



Notification of a proposal to issue an Airworthiness Directive

PAD No.: 17-016

Issued: 01 February 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:

ROLLS-ROYCE plc

Type/Model designation(s):

Trent 1000 Engines

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

TCDS Number(s): EASA.E.036

Foreign AD: Not applicable

Supersedure: None

ATA 72 – Engine – Intermediate Pressure Turbine Blades – Inspection / Replacement

Manufacturer(s):

Rolls-Royce plc (RR)

Applicability:

Trent 1000-A, Trent 1000-A2, Trent 1000-AE2, Trent 1000-C, Trent 1000-C2, Trent 1000-CE2, Trent 1000-D, Trent 1000-D2, Trent 1000-E, Trent 1000-E2, Trent 1000-G, Trent 1000-G2, Trent 1000-H, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2 and Trent 1000-L2 engines, all serial numbers.

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

Reason:

During a recent flight of a Trent 1000-powered Boeing 787, following reports of N2 vibration and multiple other messages, the flight crew performed an engine in-flight shut-down (IFSD) and returned to the departure airport, landing uneventfully. The post-flight boroscope inspection of the affected engine revealed an intermediate pressure (IP) turbine blade missing at the shank. This is the fifth reported occurrence of an IP turbine blade failure on a Trent 1000 engine. The failures are driven by sulphidation corrosion cracking.



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

To address this potential unsafe condition, RR issued Alert Non-Modification Service Bulletin (NMSB) TRENT 1000 72-AJ575 to provide instructions for engine removal from service when any IP turbine blade with a high level of sulphidation exposure is identified by corrosion fatigue life (CFL) model.

For the reason described above, this AD requires removal from service of certain engines, to be corrected in shop.

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 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.

- (1) From the effective date of this AD, within 80 engine flight cycles after receipt of an alert engine health monitoring (EHM) notification (as shown in Figure 1 of this AD) from the RR Operational Service Desk (OSD – see Note 2 of this AD), remove the affected engine from service.

Note 2: RR OSD manages the EHM process. CFL model is used to identify Trent 1000 engines that are at risk of IP turbine blade failure. RR OSD will send an alert EHM notification containing the wording as shown in Figure 1 of this AD.

Figure 1 – Alert EHM Notification

“Possible Causes
 The latest run of the CFL model has highlighted the above engine as being at increased risk of IP Turbine shank cracks as a result of sulphidation corrosion.
 Reaction Time
 80 flight cycles
 Recommended Troubleshooting
 The engine should be removed within a maximum of 80 flight cycles in accordance with NMSB TRENT 1000 72-AJ575.”

- (2) After removing an engine from service as required by paragraph (1) of this AD, contact RR (see contact details in the Remarks section of this AD) for approved instructions and, before release to service of the engine, accomplish those instructions accordingly.

Ref. Publications:

Rolls-Royce Alert NMSB TRENT 1000 72-AJ575 original issue, dated 29 November 2016.

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



Remarks:

1. This Proposed AD will be closed for consultation on 01 March 2017.
2. Enquiries regarding this PAD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
3. For any question concerning the technical content of the requirements in this PAD, 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 identifying the correspondence as being related to **Airworthiness Directives**.

