



[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2013-1015; Directorate Identifier 2013-NE-37-AD; Amendment 39-18768; AD 2017-01-01]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce plc Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: We are superseding airworthiness directive (AD) 2014-05-25 for all Rolls-Royce plc (RR) RB211-Trent 970-84, RB211-Trent 970B-84, RB211-Trent 972-84, RB211-Trent 972B-84, RB211-Trent 977-84, RB211-Trent 977B-84, and RB211-Trent 980-84 turbofan engines. AD 2014-05-25 required inspections of the low-pressure turbine (LPT) exhaust case and support assembly or tail bearing housing (TBH) to detect cracks or damage. This AD modifies the inspection schedule for the affected engines and adds an optional terminating action. This AD was prompted by RR performing additional analysis of inspection results and determining that the existing inspections need to be modified. We are issuing this AD to correct the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 15 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 this AD as of [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

We must receive any comments on this AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: 202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.
- Hand Delivery: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

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: 011-44-1332-245418, or email:

http://www.rolls-royce.com/contact/civil_team.jsp. You may view this service information at the FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803. 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-2013-1015.

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-2013-1015; 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 in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7754; fax: 781-238-7199; email: robert.green@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

This AD is a final rule that involves requirements affecting flight safety, and we did not provide you with notice and an opportunity to provide your comments before it becomes effective. However, we invite you to send any written data, views, or arguments about this AD. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2013-1015; Directorate Identifier 2013-NE-37-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory,

economic, environmental, and energy aspects of this AD. We will consider all comments received by the closing date and may amend this AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this AD.

Discussion

On February 27, 2014, we issued AD 2014-05-25, Amendment 39-17798 (79 FR 15665, March 21, 2014), “AD 2014-05-25,” for all RR RB211-Trent 970-84, RB211-Trent 970B-84, RB211-Trent 972-84, RB211-Trent 972B-84, RB211-Trent 977-84, RB211-Trent 977B-84, and RB211-Trent 980-84 turbofan engines. AD 2014-05-25 required inspections of the LPT exhaust case and support assembly or TBH to detect cracks or damage. AD 2014-05-25 resulted from an RR structural re-analysis indicating that the TBH may not retain full limit load capability in all fail-safe conditions. We issued AD 2014-05-25 to prevent failure of the TBH, resulting in damage to the engine and to the airplane.

Actions Since AD 2014-05-25 was Issued

Since we issued AD 2014-05-25, RR has analyzed inspection results and determined that the existing inspections need to be modified. Also since we issued AD 2014-05-25, the European Aviation Safety Agency (EASA) has issued AD 2016-0193, dated September 30, 2016, which modifies the inspection schedule for the affected engines and adds an optional terminating action.

Related Service Information under 1 CFR Part 51

RR has issued Alert Non-Modification Service Bulletin (NMSB) RB.211-72-AG971, Revision 2, dated May 5, 2016; Alert NMSB RB.211-72-AH154, Revision 5, dated May 5, 2016; Alert NMSB RB.211-72-AJ101, dated May 5, 2016; and Service Bulletin (SB) RB.211-72-J055, dated March 22, 2016. RR Alert NMSB RB.211-72-AG971 describes procedures for on-wing or in-shop inspection of the TBH mount lug run-outs. RR Alert NMSB RB.211-72-AH154 describes procedures for an on-wing or in-shop inspection of a pre-mod 72-J024 TBH. RR Alert NMSB RB.211-72-AJ101 describes procedures for on-wing or in-shop inspection of a post-mod 72-J024 TBH. RR SB RB.211-72-J055 describes procedures for modifying the engine by introducing a revised TBH. 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.

Other Related Service Information

RR has also issued Technical Variance (TV) No. 124801, Issue 2, dated July 4, 2012; TV No. 124851, Issue 2, dated July 4, 2012; Repeater TV No. 132043, Issue 1, dated March 25, 2013; and Repeater TV No. 132217, Issue 5, dated May 23, 2013. RR TV No. 124801 and RR TV No. 124851 provide details on the fluorescent penetrant inspection of the TBH mount lug run-outs. RR Repeater TV No. 132043 includes details of the inspection of the mount lug forging LE areas. RR Repeater TV No. 132217 makes the removal and installation of the exhaust nozzle and forward and aft exhaust plugs optional tasks.

FAA’s Determination

We are issuing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

AD Requirements

This AD modifies the inspection schedule for the affected engines and adds an optional terminating action.

FAA’s Justification and Determination of the Effective Date

No domestic operators use this product. Therefore, we find that notice and opportunity for prior public comment are unnecessary and that good cause exists for making this amendment effective in less than 30 days.

Costs of Compliance

We estimate that this AD affects 0 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspection of the TBH	8 work-hours x \$85 per hour = \$680	\$0	\$680 per inspection cycle	\$0

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) 2014-05-25, Amendment 39-17798 (79 FR 15665, March 21, 2014), and adding the following new AD:

2017-01-01 **Rolls-Royce plc**: Amendment 39-18768; Docket No. FAA-2013-1015; Directorate Identifier 2013-NE-37-AD.

(a) Effective Date

This AD is effective [INSERT DATE 15 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2014-05-25, Amendment 39-17798 (79 FR 15665, March 21, 2014).

(c) Applicability

This AD applies to all Rolls-Royce plc (RR) RB211-Trent 970-84, RB211-Trent 970B-84, RB211-Trent 972-84, RB211-Trent 972B-84, RB211-Trent 977-84, RB211-Trent 977B-84, and RB211-Trent 980-84 turbofan engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7200, Engine (Turbine/Turboprop).

(e) Unsafe Condition

This AD was prompted by RR performing additional analysis of inspection results and determining that the existing inspections need to be modified. We are issuing this AD to prevent failure of the tail bearing housing (TBH), resulting in damage to the engine and to the airplane.

(f) Compliance

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

(1) Within the compliance times and using the service information specified in Table 1 to paragraph (f) of this AD, accomplish on-wing inspections of the TBH features using the following instructions, as applicable.

(i) If during any on-wing inspection of the TBH mount lug run-outs done using the Accomplishment Instructions, paragraph 3.A.(1), of RR Alert Non-Modification Service Bulletin (NMSB) RB.211-72-AG971, Revision 2, dated May 5, 2016, any cracks less than or equal to 2 mm in length are found, remove the engine from service within 10 flight cycles (FCs). If any cracks greater than 2 mm are found, remove the engine from service before further flight.

(ii) If during any on-wing inspection of the TBH mount lug run-outs done using the Accomplishment Instructions, paragraph 3.A.(2), of RR Alert NMSB RB.211-72-AG971, Revision 2, dated May 5, 2016, any crack indications resulting in an inspection signal with an amplitude of 50% full screen height or more are found, remove the engine from service before further flight.

(iii) If during any on-wing inspection of a pre-mod 72-J024 TBH, any crack or damage is found on the TBH mount lug forging leading edge (LE) areas, re-inspect the engine or remove the engine from service in accordance with the Accomplishment Instructions, paragraph 3.A.(3)(t), of RR Alert NMSB RB.211-72-AH154, Revision 5, dated May 5, 2016.

(iv) If during any on-wing inspection of a post-mod 72-J024 TBH, any crack is found on the TBH mount lug forging LE or cutback areas, re-inspect the engine or remove the engine from service in accordance with the Accomplishment Instructions, paragraph 3.A.(3)(t), of RR Alert NMSB RB.211-72-AJ101, dated May 5, 2016.

(2) Within the compliance times and using the service information specified in Table 2 to paragraph (f) of this AD, perform in-shop inspections of the TBH features using the following instructions, as applicable.

(i) If during any in-shop inspection of the TBH, any crack is found on the TBH mount lug or central male catcher run-outs, replace the TBH with a TBH eligible for installation before the engine is returned to service.

(ii) If during any in-shop inspection of the TBH, any crack is found on the top core vanes, reject as unserviceable or repair the TBH in accordance with the Accomplishment Instructions, paragraph 3.C.(1)(f), of RR Alert NMSB

RB.211-72-AG971 Revision 2, dated May 5, 2016, before the engine is returned to service.

(iii) If during any in-shop inspection of a pre-mod 72-J024 TBH, any crack or damage is found on the TBH mount lug forging LE areas, reject as unserviceable or repair the TBH in accordance with the Accomplishment Instructions, paragraph 3.B.(2)(u)(ii), of RR Alert NMSB RB.211-72-AH154, Revision 5, dated May 5, 2016, or the Accomplishment Instructions, paragraph 3.C.(1)(f), of RR Alert NMSB RB.211-72-AG971, Revision 2, dated May 5, 2016, before the engine is returned to service.

(iv) If during any in-shop inspection of a post-mod 72-J024 TBH, any crack is found on the TBH mount lug forging LE or cutback areas, repair the TBH in accordance with the Accomplishment Instructions, paragraph 3.B.(2)(u)(ii), of RR Alert NMSB RB.211-72-AJ101, dated May 5, 2016, or the Accomplishment Instructions, paragraph 3.C.(1)(f), of Alert NMSB RB.211-72-AG971, Revision 2, dated May 5, 2016, before the engine is returned to service.

Table 1 to Paragraph (f) – TBH On-Wing Inspections

Affected TBH P/N and Feature	Applicable NMSB and Paragraph	Alternate NMSB instructions acceptable for prior compliance	Initial Inspection	Repeat Inspection Interval (not to exceed)
All – Mount Lug Run-outs	RB.211-72-AG971 Revision 2, Paragraph 3.A.	In-shop: RB.211-72-AG971 Revision 2, Paragraph 3.B or 3.C.	Before exceeding 2,200 FCs since new	2,200 FCs

Affected TBH P/N and Feature	Applicable NMSB and Paragraph	Alternate NMSB instructions acceptable for prior compliance	Initial Inspection	Repeat Inspection Interval (not to exceed)
Pre-mod 72-J024 TBH – Mount Lug Forging LE Areas - for a TBH that has not exceeded 900 FCs since new on April 7, 2014	RB.211-72-AH154, Revision 5, Paragraph 3.A.	In-shop: RB.211-72-AH154, Revision 5, Paragraph 3.B., or RB.211-72-AG971 Revision 2, Paragraph 3.C.	Before exceeding 1,000 FCs since new	1,000 FCs
Pre-mod 72-J024 TBH – Mount Lug Forging LE Areas - for a TBH that has exceeded 900 FCs since new on April 7, 2014	RB.211-72-AH154, Revision 5, Paragraph 3.A.	In-shop: RB.211-72-AH154, Revision 5, Paragraph 3.B., or RB.211-72-AG971 Revision 2, Paragraph 3.C.	Within 100 FCs after April 7, 2014	1,000 FCs
Post-mod 72-J024 TBH – Mount Lug Forging LE and Cutback Areas	RB.211-72-AJ101, Paragraph 3.A.	In-shop: RB.211-72-AG971, Revision 2, Paragraph 3.C, or RB.211-72-AJ101, Paragraph 3.B.	Before exceeding 1,000 FCs since NMSB RB.211-72-J024 embodiment	1,000 FCs

Table 2 to Paragraph (f) – TBH In-Shop Inspections

Affected TBH P/N and Feature	Applicable NMSB and Paragraph	Alternate NMSB instructions acceptable for prior compliance	Initial Inspection	Repeat Inspection Interval (not to exceed)
All – Mount Lug Run-outs	RB.211-72-AG971, Revision 2, Paragraph 3.	On-wing: RB.211-72-AG971 Rev 2, Paragraph 3.A., or In-shop: RB.211-72-AG971 Revision 2, Paragraph 3.C.	Before exceeding 2,200 flight FCs since new	2,200 FCs
All – Top Core Vanes and Central Male Catcher Run-outs	RB.211-72-AG971, Revision 2, Paragraph 3.C.	None	Before exceeding 3,800 FCs since new	3.800 FCs
Pre-mod 72-J024 TBH – Mount Lug Forging LE Areas - for a TBH which has not exceeded 900 FCs since new on April 7, 2014.	RB.211-72-AH154, Revision 5, Paragraph 3.B.	On-wing: RB.211-72-AH154, Revision 5, Section 3.A, or In-shop: RB.211-72-AG971, Revision 2, Paragraph 3.C.	Before exceeding 1,000 FCs since new	1,000 FCs

Affected TBH P/N and Feature	Applicable NMSB and Paragraph	Alternate NMSB instructions acceptable for prior compliance	Initial Inspection	Repeat Inspection Interval (not to exceed)
Pre-mod 72-J024 TBH – Mount Lug Forging LE Areas - for a TBH which has exceeded 900 FCs since new on April 7, 2014.	RB.211-72-AJ101, Paragraph 3.B.	On-wing: RB.211-72-AH154 Rev 5, Section 3.A, or In-shop: RB.211-72-AG971, Revision 2, Paragraph 3.C.	Within 100 FCs after the effective date of this AD.	1,000 FCs
Post-mod 72-J024 TBH – Mount Lug Forging LE and Cutback Areas	RB.211-72-AJ101, Paragraph 3.B.	On-wing: RB.211-72-AJ101, Section 3.A, or In-shop: RB.211-72-AG971 Rev 2, Paragraph 3.C.	Before exceeding 1,000 FCs since NMSB RB.211-72-J024 embodiment.	1,000 FCs

(g) Credit For Previous Actions

(1) If you performed inspections and corrective actions on an engine before the effective date of this AD, in accordance with earlier versions of RR Alert NMSB RB.211-72-AG971, Revision 2, dated May 5, 2016, or RR Alert NMSB RB.211-72-AH154, Revision 5, dated May 5, 2016, you met the requirements of paragraph (f)(1) or (2) of this AD, as applicable.

(2) If, on or before April 7, 2014, you performed the inspections and corrective actions required by paragraphs (f)(1) and (2) of this AD using RR Technical Variance

(TV) No. 124801, Issue 2, dated July 4, 2012 or earlier versions; or RR TV No. 124851, Issue 2, dated July 4, 2012 or earlier versions; you met the requirements for a mount lug run-out inspection.

(3) If, on or before April 7, 2014, you performed the inspections and corrective actions required by paragraphs (f)(1) and (2) of this AD using RR Repeater TV No. 132043, Issue 1, dated March 25, 2013 or earlier versions; or using RR Repeater TV No. 132217, Issue 5, dated May 23, 2013 or earlier versions; you met the requirements for the mount lug forging LE inspections of this AD.

(h) Optional Terminating Action

(1) Accomplishment of corrective actions required by paragraphs (f)(1) and (2) of this AD does not constitute terminating action for the repetitive inspections required by this AD.

(2) Modification of an engine in accordance with the instructions of RR SB RB.211-72-J055, dated March 22, 2016, constitutes terminating action for the repetitive inspections required by paragraphs (f)(1) and (2) of this AD for that engine, provided that, following this modification, no affected TBH is installed on that engine.

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

(j) Related Information

(1) For more information about this AD, contact Robert Green, Aerospace Engineer, Engine Certification Office, FAA, Engine & Propeller Directorate, 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 AD 2016-0193, dated September 30, 2016, 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-2013-1015.

(3) RR TV No. 124801, Issue 2, dated July 4, 2012; RR TV No. 124851, Issue 2, dated July 4, 2012, Repeater TV No. 132043, Issue 1, dated March 25, 2013, and Repeater TV No. 132217, Issue 5, dated May 23, 2013; which are not incorporated by reference in this AD, can be obtained from RR using the contact information in paragraph (k)(3) of this AD.

(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 plc (RR) Service Bulletin RB.211-72-J055, dated March 22, 2016.

(ii) RR Alert Non-Modification Service Bulletin (NMSB) RB.211-72-AJ101, dated May 5, 2016;

(iii) RR Alert NMSB RB.211-72-AG971, Revision 2, dated May 5, 2016; and

(iv) RR Alert NMSB RB.211-72-AH154, Revision 5, dated May 5, 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: 011-44-1332-245418, or email: http://www.rolls-royce.com/contact/civil_team.jsp.

(4) You may view this service information at FAA, Engine & Propeller Directorate, 1200 District Avenue, Burlington, MA 01803. 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 December 22, 2016.

Colleen M. D'Alessandro,
Manager, Engine & Propeller Directorate,
Aircraft Certification Service.
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