

## Airworthiness Directive

**AD No.:** 2024-0118

**Issued:** 25 June 2024

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, or Annex Vb Part ML.A.301, as applicable, 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 Annex Vb Part ML.A.303, as applicable] 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 &amp; Co KG

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

Trent 1000 engines

**Effective Date:** 09 July 2024

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

**Foreign AD:** None

**Supersedure:** This AD supersedes EASA AD 2019-0099R2 dated 06 September 2019.

### ATA 72 – Engine – High Pressure Turbine Blades – Inspection / Limitation

**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.

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-AK316 Revision 4.

Where, in this AD, reference is made to a Rolls-Royce modification (mod), 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.

**Affected part:** High pressure turbine (HPT) blades, having Part Number (P/N) KH10575 (pre-mod/SB 72-J550), or P/N KH64485 (post-mod/SB 72-J550).

**Serviceable part:** An affected part which is new (not previously installed).

**Reason:**

In-service experience with Trent 1000 TEN engines has shown that the affected parts may deteriorate, despite being subject to the inspections and life limits as specified in the current Rolls-Royce Time Limits Manual, T-Trent-10RRT, Chapters 05-10 and 05-20.

This condition, if not detected and corrected, could lead to HPT blade failure, possibly resulting in engine in-flight shut-down (IFSD) and consequent reduced control of the aeroplane.

To address this potential unsafe condition, Rolls-Royce developed on-wing borescope inspection instructions and issued NMSB TRENT 1000 72-AK316 accordingly. Prompted by this development EASA issued AD 2019-0099 (later revised) to require repetitive inspections of the affected parts to detect leading edge axial cracking and, depending on findings, removal from service of the engine for in-shop replacement of the affected parts. That AD also introduced de-pairing instructions and limitations.

Since EASA AD 2019-0099R2 was issued, Rolls-Royce issued the NMSB, as defined in this AD, removing the de-pairing instructions, reducing the inspection thresholds and introducing Convex surface inspections.

For the reasons described above, this AD partially retains the requirements of EASA AD 2019-0099R2, which is superseded, requires inspections within reduced inspection threshold and expands the inspection area to include the HPT blade Convex surface.

This AD is still considered to be an interim action and further AD action is expected.

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

Required as indicated by this AD, unless the action(s) required by this AD have been already accomplished:

**Inspection(s):**

- (1) Before exceeding the compliance time as specified in Table 1 of this AD, as applicable, but not exceeding 50 flight cycles (FC) since last inspection of the affected parts in accordance with the instructions of Rolls-Royce Alert NMSB TRENT 1000 72-AK316 up to Revision 3 (inclusive), and, thereafter, at intervals not to exceed 50 FC, accomplish an on-wing borescope inspections of the leading edge (Area A) and Convex surface (Area C4) of all affected parts in accordance with the instructions of Section 3.C of the NMSB.



Table 1 – Inspection Threshold(s) (see Note 1 of this AD)

FC Accumulated	Compliance Time
Less than 550 FC	Before exceeding 600 FC
550 FC or more	Within 50 FC after the effective date of this AD

Note 1: Unless indicated otherwise, the FC specified in Table 1 and paragraph (3) of this AD are those accumulated by the engine(s) since first flight, or since last in-service HPT blade set replacement(s), as applicable.

- (2) From 20 May 2019 [the effective date of the EASA AD 2019-0099], within 10 FC after IFSD of an engine on an aeroplane, accomplish an on-wing borescope inspection of all affected parts installed on the not-affected (no IFSD) engine of that aeroplane in accordance with the instructions of Section 3.C of the NMSB.

#### Limitations:

- (3) From 20 May 2019 [the effective date of the EASA AD 2019-0099], do not operate an aeroplane having an engine installed that has accumulated 1 000 FC or more (see Note 1 of this AD).

#### Corrective Action(s):

- (4) If, during any inspection as required by paragraph (1) or (2) of this AD, any crack indication, as defined in the NMSB, is found on the leading edge (Area A), within the compliance time specified in Table 2 of this AD, as applicable, remove the engine from service and, before release to service of that engine, replace the affected parts with a full set of serviceable parts, as defined in this AD, in accordance with the instructions of Rolls-Royce SB TRENT 1000 72-J550.

Table 2 – Engine Removal from Service (leading edge (Area A) cracking)

Affected Part Finding(s)	Compliance Time
Cracks exceeding 4 mm (0.16 inch) in length	Before next flight
Cracks up to 4 mm (0.16 inch) in length	Within 10 FC after the inspection detecting crack(s)

- (5) If, during any inspection as required by paragraph (1) or (2) of this AD, any crack indication, as defined in the NMSB, is found on the Convex surface (Area C4), within the compliance time specified in Table 3 of this AD, as applicable, remove the engine from service and, before release to service of that engine, replace the affected parts with a full set of serviceable parts, as defined in this AD, in accordance with the instructions of Rolls-Royce SB TRENT 1000 72-J550.



Table 3 – Engine Removal from Service (Convex surface (Area C4) cracking)

Affected Part Finding(s)	Compliance Time
Cracks exceeding 3 mm (0.12 inch) in length	Before next flight
Cracks up to 3 mm (0.12 inch) in length	Within 6 FC after the inspection detecting crack(s)

- (6) Following removal from service of an engine, prompted by the limitations as required by paragraph (3) of this AD, in-shop replacement on that engine of the affected parts with a full set of serviceable parts, as defined in this AD, in accordance with the instructions of Rolls-Royce SB TRENT 1000 72-J550, allows that engine to be returned to service.

#### Terminating Action:

- (7) None.

#### Credit:

- (8) Inspection(s) accomplished on an engine before the effective date of this AD in accordance with the instructions of Rolls-Royce Alert NMSB TRENT 1000 72-AK316 up to Revision 3 (inclusive), are acceptable to comply with the requirements of paragraph (2) of this AD, as applicable, for that engine.

#### Ref. Publications:

Rolls-Royce Alert NMSB TRENT 1000 72-AK316 original issue dated 09 April 2019, or Revision 1 dated 18 April 2019, or Revision 2 dated 30 April 2019, or Revision 3 dated 16 July 2019, or Revision 4 dated 10 May 2024.

Rolls-Royce SB TRENT 1000 72-J550 original issue dated 21 November 2017.

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. This AD was posted on 06 June 2024 as PAD 24-065 for consultation until 20 June 2024. The Comment Response Document can be found in the [EASA Safety Publications Tool](#), in the compressed ('zipped') file, attached to the record for this AD.
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. 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 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**.

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