A/C TYPE EC 155B

A/C REGN 9M-SAS S/N 6583

TYPE OF CHECK

eurocopter
an EADS Company

EUROCOPTER SOUTH EAST ASIA PTE LTD
48 Loyang Way Singapore 508740
Company Registration No.: 197702516C

NO: 17536 FORM NO: M/003

JOB NO.

PAGE OF

DEFECT AND RECTIFICATION WORKSHEET/CERTIFICATE OF RELEASE TO SERVICE

ITEM NO.	REPORTED BY DATE	DEFECT/WORK REQUIRED	ACTION TAKEN	COMPONENT CHANGES S/N OFF	COMPONENT CHANGES S/N ON	G.I.N.NO. OR O/HAUL REPORT NO.	MAN HOURS	MECH	LIC/ APP NO. DATE
1.	SIEW LAY 06/12/04	COMPLY WITH SB 67-002 – ROLL, PITCH AND YAW SERIES ACTUATORS (PARA 2B1)	Carried out checking of lock washer of rod/end-fitting coupling for interference with the body of the Series actuator IAW SB 67-002 Para 2.B.1 and found assembly is IAW Standard.				1		A1818 20/12/04
2.	SIEW LAY 06/12/04	COMPLY WITH ASB 62A 006 – CHECK FOR CORRECT POSITIONING OF THE FILER WEDGE OF THE TENON AT THE MRB TIP (PARA 2B1 & 2B5) [REF. AD F-2004-106(A)]	Inspection of filler wedge on the tenon at the MRB Tip carried out IAW ASB 62A 006 (Para 2B1 and 2B5) Carried out found sats.				4		A1119 17/12/04

THE WORK RECORDED ABOVE HAS BEEN CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS FOR THE TIME BEING IN FORCE AND IN THAT RESPECT THE AIRCRAFT/ EQUIPMENT IS CONSIDERED FIT FOR RELEASE TO SERVICE:

- ☐ SINGAPORE AIR NAVIGATION ORDER
- ☐ ~~JAR 145 NO : F-04E~~ EASA.145.0056
- ☐
- ☑ MALAYSIAN CIVIL AVIATION REGULATIONS
- ☐ MANUFACTURER'S PUBLICATIONS

AWM/024/01 #56
(IRS #17536)

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SERVICE BULLETIN EC155

EUROCOPTER
DIRECTION TECHNIQUE SUPPORT
13725 MARIGNANE CEDEX FRANCE

CIVIL VERSION(S): B,B1

SERVICE BULLETIN

No. 67-002

SUBJECT: **ROTOR FLIGHT CONTROLS**

Roll, Pitch and Yaw Series Actuators

LIST OF APPROVED REVISIONS	REVISION No. 0 APPROVED
Not applicable	Date: July 13, 2004

1. PLANNING INFORMATION

1.A. EFFECTIVITY

Aircraft delivered before April 1, 2003.

1.B. ASSOCIATED REQUIREMENTS

Not applicable.

1.C. REASON

To prevent instability of the aircraft on take-off and loss of the AFCS assistance.

1.D. DESCRIPTION

EUROCOPTER has discovered that:

- There is a risk of interference between the lockwasher of the rod / end-fitting coupling and the body of the pitch, left roll, right roll or yaw control series actuators, due to faulty adjustment of the lockwasher.
  The reduction of the travel of the series actuator is detected by the Automatic Flight Control System when the lockwasher overlaps onto the effective travel of the series actuator by more than 1.5 mm.
  When this type of fault is detected, the pilot loses the AFCS assistance on the affected channel.

- The heat shrink sleeve is missing on the rod / end-fitting coupling of the series actuator.

- In some cases the lockwasher is not bent over which can cause the loss of the tightening torque load of the lock nut of the rod / end-fitting coupling of the series actuator, and induce insignificant play, which is not detected by the pilot.
  There is no risk of losing the adjustment of the end-fitting provided that the lock nut, which is part of the half-rod / end-fitting coupling on the opposite end of the series actuator, is correctly locked.

- There is a risk of interchanging the electrical connectors of the left roll and pitch series actuators despite the existing nylon index cables.
  These nylon index cables are not in accordance with the assembly standard (cables too long compared to the assembly drawing) which involves the risk of interchanging the two electrical connectors).
  Interchanged installation of these two electrical connectors can cause instability of the aircraft during the take-off phase when the Automatic Flight Control System (or backup SAS) is engaged. During this phase and according to the response time of the pilot, this instability can lead to a significant reduction of the safety margins.

  It must be noted that this fault remains hidden until take-off phase.

Pending a modification, EUROCOPTER recommends compliance with the following measures:
- check that the rod / end-fitting coupling of the pitch, left roll, right roll and yaw series actuators is assembled in compliance with the assembly standard,
- adjust the lockwasher,
- check that the electrical connectors of the left roll and pitch series actuators are correctly connected,
- check the length of the nylon index cables,
- adjust the length of the nylon index cables, if necessary,
- do a functional test of the pitch series actuator.

1.E. COMPLIANCE

EUROCOPTER recommends compliance with this Service Bulletin.

1.E.1. At the works

1.E.1.a. On aircraft: Not applicable.

1.E.1.b. On spares: Not applicable.

1.E.2. Retrofit action

1.E.2.a. On aircraft: By the operator:

1) Comply with paragraph 2.B.1.:
- at the next 600-hour inspection or 24 months, the first limit reached is applicable,
- or when replacing one of the pitch, left roll, right roll or yaw series actuators,
- or when replacing the end-fitting of one of the pitch, left roll, right roll or yaw series actuators,

2) Comply with paragraph 2.B.2.:
- within 3 months,
- or before performing work on the aircraft.

c/out on 20/10/04 CRS A17503.

1.E.2.b. On spares:

Comply once with paragraph 2.B.3.d. on assemblies delivered before December 1, 2002:
- cable fitted with snap hook, part number 365A61.1622.00,
- cable fitted with ring, part number 365A61.1622.01.

1.F. APPROVAL

Approval is limited to civil version helicopters subject to an Airworthiness Certificate.

The technical information contained in this Service Bulletin was approved on July 13, 2004 under the authority of DGAC Design Organisation Approval No. F.JA01.

1.G. MANPOWER

1.G.1. Paragraph 2.B.1.: Checking the lockwasher of the rod / end-fitting coupling for interference with the body of the series actuator

Qualification: 1 mechanic, approximately 3.5 hours.

1.G.2. Paragraph 2.B.2.: Checking the electrical connectors and the length of the nylon index cables

Qualification: 1 mechanic, approximately 1.5 hours.

1.H. WEIGHT AND BALANCE

Weight: Not applicable.
Moment: Not applicable.

1.I. EFFECT ON ELECTRICAL LOADS

Not applicable.

1.J. SOFTWARE MODIFICATION EMBODIMENT STATE

Not applicable.

1.K. REFERENCES

Aircraft Maintenance Manual (AMM) Tasks:
- 24-00-00-481
- 29-12-00-481
- 60-00-00-911
- 67-00-00-211
- 67-00-00-911
- 67-00-00-991
- 67-10-00-821
- 67-20-00-821

Standard Practices Manual (MTC) Work Cards:
- 20.02.06.404
- 20.02.06.410
- 20.02.07.101
- 20.02.07.401
- 20.05.01.211

1.L. OTHER DOCUMENTS CONCERNED

Aircraft Maintenance Manual (AMM):
The following tasks will be updated by a Rush Revision:
- 67-00-00-061
- 67-00-00-991
- 67-11-01-061
- 67-20-02-063

1.M. INTERCHANGEABILITY AND MIXABILITY OF PARTS

Not applicable.

2. ACCOMPLISHMENT INSTRUCTIONS

2.A. GENERAL

Comply with the general safety instructions:
- as per AMM Task 60-00-00-911: - Power Transmission Systems
- as per AMM Task 67-00-00-911: - Flight Controls

2.B. OPERATIONAL PROCEDURE

2.B.1. Checking the lockwasher of rod / end-fitting coupling for interference with the body of the series actuator (Figure 3)

NOTE

The procedure described in paragraph 2.B.1. is to be applied to the left roll (D), right roll (U), pitch (C) and yaw (V) series actuators.

Open the cowlings providing access to the series actuators.

2.B.1.a. Check that heat shrink sleeve (X) is installed on series actuator (W)

1) If the heat shrink sleeve is not installed:
Check that lockwasher (Y) is correctly bent over and does not overlap onto groove (Z) of the rod of series actuator (W) (Detail I).
- If the assembly is in accordance with standard:
  . remove the rod assembly as described in Appendices 1 to 4,
  . install heat shrink sleeve (3) as per MTC Work Card 20.02.06.410, in such a way that heat shrink sleeve (3) does not overlap onto groove (Z) of the rod of series actuator (W) (Detail H),
  . install the rod assembly as described in Appendices 1 to 4,
  . comply with paragraph 2.B.4. to check that pitch (C) and left roll (D) series actuators are correctly assembled,
- If the assembly is not in accordance with standard:
  . remove the rod assembly as described in Appendices 1 to 4,
  . comply with paragraph 2.B.1.b.

2) If heat shrink sleeve is installed

Check:
a) that lockwasher (Y) or heat shrink sleeve (X) does not overlap onto groove (Z) of the rod of series actuator (W) (Detail H),
b) that there is no distortion or abnormal kink on heat shrink sleeve (X).
- If the assembly is in accordance with standard, leave as is.
- If the assembly is not in accordance with standard:
. remove the rod assembly as described in Appendices 1 to 4,
. remove heat shrink sleeve (X),
- If lockwasher (Y) is incorrectly bent over or if it overlaps onto groove (Z), comply with paragraph 2.B.1.b.
- If lockwasher (Y) is correctly assembled:
. install heat shrink sleeve (3) as per MTC Work Card 20.02.06.410, in such a way that heat shrink sleeve (3) does not overlap onto groove (Z) of the rod of series actuator (W) (Detail H),
. install the rod assembly as described in Appendices 1 to 4,
. refer to paragraph 2.B.4. to check pitch C) and left roll (D) series actuators for correct assembly.

2.B.1.b. Removal / installation of the lockwasher (Detail I).

1) Before removing lockwasher (Y), measure length "e".
Length "e" will be used as presetting length when installing end-fitting (AA).

2) Removal
- Disengage lockwasher (Y).
- Loosen and remove locknut (AB).
- Remove end-fitting (AA).
- Scrap lockwasher (Y).

3) Installation
- Adjust lockwasher (4) in accordance with paragraph 2.B.1.c.
- Apply sealing compound (5) to end-fitting (AA) as per MTC Work Card 20.05.01.211.
- Fit end-fitting (AA) complete with locknut (AB) and adjusted lockwasher (4) to series actuator (W), using presetting length "e" measured in compliance with paragraph 2.B.1.b.1).
- Do the electrical bonding as per MTC Work Cards 20.02.07.101 and 20.02.07.401.
- Perform final adjustment of end-fitting (AA) as per AMM Subtask 67-10-00-821-002 of Task 67-10-00-821 or Subtask 67-20-00-821-002 of Task 67-20-00-821.
When complying with Subtasks 67-10-00-821-002 and 67-20-00-821-002 of Tasks 67-10-00-821 and 67-20-00-821:
. to adjust end-fitting (AA) of the yaw series actuator, do not disconnect the flexible ball-type control from the bellcrank on the tail boom.
. When locking adjusted lockwasher (4), make sure that the bent part of the shortened portion measures 3 mm (+0.5 / 0) (Detail I).
. Install heat shrink sleeve (3) as per MTC Work Card 20.02.06.410, in such a way that heat shrink sleeve (3) does not overlap onto groove (Z) of the rod of series actuator (W) (Detail H).
. Install the rod assembly as described in Appendices 1 to 4.
- Comply with paragraph 2.B.4. to check pitch C) and left roll (D) series actuators for correct assembly.

2.B.1.c. Adjustment of lockwasher (4) (Detail J).

Lockwasher (4) has already a bent portion (AC).
Cut bent portion (AC) so as to ensure a length of 9 mm from the center of lockwasher (4) up to the end of the shortened part.

2.B.2. Checking the electrical connectors and the length of the nylon index cables (Figure 2)

2.B.2.a. Preliminary steps

Open the left lateral cowlings providing access to left roll (D) and pitch (C) series actuators.

2.B.2.b. Check of electrical connectors "7C-P1" (S) and "11C-P1" (T)

Make sure that:
- electrical connector "7C-P1" (S) is connected to left roll series actuator (D),
- electrical connector "11C-P1" (T) is connected to pitch series actuator (C).

1) If connectors "7C-P1" (S) and "11C-P1" (T) are correctly connected, comply with paragraph 2.B.2.c.
2) If electrical connectors "7C-P1" (S) and "11C-P1" (T) are interchanged, this indicates that nylon index cables (O) are too long. Comply with paragraph 2.B.3.

NOTE

If in doubt about correct connection of electrical connectors "7C-P1" and "11C-P1" (the electrical markers have disappeared), comply with paragraph 2.B.2.c.

2.B.2.c. Checking the length of nylon index cables (O) (Figure 2)

Check the length of nylon index cables (O).
1) Nylon index cable (O) is 140 ± 5 mm long: the cable length is correct.
   - Leave as is.
2) Nylon index cable (O) is longer than 140 ± 5 mm.
   - Comply with paragraph 2.B.3.

2.B.3. Setting nylon index cables (O) or (1) to length (Figure 2)

2.B.3.a. Disconnect the electrical connectors from left roll (D) and pitch (C) series actuators.

2.B.3.b. Remove nylon index cables (O) by opening rings (P) on removable connector side.

2.B.3.c. Retain snap hook (K).
Snap hook (N) remains hooked to left roll series actuator (D).

2.B.3.d. Setting nylon cables (O) or (1) to length, Detail G.
- Cut nylon cable (O) or (1) on one end, flush with bushing (Q).
- Retain ring (P).
- Slip new bushing (2) on the cable end.
- Knot ring (P) to the shortened end of nylon cable (R), so that the length between both rings is 140 ± 5 mm.
- Crimp bushing (2) using crimping pliers (6) to wedge the two cable end pieces.

2.B.3.e. Open rings (P) to fit modified nylon cables (R) and secure nylon cables (R) to electrical connectors "7C-P1" (S) and "11C-P1" (T), by closing rings (P), (Details E and F).

NOTE

There is a double index device:
- *A snap hook and a ring on the electrical connector and on the actuator:*
  - *For left roll series actuator (D), snap hook (N) is on the actuator, and ring (M) on electrical connector "7C-P1" (S) (Detail F).*
  - *For pitch series actuator (C), ring (L) is on the actuator and snap hook (K) on electrical connector "11C-P1" (T) (Detail E).*
- *The routing of the two electrical harnesses which eliminates the risk of the harnesses being connected to the opposite actuator when the snap hook is connected to the actuator.*

2.B.3.f. Hooking of nylon cables (R), (Details E and F):
- Electrical connector "7C-P1" (S): nylon cable (R) is secured to snap hook (N) of left roll series actuator (D).
- Electrical connector "11C-P1" (T): nylon cable (R) equipped with snap hook (K) is secured to ring (L) of pitch series actuator (C).

2.B.3.g. Connect electrical connectors and make sure that:
- Electrical connector "7C-P1" (S) is connected to left roll series actuator (D).
- Electrical connector "11C-P1" (T) is connected to pitch series actuator (C).

2.B.3.h. Comply with paragraph 2.B.4.

2.B.4. Functional test of pitch series actuator (C) (Figures 1 and 2):

- Energize the helicopter power systems as per Subtask 24-00-00-481-002 of Task 24-00-00-481.

- Supply hydraulic pressure to the helicopter system as per Subtask 29-12-00-481-001 of Task 29-12-00-481.

- On the AHRS control units 1 and 2, set the AHRS 1 and 2 switches to "ON".

- Make sure that the amber "OFF" light of "AP" pushbutton (E) on APMS control unit (G) comes on.

- Set "TRIM FEEL CYCL" switch (B) on overhead panel 12 ALPHA (A) to "ON".

- Push "AP" pushbutton (E) on APMS control unit (G) to engage the AFCS.

  . Make sure that the "'OFF" light of the "AP" (E) pushbutton goes off.
  . Make sure that "A. TRIM CYC" and "A.TRIM YAW" push button lights (F) remain off.

- Move the cyclic stick to the "nose-up" stop position using "TRIM REL" button (H) on the pilot's cyclic stick grip.

- Push "BEEP TRIM" switch (I) to the "nose-down" stop position without applying loads to the cyclic stick.

  . Make sure that the rod of pitch series actuator (C) extends.

NOTE

If the rod of pitch actuator (C) does not extend, it is likely that the electrical connectors of left roll (D) and pitch (C) series actuators are interchanged.

- Push "AFCS" button (J) on the pilot's cyclic stick to disengage the AFCS.

  . Make sure that the "OFF" light of the "AP" pushbutton (E) of APMS control unit (G) comes on.
  . Make sure that the "OFF" message is displayed on all the axes, on the PFD screen.

- Do a prefllight test:
  Push "TEST" pushbutton (AD) on APMS control unit (G).

- Set "TRIM FEEL CYCL" switch (B) on overhead panel 12 ALPHA (A), to "OFF".

- Check the cyclic stick for full mechanical travel.

- On the AHRS control units 1 and 2, set the AHRS 1 and 2 switches to "OFF".

- Stop the hydraulic pressure supply to the helicopter system as per Subtask 29-12-00-481-001 of Task 29-12-00-481.

- De-energize the helicopter power systems as per Subtask 24-00-00-481-002 of Task 24-00-00-481.

2.B.5. Final steps

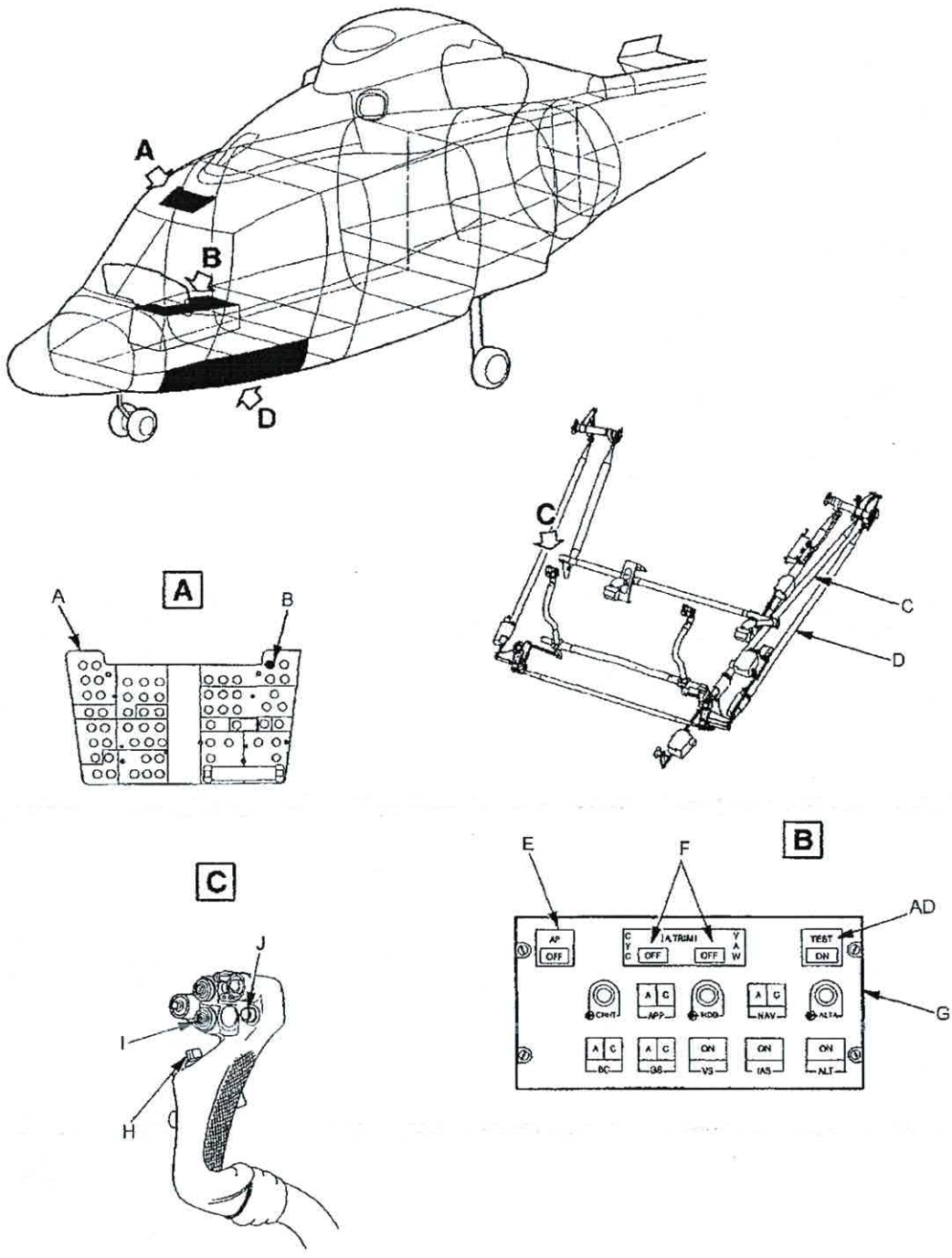
Close the cowling(s) providing access to the series actuators.

2.C. IDENTIFICATION

Record compliance with this Service Bulletin in the aircraft documents.

2.D. OPERATING AND MAINTENANCE INSTRUCTIONS

Not applicable.


A
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D
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Figure 1

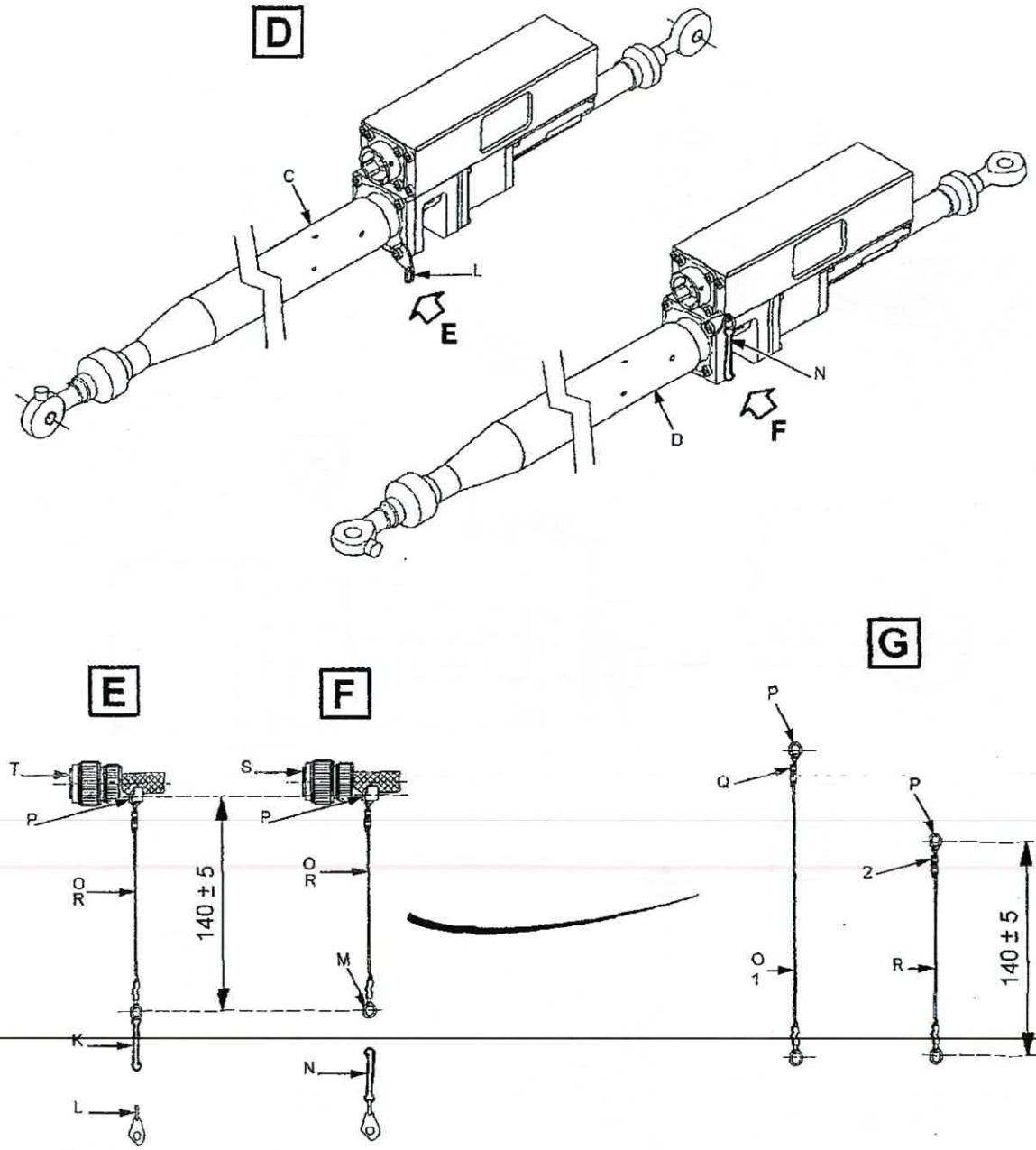


Figure 2

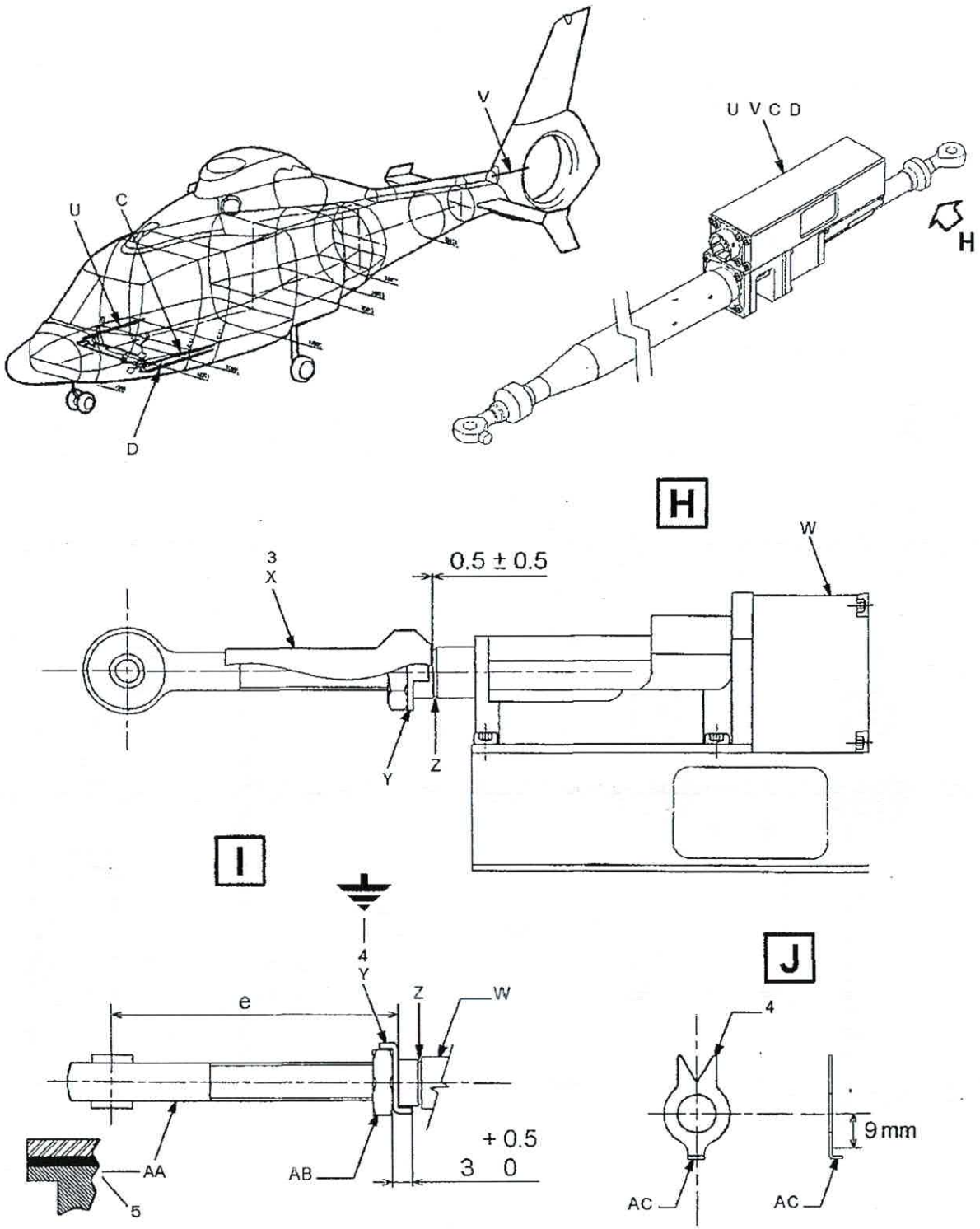


Figure 3

3. MATERIAL INFORMATION

3.A. MATERIAL: COST – AVAILABILITY

For any information, contact the Customer Support Sales Department.

3.B. INFORMATION CONCERNING INDUSTRIAL SUPPORT

Not applicable.

3.C. MATERIAL REQUIRED FOR EACH AIRCRAFT, ENGINE/COMPONENTS

3.C.1. Component(s) to be ordered

New Part Number	Qty	Item	Key Word	Former Part Number	Instructions Disposition
57303-250	AR	1	Nylon cable		
365A61-5414-21	AR	2	Bushing		
VG95343T05A012A	AR	3	Heat shrink sleeve		
23351AC100LE	AR	4	Lockwasher		
* Mastinox 6856 K	AR	5	Sealing compound		
Appendices					
23310CA015015	AR	1 and 9	Cotter pin		

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.C.2. Tooling

New Part Number	Qty	Item	Key Word	Former Part Number	Instructions Disposition
~~2074P~~	~~AR~~	~~6~~	~~Crimping pliers~~ (SOURIAU tool)		

NOTE 1

Any other similar "SOURIAU" 2074P crimping pliers can be used.

3.D. MATERIAL REQUIRED FOR EACH SPARE PART

Not applicable.

3.E. RE-IDENTIFIED PARTS

Not applicable.

3.F. TOOLING: COST – AVAILABILITY

For any information, contact the Customer Support Sales Department.

3.G. PROCUREMENT CONDITIONS

Order the required quantity (unless otherwise specified)

from

EUROCOPTER
Etablissement de Marignane
Direction VENTES Service Client
S.V.
13725 MARIGNANE CEDEX
FRANCE

NOTE 2

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

4. APPENDICES

4 appendices.

Removal / Installation

Removal / Installation - Flight Control Rod

A. Special Tools

None.

B. Materials

CM518 ..... Corrosion preventive paste

C. Routine Replacement Parts

AMM		Nomenclature	IPC
Figure	Item		Subject - Fig.Item - Variant
Appendix 4	(1)	Cotter pin	67200201-060-
Appendix 4	(9)	Cotter pin	67200201-060-

D. Applicable Documents

60-00-00-911 ..... General Safety Instructions - Power Transmission Systems
67-00-00-211 ..... Inspection After Maintenance Operations - Flight Controls
67-00-00-911 ..... General Safety Instructions - Flight Controls
67-00-00-991 ..... Torque Loads and Safetying - Flight Controls
MTC 20.02.06.404 ..... Safetying with Cotter Pins
MTC 20.05.01.211 ..... Sealing Compound MASTINOX 6856

E. Preliminary Steps

CAUTION

BEFORE YOU DO THE WORK ON THE POWER TRANSMISSION SYSTEMS, READ THE TASK 60-00-00-911.

CAUTION

BEFORE YOU DO THE WORK ON THE FLIGHT CONTROLS, READ THE TASK 67-00-00-911.

F. Procedure

(1) Remove the flight control rod. *(Appendix 4)*

(a) If necessary, disconnect the electrical connector.

(b) According to the series actuator, disconnect the index cable.

NOTE

- *The index cable for the left roll series actuator has the ring (10).*
- *The index cable for the pitch series actuator has the snap hook (12).*

(c) Remove the cotter pins (1) and (9).

(d) Loosen and remove the nuts (2) and (8).

(e) Remove the washers (3) and (7).

(f) Hold the flight control rod (5) in position and remove the bolts (4) and (6).

(g) Remove the flight control rod (5).

(2) Install the flight control rod. *(Appendix 4)*

NOTE

There are three index devices.

- *a snap hook and a ring on the electrical connector and on the actuator:*
  For the left roll series actuator: the snap hook (11) is on the actuator and the ring (10) is on the electrical connector "7C-P1".
  For the pitch series actuator: the ring (13) is on the actuator and the snap hook (12) is on the electrical connector "11C-P1".
- *the routing of the two harnesses: When the snap hook is attached to the actuator, you can only connect the harness to the correct actuator,*
- *the color on the end of the rod connected to the helicopter linkage, which is identified with the same color (e.g. yellow for the left roll actuator).*

(a) Refer to the MTC 20.05.01.211 and apply a thin layer of the compound CM518 on the plain sections of the bolts (4) and (6).

(b) Put the flight control rod (5) in position.

- For the left roll series actuator, put the yellow adhesive tape on the side of the yellow mark of the left mixing unit.

Appendix 2

CAUTION

DO NOT USE FORCE TO INSTALL THE BOLTS (4) AND (6).

(c) Install the bolts (4) and (6).

(d) Install the washers (3) and (7) and then the nuts (2) and (8).

(e) Refer to the task 67-00-00-991 and torque the nuts (2) and (8).

(f) Refer to the MTC 20.02.06.404 and install the new cotter pins (1) and (9).

(g) According to the series actuator, check the length of the index cable and connect it, as shown on Detail A:

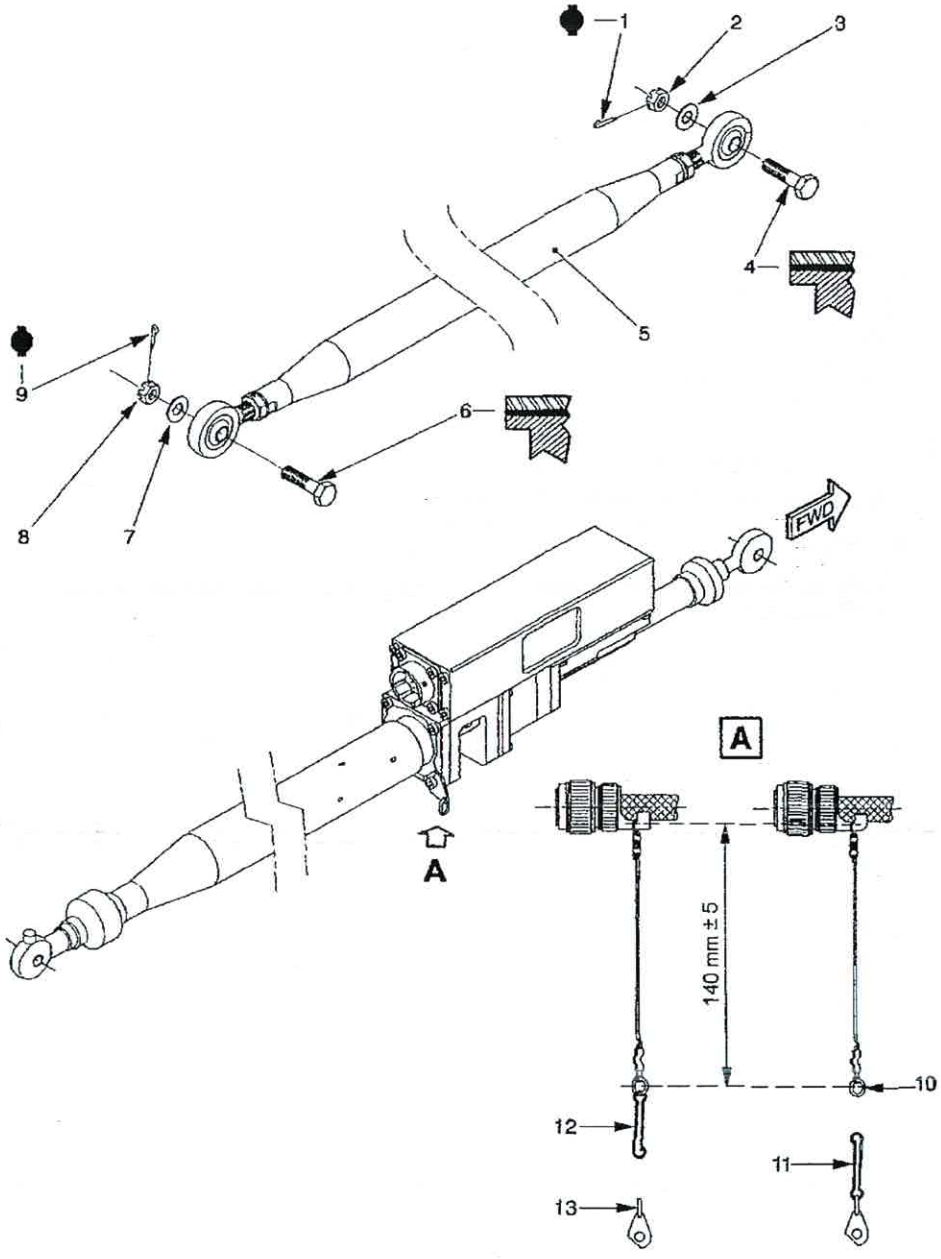
- to the snap hook (11) for the left roll series actuator,
- to the ring (13) for the pitch series actuator.

(h) If necessary, connect the electrical connector.

G. Final Steps

(1) Refer to the task 67-00-00-211 and do an inspection after maintenance work on the flight controls.

Appendix 3



Appendix 4

AWM/024/01 #52
(CRS #17536)

eurocopter
an EADS Company

ALERT SERVICE BULLETIN EC155

EUROCOPTER
DIRECTION TECHNIQUE SUPPORT
13725 MARIGNANE CEDEX FRANCE

CIVIL VERSION(S): B,B1

ALERT SERVICE BULLETIN

No. 62A006

SUBJECT: **MAIN ROTOR**

Check for Correct Positioning of the Filler Wedge of the Tenon at the Main Rotor Blade Tip

LIST OF APPROVED REVISIONS	REVISION No. 0 APPROVED
Not applicable	Date: May 18, 2004

1. PLANNING INFORMATION

1.A. EFFECTIVITY

Main rotor blades, part number 365A11-0080-00.

1.B. ASSOCIATED REQUIREMENTS

Not applicable.

1.C. REASON

The purpose of this ALERT SERVICE BULLETIN, which forms the subject of an EC155 Airworthiness Directive, is:

- To supersede ALERT TELEX No. 05A004, issued on November 3, 2003.
- For main rotor blades with serial numbers equal to or below 808:
  . to check that the tenon filler wedge is correctly positioned,
  . to check that there is no crack and that the blade/tip cap junction is aligned in the flapping direction on aircraft,
  . to limit the use of blades fitted with an incorrectly positioned tenon filler wedge, to September 30, 2004,
  . to limit the service life of blades, fitted with a correctly positioned tenon filler wedge, to 10,000 flying hours,
  . to introduce a periodical check of the tenon leading edge zone.

- For blades with serial numbers equal to or above 809:
  . to limit the service life to 10,000 flying hours,
  . to introduce a periodical check of the tenon leading edge zone.

1.D. DESCRIPTION

Further to TELEX INFORMATION No. 00000149, issued on October 29, 2003, crack initiation appears to have been discovered on a main rotor blade, in the tenon that secures the blade tip cap.
The crack was discovered after removal of the blade tip cap which had been removed because of abnormal tilt in the flapping direction relative to the blade.
ALERT TELEX No. 05A004, issued on November 3, 2003, required operators to disassemble the blade tip cap to make sure that there was no crack in the affected zone, and then monitor the blade in operation.

Investigations conducted led to the following results:

- On some blades, the tenon filler wedge positioning, an essential factor for crack initiation, was found to be non-compliant.
- Fatigue tests conducted on a blade fitted with a correctly positioned tenon filler wedge led to the reduction of the initial service life limit of the blade from 20,000 flying hours to 10,000 flying hours.
- Erosion in the zone of the tenon leading edge requires caulking of this zone.

1.E. COMPLIANCE

EUROCOPTER renders compliance with this ALERT SERVICE BULLETIN mandatory.

1.E.1. At the works:

1.E.1.a. On aircraft: For blades with serial numbers equal to or below 808, comply with paragraph 2.B. prior to delivery of the aircraft.

1.E.1.b. On spares: For blades with serial numbers equal to or below 808, comply with paragraph 2.B. prior to delivery of the blades.

1.E.2. Retrofit action: By the operator.

1.E.2.a. On aircraft: 1) The service life of blades specified in paragraph 1.A., is reduced from 20,000 to 10,000 flying hours, as from receipt of this ALERT SERVICE BULLETIN

2) For blades with serial numbers equal to or below 808:
- On receipt of this ALERT SERVICE BULLETIN:
. comply with paragraph 2.B.4. after the last flight of each day, without exceeding 10 flying hours between two checks (using value "Do", measured in compliance with ALERT TELEX No. 05A004, issued on November 3, 2003) then:
- At the latest within 3 months following receipt of this ALERT SERVICE BULLETIN:
. comply with paragraph 2.B.

a) Blades fitted with an INCORRECTLY positioned tenon filler wedge must be checked in compliance with paragraph 2.B.4., after the last flight of each day, without exceeding 10 flying hours between two checks, and in compliance with paragraphs 2.B.1. and 2.B.5. every 660 flying hours (check the condition of the tenon leading edge zone). These blades must be removed from service at the latest by September 30, 2004.

Contact: EUROCOPTER
Support Pales - Service à la Clientèle
2 à 20 avenue Marcel Cachin
93126 La Courneuve Cedex
France
Tel: 33 (0) 1.49.34.42.93
Fax:33 (0) 1.49.34.41.70
E-mail: olivier.tillier@eurocopter.com

b) For blades fitted with a CORRECTLY positioned tenon filler wedge, only compliance ~~with paragraphs 2.B.1. and 2.B.5. is required at 660 flying hours, then every 660 flying~~ hours (check of the condition of the tenon leading edge zone).

3) For blades with serial numbers equal to or above 809:
- Comply with paragraphs 2.B.1 and 2.B.5. at 660 flying hours then every 660 flying hours (check of the condition of the tenon leading edge zone).
. if a blade has logged more than 660 flying hours on receipt of this ALERT SERVICE BULLETIN:
- comply with paragraphs 2.B.1. and 2.B.5. for the first time within 100 flying hours then every 660 flying hours.

1.E.2.b. On spares: Prior to installing rotor blades with serial numbers equal to or below 808, on an aircraft, comply with paragraph 2.B. (refer to the equipment log card (FME)).

1.F. APPROVAL

Approval is limited to civil version helicopters subject to an Airworthiness Certificate.

The technical information contained in this ALERT SERVICE BULLETIN was approved on May 18, 2004 under the authority of DGAC Design Organisation Approval No. F.JA01.

1.G. MANPOWER

- Qualification 1 mechanic.
- Time: - Approximately 3 hours per blade for the check of the blade tip cap and/or tenon in compliance with paragraphs 2.B.2. and 2.B.5.
- Approximately 24 hours per blade for the caulking operation in compliance with paragraph 2.B.6.

1.H. WEIGHT AND BALANCE

Not applicable.

1.I. EFFECT ON ELECTRICAL LOADS

Not applicable.

1.J. SOFTWARE MODIFICATION EMBODIMENT STATE

Not applicable.

1.K. REFERENCES

- Aircraft Maintenance Manuel (AMM):
  . Task 62-10-00-062

- Standard Practices Manual (MTC):
  . Work Card: 20.06.01.312

1.L. OTHER DOCUMENTS CONCERNED

Master Servicing Manual (MSM) Chapter 4 will be updated at the next revision.

1.M. INTERCHANGEABILITY AND MIXABILITY OF PARTS

Not applicable.

2. ACCOMPLISHMENT INSTRUCTIONS

2.A. GENERAL

Not applicable.

2.B. OPERATIONAL PROCEDURE

2.B.1. Preliminary steps

- Remove the main rotor blade as per Subtask 62-10-00-021-001 of (AMM) Task 62-10-00-061.
- Remove the blade tip cap as per (AMM) Task 62-10-00-062.
- Scrap the 35 attachment screws.

2.B.2. Check of the tenon filler wedge positioning

- If necessary, lightly sand (max. depth 1 mm) the tenon end edge using (No. 150-grit) abrasive paper to better visualize the different skin fabrics.
- Check the correct positioning of the tenon filler wedge at the blade tip edge:
  . Faulty positioning of the wedge is indicated by a dissymmetrical position of the wedge relative to the skins on the blade pressure and suction faces. This dissymmetry can be determined by the fact that the (black) carbon skins do not exist on the pressure face side of the blade tip edge, yet they exist on the suction face side. (Refer to Figure 2).
  . Correct positioning of the wedge is indicated by a symmetrical position of the wedge relative to the pressure and suction face skins (Refer to Figure 1).
- If the filler wedge positioning is correct, check leading edge zone 1 in accordance with paragraph 2.B.5.
- If the filler wedge positioning is incorrect, check that there is no crack in the tenon, in accordance with paragraph 2.B.3.

2.B.3. Check of the tenon for absence of crack(s)

- On the blade pressure face, then on the blade suction face, closely inspect the embedded portion of tenon (4), shown on Figure 5, (use a magnifying glass if necessary):
  . to facilitate the check, apply a light manual upward and then a light manual downward load to the tenon to reveal any crack.

- Interpretation of the checks:
  a) if there is no crack in tenon (4),
     1. check leading edge zone 1 in accordance with paragraph 2.B.5. and if necessary, caulk the zone in accordance with paragraph 2.B.6.,
     2. return the blade to flight configuration in accordance with paragraph 2.B.7.,
     3. on the blade suction face portion (2), position an approximately 500mm ruler overlapping the blade (2) and the blade tip cap (3), as shown on Figure 4, in such a way that the middle of the ruler (1) is positioned at the blade/tip cap junction. The ruler (1) must be parallel to the leading edge and located between the two hatches that include the balancing weights,
     4. mark the position of the ruler (1) with "paint or ink" to be able to position it later in the same place,
     5. at the blade/tip cap junction, measure clearance "Do", if any, between the ruler (1) and the blade/tip cap junction,
     6. record this initial clearance value "Do". This value "Do" supersedes any previous value.

b) if a crack is found in the tenon (4), remove the blade from service and contact the Customer Service Blades Support Department in La Courneuve at:
Tel.: 33 (0)1.49.34.42.93
Fax: 33 (0)1.49.34.41.70
E-mail: olivier.tillier@eurocopter.com

2.B.4. Check of the blade/tip cap junction on aircraft for correct alignment in the flapping direction

Position the rule (1) in accordance with the procedure described in paragraph 2.B.3.a.3.
- Hold the leading edge of the blade (2) and apply an upward bending load to the blade tip cap (3), as shown on Figure 6.
- Measure clearance "D" between the ruler (1) and the blade/tip cap junction, as shown on Figure 3.
- Interpretation of the check:
  . if "D" smaller than "Do" + 2 mm,
    - Resume flights.
  . if "D" equal to or greater than "Do" + 2 mm,
    - Remove the blade and contact the Customer Service – Blades Support Department in La Courneuve at :
      Tel.: 33 (0)1.49.34.42.93
      Fax: 33 (0)1.49.34.41.70
      E-mail: olivier.tillier@eurocopter.com

2.B.5. Check of leading edge zone 1

- Check that there is no erosion in leading edge zone 1 (Refer to Figure 7):
  . if there is no erosion, leave as is and comply with paragraph 2.B.7.
  . if there is erosion, caulk in accordance with paragraph 2.B.6.

2.B.6. Erosion caulking procedure

- Clean the zone with gauze swabs moistened with methyl ethyl ketone. Traces of previous caulking, if any, need not be removed.
- Allow to dry for 1 hour and 30 minutes at ambient temperature to allow the solvents to evaporate.
- Prepare EA 9309-3 NA adhesive as per MTC Work Card 20.06.01.312.
- Caulk the eroded zone with EA 9309-3 NA adhesive to restore the original flat shape of the zone.
- Curing as per MTC Work Card 20.06.01.312.
- After curing, remove any projections of the adhesive.
- Comply with paragraph 2.B.7.

2.B.7. Final steps

- Re-install the blade tip cap using new screws (1), as per AMM Task 62-10-00-062.
- Upon re-installation of the blade tip cap, two loose inserts per face are tolerated.
- Caulk the gap between tip cap and blade with CN EC 1239 B1/2 cement or equivalent.

2.C. IDENTIFICATION

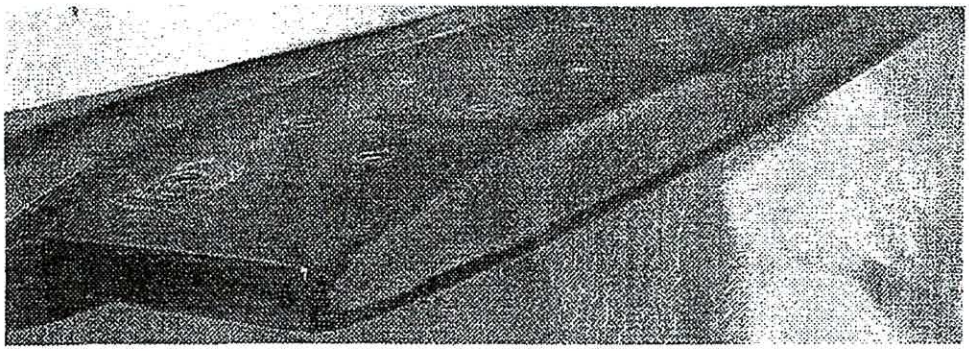
- Record compliance with this ALERT SERVICE BULLETIN as well as the result of the check described in paragraph 2.B.2., on the equipment log card (FME) of the main rotor blade.
- Please complete the sheet provided in Appendix 1 and return it to:

EUROCOPTER
Support Pales – Service à la Clientèle
2 à 20 avenue Marcel Cachin
93126 La Courneuve Cedex
France

Tel: 33 (0) 1.49.34.42.93
Fax:33 (0) 1.49.34.41.70
E-mail: olivier.tillier@eurocopter.com

2.D. OPERATING AND MAINTENANCE INSTRUCTIONS

Refer to the Maintenance Program.



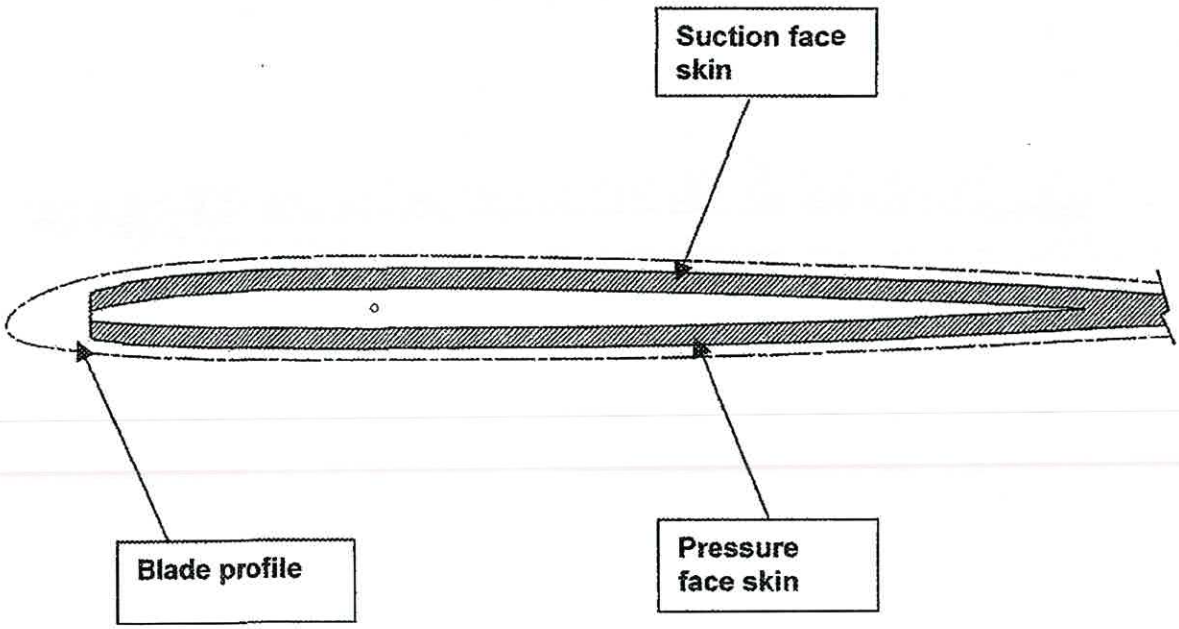


Figure 1

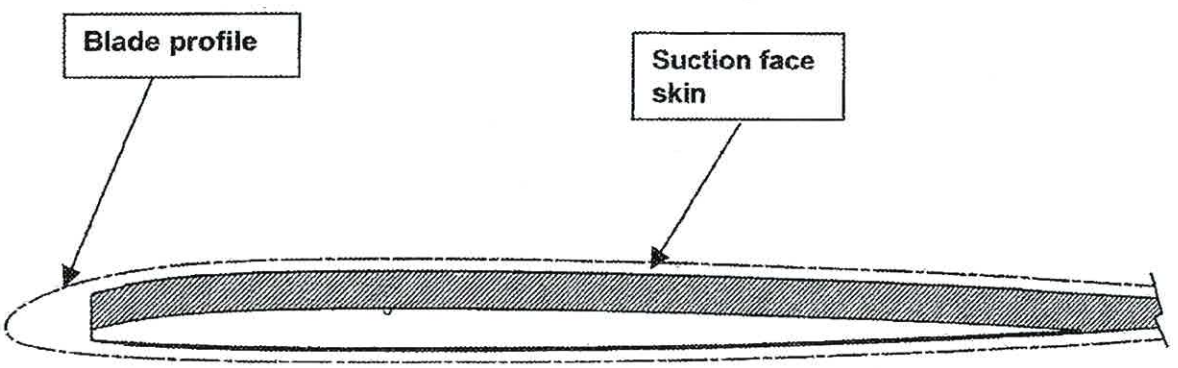


Figure 2

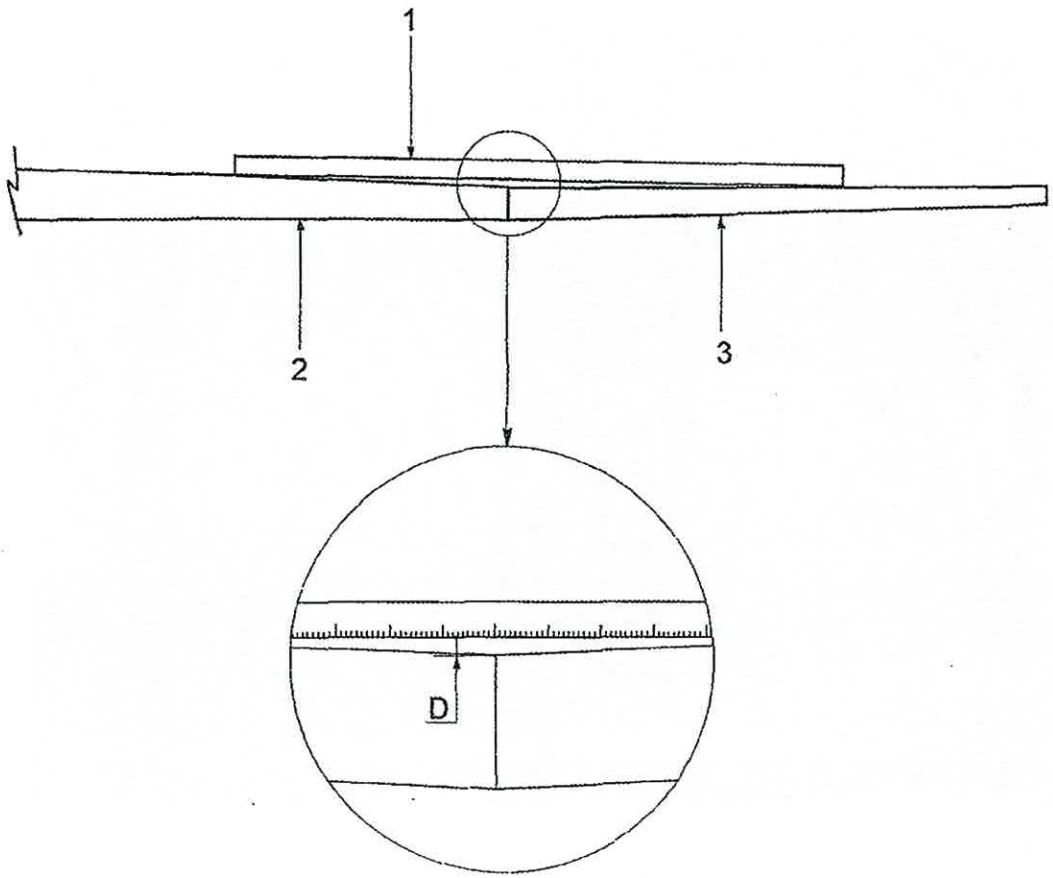


Figure 3

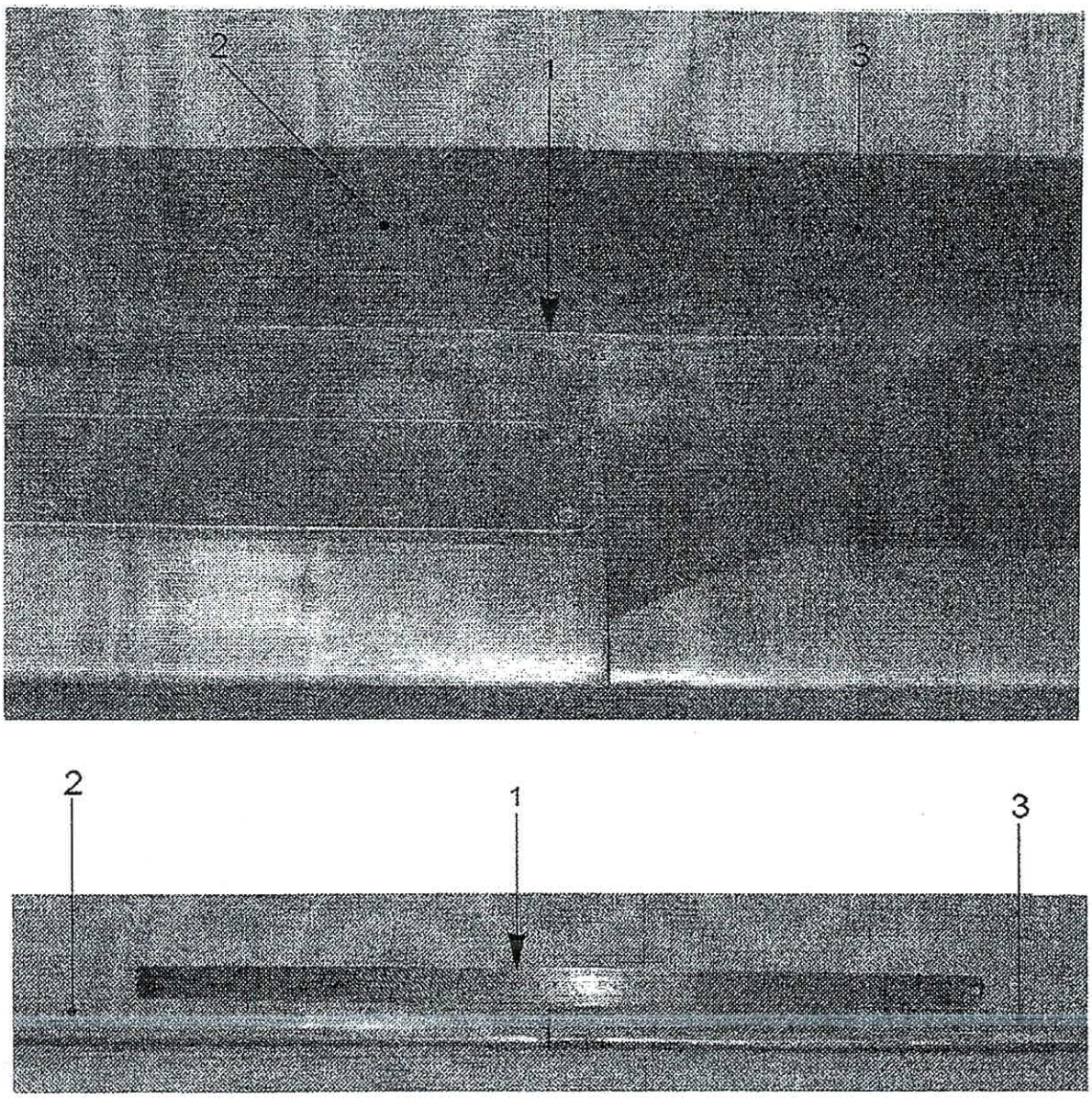


Figure 4

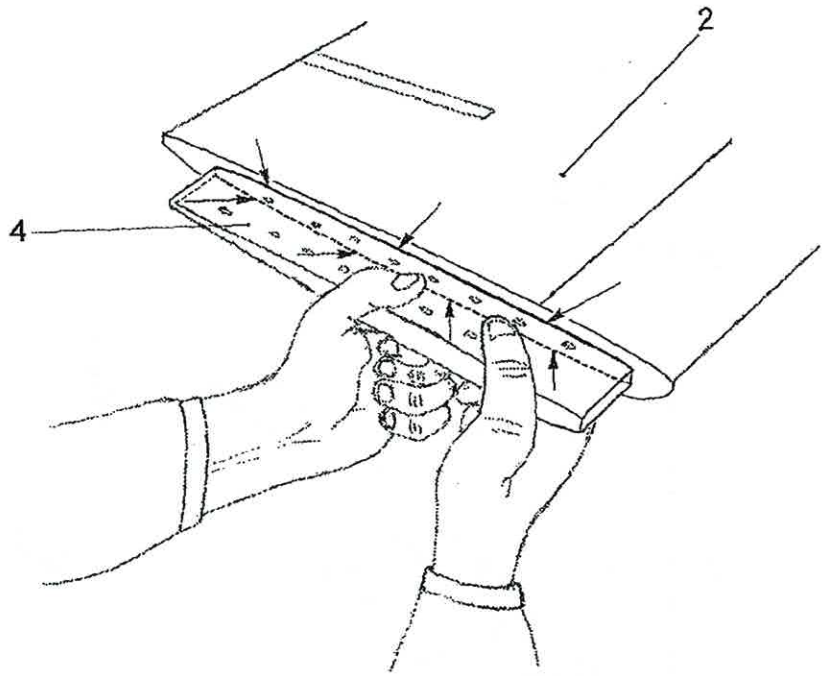


Figure 5

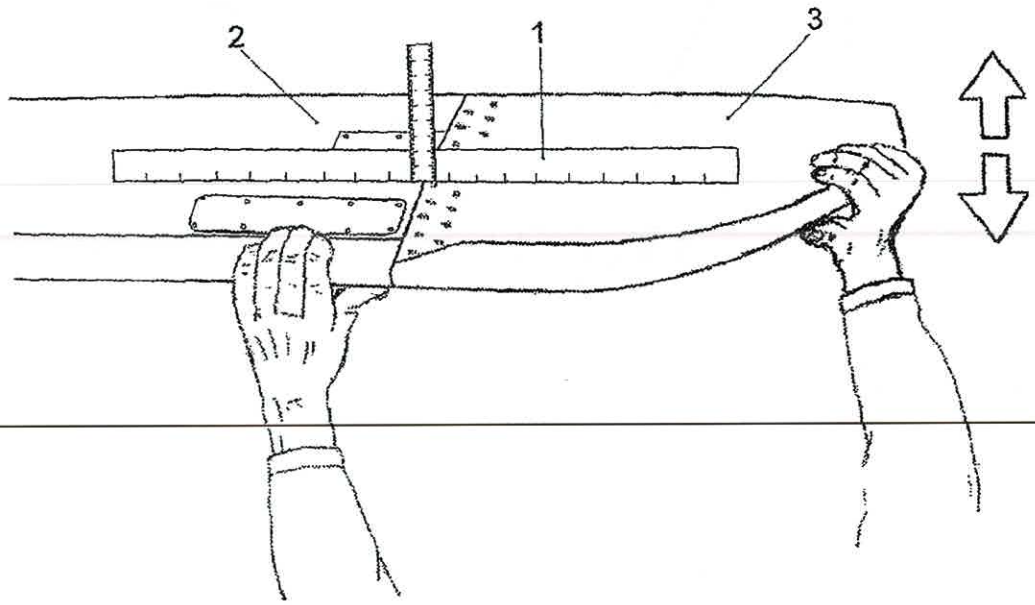


Figure 6

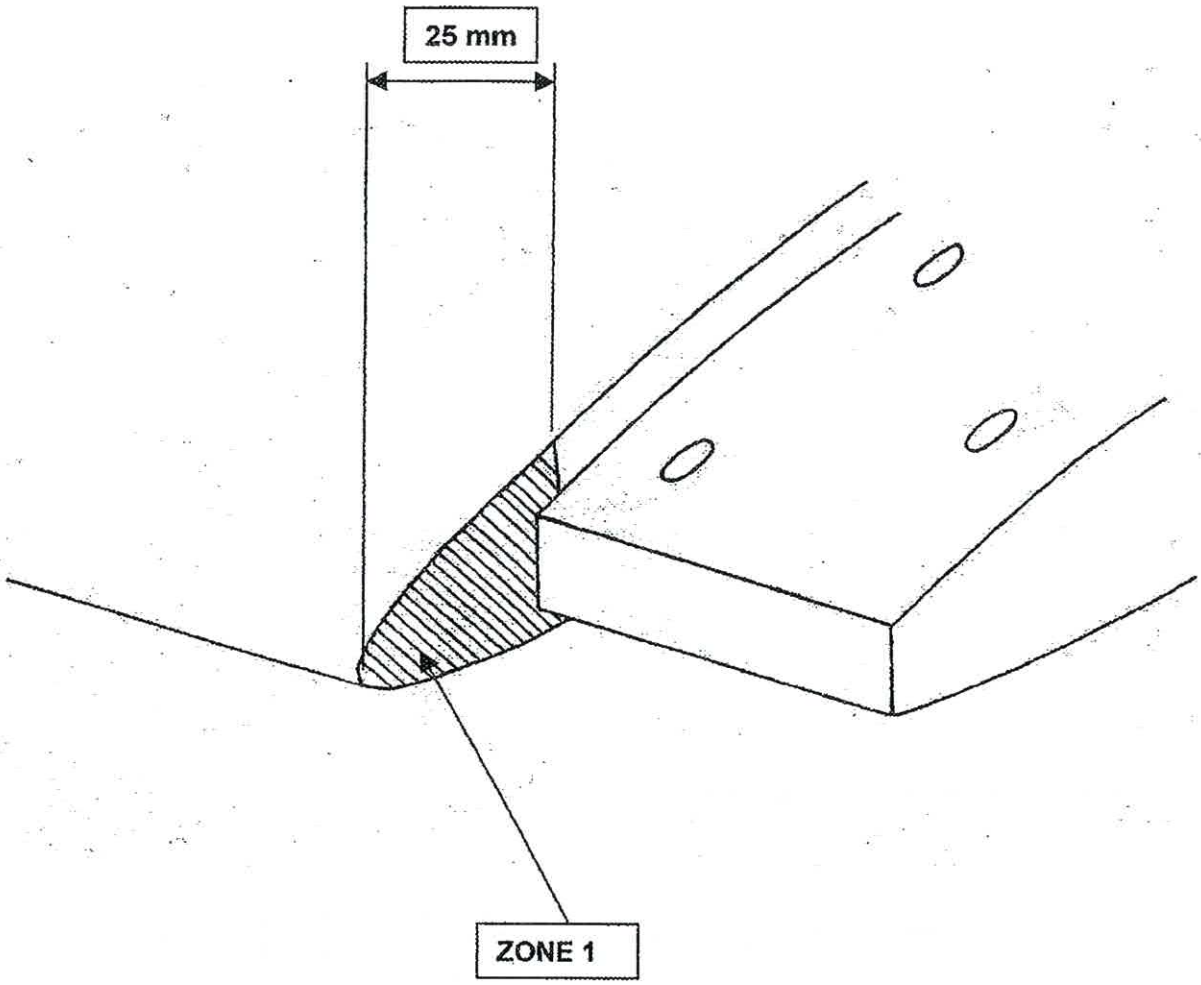


Figure 7

3. MATERIAL INFORMATION

3.A. MATERIAL: COST – AVAILABILITY

For any information, contact the Blades Support Department.

3.B. INFORMATION CONCERNING INDUSTRIAL SUPPORT

Not applicable.

3.C. MATERIAL REQUIRED FOR EACH AIRCRAFT, ENGINE/COMPONENTS

3.C.1. Component(s):

New Part Number	Qty	Item	Key Word	Former Part Number	Instructions Disposition
A0086CM050010	35	1	Screws		

3.C.2. Elements to be ordered separately

New Part Number	Qty	Item	Key Word	Former Part Number	Instructions Disposition
"*"DHS171-200.40	AR	/	EA 9309-3 NA adhesive		
"*"CN EC1239 B1/2	AR	/	Cement		

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
Telephone: +49.41.91.809.300
AOG: +49.41.91.809.444

3.D. MATERIAL REQUIRED FOR EACH SPARE PART

Not applicable.

3.E. RE-IDENTIFIED PARTS

Not applicable.

3.F. TOOLING: COST – AVAILABILITY

For any information, contact the Blades Support Department.

3.G. PROCUREMENT CONDITIONS

Order the required quantity (unless otherwise specified)

from

EUROCOPTER
Etablissement de La Courneuve
Direction Support Pales
SRP
93123 LA COURNEUVE
FRANCE

NOTE 1

For ALERT SERVICE BULLETINS, order by:
Telex: HELICOP 410 969F
Fax: +33 (0)4 42 85 99 96

NOTE 2

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

4. APPENDIX

Appendix 1

INFORMATION SHEET

Aircraft serial number: _____

Monthly flying hour rate: _____

Blade P/No.	Serial Number	Flying Hours	Tenon Filler Wedge Positioning	
			Correct	Incorrect