Bell Helicopter TEXTRON

A Subsidiary of Textron, Inc.

March 17, 2009

TO: **All Owners/Operators of Bell 205 Helicopters**

SUBJECT: **REVISION "A" TO TECHNICAL BULLETIN 205-82-47:** Replacement of upper honeycomb panel, tailboom baggage compartment, with sheet metal skin and modification of Frame P/N 212-030-631-115.

Revision "A" to this bulletin includes the modification to Frame P/N 212-030-631-115. There are no change bars in this revision due to the extensive minor and major changes made to the entire bulletin. This bulletin mandates the repair of frame P/N 212-030-631-115 in accordance with this bulletin or by equivalent means of compliance.

# TECHNICAL BULLETIN

Bell Helicopter
A Textron Company

| | |
|---|---|
| No. | 205-82-47 |
| Date | 08-16-82 |
| Page | 1 of 17 |

DATE Mar 17, 2009

REV "A"

**MODEL AFFECTED:** **205A/205A-1**

**SUBJECT:** **REPLACEMENT OF UPPER HONEYCOMB PANEL, TAILBOOM BAGGAGE COMPARTMENT, WITH SHEETMETAL SKIN.**

**HELICOPTERS AFFECTED:** **All Model 205A/205A-1 Helicopters serial number 30001 through 30332.**

**COMPLIANCE:** At customer's option. It is recommended this bulletin be accomplished when panel requires replacement. Frame P/N 212-030-613-115 modified prior to Rev "A" of this T.B. must comply with or show an equivalent means of compliance to Rev "A" of this T.B no later than the next 3000 Hour/5 Year inspection.

**DESCRIPTION:**

Operators of Bell 205A/205A-1 helicopters have experienced delamination of skin and core in the baggage compartment upper honeycomb skin. Replacement of the honeycomb panel will eliminate this problem.

**APPROVAL:**

The engineering design aspects of this bulletin are FAA/DER approved.

**MANPOWER:**

Approximately 72.0 man-hours are required to complete this bulletin. Man-hours are based on hands-on time, and may vary with personnel and facilities available.

**WARRANTY:**

There is no warranty provided for this bulletin.

**MATERIALS:**

**Required Material:**
The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

| Part Number | Nomenclature | Quantity |
|---|---|---|
| 212-030-630-115 | Skin | 1 |
| 212-030-631-115 | Frame, Bulkhead | 1 |
| 212-030-631-117 | Support, Attachment Angle | 1 |
| 110-001-3 (84 inches long) | Stiffener (J-Stiffener) | 2 |
| 150-021-14C1-1 [1] | Aluminum Sheet | 1 |
| 150-021-10B1-1 | Doubler | 1 |

**Consumable Material:**
The following material is required to accomplish this bulletin; however this material is considered consumable (bench stock) material and may not require ordering depending on the operator's consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

| Part Number | Nomenclature | Quantity | Reference |
|---|---|---|---|
| NAS1738B4 | Rivet (Blind) | 500 Approx | |
| NAS1738B4 | Rivet (Blind) | 20 Approx | |
| NAS1738B4 | Rivet (Blind) | 11 Approx | |
| MS20426AD4 | Rivet (Solid) | 8 Approx | |
| MS20470AD4 | Rivet (Solid) | 200 Approx | |
| 140-001-1 | Washer | 11 Approx | |
| 299-947-100 TY2 CL2 PT | Adhesive | 1 Pt. | C-317 |
| Mil-C-81706 1 Qt | Chemical Film Material | 1 Qt | C-100 |
| MIL-PRF-23377T1,CLC | Primer kit | 1 | C-204 |
| MIL-PRF-680, Type 2 | Solvent, Drycleaning, Degreaser | A/R | C-304 |
| Methyl Ethyl Ketone | MEK | A/R | C-309 |
| Scotch-Brite very fine | Abrasive Pad Type A | 1 | C-407 |
| MILC87936TY1 | Cleaning compound | A/R | C-318 |

[1] For alternate use 0.040 2024 T3 AL ALY Per QQ-A-250/4

| | | | |
|---|---|---|---|
| Aluminum Wool | Aluminum Wool | A/R | C-422 |
| Masking tape | Masking tape 1” Wide | 1 | C-426 |
| MILS81733TY2-2PT | Sealant | 1 | C-251 |

**SPECIAL TOOLS:**

Tail Rotor Driveshaft alignment tools in accordance with Chapter 66 of the 205A-1 Maintenance Manual.

**WEIGHT AND BALANCE:**

| | Longitudinal | | Lateral* | |
|---|---|---|---|---|
| **Weight** | **Arm** | **Moment** | **Arm** | **Moment** |
| 0.7 Lbs | 279.0 in. | +195.3 in-Lbs | 0.0 in. | 0.0 in-Lbs |

* In lateral calculations, - is left and + is right.

**ELECTRICAL LOAD DATA:**

Not affected

**REFERENCES:**

BHT-205A-1-MM Maintenance Manual
BHT-MED-SRM-1
BHT-ALL-SPM

**PUBLICATIONS AFFECTED:**

None affected

**ACCOMPLISHMENT INSTRUCTIONS:**

1. Remove tailboom from helicopter and place in support cradles. The top of the forward bulkhead and the skin to longeron attachment must be accessible. (See Figure 1). Remove drive train components from the top of the baggage compartment. Remove drive shaft cover and support angles.

2. Remove the top honeycomb panel and record type and size of rivets used. Clean faying surfaces of bulkheads, longerons and frames.

3. Locate and mark Boom Station (B.S. 33.70) on baggage compartment top panel. Locate and mark centerline on baggage compartment top panel. (See Figure 2).

4. Locate the center of the 0.62 inch (15.75 mm) wide flange on support angle P/N 212-030-631-117. Layout 13 equally spaced rivet holes, 7.60 inches (193.04 mm) either side of center line. Rivets to have a minimum of 0.31 inch (7.87 mm) edge distance on all edges. (See Figure 3 view “E”).

5. Place support P/N 212-030-631-117 on top of baggage compartment with the 0.75 inch (19.05 mm) flange up and aft. Align the aft face of the 0.75 inch (19.05 mm) flange with the line previously drawn in step 3 at Boom Station (B.S. 33.70) (See Figure 4 Section “B-B”) and align the centerline on the support with the centerline that was drawn in step 3 (See Figure 3 View “E”).

6. Using a #27 drill bit; drill and cleco rivet pattern through stiffener and top skin of baggage compartment roof panel. Remove and deburr stiffener, and top skin of the baggage compartment roof panel.

7. Drill out holes from step 6 in baggage compartment (top skin only) to 0.25 - 0.26 inch (6.35–6.60 mm) (See Figure 4 Section “B-B”). Undercut core between skins to a diameter of 0.50 inch (12.7 mm). Remove all debris from the holes using a vacuum or clean (oil free) shop air.

8. Fill holes/cavities with adhesive C-317. Allow to cure for 24 hours before continuing with bulkhead installation.

9. While adhesive is curing, locate and clamp “J” stiffener flange to Bulkhead return flange at Butt Line (B.L. 8.73) at Boom Station (B.S. 17.37) and Bulkhead return flange at Butt Line (B.L. 7.18) at Boom Station (B.S. 101.38). The return flange must be facing outward (See Figure 4 detail “D”) Mark flange of bulkheads at Boom Station (B.S. 59.50) and Boom Station (B.S. 80.44) along “J” stiffener mold line and flange (See Figure 4 detail “D”). Typical both sides. Mark a line 0.38 inch (9.65 mm) inboard of “J” stiffener mold line on top flange of bulkhead at Boom Station (B.S. 80.44) and Boom Station (B.S. 59.50) only (See Figure 4 detail “D”). Do not mark the Bulkheads at Boom Stations (B.S. 17.37) and Boom Station (B.S. 101.38) with this additional line.

10. Using Frame P/N 212-030-631-115 as a template; align inboard edge of stiffener cutout in frame P/N 212-030-631-115 with inboard line established in step 9 and flush with the top of the bulkhead (See Figure 4 detail “C”) Lay out and cut stiffener cutout in L/H and R/H side of bulkheads located at Boom Station (B.S 80.44) and Boom Station (B.S. 59.50) and remove all sharp edges. Treat all bare metal surfaces with chemical film in accordance with BHT-ALL-SPM section 3-16. Prime all bare metal surfaces using Epoxy Polyamide primer (C-204) and allow to dry.

11. Modify frame P/N 212-030-631-115 by preparing Doubler from 150-021-10B material, (See Figure 6 detail B). Form a 0.38 inch (9.65 mm) flange on doubler (See Figure 7 Section "D-D") by bending. Maintain a 0.13 inch (3.30 mm) minimum bend radius. Trim and fit the doubler (See Figure 6 Detail B) while maintaining 0.38 inch (9.65 mm) minimum edge distance on all fasteners except as noted. Using a #30 drill bit, drill all fastener holes except for the holes common to support P/N 212-030-631-117. These holes will be drilled in step 27.

**CAUTION**

Do not drill the 1.88 inch (47.75 mm) hole at this time.

12. Remove doubler, de-burr all holes and edges, remove debris and loose material. All corners to have a minimum 0.25 inch (6.35 mm) radius and 0.38 inch (9.65 mm) minimum corner radii on the corners of the lightning hole in the frame. (See Figure 6 Detail "B").

-NOTE-

Do not soak parts to be bonded in cleaner (M.E.K., Acetone, etc.) Use of moist rag recommended.

13. Remove dirt and primer from repair doubler area and clean for bonding.

**CAUTION**

Ensure "peel ply" is removed from doubler composite bond material prior to bonding.

14. Remove "peel ply" from doubler and lightly sand composite bond material prior to bonding. Install doubler in position using bonding adhesive (C-317) and secure with MS20470AD4 rivets (grip length to suit) wet with adhesive, while doubler adhesive is still wet.

15. Remove excess adhesive squeeze out.

16. Allow to cure at room temperature for 24 hours applying a pressure of 0.5 to 1.0 PSI (3.5 to 6.9 KPA) to repair area.

17. Inspect for voids and un-bonded area(s). Voids shall not exceed 10% of total bonded area. No one void shall exceed 0.25 $in^2$ (161.29 $mm^2$) in area.

18. Locate the center of the 1.88 inch (47.75 mm) diameter hole (See Figure 6 Detail "B") and drill through both the doubler and the frame. De-burr hole on both sides.

19. Treat all bare metal surfaces with chemical film in accordance with BHT-ALL-SPM section 3-16. Prime all bare metal surfaces using Epoxy Polyamide Primer (C-204), and allow to dry.

20. Seal all edges of modified area using sealant (C-251). Allow to dry and re-prime sealant.

21. Fabricate two attach clips (See Figure 8 and 9) for attaching "J" stiffeners to forward bulkhead Boom Station (B.S. 17.37) and two attach clips for attaching "J" stiffener to aft bulkhead Boom Station (B.S. 101.38) (See Figure 2 Detail "A"). The FWD and AFT clips attachment flange will have to be adjusted to allow for interpitching of the rivets on the return flanges on Bulkheads at Boom Stations (B.S. 17.37 and B.S. 101.38). "J" stiffeners and clips manufactured and installed prior to Rev "A" of this T.B. are acceptable and do not need to be changed.

22. Trim and scarf end of "J" stiffeners (See Figure 2 Detail "A") to fit between the aft face of the forward bulkhead and the forward face of the aft bulkhead in baggage compartment area. When the flange is turned outboard and web is aligned with mold line marks (from step 9) the sum of gaps between bulkhead and "J" stiffeners ends should be 0.20 inch (5.08 mm). Center stiffeners between bulkheads and mark both ends of "J" stiffener flanges at edge of bulkhead return flanges.

23. Cut off top flange of "J" stiffener along the line marked in step 22 (See Figure 2 Detail "A"). The cut should be parallel to flange surface of "J" stiffener and a minimum corner radius of 0.09 inch (2.29 mm) shall be maintained. Treat all bare metal surfaces with chemical film (C-100) in accordance with BHT-ALL-SPM section 3-16. Prime all bare metal surfaces using Epoxy Polyamide Primer (C-204) and allow to dry.

24. After adhesive injected at step 8 has cured, sand surface smooth and flush. Locate support P/N 212-030-631-117 as directed in step 5. With #27 drill bit, drill holes completely through baggage compartment panel to match the 13 holes located in support and deburr. (Refer to Figure 4 Section B-B)

25. Apply sealant (C-251) to support flange and install support to baggage compartment panel using NAS1738B4 rivets (grip length to suit) and washers (See Figure 4 Section "B-B").

26. On Fwd face of support angle P/N 212-030-631-117 layout a pattern of 17 equally-spaced rivets, while maintaining a 0.31 inch (7.87 mm) edge distance (See Figure 3 View "A-A").

27. Fit frame P/N 212-030-631-115 on aft face of support P/N 212-030-631-117 with flange forward. Verify the edge of the frame is in alignment with adjacent bulkheads by use of a straight edge at several locations. After alignment has been achieved, clamp frame to support angle P/N 212-030-631-117. Using a #30 drill, drill the 17 holes that were previously laid out in step 26. Remove frame and deburr frame and support. Install frame (See Figure 3 View A-A) using MS20470AD4 rivets (grip length to suit) with rivet heads forward.

28. Assemble “J” stiffeners (with flange outboard) and clips to bulkhead at Boom Stations (B.S. 17.37 and B.S. 101.38). Confirm fit of clips to bulkheads and “J” stiffeners (new clips may need to be manufactured to allow for the inter-pitching of rivets between existing rivet holes). The top (trapezoidal) flange of clip should fit against the bulkhead flange and stiffener flange when the clip is clamped against web of stiffener. Adjust or modify clips to obtain a proper fit. (See Figure 2 Detail “A”).

29. When proper fit has been obtained, using a #30 drill; drill two holes (maintain minimum of 3D from existing rivet holes in the bulkhead flange) through the bulkhead flange at Boom Stations (B.S. 17.37 and B.S. 101.38) and the clip. Cleco in place. Lay out 4 equally-spaced rivets in the flange of the clip (See Figure 2 Detail “A”) and using a #30 drill; drill 4 holes in the “J” stiffener web and cleco in place. Repeat for each end of the “J” stiffeners.

30. Remove parts and countersink the holes in the bulkhead flanges to accept the MS20426AD4 rivets. Deburr all parts.

31. Apply sealant (C-251) to faying surface of clips and attach clips to appropriate bulkheads with two MS20426AD4 rivets each (grip length to suit). Wipe off excessive sealant.

32. Apply sealant (C-251) to faying surfaces of “J” stiffener web and flange. Attach “J” stiffener to clips with 4 MS20470AD4 rivets (grip length to suit) at each end on both sides (See Figure 2 Detail “A”). Wipe off excessive sealant.

33. Prime all bare metal surfaces (C-204)

34. Using the bulkhead at Boom Station (B.S. 59.50) as a guide and maintain a 0.25 inch (6.35 mm) edge distance on all edges, layout and drill the bulkhead at Boom Station (B.S. 33.70) using a #30 drill. Deburr all holes.

35. Fit skin P/N 212-030-630-115 to tailboom and trim as required. Using a #30 drill; pick up and drill bulkhead and longeron rivet hole pattern and attach with cleco fasteners.

36. Using standard practices layout and drill the skin and “J” stiffeners using a #30 drill.

37. Locate Driveshaft Cover Support Angles on skin and drill skin to match.

38. Remove skin from tailboom, deburr all holes and prime all bare metal surfaces using Epoxy Polyamide Primer (C-204) and allow to dry.

39. Apply Sealant (C-251) to faying surfaces of Driveshaft Cover Support Angles and attach angles to skin using MS20470AD4 rivets (grip length to suit). Omit rivets common to bulkhead holes at this time.

40. Apply Sealant (C-251) to faying surfaces of longerons, stiffeners and bulkheads.

41. Place skin on tailboom and attach to bulkheads and “J” stiffeners with NAS1738B4 rivets (grip length to suit). Finish attaching the Driveshaft Cover Support Angles at this time.

42. Prime and paint tailboom affected areas in accordance with instructions in BHT-ALL-SPM.

43. Carry out tail rotor drive shaft alignment check in accordance with instructions in Chapter 66 of the 205A-1 Maintenance Manual.

44. Reinstall drive train components on top of baggage compartment in accordance with instructions in Chapter 66 of the 205A-1 Maintenance Manual.

45. Reinstall tailboom on aircraft.

46. Make an entry in the helicopter historical records indicating compliance with this Technical Bulletin.

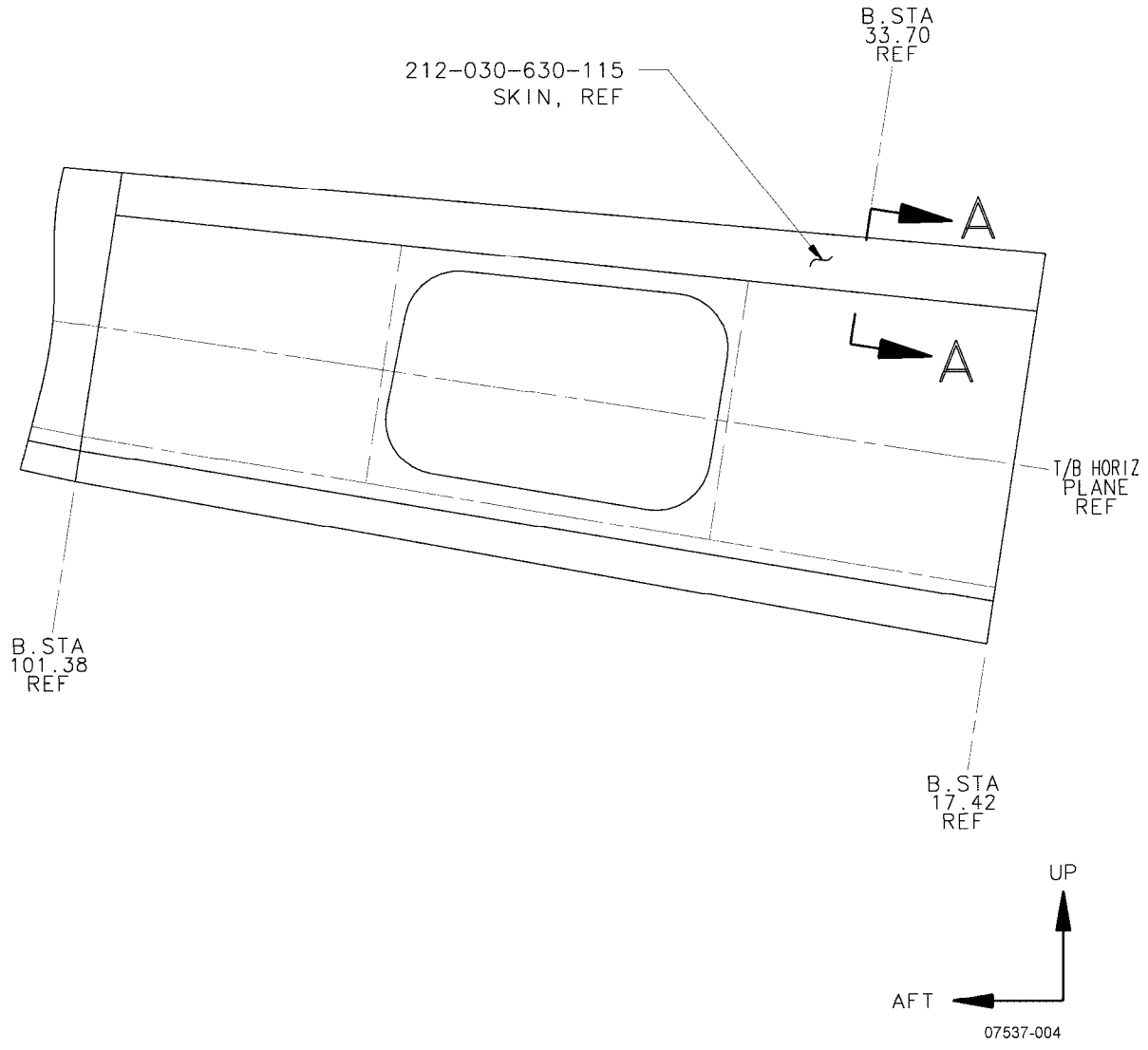

B.STA
33.70
REF
212-030-630-115
SKIN, REF
A
A
T/B HORIZ
PLANE
REF
B.STA
101.38
REF
B.STA
17.42
REF
UP
AFT
07537-004

Figure 1

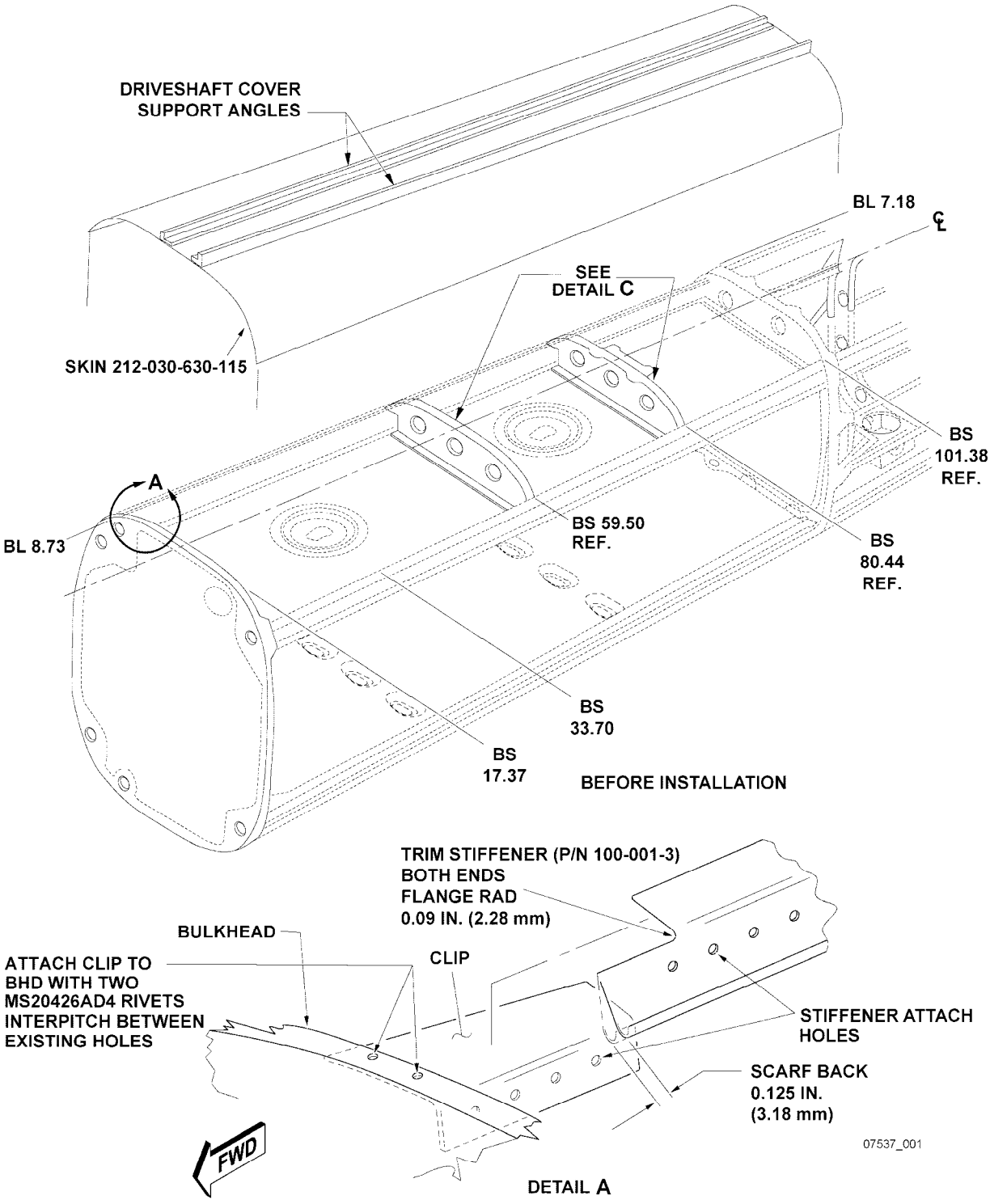
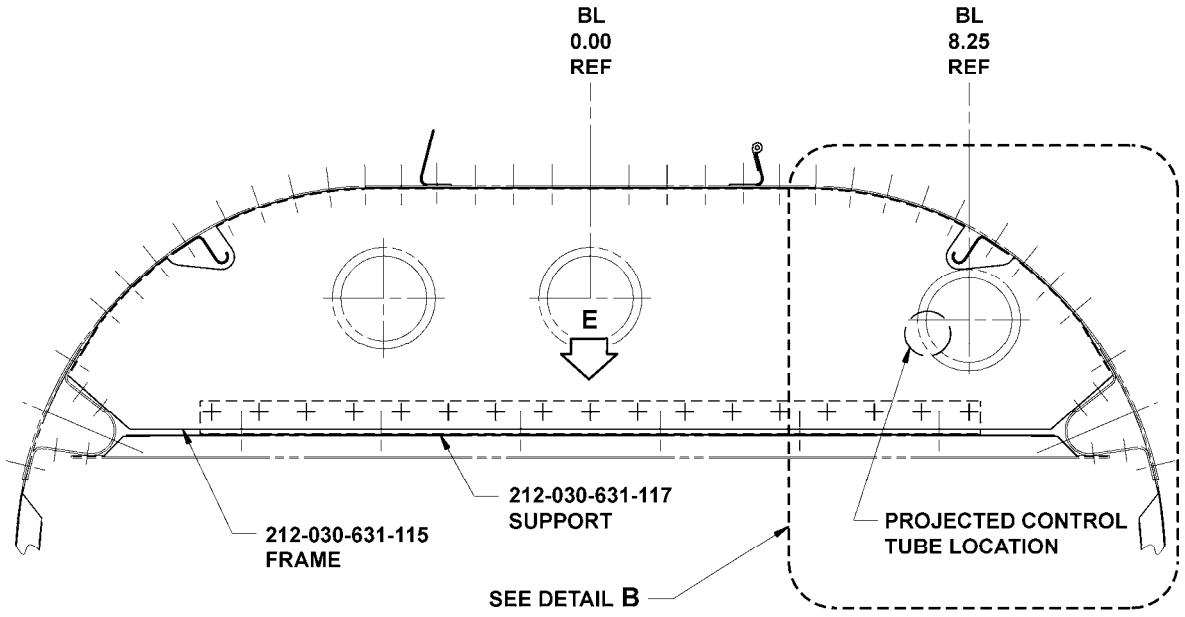
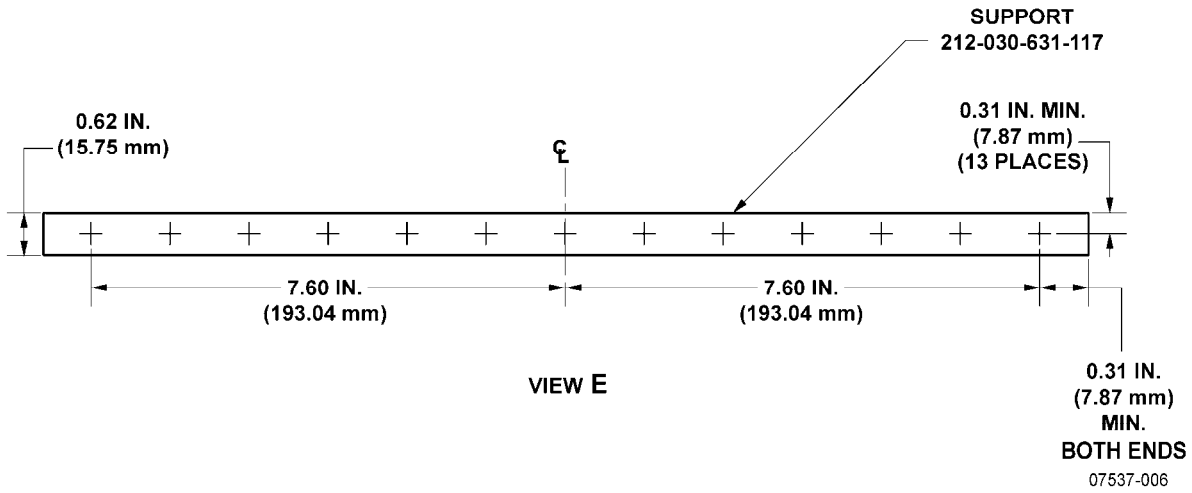

DRIVESHAFT COVER SUPPORT ANGLES
SKIN 212-030-630-115
BL 7.18
℄
SEE DETAIL C
BS 101.38 REF.
A
BL 8.73
BS 59.50 REF.
BS 80.44 REF.
BS 33.70
BS 17.37
BEFORE INSTALLATION
TRIM STIFFENER (P/N 100-001-3) BOTH ENDS FLANGE RAD 0.09 IN. (2.28 mm)
BULKHEAD
CLIP
ATTACH CLIP TO BHD WITH TWO MS20426AD4 RIVETS INTERPITCH BETWEEN EXISTING HOLES
STIFFENER ATTACH HOLES
SCARF BACK 0.125 IN. (3.18 mm)
FWD
07537_001
DETAIL A

Figure 2

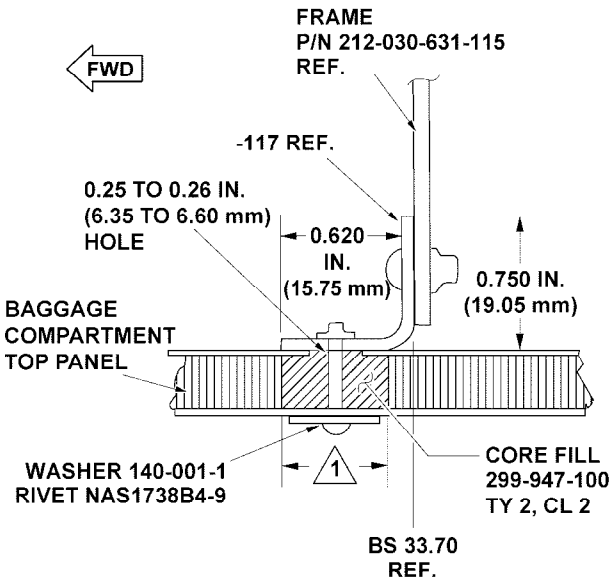



VIEW **A-A**
VIEW LOOKING FWD NORMAL TO FRAME

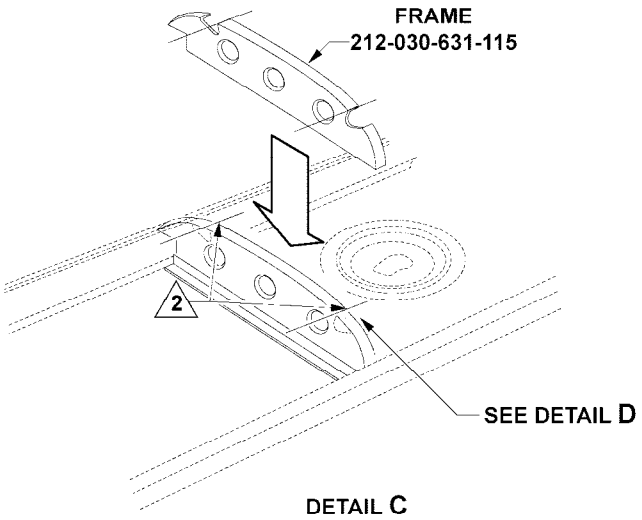



VIEW **E**

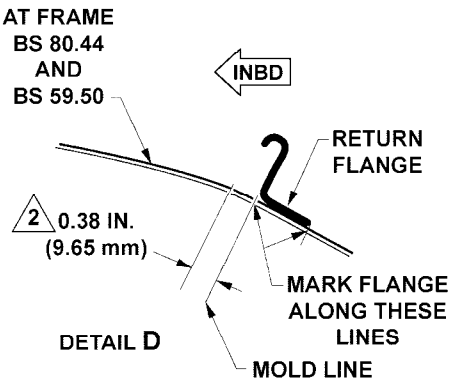
Figure 3




SECTION **B-B**




DETAIL **C**




DETAIL **D**

**NOTES**

1. Undercut core between skins to a diameter of 0.5 inch (12.7 mm).
2. Mark flange of frames along J-Stiffener (typical both sides).

07537-002

Figure 4

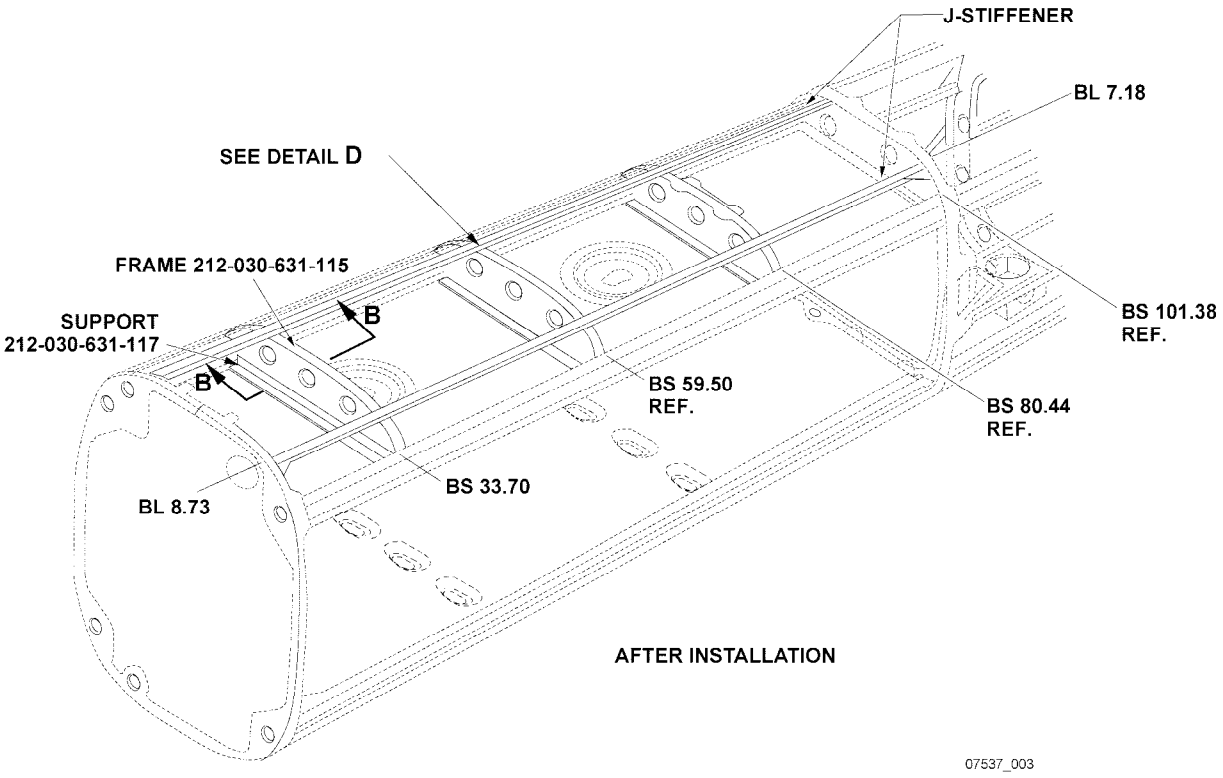

J-STIFFENER
BL 7.18
SEE DETAIL D
FRAME 212-030-631-115
B
SUPPORT
212-030-631-117
B
BS 101.38
REF.
BS 59.50
REF.
BS 80.44
REF.
BS 33.70
BL 8.73
AFTER INSTALLATION
07537_003

Figure 5

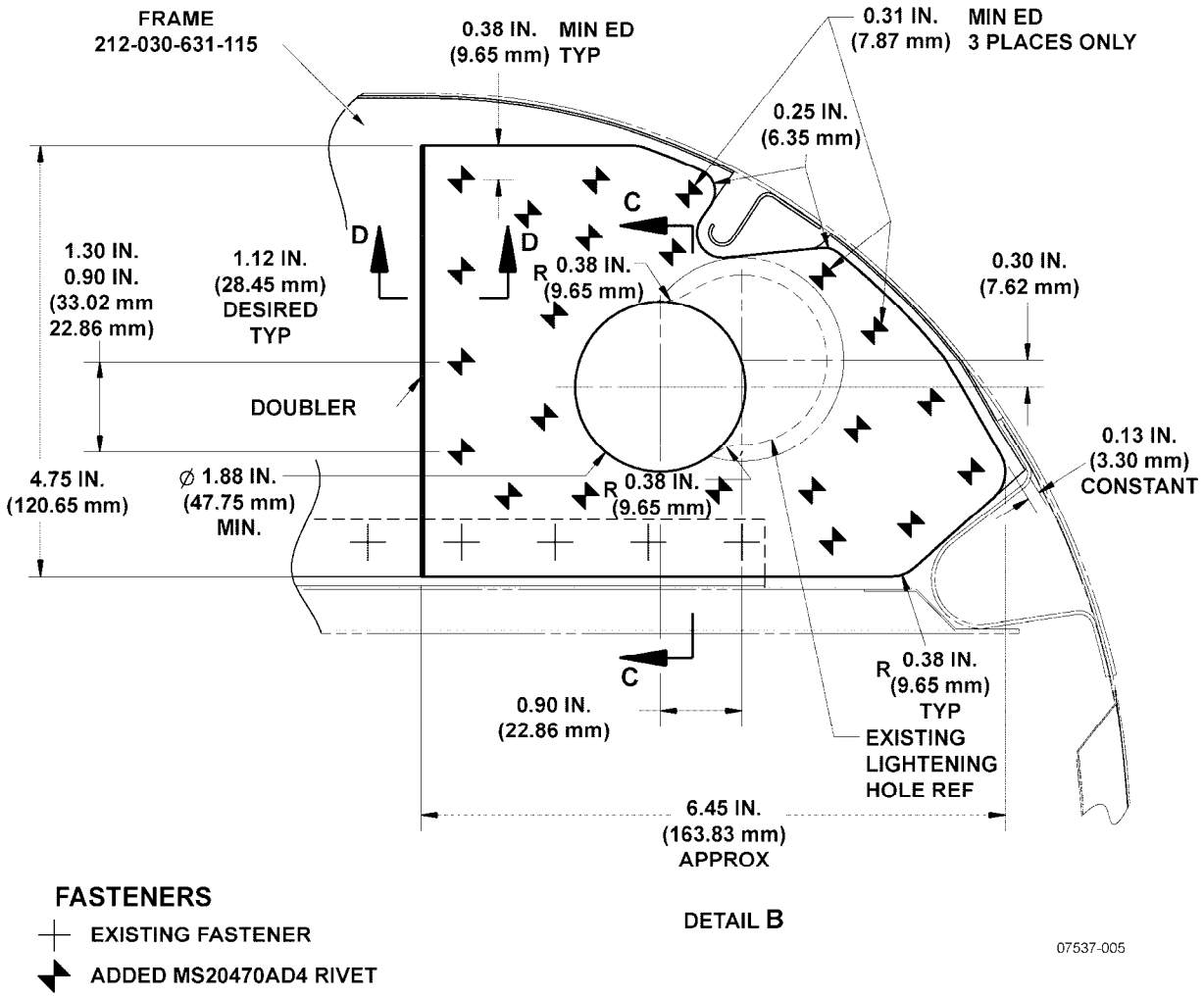

FRAME
212-030-631-115
0.38 IN. MIN ED
(9.65 mm) TYP
0.31 IN. MIN ED
(7.87 mm) 3 PLACES ONLY
0.25 IN.
(6.35 mm)
1.30 IN.
0.90 IN.
(33.02 mm
22.86 mm)
1.12 IN.
(28.45 mm)
DESIRED
TYP
D
D
C
R 0.38 IN.
(9.65 mm)
0.30 IN.
(7.62 mm)
DOUBLER
0.13 IN.
(3.30 mm)
CONSTANT
4.75 IN.
(120.65 mm)
Ø 1.88 IN.
(47.75 mm)
MIN.
R 0.38 IN.
(9.65 mm)
C
R 0.38 IN.
(9.65 mm)
TYP
0.90 IN.
(22.86 mm)
EXISTING
LIGHTENING
HOLE REF
6.45 IN.
(163.83 mm)
APPROX
FASTENERS
EXISTING FASTENER
ADDED MS20470AD4 RIVET
DETAIL B
07537-005

Figure 6

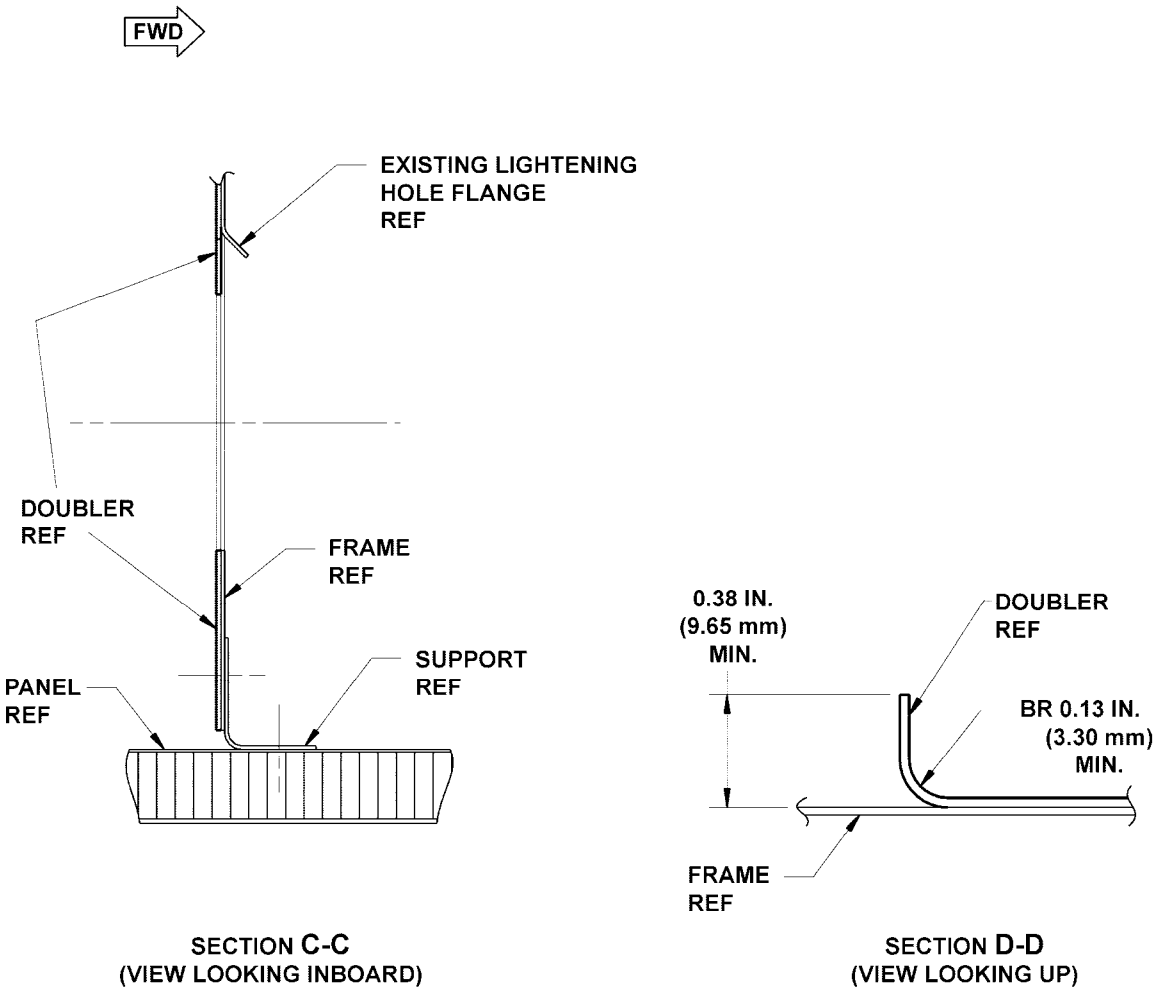
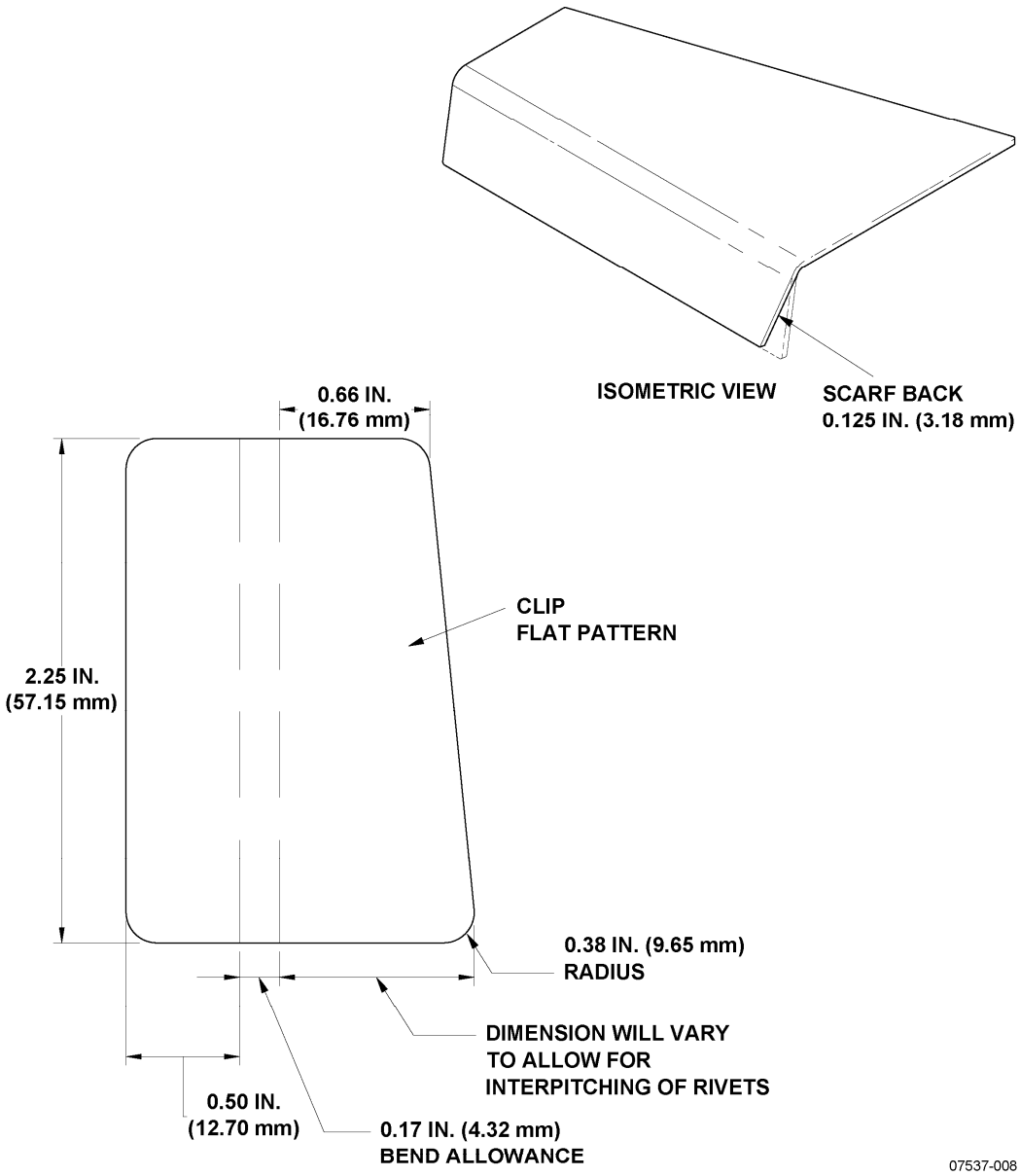
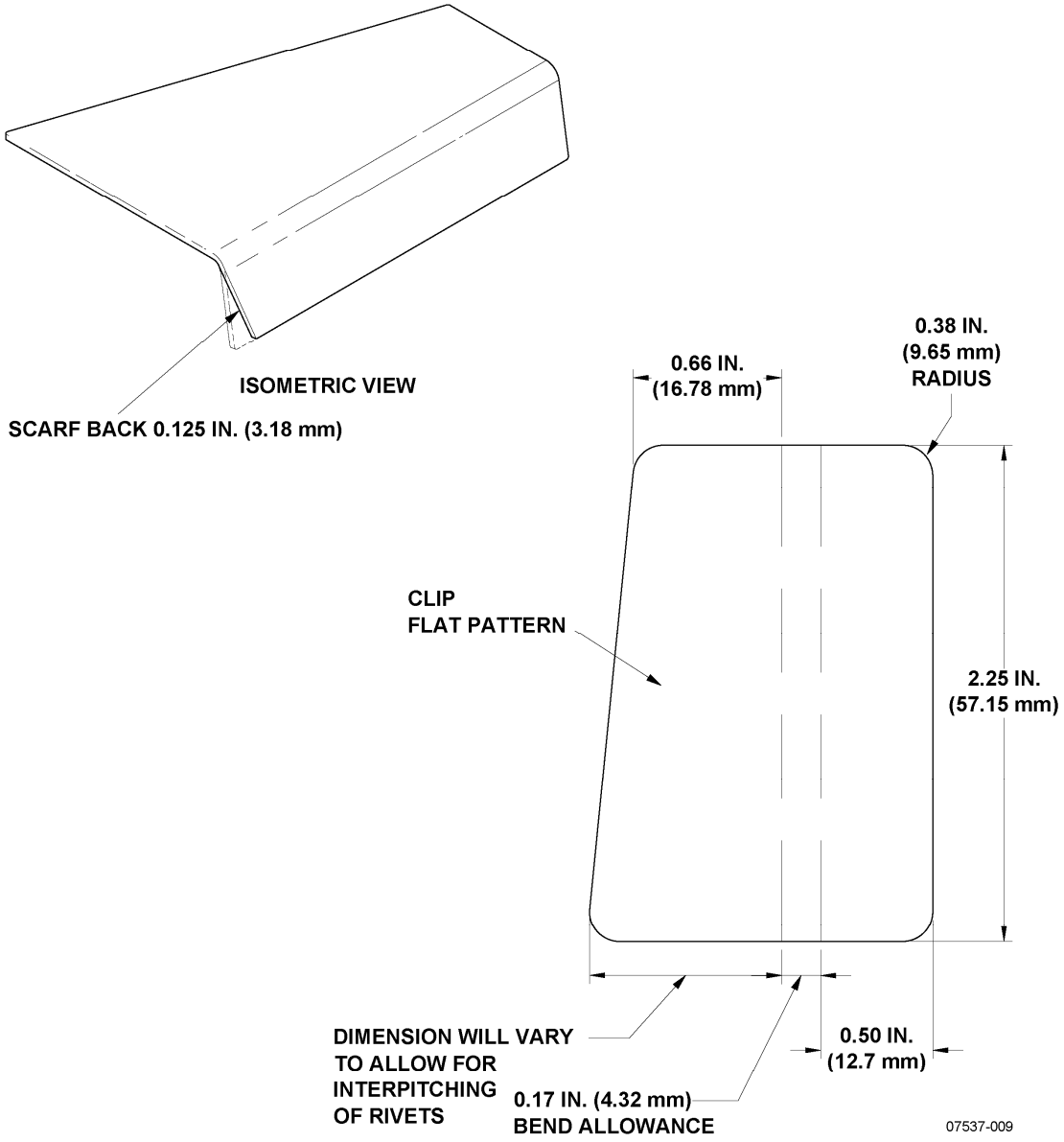

FWD
EXISTING LIGHTENING HOLE FLANGE REF
DOUBLER REF
FRAME REF
SUPPORT REF
PANEL REF
SECTION C-C
(VIEW LOOKING INBOARD)
0.38 IN.
(9.65 mm)
MIN.
DOUBLER REF
BR 0.13 IN.
(3.30 mm)
MIN.
FRAME REF
SECTION D-D
(VIEW LOOKING UP)
07537-007

Figure 7




MAKE FROM 0.040 INCH (1.02 mm)
2024-T3 ALUMINUM ALLOY
TOLERANCE ±0.030 INCH (±0.76 mm) TYPICAL

Figure 8




**MAKE FROM 0.040 INCH (1.02 mm)**
**2024-T3 ALUMINUM ALLOY**
**TOLERANCE ±0.030 INCH (±0.76 mm) TYPICAL**

Figure 9