



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2018-0259; Product Identifier 2018-NE-09-AD]**

**RIN 2120-AA64**

**Airworthiness Directives; Rolls-Royce Corporation Engines**

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

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to adopt a new airworthiness directive (AD) for Rolls-Royce Corporation (RRC) AE 2100D2A and AE 2100D3 model turboprop engines and AE 3007A2 model turbofan engines. This proposed AD was prompted by the possibility of a low-cycle fatigue failure on certain turbine wheels. This proposed AD would require removing the affected turbine wheels at the next engine shop visit or before reaching the new reduced life limit, whichever occurs first, and replacing them with parts eligible for installation. We are proposing this AD to address the unsafe condition on these products.

**DATES:** We must receive comments on this proposed 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: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Rolls-Royce Corporation, 450 South Meridian Street, Indianapolis, IN 46225; phone: 317-230-3774. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

### **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-2018-0259; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, the regulatory evaluation, any comments received, and other information. The street address for Docket Operations (phone: 800-647-5527) is listed above. Comments will be available in the AD docket shortly after receipt.

**FOR FURTHER INFORMATION CONTACT:** Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO Branch, FAA, 2300 E. Devon Ave., Des Plaines, IL 60018; phone: 847-294-7836; fax: 847-294-7834; email: [kyri.zaroyiannis@faa.gov](mailto:kyri.zaroyiannis@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2018-0259; Product Identifier 2018-NE-09-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this NPRM. We will consider all comments received by the closing date and may amend this NPRM 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 NPRM.

### **Discussion**

We were prompted to issue this NPRM based upon a report of the discovery of steel inclusion in the production process at an RRC forging supplier. Ultrasonic inspection at the forging supplier revealed steel impurities could be introduced into turbine wheels during forging. Analysis and testing by RRC of these wheels indicated that, because of imperfections, these turbine wheels could not be operated safely up to their published life limits. The affected turbine wheels include 1<sup>st</sup>-stage gas generator turbine wheels, installed on AE 2100D2A and AE 2100D3 model turboprop engines, and 1<sup>st</sup>-stage high-pressure turbine (HPT) wheels, installed on AE 3007A2 turbofan engines.

This condition, if not addressed, could result in uncontained turbine wheel release, damage to the engine, and damage to the airplane.

### **Related Service Information under 1 CFR part 51**

We reviewed RRC Alert Service Bulletin (ASB) AE 2100D2-A-72-090, Revision 1, dated July 11, 2014, and RRC ASB AE 2100D3-A-72-286, Revision 1, dated July 11, 2014 (one document, referred to herein as “RRC ASB AE 2100D2-A-72-090/AE 2100D3-A-72-286”), and RRC ASB AE 3007A-A-72-419, Revision 2, dated December 4, 2017. RRC ASB AE 2100D2-A-72-090/AE 2100D3-A-72-286 provides removal and replacement instructions and a new life limit for the affected 1<sup>st</sup>-stage gas generator turbine wheels installed on RRC AE 2100D2A and AE 2100D3 model turboprop engines. ASB AE 3007A-A-72-419 provides removal and replacement instructions and a new life limit for 1<sup>st</sup>-stage HPT wheels installed on RRC AE 3007A2 model turbofan engines. 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.

**FAA’s Determination**

We are proposing 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.

**Proposed AD Requirements**

This proposed AD requires the removal and replacement of the affected turbine wheels at the next engine shop visit or before reaching their new life limit, whichever occurs first.

**Costs of Compliance**

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

We estimate the following costs to comply with this proposed AD:

**Estimated costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Replace turbine wheels	0 work-hours x \$85 per hour = \$0	\$160,829	\$160,829	\$1,447,461

**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 proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would 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 proposed regulation:

- (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),
- (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.

### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 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 airworthiness directive (AD):

**Roll-Royce Corporation (Type Certificate previously held by Allison Engine Company):** Docket No. FAA-2018-0259; Product Identifier 2018-NE-09-AD.

**(a) Comments Due Date**

We must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE Federal Register].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to:

(1) Rolls-Royce Corporation (RRC) AE 2100D2A turboprop engines with 1<sup>st</sup>-stage gas generator turbine wheels, part number (P/N) 23089692, with serial numbers (S/Ns) MW65898 or MW68310, installed.

(2) RRC AE 2100D3 turboprop engines with 1<sup>st</sup>-stage gas generator turbine wheels, P/N 23088906, with S/Ns MW65895, MW65896, MW65900, MW65901, MW65903, MW68305, MW68306, MW68307, MW68312, MW68314, MW68316, MW68318, or MW68319 installed.

(3) RRC AE 3007A2 turbofan engines with 1<sup>st</sup>-stage high-pressure turbine (HPT) wheels, P/N 23088906, with S/Ns MW65894, MW68303, or MW68315 installed.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7250, Turbine section.

**(e) Unsafe Condition**

This AD was prompted by the possibility of steel inclusions in the turbine wheel forging. We are proposing this AD to prevent a low-cycle fatigue failure of a 1<sup>st</sup>-stage gas

generator turbine wheel or 1<sup>st</sup>-stage HPT wheel. The unsafe condition, if not addressed, could result in uncontained turbine wheel release, damage to the engine, and damage to the airplane.

**(f) Compliance**

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

**(g) Required Actions**

(1) Remove the affected 1<sup>st</sup>-stage gas generator turbine wheel and replace with a part eligible for installation at the next engine shop visit or before exceeding the life limit of 4,800 engine cycles, whichever occurs first, in accordance with the Accomplishment Instructions, Paragraph 2, of RRC Alert Service Bulletin (ASB) AE 2100D2-A-72-090, Revision 1, dated July 11, 2014, and RRC ASB AE 2100D3-A-72-286, Revision 1, dated July 11, 2014 (one document).

(2) Remove the affected 1<sup>st</sup>-stage HPT wheel and replace with a part eligible for installation at the next engine shop visit or before exceeding the life limit of 5,600 engine cycles, whichever occurs first, in accordance with the Accomplishment Instructions, Paragraph 2, of RRC ASB AE 3007A-A-72-419, Revision 2, dated December 4, 2017.

**(h) Definition**

For the purpose of this AD, an “engine shop visit” is the induction of an engine into the shop for maintenance involving the separation of pairs of major mating engine flanges, except that the separation of engine flanges solely for the purposes of transportation without subsequent engine maintenance is not an engine shop visit.

**(i) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Chicago ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the

manager of the certification office, send it to the attention of the person identified in paragraph (j)(1) of this AD.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(j) Related Information**

(1) For more information about this AD, contact Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO Branch, FAA, 2300 E. Devon Ave., Des Plaines, IL 60018; phone: 847-294-7836; fax: 847-294-7834; email: kyri.zaroyiannis@faa.gov.

(2) For service information identified in this AD, contact Rolls-Royce Corporation, 450 South Meridian Street, Indianapolis, IN 46225; phone: 317-230-3774. You may view this service information at the FAA, Engine and Propeller Standards Branch, 1200 District Avenue, Burlington, MA. For information on the availability of this material at the FAA, call 781-238-7759.

Issued in Burlington, MA, on April 25, 2018.

Robert J. Ganley,  
Manager, Engine and Propeller Standards Branch,  
Aircraft Certification Service.  
[FR Doc. 2018-09012 Filed: 4/27/2018 8:45 am; Publication Date: 4/30/2018]