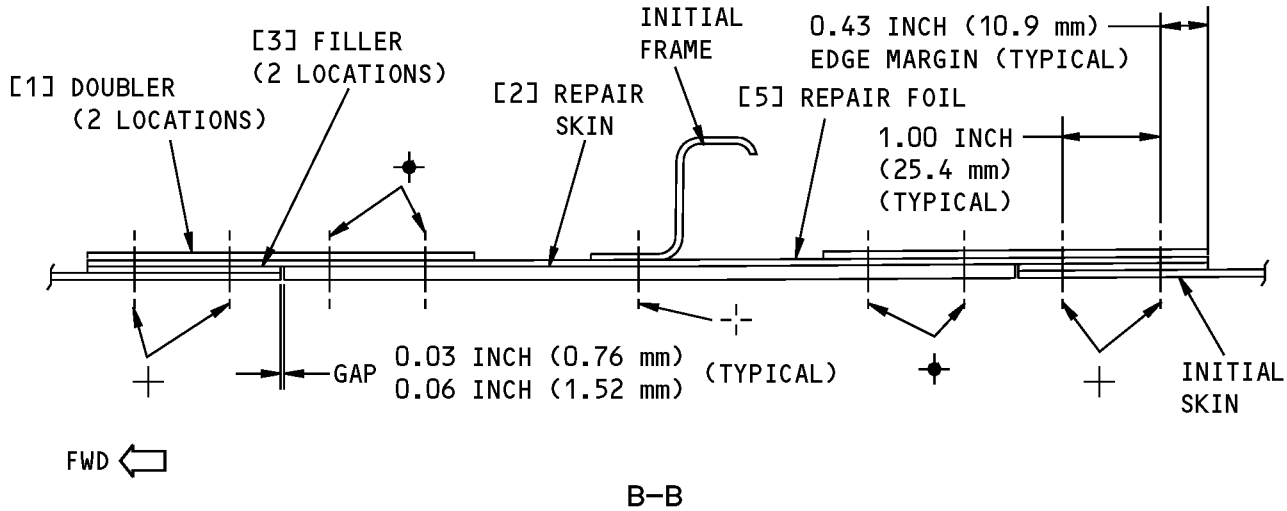
⊹ REPAIR FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.

┼ REPAIR FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



B–B

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 10 - FAN COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE C

1. Applicability

A. Repair 10 is applicable to damage to the Fan Cowl Skin at a frame in Zone C. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 10.

B. Repair 10 is not applicable to damage at the forward or aft edges.

C. Repair 10 is not applicable to damage adjacent to drain holes, access panels, or ground support equipment (GSE) attachment points.

D. For repairs that overlap into Zone B, as shown in Engine Fan Cowl Skin Location, Figure 201/REPAIR 10, refer to 54-20-01, Repair 9.

2. General

A. Repair 10 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

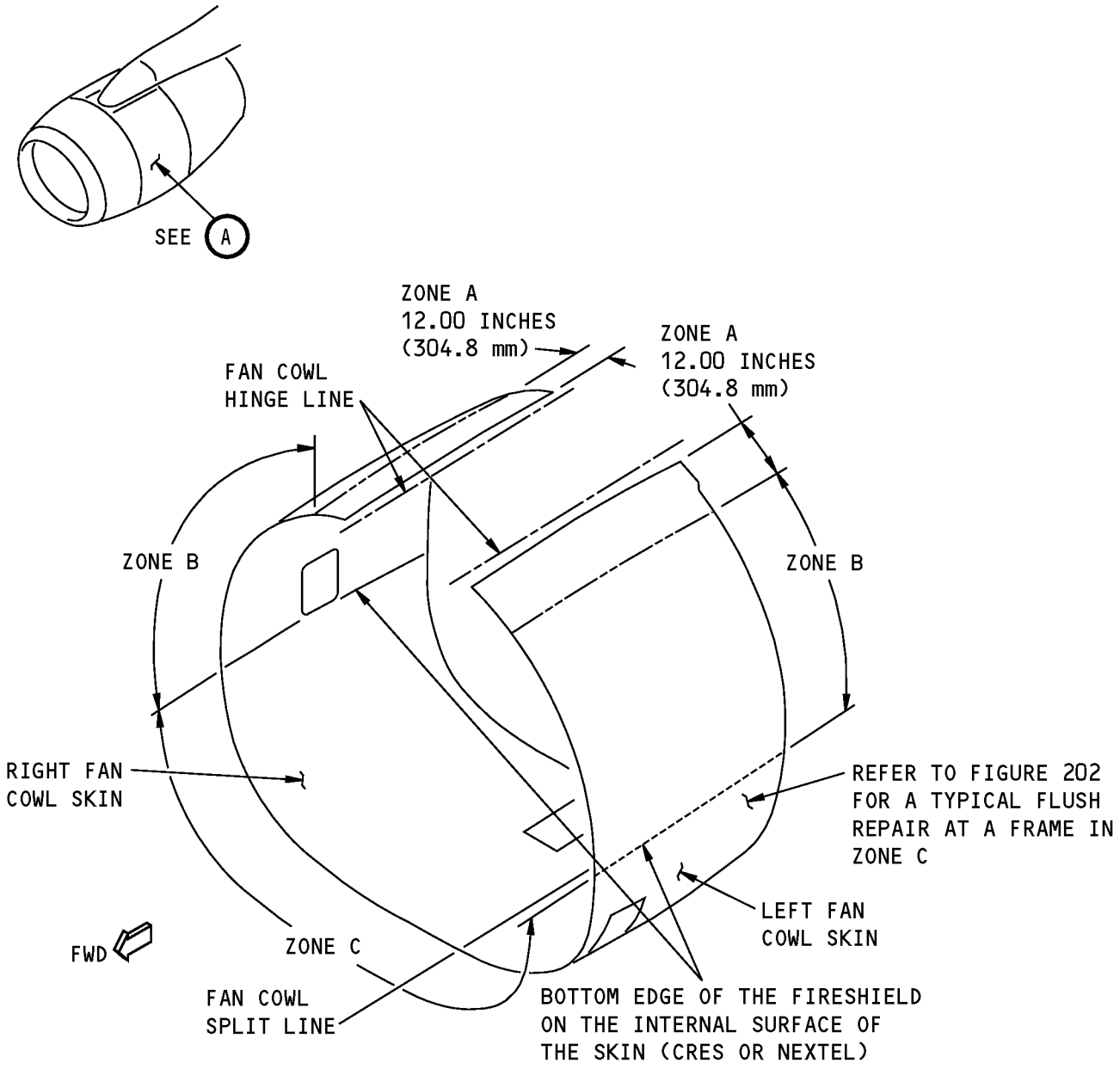
B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).

C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).

D. The lower edges of the repair doublers must be a minimum of 3.00 inches (76.2 mm) above (measured circumferentially):

(1) The latch-to-cowl attach fastener furthest from the fan cowl split line.

E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
54-20-01	FAN COWL DOOR SKIN
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.

(1) If the stop hole is at a frame, do the steps that follow:

(a) Remove a sufficient number of fasteners to move the skin away from the frame.

(b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.

C. Cut and remove the damaged skin to a rectangular shape.

(1) Make the radii of the corners of the cutout a minimum of 0.50 inches (12.7 mm).

(2) Do not cause damage to the frame.

D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 10 for the materials.

F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 10.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet

REPAIR MATERIAL			
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[3]	Filler	2	Use 0.025 inch (0.64 mm) thick 2024-T3 sheet
[4]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 10. Refer to 51-40-05, 51-40-06, and 51-40-08.

H. Disassemble the repair parts.

I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.

J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.

K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

L. Apply two layers of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):

(1) The bare external surfaces of the initial skin

(2) The internal and external surfaces of the repair parts.

M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

N. Install the fasteners with BMS 5-95 sealant.

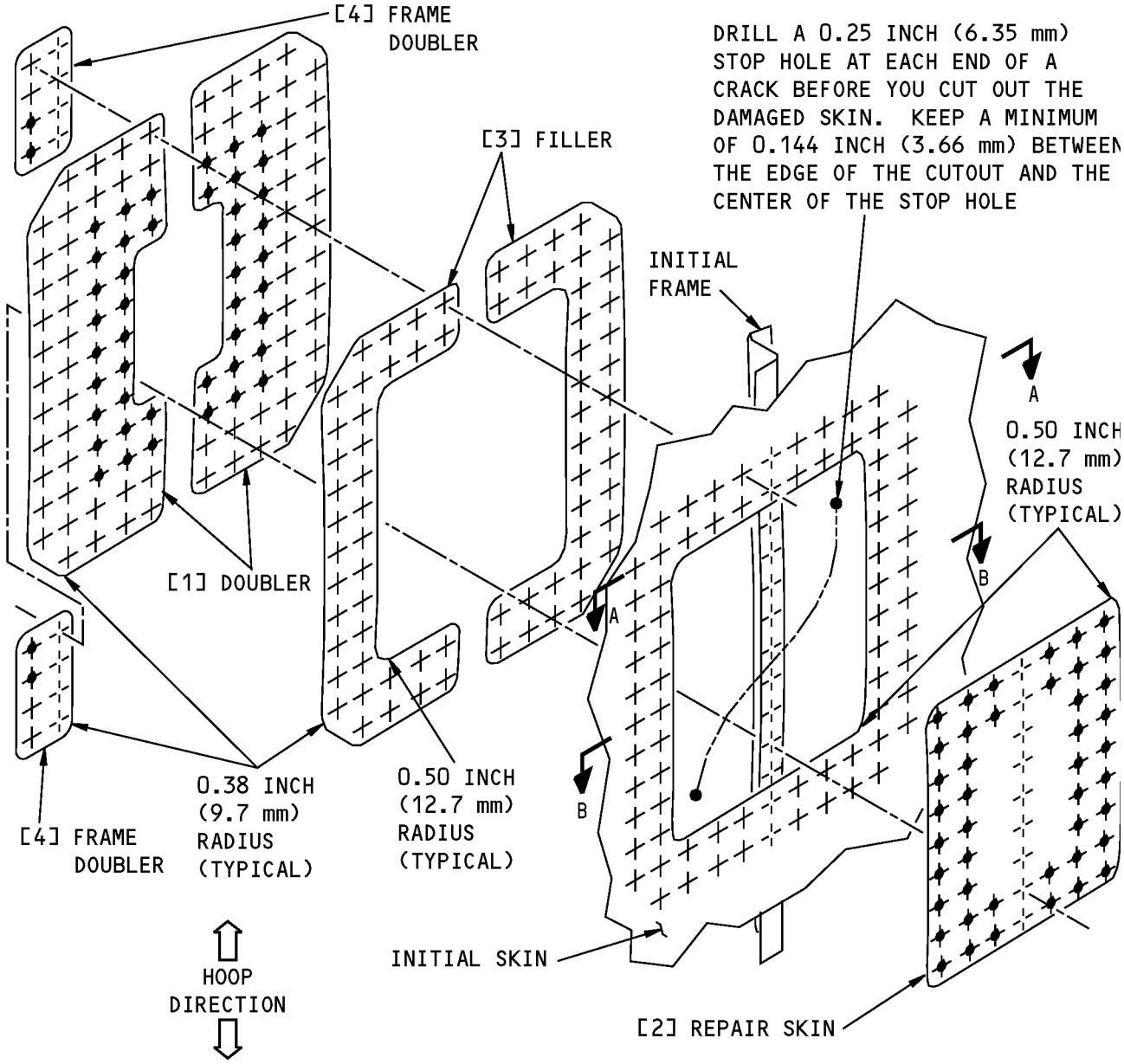
O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):

(1) Around the edge of the part [1] Doubler

(2) The space between the part [2] Repair Skin and the initial skin.

Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



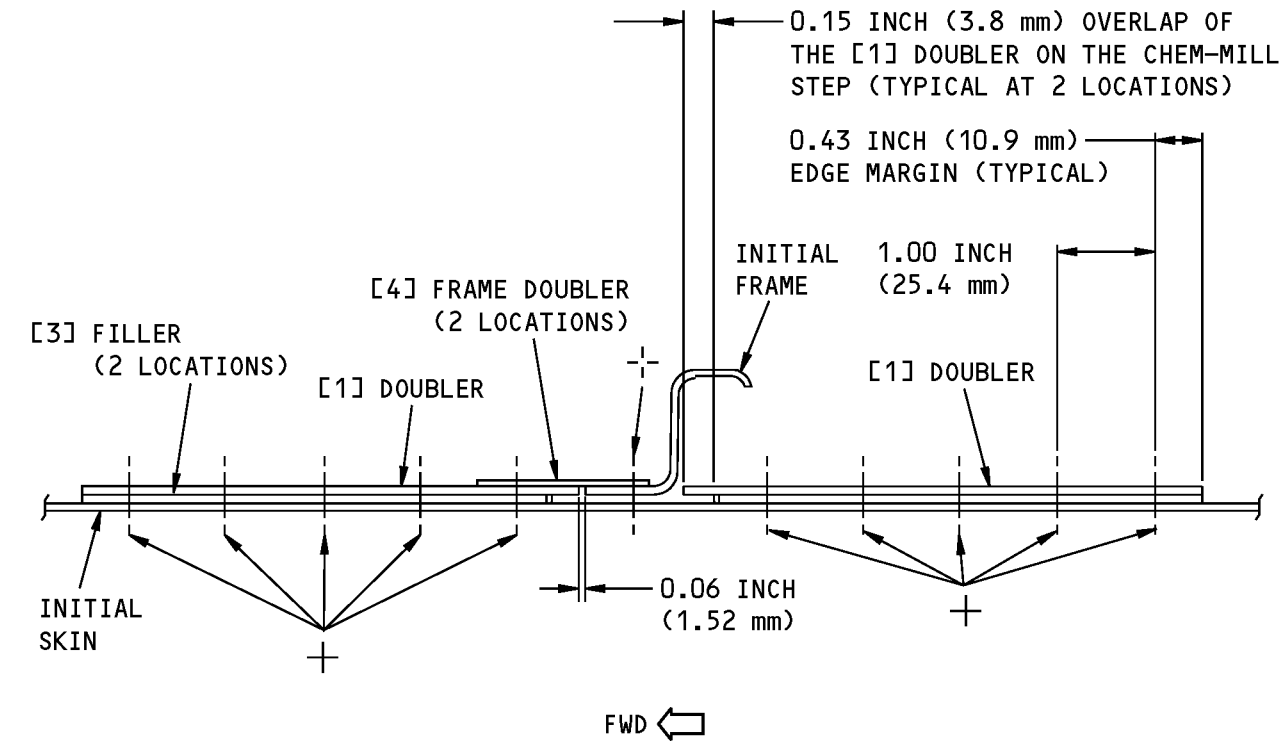
FASTENER SYMBOLS

-⊹- INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.

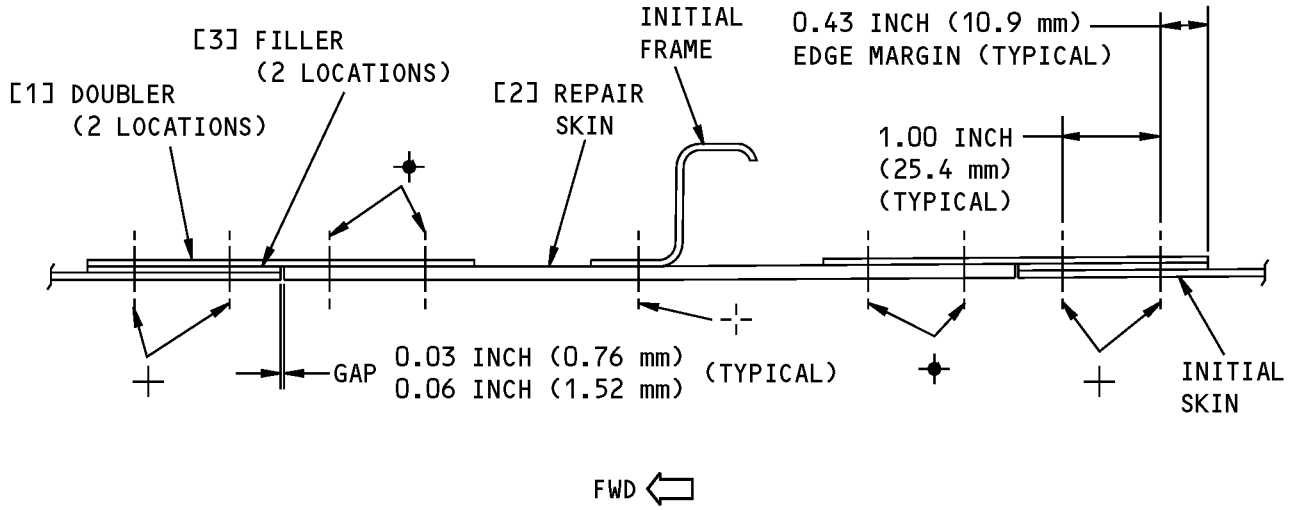
⊕ REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

⊹ REPAIR FASTENER LOCATION. INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)



A–A



B–B

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

REPAIR 11 - LAMINATED FIRESHIELD (NEXTEL OR FIBERGLASS)

1. Applicability

A. Repair 11 is applicable to hole, puncture or delamination damage to the laminated fireshield material made form either Nextel or fiberglass that is:

(1) On the internal surface of the fan cowl skin between frames

(2) In Zones A and B, in areas with or without chem-milled pockets (Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 11).

B. Repair 11 is not applicable to damage at the forward or aft edges of the fan cowl doors.

C. Repair 11 is not applicable to damage where the repair parts will cause interference with the initial structure.

2. General

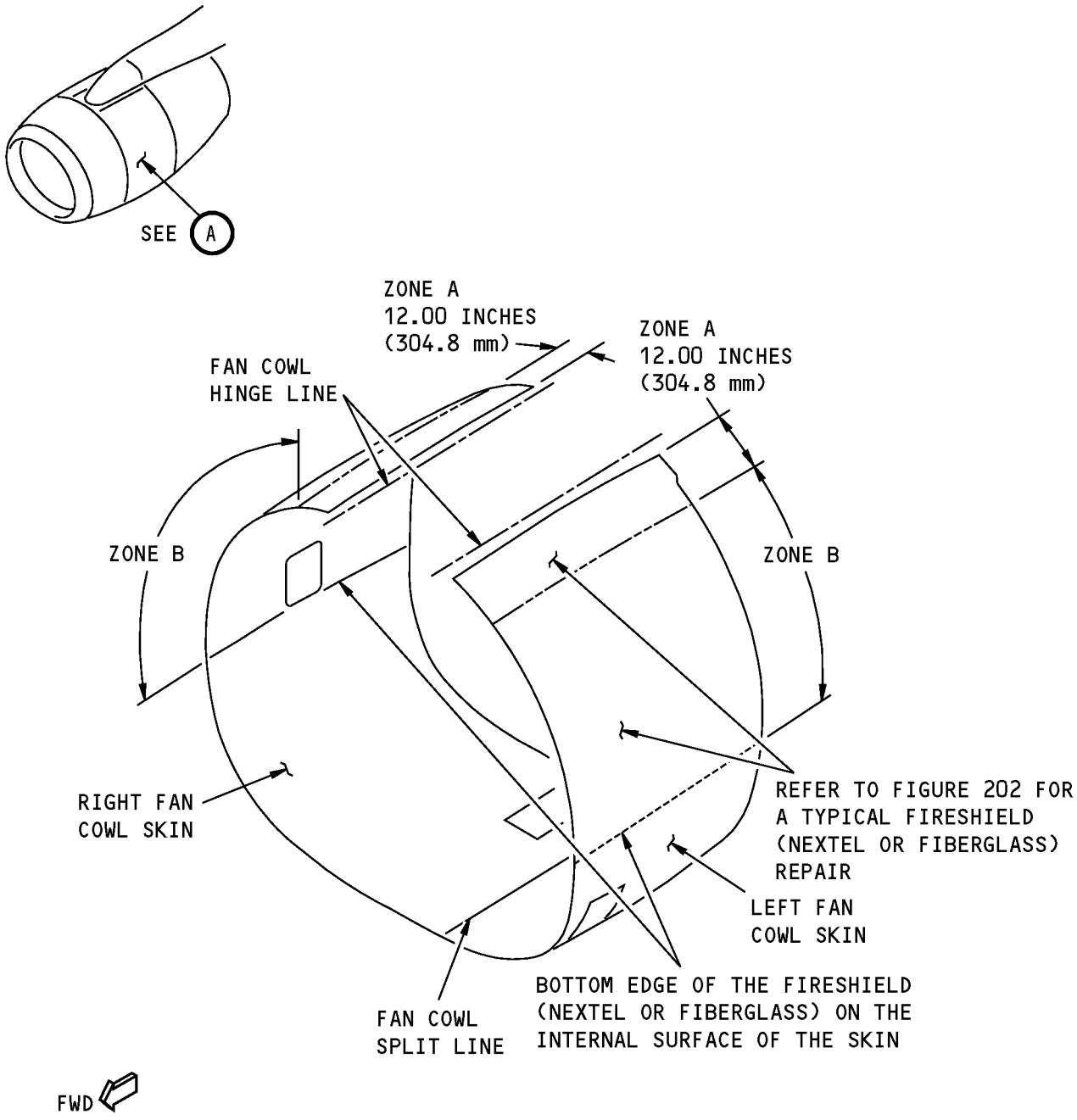
A. Repair 11 is a permanent repair. Refer to 51-00-06 to find the definitions of the different types of repairs.

B. The maximum circumferential length of the damage cutout is 2.00 inches (50.8 mm).

C. The maximum fore/aft length of the damage cutout is 7.00 inches (177.8 mm).

D. The edges of the damaged part of the fireshield material must be a minimum of 1.25 inches (31.8 mm) from the parts of other repaired damage. The damage can extend up to a frame edge.

E. There are three possible skin/frame configurations for this repair. Refer to Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , and C to find the applicable configuration for the repair area.



Engine Fan Cowl Skin Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-30-03	Standard Overhaul Practices Manual
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. Cut and remove the damaged fireshield material. Use small scissors and cut the material as near to the fan cowl door skin as possible.

C. Abrade the silicon coating in the repair area with 150-grit or smaller abrasive paper.

(1) Do not cause damage to the fibers below the silicon coating.

(2) Do not cause damage to the aluminum skin of the fan cowl door.

D. Remove the fasteners from the skin and frames in the repair area. Refer to Layout of the Repair Parts, Figure 202/REPAIR 11, Details A and B , and 51-40-02.

NOTE: Fastener removal is not necessary for Layout of the Repair Parts, Figure 202/REPAIR 11, Detail C .

E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 11 for the materials, and Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C for the layout of the repair parts.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, YOU CAN CAUSE SKIN IRRITATION OR INJURY TO PERSONS. DO NOT USE SOLVENTS IN AREAS WITH EQUIPMENT THAT CAN PRODUCE HEAT OR SPARKS. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURIES.

F. Clean the repair area and the repair parts with solvent and wipe them dry before the solvent evaporates. Refer to SOPM 20-30-03.

G. Apply a thin layer of Dow Corning 1200 primer to:

(1) All of the aluminum surfaces in the repair area that are open to the air

(2) The mating surfaces of the fan cowl skin and the repair parts.

(3) Do not apply the primer to the red silicon adhesive.

H. Permit the primer to dry at room temperature for a minimum of 1 hour.

I. Apply a layer of Dow Corning 90-006 adhesive to the mating surfaces of the fan cowl skin and the repair parts.

(1) To give a smooth surface, use a sufficient quantity of adhesive to fill in the areas of the skin at:

(a) The edges of the chem-milled pockets

(b) The locations of missing Nextel fireshield material.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Foil	1	Use 0.005 inch (0.13 mm) thick CRES 321 foil
[2]	Repair Doubler	2	Use 0.020 inch (0.51 mm) thick CRES 321 sheet

J. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C .

K. Apply pressure to the repair area to get the maximum adhesion between the fan cowl door skin and the repair parts. Use a squeegee or a roller.

L. Do a visual inspection to make sure that "squeeze out" of the adhesive has occurred along the full length of all edges of the part 1 repair foil.

M. Cure the adhesive for 2 hours at ambient temperature followed by 2 hours at a temperature between 140°F and 190°F (60°C and 89°C).

N. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C . Refer to 51-40-05.

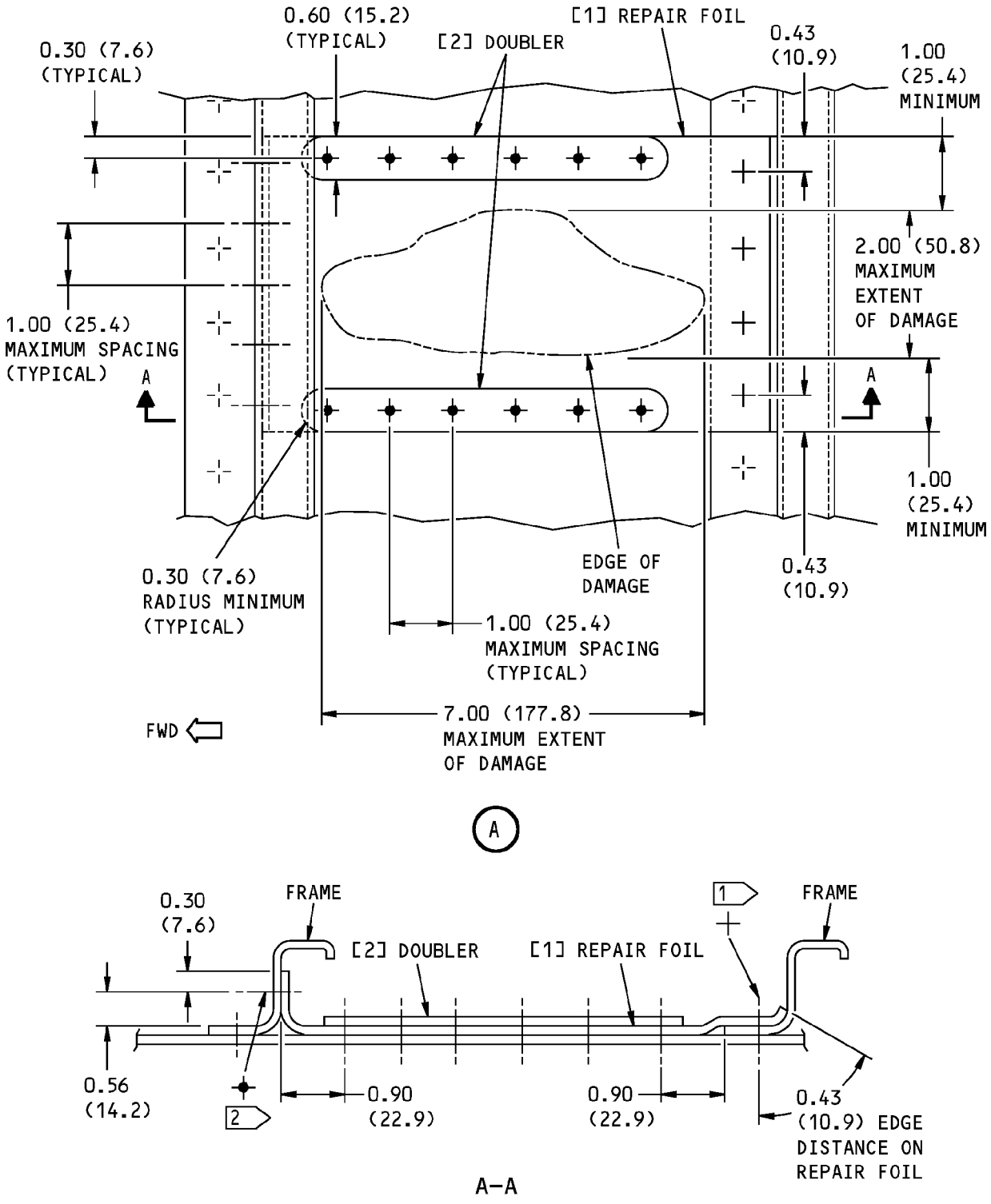
O. Install the fasteners wet with BMS 5-26 (preferred) or BMS 5-95 sealant.

(1) In areas not covered by the part (2) doublers, install CRES washers under the upset heads of the rivets. Refer to Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C for the fastener and CRES washer callouts.

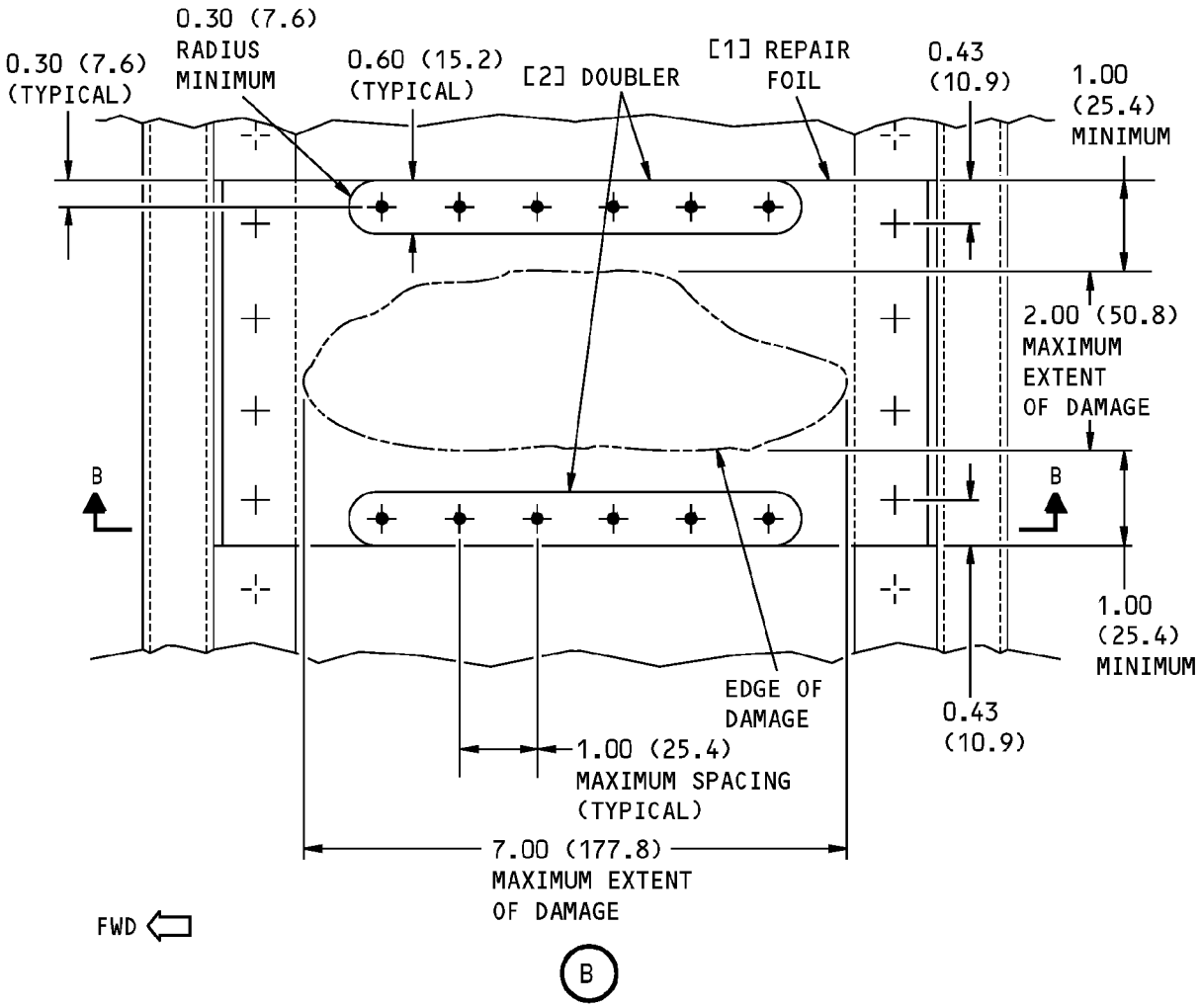
NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install BACR15CE6M rivets, apply the cadmium as given in QQ-P-416, Type I, Class III, to a thickness of 0.0002 to 0.0004 inch (0.0051 mm to 0.010 mm).

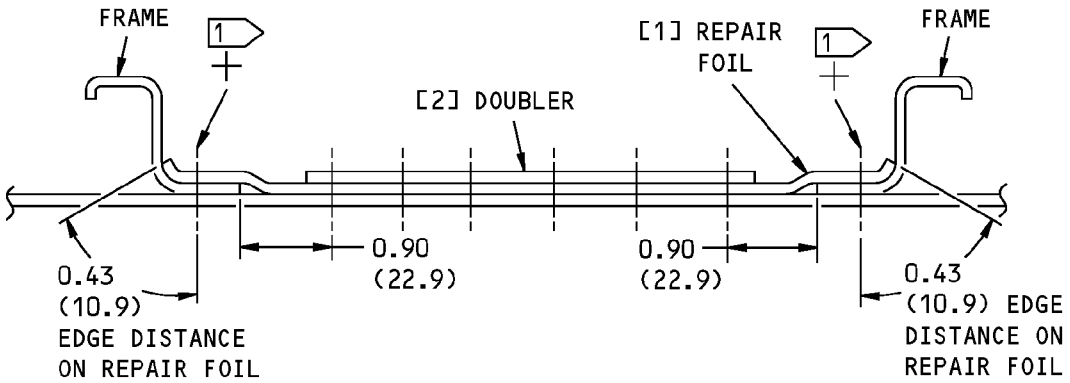
P. As an option, you can apply a layer of DC 1200 primer and a layer of Dow Corning 90-006 adhesive over the repair parts. Permit the primer to dry for 1 hour before you apply the adhesive.

NOTE: This optional procedure is for cosmetic restoration of the fireshield finish and can be omitted.



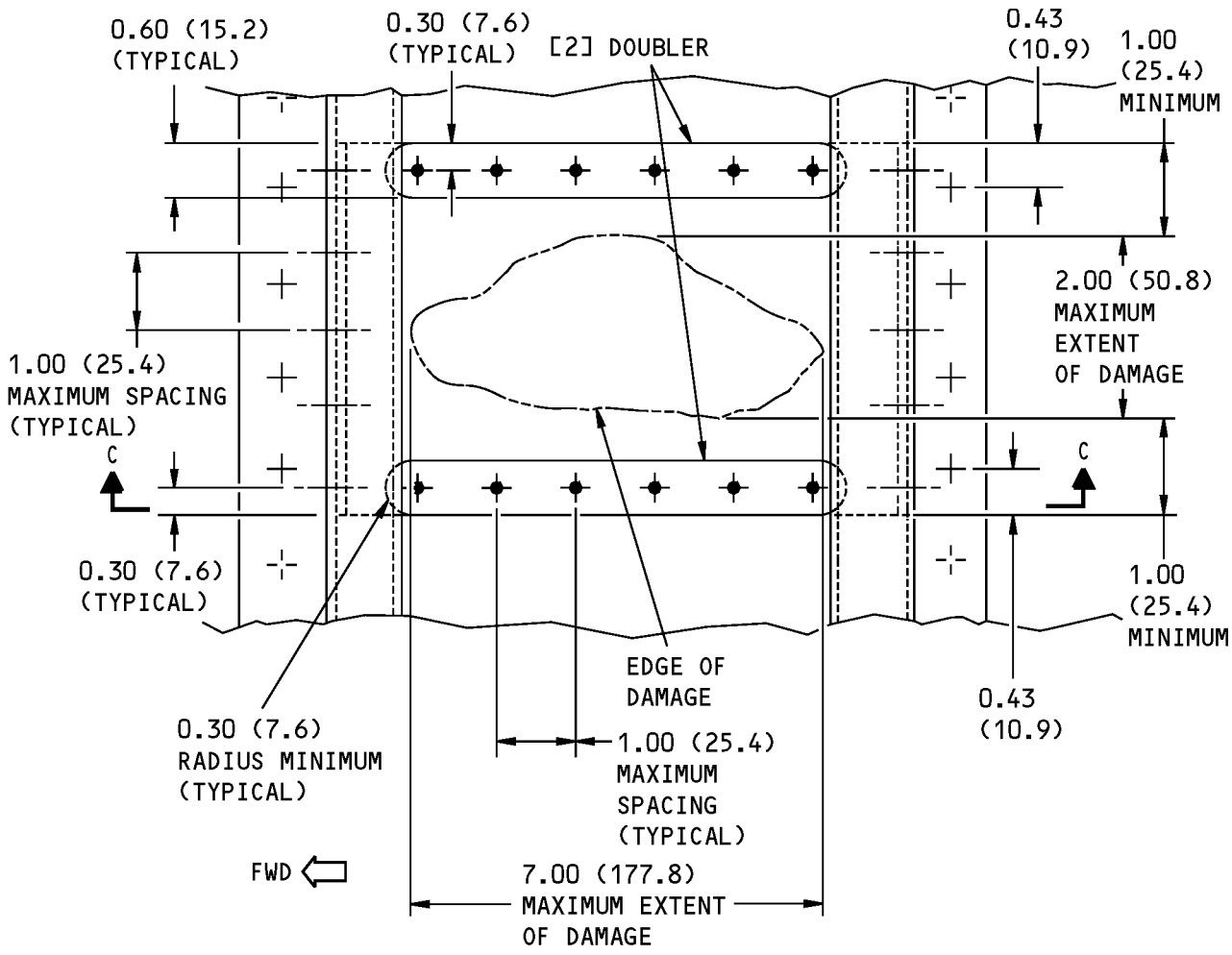
Layout of the Repair Parts
Figure 202 (Sheet 1 of 4)

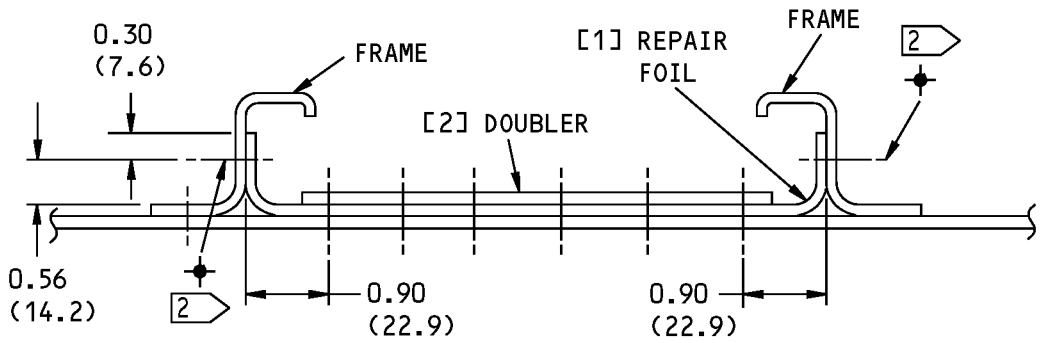




B–B

Layout of the Repair Parts
Figure 202 (Sheet 2 of 4)





C–C

Layout of the Repair Parts
Figure 202 (Sheet 3 of 4)

NOTES

- ALL DIMENSIONS ARE IN INCHES (mm).

1 INSTALL NAS1149C0332R CRES WASHERS UNDER THE UPSET HEAD OF 3/16 INCH DIAMETER RIVETS.

2 INSTALL NAS1149CN432R CRES WASHERS UNDER THE UPSET HEAD OF 1/8 INCH DIAMETER RIVETS (AT FRAME LOCATION ONLY)

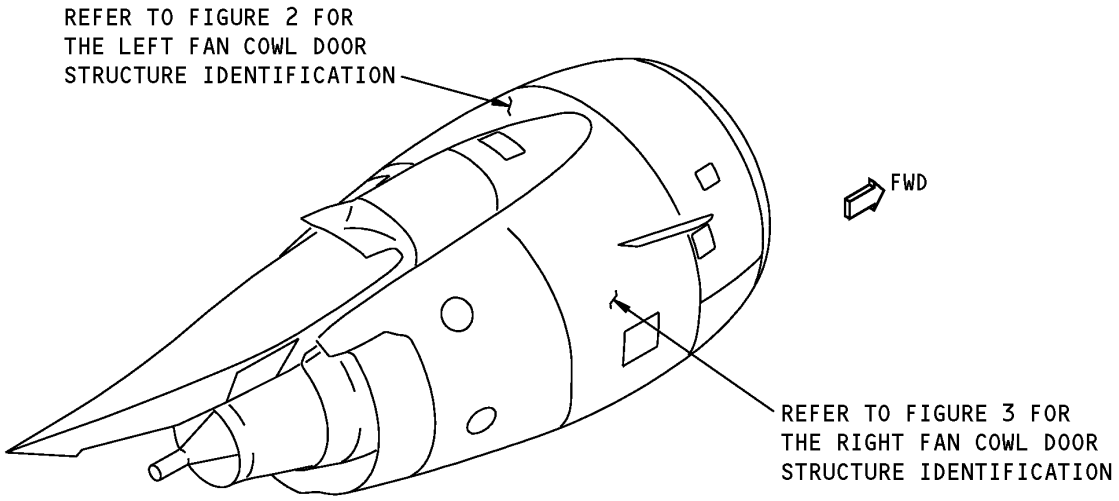
FASTENER SYMBOLS

INITIAL FASTENER LOCATION. INSTALL A NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET.

REPAIR FASTENER LOCATION. INSTALL A MS20615-4MP PROTRUDING HEAD RIVET.

Layout of the Repair Parts
Figure 202 (Sheet 4 of 4)

IDENTIFICATION 1 - FAN COWL DOOR STRUCTURE

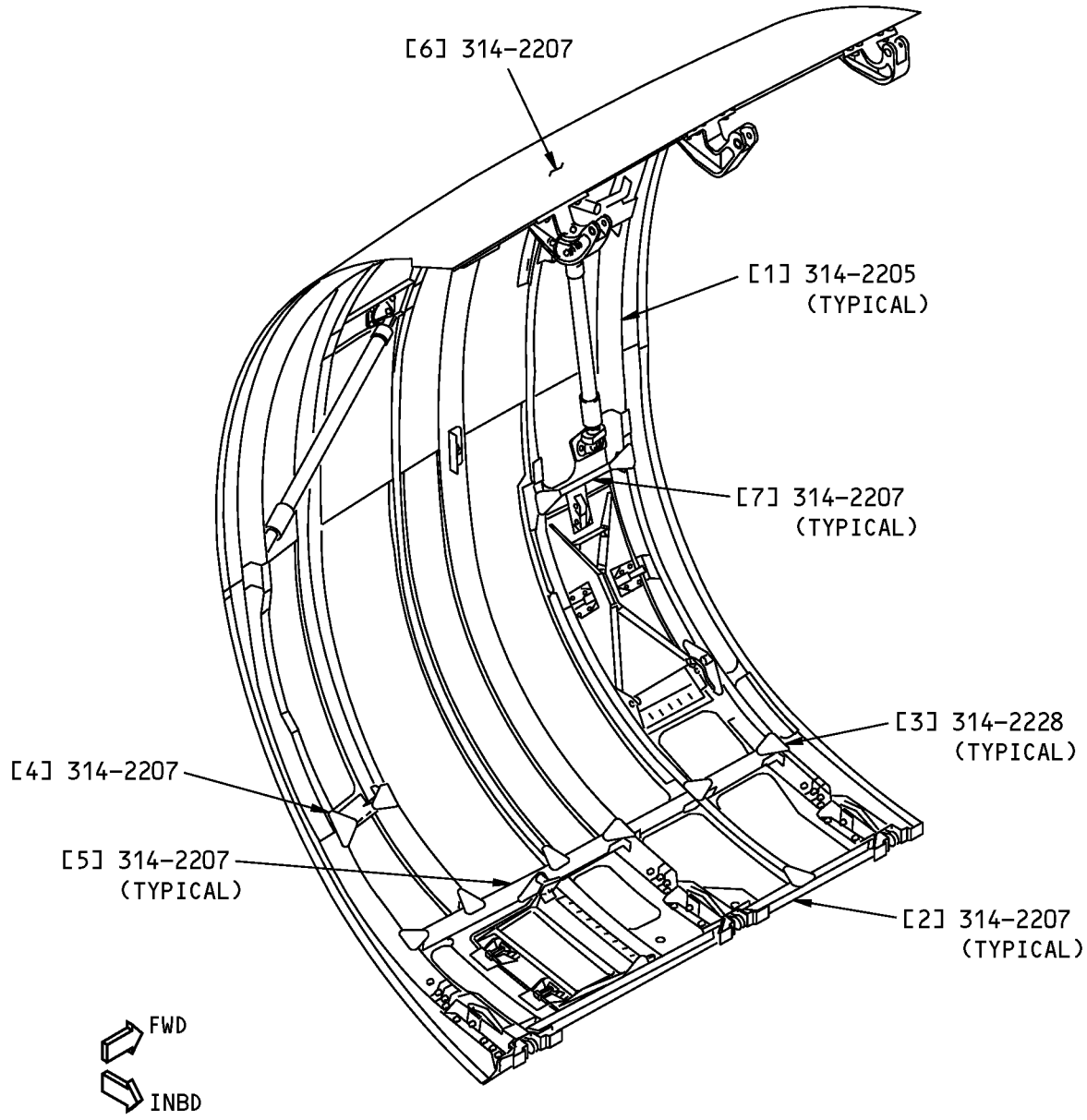


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Fan Cowl Door Structure Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
314-2200	Cowl Assembly - Fan, Left and Right
314-2201	Fan Cowl Structure Assembly, LH
314-2202	Fan Cowl Structure Assembly, RH
314-2205	Details - Frames and Doublers, Fan Cowl
314-2206	Details - Frames and Doublers, Fan Cowl, RH
314-2207	Details - Longeron, Intercostal, and Doubler



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

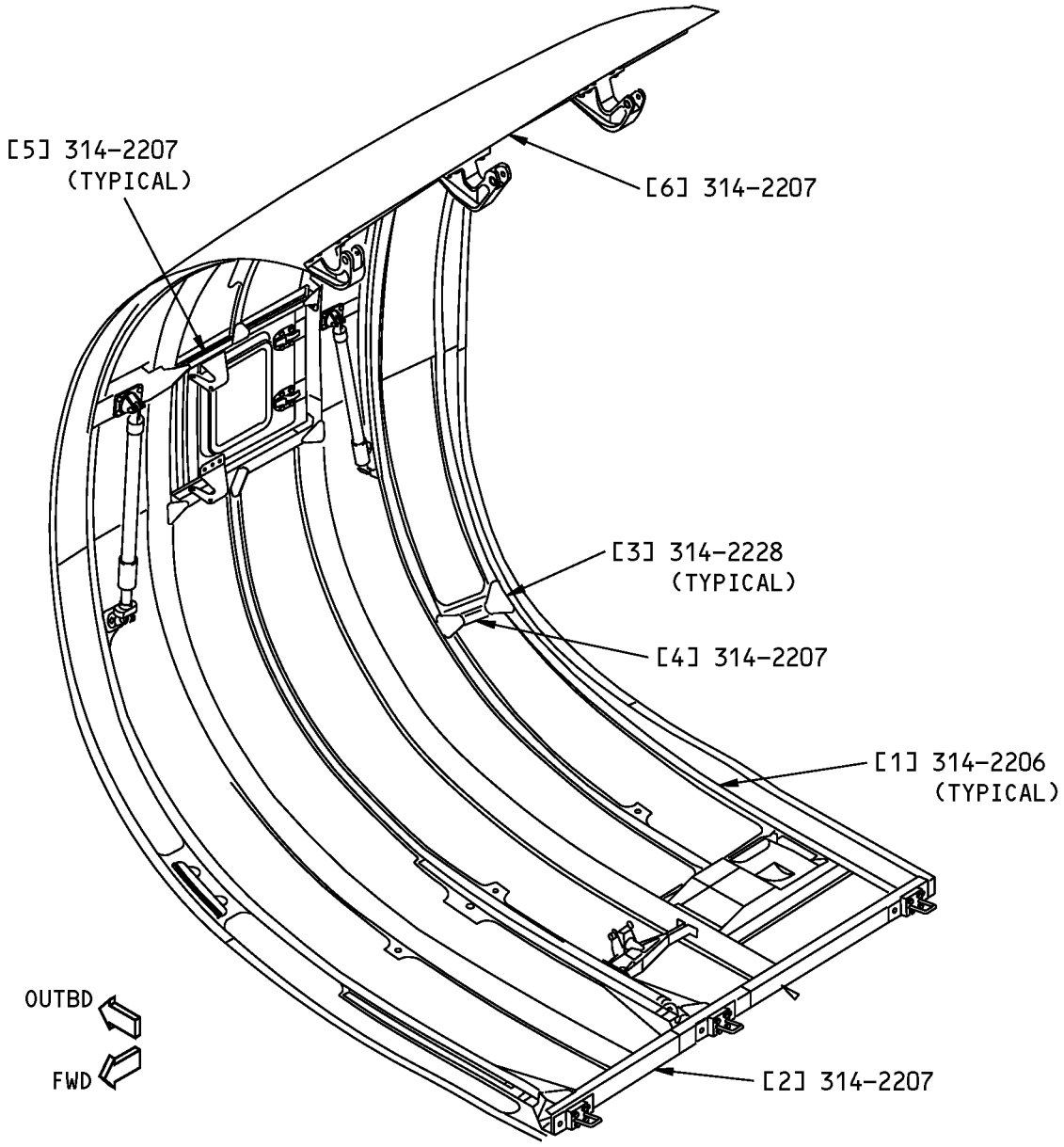
VIEW WHEN YOU LOOK OUTBOARD

Left Fan Cowl Door Structure Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Zee Frame	0.063 (1.60)	2024-T62	
[2]	Cee Longeron	0.063 (1.60)	2024-T62	
[3]	Gusset	0.063 (1.60)	2024-T3	
[4]	Zee Intercostal	0.063 (1.60)	2024-T62	
[5]	Cee Intercostal	0.063 (1.60)	2024-T62	
[6]	Upper Zee Longeron	0.063 (1.60)	Nickel alloy steel 625	
[7]	Zee Intercostal	0.050 (1.27)	2024-T62	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

VIEW WHEN YOU LOOK OUTBOARD

Right Fan Cowl Door Structure Identification
Figure 3

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Zee Frame	0.063 (1.60)	2024-T62	
[2]	Cee Longeron	0.063 (1.60)	2024-T62	
[3]	Gusset	0.063 (1.60)	2024-T3	
[4]	Zee Intercostal	0.063 (1.60)	2024-T62	
[5]	Cee Intercostal	0.063 (1.60)	2024-T62	
[6]	Upper Zee Longeron	0.063 (1.60)	Nickel alloy steel 625	
[7]	Zee Intercostal	0.050 (1.27)	2024-T62	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - FAN COWL DOOR STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the fan cowl structure shown in Fan Cowl Door Structure Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

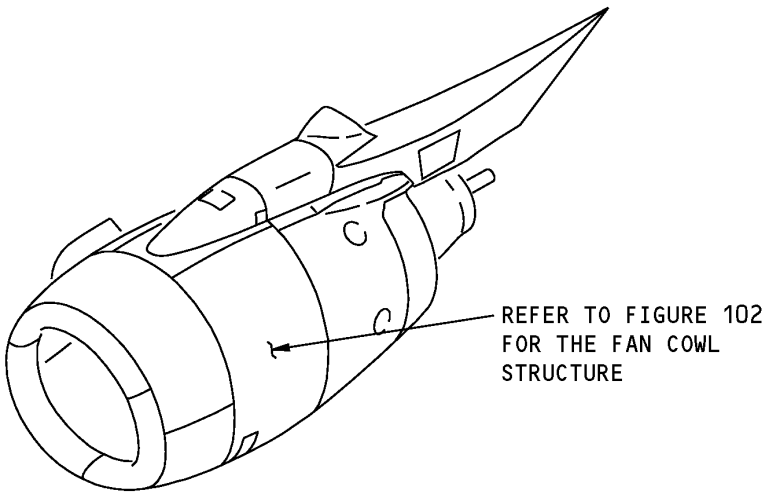
B. After you remove the damage, do as follows:

(1) Apply the finishes that follow to the reworked aluminum parts:

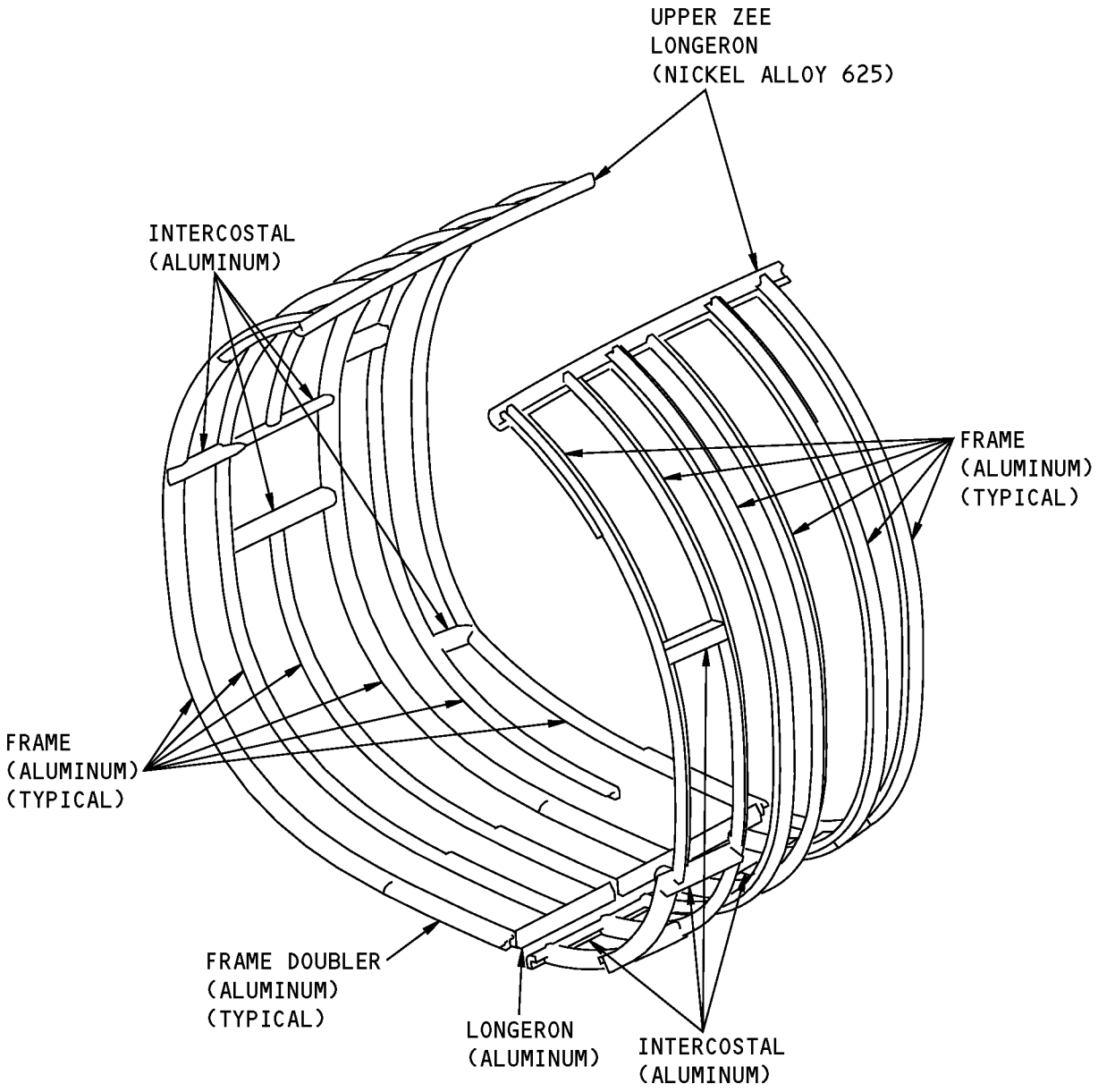
(a) Apply a chemical conversion coating as given in 51-20-01.

(b) Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04.

(2) Apply a finish to the reworked areas as given AMM 51-20-00/701.



Fan Cowl Door Structure Location
Figure 101



Fan Cowl Structure
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-20-00/701	Decorative Exterior Paint System - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Frames, Longerons, Frame Doublers, and Intercostals:

(1) Cracks:

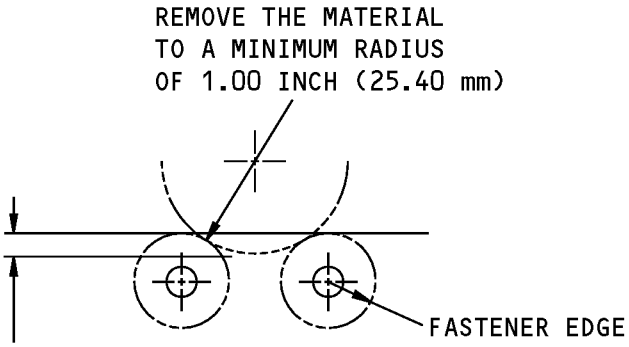
(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

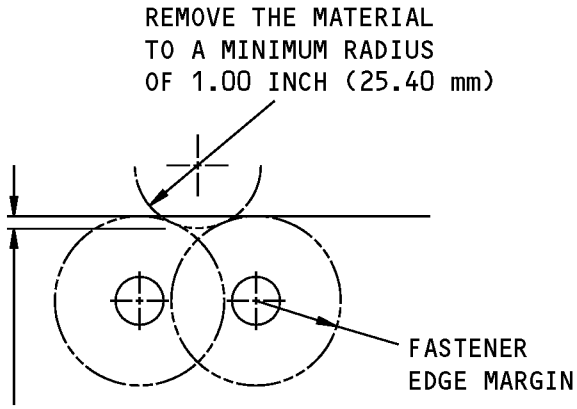
(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.



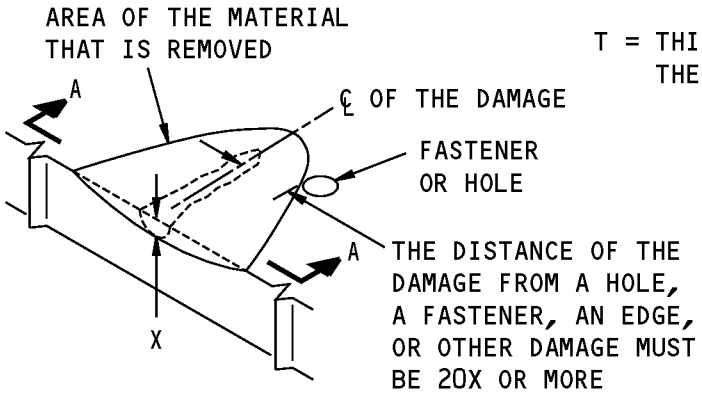
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

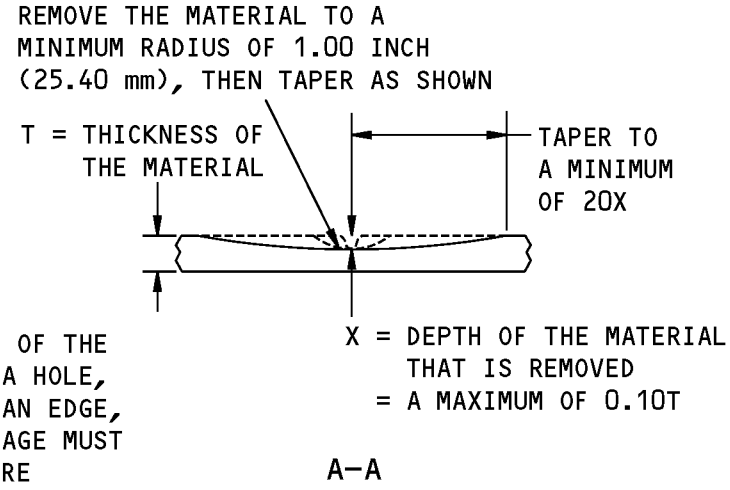
A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

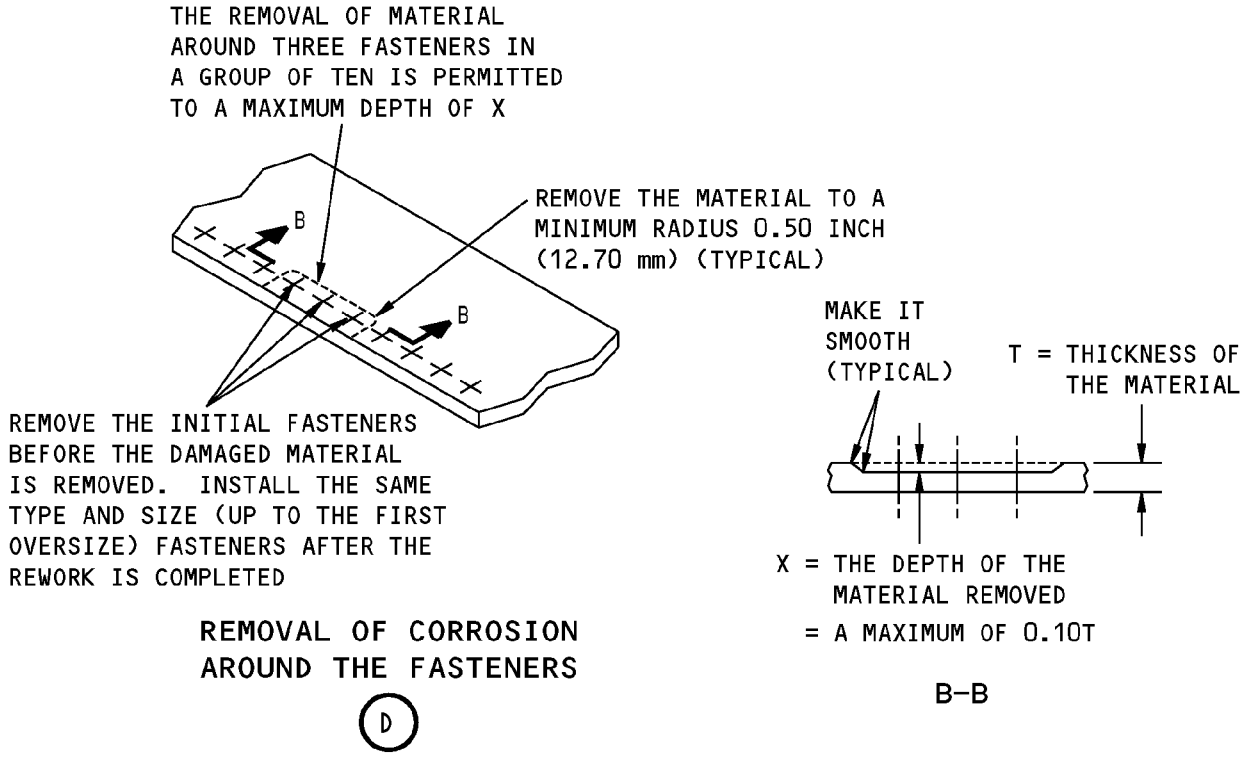


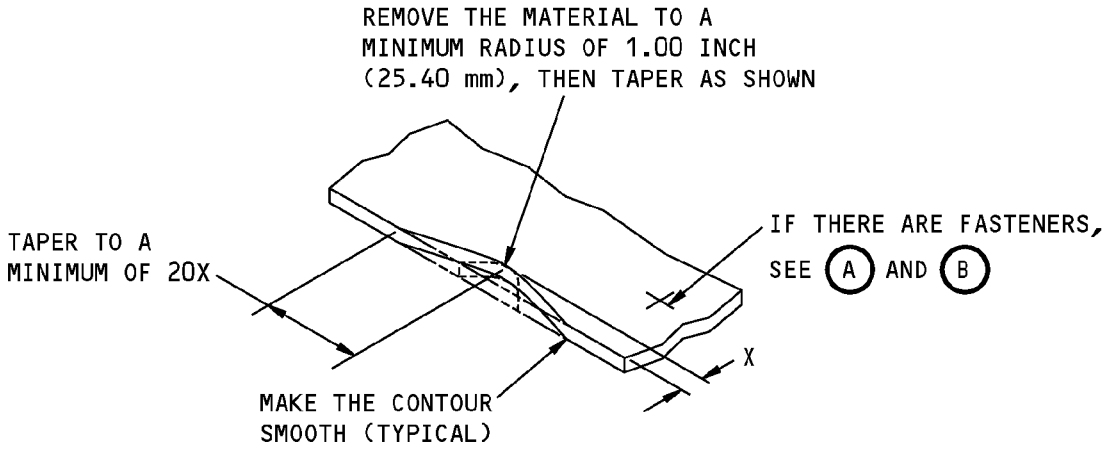


REMOVAL OF DAMAGED MATERIAL ON A SURFACE

C

Allowable Damage Limits
Figure 103 (Sheet 1 of 2)





Allowable Damage Limits
Figure 103 (Sheet 2 of 2)

REPAIR 1 - FAN COWL DOOR FRAMES

1. Applicability

A. Repair 1 is applicable to damage to a Frame of the Fan Cowl Door. Refer to Fan Cowl Door Frame Location, Figure 201/REPAIR 1.

B. Repair 1 is not applicable at frame locations where interference between the repair parts and initial structure can occur. This includes structures such as frames, reinforcing angles, reinforcing tees, and longerons.

2. General

A. Repair 1 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

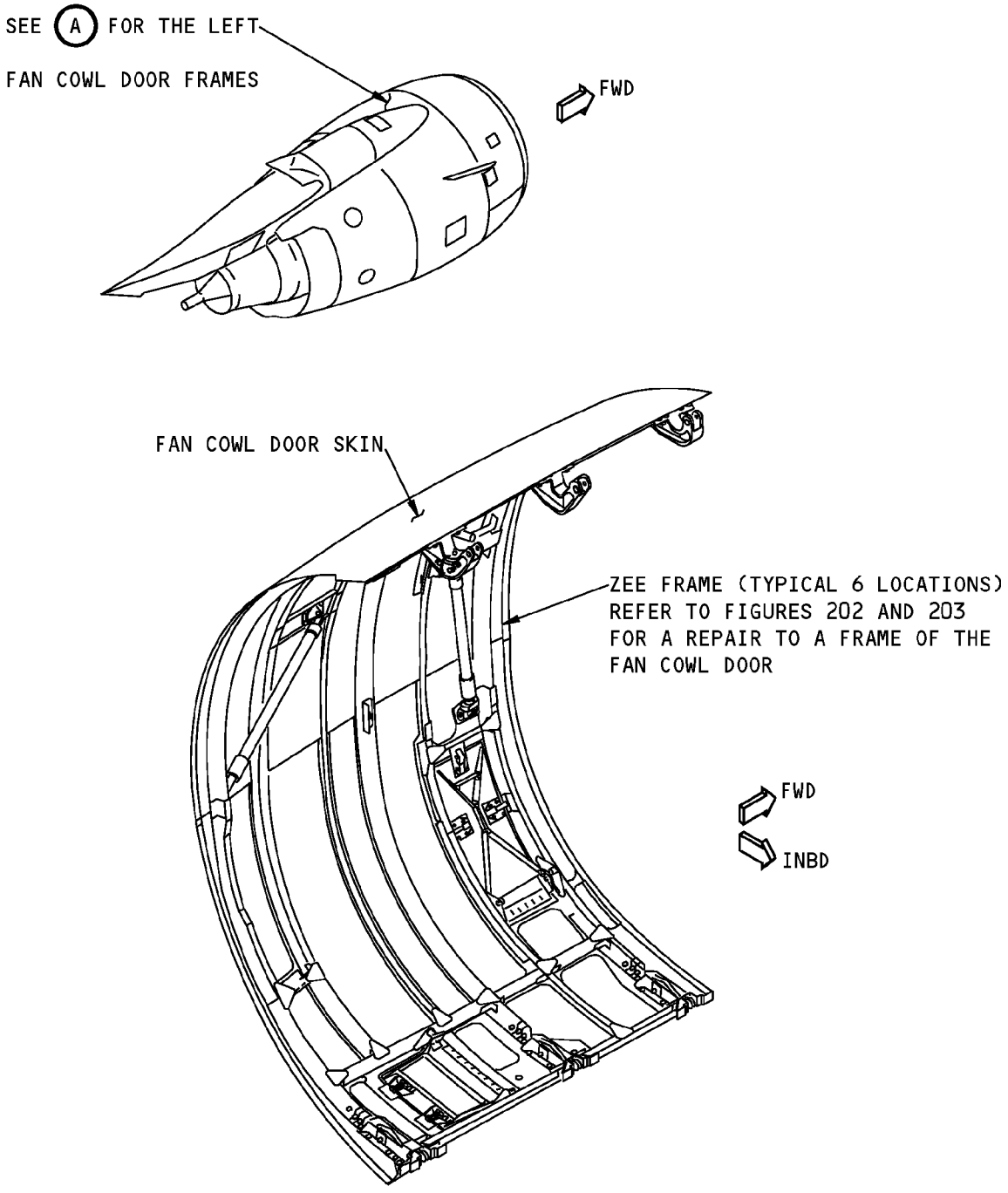
B. The edge of the damage must be a minimum of 4.00 inches (101.6 mm) away from:

(1) The fan cowl hinge fittings

(2) The fan cowl latch fittings

(3) The repair parts of other frame repairs.

C. The length of the frame that is removed must not be more than 12.00 inches (304.8 mm).



Fan Cowl Door Frame Location
Figure 201

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Repair Instructions

A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.

B. Remove the damaged part of the frame. Refer to 51-10-02.

NOTE: Use care not to cause damage to the Nextel or the CRES fireshield.

C. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

D. Make the repair parts to the same contour as the initial frame. Refer to Table 201/REPAIR 1 for the materials. Refer to Splice Dimensions, Figure 202/REPAIR 1 for the dimensions of the part [2] and the part [3] splices.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Filler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Splice	1	Use 0.040 inch (1.02 mm) thick 625 nickel alloy
[3]	Splice	1	Use 0.040 inch (1.02 mm) thick 625 nickel alloy

E. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 203/REPAIR 1.

F. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 203/REPAIR 1. Refer to 51-40-05 and 51-40-06.

G. Disassemble the repair parts.

H. Remove the nicks, scratches, and gouges from the initial parts. Refer to 51-10-02.

I. Remove the sharp edges from the initial and repair parts. Refer to BAC 5300, Sonic Edge Finish.

J. Apply a chemical conversion coating to the part [1] filler and to the bare surfaces of the initial parts. Refer to 51-20-01.

K. Apply two layers of BMS 10-79, Type III primer to the bare surfaces and edges of the initial and repair parts. Refer to SOPM 20-44-04.

L. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

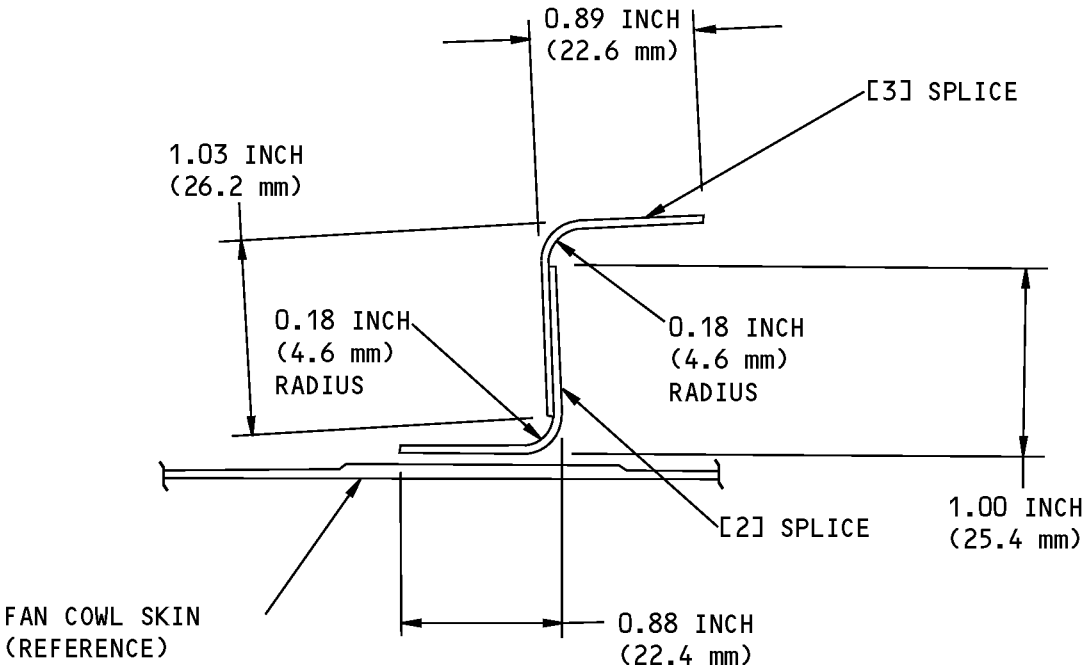
(1) Install the part [1] Filler and the part [2] Splice on the fan cowl door skin.

(2) Install the part [3] Splice on the frame.

M. Install the fasteners with BMS 5-95 sealant.

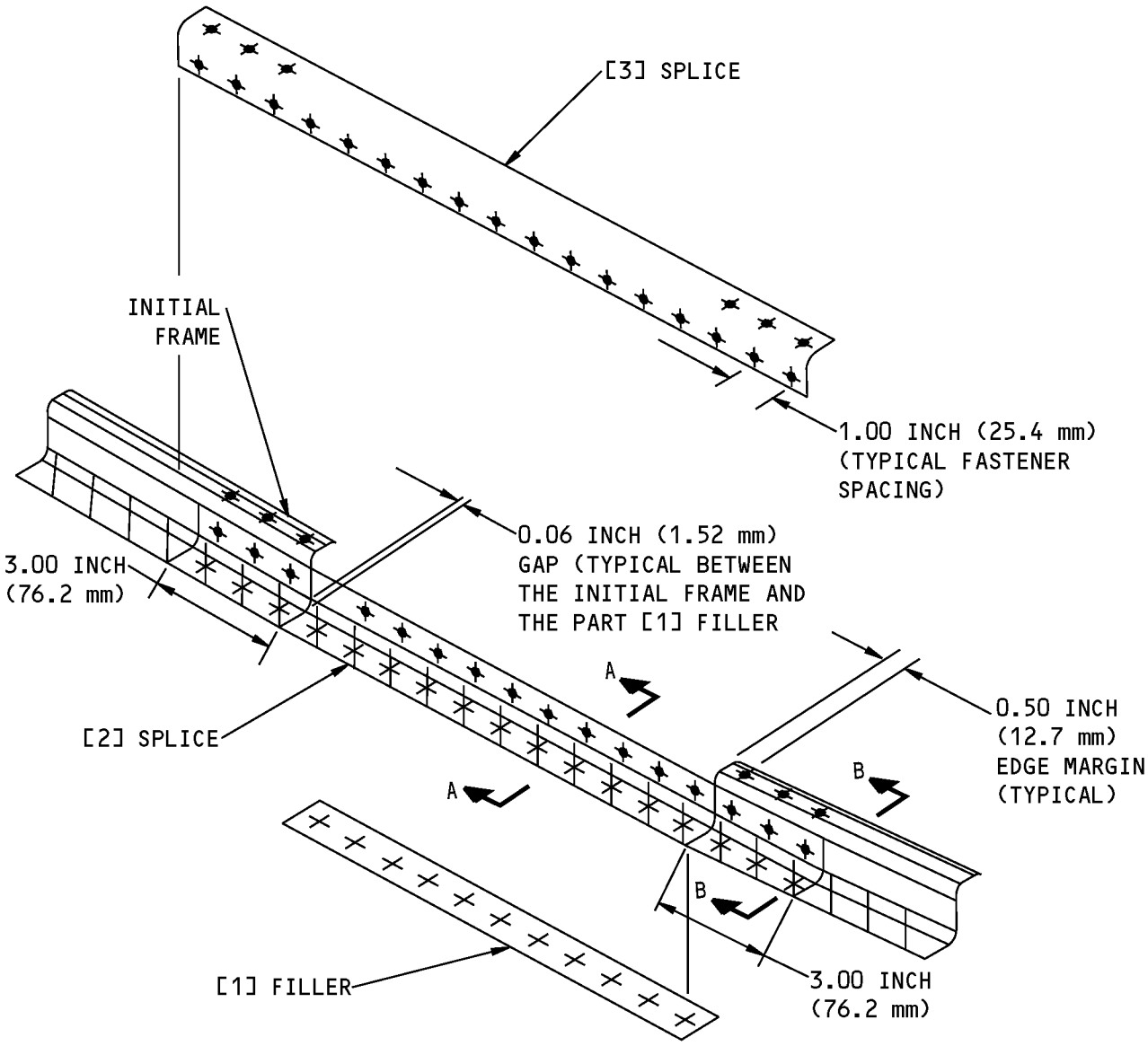
N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

O. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.



NOTE: MAKE THE LENGTH OF THE SPLICES SUFFICIENT TO GIVE A MINIMUM OF 3 FASTENERS ON BOTH ENDS OF THE REPAIR. REFER TO FIGURE 203.

Splice Dimensions
Figure 202

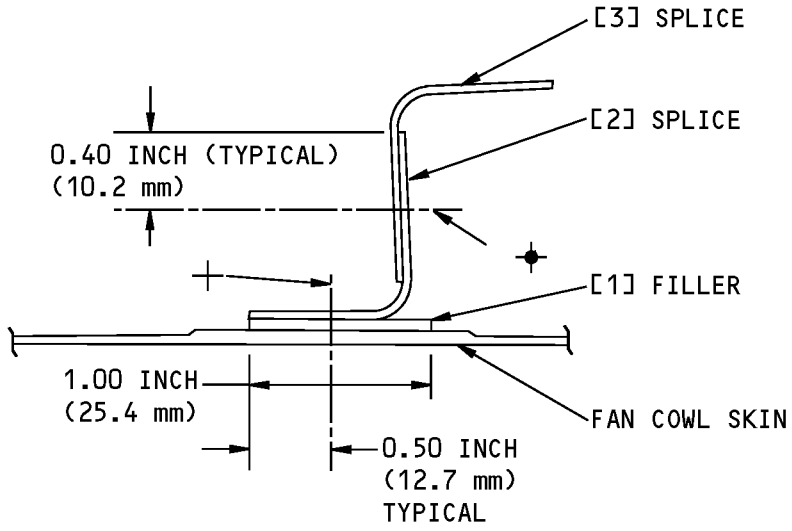


FASTENER SYMBOLS

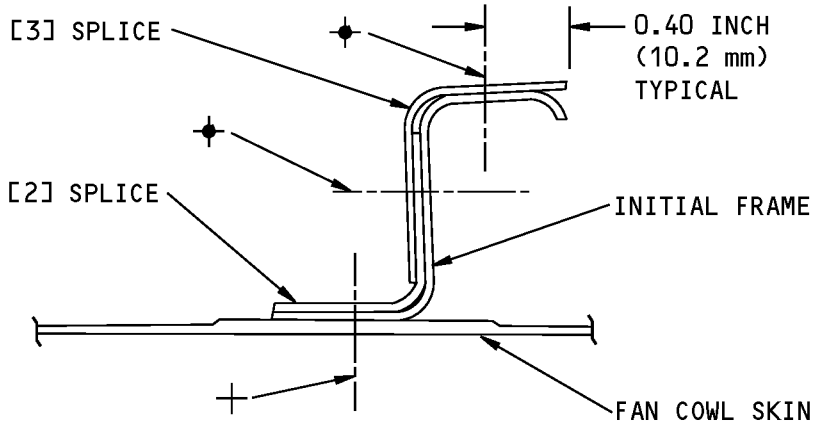
┼ INITIAL FASTENER LOCATION. INSTALL A NAS1200M6-()P RIVET

✦ REPAIR FASTENER LOCATION. INSTALL A MS20615-6MP RIVET.

Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)



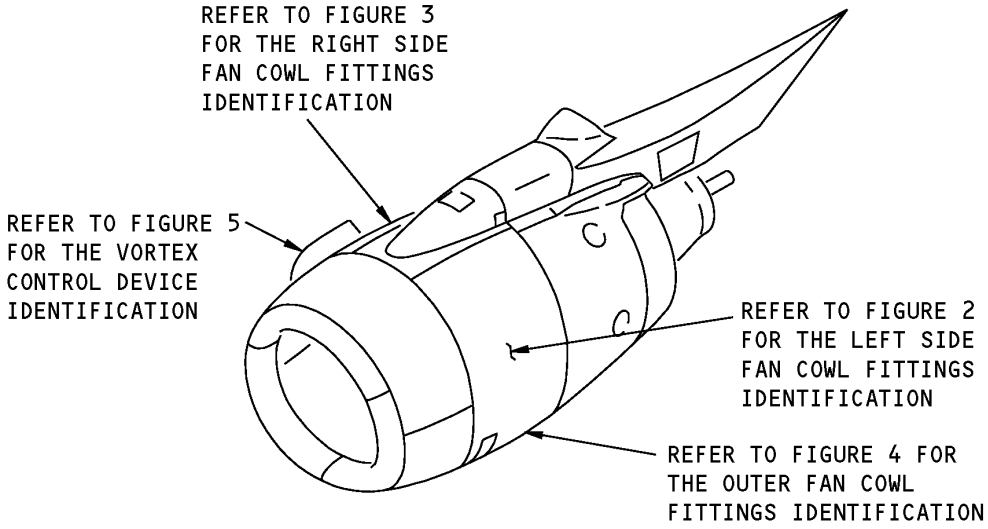
A – A



B – B

Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

IDENTIFICATION 1 - FAN COWL FITTINGS



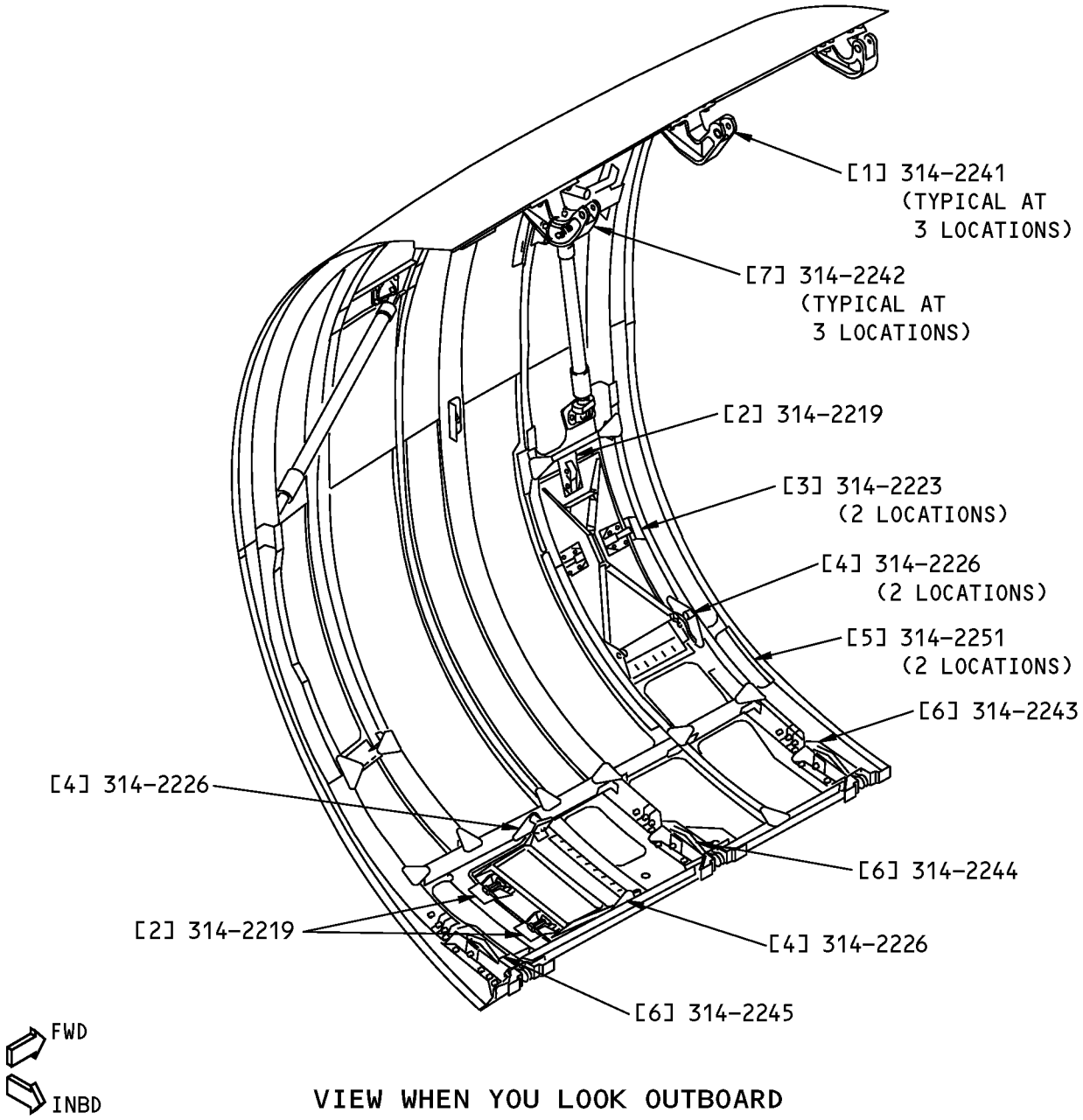
NOTE: REFER TO TABLE 1 FOR THE LIST OF MATERIALS.

Fan Cowl Fittings Locations
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
314-2219	Plate - Strike
314-2223	Plate - Strike, Side IDG Door, Fan Cowl
314-2226	Plate Assembly, Stop - Access Door, Fan Cowl
314-2233	Port, Starter Guide
314-2234	Scupper - Drain, Fan Cowl
314-2240	Hinge - Forward, Fan Cowl
314-2241	Hinge - Center, Fan Cowl
314-2242	Hinge - Aft, Fan Cowl
314-2243	Housing - Latch, Forward, Fan Cowl, LH
314-2244	Housing - Latch, Mid, Fan Cowl, LH
314-2245	Housing - Latch, Aft, Fan Cowl, LH
314-2246	Housing - Keeper, Forward, Fan Cowl, RH
314-2247	Housing - Keeper, Mid, Fan Cowl, RH
314-2248	Housing - Keeper, Aft, Fan Cowl, RH
314-2251	Blade - Axial Locator, Fan Cowl, LH and RH

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
314-2253	Restraint Assembly, Radial - Fan Cowl, RH



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

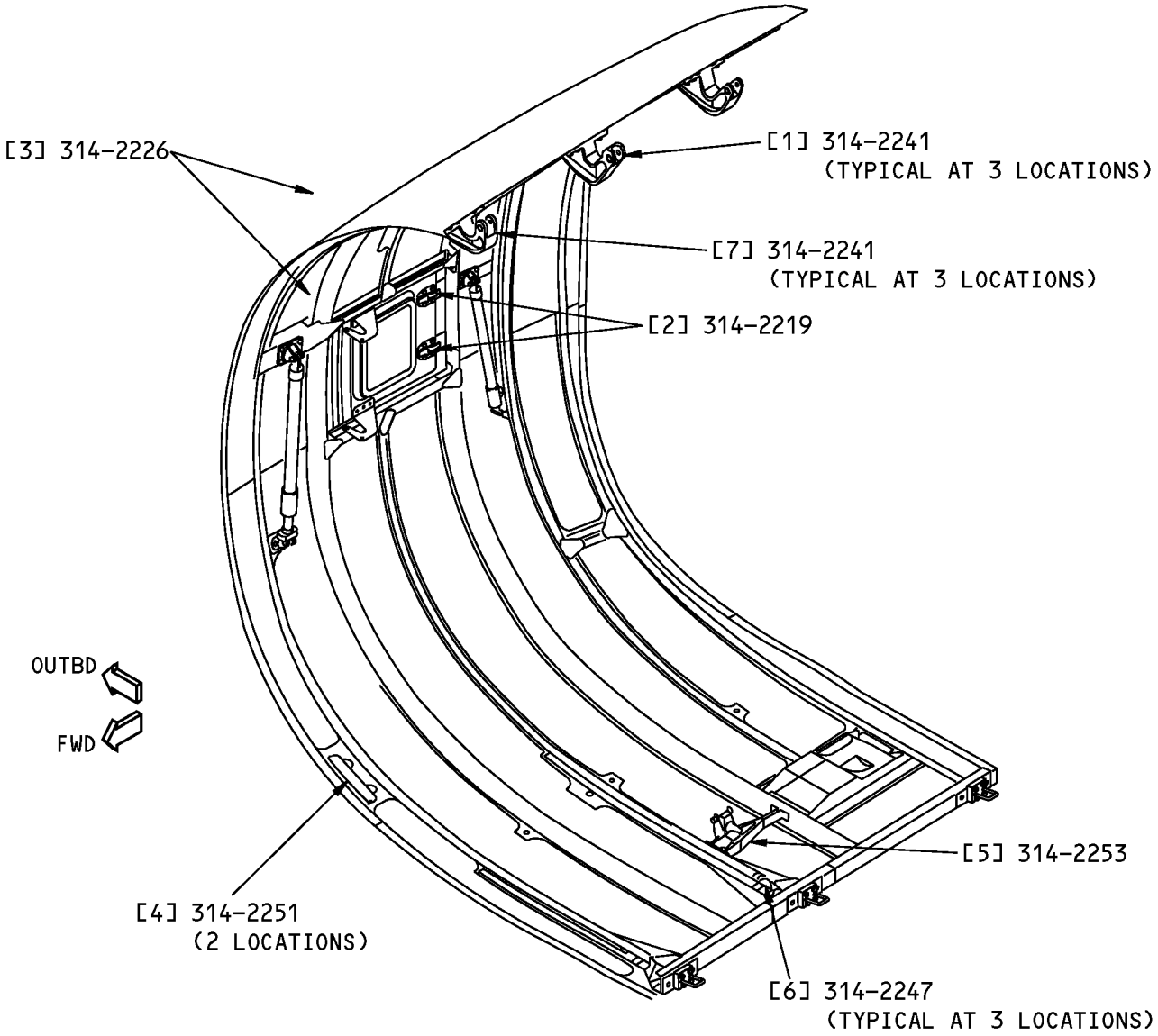
BS-003

Left Side Fan Cowl Fittings Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Fan Cowl Hinge		Ti-6Al-4V titanium casting in the annealed condition	
[2]	Strike Plate	0.040 (1.02)	301 CRES sheet as given in AMS 5517, 1/4 hard	
[3]	IDG Door Side Strike Plate	0.080 (2.03)	Half Solid/Half Laminated CRES sheet	
[4]	Access Door Stop Plate Assembly	0.125 (3.18)	2024-T3 sheet as given in QQ-A-250/4	
[5]	Fan Cowl Axial Locator Blade		17-4PH H1100 CRES casting as given in AMS 5342	
[6]	Fan Cowl Latch Housing		7075-T74 forged aluminum as given in AMS 4131	
[7]	Starter Guide Port		A357.0-T61 aluminum casting as given in AMS 4219	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

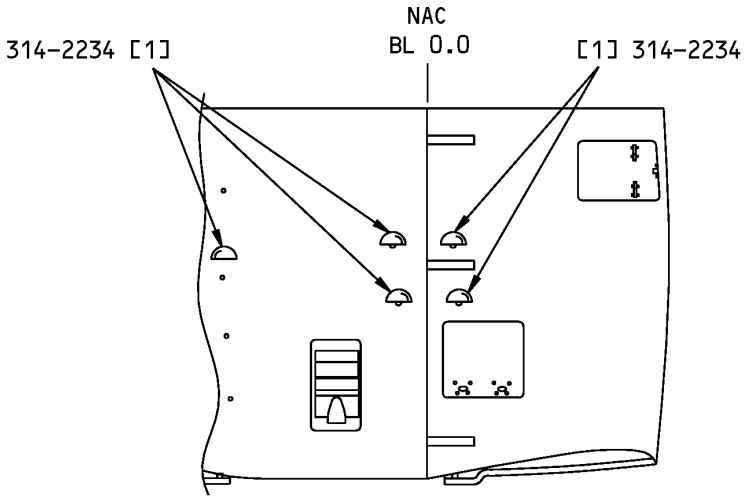
VIEW WHEN YOU LOOK OUTBOARD

Right Side Fan Cowl Fittings Identification
Figure 3

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Fan Cowl Hinge		Ti-6Al-4V titanium casting in the annealed condition	
[2]	Strike Plate	0.040 (1.02)	301 CRES sheet as given in AMS 5517, 1/4 hard	
[3]	Access Door Stop Plate	0.125 (3.18)	2024-T3 sheet as given in QQ-A-250/4	
[4]	Fan Cowl Axial Locator Blade		17-4PH H1100 CRES casting as given in AMS 5342	
[5]	Radial Restraint Assembly		Ti-6Al-4V titanium casting in the annealed condition	
[6]	Fan Cowl Keeper Housing		7075-T74 forged aluminum as given in AMS 4131	
[7]	Starter Guide Port		A357.0-T61 aluminum casting as given in AMS 4219	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 4 FOR THE REFERENCE DRAWINGS.

VIEW WHEN YOU LOOK UP

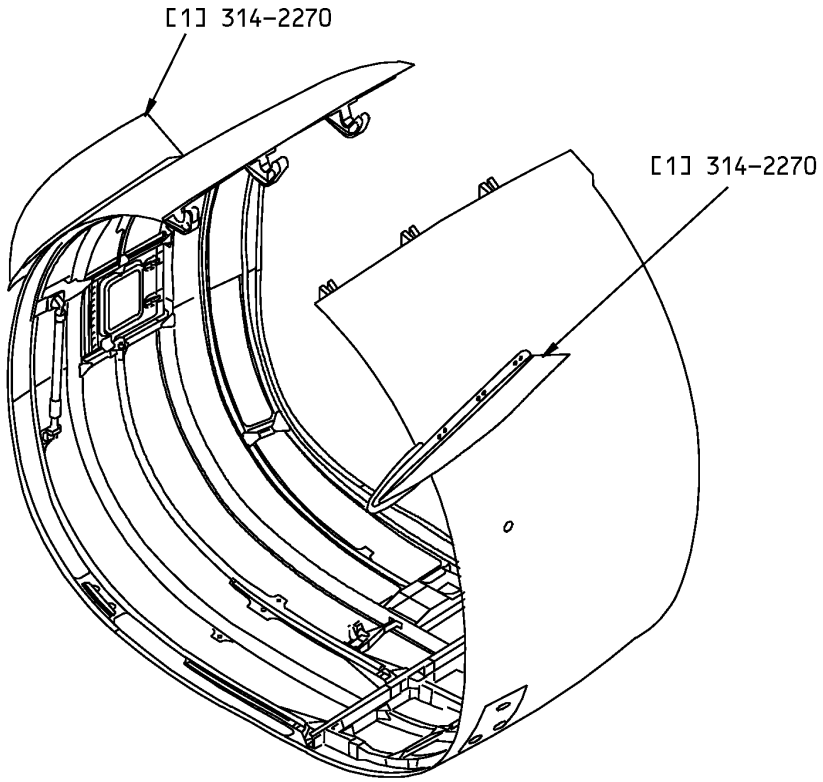
BS-031

Outer Fan Cowl Fittings Identification, Right Side and Left Side
Figure 4

Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Fan Cowl Drain Scupper	0.040 (1.02)	2024-T62 sheet as given in QQ-A-250/4	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTES

- REFER TO TABLE 5 FOR THE LIST OF MATERIALS.
- BOTH VORTEX CONTROL DEVICES ARE ILLUSTRATED TO SHOW LOCATION. ONLY ONE IS INSTALLED ON THE INBOARD FAN COWL DOOR OF EACH ENGINE NACELLE.

BS-032

Fan Cowl Vortex Control Device Fittings Identification
Figure 5

Table 5:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Vortex Control Device		2024-T8511 extrusion as given in QQ-A-200/3	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - FAN COWL FITTINGS

1. Applicability

A. This subject gives the allowable damage limits for the fan cowl fittings shown in Fan Cowl Fittings Location, Figure 102/ALLOWABLE DAMAGE 1.

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

B. After you remove the damage, do as follows:

(1) Apply a chemical conversion coating to the reworked aluminum areas. Refer to 51-20-01.

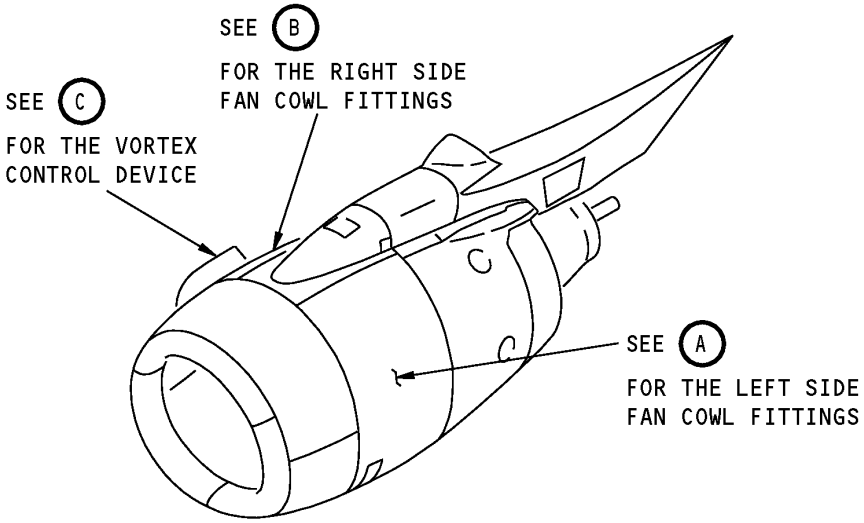
(2) Apply two layers of BMS 10-79, Type III primer on the reworked areas of the CRES, aluminum, and titanium areas as given in SOPM 20-44-04.

NOTE: This requirement is not applicable to Vortex Control Device.

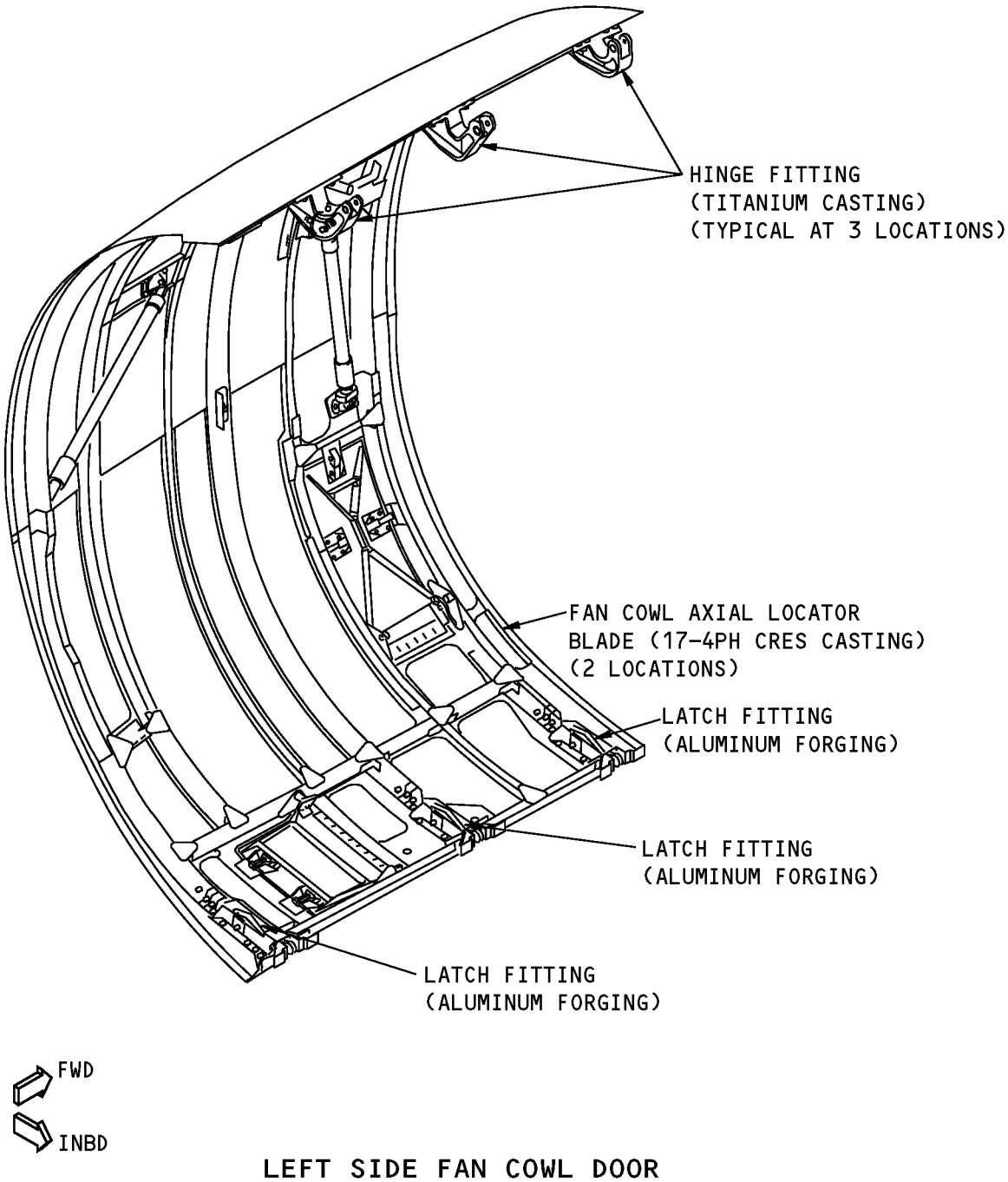
C. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits for the different fan cowl fittings.

Table 101:

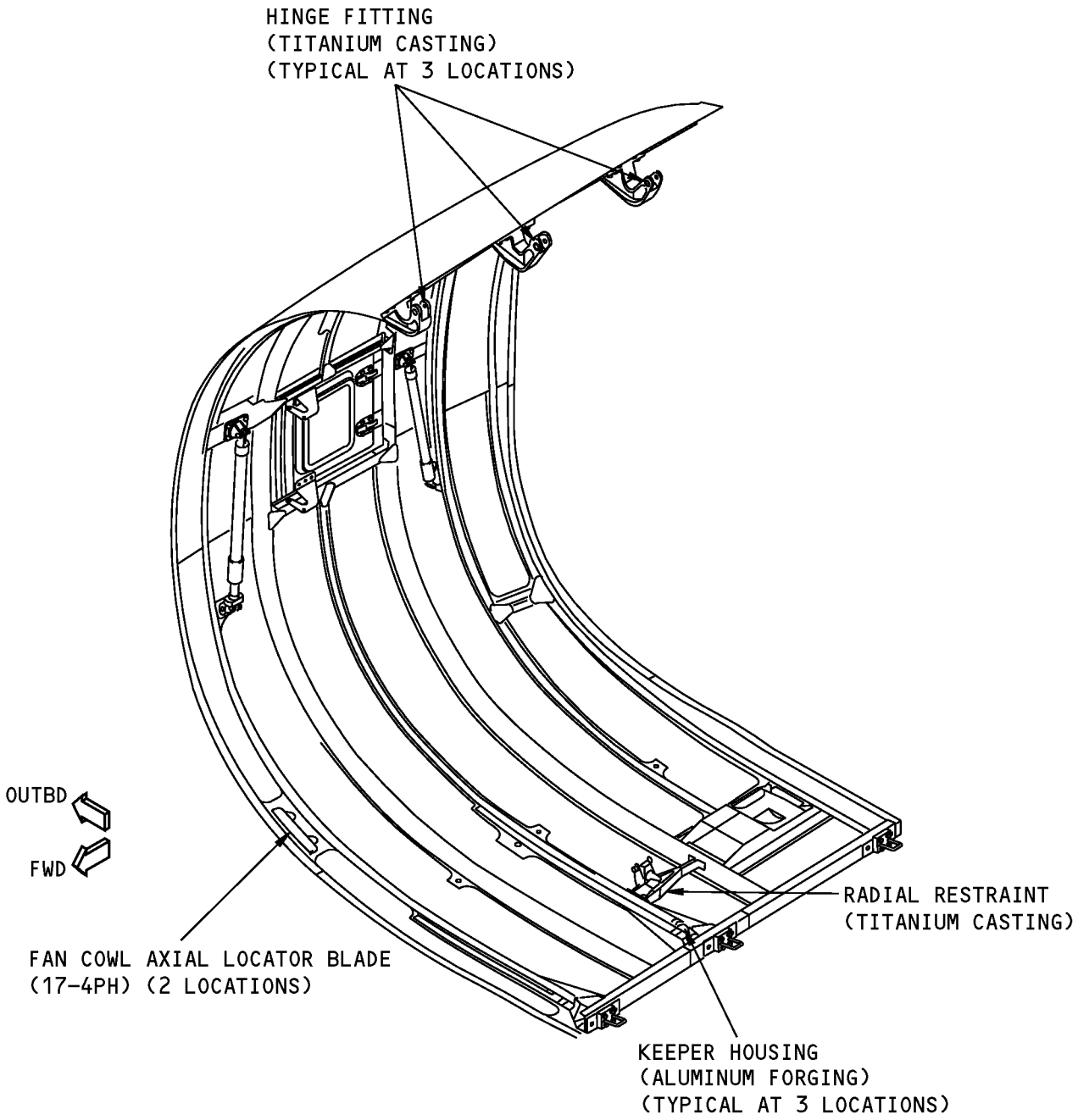
PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS	
FAN COWL FITTINGS	**PARAGRAPH**
Hinge Fittings	4.A
Latch and Keeper Housings	4.B
Axial Locator and Radial Restraint Fittings	4.C
Vortex Control Device Fitting	4.D



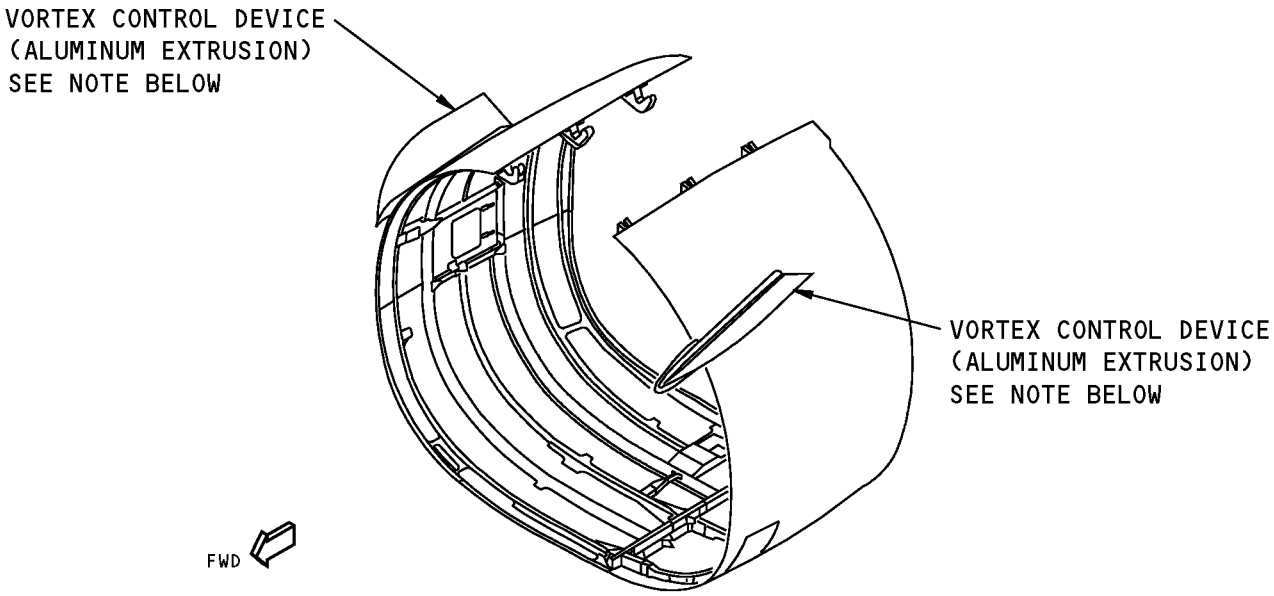
Fan Cowl Locations
Figure 101



Fan Cowl Fittings Location
Figure 102 (Sheet 1 of 3)



Fan Cowl Fittings Location
Figure 102 (Sheet 2 of 3)



VORTEX CONTROL DEVICE FITTING

C

NOTE: BOTH VORTEX CONTROL DEVICES ARE ILLUSTRATED TO SHOW LOCATION. ONLY ONE IS INSTALLED ON THE INBOARD FAN COWL DOOR OF EACH ENGINE NACELLE.

Fan Cowl Fittings Location
Figure 102 (Sheet 3 of 3)

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Hinge Fittings

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits - Fan Cowl Fittings, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(b) Remove the damage in the lug areas as shown in Allowable Damage Limits - Fan Cowl Fittings, Figure 103/ALLOWABLE DAMAGE 1, Detail E .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

B. Latch and Keeper Housings

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits - Fan Cowl Fittings, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

C. Axial Locator and Radial Restraint Fittings

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits - Fan Cowl Fittings, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

D. Vortex Control Device Fitting

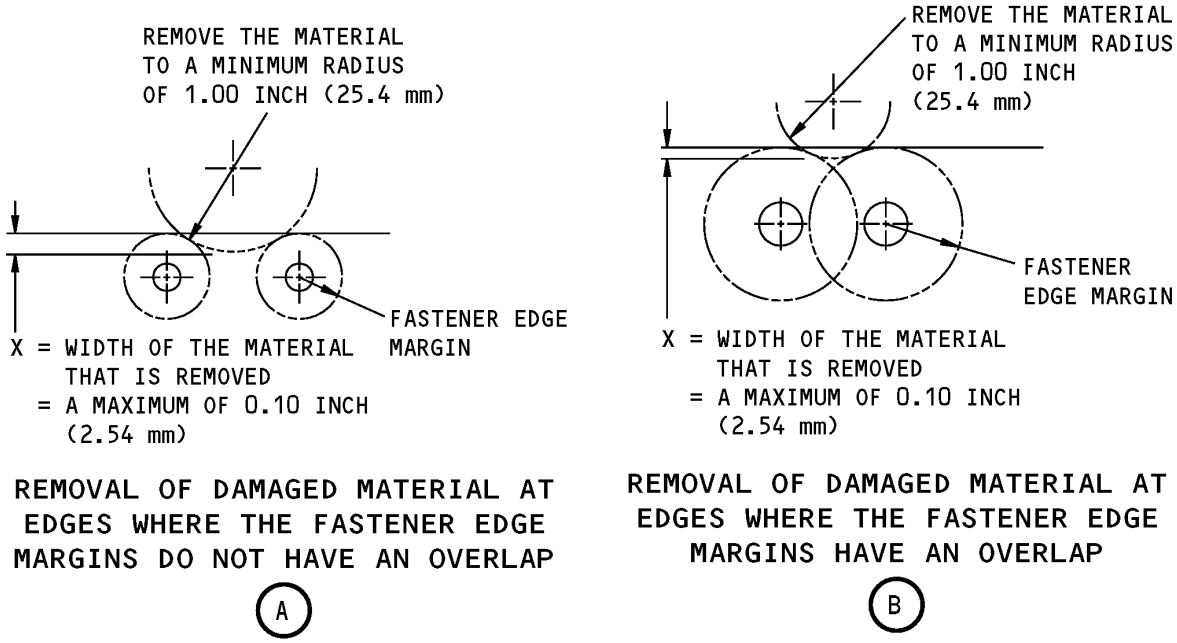
(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

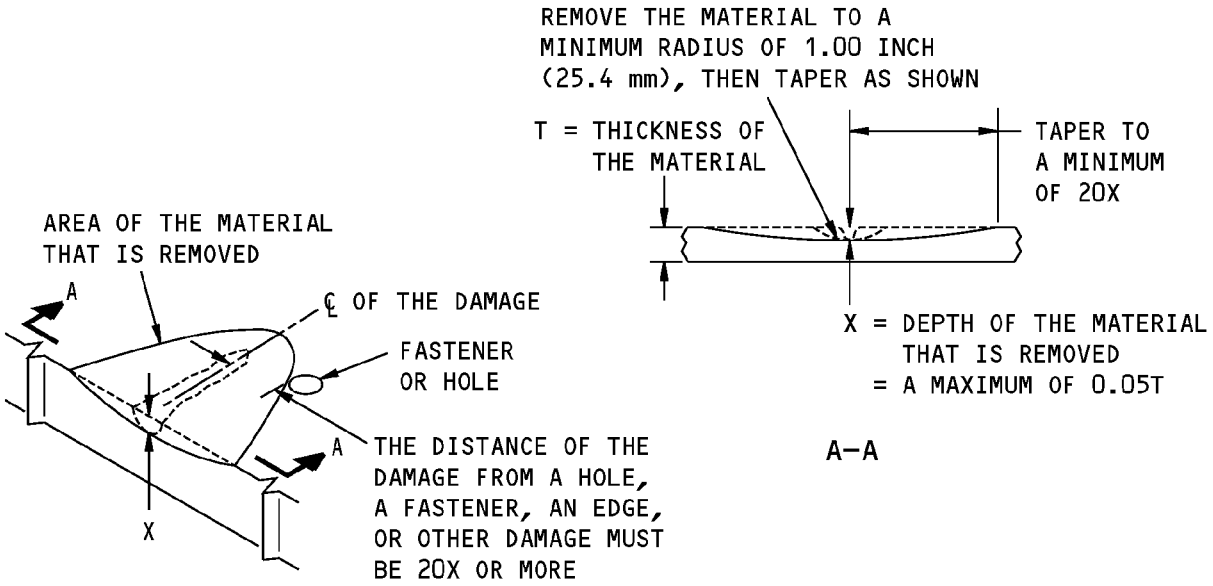
(a) Remove the damage as shown in Allowable Damage Limits - Fan Cowl Fittings, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

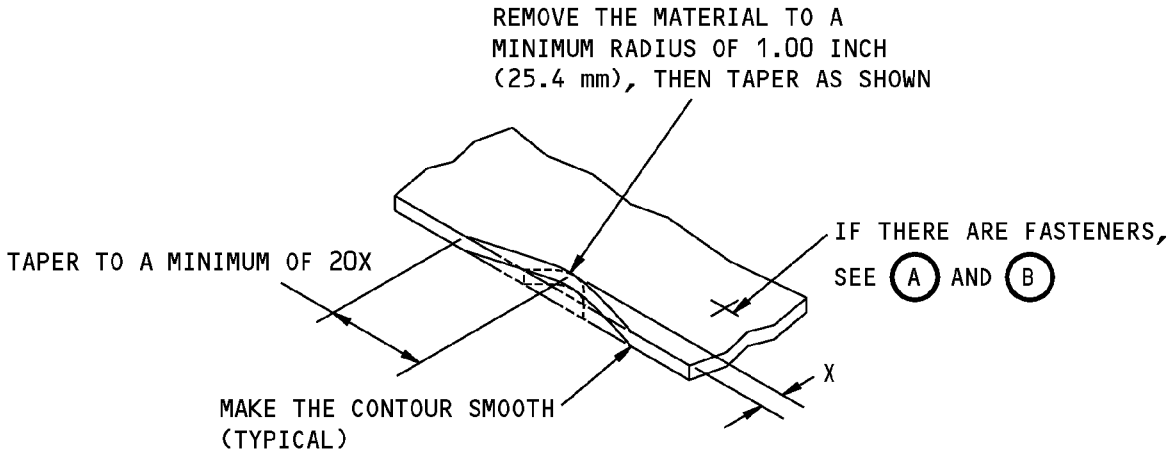


Allowable Damage Limits - Fan Cowl Fittings
Figure 103 (Sheet 1 of 3)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

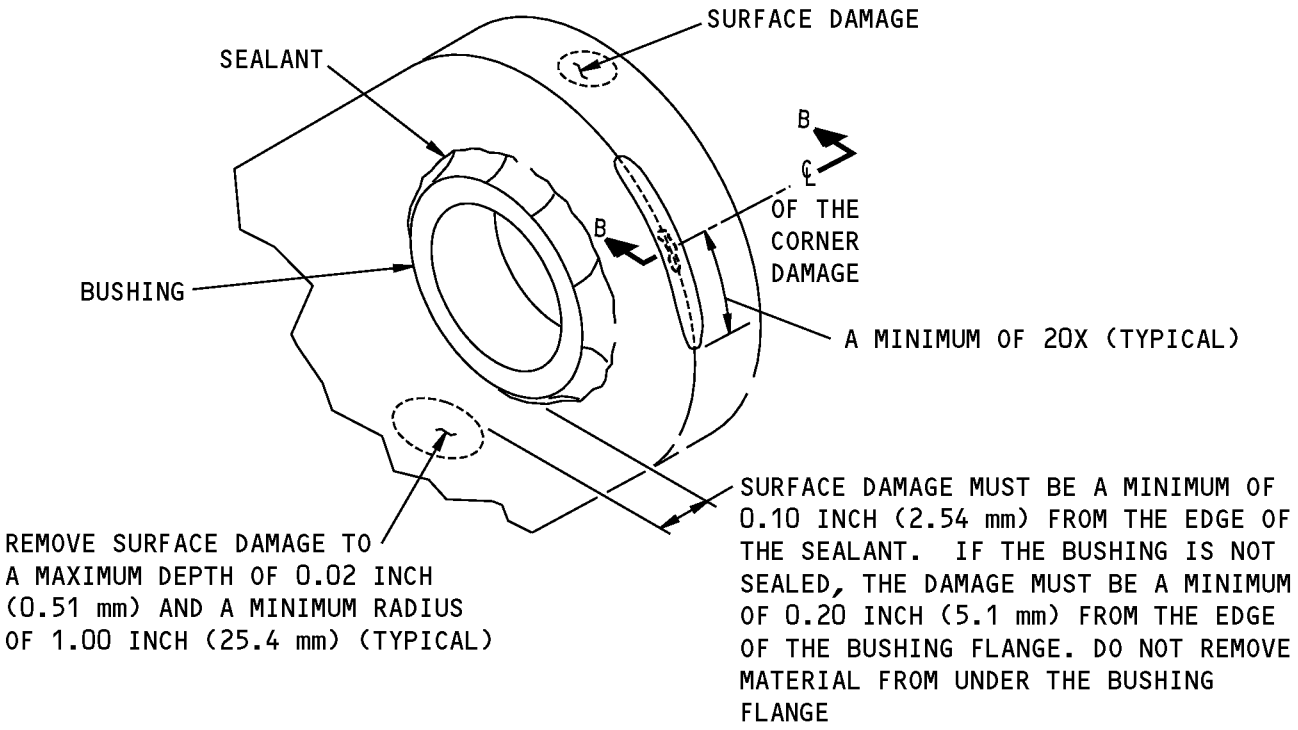


X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

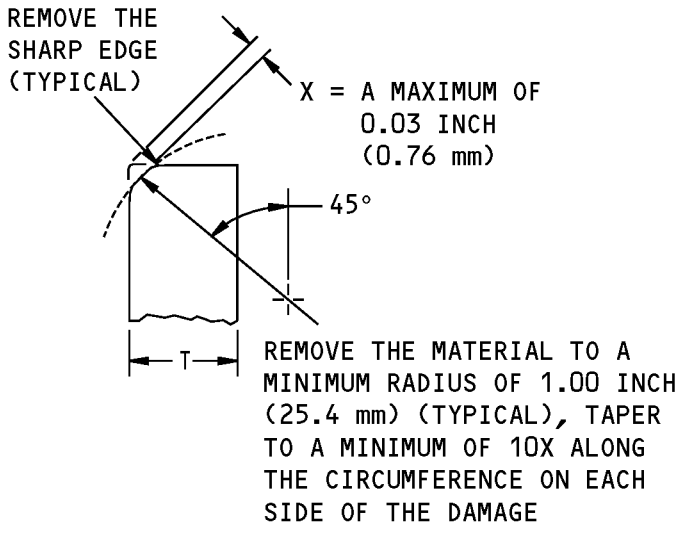
(D)

Allowable Damage Limits - Fan Cowl Fittings
Figure 103 (Sheet 2 of 3)



REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING

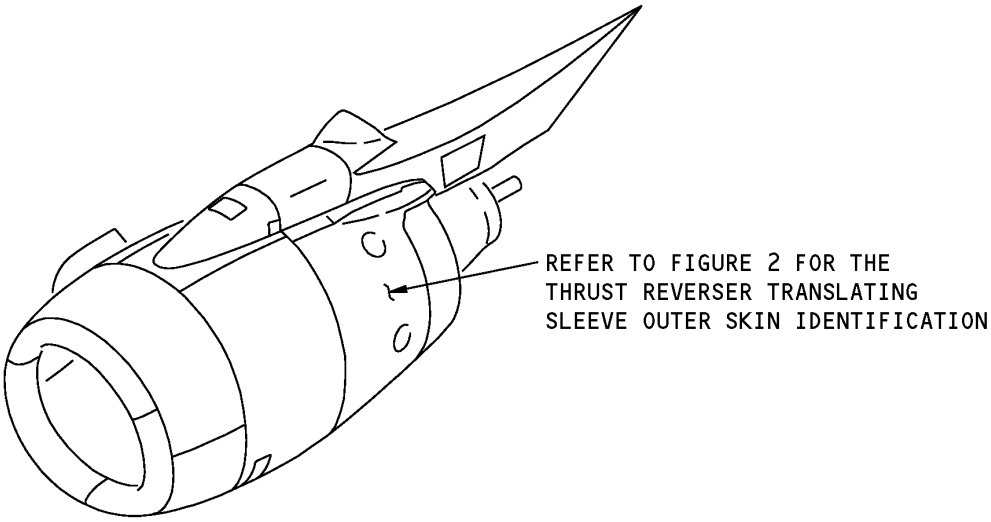
E



B–B

Allowable Damage Limits - Fan Cowl Fittings
Figure 103 (Sheet 3 of 3)

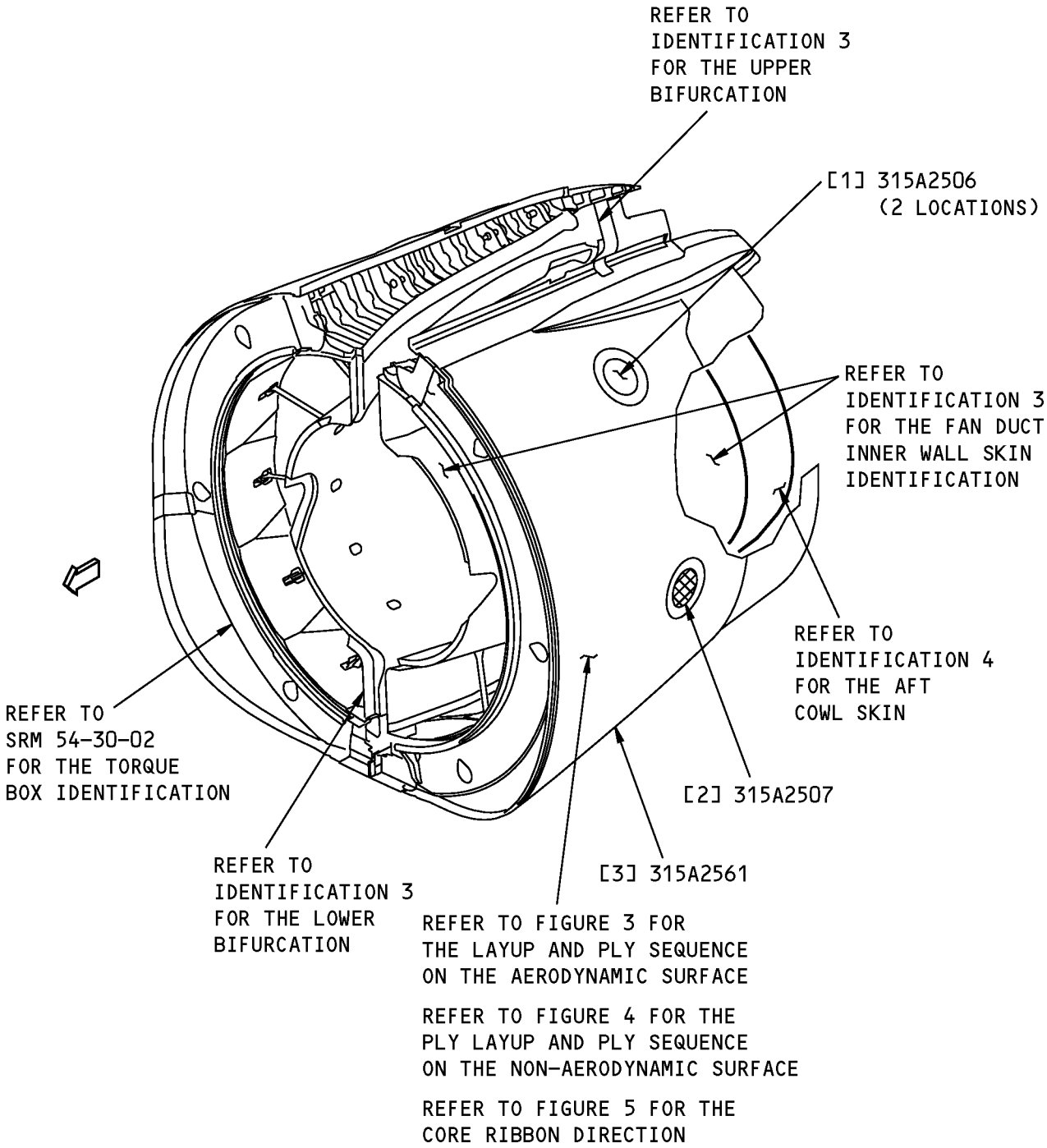
IDENTIFICATION 1 - THRUST REVERSER TRANSLATING SLEEVE OUTER SKIN



Thrust Reverser Translating Sleeve Outer Skin Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
315A2020	Engine Fan Duct Cowl and Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2500	Thrust Reverser Translating Sleeve Assembly

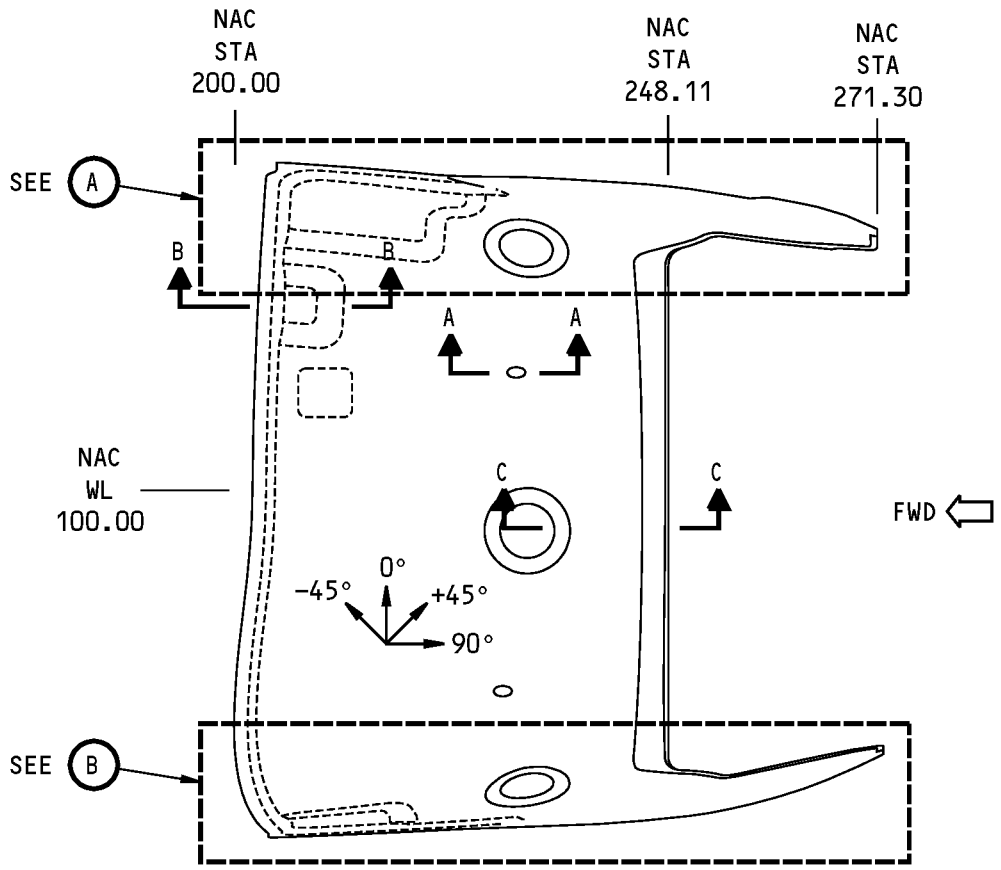


Thrust Reverser Translating Sleeve Outer Cowl Skin Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Actuator Access Door - Common (2)		Epoxy sheet molding compound as given in BMS 8-327, Type 1	
[2]	Actuator Access Door - Vented		Epoxy sheet molding compound as given in BMS 8-327, Type 1	
[3]	Outer Cowl Panel Assembly - Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich, aluminum foil mesh lightning protection (Y6001 to Y6037 only), and Glass Fiber Reinforced Plastic (GFRP) isolation plies	
	Skin		Refer to Figure 3 for the aerodynamic surface (toolside) skin plies. Refer to Figure 4 for the non-aerodynamic surface (bag side) skin plies	
	Core	0.60 (15.24)	Non-metallic honeycomb as given in BMS 8-124, Type I, Class 1, Grade 8.0. Refer to Figure 5 for the core ribbon direction	
	Core	0.60 (15.24)	Non-metallic honeycomb as given in BMS 8-124, Type V, Class VI, Grade 3.0. Refer to Figure 5 for the core ribbon direction	
	Overexpanded Core	0.60 (15.24)	Non-metallic honeycomb as given in BMS 8-124, Type IV, Class I, Grade 4.5. Refer to Figure 5 for the core ribbon direction	
	Dense Core	0.60 (15.24)	Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0. Refer to Figure 5 for the core ribbon direction	CUM LINE 001 THRU 432
	Dense Core	0.60 (15.24)	Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0. (Optional: Non-metallic honeycomb as given in BMS 8-124, Type I, Class 7, Style C, Grade 16.0) Refer to Figure 5 for the core ribbon direction	CUM LINE 433 AND ON

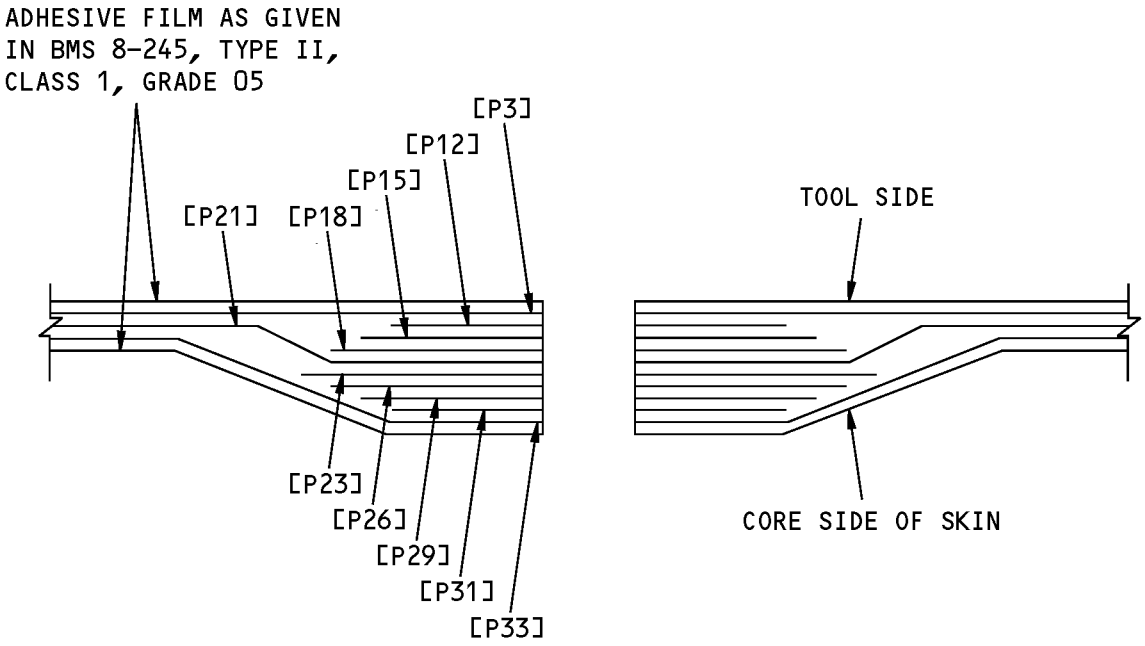
*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



PLY LAYUP AND CORE RIBBON DIRECTION

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 3 (Sheet 1 of 2)



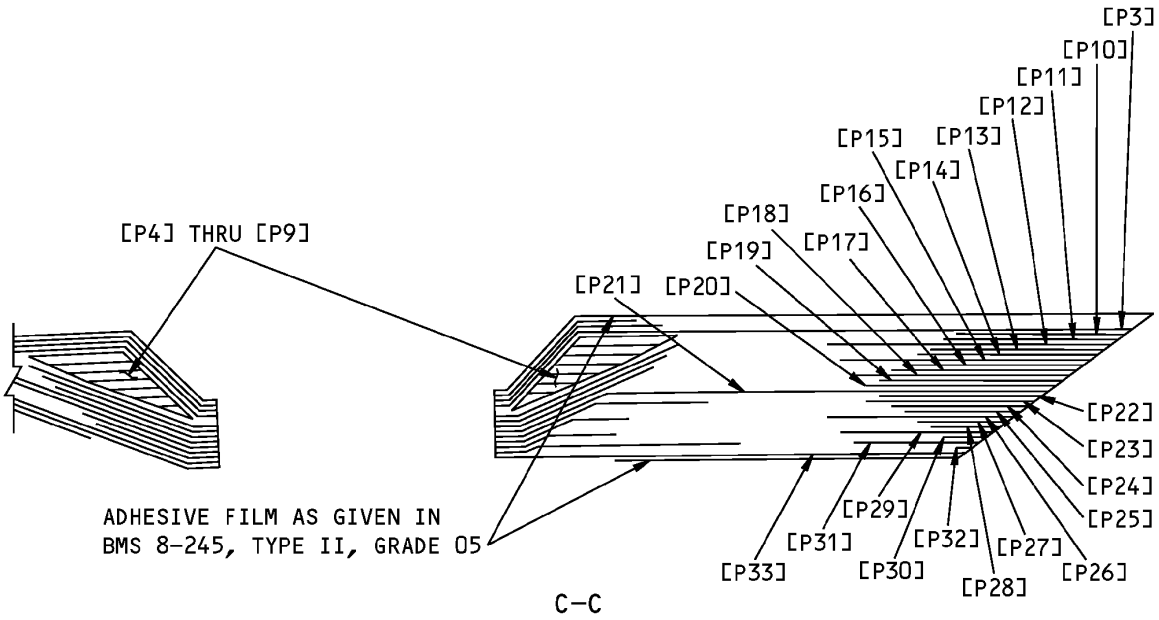
Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 3 (Sheet 2 of 2)

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION A-A		
PLY	**DIRECTION**	**MATERIAL**
P3, P15, P18, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P21, P23, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION B-B		
PLY	**DIRECTION**	**MATERIAL**
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P24, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P13, P19, P21, P23, P27, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

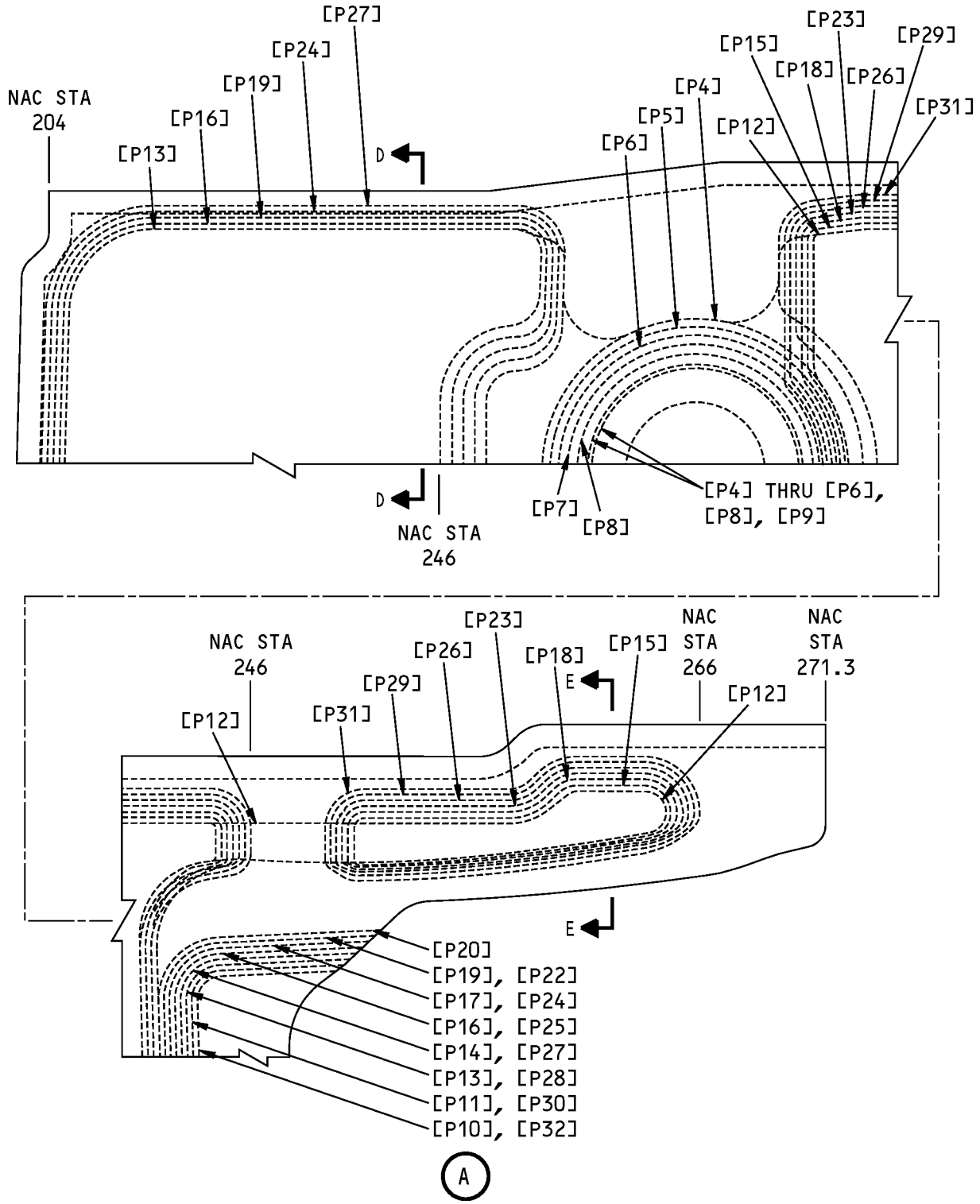


Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 4

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION C-C		
PLY	**DIRECTION**	**MATERIAL**
P4, P5, P6, P7, P8	———	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 30, Form 67, Style G

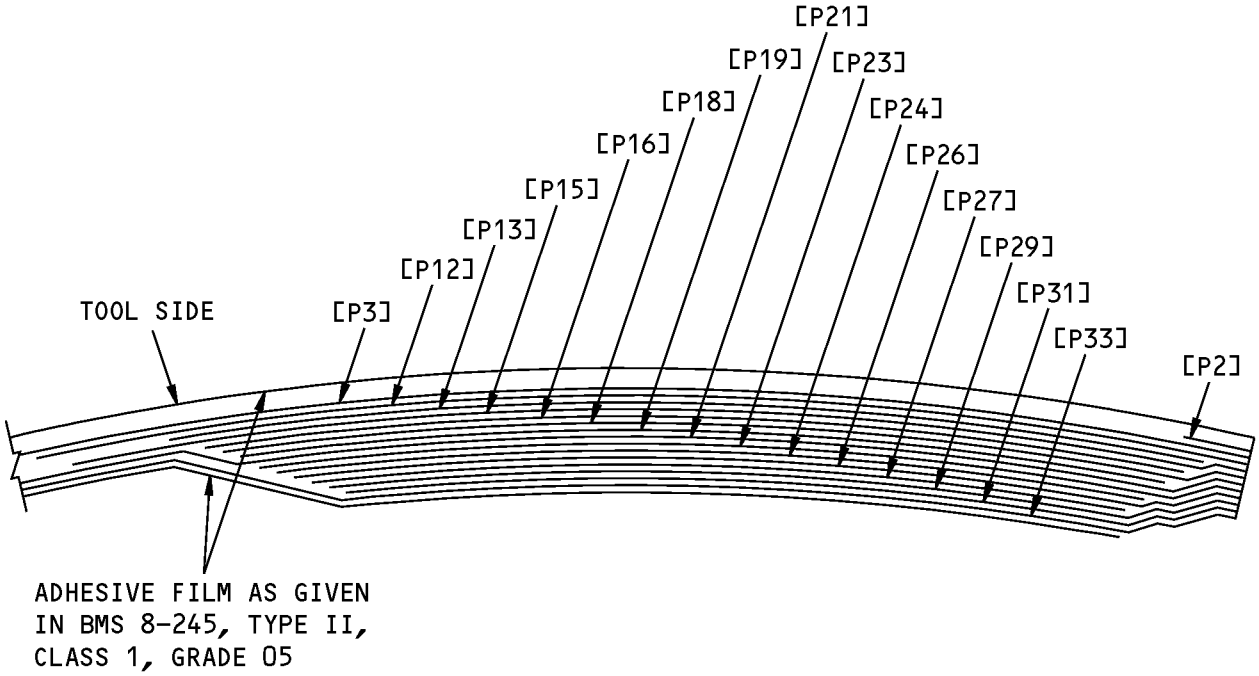
PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION C-C		
PLY	**DIRECTION**	**MATERIAL**
P9	———	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 20, Form 67, Style G
P3, P11, P15, P17, P18, P20, P24, P26, P28, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P10, P12, P13, P14, P16, P19, P21, P22, P23, P27, P29, P30, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



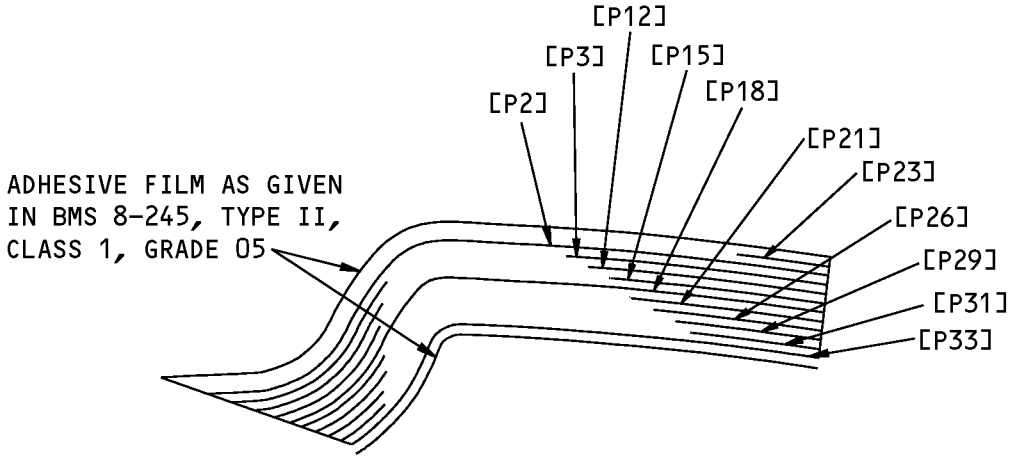
Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 5

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, DETAIL A		
PLY	**DIRECTION**	**MATERIAL**
P4, P5, P6, P7, P8	———	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 30, Form 67, Style G
P9	———	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 20, Form 67, Style G
P11, P15, P17, P18, P20, P24, P26, P28, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P10, P12, P13, P14, P16, P19, P22, P23, P25, P27, P29, P30, P32	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



D-D



E-E

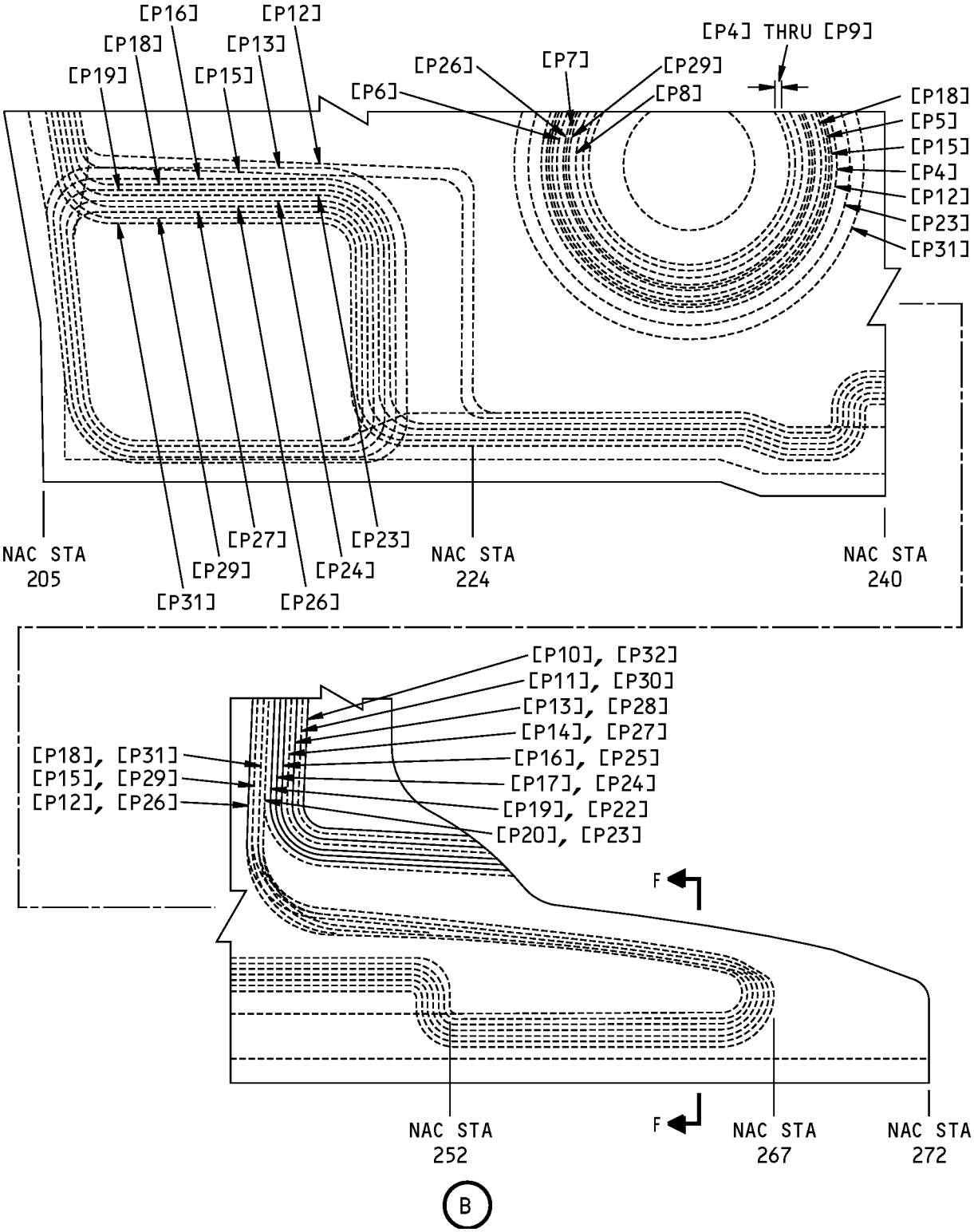
Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 6

Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION D-D		
PLY	**DIRECTION**	**MATERIAL**
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P24, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P13, P16, P19, P21, P23, P27 ,P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

Table 8:

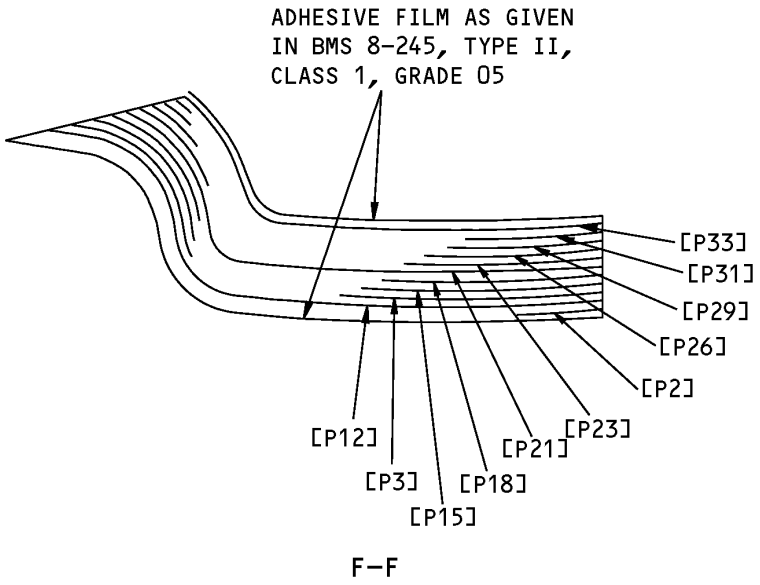
PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION E-E		
PLY	**DIRECTION**	**MATERIAL**
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P24, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P13, P21, P23, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 7

Table 9:

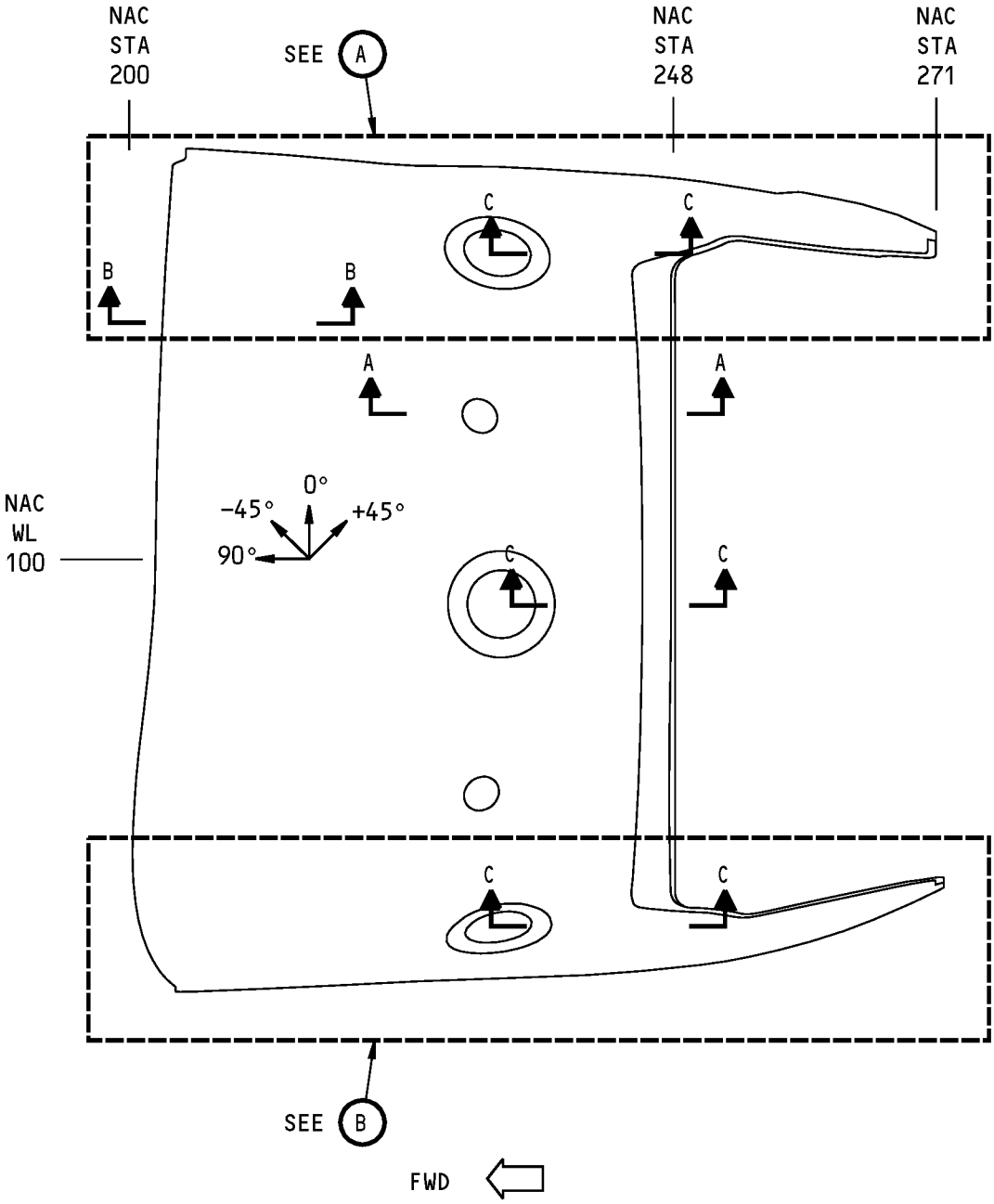
PLY MATERIAL AND DIRECTION FOR FIGURE 3, DETAIL B		
PLY	**DIRECTION**	**MATERIAL**
P11, P15, P17, P18, P20, P24, P26, P28, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P10, P12, P13, P14, P16, P19, P22, P23, P25, P27, P29, P30, P32	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



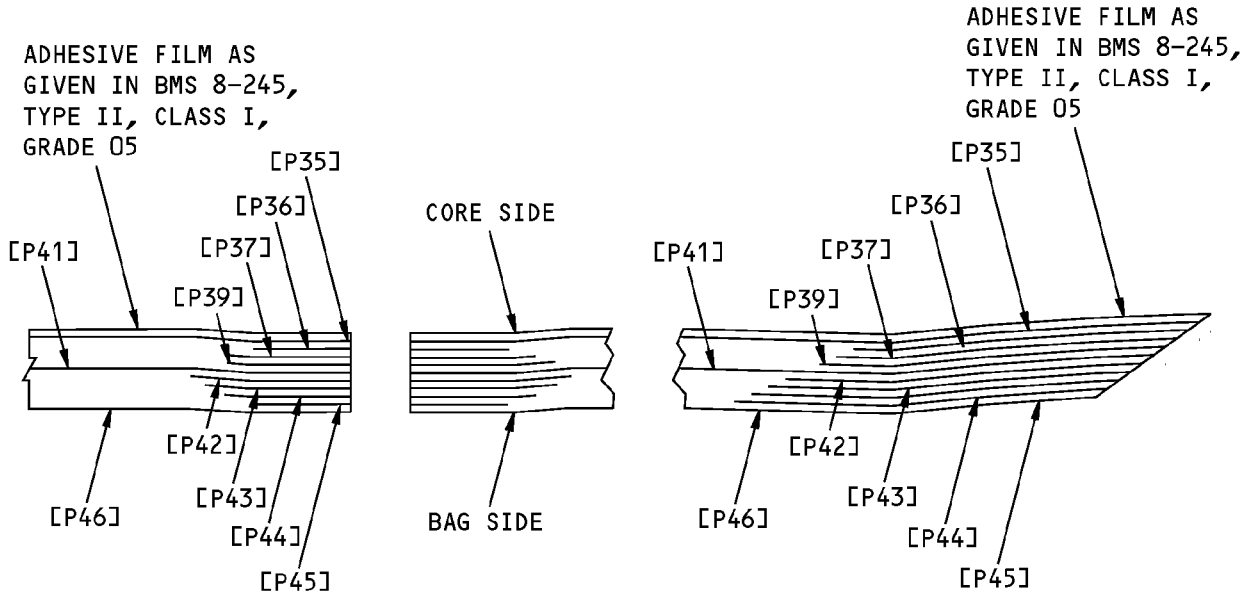
Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 8

Table 10:

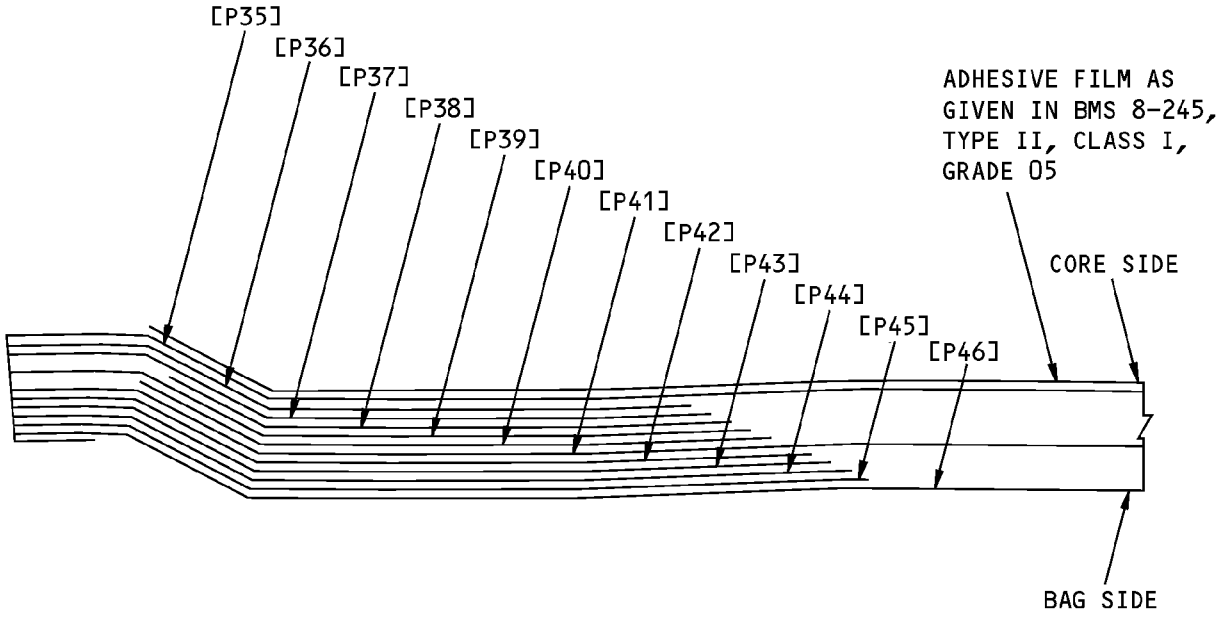
PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION F-F		
PLY	**DIRECTION**	**MATERIAL**
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P21, P23, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



Ply Layup and Ply Sequence on the Non-Aerodynamic (Bagside) of the Translating Sleeve Outer Cowl Skin
Figure 9 (Sheet 1 of 2)



A-A



B-B

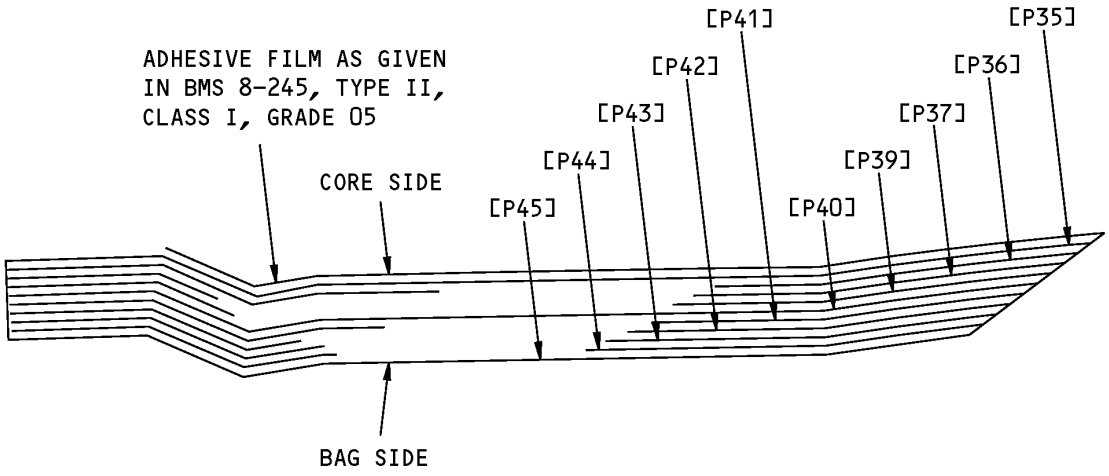
Ply Layup and Ply Sequence on the Non-Aerodynamic (Bagside) of the Translating Sleeve Outer Cowl Skin
Figure 9 (Sheet 2 of 2)

Table 11:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION A-A		
PLY	**DIRECTION**	**MATERIAL**
P36, P39, P43, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

Table 12:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION B-B		
PLY	**DIRECTION**	**MATERIAL**
P36, P39, P40, P43, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

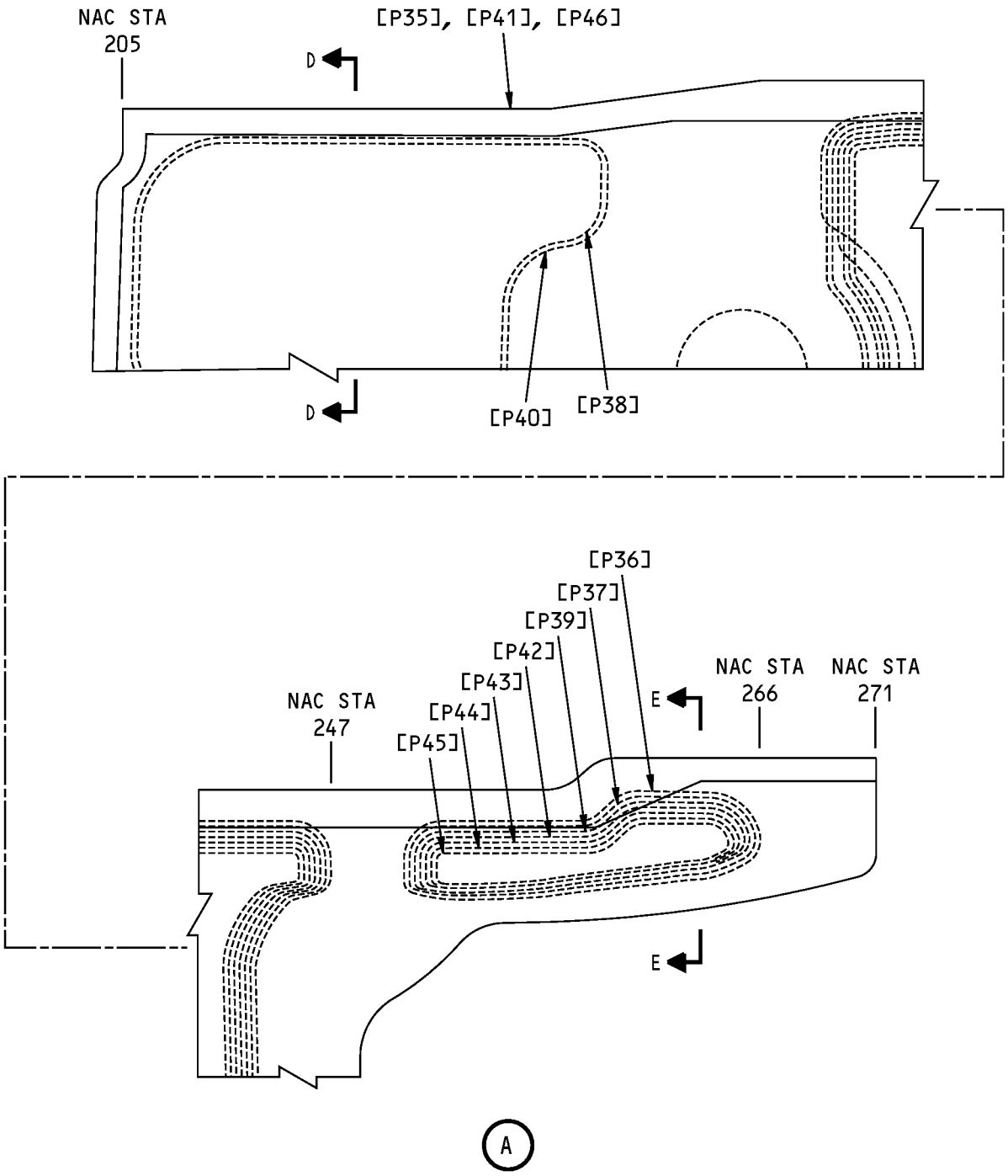


C-C

Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve Outer Cowl Skin
Figure 10

Table 13:

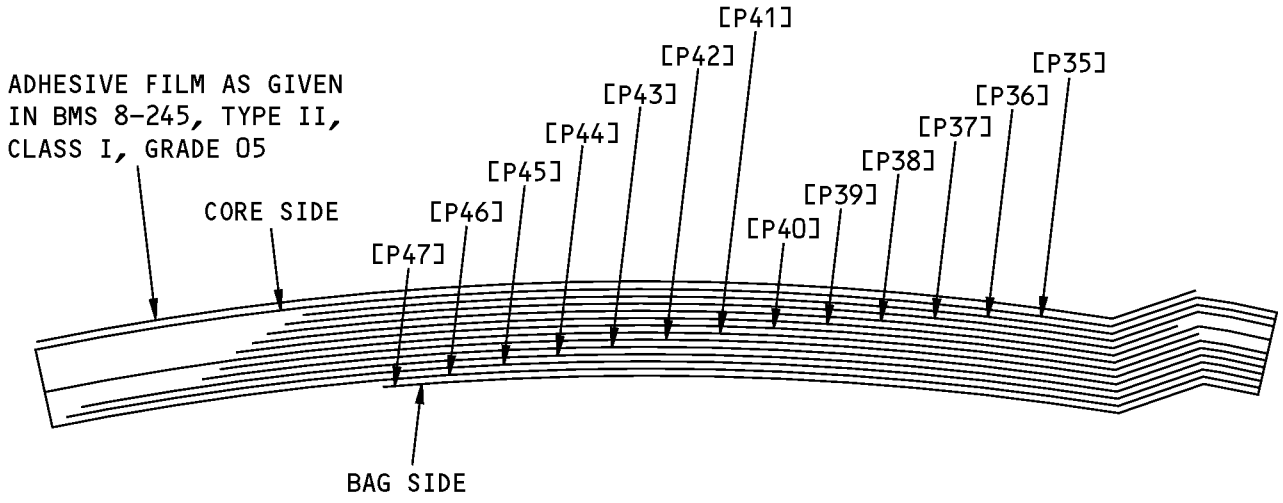
PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION C-C		
PLY	**DIRECTION**	**MATERIAL**
P36, P39, P40, P43	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



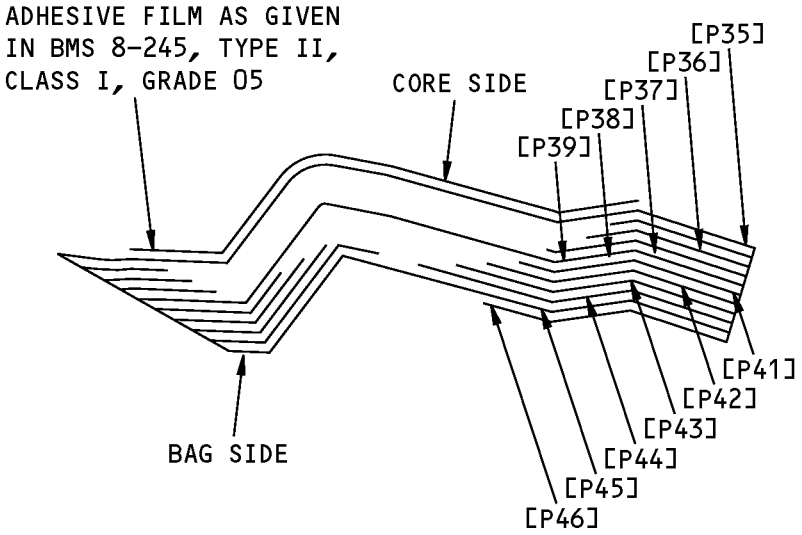
Ply Direction, Core Ribbon Direction, and Ply Sequence for the Translating Sleeve Outer Cowl Skin, Figure 2, Item [3]
Figure 11

Table 14:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, DETAIL A		
PLY	**DIRECTION**	**MATERIAL**
P36, P39, P40, P43, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



D-D



E-E

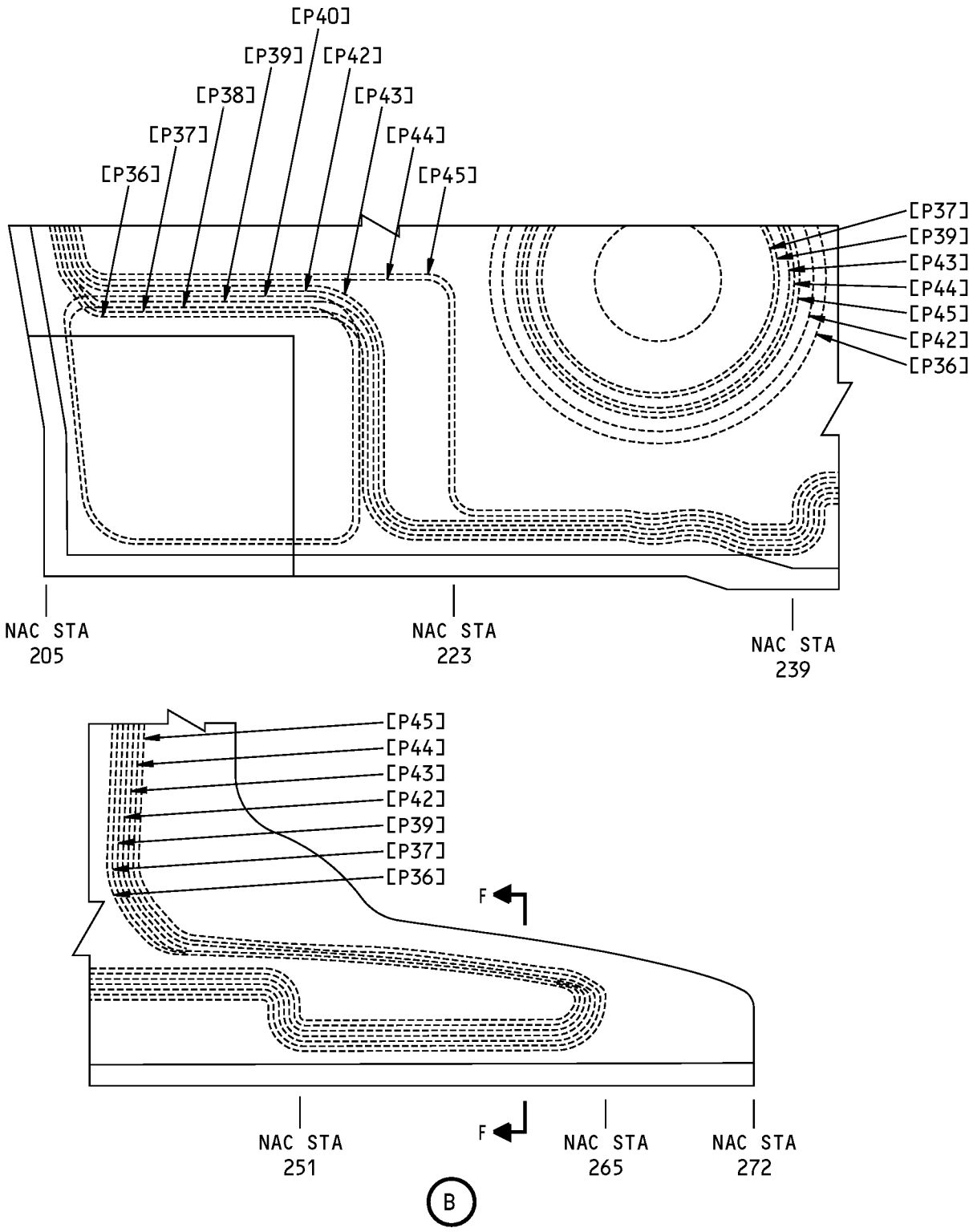
Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve Outer Cowl Skin
Figure 12

Table 15:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION D-D		
PLY	**DIRECTION**	**MATERIAL**
P47	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P36, P39, P40, P43, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

Table 16:

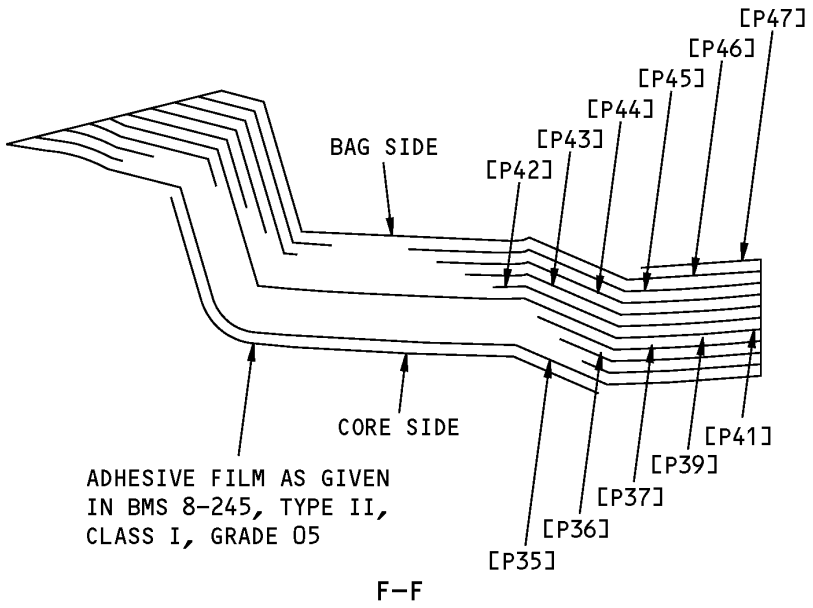
PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION E-E		
PLY	**DIRECTION**	**MATERIAL**
P36, P39, P43, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve Outer Cowl Skin
Figure 13

Table 17:

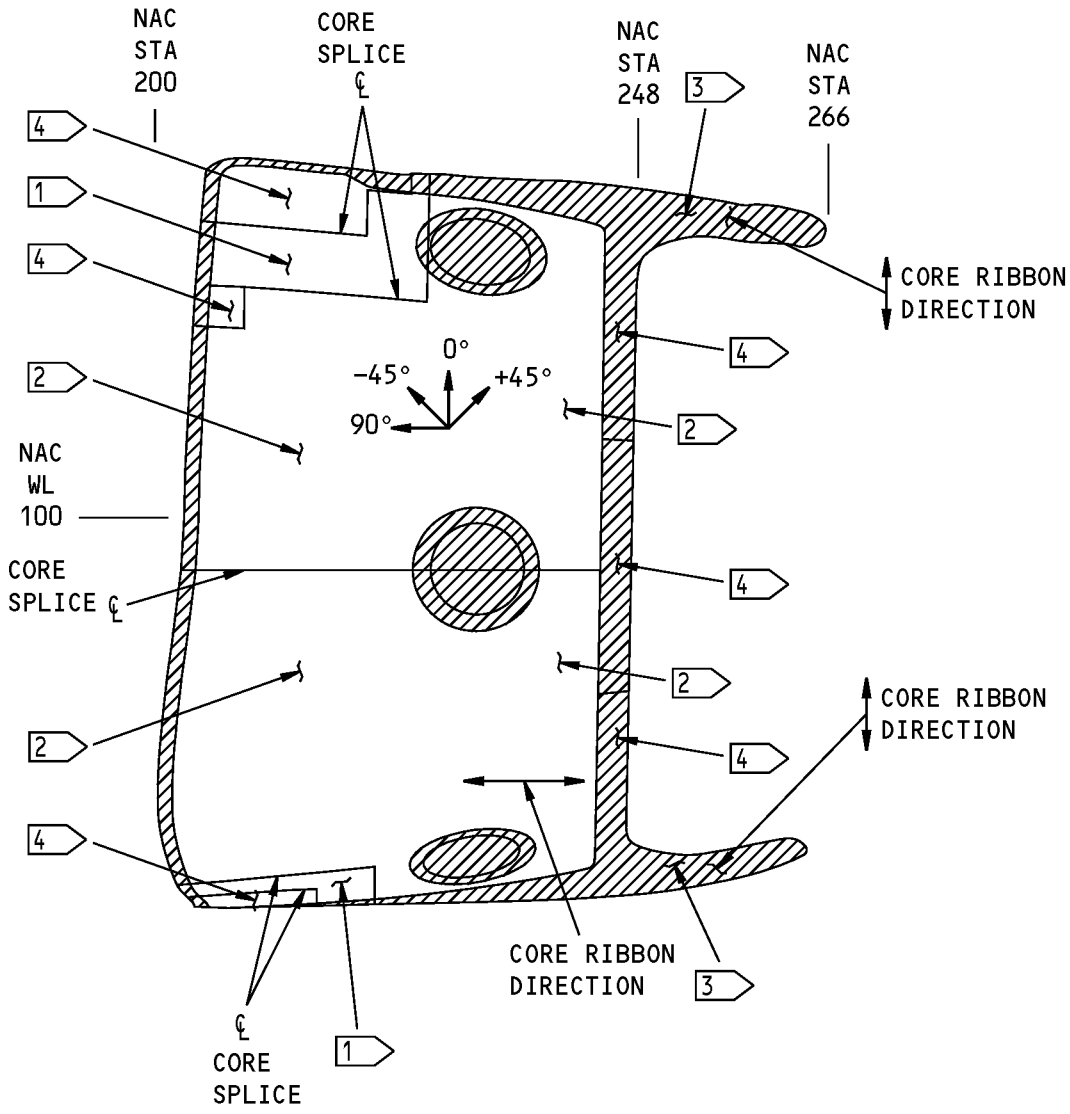
PLY MATERIAL AND DIRECTION FOR FIGURE 4, DETAIL B		
PLY	**DIRECTION**	**MATERIAL**
P2, P47	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P36, P39, P40, P43, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P37, P38, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve Outer Cowl Skin
Figure 14

Table 18:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION F-F		
PLY	**DIRECTION**	**MATERIAL**
P47	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P36, P39, P43, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



NOTES

- ALL HONEYCOMB CORE RIBBON DIRECTIONS ARE FORE/AFT UNLESS SHOWN DIFFERENTLY.

1 BMS 8-124, TYPE I, CLASS I, GRADE 8.0 HONEYCOMB CORE.

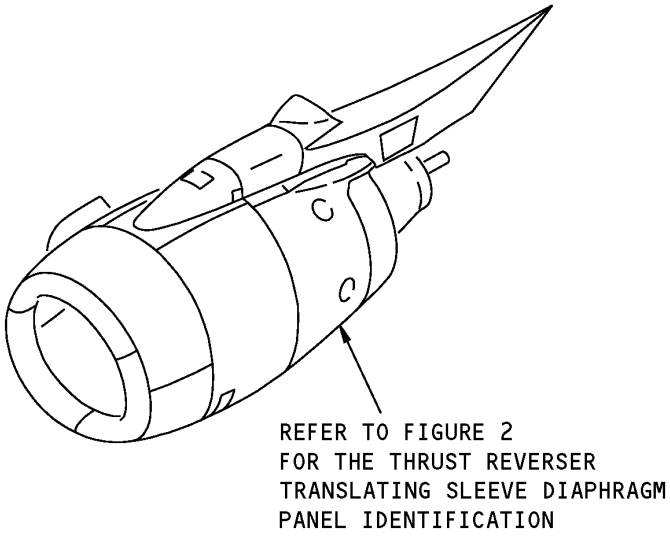
2 BMS 8-124, TYPE V, CLASS VI, GRADE 3.0 HONEYCOMB CORE.

3 BMS 8-124, TYPE IV, CLASS I, GRADE 4.5 HONEYCOMB CORE.

4 BMS 8-342, TYPE III, CLASS II, GRADE 15.0 HONEYCOMB CORE.

Core Ribbon Direction
Figure 15

IDENTIFICATION 2 - THRUST REVERSER TRANSLATING SLEEVE DIAPHRAGM ACOUSTIC PANEL

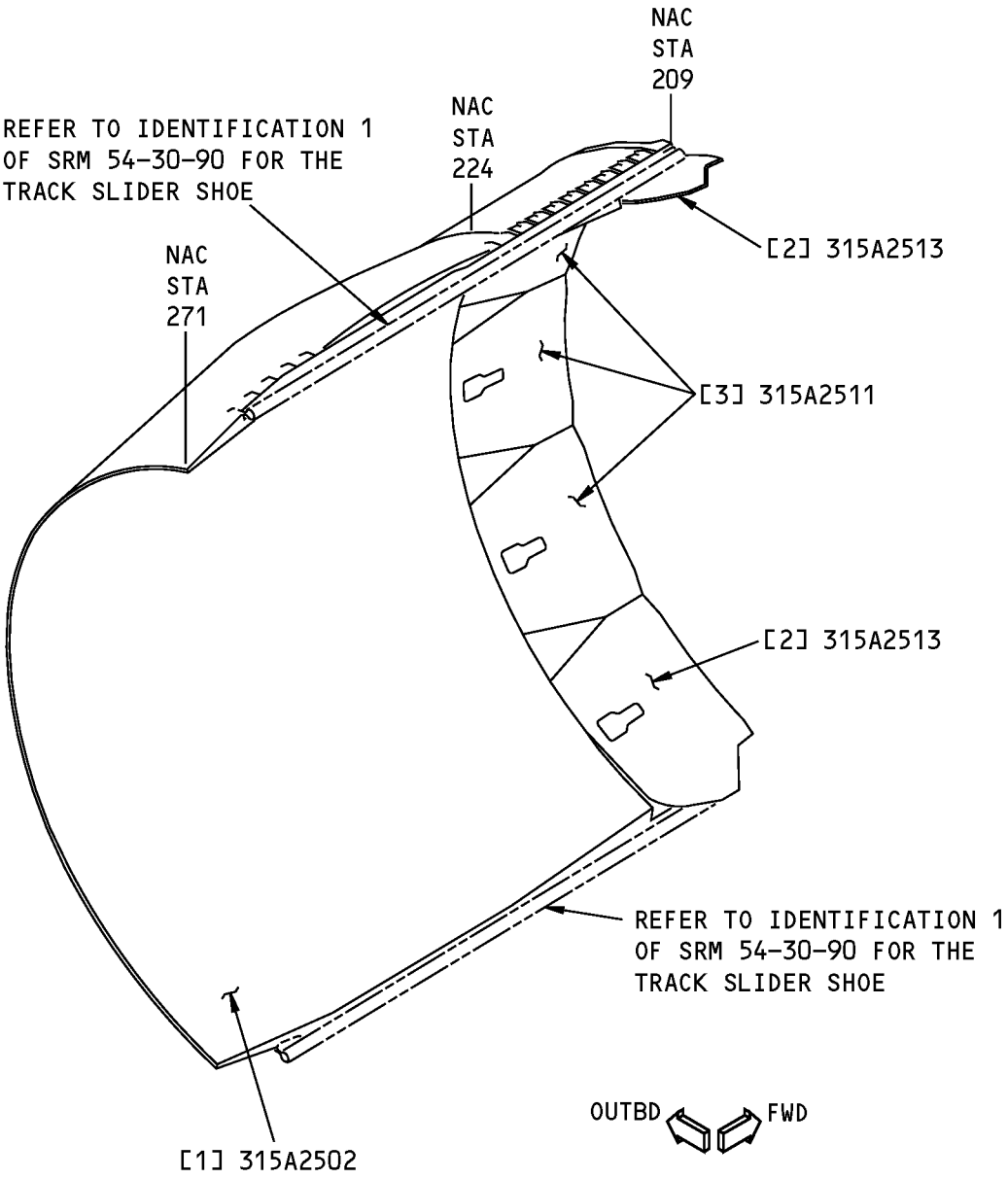


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
300A2020	Engine Fan Duct Cowl and Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2500	Thrust Reverser Sleeve Assembly
315A2501	Thrust Reverser Sleeve Acoustic Panel Assembly
315A2502	Acoustic Panel/Diaphragm Bond Assembly
315A2510	Common Blocker Door Assembly
315A2512	End Blocker Door Assembly



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

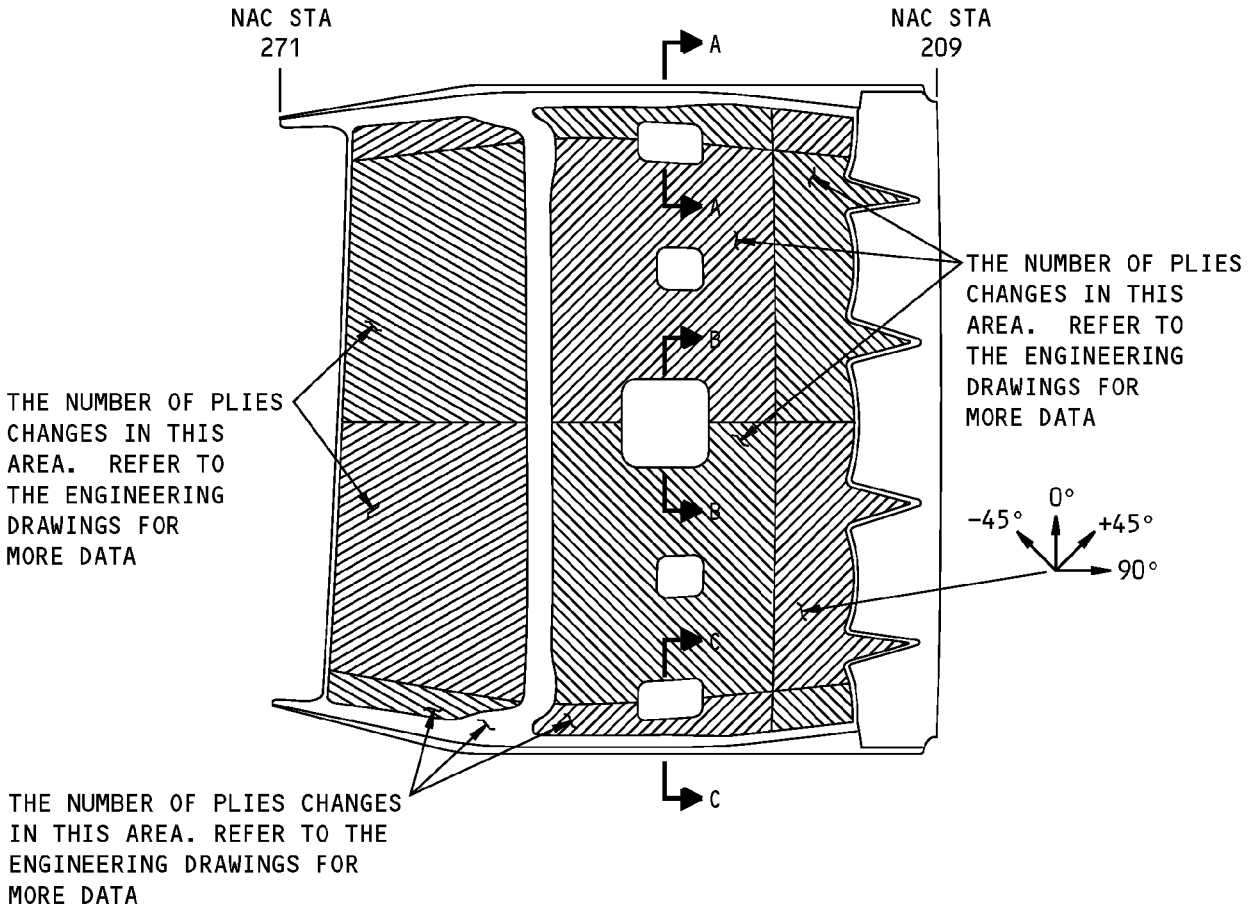
LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Diaphragm Acoustic Panel Assembly Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich and Glass Fiber Reinforced Plastic (GFRP) isolation plies	
	Perforated Facesheet		Refer to Figure 3	
	Solid Facesheet		Refer to Figure 4	
	Diaphragm Panel - Bonded Part		Refer to Figure 4	
	High Density Core	0.70 (17.78) 1.00 (25.40) 2.00 (50.80)	Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0	CUM LINE 001 THRU 432
	High Density Core	0.70 (17.78) 1.00 (25.40) 2.00 (50.80)	Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0 (Optional: Non-metallic honeycomb as given in BMS 8-124, Type I, Class 7, Style C, Grade 16.0)	CUM LINE 433 AND ON
	Core	1.25 (31.75) 2.85 (72.39)	Non-metallic honeycomb as given in BMS 8-124, Type III, Class I, Grade 4.5	
	Core	0.70 (17.78)	Non-metallic honeycomb as given in BMS 8-124, Type V, Class VI, Grade 3.0	
	Septum		Septum material as given in BMS 5-114, Grade 117	
[2]	End Blocker Door Bonded Part		CFRP honeycomb sandwich with GFRP isolation plies	
	Skin		Refer to Figure 5	
	Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type I, Class 1, Grade 8	
[3]	Common Blocker Door Bonded Part		CFRP honeycomb sandwich with GFRP isolation plies	
	Skin		Refer to Figure 6	
	Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type I, Class I, Grade 8	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



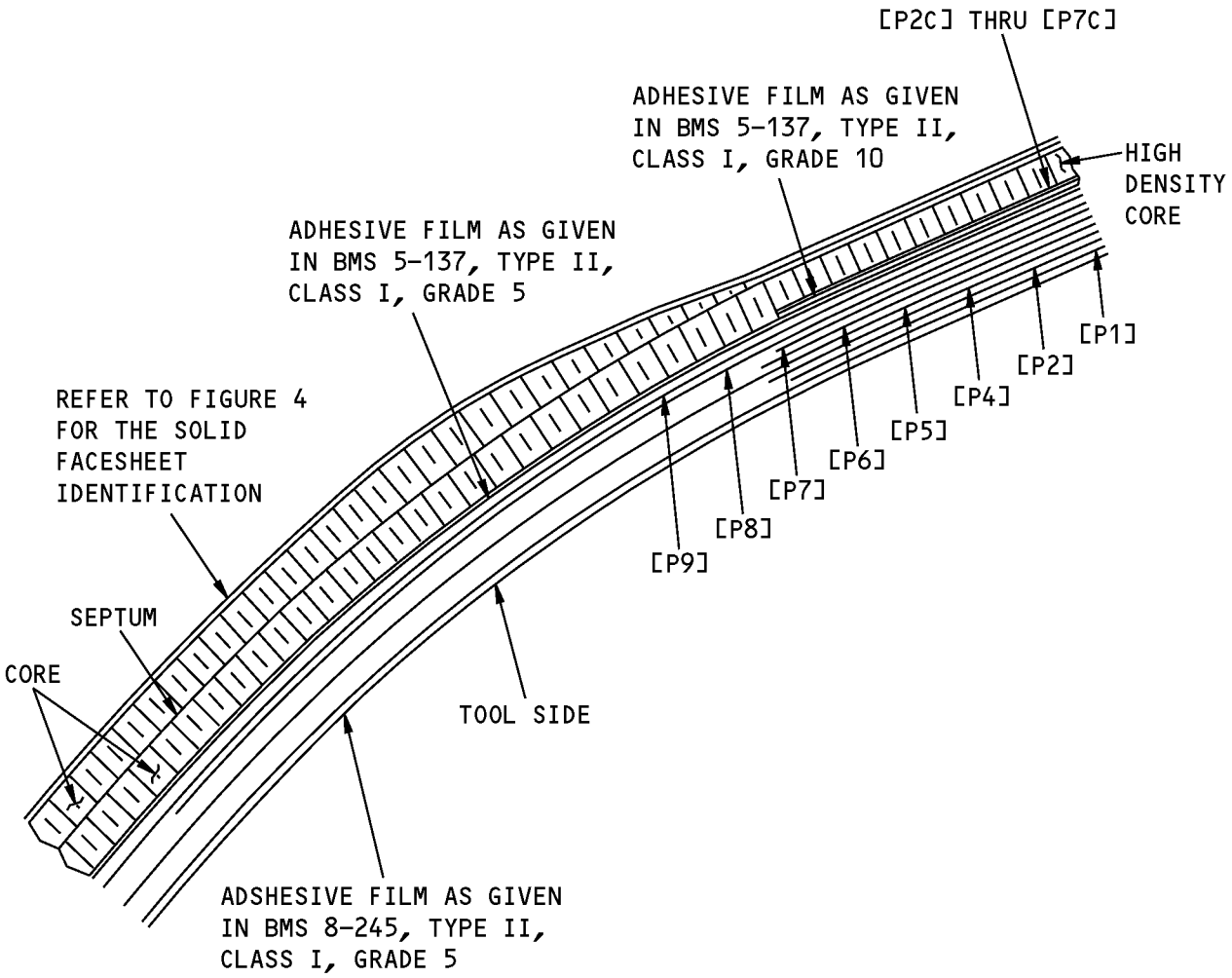
VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A, B-B, AND C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION A-A.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION B-B.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION C-C.

Ply Direction and Ply Sequence for the Diaphram Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 3 (Sheet 1 of 2)



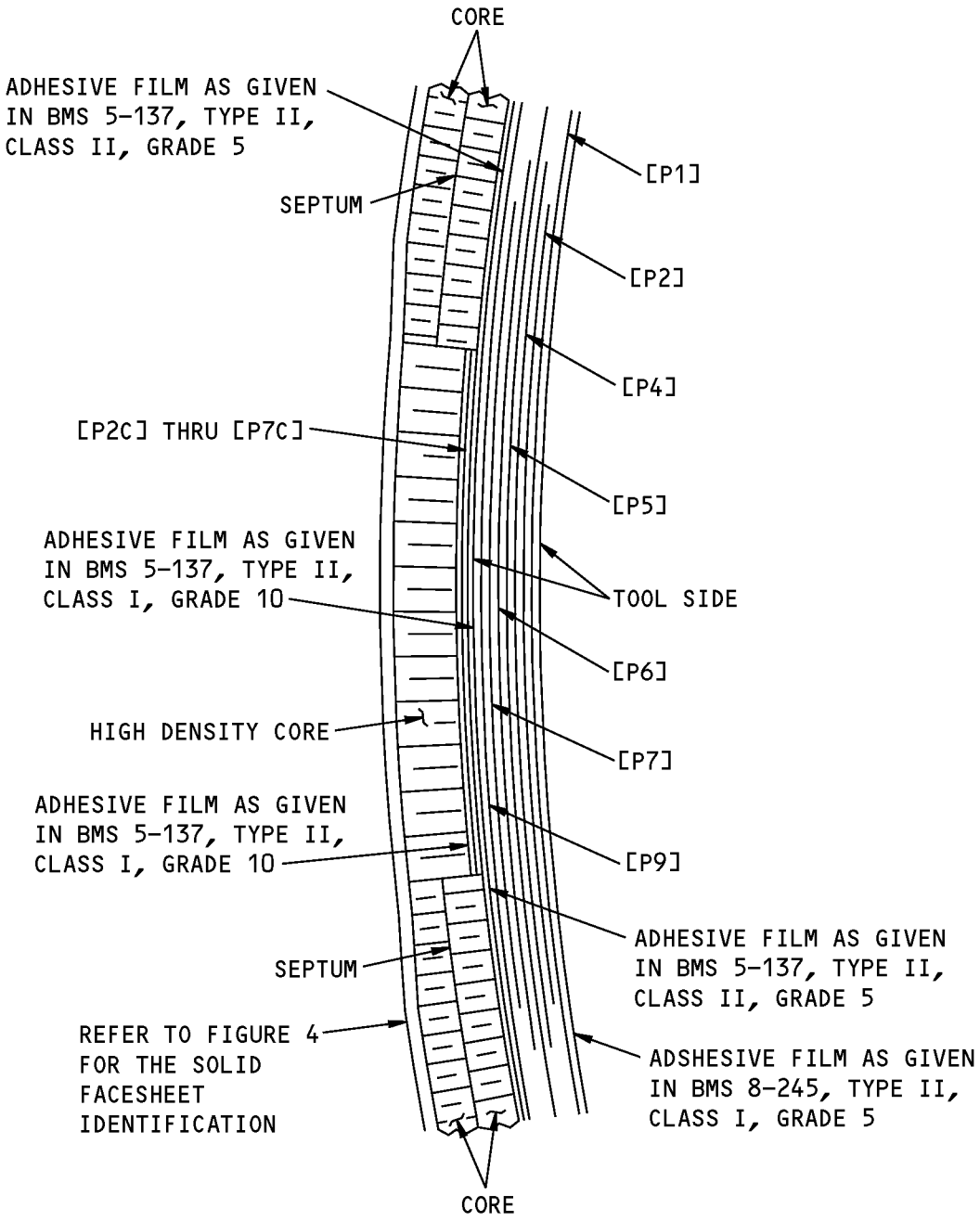
NOTE: (C) = CORE DOUBLER ASSEMBLY PLY

PLY SEQUENCE
A-A

Ply Direction and Ply Sequence for the Diaphram Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 3 (Sheet 2 of 2)

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION A-A		
PLY	**DIRECTION**	**MATERIAL**
P3, P5, P9	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P1, P6, P8	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P7	0 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190
P4	90 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190
P3(C), P6(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H
P2(C), P4(C), P5(C), P7(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H



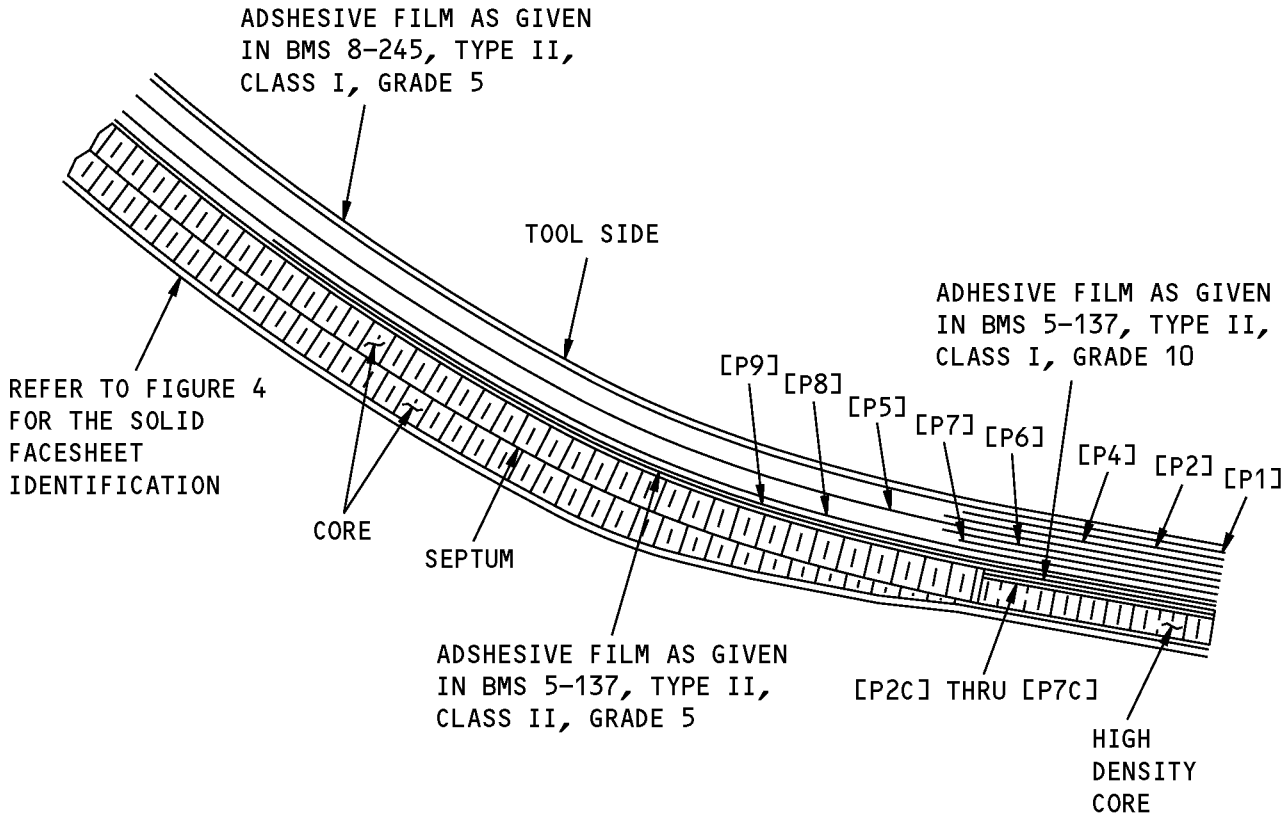
NOTE: (C) = CORE DOUBLER ASSEMBLY PLY

PLY SEQUENCE
B-B

Ply Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 4

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION B-B		
PLY	**DIRECTION**	**MATERIAL**
P3, P5, P9	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P1, P6,	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P7	0 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190
P4	90 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190
P3(C), P6(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H
P2(C), P4(C), P5(C), P7(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H



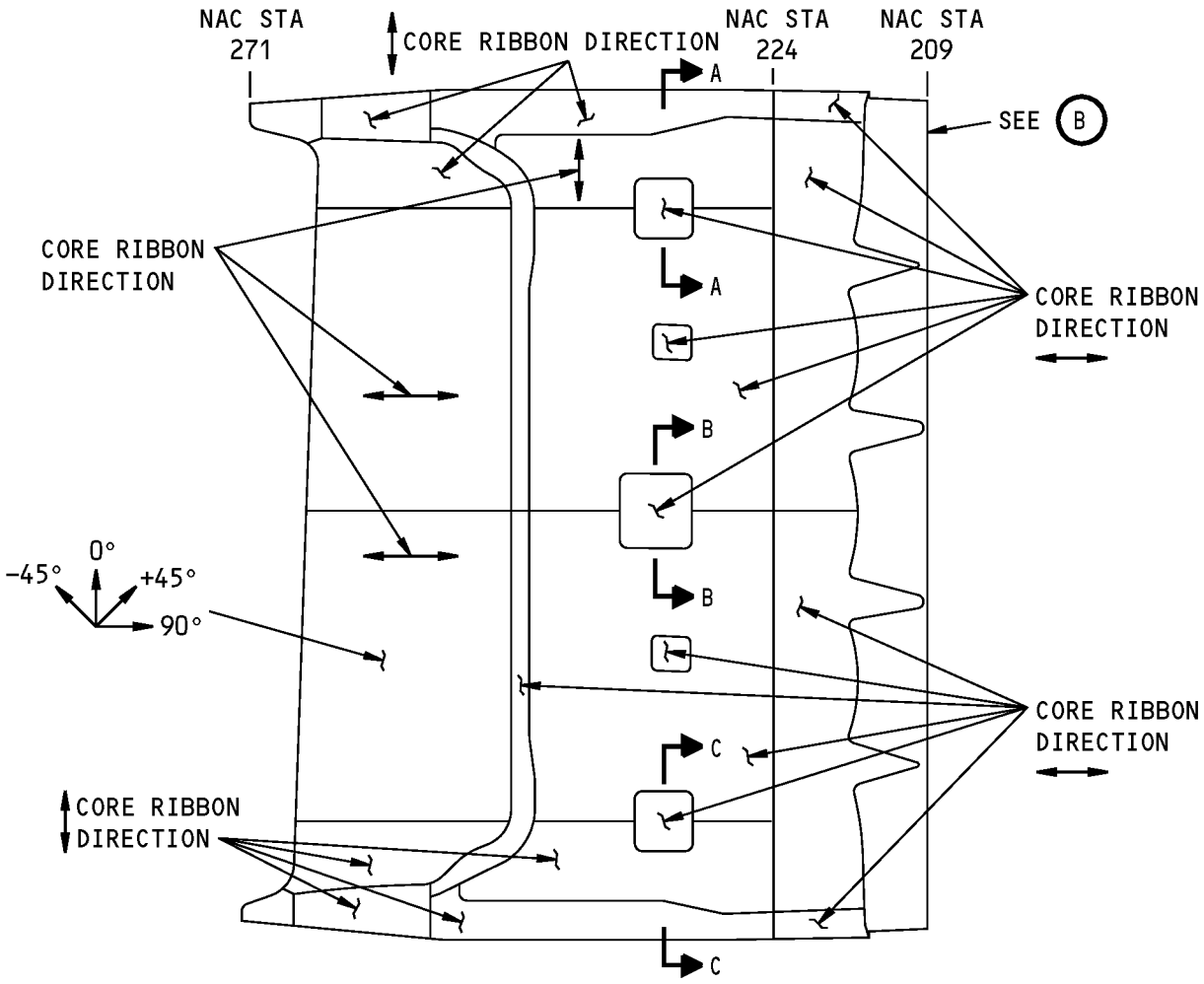
NOTE: (C) = CORE DOUBLER ASSEMBLY PLY

PLY SEQUENCE
C-C

Ply Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 5

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION C-C		
PLY	**DIRECTION**	**MATERIAL**
P3, P5, P9	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P1, P6, P8	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P7	0 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190
P4	90 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190
P3(C), P6(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H
P2(C), P4(C), P5(C), P7(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H



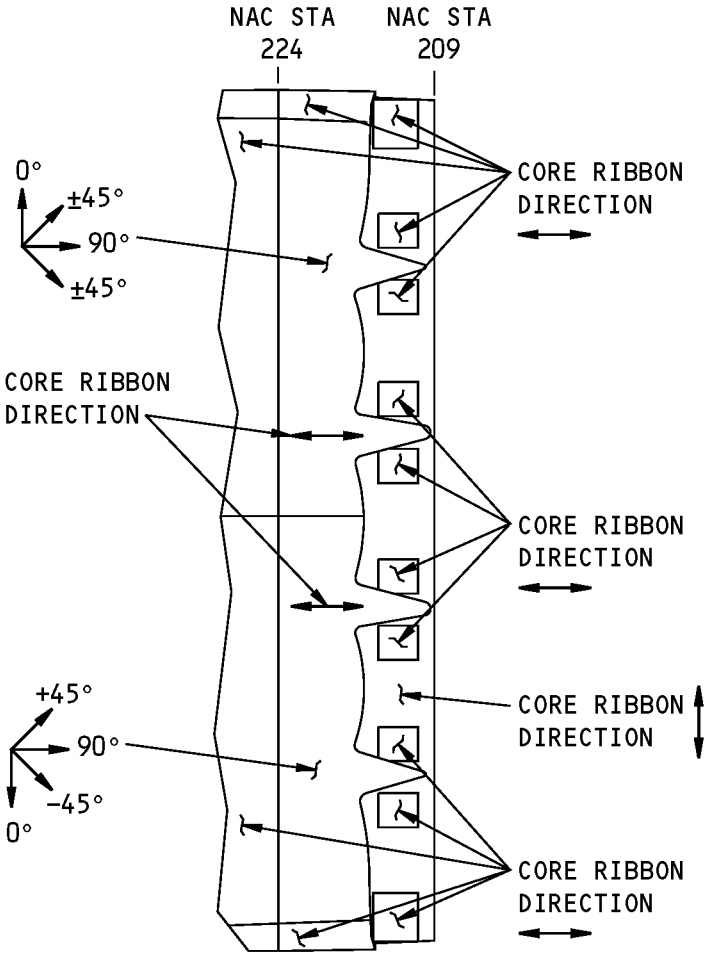
VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP AND CORE RIBBON DIRECTION

A

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A, B-B, AND C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION A-A.
- REFER TO TABLE 7 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION B-B.
- REFER TO TABLE 8 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION C-C.

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 6 (Sheet 1 of 3)



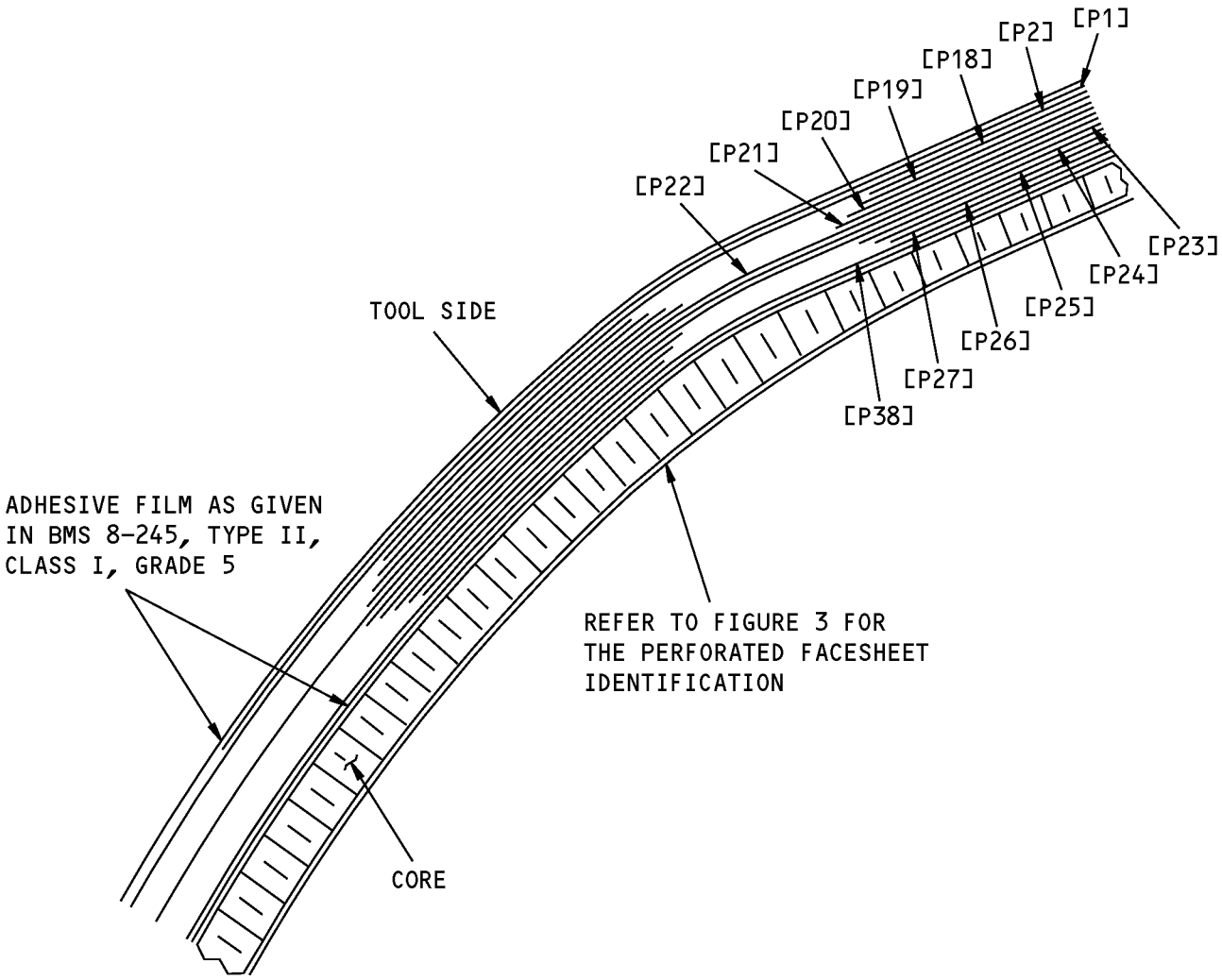
VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP AND CORE RIBBON DIRECTION

B

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL B FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A, B-B, AND C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION A-A.
- REFER TO TABLE 7 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION B-B.
- REFER TO TABLE 8 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION C-C.

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 6 (Sheet 2 of 3)

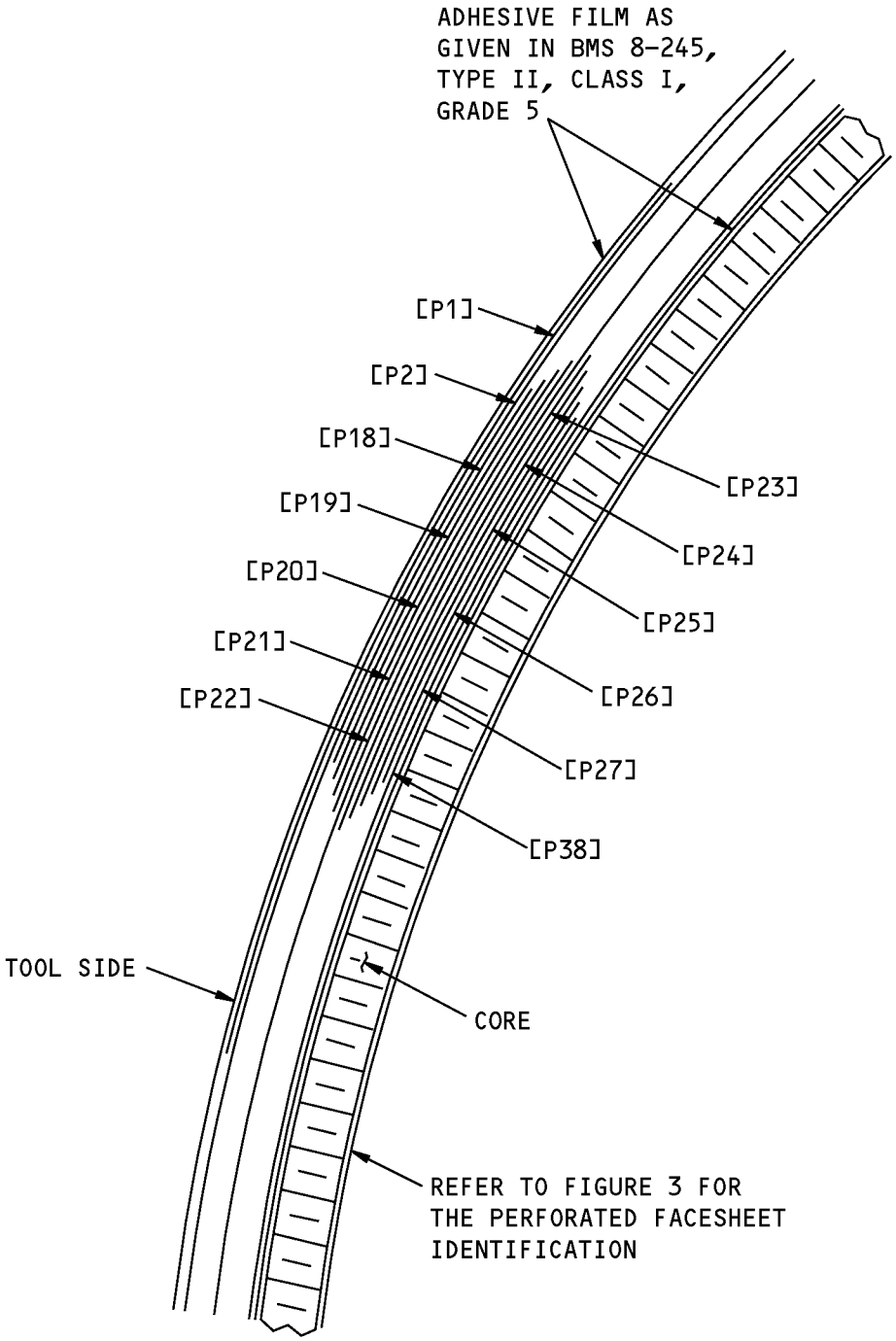


PLY SEQUENCE
A-A

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 6 (Sheet 3 of 3)

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION A-A		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108
P18, P20, P22, P23, P25, P27, P38	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW

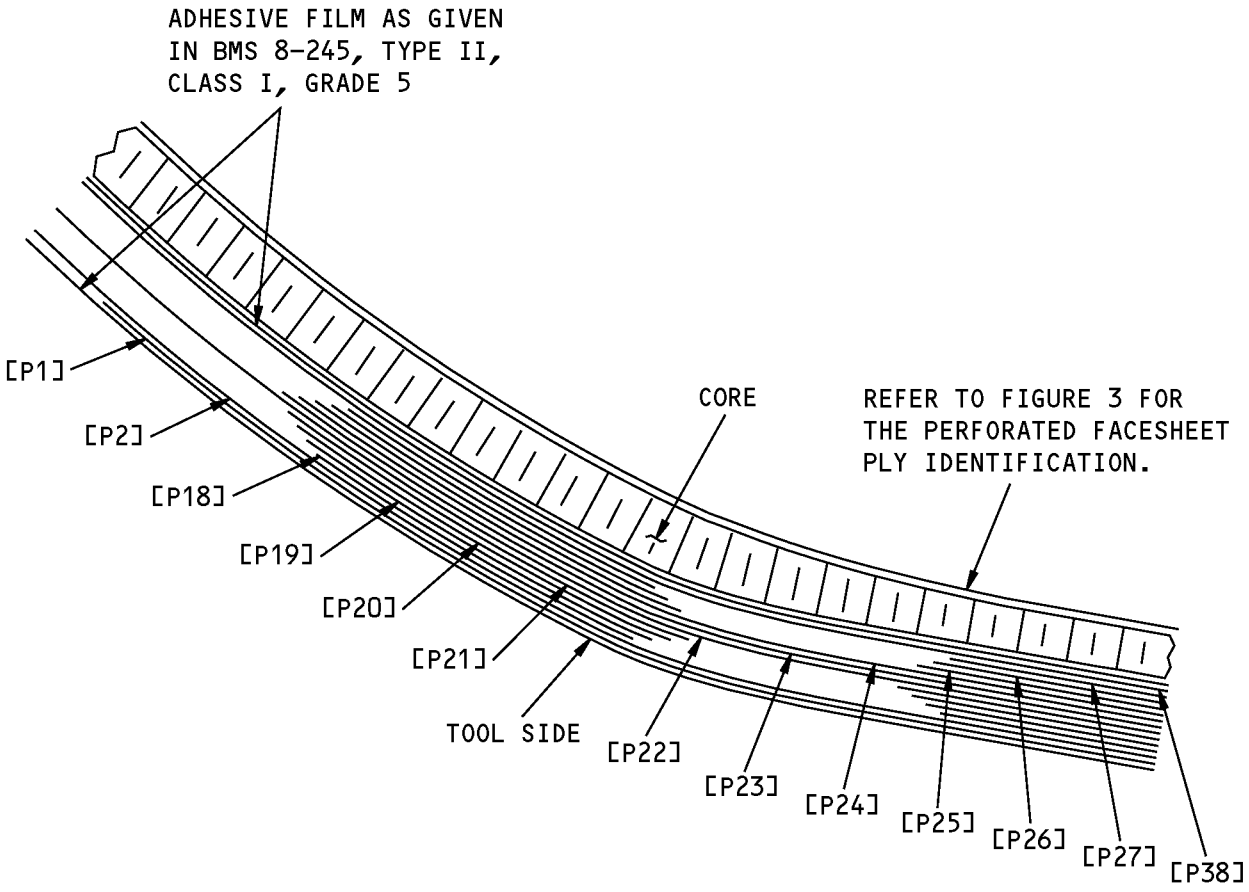


PLY SEQUENCE
B–B

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 7

Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION B-B		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108
P18, P20, P22, P23, P25, P27, P38	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW

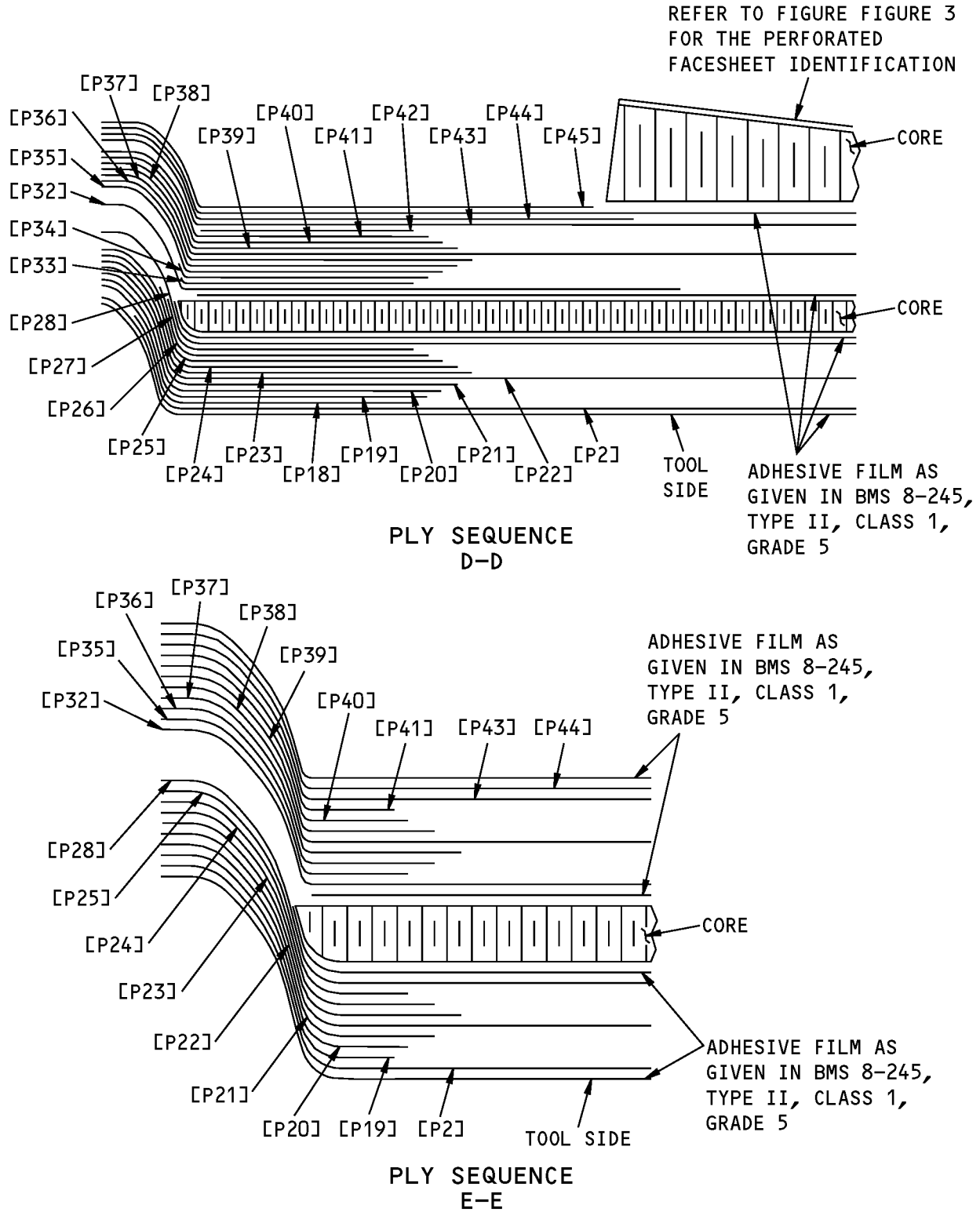


PLY SEQUENCE
C-C

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 8

Table 8:

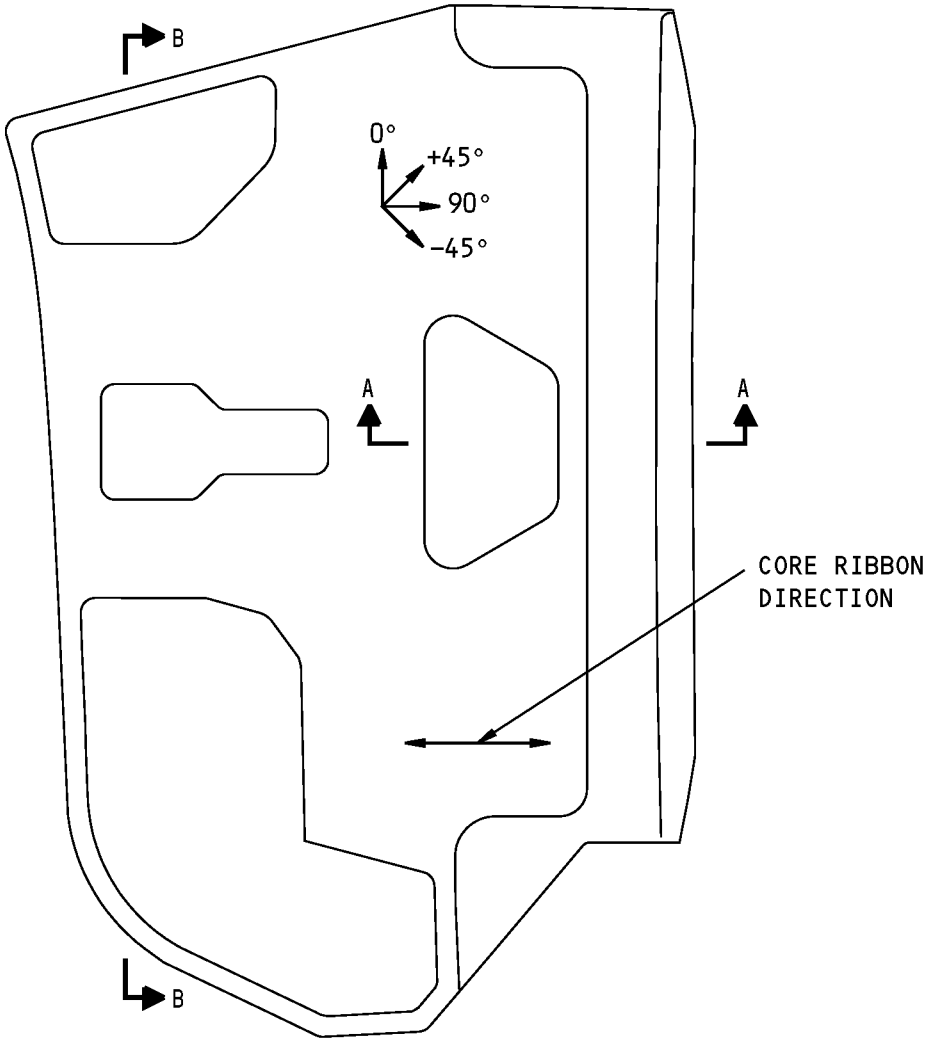
PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION C-C		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108
P18, P20, P22, P23, P25, P27, P38	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW



Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 9

Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTIONS D-D and E-E		
PLY	**DIRECTION**	**MATERIAL**
P20, P22, P25, P28, P32, P33, P35, P37, P38, P40, P42	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26, P34, P36, P39, P41, P43	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P44	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108



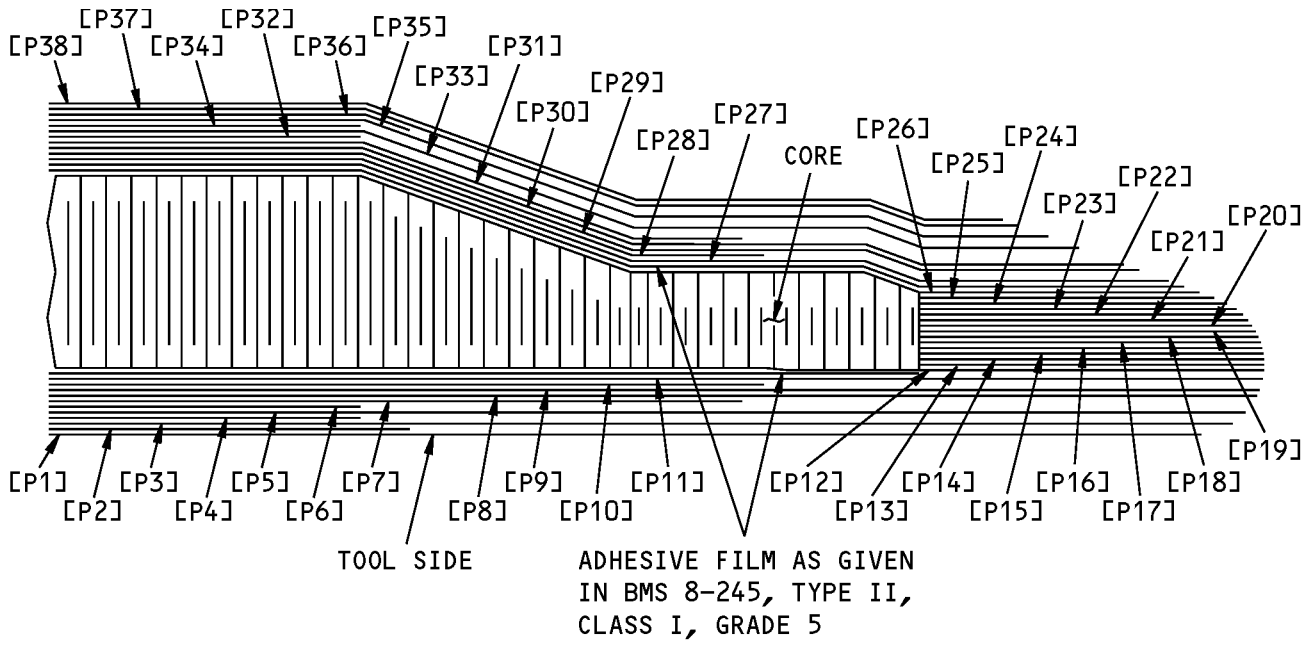
THE VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP AND CORE RIBBON DIRECTION

(A)

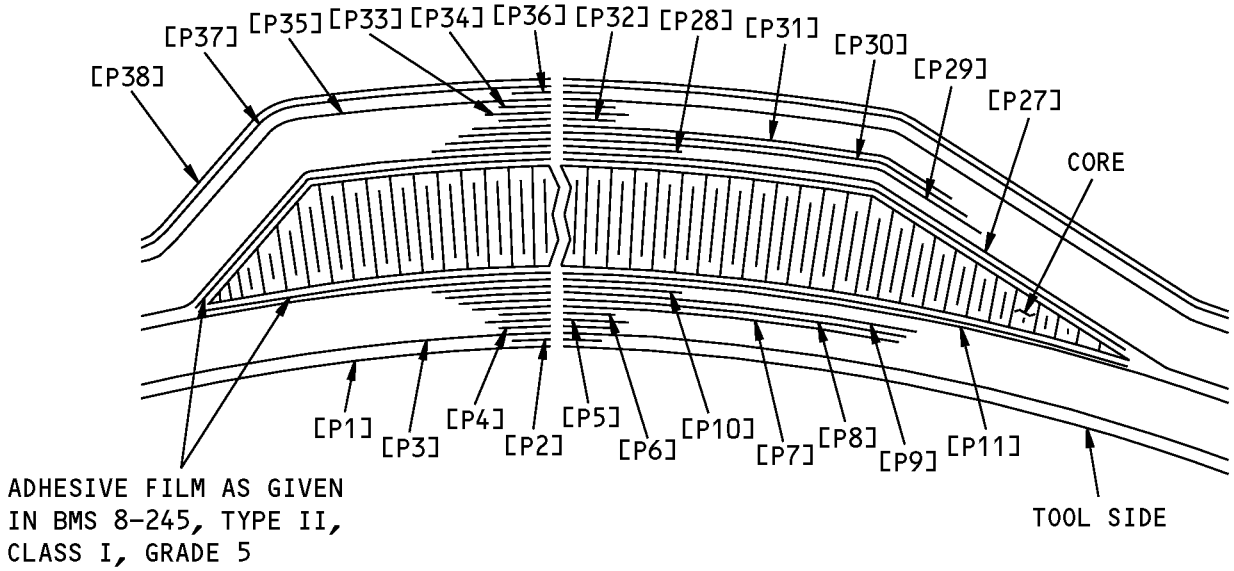
NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 10 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A AND B-B.

Ply Direction, Core Ribbon Direction, and Ply Sequence for the End Blocker Door Panel, Figure 2, Item [2]
Figure 10 (Sheet 1 of 2)



PLY SEQUENCE
A-A

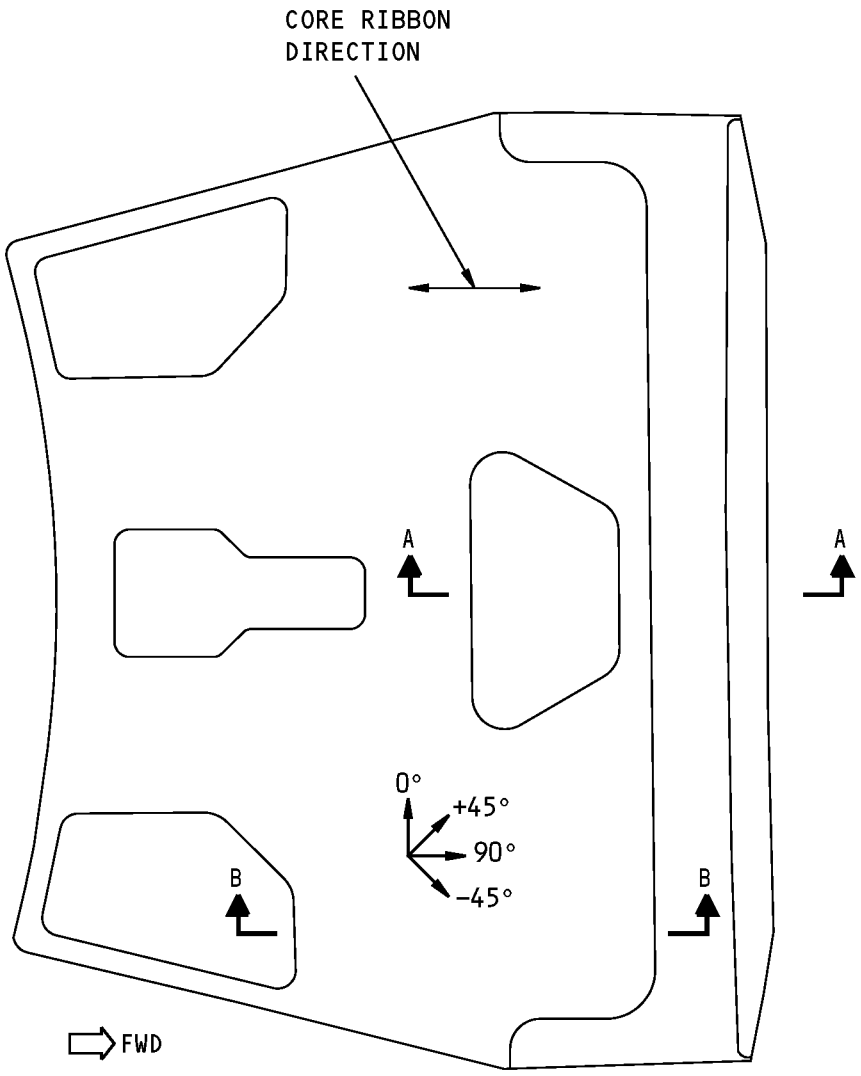


ROTATED 90° COUNTER CLOCKWISE
PLY SEQUENCE
B-B

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the End Blocker Door Panel, Figure 2, Item [2]
Figure 10 (Sheet 2 of 2)**

Table 10:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	**DIRECTION**	**MATERIAL**
P2, P3, P11, P13, P15, P17, P19, P21, P23, P25, P27, P35, P36	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P1, P4, P6, P8, P10, P12, P14, P16, P18, P20, P22, P24, P26, P28, P30, P32, P34, P37	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P5, P7, P9, P29, P31, P33	0 degrees	Epoxy impregnated graphite tape as given in BMS 8-297, Class I, Type III, Grade 190
P38	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108



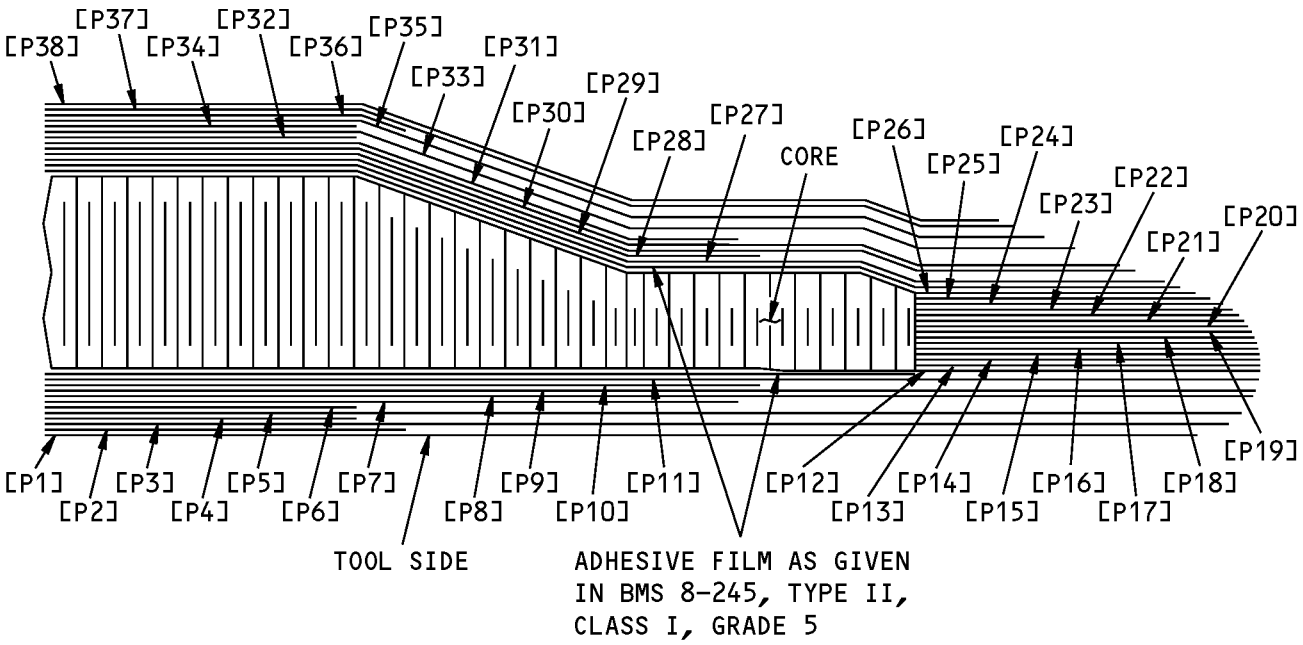
THE VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP AND CORE RIBBON DIRECTION

A

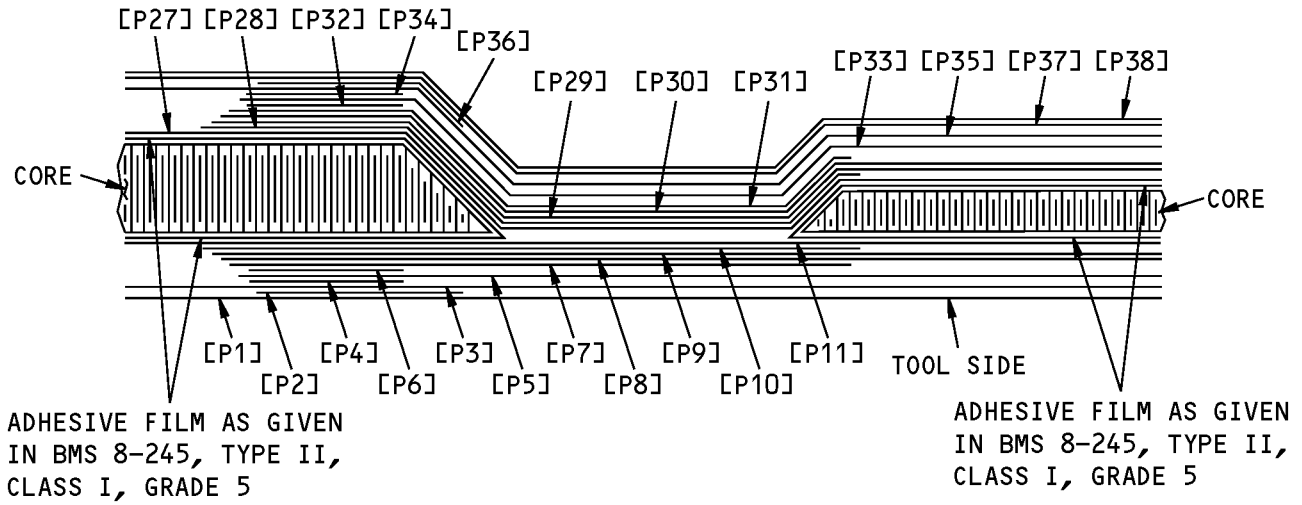
NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 11 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A AND B-B.

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Common Blocker Door Panel Figure 2, Item [3] Figure 11 (Sheet 1 of 2)



PLY SEQUENCE
A–A



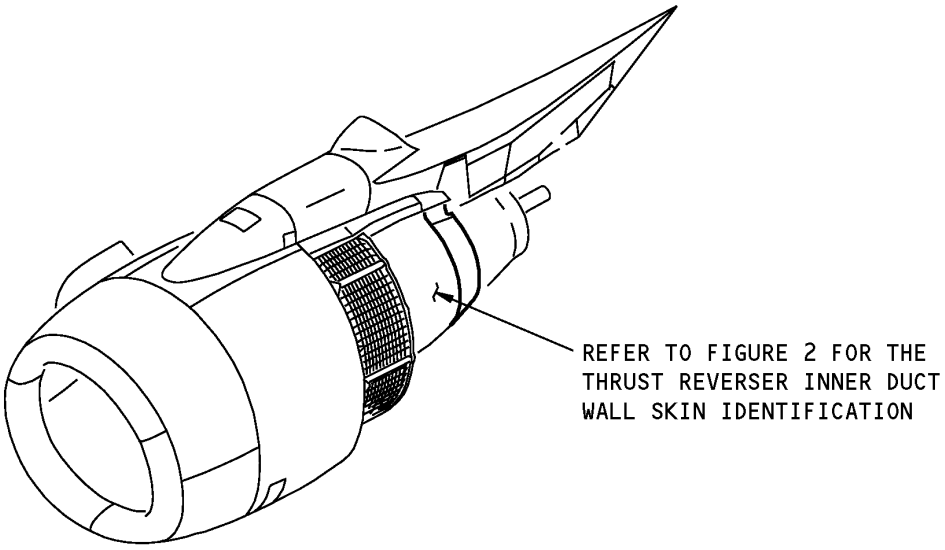
PLY SEQUENCE
B–B

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Common Blocker Door Panel Figure 2, Item [3]
Figure 11 (Sheet 2 of 2)**

Table 11:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	**DIRECTION**	**MATERIAL**
P2, P3, P11, P13, P15, P17, P19, P21, P23, P25, P27, P35, P36	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P1, P4, P6, P8, P10, P12, P14, P16, P18, P20, P22, P24, P26, P28, P30, P32, P34, P37	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P5, P7, P9, P29, P31, P33	0 degrees	Epoxy impregnated graphite tape as given in BMS 8-297, Class I, Type III, Grade 190
P38	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108

IDENTIFICATION 3 - THRUST REVERSER INNER DUCT WALL SKIN



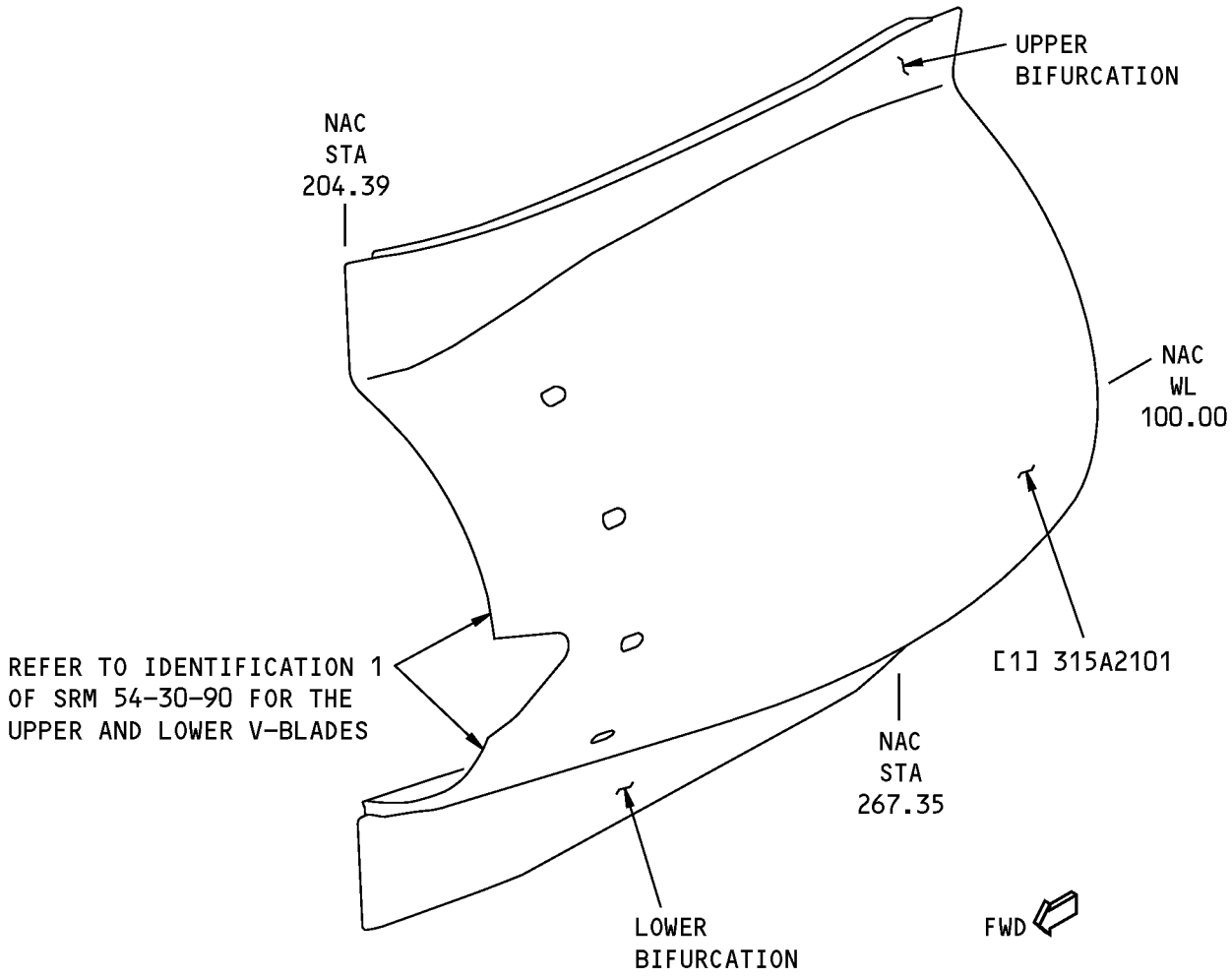
NOTES

- REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.
- THE TRANSLATING SLEEVE IS NOT SHOWN.

Thrust Reverser Inner Duct Wall Skin Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
300A2020	Engine Fan Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2101	Fan Duct Inner Wall Bond Panel Assembly - L.H.
315A2102	Fan Duct Inner Wall Bond Panel Assembly - R.H.



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

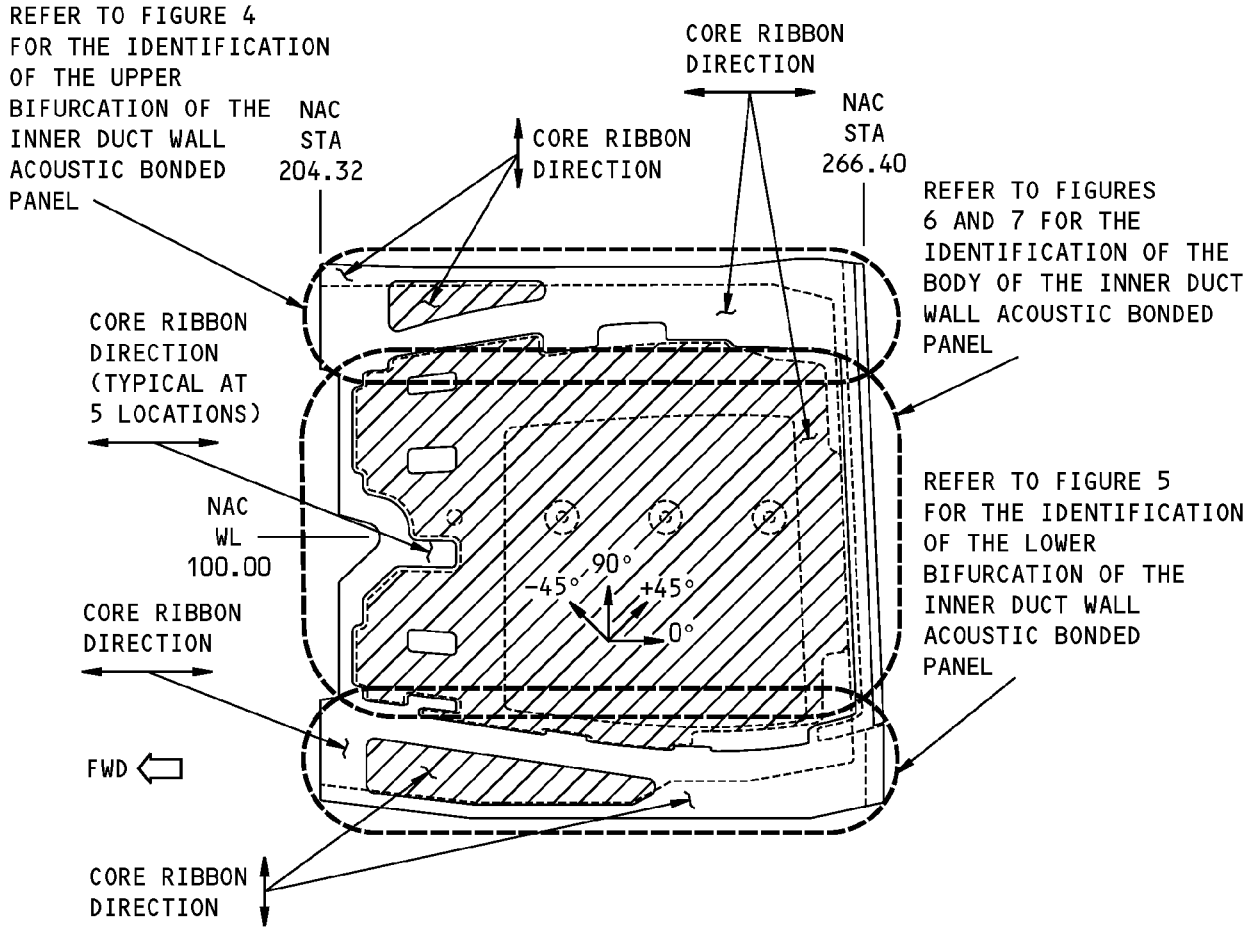
LEFT INNER DUCT WALL BOND PANEL IS SHOWN,
RIGHT INNER DUCT WALL BOND PANEL IS ALMOST THE SAME

Thrust Reverser Inner Duct Wall Skin Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Inner Duct Wall Assembly - Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich and Glass Fiber Reinforced Plastic (GFRP) isolation plies	
	Skin		Refer to Figure 3	
	Core	0.96 (24.38)	Carbon fiber honeycomb as given in BMS 8-339, Type 6, Class IV, Grade 5.4. Refer to Figure 3 for the core ribbon direction	CUM LINE 001 THRU 514
		0.96 (24.38)	Aluminum honeycomb as given in BMS 4-25, Type 6-30, Class III, Grade 1.	CUM LINE 515 AND ON
	Core Septum		As given in BMS 5-114, Grade 17	
	Core	0.47 (11.94) 0.91 (23.11) 1.00 (25.40)	Carbon fiber honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0. Refer to Figure 3 for the the core ribbon direction Non-metallic honeycomb as given in BMS 8-124, Type I, Class 7, Style C, Grade 16.0 (This replaces BMS 8-342 in all locations but the upper and lower bifurcations)	CUM LINE 001 THRU 514 CUM LINE 515 AND ON
			Non-metallic honeycomb as given in BMS 8-125, Type III, Class 2, Grade 19.5 (This replaces BMS 8-342 only in the locations of the upper and lower bifurcations)	CUM LINE 515 AND ON

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



VIEW WHEN YOU LOOK INBOARD

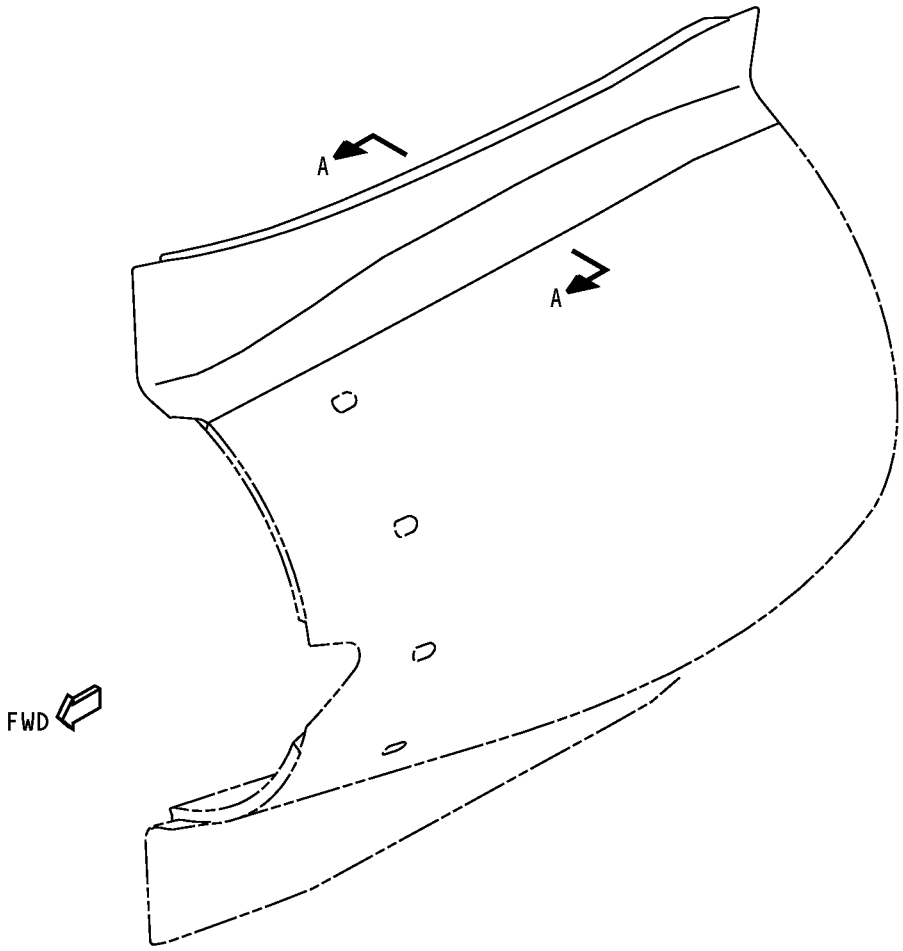
LEFT SIDE IS SHOWN,
RIGHT SIDE IS ALMOST THE SAME

A

NOTES

- THE SHADED AREAS SHOW THE LOCATIONS OF PERFORATED ACOUSTIC SKIN.
- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.

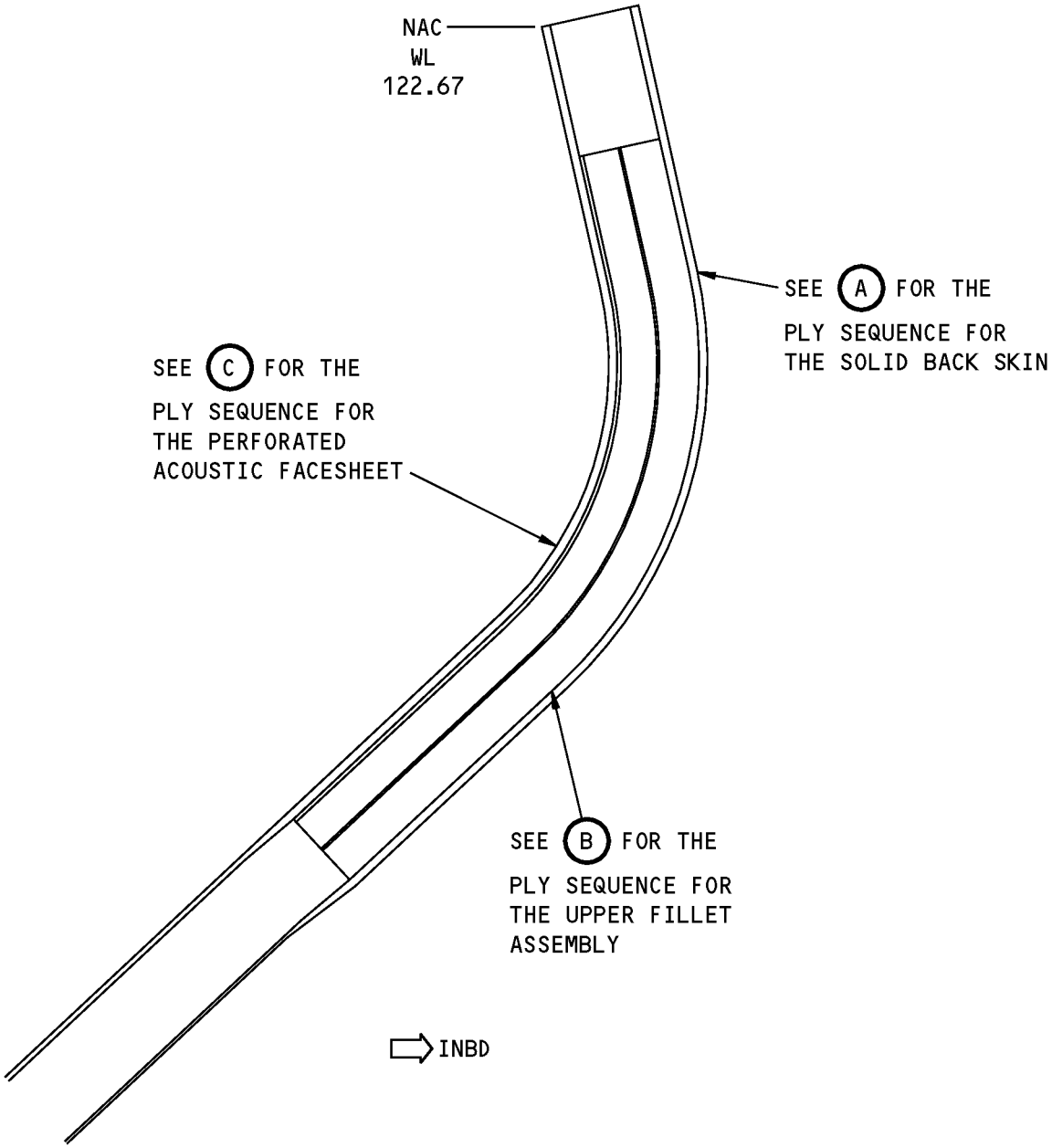
Ply Direction and Core Ribbon Direction for the Inner Duct Wall Panel, Figure 2, Item [1]
Figure 3



NOTES

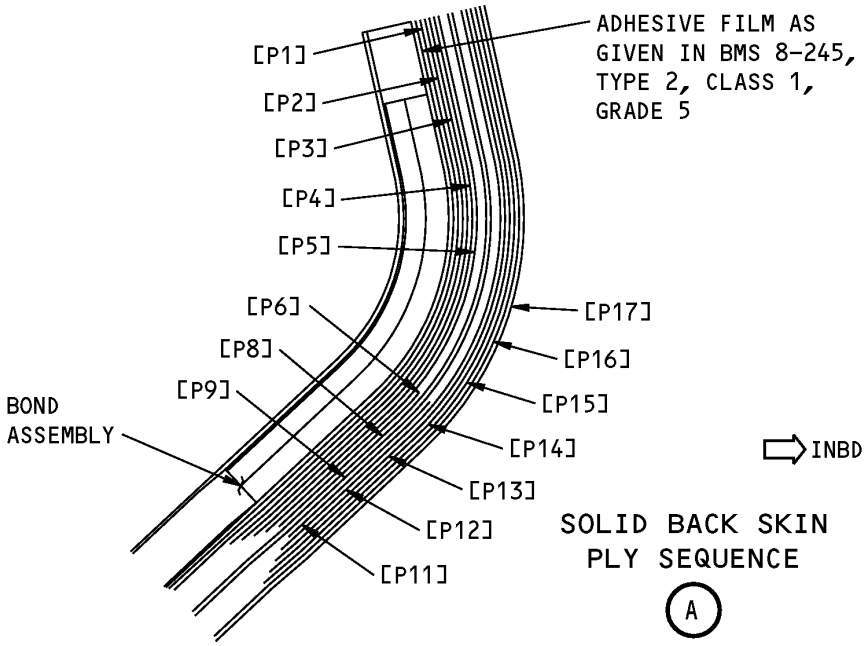
- REFER TO FIGURE 3 FOR THE 0 DEGREE PLY DIRECTION AND CORE RIBBON DIRECTION.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL A.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL B.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL C.

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 1 of 3)



A–A

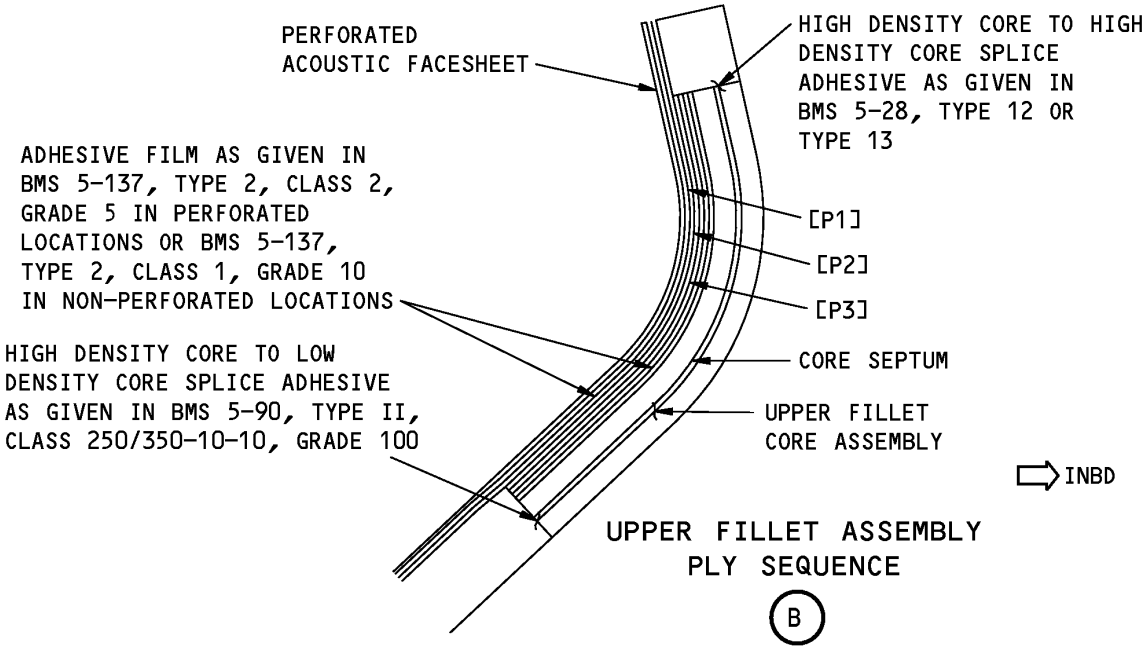
Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 2 of 3)



Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 3 of 3)

Table 3:

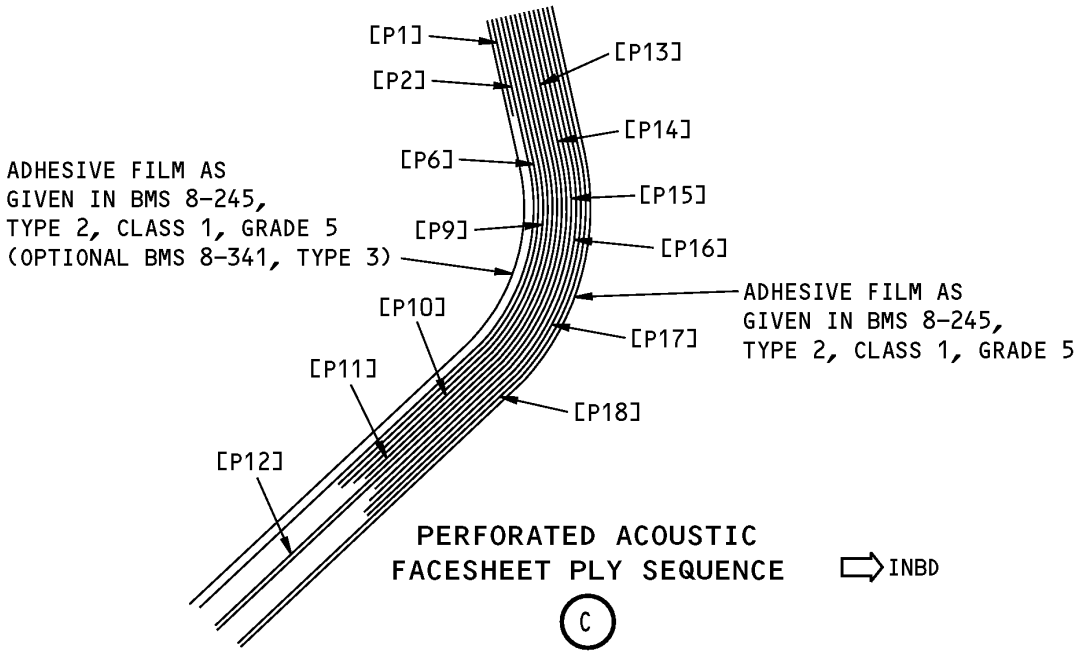
PLY MATERIAL AND DIRECTION FOR FIGURE 4, DETAIL A		
PLY	**DIRECTION**	**MATERIAL**
P1, P3, P5, P7, P10, P12, P14 P16	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class II, Style 3K-70-PW
P2, P4, P6, P8, P9, P11, P13, P15	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class II, Style 3K-70-PW
P17	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108



Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 5

Table 4:

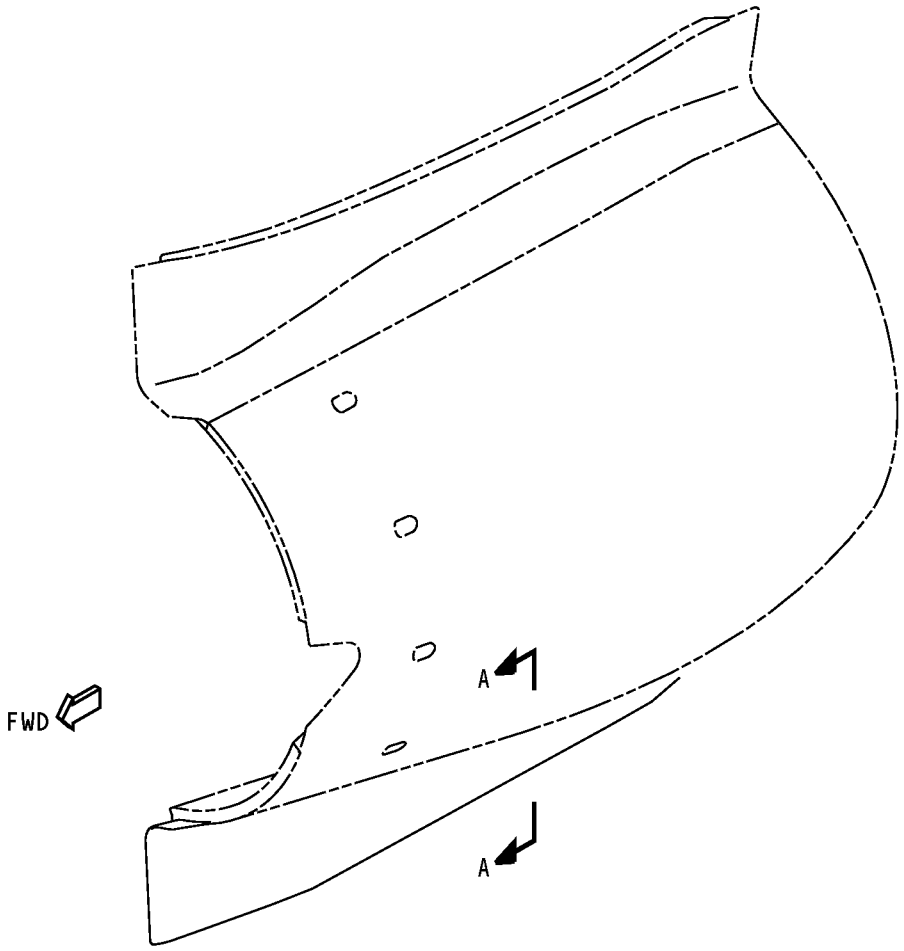
PLY MATERIAL AND DIRECTION FOR FIGURE 4, DETAIL B		
PLY	**DIRECTION**	**MATERIAL**
Perforated Acoustic Facesheet		Fabricate as given in BAC 5317-6, Stage I. Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108
P2	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H
P1, P3	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H



Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 6

Table 5:

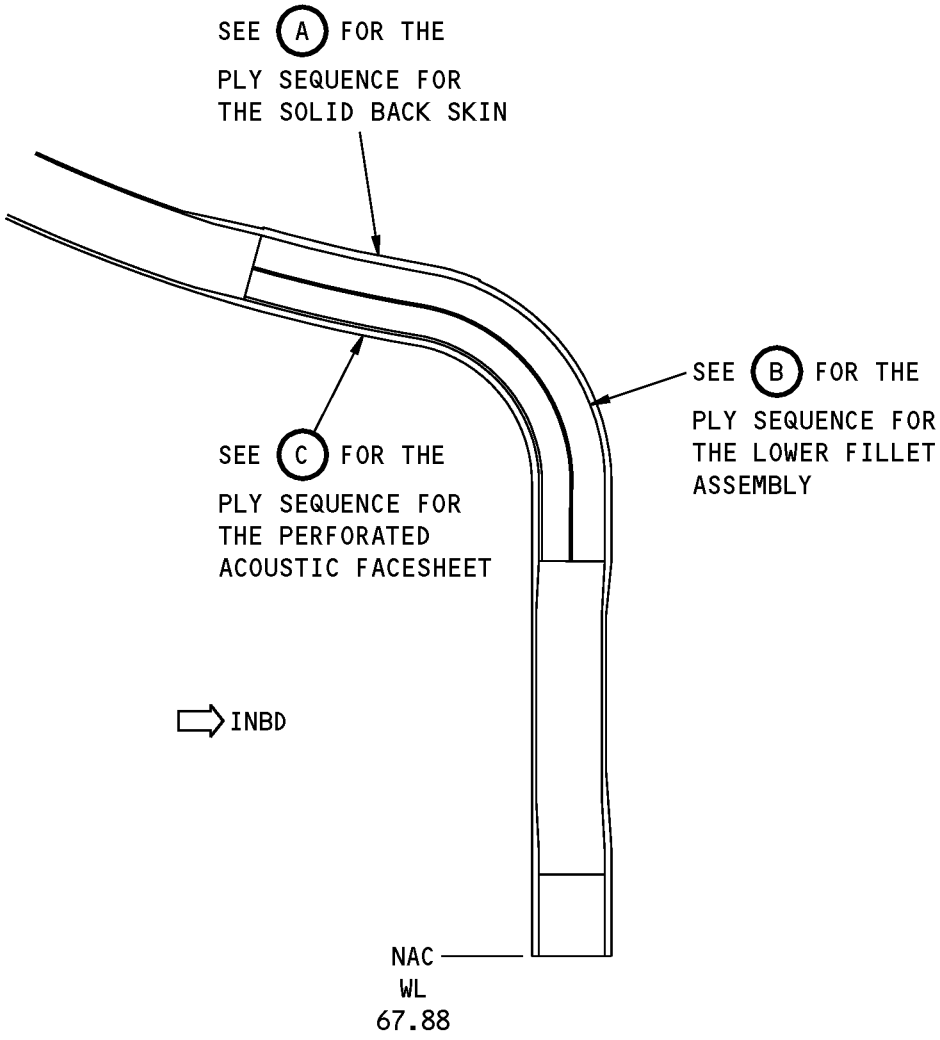
PLY MATERIAL AND DIRECTION FOR FIGURE 4, DETAIL C		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108
P2, P9, P11, P14, P16, P18	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P6, P10, P12, P13, P15, P17	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P3, P4, P5, P7, P8	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H



NOTES

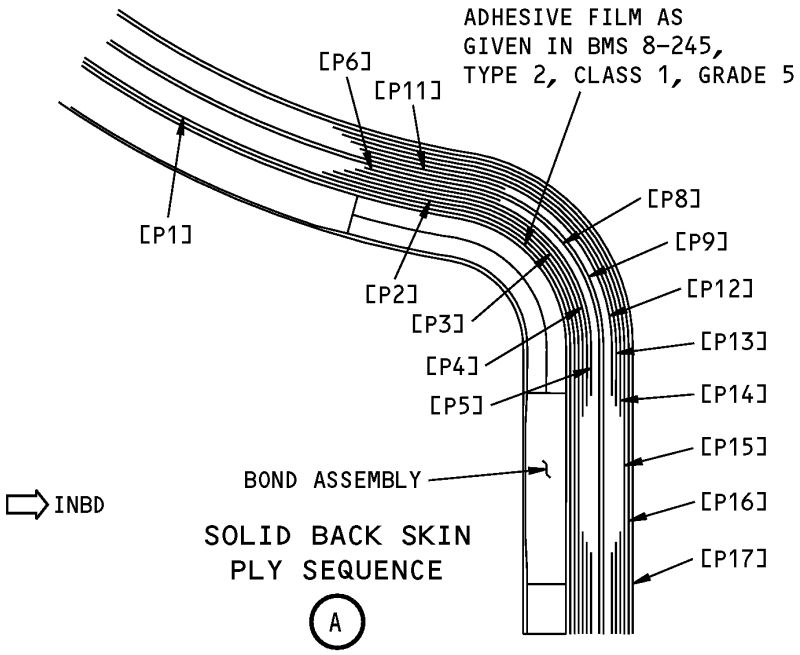
- REFER TO FIGURE 3 FOR THE 0 DEGREE PLY DIRECTION AND CORE RIBBON DIRECTION.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL A.
- REFER TO TABLE 7 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL B.
- REFER TO TABLE 8 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL C.

Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 7 (Sheet 1 of 3)



A–A

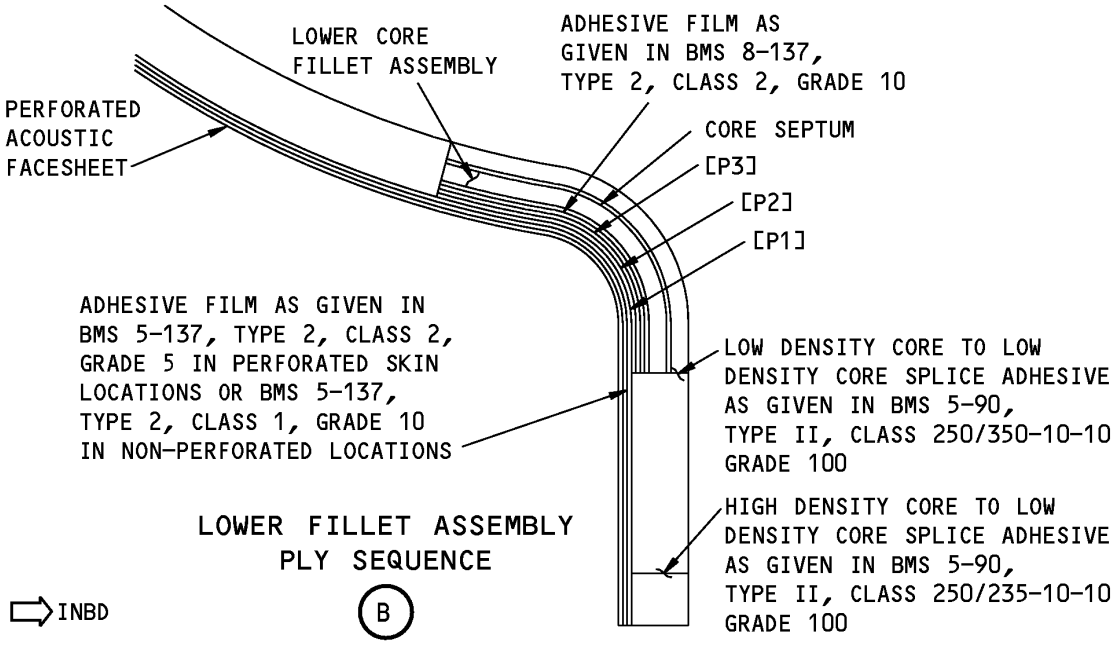
Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 7 (Sheet 2 of 3)



Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 7 (Sheet 3 of 3)

Table 6:

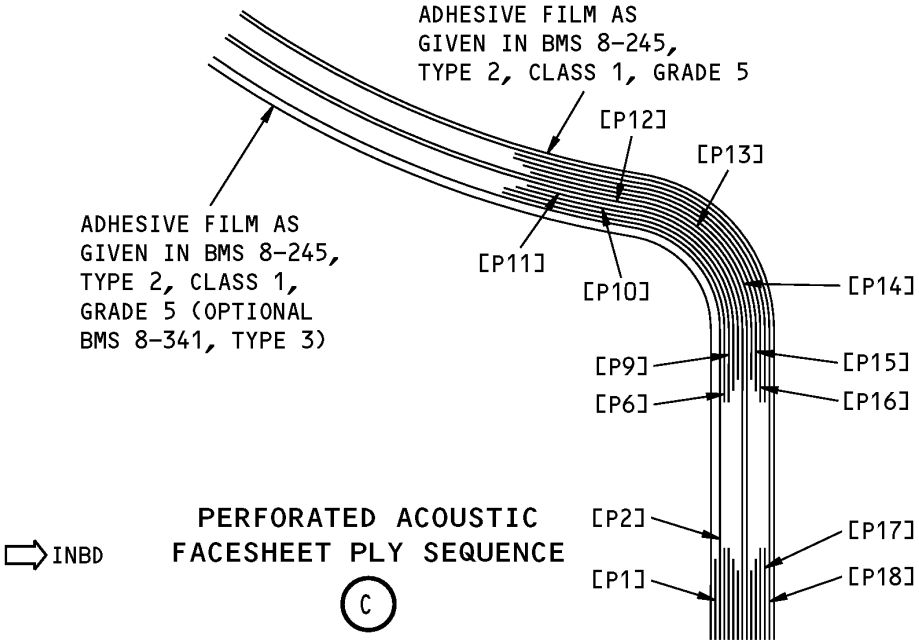
PLY MATERIAL AND DIRECTION FOR FIGURE 5, DETAIL A		
PLY	**DIRECTION**	**MATERIAL**
P1, P3, P5, P7, P10, P12, P14, P16	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P8, P9, P11, P13, P15	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P17	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108



Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 8

Table 7:

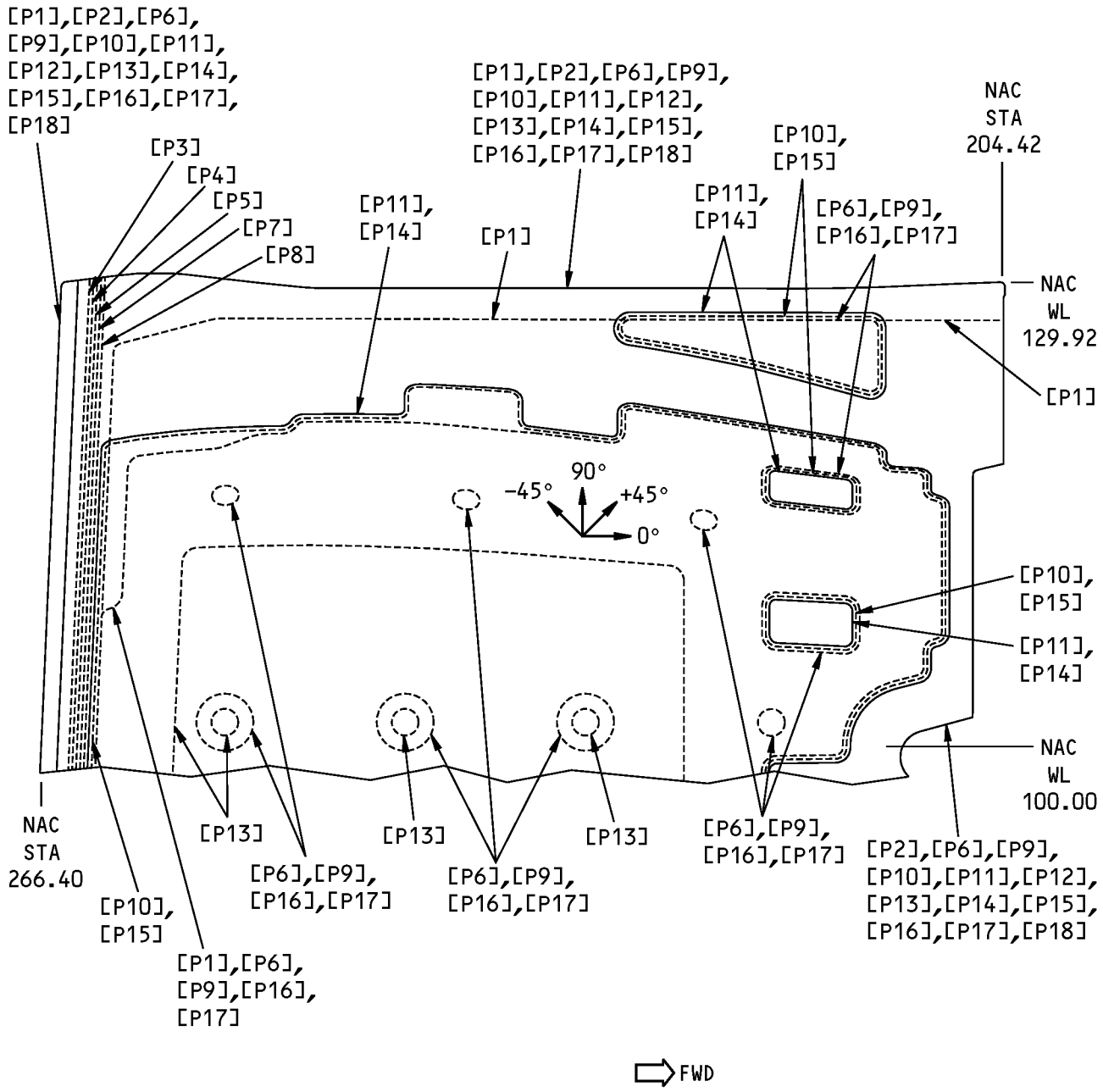
PLY MATERIAL AND DIRECTION FOR FIGURE 5, DETAIL B		
PLY	**DIRECTION**	**MATERIAL**
Perforated Acoustic Facesheet		Fabricate as given in BAC 5317-6, Stage I. Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108
P2	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H
P1, P3	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H



Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 9

Table 8:

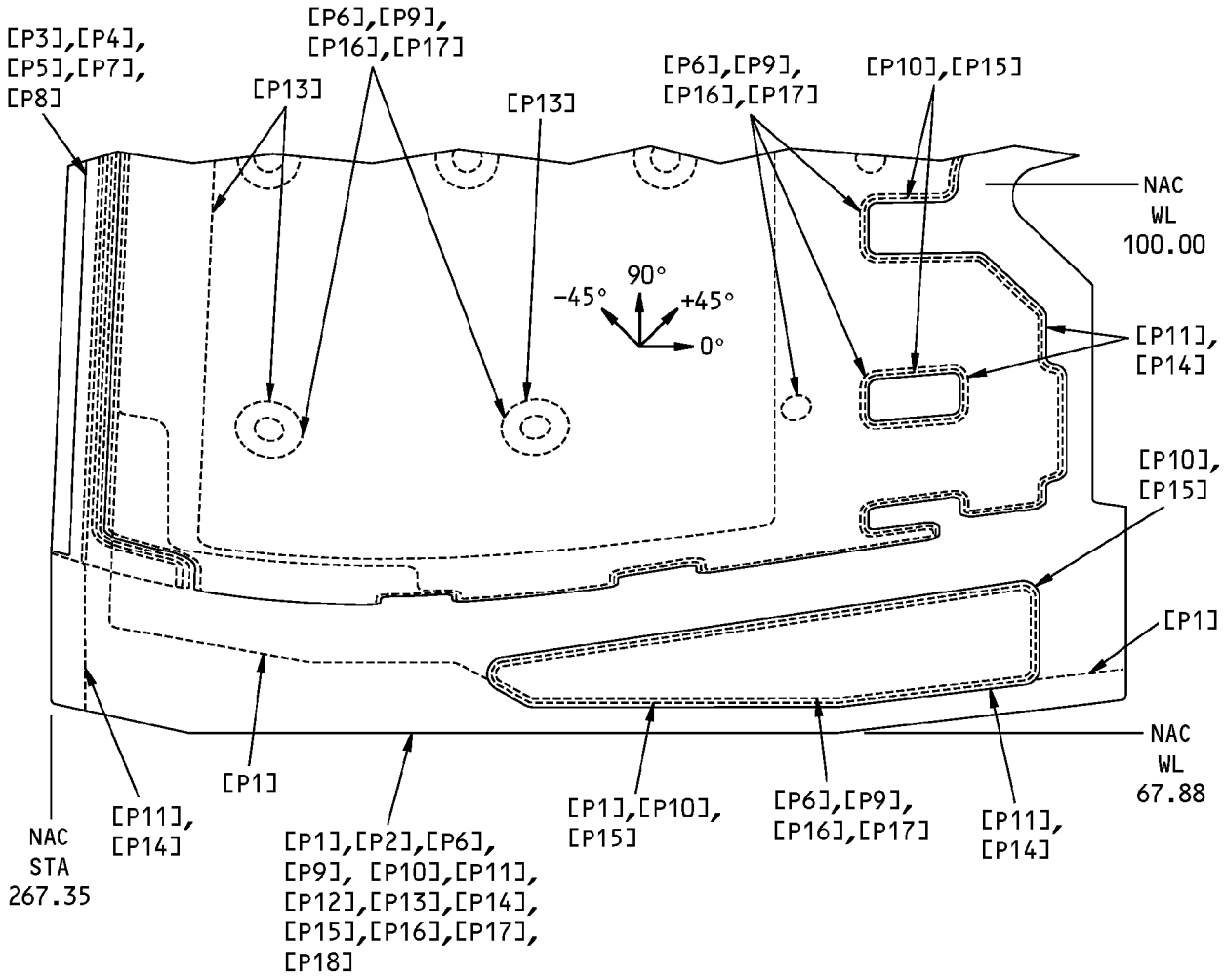
PLY MATERIAL AND DIRECTION FOR FIGURE 5, DETAIL C		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108
P2, P9, P11, P14, P16, P18	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P6, P10, P12, P13, P15, P17	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class I, Style 3K-70-PW



VIEW WHEN YOU LOOK OUTBOARD

ABOVE NAC WL 100.00

Ply Orientation and Ply Sequence for the Inner Duct Wall Acoustic Skin
Figure 10 (Sheet 1 of 2)



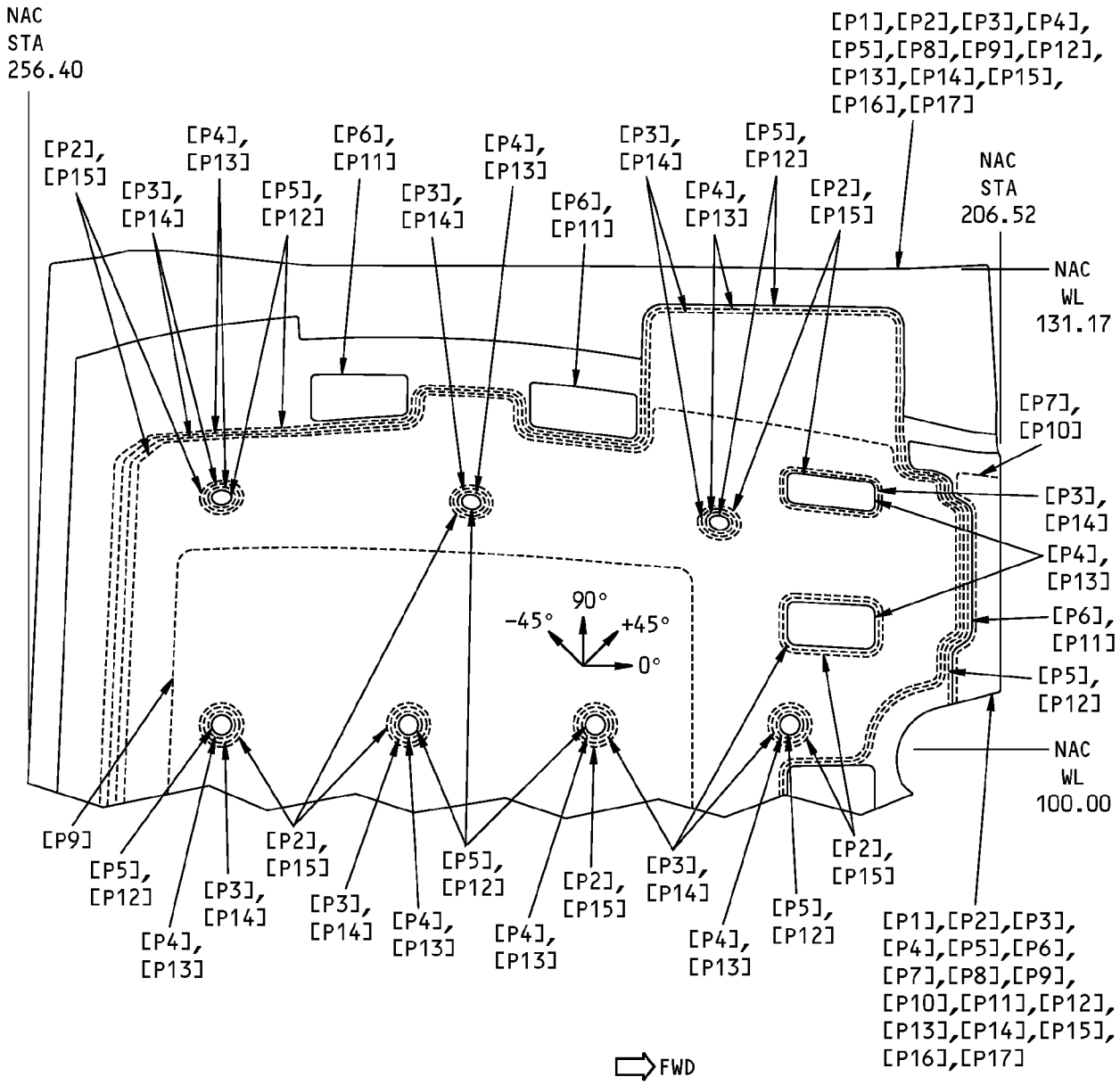
VIEW WHEN YOU LOOK OUTBOARD

BELOW NAC WL 100.00

Ply Orientation and Ply Sequence for the Inner Duct Wall Acoustic Skin
Figure 10 (Sheet 2 of 2)

Table 9:

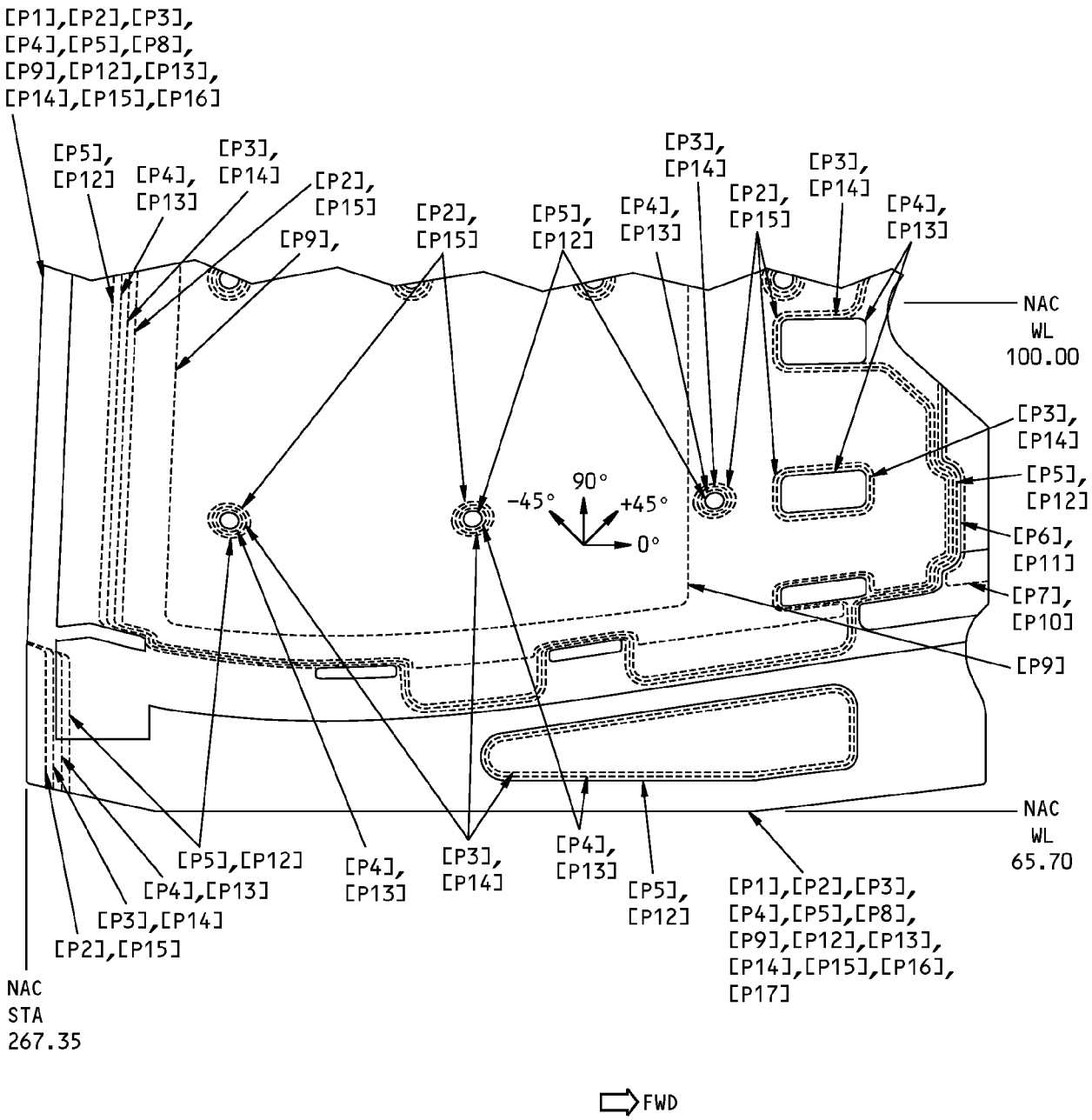
PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108
P2, P9, P11, P14, P16, P18	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P6, P10, P12, P13, P15, P17	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P3, P4, P5, P7, P8	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H



VIEW WHEN YOU LOOK OUTBOARD

ABOVE NAC WL 100.00

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 1 of 2)



VIEW WHEN YOU LOOK OUTBOARD

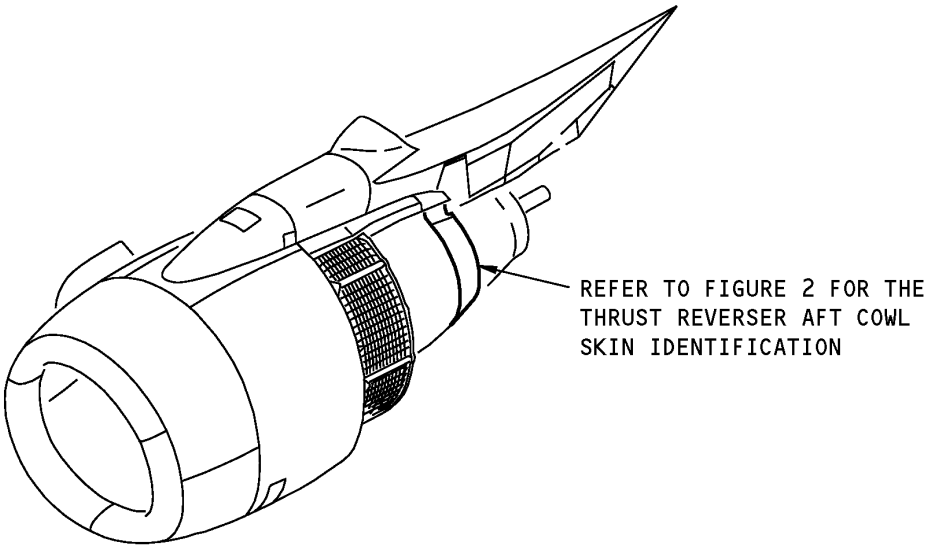
BELOW NAC WL 100.00

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 2 of 2)

Table 10:

PLY MATERIAL AND DIRECTION FOR FIGURE 7		
PLY	**DIRECTION**	**MATERIAL**
P17	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class III, Style 108
P1, P3, P5, P7, P10, P12, P14, P16	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P8, P9, P11, P13, P15	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

IDENTIFICATION 4 - THRUST REVERSER AFT COWL SKIN

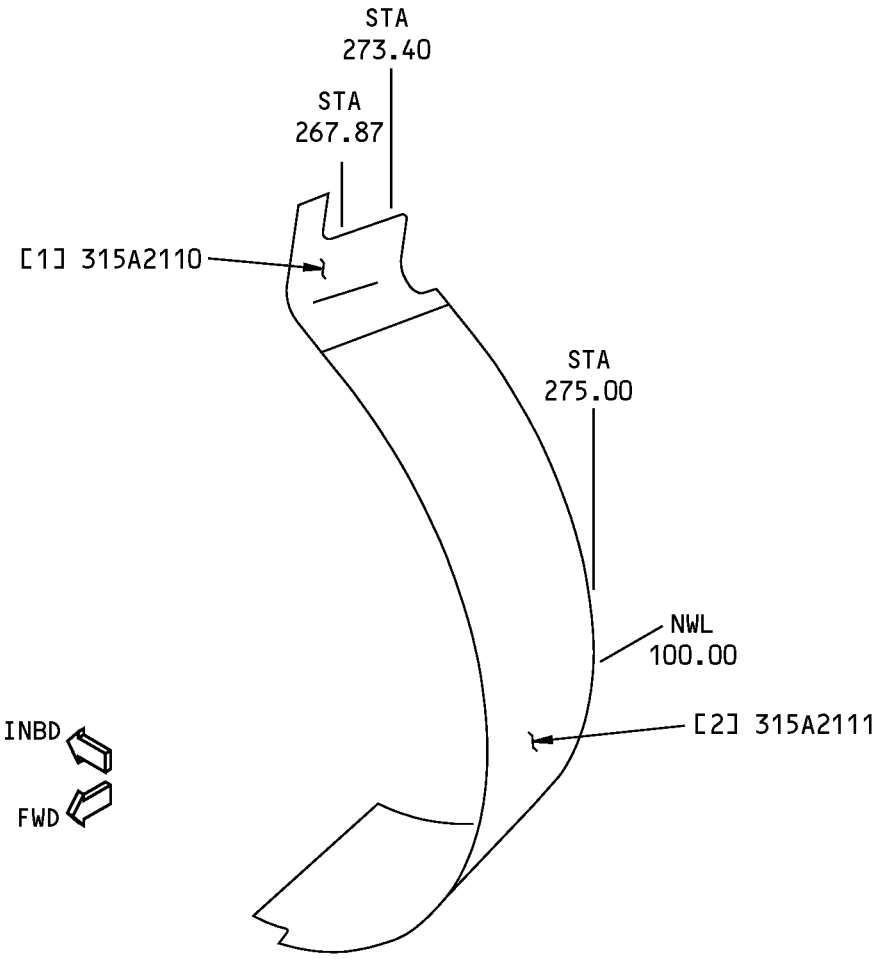


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Thrust Reverser Aft Cowl Skin Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
300A2020	Engine Fan Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2103	Aft Cowl Panel Installation
315A2104	Aft Cowl Panel Assembly



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE AFT COWL SKIN IS SHOWN,
RIGHT SIDE AFT COWL SKIN IS OPPOSITE

Thrust Reverser Aft Cowl Skin Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Aft Cowl Skin - Upper	0.071 (1.80)	2219-T81 sheet as given in QQ-A-250/30	
[2]	Aft Cowl Skin - Lower	0.071 (1.80)	2219-T81 sheet as given in QQ-A-250/30	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - THRUST REVERSER TRANSLATING SLEEVE OUTER SKIN

1. Applicability

A. This subject gives the allowable damage limits for the part of the Thrust Reverser Translating Sleeve Outer Skin Panel that follow (Refer to Thrust Reverser Translating Sleeve Outer Skin, Figure 101/ALLOWABLE DAMAGE 1):

(1) The Outer Cowl Panel

(2) The Actuator Access Doors

2. General

A. The composite structure allowable damage limits are applicable only if the damage is sealed as given in Paragraph 2.B(3).

B. If you have damage to the composite parts, do as follows:

(1) Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(a) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 1 for the definitions of the length, width, and depth of the damage for the translating sleeve outer skin panel.

(b) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 1 for the definitions of the facesheets of a honeycomb core area.

(2) Remove all of the contamination and water from the part.

(a) Refer to 51-70-04 for the damage removal procedures.

(b) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

(3) Seal all the permitted damage areas on the parts. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1. Seal the damage with one of the three methods that follows:

(a) For the epoxy/glass sheet actuator access doors, make a permanent seal with one of the two materials that follows:

1) BMS 5-92, Type 1 or Type 3 epoxy resin

2) BMS 5-123 adhesive.

3) Cure the compound that you have selected as follows:

a) Cure the BMS 5-92 epoxy resin at 75°F (24°C) for 24 hours.

b) Cure the BMS 5-123 adhesive at 75°F (24°C) for 1 hour.

(b) For the damage to the translating sleeve outer skin that does not cause damage to the fibers, make a permanent seal.

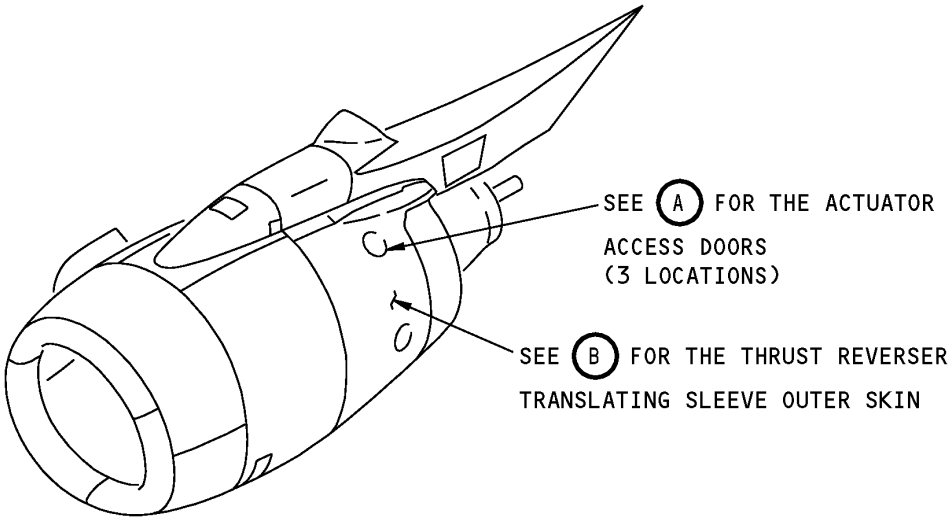
1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

2) Apply one layer of BMS 10-79, Type 3, or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.

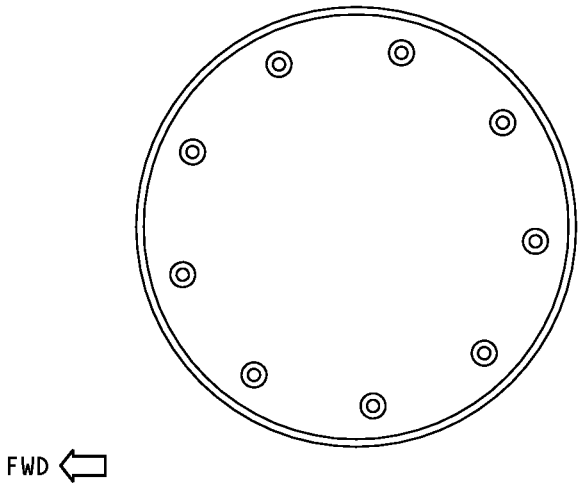
3) Apply one layer of BMS 10-60, Type II enamel to the external surfaces sealed with epoxy resin. Refer to AMM 51-21-00/701.

(c) Seal all of the damage areas of the translating sleeve outer cowl skin that causes damage to the fibers. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1 Seal the damage as follows:

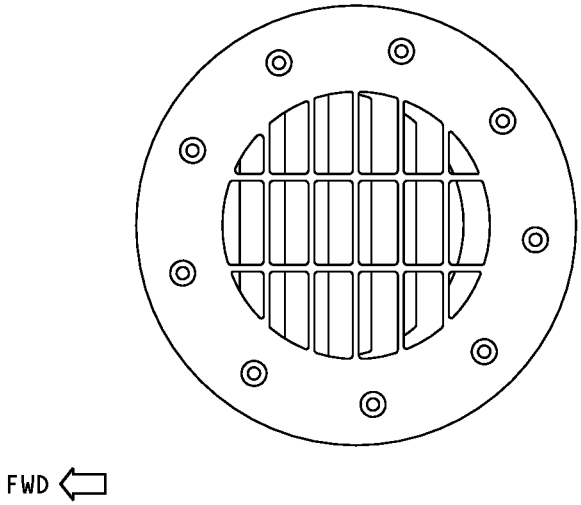
1) Use a vacuum and heat, as necessary, to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.
2) Make a temporary seal with aluminum foil tape (speed tape).
3) Keep a record of the location of the damage.
4) Repair the damage at or before 400 flight hours from the time the seal was made.



Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 1 of 4)



ACTUATOR ACCESS DOOR (WITHOUT VENTS)
EPOXY/GLASS SHEET MOLDING

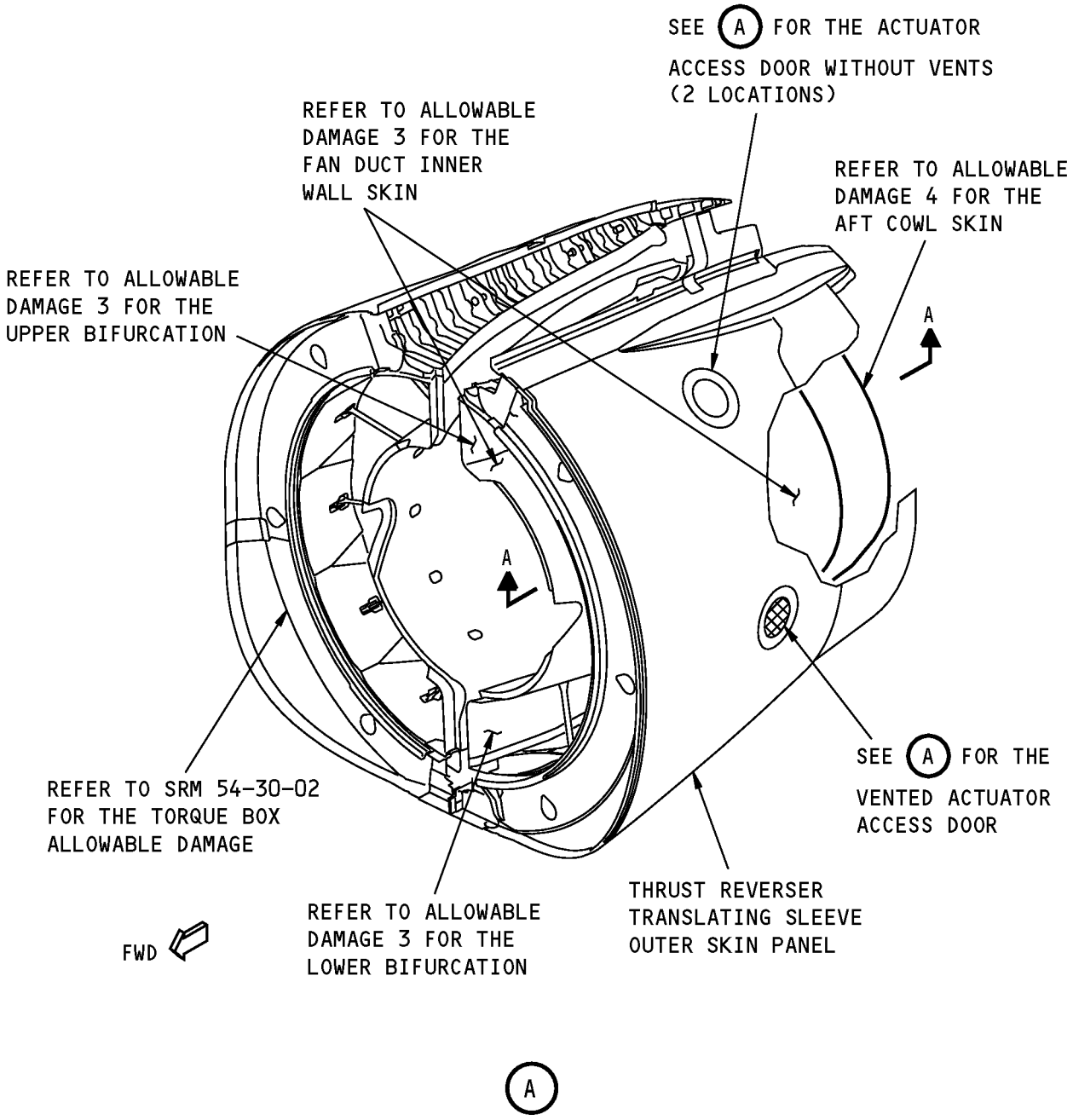


VENTED ACTUATOR ACCESS DOOR
EPOXY/GLASS SHEET MOLDING

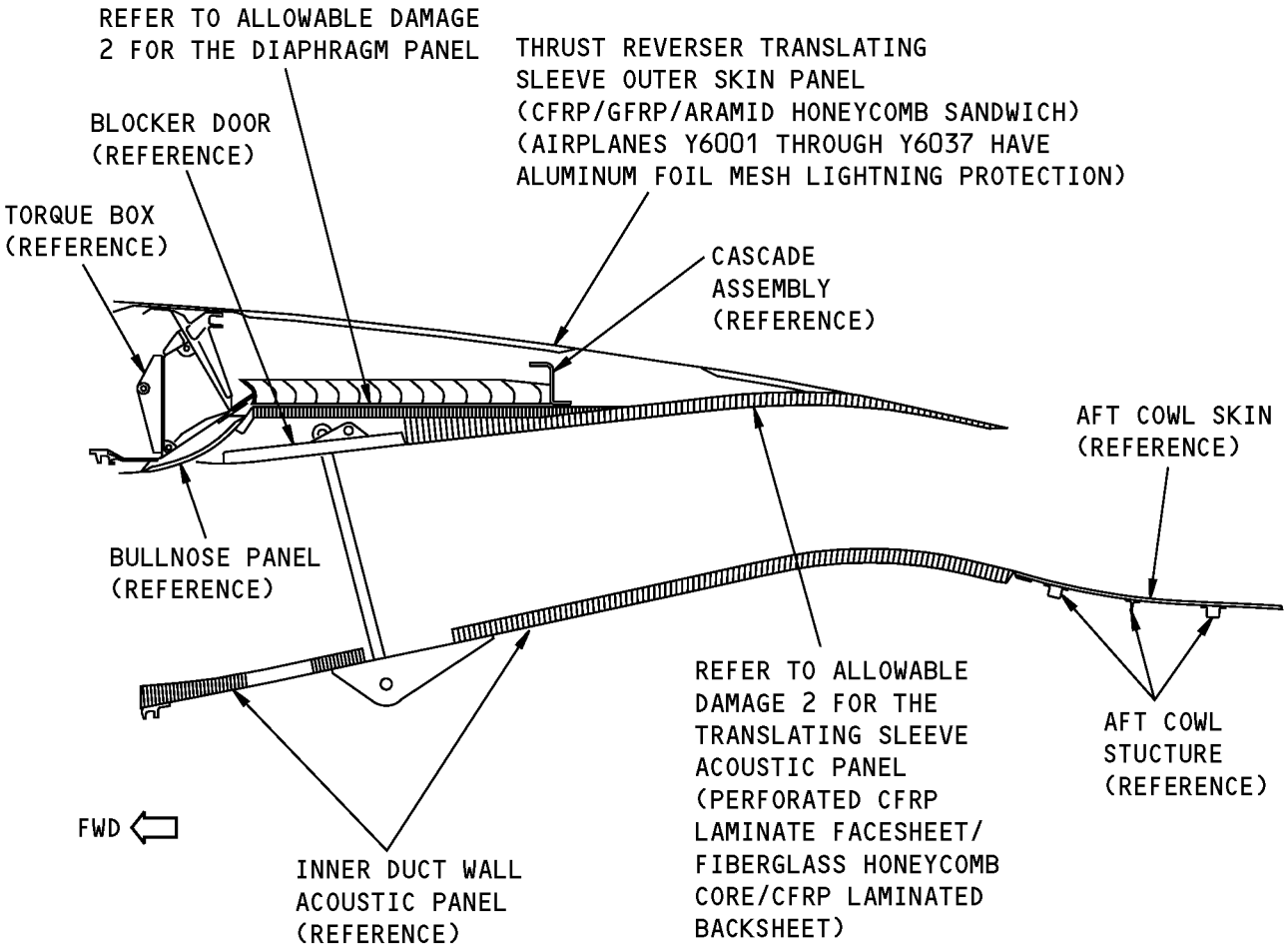
ACTUATOR ACCESS DOORS

A

Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 2 of 4)

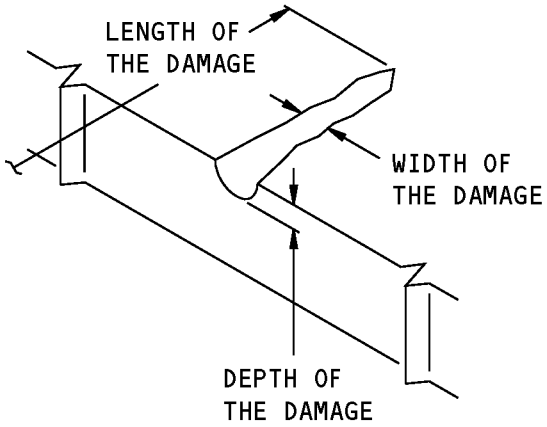


Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 3 of 4)



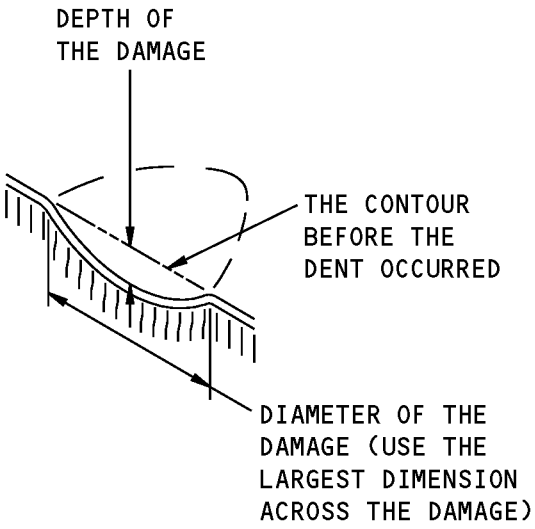
A–A

Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 4 of 4)



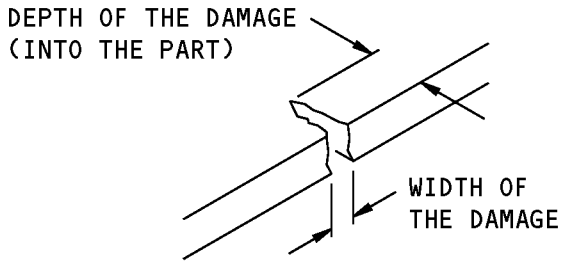
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

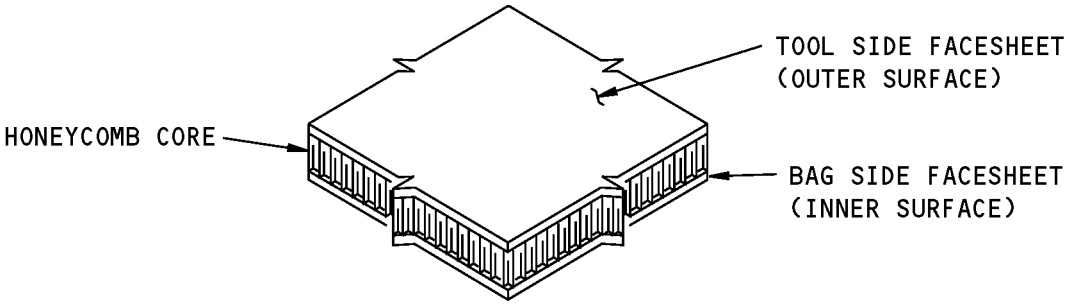
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 102



Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Actuator Access Doors

(1) Cracks:

(a) Remove edge damage as given in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and C .

(2) Nick, Gouges, and Scratches:

(a) Removal of the damage is permitted as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , and D if it is:

1) A minimum of 4D (D = the diameter of the damage) away from other damage, the nearest hole, or the edge of the part.

(3) Dents:

(a) Dents usually result in cracks. Use the limits given for cracks.

(4) Holes and Punctures:

(a) Damage to the actuator access doors without vents is permitted if:

1) It is less than or equal to 0.25 inch (6.4 mm) in diameter
2) It is a minimum of 4D (D = diameter of the damage) away from:
   a) Other damage
   b) The nearest hole
   c) The edge of the part.

(b) Damage to the vented actuator access doors is not permitted.

(5) Delaminations are not permitted.

(6) Edge Crushing and Edge Erosion:

(a) Remove Edge Crushing damage as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and C .

(b) Remove the Edge Erosion damage as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 104/ALLOWABLE DAMAGE 1, Detail E .

B. Translating Sleeve Outer Skin - Edgeband

(1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.

(a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.B.(3)(b)/ALLOWABLE DAMAGE 1

(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.

(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 105/ALLOWABLE DAMAGE 1, Detail A if they are:

(a) Cleaned and sealed as given in Paragraph 2.B.(3)(c)/ALLOWABLE DAMAGE 1

(4) Dents are not permitted.

(5) Holes and Punctures are not permitted.

(6) Delaminations are not permitted.

(7) Edge Damage is permitted if it is:

(a) A maximum of 0.20 inch (5.1 mm) in depth

(b) A maximum of 0.50 inch (12.7 mm) in width

(c) Cleaned and sealed as given in Paragraph 2.

(d) Repaired by 5000 flight hours.

(8) Edge Erosion is permitted as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 105/ALLOWABLE DAMAGE 1, Detail B if it is repaired by 5000 flight hours.

C. Translating Sleeve Outer Skin - Honeycomb Panel Area

(1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.

(a) If the damage goes through only the glass fibers and does not cause damage to the carbon fibers below, clean and seal the damage as given in Paragraph 2.B.(3)(b)/ALLOWABLE DAMAGE 1

(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.

(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 106/ALLOWABLE DAMAGE 1, Detail A if they are:

(a) Cleaned and sealed as given in Paragraph 2.B.(3)(c)/ALLOWABLE DAMAGE 1

(4) Dents are permitted as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 106/ALLOWABLE DAMAGE 1, Detail A if they are:

(a) A maximum of 0.05 inch (1.27 mm) in depth

(b) Cleaned and sealed as given in Paragraph 2.B.(3)(b)/ALLOWABLE DAMAGE 1 or Paragraph 2.B.(3)(c)/ALLOWABLE DAMAGE 1.

(5) Holes and Punctures are permitted on the two sides of the skin as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 106/ALLOWABLE DAMAGE 1, Detail A if:

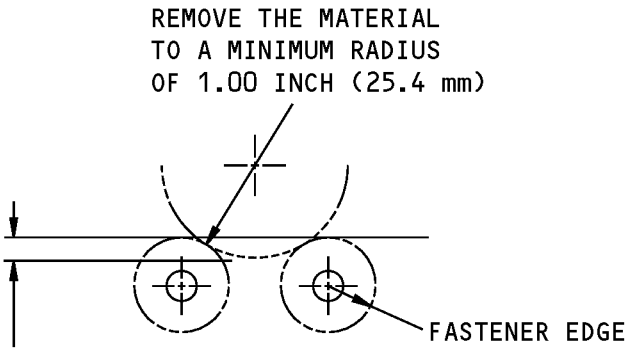
(a) They are a maximum of 0.25 inch (6.4 mm) in depth

(b) Cleaned and sealed as given in Paragraph 2.B.(3)(b)/ALLOWABLE DAMAGE 1 or Paragraph 2.B.(3)(c)/ALLOWABLE DAMAGE 1.

(6) Delaminations are permitted as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 106/ALLOWABLE DAMAGE 1, Detail A if they are cleaned and sealed as given in Paragraph 2.B.(3)(b)/ALLOWABLE DAMAGE 1 or Paragraph 2.B.(3)(c)/ALLOWABLE DAMAGE 1.

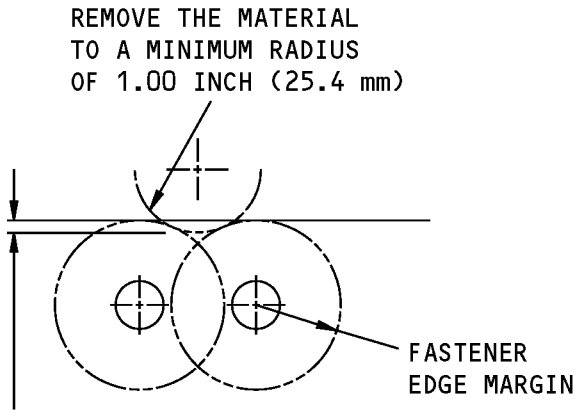
(7) Edge damage is not permitted.

(8) Edge Erosion is not permitted.



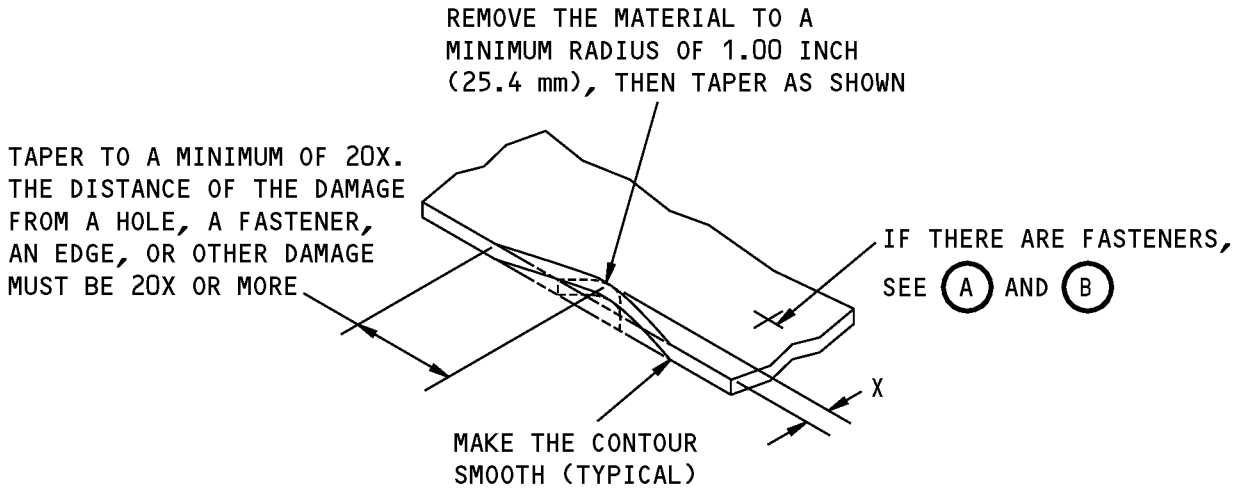
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

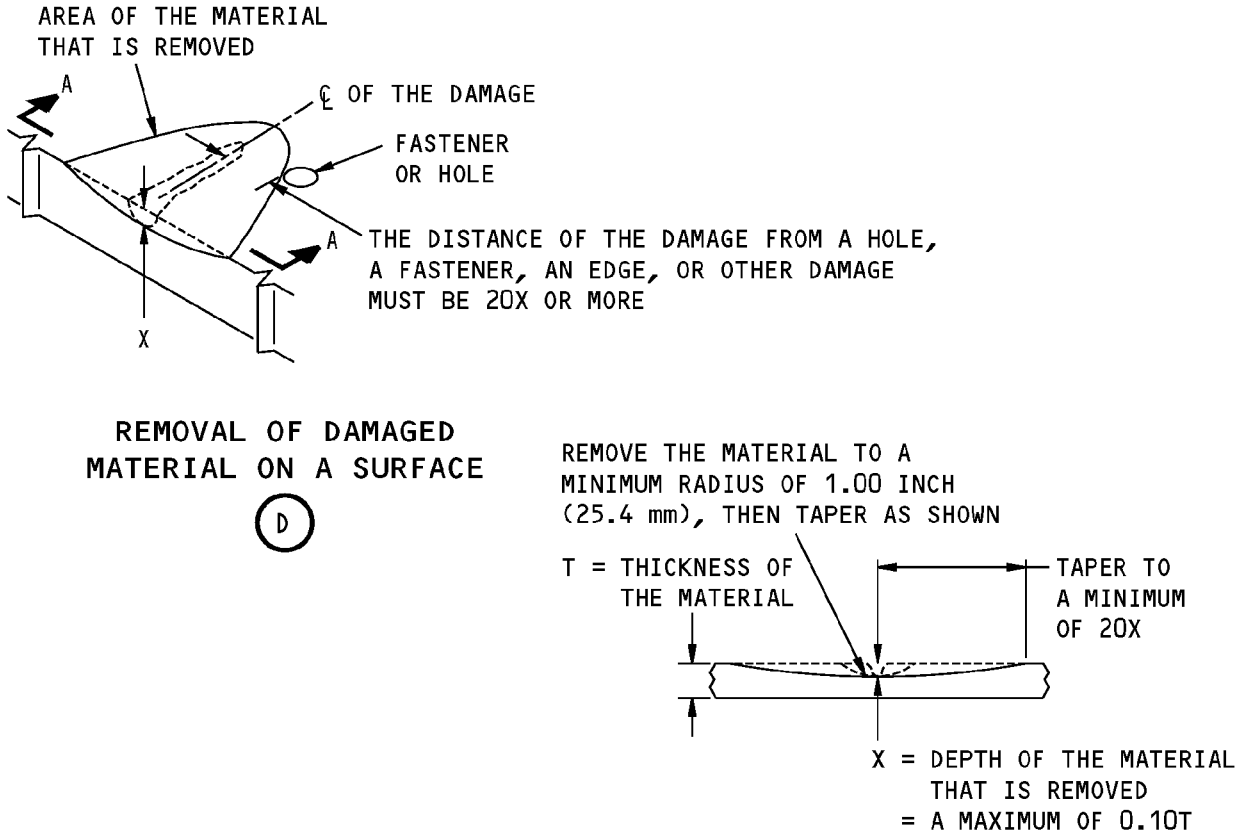


X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.5 mm)

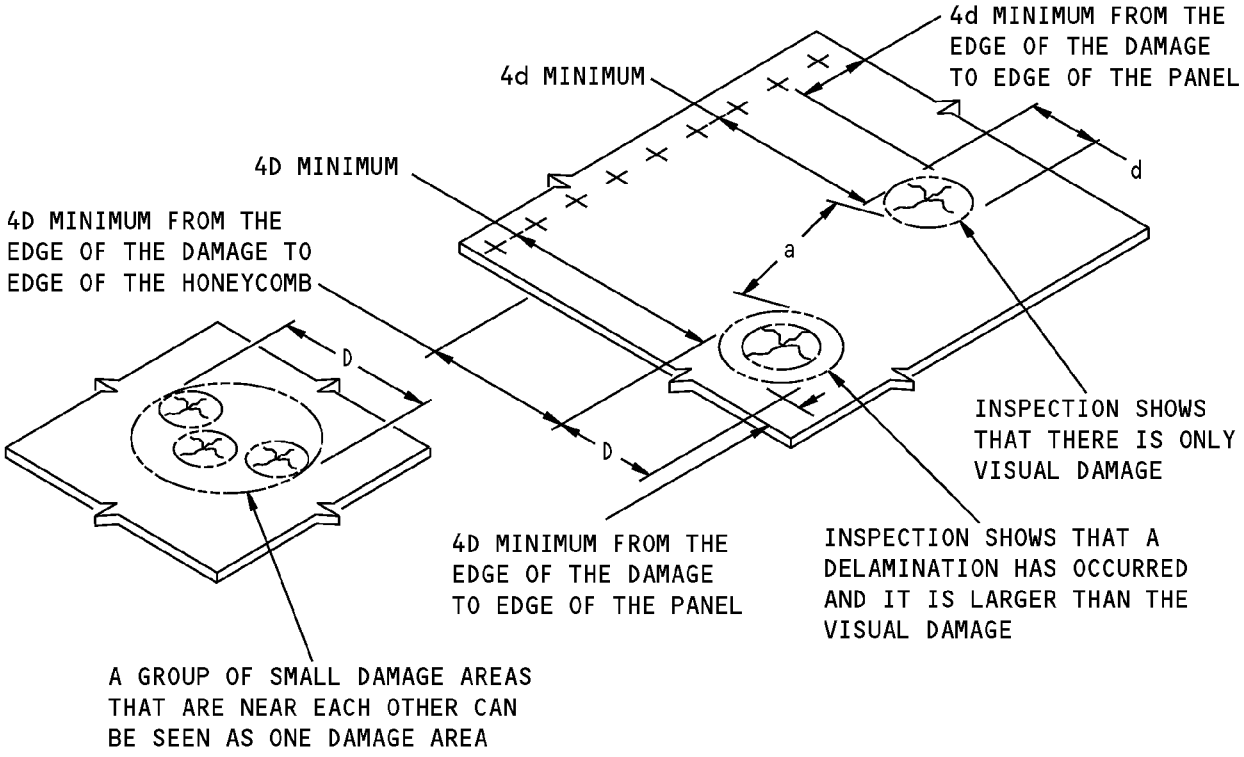
REMOVAL OF DAMAGED MATERIAL AT AN EDGE

C

Allowable Damage Limits - Translating Sleeve Outer Skin
Figure 104 (Sheet 1 of 2)



Allowable Damage Limits - Translating Sleeve Outer Skin
Figure 104 (Sheet 2 of 2)



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:
- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:
- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

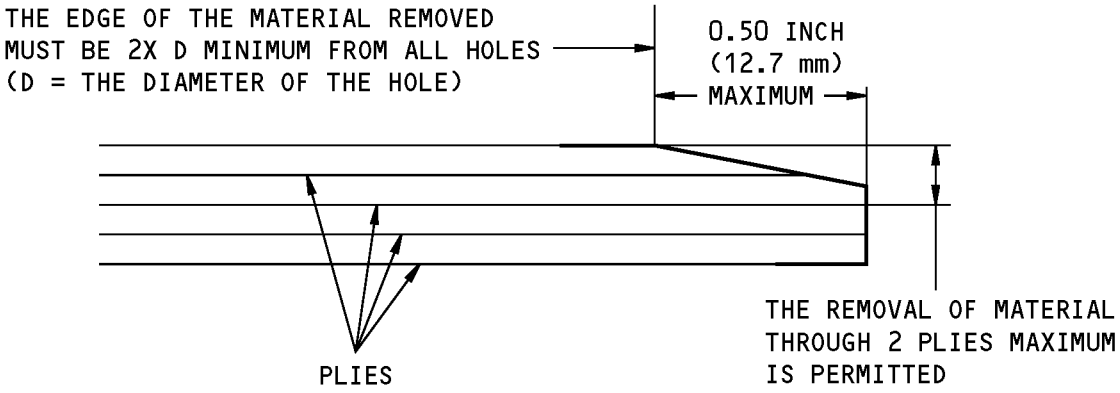
d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON THE TWO SIDES OF THE PANEL).

(A)

Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 105 (Sheet 1 of 2)



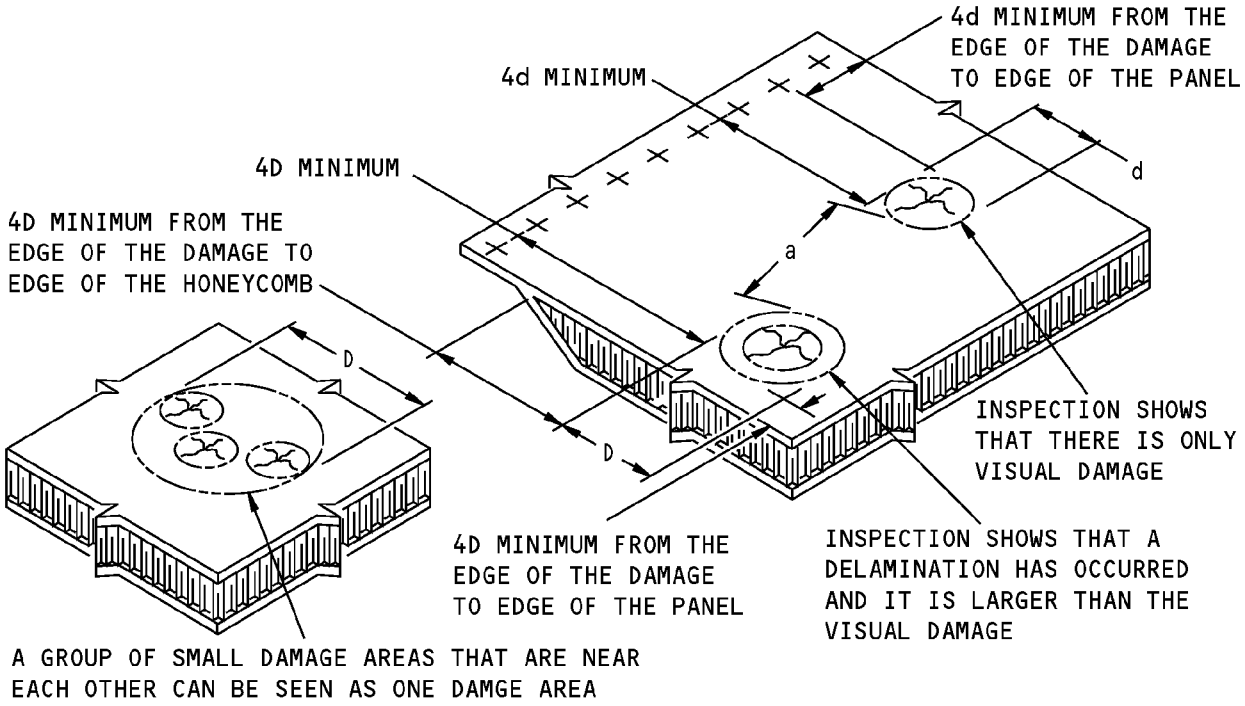
NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
  - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
  - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.
- SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:
  - A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).
    1. KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION BEFORE EACH 400 FLIGHT HOURS.
    2. REPLACE THE TAPE IF YOU FIND DETERIORATION.
    3. REPAIR THE DAMAGE BEFORE 5,000 FLIGHT HOURS OCCURS.
  - B. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:
    - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR TYPE III ADHESIVE AT 75°F (24°C) FOR 24 HOURS.
    - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75° (24°C)FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE AND A TEMPORARY OR PERMANENT REPAIR TO SEAL THE EDGE

(B)

Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 105 (Sheet 2 of 2)



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:
- A CRACK
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:
- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON THE TWO SIDES OF THE PANEL)

DAMAGE SIZE AND SPACING DATA FOR COMPOSITE PANELS
REQUIREMENTS - HONEYCOMB CORE AREA OF THE BOND PANEL

(A)

Allowable Damage Limits - Translating Sleeve Outer Skin
Figure 106

ALLOWABLE DAMAGE 2 - THRUST REVERSER TRANSLATING SLEEVE DIAPHRAGM ACOUSTIC PANEL

1. **Applicability**

   A. This subject gives the allowable damage limits for the Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel shown in Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Location , Figure 101/ALLOWABLE DAMAGE 2.

2. **General**

   A. For damage to the composite parts, do as follows:

      (1) Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspections procedures.

      NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

      (a) For the honeycomb core areas, the tap test is an alternative procedure to instrumented NDT. Refer to 737 NDT Part 1, 51-05-01 for the procedures.

      (b) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 2 for the definitions of the length, width, and depth of the damage.

      (c) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 2 for the definitions of the facesheets of a honeycomb core area.

      (d) Refer to Allowable Damage Zones for the Diaphragm Acoustic Panel, Figure 104/ALLOWABLE DAMAGE 2 for the allowable damage zones and related damage dimensions.

      (2) Remove all of the contamination and water from the diaphragm acoustic panel. Refer to 51-70-04.

      (a) Refer to 51-70-04 for the damage removal procedures.

      (b) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

      (3) Refer to 54-00-01 for the data about acoustic panel loss limits.

      (a) Use the maximum loss limits given in 54-00-01 unless given differently.

      (4) Make a seal of all the areas where damage is permitted with one of the two methods that follows (Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2):

      NOTE: Damage which causes fiber damage is structural damage, and the two seal methods that follow are temporary. Damage which does not cause fiber damage is non-structural and the seal methods that follow are temporary or permanent.

      (a) Make a temporary seal.

      1) Apply aluminum foil tape (speed tape).

      2) Keep a record of the location of the damage.

      3) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.

      4) Do a permanent repair of the damage at or before 5000 flight hours from the time the seal was made.

      (b) Make a temporary seal for areas with structural damage or a permanent seal for areas with non-structural damage.

1) Apply BMS 8-207 88OR BMS 8-301 epoxy resin to the area as given in 51-70-08.
2) Apply one layer of BMS 10-79, Type 3 or BMS 1-103, Type 1 primer. Refer to SOPM 20-44-04.
3) Apply one layer of BMS 10-60, Type II enamel to the internal surfaces sealed with epoxy resin. Refer to AMM 51-21-00/701.
4) Repair the damage at or before 5000 flight hours from the time the seal was made.

B. For lightning strike damage, do as follows:

(1) (1) Do an inspection of the damaged area to find the length, width, and depth of the damage using. Refer to 737 NDT Part 1, 51-01-03 for inspection procedures.

(a) For the honeycomb core areas, the tap test is an alternative procedure to instrumented NDT. Refer to 737 NDT Part 1, 51-05-01 for the procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(b) Refer to Lightning Strike Allowable Damage Zones for the Diaphragm Acoustic Panel, Figure 104 (Sheet 2), Detail B for the allowable damage zones and related damage dimensions.

(2) Make a seal of all the areas where damage is permitted with the method that follows (Refer to the allowable damage limits given in Paragraph Paragraph 4.C./ALLOWABLE DAMAGE 2):

(a) Keep a record of the location of the damage.

(b) Carefully sand damaged area to remove rough edges.
- Sand in a circular pattern.
- Use 80 grit sand paper.

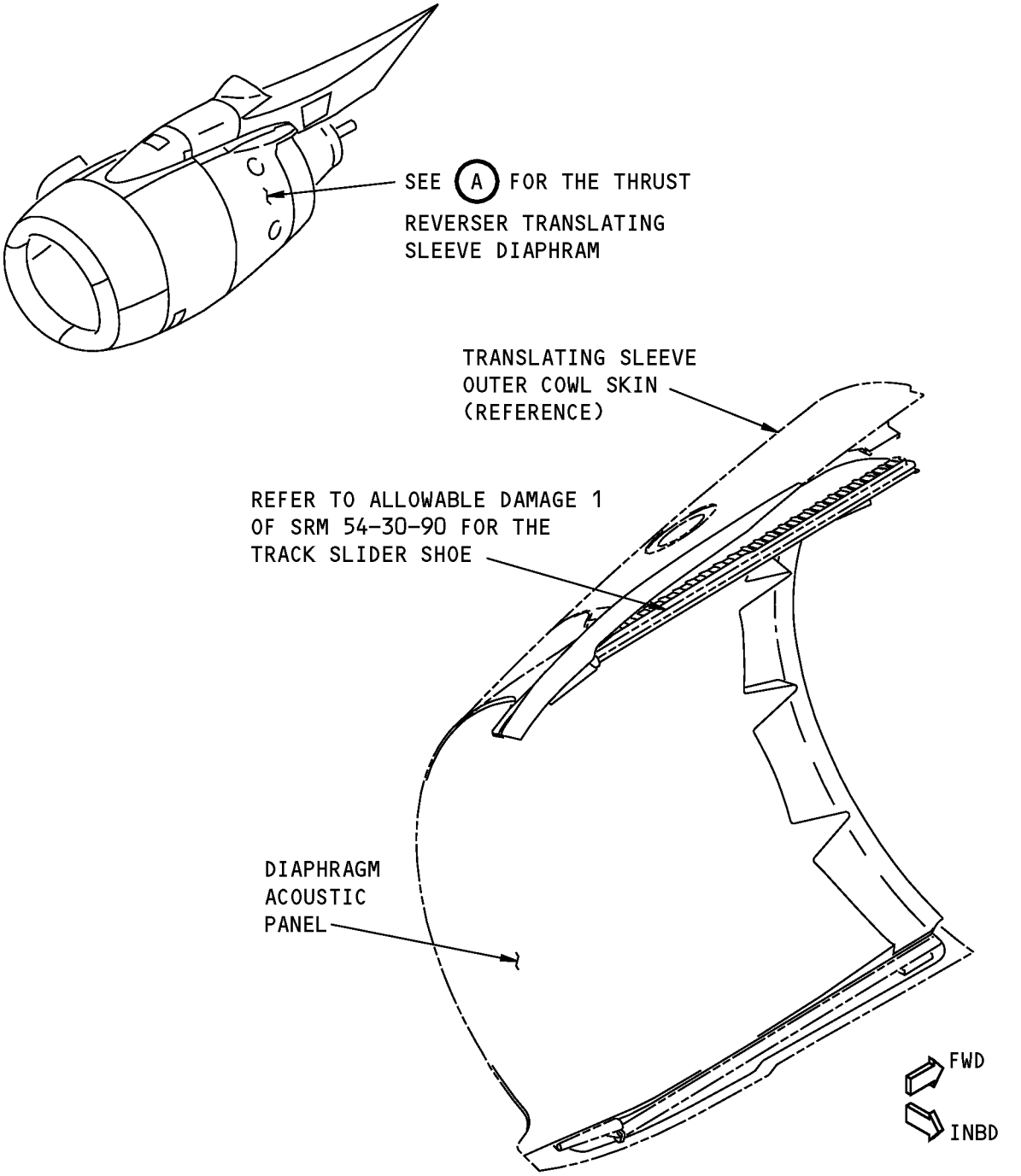
(c) Solvent wipe and allow to dry (15 minutes) or dry using a cloth.

(d) If necessary, insert a temporary filler such as foam in the damaged hole.

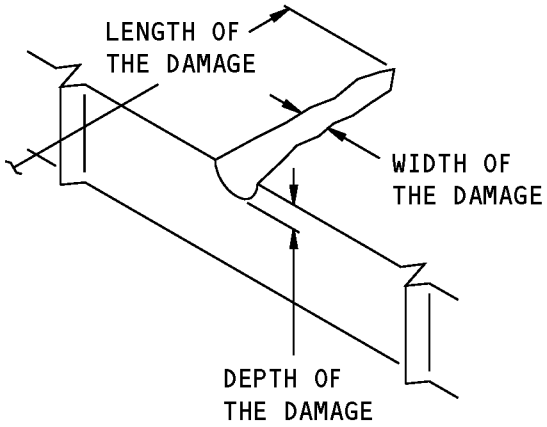
(e) Apply aluminum speed tape such that it completely covers the sanded area.

(f) Make sure that the tape is in satisfactory condition after each 1 day interval.

(g) Do a permanent repair of the damage at or before 10 days from the time the seal was made.

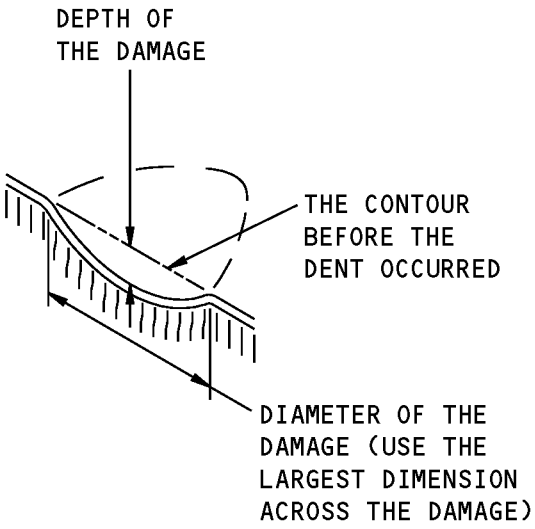


Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Location
Figure 101



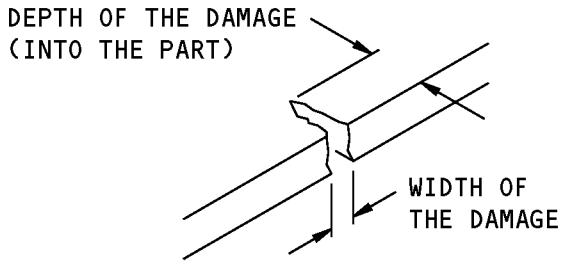
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

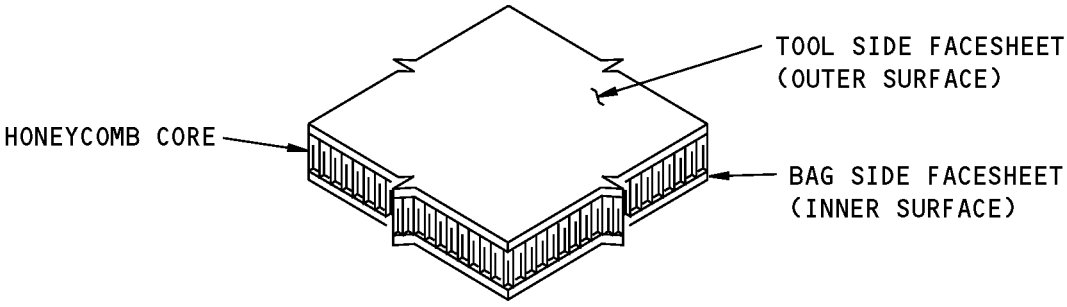
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 102



Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
54-00-01	NACELLES/PYLONS - GENERAL
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

NOTE: The allowable damage limits that follow are applicable to all allowable damage zones. Refer to Allowable Damage Zones for the Diaphragm Acoustic Panel, Figure 104/ALLOWABLE DAMAGE 2 for the locations and the maximum damage dimensions of each zone.

A. Solid Laminate Areas

(1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.

(a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 2

(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon plies are permitted.

(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail A if they are:

(a) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2

(4) Dents are not permitted.

(5) Holes and Punctures are not permitted.

(6) Delaminations are not permitted.

(7) Edge Damage is permitted if it is:

(a) A maximum of 0.20 inch (5.1 mm) in depth

(b) A maximum of 0.50 inch (12.7 mm) in width

(c) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2

(d) Repaired by 5000 flight hours.

(8) Edge Erosion is permitted as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail B if it is repaired by 5000 flight hours.

B. Honeycomb Core Areas.

NOTE: The total area of damage on a panel must not be more than 3.0 inches^2 (58.0 cm^2) if:

- By 400 flight hours, you make a repair that fits in a diameter of more than 0.50 inch (12.7 mm) and less than 0.75 inch (19.1 mm).
- By 25 flight hours, you make a repair that fits in a diameter of more than 0.75 inch (19.1 mm).

(1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.

(a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 2.

(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon plies are permitted.

(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if:

(a) You use the limits for holes and punctures

(b) The damage is cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2

(4) Dents are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if they are:

(a) A maximum of 0.05 inch (1.8 mm) in depth

(b) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2

(5) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if:

(a) They are a maximum of one facesheet and the core in depth

(b) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2

(c) They are a maximum of 0.25 inch (6.4 mm) in diameter.

(6) Delaminations are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if they are cleaned and sealed as given in Paragraph 4./ALLOWABLE DAMAGE 2

(7) Edge Damage is not permitted.

(8) Edge Erosion is not permitted.

C. Lightning Strike Damage..

NOTE: The area of damage on a panel must not be more than that shown in Figure 104 (Sheet 2) Detail B.

(1) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if:

(a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.

(b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.

(2) Dents are permitted if:

(a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.

(b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.

(3) Holes and Punctures are permitted as shown in Allowable Damage Limits if:

(a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.

(b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.

(4) Delaminations are permitted as shown in Allowable Damage Limits if:

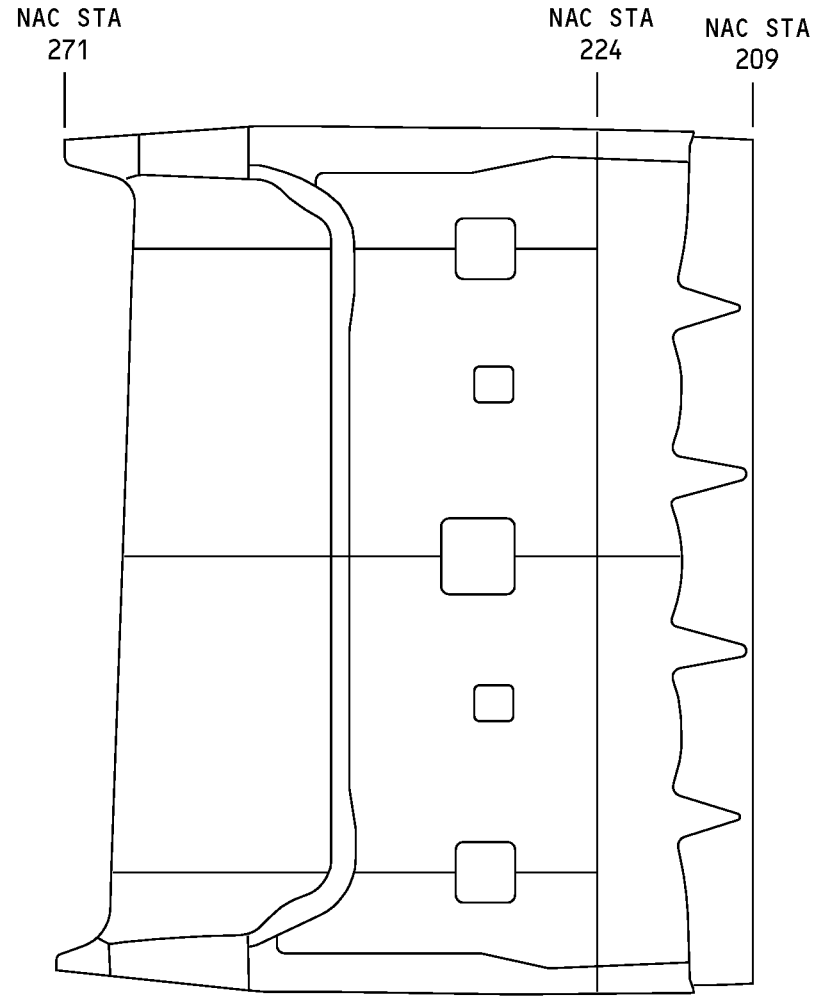
(a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.

(b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.

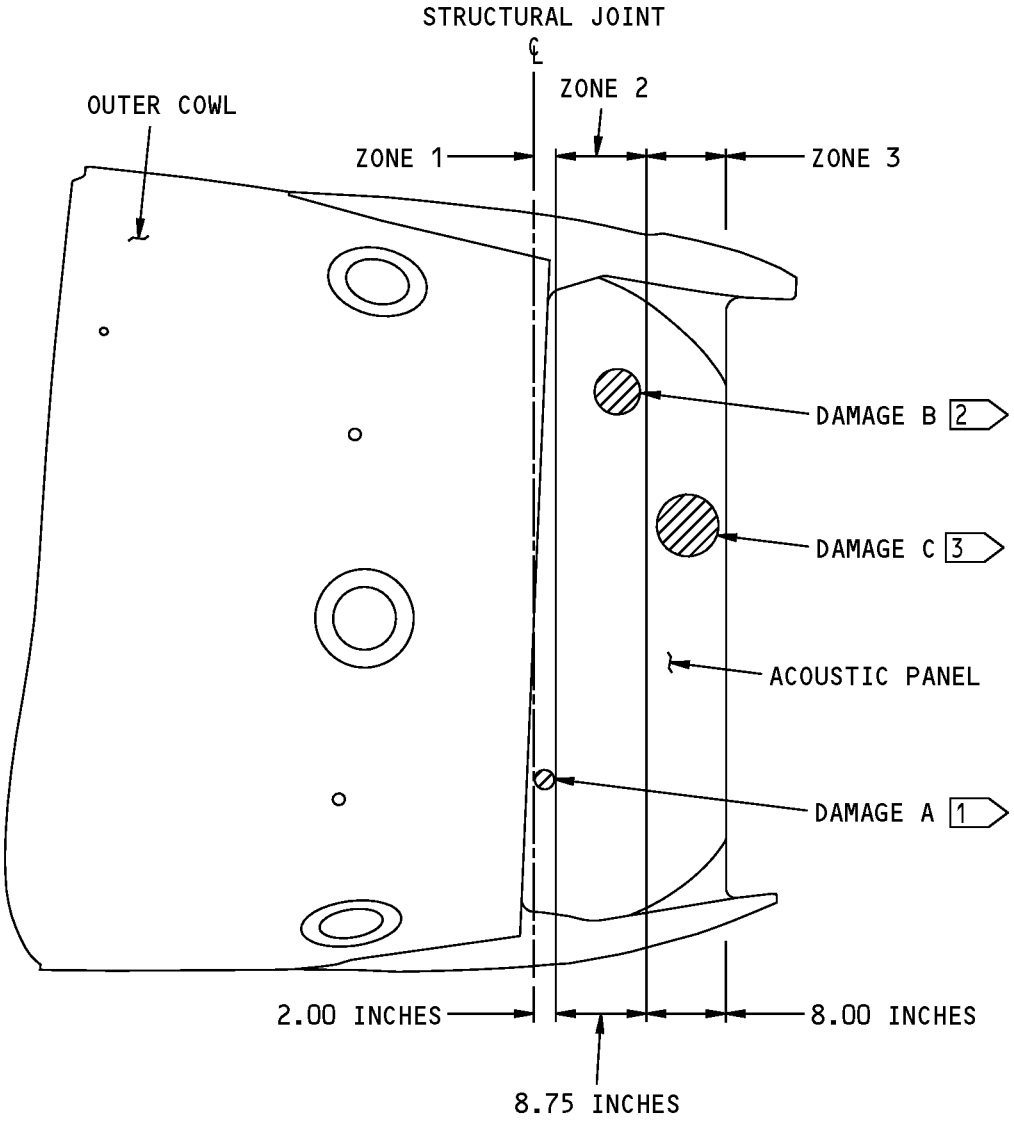
(5) Edge Damage is permitted if:

(a) They are no more than the limits shown Figure 106 (Sheet 2)Figure 106/ALLOWABLE DAMAGE 2, Detail B.

(b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.



Allowable Damage Zones for the Diaphragm Acoustic Panel
Figure 104 (Sheet 1 of 2)



NOTES

- ONLY ONE DAMAGE AREA IS PERMITTED FOR EACH ZONE ON ONE PANEL

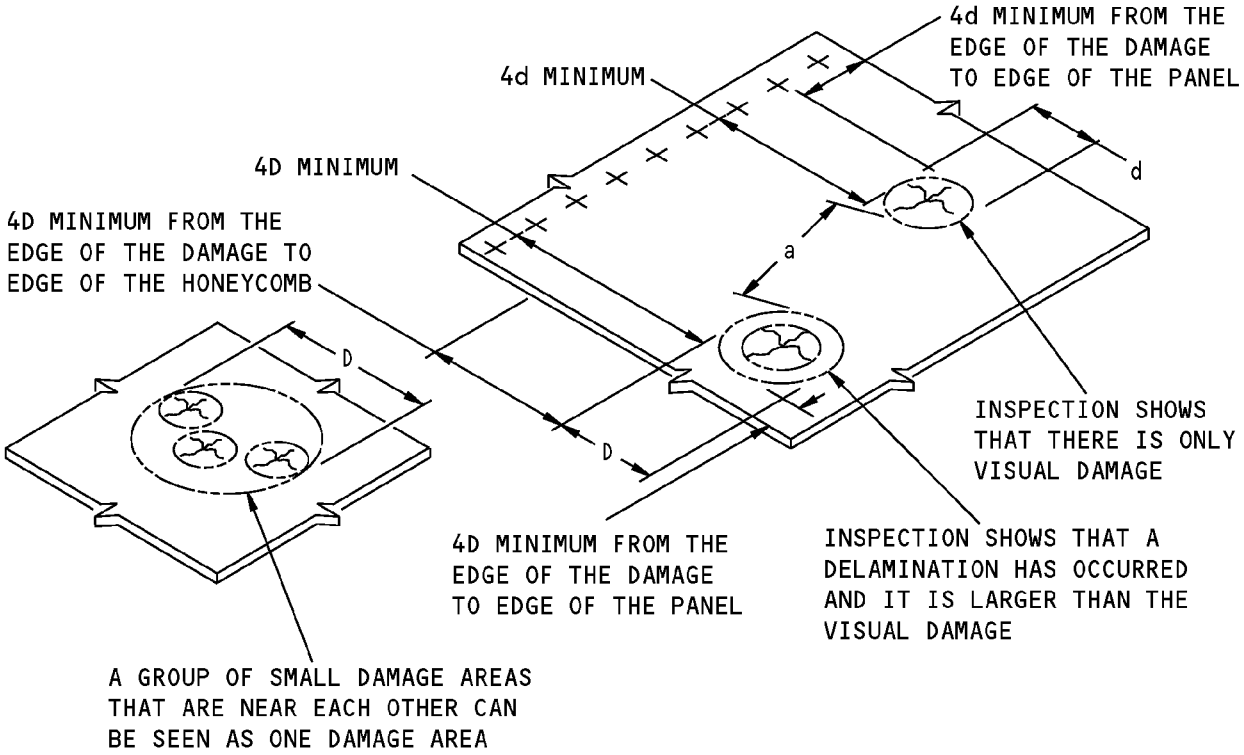
1 > 2.0 INCH DIAMETER MAXIMUM DAMAGE PERMITTED WITH NO MORE THAN 3 FASTENERS BEING DAMAGED.

2 > 4.3 INCH DIAMETER MAXIMUM DAMAGE PERMITTED.

3 > 6.0 INCH DIAMETER MAXIMUM DAMAGE PERMITTED.

B

Allowable Damage Zones for the Diaphragm Acoustic Panel
Figure 104 (Sheet 2 of 2)



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:
- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:
- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

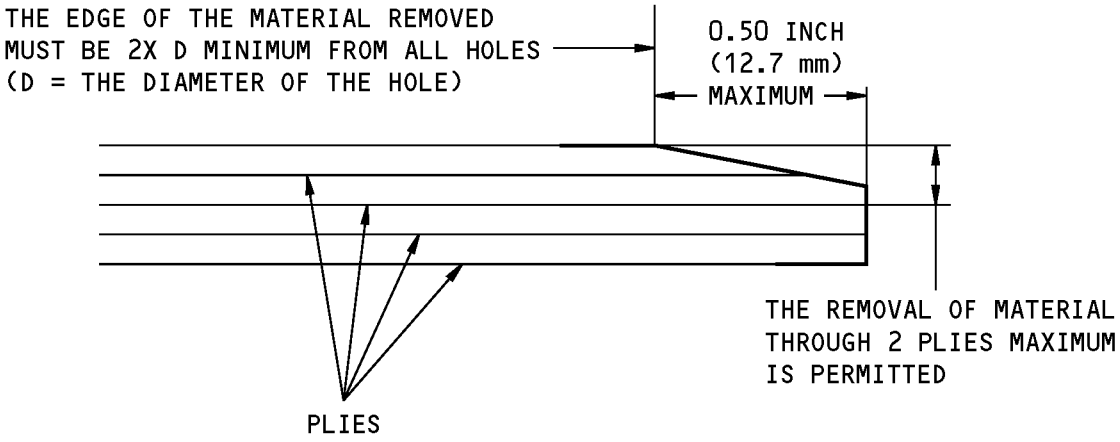
d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON ONE OR BOTH SIDES OF THE PANEL).

(A)

Allowable Damage Limits
Figure 105 (Sheet 1 of 2)



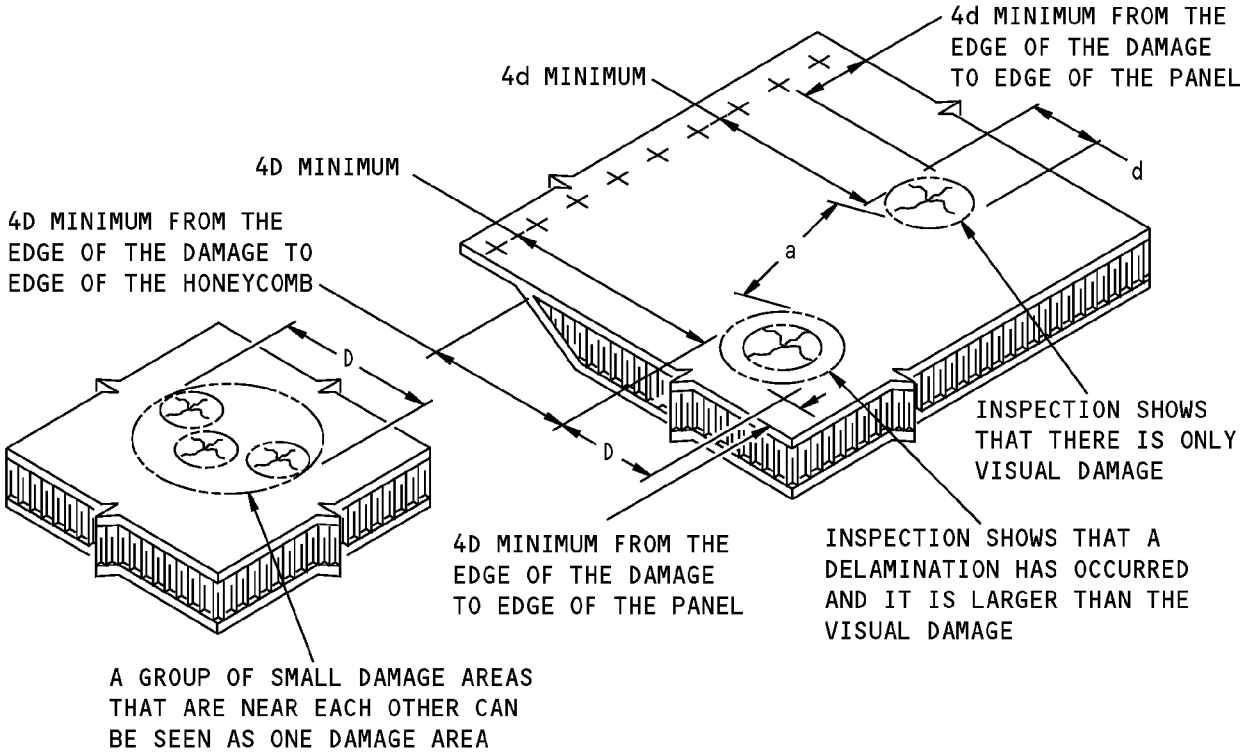
NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
  - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
  - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.
- SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:
  - A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).
    1. KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION BEFORE EACH 400 FLIGHT HOURS.
    2. REPLACE THE TAPE IF YOU FIND DETERIORATION.
    3. REPAIR THE DAMAGE BEFORE 5,000 FLIGHT HOURS OCCURS.
  - B. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:
    - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR TYPE III ADHESIVE AT 75°F (24°C) FOR 24 HOURS.
    - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75° (24°C)FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE AND
A TEMPORARY OR PERMANENT REPAIR TO SEAL THE EDGE

(B)

Allowable Damage Limits
Figure 105 (Sheet 2 of 2)



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:
- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:
- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

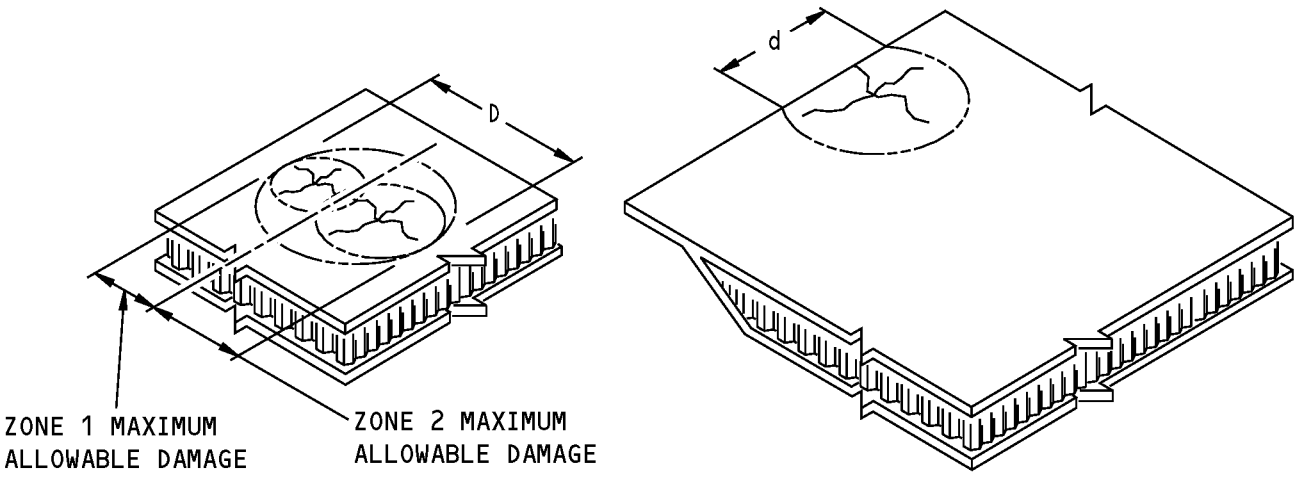
d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON ONE OR BOTH SIDES OF THE PANEL).

(A)

Allowable Damage Limits
Figure 106 (Sheet 1 of 2)



EXAMPLE OF OVERLAP DAMAGE
BETWEEN ZONES 1 AND 2

NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:

- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D = TOTAL OVERLAP DAMAGE BETWEEN ZONES WHERE THE DAMAGE IS NO MORE THAN THE TOTAL ALLOWABLE DAMAGE FOR EACH INDIVIDUAL ZONE.

d = MAXIMUM EDGE DAMAGE WIDTH = 3 INCHES.

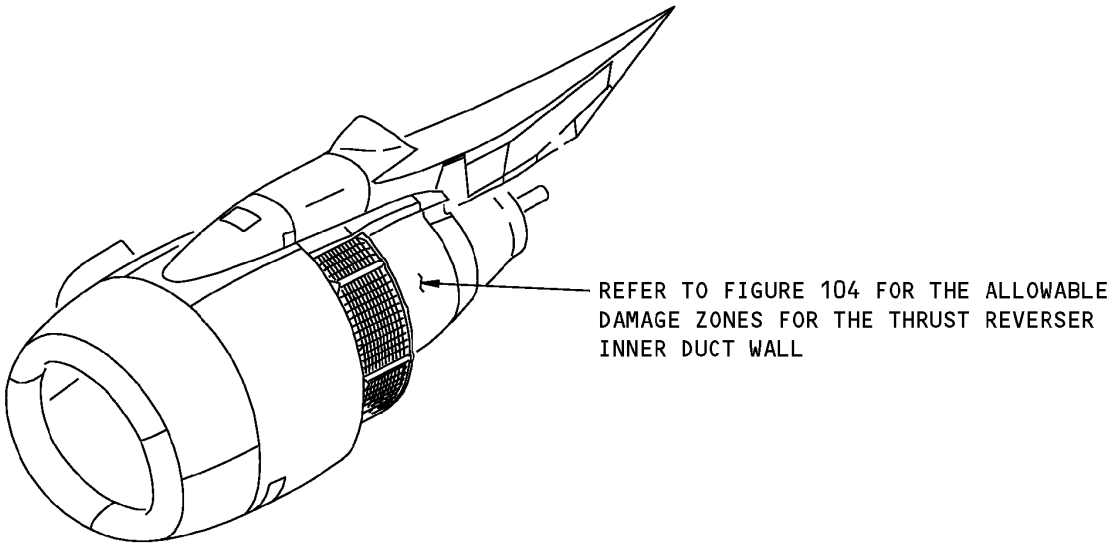
B

Allowable Damage Limits
Figure 106 (Sheet 2 of 2)

ALLOWABLE DAMAGE 3 - THRUST REVERSER INNER DUCT WALL SKIN PANEL

1. Applicability

A. This subject gives the allowable damage limits for the Thrust Reverser Inner Duct Wall Acoustic Panel for the CFM56-7 engine nacelle shown in Thrust Reverser Inner Duct Wall Location, Figure 101/ALLOWABLE DAMAGE 3.



NOTE: THRUST REVERSER TRANSLATING SLEEVE IS NOT SHOWN.

Thrust Reverser Inner Duct Wall Location
Figure 101

2. General

A. If you have damage to the composite parts, do as follows:

(1) Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspections procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(a) For the honeycomb core areas, the tap test is an alternative procedure to instrumented NDT. Refer to 737 NDT Part 1, 51-05-01 for the procedures.

(b) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 3 for the definitions of the length, width, and depth of the damage.

(c) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 3 for the definitions of the facesheets of a honeycomb core area.

(d) Refer to for the allowable damage zones and related damage dimensions.

(2) Remove all of the contamination and water from the inner duct wall panel. Refer to 51-70-04.

(a) Refer to 51-70-04 for the damage removal procedures.

(b) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

(3) Refer to 54-00-01 for the data about acoustic panel loss limits.

(a) Use the maximum loss limits given in 54-00-01 unless given differently.

(4) Make a seal of all the areas where damage is permitted with one of the two methods that follows (Refer to the allowable damage limits in Paragraph 4./ALLOWABLE DAMAGE 3

NOTE: Damage which causes fiber damage is structural damage, and the two seal methods that follow are temporary. Damage which does not cause fiber damage is non-structural and the seal methods that follow are temporary or permanent.

(a) Make a temporary seal.

1) Apply aluminum foil tape (speed tape).

2) Keep a record of the location of the damage.

3) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.

4) Do a permanent repair of the damage at or before 5000 flight hours from the time the seal was made.

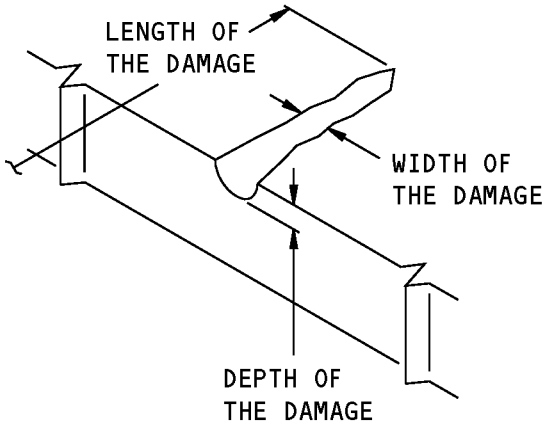
(b) Make a temporary seal for areas with structural damage or a permanent seal for areas with non-structural damage.

1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

2) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.

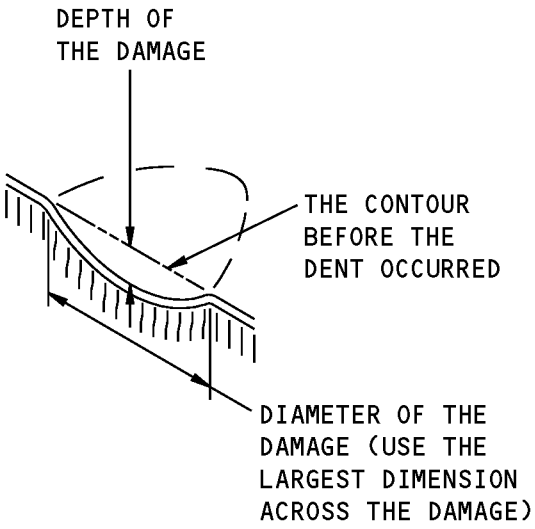
3) Apply one layer of BMS 10-60, Type II enamel to the external surfaces sealed with epoxy resin. Refer to AMM 51-21-00/701.

4) Repair the damage at or before 5000 flight hours from the time the seal was made.



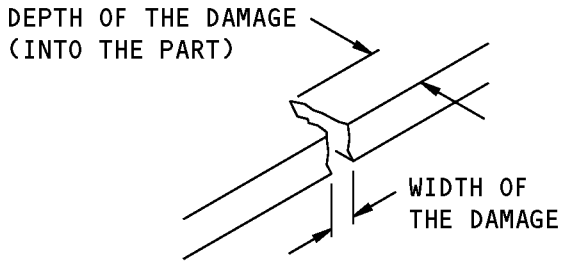
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

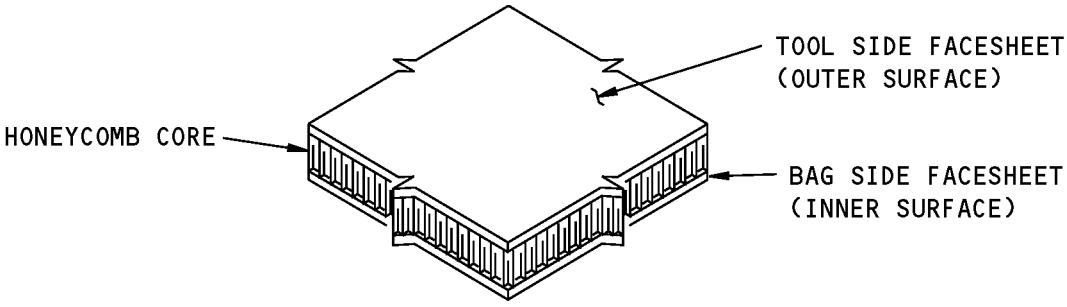
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 102



Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
54-00-01	NACELLES/PYLONS - GENERAL
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

NOTE: The allowable damage limits that follow are applicable to all allowable damage zones. Refer to Figure 104/ALLOWABLE DAMAGE 3 for the locations and the maximum damage dimensions at each zone.

A. Solid Laminate Areas:

(1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.

(a) If the fibers go through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 3

(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.

(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 105/ALLOWABLE DAMAGE 3
Paragraph 2.A./ALLOWABLE DAMAGE 3, Detail A if they are:

(a) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3

(4) Dents are not permitted.

(5) Holes and Punctures are not permitted.

(6) Delaminations are not permitted.

(7) Edge Damage is permitted if it is:

(a) A maximum of 0.20 inch (5.1 mm) in depth

(b) A maximum of 0.50 inch (12.7 mm) in width

(c) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3

(d) Repaired by 5000 flight hours.

(8) Edge Erosion is permitted as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 105/ALLOWABLE DAMAGE 3, Detail B if it is repaired by 5000 flight hours.

B. Honeycomb Core Areas:

NOTE: The total area of damage must not be more than 2.0 inches^2 (25.8 cm^2) if:

- By 400 flight hours, you make a repair that fits in a diameter of more than 0.50 inch (12.7 mm) and less than 0.75 inch (19.1 mm).
- By 25 flight hours, you make a repair that fits in a diameter of more than 0.75 inch (19.1 mm).

(1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.

(a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 3

(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon plies are permitted.

(3) Nicks, Gouges, and Scratches that cause damage to the carbon plies are permitted as shown in Allowable Damage Limits - Inner Duct Wall, Figure 106/ALLOWABLE DAMAGE 3, Detail A if:

(a) You use the limits for holes and punctures

(b) You clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 3

(4) Dents are permitted as shown in Allowable Damage Limits - Inner Duct Wall, Figure 106/ALLOWABLE DAMAGE 3, Detail A if they are:

(a) A maximum of 0.05 inch (1.27 mm) in depth

(b) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3

(5) Holes and Punctures are permitted on the toolside (outer) skin as shown in Allowable Damage Limits - Inner Duct Wall, Figure 106/ALLOWABLE DAMAGE 3, Detail A if:

(a) They are a maximum of one facesheet and the core in depth

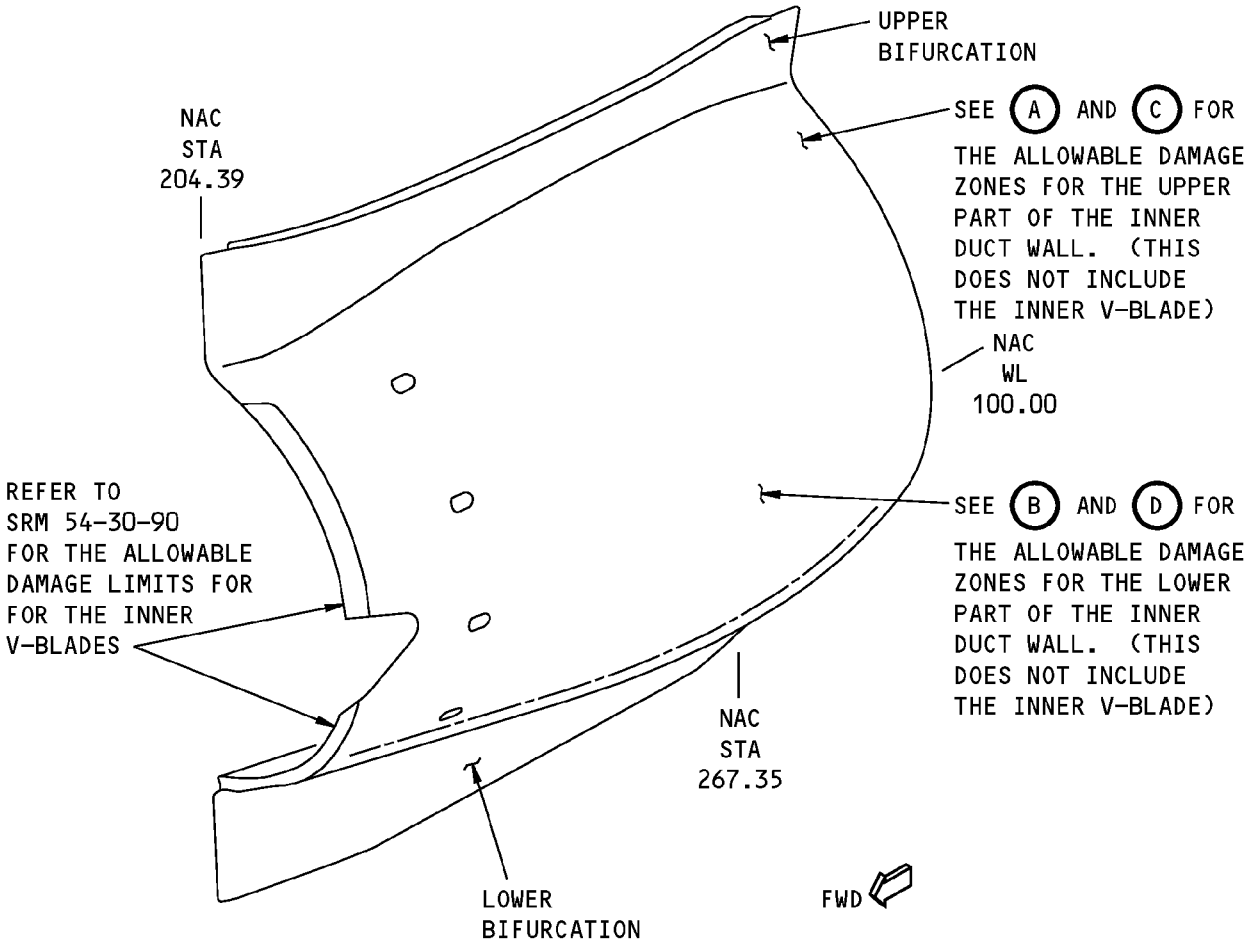
(b) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3

(c) They are a maximum of 0.25 inch (6.4 mm) in diameter.

(6) Delaminations are permitted as shown in Allowable Damage Limits - Inner Duct Wall, Figure 106/ALLOWABLE DAMAGE 3, Detail A if they are cleaned and sealed as given in Paragraph 4./ALLOWABLE DAMAGE 3

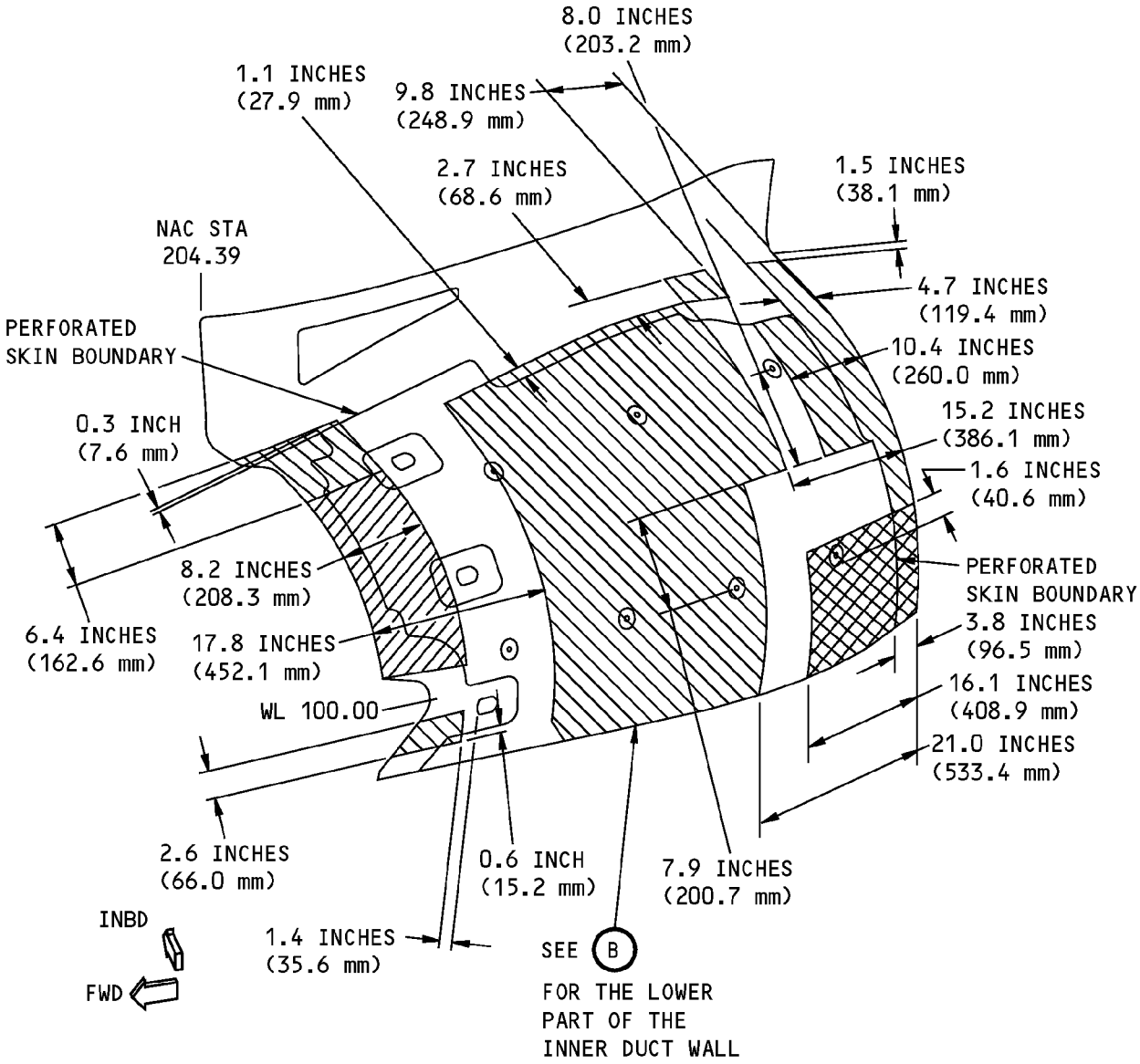
(7) Edge Damage is not permitted.

(8) Edge Erosion is not permitted.



LEFT INNER DUCT WALL BOND PANEL IS SHOWN,
RIGHT INNER DUCT WALL BOND PANEL IS ALMOST THE SAME

Allowable Damage Zones for the Composite Panels
Figure 104 (Sheet 1 of 3)



ZONE 1 – MAXIMUM DAMAGE DIAMETER (D) OF 0.25 INCH (6.35 mm) IS PERMITTED

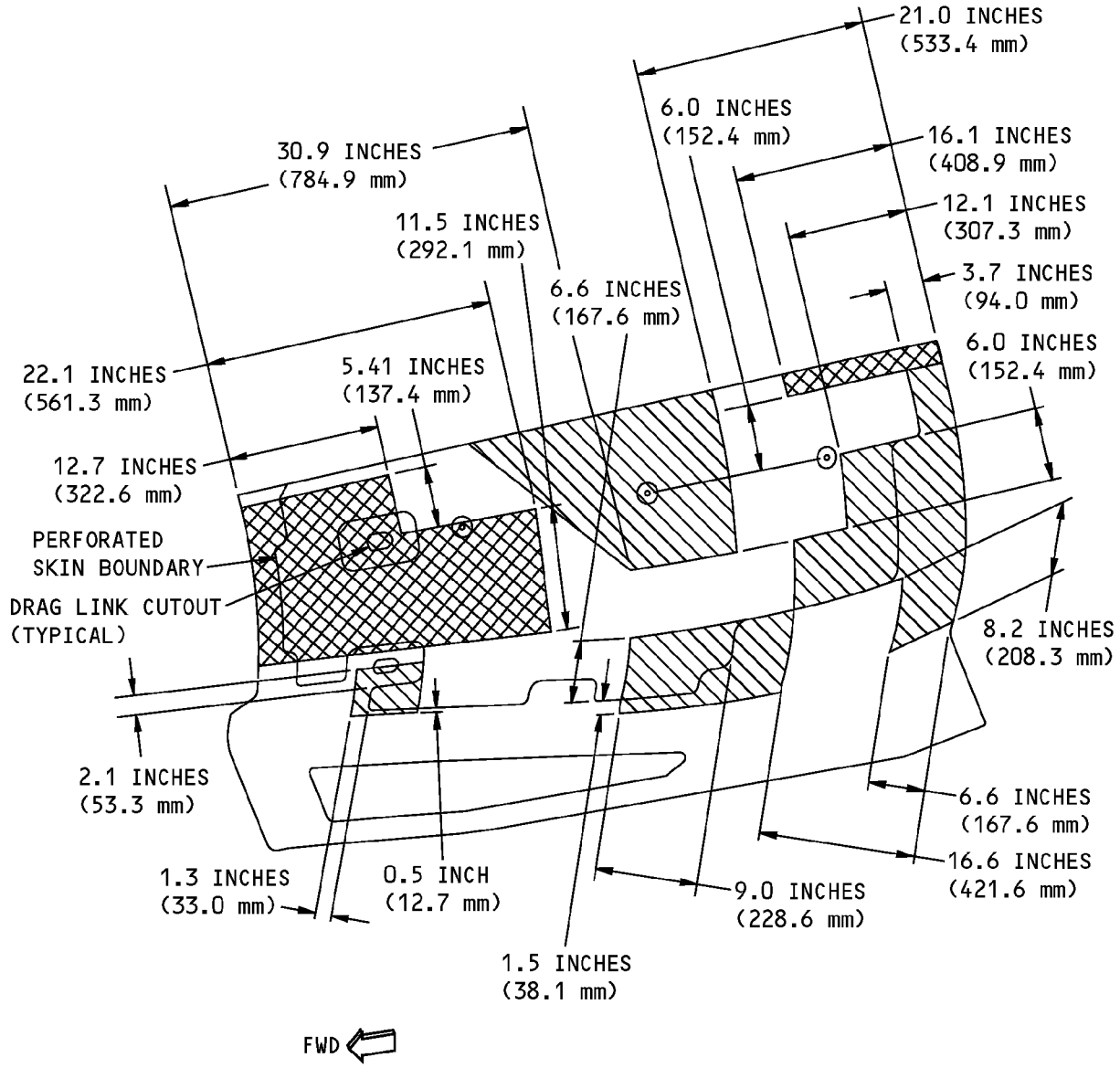
ZONE 2 – MAXIMUM DAMAGE DIAMETER (D) OF 1.00 INCH (25.4 mm) IS PERMITTED

ZONE 3 – MAXIMUM DAMAGE DIAMETER (D) OF 0.75 INCH (19.1 mm) IS PERMITTED

ZONE 4 – MAXIMUM DAMAGE DIAMETER (D) OF 0.50 INCH (12.7 mm) IS PERMITTED

A

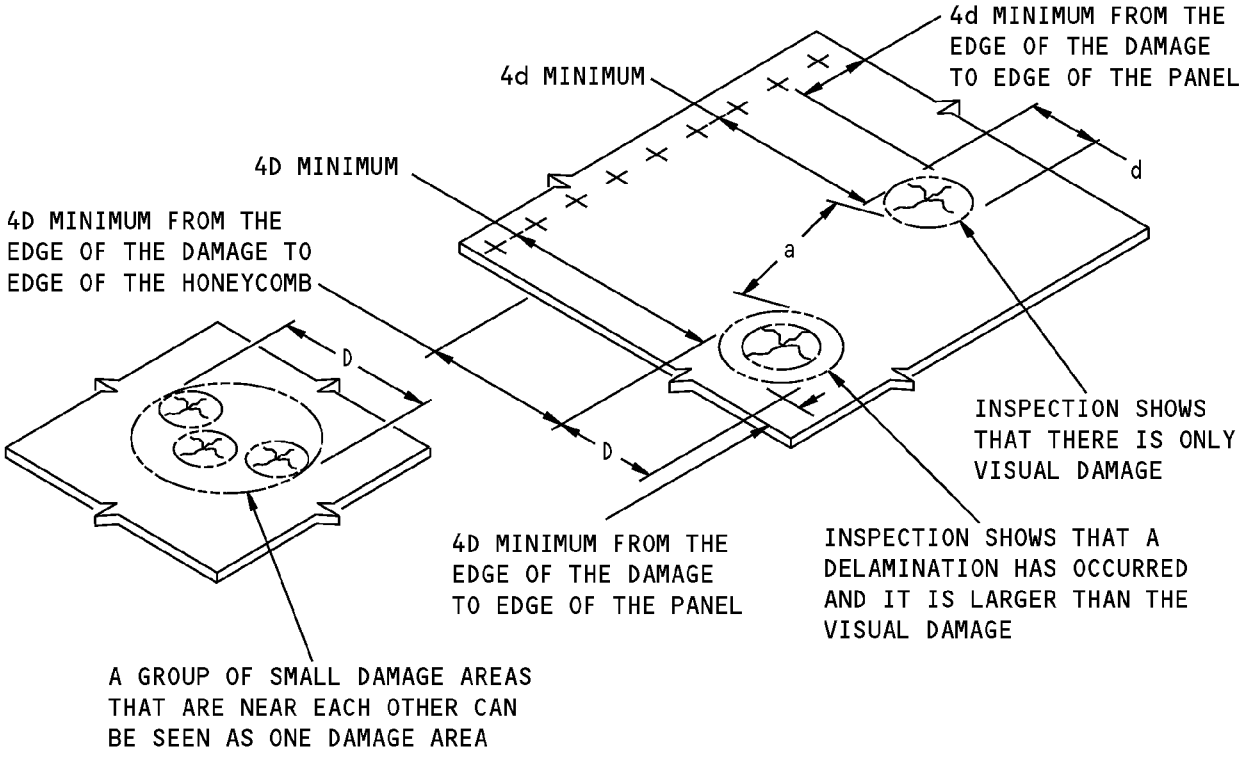
Allowable Damage Zones for the Composite Panels
Figure 104 (Sheet 2 of 3)



ZONE 1 - MAXIMUM DAMAGE DIAMETER (D) OF 0.25 INCH (6.35 mm) IS PERMITTED
ZONE 2 - MAXIMUM DAMAGE DIAMETER (D) OF 1.00 INCH (25.4 mm) IS PERMITTED
ZONE 3 - MAXIMUM DAMAGE DIAMETER (D) OF 0.75 INCH (19.1 mm) IS PERMITTED
ZONE 4 - MAXIMUM DAMAGE DIAMETER (D) OF 0.50 INCH (12.7 mm) IS PERMITTED

B

Allowable Damage Zones for the Composite Panels
Figure 104 (Sheet 3 of 3)



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:
- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:
- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

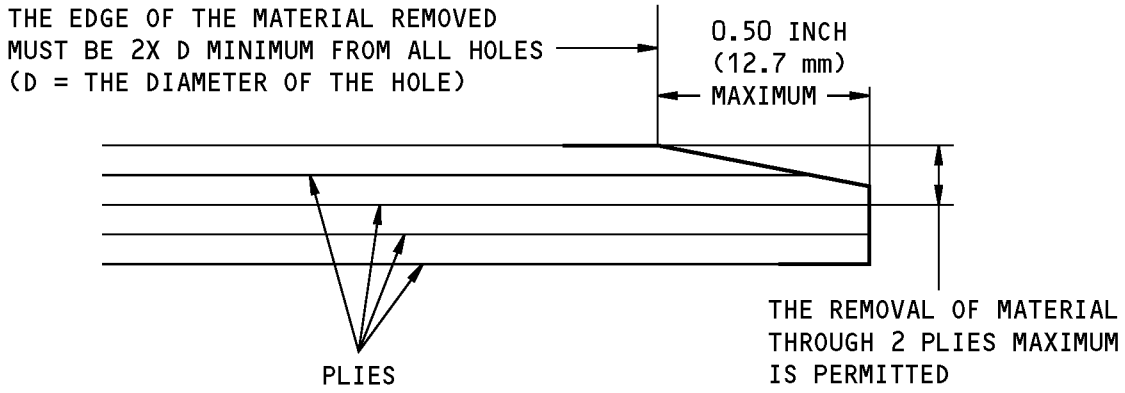
d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON THE TWO SIDES OF THE PANEL).

(A)

Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 105 (Sheet 1 of 2)



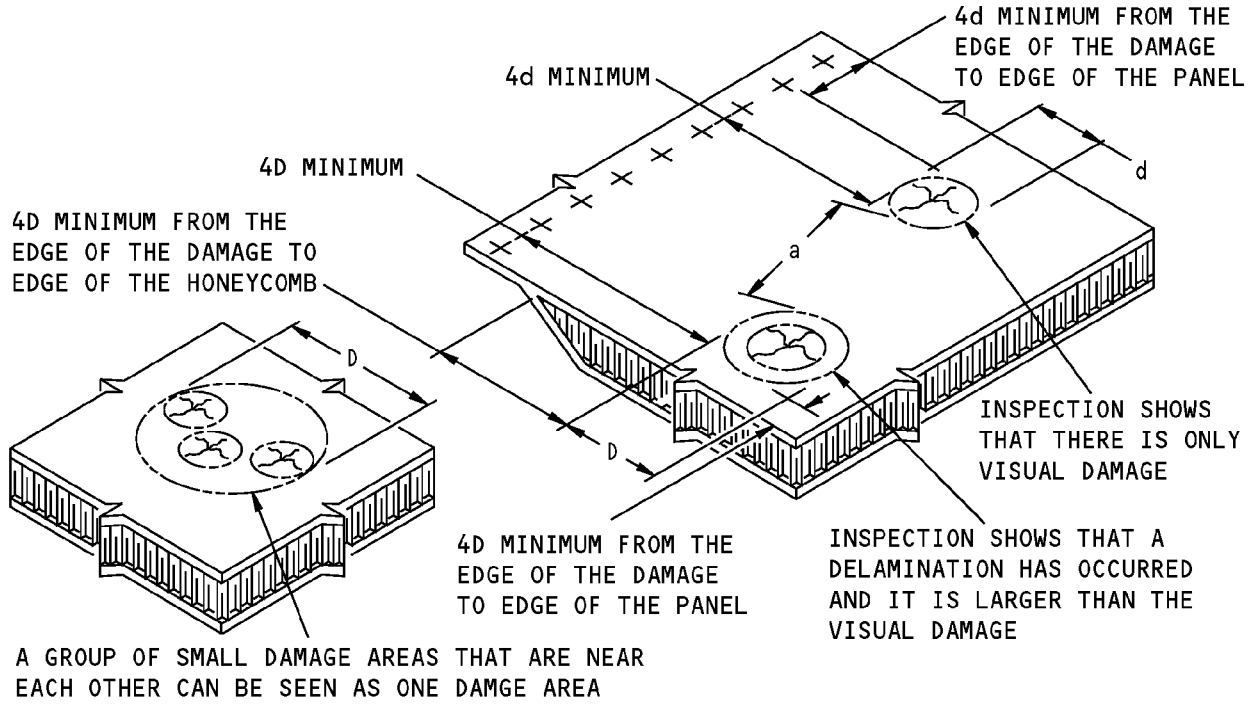
NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
  - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
  - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.
- SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:
  - A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).
    1. KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION BEFORE EACH 400 FLIGHT HOURS.
    2. REPLACE THE TAPE IF YOU FIND DETERIORATION.
    3. REPAIR THE DAMAGE BEFORE 5,000 FLIGHT HOURS OCCURS.
  - B. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:
    - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR TYPE III ADHESIVE AT 75°F (24°C) FOR 24 HOURS.
    - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75° (24°C)FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE AND A TEMPORARY OR PERMANENT REPAIR TO SEAL THE EDGE OF SOLID LAMINATE AREAS

(B)

Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 105 (Sheet 2 of 2)



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:
- A CRACK
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES. (REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:
- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

THE MINIMUM a THAT IS PERMITTED IS 6D (ON THE TWO SIDES OF THE PANEL)

(A)

Allowable Damage Limits - Inner Duct Wall
Figure 106

ALLOWABLE DAMAGE 4 - THRUST REVERSER AFT COWL SKIN

1. Applicability

A. This subject gives the allowable damage limits for the Thrust Reverser Aft Cowl Skin as shown in Figure 101/ALLOWABLE DAMAGE 4.

2. General

A. Refer to Paragraph 4./ALLOWABLE DAMAGE 4 for the allowable damage limits.

B. After you remove the damage, do the steps that follow:

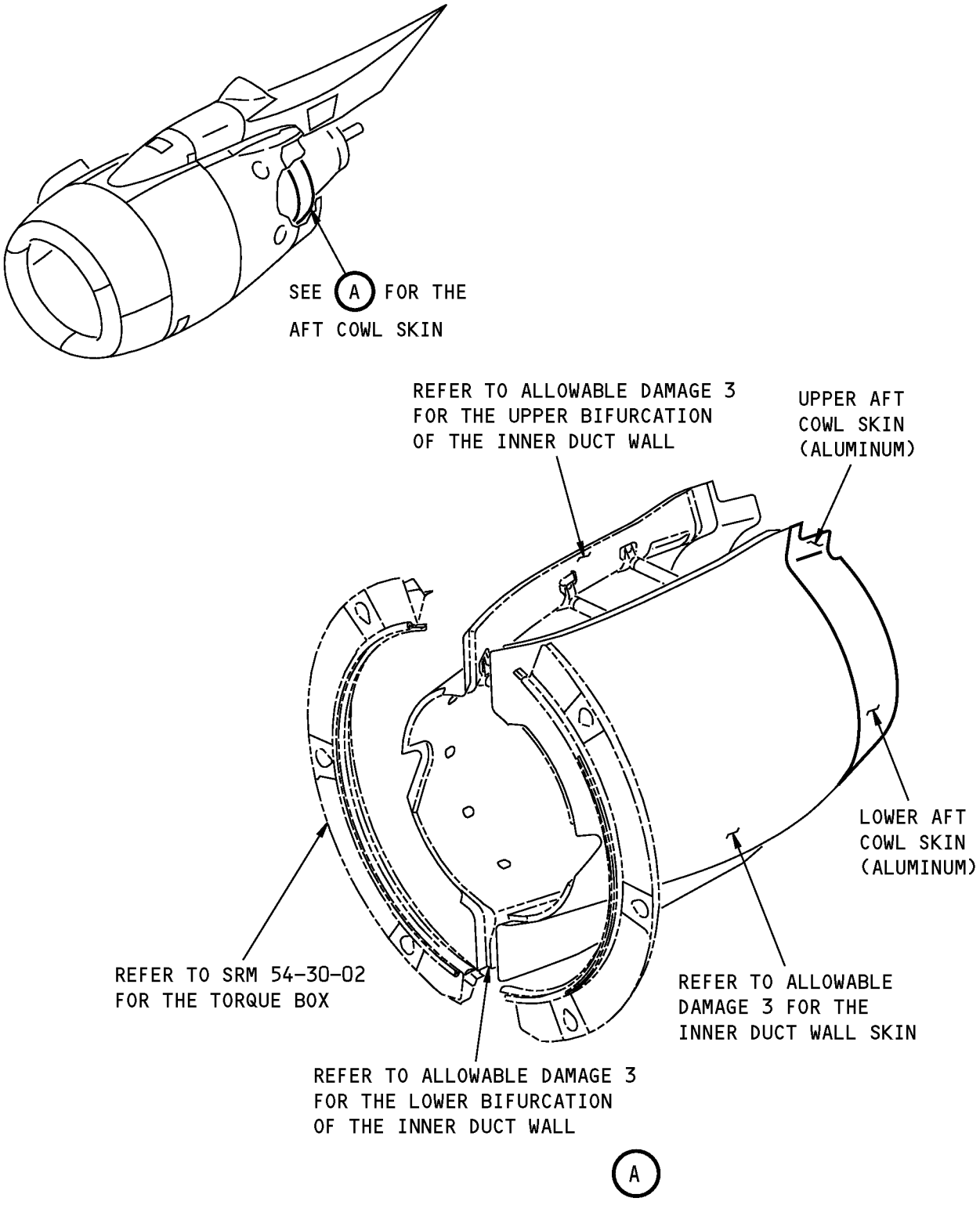
(1) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.

(2) Apply one layer of DeSoto Hi-Temperature Polyurethane Primer, Base 825-009, Catalyst 910-175, and Thinner 020-044 as given in BAC 5710, Type 51. Refer to SOPM 20-41-02.

(a) Apply the material to a dry film thickness of 0.002 inch to 0.003 inch (0.051 mm to 0.0765 mm).

C. Refer to 51-30-03 for the possible sources of the abrasive and other materials you can use to remove the damage.

D. Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.



Thrust Reverser Aft Cowl Skin Location
Figure 101

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Aft Cowl Skins - Upper and Lower

(1) Cracks:

(a) Remove edge damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 4, Details A , B , and F .

(2) Nicks, Gouges, and Scratches, and Corrosion:

(a) Remove damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 4, Details A , B , C , E , and F .

(3) Dents:

(a) Damage is permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 4, Detail D if it is:

1) A maximum diameter of 1.5 inches (38.1 mm) in each square foot (929 cm^2) of area

2) A minimum of 6.0 inches (152.4 mm) from other damage

3) A minimum of 1.0 inch (25.4 mm) from a hole or the edge of the part.

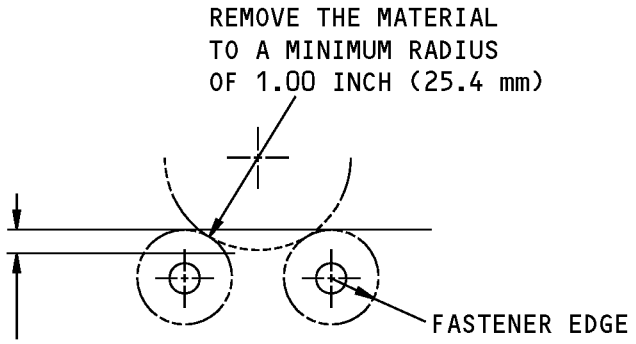
(4) Holes and Punctures:

(a) Damage is permitted if:

1) You remove the damage to a maximum diameter of 0.25 inch (6.4 mm)

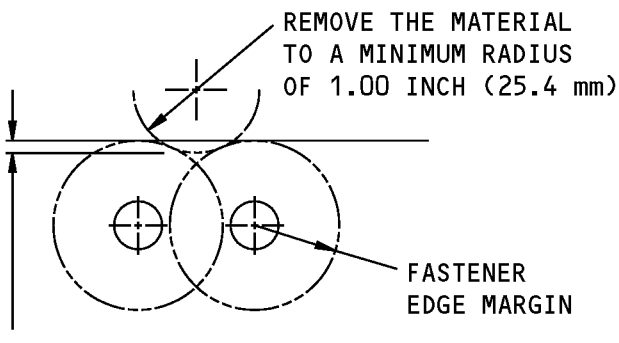
2) It is a minimum of 1.0 inch (25.4 mm) from a hole, other damage, or the edge of the part

3) You install a 2117-T3 or 2117-T4 protruding head rivet with BMS 5-63 sealant.



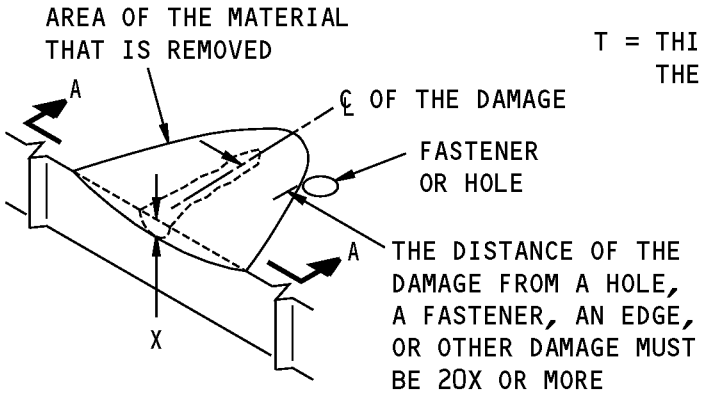
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

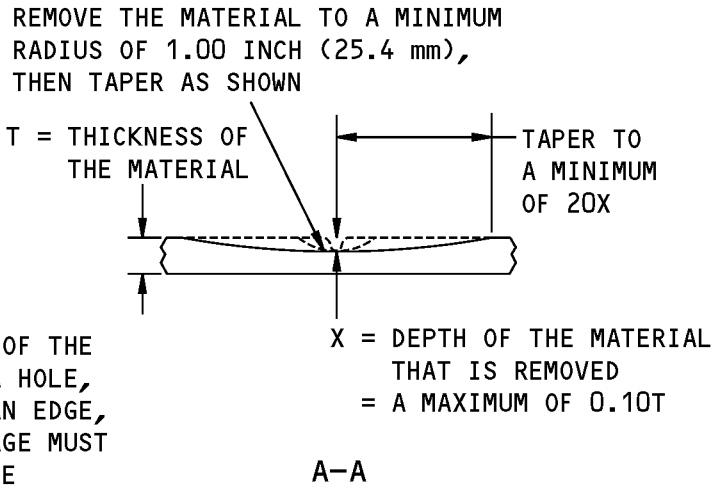
A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

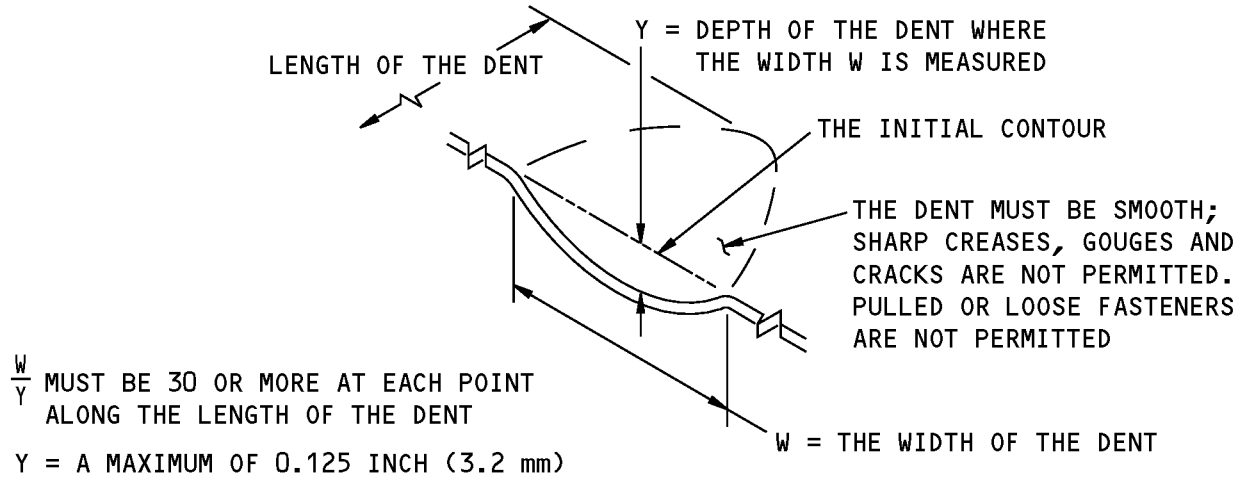




REMOVAL OF DAMAGED MATERIAL ON A SURFACE

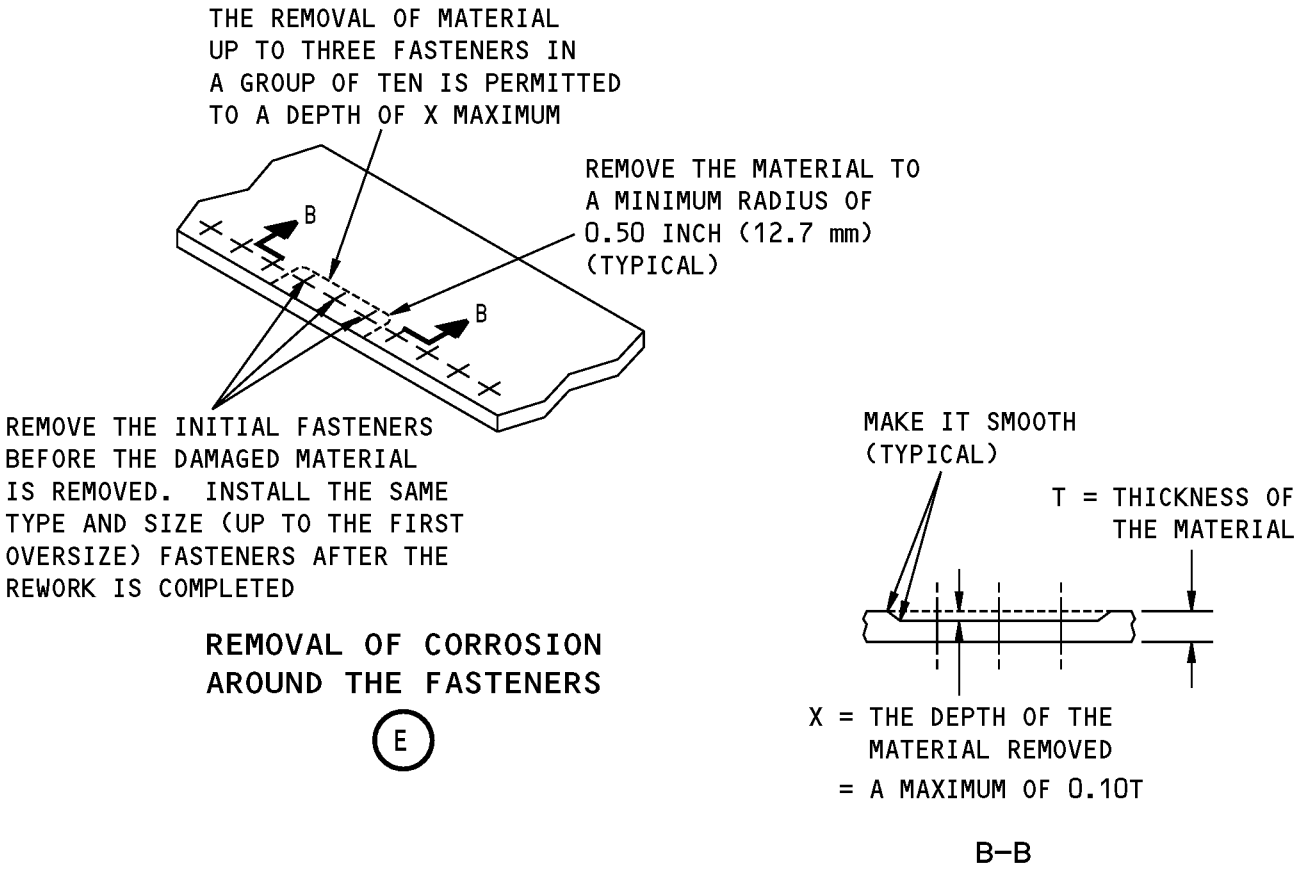
C

Allowable Damage Limits
Figure 102 (Sheet 1 of 3)



DENT THAT IS PERMITTED

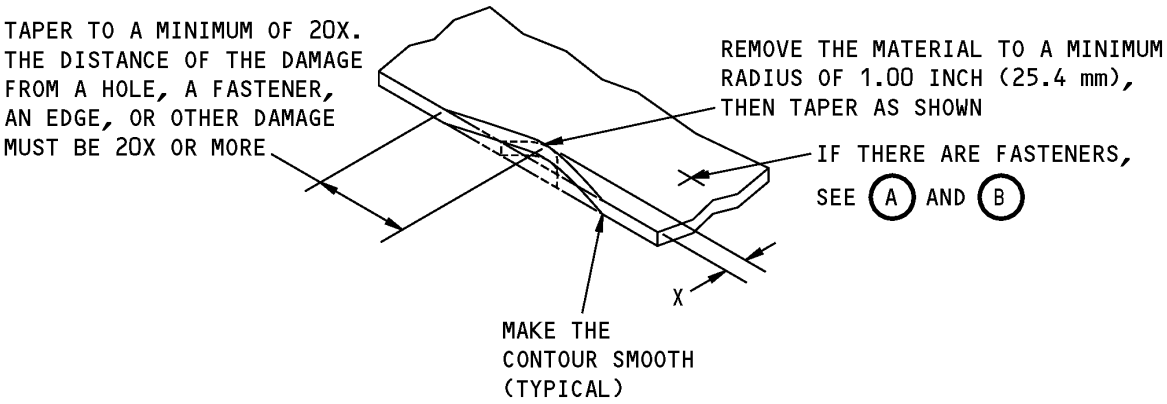
D



REMOVAL OF CORROSION AROUND THE FASTENERS

E

Allowable Damage Limits
Figure 102 (Sheet 2 of 3)



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.5 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL SKIN OR WEB

F

Allowable Damage Limits
Figure 102 (Sheet 3 of 3)

ALLOWABLE DAMAGE 5 - THRUST REVERSER BLOCKER DOORS

1. Applicability

A. This subject gives the allowable damage limits for the Thrust Reverser Blocker Doors shown in Thrust Reverser Blocker Door Locations, Figure 101/ALLOWABLE DAMAGE 5.

2. General

A. The composite structure allowable damage limits are applicable only if the damage is sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 5 and Paragraph 4.B./ALLOWABLE DAMAGE 5, as applicable.

B. If you have damage to the composite parts, do as follows:

(1) Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Nondestructive Inspection (NDI) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspections procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(a) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 5 for the definitions of the length, width, and depth of the damage.

(b) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 5 for the definitions of the facesheets of a honeycomb core area.

(2) Remove all of the contamination and water from the part.

(a) Refer to 51-70-04 for the damage removal procedures.

(b) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

(3) Seal all the permitted damage areas on the parts. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 5Paragraph 4.

(a) Make a temporary seal.

1) Apply aluminum foil tape (speed tape).

2) Keep a record of the location.

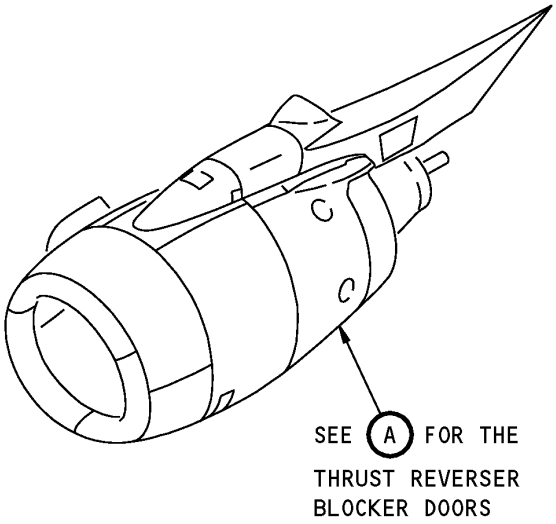
3) Make sure the tape is in satisfactory condition at each 400 flight hour interval or more frequently.

4) Do a permanent repair of the damage at or before 5000 flight hours from the time the seal was made.

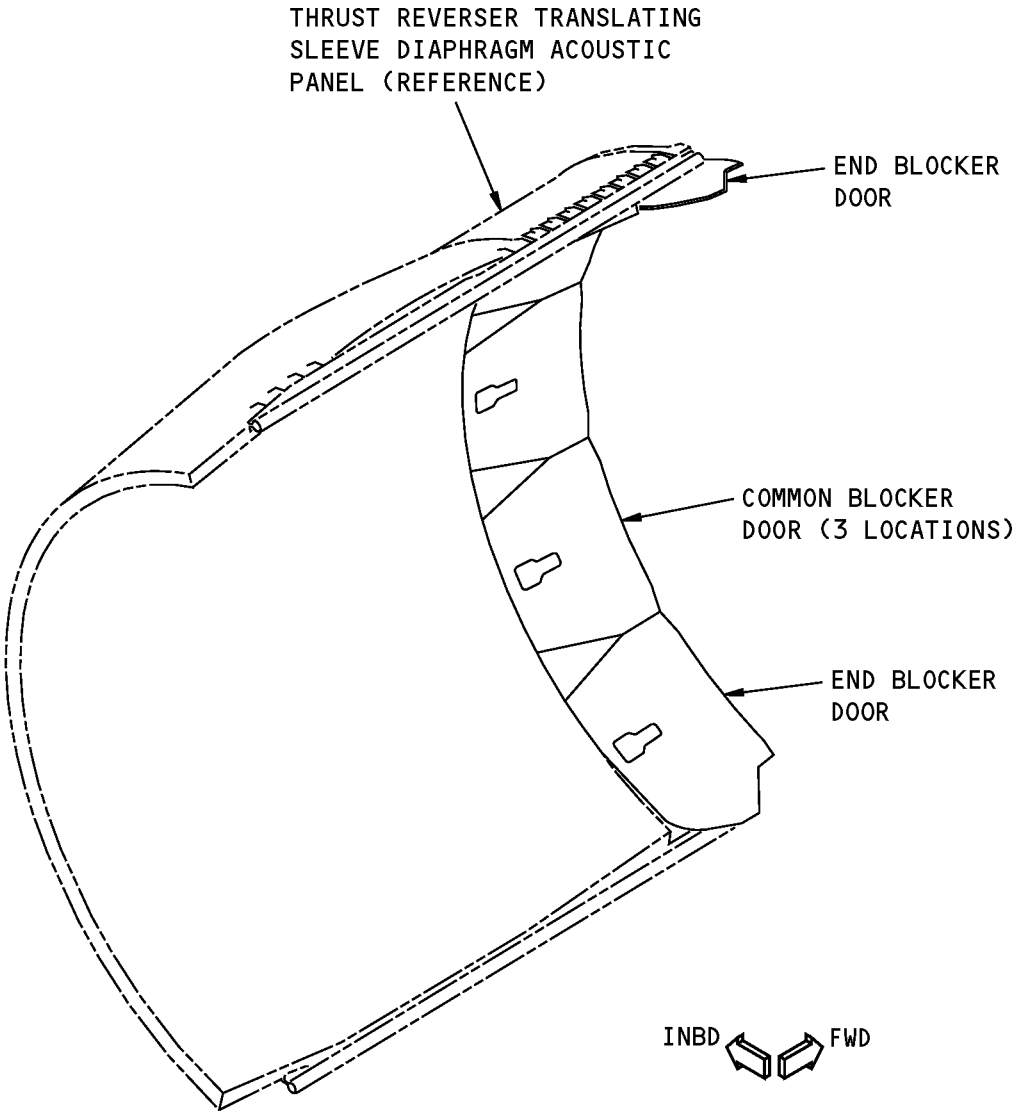
(b) Make a permanent seal.

1) Apply BMS 8-207, Type I, Class 2 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

2) Apply aluminized epoxy primer as given in BAC 5755, Type 10.



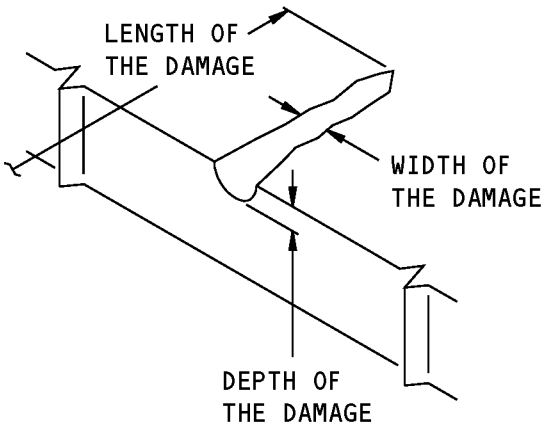
Thrust Reverser Blocker Door Locations
Figure 101 (Sheet 1 of 2)



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

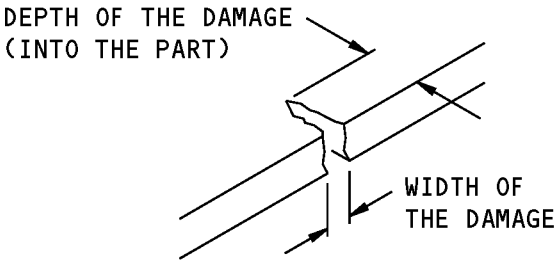
(A)

Thrust Reverser Blocker Door Locations
Figure 101 (Sheet 2 of 2)



SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

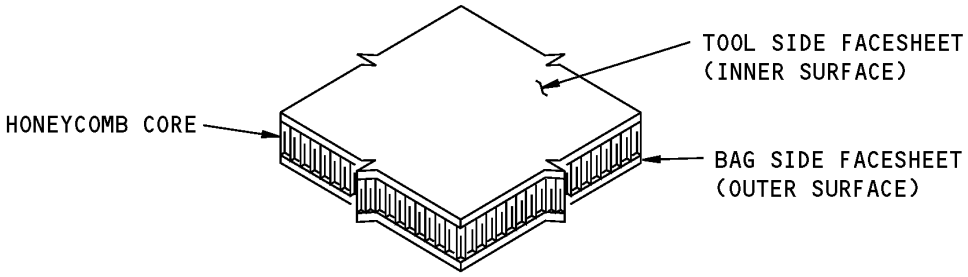
A



SIZE DEFINITIONS FOR
EDGE DAMAGE

B

Definitions of the Damage Size
Figure 102



Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Thrust Reverser Blocker Doors - Solid Laminate Edgeband Edges

NOTE: The sum of all areas of allowable damage is a maximum of 1.0 square inches (645.2 square mm).

(1) Cracks:

(a) For damage less than or equal to 0.03 inch (0.76 mm) in depth as shown in Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 5, Detail B , or less than or equal to 10 percent of the thickness as shown in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Detail D as follows:

1) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , C , and D .

2) Seal the damage location as given in Paragraph 2.A./ALLOWABLE DAMAGE 5

(2) Nicks, Gouges, Scratches, and Laminate Edge Abrasions:

(a) If there is no fiber damage then seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 5

(b) If there is fiber damage and the damage is less than or equal to the dimensions given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , C , and D then do as follows:

1) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , C , and D .

2) Seal the damage location as given in Paragraph 2.A./ALLOWABLE DAMAGE 5

(3) Edge Erosion:

(a) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Detail E and do as follows:

1) Seal the damage location as given in Paragraph 2.A./ALLOWABLE DAMAGE 5

(4) Dents are not permitted.

(5) Holes and Punctures:

(a) For damage less than or equal to 0.03 inch (0.76 mm) in depth as shown in Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 5, Detail B do as follows:

1) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , and C .

2) Seal the damage location as given in Paragraph 2.A./ALLOWABLE DAMAGE 5

(6) Edge Delamination is not permitted.

B. Thrust Reverser Blocker Doors - Honeycomb Core Areas

(1) Edge Potting Cracks:

(a) Apply BMS 5-92, Type I adhesive to seal hairline cracks.

(2) Nicks, Gouges, and Scratches:

(a) Fiber damage is not permitted.

(b) If there is no fiber damage then seal the damage location as given in Paragraph 2.

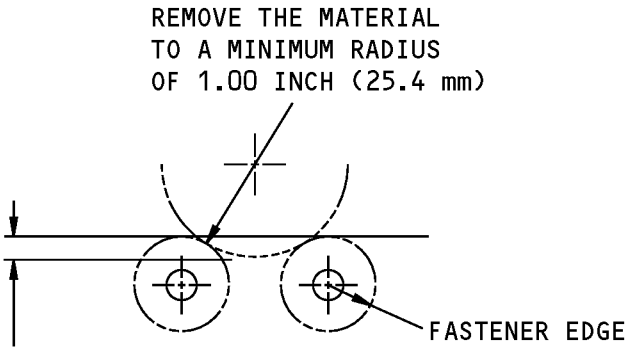
(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

(5) Delaminations are not permitted.

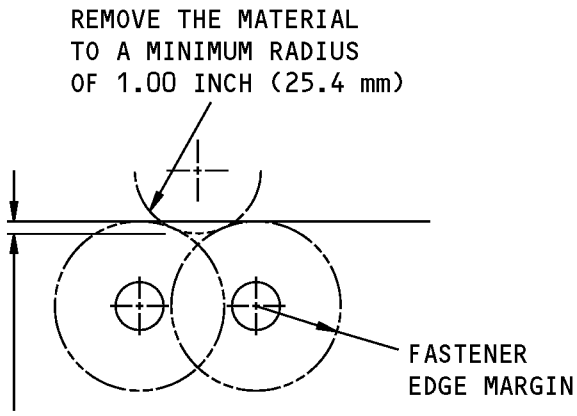
(6) Edge Erosion:

(a) If the damage is less than or equal to 10 percent of the facesheet thickness then seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 5



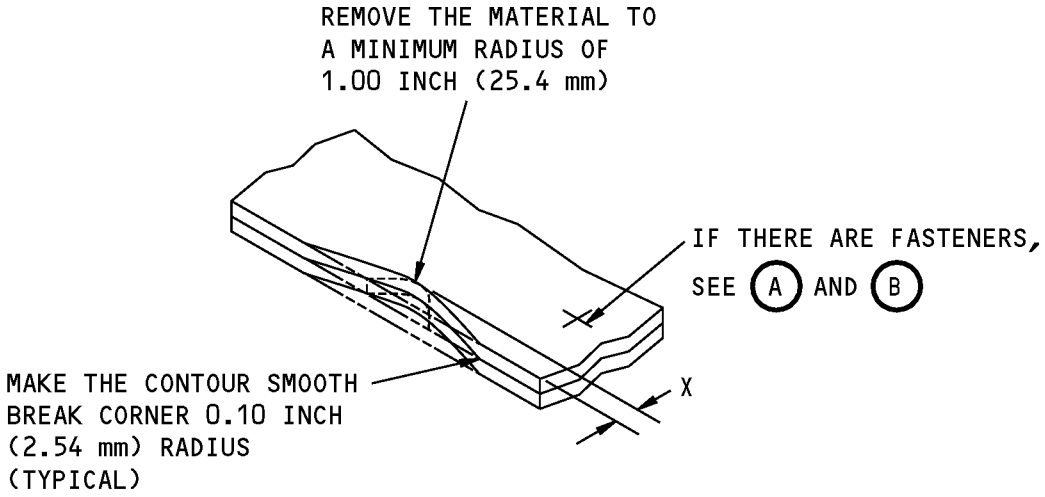
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

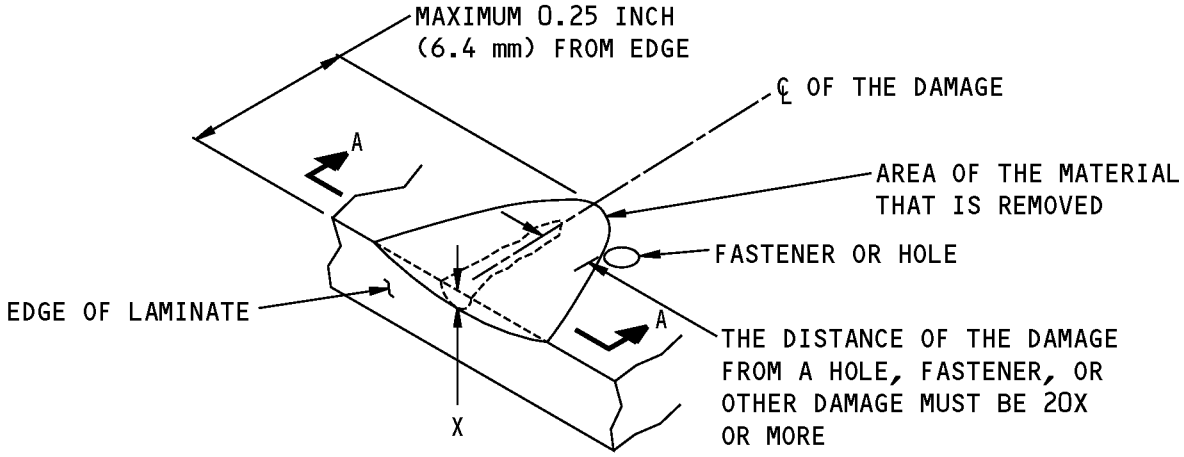


X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.03 INCH (0.76 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

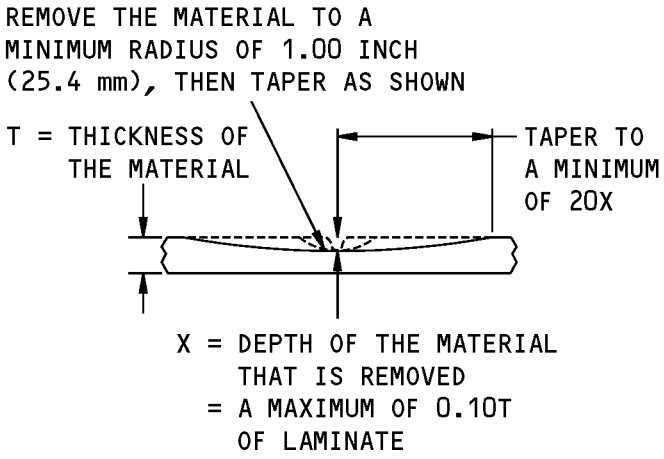
C

Allowable Damage Limits - Thrust Reverser Blocker Doors
Figure 104 (Sheet 1 of 3)



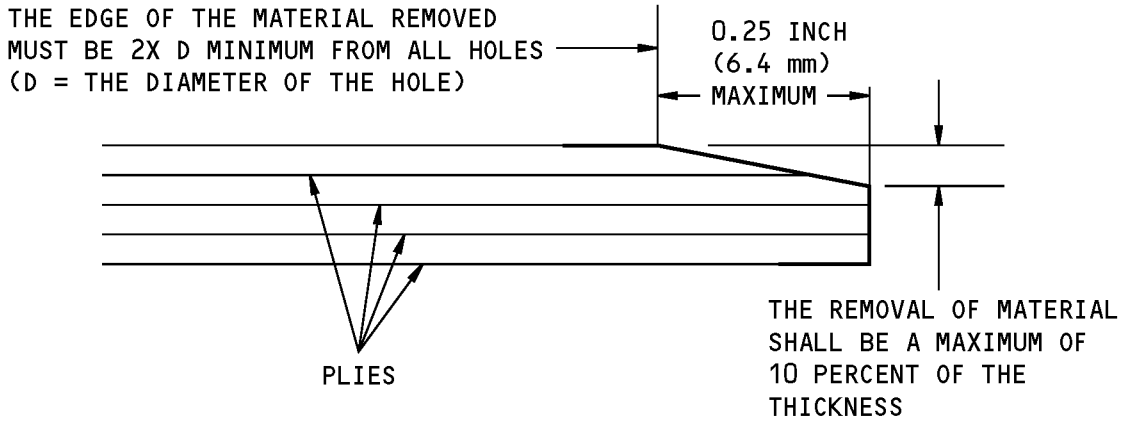
REMOVAL OF DAMAGED
MATERIAL ON A SURFACE AT AN EDGE

(D)



A–A

Allowable Damage Limits - Thrust Reverser Blocker Doors
Figure 104 (Sheet 2 of 3)



NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
  - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
  - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.

REMOVAL OF EROSION AT AN EDGE AND A TEMPORARY OR PERMANENT REPAIR TO SEAL THE EDGE OF SOLID LAMINATE AREAS

(E)

Allowable Damage Limits - Thrust Reverser Blocker Doors
Figure 104 (Sheet 3 of 3)

REPAIR 1 - THRUST REVERSER TRANSLATING SLEEVE OUTER COWL SKIN

1. Applicability

A. Repair 1 is applicable to damage on the parts that follow: (Refer to Thrust Reverser Translating Sleeve Assembly, Figure 201/REPAIR 1)

(1) Vented and Non-Vented Actuator Access Doors

(2) Translating Sleeve Outer Skin Panel

2. General

A. Get access to the damaged area.

(1) Remove the applicable translating sleeve assembly, if necessary. Refer to AMM 78-31-02/401.

(a) Refer to 51-40-02 for fastener removal.

B. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 1 for the definitions of the length, width, and depth of damage.

D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.

E. On airplanes Y6001 through Y6037, the Glass Fiber Reinforced Plastic (GFRP) panels of the Translating Sleeve Outer Skin have BMS 8-336 expanded aluminum foil mesh and BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:

(1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh and the aluminum foil.

(2) Seal the damage as given in 51-70-14.

F. Do the repair as given in Paragraph 4./REPAIR 1

G. Put the translating sleeve outer skin panel back to the initial condition, as applicable.

(1) Install the translating sleeve as given in AMM 78-31-02/401, if it was removed.

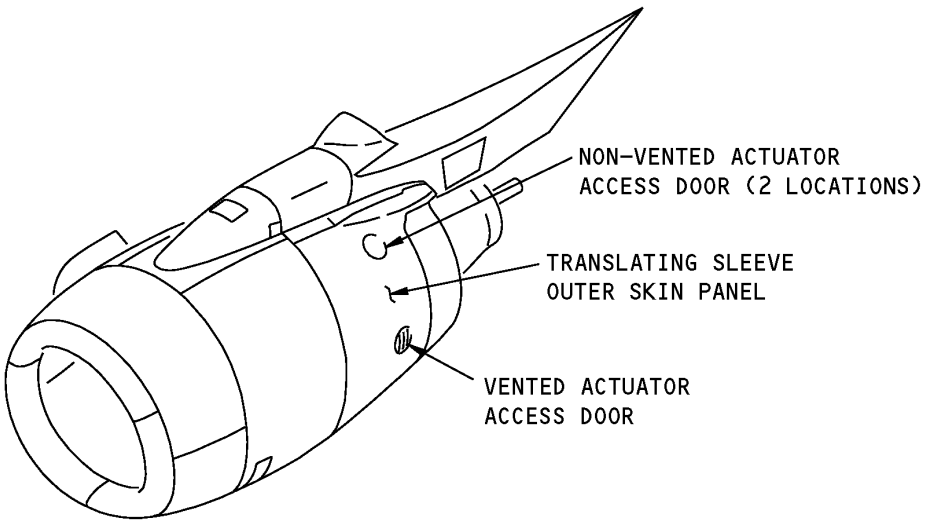
(a) Refer to 51-40-02 for fastener installation.

(2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

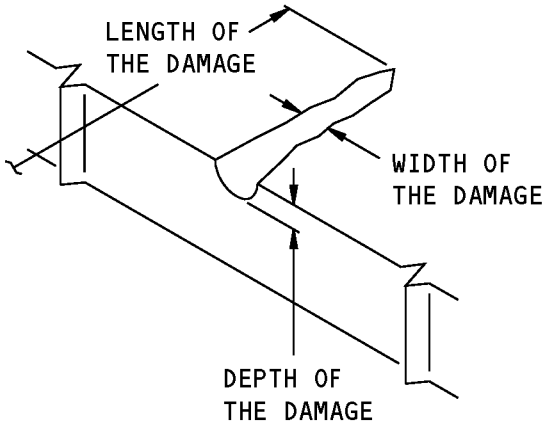
H. Refer to Table 201/REPAIR 1 for the repair references for the components of the thrust reverser translating sleeve assembly.

Table 201:

REPAIR REFERENCES FOR THE THRUST REVERSER TRANSLATING SLEEVE ASSEMBLY	
COMPONENT	**REPAIR**
Translating Sleeve Outer Cowl Skin - Bonded Panel	Refer to Paragraph 4
Vented and Non-Vented Actuator Access Doors	The Boeing Company has not found it necessary to supply repairs for these parts. If the damage to the struc- ture is more than the limits given in SRM 54-30-02, Allow- able Damage 2, then replace the damaged part

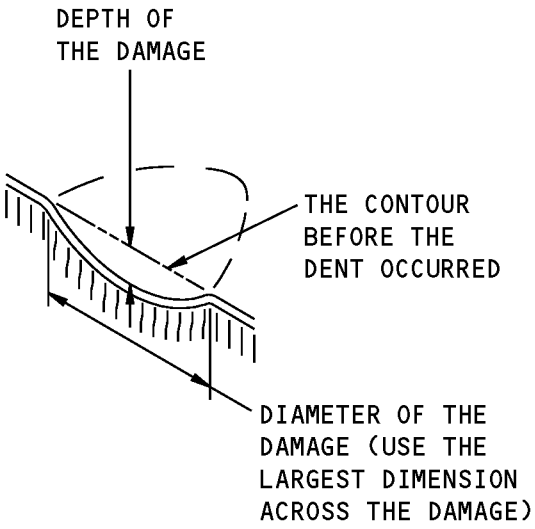


Thrust Reverser Translating Sleeve Assembly
Figure 201



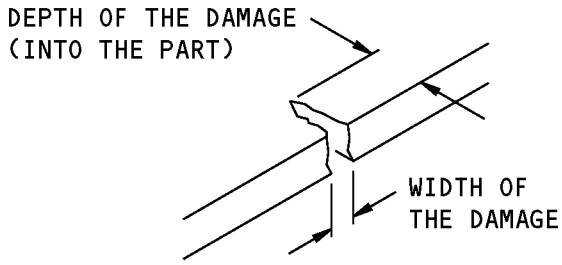
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

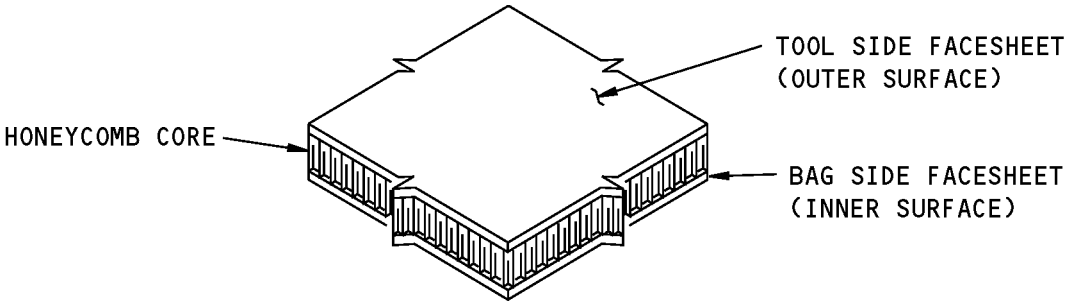
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 202



Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
51-70-06	ROOM TEMPERATURE CURE REPAIRS
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
AMM 78-31-02/401	Translating Sleeve - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. Refer to Translating Sleeve Outer Cowl Panel Repair Data, Figure 204/REPAIR 1, Table A for the repair data that is applicable to damage to the translating sleeve outer cowl skin panel.

B. For a Category A repair made with preimpregnated wet layup materials and cured at 350°F (177°C), refer to 51-70-05.

C. For a Category B repair made with wet layup materials and cured at 200°F (121°C) or 150°F (66°C), refer to 51-70-04 or 51-70-06.

(1) Examine a Category B repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

(a) If deterioration is found, replace a Category B repair with a Category A repair.

DAMAGE	CATEGORY B REPAIRS 1		CATEGORY A REPAIRS
	WET LAYUP 150°F (66°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	WET LAYUP 200° (93°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350°F (177°C) CURE REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLES	REPAIRS ARE PERMITTED AS SHOWN IN FIGURE 205. THE MAXIMUM REPAIR SIZE LIMIT IS EQUAL TO THE ALLOWABLE DAMAGE LIMIT FOR THE LOCATION OF THE REPAIR ON THE PANEL. REFER TO THE APPLICABLE ALLOWABLE DAMAGE LIMITS FOR THE SPECIFIED COMPONENT 2		NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	IF THERE IS NO FIBER DAMAGE, FILL THE NICKS OR GOUGES WITH SEALING RESIN IF THERE IS FIBER DAMAGE, CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE EDGE DELAMINATIONS ARE LIMITED TO A MAXIMUM LENGTH OF 0.25 INCH (6.35 mm) WITH ONE REPAIR IN EACH LINEAR FOOT (30.5 cm)		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN		IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN

TABLE A

Translating Sleeve Outer Cowl Panel Repair Data
Figure 204 (Sheet 1 of 2)

NOTES

1 MAKE A NONDESTRUCTIVE INSPECTION (NDI) OF AN INTERIM REPAIR AT EACH 400 FLIGHT CYCLE INTERVAL OR MORE FREQUENTLY. REFER TO NDT PART 1, 51-01-01. A PERMANENT REPAIR IS NECESSARY IF THERE IS ANY DETERIORATION.

THESE REPAIRS HAVE FAA APPROVAL IF THE INSPECTIONS ARE ACCOMPLISHED AT THE SPECIFIED INTERVALS.

2 FOR REPAIRS THAT ARE LESS THAN OR EQUAL TO 0.25 INCH (6.35 mm) IN DIAMETER, FOUR REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

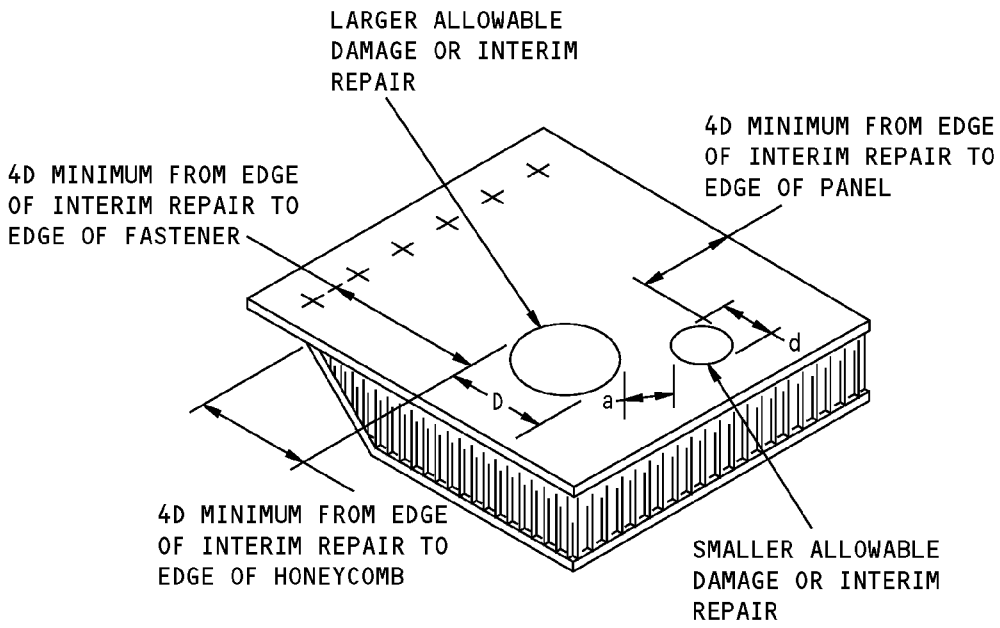
FOR REPAIRS THAT ARE MORE THAN 0.25 INCH (6.35 mm) AND LESS THAN OR EQUAL TO 0.50 INCH (12.7 mm) IN DIAMETER, THREE REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

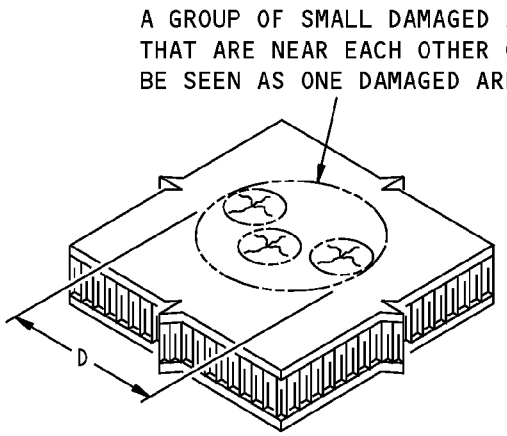
FOR REPAIRS THAT ARE MORE THAN 0.50 INCH (12.7 mm) AND LESS THAN OR EQUAL TO 1.00 INCH (25.4 mm) IN DIAMETER, TWO REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 1.00 INCH (25.4 mm) IN DIAMETER, ONE REPAIR IS PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

THE MAXIMUM AREA OF TOTAL ALLOWABLE DAMAGE AND/OR REPAIRS IS 4.0 SQUARE INCHES (103.22 cm^2) IN EACH PANEL.

Translating Sleeve Outer Cowl Panel Repair Data
Figure 204 (Sheet 2 of 2)





NOTE:
- -D- IS THE LARGER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- -d- IS THE SMALLER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- -a- IS THE DISTANCE BETWEEN ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- THE MINIMUM -a- THAT IS PERMITTED IS 6D (ON ONE SIDE OF THE PANEL OR THE OTHER).

Category B Repair Spacing Data for Composite Panels
Figure 205

REPAIR 2 - THRUST REVERSER TRANSLATING SLEEVE ACOUSTIC PANELS

1. Applicability

A. Repair 2 is applicable to damage on the acoustic panels of the thrust reverser translating sleeve. Refer to Thrust Reverser Translating Sleeve Acoustic Panel Location, Figure 201/REPAIR 2.

2. General

A. Get access to the damaged area.

(1) Remove the applicable translating sleeve assembly, if necessary. Refer to AMM 78-31-02/401.

(a) Refer to 51-40-02 for fastener removal.

B. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 2 for the definitions of the length, width, and depth of damage.

D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 2 for the definitions of the facesheets of a honeycomb core area.

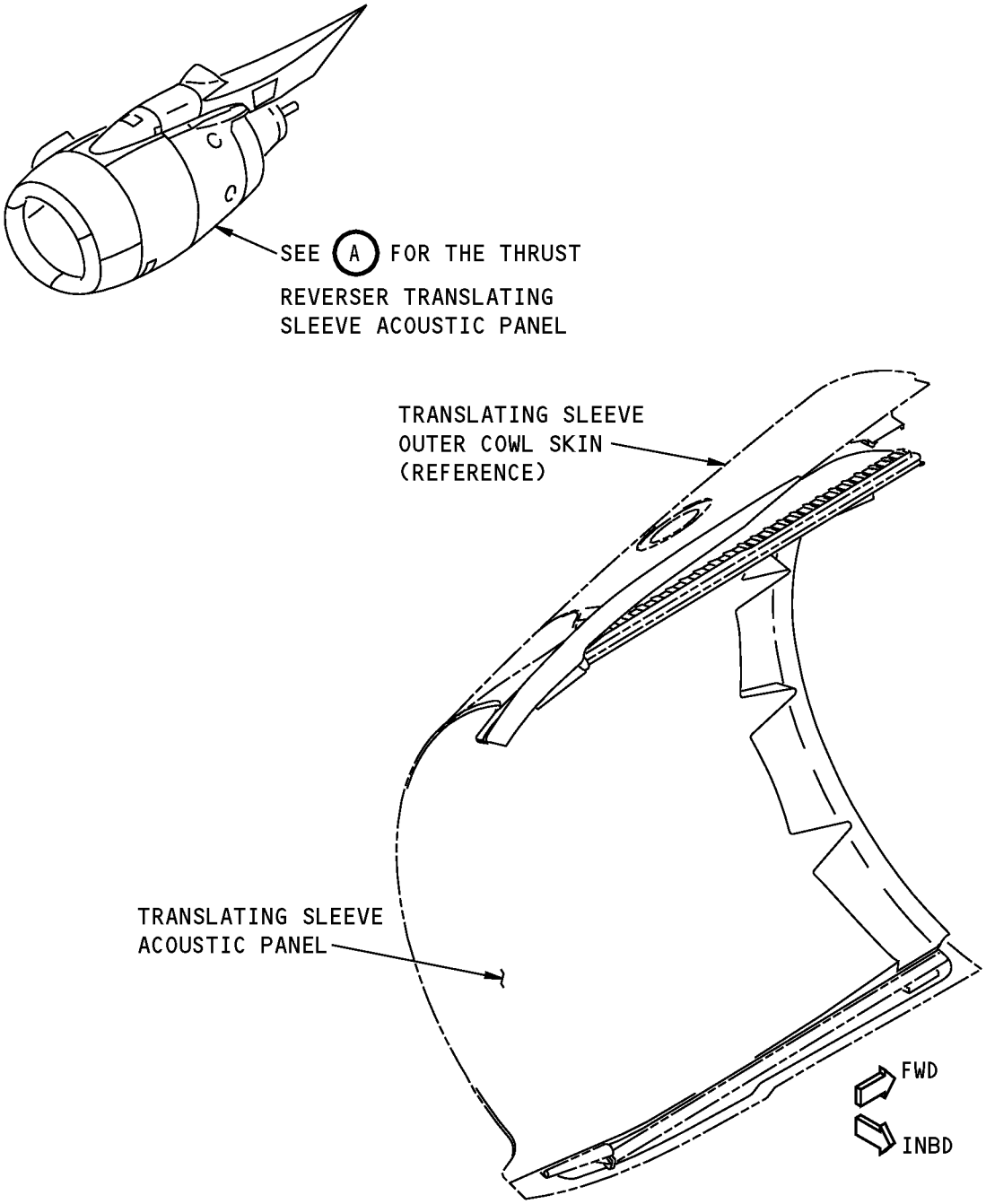
E. Do the repair as given in Paragraph 4./REPAIR 2

F. Put the translating sleeve acoustic panel back to the initial condition, as applicable.

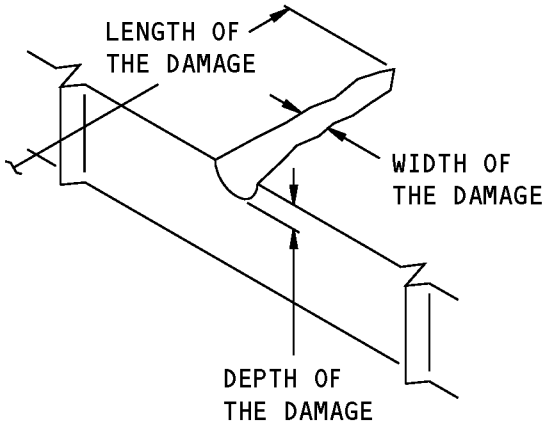
(1) Install the translating sleeve as given in AMM 78-31-02/401, if it was removed.

(a) Refer to 51-40-02 for fastener installation.

(2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

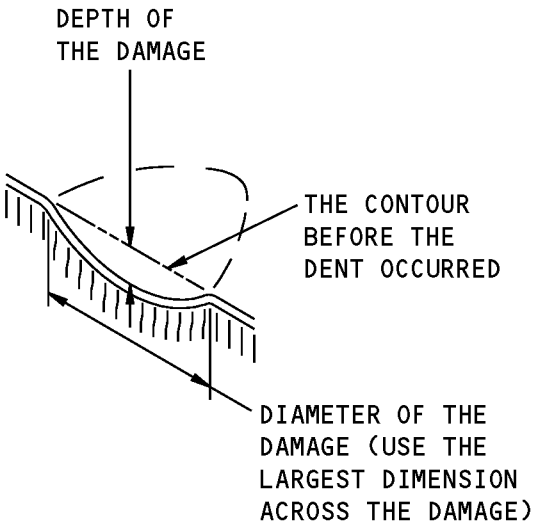


Thrust Reverser Translating Sleeve Acoustic Panel Location
Figure 201



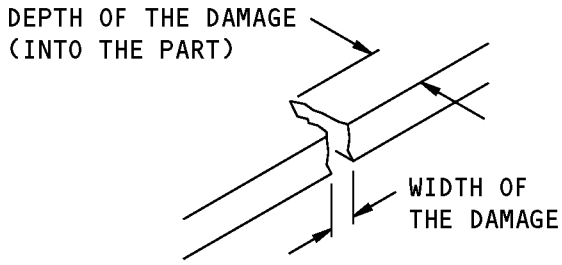
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

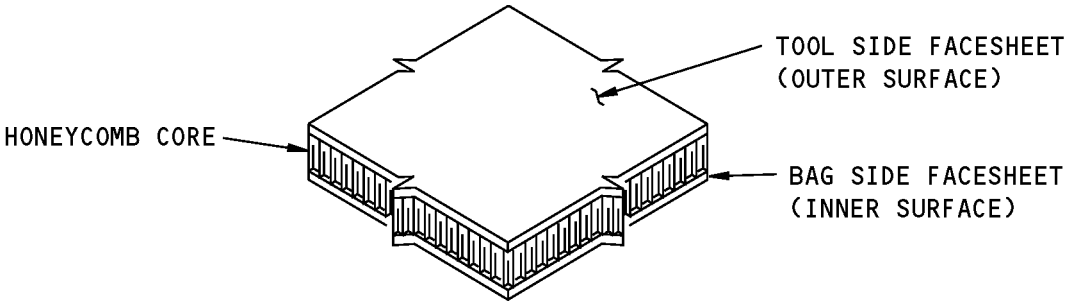
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 202



Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-05, GENERAL	Repair Sealing
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
51-70-06	ROOM TEMPERATURE CURE REPAIRS
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 78-31-02/401	Translating Sleeve - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. Refer to Translating Sleeve Acoustic Panel Repair Data, Figure 204/REPAIR 2, Table A for the repair data that is applicable to damage to the translating sleeve acoustic panels.

B. For a Category A repair made with preimpregnated wet layup materials and cured at 350°F (177°C), refer to 51-70-05.

C. For a Category B repair made with wet layup materials and cured at 200°F (93°C) or 150°F (66°C), refer to 51-70-04 or 51-70-06.

(1) Examine a Category B repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after you do the tap test.

(a) If deterioration is found, replace a Category B repair with a Category A repair.

DAMAGE	CATEGORY B REPAIRS [1]		CATEGORY A REPAIRS
	WET LAYUP 150°F (66°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	WET LAYUP 200° (93°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350°F (177°C) CURE REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLES	REPAIRS ARE PERMITTED AS SHOWN IN FIGURE 205. THE MAXIMUM REPAIR SIZE LIMIT IS EQUAL TO THE ALLOWABLE DAMAGE LIMIT FOR THE LOCATION OF THE REPAIR ON THE PANEL. REFER TO THE APPLICABLE ALLOWABLE DAMAGE LIMITS FOR THE SPECIFIED COMPONENT [2]		NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	IF THERE IS NO FIBER DAMAGE, FILL THE NICKS OR GOUGES WITH SEALING RESIN IF THERE IS FIBER DAMAGE, CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE EDGE DELAMINATIONS ARE LIMITED TO A MAXIMUM LENGTH OF 0.25 INCH (6.35 mm) WITH ONE REPAIR IN EACH LINEAR FOOT (30.5 cm)		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN		IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN

TABLE A

Translating Sleeve Acoustic Panel Repair Data
Figure 204 (Sheet 1 of 2)

NOTES

1. MAKE A NONDESTRUCTIVE INSPECTION (NDI) OF AN INTERIM REPAIR AT EACH 400 FLIGHT CYCLE INTERVAL OR MORE FREQUENTLY. REFER TO NDT PART 1, 51-01-01. A PERMANENT REPAIR IS NECESSARY IF THERE IS ANY DETERIORATION.

   THESE REPAIRS HAVE FAA APPROVAL IF THE INSPECTIONS ARE ACCOMPLISHED AT THE SPECIFIED INTERVALS.

2. FOR REPAIRS THAT ARE LESS THAN OR EQUAL TO 0.25 INCH (6.35 mm) IN DIAMETER, FOUR REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

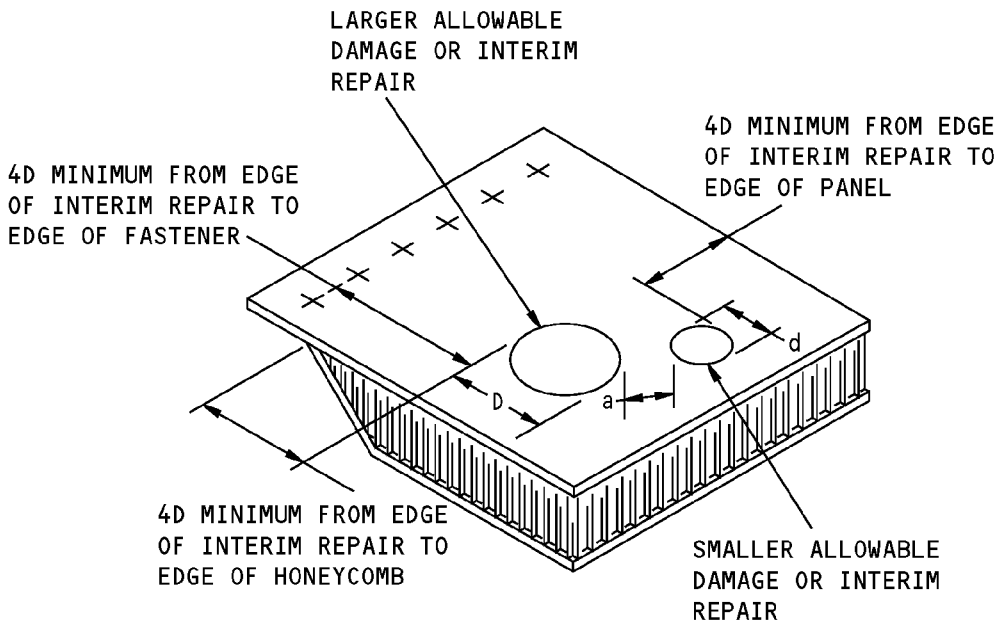
   FOR REPAIRS THAT ARE MORE THAN 0.25 INCH (6.35 mm) AND LESS THAN OR EQUAL TO 0.50 INCH (12.7 mm) IN DIAMETER, THREE REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

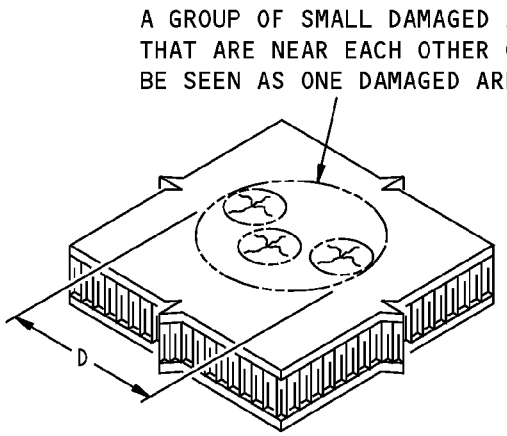
   FOR REPAIRS THAT ARE MORE THAN 0.50 INCH (12.7 mm) AND LESS THAN OR EQUAL TO 1.00 INCH (25.4 mm) IN DIAMETER, TWO REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

   FOR REPAIRS THAT ARE MORE THAN 1.00 INCH (25.4 mm) IN DIAMETER, ONE REPAIR IS PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

   THE MAXIMUM AREA OF TOTAL ALLOWABLE DAMAGE AND/OR REPAIRS IS 4.0 SQUARE INCHES (103.2 cm^2) ON EACH PANEL.

Translating Sleeve Acoustic Panel Repair Data
Figure 204 (Sheet 2 of 2)





NOTE:
- -D- IS THE LARGER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- -d- IS THE SMALLER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- -a- IS THE DISTANCE BETWEEN ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- THE MINIMUM -a- THAT IS PERMITTED IS 6D (ON ONE SIDE OF THE PANEL OR THE OTHER).

Category B Repair Spacing Data for Composite Panels
Figure 205

REPAIR 3 - THRUST REVERSER INNER DUCT WALL ACOUSTIC PANEL

1. Applicability

A. Repair 3 is applicable to damage on the acoustic panel of the thrust reverser inner duct wall. Refer to Thrust Reverser Inner Duct Wall Acoustic Panel Location, Figure 201/REPAIR 3.

2. General

A. Get access to the damaged area.

(1) Remove the applicable translating sleeve assembly, if necessary. Refer to AMM 78-31-02/401.

(a) Refer to 51-40-02 for fastener removal.

B. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 3 for the definitions of the length, width, and depth of damage.

D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 3 for the definitions of the facesheets of a honeycomb core area.

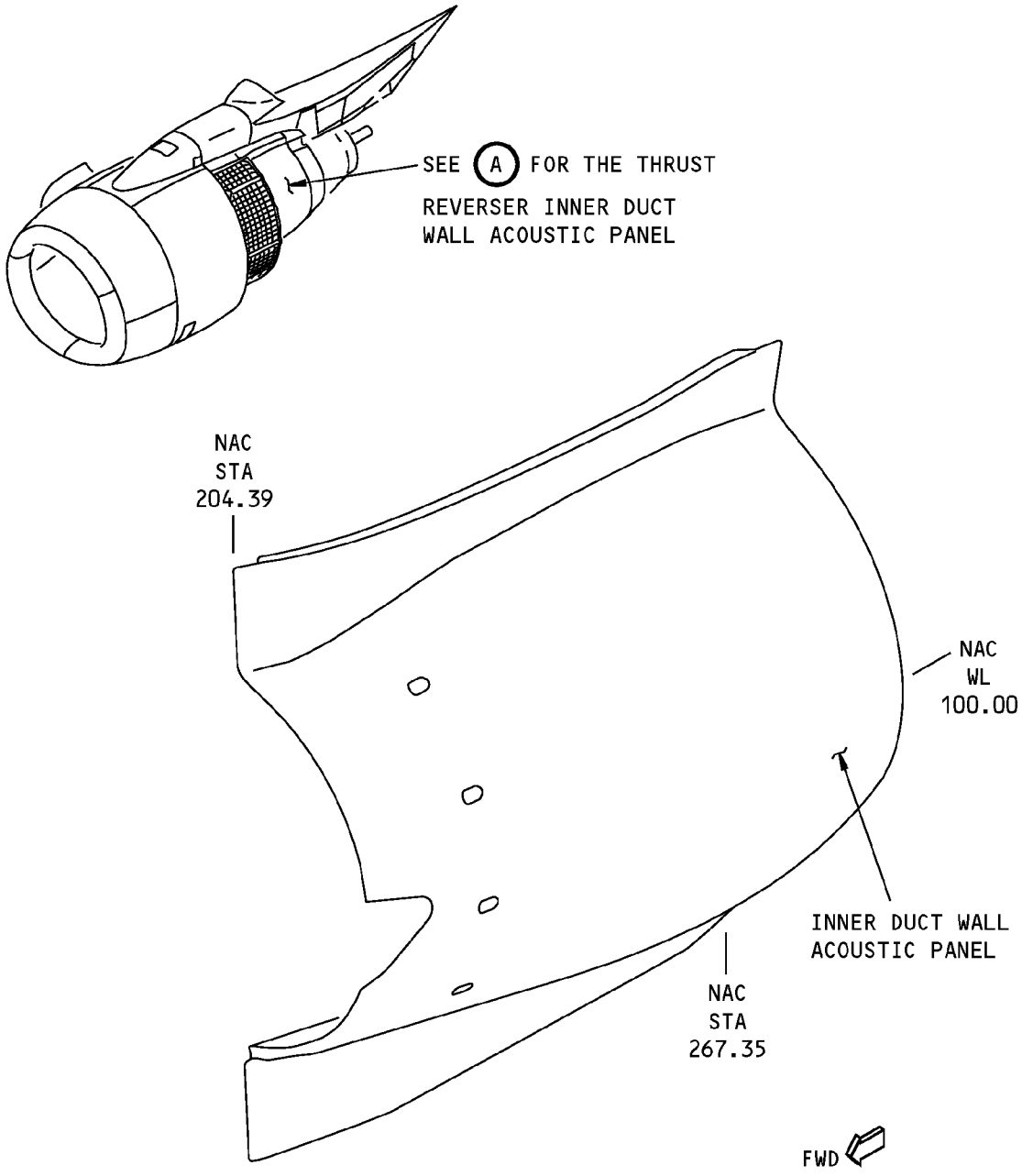
E. Do the repair as given in Paragraph 4./REPAIR 3

F. Put the translating sleeve acoustic panel back to the initial condition, as applicable.

(1) Install the translating sleeve as given in AMM 78-31-02/401, if it was removed.

(a) Refer to 51-40-02 for fastener installation.

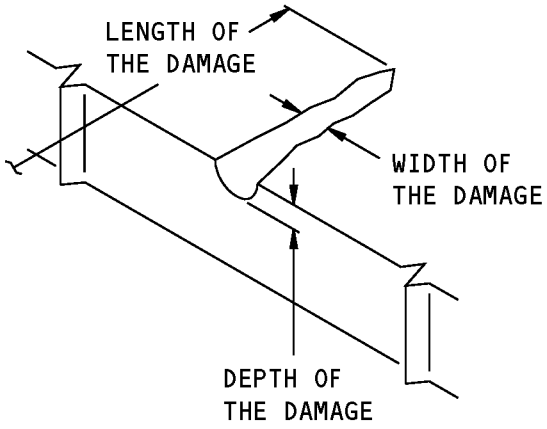
(2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



LEFT INNER DUCT WALL ACOUSTIC PANEL IS SHOWN,
RIGHT INNER DUCT WALL ACOUSTIC PANEL IS ALMOST THE SAME

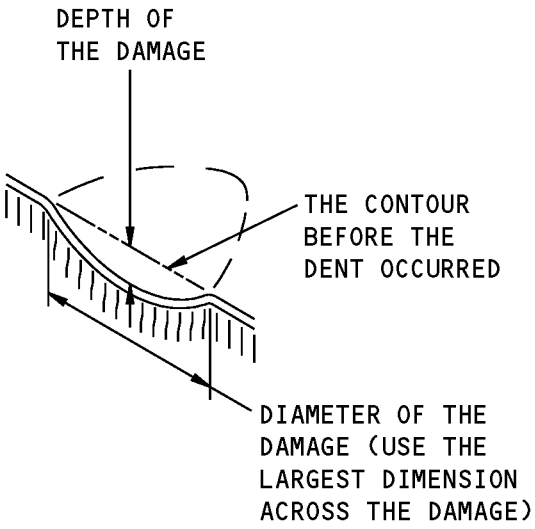
(A)

Thrust Reverser Inner Duct Wall Acoustic Panel Location
Figure 201



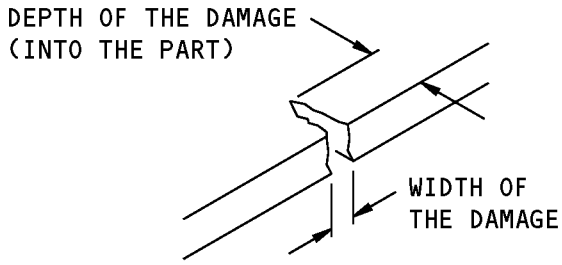
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

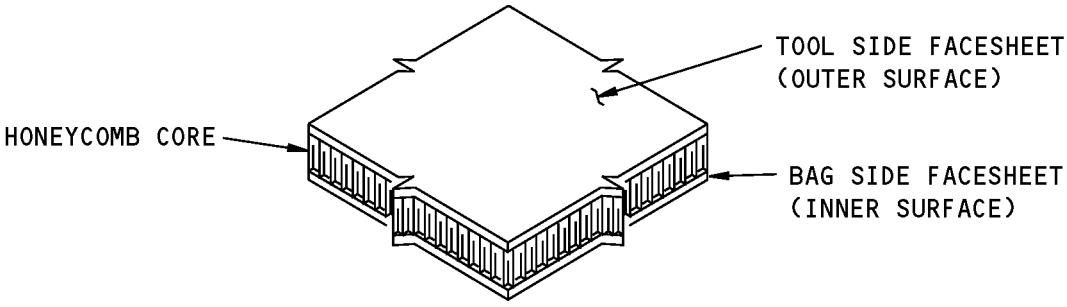
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 202



Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
51-70-06	ROOM TEMPERATURE CURE REPAIRS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
AMM 78-31-02/401	Translating Sleeve - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. Refer to Thrust Reverser Inner Duct Wall Acoustic Panel Repair Data, Figure 204/REPAIR 3, Table A for the repair data that is applicable to damage to the translating sleeve acoustic panels.

B. For a Category A repair made with preimpregnated wet layup materials and cured at 350°F (177°C), refer to 51-70-05.

C. For a Category B repair made with wet layup materials and cured at 200°F (121°C) or 150°F (66°C), refer to 51-70-04 or 51-70-06.

(1) Examine a Category B repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after you do the tap test.

(a) If deterioration is found, replace a Category B repair with a Category A repair.

DAMAGE	CATEGORY B REPAIRS [1]		CATEGORY A REPAIRS
	WET LAYUP 150°F (66°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	WET LAYUP 200° (93°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350°F (177°C) CURE REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLES	REPAIRS ARE PERMITTED AS SHOWN IN FIGURE 205. THE MAXIMUM REPAIR SIZE LIMIT IS EQUAL TO THE ALLOWABLE DAMAGE LIMIT FOR THE LOCATION OF THE REPAIR ON THE PANEL. REFER TO THE APPLICABLE ALLOWABLE DAMAGE LIMITS FOR THE SPECIFIED COMPONENT [2]		NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	IF THERE IS NO FIBER DAMAGE, FILL THE NICKS OR GOUGES WITH SEALING RESIN IF THERE IS FIBER DAMAGE, CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE EDGE DELAMINATIONS ARE LIMITED TO A MAXIMUM LENGTH OF 0.25 INCH (6.35 mm) WITH ONE REPAIR IN EACH LINEAR FOOT (30.5 cm)		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN		IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN

TABLE A

Thrust Reverser Inner Duct Wall Acoustic Panel Repair Data
Figure 204 (Sheet 1 of 2)

NOTES

1> MAKE A NONDESTRUCTIVE INSPECTION (NDI) OF AN INTERIM REPAIR AT EACH 400 FLIGHT CYCLE INTERVAL OR MORE FREQUENTLY. REFER TO NDT PART 1, 51-01-01. A PERMANENT REPAIR IS NECESSARY IF THERE IS ANY DETERIORATION.

THESE REPAIRS HAVE FAA APPROVAL IF THE INSPECTIONS ARE ACCOMPLISHED AT THE SPECIFIED INTERVALS.

2> FOR REPAIRS THAT ARE LESS THAN OR EQUAL TO 0.25 INCH (6.35 mm) IN DIAMETER, FOUR REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

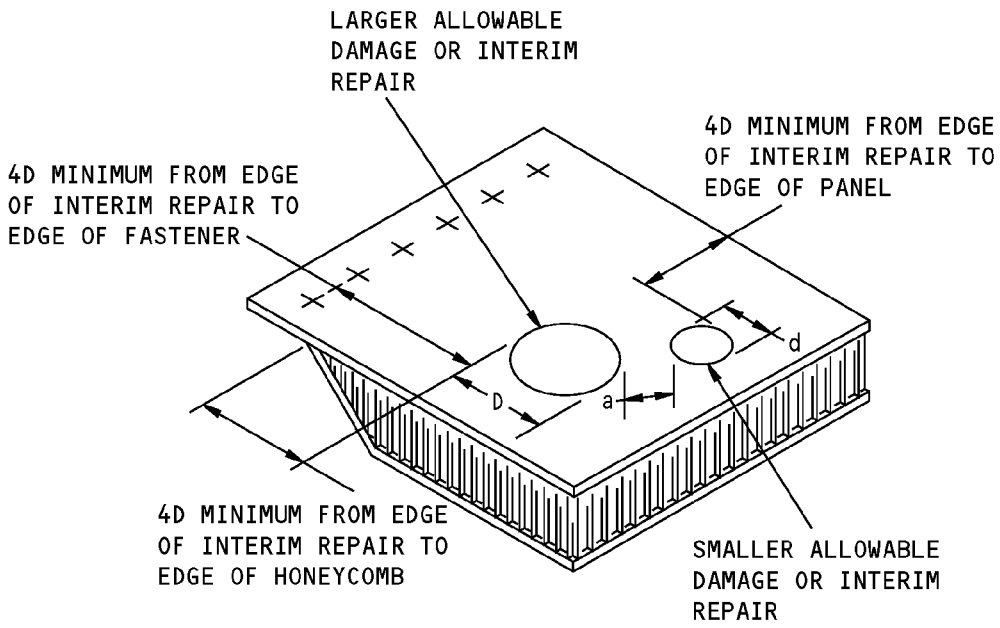
FOR REPAIRS THAT ARE MORE THAN 0.25 INCH (6.35 mm) AND LESS THAN OR EQUAL TO 0.50 INCH (12.7 mm) IN DIAMETER, THREE REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

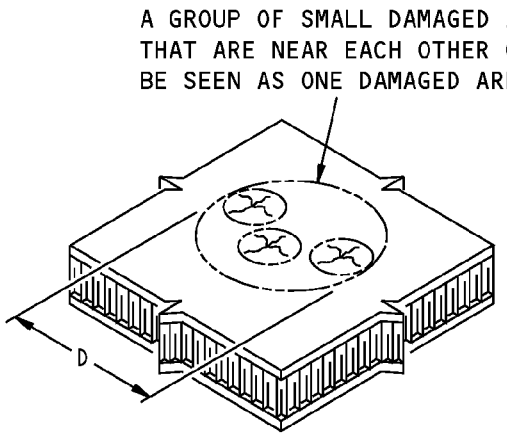
FOR REPAIRS THAT ARE MORE THAN 0.50 INCH (12.7 mm) AND LESS THAN OR EQUAL TO 1.00 INCH (25.4 mm) IN DIAMETER, TWO REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 1.00 INCH (25.4 mm) IN DIAMETER, ONE REPAIR IS PERMITTED IN EACH SQUARE FOOT (929.0 cm^2) OF AREA.

THE MAXIMUM AREA OF TOTAL ALLOWABLE DAMAGE AND/OR REPAIRS IS 4.0 SQUARE INCHES (103.22 cm^2) ON EACH PANEL.

Thrust Reverser Inner Duct Wall Acoustic Panel Repair Data
Figure 204 (Sheet 2 of 2)





NOTE:
- -D- IS THE LARGER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- -d- IS THE SMALLER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- -a- IS THE DISTANCE BETWEEN ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR CATEGORY B REPAIR AREAS.
- THE MINIMUM -a- THAT IS PERMITTED IS 6D (ON ONE SIDE OF THE PANEL OR THE OTHER).

Category B Repair Spacing Data for Composite Panels
Figure 205

REPAIR 4 - THRUST REVERSER BLOCKER DOOR PANELS

1. Applicability

A. Repair 4 is applicable to damage on the thrust reverser blocker doors shown in Thrust Reverser Blocker Door Locations, Figure 201/REPAIR 4.

2. General

A. Get access to the damaged area.

(1) Remove the applicable translating sleeve if necessary. Refer to AMM 78-31-02/401.

(a) Refer to 51-40-02 for fastener removal.

(2) Remove the applicable thrust reverser blocker door if necessary. Refer to AMM 78-31-06/401.

(a) Refer to 51-40-02 for fastener removal.

B. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 4 for the definitions of the length, width, and depth of damage.

D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 4 for the definitions of the facesheets of a honeycomb core area.

E. Do the repair as given in Paragraph 4./REPAIR 4

F. Put the blocker door back to the initial condition, as applicable.

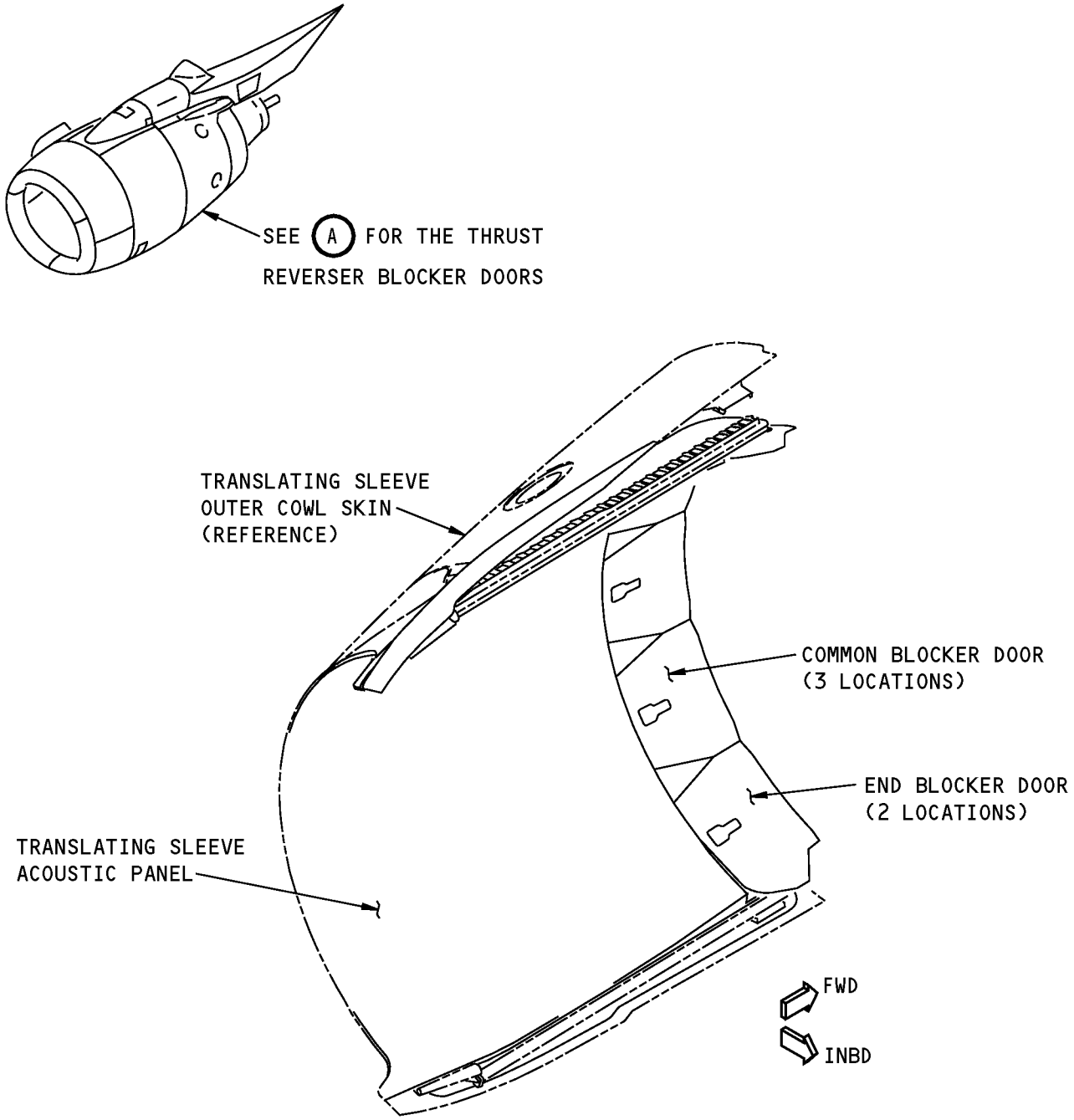
(1) Install the thrust reverser blocker door as given in AMM 78-31-06/401, if it was removed.

(a) Refer to 51-40-02 for fastener installation.

(2) Install the thrust reverser translating sleeve as given in AMM 78-31-02/401, if it was removed.

(a) Refer to 51-40-02 for fastener installation.

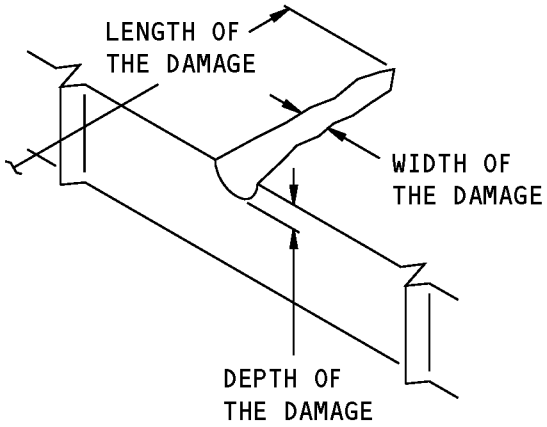
(3) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



LEFT THRUST REVERSER BLOCKER DOORS ARE SHOWN,
RIGHT THRUST REVERSER BLOCKER DOORS ARE OPPOSITE

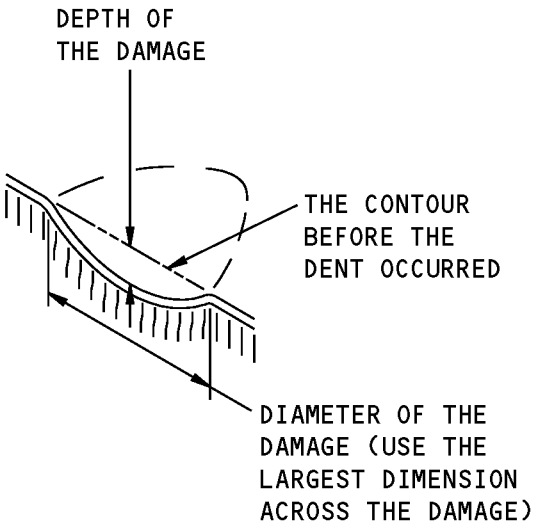
(A)

Thrust Reverser Blocker Door Locations
Figure 201



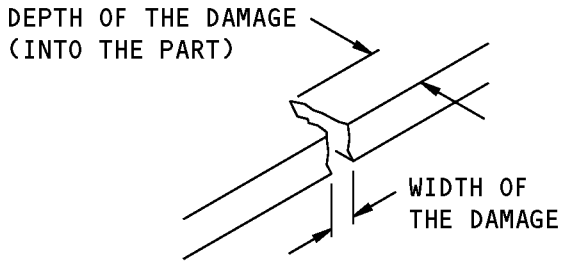
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

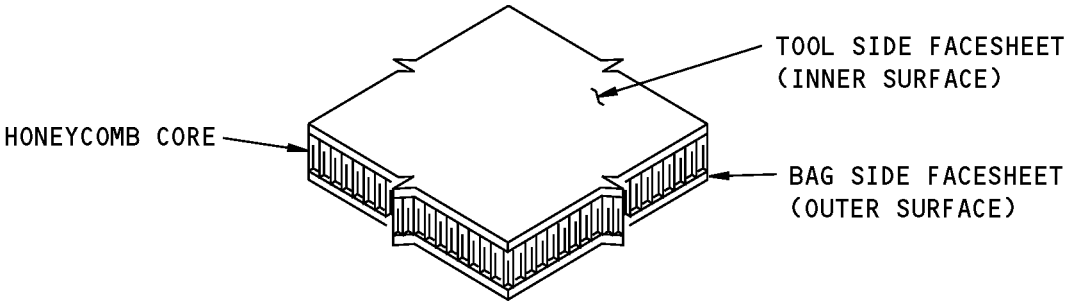
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 202



Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
AMM 78-31-02/401	Translating Sleeve - Removal/Installation
AMM 78-31-06/401	Aircraft Maintenance Manual
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. Refer to Thrust Reverser Blocker Door Panel Repair Data, Figure 204/REPAIR 4 for the repair data that is applicable to damage to the thrust reverser blocker doors.

B. For a Category A repair made with preimpregnated layup materials and cured at 350°F (177°C), refer to 51-70-05.

C. For a Category B repair made with wet layup materials and cured at 200°F (121°C) or 150°F (66°C), refer to 51-70-04.

(1) Examine a Category B repair after 400 flight cycles. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

(a) If deterioration is found, replace a Category B repair with a Category A repair.

(b) If deterioration is not found, examine a Category B repair after each interval of 1000 flight cycles or more frequently.

(c) These repairs have FAA approval if the inspections are accomplished at the specified intervals.

	CATEGORY B REPAIRS 1	CATEGORY A REPAIRS
DAMAGE	WET LAYUP 150°F (66°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350°F (177°C) CURE 2 REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
	WET LAYUP 200°F (93°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	
HOLES AND PUNCTURES	REPAIRS ARE PERMITTED ON CLEANED UP DAMAGE UP TO A MAXIMUM DIAMETER OF 0.25 INCH (6.35 mm) AND NOT NEARER THAN 1.0 INCH (25.4 mm) (EDGE TO EDGE) TO ANY FASTENER HOLE OR MATERIAL EDGE	CUT AND REMOVE THE DAMAGE ADD EXTRA REPAIR PLY AS GIVEN IN SRM 51-70-05 NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	EDGE EROSION IS NOT PERMITTED	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE

HONEYCOMB CORE AREAS

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 1 of 8)

	CATEGORY B REPAIRS	CATEGORY A REPAIRS
DAMAGE		CURE FOR 8 HOURS MINIMUM AT ROOM TEMPERATURE PLUS 1.5 HOURS AT 260° ±15°F (OR 1 HOUR AT 350° ±15°F).
EDGE POTTING CRACKS AND DEFECTS	EDGE POTTING CRACKS ARE NOT PERMITTED.	IF POTTING IS MISSING OR DAMAGED, REMOVE THE DEFECT BY MECHANICAL MEANS. MAXIMUM DEPTH OF REWORK IS NOT TO EXCEED 0.190 INCH INTO EDGE OF PANEL. DO NOT DAMAGE FACE SHEETS. RE-POT THE DAMAGED AREA USING BMS 5-28, TYPE 26 FLEXIBLE EDGE POTTING. UP TO 5 PERCENT BY WEIGHT OF CAB-O-SIL MAY BE MIXED WITH THE BLENDED BMS 5-28, TYPE 26. SEAL REPAIR USING BMS 5-92, TYPE I.

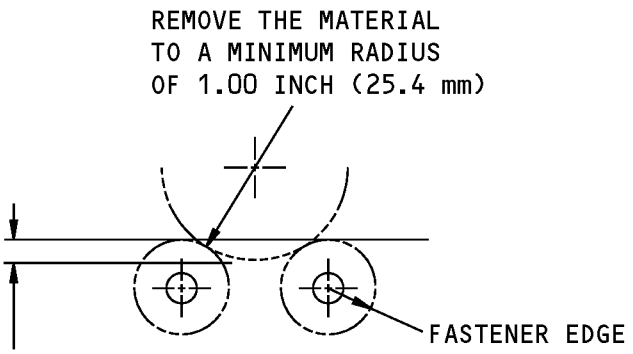
HONEYCOMB CORE EDGE POTTING

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 2 of 8)

	CATEGORY B REPAIRS [1]	CATEGORY A REPAIRS
DAMAGE	WET LAYUP 200°F (93°C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES EXCEPT AS NOTED BELOW [3]	PREIMPREGNATED LAYUP 350°F (177°C) CURE [2] REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLES AND PUNCTURES	HOLES ARE NOT PERMITTED REFER TO FIGURE 204, DETAILS A, B, C, AND D FOR EDGE PUNCTURE DAMAGE LIMITS AND DAMAGE REMOVAL DEFINITION REFER TO FIGURE 204, DETAIL E AND SRM 51-70-04, REPAIR 9 FOR REPAIR PROCEDURE USING CHOPPED FIBER AND RESIN MIX, AND TWO BMS 9-3, TYPE D FIBERGLASS REPAIR PLIES	CUT AND REMOVE THE DAMAGE ADD EXTRA REPAIR PLY AS GIVEN IN SRM 51-70-05 NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO AN EDGE PUNCTURE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO AN EDGE PUNCTURE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	REFER TO FIGURE 204, DETAIL F FOR EDGE DELAMINATION LIMITS REFER TO SRM 51-70-04 REPAIR 13 FOR THE REPAIR PROCEDURE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	DENTS ARE NOT PERMITTED	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	EDGE EROSION IS NOT PERMITTED	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE

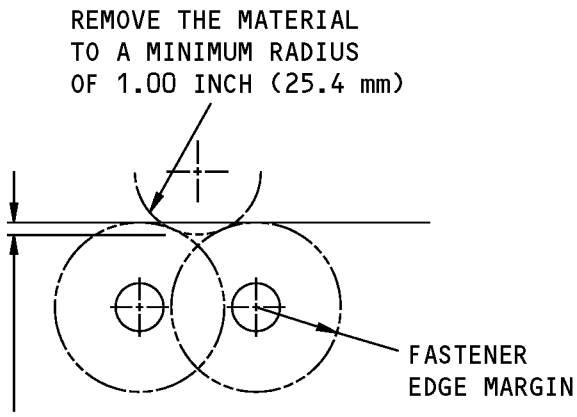
SOLID LAMINATE EDGEBAND AREAS

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 3 of 8)



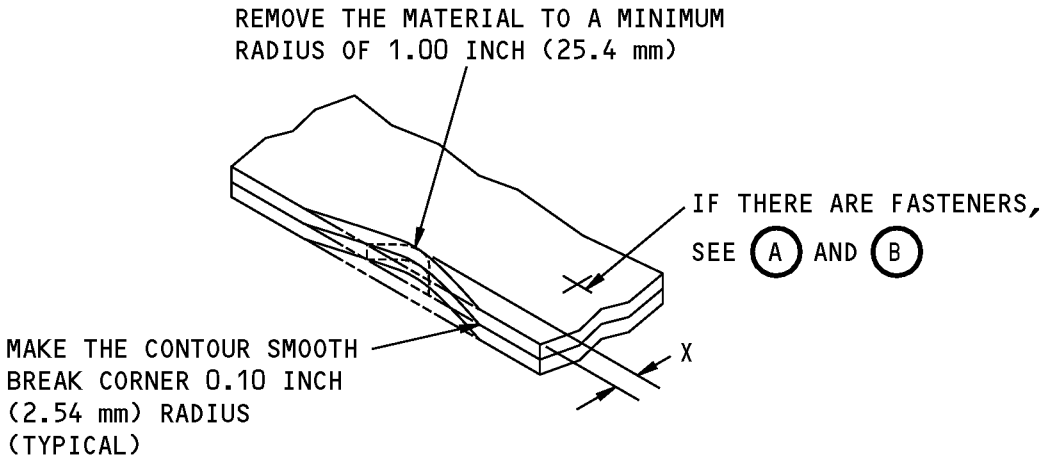
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

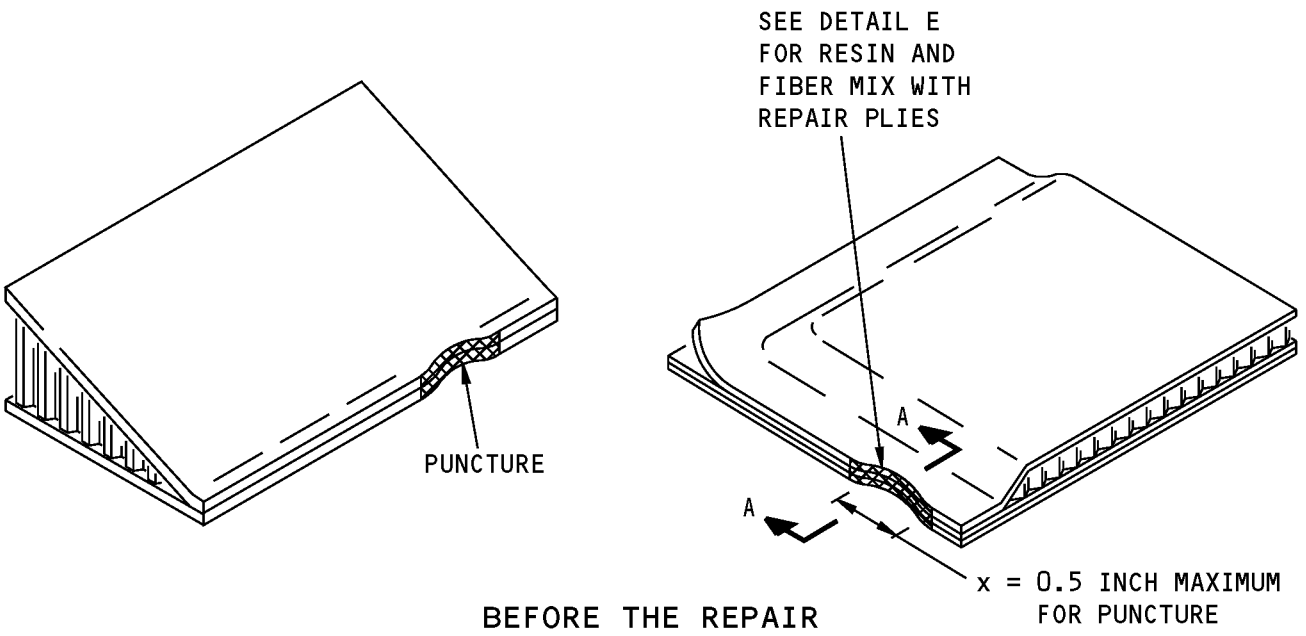


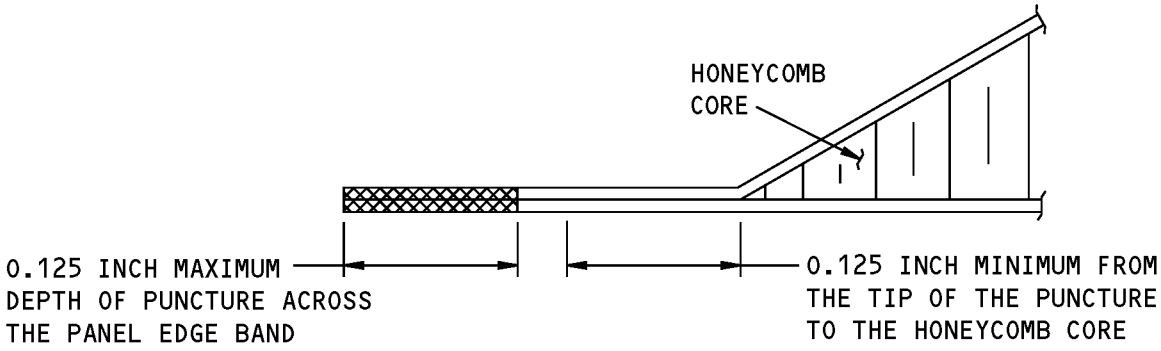
X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.125 INCH (3.18 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

C

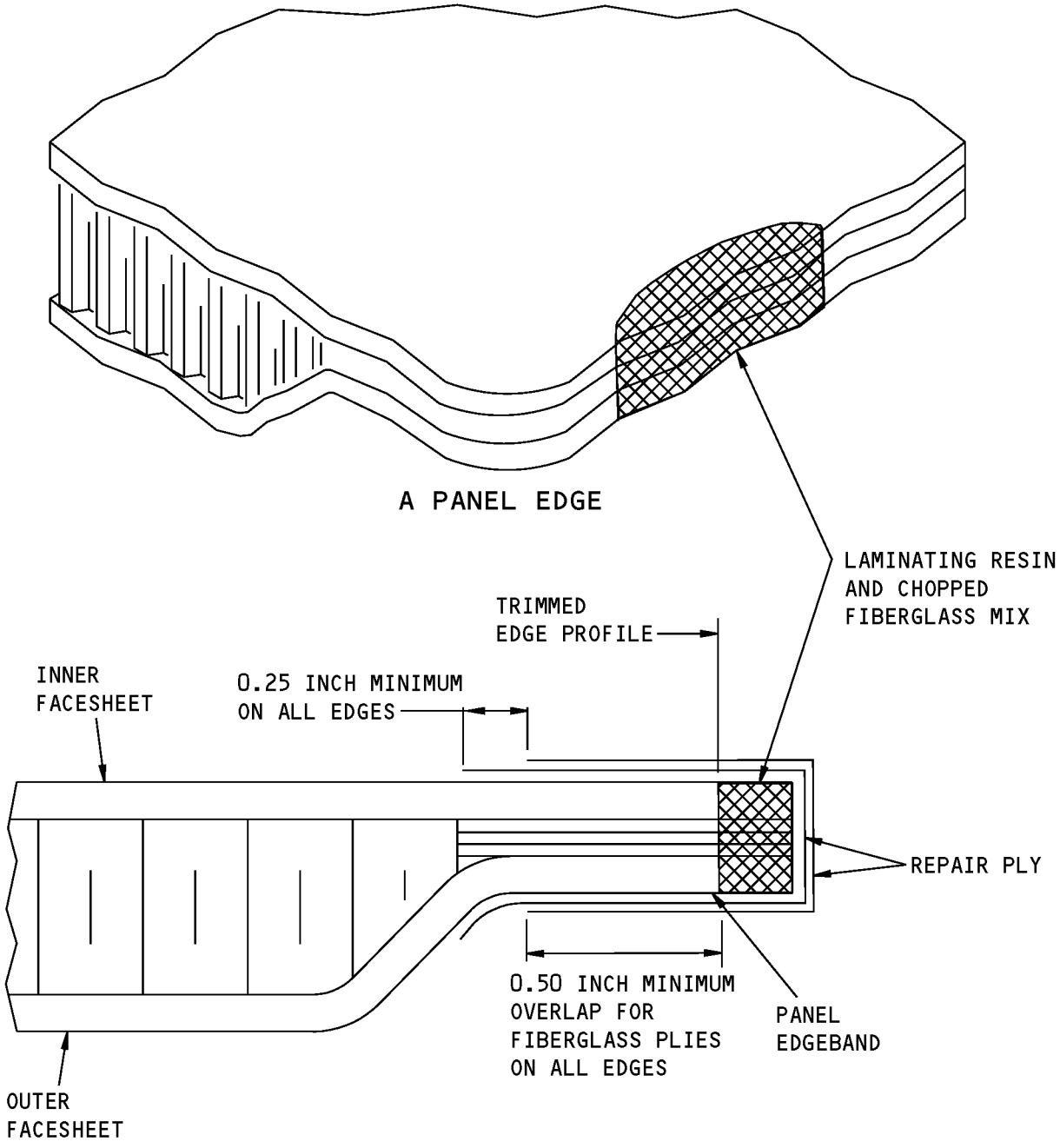
Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 4 of 8)





A–A
(TYPICAL)
D

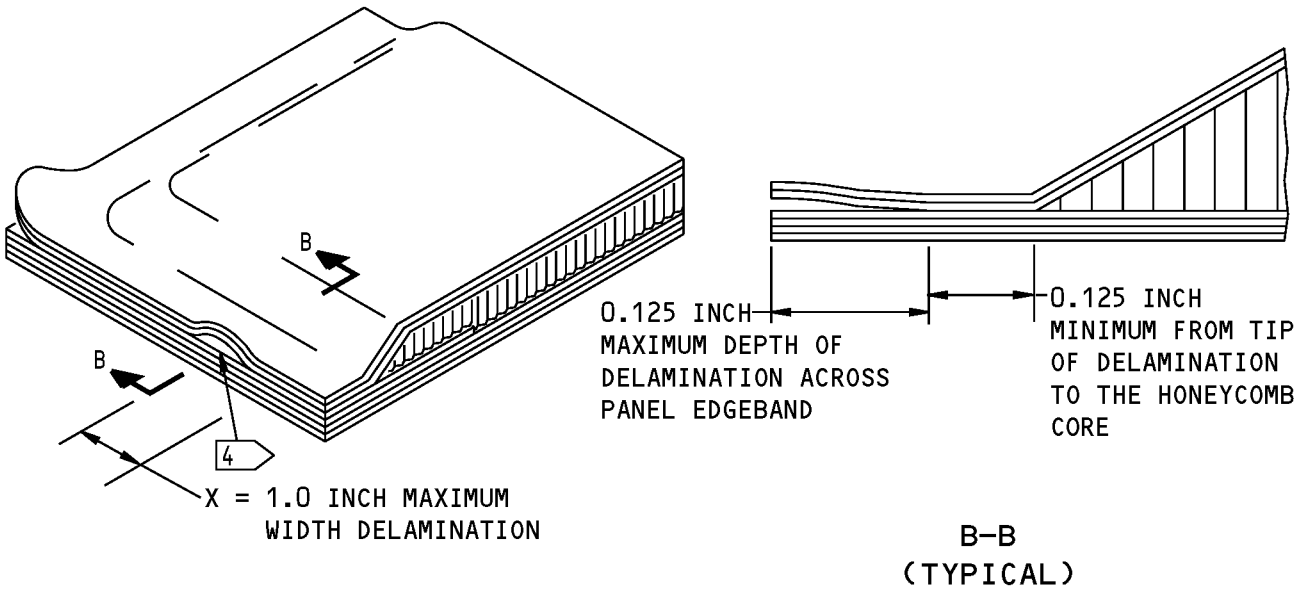
Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 5 of 8)

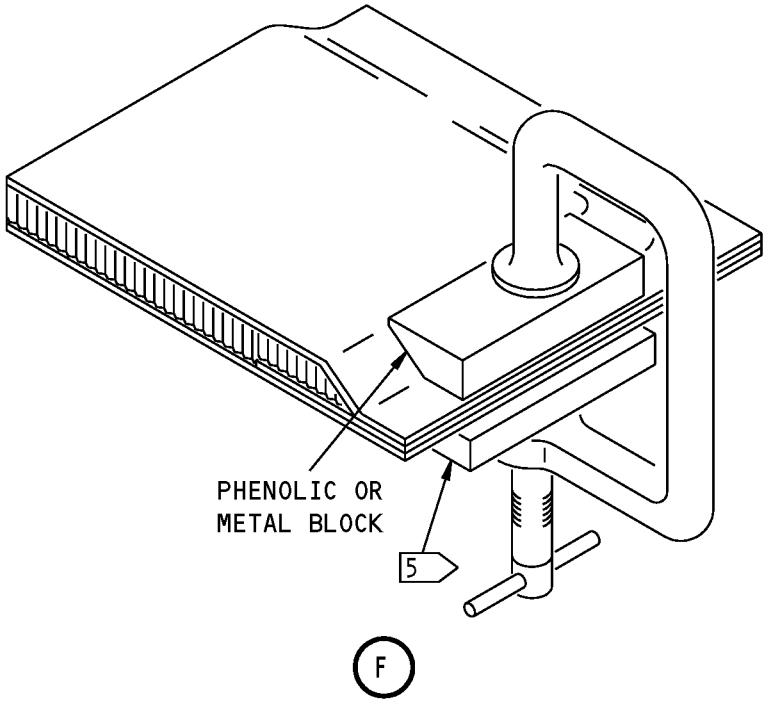


SECTION THROUGH THE CENTER OF THE REPAIR
(HONEYCOMB PANEL IS SHOWN)

E

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 6 of 8)





Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 7 of 8)

NOTES

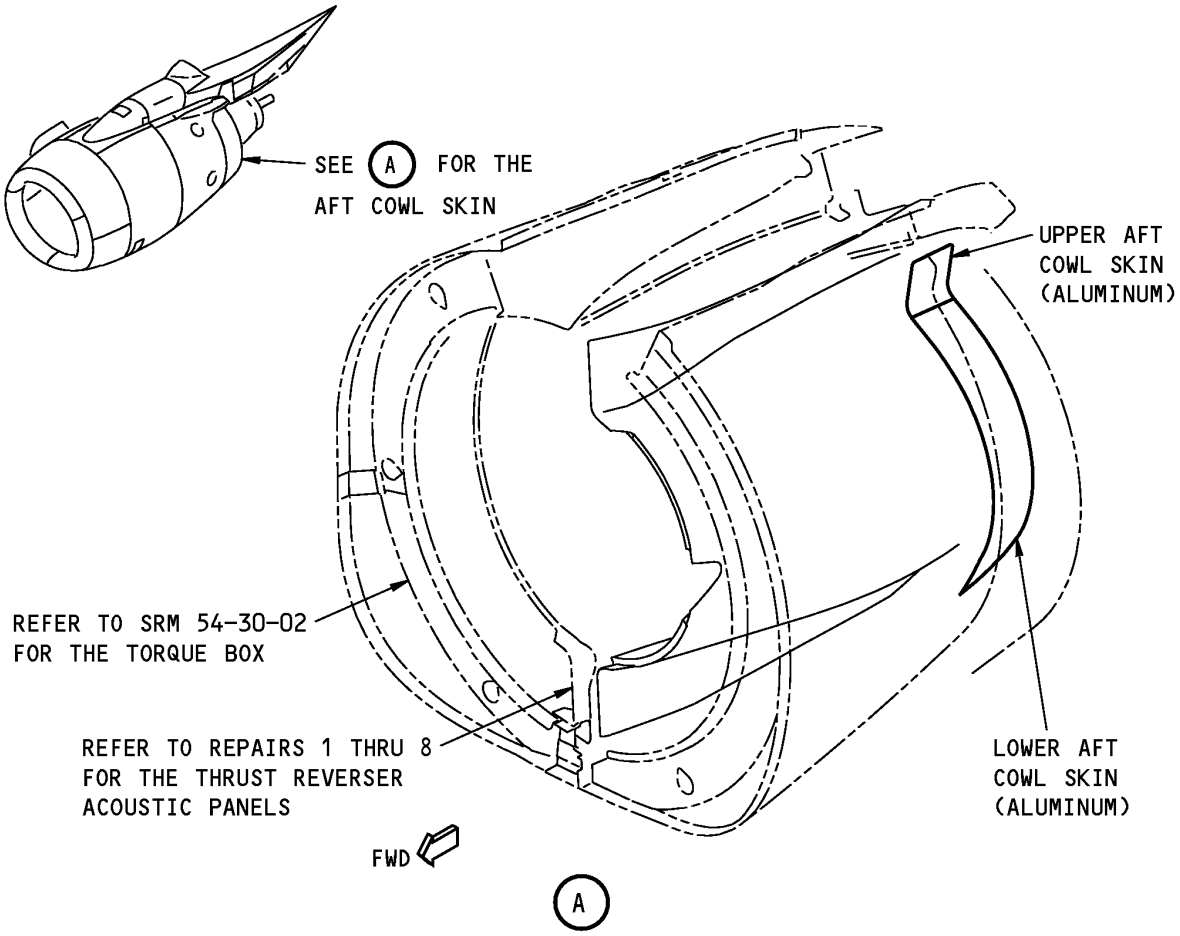
1. THE SUM OF ALL THE AREAS OF INTERIM REPAIRS IN HONEYCOMB CORE AREAS IS A MAXIMUM OF 1.0 INCH BY 1.0 INCH (25.4 mm BY 25.4 mm). THE SUM OF ALL AREAS OF LAMINATE EDGEBAND INTERIM REPAIRS IS A MAXIMUM OF 1.0 INCH BY 1.0 INCH (25.4 mm BY 25.4 mm). INTERIM REPAIRS SHALL NOT BE NEARER THAN 1.5 INCHES (38.1 mm) (EDGE TO EDGE) FROM ANY OTHER DAMAGE OR CATEGORY B REPAIRS ON ONE SIDE OF THE PANEL OR THE OTHER.
2. 250°F CURE CATEGORY A REPAIRS ARE NOT PERMITTED.
3. 150°F CURE CATEGORY B REPAIRS ARE NOT PERMITTED.
4. USE FORCE TO PUSH THE INJECTION RESIN INTO THE DELAMINATION.
5. USE A CLAMP TO KEEP THE PLIES TOGETHER.

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 8 of 8)

REPAIR 5 - THRUST REVERSER AFT COWL SKIN

1. Applicability

A. Repair 5 is applicable to the skin of the Thrust Reverser Aft Cowl as shown in Aft Cowl Skin Location, Figure 201/REPAIR 5.



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

Aft Cowl Skin Location
Figure 201

2. General

A. The typical repairs given in 51-70-13 can be used when applicable if:

(1) There is sufficient clearance between the repair parts and the adjacent structure.

B. Refer to the limits of the typical repairs given in and 51-70-13 before you start a repair.

3. References

Reference	Title
51-70-13	TYPICAL WEB REPAIRS
54-30-01, ALLOWABLE DAMAGE 4	Thrust Reverser Aft Cowl Skin
54-30-01, IDENTIFICATION 4	Thrust Reverser Aft Cowl Skin

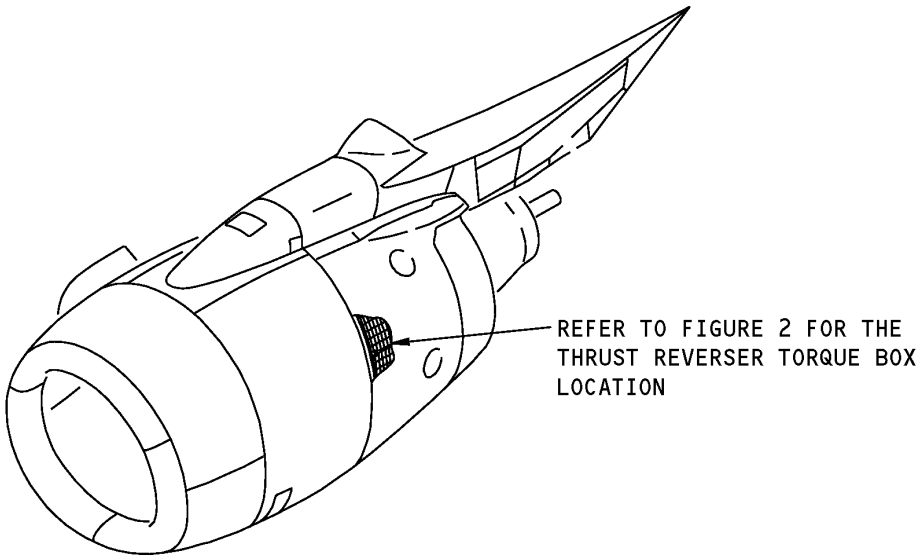
4. Repair Instructions

A. Refer to Table 201/REPAIR 5 to find the applicable repairs for the thrust reverser aft cowl skin.

Table 201:

REPAIR REFERENCES FOR THE ENGINE STRUT FORWARD FAIRING STRUCTURE	
COMPONENT	**REPAIR**
Upper and Lower Aft Cowl Skins	Refer to SRM 51-70-01

IDENTIFICATION 1 - THRUST REVERSER TORQUE BOX STRUCTURE

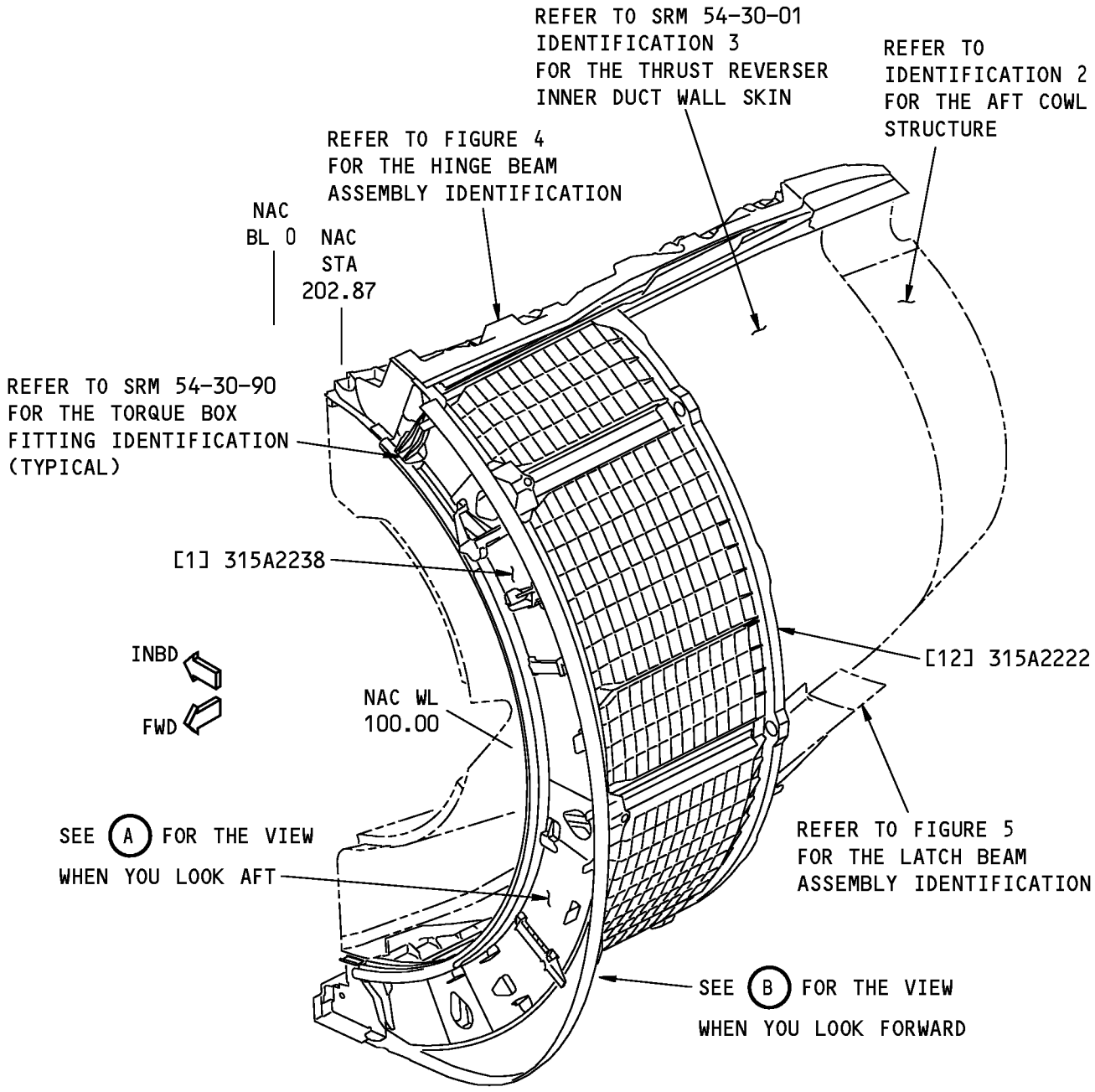


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Thrust Reverser Torque Box Structure
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
315A2202	Torque Box Installation
315A2231	Torque Box Structural Assembly
315A2232	Torque Box Assembly

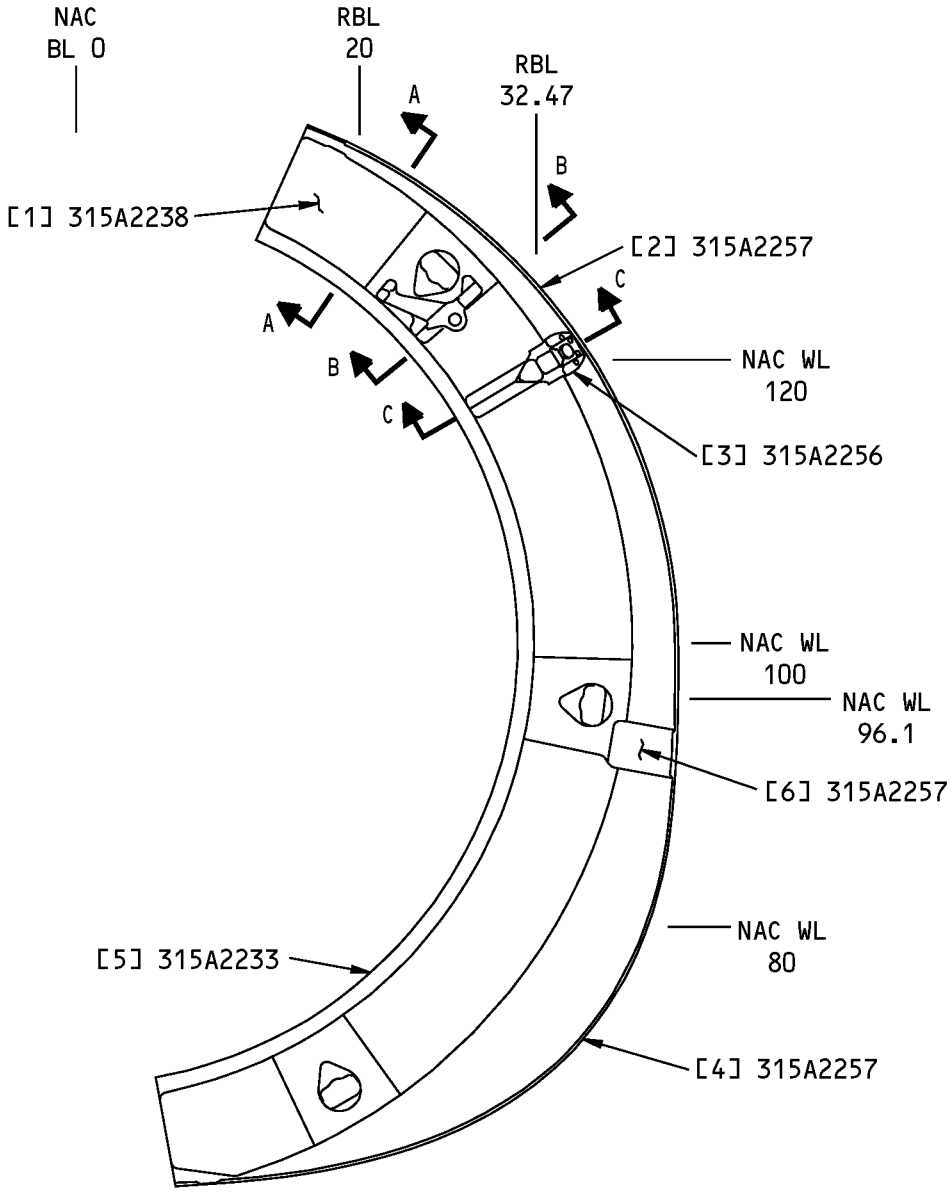


LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

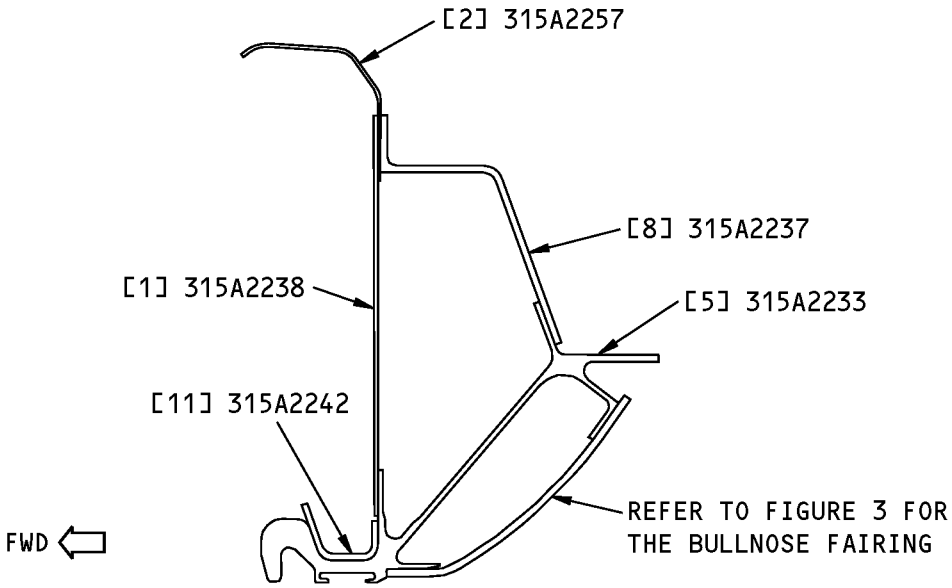
Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 1 of 8)



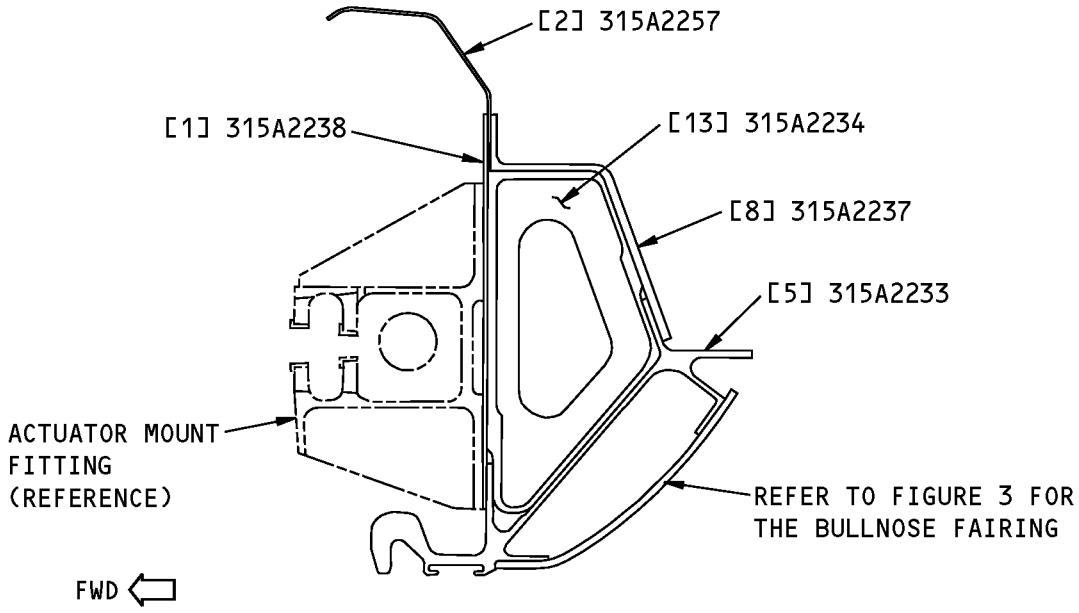
LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE VIEW WHEN YOU LOOK AFT

(A)

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 2 of 8)

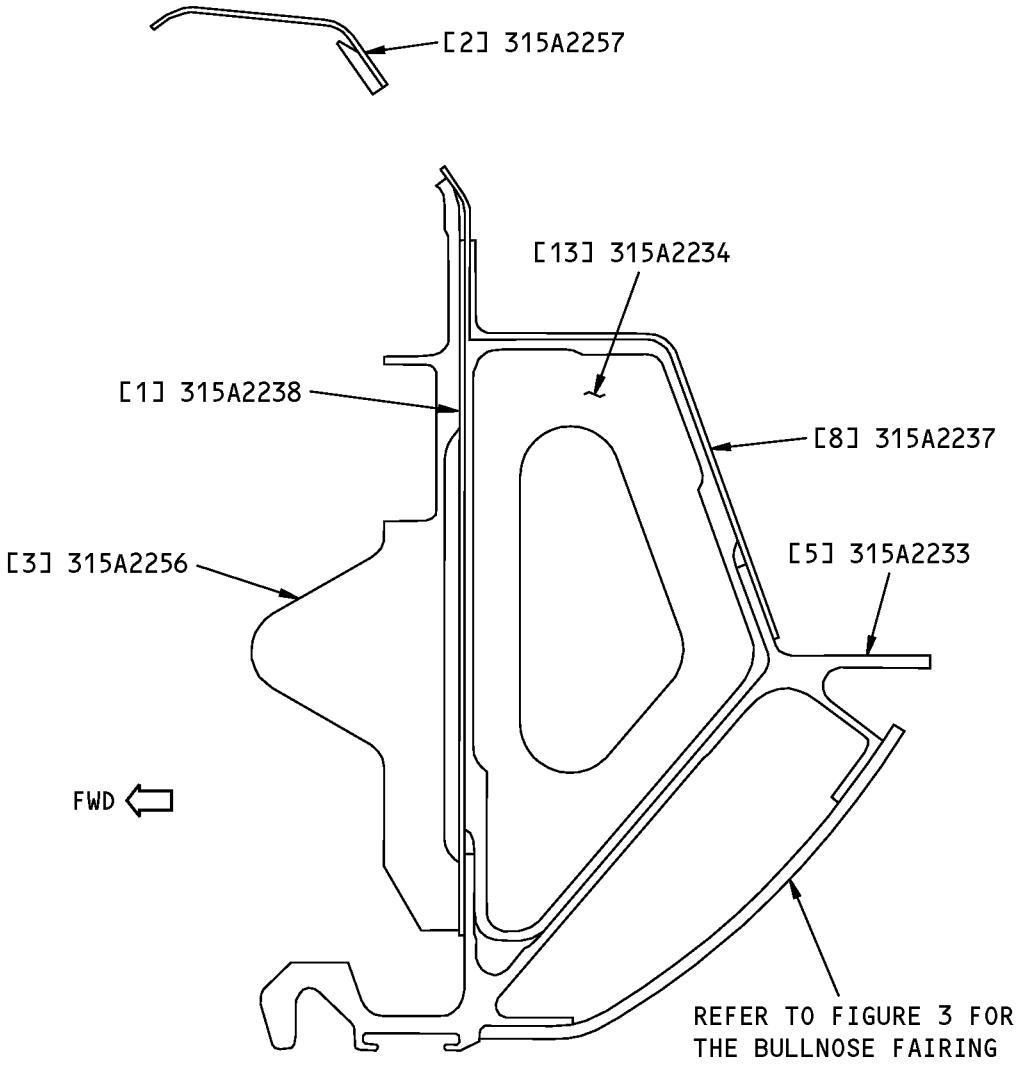


A–A

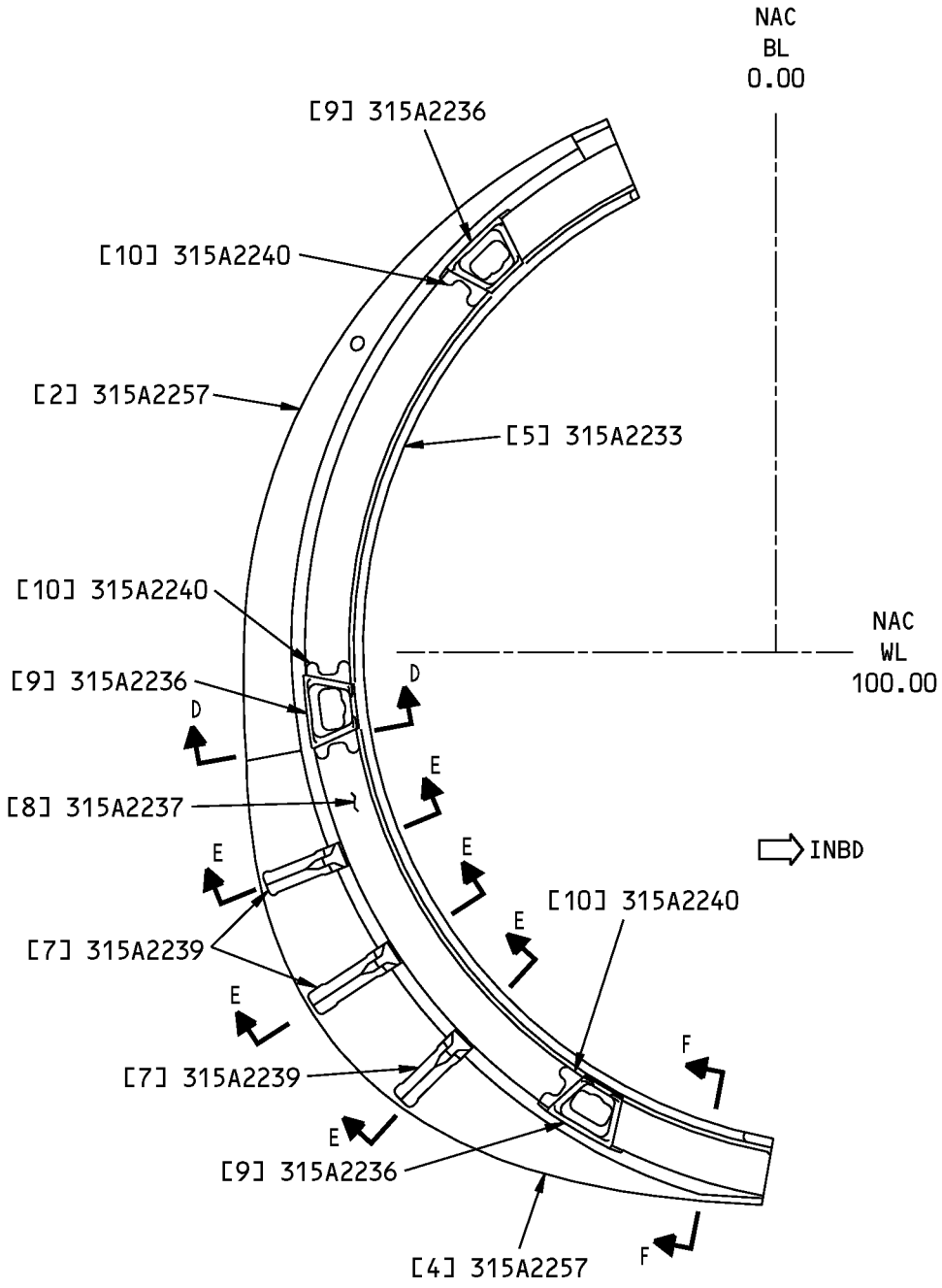


B–B

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 3 of 8)



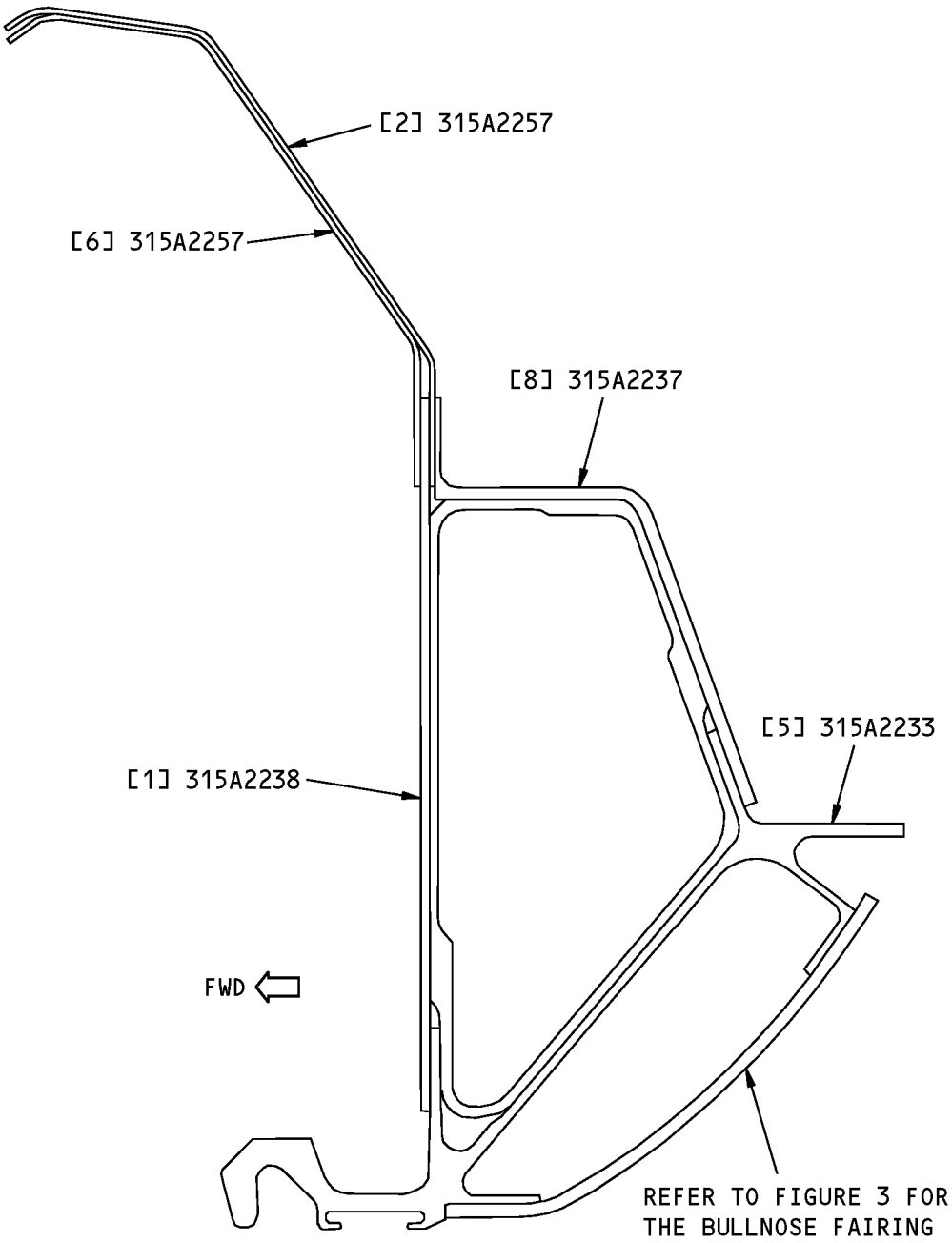
Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 4 of 8)



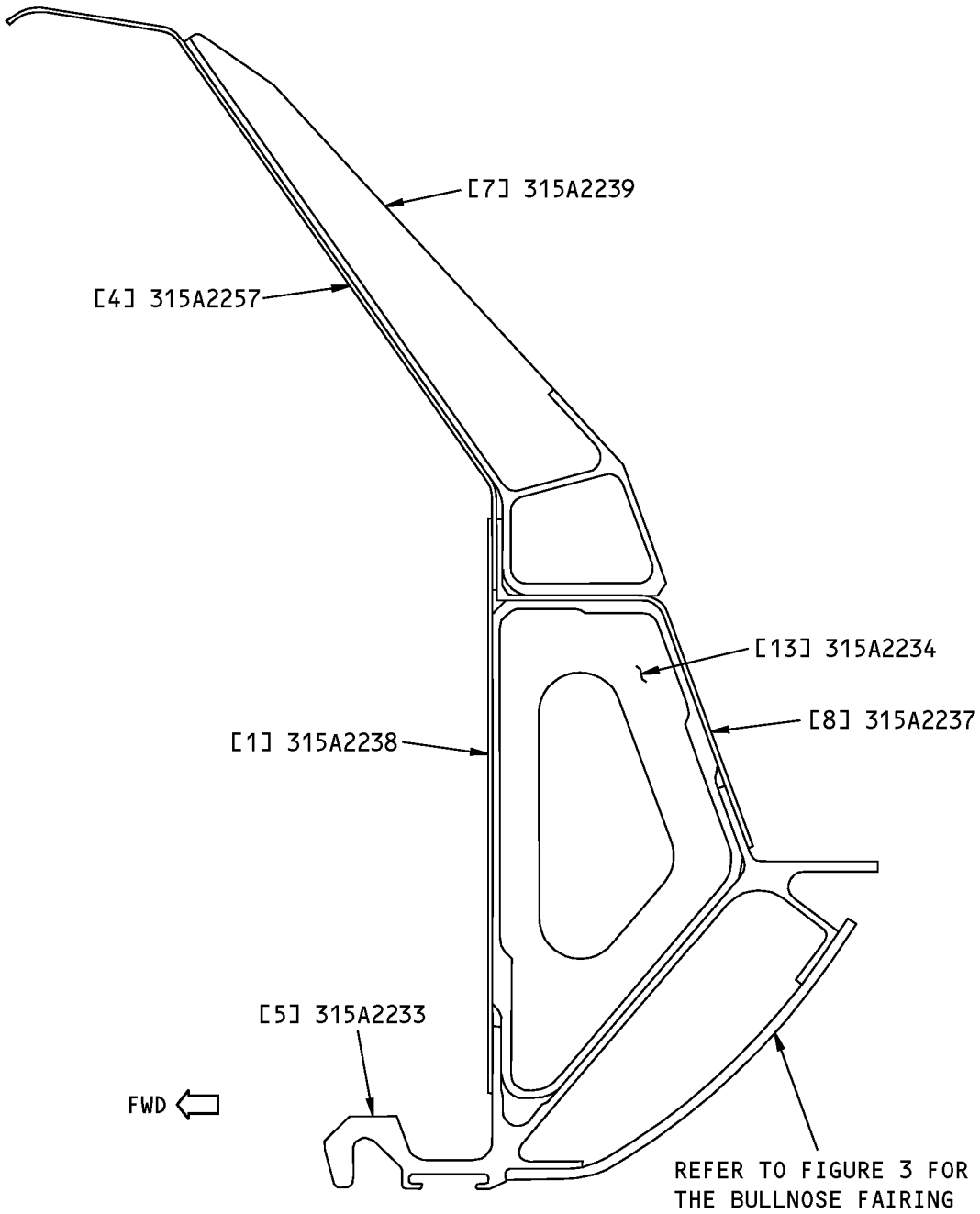
LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE VIEW WHEN YOU LOOK FORWORD

B

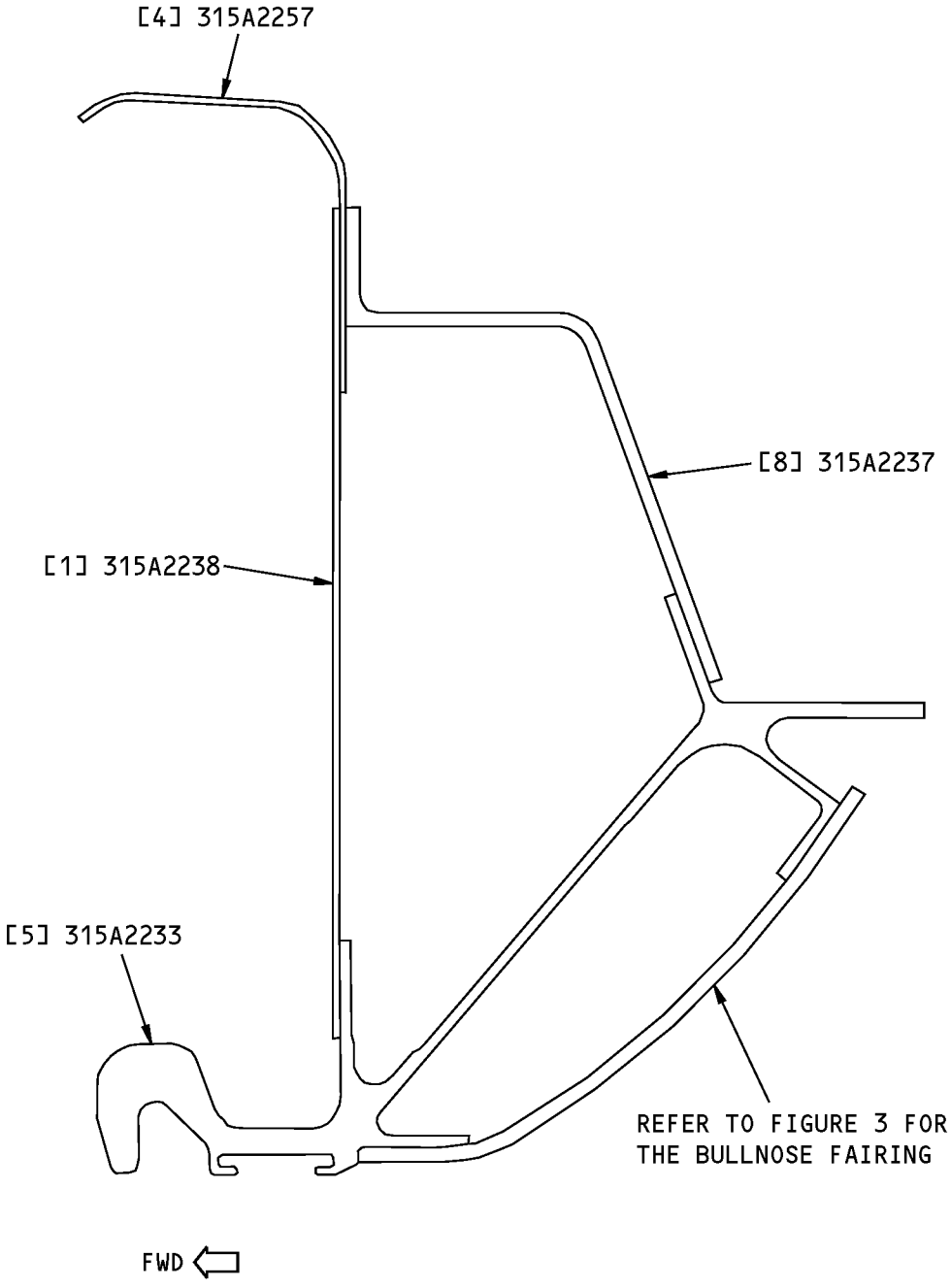
Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 5 of 8)



Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 6 of 8)



Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 7 of 8)

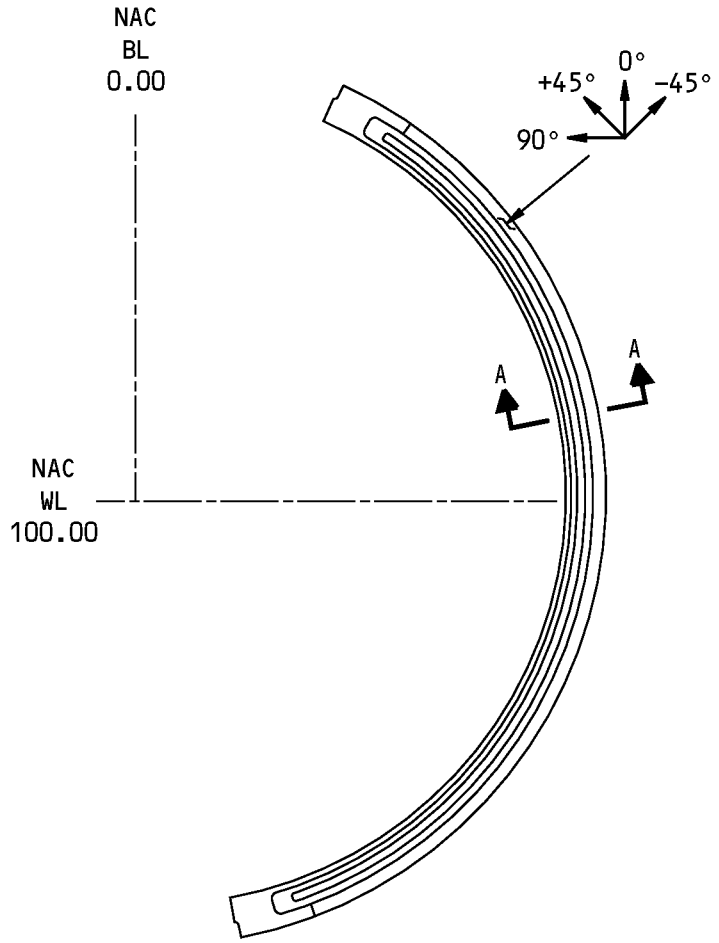


Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 8 of 8)

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Forward Web - Torque Box	0.080 (2.03)	Ti-6Al-4V titanium as given in MIL-T-9046, Code AB-1, in the annealed condition	
[2]	Outer Web - Upper		Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[3]	Mount Sleeve - Stow Sensor		7075-T73 die forging as given in BMS 7-186	
[4]	Outer Web - Lower		Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[5]	Outer V-Blade		7050-T7452 forged ring as given in BMS 7-214	
[6]	Outer Web - Splice		Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[7]	Gusset - Torque Box (3 locations)		7075-T73 die forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS 7-186)	
[8]	Aft Web - Torque Box		2024-T62 sheet as given in QQ-A-250/4 7050-T7452 rolled ring as given in BMS 7-214	Y6001 thru Y6017 Y6018 to Y8949
[9]	Actuator Attach Fitting (3 locations)		15-5 PH CRES bar as given in AMS 5659, heat treated to 150 to 170 KSI	
[10]	Doubler - Aft Web Cutout	0.050 (1.27)	2024-T62 clad sheet as given in QQ-A-250/4	Y6001 thru Y6017
[11]	V-Blade Fireshield	0.016 (0.41)	Commercially pure titanium, as given in MIL-T-9046, in the annealed condition	
[12]	Cascade Support Ring		7075-T73 forged ring as given in BMS 7-186	
[13]	Frame (5 locations)		7075-T73 die forging as given in BMS 7-186	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



LEFT BULLNOSE ASSEMBLY IS SHOWN,
RIGHT BULLNOSE ASSEMBLY IS THE SAME

VIEW WHEN YOU LOOK AFT
VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE

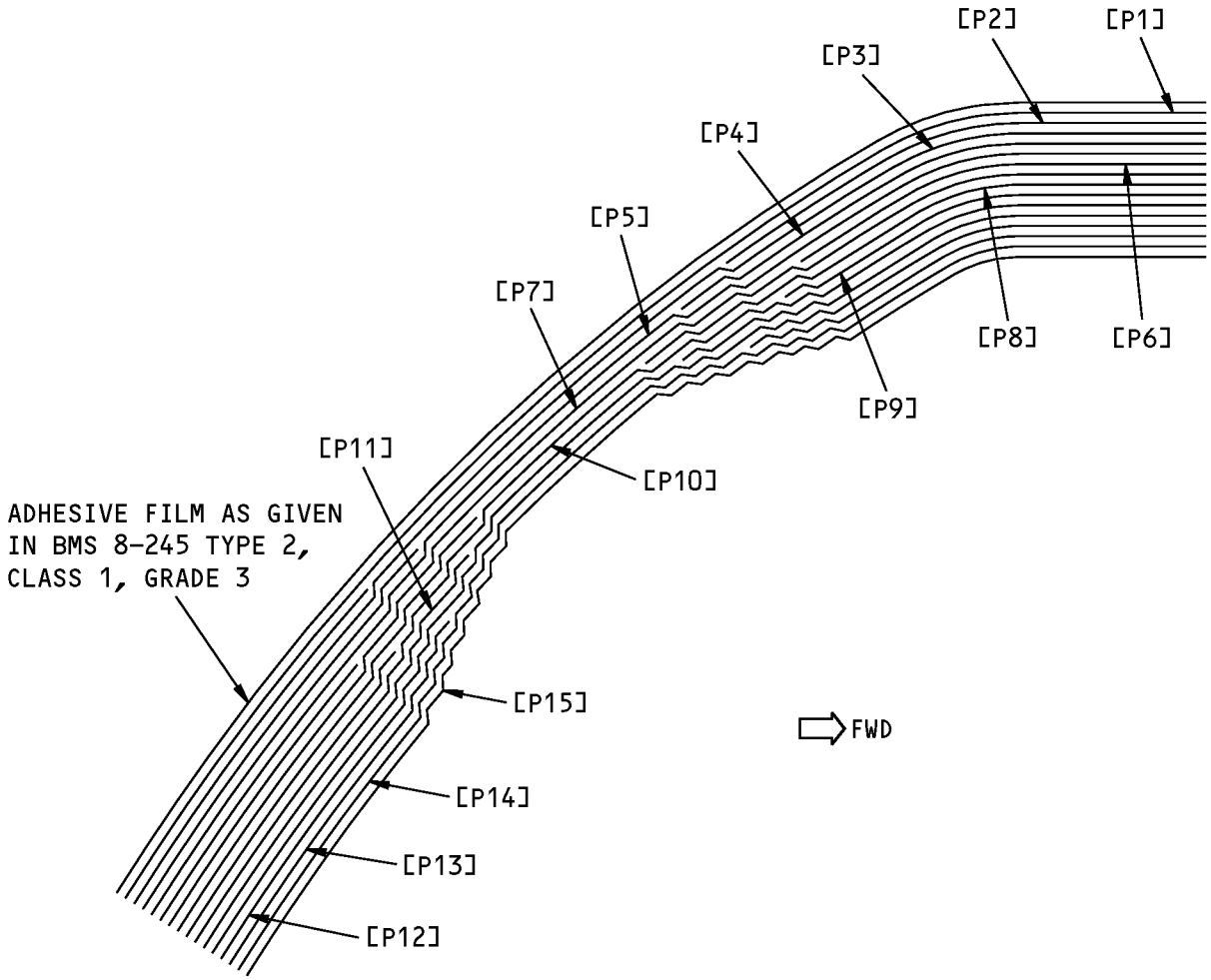
PLY LAYUP DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

Ply Direction and Ply Sequence for the Torque Box Bullnose Assembly
Figure 3 (Sheet 1 of 2)

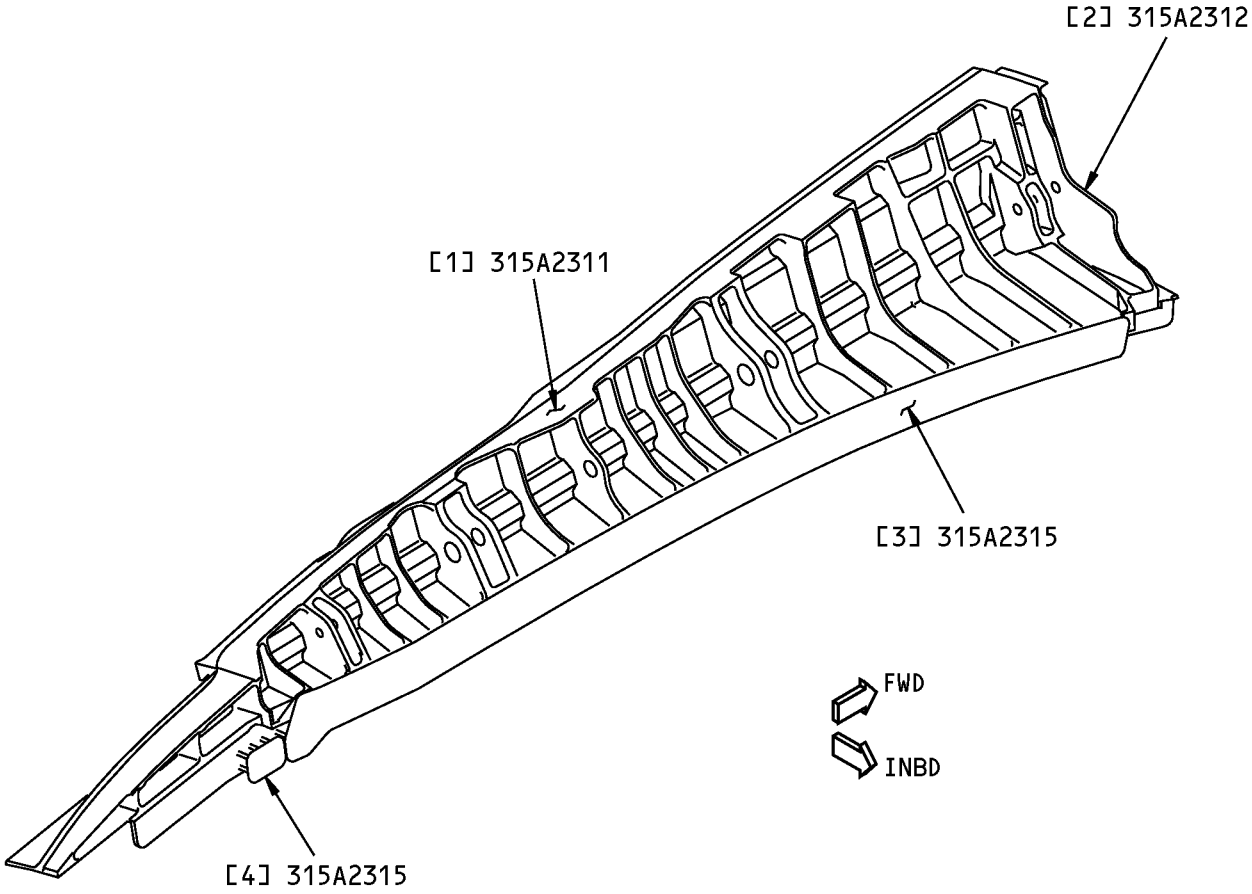


PLY SEQUENCE
A-A

Ply Direction and Ply Sequence for the Torque Box Bullnose Assembly
Figure 3 (Sheet 2 of 2)

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION A-A		
PLY	**DIRECTION**	**MATERIAL**
P1, P4, P7, P8, P11, P14	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW, nominal thickness 0.0083 inch (0.21 mm)
P2, P3, P5, P6, P9, P10, P12, P13	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW, nominal thickness 0.0083 inch (0.21 mm)
P15	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108, Class III, nominal thickness 0.0025 inch (0.06 mm)



NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

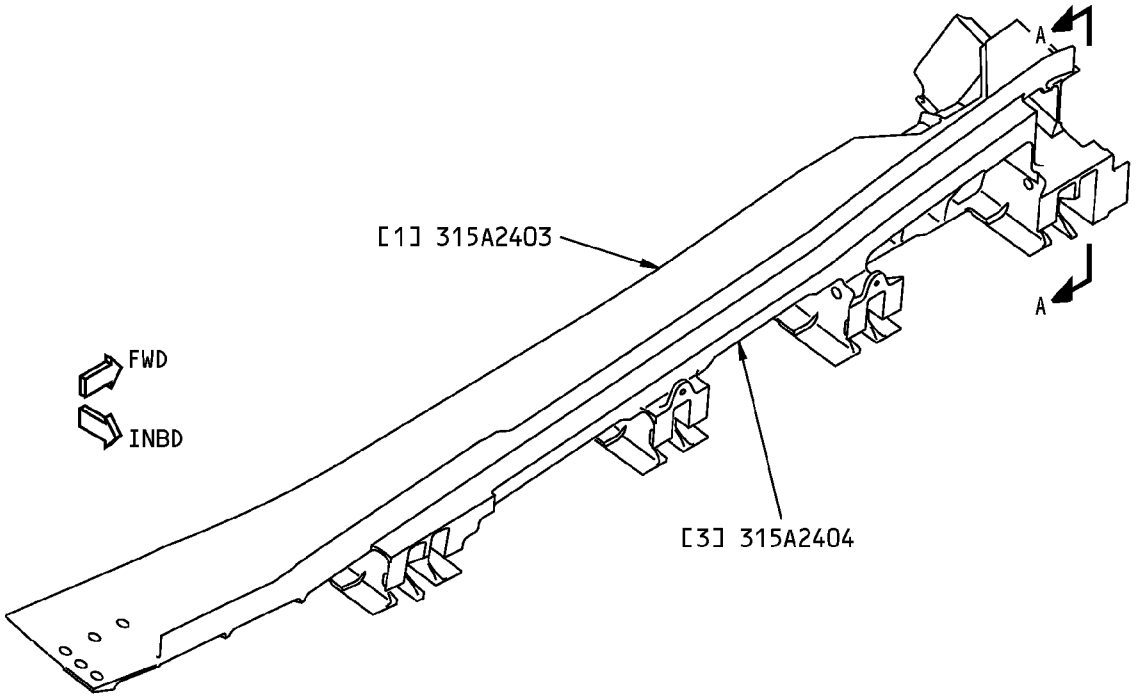
LEFT HINGE BEAM IS SHOWN, RIGHT HINGE BEAM IS OPPOSITE

Thrust Reverser Hinge Beam Assembly Identification
Figure 4

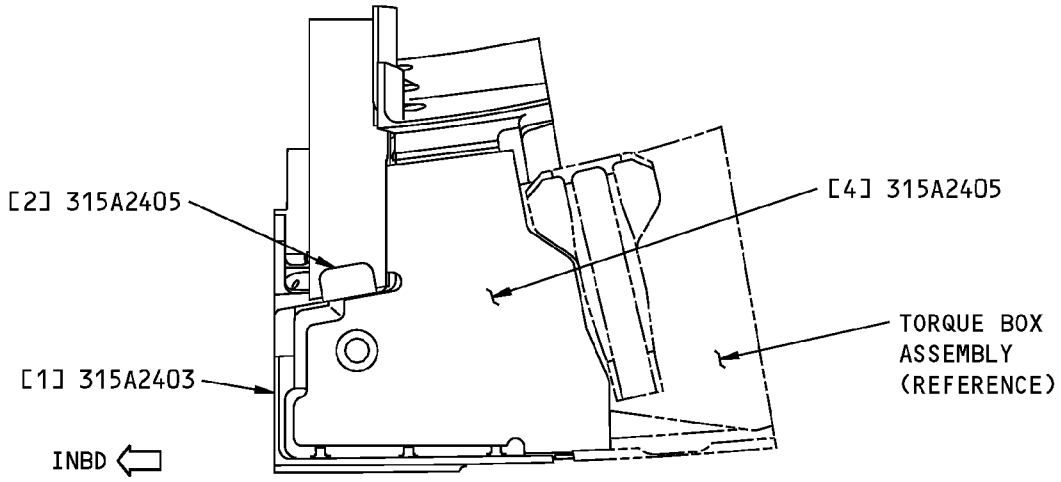
Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Hinge Beam		7075-T73 forged block as given in BMS 7-186	
[2]	Forward Firewall	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[3]	Splice Plate	0.071 (1.80)	2024-T81 clad sheet as given in QQ-A-250/5	
[4]	Splice Plate	0.050 (1.27)	2024-T81 clad sheet as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



LEFT LATCH BEAM IS SHOWN, RIGHT LATCH BEAM IS OPPOSITE



A–A

NOTES

- REFER TO TABLE 5 FOR THE LIST OF MATERIALS.

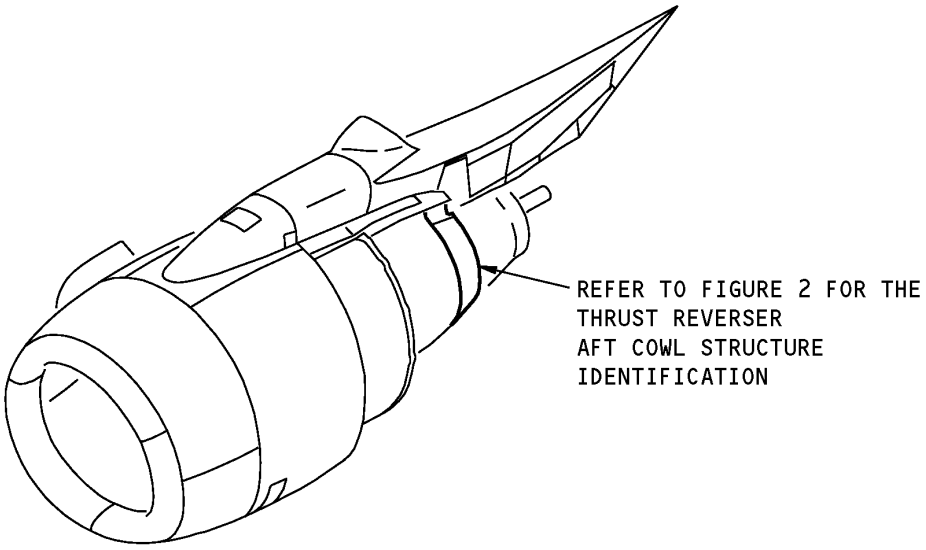
Thrust Reverser Latch Beam Assembly Identification
Figure 5

Table 5:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Latch Beam		7075-T73 forged block as given in BMS 7-186	
[2]	Fireshield	0.040 (1.02)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[3]	Splice Plate Cover	0.071 (1.80)	2024-T81 sheet as give in QQ-A-250/5	
[4]	Fireshield	0.032 (0.81)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

IDENTIFICATION 2 - THRUST REVERSER AFT COWL STRUCTURE

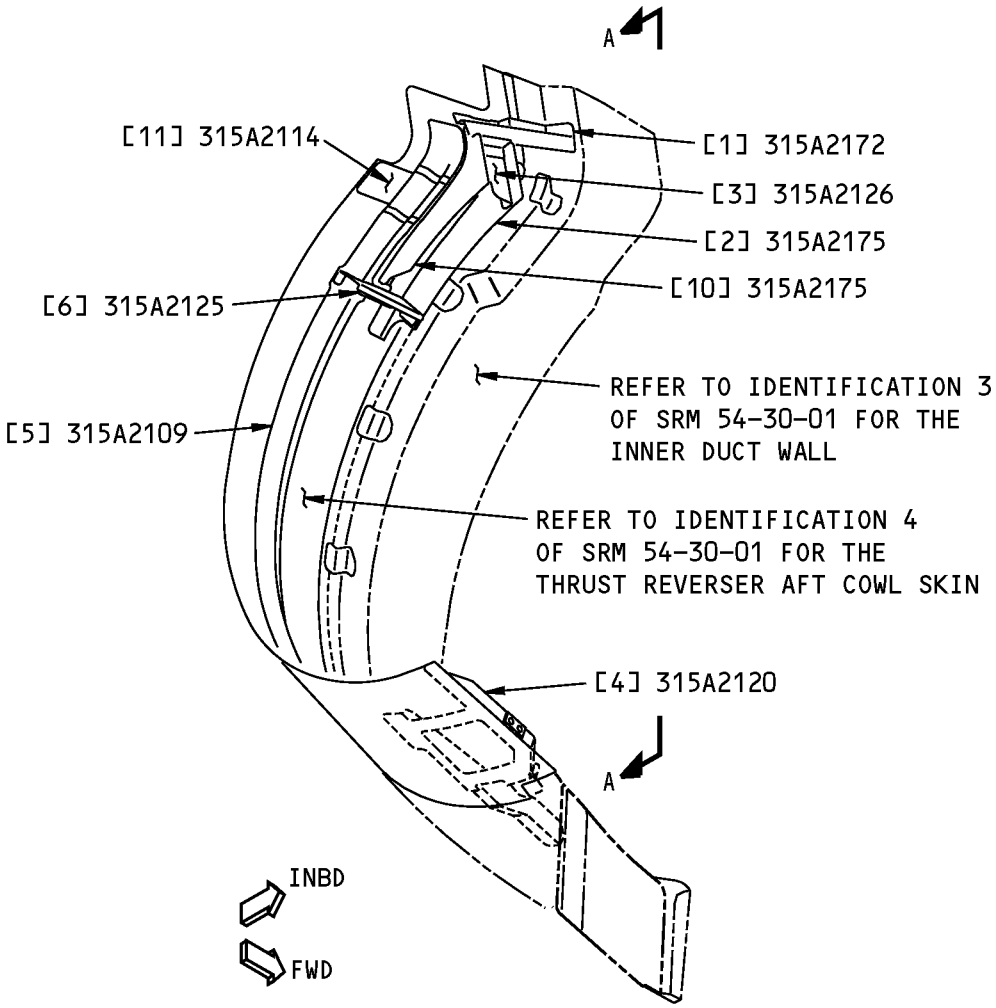


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Thrust Reverser Aft Cowl Structure Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
301A2094	Management Premodule Collector - 737 CFM56-7 Nacelle Propulsion System Basic
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2103	Aft Cowl Panel Installation
315A2104	Aft Cowl Panel Assembly

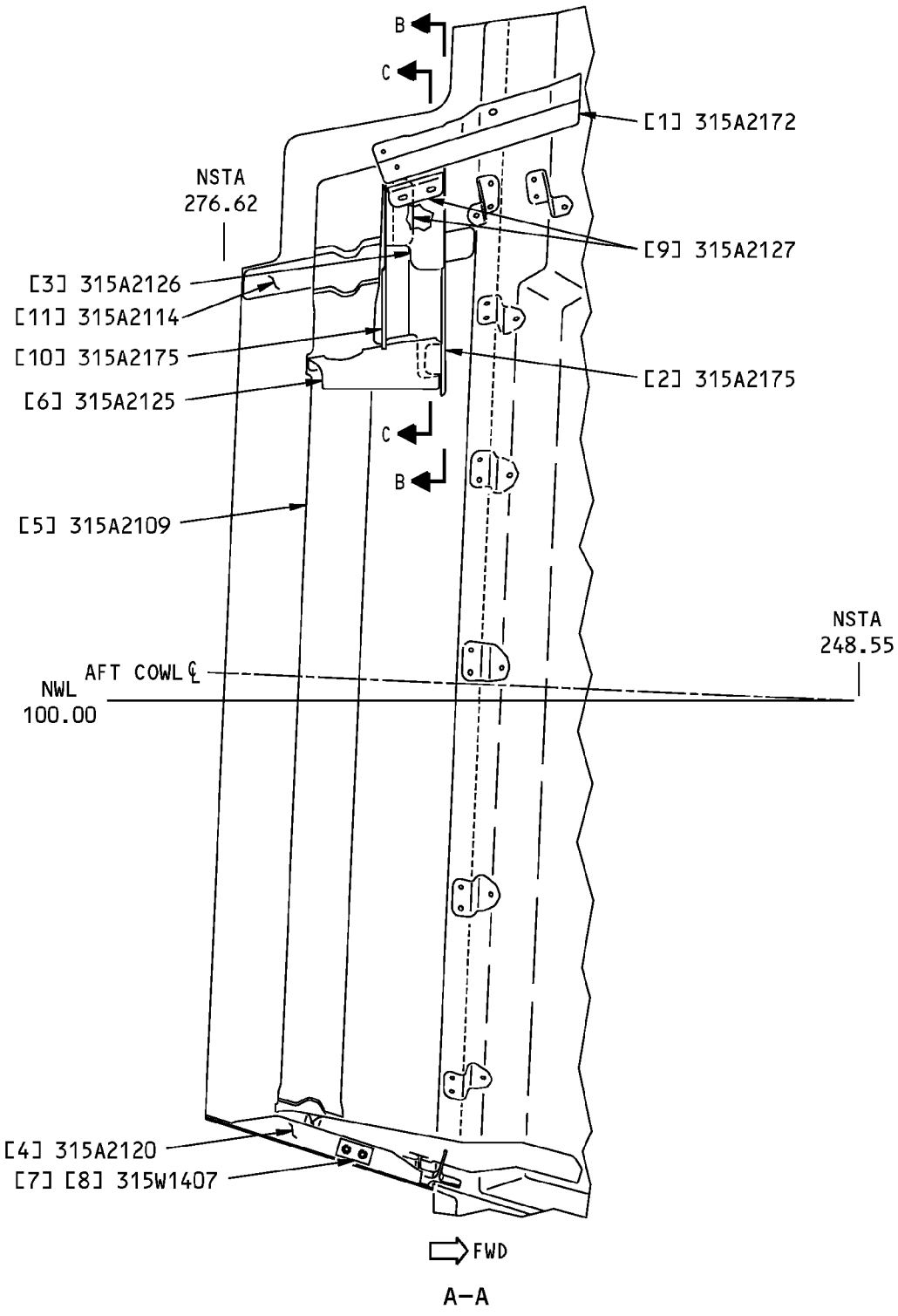


LEFT AFT COWL IS SHOWN,
RIGHT AFT COWL IS OPPOSITE

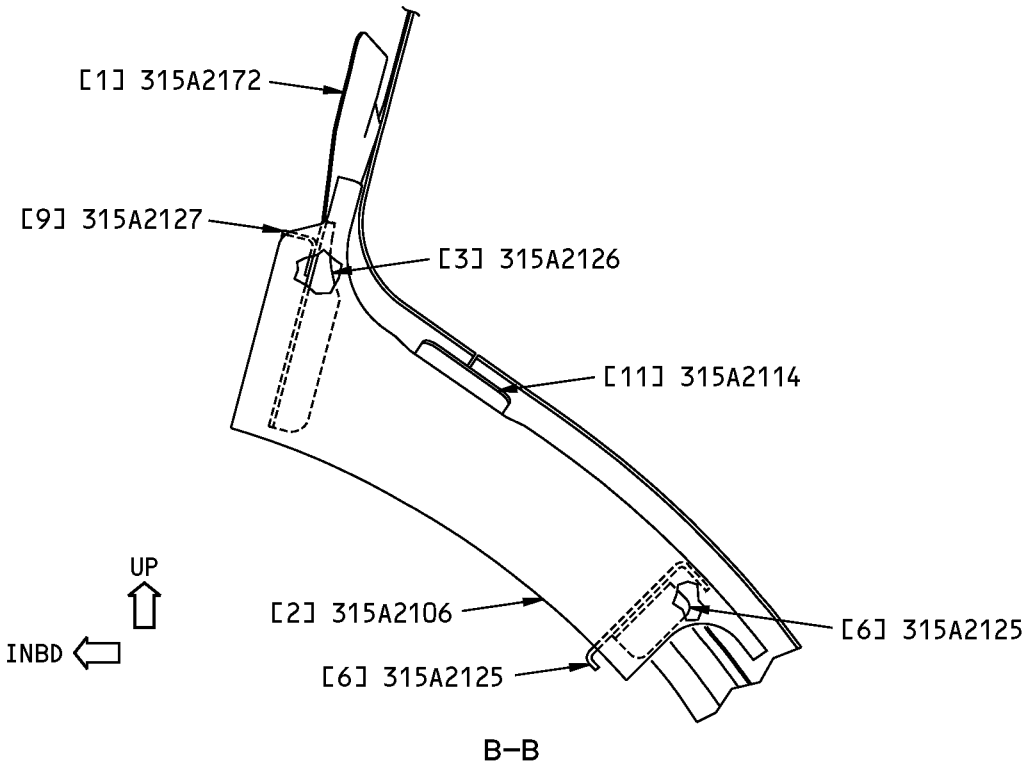
NOTES

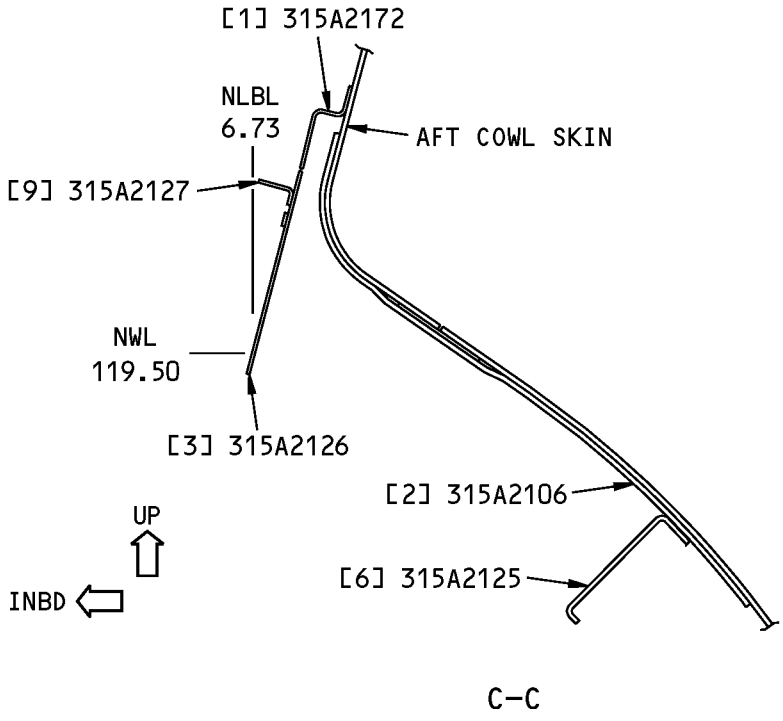
- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 1 of 3)



Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 2 of 3)





Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 3 of 3)

Table 2:

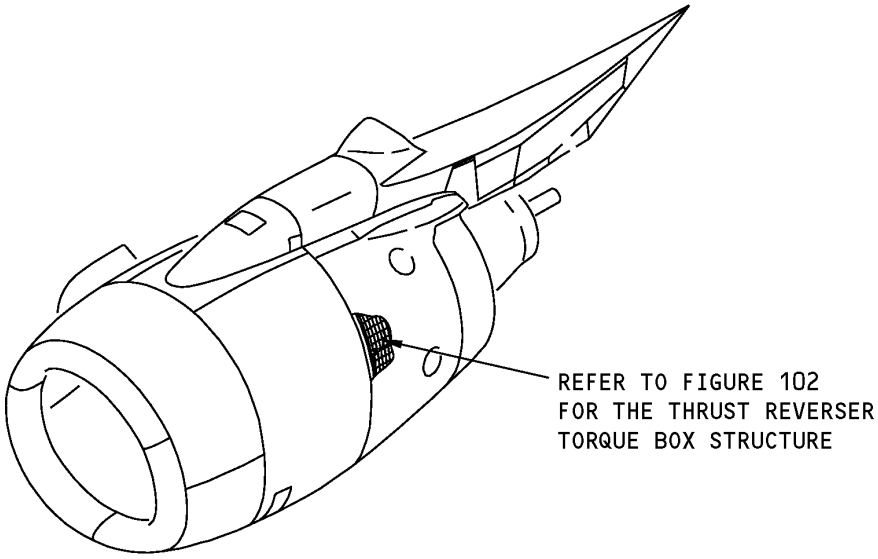
LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Standoff - Upper Fire Seal	0.050 (1.27)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[2]	Fire Barrier - Upper	0.063 (1.60)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[3]	Standoff - Lower Fire Seal	0.040 (1.02)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[4]	Lower Closeout Fitting	2.5 (63.5)	Ti-6Al-2Sn-4Zr-2Mo titanium plate as given in MIL-T-9046, Code AB-4, condition DA (Optional: Ti-6Al-2Sn-4Zr-2Mo bar as given in MIL-T-9047, condition DA)	
[5]	Frame - Aft Cowl Trailing Edge	0.050 (1.27)	Ti-6Al-2Sn-4Zr-2Mo titanium as given in MIL-T-9046, composition AB-4, condition DA	
[6]	Fire Barrier - Lower Aft Cowl	0.050 (1.27)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[7]	Wear Plate	0.100 (2.54)	2024-T63 sheet as given in QQ-A-250/4	
[8]	Spacer	0.016 (0.41)	2024-T81 clad sheet as given in QQ-A-250/5	
[9]	Clip - Fire Seal	0.040 (0.41)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[10]	Fire Seal Bracket	0.050 (1.27)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[11]	Splice Plate	0.071 (1.80)	2219-T81 sheet as given in QQ-A-250/30	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

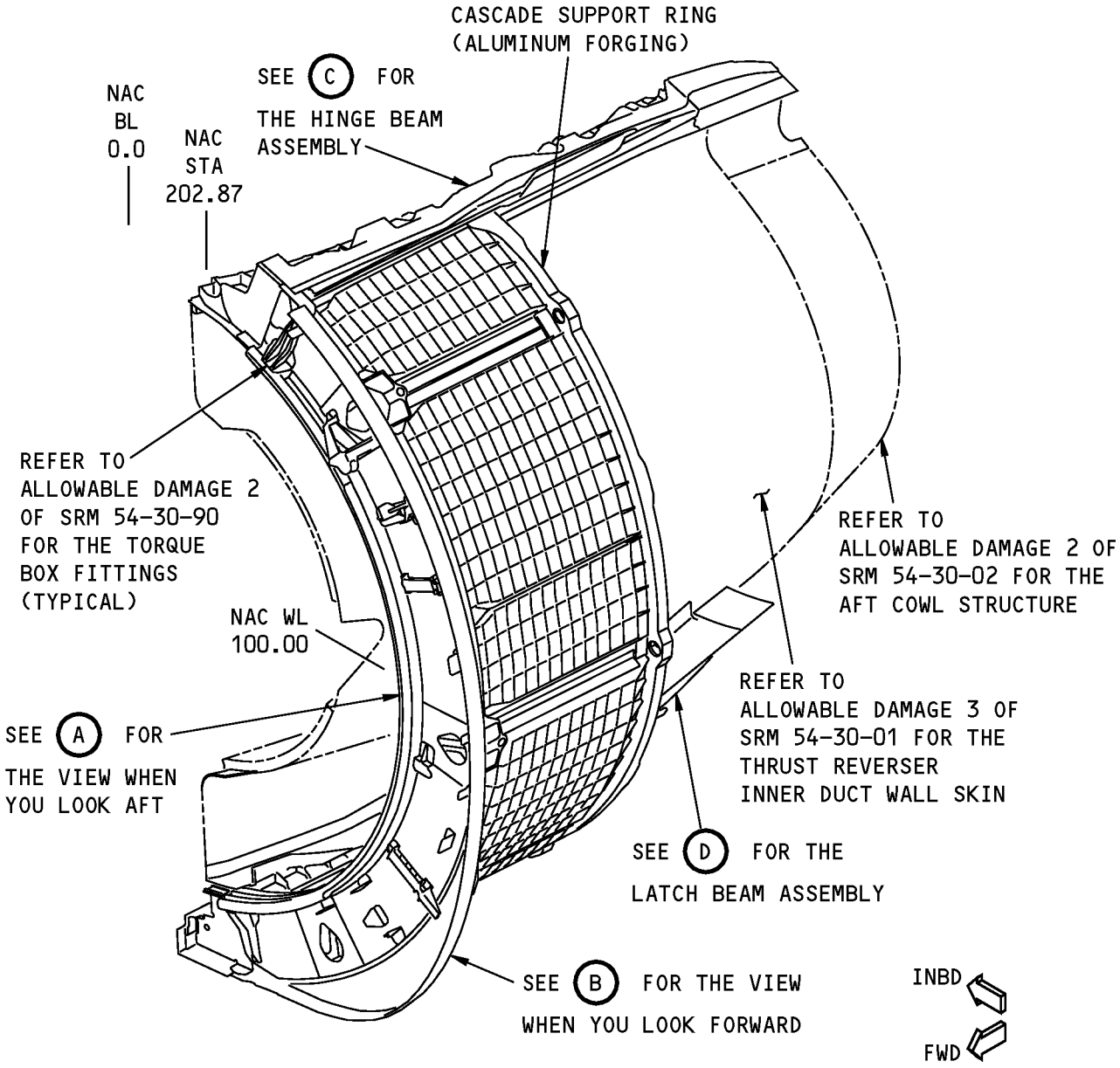
ALLOWABLE DAMAGE 1 - THRUST REVERSER TORQUE BOX STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the thrust reverser torque box structure shown in Thrust Reverser Torque Box Structure Location, Figure 101/ALLOWABLE DAMAGE 1.

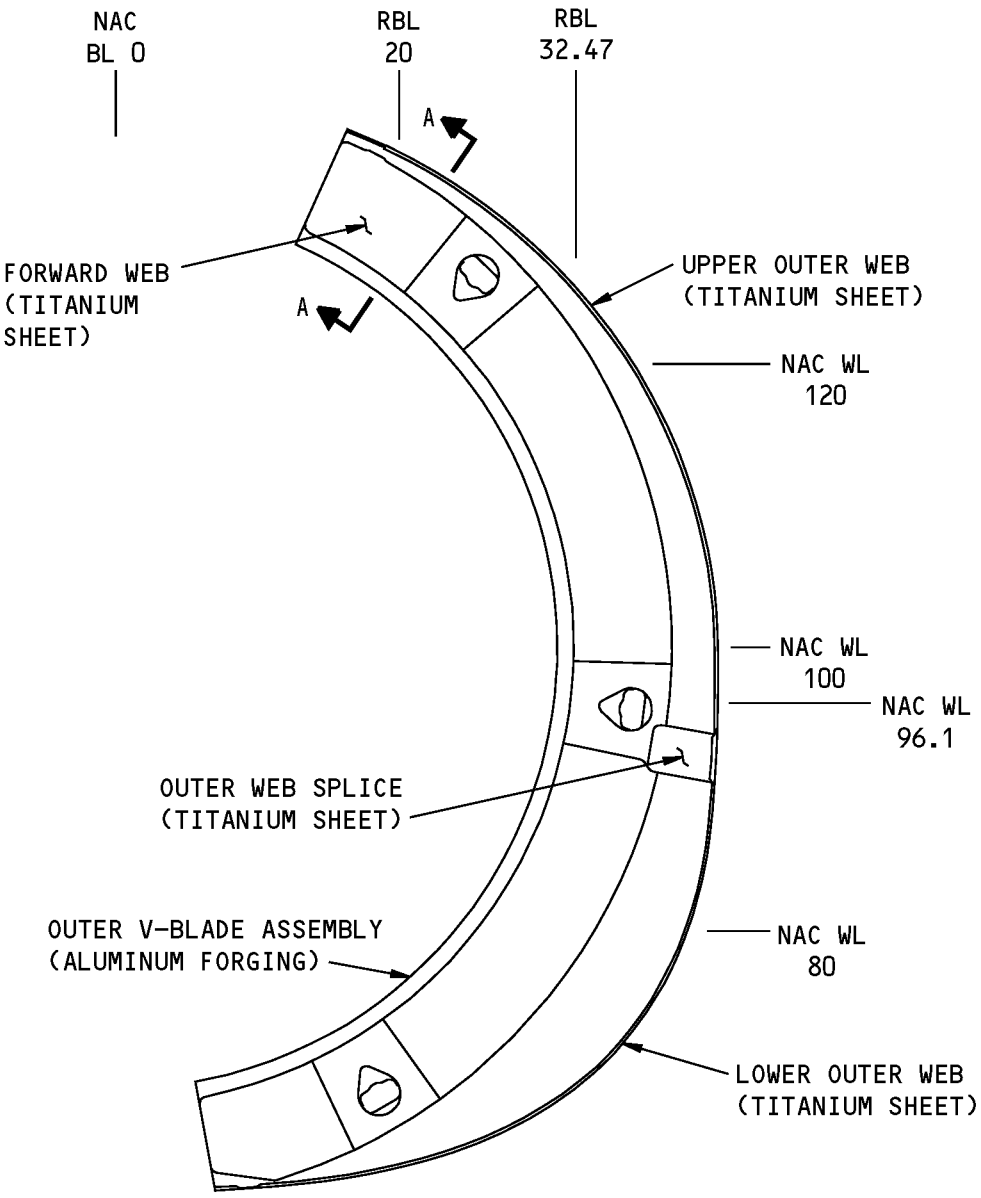


Thrust Reverser Torque Box Structure Location
Figure 101



LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 1 of 7)

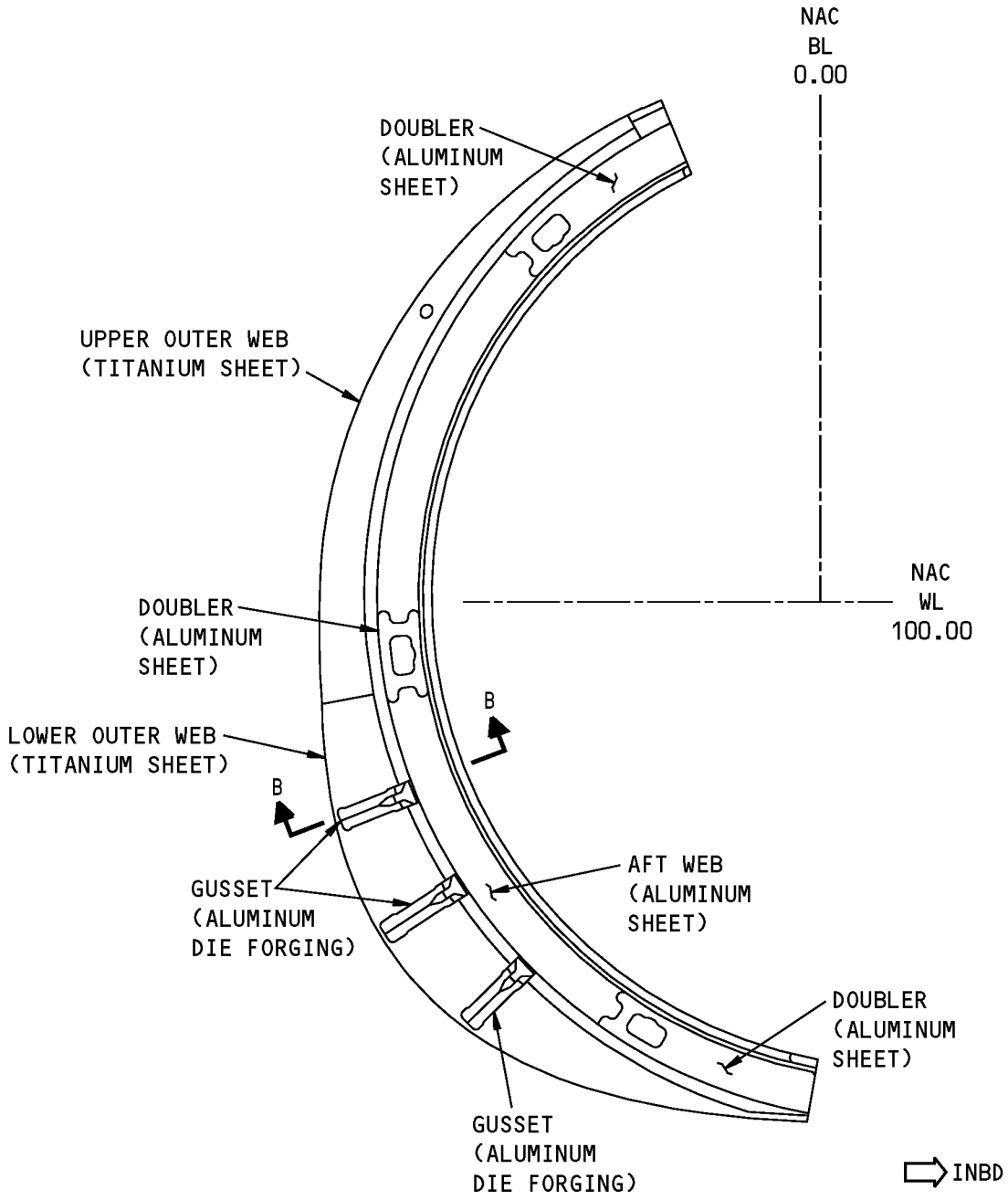


LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

VIEW WHEN YOU LOOK AFT

(A)

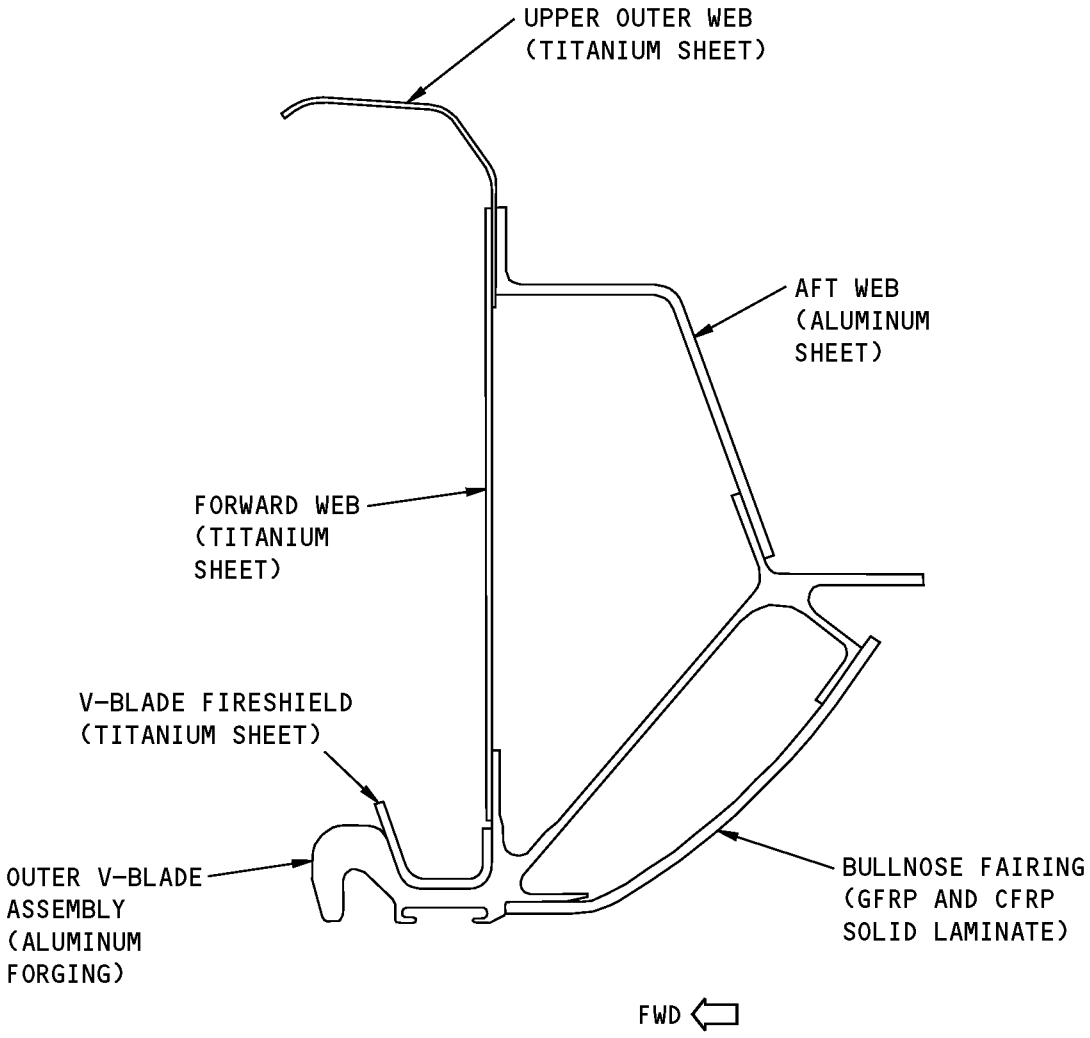
Thrust Reverser Torque Box Structure
Figure 102 (Sheet 2 of 7)



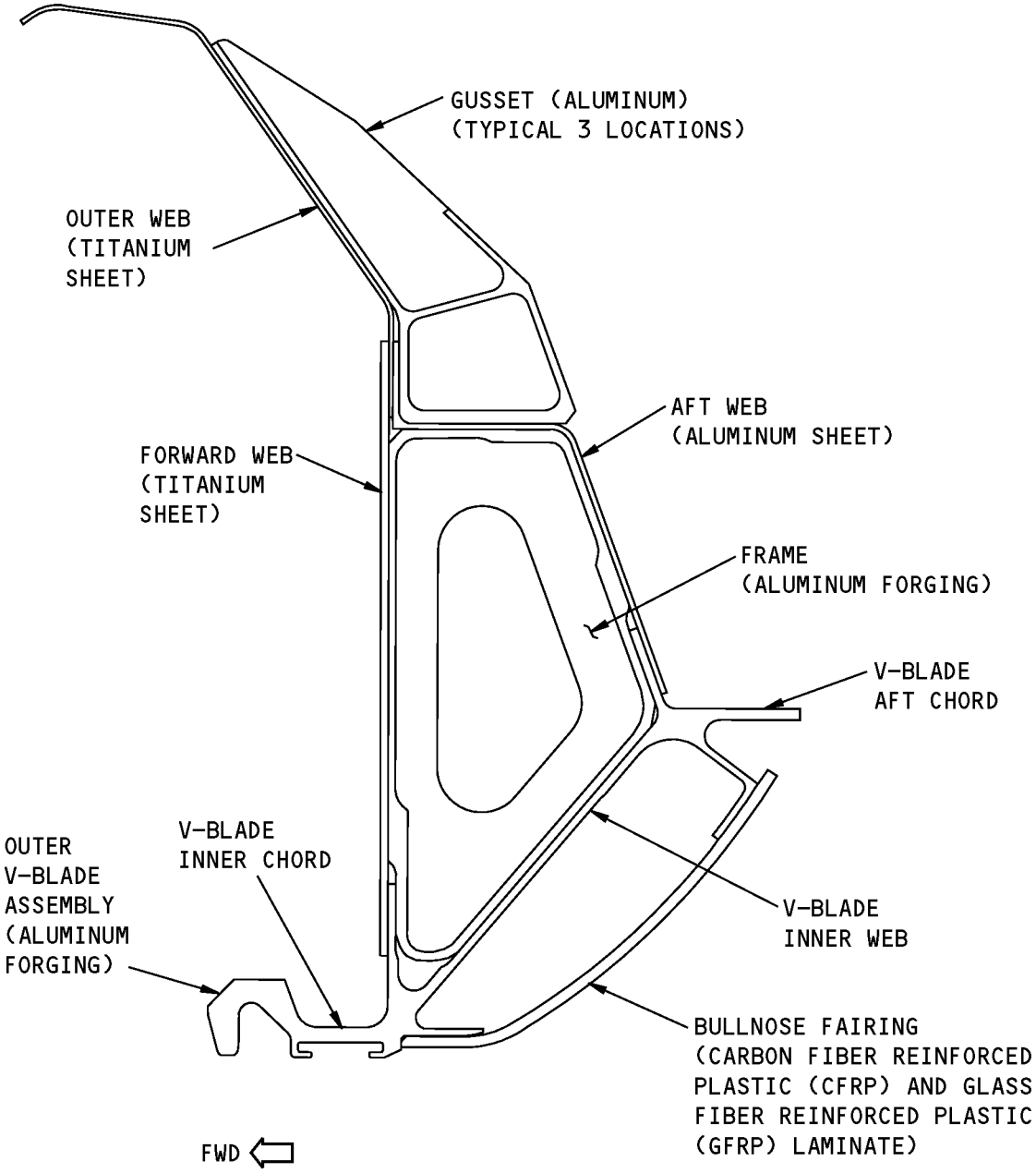
LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE VIEW WHEN YOU LOOK FORWORD

B

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 3 of 7)

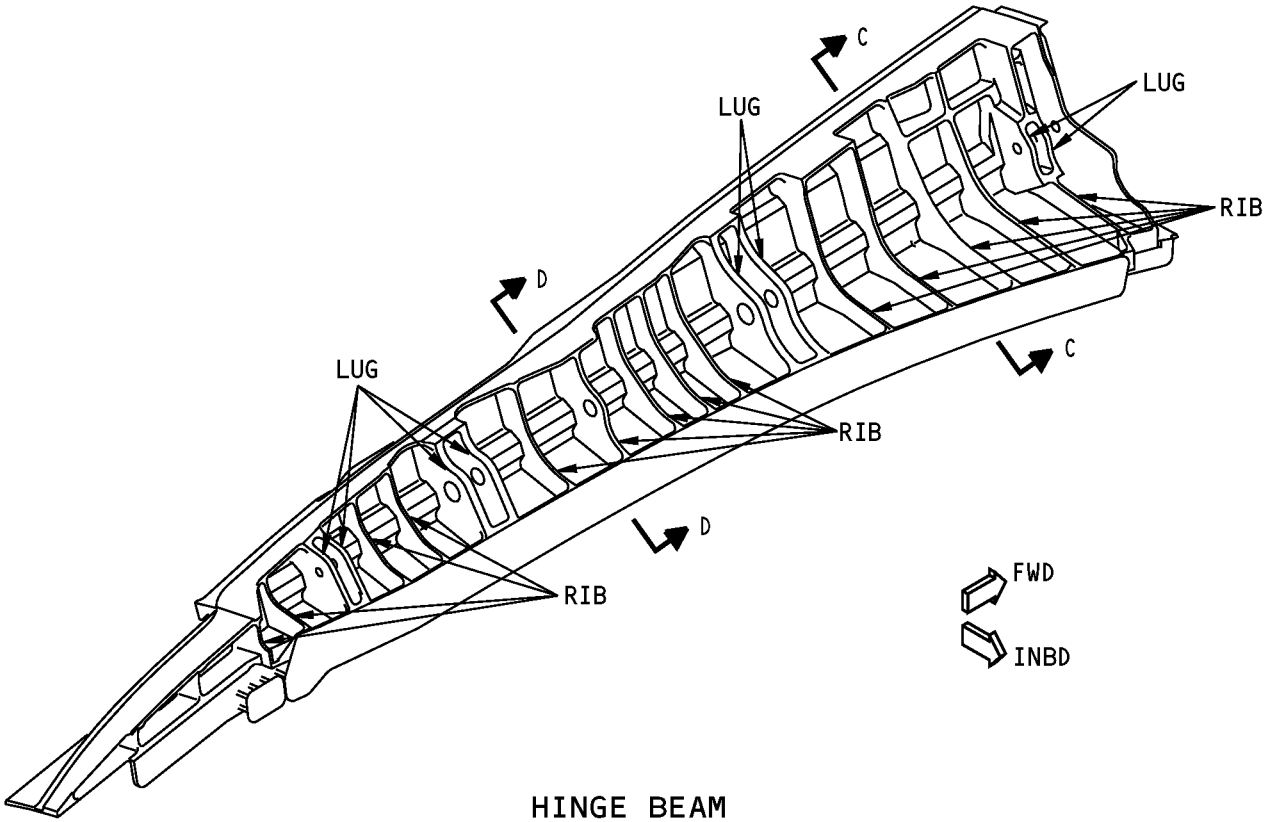


Thrust Reverser Torque Box Structure
Figure 102 (Sheet 4 of 7)



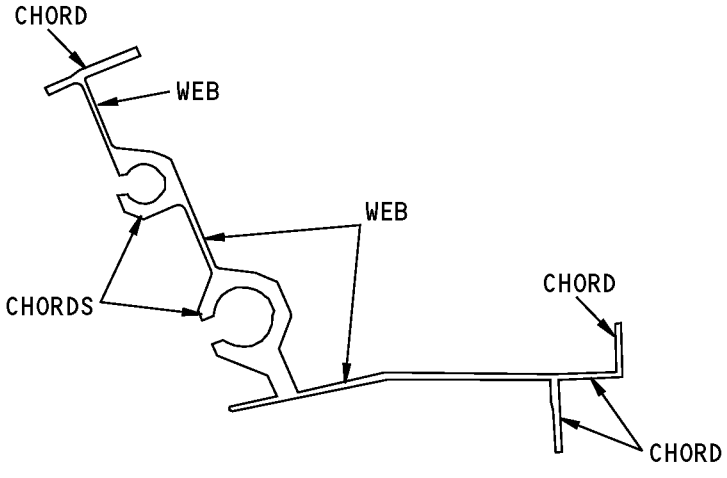
B-B
(TYPICAL 5 LOCATIONS)

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 5 of 7)

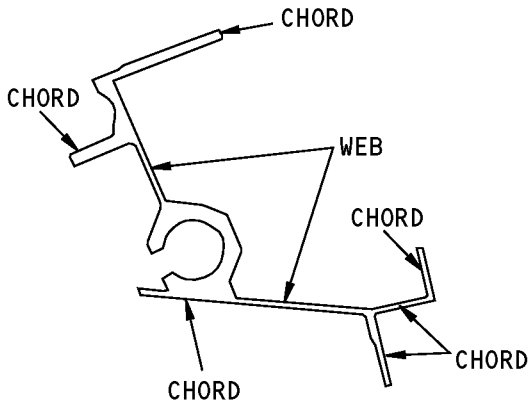


HINGE BEAM
(ALUMINUM FORGING)

C

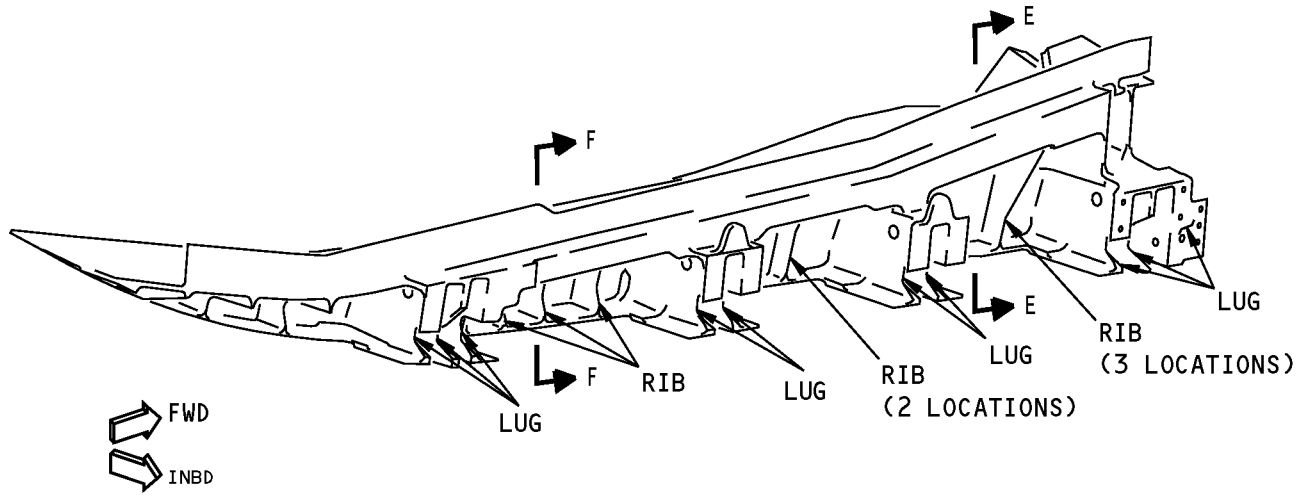


C–C



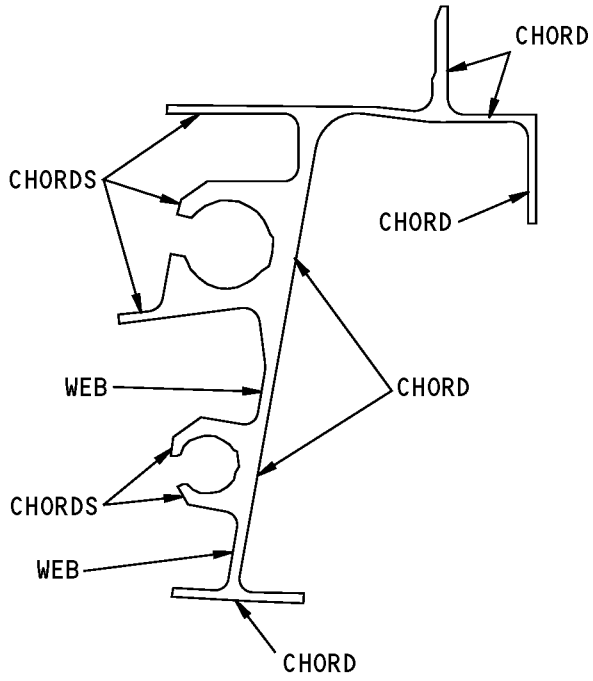
D–D

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 6 of 7)

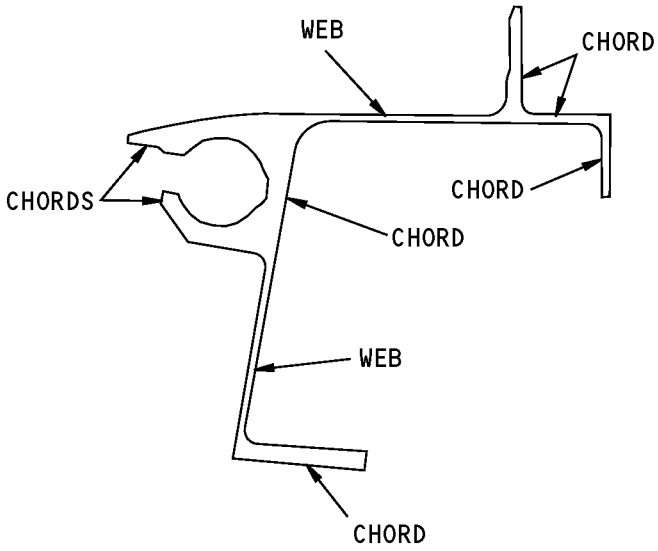


LATCH BEAM
(ALUMINUM FORGING)

D



E–E



F–F

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 7 of 7)

2. General

A. Do the steps that follow if you have damage to the metal parts.

(1) Remove the damaged material as necessary.

WARNING: SMALL PARTICLES OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

(a) Refer to SOPM 20-10-07 when you work with titanium.

(b) Refer to 51-10-02 for the removal procedures.

(c) Refer to 51-30-03 for possible sources of nonmetallic materials you can use to remove the damage.

(d) Refer to 51-30-05 for possible sources of equipment you can use to remove the damage.

(e) Refer to Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits.

(2) After you remove the damage, do as follows:

(a) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.

(b) Apply the finishes to the aluminum parts as follows: (Refer to SOPM 20-41-02)

1) Apply two layers of BMS 10-11, Type I primer to the bare surfaces of:

a) V-Blade Support Fittings

b) Thrust Reverser Opening Actuator Attachment Fittings

2) Apply one layer of BMS 10-11, Type I primer to the bare surfaces of:

a) Torque Box Actuator Attach Fittings

b) Aft Web Cutout Doublers

c) Hinge Beam Forward Firewall

3) Apply one layer of BMS 10-11, Type I primer and one layer of BMS 10-11, Type 2 enamel to the bare surfaces of:

a) Hinge Beam Splice Plates

b) Latch Beam Fire Shields

4) Apply one layer of BMS 10-79, Type III primer to the bare surfaces of:

a) Hinge Beam

b) Latch Beam

B. Do the steps that follow if you have damage to bullnose fairing made of Carbon Fiber Reinforced Plastic (CFRP).

(1) Seal the damage that is not more than one ply in depth and that agrees with the allowable damage limits in Paragraph 4./ALLOWABLE DAMAGE 1

(a) Make a temporary seal.

1) Apply aluminum foil tape (speed tape) to the damaged area.

2) Keep a record of the location.

3) Make sure the tape is in satisfactory condition at each 400 flight hour interval or more frequently.

4) Make a permanent seal no later than 5000 flight hours.

(b) Make a permanent seal.

1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the damaged area as given in SRM 51-70-08 .

2) Apply one layer of BMS 10-79, Type 3, or BMS 10-103, Type 1 primer on the aerodynamic surfaces of the bullnose fairing.

Table 101:

ALLOWABLE DAMAGE LIMITS PARAGRAPH REFERENCE	
COMPONENT	**PARAGRAPH**
Chords, Frames, V-Blade Ring, and Cascade Support Ring	4.A
Webs	4.B
Hinge Beam and Latch Beam	4.C
Bullnose Fairing	4.D

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
SOPM 20-10-07	Machining of Titanium
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Frames, V-Blade Ring Chords, and Cascade Support Ring

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , G , and H .

(2) Nicks, Scratches, Gouges, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , E , F , G , and H .

(3) Dents are not permitted.

(4) Holes and Punctures are permitted only in the cascade support ring assembly if:

(a) You remove the damage to a maximum diameter of 0.25 inch (6.35 mm)

(b) The damage is a minimum of 1.00 inch (25.4 mm) from a fastener hole or the edge of the part

(c) The damage is a minimum of 6.00 inches (152.4 mm) from other damage

(d) The damage is a minimum of 6.00 inches (152.4 mm) from the attachment to the hinge beam or the latch beam

(e) You install a 2117-T3 or 2117-T4 rivet wet with BMS 5-63 sealant in the hole.

B. Webs

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and H .

(2) Nicks, Scratches, and Gouges

(a) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , F , and H .

(3) Dents

(a) Damage is permitted as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Detail D .

(b) Damage must be a minimum of 6.00 inches (152.4 mm) away from other damage.

(4) Holes and Punctures are permitted if:

(a) You remove the damage to a maximum diameter of 0.25 inch (6.35 mm)

(b) The damage is a minimum of 1.00 inch (25.4 mm) from a fastener hole or the edge of the part

(c) The damage is a minimum of 6.00 inches (152.4 mm) from other damage

(d) You install a 2117-T3 or 2117-T4 rivet wet with BMS 5-63 sealant in aluminum webs

(e) You install a monel rivet wet with BMS 5-63 sealant in titanium webs.

C. Hinge Beam and Latch Beam

(1) Chords

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , G , and K .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , E , G , and K .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(2) Lugs

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Detail J .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details C and K .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(3) Ribs and Webs

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Detail A , B , and H .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits - Metallic Structure, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , G , and H .

(c) Dents are not permitted.

(d) Holes and Punctures only in the webs are permitted if:

1) You remove the damage to a maximum diameter of 0.25 inch (6.35 mm)

2) The damage is a minimum of 1.00 inch (25.4 mm) from a fastener hole or the edge of the part

3) The damage is a minimum of 6.00 inches (152.4 mm) from other damage

4) You install a 2117-T3 or 2117-T4 rivet wet with BMS 5-63 sealant in the hole.

D. Bullnose Fairing

NOTE: Refer to Definitions of the Damage Size, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and C for the definitions of the length, width, and diameter of damage.

(1) Nicks, Gouges, and Scratches that do not cause damage to the fibers are permitted.

(2) Nicks, Gouges, and Scratches that do cause damage to the fibers are permitted if they are:

(a) A maximum of one ply in depth.

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

(b) A maximum of 3.0 inches (76.2 mm) in length.

(c) A maximum of 0.25 inch (6.4 mm) in width.

(d) A minimum of 3.0 inches (76.2 mm) away from other damage.

(3) Dents are permitted if:

NOTE: Dents usually cause fiber damage or a delamination which may not be apparent with the use of visual or tap test examination procedures.

(a) The dent is smooth and has no sharp creases, gouges, or cracks. Use the limits for a hole.

(b) If the fibers are damaged, use the limits for a hole and do the steps that follow:

1) Remove the moisture from the damaged area.

2) Apply sealing resin to the damaged area as given in 51-70-04.

3) Apply aluminum foil tape to the damaged area.

4) Keep a record of the location of the damage.

5) Do an inspection of the aluminum foil tape every 10 flight cycles or more frequently. Replace the aluminum foil tape if there is deterioration.

6) Make a permanent repair of the damage:

a) If the panel shows deterioration

b) Before 400 flight cycles occurs after the application of the aluminum foil tape.

(c) If the fibers are not damaged, do the steps that follow:

1) Apply aluminum foil tape to the damaged area.

2) Keep a record of the location of the damage.

3) Do an inspection of the aluminum foil tape every 400 flight cycles or more frequently. Replace the aluminum foil tape if there is deterioration.

4) Make a permanent repair of the damage:

a) If the panel shows deterioration

b) Before 5000 flight cycles occurs after the application of the aluminum foil tape.

(4) Holes and Punctures

(a) Damage is permitted if:

1) You remove the damage to a maximum diameter (D) of 0.25 inch (6.35 mm)

2) The damage is a minimum of 1.00 inch (25.4 mm) away from a fastener hole or the edge of the part

3) The damage is a minimum of 6.00 inches (152.4 mm) away from other damage

(5) Delaminations are permitted if:

(a) They are a maximum of 0.25 inch (6.35 mm) in diameter

(b) They are a minimum of 1.0 inch (25.4 mm) away from a hole or the edge of the material

(c) They are a minimum of 3.0 inches (76.2 mm) away from other damage.

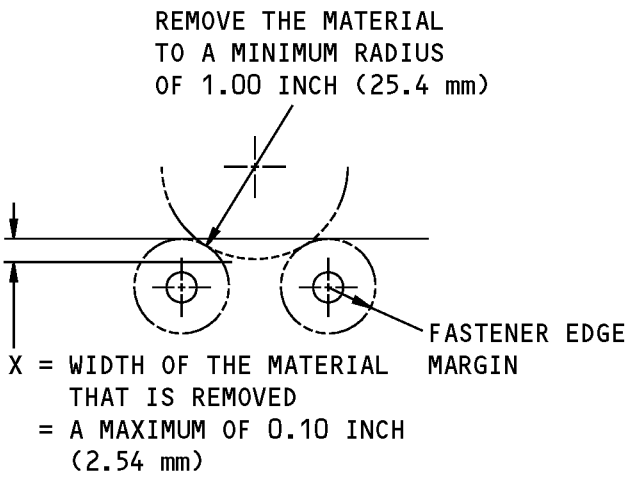
(6) Edge Damage

(a) Edge damage is permitted as shown in Allowable Damage Limits - Composite Structure, Figure 105/ALLOWABLE DAMAGE 1, Detail A if it is:

1) A maximum of 0.10 inch (2.54 mm) in depth.

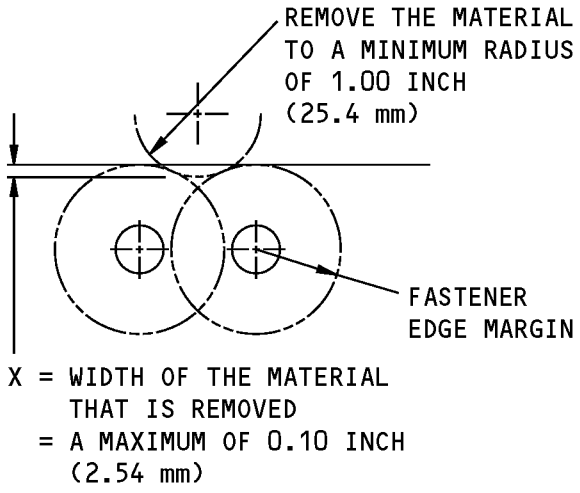
2) A maximum of 0.25 inch (6.35 mm) in width.

(7) Edge Erosion is permitted as shown in Allowable Damage Limits - Composite Structure, Figure 105/ALLOWABLE DAMAGE 1, Detail B .



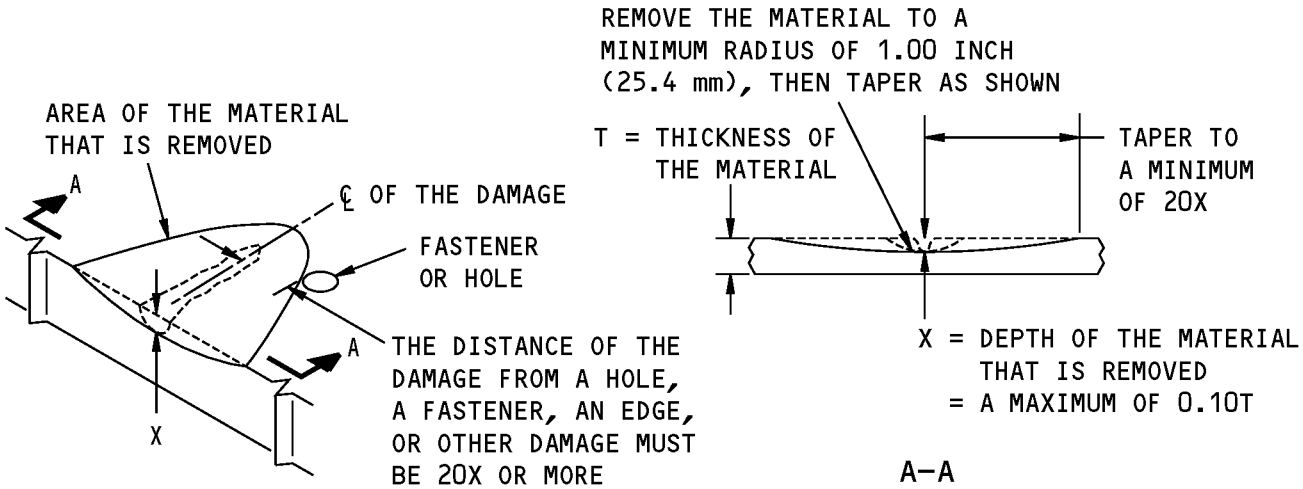
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

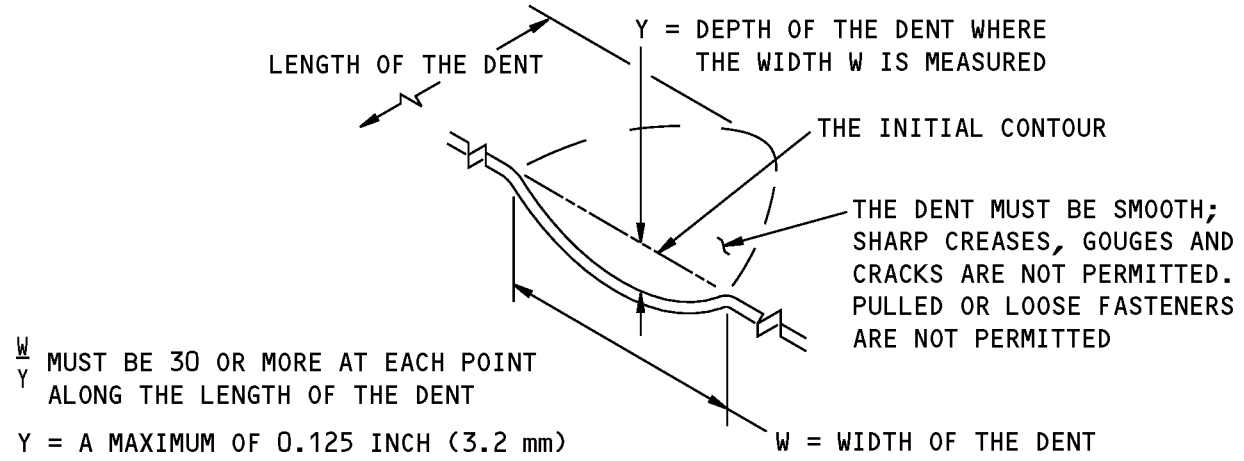
B



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

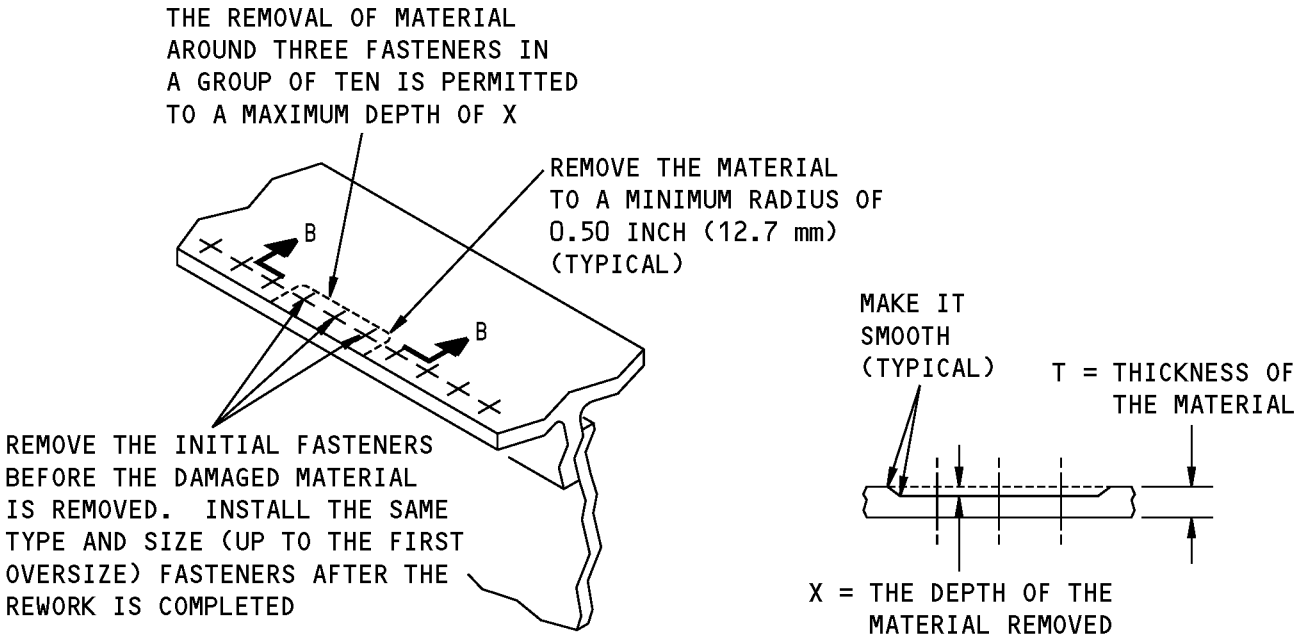
C

Allowable Damage Limits - Metallic Structure
Figure 103 (Sheet 1 of 6)



DENT THAT IS PERMITTED

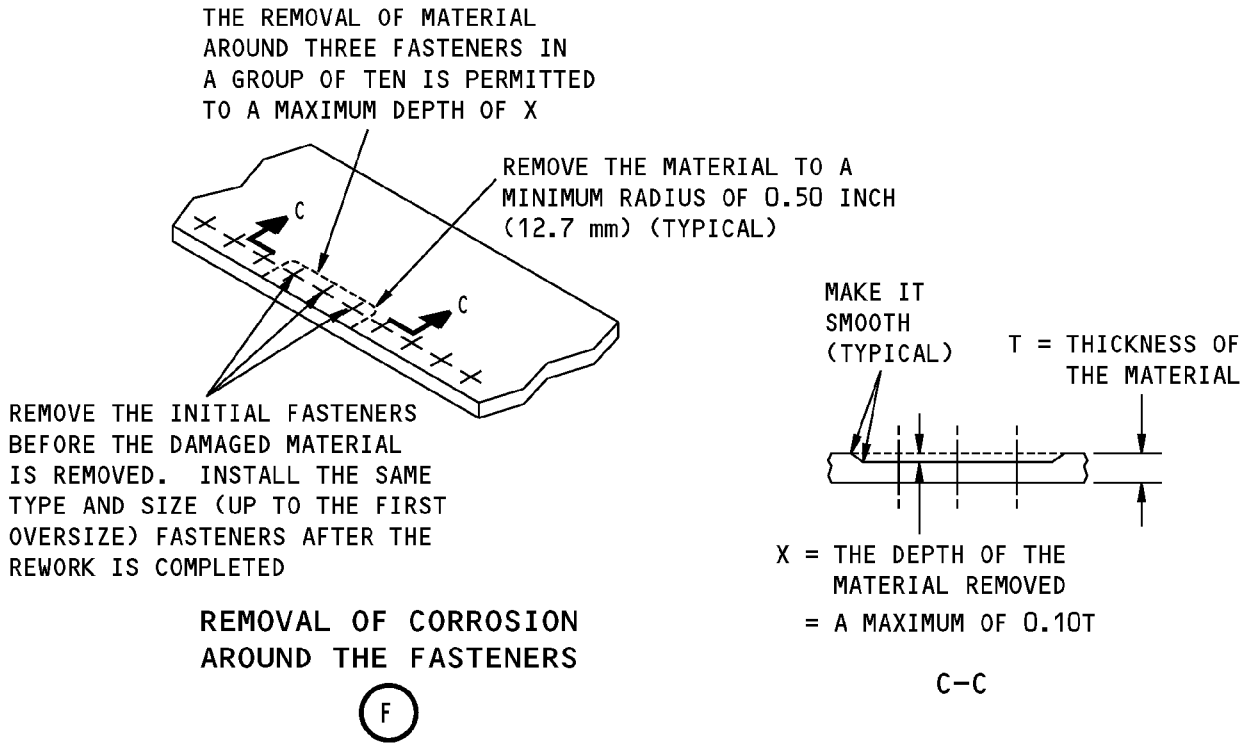
D

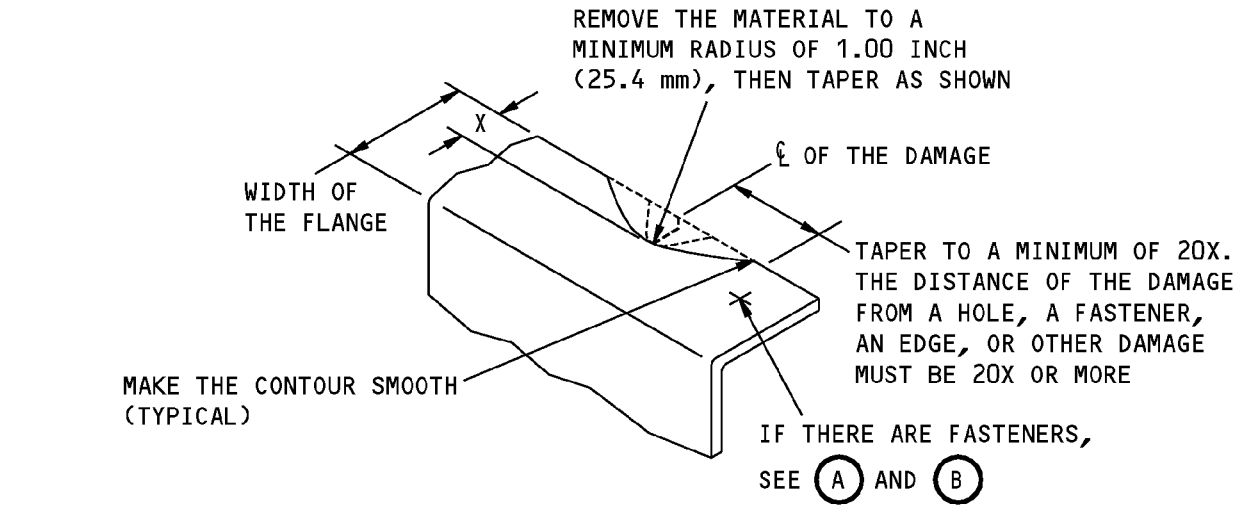


REMOVAL OF CORROSION AROUND THE FASTENERS

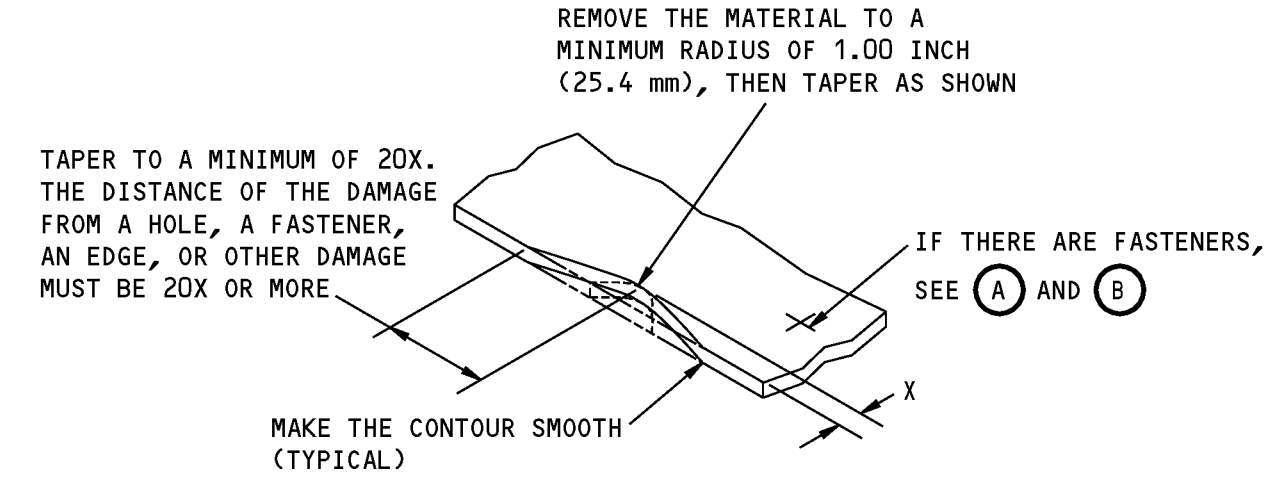
E

Allowable Damage Limits - Metallic Structure
Figure 103 (Sheet 2 of 6)





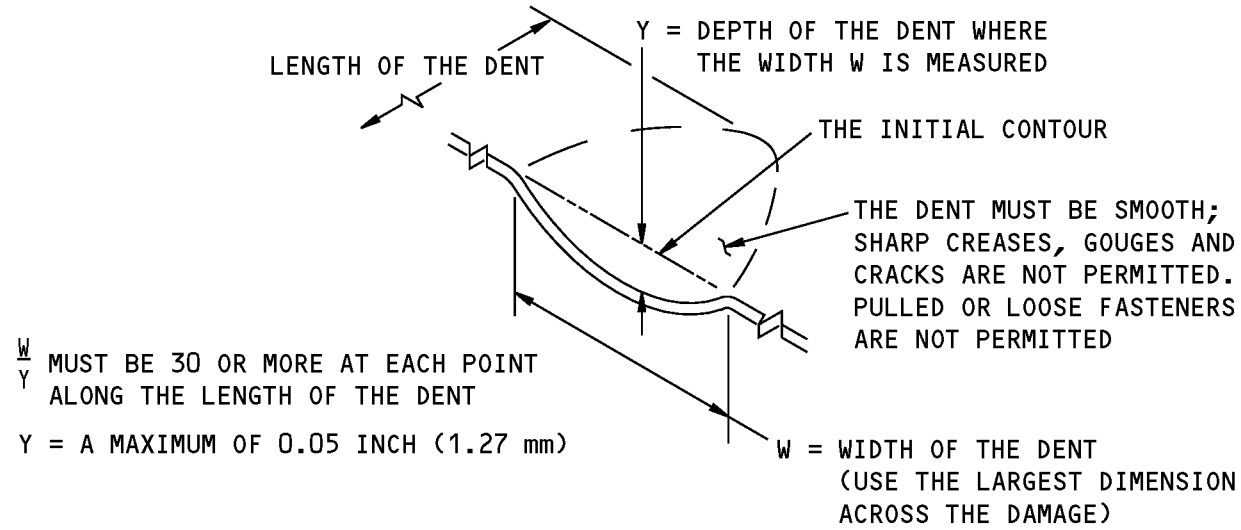
Allowable Damage Limits - Metallic Structure
Figure 103 (Sheet 3 of 6)



X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL SKIN OR WEB

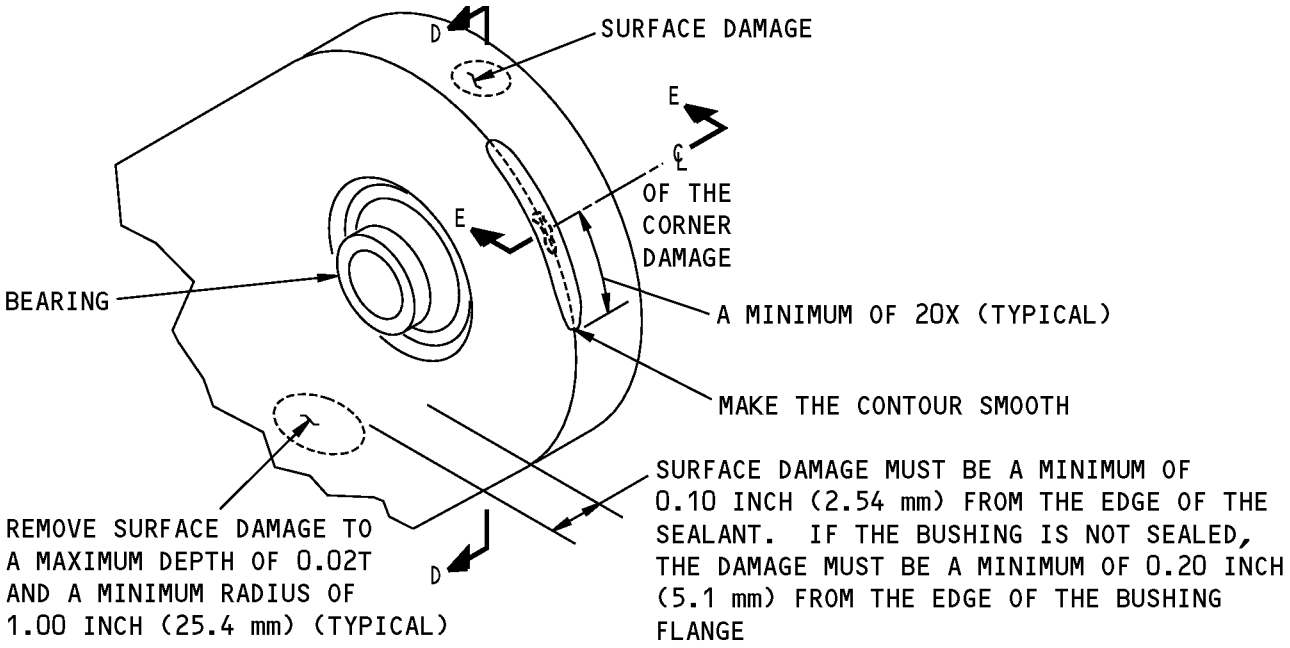
H



DENT THAT IS PERMITTED

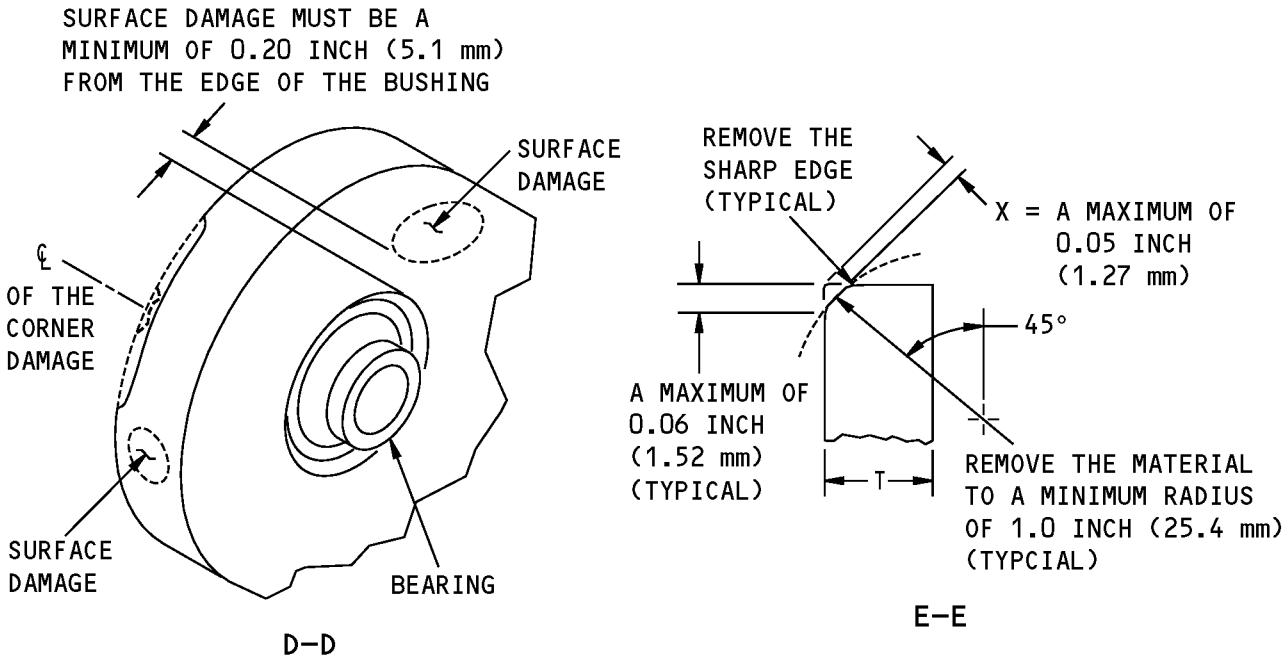
I

Allowable Damage Limits - Metallic Structure
Figure 103 (Sheet 4 of 6)

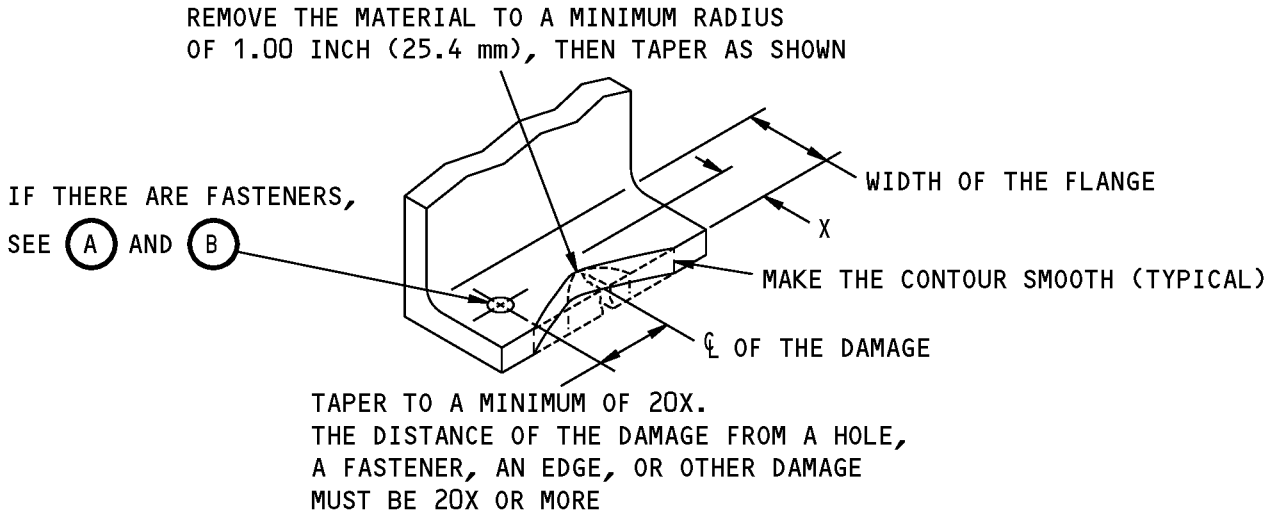


REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BEARING

(J)



Allowable Damage Limits - Metallic Structure
Figure 103 (Sheet 5 of 6)

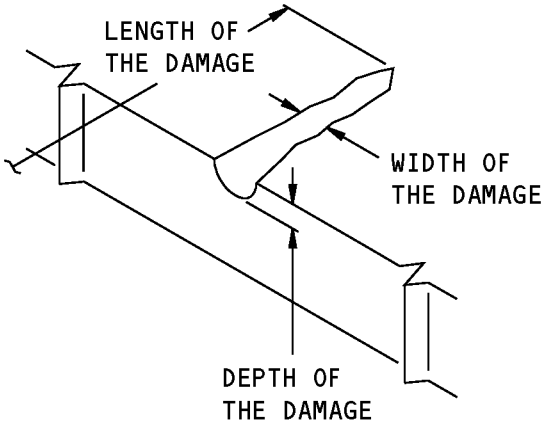


X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE OR 0.05 INCH (1.27 mm) THAT WHICH IS LESS

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

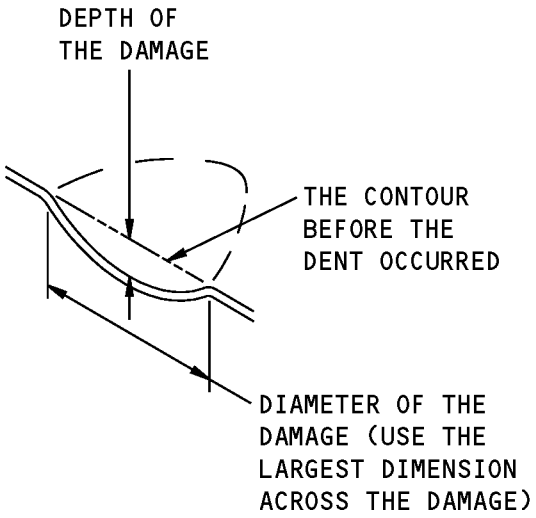
K

Allowable Damage Limits - Metallic Structure
Figure 103 (Sheet 6 of 6)



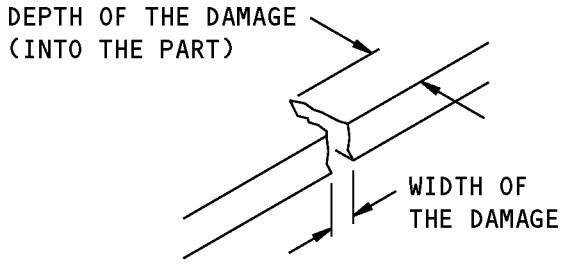
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

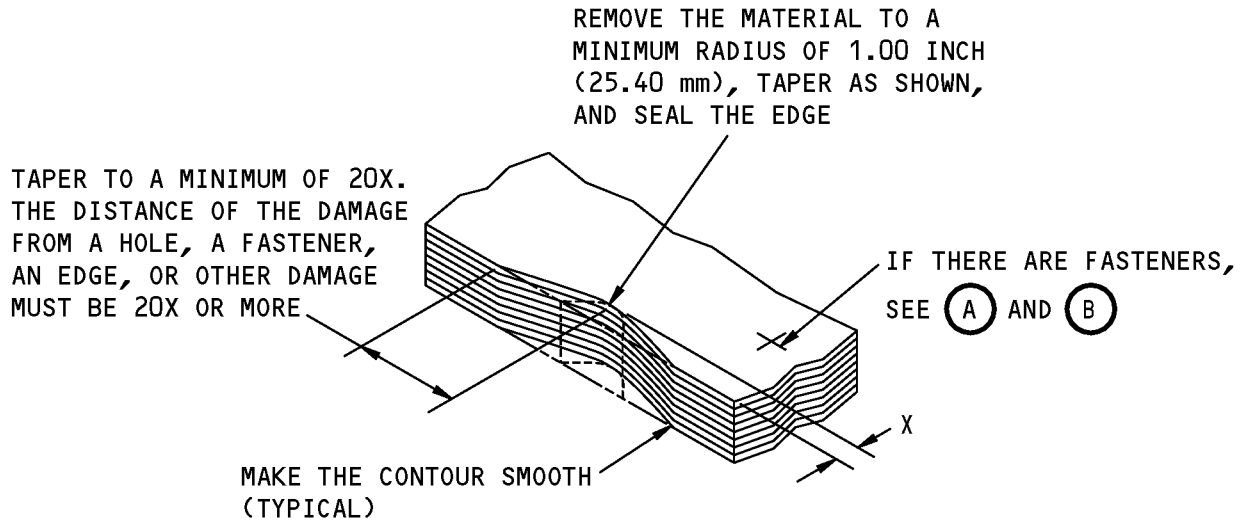
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 104

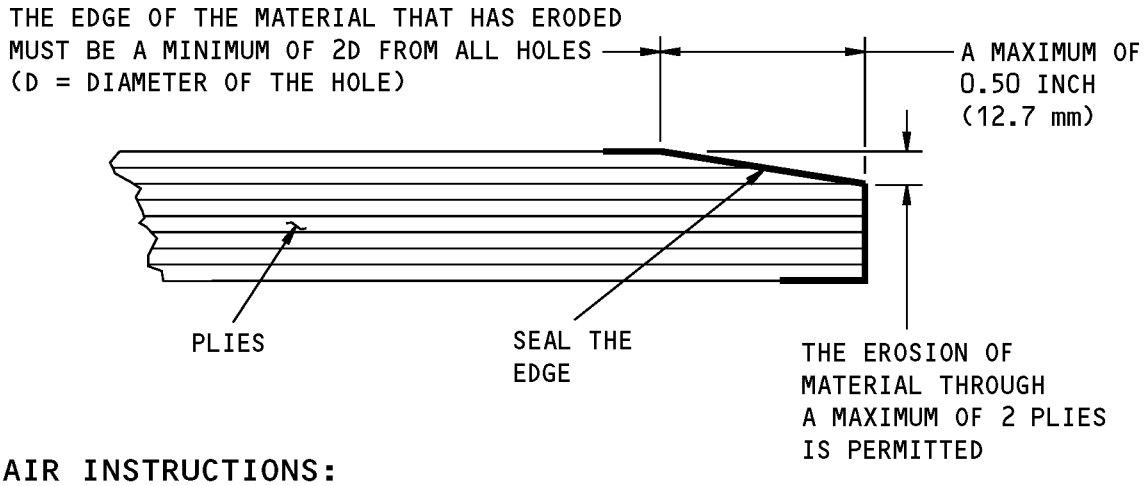


X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL ON AN EDGE OF COMPOSITE PARTS

A

Allowable Damage Limits - Composite Structure
Figure 105 (Sheet 1 of 2)



REPAIR INSTRUCTIONS:

1. CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.

2. MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.

   A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.

   B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.

3. SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:

   A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).

      1) KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION EVERY 400 FLIGHT HOURS OR MORE FREQUENTLY.

      2) REPLACE THE TAPE IF YOU FIND DETERIORATION.

      3) REPAIR THE DAMAGE BEFORE 5000 FLIGHT CYCLES OCCURS.

4. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:

   - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR III ADHESIVE AT 75° (24°C) FOR 24 HOURS.

   - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75°F (24°C) FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE

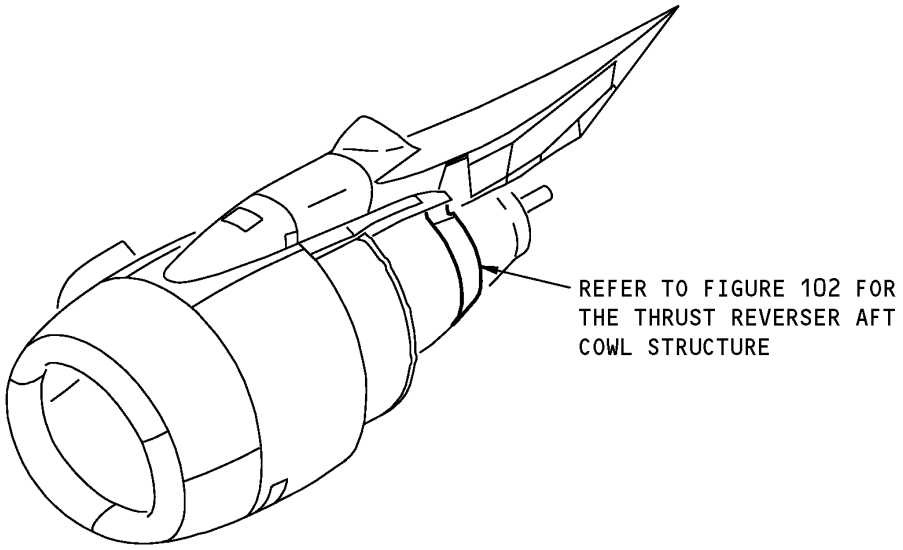
B

Allowable Damage Limits - Composite Structure
Figure 105 (Sheet 2 of 2)

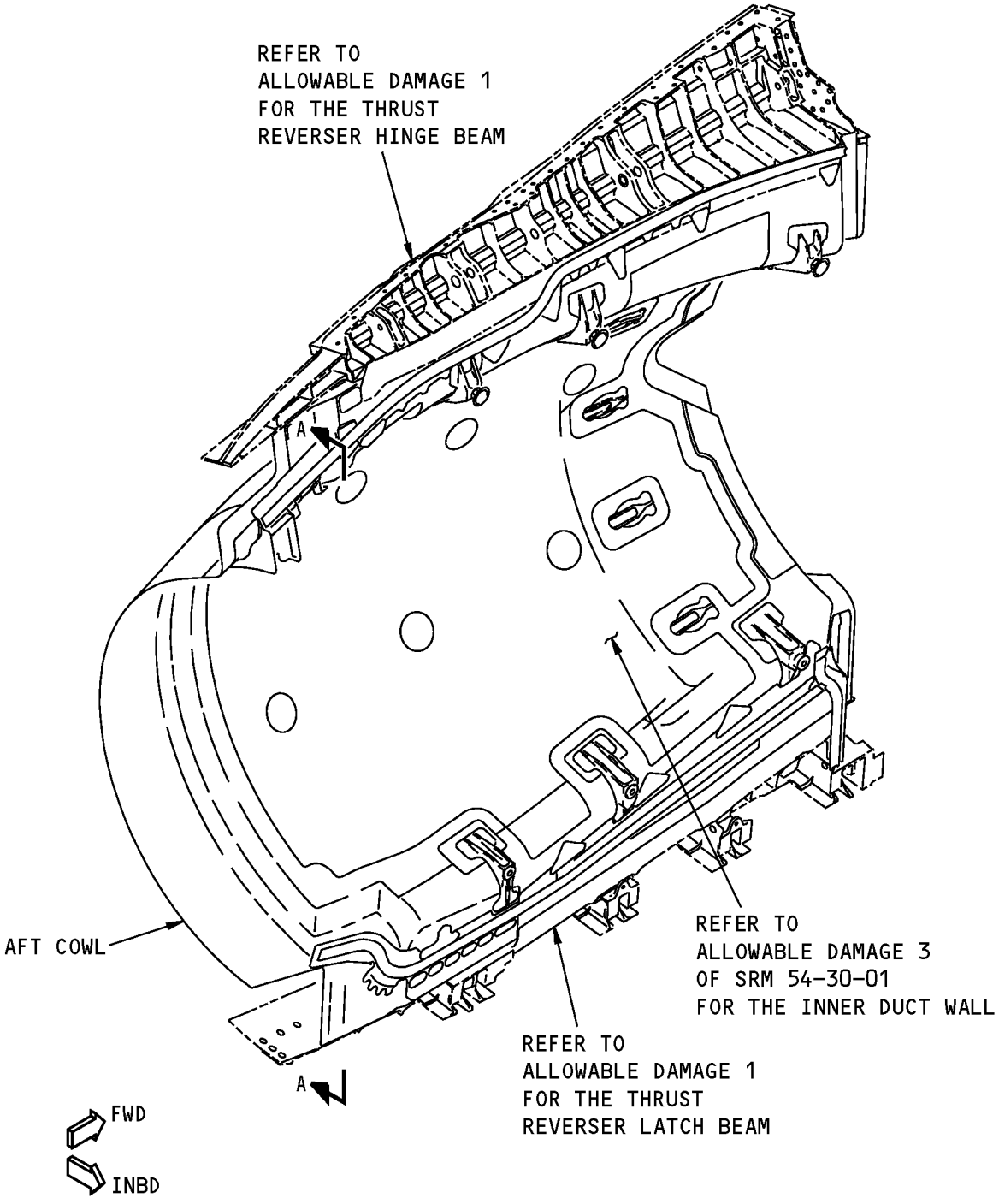
ALLOWABLE DAMAGE 2 - THRUST REVERSER AFT COWL STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the Aft Cowl structure of the Thrust Reverser shown in Thrust Reverser Aft Cowl Structure Location, Figure 101/ALLOWABLE DAMAGE 2.

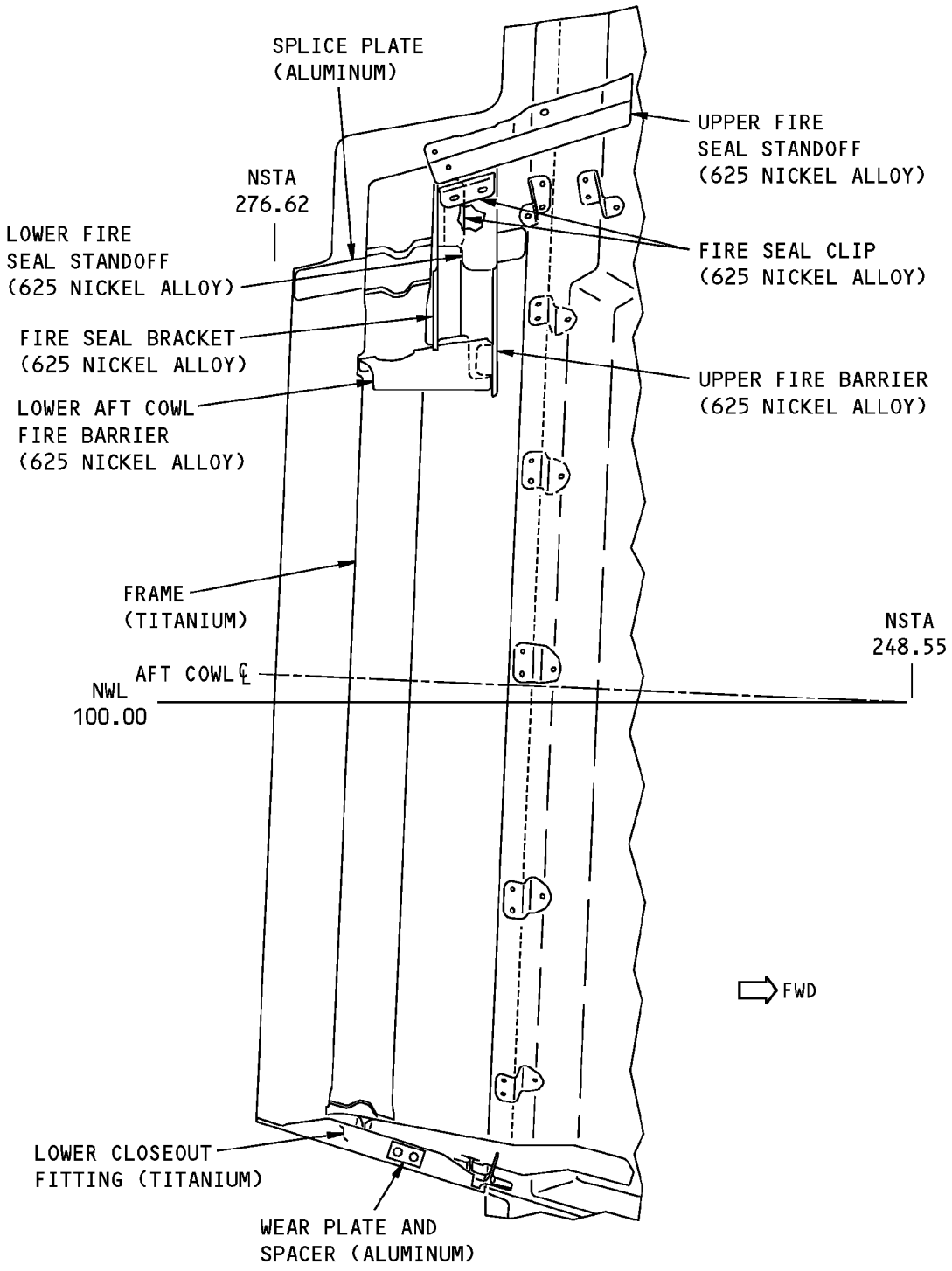


Thrust Reverser Aft Cowl Structure Location
Figure 101



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Thrust Reverser Aft Cowl Structure
Figure 102 (Sheet 1 of 2)



A–A

Thrust Reverser Aft Cowl Structure
Figure 102 (Sheet 2 of 2)

2. General

A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

(1) Refer to SOPM 20-10-07 when you work with titanium.

(2) Refer to 51-10-02 for the removal procedures.

(3) Refer to 51-30-03 for possible sources of nonmetallic materials you can use to remove the damage.

(4) Refer to 51-30-05 for possible sources of equipment you can use to remove the damage.

(5) Refer to Table 101/ALLOWABLE DAMAGE 2 for the references for the allowable damage limits.

B. After you remove the damage, do as follows:

(1) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.

(2) Apply two layers of BMS 10-11, Type I primer to the bare surfaces of the aluminum parts. Refer to SOPM 20-41-02.

(3) Apply one layer of BMS 10-79, Type III primer to the bare surfaces of the 625 nickel alloy parts. Refer to SOPM 20-41-02.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS FOR THE AFT COWL STRUCTURE	
COMPONENT	**PARAGRAPH**
Frames and Splice Plate	4.A
Fire Barrier and Standoff	4.B
Clips and Brackets	4.C

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-07	Machining of Titanium
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Frame and Splice Plate

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , F , and G .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , E , F , and G .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

B. Fire Barriers and Standoff

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , F , and G .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , E , F , and G .

(b) Dents are not permitted.

(c) Holes and Punctures are permitted if:

1) You remove the damage to a maximum diameter of 0.25 inch (6.35 mm)

2) The damage is a minimum of 1.00 inch (25.40 mm) away from a fastener hole, bend radii, or the edge of the part

3) The damage is a minimum of 3.00 inches (76.20 mm) away from other damage

4) You install a monel rivet wet with BMS 5-63 sealant.

C. Aft Cowl Clips and Support Brackets

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A , B , F , and G .

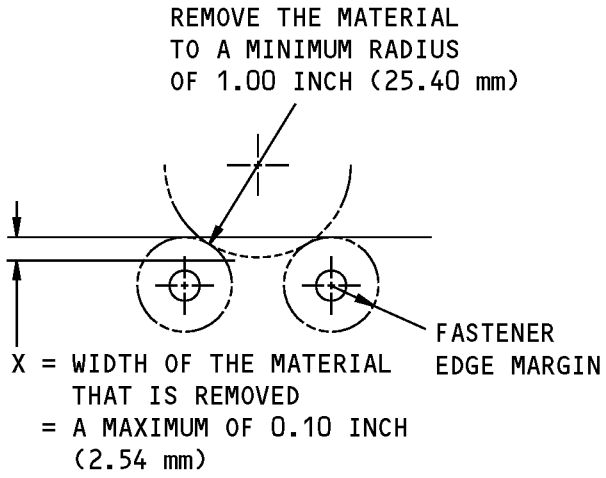
(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , E , F , and G .

(3) Dents:

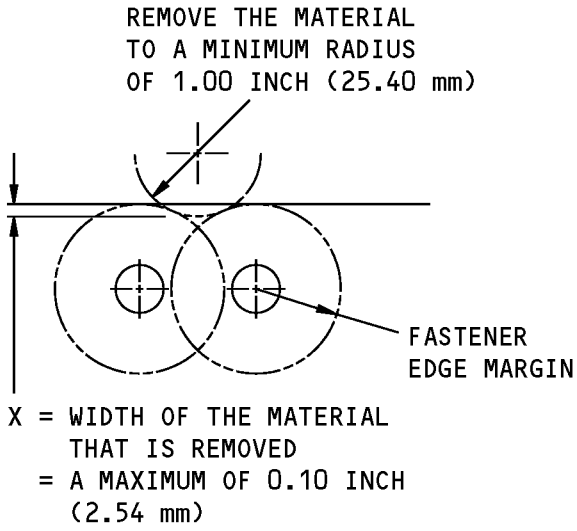
(a) Damage is permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail D .

(4) Holes and Punctures are not permitted.



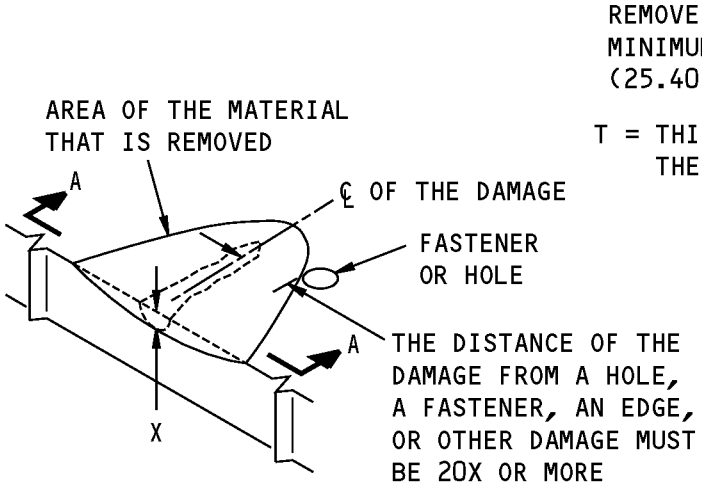
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

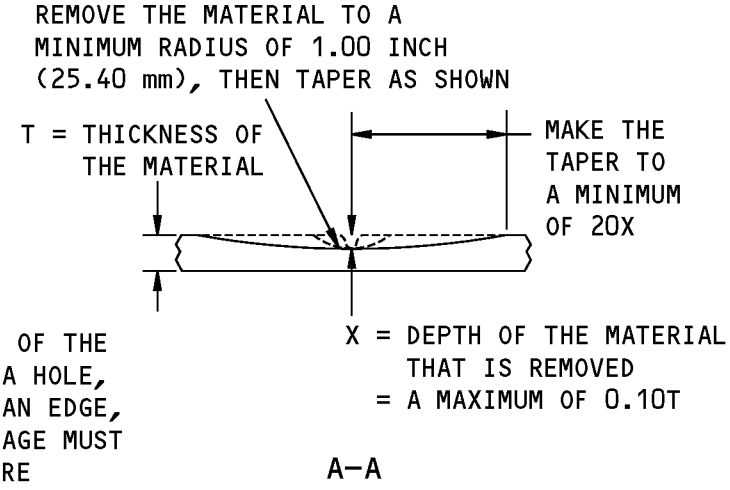
A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

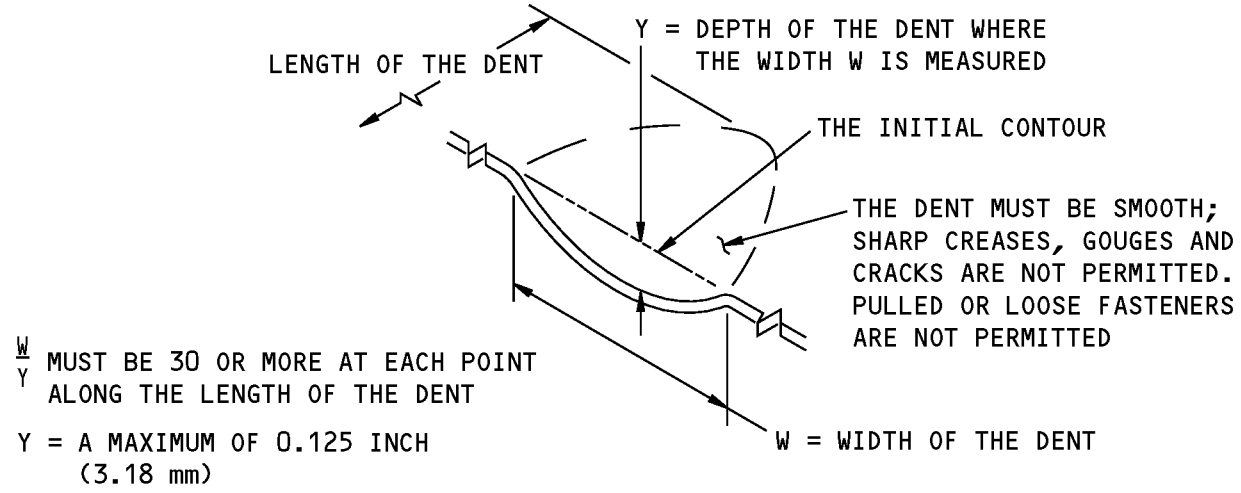




REMOVAL OF DAMAGED MATERIAL ON A SURFACE

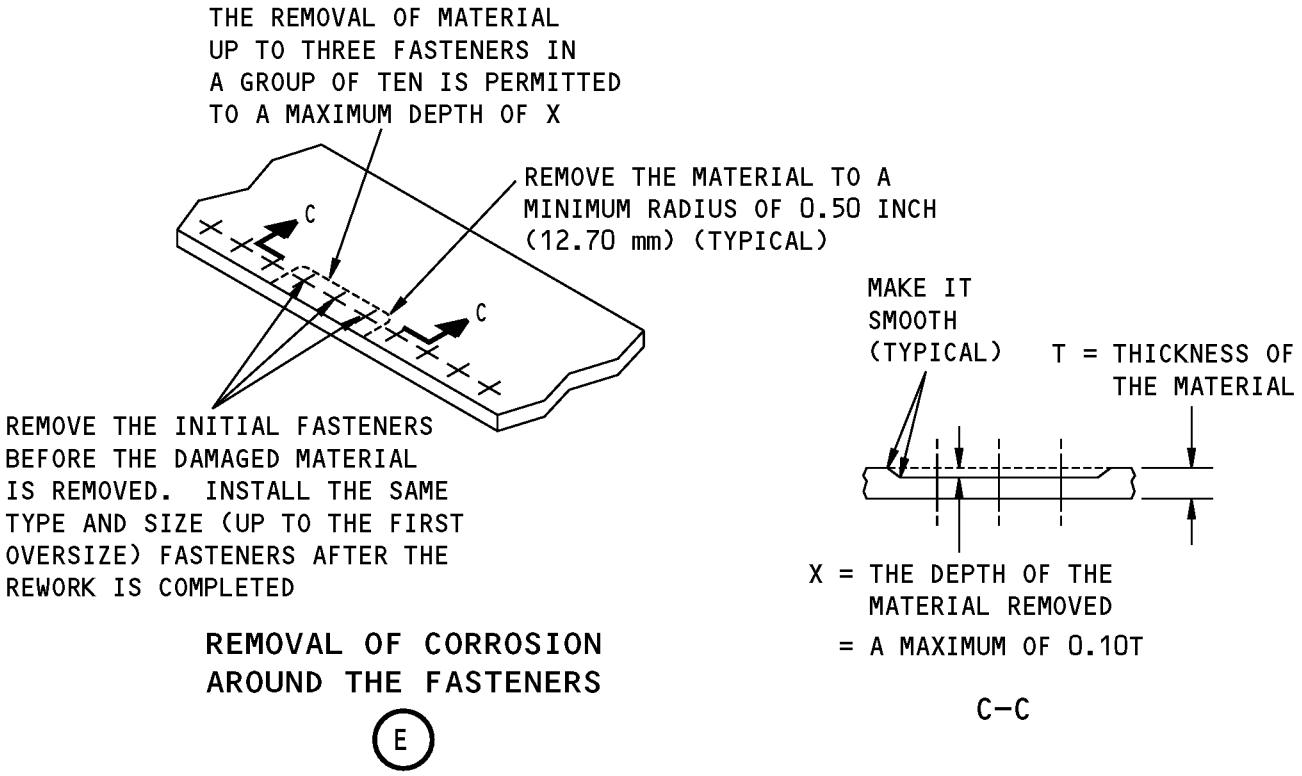
C

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)



DENT THAT IS PERMITTED

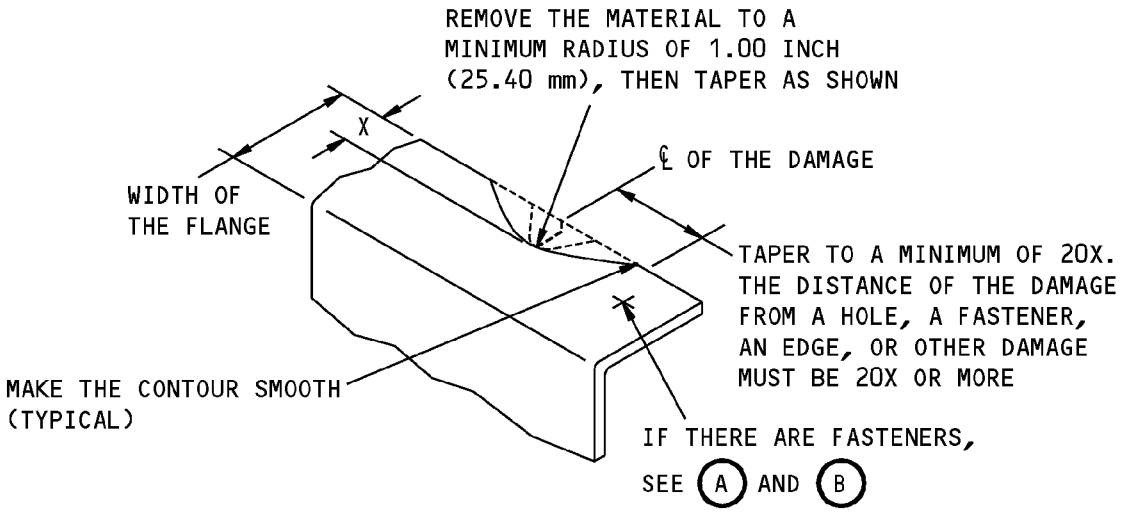
D



REMOVAL OF CORROSION AROUND THE FASTENERS

E

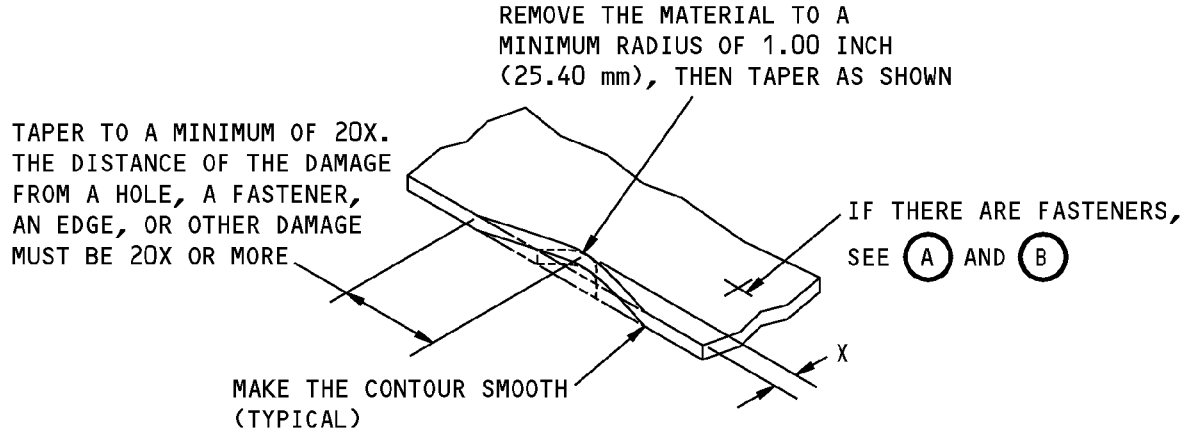
Allowable Damage Limits
Figure 103 (Sheet 2 of 3)



X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE
OR A MAXIMUM OF 0.10 INCH (2.54 mm) THAT WHICH IS LESS

REMOVAL OF DAMAGED MATERIAL ON AN EDGE

F



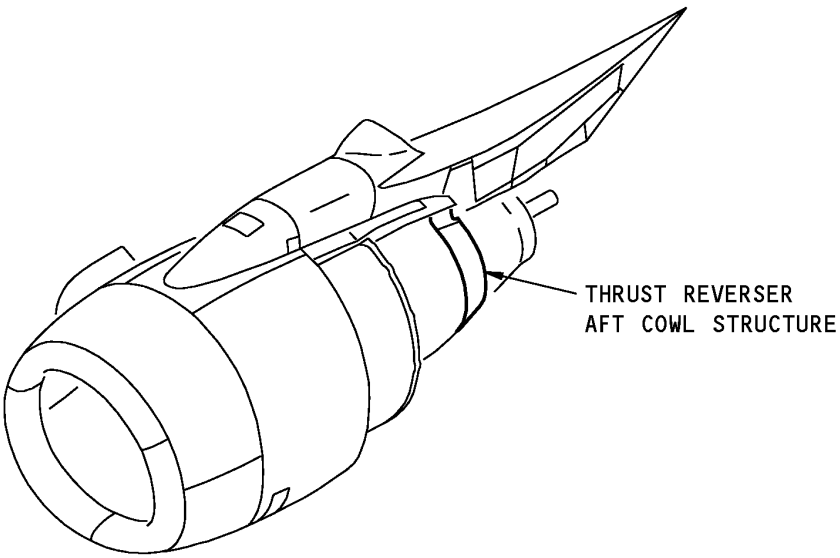
X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL SKIN OR WEB

G

Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

REPAIR 2 - THRUST REVERSER AFT COWL STRUCTURE

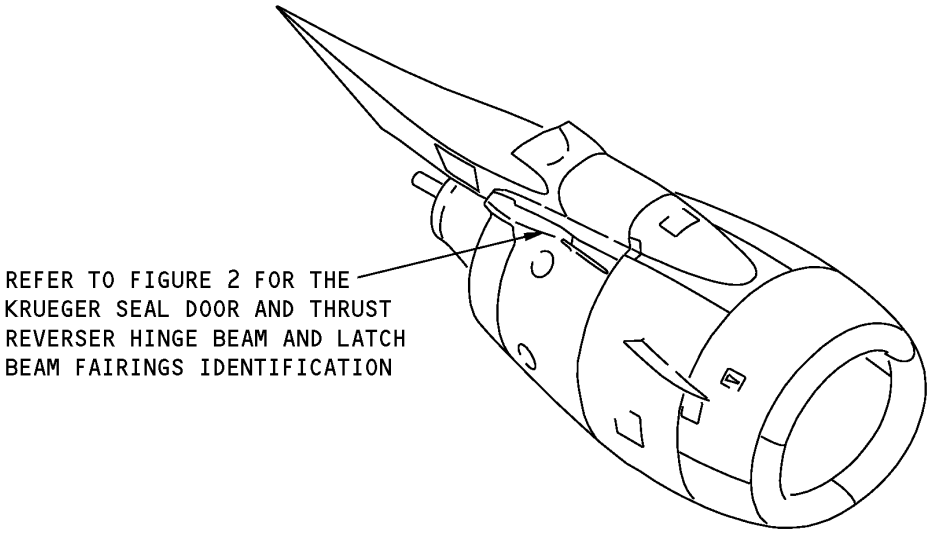


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Thrust Reverser Aft Cowl Structure Location
Figure 201

IDENTIFICATION 1 - KRUEGER SEAL DOOR ASSEMBLY AND THRUST REVERSER HINGE BEAM AND LATCH BEAM FAIRINGS

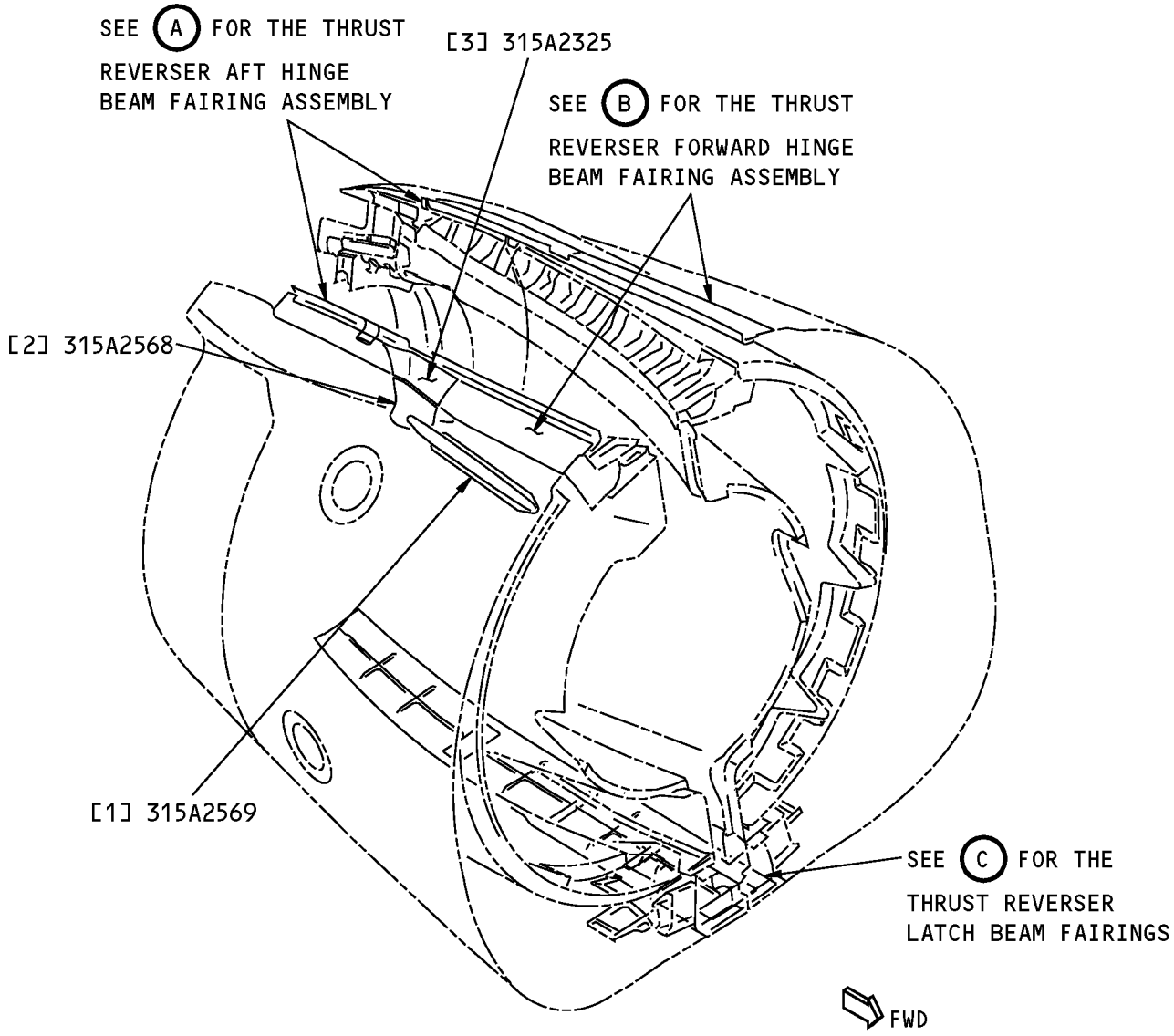


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
315A2300	Hinge Beam Installation
315A2302	Thrust Reverser Fairing - Production Kit
315A2430	Fairing and Details - Latch Beam
315A2565	Krueger Seal Door Deflector and Fairing Installation

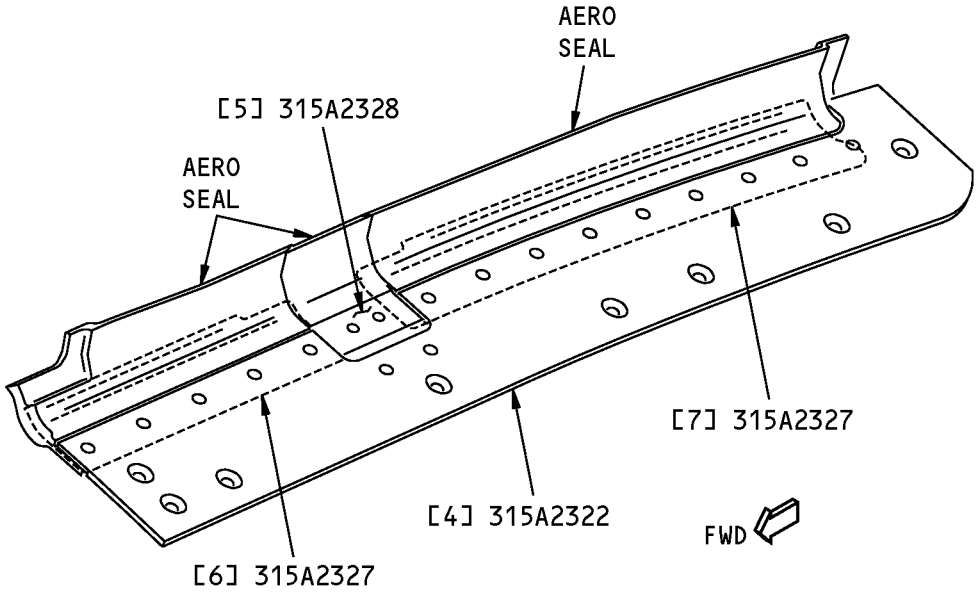


LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE

NOTES

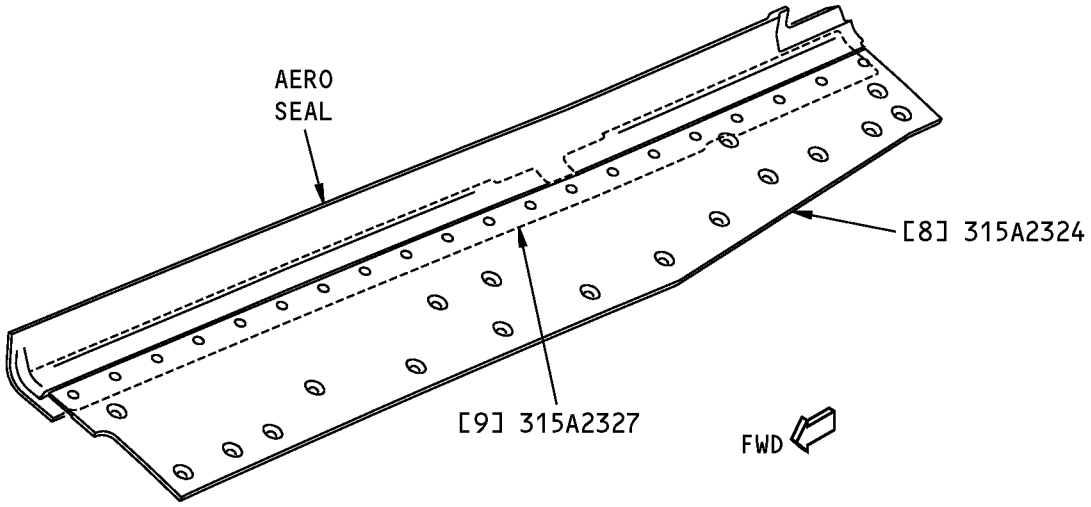
- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Identification
Figure 2 (Sheet 1 of 3)



LEFT AFT HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT AFT HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

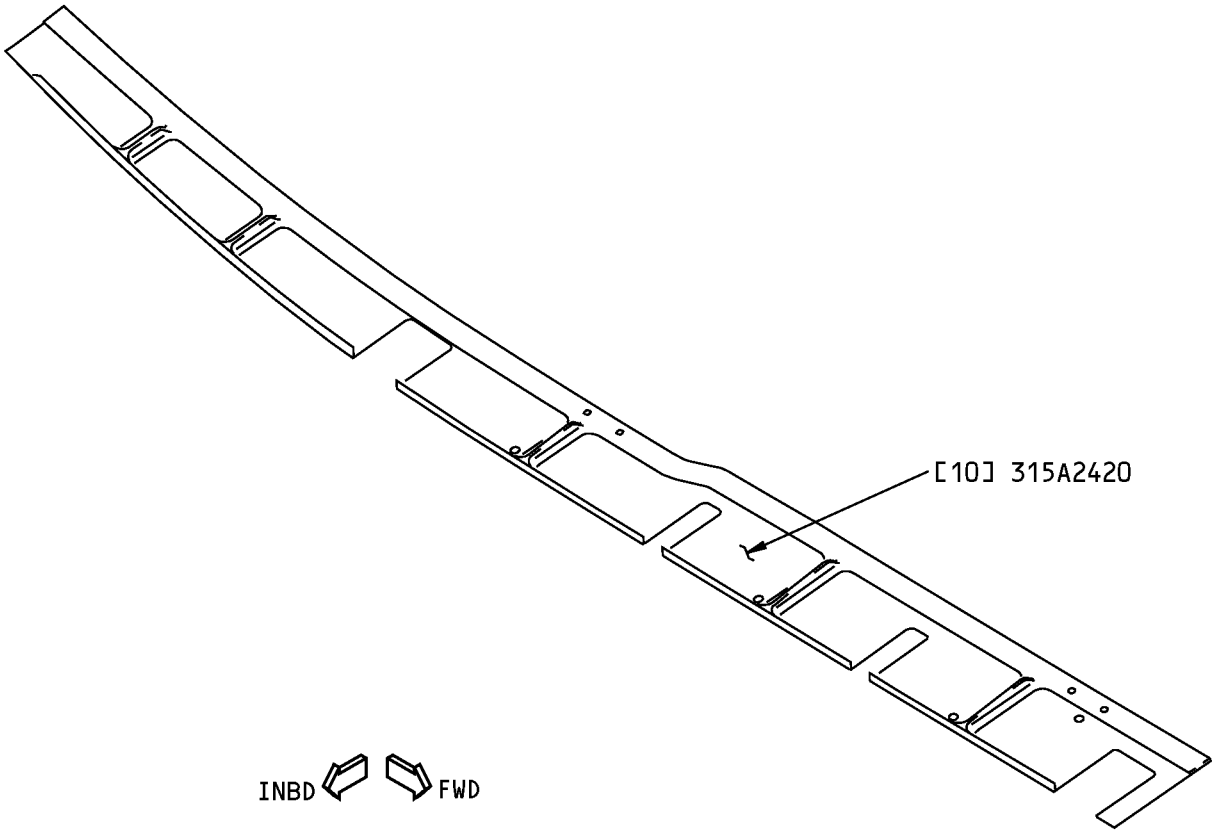
A



LEFT FORWARD HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT FORWARD HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

B

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Identification
Figure 2 (Sheet 2 of 3)



LEFT LATCH BEAM FAIRING IS SHOWN,
RIGHT LATCH BEAM FAIRING IS ALMOST THE SAME

C

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Identification
Figure 2 (Sheet 3 of 3)

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Deflector Molding		Polyamide 6/12 injection molding as given in BMS 8-323, Type I, Class 3, Form B, Grade 30	
[2]	Seal Door Fairing (2 locations)		Polyether ether ketone (PEEK) injection molding as given in BMS 8-317, Type V, Class 1, Form B, Grade 30	
[3]	Krueger Bump Fairing		Epoxy glass sheet compression molding compound as given in BMS 8-327, Type I	
[4]	Aft Hinge Beam Fairing (2 locations)		Epoxy glass sheet molding compound as given in BMS 8-327, Type I	
[5]	Seal Retainer	0.040 (1.02)	301 CRES sheet or strip as given in AMS 5518	
[6]	Seal Retainer	0.040 (1.02)	Nickel alloy 625 sheet or strip as given in AMS 5599	
[7]	Seal Retainer	0.040 (1.02)	Nickel alloy 625 sheet or strip as given in AMS 5599	
[8]	Forward Hinge Beam Fairing		Epoxy glass sheet molding compound as given in BMS 8-327, Type I	
[9]	Seal Retainer	0.040 (1.02)	Nickel alloy 625 sheet or strip as given in AMS 5599	
[10]	Latch Beam Fairing		Epoxy glass sheet molding as given in BMS 8-327, Type 1	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - KRUEGER SEAL DOOR ASSEMBLY AND THRUST REVERSER HINGE BEAM AND LATCH BEAM FAIRINGS

1. Applicability

A. This subject gives the allowable damage limits for these structures shown in Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location, Figure 101/ALLOWABLE DAMAGE 1:

(1) The Krueger Seal Door Assembly which includes:

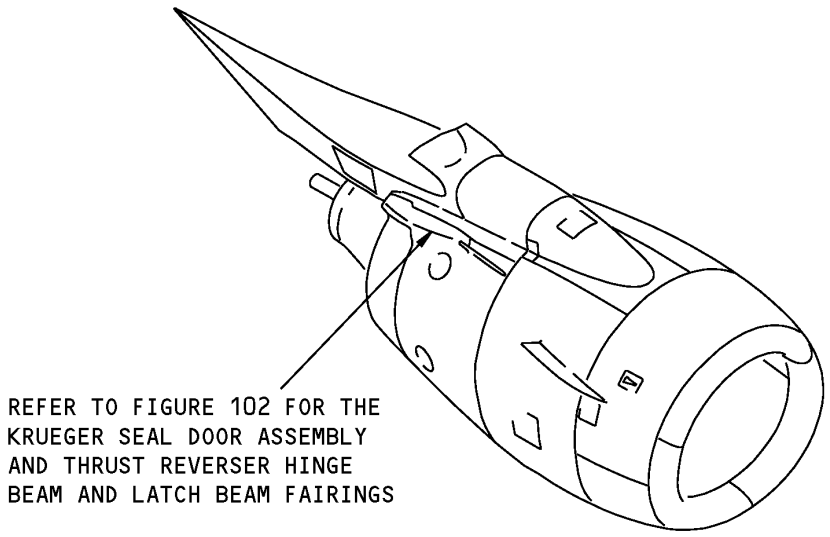
(a) The Deflector Molding

(b) The Seal Door Fairing

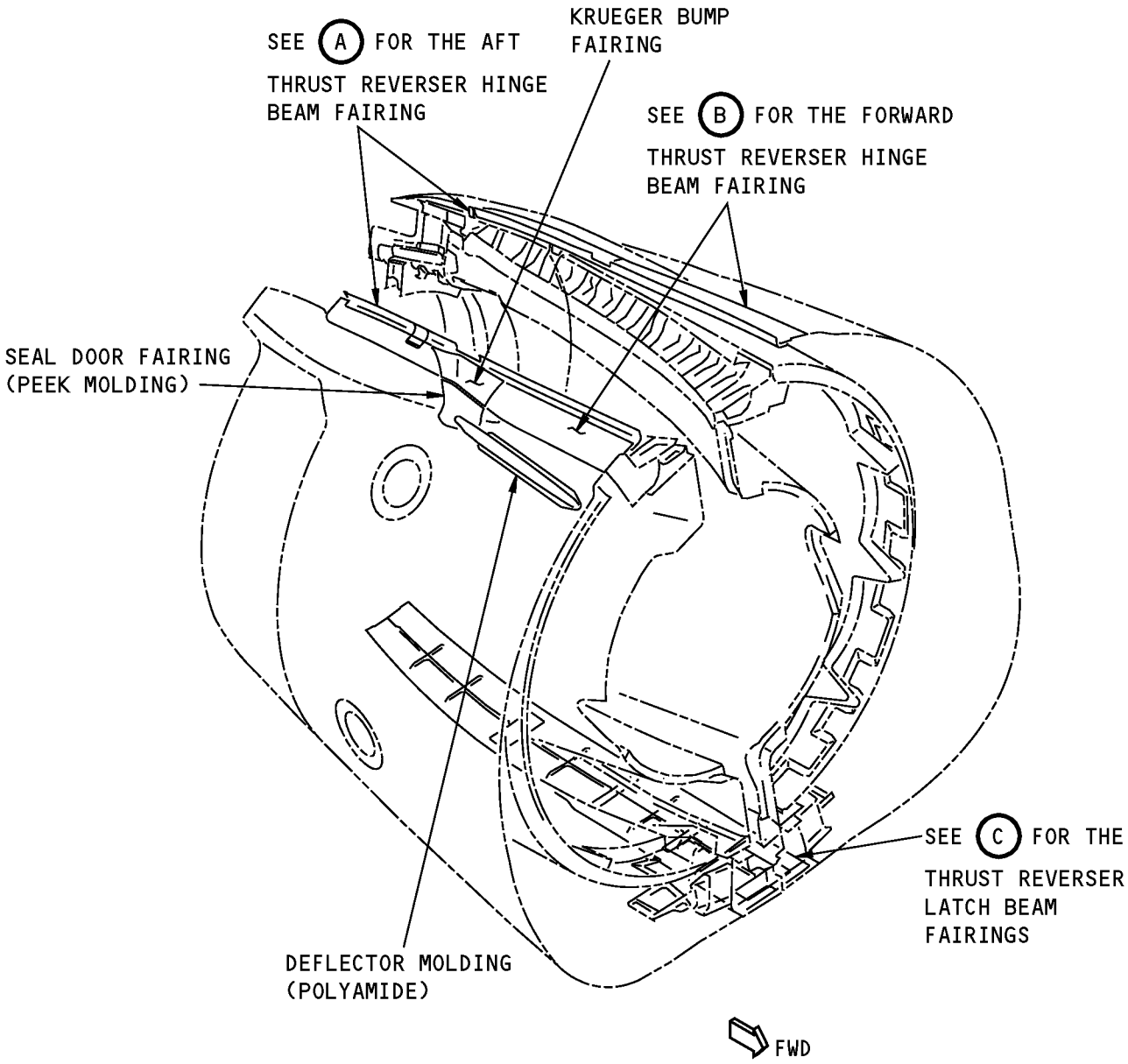
(c) The Bump Fairing.

(2) The Hinge Beam Fairings

(3) The Latch Beam Fairings

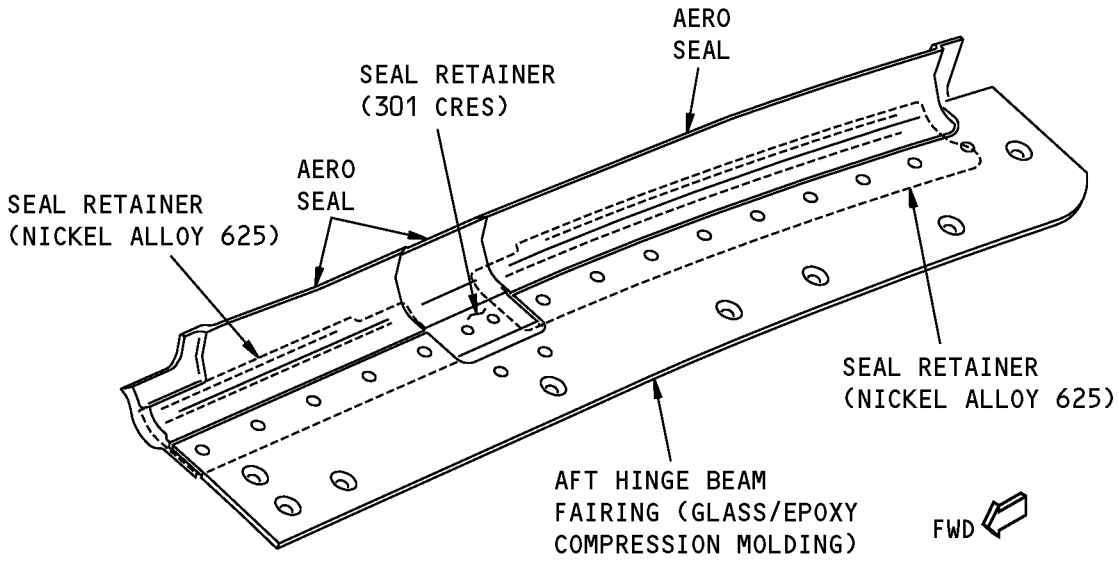


Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location
Figure 101



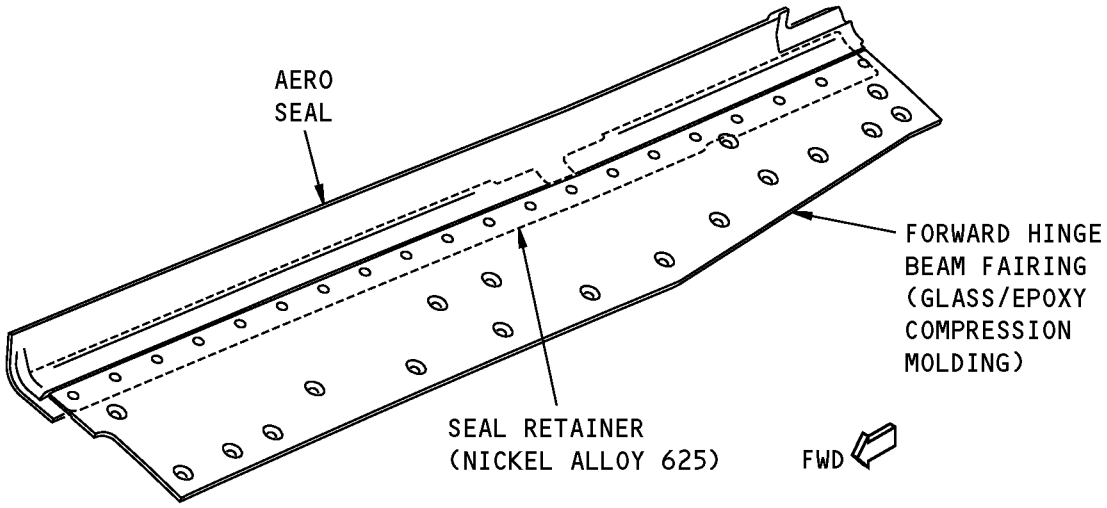
LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings
Figure 102 (Sheet 1 of 3)



LEFT AFT HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT AFT HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

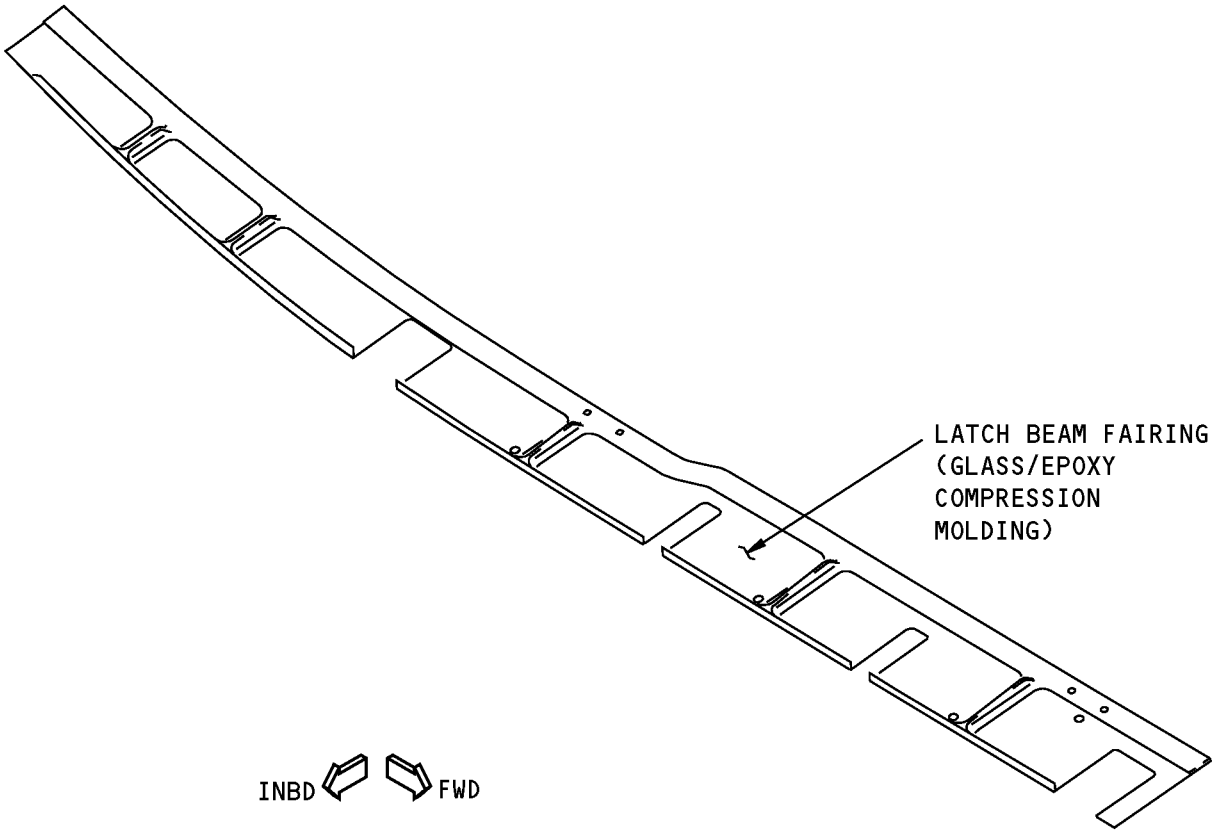
A



LEFT FORWARD HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT FORWARD HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

B

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings
Figure 102 (Sheet 2 of 3)



LEFT LATCH BEAM FAIRING IS SHOWN,
RIGHT LATCH BEAM FAIRING IS ALMOST THE SAME

(C)

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings
Figure 102 (Sheet 3 of 3)

2. General

A. Remove the damage as necessary the parts made of plastic or epoxy/glass sheet moldings:

(1) Do an inspection of the damaged area to find the length, width, and depth of the damage.

(2) Remove all of the contamination and water from the part.

(a) Refer to 51-70-04 for the damage removal procedures.

(b) Refer to 51-30-05 for possible sources of the equipment to remove the damage.

(3) Seal all the permitted damage areas with one of the two methods that follow:

(a) Make a temporary seal with aluminum foil tape (speed tape).

1) Keep a record of the location.

2) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.

3) Repair the damage at or before 5000 flight hours from the time the seal was made.

(b) Make a permanent seal with one of the two adhesive compounds that follow:

1) BMS 5-92, Type 1 or Type 3 epoxy resin

2) BMS 5-123 adhesive.

3) Cure the adhesive compounds as follows:

a) Cure the BMS 5-92 epoxy resin at 75°F (24°C) for 24 hours.

b) Cure the BMS 5-123 adhesive at 75°F (24°C) for 1 hour.

B. For the seal retainers made of 301 CRES or nickel alloy 625, do as follows:

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment you can use to remove the damage.

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
AMM 51-21-99	DECORATIVE EXTERIOR PAINT SYSTEM
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Krueger Seal Door Assembly

(1) Deflector (Plastic Molding)

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and C .

(b) Nicks, Gouges, and Scratches:

1) Remove the damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

2) Damage is permitted if it is a minimum of 4D (D = diameter of the damage) away from:

a) Other damage

b) The nearest hole

c) The edge of the part.

(c) Dents:

1) Dents usually result in cracks. Use the limits for cracks.

(d) Holes and Punctures are not permitted.

(e) Delaminations are not permitted.

(f) Edge Erosion and Edge Crushing:

1) Remove edge crushing damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and C .

2) Remove the edge erosion damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Detail E .

(2) Seal Door Fairing (PEEK) and Bump Fairing (Glass/Epoxy Molding)

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and C .

(b) Nicks, Gouges, and Scratches:

1) Remove the damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

2) Damage is permitted if it is a minimum of 4D (D = diameter of the damage) away from:

a) Other damage

b) The nearest hole

c) The edge of the part.

(c) Dents:

1) Dents usually result in cracks. Use the limits for cracks.

(d) Holes and Punctures:

1) Damage to a maximum of 0.25 inch (6.35 mm) is permitted if it is a minimum of 4D (D = diameter of the damage) away from:

a) Other damage

b) The nearest hole

c) The edge of the part.

(e) Delaminations are not permitted.

(f) Edge Erosion and Edge Crushing:

1) Remove edge crushing damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and C .

2) Remove the edge erosion damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Detail E .

B. Hinge Beam and Latch Beam Fairings

(1) Cracks:

(a) Remove edge damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and C .

(2) Nicks, Gouges, and Scratches:

(a) Remove the damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(b) Damage is permitted if it is a minimum of 4D (D = diameter of the damage) away from:

1) Other damage

2) The nearest hole

3) The edge of the part.

(3) Dents:

(a) Dents usually result in cracks. Use the limits for cracks.

(4) Holes and Punctures:

(a) Damage to a maximum of 0.25 inch (6.35 mm) is permitted if it is a minimum of 4D (D = diameter of the damage) away from:

1) Other damage

2) The nearest hole

3) The edge of the part.

(5) Delaminations are not permitted.

(6) Edge Erosion and Edge Crushing:

(a) Remove edge crushing damage as shown in Allowable Damage Limits - Composite Parts, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and C .

(b) Remove the edge erosion damage as shown in Allowable Damage Limits - Seal Retainers, Figure 104/ALLOWABLE DAMAGE 1, Detail E .

C. Seal Retainers (Nickel or CRES)

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits - Seal Retainers, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and C .

(2) Nicks, Gouges, and Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits - Seal Retainers, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , D and E .

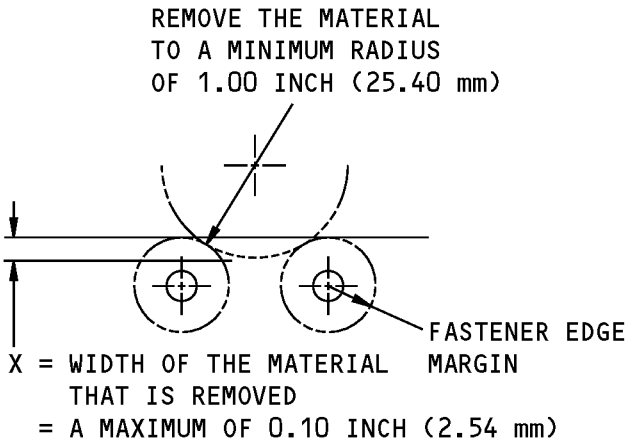
(3) Dents are permitted as shown in Allowable Damage Limits - Seal Retainers, Figure 104/ALLOWABLE DAMAGE 1, Detail F if they are:

(a) A minimum of 4D (D = the dimension of the damage) (edge to edge) from other damage or the edge of the part.

(4) Holes and Punctures are permitted if they are:

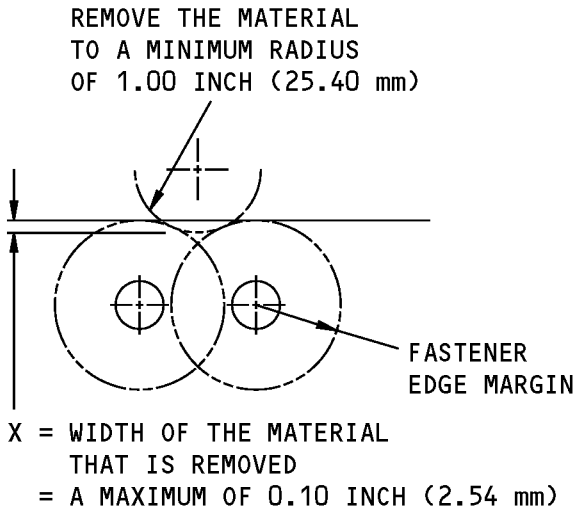
(a) A maximum of 0.25 inch (6.35 mm) in diameter

(b) A minimum of 4D (D = dimension of the damage) (edge to edge) from other damage or the edge of the part.



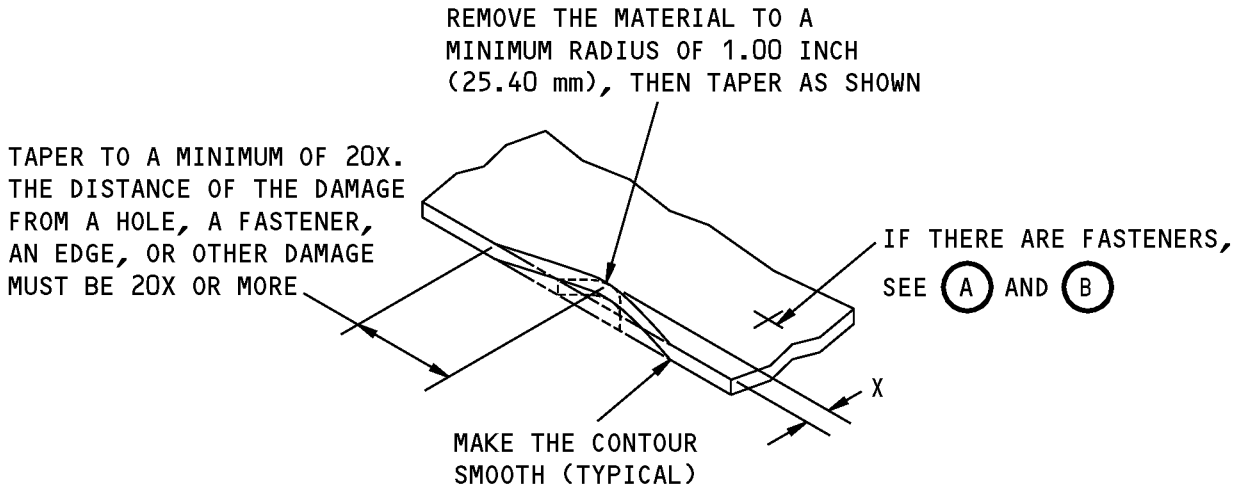
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

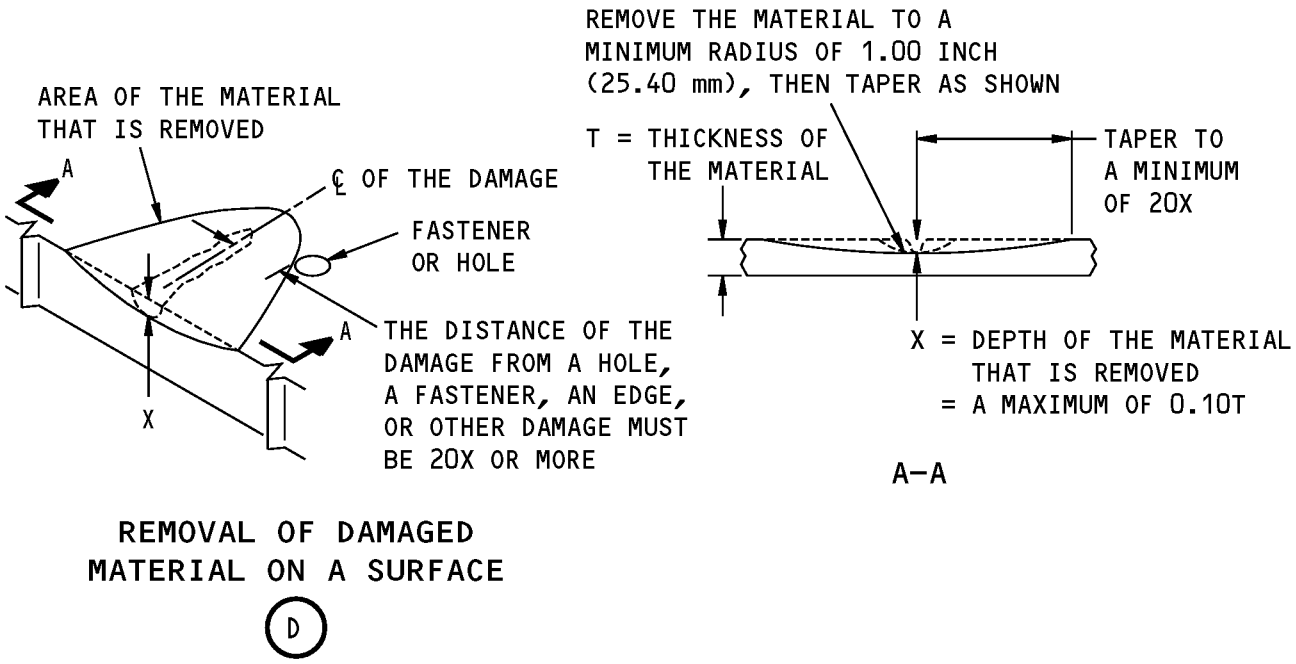


X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

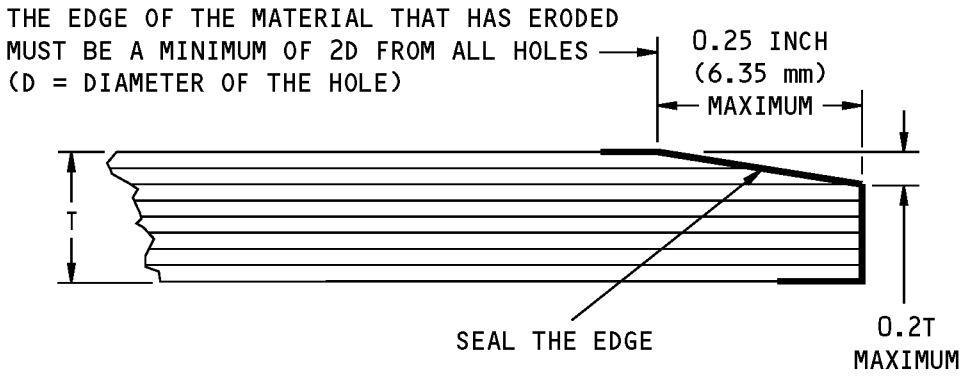
C

Allowable Damage Limits - Composite Parts
Figure 103 (Sheet 1 of 2)



REMOVAL OF DAMAGED
MATERIAL ON A SURFACE

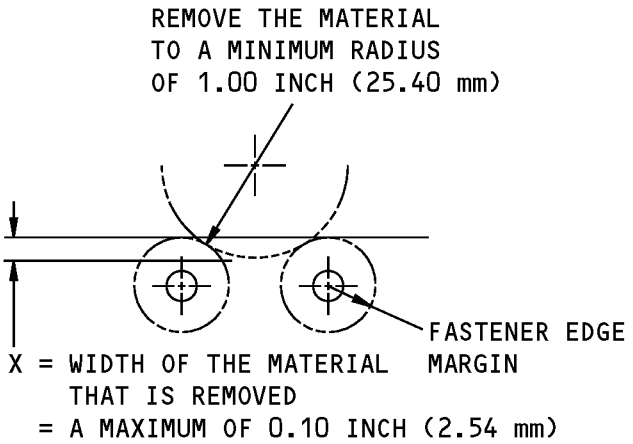
D



SEALING OF EROSION DAMAGE AT AN EDGE OF A COMPOSITE PART

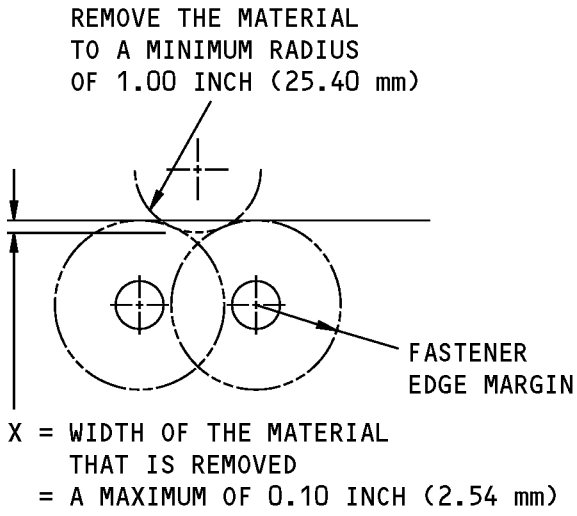
E

Allowable Damage Limits - Composite Parts
Figure 103 (Sheet 2 of 2)



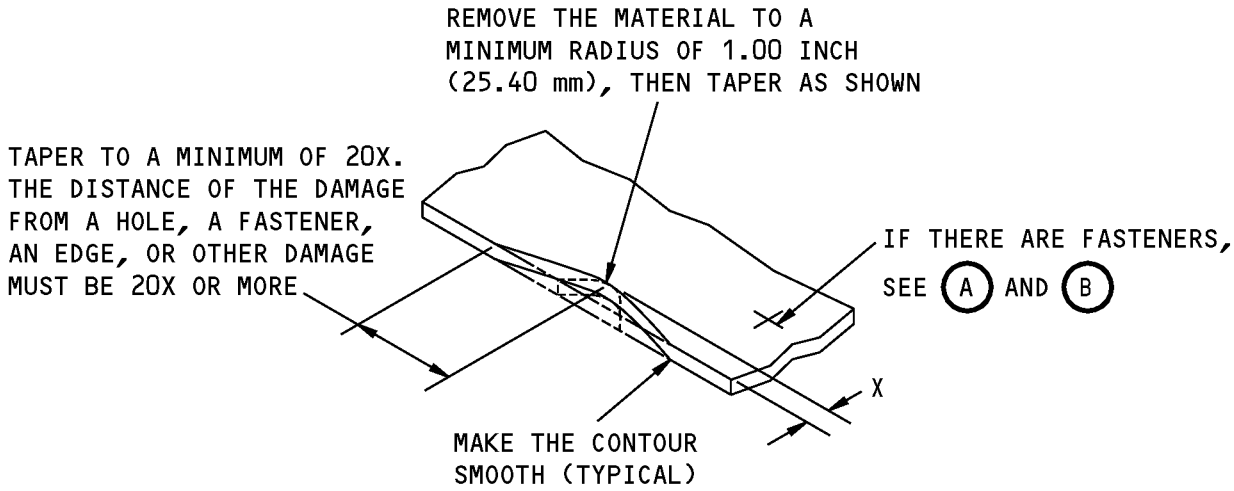
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

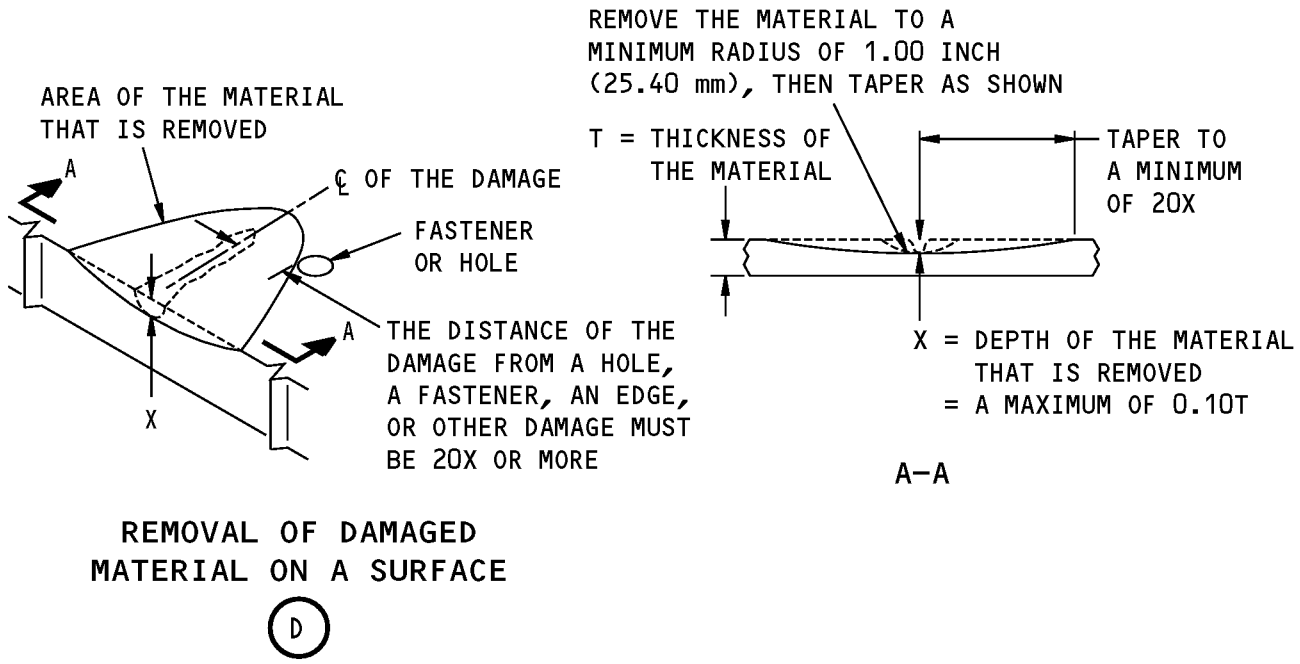


X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

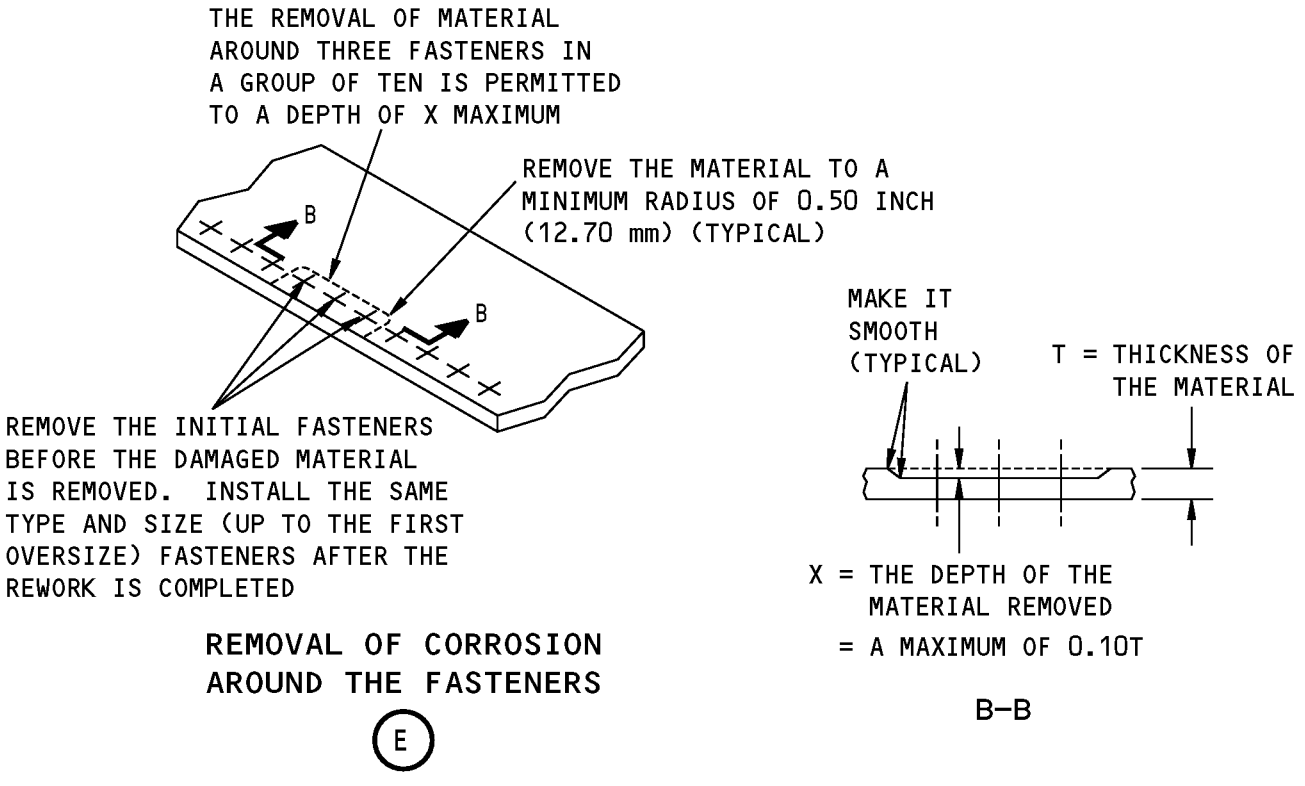
C

Allowable Damage Limits - Seal Retainers
Figure 104 (Sheet 1 of 3)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

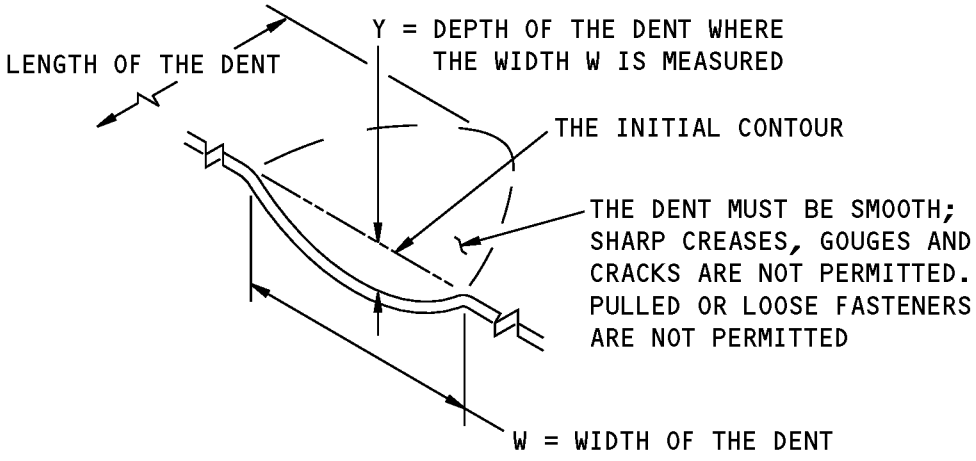
D



REMOVAL OF CORROSION AROUND THE FASTENERS

E

Allowable Damage Limits - Seal Retainers
Figure 104 (Sheet 2 of 3)



$\frac{W}{Y}$ MUST BE 30 OR MORE AT EACH POINT
ALONG THE LENGTH OF THE DENT

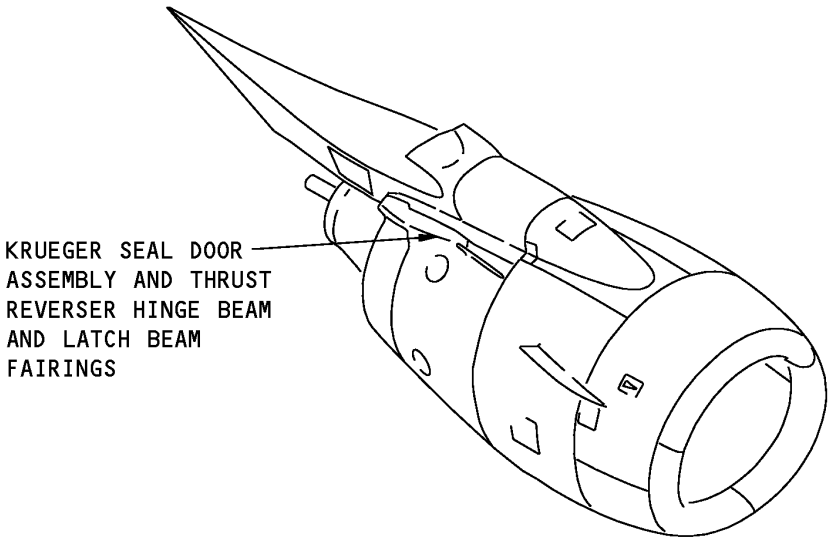
Y = A MAXIMUM OF 0.125 INCH (3.18 mm)

DENT THAT IS PERMITTED

F

Allowable Damage Limits - Seal Retainers
Figure 104 (Sheet 3 of 3)

REPAIR 1 - KRUEGER SEAL DOOR ASSEMBLY AND THRUST REVERSER HINGE BEAM AND LATCH BEAM FAIRINGS

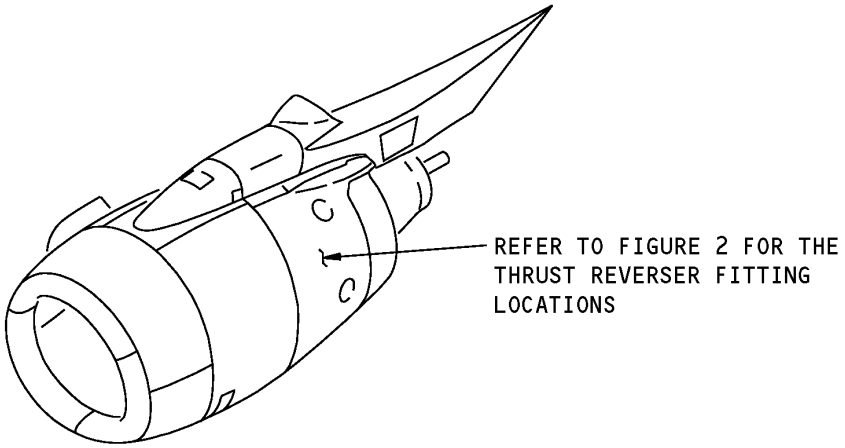


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME. IF DAMAGE TO THE STRUCTURE IS MORE THAN THE LIMITS GIVEN IN SRM 54-30-70, ALLOWABLE DAMAGE 1, THEN REPLACE THE DAMAGED PART.

LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location
Figure 201

IDENTIFICATION 1 - THRUST REVERSER FITTINGS

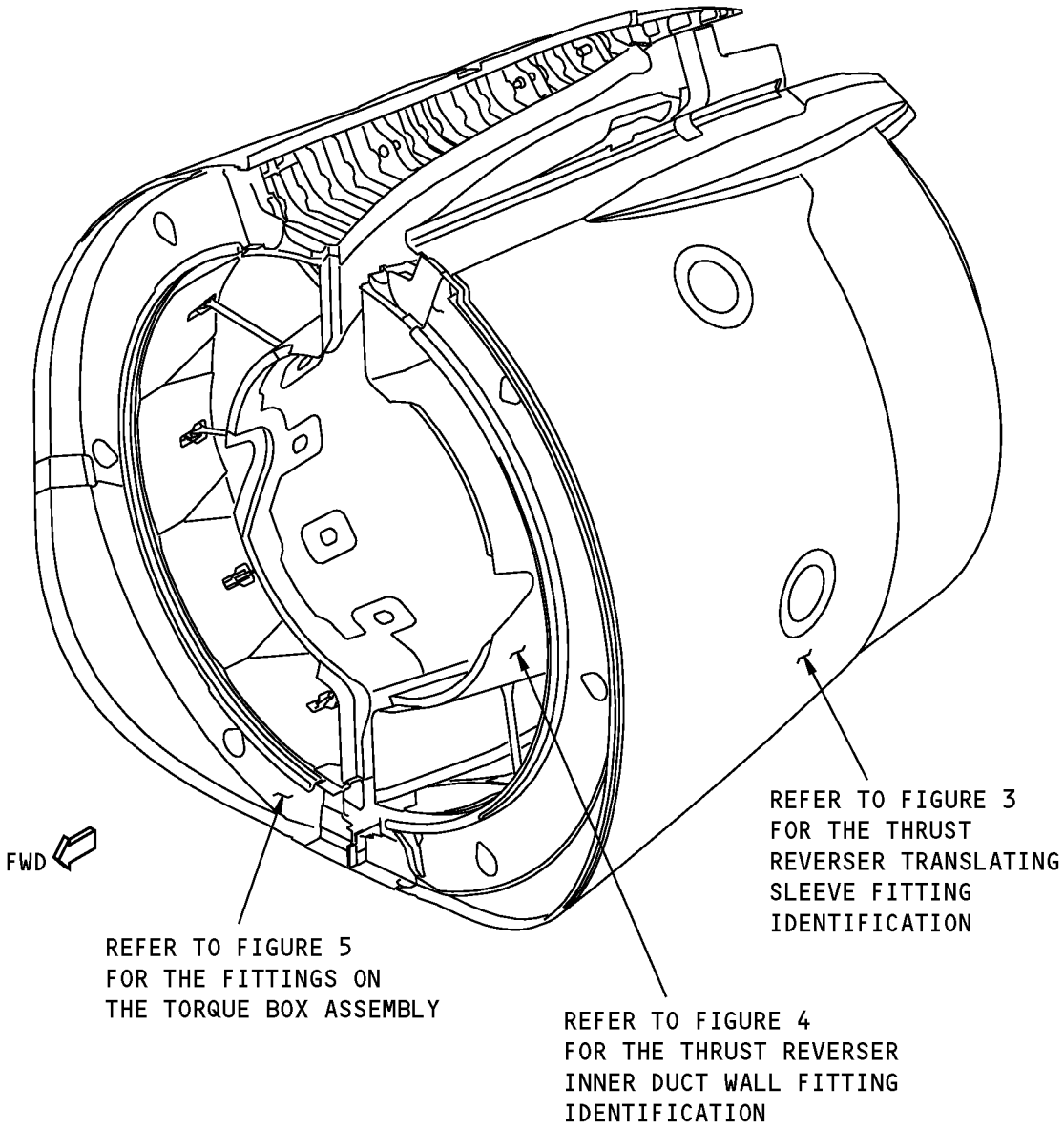


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Thrust Reverser Fittings
Figure 1

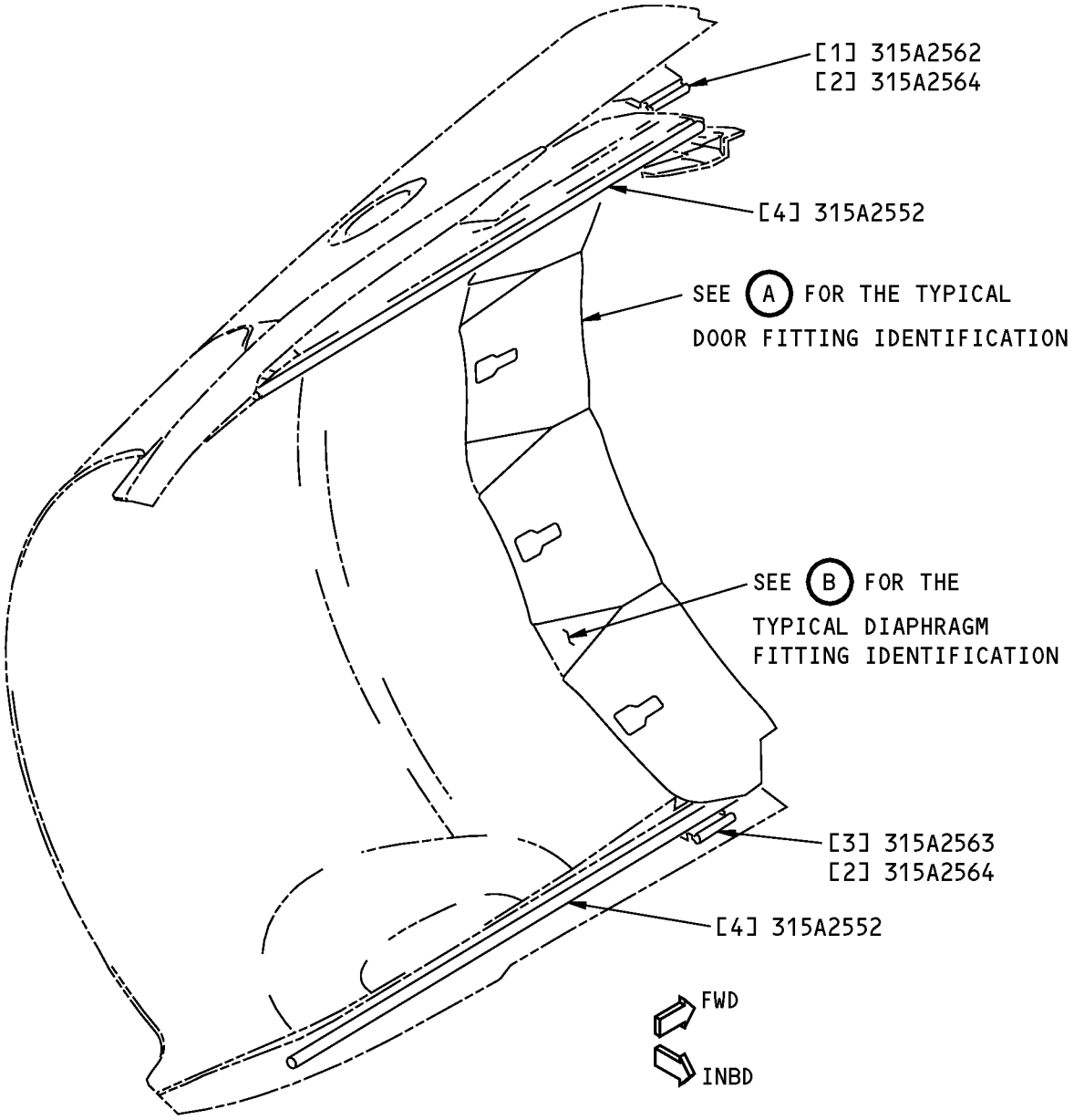
Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
300A2020	Engine Fan Duct Cowl and Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2500	Thrust Reverser Translating Sleeve Assembly
315A2501	Acoustic Panel Assembly - Translating Sleeve



LEFT THRUST REVERSER ASSEMBLY IS SHOWN,
RIGHT THRUST REVERSER ASSEMBLY IS OPPOSITE

Thrust Reverser Fitting Locations
Figure 2

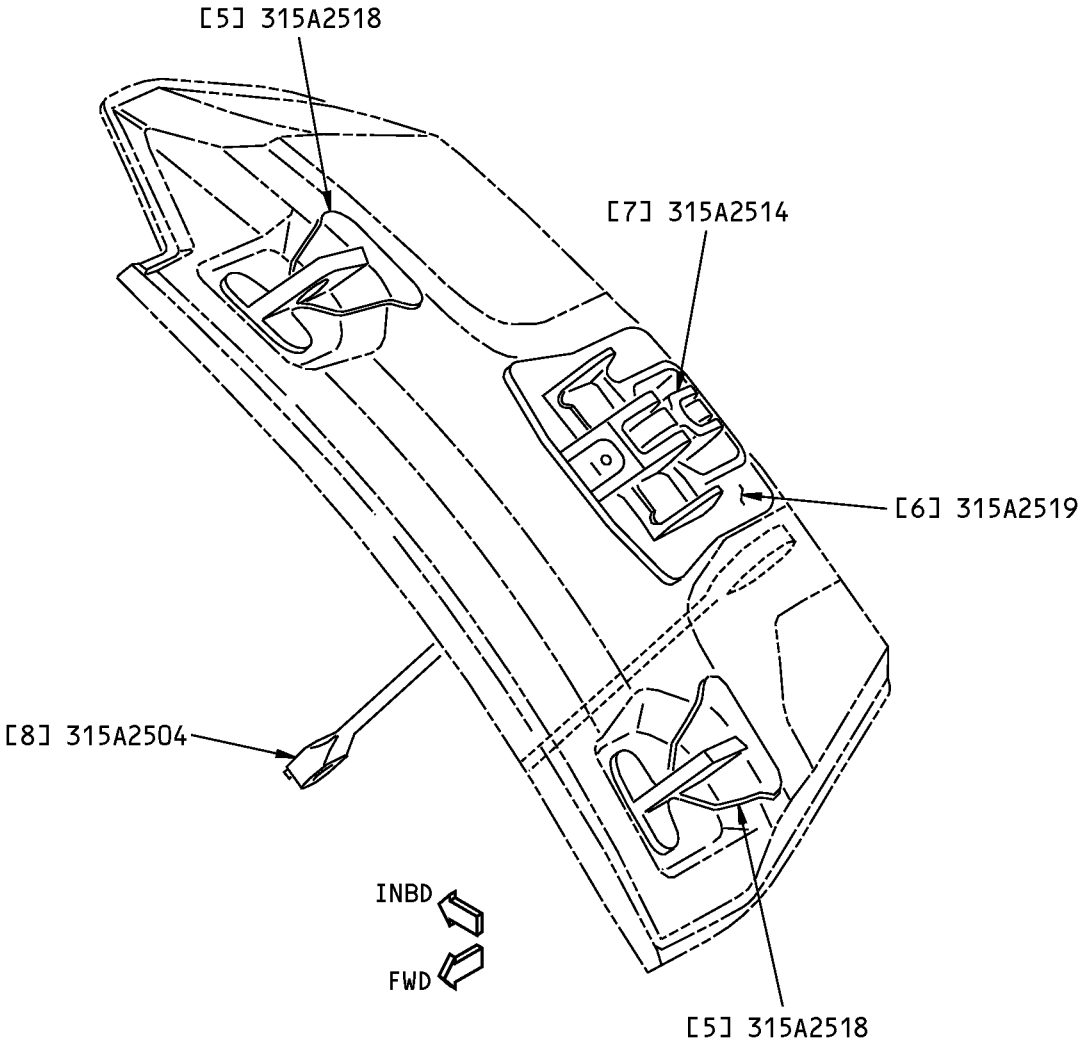


LEFT TRANSLATING SLEEVE IS SHOWN,
RIGHT TRANSLATING SLEEVE IS OPPOSITE

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 1 of 4)

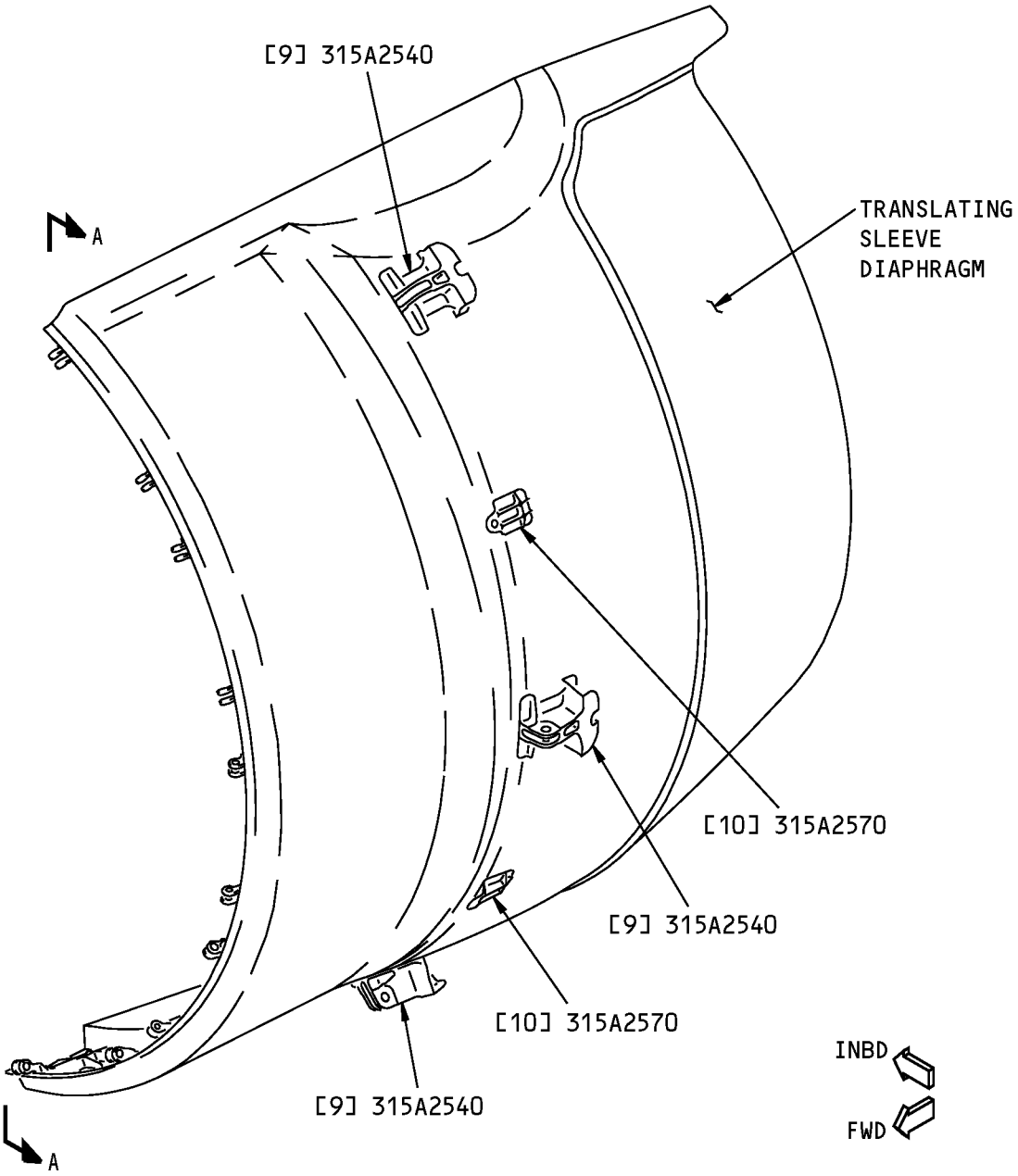


FITTINGS ON THE UPPER END BLOCKER DOOR ARE SHOWN,
FITTINGS ON ALL BLOCKER DOORS ARE THE SAME

VIEW IS ON THE NON-AERODYNAMIC SURFACE

A

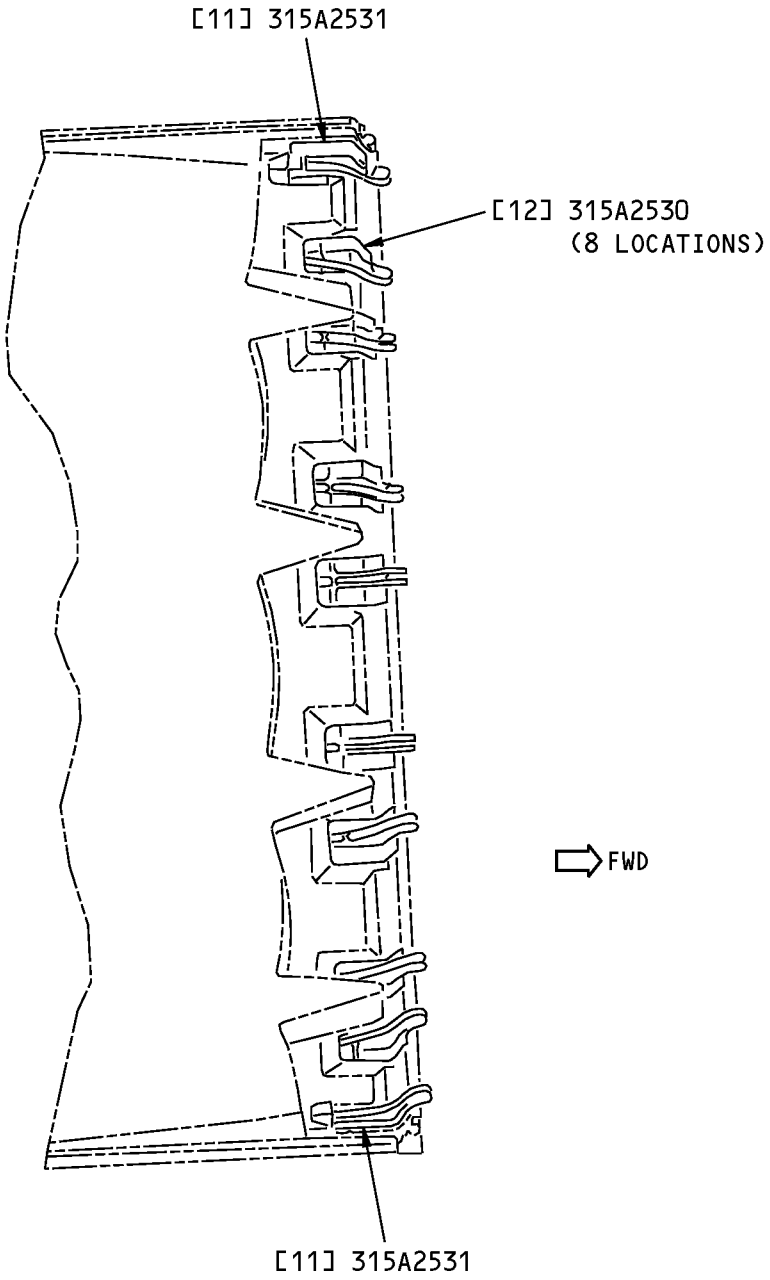
Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 2 of 4)



LEFT TRANSLATING SLEEVE DIAPHRAGM IS SHOWN,
RIGHT TRANSLATING SLEEVE DIAPHRAGM IS OPPOSITE

B

Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 3 of 4)

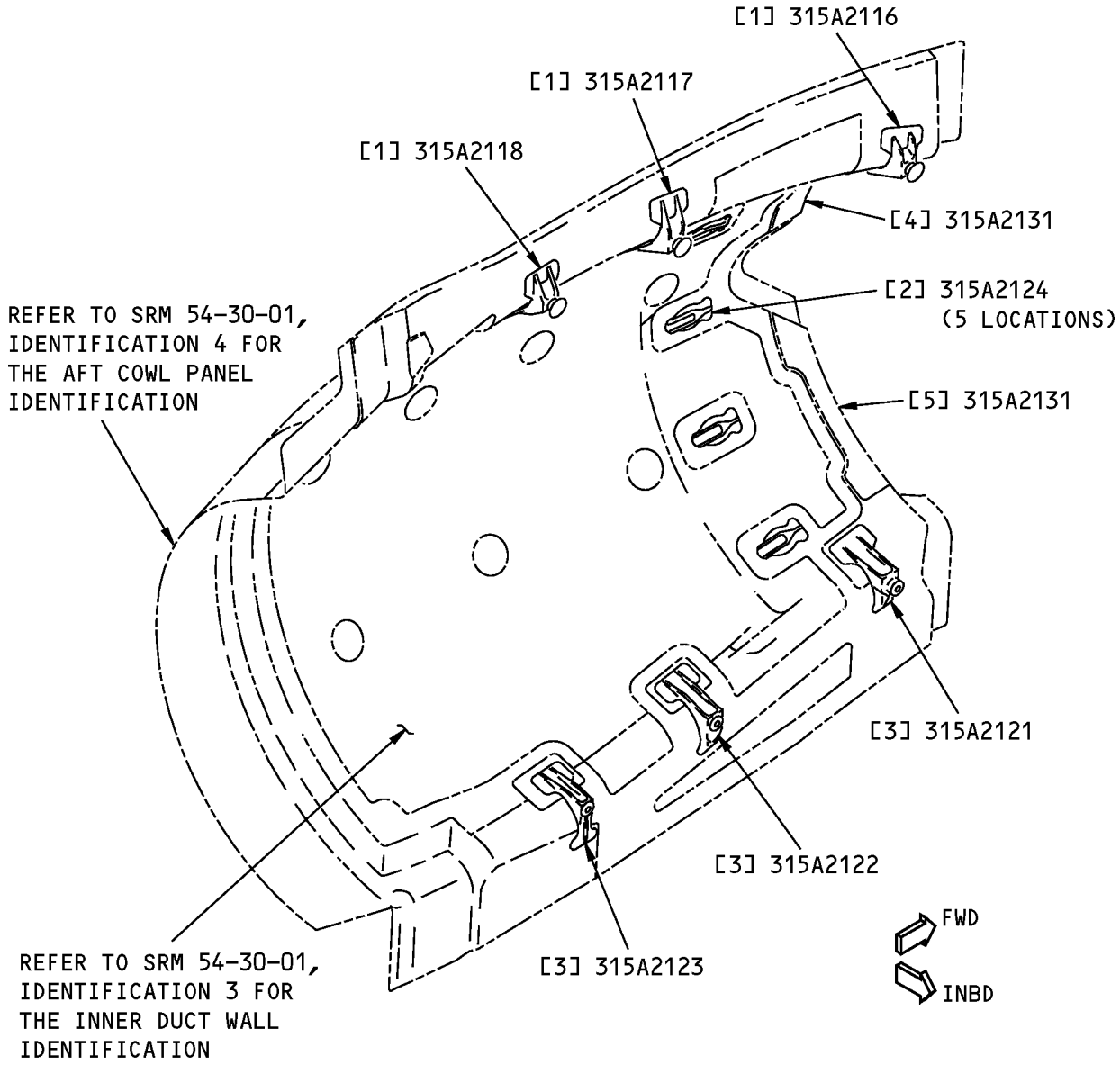


Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 4 of 4)

Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Auxiliary Track Slider	0.750 (19.1)	7050-T7451 aluminum as given in AMS 4050	
[2]	Upper Auxiliary Track Slider Attach Fitting		7075-T73 forged block as given in BMS 7-186 (Optional: 7050-T7451 plate as given in BMS 7-323)	
[3	Lower Auxiliary Track Slider Attach Fitting		7075-T73 forged block as given in BMS 7-186	
[4]	Main Track Slider Fitting	0.500 (12.7)	2024-T8511 extruded bar as given in QQ-A-200/3	
[5]	Hinge Fitting		7075-T73 die forging as given in BMS 7-186	
[6]	Link Attach Fitting		7075-T73 die forging as given in BMS 7-186	
[7]	Control Link		7075-T7351 bar as given in QQ-A-225/9	
[8]	Drag Link	0.50 (12.7)	15-5PH CRES bar as given in AMS 5619, heat treated to 150-170 ksi	
[9]	Actuator Attach Fitting		7075-T7451 aluminum plate as given in AMS 4050 (Optional: 7075-T73 forged aluminum block as given in BMS 7-186)	
[10]	Deactivation Fitting	1.00 (25.40)	7075-T7351 machined plate as given in QQ-A-250/12	
[11]	End Diaphragm Hinge Fitting (2)		7075-T73 forged aluminum bar as given in BMS 7-186	
[12]	Common Diaphragm Hinge Fitting (8)		7075-T73 die forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS 7-186)	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

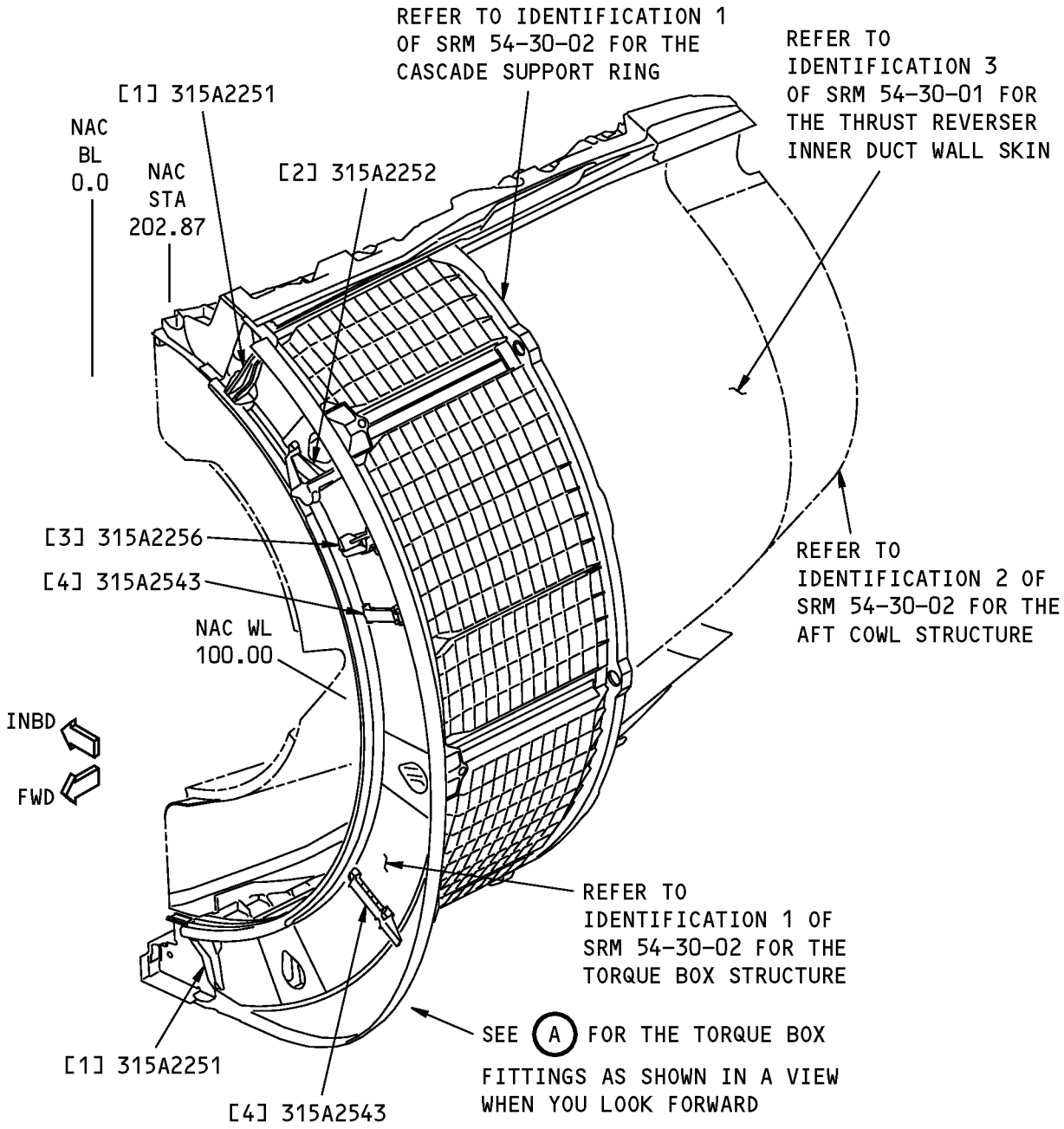
LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Thrust Reverser Inner Duct Wall Fitting Identification
Figure 4

Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Upper Compression Pad		7075-T73 precision forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS 7-186)	
[2]	Drag Link Anchor Fitting		7075-T73 precision forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS 7-186)	
[3]	Lower Compression Pad		7075-T73 precision forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS 7-186)	
[4]	Upper Inner V-Blade Fitting		7075-T73 forged ring as given in BMS 7-186	
[5]	Lower Inner V-Blade Fitting		7075-T73 forged ring as given in BMS 7-186	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

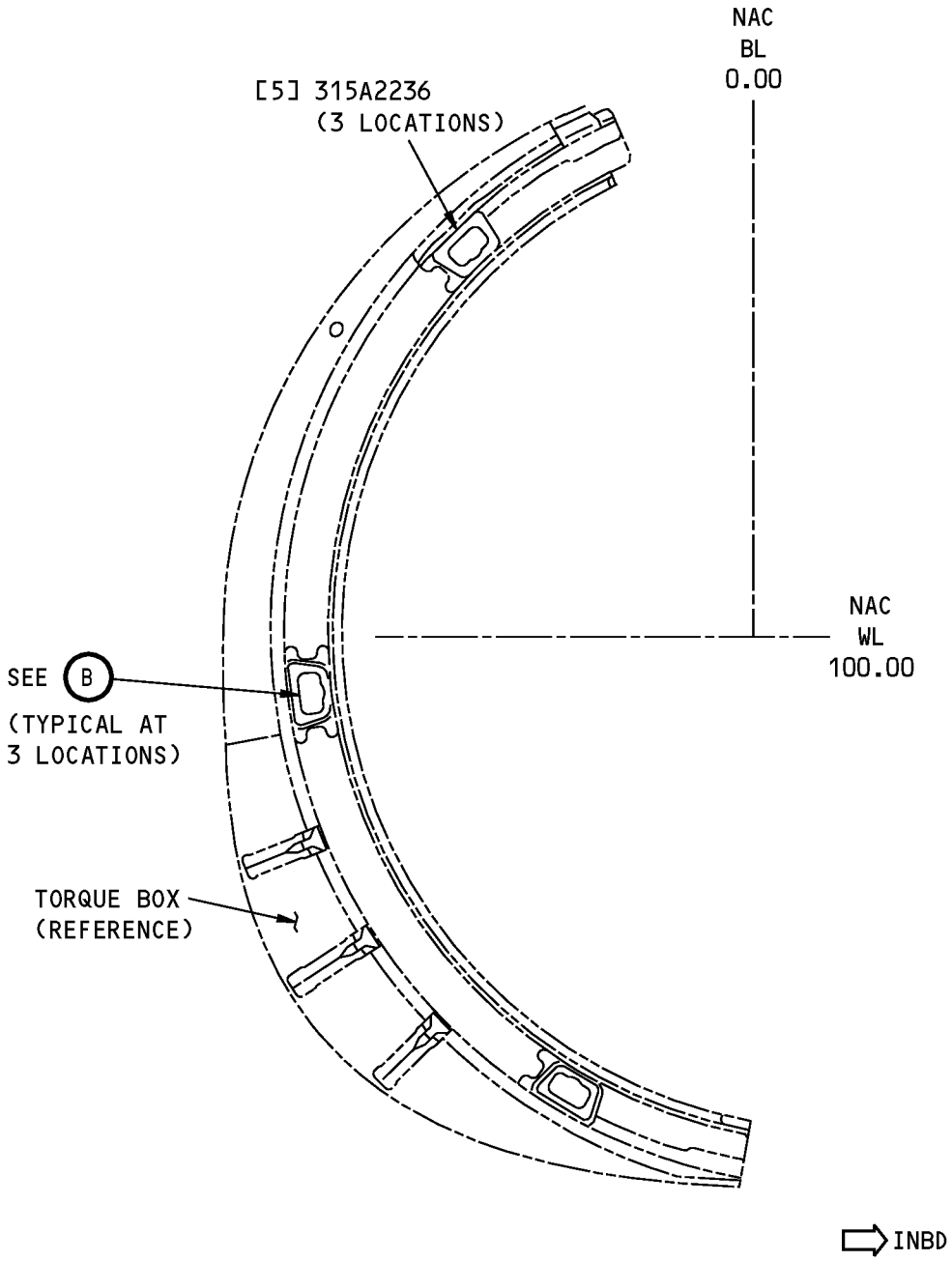


LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

NOTES

- REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

Thrust Reverser Torque Box Fittings
Figure 5 (Sheet 1 of 3)

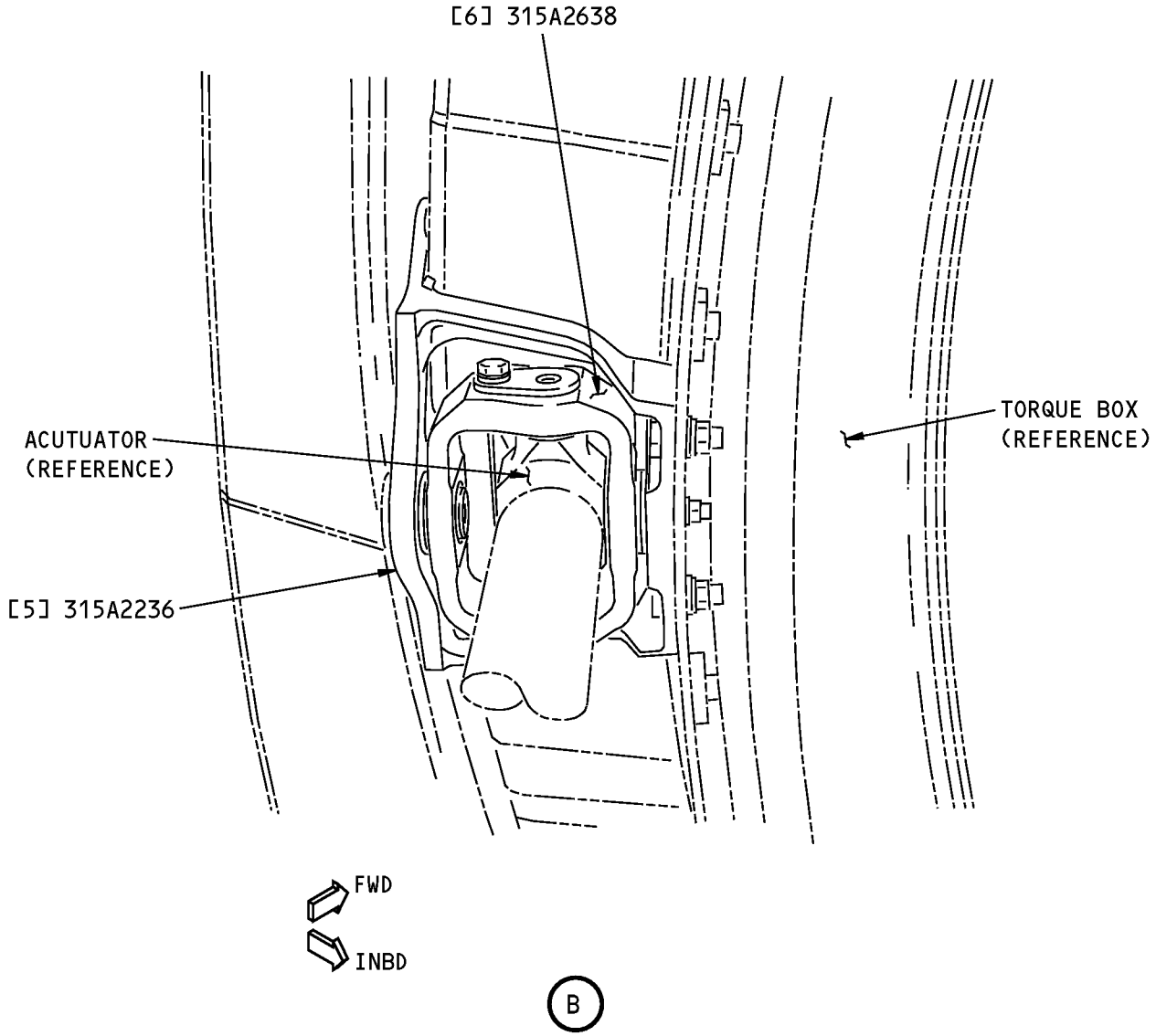


LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

VIEW WHEN YOU LOOK FORWARD

A

Thrust Reverser Torque Box Fittings
Figure 5 (Sheet 2 of 3)



Thrust Reverser Torque Box Fittings
Figure 5 (Sheet 3 of 3)

Table 4:

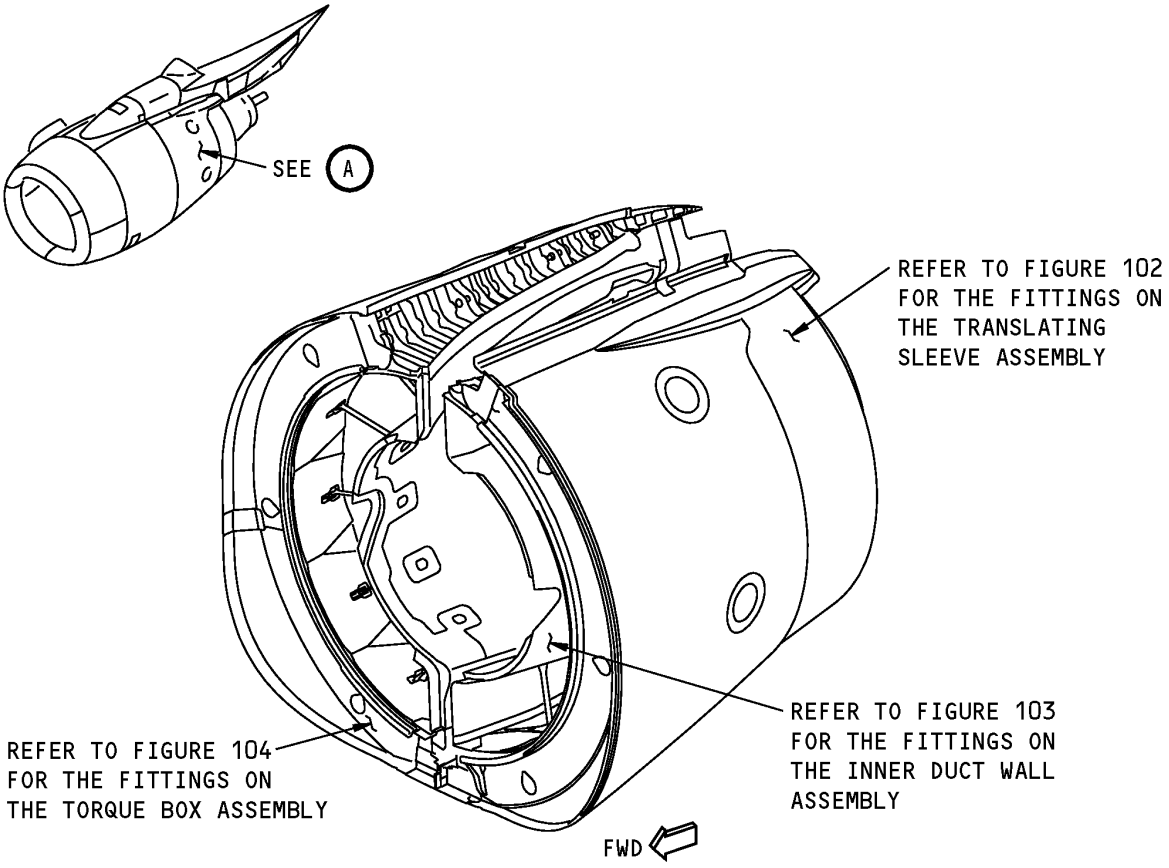
LIST OF MATERIALS FOR FIGURE 5				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	V-Blade Support Fitting (2)		7050-T7452 die forging as given in BMS 7-214 (Optional: 7050-T7451 plate as given in AMS 4050 that is 1.95 inches (49.5 mm) thick)	
[2]	Opening Actuator Fitting (3)	4.00 (101.6)	7050-T7452 forging as given in BMS 7-214	
[3]	Mount Sleeve - Stow Sensor		7075-T73 die forging as given in BMS 7-186	
[4]	Tube Support Fitting (2)		7075-T73 forged block as given in BMS 7-186	
[5]	Actuator Attach Fitting (3)	4.00 (101.6)	15-5PH bar as given in AMS 5659	
[6]	Gimbal Ring (3)		Ti-6Al-4V forged titanium bar as given in MIL-T-9047, in the annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

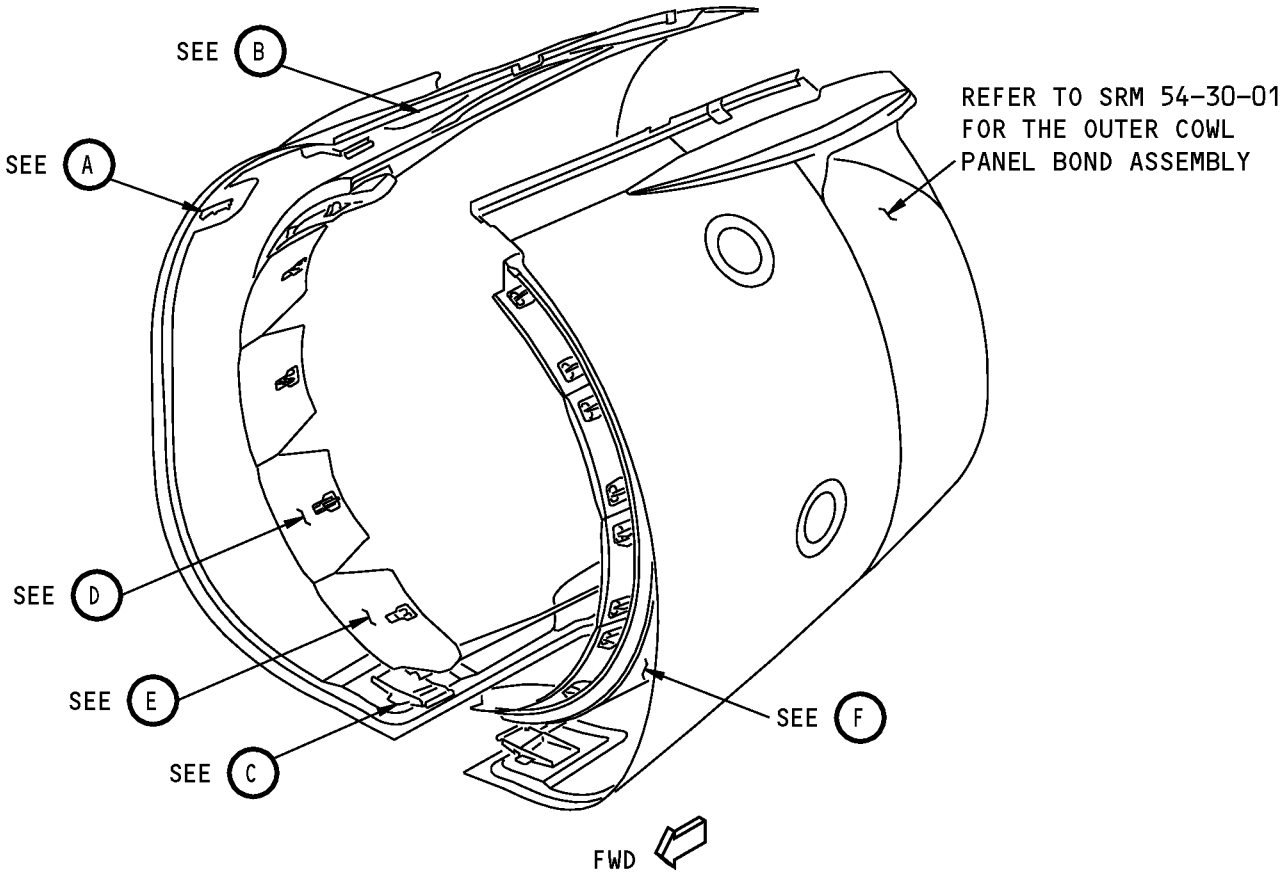
ALLOWABLE DAMAGE 1 - THRUST REVERSER FITTINGS

1. Applicability

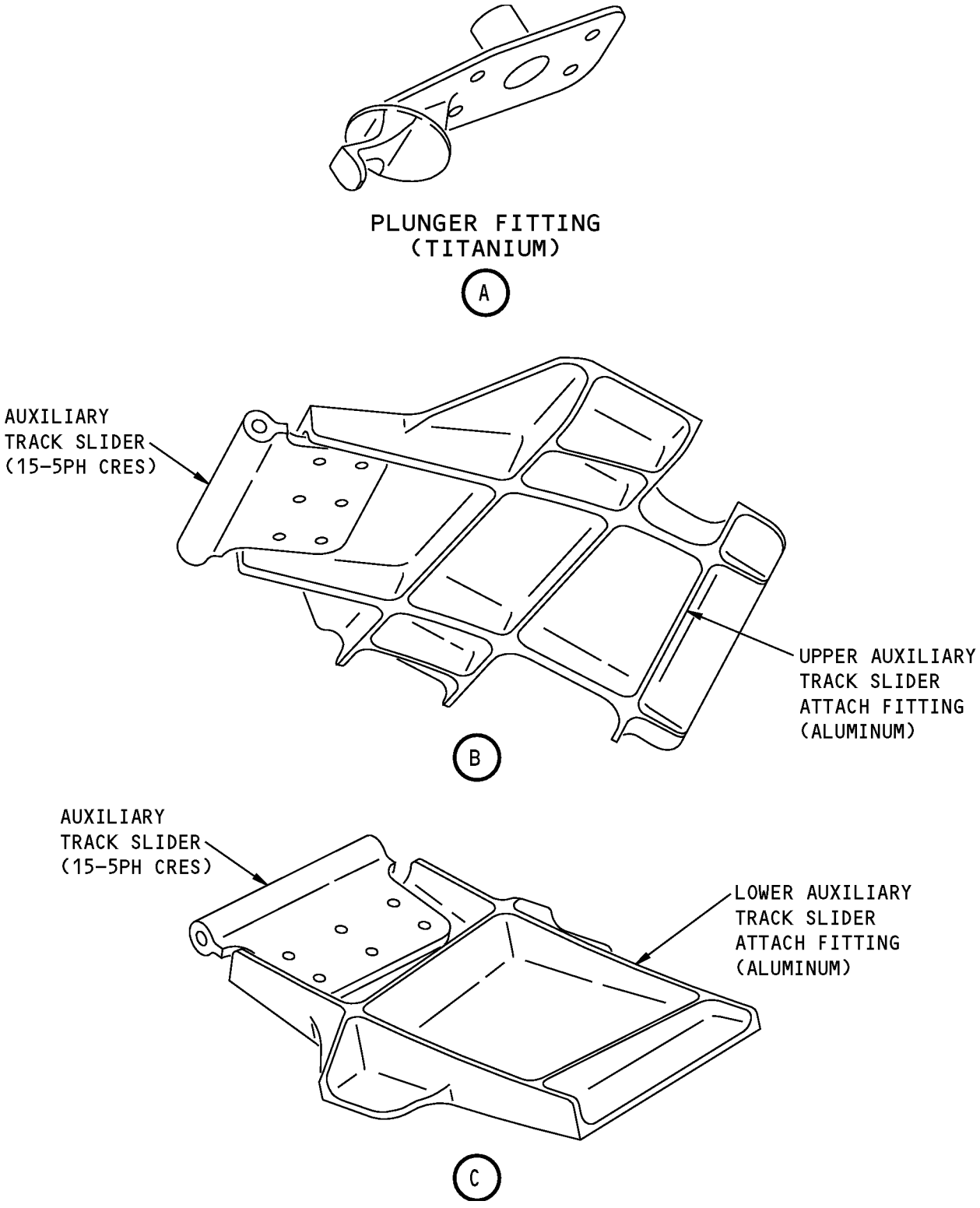
A. This subject gives the allowable damage limits for the fittings on the thrust reverser assemblies shown in Thrust Reverser Fittings Location, Figure 101/ALLOWABLE DAMAGE 1.



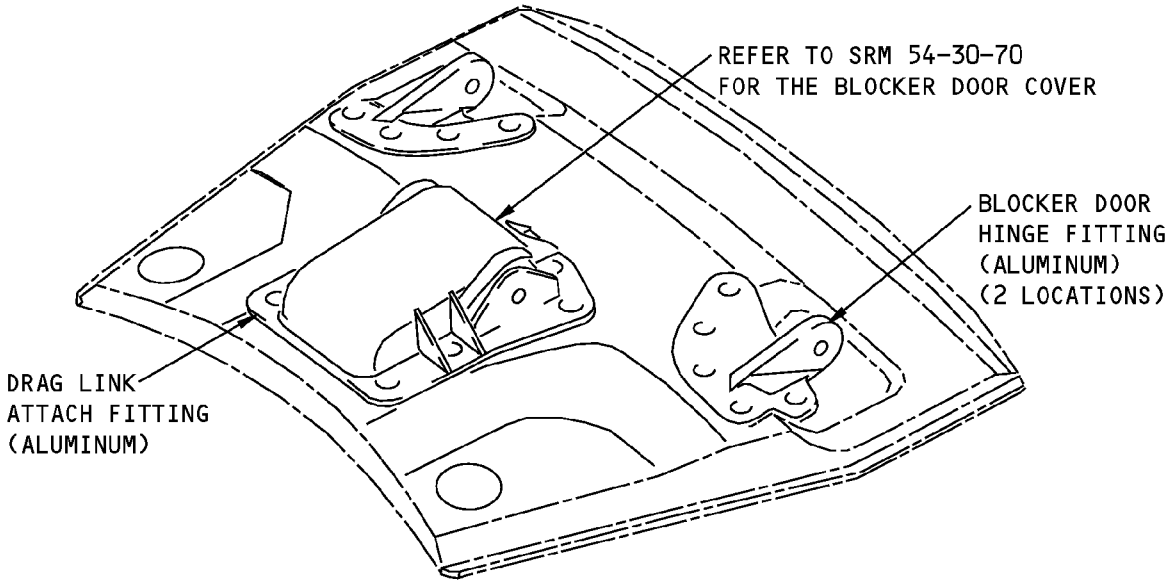
Thrust Reverser Fittings Location
Figure 101



Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 1 of 6)

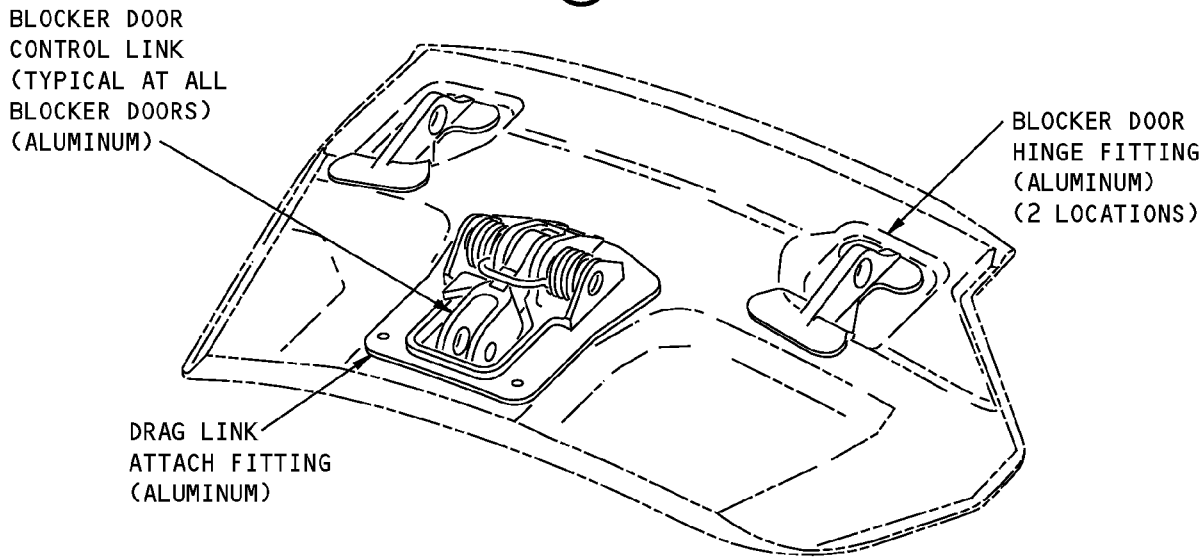


Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 2 of 6)



COMMON BLOCKER DOOR ASSEMBLY
(TYPICAL AT 3 LOCATIONS)

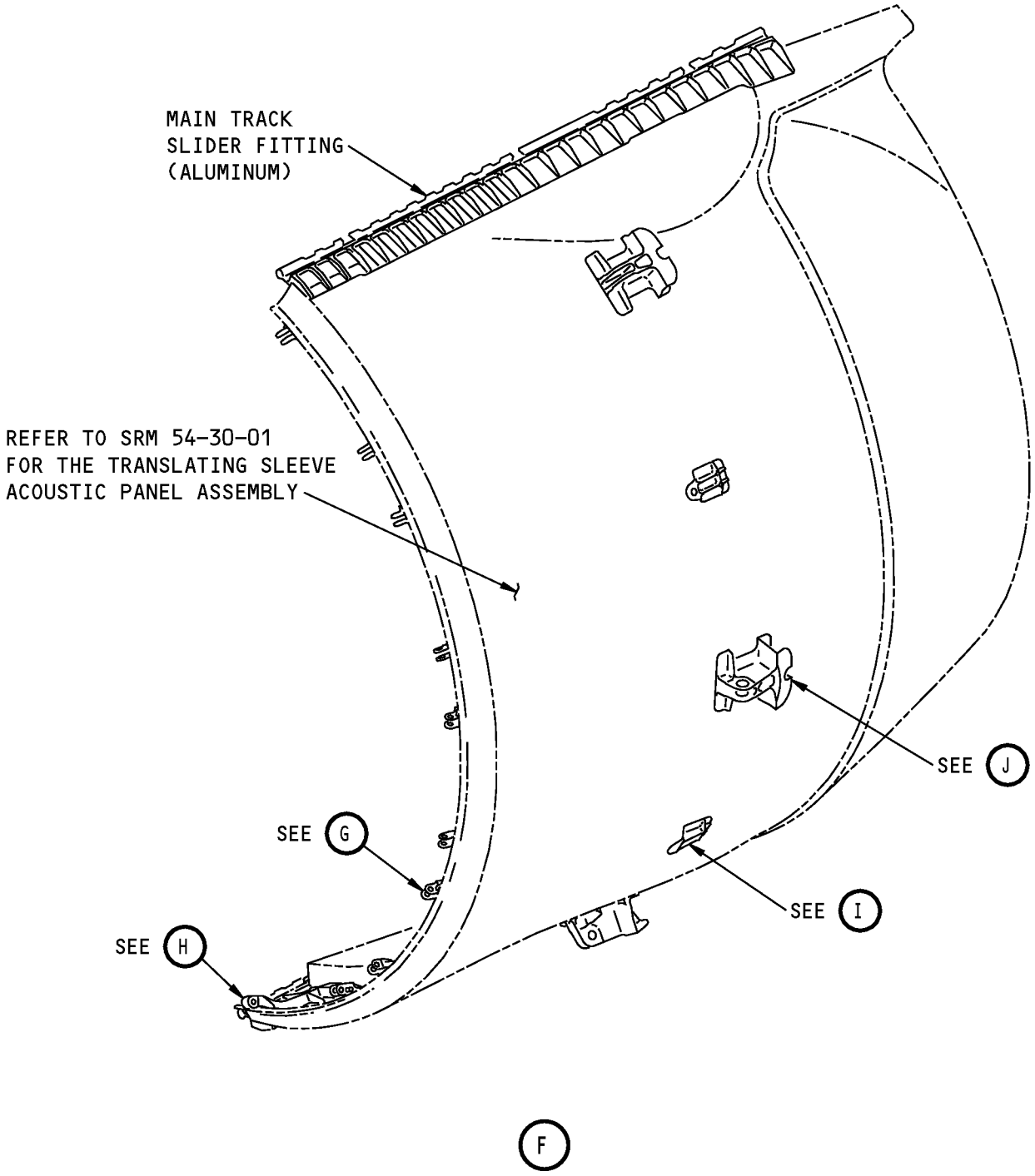
D



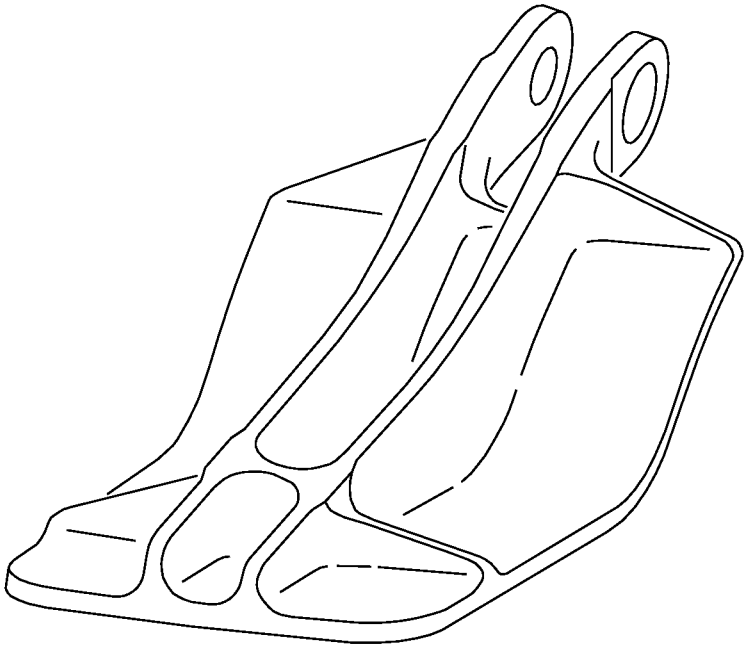
END BLOCKER DOOR ASSEMBLY
(COVER REMOVED)
(TYPICAL AT 2 LOCATIONS)

E

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 3 of 6)

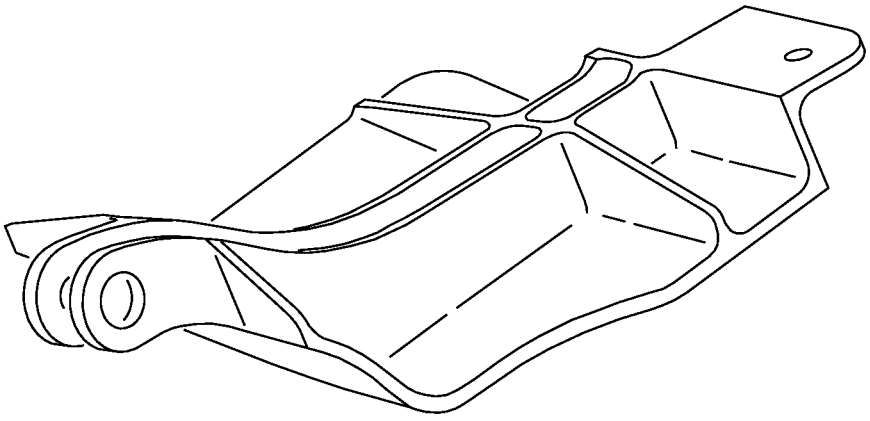


Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 4 of 6)



COMMON DIAPHRAGM HINGE FITTING
(ALUMINUM)
(8 LOCATIONS)

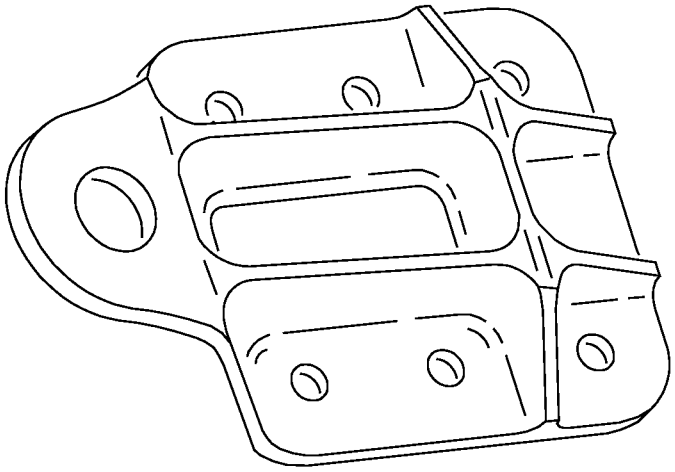
G



END DIAPHRAGM HINGE FITTING
(ALUMINUM)
(2 LOCATIONS)

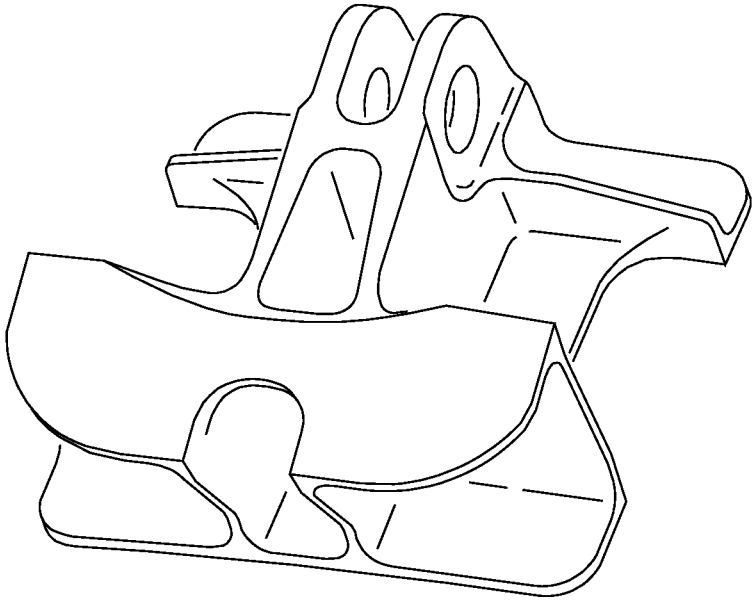
H

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 5 of 6)



DEACTIVATION FITTING
(ALUMINUM)
(2 LOCATIONS)

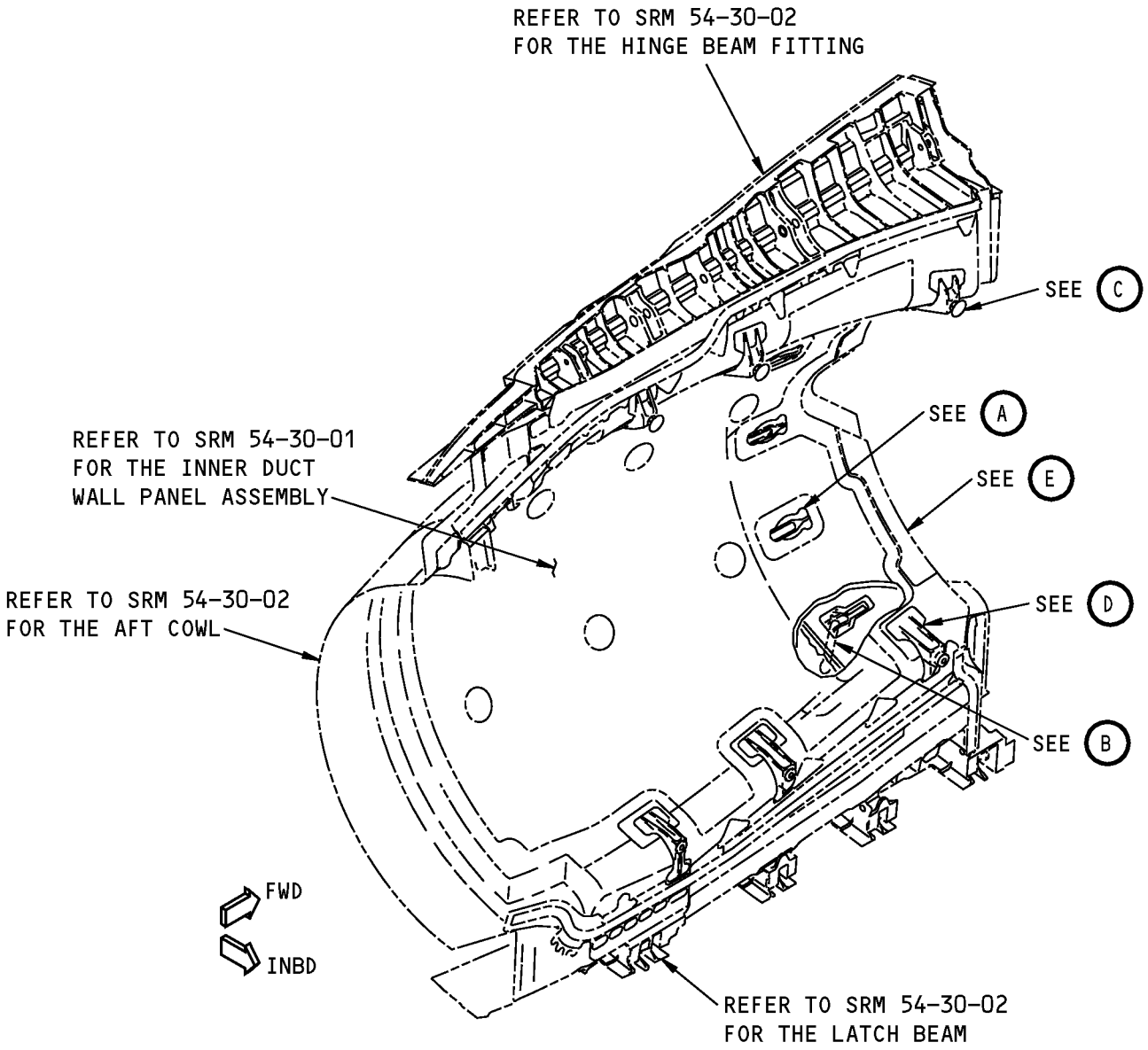
I



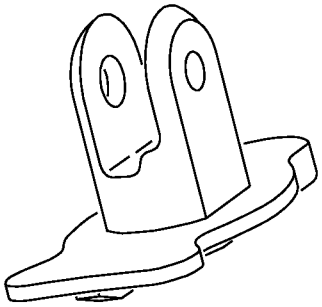
ACTUATOR ATTACH FITTING
(ALUMINUM)
(3 LOCATIONS)

J

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 6 of 6)

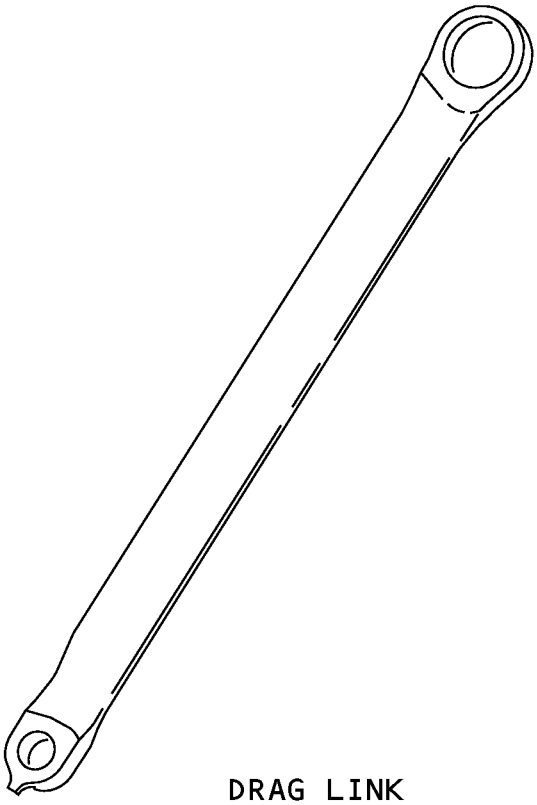


Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 1 of 4)



DRAG LINK ANCHOR FITTING
(ALUMINUM)
(TYPICAL AT 5 LOCATIONS)

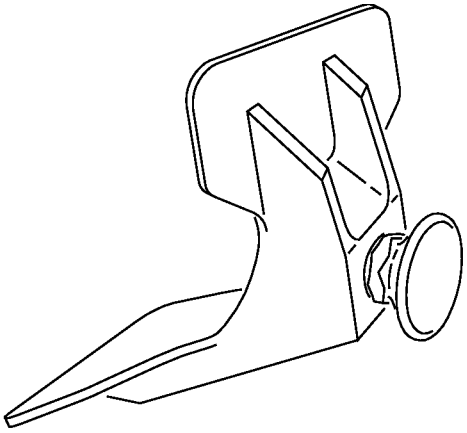
A



DRAG LINK
(15-5PH CRES)
(TYPICAL AT 5 LOCATIONS)

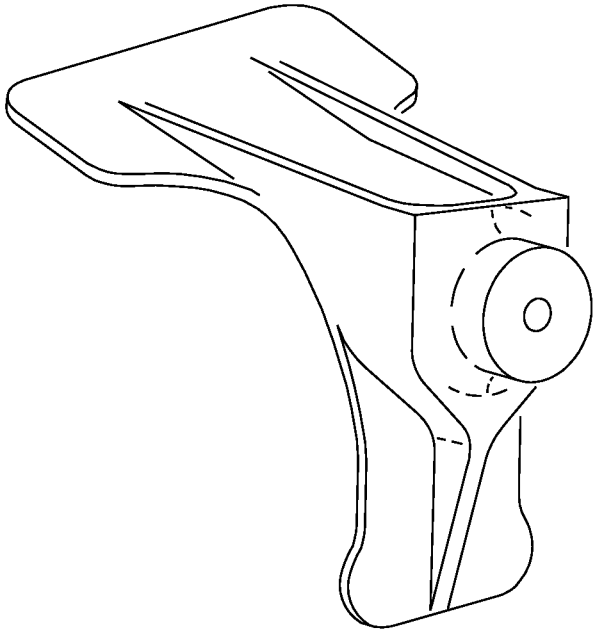
B

Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 2 of 4)



UPPER FORWARD COMPRESSION PAD IS SHOWN, (ALUMINUM)
(THE UPPER CENTER AND REAR COMPRESSION
PADS ARE ALMOST THE SAME)

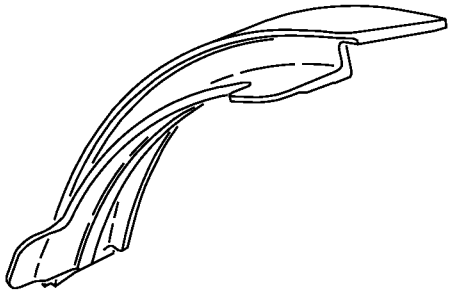
C

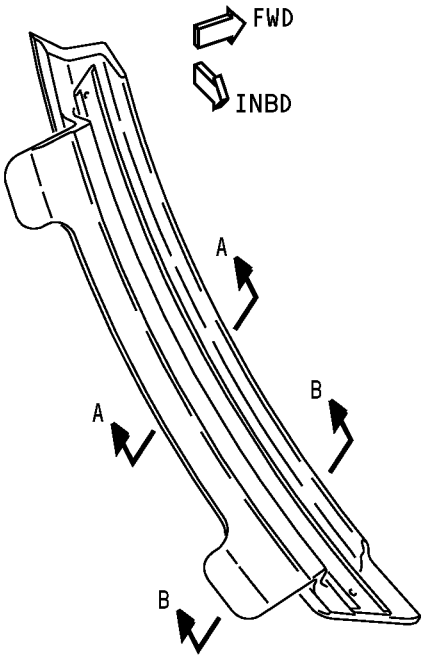


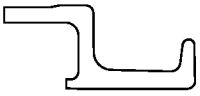
LOWER FORWARD COMPRESSION PAD IS SHOWN, (ALUMINUM)
(THE LOWER CENTER AND REAR COMPRESSION
PADS ARE ALMOST THE SAME)

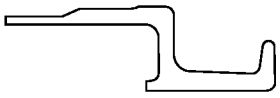
D

Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 3 of 4)

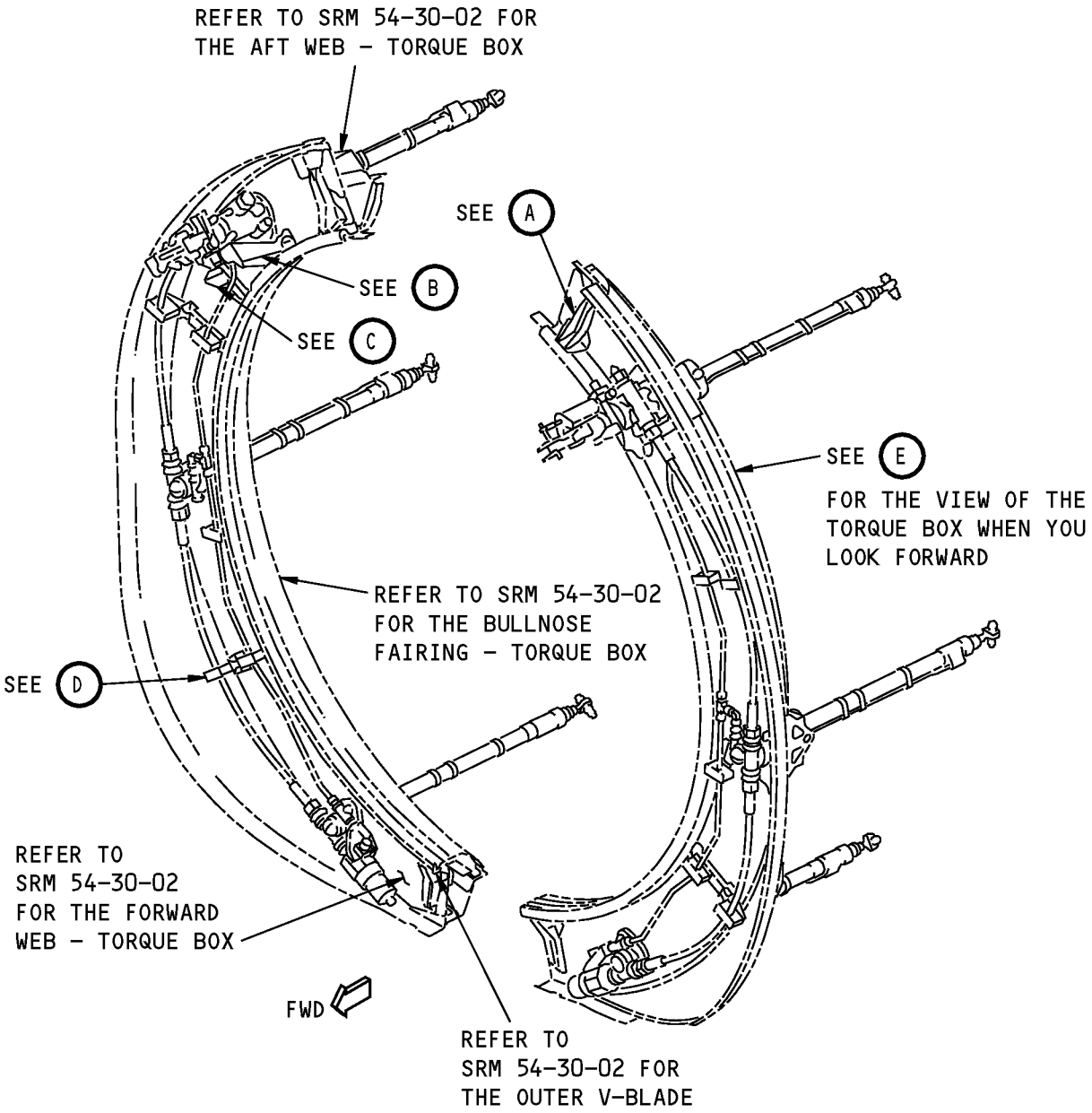




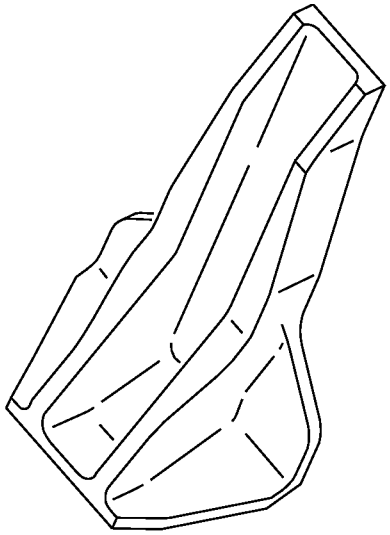




Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 4 of 4)

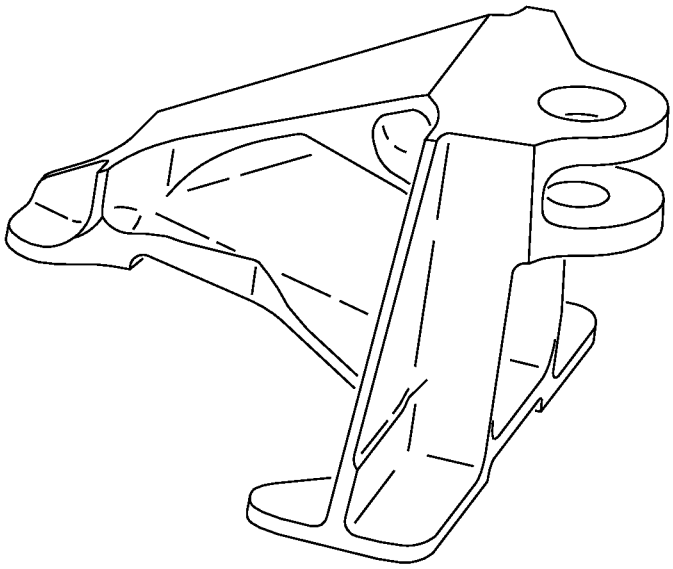


Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 1 of 5)



OUTER V-BLADE SUPPORT FITTING
(ALUMINUM)

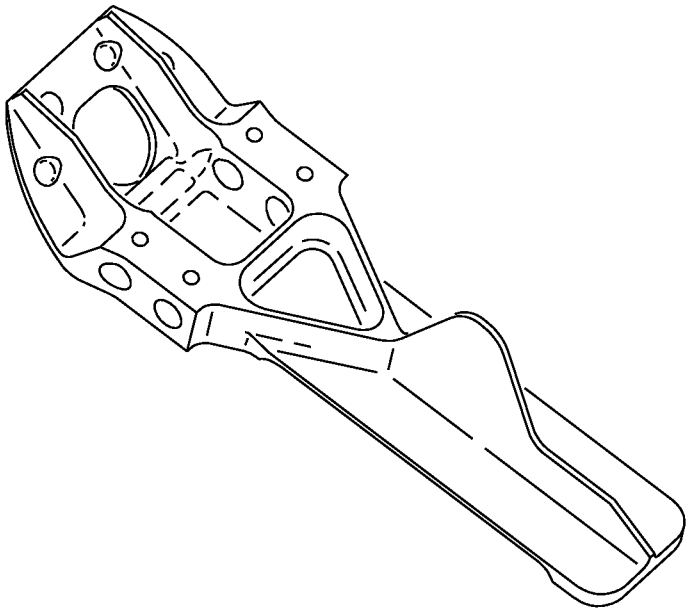
A



ATTACH FITTING - THRUST REVERSER
OPENING ACTUATOR
(ALUMINUM)

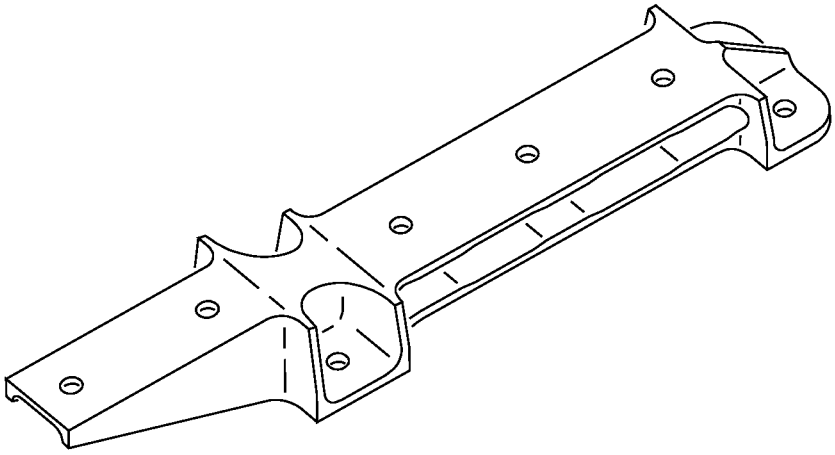
B

Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 2 of 5)



SENSOR MOUNT – SLEEVE STOW
(ALUMINUM)

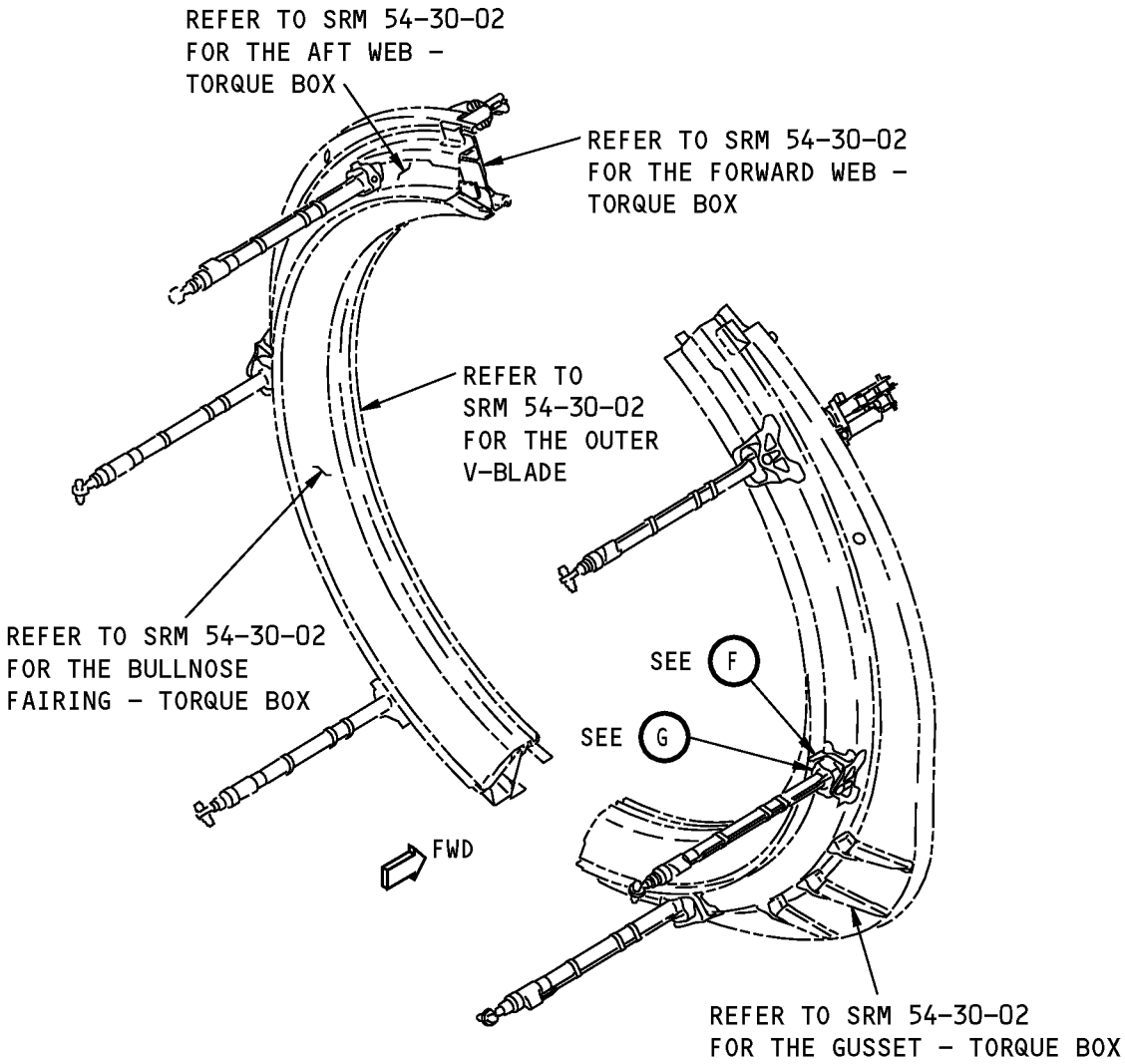
C



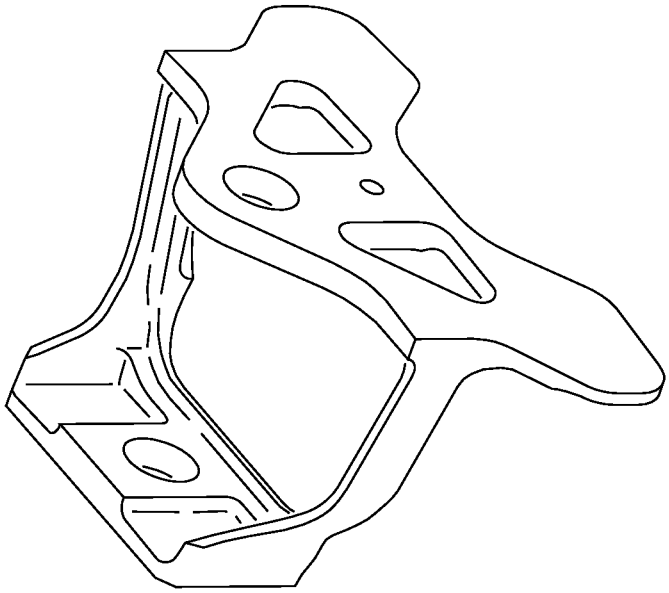
TUBE SUPPORT FITTINGS
(ALUMINUM)

D

Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 3 of 5)

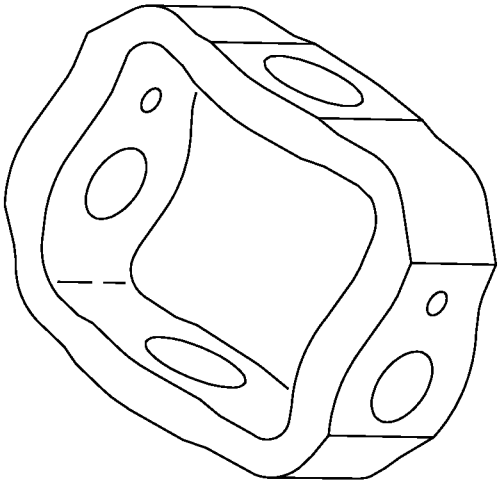


Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 4 of 5)



ACTUATOR FITTING
(15-5PH CRES)

F



GIMBAL RING
(TITANIUM)

G

Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 5 of 5)

2. General

A. Refer to Table 101/ALLOWABLE DAMAGE 1 for a list of the references for the allowable damage data.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA		
SUBJECT	**PARAGRAPH**	**FIGURE NO.**
Translating Sleeve Outer Cowl Panel Fittings - Auxiliary Track Slider Fittings, and Upper and Lower Auxiliary Track Slider Attach Fittings	4.A	102
Translating Sleeve Diaphragm Fittings - Main Track Slider Fittings, Diaphragm Hinge Fittings, Deactivation Fittings, and Actuator Attach Fittings	4.A	102
Translating Sleeve Blocker Door Fittings - Control Links, Drag Link Attach Fittings, and Hinge Fittings	4.A	102
Inner Duct Wall Fittings - Drag Link Anchor Fittings, Drag Links, Compression Pads, and Inner V-Blade	4.B	103
Torque Box Fittings - V-Blade Support Fittings, Opening Actuator Fittings, Stow Sensor Mount, Tube Support Fittings, Actuator Fittings, and Gimbal Rings	4.C	103

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

B. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

(4) Put a surface finish of 125 microinches (0.003 mm) Ra or better on the reworked areas.

(5) Refer to SOPM 20-20-02 for the penetrant inspection procedures.

(6) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.

C. After the damage is removed, do the steps that follow:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

(1) Flap peen or shot peen the reworked areas of all fittings.

NOTE: The flap peen or shot peen procedures do not include:

- Translating Sleeve Common Diaphragm Fittings
- Inner Duct Wall Fittings
- Compression Pads
- Torque Box Fittings.

(a) Refer to 51-20-06 for shot peen intensity and shot number.

(b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.

(2) Apply a chemical conversion coating to the bare surfaces of the reworked aluminum parts. Refer to 51-20-01.

(3) Apply 2 layers of BMS 10-11, Type I primer to the surfaces of the reworked aluminum parts. Refer to SOPM 20-41-02.

D. If you have damage to the V-Blades, do as follows:

(1) Remove the damage as given in Paragraph 4.B./ALLOWABLE DAMAGE 1

(2) After you remove the damage, do as follows:

WARNING: MAKE SURE THAT YOU USE EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

(a) Flap peen or shot peen the reworked areas of the V-Blade.

1) Refer to 51-20-06 for the shot peen intensity and shot number.

2) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.

(b) Apply a chemical conversion coating to the reworked areas of the V-Blade.

(c) Apply one layer of BMS 10-11, Type I primer to the reworked areas. Refer to SOPM 20-41-02.

(d) Apply one layer of BMS 10-11, Type II enamel to the reworked areas. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
SOPM 20-10-03	General - Shot Peening Procedures
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-42-05	Bright Cadmium Plating
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Allowable Damage Limits

A. Thrust Reverser Translating Sleeve Fittings:

(1) Outer Cowl Fittings:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , and C .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage to the face of the lug as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(2) Diaphragm Hinge Fittings:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , and F .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage to the face of the lug as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and F .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(3) Blocker Door Fittings:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , F , and G .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage to the face of the lug as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and G .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(4) Actuator Attachment Fittings:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , and F .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage to the face of the lug as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and F .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(5) Deactivation Fittings:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , and H .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage to the face of the lug as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and H .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

B. Inner Duct Wall Fittings:

(1) Drag Link Anchor Fittings and Drag Links:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , F , and G .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and G .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(2) Compression Pads and Inner V-Blade:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , and C .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

C. Torque Box Fittings:

(1) V-Blade Support Fittings, Stow Sensor Mounts, and Tube Support Fittings:

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , and C .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(2) Actuator Fittings and Gimbal Rings:

(a) Cracks:

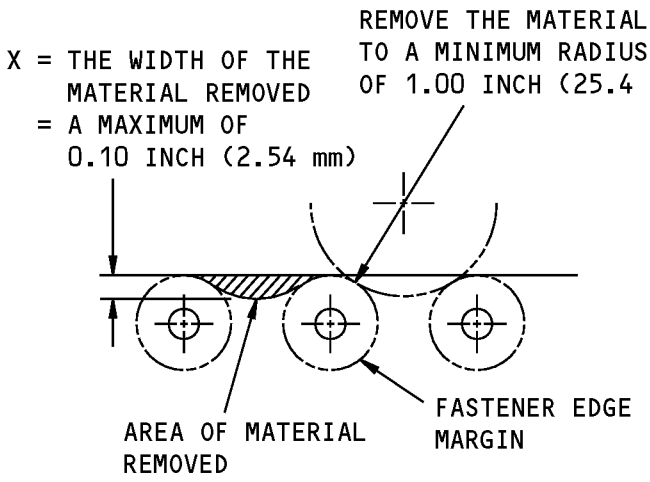
1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , and F .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and F .

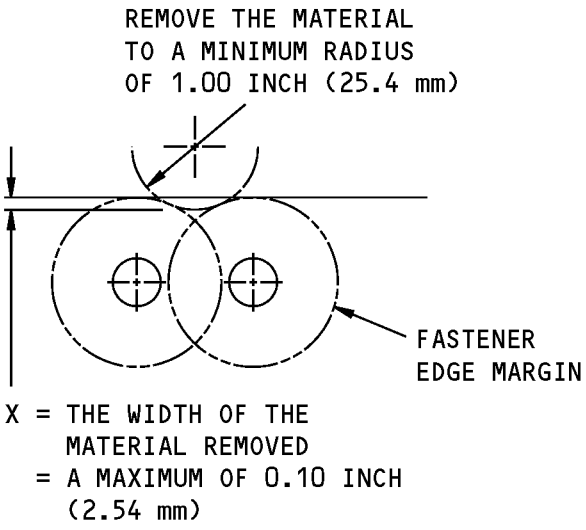
(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.



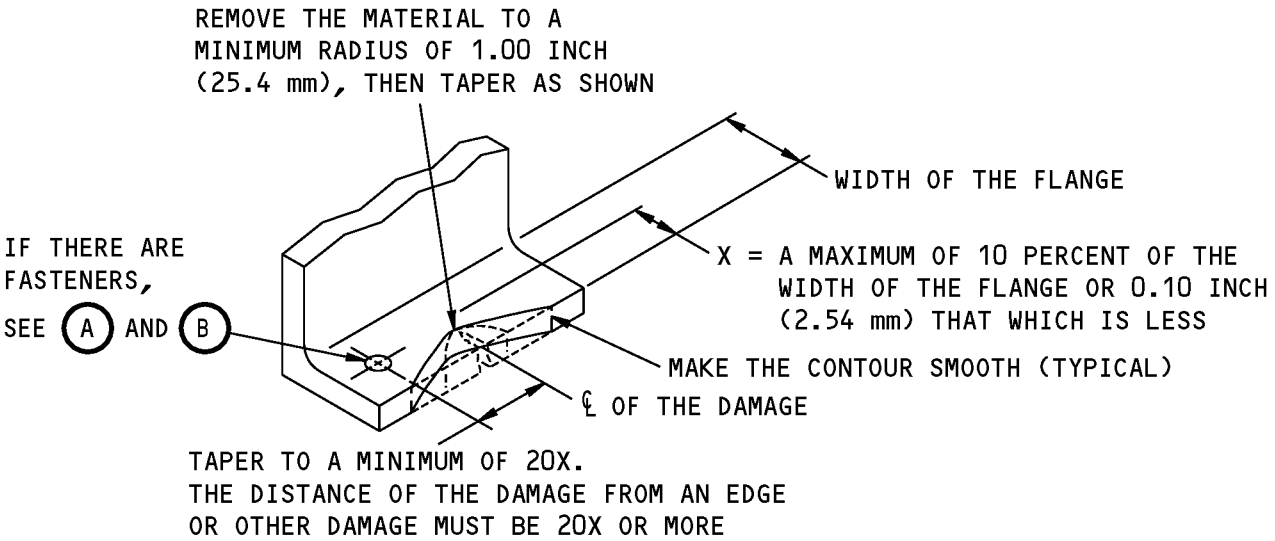
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

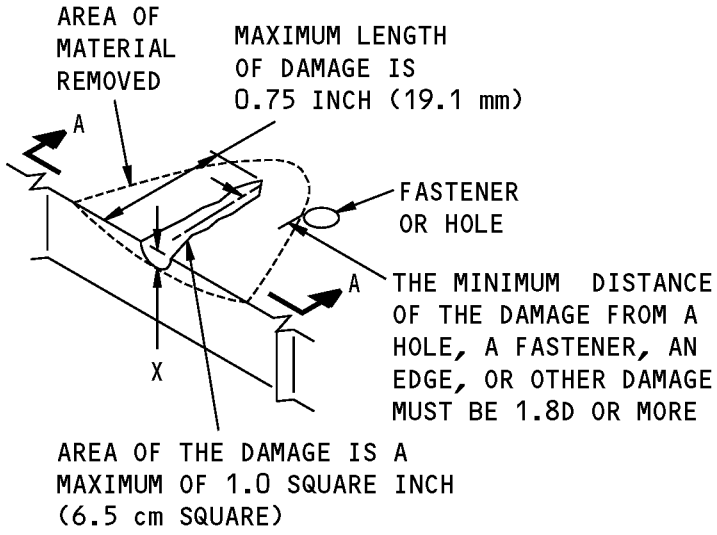
B



REMOVAL OF DAMAGED MATERIAL AT AN EDGE

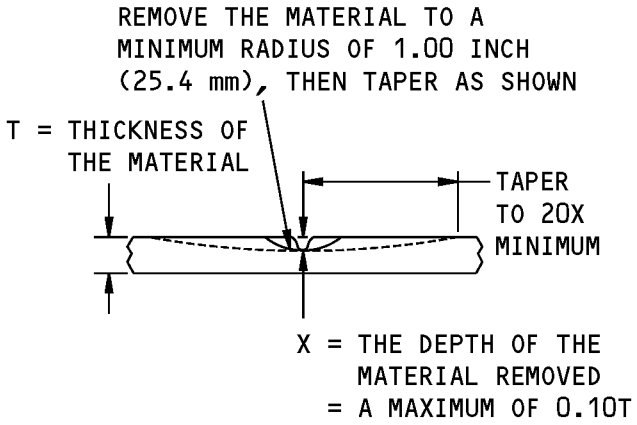
C

Allowable Damage Limits
Figure 105 (Sheet 1 of 6)



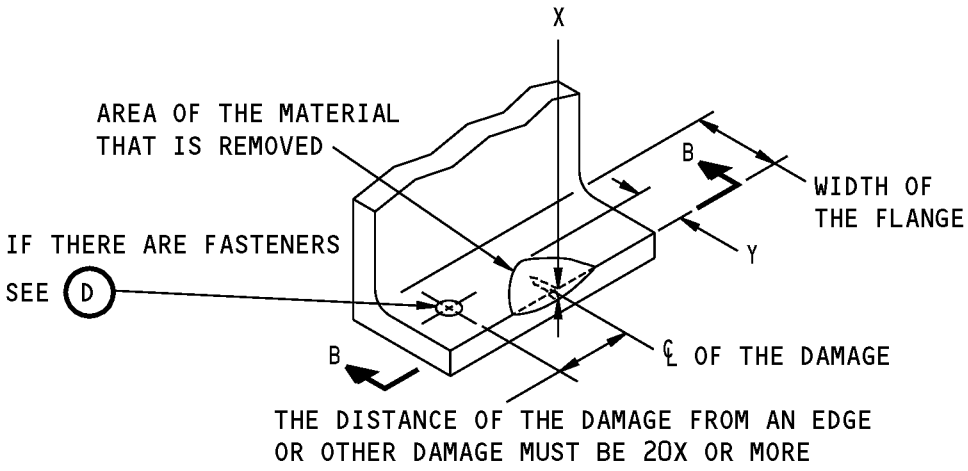
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

(D)



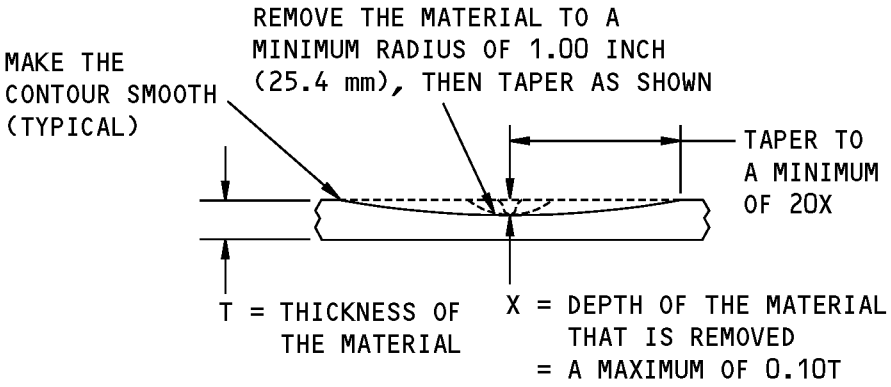
A–A

Allowable Damage Limits
Figure 105 (Sheet 2 of 6)



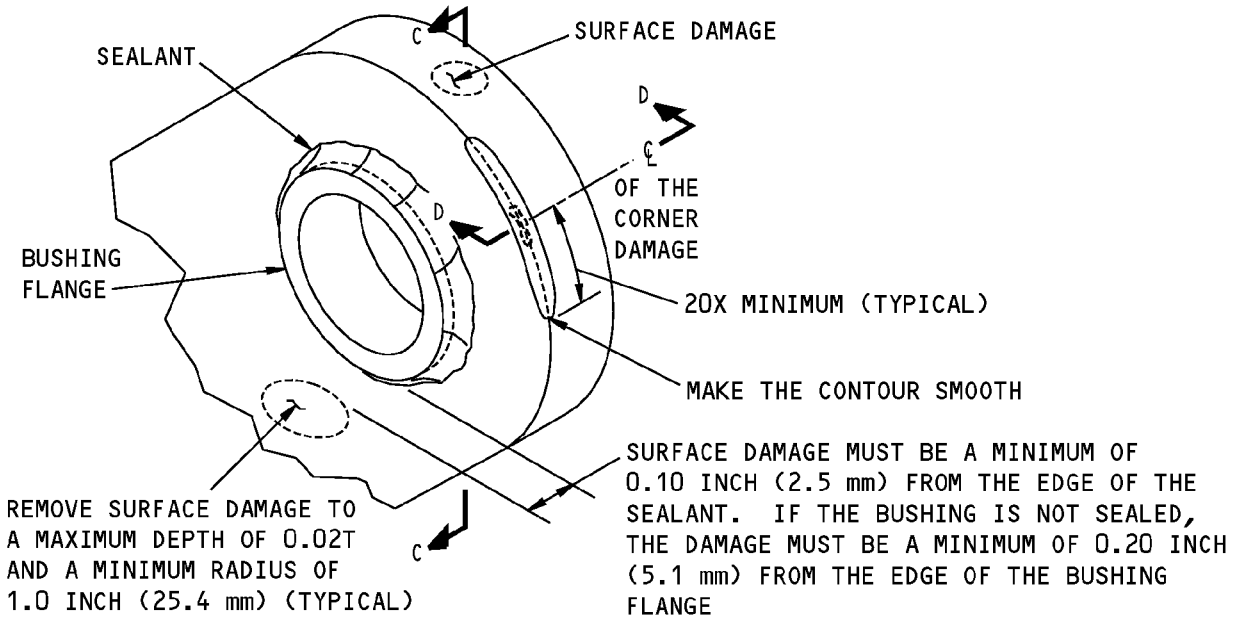
Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE
E



B–B

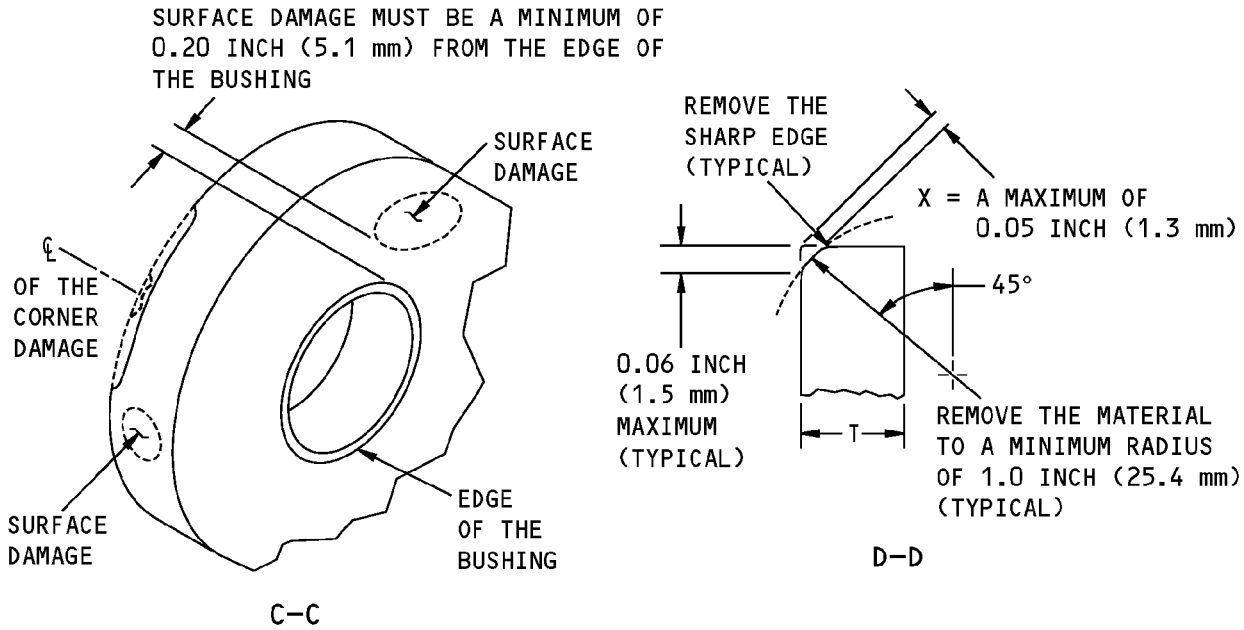
Allowable Damage Limits
Figure 105 (Sheet 3 of 6)



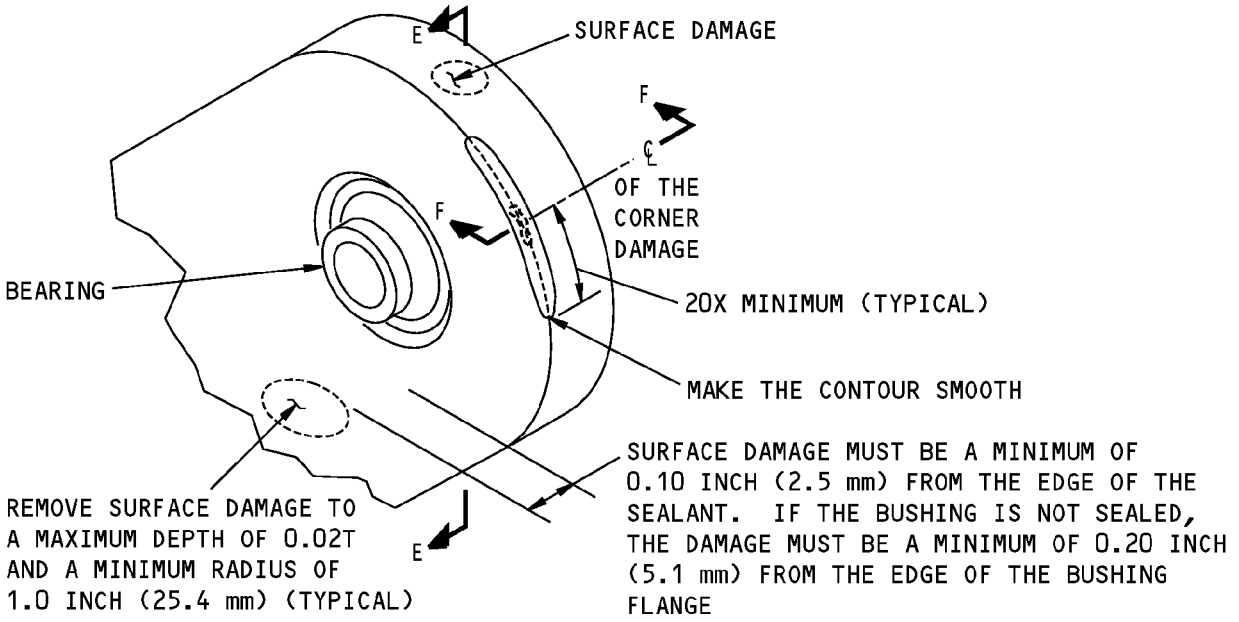
NOTE: DAMAGED SEALANT IS NOT PERMITTED. IF THE SEALANT IS DAMAGED, LOOK FOR MIGRATION OR ROTATION OF THE BUSHING. IF THERE IS NO MIGRATION, ROTATION, OR CORROSION, REMOVE THE DAMAGED SEALANT AND APPLY A NEW FILLET SEAL.

REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING

(F)

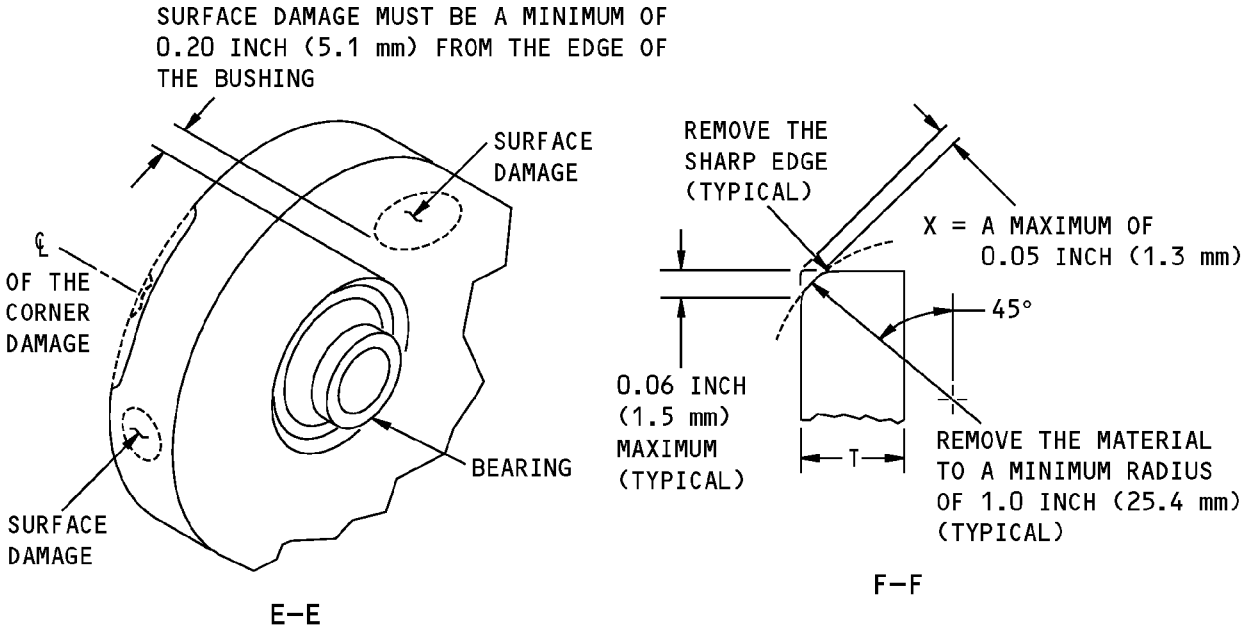


Allowable Damage Limits
Figure 105 (Sheet 4 of 6)

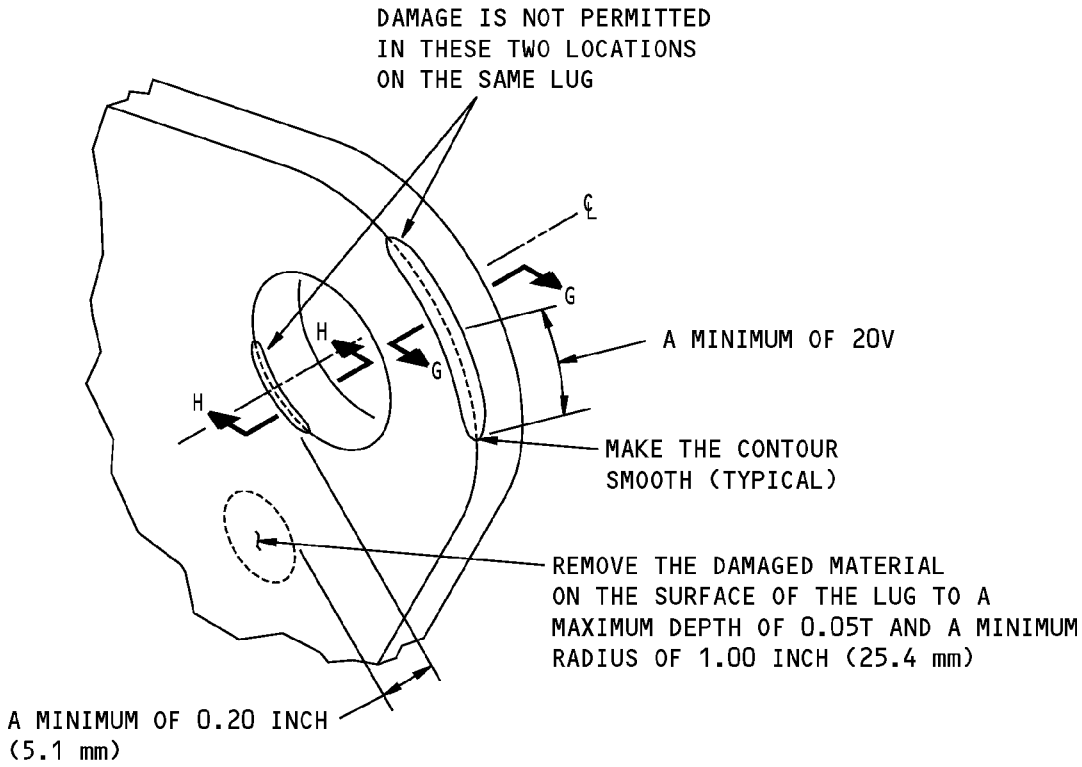


REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BEARING

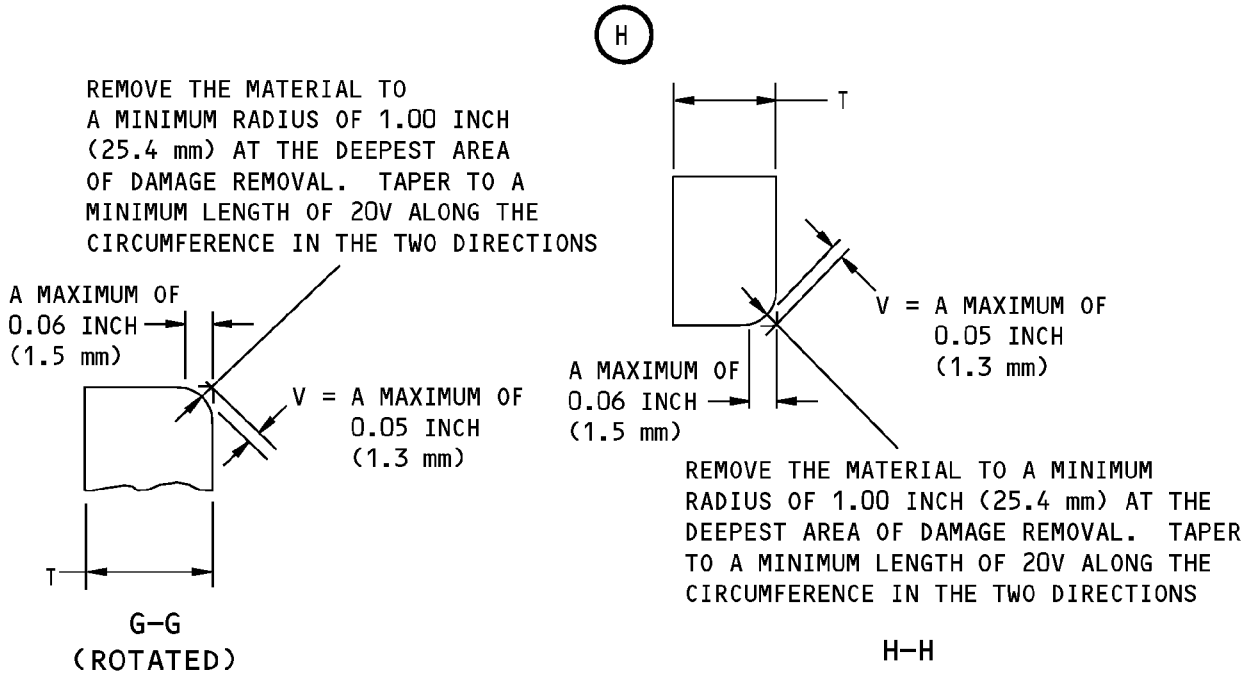
G



Allowable Damage Limits
Figure 105 (Sheet 5 of 6)

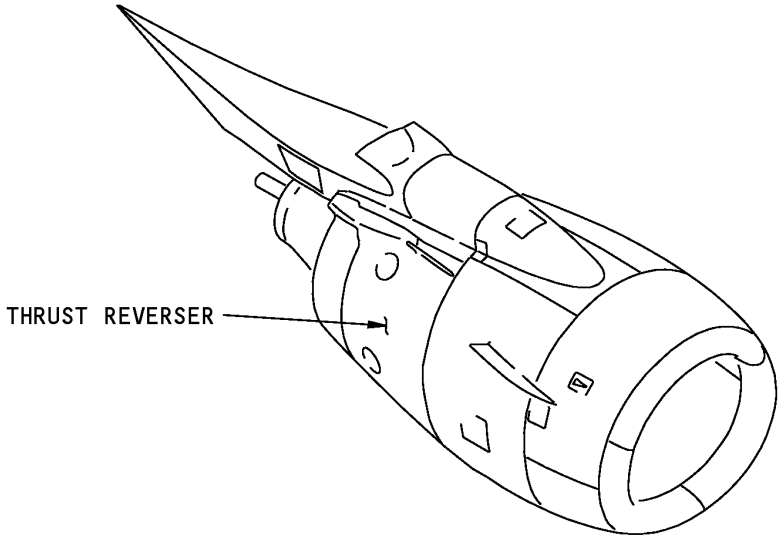


REMOVAL OF DAMAGED MATERIAL ON A LUG WITHOUT BUSHINGS



Allowable Damage Limits
Figure 105 (Sheet 6 of 6)

REPAIR 1 - THRUST REVERSER FITTINGS

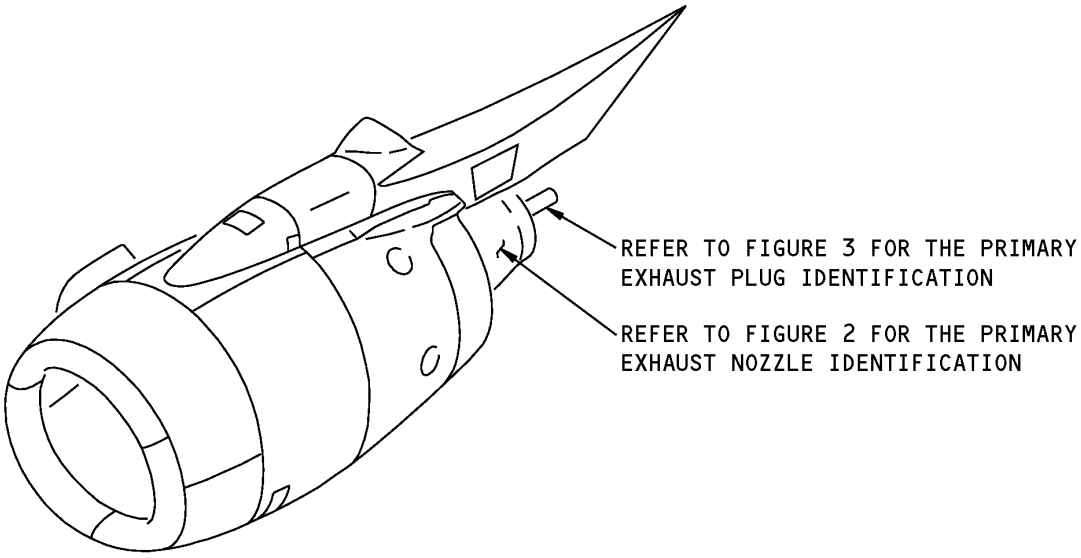


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE

Fan Duct Cowl and Thrust Reverser Hinge Fittings Location
Figure 201

IDENTIFICATION 1 - PRIMARY EXHAUST SYSTEM

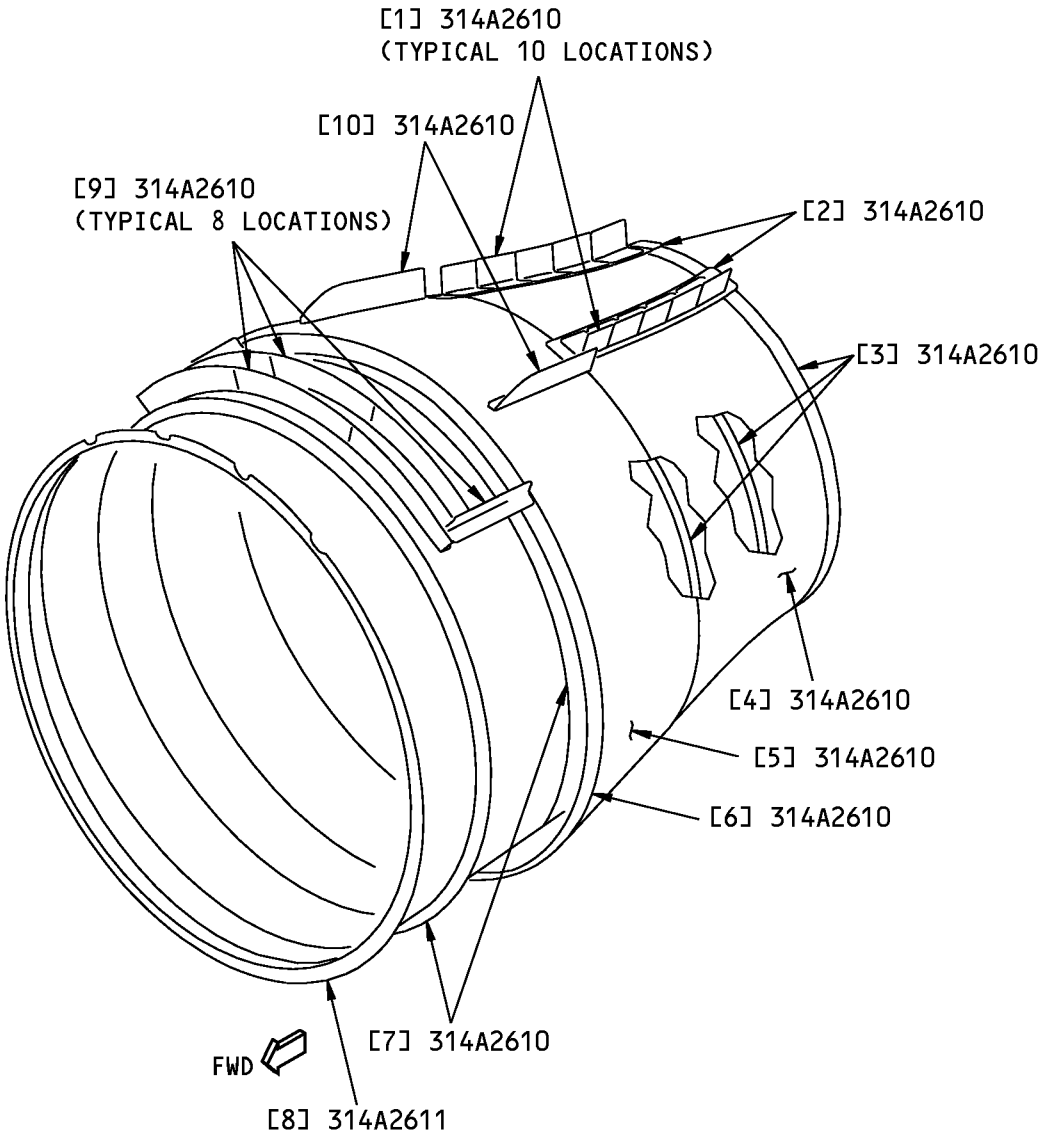


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Primary Exhaust Nozzle and Plug Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
300A2020	Management Collector - 737 CFM56-7 EBU End Item - Propulsion System Basic
333A2100	Exhaust Installation
314A2610	Primary Nozzle Assembly
314A2620	Primary Plug Assembly



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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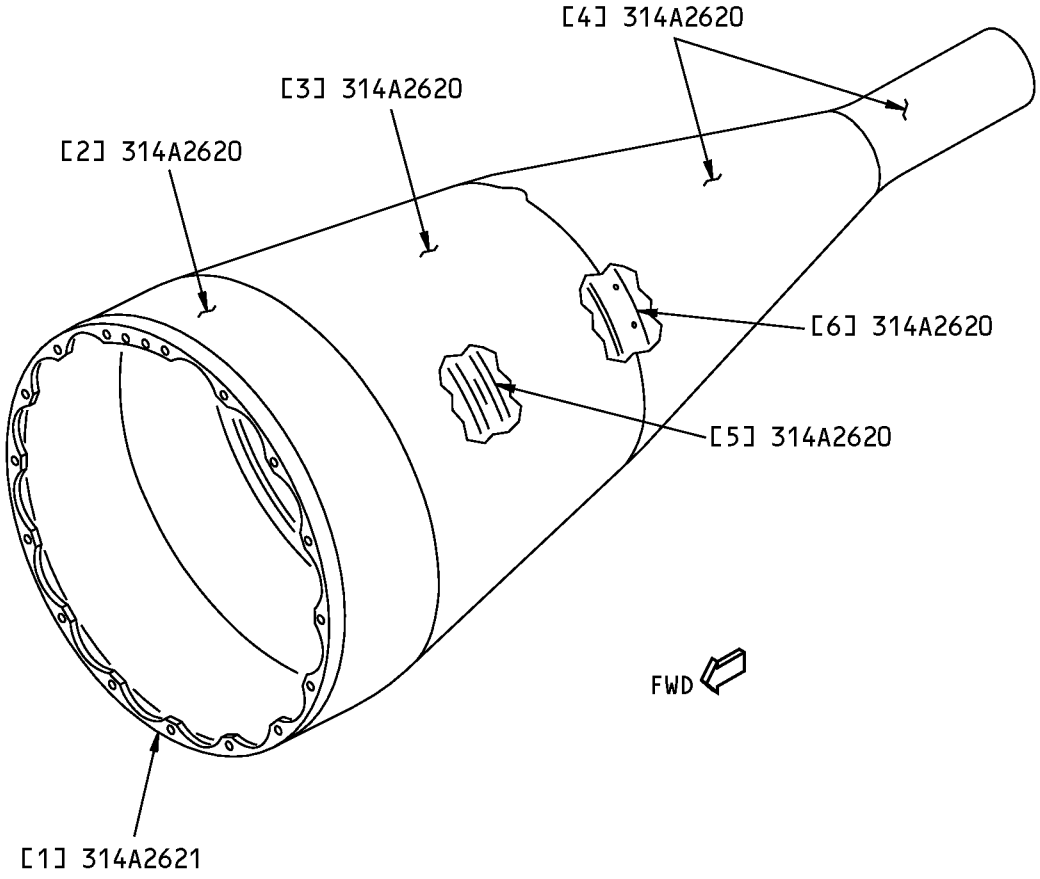
Primary Exhaust Nozzle Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Nozzle Fence (10 locations)	0.050 (1.27)	A286 CRES sheet as given in AMS 5525	
[2]	Fence Doubler (2 locations)	0.050 (1.27)	A286 CRES sheet as given in AMS 5525	
[3]	Inner Sleeve Doubler (3 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[4]	Inner Sleeve Skin	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[5]	Fairing Skin	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[6]	Leading Edge Fairing Stiffener	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[7]	Hat Stiffener (2 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[8]	Nozzle Attach Ring		Nickel alloy 625 bar as given in AMS 5566, annealed	
[9]	Labyrinth Detail (8 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[10]	Nozzle Fence (2 locations)	0.050 (1.27)	A286 CRES sheet as given in AMS 5525, or Nickel alloy 625 sheet as given in AMS 5599, annealed	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

Primary Exhaust Plug Identificaton
Figure 3

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Attach Ring - Forward Plug		Nickel alloy 625 bar as given in AMS 5666, annealed	
[2]	Forward Skin - Forward Plug	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[3]	Mid Skin - Forward Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[4]	Aft Skin - Aft Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[5]	Stiffener - Forward Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	
[6]	Splice Stiffener - Forward Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - PRIMARY EXHAUST SYSTEM

1. Applicability

A. This subject gives the allowable damage limits for the primary exhaust system for the CFM56-7 engine. The primary exhaust system has two components. These are the nozzle and the plug as shown in Allowable Damage - Primary Exhaust Nozzle and Plug Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Refer to 51-10-01 for the Aerodynamic Smoothness Requirements.

B. Refer to CMM 78-11-37 for weld repairs for the primary nozzle.

C. Refer to CMM 78-11-38 for weld repairs for the primary plug.

D. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 for the allowable damage limits.

E. These Allowable Damage Limits for the primary exhaust nozzle and plug have FAA approval only if the inspections given in this subject are completed at the specified times.

F. Do the steps that follow if you have damage to the Corrosion Resistant Steel (A286) or nickel alloy 625 parts:

(1) Remove the damage.

(a) Refer to 51-10-02 for the inspection and removal of damage.

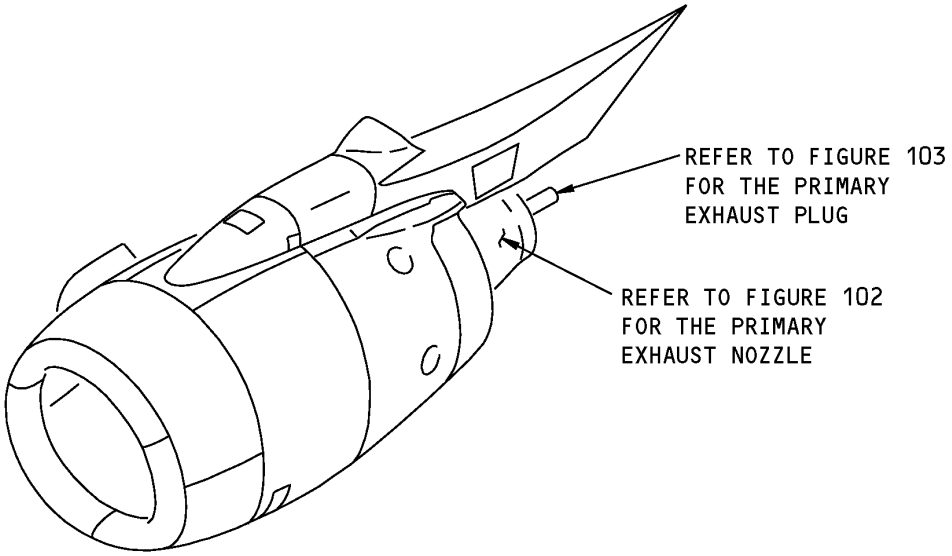
(b) Refer to 51-30-03 for possible sources of abrasive materials you can use to remove the damage.

(c) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

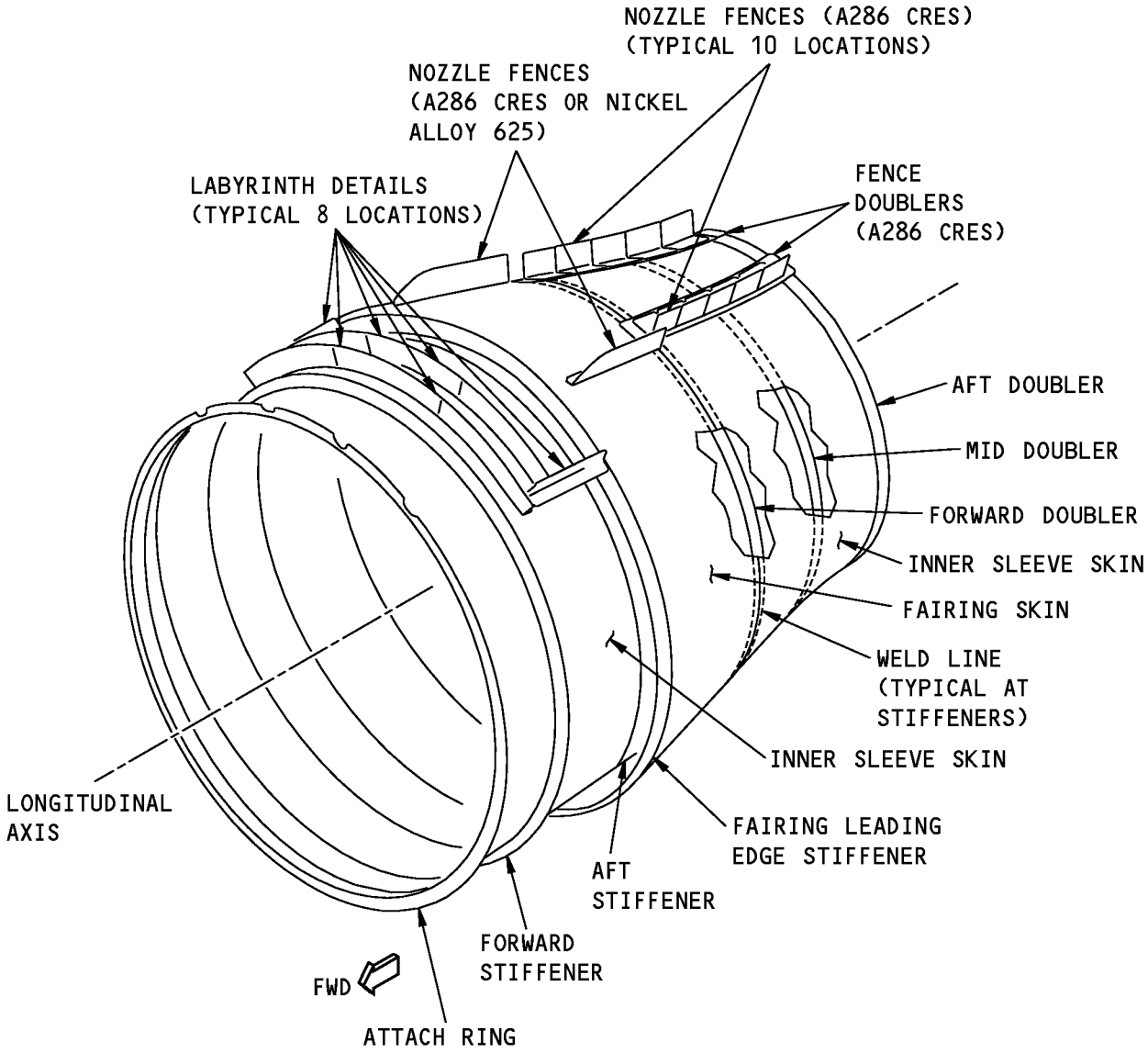
G. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage data for the different parts.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE	
PART	**PARAGRAPH**
PRIMARY NOZZLE	4.A
Attach Ring	4.A.(1)
Inner Sleeve Skin	4.A.(2)
Fairing Skin	4.A.(3)
Stiffeners and Doublers	4.A.(4)
Fences (12)	4.A.(5)
Labyrinth Seals (8)	4.A.(6)
PRIMARY PLUG	4.B
Attach Ring	4.B.(1)
Forward Skin, Mid Skin, and Aft Plug	4.B.(2)
Tail Ring	4.B.(3)
Stiffeners	4.B.(4)



Allowable Damage - Primary Exhaust Nozzle and Plug Location
Figure 101



NOTE: ALL PARTS ARE MADE FROM NICKEL ALLOY 625 MATERIAL, UNLESS SPECIFIED DIFFERENTLY.

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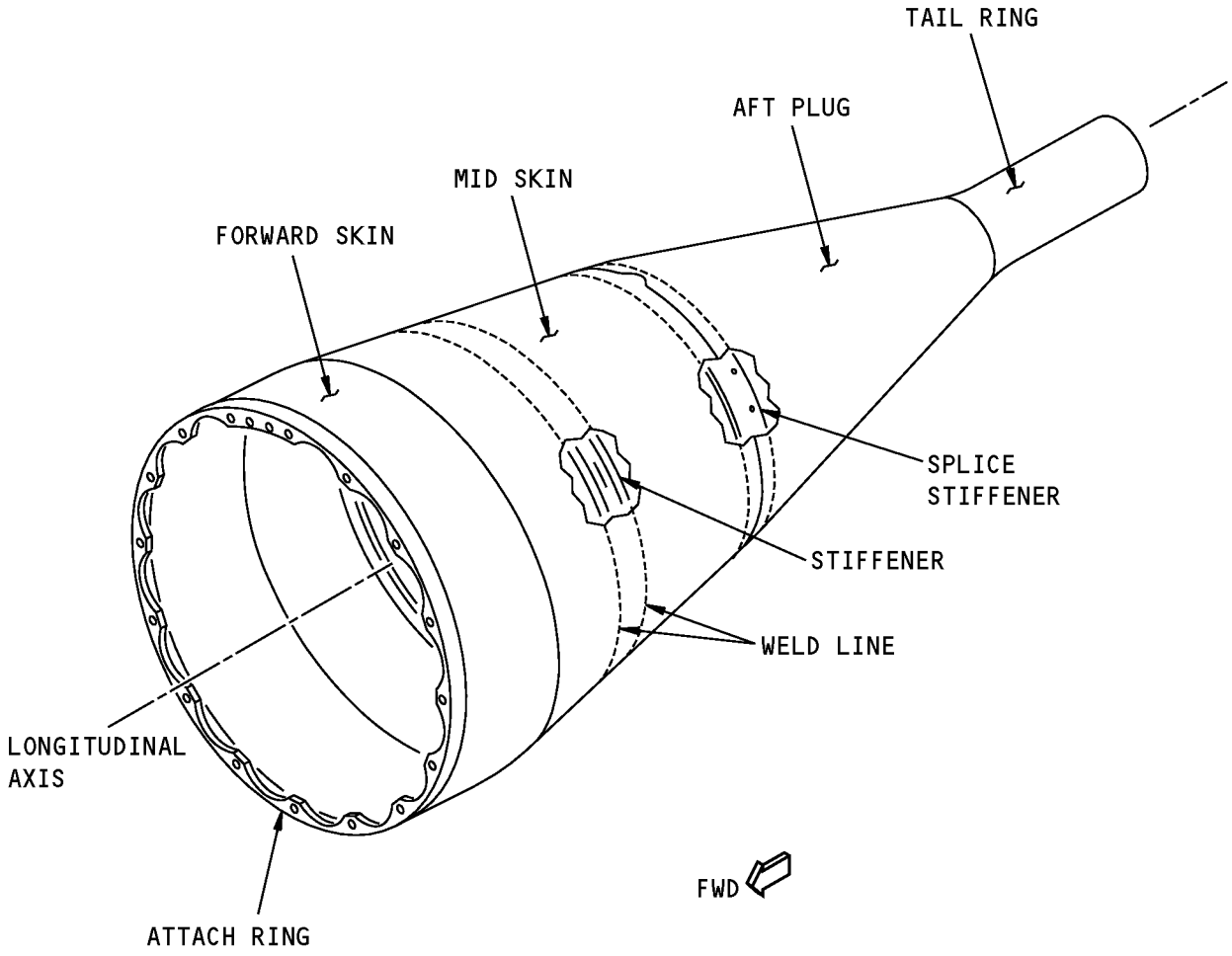
Primary Exhaust Nozzle
Figure 102



NOTE: ALL PARTS ARE MADE OF NICKEL ALLOY 625 MATERIAL.

Primary Exhaust Plug
Figure 103

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 78-11-37,	Primary Nozzle
CMM 78-11-38,	Primary Plug

4. Allowable Damage Limits

A. Primary Nozzle

(1) Attach Ring

(a) Cracks are not permitted.

(b) Nicks, Gouges, and Scratches:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Remove the damage to the flanges of the attach ring as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .

a) The maximum permitted length or diameter of the cleanup is 0.50 inch (12.7 mm).

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

(2) Inner Sleeve Skin

(a) Cracks:

1) Remove the edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1 Details A , B , and D .

2) Damage up to a maximum length of 1.50 inches (38.1 mm) is permitted if:

a) The crack has no more than two ends

b) There is a maximum of four cracks

c) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack

d) The crack goes across a weld at a right angle

e) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld

f) The damage is a minimum of 1.00 inch (25.4 mm) away from stiffeners and doublers

g) The damage is a minimum of 3.00 inches (76.2 mm) away from other cracks or dents

h) The damage is a minimum of 2.00 inches (50.8 mm) away from:

- Fasteners
- Fences
- Labyrinth seals
- Forward attach ring

- The aft edge of the inner sleeve.

i) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
   - Do a repair as given in CMM 78-11-37 if the damage shows an increase in length.

(b) Nicks, Gouges, and Scratches:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .

a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).

(c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:

1) A minimum of 3.00 inches (76.2 mm) away from a crack

2) A minimum of 6.00 inches (152.4 mm) away from other dents

3) A minimum of 1.00 inch (25.4 mm) away from stiffeners and doublers

4) A minimum of 2.00 inches (50.8 mm) away from:

a) Fasteners

b) Fences

c) Labyrinth seals

d) Forward attach ring

e) The aft edge of the inner sleeve.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

NOTE: This is not applicable to stop drill holes.

(3) Fairing Skin

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1 Details A , B , and D .

2) Damage up to a maximum length of 1.50 inches (38.1 mm) is permitted if:

a) The crack has no more than two ends

b) There is a maximum of four cracks

c) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack

d) The crack goes across a weld at a right angle

e) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld

f) The damage is a minimum of 3.00 inches (76.2 mm) away from a crack or a dent

g) The damage is a minimum of 2.00 inches (50.8 mm) away from a fastener

h) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
   - Do a repair as given in CMM 78-11-37 if the damage shows an increase in length.

(b) Nicks, Gouges, and Scratches:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .

a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).

(c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:

1) A minimum of 3.00 inches (76.2 mm) away from a crack

2) A minimum of 6.00 inches (152.4 mm) away from other dents

3) A minimum of 2.00 inches (50.8 mm) away from fasteners.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

NOTE: This is not applicable to stop drill holes.

(4) Stiffeners and Doublers

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

(5) Fences (12 locations)

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Damage up to a maximum length of 1.00 inch (25.4 mm) in a fence segment is permitted if:

a) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack

b) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.

- Replace the fence as given in CMM 78-11-37 if the damage shows an increase in length.

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

NOTE: This is not applicable to stop drill holes.

(6) Labyrinth Seals (8 locations)

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Two cracks up to a maximum length of 1.00 inch (25.4 mm) are permitted in a seal segment if:

a) The cracks are a minimum of 3.00 inches (76.2 mm) away from each other

b) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack

c) You examine the damage at every 50 flight cycles to find if there is an increase in the length of the crack.

- Replace the seal segment as given in CMM 78-11-37 if the damage shows an increase in length.

(b) Nicks, Gouges, and Scratches:

1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , and D .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

NOTE: This is not applicable to stop drill holes.

B. Primary Plug

(1) Attach Ring

(a) Cracks are not permitted.

(b) Nicks, Gouges, and Scratches:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail D .

2) Remove other damage to the flanges of the attach ring as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .

a) The maximum permitted length or diameter of the cleanup is 0.50 inch (12.7 mm).

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.

(2) Forward Skin, Mid Skin, and Aft Plug

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Damage up to a maximum length of 1.50 inches (38.1 mm) is permitted if:

a) The crack has no more than two ends

b) There is a maximum of four cracks in the primary plug

c) There is a maximum of two cracks in the aft plug

d) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack

e) The crack goes across a weld at a right angle

f) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld

g) The damage is a minimum of 3.00 inches (76.2 mm) away from other cracks or dents

h) The damage is a minimum of 2.00 inches (50.8 mm) away from:
- Fasteners
- Forward attach ring.

i) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
- Do a repair as given in CMM 78-11-38 if the damage shows an increase in length.

(b) Nicks, Gouges, and Scratches:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .

a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).

(c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:

1) A minimum of 3.00 inches (76.2 mm) away from a crack

2) A minimum of 6.00 inches (152.4 mm) away from other dents

3) A minimum of 2.00 inches (50.8 mm) away from:

a) Fasteners

b) Forward attach ring.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.

NOTE: This is not applicable to stop drill holes.

(3) Tail Ring

(a) Cracks:

1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail D .

2) Damage up to a maximum length of 1.00 inch (25.4 mm) is permitted if:

a) The crack has no more than two ends

b) There is a maximum of two cracks in the tail ring

c) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack

d) The crack goes across a weld at a right angle

e) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld

f) The damage is a minimum of 3.00 inches (76.2 mm) away from other cracks or dents

g) The damage is a minimum of 2.00 inches (50.8 mm) away from the aft edge of the tail ring.

h) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
- Do a repair as given in CMM 78-11-38 if the damage shows an increase in length.

(b) Nicks, Gouges, and Scratches:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail D .

2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .

a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).

(c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:

1) A minimum of 3.00 inches (76.2 mm) away from a crack or other dent

2) A minimum of 2.00 inches (50.8 mm) away from the aft edge of the tail ring.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.

NOTE: This is not applicable to stop drill holes.

(4) Stiffeners

(a) Cracks:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

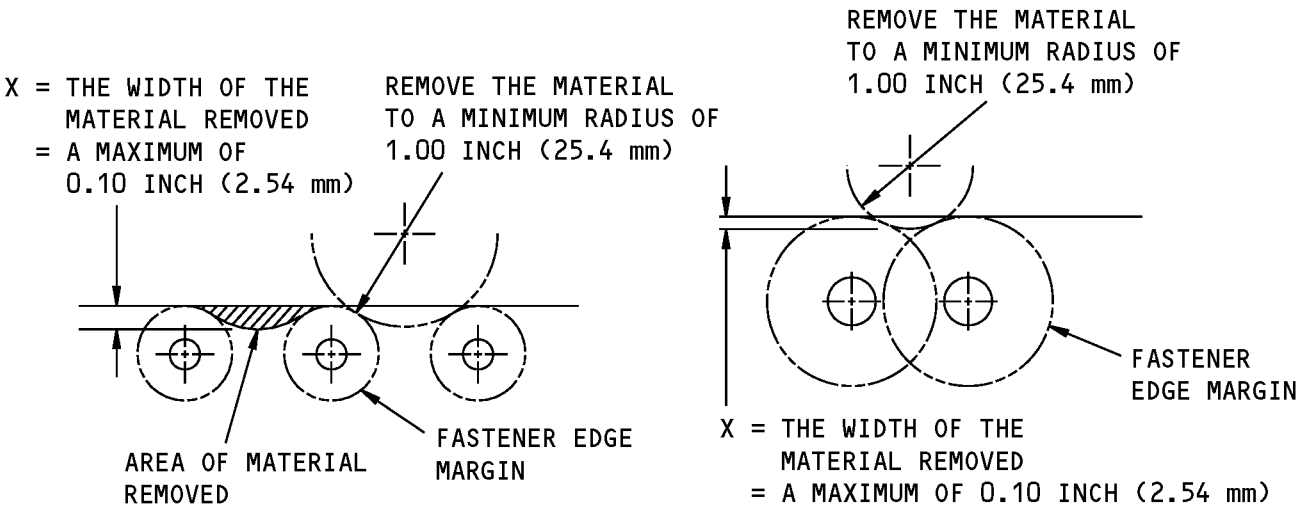
(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .

2) Remove other damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.

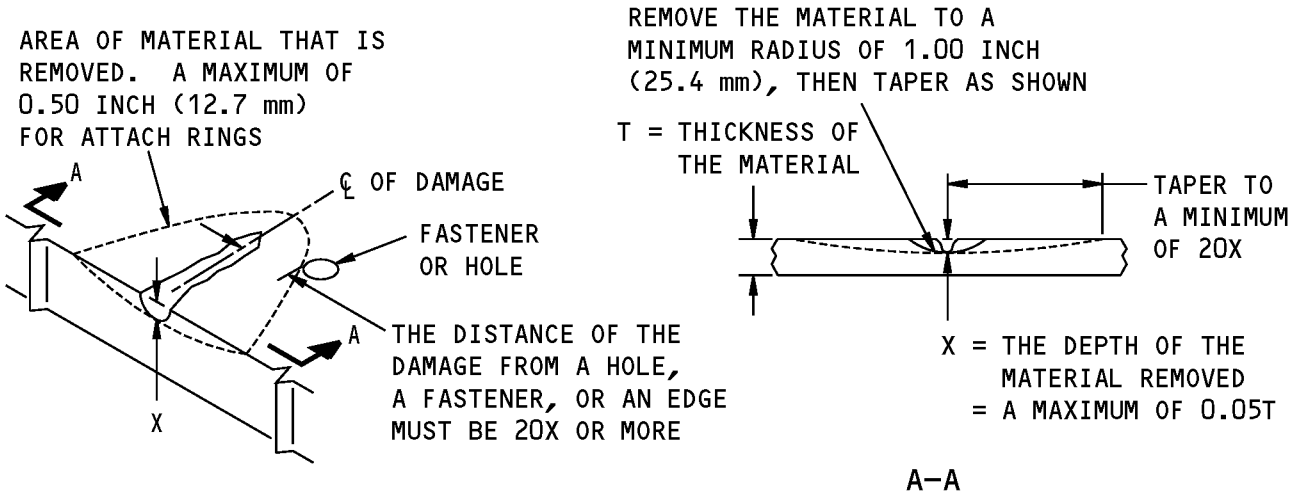


REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

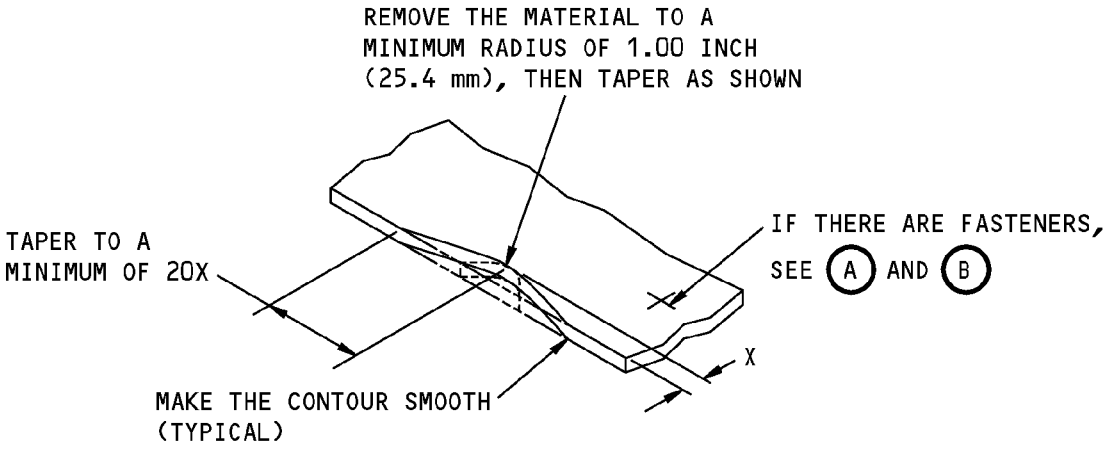
B



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

C

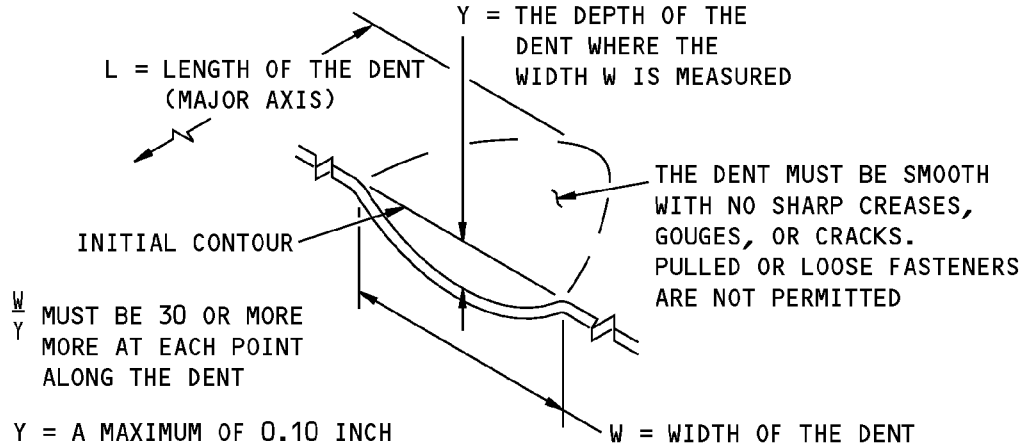
Allowable Damage Limits
Figure 104 (Sheet 1 of 2)



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

D



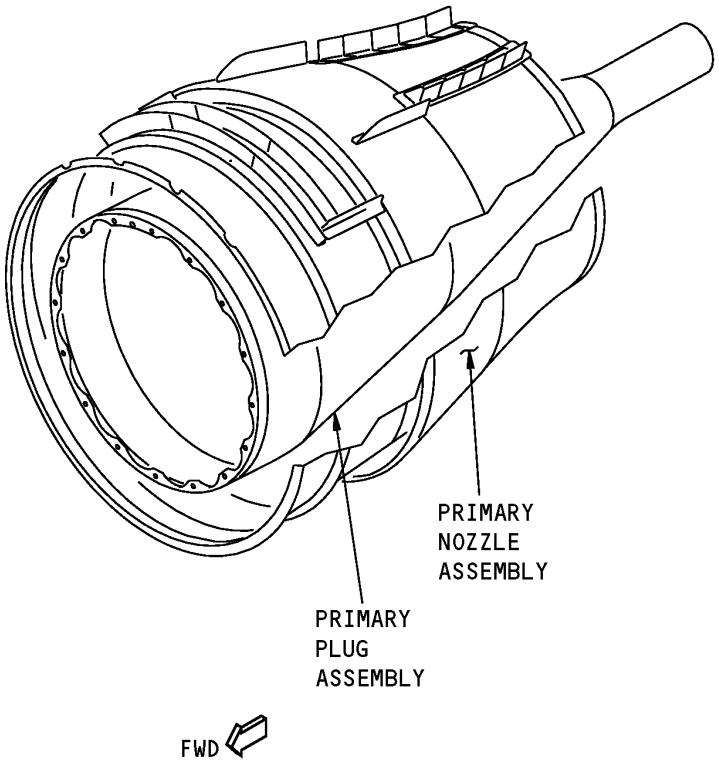
W = A MAXIMUM OF 4.00 INCHES (101.6 mm)
L = A MAXIMUM OF 4.00 INCHES (101.6 mm)

A DENT THAT IS PERMITTED

E

Allowable Damage Limits
Figure 104 (Sheet 2 of 2)

REPAIR 1 - PRIMARY EXHAUST SYSTEM

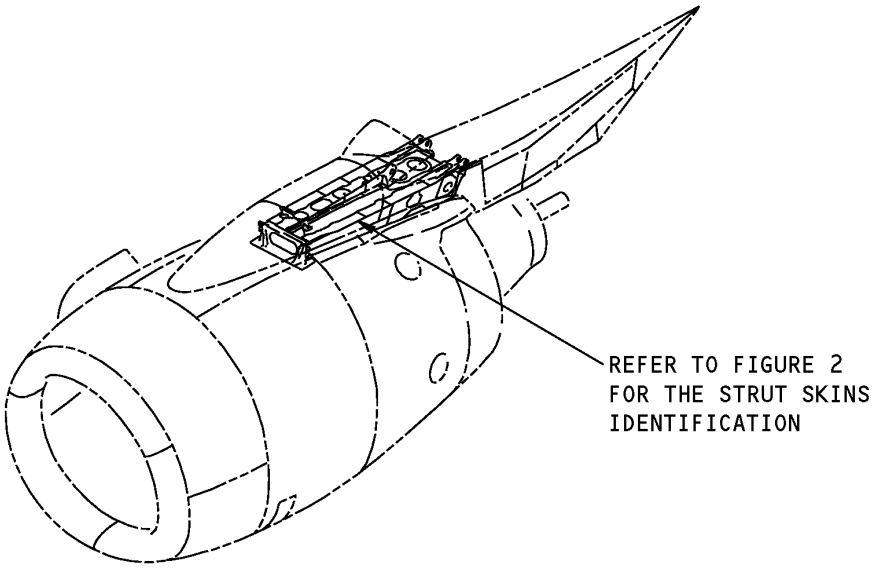


NOTE: REFER TO THE COMPONENT MAINTENANCE MANUALS THAT FOLLOW FOR THE WELD REPAIRS:

- CMM 78-11-37 FOR THE PRIMARY NOZZLE ASSEMBLY
- CMM 78-11-38 FOR THE PRIMARY PLUG ASSEMBLY

Repair - Primary Exhaust System
Figure 201

IDENTIFICATION 1 - ENGINE STRUT SIDE SKINS

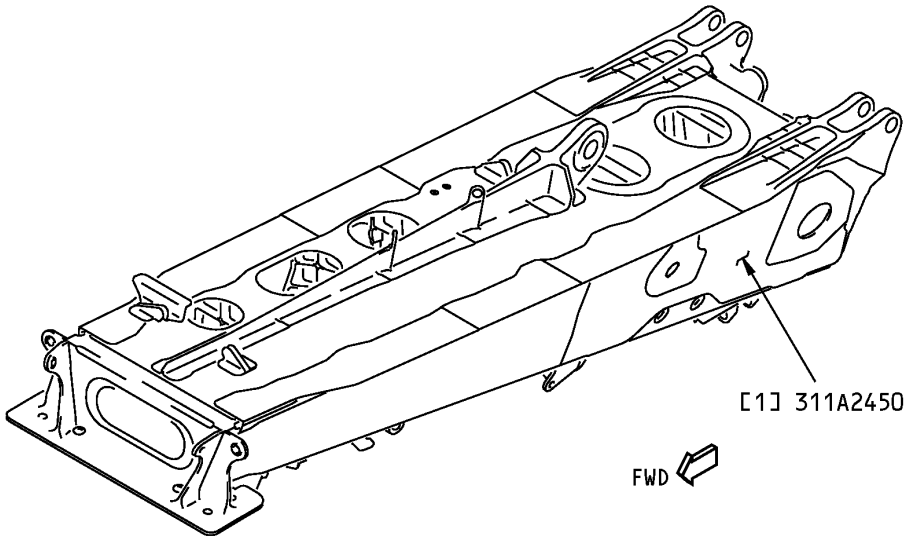


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut Skins Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2007	Structure Assembly Collector - Strut
311A2101	Torque Box Assembly - Strut
311A2400	Skin Installation - Strut



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Engine Strut Skins Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Side Skin	0.275 (6.99)	Ti-6Al-4V titanium plate, Code AB-1, annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - ENGINE STRUT SIDE SKINS

1. Applicability

A. This subject gives the allowable damage limits for the side skins of the CFM56-7 engine strut as shown in Engine Strut Side Skin Allowable Damage, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

(1) Refer to SOPM 20-10-07 when you work with titanium.

(2) Refer to 51-10-02 for the damage removal procedures.

(3) Refer to 51-30-03 for the possible sources of the abrasive materials you can use to remove the damage.

(4) Refer to 51-30-05 for the possible sources of the equipment and tools you can use to remove the damage.

B. After you remove the damage from titanium parts, do as follows:

(1) Do a penetrant inspection to make sure that all the damage is removed. Refer to SOPM 20-20-02.

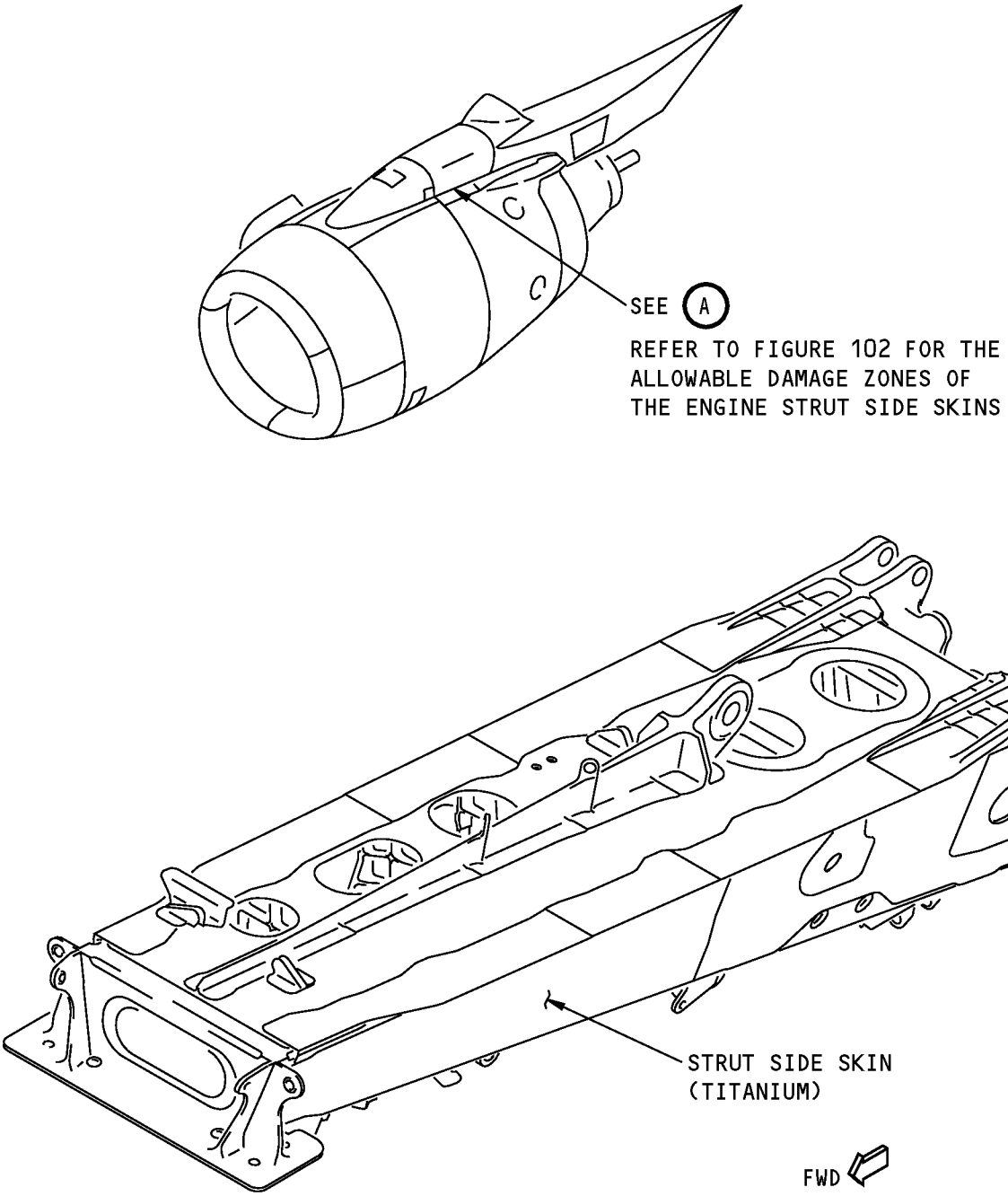
(2) At the edges of the access holes, make sure there is a complete seal around the perimeter of the access door. If there is a leakage, then apply a fillet seal around the edge of the access hole.

C. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage zones for the engine strut side skins.

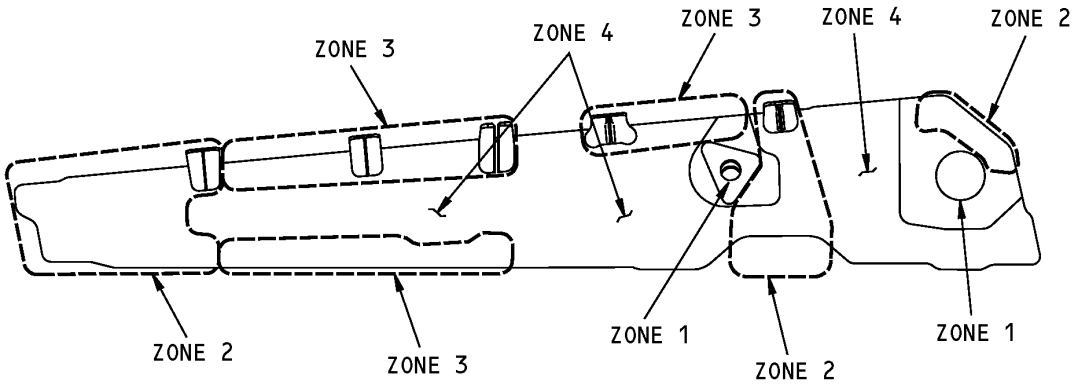
D. Refer to Engine Strut Side Skin Zone Locations, Figure 102/ALLOWABLE DAMAGE 1 for the allowable damage zones for the engine strut side skins.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE	
ZONE LOCATION	PARAGRAPH
1	4.A
2	4.B
3	4.C
4	4.D



Engine Strut Side Skin Allowable Damage
Figure 101



NOTE: REFER TO TABLE 1 FOR THE PARAGRAPH REFERENCE FOR THE ALLOWABLE DAMAGE LIMITS OF THE APPLICABLE STRUT SIDE SKIN ZONE.

Engine Strut Side Skin Zone Locations
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Zone 1 - Area Around Access Holes and Tie Rod Holes

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail A . Refer to SOPM 20-10-07.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail A .

(b) The length of the damage along the edge must not be more than the length found in 45 degrees of arc of the circumference of the hole.

B. Zone 2 - Strut Side Skin Locations Adjacent to the Engine Mount Bulkheads

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , D , and E . Refer to SOPM 20-10-07.

(b) The damage must be a minimum of 2D (D = fastener diameter) from a fastener hole.

(c) The material removed must not be less than 1.7D (D = the largest damage dimension) to more than one fastener.

(d) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , D , E , and K .

(b) The damage must be more than 2D (D = fastener diameter) from a fastener.

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .

(4) Holes and Punctures:

(a) Remove the damaged material to a maximum diameter of 0.25 inch (6.35 mm). Refer to SOPM 20-10-07.

(b) The damage must be a minimum of 4D (D = fastener diameter) from an adjacent hole or other damage.

(c) The damage must be a minimum of 1.5D (D = fastener diameter) from the edge of the hole to the edge of the part.

(d) Install a copper-nickel alloy blind rivet in the hole without sealant.

C. Zone 3 - Side Skin Along Chords

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , F , and G . Refer to SOPM 20-10-07.

(b) The damage must be more than 2D (D = fastener diameter) from a fastener hole.

(c) The material removed must not be less than 1.7D (D = the largest damage dimension) from more than one fastener.

(d) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , F , G , and K .

(b) The damage must not be less than 2D (D = fastener diameter) from a fastener hole.

(c) The material removed must not be less than 1.7D (D = the largest damage dimension) from more than one fastener.

(d) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener hole.

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .

(4) Holes and Punctures:

(a) Remove the damaged material to a maximum diameter of 0.25 inch (6.35 mm). Refer to SOPM 20-10-07.

(b) The damage must be a minimum of 1.5D (D = fastener diameter) from the edge of the hole to the edge of the part.

(c) Install a copper-nickel alloy blind rivet in the hole without sealant.

D. Zone 4 - All Strut Side Skin Locations not found in Zones 1, 2, or 3.

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , H , and I . Refer to SOPM 20-10-07.

(b) Damage is permitted if:

1) The material removed is more than 2D (D = fastener diameter) from the nearest fastener hole

2) The material removed is not less than 2.0D (D = fastener diameter) from more than two adjacent fasteners

3) The material removed is not nearer than 1.7D (D = the largest damage dimension) to more than three fasteners.

(c) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , H , and I , and K .

(b) Damage is permitted if:

1) The material removed is a minimum of 2D (D = fastener diameter) from more than two adjacent fasteners

2) The material removed is not less than 1.7D (D = the largest damage dimension) to more than three fasteners

3) The material removed is more than 2D (D = fastener diameter) from three or more fasteners in ten.

(c) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .

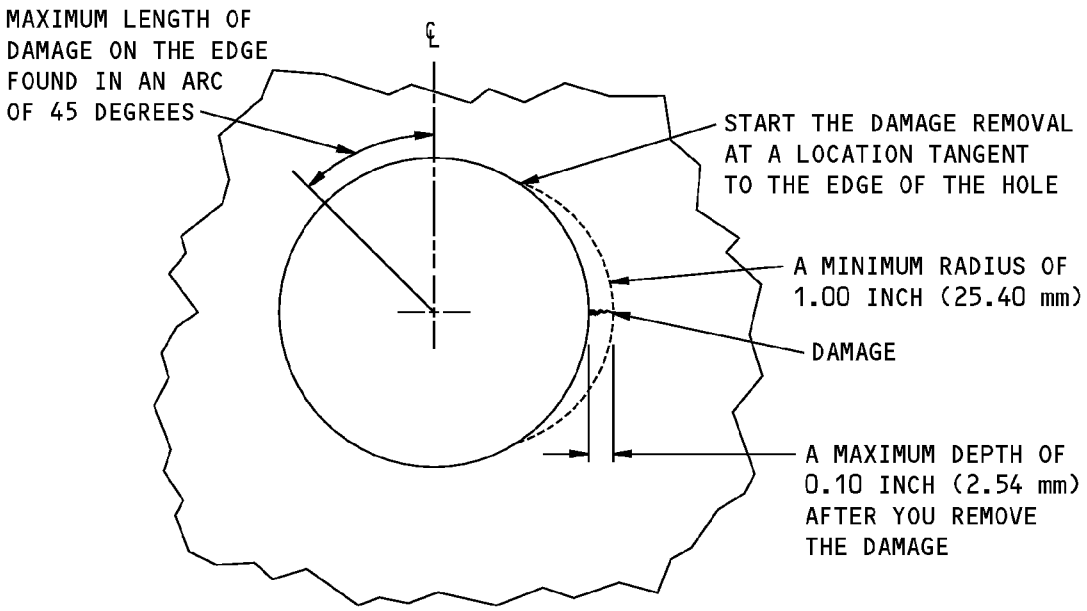
(4) Holes and Punctures:

(a) Remove the damaged material to a maximum diameter of 0.25 inch (6.35 mm). Refer to SOPM 20-10-07.

(b) The damaged material removed must be a minimum of 4D (D = fastener diameter) from an adjacent hole or other damage.

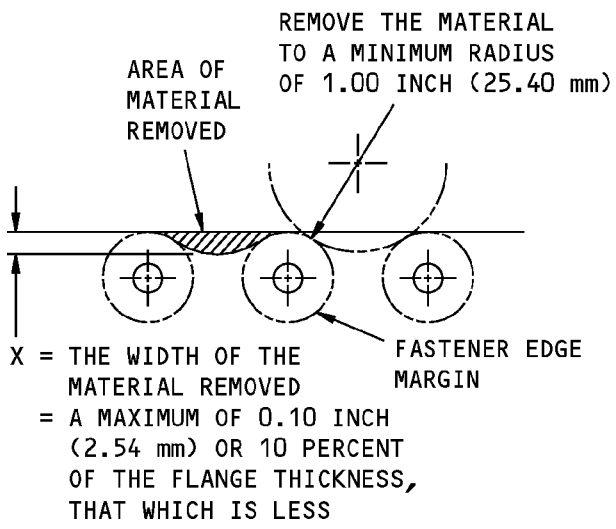
(c) The damage removed must be a minimum of 1.5D (D = fastener diameter) from the edge of the hole to the edge of the part.

(d) Install a copper-nickel alloy blind rivet in the hole without sealant.



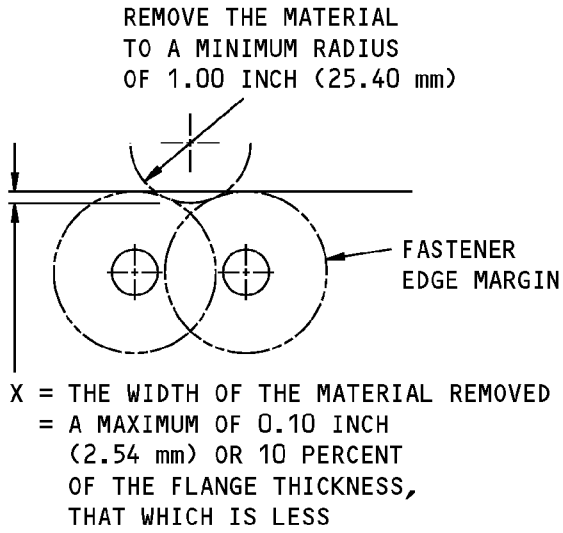
REMOVAL OF DAMAGED MATERIAL IN ZONE 1

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

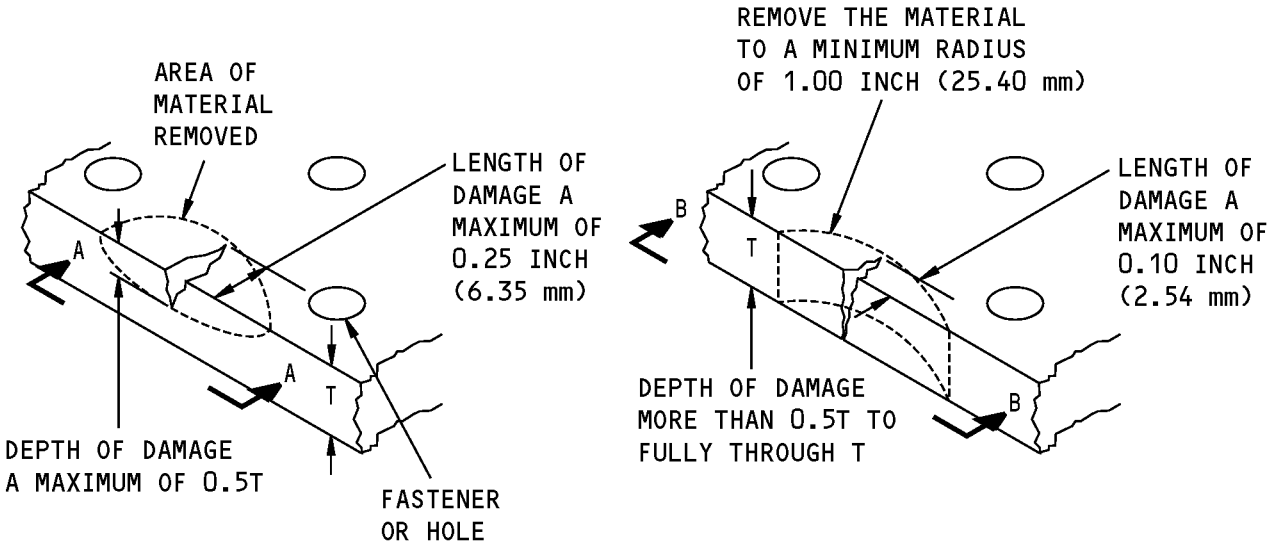
(B)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

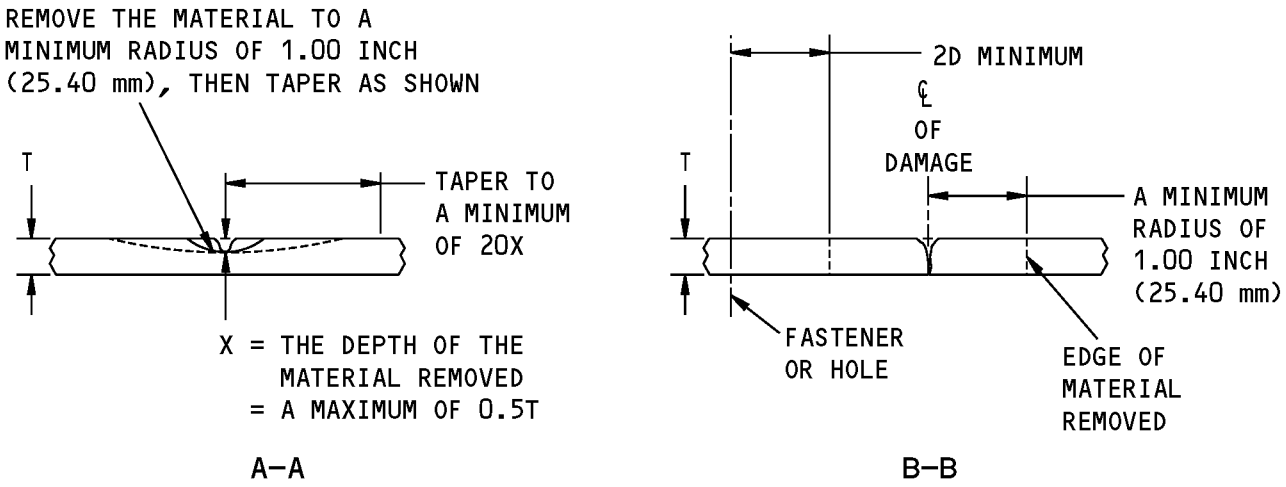
(C)

Allowable Damage Limits
Figure 103 (Sheet 1 of 8)



REMOVAL OF DAMAGED MATERIAL AT AN EDGE IN ZONE 2

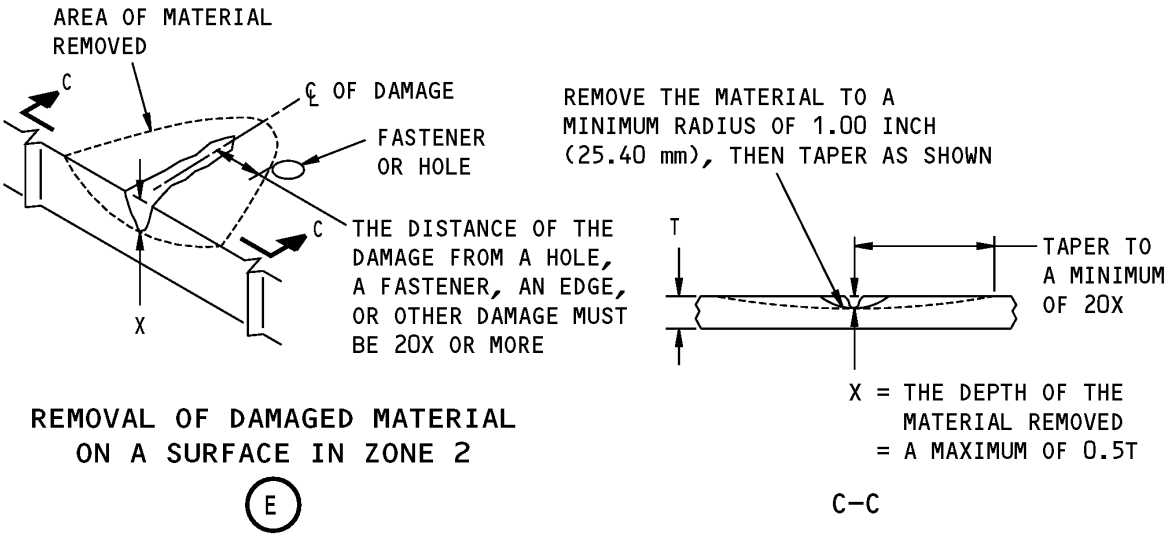
(D)



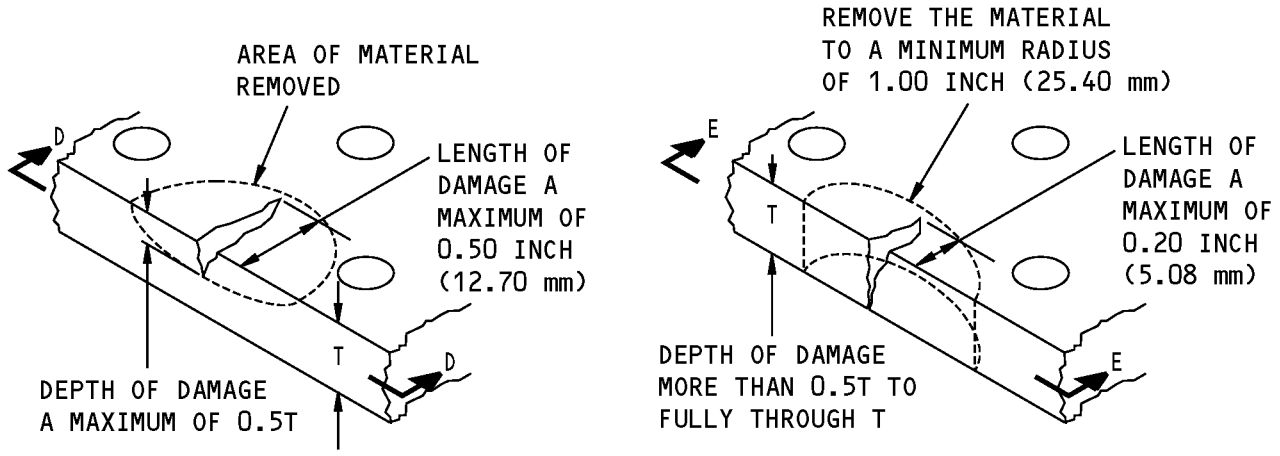
NOTES

- T = THE THICKNESS OF THE MATERIAL

Allowable Damage Limits
Figure 103 (Sheet 2 of 8)

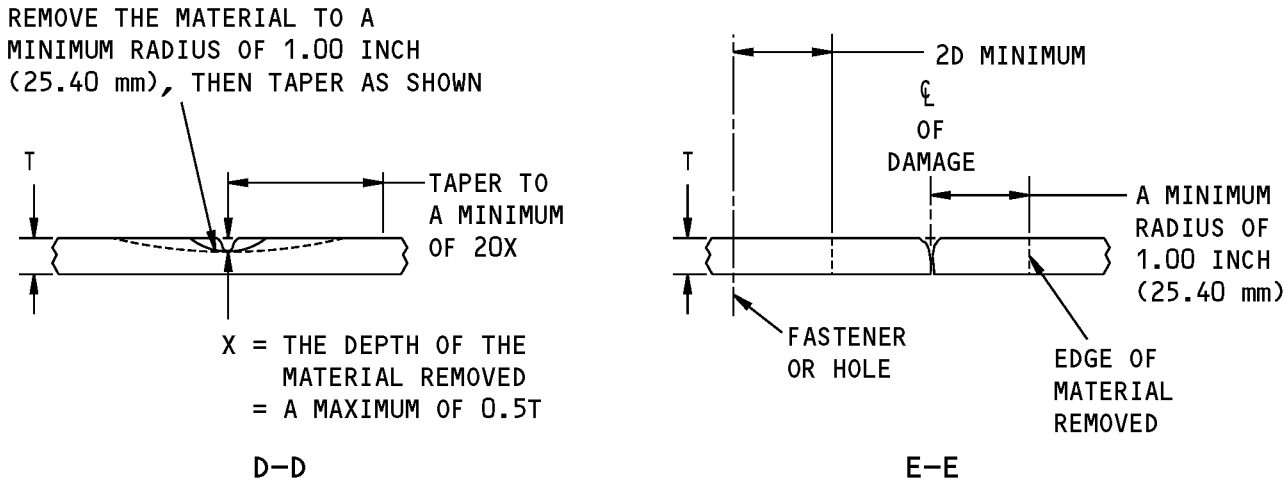


Allowable Damage Limits
Figure 103 (Sheet 3 of 8)

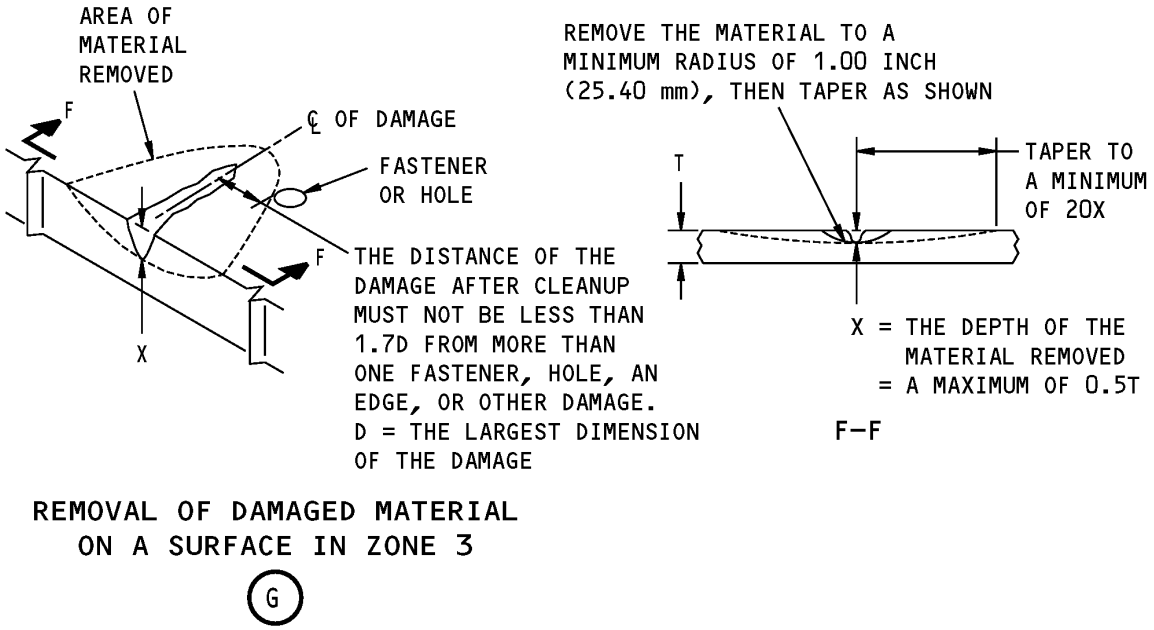


REMOVAL OF DAMAGED MATERIAL AT AN EDGE IN ZONE 3

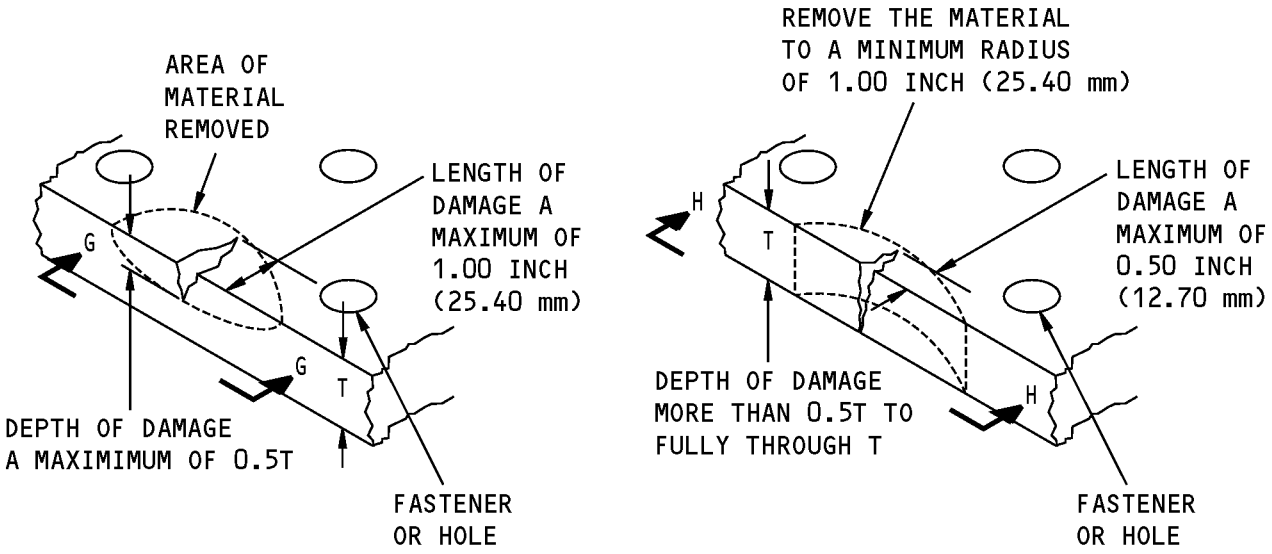
(F)



Allowable Damage Limits
Figure 103 (Sheet 4 of 8)

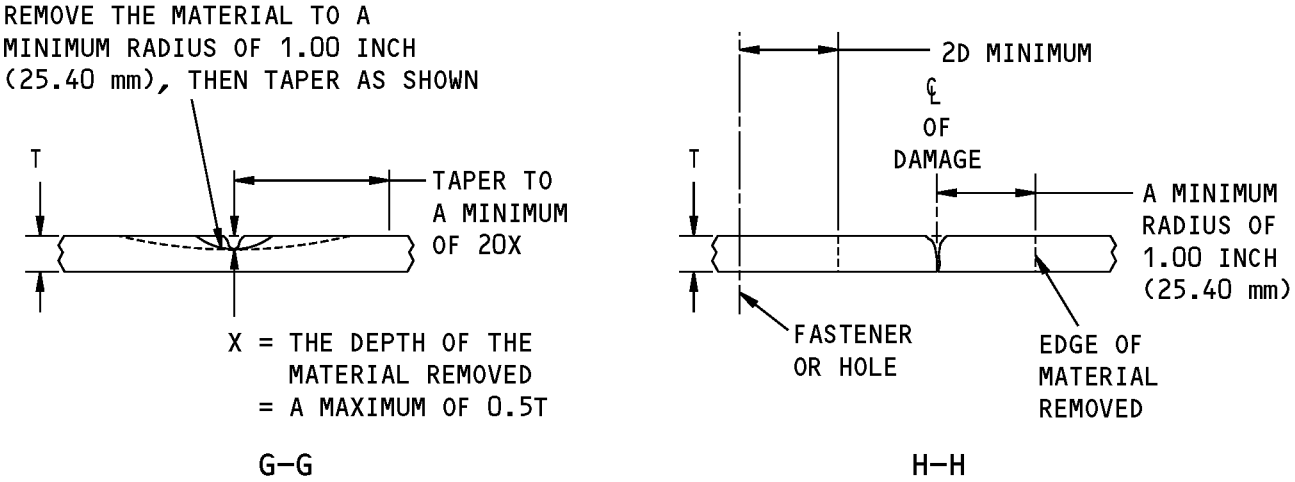


Allowable Damage Limits
Figure 103 (Sheet 5 of 8)

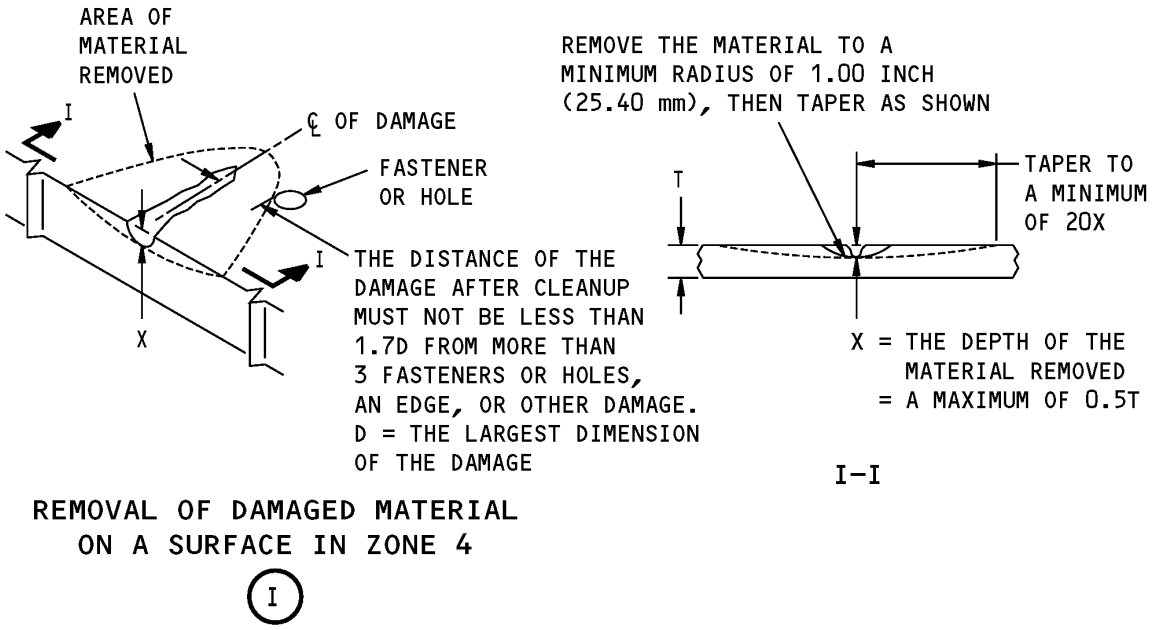


REMOVAL OF DAMAGED MATERIAL AT AN EDGE IN ZONE 4

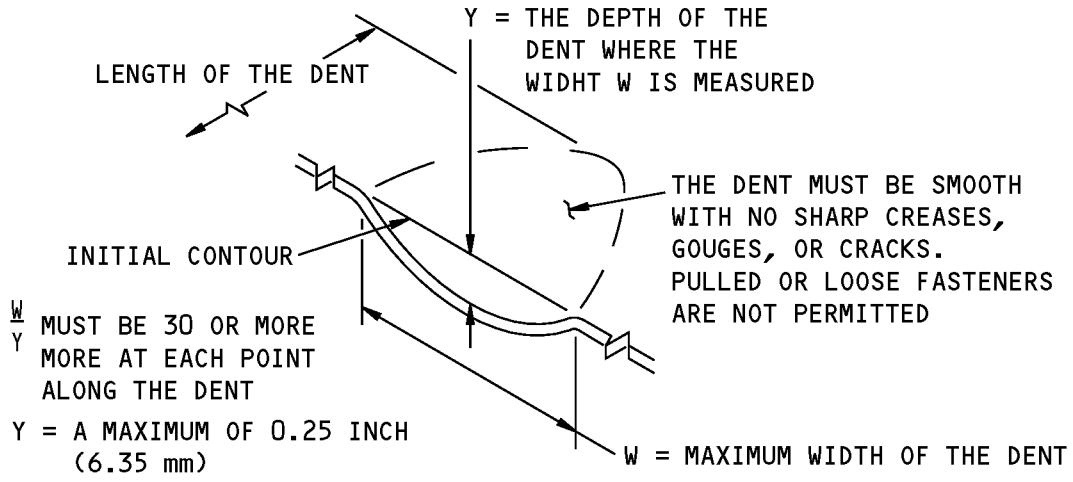
(H)



Allowable Damage Limits
Figure 103 (Sheet 6 of 8)



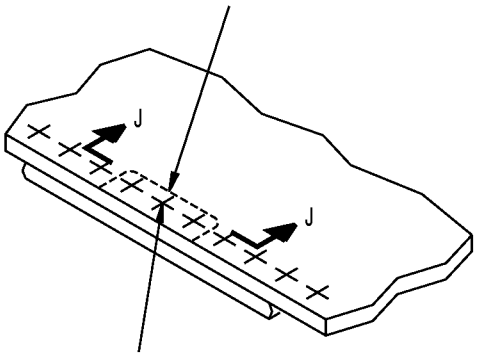
Allowable Damage Limits
Figure 103 (Sheet 7 of 8)



A DENT THAT IS PERMITTED

J

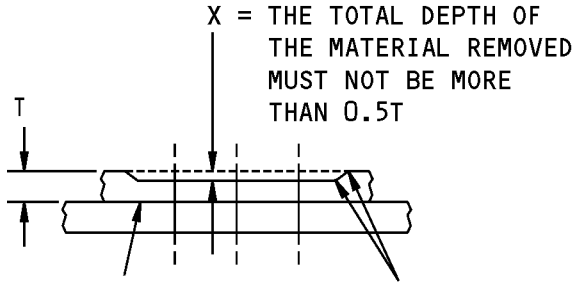
THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVE THE FASTENERS BEFORE YOU REMOVE THE DAMAGE. INSTALL THE FASTENERS AFTER THE REWORK IS COMPLETED

REMOVAL OF CORROSION DAMAGE AROUND THE FASTENERS

K

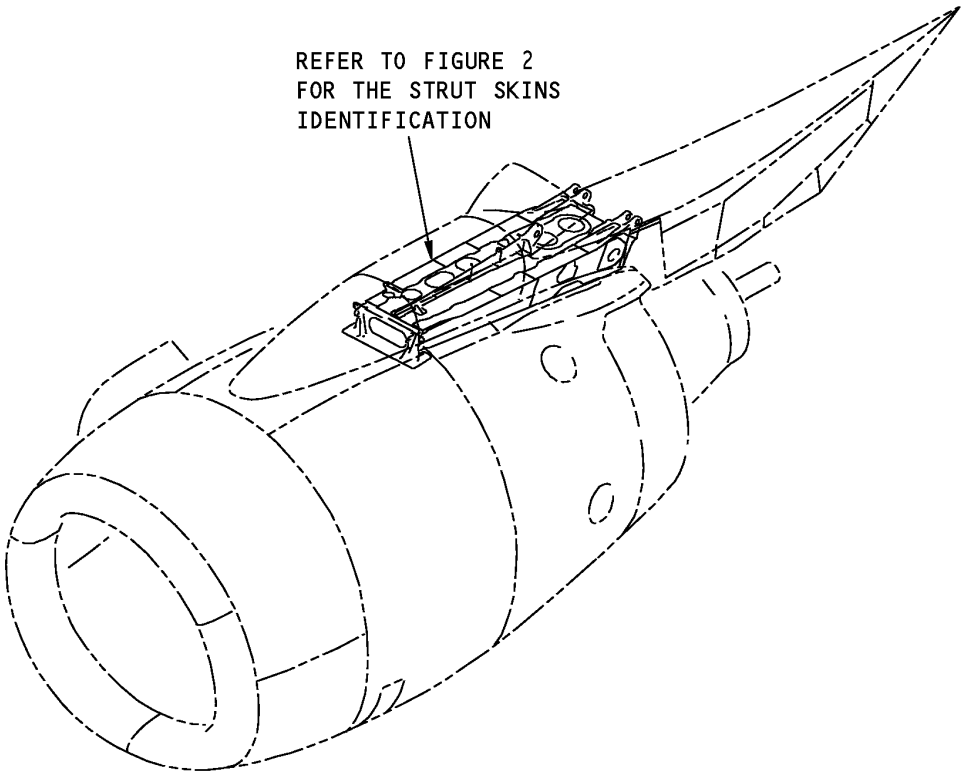


NOTE: IF MATERIAL IS REMOVED FROM TWO SIDES, THE TOTAL REMOVED MUST NOT BE MORE THAN 0.5T.

J–J

Allowable Damage Limits
Figure 103 (Sheet 8 of 8)

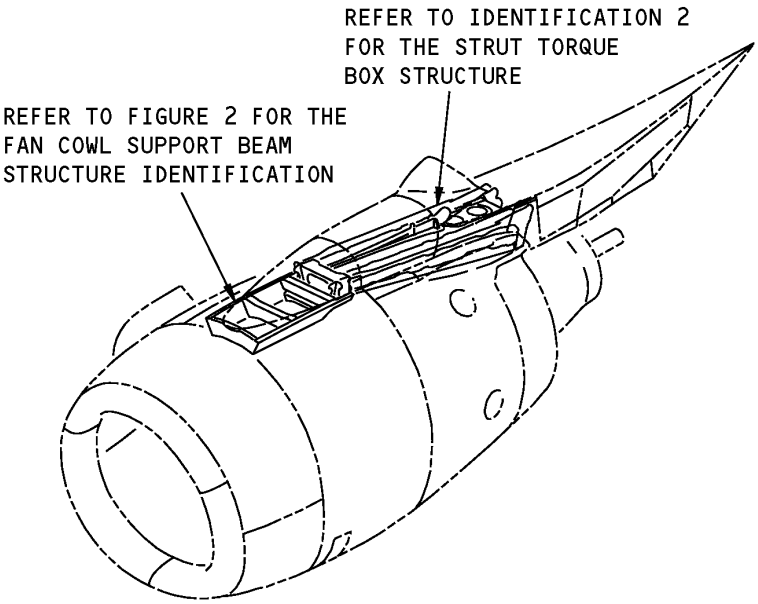
REPAIR 1 - ENGINE STRUT SIDE SKINS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

Engine Strut Skins Location
Figure 201

IDENTIFICATION 1 - FAN COWL SUPPORT BEAM STRUCTURE

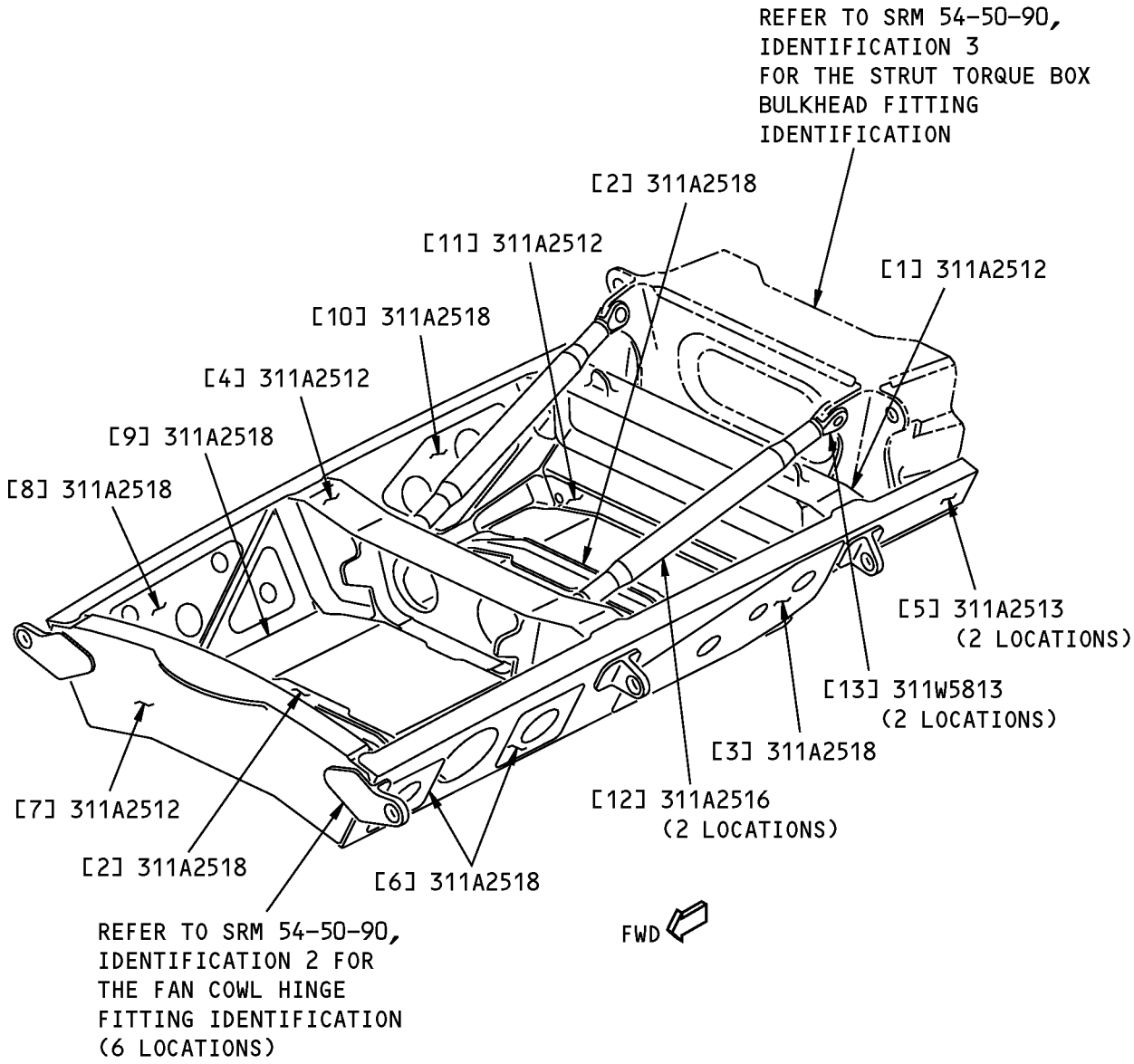


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Fan Cowl Support Beam Structure Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2510	Fan Cowl Support Beam Installation
311A2511	Fan Cowl Support Beam Assembly



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

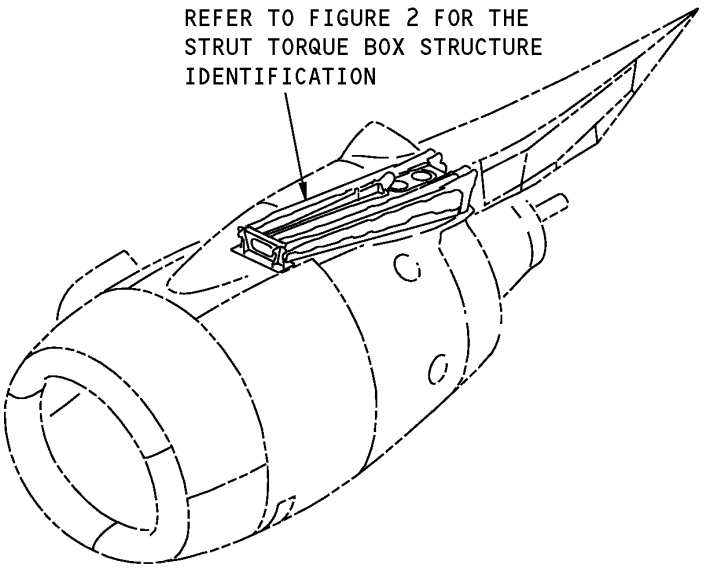
Fan Cowl Support Beam Structure Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Aft Bulkhead	3.2 (81.28)	7050-T7451 machined plate as given in AMS 4050	
[2]	Stiffener		BAC1505-101094 2024-T42 extrusion as given in QQ-A-200/3	
[3]	Disconnect Panel	0.071 (1.80)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[4]	Frame	5.4 (137.2)	7050-T7451 machined plate as given in BMS 7-323	
[5]	Side Beam Fitting	2.50 (63.5)	7050-T7451 machined plate as given in AMS 4050	
[6]	Disconnect Panel	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[7]	Forward Bulkhead	2.4 (60.96)	7050-T7451 machined plate as given in AMS 4050	
[8]	Disconnect Panel	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[9]	Web	0.063 (1.60)	2024-T3 sheet as given in QQ-A-250/4	
[10]	Disconnect Panel	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[11]	Closeout Fitting	1.7 (43.18)	7050-T7451 machined plate as given in AMS 4050	
[12]	Tube		2024-T42 tube, 1.25 inch (31.75 mm) in diameter	
[13]	Tie Rod Clevis		7075-T7351 rod as given in QQ-A-225/9	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

IDENTIFICATION 2 - ENGINE STRUT TORQUE BOX STRUCTURE

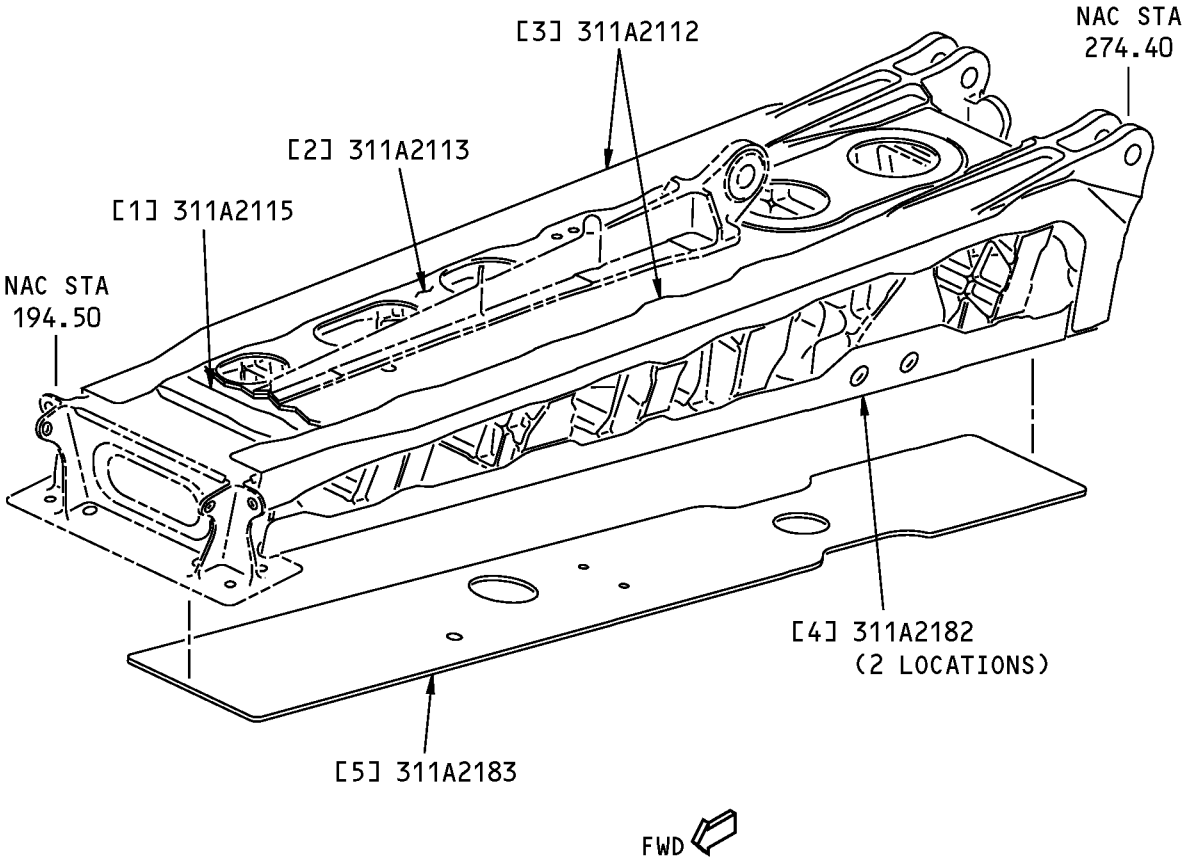


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut Torque Box Structure
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2007	Strut Structure Assembly
311A2101	Strut Torque Box Assembly
311A2116	Web Assembly - Upper Spar



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Engine Strut Torque Box Identifcation
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Upper Spar Stiffener		BAC1505-100172 2024-T8511 extrusion as given in QQ-A-200/3	
[2]	Upper Spar Web	0.32 (8.13)	2024-T851 machined plate as given in QQ-A-250/4	
[3]	Upper Spar Chord		15-5PH die forged CRES as given in AMS 5659, Type 1, solution heat treated to 180-220 KSI	
[4]	Lower Spar Chord		15-5PH die forged CRES as given in AMS 5659, Type 1, solution heat treated to 180-220 KSI	
[5]	Lower Spar Web	0.20 (5.08)	Ti-6Al-4V machined titanium plate as given in Mil-T-9046, Code AB-1, in the annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - FAN COWL SUPPORT BEAM STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the fan cowl support beam shown in Fan Cowl Support Beam Structure Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

(1) Refer to SOPM 20-10-07 when you work with titanium.

(2) Refer to 51-10-02 for the removal procedures.

(3) Refer to 51-10-02 for the procedures.

(4) Refer to 51-30-03 for possible sources of the nonmetallic materials you can use to remove the damage.

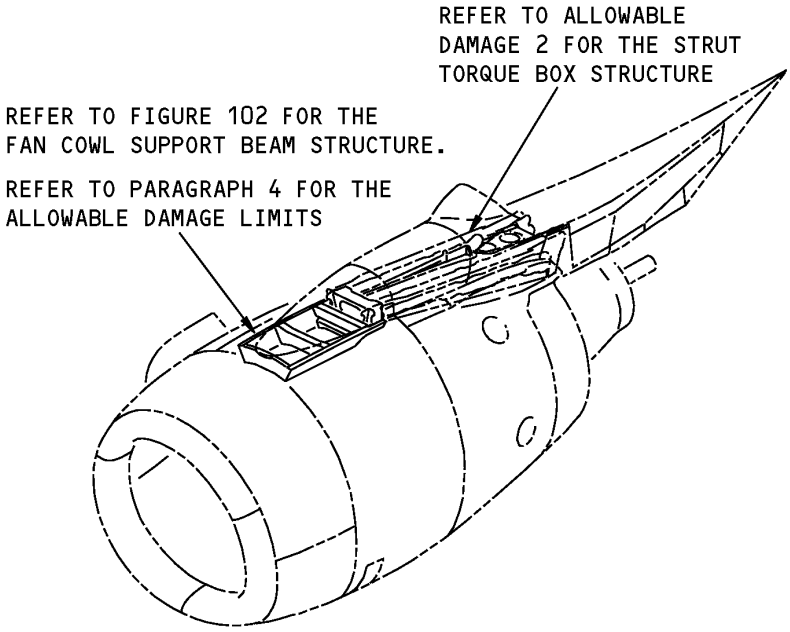
(5) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

B. After you remove the damage, do as follows:

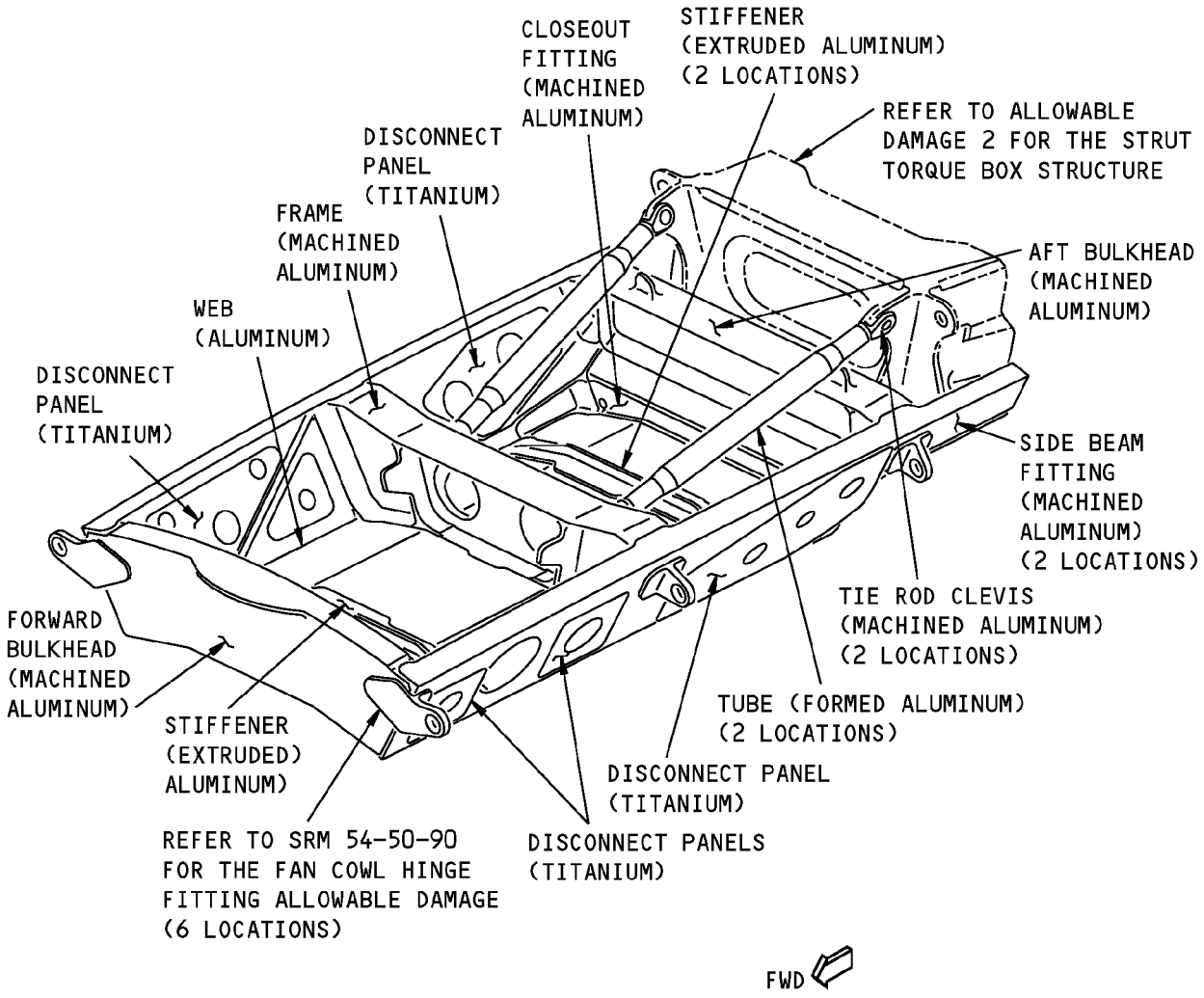
(1) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.

(2) Apply two layers of BMS 10-11, Type I primer to the bare surfaces of the aluminum parts. Refer to SOPM 20-41-02.

(3) Apply one layer of BMS 10-11, Type I primer to the bare surfaces of the titanium parts. Refer to SOPM 20-41-02.



Fan Cowl Support Beam Structure Location
Figure 101



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Fan Cowl Support Beam Structure
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-07	Machining of Titanium
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Bulkheads, Frame, Stiffeners, and Fittings

(1) Cracks:

(a) Remove the edge damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and H .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

B. Webs and Disconnect Panels

(1) Cracks:

(a) Remove the edge damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and F .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and F .

(3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail G .

(4) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail I .

C. Tie Rod Clevis:

NOTE: No damage is permitted in the surface of the lug bore. You are permitted to drill the bore:

- To a maximum oversize diameter of 0.875 inch (22.23 mm)
- If there is no damage on the edge of the lug.

(1) Cracks:

(a) Remove the damage to a corner of the lug as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

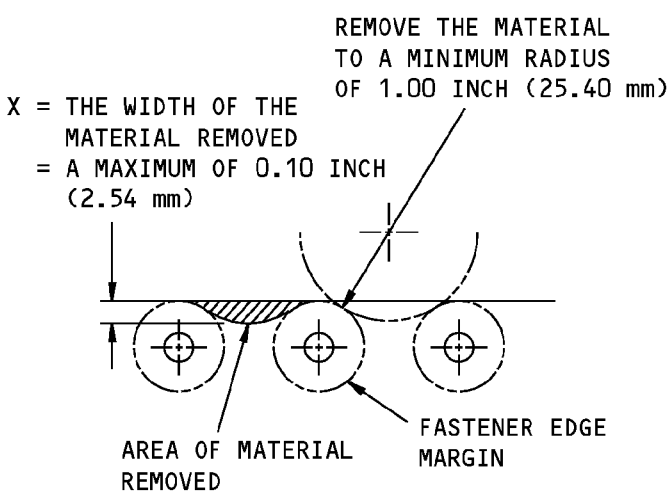
D. Tubes

(1) Cracks are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail K .

(2) Nicks, Gouges, Scratches, and Corrosion are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail K .

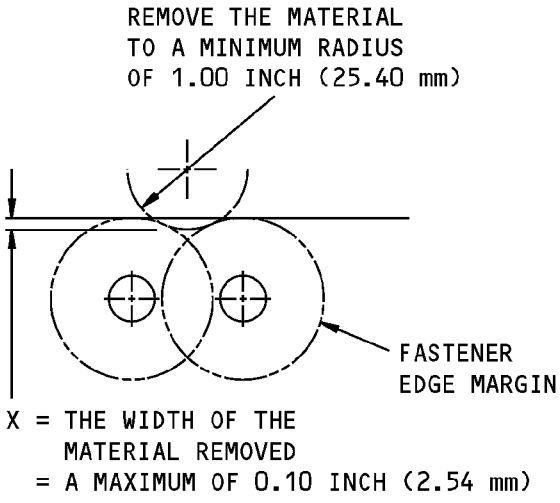
(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.



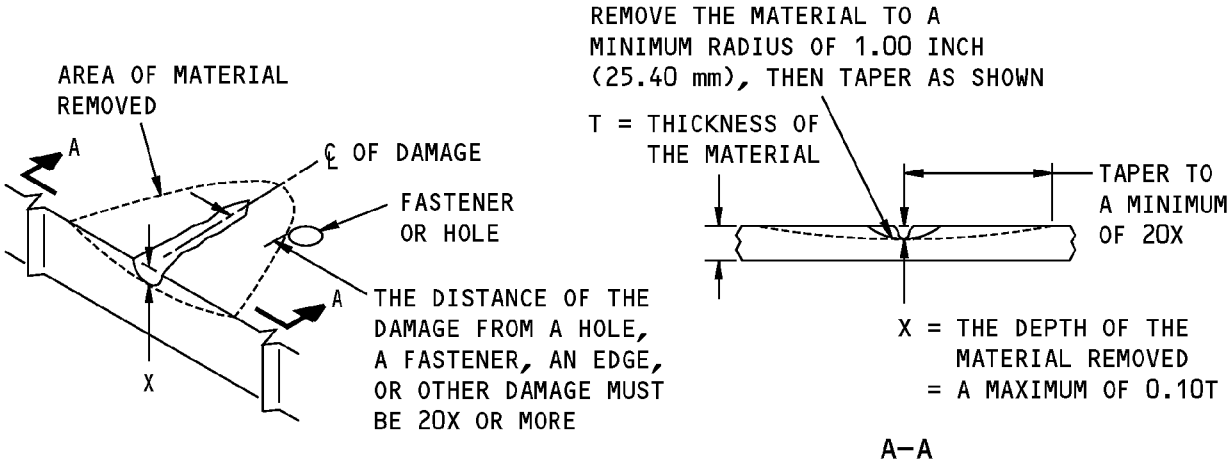
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

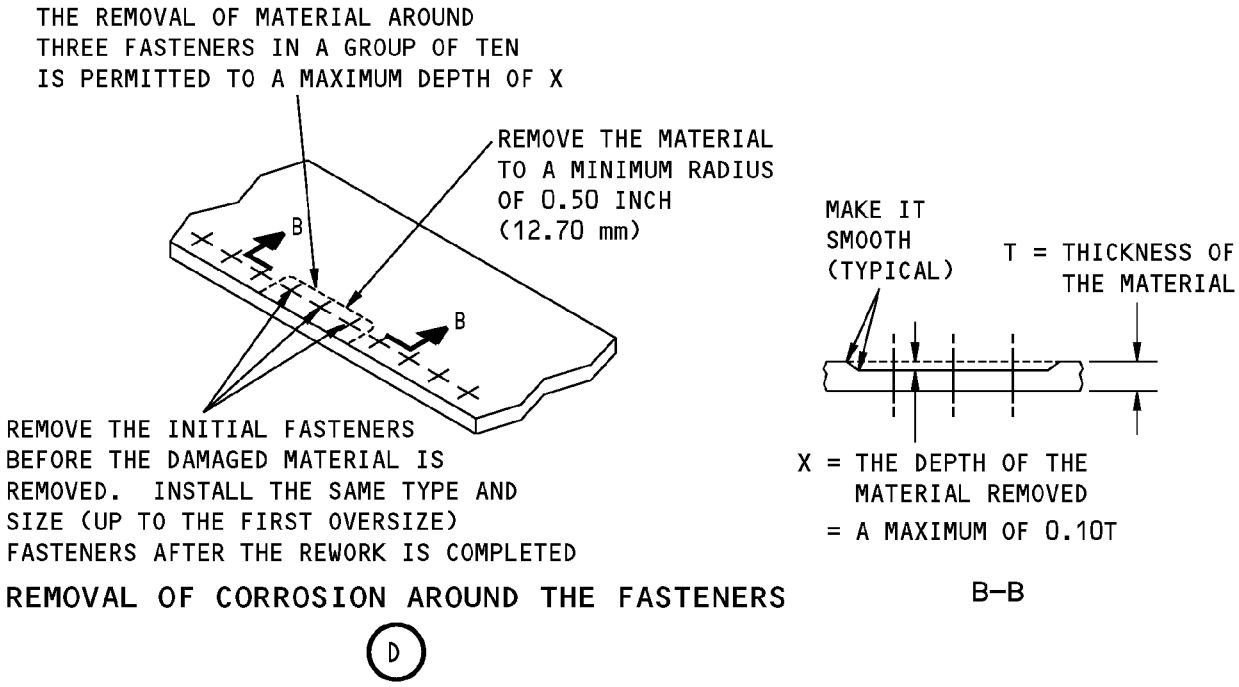
B



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

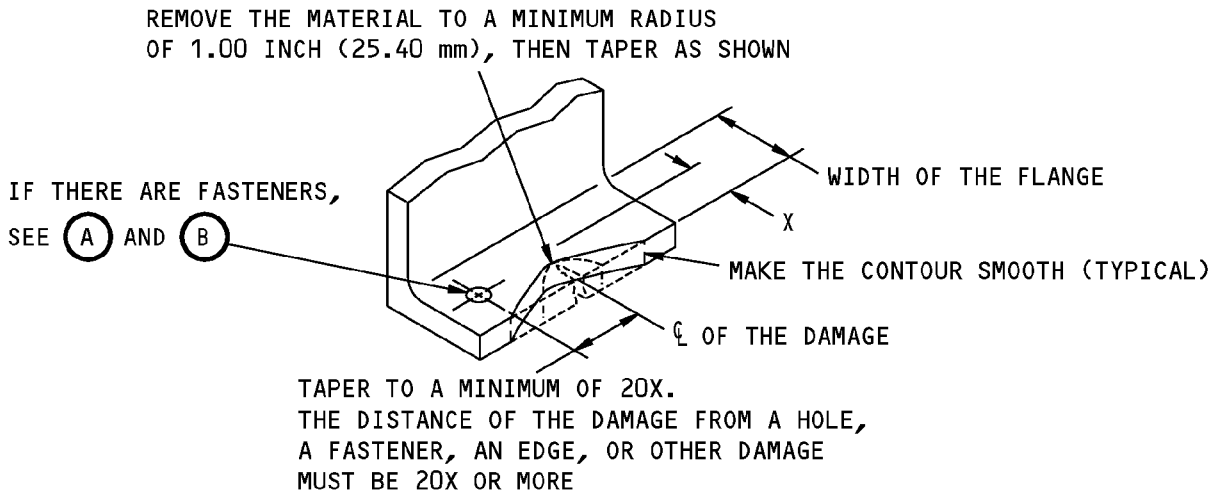
C

Allowable Damage Limits
Figure 103 (Sheet 1 of 7)



REMOVAL OF CORROSION AROUND THE FASTENERS

(D)

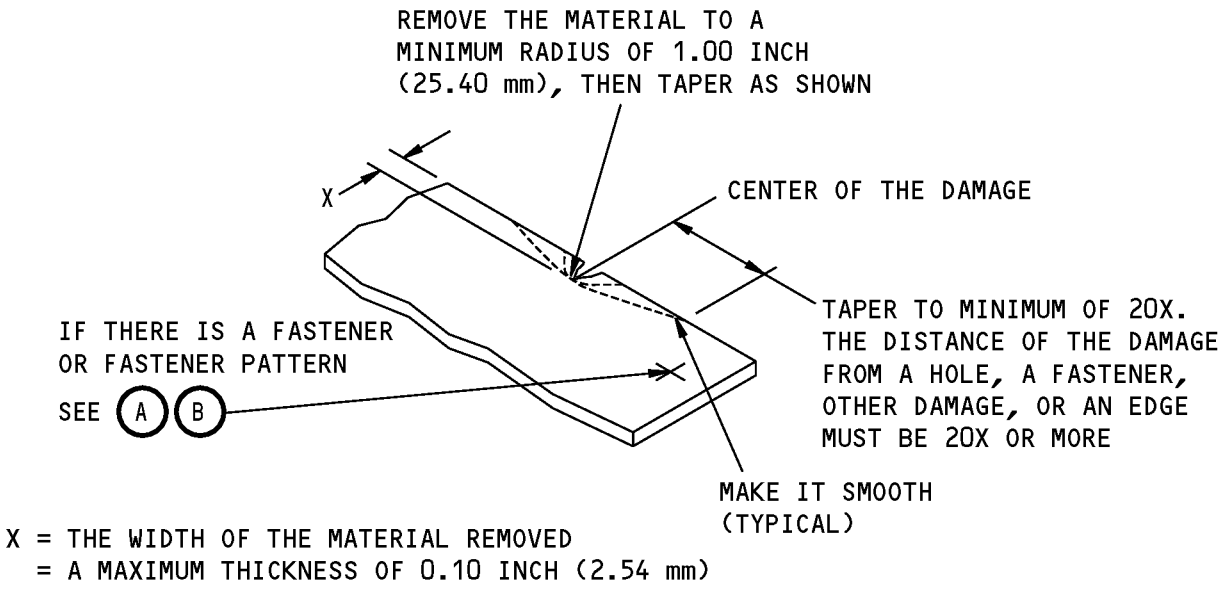


X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL AT AN
EDGE OF A MACHINED OR EXTRUDED PART

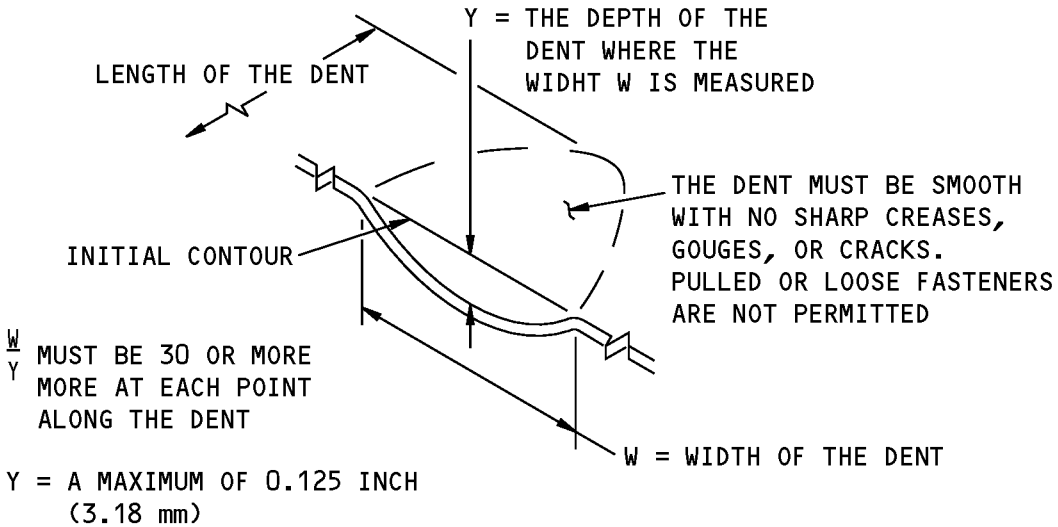
(E)

Allowable Damage Limits
Figure 103 (Sheet 2 of 7)



REMOVAL OF DAMAGED MATERIAL AT AN EDGE

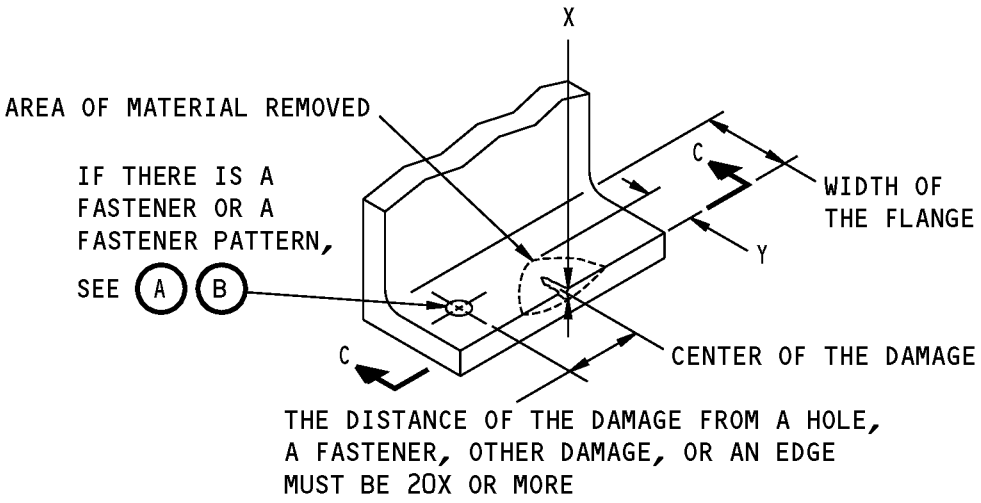
F



A DENT THAT IS PERMITTED

G

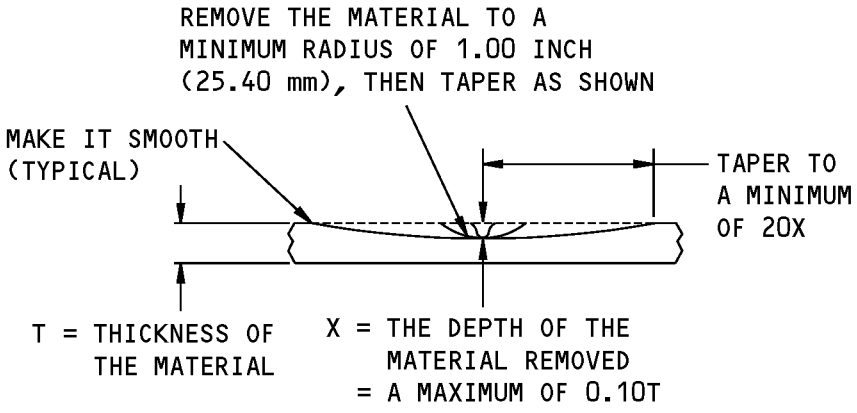
Allowable Damage Limits
Figure 103 (Sheet 3 of 7)



Y = THE WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

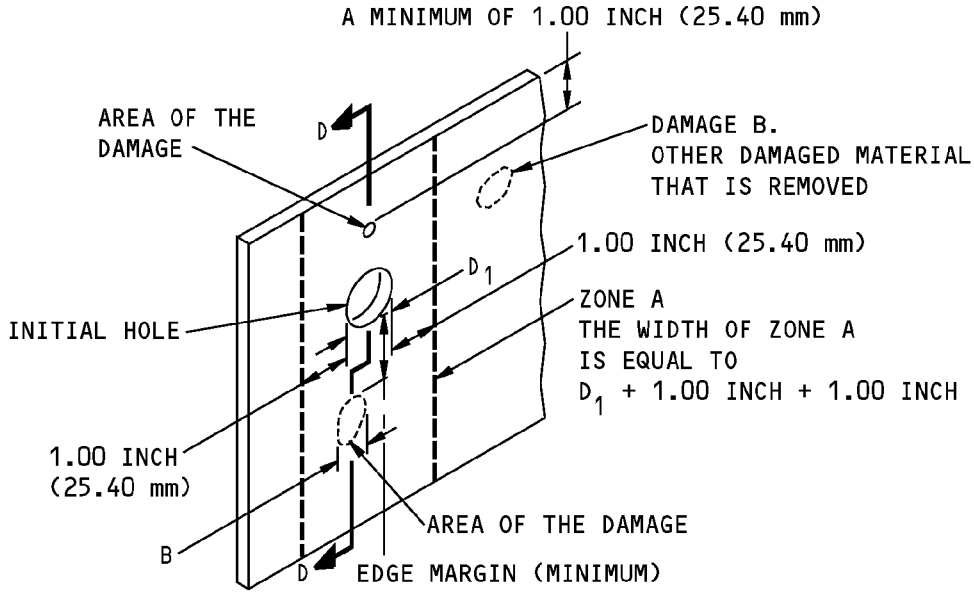
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

H



C–C

Allowable Damage Limits
Figure 103 (Sheet 4 of 7)



NOTE: DAMAGE B IS NOT LOCATED IN ZONE A AND SHOULD NOT BE INCLUDED IN THE CALCULATION OF THE TOTAL CROSS-SECTIONAL AREA SHOWN IN D-D.

REMOVAL OF DAMAGE FROM A WEB

(I)

D_1 = DIAMETER OF THE INITIAL HOLE

D_2 = DIAMETER OF THE HOLE DAMAGE

H = HEIGHT OF THE WEB

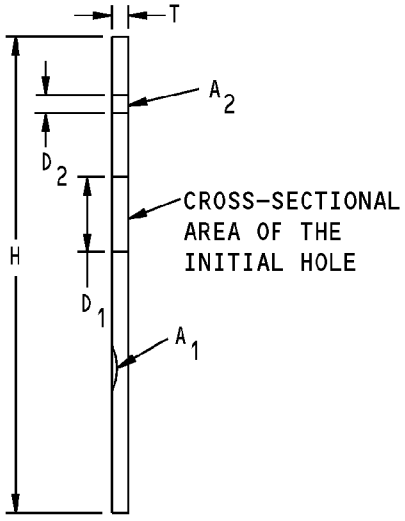
T = THICKNESS OF THE WEB

A_i = INITIAL NET AREA
= TOTAL CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL HOLES
= $HT-D_1T$

A_1 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED FROM LOCATION 1

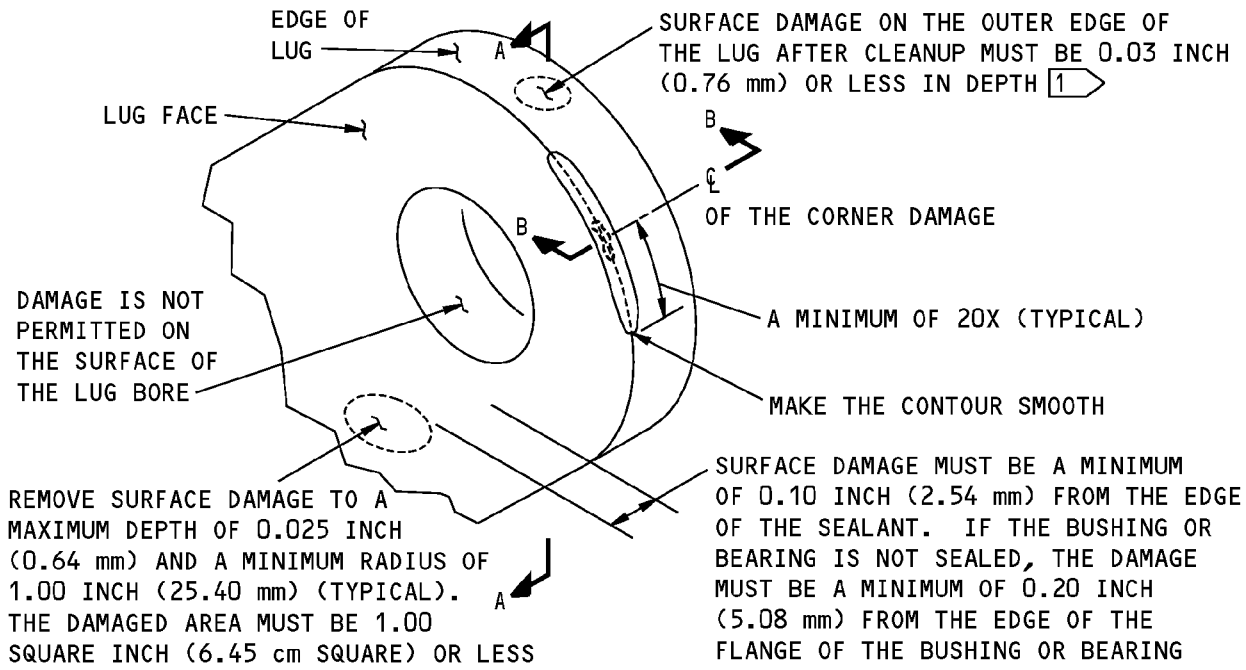
A_2 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED FROM LOCATION 2
= D_2T

$\left(\frac{A_1+A_2}{A_i}\right) X\ 100$ = PERCENT OF CROSS-SECTIONAL AREA REMOVED
= 10 PERCENT MAXIMUM



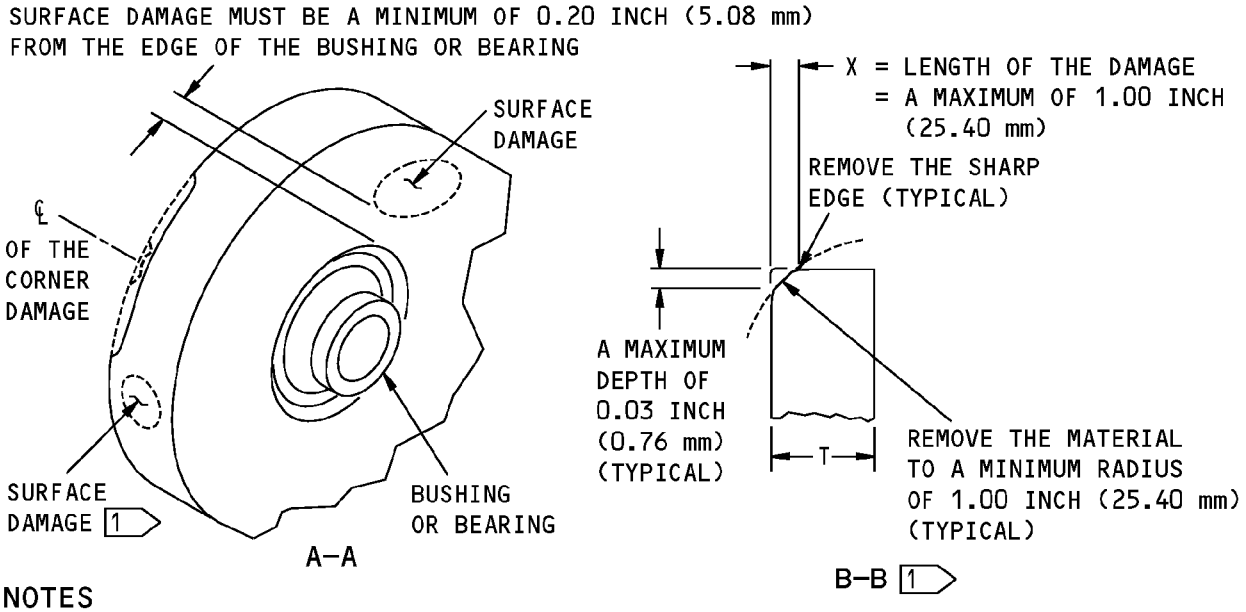
D-D

Allowable Damage Limits
Figure 103 (Sheet 5 of 7)



REMOVAL OF SURFACE AND EDGE DAMAGE

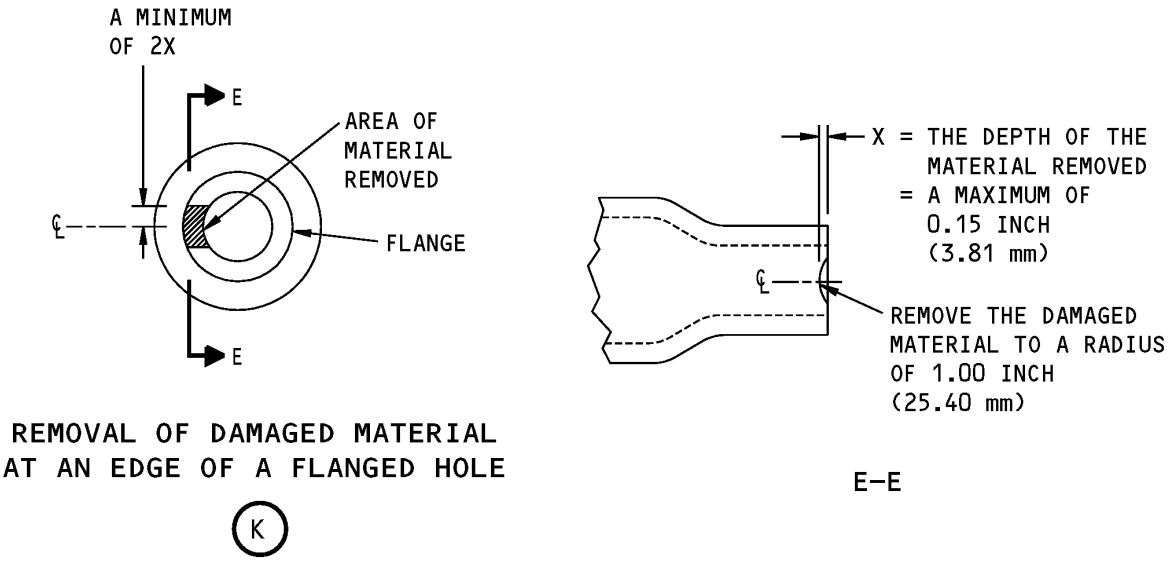
J



NOTES

1 THESE ALLOWABLE DAMAGE LIMITS ARE APPLICABLE ONLY IF THE BORE OF THE LUG HAS NOT BEEN OVERSIZED. IF THE BORE IS OVERSIZED, THEN ONLY SURFACE DAMAGE IS PERMITTED AS SHOWN.

Allowable Damage Limits
Figure 103 (Sheet 6 of 7)



Allowable Damage Limits
Figure 103 (Sheet 7 of 7)

ALLOWABLE DAMAGE 2 - ENGINE STRUT TORQUE BOX STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the engine strut torque box structure shown in Engine Strut Torque Box Structure Location, Figure 101/ALLOWABLE DAMAGE 2.

2. General

A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

(1) Refer to SOPM 20-10-07 when you work with titanium.

(2) Refer to 51-10-02 for the removal procedures.

(3) Refer to 51-30-03 for sources of the nonmetallic materials you need to remove the damage.

(4) Refer to 51-30-05 for sources of the equipment and tools you need to remove the damage.

B. After you remove the damage, do as follows:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

(1) Flap peen or shot peen the reworked parts made of Corrosion Resistant Steel (CRES).

(a) Refer to 51-20-06 for shot peen intensity and shot number.

(b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.

(2) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.

(3) Apply cadmium plating to the bare surfaces of the CRES parts. Refer to SOPM 20-42-05.

(4) Apply one layer of BMS 10-11, Type 1 primer to the surfaces of the reworked CRES and aluminum parts. Refer to SOPM 20-41-02.

(a) Make sure there is a complete seal between the access doors and the spar webs.

1) Apply a fillet seal all around the edge of the access hole as necessary.

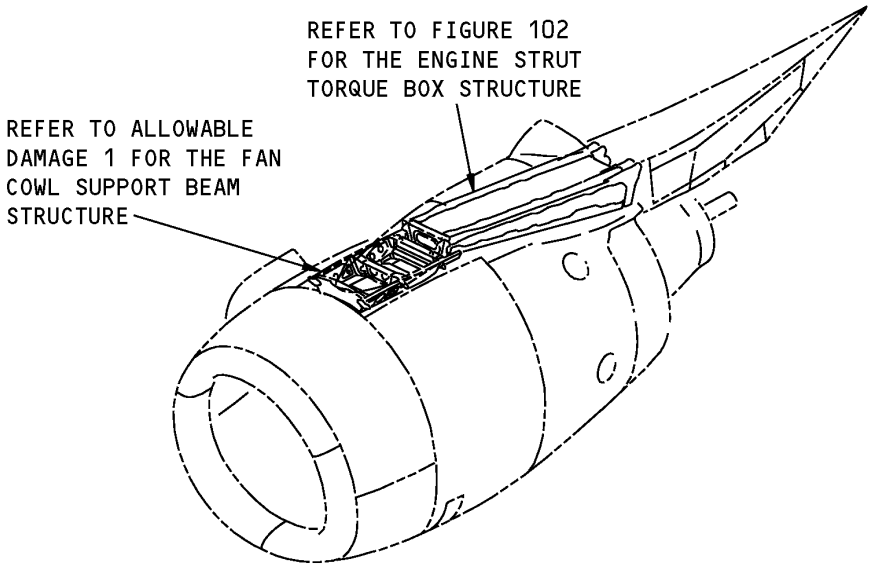
(5) Apply one layer of BMS 10-70, Type 3 primer to the reworked surfaces. Refer to SOPM 20-44-04.

C. Refer to Table 101/ALLOWABLE DAMAGE 2 for the references for the allowable damage zones for the strut torque box structure.

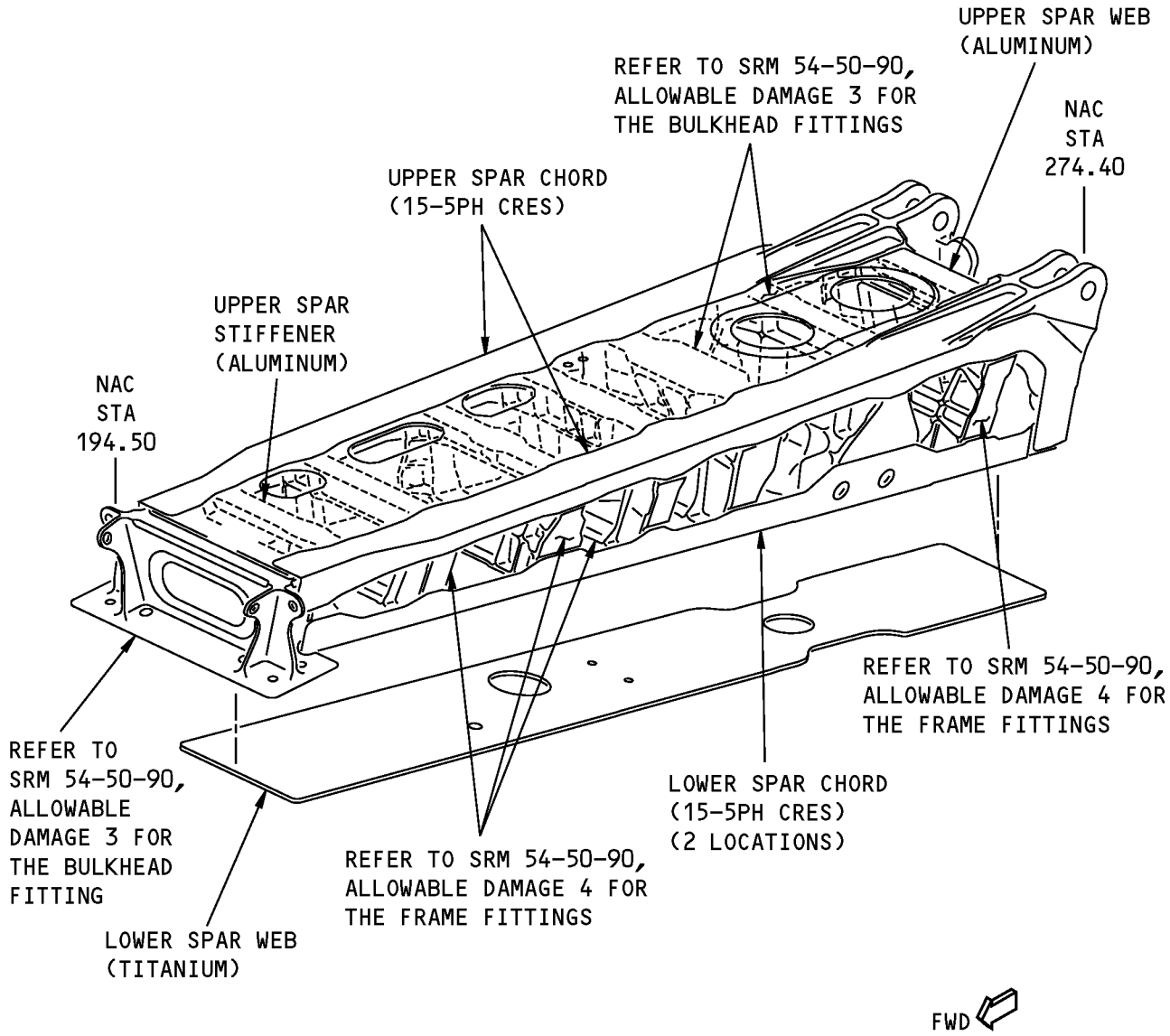
Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE		
STRUCTURE	**ZONE LOCATION**	**PARAGRAPH**
UPPER AND LOWER SPAR CHORDS	———	4.A
UPPER SPAR STIFFENER	———	4.B

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE		
STRUCTURE	**ZONE LOCATION**	**PARAGRAPH**
UPPER AND LOWER SPAR WEBS	1	4.C
	2	4.D
	3	4.E
	4	4.F



Engine Strut Torque Box Structure Location
Figure 101



NOTE: REFER TO PARAGRAPH 4 FOR THE ALLOWABLE DAMAGE LIMITS.

Engine Strut Torque Box Structure
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	General - Shot Peening Procedures
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-42-05	Bright Cadmium Plating
SOPM 20-44-04	Application of Urethane Compatible Primers

4. Allowable Damage Limits

A. Upper and Lower Spar Chords

(1) Cracks:

(a) Remove the damage as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , E , and F .

(b) The damage must not be nearer than 2D (D = fastener diameter) to more than 1 fastener in 6 adjacent fasteners at frame fitting attachment locations.

(c) For damage that is more than is permitted in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A and B , do as follows:

1) Remove the fastener.

2) Install a different freeze plug wet with BMS 5-63 sealant in each structural part that was joined by the fastener. Refer to 51-20-10.

a) Use the same material for the fastener as each initial part of the assembly.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , D , E , F , and G .

1) The area of the damage on a surface after cleanup must not be more than 1 square inch (6.45 cm^2).

2) The damage must not be nearer than 2D (D = fastener diameter) to more than 1 fastener in 6 adjacent fasteners.

(3) Dents are permitted as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail H .

(4) Holes and Punctures are not permitted.

B. Upper Spar Stiffener

(1) Cracks:

(a) Remove the damage as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , E , and F .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as given in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , D , E , and F .

(3) Dents are permitted as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail H .

(4) Holes and Punctures are not permitted.

C. Upper and Lower Spar Webs (Refer to Allowable Damage Zones, Figure 104/ALLOWABLE DAMAGE 2 for the allowable damage zones)

(1) Zone 1 - Area Around Access Holes and Tie Rod Holes

(a) Cracks:

1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details A , B , and C .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details A , B , and C .

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted.

(2) Zone 2

(a) Cracks:

1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , and D .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as given in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , D , and E , and F .

(c) Dents are permitted as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail H .

(d) Holes and Punctures are not permitted.

(3) Zone 3

(a) Cracks:

1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , and D .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as given in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , D , E , and F .

(c) Dents are permitted as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail H .

(d) Holes and Punctures are not permitted.

(4) Zone 4

(a) Cracks:

1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , and D .

(b) Nicks, Gouges, Scratches, and Corrosion:

1) Remove the damage as given in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , E and F .

2) If the material removed is nearer than 1.5D (D = fastener diameter) to a fastener, then do as follows:

a) Remove the fastener.

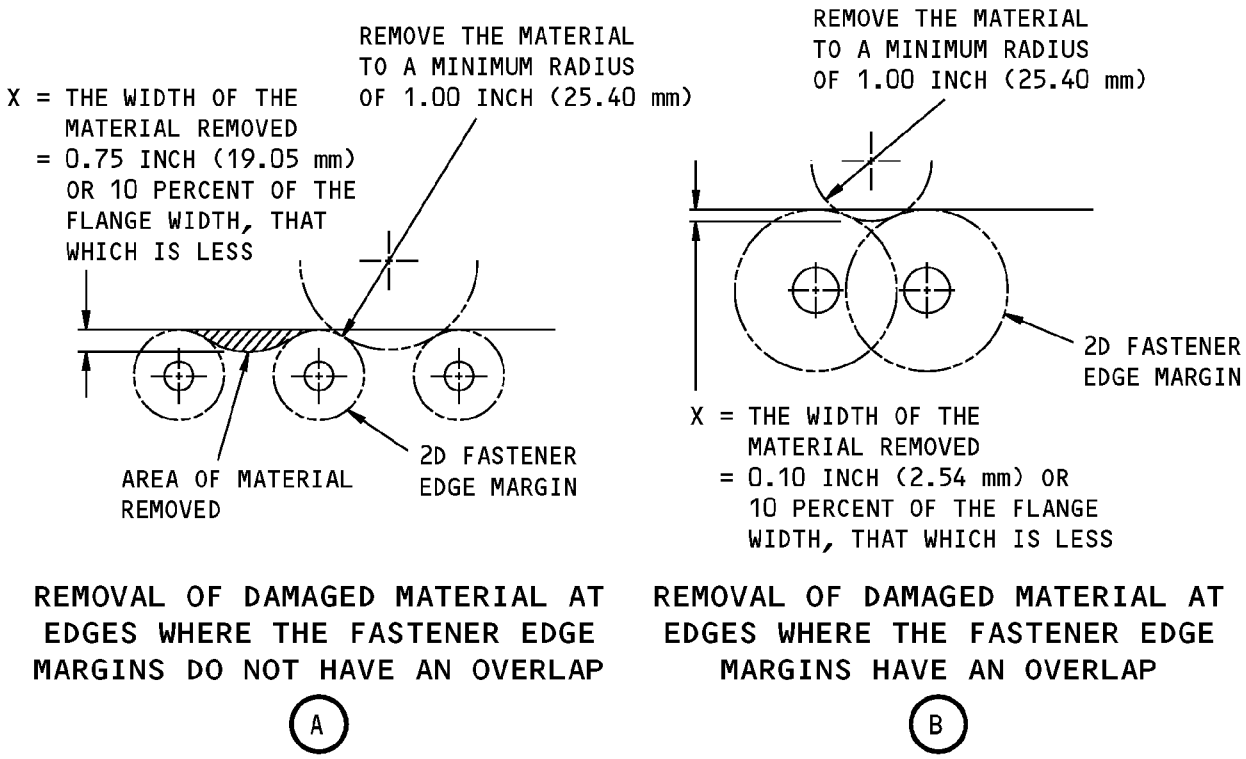
b) Install freeze plugs as necessary. Refer to 51-20-10.

- Install a freeze plug in the web
- Install a different freeze plug in the structure attached to the web.

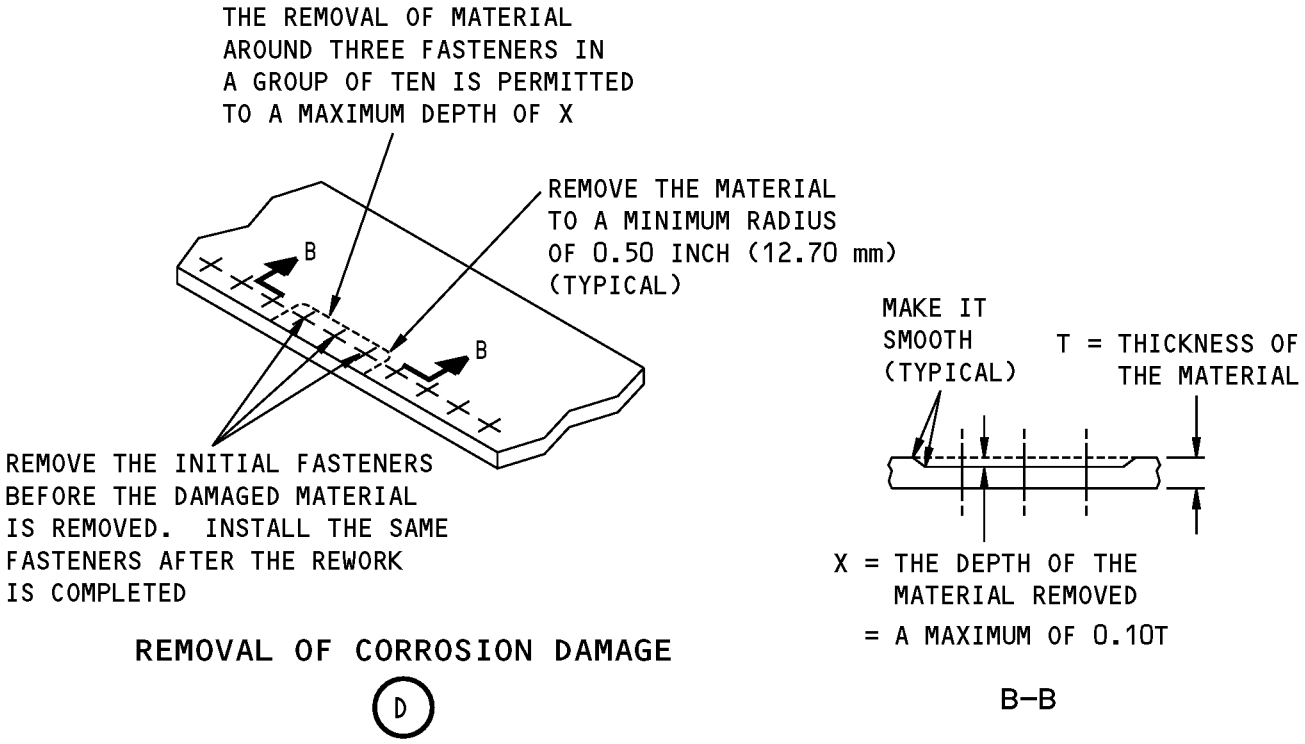
NOTE: Make sure the freeze plug does not join the web and the structure together.

(c) Dents are permitted as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail G .

(d) Holes and Punctures are not permitted.

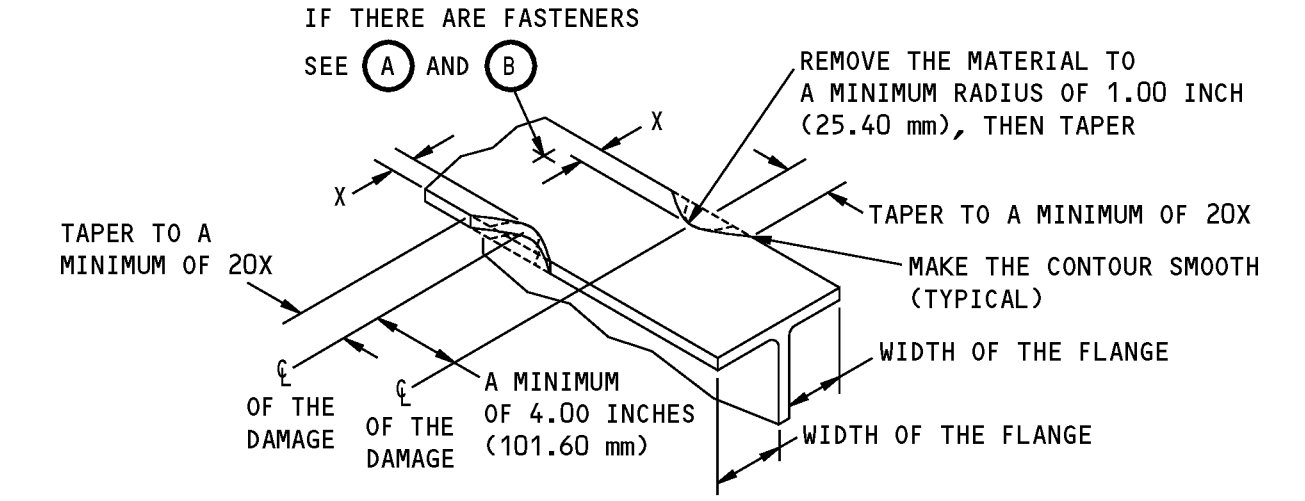


Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 1 of 5)



REMOVAL OF CORROSION DAMAGE

(D)

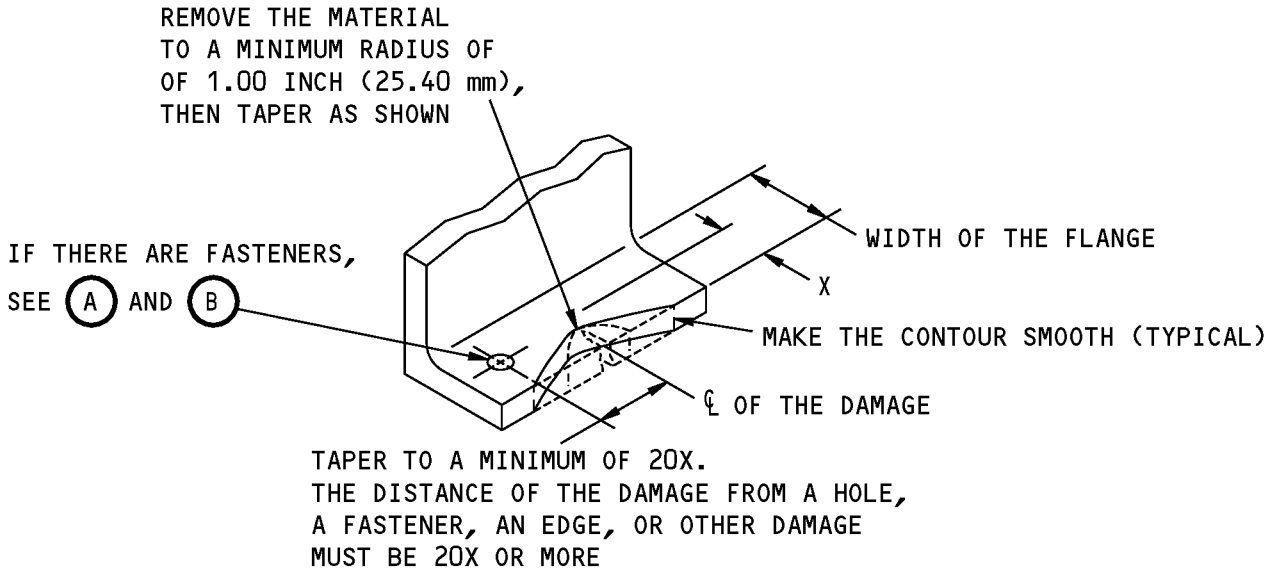


X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(E)

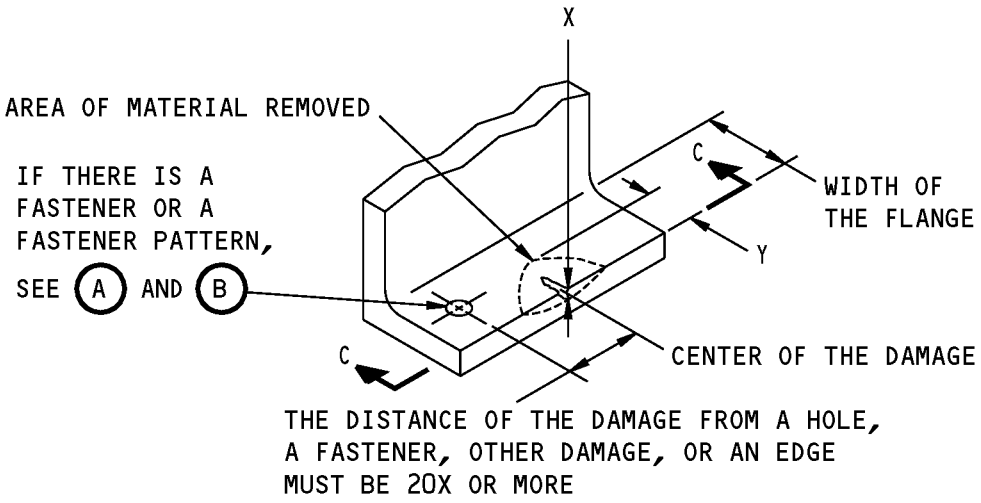
Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 2 of 5)



REMOVAL OF DAMAGED MATERIAL AT AN EDGE

F

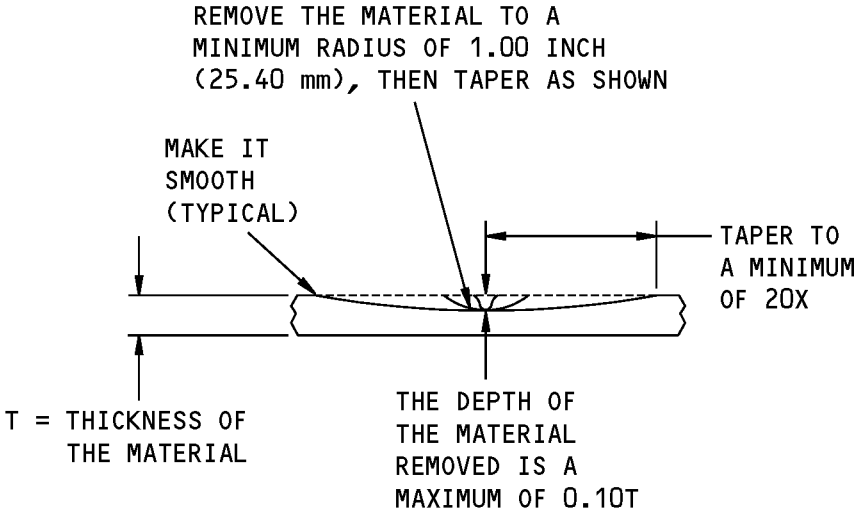
Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 3 of 5)



Y = THE WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

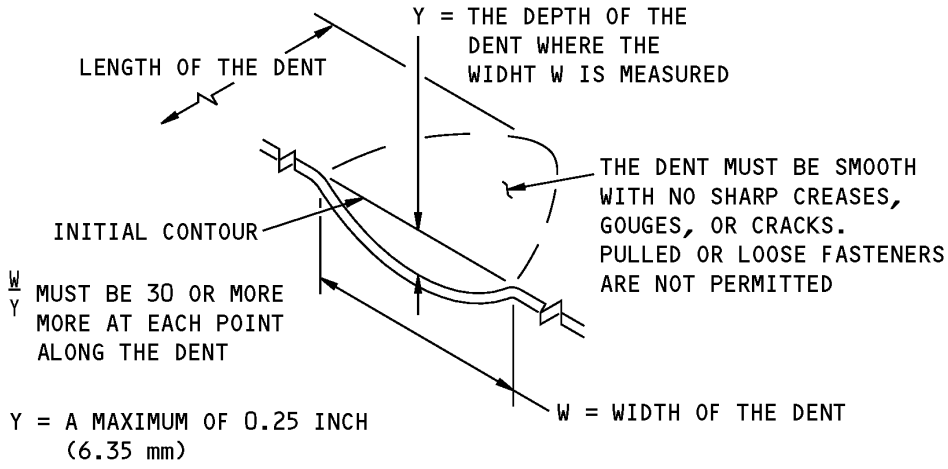
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

G

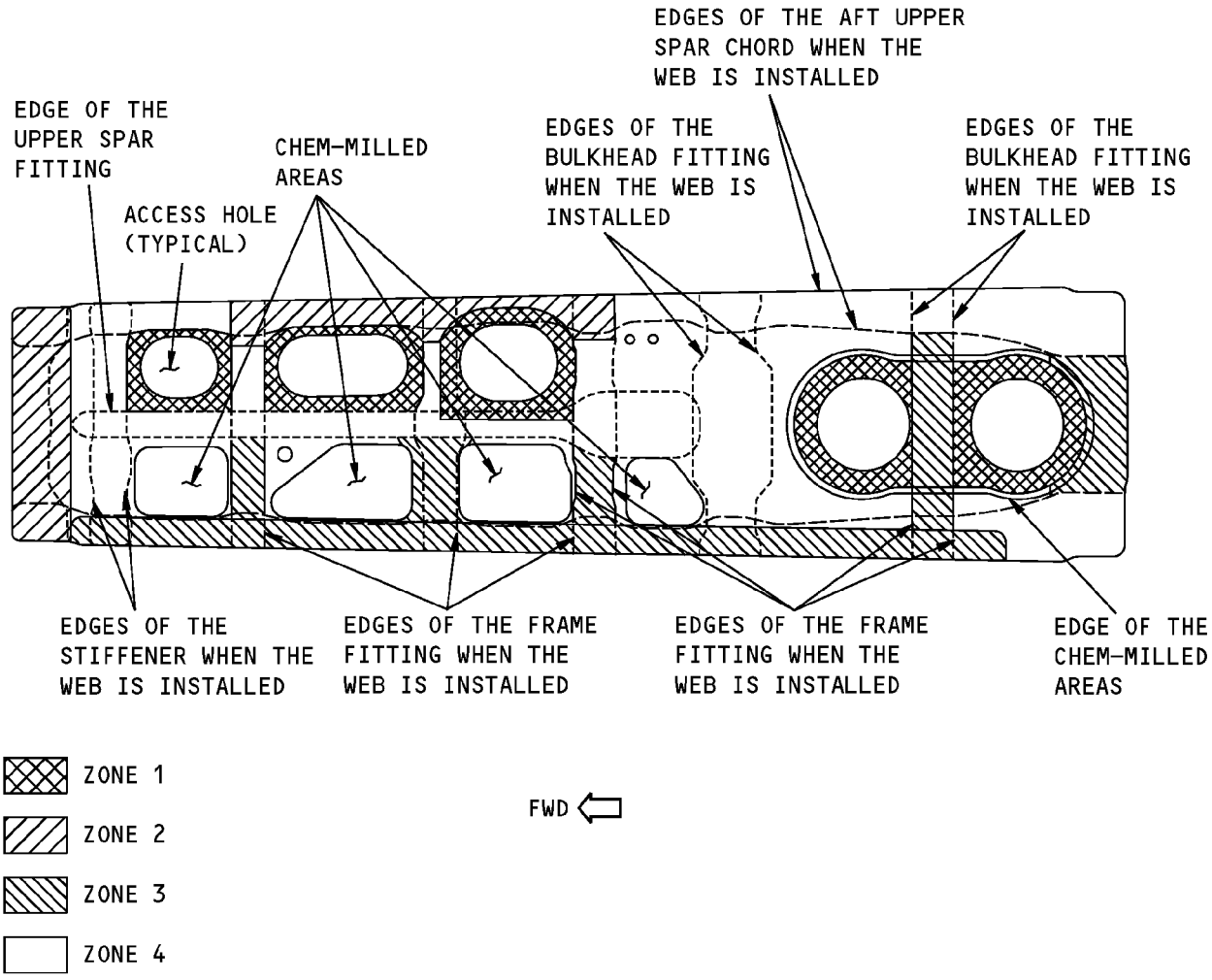


C–C

Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 4 of 5)



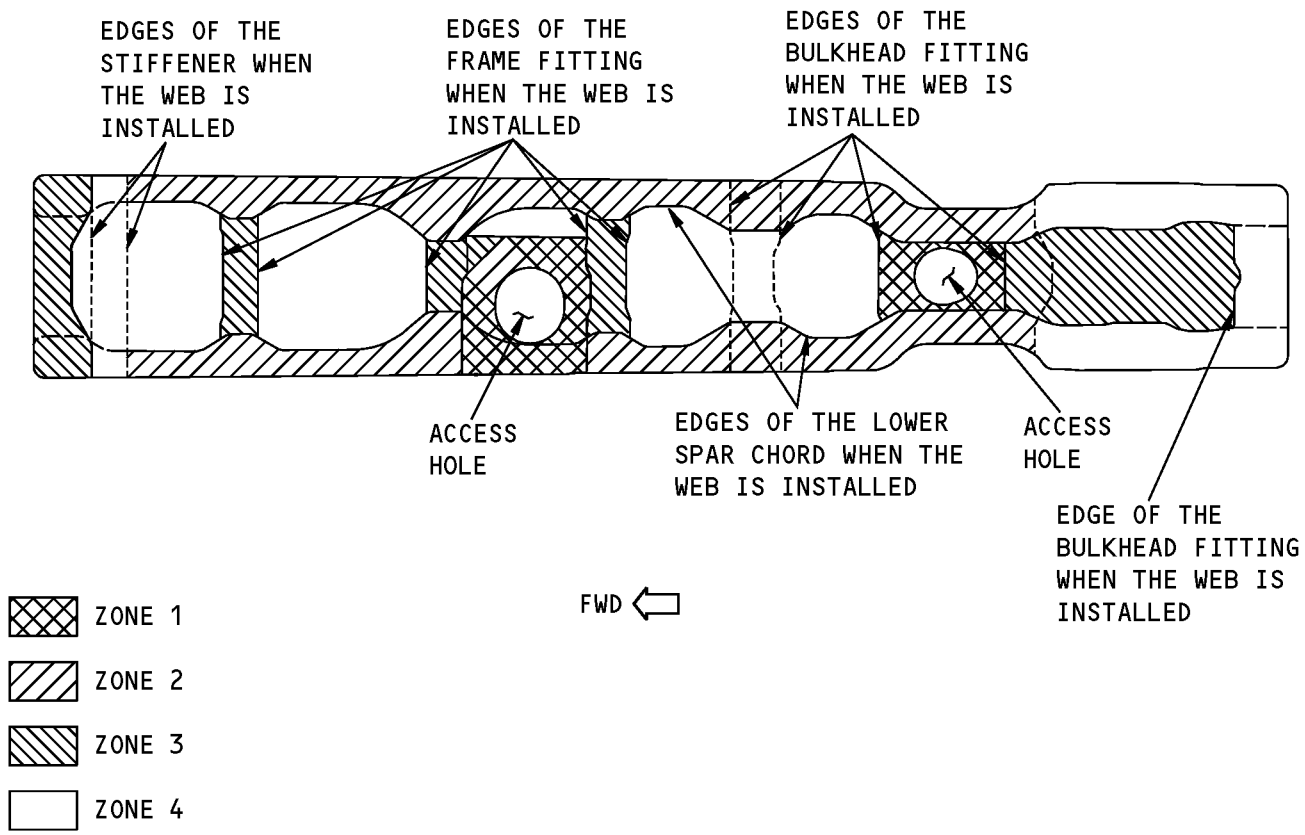
Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 5 of 5)



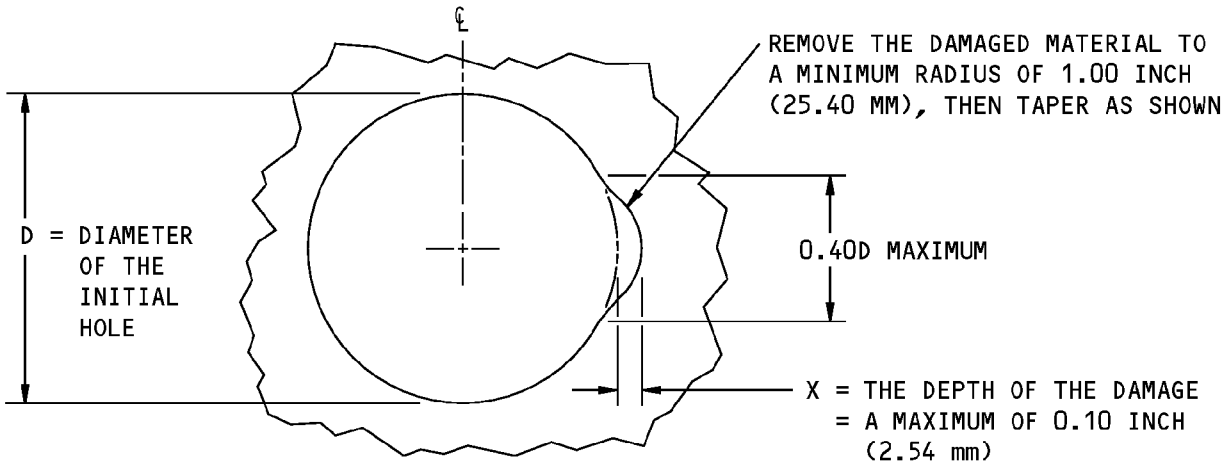
UPPER SPAR WEB

TOP VIEW

Allowable Damage Zones
Figure 104 (Sheet 1 of 2)

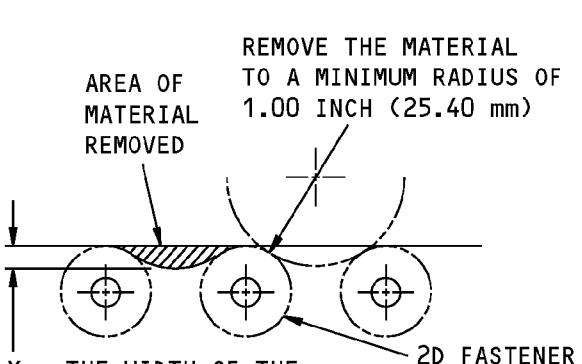


Allowable Damage Zones
Figure 104 (Sheet 2 of 2)



REMOVAL OF DAMAGE FROM THE EDGE OF AN INITIAL HOLE IN ZONE 1

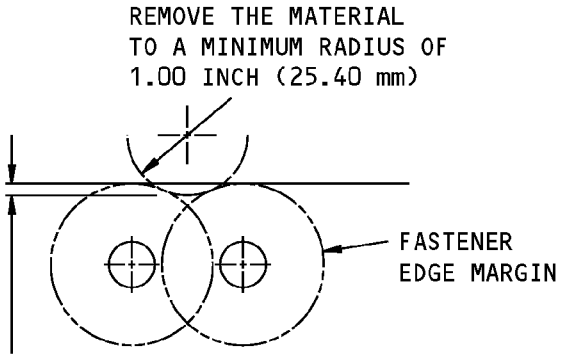
(A)



X = THE WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 0.10 INCH (2.54mm) FOR ZONES 1 AND 2
= A MAXIMUM OF 0.20 INCH (5.08 mm) FOR ONE FASTENER IN A GROUP OF TEN FOR ZONE 3
= A MAXIMUM OF 0.50 INCH (12.70 mm) FOR THREE FASTENERS IN A GROUP OF TEN FOR ZONE 4 IF THE THREE FASTENERS ARE NOT ADJACENT

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(B)

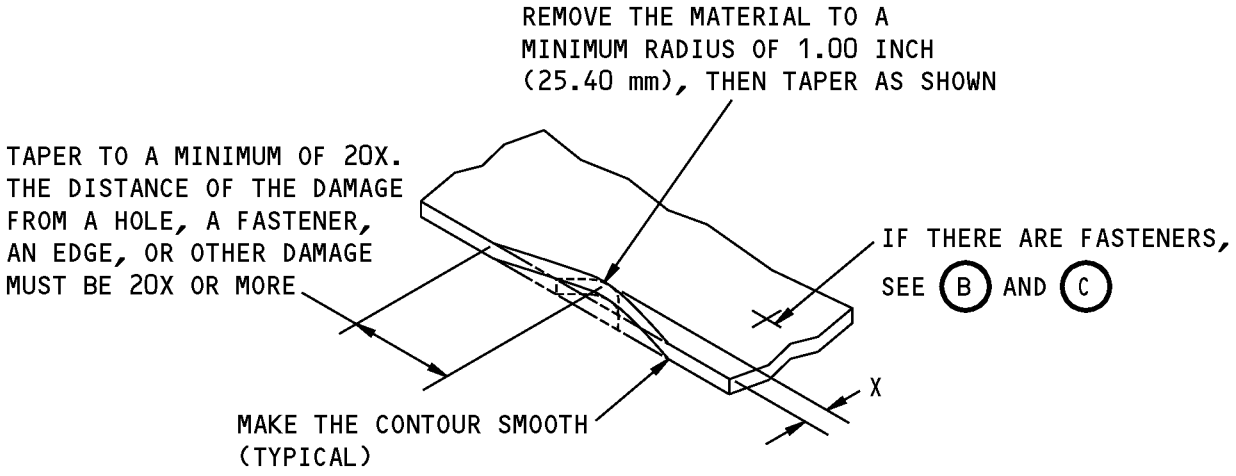


X = THE WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm) FOR ZONES 1 AND 2
= A MAXIMUM OF 0.20 INCH (5.08 mm) FOR ONE FASTENER IN A GROUP OF TEN IN ZONE 3
= A MAXIMUM OF 0.50 INCH (12.70 mm) FOR THREE FASTENERS IN A GROUP OF TEN FOR ZONE 4, IF THE THREE FASTENERS ARE NOT ADJACENT

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(C)

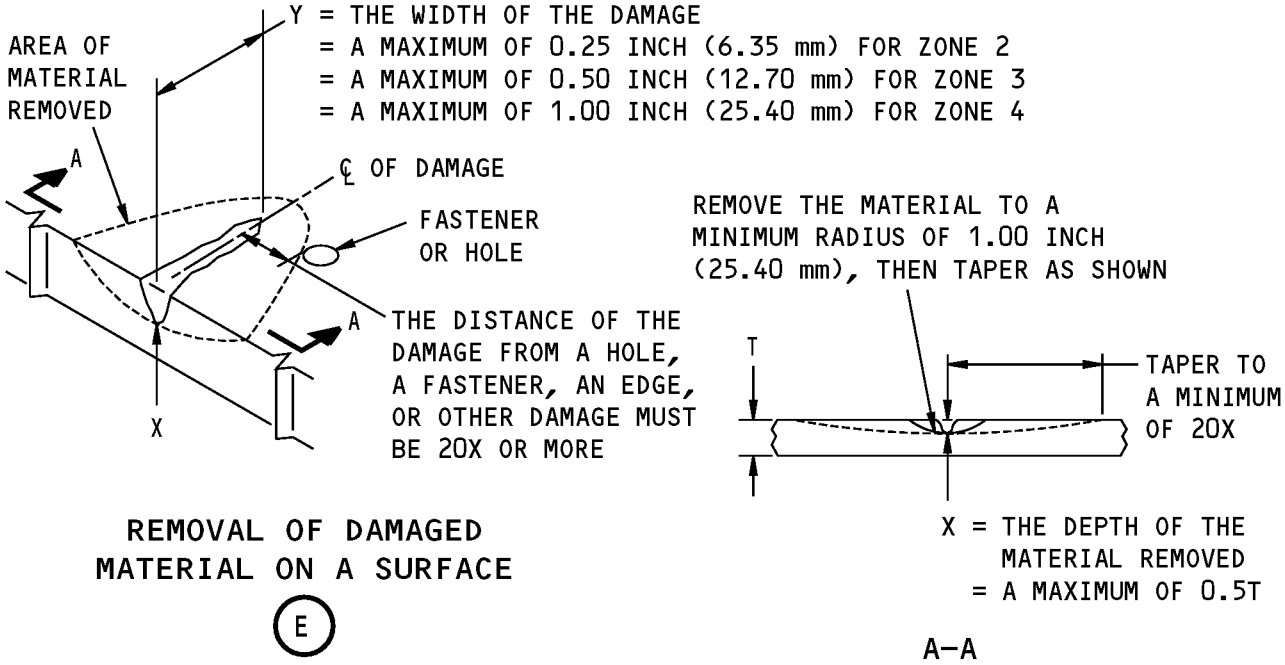
Upper and Lower Spar Web Allowable Damage Limits
Figure 105 (Sheet 1 of 3)



X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm) FOR ZONE 2
= A MAXIMUM OF 0.20 INCH (5.08 mm) FOR ZONE 3
= A MAXIMUM OF 0.50 INCH (12.70 mm) FOR ZONE 4

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL WEB

D

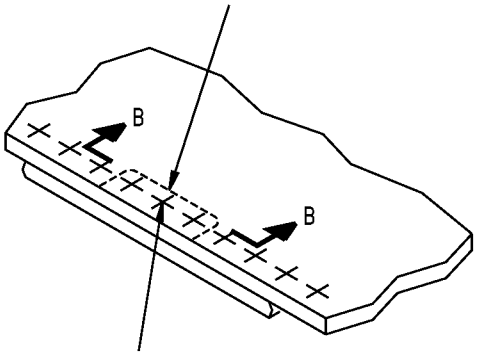


REMOVAL OF DAMAGED MATERIAL ON A SURFACE

E

Upper and Lower Spar Web Allowable Damage Limits
Figure 105 (Sheet 2 of 3)

THE REMOVAL OF MATERIAL IS PERMITTED
TO A MAXIMUM DEPTH OF X AROUND:
- ONE FASTENER IN A GROUP OF 10 FOR ZONE 3
- THREE FASTENERS IN A GROUP OF 10 FOR ZONE 4, IF THE THREE FASTENERS ARE NOT ADJACENT

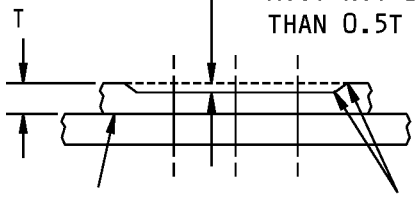


REMOVE THE FASTENERS BEFORE YOU REMOVE THE DAMAGE. INSTALL THE FASTENERS AFTER THE REWORK IS COMPLETED

REMOVAL OF CORROSION DAMAGE AROUND THE FASTENERS

F

X = THE TOTAL DEPTH OF THE MATERIAL REMOVED MUST NOT BE MORE THAN 0.5T

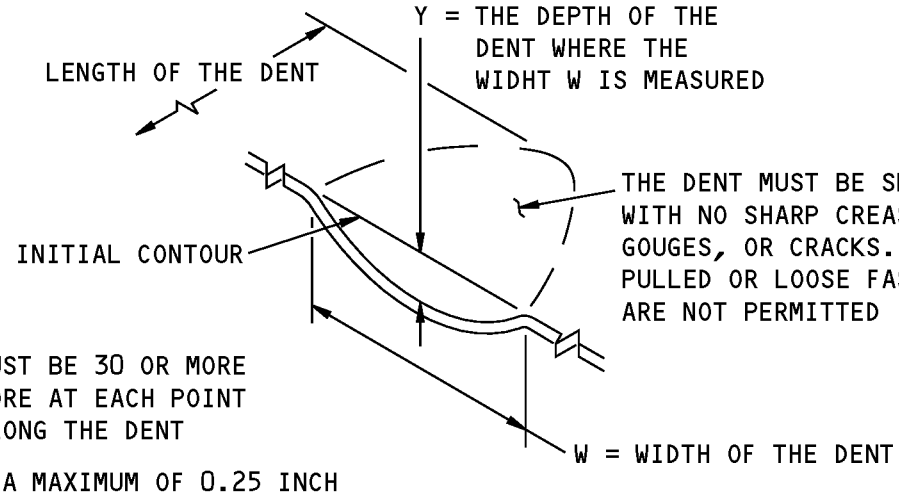


REMOVE CORROSION ON THE MATING SURFACE TO THE MAXIMUM DEPTH PERMITTED AND FILL WITH AN ALUMINUM SHIM

MAKE IT SMOOTH TO A MINIMUM RADIUS OF 0.50 INCH (12.70 mm)

NOTE: YOU ARE PERMITTED TO REMOVE THE MATERIAL FROM OPPOSITE SIDES OF THE WEB IF X IS NOT MORE THAN 0.5T

B–B

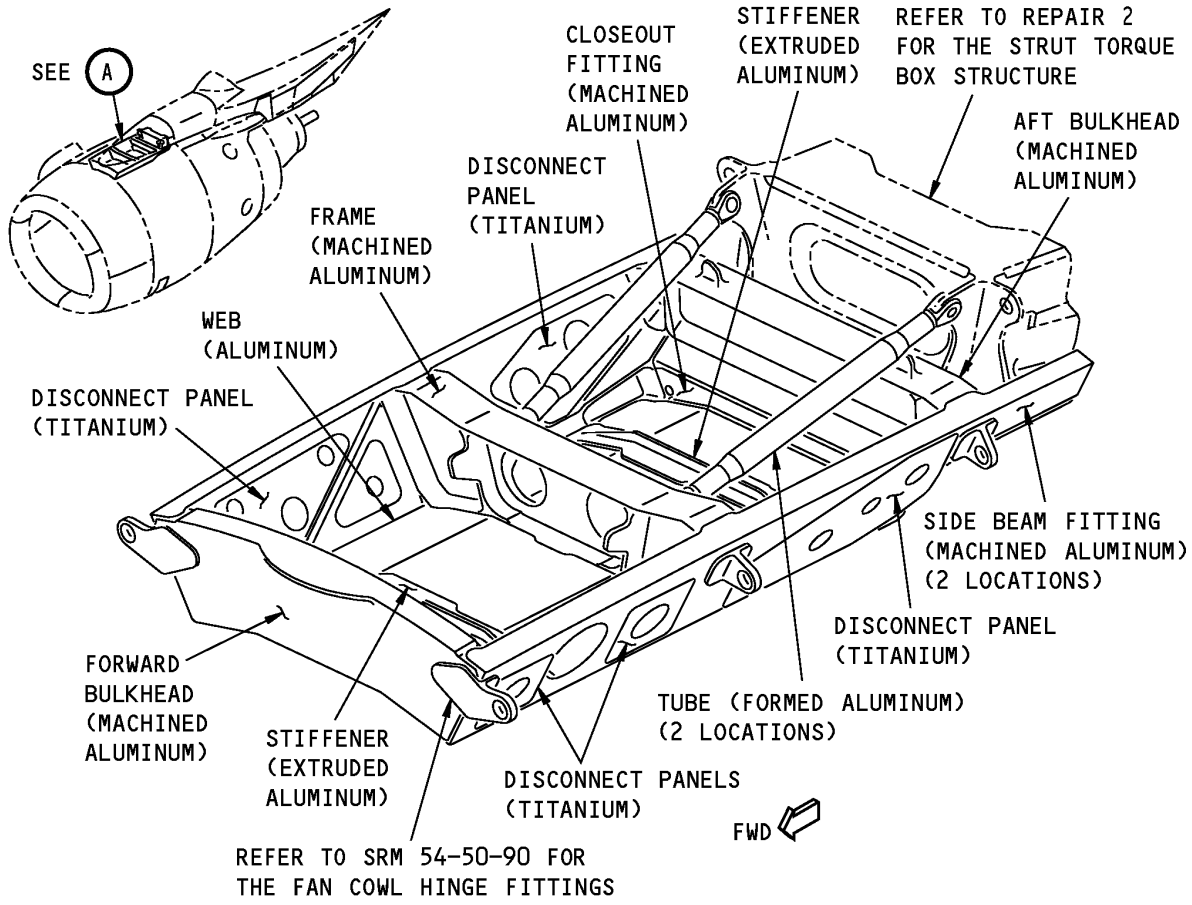


A DENT THAT IS PERMITTED

G

Upper and Lower Spar Web Allowable Damage Limits
Figure 105 (Sheet 3 of 3)

REPAIR 1 - FAN COWL SUPPORT BEAM STRUCTURE

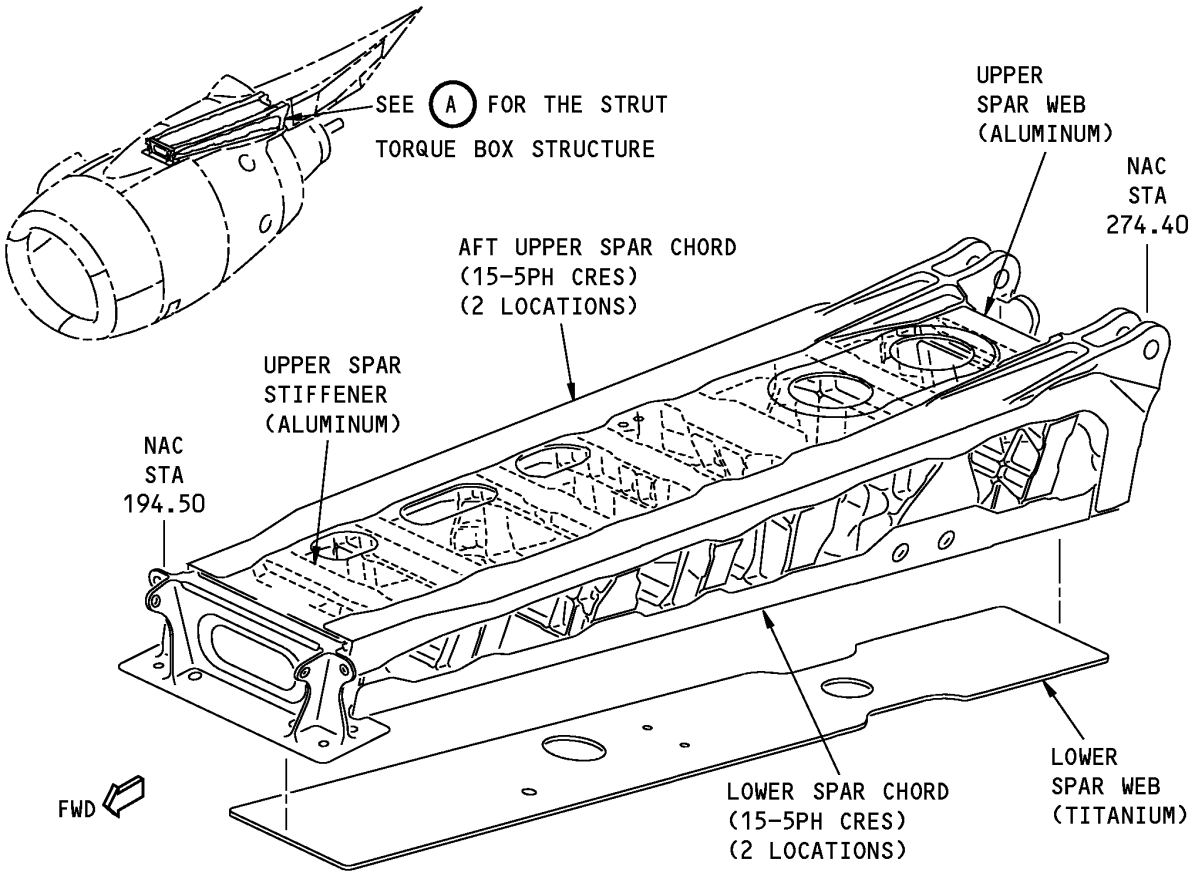


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

A

Fan Cowl Support Beam Structure
Figure 201

REPAIR 2 - ENGINE STRUT TORQUE BOX STRUCTURE

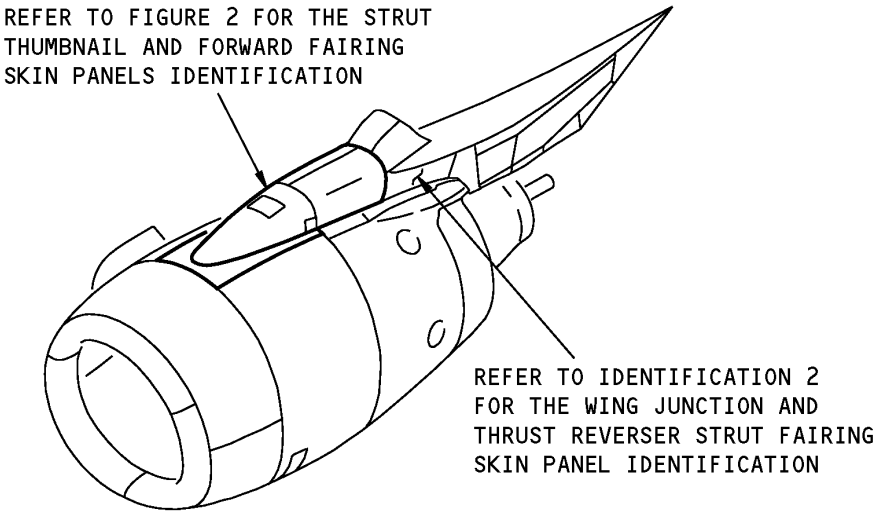


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

(A)

Engine Strut Torque Box Structure
Figure 201

IDENTIFICATION 1 - STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANELS

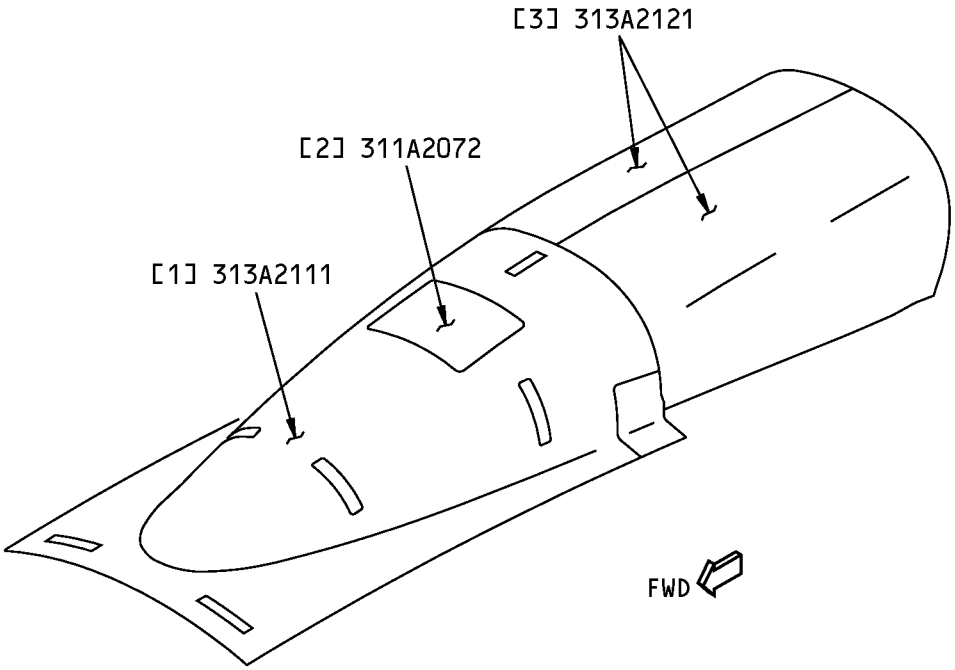


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Strut Thumbnail and Forward Fairing Skin Panel Locations
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2071	Pressure Relief Door Assembly
313A2200	Forward Fairing Installation
313A2110	Thumbnail Fairing Installation
313A2111	Thumbnail Fairing Assembly
313A2121	Forward Fairing Panel Assembly



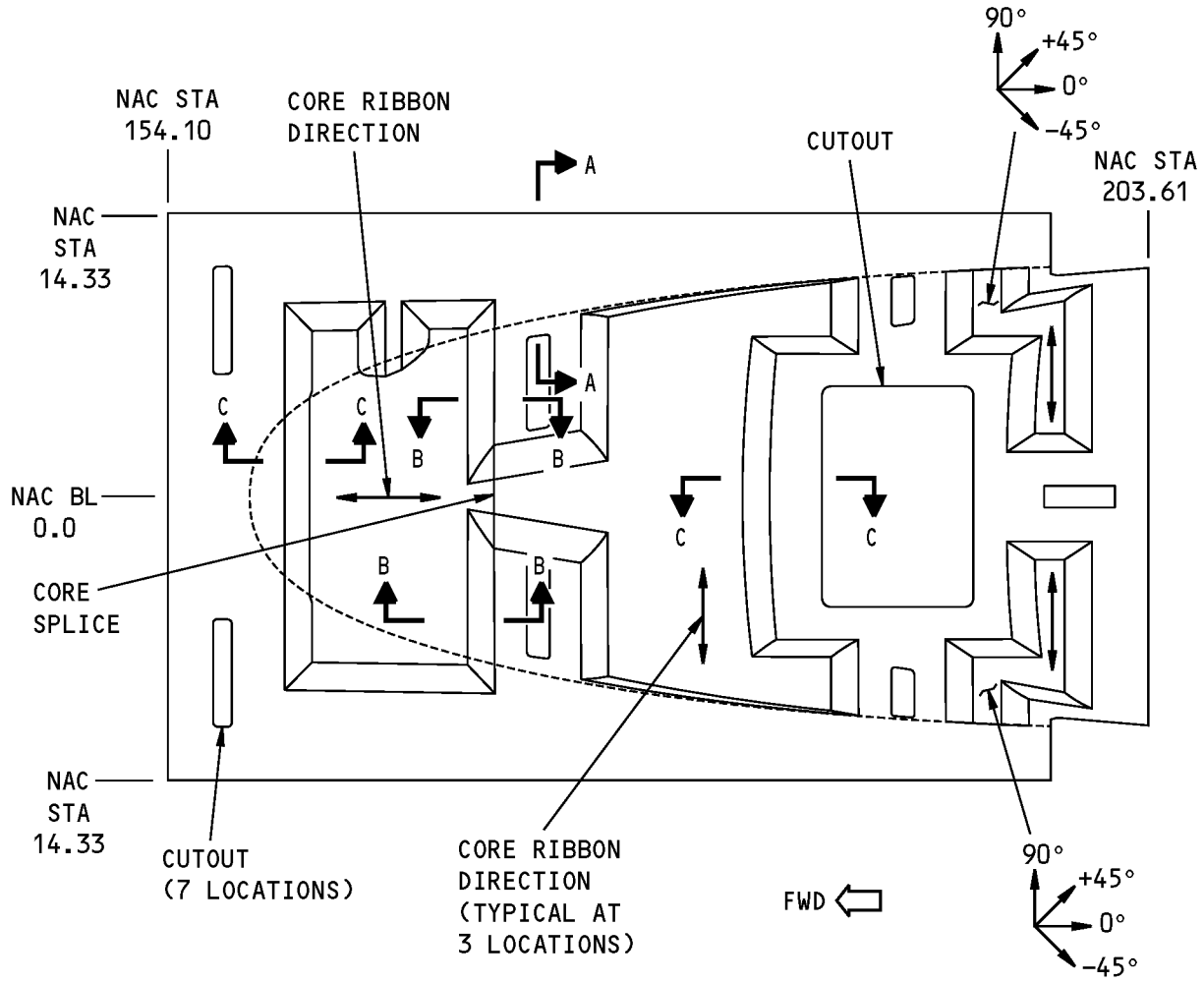
NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Strut Thumbnail and Forward Fairing Skin Panels Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Thumbnail Fairing Skin Panel Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich with aluminum foil mesh lightning protection and GFRP isolation plies	
	Skin		Refer to Figure 3 for the zero degree ply direction and the ply layup sequence	
	Core	0.500 (12.70)	Non-metallic honeycomb as as given in BMS 8-124, Type V, Class IV, Grade 5.0. Refer to Figure 3 for the core ribbon direction	
[2]	Pressure Relief Door		A357.0-T6 aluminum investment casting as given in AMS 4214, strength Class 2 (Optional: 1.75 inch (44.45 mm) thick 7075-T7351 plate as given in QQ-A-250/12)	
[3]	Forward Fairing Skin Panel Bonded Part		Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich with aluminum foil mesh lightning protection	
	Skin		Refer to Figure 4 for the zero degree ply direction and the ply layup sequence	
	Core	0.500 (12.70)	Non-metallic honeycomb as as given in BMS 8-124, Type V, Class IV, Grade 4.0. Refer to Figure 4 for the core ribbon direction	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

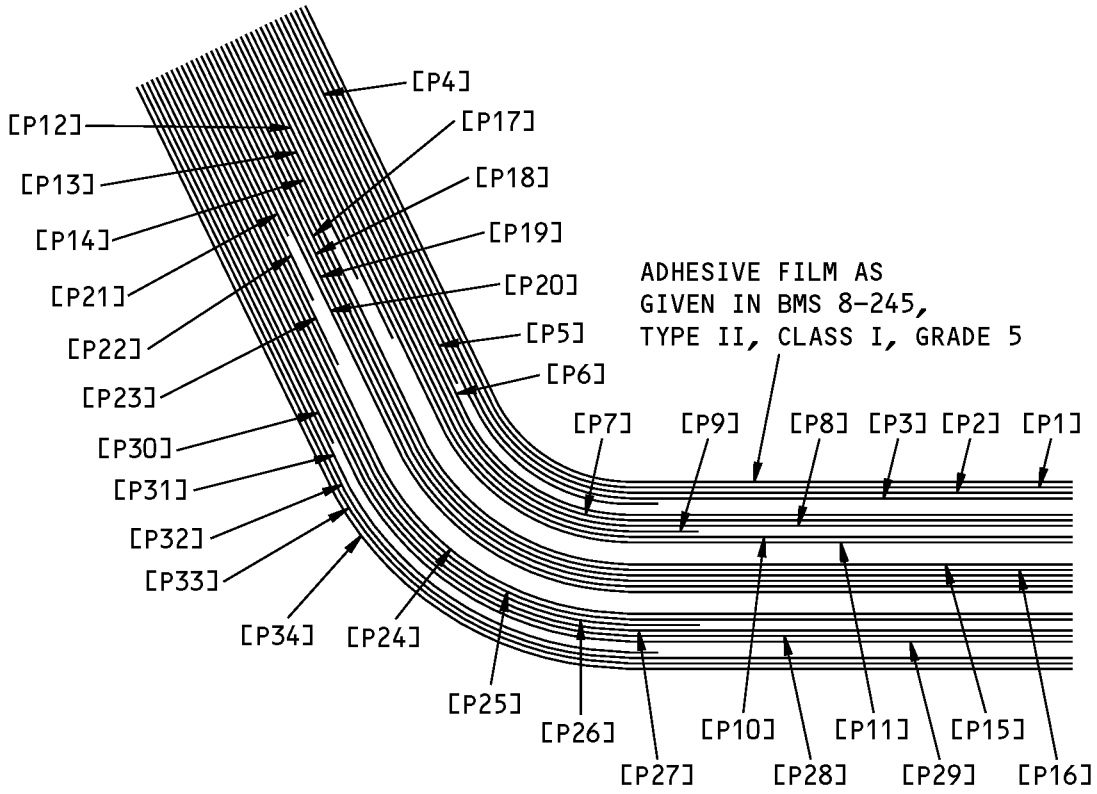
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

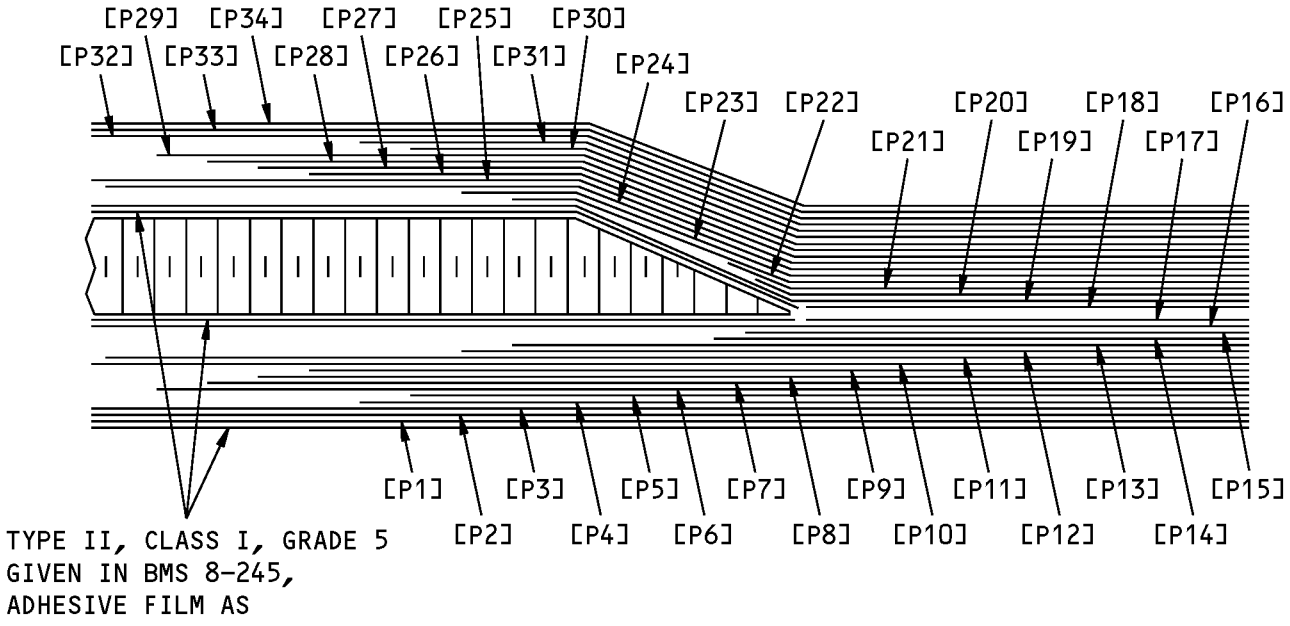
- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 1 of 4)



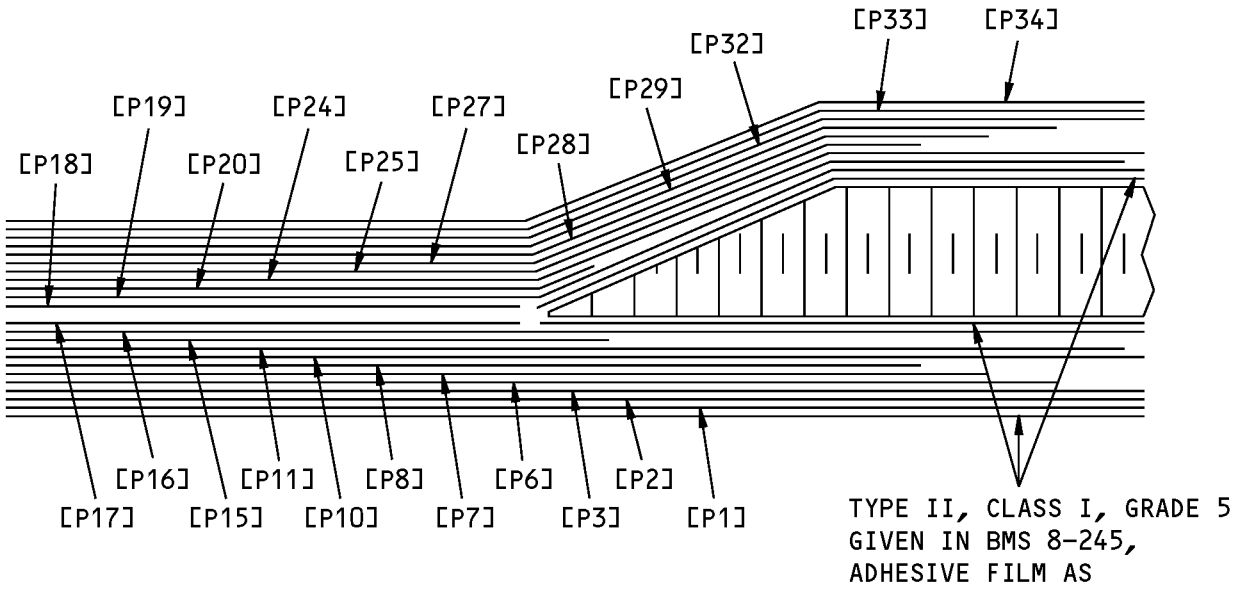
PLY SEQUENCE
A-A

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 2 of 4)**



PLY SEQUENCE
B-B

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 3 of 4)**

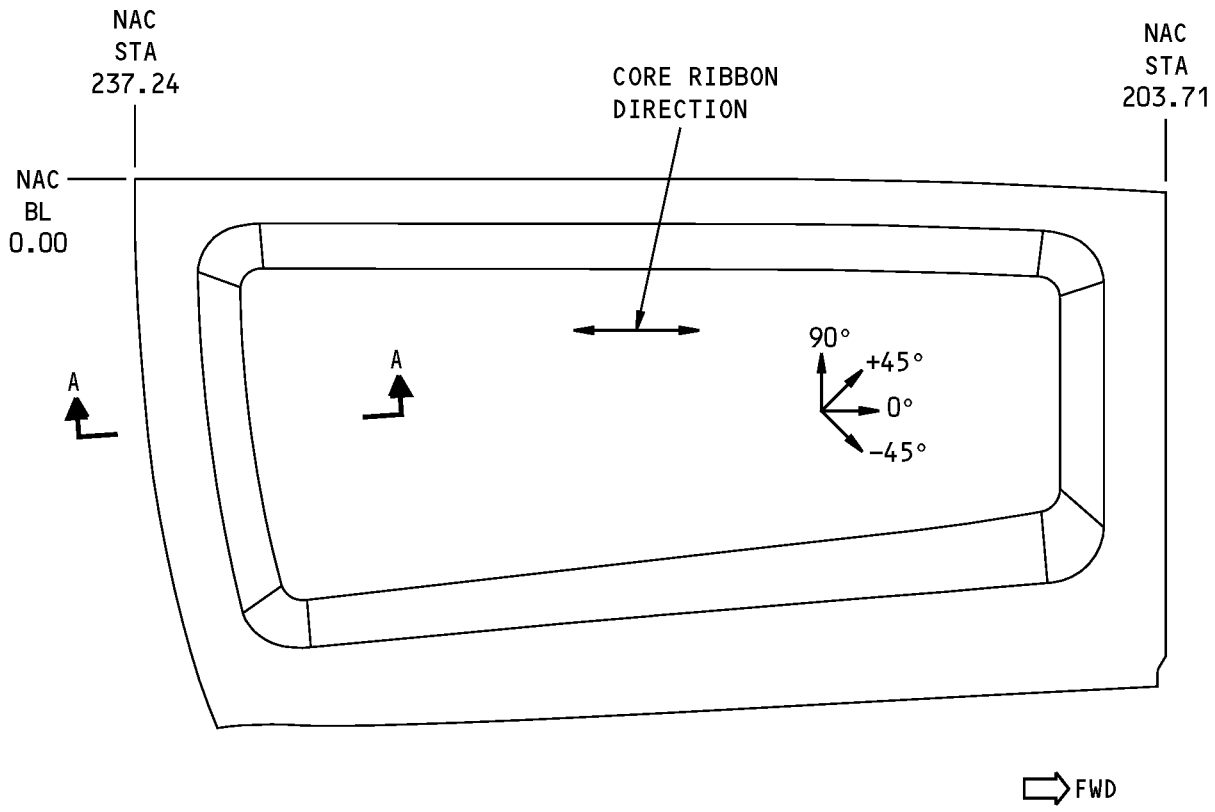


PLY SEQUENCE
C-C

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 4 of 4)**

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTIONS A-A, B-B, AND C-C		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class 1, Grade A
P3, P5, P7, P9, P11, P13, P15, P17, P18, P20, P22, P24, P26, P28, P30, P32	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P12, P14, P16, P19, P21, P23, P25, P27, P29, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P33	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108
P34	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0/350/2/1235/002 or Type 0/350/2/1100/002, Form 1



LEFT FORWARD FAIRING SKIN PANEL IS SHOWN,
RIGHT FORWARD FAIRING SKIN PANEL IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

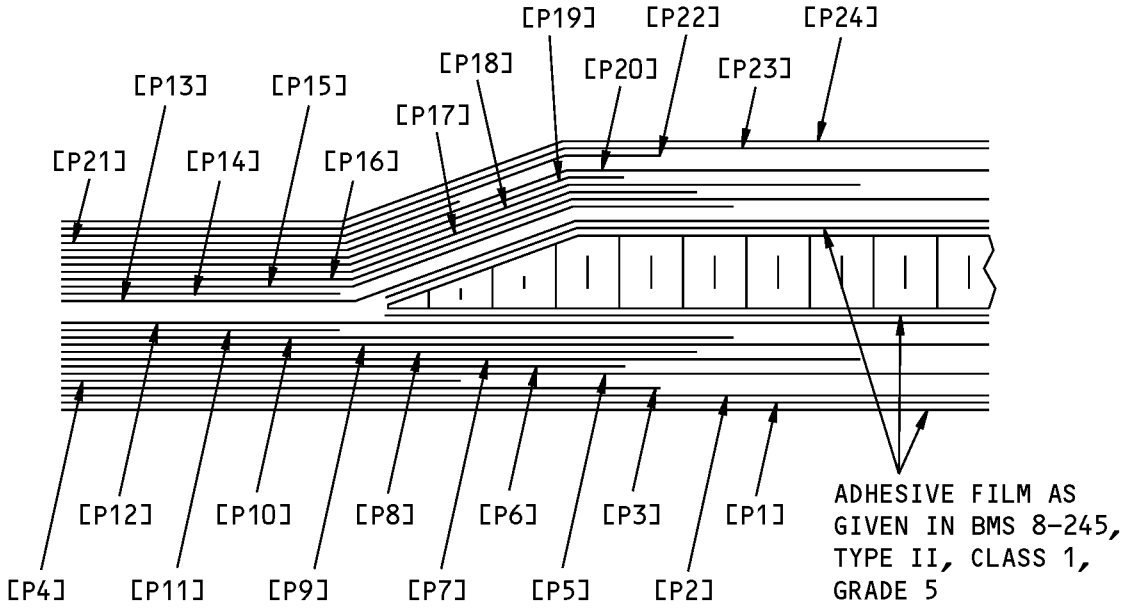
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Strut Forward Fairing Skin Panel, Figure 2, Item [3]
Figure 4 (Sheet 1 of 2)



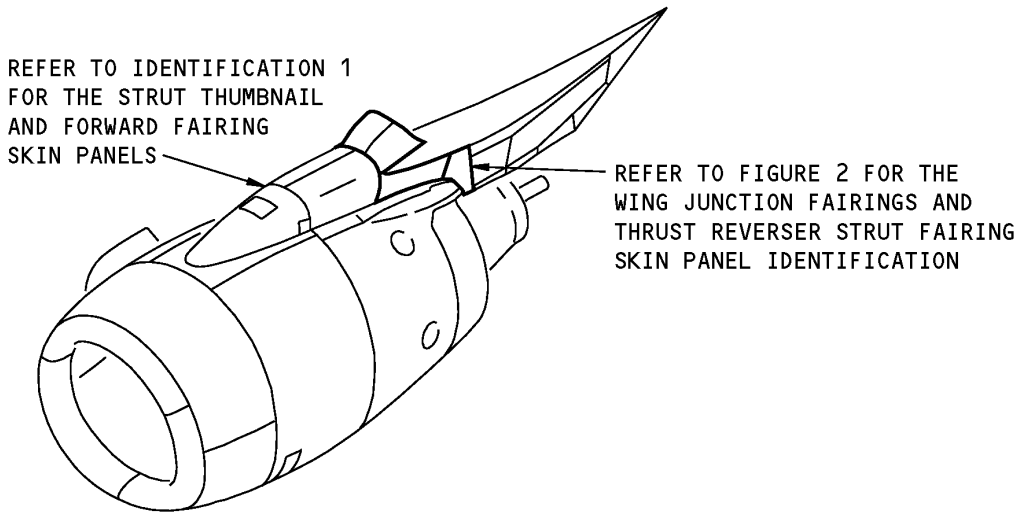
PLY SEQUENCE
A-A

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Strut Forward Fairing Skin Panel, Figure 2, Item [3]
Figure 4 (Sheet 2 of 2)

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION A-A		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type 1, Class 1, Grade 16, Form A
P2, P12, P13, P23	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class 1
P5, P9, P16, P20	+ or - 45 degrees	Epoxy impregnated glass fabric as as given in BMS 8-139, Style 120, Class 1
P4, P7, P10, P15, P18, P21	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, Class 1
P3, P6, P8, P11, P14, P17, P19, P22	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, Class 1
P24	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0/350/2/1100/002, Form 1

IDENTIFICATION 2 - WING JUNCTION AND THRUST REVERSER STRUT FAIRING SKIN PANELS

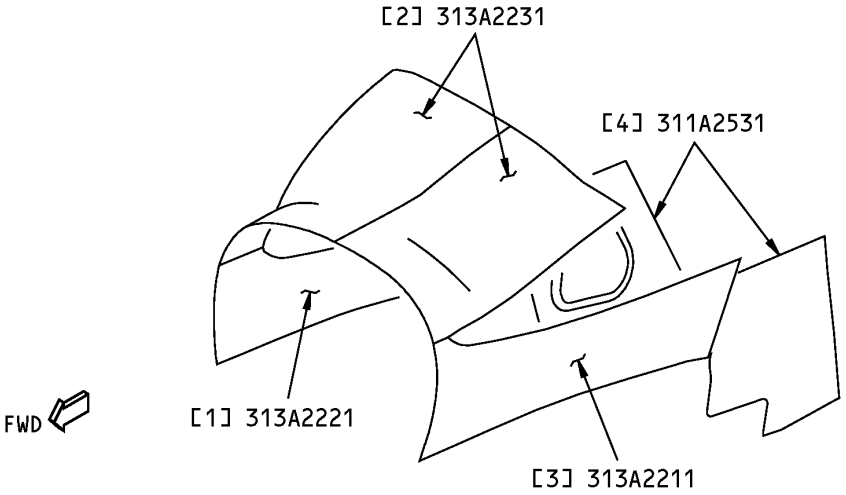


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2530	Thrust Reverser Strut Fairing Installation
311A2531	Thrust Reverser Strut Fairing Assembly
313A2200	Wing Junction Fairing Installation
313A2210	Outboard Underwing Fairing Assembly
313A2220	Inboard Underwing Fairing Assembly
313A2230	Overwing Fairing Assembly



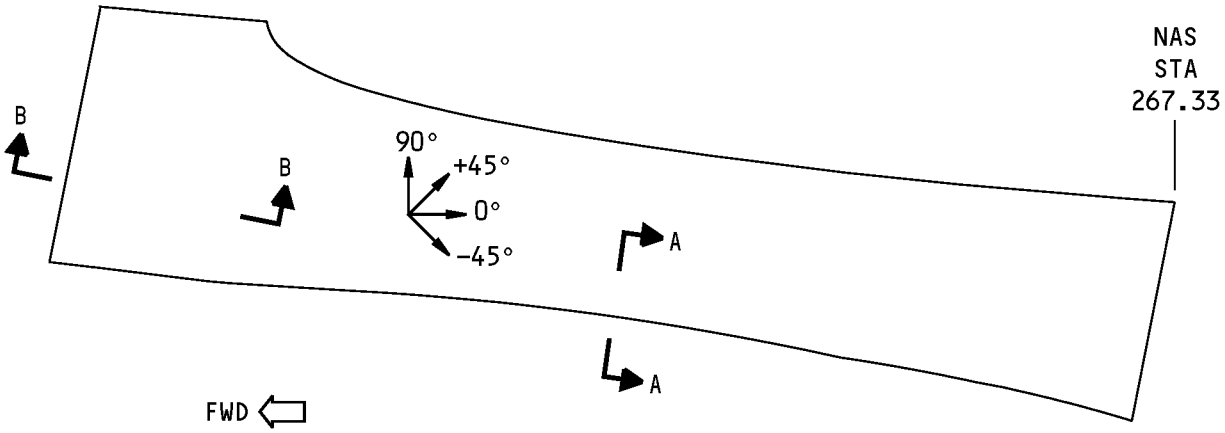
NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Wing Junction and Thrust Reverser Strut Fairing Skin Panel Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Inboard Underwing Fairing Panel - Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) laminate with aluminum foil mesh lightning protection and Glass Fabric Reinforced Plastic (GFRP) isolation plies	
	Skin		Refer to Figure 3	
[2]	Overwing Fairing Panel - Bonded Part		CFRP honeycomb sandwich with aluminum foil mesh lightning protection and GFRP isolation plies	
	Skin		Refer to Figure 4	
	Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 5.0. Refer to Figure 4 for the core ribbon direction	
[3]	Outboard Underwing Fairing Panel - Bonded Part		CFRP laminate with aluminum foil mesh lightning protection and GFRP isolation plies	
	Skin		Refer to Figure 5	
[4]	Thrust Reverser Strut Fairing Panel - Bonded Part		GFRP honeycomb sandwich	
	Skin		Refer to Figure 6	
	Core	0.40 (10.16)	Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 4.0. Refer to Figure 6 for the core ribbon direction	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

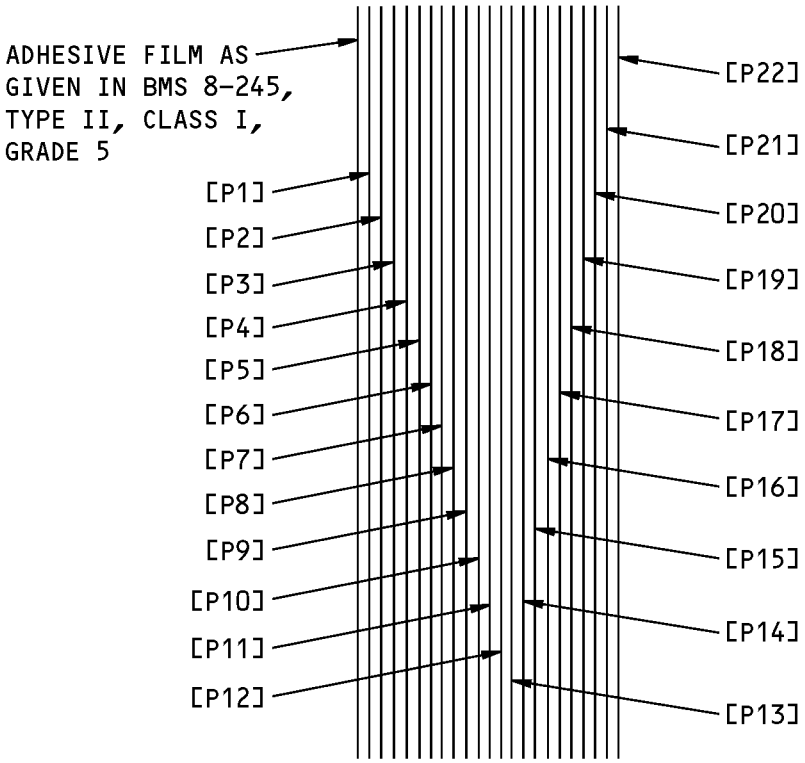
PLY LAYUP DIRECTION

(A)

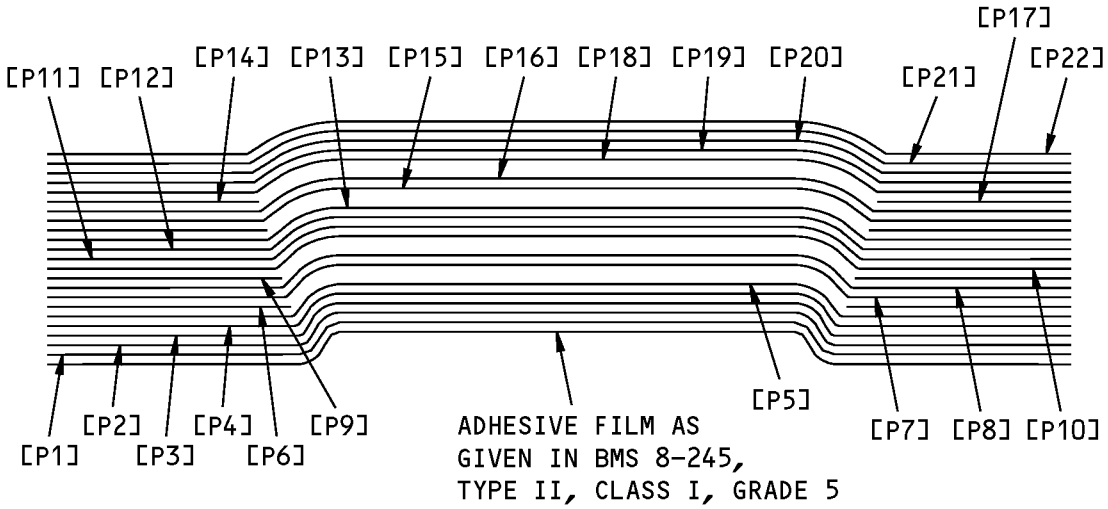
NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY LAYUP DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY LAYUP SEQUENCE.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

Ply Direction and Ply Sequence for the Inboard Underwing Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 1 of 2)



PLY LAYUP SEQUENCE
A-A

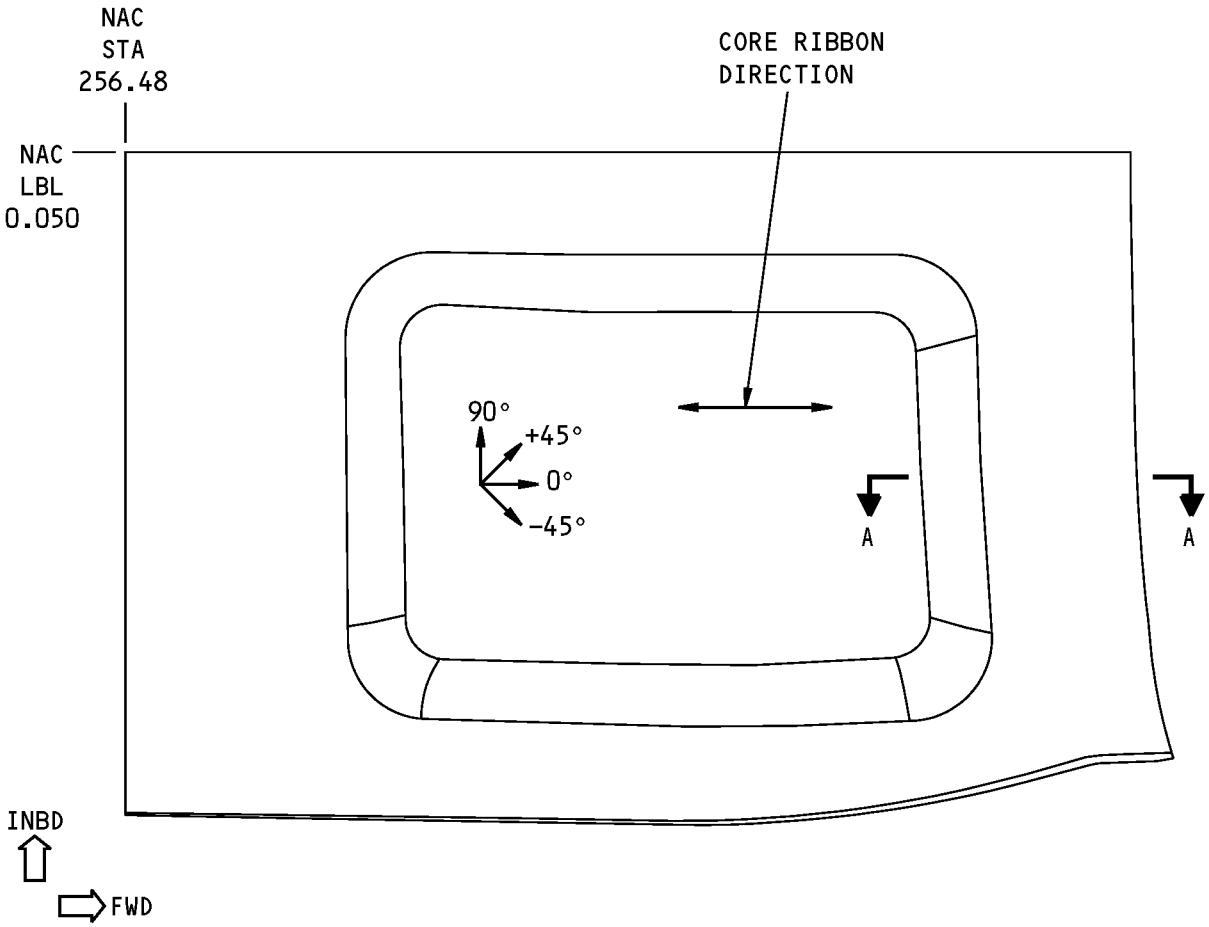


PLY LAYUP SEQUENCE
B-B

Ply Direction and Ply Sequence for the Inboard Underwing Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 2 of 2)

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated glass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P13, P15, P17, P19	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P21	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108, Class III
P22	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0.350/2/1100/002, Form I



LEFT ENGINE OUTBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE OUTBOARD OVERWING PANEL IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

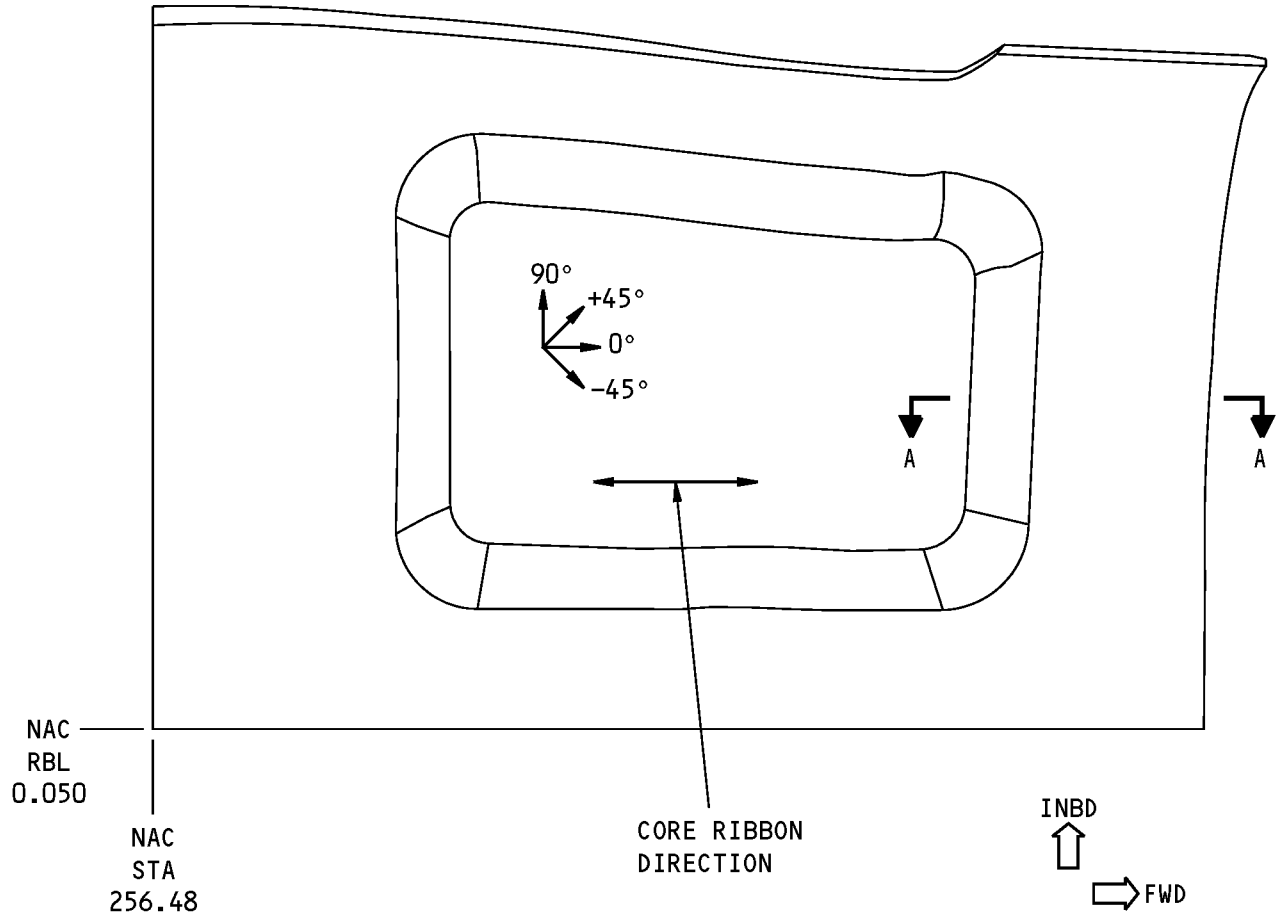
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A AND DETAIL B FOR THE 0 DEGREE PLY LAYUP DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTION A-A FOR THE PLY LAYUP SEQUENCE OVER EACH CORE.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

Ply Direction, Core Ribbon Direction and Ply Sequence for the Strut Overwing Fairing Skin Panel, Figure 2, Item [2]
Figure 4 (Sheet 1 of 3)



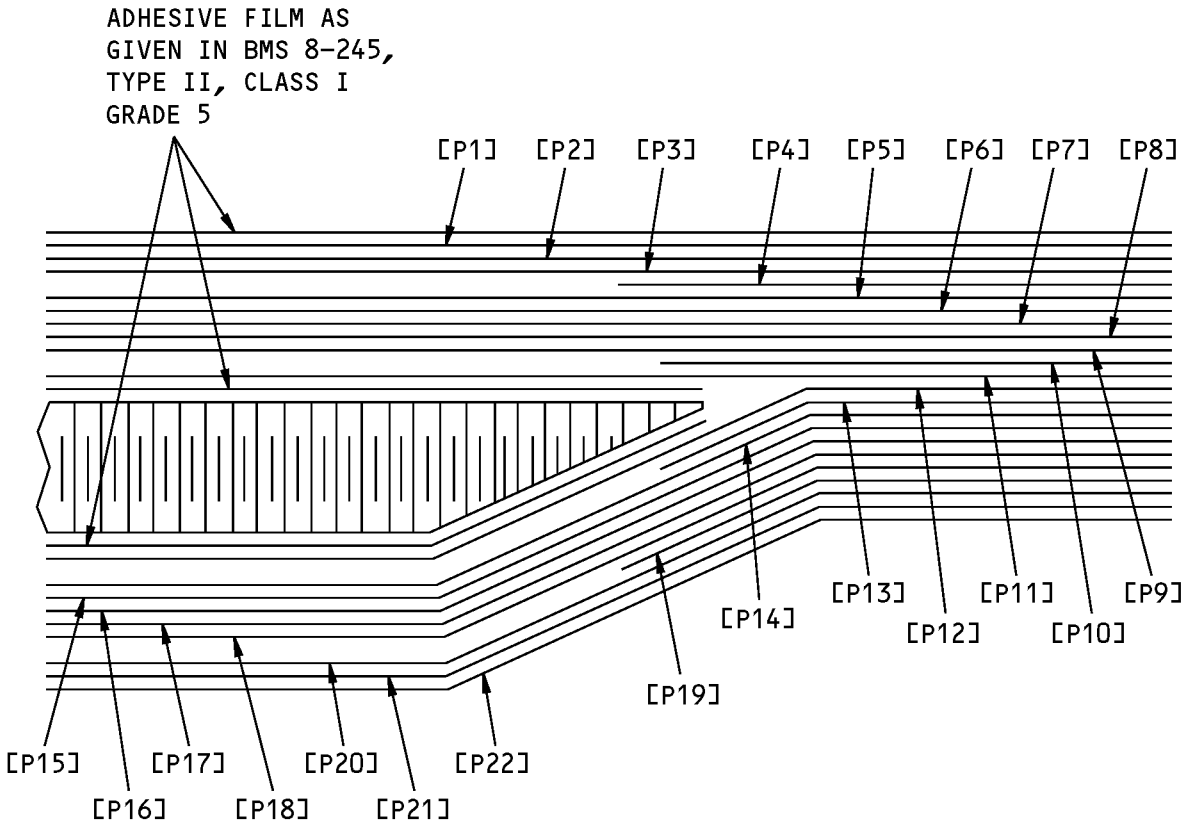
LEFT ENGINE INBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE INBOARD OVERWING PANEL IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

B

Ply Direction, Core Ribbon Direction and Ply Sequence for the Strut Overwing Fairing Skin Panel, Figure 2, Item [2]
Figure 4 (Sheet 2 of 3)

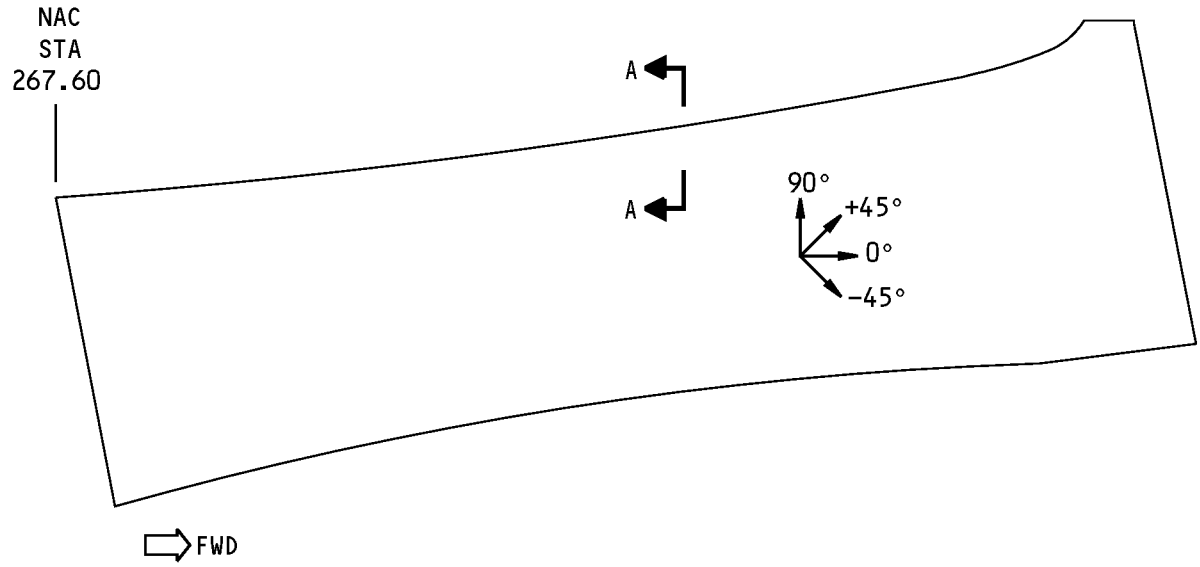


PLY LAYUP SEQUENCE
A-A

Ply Direction, Core Ribbon Direction and Ply Sequence for the Strut Overwing Fairing Skin Panel, Figure 2, Item [2]
Figure 4 (Sheet 3 of 3)

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated glass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P13, P15, P17, P19	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P21	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108
P22	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0/350/2/1235/002, Form 1 (Optional: Type 0/350/2/1100/002, Form 1



VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

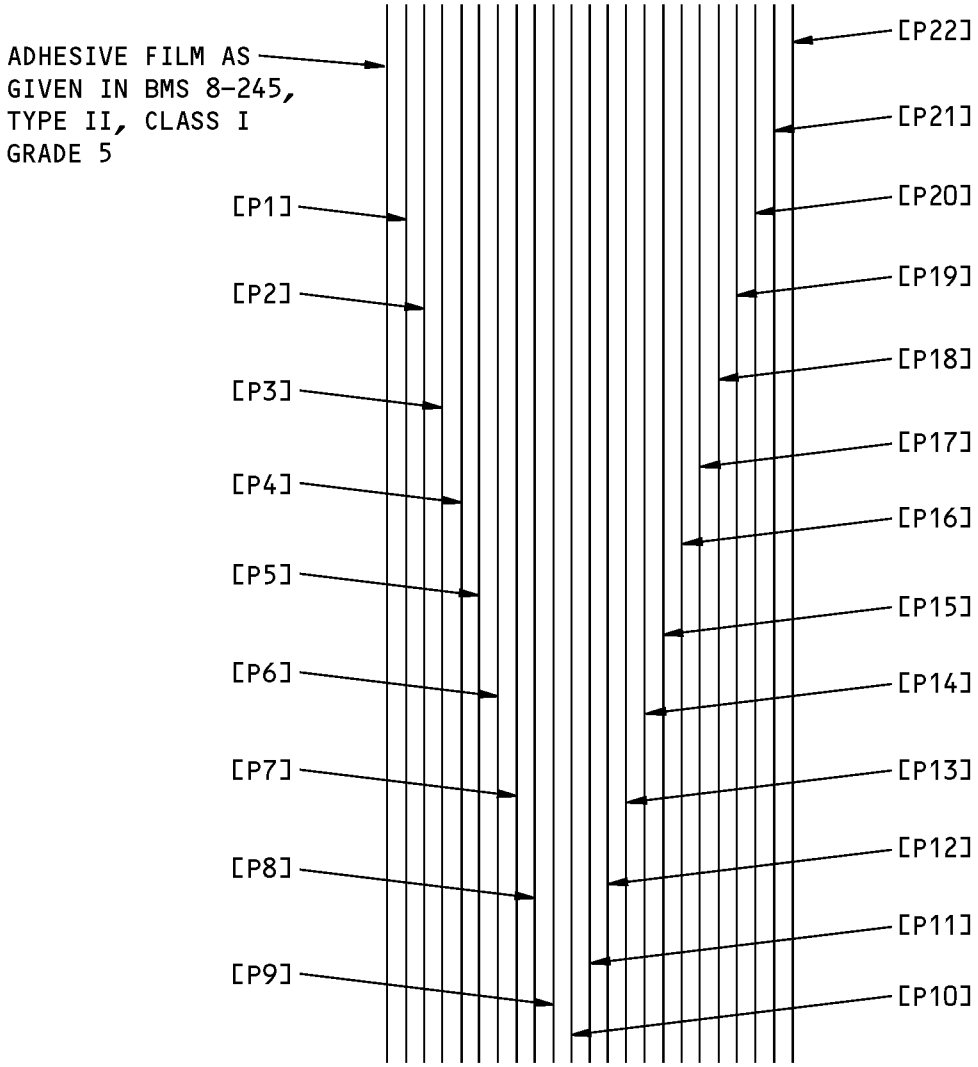
PLY LAYUP DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY LAYUP DIRECTION.
- REFER TO SECTION A-A FOR THE PLY LAYUP SEQUENCE.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

Ply Direction and Ply Sequence for the Outboard Underwing Fairing Skin Panel, Figure 2, Item [3]
Figure 5 (Sheet 1 of 2)

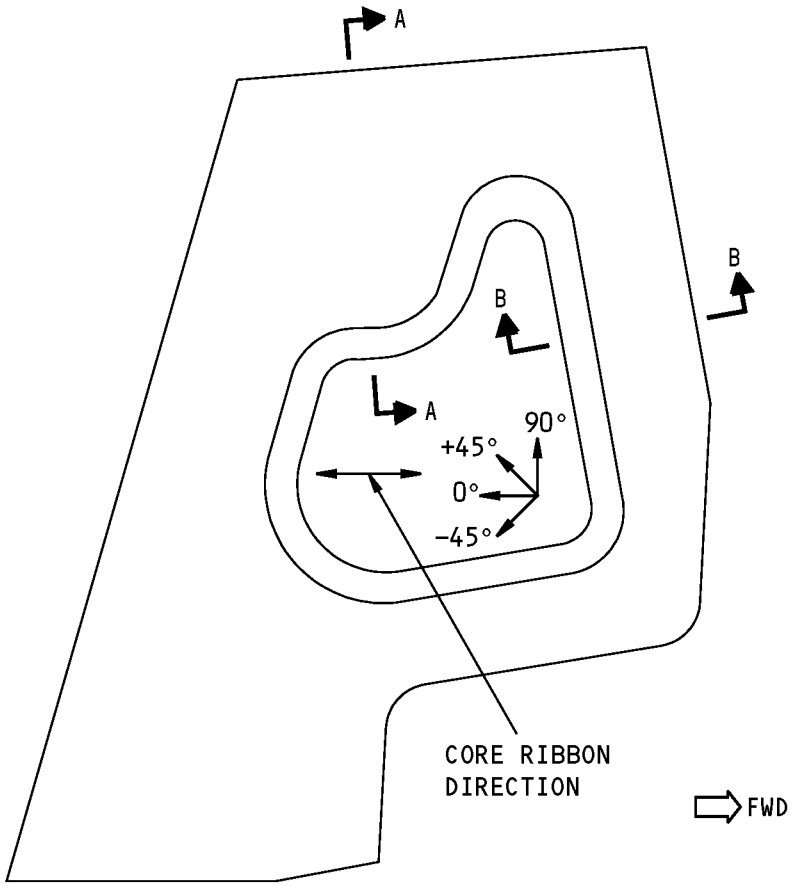


PLY LAYUP SEQUENCE
A-A

Ply Direction and Ply Sequence for the Outboard Underwing Fairing Skin Panel, Figure 2, Item [3]
Figure 5 (Sheet 2 of 2)

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	**DIRECTION**	**MATERIAL**
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated glass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P13, P15, P17, P19	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P21	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108, Class III
P22	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0.350/2/1100/002, Form I



LEFT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING IS SHOWN, RIGHT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

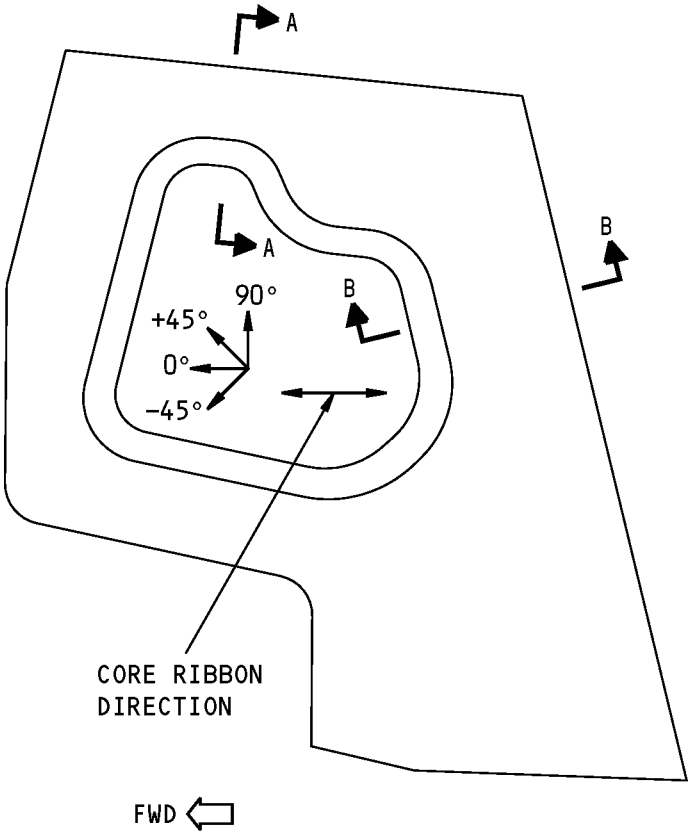
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A AND DETAIL B FOR THE 0 DEGREE PLY LAYUP DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY LAYUP SEQUENCE OVER EACH CORE.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thrust Reverser Strut Fairing Skin Panel, Figure 2, Item [4]
Figure 6 (Sheet 1 of 3)



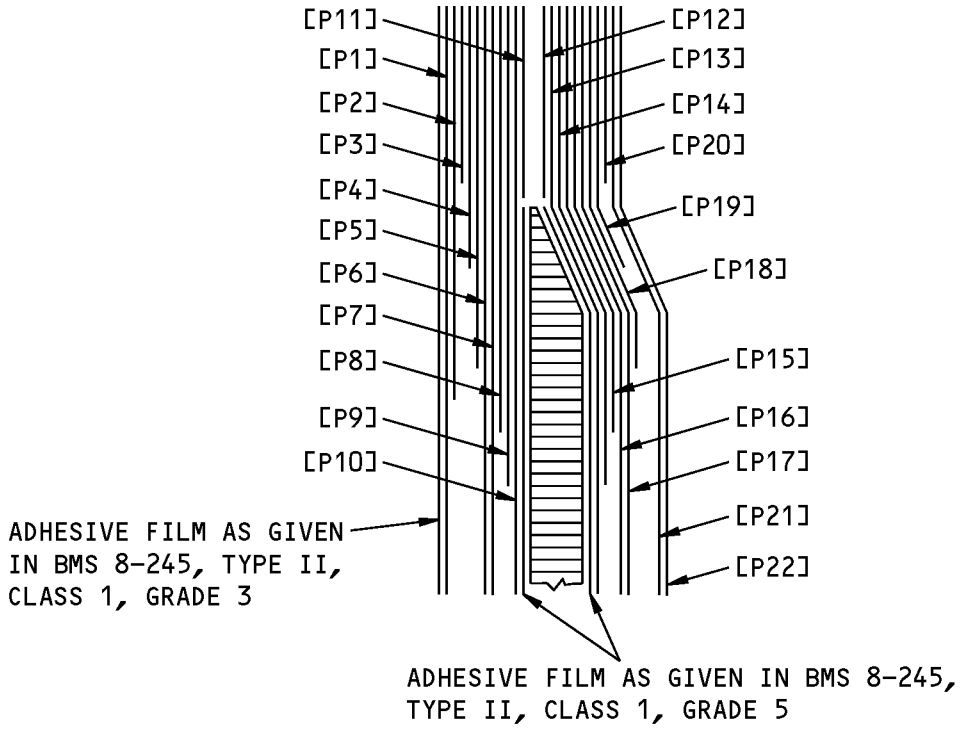
LEFT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS SHOWN,
RIGHT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

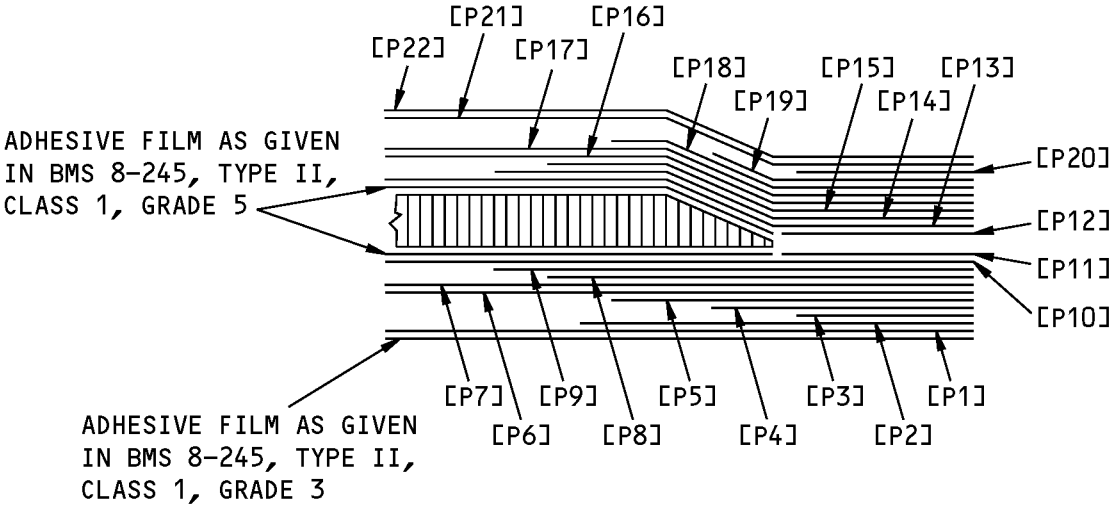
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

B

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thrust Reverser Strut Fairing Skin Panel, Figure 2, Item [4]
Figure 6 (Sheet 2 of 3)



PLY LAYUP SEQUENCE
A-A



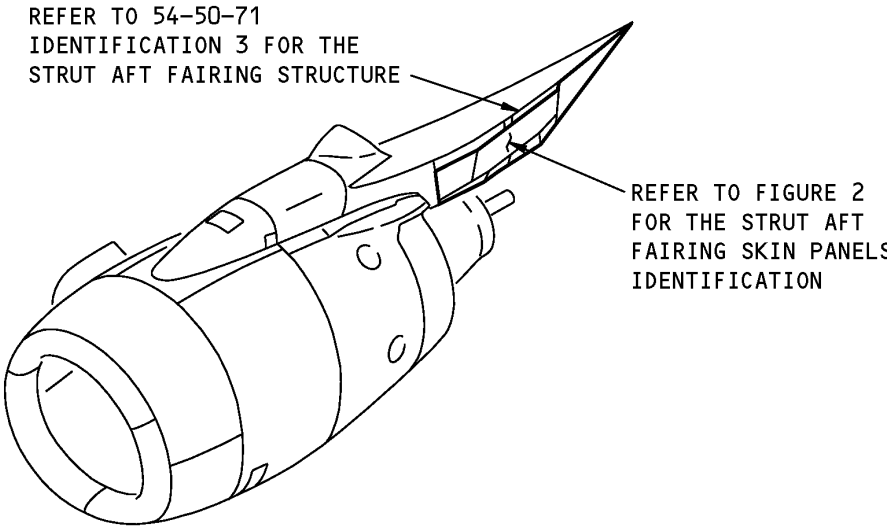
PLY LAYUP SEQUENCE
B-B

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thrust Reverser Strut Fairing Skin Panel, Figure 2, Item [4]
Figure 6 (Sheet 3 of 3)

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	**DIRECTION**	**MATERIAL**
P1, P22	-45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P7, P16	+45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P10, P13	0 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P6, P17	90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P4, P8, P15, P19	-45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I
P2, P11, P12, P21	+45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I
P5, P18	0 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I
P3, P9, P14, P20	90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I

IDENTIFICATION 3 - ENGINE STRUT AFT FAIRING SKIN PANELS

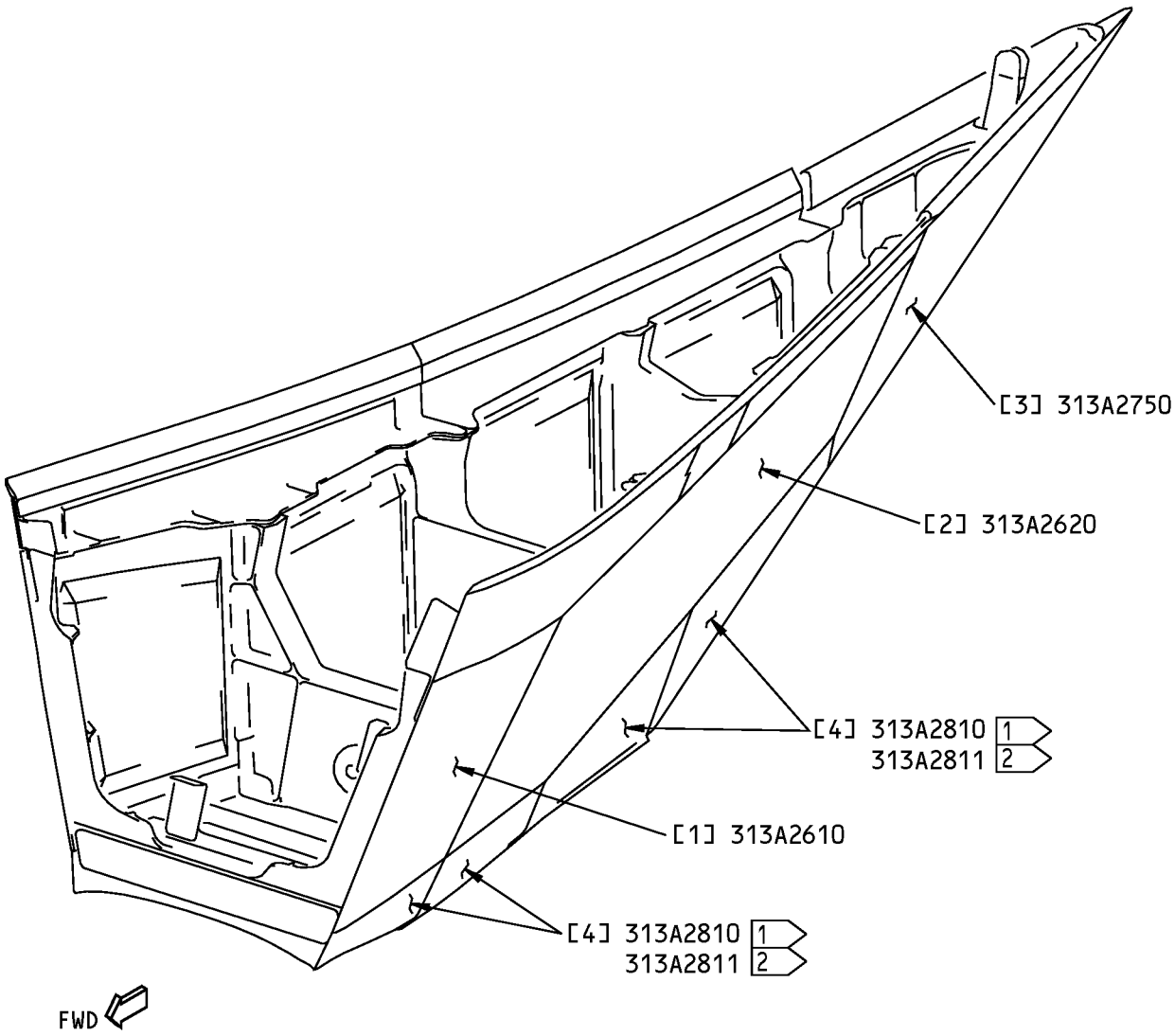


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut Aft Fairing Skin Panel Locations
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
313A2060	Aft Fairing End Item
313A2400	Panel Installation - Aft Fairing
313A2750	Trailing Edge Installation
313A2800	Heat Shield Installation



NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

1 CUM LINE NUMBER FROM 1 THRU 1176

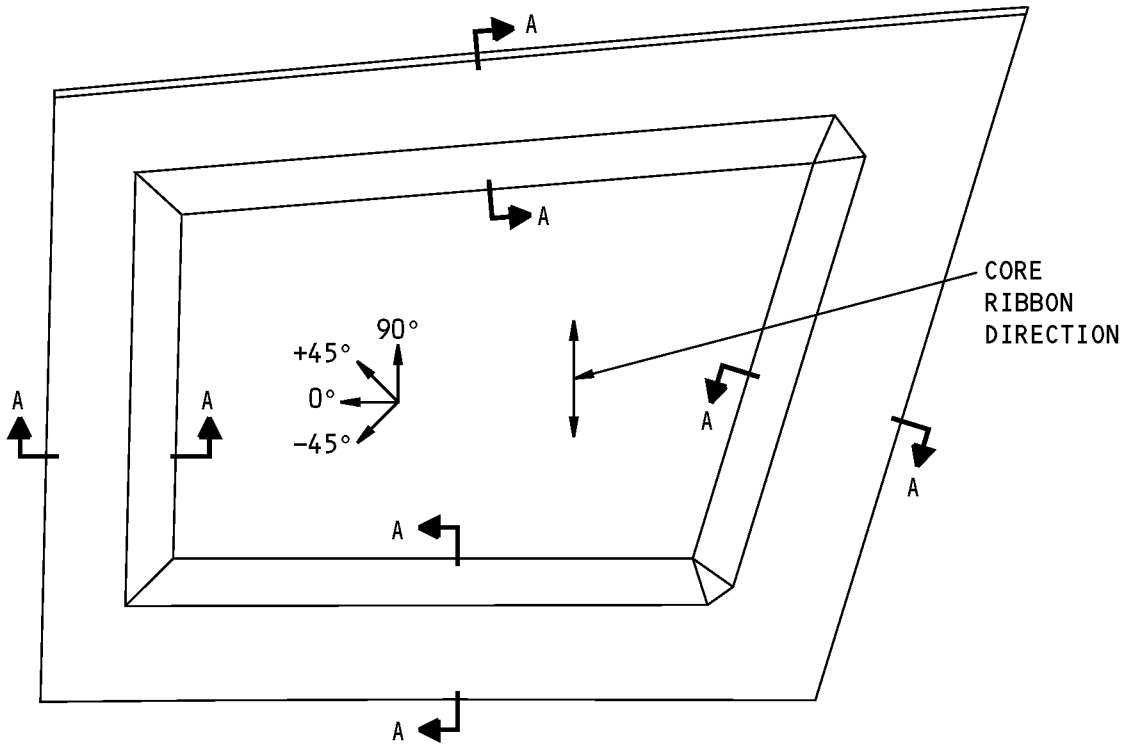
2 CUM LINE NUMBER 1177 AND ON

Aft Strut Fairing Skin Panel Identification
Figure 2

Table 2:

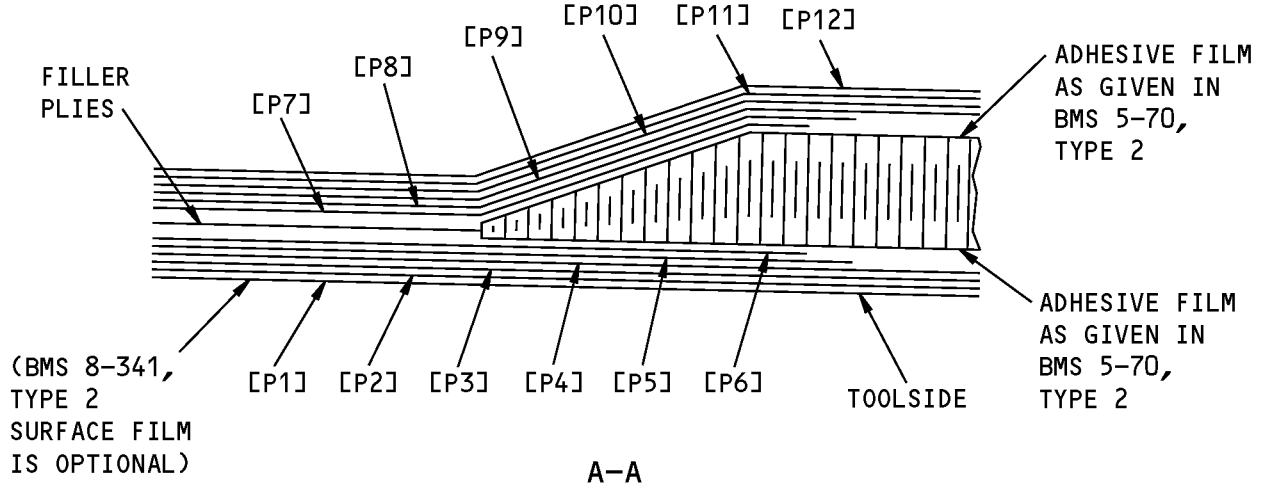
LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Forward Panel Assembly Bonded Part		Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich	
	Skin		Refer to Figure 3 Refer to Figure 5	1 THRU 1176 1177 AND ON
	Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type V, Class IV, Grade 4.0. Refer to Figure 3 for the core ribbon direction	
[2]	Aft Panel Assembly Bonded Part		Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich	
	Skin		Refer to Figure 4	
	Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type V, Class IV, Grade 4.0. Refer to Figure 4 for the core ribbon direction	
[3]	Casting - Trailing Edge		A357.0-T6 aluminum casting as given in MIL-A-21180, strength Class 12	
[4]	Heat Shield - Pan Casting		Titanium 6-2-4-2 casting as given in BMS 7-336	1 THRU 1176
	Heat Shield - Pan	0.090 (2.386)	TI-6AL-4V Titanium sheet as given in AMS-T-9046 Cond A	1177 AND UP

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



VIEW IS ON THE BAGSIDE

THE LEFT SIDE FORWARD PANEL IS SHOWN,
THE RIGHT SIDE FORWARD PANEL IS OPPOSITE

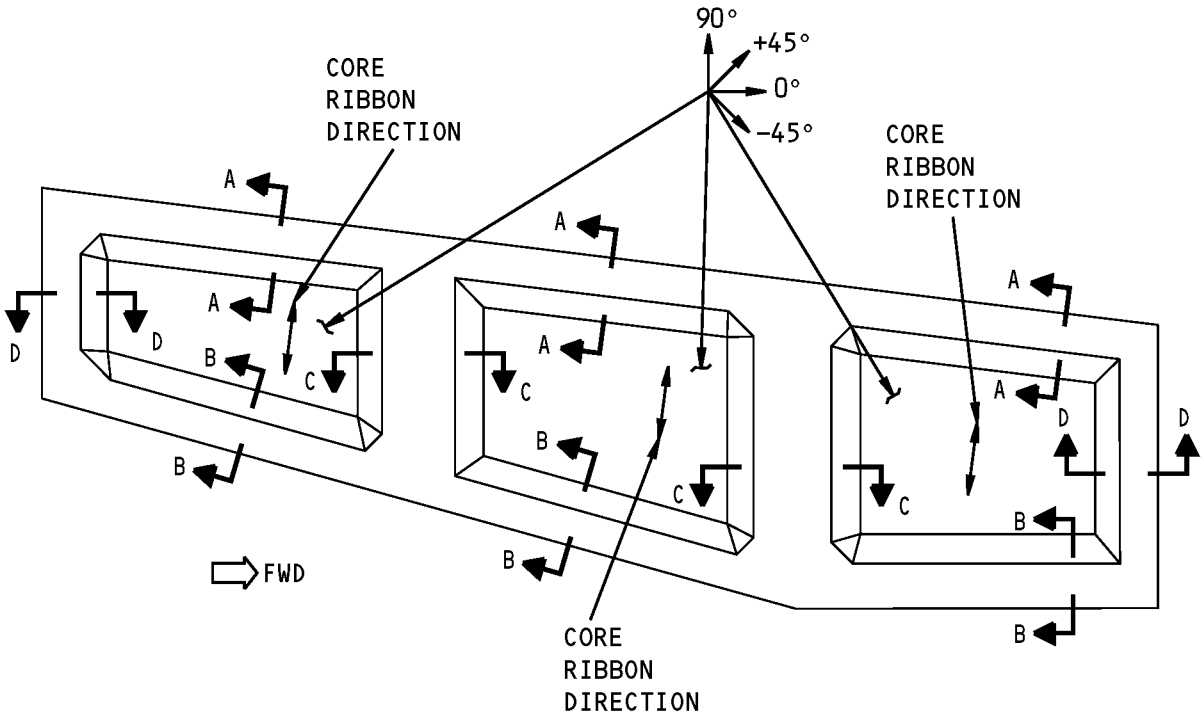


A-A
(TYPICAL)

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Forward Fairing Panel Assembly, Figure 2, Item [1]
Figure 3

Table 3:

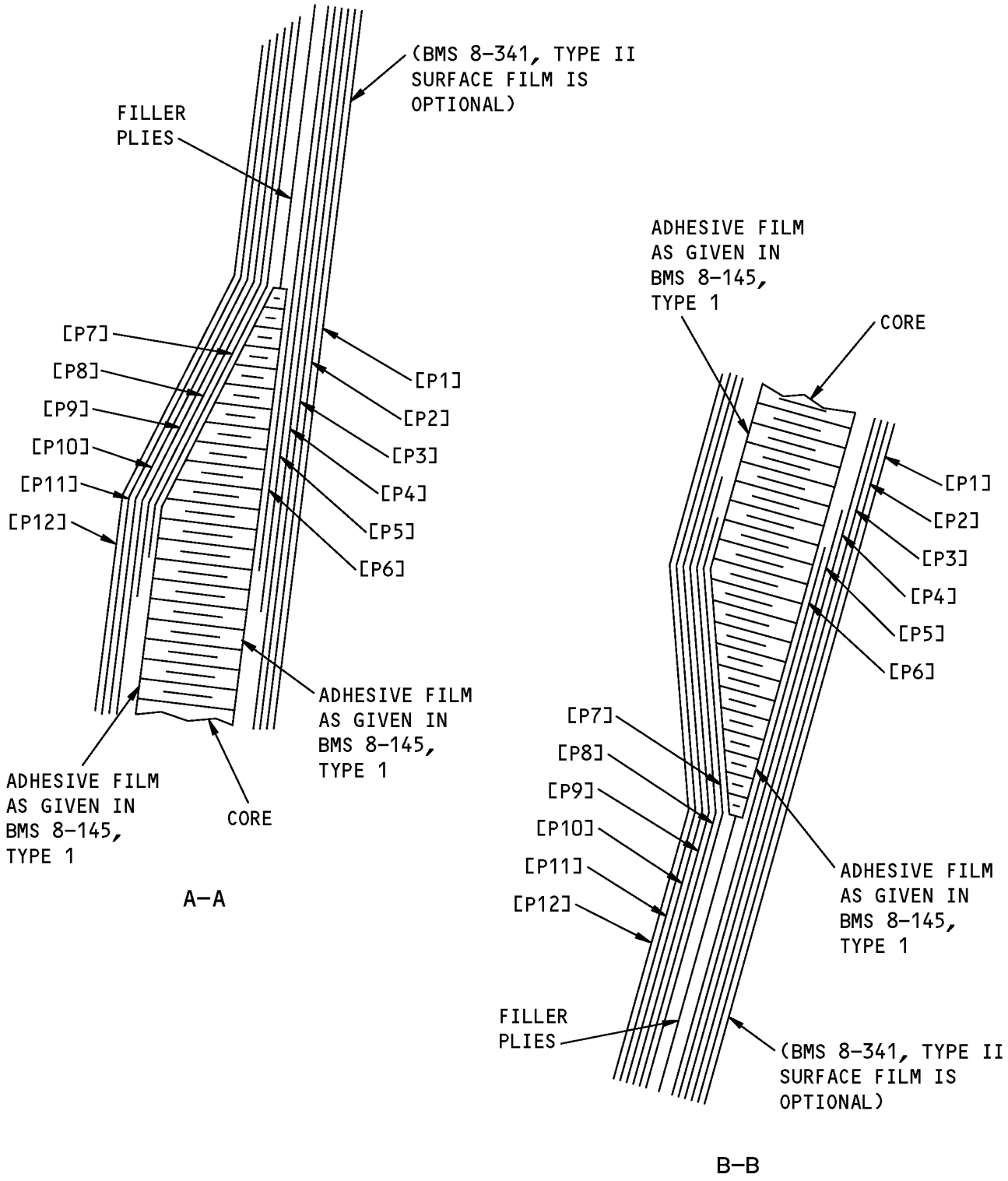
PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	**DIRECTION**	**MATERIAL**
P1, P3, P10, P12	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120
P2, P4, P9, P11	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120
P5, P6, P7, P8	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781 or Style 1581
Filler Plies	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, or Style 7781, or Style 120. Class 2 is an option for all filler plies. Adjust the number of plies to equal the thickness as specified in the drawings



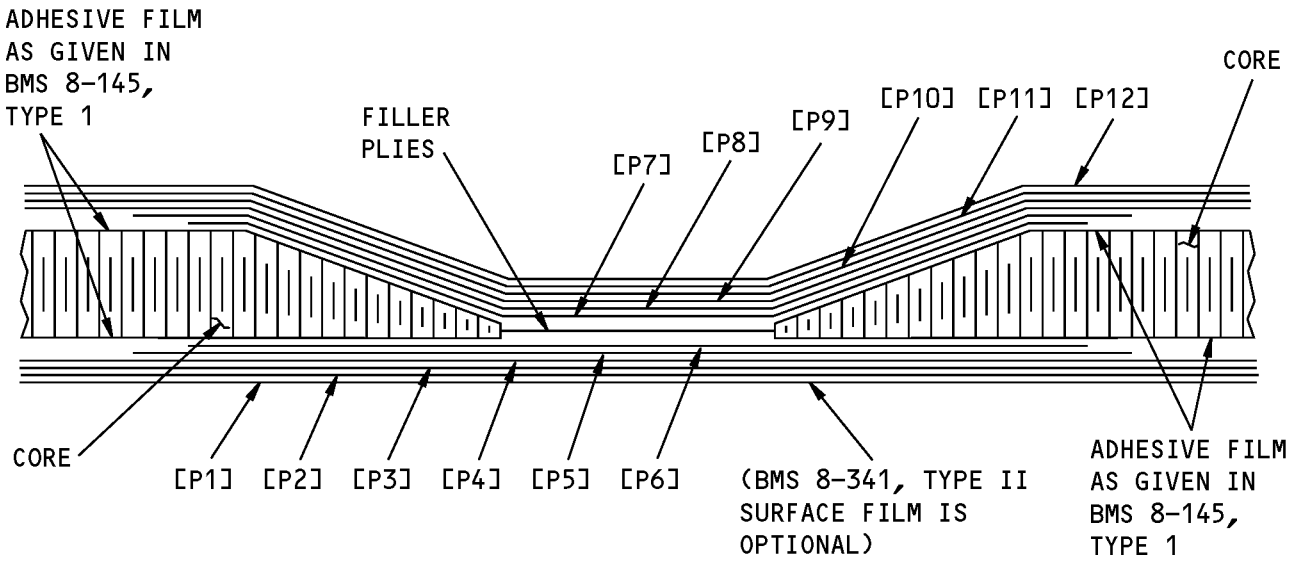
VIEW IS ON THE BAGSIDE

THE LEFT SIDE AFT PANEL IS SHOWN,
THE RIGHT SIDE AFT PANEL IS OPPOSITE

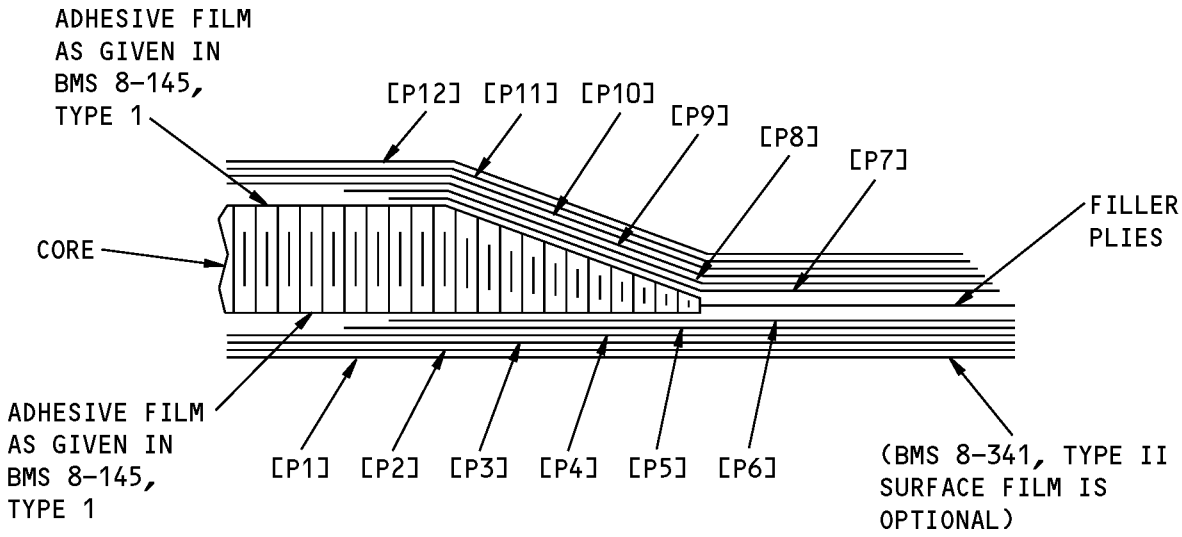
Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 1, Item [2]
Figure 4 (Sheet 1 of 3)



Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 1, Item [2]
Figure 4 (Sheet 2 of 3)



C-C

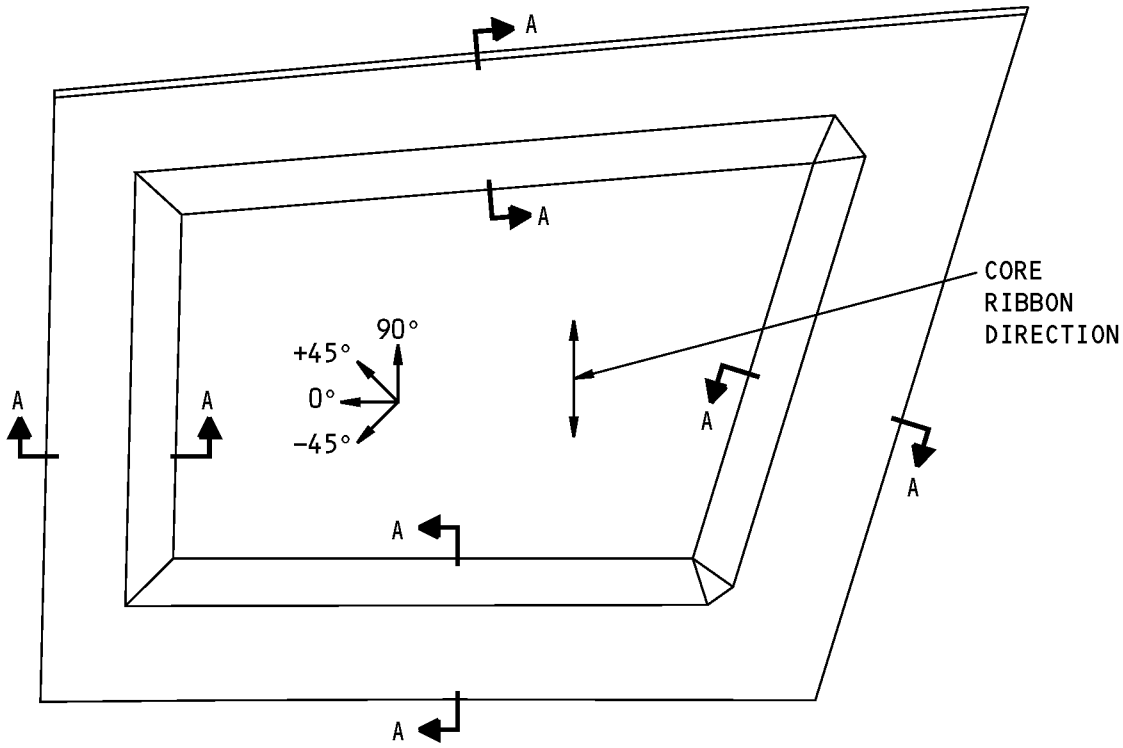


D-D

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 1, Item [2]
Figure 4 (Sheet 3 of 3)

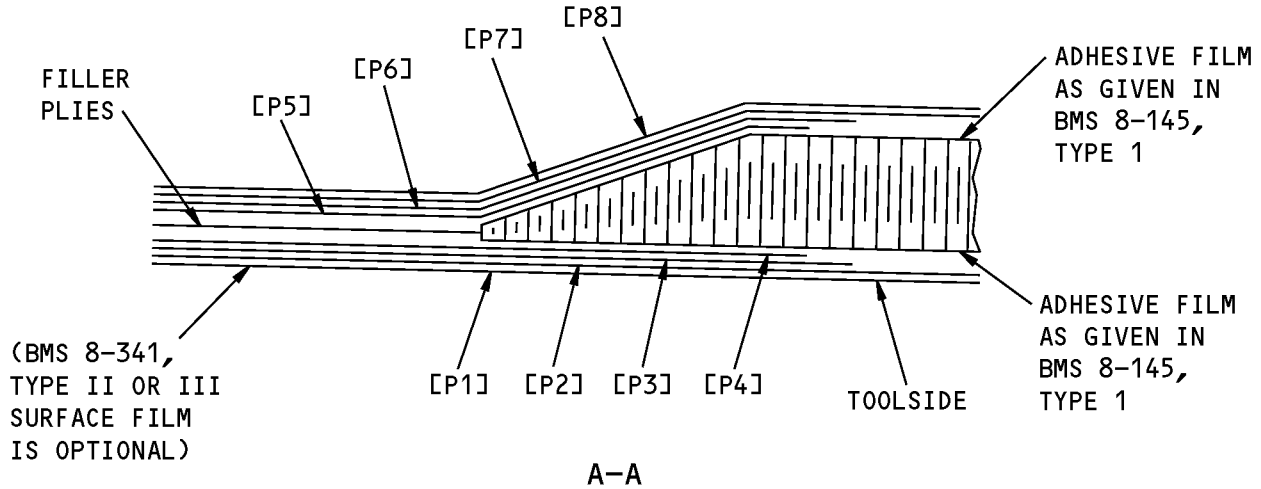
Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	**DIRECTION**	**MATERIAL**
P1, P3, P10, P12	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120
P2, P4, P9, P11	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120
P5, P6, P7, P8	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781 or Style 1581
Filler Plies	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, or Style 7781, or Style 120. Class 2 is an option for all filler plies. Adjust the number of plies to equal the thickness as specified in the drawings



VIEW IS ON THE BAGSIDE

THE LEFT SIDE FORWARD PANEL IS SHOWN,
THE RIGHT SIDE FORWARD PANEL IS OPPOSITE



A-A
(TYPICAL)

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Forward Fairing Panel Assembly, Figure 2, Item [1]
Figure 5

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	**DIRECTION**	**MATERIAL**
P2, P7	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781 or Style 1581, 0.095 (2.4) thick
P1, P3, P4, P5, P6, P8	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781 or Style 1581, 0.095 (2.4) thick
Filler Plies	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, or Style 7781, or Style 120. Class 2 is an option for all filler plies. Adjust the number of plies to equal the thickness as specified in the drawings

ALLOWABLE DAMAGE 1 - ENGINE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANELS

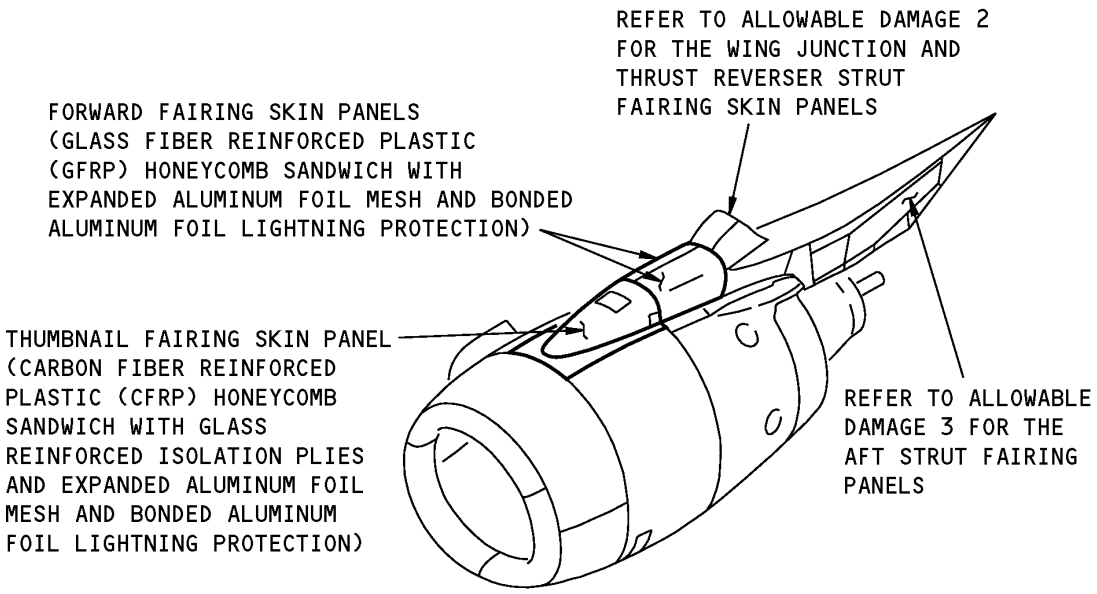
1. Applicability

A. This subject gives the allowable damage limits for the parts of the engine strut that follow: (Refer to Strut Thumbnail and Forward Fairing Skin Panel Locations, Figure 101/ALLOWABLE DAMAGE 1)

(1) The Thumbnail Fairing skin panel

(2) The Forward Fairing skin panels

B. The composite structure allowable damage limits are applicable only if the damage is sealed as given in 51-70-14



Strut Thumbnail and Forward Fairing Skin Panel Locations
Figure 101

2. General

A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspections procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(1) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 1 for the definitions of the length, width, and depth of the damage.

(2) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 1 for the definitions of the facesheets of a honeycomb core area.

B. Remove all of the contamination and water from the fairing. Refer to 51-70-04.

(1) Refer to 51-70-04 for the damage removal procedures.

(2) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

C. Seal all the permitted damage areas that are not more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1 Seal the damage with one of the two methods that follow:

(1) Make a temporary seal.

(a) Apply aluminum foil tape (speed tape).

(b) Keep a record of the location of the damage.

(c) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.

(d) Repair the damage at or before 5000 flight hours from the time the seal was made.

(2) Make a permanent seal.

(a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

(b) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.

(c) Apply one layer of BMS 10-60, Type II enamel to the external surfaces sealed with epoxy resin. Refer to AMM 51-21-00/701.

D. Seal all of the damage areas that are more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1 Seal the damage as follows:

(1) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.

(2) Make a temporary seal with aluminum foil tape (speed tape).

(3) Keep a record of the location of the damage.

(4) Repair the damage at or before 400 flight hours from the time the seal was made.

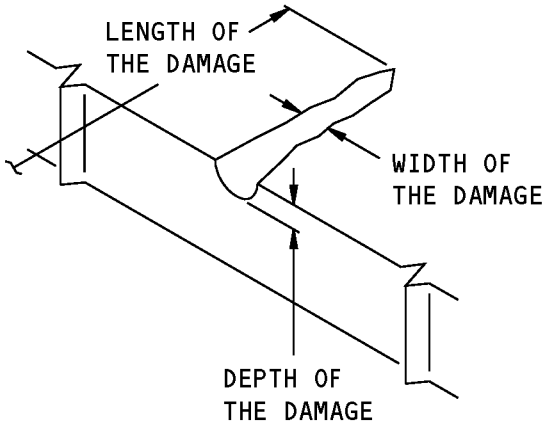
Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
MATERIAL	PART NAME	PARAGRAPH
CFRP HONEYCOMB SANDWICH PANEL	THUMBNAIL FAIRING HONEYCOMB CORE AREAS	4.A
CFRP HONEYCOMB SANDWICH PANEL	THUMBNAIL FAIRING SOLID LAMINATE AREAS	4.B.
GFRP HONEYCOMB SANDWICH PANEL	STRUT FORWARD FAIRINGS HONEYCOMB CORE AREAS	4.C
GFRP HONEYCOMB SANDWICH PANEL	STRUT FORWARD FAIRINGS SOLID LAMINATE AREAS	4.D.

E. The GFRP panels of the Strut Forward Fairing have BMS 8-336 expanded aluminum foil mesh or BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:

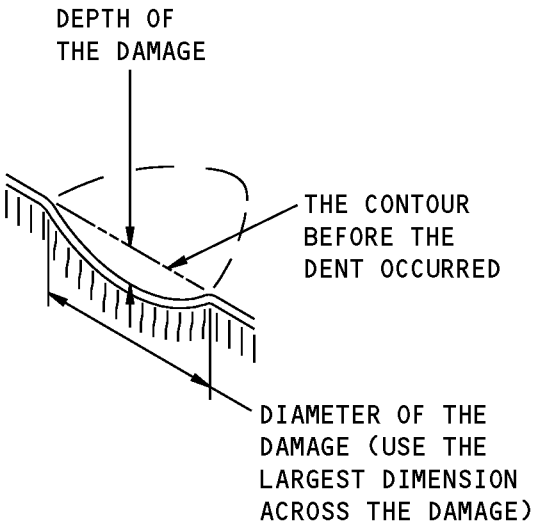
(1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.

(2) Seal the damaged area as given in 51-70-14.



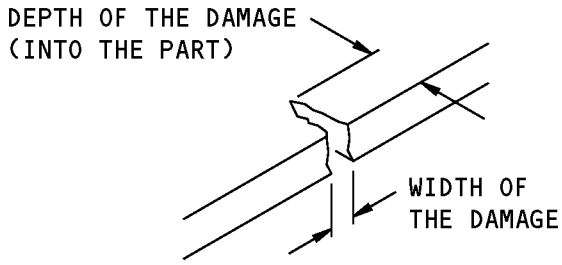
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

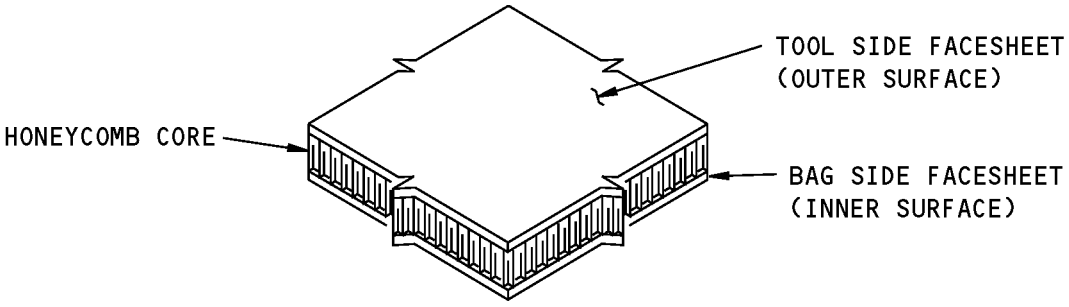
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 102



Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

A. Thumbnail Fairing - Honeycomb Core Areas (Refer to Allowable Damage Zones for the Thumbnail Fairing, Figure 104/ALLOWABLE DAMAGE 1)

(1) Zone 1

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.2 inch (5.08 mm) in length

3) A maximum of 0.2 inch (5.08 mm) in width

4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:
1) A maximum of 1.7 inches 43.18 mm) in width
2) A maximum of 0.05 inch (1.27 mm) in depth
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:
1) A maximum of one facesheet and the core in depth
2) A maximum of 0.2 inch (5.08 mm) in diameter
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:
1) A maximum of 0.2 inch (5.08 mm) in diameter
2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(2) Zone 2

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.7 inch (17.78 mm) in length
3) A maximum of 0.7 inch (17.78 mm) in width
4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:

1) A maximum of 2.5 inches (63.5 mm) in width

2) A maximum of 0.05 inch (1.27 mm) in depth

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:

1) A maximum of one facesheet and the core in depth

2) A maximum of 0.7 inch (17.78 mm) in diameter

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:

1) A maximum of 0.7 inch (17.78 mm) in diameter

2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

B. Thumbnail Fairing - Solid Laminate Areas (Refer to Allowable Damage Zones for the Thumbnail Fairing, Figure 104/ALLOWABLE DAMAGE 1)

(1) Zone 3

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 1.7 inches (43.18 mm) in length

3) A maximum of 1.7 inches (43.18 mm) in width

4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:

1) A maximum of 1.7 inches (43.18 mm) in width

2) A maximum of 0.05 inch (1.27 mm) in depth

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:

1) A maximum of one facesheet and the core in depth

2) A maximum of 1.7 inches (43.18 mm) in diameter

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:

1) A maximum of 1.7 inches (43.18 mm) in diameter

2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(2) Zone 4

(a) Damage is not permitted.

(3) Zone 5

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.72 inch (18.29 mm) in length

3) A maximum of 0.72 inch (18.29 mm) in width

4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:

1) A maximum of 0.72 inch (18.29 mm) in width
2) A maximum of 0.05 inch (1.27 mm) in depth
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:

1) A maximum of one facesheet and the core in depth
2) A maximum of 0.72 inch (18.29 mm) in diameter
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:

1) A maximum of 0.72 inch (18.29 mm) in diameter
2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(4) Zone 6

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

1) A maximum of one ply in depth

   NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 2.5 inches (63.5 mm) in length
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:

1) A maximum of 2.5 inches (63.5 mm) in width
2) A maximum of 0.05 inch (1.27 mm) in depth

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:
1) A maximum of one facesheet and the core in depth
2) A maximum of 2.5 inches (63.5 mm) in diameter
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:
1) A maximum of 2.5 inches (63.5 mm) in diameter
2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(5) Zone 7

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.20 inch (5.08 mm) in length
3) A maximum of 0.20 inch (5.08 mm) in width
4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:
1) A maximum of 0.20 inch (5.08 mm) in width
2) A maximum of 0.05 inch (1.27 mm) in depth
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:

1) A maximum of one facesheet and the core in depth

2) A maximum of 0.20 inch (5.08 mm) in diameter

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:

1) A maximum of 0.2 inch (5.08 mm) in diameter

2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(6) Zone 8

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.50 inch (12.70 mm) in length

3) A maximum of 0.50 inch (12.70 mm) in width

4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:

1) A maximum of 0.50 inch (12.70 mm) in width

2) A maximum of 0.05 inch (1.27 mm) in depth

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

a) Do not cause damage to the carbon fiber plies

b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:

1) A maximum of one facesheet and the core in depth
2) A maximum of 0.50 inch (12.70 mm) in diameter
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:
1) A maximum of 0.50 inch (12.70 mm) in diameter
2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

C. Strut Forward Fairing - Honeycomb Core Areas (Refer to Allowable Damage Zones for the Strut Forward Fairing, Figure 105/ALLOWABLE DAMAGE 1)

(1) Zone 1

(a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.2 inch (5.08 mm) in length
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:
1) A maximum of 0.2 inch (5.08 mm) in width
2) A maximum of 0.05 inch (1.27 mm) in depth
3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:
1) A maximum of one facesheet and the core in depth
2) A maximum of 0.2 inch (5.08 mm) in diameter

3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:
1) A maximum of 0.2 inch (5.08 mm) in diameter
2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
   a) Do not cause damage to the carbon fiber plies
   b) Are sealed as given in 51-70-14

D. Strut Forward Fairing - Solid Laminate Areas (Refer to Allowable Damage Zones for the Strut Forward Fairing, Figure 105/ALLOWABLE DAMAGE 1)

(1) Zone 2
   (a) Damage is not permitted.

(2) Zone 3
   (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply are permitted.
   (b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
   1) A maximum of one ply in depth

      NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

   2) A maximum of 0.50 inch (12.70 mm) in length
   3) A maximum of 0.50 inch (12.70 mm) in width
   4) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
      a) Do not cause damage to the carbon fiber plies
      b) Are sealed as given in 51-70-14
   (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
   1) A maximum of 0.50 inch (12.70 mm) in width
   2) A maximum of 0.05 inch (1.27 mm) in depth
   3) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
      a) Do not cause damage to the carbon fiber plies
      b) Are sealed as given in 51-70-14
   (d) Holes and Punctures are permitted if they are:
   1) A maximum of one facesheet and the core in depth

2) A maximum of 0.5 inch (12.70 mm) in diameter

3) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

   a) Do not cause damage to the carbon fiber plies

   b) Are sealed as given in 51-70-14

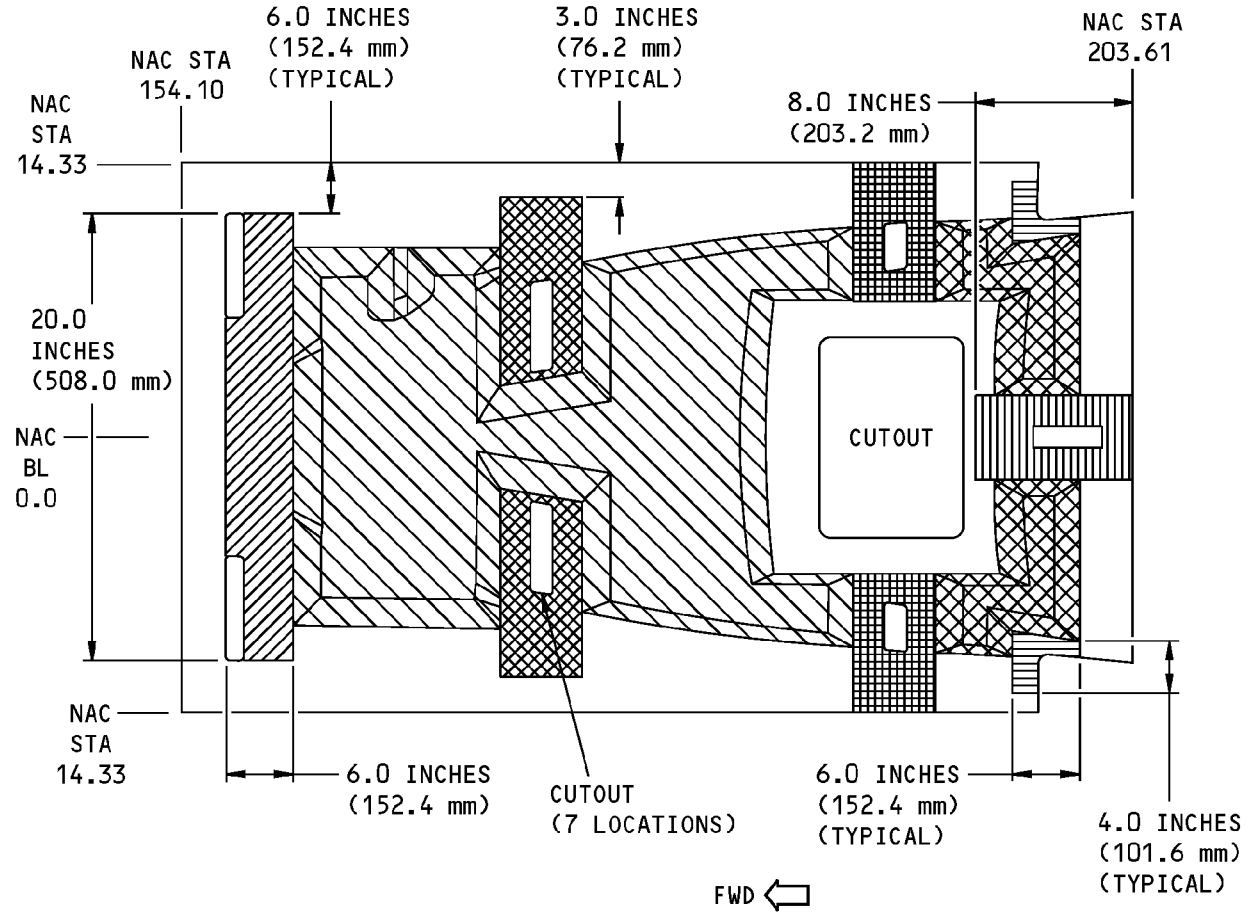
(e) Delaminations are permitted if they are:

1) A maximum of 0.5 inch (12.70 mm) in diameter

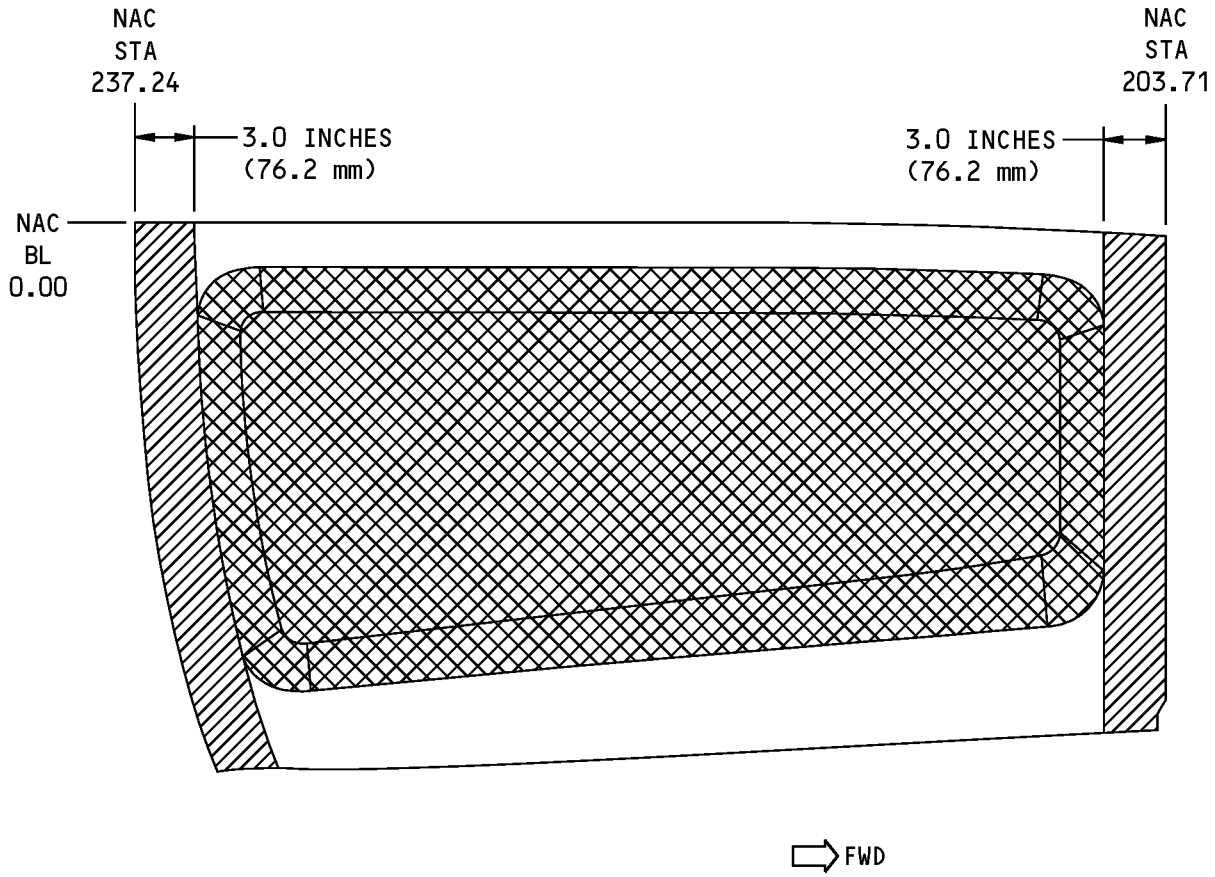
2) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

   a) Do not cause damage to the carbon fiber plies

   b) Are sealed as given in 51-70-14



Allowable Damage Zones for the Thumbnail Fairing
Figure 104



LEFT STRUT FORWARD FAIRING SKIN PANEL IS SHOWN,
RIGHT STRUT FORWARD FAIRING SKIN PANEL IS OPPOSITE

Allowable Damage Zones for the Strut Forward Fairing
Figure 105

ALLOWABLE DAMAGE 2 - WING JUNCTION AND THRUST REVERSER STRUT FAIRING SKIN PANELS

1. Applicability

A. This subject gives the allowable damage limits for the parts that follow (Refer to Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations , Figure 101/ALLOWABLE DAMAGE 2):

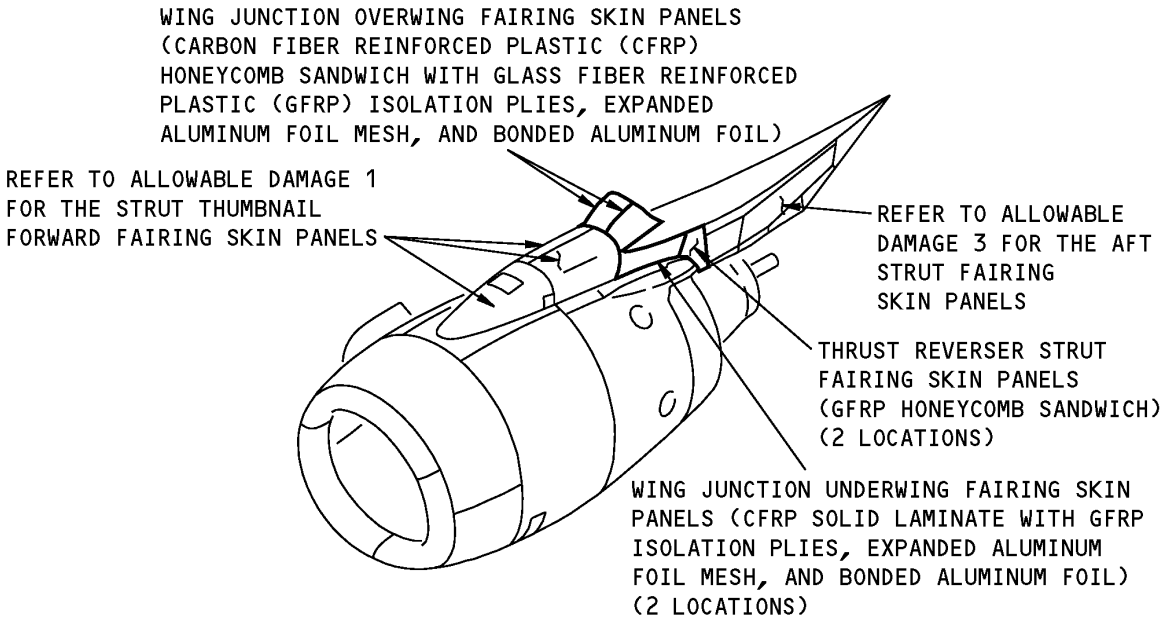
(1) The Wing Junction Fairing which includes:

(a) The left and right Strut Overwing Fairings

(b) The inboard and outboard Strut Underwing Fairings.

(2) The left and right Thrust Reverser Strut Fairings.

B. The composite structure allowable damage limits are applicable only if the damage is sealed as given in 51-70-14



Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations
Figure 101

2. General

A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspections procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(1) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 2 for the definitions of the length, width, and depth of the damage.

(2) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 2 for the definitions of the facesheets of a honeycomb core area.

B. Remove all of the contamination and water from the fairing. Refer to 51-70-04.

C. Refer to 51-30-03 for the possible sources of the materials you can use to remove the damage.

D. Refer to 51-30-05 for the possible sources of the equipment you can use to remove the damage.

E. Seal all the permitted damage areas that are not more than one ply in depth with one of the two methods that follows: (Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2)

(1) Make a temporary seal.

(a) Apply aluminum foil tape (speed tape).

(b) Keep a record of the location of the damage.

(c) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.

(d) Repair the damage at or before 5000 flight hours from the time the seal was made.

(2) Make a permanent seal.

(a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

(b) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.

(c) Apply one layer of BMS 10-60, Type II enamel to the external surfaces sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.

F. Seal all of the damage areas that are more than one ply in depth as follows: (Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2)

(1) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.

(2) Make a temporary seal with aluminum foil tape (speed tape).

(3) Keep a record of the location of the damage.

(4) Repair the damage at or before 400 flight hours from the time the seal was made.

G. The CFRP panels of the Wing Junction Overwing and Underwing Fairings have BMS 8-336 expanded aluminum foil mesh and BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:

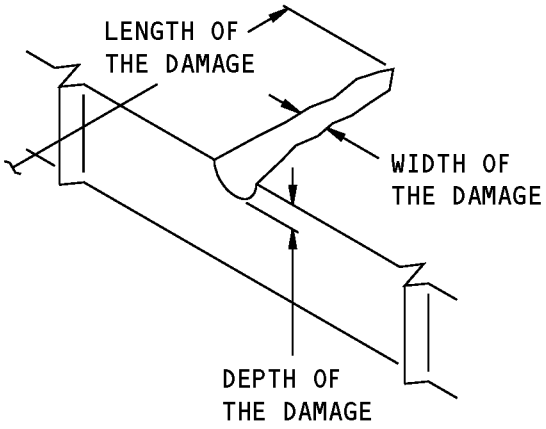
(1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.

(2) Seal the damaged area as given in 51-70-14.

H. Refer to Table 101/ALLOWABLE DAMAGE 2 for the references for the allowable damage limits.

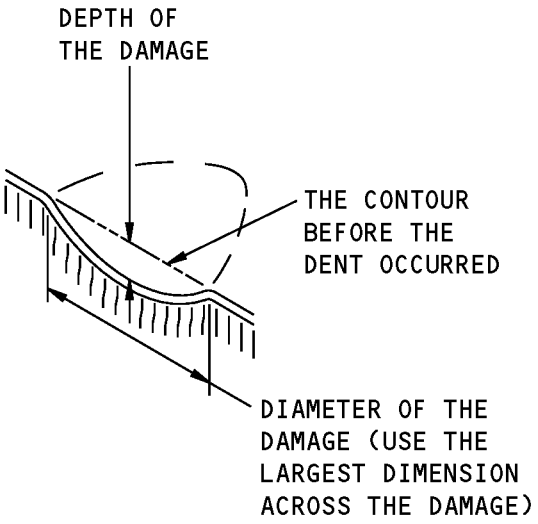
Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
PART NAME	MATERIAL	PARAGRAPH
OVERWING FAIRING SKIN PANELS	CFRP HONEYCOMB SANDWICH PANEL	4.A
INBOARD AND OUT- BOARD UNDERWING FAIRING SKIN PANELS	CFRP LAMINATE PANEL	4.B
THRUST REVERSER STRUT FAIRING SKIN PANELS	GFRP HONEYCOMB SANDWICH PANEL	4.C



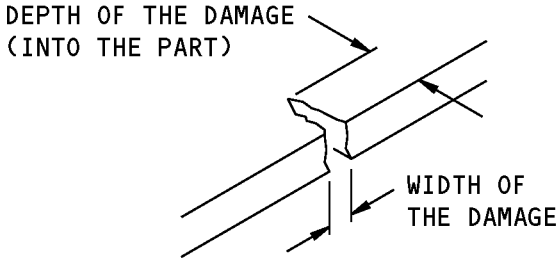
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

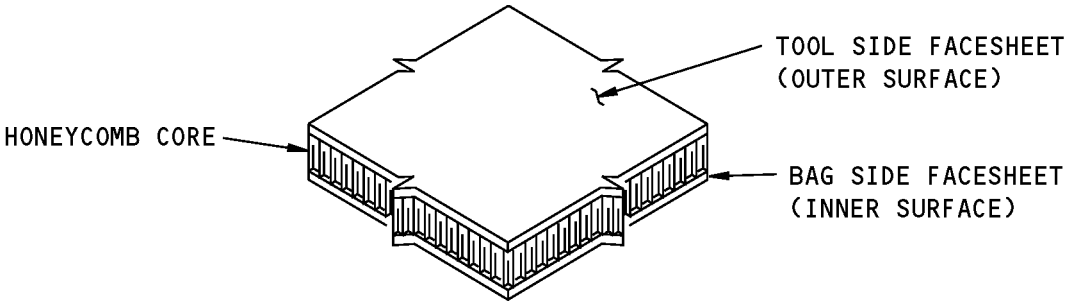
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 102



Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Overwing Fairing Skin Panels (Refer to Allowable Damage Zones for the Overwing Fairing Skin Panels, Figure 104/ALLOWABLE DAMAGE 2)

(1) Zone 1 - Honeycomb Core Area

(a) Nicks, Gouges and Scratches that do not cause damage to the carbon fibers are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.20 inch (5.08 mm) in length

3) A maximum of 0.20 inch (5.08 mm) in width

4) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.

NOTE: Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:

1) A maximum of 0.20 inch (5.08 mm) in diameter
2) A maximum of 0.20 inch (1.27 mm) in depth
3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.

NOTE: Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:

1) A maximum of one facesheet and the core in depth
2) A maximum of 0.20 inch (5.08 mm) in diameter
3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.

NOTE: Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:

1) A maximum of 0.2 inch (5.08 mm) in diameter
2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.

NOTE: Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(2) Zone 2 - Solid Laminate Area

(a) Edge Erosion is permitted as shown in Damage that is Permitted to the Edgeband of a Honeycomb Panel, Figure 106/ALLOWABLE DAMAGE 2.

(b) Other damage is not permitted.

(3) Zone 3 - Solid Laminate Area

(a) Nicks, Gouges and Scratches that do not cause damage to the carbon fibers are permitted.

(b) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.4 inch (10.2 mm) in length

3) A maximum of 0.4 inch (10.2 mm) in width

4) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(c) Dents that do not cause damage to the carbon fibers are permitted if they are:

1) A maximum of 0.4 inch (10.2 mm) in width

2) A maximum of 0.05 inch (1.27 mm) in depth

3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(d) Holes and Punctures are permitted if they are:

1) A maximum of 0.4 inch (10.2 mm) in diameter

2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(e) Delaminations are permitted if they are:

1) A maximum of 0.4 inch (10.2 mm) in diameter

2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in 51-70-14

(f) Edge Erosion is permitted as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail B .

B. Inboard and Outboard Underwing Fairing Skin Panels

(1) Nicks, Gouges, and Scratches that do not cause damage to the fibers are permitted.

(2) Edge Erosion is permitted as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail B .

C. Thrust Reverser Strut Fairing Skin Panels (Refer to Allowable Damage Zones for the Thrust Reverser Strut Fairing Skin Panel , Figure 108/ALLOWABLE DAMAGE 2)

(1) Zone 1 - Solid Laminate Area

(a) Nicks, Gouges, and Scratches are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.3 inch (7.6 mm) in length

3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(b) Dents are permitted if they are:

1) A maximum of 0.3 inch (7.6 mm) in diameter

2) A maximum of 0.05 inch (1.27 mm) in depth

3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(c) Holes and Punctures are permitted if they are:

1) A maximum of 0.3 inch (7.6 mm) in diameter

2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(d) Delaminations are permitted if they are:

1) A maximum of 0.3 inch (7.6 mm) in diameter

2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(2) Zone 2 - Solid Laminate and Honeycomb Core Area

(a) Nicks, Gouges, and Scratches are permitted if they are:

1) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

2) A maximum of 0.50 inch (12.70 mm) in length

3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(b) Dents are permitted if they are:

1) A maximum of 0.50 inch (12.70 mm) in diameter

2) A maximum of 0.05 inch (1.27 mm) in depth

3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(c) Holes and Punctures are permitted in the solid laminate and honeycomb core areas if they are:

1) A maximum of one facesheet and the core in depth for honeycomb core areas

2) A maximum of 0.50 inch (12.70 mm) in diameter

3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(d) Delaminations are permitted if they are:

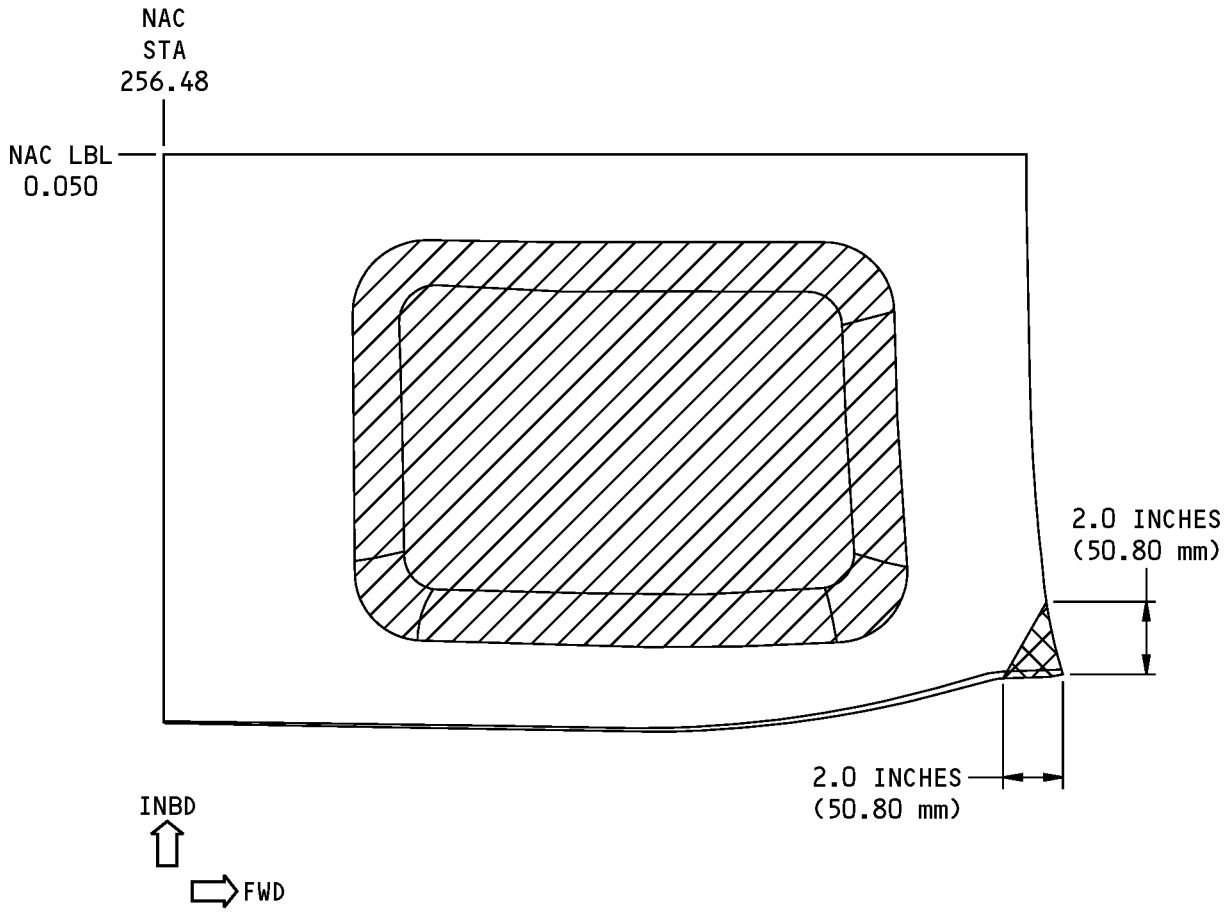
1) A maximum of 0.50 inch (12.70 mm) in diameter

2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in 51-70-14

(e) Edge Erosion is permitted as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail B .

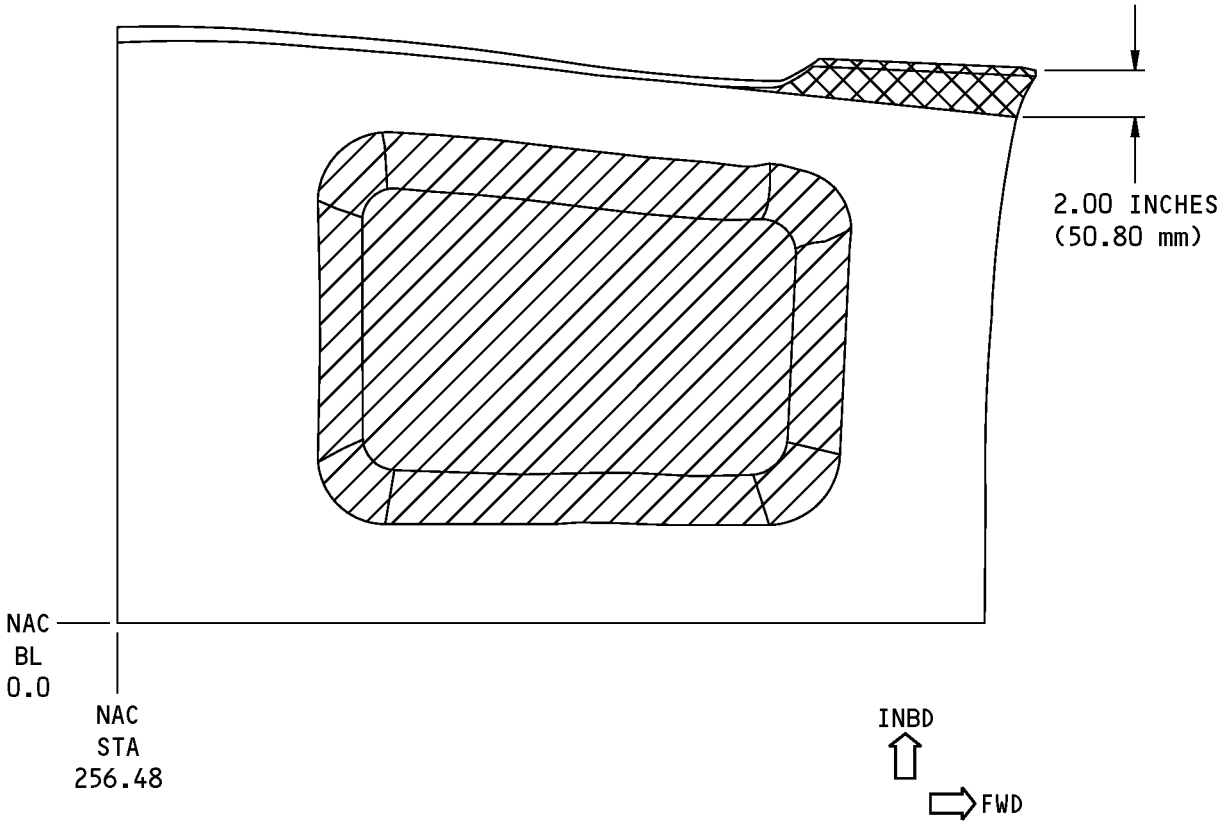


LEFT ENGINE OUTBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE OUTBOARD OVERWING PANEL IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

ZONE 1 - HONEYCOMB CORE AREA
ZONE 2 - SOLID LAMINATE AREA
ZONE 3 - SOLID LAMINATE AREA

Allowable Damage Zones for the Overwing Fairing Skin Panels
Figure 104 (Sheet 1 of 2)

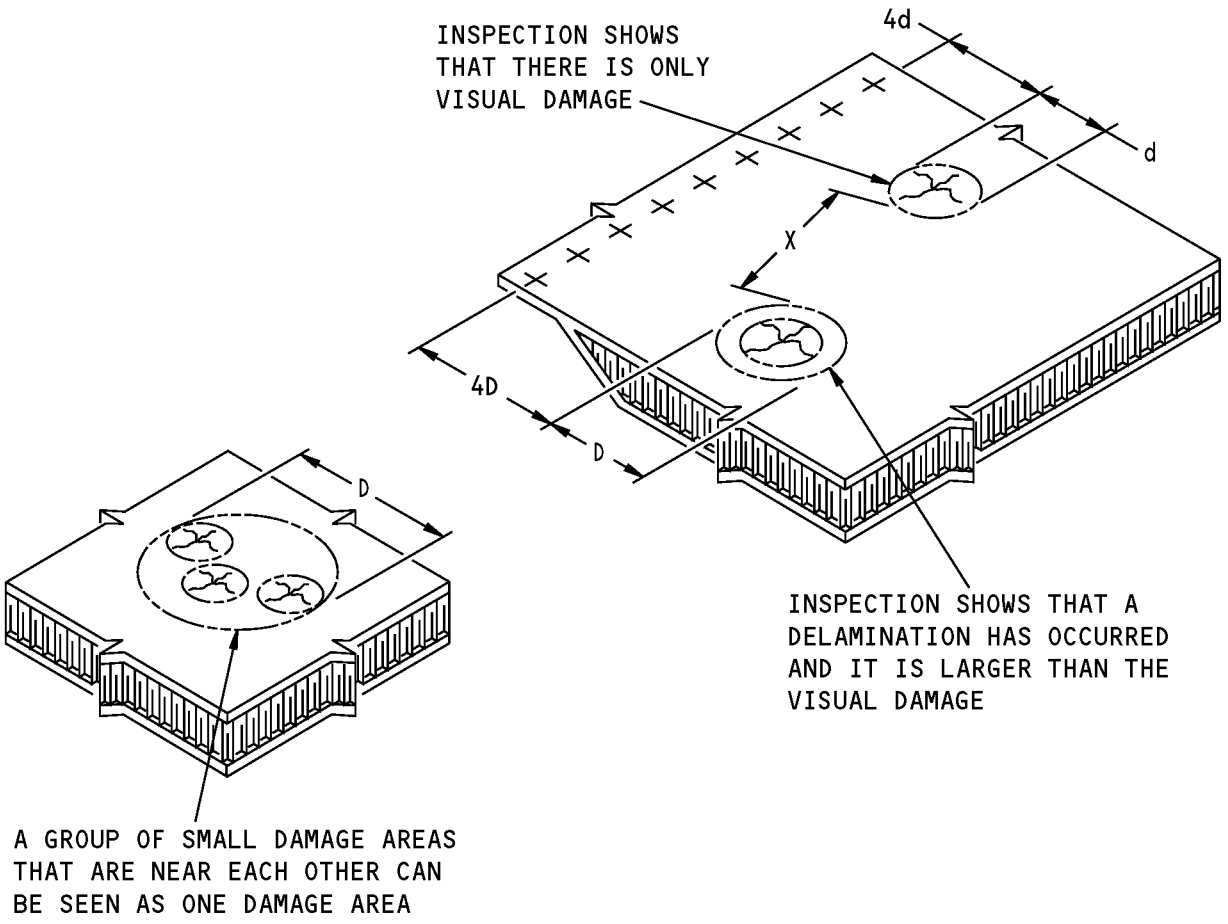


LEFT ENGINE INBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE INBOARD OVERWING PANEL IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

ZONE 1 - HONEYCOMB CORE AREA
ZONE 2 - SOLID LAMINATE AREA
ZONE 3 - SOLID LAMINATE AREA

Allowable Damage Zones for the Overwing Fairing Skin Panels
Figure 104 (Sheet 2 of 2)



NOTE: TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES. REFER TO NDT PART 1, 51-01-02.

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

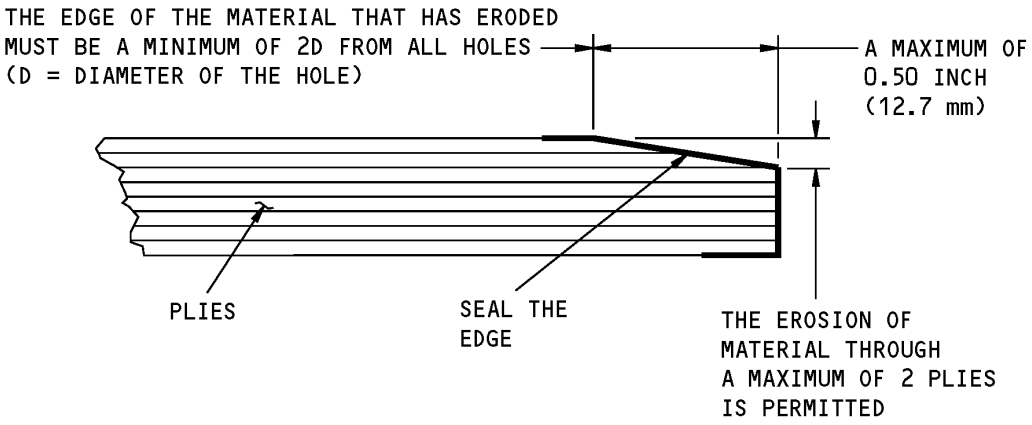
D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND CAN BE A MAXIMUM OF 2 INCHES (50.80 MILLIMETERS).

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

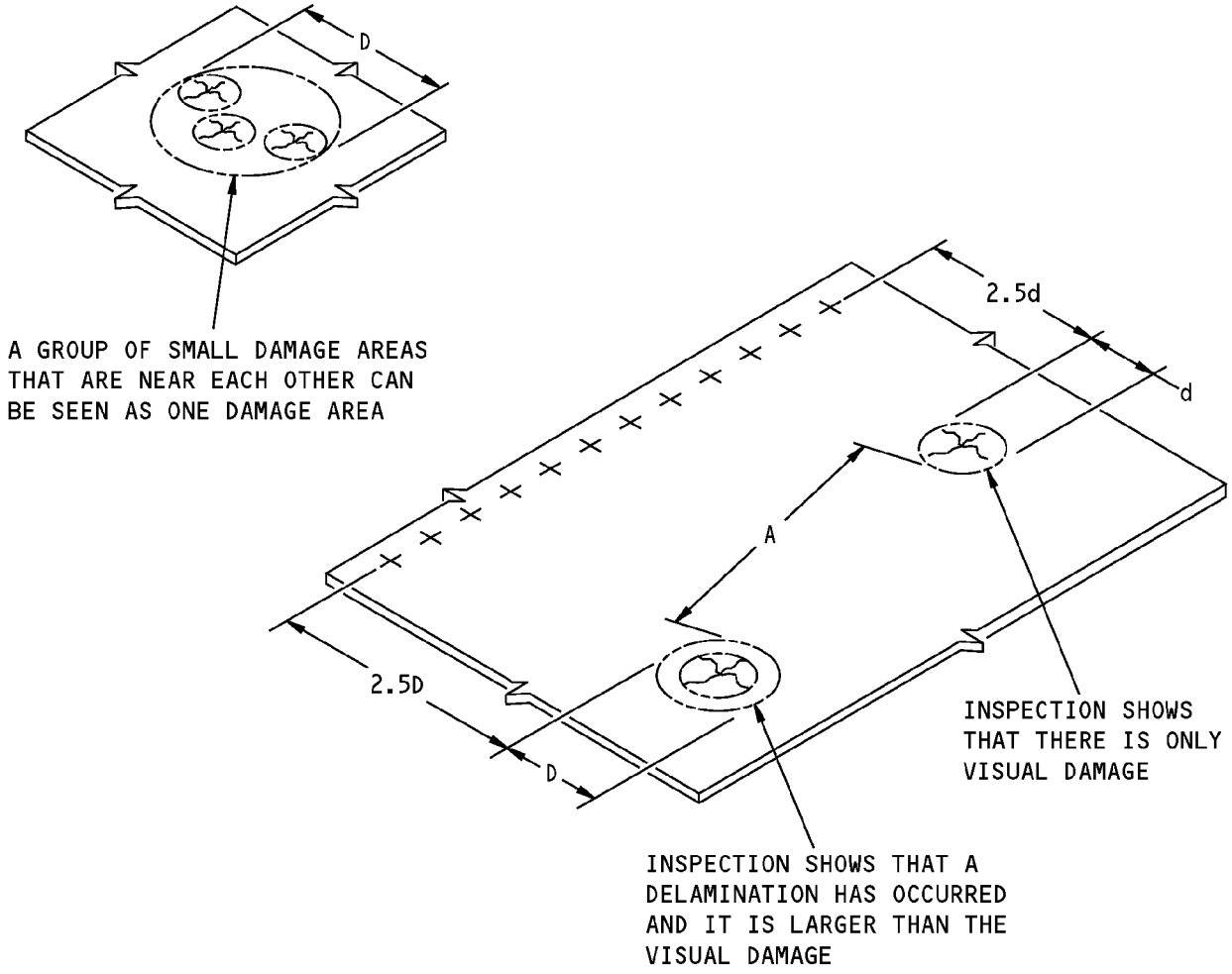
X IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.

THE MINIMUM X THAT IS PERMITTED IS THE LARGER OF 0.75D OR 3d.

Damage that is Permitted to Honeycomb Core Areas
Figure 105



Damage that is Permitted to the Edgeband of a Honeycomb Panel
Figure 106



NOTE: TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES. REFER TO NDT PART 1, 51-01-02.

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

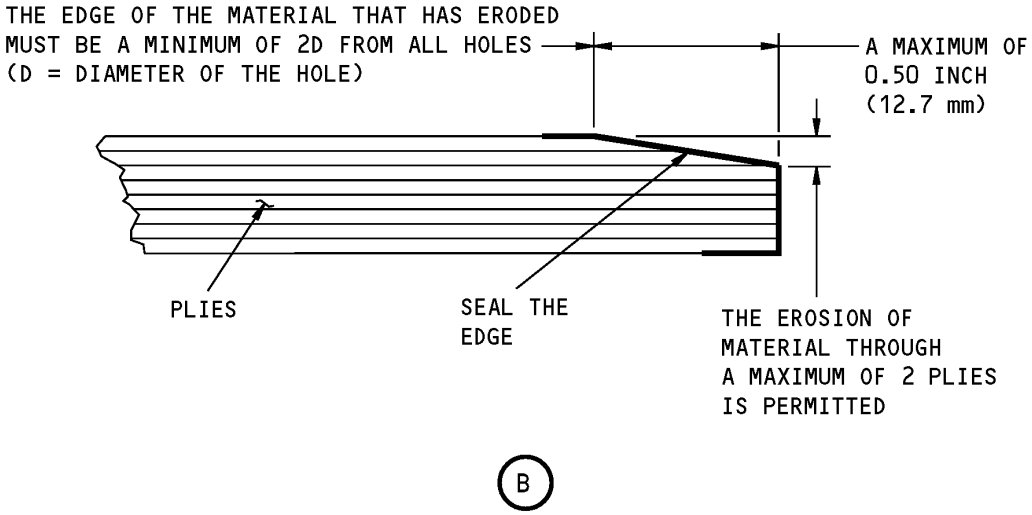
d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

A IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.

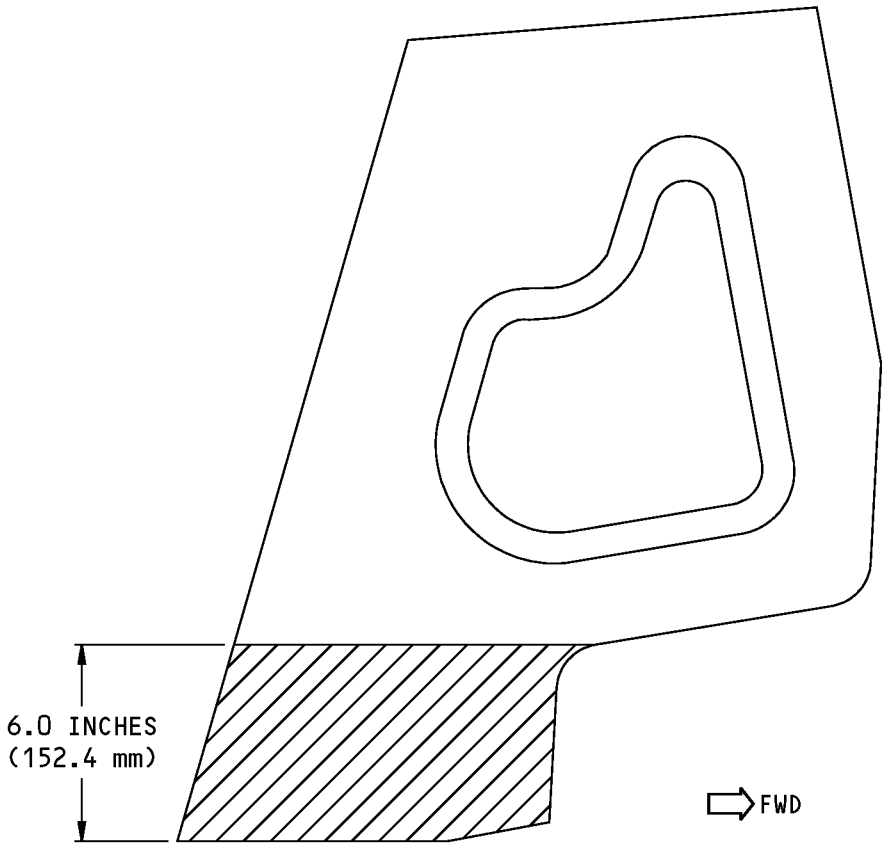
THE MINIMUM A THAT IS PERMITTED IS 2.5D.

(A)

Damage that is Permitted to Solid Laminate Areas
Figure 107 (Sheet 1 of 2)



Damage that is Permitted to Solid Laminate Areas
Figure 107 (Sheet 2 of 2)



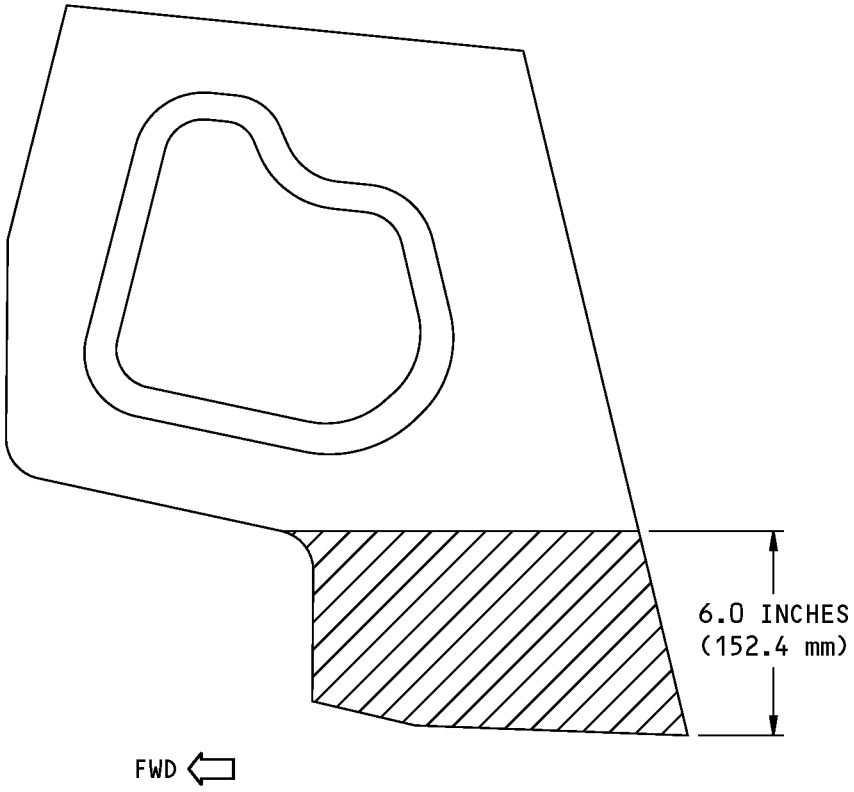
LEFT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING IS SHOWN,
RIGHT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

ZONE 1 - SOLID LAMINATE AREA

ZONE 2 - SOLID LAMINATE AND HONEYCOMB CORE AREA

Allowable Damage Zones for the Thrust Reverser Strut Fairing Skin Panel
Figure 108 (Sheet 1 of 2)



LEFT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS SHOWN,
RIGHT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

ZONE 1 - SOLID LAMINATE AREA

ZONE 2 - SOLID LAMINATE AND HONEYCOMB CORE AREA

Allowable Damage Zones for the Thrust Reverser Strut Fairing Skin Panel
Figure 108 (Sheet 2 of 2)

ALLOWABLE DAMAGE 3 - ENGINE STRUT AFT FAIRING SKIN PANELS

1. Applicability

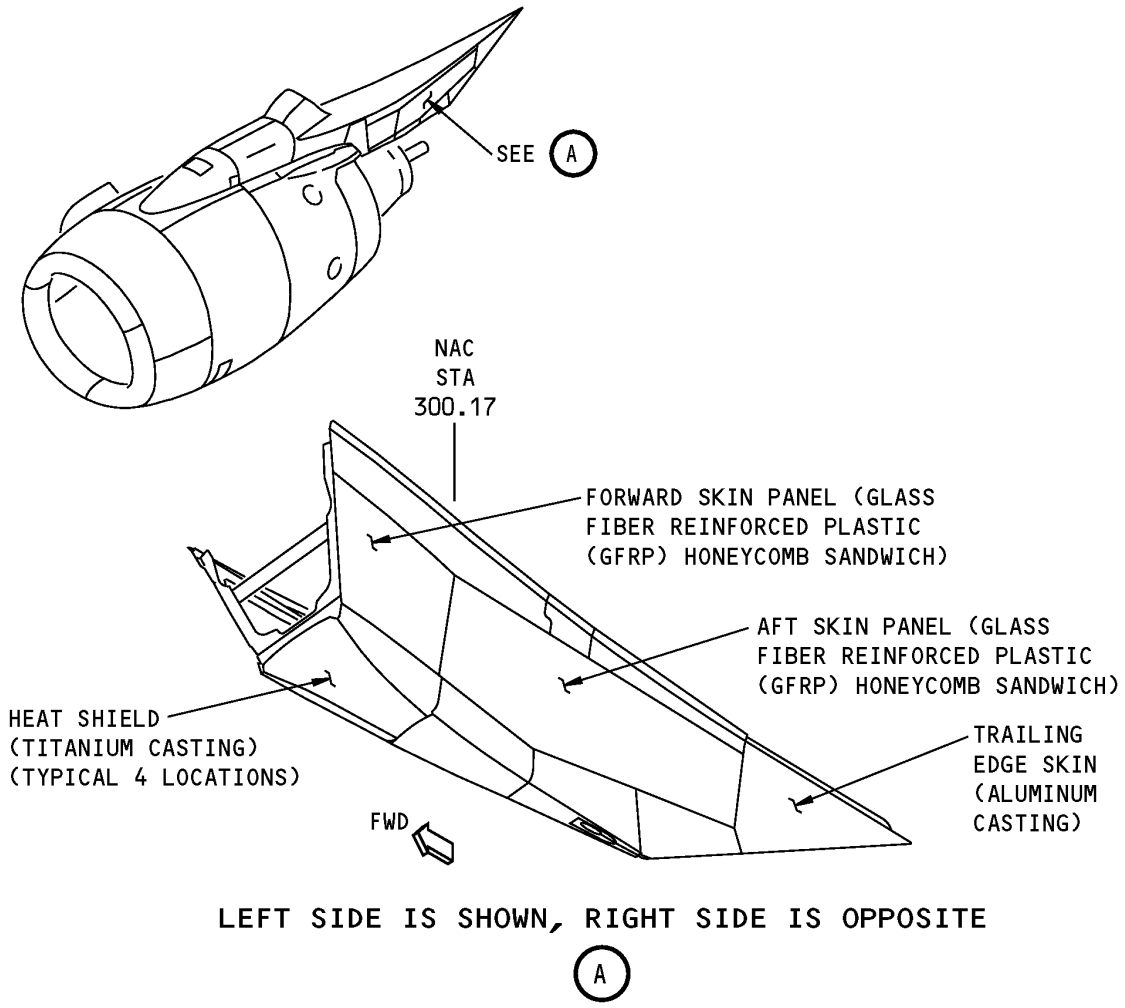
A. This subject gives the allowable damage limits for the aft strut fairing skin panels that follow: (Refer to Engine Strut Aft Fairing Skin Locations, Figure 101/ALLOWABLE DAMAGE 3)

(1) The forward and aft strut skins that are made of Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich material

(2) The heat shield skins that are made from titanium castings

(3) The trailing edge that are made from an aluminum casting.

B. The composite structure allowable damage limits are applicable only if they are sealed as given in Paragraph 4./ALLOWABLE DAMAGE 3



Engine Strut Aft Fairing Skin Locations
Figure 101

2. General

A. Do the steps that follow for parts made from Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich material:

(1) Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(a) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 3 for the definitions of the length, width, and depth of the damage.

(b) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 3 for the definitions of the facesheets of a honeycomb core area.

(2) Remove all of the contamination and water from the fairing. Refer to 51-70-04.

(3) Refer to 51-30-05 for the possible sources of the equipment to remove the damage.

(4) Seal all the permitted damage areas that are not more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 3 Seal the damage with one of the two methods that follow:

(a) Make a temporary seal.

1) Apply aluminum foil tape (speed tape).

2) Keep a record of the location of the damage.

3) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.

4) Repair the damage at or before 5000 flight hours from the time the seal was made.

(b) Make a permanent seal.

1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

2) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.

3) Apply one layer of BMS 10-60, Type II enamel to the external surfaces sealed with epoxy resin. Refer to AMM 51-21-00/701.

(5) Seal all of the damage areas that are more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 3 Seal the damage as follows:

(a) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.

(b) Make a temporary seal with aluminum foil tape (speed tape).

(c) Keep a record of the location of the damage.

(d) Repair the damage at or before 400 flight hours from the time the seal was made.

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. WATER IN CONTACT WITH MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

B. Do the steps that follow for the aluminum or titanium parts.

(1) Remove the damage as necessary.

(a) Refer to 51-10-02 for the investigation and cleanup procedures.

(b) Refer to 51-30-03 for the possible sources of the abrasive and other materials you need to remove the damage.

(c) Refer to 51-30-05 for the possible sources of the equipment and tools you need to remove the damage.

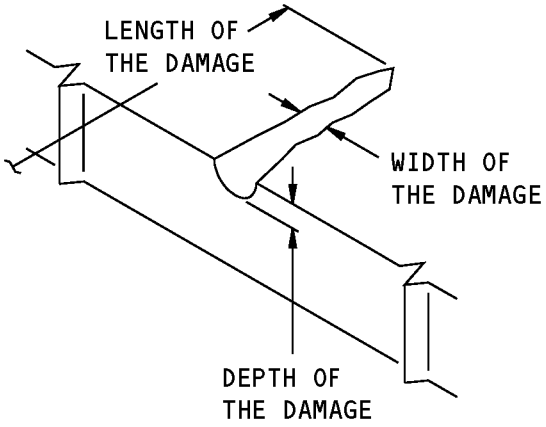
(d) Make the surface texture roughness for all cut surfaces 125 microinches Ra or smoother.

(2) Apply a chemical conversion coating layer to the bare surfaces of the reworked aluminum areas. Refer to 51-20-01.

(3) Apply two layers of BMS 10-11, Type I primer to the reworked aluminum areas. Refer to SOPM 20-41-02.

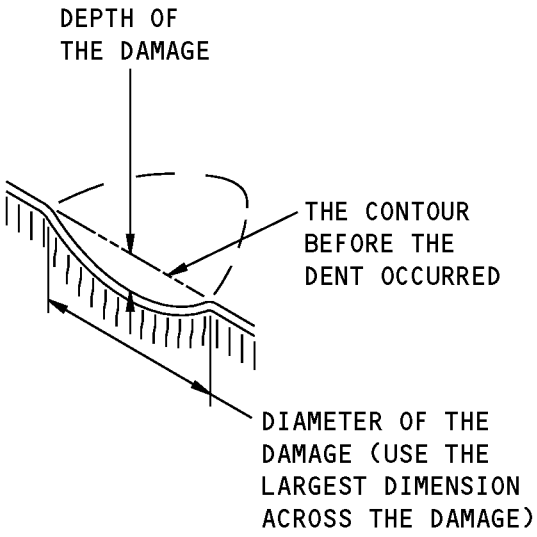
Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
MATERIAL	TYPE OF STRUCTURE	PARAGRAPH
GFRP HONEYCOMB SANDWICH	AFT STRUT FAIRING PANELS, FORWARD AND AFT	4.A
TITANIUM CASTING	HEAT SHIELD	4.B
ALUMINUM CASTING	TRAILING EDGE SKIN	4.C



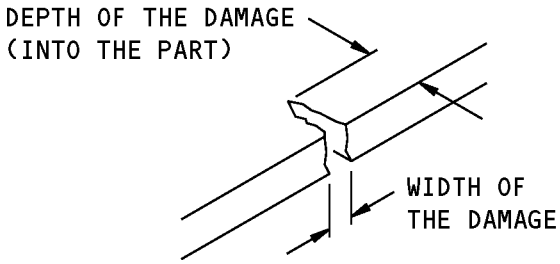
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

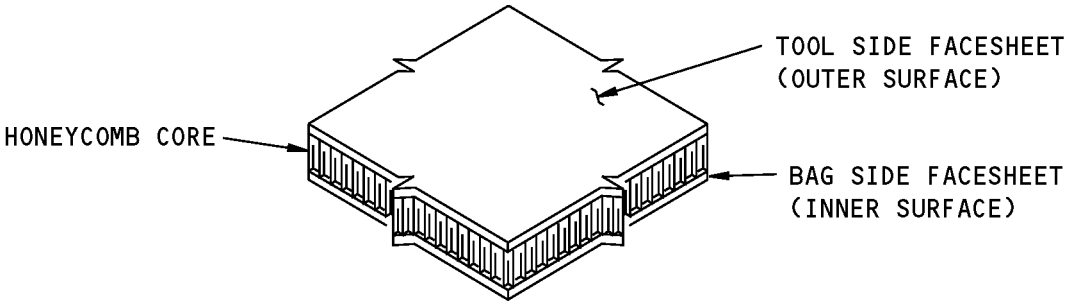
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 102



Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primers
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Forward and Aft Fairing Skin Panels - (GFRP Honeycomb Sandwich)

(1) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if they are:

(a) A maximum depth of one ply

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.

(b) A maximum length of 2.5 inches (63.5 mm)

(c) A maximum width of 0.25 inch (6.35 mm)

(d) A minimum of 0.60 inch (15.24 mm) away from the edge of a fastener hole

(e) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . Other damage does not include nicks, gouges, and scratches that:

1) Do not cause damage to the glass fiber plies

2) Are sealed as given in Paragraph 2.A.(4)/ALLOWABLE DAMAGE 3

(2) Dents that do not cause damage to the glass fibers are permitted if they are:

(a) A maximum depth of 0.05 inch (1.27 mm)

(b) A maximum diameter of 2.5 inches (63.5 mm)

(c) A minimum of 0.60 inch (15.24 mm) away from the edge of a fastener hole

(d) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . Other damage does not include nicks, gouges, and scratches that:

1) Do not cause damage to the glass fiber plies

2) Are sealed as given in Paragraph 2.A.(4)/ALLOWABLE DAMAGE 3

(3) Holes and Punctures are permitted if they are:

(a) A maximum depth of one facesheet and the honeycomb core

(b) A maximum diameter of 2.5 inches (63.5 mm)

(c) A minimum of 0.60 inch (15.24 mm) away from the edge of a fastener hole

(d) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . Other damage does not include nicks, gouges, and scratches that:

1) Do not cause damage to the glass fiber plies

2) Are sealed as given in Paragraph 2.A.(4)/ALLOWABLE DAMAGE 3

(4) Delaminations are permitted if they are:

(a) A maximum length of 2.5 inches (63.5 mm)

(b) A maximum width of 2.5 inches (63.5 mm)

(c) A minimum of 0.60 inch (15.24 mm) away from the edge of a fastener hole

(d) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . Other damage does not include nicks, gouges, and scratches that:

1) Do not cause damage to the glass fiber plies

2) Are sealed as given in Paragraph 2.A.(4)/ALLOWABLE DAMAGE 3

(5) Edge Erosion is permitted as shown in Allowable Damage Details for Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail B .

B. Heat Shield (Titanium Casting)

(1) Cracks:

(a) Remove the damage as given in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 3, Details A , B , and C .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 3, Details C and D .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

C. Trailing Edge Skin (Aluminum Casting)

(1) Cracks:

(a) Remove the damage as given in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 3, Details A , B , and C .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage with one of the two damage removal procedures that follows:

1) Remove the damage as given in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 3, Details C and D .

2) Drill a hole through the part at the damage location to:

NOTE: Do not drill out the damage if it has been blended out before.

a) A maximum of 0.25 inch (6.35 mm) in diameter

b) A minimum of 1.0 inch (25.4 mm) from a fastener hole, the edge of the part, or other damage.

c) Fill the hole with a 2117-T3 or 2117-T4 aluminum rivet installed without sealant.

(3) Dents are not permitted.

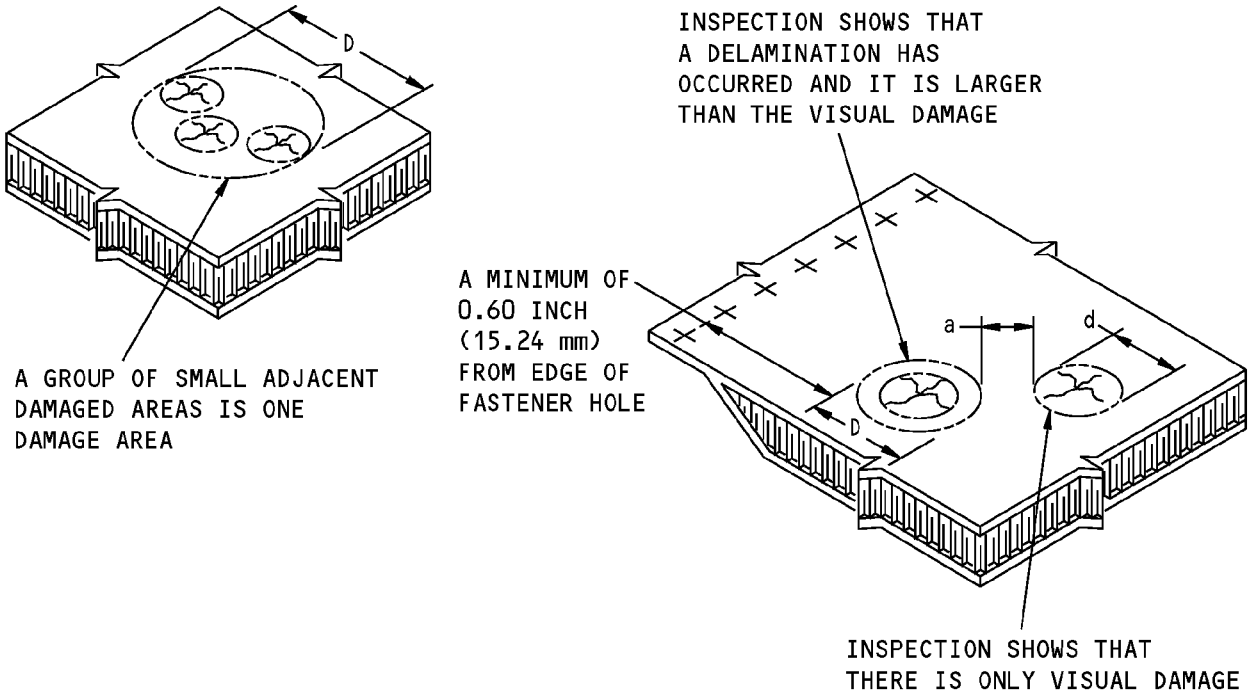
(4) Holes and Punctures:

(a) The damage is permitted if it is:

1) A maximum diameter of 0.25 inch (6.35 mm)

2) A minimum of 2.0 inches (50.80 mm) away from a fastener hole, the edge of the part, or other damage.

3) Filled with a 2117-T3 or 2117-T4 aluminum protruding head rivet installed without sealant.



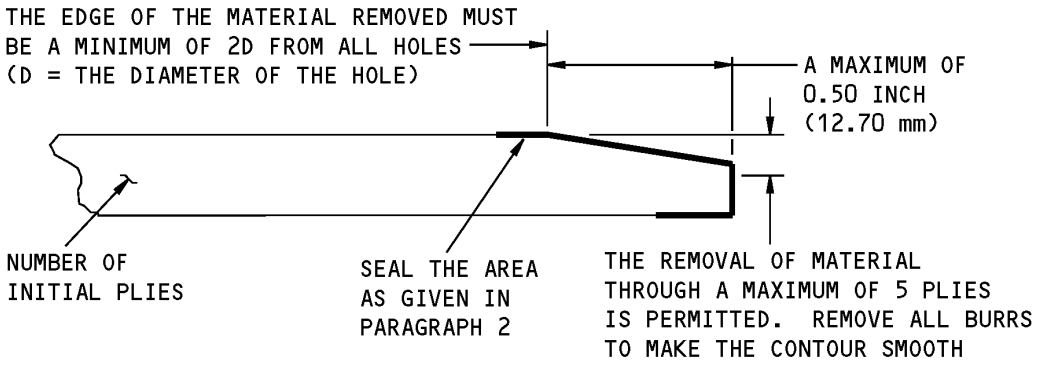
SPACING LIMITS FOR ADJACENT DAMAGE AREAS

(A)

NOTE:

- A DAMAGED AREA CAN INCLUDE ANY OF THE TYPES OF DAMAGE WHICH FOLLOW:
  - A DENT
  - A DELAMINATION
  - A HOLE OR PUNCTURE
- TO FIND DELAMINATION, USE NONDESTRUCTIVE INSPECTION PROCEDURES AS GIVEN IN NDT PART 1, 51-01-02.
- THE DIAMETER OF A DAMAGE AREA IS THE LARGER OF THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.
- D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS.
- d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.
- a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.
- THE MINIMUM a THAT IS PERMITTED IS THE LARGER OF 0.75D OR 2d.

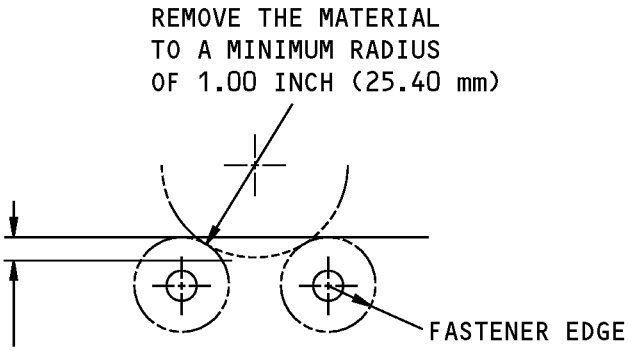
Allowable Damage Details for Composite Skin Panels
Figure 104 (Sheet 1 of 2)



CLEANUP AND SEALING OF EDGE EROSION DAMAGE

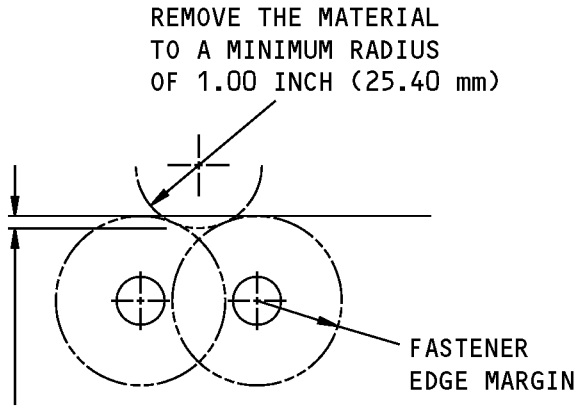
B

Allowable Damage Details for Composite Skin Panels
Figure 104 (Sheet 2 of 2)



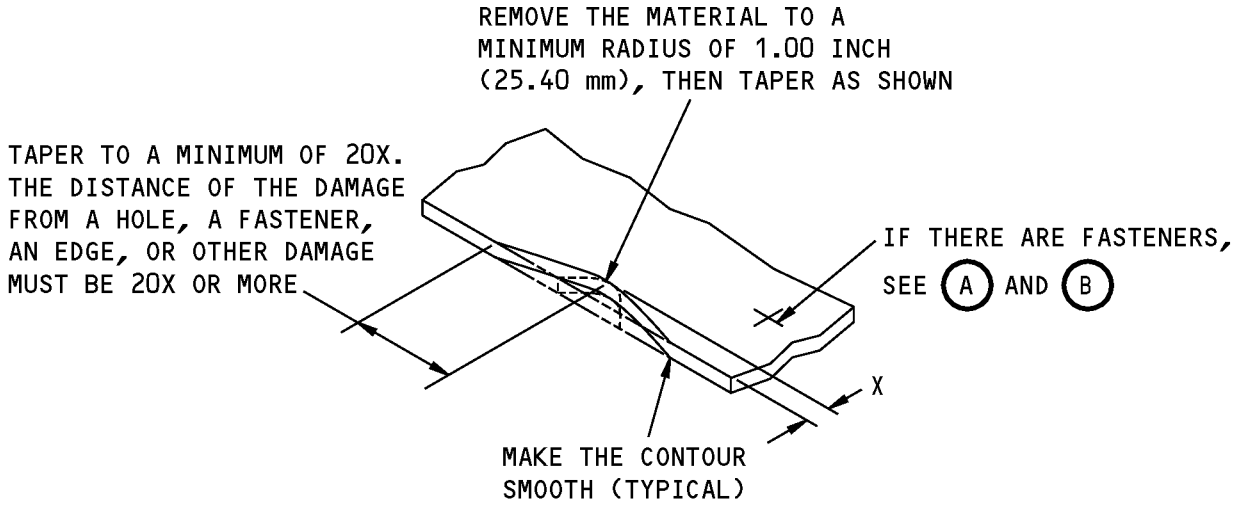
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

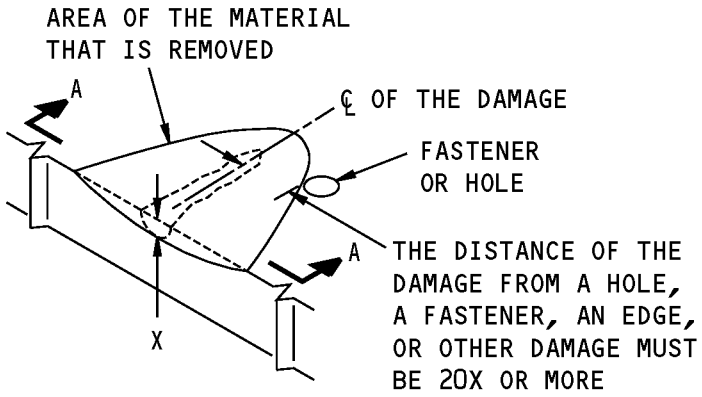


X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL SKIN OR WEB

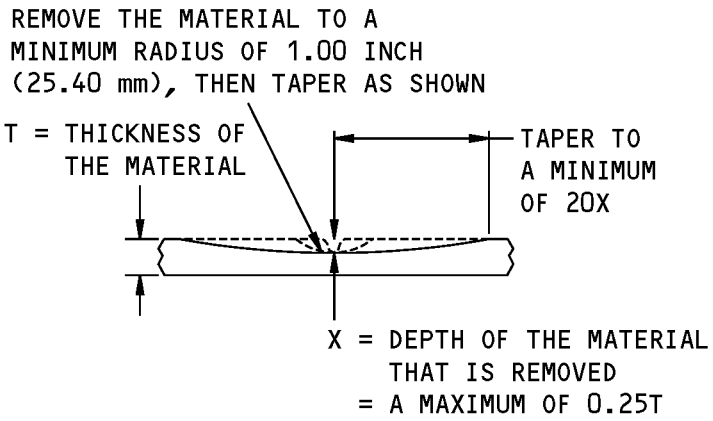
C

Allowable Damage Limits
Figure 105 (Sheet 1 of 2)



REMOVAL OF DAMAGED
MATERIAL ON A SURFACE

(D)



A–A

Allowable Damage Limits
Figure 105 (Sheet 2 of 2)

REPAIR 1 - ENGINE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANELS

1. Applicability

A. Repair 1 is applicable to damage on the skin panels of: (Refer to Strut Thumbnail and Forward Fairing Skin Panel Locations, Figure 201/REPAIR 1.)

(1) The Strut Thumbnail Fairing

(2) The Forward Fairing

2. General

A. Get access to the damaged area.

(1) Remove the applicable fairing panel, if necessary. Refer to AMM 54-52-01/401.

(a) Refer to 51-40-02 for fastener removal.

B. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 1 for the definitions of the length, width, and depth of damage.

D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.

E. The GFRP panels of the Strut Forward Fairing have BMS 8-336 expanded aluminum foil mesh or BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:

(1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.

(2) Seal the damage as given in 51-70-14.

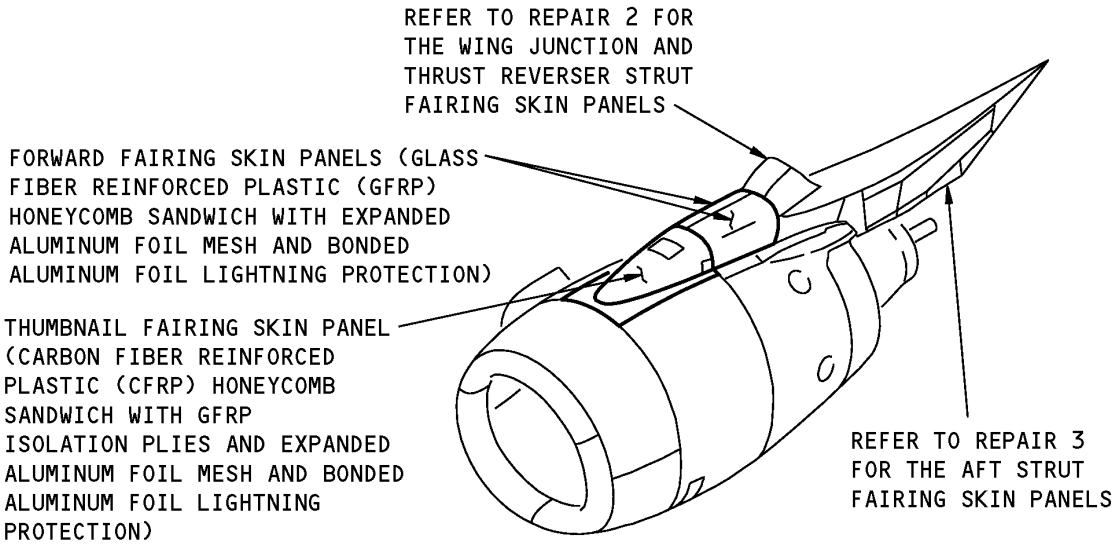
F. Do the repair as given in Paragraph 4./REPAIR 1

G. Put the fairing panel back to the initial condition, as applicable.

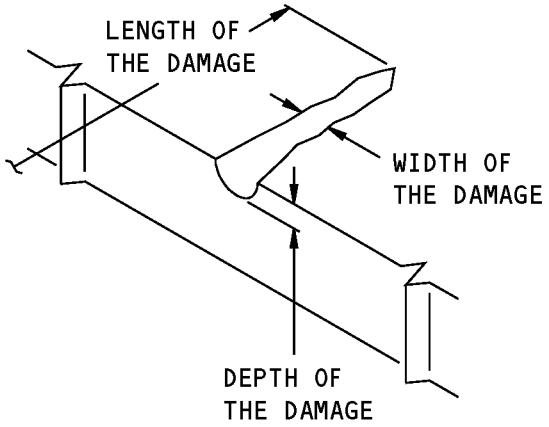
(1) Install the fairing panel as given in AMM 54-52-01/401, if it was removed.

(a) Refer to 51-40-02 for fastener installation.

(2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

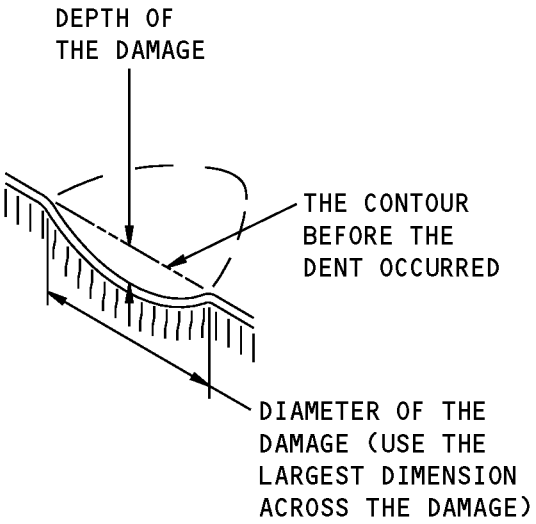


Strut Thumbnail and Forward Fairing Skin Panel Locations
Figure 201



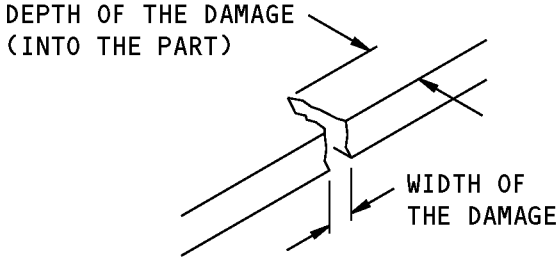
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

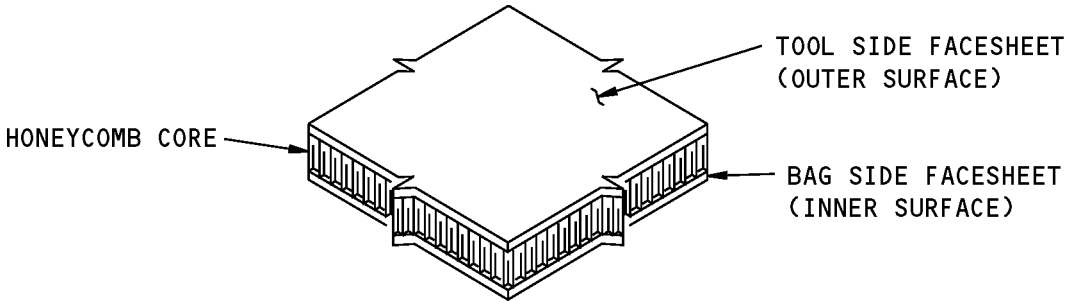
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 202



Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 54-52-01/401	Strut Forward Fairings - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. For dents that are a maximum of 2 inches (50.80 mm) in diameter and have no fiber damage and delamination, do the steps that follow:

(1) Fill the dent with BMS 5-28, Type 7 potting compound.

(2) Apply a fiberglass patch over the potted area as given in 51-70-04.

B. If Paragraph 4.A./REPAIR 1 is not applicable, then refer to:

(1) Table 201/REPAIR 1 for the repair data that is applicable to damage in the honeycomb core and the edgeband areas of the fairing skin panels.

C. For a Category B repair made with wet layup materials and cured at 150°F (66°C), do the steps that follow:

(1) Use one repair ply of carbon fiber reinforced plastic (CFRP) for each initial ply that was damaged.

(2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

(a) Put the first structural ply at ±45 degrees to the core ribbon direction.

(b) Put the second structural ply at 0 or 90 degrees.

(3) Add one glass fabric reinforced plastic (GFRP) isolation ply.

(a) Ply direction is optional.

(4) Examine a Category B repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

(a) If deterioration is found, replace a Category B repair with a Category A repair.

D. For a Category A repairs made with wet layup materials and cured at 200°F (93°C), do the steps that follow:

(1) Use one repair ply of CFRP for each initial ply that was damaged.

(2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

(a) Put the first structural ply at ±90 degrees to the core ribbon direction.

(b) Put the second structural ply at 90 degrees to the first.

(3) Add one glass GFRP isolation ply.

(a) Ply direction is optional.

E. For a Category A repairs made with preimpregnated layup materials and cured at 250°F (121°C), do the steps that follow:

(1) Use the same material, ply direction, and number of repair plies of CFRP for each initial ply that was damaged.

Table 201:

REPAIR DATA FOR THE 350°F (177°C) CURE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANEL FOR HONEYCOMB CORE AND EDGEBAND AREAS				
REPAIR TYPE	**CATEGORY B WET LAYUP**	**CATEGORY A WET LAYUP**	**CATEGORY A WET LAYUP**	**CATEGORY A PREIMPREGNATED LAYUP**
REPAIR CURE TEMPERATURE	**ROOM TEMPERATURE**	**150°F (66°C)**	**200°F (93°C)**	**250°F (121°C)**
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 2.0 inches (50.8 mm) in diameter - 10 percent of the smallest dimension across the panel at the damage location - One facesheet and the honey- comb core in depth One repair for each square foot (929 cm^2)	Damage that is a maximum of: - 4.0 inches (101.6 mm) in diameter - 20 percent of the smallest dimension across the panel at the damage loca tion - One facesheet and the honeycomb core in depth One repair for each square foot (929 cm^2)	Damage that is a maximum of: - 8.0 inches (203.2 mm) in diameter - 30 percent of the smallest dimension across the panel at the damage location One repair for each square foot (929 cm^2)	There are no size limits on the dimensions of the repair

REPAIR DATA FOR THE 350°F (177°C) CURE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANEL FOR HONEYCOMB CORE AND EDGEBAND AREAS				
REPAIR TYPE	**CATEGORY B WET LAYUP**	**CATEGORY A WET LAYUP**	**CATEGORY A WET LAYUP**	**CATEGORY A PREIMPREGNATED LAYUP**
REPAIR CURE TEMPERATURE	**ROOM TEMPERATURE**	**150°F (66°C)**	**200°F (93°C)**	**250°F (121°C)**
	6.0 inches (152.4 mm) minimum clearance from: -other repairs -fastener holes -panel edges	6.0 inches (152.4 mm) minimum clearance from: -other repairs -fastener holes -panel edges	6.0 inches (152.4 mm) minmum clearance from: -other repairs -fastener holes -panel edges	
REPAIR PROCEDURES	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.E

REPAIR 2 - WING JUNCTION AND THRUST REVERSER STRUT FAIRING SKIN PANELS

1. Applicability

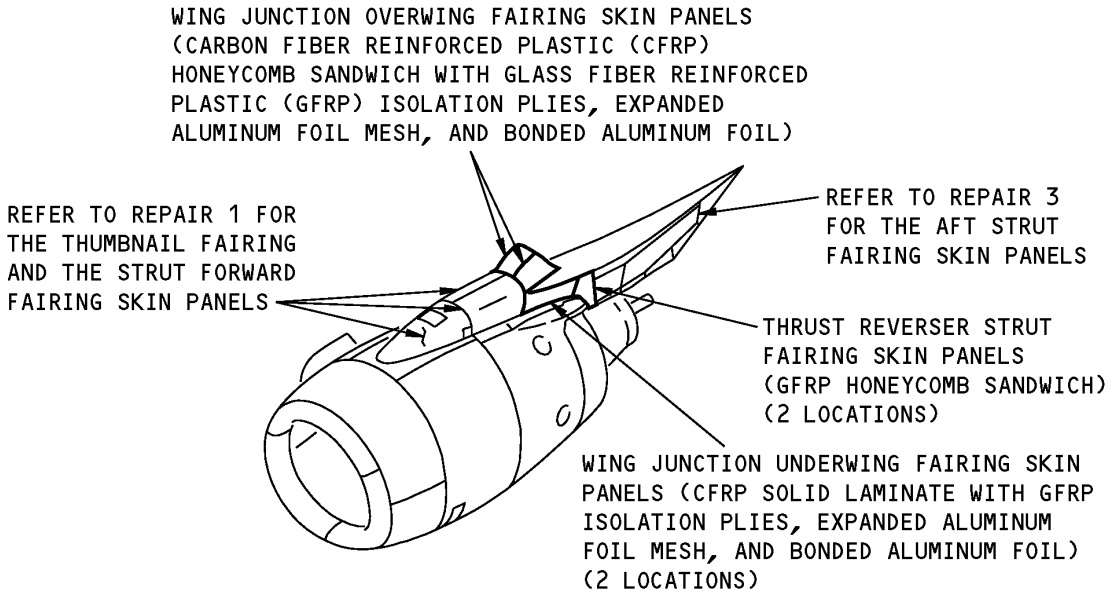
A. Repair 2 is applicable to damage on the skin panels of:

(1) The Wing Junction Fairing which includes:

(a) The left and right Overwing Fairings

(b) The inboard and outboard Underwing Fairings.

(2) The left and right Thrust Reverser Strut Fairings.



Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations
Figure 201

2. General

A. Get access to the damaged area.

(1) Remove the applicable fairing panel, if necessary.

(a) Refer to AMM 54-52-03/401 for the Wing Junction Overwing and Underwing Fairings.

(b) Refer to AMM 54-53-02/401 for the Thrust Reverser Strut Fairings.

(c) Refer to 51-40-02 for fastener removal.

B. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 2 for the definitions of the length, width, and depth of damage.

D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 2 for the definitions of the facesheets of a honeycomb core area.

E. The CFRP panels of the Wing Junction Overwing and Underwing Fairings have BMS 8-336 expanded aluminum foil mesh and BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:

(1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.

(2) Seal the damage as given in 51-70-14.

F. Do the repair as given in Paragraph 4./REPAIR 2

G. Put the fairing panel back to the initial condition, as applicable.

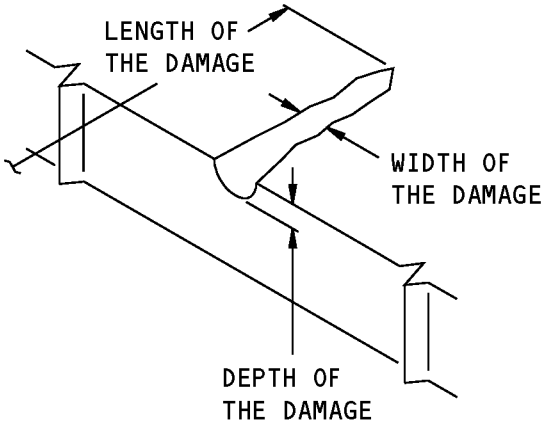
(1) Install the fairing panel if it was removed.

(a) Refer to AMM 54-52-03/401 for the Wing Junction Overwing and Underwing Fairings.

(b) Refer to AMM 54-53-02/401 for the Thrust Reverser Strut Fairing Panels.

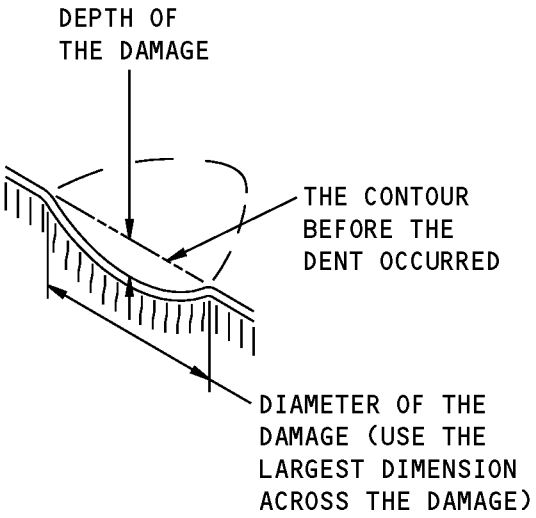
(c) Refer to 51-40-02 for fastener removal.

(2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.



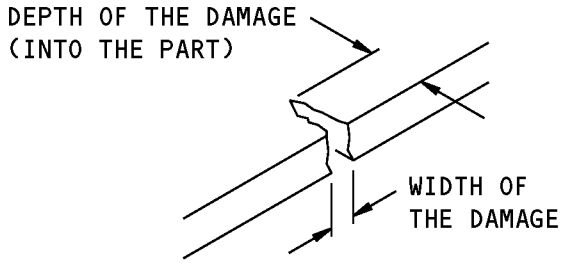
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

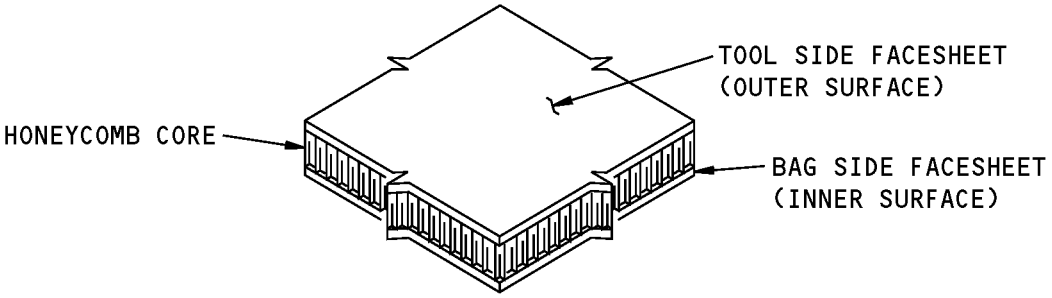
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 202



Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 54-52-03/401	Wing Junction Fairings - Removal/Installation
AMM 54-53-02/401	Strut Access Panels - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. For dents that are a maximum of 2 inches (50.8 mm) in diameter and have no fiber damage and delamination, do the steps that follow:

(1) Fill the dent with BMS 5-28, Type 7 potting compound.

(2) Apply a fiberglass patch over the potted area as given in 51-70-04.

B. If Paragraph 4.A./REPAIR 2 is not applicable, then refer to:

(1) Table 201/REPAIR 2 for the repair data that is applicable to damage in the honeycomb core areas of the fairing skin panels.

(2) Table 202/REPAIR 2 for the repair data that is applicable to damage in the edgeband areas of honeycomb core panels.

(3) Table 203/REPAIR 2 for the repair data that is applicable to damage in solid laminate panels.

C. For an interim repair (Category B) made with wet layup materials and cured at 150°F (66°C), do the steps that follow:

(1) Use one repair ply of carbon fiber reinforced plastic (CFRP) for each initial ply that was damaged.

(2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

(a) Put the first structural ply at ±45 degrees to the core ribbon direction.

(b) Put the second structural ply at 0 or 90 degrees.

(3) Add one glass fabric reinforced plastic (GFRP) isolation ply. Ply direction is optional.

(4) Examine an interim repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

(a) If deterioration is found, replace an interim repair with a permanent repair.

D. For a permanent repair (Category A) made with wet layup materials and cured at 200°F (93°C), do the steps that follow:

(1) Use one repair ply of CFRP for each initial ply that was damaged.

(2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

(a) Put the first structural ply at ±45 degrees to the core ribbon direction.

(b) Put the second structural ply at 90 degrees to the first.

(3) Add one glass GFRP isolation ply. Ply direction is optional.

E. For a permanent repair made with preimpregnated layup materials and cured at 250°F (121°C), do the steps that follow:

(1) Use one repair ply of CFRP for each initial ply that was damaged.

(2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

(a) Put the first structural ply at ±45 degrees to the core ribbon direction.

(b) Put the second structural ply at 90 degrees to the first.

(3) Add one glass GFRP isolation ply. Ply direction is optional.

F. For a permanent repair made with preimpregnated layup materials and cured at 350°F (177°C), do the steps that follow:

(1) Use the same material, ply direction, and number of repair plies of CFRP for each initial ply that was damaged.

Table 201:

REPAIR DATA FOR THE 350°F (177°C) CURE HONEYCOMB CORE AREAS				
REPAIR TYPE	**INTERIM REPAIR WET LAYUP**	**PERMANENT REPAIR WET LAYUP**	**PERMANENT REPAIR PREIMPREG-NATED LAYUP**	**PERMANENT REPAIR PREIMPREGNATED LAYUP**
REPAIR CURE TEMPERATURE	**150°F (66°C)**	**200°F (93°C)**	**250°F (121°C)**	**350°F (177°C)**
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 4.0 inches (101.6 mm) in diameter - 20 percent of the smallest dimension across the honeycomb core in the damage location - One facesheet and the honey- comb core in depth	Damage that is a maximum of: - 8.0 inches (203.2 mm) in diameter - 30 percent of the smallest dimension across the honeycomb core in the damage location	Damage that is a maximum of: - 10.0 inches (254.0 mm) in diameter - 50 percent of the smallest dimension across the honeycomb core in the damage location	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	Paragraph 4.C and SRM 51-70-04	Paragraph 4.D and SRM 51-70-04	Paragraph 4.E and SRM 51-70-05	Paragraph 4.E and SRM 51-70-05

Table 202:

REPAIR DATA FOR THE 350°F (177°C) CURE SOLID LAMINATE AND EDGEBAND AREAS				
REPAIR TYPE	**INTERIM REPAIR WET LAYUP**	**PERMANENT REPAIR WET LAYUP**	**PERMANENT REPAIR PREIMPREG-NATED LAYUP**	**PERMANENT REPAIR PREIMPREGNATED LAYUP**
REPAIR CURE TEMPERATURE	**150°F (66°C)**	**200°F (93°C)**	**250°F (121°C)**	**350°F (177°C)**
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 20 percent of the length of the edgeband on a side - 20 percent of the cross-sectional area through the edgeband One repair for each square foot (0.093 m^2) of area	Damage that is a maximum of: - 30 percent of the length of the edgeband on a side - 30 percent of the cross-sectional area through the edgeband	Damage that is a maximum of: - 50 percent of the length of the edgeband on a side - 50 percent of the cross-sectional area through the edgeband	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	Paragraph 4.C and SRM 51-70-04	Paragraph 4.D and SRM 51-70-04	Paragraph 4.E and SRM 51-70-05	Paragraph 4.E and SRM 51-70-05

Table 203:

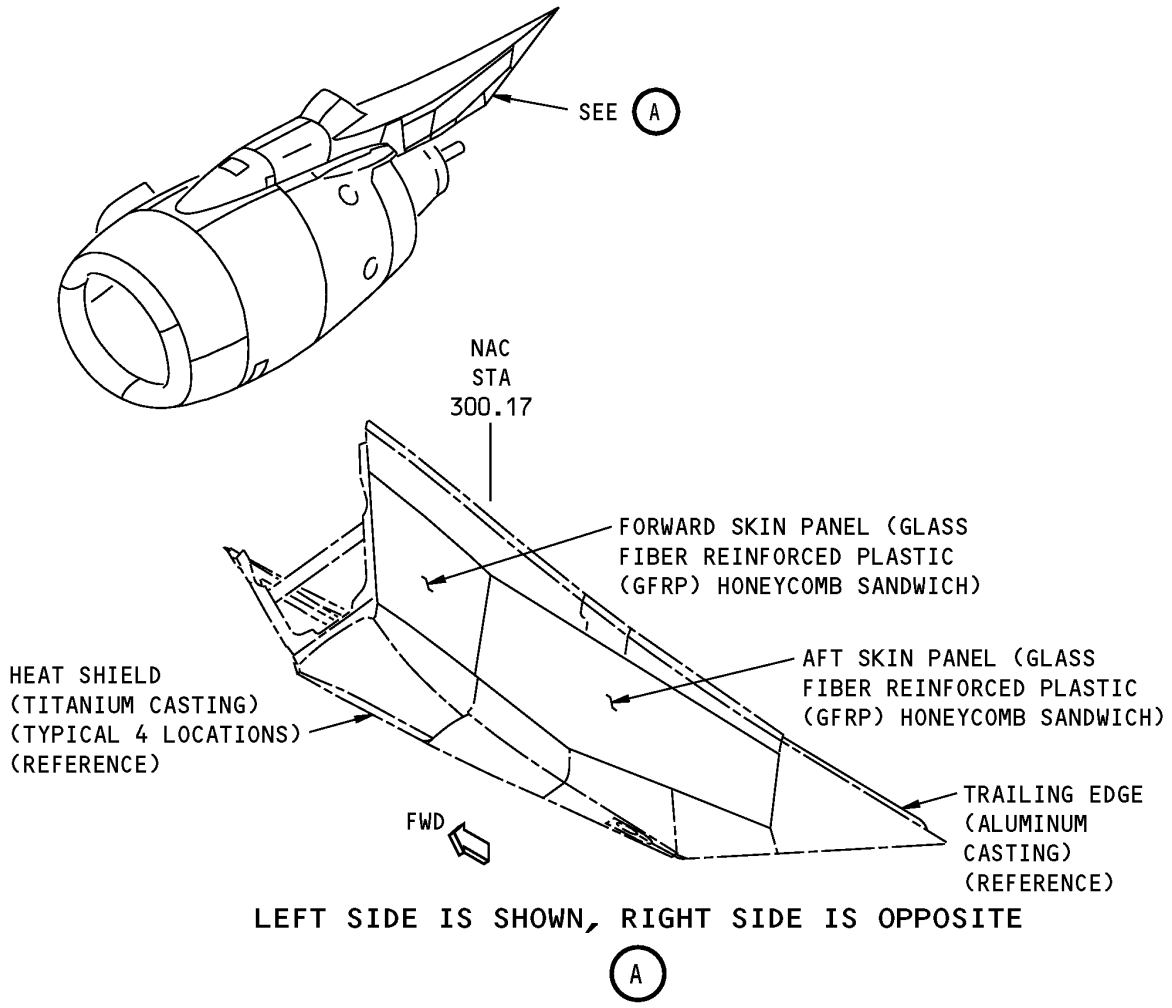
REPAIR DATA FOR THE 350°F (177°C) CURE SOLID LAMINATE PANELS				
REPAIR TYPE	**INTERIM REPAIR WET LAYUP**	**PERMANENT REPAIR WET LAYUP**	**PERMANENT REPAIR PREIMPREG-NATED LAYUP**	**PERMANENT REPAIR PREIMPREGNATED LAYUP**
REPAIR CURE TEMPERATURE	**150°F (66°C)**	**200°F (93°C)**	**250°F (121°C)**	**350°F (177°C)**
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 20 percent of the length of the panel on a side - 20 percent of the cross-sectional area through the panel One repair for each square foot (0.093 m^2) of area	Damage that is a maximum of: - 30 percent of the length of the panel on a side - 30 percent of the cross-sectional area through the panel	Damage that is a maximum of: - 50 percent of the length of the panel on a side - 50 percent of the cross-sectional area through the panel	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	Paragraph 4.C and SRM 51-70-04	Paragraph 4.D and SRM 51-70-04	Paragraph 4.E and SRM 51-70-05	Paragraph 4.E and SRM 51-70-05

REPAIR 3 - ENGINE STRUT AFT FAIRING SKIN PANELS

1. Applicability

A. Repair 3 is applicable to damage on the forward and aft composite skin panels on the engine strut aft fairing as shown in Engine Strut Aft Fairing Skin Locations, Figure 201/REPAIR 3.

B. Repair 3 is applicable to damage that is more than the limits permitted in Allowable Damage 3. Refer to Allowable Damage 3 for the type and size of damage that is permitted.



Engine Strut Aft Fairing Skin Locations
Figure 201

2. General

A. Get access to the damaged area.

(1) Remove the parts if necessary.

(a) Refer to AMM 54-53-03/401 for removal of the engine strut aft fairing skin panels.

(b) Refer to 51-40-02 for the data on fastener removal.

B. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

(1) Refer to Figure 202/REPAIR 3 for the definitions of the length, width, and depth of damage.

(2) Refer to Figure 203/REPAIR 3 for the definitions of the facesheets of a honeycomb core area.

C. Do the repair as given in Paragraph 4./REPAIR 3

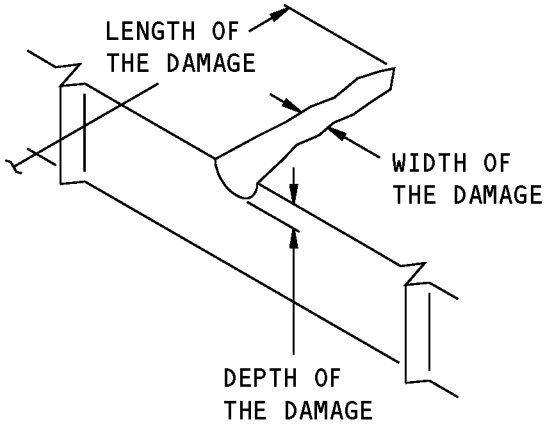
D. Put the fairing skin panels back to the initial condition, as applicable.

(1) Install the parts if they were removed.

(a) Refer to AMM 54-53-03/401 for installation of the aft strut fairing skin panels.

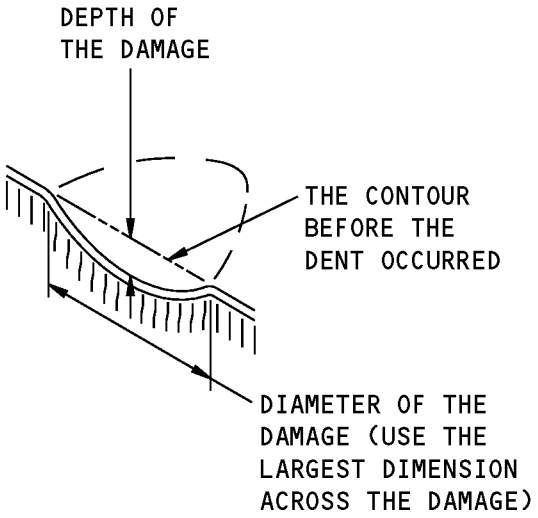
(b) Refer to 51-40-02 for information on fastener installation.

(2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane.



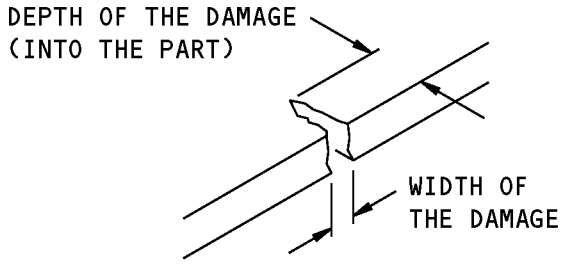
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

A



SIZE DEFINITIONS FOR
DENT DAMAGE

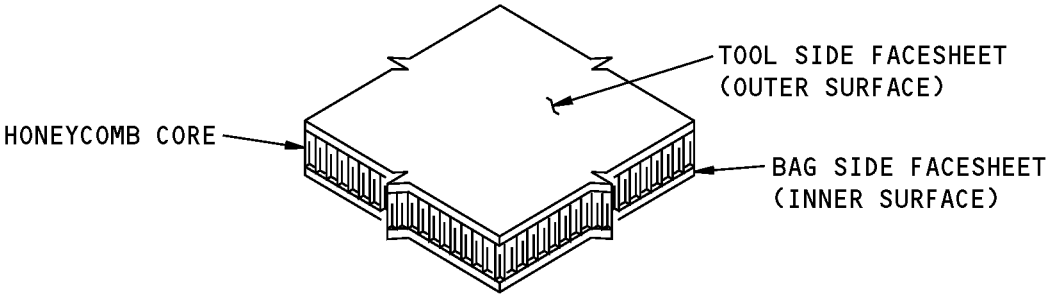
B



SIZE DEFINITIONS FOR
EDGE DAMAGE

C

Definitions of the Damage Size
Figure 202



Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
AMM 54-53-03/401	Aft Strut Fairing Skin Panels - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

A. For dents that are a maximum of 3.0 inches (76.2 mm) in diameter and have no fiber damage and delamination, do the steps that follow:

(1) Fill the dent with BMS 5-28, Type 7 potting compound.

(2) Apply a fiberglass patch over the potted area as given in 51-70-04.

B. If Paragraph 4.A./REPAIR 3 is not applicable, then refer to:

(1) Table 201/REPAIR 3 for the repair data that is applicable to damage in the honeycomb sandwich areas of the aft strut fairing skin panels

(2) Table 202/REPAIR 3 for the repair data that is applicable to damage in the edgeband areas of the aft strut fairing skin panels.

C. For repairs made with wet layup materials, do as follows, as applicable:

(1) Use one repair ply for each initial ply that was damaged.

(2) Add two structural plies of fabric for each facesheet that is repaired. Put one structural ply at ±45 degrees to the core ribbon direction and the other ply at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

(3) Examine Category B repairs after each interval of 800 flight hours or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures. If deterioration is found, then the repair must be replaced with a Category A repair.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

D. For repairs made with preimpregnated layup materials, use the same number of repair plies as the number of initial plies that were damaged.

Table 201:

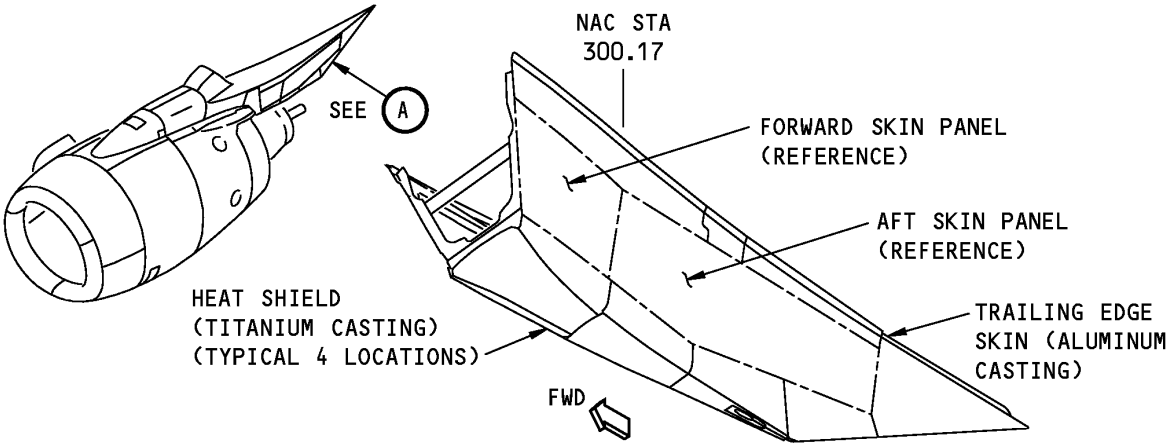
REPAIR DATA FOR THE 350°F (177°C) CURE AFT STRUT FAIRING SKIN PANELS FOR AREAS OTHER THAN THE EDGEBANDS			
REPAIR TYPE	**CATEGORY B WET LAYUP**	**CATEGORY A WET LAYUP**	**CATEGORY A PREIMPREGNATED LAYUP**
REPAIR CURE TEMPERATURE	150°F (66°C) CURE	200°F (93°C) CURE	350°F (177°C) CURE
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 5.0 inches (127.0 mm) in diameter - 30 percent of the smallest dimension across the panel at the damage location - One facesheet and honeycomb core in depth - One repair in each square foot (929 cm square) of area - 6.0 inches (152.4 mm) mini- mum clearance from: - other repairs - fastener holes - panel edges	Damage that is a maximum of: - 6.0 inches (152.4 mm) in diameter - 50 percent of the smallest dimension across the panel at the damage location - One repair in each square foot (929 cm square) of area - 2.0 inches (50.80 mm) mini- mum clearance from: - other repairs - fastener holes - panel edges	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D

Table 202:

REPAIR DATA FOR THE 350°F (177°C) CURE EDGEBANDS FOR THE AFT STRUT FAIRING SKIN PANELS			
REPAIR TYPE	**CATEGORY B WET LAYUP**	**CATEGORY A WET LAYUP**	**CATEGORY A PREIMPREGNATED LAYUP**
REPAIR CURE TEMPERATURE	150°F (66°C) CURE	200°F (93°C) CURE	350°F (177°C) CURE
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 15 percent of the cross- sectional area of the edgeband at the damage location - 10 percent of length of the edgeband on the side of the damage	There are no size limits on the dimensions of the repair	There are no size limits on the dimensions of the repair

REPAIR DATA FOR THE 350°F (177°C) CURE EDGEBANDS FOR THE AFT STRUT FAIRING SKIN PANELS			
REPAIR TYPE	**CATEGORY B WET LAYUP**	**CATEGORY A WET LAYUP**	**CATEGORY A PREIMPREGNATED LAYUP**
REPAIR PROCEDURES	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D

REPAIR 4 - ENGINE STRUT AFT FAIRING - TRAILING EDGE SKIN AND HEAT SHIELD

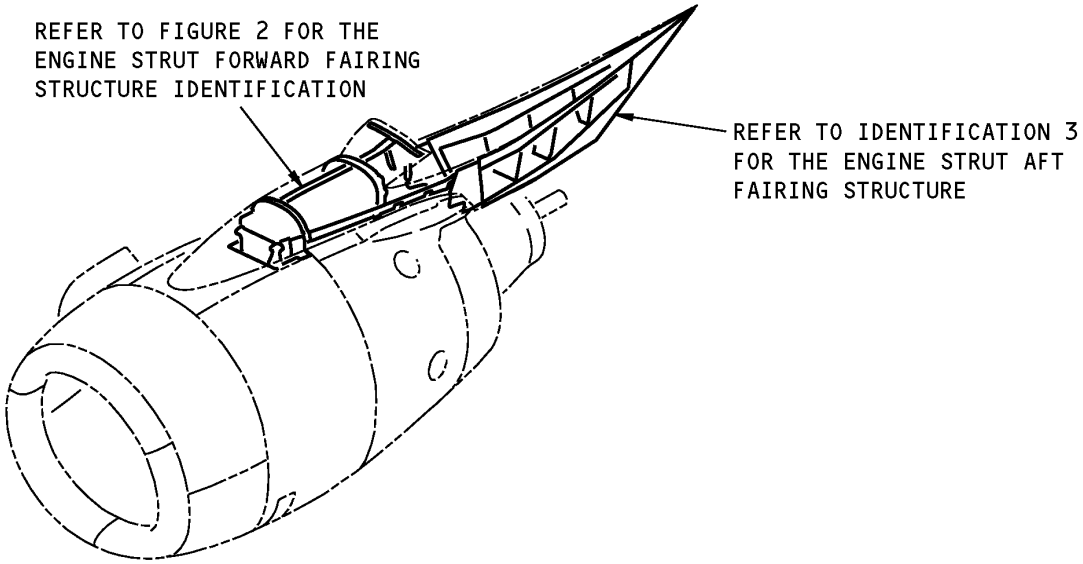


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

A

Engine Strut Aft Fairing Trailing Edge Skin and Heat Shield Locations
Figure 201

IDENTIFICATION 1 - ENGINE STRUT FORWARD FAIRING STRUCTURE

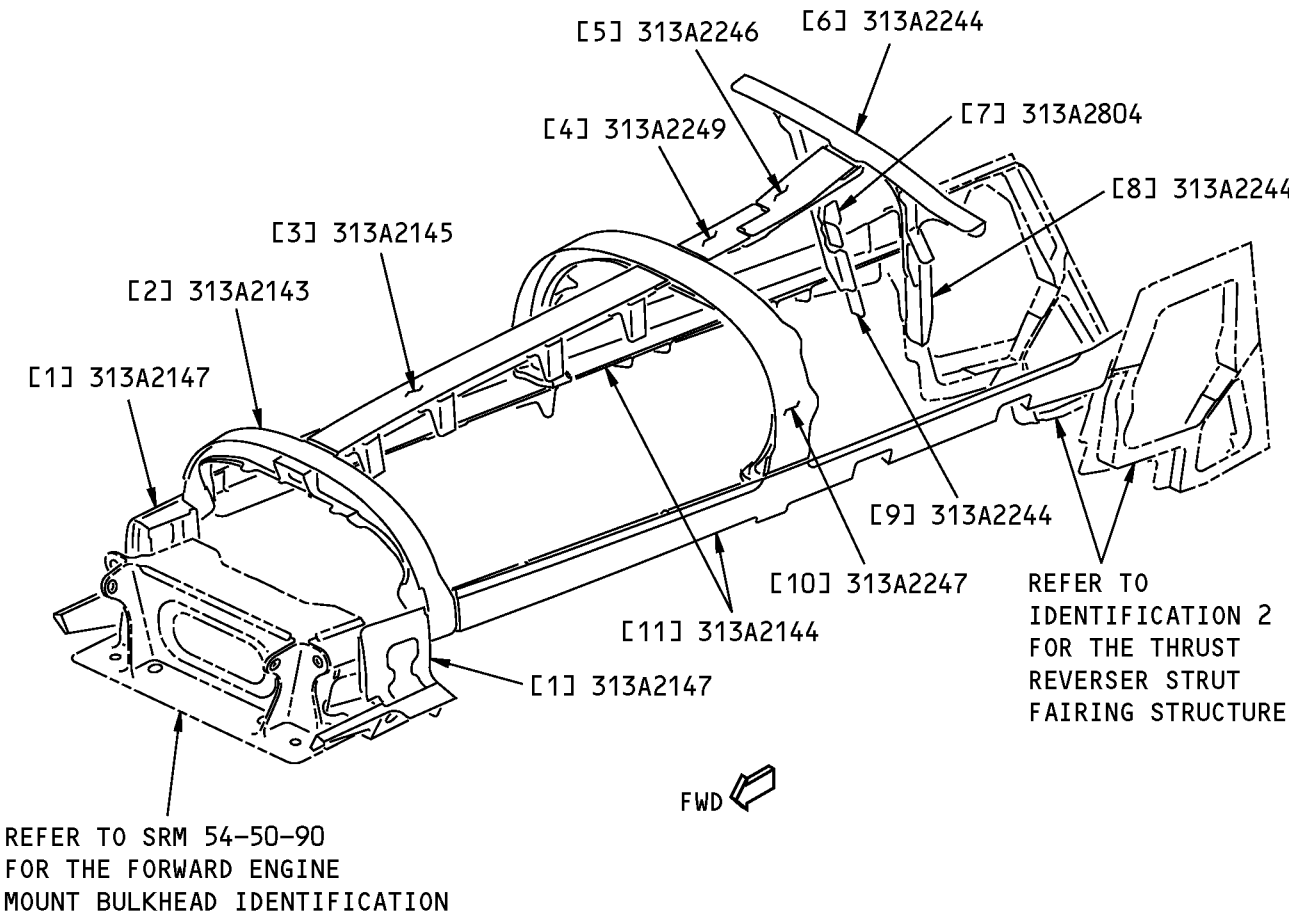


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut Forward Fairing Structure Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2006	Strut Fairing Structure Assembly
313A2143	Strut Forward Fairing Support Frame Assembly
313A2240	Wing Junction Fairing Support Installation



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

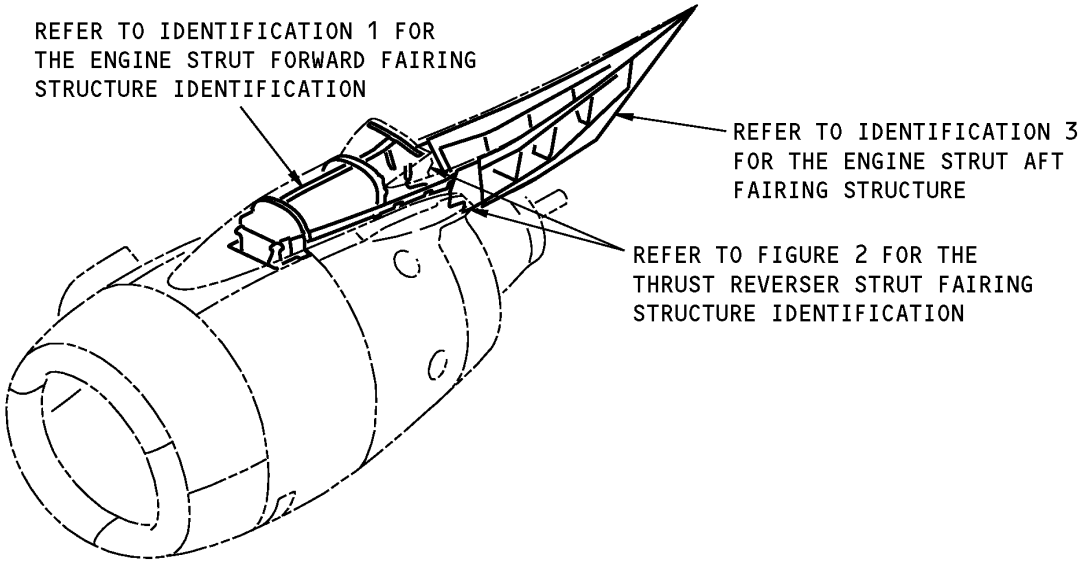
Engine Strut Forward Fairing Structure Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Support Fitting - Access Panel (2 locations)	2.7 (68.6)	2124-T851 machined plate as given in QQ-A-250/29	
[2]	Forward Frame	3.8 (96.5)	2124-T851 machined plate as given in QQ-A-250/29	
[3]	Forward Support	3.0 (76.2)	2124-T851 machined plate as given in QQ-A-250/29	
[4]	Support	3.1 (78.7)	2124-T851 machined plate as given in QQ-A-250/29	
[5]	Support	3.1 (78.7)	2124-T851 machined plate as given in QQ-A-250/29	
[6]	Upper Frame	2.00 (50.8)	2124-T851 machined plate as given in QQ-A-250/29	
[7]	Bracket	1.10 (27.9)	BAC1510-1317 2024-T8511 extrusion as given in QQ-A-200/3 (Optional: 2024-T851 machined bar as given in QQ-A-225/6, or 2124-T851 plate as given in QQ-A-250/29)	
[8]	Lower Outboard Frame (2 locations)		BAC1503-100161 2024-T8511 extrusion as given in QQ-A-200/3 (Optional: 2024-T851 machined bar as given in QQ-A-225/6, or 2124-T851 plate as given in QQ-A-250/29)	
[9]	Lower Inboard Frame (2 locations)		BAC1503-100161 2024-T8511 extrusion as given in QQ-A-200/3 (Optional: 2024-T851 machined bar as given in QQ-A-225/6, or 2124-T851 plate as given in QQ-A-250/29)	
[10]	Aft Frame	3.8 (96.5)	2124-T851 machined plate as given in QQ-A-250/29	
[11]	Skate Angle (2 locations)	3.2 (81.3)	7050-T7451 machined plate as given in AMS 4050	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

IDENTIFICATION 2 - THRUST REVERSER STRUT FAIRING STRUCTURE

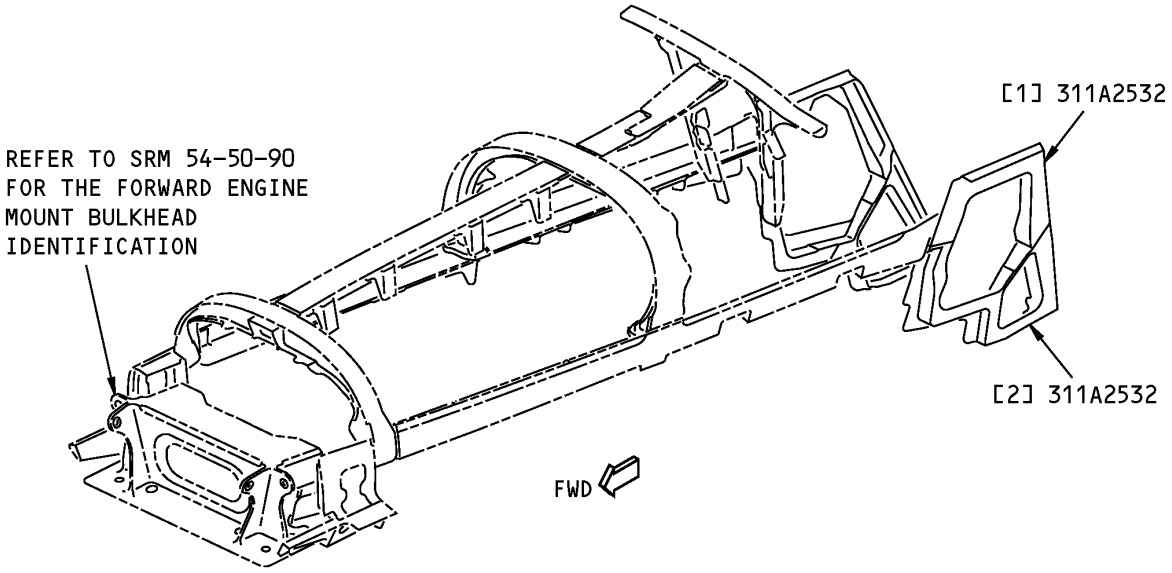


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Thrust Reverser Strut Fairing Structure Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2530	Thrust Reverser Strut Fairing Installation
311A2533	Thrust Reverser Strut Fairing Structure Assembly



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

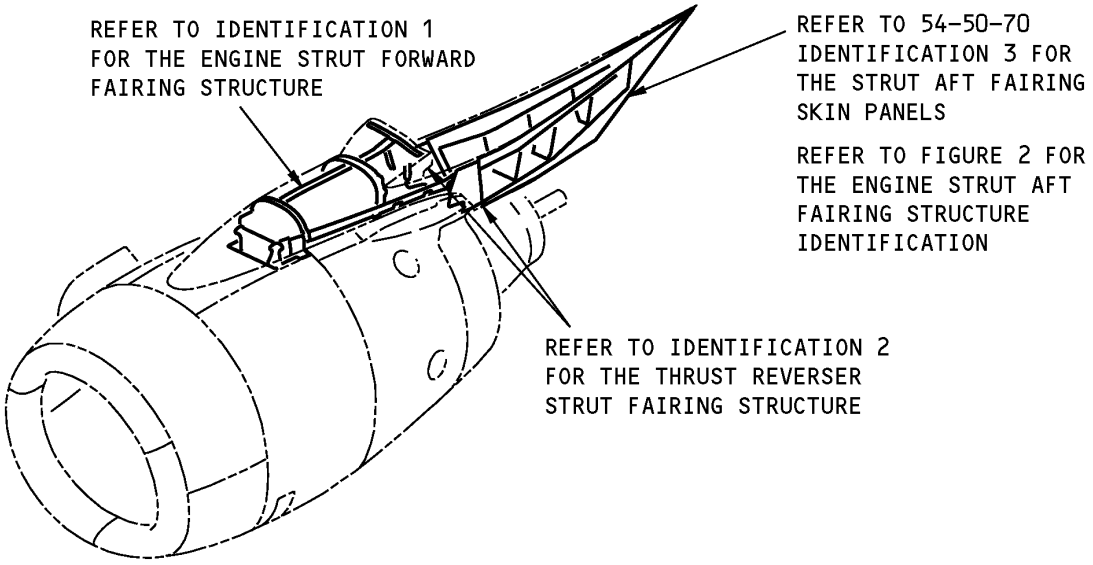
Thrust Reverser Strut Fairing Structure Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Upper Fitting - Thrust Reverser Strut Fairing Support		2124-T851 machined plate as given in QQ-A-250/29	
[2]	Lower Fitting - Thrust Reverser Strut Fairing Support		2124-T851 machined plate as given in QQ-A-250/29	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

IDENTIFICATION 3 - ENGINE STRUT AFT FAIRING STRUCTURE

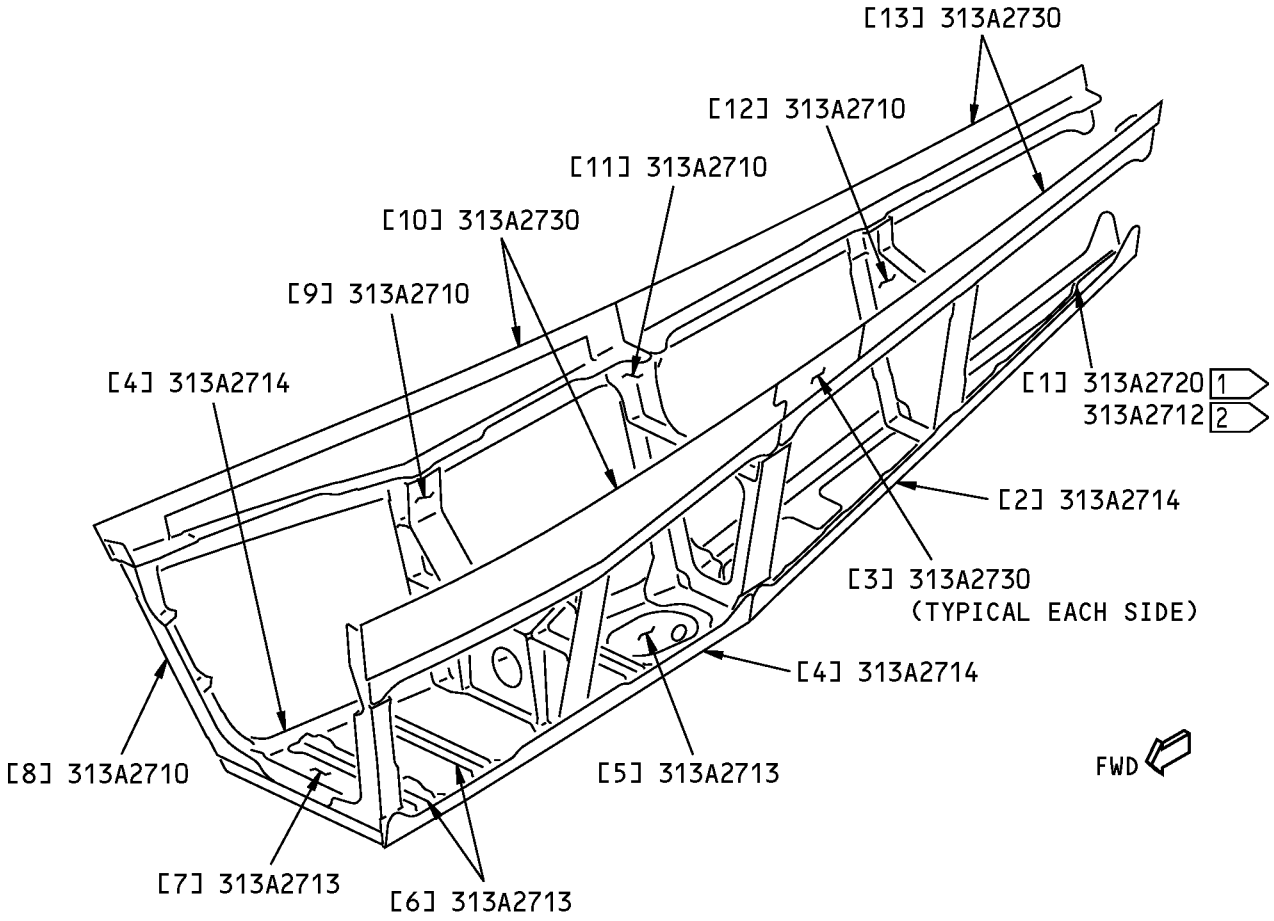


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut Aft Fairing Structure Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2006	Strut Fairing Structure Assembly
313A2700	Strut Aft Fairing Frame and Spar Assembly



NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

1 CUM LINE NUMBER FROM 1 THRU 1176

2 CUM LINE NUMBER 1177 AND ON

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

Engine Strut Aft Fairing Structure Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Aft Web Assembly			
	Aft Web	0.100 [2.54]	2219-T81 sheet as given in given in QQ-A-250/30	
	Lower Aft Chord RH		BAC1514-3065 2024-T8511 extrusion as given in QQ-A-200/3	1 THRU 1176
	Lower Aft Chord RH		2124-T851 machined plate as given in QQ-A-250/29	1177 AND ON
[2]	Lower Aft Chord LH		BAC1514-3065 2024-T8511 extrusion as given in QQ-A-200/3	1 THRU 1176
	Lower Aft Chord LH		2219-T81 sheet as given in QQ-A-250/30	1177 AND ON
[3]	Cover Plate	0.160 (4.06)	2024-T851 machined plate as given in QQ-A-250/4	
[4]	Lower Forward Chords, LH and RH		BAC1514-3064 2024-T8511 extrusion as given in QQ-A-200/3	1 THRU 1176
	Lower Forward Chords, LH and RH		2124-T851 machined plate as given in QQ-A-250/29	1177 AND ON
[5]	Sump	0.063 (1.60)	625 nickel alloy as given in AMS 5599	
[6]	Tee		BAC1505-100416 2219-T8511 extrusion as given in BMS 7-118	
[7]	Forward Web	0.100 (2.54)	2219-T81 sheet as given in QQ-A-250/30	
[8]	Number 1 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[9]	Number 2 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[10]	Upper Forward Chords, LH and RH		2124-T851 machined plate as given in QQ-A-250/29	
[11]	Number 3 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[12]	Number 4 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[13]	Upper Aft Chords LH and RH		2124-T851 machined plate as given in QQ-A-250/29	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - ENGINE STRUT FORWARD FAIRING STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the structure of the Engine Strut Forward Fairings as shown in Engine Strut Forward Fairing Structure Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

B. After you remove the damage, do as follows:

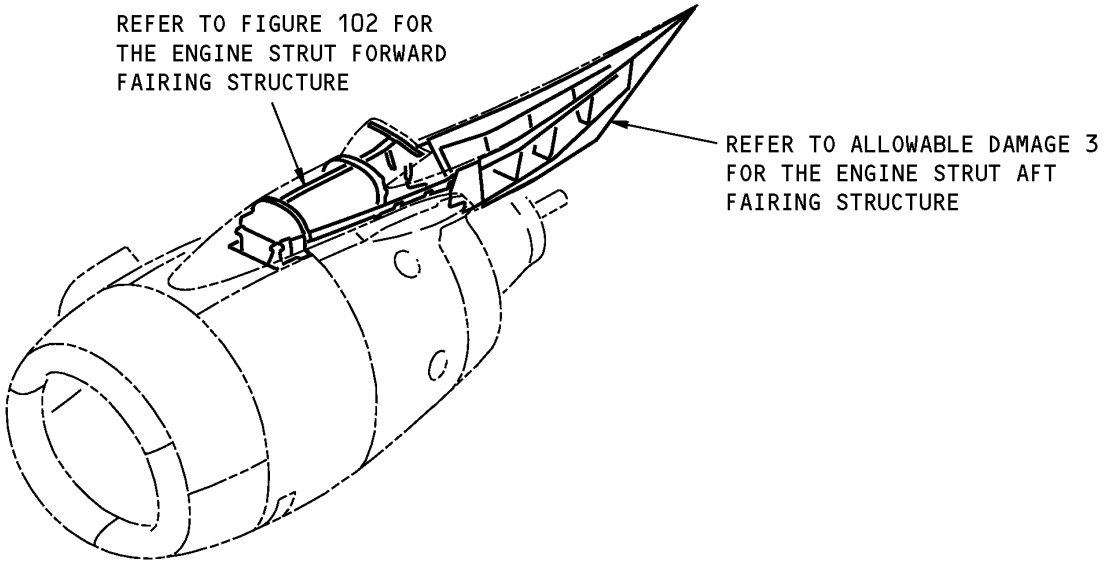
(1) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.

(2) Apply the finishes that follow to the reworked surfaces:

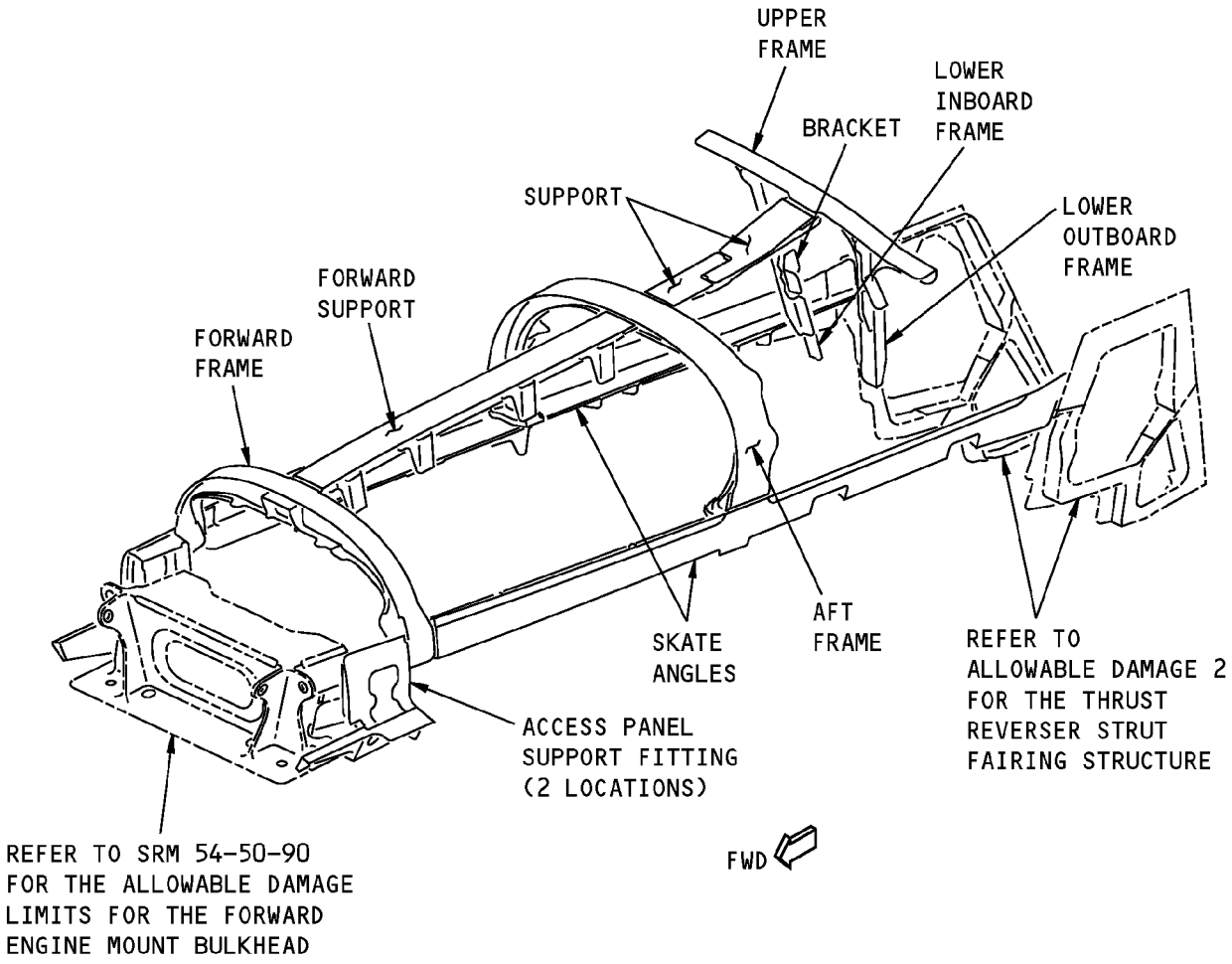
(a) Apply one layer of BMS 10-11, Type I primer. Refer to SOPM 20-41-02.

(b) Apply one layer of BMS 10-60, Type II enamel. Refer to AMM PAGEBLOCK 51-21-99/701.

(c) Apply one layer of BMS 10-11, Type II enamel to the Aft Frame, Skate Frames, and Upper Frames of the Support Assembly. Refer to AMM PAGEBLOCK 51-21-99/701.



Engine Strut Forward Fairing Structure Location
Figure 101



NOTE: ALL PARTS ARE MADE OF MACHINED OR EXTRUDED ALUMINUM.

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

Engine Strut Forward Fairing Structure
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Cracks:

(1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , E , and G .

(a) The damage must not be nearer than 2D (D = fastener diameter) from more than one fastener in each group of ten fasteners.

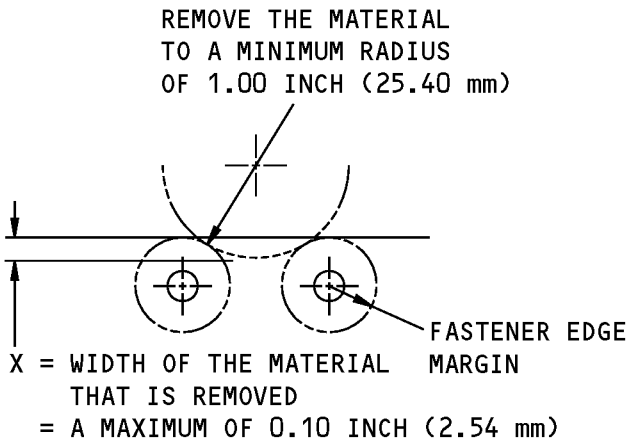
B. Nicks, Gouges, Scratches, and Corrosion:

(1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and G .

(a) Install shim material the surface blendout areas so it will be flush with the surface of an external flange.

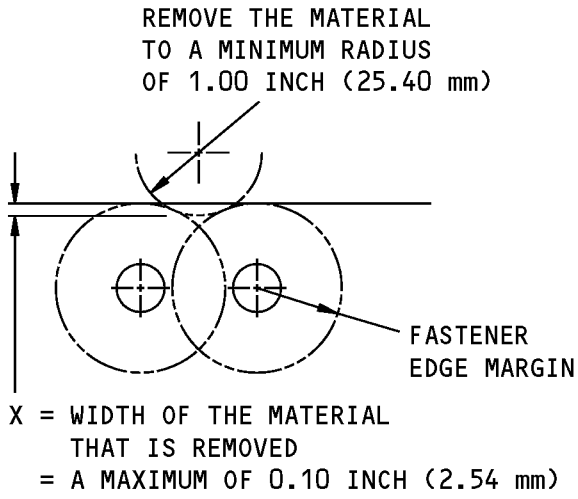
C. Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail H .

D. Holes and Punctures are not permitted.



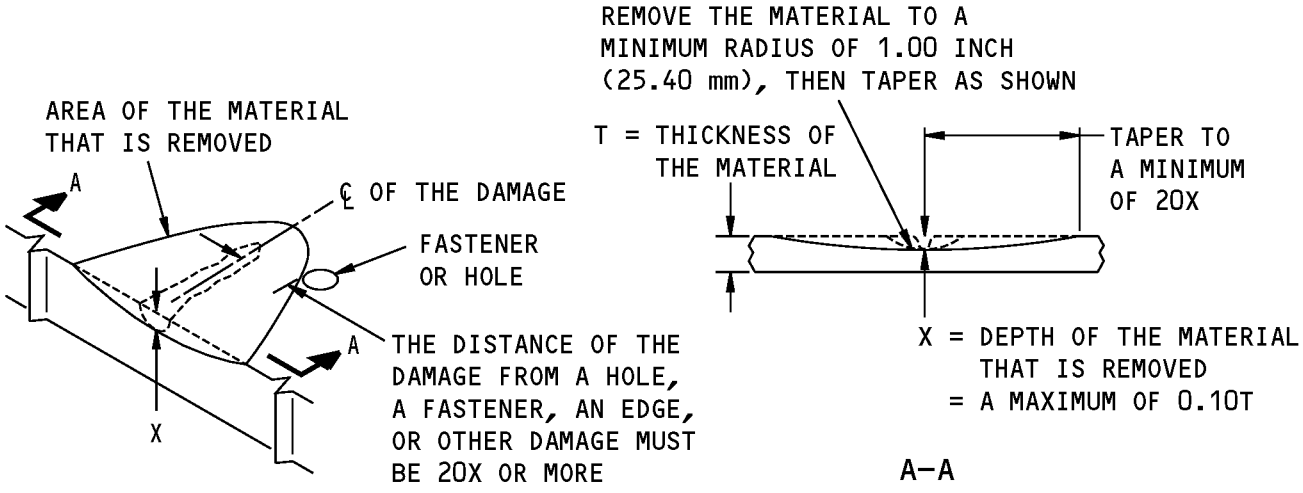
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

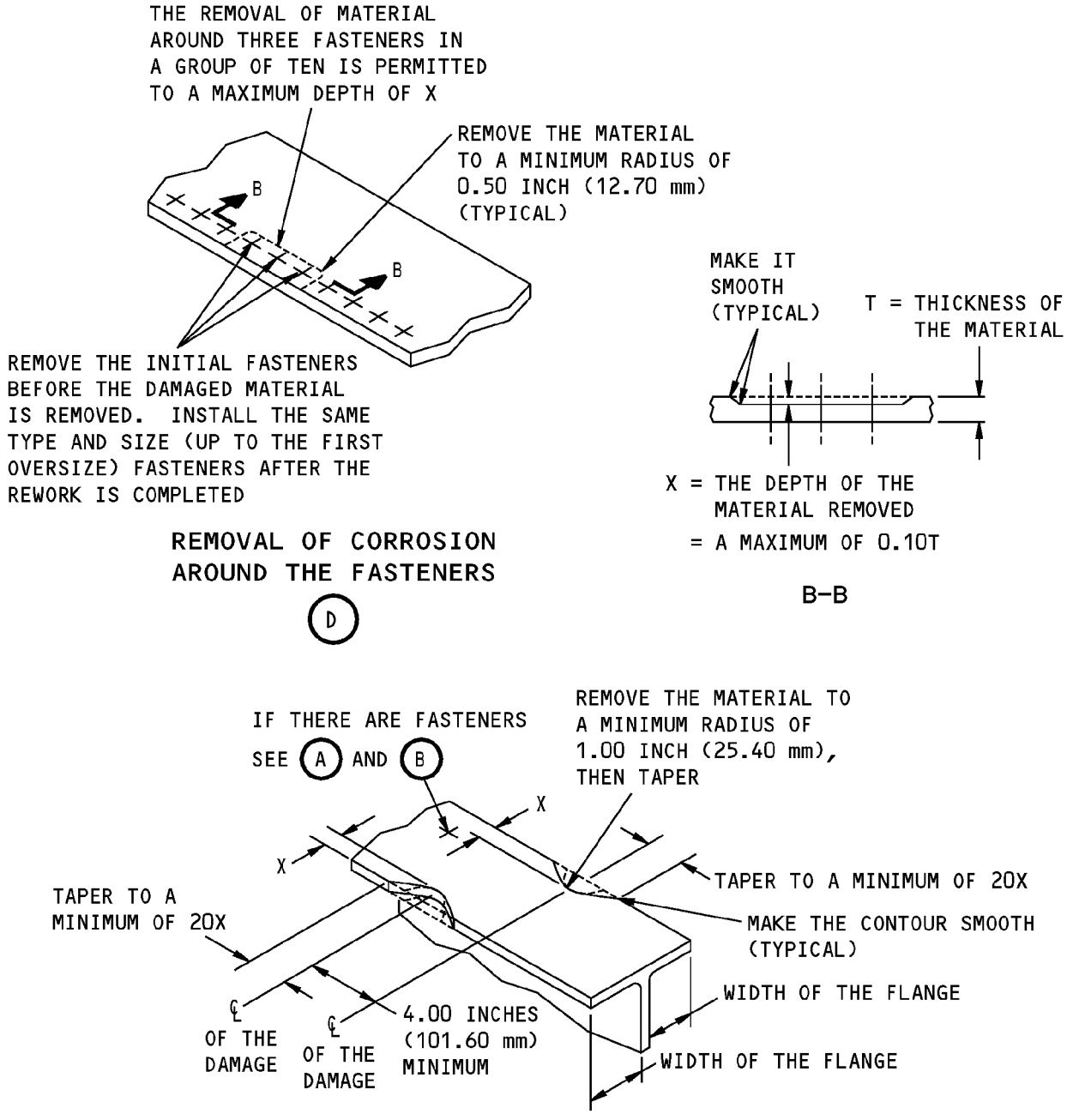
B



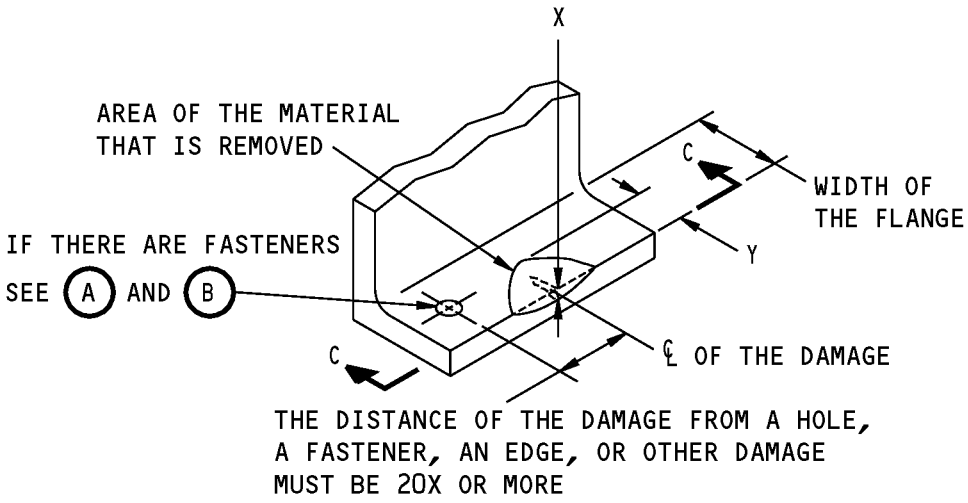
REMOVAL OF DAMAGED MATERIAL ON A SURFACE

C

Allowable Damage Limits
Figure 103 (Sheet 1 of 4)



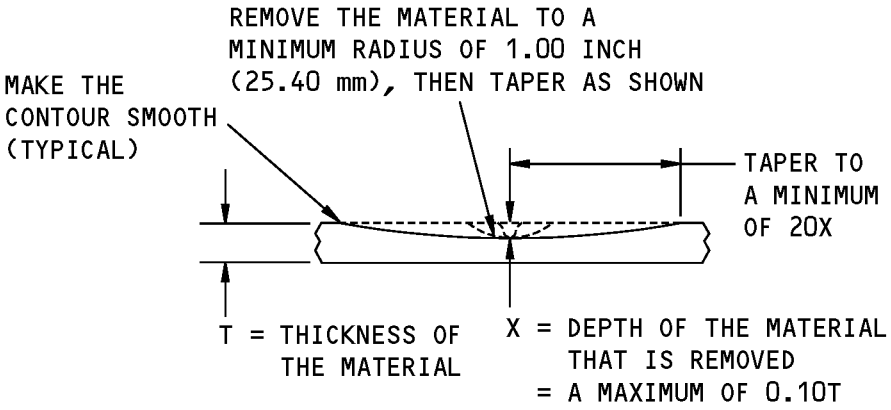
Allowable Damage Limits
Figure 103 (Sheet 2 of 4)



Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

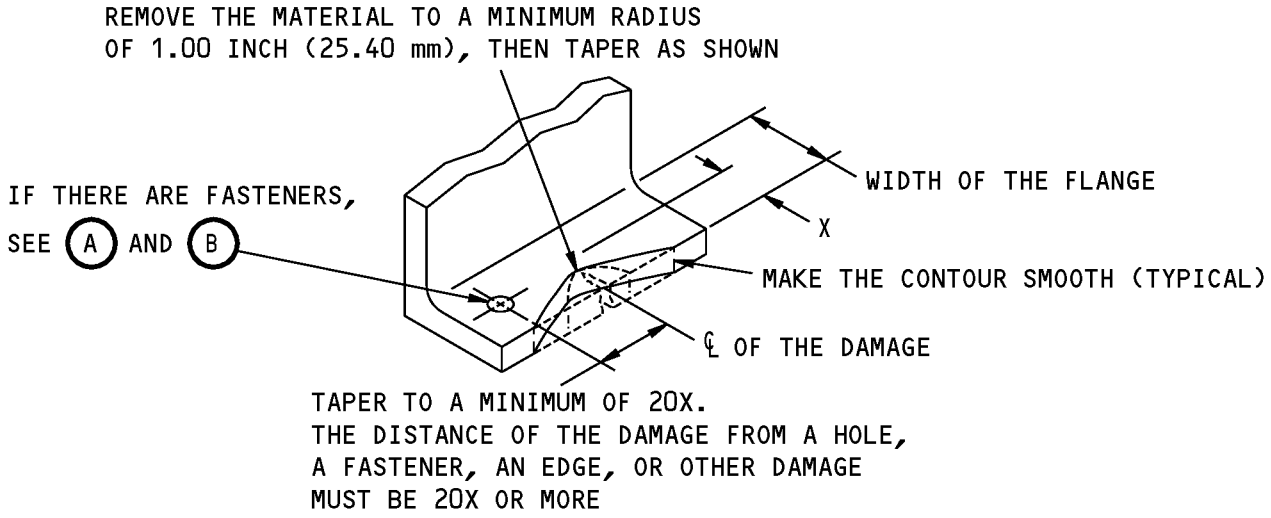
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

F



C–C

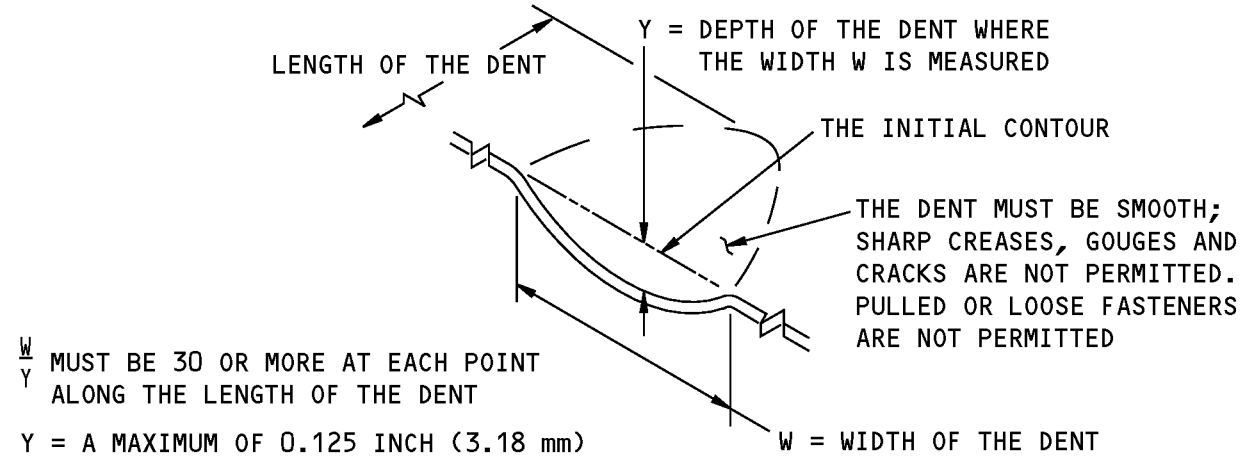
Allowable Damage Limits
Figure 103 (Sheet 3 of 4)



X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

G



DENT THAT IS PERMITTED

H

Allowable Damage Limits
Figure 103 (Sheet 4 of 4)

ALLOWABLE DAMAGE 2 - THRUST REVERSER STRUT FAIRING STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the structure of the Thrust Reverser Strut Fairing as shown in Thrust Reverser Strut Fairing Structure Location, Figure 101/ALLOWABLE DAMAGE 2.

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

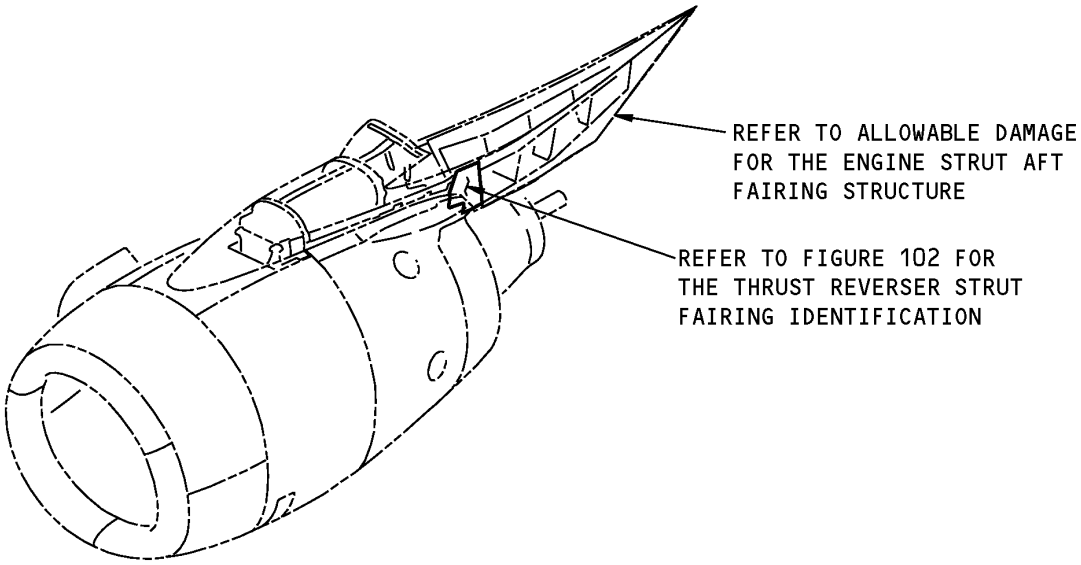
(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

(4) Put a surface finish of 125 microinches (0.003 mm) Ra or better on the reworked areas.

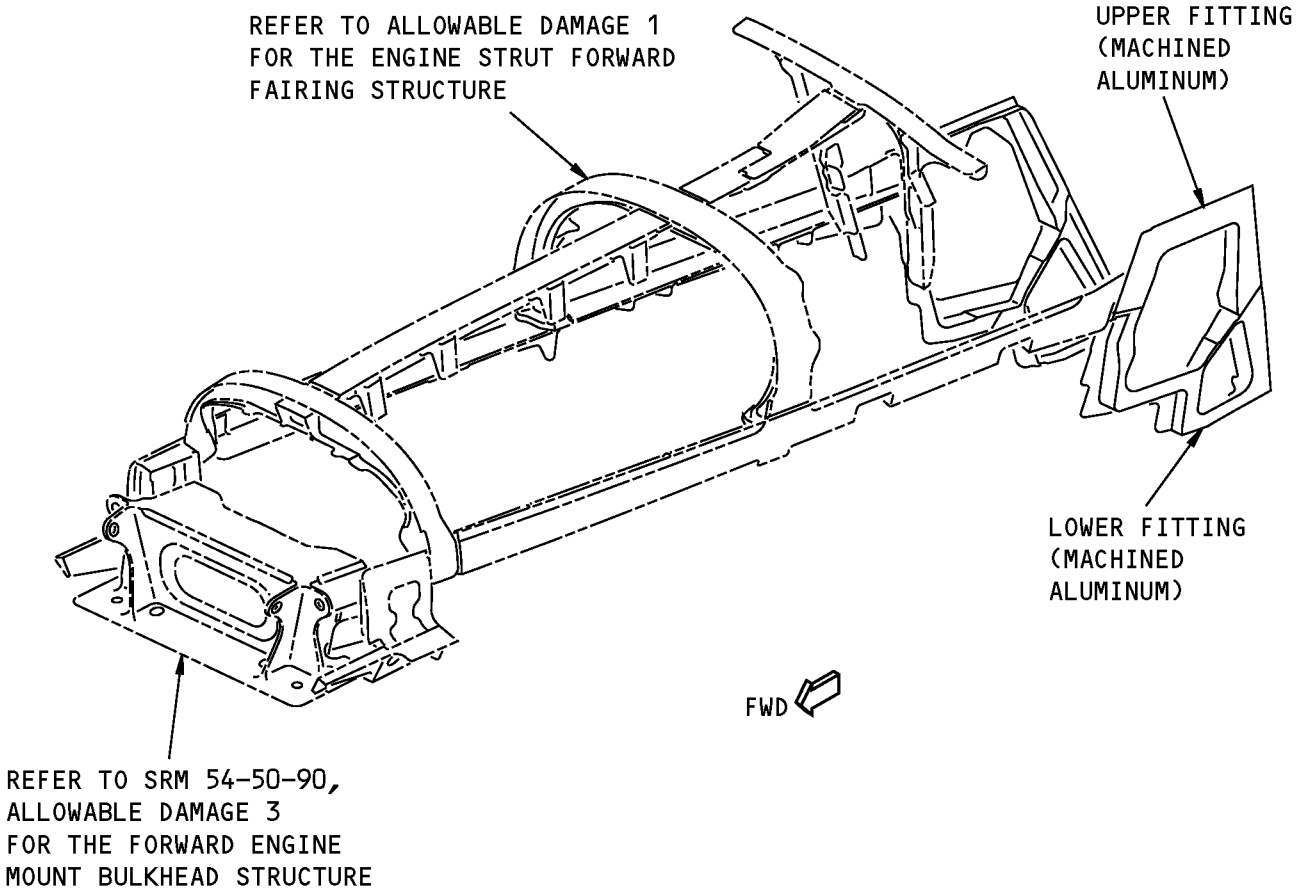
B. After you remove the damage, do as follows:

(1) Apply a chemical conversion coating to the reworked surfaces. Refer to 51-20-01.

(2) Apply a layer of DeSoto Hi-Temperature Polyurethane Primer to the reworked surfaces. Refer to SOPM 20-44-01.



Thrust Reverser Strut Fairing Structure Location
Figure 101



LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

Thrust Reverser Strut Fairing Structure
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-01	Application of Special Purpose Coatings and Finishes

4. Allowable Damage Limits

A. Cracks:

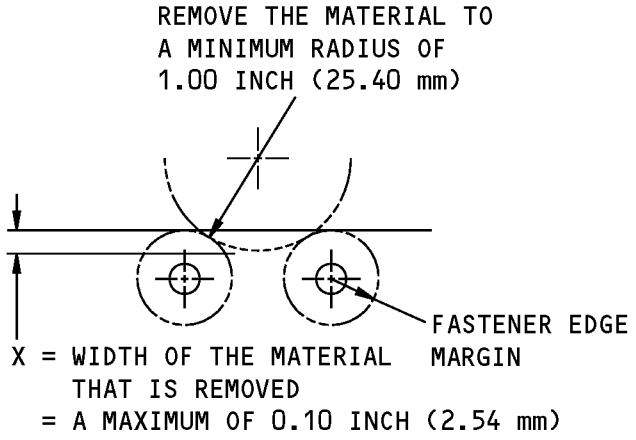
(1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , and E .

B. Nicks, Gouges, Scratches, and Corrosion:

(1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , D , and E .

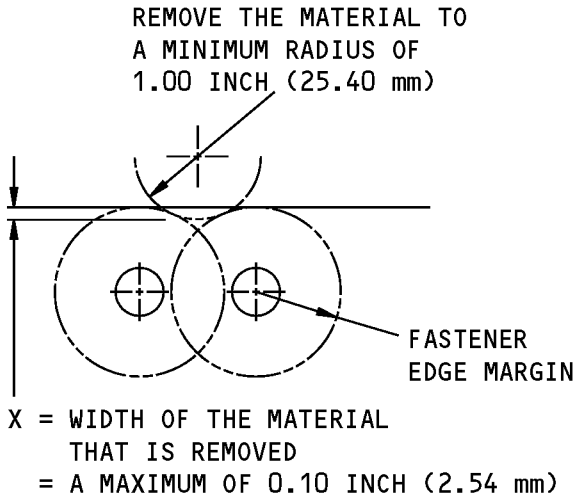
C. Dents are not permitted.

D. Holes and Punctures are not permitted.



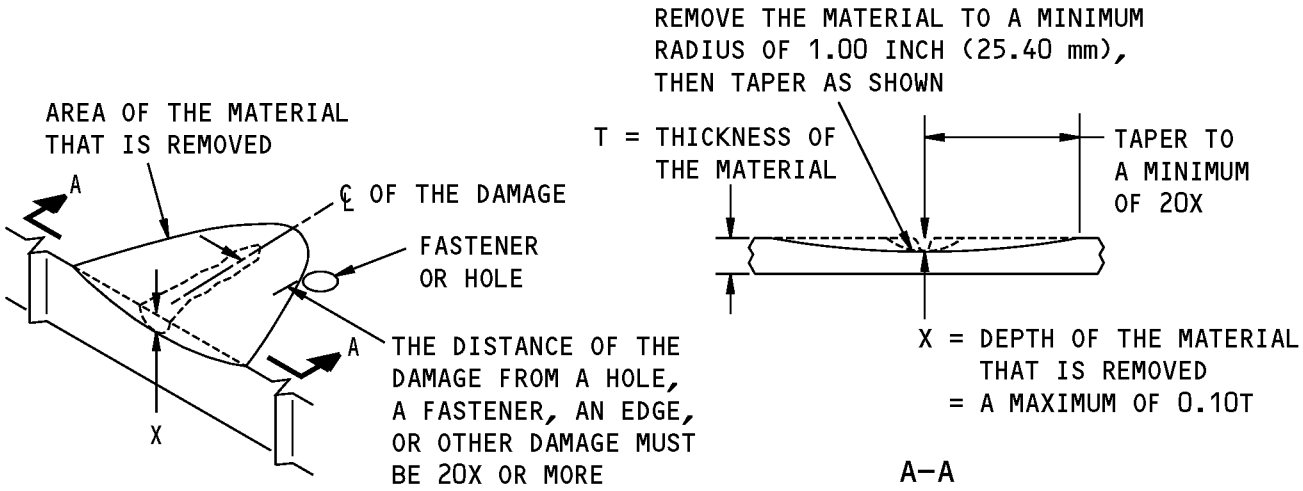
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

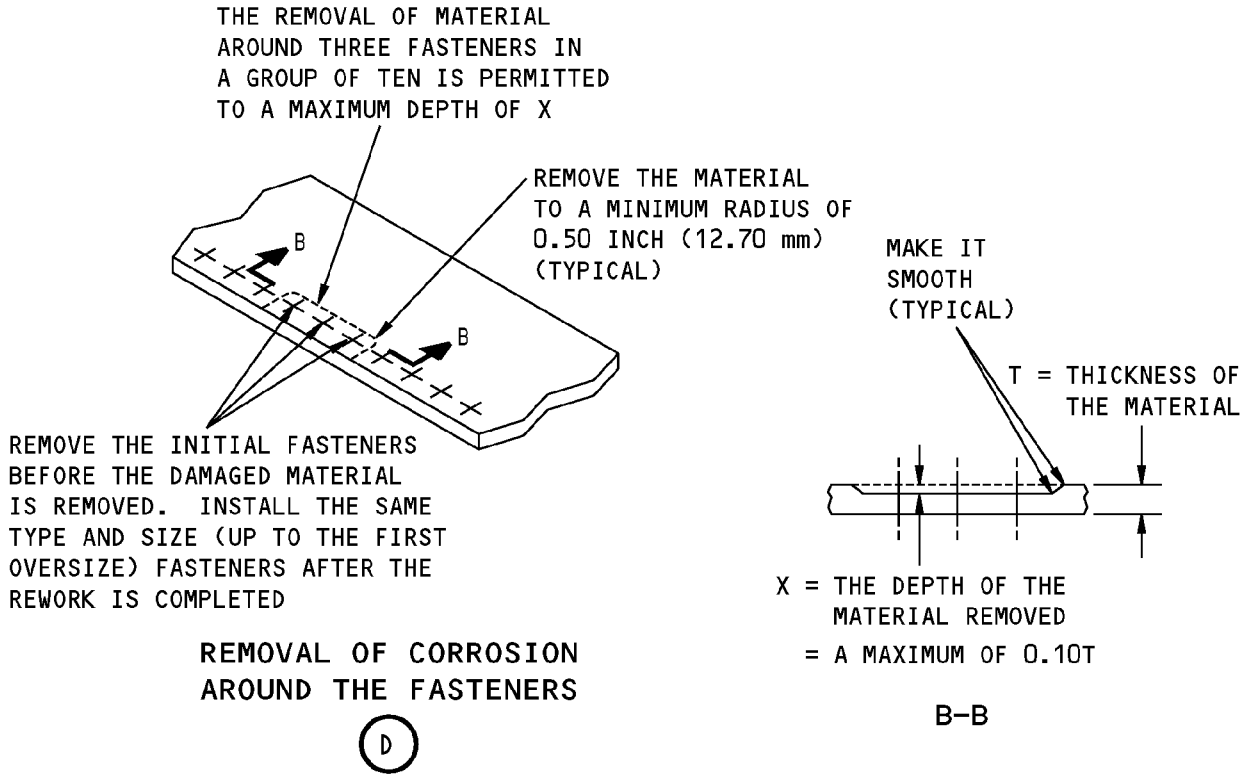
(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

Allowable Damage Limits
Figure 103 (Sheet 1 of 2)



Allowable Damage Limits
Figure 103 (Sheet 2 of 2)

ALLOWABLE DAMAGE 3 - ENGINE STRUT AFT FAIRING STRUCTURE

1. Applicability

A. This subject gives the allowable damage limits for the structure of the engine strut aft fairing as shown in Engine Strut Aft Fairing Structure Location, Figure 101/ALLOWABLE DAMAGE 3.

2. General

A. Remove the damage as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of the abrasive materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

(4) Put a surface finish of 125 microinches (0.003 mm) Ra or better on the reworked areas.

B. After you remove the damage, do as follows:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

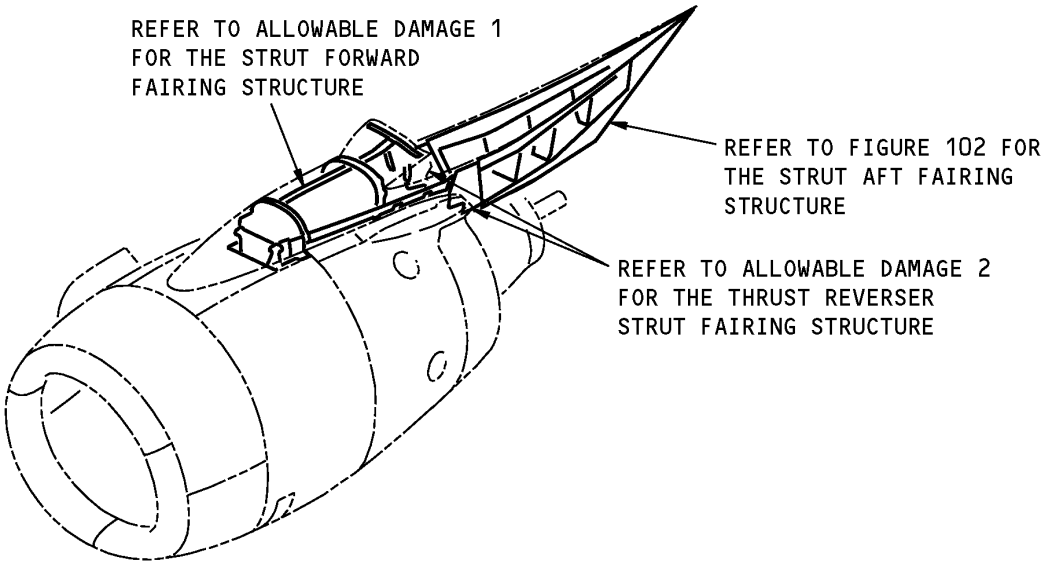
(1) Flap peen or shot peen the reworked aluminum parts.

(a) Refer to 51-20-06 for the shot peen intensity and shot number.

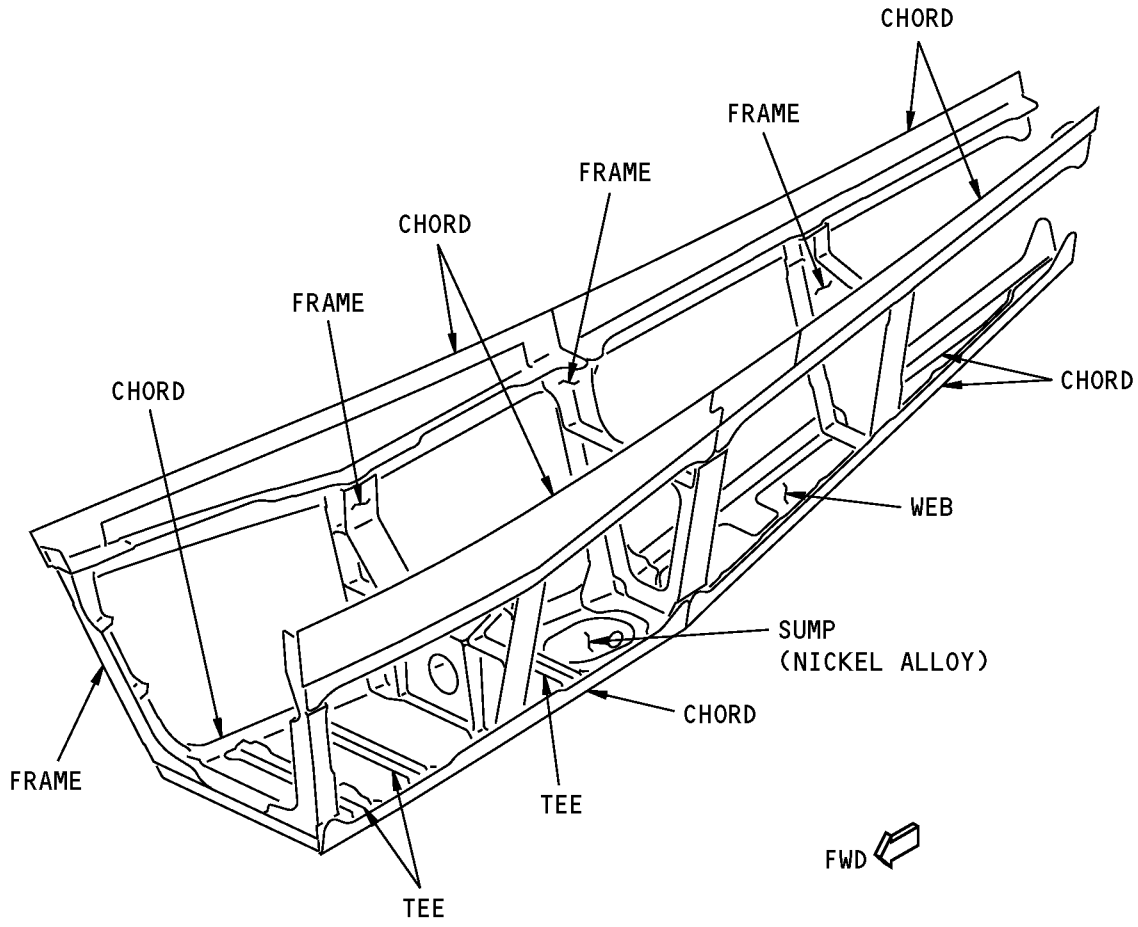
(b) Refer to SOPM 20-10-03 for the flap peen and shot procedures.

(2) Apply a chemical conversion coating to the reworked areas of the aluminum parts. Refer to 51-20-01.

(3) Apply two layers of BMS 10-11, Type I primer to the reworked areas. Refer to SOPM 20-41-02.



Engine Strut Aft Fairing Structure Location
Figure 101



NOTE: ALL PARTS ARE MADE OF ALUMINUM UNLESS SPECIFIED DIFFERENTLY.

Engine Strut Aft Fairing Structure
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	General - Shot Peening Procedures
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Frames, Chords, Fitting, and Cover Plate

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Details A , B , and F .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Details A , B , C , D , and F .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

B. Webs and Sump

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Details A , B , and F .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) You are permitted to do one of the procedures that follows:

1) Remove the damage as given in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Details A , B , C , D , and F .

2) Drill out the damage as given in Holes and Punctures for the Web.

NOTE: The damage cannot be drilled out as a hole if the damage has been blended out.

(3) Dents

(a) Damage is permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Detail G .

(4) Holes and Punctures

(a) Holes and punctures are permitted to a maximum diameter of 0.25 inch (6.35 mm) after cleanup if:

1) The damage is a minimum of 1.0 inch (25.40 mm) away from other holes, edge of the part or other damage

2) You install a 2117-T3 or 2117-T4 aluminum rivet in the hole without sealant.

C. Tees

(1) Cracks:

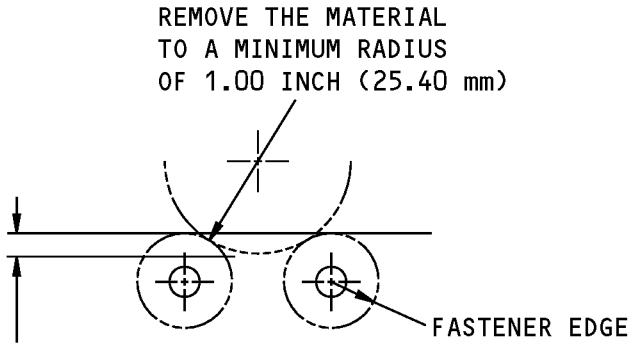
(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Details A , B , and E .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Details A , B , C , D , and E .

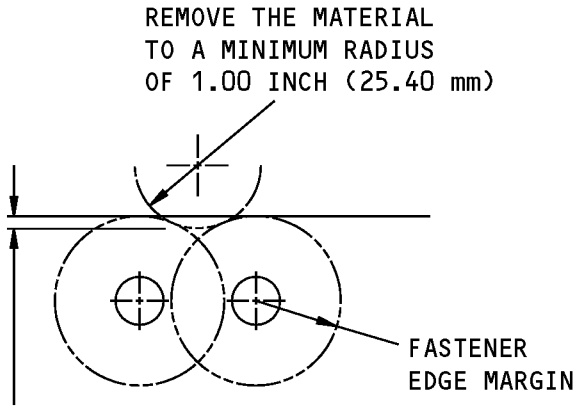
(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.



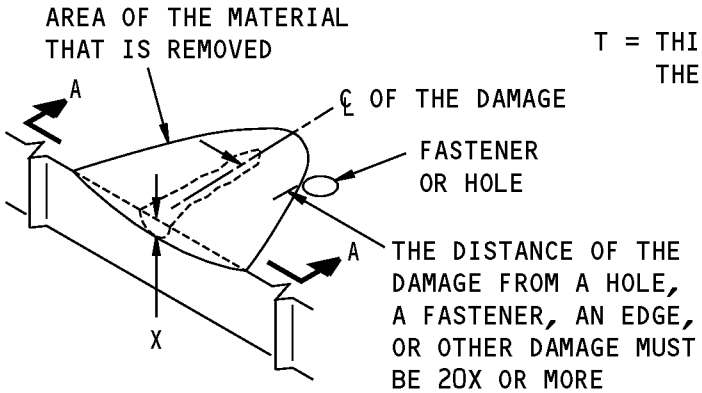
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

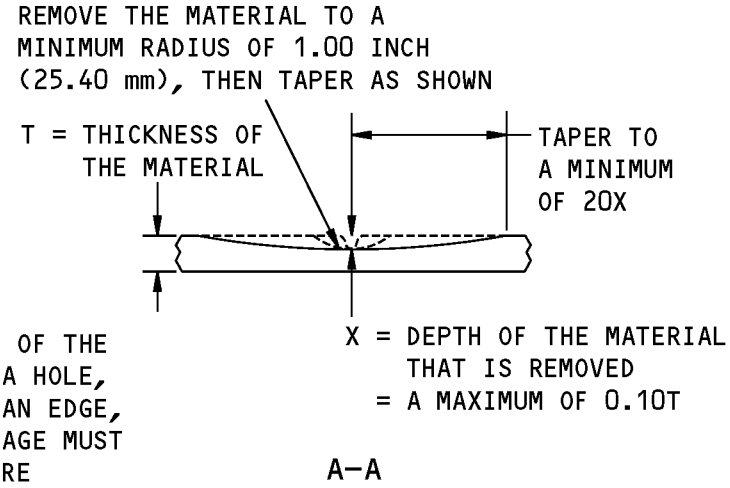
A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B

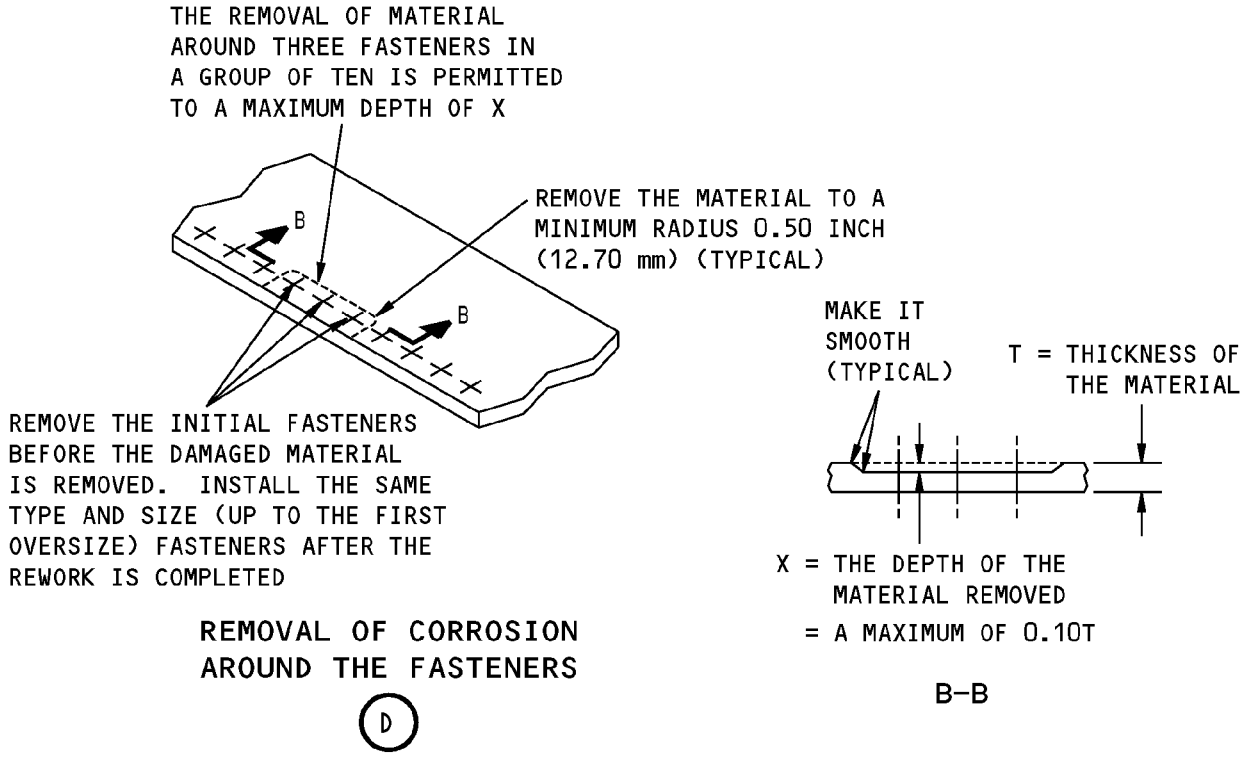


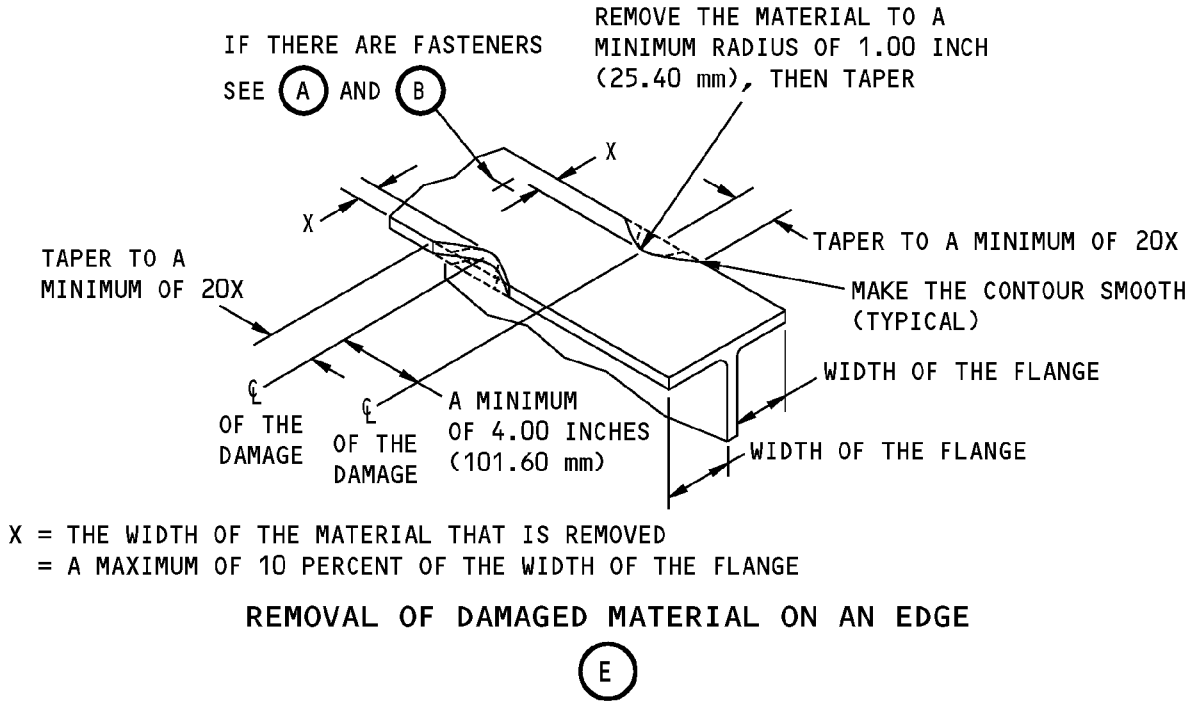


REMOVAL OF DAMAGED MATERIAL ON A SURFACE

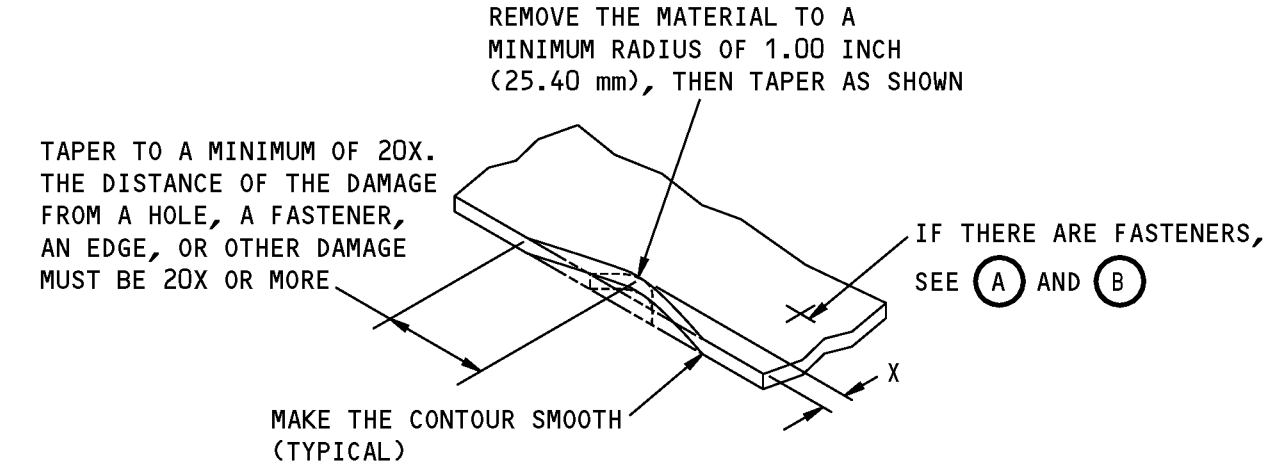
C

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)





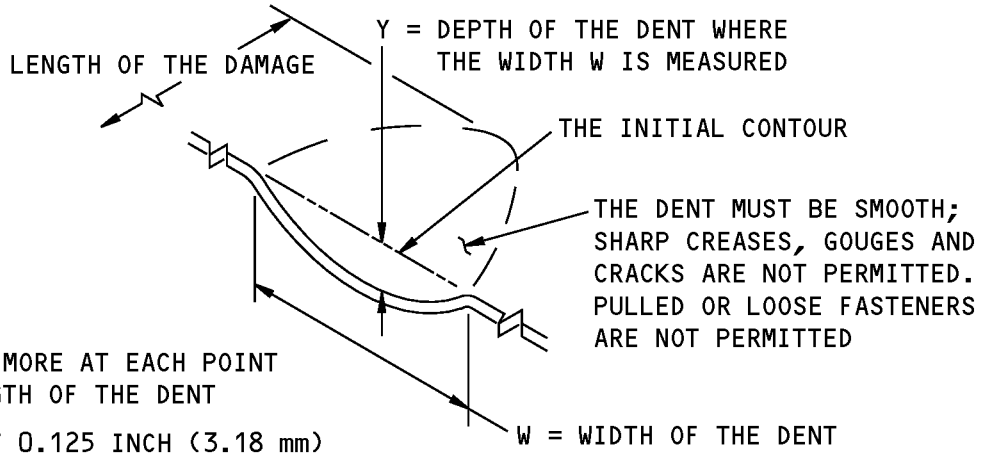
Allowable Damage Limits
Figure 103 (Sheet 2 of 3)



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.20 INCH (5.08 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

F



DENT THAT IS PERMITTED

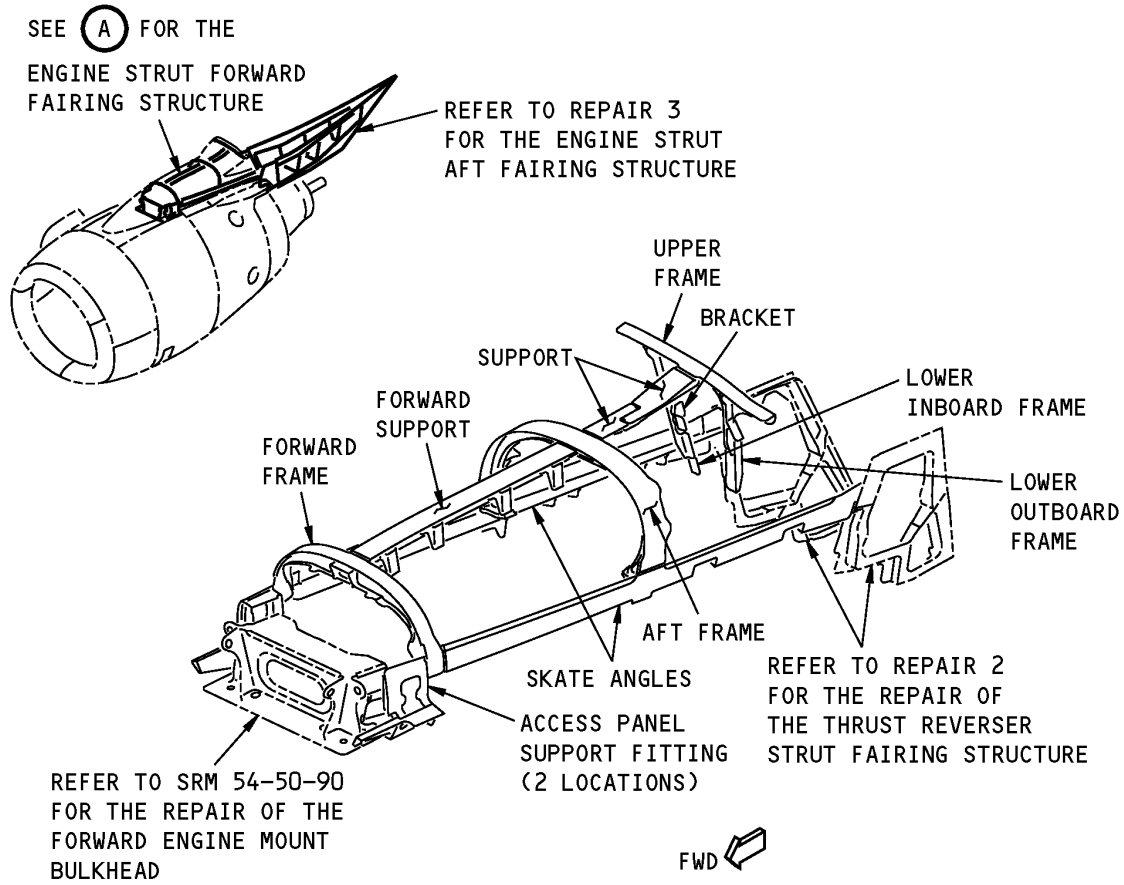
G

Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

REPAIR 1 - ENGINE STRUT FORWARD FAIRING STRUCTURE

1. Applicability

A. Repair 1 is applicable to the structure of the Engine Strut Forward Fairing as shown in Engine Strut Forward Fairing Structure Repair, Figure 201/REPAIR 1.



NOTE: ALL PARTS ARE MADE OF MACHINED OR EXTRUDED ALUMINUM.

ENGINE STRUT FORWARD FAIRING STRUCTURE

(A)

Engine Strut Forward Fairing Structure Repair
Figure 201

2. General

A. The typical repairs given in 51-70-12 can be used when applicable if:

(1) There is sufficient clearance between the repair parts and the adjacent structure.

B. Refer to the limits of the typical repairs given in 51-70-12 before you start a repair.

3. References

Reference	Title
51-70-12	EXTRUDED SECTION REPAIRS
54-50-71, ALLOWABLE DAMAGE 1	Engine Strut Forward Fairing Structure
54-50-71, IDENTIFICATION 1	Engine Strut Forward Fairing Structure

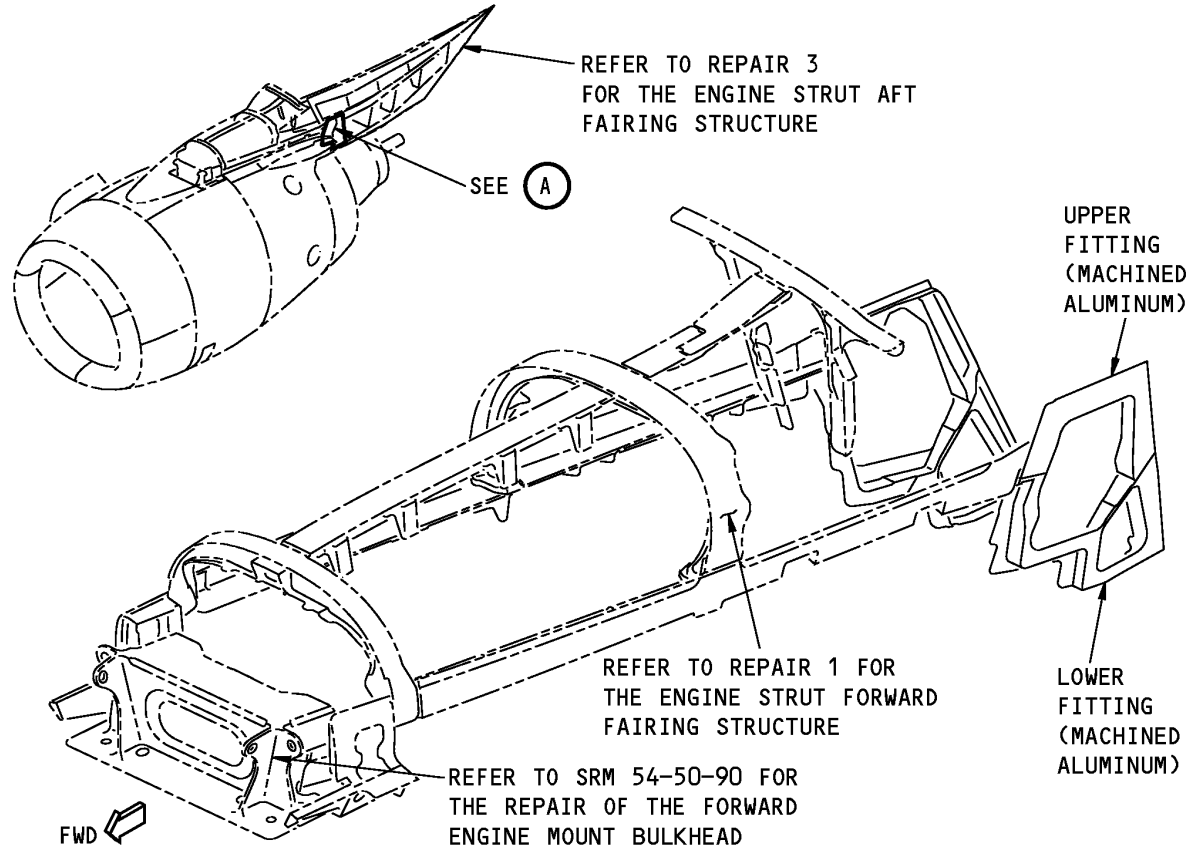
4. Repair Instructions

A. Refer to Table 201/REPAIR 1 to find the applicable repairs for the engine strut forward fairing structure.

Table 201:

REPAIR REFERENCES FOR THE ENGINE STRUT FORWARD FAIRING STRUCTURE	
COMPONENT	**REPAIR**
Forward Support and Skate Angles	Refer to SRM 51-70-12
Forward Frame, Aft Frame, Upper and Lower Frames, Supports	There are no repairs for these components in the Structural Repair Manual at this time.
Brackets and Fittings	If the damage to the structure is more than the limits given in SRM 51-50-71, Allowable Damage 1, then replace the damaged part. There are no repairs for these components in the Structural Repair Manual at this time.

REPAIR 2 - THRUST REVERSER STRUT FAIRING STRUCTURE



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

A

Thrust Reverser Strut Fairing Structure
Figure 201

REPAIR 3 - ENGINE STRUT AFT FAIRING STRUCTURE

1. Applicability

A. Repair 3 is applicable to the structure of the Engine Strut Aft Fairing as shown in Engine Strut Aft Fairing Structure Repair, Figure 201/REPAIR 3.

2. General

A. The typical repairs given in 51-70-11 and 51-70-12 can be used when applicable if:

(1) There is sufficient clearance between the repair parts and the adjacent structure.

B. Refer to the limits of the typical repairs given in 51-70-11 and 51-70-12 before you start a repair.

3. References

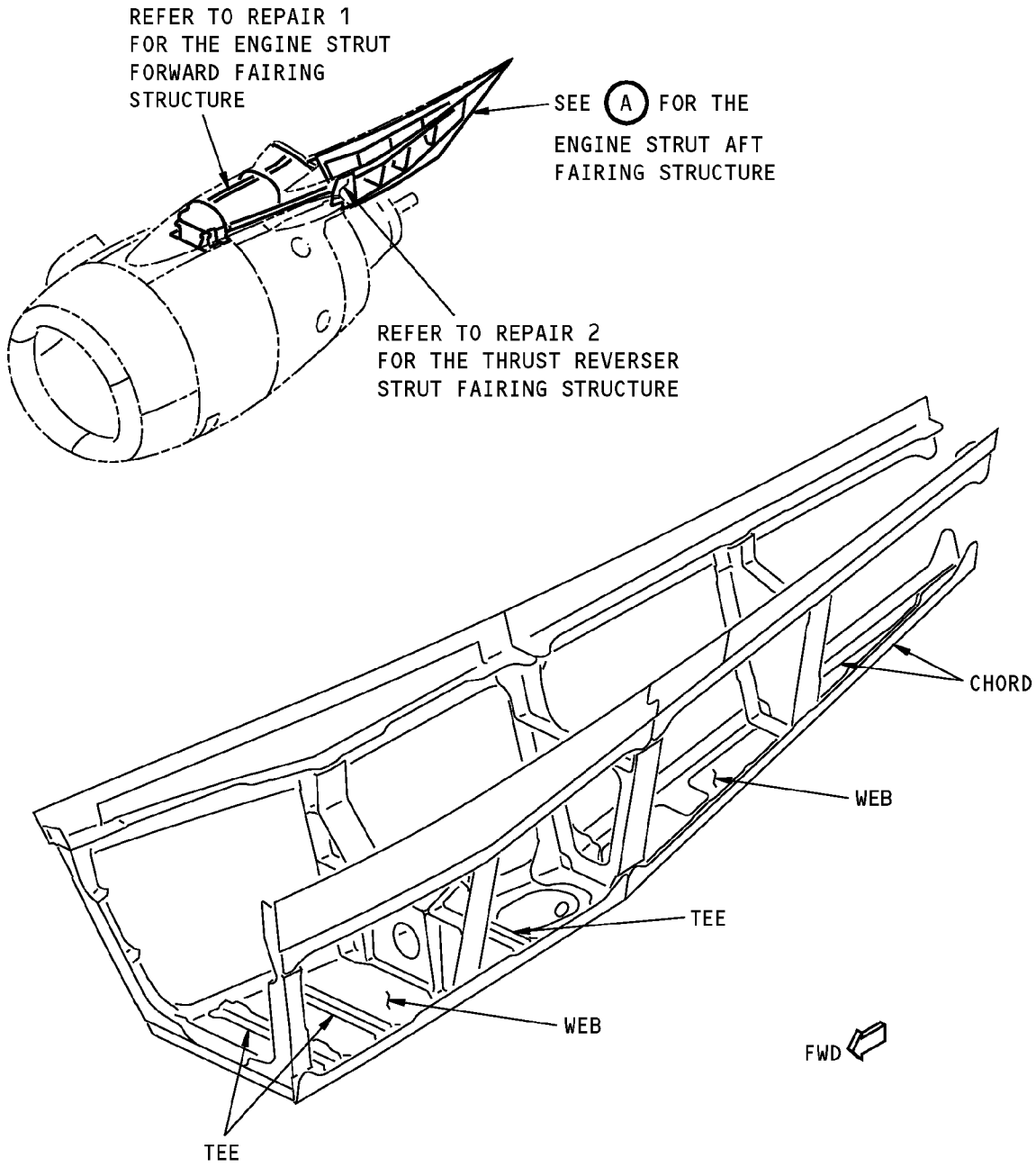
Reference	Title
51-70-11	TYPICAL FORMED SECTION REPAIRS
51-70-12	EXTRUDED SECTION REPAIRS
54-50-71, ALLOWABLE DAMAGE 3	Engine Strut Aft Fairing Structure
54-50-71, IDENTIFICATION 3	Engine Strut Aft Fairing Structure

4. Repair Instructions

A. Refer to Table 201/REPAIR 3 to find the applicable repairs for the engine strut forward fairing structure.

Table 201:

REPAIR REFERENCES FOR THE ENGINE STRUT AFT FAIRING STRUCTURE	
COMPONENT	**REPAIR**
Inner Chords	Refer to SRM 51-70-12
Webs	Refer to SRM 51-70-11
Straps, Brackets, Formed Angles, and Machined Splice Angles	There are no repairs for these components in the Structural Repair Manual at this time. If the damage to the structure is more than the limits given in SRM 51-50-71, Allowable Damage 3, then replace the damaged part.



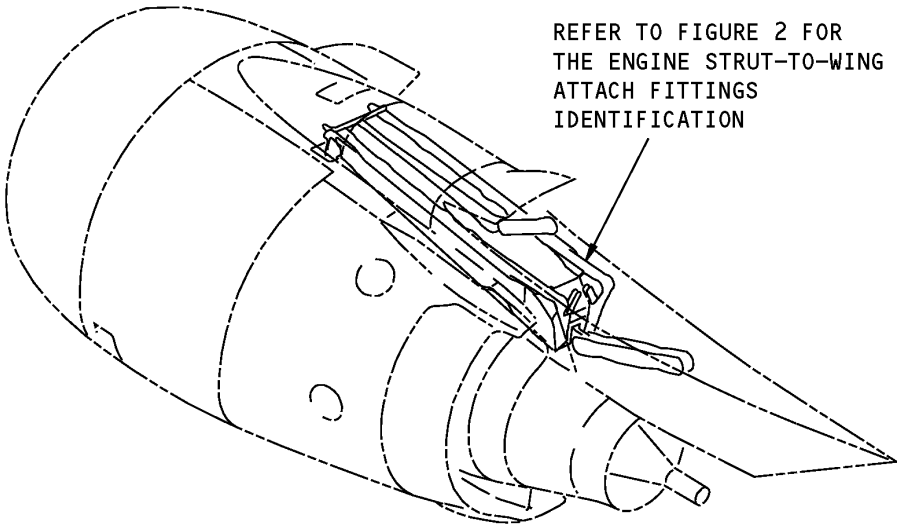
NOTE: ALL PARTS ARE MADE OF ALUMINUM.

ENGINE STRUT AFT FAIRING STRUCTURE

(A)

Engine Strut Aft Fairing Structure Repair
Figure 201

IDENTIFICATION 1 - ENGINE STRUT-TO-WING ATTACH FITTINGS

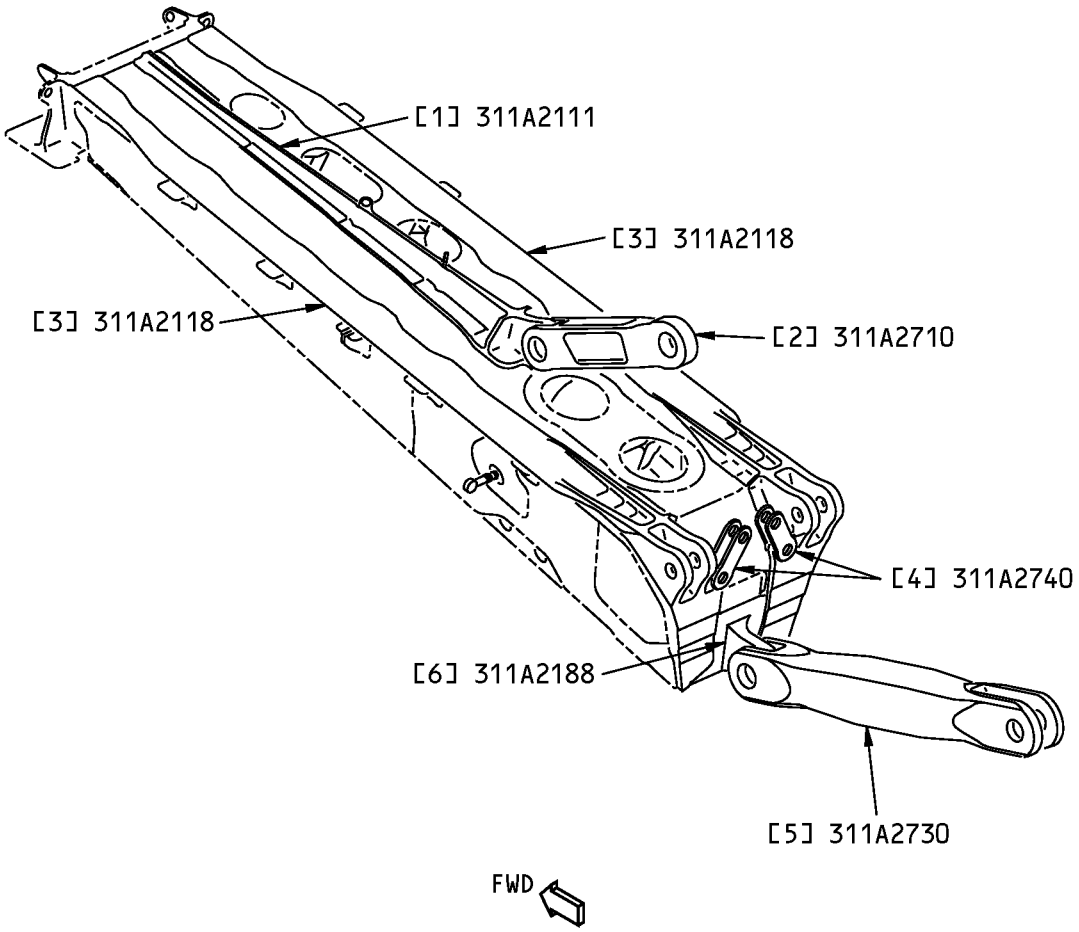


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut-to-Wing Attach Fitting Locations
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
310A2000	Strut-to-Wing Installation - CFM56-7 Engine
311A2111	Upper Spar Fitting Assembly
311A2112	Aft Upper Spar Fitting Assembly
311A2710	Upper Link Assembly
311A2730	Diagonal Brace Assembly
311A2740	Side Link Assembly



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

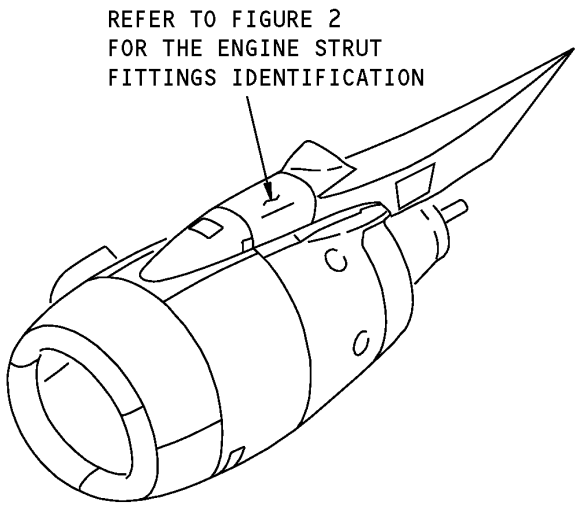
Engine Strut-to-Wing Attach Fitting Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Upper Spar Fitting		Ti-6Al-4V forged titanium block in the annealed condition	
[2]	Upper Link		15-5PH CRES bar heat treated to 150-170 KSI	
[3]	Aft Upper Spar Fitting		15-5PH die forged CRES	
[4]	Side Link		Ti-6Al-4V titanium plate in the annealed condition (Optional: Ti-6Al-4V bar in the annealed condition)	
[5]	Diagonal Brace		7075-T73 extruded tubing 7050-T7451 Plate as given in BMS 7-323, Type I	For Line Numbers 1 through 1518 For Line Numbers 1519 and on
[6]	Diagonal Brace Fitting		Ti-6Al-4V titanium forging in the annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

IDENTIFICATION 2 - ENGINE STRUT HINGE FITTINGS

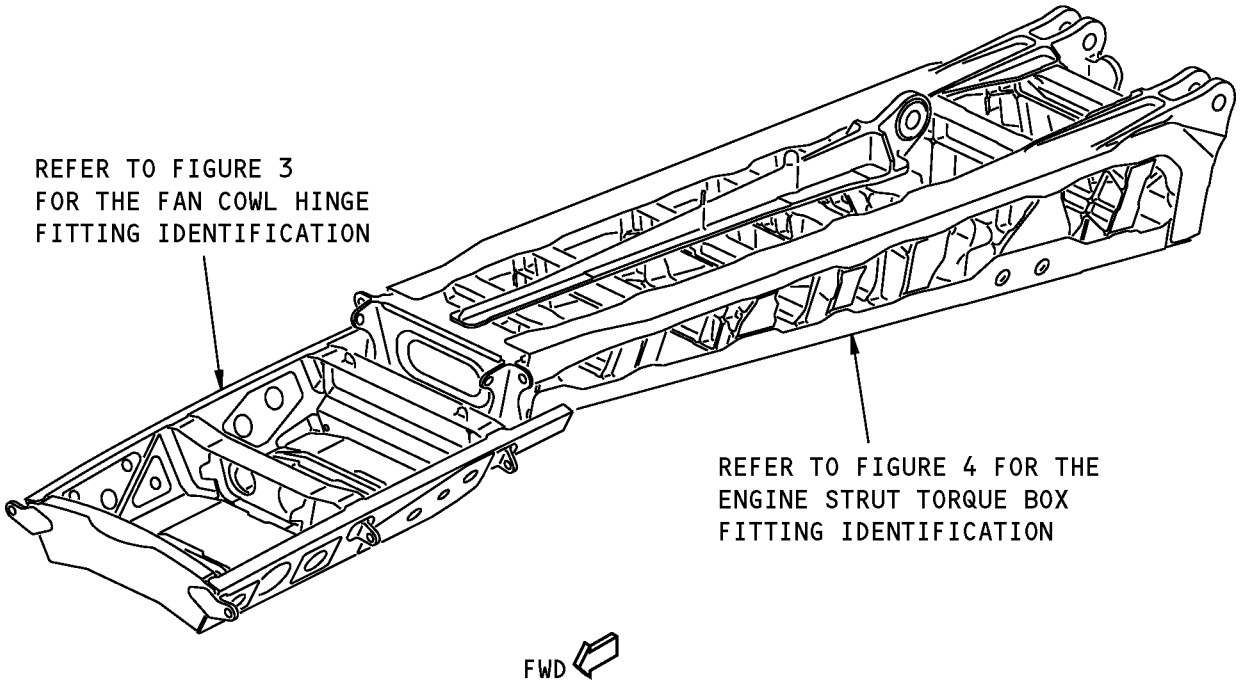


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

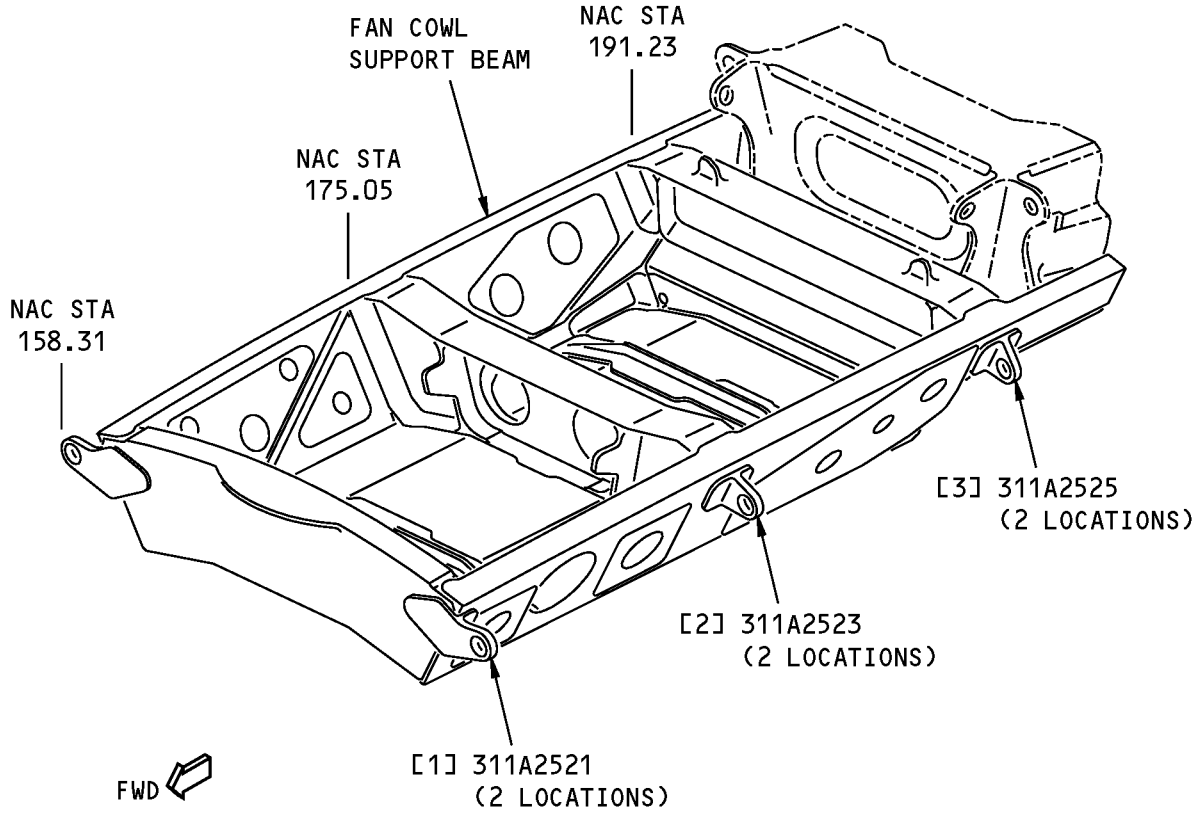
Engine Strut Fitting Locations
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2101	Torque Box Assembly
311A2050	Aft Bootstrap Fitting Assembly - GSE
311A2265	Aft Engine Mount Stop Details
311A2510	Fan Cowl Support Beam Installation
311A2550	Thrust Reverser Hinge Installation
311A2650	Precooler Support Fitting Assembly



Engine Strut Fitting Identification
Figure 2



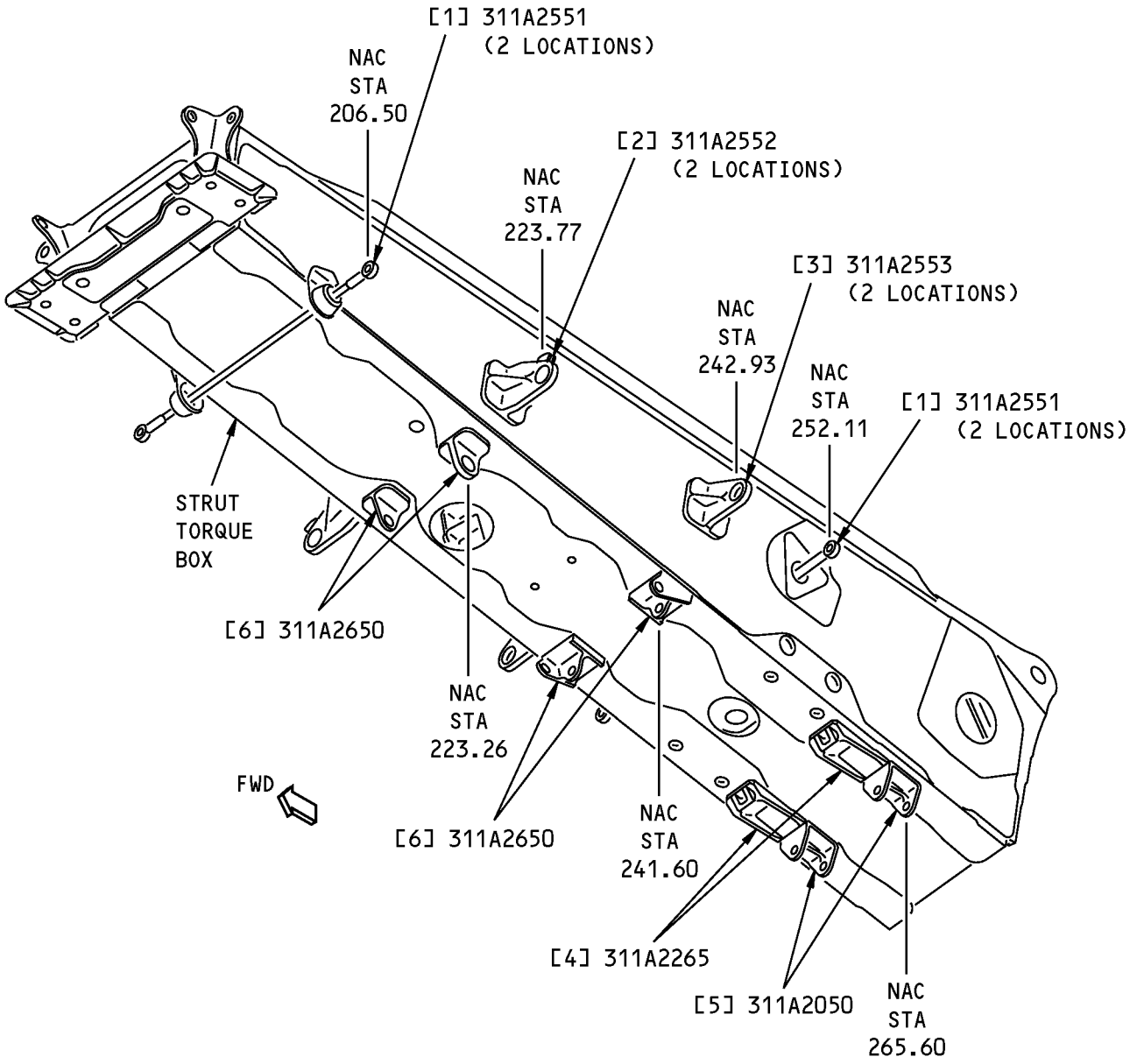
NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Fan Cowl Hinge Fitting Identification
Figure 3

Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Hinge Fitting - NAC STA 158.313 NAC STA 158.313		TI-6AL-4V machined titanium plate in the annealed condition	For line numbers 1 thru 2249
			15-5PH bar as given in AMS 5659. Heat treat to 180-200 KSI as given in BAC 5619	For line numbers 2250 and on
[2]	Hinge Fitting - NAC STA 175.048 NAC STA 158.313		TI-6AL-4V machined titanium plate in the annealed condition	
[3]	Hinge Fitting - NAC STA 191.226 NAC STA 158.313		TI-6AL-4V machined titanium plate in the annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

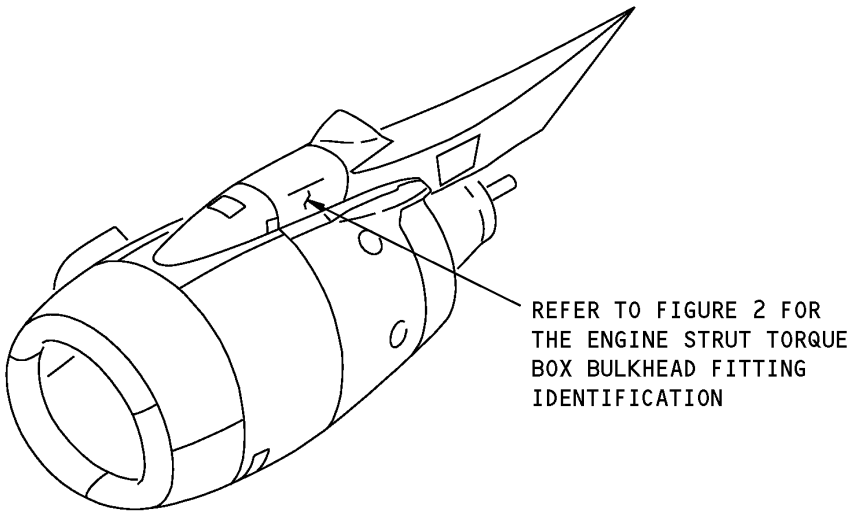
Engine Strut Torque Box Fitting Identification
Figure 4

Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Tie Rod		Ti-6Al-4V machined titanium rod as given in MIL-T-9047 in the annealed condition	
[2]	Thrust Reverser Hinge Fitting Number 2		Ti-6Al-4V forged titanium block as given in MIL-T-9047 in the annealed condition	
[3]	Thrust Reverser Hinge Fitting Number 3		Ti-6Al-4V forged titanium block as given in MIL-T-9047 in the annealed condition	
[4]	Aft Engine Mount Stop Fitting		Ti-6Al-4V machined titanium bar as given in MIL-T-9047 in the annealed condition	
[5]	GSE Aft Bootstrap Fitting		Ti-6Al-4V machined titanium bar as given in MIL-T-9047 in the annealed condition	
[6]	Precooler Support Fitting		15-5PH CRES bar heat treated to 180-200 ksi	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

IDENTIFICATION 3 - ENGINE STRUT BULKHEAD FITTINGS

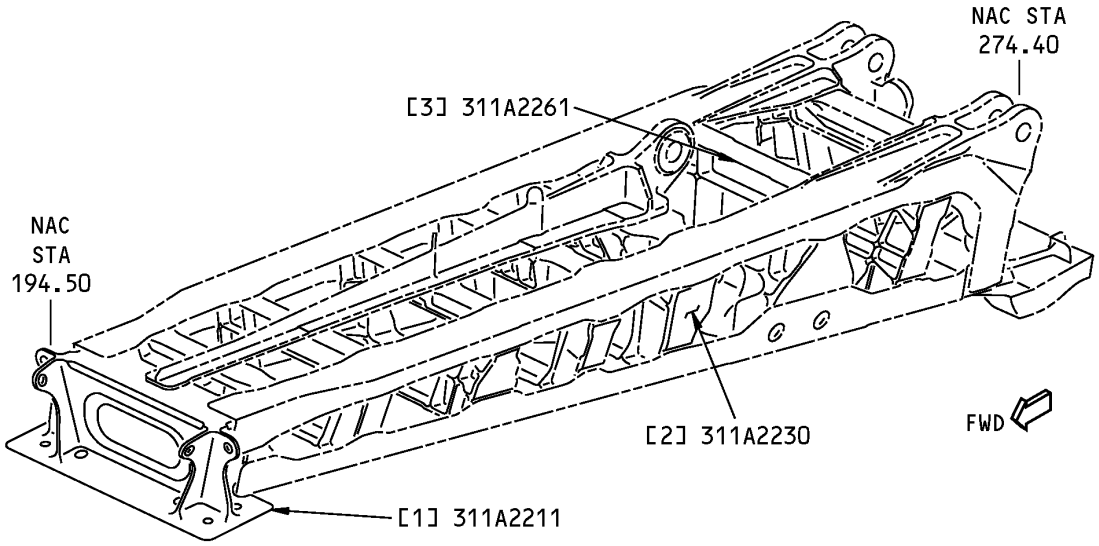


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut Torque Box Bulkhead Fitting Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2101	Torque Box Assembly
311A2210	Forward Engine Mount Bulkhead Assembly
311A2230	Mid-Strut Bulkhead Fitting
311A2260	Aft Engine Mount Bulkhead Fitting Assembly



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

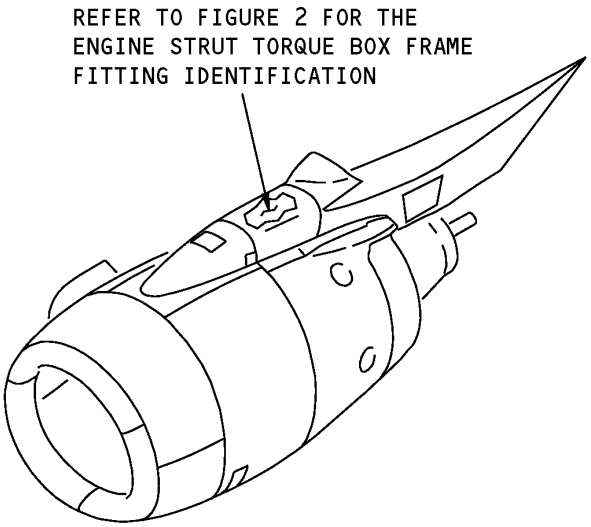
Engine Strut Torque Box Bulkhead Fitting Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Forward Engine Mount Bulkhead Fitting		Ti-6Al-4V forged titanium block in the annealed condition	
[2]	Mid-Strut Bulkhead Fitting		Ti-6Al-4V forged titanium block in the annealed condition	For Line Numbers 1 Thru 1312
[2]	Mid-Strut Bulkhead Fitting		7050-T7451 plate per BMS 7-323, Type I	For Line Numbers 1313 and on
[3]	Aft Engine Mount Bulkhead Fitting		Ti-6Al-4V forged titanium block in the annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

IDENTIFICATION 4 - ENGINE STRUT TORQUE BOX FRAME FITTINGS

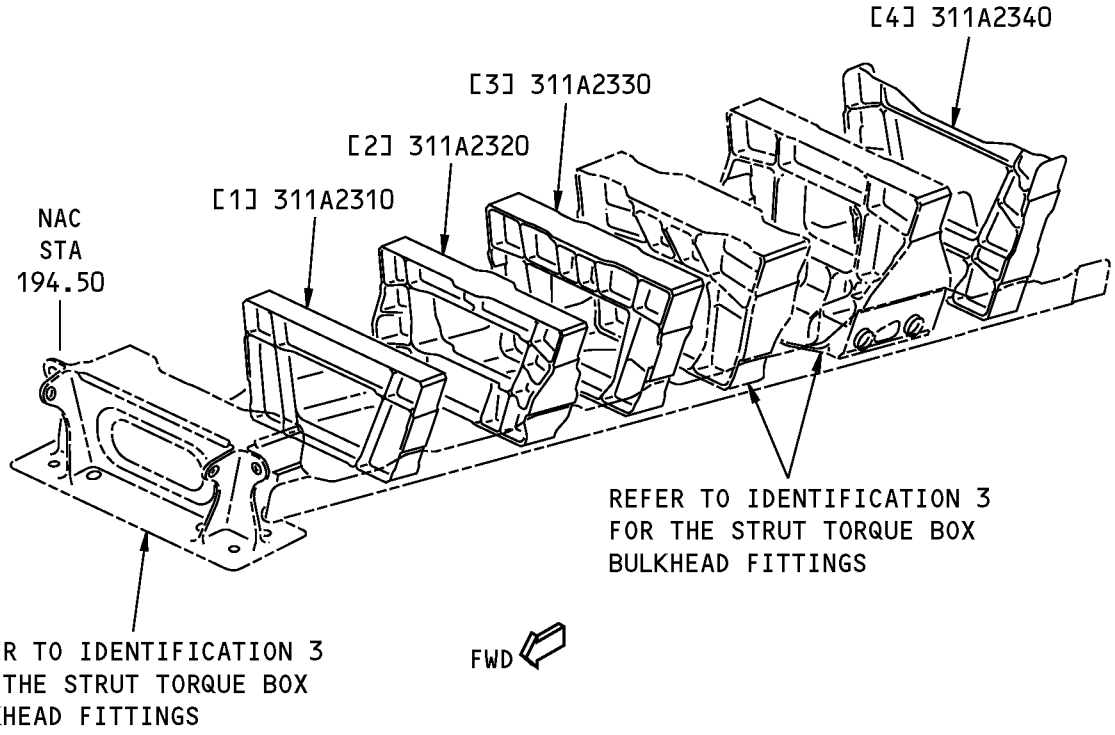


NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Engine Strut Torque Box Frame Fitting Locations
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
311A2101	Torque Box Assembly
311A2310	Frame Number 1
311A2320	Frame Number 2 Fitting
311A2330	Frame Number 3 Fitting
311A2340	Frame Number 4 Fitting



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Engine Strut Torque Box Frame Fitting Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Frame Fitting Number 1	2.50 (63.5)	2219-T851 plate	
[2]	Frame Fitting Number 2	4.40 (111.8)	2219-T851 plate	
[3]	Frame Fitting Number 3	3.30 (83.8)	2219-T851 plate	
[4]	Frame Fitting Number 4	3.30 (83.8)	Ti-6Al-4V forged titanium block in the annealed condition	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

ALLOWABLE DAMAGE 1 - ENGINE STRUT-TO-WING ATTACH FITTINGS

1. Applicability

A. This subject gives the allowable damage limits for the fittings that attach the CFM56-7 engine strut to the wing as shown in Engine Strut-to-Wing Attach Fitting Locations, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Remove the parts as necessary to get access to the strut-to-wing attach fittings.

B. Refer to Engine Strut-to-Wing Attach Fitting Zones, Figure 102/ALLOWABLE DAMAGE 1 for the definitions of the different areas of the fittings covered in the allowable damage limits.

C. Refer to Table 101/ALLOWABLE DAMAGE 1 for a list of the references for the allowable damage data.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	PARAGRAPH
Fitting Lugs	4.A
First row of fasteners adjacent to a fitting lug	4.B
Fitting	4.C
Links	4.D

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

D. Remove the damaged material as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of abrasives and other materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.

(4) Refer to SOPM 20-20-02 for the penetrant inspection procedures.

(5) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.

E. After the damage is removed, do the steps that follow:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

(1) Flap peen or shot peen the reworked areas.

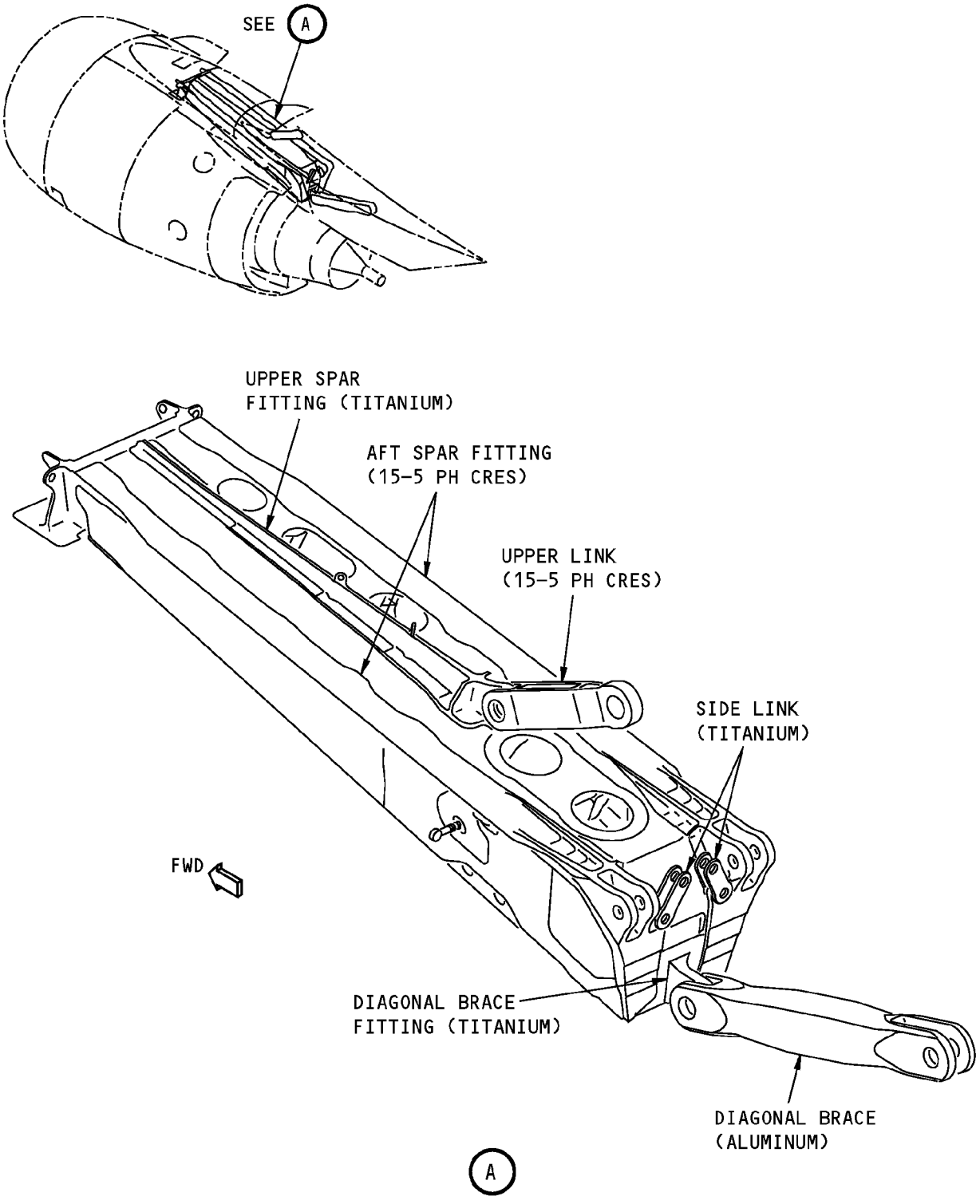
(a) Refer to 51-20-06 for shot peen intensity and shot number.

(b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.

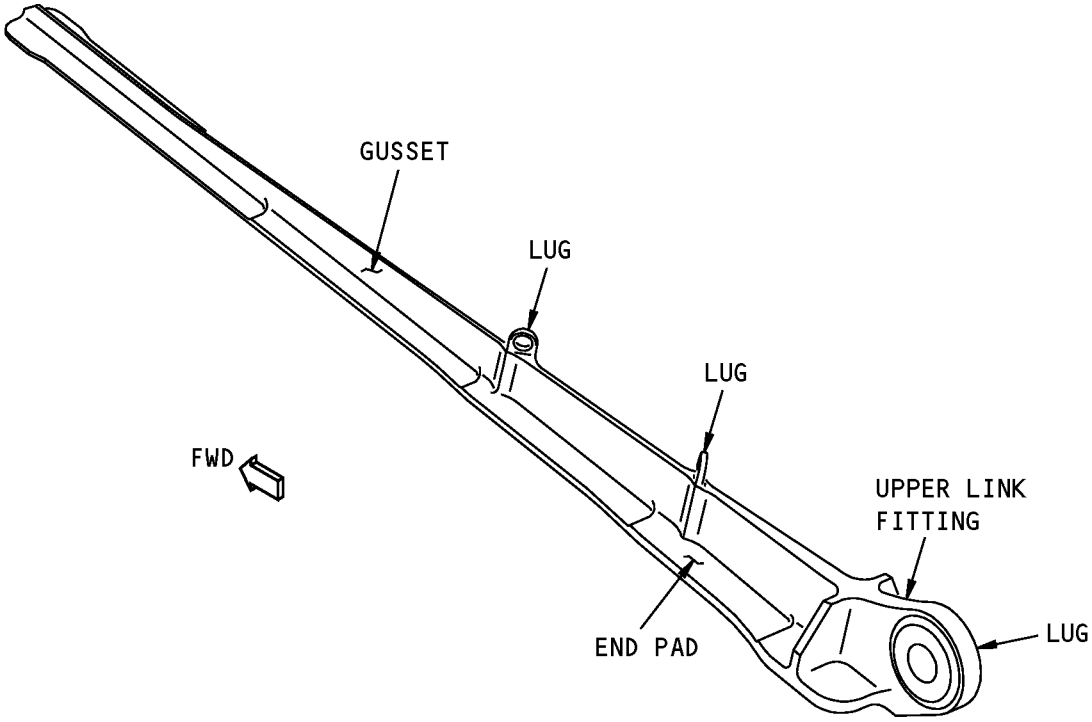
(2) Apply a chemical conversion coating to the bare surfaces of the reworked aluminum parts (diagonal brace only). Refer to 51-20-01.

(3) Apply 2 layers of BMS 10-11, Type I primer to the surfaces of the reworked aluminum parts (the diagonal brace) and the aft upper spar fitting. Refer to SOPM 20-41-02.

(4) Apply a layer of phosphate-fluoride coating and a layer of high temperature polyurethane primer to the surfaces of the reworked titanium parts (the upper spar fitting and the diagonal brace fitting). Refer to SOPM 20-41-02.

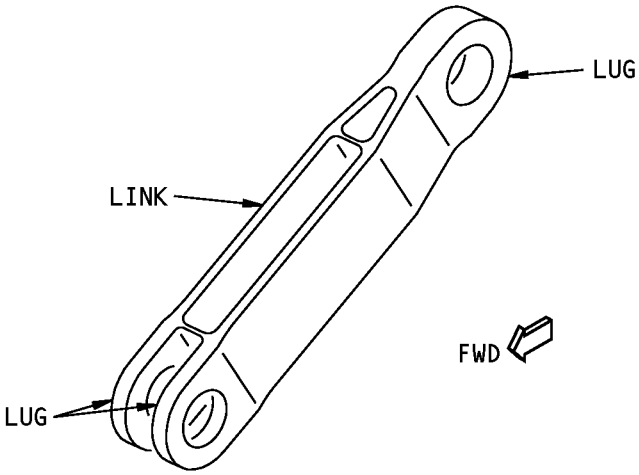


Engine Strut-to-Wing Attach Fitting Locations
Figure 101



UPPER SPAR FITTING

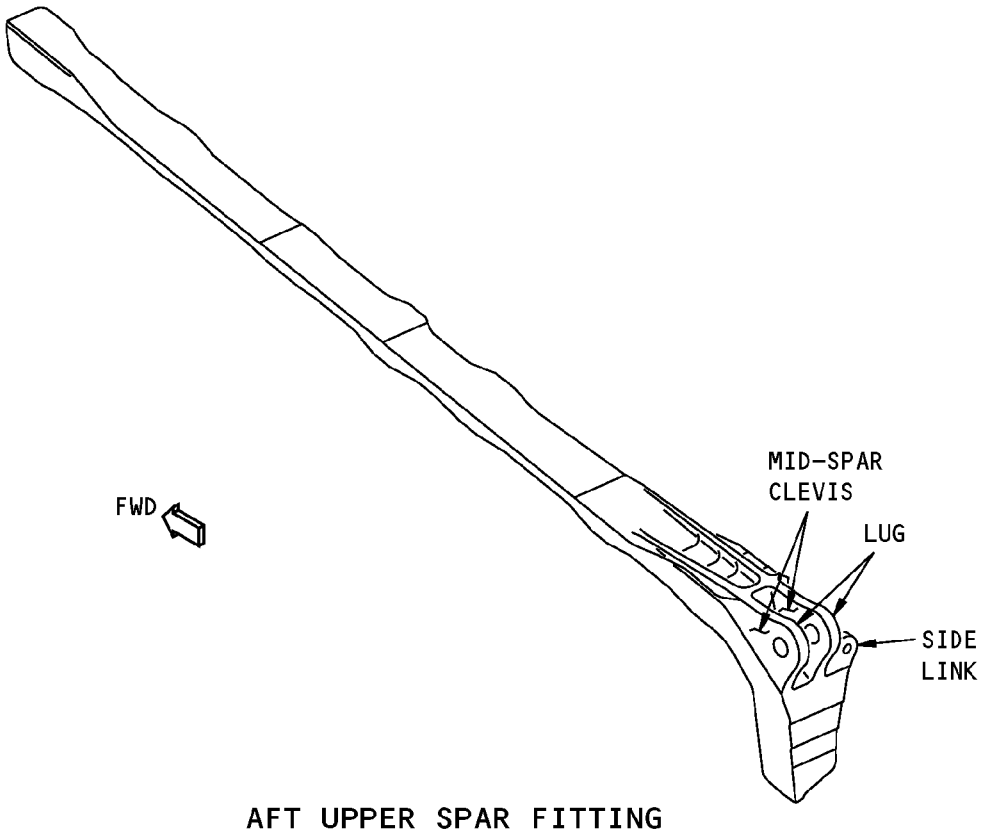
A



UPPER LINK

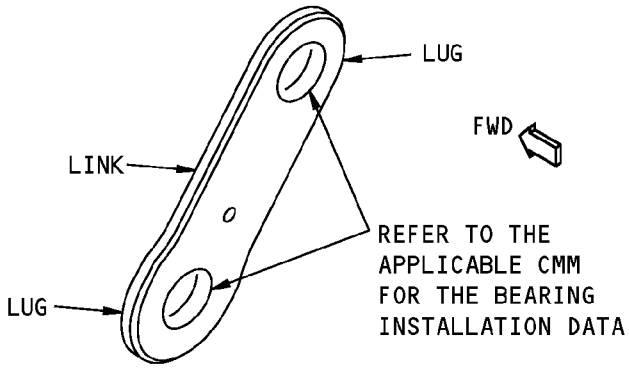
B

Engine Strut-to-Wing Attach Fitting Zones
Figure 102 (Sheet 1 of 3)



AFT UPPER SPAR FITTING

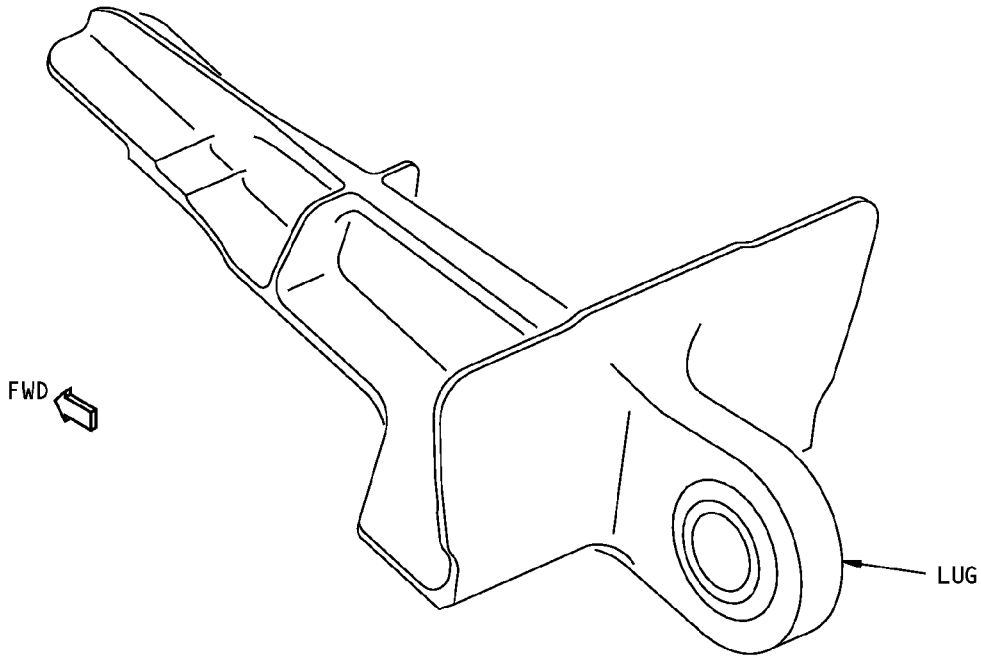
C



SIDE LINK

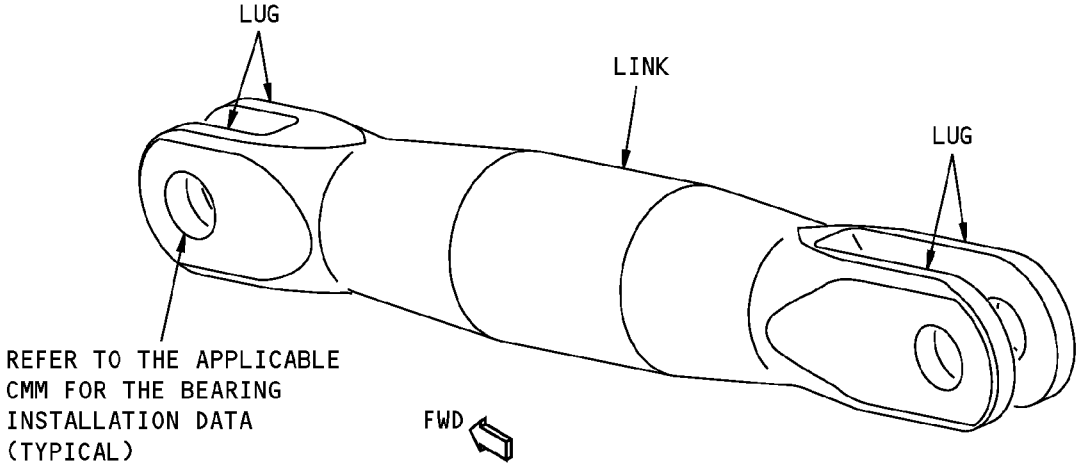
D

Engine Strut-to-Wing Attach Fitting Zones
Figure 102 (Sheet 2 of 3)



DIAGONAL BRACE FITTING

E



DIAGONAL BRACE

F

Engine Strut-to-Wing Attach Fitting Zones
Figure 102 (Sheet 3 of 3)

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	General - Shot Peening Procedures
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Allowable Damage Limits

A. Lug Fittings:

NOTE: You can not have reworked areas of the bore and the edge on the same lug fitting. You can remove damage to the bore or to the edge, but not the two surfaces.

(1) Cracks:

(a) If there is no damage to the edge, you can remove the damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 1.

(b) If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.

(c) Remove the damage to the face of the lug as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) If there is no damage to the edge, you can remove the damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 1.

(b) If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.

(c) Remove the damage to the face of the lug as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

Table 102:

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
FITTING	DIAMETER IN INCHES (mm)
Upper Link Fitting	
Wing Side	2.136 (54.25)
Strut Side	2.296 (58.32)

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
Diagonal Brace Fitting	
Wing Side	2.151 (53.99)
Strut Side	2.276 (57.81)
Side Link Fitting	
Wing Side	1.061 (26.95)
Strut Side	1.061 (26.95)
Mid-Spar Clevis	1.895 (48.13)

B. The first row of fasteners adjacent to the lugs of the fitting:
   (1) Cracks:
      (a) Remove the damage as shown in First Row of Fasteners Adjacent to a Fitting Lug - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1.
         1) The damaged area must be 1.0 inch (25.4 mm) or less in length in all directions.
   (2) Nicks, Gouges, Scratches, and Corrosion:
      (a) Remove the damage as shown in First Row of Fasteners Adjacent to a Fitting Lug - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1.
         1) The damaged area after cleanup is 1.0 inch (25.4 mm) or less in length in any direction.
   (3) Dents are not permitted.
   (4) Holes and Punctures are not permitted.

C. Fitting (This data does not include the lugs or the first fastener row adjacent to the lugs):
   (1) Cracks:
      (a) Remove the damage as shown in Attach Fitting Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1.
      (b) The damaged area after cleanup must be 2.0 inches (50.80 mm) or less in length in all directions.
      (c) If the material removed is 1.5D or less from a fastener hole do the steps that follow:
         1) Remove the fastener that is less than 1.5D from the damage.
         2) Install a freeze plug with BMS 5-63 sealant in the holes of the fitting and each part in the joint at that fastener location. Refer to 51-20-10.

            NOTE: Use the same material for the freeze plug as the initial part in which you install it.

         3) The installation of freeze plugs in adjacent fastener holes is not permitted.
   (2) Nicks, Gouges, Scratches, and Corrosion:
      (a) Remove the damage as shown in Attach Fitting Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1.
      (b) The damaged area after cleanup must be 2.0 inches (50.80 mm) or less in length in all directions.
      (c) For damage that is 1.5D or less from a fastener, do the steps that follow:
         1) Remove the fastener that is less than 1.5D from the damage.

2) Install a freeze plug with BMS 5-63 sealant in the holes of the fitting and each part in the joint at that fastener location. Refer to 51-20-10.

NOTE: Use the same material for the freeze plug as the initial part in which you install it.

3) The installation of freeze plugs in adjacent fastener holes is not permitted.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

D. Links:

(1) Cracks:

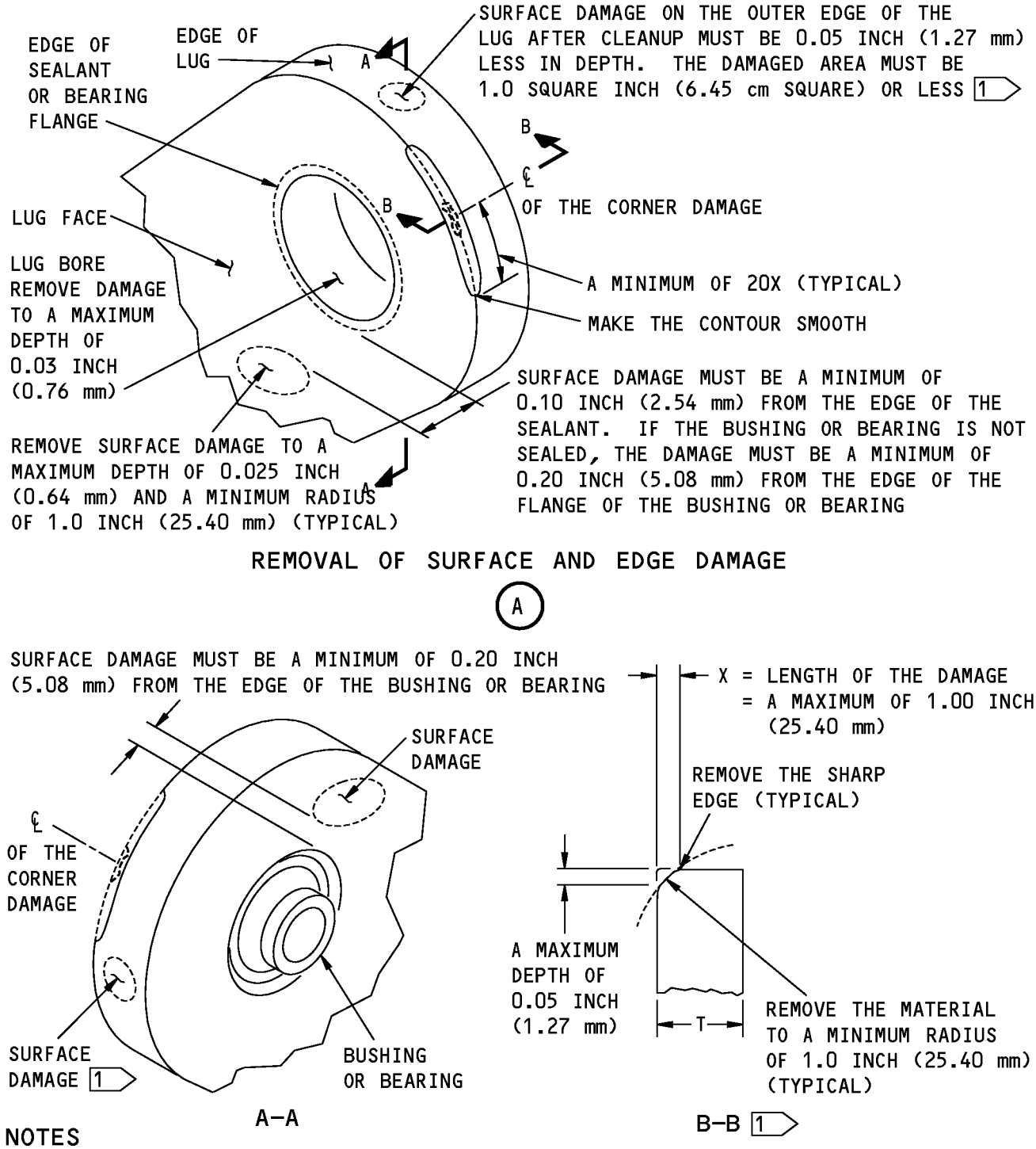
(a) Remove the damage as shown in Link Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 1.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Link Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 1.

(3) Dents are not permitted.

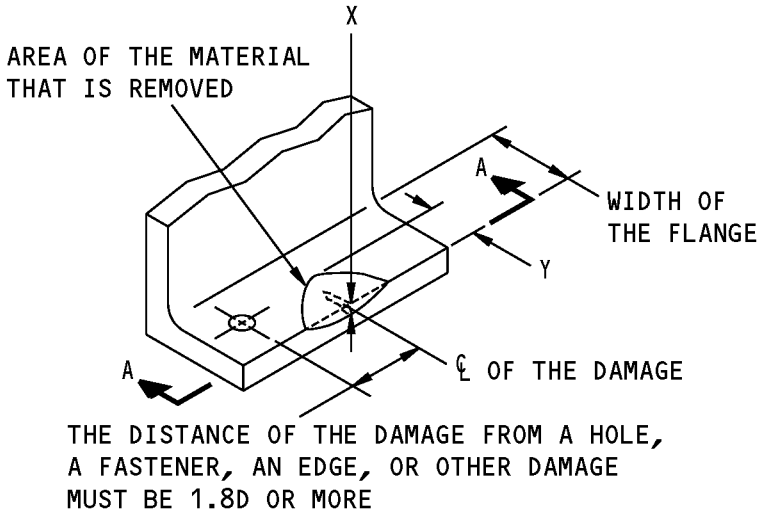
(4) Holes and Punctures are not permitted.



NOTES

1 THESE ALLOWABLE DAMAGE LIMITS ARE APPLICABLE ONLY IF THERE IS NO DAMAGE IN THE BORE OF THE LUG.

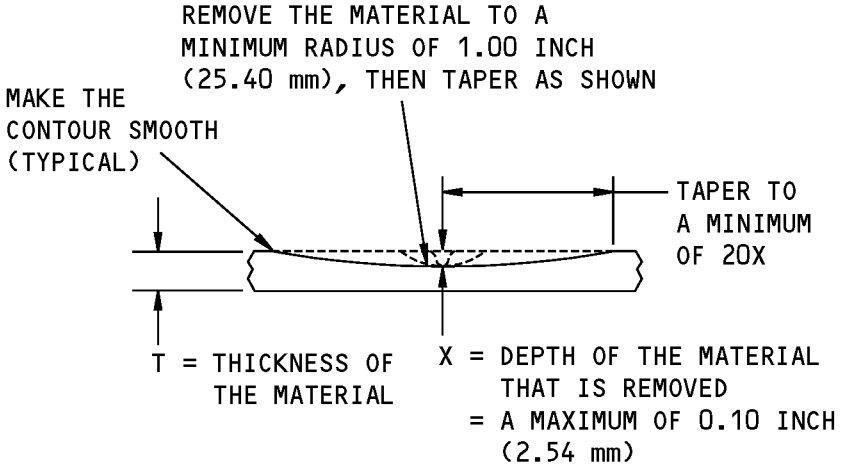
Lug Fitting Allowable Damage Limits
Figure 103



Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 1.0 INCH (25.40 mm)

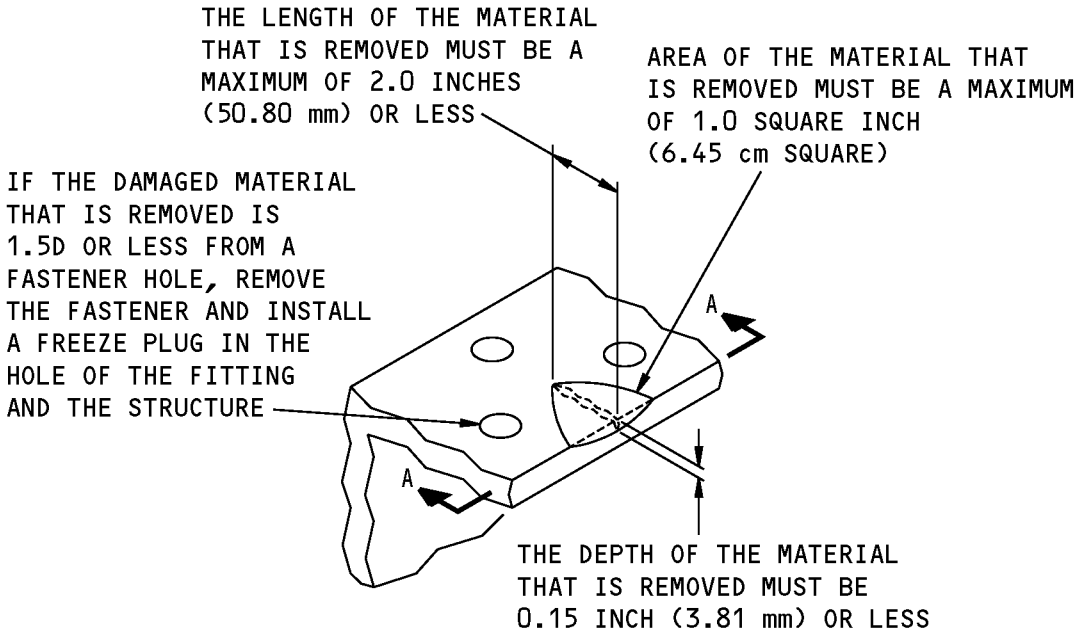
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(A)

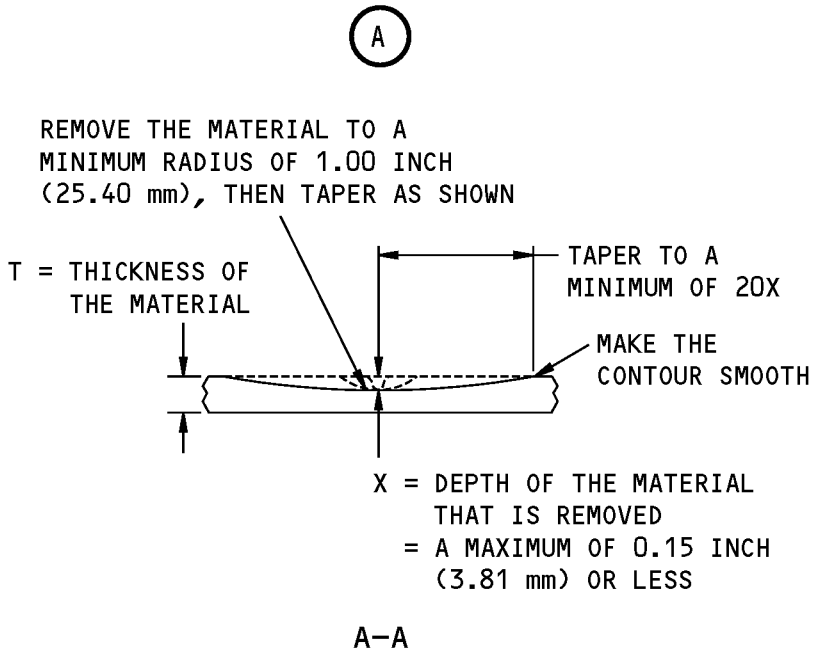


A–A

First Row of Fasteners Adjacent to a Fitting Lug - Allowable Damage Limits
Figure 104



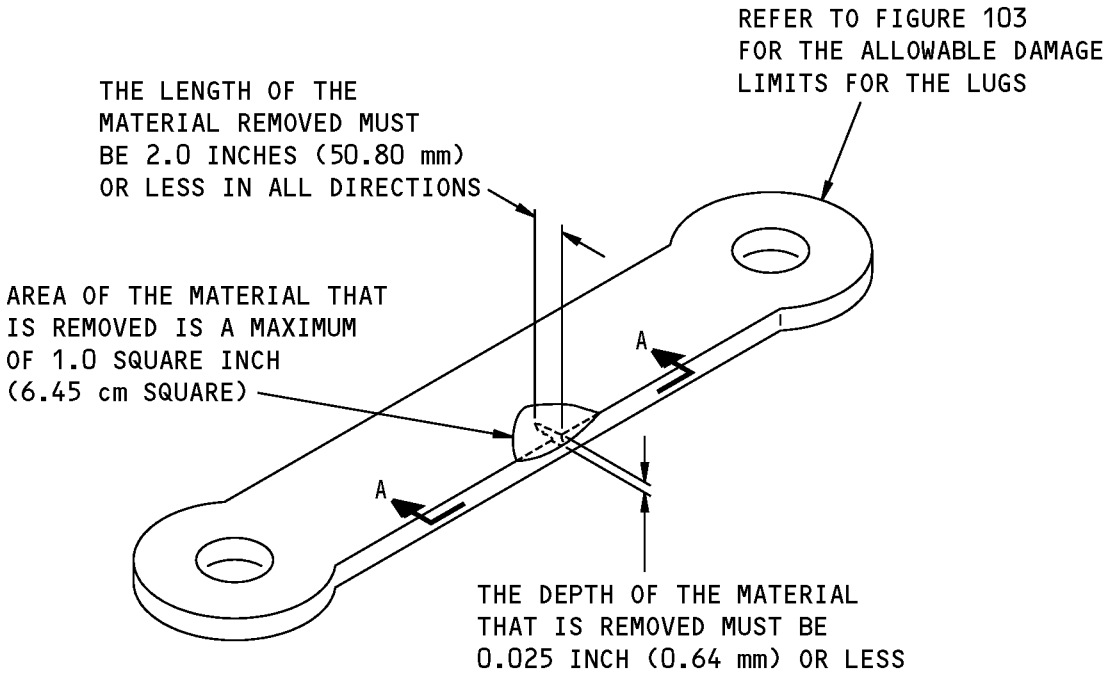
REMOVAL OF DAMAGED MATERIAL ON A SURFACE AT AN EDGE



NOTES

- REFER TO PARAGRAPH 4.A FOR DATA ABOUT THE LUGS OF A FITTING.
- REFER TO PARAGRAPH 4.B FOR DATA ABOUT THE FIRST ROW OF FASTENERS ADJACENT TO THE LUG OF A FITTING.

Attach Fitting Allowable Damage Limits
Figure 105



Link Allowable Damage Limits
Figure 106

ALLOWABLE DAMAGE 2 - ENGINE STRUT HINGE FITTINGS

1. Applicability

A. This subject gives the allowable damage limits for the strut fittings shown in Engine Strut Assembly Fitting Locations, Figure 101/ALLOWABLE DAMAGE 2.

2. General

A. Remove the parts as necessary to get access to the strut fittings.

B. Refer to Strut Fittings, Figure 102/ALLOWABLE DAMAGE 2 for the definitions of the different areas of the fittings covered in the allowable damage limits.

C. Refer to Table 101/ALLOWABLE DAMAGE 2 for a list of the references for the allowable damage data.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	**PARAGRAPH**
Fitting Lugs and Tie Rod Ends	4.A
End Pads and Gussets	4.B
Tie Rods and Threads	4.C
Aft Engine Mount Stop Fitting	4.D

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

D. Remove the damaged material as necessary.

(1) Refer to 51-10-02 for the inspection and removal of damage.

(2) Refer to 51-30-03 for possible sources of abrasives and other materials you can use to remove the damage.

(3) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.

E. After the damage is removed, do the steps that follow:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY AN OCCUR.

(1) Flap peen or shot peen the reworked areas.

(a) Refer to 51-20-06 for shot peen intensity and shot number.

(b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.

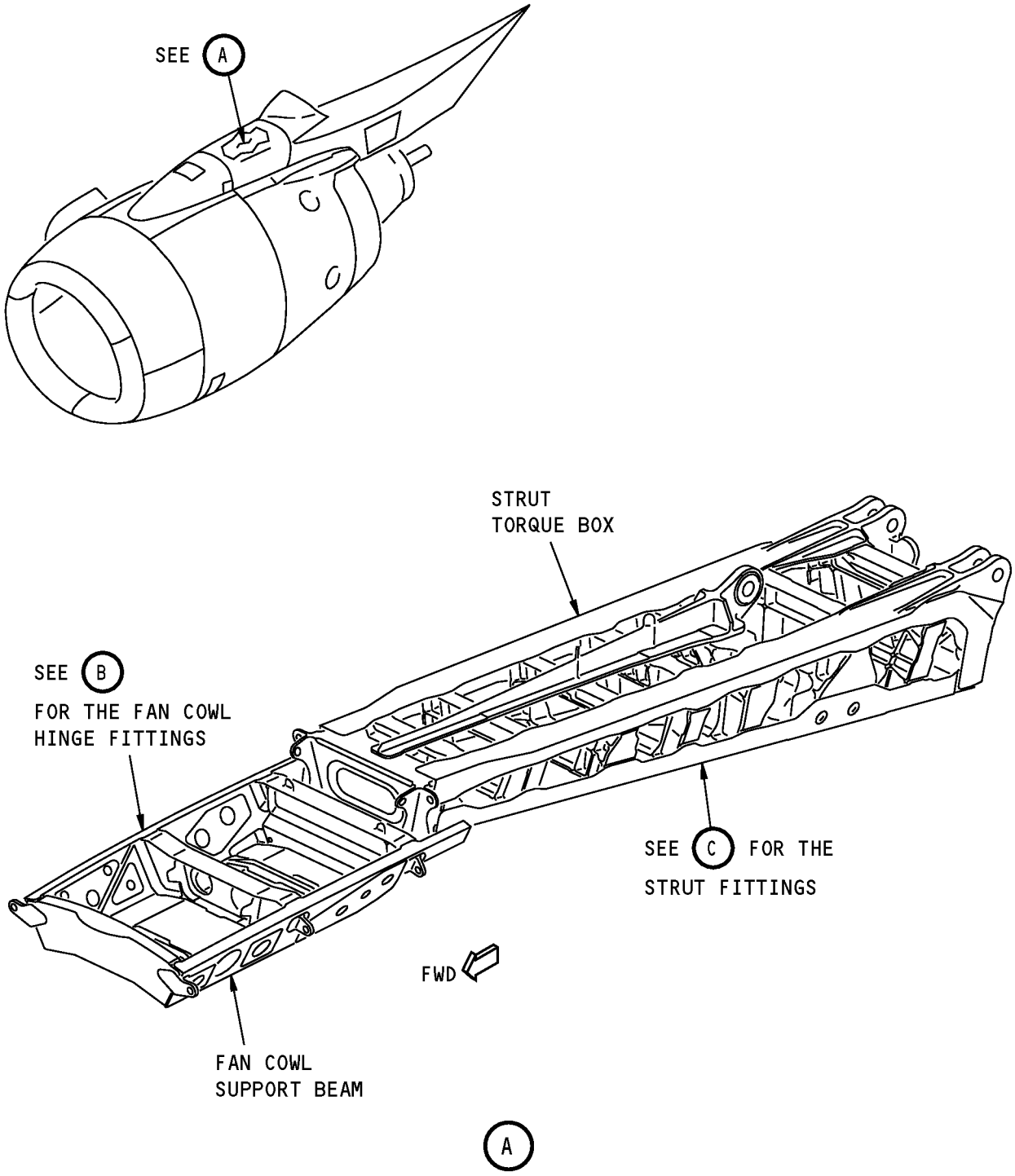
(2) Apply a layer of phosphate-fluoride coating with one layer of BMS 10-11, Type 1 primer to the reworked areas of the Number 2 thrust reverser hinge fitting. Refer to SOPM 20-41-02.

NOTE: Do not apply the coatings to the bore of the hinge fitting.

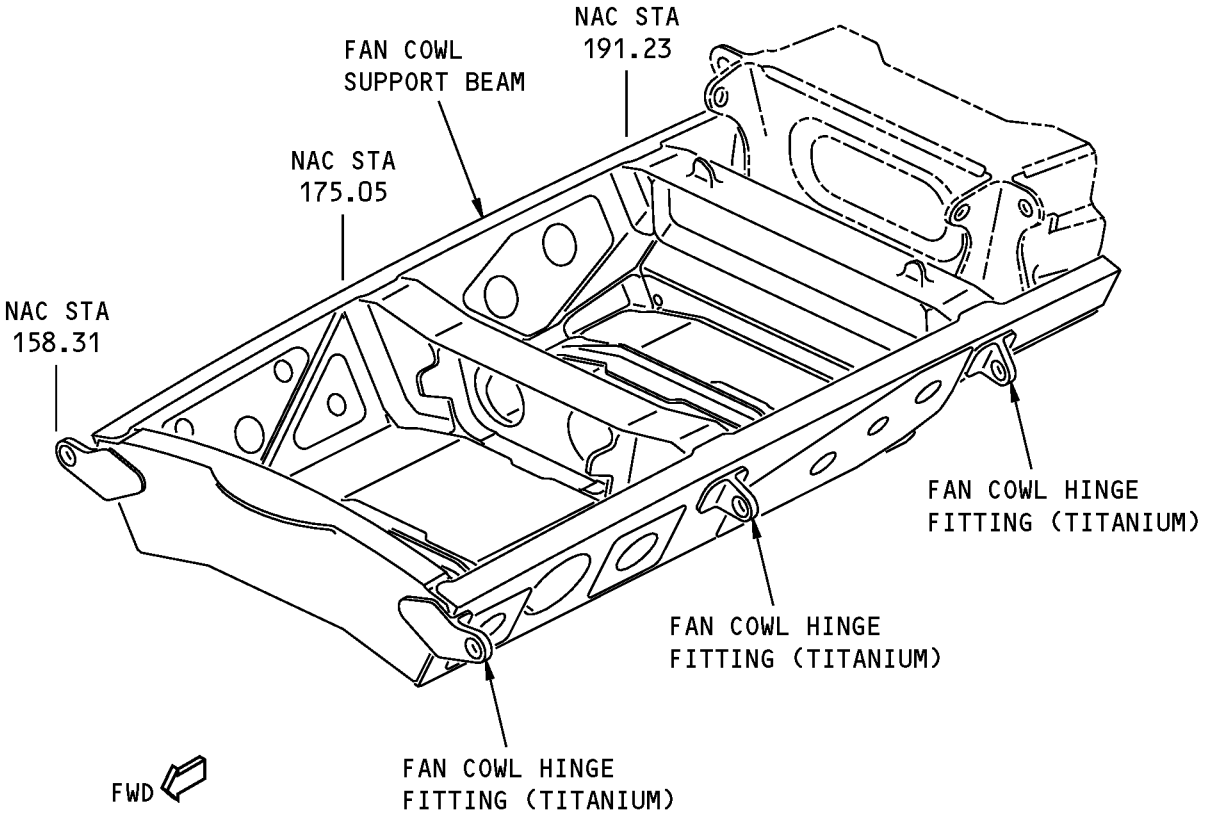
(3) Apply a layer of phosphate-fluoride coating with one layer of high temperature polyurethane primer to the reworked areas of the aft engine mount stop, and the aft GSE bootstrap fitting. Refer to SOPM 20-41-02.

(4) Apply a layer of phosphate-fluoride coating on reworked areas of the tie rod, but not to the threads. Refer to SOPM 20-41-02.

(5) Apply on layer of BMS 3-8 to the threads of the tie rod. Refer to SOPM 20-41-02.



Engine Strut Assembly Fitting Locations
Figure 101 (Sheet 1 of 3)

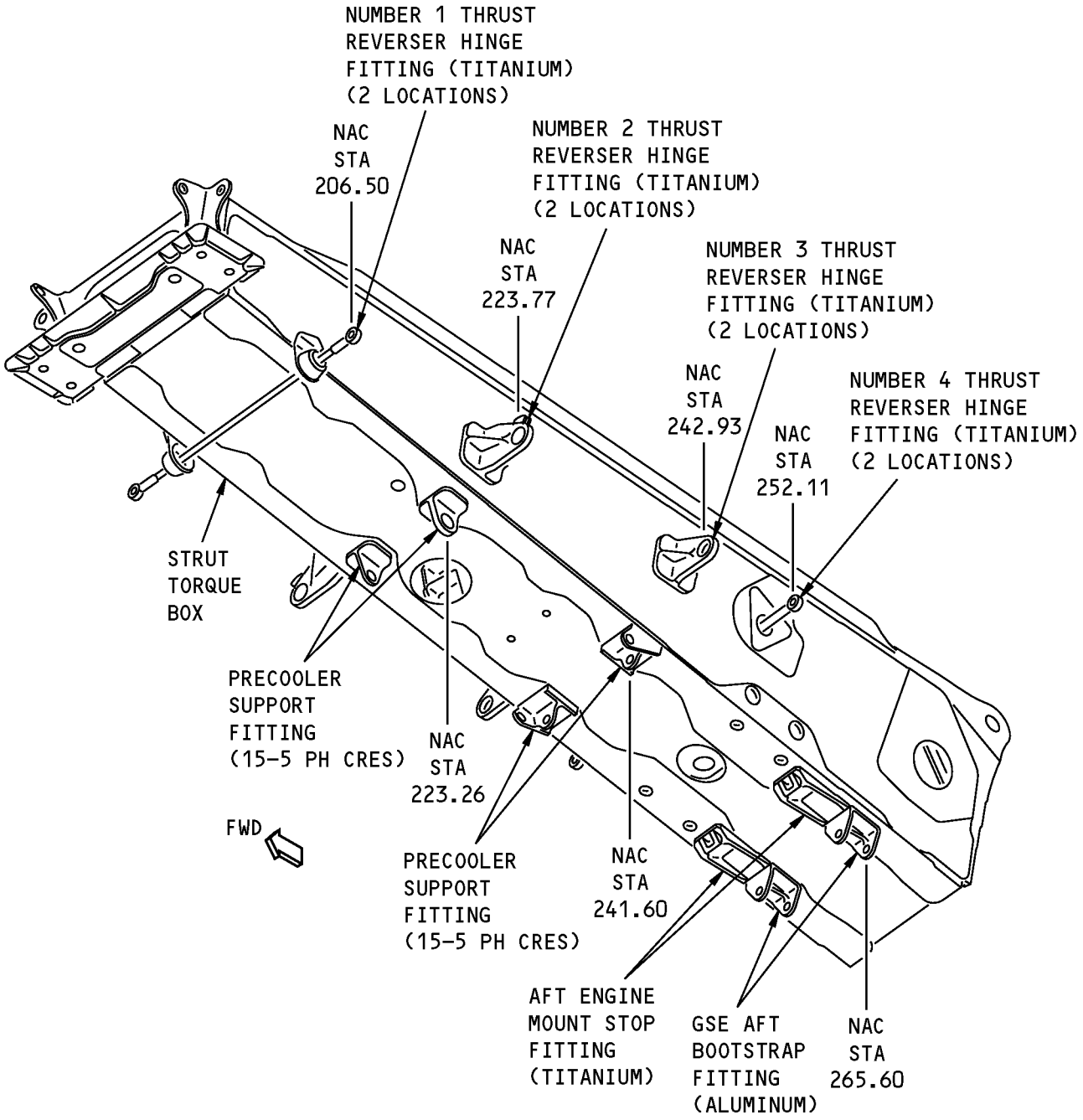


LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

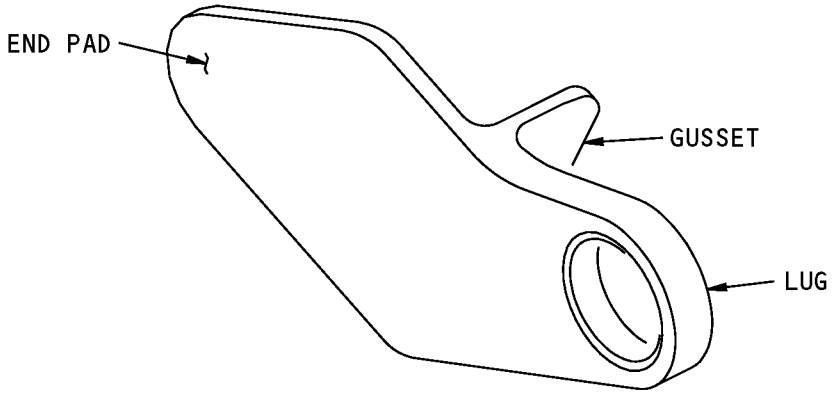
FAN COWL HINGE FITTINGS

B

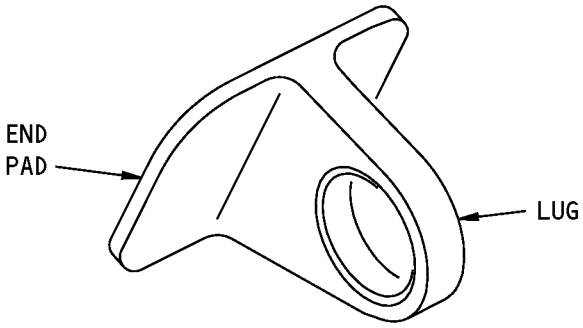
Engine Strut Assembly Fitting Locations
Figure 101 (Sheet 2 of 3)



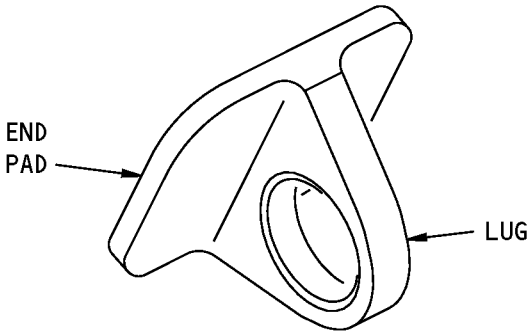
Engine Strut Assembly Fitting Locations
Figure 101 (Sheet 3 of 3)



FAN COWL HINGE FITTING
NAC STA 158.31
A

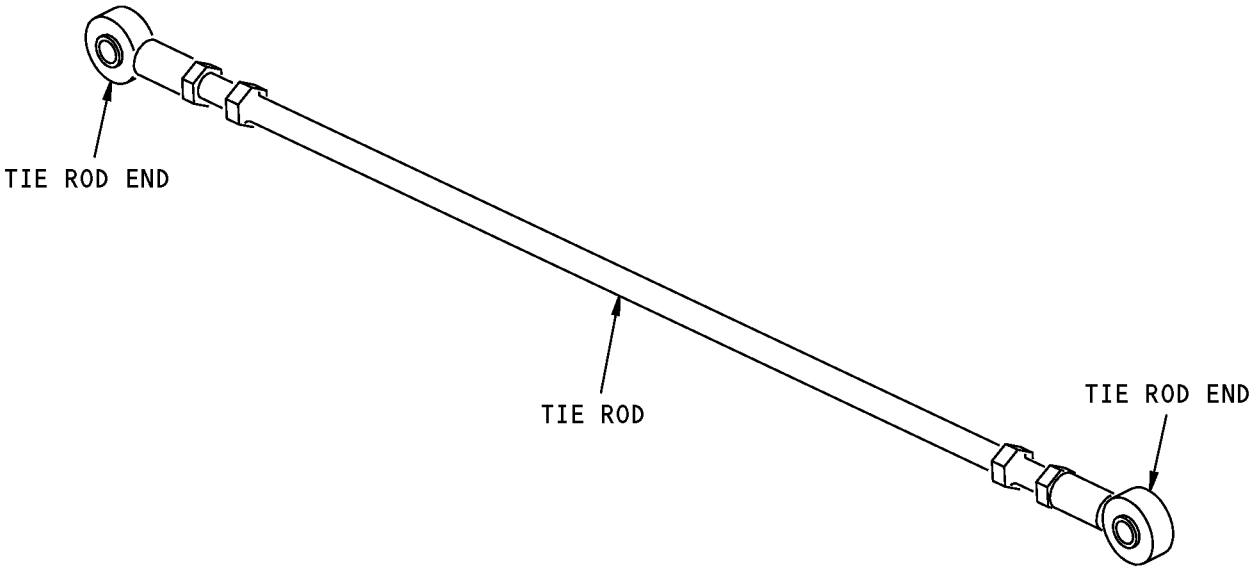


FAN COWL HINGE FITTING
NAC STA 175.05
B



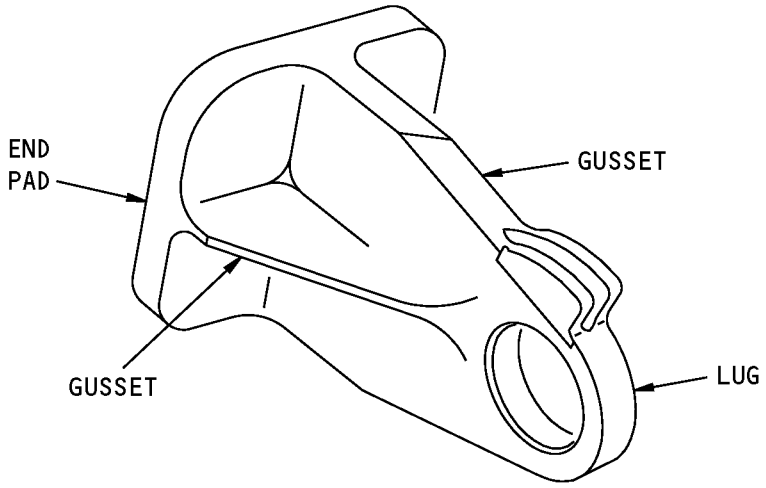
FAN COWL HINGE FITTING
NAC STA 191.23
C

Strut Fittings
Figure 102 (Sheet 1 of 4)



TIE ROD ASSEMBLY - NUMBERS 1 AND 4 THRUST REVERSER HINGE FITTINGS AT NAC STA 206.50 AND NAC STA 252.11

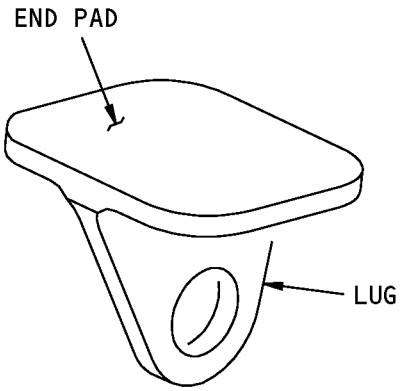
(D)



NUMBERS 2 AND 3 THRUST REVERSER HINGE FITTINGS TYPICAL AT NAC STA 223.77 AND NAC STA 242.93

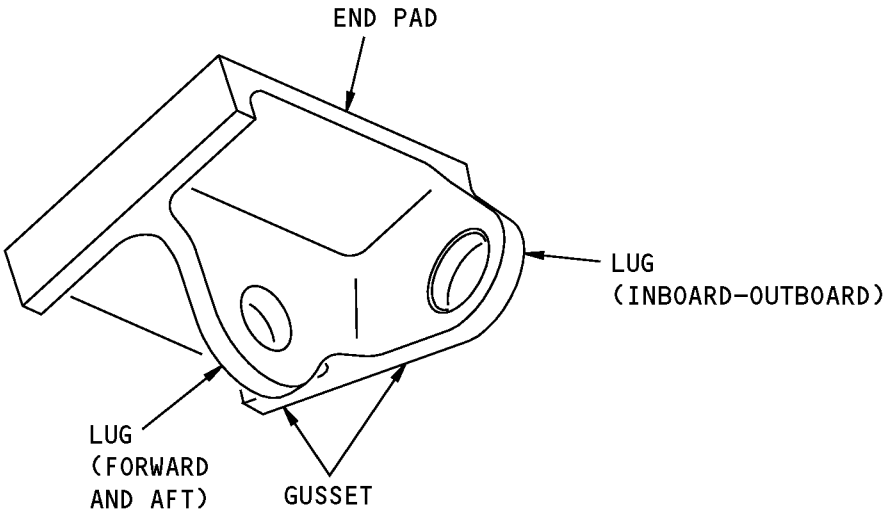
(E)

Strut Fittings
Figure 102 (Sheet 2 of 4)



PRECOOLER SUPPORT FITTING AT NAC STA 223.26

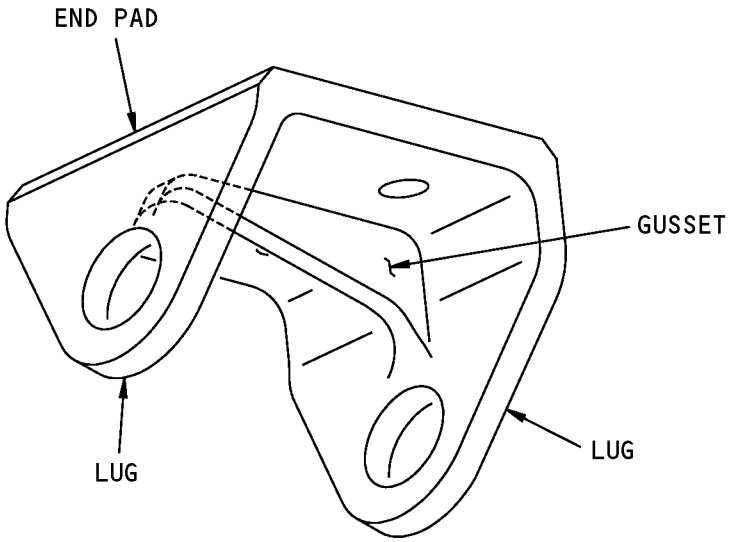
F



PRECOOLER SUPPORT FITTING AT NAC STA 241.60

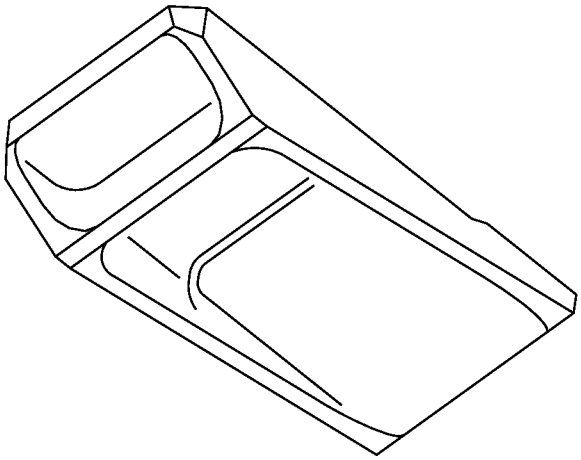
G

Strut Fittings
Figure 102 (Sheet 3 of 4)



GSE AFT BOOTSTRAP FITTING AT NAC STA 265.60

H



AFT ENGINE MOUNT STOP FITTING

I

Strut Fittings
Figure 102 (Sheet 4 of 4)

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	General - Shot Peening Procedures
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Lug Fittings and Tie Rod Ends:

NOTE: You can not have reworked areas of the bore and the edge on the same lug fitting or tie rod end. You can remove damage to the bore or damage to the edge, but not the two surfaces.

(1) Cracks:

(a) If there is no damage to the edge, you can remove the damage on the bore of the lug to the diameters given in Table 102/ALLOWABLE DAMAGE 2.

(b) If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .

(c) Remove the damage on the face of the lug as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) If there is no damage to the edge, you can remove the damage on the bore of the lug to the diameters given in Table 102/ALLOWABLE DAMAGE 2.

(b) If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .

(c) Remove the damage on the face of the lug as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

Table 102:

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
FITTING	DIAMETER IN INCHES (mm)
Fan Cowl Hinge Fittings	1.063 (27.00)
Numbers 1 and 4 Thrust Reverser Hinge Fittings	1.010 (26.65)
Numbers 2 and 3 Thrust Reverser Hinge Fittings	1.490 (37.85)

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
GSE Aft Bootstrap Fittings	0.876 (26.65)
Precooler Support Fitting (LH at NAC STA 223.26)	1.315 (22.25)
Precooler Support Fitting (RH at NAC STA 223.26)	0.917 (23.29)
Precooler Support Fittings (forward-and-aft lugs at NAC STA 241.60)	0.866 (21.99)
Precooler Support Fittings (inboard-and-outboard lugs at NAC STA 241.60)	0.751 (19.07)

B. End Pads and Gussets:

(1) Cracks:

(a) Remove the damage on an edge as shown in Fitting End Pad and Gusset Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A , B , and D .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage on an edge as shown in Fitting End Pad and Gusset Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A , B , D .

1) The length of the damage after cleanup must be 0.5 inch (12.70 mm) or less.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

C. Tie Rod - (Numbers 1 and 4 Thrust Reverser Hinge Fitting Locations):

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Tie Rod and Thread Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details A and B .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

D. Aft Engine Mount Stop Fitting:

(1) Cracks:

(a) Remove the damage as shown in Aft Engine Mount Stop Fitting Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Details A and B .

(b) For damage that is less than 1.8D (D = the largest dimension of the damage) away from a fastener hole, do the steps that follow:

1) Remove the fastener that is less than 1.8D (D = the largest dimension of the damage) from the damage.

2) Install a freeze plug with BMS 5-63 sealant in the holes of the fitting and each part of the joint at that fastener location. Refer to 51-20-10.

NOTE: Use the same material for the freeze plug as the initial part in which you install it.

3) The installation of freeze plugs in adjacent fastener holes is not permitted.

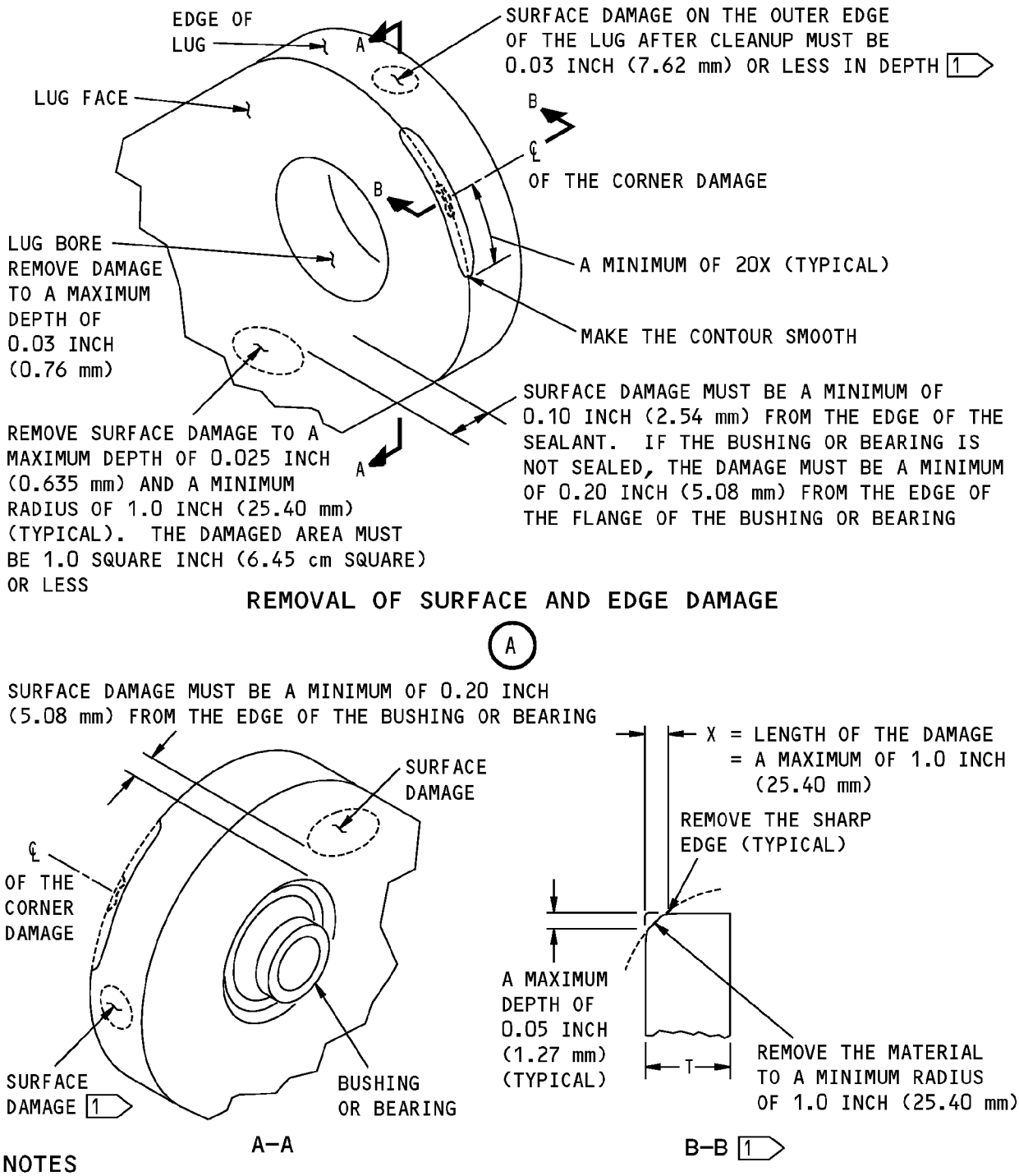
(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove damage on an edge as shown in Aft Engine Mount Stop Fitting Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Details A and B .

(b) Remove damage at locations other than on an edge as shown in Aft Engine Mount Stop Fitting Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail C .

(3) Dents are not permitted.

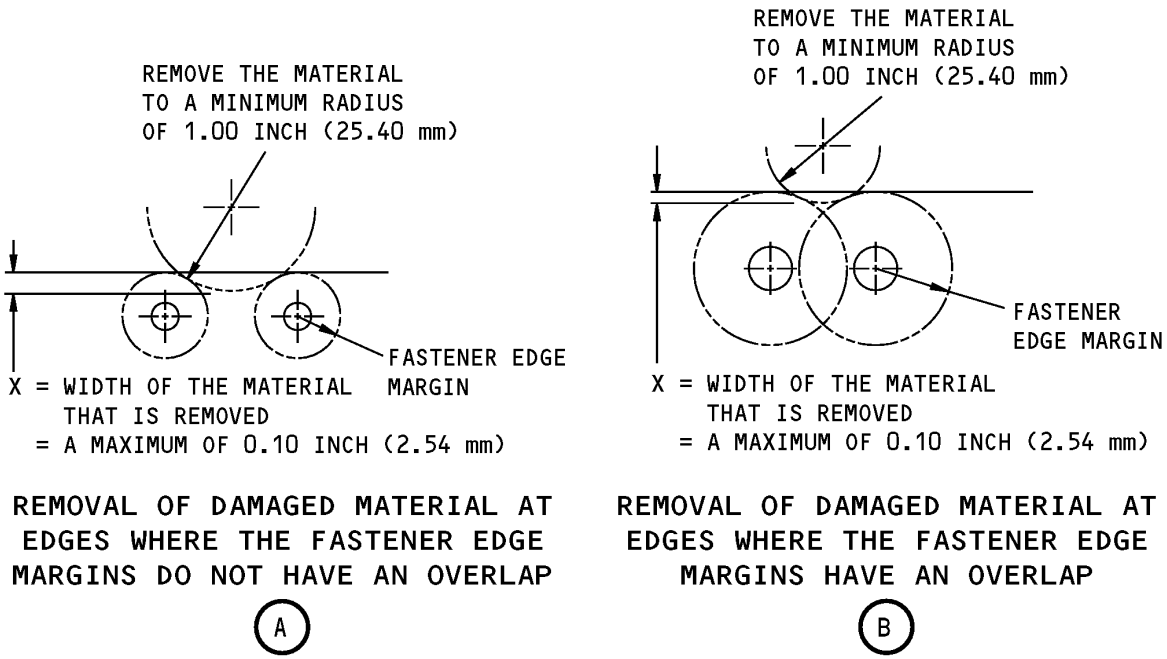
(4) Holes and Punctures are not permitted.



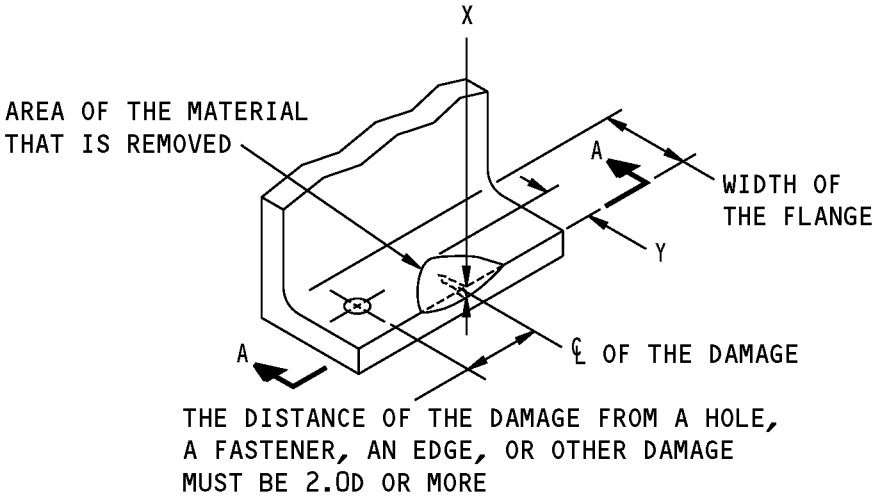
NOTES

1 THESE ALLOWABLE DAMAGE LIMITS ARE APPLICABLE ONLY IF THERE IS NO DAMAGE IN THE BORE OF THE LUG.

Fitting Lug and Tie Rod End Allowable Damage Limits
Figure 103

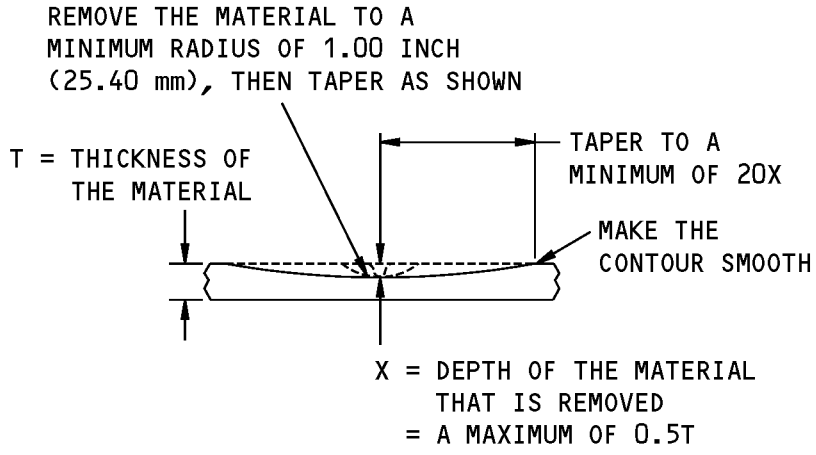


Fitting End Pad and Gusset Allowable Damage Limits
Figure 104 (Sheet 1 of 3)



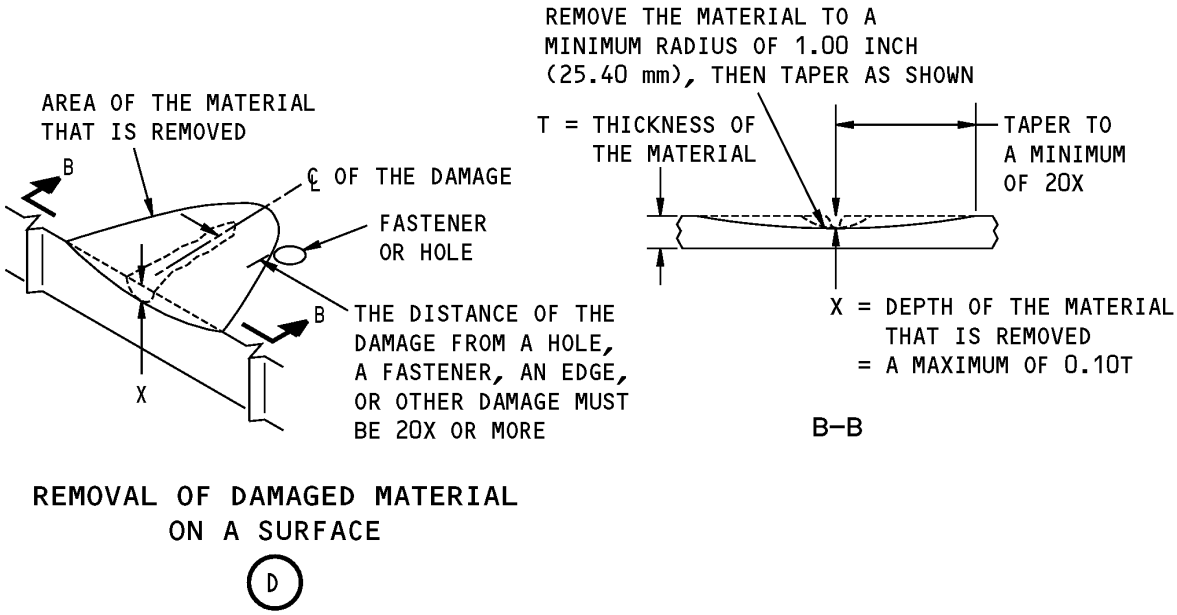
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

C

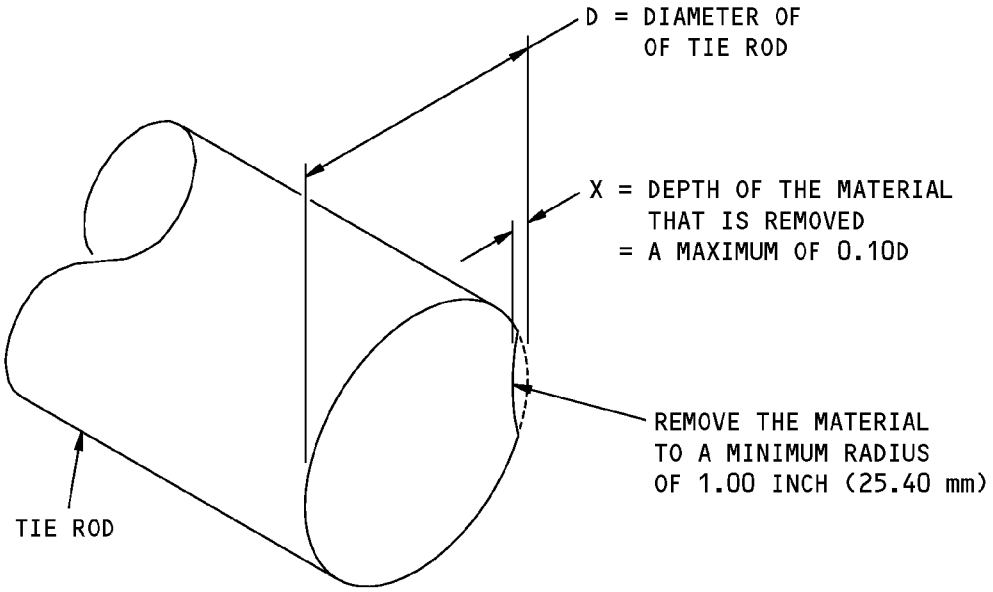


A–A

Fitting End Pad and Gusset Allowable Damage Limits
Figure 104 (Sheet 2 of 3)

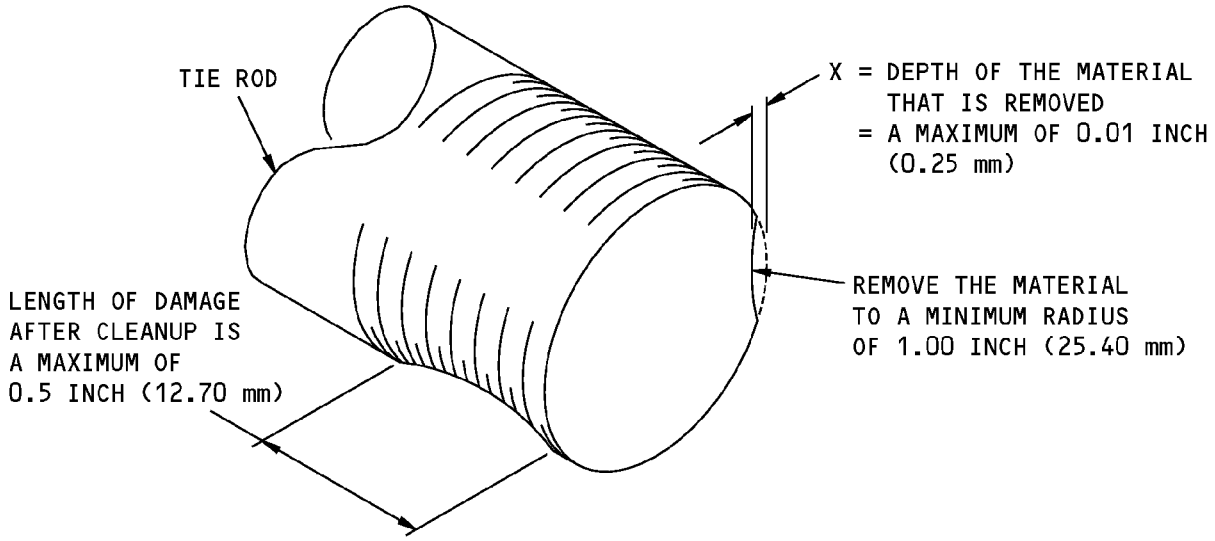


Fitting End Pad and Gusset Allowable Damage Limits
Figure 104 (Sheet 3 of 3)



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE OF THE TIE ROD

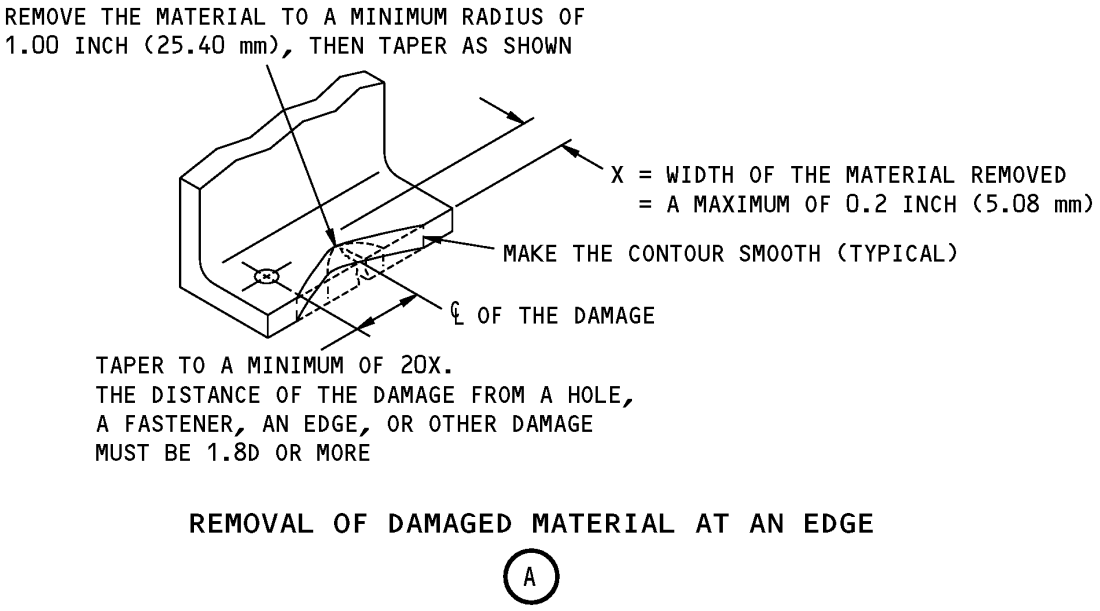
A



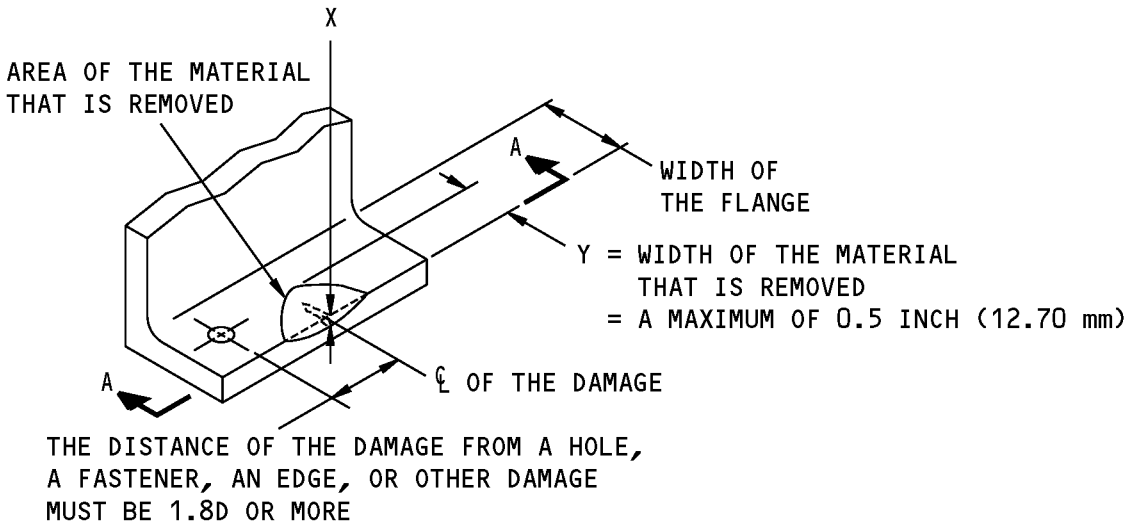
REMOVAL OF DAMAGED MATERIAL FROM
THE THREADS OF THE TIE ROD

B

Tie Rod and Thread Allowable Damage Limits
Figure 105

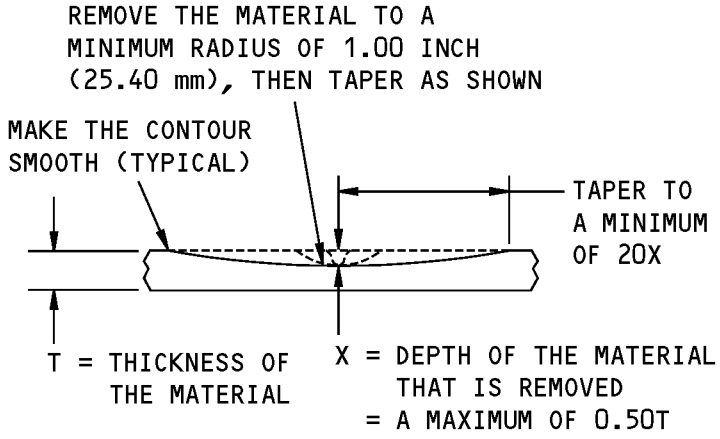


Aft Engine Mount Stop Fitting Allowable Damage Limits
Figure 106 (Sheet 1 of 3)



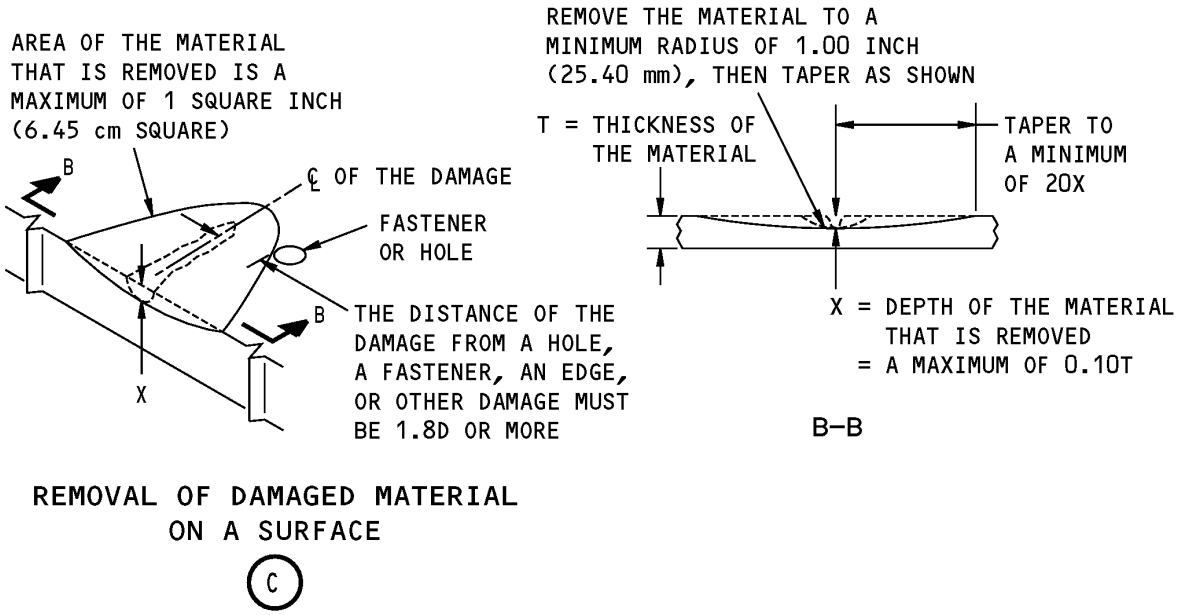
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

B



A–A

Aft Engine Mount Stop Fitting Allowable Damage Limits
Figure 106 (Sheet 2 of 3)



Aft Engine Mount Stop Fitting Allowable Damage Limits
Figure 106 (Sheet 3 of 3)

ALLOWABLE DAMAGE 3 - ENGINE STRUT TORQUE BOX BULKHEAD FITTINGS

1. **Applicability**

   A. This subject gives the allowable damage limits for the torque box bulkhead fittings shown in Engine Strut Torque Box Bulkhead Fitting Locations, Figure 101/ALLOWABLE DAMAGE 3.

2. **General**

   A. Remove the parts as necessary to get access to the strut torque box bulkhead fittings.

   B. Refer to Table 101/ALLOWABLE DAMAGE 3 for a list of the references for the allowable damage data.

   C. Refer to Engine Strut Torque Box Bulkhead Fittings, Figure 102/ALLOWABLE DAMAGE 3 for the definitions of the different areas of the strut torque box bulkhead fittings.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	**PARAGRAPH**
Lugs of the Forward Engine Mount Bulkhead Fitting	4.A
Locations where the bulkhead fittings are attached to the side skins, the upper and lower spar webs, and the lower chords	4.B
Forward and Aft Engine Mount Bulkhead Fittings - Shear Pin, Engine Mount Tension Bolt Holes, and Shear Boss Locations	4.C
Bulkhead Fitting Webs	4.D
Forward Engine Mount Bulkhead Fitting - Lower Flange Gussets	4.E

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

D. Remove the damaged material as necessary.

   (1) Refer to 51-10-02 for the inspection and removal of damage.

   (2) Refer to 51-20-10 for freeze plug installation.

   (3) Refer to 51-30-03 for possible sources of abrasive materials and other materials you can use to remove the damage.

   (4) Refer to 51-30-05 for possible sources of tools and equipment you can use to remove the damage.

   (5) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.

E. After the damage is removed, do the steps that follow:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

   (1) Flap peen or shot peen the reworked areas.

      (a) Refer to SRM 52-20-06 for shot peen intensity and shot number.

      (b) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.

(2) Apply a chemical conversion coating to the reworked areas of the mid-strut bulkhead fitting (aluminum only). Refer to 51-20-01.

(3) Apply two layers of BMS 10-11, Type 1 primer to the reworked areas of the mid-strut bulkhead fitting (aluminum only). Refer to SOPM 20-41-02.

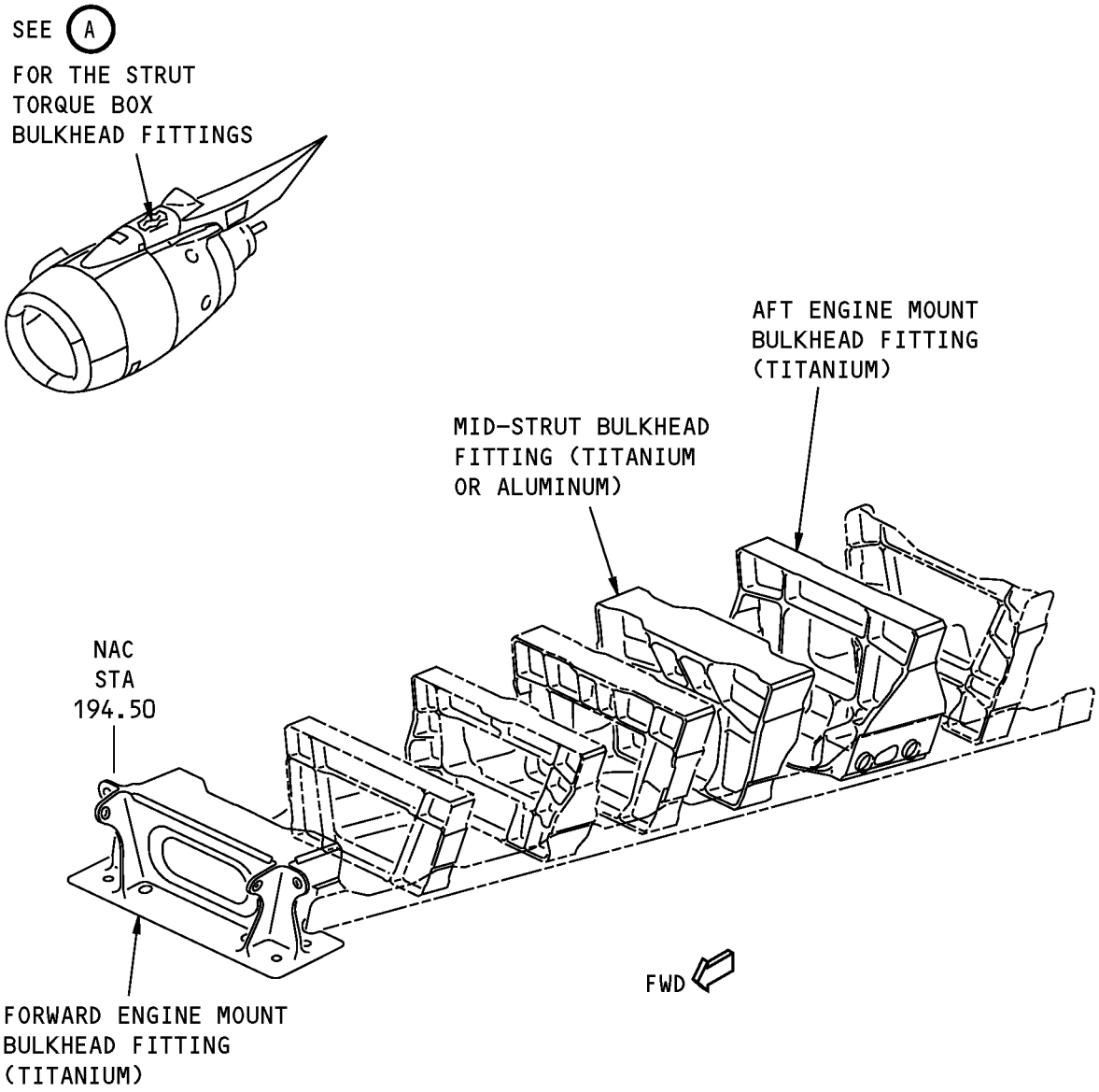
NOTE: Do not apply the BMS 10-11, Type 1 primer to the holes of the fitting.

(4) Apply a layer of phosphate-fluoride coating and a layer of BMS 10-11, Type 1 primer to the reworked areas of the forward engine mount bulkhead fitting and the mid-strut bulkhead fitting (Titanium only). Refer to SOPM 20-41-02.

NOTE: Do not apply the BMS 10-11, Type 1 primer to the holes of the fitting.

(5) Apply a layer of phosphate-fluoride coating and a layer of high temperature polyurethane primer on the reworked areas of the aft engine mount bulkhead fitting. Refer to SOPM 20-41-02.

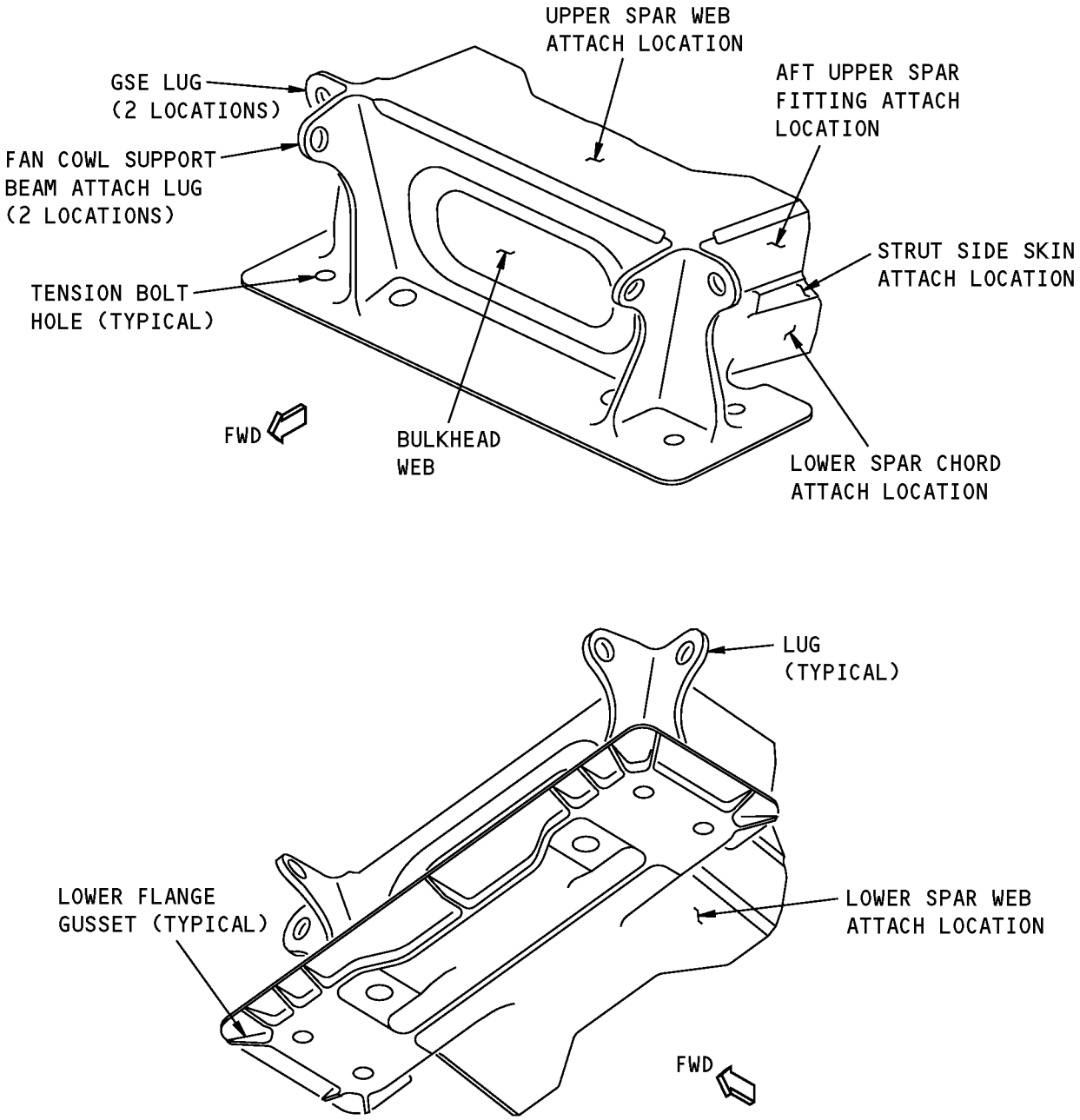
NOTE: Do not apply the polyurethane primer to the hole or counterbore of the fitting.



NOTE: REFER TO PARAGRAPH 4 FOR THE ALLOWABLE DAMAGE LIMITS.

A

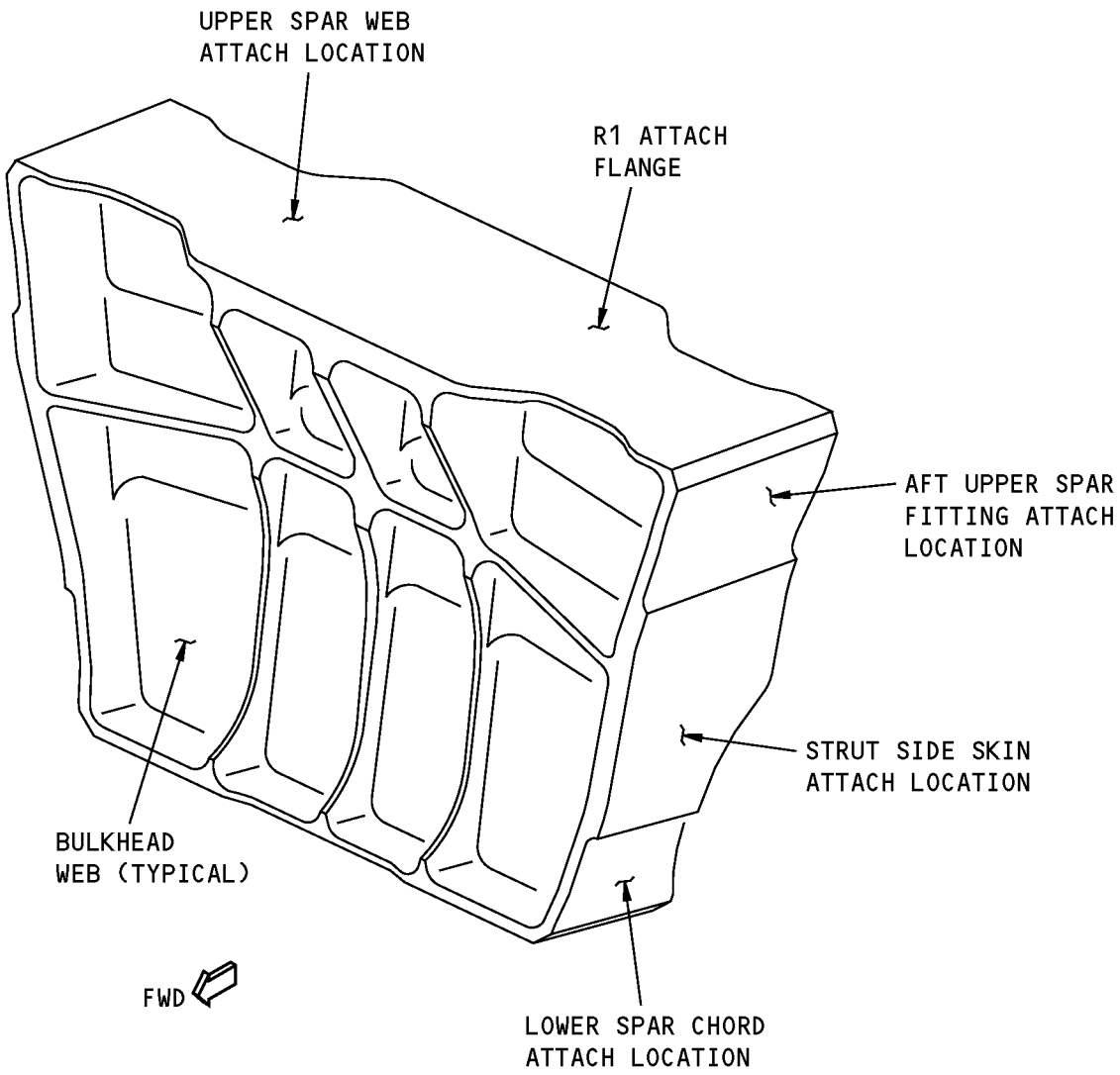
Engine Strut Torque Box Bulkhead Fitting Locations
Figure 101



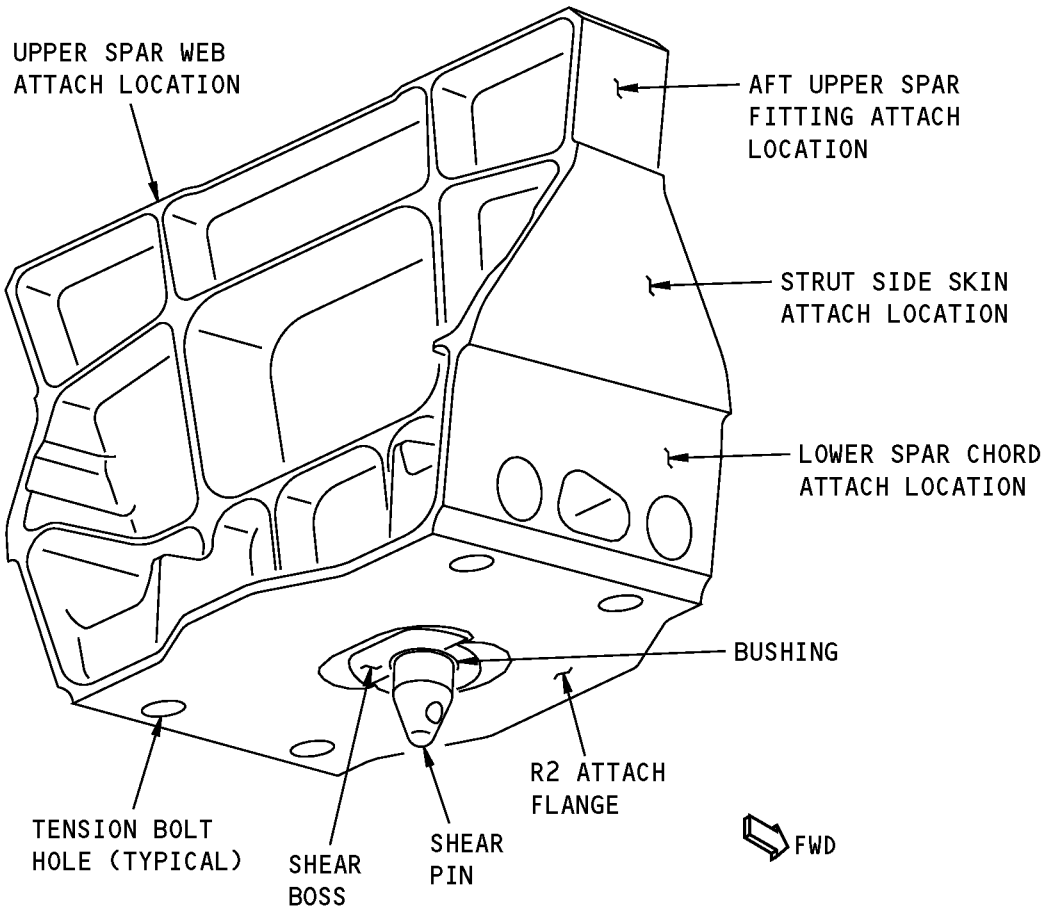
FORWARD ENGINE MOUNT BULKHEAD FITTING

A

Engine Strut Torque Box Bulkhead Fittings
Figure 102 (Sheet 1 of 3)



Engine Strut Torque Box Bulkhead Fittings
Figure 102 (Sheet 2 of 3)



AFT ENGINE MOUNT BULKHEAD FITTING

C

Engine Strut Torque Box Bulkhead Fittings
Figure 102 (Sheet 3 of 3)

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	General - Shot Peening Procedures
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Allowable Damage Limits

A. Lugs of the Forward Engine Mount Bulkhead Fitting:

NOTE: You can not have reworked areas on the bore and the edge of the same lug fitting. You can remove damage on the bore or damage on the edge, but not on the two surfaces.

(1) Cracks:

(a) If there is no damage on the edge, you can remove damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 3.

(b) If there is no damage on the bore of the lug, you can remove the damage on the edge as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.

(c) Remove the damage on the face of the lug as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) If there is no damage on the edge, you can remove damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 3.

(b) If there is no damage on the bore of the lug, you can remove the damage on the edge as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.

(c) Remove the damage on the face of the lug as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

Table 102:

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
FITTING	DIAMETER IN INCHES (mm)
Fan Cowl Support Beam Attach Lug	0.875 (22.22)
GSE Lug	0.877 (22.27)

B. Fitting attachment surfaces at the Strut Side Skin, Upper and Lower Spar Webs, and the Lower Spar Chords:

(1) Cracks:

(a) Remove the damage as shown in Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Details A , B , and C .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage on an edge as shown in Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Details A , B , C , and D .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

C. Forward and Aft Engine Mount Bulkhead Fittings - Shear Pin, Engine Mount Tension Bolt Holes and Shear Boss Locations:

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Forward and Aft Engine Mount Bulkhead Fittings - Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 3.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

D. Bulkhead Fitting Webs:

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Engine Strut Bulkhead Fitting Webs - Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 3, Details A and B .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

E. Forward Engine Mount Bulkhead Fitting - Lower Flange Gussets:

(1) Cracks:

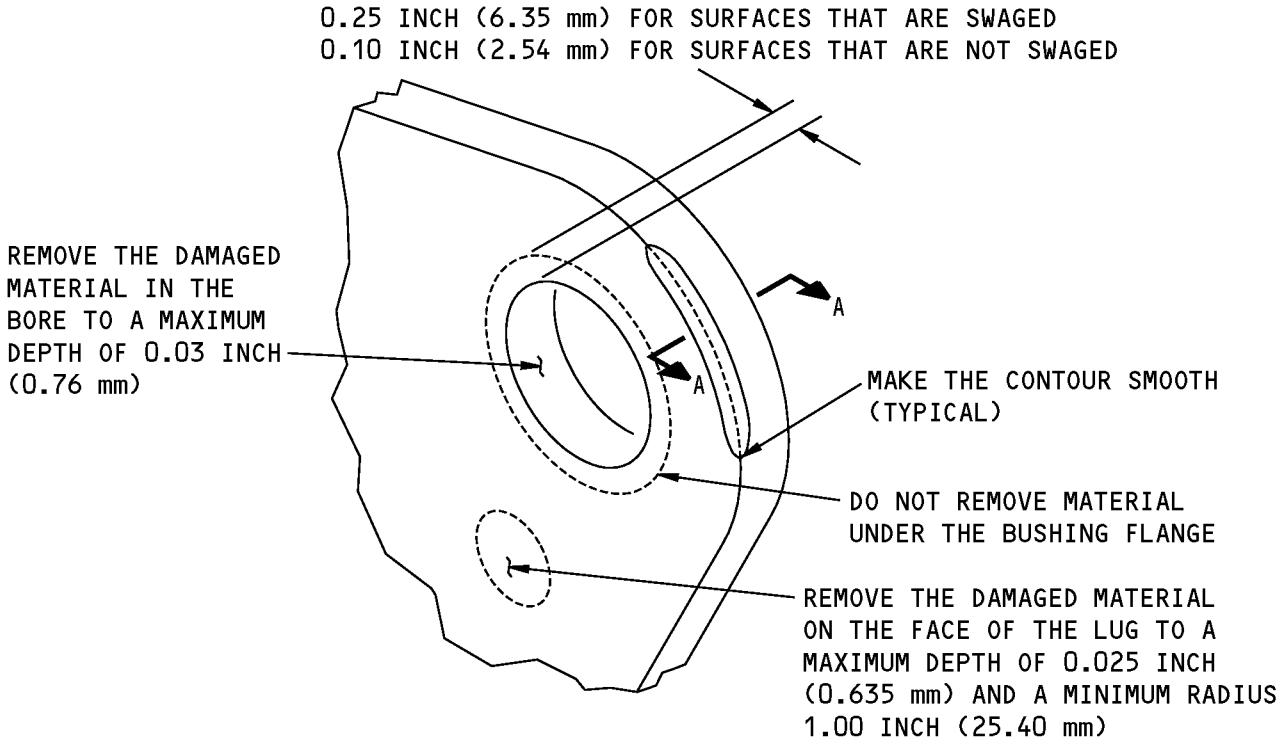
(a) Remove the damage as given in Forward Engine Mount Fitting, Lower Flange Gussets - Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 3, Detail A .

(2) Nicks, Gouges, Scratches, and Corrosion:

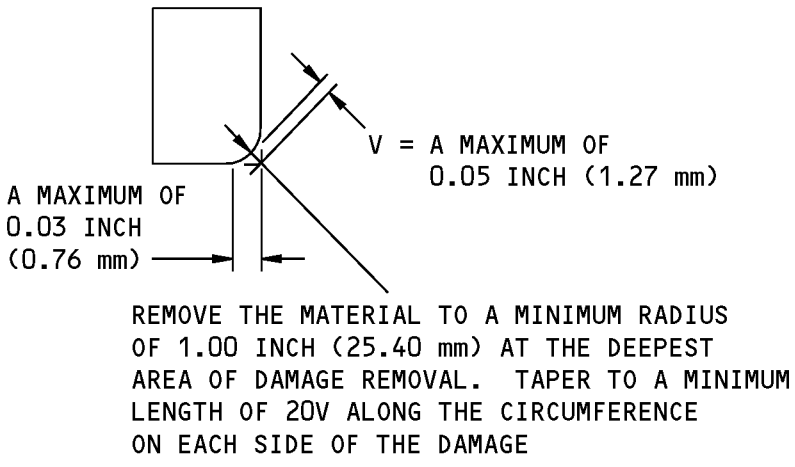
(a) Remove the damage as shown in Forward Engine Mount Fitting, Lower Flange Gussets - Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 3, Details A and B .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

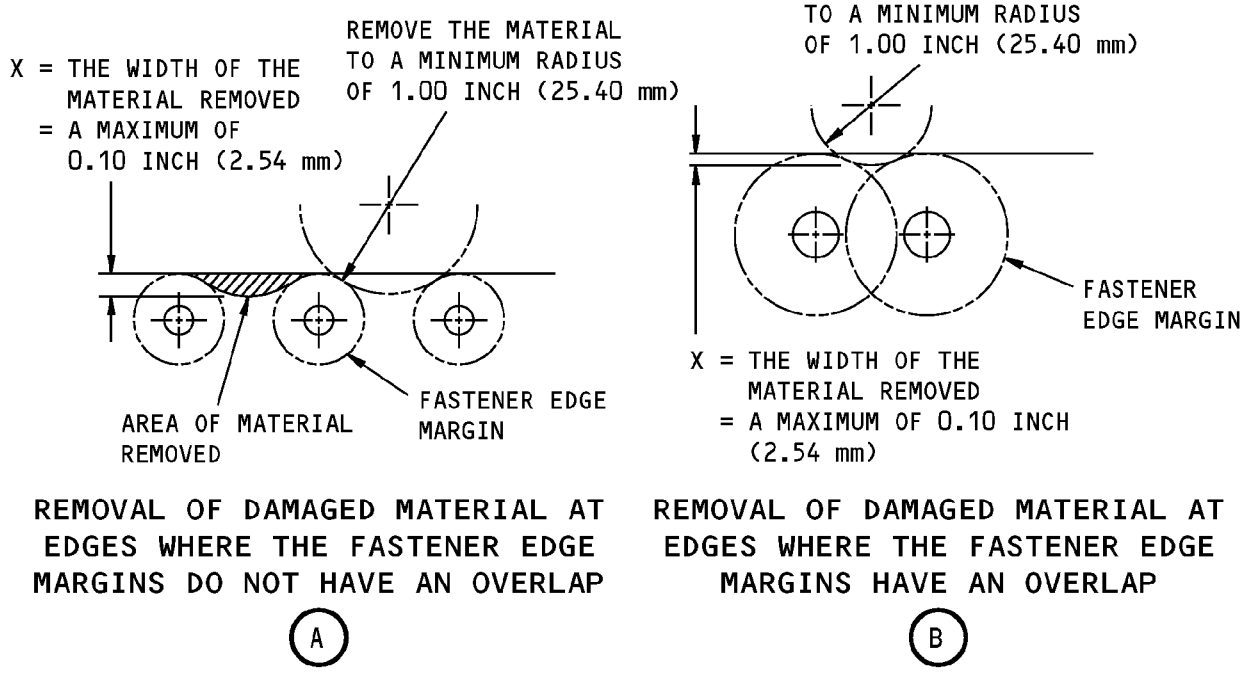


REMOVAL OF DAMAGED MATERIAL ON A LUG WITH BUSHINGS

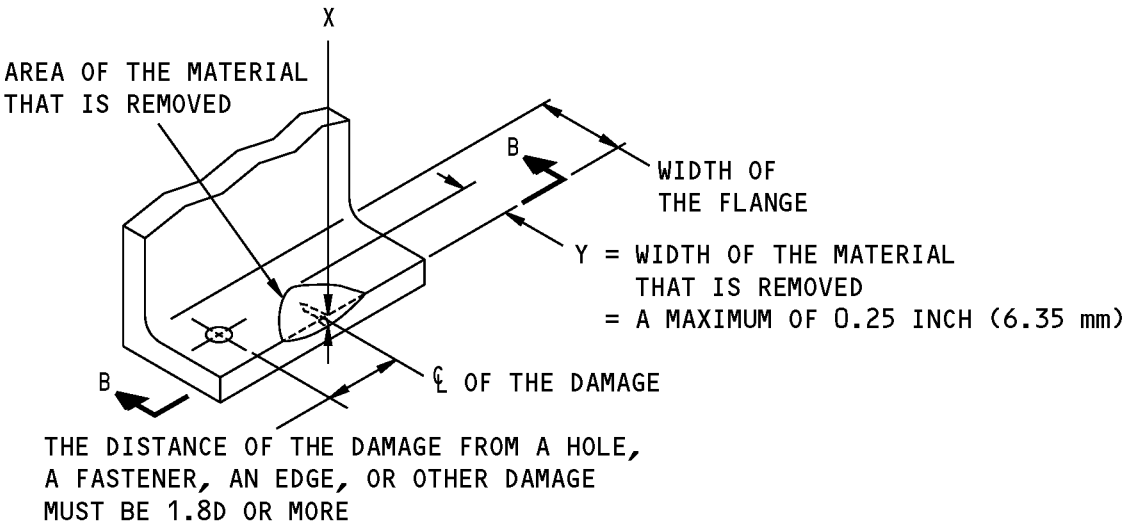


A–A

Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits
Figure 103

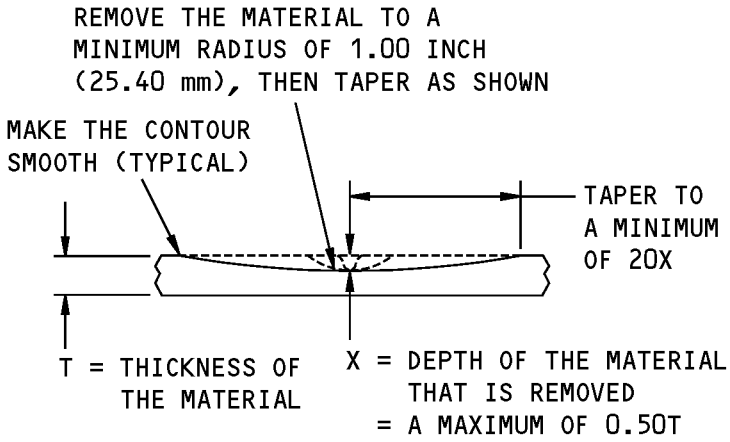


Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords - Allowable Damage Limits
Figure 104 (Sheet 1 of 2)



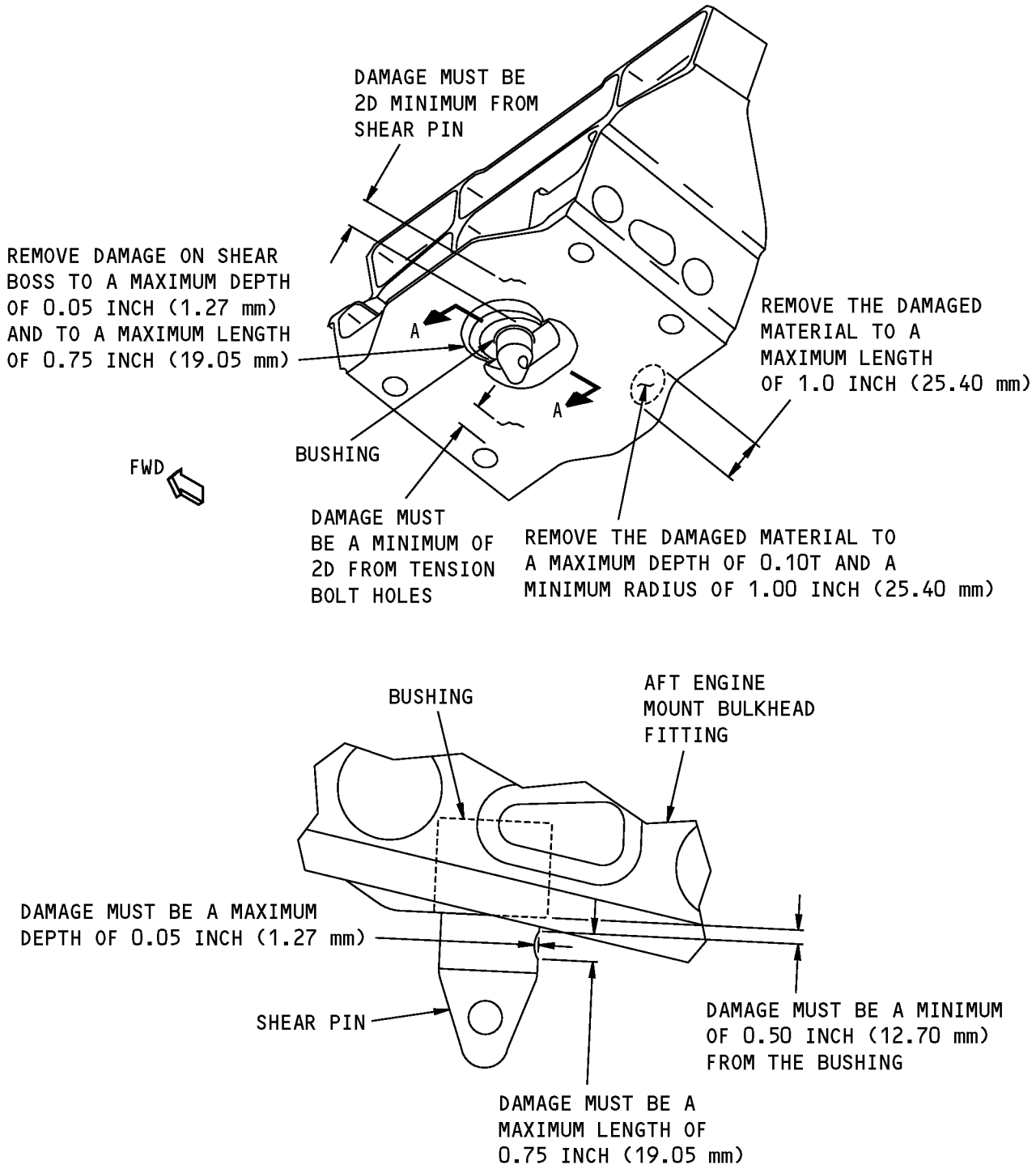
REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(D)

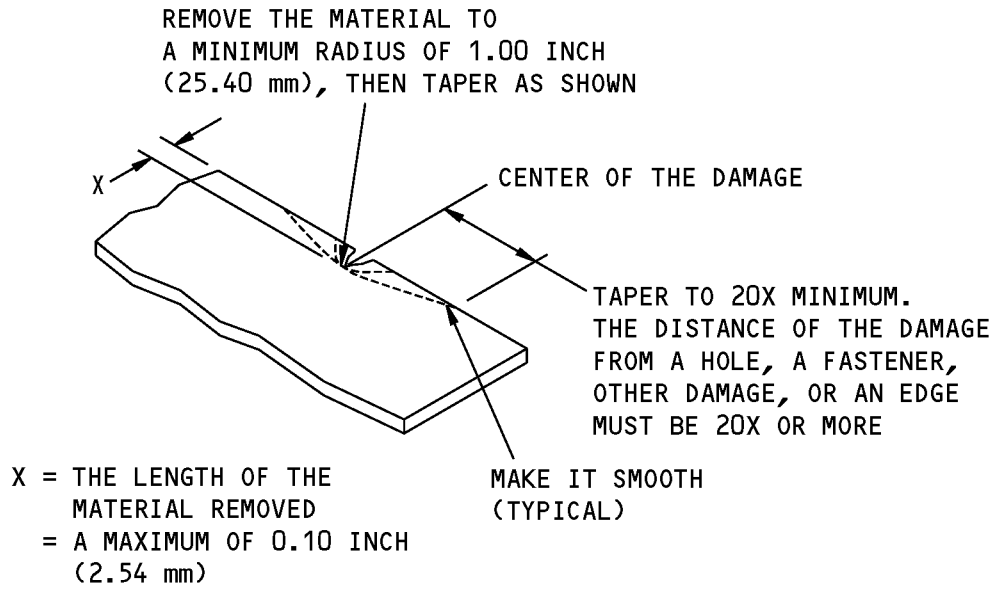


B–B

Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords - Allowable Damage Limits
Figure 104 (Sheet 2 of 2)

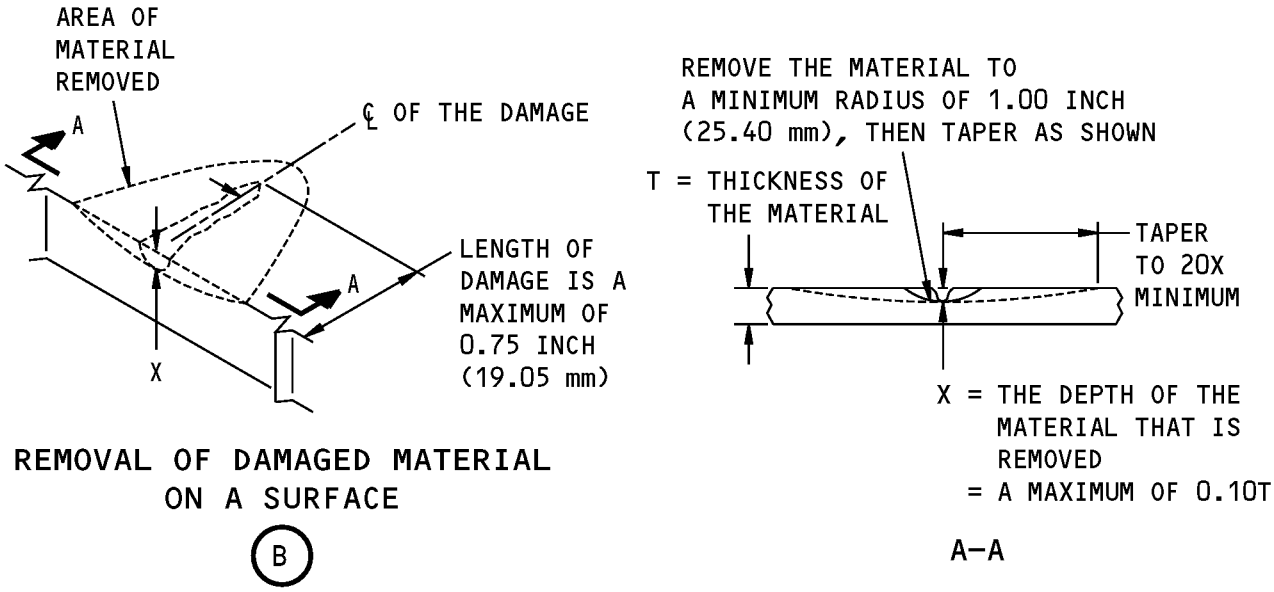


Forward and Aft Engine Mount Bulkhead Fittings - Allowable Damage Limits
Figure 105



REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(A)

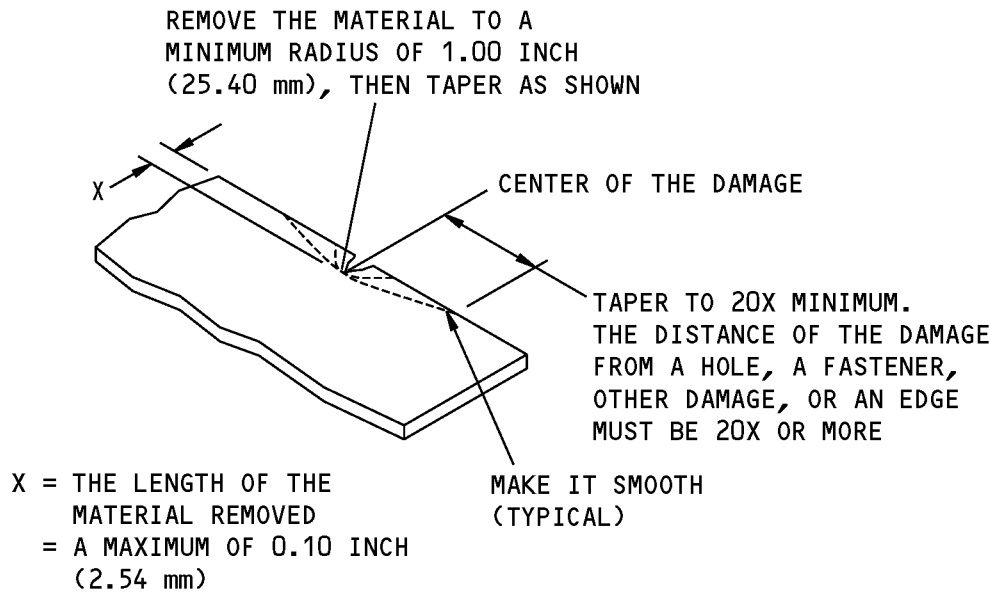


REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

(B)

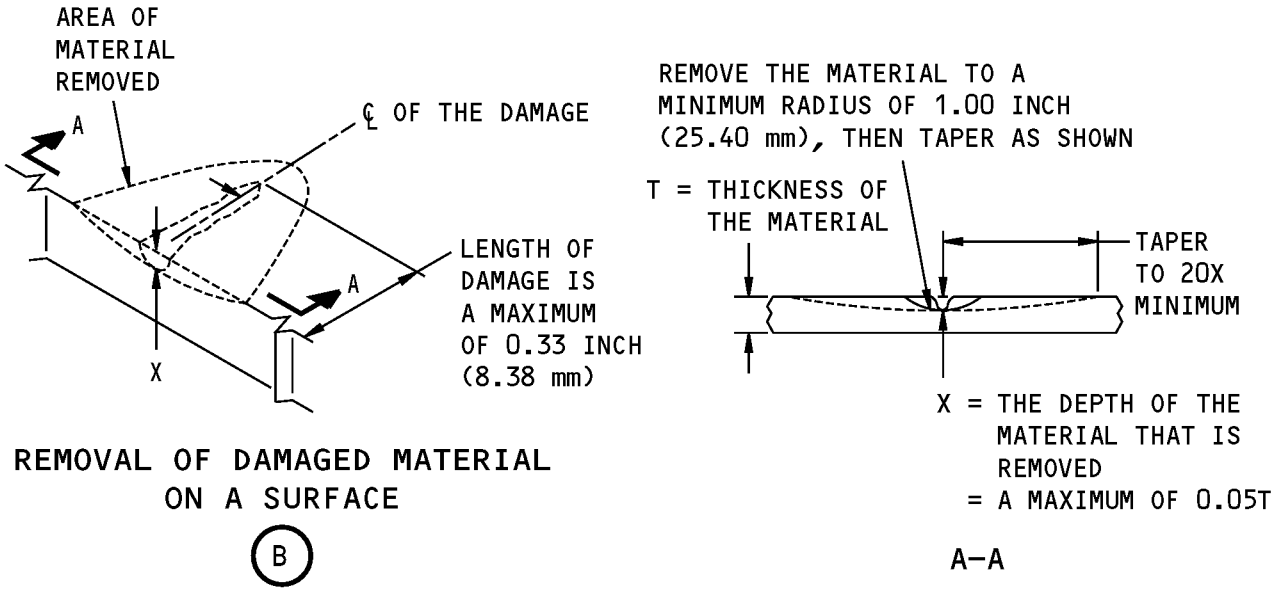
A–A

Engine Strut Bulkhead Fitting Webs - Allowable Damage Limits
Figure 106



REMOVAL OF DAMAGED MATERIAL AT AN EDGE

A



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

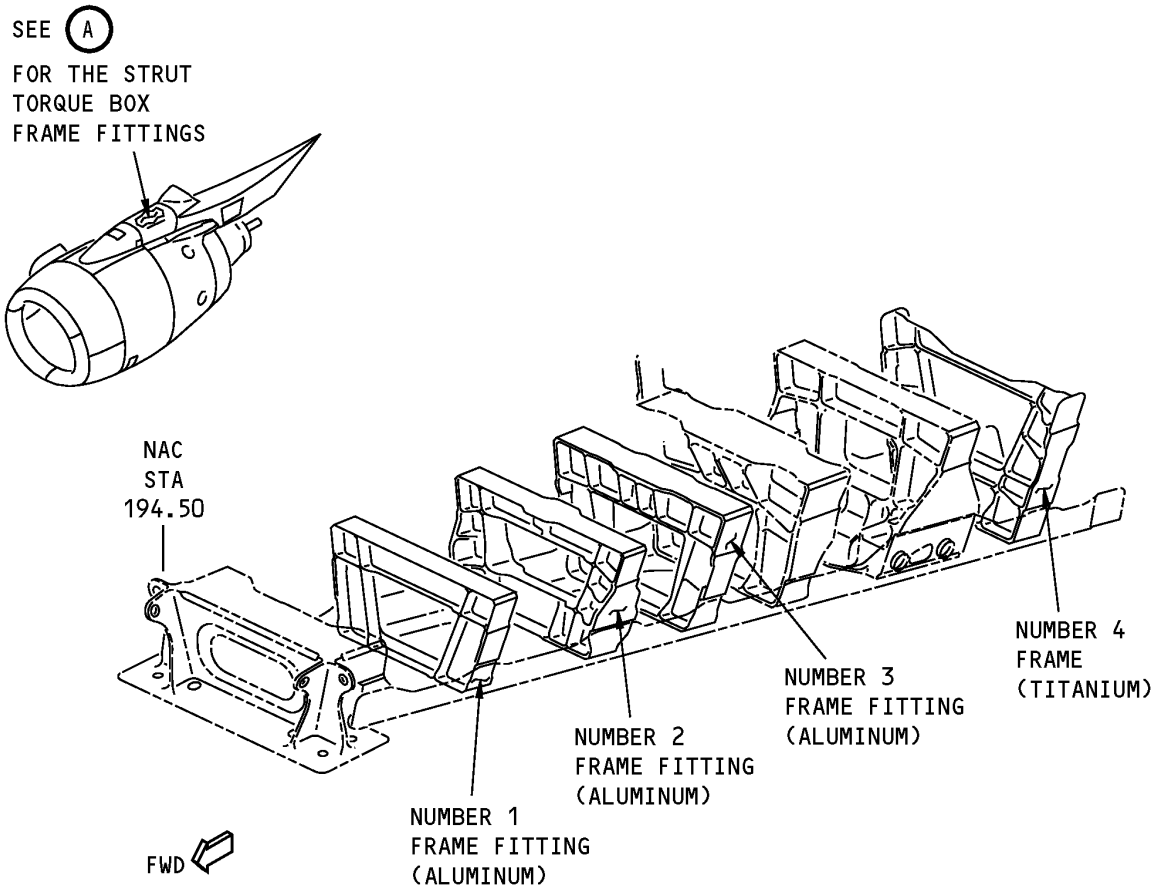
B

Forward Engine Mount Fitting, Lower Flange Gussets - Allowable Damage Limits
Figure 107

ALLOWABLE DAMAGE 4 - ENGINE STRUT TORQUE BOX FRAME FITTINGS

1. Applicability

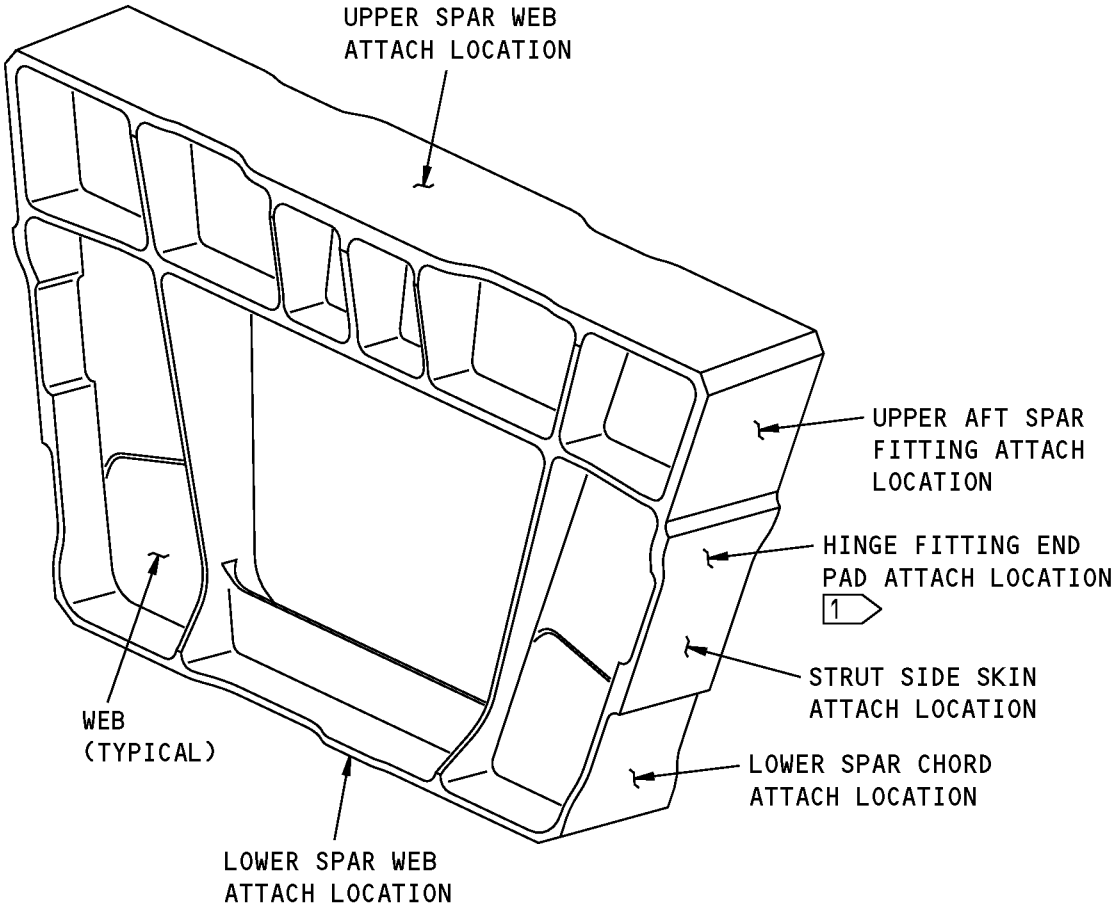
A. This subject gives the allowable damage limits for the frame fittings of the strut torque box shown in Engine Strut Torque Box Frame Fitting Locations, Figure 101/ALLOWABLE DAMAGE 4.



NOTE: REFER TO PARAGRAPH 4 FOR THE ALLOWABLE DAMAGE LIMITS.

(A)

Engine Strut Torque Box Frame Fitting Locations
Figure 101



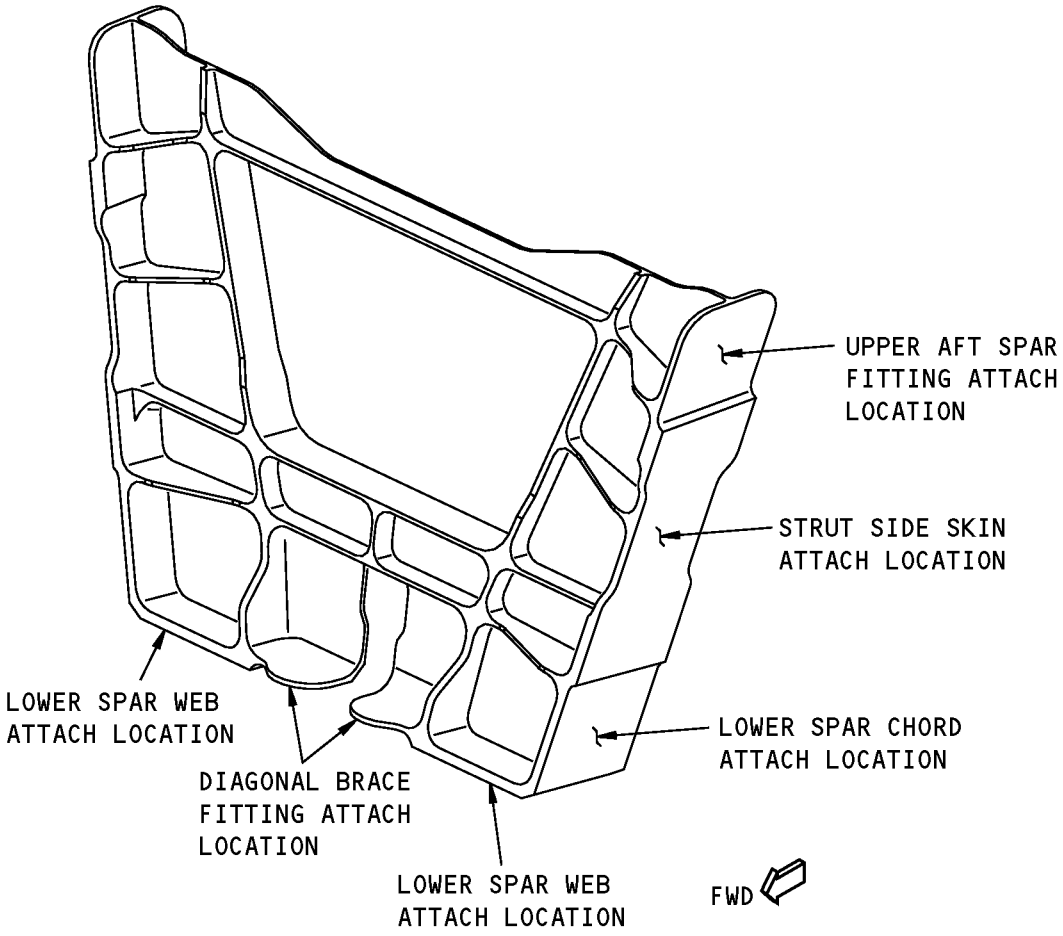
LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

TYPICAL ALLOWABLE DAMAGE LOCATIONS FOR
FRAME FITTINGS – NUMBERS 1 THROUGH 3

NOTES

1 HINGE FITTING ENDPAD ATTACH LOCATIONS ARE FOUND ON THE NUMBER 2 AND NUMBER 3 FRAME FITTINGS.

Allowable Damage Locations - Strut Torque Box Frame Fittings
Figure 102 (Sheet 1 of 2)



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

ALLOWABLE DAMAGE LOCATIONS FOR THE NUMBER 4 FRAME FITTING

Allowable Damage Locations - Strut Torque Box Frame Fittings
Figure 102 (Sheet 2 of 2)

2. General

A. Remove the parts as necessary to get access to the strut torque box frame fittings.

B. Refer to Table 101/ALLOWABLE DAMAGE 4 for a list of the references for the allowable damage data.

C. Refer to Allowable Damage Locations - Strut Torque Box Frame Fittings, Figure 102/ALLOWABLE DAMAGE 4 for the definitions of the different areas of the fittings covered in the allowable damage limits.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	**PARAGRAPH**
Locations of Fitting Attachments to the Side Skins, Upper and Lower Webs, Aft Upper Spar Fittings, and Lower Chords	4.A
Location of the Number 4 Frame Fitting Attachment to the Diagonal Brace Fitting	4.B
Webs of the Frame Fittings	4.C
Location of Thrust Reverser Hinge Fitting Attachment to the Endpads of the Number 2 Frame Fitting	4.D

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

D. Remove the damaged material as necessary.

(1) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.

(2) Refer to 51-10-02 for the inspection and removal of damage.

(3) Refer to 51-20-10 for freeze plug installation.

(4) Refer to 51-30-03 for possible sources of abrasive materials and other materials you can use to remove the damage.

(5) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.

E. After the damage is removed, do the steps that follow:

(1) Apply a chemical conversion coating to the reworked areas of the aluminum frame fittings. Refer to 51-20-01.

(2) Apply two layers of BMS 10-11, Type I primer to the reworked areas of the aluminum parts. Refer to SOPM 20-41-02.

(3) Apply a layer of phosphate-fluoride coating and a layer of high temperature polyurethane primer to the reworked areas of the titanium parts (Number 4 frame fitting). Refer to SOPM 20-41-02.

(4) Apply one layer of BMS 10-11, Type I primer to the reworked areas of the titanium parts. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Figure 4	Surface Inspection of Aluminum Parts

4. Allowable Damage Limits

A. Fitting attachment surfaces at the Side Skins, Upper and Lower Webs, Aft Upper Spar Fittings, and the Lower Chords:

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 4, Details A and B .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 4, Details A , B , and C .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

B. Location of the Number 4 Frame Fitting Attachment to the Diagonal Brace Fitting:

(1) Cracks:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 4, Details A , B , and C .

(b) The damage on an edge must be 2D or more from all fasteners that attach the diagonal brace fitting to the web and flanges of the frame fitting.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Figure 104 , Details A and B .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

C. Webs of the Frame Fittings:

(1) Cracks are not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 4, Detail D .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

D. Location of the Thrust Reverser Hinge Endpad Attachment to the Number 2 and Number 3 Frame Fittings:

(1) Cracks:

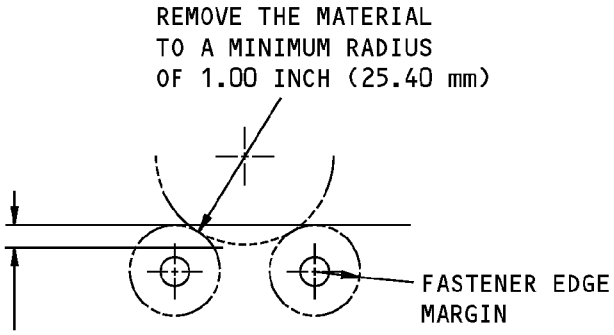
(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 4, Details A , B , and C .

(2) Nicks, Gouges, Scratches, and Corrosion:

(a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 4, Details A , B and C .

(3) Dents are not permitted.

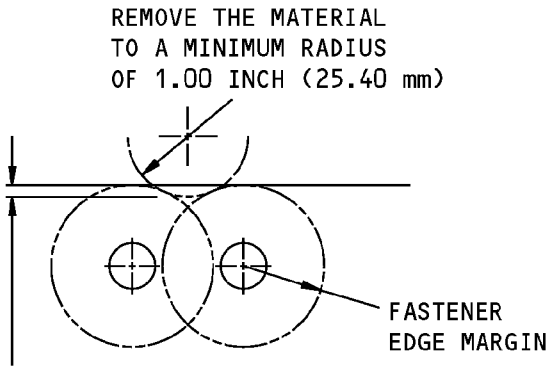
(4) Holes and Punctures are not permitted.



X = LENGTH OF THE MATERIAL
THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)
FOR DAMAGE THAT GOES FULLY
THROUGH THE MATERIAL
= A MAXIMUM OF 0.25 INCH (6.35 mm)
FOR DAMAGE THAT IS ONE HALF THE
THICKNESS OF THE MATERIAL IN DEPTH

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

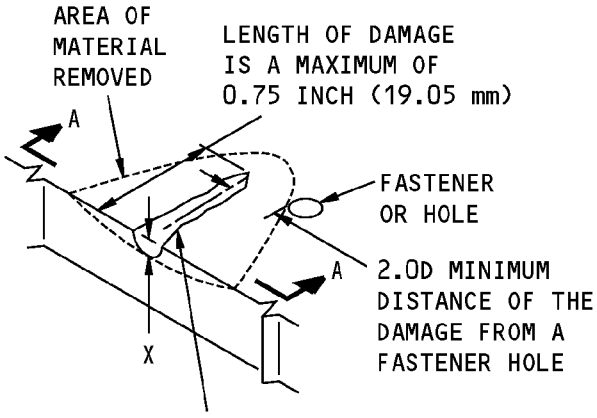
A



X = LENGTH OF THE MATERIAL
THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)
FOR DAMAGE THAT GOES FULLY
THROUGH THE MATERIAL
= A MAXIMUM OF 0.25 INCH (6.35 mm)
FOR DAMAGE THAT IS ONE HALF THE
THICKNESS OF THE MATERIAL IN DEPTH

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

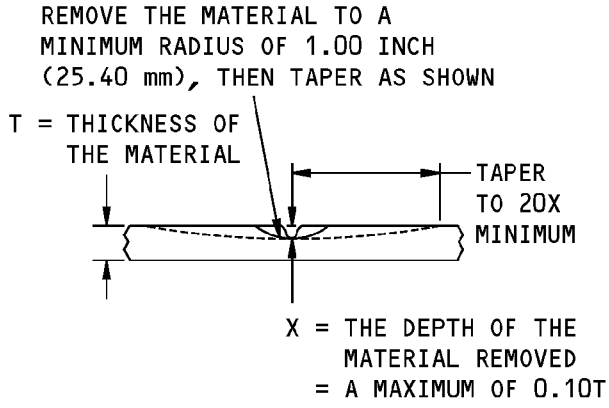
B



AREA OF THE DAMAGE IS A MAXIMUM
OF 1.0 SQUARE INCH (6.45 cm)

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

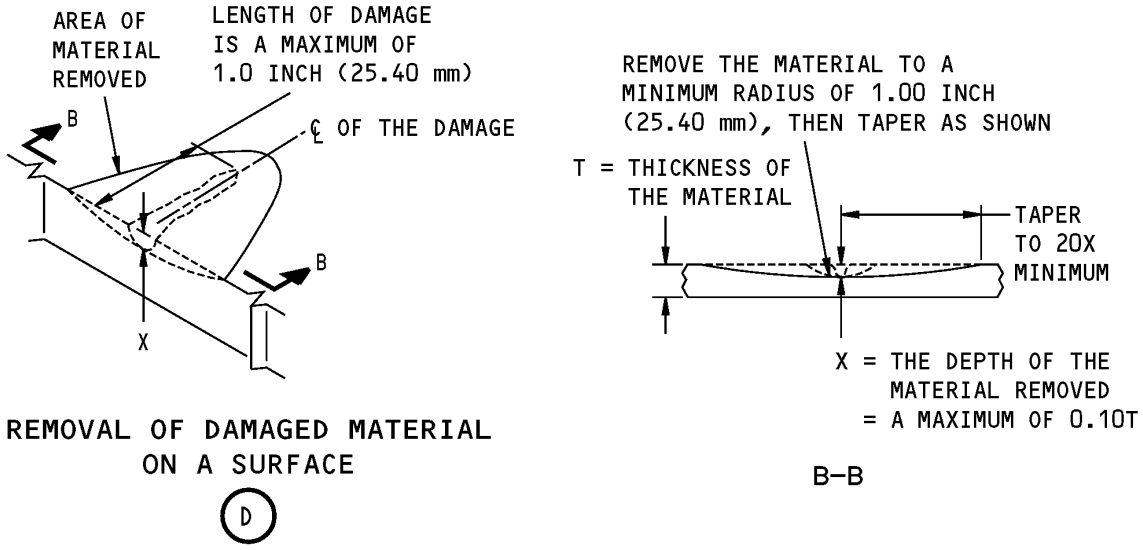
C



X = THE DEPTH OF THE
MATERIAL REMOVED
= A MAXIMUM OF 0.10T

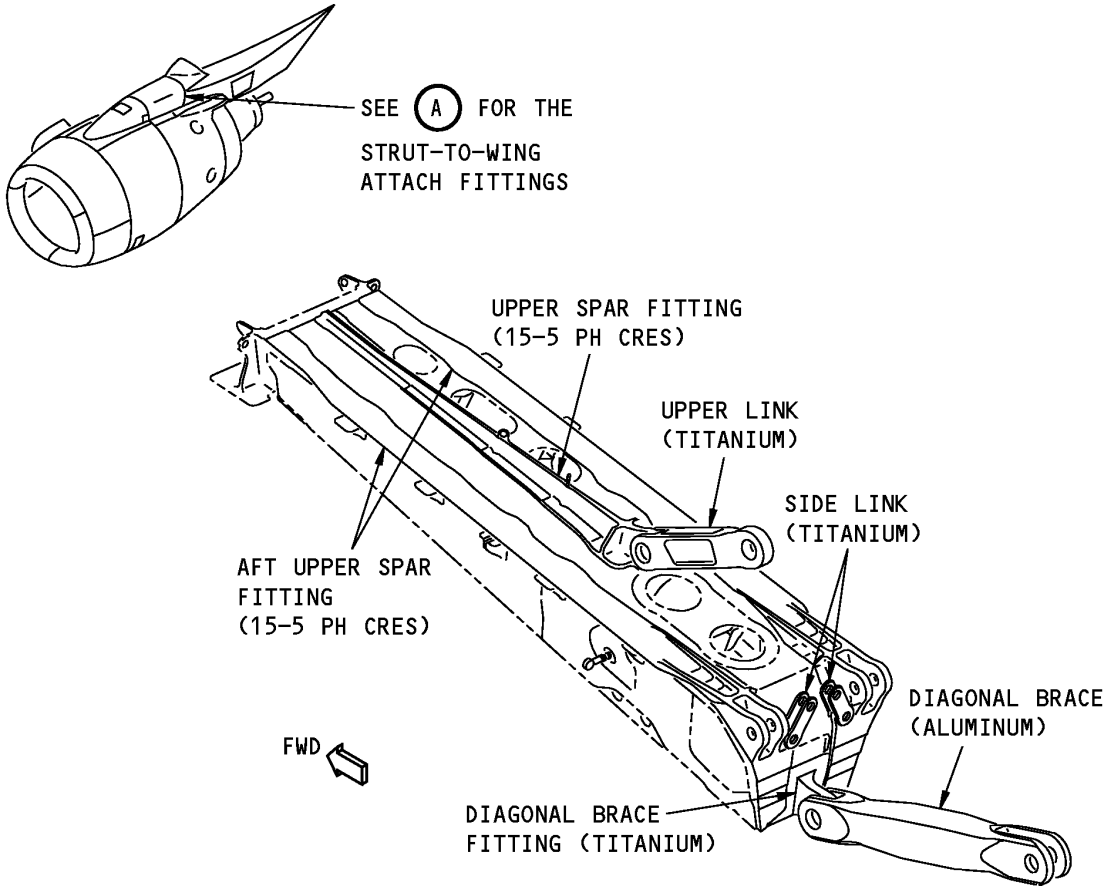
A–A

Allowable Damage Limits
Figure 103 (Sheet 1 of 2)



Allowable Damage Limits
Figure 103 (Sheet 2 of 2)

REPAIR 1 - ENGINE STRUT-TO-WING ATTACH FITTINGS

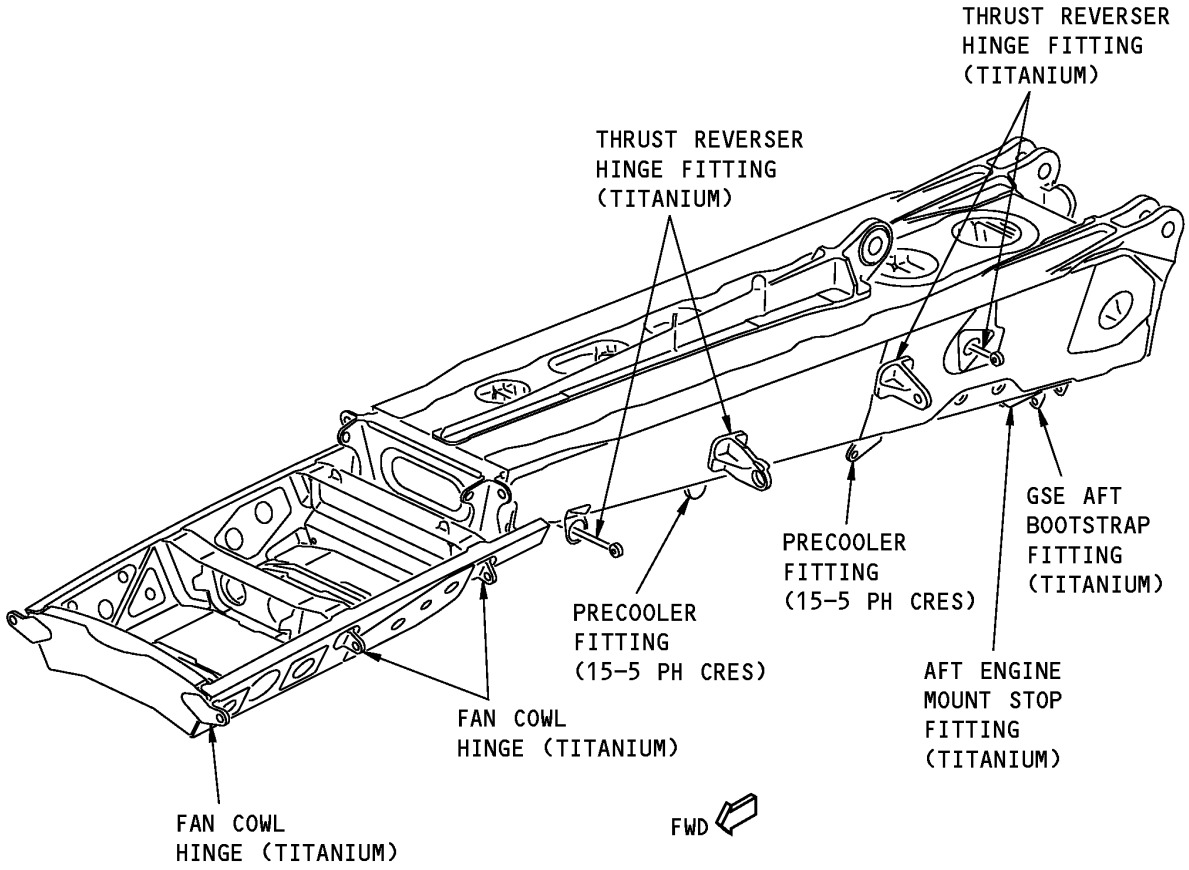


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

(A)

Engine Strut-to-Wing Attach Fitting Repair
Figure 201

REPAIR 2 - ENGINE STRUT HINGE FITTINGS

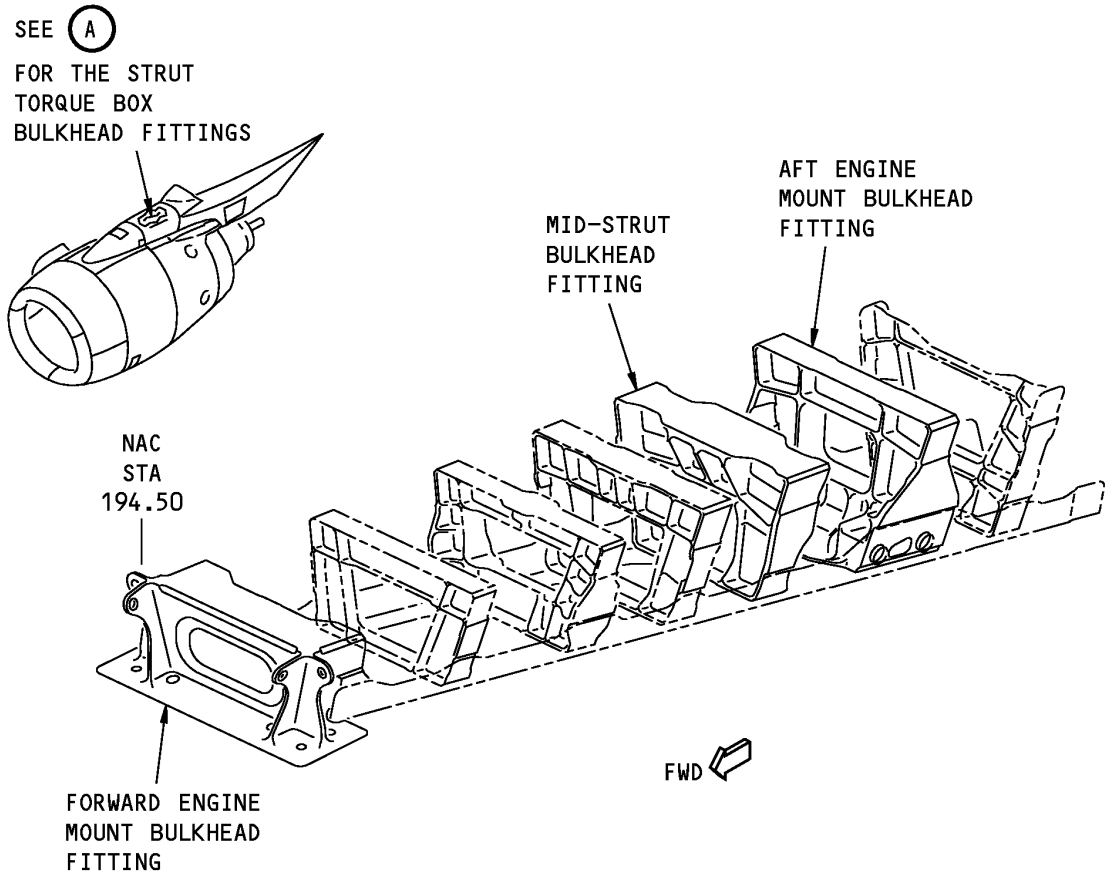


LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

Engine Strut Hinge Fitting Repair
Figure 201

REPAIR 3 - ENGINE STRUT TORQUE BOX BULKHEAD FITTINGS

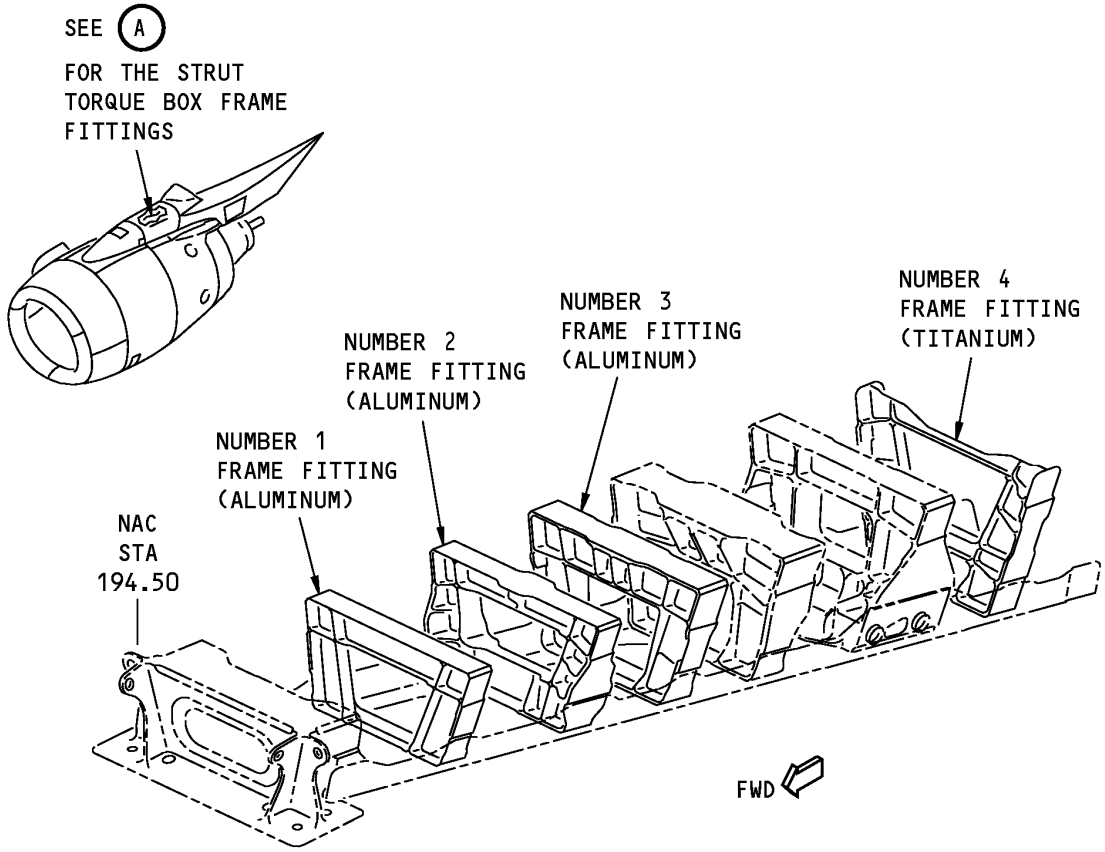


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

A

Engine Strut Torque Box Bulkhead Fitting Repair
Figure 201

REPAIR 4 - ENGINE STRUT TORQUE BOX FRAME FITTINGS

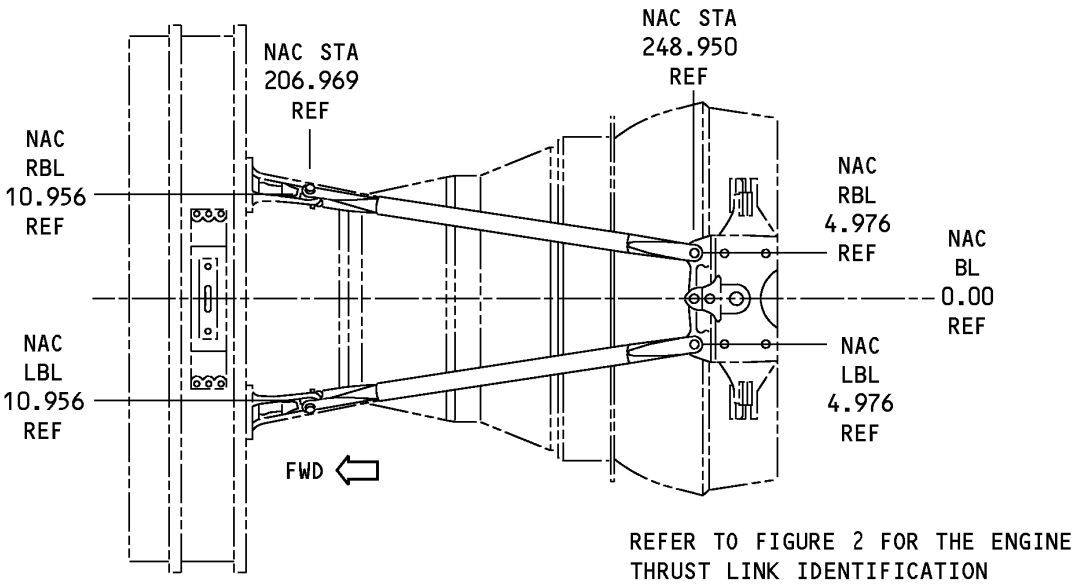


NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

A

Engine Strut Torque Box Frame Fitting Repair
Figure 201

IDENTIFICATION 1 - ENGINE THRUST LINKS



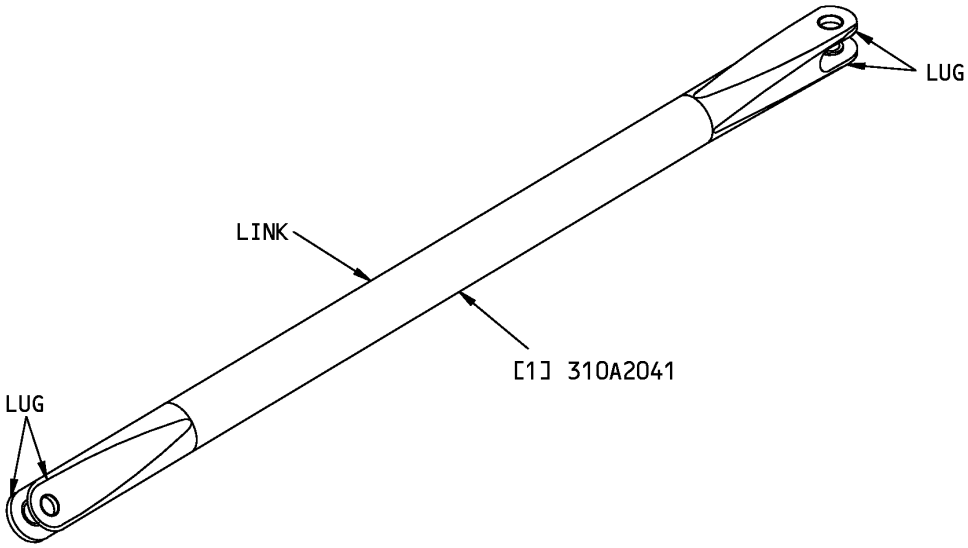
NOTE: REFER TO TABLE 1 FOR REFERENCE DRAWINGS

VIEW LOOKING DOWN

Engine Thrust Link Location
Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	**TITLE**
310A2040	Thrust Link Installation - CMF56-7 Engine
310A2041	Thrust Link Assembly - CMF56-7 Engine



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

Engine Thrust Link Identification
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	**DESCRIPTION**	**T*[1]**	**MATERIAL**	**EFFECTIVITY**
[1]	Thrust Link	2.00 (5.08)	15-5PH Rolled Bar As Given In AMS5659	

*[1] Note: T = Pre-manufactured thickness in inches (centimeters).

ALLOWABLE DAMAGE 1 - ENGINE THRUST LINKS

1. Applicability

A. This subject gives the allowable damage limits for the CFM56-7 engine thrust links shown in Engine Thrust Link Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

A. Refer to Allowable Damage Zones, Figure 102/ALLOWABLE DAMAGE 1 for the allowable damage zones.

B. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 for the allowable damage limits.

C. Remove the damaged material as necessary.

(1) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the inspection and removal of damage.

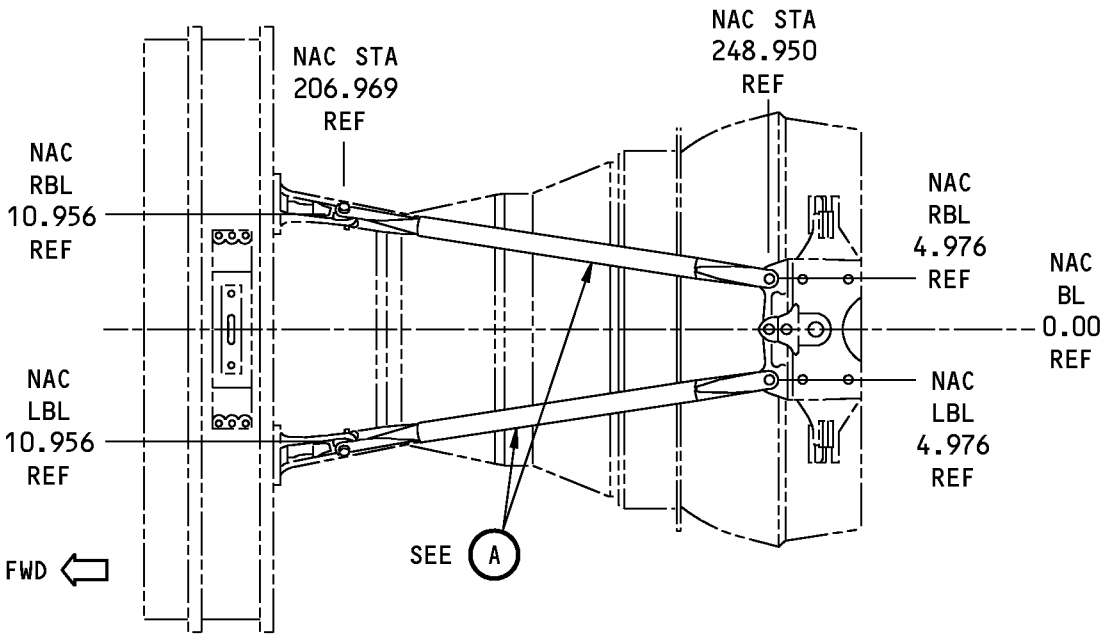
(2) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.

D. Keep a surface smoothness of 125 microinches Ra, or better.

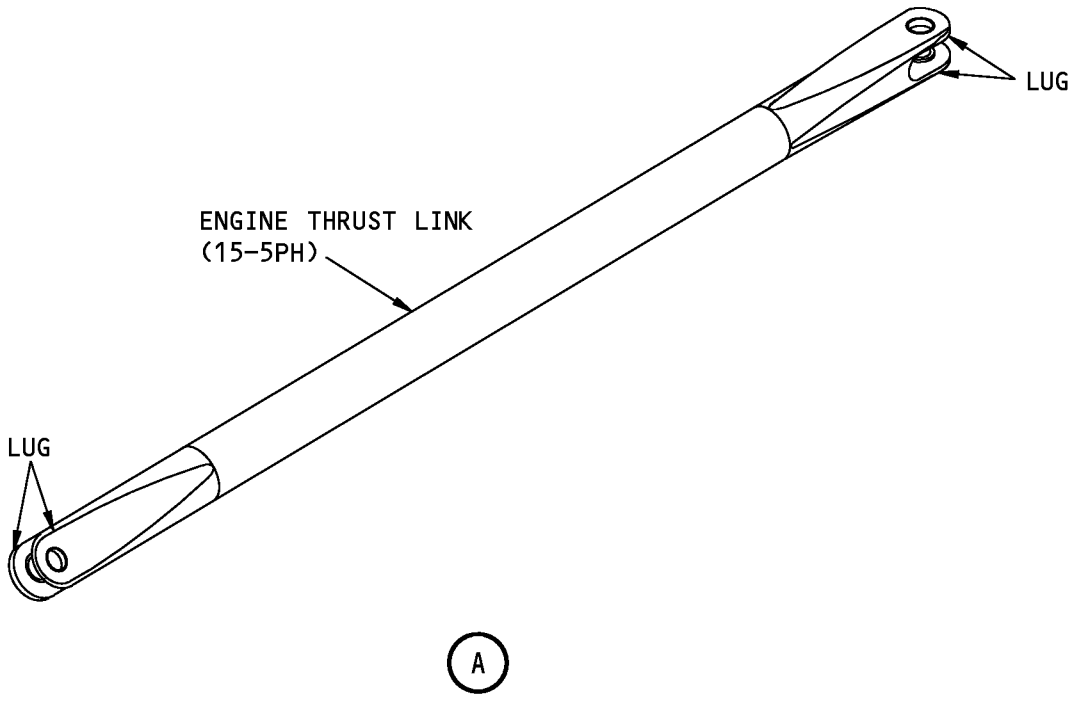
E. Do a magnetic particle inspection on the reworked material. Refer to SOPM 20-20-01.

F. Passivate the reworked surface. Refer to SOPM 20-30-03.

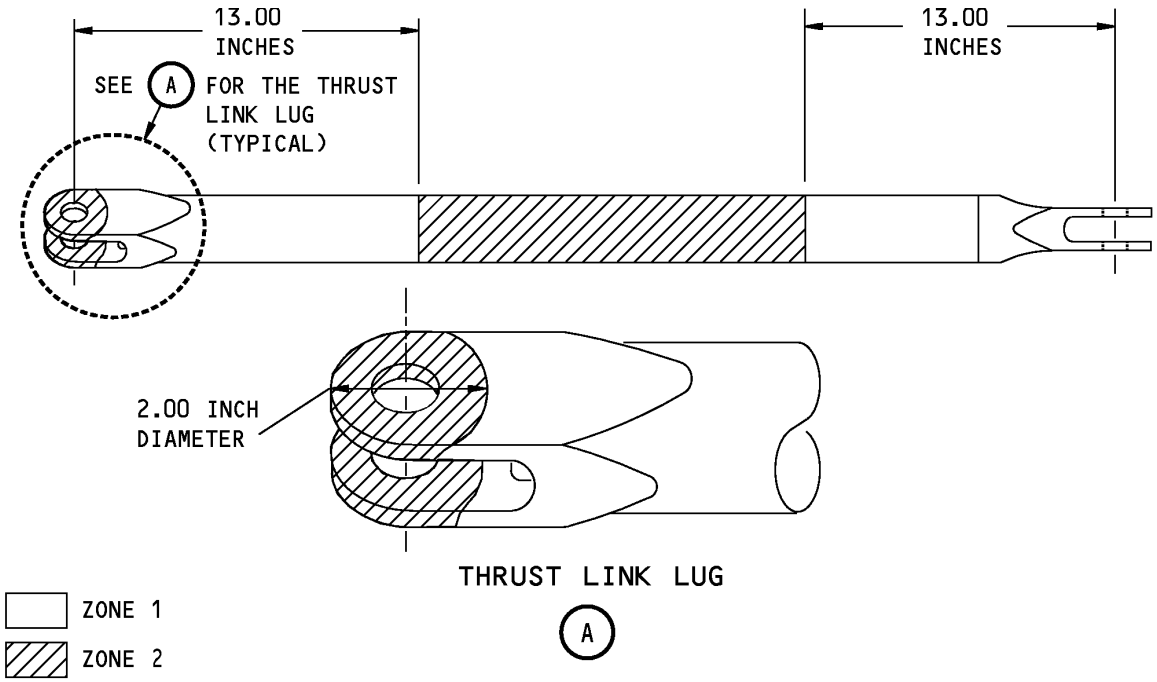
NOTE: An alternative procedure to passivate the reworked material is to remove all contamination from the surface with scotchbrite and solvent wipes.



VIEW LOOKING DOWN



Engine Thrust Link Location
Figure 101



Allowable Damage Zones
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 71-04-26	Component Maintenance Manual
SOPM 20-20-01	Magnetic Particle Inspection
SOPM 20-30-03	Standard Overhaul Practices Manual

4. Allowable Damage Limits for the CFM56-7 Engine Thrust Links

A. Zone 1:

(1) Link:

(a) Remove the damage as shown in Link Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail A.

(2) Lugs:

(a) You can remove the damaged material from the areas that follow:

1) The four outer corners of the lug.

a) Remove the damage as shown in Lug Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail A.

2) The lug surface.

a) Remove the damage as shown in Lug Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail B.

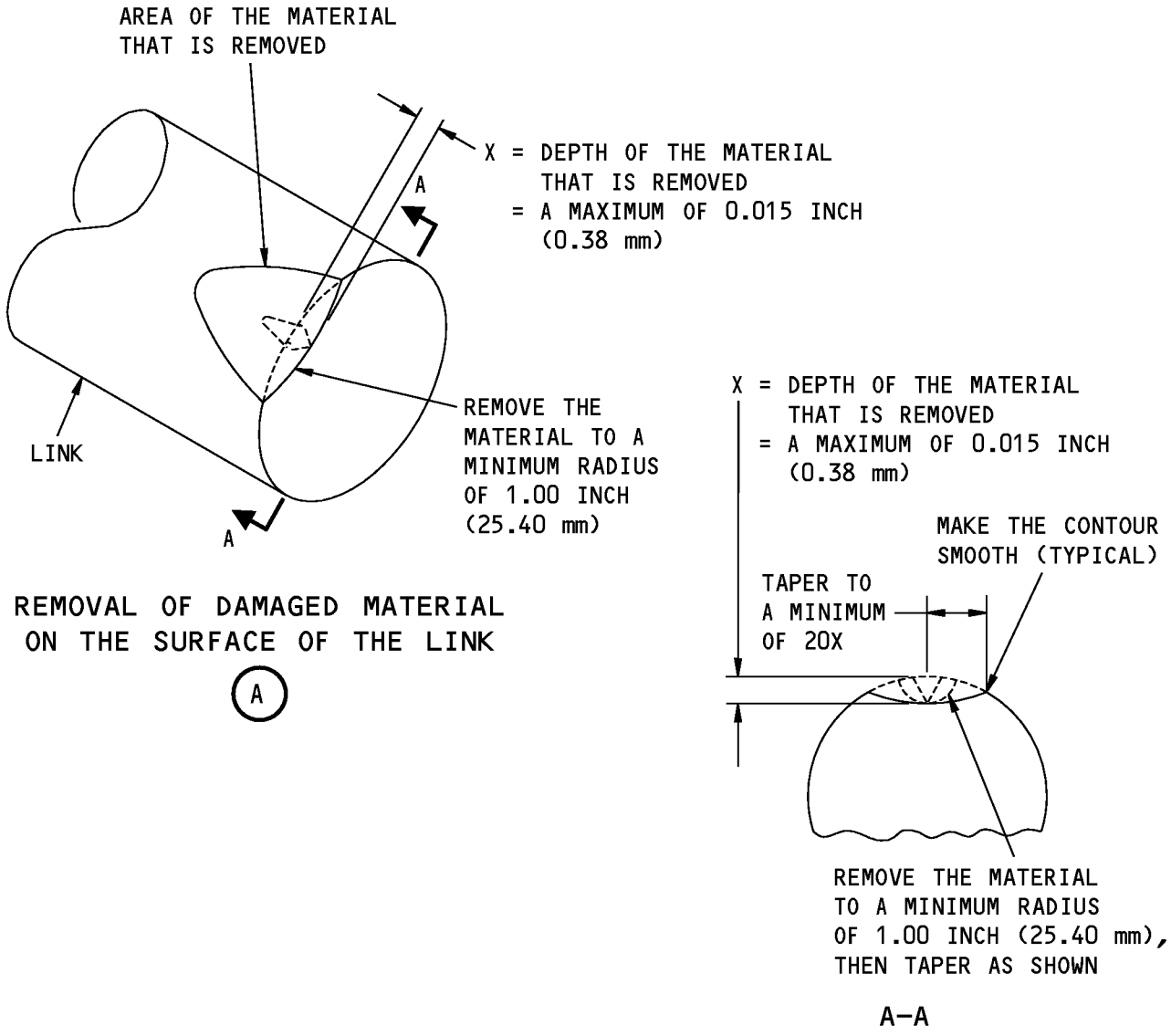
B. Zone 2:

(1) Link:

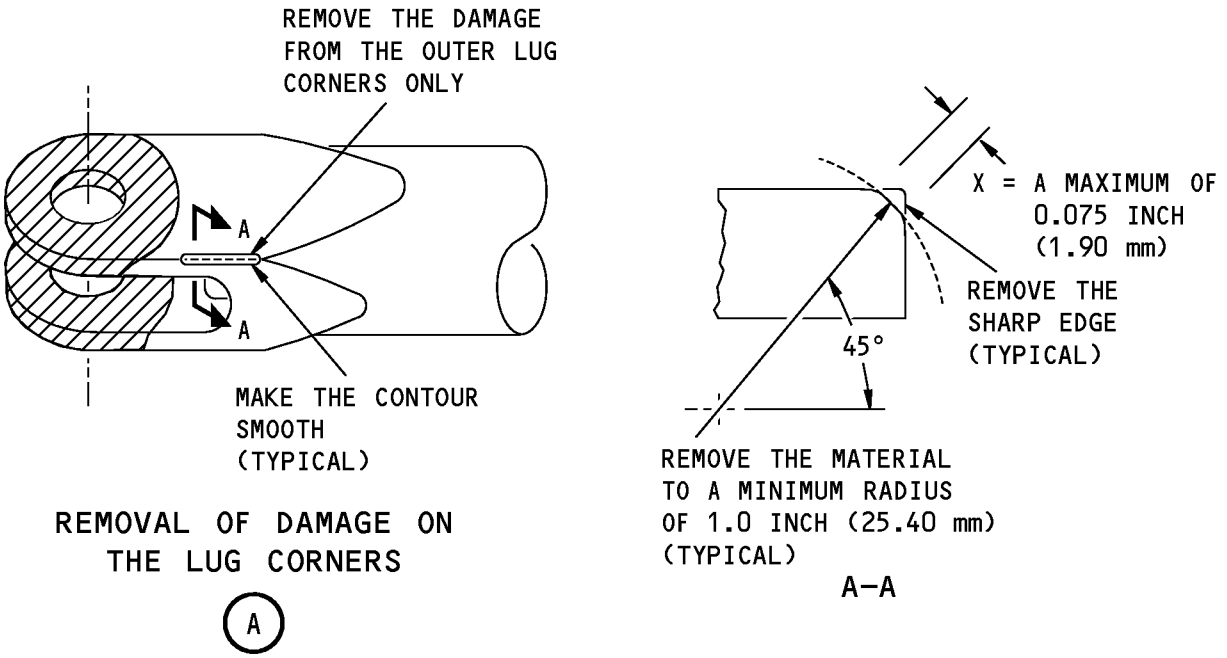
(a) Rework of damaged material is not permitted in this area. Contact The Boeing Company if you find damage.

(2) Lugs:

(a) Rework of damaged material is not permitted in this area. A repair of the lug hole is permitted. Refer to CMM 71-04-26 for the lug hole repair procedure.



Link Allowable Damage Limits
Figure 103



Lug Allowable Damage Limits
Figure 104

ALLOWABLE DAMAGE 2 - AFT ENGINE MOUNT HANGER FITTING LOOP

1. Applicability

A. This subject gives the allowable damage limits for the 310A2031-23 and -25 aft engine mount hanger fitting loops shown in Figure 101/ALLOWABLE DAMAGE 2.

2. General

A. Refer to Figure 102/ALLOWABLE DAMAGE 2 for the allowable damage location.

B. Refer to Paragraph 4./ALLOWABLE DAMAGE 2 for the allowable damage limits.

C. Remove damaged material as necessary.

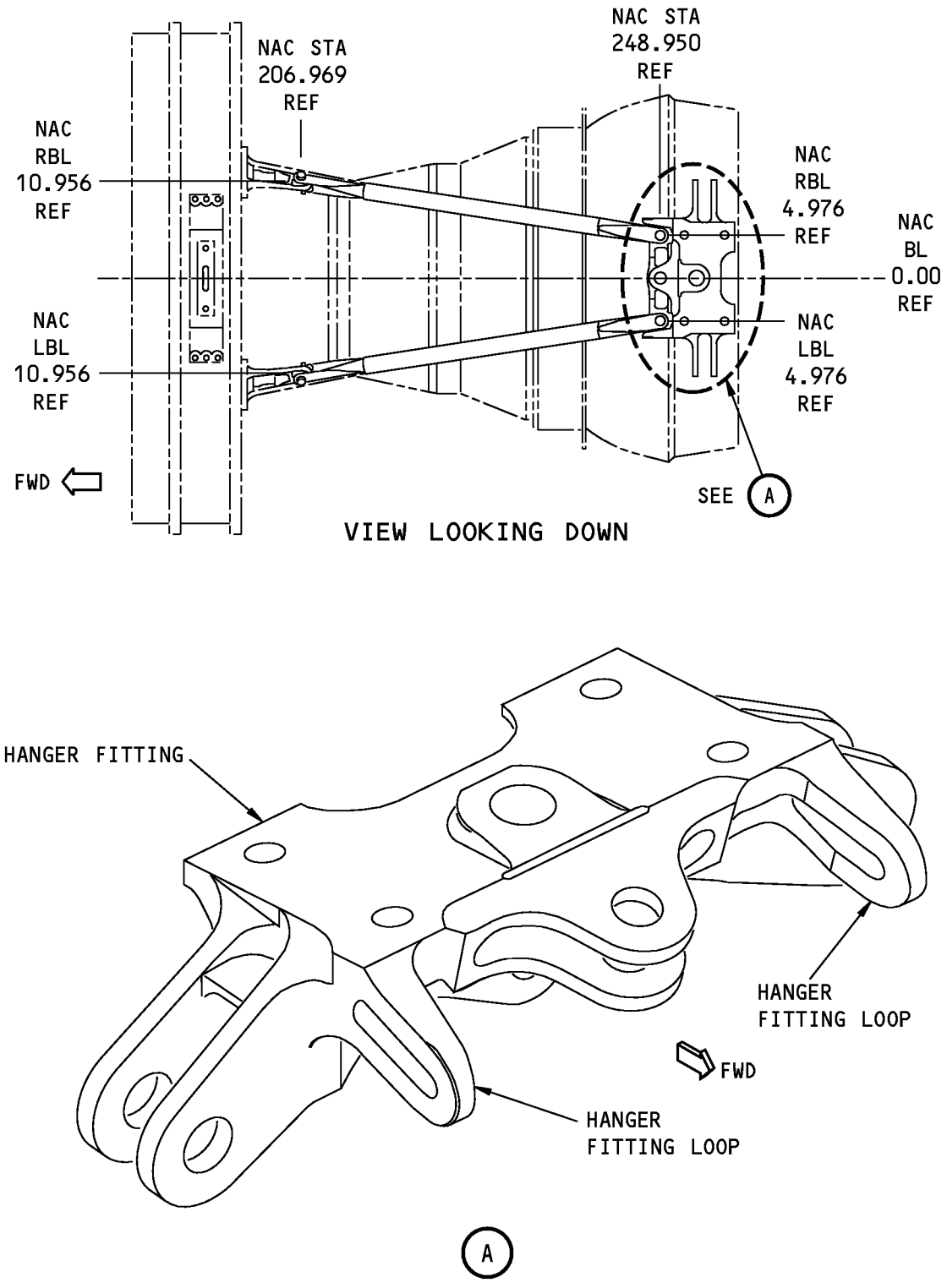
(1) Refer to 51-10-02, GENERAL and SOPM 20-10-07 for the inspection and removal of damage.

(2) Refer to 51-30-05, GENERAL for possible sources of equipment and tools you can use to remove the damage.

(3) Keep a surface smoothness of 125 microinches Ra, or better.

D. Do a fluorescent penetrant inspection of the reworked material. Refer to SOPM 20-20-02.

E. Boeing recommends that you install a 310A2040-7 sacrificial washer to prevent more wear. Refer to AMM 71-21-02.



Aft Engine Mount Hanger Fitting Loop Location
Figure 101

3. References

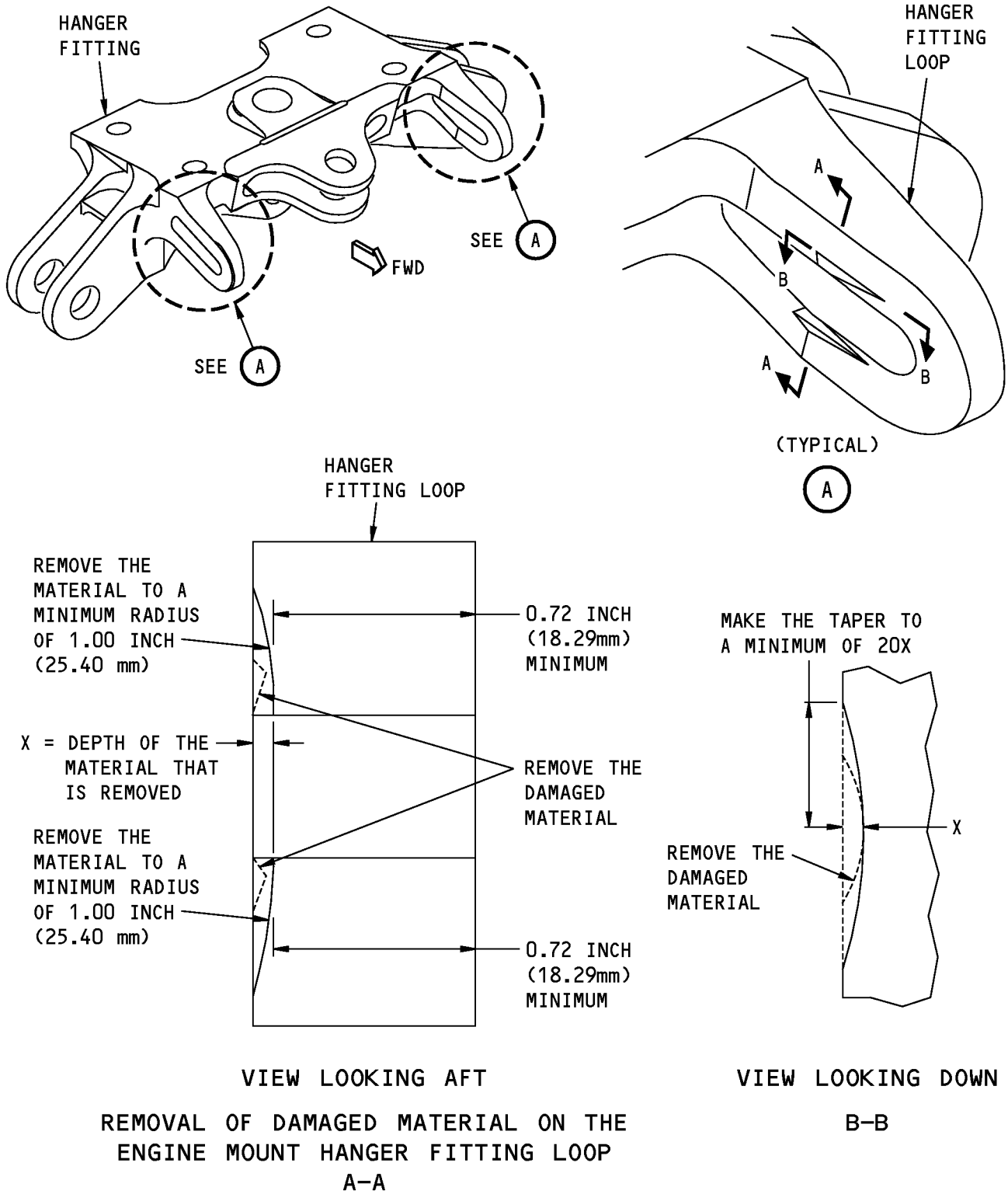
Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-30-05, GENERAL	Equipment and Tools For Repairs
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	Standard Overhaul Practices Manual

4. Allowable Damage Limits for the Aft Engine Mount Hanger Fitting Loop

A. Remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 2.

(1) Blend out the damage to the minimum depth necessary to remove the damage.

(2) The minimum loop thickness permitted at the blended area is 0.72 inch (18.29 mm).



Aft Engine Mount Hanger Fitting Loop Allowable Damage
Figure 102

ALLOWABLE DAMAGE 3 - FORWARD ENGINE MOUNT HANGER FITTING

1. Applicability

A. This procedure gives the allowable damage limits for the 310A2021–5/–7 forward engine mount hanger fitting shown in Figure 101/ALLOWABLE DAMAGE 3.

B. The depth of the damage cannot be more than 0.030 in. (0.762 mm).

2. General

A. Refer to Figure 101/ALLOWABLE DAMAGE 3 for the allowable damage location.

B. Refer to Paragraph 4./ALLOWABLE DAMAGE 3 for the allowable damage limits.

C. Remove the damaged material.

(1) Refer to 51-10-02, GENERAL and SOPM 20-10-07 for the inspection and removal of damage.

(2) Refer to 51-30-05, GENERAL for possible sources of equipment and tools you can use to remove the damage.

(3) Keep a surface roughness of 125 microinches Ra or smoother.

D. Do a penetrant inspection of the blend area. Refer to SOPM 20-20-02.

E. Shot peen the blend area with an intensity between 0.008A and 0.013A. When you shot peen, use 200% coverage. You can peen the blend area manually to get the intensity and the coverage necessary. Refer to 51-20-06, GENERAL.

F. The Boeing Company recommends that you install a 310A2040–7 sacrificial washer to prevent more worn areas. If you do not install the washer, the hanger fitting will become more worn. Refer to AMM SUBJECT 71-21-01 or CMM 71-21-37.

NOTE: Do not install more than one sacrificial washer.

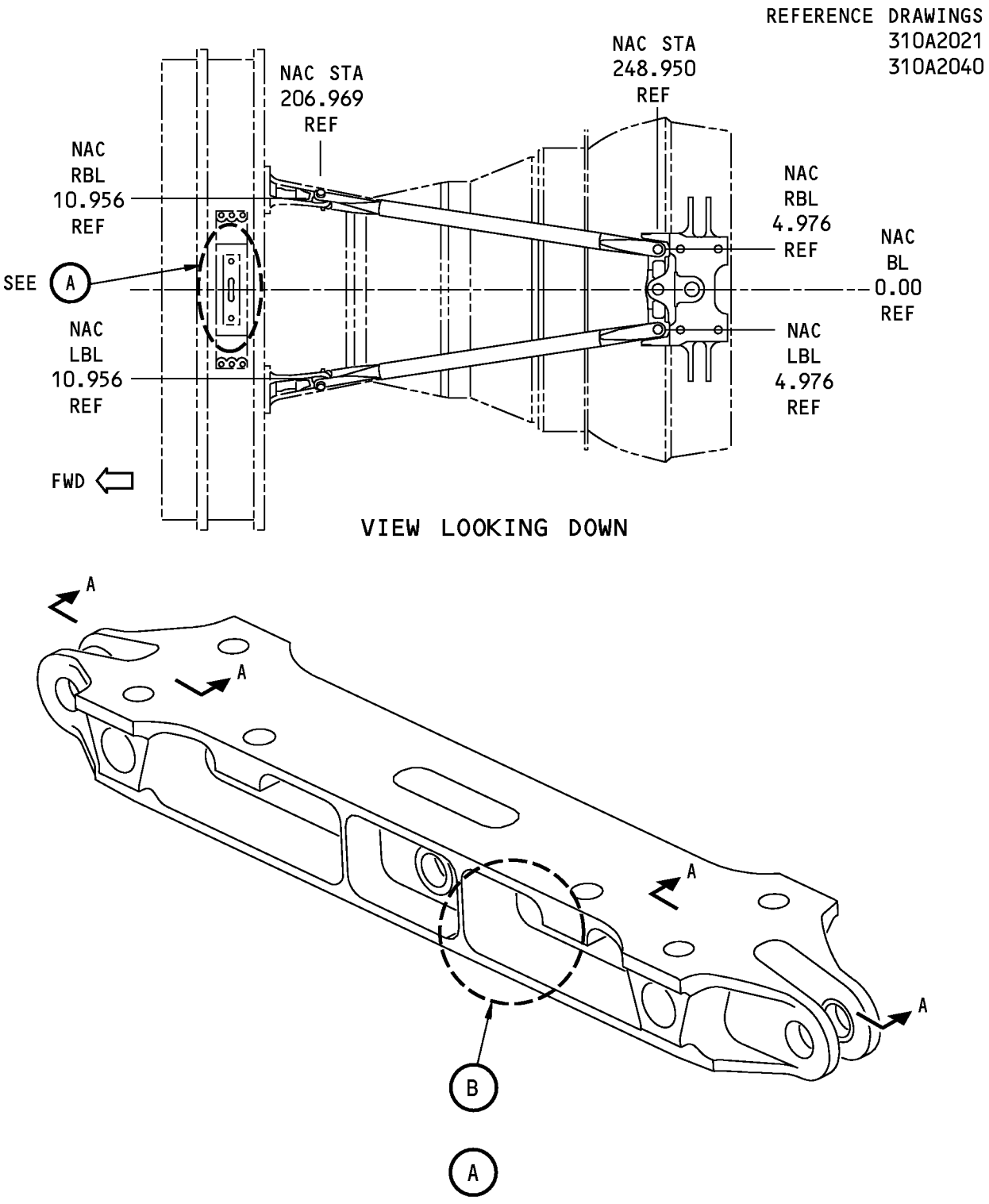
3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-06, GENERAL	Shot Peening
51-30-05, GENERAL	Equipment and Tools For Repairs
AMM 71-21-01	FORWARD ENGINE MOUNT
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits for the Forward Engine Mount Hanger Fitting

A. Remove the damage as shown in Figure 101/ALLOWABLE DAMAGE 3.

(1) Remove the damage with a 10:1 blend ratio.



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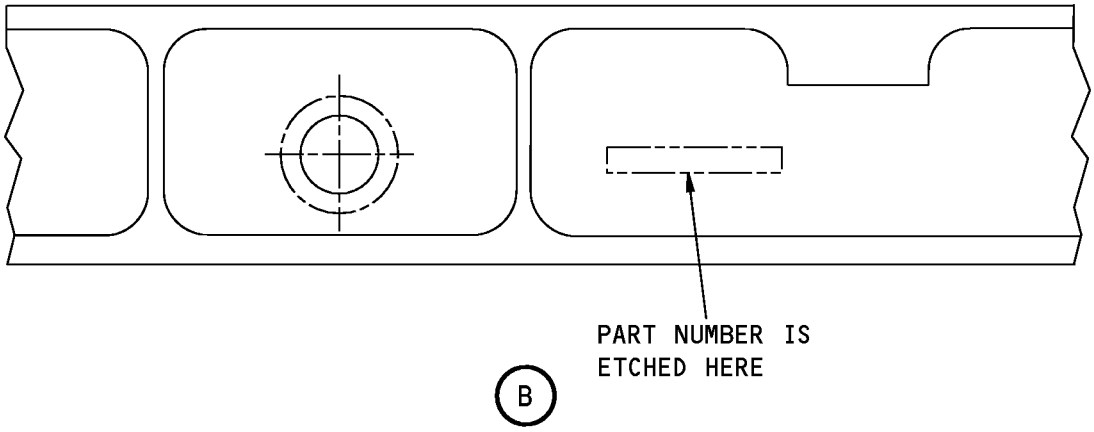
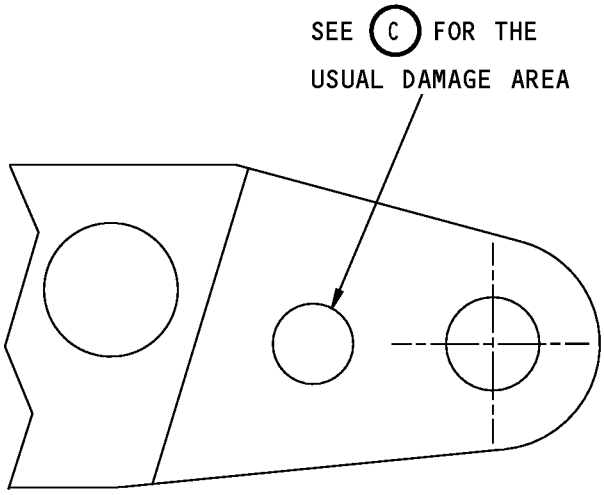
Hanger Fitting Assembly Forward Engine Mount
Figure 101 (Sheet 1 of 3)

REFERENCE DRAWINGS
310A2021
310A2040

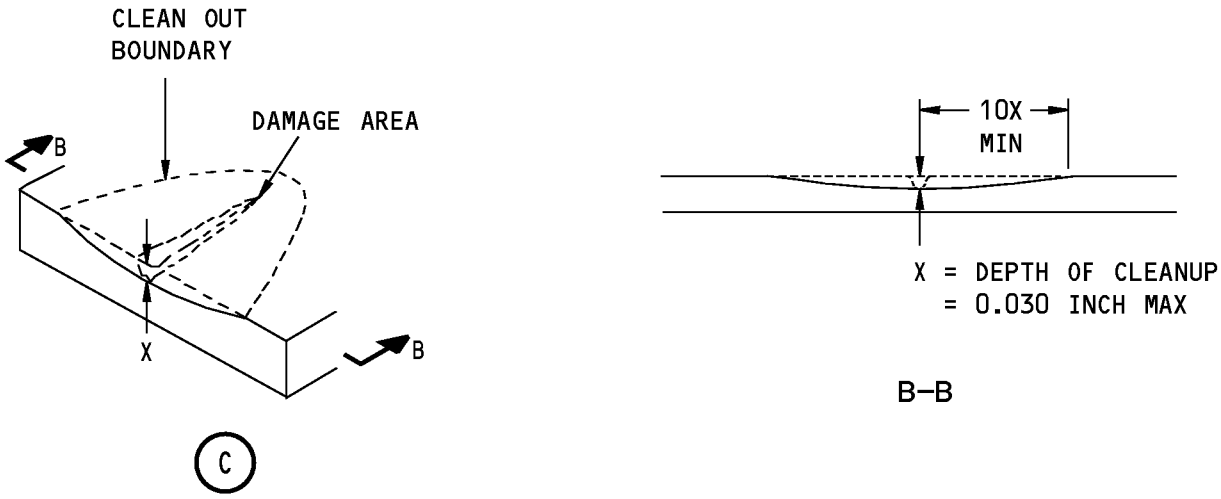




VIEW IN THE AFT DIRECTION
FORWARD VIEW OPPOSITE
A–A

1694661 S0000307881_V1

Hanger Fitting Assembly Forward Engine Mount
Figure 101 (Sheet 2 of 3)



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Hanger Fitting Assembly Forward Engine Mount
Figure 101 (Sheet 3 of 3)

ALLOWABLE DAMAGE 4 - FORWARD ENGINE MOUNT FAN CASE FITTING

1. Applicability

A. This procedure gives the allowable damage limits for the 310A2028-12/-14/-16 forward engine mount fan case fitting shown in Figure 101/ALLOWABLE DAMAGE 4.

B. The depth of the damage cannot be more than 0.030 in. (0.762 mm).

2. General

A. Refer to Figure 101/ALLOWABLE DAMAGE 4 for the allowable damage location.

B. Refer to Paragraph 4./ALLOWABLE DAMAGE 4 for the allowable damage limits.

C. Remove the damaged material.

(1) Refer to 51-10-02, GENERAL and SOPM 20-10-07 for the inspection and removal of damage.

(2) Refer to 51-30-05, GENERAL for possible sources of equipment and tools you can use to remove the damage.

(3) Keep a surface roughness of 125 microinches Ra or smoother.

D. Do a penetrant inspection of the blend area. Refer to SOPM 20-20-02.

E. Shot peen the blend area with an intensity between 0.006A and 0.011A. When you shot peen, use 200% coverage. You can peen the blend area manually to get the intensity and the coverage necessary. Refer to 51-20-06, GENERAL.

F. The Boeing Company recommends that you install a 310A2040–7 sacrificial washer to prevent more worn areas. If you do not install the washer, the fan case fitting will become more worn. Refer to AMM SUBJECT 71-21-01 or CMM 71-21-37.

NOTE: Do not install more than one sacrificial washer.

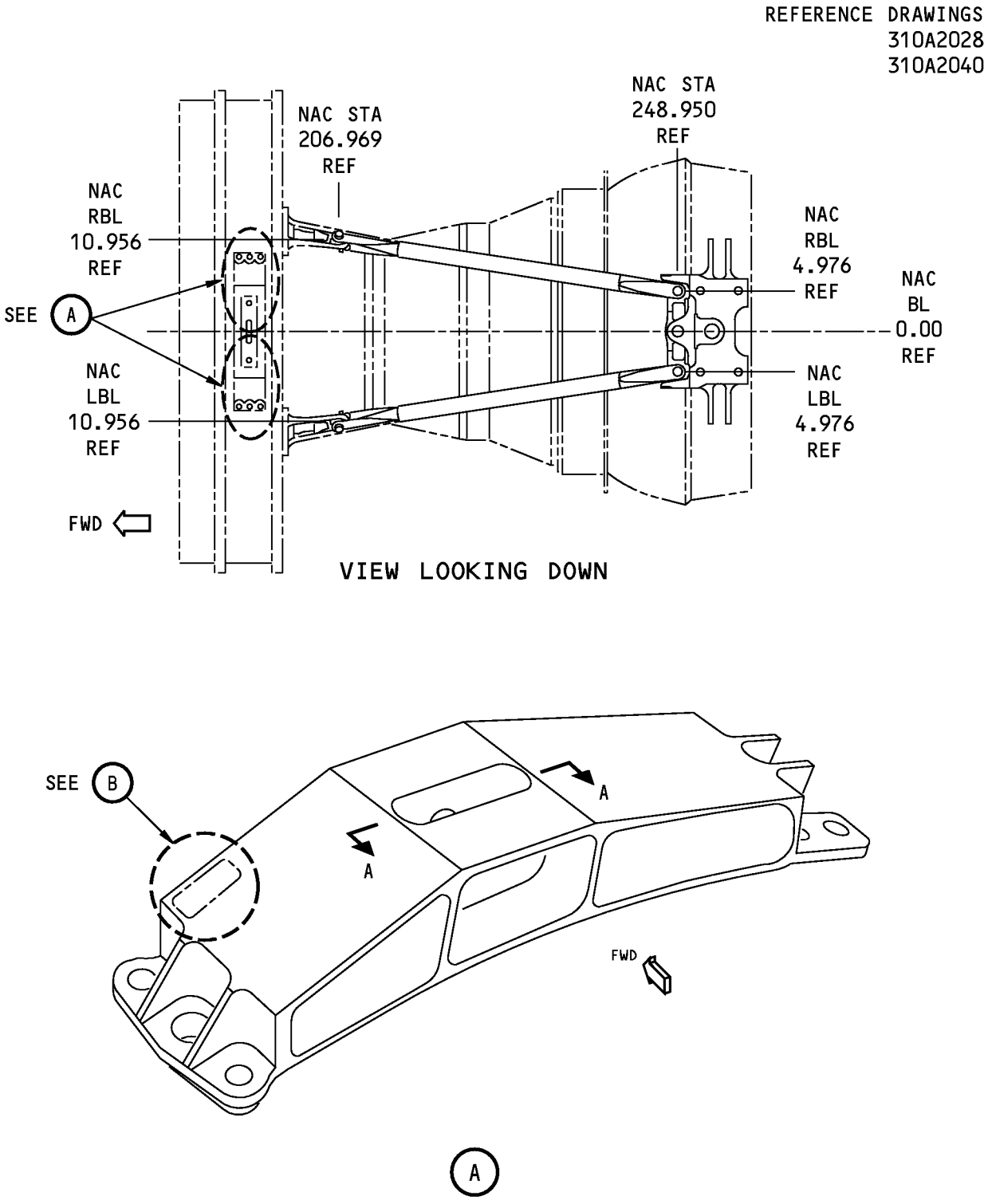
3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-06, GENERAL	Shot Peening
51-30-05, GENERAL	Equipment and Tools For Repairs
AMM 71-21-01	FORWARD ENGINE MOUNT
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits for the Forward Engine Mount Fan Case Fitting

A. Remove the damage as shown in Figure 101/ALLOWABLE DAMAGE 4.

(1) Remove the damage with a 10:1 blend ratio.



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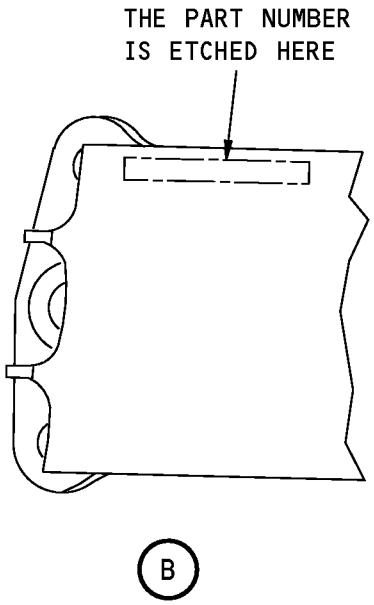
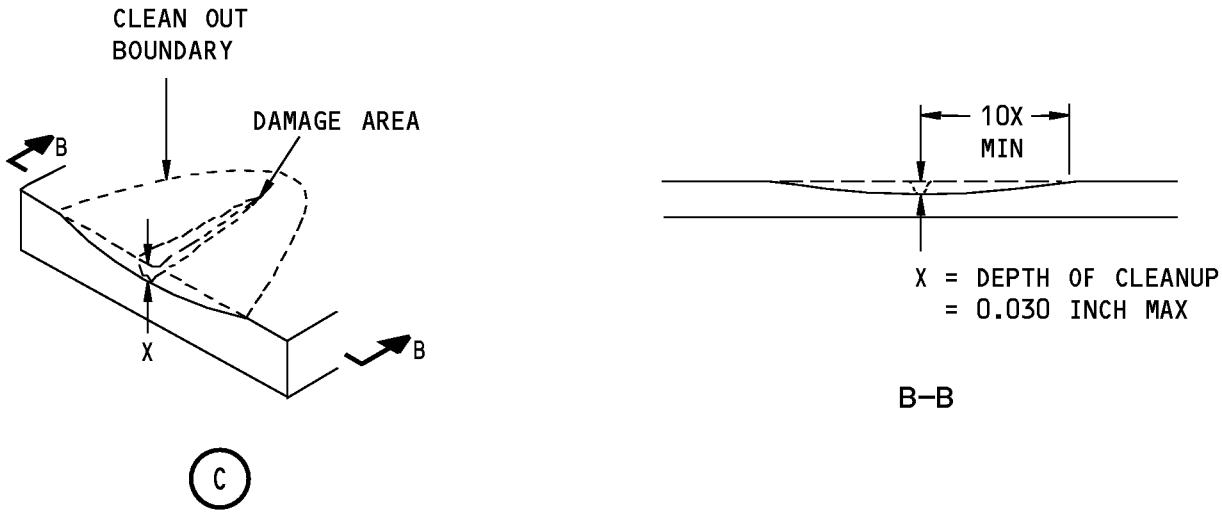
Forward Engine Mount Fan Case Fitting
Figure 101 (Sheet 1 of 3)



VIEW IN THE AFT DIRECTION, FORWARD VIEW OPPOSITE
A-A

1685758 S0000307739_V1

Forward Engine Mount Fan Case Fitting
Figure 101 (Sheet 2 of 3)



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Forward Engine Mount Fan Case Fitting
Figure 101 (Sheet 3 of 3)