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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2009-0811; Directorate Identifier 2008-NE-41-AD; Amendment 39-16429; AD 2010-19-01]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Rolls-Royce Corporation (RRC) AE 3007A Series Turbofan Engines**

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

**ACTION:** Final rule.

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**SUMMARY:** The FAA is superseding an existing airworthiness directive (AD) for RRC AE 3007A series turbofan engines. That AD currently requires performing an eddy current inspection (ECI) or surface wave ultrasonic test (SWUT) inspection on each affected high-pressure turbine (HPT) wheel. This AD requires removing or performing initial and repetitive ECIs or SWUT inspections on HPT stage 2 wheels for cracks. This AD also reduces the approved life limits of certain HPT stage 2 wheels. This AD results from reports of cracked HPT stage 2 wheels. We are issuing this AD to prevent uncontained failure of the HPT stage 2 wheel and damage to the airplane.

**DATES:** This AD becomes effective October 27, 2010. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of October 27, 2010.

**ADDRESSES:** You can get the service information identified in this AD from Rolls-Royce Corporation, P.O. Box 420, Speed Code U15, Indianapolis, IN 46206-0420, e-mail: indy.pubs.services@rolls-royce.com.

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:** Kyri Zaroyiannis, Aerospace Engineer, Chicago Aircraft Certification Office, Small Airplane Directorate, FAA, 2300 E. Devon Ave., Des Plaines, IL 60018; e-mail: kyri.zaroyiannis@faa.gov; telephone (847) 294-7836; fax (847) 294-7834.

**SUPPLEMENTARY INFORMATION:** The FAA proposed to amend 14 CFR part 39 by superseding AD 2009-08-51, Amendment 39-15905 (74 FR 22091, May 12, 2009), with a proposed

AD. The proposed AD applies to RRC AE 3007A series turbofan engines. We published the proposed AD in the Federal Register on February 18, 2010 (75 FR 7209). That action proposed to require:

- Removing from service, any engine with certain part number (P/N) HPT stage 2 wheels that have a cycles-since-new (CSN) specified in Table 1 of this AD, by the compliance time specified in Table 1 of this AD; or
- Performing an ECI or SWUT inspection on certain P/N HPT stage 2 wheels that have a CSN specified in Table 1 of this AD by the compliance time specified in Table 1 of this AD; and
- Performing repetitive ECI or SWUT inspections of the HPT stage 2 wheels within 3,000 cycles-since-last inspection.

### **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 (telephone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

### **Comments**

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

### **Request To Clarify Repetitive Inspection Paragraph**

One commenter asks us to clarify paragraph (i) of the proposed AD, which states "Thereafter, within 3,000 cycles since last inspection, remove the engine from service \* \* \*" The commenter asks if the last inspection means those inspections performed to comply with ADs 2008-19-51, 2008-26-06 and 2009-08-51. The commenter feels paragraph (i) of the proposed AD is not clear.

We agree. We changed paragraph (i) of this AD to "Thereafter, within 3,000 cycles-since-last inspection performed as a result of this AD or its predecessor ADs (Emergency ADs 2008-19-51, AD 2008-26-06, and 2009-08-51), remove the engine from service \* \* \*

### **Request To Credit for Work Done to Previous Revisions of the Service Bulletins**

Four commenters ask us to allow credit for initial and repetitive inspections performed using previous versions of RRC Alert Service Bulletin (ASB) AE 3007A-A-72-367, Revision 2, dated June 22, 2009, Service Bulletin (SB) AE 3007A-72-176, Revision 5, dated September 2, 2008; SB AE 3007A-72-215, Revision 2, dated September 28, 2009; SB AE 3007A-72-368, Revision 3, dated May 24, 2010; and SB AE 3007A-72-369, Revision 2, dated November 5, 2009.

We agree. We added paragraph (g)(6) to allow credit for initial and repetitive inspections performed using earlier versions of RRC ASB AE 3007A-A-72-367, Revision 2, dated June 22, 2009; SB AE 3007A-72-368, Revision 3, dated May 24, 2010; and SB AE 3007A-72-369, Revision 2, dated November 5, 2009. We also changed paragraph (l) of this AD to state "For wheels, P/N 23069438 \* \* \* RRC SB AE 3007A-72-176, Revision 5, dated September 2, 2008, or earlier version; or SB AE 3007A-72-215, Revision 2, dated September 28, 2009, or earlier version, remove the wheel before exceeding the new, reduced ECLL of 10,000 CSN."

## **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.

## **Costs of Compliance**

We estimate that this AD will affect 1402 engines installed on airplanes of U.S. registry. We also estimate that it will take about 2 work-hours per engine to perform both the ECI and SWUT. The average labor rate is \$85 per work-hour. No parts are required for the inspection. We estimate the prorated life lost per stage 2 wheel is about \$13,177. Based on these figures, we estimate the total cost of the AD to U.S. operators to be \$18,712,494. This estimate is exclusive of any 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 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 39-15905 (74 FR 22091, May 12, 2009), and by adding a new airworthiness directive, Amendment 39-16429, to read as follows:



**2010-19-01 Rolls-Royce Corporation (Formerly Allison Engine Company):** Amendment 39-16429. Docket No. FAA-2009-0811; Directorate Identifier 2008-NE-41-AD.

**Effective Date**

(a) This airworthiness directive (AD) becomes effective October 27, 2010.

**Affected ADs**

(b) This AD supersedes AD 2009-08-51, Amendment 39-15905.

**Applicability**

(c) This AD applies to Rolls-Royce Corporation (RRC) AE 3007A series turbofan engines with high-pressure turbine (HPT) stage 2 wheels, part numbers (P/Ns) 23069438, 23069592, 23074462, 23074644, 23075345, or 23084520 installed. These engines are installed on, but not limited to, Empresa Brasileira de Aeronautica S. A. (EMBRAER) EMB-135 and EMB-145 airplanes.

**Unsafe Condition**

(d) This AD results from reports of cracked HPT stage 2 wheels. We are issuing this AD to prevent uncontained failure of the HPT stage 2 wheel and 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.

**HPT Stage 2 Wheels Exempted From the Inspection Requirements of This AD**

(f) The following engines are exempt from the inspection requirements of this AD:

- (1) All engines with an HPT stage 2 wheel, P/N 23084520.
- (2) All engines with an HPT stage 2 wheel, P/N 23075345, that has a serial number (S/N)

specified in Table 1 of this AD, and

- (3) All engines with an HPT stage 2 wheel, P/N 23074462, that has a S/N specified in Table 2 of this AD.

**Table 1 – HPT Stage 2 Wheel, P/N 23075345 by S/N Excluded From Inspection Requirements (g) through (i) of this AD**

MM507646	MM508211	MM508319
MM508144	MM508221	MM508320
MM508153	MM508241	MM508322
MM508176	MM508248	MM508337

MM508186	MM508251	MM508338
MM508188	MM508264	MM508382
MM508205	MM508305	MM508387
MM508208	MM508311	

**Table 2 – HPT Stage 2 Wheel, P/N 23074462 by S/N Excluded From Inspection Requirements (g) through (i) of this AD**

MM504890	MM505025	MM505054
MM504963	MM505034	MM505055
MM504990	MM505041	MM505056
MM504995	MM505045	MM505061
MM505007	MM505046	All ‘MM’ prefix S/Ns higher than MM505061
MM505017	MM505048	All S/Ns with ‘MW’ prefix

**Initial Eddy Current Inspection (ECI) or Surface Wave Ultrasonic Testing (SWUT) Inspection**

(g) For engines with an HPT stage 2 wheel, P/Ns 23069438, 23069592, 23074462, 23074644, or 23075345, remove the engine from service or perform an initial inspection of the wheel by the cycle limit specified in Table 3 of this AD. Use one of the following methods for the inspection:

(1) For HPT stage 2 wheels that have S/Ns listed in Table 4 of this AD, use paragraphs 2.A. through 2.C.(4) of RRC Alert Service Bulletin (ASB) AE 3007A-A-72-367, Revision 2 dated June 22, 2009, to inspect the wheel.

(2) For HPT stage 2 wheels that have S/Ns not listed in Table 4 of this AD, use paragraphs 2.A. through 2.C.(4) of RRC ASB AE 3007A-A-72-367, Revision 2, dated June 22, 2009, or use paragraphs 2.A. through 2.N. of RRC Service Bulletin (SB) AE 3007A-72-368, Revision 3, dated May 24, 2010; or use 2.A. through 2.V.(4) of RRC SB AE 3007A-72-369, Revision 2, dated November 5, 2009, to perform the inspections.

**Table 3 – Compliance Times for Engine Removal or ECI or SWUT Inspection of the HPT Stage 2 Wheels by Cycles-Since-New (CSN)**

<b>For HPT stage 2 wheels with the following CSN on the effective date of this AD:</b>	<b>Remove engine from service or inspect wheel within the following cycles-in-service (CIS) after the effective date of this AD:</b>
(3) 17,500 or more CSN.	Remove engine from service or inspect before next flight.
(4) 10,000 to 17,499 CSN.	15 CIS.
(5) 9,999 or fewer CSN.	Before accumulating 10,015 CSN.

**Credit for Previous Inspections**

(6) Inspections performed before the effective date of this AD using earlier versions of RRC ASB AE 3007A-A-72-367 or RRC SB AE 3007A-72-368 or RRC SB AE 3007A-72-369 comply with the requirements of paragraphs (g)(1) and (g)(2) of this AD.

**Table 4 – S/Ns of HPT Stage 2 Wheels to be Inspected by SB AE 3007A-72-367 (ECI Method Only)**

<b>HPT Stage 2 Wheels Requiring ECI Method Only</b>	
MM119400	MM183796
MM119480	MM183808
MM119508	MM183831
MM155847	MM228730
MM155907	MM228951
MM155908	MM503748
MM183236	MM504004
MM183362	MM57188
MM183754	MM57440
MM183762	MM57480

**Installation Prohibition**

(h) After the effective date of this AD, don't return to service, any HPT stage 2 wheel that was installed in any RRC AE 3007A series engine that has been removed as a result of the inspection requirements of this AD, unless the HPT stage 2 wheel was inspected as specified in RRC ASB AE 3007A-A-72-367, Revision 2, dated June 22, 2009; or RRC SB AE 3007A-72-368, Revision 3, dated May 24, 2010; or RRC SB AE 3007A-72-369, Revision 2, dated November 5, 2009.

**Repetitive Inspection**

(i) Thereafter, within 3,000 cycles-since-last inspection performed as a result of this AD or its predecessor ADs (Emergency ADs 2008-19-51, AD 2008-26-06, and 2009-08-51), remove the engine from service until an ECI or SWUT inspection is performed on the HPT stage 2 wheel. Use paragraphs 2.A. through 2.C.(4) of RRC ASB AE 3007A-A-72-367, Revision 2, dated June 22, 2009, or use paragraphs 2.A. through 2.N. of RRC SB AE 3007A-72-368, Revision 3, dated May 24, 2010; or use 2.A. through 2.V.(4) of RRC SB AE 3007A-72-369, Revision 2, dated November 5, 2009, to inspect the wheel.

**New, Reduced Engine Cycle Life Limit and Removal From Service**

(j) For HPT stage 2 wheels, P/N 23084520, do the following:

(1) For wheels that have 22,985 CSN or more on the effective date of this AD, remove the wheel from service within 15 CIS after the effective date of this AD.

(2) Thereafter, remove HPT stage 2 wheels, P/N 23084520, before exceeding the new, reduced engine cycle life limit (ECLL) of 23,000 CSN.

(k) For HPT stage 2 wheels, P/N 23075345 and 23074644, do the following:

(1) For wheels that have 19,985 CSN or more on the effective date of this AD, remove the wheel from service within 15 CIS after the effective date of this AD unless paragraph (k)(3) of this AD applies.

(2) Thereafter, remove HPT stage 2 wheels, P/N 23075345 and 23074644, before exceeding the new, reduced ECLL of 20,000 CSN.

(3) For HPT stage 2 wheels, P/N 23075345, that have a S/N listed in Table 5 of this AD and that have 22,985 CSN or more on the effective date of this AD, remove the wheel from service within 15 CIS after the effective date of this AD.

(4) Thereafter, for HPT stage 2 wheels, P/N 23075345, that have a S/N listed in Table 5 of this AD, remove the wheel from service before exceeding the new, reduced ECLL of 23,000 CSN.

**Table 5 – S/Ns of HPT Stage 2 Wheel, P/N 23075345, Eligible to Remain In Service until 23,000 CSN**

MM507646	MM508205	MM508251	MM508322
MM508144	MM508208	MM508264	MM508337
MM508153	MM508211	MM508305	MM508338
MM508176	MM508221	MM508311	MM508382
MM508186	MM508241	MM508319	MM508387
MM508188	MM508248	MM508320	

(l) For wheels, P/N 23069438, in engines that have not complied with RRC SB AE 3007A-72-176, Revision 5, dated September 2, 2008, or earlier version; or SB AE 3007A-72-215, Revision 2, dated September 28, 2009, or earlier version, remove the wheel before exceeding the new, reduced ECLL of 10,000 CSN.

(m) For wheels, P/N 23069438, in engines that have complied with RRC SB AE 3007A-72-176, Revision 5, dated September 2, 2008, or earlier version; or SB AE 3007A-72-215, Revision 2, dated September 28, 2009, or earlier version; do the following:

(1) For wheels that have 19,985 CSN or more on the effective date of this AD, remove the wheel from service within 15 CIS after the effective date of this AD.

(2) Thereafter, remove the wheel from service before exceeding the new, reduced ECLL of 20,000 CSN.

### **Alternative Methods of Compliance**

(n) The Manager, Chicago Aircraft 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.

### **Special Flight Permits**

(o) Under 14 CFR 39.23, we are limiting the special flight permits for this AD by restricting the flight to essential flight crew only.

### **Related Information**

(p) Contact Kyri Zaroyiannis, Aerospace Engineer, Chicago Aircraft Certification Office, Small Airplane Directorate, FAA, 2300 E. Devon Ave., Des Plaines, IL 60018; e-mail: kyri.zaroyiannis@faa.gov; telephone (847) 294-7836; fax (847) 294-7834, for more information about this AD.

### **Material Incorporated by Reference**

(q) You must use the service information specified in Table 6 of this AD to perform the inspections 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. You can get a copy from Rolls-Royce Corporation, P.O. Box 420, Indianapolis, IN 46206; telephone (317) 230-3774; fax (317) 230-8084; e-mail: [indy.pubs.services@rolls-royce.com](mailto:indy.pubs.services@rolls-royce.com). You may review copies at the FAA, New England Region, 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**

<b>Rolls-Royce Corporation Service Information No.</b>	<b>Page</b>	<b>Revision</b>	<b>Date</b>
Alert Service Bulletin AE 3007A-A-72-367	ALL	2	June 22, 2009
Total Pages: 8			
Service Bulletin AE 3007A-72-368	ALL	3	May 24, 2010
Total Pages: 23			
Service Bulletin AE 3007A-72-369	ALL	2	November 5, 2009
Total Pages: 22			

(Only the transmittal letter for Alert Service Bulletin (ASB) AE 3007A-A-72-367, Revision 2, dated June 22, 2009, identifies this service bulletin as an ASB; no other page of this document contains this information.)

Issued in Burlington, Massachusetts, on September 1, 2010.  
 Robert G. Mann,  
 Acting Manager, Engine and Propeller Directorate,  
 Aircraft Certification Service.