Airworthiness Directive

AD No.: 2017-0102R1

Issued: 16 February 2022

Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EU) 2018/1139 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 129 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 (EU) 2018/1139, Article 71 exemption].

Design Approval Holder's Name:

SAFRAN HELICOPTER ENGINES

Type/Model designation(s):

ARRIEL 2 engines

Effective Date: Revision 1: 23 February 2022
Original Issue: 27 June 2017

TCDS Number(s): EASA.E.001

Foreign AD: Not applicable

Revision: This AD revises EASA AD 2017-0102 dated 13 June 2017, which superseded EASA AD 2010-0215R1 dated 26 January 2016.

ATA 73 – Engine Fuel & Control – High Pressure / Low Pressure Fuel Pump Metering Unit – Inspection / Replacement

Manufacturer(s):

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

Applicability:

ARRIEL 2B, 2B1 and 2B1A engines, all manufacturer serial numbers.

These engines are known to be installed on, but not limited to, Airbus Helicopters (formerly Eurocopter) AS 350 B3 and EC 130 B4 helicopters, and Changhe Z11 helicopters.

Definitions:

For the purpose of this AD, the following definitions apply:

The inspection MSB: SAFRAN Mandatory Service Bulletin (MSB) A292 73 2830 Version C or MSB A292 73 2836 Version B, as applicable.

The modification MSB: SAFRAN MSB 292 73 2178 Version B.

Groups: Group 1 engines are those that do not have Turboméca modification (mod) TU 147 embodied. Group 2 engines are those that have Turboméca mod TU 147 embodied, provided the

mod was incorporated on or before 31 March 2010, except high pressure (HP)/low pressure (LP) pump metering units listed by serial number and Part Number in Figures 2 and 3 of Turboméca MSB A292 73 2836 version A.

Reason:

Several events were reported on ARRIEL 2 engines where the “low fuel pressure switch” lighted up. In most cases, the pilot activated the fuel booster pump in accordance with the Flight Manual Instructions and landed safely with no other incident. In another case, on a single-engine helicopter, the pilot failed to activate the fuel booster pump and, since the helicopter was operated with high flight load factor, this led to a sudden engine power loss. Analysis showed that these events were due to uncoupling between of the LP fuel pump impeller and the HP fuel pump shaft.

This condition, if not detected and corrected, may lead to reduced engine power, or an un-commanded in-flight shut-down. On a single-engine helicopter, the result may be an emergency autorotation landing.

Prompted by these findings, Turboméca developed mod TU 147, which consists of bonding the LP fuel pump impeller with the impeller screw. For in-service engines, Turboméca issued MSB A292 73 2830 Version B and EASA issued AD 2009-0184 to require a one-time inspection and, depending on findings, corrective action. That AD did not apply to engines in post-mod TU 147 configuration, because that modification was specifically designed to prevent uncoupling.

After that AD was issued, three occurrences of uncoupling of the LP fuel pump impeller and the HP fuel pump shaft on engines in post-mod TU 147 configuration were reported. In response to these findings, from March 2010, Turboméca introduced production improvements, reinforced the control of the bonding manufacturing scheme and issued MSB A292 73 2836 Version A to provide inspection instructions. Consequently, EASA issued AD 2010-0215 (later revised), which superseded EASA AD 2009-0184, partially retaining its requirements, to require a one-time inspection of certain post-mod TU 147 HP/LP pump metering units and, depending on findings, replacement. EASA AD 2010-0215R1 was issued to specify that modification of an engine in accordance with Turboméca MSB 292 73 2178 Version A was an acceptable alternative method of compliance, and to reduce the Applicability, excluding post-mod TU 178 engines.

After that AD was issued, analysis determined that modification of an engine to incorporate mod TU 178 provides a more effective method to reduce the risk of uncoupling of the LP fuel pump impeller and the HP fuel pump shaft than mod TU 147. Consequently, SAFRAN issued the modification MSB, as defined in this AD, to provide instructions for embodiment of mod TU 178 for in-service engines, and EASA published AD 2017-0102, which superseded EASA AD 2010-0215R1, retaining its requirements, and mandating this additional modification.

Since that AD was issued, additional service experience analyses confirmed that the compliance time to embody this modification could be extended, and SAFRAN published the MSB 292 73 2178 Version D, updating the compliance time information.

For the reason described above, this AD is revised to extend the compliance time for modification. This AD also includes editorial changes, introducing the latest AD writing standards, without affecting the requirements.

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

Required as indicated, unless accomplished previously:

Inspection:

(1) Within the compliance time and in accordance with the instructions defined in Table 1 of this AD, as applicable to HP/LP pump metering unit configuration, inspect the torque between the LP pump impeller and the HP pump shaft.

Table 1 – Torque Inspection

Group	Compliance Time	Turboméca MSB
Group 1	Within 500 engine flight hours (EFH) after 28 August 2009 [the effective date of EASA AD 2009-0184] but no later than 30 June 2010 [the original compliance date of EASA AD 2009-0184]	A292 73 2830 Version B
Group 2	Within 750 EFH after 28 October 2010 [the effective date of the original issue of EASA AD 2010-0215], but no later than 14 months after 28 October 2010 [the effective date of the original issue of EASA AD 2010-0215]	A292 73 2836 Version A

Corrective Action(s):

(2) If, during the inspection~~,~~ as required by paragraph (1) of this AD, any discrepancy is detected, as specified in the inspection MSB, before next flight, replace the HP/LP pump metering unit with a serviceable post-mod TU 178 unit in accordance with the inspection MSB.

Credit:

(3) Replacement of a HP/LP pump metering unit, accomplished before the effective date of this AD, (for Group 1 engines) with a pre-mod or post-mod TU 147 unit, or (for Group 2 engines) with a post-mod TU 147 unit, in accordance with the Turboméca MSB specified in Table 1 of this AD, as applicable, is acceptable to comply with the requirements of paragraph (2) of this AD.

Modification:

(4) Modification of an engine, accomplished before the effective date of this AD in accordance with the instructions of Turboméca SB 292 73 2178 at any Version is an acceptable alternative method to comply with the requirements of paragraph (1) and (2) of this AD.

(5) Unless accomplished as specified by paragraph (4) of this AD, or in accordance with the inspection MSB, within 2 200 EFH or 138 months, whichever occurs first after 27 June 2017 [the effective date of the original issue this AD], modify the engine by replacing the HP/LP pump metering unit with a part in post-mod TU 178 configuration in accordance with the SAFRAN MSB 292 73 2178 Version D.

Part(s) Installation:

(6) For Group 1 and Group 2 engines: From 28 October 2010 [the effective date of the original issue of EASA AD 2010-0215], it allowed to install a pre-mod 178 HP/LP fuel pump metering unit on an engine, provided the part has passed an inspection in accordance with the instructions of the Turboméca MSB, as identified in Table 1 of this AD, or in accordance with the inspection MSB, as applicable.

(7) For engines in pre-mod TU 178 configuration: After modification of an engine as specified in paragraph (4) of this AD, or as required by paragraph (5) of this AD, as applicable, do not install a pre-mod TU 178 HP/LP fuel pump metering unit on that engine.

(8) For engines in post-mod TU 178 configuration: From 28 October 2010 [the effective date of the original issue of EASA AD 2010-0215], do not install a pre-mod TU 178 HP/LP fuel pump metering unit.

Ref. Publications:

Turbomeca MSB A292 73 2830 Version B dated 10 July 2009, or SAFRAN MSBA292 73 2830 Version C dated 05 April 2017.

Turbomeca MSB A292 73 2836 Version A dated 17 August 2010, or SAFRAN MSB A292 73 2836 Version B dated 05 April 2017.

Turbomeca MSB 292 73 2178 Version A dated 01 April 2015, or SAFRAN MSB 292 73 2178 Version B dated 23 March 2017, or Version C dated 19 October 2018, or Version D dated 08 February 2022.

The use of later approved revisions of the above-mentioned 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 May 2017 as PAD 17-057 for consultation until 31 May 2017. 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. Information about any failures, malfunctions, defects or other occurrences, which may be similar to the unsafe condition addressed by this AD, and which may occur, or have occurred on a product, part or appliance not affected by this AD, can be reported to the EU aviation safety reporting system. This may include reporting on the same or similar components, other than those covered by the design to which this AD applies, if the same unsafe condition can exist or may develop on an aircraft with those components installed. Such components may be installed under an FAA Parts Manufacturer Approval (PMA), Supplemental Type Certificate (STC) or other modification.

5. For any question concerning the technical content of the requirements in this AD, please contact: SAFRAN Helicopter Engines, S.A. at www.tools.safran-helicopter-engines.com.