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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2009-0162; Directorate Identifier 2004-NE-19-AD; Amendment 39-16803; AD 2011-18-21]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Rolls-Royce plc (RR) RB211-524 Series Turbofan Engines**

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

**ACTION:** Final rule.

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**SUMMARY:** We are superseding an existing airworthiness directive (AD) for the products listed above. That AD currently requires initial and repetitive borescope inspections of the head section and meterpanel assembly of the combustion liner, and replacement if necessary. This new AD requires those same inspections, and replacement. This AD also expands the applicability to include part numbers (P/N) of additional combustion liners. This AD was prompted by an inquiry submitted by an operator, which resulted in RR performing a complete review of the affected front combustion liner part numbers. We are issuing this AD to prevent deterioration of the engine combustion liner, which can result in combustion liner breakup, case burn-through, engine fire, and damage to the airplane.

**DATES:** This AD is effective February 13, 2012.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of February 9, 2005 (70 FR 680, January 5, 2005).

**ADDRESSES:** For service information identified in this AD, contact Rolls-Royce plc, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: 011-44-1332-242424; fax: 011-44-1332-249936, for the service information identified in this proposed AD. You may review copies of the referenced 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>; 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 01803; phone: (781) 238-7143; fax: (781) 238-7199; email: alan.strom@faa.gov.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a supplemental notice of proposed rulemaking (SNPRM) to amend 14 CFR part 39 to supersede airworthiness directive (AD) 2004-26-05, amendment 39-13917 (70 FR 680, January 5, 2005). That AD applies to the specified products. The SNPRM published in the Federal Register on October 18, 2010 (75 FR 63727). The SNPRM proposed to require:

- Initial and repetitive borescope inspections of the combustion liner head section and meterpanel assembly of the combustion liner and, if necessary, replacement.
- Reduction of the inspection intervals of certain RB211-524 engine models that have not been repaired to RR Field Repair Scheme FRS5367/B, and
- A mandatory terminating action to the repetitive inspections to be completed no later than December 31, 2012.

### **Comments**

We gave the public the opportunity to participate in developing this AD. We have considered the comment received. The Boeing Company supports the SNPRM published in the Federal Register on October 18, 2010 (75 FR 63727).

We simplified wording for clarity in the regulatory section. We did not change the requirements of this AD.

### **Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting the AD as proposed.

### **Costs of Compliance**

We estimate that this AD will affect 18 engines installed on airplanes of U.S. registry. We also estimate that it will take about 32 work-hours per engine to perform the required actions, and that the average labor rate is \$85 per work-hour. Required parts will cost about \$231,000. Based on these figures, we estimate the total cost of the AD to U.S. operators to be \$4,206,960.

### **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) 2004-26-05, Amendment 39-13917 (70 FR 680, January 5, 2005), and adding the following new AD:



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**2011-18-21 Rolls-Royce plc:** Amendment 39-16803; Docket No. FAA-2009-0162; Directorate Identifier 2004-NE-19-AD.

**(a) Effective Date**

This airworthiness directive (AD) is effective February 13, 2012.

**(b) Affected ADs**

This AD supersedes AD 2004-26-05, Amendment 39-13917 (70 FR 680, January 5, 2005).

**(c) Applicability**

This AD applies to Rolls-Royce plc (RR) engine models RB211-524B-02, -524B3-02 engines and RB211-524B2, -524B4, -524C2, and -524D4 series engines with a front combustion liner assembly that incorporates RR Service Bulletin (SB) No. RB.211-72-7221 or RR SB No. RB.211-72-7998, but doesn't incorporate RR SB No. RB.211-72-9670 or RR SB No. RB.211-72-9764, and engine models RB211-524G and -524H series engines with a front combustion liner assembly that doesn't incorporate RR SB No. RB.211-72-9764.

**(d) Unsafe Condition**

This AD results from an inquiry submitted by an operator which resulted in RR performing a complete review of the affected front combustion liner part numbers. We are issuing this AD to prevent deterioration of the engine combustion liner, which can result in combustion liner breakup, case burn-through, engine fire, and damage to the airplane.

**(e) Compliance**

You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

**(f) Credit for Previous Inspections**

Engine inspections previously done using RR SB No. RB.211-72-B482, Revision 8, meet the requirements of this AD for the initial and repetitive inspections specified in paragraph (g) and Table 1 of this AD; and paragraph (h) and Table 2 of this AD.

**(g) Inspections of Combustion Liner Head Sections—Not Previously Repaired**

Borescope-inspect combustion liner head sections that have not been previously repaired. Use paragraphs 3.A.(1) through 3.A.(5) of the Accomplishment Instructions of RR Alert Service Bulletin (ASB) No. RB.211-72-AB482, Revision 9, dated July 28, 2003, and the compliance thresholds in Table 1 of this AD to do the inspections.

**Table 1–Combustion Liner Head Section–Not Previously Repaired**

<b>Engine Series</b>	<b>Initial Inspection</b>	<b>Repetitive Inspection</b>	<b>Parts Exceeding Initial Inspection Cycles</b>
(1) RB211-524C2, -524D4, -524G, and -524H.	Within 1,400 to 1,600 cycles-since-new (CSN).	Within 200 cycles-since-last inspection (CSLI).	Within 100 cycles-in-service (CIS) after the effective date of this AD.
(2) RB211-524B-02, -524B2, -524B3-02, and -524B4	Within 3,000 to 3,200 CSN.	Within 200 CSLI.	Within 200 CIS after the effective date of this AD.

**(h) Inspections of Combustion Liner Head Sections–Previously Repaired Using RR Field Repair Scheme FRS5367/B**

Borescope-inspect combustion liner head sections previously repaired using RR Field Repair Scheme FRS5367/B. Use paragraphs 3.A.(1) through 3.A.(5) of the Accomplishment Instructions of RR ASB No. RB.211-72-AB482, Revision 9, dated July 28, 2003, and the compliance thresholds in Table 2 of this AD to do the inspections.

**Table 2–Combustion Liner Head Section–Previously Repaired Using RR Field Repair Scheme FRS5367/B**

<b>Engine Series</b>	<b>Initial Inspection</b>	<b>Repetitive Inspection</b>	<b>Parts Exceeding Initial Inspection Cycles</b>
(1) RB211-524C2, -524D4, -524G, and -524H.	Within 1,800 to 2,200 cycles-since-last repair (CSLR).	Within 400 CSLI.	Within 200 CIS after the effective date of this AD.
(2) RB211-524B-02, -524B2, -524B3-02, and -524B4	Within 3,000 to 3,200 CSLR.	Within 400 CSLI.	Within 200 CIS after the effective date of this AD.

**(i) Inspections of Combustion Liner Head Sections That Have Been Repaired But Did Not Use RR Field Repair Scheme FRS5367/B**

Borescope-inspect combustion liner head sections that have been repaired using a method other than RR Field Repair Scheme FRS5367/B. Use paragraphs 3.A.(1) through 3.A.(5) of the Accomplishment Instructions of RR ASB No. RB.211-72-AB482, Revision 9, dated July 28, 2003, and the compliance thresholds in Table 3 of this AD to do the inspections.

**Table 3–Combustion Liner Head Section–Repaired, But Did Not Use RR Field Repair Scheme FRS5367/B**

<b>Engine Series</b>	<b>Initial Inspection</b>	<b>Repetitive Inspection</b>	<b>Parts Exceeding Initial Inspection Cycles</b>
(1) RB211-524C2, -524D4, -524G, and -524H.	Within 500 to 700 CSLR.	Within 200 CSLI.	Within 100 CIS after the effective date of this AD.
(2) RB211-524B-02, -524B2, -524B3-02, and -524B4	Within 2,000 to 2,200 CSLR.	Within 200 CSLI.	Within 200 CIS after the effective date of this AD.

(1) For an installed front combustion liner that is subject to RR ASB No. RB.211-72-AB482, Revision 9, dated July 28, 2003, if the microbraze repair RR Field Repair Scheme FRS5367 has been applied to all 18 struts, then that repair is equivalent to compliance with RR Field Repair Scheme FRS5367/B.

(2) Head sections repaired by replacement of all 18 struts using RR Field Repair Scheme FRS6548 are considered as equivalent to fitting a new head section for inspection purposes.

**(j) Inspections of Meterpanel Assemblies–Not Repaired**

Borescope-inspect meterpanel assemblies that incorporate SB No. RB.211-72-7998, that have not been previously repaired. Use paragraphs 3.B.(1) through 3.B.(7) of the Accomplishment Instructions of RR ASB No. RB.211-72-AB482, Revision 9, dated July 28, 2003, and the compliance thresholds in Table 4 of this AD to do the inspections.

**Table 4–Meterpanel Assembly–Not Repaired**

<b>Engine Series</b>	<b>Initial Inspection</b>	<b>Repetitive Inspection</b>	<b>Parts Exceeding Initial Inspection Cycles</b>
(1) RB211-524D4, -524G, and -524H.	Within 1,000 to 1,200 CSN.	Within 400 CSLI.	Within 50 CIS after the effective date of this AD.
(2) RB211-524D4, -524G, and -524H that have not used RB211-524H ratings at any time.	Within 1,800 to 2,000 CSN.	Within 400 CSLI.	Within 50 CIS after the effective date of this AD.

**(k) Inspections of Meterpanel Assemblies–Repaired**

Borescope-inspect meterpanel assemblies that incorporate SB No. RB.211-72-7998, that have been previously repaired. Use paragraphs 3.B.(1) through 3.B.(7) of the Accomplishment Instructions of RR ASB No. RB.211-72-AB482, Revision 9, dated July 28, 2003, and the compliance thresholds in Table 5 of this AD to do the inspections.

**Table 5–Meterpanel Assembly–Repaired**

<b>Engine Series</b>	<b>Initial Inspection</b>	<b>Repetitive Inspection</b>	<b>Parts Exceeding Initial Inspection Cycles</b>
(1) RB211-524D4, -524G, and -524H.	Within 500 to 700 CSLR.	Within 400 CSLI.	Within 50 CIS after the effective date of this AD.

**(l) Reject Parts**

Remove from service, parts that exceed the acceptance criteria.

**(m) Mandatory Terminating Action**

Replace any front combustion liner assembly that has a P/N listed in paragraph (c) of this AD at the next shop visit.

(1) For RB211-524B-02, -524B3-02, -524B4, -524C2 and -524B2, -524B4, -524C2, and -524D4 series engines, replacing the front combustion liner assembly with a front combustion liner assembly that incorporates the modifications in RR SB No. RB.211-72-9670, Original Issue, dated August 27,

1993; or RR SB No. RB.211-72-9764, Revision 3, dated January 16, 1998, constitutes terminating action to the repetitive inspections in paragraphs (g), (h), (i), (j), and (k) of this AD.

(2) For RB211-524G and -524H engines, replacing the front combustion liner assembly with a front combustion liner assembly that incorporates the modifications in RR SB No. RB.211-72-9764, Revision 3, dated January 16, 1998, constitutes terminating action to the repetitive inspections in paragraphs (f), (g), (h), (i), and (j) of this AD.

#### **(n) Definition of Shop Visit**

For the purpose of this AD, a shop visit is any time that the 04 module is removed for refurbishment or overhaul.

#### **(o) Related Information**

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

#### **(p) Material Incorporated by Reference**

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) of the following service information under 5 U.S.C. 552(a) and 1 CFR part 51 on the date specified:

(1) Rolls-Royce plc Alert Service Bulletin No. RB.211-72-AB482, Revision 9, July 28, 2003, approved for IBR February 9, 2005 (70 FR 680, January 5, 2005).

(2) Rolls-Royce plc Service Bulletin No. RB.211-72-9670, Original Issue, August 27, 1993, approved for IBR February 9, 2005 (70 FR 680, January 5, 2005).

(3) Rolls-Royce plc Service Bulletin No. RB.211-72-9764, Revision 3, January 16, 1998, approved for IBR February 9, 2005 (70 FR 680, January 5, 2005).

(4) For service information identified in this AD, contact Rolls-Royce plc, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: 011-44-1332-242424; fax: 011-44-1332-249936.

(5) You may review copies of the 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.

(6) 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](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

Issued in Burlington, Massachusetts, on December 28, 2011.

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