Airworthiness Directive 2012-21-51 Summary

Subject:	To prevent vibration due to a failed bearing, failure of the tail rotor, and subsequent loss of control of the helicopter		
Manufacturer:	Eurocopter France	Category:	Airframe
Effective Date:	Upon Receipt	Recurring:	No
Supersedes:	N/A	Superseded By:	N/A

For complete information on this AD, please see:
AD 2012-21-51 FAA Copy
AD 2012-21-51 Preamble
AD 2012-21-51 CFR Copy

Model Applicability:
Eurocopter France Model AS350B3 helicopters

Applicable Manufacturers Service Information:
None

Summary:
This EAD is prompted by premature failures of laminated half-bearings (bearings), three cases of vibrations originating from the tail rotor due to premature failure of bearings installed with certain tail rotor blades, and an accident. This EAD requires installing two placards and revising the Rotorcraft Flight Manual (RFM). This EAD also requires certain checks and inspecting and replacing, if necessary, all four bearings. Finally, this EAD requires a one-time removal and inspection of the bearings, and replacing the bearings if necessary. These EAD actions are intended to prevent vibration due to a failed bearing, failure of the tail rotor, and subsequent loss of control of the helicopter. The European Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Union, has issued EASA AD No. 2012-0207-E, dated October 5, 2012, to correct this unsafe condition for certain Eurocopter Model AS350B3 helicopters.

FAA
Aviation Safety

EMERGENCY AIRWORTHINESS DIRECTIVE

www.faa.gov/aircraft/safety/alerts/

DATE: October 17, 2012
AD #: 2012-21-51

This emergency airworthiness directive (EAD) No. 2012-21-51 is being sent to owners and operators of Eurocopter France (Eurocopter) Model AS350B3 helicopters.

Background

This EAD is prompted by premature failures of laminated half-bearings (bearings), three cases of vibrations originating from the tail rotor due to premature failure of bearings installed with certain tail rotor blades, and an accident. This EAD requires installing two placards and revising the Rotorcraft Flight Manual (RFM). This EAD also requires certain checks and inspecting and replacing, if necessary, all four bearings. Finally, this EAD requires a one-time removal and inspection of the bearings, and replacing the bearings if necessary. These EAD actions are intended to prevent vibration due to a failed bearing, failure of the tail rotor, and subsequent loss of control of the helicopter.

The European Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Union, has issued EASA AD No. 2012-0207-E, dated October 5, 2012, to correct this unsafe condition for certain Eurocopter Model AS350B3 helicopters.

FAA's Determination

This helicopter has been approved by the aviation authority of France and is approved for operation in the United States. Pursuant to our bilateral agreement with France, the EASA, its technical representative, has notified us of the unsafe condition described in the EASA AD. We are issuing this EAD because we evaluated all information provided by EASA and determined the unsafe condition exists and is likely to exist or develop on other helicopters of this same type design.

Related Service Information

Eurocopter has issued an Emergency Alert Service Bulletin (EASB) with two numbers, No. 01.00.65 for the Model AS350B3 helicopters and No. 01.00.24 for the non-FAA type certificated Model AS550C3 helicopters, both Revision 0, and both dated October 4, 2012. The EASB specifies limiting the maximum flying speed to 100 knots, on-aircraft checks of the bearings before each flight, and a one-time removal and inspection of the bearings. The EASB also defines an RFM procedure in case of in-flight vibrations originating in the tail rotor. The EASB specifies a placard to limit true airspeed (TAS). This EAD is written in terms of indicated airspeed (IAS).

EAD Requirements

This EAD requires the following:

- Before further flight, install two placards on the instrument panel.

- Before further flight, revise the RFM to reduce the V_{NE} airspeed limit.

- Before further flight and thereafter after each flight, without exceeding 3 hours time-in-service between two checks, visually check all the visible faces of the bearings.

- An owner/operator (pilot) may perform the visual checks required by this EAD and must enter compliance into the helicopter maintenance records in accordance with 14 CFR §§ 43.9(a)(1)-(4) and 91.417(a)(2)(v). A pilot may perform this check because it involves only a visual check for separation, a crack, or an extrusion in the tail rotor blade and can be performed equally well by a pilot or a mechanic. This procedure is an exception to our standard maintenance regulations.

- If there is an extrusion on any bearing, before further flight, replace the four bearings with airworthy bearings.

- If there is a separation or a crack on the pressure side bearing, measure the separation or the crack. If the separation or crack is greater than 5 millimeters (.196 inches), before further flight, replace the four bearings with airworthy bearings.

- After the last flight of the day, perform a one-time inspection by removing the bearings and inspecting for a separation, a crack, or an extrusion. If there is a separation, crack, or extrusion, before further flight, replace the four bearings.

Interim Action

We consider this EAD to be an interim action. The design approval holder is currently developing a modification that will address the unsafe condition identified in this EAD. Once this modification is developed, approved, and available, we might consider additional rulemaking.

Differences Between This EAD and the EASA EAD

The EASA EAD defines a placard to limit true airspeed (TAS). This EAD defines a placard to limit indicated airspeed (IAS). The pilot reads IAS in the cockpit and a limitation in IAS will have less impact to pilot workload than a limitation in TAS, which would require a calculation.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. "Subtitle VII, Aviation Programs," describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in "Subtitle VII, Part A, Subpart III, Section 44701, General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Adoption of the Emergency Airworthiness Directive (EAD)

We are issuing this EAD under 49 U.S.C. Sections 106(g), 40113, and 44701 according to the authority delegated to me by the Administrator.

2012-21-51 **EUROCOPTER FRANCE:** Directorate Identifier 2012-SW-095-AD.

(a) Applicability.

This EAD applies to Model AS350B3 helicopters, with Modification (MOD) 07 5601, with laminated half-bearing (bearing) part number (P/N) 704A33-633-261 in combination with tail rotor blade P/N 355A12.0055.00 or 355A12.0055.01 installed, certificated in any category.

Note 1 to Applicability: MOD 07 5601 is an integral part of a specific Model AS350B3 configuration, commercially identified as "AS350B3e" and is not fitted on Model AS350B3 helicopters of other configurations.

(b) Unsafe Condition.

This EAD defines the unsafe condition as severe vibrations due to failure of bearings. This condition could result in failure of the tail rotor and subsequent loss of control of the helicopter.

(c) Effective Date.

This EAD is effective upon receipt.

(d) Compliance.

You are responsible for performing each action required by this EAD within the specified compliance time unless it has already been accomplished.

(e) Required Actions.

(1) Before further flight:

(i) Install a velocity never exceed (V_{NE}) placard that reads as follows on the instrument panel in full view of the pilot and co-pilot with 6-millimeter red letters on a white background:

"VNE LIMITED TO 100 KTS IAS."

(ii) Replace the IAS limit versus the flight altitude placard with the placard as depicted in Figure 1 to paragraph (e)(1)(ii) of this EAD inside the cabin on the center post.

VNE POWER ON	
Hp (ft)	**IAS (kts)**
0	100
2000	97
4000	94
6000	91
8000	88
10000	85
12000	82
14000	79
16000	76
18000	73
20000	70
22000	67
Valid for VNE POWER OFF	

Figure 1 to paragraph (e)(1)(ii)

(2) Before further flight, revise the Rotorcraft Flight Manual (RFM) as follows:

(i) Insert Figure 2 to paragraph (e)(2)(i) into paragraph 2.3 of the RFM.

(ii) Insert Figure 3 to paragraph (e)(2)(ii) into paragraph 2.6 of the RFM.

(iii) Insert Figure 4 to paragraph (e)(2)(iii) to add paragraph 3.3.3 to the RFM.

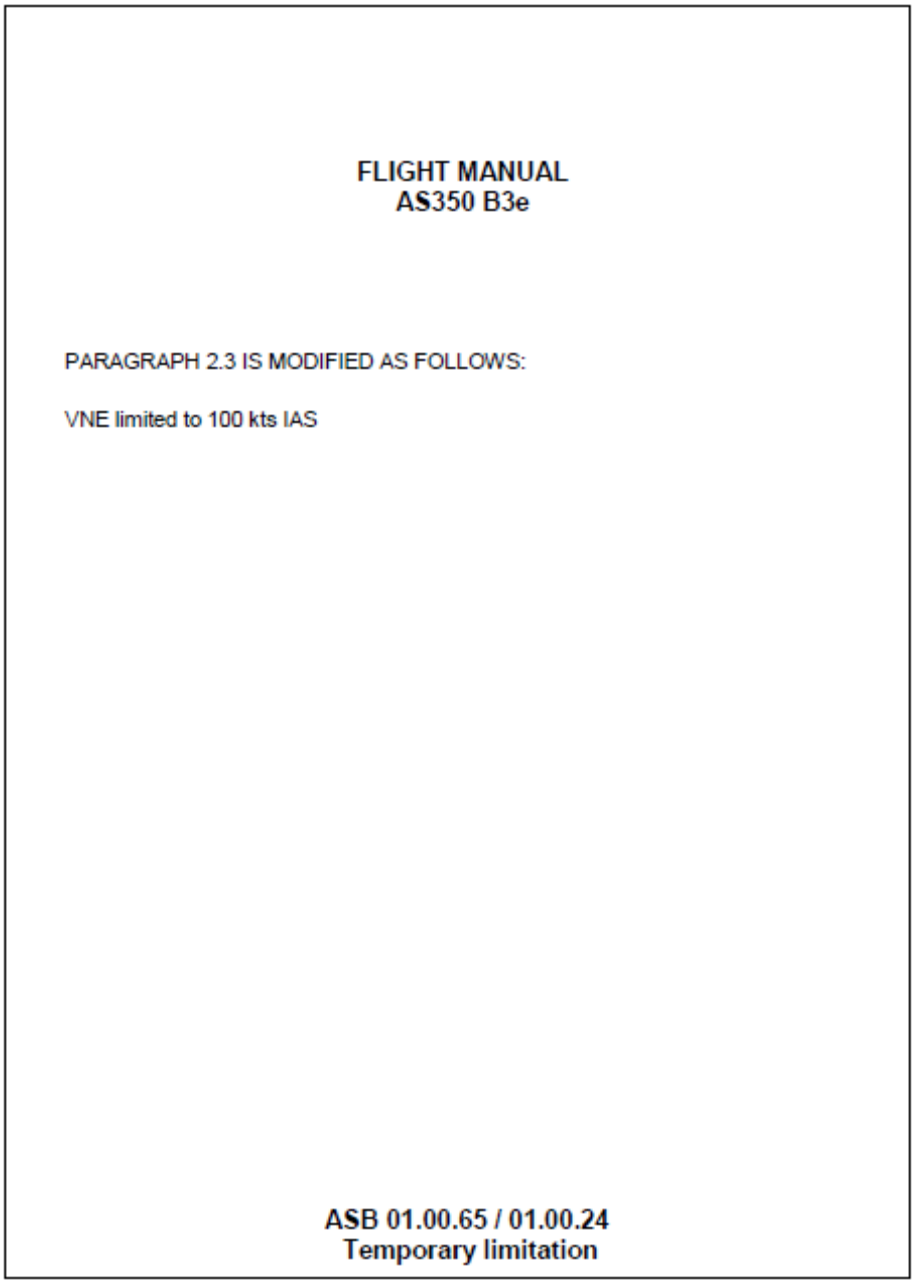


Figure 2 to paragraph (e)(2)(i)

FLIGHT MANUAL
AS350 B3e

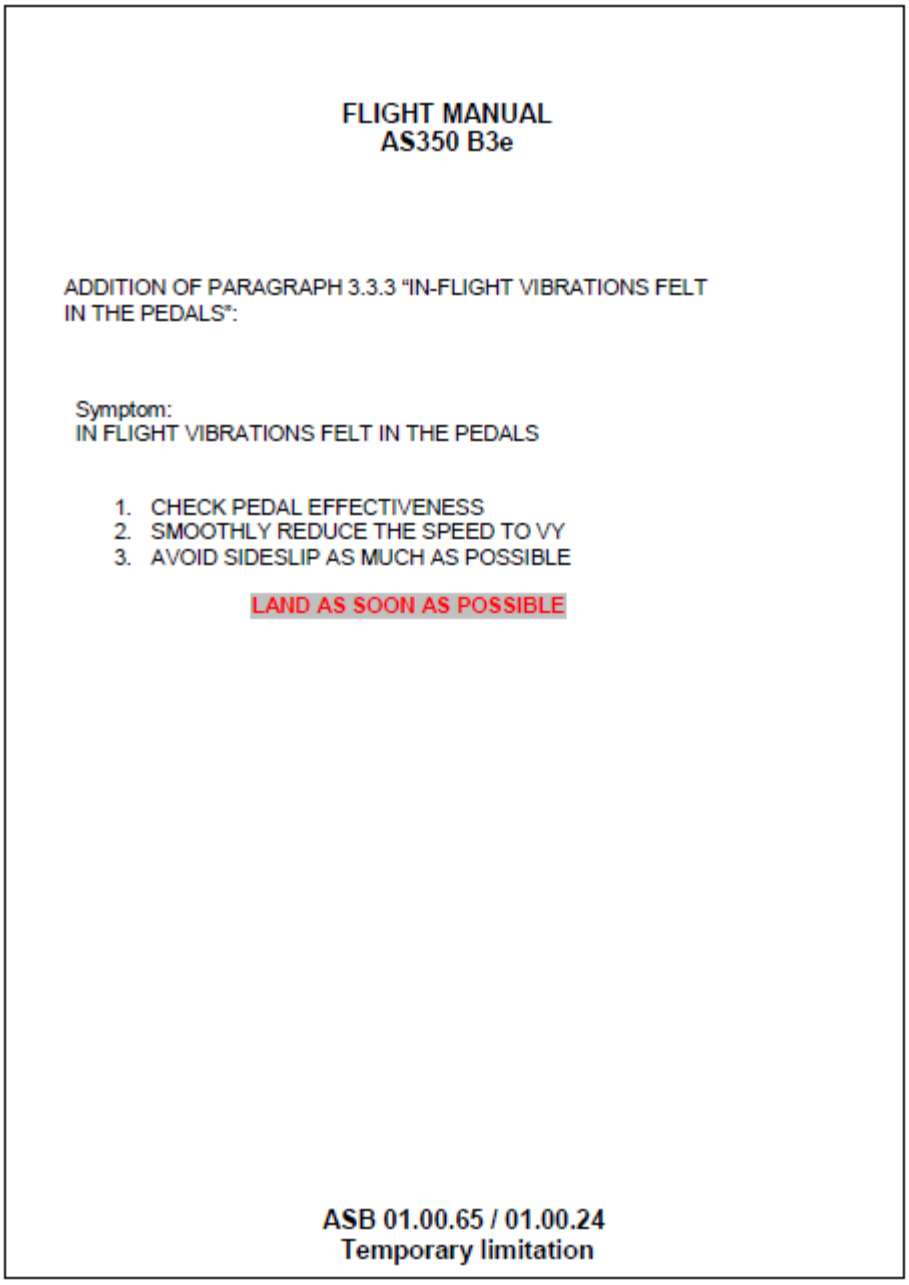
PARAGRAPH 2.6 IS MODIFIED AS FOLLOWS:

VNE EN PUISSANCE	
Zp (ft)	Vi (kts)
0	100
2000	97
4000	94
6000	91
8000	88
10000	85
12000	82
14000	79
16000	76
18000	73
20000	70
22000	67
Valide pour VNE SANS PUISSANCE	

VNE POWER ON	
Hp (ft)	IAS (kts)
0	100
2000	97
4000	94
6000	91
8000	88
10000	85
12000	82
14000	79
16000	76
18000	73
20000	70
22000	67
Valid for VNE POWER OFF	

ASB 01.00.65 / 01.00.24
Temporary limitation

Figure 3 to paragraph (e)(2)(ii)



FLIGHT MANUAL
AS350 B3e

ADDITION OF PARAGRAPH 3.3.3 "IN-FLIGHT VIBRATIONS FELT IN THE PEDALS":

Symptom:
IN FLIGHT VIBRATIONS FELT IN THE PEDALS

1. CHECK PEDAL EFFECTIVENESS
2. SMOOTHLY REDUCE THE SPEED TO VY
3. AVOID SIDESLIP AS MUCH AS POSSIBLE

LAND AS SOON AS POSSIBLE

ASB 01.00.65 / 01.00.24
Temporary limitation

Figure 4 to paragraph (e)(2)(iii)

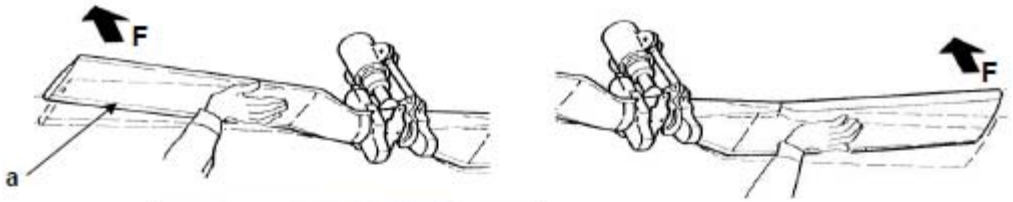
(3) Before further flight and thereafter after each flight, without exceeding 3 hours time-in-service between two checks, visually check each bearing as follows:

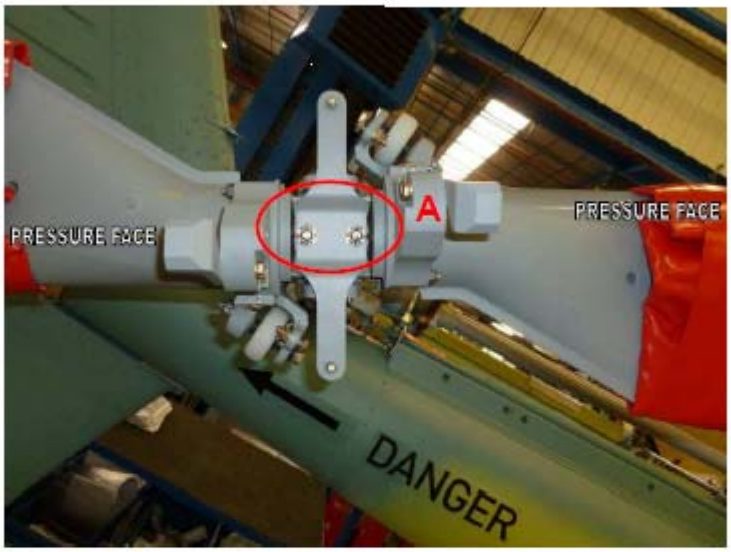
(i) Position both tail rotor blades horizontally.

(ii) Apply load (F) by hand, perpendicular to the pressure face of one tail rotor blade (a), as shown in Figure 5 to paragraph (e)(3)(ii) and (e)(3)(iii) of this EAD, taking care not to reach the extreme position against the tail rotor hub. The load will deflect the tail rotor blade towards the tail boom.

(iii) While maintaining the load, check all the visible faces of the bearings (front and side faces) in area B of DETAIL A of Figure 5 to paragraphs (e)(3)(i) and (e)(3)(iii) of this EAD for separation between the elastomer and metal parts, a crack in the elastomer, or an extrusion (see example in Figure 6 to paragraph (e)(3)(iii) of this EAD).

Note 2 to paragraph (e)(3)(iii): A flashlight may be used to enhance the check.





DETAIL A

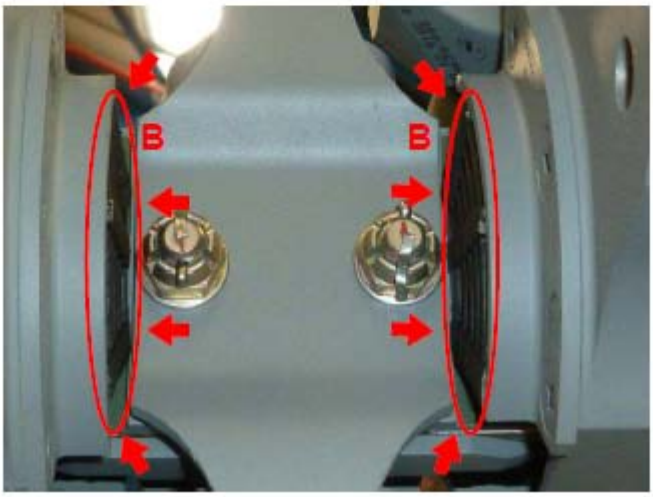


Figure 5 to paragraphs (e)(3)(ii) and (e)(3)(iii)

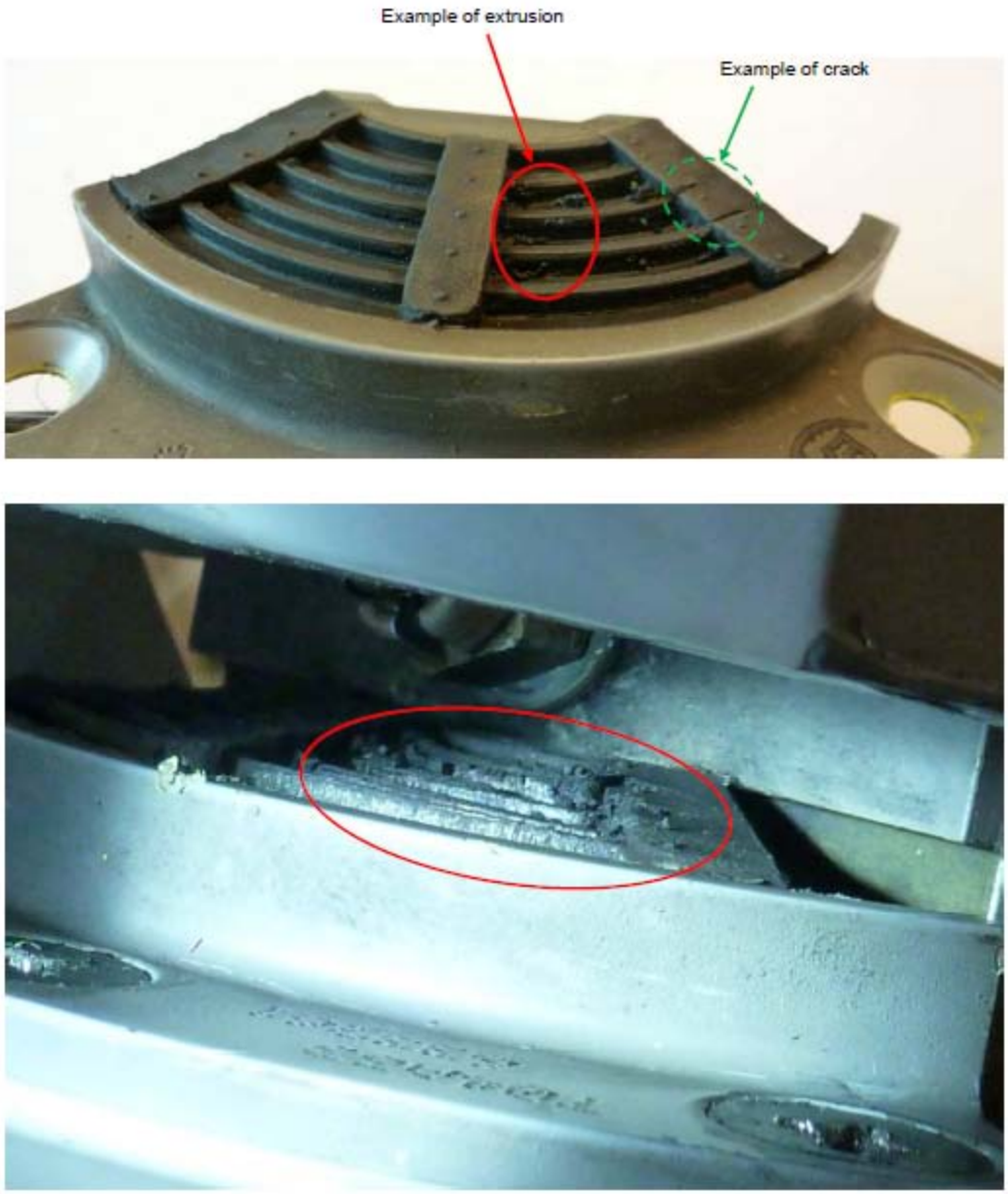
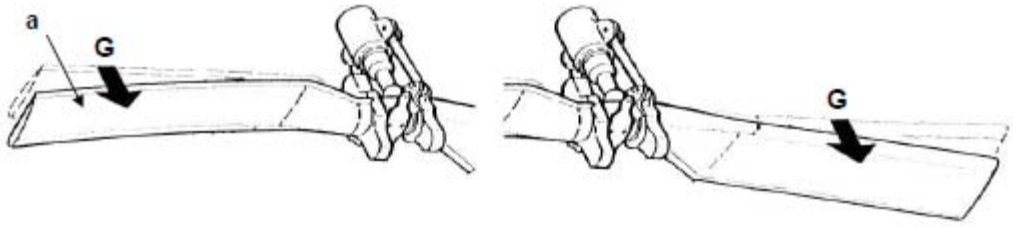


Figure 6 to paragraph (e)(3)(iii)

(iv) Repeat paragraphs (e)(3)(i) through (e)(3)(iii) on the other tail rotor blade.

(v) Apply load (G) by hand perpendicular to the suction face of one tail rotor blade as shown in Figure 7 to paragraphs (e)(3)(v) and (e)(3)(vi) of this EAD. The load will deflect the tail rotor blade away from the tail boom.



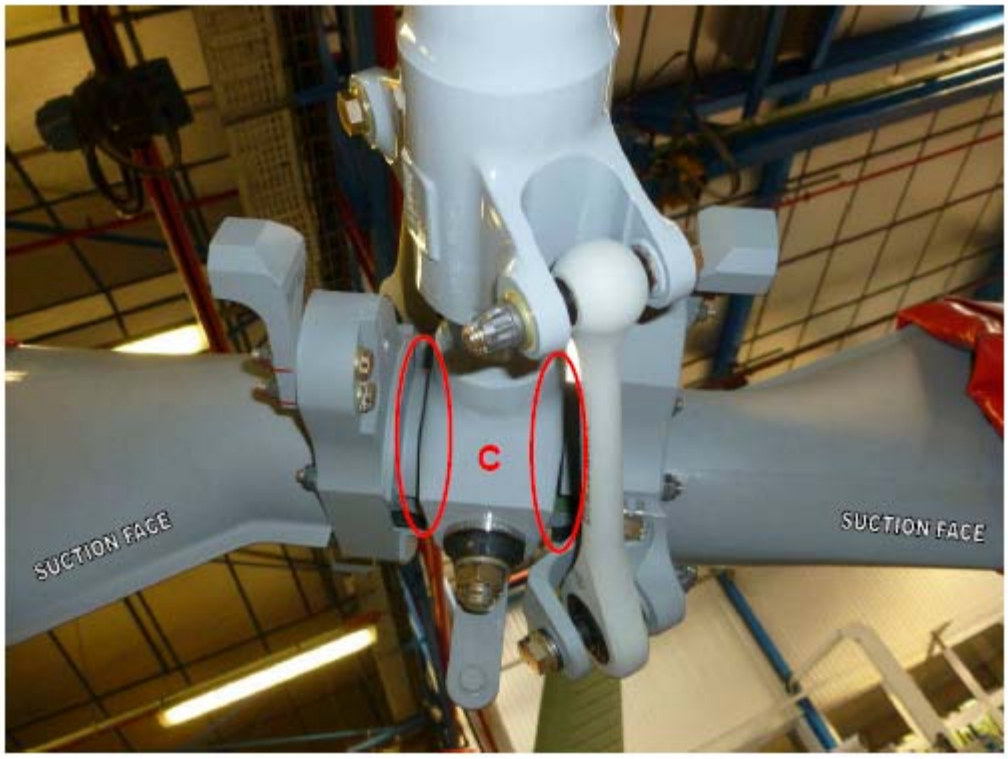


Figure 7 to paragraphs (e)(3)(v) and (e)(3)(vi)

(vi) While maintaining the load, check visible faces of Area C as shown in Figure 7 to paragraphs (e)(3)(v) and (e)(3)(vi) of this EAD for any extrusion.

Note 3 to paragraph (e)(3)(vi): A flashlight may be used to enhance the check.

(vii) Repeat paragraphs (e)(3)(v) and (e)(3)(vi) on the other tail rotor blade.

(4) The actions required by paragraphs (e)(3)(i) through (e)(3)(vii) of this EAD may be performed by the owner/operator (pilot) holding at least a private pilot certificate, and must be entered into the aircraft records showing compliance with this EAD in accordance with 14 CFR §§ 43.9 (a)(1)-(4) and 14 CFR 91.417(a)(2)(v). The record must be maintained as required by 14 CFR §§ 91.173, 121.380, or 135.439.

(5) If there is an extrusion on any bearing, before further flight, replace the four bearings with airworthy bearings.

(6) If there is a separation or a crack on the pressure side bearing, measure the separation or the crack. If the separation or crack is greater than 5 millimeters (.196 inches) as indicated by dimension “L” in Figure 8 to paragraph (e)(6), before further flight, replace the four bearings with airworthy bearings.

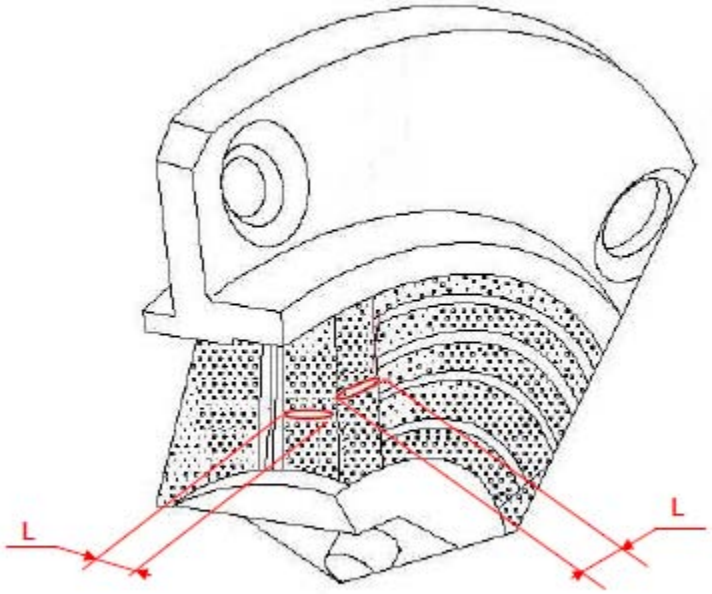


Figure 8 to paragraph (e)(6)

(7) After the last flight of the day, perform a one-time inspection by removing the bearings and inspecting for a separation, a crack, or an extrusion. If there is a separation, crack, or extrusion, before further flight, replace the four bearings with airworthy bearings.

(f) Special Flight Permit.

Special flight permits are prohibited by this EAD.

(g) Alternative Methods of Compliance (AMOCs).

(1) The Manager, Safety Management Group, FAA, may approve AMOCs for this EAD. Send your proposal to: Robert Grant, Aviation Safety Engineer, Safety Management Group, FAA, 2601 Meacham Blvd., Fort Worth, Texas 76137; telephone 817-222-5328; email robert.grant@faa.gov.

(2) For operations conducted under a 14 CFR part 119 operating certificate or under 14 CFR part 91, subpart K, we suggest that you notify your principal inspector, or lacking a principal inspector, the manager of the local flight standards district office or certificate holding district office, before operating any aircraft complying with this EAD through an AMOC.

(h) Additional Information.

(1) For further information contact: Robert Grant, Aviation Safety Engineer, Safety Management Group, FAA, 2601 Meacham Blvd., Fort Worth, Texas 76137; telephone 817-222-5328; email robert.grant@faa.gov.

(2) Eurocopter Emergency Alert Service Bulletin (EASB) No. 01.00.65, dated October 4, 2012, which is not incorporated by reference, contains additional information about the subject of this EAD.

(3) For a copy of the service information referenced in this EAD, contact: American Eurocopter Corporation, 2701 N. Forum Drive, Grand Prairie, TX 75052; telephone (972) 641-0000 or (800) 232-0323; fax (972) 641-3775; or at http://www.eurocopter.com/techpub.

(i) Subject.

Joint Aircraft Service Component (JASC) Tracking Code: 6400 Tail Rotor.

Issued in Fort Worth, Texas, on October 17, 2012.

Gwendolynne O'Connell
Acting Manager, Rotorcraft Directorate,
Aircraft Certification Service.