

Nomad

ALERT SERVICE BULLETIN

STRUCTURE ASSEMBLY — FUSELAGE — REAR — INSPECTION, REPAIR AND INCORPORATION OF MOD N806 (REAR FAIRING STRENGTHENING)

1. **PLANNING INFORMATION**

A. **Effectivity**

(1) Aircraft affected:

- (a) **N22 Series** line sequence numbers 1 to 9, 11 to 29, 31, 33, 35, 37, 39 to 41, 43, 45, 47 to 59, 61, 63, 65 to 70, 82 to 88, 90 to 95, 97, 100, 102 to 114, 116, 118, 125, 126, 131 to 134, 136 to 138, 141, 143 to 170.
- (b) **N24 Series** line sequence numbers 10, 30, 32, 34, 36, 38, 42, 44, 46, 60, 62, 64, 71 to 81, 89, 96, 98, 99, 101, 115, 117, 119 to 124, 127 to 130, 135, 139, 140, 142.

B. **Reason**

Original

A number of operators have reported cracks adjacent to the bulkhead rivet heads at STA 463.41 (N22 Series) and STA 508.41 (N24 Series). Frame failure may lead to a loss of structural integrity and a possible loss of aircraft control.

Revision 1

ASTA now considers that the original method of inspection is inadequate as some cracks may only be visible when the bulkhead is inspected from the aft face. Consequently the inspection procedure has been amended. This revision also issues a repair scheme and a long term life improvement modification.

Revision 2

Mod N806 incorporation dates added to Compliance, Part 3.

Detailed instructions for the installation of Part 4- optional rear access panel PN 1/N-12-230 added.

Revision 3

Minor changes to Para 2.C. to clarify modification incorporation procedures.

C. **Description**

(1) Part 1

The fuselage rear bulkhead STA 463.41 (N22 Series) and STA 508.41 (N24 Series) is inspected for cracks adjacent to the rivets attaching the bulkhead to the rear fairing attachment angle.

(2) Part 2

Repair of fuselage rear bulkhead if required.

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- (3) Part 3
Incorporation of modification N806.
- (4) Part 4
Optional installation of rear access panel.

D. **Compliance**

- (1) Incorporation of this Service Bulletin is MANDATORY.
- (2) Part 1 – Inspection (Pre Mod N806 aircraft only)
 - (a) For aircraft in standard condition which HAVE NOT been repaired in accordance with ASTA drawing N-03-1019 (Ref Figure 1 and Figure 2), ASTA drawing N-03-1057 (N24A-LS38 only) or Service Bulletin ANMD-53-15 Part 2;
 - i. Basic inspection
 - a. Inspect before the next flight, if not already inspected in accordance with original issue of this Service Bulletin.
 - b. Inspect every two calendar months or every 100 flying hours, whichever is sooner, if parked outside for less than 50% of aircraft ground time.
 - c. Inspect every calendar month or every 100 flying hours, whichever is sooner, if parked outside for 50% (or more) of aircraft ground time.
 - ii. Detailed inspection
To be performed at the next scheduled 100 hour inspection and repeated each 300 flying hours service or every six calendar months (whichever is sooner) thereafter.
 - (b) For aircraft which HAVE been repaired in accordance with the above schemes and a period of five years has passed since the incorporation of the repair;
 - i. Basic inspection
Inspect at the next scheduled 100 flying hours inspection and every 100 flying hours thereafter.
 - ii. Detailed inspection
To be performed at the next scheduled 100 hour inspection and repeated each 300 flying hours service or every six calendar months (whichever is sooner) thereafter.
- (3) Part 2- Repair
If cracks are found during inspection at Part 1 the repair is to be carried out before next flight.
- (4) Part 3 – Mod N806 Incorporation
 - (a) MANDATORY within 12 months of receipt of Rev 1 of this Service Bulletin (issued April 96) for aircraft with unrepaired rear bulkhead (ie. Mod N806 incorporated by April 97).
 - (b) MANDATORY within 3000 flying hours of incorporating one of the repairs listed below or within 18 months of receipt of Rev 1 of this Service Bulletin (issued April 96), whichever is sooner (ie. Mod N806 incorporated by October 97).
 - i. In accordance with ASTA drawing N-03-1019
 - ii. In accordance with ASTA drawing N-03-1057 (N24A-LS38 only)
 - iii. In accordance with Part 2 of this Service Bulletin.

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- (5) Part 4 - Optional Installation of Rear Access Panel PN 1/N-12-230

The installation of the rear access panel is RECOMMENDED to facilitate the incorporation of Part 3 of this Service Bulletin.

E. Approval

The requirement detailed herein has been approved by a person authorised under Civil Aviation Regulation 35 and conforms to the type certification requirements.

F. Manpower

Part 1 - Inspection

Basic inspection one man 0.5 hr

Detailed inspection two men 5 hrs

Part 2 - Repair

Two men 20 hrs

Part 3 - Mod N806

Two men 24 hrs

G. Materials - Price and Availability

For price and availability of repair parts kit ANMD-53-15-1 and modification parts kit ANMD-53-15-2 contact Boeing Aircraft Systems - ASTA, Nomad Support customer spares. Kit PN 1/N-12-230 may be obtained from Boeing Aircraft Systems- ASTA, FOC.

H. Tooling - Price and Availability

None.

I. Weight and Balance Additions

- (1) Part 2 -Full repair (including repair below datum 'Y' - Refer Figure 1 and Figure 2)

	N22 Series		N24 Series	
	SI	Imperial	SI	Imperial
Weight	0.58 kg	1.279 lb	0.58 kg	1.279 lb
Arm	11771 mm	463.425 in	12914 mm	508.425 in
Index Units	6.83 $\frac{\text{kg mm}}{1000}$	0.593 $\frac{\text{lb in}}{1000}$	7.50 $\frac{\text{kg mm}}{1000}$	0.650 $\frac{\text{lb in}}{1000}$

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(2) Part 2 - Partial repair (excluding repair below datum 'Y' - Refer Figure 1 and Figure 2)

	N22 Series		N24 Series	
	SI	Imperial	SI	Imperial
Weight	0.50 kg	1.102 lb	0.50 kg	1.102lb
Arm	11771 mm	463.425 in	12914 mm	508.425 in
Index Units	5.89 $\frac{\text{kg mm}}{1000}$	0.511 $\frac{\text{lb in}}{1000}$	6.46 $\frac{\text{kg mm}}{1000}$	0.560 $\frac{\text{lb in}}{1000}$

(3) Part 3 - Mod N806 only

	N22 Series		N24 Series	
	SI	Imperial	SI	Imperial
Weight	1.23 kg	2.712 lb	1.23 kg	2.712 lb
Arm	12016 mm	473.00 in	13309 mm	523.976 in
Index Units	14.78 $\frac{\text{kg mm}}{1000}$	1.283 $\frac{\text{lb in}}{1000}$	16.37 $\frac{\text{kg mm}}{1000}$	1.421 $\frac{\text{lb in}}{1000}$

(4) Part 2 - Full repair and Part 3 - Mod N806

	N22 Series		N24 Series	
	SI	Imperial	SI	Imperial
Weight	1.81 kg	3.990 lb	1.81 kg	3.990 lb
Arm	11936 mm	469.921 in	13183 mm	519.015 in
Index Units	21.60 $\frac{\text{kg mm}}{1000}$	1.875 $\frac{\text{lb in}}{1000}$	23.86 $\frac{\text{kg mm}}{1000}$	2.071 $\frac{\text{lb in}}{1000}$

(5) Part 2 - Partial repair and Part 3 - Mod N 806

	N22 Series		N24 Series	
	SI	Imperial	SI	Imperial
Weight	1.73 kg	3.814 lb	1.73 kg	3.814 lb
Arm	11943 mm	470.196 in	13195 mm	519.488 in
Index Units	20.66 $\frac{\text{kg mm}}{1000}$	1.793 $\frac{\text{lb in}}{1000}$	22.83 $\frac{\text{kg mm}}{1000}$	1.981 $\frac{\text{lb in}}{1000}$

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J. **References**

Maintenance Manual Chapter 53-00-00, 55-20-00, 55-30-00, 55-40-00.

Structural Repair Manual Chapter 53-10-31, 51-30-00.

K. **Publications Affected**

Maintenance Manual Chapter 55-40-00.

Illustrated parts catalogue Chapter 53-18-00.

2. **ACCOMPLISHMENT INSTRUCTIONS**

A. **Part 1 - Inspection**

(1) **Basic inspection**

Inspect the forward face of the bulkhead at STA 463.41 (N22 series) and STA 508.41 (N24 series) for cracks adjacent to the rivets attaching the bulkhead web to the rear fairing attachment angles (Annex A paragraph 2.). Access to this area is by accessing the inside of the aircraft rear fuselage to the required station. Ensure the aircraft is properly supported to prevent fuselage rotation.

(2) **Detailed inspection**

- (a) Disconnect aircraft battery and electrically disconnect the rear positioning light on the tail cone.
- (b) Measure the vertical gap between the bottom of the rudder and the top of the top diaphragm of the rear fairing along dimension F at each end and midway (Ref Figure 3). Record the position where the measurement is made by placing a mark on the rudder and the top diaphragm. Also record the dimensions for later reference.
- (c) Attach the rear fairing top diaphragm to the bottom of the rudder with some adhesive tape evenly space at each end and mid point. Placard the cockpit controls "DO NOT OPERATE RUDDER AND TRIM CONTROLS".

NOTE

- The intent of the adhesive tape is to support the rear fairing top diaphragm when the rear fairing is removed from the aircraft.
- All deriveting is to be carried out as follows:
 - i Drill heads of rivets only.
 - ii Take care to use correct size drill.
 - iii Where possible, separate parts and remove rivet tails using a punch on a work bench.
 - iv For in situ removal, support the rear side of the panel adjacent to rivet tail with a suitable bucking bar and punch out the rivet tails.

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- (d) Whilst supporting the rear fairing de-rivet it from the top diaphragm and from the angles attaching it to the rear frame.
- (e) Remove the rear fairing leaving the top diaphragm attached to the rear frame and supported by the rudder via adhesive tape.

NOTE

Ideally it would be desirable to remove the rear fairing and top diaphragm as a single assembly. However, access to the attachment point of the top diaphragm to the rear frame is restricted and only possible from the inside of the rear fairing via the lightening holes on the top diaphragm. Operators may use this method to gain access to the rear frame, but extra care is required so as not to introduce structural damage. Support of the top diaphragm (step (c)) will not be required.

- (f) For **unrepaired** aircraft:
 - i. Derivet and remove rear fairing attachment angles on rear bulkhead. Remove **only one** angle at a time.
 - ii. Inspect the aft face of the bulkhead and rear fairing attachment angles for evidence of cracking adjacent to the rivet heads. (Ref Annex A Paragraph 2.).
 - iii. If cracks are found derivet top diaphragm and proceed to Part 2 - Repair.
 - iv. Record the details of the damage on the forms provided in Annex A and send to Boeing Aircraft Systems - ASTA, Nomad Support.
 - v. If no cracks are found proceed to Part 3 - Incorporation of Mod N806 or proceed to step 2.A.(h) if Mod N806 is to be incorporated at a later date.
- (g) For **repaired** aircraft:
 - i. Inspect the aft face of the bulkhead, rear fairing attachment angles and rear doublers for signs of damage, particularly for cracking adjacent to the rivet heads. (Ref Figure 1).
 - ii. If cracks are found or other signs of damage are evident contact Boeing Aircraft Systems - ASTA, Nomad Support with full details of the damage. Repair instructions will be provided.
 - iii. If no cracks are found proceed to Part 3 - Incorporation of Mod N806 or proceed to step 2.A.(h) if Mod N806 is to be incorporated at a later date.
- (h) Refit attachment angles if removed. Use MS20470AD4 rivets.
- (i) Wet assemble rear fairing ensuring it is returned to its original position as recorded in step (b). Install diaphragm 1A/N-12-107 as shown in Figure 3.
- (j) Reconnect tail positioning light.
- (k) Reconnect aircraft battery.
- (l) Remove adhesive tape used in step 2.A.(c).

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B. Part 2 - Repair

(1) Preparation

- (a) Place the rear fuselage aft support stand at STA 420.00 (N22 series) or STA 465.00 (N24 series).
- (b) Remove the dorsal fin (Ref MM 55-30-00).
- (c) Remove the horizontal stabiliser (Ref MM Chap 55-20-00).
- (d) Remove the rudder assembly (Ref MM Chap 55-40-00).
- (e) Remove the vertical stabiliser (Ref MM Chap 55-30-00).

NOTE

All deriveting is to be carried out as follows:

- Drill heads of rivets only.
- Take care to use correct size drill.
- Where possible, separate parts and remove rivet tails using a punch on a work bench.
- For in situ removal, support the rear side of the panel adjacent to rivet tail with a suitable bucking bar and punch out the rivet tails.

(2) Remove the following items:

- (a) Rear fairing top diaphragm and attachment angle PN 1N/N-12-195, (Ref Figure 1 and Figure 2).
- (b) Rear fairing attachment angles PN 1G/N-12-195 LH and PN 1H/N-12-195 RH (Ref Figure 1 and Figure 2).
- (c) Rudder lower pivot bracket assembly. Leave the top platform angle attached to the aircraft (Ref IPC Chap 53-18-05 Figure 1 Item 17A).
- (d) Anchor nuts (8 off) on rudder cable fairleads. Retain anchor nuts for refitting.
- (e) Angle PN 1M/N-12-195 (Ref Figure 1).
- (f) Rudder lower pivot bracket assembly attachment angle PN 1L/N-12-195 (Ref Figure 1) and discard.
- (g) Rudder rigging bracket PN 1R/N-12-195 (Ref Figure 1) and discard.
- (h) Rivets securing rear bulkhead to aircraft skin as shown in Figure 1 'View on arrow D'.

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- (3) Cut rear bulkhead and remove damaged and cracked material between Datum 'X' and Datum 'Y' (Ref Figure 1).

NOTE

- Size the cut-out as required to suit the packing angle PN 1A/N-03-1019 LH and 1B/N-03-1019 RH.
 - Maximum allowable gap between the packing angle and the bulkhead is 0.04 in (Ref Figure 1).
- (4) If cracks and damage in the rear bulkhead are below Datum 'Y';
- (a) Remove the rear tie-down point and the two vertical tie-down strengthening angles PN 1P/N-12-195 RH and 1Q/N-12-195 LH (Ref Figure 1).
 - (b) Cut out the bottom section of the rear bulkhead as shown in Figure 2.
- (5) Deburr the cut-out, remove any sharp edges and apply Alodine (Ref SRM Chap 51-30-00).
- (6) To repair rear bulkhead between Datum 'X' and Datum 'Y', proceed as follows.
- (a) Position the packing angle PN 1A/N-03-1019 on LH side of the bulkhead as shown in Fig 1.
 - (b) Position the packing angle PN 1B/N-03-1019 on RH side of the bulkhead as shown in Fig 1.
 - (c) Position the lower nesting angle PN 1P/N-03-1019 on LH and PN 1Q/N-03-1019 on RH side of the bulkhead as shown in Figure 2 Section B-B.
 - (d) Position the upper nesting angle PN 1M/N-03-1019 on LH and the upper nesting angle PN 1N/N-03-1019 on RH side of the bulkhead as shown in Figure 2 Section A-A.

NOTE

Minimum edge distance of 0.32 in for 5/32 dia holes and .25 in for 1/8 dia holes is to be maintained on all the parts.

- (e) Using the rear fuselage skin as a template drill the angles and fit skin pins progressively.
- (f) Position the rear doubler plate PN 1C/N-03-1019 on LH side of the aft face of the rear bulkhead, back drill several holes and skin pin in place.
- (g) Position the rear doubler plate PN 1D/N-03-1019 on RH side of the aft face of the rear bulkhead, back drill several holes and skin pin in place.
- (h) Using the rear fairing as a guide, position the new angles PN 1G/N-12-195 on LH side and PN 1H/N-12-195 on RH side of the rear bulkhead (Ref Figure 1).
- (i) Remove the rear fairing and back drill the rear doubler plates and angles aligned in the above step. Deburr and skin pin progressively.

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- (j) Position the packer PN 1S/N-03-1019 along with the angle PN 1M/N-12-195 on the forward face of the bulkhead and pin the angle using two outer holes.

NOTE

- If the angle is damaged use the new angle supplied in the kit.
- Trim the packer PN 1S/N-03-1019 as required.

- (k) Drill the angle and the packer.
- (l) Position the angle PN 1N/N-12-195 along with the packer PN 1R/N-03-1019 (Ref Figure 1) and back drill rivet holes.
- (m) Position the new angle PN 1L/N-12-195 and the packer PN 1H/N-03-1019 and back drill rivet holes.
- (n) Position new rudder rigging bracket PN 1R/N-12-195 (Ref Figure 2 View C), drill rivet holes and temporarily skin pin in place.
- (o) Locate the rudder rigging pin hole on the angle PN 1R/N-12-195 (Ref Figure 2 View C), drill and final ream to the size indicated in View C.
- (p) Remove the angles located in step (j) to step (o) and deburr all the holes.
- (q) Remove the rear doubler plate PN 1C/N-03-1019 LH and 1D/N-03-1019 RH from the assembly.
- (r) Mark position of slots for rudder cables on the upper nesting angles. Remove the nesting angles and cut-out the slots.

NOTE

- Maintaining minimum of 0.3 in edge distance when marking rivet holes on the doubler plates.
 - If the bottom section of rear bulkhead has been removed (step B.(4)) refer to Figure 2 when marking rivet holes.
- (s) Mark remaining rivet holes on the rear doublers according to the pattern shown in Figure 1 and pilot drill using 1/16 in dia drill.
- (t) Pin the doubler plates and upper nesting angles in position and open up 1/16 in pilot holes to 1/8 in.
- (u) Proceed to Step (7) if bottom section of the rear bulkhead is to be repaired.
- (v) Mark position of slots for rudder cables on the rear doublers PN 1C/N-03-1019 and 1D/N-03-1019. Remove the doublers and cut-out the slots.
- (w) Using the rear fairing as a template, drill the fastener holes on the rear flange of the angles PN 1G/N-12-195 LH, 1H/N-12-195 RH and 1N/N-12-195 (Ref Figure 1).
- (x) Remove all items which were temporarily skin pinned in place and deburr all holes.

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- (y) Drill and dimple anchor nut rivet holes on the upper nesting angle.
- (7) If the bottom section of the rear bulkhead (below Datum 'Y') is repaired;
 - (a) Position the diaphragm PN 1J/N-03-1019 as shown in Figure 2, drill rivet holes and skin pin progressively.
 - (b) Mark and pilot drill new rivet positions on the strap PN 1K/N-03-1019 using 1/16 in drill (Ref Figure 2).
 - (c) Position the strap PN 1K/N-03-1019 along with packer PN 1L/N-03-1019 as shown in Figure 2 and pilot drill several holes through packer and the diaphragm to clamp parts in place.
 - (d) Skin pin parts in position drill pilot holes through replacement and existing diaphragms, and the packer.
 - (e) Open up pilot holes for 1/8 in rivets.
 - (f) Skin pin two vertical tie down strengthening angles removed and drill rivet holes through the packer and the strap.
 - (g) Clamp the rear tie down point and drill the remaining centre hole into the replacement diaphragm.
 - (h) Remove parts which were temporarily skin pinned in place and deburr holes.
 - (i) Carry out Step (6)(v) to Step (6)(y).
- (8) Thoroughly clean working areas inside the rear fuselage of all metal filings and rivet tails.
- (9) For Repairs with Bulkhead Damage below Datum 'Y' reassemble as follows;
 - (a) Position replacement bulkhead/diaphragm PN 1J/N-03-1019 (Figure 2) and skin pin in place.
 - (b) Position rear doublers PN 1C/N-03-1019 and PN 1D/N-03-1019 (Ref Figure 1 and Figure 2) and skin pin in place.
 - (c) Position packer PN 1L/N-03-1019 and strap PN 1K/N-03-1019 (Ref Figure 2) and skin pin in place.
 - (d) Skin pin the two vertical tie down strengthening angles (Ref Figure 1) in position.
- (10) For Repairs without Bulkhead Damage below Datum 'Y' reassemble as follows;

NOTE

- Wet assemble all rivets using an approved sealant (Ref SRM Chap 51-30-00).
- Determine rivet grip length on assembly.
- (a) Rivet anchor nuts (8 off) to the upper nesting angles.

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- (b) Wet assemble packing angles PN 1A/N-03-1019 and PN 1B/N-03-1019 (Ref Figure 1) in place using skin pins.
- (c) Position rear doublers PN 1C/N-03-1019 and PN 1D/N-03-1019 (Ref Figure 1) and skin pin in place.
- (d) Position lower nesting angles PN 1P/N-03-1019 and PN 1Q/N-03-1019 and skin pin in place.
- (e) Position upper nesting angles PN 1M/N-03-1019 and PN 1N/N-03-1019 and skin pin in place.
- (f) Position rear fairing attachment angles PN 1G/N-12-195 and PN 1H/N-12-195 and skin pin in place.
- (g) Wet assemble the angle PN 1M/N-12-195, and packer PN 1S/N-03-1019 on the forward face of rear bulkhead and angle PN 1U/N-12-195, when Mod N806 is being incorporated simultaneously (Ref 2.C.(5) and NO TAG), using skin pins (Ref Figure 1 and Figure 7).
- (h) Wet assemble the angle PN 1L/N-12-195 and the packer PN 1H/N-03-1019 and skin pin in place.
- (i) Wet assemble the angle PN 1N/N-12-195 and the packer PN 1R/N-03-1019 and skin in place.
- (j) Position angle PN 1R/N-12-195 and skin pin in place.
- (k) Wet assemble and clamp rear tie-down point in place.
- (l) Rivet all items in place using fasteners detailed in Figure 1 and Figure 2.
- (m) Wet assemble and attach rear fuselage skin.
- (n) Refit lower rudder pivot bracket assembly.
- (o) Refit clamps and electrical looming for rear position light to the rear fairing rib.
- (p) Refit top diaphragm to rear frame.
- (q) If incorporating Mod N806 concurrently with this repair then proceed to C. otherwise continue.
- (r) Remove all metal particles and thoroughly clean the working areas. Surface finish the assembled parts to match existing colour.
- (s) Reconnect the rear positioning light on the rear fairing and wet assemble the rear fairing to rear frame and top diaphragm as shown on Figure 3.
- (t) Touch up paint as required.
- (u) Refit the vertical stabiliser (Ref MM Chap 55-30-00).
- (v) Refit the rudder assembly (Ref MM Chap 55-40-00).

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- (w) Refit the horizontal stabiliser (Ref MM Chap 55-20-00).
- (x) Refit the dorsal fin (Ref MM 55-30-00).
- (y) Remove rear fuselage aft support stand.
- (z) Reconnect aircraft battery.

C. Part 3 - Mod N806 Incorporation

- (1) If incorporating Mod N806 immediately after the detailed inspection or the repair, proceed to step (4).
- (2) If incorporating Mod N806 as a separate task proceed to step (3).
- (3) Preparation
 - (a) Place the rear fuselage aft support stand at STA 420.00 (N22 series) or STA 465.00 (N24 series).
 - (b) Disconnect aircraft battery.
 - (c) Electrically disconnect the rear positioning light on the rear frame and unclamp the most aft clamp holding the cable. Discard stiffnut and retain clamp and screw for refitment.
 - (d) Carry out step 2.A.(2)(b) to 2.A.(2)(e).

NOTE

All deriveting is to be carried out as follows:

- Drill heads of rivets only.
 - Take care to use correct size drill.
 - Where possible, separate parts and remove rivet tails using a punch on a work bench.
 - For in situ removal, support the rear side of the panel adjacent to rivet tail with a suitable bucking bar and punch out the rivet tails.
- (4) Drill out all rivets attaching Angle PN 1M/N-12-195 to the forward side of rear bulkhead if not already removed for repair.

NOTE

For easier access to the forward side of the rear frame utilise the rear fuselage access panel RHS (part of Customer Option G101, if fitted).

If Customer Option G101 is not fitted, the rear fuselage access panel may be installed to improve access. The Rear Fuselage Access Panel RHS PN 1/N-12-230 may be obtained from Boeing Aircraft Systems – ASTA, Nomad Support. Ref to Para 2.D. for installation instructions.

- (5) Place Angles PN 1M/N-12-195 and PN 1U/N-12-195 back to back and backdrill Angle PN 1U/N-12-195.

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- (6) Wet assemble Angle PN 1M/N-12-195, Packer 1S/N-03-1019 (if repair has been carried out) and Angle PN 1U/N-12-195 to rear frame. Hold in position with skin pins and rivet up as in Figure 1.
- (7) Remove old Sealing Patch PN 1/N-12-247 from top diaphragm and scrap.
- (8) Mark a centre line on the top of Angle PN 1U/N-12-195.
- (9) Accurately position and clamp Angle - LH PN 1C/N-12-107 and Angle - RH PN 1D/N-12-107 along length of Web PN 1B/N-12-107 as in Figure 3 (with flanges downwards), then clamp all to Angle 1U/N-12-195, top surface of web mates with bottom surface of angle. Ensure there is a minimum 0.30 in edge distance. Drill holes through web and Angle PN 1U/N-12-195 only (not thorough 1C/N-12-107 and 1D/N-12-107 at corners), deburr and pin all together.
- (10) Reset the gap between rudder and top diaphragm, recorded in step 2.A.(2)(b), by bringing the web up to the under face of top diaphragm (Ref Figure 6). Clamp in position, drill holes through web into top diaphragm, deburr and pin.
- (11) Position 'zee' Angles PN 1J/N-12-107 and PN 1H/N-12-107 on Web PN 1B/N-12-107. Ensure the top and bottom faces of 'Zee' angles mate with the web and top diaphragm respectively (Ref Figure 3 and Figure 6), clamp and mark position.
- (12) Refit rear fairing to rear frame and top diaphragm and secure with skin pins.
- (13) Adjust position of clamped up Angle - LH PN 1C/N-12-107 and Angle - RH PN 1D/N-12-107 if necessary to make contact with the side of the fairing. Backdrill several holes along length of angles into Rear fairing. Pin rear fairing to angles.
- (14) Remove rear fairing complete with pinned and clamped up assembly of angles, web and 'zee' angles.
- (15) On a work bench backdrill the remaining holes through angles into rear fairing.
- (16) Remove clamped up assembly of angles, web and 'zee' angles and open up the holes in rear fairing to 17/64 in.
- (17) Bond Spacers PN NAS42DD410A into the holes in rear fairing using Araldite AW106/HV953U or alternately use a K106 kit (Ref Figure 4). Allow to cure.

NOTE

Ensure any void between spacer and core is filled with Araldite.

- (18) Drill all holes through web into Angle - LH PN 1C/N-12-107 and Angle - RH PN 1D/N-12-107 and through 'zee' angles into web, deburr holes.
- (19) Attach anchor nut PN MS21047-06 to bottom side of web using rivets PN MS20470AD3-4 as shown in Figure 5.
- (20) On the aircraft, reassemble and pin web, LH and RH angles, and 'zee' angles to Angle PN 1U/N-12-195 and top diaphragm.
- (21) Access the 'zee' angles through the aft lightening hole in the top diaphragm.
 - (a) Back-mark the rear edge of 'zee' angle PN 1H/N-12-107 onto the under surface of the diaphragm.
 - (b) Back-mark the forward face of 'zee' angle PN 1J/N-12-107 onto the under surface of the diaphragm.
- (22) Remove the top diaphragm from the aircraft.

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- (23) To obtain the centre line of the rivet holes to be drilled:
 - (a) Add 0.30 in forward of the back mark for 'zee' angle PN 1H/N-12-107.
 - (b) Add 0.40 in rearward of the back mark for 'zee' angle PN 1J/N-12-107.
- (24) Mark out in the top diaphragm, four rivet holes for the forward 'zee' angle and three rivet holes for the aft 'zee' angle, drill and deburr (Ref Figure 6).
- (25) Locate Reinforcing Plate PN 1K/N-12-107 on top diaphragm. Ensuring correct edge distance, drill eleven through holes plus six additional holes. (Ref Figure 6).
- (26) Refit top diaphragm and:
 - (a) Back drill four holes through top flange of 'zee' angle 1H/N-12-107
 - (b) Back drill three holes through top flange of 'zee' angle 1J/N-12-107Remove diaphragm deburr and clean area.
- (27) Attach reinforcing plate to top diaphragm with 6-off rivets PN NAS1097AD4-4 and 4-off rivets PN CR3222-4-02 (Ref Figure 6). Install rivets wet.
- (28) Wet assemble and rivet up web, LH and RH angles, and 'zee' angles to Angle PN 1U/N-12-195 and top diaphragm. (Ref Figs 3, 5, 6 and 7).
- (29) Reroute rear positioning light cable through the aft lightening hole in the web and clamp in position on web. Allow sufficient slack to prevent cable rubbing on edge of lightening hole.
- (30) Derivet and remove Gust Lock Spigot Assembly PN 1/N-12-280 fitted to LH side rear fuselage and retain for fitment (Ref Figure 7).
- (31) Derivet and remove triangular Reinforcing Plate PN 1A/NR11384 (if fitted), LHS and RHS and scrap.
- (32) Pin rear fairing to aircraft.
- (33) Place the reinforcing doubler PN 1E/N-12-107 over the LHS of rear fuselage and fairing as shown in Figure 3 and trace the outline onto the rear fuselage skin and rear fairing. Remove and check that all rivets 'A' in Figure 7, and all holes in the fairing within the traced outline have at least 0.30 inch edge distance to the traced outline. If not, reposition and retrace until this is satisfied. If it cannot be satisfied at both ends, ensure that rivets 'A' all have edge distance and trim the aft end of the reinforcing plate to miss the aft most hole. Trim internal doubler 1G/N-12-107 to match.
- (34) Repeat step (33) for RHS using the reinforcing doubler PN 1F/N-12-107.
- (35) Remove rear fairing.
- (36) Replace Reinforcing Doubler PN 1E/N-12-107 and Internal Doubler PN 1G/N-12-107, align to marks on rear fuselage, and clamp to Angle PN 1C/N-12-107. Backdrill through angle into doublers. Remove and deburr. Repeat for RHS.
- (37) Pin rear fairing to aircraft.
- (38) Pin reinforcing and internal doublers to rear fairing and angle with the internal doubler on the outside. Drill through doublers into rear fairing.
- (39) Remove rear fairing and open up holes to 17/64 in.
- (40) Bond Spacer PN NAS42DD410A into the holes in rear fairing using Araldite AW106/HV953U or alternately use a K106 kit (Ref Figure 4). Allow to cure.

NOTE

Ensure any void between spacer and core is filled with Araldite.

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- (41) Clamp Cover Strips PN 1L/N-12-107 (Ref Figure 3) to Angle PN 1C/N-12-107 ensuring there is sufficient edge distance at both ends. Backdrill through angle, remove and deburr.
- (42) Skin pin internal doublers and reinforcing doublers to rear fairing. Rivet up using Cherrymax rivets PN CR3223-4-04 (Ref Figure 3). Install rivets wet.
- (43) Drill out rivets identified by 'A' in Figure 7.
- (44) Pin rear fairing to aircraft.
- (45) Fit Packer PN 1/N-12-434 between reinforcing doubler and rear fuselage skin. Trim where necessary.
- (46) Backdrill all holes marked A (Ref Figure 7) into packer and reinforcing doublers LH and RH or alternatively make a template from perspex for hole pick up.
- (47) Drill all holes marked B in (Ref Figure 7) through reinforcing doubler into packer and rear fuselage skin.
- (48) Skin pin reinforcing doublers and packers to rear fuselage.
- (49) Check for any mismatch at abutment of fuselage and rear fairing, LH and RH side shaded area in Figure 7. Mismatch is not to exceed 0.020 in.
- (50) If necessary pack mismatch with Laminated Shim Stock PN M22499/1-045, approximately 0.70 in wide, between reinforcing doubler and rear fairing. Peel laminations as required to within mismatch requirements.
- (51) Backdrill through Angle-LH PN 1G/N-12-195 and Angle-RH PN 1H/N-12-195, packers (where fitted) and reinforcing doubler.
- (52) Remove rear fairing and deburr all holes in reinforcing doublers, packers and rear fuselage skin.
- (53) Replace rear fairing, packers and cover strips, and hold in position with skin pins.
- (54) Wet assemble and rivet-up according to Figure 7. Install rivets wet. Alternately, where access is limited, Cherrymax rivets PN CR3223-4 may be used.
- (55) On LH side refit Spigot Assembly PN 1/N-12-280 (Ref Figure 7).
- (56) Remove all metal particles and thoroughly vacuum any swarf from inside rear fairing and inside rear fuselage. Surface finish the assembled parts to match existing colour.
- (57) Reconnect the rear positioning light.
- (58) Locate Sealing Patch PN 2/N-12-247 on top diaphragm and dope with Clear Nitrocellulose.
- (59) If incorporating Mod N806 in conjunction with the rear frame repair, return to 2.B.(10)(u).
- (60) Surface finish reworked areas to original colour scheme.
- (61) Remove rear fuselage aft support stand.
- (62) Reconnect aircraft battery.

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D. Part 4- Optional Installation of Rear Access Panel PN 1/N-12-230 (Ref Figure 8)

- (1) On RH side of aircraft mark reference line at STA 450.44 for N22 series aircraft or STA 495.44 for N24 series aircraft on the outer skin.
- (2) Using cover PN 1B/N-12-230 as a template, align LH edge to reference line at STA 450.44 for N22 series aircraft, or STA 495.44 for N24 series aircraft, and rest the top edge against lower edge of the fin skin to fuselage overlap (Ref Figure 8), mark cutout.
- (3) Remove cover, make cutout and deburr edges.
- (4) Remove existing rivets (7 off) above cutout.
- (5) Position plate PN 1A/N-12-230 centrally in cutout and clamp in position.
- (6) Back drill 7 holes (from Para (4)). Pilot drill remaining 18 rivet holes as per drilling pattern in Figure 9, through outer skin and plate. Enlarge rivet holes using No.30 dia drill. Remove plate and deburr holes.
- (7) Reposition plate PN 1A/N-12-230 to aircraft and service pin.
- (8) Position cover to cutout. Check for 0.030in edge gap between cutout and cover. Adjust cutout as necessary to achieve this dimension.
- (9) Back drill 8 pilot holes through cover PN 1B/N-12-230 into plate PN 1A/N-12-230.
- (10) Enlarge holes in cover PN 1B/N-12-230 to 0.312in (5/16in) dia and deburr.

NOTE

All reworked surfaces to be cleaned and bare metal protected in accordance with Structural Repair Manual Chap 51-30-00.

- (11) Assemble Camloc Studs PN 2600-2 and washers PN 2600-LW to cover.
- (12) Enlarge 8 cover mounting holes in Plate PN 1A/N-12-230 to 0.50in dia.
- (13) Locate Camloc receptacles PN 212-12N centrally over 0.50in dia holes. Using receptacles as a template, drill 16 off (2 per receptacle) No. 40 dia holes, deburr and countersink.
- (14) Wet assemble receptacles to plate using rivets PN MS20426AD3-4.
- (15) Wet assemble Plate to fuselage using rivets PN MS20470AD4-5 (7off) along the top edge and rivets PN MS20470AD4-4 in the remaining 18 positions.
- (16) Clean all swarf and rivet tails from internal structure. Ensure free movement of control cables and pulleys.
- (17) Position cover and engage fasteners.
- (18) Check for fit, then remove cover and seal in accordance with Structural Repair Manual Chap 51-30-00.
- (19) Position cover and engage fasteners.
- (20) Paint to match external colour scheme in accordance with Structural Repair Manual Chap 51-30-00.

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3. MATERIALS INFORMATION

A. Part 1 - Inspection

Nil

B. Part 2 - Repair

Parts kit PN ANMD-53-15-1 is required to repair the rear frame and contains the following items.

New Part No	Qty	Description	Old Part No	Remarks
Contents of Service Bulletin Kit PN ANMD-53-15-1				
1A/N-03-1019/950	1	ANGLE		
1B/N-03-1019/950	1	ANGLE		
1C/N-03-1019/950	1	DOUBLER		
1D/N-03-1019/950	1	DOUBLER		
1H/N-03-1019/950	1	PACKER		
1J/N-03-1019/950	1	DIAPHRAGM		
1K/N-03-1019/950	1	STRAP		
1L/N-03-1019/950	1	PACKER		
1M/N-03-1019/950	1	ANGLE		
1N/N-03-1019/950	1	ANGLE		
1P/N-03-1019/950	1	ANGLE		
1Q/N-03-1019/950	1	ANGLE		
1R/N-03-1019/950	1	PACKER		
1S/N-03-1019/950	1	PACKER		
1G/N-12-195/950	1	ANGLE		
1H/N-12-195/950	1	ANGLE		
1L/N-12-195/950	1	ANGLE	1L/N-12-195	Scrap
1M/N-12-195/950	1	ANGLE	1M/N-12-195	Scrap
1N/N-12-195/950	1	ANGLE	1N/N-12-195	Scrap
1R/N-12-195/950	1	ANGLE	1R/N-12-195	Scrap
MS20470AD4-3	95	RIVET		
MS20470AD4-4	45	RIVET		
MS20470AD5-5	45	RIVET		
MS20470AD6-6	7	RIVET		

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C. Part 3 - Mod N806 Incorporation

Modification parts kit PN ANMD-53-15-2 is required to carry out Mod N806 and contains the following items.

New Part No	Qty	Description	Old Part No	Remarks
Contents of Service Bulletin Kit PN ANMD-53-15-2				
1B/N-12-107	1	WEB		
1C/N-12-107	1	ANGLE, LH		
1D/N-12-107	1	ANGLE, RH		
1E/N-12-107	1	DOUBLER, Reinforcing, LH		
1F/N-12-107	1	DOUBLER, Reinforcing, RH		
1G/N-12-107	2	DOUBLER, Internal		
1H/N-12-107	1	ANGLE, Zee		
1J/N-12-107	1	ANGLE, Zee		
1K/N-12-107	1	PLATE, Reinforcing		
1L/N-12-107	2	STRIP, Cover		
2/N-12-247	1	PATCH, Sealing		
NAS42DD4-10A	104	SPACER		
MS20470AD4-4	150	RIVET		
MS20470AD4-5	62	RIVET		
CR3223-4-02	91	RIVET, Cherrymax, UH		
CR3223-4-04	84	RIVET, Cherrymax, UH		
CR3223-4-05	20	RIVET, Cherrymax, UH		
CR3222-4-02	11	RIVET, Cherrymax, CSK HD		
NAS1097AD4-4	6	RIVET		
CR3223-4-03	22	RIVET, Cherrymax, UH		
NAS1398MW5-3	4	RIVET, Blind		
1/N-00-115	2	SHIM, Aluminium alloy		
MS20470AD4-3	54	RIVET		
1U/N-12-195	1	ANGLE		
MS20426AD5-7	8	RIVET		
1/N-12-434	2	PACKER		
MS20470AD3-4	2	RIVET		
MS21047-06	1	ANCHOR NUT		
Parts Removed				
	2	PLATE, Reinforcing	1A/NR11384	Scrap

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D. Part 4 - Optional Installation of Rear Access Panel PN 1/N-12-230

If Customer Option G101 is not fitted, Access Panel kit PN 1/N-12-230 may be obtained from Boeing Aircraft Systems - ASTA, Nomad Support, FOC. This panel improves access to the forward face of the rear frame.

New Part No	Qty	Description	Old Part No	Remarks
Contents of Access Panel kit PN 1/N-12-230				
1A/N-12-230	1	Plate		
1B/N-12-230	1	Cover		
212-12N	8	Receptacle (Camloc)		
2600-2	8	Stud (Camloc)		
2600-LW	8	Washer (Camloc)		
MS20426AD3-4	16	Rivet		
MS20470AD4-4	18	Rivet		
MS20470AD4-5	7	Rivet		

E. Special Tools and Equipment

None.

4. RECORDING ACTION

A. Part 1

Record compliance with Service Bulletin ANMD-53-15 Rev 3 Part 1 Inspection in the Airframe Log Book.

B. Part 2

Record compliance with Service Bulletin ANMD-53-15 Rev 3 Part 2 Repair in the Airframe Log Book.

C. Part 3

Record compliance with Service Bulletin ANMD-53-15 Rev 3 Part 3 Mod N806 in the Airframe Log Book.

D. Part 4 (Optional)

Record compliance with Service Bulletin ANMD-53-15 Rev 3 Part 4 Mod N806 in the Airframe Log Book if installed.

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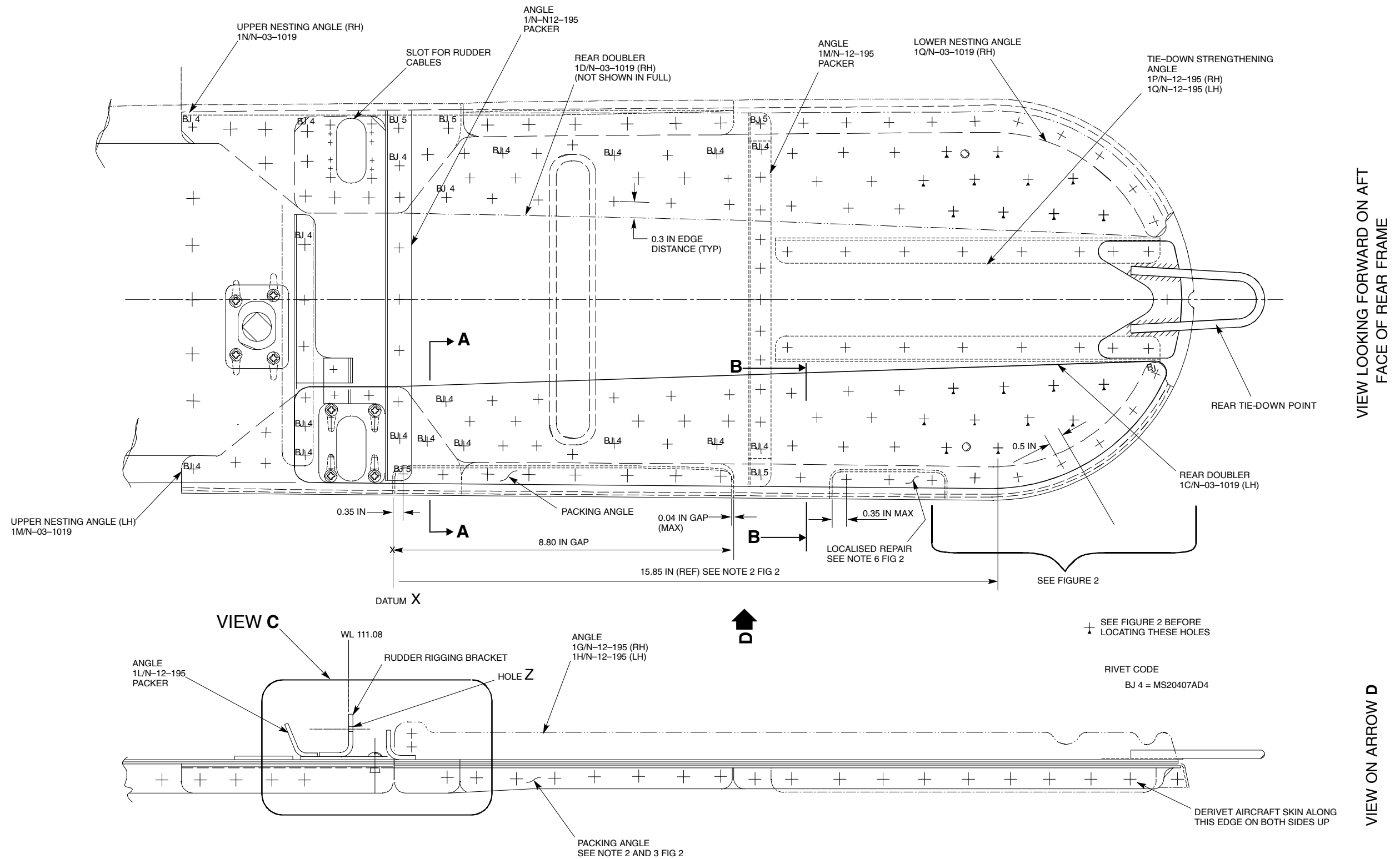


Figure 1 Rear Bulkhead Repair (ASTA Drawing N-03-1019)

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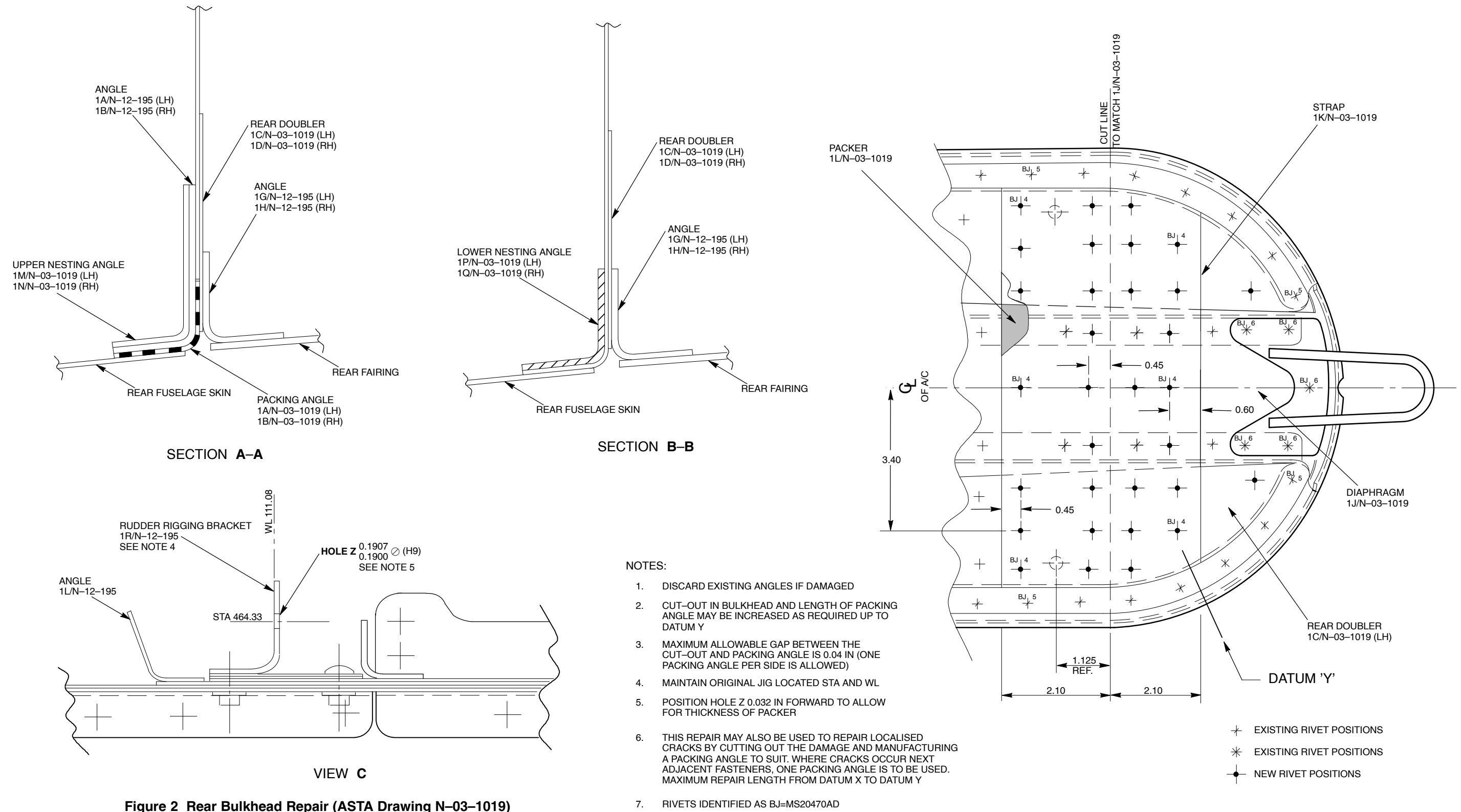


Figure 2 Rear Bulkhead Repair (ASTA Drawing N-03-1019)

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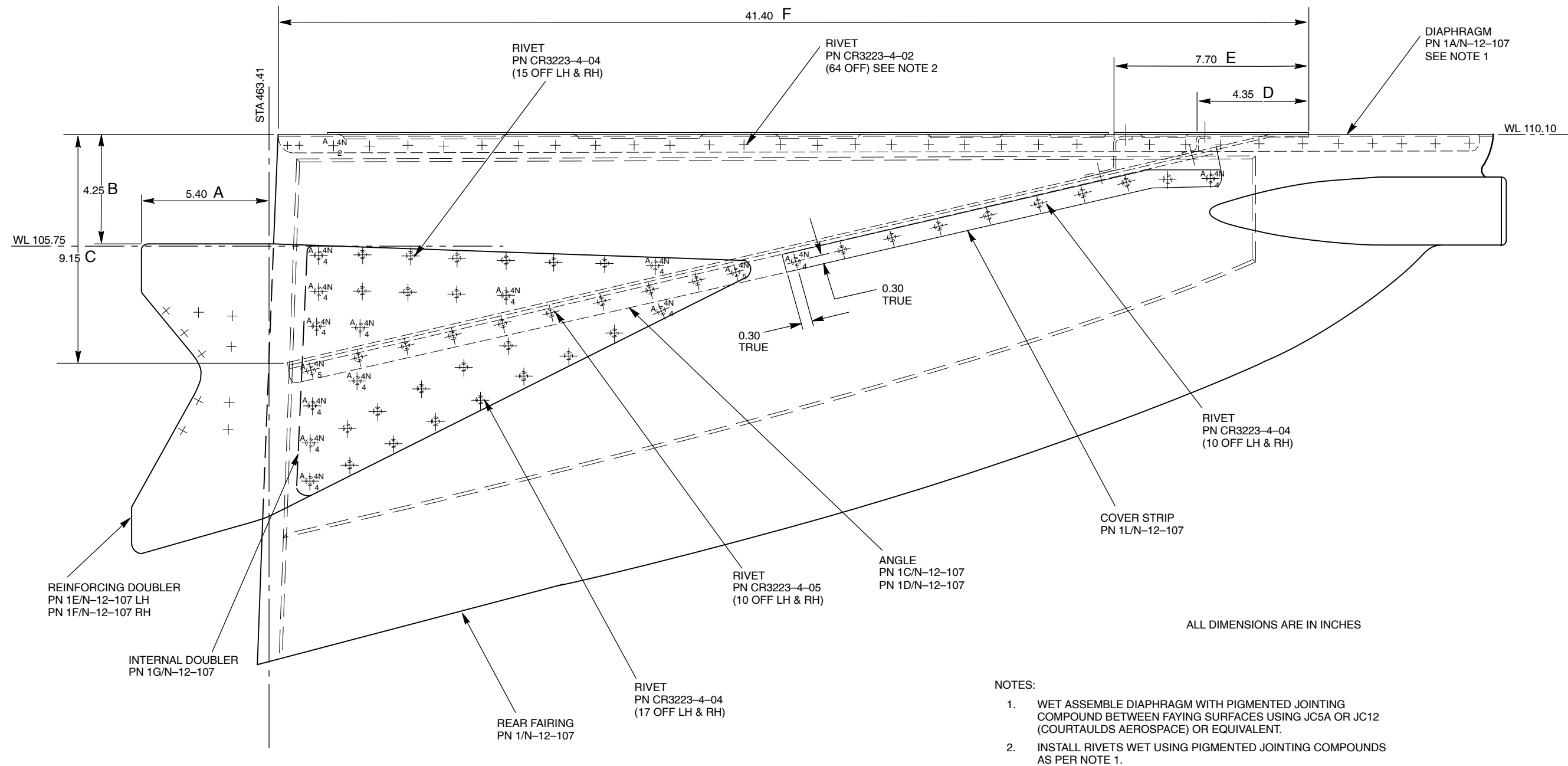


Figure 3 Angle, Doubler and Cover Strip Assembly Details

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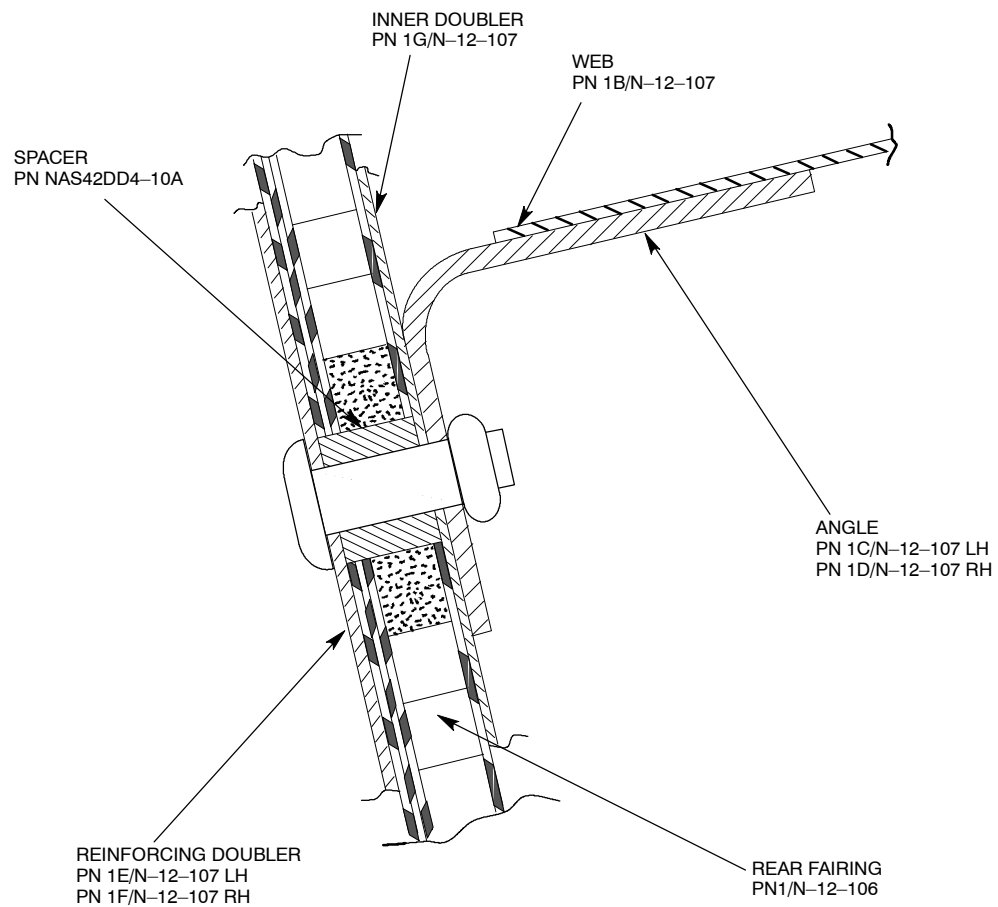


Figure 4 Fitment of Spacers in Rear Fairing

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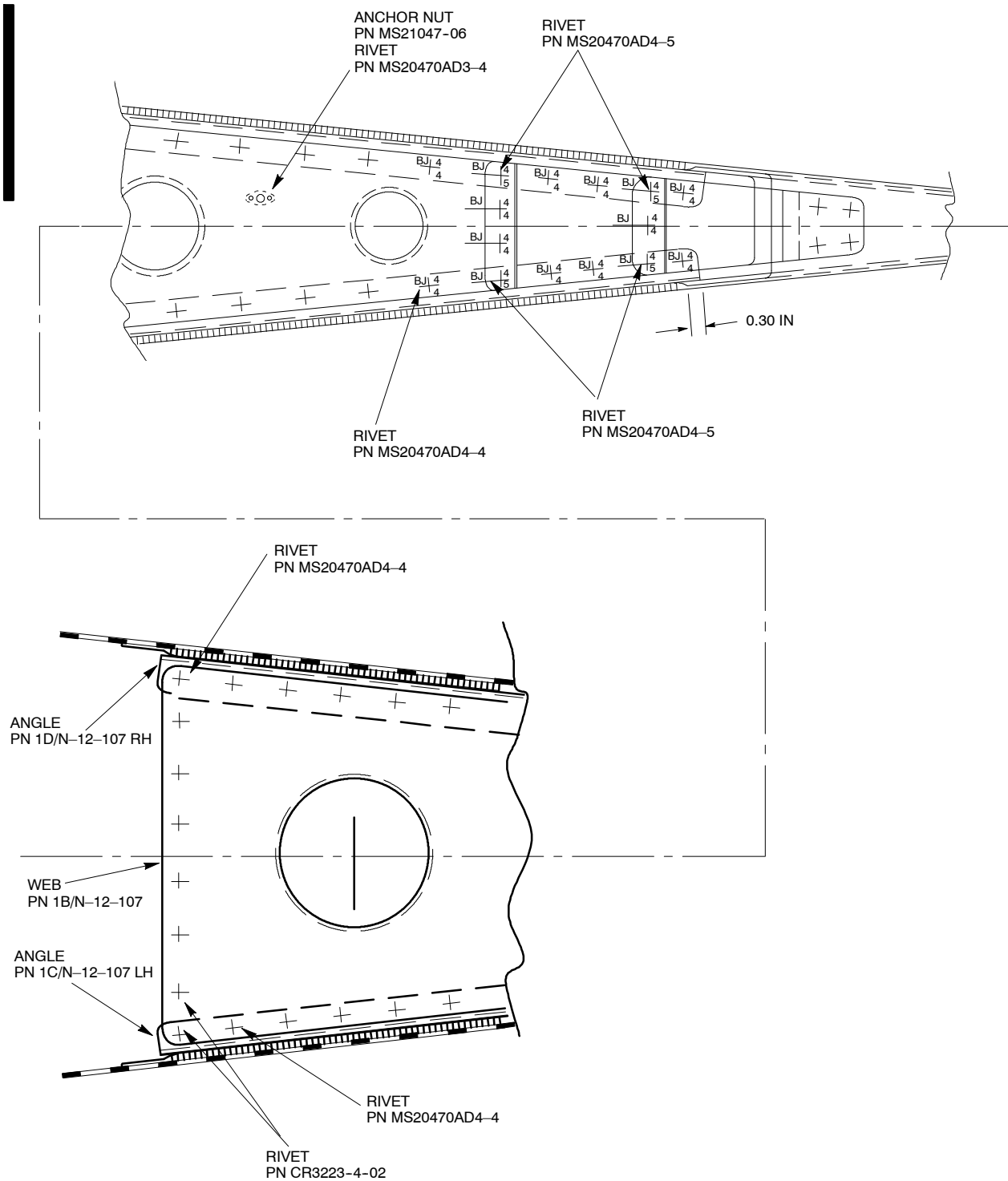
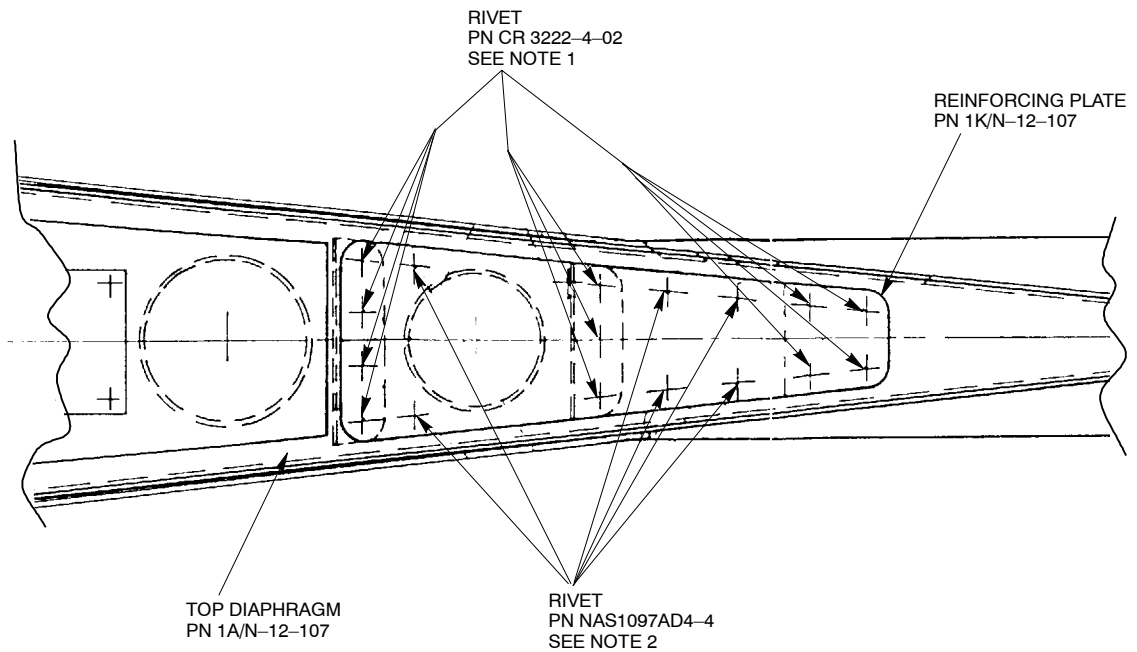


Figure 5 Web, Angle and Zee Angle Assembly

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NOTES:

1. RIVET ZEE ANGLES TO TOP DIAPHRAGM.
2. WET ASSEMBLE REINFORCING PLATE TO TOP DIAPHRAGM.

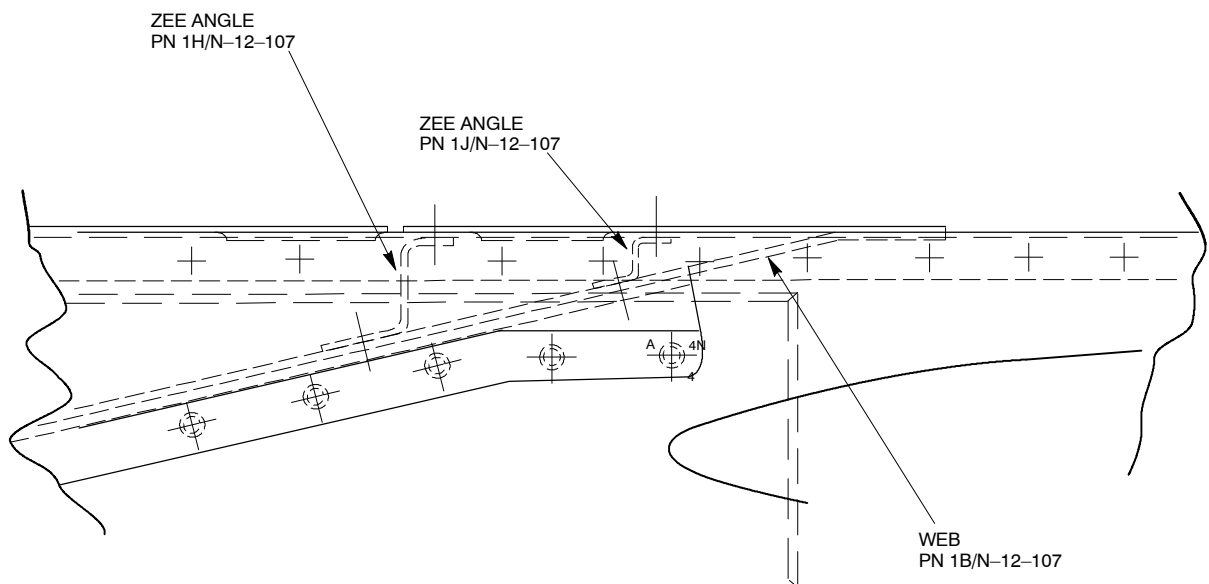


Figure 6 Web and Reinforcing Plate Attachment to Top Diaphragm

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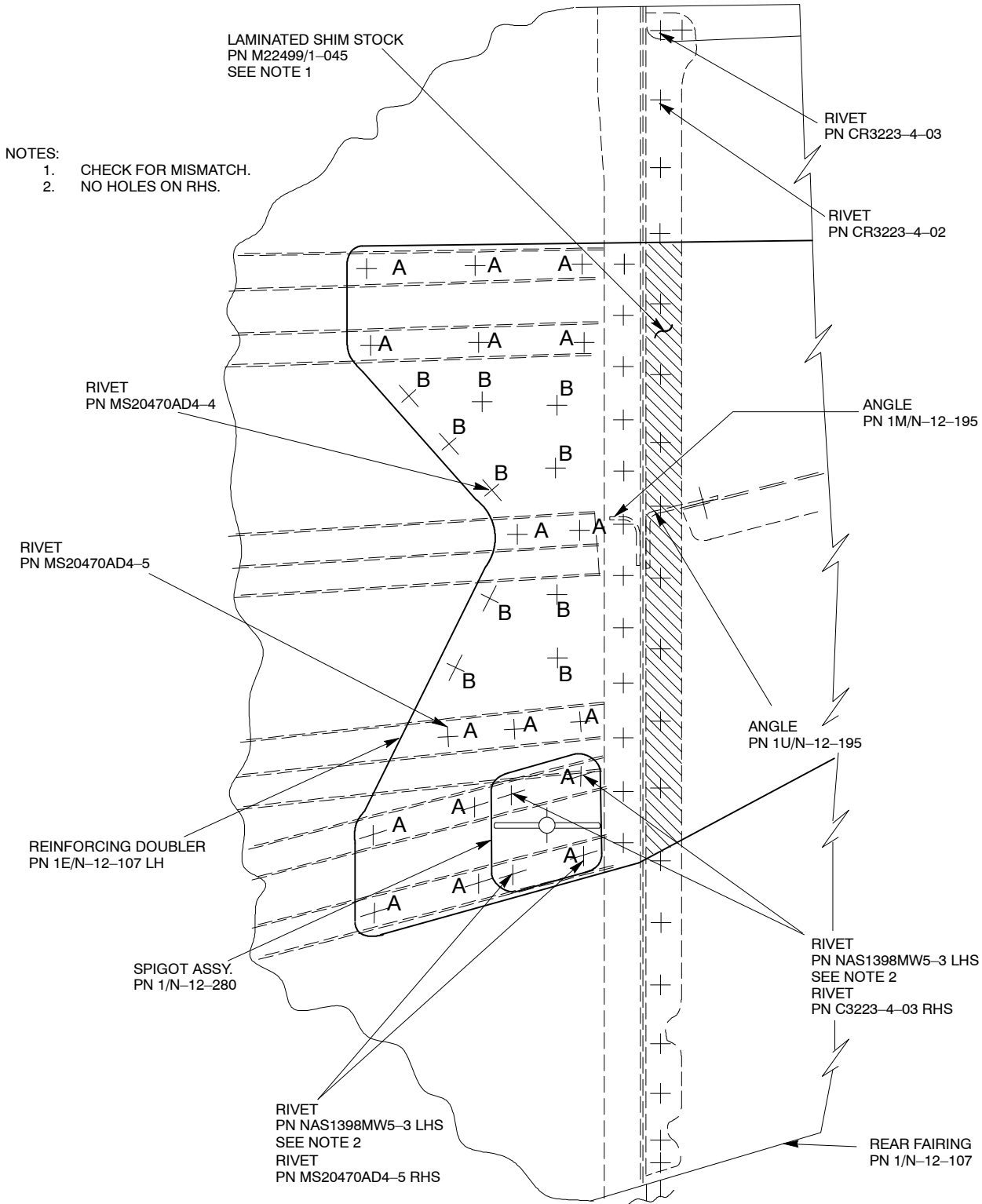


Figure 7 Attachment to Rear Fuselage

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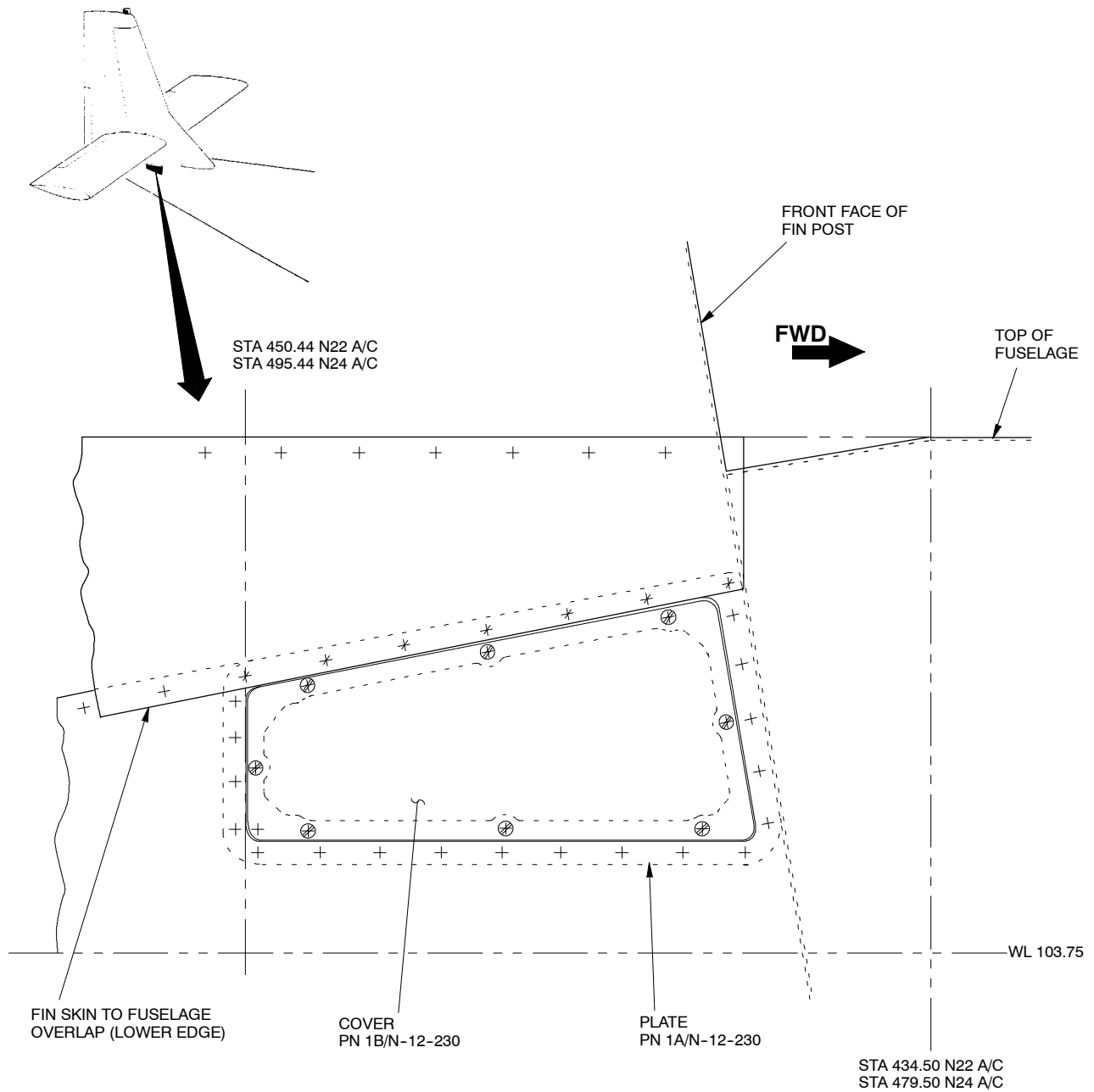
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NOTES:

UNLESS OTHERWISE STATED, ALL DIMENSIONS IN INCHES

* INDICATES EXISTING RIVET POSITIONS

Figure 8 Access Panel Installation

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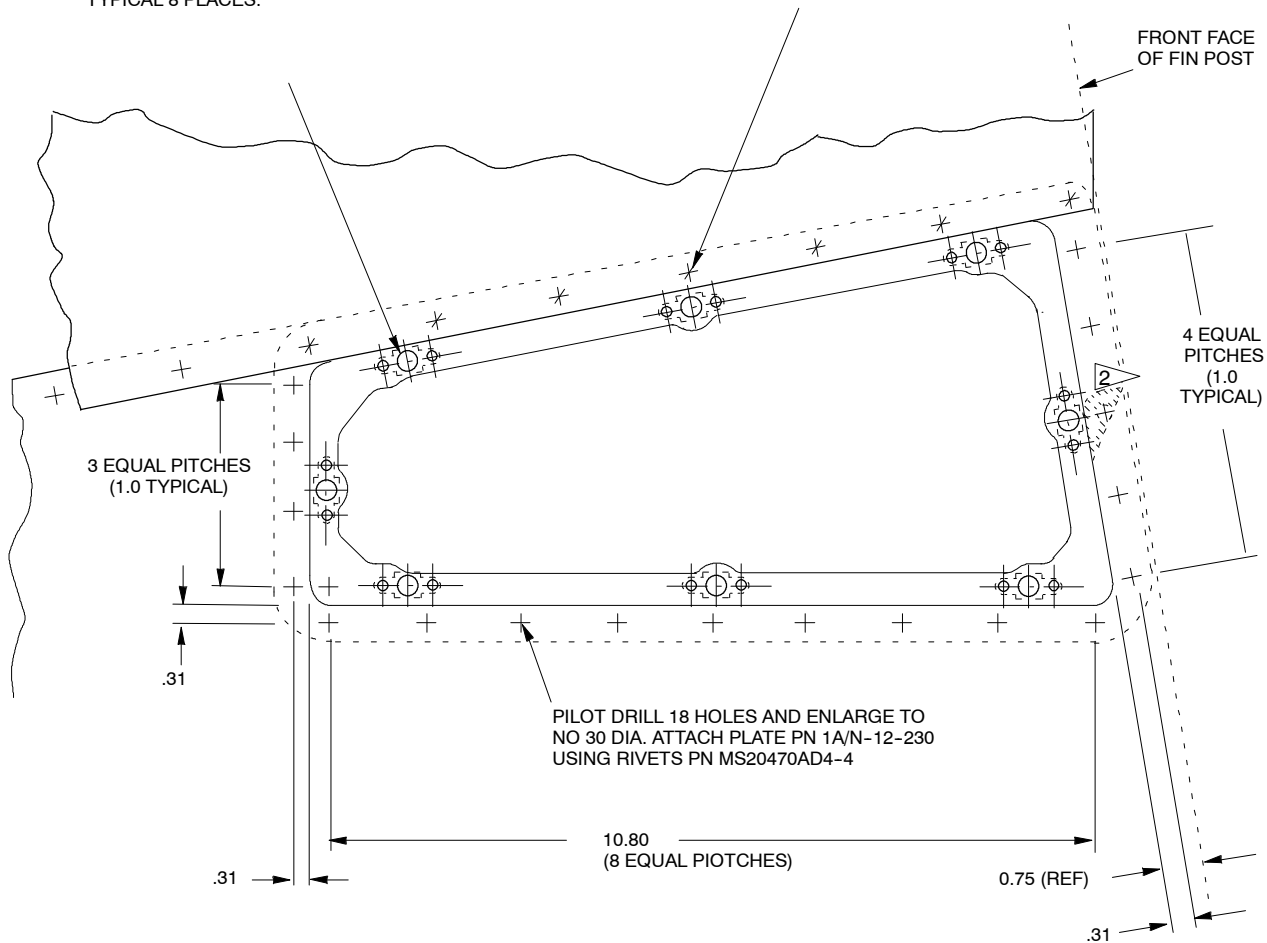
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ENLARGE HOLE TO 0.50IN DIA AND CENTRALLY LOCATE CAMLOC RECEPTACLE. DRILL 2 HOLES 2.45MM DIA AND COUNTERSINK. ASSEMBLE RECEPTACLE TO PLATE USING RIVETS PN MS20426AD3-4 . TYPICAL 8 PLACES.

REMOVE EXISTING RIVETS (7 OFF). BACK DRILL THROUGH SKIN INTO PLATE PN 1A/N-12-230 AND SIZE TO NO 30 DIA. ATTACH PLATE USING RIVETS PN MS20470AD4-5



NOTES:

- 1 UNLESS OTHERWISE STATED, ALL DIMENSIONS IN INCHES
- 2 AT THIS LOCATION A 6.5MM DIA HOLE MAX IS ACCEPTABLE IN FIN POST ANGLE TO CLEAR RIVET TAIL, OR AS AN ALTERNATIVE TRIM FIN POST ANGLE AS SHOWN BY SHADED AREA
- * INDICATES EXISTING RIVET POSITIONS

Figure 9 Access Panel Doubler Plate Installation

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ANNEX A

FACSIMILE MESSAGE

To : Boeing Aircraft Systems - ASTA, Nomad Support
From :
Fax No: +61 3 5282 1209
Telephone: +61 3 5227 9453
(Nomad Support to forward to ASTA Engineering on receipt)

Subject: CRACKING REAR FUSELAGE FRAME

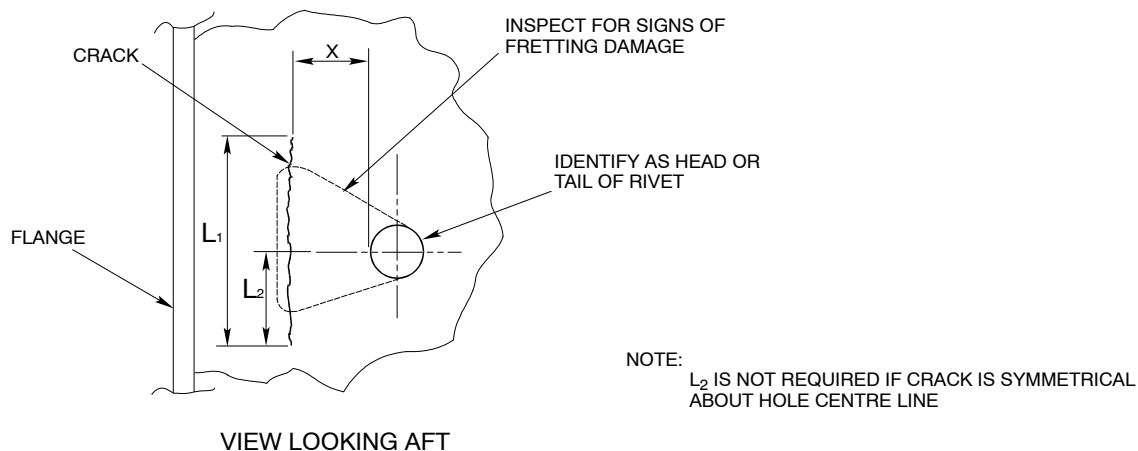
To assist in the analysis of the defect and up keep of our data base please provide the following:-

Use this fax as reply form.

1. Aircraft Details

Operator: _____ Type: N22/N24
Registration No: _____ Serial No: _____
Time in Service:hours____ Number of Landings: _____
Is aircraft usually hangared or parked outside: Yes/No
If parked outside, is external Rudder Gust Lock usually fitted: Yes/No
Are conditions outside usually gusty: Yes/No

2. Crack Details



- Show location of cracks on attached diagram. Show orientation of crack also.
- Provide crack details on attached table.

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Note: Rivet location numbers must correspond to diagram showing location.

Rivet Location	L ₁ (in)	L ₂ (in)	x (in)	Head (H) Tail (T)	Fretting Damage (Y/N)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
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