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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2024-0043; Project Identifier MCAI-2023-00985-E; Amendment 39-22760; AD 2024-10-14]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for all Rolls-Royce Deutschland Ltd & Co KG (RRD) Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G, and Trent 1000-H engines. This AD is prompted by reports of cracking and separation of certain low-pressure turbine (LPT) stage 1 blade assemblies. This AD requires initial and repetitive inspections of affected LPT stage 1 blade assemblies for cracking or separation and, depending on the results of the inspections, reduction of the inspection interval or replacement of the LPT stage 1 blade set and disk. This AD also prohibits the installation of an LPT disk or blade set assembly unless it is considered a serviceable part, as specified in a European Union Aviation Safety Agency (EASA) AD, which is incorporated by reference. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective August 13, 2024.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of August 13, 2024.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA-2024-0043; 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.

Material Incorporated by Reference:

- For EASA service information, contact EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; phone: +49 221 8999 000; email: ADs@easa.europa.eu. You may find this material on the EASA website at ad.easa.europa.eu.
- 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 (817) 222-5110. It is also available at *regulations.gov* under Docket No. FAA-2024-0043.

FOR FURTHER INFORMATION CONTACT:

Sungmo Cho, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7241; email: sungmo.d.cho@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 all RRD Model Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G, and Trent 1000-H engines. The NPRM published in the **Federal Register** on February 01, 2024 ([89 FR 6450](#)). The NPRM was prompted by EASA AD 2023-0165, dated August 22, 2023 (EASA AD 2023-0165) (also referred to as the MCAI), issued by EASA, which is the Technical Agent for the Member States of the European Union. The MCAI states that manufacturer inspections detected cracking and separation of blade pairs in the weld region of certain LPT stage 1 blade assemblies. A blade assembly consists of a pair of blades welded together at the outer shroud. There are 85 LPT stage 1 blade assemblies in one set. Such cracking and separation could cause failure of affected parts and damage to the LPT module.

In the NPRM, the FAA proposed to require accomplishing the actions specified in EASA AD 2023-0165, except for any differences identified as exceptions in the regulatory text. The FAA is issuing this AD to address the unsafe condition on these products.

You may examine the MCAI in the AD docket at *regulations.gov* under Docket No. FAA-2024-0043.

Discussion of Final Airworthiness Directive

Comments

The FAA received one comment from Boeing, which supported the NPRM without change.

Additional Change Made to This Final Rule

Since the NPRM published, the FAA determined that paragraph (c) of the proposed AD incorrectly included “Rolls-Royce Deutschland Ltd & Co KG Trent 1000.” Therefore, the FAA has revised the applicability of this AD to remove that text. Since there are no additional engines on the U.S. registry, no changes have been made to the Costs of Compliance paragraph in this final rule.

Conclusion

These products have been approved by the aviation authority of another country and are approved for operation in the United States. Pursuant to the FAA's bilateral agreement with this State of Design Authority, it has notified the FAA of the unsafe condition described in the MCAI referenced above. The FAA reviewed the relevant data, considered the comment 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, this AD is adopted as proposed in the NPRM. None of the changes increase the economic burden on any operator.

Related Service Information Under [1 CFR Part 51](#)

The FAA reviewed EASA AD 2023-0165, which specifies procedures for inspection of affected LPT stage 1 blade assembly outer shrouds and replacement of the LPT stage 1 blade set and disk. EASA AD 2023-0165 also specifies a reduction of the repetitive inspection intervals if cracking or separation is detected and meets certain criteria. This material is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in **ADDRESSES**.

Costs of Compliance

The FAA estimates that this AD affects 28 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
Inspect LPT stage 1 blade outer shroud	4 work-hours × \$85 per hour = \$340	\$0	\$340	\$9,520

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

On-Condition Costs

Action	Labor cost	Parts cost	Cost per product
Replace LPT stage 1 blade set	10 work-hours × \$85 per hour = \$850	\$466,480	\$467,330
Replace LPT stage 1 disk	10 work-hours × \$85 per hour = \$850	256,908	257,758

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 that 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:

2024-10-14 Rolls-Royce Deutschland Ltd & Co KG: Amendment 39-22760; Docket No. FAA-2024-0043; Project Identifier MCAI-2023-00985-E.

(a) Effective Date

This airworthiness directive (AD) is effective August 13, 2024.

(b) Affected Ads

None.

(c) Applicability

This AD applies to Rolls-Royce Deutschland Ltd & Co KG Trent 1000-A, Trent 1000-AE, Trent 1000-C, Trent 1000-CE, Trent 1000-D, Trent 1000-E, Trent 1000-G, and Trent 1000-H engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

(e) Unsafe Condition

This AD was prompted by reports of cracking and separation of certain low-pressure turbine (LPT) stage 1 blade assemblies. The FAA is issuing this AD to prevent failure of the LPT stage 1 blades. The unsafe condition, if not addressed, could result in high energy debris release, damage to the airplane, and reduced control of the airplane.

(f) Compliance

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

(g) Required Actions

Except as specified in paragraphs (h) and (i) of this AD: Perform all required actions within the compliance times specified in, and in accordance with, European Union Aviation Safety Agency

(EASA) AD 2023-0165, dated August 22, 2023 (EASA AD 2023-0165).

(h) Exceptions to EASA AD 2023-0165

(1) Where EASA AD 2023-0165 refers to its effective date, this AD requires using the effective date of this AD.

(2) This AD does not adopt the Remarks paragraph of EASA AD 2023-0165.

(3) Where the service information referenced in EASA AD 2023-0165 specifies discarding the removed low pressure (LP) turbine stage 1 blade set, this AD requires removing the affected part from service.

(4) Where the service information referenced in EASA AD 2023-0165 specifies to quarantine the removed LP turbine stage 1 rotor disk, this AD requires removing the affected part from service.

(i) No Reporting Requirement

Although the service information referenced in EASA AD 2023-0165 specifies to submit certain information to the manufacturer, this AD does not include that requirement.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, AIR-520 Continued Operational Safety 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 AIR-520 Continued Operational Safety Branch, send it to the attention of the person identified in paragraph (k) of this AD and email 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) Additional Information

For more information about this AD, contact Sungmo Cho, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: (781) 238-7241; email: sungmo.d.cho@faa.gov.

(l) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference 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) European Union Aviation Safety Agency (EASA) AD 2023-0165, dated August 22, 2023.

(ii) [Reserved]

(3) For EASA AD 2023-0165, contact EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; phone: +49 221 8999 000; email: Ads@easa.europa.eu; website: easa.europa.eu. You may find this EASA AD on the EASA website at ad.easa.europa.eu.

(4) You may view this material 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 (817) 222-5110.

(5) You may view this material at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, visit www.archives.gov/federal-register/cfr/ibr-locations or email fr.inspection@nara.gov.

Issued on May 16, 2024.

Suzanne Masterson,

Deputy Director, Integrated Certificate Management Division, Aircraft Certification Service.

Editorial Note:

This document was received for publication by the Office of the Federal Register on July 2, 2024.

[[FR Doc. 2024-14945](#) Filed 7-8-24; 8:45 am]

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