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[Page 58290-58292]  
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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2010-0364; Directorate Identifier 2009-NE-27-AD; Amendment 39-16446; AD 2010-20-11]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Rolls-Royce plc RB211 Trent 700 and Trent 800 Series Turbofan Engines**

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

**ACTION:** Final rule.

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**SUMMARY:** We are adopting a new airworthiness directive (AD) for the products listed above. This AD results from mandatory continuing airworthiness information (MCAI) issued by an aviation authority of another country to identify and correct an unsafe condition on an aviation product. The MCAI describes the unsafe condition as:

In completing a review of Engine Manual repair/acceptance limits for titanium compressor shafts, Rolls-Royce has found the specified limits to be incorrect such that the shot peened surface layer at life critical features (the axial dovetail slots) may have been inadvertently removed in-service. Removal of the shot peened layer results in increased vulnerability of the part to tensile stresses, which could reduce the life of the shaft to below the published life limits.

We are issuing this AD to prevent failure of the intermediate-pressure (IP) and high-pressure (HP) shaft, which could result in an overspeed condition, possible uncontained disc failure and damage to the airplane.

**DATES:** This AD becomes effective October 29, 2010.

**ADDRESSES:** The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

**FOR FURTHER INFORMATION CONTACT:** James Lawrence, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park,

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that would apply to the specified products. That NPRM was published in the Federal Register on April 7, 2010 (75 FR 17630). That NPRM proposed to correct an unsafe condition for the specified products. The MCAI states:

In completing a review of Engine Manual repair/acceptance limits for titanium compressor shafts, Rolls-Royce has found the specified limits to be incorrect such that the shot peened surface layer at life critical features (the axial dovetail slots) may have been inadvertently removed in-service. Removal of the shot peened layer results in increased vulnerability of the part to tensile stresses, which could reduce the life of the shaft to below the published life limits. The acceptable limits for material loss on these surfaces have now been corrected in the Engine Manual.

This AD identifies shafts for which such dressing operations have been known to have been carried out and requires that an inspection for compliance with the corrected Engine Manual limits be accomplished and that the shafts be dispositioned accordingly.

### **Comments**

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

We gave the public the opportunity to participate in developing this AD. We considered the comments received.

### **Requests To Change Paragraphs (e)(1) and (e)(2) of the Proposed AD**

Two commenters, The Boeing Company and American Airlines, ask us to change paragraphs (e)(1) and (e)(2) of the proposed AD to clarify the focused inspections and to include a reference to Rolls-Royce (RR) Alert Non-Modification Service Bulletin (NMSB) RB.211-72-AG086.

The Boeing Company asks us to change paragraph (e)(2) to include a reference to RR Alert NMSB RB.211-72-AG086. They state that guidance on full-focused inspections and acceptance limits can be found in either the current applicable RR engine manual or RR Alert NMSB RB.211-72-AG086. The Boeing Company feels that the information contained in the engine manual is not as clear or as accessible as in the RR Alert NMSB and that including the RR Alert NMSB, as an additional source of guidance, will assist the operators in conducting the associated inspections properly.

We agree. We changed paragraph (e)(2) to include a reference to RR Alert NMSB RB.211-72-AG086.

American Airlines, asks us to change paragraph (e)(1) to include a requirement for "all applicable focus inspection subtasks of the IP and HP compressor shafts \* \* \*" American Airlines states that the Rolls-Royce Time Limits Manual and the applicable Engine Inspection Tasks do not use "full-focused inspection" terminology (as used in the NPRM). American Airlines believes that the AD terminology should be consistent with the manuals.

We agree. We changed paragraph (e)(1) to state "Perform a one-time, piece-part, full inspection, including all applicable focus inspection Subtasks, of the IP and HP compressor shafts, listed by part number and serial number in Table 1 of this AD, before exceeding the compliance period specified in Table 1 of this AD."

## **Conclusion**

We reviewed the available data, including the comment[s] received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We determined that these changes will not increase the economic burden on any operator or increase the scope of the AD.

## **Costs of Compliance**

Based on the service information, we estimate that this AD would affect about 12 products of U.S. registry. We also estimate that it would take about 8 work-hours per product to comply with this AD. The average labor rate is \$85 per work-hour. Required parts would cost about \$15,000 per product. Based on these figures, we estimate the cost of the AD on U.S. operators to be \$188,160. Our cost estimate is exclusive of possible warranty coverage.

## **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 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 this AD:

1. Is not a "significant regulatory action" under Executive Order 12866;
2. Is not a "significant rule" under the 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 regulatory evaluation of the estimated costs to comply with this AD and placed it in the AD docket.

## **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office 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 street address for the Docket Operations office (phone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, 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 adding the following new AD:



**2010-20-11 Rolls-Royce plc:** Amendment 39-16446. Docket No. FAA-2010-0364; Directorate Identifier 2009-NE-27-AD.

**Effective Date**

(a) This airworthiness directive (AD) becomes effective October 29, 2010.

**Affected ADs**

(b) None.

**Applicability**

(c) This AD applies to Rolls-Royce plc model (RR) RB211 Trent 768-60, 772-60, 772B-60, 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17, and 895-17 turbofan engines that have a compressor shaft listed by part number and serial number in Table 1 of this AD. These engines are installed on, but not limited to, Airbus A330 series and Boeing 777 series airplanes.

**Reason**

(d) This AD results from a review of engine manual repair/acceptance limits for titanium compressor shafts by RR. We are issuing this AD to prevent failure of the intermediate-pressure (IP) and high-pressure (HP) shaft, which could result in an overspeed condition, possible uncontained disc failure and damage to the airplane.

**Actions and Compliance**

(e) Unless already done, do the following actions.

(1) Perform a one-time, piece-part, full inspection, including all applicable focus inspection Subtasks, of the IP and HP compressor shafts listed by part number and serial number in Table 1 of this AD before exceeding the compliance period specified in Table 1 of this AD.

(2) Guidance on full and focused inspections and acceptance limits can be found in the current, applicable RR engine manual and RR Alert Non-Modification Service Bulletin (NMSB) RB.211-72-AG086.

**Table 1 – List of Affected Shafts**

<b>Engine Series</b>	<b>Affected Component</b>	<b>Part No.</b>	<b>Shaft Serial No.</b>	<b>Compliance Period (flight cycles in service after December 4, 2008.)</b>
Trent 800	1-8 IP Compressor Shaft	FK24100	MW0115238	750
Trent 800	1-4 HP Compressor Shaft	FK32580	MW0115512	750

Trent 800	1-4 HP Compressor Shaft	FK32580	MW0004708	2000
Trent 800	1-4 HP Compressor Shaft	FK32580	MW00063868	2500
Trent 800	1-8 IP Compressor Shaft	FK24100	DN65507	2500
Trent 800	1-8 IP Compressor Shaft	FK24100	DN65158	2500
Trent 800	1-4 HP Compressor Shaft	FK32580	MW0125467	3500
Trent 800	1-4 HP Compressor Shaft	FW11590	DN65189	3500
Trent 800	1-8 IP Compressor Shaft	FK24100	MW0091518	3500
Trent 800	1-8 IP Compressor Shaft	FK24100	MW0126365	3500
Trent 800	1-8 IP Compressor Shaft	FK24100	DN66422	4750
Trent 800	1-8 IP Compressor Shaft	FK24100	MW0203314	4750
Trent 700	1-8 IP Compressor Shaft	FK22279	DN63228	3250
Trent 700	1-8 IP Compressor Shaft	FK26048	MW0026046	4500

### **Other FAA AD Provisions**

(f) Alternative Methods of Compliance (AMOCs): The Manager, Engine Certification Office, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19.

### **Related Information**

(g) Refer to MCAI EASA Airworthiness Directive 2009-0021 (Corrected February 9, 2009), dated February 6, 2009, and RR Alert NMSB RB.211-72-AG086, for related information.

(h) Contact James Lawrence, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: james.lawrence@faa.gov; telephone (781) 238-7176; fax (781) 238-7199, for more information about this AD.

### **Material Incorporated by Reference**

(i) None.

Issued in Burlington, Massachusetts, on September 17, 2010.  
 Robert J. Ganley,  
 Acting Manager, Engine and Propeller Directorate,  
 Aircraft Certification Service.