

Temporary Maintenance Instruction TMI 139-471 Rev.C

Tail boom frame STA 8701.6 P/N 3G5350A04353 – Specific Repair Procedure

AW139 Helicopters
S/Ns: 31026, 41003, 41010, 41018

The technical content of this document is approved under the authority of DOA nr. EASA.21J.005.

The present TMI will be evaluated for its introduction in the standard set of Technical Publication.

*If no further notice is received, the present document expires on: **May 20th 2020.***

2019-05-20

Introduction

This TMI provides the instructions and requirements to replace the AW139 tail boom frame STA 8701.6 P/N 3G5350A04353 with the retromod frame P/N 3G5350A04353A1.

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Table 1 References

Data Module	Title
39-A-00-20-00-00A-120A-A	Helicopter safety - Pre-operation (make helicopter safe for maintenance)
39-A-53-40-00-00A-520A-A	Tail section (structure) - Remove procedure
39-A-53-40-00-00A-520B-A	Tail section (system components installed) - Remove procedure
39-A-53-40-00-00A-720A-A	Tail section (structure) - Install procedure
39-A-53-40-00-00A-720B-A	Tail section (system components installed) - Install procedure

Preliminary requirements

Required conditions

Table 2 Required conditions

Condition	Data Module/Technical Publication
The Helicopter must be safe for maintenance	39-A-00-20-00-00A-120A-A
Tail section must be removed	39-A-53-40-00-00A-520A-A or 39-A-53-40-00-00A-520B-A

Support equipment

Table 3 Support Equipment

Nomenclature	Identification No.	Qty
1. Positioning and drilling tool kit	3G5350A00133A005A	1

NOTE: Refer also to ITEP for the special tools required to comply with the AMP Data Module referenced in Procedure and in Required conditions.

Supplies

Table 4 Supplies

Nomenclature	Identification No.	Qty
1. Adhesive DAPCO 3300	C227	AR
2. Rivet	A297A05TW02	AR
	A297A05TW03	AR
	A298A05TW02	AR
	A298A05TW05	AR
	A298A06TW04	AR
	A298A06TW05	AR

NOTE: materials required for repairs are reported on relevant repair document; sealants are reported on Appendix A.

NOTE: grip length has to be adapted to the installation; before rivet installation in places where fasteners were just removed, check holes diameter and if necessary install oversized rivets. Refer to CSR.P.

NOTE: Refer also to ITEP for the supplies required to comply with the AMP Data Module referenced in Procedure and in Required conditions.

Spares

Table 3 Spares

Nomenclature	Identification No.	Qty
1. FRAME STA 8701.6	3G5350A04353A1	1
2. SEAL	3G5350A10352	1

Safety conditions

NOTES:

- A. Place an identification tag on all components that are re-usable, including the attaching hardware that has been removed to gain access to the modification area and adequately protect them until their later re-use.
- B. During drilling operations pay extreme attention in order to prevent instruments, cables and hosing damage. After drilling, clean the area and remove sharp edges. Apply on bare metal a light film of primer unless the hole is used for ground connection.
- C. Before installing new rivets check for holes condition; if holes condition is not suitable use oversize rivets. If necessary install rivets with different grips.
- D. All riveting and de-riveting in accordance with the IETP CSRP.
- E. All Hi-Lok fasteners installed and removed in accordance with IETP CSRP.
- F. Use aliphatic naphtha to degrease. Cleaned surfaces shall be allowed to air dry for at least 30 minutes before bonding.
- G. All dimensions are in mm.

Procedure

1. In accordance with AMP DM [39-A-00-20-00-00A-120A-A](#) prepare the helicopter on ground for a safe maintenance. Disconnect the battery, all electrical power sources and/or the external power supply.
2. In accordance with AMP [39-A-53-40-00-00A-520A-A](#) (or AMP [39-A-53-40-00-00A-520B-A](#)) remove the tail section.
3. Disconnect any electrical cable / hydraulic lines installed on frame STA 8701.6.
4. Check the reference plane of the frame STA 8701.6 by measuring and recording the after spot-facing dimensions of fitting bosses (over frame surface) for the 6 tail longeron fittings as shown on figure 11.
5. Use the positioning and drilling tool kit ([Support Equipment Ref. 1](#)) to check and record the reference tail fittings plane/position:
 - 5.1. With reference to Figures 7 and 8, install the positioning and drilling tool kit ([Support Equipment Ref. 1](#)) on the tail assy, center the plate, and then lock it.
 - 5.2. With reference to Figures 9 and 10, by means of depth mike, measure, annotate and store the distance between the drilling tool kit ([Support Equipment Ref. 1](#)) and the front surface of the six tail fittings.
 - 5.3. Remove the positioning and drilling tool kit ([Support Equipment Ref. 1](#)) from the tail assy.
6. Remove hardware connecting the frame STA 8701.6 to the upper, lateral and lower panels of the tail boom along the entire frame contour/profile.

NOTE:

It is not required to remove the hi-lok connecting the fittings to the longerons.

7. Remove the old frame STA 8701.6.
8. Temporary put in place the new frame STA 8701.6 ([Spare Ref. 1](#)).

NOTE:

Make sure that the position of longerons allows obtaining the dimension of 0.70/0.95 mm (after spot-facing) and the planarity within 0.125 mm between all fitting bosses. In case of difficulties to meet the aforementioned specification, report the actual measurements to AW139 Product Support Engineering for acceptability confirmation.

9. With reference to Figures 7 and 8, install the positioning and drilling tool kit ([Support Equipment Ref. 1](#)) to verify that the tail fittings reference plane measured and recorded at previous step 5 is obtained.

NOTE:

With reference to Figures 6, make sure that correct gaps between existing structure and contour of frame at STA 8701.6 are maintained. If interference is detected between angles of new frame STA 8701.6 and tail longerons, please report it to AW139 Product Support Engineering in order to evaluate the possibility to trim the frame angles contour.

10. Using the lateral, upper and lower panels of the tail as a template, report on the new frame STA 8701.6 all the holes (ref. dia Ø3.2mm) already present on structure.
11. Remove the positioning and drilling tool kit ([Support Equipment Ref. 1](#)).
12. Remove, clean and deburr the new frame STA 8701.6 ([Spare Ref. 1](#)).
13. Put in place the new frame STA 8701.6 ([Spare Ref. 1](#)) and ensure the proper alignment of frame holes, counterdrilled at previous step 8, with surrounding tail structure holes.
14. With reference to Figures 7 and 8, install the positioning and drilling tool kit ([Support Equipment Ref. 1](#)) to restore the tail fittings reference plane as measured and recorded at previous step 5.
15. With reference to Figures 1 to 6, install the new frame STA 8701.6 ([Spare Ref. 1](#)) by riveting the frame contour to the surrounding structure.

NOTE:

Please be aware that hardware used to install frame and surrounding structures can be different from the previously installed ones. Refer to applicable figures to identify the hardware.

NOTE:

After frame riveting, make sure that after spot-facing dimensions of all fitting bosses (over frame surface) are aligned with the recorded measurements at previous step 8. If not, report such measurements to AW139 Product Support Engineering for evaluation.

16. Remove the positioning and drilling tool kit ([Support Equipment Ref. 1](#)).
17. With reference to Figure 6 (section J – J), evaluate the condition of the seal and, if required, replace it with a new one ([Spare Ref. 2](#)), to be installed using adhesive DAPCO 3300 ([Supplies Ref. 1](#)).

18. With reference to Figure 12, seal the joint between side panels, frame STA 8701.6 ([Spare Ref. 1](#)) and but straps with method I using type 1C sealant and method IV using type 1C sealant. Refer to [Appendix A](#) for details about sealing.
19. With reference to Figure 12, seal the joint between fittings STA 8700, longerons, side panels and cover molding with method I using type 1C sealant and method IV using type 1C sealant. Refer to [Appendix A](#) for details about sealing.
20. Install any previously removed electrical cable / hydraulic lines on the new frame STA 8701.6 ([Spare Ref. 1](#)).
21. In accordance with AMP [39-A-53-40-00-00A-720A-A](#) (or AMP [39-A-53-40-00-00A-720B-A](#)) install the tail section.

Requirements after job completion

1. Return helicopter to flight configuration.
2. Perform the Tail rotor control system Operation test. Refer to AMP DM [39-A-67-21-00-00A-320A-A](#).
3. Remove all the tools and the other items from the work area. Make sure that the work area is clean.

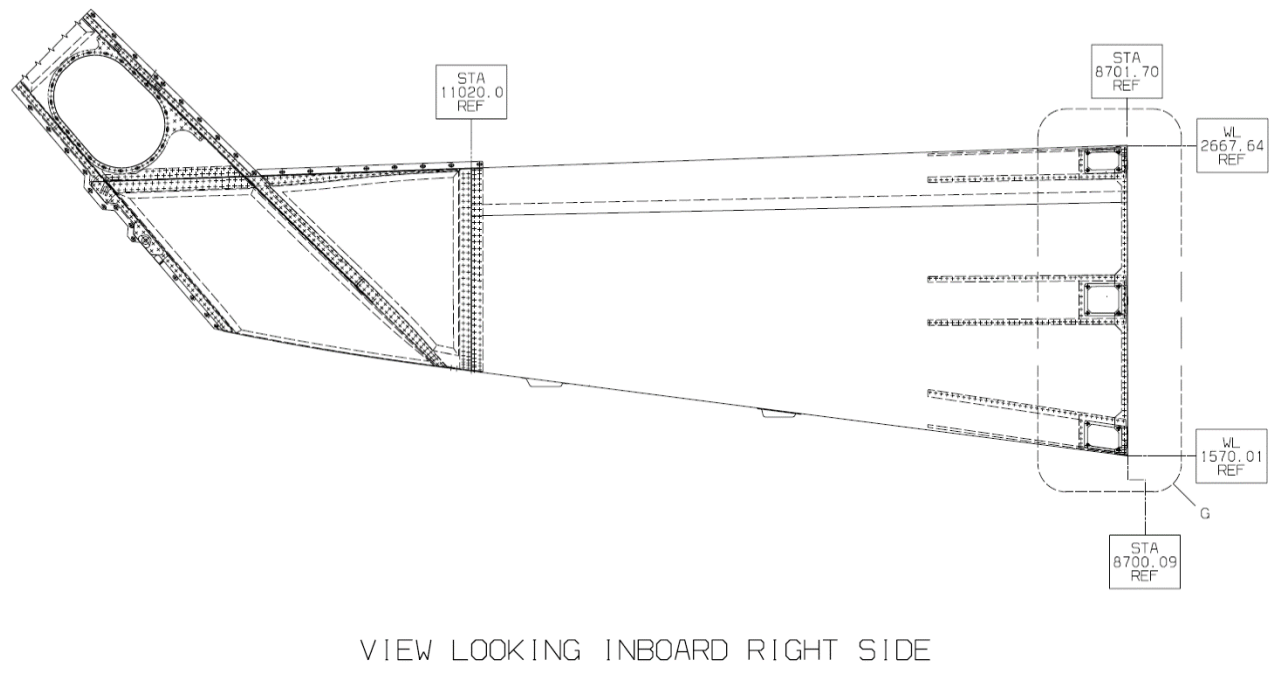
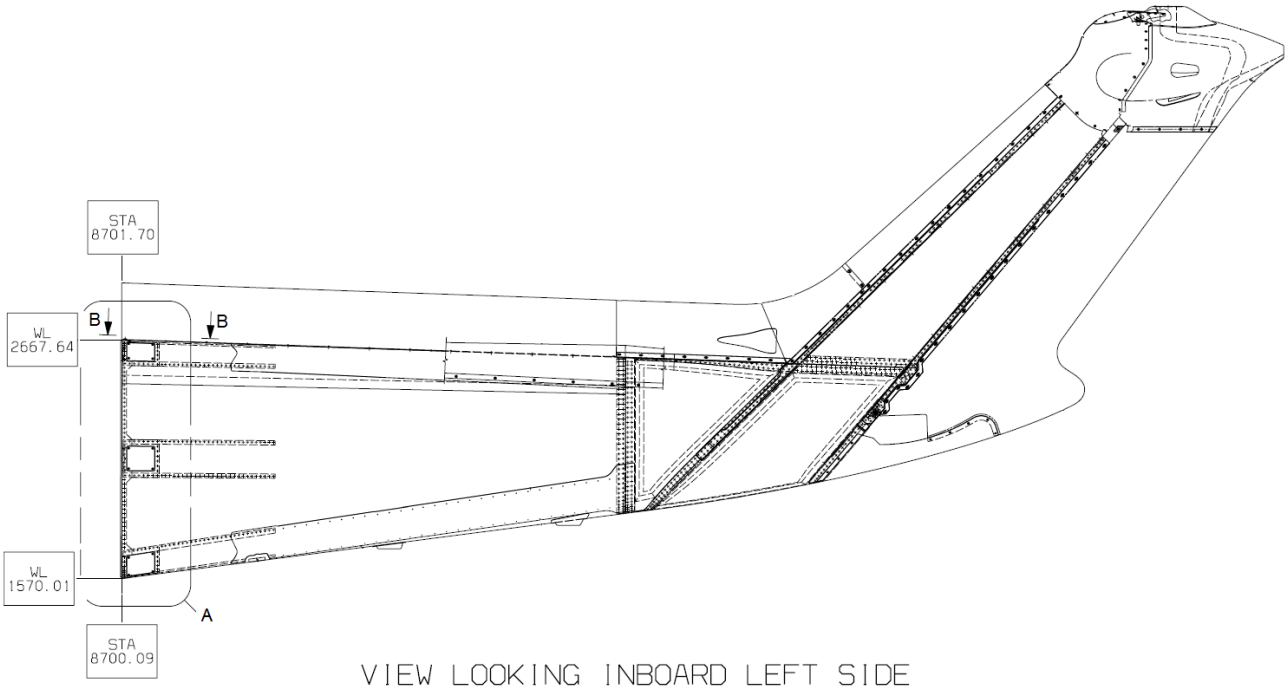


Figure 1

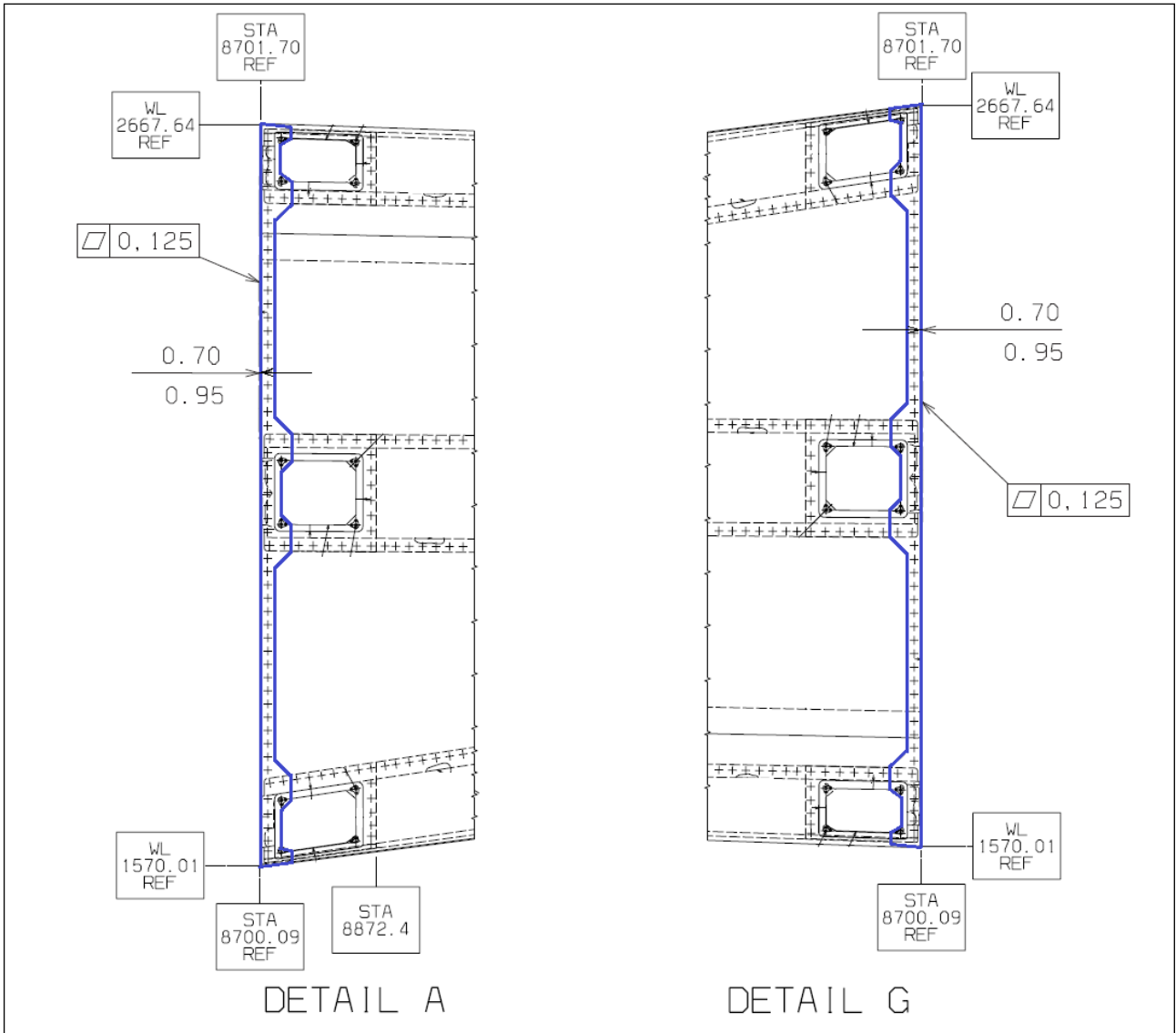


Figure 2

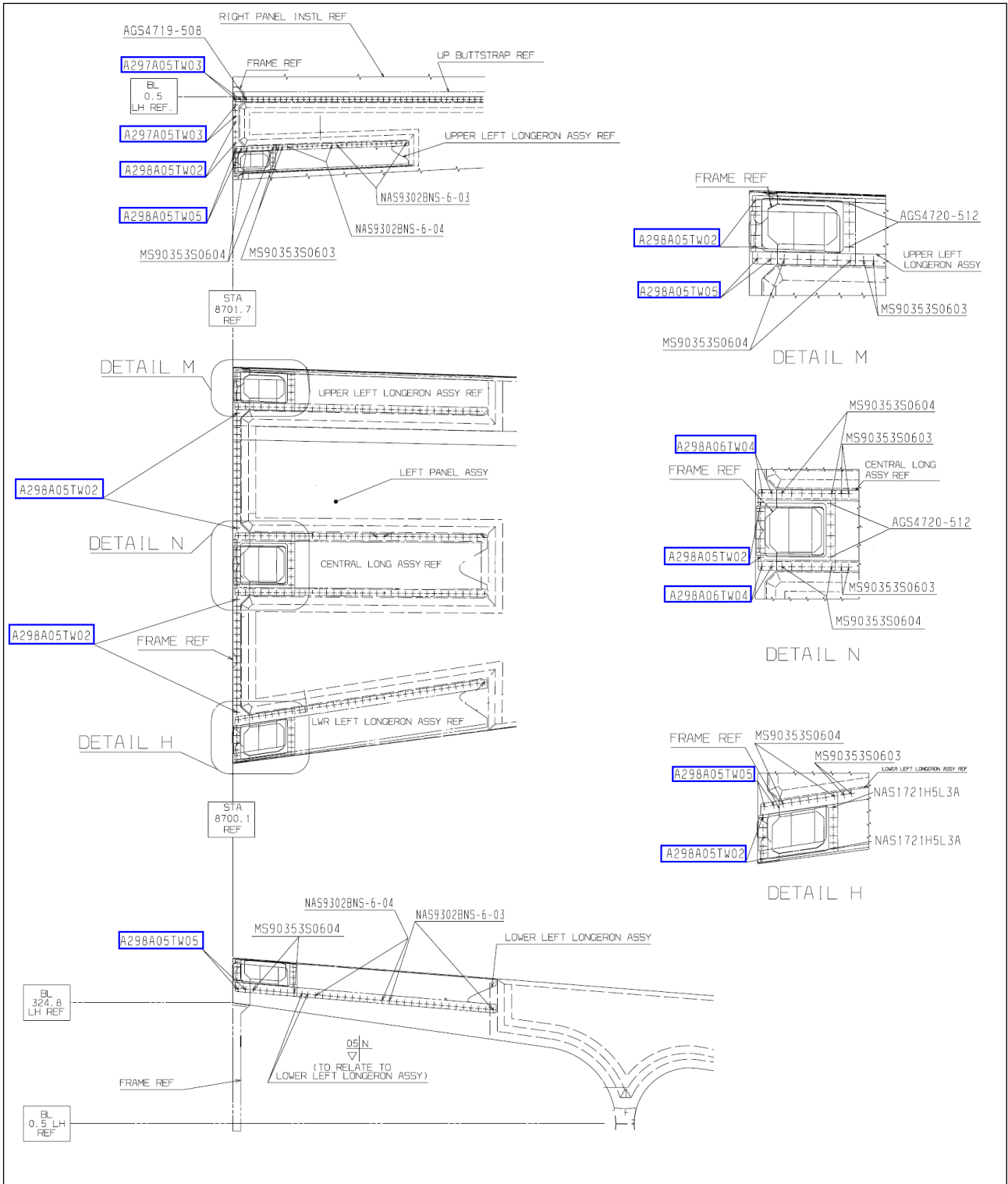


Figure 3

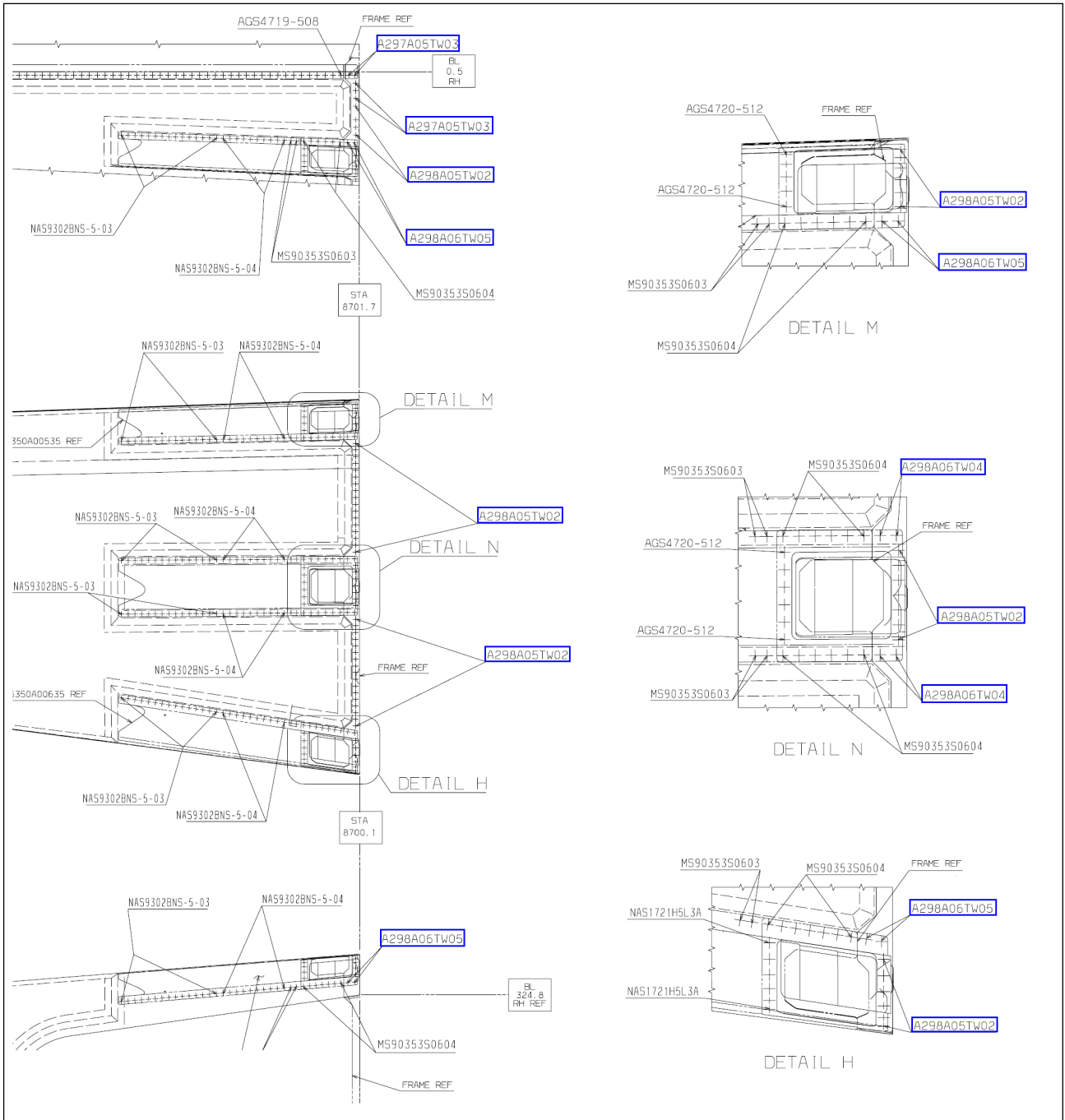


Figure 4

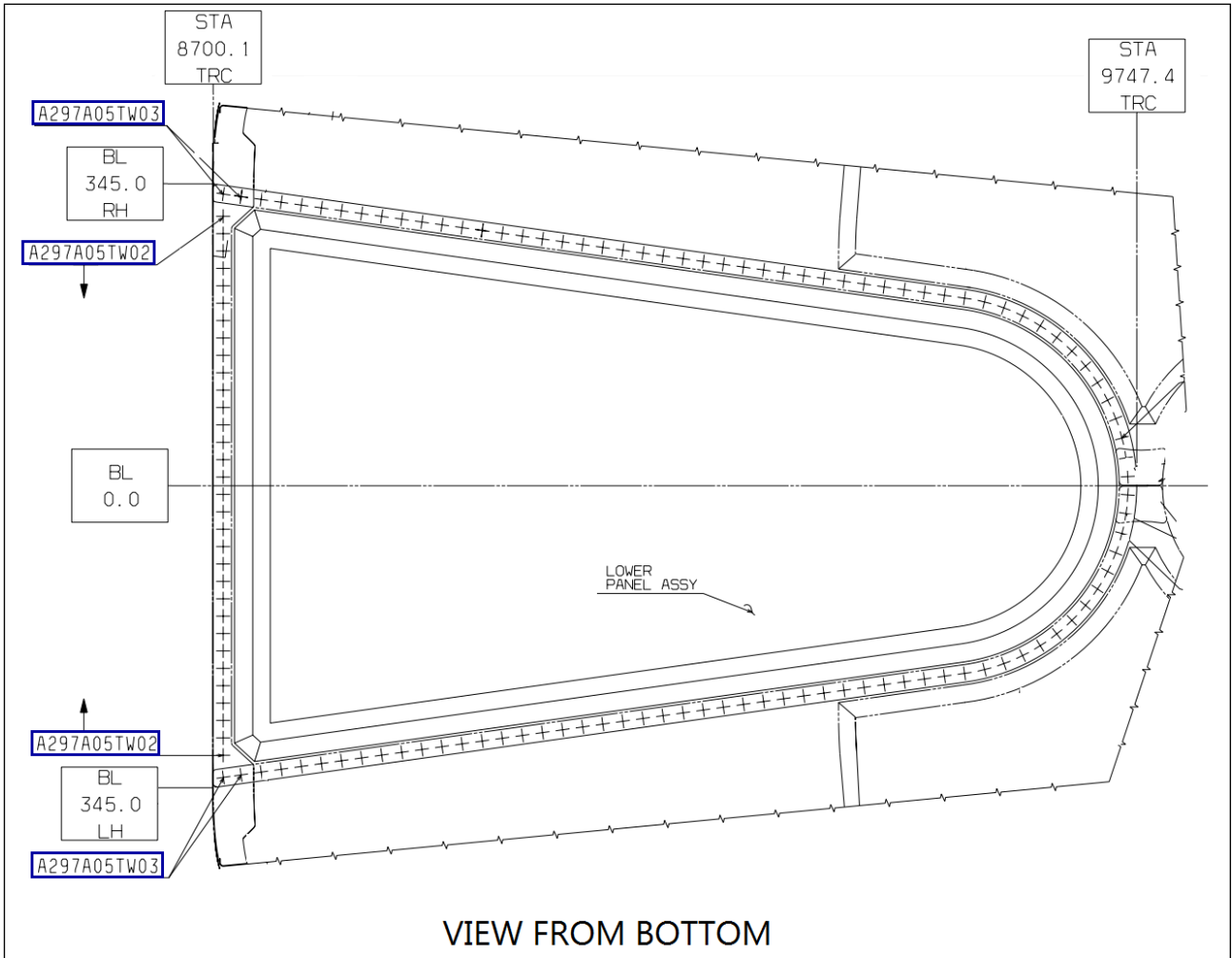


Figure 5

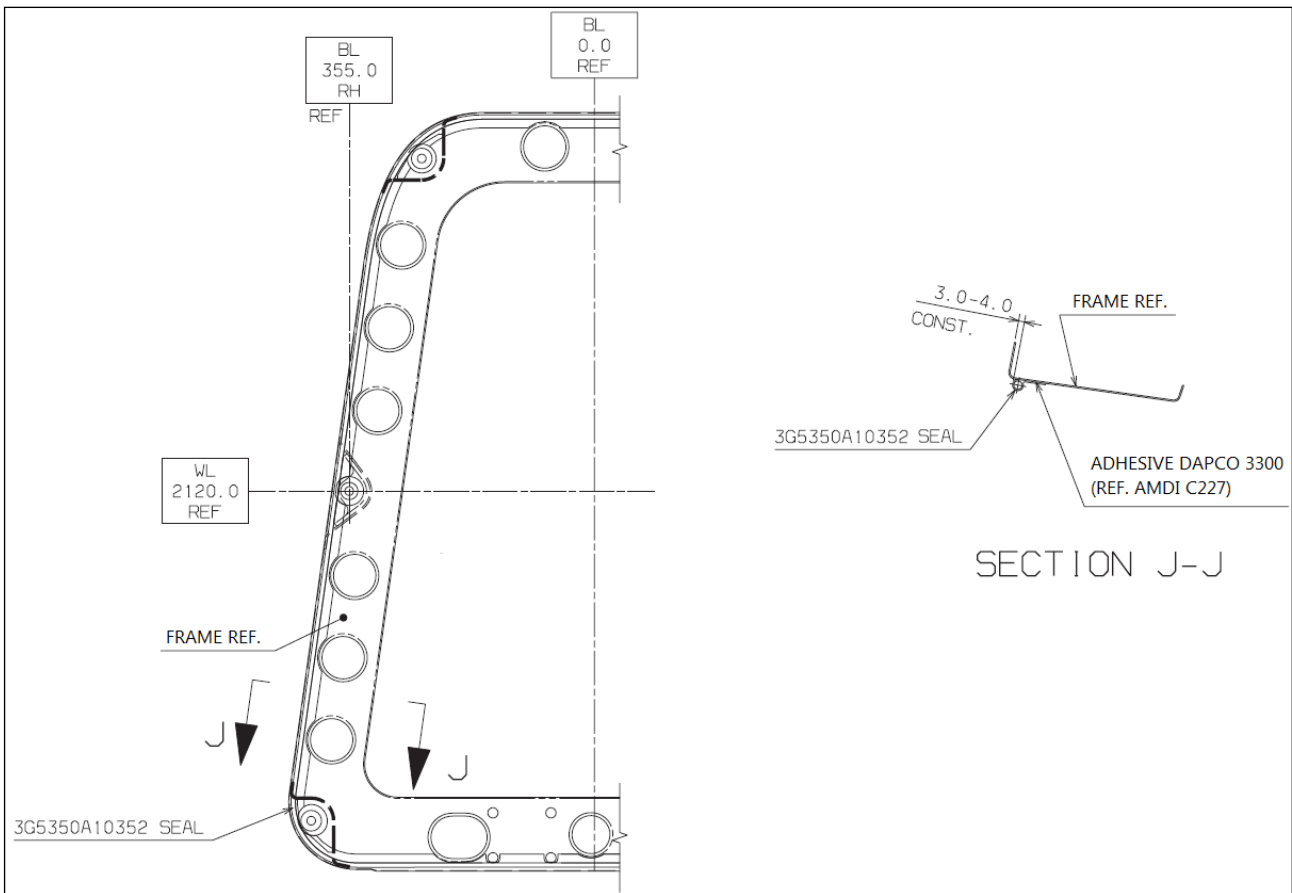
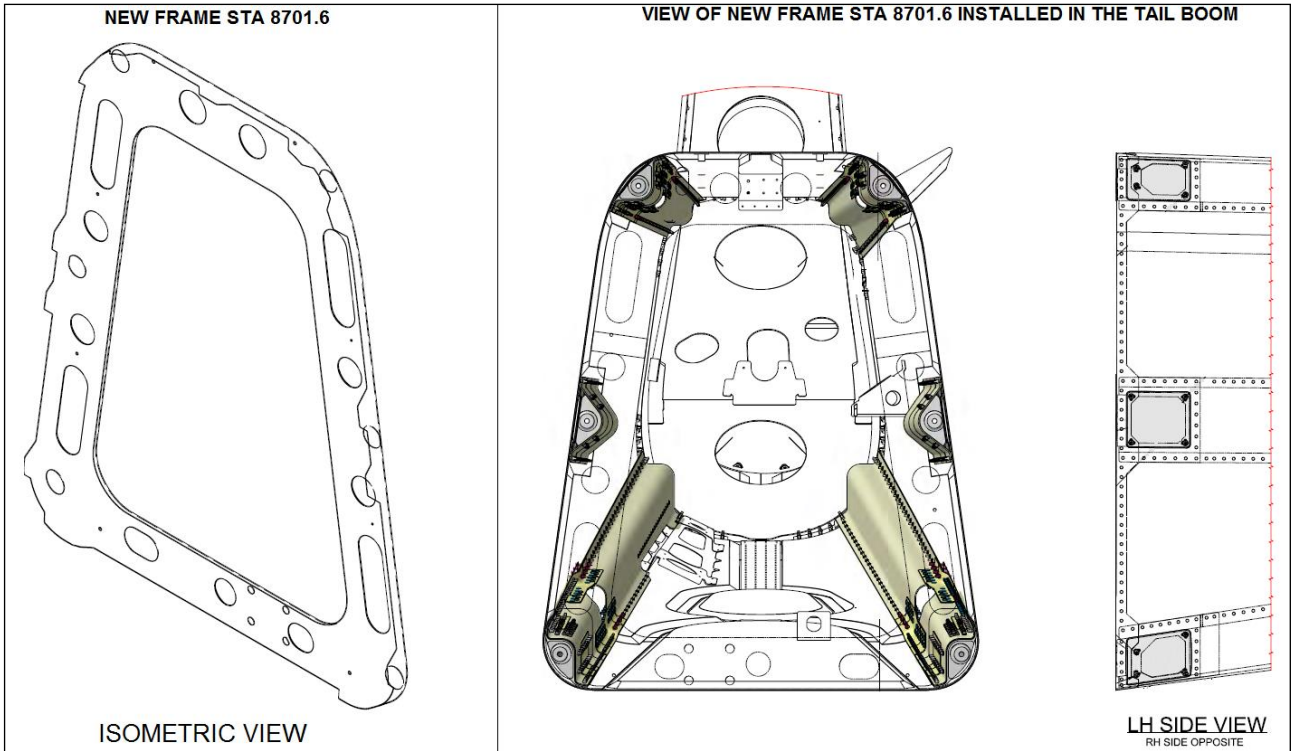


Figure 6

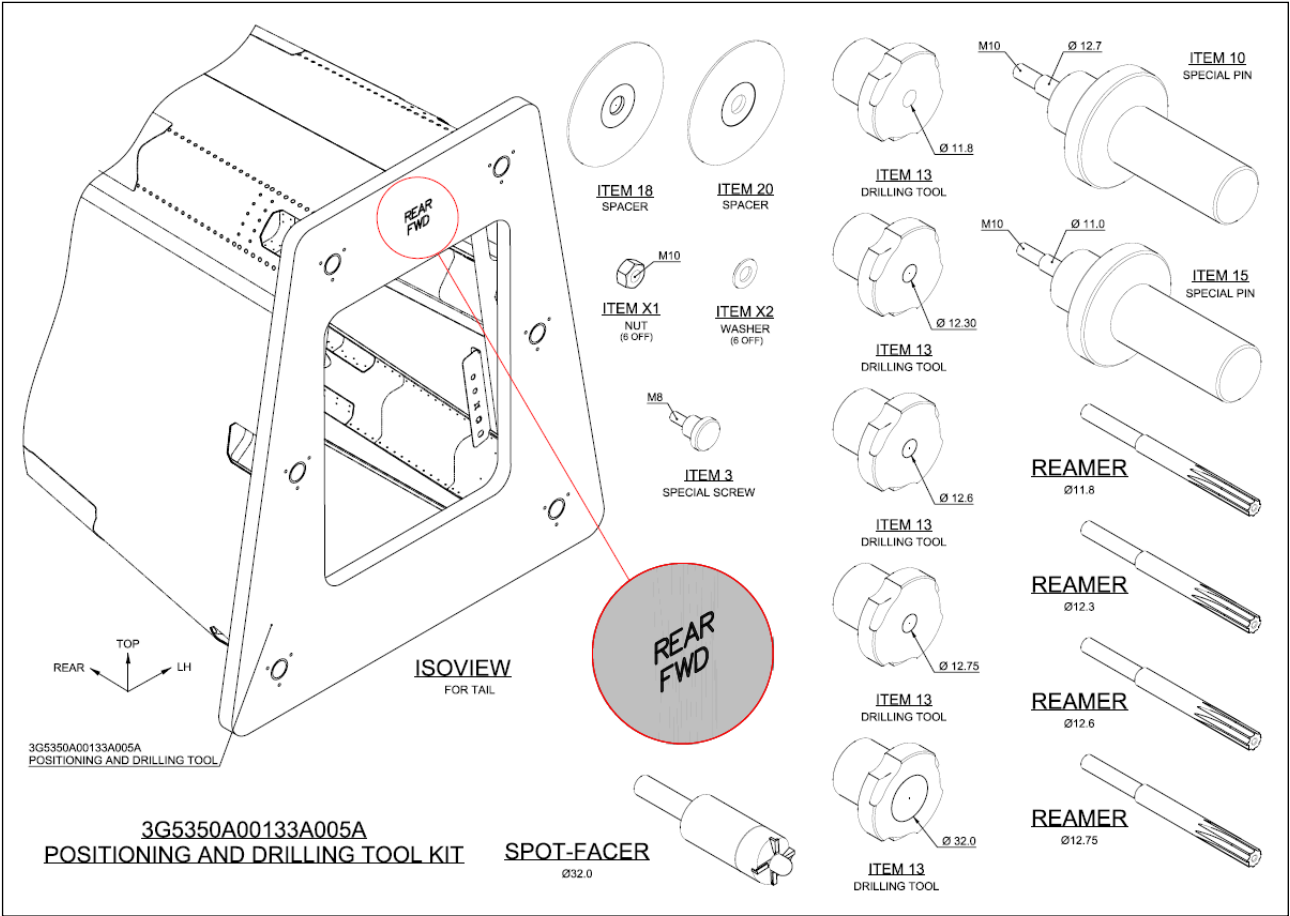


Figure 7

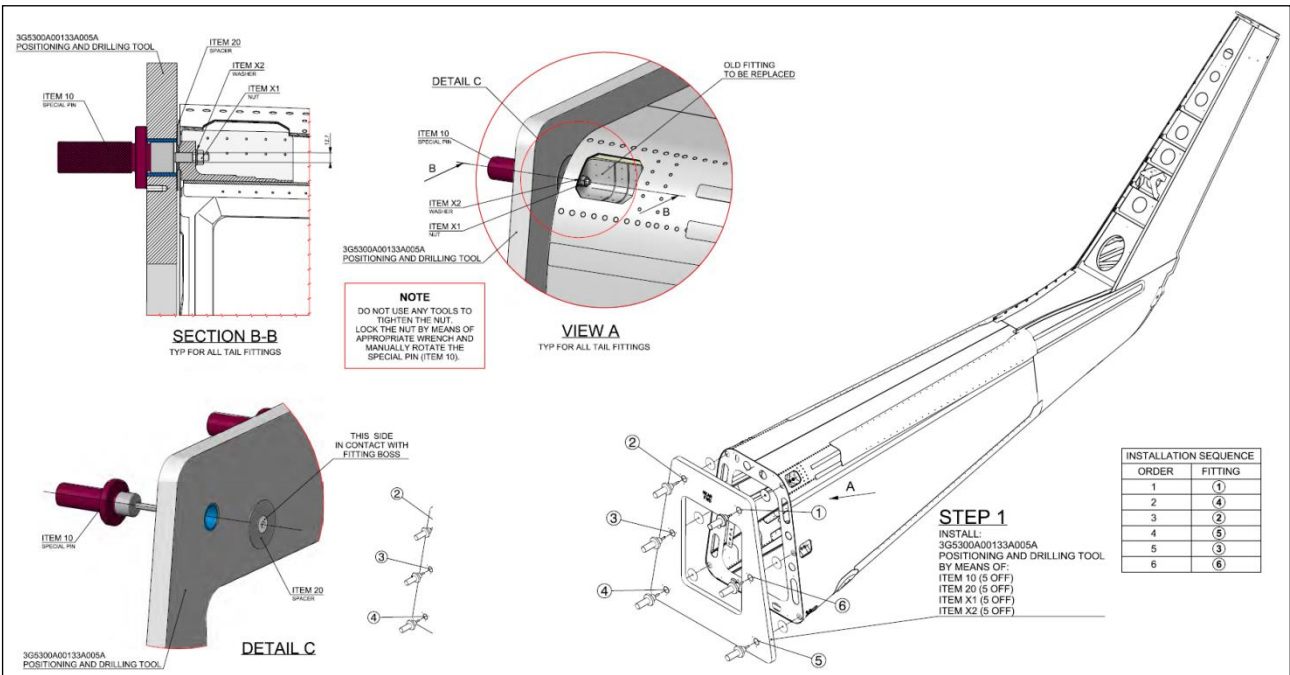


Figure 8

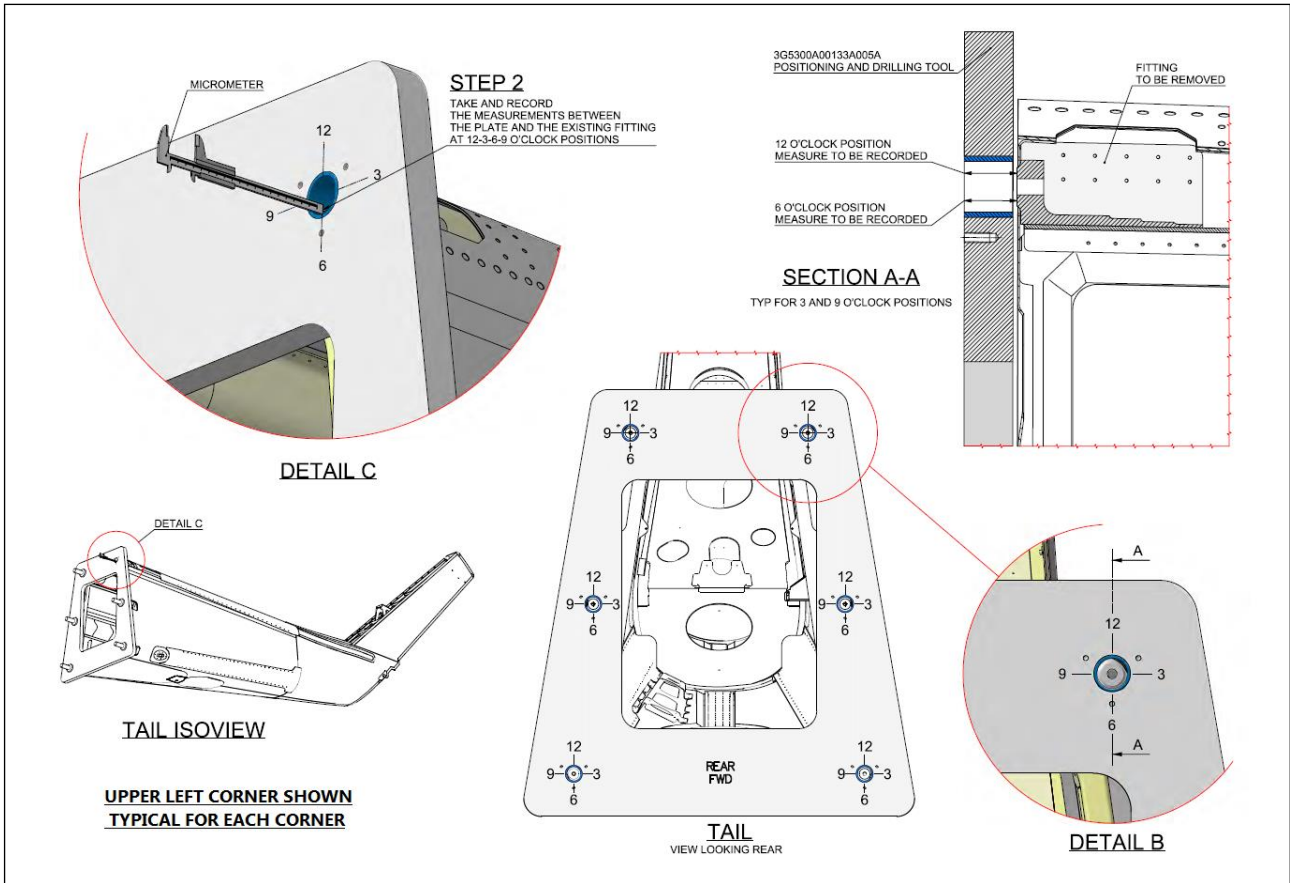


Figure 9

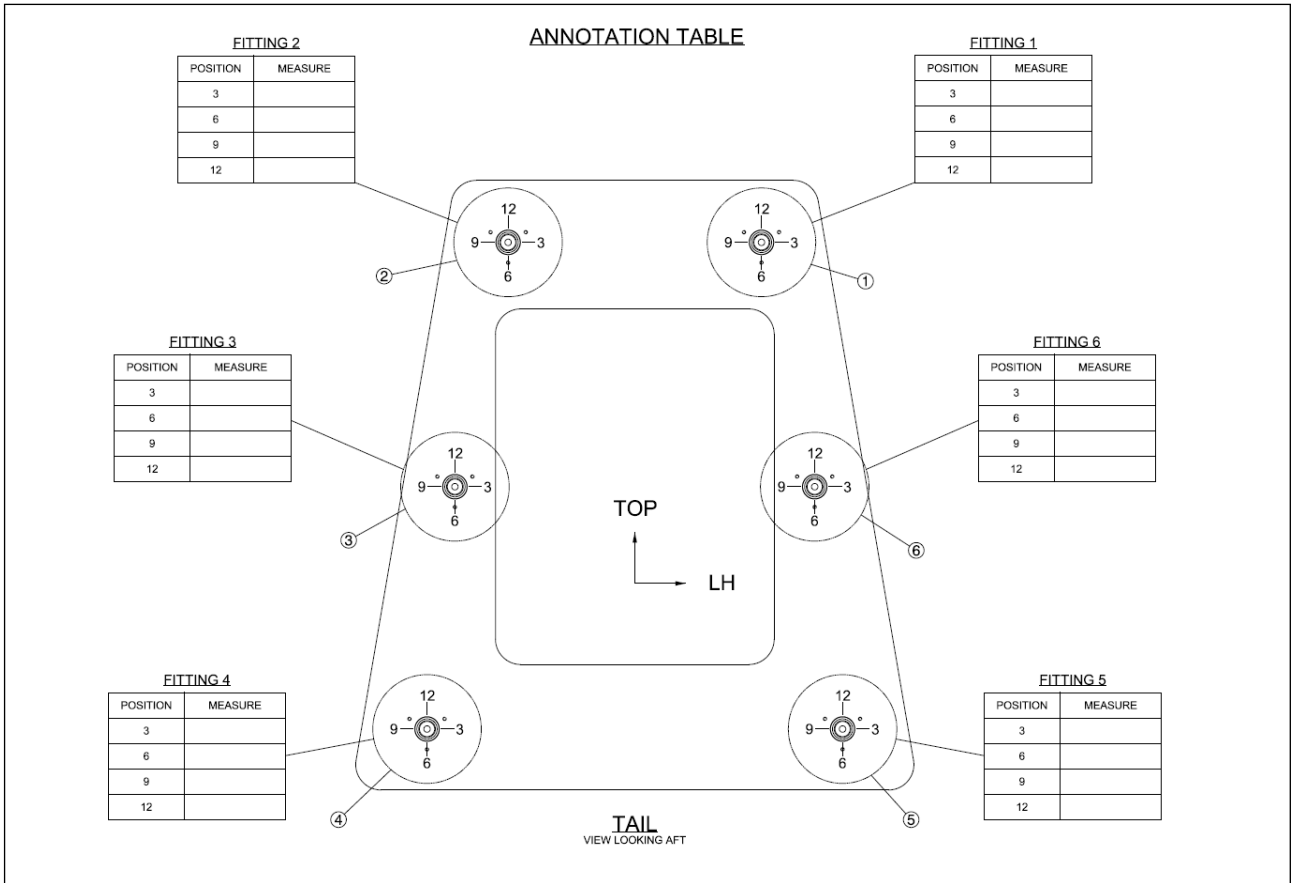


Figure 10

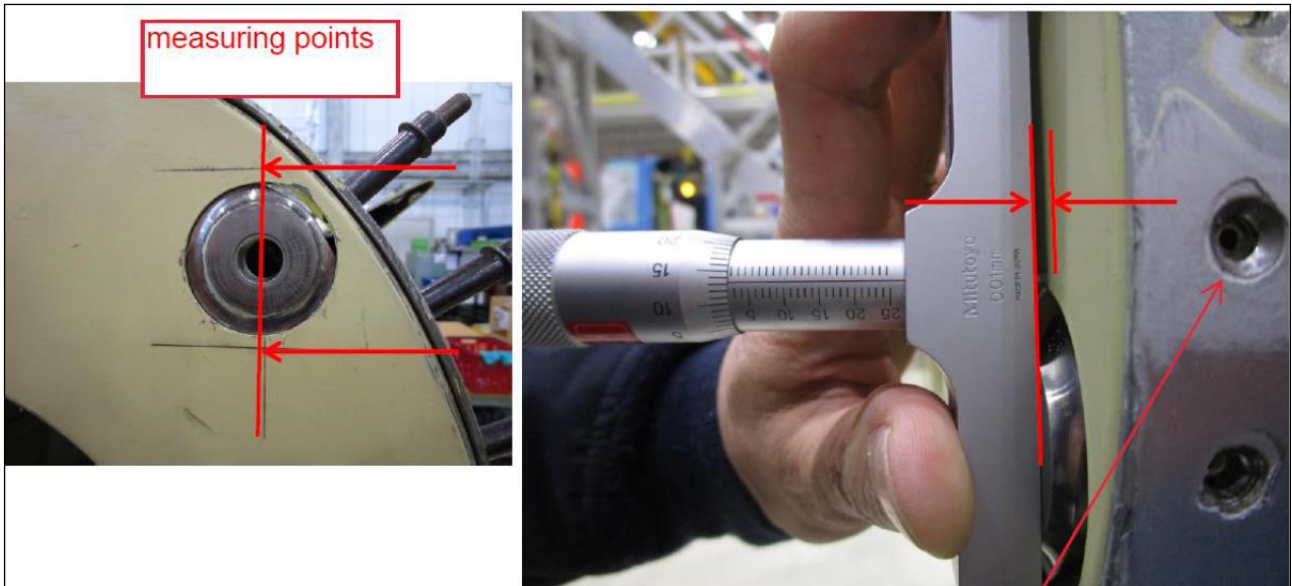


Figure 11

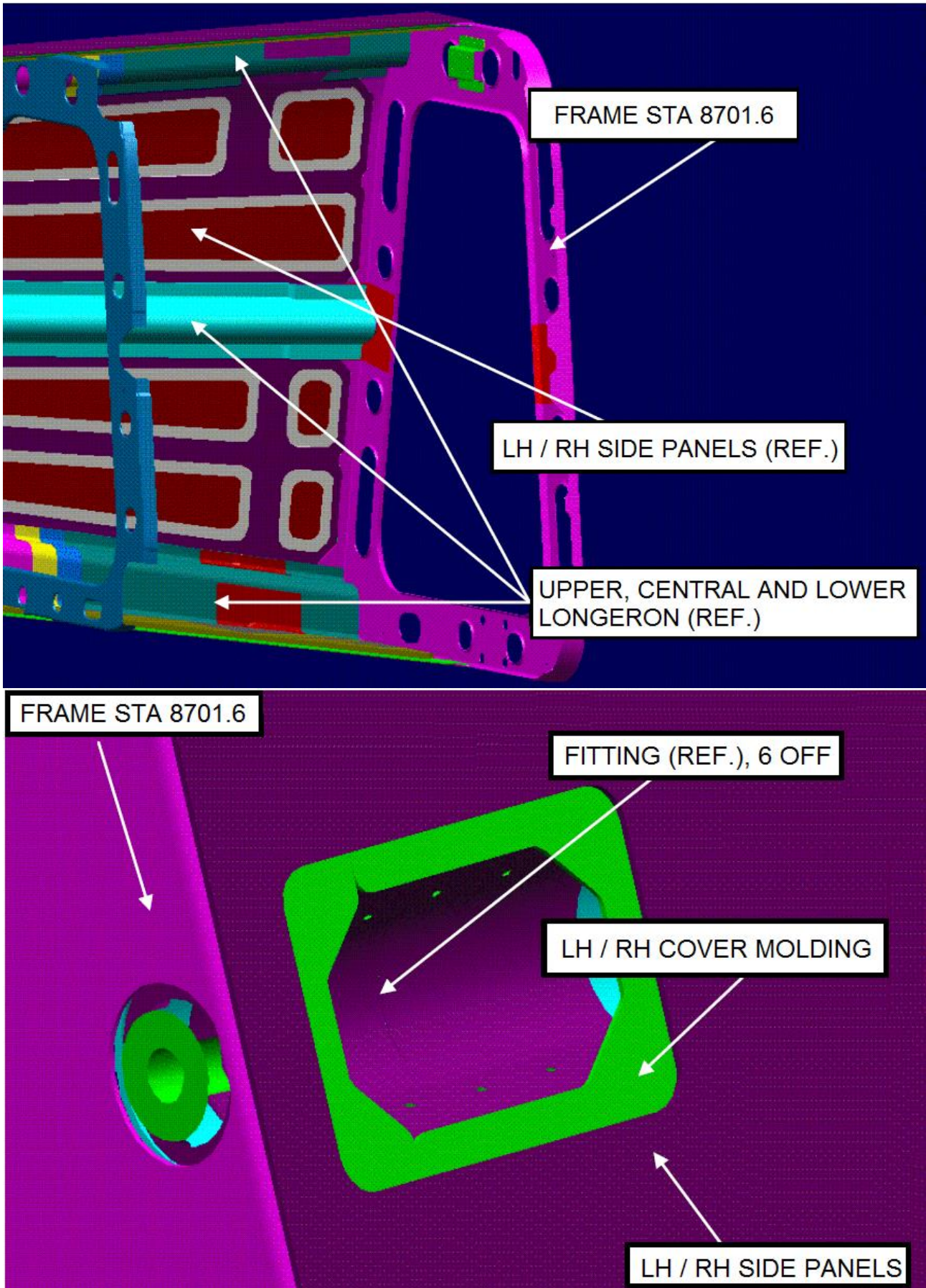


Figure 12

Appendix A – FUSELAGE STRUCTURE SEALING

A.1 Sealant Type

Table 1: Sealant materials

Type	Specifications	Type and/or class	Material characteristics	Commercial name
1A 1B 1C	AWMS05-001	Type I CL A 2 Type I CL B 2 Type I CL C 1	Low density sealant	MC-780

AW DESIGNATION	VENDOR DESIGNATION	VENDOR NAME
AWMS05-001 type I class C grade 1	MC-780 C-2 MC-780 C-4 MC-780 C-8 MC-780 C-12 MC-780 C-24	Chemetall GmbH

A.2 Sealing Process

A.2.1 Surfaces Cleaning

Sealing compounds shall be applied on surfaces carefully cleaned and free from foreign materials as oils, greases, swarfs, dust, etc. For conventional sealants, clean small areas at one time with rags free from flints soaked in Methyl Ethyl Ketone or ethyl acetates.

Always pour solvent on the rag in order to avoid contamination of the latter, carefully wipe dry with clean cloths before solvent evaporates in order to avoid that contaminants redeposit.

A.2.2 Surfaces Cleaning

Sealing products listed in this specification can be applied both on bare surface and on surfaces coated with chromate free epoxy primer (XPFW). It is to be noted however that the finishing general specification for LHD requires primer coating in nearly every joint.

Before applying the sealant compound on a surface coated with epoxy primer check coat anchorage. Apply on the area to be checked a strip of adhesive tape, which has not exceeded the expiry date more than six months, then quickly tear it off perpendicularly to the surface to be examined.

Surface must be intact and no primer traces must be evident on the tape.

A.2.3 Preparation of sealant compound

Mix the base compound quantity with the catalyst compound according to the technical specification requirements of sealants. Pour the accelerating compound into the base compound and mix them until catalyst is uniformly distributed into the base compound.

CAUTION

Do not use glass containers to keep or to mix sealing compound.

A.2.4 Method I –Sealing by interposition

1. Prepare surfaces to be bonded and mix the compound (refer to paragraphs A.2.1, A.2.2 and A.2.3).
2. Apply sealant on both surfaces to joint (see Figure 3 and Figure 6). If necessary smooth it with a spatula paying attention not to create depressions or protrusions.
3. Assemble parts with the sealant not yet cured and anyway within a time not exceeding 10 hours. If necessary during curing clamp matching parts by means of tack rivets in order to avoid relative movements of the surfaces.
4. Exceeding sealant squeeze out from edge shall be visible and constant (Figure 4 and Figure 7); remove squeeze out sealant by means of a suitable plexiglass or wood spatula (Figure 5 and Figure 8).

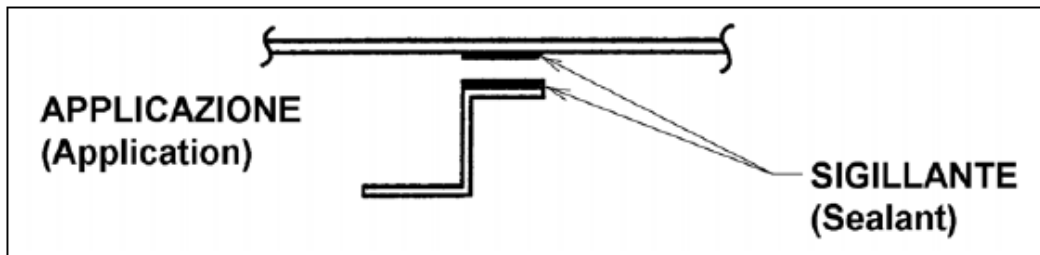


Figure 3: Sealant application

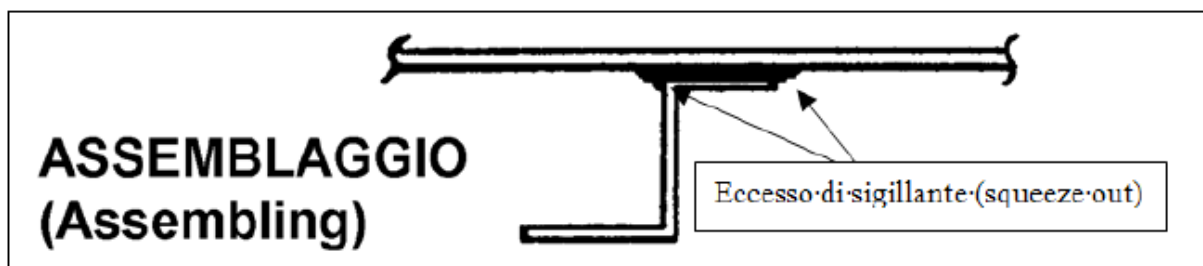


Figure 4: Check that the squeeze out of sealant is uniform along the edge, visible and enough to allow the correct final finishing of the sealing

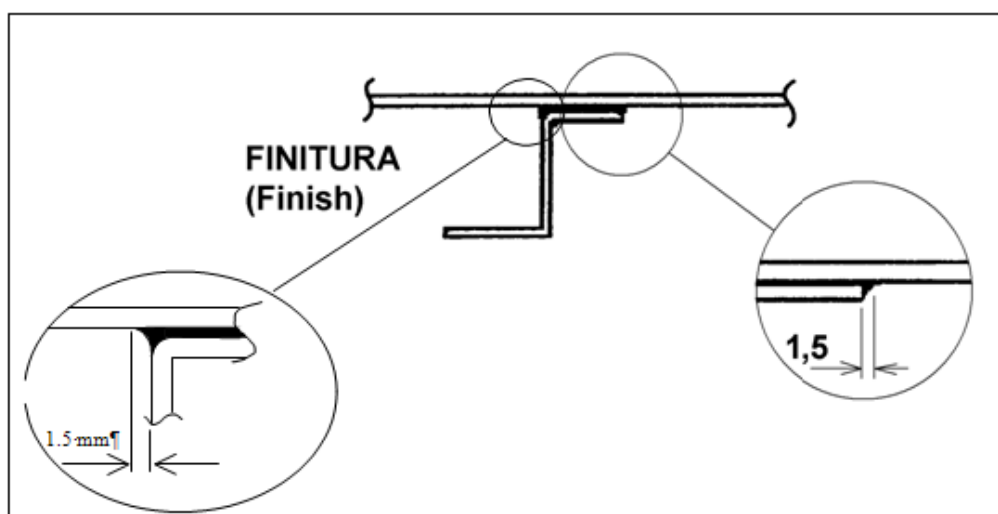


Figure 5: Final finishing of the sealing

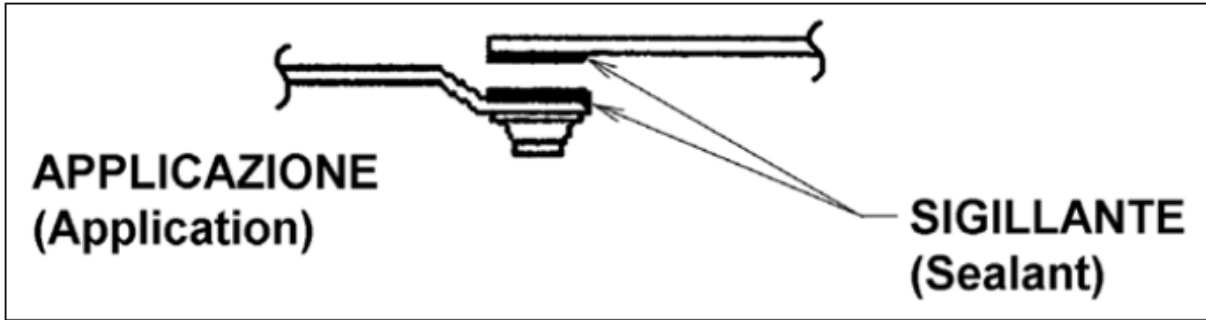


Figure 6: Sealant application

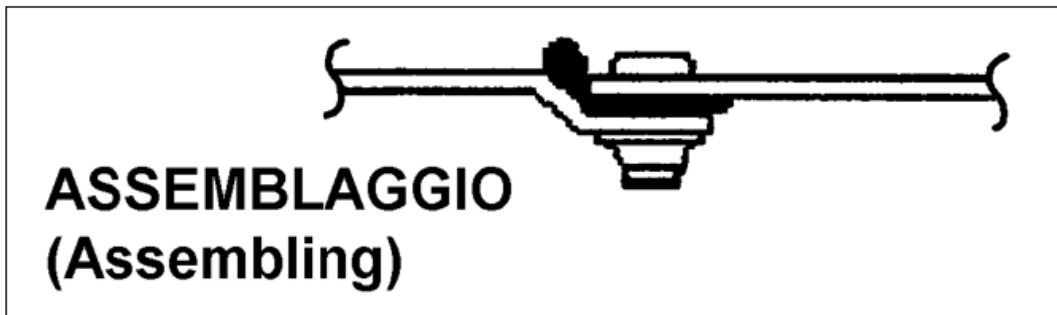


Figure 7: Check that the squeeze out of sealant is uniform along the edge, visible and enough to allow the correct final finishing of the sealing

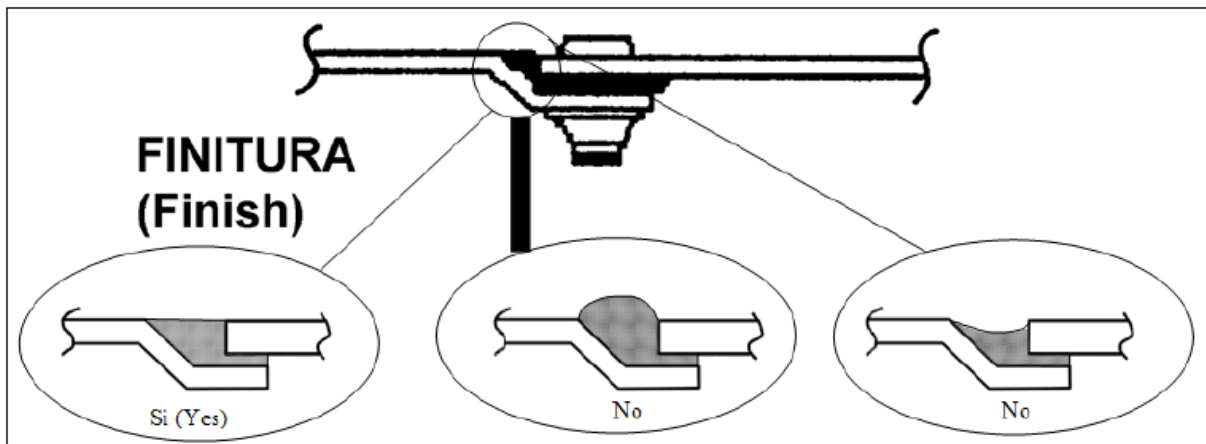


Figure 8: Final finishing of the sealing

A.2.5 Method IV – Fasteners sealing

Rivets, blind rivet and Hi-Lok

- a) For “WET” installation of RIVETS, BLIND RIVETS and HI-LOK, dip fastener into TYPE 1C or TYPE 3 sealant (high temperature areas) before installation (Figure 12) and install it with sealant still wet.
- b) During riveting protect eyes from possible sealant splashes with suitable protective glasses.
- c) Clean sealant in excess from the affected area with Methyl Ethyl Ketone.

NOTE:

This procedure shall be applied to all connections between frames or outside panels and inside parts, as well as for all connections between carbon and aluminium alloy (or similar) parts.

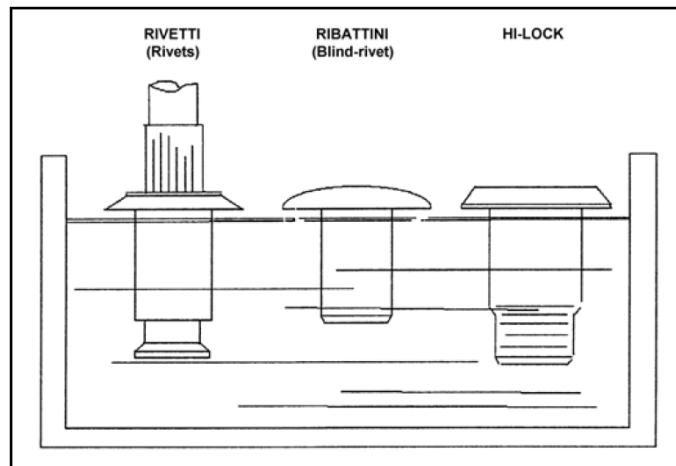


Figure 12: Wet sealing

Bolts

- a) Prepare surfaces to seal and mix sealing compound (refer to paragraphs A.2.1, A.2.2 and A.2.3). If necessary, protect surface not subject to sealing with protective self-adhesive tape.
- b) Apply sealant as indicated in Figure 13 with a pressure gun or syringe and eventually spread it with a wood or plexiglass spatula.

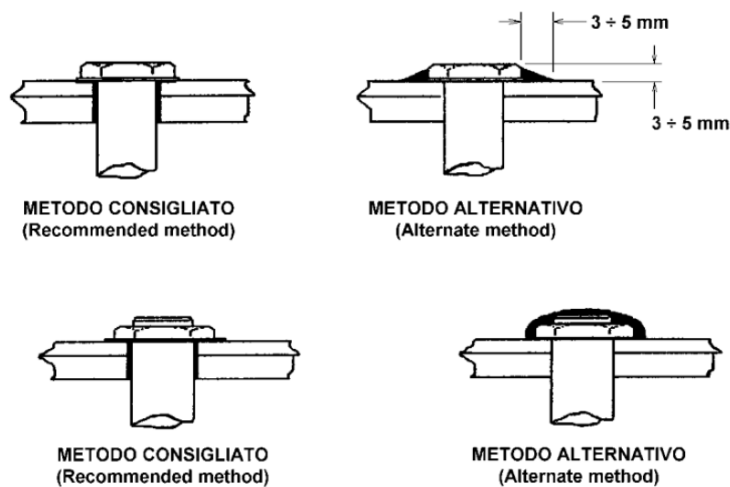


Figure 13: Bolt sealing

Nut, cap; nut, blind rivet

- Prepare surfaces to seal and mix sealing compound (refer to paragraphs A.2.1, A.2.2 and A.2.3). If necessary, protect surface not subject to sealing with protective self-adhesive tape.
- Apply sealant with a pressure gun or syringe and eventually spread it with a wood or plexiglass spatula.
- Install nut or rivet-nut and perform the peripheral bead as shown in Figure 14 and Figure 15.

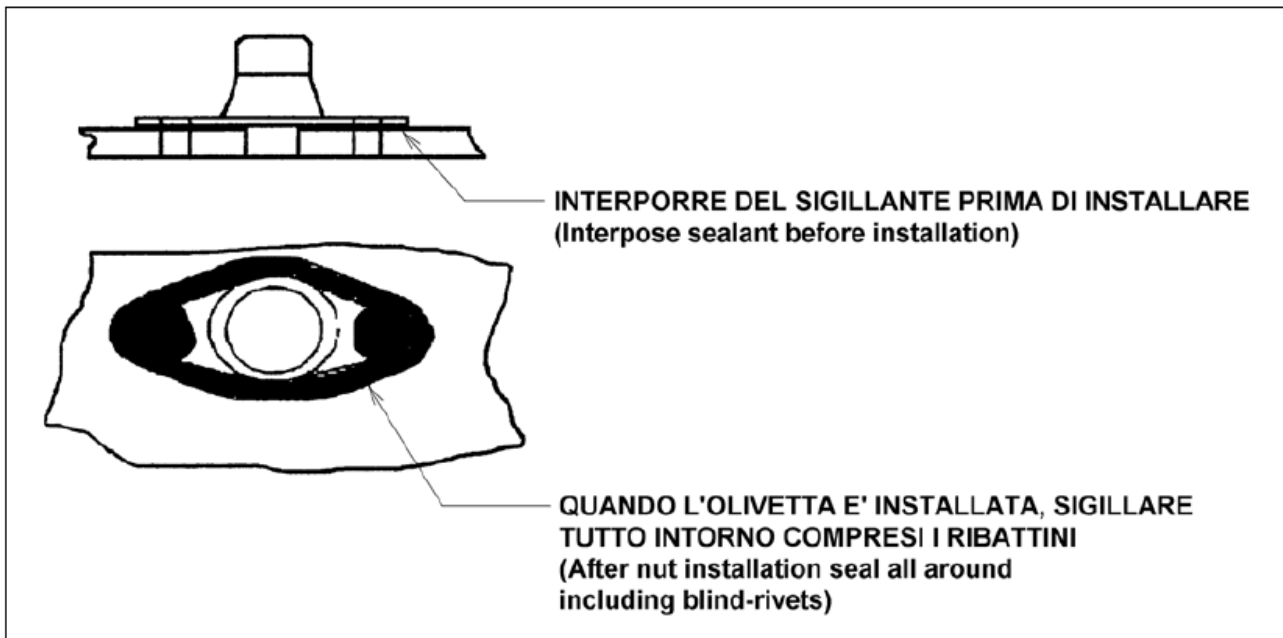


Figure 14:Anchor nut sealing

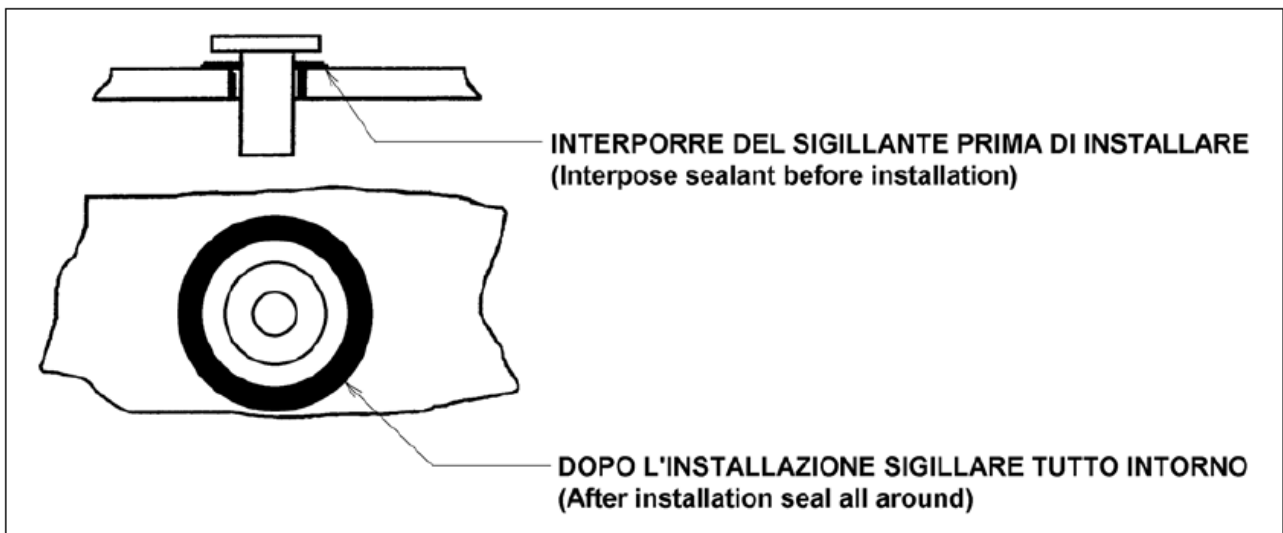


Figure 15: Rivet nut sealing