

Issued on October 25, 2023.

Caitlin Locke,

*Director, Compliance & Airworthiness
Division, Aircraft Certification Service.*

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2023-1637; Project Identifier MCAI-2023-00184-E; Amendment 39-22588; AD 2023-22-04]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG Engines

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) Model Trent 1000-A2, Trent 1000-AE2, Trent 1000-C2, Trent 1000-CE2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 engines. This AD was 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, 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 December 26, 2023.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of December 26, 2023.

ADDRESSES:

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2023-1637; 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 service information identified in this final rule, 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 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](https://www.regulations.gov) under Docket No. FAA-2023-1637.

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-A2, Trent 1000-AE2, Trent 1000-C2, Trent 1000-CE2, Trent 1000-D2, Trent 1000-E2, Trent 1000-G2, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 engines. The NPRM published in the **Federal Register** on July 31, 2023 (88 FR 49361). The NPRM was prompted by EASA AD 2023-0027, dated January 31, 2023 (EASA AD 2023-0027) (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.

You may examine the MCAI in the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2023-1637.

In the NPRM, the FAA proposed to require 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. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received one comment from The Boeing Company (Boeing). Boeing supported the NPRM without change.

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 the 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.

Related Service Information Under 14 CFR Part 51

The FAA reviewed EASA AD 2023-0027, which specifies procedures for inspection of affected LPT stage 1 blade assemblies and replacement of the LPT stage 1 blade set and disk. EASA AD 2023-0027 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 26 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
Inspection LPT stage 1 blade assemblies	4 work-hours × \$85 per hour = \$340	\$0	\$340	\$8,840

The FAA estimates the following costs to do any necessary replacements

that are 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 and disk	4 work-hours × \$85 per hour = \$340	\$720,000	\$720,340

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:

2023–22–04 Rolls-Royce Deutschland Ltd & Co KG: Amendment 39–22588; Docket No. FAA–2023–1637; Project Identifier MCAI–2023–00184–E.

(a) Effective Date

This airworthiness directive (AD) is effective December 26, 2023.

(b) Affected ADs

None.

(c) Applicability

This AD applies to Rolls-Royce Deutschland Ltd & Co KG (RRD) Model Trent 1000–A2, Trent 1000–AE2, Trent 1000–C2, Trent 1000–CE2, Trent 1000–D2, Trent 1000–E2, Trent 1000–G2, Trent 1000–H2, Trent 1000–J2, Trent 1000–K2, and Trent 1000–L2 engines.

(d) Subject

Joint Aircraft Service 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 AD 2023–0027, dated January 31, 2023 (EASA AD 2023–0027).

(h) Exceptions to EASA AD 2023–0027

(1) Where EASA AD 2023–0027 specifies compliance from 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 2023–0027.

(3) Where the service information referenced in EASA AD 2023–0027 specifies discarding the removed LP turbine stage 1 blade set, this AD requires removing the affected part from service.

(4) Where the service information referenced in EASA AD 2023–0027 specifies to quarantine the removed LP turbine stage 1 rotor disc, this AD requires removing the affected part from service.

(i) No Reporting Requirement

Although the service information referenced in EASA AD 2023–0027 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 2023-0027, dated January 31, 2023.

(ii) [Reserved]

(3) For EASA AD 2023-0027, 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 service information at 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 October 27, 2023.

Caitlin Locke,

Director, Compliance & Airworthiness Division, Aircraft Certification Service.

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-1311; Project Identifier MCAI-2022-00624-E; Amendment 39-22587; AD 2023-22-03]

RIN 2120-AA64

Airworthiness Directives; Safran Helicopter Engines, S.A. (Type Certificate Previously Held by Turbomeca, S.A.) Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is superseding Airworthiness Directive (AD) 2021-08-

02 for all Safran Helicopter Engines, S.A. (Safran) (type certificate previously held by Turbomeca, S.A.) Model Arriel 2D and Arriel 2E engines. AD 2021-08-02 required replacing certain critical parts before reaching their published in-service life limits, performing scheduled maintenance tasks before reaching their published periodicity, and performing unscheduled maintenance tasks when the engine meets certain conditions. Since the FAA issued AD 2021-08-02, Safran has revised the airworthiness limitation section (ALS) of the existing maintenance and overhaul manuals, introducing new and more restrictive instructions and maintenance tasks, which prompted this AD action. This AD requires updating the ALS of the existing engine maintenance manual (EMM) or instructions for continued airworthiness (ICA) and the existing approved maintenance or inspection program, as applicable, by incorporating the actions and associated thresholds and intervals, including life limits, as specified in a European Union Aviation Safety Agency (EASA) AD, which is incorporated by reference. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: This AD is effective December 26, 2023.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of December 26, 2023.

ADDRESSES:

AD Docket: You may examine the AD docket at regulations.gov under Docket No. FAA-2022-1311; 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 service information identified in this final rule, 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. It is also available at regulations.gov under Docket No. FAA-2022-1311.

- 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.

FOR FURTHER INFORMATION CONTACT:

Kevin Clark, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; phone: (781) 238-7088; email: kevin.m.clark@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2021-08-02, Amendment 39-21496 (86 FR 26651, May 17, 2021), (AD 2021-08-02). AD 2021-08-02 applied to all Safran Model Arriel 2D and Arriel 2E engines. AD 2021-08-02 required replacing certain critical parts before reaching their published in-service life limits, performing scheduled maintenance tasks before reaching their published periodicity, and performing unscheduled maintenance tasks when the engine meets certain conditions. As a terminating action, AD 2021-08-02 required operators to revise the ALS of their existing approved aircraft maintenance program (AMP) by incorporating the revised airworthiness limitations and maintenance tasks. The FAA issued AD 2021-08-02 to prevent failure of the engine.

The NPRM published in the **Federal Register** on October 31, 2022 (87 FR 65535). The NPRM was prompted by EASA AD 2022-0083, dated May 11, 2022 (EASA AD 2022-0083), issued by EASA, which is the Technical Agent for the Member States of the European Union (referred to after this as the MCAI), which supersedes EASA AD 2018-0273, dated December 13, 2018 (EASA AD 2018-0273). The MCAI states that the manufacturer published a revised ALS introducing new and more restrictive maintenance tasks and airworthiness limitations. These new or more restrictive maintenance tasks and airworthiness limitations include initial and repetitive inspections for clogging of the power turbine air pressurization pipe.

You may examine the MCAI in the AD docket at regulations.gov under Docket No. FAA-2022-1311.

In the NPRM, the FAA proposed to require revising the ALS of the operator's existing approved maintenance or inspection program, as applicable, to incorporate new and more restrictive airworthiness limitations.

The FAA issued a supplemental notice of proposed rulemaking (SNPRM) to amend 14 CFR part 39 to supersede AD 2021-08-02. The SNPRM published in the **Federal Register** on July 14, 2023 (88 FR 45109). The SNPRM was