



Airworthiness Directive

AD No.: 2013-0170R1

Issued: 18 April 2017

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) 216/2008 on behalf of the European Union, 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 Regulation (EU) 748/2012, Part 21.A.3B. In accordance with Regulation (EU) 1321/2014 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 [Regulation (EU) 1321/2014 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [Regulation (EC) 216/2008, Article 14(4) exemption].

Design Approval Holder's Name:

SAFRAN HELICOPTER ENGINES

Type/Model designation(s):

ARRIEL 2 engines

Effective Date: Revision 1: 25 April 2017
Original issue: 13 August 2013

TCDS Number(s): EASA.E.001

Foreign AD: Not applicable

Revision: This AD revises EASA AD 2013-0170 dated 30 July 2013, which superseded EASA AD 2007-0044 dated 21 February 2007.

ATA 73 – Engine Fuel & Control – Hydro-Mechanical Metering Unit – Inspection / Replacement

Manufacturer(s):

SAFRAN Helicopter Engines, S.A. (formerly Turboméca)

Applicability:

ARRIEL 2B, 2B1, 2B1A, 2B1B, 2C, 2C1, 2C2, 2S1 and 2S2 engines, all manufacturer serial numbers.

These engines are known to be installed on, but not limited to, Airbus Helicopters (formerly Eurocopter, Eurocopter France, Aerospatiale) AS 350 B3, EC 130 B4, AS 365 N3 and EC 155 B1, Changhe Z11, and Sikorsky S-76C helicopters.

Reason:

In 2007, two cases of in-flight shutdown were reported on ARRIUS 2B1 engine, resulting from spline deterioration of the high/low pressure (HP/LP) fuel pump assembly drive shaft. The Hydro-Mechanical Metering Unit (HMMU) of the ARRIEL 2 engine has the same HP/LP pump drive design as the one installed on the ARRIUS 2B1 engine.

This condition, if not corrected, could lead to an uncommanded in-flight shut-down, possibly resulting in an emergency autorotation landing.



To address this potential unsafe condition, Turboméca published Mandatory Service Bulletin (SB) 292 73 2812 for engines installed on single engine helicopters and SB 292 73 2822 for engines installed on twin-engine helicopters. Consequently, EASA issued AD 2007-0044, requiring a one-time inspection of the HMU drive gear shaft splines and coupling shaft assembly splines before exceeding a defined limit of operating hours, for single-engine applications.

Since that AD was issued, additional occurrences of wear of HMU drive gear shaft splines and coupling shaft assembly splines were reported, affecting both ARRIEL 2 engines of the same helicopter. Prompted by this development, EASA decided that engines on twin-engine helicopters had to be inspected as well, and issued AD 2013-0170 to retain and clarify the requirements of EASA AD 2007-0044, which was superseded, requiring inspections of each HMU and, depending on findings, replacement; expanding the Applicability to include ARRIEL 2C, 2C1, 2C2, 2S1 and 2S2 engines (installed on twin-engine helicopters) and ARRIEL 2B1B engines, which were, at the time of the AD issuance, recently certified.

Since that AD was issued, SAFRAN Helicopter Engines (SAFRAN) developed an improved HMU drive gear and coupling shafts, available for embodiment through SAFRAN modification (mod) TU 184, and demonstrated that the modified HMU drive gear and coupling shaft is not susceptible to the unsafe condition addressed by this AD. SAFRAN also revised Mandatory SB 292 73 2812 and SB 292 73 2822 accordingly.

For the reason described above, this AD is revised to exclude engines equipped with an HMU modified in accordance with SAFRAN mod TU 184 from the inspection requirements. This revision also contains some editorial changes without affecting the technical content or requirements of the AD.

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

Required as indicated, unless accomplished previously:

Note 1: Where in this AD, reference is made to MSB 292 73 2812 or MSB 292 73 2822, that means using version G, respectively version F, as published by Turboméca, as the required document, whereas the use of version H, respectively version G, as published by SAFRAN, is acceptable for compliance.

Inspection(s):

- (1) For ARRIEL 2B, 2B1, 2B1A and 2B1B engines equipped with a pre-mod TU 184 HMU, within the compliance time specified in Table 1 of this AD, as applicable, inspect the HP pump drive gear shaft splines and coupling shaft assembly splines in accordance with the instructions of MSB 292 73 2812 (see Note 1 of this AD).



Table 1 – HP Pump Drive Gear and Coupling Inspection

Operating Hours (see Note 2 of this AD)	Compliance Time
500 or more	Within 25 operating hours after 13 August 2013 [the effective date of this AD at original issue]
Less than 500	Within 25 operating hours after exceeding 500 operating hours

Note 2: Unless specified otherwise, the operating hours in Table 1 and Table 2 of this AD are those accumulated by an HMU unit, on 13 August 2013 [the effective date of this AD at original issue], since first installation on an engine or Module 01, or since overhaul or repair, as applicable.

- (2) For ARRIEL 2C, 2C1, 2C2, 2S1 and 2S2 engines equipped with a pre-mod TU 184 HMU, within the compliance time specified in Table 2 of this AD, as applicable, inspect the HP pump drive gear shaft and coupling shaft assembly splines in accordance with the instructions of MSB 292 73 2822 (see Note 1 of this AD).

Table 2 – HP Pump Drive Gear and Coupling Inspection

Operating Hours (see Note 2 of this AD)	Compliance Time
500 or more, or unknown	Within 200 operating hours after 13 August 2013 [the effective date of this AD at original issue]
more than 300, but less than 500	Within 200 operating hours after exceeding 500 operating hours, or within 225 operating hours after 13 August 2013 [the effective date of this AD at original issue], whichever occurs first
300 or less	Within 25 operating hours after exceeding 500 operating hours

Corrective Action(s):

- (3) If, during the inspection as required by paragraph (1) or (2) of this AD, any discrepancy is detected, before next flight, replace the affected HMU with a serviceable HMU in accordance with the instructions of MSB 292 73 2812 or MSB 292 73 2822 (see Note 1 of this AD), as applicable.

Credit:

- (4) Inspections and corrective action(s) on an engine, accomplished before 13 August 2013 [the effective date of this AD at original issue] in accordance with the instructions of Turboméca MSB 292 73 2812 version F or earlier, or MSB 292 73 2822 version E or earlier, as applicable to engine model, are acceptable to comply with the requirements of paragraph (1) or (2), as applicable, and paragraph (3) of this AD, for that engine.

Parts Installation:

- (5) From 13 August 2013 [the effective date of this AD at original issue], installation of an HMU on a Module 01, or a Module 01 on an engine is allowed, provided that, before installation, the



HMU has passed an inspection in accordance with the instructions of MSB 292 73 2812, or MSB 292 73 2822, as applicable (see Note 1 of this AD).

From 13 August 2013 [the effective date of this AD at original issue], installation of an HMU on a Module 01, or a Module 01 on an engine is allowed without prior inspection, provided that the HMU has never been installed on an engine, or has not accumulated any operating hours since repair or overhaul.

- (6) From 13 August 2013 [the effective date of this AD at original issue], installation of an engine on a helicopter is allowed, provided that the HMU is in compliance with the requirements of this AD.

Ref. Publications:

Turboméca MSB 292 73 2812 version G dated 24 June 2013, or SAFRAN Helicopter Engines MSB 292 73 2812 version H dated 28 February 2017.

Turboméca MSB 292 73 2822 version F dated 21 June 2013, or SAFRAN Helicopter Engines MSB 292 73 2822 version G dated 28 February 2017.

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 original issue of this AD was posted on 03 July 2013 as PAD 13-093 for consultation until 24 July 2013. No comments were received during the consultation period.
3. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
4. For any question concerning the technical content of the requirements in this AD, please contact: SAFRAN Helicopter Engines, ARRIEL 2 Customer Support, 40220 Tarnos, France, Fax: +33 5 59 74 45 15, or your usual or nearest SAFRAN Helicopter Engines technical representative at <https://tools.safran-helicopter-engines.com/pg/en/home>.

