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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2007-27267; Directorate Identifier 2002-NE-40-AD; Amendment 39-14991; AD 2007-06-10]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce plc RB211-524 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is superseding an existing airworthiness directive (AD) for Rolls Royce plc (RR) RB211-524 series turbofan engines with certain part number (P/N) intermediate pressure compressor (IPC) stage 5 disks installed. That AD currently requires new reduced IPC stage 5 disk cyclic limits. This AD requires the same reduced IPC stage 5 disk cyclic limits, requires removal from service of affected disks that already exceed the new reduced cyclic limit, and, removal from service of other affected disks before exceeding their cyclic limits using a drawdown schedule. This AD also exempts disks reworked to RR Service Bulletin (SB) No. RB.211-72-E182, Revision 1, dated July 30, 2004, and allows an on-wing eddy current inspection (ECI) on RB211-524G and RB211-524H series engines. This AD results from the manufacturer issuing a revised Alert Service Bulletin (ASB) to remove certain disks from applicability, and to allow an on-wing ECI on RB211-524G and RB211-524H series engines. We are issuing this AD to prevent failure of the IPC stage 5 disk, which could result in uncontained engine failure and possible damage to the airplane.

DATES: This AD becomes effective April 19, 2007. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of April 19, 2007.

ADDRESSES: You can get the service information identified in this AD from Rolls-Royce plc, P.O. Box 31 Derby, DE248BJ, United Kingdom; telephone 011-44-1332-242424; fax 011-44-1332-249936.

You may examine the AD docket on the Internet at <http://dms.dot.gov> or in Room PL-401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: Ian Dargin, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238-7178; fax (781) 238-7199; e-mail: ian.dargin@faa.gov.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 with a proposed AD. The proposed AD applies to RR RB211-524 series turbofan engines with certain P/N IPC stage 5 disks installed. We published the proposed AD in the Federal Register on July 11, 2006 (71 FR 39025). That action proposed to require:

- Establishing new reduced IPC stage 5 disk cyclic limits.
- Removing from service affected disks that already exceed the new reduced cyclic limit.
- Removing from service other affected disks before exceeding their cyclic limits, using a drawdown schedule.
- Allowing optional inspections at each shop visit or an on-wing ECI to extend the disk life beyond the specified life.

Examining the AD Docket

You may examine the docket that contains the AD, any comments received, and any final disposition in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Docket Office (telephone (800) 647-5227) is located on the plaza level of the Department of Transportation Nassif Building at the street address stated in ADDRESSES. Comments will be available in the AD docket shortly after the DMS receives them.

Comments

We provided the public the opportunity to participate in the development of this AD. We have considered the comments received.

Request To Add a Note

One commenter, Rolls-Royce plc, requests that we add a note, just above compliance paragraph (j)(5), that states: "To qualify for maximum alleviation since last NDT inspection (see Table 5 of this AD) it is recommended that discs be ECI inspected using paragraph 3.D. of the Accomplishment Instructions of RR Alert Service Bulletin No. RB.211-72-AD428, Revision 5, dated March 18, 2005." The commenter feels that this note adds clarification to the AD compliance. We do not agree. The note is identified in the service bulletin that is incorporated by reference, and need not be included in the text of the AD. We did not change the AD.

Request To Add Engine Series

Rolls-Royce plc requests that we add the RB211-524B/B3 engine series to compliance paragraph (k)(1), and add the RB211-524H2 and RB211-524H2-T engine series to compliance paragraph (k)(2), as they need to be included, the same as they appear in the service bulletin. We agree and added those engine series to the paragraphs.

Clarification of Paragraph (g)

Since we issued the proposed AD, we reviewed the wording in paragraph (g) and realized that the compliance times in that paragraph were in conflict. We clarified that paragraph. It now states to comply with the reduced cyclic life limits in Table 3 of this AD within 30 days after the effective date of this AD, or conduct optional qualifying nondestructive test (NDT) inspections before December 1, 2008, to extend the IPC stage 5 disk life as specified in paragraph (i) of this AD.

Conclusion

We have carefully 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 have determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Docket Number Change

We are transferring the docket for this AD to the Docket Management System as part of our ongoing docket management consolidation efforts. The new Docket No. is FAA-2007-27267. The old Docket No. became the Directorate Identifier, which is 2002-NE-40-AD. This AD might get logged into the DMS docket, ahead of the previously collected documents from the old docket file, as we are in the process of sending those items to the DMS.

Costs of Compliance

We estimate this AD will not affect any engines installed on airplanes of U.S. registry. Based on this, we estimate this AD will not have any cost to U.S. operators.

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); 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 summary of the costs to comply with this AD and placed it in the AD Docket. You may get a copy of this summary at the address listed under ADDRESSES.

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 Federal Aviation Administration 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 Amendment 39-14202 (70 FR 43036, July 26, 2005) and by adding a new airworthiness directive, Amendment 39-14991, to read as follows:



2007-06-10 Rolls-Royce plc: Amendment 39-14991. Docket No. FAA-2007-27267; Directorate Identifier 2002-NE-40-AD.

Effective Date

(a) This airworthiness directive (AD) becomes effective April 19, 2007.

Affected ADs

(b) This AD supersedes AD 2005-15-13, Amendment 39-14202.

Applicability

(c) This AD applies to the Rolls-Royce plc (RR) RB211-524 series turbofan engines listed in the following Table 1, with intermediate pressure compressor (IPC) stage 5 disk part numbers (P/Ns) listed in Table 2 of this AD, installed.

Table 1 - Engine Models Affected

-524B-02	-524B-B-02	-524B3-02	-524B4-02	-524B4-D-02
-524B2-19	-524B2-B-19	-524C2-19	-524C2-B-19	-524D4-19
-524D4-B-19	-524D4X-19	-524D4X-B-19	-524D4-39	-524D4-B-39
-524G2-19	-524G2-T-19	-524G3-19	-524G3-T-19	-524H2-19
-524H2-T-19	-524H-36	-524H-T-36		

These engines are installed on, but not limited to, Boeing 747, 767, and Lockheed L-1011 series airplanes.

Table 2 - IPC Stage 5 Disk P/Ns Affected

LK60130	LK65932	LK69021	LK81269	LK83282
LK83283	UL12290	UL15743	UL15744	UL15745
UL19132	UL20785	UL20832	UL23291	UL25011
UL36821	UL36977	UL36978	UL36979	UL36980
UL36981	UL36982	UL36983	UL37078	UL37079
UL37080	UL37081	UL37082	UL37083	UL37084

Unsafe Condition

(d) This AD results from the manufacturer issuing a revised Alert Service Bulletin (ASB) to remove certain disks from applicability and to allow an on-wing eddy current inspection (ECI) on RB211-524G and RB211-524H series engines. The actions specified in this AD are intended to prevent failure of the IPC stage 5 disk, which could result in uncontained engine failure and possible damage to the airplane.

Compliance

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

Exempted Disks

(f) For engines with an IPC stage 5 disk P/N listed in Table 2 of this AD, reworked to RR SB No. RB.211-72-E182, Revision 1, dated July 30, 2004, no further action is necessary.

Cycle Limits

(g) Comply with the reduced cyclic life limits in Table 3 of this AD within 30 days after the effective date of this AD, or conduct optional qualifying nondestructive test (NDT) inspections before December 1, 2008 to extend the IPC stage 5 disk life, as specified in paragraph (i) of this AD.

Table 3 - Cyclic Life Limits Without Qualifying NDT Inspection

Date of Reduced Life Limit	Engine Models			
	-524G2, G2-T, G3, G3-T, H2, H2-T, H-36, H-T-36	-524D4, D4-B, D4-B-39, D4X, D4X-B, D4-39	-524B2, B2-B, C2, C2-B	-524B-02, B-B-02, B3-02, B4-02, B4-D-02
November 30, 2002	13,500 cycles-in-service (CIS)	16,150 CIS	16,000 CIS	16,200 CIS
April 1, 2003	13,500 CIS	13,500 CIS	13,500 CIS	14,000 CIS
December 1, 2003	12,000 CIS	13,500 CIS	13,500 CIS	14,000 CIS
December 1, 2004	11,000 CIS	13,500 CIS	12,000 CIS	12,000 CIS
December 1, 2005	11,000 CIS	12,000 CIS	12,000 CIS	12,000 CIS

(h) On December 1, 2008, the revised cyclic life limits specified in Table 4 of this AD become effective. Incorporate the revised cyclic life limits specified in Table 4 of this AD into the RR Time Limits Manual, 05-10-01.

Table 4 - Cyclic Life Limits on December 1, 2008

Date of Reduced Life Limit	Engine Models			
	-524G2, G2-T, G3, G3-T, H2, H2-T, H-36, H-T-36	-524D4, D4-B, D4-B-39, D4X, D4X-B, D4-39	-524B2, B2-B, C2, C2-B	-524B-02, B-B-02, B3-02, B4-02, B4-D-02
December 1, 2008	7,830 CIS	8,700 CIS	8,900 CIS	9,000 CIS

Optional Inspections

(i) Before December 1, 2008, you may perform an optional NDT inspection on-wing or at each shop visit to extend the disk life. Guidance for these inspections is provided in paragraphs (j) or (k) of this AD.

Optional Inspections at Shop Visit

(j) Perform optional inspections at shop visit, as follows:

(1) Remove corrosion protection from IPC stage 5 disk. Information on corrosion protection removal can be found in the Engine Maintenance Manual.

(2) Perform a visual inspection and a binocular inspection of the IPC stage 5 disk for corrosion pitting at the cooling air holes and defender holes in the disk front spacer arm. Follow paragraph 3.C. of the Accomplishment Instructions of RR ASB No. RB.211-72-AD428, Revision 5, dated March 18, 2005. The RR Engine Maintenance Manual, Inspection Check-00 (ATA 72-32-31-200-000), contains limits for corrosion pitting of the IPC stage 5 disk.

(3) If the disk has corrosion pitting in excess of limits, remove the disk from service.

(4) If the disk is free from corrosion pitting, perform a magnetic penetrant inspection (MPI) of the entire disk as follows:

(i) For RB211-524G2-T, RB211-524G3-T, and RB211-524H-T series engines, the RR Engine Maintenance Manual, Inspection Check 08 (ATA 72-32-31-200-008), contains limits for corrosion pitting of the IPC stage 5 disk.

(ii) For RB211-524G2, RB211-524G3, and RB211-524H series engines, the RR Engine Maintenance Manual, Inspection Check 09 (ATA 72-32-31-200-009), contains limits for corrosion pitting of the IPC stage 5 disk.

(iii) If the disk passes the MPI and you find no cracks, complete all other inspections, re-apply corrosion protection to the disk, and return the disk to service using the cyclic limits allowed by paragraph (m) of this AD. RR Repair FRS5900 contains information on re-applying corrosion protection.

(5) If the disk has corrosion pitting that is within limits, do the following:

(i) Perform an ECI on all disk cooling air holes, defender holes, and inner and outer faces. Use paragraph 3.D. of the Accomplishment Instructions of RR ASB No. RB.211-72-AD428, Revision 5, dated March 18, 2005. The RR Engine Maintenance Manual, Inspection Check-00 (ATA 72-32-31-200-000), contains limits for corrosion pitting of the IPC stage 5 disk.

(ii) If the disk passes the ECI and you find no cracks, perform an MPI on the entire disk.

(iii) If the disk passes the MPI and you find no cracks, re-apply corrosion protection to the disk, and return the disk to service using the cyclic limits allowed by paragraph (m) of this AD.

Optional On-Wing Eddy Current Inspections

(k) You may perform an optional on-wing ECI of the IPC stage 5 disk only once between shop visit inspections as follows:

(1) For RB211-524B2/C2, RB211-524B/B3, and RB211-524B4/D4 series engines, use paragraphs 3.A. through 3.F. of the Accomplishment Instructions of RR SB No. RB.211-72-E148, dated March 13, 2003, and RR SB No. RB.211-72-E150, Revision 1, dated June 4, 2003.

(2) For RB211-524G2, RB211-524G2-T, RB211-524G3, RB211-524G3-T, RB211-524H, RB211-524H-T, RB211-524H2, and RB211-524H2-T series engines, use paragraphs 3.A. through 3.M. of the Accomplishment Instructions of RR SB No. RB.211-72-E171, Revision 1, dated February 8, 2005.

(3) If the disk passes the ECI and you find no cracks, you may extend the cycle life as specified in paragraph (m) of this AD.

Definition of Shop Visit

(l) The manufacturer defines a shop visit as the separation of an engine major case flange. This definition excludes shop visits when only field maintenance type activities are performed in lieu of performing them on-wing (such as to perform an on-wing inspection of a tail engine installation on a Lockheed L-1011 series airplane).

Cyclic Life Extension

(m) Disks that pass an optional inspection may remain in service after that inspection for the additional cycles listed in the following Table 5, until the next inspection, until the cyclic life limit published in the RR Time Limits Manual, 05-10-01, is reached, or December 1, 2008, whichever occurs first.

Table 5 - Cyclic Life Extension

Type of Extension	Engine Models			
	-524G2, G2-T, G3, G3-T, H2, H2-T, H-36, H-T-36 (cycles)	-524D4, D4-B, D4-B-39, D4X, D4X-B, D4-39 (cycles)	-524B2, B2-B, C2, C2-B (cycles)	-524B-02, B-B-02, B3-02, B4-02, B4-D-02 (cycles)
Extension After Passing MPI.	1,600	2,000	2,000	2,000
Extension After Passing In-Shop ECI.	3,800	4,500	4,500	4,500
Extension After Passing On-Wing ECI.	1,000	1,200	1,200	1,200

Disks That Have Been Intermixed Between Engine Models

(n) The RR Time Limits Manual, 05-00-01, contains information on intermixing disks between engine models.

Alternative Methods of Compliance

(o) The Manager, Engine Certification Office, has the authority to approve alternative methods of compliance for this AD if requested using the procedures found in 14 CFR 39.19.

Credit for Previous Inspections

(p) Inspections done using RR SB No. RB.211-72-E150, dated April 17, 2003, SB No. RB.211-72-E171, dated December 14, 2004, SB No. RB.211-72-D428, Revision 3, dated June 30, 2003, and ASB No. RB.211-72-AD428, Revision 4, dated March 7, 2005, meet the requirements of this AD.

Reporting Requirement

(q) Report findings of all inspections of the IPC stage 5 disk using paragraph 3.B.(2) of the Accomplishment Instructions of RR No. ASB RB.211-72-AD428, Revision 5, dated March 18, 2005. The Office of Management and Budget (OMB) has approved the reporting requirements specified in Paragraph 3.B. of the Accomplishment Instructions of RR No. ASB RB.211-72-AD428, Revision 5, dated March 18, 2005, and assigned OMB control number 2120-0056.

Related Information

(r) CAA airworthiness directive G-2005-0008, dated March 8, 2005, also addresses the subject of this AD.

(s) Contact Ian Dargin, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; telephone (781) 238-7178; fax (781) 238-7199; e-mail: ian.dargin@faa.gov for more information about this AD.

Material Incorporated by Reference

(t) You must use the service information specified in Table 6 to perform the actions required by this AD. The Director of the Federal Register approved the incorporation by reference of the documents listed in Table 6 of this AD in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Contact Rolls-Royce plc, P.O. Box 31 Derby, DE248BJ, United Kingdom; telephone 011-44-1332-242424; fax 011-44-1332-249936 for a copy of this service information. You may review copies at the FAA, New England Region, Office of the Regional Counsel, 12 New England Executive Park, Burlington, MA; or 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>.

Table 6 – Incorporation by Reference

Rolls-Royce plc Service Bulletin (SB)/Alert Service Bulletin (ASB) No.	Page	Revision	Date
SB No. RB.211-72-E148 Total Pages: 83	All	Original	March 13, 2003
SB No. RB.211-72-E150 Total Pages: 72	All	1	June 4, 2003
SB No. RB.211-72-E171 Total Pages: 71	All	1	February 8, 2005
ASB No. RB.211-72-AD428 Total Pages: 27	All	5	March 18, 2005

Appendix 1 of ASB No. RB.211-72-AD428 Total Pages: 4	All	5	March 18, 2005
Appendix 2 of ASB No. RB.211-72-AD428 Total Pages: 2	All	5	March 18, 2005
Appendix 3 of ASB No. RB.211-72-AD428 Total Pages: 5	All	5	March 18, 2005
Appendix 4 of ASB No. RB.211-72-AD428 Total Pages: 2	All	5	March 18, 2005

Issued in Burlington, Massachusetts, on March 7, 2007.

Peter A. White,

Acting Manager, Engine and Propeller Directorate, Aircraft Certification Service.

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