EASA	AIRWORTHINESS DIRECTIVE
	AD No.: 2012-0054 **Date: 02 April 2012** 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	ARRIEL 2 turboshaft engines

TCDS Number:	EASA.E.001
Foreign AD:	Not applicable
Supersedure:	This AD supersedes EASA AD 2010-0198 dated 01 October 2010.

ATA 72	**Engine – Module M03 (Gas Generator) – Turbine Blade – Modification**

Manufacturer(s):	Turboméca S.A.
Applicability:	ARRIEL 2B, 2B1, 2B1A and 2S2 turboshaft engines, all serial numbers, except those incorporating Turboméca modification TU166. These engines are known to be installed on, but not limited to: Eurocopter AS 350 B3 and EC 130 B4 helicopters, Changhe Z11 helicopters, and Sikorsky S-76C++ helicopters.
Reason:	Several cases of Gas Generator (GG) Turbine blade rupture occurred in service on ARRIEL 2 twin engine and one on single engine helicopters. For the case occurring in flight on a single engine helicopter (ARRIEL 2B1 engine), the pilot performed an emergency autorotation, landing the helicopter without further incident. The design of ARRIEL 2 engines (containment shield around the GG Turbine) allows debris from a blade to be contained in the event of rupture. However, the rupture of a GG Turbine blade may lead to an uncommanded In Flight Shut-Down (IFSD) which, on a single-engine helicopter, could ultimately lead to an emergency autorotation landing. The most probable root cause of the ruptures is an excitation of one of the vibration modes of the GG Turbine blade in conjunction with several secondary contributing factors which are deemed sufficient to reduce the vibratory stress margin of the blade to a level consistent with the rate of occurrences of ruptures encountered. Turboméca has released TU166 modification which consists in inserting blade dampers between the GG Turbine disc and the GG Turbine blade platform. Introduction of these dampers minimizes the effects of the GG Turbine blade

	vibratory excitation and increases the blade tolerance for this type of stress. For the reasons stated above, EASA issued AD 2010-0198 to require the accomplishment of TU166 modification on ARRIEL 2 single engine applications. After that AD was issued, an accident occurred with a Sikorsky S-76C++ twin-engine helicopter following an uncommanded IFSD of one of its ARRIEL 2S2 engines, resulting from a GG Turbine blade rupture. The affected ARRIEL 2S2 engine did not have TU166 modification incorporated. For the reason described above, this AD, which supersedes EASA AD 2010-0198, extends the applicability of the AD to the ARRIEL 2S2 engines and requires embodiment of modification TU166.
Effective Date:	16 April 2012
Required Action(s) and Compliance Time(s):	Required as indicated, unless accomplished previously: (1) Accomplish TU166 modification in accordance with the instructions of Turboméca Mandatory Service Bulletin (MSB) A292 72 3166 version B for the ARRIEL 2B, 2B1 and 2B1A, and Turboméca MSB A292 72 4166 version A for the ARRIEL 2S2: when the GG Turbine is replaced (at approved Operator or Service Center), or when the engine or Module M03 is going through overhaul or repair (at approved Maintenance or Repair Center), whichever occurs first, but no later than: • 25 months after 15 October 2010 [the effective date of EASA AD 2010-0198] for ARRIEL 2B, 2B1 and 2B1A engines • 7 months after the effective date of this AD for ARRIEL 2S2 engines. (2) Accomplishment, before the effective date of this AD, of modification TU166, in accordance with the instructions of Turboméca MSB A292 72 3166 version A for the ARRIEL 2B, 2B1 and 2B1A, or in accordance with the instructions of Turboméca SB 292 72 2166 versions A through F for the ARRIEL 2S2, is acceptable for compliance with the requirement of paragraph (1) of this AD. (3) From the effective date of this AD, do not install an ARRIEL 2B, 2B1, 2B1A or 2S2 engine on a helicopter, unless in compliance with the requirements of this AD.
Ref. Publications:	Turboméca MSB A292 72 3166 version B dated 20 September 2010. Turboméca MSB A292 72 4166 version A dated 23 March 2012. 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 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: **Turboméca, S.A.**, ARRIEL 2 Customer Support 40220 Tarnos, France Fax: +33 5 59 74 45 15 or your usual or nearest Turboméca technical representative at www.turbomeca-support.com