



## Emergency Airworthiness Directive

**AD No.:** 2017-0253-E

**Issued:** 21 December 2017

Note: This Emergency 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:

ROLLS-ROYCE plc

### Type/Model designation(s):

Trent 1000 Engines

**Effective Date:** 22 December 2017

**TCDS Number(s):** EASA.E.036

**Foreign AD:** Not applicable

**Supersedure:** None

## ATA 72 – Engine – Removal / De-Pairing

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### Manufacturer(s):

Rolls-Royce plc (RR)

### Applicability:

Trent 1000 engines (any configuration), serial numbers (ESN) 10196, 10253, 10290, 10292, 10294, 10295, 10340, 10347, 10380, 10381, 10408, 10409, 10427, 10434 and 10435, except those that embody RR Mod 72-H818 in production, or have been modified by RR Service Bulletin (SB) TRENT 1000 72-H818 in service.

These engines are known to be installed on, but not limited to, Boeing 787 aeroplanes.

### Definitions:

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

**The NMSB:** Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) TRENT 1000 72-AJ992.

### Reason:

An occurrence was reported where, following N2 vibration and multiple messages, the flight crew performed an engine in-flight shut-down (IFSD) and returned to the departure airport, landing uneventfully. The post-flight borescope inspection of the engine revealed an intermediate pressure



turbine blade (IPTB) missing at the shank. Analysis shows that this kind of failure is due to sulphidation corrosion cracking.

This condition, if not detected and corrected, could lead to IPTB shank release, possibly resulting in an IFSD and consequent reduced control of the aeroplane.

To address this potential unsafe condition, RR issued Alert NMSB Trent 1000 72-AJ575 to provide instructions for engine removal from service when any IPTB with a high level of sulphidation exposure is identified by corrosion fatigue life (CFL) model. Consequently, EASA issued AD 2017-0056 to require removal from service of certain engines, to be corrected in shop.

Since that AD was issued, prompted by further occurrences and analyses, it has been decided that, to reduce the risk of dual IFSD, a new cyclic life limit must be applied to certain engines, which determines when an engine can no longer be installed on an aeroplane in combination with certain other engines.

For the reason described above, this AD requires de-pairing of the affected engines. This AD is considered an interim action and further AD action may follow.

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

Required as indicated, unless accomplished previously:

Note 1: Where, in this AD, reference is made to an RR SB or NMSB with an 'A' (Alert) in the number, it should be recognised that an earlier or later revision may not have that 'A'. This kind of change does not effectively alter the publication references for the purpose of this AD.

#### De-Pairing of Affected Engines:

- (1) For an aeroplane that has two affected engines installed: Before both engines exceed their respective IPTB cyclic limit, as specified in Appendix 1 of the NMSB, or within 20 flight cycles after the effective date of this AD, whichever occurs later, remove one of the affected engines from the aeroplane.

#### Affected Engine Installation:

- (2) After removal of an affected engine, as required by paragraph (1) of this AD, do not install that engine on an aeroplane, except within the limitations as specified in Section 3.A of the NMSB.

#### Terminating Action:

- (3) Modification of an affected engine in accordance with the instructions of RR SB TRENT 1000 72-H818 constitutes terminating action for the requirements of paragraphs (1) and (2) of this AD for that engine.

#### Ref. Publications:

Rolls-Royce Alert NMSB TRENT 1000 72-AJ992 original issue, dated 20 December 2017.

Rolls-Royce SB TRENT 1000 72-H818 original issue, dated 14 November 2016.



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 results of the safety assessment have indicated the need for immediate publication and notification, without the full consultation process.
3. 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).
4. For any question concerning the technical content of the requirements in this AD, please contact your designated Rolls-Royce representative, or download the publication from your Rolls Royce Care account at <https://customers.rolls-royce.com>.

If you do not have a designated representative or Rolls Royce Care account, please contact **Corporate Communications** at **Rolls-Royce plc**, P.O. Box 31, Derby, DE24 8BJ, United Kingdom Telephone +44 (0)1332 242424,

or send an email through [http://www.rolls-royce.com/contact/civil\\_team.jsp](http://www.rolls-royce.com/contact/civil_team.jsp) identifying the correspondence as being related to **Airworthiness Directives**.

