


EASA	EMERGENCY AIRWORTHINESS DIRECTIVE
	<p>AD No.: 2012-0225-E</p> <p>Date: 25 October 2012</p> <p>Note: This Emergency Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.</p>
This AD is issued in accordance with EU 748/2012, Part 21.A.3B. In accordance with EC 2042/2003 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 [EC 2042/2003 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].	
Design Approval Holder's Name: EUROCOPTER	Type/Model designation(s): AS 332 and EC 225 helicopters
TCDS Number:	EASA.R.002
Foreign AD:	Not applicable
Supersedure:	This AD supersedes EASA Emergency AD 2012-0115-E dated 28 June 2012.
ATA 63	Main Rotor Drive – Main Gear Box Bevel Gear Vertical Shaft – Inspection / Limitation
Manufacturer(s):	Eurocopter (formerly EUROCOPTER France)
Applicability:	AS 332 C, AS 332 C1, AS 332 L, AS 332 L1, AS 332 L2 and EC 225 LP helicopters, all serial numbers, if equipped with Main Gear Box (MGB) bevel gear vertical shaft Part Number (P/N) 332A32.5101.00, P/N 332A32.5101.05, P/N 332A32.5101.10 or P/N 332A32.5101.15, all Serial Number (S/N).
Reason:	<p>In May 2012, an EC 225 LP helicopter carried out an emergency ditching in the North Sea after warning indication of MGB loss of oil pressure and subsequent additional red alarm on the MGB emergency lubrication system.</p> <p>A full circumferential crack of the lower vertical shaft of the MGB bevel gear occurred in the area where the two sections of the shaft are welded together. As a result, the vertical shaft ceased to drive the main and backup oil pumps, leading to warning indications of the loss of the MGB main and standby oil lubrication systems. The crew activated the MGB emergency lubrication system and, following a subsequent warning indicating failure of that system, performed a controlled ditching into the sea.</p> <p>Results from the investigation of the failed shaft revealed that the crack had initiated from an oxidation pit found in the chamfer of the vertical shaft welding stop hole. This bore hole is fitted with a plastic plug under which the corrosion became trapped into a confined area of the hole chamfer whose shape had been previously modified by a production change in the manufacturing process of the MGB bevel gear. A thorough review of the production files identified the S/Ns of vertical shafts manufactured after the production change as a batch of potentially affected parts.</p>

	<p>Although the corroded vertical shaft failed after a low number of accumulated flight hours, the investigation showed that failure could not be precluded at any specific value of accumulated flight hours, therefore the crack could have initiated at low MGB torque levels. This is the reason why AS 332 models might be affected in the same way as EC 225 helicopters.</p> <p>The investigation also determined that, prior to the flight during which the helicopter ditched, the Vibration Health Monitoring (VHM) system installed on the helicopter had identified a rising trend in certain monitoring parameters associated with the MGB oil pump drive system.</p> <p>To address the unsafe condition of MGB bevel gear vertical shaft failure, EASA issued Emergency AD 2012-0115-E, which superseded previously issued EASA AD 2012-0107, EASA AD 2012-0104 and EASA Emergency AD 2012-0087-E.</p> <p>EASA AD 2012-0115-E applied to all AS 332 and EC 225 helicopters equipped with potentially affected shafts, identified by S/N. The AD required for those helicopters, when equipped with a serviceable VHM system and flying over water in either Instrument Meteorological Conditions (IMC) or at night, to download and review some VHM data at different intervals, depending on helicopters models. For helicopters without VHM, or with an unserviceable VHM system, the AD imposed a restriction, to limit flight over water operation to day visual flight rules (Day VFR) only.</p> <p>Since that AD was issued, a report was received following the ditching in the North Sea of another EC 225 LP helicopter. The helicopter ditched under the same warning circumstances as it occurred for the instance in May 2012, i.e. indication of MGB loss of oil pressure and subsequent red alarm on the MGB emergency lubrication system activated by the crew.</p> <p>The affected helicopter was equipped with a MGB bevel gear vertical shaft with a S/N outside the identified batch of potentially affected parts and was therefore not subject to the VHM monitoring required by EASA AD 2012-0115-E. While the investigation is still at an early stage, the cause of this new ditching seems to result from the failure of that vertical shaft. Additionally, the analysis of the data recorded by the VHM system of the helicopter, prior to the flight during which it ditched, also showed some VHM rising trends.</p> <p>For the reasons described above and pending further results from the investigation, this new AD retains the requirements of AD 2012-0115E, which is superseded, extends its Applicability to all vertical shafts, regardless of S/N, reduces the time intervals for downloading and reviewing the VHM data and requires this for any flight over water. Furthermore, for helicopters without a VHM system installed, and helicopters with an unserviceable VHM, this AD prohibits flight over water.</p>
Effective Date:	25 October 2012
Required Action(s) and Compliance Time(s):	<p>Required as indicated, unless accomplished previously:</p> <ol style="list-style-type: none"> (1) For helicopters equipped with a serviceable Eurocopter VHM system, and operated over water, before next flight over water, after the effective date of this AD, and, thereafter, at intervals as specified in Appendix 1 of this AD, download VHM data to review indicators as applicable for helicopter models listed in that Appendix, in accordance with instructions of Eurocopter AS332 ASB No. 01.00.82 or EC225 ASB No. 04A009, as applicable to helicopter model, and prior to further flight, report to Eurocopter any increasing trend indication or unusual behaviour of downloaded parameters and accomplish Eurocopter instructions accordingly. Note 1: For further advice regarding interpretation of the VHM data, contact Eurocopter Technical Support. (2) For helicopters which combine operations over water with any other

	<p>operation, the requirements of paragraph (1) of this AD apply.</p> <p>(3) For helicopters not equipped with a Eurocopter VHM system, and helicopters equipped with an unserviceable Eurocopter VHM system, before next flight after the effective date of this AD, accomplish the following actions concurrently:</p> <p>(3.1) Remove from the helicopter and from the Rotorcraft Flight Manual (RFM) any placard and copy of EASA AD 2012-0115-E as previously required.</p> <p>(3.2) Install a placard "FLIGHT OVER WATER PROHIBITED" in full view of the pilots;</p> <p>(3.3) Insert a copy of this AD in the RFM of the helicopter.</p> <p>Note 2: The placard prohibition shall be intended as: fly over water beyond safe forced landing distance from land is prohibited.</p> <p>(4) Following rectification of the VHM system for a helicopter equipped with an unserviceable Eurocopter VHM system as specified in paragraph (3) of this AD, depending on the type of operations, paragraphs (1) and (2) of this AD apply to the helicopter. Concurrently, the placard and copy of the AD, as previously required by paragraphs (3.2) and (3.3) of this AD, can be removed from the helicopter and RFM.</p>
Ref. Publications:	<p>Eurocopter AS332 ASB No. 01.00.82 Revision 1 dated 24 October 2012.</p> <p>Eurocopter EC225 ASB No. 04A009 Revision 1 dated 24 October 2012.</p> <p>The use of later approved revisions of these documents is acceptable for compliance with the requirements of this AD.</p>
Remarks:	<ol style="list-style-type: none"> 1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD. 2. The results of the safety assessment have indicated the need for immediate publication and notification, without the full public consultation process. 3. Enquiries regarding this AD should be referred to the Safety Information Section, Executive Directorate, EASA. E-mail: ADs@easa.europa.eu. 4. For any question concerning the technical content of the requirements in this AD, please contact: EUROCOPTER (STDI) – Aéroport de Marseille Provence 13725 Marignane Cedex, France; telephone +33 (4) 42 85 97 97; facsimile +33 (4) 42 85 99 66; E-mail: Directive.technical-support@eurocopter.com.

Appendix 1 – Download and Review interval of VHM indicators

Helicopter Model(s)	VHM Download Interval	VHM Indicators to be reviewed
AS 332 C, AS 332 C1, AS 332 L, AS 332 L1	Not exceeding 6 flight hours (FH)	EuroHUMS: analyse the indicators of the S9 component relating to the monitoring of the shaft and bevel gear area, in particular indicator SDB1
AS 332 L2	Not exceeding 4,5 FH	EuroARMS: analyse the indicators relating to the monitoring of the shaft and bevel gear area
		EuroHUMS: analyse the indicators of the S9 component relating to the monitoring of the shaft and bevel gear area, in particular indicator SDB1
EC 225 LP	Not exceeding 3 FH	MARMS: analyze indicators MOD-45 and MOD-70.