Airworthiness Directive

AD No.: 2019-0282

Issued: 20 November 2019

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:
ROLLS-ROYCE DEUTSCHLAND Ltd & Co KG

Type/Model designation(s):
Trent 1000 and Trent 7000 engines

Effective Date: 27 November 2019

TCDS Number(s): EASA.E.036

Foreign AD: Not applicable

Supersedure: None

ATA 72 – Engine – Intermediate Pressure Compressor Shaft Assembly – Inspection

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Manufacturer(s):
Rolls-Royce plc

Applicability:
Trent 1000-AE3, Trent 1000-CE3, Trent 1000-D3, Trent 1000-G3, Trent 1000-H3, Trent 1000-J3, Trent 1000-K3, Trent 1000-L3, Trent 1000-M3, Trent 1000-N3, Trent 1000-P3, Trent 1000-Q3 and Trent 1000-R3 engines, all serial numbers (ESN); and

Trent 7000-72 and Trent 7000-72C engines, all ESN.

These engines are known to be installed on, but not limited to, Boeing 787 and Airbus A330 aeroplanes.

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

Where, in this AD, reference is made to a Rolls-Royce modification, Service Bulletin (SB) or Non-Modification SB (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.

The NMSB: Rolls-Royce TRENT 1000 Alert NMSB 72-AK451.

Affected part: Intermediate pressure compressor (IPC) shaft assemblies, having Part Number KH18436.

Serviceable part: An affected part which is new (never previously installed on an engine); or that, before (re)installation, has passed (no crack detected) an inspection in accordance with the instructions of the NMSB.

Reason:

An occurrence was reported of finding cracks in the front air seal of the IPC shaft assembly during stripping of a flight test engine. Follow-up inspections of other in-shop engines revealed two more cracked front air seals of IPC shaft assemblies.

This condition, if not detected and corrected, could lead to IPC shaft failure, possibly resulting in engine in-flight shut-down and consequent reduced control of the aeroplane.

To address this potential unsafe condition, Rolls-Royce developed an inspection method and issued the NMSB, providing those inspection instructions.

For the reason described above, this AD requires repetitive on-wing inspections of the front air seal of the affected part at a specific area between the fourth (rearmost) seal fin of the IPC shaft assembly front air seal and the IPC Stage 1 disc and, depending on findings, removal from service of the engine for corrective action(s).

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

Required as indicated, unless accomplished previously:

Inspection(s):

(1) Initially, within the compliance times specified in Table 1 of this AD, and, thereafter, at intervals not to exceed 200 flight cycles (FC), inspect the affected part in accordance with the instructions of Section 3.B of the NMSB.

Table 1 – Initial Inspection of Affected Part (see Note 1 of this AD)

FC Accumulated	Compliance Time
700 FC or less	Before exceeding 500 FC, or within 100 FC after the effective date of this AD, whichever occurs later
More than 700 FC, up to 1 000 FC (inclusive)	Within 50 FC after the effective date of this AD
More than 1 000 FC	Within 25 FC or 30 days, whichever occurs first after the effective date of this AD

Note 1: Unless indicated otherwise, the FC specified in Table 1 of this AD are those accumulated by the affected part since new (first installation on an engine).

(2) An in-shop inspection in accordance with the instructions of Section 3.A of the NMSB may be substituted for any on-wing inspection as required by paragraph (1) of this AD, provided the compliance time is not exceeded.

Corrective Action(s):

(3) If, during any on-wing inspection as required by paragraph (1) of this AD, any crack is detected, before next flight, remove the engine from service and, before release to service of the engine, contact Rolls-Royce for approved corrective actions instructions and accomplish those instructions accordingly.

(4) If, during any in-shop inspection as specified in paragraph (2) of this AD, any crack is detected, before release to service of the engine, contact Rolls-Royce for approved corrective actions instructions and accomplish those instructions accordingly.

Credit:

(5) Inspection of an engine, either on-wing or in-shop, before the effective date of this AD in accordance with the instructions of Rolls-Royce TRENT 1000 NMSB 72-K452 or Technical Variance TV207889, as applicable, is an acceptable method to comply with the initial inspection as required by paragraph (1), or as specified in paragraph (2) of this AD, as applicable.

Terminating Action:

(6) None.

Parts Installation:

(7) From the effective date of this AD, it is allowed to install on any engine an affected part, provided it is a serviceable part, as defined in this AD.

Ref. Publications:

Rolls-Royce TRENT 1000 Alert NMSB 72-AK451 original issue dated 14 November 2019.

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

Rolls-Royce TRENT 1000 NMSB 72-K452 original issue dated 21 October 2019.

Remarks:

1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD.

2. Based on the required actions and the compliance time, EASA have decided to issue a Final AD with Request for Comments, postponing the public consultation process until after publication.

3. Enquiries regarding this AD should be referred to the EASA Programming and Continued Airworthiness 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.

5. 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 identifying the correspondence as being related to **Airworthiness Directives**.