

[Federal Register Volume 86, Number 171 (Wednesday, September 8, 2021)]  
[Rules and Regulations]  
[Pages 50230-50232]  
From the Federal Register Online via the Government Publishing Office [www.gpo.gov]  
[FR Doc No: 2021-19279]

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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2021-0198; Project Identifier MCAI-2020-00950-E; Amendment 39-21695; AD 2021-17-12]**

**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 superseding Airworthiness Directive (AD) 2020-13-07 for all Rolls-Royce Deutschland Ltd & Co KG (RRD) Trent 1000-D2, Trent 1000-J2, and Trent 1000-K2 model turbofan engines with a certain part-numbered fuel pump installed. AD 2020-13-07 required removal and replacement of the fuel pump with a part eligible for installation. This AD was prompted by the manufacturer's investigation into an unexpected reduction in fuel pump performance in certain high life fuel pumps and subsequent determination that an additional part-numbered fuel pump is subject to the same unsafe condition. This AD requires new and reduced life limits for certain part-numbered fuel pumps, depending on the engine model the fuel pump is installed on. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective October 13, 2021.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of October 13, 2021.

**ADDRESSES:** For service information identified in this final rule, contact Rolls-Royce plc, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; 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 <http://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0198.

## Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0198; 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 AD, 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 M. 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](mailto: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 2020-13-07, Amendment 39-21152 (85 FR 38312, June 26, 2020), (AD 2020-13-07). AD 2020-13-07 applied to all RRD Trent 1000-D2, Trent 1000-J2, and Trent 1000-K2 model turbofan engines with fuel pump, part number G5030FPU01, installed. The NPRM published in the Federal Register on March 30, 2021 (86 FR 16548). The NPRM was prompted by the manufacturer's investigation into an unexpected reduction in fuel pump performance in certain high life fuel pumps and life-related wear-out of the internal components and subsequent determination that an additional part-numbered fuel pump is subject to this same unsafe condition. In the NPRM, the FAA proposed to retain all the requirements of AD 2020-13-07. In the NPRM, the FAA also proposed to add an additional part-numbered fuel pump and additional Trent 1000 model turbofan engines on which this fuel pump is installed to the applicability. In the NPRM, the FAA also proposed to require new and reduced life limits for certain part-numbered fuel pumps, depending on the engine model the fuel pump is installed on. 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 2021-0006, dated January 7, 2021 (referred to after this as "the MCAI"), to address the unsafe condition on these products. The MCAI states:

An unexpected reduction in fuel pump performance has been seen during testing of high life units. Strip examination of these fuel pumps has identified that life related wear-out of the internal components is causing deterioration in pump efficiency. The effect of the loss of fuel pump efficiency is more pronounced on higher rated engines.

This condition, if not corrected, could lead to reduced engine thrust, possibly resulting in reduced control of the aeroplane.

To address this potential unsafe condition, Rolls-Royce published NMSB 73-AK581 (original issue) to provide instructions for replacement of the affected parts before exceeding reduced life limits. Consequently, EASA issued AD 2020-0124 to require the removal from service of the affected parts.

After that [EASA] AD was issued, Rolls-Royce issued NMSB 73-AK581 Revision 1, introducing an additional fuel pump, P/N TPS1000-05, as well as new and reduced life limits for the affected parts, depending on engine model (rating). Consequently, EASA issued AD 2020-0154, retaining the requirements of EASA AD 2020-0124, which was

superseded, expanding the Applicability to include additional engine models (ratings) and requiring implementation of the new and reduced life limits.

Since that [EASA] AD was issued, Rolls-Royce issued the NMSB, as defined in this [EASA] AD, introducing new and reduced life limits for the affected parts, depending on engine model (rating).

For the reason described above, this [EASA] AD retains the requirements of EASA AD 2020-0154, which is superseded, and requires implementation of the new and reduced life limits, as applicable.

You may obtain further information by examining the MCAI in the AD docket on <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0198.

## **Discussion of Final Airworthiness Directive**

### **Comments**

The FAA received comments from two commenters. The commenters were The Boeing Company (Boeing) and Rolls-Royce. The following presents the comments received on the NPRM and the FAA's response to each comment.

### **Request To Update Service Bulletin**

Boeing and Rolls-Royce requested that the FAA update the specified service information by referencing Revision 3 of Rolls-Royce (RR) Alert Non-Modification Service Bulletin (NMSB) TRENT 1000-73-AK581.

The FAA agrees and has updated this AD to reference RR Alert NMSB TRENT 1000-73-AK581, Revision 3, dated April 7, 2021. This change to this AD imposes no additional burden on operators.

### **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 RR Alert NMSB TRENT 1000-73-AK581, Revision 3, dated April 7, 2021 (RR Alert NMSB). The RR Alert NMSB introduces a reduced life limit for affected fuel pumps installed on certain RRD Trent 1000 model turbofan engines. The RR Alert NMSB also includes additional RRD Trent 1000 turbofan engine models that require implementation of the reduced life limits for affected fuel pumps. 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.

## Interim Action

The FAA considers this AD interim action. If final action is later identified, the FAA might consider further rulemaking.

## 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 |
|-------------------|---|------------|------------------|------------------------|
| Replace fuel pump | 3 work-hours × \$85 per hour<br>= \$255 | \$393,552  | \$393,807        | \$11,026,596           |

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected individuals.

## 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

The FAA has determined that 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 part 39 of the Federal Aviation Regulations (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:

- a. Removing Airworthiness Directive 2020-13-07, Amendment 39-21152 (85 FR 38312, June 26, 2020); and
- b. Adding the following new airworthiness directive:



**FAA**  
**Aviation Safety**

## **AIRWORTHINESS DIRECTIVE**

[www.faa.gov/aircraft/safety/alerts/](http://www.faa.gov/aircraft/safety/alerts/)  
[www.gpoaccess.gov/fr/advanced.html](http://www.gpoaccess.gov/fr/advanced.html)

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**2021-17-12 Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc):** Amendment 39-21695; Docket No. FAA-2021-0198; Project Identifier MCAI-2020-00950-E.

### **(a) Effective Date**

This airworthiness directive (AD) is effective October 13, 2021.

### **(b) Affected ADs**

This AD replaces AD 2020-13-07, Amendment 39-21152 (85 FR 38312, June 26, 2020).

### **(c) Applicability**

This AD applies to Rolls-Royce Deutschland Ltd & Co KG (RRD) (Type Certificate previously held by Rolls-Royce plc) Trent 1000-A, Trent 1000-A2, Trent 1000-AE, Trent 1000-AE2, Trent 1000-C, Trent 1000-C2, Trent 1000-CE, Trent 1000-CE2, Trent 1000-D, Trent 1000-D2, Trent 1000-G, Trent 1000-G2, Trent 1000-H, Trent 1000-H2, Trent 1000-J2, Trent 1000-K2, and Trent 1000-L2 model turbofan engines with a fuel pump, part number (P/N) G5030FPU01 or P/N TPS1000-05, installed.

### **(d) Subject**

Joint Aircraft System Component (JASC) Code 7314, Engine Fuel Pump.

### **(e) Unsafe Condition**

This AD was prompted by the manufacturer's investigation into an unexpected reduction in fuel pump performance in certain high life fuel pumps and life-related wear-out of the internal components, which causes deterioration in fuel pump efficiency. The FAA is issuing this AD to prevent failure of the fuel pump, loss of engine thrust control and reduced control of the airplane. The unsafe condition, if not addressed, could result in failure of the fuel pump, loss of thrust control, and loss of the airplane.

### **(f) Compliance**

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

### **(g) Required Actions**

Within the compliance time specified in Planning Information, paragraph 1.D.2, of Rolls-Royce (RR) Alert Non-Modification Service Bulletin TRENT 1000 73-AK581, Revision 3, dated April 7, 2021 (the RR Alert NMSB), or within 30 days after the effective date of this AD, whichever occurs

later, remove the fuel pump, P/N G5030FPU01 or P/N TPS1000-05, and replace it with a part eligible for installation.

#### **(h) Definition**

For the purpose of this AD, a “part eligible for installation” is a fuel pump with a P/N other than G5030FPU01 or TPS1000-05 or a fuel pump that has not exceeded the compliance time specified in Planning Information, paragraph 1.D.2, of the RR Alert NMSB.

#### **(i) 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 paragraph (j) of this AD. 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.

#### **(j) Related Information**

(1) For more information about this AD, contact Kevin M. 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 2021-0006, dated January 7, 2021, for more information. You may examine the EASA AD in the AD docket at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0198.

#### **(k) 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 (RR) Alert Non-Modification Service Bulletin TRENT 1000-73-AK581, Revision 3, dated April 7, 2021.

(ii) [Reserved]

(3) For RR service information identified in this AD, contact Rolls-Royce plc, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; 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.

[FR Doc. 2021-19279 Filed 9-7-21; 8:45 am]