EASA	AIRWORTHINESS DIRECTIVE
	AD No.: 2011-0066 **Date: 11 April 2011** 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 EC 1702/2003, Part 21A.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].

Type Approval Holder's Name :	**Type/Model designation(s) :**
Turboméca	TM 333 series turboshaft engines

TCDS Number :	EASA.E.030
Foreign AD :	Not applicable
Supersedure :	This AD supersedes EASA AD 2010-0161, dated 03 August 2010.

ATA 72	**Engine – Maintenance Manual – Airworthiness Limitation Section Update**
Manufacturer(s):	Turboméca S.A.
Applicability:	TM 333 2B2 and TM 333 2M2 turboshaft engines, all serial numbers. TM 333 2B2 engines are known to be installed on, but not limited to, Hindustan Aeronautics Limited "Dhruv" (ALH) helicopters, as twin-engines. TM 333 2M2 engines are known to be installed on, but not limited to, Hindustan Aeronautics Limited "Cheetal" helicopters, as single-engines.
Reason:	Post-certification assessment of the TM 333 2B2 oil cooling fan unit has shown that in case of failure of the oil cooling unit fan the debris may not be contained by the oil cooling fan casing. Although the oil cooling unit fan has a significant margin to burst and crack initiation, it needs to be classified as a Critical Part, life-limited, and its life needs to be recorded in the Airworthiness Limitation Section (ALS) of the Engine Maintenance Manual (MM). The updated life assessment of the TM 333 2B2 oil cooling unit fan requires the introduction of a life limit of 6 000 power turbine cycles on the fan in order to maintain its integrity. In addition, the maximum authorised transient power turbine (N2) speed has been exceeded several times in service, on some TM 333 2B2 engines on HAL Dhruv helicopters. These over-speeds must be taken into account in the cycle counting applicable to the power turbine disc and to the oil cooling fan. Moreover, the Airworthiness Limitation Sections (ALS) of the TM 333 2B2

MM and Overhaul Manual (OM) has to be modified in order to:

- Improve the cycle counting and overhaul process applied to TM 333 2B2 engine critical life-limited parts.

- Maintain the One Engine Inoperative (OEI) ratings power availability, following an update of TM 333 2B2 engine safety analysis.

Exceeding the approved life limit of the TM 333 2B2 engine critical life-limited parts, among which the power turbine disc and the oil cooling unit fan, could result in a disc burst with uncontained high energy debris.

Non-availability of OEI rating may result in an unsafe condition for the aircraft.

EASA AD 2010-0161 initially required the implementation of these new maintenance and overhaul tasks in the ALS of the TM 333 2B2 MM and OM.

Following the issuance of EASA AD 2010-0161, it has been identified that some of these maintenance and overhaul tasks in the ALS are relevant for the TM 333 2M2 MM and OM as well.

For the reasons described above, this new AD retains the requirements of EASA AD 2010-0261, which is superseded, extends its Applicability and requires the implementation of the above new or more restrictive maintenance requirements for TM 333 2B2 and TM 333 2M2 engines.

Effective Date: 25 April 2011

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

Required as indicated, unless accomplished previously:

(1) Within the compliance times defined in Table 1 of this AD, comply with all applicable maintenance requirements and associated airworthiness limitations specified in Table 1 of this AD.

Table 1

Applicability TM 333		**Action**	**Compliance Time**
2B2	**2M2**		
X	X	(1.1) Introduce the oil cooling unit fan as life-limited part in the engine log book as instructed by *Ref [2]* of this AD **and** *Ref [3]* of this AD or *Ref [5]* of this AD, as applicable	Upon accumulating 50 flight hours (FH) after the effective date of this AD, or upon first return to an approved Repair Center, whichever occurs first
X	X	(1.2) If conditions of *Ref [2]* of this AD Par. 2.B.(2)(d)2.3 are met, discard the fan and install a new one	Upon first return to an approved Repair Center
X	X	(1.3) Update the number of power turbine cycles in case of power turbine over-speed above 107% N2, including for the oil cooling unit fan, as instructed by *Ref [1]* of this AD	Upon accumulating 50 FH after the effective date of this AD, or upon first return to an approved Repair Center, whichever

			occurs first
X	X	(1.4) Perform the counting/recording of cycles, as instructed by *Ref [3]* of this AD or *Ref [5]* of this AD, as applicable	Upon accumulating 50 FH after the effective date of this AD
X	X	(1.5) Perform the overhaul/inspection of the engine life-limited parts as instructed by *Ref [3]* of this AD or *Ref [5]* of this AD, as applicable	Upon accumulating 50 FH after the effective date of this AD, or upon first return to an approved Repair Center, whichever occurs first
X		(1.6) Perform the maintenance tasks “Do a test of P0 consistency” and “Do a test of T1 consistency” on the TM 333 2B2 engine, as instructed by *Ref [3]* of this AD, and repeat these maintenance tasks at intervals not to exceed 25 hours	Upon accumulating 50 FH after the effective date of this AD
X		(1.7) Perform the maintenance task “Select OEI limit” on the TM 333 2B2 engine, as instructed by *Ref [3]* of this AD, and repeat these maintenance tasks at intervals not to exceed 100 hours	Upon accumulating 100 FH after the effective date of this AD
X		(1.8) In case of : - engine cumulated operating time of 12 min or more at 2-min OEI rating remove the TM 333 2B2 engine as instructed by *Ref [3]* of this AD and carry out the engine overhaul as instructed by *Ref [4]* of this AD	Upon accumulating 50 FH after the effective date of this AD, or upon first return to an approved Repair Center, whichever occurs first
X	X	(1.9) In case of : - gas generator over-speed, or - engine shutdown due to power turbine over-speed, remove the engine as instructed by *Ref [3]* of this AD or *Ref [5]* of this AD, as applicable, and carry out the engine overhaul as instructed by *Ref [4]* of this AD	

Note: All Ref [No.] are defined in Ref. Publications of this AD.

(2) Compliance with the requirements of paragraph (1) of this AD can be demonstrated by:

(2.1) Revising as follows, unless accomplished previously, the approved Aircraft Maintenance Programme from which the Operator or the Owner ensures the continuing airworthiness of each operated helicopter, incorporating tasks of Table 1 of this AD,

and

	(2.2) Complying with the approved Aircraft Maintenance Programme as described in paragraph (2.1) of this AD. (3) After the effective date of this AD, do not install a TM 333 2B2 or a TM 333 2M2 engine on any helicopter unless in compliance with the requirements of this AD.
Ref. Publications:	Turboméca Mandatory Service Bulletin (MSB) A333 73 0809 version B, dated 18 January 2011: Ref [1]. Turboméca Mandatory Service Bulletin (MSB) A333 73 0811 version B, dated 18 January 2011: Ref [2]. TM 333 2B2 Maintenance Manual X 333 H8 450 2 Update 17 Airworthiness Limitation Section Task 05-10-00-150-801-A01 Authorized In-Service Life Limits, Counting/Recording of cycles and Table of Mandatory Maintenance Tasks: Ref [3]. TM 333 2B2/2M2 Overhaul Manual X 333 H8 500 2 Update 15 Airworthiness Limitation Section Task 05-10-00-150-801-A01 Authorized In-Service Life Limits, Counting/Recording of cycles and Table of Mandatory Maintenance Tasks: Ref [4]. TM 333 2M2 Maintenance Manual X 333 B2 450 2 Update 8 Airworthiness Limitation Section Task 05-10-00-150-801-A01 Authorized In-Service Life Limits, Counting/Recording of cycles and Table of Mandatory Maintenance Tasks: Ref [5]. 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. The required actions and the risk allowance have granted the issuance of a Final AD with Request for Comments, postponing the public consultation process after publication. 3. Enquiries regarding this AD should be referred to the Airworthiness Directives, Safety Management & Research Section, Certification Directorate, EASA. E-mail: ADs@easa.europa.eu. 4. For any question concerning the technical content of the requirements in this AD, please contact: Turboméca Operator Support & Sales TM 333 40220 Tarnos – France Phone: +33 (0)5 59 74 44 95; Fax: +33 (0)5 59 74 45 16 or contact your nearest technical representative at www.turbomeca-support.com