EASA AD No.: 2015-0128

EASA

AIRWORTHINESS DIRECTIVE

AD No.: 2015-0128

Date: 03 July 2015

Note: This 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.

This AD is issued in accordance with EU 748/2012, Part 21.A.3B. In accordance with 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 [EU 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].

Design Approva	al Holder's Name:	Type/Model designation(s): TURMO IV C engines
TCDS Number:	EASA.E.074	
Foreign AD:	Not applicable	
Supersedure:	This AD supersedes DGAC Fran approval 2005-1910.	nce AD F-2005-037 dated 02 March 2005, EASA
ATA 72	Engine – Centrifugal Compressor – Replacement / Inspection	
Manufacturer(s):	Turbomeca, S.A.	
Applicability:	TURMO IV C engines, all serial numbers.	
	These engines are known to be installed on, but not limited to, Airbus Helicopters (formerly Eurocopter, Aerospatiale) SA 330 J (PUMA) helicopters	
Reason:	Several occurrences were reported of engine power loss or in-flight shut-dow as a result of detachment of one or more blade pieces from a TURMO IV centrifugal compressor inducer. Investigations revealed that the failures were due to fatigue cracks on these blades, caused either by a corrosion phenomenon, or by an impact associated to vibratory stress in a range from 80% to 83% gas generator speed, or by a superposition of the inducer vibrator resonances.	
	This condition, if not detected and corrected, could lead to an uncommanded engine in-flight shut-down, possibly resulting in an emergency landing with consequent damage to the helicopter and injury to occupants.	
	To address this potential unsafe condition, Turbomeca developed several standards of centrifugal compressor inducers. In-service experience shows different behaviour in terms of initiation of corrosion and/or cracks between these standards. This led to the issuance of Service Bulletins providing instructions for repetitive inspections (ultrasonic, Eddy Current or boroscopic) of the centrifugal compressors, with different periodicities depending on the standard of centrifugal compressors.	
	Prompted by these findings, DGAC France issued AD 97-122 (later revised and re-numbered as 1997-122) to require those repetitive inspections of the	

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centrifugal compressor, in order to detect incipient cracks on the blades and/or presence of corrosion. DGAC France AD 1997-122 R3 was subsequently superseded by DGAC France AD F-2005-037 (EASA approval 2005-1910), retaining the requirements, but specifying amended inspections intervals.

Since AD F-2005-037 was issued, a specific vibration criterion was introduced during manufacture on certain centrifugal compressors, incorporating modification (mod) TU 224 (centrifugal compressor assembly Part Number (P/N) 0 249 25 790 0, or P/N 0 249 25 811 0) to prevent vibratory resonances superposition. In-service experience shows that no crack associated to this resonance phenomenon has been reported on post-mod TU 224 engines.

More recently, a case of centrifugal compressor inducer blade loss occurred on a post-mod TU 224 engine. This blade loss was determined to be due to cracks caused by impacts combined with significant erosion of the part.

For the reasons described above, this AD does not retain the requirements of DGAC France AD F-2005-037, which is superseded, and requires modification of engines in post-mod TU 197 or TU 215 configuration to post-mod TU 224 configuration, repetitive ultra-sonic or Eddy Current inspections of centrifugal compressor inducers, repetitive boroscope inspections of centrifugal compressor inducers and, depending on findings, replacement of the centrifugal compressor.

Effective Date:

17 July 2015

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

Required as indicated, unless accomplished previously:

- (1) For engines in post-mod TU 197 or post-mod TU 215 configuration: within 30 days after the effective date of this AD, replace each pre-mod TU 224 centrifugal compressor with a post-mod TU 224 centrifugal compressor in accordance with the instructions of Turbomeca Mandatory SB (MSB) A249 72 0100 Version H.
- (2) Within the threshold specified in Turbomeca MSB A249 72 0100 Version H, as applicable depending on the engine configuration, and, thereafter, at intervals not to exceed the values specified in Table 1 of this AD, (except as specified in Note 1 of this AD), accomplish an ultra-sonic or Eddy Current inspection of the centrifugal compressor inducer in accordance with the instructions of Turbomeca MSB A249 72 0100 Version H.

Table 1 – Intervals for Repetitive Inspection

Engine Configuration	Interval
Engines without the following modifications: TU 191, TU 197, TU 215 or TU 224	400 flight hours (FH)
Post-mod TU 191 engines	
Post-mod TU 224 engines, fitted with a centrifugal compressor assembly Part Number (P/N) 0 249 25 802 0	1 000 FH
Post-mod TU 224 engines fitted with a centrifugal compressor assembly P/N 0 249 25 790 0 or P/N 0 249 25 811 0 and an inducer serial number (S/N) listed in Appendix 1 of this AD	
Post-mod TU 224 engines fitted with a centrifugal compressor assembly P/N 0 249 25 790 0 or P/N 0 249 25 811 0, and an inducer S/N not listed in Appendix 1 of this AD	3 000 FH

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	(3) Within the threshold specified in Turbomeca MSB A249 72 0100 Version H, as applicable depending on the engine configuration, and, thereafter, at intervals not to exceed 100 FH or 12 months, whichever occurs first, accomplish a boroscope inspection of the centrifugal compressor inducer in accordance with the instructions of Turbomeca MSB A249 72 0100 Version H.
	Note 1: A non-cumulative tolerance of 10 FH may be applied only to the repetitive inspection interval expressed in FH, as specified in paragraphs (2) and (3) of this AD.
	(4) Accomplishment on an engine of an ultra-sonic or Eddy Current inspection of the inducer, as required by paragraph (2) of this AD, is acceptable in lieu of a boroscope inspection as required by paragraph (3) of this AD for that engine.
	(5) If, during any inspection as required by paragraph (2) or (3) of this AD, as applicable, any crack, corrosion or other damage is detected on the inducer, before next flight, replace the affected centrifugal compressor with a serviceable part.
	(6) Modification of an engine, accomplished before the effective date of this AD in accordance with the instructions of Turbomeca MSB A249 72 0100 Version G or an earlier version, is acceptable to comply with the modification requirement of paragraph (1) of this AD for that engine.
	(7) Inspections and corrective actions, accomplished on an engine before the effective date of this AD in accordance with the instructions of Turbomeca MSB A249 72 0100 Version G or an earlier version, are acceptable to comply with the initial inspection requirements of this AD for that engine.
	(8) Replacement of a centrifugal compressor on an engine, as required by paragraph (5) of this AD, does not constitute terminating action for the repetitive inspections as required by paragraphs (2) and (3) of this AD for that engine.
	(9) From the effective date of this AD, installation of a centrifugal compressor on an engine is allowed, provided the part has been modified to incorporate Turbomeca mod TU 224.
Ref. Publications:	Turbomeca MSB A249 72 0100 Version H dated 27 May 2015.
	The use of later approved revisions of this document is acceptable for compliance with the requirements of this AD.
Remarks:	 If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.
	 This AD was posted on 29 May 2015 as PAD 15-071 for consultation until 26 June 2015. No comments were received during the consultation period.
	 Enquiries regarding this AD should be referred to the Safety Information Section, Certification Directorate, EASA. E-mail: ADs@easa.europa.eu.
	 For any question concerning the technical content of the requirements in this PAD, please contact: Operator Support & Sales TURMO - TURBOMECA 40220 TARNOS – France Telephone: +33 (0)5 59 74 40 00, Fax: +33 (0)5 59 74 45 15,
	or contact your nearest TURBOMECA field representative on http://www.turbomeca-support.com .

Appendix 1 – Affected Inducers P/N 2 249 25 138 0 listed by S/N

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