


<b>EASA</b>	<b>AIRWORTHINESS DIRECTIVE</b>
	<p><b>AD No.: 2014-0036</b></p> <p><b>Date: 11 February 2014</b></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 EU 748/2012, Part 21.A.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].</p>	
<p><b>Design Approval Holder's Name:</b></p> <p>TURBOMÉCA</p>	<p><b>Type/Model designation(s):</b></p> <p>ARRIEL 1 and ARRIEL 2 engines</p>
TCDS Number:	EASA.E.073 and EASA.E.001
Foreign AD:	Not applicable
Supersedure:	None
<b>ATA 72</b>	<b>Engine – Accessory Gear Box (M01) – 41/23 Tooth Bevel Gear Assembly – Check / Replacement</b>
Manufacturer(s):	Turbomeca S.A.
Applicability:	<p>ARRIEL 1A1, 1A2, 1B, 1C, 1C1, 1C2, 1D, 1D1, 1E2, 1K, 1K1, 1S and 1S1 turbo-shaft engines, all serial numbers:</p> <p>These engines are known to be installed on, but not limited to, Airbus Helicopters (formerly Eurocopter, Eurocopter France, Aerospatiale) AS 350 B, BA, BB, B1 and B2, AS 365 and SA 365, Airbus Helicopters Deutschland (formerly Eurocopter Deutschland, Messerschmidt-Bölkow-Blohm) MBB-BK117-C1 and -C2, AgustaWestland (formerly Agusta) A 109 K2, and Sikorsky S-76A helicopters.</p> <p>ARRIEL 2B, 2B1, 2B1A, 2B1B, 2C, 2C1, 2C2, 2S1 and 2S2 engines, all serial numbers:</p> <p>These engines are known to be installed on, but not limited to, Eurocopter AS 350 B3, EC 130 B4, AS 365 N3 and EC 155 B1, Changhe Z11 and Sikorsky S-76C helicopters.</p>
Reason:	<p>Several cases of uncommanded in-flight shut-down (IFSD) have been reported on ARRIEL 1 or ARRIEL 2 engines following rupture of the 41-tooth gear forming part of the 41/23 tooth bevel gear located in the Accessory Gear Box (AGB) within engine Module M01.</p> <p>Results of subsequent investigations showed that the meshing quality of the bevel gear may have contributed to tooth rupture.</p> <p>The rupture of the AGB 41-tooth gear may lead to loss of driving of equipment essential to engine operation.</p> <p>This condition, if not detected and corrected, could lead to an uncommanded engine in-flight shut-down and may ultimately lead to an emergency landing.</p>

	<p>Prompted by these findings, Turbomeca has introduced into the engine acceptance test a vibration check to detect discrepancies of the meshing quality of the AGB 41/23 tooth bevel gear.</p> <p>For the reasons described above, this AD requires accomplishment of vibration checks of the AGB 41/23 tooth bevel gear meshing on ARRIEL 1 and ARRIEL 2 engines and depending on findings, accomplishment of corrective actions.</p>
Effective Date:	25 February 2014
Required Action(s) and Compliance Time(s):	<p>Required as indicated, unless accomplished previously:</p> <p><u>One time action:</u></p> <p>(1) For ARRIEL 1B, 1D and 1D1 engines, except for module M01 having a Serial Number (SN) listed in Figure 01 of Turbomeca Mandatory Service Bulletin (MSB) 292 72 0839 version B, and for ARRIEL 2B, 2B1, 2B1A and 2B1B engines, except for module M01 having a SN listed in Figure 01 of Turbomeca MSB 292 72 2849 version B, within 32 months after the effective date of this AD, accomplish a one-time vibration check of the AGB 41/23 tooth bevel gear meshing in accordance with Turbomeca applicable documents indicated in Appendix 1 of this AD, as applicable.</p> <p>(2) If, during the vibration check as required by paragraph (1) of this AD, any discrepancy is identified, within the compliance times specified in Appendix 1 of this AD, as applicable, replace the module M01 with a serviceable module M01.</p> <p><u>Repetitive actions:</u></p> <p>(3) For all engines affected by this AD, from the effective date of this AD, during each qualifying shop visit (see Note 1 of this AD), accomplish a vibration check of the AGB 41/23 tooth bevel gear meshing in accordance with one of the applicable Turbomeca documents listed in Appendix 2 of this AD, as applicable.</p> <p>Note 1: For the purpose of this AD, a qualifying shop visit is when an engine is removed from the helicopter and the module M01/engine is overhauled or repaired in a qualified Repair Center.</p> <p>(4) If, during any vibration check as required by paragraph (3) of this AD, any discrepancy is identified, before release to service of the engine, replace the module M01 with a serviceable module M01.</p> <p><u>Credits:</u></p> <p>(5) Accomplishment of a vibration check of the AGB 41/23 tooth bevel gear meshing during a qualifying shop visit (see Note 1 of this AD) is acceptable to comply with the requirements of paragraphs (1) and (2) of this AD.</p> <p>(6) Actions and corrective actions accomplished, before the effective date of this AD, in accordance with the instructions of Turbomeca MSB 292 72 0839 version A or Turbomeca MSB 292 72 2849 version A, as applicable, are acceptable to comply with the requirements of paragraphs (1) and (2) of this AD, as applicable.</p>
Ref. Publications:	<p>Turbomeca MSB 292 72 0839 version B dated 25 November 2013.</p> <p>Turbomeca MSB 292 72 2849 version B dated 25 November 2013.</p> <p>Turbomeca Technical Instruction (TI) X 292 72 0839 update 1.</p> <p>Turbomeca TI X 292 72 2849 update 1.</p> <p>Turbomeca TI X 292 72 0840 original issue.</p> <p>Turbomeca TI X 292 72 2850 original issue.</p> <p>Turbomeca Internal Directive (ID) 383952 version C.</p>

	<p>Turbomeca Repair Technical Directive (RTD) X 292 65 327 2.</p> <p>Turbomeca Engine Test Bed Acceptance Test Specifications (CCT) as listed in Appendix 2 of this AD.</p> <p>Turbomeca Maintenance Manuals (MM) as listed in Appendix 3 of this AD.</p> <p>The use of later approved revisions of these documents is acceptable for compliance with the requirements of this AD.</p>
Remarks:	<ol style="list-style-type: none"> <li>1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.</li> <li>2. This AD was posted on 09 January 2014 as PAD 14-007 for consultation until 06 February 2014. The Comment Response Document can be found at <a href="http://ad.easa.europa.eu">http://ad.easa.europa.eu</a>.</li> <li>3. Enquiries regarding this AD should be referred to the Safety Information Section, Executive Directorate, EASA. E-mail: <a href="mailto:ADs@easa.europa.eu">ADs@easa.europa.eu</a>.</li> <li>4. For any question concerning the technical content of the requirements in this AD, please contact: Turbomeca, S.A., ARRIEL 1 Customer Support, 40220 Tarnos, France, Fax: +33 5 59 74 45 15, or contact your usual or nearest Turboméca technical representative at <a href="http://www.turbomeca-support.com">www.turbomeca-support.com</a>.</li> </ol>

## Appendix 1 – One-time Vibration Check

<b>Engines</b>	<b>Turbomeca Applicable Document</b>	<b>Compliance time for the Corrective Actions</b>
ARRIEL 1B, 1D and 1D1 engines	MSB 292 72 0839 version B and TI X 292 72 0839	Within the compliance times specified in Turbomeca MSB 292 72 0839 version B paragraph 6.B.(1)
	MSB 292 72 0839 version B and TI X 292 72 0840, to be accomplished concurrent with accomplishment of task 71-02-15-760-801-A01 of the applicable MM listed in Appendix 3	Before release to service of the engine
ARRIEL 2B, 2B1, 2B1A and 2B1B engines	MSB 292 72 2849 version B and TI X 292 72 2849	Within the compliance times specified in Turbomeca MSB 292 72 2849 version B paragraph 6.B.(1)
	MSB 292 72 2849 version B and TI X 292 72 2850, to be accomplished concurrent with accomplishment of task 71-02-15-760-801-A01 of the applicable MM listed in Appendix 3	Before release to service of the engine

Note 2: Turbomeca TI can be accomplished on engine installed on helicopter, or when the engine is removed from helicopter, as applicable.

## Appendix 2 – Applicable Turbomeca documents for module M01/engine repair/overhaul

**Engine Test Bed Acceptance Test Specifications (CCT)**

<b>Engine</b>	<b>CCT Reference</b>
ARRIEL 1A1, 1A2, 1B	0292009400 version T
ARRIEL 1C, 1C1, 1C2, 1D, 1D1	0292019400 version R
ARRIEL 1E2	0292019690 version I
ARRIEL 1K, 1K1	0292019530 version K
ARRIEL 1S, 1S1	0292019610 version K
ARRIEL 2B	0292029450 version J
ARRIEL 2B1	0292029490 version I
ARRIEL 2B1A	0292029600 version F
ARRIEL 2B1B	AA051773 version C
ARRIEL 2C	0292029440 version I
ARRIEL 2C1	0292029480 version K
ARRIEL 2C2	0292029520 version H
ARRIEL 2S1	0292029410 version L
ARRIEL 2S2	0292029530 version H

Or

Turbomeca ID 383952, for all engines;

Or

Turbomeca RTD X 292 65 327 2, for all engines.

## Appendix 3

**Engine Maintenance Manuals (MM)**

Engine Variant	Maintenance Manual (MM)	
	French Version	English Version
ARRIEL 1B	X 292 65 452 1 Issue 14	X 292 65 452 2 Issue 14
ARRIEL 1D	X 292 E5 452 1 Issue 15	X 292 E5 452 2 Issue 15
ARRIEL 1D1	X 292 G2 452 1 Issue 15	X 292 G2 452 2 Issue 15
ARRIEL 2B	X 292 M5 450 1 Issue 32	X 292 M5 450 2 Issue 32
ARRIEL 2B1	X 292 N5 450 1 Issue 29	X 292 N5 450 2 Issue 29
ARRIEL 2B1A	-	X 292 P4 450 2 Issue 23
ARRIEL 2B1B	-	X 292 P6 450 2