



Airworthiness Directive

AD No.: 2016-0199

Issued: 07 October 2016

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) 216/2008 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

This AD is issued in accordance with Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EC) 216/2008, Article 14(4) exemption].

Design Approval Holder's Name:

AIRBUS HELICOPTERS

Type/Model designation(s):

AS 332 L2 and EC 225 LP helicopters

Effective Date: 13 October 2016

TCDS Number(s): EASA.R.002

Foreign AD: Not applicable

Supersedure: This AD supersedes EASA Emergency AD 2016-0104-E dated 02 June 2016, including its Corrections, dated 03 June and 09 June 2016.

ATA 05 – Time Limits / Maintenance Checks – Main Gearbox Particle Detector / Oil Filter – Inspection

ATA 63 – Main Rotor Drive – Epicyclic Module – Replacement / Reduced Service Life Limit

Manufacturer(s):

Airbus Helicopters (formerly Eurocopter, Eurocopter France, Aerospatiale)

Applicability:

AS 332 L2 and EC 225 LP helicopters, all manufacturer serial numbers.

Reason:

Following a fatal accident that occurred in Norway to an EC 225 LP helicopter, involving in-flight detachment of the main rotor hub from the main gearbox (MGB), EASA issued Emergency AD 2016-0089-E to require, as a precautionary measure, the accomplishment of certain one-time inspections. Review of the data collected through the reporting required by that AD resulted in findings relating to the installation of the MGB upper deck fittings of the three MGB suspension bars. Prompted by these findings, EASA issued Emergency AD 2016-0103-E, which superseded AD 2016-0089-E, to require further inspection to ensure correct installation of the MGB suspension bars and attachment fittings.



Soon after EASA AD 2016-0103-E was issued, a second preliminary report from the investigation board indicated metallurgical findings of fatigue and surface degradation in the outer race of a second stage planet gear of the MGB epicyclic module. At that time, it could not be determined whether that was a contributing factor to the accident, or a subsequent failure of another origin.

Prompted by these findings, pending further investigation to determine the root cause(s) of the reported damage, EASA decided, as an additional precautionary measure, to temporarily ground the fleet by issuing Emergency AD 2016-0104-E, prohibiting flight of all AS 332 L2 and EC 225 LP helicopters.

Since that AD was issued, Airbus Helicopters (AH) have investigated possible accident contributory factors and determined that the likely cause relates to the rupture of the second stage planet gear, which was found with fatigue and surface degradation. Although the root cause of this failure is still not fully understood, it involved cracking of the planet gear bearing outer race, some spalling and propagation of a crack into the rim of the gear, finally resulting in its rupture.

There are two configurations of planet gear within the current type design. In depth review of the design and service data showed that one configuration has higher operating stress levels that result in more frequent events of spalling, associated with rolling contact fatigue, while the other exhibits better reliability behaviour. By limiting the type design to the gear configuration with lower stress levels and better reliability and specifying a reduced life limit, combined with more effective oil debris monitoring procedures and other operational controls, an acceptable level of safety can be restored.

Prompted by these determinations, AH issued AS332 Emergency Alert Service Bulletin (ASB) 63.00.83 and EC225 ASB 63A030 (single document at Revision 1), and AS332 Emergency ASB 05.01.07 and EC225 ASB 05A049 (single document at Revision 2), to introduce the necessary instructions to allow return to service.

For the reasons described above, this AD ends the flight prohibition imposed by EASA Emergency AD 2016-0104-E, which is superseded, and requires accomplishment of the actions specified in the related AH service publications.

This AD is considered to be an interim action and further AD action may follow.

Required Action(s) and Compliance Time(s):

Required as indicated, unless accomplished previously.

Parts Removal from Service:

- (1) Before next flight after the effective date of this AD, identify the Part Number (P/N) of each second stage planet gear assembly and replace each assembly, having P/N 332A32-3335-00, P/N 332A32-3335-02, P/N 332A32-3335-03, P/N 332A32-3335-05 or P/N 332A32-3335-07, with a serviceable part (see Note 1 of this AD) in accordance with the instructions of AH AS332 ASB 63.00.83 or EC225 ASB 63A030, as applicable.



Note 1: For the purpose of this AD, a serviceable second stage planet gear assembly has P/N 332A32-3335-04, or P/N 332A32-3335-06, and has not exceeded the applicable reduced life limit as specified in Table 1 of AH AS332 ASB 63.00.83 or EC225 ASB 63A030, as applicable.

Parts Service Life Reduction:

- (2) From the effective date of this AD, before exceeding the applicable reduced life limit, as specified in Table 1 of AH AS332 ASB 63.00.83 and EC225 ASB 63A030, replace each second stage planet gear assembly P/N 332A32-3335-04 and P/N 332A32-3335-06 with a serviceable part (see Note 1 of this AD) in accordance with the instructions of AH AS332 ASB 63.00.83 or EC225 ASB 63A030, as applicable.

Serviceability Determination of Epicyclic Modules:

- (3) Before next flight after the effective date of this AD, determine whether the epicyclic module is a serviceable epicyclic module (see Note 2 of this AD) in accordance with the instructions as specified in Section 1.E.2 of AH AS332 ASB 05.01.07 or EC225 ASB 05A049, as applicable, and, depending on that determination, remove each unserviceable module from the helicopter.

Note 2: For the purpose of this AD, a serviceable epicyclic module is a module equipped with serviceable second stage planet gear assemblies (see Note 1 of this AD) and that has never been subject to repair and/or parts replacement ("RE" as per AH terminology) following an event as specified in Table 1 of AH AS332 ASB 05.01.07 or EC225 ASB 05A049, as applicable.

Rotorcraft Flight Manual (RFM) Amendment – MGB Particle Burning In-Flight Prohibited:

- (4) Before next flight after the effective date of this AD, amend the applicable RFM by inserting a copy of Appendix 4.B (AS332L2) or Appendix 4.C (EC225LP), as applicable, of AH AS332 ASB 05.01.07 or EC225 ASB 05A049, as applicable, inform all flight crews and, thereafter, operate the helicopter accordingly.

Introducing a later revision of the RFM that includes these instructions is an acceptable method to comply with the requirements of paragraph (4) of this AD.

Repetitive Inspections of MGB Particle Detectors:

- (5) Before next flight after the effective date of this AD, and, thereafter, during each "after last flight" of the day (ALF) inspection, or at intervals not to exceed 10 FH, whichever occurs first, inspect the MGB particle detectors (epicyclic module, MGB sump, flared casing and MGB oil cooler) in accordance with the instructions of Section 3.B.1 of AH AS332 ASB 05.01.07 or EC225 ASB 05A049, as applicable.

Repetitive Inspections of MGB Oil Filter:

- (6) Before next flight after the effective date of this AD, and, thereafter, at intervals not to exceed 10 FH, inspect the MGB oil filter in accordance with the instructions of Section 3.B.2 of AH AS332 ASB 05.01.07 or EC225 ASB 05A049, as applicable.

Corrective Action(s):

- (7) If, during any inspection as required by paragraph (5) or (6) of this AD, particles are detected, exceeding the criteria as defined in Appendix 4.A of AH AS332 ASB 05.01.07 or EC225 ASB 05A049, as applicable, before next flight, accomplish the applicable corrective action(s) in



accordance with the instructions of Appendix 4.A of AH AS332 ASB 05.01.07 or EC225 ASB 05A049, as applicable.

Terminating Action: None

- (8) Accomplishment of corrective action(s) on a helicopter, as required by paragraph (7) of this AD, does not constitute terminating action for the repetitive inspections as required by paragraphs (5) and (6) of this AD for that helicopter.

Parts Installation:

- (9) From the effective date of this AD, do not install on any helicopter an epicyclic module second stage planet gear assembly, having P/N 332A32-3335-00, P/N 332A32-3335-02, P/N 332A32-3335-03, P/N 332A32-3335-05 or P/N 332A32-3335-07. It is allowed to install on any helicopter a replacement MGB epicyclic module, provided that, prior to installation, it is determined that it is a serviceable module (see Note 2 of this AD).

Ref. Publications:

Airbus Helicopters AS332 ASB 63.00.83 and EC225 ASB 63A030 (single document) Revision 1, dated 07 October 2016.

Airbus Helicopters AS332 ASB 05.01.07 and EC225 ASB 05A049 (single document) Revision 2, dated 07 October 2016.

The use of later approved revisions of these documents is acceptable for compliance with the requirements of this AD.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
2. Based on the required actions and the compliance time, EASA have decided to issue a Final AD with Request for Comments, postponing the public consultation process until after publication.
3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
4. For any question concerning the technical content of the requirements in this AD, please contact: Airbus Helicopters (Technical Support) – Aéroport de Marseille Provence 13725 Marignane Cedex, France, Telephone +33 (0)4 42 85 97 97, Fax +33 (0)4 42 85 99 66, E-mail: TechnicalSupport.Helicopters@airbus.com.

