



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2017-1117; Product Identifier 94-ANE-39-AD; Amendment 39-19112; AD 2017-24-08]**

**RIN 2120-AA64**

**Airworthiness Directives; Rolls-Royce plc Turbofan Engines**

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

**ACTION:** Final rule.

**SUMMARY:** We are superseding airworthiness directive (AD) 2014-24-08 for all Rolls-Royce plc (RR) RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 turbofan engines with certain low-pressure (LP) fuel filter-to-high-pressure (HP) fuel pump tube assemblies, or HP fuel pump-to-fuel flow governor (FFG) or FFG-to-HP pump inlet overspill return tube assemblies and flanged adaptor, installed. AD 2014-24-08 required replacing certain LP fuel filter-to-HP fuel pump tube assemblies. This AD retains the requirement in AD 2014-24-08 to remove the LP fuel filter-to-HP fuel pump tube, adds new compliance thresholds, and requires installation of new HP fuel pump-to-FFG and FFG-to-HP pump inlet overspill return tube assemblies and flanged adaptor. This AD was prompted by fuel leaks that have occurred at the flanged joints of the HP fuel pump-to-FFG tube assembly and FFG-to-HP pump inlet overspill return tube assembly. We are issuing this AD to correct the unsafe condition on these products.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** For service information identified in this final rule, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011-44-1332-242424; fax: 011-44-1332-249936; email: [http://www.rolls-royce.com/contact/civil\\_team.jsp](http://www.rolls-royce.com/contact/civil_team.jsp); Internet: [https:// customers.rolls-royce.com/public/rollsroycecare](https://customers.rolls-royce.com/public/rollsroycecare). You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125. It is also available on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA- 2017-1117.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA- 2017-1117; or in person at the Docket Management Facility 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, regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, 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:** Robert Green, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7754; fax: 781-238-7199; email: [robert.green@faa.gov](mailto:robert.green@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2014-24-08, Amendment 39-18041 (79 FR 71308, December 2, 2014), “AD 2014-24-08,” for all RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 turbofan engines. AD 2014-24-08 applied to the specified products. The NPRM published in the Federal Register on May 26, 2017 (82 FR 24262). The NPRM proposed to continue to require replacing certain LP fuel filter-to-HP fuel pump tube assemblies. That NPRM also proposed to require installation of new HP fuel pump-to-FFG and FFG-to-HP pump inlet overspill return tube assemblies and flanged adaptor.

### **Comments**

We gave the public the opportunity to participate in developing this AD. We considered the comments received.

### **Request to Change Installation Prohibition**

American Airlines (AAL) and FedEx Express stated the proposed AD would prohibit reinstallation of earlier HP fuel pump to FFG and FFG to HP pump inlet overspill return tube assemblies. AAL and FedEx Express request clarification that the HP fuel tube does not require replacement if removed simply to gain access to other components.

FedEx is concerned that the current wording would result in serviceable tube assemblies having to be replaced in a line environment when components such as the FFG or fuel pump are replaced as part of fuel system troubleshooting. AAL didn’t justify their request.

We agree. This AD requires replacement of the affected parts before they exceed 4,750 engine flight cycles (FC) or 15,000 flight hours (FH), or at a shop visit, whichever occurs first. To address this comment, we deleted the Installations Prohibition paragraph and integrated the previous restrictions into paragraph (h), Definitions, adding the statement that “The reinstallation of affected parts, removed to facilitate on-wing/in-service maintenance of adjacent components, is acceptable within the limits prescribed by paragraphs (g)(1) and (2) of this AD.”

### **Request to Change Applicability**

AAL and UPS requested clarification of shop visit. They would like to clarify the shop visit definition as, “For the purpose of this AD, a shop visit is defined as the separation of major mating module flanges to perform maintenance or overhaul, excluding the removal or replacement of the high speed gearbox, or for the sole purpose of transporting the engine without performing subsequent maintenance or overhaul.” They gave no justification for the requested change.

We disagree. The shop visit definition is intended to require the replacement of parts when the engine is in a shop for maintenance or overhaul with no exceptions, consistent with the associated service bulletin. We did not change this AD.

### **Request to Add Credit for Previous Actions**

UPS stated the proposed AD requires incorporation of Service Bulletins (SBs) RB.211-73-H131, Revision 1 and RB.211-73-G230, Revision 3. UPS requests this AD give credit for previous incorporation of any prior revision of these two service bulletins.

We agree. Corrective action done prior to the effective date of this AD using earlier revisions of the cited service bulletins is acceptable. We added a new section Credit for Previous Actions after paragraph (h) of this AD.

#### **Request to Change Required Actions**

UPS requested that the pre-SB RB.211-73-H131 part numbers be listed in paragraph (g)(1) of this AD, to clarify only pre-SB RB.73-H131 engines are affected.

We agree. We revised paragraph (g)(1) of this AD.

#### **Request to Change Compliance Time**

UPS stated the proposed AD section (g)(1) requires incorporation of SB RB.211-73-H131 before the LP fuel filter-to-HP fuel pump tube exceeds 4,750 FC or 15,000 FH. These time and cycle limits appear to have originated with SB RB.211-73-E355, which UPS has previously interpreted as "soft limits" rather than "hard limits" due to the verbiage used in the SB. UPS requests the final rule include a drawdown period of 400 cycles / 800 hours to allow time for operators to incorporate these modifications on those engines which already exceed the stated thresholds. UPS justified the request to prevent operational disruptions. RR has reviewed the original technical justification for introducing the life limits and modifications. Given the lives of the UPS fleet, a 400 flight cycle extension does not have an appreciable effect on engine safety. The dual engine in-flight shut down rate remains below the continued airworthiness threshold.

We agree. A RR review supports the requested drawdown plan. We revised paragraph (g)(1) of this AD.

## **Request to Define Engine Hours/Cycles Since New**

UPS requests that the compliance thresholds be listed as (engine or part) hours/cycles since new or since last accomplishment of SB RB.211-73-E355, whichever is sooner. They state that SB RB.211-73-E355 installs a new LP fuel filter-to-HP fuel pump tube.

We partially agree. We agree that time since accomplishing SB RB.211-73-E355 is equivalent to time since new for the replaced part. We disagree that the compliance thresholds need to be changed as this AD already specifies compliance before “the part exceeds 4,750 engine flight cycles (FC) or 15,000 flight hours (FH), since new”. We did not change this AD.

## **Conclusion**

We reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously. We determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

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

Rolls-Royce plc has issued SB RB.211-73-G230, Revision 3, dated April 8, 2016. The SB describes a modification (mod 73-G230) and introduces new HP fuel pump-to-FFG and FFG-to-HP pump inlet overspill return tube assemblies with a larger O-ring groove on the end adaptor sealing face. RR has also issued SB RB.211-73-H131, Revision 1, dated September 2, 2014. The SB introduces a new LP fuel filter-to-HP fuel pump tube assembly. 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 the ADDRESSES section.

**Costs of Compliance**

We estimate that this AD affects 100 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

**Estimated costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Replacement of fuel tube assemblies	8.5 work-hours X \$85 per hour = \$722.50	\$17,800.00	\$18,522.50	\$1,852,250.00

**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.

We are 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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and associated appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

### **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) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, and
- (4) 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.

## **Adoption of 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 removing airworthiness directive (AD) 2014-24-08, Amendment 39 18041 (79 FR 71308, December 2, 2014), and adding the following new AD:

2017-24-08 **Rolls-Royce plc**: Docket No. FAA 2017-1117; Amendment 39-19112;

Product Identifier 94-ANE-39-AD.

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

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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

This AD supersedes AD 2014-24-08, Amendment 39-18041 (79 FR 71308, December 2, 2014).

#### **(c) Applicability**

This AD applies to all Rolls-Royce plc (RR) RB211-535E4-37, RB211-535E4-B-37, and RB211-535E4-C-37 turbofan engines with low-pressure (LP) fuel filter-to-high-pressure (HP) fuel pump tube assembly, part number (P/N) UL16692, AE709623-1, 163521538, or 163521545, installed; or HP fuel pump-to-fuel flow governor (FFG), P/N

UL16691 or UL37214, installed; or FFG-to-HP pump inlet overspill return tube assemblies, P/N UL16690 or UL37213, installed; or flanged adaptor, P/N UL37218, installed.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7321, Fuel Control/Turbine Engines.

**(e) Unsafe Condition**

This AD was prompted by reports of fuel leaks that have resulted in engine in-flight shutdowns. We are issuing this AD to prevent loss of fuel supply to the engine, which could lead to the in-flight shutdown of one or more engines, loss of thrust control, and damage to the airplane.

**(f) Compliance**

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

**(g) Required Actions**

(1) Remove LP fuel filter-to-HP fuel pump tube assembly, P/N UL16692, AE709623-1, 163521538, and 163521545, and replace with a part eligible for installation, at the applicable compliance times specified in paragraphs (g)(1)(i) or (ii) of this AD, whichever occurs first, using the Accomplishment Instructions of RR Service Bulletin (SB) RB.211-73-H131, Revision 1, dated September 2, 2014.

(i) At the next shop visit after the effective date of this AD, or

(ii) at the later of the following:

(A) Before the part exceeds 4,750 engine flight cycles (FC) or 15,000 flight hours (FH), since new, whichever occurs first, or

(B) Within 400 FC or 800 FH, whichever occurs first, after the effective date of this AD.

(2) For affected engines with an HP fuel pump-to-FFG tube assembly or FFG-to-HP pump inlet overspill return tube assembly, or flanged adaptor, installed, replace the parts concurrent with the actions specified in paragraph (g)(1) of this AD, if applicable, or during the next shop visit, using the Accomplishment Instructions of RR SB RB.211-73-G230, Revision 3, dated April 8, 2016.

**(h) Definitions**

(1) For the purpose of this AD, a part eligible for installation excludes the following: LP fuel filter-to-HP fuel pump tube assembly, P/N UL16692, AE709623-1, 163521538, or 163521545; HP fuel pump-to-FFG tube assembly, P/N UL16691 or UL37214; or FFG-to-HP pump inlet overspill return tube assembly, P/N UL16690 or UL37213; or flanged adaptor, P/N UL37218. The reinstallation of affected parts, removed to facilitate on-wing/in-service maintenance of adjacent components is acceptable within the limits prescribed by paragraphs (g)(1) and (2) of this AD.

(2) For the purpose of this AD, a shop visit is the induction of an engine into the shop for maintenance or overhaul.

**(i) Credit for Previous Actions**

You may take credit for the corrective action required by paragraphs (g)(1) and (2) of this AD, if you performed these actions before the effective date of this AD using RR Alert NMSB RB.211-73-H131, original issue, dated May 10, 2013 or RR Alert NMSB RB.211-73-G230, Revision 2, dated December 20, 2012, respectively.

**(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 ECO Branch, send it to the attention of the person identified in paragraph (l)(1) 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.

**(k) Related Information**

(1) For more information about this AD, contact Robert Green, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7754; fax: 781-238-7199; email: robert.green@faa.gov.

(2) Refer to MCAI European Aviation Safety Agency (EASA) AD 2017-0006, dated January 10, 2017, and EASA AD 2014-0123, dated May 15, 2014, for more information. You may examine the MCAI in the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating it in Docket No. FAA- 2017-1117.

**(l) 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 plc (RR) Service Bulletin (SB) RB.211-73-H131, Revision 1, dated September 2, 2014.

(ii) RR SB RB.211-73-G230, Revision 3, dated April 8, 2016.

(3) For RR service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE24 8BJ; phone: 011-44-1332-242424; fax: 011-44-1332-249936; email: [http://www.rolls-royce.com/contact/civil\\_team.jsp](http://www.rolls-royce.com/contact/civil_team.jsp); Internet: [https:// customers.rolls-royce.com/public/rollsroycecare](https://customers.rolls-royce.com/public/rollsroycecare).

(4) You may view this service information at FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

(5) You may view this service information at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on November 22, 2017.

Robert J. Ganley,  
Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.  
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