A/C TYPE EC135B

A/C REGN 9M-SAS S/N 0583

TYPE OF CHECK

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EUROCOPTER SOUTH EAST ASIA PTE LTD
48 Loyang Way Singapore 508740

NO: 17016 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 28/7/04	COMPLY WITH ASB 67A003 RI [REF. AD 2003-332 (A)] - INTRODUCTION OF DOUBLE LOCKING OF FLIGHT CONTROL STOP SCREWS BY SEALING THE SCREWS (PARA 2B2) (MOD 0767858). 29/7/04 REF. AD F-2003-332 (A) RI]	Carried out ASB 67A003 RI IAW Para 2B1.4 and 2B2.				1		A1818 29/7/04
2	SIEW LAY 28/7/04	COMPLY WITH TLX INFO. TFS # 00000194 - CRACK IN THE WEB OF THE PLANET GEAR CARRIER - MGB OIL SAMPLE FOR SOA	OIL Sample taken from MGB for S.O.A IAW T.LX Information TFS No 00000194				1/2		A1818 29/7/04

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
- ☐
- ☑ MALAYSIAN CIVIL AVIATION REGULATIONS
- ☐ MANUFACTURER'S PUBLICATIONS

AWM/034/01 #33

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ALERT SERVICE BULLETIN EC155

EUROCOPTER
DIRECTION TECHNIQUE SUPPORT
13725 MARIGNANE CEDEX FRANCE

CIVIL VERSION(S): B,B1

ALERT SERVICE BULLETIN

No. 67A003

SUBJECT: **ROTOR FLIGHT CONTROLS**

Introduction of Double Locking of Flight Control Stop Screws by Sealing the Screws

Corresponds to MOD: 0767B58

LIST OF APPROVED REVISIONS		REVISION No. 1 APPROVED
No. 0	Date: July 31, 2003	Date: January 12, 2004

1. PLANNING INFORMATION

1.A. EFFECTIVITY

Helicopters pre MOD 0767B58.

Components affected: Yaw channel auxiliary flight control stops.

1.B. ASSOCIATED REQUIREMENTS

Not applicable.

1.C. REASON

To ensure double locking of the screws of the auxiliary stops.

This ALERT SERVICE BULLETIN will form the subject of a DGAC Airworthiness Directive.

Revision 1 of this ALERT SERVICE BULLETIN provides additional information concerning the preparation and the sealing procedure for the stop screws.
This Revision 1 does not affect compliance with Revision 0.

1.D. DESCRIPTION

On a ground run-up with an EC120 aircraft, a pilot noticed that he could push the collective lever downward, beyond its normal position. The mechanic discovered that the locknut of the low pitch stop had come loose and that the stop was out of adjustment.

The screws of the yaw channel auxiliary flight control stops of EC155 and EC120 aircraft are safetied only by single locking.
Loss of the locking can lead to misadjustment of the stops.

Sealing the stop screws with resin will ensure additional locking of the stop screws.

1.E. COMPLIANCE

1.E.1. At the works:

1.E.1.a. On aircraft: Comply with paragraph 2.B.2 on receipt of this ALERT SERVICE BULLETIN.

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

1.E.2. Retrofit action

1.E.2.a. On aircraft, by the operator:

- Comply with paragraph 2.B.1 within 100 flight hours from receipt of this ALERT SERVICE BULLETIN.
- Comply with paragraph 2.B.2 within 500 flight hours or 1 year, (whichever limit is reached first), from receipt of this ALERT SERVICE BULLETIN.

1.E.2.b. On spares: Not applicable.

1.F. APPROVAL

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

The information or instructions relate to change: MOD 0767B58, which was approved on June 5, 2003 by the DGAC.

The technical information contained in the original ALERT SERVICE BULLETIN was approved on July 30, 2003 under the authority of DGAC Design Organisation Approval No. F.JA01.

The technical information contained in Revision 1 of this ALERT SERVICE BULLETIN was approved on January 12, 2004 under the authority of DGAC Design Organisation Approval No. F.JA01.

1.G. MANPOWER

Qualification: 1 mechanic.
Time: 2 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

AMM: Aircraft Maintenance Manual Tasks:

- 67-00-00-911: "General Safety Instructions – Flight Controls"
- 67-20-01-821: "Adjustment – Pedal Stops"

1.L. OTHER DOCUMENTS CONCERNED

Not applicable.

1.M. INTERCHANGEABILITY AND MIXABILITY OF PARTS

1.M.1. Interchangeability: Not applicable.

1.M.2. Mixability: Not applicable.

2. ACCOMPLISHMENT INSTRUCTIONS

2.A. GENERAL

Comply with the: "General Safety Instructions – Flight Controls" as per AMM Task 67-00-00-911.

2.B. OPERATIONAL PROCEDURE

2.B.1. Checking and, if necessary, adjusting the stops

2.B.1.a Check (as per Figure 1)

Apply the following procedure to prevent any involuntary misadjustment of the stops:

- Do a tactile check of the screws of the auxiliary stops (a) and (b) in order to make sure that the screws do not turn freely:

  . If one or the two screws of the auxiliary stops (a) and (b) turn freely, adjust the stops in accordance with paragraph 2.B.1.b.
  . If the screws of the auxiliary stops (a) and (b) do not turn, leave as is.

2.B.1.b Adjustment

Adjust the auxiliary stops (a) and (b) in accordance with AMM Task 67-20-01-821: "Adjustment – Pedal Stops".

2.B.2. Sealing the screws of the auxiliary stops (Figure 2)

Before you seal the screws, do the checks described paragraph 2.B.1.a.

Preparation of the surfaces:

- Before you apply the sealing mix, clean the surface, it must be perfectly clean.
- Degrease it using a clean cloth moistened with trichlorethylene or acetone.

Proportion of ingredients of the mix to be prepared for one stop screw in a non-porous can:

- Powder: 2 parts by volume, i.e. approximately 5ml of powder.
- Liquid: 1 part by volume, i.e. approximately 2.5ml of hardener.

NOTE 1

This mix dries very quickly (drying time approximately 5 minutes). EUROCOPTER therefore recommends that you prepare the mix for one stop at a time.
The cure time is slightly shorter at ambient temperatures above 25°C.

Recommendations for preparation:

- After the mix has been prepared, wait until the resin becomes pasty before you apply it to the stop screw.
- When the resin is no longer sticky, shape and press the mix on the stop screw, using a spatula or with your fingers.

Seal the screws of the auxiliary stops (a) and (b) with TECHNOVIT resin (1) to be applied to all the visible threaded sections of each screw, between the screw head and the structure to which the screw is secured.
For the auxiliary stop (a) located forward of the bellcrank (d), apply the resin to the external surfaces of the locknut (see Figure 2).
During this operation, take care not to apply any resin to the surrounding components.

NOTE 2

Figure 2 is a general drawing that depicts the sealing area.
The configuration of your aircraft is not necessarily the same as that shown on Figure 2 (location of the locknut different).
Apply the sealing procedure to the stop screws without modifying the adjustment or configuration of your aircraft.

2.C. IDENTIFICATION

Record compliance with this ALERT SERVICE BULLETIN in the aircraft documents.

2.D. OPERATING AND MAINTENANCE INSTRUCTIONS

Not applicable.

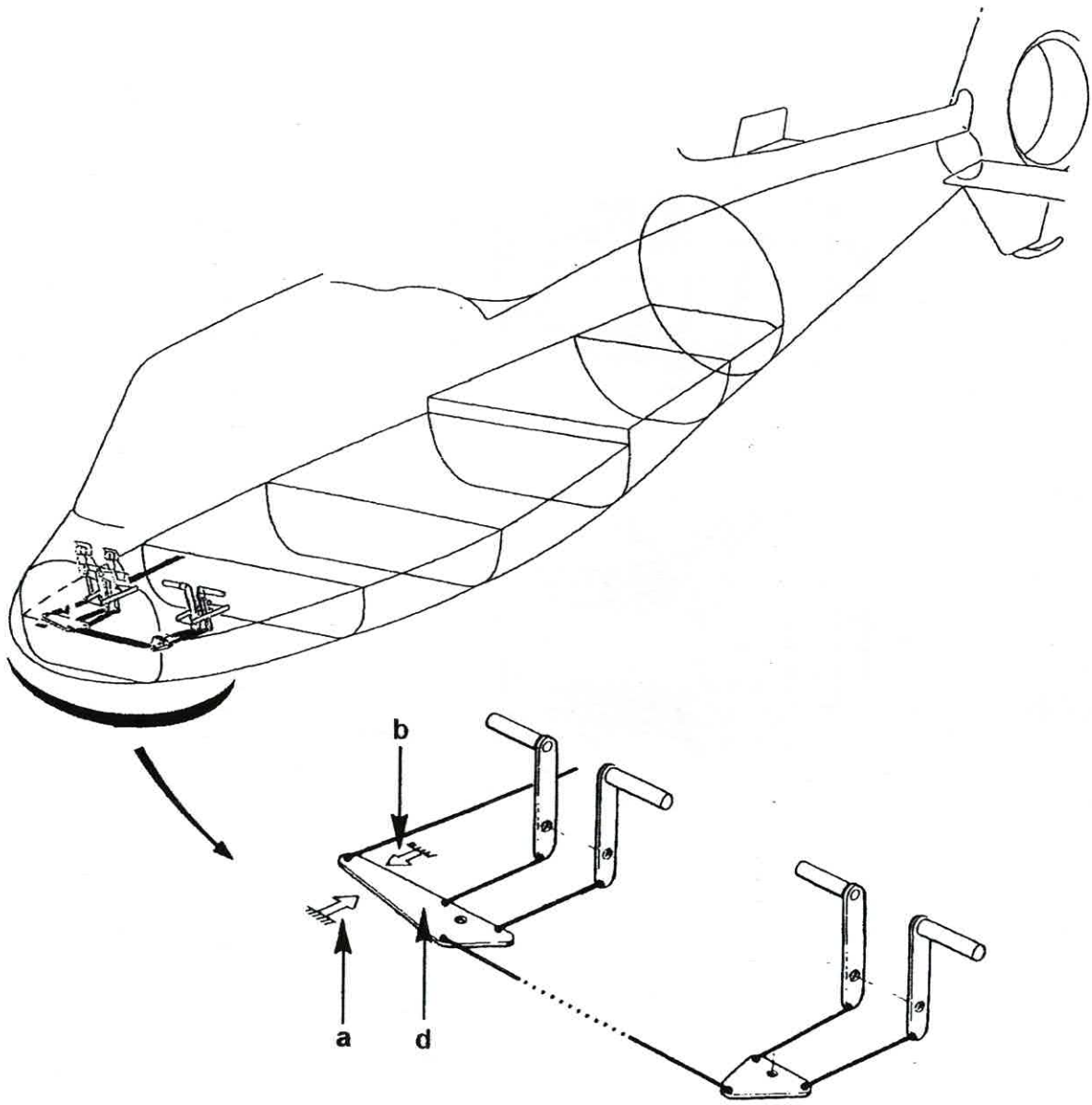

Figure 1

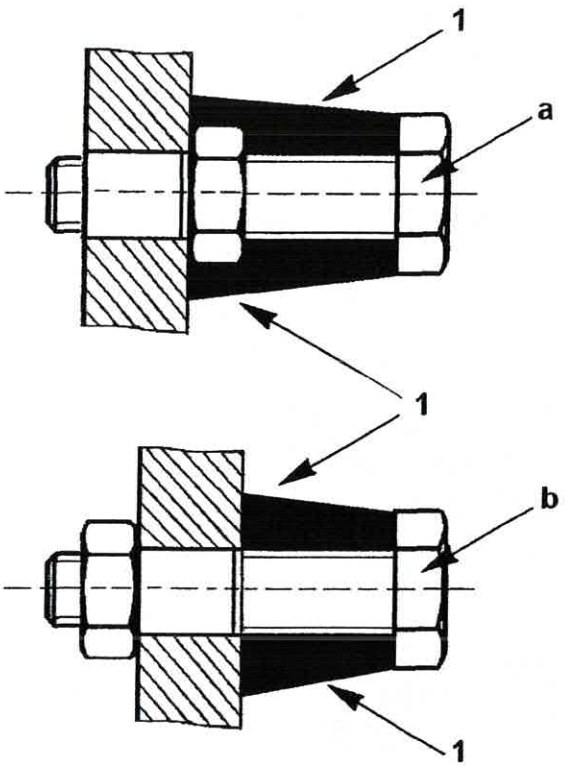

Figure 2

3. MATERIAL INFORMATION

3.A. MATERIAL - COST - AVAILABILITY

For all information, contact the Customer Support Sales Department.

3.B. INFORMATION CONCERNING INDUSTRIAL SUPPORT

Not applicable.

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

To be ordered separately: Resin TECHNOVIT3040 kit 100gr

New P/N	Qty	Item	Key Word	Former P/N	Instructions Disposition
* NR070700012	1	1	TECHNOVIT3040KIT100GR	N/A	N/A

The materials identified by an asterisk "*" can be ordered from INTERTURBINE company, e-mail address: http://www.itlogistics.de

3.D. MATERIAL REQUIRED FOR EACH SPARE PART

Not applicable.

3.E. RE-IDENTIFIED PARTS

Not applicable.

3.F. TOOLING – COST – AVAILABILITY

Not applicable.

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 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

Not applicable.

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EUROCOPTER - MARIGNANE - TLX 42506F

TELEX INFORMATION

AIRCRAFT:	**365**	Civil Version(s): Military Version(s):	**N, N1, N2, N3** **F, Fs, Fi, K**
AIRCRAFT:	**565**	Military Version(s):	**AA, MA, MB, SA, SB, UB**
AIRCRAFT:	**366**	Civil Version(s): Military Version(s):	**G1** **GA**
AIRCRAFT:	**EC155**	Civil Version(s):	**B, B1.**

SUBJECT: MAIN ROTOR DRIVE
Crack in the Web of the Planet Gear Carrier

Dear Customer,

We informed you through Telex Information No. TFS No. 00000191, dated June 15, 2004, of two cases of cracks found in the web of the main gearbox planet gear carrier. The cracks were discovered during overhaul/repair of two main gearboxes that had been removed subsequent to the detection of metal chips at the magnetic plugs.

EUROCOPTER reminded you that the magnetic plug and the filter are to be checked very carefully during the periodical checks.

NOTE

Should you detect any particles, we remind you that EUROCOPTER can provide assistance if some doubt subsists as to the origin of the particles (cf. Standard Practices Manual (MTC) Work Card 20.08.01.601).

From the results of the investigations and analyses conducted following the initial case of crack occurrence (that associated with the failure of the head of one of the screws that secure the sun gear bearing), we are now able to conclude that this crack was caused by the head of the screw when it was caught by the planet gear / sun gear / fixed ring gear drive train. In fact, this event caused excessive local stresses at the blending radius of one of the crankpins (crankpin on which the screw-damaged planet gear was installed) with the planet gear carrier web. These excessive stresses explain the crack initiation and crack growth.

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EUROCOPTER - MARIGNANE - TLX 42506F

Complementary investigations have shown that the failure of the head of this screw which led to the generation of a large quantity of particles is the result of incorrect installation of this screw. EUROCOPTER is currently preparing an information note that will be issued to all repair stations to draw their attention to this assembly.

As for the second case, investigations conducted in the laboratory have revealed a progressive fatigue crack. It too starts from the blending radius of one of the crankpins with the planet gear carrier web. In addition, examination of the MGB has revealed abnormal wear on the teeth of the planet gears and sun gear. The remaining part of the MGB shows no significant damage as in the previous case. The wear is difficult to detect using usual monitoring equipment (magnetic plug and filter) but can lead to a significant increase in iron concentration detectable when a spectrometric oil analysis (SOAP) is conducted.

Analyses and investigations are still in progress and EUROCOPTER will take all actions to establish the cause of the crack in the planet gear carrier and the associated wear on the teeth of the planet gears and the sun gear, as soon as possible.

In the scope of the investigations and to collect all the pieces of information required to determine the cause of this crack, we ask you to provide EUROCOPTER with the following information concerning the main gearboxes on your aircraft, as soon as possible.

- Information concerning the aircraft (Customer, type of aircraft, S/N).
- Information concerning the MGB (P/N, S/N, TSO, number of cycles).
- Iron concentration in the oil recorded during spectrometric oil analysis.

Please complete the appended information sheet and return it to EUROCOPTER.

Your co-operation would be gratefully appreciated.

Yours sincerely,

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an EADS Company

T.F.S. No. 00000194 dated July 20, 2004
EUROCOPTER - MARIGNANE - TLX 42506F

- Appendix -

To be returned to: EUROCOPTER Marignane, Aéroport Marseille Provence
13725 Marignane
Service : STXV
Fax: +33.(0)4.42.85.99.66

Customer:

- HRH SULTAN OF PAHANG

Aircraft:

Type: EC155B
S/N: 6583

Main gearbox (MGB):

P/N: 365A32-9001-00
S/N: 2019
TSO: N/A TSN: 532:35 HRS
Number of cycles since last overhaul: N/A

NOTE

Please send us a copy of the updated equipment log card if the last REPAIR/OVERHAUL of the MGB was not carried out at the EUROCOPTER Marignane works.

Spectrometric Oil Analysis (SOA):

(Oil sample to be taken in compliance with Standard Practices Manual (MTC) Work Card 20.08.02.601)

System used (rotating disk electrode or plasma):
Operating hours of the oil since last oil change: 324:25
Iron concentration (ppm):

NOTE

If you do not have at your disposal the technical facilities that are required to conduct this SOA, please send an oil sample along with the following information (Customer, type of aircraft, S/N, part number of the MGB, S/N, TSO/TSN, number of cycles, operating hours of the oil since last oil change) to the address specified above.

	AIRWORTHINESS DIRECTIVE No F-2003-322 R1	Distribution : A	Issue date : May 26, 2004	Page : 1 / 2
Direction générale de l'aviation civile France	This Airworthiness Directive is published by the DGAC : ☒ on behalf of EASA, the Primary Airworthiness Authority for the affected product. ☐ as the Registration Airworthiness Authority for the affected aircraft.		*Translation of «Consigne de Navigabilité» of same number.* *In case of difficulty, reference should be made to the French issue.*	
GSAC Publication	***No person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive, unless otherwise agreed with the Authority of the State of Registry.***			

Corresponding foreign Airworthiness Directive(s) : **Not applicable**	Airworthiness Directive(s) replaced : **2003-322 original issue**
Person in charge of airworthiness : **EUROCOPTER**	Type(s) : **AS 350, AS 355, EC 130, AS 365 N, SA 366, EC 155 and EC 120 helicopters**
Type certificate(s) No. **84, 168, 86, 189** TCDS No. **157, 168, 159, 189**	
ATA Chapter(s) : **67**	Subject : **Rotor flight controls - Double locking of the stop screws**

1. EFFECTIVITY :

The following helicopters :

- AS 350 B, BA, BB, B1, B2, B3 and D - AS 355 E, F, F1, F2 and N - EC 130 B4	before embodiment of MOD 073206 or MOD 073102. Components affected: Roll, pitch and collective flight control stops.
- AS 365 N, N1, N2 and N3 - SA 366 G1 - EC 155 B and B1	before embodiment of MOD 0767B58. Components affected: Yaw channel auxiliary flight control stops
- EC 120 B	delivered before June 30, 2003. Components affected: Roll, pitch and collective flight control stops.

2. REASONS :

This Airworthiness Directive (AD) is issued to prevent the flight control stop screws from loosening, which could lead to misadjustment of the stops.

Revision 1 of this AD covers Revisions of the referenced Alert Service Bulletins (ASB), with no change to the technical content but with additional information for AS 350, AS 355 and EC 130 helicopters in the "EFFECTIVITY" paragraph.

3. MANDATORY ACTIONS AND COMPLIANCE TIMES :

The following measures were rendered mandatory from the effective date of the original issue of this AD.

3.1.

Within 100 flying hours, check and, if necessary, adjust the stops in compliance with the instructions described in paragraph 2.B.1 of the referenced Alert Service Bulletin (ASB) applicable to the type of helicopter.

3.2.

Within 500 flying hours or within one year at the latest (whichever limit is reached first), seal the stop screws in compliance with the instructions described in paragraph 2.B.2 of the referenced ASB applicable to the type of helicopter.

4. REFERENCE PUBLICATIONS :

EUROCOPTER Alert Service Bulletins :

AS 350 No. 67.00.25 R1

AS 355 No. 67.00.25 R1

EC 130 No. 67A004 R1

AS 365 N No. 67.00.09 R1

SA 366 No. 67.04 R1

EC 155 No. 67A003 R1

EC 120 No. 67A010 R2

(Any subsequent approved revision of these ASB is acceptable).

5. EFFECTIVE DATES :

Original issue : September 13, 2003

Revision 1 : June 05, 2004.

6. REMARK :

For any questions concerning the technical content of the requirements in this AD, please contact :

EUROCOPTER (STXI) - Aéroport de Marseille Provence, 13725 Marignane Cedex - France
Phone : +33 (0)4 42 85 97 97 - Fax : +33 (0)4 42 85 99 66
E-mail : Directive.technical-support@eurocopter.com

7. APPROVAL :

This AD Revision is approved under EASA reference No 2004-5339 dated May 17, 2004.