



## Notification of a Proposal to issue an Airworthiness Directive

**PAD No.: 17-057**

**Issued: 03 May 2017**

Note: This Proposed Airworthiness Directive (PAD) 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.

In accordance with the EASA Continuing Airworthiness Procedures, the Executive Director is proposing the issuance of an EASA Airworthiness Directive (AD), applicable to the aeronautical product(s) identified below.

All interested persons may send their comments, referencing the PAD Number above, to the e-mail address specified in the 'Remarks' section, prior to the consultation date indicated..

**Design Approval Holder's Name:**

SAFRAN HELICOPTER ENGINES

**Type/Model designation(s):**

ARRIEL 2 engines

**Effective Date:** [TBD – standard: 14 days after AD issue date]

**TCDS Number(s):** EASA.E.001

**Foreign AD:** Not applicable

**Supersedure:** This AD supersedes 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. (formerly Turbomeca, 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.

**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 low pressure (LP) fuel pump impeller and the high pressure (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 (IFSD). On a single-engine helicopter, the result may be an emergency autorotation landing.

Prompted by these findings, Turbomeca developed modification (mod) TU 147, which consists of bonding the LP fuel pump impeller with the impeller screw. For in-service engines, Turbomeca issued Mandatory Service Bulletin (SB) A292 73 2830 to provide inspection instructions. Consequently, 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.

Since 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, Turbomeca introduced production improvements, reinforced the control of the bonding manufacturing scheme and issued Mandatory SB A292 73 2836 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 Turbomeca SB 292 73 2178 was an acceptable alternative method of compliance, and to reduce the Applicability, excluding post-mod TU 178 engines.

Since 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 Helicopter Engines issued Mandatory SB 292 73 2178 Version B to provide instruction for embodiment of mod TU 178 for in-service engines.

For the reasons described above, this AD retains the requirements of EASA AD 2010-0215R1, which is superseded, and additionally requires a modification.

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

Required as indicated, unless accomplished previously:

Note 1: For the purpose of this AD, Group 1 engines are those in pre-mod TU 147 configuration. Group 2 engines are those in post-mod TU 147 configuration, if incorporated before or on 31 March 2010, except HP/LP pump metering units listed by serial number and Part Number in Figures 2 and 3 of Turbomeca Mandatory SB A292 73 2836 version A.

#### **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 (see Note 1 of this AD)	Compliance time	Turboméca SB
Group 1	Within 500 engine flight hours (EFH) after 28 August 2009 [effective date of EASA AD 2009-0184] but no later than 30 June 2010 [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 instructions defined in Table 1 of this AD, as applicable to HP/LP pump metering unit configuration, before next flight, replace the HP/LP pump metering unit with a serviceable post-mod TU 178 unit in accordance with Safran Helicopter Engines Mandatory SB A292 73 2830 Version C or A292 73 2836 Version B.

**Credit:**

- (3) Replacement of a HP/LP pump metering unit, 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 Turbomeca SB 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, before the effective date of this AD, in accordance with the instructions of Turbomeca SB 292 73 2178 (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 Safran Helicopter Engines Mandatory SB A292 73 2830 Version C or A292 73 2836 Version B, within 2 200 EFH or 72 months, whichever occurs first after the effective date of 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 Safran Mandatory SB 292 73 2178 Version B.

**Parts 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 Turbomeca SB, as identified in Table 1 of this AD, 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 the effective date of this AD, do not install a pre-mod TU 178 HP/LP fuel pump metering unit.

**Ref. Publications:**

Turbomeca Mandatory SB A292 73 2830 Version B dated 10 July 2009 or Safran Helicopter Engines Mandatory SB A292 73 2830 Version C dated 05 April 2017.

Turbomeca Mandatory SB A292 73 2836 Version A dated 17 August 2010 or Safran Helicopter Engines Mandatory SB A292 73 2836 Version B dated 05 April 2017.

Turbomeca SB 292 73 2178 Version A dated 01 April 2015 or Safran Helicopter Engines Mandatory SB 292 73 2178 Version B dated 23 March 2017.

The use of later approved revisions of these documents is acceptable for compliance with the requirements of this AD.

**Remarks:**

1. This Proposed AD will be closed for consultation on 31 May 2017.
2. Enquiries regarding this AD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: [ADs@easa.europa.eu](mailto:ADs@easa.europa.eu).
3. For any question concerning the technical content of the requirements in this AD, please contact:  
Turbomeca, ARRIEL 2 Customer Support, 40220 Tarnos, France, Fax: +33 5 59 74 45 15,  
or your usual or nearest Turbomeca technical representative at [www.turbomeca-support.com](http://www.turbomeca-support.com).

