EASA	AIRWORTHINESS DIRECTIVE
	AD No.: 2009-0090 **Date: 28 April 2009** 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 Airworthiness Directive applies, except in accordance with the requirements of that Airworthiness Directive 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) :**
TURBOMECA	MAKILA 1 turbo-shaft engines

TCDS Number :	DGAC (France) M10
Foreign AD :	Not applicable
Supersedure :	None

ATA 73	**Engine Fuel & Control - Engine Control Unit (ECU) – Hardware – Replacement**
Manufacturer(s):	Turboméca
Applicability:	MAKILA 1A and MAKILA 1A1 turboshaft engines, all serial numbers, having ECUs equipped with TU250 Comparator / Selector (CS) boards with serial numbers in the range 241 EL to 1192 EL. These engines are installed in, but not limited to, Eurocopter AS 332 C, C1, L and L1 helicopters.
Reason:	MAKILA 1A and 1A1 ECUs incorporate a backup control law that fixes N1 (gas generator speed) at 65% when at least two of the three N2 (power turbine speed) signals are lost. The intent is to limit the maximum speed attainable by the power turbine in the event of a failure of the shaft between the engine and the main gearbox that could result in collateral damage to the N2 speed probes. Several occurrences of 65% N1 backup activation remain unexplained despite detailed investigation. It is postulated that the events may have been due to corruption of the engine N2 speed signals by short perturbations, for example by electromagnetic interference. The potential therefore existed for a hazardous condition in which both engines on the same helicopter were simultaneously affected. To address this risk, Turboméca introduced modification TU250, which affects the CS board in the ECU and allows recovery from the 65% backup mode if the loss of N2 speed signals is determined to be temporary. Incorporation of modification TU250 is mandated by EASA AD 2007-0144.

	The installation of TU250 CS boards, however, has resulted in a few occurrences of erratic engine behaviour, in the form of unexpected N1 variations and/or illumination of the “GOV” warning light. The conclusions from an investigation by Turboméca are that these malfunctions are due to a lapse of quality control in the varnishing process applied to the boards, and that only boards in a specific serial number range, as defined under “Applicability” and referred to below as the “suspect batch”, are affected. Turboméca has addressed this latest concern in two steps which provide first a near-term and then a long-term solution. The two steps are described in the referenced mandatory service bulletins (MSB). The first step, described in MSB 298 73 0809, recommends that no helicopter has CS boards from the suspect batch in both engines. Boards with more than 200 hours of trouble-free operation are exempt because service experience has shown that the malfunctions potentially induced by this manufacturing discrepancy are most likely to occur early in the lives of the boards. The second step, described in MSB 298 73 0810, recommends that ultimately all TU250 CS boards in the suspect batch, regardless of time in operation, be replaced with TU250 boards not from the suspect batch. This Airworthiness Directive makes the replacement of TU250 CS boards in the suspect batch mandatory.
Effective Date:	12 May 2009
Required Action(s) and Compliance Time(s):	Required as indicated unless accomplished previously. 1. Within 50 operating hours from the effective date of this AD, if both TU250 CS boards on the same helicopter are from the suspect batch and if both have an operating time since new of less than 200 hours, replace at least one of the boards with a board not from the suspect batch in accordance with the instructions of Turboméca MSB 298 73 0809 Version A. 2. During the next 500-hour routine inspection, or before 30 November 2009, whichever comes first, replace all TU250 CS boards from the suspect batch with boards not from the suspect batch in accordance with the instructions of Turboméca MSB 298 73 0810 Version B.
Ref. Publications:	TURBOMECA Mandatory Service Bulletins 298 73 0809 Version A and 298 73 0810 Version B. 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. This AD was posted on 20 February 2009 as PAD 09-044 for consultation until 20 March 2009. No comments were received during the consultation period. 3. Enquiries regarding this PAD 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**, S.A., MAKILA 1 Customer Support, 40220 TARNOS, FRANCE. Fax: +33 5 59 74 45 15; or contact your nearest technical representative at www.turbomeca-support.com