Temporary Maintenance Instruction
TMI109-415 Rev. H

Plate fitting P/N 109-0330-17- Replacement

A109E / A109S / AW109SP – AW109SP-REGA / A119 / AW119MKII / A109LUH / A109LUHS / A109LUHN / A109LUHNZ / A109LUHAP / A109LUHAG / A109LOH

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: December 31th, 2022.

2021-01-28

Introduction

The purpose of this TMI is to provide the procedure for the Plate fitting P/N 109-0330-17 (LH and/or RH) replacement. The information reported in this TMI will not be embodied within the helicopter Technical Publication.

Revision H of this TMI is published in order to extend the expiration date.

Plate fitting 109-0330-17 – Replacement

Table of contents

List of tables

List of figures

References

Table 1 References

Data Module	Title
0B-A-07-11-00-00A-000A-A (1)	Helicopter - Lift on jacks – General
0B-A-08-21-00-00A-000A-A (1)	Helicopter - Level procedure – General
0B-A-63-21-00-00A-520A-A (1)	Main transmission assembly - Remove procedures
0B-B-51-51-00-00A-010A-S (1)	Riveted structures - General data
CSRP-A-51-42-00-00A-720A-D (1)	Potted blind-type inserts - Install procedures
0B-B-51-71-01-00A-010A-S (1)	Polyamide epoxy primer - General data

(1) Valid for AW109SP / SP REGA – For other models refer to the applicable MM section.

Preliminary requirements

Required conditions

Table 2 Required conditions

Condition	Data Module/Technical Publication
The main transmission must be removed from the helicopter	0B-A-63-21-00-00A-520A-A (1)
The helicopter must be on the jacks	0B-A-07-11-00-00A-000A-A (1)
The helicopter must be leveled	0B-A-08-21-00-00A-000A-A (1)
The passengers' cabin ceiling liners must be removed	N/A (1)

(1) Valid for AW109SP / SP REGA – For other models refer to the applicable MM section.

Support equipment

Table 3 Support equipment

Nomenclature	Identification No.	Alternative Identification No.	Qty
1. Tool set	109G5333G01-101	(refer to Figure 1)	1
1A. Anti-torque plate or equivalent AW approved	AS-3A-014-001	109-0402-28, rework as shown in Figure 1	1
1B. Reamer guide	N/A	Manufacture as shown in Figure 1 (9310 or X53 steel carburized)	4
1C. Special bolt	AS-3A-014-004	Manufacture as shown in Figure 1 and starting from bolt NAS6612D56	2
1D. Bolt	AS-3A-014-006	NAS6208-29	4
1E. UNF28 Tap	Local supply	1	
1F. Pusher Assy	AS-3A-014-003	-	1
2. Non-metallic spatula	Local supply	-	1
3. Digital level	Local supply	-	1
4. Screw	MS35207-XX (Length in accordance, see step 7.)	-	1

Supplies

Table 4 Supplies

Nomenclature	Identification No.	Qty
1. Epoxy polyamide primer (*)	MIL-PRF-23377, Type I Class C	A.R.
2. Cleaning solvent (*)	MIL-PRF-680, Type II	A.R.
3. Adhesive (*)	199-05-002, Type II Class 2 / EA934NA	A.R.
4. Sealing compound (*)	199-05-004, Type II Class B2 / AMS-S-8802 / Proseal 890 B2	A.R.
5. Sealing compound (*)	PR1428 class B / MIL-S-8784	A.R.
6. Chemical conversion coating (*)	MIL-DTL-81706, Class 1A / Alodine 1200	A.R.

Spares

Table 5 Spares

Nomenclature	Identification No.	Qty
1. Plate fitting	109-0330-17-107A1 (LH) (not for A119 / AW119MKIII)	1
	109-0330-17-107 (LH) (not for A119 / AW119MKIII)	ALT (*)
	109-0330-17-105A1 (LH) (only for A119 / AW119MKII)	1
	109-0330-17-105 (LH) (only for A119/AW119MKII)	ALT (*)
	109-0330-17-108 (RH) (not for A119 / AW119MKIII)	ALT (*)
	109-0330-17-106A1 (RH) (only for A119/AW119MKII)	1
	109-0330-17-106 (RH) (only for A119/AW119MKII)	ALT (*)
	109-0330-17-113 (LH) (not for the A119/AW119MKII)	1(*)(**)
	109-0330-17-113M01 (LH) (not for the A119/AW119MKII)	ALT (**)
	109-0330-17-114 (RH) (not for the A119/AW119MKII)	1(*)(**)
	109-0330-17-114M01 (RH) (not for the A119/AW119MKII)	ALT (**)
	109-0330-17-115 (LH) (only for the A119/AW119MKII)	1(*)(**)
	109-0330-17-115M01 (LH) (only for the A119/AW119MKII)	ALT (**)
	109-0330-17-116 (RH) (only for the A119/AW119MKII)	1(*)(**)
	109-0330-17-116M01 (RH) (only for the A119/AW119MKII)	ALT (**)
2. Bushing	999-0050-02-247	2 (for each fitting)
3. Hi-lok pin	HL20PB-6-6	4(****)
4. Hi-lok pin	HL20PB-6-8	6(****)
5. Hi-lok pin	HL20PB-6-9	8(***)
6. Hi-lok pin	HL20-PB-6-10	12(***)
7. Hi-lok pin	HL20PB-8-6	4(****)
8. Hi-lok pin	HL20PB-8-9	8(***)
9. Hi-lok collar	HL86PB-6	AR
10. Hi-lok collar	HL86PB-8	AR
11. Rivet	MS20470AD5	A.R.
12. Rivet	MS20470DD6 (or alternative MS20470E6)	A.R.
13. Rivet	MS20615-5M	A.R

14.	Rivet	MS20615-6M	A.R.
15.	Rivet	NAS1738B4-3 (or alternative NAS9301B)	A.R.
16.	Rivet	NAS1738B5-4 (or alternative NAS9301B)	A.R.
17.	Rivet	NAS1738B5-5 (or alternative NAS9301B)	A.R.
18.	Rivet	NAS1738B5-6 (or alternative NAS9301B)	A.R.
19.	Rivet	NAS1739B4-3 (or alternative NAS9304B)	A.R.
20.	Rivet	NAS1739B4-4 (or alternative NAS9304B)	A.R.
21.	Rivet	NAS1739B5-5 (or alternative NAS9304B)	A.R.
22.	Rivet	NAS1739B5-6 (or alternative NAS9304B)	A.R.
23.	Insert	NAS1832-3-3	1

(*) Part provided with no pilot holes
(**)Intermixing of Plate Fittings P/N 109-0330-17-113/-114/-115/-116 with Plate Fittings P/N 109-0330-17-105/-106/-107/-108 is not allowed. When utilizing Plate Fittings P/N 109-0330-17-113/-114/-115/-116, the opposite side plate must also be changed with applicable Plate Fitting P/N 109-0330-17-113/-114/-115/-116.
(***) Only required if installing Plate Fitting P/N 109-0330-17-113/-114/-115/-116
(****)Only required if installing Plate Fitting P/N 109-0330-17-105/-106/-107/-108

Safety conditions

WARNING

THE CONSUMABLE MATERIALS IDENTIFIED BY "(*)" ARE DANGEROUS MATERIALS.
BEFORE USE, MAKE SURE TO KNOW:

- THE SAFETY PRECAUTIONS AND FIRST AID INSTRUCTIONS PRINTED ON THE LABEL ON THE CONTAINER THE MATERIAL WAS SUPPLIED IN.
- THE SAFETY PRECAUTIONS AND FIRST AID INSTRUCTIONS ON THE MATERIAL SAFETY DATA SHEET.
- THE LOCAL SAFETY REGULATIONS.

ALSO MAKE SURE THAT THE APPLICABLE FIRST AID MATERIALS ARE AVAILABLE.

Procedure

NOTE: (1) Valid for AW109SP / SP REGA – For other models refer to the applicable MM.

NOTE: Do step 1.a. thru 1.c. that follow only if a reworked anti-torque plate 109-0402-28 is used as template**.** If an AW approved tool set is available go to step 2.

1. Prepare tool set (Support equipment Ref. 1) for the plate fitting replacement as follows (see Figure 1):
   a. Drill a hole Ø 4.8 mm in the center of the anti-torque plate (Support equipment Ref. 1A) as shown in Figure 1.
   b. Drill four holes Ø 4.8 mm, as shown in Figure 1, thread using a UNF28 Tap (Support equipment Ref. 1E) and install four screws and nuts (see Detail B).
   c. Remove the bushings from the four mounting holes of the anti-torque plate and insert the reamer guide (Support equipment Ref. 1B) (See Detail A).
2. Position and install the tool set (Support equipment Ref. 1) on the two plate fittings with the bolts (Support equipment Ref. 1D), inserting them from the lower side (cabin side), and four nuts.
3. Countermark the central reference hole (Figure 1) of the tool set (Support equipment Ref. 1) in the underlying panel.
4. Remove the tool set (Support equipment Ref. 1) with the four bolts (Support equipment Ref. 1D).
5. In accordance with the procedures included in the CSRP (Ref. CSRP-A-51-42-00-00A-720A-D) (1) install on the cabin roof panel No. 1 insert P/N NAS1832-3-3 (Spare Ref. 23).
6. Reinstall the tool set (Support equipment Ref. 1) and secure with bolts (Support equipment Ref. 1D) and nuts. Tighten the four nuts between 17.0 and 22.6 Nm.
7. Add a shim or shims as required (between the plate and the cabin roof panel) under the central hole of the plate in order to avoid bending of the plate itself, then insert a screw (Support equipment Ref. 4) into the central hole (see Figure 1) of the tool set (Support equipment Ref. 1) and screw into insert P/N NAS1832-3-3 installed at step 5.
8. Screw the 4 positioning screws (see detail B in Figure 1) until in contact with the cabin roof panel and tighten the four nuts to block the screw in position (If you are using the Tool Set Support Equipment Ref. 1, tighten the four knob).
9. Measure the longitudinal and lateral leveling value of the tool set (Support equipment Ref. 1) with the digital level (Support equipment Ref. 3). Record the digital level position and both leveling values (see Figure 2).
10. Remove the tool set (Support equipment Ref. 1) with the four bolts (Support equipment Ref. 1D).

CAUTION

IN CASE OF REPLACEMENT OF BOTH LH AND RH PLATE FITTINGS COMPLETE THE REPLACEMENT THE RIGHT PLATE PRIOR TO REMOVING THE LH PLATE.

NOTE: This procedure is applicable to RH/LH plate fittings.

NOTE: Intermixing of Plate Fittings P/N 109-0330-17-113/-114/-115/-116 with Plate Fittings P/N 109-0330-17-105/-106/-107/-108 is not allowed. When utilizing Plate Fittings P/N 109-0330-17-113/-114/-115/-116, the opposite side plate must also be changed with applicable Plate Fitting P/N 109-0330-17-113/-114/-115/-116 after completing the installation of the RH Plate.

NOTE: During the removal of the plate, pay attention to avoid any damage on the tail rotor control rod

11. Remove the damaged plate fitting P/N 109-0330-17 as follows:

    a. Remove the attachment hardware (Hi-Loks and rivets) of the plate fitting taking care not to enlarge the holes.

    b. Remove, with a non-metallic spatula (Support equipment Ref. 2), the plate fitting from the lower side (cabin side).

12. Remove the residual adhesive from the fitting support area and clean with cleaning solvent (Supply Ref.2).

13. Remove No. 12 screws and No. 12 washers so to remove the access door P/N 109-0330-59-129 (Helicopters A109S) P/N 109-0332-12-153 (Helicopters AW109SP / AW109SP-REGA), or P/N109-0322-10-41 (Helicopters A119/AW119MKII), (LH or RH) (see Figure 5).

14. Clean the internal part of the repair area with a vacuum cleaner.

15. Clean the repair area with a lint-free cloth soaked with cleaning solvent (Supply Ref. 2).

16. Install the access door P/N 109-0330-59-129 (Helicopters A109S), or P/N 109-0332-12-153 (Helicopters AW109SP / AW109SP-REGA), or P/N109- 0322-10-41 (Helicopters A119/AW119MKII), applying sealant compound (Supply Ref. 5) and reinstalling No. 12 screws and No. 12 washers (see Figure 5).

17. Prepare the new plate fitting (LH or RH) (Spares Ref. 1)(Figure 3) as follows:

    a. Measure the dimension "A_1 & A_2" (Figure 7) of the two mounting-pads of the removed plate fitting (Figure 3) and record the values.

NOTE: Washers may be found on the upper surface of the two mounting-pads of the removed plate fitting. In this case dimension per step above has to consider also washer thickness

    b. If the difference between (A1 & A2) is larger than 1 mm, contact AW109/AW119 Product Support Engineering.

CAUTION

IT IS ESSENTIAL TO ENSURE THE PERFECT PLANARITY ON EACH MOUNTING PADS.

NOTE: Rework tolerances are in accordance with standard machining procedures.

NOTE: Check the planarity on each pad by measuring dimension "A_1 & A_2" (Figure 7) at several locations on each pad.

c. Spot face the two mounting-pads of the new fitting, to the dimensions "A_1 & A_2" (Figure 7) previously recorded at step a.

d. Verify the correct planarity on each pad of the new fitting by measuring dimension "A_1 & A_2" (Figure 7) at several locations on each pad.

NOTE: Ream the holes to a dimension close to the maximum tolerance to facilitate the installation of the bushings.

e. Bore the two holes, of the mounting-pads of the new fitting, to the final diameter 15.862 - 15.888 mm, perpendicular to Line C on Figure 7.

NOTE: If the dimensions of "A_1 & A_2" (Figure 7) are equivalent, go to step 18.

NOTE: If the dimensions of "A_1 & A_2" (Figure 7) are not equivalent, it is necessary to mill the bottom pads in order to create a parallel plane (Line D on Figure 7).

f. Measure the difference between (A_1 & A_2) (Figure 7) on new fitting plate.

g. Calculate the value of B_1 with the following formula, $B_1 = B_2 – (A_1 - A_2)$, (Figure 7).

h. Turn the new fitting plate upside down, lay the finished face (Line C on Figure 7) flat on a level surface of the milling machine.

i. Mill the new plane (Line D on Figure 7) to the height of B_1 to make it parallel to (Line C on Figure 7).

NOTE: Remove as little material as possible, following the delta, to achieve planarity.

18. Position the tool set (Support equipment Ref. 1) at the location determined at step 9, and fix it with the central bolt (Support equipment Ref. 4) into insert P/N NAS1832-3-3 (Spares Ref. 23), and with the two bolts (Support equipment Ref. 1D) and nuts into the installed plate fitting.

19. Check that the positioning screws (see detail B in Figure 1) are in contact with the cabin roof panel (If you are using the Tool Set Support Equipment Ref. 1, tighten the four knob)..

NOTE: The digital level must be positioned at the same locations recorded at step 9.

20. Check the correct longitudinal and lateral leveling of the tool set (Support equipment Ref. 1) with the digital level (Support equipment Ref. 3) comparing the values with the ones recorded in step 9.

21. Position and fix the new plate fitting (Spares Ref. 1) with the two special bolts (Support equipment Ref. 1C) and countermark the new plate fitting (Spares Ref. 1) for the Hi-Loks and the rivets installation using existing holes.

NOTE: If the condition of holes is not suitable, use oversized rivets. Refer to the SRM – 03-14-00.

22. Remove the new plate fitting (Spares Ref. 1) with the two special bolts (Support equipment Ref. 1C).
23. Drill the new plate fitting (Spares Ref. 1) for Hi-Loks and rivets installation as shown in Figure 4.
24. Deburr holes and remove all debris and loose material.
25. Clean repair area and the new plate fitting (Spares Ref. 1) in preparation for bonding using cleaning solvent (Supply Ref. 2).
26. Apply chemical conversion coating (Supply Ref. 6) on the plate fitting area not protected by primer.
27. Position the new plate fitting (Spares Ref. 1) applying a layer of adhesive EA934NA (Supply Ref. 3) between the plate fitting and the lower structure of the fuselage.
28. Secure the new plate fitting (Spares Ref. 1) to the tool set (Support equipment Ref. 1) using the two special attachment bolts (Support equipment Ref. 1C) and nuts.

NOTE: Install fasteners while adhesive is wet.

29. Secure the new plate fitting (Spares Ref. 1) to the structure with the Hi-Loks as shown in Figure 4.
30. Loosen the nuts and check that the special bolts (Support equipment Ref. 1C) fit freely to verify proper positioning of plate fitting.
31. Loosen the two remaining nuts and the central bolt and remove the tool set (Support equipment Ref. 1).
32. Complete the installation of the new plate fitting (Spares Ref. 1) with missing rivets as shown in Figure 4.
33. Remove adhesive in excess and allow bonding to cure, 5/7 days at ambient temperature (21 - 32°C).

NOTE: Refer to CSRP-A-51-30-01-00A-030A-D Adhesives and sealants - Technical data for alternative curing and options.

NOTE: The bushing can be installed after 24h.

34. To ensure an installation without interference, cool down the new bushings (Spares Ref. 2).

NOTE: The use cold atmosphere cell at -40 °C for 12 hours is suggested.

NOTE: Make sure that the upper part of the bushing is about 0,3 - 0,5 mm below the pad level.

35. Insert one at a time the new bushings (Spares Ref. 2) in the plate fitting using suitable equipment (see Figure 4, section A-A) or use the Pusher Assy (Support equipment Ref. 1F, see Figure 6).
36. Reinstall the tool set (Support equipment Ref. 1) with the two bolts (Support equipment Ref. 1D) and nuts into the plate fitting that was not replaced.
37. Check that the transmission attachment bolts fit freely. In case of interference use a reamer with a diameter of 12.7 mm.
38. Remove the anti-torque plate (Support equipment Ref. 1) with the two bolts (Support equipment Ref. 1D).
39. Seal the upper surface of the replaced plate fitting with sealing compound (Supply Ref. 4).

40. Restore the primer (Supply Ref. 1) at the lower surface (passenger cabin side) of the replaced fitting. Refer to ASRP (0B-B-51-71-01-00A-010A-S) (1).

NOTE: If the LH plate fitting must be replaced, repeat the procedure starting from step 11 before sealing the insert.

41. Seal the insert installed in step 5. on the cab roof with sealing compound (Supply Ref. 4).

Requirements after job completion

1. Reinstall the main transmission (Ref. 0B-A-63-21-00-00A-720A-A) (1).
2. Reinstall the passenger's cabin ceiling liners.
3. Remove all the tools and other items from the work area. Make sure that the work area is clean.

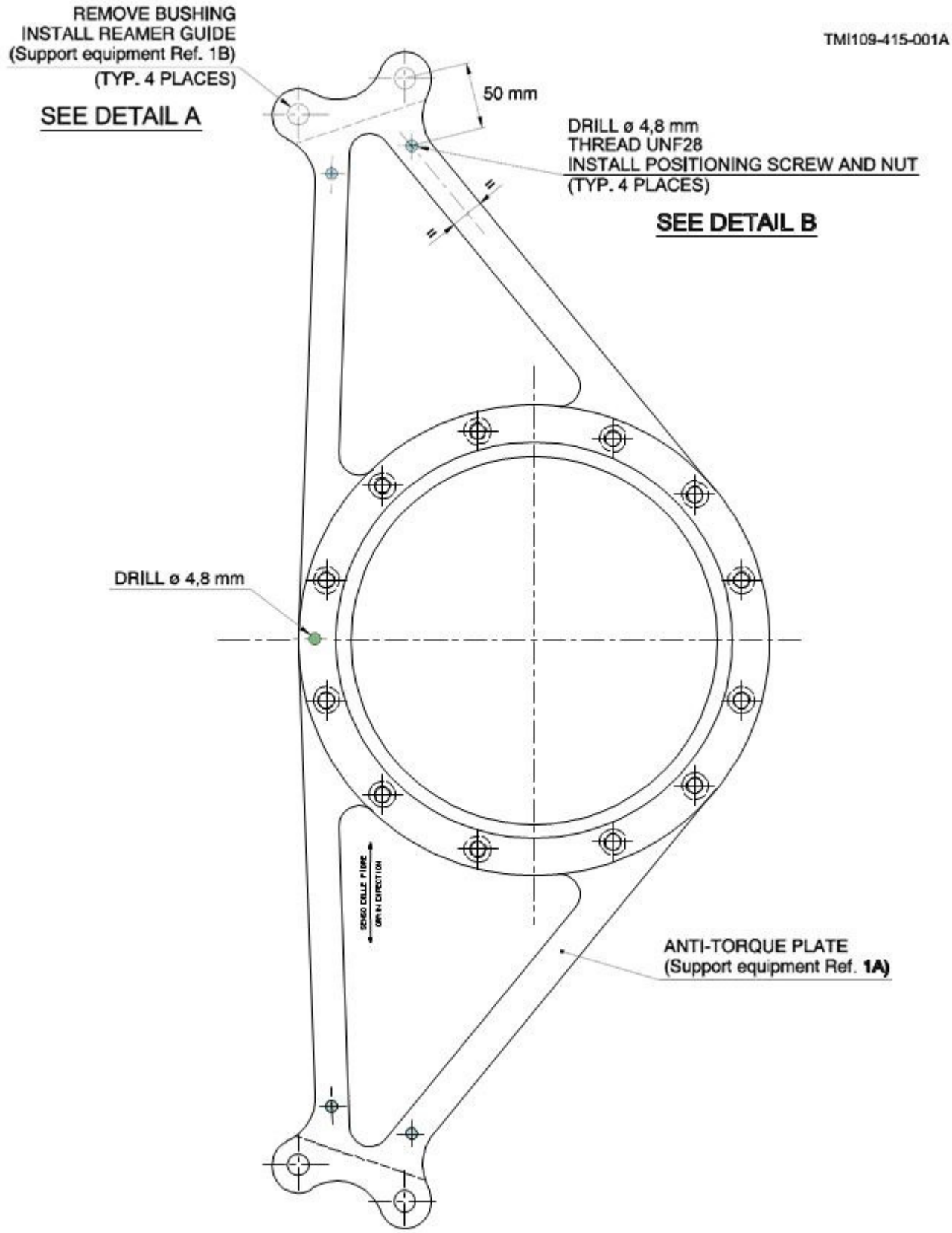

Figure 1 – Tool set (Support equipment Ref. 1) – preparing (sheet 1 of 2)

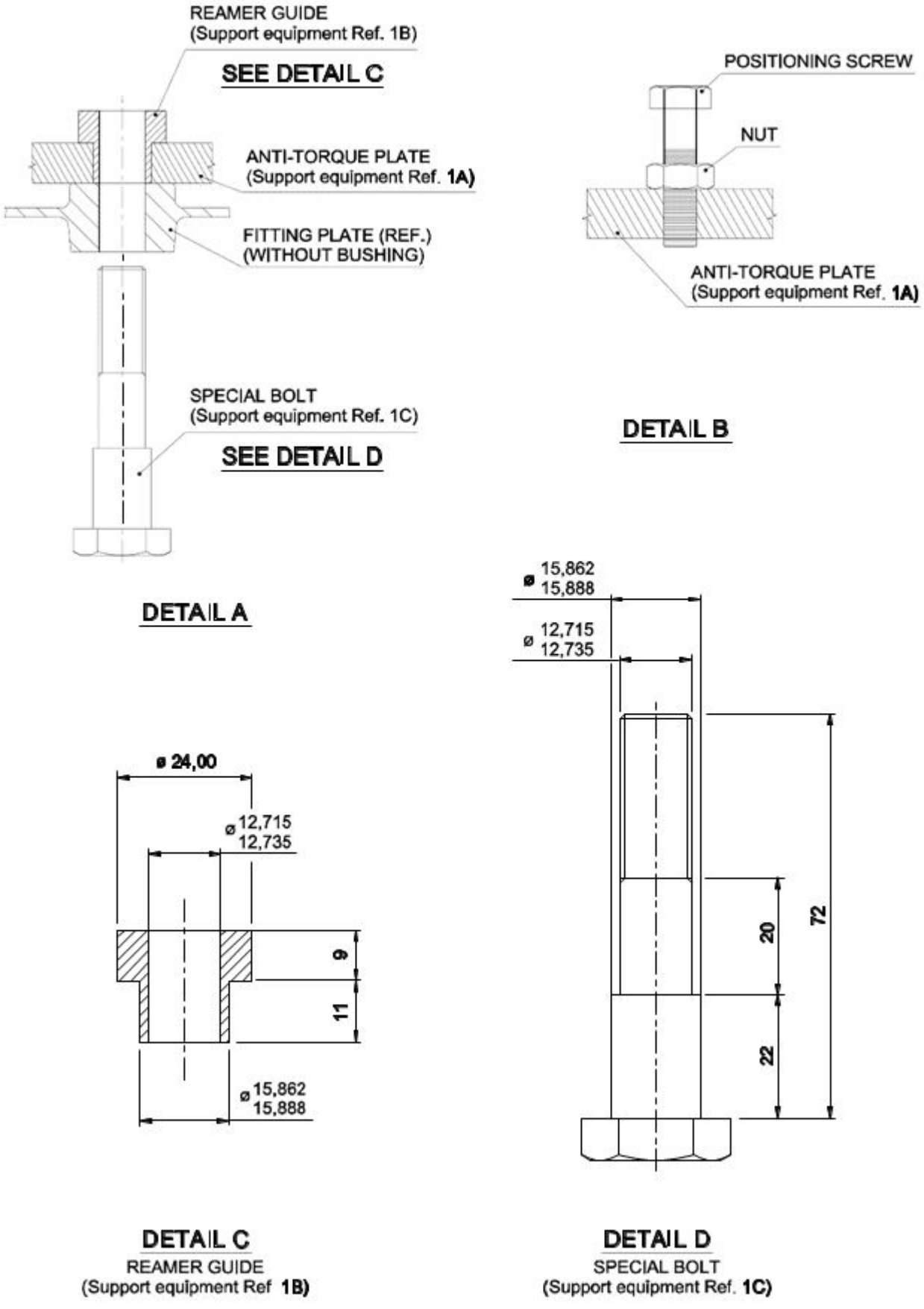

Figure 1 – Tool set (Support equipment Ref. 1) – preparing (sheet 2 of 2)

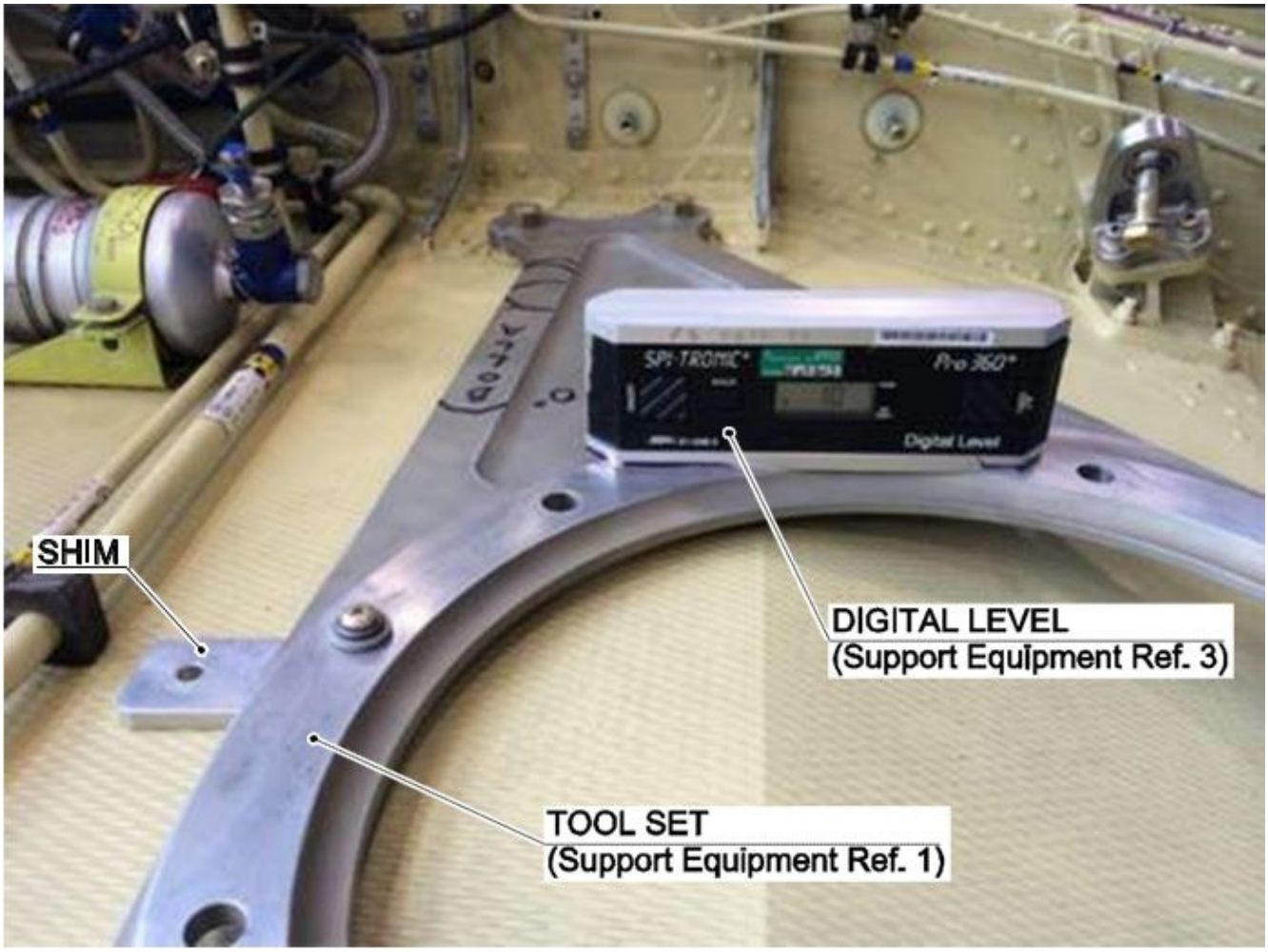

Figure 2 – Tool set (Support equipment Ref. 1) – leveling

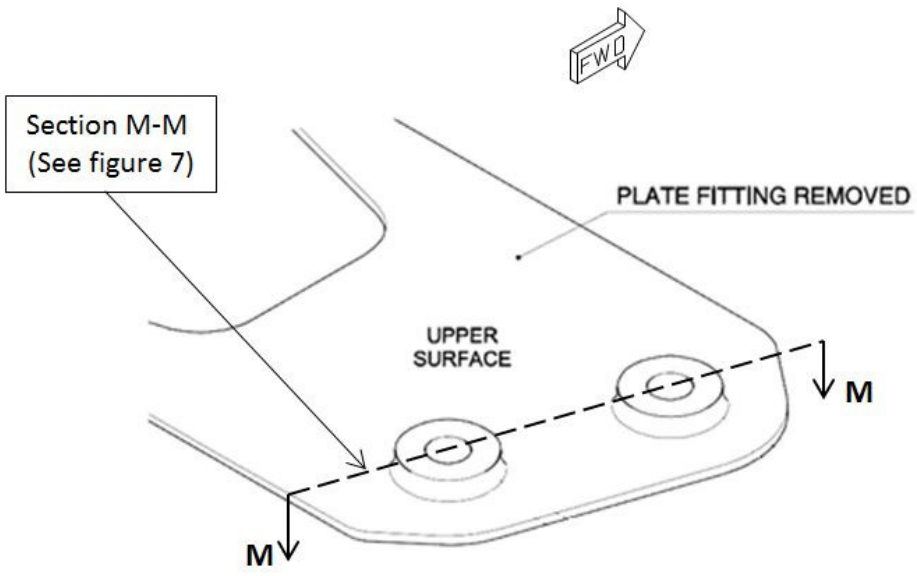

Figure 3 – Fitting Plate P/N 109-0330-17

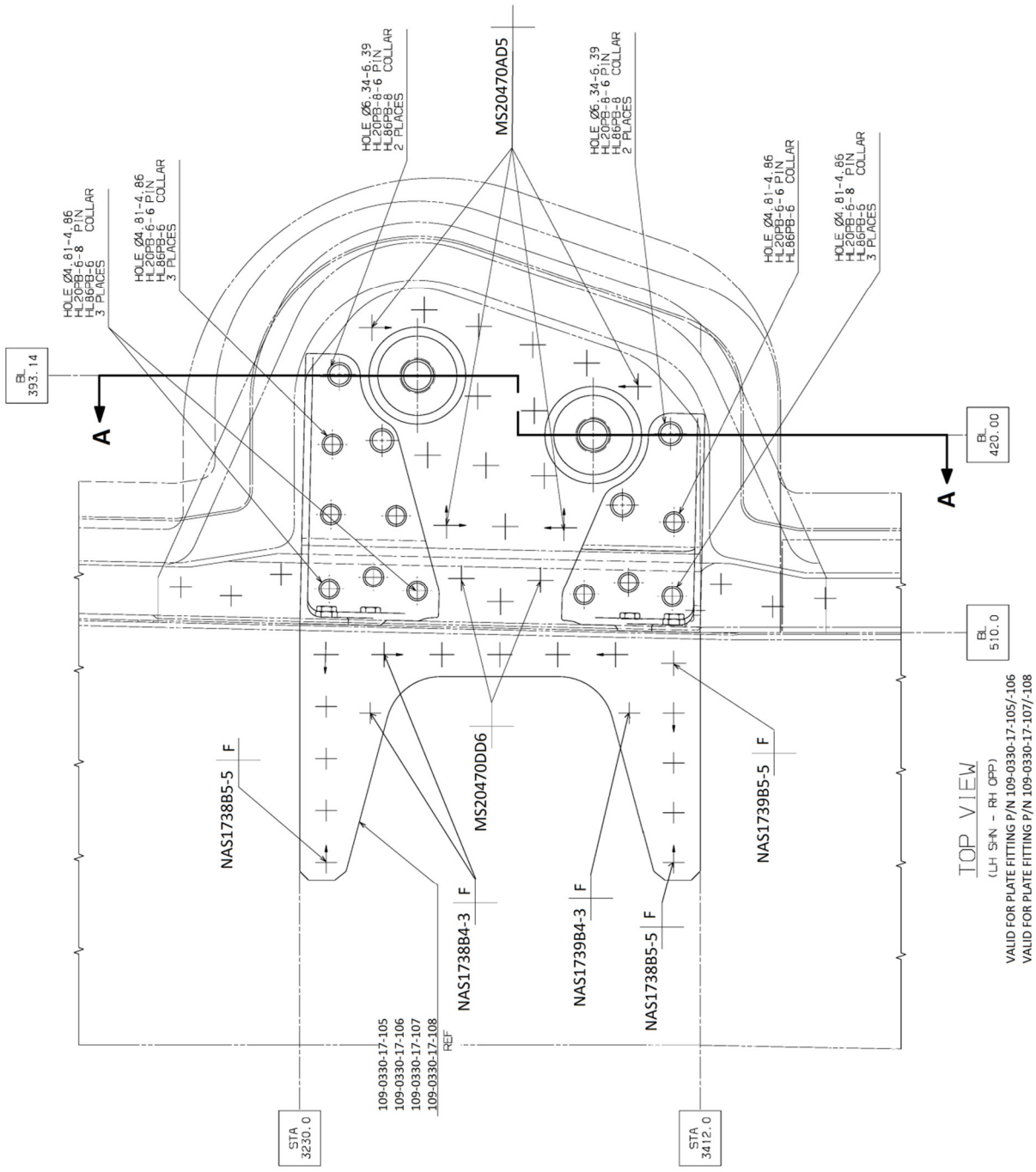

Figure 4 – Plate fitting installation (sheet 1 of 3)

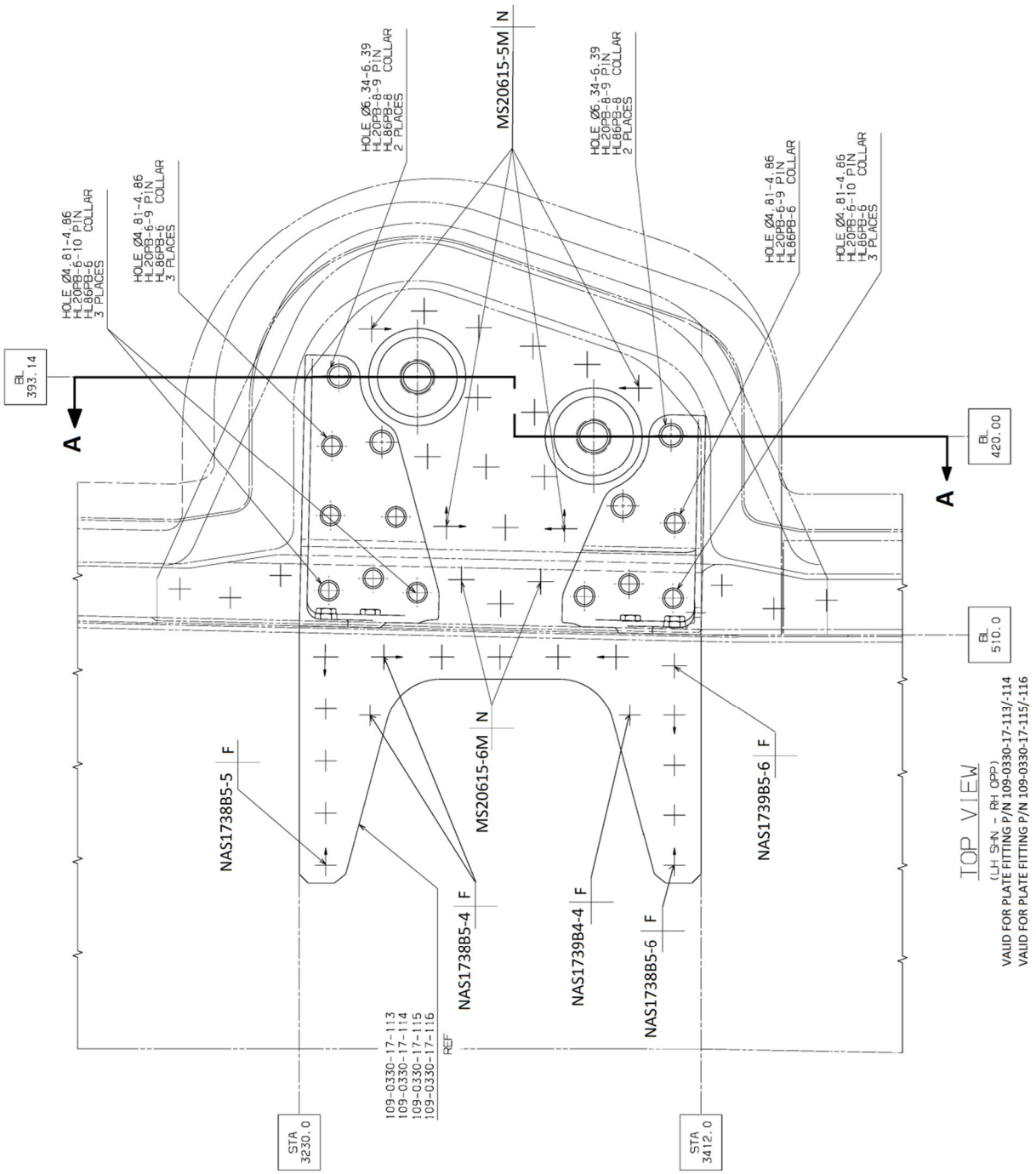

Figure 4 – Plate fitting installation (sheet 2 of 3)

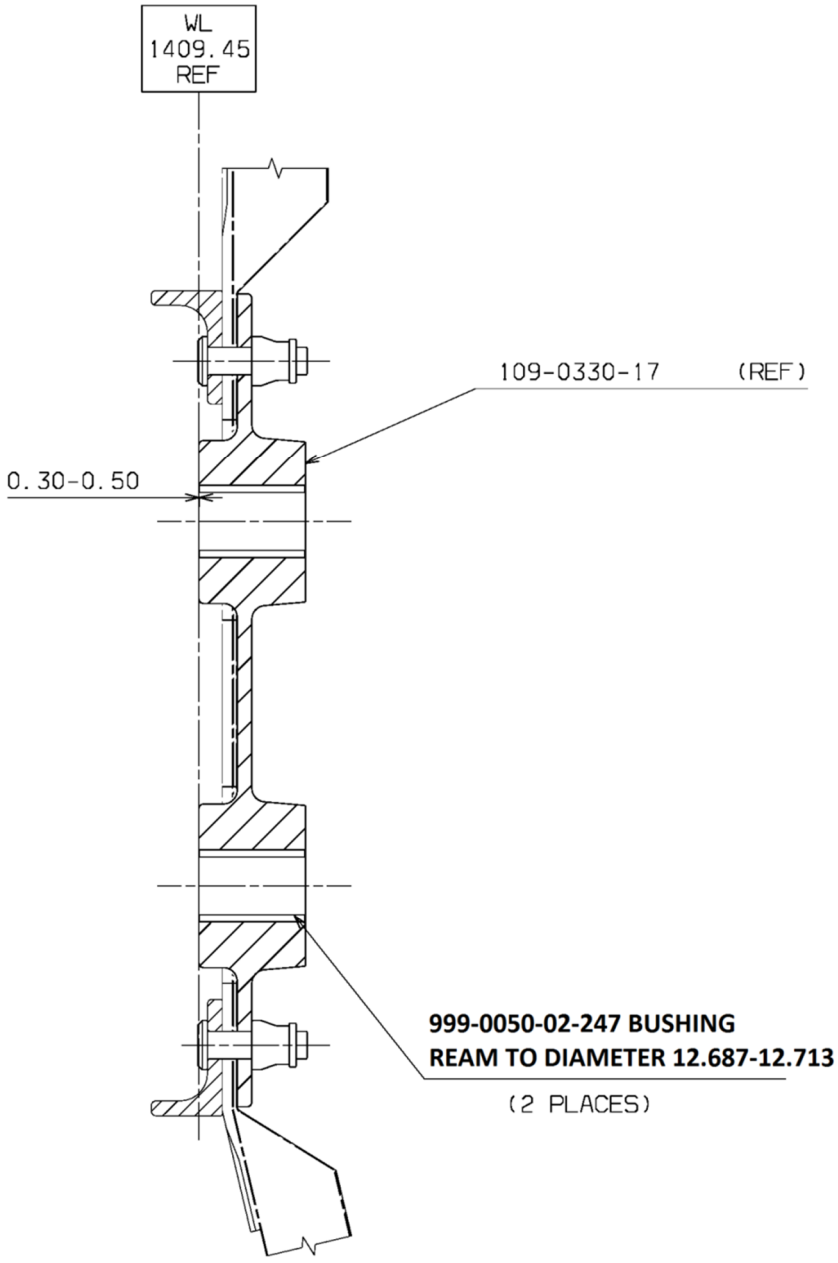

Figure 4 – Plate fitting installation (sheet 3 of 3)

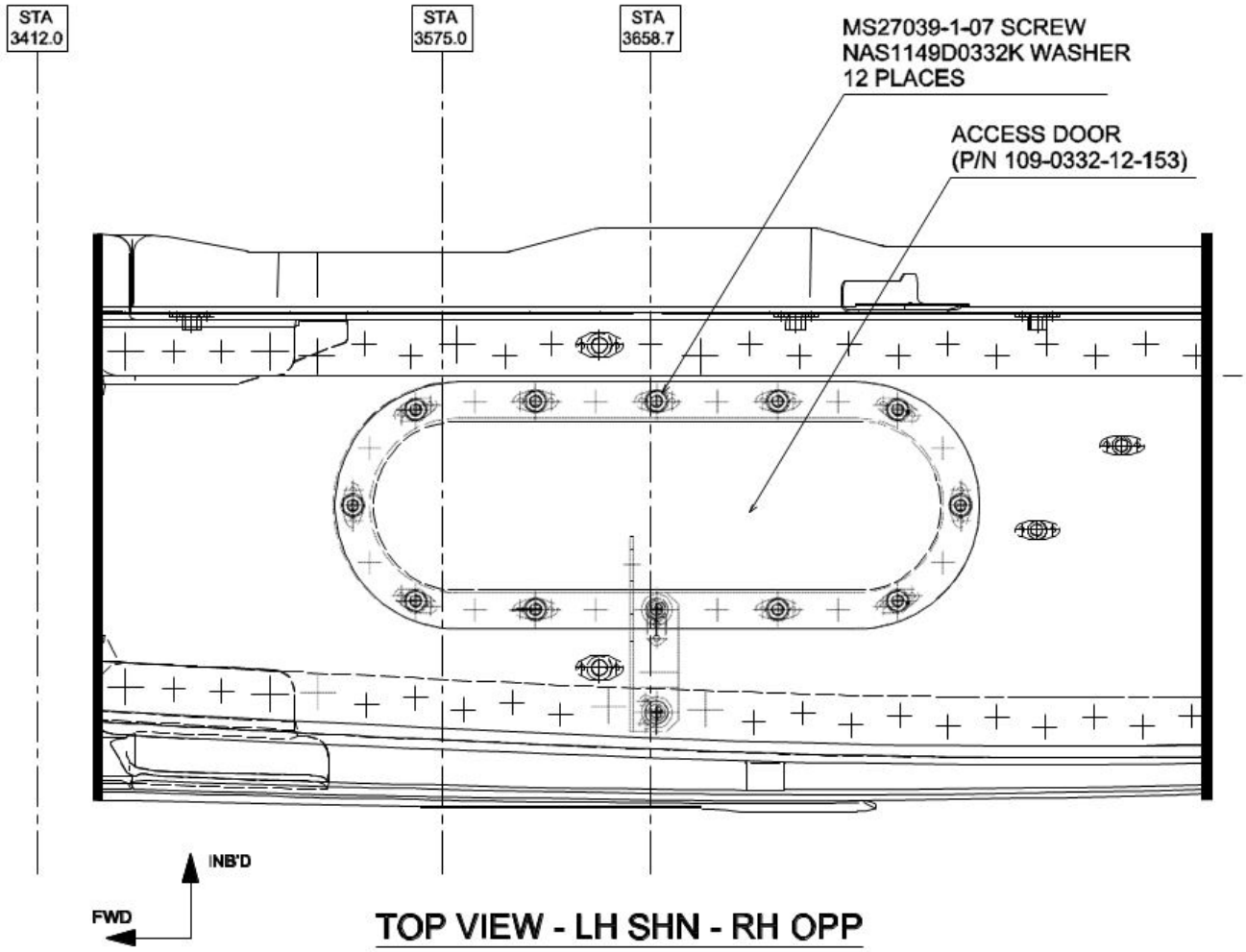

Figure 5 – Access door removal/installation

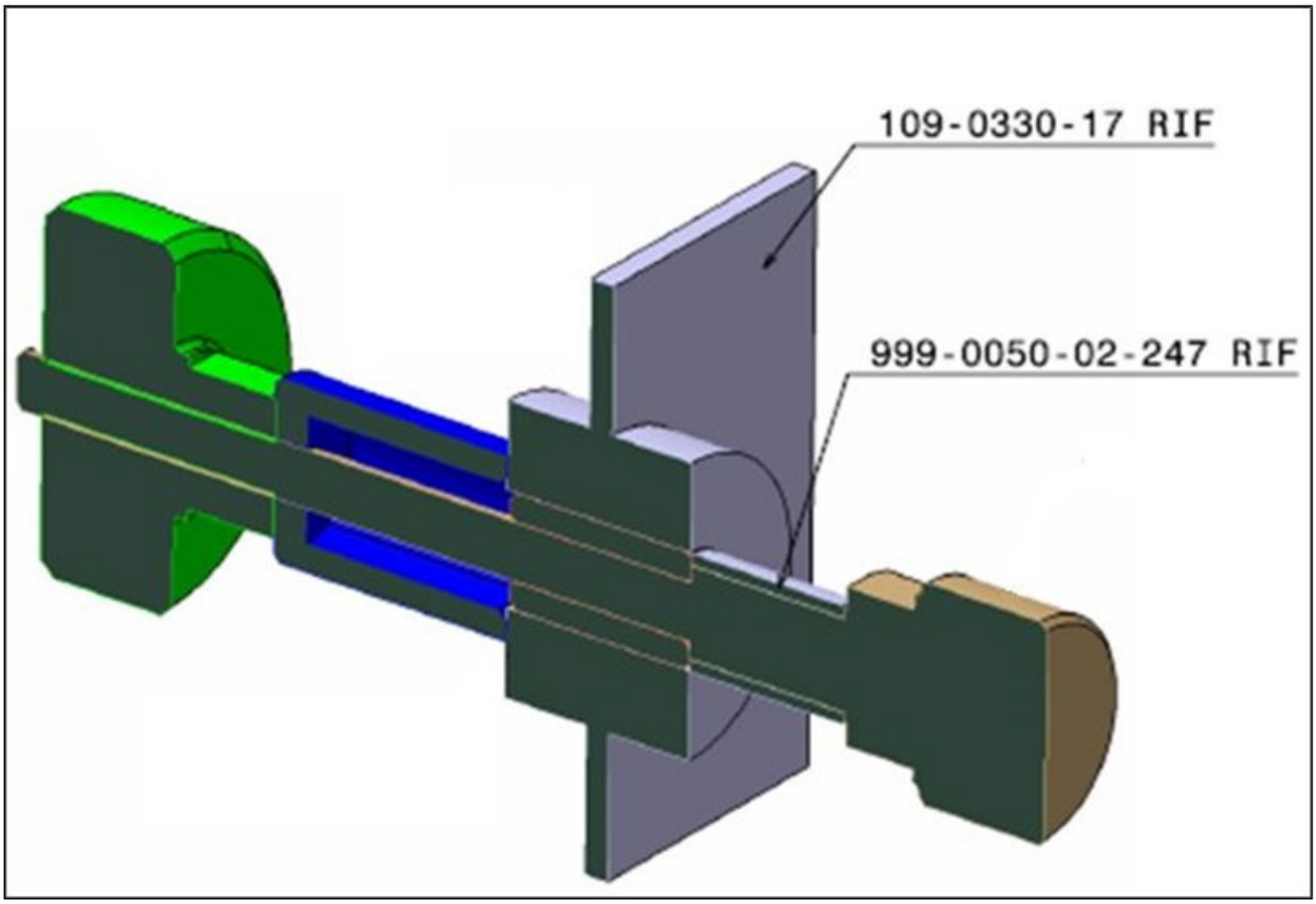

Figure 6 – AS-3A-014-003 Pusher Assy usage scheme

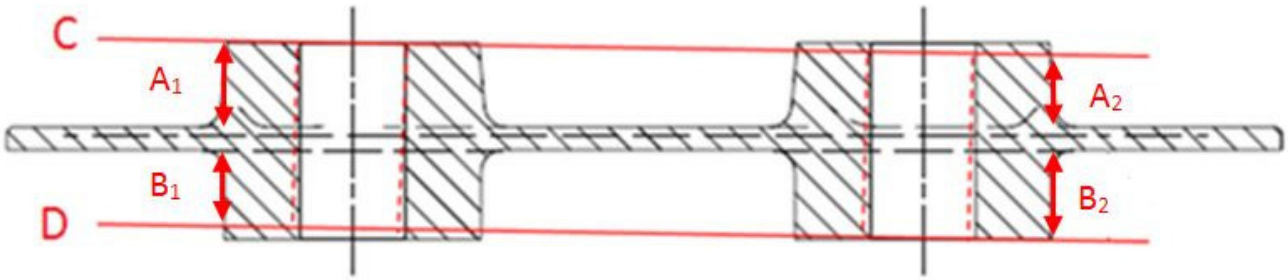

Figure 7 – Section M-M Fitting Plate P/N 109-0330-17