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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. FAA-2021-0381; Project Identifier MCAI-2020-01656-E; Amendment 39-21694; AD 2021-17-11]

RIN 2120-AA64

### Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG (Type Certificate Previously Held by Rolls-Royce plc) Turbofan Engines

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for certain Rolls-Royce Deutschland Ltd & Co KG (RRD) Trent XWB-75, Trent XWB-79, Trent XWB-79B, and Trent XWB-84 model turbofan engines. This AD was prompted by reports of cracks in the intermediate-pressure compressor (IPC) rotor 1 (R1) blades installed on certain Trent XWB model turbofan engines. This AD requires initial and repetitive borescope inspections (BSIs) of the affected IPC R1 blades and, depending on the results of the inspections, replacement of all 34 IPC R1 blades. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective October 12, 2021.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of October 12, 2021.

**ADDRESSES:** For service information identified in this final rule, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; fax: +44 (0)1332 249936; website: <https://www.rolls-royce.com/contact-us.aspx>. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759. It is also available at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0381.

#### Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0381; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday

through Friday, except Federal holidays. The AD docket contains this final rule, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

**FOR FURTHER INFORMATION CONTACT:** Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: kevin.m.clark@faa.gov.

## **SUPPLEMENTARY INFORMATION:**

### **Background**

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain RRD Trent XWB-75, Trent XWB-79, Trent XWB-79B, and Trent XWB-84 model turbofan engines. The NPRM published in the Federal Register on May 28, 2021 (86 FR 28716). The NPRM was prompted by reports of cracks in the IPC R1 blades installed on certain Trent XWB model turbofan engines. The NPRM proposed to require initial and repetitive BSIs of the affected IPC R1 blades and, depending on the results of the inspections, replacement of all 34 IPC R1 blades with parts eligible for installation. The FAA is issuing this AD to address the unsafe condition on these products.

The European Union Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Community, has issued EASA AD 2020-0277, dated December 11, 2020 (referred to after this as “the MCAI”), to address the unsafe condition on these products. The MCAI states:

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 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 avoid dual engine IFSD, Rolls-Royce issued the inspection NMSB to provide inspection instructions and the NMSB to provide information on threshold and intervals.

For the reasons described above, this [EASA] AD requires repetitive inspections of the affected parts and, depending on findings, accomplishment of applicable corrective action(s).

You may obtain further information by examining the MCAI in the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0381.

### **Discussion of Final Airworthiness Directive Comments**

The FAA received comments from two commenters. The commenters were Delta Air Lines (Delta) and the Air Line Pilots Association, International (ALPA). The following presents the comments received on the NPRM and the FAA's response to each comment.

## **Request To Add a Definition for “Affected IPC Blades”**

Delta requested that the FAA add a definition of “affected IPC blades” to paragraph (h) of this AD. Delta reasoned that the part number of the affected IPC R1 blades was established in paragraph (c), Applicability, but not in the proposed rule.

The FAA disagrees with the need to add a definition of an affected IPC blade to this AD, because paragraph (c), Applicability, is part of the proposed rule. The FAA clarified paragraph (c), Applicability, of this AD, by adding “(affected IPC R1 blade).”

## **Request To Add Clarifying Instructions for Repeat BSI**

Delta requested that the FAA add language similar to paragraph (g)(1) of this AD to paragraph (g)(2) of this AD to clarify the instructions for the repeat BSI requirement.

The FAA disagrees. Paragraph (g)(2) of this AD instructs the operator to repeat the inspection required by paragraph (g)(1) of this AD. It is unnecessary to add additional information to paragraph (g)(2) of this AD since the repetitive inspection required by paragraph (g)(2) of this AD is the same as required by paragraph (g)(1) of this AD.

## **Support for the AD**

The ALPA supported the AD without further comment.

## **Conclusion**

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

## **Related Service Information Under 1 CFR Part 51**

The FAA reviewed Rolls-Royce Non-Modification Service Bulletin (NMSB) Trent XWB 72-K633, Initial Issue, dated August 7, 2020. This service information specifies procedures for performing initial and repetitive BSIs of the Trent XWB-75, XWB-79, XWB-79B, and XWB-84 IPC R1 blades. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

## **Other Related Service Information**

The FAA reviewed Rolls-Royce Alert NMSB Trent XWB 72-AK612, Initial Issue, dated July 9, 2020; Rolls-Royce Alert NMSB Trent XWB 72-AK613, Initial Issue, dated July 17, 2020; and Rolls-Royce Alert NMSB Trent XWB 72-AK632, Initial Issue, dated August 7, 2020.

Rolls-Royce Alert NMSB Trent XWB 72-AK612 describes procedures for performing a in-shop BSI of the Trent XWB-75, XWB-79, XWB-79B, and XWB-84 IPC R1 blades. Rolls-Royce Alert NMSB Trent XWB 72-AK613 describes procedures for performing an on-wing BSI of the Trent XWB-75, XWB-79, XWB-79B, and XWB-84 IPC R1 blades. Rolls-Royce Alert NMSB Trent XWB 72-AK632 defines the initial inspection threshold and repeat inspection intervals for Trent XWB-75, XWB-79, XWB-79B, and XWB-84 IPC R1 blades.

## Costs of Compliance

The FAA estimates that this AD affects 15 engines installed on airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

### Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
BSI affected IPC R1 blades	6 work-hours × \$85 per hour = \$510	\$0	\$510	\$7,650

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the mandated inspection. The FAA has no way of determining the number of aircraft that might need this replacement.

### On-Condition Costs

Action	Labor cost	Parts cost	Cost per product
Replacement of IPC blades	100 work-hours × \$85 per hour = \$8,500	\$187,408	\$195,908

## Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

## Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **The Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

### **PART 39—AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by adding the following new airworthiness directive:



# **AIRWORTHINESS DIRECTIVE**

**2021-17-11 Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc):** Amendment 39-21694; Docket No. FAA-2021-0381; Project Identifier MCAI-2020-01656-E.

**(a) Effective Date**

This airworthiness directive (AD) is effective October 12, 2021.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc) Trent XWB-75, Trent XWB-79, Trent XWB-79B, and Trent XWB-84 model turbofan engines with an installed intermediate-pressure compressor (IPC) rotor 1 (R1) blade, part number (P/N) KH21559 (affected IPC R1 blade).

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

**(e) Unsafe Condition**

This AD was prompted by reports of cracks in the IPC R1 blades installed on certain Trent XWB model turbofan engines. The FAA is issuing this AD to prevent failure of the IPC R1 blades. The unsafe condition, if not addressed, could result in failure of the engine, in-flight shutdown of the engine, and loss of the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) Within the compliance time specified in Figure 1 to paragraph (g)(1) of this AD, perform an initial borescope inspection (BSI) of the affected IPC R1 blades using the Accomplishment Instructions, paragraphs 3.A.(3)(b) and (c) (on-wing) or 3.B.(2)(b) and (c) (in-shop), as applicable, of Rolls-Royce Non-Modification Service Bulletin Trent XWB 72-K633, Initial Issue, dated August 7, 2020.

**Figure 1 to Paragraph (g)(1) – Inspection threshold**

<b>Flight cycles (FCs) since new</b>	<b>Compliance time</b>
Less than 2,300 FCs since new	Before exceeding 2,300 FCs since new, or within 50 FCs after the effective date of this AD, whichever occurs later
2,300 or more FCs since new	Within 50 FCs after the effective date of this AD

(2) Thereafter, repeat the BSI of the affected IPC R1 blades required by paragraph (g)(1) of this AD before exceeding 200 engine FCs since the last BSI of the IPC R1 blades.

(3) If, during any inspection required by paragraph (g)(1) or (2) of this AD, any affected IPC R1 blade is found cracked, remove all 34 IPC R1 blades from service and replace with parts eligible for installation.

Note 1 to paragraph (g): The FCs specified in Figure 1 to paragraph (g)(1) of this AD are those accumulated by the IPC R1 blade having the highest flight cycles in the IPC R1 blade set since the first installation of the blade on an engine. When the FCs of the IPC R1 blade set cannot be established, use the FCs accumulated by the engine since new.

**(h) Definition**

For the purpose of this AD, a part eligible for installation is any IPC R1 blade having P/N KH21559 with zero engine FCs since new, any IPC R1 blade having P/N KH21559 that has been inspected in accordance with paragraph (g)(1) of this AD and a crack was not found, or any IPC R1 blade having a P/N not listed in this AD.

**(i) Credit for Previous Actions**

You may take credit for the initial BSI required by paragraph (g)(1) of this AD if you performed the initial BSI before the effective date of this AD using Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) Trent XWB 72-AK612, Initial Issue, dated July 9, 2020, or Rolls-Royce Alert NMSB Trent XWB 72-AK613, Initial Issue, dated July 17, 2020, as applicable.

**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(k) Related Information**

(1) For more information about this AD, contact Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: kevin.m.clark@faa.gov.

(2) Refer to European Union Aviation Safety Agency (EASA) AD 2020-0277, dated December 11, 2020, for more information. You may examine the EASA AD in the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0381.

**(I) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rolls-Royce Non-Modification Service Bulletin Trent XWB 72-K633, Initial Issue, dated August 7, 2020.

(ii) [Reserved]

(3) For Rolls-Royce service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; fax: +44 (0)1332 249936; website: <https://www.rolls-royce.com/contact-us.aspx>.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov), or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on August 12, 2021.

Lance T. Gant,

Director, Compliance & Airworthiness Division, Aircraft Certification Service.

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