



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-28059; Directorate Identifier 2007-NE-13-AD; Amendment 39-17061; AD 2012-10-12]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce plc (RR) Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are superseding an existing airworthiness directive (AD) for all RR RB211-Trent 553-61, 553A2-61, 556-61, 556A2-61, 556B-61, 556B2-61, 560-61, 560A2-61, 768-60, 772-60, 772B-60, 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17, and 895-17 turbofan engines. That AD currently requires inspecting the intermediate-pressure (IP) compressor rotor shaft rear balance land for cracks. This new AD continues to require initial inspections, adds additional inspections, and a mandatory terminating action. This AD was prompted by additional cracking on RB211-Trent 700 and RB211-Trent 800 IP compressor rotor shafts found since the existing AD was issued. We are issuing this AD to detect cracking on the IP compressor rotor rear balance land. IP compressor rotor rear balance land cracking can lead to uncontained failure of the rotor and damage to the airplane.

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

The Director of the Federal Register approved the incorporation by reference of certain publications listed in the AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: 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 e-mail from http://www.rolls-royce.com/contact/civil_team.jsp. You may review copies of the referenced service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7121.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; 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 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: Alan Strom, Aerospace Engineer, Engine Certification Office, FAA, 12 New England Executive Park, Burlington, MA; phone: 781-238-7143; fax: 781-238-7199; e-mail: alan.strom@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a supplemental notice of proposed rulemaking (SNPRM) to amend 14 CFR part 39 to supersede AD 2008-18-08, Amendment 39-15665 (73 FR 52201, September 9, 2008). That AD applies to the specified products. The SNPRM published in the Federal Register on January 20, 2012 (77 FR 2932). The original NPRM (76 FR 64283, October 18, 2011) proposed to continue to require initial inspections, add additional inspections, and an optional terminating action. The SNPRM proposed to

continue to require initial inspections, add additional inspections, and a mandatory terminating action.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the proposal and the FAA's response to each comment.

Request to Correct the Type of Inspection Called Out

One commenter, Rolls-Royce plc, requested that we change "Since we issued that NPRM, RR has ceased efforts to develop an on-wing ECI" to "Since we issued that NPRM, RR has ceased efforts to develop an on-wing ultrasonic inspection." The commenter stated that they were developing an ultrasonic inspection, not an ECI.

We agree that we called out the wrong type of inspection in that part of the SNPRM preamble. However, that information is not repeated in the final rule. We did not change the AD.

Request to Correct Reference Errors

Two commenters, The Boeing Company and Rolls-Royce plc, requested that we change the service bulletin number in paragraph (k)(2)(iii), from RR Alert Service Bulletin (ASB) No. RB.211--72-AG401, Revision 2, dated July 5, 2011, to RR ASB No. RB.211-72-AG402, Revision1, dated January 11, 2011. They also requested that we correct the paragraph (j)(1) to (j)(2) in that same paragraph.

We partially agree. We agree that we misnumbered the service bulletins. We do not agree to correct them because we deleted paragraph (k)(2)(iii) from the final AD.

Request to Clarify That Re-Balancing Eliminates the Requirement for All Repetitive Inspections

Rolls-Royce plc requested that we clarify that re-balancing eliminates the requirement for all repetitive inspections.

We agree. We changed the AD so that the mandatory terminating action eliminates the requirements for both on-wing and in-shop repetitive inspections.

Request for Clarification of Inspections Acceptable for Use

American Airlines requested that we make it clear that the inspections required in paragraph 2(f)(1) of the SNPRM are acceptable for use whether the engine is on-wing (installed on an airplane) or in-shop, but not during maintenance defined as a shop visit by the AD. American also recommended that we re-arrange the inspections in paragraphs (f)(1) and (f)(2) so that they are aligned with on-wing and off-wing maintenance activities.

We agree. We clarified the AD by eliminating the headings of “On-Wing Inspections” and “In-Shop Inspections” from paragraphs (f)(1), (f)(2), (g)(1), and (g)(2) of the AD. We also re-numbered the sub-paragraphs under paragraph (f), to (1), (2) and (3), without sub-headings. We also re-numbered the sub-paragraphs under paragraph (g) to (1), (2) and (3), without sub-headings.

Request to Delete the Re-Balance Requirement

American Airlines requested that in the Mandatory Terminating Action paragraph (j) of the SNPRM, we delete the requirement to re-balance the engines in accordance with ASBs No. RB.211-72-AG401 and No. RB.211-72-AG402. Instead, require inspection of the IP compressor rear shaft balance land, prohibit re-installation of balance weights on the IP compressor rear shaft balance land, simplify paragraph (k) to combine the previous credit inspection paragraphs, and delete the re-balancing paragraph.

The commenter stated that removal of the unsafe condition is accomplished by removal of the IP compressor balance weights from the rear balance land, which stops the fretting that causes the compressor rear shaft to crack.

We partially agree. We agree with eliminating the requirement to re-balance the engine in accordance with ASBs No. RB.211-72-AG401 and No. RB.211-72-AG402,

and removing the associated previous credit paragraphs because permanently removing the existing balance weights from the IP compressor rotor rear shaft balance land eliminates the unsafe condition. Accordingly, we changed the AD by eliminating the requirement to re-balance the engine in accordance with ASBs No. RB.211-72-AG401 and No. RB.211-72-AG402. We do not agree with further simplifying paragraph (k) because we maintained all of the sub-paragraphs for paragraph (f) and (g).

We also added the following Prohibition Statement: "Once you have accomplished paragraphs (j)(1) or (j)(2) of this AD, do not re-install balance weights on the compressor rear shaft balance land."

We also deleted previous credit for re-balancing paragraphs (k)(1)(iii) and (k)(2)(iii) from the AD.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of the AD.

Costs of Compliance

We estimate that this AD will affect about 136 engines installed on airplanes of U.S. registry. We also estimate that it will take about 3.5 work-hours per engine to perform the on-wing/in-shop visual inspections, about 2.5 work-hours per engine to perform the in-shop eddy current inspections, and about 8 work-hours to rebalance the IP compressor. The average labor rate is \$85 per work-hour. Based on these figures, we estimate the total cost of the AD to U.S. operators to be \$470,696.

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 have 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) 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, 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 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) 2008-18-08, Amendment 39-15665 (73 FR 52201, September 9, 2008), and adding the following new AD:

2012-10-12 **Rolls-Royce plc:** Amendment 39-17061; Docket No. FAA-2007-28059; Directorate Identifier 2007-NE-13-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 2008-18-08, Amendment 39-15665, (73 FR 52201, September 9, 2008).

(c) Applicability

This AD applies to Rolls-Royce plc (RR) RB211-Trent 553-61, 553A2-61, 556-61, 556A2-61, 556B-61, 556B2-61, 560-61, 560A2-61, 768-60, 772-60, 772B-60, 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17, and 895-17 turbofan engines.

(d) Unsafe Condition

This AD was prompted by additional cracking on RB211-Trent 700 and RB211-Trent 800 IP compressor rotor shafts found since the existing AD 2008-18-08, Amendment 39-15665, (73 FR 52201, September 9, 2008) was issued. We are issuing

this AD to detect cracking on the IP compressor rotor rear balance land. IP compressor rotor rear balance land cracking can lead to uncontained failure of the rotor and damage to the airplane.

(e) Compliance

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

(f) RB211-Trent 700 Series Engines - Rear Balance Land Inspections

(1) Within 625 cycles-in-service (CIS) after the effective date of this AD, borescope inspect the IP compressor rotor shaft rear balance land. Use RB211 Trent 700 Series Propulsion System Non-Modification Alert Service Bulletin (NMASB) No. RB.211-72-AG270, Revision 4, dated March 21, 2011, sections 3.A.(2)(a) through 3.A.(2)(c) and 3.A.(3)(a) through 3.A.(3)(c), or 3.B.(2)(a) through 3.B.(2)(c) and 3.B.(4)(a) through 3.B.(4)(c), to do the inspection.

(2) Thereafter, repeat the inspection within every 625 cycles-since-last inspection (CSLI). You may count CSLI from the last borescope inspection or the last eddy current inspection (ECI), whichever has occurred last.

(3) At each shop visit after the effective date of this AD, perform an ECI and visually inspect the IP compressor rotor rear shaft balance land, and visually inspect the balance weights. Use RB211 Trent 700 and 800 Series Propulsion Systems NMASB No. RB.211-72-AG085, Revision 2, dated July 7, 2011, sections 3.A. through 3.D.(3)(b)(v), except paragraphs 3.D.(3)(a)(ii) and 3.D.(3)(b)(iii), to do the inspections.

(g) RB211-Trent 800 Series Engines - Rear Balance Land Inspections

(1) Within 475 CIS after the effective date of this AD, borescope inspect the IP compressor rotor shaft rear balance land. Use RB211 Trent 800 Series Propulsion System NMASB No. RB.211-72-AG264, Revision 5, dated March 21, 2011, sections 3.A.(2)(b) through 3.A.(2)(c) and 3.A.(3)(a) through 3.A.(3)(c), or 3.B.(2)(a) through 3.B.(2)(c) and 3.B.(4)(a) through 3.B.(4)(c), to do the inspection.

(2) Thereafter, repeat the inspection within every 475 CSLI. You may count CSLI from the last borescope inspection or the last ECI, whichever has occurred last.

(3) At each shop visit, perform an ECI and visually inspect the IP compressor rotor rear shaft balance land, and visually inspect the balance weights. Use RB211 Trent 700 and 800 Series Propulsion Systems NMASB No. RB.211-72-AG085, Revision 2, dated July 7, 2011, sections 3.A. through 3.D.(3)(b)(v), except paragraphs 3.D.(3)(a)(ii) and 3.D.(3)(b)(iii), to do the inspections.

(h) RB211-Trent 500 Series Engines – In-Shop Rear Balance Land Inspections

At each shop visit, perform an ECI of the IP compressor rotor shaft and visually inspect the balance weights. Use RB211 Trent 500 Series Propulsion System NMASB No. RB.211-72-AF260, Revision 5, dated July 7, 2011 sections 3.A. through 3.B.(3)(a)(iii) to do the visual inspection, or RB211 Trent 500 and 900 Series Propulsion Systems Non-Modification Service Bulletin (NMSB) No. RB.211-72-G448, Revision 3, dated July 7, 2011 section 3.D.(1) through 3.D.(14) to do the ECI.

(i) Definition

For the purposes of this AD, a shop visit is defined as introduction of an engine into a shop, and disassembly sufficient to expose the IP compressor module rear face.

(j) Mandatory Terminating Action for RB211-Trent 700 and RB211-Trent 800 Engines

(1) Perform mandatory terminating action to the in-shop repetitive inspections in paragraph (f)(2) and (f)(3) of this AD. At the next shop visit in which any level of inspection or strip is scheduled to be carried out on the IP compressor, modify RB211-Trent 700 engines by removing the existing IP compressor balance weights.

(2) Perform mandatory terminating action to the in-shop repetitive inspections in paragraph (g)(2) and (g)(3) of this AD. At the next shop visit in which any level of

inspection or strip is scheduled to be carried out on the IP compressor, modify RB211-Trent 800 engines by removing the existing IP compressor balance weights.

(3) Once you have accomplished paragraph (j)(1) or (j)(2) of this AD, do not re-install balance weights on the IP compressor rear shaft balance land.

(k) Credit for Previous Actions

(1) For RB211-Trent 700 series engines:

(i) If you borescope inspected your RB211-Trent 700 series engine using RB211 Trent 700 Series Propulsion System NMASB No. RB.211-72-AG270, Revision 1, dated December 14, 2009, or Revision 2, dated December 21, 2010, or Revision 3, dated February 25, 2011, before the effective date of this AD, you have satisfied the requirements of paragraph f(1) of this AD.

(ii) If you performed the ECI and visual inspection of your RB211-Trent 700 series engines using RB211 Trent 700 and 800 Series Propulsion Systems NMASB No. RB.211-72-AG085, Revision 1, dated September 27, 2010, before the effective date of this AD, you have satisfied the ECI and visual inspections required by paragraph (f)(3) of this AD.

(2) For RB211-Trent 800 series engines:

(i) If you borescope inspected your RB211-Trent 800 series engine using RB211 Trent 800 Series Propulsion System NMASB No. RB.211-72-AG264, Revision 3, dated December 21, 2010, or Revision 4, dated February 25, 2011, before the effective date of this AD, you have satisfied the requirements of paragraph (g)(1) of this AD.

(ii) If you performed the ECI and visual inspection of your RB211-Trent 800 series engines using RB211 Trent 700 and 800 Series Propulsion Systems NMASB No. RB.211-72-AG085, Revision 1, dated September 27, 2010, before the effective date of this AD, you have satisfied the ECI and visual inspections required by paragraph (g)(3) of this AD.

(3) For RB211-Trent 500 series engines:

(i) If you performed the ECI of your RB211-Trent 500 series engines using RB211 Trent 500 Series Propulsion System NMASB No. RB.211-72-AF260, Revision 4, dated July 28, 2009, before the effective date of this AD, you have satisfied the ECIs required by paragraph (h) of this AD.

(ii) If you performed the in-shop visual inspection of your RB211-Trent 500 series engines using RB211 Trent 500 and 900 Series Propulsion Systems NMSB No. RB.211-72-G448, Revision 2, dated December 23, 2010, before the effective date of this AD, you have satisfied the in-shop visual inspections required by paragraph (h) of this AD.

(l) Alternative Methods of Compliance (AMOCs)

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

(m) Related Information

(1) For more information about this AD, contact Alan Strom, Aerospace Engineer, Engine Certification Office, FAA, 12 New England Executive Park, Burlington, MA; phone: 781-238-7143; fax: 781-238-7199; e-mail: alan.strom@faa.gov.

(2) European Aviation Safety Agency AD 2011-0221, dated November 14, 2011, also pertains to the subject of this AD.

(n) Material Incorporated by Reference

(1) 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.

(2) You must use the following service information to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rolls-Royce plc RB211 Trent 700 Series Propulsion System Non-Modification Alert Service Bulletin No. RB.211-72-AG270, Revision 4, dated March 21, 2011.

(ii) Rolls-Royce plc RB211 Trent 700 and 800 Series Propulsion Systems Non-Modification Alert Service Bulletin No. RB.211-72-AG085, Revision 2, dated July 7, 2011.

(iii) Rolls-Royce plc RB211 Trent 800 Series Propulsion System Non-Modification Alert Service Bulletin No. RB.211-72-AG264, Revision 5, dated March 21, 2011.

(iv) Rolls-Royce plc RB211 Trent 500 Series Propulsion System Non-Modification Alert Service Bulletin No. RB.211-72-AF260, Revision 5, dated July 7, 2011.

(v) Rolls-Royce plc RB211 Trent 500 and 900 Series Propulsion Systems Non-Modification Service Bulletin No. RB.211-72-G448, Revision 3, dated July 7, 2011.

(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 e-mail from http://www.rolls-royce.com/contact/civil_team.jsp.

(4) You may review copies of the referenced service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803. 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 IBR 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 May 15, 2012.

Peter A. White,
Manager, Engine & Propeller Directorate,
Aircraft Certification Service.

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