
AGENDA:

- **Metal To Metal Bonding**
- **Fuel Tank Sealant.**
- **SRM Task Out of limit:
Repair suggestion.
RDAS**
- **SRM Task Evaluation Continue, from day 4.**

SKILLMAN DAY 5

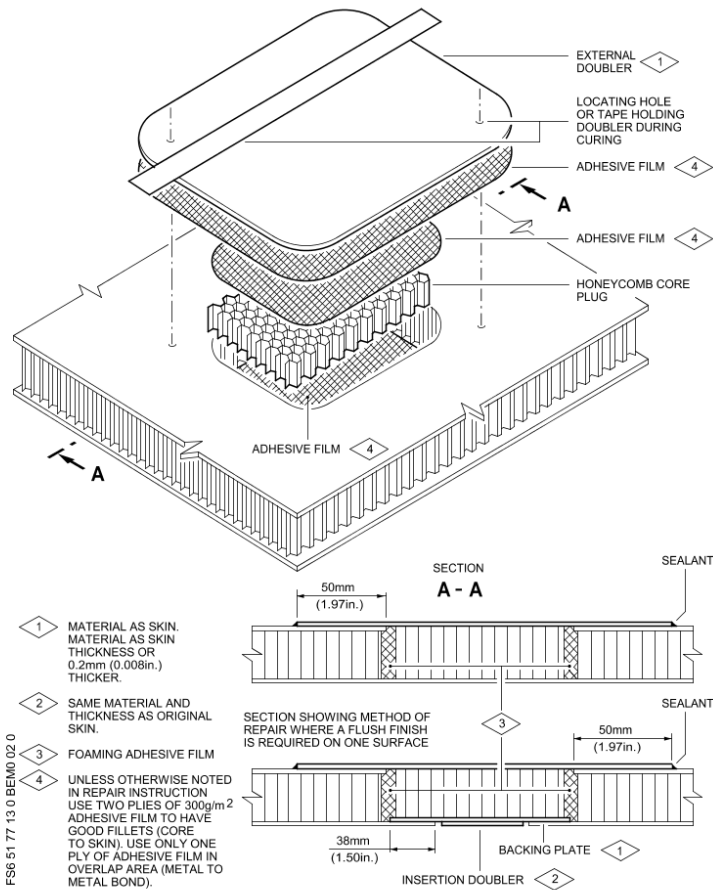


Figure 033 (sheet 1) / 51-77-13 Hot Bonded Repair with Core Replacement - one skin or both skins damaged

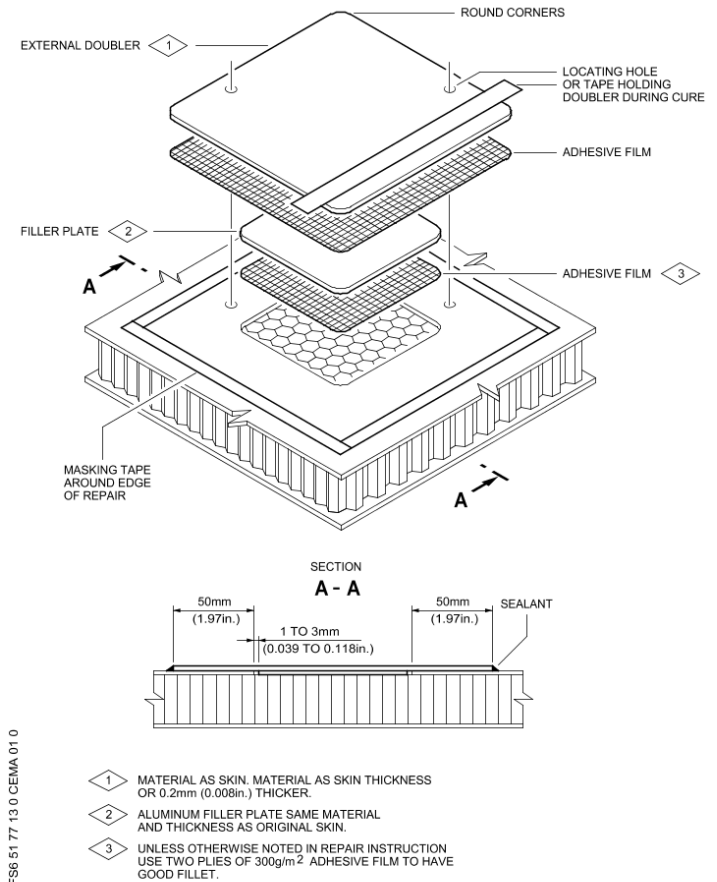
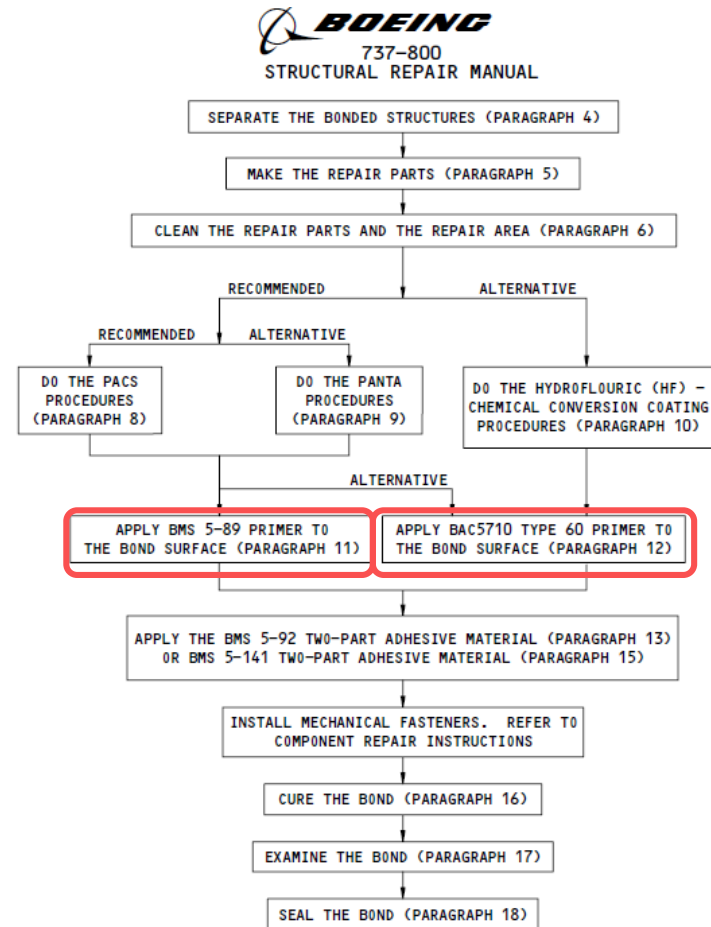


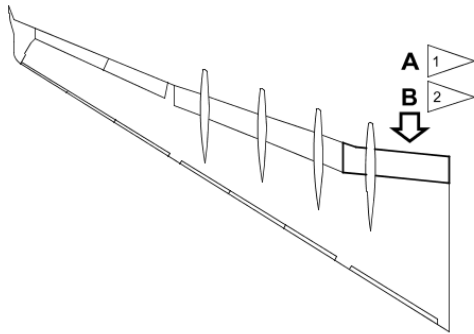
Figure 031 (sheet 1) / 51-77-13 Delamination Repair or Skin Repair

**BOEING
SRM 51-70-09**



REPAIR STEPS FOR THE USE OF BMS 5-92 AND
BMS 5-141 ADHESIVE MATERIAL FOR CURING AT
ROOM TEMPERATURE AND ABOVE ROOM TEMPERATURE

Flow Chart of the Repair Steps for Cures
Figure 1 (Sheet 2)

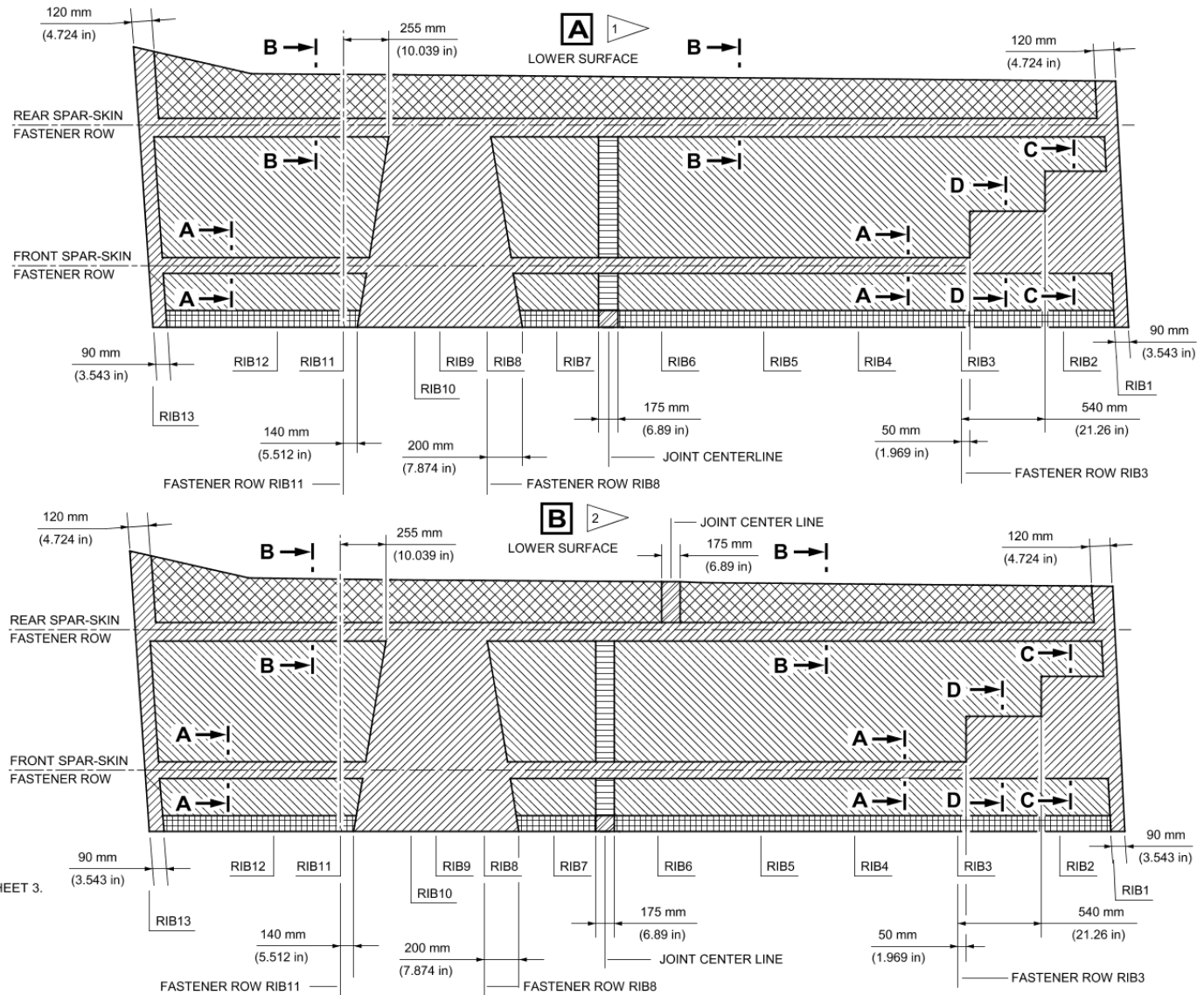


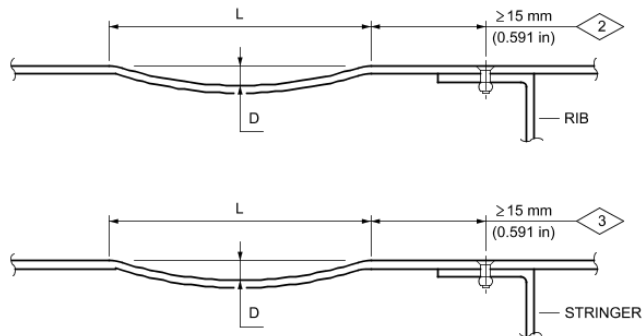
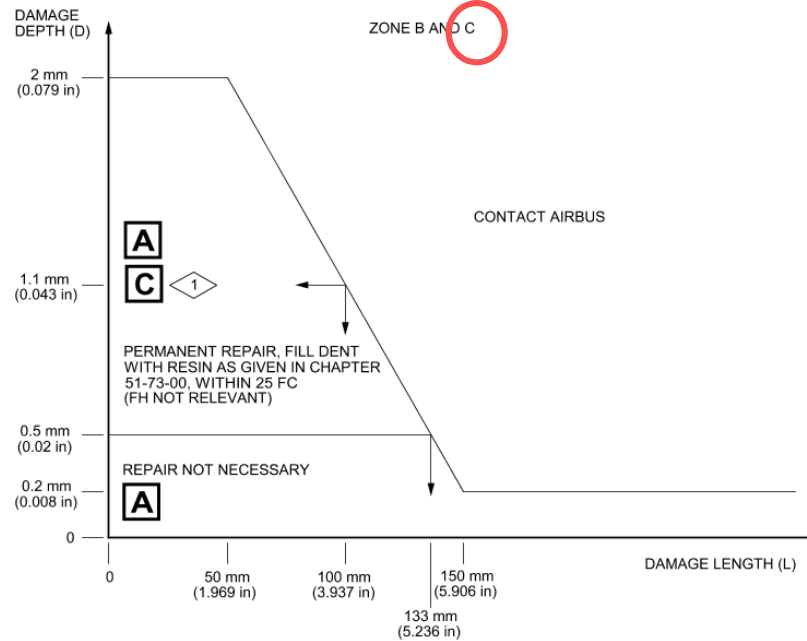
NOTE: FOR SECTIONS A-A, B-B, C-C AND D-D, REFER TO SHEET 3.

1 IN CASE OF DAMAGE IN ZONE F, CONTACT AIRBUS.

1 BEFORE MODIFICATION 47798D42578

2 AFTER MODIFICATION 47798D42578





CAUTION: OBEY THE ALLOWABLE DAMAGE EFFECTIVITY PER WEIGHT VARIANT AND AIRCRAFT TYPE GIVEN IN THE RELEVANT TABLE.

NOTE: FOR DAMAGE IN ZONE A AND F, CONTACT AIRBUS.

THE DAMAGED AREA MUST BE FREE OF CRACKS. INSPECT ACCORDING TO NTM TASK 51-10-08-250-802.

- 1 REPAIR NEEDS TO BE PERFORMED TO REMOVE POSSIBLE DETRIMENTAL FLIGHT PHYSICS CHARACTERISTICS.
- 2 DENTS ARE NOT ALLOWED IN THE AREA OF RIBS, AT LEAST A DISTANCE OF 15 mm (0.591 in) FROM THE CENTER OF THE FASTENER TO THE DENT HAS TO BE MAINTAINED. IN CASE OF DENTS AFFECTING A RIB AREA, CONTACT AIRBUS.
- 3 APPLICABLE FOR AIRCRAFT A330-200 WV057 (MODIFICATION 58859H16361 OR MODIFICATION 58862H16363), WV058 (MODIFICATION 58860H16362 OR MODIFICATION 58862H16363) AND A330-200/300 WV080 THRU 083 (MODIFICATION 58862H16363), DENTS ARE NOT ALLOWED IN THE AREA OF STRINGER BETWEEN RIB 6 AND RIB 7, UPPER SKIN. AT LEAST A DISTANCE OF 15 mm (0.591 in) FROM THE CENTER OF THE STRINGER FOOT (MODIFICATION 54098D44945) RESPECTIVELY FASTENER RIVETING TO THE DENT HAS TO BE MAINTAINED. IN CASE OF DENTS AFFECTING THIS STRINGER AREA, CONTACT AIRBUS.

X REPAIR CATEGORY



(1). Hot Bonded Repair with Core Replacement - one skin damaged (Refer to Figure [033](#))

- (a) Remove the damaged skin and core and prepare the repair area (Refer to Paragraph [4.A.\(1\)](#)).
- (b) Lightly abrade the original adhesive and remove remaining core on the bottom of the hole. Use abrasive cloth 400 grade to remove the adhesive fillet and to get a smooth matt surface. Be careful not to remove all of the bonding adhesive (Refer to Figure [027](#) , sheet [2](#)).
- (c) Clean the area with a vacuum cleaner.
- (d) Clean the repair area with cleaning agent (Material No. [11-003](#) or [11-004](#) and refer to [Chapter 51-77-11](#) , Paragraph 4.E.).
- (e) Prepare the honeycomb core plug (Refer to Paragraph [4.A.\(3\)](#)).
- (f) Install the core plug (Refer to [Chapter 51-77-11](#) , Paragraph 5.G.). Use adhesive film (Refer to [Chapter 51-77-11](#) , Paragraph 6.B.(6)) and foaming adhesive film (Refer to [Chapter 51-77-11](#) , Paragraph 6.B.(5)).

NOTE: Install the vacuum bag and heating equipment on both sides of damage (Refer to [Chapter 51-77-11](#) , Paragraph 5.D.).

- (g) Abrade or cut the top surface of honeycomb core plug to the same level with the skin surface.
- (h) Clean the repair area with cleaning agent (Material No. [11-003](#) or [11-004](#) and refer to [Chapter 51-77-11](#) , Paragraph 4.E.).
- (i) Prepare the external doubler (Refer to Paragraph [4.A.\(2\)](#)).

CAUTION: WEAR CLEAN COTTON GLOVES WHEN HANDLING TREATED PARTS AND ADHESIVE FILM.

- (j) Prepare the adhesive film (Refer to [Chapter 51-77-11](#) , Paragraph 6.B.(6) and Paragraph 4.A.).

NOTE: Cut the adhesive film in dimension 0mm to 3 mm (0.118 in.) more than the doubler.

- (k) Remove one separator and apply the adhesive film on the mating surface of the doubler. If required, use an aluminum filler. Press the adhesive film tightly to avoid to entrap air. When more than one piece of adhesive film is required, butt splice pieces with no gap or an overlap of 5 mm (0.197 in.) maximum.
- (l) Remove the second separator and put the (aluminum filler if used and) doubler in position. Make sure, that the repair parts are in correct position before the parts will be tightly attached. For a cut-out larger than 50 mm (1.969 in.) with an aluminum filler and the repair cured under vacuum, apply a scrim cloth (Material No. [05-021](#)) between the core and the adhesive film. Extend the scrim cloth up to the edge of the repair (shown in Figure [031](#) , sheet [2](#)) or use the adhesive film (Material No. [08-042A](#)) and cure at 90 °C (194.0 °F) (Refer to [Chapter 51-77-11](#) , Paragraph 6.B.(6)). Put pegs in locating holes to prevent slippage or hold the doubler in position with polyester tape and apply an equal pressure to the doubler.
- (m) Let the adhesive film cure under pressure. To apply pressure, use a vacuum bag (Refer to [Chapter 51-77-11](#) , Paragraph 5.D.).

NOTE: Let the adhesive film cure at 120 °C (248.0 °F) and the required vacuum (if Material No. [08-042A](#) is used let cure at 90 °C (194.0 °F)). To avoid further disbonding, the areas not subject to the vacuum or mechanical pressure must not exceed 90 °C (194.0 °F) during cure. Do not remove the vacuum pressure before the assembly has cooled down to 70 °C (158.0 °F).

- (n) Remove the equipment, parting film and locating pegs or tape. Fill the locating holes with blind rivets or seal with adhesive past (Refer to [Chapter 51-77-11](#) , Paragraph 6.B.(1) and Paragraph 4.A.).
- (o) Inspect the adhesive fillet and tap test inspect the repair area (Refer to [Chapter 51-77-10](#) , Paragraph 5.).
- (p) Do not remove the adhesive fillet and seal the edge of repair (shown in Figure [025](#) , sheet [2](#)) and blind rivets with sealant (Material No. [09-002](#) or [09-013](#) or [09-016](#) and refer to [Chapter 51-76-11](#)).
- (q) Restore the surface protection (Refer to [Chapter 51-75-12](#) , Paragraph 4.).

(2). Doubler and Aluminum Filler Plates

All mating surfaces of doublers and aluminum filler plates must be fully cleaned and prepared to get the maximum adhesive bonding. Doublers and aluminum filler plates can be prepared in advance and stored as given in [Chapter 51-77-11](#) , Paragraph 4.B.(6).

NOTE: Prepare also the edge of the repair doubler and aluminum filler.

(a) Doubler and Filler Plate Manufacture

Cut doubler from same material as original skin material, or 0.2 mm (0.008 in.) thicker than original skin material, to the specified size and bring it in shape. If required, cut filler plate from same material and thickness as original skin but smaller than the hole. With a gap of 1 mm (0.039 in.) (+/- 0.5 mm (0.020 in.)). Prefit before final cleaning. Make all doubler and filler plate edges smooth and round the corner with a radius of 12 mm (0.472 in.) to 25 mm (0.984 in.).

(b) Surface Preparation

Use the following procedure (preferred) or one of the procedures given in Paragraph [3.A.\(1\)\(b\)](#) .

1 Chromic Acid Anodizing (CAA) and Anti-Corrosion Bonding Primer Method

- a Clean and degrease doubler and filler plate with alkaline solution (Refer to the PMS (Process and Material Specification), Process Specification 01-01-03)).
- b Pickle the bonding surfaces with alkaline solution (Refer to the PMS, Process Specification 01-01-21)) and anodize with chromic acid (Process Specification 01-02-08).
- c Within 8 hours apply a thin uniform coat of anti corrosion bonding primer (Material No. [08-055](#)) on the mating surfaces and cure the coating (Refer to [Chapter 51-77-11](#) , Paragraph 4.B.(6)).

NOTE: To prevent contamination the repair procedure must follow immediately, or store the primed panels in an opaque sealed polyethylene bag. To prevent contamination after degreasing operation wear clean white gloves when handling the doubler or filler plates.

AIRCRAFT DEFECT / DAMAGE REPORT	
Aircraft:	
Type: _____	Operator: _____ MSN: _____ Operator Reg. No.: _____
Age: _____	FC: _____ FH: _____ Weight Variant: _____
Date defect / damage occurred or found: _____	
Maintenance check code: _____ Layover from _____ to _____	
Return service date: _____	
Reporter's reference and name: _____	
Damaged Part (Component): _____	
Description / Part No. / Item Ref. of Component affected: _____	
Frame: _____ Stringer: _____ Rib: _____ LH <input type="checkbox"/> RH <input type="checkbox"/>	
Serial No.: _____ Mod. status: _____	
Age: _____ FC: _____ FH: _____	
Details of finding defect / damage:	
Inspection: scheduled <input type="checkbox"/> unscheduled <input type="checkbox"/> Doc. No.: _____	
Inspection method:	
visual <input type="checkbox"/> close visual <input type="checkbox"/> x-ray <input type="checkbox"/> ultra sonic <input type="checkbox"/>	
eddy current (MF) <input type="checkbox"/> eddy current (LF) <input type="checkbox"/> others <input type="checkbox"/>	
Details of defect / damage:	
Type: crack <input type="checkbox"/> hole <input type="checkbox"/> scratch <input type="checkbox"/> dent <input type="checkbox"/> corrosion <input type="checkbox"/>	
corrosion blended out <input type="checkbox"/> delamination <input type="checkbox"/> debonding <input type="checkbox"/>	
other: _____	
Size: Length: _____ width: _____ depth: _____ (unit: _____)	
Location of deepest point: _____	
Direction: _____	
Location: inside <input type="checkbox"/> outside <input type="checkbox"/> distance (to frame etc.): _____	
Suspected cause of defect / damage: _____	
Type of materials affected: _____	
Details of any unusual event: _____	
Details of any secondary damage: _____	
Details of existing adjacent repairs: _____	
Operator's requirements:	
Temporary repair for specified number of flights: _____	
Permission to defer final action for specified number of flights: _____	
Permanent repair: _____	
Urgency with specified dates: _____	
Additional information: _____	

Sketch: see pages: _____	

← AIRCRAFT DATA

← COMPONENT DATA

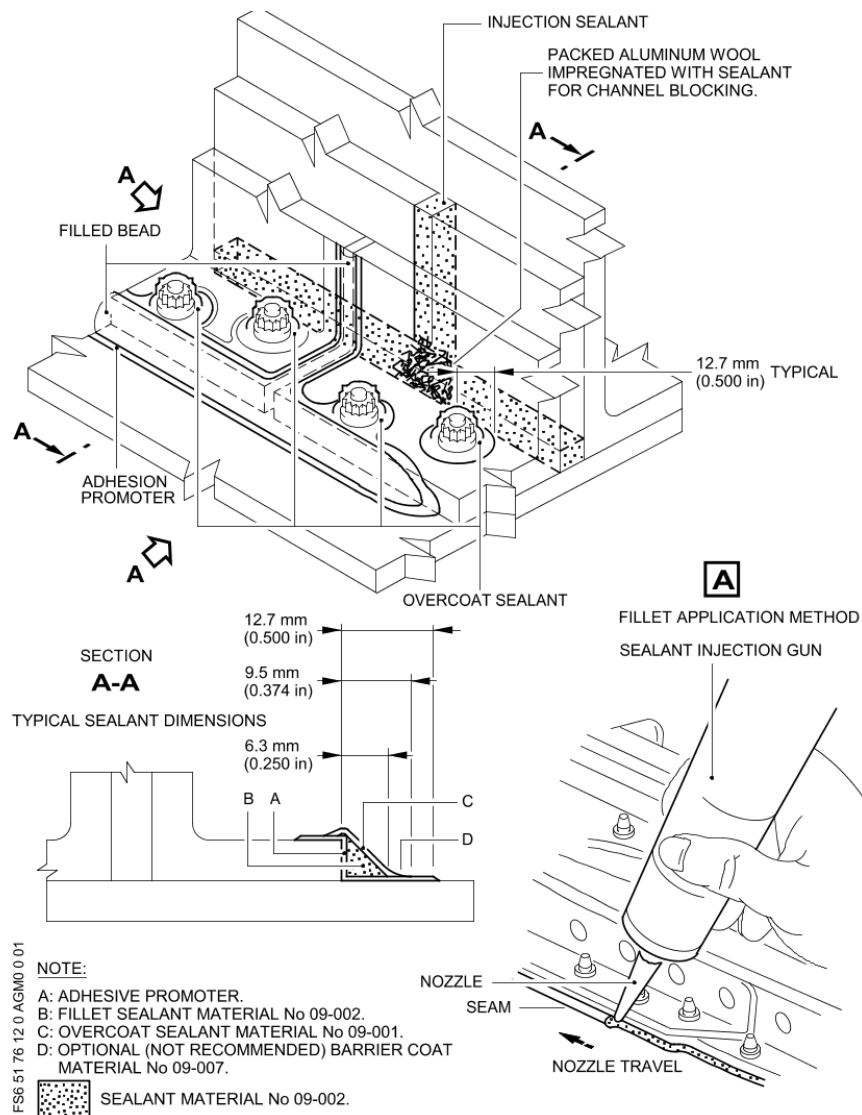
← INSPECTION DATA

← DETAILS OF DAMAGE

← REQUIREMENTS FROM OPERATOR

SRM TASK EVALUATION CONTINUE

FUEL TANK SEALANT



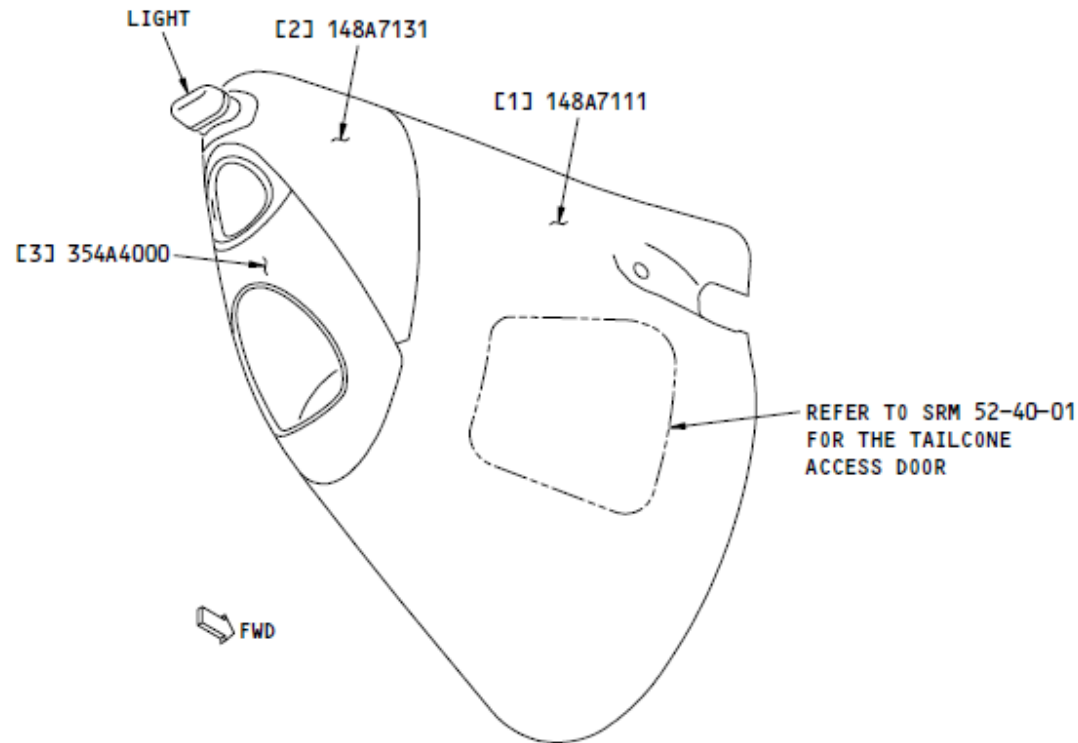
3. References

- A. AMM 20-30-88/201, Final Cleaning of Metal Prior to Non-structural Bonding (Series 88)
- B. AMM 20-41-00/201, Airplane Grounding - Maintenance Practices
- C. AMM 28-11-00/201, Fuel Tanks - Maintenance Practices
- D. AMM 51-21-00, Protective Finishes - Cleaning/Painting
- E. CPM, 737 Corrosion Prevention Manual
- F. NDT Part 4, 51-00-02, Full Depth Honeycomb and Laminate Structure Inspection (TTU)
- G. SOPM 20-30-03, General Cleaning Procedures
- H. SOPM 20-30-80, Final Cleaning of Metal Prior to Non-structural Bonding (Series 88)
- I. SOPM 20-41-05, Application of Corrosion Inhibiting Compound
- J. SOPM 20-42-01, Low Hydrogen Embrittlement Cadmium-Titanium Alloy Plating
- K. SOPM 20-41-05, Bright Cadmium Plating
- L. SOPM 20-43-03, Chemical Conversion Coatings for Aluminum
- M. SOPM 20-44-01, Application of Special Purpose Coatings and Finishes
- N. SRM 51-10-02, General - Inspection and Removal of Damage
- O. SRM 51-20-02, General - Hardness Testing
- P. SRM 51-20-03, General - Fire Damage Analysis
- Q. SRM 51-20-05, General - Repair Sealing
- R. SRM 51-30-03, General - Sources for Non-Metallic Repair Materials
- S. SRM 51-60-00, General - Control Surface Balance Requirements
- T. SRM 51-70-03, General - Composite Materials Alternatives
- U. SRM 51-70-04, Repair General - Repair Procedures For Wet Layup Materials

51-20-01

4. Maximum Permitted Temperatures for Coatings, Sealants, Adhesives, Primers, and Paints (Refer to Table 1.)

MAXIMUM PERMITTED TEMPERATURES FOR COATINGS, SEALANTS, ADHESIVES, PRIMERS, AND PAINTS	
COATING, SEALANTS, ADHESIVES, PRIMERS, AND PAINTS	MAXIMUM PERMITTED TEMPERATURE °F (°C)
BAC 5710, Type 47 PTFE Coating	700 (371) Peak 425 (218) Continuous
BAC 5755, Aluminized Primer	450 (232)
BMS 3-27, Coating	160 (71)
BMS 5-26, Sealant	200 (93)
BMS 5-28 Potting Compound Type 3,4,9,10,15,16,17,18,19,20,24,28 Type 11 Type 6,7,12,13,14,21,25,27	----- 160 (71) 250 (121) 350 (177)
BMS 5-63, Sealant	450 (232)
BMS 5-89, Primer	300 (149)
BMS 5-92, Adhesive	160 (71)
BMS 5-95, Sealant	200 (93)
BMS 5-126, Type II, III Potting Compound	160 (71)
BMS 10-11, Type I and II Primer	300 (149)
BMS 10-20, Type II Primer	300 (149)
BMS 10-21, Type III Anti-static Coating	300 (149)
BMS 10-60, Type I and II Paint	300 (149)
BMS 10-79, Type I and II Sealant	300 (149)



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

Tailcone Fairing Skin Identification
Figure 2

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T	MATERIAL	EFFECTIVITY
[1]	Forward Tailcone Assembly		Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich	
	Skin		Refer to Figure 3	
	Core	0.50 (1.27)	Nonmetallic honeycomb as given in BMS 8-124, Class IV, Type 5, Grade 3.0	
	Core	0.50 (1.27)	Aluminum honeycomb as given in BMS 4-4, Class NPA, Type 2-07, Grade 1.0	

(3) Dents are permitted if they are:

- (a) In a maximum of one facesheet
- (b) A maximum diameter of 6.0 inches (152.4 mm). Damage to a maximum diameter of 12.0 inches (304.8 mm) is permitted for a maximum of 20 flight cycles.

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ALLOWABLE DAMAGE 1

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4. Allowable Damage Limits for the Section 48 Tailcone Fairing Skin (Continued)

- (c) A minimum distance of 6.0 inches (152.4 mm) away from the edge of any other damage and a minimum of 2.0 inches (50.8 mm) away from any hole or part edge.
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum of 1.0 inch (25.4 mm) in diameter
 - (b) A minimum distance of 6.0 inches (152.4 mm) away from the edge of any other damage and a minimum of 2.0 inches (50.8 mm) away from any hole or part edge.
- (5) Delaminations are permitted if they are:
 - (a) In a maximum of one facesheet
 - (b) A maximum diameter of 6.0 inches (152.4 mm). A maximum diameter of 12.0 inches (304.8 mm) is permitted for a maximum of 20 flight cycles.
 - (c) A minimum distance of 6.0 inches (152.4 mm) away from the edge of any other damage and a minimum of 2.0 inches (50.8 mm) away from any hole or part edge.