LEONARDO HELICOPTERS

LEONARDO MALAYSIA SDN. BHD.

WORKSHEET

SERVICE ORDER :	9	0	0	2	5	5	6	6	WORKSHEET NUMBER :	2022/31763/007-12	
AIRCRAFT REGISTRATION :	9M-BGH	AIRCRAFT SERIAL NUMBER :	31763	AIRFRAME HOURS :	300:40	LANDINGS :	838				
#1 ENGINE SERIAL NO.:	PCE-KB1931	#1 ENGINE HOURS :	300:40	#2 ENGINE SERIAL NO.:	PCE-KB1885	#2 ENGINE HOURS :	300:40	APU SERIAL NO.:	N/A	APU HOURS :	N/A
CRITICAL MAINTENANCE TASK REQUIREMENT	YES		NO	K	RAISED BY :	SYAQIRA	RAISED DATE :	17-11-2022			

DESCRIPTION / WORK TO BE CARRIED OUT	CORRECTIVE ACTION TAKEN
EASA AD NO.: 2021-0121 ISSUED: 04 MAY 2021 (ASB139-609 DATE:	NOT APPLICABLE DUE TO NOT DUE YET.
DECEMBER 18, 2019) ATA 63 - MGB BEARING LOCK-NUT REPLACEMENT	
TO BE CARRIED OUT I.A.W EASA AD AND ASB ATTACHED.	
DUE @ TO BE APPLIED WITHIN 2000 LDG UPON REACHING 26000 LDG OR	
NEXT OVERHAUL	
MECHANIC SIGN	N/A / N/A

MAINTENANCE ACTIVITIES ABOVE ARE PERFORMED IN ACCORDANCE WITH: (CIRCLE THE SELECTED MODEL WHERE APPLICABLE)

AIRCRAFT MAINTENANCE MANUAL	AW189|AW169|AW139|A119|A109S/AW109SP IETP N/A ISSUE: N/A UPDATED: N/A
ENGINE MAINTENANCE MANUAL	GE CT7-2E|PW210A|PT6C-67C|PT6B-37A|PW206C/PW207C MM REV./ISSUE NO. N/A DATED: N/A
APU MAINTENANCE MANUAL	DT13-01_eAPU60-MLE 342 ISSUE NO.: N/A DATED: N/A
OTHER APPROVED MAINTENANCE DATA	EASA AD NO.: 2021-0121 ISSUED: 04 MAY 2021

INDEPENDENT INSPECTION / RE-INSPECTION I.A.W MOE 2.23

DESCRIPTION OF CRITICAL MAINTENANCE TASK REQUIREMENT AREA :

AUTHORISATION HOLDER

NAME	STAMP	SIGNATURE	DATE

INDEPENDENT INSPECTOR

NAME	STAMP	SIGNATURE	DATE

PARTS / MATERIAL USED / COMPONENT CHANGE RECORD (IF APPLICABLE)

DESCRIPTION	PART NO.	REMOVED		INSTALLED		RELEASE DOCUMENT
		SERIAL NO.	TSN/TSO	SERIAL NO.	TSN/TSO	
			N/A			

☐ ADDITIONAL PARTS / MATERIAL USED / COMPONENT CHANGE RECORD HAVE BEEN RAISED AND ATTACHED.

☐ CALIBRATED / SPECIAL TOOLS RECORD SHEET HAVE BEEN RAISED AND ATTACHED.

* CERTIFYING STAFF HAVE VERIFIED THAT ALL TOOLS, EQUIPMENT AND OTHER EXTRANEOUS PART OF MATERIALS ARE CLEARED AND ALL TASKS OR INSPECTIONS HAVE BEEN CARRIED OUT TO THE REQUIRED STANDARD. TASK HAS BEEN PERFORMED I.A.W. MAINTENANCE MANUAL SPECIFIED ABOVE.

CERTIFICATE OF RELEASE TO SERVICE

* CERTIFYING STAFF NAME	SIGNATURE	STAMP	LOCATION	DATE
S. ELGER		LOT LM	SZB	22/11/22

CAAM (MALAYSIA) AMO/2016/40 - CERTIFIES THAT THE WORK SPECIFIED, EXCEPT AS OTHERWISE SPECIFIED, WAS CARRIED OUT IN ACCORDANCE WITH CAA MALAYSIA REQUIREMENTS AND IN RESPECT TO THAT WORK THE AIRCRAFT / AIRCRAFT COMPONENT IS CONSIDERED READY FOR RELEASE TO SERVICE.

European Union Aviation Safety Agency

Airworthiness Directive

AD No.: 2021-0121

Issued: 04 May 2021

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EU) 2018/1139 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 129 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EU) 2018/1139, Article 71 exemption].

Design Approval Holder's Name:
LEONARDO S.p.A.

Type/Model designation(s):
AB139 and AW139 helicopters

Effective Date: 18 May 2021

TCDS Number(s): EASA.R.006

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA AD 2020-0011R1 dated 20 November 2020.

ATA 63 – Main Rotor Drive – Main Gearbox Bearing Lock Nut – Replacement

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Manufacturer(s):
Leonardo S.p.A. Helicopters, formerly Finmeccanica S.p.A, AgustaWestland S.p.A., Agusta S.p.A.; and AgustaWestland Philadelphia Corporation, formerly Agusta Aerospace Corporation

Applicability:
AB139 and AW139 helicopters, all serial numbers (s/n).

Definitions:
For the purpose of this AD, the following definitions apply:

Affected MGB: Main gearboxes (MGB), having a Part Number (P/N) as specified in Table 1 of this AD, except those having MGB bearing lock nuts P/N 3G6320A09152 installed.

Serviceable MGB: Any MGB that is not an affected MGB.

The ASB: Leonardo Alert Service Bulletin (ASB) 139-609.

Groups: Group 1 helicopters are those that have an affected MGB in pre-ASB 139-567 configuration installed, except Group 3 helicopters.
Group 2 helicopters are those have an affected MGB in post-ASB 139-567 configuration installed, except Group 3 helicopters.

Group 3 and Group 4 helicopters are those that have an affected MGB installed, having a P/N and s/n as specified in Appendix 1 of this AD.
Group 5 helicopters are those that do not have an affected MGB installed. A helicopter on which the MGB Log Card records the bearing lock-nut P/N 3G6320A09152 is a Group 5 helicopter.

Reason:
An occurrence was reported where, during non-destructive testing accomplished as a part of overhaul activity, a cracked MGB spherical bearing lock nut P/N 3G6320A09151 was found. The bearing lock nut, the purpose of which is to keep planetary gears in position, was installed on an MGB removed from service for its second scheduled overhaul.

This condition, if not corrected, could lead to failure of the MGB planetary gears, possibly resulting in loss of control of the helicopter.

To address this potential unsafe condition, EASA initially published AD 2019-0036 to require the removal of the MGB and replacement of MGB bearing lock nut P/N 3G6320A09151.

After that AD was issued and prompted by an additional occurrence of a cracked MGB bearing lock-nut P/N 3G6320A09151, EASA published AD 2019-0174, retaining the requirements of EASA AD 2019-0036, which was superseded, but with reduced compliance times.

After that AD was issued, Leonardo published the ASB to provide instructions for installation of an improved MGB lock nut, having P/N 3G6320A09152, which differs from P/N 3G6320A09151 by having a redesigned flange fillet reducing the stresses acting at the nut locations where cracks were found in service. The new P/N has a Retirement Life published in the applicable Maintenance Manual, 39-A-AMPI-00-P Chapter 4 (Airworthiness Limitation Section) Issue 12. Consequently, EASA issued AD 2020-0011 (later revised), partially retaining the requirements of EASA AD 2019-0174, which was superseded, to amend the compliance times and to require replacement of MGB bearing lock nuts P/N 3G6320A09151 with new P/N 3G6320A09152 lock nuts.

Since that AD was issued, it was identified that a limited number of MGBs having P/N 3G6320A00136 are also affected parts and Leonardo amended the ASB accordingly.

For the reason described above, this AD retains the requirements of EASA AD 2020-0011R1, which is superseded, and requires replacement of MGB bearing lock nuts for MGB having P/N 3G6320A00136 and s/n as listed in Appendix 1 of this AD.

Required Action(s) and Compliance Time(s):
Required as indicated, unless accomplished previously:

Table 1 – Affected MGB P/N

3G6320A00131	3G6320A00134	3G6320A22031
3G6320A00132	3G6320A00135	4G6320A00132
3G6320A00133	3G6320A00136	4G6320A00133

Replacement:

(1) Within the compliance times specified in Table 2 of this AD, as applicable to helicopter Group, remove the affected MGB from the helicopter and replace each bearing lock nut P/N 3G6320A09151 with a bearing lock nut P/N 3G6320A09152 in accordance with the instructions of the ASB.

Table 2 – MGB Bearing Lock-nut Replacement (see Note 1 of this AD)

Group	Landings	Compliance Times
1	Less than 26 000	During the next MGB overhaul after 12 February 2020 [the effective date of EASA AD 2020-0011 at original issue], or within 2 000 landings after accumulating 26 000 landings, whichever occurs first
	26 000 or more	Within 2 000 landings, or during the next MGB overhaul, whichever occurs first after 12 February 2020 [the effective date of EASA AD 2020-0011 at original issue]
2	Not applicable	Within 28 000 landings or during the next MGB overhaul, whichever occurs first after the date of embodiment of ASB 139-567
3	Not applicable	Within 28 000 landings or during the next MGB overhaul, whichever occurs first after 14 May 2018
4	Not applicable	Within 28 000 landings since MGB first installation on a helicopter or during the next MGB overhaul after the effective date of this AD, whichever occurs first

Note 1: Unless specified otherwise, the landings indicated in Table 2 of this AD are those accumulated by an affected MGB, on 12 February 2020 [the effective date of EASA AD 2020-011 at original issue], since its first installation on a helicopter.

(2) If the number of landings accumulated by an affected MGB is unknown, the number of flight hours accumulated by that MGB since its first installation on a helicopter must be multiplied by six (6) to determine the applicable compliance times in Table 1 of this AD for the actions required by paragraph (1) of this AD.

Lock Nuts Installation:

(3) From the effective date of this AD, do not mix MGB bearing lock nuts having P/N 3G6320A09151 with lock nuts having P/N 3G6320A09152 on the same MGB assembly.

MGB Installation:

(4) Installation on a helicopter of a serviceable MGB, as defined in this AD, is an acceptable method to comply with the requirements of paragraph (1) of this AD for that helicopter.

(5) Do not install an affected MGB on any helicopter, as required by paragraph (5.1) or (5.2) of this AD, as applicable.

(5.1) For Group 1, Group 2, Group 3 and Group 4 helicopters: After modification of the helicopter as required by paragraph (1) of this AD.

(5.2) For Group 5 helicopters: From the effective date of this AD.

Ref. Publications:

Leonardo S.p.A. Helicopters ASB 139-609 original issue dated 18 December 2019, or Revision A dated 13 April 2021.

Leonardo S.p.A. Helicopters ASB 139-567 original issue dated 14 February 2019, or Revision A dated 05 July 2019, or Revision B dated 18 October 2019.

The use of later approved revisions of the above-mentioned documents is acceptable for compliance with the requirements of this AD.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.

2. Based on the required actions and the compliance time, EASA have decided to issue a Final AD with Request for Comments, postponing the public consultation process until after publication.

3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.

4. Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this AD, and which may occur, or have occurred on a product, part or appliance not affected by this AD, can be reported to the EU aviation safety reporting system. This may include reporting on the same or similar components, other than those covered by the design to which this AD applies, if the same unsafe condition can exist or may develop on an aircraft with those components installed. Such components may be installed under an FAA Parts Manufacturer Approval (PMA), Supplemental Type Certificate (STC) or other modification.

5. For any question concerning the technical content of the requirements in this AD, please contact: Leonardo S.p.A. Helicopters. E-mail: engineering.support.lhd@leonardocompany.com.

Appendix 1

MGB P/N and s/n installed on Group 3 helicopters

P/N	S/N					
3G6320A00133	M23					
3G6320A00134	M6	N76	N92	P124	P129	P131
	P162	P184	Q230	Q243	Q249	R272
	V163	V21	V211	V241	V272	V281
	V384	V386	V39	V622	V96	

MGB P/N and s/n installed on Group 4 helicopters

P/N	S/N				
3G6320A00136	AW1	AW2	AW3	AW5	AW10

Leonardo S.p.A.
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Agusta Westland Products

SERVICE BULLETIN

N° 139-609

ALERT

DATE: December 18, 2019

REV. : /

TITLE

ATA 63 - MGB BEARING LOCK-NUT REPLACEMENT

REVISION LOG

First Issue

An appropriate entry should be made in the aircraft log book upon accomplishment.
If ownership of aircraft has changed, please, forward to new owner.

1. PLANNING INFORMATION

A. EFFECTIVITY

AB139/AW139 helicopters equipped with MGB P/N 3G6320A00131, P/N 3G6320A00132, P/N 3G6320A00133, P/N 3G6320A00134, P/N 3G6320A00135, P/N 4G6320A00132, P/N 4G6320A00133 or P/N 3G6320A22031 and NOT equipped with MGB bearing lock-nut P/N 3G6320A09152.

NOTE

MGB without bearing lock-nut P/N recorded on the component Log Card are affected by this Service Bulletin.

B. COMPLIANCE

- For MGB already compliant with Service Bulletin 139-567: within twenty eight thousand (28000) landings or at next overhaul, whichever occurs first, from the accomplishment date of Service Bulletin 139-567.
- For MGB having S/N listed in the following Table 1: within twenty eight thousand (28000) landings or at next overhaul, whichever occurs first, since 14 May 2018.

P/N	S/N		
3G6320A00133	M23		
3G6320A00134	M6	P124	P129
	P131	P162	P184
	Q230	Q243	Q249
	R272	V163	V21
	V211	V241	V272
	V281	V384	V386
	V39	V622	V96
	N76	N92	-

Table 1

- For MGB having S/N not listed in the above Table 1 and having logged twenty six thousand (26000) landings or more from new: within two thousand (2000) landings or at next overhaul, whichever occurs first, from the issue date of this Service Bulletin.
- For MGB having S/N not listed in the above Table 1 and having logged less than twenty six thousand (26000) landings from new: within two thousand (2000) landings upon reaching twenty six thousand (26000) landings or at next overhaul, whichever occurs first.

NOTE

If the number of landings applicable to each single MGB is not known throughout the entire service life of the MGB, the number of landings shall be calculated multiplying the MGB flight hours by a factor of six (6).

C. CONCURRENT REQUIREMENTS

This Service Bulletin cancels and supersedes Service Bulletin 139-567 Rev. B.

D. REASON

This Service Bulletin is issued to manage the one-off replacement of the MGB bearing lock-nut P/N 3G6320A09151 with MGB bearing lock-nut P/N 3G6320A09152.

E. DESCRIPTION

As a consequence of an in service issue reported during non-destructive testing of the standard overhaul activity, LHD has reviewed MGB overhaul procedures introducing the replacement of MGB lock-nut P/N 3G6320A09151 and issued Service Bulletin 139-567 to prescribe the same one-off replacement in the operating fleet.

This Service Bulletin prescribes the introduction of the new MGB bearing lock-nut P/N 3G6320A09152.

The main difference between the existing nut P/N 3G6320A09151 and the new P/N 3G6320A09152 is related to the increase in the fillet radius between the cylindrical threaded part of the component and the flanged end; this allows reduction of the local peak stress in the critical areas of the nut which were found cracked in service. The new spherical bearing lock nut P/N 3G6320A09152 will be introduced on new built MGB and will be in any case replaced on all MGBs at next Overhaul.

NOTE

Replacement of existing MGB lock-nuts P/N 3G6320A09151 with P/N 3G6320A09151 is not allowed.

NOTE

MGB lock-nut replacement procedure described in this Service Bulletin, has also been introduced in CR&OP with IETP Issue 35.

NOTE

MGB bearing lock-nut P/N 3G6320A09152 is fully interchangeable with MGB bearing lock-nut P/N 3G6320A09151, but the mixing of the current and new P/N on the same assembly is NOT allowed.

NOTE

MGB lock-nut P/N 3G6320A09152 has been classified as Critical Part, having a Retirement Life introduced in AMPI Chapter 4 Issue 12.

F. APPROVAL

The technical content of this Service Bulletin is approved under the authority of DOA nr. EASA.21.J.005. For helicopters registered under other Aviation Authorities, before applying the Service Bulletin, applicable Aviation Authority approval must be checked within Leonardo Helicopters customer portal.

EASA states mandatory compliance with inspections, modifications or technical directives and related time of compliance by means of relevant Airworthiness Directives.

If an aircraft listed in the effectivity embodies a modification or repair not LHD certified and affecting the content of this Service Bulletin, it is responsibility of the Owner/Operator to obtain a formal approval by Aviation Authority having jurisdiction on the aircraft, for any adaptation necessary before incorporation of the present Service Bulletin.

G. MANPOWER

To comply with this Service Bulletin one hundred and ninety (190) MMH are deemed necessary.

MMH are based on hands-on time and can change with personnel and facilities available.

H. WEIGHT AND BALANCE

N.A.

I. REFERENCES

1) PUBLICATIONS

DATA MODULE		DESCRIPTION	PART
DM01	39-A-00-20-00-00A-120A-A	Helicopter on ground for a safe maintenance.	-
DM02	39-A-63-20-00-00A-520A-A	Main gearbox group - Remove procedure	-
DM03	39-A-63-20-00-00A-720A-A	Main gearbox group - Install procedure	-
DM04	39-A-71-11-07-00A-520A-A	Forward sliding fairing - Remove procedure	-
DM05	39-A-71-11-07-00A-720A-A	Forward sliding fairing - Install procedure	-
DM06	39-A-63-20-00-00A-364A-A	Main gearbox group – leak check	-

2) ACRONYMS

AMDI	Aircraft Material Data Information
AMP	Aircraft Maintenance Publication
AMPI	Air vehicle maintenance planning information
CR&OP	Component Repair and Overhaul Publication
DM	Data Module
IETP	Interactive Electronic Technical Publication
ITEP	Illustrated Tools and Equipment Publication
LHD	Leonardo Helicopter Division
MGB	Main Gearbox
MMH	Maintenance Man Hours

3) ANNEX

Annex A	MGB bearing lock-nut replacement

J. PUBLICATIONS AFFECTED

N.A.

K. SOFTWARE ACCOMPLISHMENT SUMMARY

N.A.

2. MATERIAL INFORMATION

A. REQUIRED MATERIALS

1) PARTS

#	P/N	ALTERNATIVE P/N	DESCRIPTION	Q.TY	LVL	NOTE	LOG P/N
1	A259A04-06		SCREW	2		(1)	139-609L1
2	MS21043-3		NUT	12		(1)	139-609L1
3	NAS1149C0332R		WASHER	22		(1)	139-609L1
4	NAS1149D0332K		WASHER	16		(1)	139-609L1
5	3G6320V00451		LIP SEAL	1		(1)	139-609L1
6	M83248/1-174	AS3209-174	PACKING	2		(1)	139-609L1
7	A866A55803W		PACKING	2		(1)	139-609L1
8	NAS1149D0432K		WASHER	10		(1)	139-609L1
9	NAS1149C0432R		WASHER	10		(1)	139-609L1
10	MS21043-4		NUT	10		(1)	139-609L1
11	3G6320A09152		RING NUT	5		(1)	139-609L1
12	3G6320A05751	A871A0490B	SPRING	5		(1)	139-609L1
13	3G6320A21131		RETAINING PLATE	5		(1)	139-609L1
14	MS21043-5		NUT	30		(1)	139-609L1
15	NAS1149C0532R		WASHER	30		(1)	139-609L1
16	NAS1149D0532K		WASHER	22		(1)	139-609L1
17	AS3209-014		PACKING	6		(1)	139-609L1
18	AS3209-018		PACKING	8		(1)	139-609L1
19	A259A05-08		SCREW	3		(1)	139-609L1
20	NAS1802-3-20		SCREW	10		(1)	139-609L1
21	AS3209-131		O-RING	3		(1)	139-609L1
22	AS3209-121		O-RING	2		(1)	139-609L1
23	AS3209-020		O-RING	2		(1)	139-609L1
24	AS3209-011		O-RING	1		(1)	139-609L1
25	M25988/1-028		O-RING	2		(1)	139-609L1
26	M83248/1-247	AS3209-247	O-RING	1		(1)	139-609L1
27	AS3209-013		PACKING	4		(1)	139-609L1
28	MS35266-62	MS9565-05	SCREW	4		(1)	139-609L1
29	AS3208-02		PACKING	4		(1)	139-609L1

2) CONSUMABLES

The following consumable materials, or equivalent, are necessary to accomplish this Service Bulletin:

#	Spec./LHD code number	DESCRIPTION	Q.TY	NOTE	PART
30	Commercial	Linth-free cloth (C011)	AR	(2)	-
31	MIL-PRF-680, Type II	Cleaning solvent (C010) Ardrox 5503A	AR	(2)	-
32	MS20995C32	Safety wire (C014)	AR	(2)	-
33	MIL-PRF-81322F	Grease (C009)	AR	(2)	-
34	ASTM D5363	Adhesive (C029) Loctite 222	AR	(2)	-
35	AWMS05-001 Type I class B grade 2	MC-780 B 2 (C355)	AR	(2)	-
36	Commercial	Cleaner (C023) Loctite quick clean 7031	AR	(2)	-
37	Commercial	Parker "Super O-Lube" oil – Grease (C115)	AR	(2)	-
38	Commercial	Grease (C147) or SYN-TECH 3913-G1	AR	(2)	-
39	DOD-L-85734	Turbo Oil (C008)	AR	(2)	-
40	MIL-S-46163, Type II grade N	Loctite 242	AR	(2)	-

#	Spec./LHD code number	DESCRIPTION	Q.TY	NOTE	PART
41	MIL-PRF-23699G	Oil (C007)	AR	(2)	-
42	DOD-PRF-85734	Oil (C366)	AR	(2)	-
43	MIL-PRF-23699F	Oil (C548)	AR	(2)	-
44	MIL-PRF-85285 Type I	High-Solids Paint, grey, n. 16440 (C380)	AR	(2)	-
45	MIL-PRF-23377	Primer (C393)	AR	(2)	-

Refer also to AMDI for the consumable materials required to comply with the AMP DM referenced in the accomplishment instructions.

3) LOGISTIC MATRIX

In order to apply this Service Bulletin, the following Logistic P/N can be ordered in accordance with the applicable notes:

LOGISTIC P/N	Q.TY (PER HELO)	NOTE	PART
139-609L1	1	(1) (3)	-
3G6320A09152	5	(1) (4)	-

NOTE

(1) This item is required for MGB bearing lock-nut replacement procedure described in Annex A.

(2) Item to be procured as local supply.

(3) This item is NOT required for Customers who have already been provided with logistic P/N 139-567L1.

(4) This item is required only for Customers who have already been provided with logistic P/N 139-567L1.

B. SPECIAL TOOLS

The following special tools, or equivalent, are necessary to accomplish this Service Bulletin:

#	P/N	DESCRIPTION	Q.TY	NOTE	PART
46	3G6320A00231A188A	Work trolley	1	(B1)	-
47	3G6320A00231A029C	Removal tool, lip seal	1	(B1)	-
48	3G6320A00231A181C	Lifting tool, mast-planetary assembly	1	(B1)	-
49	3G6320A00231A029B	Removal tool, roller bearing	1	(B1)	-
50	3G6320A07231A188A	Work trolley, mast-planetary assembly	1	(B1) (B2)	-
51	3G6320A00231A029E	Extractor	3	(B1)	-
52	3G6320A07231A023D	Reaction tool assembly	1	(B1)	-
53	3G6320A00231A023G	Tool, upper module lip seal installation	1	(B1)	-
54	3G6320A00131A181A or 3G6305G00431	Lifting tool	1	(B1)	-
55	3G6320A00231A023M	Clamps	4	(B1)	-
56	4F6320A00231A023B	Clamps	3	(B1)	-
57	3G6320A00231A029F	Disassembly tool, planetary crown	1	(B1)	-
58	3G6320A00131A029A	Extractor tool, oil union	1	(B1)	-
59	3G6320A00231A181B	Lifting tool, upper module	4	(B1)	-
60	3G6320A00231A023D	Aligning pin	2	(B1)	-
61	3G6320A00231A181A	Lifting tool, ring gear	1	(B1)	-

#	P/N	DESCRIPTION	Q.TY	NOTE	PART
62	3G6320A00231A023C	Bearing installation tool	1	(B1)	-
63	3G0000X00533A182C	Wooden support	1	(B1)	-

Refer also to ITEP for the special tools required to comply with the AMP DM referenced in the accomplishment instructions.

SPECIAL TOOLS NOTE

(B1) This item is required for MGB bearing lock-nut replacement procedure described in Annex A.

(B2) This tool may be assembled using P/N 3G6320A07235A026A, P/N MN3-00155 and P/N MN3-00138.

C. INDUSTRY SUPPORT INFORMATION

WARRANTY: Owners/Operators who comply with the instructions of this Service Bulletin no later than the applicable date in the "Compliance" section will be eligible to receive REQUIRED MATERIALS on free of charge basis, except for Consumable Materials and Special Tools.

NOTE: Customers who fail to comply with the instructions in this Service Bulletin before the compliance date are not eligible for the aforementioned special policy.

NOTE: Customers who have already been provided with MGB bearing lock-nuts P/N 3G6320A09151 shall return these to LHD in order to receive the superseding P/N 3G6320A09152 on a free of charge basis. Contact dedicated Spares Orders administrator to arrange parts exchange.

Please Issue relevant MMIR form to your Warranty Administration Dpt.

NOTE: Please contact LHD order administration in advance from the scheduled Service Bulletin application to request the tools supplying on loan. As soon as the present Service Bulletin is implemented, the tools supplied on loan must be promptly returned to LHD.

3. ACCOMPLISHMENT INSTRUCTIONS

NOTE

Customer is requested to contact the usual Customer Support & Service Management focal point in advance from the Service Bulletin scheduled application, to request the materials and special tools and to plan the MGB bearing lock-nut replacement as described in Annex A.

GENERAL 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) Protect properly all those equipment not removed from area affected by the modification during installation 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 DM 39-A-71-11-07-00A-520A-A, remove the forward sliding fairing.
3. In accordance with AMP DM 39-A-63-20-00-00A-520A-A, remove the main gearbox.
4. Perform the MGB bearing lock-nut replacement as described in Annex A.
5. Record the compliance with this Service Bulletin on the MGB log card.
6. In accordance with AMP DM 39-A-63-20-00-00A-720A-A install the main gearbox.
7. In accordance with AMP DM 39-A-63-20-00-00A-364A-A, perform the MGB leak check. With reference to figures A2 and A4 in Annex A, pay particular attention to:
   - the junction between the upper module assembly and the main case assembly;
   - the lip seal (46).

   If no leakage is found, seal the junction line with sealing compound MC-780.
8. Protect the external surfaces with primer MIL-PRF-23377 and refinish paint, where required, applying two layers of High-Solids MIL-PRF-85285 Type I.
9. In accordance with AMP DM 39-A-71-11-07-00A-720A-A install the forward sliding

fairing.

10. Return the helicopter to flight configuration and record for compliance with this Service Bulletin on the helicopter logbook.
11. Send the attached compliance form to the following mail box:

    cse.aw139.aw@leonardocompany.com

    As an alternative, gain access to My Communications section on Leonardo WebPortal and compile the "Service Bulletin Application Communication".

ANNEX A

MGB BEARING LOCK-NUT REPLACEMENT

The following procedure describes the replacement of MGB bearing lock-nut:

NOTE

The MGB bearing lock-nut P/N 3G6320A09151 and P/N 3G6320A09152 will be referred to in this procedure as the ring nut.

1. With reference to Figure A3, cut and remove the lock wire between the check valve plug (90) and the main case assembly.
2. With reference to Figure A3, remove the check valve plug (90) and the relevant packing (91) from the main case assembly.
3. With reference to Figure A2 detail G, cut and remove the lock wire between the plug (27) and the main case assembly.
4. With reference to Figure A2 detail G, remove the plug (27) and the relevant packing (28) from the main case assembly
5. With reference to Figure A3 detail Q, cut and remove the lock wire between the oil relief valve (95) and the main case assembly.
6. With reference to Figure A3 detail Q, remove the oil relief valve (95) and the relevant packings (96) and (97) from the main case assembly.
7. With reference to Figure A2, remove the three nylon screws (26).
8. With reference to Figure A2 details A, B, C and D, remove nuts (15), washers (16), (17) and brackets (18), (19) and (20) in indicated positions.
9. Install the MGB lifting tool P/N 3G6320A00131A181A on the top of the mast.
10. Connect the lifting device to the MGB lifting tool P/N 3G6320A00131A181A.

CAUTION

Performing following step 11, the ring fixed gear, that is part of the upper module assy, will remain installed on the main case assembly.

11. Lift with precaution the upper module until it is completely disconnected from the main case assembly.
12. Put the upper module on the upper module support trolley P/N 3G6320A00231A188A and lock it using the lifting tool upper module P/N 3G6320A00231A181B.
13. Remove the ring fixed gear from the main case assembly using the tool P/N 3G6320A00231A029F.
14. Remove the oil union (21) and the four oil unions (23) from the main case assembly, using the oil union extractor tool P/N 3G6320A00131A029A.
15. With reference to Figures A1 and A4, disassemble the upper module assy as described in the following procedure:

15.1 With reference to Figure A1, remove the four oil jets (14A) and (16A), with related screws (10A), washers (11A) and O-rings (12A) and (13A).

15.2 With reference to Figure A4, using the knob of the work trolley P/N 3G6320A00231A188A, turn the upper module 180° on the work trolley.

15.3 Remove nuts (55) and washers (53) (54) from the top case and the flanged outer race of the ball bearing.

15.4 Install the mast-planetary assembly lifting tool P/N 3G6320A00231A181C on the mast-planetary assembly. Use the attaching items that are parts of the tool.

15.5 Attach the lifting device to the mast-planetary assembly lifting tool P/N 3G6320A00231A181C and slowly lift the mast-planetary assembly until the ball bearing is free from its seat.

15.6 Put the mast-planetary assembly, using the lifting device, on the mast-planetary assembly work trolley P/N 3G6320A07231A188A and fix it using the applicable clamps.

15.7 Remove the mast-planetary assembly lifting tool P/N 3G6320A00231A181C from the mast-planetary assembly.

15.8 Turn 180° the top case (50) on the work trolley P/N 3G6320A00231A188A.

15.9 Remove the two nylon screws (41), the nuts (42) and the washers (43) (44).

15.10 Remove the mast cover (45) from the top of the mast-planetary assembly with the two extractors P/N 3G6320A00231A029E.

15.11 Remove the lip seal (46) from the mast cover (45) using the tool P/N 3G6320A00231A029C.

15.12 Remove the roller bearing (48) from the top case (50) by means of tool P/N 3G6320A00231A029B.

16. With reference to Figures A5 thru A8, remove the ring nuts P/N 3G6320A09151 from the mast-planetary assembly as described in the following procedure:

16.1 Install the reaction tool P/N 3G6320A07231A023D on the work bench, using its applicable hardware or a proper vice.

16.2 Using the knob of the work trolley P/N 3G6320A07231A188A, turn the mast-planetary assembly in order to have the tip of the mast on top.

NOTE

Following step 16.3 is applicable to mast planetary assy P/N 3G6320A07235 or if main rotor oil collector variant P/N 3G6306P01611 is installed.

16.3 With reference to Figures A7 and A8, remove screws (23) and washers (24).

16.4 Remove the five retaining springs (10).

16.5 Put the mast-planetary assembly on the reaction tool assembly P/N 3G6320A07231A023D.

NOTE

Following steps 16.6 and 16.7 are not applicable to mast planetary assy P/N 3G6320A07235 or if main rotor oil collector variant P/N 3G6306P01611 is installed.

16.6 Loosen and remove the ring nut (9), using the wrench of tool P/N 3G6320A07231A023D.

16.7 Repeat steps 16.5 and 16.6 on the other four ring nut positions until you have removed all the five ring nuts.

NOTE

Following steps 16.8 thru 16.10 are applicable to mast planetary assy P/N 3G6320A07235 or if main rotor oil collector variant P/N 3G6306P01611 is installed.

CAUTION

While performing step 16.8 thru 16.9, pay attention not to damage the baffle (25).

16.8 Loosen the ring nuts (9), using the wrench of tool P/N 3G6320A07231A023D.

16.9 Put the mast planetary assy on the work trolley P/N 3G6320A07231A188A and remove the ring nuts (9) using reaction tool P/N 3G6320A07231A023D.

16.10 With reference to Figures A7 and A8, remove the retaining plates (22).

16.11 Send the ring nuts to LHD.

17. With reference to Figures A1, A2 and A4, assemble the upper module assy, using new ring nuts P/N 3G6320A09152, as described in the following procedure:

17.1 Clean the ring nuts threads and the pins (7) using loctite quick clean 703 (C023).

17.2 Apply two drops of adhesive loctite 222 (C029) on the middle side of the thread of the ring nut (9). Apply the same quantity of adhesive also on the opposite side of the thread.

NOTE

Following step 17.3 is applicable to mast planetary assy P/N 3G6320A07235 or if main rotor oil collector variant P/N 3G6306P01611 is installed.

CAUTION

Performing following step 17.3, make sure to install the retaining plate with the correct orientation, as shown in Figures A7 and A8.

17.3 With reference to Figures A7 and A8, install the retaining plate (22) inside the pin (7).

CAUTION

Performing following step 17.4, make sure that the pins (7) are positioned correctly in their seat, flush with the plate (14).

17.4 Install the ring nut (9) on the pin (7). Tighten the ring nut (9) with your hand.

17.5 Torque the ring nut (9) with the installation tool P/N 3G6320A07231A023D to the minimum torque value of the interval: 275 thru 294 Nm (203 thru 217 lbf ft).

17.6 Install the retaining spring (10) on the ring nut (9). Make sure that the tang of the retaining spring (10) engages the hole in the pin (7) correctly. If not, increase the torque (obey the given tolerance) of the ring nut (9) until you get a positive result.

17.7 Repeat steps 17.1 thru 17.6 on the other four ring nut positions until you have installed all the five ring nuts.

NOTE

Following step 17.8 is applicable to mast planetary assy P/N 3G6320A07235 or if main rotor oil collector variant P/N 3G6306P01611 is installed.

17.8 With reference to Figures A7 and A8, install the two washers (23) and the two bolts (24) on the planetary assembly (6) to attach the baffle (22) to the flange (14). Apply MIL-S-46163, Type II grade N (Loctite 242) on the screw fillets and torque to 3.2 thru 3.5 Nm.

17.9 Install on the top case, in place of the roller bearing (48), the dummy roller bearing n° 10, part of the work trolley P/N 3G6320A00231A188A.

17.10 Turn by 180° the top case (50), in order to set up for mast installation.

17.11 Install the mast-planetary assembly lifting tool P/N 3G6320A00231A181C on the mast-planetary assembly. Use the attaching items that are parts of the lifting tool.

17.12 Using the lifting device, lift the n° 8 rail of the work trolley P/N 3G6320A00231A188A on the lower side of the mast.

17.13 Tighten the two bearing aligning pins P/N 3G6320A00231A023D in their seats on the support base of the ball bearing on the top case (50).

17.14 Lift the mast-planetary assembly and put it over and centred with the

top case (50).

WARNING

BE CAREFUL WHEN YOU USE THE HEAT GUN. HOT PARTS CAN CAUSE INJURY TO THE PERSONS. ALWAYS USE APPLICABLE PROTECTIVE CLOTHING.

17.15 Use the Heat gun and increase the temperature of the top case (50) locally along the seat for the ball bearing (4) of the mast-planetary assembly. Obtain 70°÷80° C maximum.

17.16 Very carefully and slowly, put the mast-planetary assembly in the top case (50), centering the holes on the bearing flange (4) and on the oil collector (5) with the aligning pins installed on the top case(50).

17.17 Install the ball bearing (4) in the related housing of the top case (50). Make sure that the flange of the ball bearing (4) fully and correctly touches the flat surface of the top case (50).

17.18 Remove the two aligning pins.

17.19 With reference to Figure A4, safety the parts in position using nuts (55) and washers (53) and (54). Do not tighten the nuts at this time.

CAUTION

Before you continue with the subsequent procedure, make sure that all the assembled parts are at the ambient temperature.

17.20 With reference to Figure A4, with the parts at ambient temperature, torque the nuts (55) to 8.5÷10.7 Nm. (75 thru 95 lbf in) gradually and in a cross sequence.

17.21 Clean and packing (51) using Parker "Super O-Lube" oil or grease (C115).

17.22 Install the packing (51) in its groove on the top case (50).

17.23 Attach the ring gear (52) to the ring gear lifting tool P/N 3G6320A00231A181A. Use the attaching items that are parts of the lifting tool.

17.24 Connect the lifting device to the lifting tool and lift the ring gear (52).

17.25 Put the ring gear (52) in the top case (50). Align the holes in the ring gear (52) with the holes of the top case (50).

17.26 Disconnect the lifting device from the ring gear lifting tool P/N 3G6320A00231A181A and remove the lifting tool from the ring gear.

17.27 Lock the ring gear (52) to the top case with the clamps P/N 3G6320A00231A023M.

17.28 Using the knob on the work trolley P/N 3G6320A00231A188A, turn the

top case (50) 180°.

17.29 Remove mounting rail n° 8.

17.30 Using two screws (M8), remove the guide and the dummy roller bearing n° 10 from the top of the top case.

WARNING

BE CAREFUL WHEN YOU USE THE HEAT GUN. HOT PARTS CAN CAUSE INJURY TO THE PERSONS. ALWAYS USE APPLICABLE PROTECTIVE CLOTHING.

17.31 Use the Heat gun and increase the temperature of the top case (50) locally along the seat for the roller bearing (48) of the mast-planetary assembly. Obtain 70°÷80° C maximum.

17.32 Lubricate with Parker "Super O-Lube" the packing (49) and put it in position on the top case (50).

17.33 Install the roller bearing in its housing on the top case with the bearing installation tool P/N 3G6320A00231A023C. Make sure that the flange of the roller bearing (48) is against the top case (50).

CAUTION

Performing the following steps, always make sure that you do not cause damage to the lip seal (46).

- The primary cause of the failure of the lip seal is the contamination that comes from dust or particles. To prevent contamination, always be careful when you touch the lip seal. Do not use grease or oil that contains silicone.
- Lubricate the mating surfaces of the lip seal and of the gear with the Grease (C147) or SYN-TECH 3913-G1.
- Install the lip seal keeping the open side on the inner side of the MGB.

17.34 Install the lip seal (46) in the seal cover using the seal installation tool P/N 3G6320A00231A023G.

17.35 Put the mast cover (45) on the basement of the seal installation tool P/N 3G6320A00231A023G.

17.36 Push the lip seal in the seal cover using the seal installation tool (3G6320A00231A023G).

17.37 Lubricate the packing (47) with the Grease (C115).

17.38 Install the packing (47) in the related groove of the seal cover (45).

17.39 Carefully put the seal cover (45) on the mast-planetary assembly. Move the seal cover (45) down until it touches the flange of the roller bearing (48).

17.40 Attach the seal cover (45) and the roller bearing (48) to the top case (50) with washers (43), (44) and nuts (42). Torque the 12 nuts (42) to 3.8 thru 5.0 N m (34 thru 45 lbf in) gradually and in a cross sequence.

NOTE

Apply a small quantity of Grease (C009) in the holes for the two screws (41) in the top case (50).

17.41 Install the two screws (41) in their related holes in the top case (50). If necessary, adjust the length of each screw during their installation.

17.42 With reference to Figure A1, install the four oil jets (14A) and (16A), with related screws (10A), washers (11A) and O-rings (12A) and (13A).

18. With reference to Figure A2, install the upper module assembly as described in the following procedure:

18.1 Lubricate the retaining plate (22) and the two packings (24), (25) using Parker "super o-lube".

18.2 Install the two retaining plates (22) on each oil union (21) and the two packings (24) on each oil union (23).

18.3 Install the packing (25) in its seat on the main gearbox assembly.

18.4 Lubricate the teeth and the pins of the five planetary gears, the teeth of the collector gear and the bearing.

18.5 Put the oil union (21) in position in its seat on the upper side of the main case assembly (TR drive zone).

18.6 Put the four oil unions (23) in position in their seat on the upper side of the main case assembly.

18.7 Tighten the lifting tool on the main rotor mast and move the upper module assembly over the main case assembly.

NOTE

Performing following step 18.8, remove the clamps P/N 3G6320A00231A023M that fix the planetary gear to the upper module assy.

18.8 Align the upper module assembly to the main case assembly and slowly move it down until it touches the main case assembly.

CAUTION

Do not seal the junction between the upper module assembly and the main case assembly before performing the leak check of the MGB.

18.9 With reference to Figure A2, install the six brackets (18) and the brackets (19) and (20), using nuts (15) and washers (16), (17), according to details A, B, C and D. Torque the nuts to 24.5÷25.5Nm (217 thru 226 lbf in) gradually and in a cross sequence.

NOTE

Apply a small quantity of Grease (C009) in the holes for the nylon screws (26).

18.10 With reference to Figure A2, install the nylon screws (26) with an over-torque of 60° ÷ 120°.

19. With reference to Figure A3, lubricate with Parker "Super O-Lube" the packing (91) and put it on the check valve plug (90). Apply a small quantity of grease MIL-PRF-81322 on the plug fillets.
20. With reference to Figure A3, install the packing (91) and the check valve plug (90). Torque the check valve plug (90) to 29.4 thru 34.3 Nm. Safety the plug (90) to the main case assembly with the lock wire.
21. With reference to Figure A3 detail Q, lubricate with Parker "Super O-Lube" the packings (96) and (97) and put them on the oil relief valve (95). Apply a small quantity of grease MIL-PRF-81322 on the oil relief valve (95).
22. With reference to Figure A3 detail Q, install the packings (96) and (97) and the oil relief valve (95). Torque the oil relief valve (95) to 26.7 thru 31.4 Nm. Safety the valve (95) to the main case assembly with the lock wire.
23. With reference to Figure A2 detail G, lubricate with Parker "Super O-Lube" the packing (28) and put it on the plug (27). Apply a small quantity of grease MIL-PRF-81322 on the plug (27).
24. With reference to Figure A2 detail G, install the packing (28) and the plug (27). Torque the plug (27) to 4.4 thru 4.8 Nm. Safety the plug (27) to the main case assembly with the lock wire.
25. Complete the assembly as described in the following procedure:

CAUTION

Do not seal the junction between the upper module assembly and the main case assembly before performing the leak check of the MGB.

25.1 Seal with sealing compound MC-780 all the mating surfaces, except the anti-torque beam junction line and the upper module assembly-main case assembly junction line.

25.2 Seal all the washers, nuts and nylon screws.

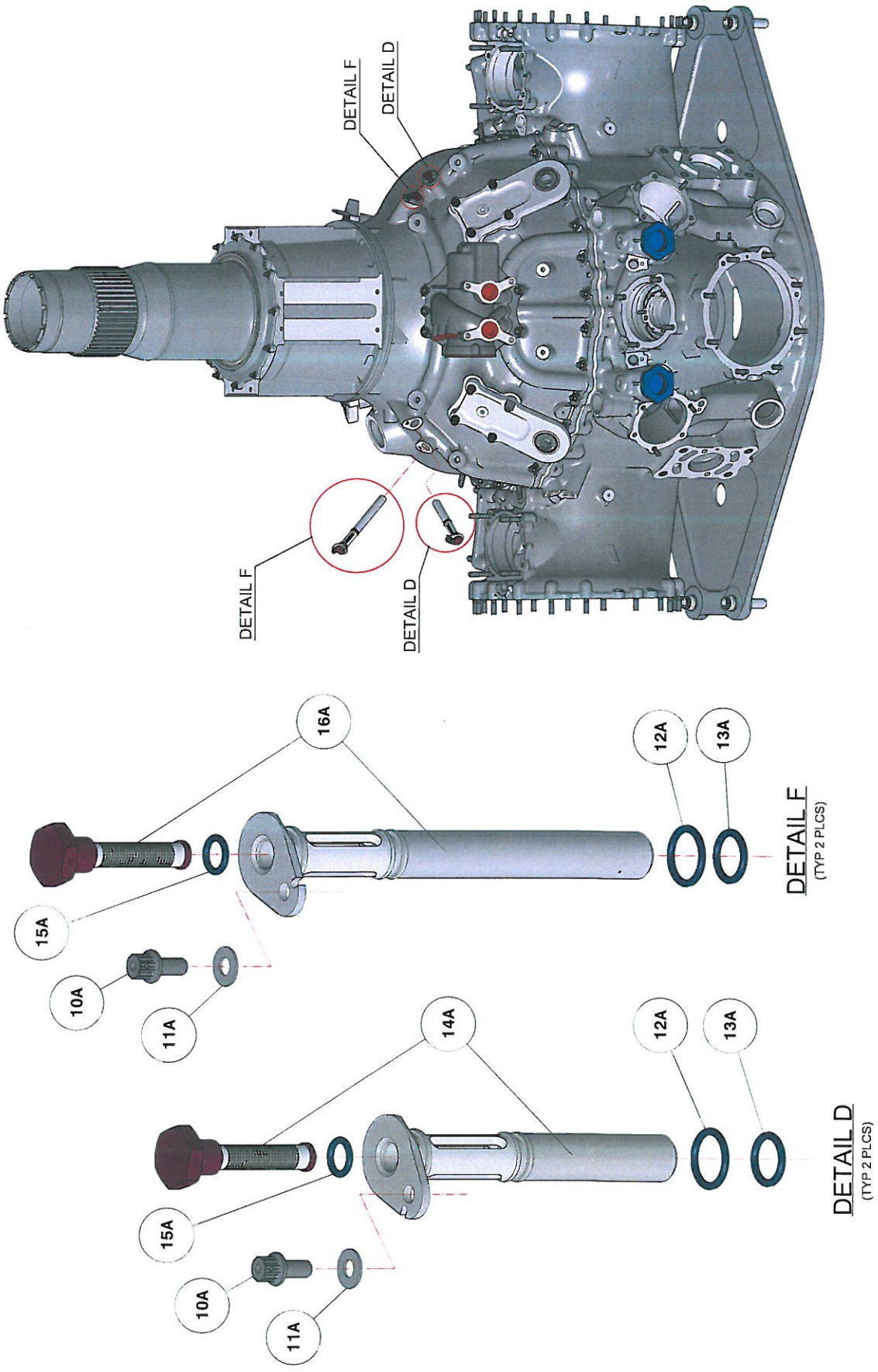

DETAIL F
DETAIL D
DETAIL F
DETAIL D
16A
12A
13A
15A
10A
11A
DETAIL F
(TYP 2 PLCS)
14A
12A
13A
15A
10A
11A
DETAIL D
(TYP 2 PLCS)

Figure A1

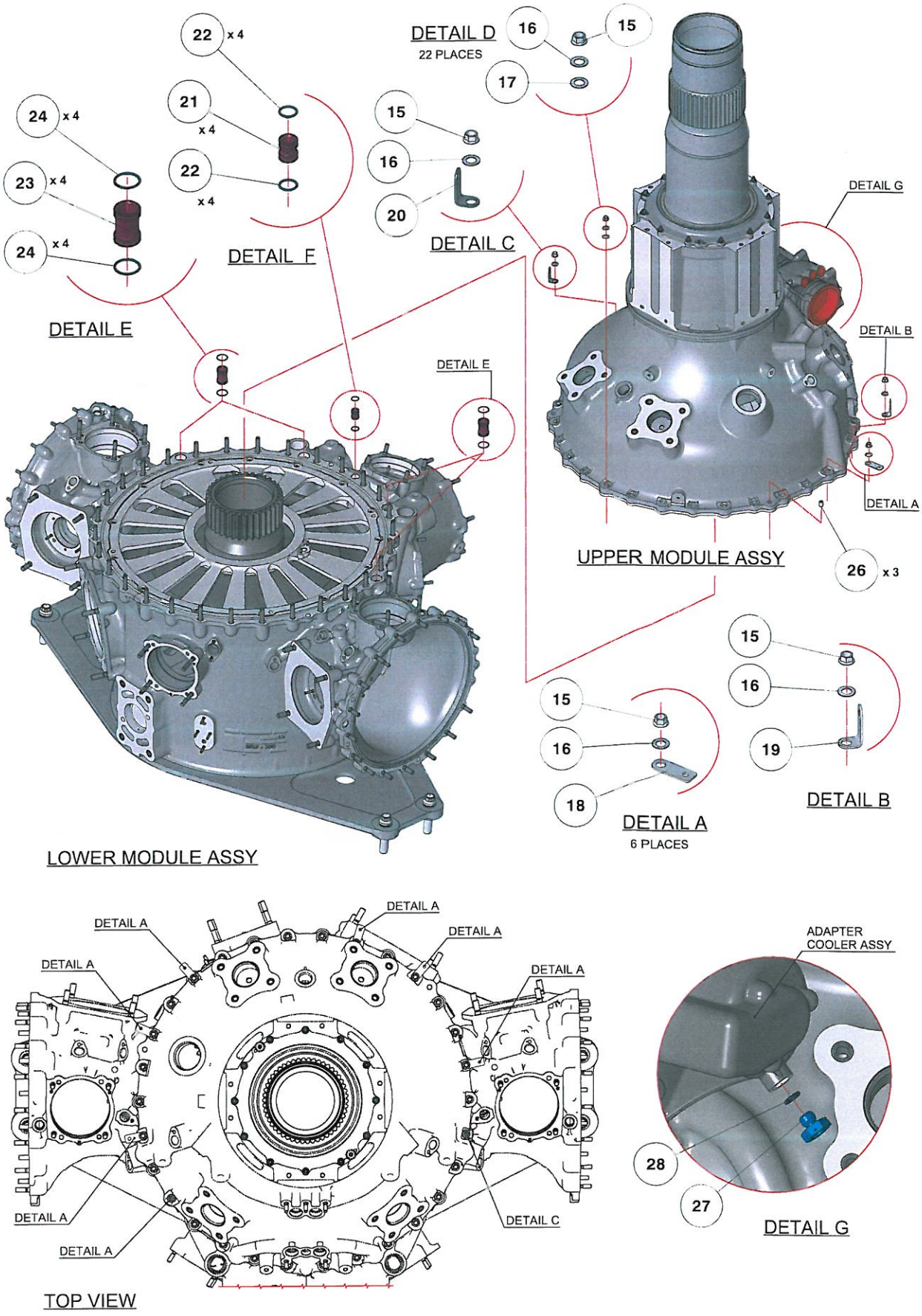

22 x 4
21 x 4
22 x 4
24 x 4
23 x 4
24 x 4
DETAIL F
DETAIL E
DETAIL D
22 PLACES
16
15
17
15
16
20
DETAIL C
DETAIL G
DETAIL B
DETAIL A
UPPER MODULE ASSY
26 x 3
DETAIL E
LOWER MODULE ASSY
15
16
18
DETAIL A
6 PLACES
15
16
19
DETAIL B
DETAIL A
DETAIL A
DETAIL A
DETAIL A
DETAIL A
DETAIL A
DETAIL C
TOP VIEW
ADAPTER
COOLER ASSY
28
27
DETAIL G

Figure A2

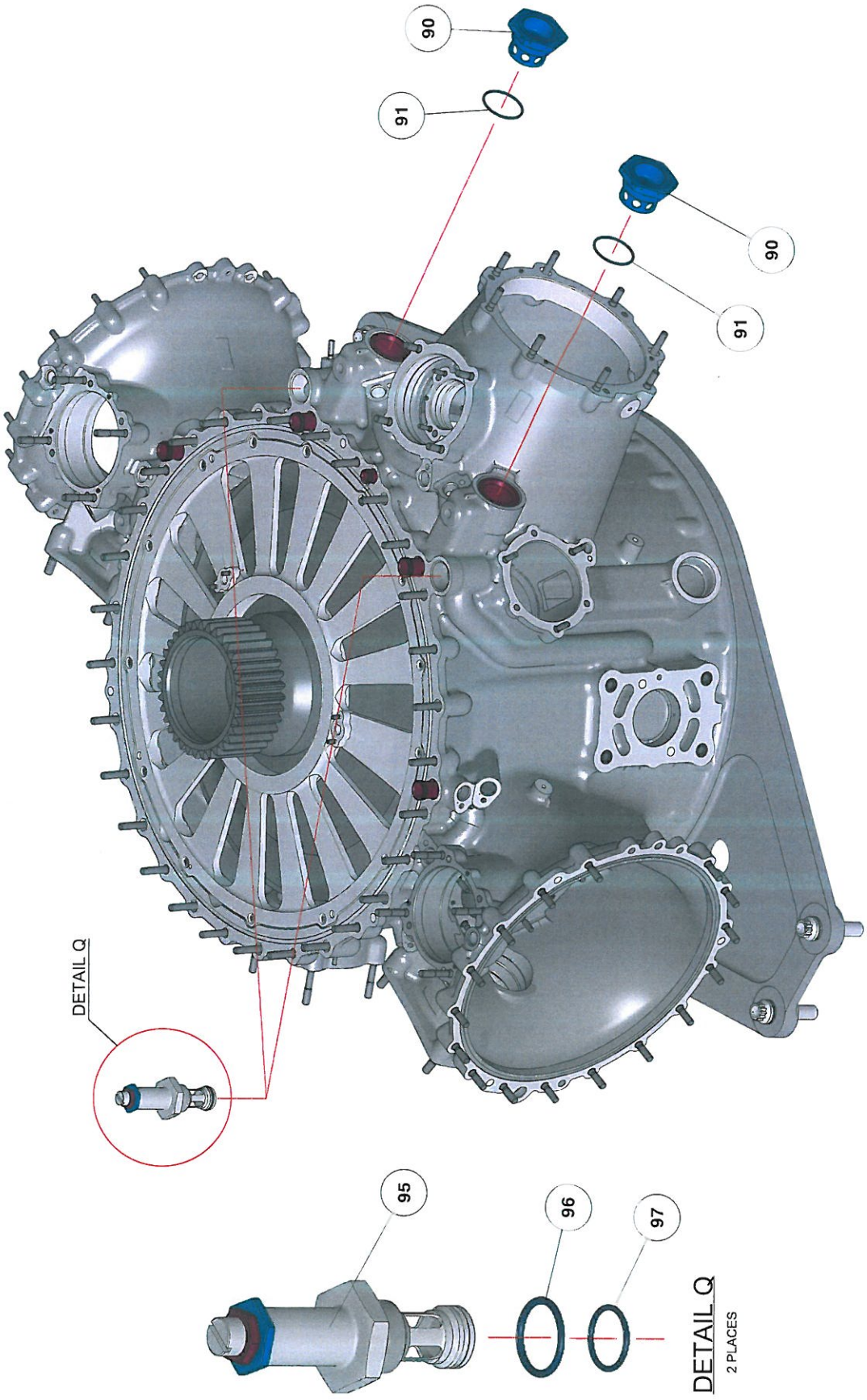


Figure A3

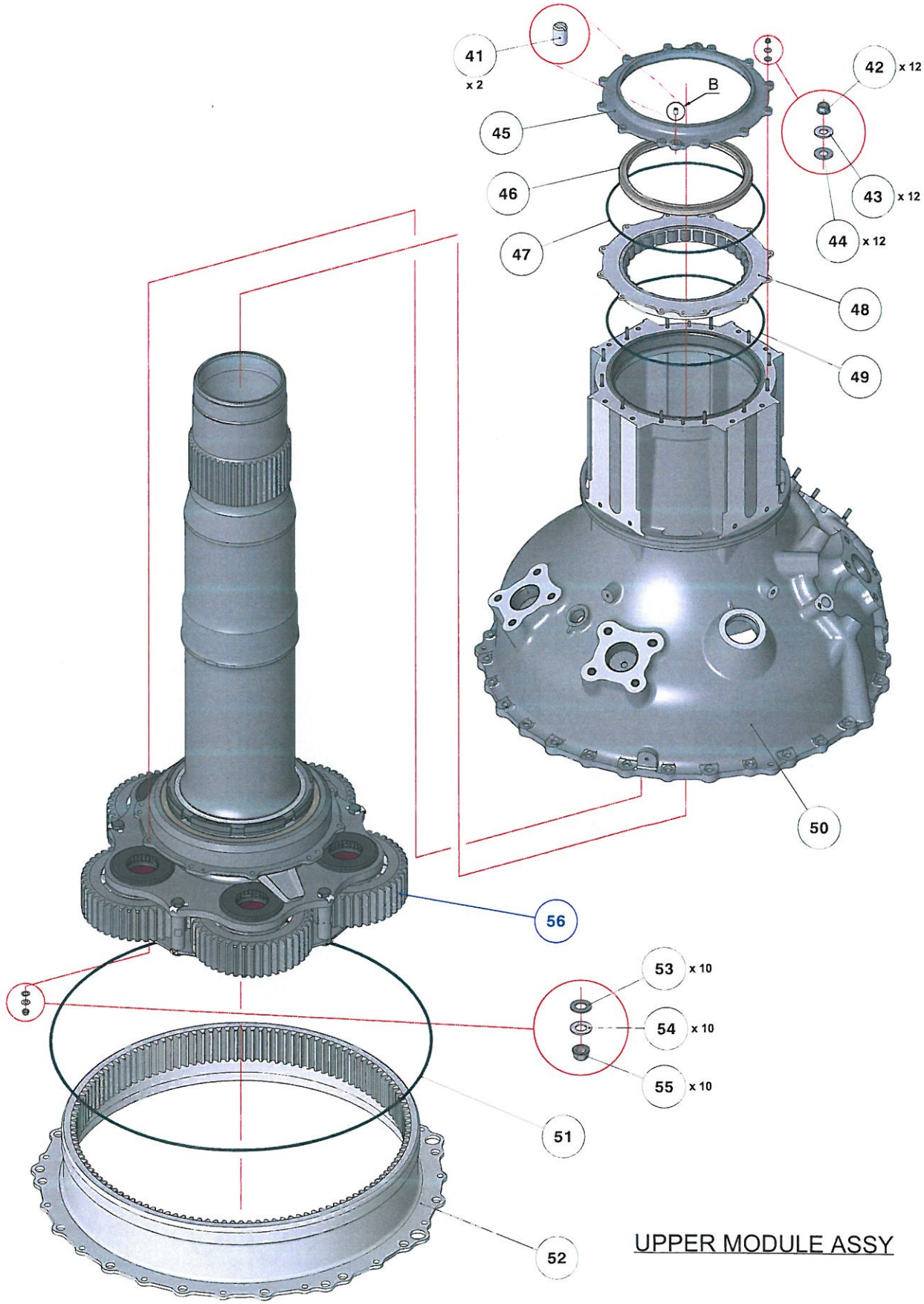

41
x 2
B
42
x 12
45
46
43
x 12
44
x 12
47
48
49
50
56
53
x 10
54
x 10
55
x 10
51
52
UPPER MODULE ASSY

Figure A4

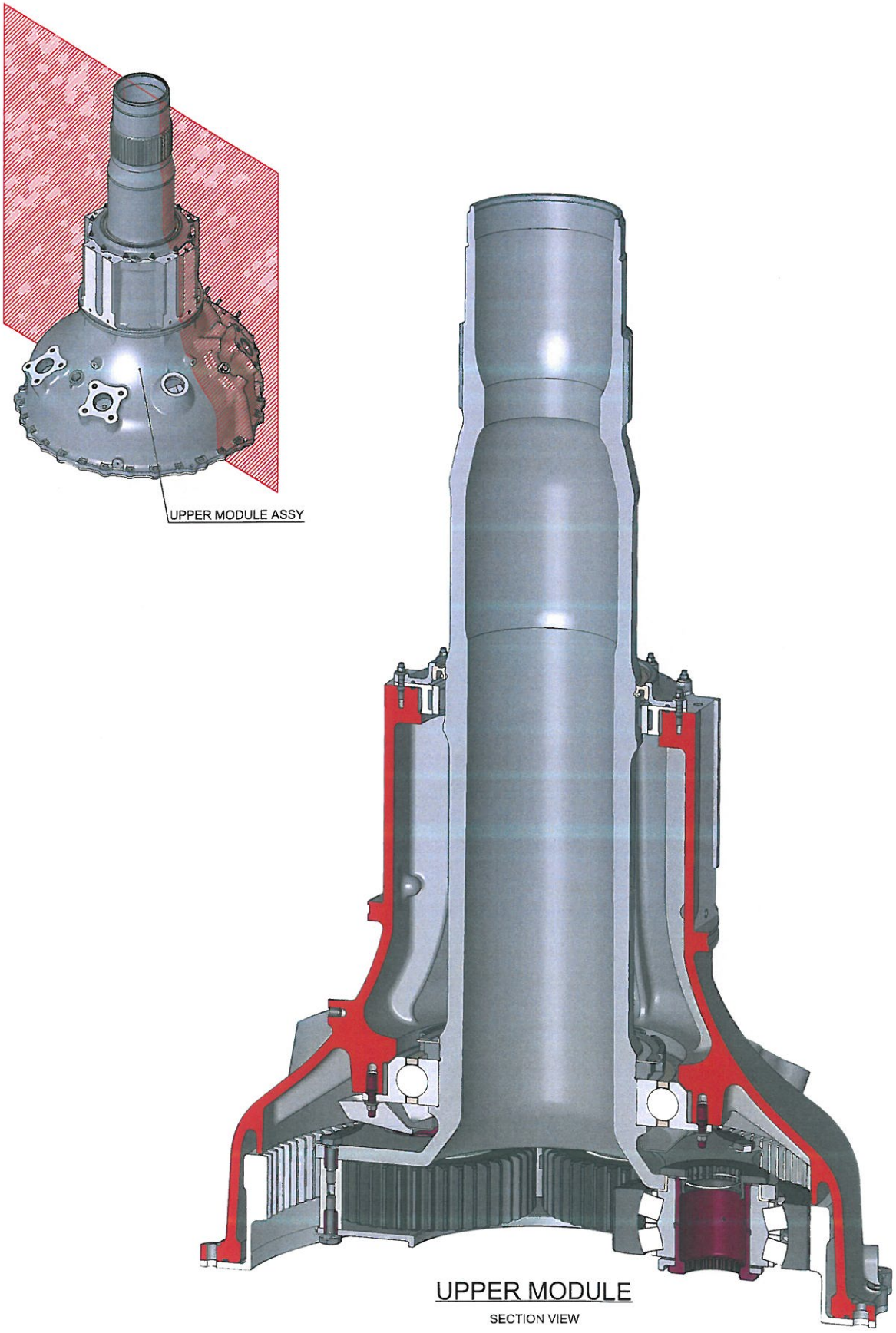
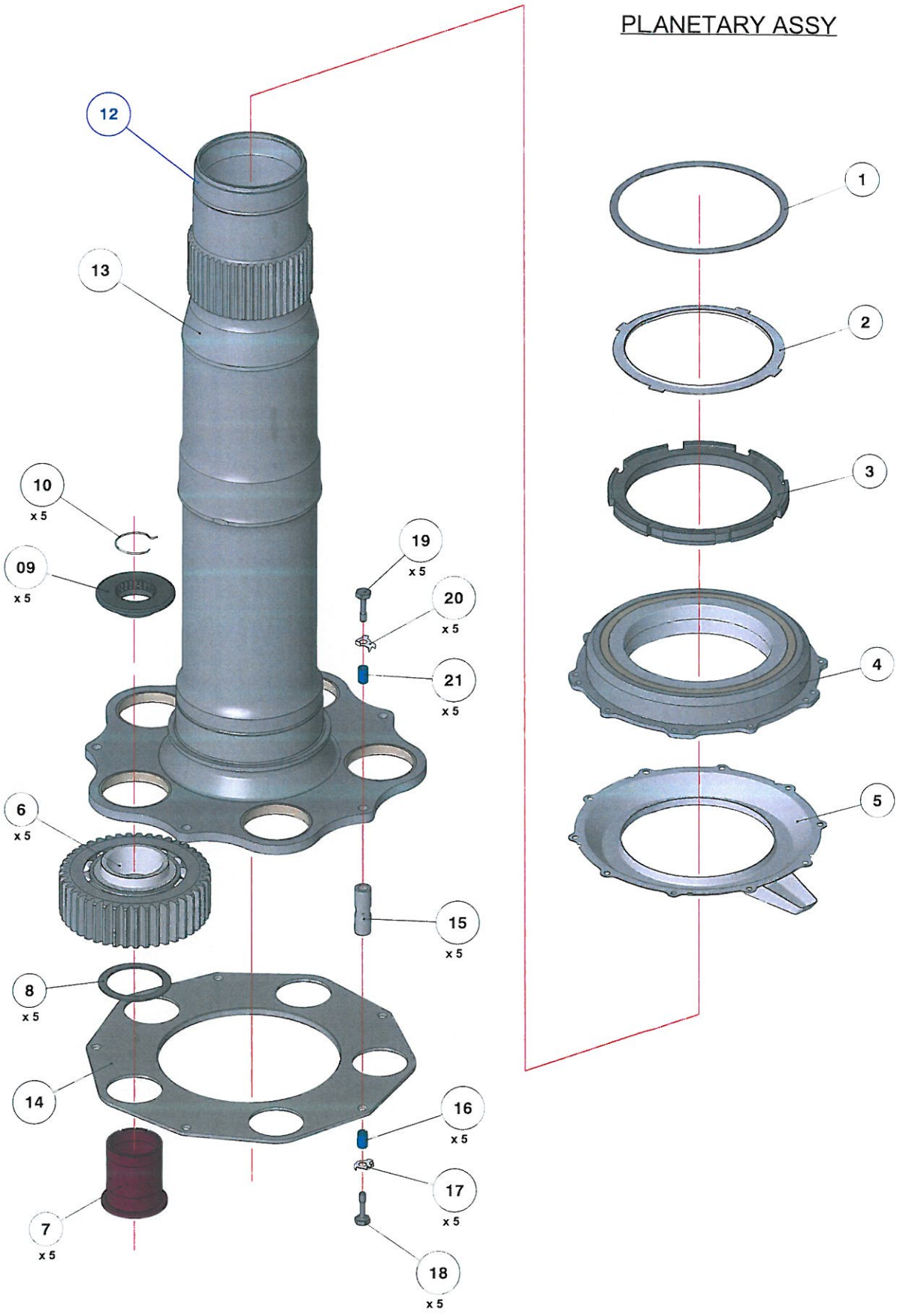


Figure A5


PLANETARY ASSY
12
13
10
x 5
09
x 5
19
x 5
20
x 5
21
x 5
6
x 5
15
x 5
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x 5
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16
x 5
17
x 5
7
x 5
18
x 5
1
2
3
4
5

Figure A6

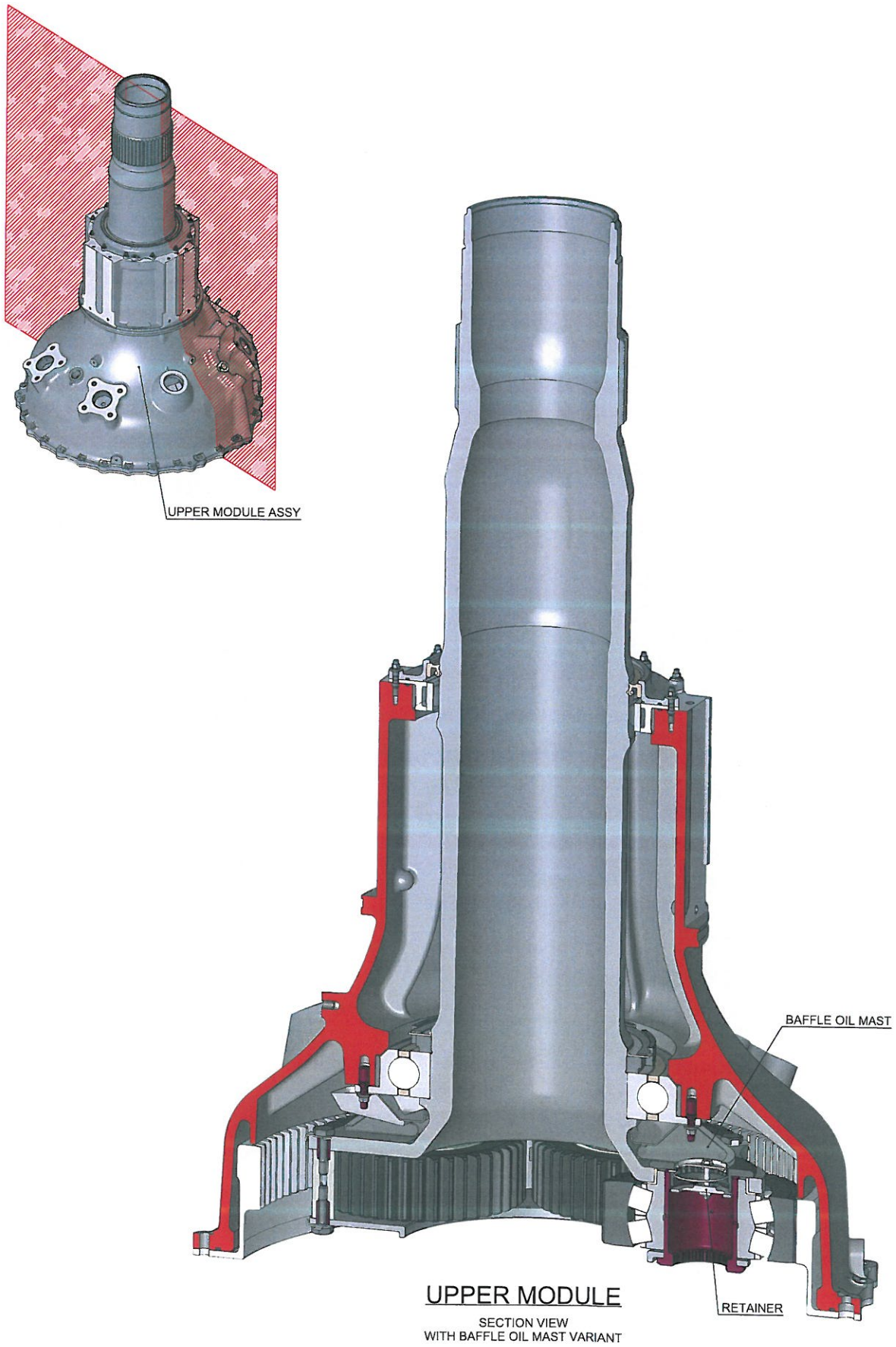
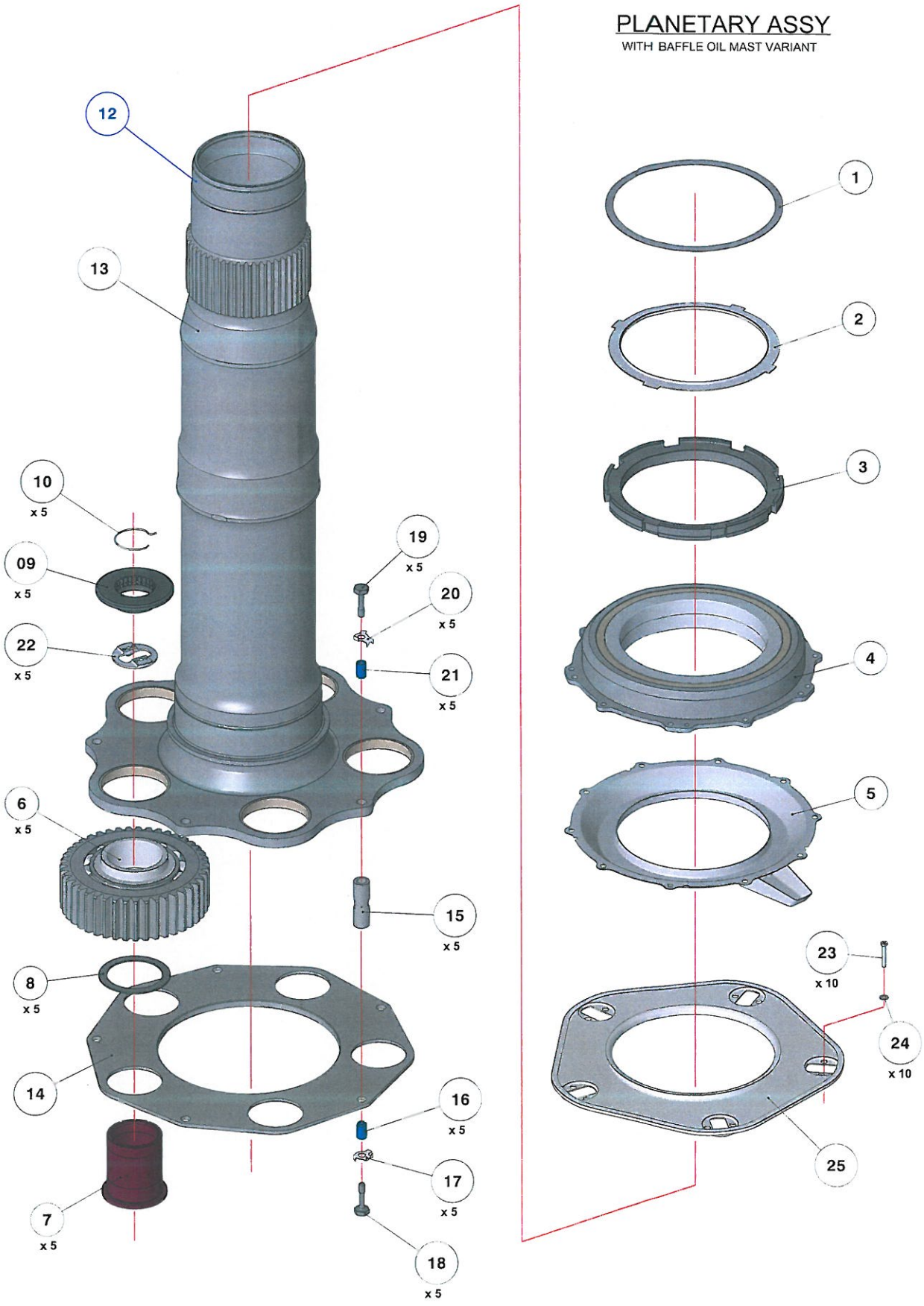

UPPER MODULE ASSY
BAFFLE OIL MAST
RETAINER
UPPER MODULE
SECTION VIEW
WITH BAFFLE OIL MAST VARIANT

Figure A7


PLANETARY ASSY
WITH BAFFLE OIL MAST VARIANT
12
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09
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21
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x 5
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x 5
18
x 5
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4
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23
x 10
24
x 10
25

Figure A8

LEONARDO
HELICOPTERS

AgustaWestland Products

Please send to the following address: **LEONARDO S.p.A.** **CUSTOMER SUPPORT & SERVICES - ITALY** **PRODUCT SUPPORT ENGINEERING & LICENSES DEPT.** Via Giovanni Agusta, 520 21017 Cascina Costa di Samarate (VA) - ITALY Tel.: +39 0331 225036 Fax: +39 0331 225988	**SERVICE BULLETIN COMPLIANCE FORM**	Date:
	Number:	
	Revision:	

Customer Name and Address:	Telephone:
	Fax:
	B.T. Compliance Date:

Helicopter Model	S/N	Total Number	Total Hours	T.S.O.

Remarks:

Information:

We request your cooperation in filling this form, in order to keep out statistical data relevant to aircraft configuration up-to-date. The form should be filled in all its parts and sent to the above address or you can communicate the application also via Technical Bulletin Application Communication Section placed in Leonardo AW Customer Portal - MyCommunications Area. We thank you beforehand for the information given.