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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2005-20742; Directorate Identifier 2005-NE-03-AD; Amendment 39-14347; AD 2005-22-03]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce Corporation (Formerly Allison Engine Company) 501-D22A, 501-D22C, and 501-D22G Turboprop Engines

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

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for Rolls-Royce Corporation (RRC) (formerly Allison Engine Company) 501-D22A, 501-D22C, and 501-D22G turboprop engines. This AD requires a onetime inspection for proper metal hardness of certain 1st stage, 2nd stage, 3rd stage, and 4th stage turbine wheels. This AD results from a report of a turbine wheel found to be over dimensional limits, caused by improper metal hardness. We are issuing this AD to prevent uncontained turbine wheel failure, leading to damage of the airplane and total loss of engine power.

DATES: This AD becomes effective November 29, 2005. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of November 29, 2005.

ADDRESSES: Contact Rolls-Royce Corporation, P.O. Box 420, 2001 South Tibbs Avenue, Indianapolis, IN 46206-0420; telephone (317) 230-2000; fax (317) 230-4020 for the service information identified in this AD.

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: Michael Downs, Aerospace Engineer, Chicago Aircraft Certification Office, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018; telephone (847) 294-7870; fax (847) 294-7834.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 with a proposed airworthiness directive (AD). The proposed AD applies to Rolls-Royce Corporation (RRC) (formerly Allison Engine Company) 501-D22A, 501-D22C, and 501-D22G turboprop engines. We

published the proposed AD in the Federal Register on March 29, 2005 (70 FR 15784). That action proposed to require a onetime inspection for proper metal hardness of certain 1st stage, 2nd stage, 3rd stage, and 4th stage turbine wheels. That action proposed to do the inspection at the next shop visit of the engine or turbine module, but not to exceed 7,400 cycles-since-new of any 1st stage, 2nd stage, 3rd stage, or 4th stage turbine wheel.

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 Docket Offices 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.

NPRM Work Hour Estimate Is Different Than Estimate in RRC Commercial Engine Bulletins

One commenter states that the NPRM work hour estimate of 0.5 hour per engine is different from the estimate in the RRC Commercial Engine Bulletins (CEBs) No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004. The CEBs state that the 0.5 hour for inspection is in addition to the time required to remove the wheel. The commenter received an estimate from a Rolls-Royce-authorized overhaul facility of 250 work hours to perform the wheel inspection, which includes turbine disassembly and reassembly. We disagree. We estimated the cost of compliance to be 0.5 hour based on the assumption that the turbine is disassembled for other reasons, notably for an overhaul. The 250 work hours are basic and unrelated to the onetime inspection required by this AD. We have clarified in this final rule that the 0.5 hour is for the onetime inspection for metal hardness, but we have not changed the total costs of compliance in the AD.

Airplane Designations Not on the Type Certificate

The same commenter states that in the Applicability paragraph of the proposed AD, the L-100-20 and L-100-30 airplane designations are not included on the type certificate. The commenter suggests that only the type certificated airplanes be listed. The commenter states that historically, the L-382E is also known as the L-100-20, and the L-382G is also known as the L-100-30. We agree. We have corrected the Applicability in the AD to list the type-certificated airplanes and put the other designations in parentheses, for reference.

The Term ''Shop Visit'' Needs Clarification

The same commenter states that in the Compliance paragraph of the proposed AD, the term "shop visit" needs clarification. The commenter asks if it is our intention to have the hardness test performed at the next visit to the engine shop, regardless of the extent of other work performed. The commenter feels that is not our intention. The commenter also cites the recommended compliance appearing in CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one

document) dated January 23, 2004. The commenter suggests that the Compliance paragraph be changed to require compliance with the hardness inspection on suspect turbine wheels based on whichever of the following events occurs first:

- Not to exceed 7,400 cycles-since-new;
- Before installation of a suspect turbine wheel onto the rotor;
- When the suspect turbine wheel is next accessed by rotor disassembly.

We disagree. We expect a "shop visit" to be a visit that results in a turbine wheel disassembly. The most common term is overhaul, but not all users request an overhaul from their supplier when a turbine module visits the shop. The type of service being sought is not relevant to the hardness inspection. What is relevant, is that you perform the inspection before 7,400 cycles-since-new. We have not changed the Compliance paragraph in the AD based on this comment.

Request To Clarify Where To Mark the Part

The same commenter requests that we change compliance paragraph (h) to allow the part to be marked after or near the end of the serial number. The commenter states that CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004, also specify the marking this way. The paragraph in the proposed AD instructs service personnel to mark the part after the serial number only. The commenter states there is not always adequate space to mark the part after the serial number. We disagree. The area suitable for marking is quite large, however RRC chose to use the words "after or near" to make sure the part is marked in a suitable place. We have not changed the AD based on this comment.

Request Clarification of When To Report Findings of Inspections

The same commenter requests clarification of when to report findings of inspections. The proposed AD requires reporting findings of inspections using the procedures specified in paragraph 2.E. of RRC CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004. Those procedures state that inspection results be reported to Rolls-Royce T56/501 Customer Support in compliance with this CEB (when done). "When done" does not specify a time frame for submitting the inspection results. Some people may interpret this as immediately and others at a later time. The commenter suggests we specify that the inspection findings be submitted within 30 days of the inspection completion. We agree. We have changed paragraph (i) of the AD to state to report findings of inspections within 30 days of inspection using the procedures specified in paragraph 2.E of RRC CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004.

Clarification of Compliance

As clarification, we have added wording to paragraph (g) of this AD, to state to install a serviceable turbine wheel. This change relates the compliance to the serviceable turbine wheel definition in paragraph (j) 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.

Costs of Compliance

There are about 150 RRC 501-D22A, 501-D22C, and 501-D22G turboprop engines of the affected design in the worldwide fleet. We estimate that 150 engines installed on airplanes of U.S. registry are affected by this AD. We also estimate that it will take about 0.5 work hour per engine to perform the onetime inspection for proper metal hardness, and that the average labor rate is $65 per work hour. Required parts will cost about $1,495 per turbine wheel. The manufacturer has stated that it may provide replacement parts for turbine wheels that do not meet inspection criteria, at no cost to operators. Based on these figures, we estimate the total cost of the AD to U.S. operators to be $229,125.

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 adding the following new airworthiness directive:

AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

We post ADs on the internet at www.faa.gov/aircraft/safety/alerts/

2005-22-03 Rolls-Royce Corporation (formerly Allison Engine Company): Amendment 39-14347. Docket No. FAA-2005-20742; Directorate Identifier 2005-NE-03-AD.

Effective Date

(a) This airworthiness directive (AD) becomes effective November 29, 2005.

Affected ADs

(b) None.

Applicability

(c) This AD applies to Rolls-Royce Corporation (RRC) (formerly Allison Engine Company) 501-D22A, 501-D22C, and 501-D22G turboprop engines with the turbine wheels listed in the following Table 1, installed.

TABLE 1.—AFFECTED TURBINE WHEELS

Turbine wheel part number	Turbine wheel	Serial numbers
6875431	1st Stage	KK50152 through KK50199.
6845592	2nd Stage	KK40998 through KK41057.
6845593	3rd Stage	KK36452 through KK36461, and KK36492 through KK36532.
6870434	4th Stage	KK40320 through KK40393, and KK40485 through KK40535.

These engines are installed on, but not limited to, Commercial Hercules L-382B, L-382E (L-100-20), L-382G (L-100-30), Airbus Super Guppy-201, Super Convair CV-580A, and CV5800 airplanes.

Unsafe Condition

(d) This AD results from a report of a turbine wheel found to be over dimensional limits, caused by improper metal hardness. We are issuing this AD to prevent uncontained turbine wheel failure, leading to damage of the airplane and total loss of engine power.

Compliance

(e) You are responsible for having the actions required by this AD performed at the next shop visit of the engine or turbine module, but not to exceed 7,400 cycles-since-new of any 1st stage, 2nd stage, 3rd stage, or 4th stage turbine wheel, unless the actions have already been done.

Onetime Inspection for Proper Metal Hardness

(f) Perform a onetime inspection for proper metal hardness of 1st stage, 2nd stage, 3rd stage, and 4th stage turbine wheels. Use paragraphs 2.B. and 2.F. of RRC Commercial Engine Bulletins (CEBs) No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004.

(g) Remove from service any turbine wheel that does not pass inspection, using paragraph 2.C. of RRC CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004, and install a serviceable turbine wheel.

(h) Mark the letters, HC, after the serial number on any turbine wheel that passes inspection, using the method described in paragraph 2.D. of RRC CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004.

Reporting Requirements

(i) Report findings of inspections within 30 days of inspection using the procedures specified in paragraph 2.E of RRC CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004. The Office of Management and Budget (OMB) has approved the reporting requirements specified in paragraph 2.E. of RRC CEBs No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004, and assigned OMB control number 2120-0056.

Definition

(j) For the purpose of this AD, a serviceable turbine wheel is:

(1) A turbine wheel that has a serial number not listed in this AD; and

(2) A turbine wheel that has a serial number listed in this AD that passed the inspection specified in paragraph (f) of this AD.

Alternative Methods of Compliance

(k) 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.

Related Information

(l) None.

Material Incorporated by Reference

(m) You must use Rolls-Royce Corporation Commercial Engine Bulletins No. CEB-72-1138, No. CEB-72-4051, and No. CEB-72-1584, (combined in one document) dated January 23, 2004, to

perform the actions required by this AD. The Director of the Federal Register approved the incorporation by reference of this service bulletin in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Contact Rolls-Royce Corporation, P.O. Box 420, 2001 South Tibbs Avenue, Indianapolis, IN 46206-0420; telephone (317) 230-2000; fax (317) 230-4020 for a copy of this service information. You may review copies at the Docket Management Facility; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL-401, Washington, DC 20590-0001, on the Internet at *http://dms.dot.gov*, 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*.

Issued in Burlington, Massachusetts, on October 17, 2005.

Francis A. Favara,

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

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