

EUROCOPTER  
DIRECTION TECHNIQUE SUPPORT  
13725 MARGNANE CEDEX FRANCE

CIVIL VERSION(S):

313B, 3130, 316B,  
316C, 3160, 318B,  
318C, 3180, 319B

# SERVICE BULLETIN

**No. 05.101****SUBJECT: TIME LIMITS - MAINTENANCE CHECKS**

Determining the amount of water in the Main Gear Box (MGB) oil

**ATA: 65**

REVISION No.	DATE OF APPROVAL	DATE OF ISSUE
Revision 0	On: March 26, 2010	2010.03.29

## **1. PLANNING INFORMATION**

### **1.A. EFFECTIVITY**

#### **1.A.1. Helicopters/installed equipment**

On all Alouette helicopters.

#### **1.A.2. Non-installed equipment**

Not applicable.

### **1.B. ASSOCIATED REQUIREMENTS**

Not applicable.

### **1.C. REASON**

To prevent the development of corrosion inside the Main Gear Box and the free wheel which can result from the presence of water in the oil.

### **1.D. DESCRIPTION**

When a helicopter was hovering, the free wheel detached, causing the loss of Main Gear Box drive (loss of power to the main rotor and tail rotor drive systems).

Examination of the free wheel revealed failure of the screws attaching the free wheel to the clutch and of the free-wheel seating flange.

This failure is due to the progressive development of corrosion inside the free-wheel coupling (clutch side). This corrosion, which results from the presence of water and other impurities in the MGB oil, led to degraded operation of the free-wheel coupling, up to final failure of the screws and the free-wheel flange, causing the in-flight loss of the free wheel.

Analysis of the oil found inside the free wheel showed a large amount of water.

Consequently, EUROCOPTER recommends compliance:

- with the periodic checks of the amount of water in the MGB oil,
- with the supplementary maintenance measures in case there is water in the MGB lubricating oil.

## **1.E. COMPLIANCE**

EUROCOPTER recommends compliance with this Service Bulletin.

### **1.E.1. Compliance at the works**

#### **1.E.1.a. On helicopters/installed equipment**

Not applicable.

#### **1.E.1.b. On non-installed equipment**

Not applicable.

### **1.E.2. Compliance in service**

#### **1.E.2.a. On helicopters/installed equipment**

##### **1.E.2.a.1. Helicopters which are grounded for a period of more than 1 month but which are not preserved**

Before returning the helicopter to service and before changing the MGB oil, comply with paragraph 2.B.2. of this Service Bulletin and wait for the results of the analyses before resuming flights.

##### **1.E.2.a.2. Helicopters in service**

- Comply with paragraph 2.B.2. of this Service Bulletin within 6 months following the date of issue of this Service Bulletin, indicated at the foot of the page.

Then, comply with paragraph 2.B.2. of this Service Bulletin every 6 months.

- If an abnormal change in the color or smell of the oil is detected during the ALF check (check after the last flight of the day), or if in doubt, comply as follows:
  - . for Alouette 2 type helicopters: 3130, 313B, comply with paragraph 2.B.3. of this Service Bulletin in addition to section 5.5 paragraph K of the MDE,
  - . for Alouette 2 type helicopters: 3180, 318B, 318C, comply with paragraph 2.B.4. of this Service Bulletin in addition to section 5.5 paragraph K of the MDE,
  - . for Alouette 3 type helicopters: 3160, 316B, 316C, 319B, comply with paragraph 2.B.4. of this Service Bulletin in addition to MDE Work Card 5.41.211.

#### **1.E.2.b. On non-installed equipment**

Not applicable.

## **1.F. APPROVAL**

### **1.F.1. Approval of modifications**

Not applicable.

### **1.F.2. Approval of the Service Bulletin**

The technical information contained in this Service Bulletin Revision 0 was approved on March 26, 2010 under the authority of EASA Design Organisation Approval No. 21J.056 for civil version helicopters subject to an Airworthiness Certificate.

## **1.G. MANPOWER**

### **1.G.1. Qualification**

EUROCOPTER recommends that compliance with this Service Bulletin is ensured by personnel qualified as follows:

Qualification: 1 mechanical engineering technician.

### **1.G.2. Time for the operations**

The operation times are given for information only and for a standard configuration.

Times for the operations: Approximately half an hour to take the oil sample.  
Approximately 8 hours for the additional checks.

## **1.H. WEIGHT AND BALANCE**

Not applicable.

## **1.I. EFFECT ON ELECTRICAL LOADS**

Not applicable.

## **1.J. SOFTWARE MODIFICATION EMBODIMENT RECORD**

Not applicable.



## 1.K. REFERENCES

Maintenance Manual:

For Alouette 2 type helicopters: 3130, 313B:

MDE: 12.0 page 3: Draining the MGB oil.

MDE: 12.0 page 4: Replenishing the MGB oil.

For Alouette 2 type helicopters: 3180, 318B, 318C:

MDE: 12.0 page 4: Draining - Replenishing the MGB oil.

MDE: 40.1.2 page 401: Removal of the MGB.

MDE: 40.1.2 page 402: Installation of the MGB.

MDE: 40.1.2 page 807: Replacement of the boot seals between the MGB and the clutch.

MDE: 40.1.3 page 401: Removal - Installation of the free-wheel coupling shaft.

MDE: 40.1.4 page 401: Removal - Installation of the power takeoff.

MDE: 40.1.4 page 402: Removal - Installation of the standard clutch.

For Alouette 3 type helicopters: 3160, 316B, 316C, 319B:

MDE: 40.00.301: Instructions for dynamic components.

MDE: 40.00.302: Instructions if the type of oil used in the MGB or TGB is changed.

MDE: 40.12.302: Draining the oil system.

MDE: 40.12.303: Replenishing the oil system.

MDE: 40.12.401: Removal - Installation of the MGB.

MDE: 40.12.801: Replacement of the boot seals between the MGB and the clutch.

MDE: 40.13.401: Removal - Installation of the free-wheel coupling shaft.

MDE: 40.14.301: Tightening torque for the clutch power takeoff.

MDE: 40.14.401: Removal - Installation of the clutch power takeoff.

MDE: 40.14.402: Removal - Installation of the standard clutch.

## 1.L. OTHER DOCUMENTS AFFECTED

### 1.L.1. Documents already updated

Not applicable.

### 1.L.2. Documents to be updated

EUROCOPTER will modify the following documents with respect to this Service Bulletin:

- MDE,
- PRE.

These documents will be issued subsequently.

**1.M. TOOLING AFFECTED**

Not applicable.

**1.N. INTERCHANGEABILITY OR MIXABILITY OF PARTS**

Not applicable.

## 2. ACCOMPLISHMENT INSTRUCTIONS

### 2.A. GENERAL

- Read and comply with the instructions for dynamic components as per MDE Work Card 40.00.301.
- Read and comply with the instructions which are applicable if the type of oil used in the MGB or TGB is changed, as per MDE Work Card 40.00.302.

### 2.B. OPERATIONAL PROCEDURE

#### NOTE 1

*The oil sample must be taken during a run-up, or otherwise the MGB must be operated manually for approximately 10 minutes in order to homogenize the MGB oil.*

#### 2.B.1. Preliminary steps

- Install appropriate access equipment.

#### 2.B.2. Oil sampling (Figure 1)

- Cut and remove the lock-wire from filler cap (a).
- Remove filler cap (a).

#### **CAUTION**

**THE TOOLS USED MUST BE FREE FROM ANY IMPURITIES, SAND, SOIL OR WATER, ETC.**

#### NOTE 2

*The sampling bottle (e.g. a 125 ml bottle) must be clean and must remain closed until the oil sample is taken.*

- Open the bottle.
- Using a pipette or a flexible tube or a syringe, take an oil sample from the MGB (b).
- Put 100 ml of the oil into the bottle.
- Close the bottle.
- Produce a label:
  - . indicate the name of the helicopter operator,
  - . the serial number of the helicopter,
  - . the serial number of the MGB,
  - . the total number of MGB operating hours,
  - . the date on which the sample is taken.
- Affix this label onto the bottle.
- To determine the water content, send the bottle to a EUROCOPTER-approved laboratory in accordance with paragraph 4., APPENDIX.
- Reinstall filler cap (a).

- Safety the filler cap with lock-wire (1).
- Comply with paragraph 2.B.5.
- For helicopters which are grounded for a period of more than 1 month but which are not preserved, wait for the results of the analyses before resuming flights.
- For the other helicopters, resume flights.

**Interpretation of the analyses when the results are received:**

**Water content  $\leq$  1,000 ppm:**

- Continue flights.

**Water content  $>$  1,000 ppm:**

- Drain the oil system as per MDE Work Card 12.0 page 3 or MDE Work Card 12.0 page 4 or MDE Work Card 40.12.302.
- For Alouette 2 type helicopters: 3130, 313B, comply with paragraph 2.B.3.
- For Alouette 2 type helicopters: 3180, 318B, 318C and Alouette 3 type helicopters: 3160, 316B, 316C, 319B; comply with paragraph 2.B.4.

**2.B.3. Supplementary maintenance for Alouette 2 type helicopters: 3130, 313B (Figure 2)**

- Comply with paragraph 2.B.1.
- Fully replenish the oil system as per MDE Work Card 12.0 page 4.
- Comply with paragraph 2.B.5.

**2.B.4. Supplementary maintenance for Alouette 2 type helicopters: 3180, 318B, 318C and Alouette 3 type helicopters: 3160, 316B, 316C, 319B (Figure 2)**

- Comply with paragraph 2.B.1.
- Remove free wheel (j) as per MDE Work Card 40.1.3 page 401 or MDE Work Card 40.13.401.
- **Check the free-wheel/MGB coupling teeth:**
  - . cut and remove the lock-wire from screws (l),
  - . remove screws (l),
  - . retain 2 half-flanges (c),
  - . extract clamping plate (m) equipped with thrust washer (h) and boot seal (g), thrust plate (e) and coupling pinion (k),
  - . check that there is no corrosion on the teeth of coupling pinion (k) and free-wheel coupling (d):
    - .. if there is no corrosion:
      - fit coupling pinion (k), thrust plate (e),
      - check the condition of boot seal (g); if in doubt, replace it as per MDE Work Card 40.1.2 page 807 or MDE Work Card 40.12.801,
      - offer up clamping plate (m) equipped with thrust washer (h) and boot seal (g),
      - attach clamping plate (m) and 2 half-flanges (c) with screws (l),
      - torque tighten screws (l) as per MDE Work Card 40.14.301,
      - safety screws (l) with lock-wire (1).



.. if corrosion is found:

- replace MGB (b) with (4) as per MDE Work Card 40.1.2 page 401 and MDE Work Card 40.1.2 page 402 or MDE Work Card 40.12.401,
- replace free wheel (j) with (3) as per MDE Work Card 40.1.3 page 401 or MDE Work Card 40.13.401,
- send MGB (b) and free wheel (j) to a EUROCOPTER-approved center for reconditioning of the components checked in accordance with this Service Bulletin.

**- Check the free-wheel/clutch coupling teeth:**

- . cut and remove the lock-wire from screws (l),
- . remove screws (l),
- . retain 2 half-flanges (c),
- . extract clamping plate (m) equipped with thrust washer (h) and boot seal (g), thrust plate (e) and coupling pinion (k),
- . check that there is no corrosion on the teeth of coupling pinion (k) and free-wheel coupling (d):
  - .. if there is no corrosion:
    - fit coupling pinion (k), thrust plate (e),
    - check the condition of boot seal (g); if in doubt, replace it as per MDE Work Card 40.1.2 page 807 or MDE Work Card 40.12.801,
    - offer up clamping plate (m) equipped with thrust washer (h) and boot seal (g),
    - attach clamping plate (m) and 2 half-flanges (c) with screws (l),
    - torque tighten screws (l) as per MDE Work Card 40.14.301,
    - safety screws (l) with lock-wire (1).

.. if corrosion is found:

- remove clutch (f) as per MDE Work Card 40.1.4 page 401 or MDE Work Card 40.14.401,
  - disassemble clutch (f) as per MDE Work Card 40.1.4 page 402 or MDE Work Card 40.14.402,
  - replace coupling pinion (k) with (5) and/or free-wheel coupling (d) with (2),
  - assemble clutch (f) as per MDE Work Card 40.1.4 page 402 or MDE Work Card 40.14.402,
  - install clutch (f) as per MDE Work Card 40.1.4 page 401 or MDE Work Card 40.14.401,
  - replace free wheel (j) with (3) as per MDE Work Card 40.1.3 page 401 or MDE Work Card 40.13.401,
  - send free wheel (j) to an approved center for reconditioning of the components checked in accordance with this Service Bulletin.
- Install free wheel (j) or (3) as per MDE Work Card 40.1.3 page 401 or MDE Work Card 40.13.401.
  - Fully replenish the oil system as per MDE Work Card 12.0 page 4 or MDE Work Card 40.12.303.
  - Comply with paragraph 2.B.5.

**2.B.5. Final steps**

- Remove the access equipment.

**2.C. IDENTIFICATION**

Record initial compliance with this Service Bulletin in the helicopter documents and on the MGB equipment log card (FM).

**2.D. OPERATING AND MAINTENANCE INSTRUCTIONS****2.D.1. Operating instructions**

Not applicable.

**2.D.2. Scheduled maintenance instructions**

These instructions will be incorporated in the Maintenance Program (PRE), in the "Inspection intervals" section, as part of a future revision. Refer to the PRE when these instructions have been incorporated.

**2.D.3. Unscheduled maintenance instructions**

Not applicable.

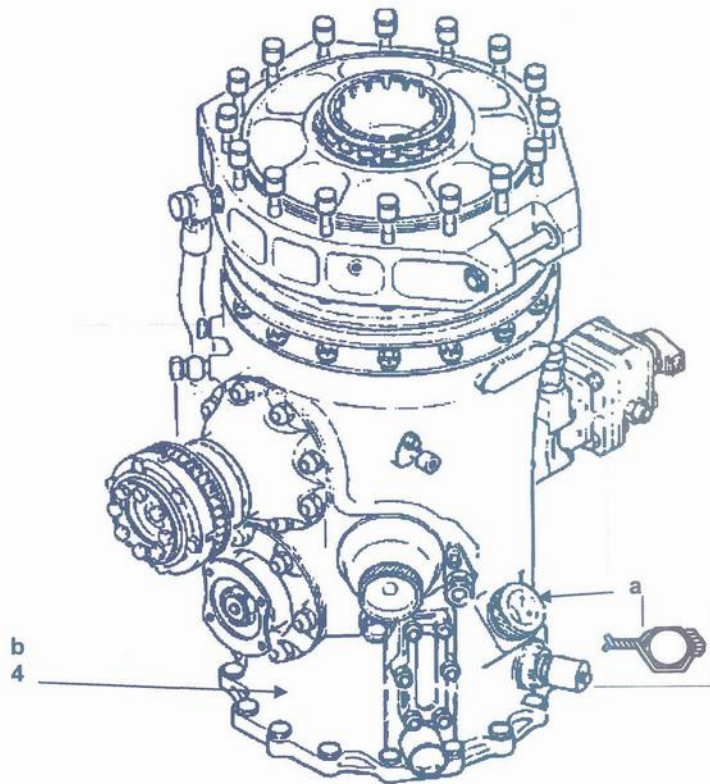


Figure 1

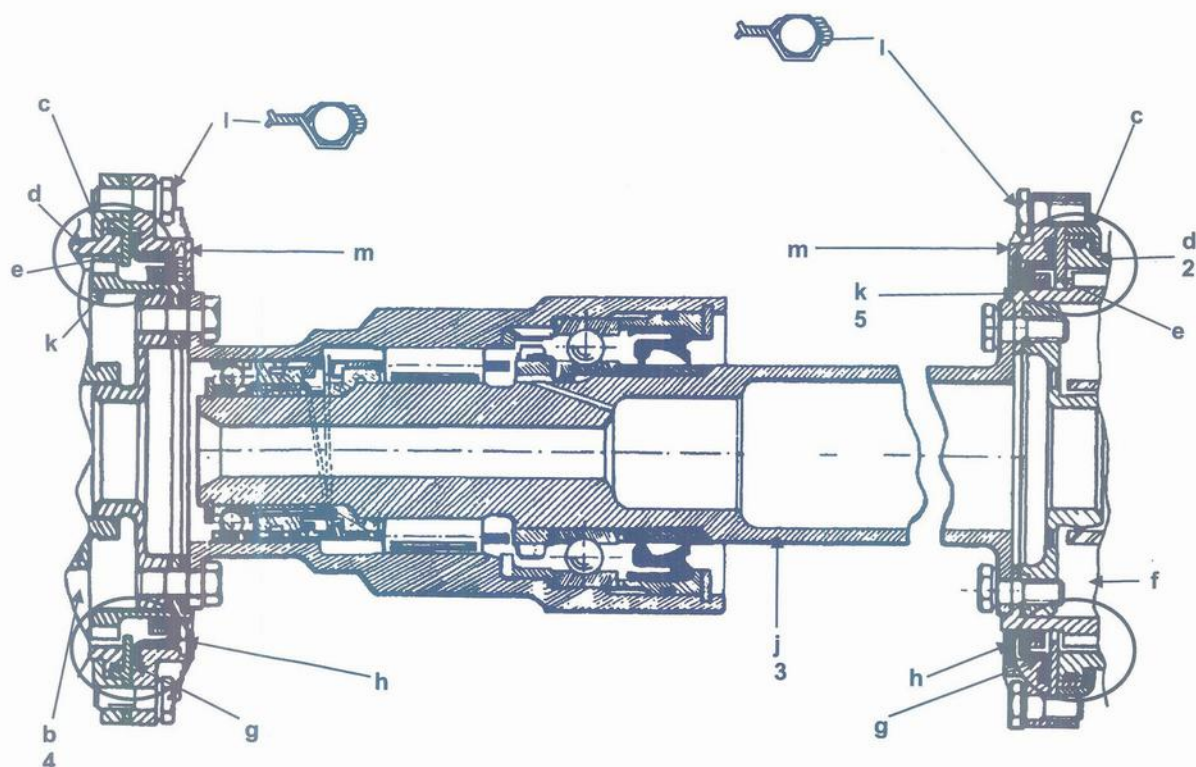
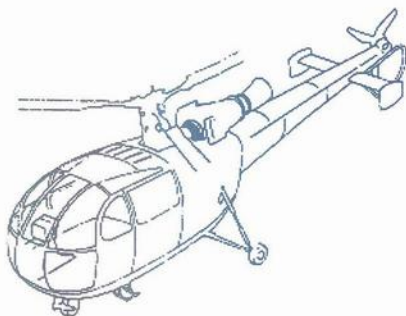


Figure 2



### 3. MATERIAL INFORMATION

#### 3.A. MATERIAL: PRICE AND AVAILABILITY

##### 3.A.1. Cost

For any information concerning the kits and/or components, contact the EUROCOPTER Network Sales & Customer Relations Department.

##### 3.A.2. Availability

The parts will be delivered on the operator's order.

#### 3.B. INFORMATION CONCERNING INDUSTRIAL SUPPORT

Not applicable.

#### 3.C. MATERIAL REQUIRED FOR EACH HELICOPTER/ENGINE/COMPONENT

##### 3.C.1. Kits or components to be ordered for one helicopter or one assembly

Material P/N	Qty	Item	Key Word	Former P/N	Instructions
3130S63-32-001	AR	2	Free-wheel coupling	3130S63-32-001	Discard
316S60-10-000-2	AR	3	Free wheel	316S60-10-000-2	Return to EUROCOPTER
319A62-00-000-4	AR	4	MGB assembly	319A62-00-000-4	Return to EUROCOPTER
3130S62-22-051-1	AR	5	Pinion	3130S62-22-051-1	Discard

##### 3.C.2. Material to be ordered separately

Material P/N	Qty	Item	Key Word
EN3628-0,8	AR	1	Lock-wire

##### 3.C.3. Products to be ordered separately

The materials identified by an asterisk "\*" or required for compliance with the Tasks and/or Work Cards listed in paragraph 1.K., can be ordered from the INTERTURBINE company:

Website: <http://www.itlogistics.de>

Phone: +49.41.91.809.300

AOG: +49.41.91.809.444.

**3.D. PROCUREMENT CONDITIONS**

Order the required quantity (unless otherwise specified)

from

EUROCOPTER  
Etablissement de Marignane  
Direction Ventes et Relations Client  
ECR  
13725 MARIGNANE CEDEX  
FRANCE

**NOTE**

*On the purchase order, please specify the mode of transport,  
the destination, and the serial numbers of the helicopters to be  
modified.*

**3.E. PROCEDURE: MATERIAL RETURN**

Return the equipment in accordance with the procedure specified in Service Letter No. 1567-00-02.

**4. APPENDIX**

The list of EUROCOPTER-approved laboratories is given in: <http://www.eurocoptersea.com/main.htm> then in the Customer Service section, select "Approved laboratories".