



適航指令發布單

Airworthiness Directive Issuance Form

| | | | |
|---|--|---------------------|-----------|
| 民航局 AD 編號 AD number | CAA-2021-07-004 | 發布日期 Date issued | 2021/7/22 |
| 適用之航空產品 Applied to (models, serial numbers or part numbers, as applicable) | Trent 7000-72 and Trent 7000-72C engines, all serial numbers. | | |
| 主旨摘要 | Engine - High Pressure Turbine Blades - Inspection | | |
| 民航局 CAA <input type="checkbox"/> 本國產品 Native products <input type="checkbox"/> 其他個案 Other | 設計國民航主管機構 Original Authorities <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> FAA <input checked="" type="checkbox"/> EASA <input type="checkbox"/> Brazil <input type="checkbox"/> Transport Canada Civil Aviation <input type="checkbox"/> DGAC </div> <div> <input type="checkbox"/> Germany LBA <input type="checkbox"/> CAA-NL <input type="checkbox"/> UK CAA <input type="checkbox"/> Japan CAB <input type="checkbox"/> CAA of Israel <input type="checkbox"/> Other _____ </div> </div> | | |
| | 設計國 AD 編號 Original AD number | 2021-0169 | |
| | 1. 直接採用原 AD 之內容?(Is the original AD directly adopted?) <input checked="" type="checkbox"/> 是(Yes) <input type="checkbox"/> 否(No) _ a. 生效日期另訂為(Re-specify the effective date as) : _____ b. 執行時限另訂為(Re-specify the compliance time or period as) : _____ <input type="checkbox"/> | | |
| | 2. 使用人是否需要將 AD 執行結果向民航局提出報告?(Do <input type="checkbox"/> Users need to report the status of compliance to the CAA?) <input type="checkbox"/> 是(Yes) <input checked="" type="checkbox"/> 否(No) | | |
| 備註 Note | ATA 72. Ref. Publications: Rolls-Royce Alert NMSB TRENT 1000 72-AK449 Revision 1 dated 12 December 2019, or Revision 2 dated 05 July 2021. | | |
| 註： 1. AD 內容後附。 2. 航空器產品使用人得向民航局提出豁免、替代符合方法、執行時限之展延之申請。 3. 如有任何問題，請聯絡交通部民用航空局初始適航科。Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail： adcaa@mail.caa.gov.tw Note： 1. The AD text is enclosed. 2. Exemption, an alternative method of compliance or adjustment of the compliance time may be proposed to the CAA for approval. 3. For further information, please contact Civil Aeronautics Administration on Tel：(02)2349-6331~3, Fax：(02)2545-8464, e-mail： adcaa@mail.caa.gov.tw | | | |



Airworthiness Directive

AD No.: 2021-0169

Issued: 19 July 2021

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 7000 engines

Effective Date: 02 August 2021

TCDS Number(s): EASA.E.036

Foreign AD: Not applicable

Supersedure: None

ATA 72 – Engine – High Pressure Turbine Blades – Inspection

Manufacturer(s):

Rolls-Royce plc

Applicability:

Trent 7000-72 and Trent 7000-72C engines, all serial numbers.

These engines are known to be installed on, but not limited to, Airbus A330 (NEO) 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-AK449 Revision 2. The NMSB has an 'A' (Alert) in the number, but an earlier or later revision may not have that 'A'. This kind of change does not effectively alter the publication references.

Affected part: High pressure turbine (HPT) blades, having Part Number (P/N) KH64485.

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



Reason:

In-service experience has shown that the affected parts may deteriorate, despite being subject to piece-part level inspections as specified in the current Rolls-Royce Trent 7000 Time Limits Manual, TLM T-T7000-1RR, Revision 9, Chapter 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 determined a flight cycle (FC) threshold and an on-wing borescope inspection method, and issued the NMSB accordingly.

For the reasons described above, this AD requires initial and repetitive inspections of the affected parts to detect axial cracking and, depending on findings, removal from service of the engine for in-shop replacement of the affected parts. This AD also requires implementation of a reduced life limit for the affected parts.

This AD is considered to be an interim action and further AD action may follow.

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

Required as indicated, unless accomplished previously:

Inspection(s):

- (1) Before exceeding the compliance time as specified in Table 1 of this AD, as applicable, accomplish an on-wing borescope inspection of all affected parts in accordance with the instructions of Section 3.A of the NMSB.

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

| FC Accumulated | Compliance Time |
|-----------------------|--|
| Less than 475 FC | Before exceeding 500 FC |
| 475 FC or more | Within 25 FC the effective date of this AD |

Note 1: Unless indicated otherwise, the FC specified in Table 1 and Table 2 of this AD are those accumulated by the engine since first flight, or since last in-service HPT blade set replacement, as applicable.

- (2) Within the compliance time as specified in Table 2 of this AD, as applicable, and, thereafter, at intervals not to exceed 50 FC, accomplish an on-wing borescope inspection of all affected parts in accordance with the instructions of Section 3.A of the NMSB.

Table 2 – First Repeat Inspection Threshold(s) (see Note 1 of this AD)

| FC Accumulated | Compliance Time |
|-----------------------|--|
| Less than 725 FC | Before exceeding 750 FC |
| 725 FC or more | Within 25 FC the effective date of this AD |



- (3) From the effective date of this AD, before next flight after IFSD of an engine on an aeroplane, if the accumulated life of the affected parts installed on the not-affected (no IFSD) engine of that aeroplane have exceeded 450 FC, accomplish an on-wing borescope inspection of all affected parts on that not-affected (no IFSD) engine in accordance with the instructions of Section 3.A of the NMSB.

Corrective Action(s):

- (4) If, during any inspection as required by paragraph (1), (2) or (3) of this AD, as applicable, any crack indication (as specified in the NMSB) is found, 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.

Table 3 – Engine Removal from Service

| 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 or 60 flight hours, whichever occurs first after the inspection detecting crack(s) |

Life Limitation:

- (5) Before the affected parts on an engine exceed 1 000 FC since new (first installation on an engine), 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.

Note 2: The HPT blade life limit as required by paragraph (5) of this AD cancels the inspection intervals as currently defined in the TLM.

Credit:

- (6) Inspection(s) and corrective action(s) on an engine, accomplished before the effective date of this AD in accordance with the instructions of Rolls-Royce Alert NMSB TRENT 1000 72-AK449 at Revision 1, are acceptable to comply with the initial requirements of paragraphs (1), (2) and (3) of this AD, as applicable, for that engine.

Terminating Action:

- (7) None.

Ref. Publications:

Rolls-Royce Alert NMSB TRENT 1000 72-AK449 Revision 1 dated 12 December 2019, or Revision 2 dated 05 July 2021.

The use of later approved revisions of the above-mentioned document 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 14 June 2021 as PAD 21-085 for consultation until 12 July 2021. 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.
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 <https://www.rolls-royce.com/contact-us/civil-aerospace.aspx> identifying the correspondence as being related to **Airworthiness Directives**.

