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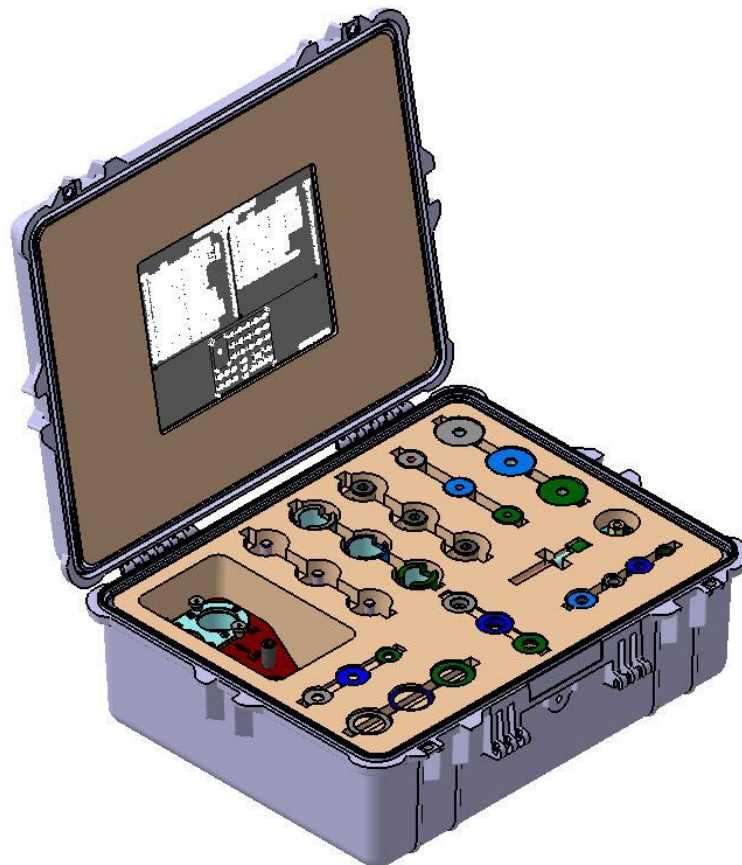
Client: Leonardo Helicopters Division

Date: 04/06/2024

PEC ITALIA S.r.l.

OPERATION AND MAINTENANCE MANUAL

**P/N 3G5330G04231 – (PEC-139-019-01)
TOOL KIT, WASHER BLEND STA5700 REWORK**



01	04/06/24	General Review	A. GIANNINI	M. IACOPONI	E. MORELLI
00	21/04/23	First Issue	A. GIANNINI	M. IACOPONI	E. MORELLI
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DOCUMENT CHANGE RECORD

Issue.	Date	Pages/Paragraphs Affected.	Reasons for change
00	21/04/2023	All	First Issue
01	04/06/2024	Changed pages: 1; 4; 5; 6; 9;15;16; 26.	Kit name changed. Updated images.

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TABLE OF CONTENTS

1	SCOPE	4
1.1	APPLICABILITY	4
1.2	OBJECT	4
1.3	GOAL	4
1.4	WARNING and SAFETY INSTRUCTIONS	4
2	DOCUMENTS	5
2.1	APPLICABLE DOCUMENTS	5
2.2	STANDARD	5
2.3	ACRONYMS USED	5
3	DESCRIPTION	6
3.1	TOP ASSEMBLY DRAWINGS	9
3.2	IDENTIFICATION TAG	9
3.3	WEIGHT	10
4	TOOL APPLICABILITY AND USAGE	10
4.1	BUSHINGS REMOVE AND INSTALLATION	11
4.2	BUSHING HOLES REWORK	14
5	SAFETY NOTES	18
6	STORAGE	19
7	MAINTENANCE	19
8	CALIBRATION	26
9	SPARE PARTS LIST	26
10	ANNEX I	28



1 SCOPE

1.1 APPLICABILITY

The contents of this document are meant to provide information on the **PEC-139-019-01 TOOL KIT, WASHER BLEND STA5700 REWORK**

1.2 OBJECT

The object of this document is to explain how to operate and maintain in service the **PEC-139-019-01 TOOL KIT, WASHER BLEND STA5700 REWORK**.




1.3 GOAL

The goal is to show trained operators all phases and possible uses and operations of **PEC-139-019-01 TOOL KIT, WASHER BLEND STA5700 REWORK**.

It will also show all needed maintenance operations for the **PEC-139-019-01 TOOL KIT, WASHER BLEND STA5700 REWORK**.

1.4 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.

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



2 DOCUMENTS

2.1 APPLICABLE DOCUMENTS

The following table lists the applicable documents

REF	REFERENCE OF DOCUMENT	TITLE
AD01	NT-GSE-2022-030	Requirement Specification for WASHER BLEND STA5700 REWORK KIT
AD02	PEC-139-019-01	TOOL KIT, WASHER BLEND STA5700 REWORK - ASSY
AD03	PEC-139-019-02	TOOL KIT, WASHER BLEND STA5700 REWORK - PART

2.2 STANDARD

N.A.

2.3 ACRONYMS USED

The main acronyms used in this document are listed below:

HC	Helicopter
P/N	Part Number
N.A.	Not Applicable



Notice

Users of this equipment must have read and understood the content of this manual before use.

3 DESCRIPTION

The equipment PEC-139-019-01 TOOL KIT, WASHER BLEND STA5700 REWORK is composed of the following main elements:

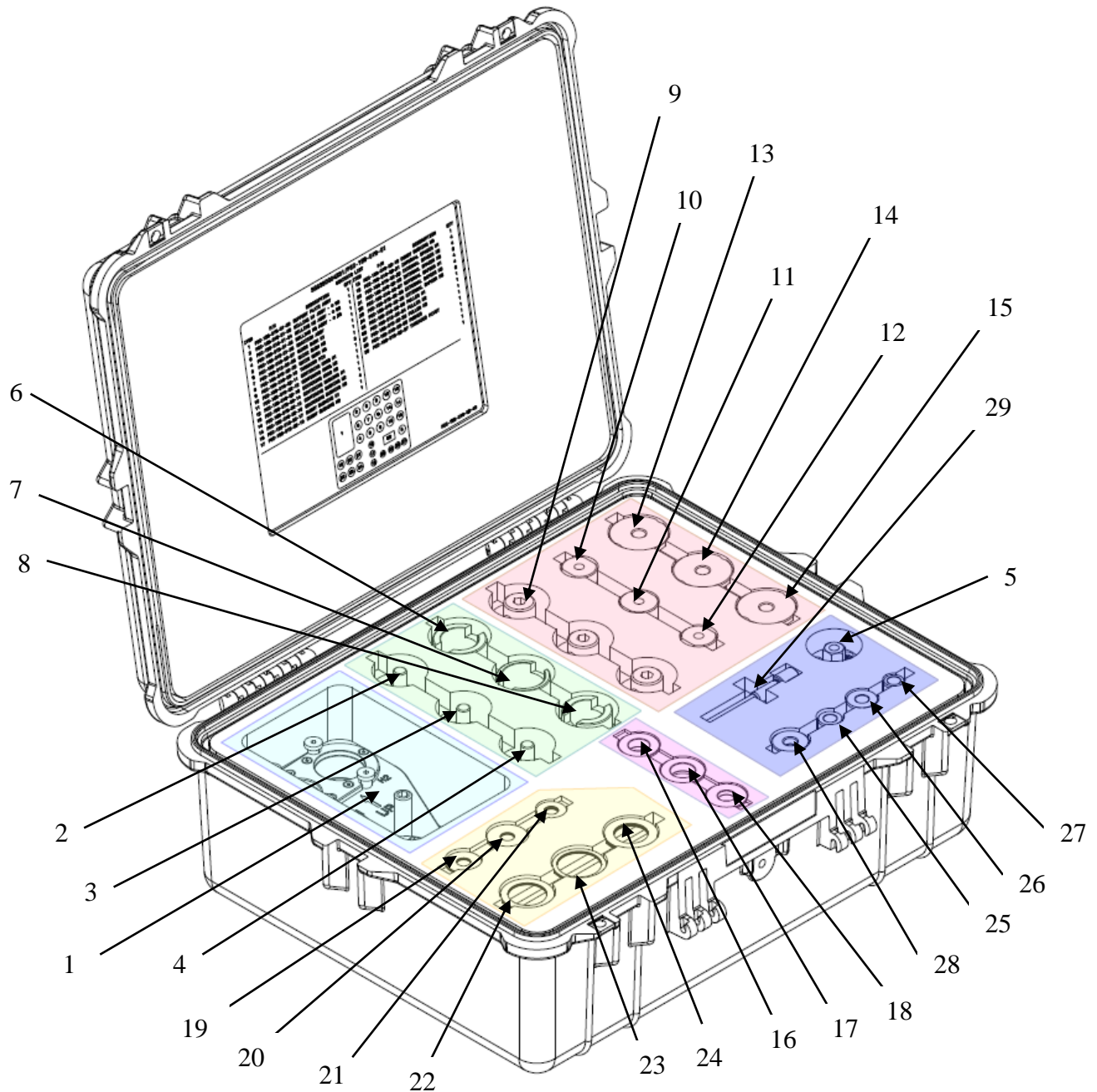


Figure 1: PEC-139-019-01 TOOL KIT, WASHER BLEND STA5700 REWORK



ITEM	P/N	DESCRIPTION
1	PEC-139-019-01-02	SUPPORT PLATE ASSY
2	PEC-139-019-01-03	END MILL ASSY, H1
3	PEC-139-019-01-04	END MILL ASSY, H2
4	PEC-139-019-01-05	END MILL ASSY, H3
5	PEC-139-019-01-06	REACTION ASSY
6	PEC-139-019-02-07	GUIDE BUSHING H1
7	PEC-139-019-02-08	GUIDE BUSHING H2
8	PEC-139-019-02-09	GUIDE BUSHING H3
9	PEC-139-019-02-10	THREADED PIN (3 REQ'D)
10	PEC-139-019-02-11	CENTERING KNOB H1
11	PEC-139-019-02-12	CENTERING KNOB H2
12	PEC-139-019-02-13	CENTERING KNOB H3
13	PEC-139-019-02-14	CENTERING BUSHING H1
14	PEC-139-019-02-15	CENTERING BUSHING H2
15	PEC-139-019-02-16	CENTERING BUSHING H3
16	PEC-139-019-02-17	DUMMY BUSHING H1
17	PEC-139-019-02-18	DUMMY BUSHING H2
18	PEC-139-019-02-19	DUMMY BUSHING H3
19	PEC-139-019-02-21	INTERNAL SPACER H1
20	PEC-139-019-02-22	INTERNAL SPACER H2
21	PEC-139-019-02-23	INTERNAL SPACER H3
22	PEC-139-019-02-27	EXTERNAL SPACER H1
23	PEC-139-019-02-28	EXTERNAL SPACER H2
24	PEC-139-019-02-29	EXTERNAL SPACER H3
25	PEC-139-019-02-33	PULLER H1
26	PEC-139-019-02-34	PULLER H2
27	PEC-139-019-02-35	PULLER H3
28	PEC-139-019-02-36	PUSHER
29	PEC-139-019-02-37	GUIDE



Caution

The tool shall be sent back to the manufacturer for proper inspection and refurbishment every five times it is operated. It is required to keep record on equipment log card (**Annex 1**) about any operation involving tool.



Warning



Caution

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.



3.1 TOP ASSEMBLY DRAWINGS

Refer to drawing P/N PEC-139-019-01.

3.2 IDENTIFICATION TAG

	PEC ITALIA s.r.l. Via G. Rossa, 5A/B - 20 57016 Rosignano Solvay (LI)-ITALY		
MODEL - P/N	PEC - 139 - 019 - 01		
DESCRIPTION	TOOL KIT, WASHER BLEND STA5700 REWORK		
SERIAL NUMBER		YEAR	
WEIGHT	18 KG		

Figure 2: Tag with P/N PEC-139-019-01

P/N	3G5330G04231		
MFG. DATE		ISS	
C. I.		GRWT kg	18.0

Figure 3: Tag with P/N 3G5330G04231

3.3 **WEIGHT**

Total weight of the equipment is 18,0 kg.

4 **TOOL APPLICABILITY AND USAGE**

The equipment is designed to restore flatness and roughness of area around bolt's holes (washers' footprints) in the lower side of frames at STA5700, on LH and RH side of the AW139.

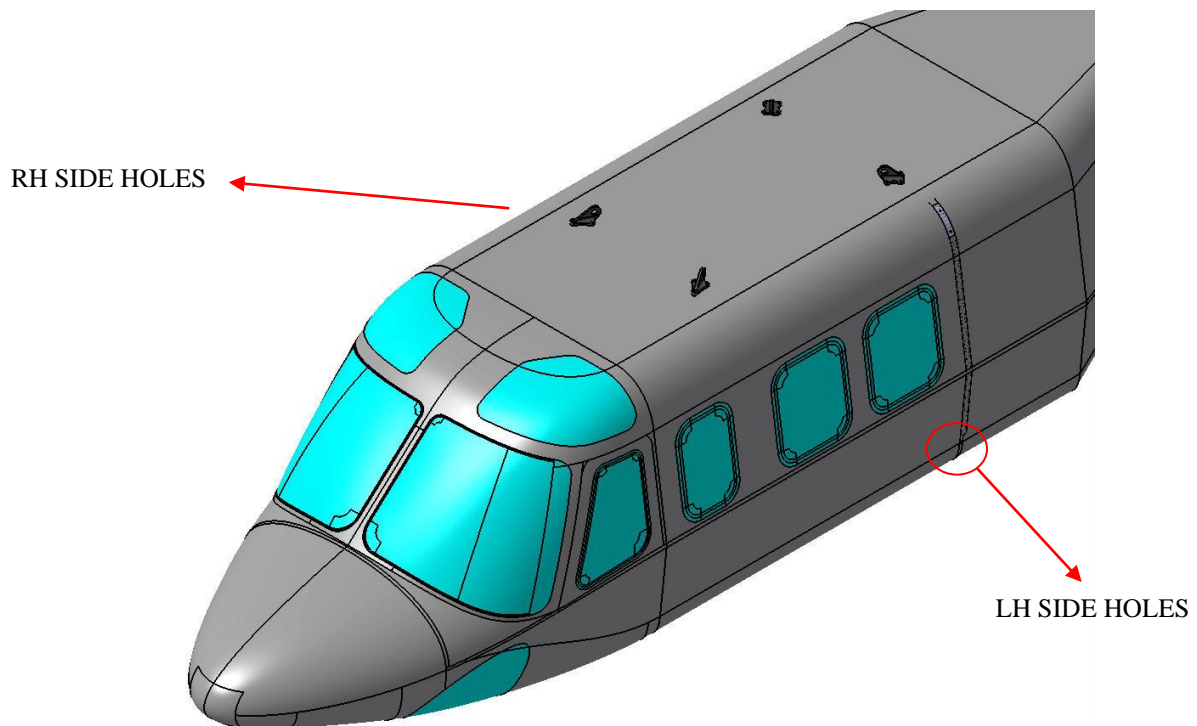


Figure 4: Area of the holes of the STA5700 frame

4.1 BUSHINGS REMOVE AND INSTALLATION

The following steps show the procedure for removing and installing the bushing in the rework area of the STA5700 frame located on the left side of the helicopter, the right side is symmetrical and the same steps are required.

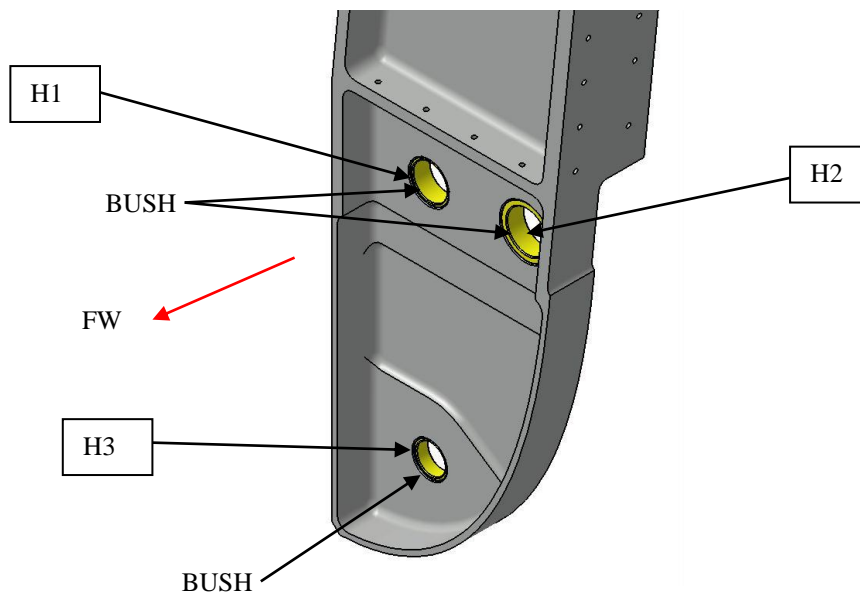
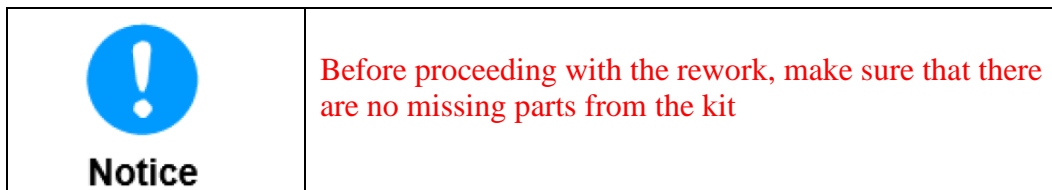


Figure 5: Work Area LH

4.1.1 BUSHING REMOVAL

- Take, according to the surface of the hole to be machined, the EXTRACTOR and the GUIDE PEC-139-019-02-37 (B1) from the case.
- For hole H1 take PEC-139-019-02-33 (A1) PULLER, for hole H2 take PEC-139-019-02-34 (A2) and for hole H3 take PEC-139-019-02-35 (A3) (Fig. 6)
- Insert the PULLER inside the bush to be removed and insert the GUIDE inside the PULLER (Fig. 6 and 7).
- Align and screw the REACTION ASSY PEC-139-019-01-06 (C1) with the guide and remove the bush (Fig.6 and 7).

(Instructions valid for LH side and RH).

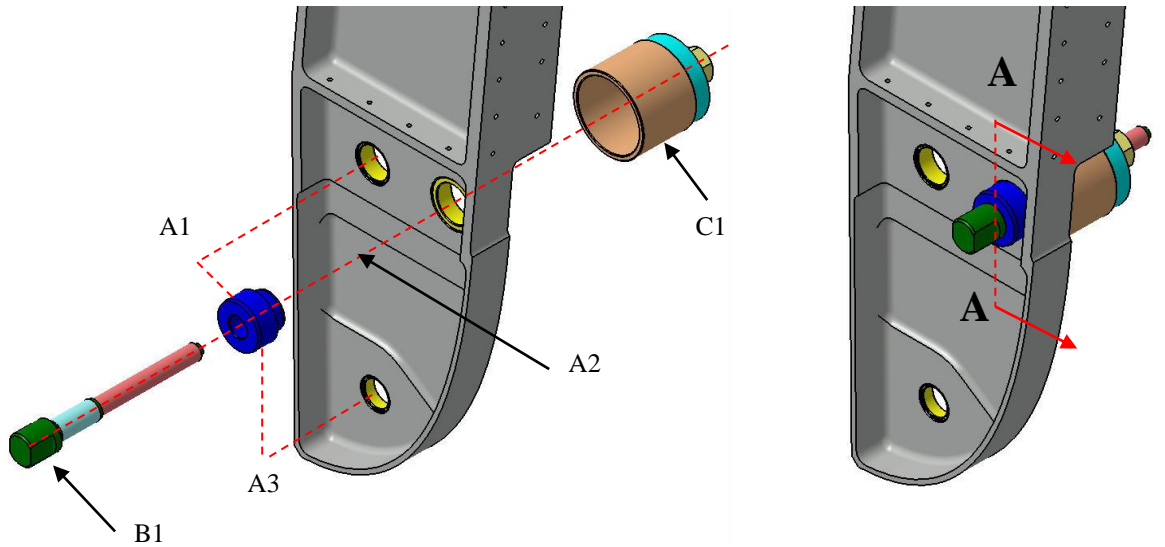


Figure 6: BUSHING REMOVAL

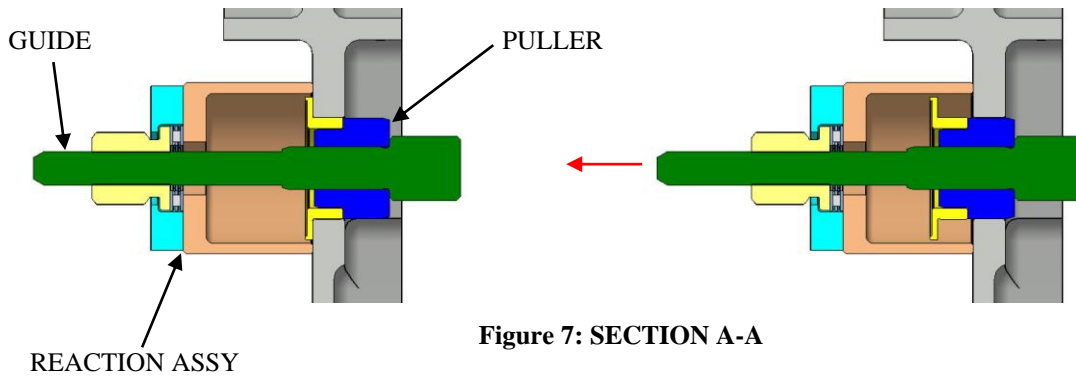


Figure 7: SECTION A-A

4.1.2 BUSHING INSTALLATION

- Take, according to the surface of the hole to be machined, the EXTRACTOR and the GUIDE PEC-139-019-02-37 (B1) from the case.
- For hole H1 take PEC-139-019-02-33 (A1) PULLER, for hole H2 take PEC-139-019-02-34 (A2) and for hole H3 take PEC-139-019-02-35 (A3) (Fig. 8)
- Insert the PULLER inside the bush to be removed and insert the GUIDE inside the PULLER (Fig. 8 and 9).
- Align and screw the REACTION ASSY PEC-139-019-01-06 (C1) with the guide and remove the bush (Fig.8 and 9).

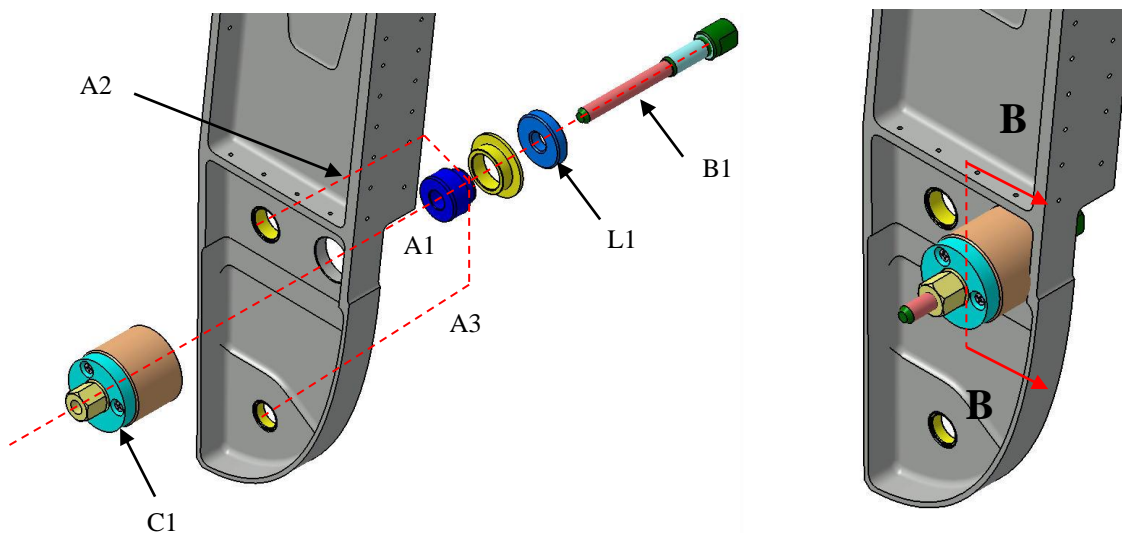


Figure 8: BUSHING INSTALLATION

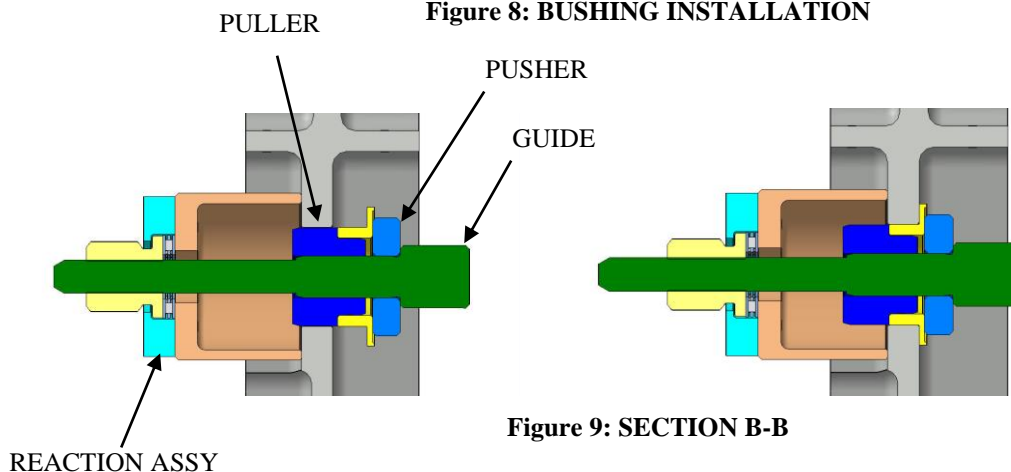



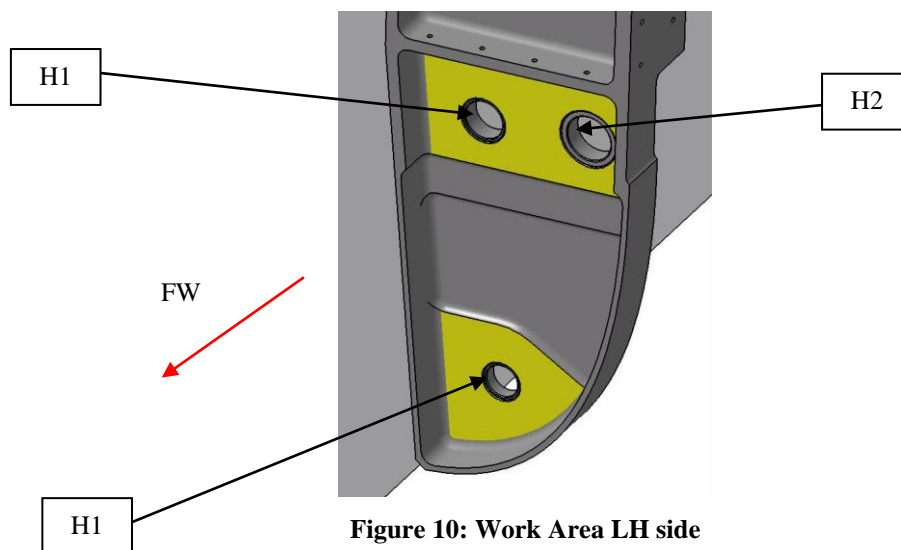
Figure 9: SECTION B-B

4.2 BUSHING HOLES REWORK

The following steps show the procedure for reworking the area around the bolt holes of the STA5700 frame placed on the left side of the helicopter, the right side is symmetrical and the exact same steps are required.

 Notice	<p>Before proceeding with the rework, make sure that there are no missing parts from the kit</p>
--	--

1. Remove the bushing of the area to be reworked (see BUSHING REM/INSTL).
2. Take the Support Plate Assy PEC-139-019-01-02 from the case and place it on top of the frame at the work area (Fig. 10). Make sure that the Support Plate Assy and the holes in the frame are aligned and that the indication “SIDE LH” is present (in case of remaking of the right-side holes area, the indication “SIDE RH” must be visible).



3. Insert the three guide bushes PEC-139-019-02-07 (D1), PEC-139-019-02-08 (D2) and PEC-139-019-02-09 (D3) in the holes of the SUPPORT PLATE ASSY as indicated in the figure (Fig. 11).
Insert the three centering bushes PEC-139-019-02-14 (E1), PEC-139-019-02-15 (E2) and PEC-139-019-02-16 (E3) as shown in the figure (Fig. 11)
Insert pins PEC-139-019-02-10 (F1) and centering bushes PEC-139-019-02-11(G1), PEC-139-019-02-12(G2), PEC-139-019-02-13(G3) as indicated in the figure (Fig. 11 and Fig. 12).
Tighten just enough. Screw in the threaded pins (H3) until they touch the frame.

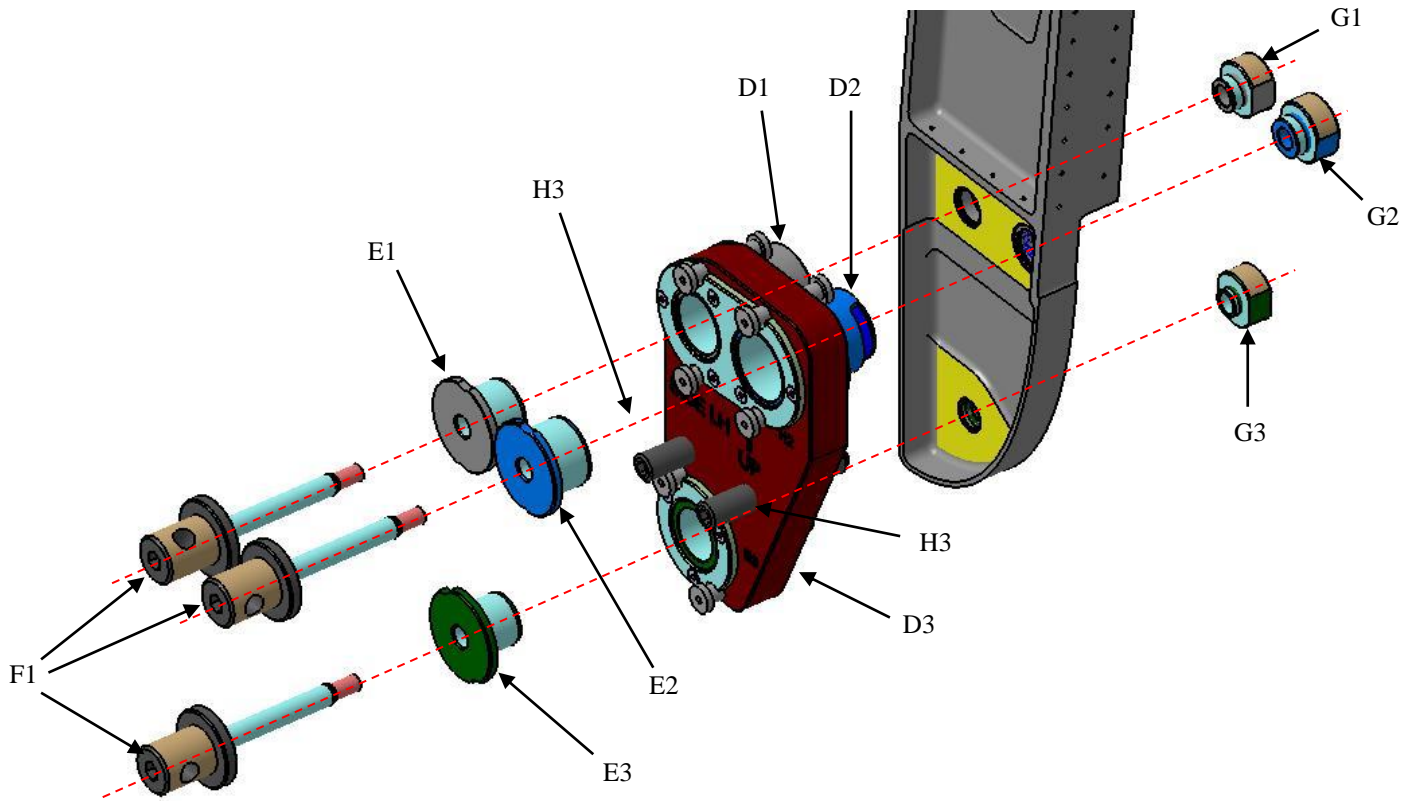
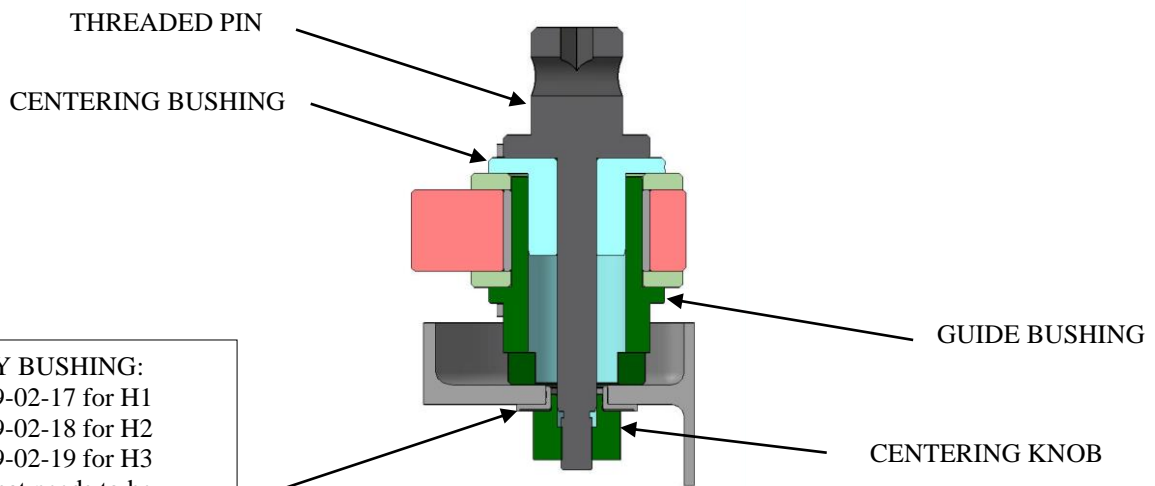


Figure 11: Equipment alignment and fixing



Use DUMMY BUSHING:
 PEC-139-019-02-17 for H1
 PEC-139-019-02-18 for H2
 PEC-139-019-02-19 for H3
 for the area that needs to be worked.

Figure 12: Detail for fixing equipment

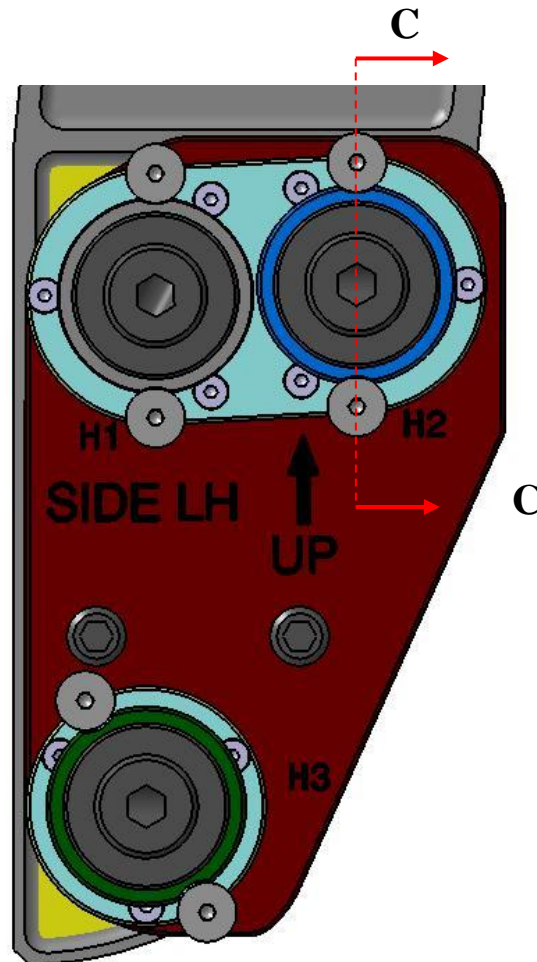


Figure 13: Support Plate upper view

1. Once the baseplate is secure and stable, remove the THREADED PIN, the CENTERING KONB and the CENTERING BUSHING from the work area.
Use a drill equipped with a END MILL ASSY PEC-139-0190-01-03 for area H1, PEC-139-019-02-04 for area H2 and PEC-139-019-01-05 for area H3.
2. Before the operation, insert the EXTERNAL SPACER (from 0.5 mm) on the END MILL ASSY in the necessary quantity:
Area H1 thickness PEC-139-019-02-27 (N°4 starting position).
Area H2 thickness PEC-139-019-02-28 (N°4 starting position).
Area H3 thickness PEC-139-019-02-27 (N°6 starting position).
3. Mill the hole until reaching the end stop as shown in Fig 14.

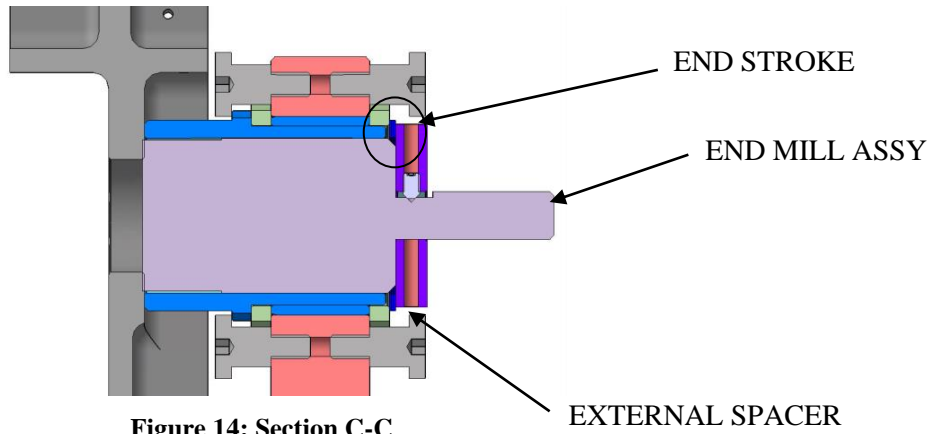



Figure 14: Section C-C

 Caution	<p>For the operating speed for milling, see the tables below.</p>
---	---

END MILL								
TABLE DIMENSION "A", "B" AND "L"								
P/N	A (±0.05)	B (g6)	L (±0.05)	RPM	N°Cutting edge	WEIGHT	Q.ty	NEXT ASSY
PEC-139-019-02-24	33.00/33.10	33.991/33.975	64.00/63.90	120	6	0.54 kg	1	PEC-139-019-01-03
PEC-139-019-02-25	38.00/38.10	38.991/38.975	64.00/63.90	120	6	0.72 kg	1	PEC-139-019-01-04
PEC-139-019-02-26	28.00/28.10	29.993/29.980	68.00/67.90	120	6	0.42 kg	1	PEC-139-019-01-05

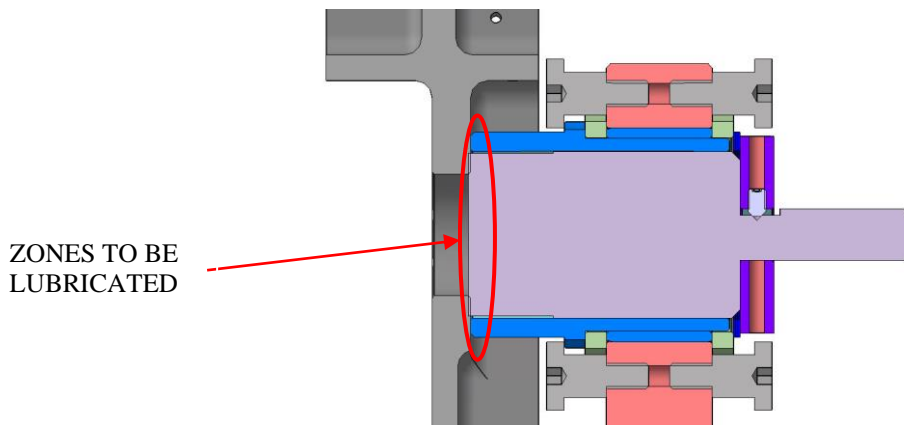



Figure 15: LUBRICANT INLET AREAS

 Caution	<p>Use cutting lubricant and drilling spray oil during milling and operation. Fig. 15 shows the areas to be lubricated.</p>
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5 SAFETY NOTES

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



Figure 16: SAFETY NOTES



6 STORAGE

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

The tools shall be stored in the dedicated transportation box (part of the kit).

Ensure that the tool parts are clean before storage.

6.1 *LUBRICATION BEFORE STORAGE*

Apply the Grease (MIL-PRF-23827) on all threaded parts before tool storage.

7 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.

7.1 *CLEANING*

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

7.1.1 *SPECIAL TOOLS, FIXTURE AND EQUIPMENT*

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

7.1.2 *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 slush deposits.

7.1.3 *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.

7.2 CHECKS

The equipment must be checked before and after every use to insure their functionality.

7.2.1 OVERALL VISUAL EXAMINATION

NOTE: The task must be performed by operators, with intermediate skill levels.

A. Examine all parts for any of the visible damage that follows (fig. 17):

N°	ACTION	ITEM POS.
1	Evidence of impact;	ALL
2	Crushing or stripping	ALL
3	Cracks;	A
4	Dents;	N/A
5	Wear;	A, B, C, D,
6	Distortions;	B, A
7	Corrosion;	ALL
8	Loose or defective attaching parts.	B
9	Unsticking of parts.	E

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

B. Marking

- 1) Visually examine the marking.
- 2) Make sure that external surface and adhesion is in good condition. If the marking is damaged or not readable, proceed to restore it.

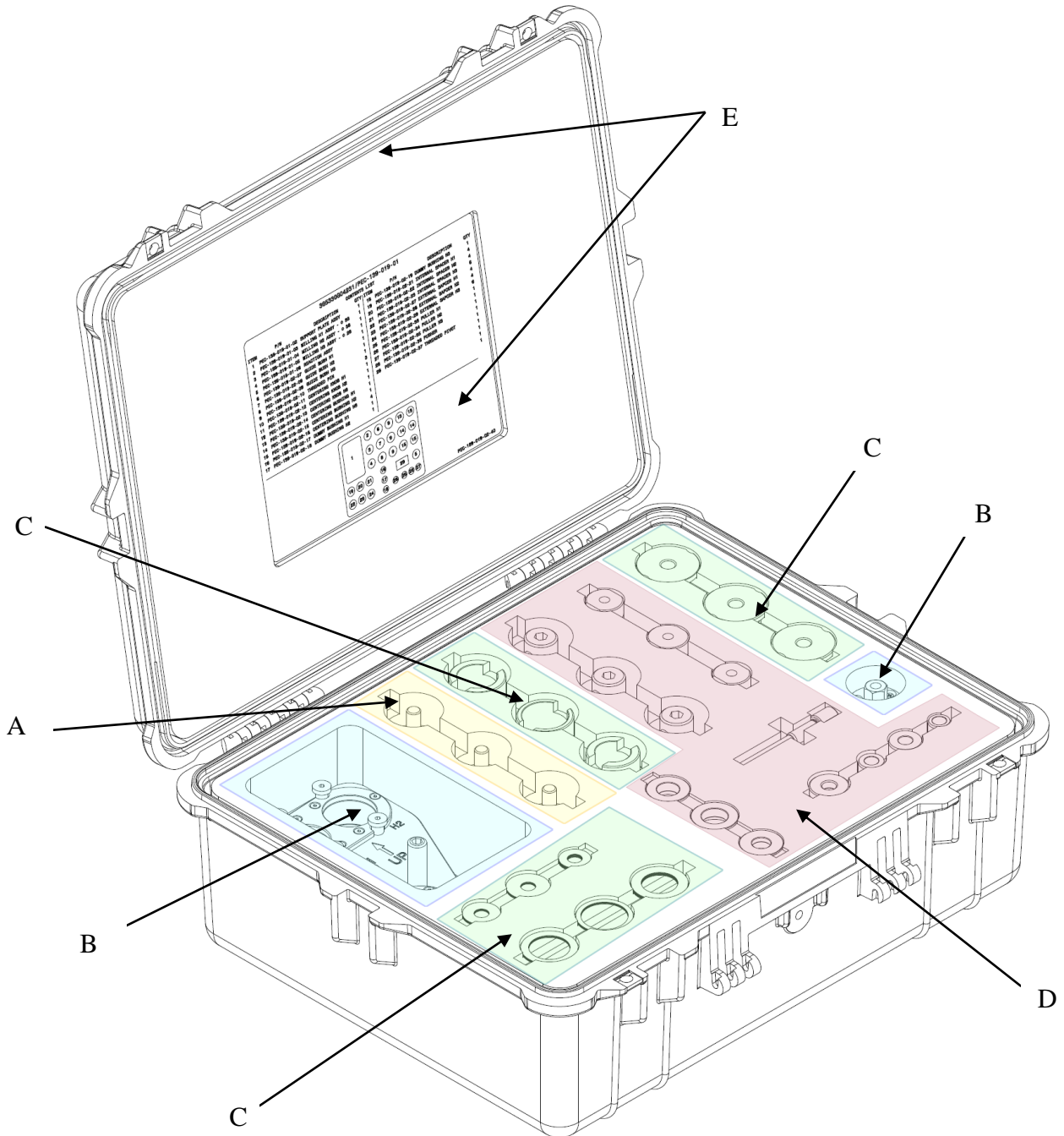


Figure 17: OVERALL VISUAL EXAMINATION

7.2.2 END MILLS, EXAMINATION

7.2.2.1 VISUAL CHECKS

Before and after each use, visually inspect the degradation and wear of the cutting tools.

On cutting tools must not be present:

1. CUTTER CHIPPING OR BREAKDOWN

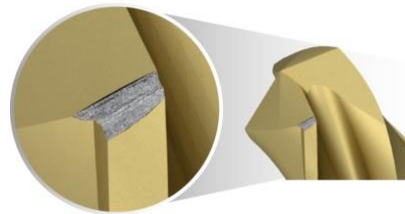


Figure 18: Example of chipping of the main cutting edges



Figure 19: Example of band chipping

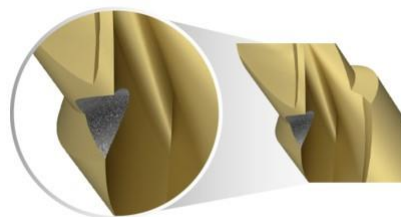


Figure 20: Example of band chipping

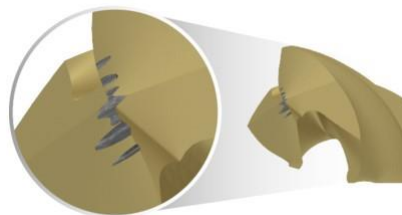


Figure 21: Example of tip corner chipping

2. CLADDING ON CUTTERS

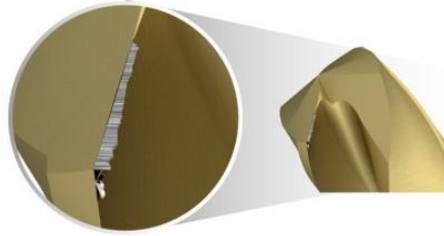






Figure 22: Example of cladding on cutters

 Notice	<p>Pay attention to localized changes in color due to materials. Possible breakdown.</p>
 Caution	<p>Replace cutting tools that show this degree of wear or degradation.</p>

7.2.2.2 ***DIMENSIONAL CHECKS***

The items to be checked before and after use are:

1. *PEC-139-019-02-07 GUIDE BUSHING H1*
Check the internal diameter with a micrometer for internal dimensions.
The size value of the internal hole must be: $\text{Ø}34.025/34.000$
2. *PEC-139-019-02-08 GUIDE BUSHING H2*
Check the internal diameter with a micrometer for internal dimensions.
The size value of the internal hole must be: $\text{Ø}39.025/39.00$
3. *PEC-139-019-02-09 GUIDE BUSHING H3*
Check the internal diameter with a micrometer for internal dimensions.
The size value of the internal hole must be: $\text{Ø}30.021/30.00$
4. *PEC-139-019-02-24 END MILL H1*
Check the external diameter of end mills with a micrometer for external dimensions.
The size value of the external diameter must be: $\text{Ø}33.00/33.10$ and $33.991/33.975$
5. *PEC-139-019-02-25 END MILL H2*
Check the external diameter of end mills with a micrometer for external dimensions.
The size value of the external diameter must be: $\text{Ø}38.00/38.10$ and $38.991/38.975$
6. *PEC-139-019-02-26 END MILL H3*
Check the external diameter of end mills with a micrometer for external dimensions.
The size value of the external diameter must be: $\text{Ø}28.00/28.10$ and $28.993/28.980$

 Caution	<p>Parts that have critical dimensions outside the required tolerances must be replaced with new ones.</p>
 Notice	<p>If you do not have the measuring instruments listed in paragraph 7.3, take the components to be checked to a specialized measuring centre.</p>

7.3 *SPECIAL TOOLS, FIXTURE AND EQUIPMENT*

- For GUIDE BUSHINGS use millesimal micrometer for internal dimensions with a measuring range from 5 to 30 mm



Figure 23: Example of millesimal micrometer for internal dimensions

- For END MILLS and REAMERS use a millesimal micrometer for external dimensions with a measuring range from 0 to 25 mm.



Figure 24: Example of millesimal micrometer for external dimensions

7.4 REPLACEMENT

All the parts for which it is allowed the components replacement are listed in Paragraph 9.

The replacement of these parts does not require specific procedures.

8 CALIBRATION

No calibration is required for maintenance.

9 SPARE PARTS LIST

Referring to the previous maintenance operation, a spare parts list is reported below:

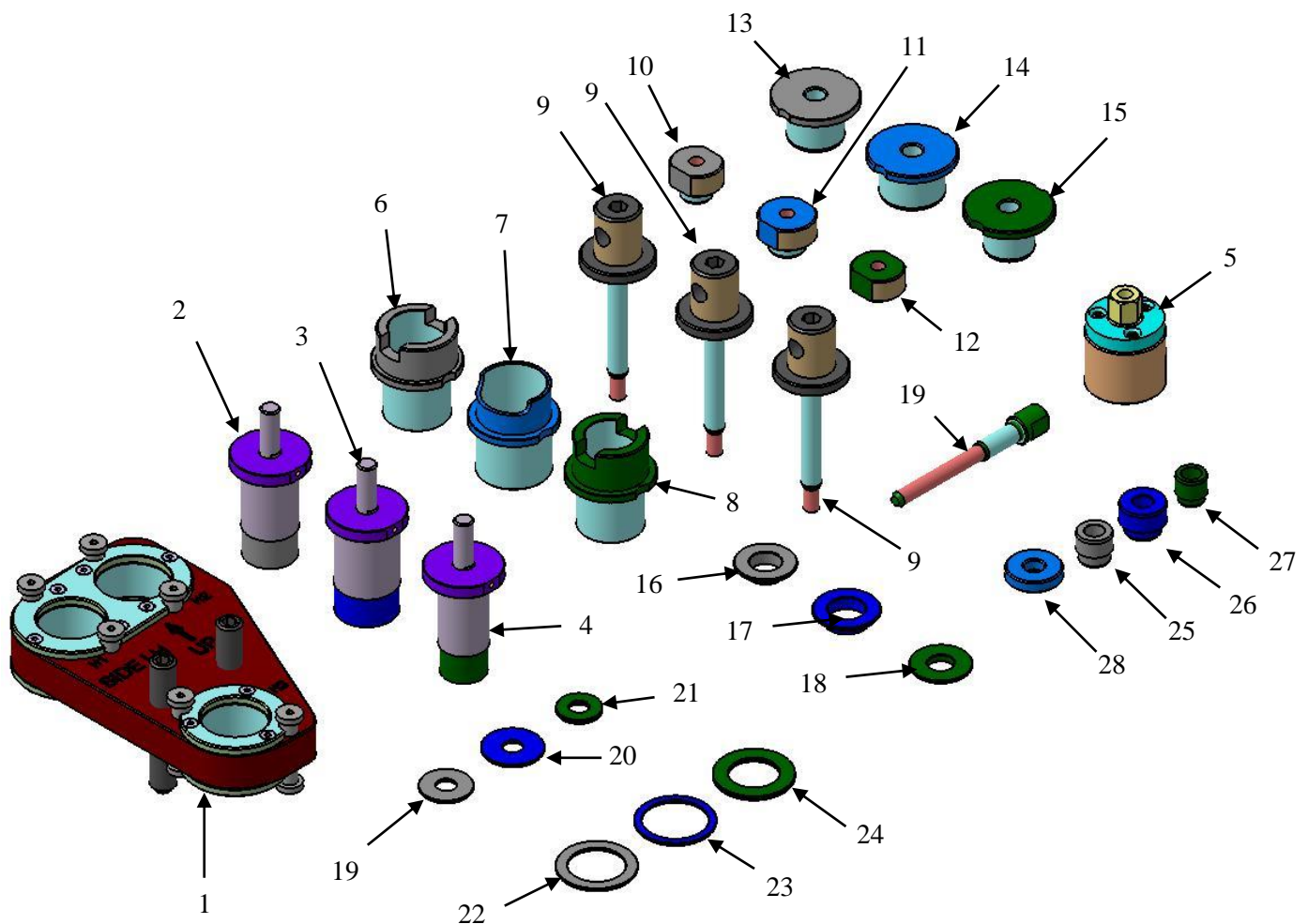


Figure 25: PEC-139-019-01 MAIN PARTS



ITEM	P/N	DESCRIPTION	Q. TY	SUPPLIER
1	PEC-139-019-01-02	SUPPORT PLATE ASSY	1	PEC
2	PEC-139-019-01-03	END MILL ASSY, H1	1	PEC
3	PEC-139-019-01-04	END MILL ASSY, H2	1	PEC
4	PEC-139-019-01-05	END MILL ASSY, H3	1	PEC
5	PEC-139-019-01-06	REACTION ASSY	1	PEC
6	PEC-139-019-02-07	GUIDE BUSHING H1	1	PEC
7	PEC-139-019-02-08	GUIDE BUSHING H2	1	PEC
8	PEC-139-019-02-09	GUIDE BUSHING H3	1	PEC
9	PEC-139-019-02-10	THREADED PIN (3 REQ'D)	3	PEC
10	PEC-139-019-02-11	CENTERING KNOB H1	1	PEC
11	PEC-139-019-02-12	CENTERING KNOB H2	1	PEC
12	PEC-139-019-02-13	CENTERING KNOB H3	1	PEC
13	PEC-139-019-02-14	CENTERING BUSHING H1	1	PEC
14	PEC-139-019-02-15	CENTERING BUSHING H2	1	PEC
15	PEC-139-019-02-16	CENTERING BUSHING H3	1	PEC
16	PEC-139-019-02-17	DUMMY BUSHING H1	1	PEC
17	PEC-139-019-02-18	DUMMY BUSHING H2	1	PEC
18	PEC-139-019-02-19	DUMMY BUSHING H3	1	PEC
19	PEC-139-019-02-21	INTERNAL SPACER H1	4	PEC
20	PEC-139-019-02-22	INTERNAL SPACER H2	4	PEC
21	PEC-139-019-02-23	INTERNAL SPACER H3	6	PEC
22	PEC-139-019-02-27	EXTERNAL SPACER H1	4	PEC
23	PEC-139-019-02-28	EXTERNAL SPACER H2	4	PEC
24	PEC-139-019-02-29	EXTERNAL SPACER H3	6	PEC
25	PEC-139-019-02-33	PULLER H1	1	PEC
26	PEC-139-019-02-34	PULLER H2	1	PEC
27	PEC-139-019-02-35	PULLER H3	1	PEC
28	PEC-139-019-02-36	PUSHER	1	PEC
29	PEC-139-019-02-37	GUIDE	1	PEC



PRIVATE ENGINEERING COMPANY

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Doc. N°: PEC-0139-MAN-0019

Issue: 01

Client: Leonardo Helicopters Division

Date: 04/06/2023

10 ANNEX I

Log Card.