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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2011-0836; Directorate Identifier 2010-NE-38-AD; Amendment 39-16898; AD 2011-26-08]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce plc (RR) RB211-Trent 800 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for all Rolls-Royce plc (RR) RB211-Trent 800 Series Turbofan Engines. This AD results from mandatory continuing airworthiness information (MCAI) originated by an aviation authority of another country to identify and correct an unsafe condition on an aviation product. The MCAI describes the unsafe condition as fuel leaks from the engine due to damage to sections of the fan case low-pressure (LP) fuel tubes. We are issuing this AD to prevent engine fuel leaks, which could result in risk to the airplane.

DATES: This AD becomes effective January 24, 2012. The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of January 24, 2012.

ADDRESSES: The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

FOR FURTHER INFORMATION CONTACT: Alan Strom, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; email: alan.strom@faa.gov; phone: (781) 238-7143; fax: (781) 238-7199.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that would apply to the specified products. That NPRM was published in the Federal Register on

August 22, 2011 (76 FR 52288). That NPRM proposed to correct an unsafe condition for the specified products. The MCAI states:

Fuel leaks from the engine have occurred in-service due to damage to sections of the fan case Low Pressure (LP) fuel tubes which run between the Low Pressure and the High Pressure (HP) fuel pumps. This damage has been caused by fretting between the securing clips and the tube outer surface, which has caused localised thinning of the tube wall thickness. The thinning of the tube wall causes the tube to fracture and fuel loss to occur.

The corrective action includes inspection of the tubes and replacement of the associated clips. The fretting and thinning of the fuel tubes is caused by relative movement between the tubes and the clips. You may obtain further information by examining the MCAI in the AD docket.

Comments

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

Request To Correct Title in Rolls-Royce Service Bulletin

A commenter, Air New Zealand, requested that we change the service bulletin reference from "RB.211-73-D685" to "RB.211-73-AD685."

We agree. We changed the AD to correct the service bulletin reference.

Request To Change Service Bulletin Revision Number

Three commenters, American Airlines (American), Delta Airlines (Delta), and the Boeing Company (Boeing), suggested that we change compliance from Revision 5 to Revision 6 of the Rolls-Royce Service Bulletin.

We agree. We changed the AD to use RR SB RB.211-73-AD685, Revision 6, dated February 21, 2011, which is the latest version of the service bulletin.

Request To Allow Compliance to Earlier Revisions of the Service Bulletin

One commenter, Delta, asked that engines previously inspected per Revision 3 of SB RB.211-73-AD685, dated August 18, 2009; or Revision 4 of SB RB.211-73-AD685, dated January 20, 2010 or Revision 5 of SB RB.211-73-AD685, dated August 18, 2010; to have met the initial inspection requirements of the AD.

We agree. We added a new paragraph to the AD called "Previous Inspection Credit" which provides credit for performing the initial inspection according to the requirements of Revisions 3, 4, or 5 of the SB.

Request To Revise Cost of Compliance

A commenter, American Airlines, requested that the cost estimate per engine be increased to \$905. American noted that the AD creates repetitive not one-time expenses due to the need for repetitive inspections. American also asserted that the estimate in the NPRM (76 FR 52288, August 22, 2011) of labor hours to comply with the AD was not accurate. American suggested 8 labor hours per inspection is a realistic figure.

We agree in part. While the AD does require repetitive inspections, we do not agree with including repetitive expenses for inspections in our cost estimate. We only include the cost of one

inspection cycle, even if the AD requires repetitive inspections, in our cost estimates. We agree our labor estimate should be increased. We accept that 8 labor hours is a realistic estimate of labor hours and allows us to make a more accurate assessment of labor cost. We changed the estimate of work hours in the AD from 3 to 8. We also corrected the cost of the parts required from \$225 in the NPRM to \$884. We revised the total cost to comply with the AD from \$52,800 to \$172,040.

Request To Revise Initial Inspection Paragraph

A commenter, Boeing, requested that the Initial Inspection paragraph be revised by including the following: "Inspect the Fuel Oil Heat Exchanged (FOHE) mounting hardware for signs of damage. Use paragraph 3.A.(4) of the Service Bulletin RB.211-73-AD685, Revision 6, dated February 21, 2011." Boeing noted that damage or wear to FOHE mounts may contribute to low pressure (LP) fuel tube cracking. Delta Airlines commented further that EASA AD 2010-0188 requires this FOHE mount inspection because it requires accomplishment of the entire service bulletin when doing the inspection. For clarity, Delta requested that the final rule include a comment that the inspection requirements do not mandate the FOHE mount inspections.

We do not agree. The requirement of this AD to inspect the fuel tubes is sufficient to ensure safe operation. The repetitive inspection intervals for fuel tubes required by this AD consider observed FOHE mount wear. This AD does not require inspection of the FOHE mounts. We did not change the AD based on this comment.

Request To Add Requirement To Remove Damaged Fuel Tubes

Two commenters, Boeing and Delta, requested clarification regarding when to replace fuel tubes. Boeing requested that under "Actions and Compliance" the following requirement be included: "Removal and replacement of damaged fuel tubes (P/N FK23986) in accordance with paragraph 3.A.(5) of the Service Bulletin RB.211-73-AD685, Revision 6, dated February 21, 2011." Boeing indicated that rejected fuel tubes need to be replaced to avoid fuel leaks. Delta indicated that the On-wing Inspection and In-shop Inspection paragraphs do not include information about replacing tubes when needed as the result of inspections. Delta also noted that the Repetitive Inspection paragraph does discuss replacement of these parts when needed.

We agree in part. Although parts that fail inspection may not be returned to service, we agree that clarifying when fuel tubes are replaced would help. We revised the On-wing Inspection and In-shop Inspection paragraphs to indicate that the tubes should be replaced if they fail inspection.

Request To Clarify Initial Inspection Requirement

One commenter, Delta, noted that under the Initial Inspection paragraph, one of the options for complying with the AD is to do the initial inspection before 3,000 hours since last inspection. Delta requested that we clarify the meaning of "last inspection."

We agree. We added a definition paragraph to indicate that our reference to 3,000 hours since last inspection refers to the inspection of the fan case LP fuel tubes for fretting between the securing clips and the tube outer surface part numbers FK22617, FK19213, and FK23986.

Request To Clarify Handling of Clips for Fuel Tubes

One commenter, Delta, asked that the final rule clarify how to handle the clips that hold the fuel tubes in place. Delta noted that paragraphs 3.A.(2) and 3.A.(3) (on-wing) and 3.B.(2) and 3.B.(3) of RR SB RB.211-73-AD685, which are referenced in the NPRM (76 FR 52288), do not include inspection criteria for the clips. Delta requested that we either require inspection or replacement of the clips with a new or serviceable part per the note in Paragraph 3.A. of the RR SB RB.211-73-

AD685, which says that "clips should be removed and replaced one at a time to prevent pre-loading of the clip position."

We agree. The fretting and thinning of the fuel tubes is caused by relative movement between the tubes and the clips. Worn or fretted clips cause increased relative movement between the tubes and the clips and thus more tube wear and fretting. Clip wear is not repairable and so the clips cannot be reused. We, therefore, revised the AD by changing the On-wing Inspection and In-shop Inspection paragraphs to indicate that the clips must be replaced during the initial inspection and during every repeat inspection.

Request To Clarify Repeat Inspections Paragraph

One commenter, Delta, requested clarification of the Repeat Inspections paragraph. Delta noted that this paragraph might be misinterpreted to mean inspection and tube replacement should be accomplished per paragraphs 3.A.(2), 3.A.(3), 3.B.(2), and 3.B.(3) of RR SB RB.211-73-AD685. Since these paragraphs only apply to replacement of the tubes, Delta believes the language should be clarified.

We agree. We revised the Repeat Inspections paragraph to clarify that paragraphs 3.A.(1) through 3.A.(3) (On-wing) or 3.B.(1) through 3.B.(3) (In-shop) of RR SB RB.211-78-AD685 apply to the inspection.

Conclusion

We reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We determined that these changes will not increase the economic burden on any operator nor increase the scope of the AD.

Costs of Compliance

We estimate that this AD affects about 110 products of U.S. registry. We also estimate that it will take about 8 work-hours per product to comply with this AD. The average labor rate is \$85 per work-hour. Required parts cost about \$884 per product. Based on these figures, we estimate the cost of the AD on U.S. operators to be \$172,040.

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.

Regulatory Findings

We 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 this AD:

1. Is not a "significant regulatory action" under Executive Order 12866;
2. Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); 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.

We prepared a regulatory evaluation of the estimated costs to comply with this AD and placed it in the AD docket.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Operations office (phone: (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

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 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 (AD):



2011-26-08 Rolls-Royce plc: Amendment 39-16898; Docket No. FAA-2011-0836; Directorate Identifier 2010-NE-38-AD.

(a) Effective Date

This airworthiness directive (AD) becomes effective January 24, 2012.

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Rolls-Royce plc (RR) RB211-Trent 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17, and 895-17 turbofan engines. These engines are installed on, but not limited to, Boeing 777 series airplanes.

(d) Reason

This AD was prompted by fuel leaks from the engine that occurred in-service due to damage to sections of the fan case low-pressure (LP) fuel tubes, which run between the LP and the high-pressure (HP) fuel pumps. This damage was caused by fretting between the securing clips and the tube outer surface, which caused localized thinning of the tube wall thickness. The thinning of the tube wall causes the tube to fracture and leak fuel. We are issuing this AD to prevent engine fuel leaks, which could result in risk to the airplane.

(e) Actions and Compliance

Unless already done, do the following actions.

(f) Initial Inspection and Clip replacement

Within 2,000 hours in service after the effective date of this AD, or before accumulating 3,000 hours-since-new or 3,000 hours-since-last-inspection, whichever is latest, do one of the following:

(1) On-Wing Inspection and Clip Replacement

Inspect the fan case LP fuel tubes, part numbers (P/Ns) FK22617, FK19213, and FK23986. Replace the clips that hold the fuel tubes in place. Use paragraphs 3.A.(1) through 3.A.(3) (on-wing) of RR Non-modification Alert Service Bulletin (ASB) RB.211-73-AD685, Revision 6, dated February 21, 2011 to do the inspection. Replace any fan case LP fuel tubes that fail inspection.

(2) In-Shop Inspection and Clip Replacement

Inspect the fan case LP fuel tubes, P/N FK22617, FK19213, and FK23986. Replace the clips that hold the fuel tubes in place with new or serviceable clips. Use paragraphs 3.B.(1) through 3.B.(3) (in-shop) of RR Non-modification ASB RB.211-73-AD685, Revision 6, dated February 21, 2011 to do the inspection. Replace any fan case LP fuel tubes that fail inspection.

(g) Repetitive Inspection and Clip Replacement

Repeat the inspection required by paragraphs (f)(1) and (f)(2) of this AD and replace the clips at intervals not exceeding every 3,000 hours time-since-last-inspection.

(h) Re-Installation Prohibition

Do not re-install any clips replaced in accordance with paragraphs (f)(1) and (f)(2) of this AD.

(i) Previous Inspection Credit

If you previously performed the inspection required by Revision 3 of SB RB.211-73-D685, dated August 18, 2009, or Revision 4 of SB RB.211-73-D685, dated January 20, 2010, or Revision 5 of ASB RB.211-73-AD685, dated August 18, 2010, you met the initial inspection requirements of this AD.

(j) Definition

"Last inspection" means the last inspection of the fan case LP fuel tubes, P/Ns FK22617, FK19213, and FK23986, for fretting between the securing clips and the tube outer surface.

(k) FAA AD Differences

None.

(l) Alternative Methods of Compliance (AMOCs)

The Manager, Engine Certification Office, FAA, may approve AMOCs for this AD. Use the procedures found in 14 CFR 39.19 to make your request.

(m) Related Information

(1) Refer to Mandatory Continuing Airworthiness Information European Aviation Safety Agency (EASA) Airworthiness Directive 2010-0188, dated September 20, 2010, and Rolls-Royce plc Alert Service Bulletin RB.211-73-AD685, Revision 6, dated February 21, 2011, for related information. Contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE248BJ; phone: 011-44-1332-242424; fax: 011-44-1332-245418; or email: http://www.rolls-royce.com/contact/civil_team.jsp, for a copy of this service information.

(2) Contact Alan Strom, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; email: alan.strom@faa.gov; phone: (781) 238-7143; fax: (781) 238-7199, for more information about this AD.

(n) Material Incorporated by Reference

(1) You must use the following service information to do the actions required by this AD, unless the AD specifies otherwise. The Director of the Federal Register approved the incorporation by reference (IBR) under 5 U.S.C. 552(a) and 1 CFR part 51 of the following service information on the date specified.

(2) Rolls-Royce plc Alert Service Bulletin RB.211-73-AD685, Revision 6, dated February 21, 2011, approved for IBR January 24, 2012.

(3) For service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, England, DE248BJ; phone: 011-44-1332-242424; fax: 011-44-1332-245418 or email: http://www.rolls-royce.com/contact/civil_team.jsp.

(4) You may review copies at the FAA, New England Region, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call (781) 238-7125.

(5) You may also review copies of the service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at an NARA facility, call (202) 741-6030, or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

Issued in Burlington, Massachusetts, on December 12, 2011.

Thomas A. Boudreau,
Acting Manager, Engine & Propeller Directorate,
Aircraft Certification Service.