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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2007-28059; Directorate Identifier 2007-NE-13-AD; Amendment 39-18087; AD 2015-02-20]**

**RIN 2120-AA64**

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

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

**ACTION:** Final rule.

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**SUMMARY:** We are superseding airworthiness directive (AD) 2013-15-10 that applies to certain Rolls-Royce plc (RR) RB211 turbofan engines. AD 2013-15-10 required inspecting the intermediate-pressure compressor (IPC) rotor shaft rear balance land for cracks. This AD requires inspecting the IPC rotor shaft rear balance land for cracks, eliminates a terminating action, expands one inspection, and eliminates certain other inspections. We are issuing this AD to detect cracking on the IPC rotor shaft rear balance land, which could lead to uncontained engine failure and damage to the airplane.

**DATES:** This AD is effective March 11, 2015.

The Director of the Federal Register approved the incorporation by reference (IBR) of certain publications listed in this AD as of March 11, 2015.

The Director of the Federal Register approved the IBR of certain other publications listed in this AD as of October 8, 2013 (78 FR 54149, September 3, 2013) and as of June 29, 2012 (77 FR 31176, May 25, 2012).

**ADDRESSES:** For 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://www.aeromanager.com>. You may view this service information at the FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

#### **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-2007-28059; 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:** Kenneth Steeves, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7765; fax: 781-238-7199; email: kenneth.steeves@faa.gov.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2013-15-10, Amendment 39-17526 (78 FR 54149, September 3, 2013), ("AD 2013-15-10"). AD 2013-15-10 applied to the specified products. The NPRM published in the Federal Register on September 11, 2014 (79 FR 54220). The NPRM proposed to retain the requirements of AD 2013-15-10 for inspecting the IPC rotor shaft rear balance land for cracks. The NPRM also proposed to require that the repetitive in-shop eddy current inspections (ECIs) in AD 2013-15-10 be performed even after modifying certain engines. The NPRM also proposed to eliminate repetitive on-wing inspections for certain other engines, and eliminate certain in-shop visual inspections for all engines.

### **Comments**

We gave the public the opportunity to participate in developing this AD. We received no comments on the NPRM (79 FR 54220, September 11, 2014).

### **Conclusion**

We reviewed the available data and determined that air safety and the public interest require adopting this AD as proposed except for minor editorial changes, e.g., paragraph references and referencing the latest version of certain service information incorporated by reference.

### **Related Service Information**

We reviewed RR Alert Non-Modification Service Bulletin (NMSB) No. RB.211-72-AH059, dated December 11, 2012; RR Alert NMSB No. RB.211-72-AH058, Revision 1, dated July 7, 2014; RR Alert NMSB No. RB.211-72-AG270, Revision 4, dated March 21, 2011; RR Alert NMSB No. RB.211-72-AG085, Revision 2, dated July 7, 2011; RR Alert NMSB No. RB.211-72-AG264, Revision 5, dated March 21, 2011; and RR NMSB No. RB.211-72-G448, Revision 4, dated August 21, 2014. The service information describes procedures for performing borescope inspections and ECIs of the IPC rotor shaft rear balance land. You can find this information in the AD docket on the Internet at <http://www.regulations.gov/#!docketBrowser;rpp=25;po=0;D=FAA-2007-28059>.

### **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 14 hours per engine to perform the inspections required by this AD. The average labor rate is \$85 per hour. Replacement parts are estimated to cost about \$2,271 per engine. Based on these figures, we estimate the cost of the AD on 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**

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) 2013-15-10, Amendment 39-17526 (78 FR 54149, September 3, 2013), and adding the following new AD:



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**2015-02-20 Rolls-Royce plc:** Amendment 39-18087; Docket No. FAA-2007-28059; Directorate Identifier 2007-NE-13-AD.

**(a) Effective Date**

This AD is effective March 11, 2015.

**(b) Affected ADs**

This AD supersedes AD 2013-15-10, Amendment 39-17526 (78 FR 54149, September 3, 2013).

**(c) Applicability**

This AD applies to all 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, 895-17, 970-84, 970B-84, 972-84, 972B-84, 977-84, 977B-84, and 980-84 turbofan engines.

**(d) Unsafe Condition**

This AD was prompted by reports of cracks in Trent 500, Trent 700, and Trent 800 intermediate-pressure compressor (IPC) rotor shaft rear balance lands and analysis that determined similar cracks may exist in Trent 900 engines. We are issuing this AD to detect cracking on the IPC rotor shaft rear balance land, which could lead to uncontained engine failure and damage to the airplane.

**(e) Compliance**

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

**(1) RB211-Trent 700 Engines–Rear Balance Land Inspections**

(i) Within 625 cycles-in-service (CIS) after June 29, 2012, or before the next flight after the effective date of this AD, whichever occurs later, borescope inspect the IPC rotor shaft rear balance land. Use RR Alert Non-Modification Service Bulletin (NMSB) No. RB.211-72-AG270, Revision 4, dated March 21, 2011, paragraphs 3.A.(2)(a) through 3.A.(2)(c) and 3.A.(3)(a) through 3.A.(3)(c) for in-shop procedures, or paragraphs 3.B.(2)(a) through 3.B.(2)(c) and 3.B.(4)(a) through 3.B.(4)(c), for on-wing procedures, to do the inspection.

(ii) 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 occurred later.

(iii) At each shop visit after the effective date of this AD, perform an ECI of the IPC rotor shaft rear balance land. Use RR Alert NMSB No. RB.211-72-AG085, Revision 2, dated July 7, 2011, paragraphs 3.A. through 3.B., to do the inspection.

(iv) To meet the requirement of paragraph (e)(1)(i) of this AD, instead of a borescope inspection, you may perform an ECI using paragraph (e)(1)(iii) of this AD.

## **(2) RB211-Trent 800 Engines–Rear Balance Land Inspections**

(i) Within 475 CIS after June 29, 2012, or before the next flight after the effective date of this AD, whichever occurs later, borescope inspect the IPC rotor shaft rear balance land. Use RR Alert NMSB No. RB.211-72-AG264, Revision 5, dated March 21, 2011, paragraphs 3.A.(2)(a) through 3.A.(2)(c) and 3.A.(3)(a) through 3.A.(3)(c), for in-shop procedures, or paragraphs 3.B.(2)(a) through 3.B.(2)(c) and 3.B.(4)(a) through 3.B.(4)(c), for on-wing procedures, to do the inspection.

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

(iii) At each shop visit after the effective date of this AD, perform an ECI of the IPC rotor shaft rear balance land. Use RR Alert NMSB No. RB.211-72-AG085, Revision 2, dated July 7, 2011, paragraphs 3.A. through 3.B., to do the inspection.

(iv) To meet the requirement of paragraph (e)(2)(i) of this AD, instead of a borescope inspection, you may perform an ECI using paragraph (e)(2)(iii) of this AD.

## **(3) RB211-Trent 500 Engines–Rear Balance Land Inspections**

(i) Within 340 CIS after October 8, 2013, or before the next flight after the effective date of this AD, whichever occurs later, borescope inspect the IPC rotor shaft rear balance land. Use RR Alert NMSB No. RB.211-72-AH058, Revision 1, dated July 7, 2014, paragraphs 3.A.(2)(a) through 3.A.(2)(c), 3.A.(3)(a) through 3.A.(3)(d), and 3.A.(5)(a) through 3.A.(5)(c), for on-wing procedures, to do the inspection.

(ii) Thereafter, repeat the inspection within every 340 CSLI. You may count CSLI from the last borescope inspection or the last ECI, whichever occurred later.

(iii) At each shop visit after the effective date of this AD, perform an ECI of the IPC rotor shaft rear balance land. Use RR NMSB No. RB.211-72-G448, Revision 4, dated August 21, 2014, paragraphs 3.D.(4) through 3.D.(5), 3.D.(6)(f) through 3.D.(7)(w), 3.D.(8)(f) through 3.D.(8)(w), and 3.D.(11) to do the inspection.

(iv) To meet the requirement of paragraph (e)(3)(i) of this AD, instead of a borescope inspection, you may perform an ECI using paragraph (e)(3)(iii) of this AD.

## **(4) RB211-Trent 900 Engines–Rear Balance Land Inspections**

(i) Within 280 flight cycles after October 8, 2013, or before the next flight after the effective date of this AD, whichever occurs later, borescope inspect the IPC rotor shaft rear balance land. Use RR Alert NMSB No. RB.211-72-AH059, dated December 11, 2012, paragraphs 3.A.(2)(a) through 3.A.(2)(c), 3.A.(3)(a) through 3.A.(3)(d), and 3.A.(5)(a) through 3.A.(5)(c) for on-wing procedures, to do the inspection.

(ii) Thereafter, repeat the inspection within every 280 CSLI. You may count CSLI from the last borescope inspection or the last ECI, whichever occurred last.

(iii) At each shop visit after the effective date of this AD, perform an ECI of the IPC rotor shaft rear balance land. Use RR NMSB No. RB.211-72-G448, Revision 4, dated August 21, 2014, paragraphs 3.D.(4) through 3.D.(5), 3.D.(6)(f) through 3.D.(7)(w), 3.D.(8)(f) through 3.D.(8)(w), and 3.D.(11) to do the inspection.

(iv) To meet the requirement of paragraph (e)(4)(i) of this AD, instead of a borescope inspection, you may perform an ECI using paragraph (e)(4)(iii) of this AD.

## **(5) RB211-Trent 500, RB211-Trent 700, RB211-Trent 800, and RB211-Trent 900 Engines IPC Balance Weight Removal**

(i) RB211-Trent 500 engines. At the next shop visit after the effective date of this AD, remove the IPC balance weights, part numbers (P/Ns) AS44695-150, AS44695-175, AS44695-200, AS44695-225, AS44695-250, AS44695-275, and AS44695-300.

(ii) RB211-Trent 700 engines. At the next shop visit after the effective date of this AD, remove the IPC balance weights, P/Ns AS44695-150, AS44695-175, AS44695-200, AS44695-225, AS44695-250, AS44695-275, and AS44695-300.

(iii) RB211-Trent 800 engines. At the next shop visit after the effective date of this AD, remove the IPC balance weights, P/Ns AS44695-150, AS44695-175, AS44695-200, AS44695-225, AS44695-250, AS44695-275, and AS44695-300.

(iv) RB211-Trent 900 engines. At the next shop visit after the effective date of this AD, remove the IPC balance weights, P/Ns AS44695-150, AS44695-175, AS44695-200, AS44695-225, AS44695-250, AS44695-275, and AS44695-300.

(v) Once you have removed the IPC balance weights, P/Ns AS44695-150, AS44695-175, AS44695-200, AS44695-225, AS44695-250, AS44695-275, and AS44695-300, do not re-install them on any IPC shaft rear balance land.

## **(6) RB211-Trent 500, RB211-Trent 700, RB211-Trent 800, and RB211-Trent 900 Engines—Terminating Action to Repetitive Borescope Inspections**

(i) Removal of the IPC balance weights as described in paragraph (e)(5) of this AD terminates the repetitive borescope inspection requirements in paragraphs (e)(1) through (e)(4) of this AD. However, at each shop visit you must still do the ECI required by paragraphs (e)(1) through (e)(4) of this AD.

(ii) Reserved.

### **(f) Credit for Previous Actions**

#### **(1) RB211-Trent 700 Engines**

(i) If you borescope inspected an RB211-Trent 700 engine, before the effective date of this AD, using RR Alert NMSB 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, you have met the requirements of paragraph (e)(1)(i) of this AD.

(ii) If you eddy current inspected an RB211-Trent 700 engine, before the effective date of this AD, using RR Alert NMSB No. RB.211-72-AG085, Revision 1, dated September 27, 2010, you met the ECI requirement of paragraph (e)(1)(iii) of this AD. However, you are still required to perform the repetitive inspections required by paragraphs (e)(1)(ii) and (e)(1)(iii) of this AD.

#### **(2) RB211-Trent 800 Engines**

(i) If you borescope inspected an RB211-Trent 800 engine, before the effective date of this AD, using RR Alert NMSB No. RB.211-72-AG264, Revision 3, dated December 21, 2010; or Revision 4, dated February 25, 2011, you met the requirements of paragraph (e)(2)(i) of this AD.

(ii) If you eddy current inspected an RB211-Trent 800 engine, before the effective date of this AD, using RR Alert NMSB No. RB.211-72-AG085, Revision 1, dated September 27, 2010, you met the ECI requirement of paragraph (e)(2)(iii) of this AD. However, you are still required to perform the repetitive inspections required by paragraphs (e)(2)(ii) and (e)(2)(iii) of this AD.

### **(3) RB211-Trent 500 Engines**

(i) If you borescope inspected an RB211-Trent 500 engine, before the effective date of this AD, using RR Alert NMSB RB.211-72-AH058, dated December 13, 2012; or RR NMSB No. RB.211-72-G448, Revision 2, dated December 23, 2010; or Revision 3, dated July 7, 2011, you met the requirement of paragraph (e)(3)(i) of this AD.

(ii) If you eddy current inspected an RB211-Trent 500 engine, before the effective date of this AD, using RR NMSB No. RB.211-72-G448, Revision 2, dated December 23, 2010; or Revision 3, dated July 7, 2011, you met the ECI requirement of paragraph (e)(3)(iii) of this AD. However, you are still required to perform the repetitive inspections required by paragraphs (e)(3)(ii) and (e)(3)(iii) of this AD.

### **(4) RB211-Trent 900 engines**

(i) If you borescope inspected an RB211-Trent 900 engine, before the effective date of this AD, using RR Alert NMSB RB.211-72-AH059, dated December 11, 2012; or RR NMSB No. RB.211-72-G448, Revision 2, dated December 23, 2010; or Revision 3, dated July 7, 2011, you met the requirements of paragraph (e)(4)(i) of this AD.

(ii) If you eddy current inspected an RB211-Trent 900 engine, before the effective date of this AD, using RR NMSB No. RB.211-72-G448, Revision 2, dated December 23, 2010; or Revision 3, dated July 7, 2011, you met the ECI requirement of paragraph (e)(4)(iii) of this AD. However, you are still required to perform the repetitive inspections required by paragraphs (e)(4)(ii) and (e)(4)(iii) of this AD.

### **(g) Definition**

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

### **(h) 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. You may email your request to: ANE-AD-AMOC@faa.gov.

### **(i) Related Information**

(1) For more information about this AD, contact Kenneth Steeves, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7765; fax: 781-238-7199; email: kenneth.steeves@faa.gov.

(2) Refer to MCAI European Aviation Safety Agency AD 2014-0152, dated June 20, 2014, and corrected on June 25, 2014, for more information. You may examine the MCAI in the AD docket on the Internet at <http://www.regulations.gov/#!documentDetail;D=FAA-2007-28059-0028>.

### **(j) 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.

(3) The following service information was approved for IBR on March 11, 2015.

(i) Rolls-Royce plc (RR) Non-Modification Service Bulletin (NMSB) No. RB.211-72-G448, Revision 4, dated August 21, 2014.

(ii) RR Alert NMSB No. RB.211-72-AH058, Revision 1, dated July 7, 2014.

(4) The following service information was approved for IBR on October 8, 2013 (78 FR 54149, September 3, 2013).

(i) RR Alert NMSB No. RB.211-72-AH059, dated December 11, 2012.

(ii) Reserved.

(5) The following service information was approved for IBR on June 29, 2012, (77 FR 31176, May 25, 2012).

(i) RR Alert NMSB No. RB.211-72-AG270, Revision 4, dated March 21, 2011.

(ii) RR Alert NMSB No. RB.211-72-AG085, Revision 2, dated July 7, 2011.

(iii) RR Alert NMSB No. RB.211-72-AG264, Revision 5, dated March 21, 2011.

(6) 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://www.aeromanager.com>.

(7) You may view this service information at FAA, Engine & Propeller Directorate, 12 New England Executive Park, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7125.

(8) 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 January 16, 2015.

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