Airworthiness Directive

AD No.: 2025-0082

Issued: 11 April 2025

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:	Type/Model designation(s):
ROLLS-ROYCE DEUTSCHLAND Ltd & Co KG	Trent XWB engines

Effective Date:	25 April 2025
TCDS Number(s):	EASA.E.111
Foreign AD:	Not applicable
Supersedure:	This AD supersedes EASA AD 2024-0167 dated 22 August 2024.

ATA 72 – Engine – Intermediate Pressure Compressor Rotor 1 Blades – Inspection / Modification

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Manufacturer(s):

Rolls-Royce plc

Applicability:

Trent XWB-75, Trent XWB-79, Trent XWB-79B and Trent XWB-84 engines, all serial numbers, except those having embodied Rolls-Royce modification (MOD) 72-AL099.

These engines are known to be installed on, but not limited to, Airbus A350 aeroplanes.

Definitions:

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

The inspection NMSB: Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) TRENT XWB 72-AK633 Revision 2.

The modification SB: Rolls-Royce Alert Service Bulletin (SB) TRENT XWB 72–AL099 Revision 1.

Where, in this AD, reference is made to a Rolls-Royce SB with an 'A' (Alert) in the number, it should be recognised that a 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: Intermediate pressure compressor (IPC) Rotor 1 (R1) blades, having Part Number KH21559 (post-SB/modification 72-H408 standard).

Serviceable part: An affected part that is new (never previously installed), or that has not exceeded 2 300 engine flight cycles (EFC) since first installation on an engine; or an affected part that, prior to installation, has passed an inspection in accordance with the instructions of the inspection NMSB; or an IPC R1 blade, eligible for installation on an engine, which is not an affected part.

Affected engine: An engine with an affected part installed.

Remaining material: For an affected part having a crack, the remaining material measured in accordance with the instructions of the inspection NMSB between the end of the crack and the bottom edge of the blade root.

Reason:

Occurrences have been reported of finding cracked IPC R1 blades on certain Trent XWB engines that were close to their first planned refurbishment shop visit.

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

To address this potential unsafe condition and to avoid dual engine IFSD, Rolls-Royce issued the NMSB TRENT XWB 72-K633 at original issue to provide inspection instructions, and NMSB TRENT XWB 72-AK632 to provide information on thresholds and intervals. Consequently, EASA issued AD 2020-0277 to require repetitive inspections of the affected parts and, depending on findings, accomplishment of applicable corrective action(s). Later, Rolls-Royce issued Revision 1 of NMSB TRENT XWB 72-AK633 introducing enhanced crack measuring and fly-on criteria, and EASA issued AD 2024-0167 mandating the use of those enhanced methods and fly-on criteria.

Since that AD was issued, Rolls-Royce issued the inspection NMSB (as defined in this AD) allowing to operate engines with certain cracked blades. Additionally, Rolls-Royce developed MOD 72-AL099 introducing IPC R1 blades with revised method of manufacture and geometry changes and issued the modification SB making that modification available for in-service engines.

For the reasons described above, this AD partially retains the requirements of EASA AD 2024-0167, which is superseded, and introduces repetitive inspections with reduced interval for engines with certain cracked blades, and removal of affected engines from service within established compliance time. This AD also requires modification of engines, which constitutes terminating action for repetitive inspections required by this AD.

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:

Inspections:

(1) Within the compliance time specified in Table 1 of this AD, as applicable, and, thereafter, except as required by paragraph (2) of this AD, at intervals not to exceed 200 EFC, accomplish an on-wing or in-shop inspection of each affected engine in accordance with the instructions of the inspection NMSB.

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

EFC Accumulated	Compliance Time
Less than 2 300 EFC	Before exceeding 2 300 EFC, or within 50 EFC after 25 December 2020 [the effective date of EASA AD 2020-0277], whichever occurs later
2 300 EFC or more	Within 50 EFC after 25 December 2020 [the effective date of EASA AD 2020-0277]

Note 1: The EFC specified in Table 1 of this AD are those accumulated on 25 December 2020 [the effective date of EASA AD 2020-0277] by the oldest affected part in the IPC R1 blade set since the first installation of this blade on an engine. In the case when the EFC of the IPC R1 blade set cannot be established, use the EFC accumulated by the engine since new.

(2) If, during any on-wing inspection as required by paragraph (1) of this AD, any affected part of an engine is found having a crack, and there is less than 3 mm, but more than 1 mm remaining material for each crack, within 100 EFC after that inspection and thereafter at intervals not exceeding 100 EFC accomplish an inspection of that engine in accordance with the instructions of the inspection NMSB.

Note 2: If, during any on-wing inspection as required by paragraph (1) of this AD, any affected part of an engine is found having a crack and there is 3 mm or more material remaining for each crack, the repetitive inspection interval remains 200 EFC, as required by paragraph (1) of this AD.

Corrective Action(s):

(3) If, during any on-wing inspection as required by paragraph (1) or (2) of this AD, as applicable, any affected part is found having a crack, and there is 1 mm or less remaining material for one crack, within the compliance time as defined in Table 2 of this AD, as applicable, depending on the size of the remaining material between the end of the crack and bottom of the blade root on front face(s), remove the engine from service and, before release to service of that engine, replace the full set of affected parts with serviceable parts in accordance with approved Rolls-Royce maintenance instructions, or modify the engine in accordance with the instructions of the modification SB.

Table 2 – Removal of an Engine from Service

Material remaining between the end of the crack and bottom of the blade root on front face(s)	Compliance Time
There is remaining material	3 EFC
There is no remaining material, or it is unclear if there is remaining material	Before next flight

(4) If, during any in-shop inspection as required by paragraph (1) of this AD, any affected part is found cracked, before release to service of the engine, replace the full set of affected parts with serviceable parts in accordance with the instructions of the inspection NMSB, or modify the engine in accordance with the instructions of the modification SB.

Modification:

(5) Unless accomplished as specified by paragraph (3) or (4) of this AD, as applicable, within 7 years and 8 months after the effective date of this AD modify the engine in accordance with the instructions of the modification SB.

Parts Installation:

(6) After modification of an engine, as required by paragraph (5) of this AD, or as specified by paragraphs (3) and (4) of this AD, do not install an affected part on that engine.

Credit:

(7) Inspection(s) and corrective action(s) on an engine, accomplished before 25 December 2020 [the effective date of EASA AD 2020-0277] in accordance with the instructions of Rolls-Royce NMSB TRENT XWB 72-AK612 or NMSB TRENT XWB 72-AK613, as applicable, are an acceptable method to comply with the initial requirements of paragraphs (1), (2), (3) and (4) of this AD for that engine.

(8) Inspection(s) accomplished on an engine before the effective date of this AD in accordance with the instructions of the original issue or Revision 1 of the Rolls-Royce TRENT XWB 72-K633 are an acceptable method to comply with the requirements of paragraphs (1), (2), (3) and (4) of this AD for that engine.

Terminating Action:

(9) Modification of an engine in accordance with the instructions of the modification SB constitutes terminating action for the repetitive inspections as required by paragraph (1) or (2) of this AD, as applicable, for that engine.

Ref. Publications:

Rolls-Royce Alert NMSB TRENT XWB 72-AK632 original issue dated 07 August 2020.

Rolls-Royce Alert NMSB TRENT XWB 72-K633 original issue dated 07 August 2020, or NMSB TRENT XWB 72-AK633 Revision 1 dated 08 July 2024, or Revision 2 dated 19 February 2025.

Rolls-Royce Alert SB TRENT XWB 72−AL099 Revision 1 dated 03 March 2025.

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 10 March 2025 as PAD 25-042 for consultation until 07 April 2025. 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
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   send an email through https://www.rolls-royce.com/contact-us/civil-aerospace.aspx identifying the correspondence as being related to **Airworthiness Directives**.