



# GSE & TOOL USE AND MAINTENANCE MANUAL

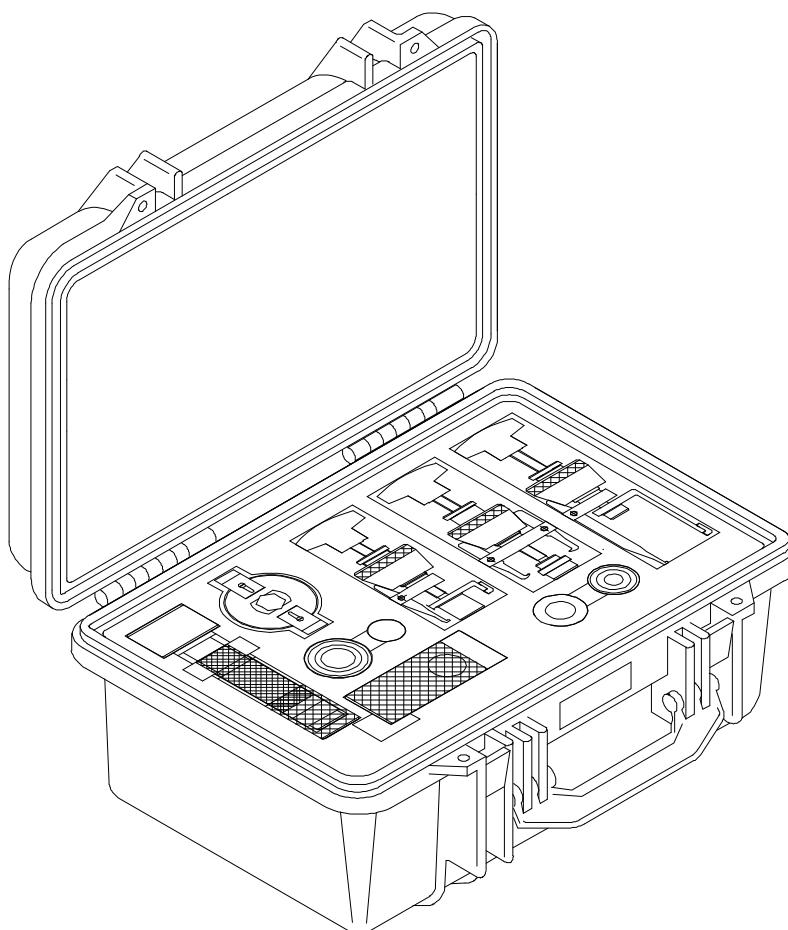
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**MAN-3G6305G32231**  
**REV. A**

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## GSE & TOOL MANUAL

**TITLE**

**TOOL KIT, MGB AGB LIP SEALS REPLACEMENT  
P/N 3G6305G32231**



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## REVISION HISTORY

REV	CHANGE DESCRIPTION	DATE
A	First issue	18/11/2021

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## 1. SCOPE

### 1.1. APPLICABILITY




The contents of this document are meant to provide information on the P/N 3G6305G32231 TOOL KIT, MGB AGB LIP SEALS REPLACEMENT.

### 1.2. OBJECT

The object of this document is to describe the AGE and its components, its main features and it will also provide all needed maintenance requirements to keep in service the P/N 3G6305G32231 TOOL KIT, MGB AGB LIP SEALS REPLACEMENT.

### 1.3. WARNING AND SAFETY INSTRUCTIONS

A number of symbols are used throughout this document to indicate information to which the user should pay attention to. These are indicated below along with the specific meaning.

 <b>Warning</b>	...Indicates a danger that might arise from a product and might result in severe injuries or even death, if no precautions are taken.
 <b>Caution</b>	... Indicates a potentially dangerous situation, which might result injury or damage to the equipment.
 <b>Notice</b>	...Indicates a note providing information to help the reader during the procedure.

*Table 1 – Warning Instruction*

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## 2. DOCUMENTS

### 2.1. APPLICABLE DOCUMENTS

The following table lists the applicable documents

REF	REFERENCE OF DOCUMENT	TITLE
N.A.	N.A.	N.A.

*Table 2 – Applicable Documents*

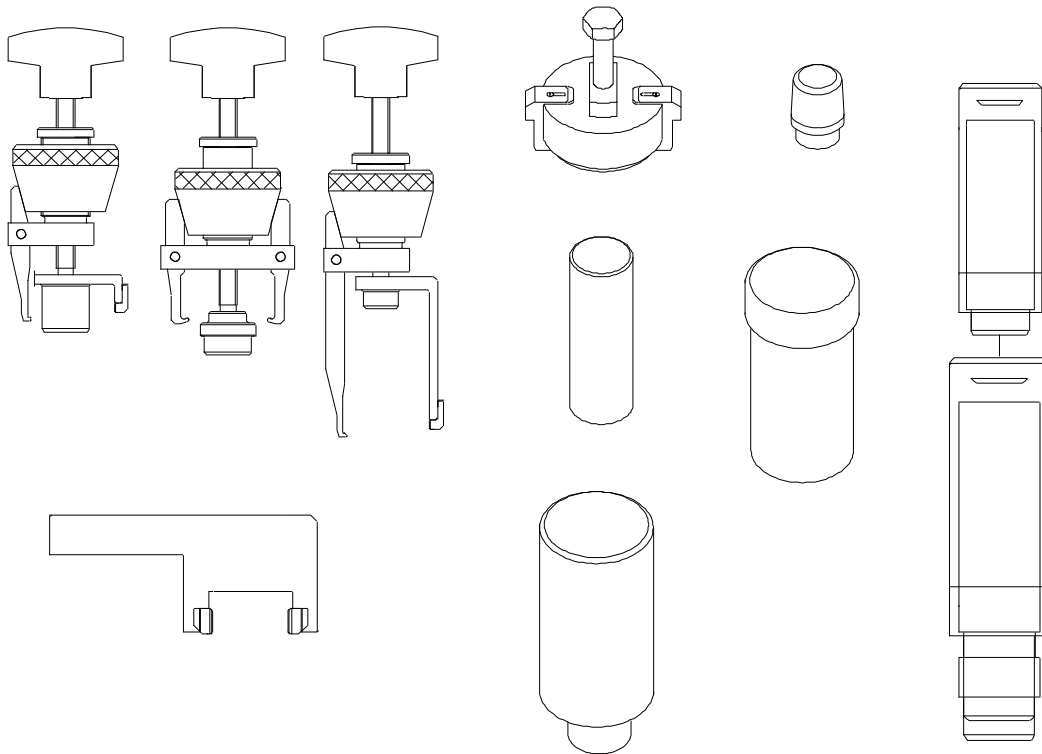
### 2.2. ACRONYMS USED

The main acronyms used in this document are listed below:

LHD	Leonardo Helicopter Division
HC	Helicopter
P/N	Part Number
S/N	Serial Number
N.A.	Not Applicable
MGB	Main Gear Box
AGB	Accessory Gear Box
ECS	Environmental Control System

### 3. DESCRIPTION

This tool kit is used at line and base level maintenance activities to perform the replacement procedure of the lip seal of the drive input hydraulic pump and gear generator drive quill on the accessory gearbox.



3G6305G32231\_1

Figure 1 – Tool Kit, MGB AGB Lip Seals Replacement.

### 4. TOP ASSEMBLY DRAWINGS

Refer to P/N 3G6305G32231 TOOL KIT, MGB AGB LIP SEALS REPLACEMENT.

### 5. IDENTIFICATION

The tool identification P/N is marked on each case on the LHD identification tag.

P/N	3 G 6 3 0 5 G 3 2 2 3 1
MFG. DATE	ISS.
C. I.	GRWT kg

Figure 2 – LHD Identification tag with P/N



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### 6. OVERALL DIMENSIONS

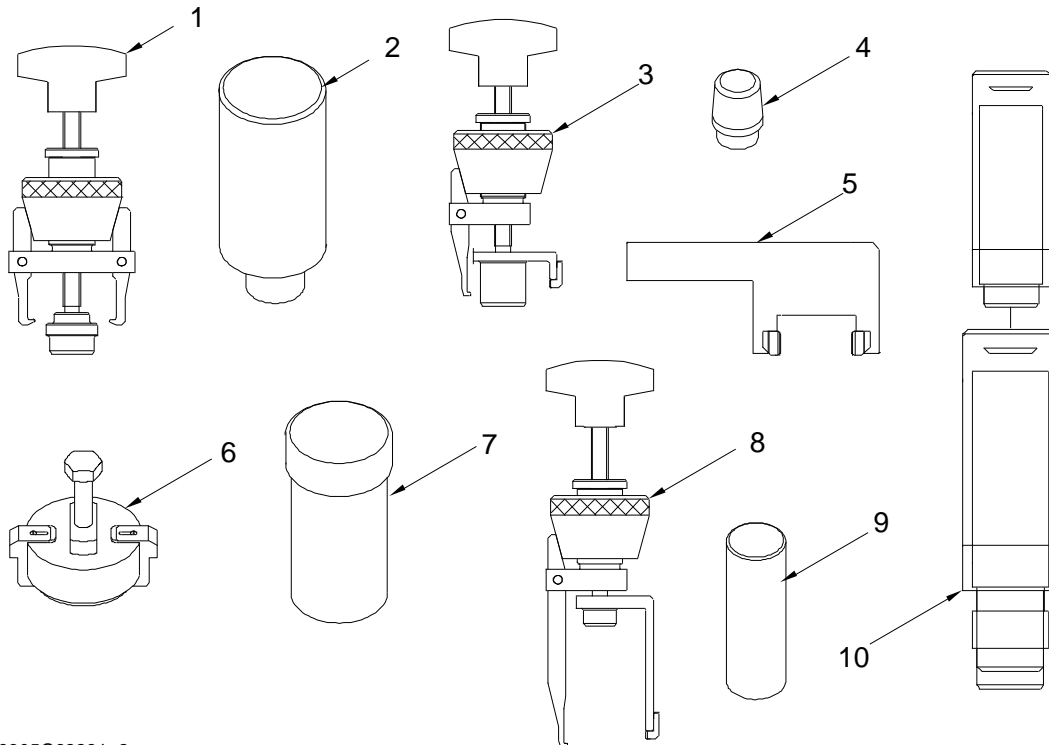
- Length: 357 mm
- Width: 471 mm
- Height: 175 mm

### 7. WEIGHT

- Total Weight: 10 kg



## 8. MAIN PARTS



3G6305G32231\_2

*Figure 3 – Main Parts*

The main parts of the TOOL KIT, MGB AGB LIP SEALS REPLACEMENT are:

- 1 Tool, AGB gen. drive quill seal housing rem.
- 2 Tool, AGB gen. drive quill seal housing instl.
- 3 Tool, AGB hyd. pump drive quill seal housing rem.
- 4 Tool, AGB hyd. pump drive quill seal housing instl.
- 5 Tool, AGB ECS drive gear ring nut rem/instl.
- 6 Tool, AGB ECS drive gear pulley rem.
- 7 Tool, AGB ECS drive gear pulley instl.
- 8 Tool, AGB ECS drive gear seal housing rem.
- 9 Tool, AGB ECS drive gear seal housing instl.
- 10 Tool, AGB drive quills lip seal rem/instl

## 9. MAIN FEATURES DESCRIPTION

The kit contains the items that follow (ref. to [Figure 3](#)):

### **1 Tool, AGB gen. drive quill seal housing rem.**

This tool is used at line and base level maintenance activities to perform the replacement procedure of the lip seal of the gear generator drive quill. The function of this tool is to remove the case seal and the lip seal all together assembled from the accessory gearbox.

### **2 Tool, AGB gen. drive quill seal housing instl.**

This tool is used at line and base level maintenance activities to perform the replacement procedure of the lip seal of the gear generator drive quill. It is composed by two items:

- pusher
- guide

The function of this tool is to install the case seal with the lip seal all together assembled on the accessory gearbox.

### **3 Tool, AGB hyd. pump drive quill seal housing rem.**

This tool is used at line and base level maintenance activities to perform the replacement procedure of the lip seal drive input hydraulic pump on the accessory gearbox. The function of this tool is to remove the case seal and the lip seal all together assembled from the accessory gearbox.

### **4 Tool, AGB hyd. pump drive quill seal housing instl.**

This tool is used at line and base level maintenance activities to perform the replacement procedure of the lip seal of the drive gear hydraulic pump. The function of this tool is to align the case seal with the lip seal all together assembled during the installation on the accessory gearbox. It must be used in conjunction with the pusher, (part of item number 10 "Tool, AGB ECS drive gear seal housing instl.").

### **5 Tool, AGB ECS drive gear ring nut rem/instl.**

This tool is used at line and base level maintenance activities to install and remove the lock nut on the accessory drive before the replacement of the lip seal. It is composed by two parts:

- splined reaction
- wrench

The function of the wrench is to torque the lock nut in order to block the ball bearing inside the pulley assy. The function of the splined reaction is to prevent the rotation of the gear ECS drive during the locking and unlocking procedure. These two parts must be used all together contemporary to perform the locking and unlocking procedures of the lock nut.

### **6 Tool, AGB ECS drive gear pulley rem.**

This tool is used at the depot level of maintenance activities to perform the replacement procedure of the lip seal of the accessory drive. The function of the pulley is to put in the correct position and successively remove the pulley assembly above the ECS drive gear.

### **7 Tool, AGB ECS drive gear pulley instl.**

This tool is used at the depot level of maintenance activities to perform the replacement procedure of the lip seal of the accessory drive. It is composed by the following parts:

- pusher
- guide

The function of the pusher is to put in the correct position and successively install the pulley assembly above the ECS drive gear. The function of the guide is to maintain in the correct centered position the pusher on the MGB during the installation procedure of the pulley assembly above the ECS drive gear. These parts must be used all together contemporary to perform the install procedure of the pulley assembly above the ECS drive gear.

### **8 Tool, AGB ECS drive gear seal housing rem.**

This tool is used at the depot level of maintenance activities to perform the replacement procedure of the lip seal of the accessory drive. It is used to remove the case seal with the lip seal all together installed on the generator drive quill.

### **9 Tool, AGB ECS drive gear seal housing instl.**

This tool is used at line and base level maintenance activities to perform the replacement procedure of the lip seal of the drive gear hydraulic pump. It is composed by the following parts:

- pusher
- guide

The function of this tool is to install the case seal with the lip seal all together assembled on the drive gear hydraulic pump.

### **1.10 Tool, AGB drive quills lip seal rem/instl.**







(This tool is used at line and base level maintenance activities to perform the replacement procedure of the lip seal of the the drive gear hydraulic pump. It is composed by the following parts:

- Base
- Puller
- Half extractor
- Puller
- Pusher.

The function of this tool is to remove/install the lip seal from/on the case seal.

## 10. WARNING AND SAFETY NOTES

### 10.1. WARNING NOTE

 <b>Warning</b>	Use this equipment only for the purpose that it is designed for. Any other use can result in injury or serious material damage to the components.
 <b>Caution</b>	
 <b>Notice</b>	The Manual can never integrally replace the adequate competence of the user.
 <b>Warning</b>   <b>Caution</b>	Before and after each use of the equipment is necessary to perform the checks required. Do not operate with a tool damaged or partially completed, or partially assembled.
 <b>Notice</b>	This Manual provides guidelines and instructions of the equipment that are in addition to - but are not intended to replace or modify but only to integrate - any general or specific rule, regulation, decree or law that is in force in the place where the equipment is in use.

*Table 3 – Warning Note*

## 10.2. SAFETY NOTES

Remember to wear protective overalls, safety shoes, protective gloves and glasses during all operational and maintenance phases.



*Figure 4 – Safety Notes*

## 11. STORAGE

The Tool shall be properly stored to provide protection from external weather conditions, damage and dirty particles.

The Kit shall be stored in the dedicated transportation boxes (part of the Kit).

Ensure that the tool parts are clean before storage.

### 11.1. LUBRICATION BEFORE STORAGE

N.A.

### 11.2. STORAGE CONFIGURATION

The tool has no particular storage configuration.

## 12. MAINTENANCE

NOTE: Correct regular maintenance allows preventing most faults and safeguards of tool performance in time, thereby making it last longer.

Every year carry out regular maintenance on a regular basis as detailed in this manual.

NOTE: Inspection intervals for tool parts placed inside in ready storage is 12 months.

### 12.1. CLEANING

Before inspection and after each use, carry out the cleaning of the tool components.

#### 12.1.1. SPECIAL TOOLS, FIXTURE AND EQUIPMENT

No special tools, fixture and equipment are required for cleaning.

#### 12.1.2. PART REQUIREMENTS

The parts to clean should be free from the moisture, emulsified water, soaps and metal shavings that can develop of corrosive acids.

They must also be free from wide grease and / or slosh deposits.

#### 12.1.3. MANUAL CLEANING

- A. Clean thoroughly all metal surfaces with a clean lint-free cloth (Local supply) moistened with Cleaning Solvent (MIL-PRF-680C, Type II) to do general spot cleaning of large groups areas. For nylon or teflon surfaces, the use of a biodegradable, water dilutable cleaning compound (MIL-PRF-87937 D, Type II) is required.
- B. Repeat the cleaning process again by means another clean lint-free cloth (Local supply).
- C. Drying.
  - Verify that the solvent should not be trapped in the cavity. Normally, the solvent evaporates at room temperature in a satisfactory manner.

## 12.2. CHECKS

Before and after each use or at least every year, carry out the check of kit component.

Before each use ensure that the manual is available to the operator, in the event of loss, request a copy to Leonardo Helicopters Division.

The Tool kit shall be submitted to following checks to guarantee the functionality.

All required checks shall be registered on CHECK RECORDS Table. Ref. *TLC\_Table 1*

After each use of tool ensure to have registered the number of uses on HISTORICAL USES RECORD Table. Ref. *TLC\_Table 2*

The Tool Log Card template contained in the Annex A of this manual can be replaced with any other log card template in use in the plant where the equipment is in use.

### 12.2.1. SPECIAL TOOLS, FIXTURE AND EQUIPMENT

No special tools, fixture and equipment are required for the checks.

### 12.2.2. VISUAL EXAMINATION

NOTE: Replace the parts that do not obey the inspection requirements.

Restore the marking of the parts that results damaged or not readable.

All required visual checks are listed on Table 4.

PERIODICITY	CHECK TYPE	COMPONENTS	
BEFORE AND AFTER EVERY USE	VISUAL EXAMINATION	Evidence of impact;	All
	Crushing or stripping	All	
	Cracks	All	
	Dents	All	
	Wear	All	
	Distortions	All	
	Corrosion	All	
	Loose or defective attaching parts (warning flag)	All	
	Unsticking of parts	All glued parts.	
	Damage to the threads	All threaded std parts.	
	Marking	Item 2, Nameplate, <a href="#">Figure 5</a> , Page 16 Items 6 and 7, Plate, <a href="#">Figure 5</a> , Page 16	
	Damage to the pins and to the shell	N.A.	
	Damage to the insulation sleeves and wires	N.A.	

*Table 4 – Visual Check*



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### **12.2.3. PERIODICAL CHECKS**

Not Applicable.

### **12.2.4. DIMENSIONAL CHECKS**

Not Applicable.

### **12.2.5. SPECIAL CHECKS SUMMARY**

Not Applicable.

## **12.3. REPLACEMENT**

All the parts for which it is allowed the components replacement are listed in Paragraph 15.

### **12.3.1. REPLACEMENT PROCEDURES**

The replacement of parts of the kit does not require specific procedures.

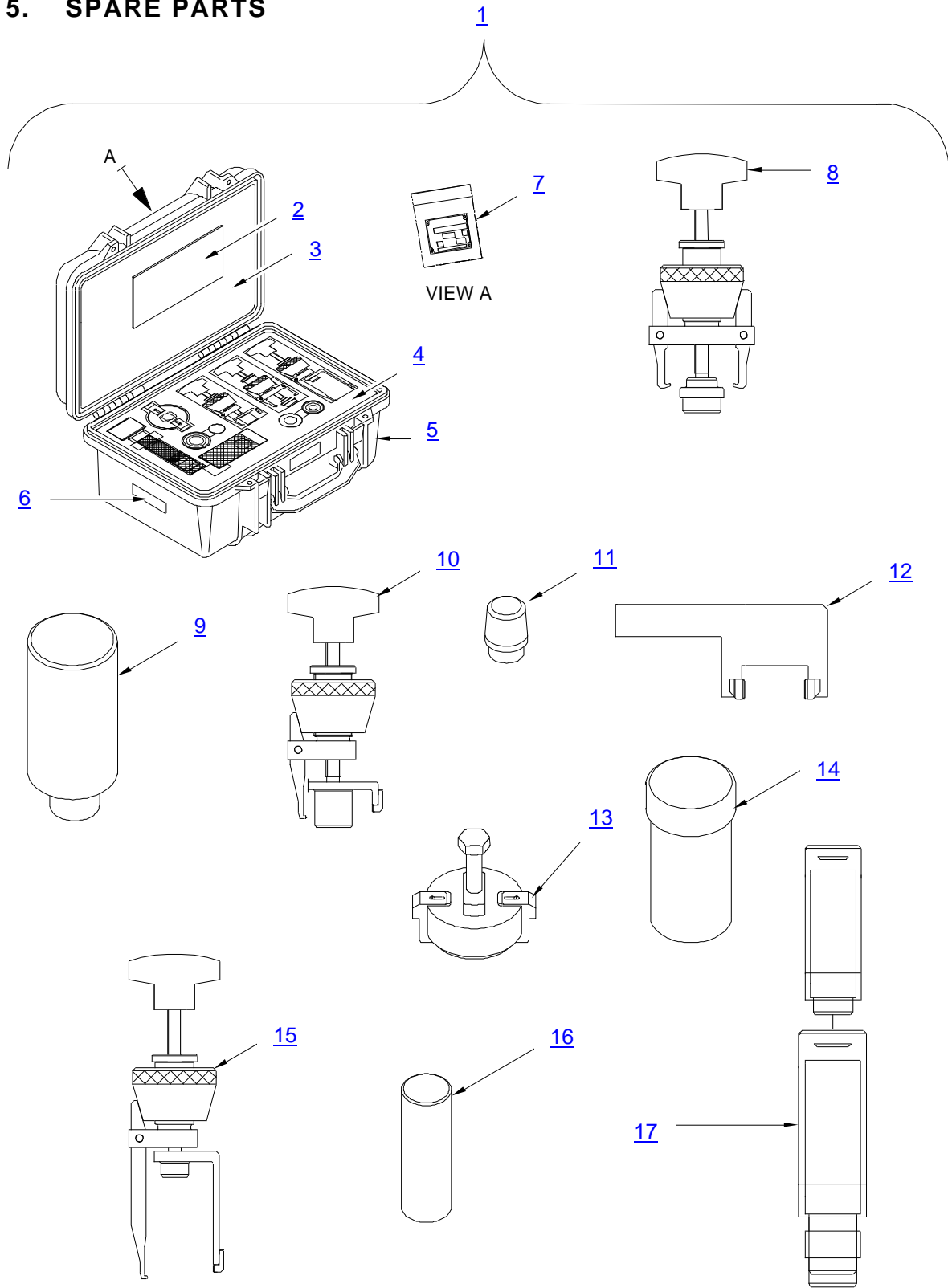
## **13. CALIBRATION**

No Calibration is required.

## **14. SHELF LIFE**

Not Applicable.

**15. SPARE PARTS**



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Figure 5 – Spare Parts





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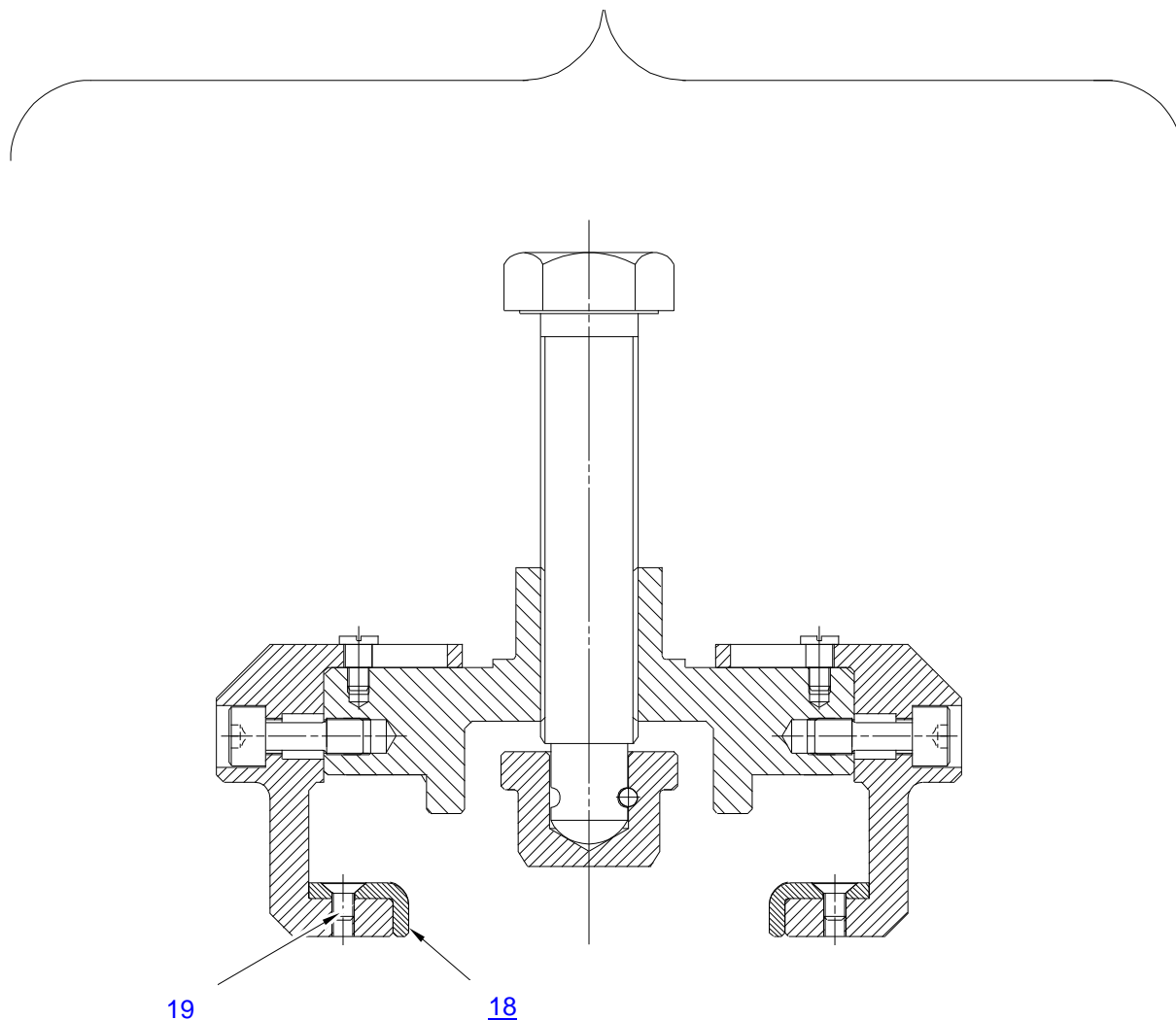
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ITEM	P/N	DESCRIPTION	Q.TY
1	3G6305G32231	TOOL KIT, MGB AGB LIP SEALS REPLACEMENT	REF.
2	3G6305G35151	NAMEPLATE	1
3	3G6305G34951	UPPER FOAM	1
4	3G6305G35051	LOWER FOAM	1
5	1500	CASE	1
6	A304A003A1	PLATE, IDENTIFICATION	1
7	A304A002A1	PLATE, IDENTIFICATION	1
8	3G6305G32331	TOOL, AGB GEN. DRIVE QUILL SEAL HOUSING REM.	1
9	3G6305G30931	TOOL, AGB GEN. DRIVE QUILL SEAL HOUSING	1
10	3G6305G33131	TOOL, AGB HYD. PUMP DRIVE QUILL SEAL HOUSING	1
11	3G6305G18251	GUIDE, PUMPS/ECS DRIVE Q. SEAL HOUS INST.	1
12	3G6305G31231	TOOL, AGB ECS DRIVE GEAR RING NUT REM/INST	1
13	3G6305G34131	TOOL, AGB ECS DRIVE GEAR PULLEY REM. (For Breakdown ref. to <a href="#">Figure 6</a> and <a href="#">Table 6</a> )	1
14	3G6305G31531	TOOL, AGB ECS DRIVE GEAR PULLEY INSTL	1
15	3G6305G33831	TOOL, AGB ECS DRIVE GEAR SEAL HOUSING REM. (For Breakdown ref. to <a href="#">Figure 7</a> and <a href="#">Table 7</a> )	1
16	3G6305G30631	TOOL, AGB ECS DRIVE GEAR SEAL HOUSING INST.	1
17	3G6305G31831	TOOL, AGB DRIVE QUILLS LIP SEAL REM/INST	1

Table 5 – Spare Parts

13

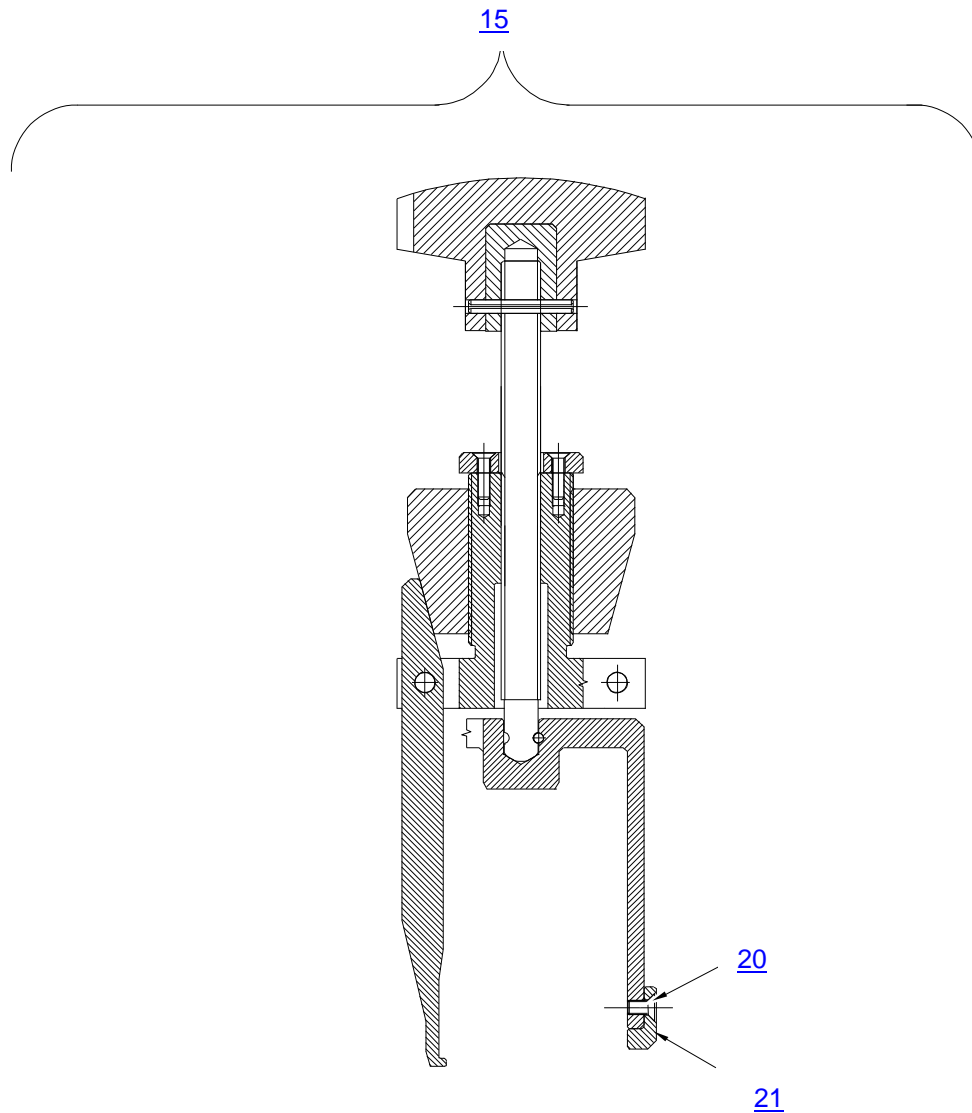


3G6305G32231\_4

*Figure 6 – Spare Parts*

ITEM	P/N	DESCRIPTION	Q.TY
13	3G6305G34131	TOOL, AGB ECS DRIVE GEAR PULLEY REM.	REF
18	3G6305G34751	PROTECTION	2
19	MS24693-C1	SCREW	2

Table 6 – Spare Parts



3G6305G32231\_5

*Figure 7 – Spare Parts*

ITEM	P/N	DESCRIPTION	Q.TY
15	3G6305G33831	TOOL, AGB ECS DRIVE GEAR SEAL HOUSING REM.	REF
20	MS24693C24	SCREW	2
21	3G6305G33751	PROTECTION	2

Table 7 – Spare Parts

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## 16. CE MARKING

No CE marking is required for the P/N 3G6305G32231 TOOL KIT, MGB AGB LIP SEALS REPLACEMENT.



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# ANNEX A

## TOOL LOG CARD



# TOOL LOG CARD

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<b>TOOL KIT P/N:</b> [1]	<b>TOOL KIT DESCRIPTION:</b> [2]	<b>TOOL KIT S/N:</b> [3]
<b>TOOL P/N:</b> [4]	<b>TOOL S/N:</b> [5]	<b>REMARKS:</b> [6]

## Section 1: CHECKS RECORD

[7] N° check	[8] DATE	[9] P/N TO CHECK	[10] CHECK	[11] FREQUENCY	[12] RESULT	[13] NOTE	CERTIFICATION [14]
							STAMP & SIGNATURE [15]
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
<b>FINAL ACCEPTANCE [16]</b>							
<b>STAMP &amp; SIGNATURE [17]</b>						<b>DATE [18]</b>	

TLC\_Table 1



# TOOL LOG CARD

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<b>TOOL KIT P/N:</b> [1]	<b>TOOL KIT DESCRIPTION:</b> [2]	<b>TOOL KIT S/N:</b> [3]
<b>TOOL P/N:</b> [4]	<b>TOOL S/N:</b> [5]	<b>REMARKS:</b> [6]

## Section 2: HISTORICAL USES RECORD

[19] N°USE	[8] DATE	[6] NOTE	[13] CERTIFICATION	[19] N°USE	[8] DATE	[6] NOTE	[13] CERTIFICATION
			[14] STAMP & SIGNATURE				[14] STAMP & SIGNATURE
1				11			
2				12			
3				13			
4				14			
5				15			
6				16			
7				17			
8				18			
9				19			
10				20			

TLC\_Table 2

## LOG CARD FILLING INSTRUCTIONS

<b>FIELD #</b>	<b>HEADER</b>	<b>NOTE</b>
<b>1</b>	Part number of the tool Kit	
<b>2</b>	Tool Kit denomination	
<b>3</b>	Serial Number of the tool Kit	
<b>4</b>	Part Number of the tool (part of kit)	
<b>5</b>	Serial Number of the tool (if applicable)	
<b>6</b>	Indicate any details of the use	
<b>7</b>	Sequential number of check performed	
<b>8</b>	Date of the activity	
<b>9</b>	PN of tool or component (part of tool) checked/affected by issue	
<b>10</b>	Typology or description of checks /issue	
<b>11</b>	Check frequency	
<b>12</b>	Check result	
<b>13</b>	Check remarks	
<b>14</b>	Performance certification	
<b>15</b>	Stamp and signature of the personnel which performs the check	
<b>16</b>	Section related to the final approval	
<b>17</b>	Stamp and signature of the personnel which performs the final approval	
<b>18</b>	Date on which the final check was made	
<b>19</b>	Sequential number of performed used of the tool	