Temporary Maintenance Instruction
TMI 139-547

Anti-torque beam fittings (STA 5100) - Special repair procedure

All AW139 Helicopters

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: August 19th 2022.

2021-08-19

Introduction

This Temporary Maintenance Instruction describes the procedure for performing a repair on the middle reinforcement P/N 3P5333A12253.

Anti-torque beam fittings (STA 5100) - Special repair procedure

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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-00-50-00-00A-010A-D	Local supply consumables, materials and expendables - General data
39-A-53-33-10-01A-028A-D	Anti-torque beam fittings (STA 5100) - General
39-A-63-20-00-00A-520A-A	Main gearbox group - Remove procedure
CSRP-A-51-10-00-00A-028A-D	Damage assessment - General

Table 1 References

Data Module	Title
CSRP-A-51-11-02-01A-010A-D	NDI - Liquid penetrant inspection - General data
CSRP-A-51-21-00-00A-028A-D	Surface treatments - General
CSRP-A-51-21-05-00A-028A-D	Cleaning of structural parts - General
CSRP-A-51-70-00-00A-010A-D	Standard repairs - General data

Table 2 Access points

Access Panel / Door Id	Data Module
No Access Point	

Table 3 Zones

Access Panel / Door Id	Data Module
No Zones	

Preliminary Requirements

Required Conditions

Table 4 Required Conditions

Conditions	Data Module/Technical Publication
The helicopter must be safe for maintenance.	39-A-00-20-00-00A-120A-A
The main gearbox group must be removed.	39-A-63-20-00-00A-520A-A
Repairable damage: damage must be completely removed after reaming. the absence of any crack must be checked with a dye penetrant inspection.	
Applicability: All. Additional effectivity restrictions: none.	
Kit/SB/Equipment compatibility limitations: none.	
Perform a complete damage assessment before repair execution.	CSRP-A-51-10-00-00A-028A-D
The repair area shall be cleaned before repair execution.	CSRP-A-51-21-05-00A-028A-D
For deviations from the indicated repair design refer to guidelines for standard repairs or tell the Manufacturer.	CSRP-A-51-70-00-00A-010A-D

Table 4 Required Conditions

Conditions	Data Module/Technical Publication
Paint and primer shall be removed from the repair area.	CSRP-A-51-21-00-00A-028A-D

Support Equipment

Table 5 Support Equipment

Nomenclature	Identification No.	Qty
Anti-torque Plate Tool & Bushing Set	3G6330A00532A005A	1
Bushing Stop	Local supply	1
Bushing Installer	Local supply	1
Reamer (Nominal diameter 15.92 mm, Tolerances +0.005/-0.000 mm)	Local supply	1
Reamer (Nominal diameter 17.00 mm, Tolerances +0.005/-0.000 mm)	Local supply	1
Reamer (Nominal diameter 18.00 mm, Tolerances +0.005/-0.000 mm)	Local supply	1
Reamer (Nominal diameter 19.00 mm, Tolerances +0.005/-0.000 mm)	Local supply	1
Reamer (Nominal diameter 19.50 mm, Tolerances +0.005/-0.000 mm)	Local supply	1
Reamer (Nominal diameter 20.00 mm, Tolerances +0.005/-0.000 mm)	Local supply	1
Reamer guide (Nominal diameter 15.92 mm, Tolerances +0.01/-0.00 mm)	3A5330G00252	4
Reamer guide (Nominal diameter 17.01 mm, Tolerances +0.03/-0.00 mm)	3A5330G00253	1
Reamer guide (Nominal diameter 18.01 mm, Tolerances +0.03/-0.00 mm)	3A5330G00254	1
Reamer guide (Nominal diameter 19.01 mm, Tolerances +0.01/-0.00 mm)	3A5330G00255	1
Reamer guide (Nominal diameter 19.51 mm, Tolerances +0.01/-0.00 mm)	3A5330G00256	1
Reamer guide (Nominal diameter 20.01 mm, Tolerances +0.01/-0.00 mm)	3A5330G00257	1
Alignment pins	3A5330G00251	4

Supplies

Table 6 Supplies

Nomenclature	Identification No.	Qty
Abrasive pad	C015	AR

Table 6 Supplies

Nomenclature	Identification No.	Qty
Primer	C042	AR
Nitrogen	C116	AR
Conversion coating	C237	AR
Sealant	C465	AR
Alloy steel (bar - AISI 4130 AMS 6370)	Local supply	AR

Spares

Table 7 Spares

Nomenclature
No Spares

Safety Conditions

WARNING

The materials that follow are dangerous. Before you do this procedure, make sure that you know all the safety precautions and first aid instructions for these materials:

- **Primer (C042)**
- **Conversion coating (C237)**
- **Sealant (C465)**
- **Nitrogen (C116) .**

Procedure

Note

The specifications given in Figure 2 are for the local fabrication of the tools.

1 During this procedure:

- Refer to CSRP for all the processes described in this DM
- Adapt manufactured items during installation on existing structure
- Protect bare aluminium surfaces (manufactured items, sanded areas and cut edges) with Conversion coating (C237)
- Protect all manufactured items with Primer
- Round out manufactured parts/cut lines corners with 5 mm radius typ
- During cutting/sanding operations take care not to damage surrounding items
- Break sharp edges with radius 0.13 thru 0.38 mm
- Deburr new fastener holes
- Select actual fastener grip at installation

- Dip the shank of fasteners into Sealant (C465) before installation
- Rivet as indicated, if holes conditions are not suitable use oversize rivets.

Note

For the identification of the applicable damages of this data module refer to 39-A-53-33-10-01A-028A-D.

2 Manufacture the applicable components in accordance with the table that follows:

	Component	Material	Applicable figure
B1 damage	Bushing 1 (Internal Diameter 15.80 mm, Tolerances +0.05/-0.00 mm) (Outer Diameter 19.03 mm, Tolerances +0.05/-0.00 mm) (Length 20.00 mm)	Alloy steel (bar - AISI 4130 AMS 6370) (Local supply)	Figure 3
	Bushing 2 (Internal Diameter 15.80 mm, Tolerances +0.05/-0.00 mm) (Outer Diameter 19.53 mm, Tolerances +0.05/-0.00 mm) (Length 20.00 mm)	Alloy steel (bar - AISI 4130 AMS 6370) (Local supply)	
	Bushing 3 (Internal Diameter 15.80 mm, Tolerances +0.05/-0.00 mm) (Outer Diameter 20.03 mm, Tolerances +0.05/-0.00 mm) (Length 20.00 mm)	Alloy steel (bar - AISI 4130 AMS 6370) (Local supply)	

3 Install the anti-torque template, part of the Anti-torque Plate Tool & Bushing Set (3G6330A00532A005A) , to the top of the four anti-torque beam holes positions on the airframe using pins and bushings supplied with the tool (refer to Figure 1).

Note

Be careful to use proper order of reaming and maintaining perpendicularity.

4 Remove the pin from the damaged bore and the bushing guide from the working hole, leaving the remaining three installed.

5 Insert the Reamer guide (Nominal diameter 17.01 mm, Tolerances +0.03/-0.00 mm) (3A5330G00253) into the anti-torque template tool to the position of the working hole.

6 Ream the hole using the Reamer (Nominal diameter 17.00 mm, Tolerances +0.005/-0.000 mm) (Local supply) .

7 Remove the reamer guide present and insert the Reamer guide (Nominal diameter 18.01 mm, Tolerances +0.03/-0.00 mm) (3A5330G00254) .

8 Ream the hole using the Reamer (Nominal diameter 18.00 mm, Tolerances +0.005/-0.000 mm) (Local supply) .

Note

Be very careful performing the next reaming phases to not compromise the fit of the bushing. Do not remove the anti-torque template.

9 Remove the reamer guide present and insert the Reamer guide (Nominal diameter 19.01 mm, Tolerances +0.01/-0.00 mm) (3A5330G00255) .

10 Ream the hole using the Reamer (Nominal diameter 19.00 mm, Tolerances +0.005/-0.000 mm) (Local supply) .

11 If damage is still present in the bore, do as follows, otherwise go to step 13:

11.1 Remove the reamer guide present and insert the Reamer guide (Nominal diameter 19.51 mm, Tolerances +0.01/-0.00 mm) (3A5330G00256)

11.2 Ream the hole using the Reamer (Nominal diameter 19.50 mm, Tolerances +0.005/-0.000 mm) (Local supply) .

12 If damage is still present in the bore, do as follows, otherwise go to step 13:

12.1 Remove the reamer guide present and insert the Reamer guide (Nominal diameter 20.01 mm, Tolerances +0.01/-0.00 mm) (3A5330G00257)

12.2 Ream the hole using the Reamer (Nominal diameter 20.00 mm, Tolerances +0.005/-0.000 mm) (Local supply) .

13 Remove all the tools and other items from the work area.

14 Clean the bore and the work area to remove residual material.

15 Examine the cleaned bores of the anti-torque beam fittings, for surface cracks with the dye penetrant. Refer to CSRP-A-51-11-02-01A-010A-D.

16 If there is evidence of cracking, tell the Manufacturer.

17 Measure the final diameter of the hole, if the hole diameter exceeds 20.021 mm, tell the Manufacturer.

18 Install an applicable bushing stop into the barrel nut bore.

19 Select the applicable bushing (bushing 1, bushing 2 or bushing 3) with the outer diameter related to the last reamer utilized.

CAUTION

Be careful using the nitrogen needed for the process.

20 Decrease the temperature of the bushing in Nitrogen (C116) or in a cold cell to the necessary temperature.

21 Apply the Primer (C042) to the bushing seat.

22 Install the bushing in its seat with an applicable bushing installation tool.

23 Insert the Reamer guide (Nominal diameter 15.92 mm, Tolerances +0.01/-0.00 mm) (3A5330G00252) into the anti-torque template tool to the position of the working hole.

24 Ream the bushing to its final dimension using the Reamer (Nominal diameter 15.92 mm, Tolerances +0.005/-0.000 mm) (Local supply) .

25 Clean the bore and the work area to remove residual material.

26 Repeat step 4 to step 25 for any other anti-torque beam fitting's holes that still have damage.

Requirements After Job Completion

1 Remove all the tools and the other items from the work area. Make sure that the work area is clean.

2 Record the performance of this repair activity into the applicable helicopter documents. If applicable part mark DM code adjacent to repair using black ink overcoated with lacquer.

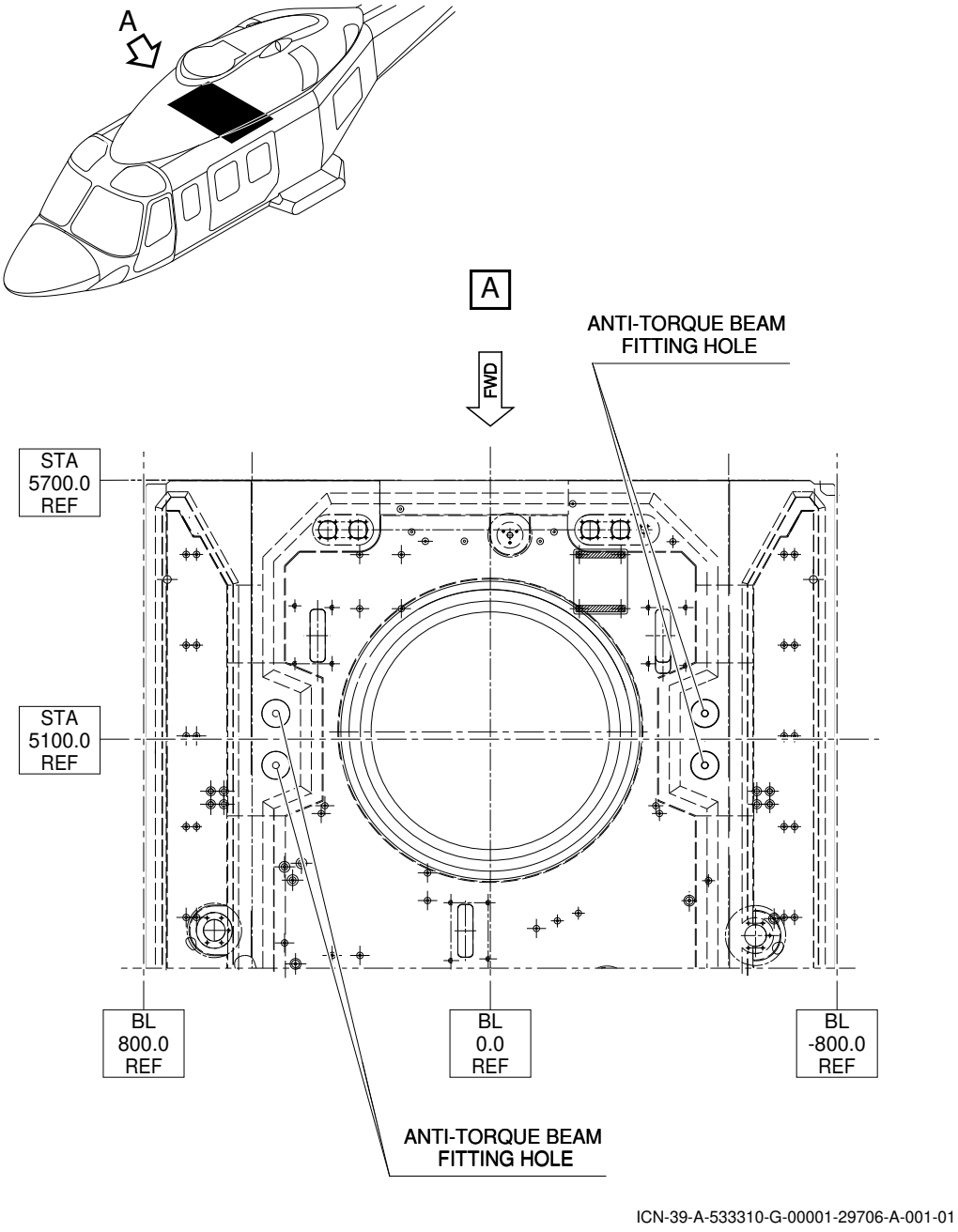
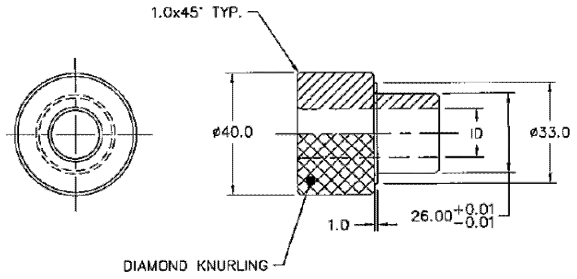


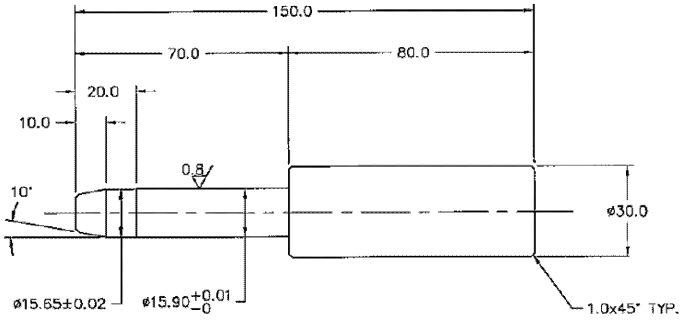
Figure 1 B1 damage - Anti-torque beam fittings (STA 5100) - Special repair procedure

REAMER GUIDE
P/N REFER TO ID TABLE
MATERIAL: STL-STEEL AISI 440C 50 [50 HRC MIN]
FINISH: NONE



ID TABLE		
P/N	ID	TOLERANCE
3A5330G00252	ø15.92	0 + .01
3A5330G00253	ø17.01	0 + .03
3A5330G00254	ø18.01	0 + .03
3A5330G00255	ø19.01	0 + .01
3A5330G00256	ø19.51	0 + .01
3A5330G00257	ø20.01	0 + .01

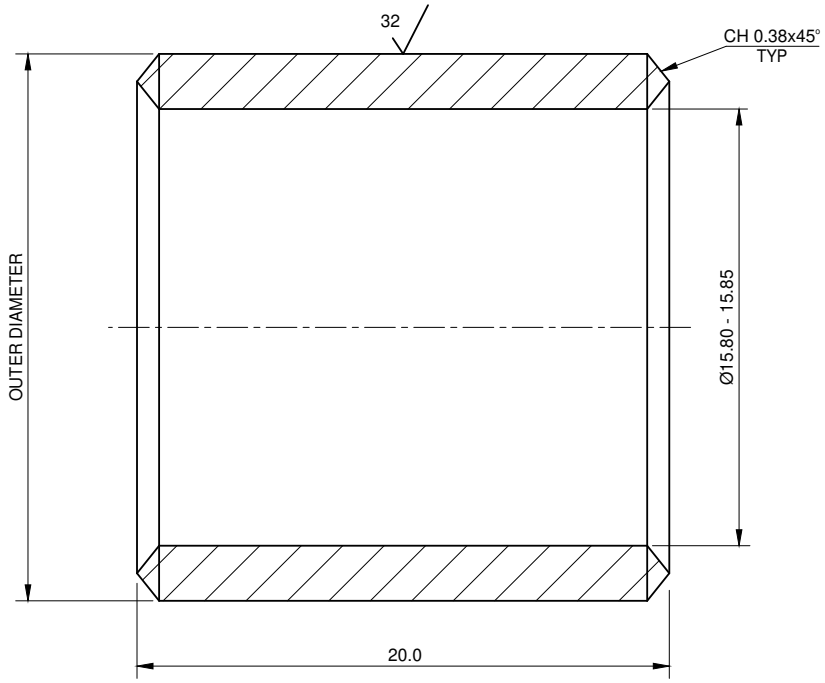
PIN
P/N 3A5330G00251
MATERIAL: STL-STEEL AISI 440C 50 [50 HRC MIN]
FINISH: NONE



DIMENSIONS ARE
IN MILLIMETERS

ICN-39-A-533310-G-00001-29703-A-001-01

Figure 2 B1 damage - Reamer guide and Alignment pin



FINISH: AMS-QQ-P-416 Type II Class 2

BUSHING

DIMENSIONS ARE
IN MILLIMETERS

ICN-39-A-533310-G-00001-29701-A-001-01

Figure 3 B1 damage - Bushing