


EASA	AIRWORTHINESS DIRECTIVE
	<p>AD No.: 2009-0010</p> <p>Date: 20 January 2009</p> <p>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.</p>
<p>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, as agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].</p>	
Type Approval Holder's Name : TURBOMECA	Type/Model designation(s) : ARRIEL 2S1 turboshaft engines
TCDS Number : EASA.E.001	
Foreign AD : Not applicable	
Supersedure : None	
ATA 73	Engine Fuel Control - Digital Engine Control Unit (DECU) – Software Modification
Manufacturer(s):	Turbomeca
Applicability:	ARRIEL 2S1 turboshaft engines, all serial numbers. These engines are known to be installed on, but not limited to, Sikorsky S-700C+ series twin-engine helicopters.
Reason:	<p>During acceleration up to One Engine Inoperative (OEI) 30-second rating, one event of in-flight loss of full automatic control occurred on an Arriel 2S1 engine.</p> <p>The selection of OEI 30-second rating on engine 1 was triggered by the automatic detection of an OEI situation further to a transient deceleration of engine 2. The transient deceleration of engine 2 was caused by the untimely reset of its DECU. Once this reset was completed, engine 2 resumed its nominal operation. Afterwards the aircraft then continued its flight safely with its engine 1 operating in manual control mode.</p> <p>The loss of full automatic control of engine 1 was caused by loss of steps of the stepper motor controlling the fuel metering valve inside the Hydromechanical Unit (HMU).</p> <p>It has been found that high accelerations, notably up to OEI 30-second rating, increase the risk of loss of steps of the HMU stepper motor.</p> <p>Therefore, this event has lead to the consideration of the following unsafe condition at aircraft level: In-flight loss of full automatic control of the engine induced by the loss of steps of the stepper motor during acceleration up to OEI 30-second rating, further to an actual OEI situation on the other engine (such as a power loss event).</p>

	<p>It has been determined that the Arriel 2S1 is the only engine variant of the Arriel 2 family affected by this potential unsafe condition.</p> <p>For the reason stated above, this AD requires, on DECU's of Arriel 2S1 engines, the application of modification TU109 - which is a software modification to version 11.01 - that increases the tolerance to loss of steps of the control system. This modification reduces significantly the risk of an in-flight loss of full automatic control due to loss of steps of the stepper motor, notably during engine accelerations up to OEI 30-second rating.</p>
Effective Date:	03 February 2009
Required Action(s) and Compliance Time(s):	<p>Required as indicated, unless accomplished previously:</p> <p>(1) No later than 31 August 2010, perform an upgrade of the DECU software to version 11.01 to implement modification TU109 in accordance with the accomplishment instructions of Turboméca Mandatory Service Bulletin N° 292 73 2109 Version E.</p> <p>Previous upgrade of the DECU software to version 11.01 accomplished before the effective date of this AD, in accordance with the accomplishment instructions of Turboméca Mandatory Service Bulletin No. 292 73 2109 Version D, dated 11 November 2007, satisfy the requirements of paragraph (1) of this AD.</p> <p>NOTE: NEVER MIX ON A TWIN ENGINE HELICOPTER A POST TU109 (DECU SOFTWARE AT VERSION 11.01) ENGINE WITH A PRE TU109 ENGINE (DECU SOFTWARE AT VERSION 8.08 OR EARLIER).</p> <p>(2) After 31 August 2010, No person shall install an ARRIEL 2S1 turbo shaft engine unless its DECU has software at version 11.01 or higher.</p>
Ref. Publications:	<p>Turboméca Mandatory Service Bulletin 292 73 2109 Version E, dated 17 September 2008.</p> <p>The use of later approved revisions of this document 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. This AD was posted on 12 December 2008 as PAD 08-141 for consultation until 09 January 2009. No comments were received during consultation period. 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: TURBOMECA S.A. ARRIEL 2 Customer Support 40220 Tarnos, France Fax: +33 5 59 74 45 15, or your usual or nearest TURBOMECA technical representative (refer to http://www.turbomeca-support.com)