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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2011-0961; Product Identifier 2011-NE-22-AD; Amendment 39-19023; AD 2017-18-14]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce Corporation Turboshaft Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are superseding Airworthiness Directive (AD) 2015-02-22 for certain Rolls-Royce Corporation (RRC) model 250 turboprop and turboshaft engines. AD 2015-02-22 required repetitive visual inspections and fluorescent-penetrant inspection (FPIs) on certain 3rd-stage and 4th-stage turbine wheels for cracks in the turbine wheel blades. This AD requires repetitive visual inspections and FPIs of 3rd-stage turbine wheels while removing from service 4th-stage turbine wheels. We are also revising the applicability to remove all RRC turboprop engines and add additional turboshaft engines. This AD was prompted by our finding that it is necessary to remove the 4th-stage wheels at the next inspection. We are issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective October 13, 2017.

ADDRESSES: See the FOR FURTHER INFORMATION CONTACT section.

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-2011-0961; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: John Tallarovic, Aerospace Engineer, FAA, Chicago ACO Branch, Compliance and Airworthiness Division, 2300 E. Devon Ave., Des Plaines, IL 60018; phone: 847-294-8180; fax: 847-294-7834; email: john.m.tallarovic@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede [AD 2015-02-22](#), Amendment 39-18090 (80 FR 5452, February 2, 2015), (“[AD 2015-02-22](#)”). [AD 2015-02-22](#) applied to certain RRC 250-B17, -B17B, -B17C, -B17D, -B17E, -B17F, -B17F/1, -B17F/2, turboprop engines; and 250-C20, -C20B, -C20F, -C20J, -C20R, -C20R/1, -C20R/2, -C20R/4, -C20S, and -C20W turboshaft engines. The NPRM published in the Federal Register on March 29, 2017 (82 FR 15474). The NPRM was prompted by our determination that it is necessary to remove the 4th-stage wheels at the next inspection. The NPRM proposed to require repetitive visual inspections and FPIs of 3rd-stage turbine wheels while removing from service 4th-stage turbine wheels. We are also revising the applicability to remove all RRC turboprop engines and add additional turboshaft engines. We are issuing this AD to prevent failure of the 3rd-stage and 4th-stage turbine wheel blades, damage to the engine, and damage to the aircraft.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Remove Certain 3rd Stage Turbine Wheel From AD

RRC requested that we remove references in this AD to the 3rd stage turbine wheel, part number (P/N) RR30000236, installed on the RRC 250-C300/A1 and 250-C300/B1 turboshaft engines. RRC indicated that 3rd stage turbine wheels, P/N RR30000236, are not susceptible to cracks. RRC noted that there have been no cracks observed on 3rd stage wheels installed on RRC 250-C300/A1 or 250-C300B/1 engines.

We agree. The 3rd stage turbine wheel, P/N RR30000236, installed on RRC 250-C300/A1 and 250-C300/B1 engines does not require inspections. They are subject to less severe operating conditions and are not susceptible to this type of failure. We removed references to the 3rd stage turbine wheel, P/N RR30000236, from this AD.

Request To Revise Power Turbine Reference

RRC requested that we change references in this AD from “power turbine” to “turbine.” RRC noted that this AD should refer to the entire turbine module rather than just to the power turbine. RRC also commented that the risk analysis for this AD is based on changing the parts anytime the turbine is being serviced, not just the power turbine. Revising the reference in this AD to “turbine” would remove the affected 4th stage turbine wheels from the fleet in a shorter time period since the actions specified in this AD are to be complied with whenever the turbine is at the shop and is disassembled for any reason, or at the next turbine wheel replacement, whichever occurs first.

We agree. We changed the reference in the Compliance section of this AD from “power turbine” to “turbine.”

RRC also commented that changing the references to “turbine” would allow for removal of the Definition section from this AD.

We disagree. The term “engine shop visit” is used as one of the criteria in this AD to determine when an inspection of affected applicable turbine wheels is required. Given that “engine shop visit”

may be interpreted in different ways, we provide a definition for this term in this AD. We did not change this AD.

Request To Clarify Removal of Blades With Cracks From Service

RRC requested that we revise the Compliance section of this AD so that it does not require removal from service all turbine wheels found with cracks. RRC commented that only certain cracks are related to this AD and are a safety concern.

We agree. The intent of this AD is to address cracks at the trailing edge of the turbine wheel blades, near the fillet at the rim. The maintenance manuals for these engines allow certain cracks in areas of the turbine wheels not subject to this AD. Engines may still operate safely with turbine wheels that have allowable cracks. We revised [paragraph \(f\)\(3\)](#) of this AD to refer to cracks found at the trailing edge, near the fillet at the rim, of the turbine blades.

Revision to Costs of Compliance

We reduced the estimated cost of inspection of 3rd stage wheels from \$320,365 to \$288,320 since we removed the 3rd stage wheel, P/N RR30000236, from the applicability of this AD. As noted in our previous comment response, these P/N 3rd stage wheels are not subject to the unsafe condition identified in this AD.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

We also determined that these changes will not increase the economic burden on any operator or increase the scope of this AD.

Costs of Compliance

We estimate that this AD affects 3,769 engines installed on airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

Estimated Costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspect 3rd-stage wheels, P/N 23065818	1 work-hour × \$85 per hour = \$85	\$0	\$85	\$288,320
Replace 4th-stage wheel, P/N 23055944 or RR30000240	0 work-hours × \$85 per hour = \$0	5,653 (pro-rated cost of part)	5,653	21,306,157

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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to engines, propellers, and appliances to the Manager, Engine and Propeller Standards Branch, Policy and Innovation Division.

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),
- (3) Will not affect intrastate aviation in Alaska to the extent that it justifies making a regulatory distinction, 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.

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 removing Airworthiness Directive (AD) 2015-02-22, Amendment 39-18090 (80 FR 5452, February 2, 2015), and adding the following new AD:



FAA
Aviation Safety

AIRWORTHINESS DIRECTIVE

www.faa.gov/aircraft/safety/alerts/
www.gpoaccess.gov/fr/advanced.html

2017-18-14 Rolls-Royce Corporation: Amendment 39-19023; Docket No. FAA-2011-0961; Product Identifier 2011-NE-22-AD.

(a) Effective Date

This AD is effective October 13, 2017.

(b) Affected ADs

This AD replaces Airworthiness Directive (AD) 2015-02-22, Amendment 39-18090 (80 FR 5452, February 2, 2015).

(c) Applicability

This AD applies to Rolls-Royce Corporation (RRC) 250-C20, -C20B, -C20F, -C20J, -C20R, -C20R/1, -C20R/2, -C20R/4, -C20W, -C300/A1, and -C300/B1 turboshaft engines with either a 3rd-stage turbine wheel, part number (P/N) 23065818, or a 4th-stage turbine wheel, P/N 23055944 or RR30000240, installed.

(d) Subject

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

(e) Unsafe Condition

This AD was prompted by in-service turbine wheel blade failures that revealed the need for changes to the inspections of certain 3rd-stage turbine wheels and removal from service of certain 4th-stage turbine wheels. We are issuing this AD to prevent failure of the 3rd-stage and 4th-stage turbine wheel blades, damage to the engine, and damage to the aircraft.

(f) Compliance

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

(1) Within 1,775 hours since last visual inspection and fluorescent-penetrant inspection (FPI) or before the next flight after the effective date of this AD, whichever occurs later:

(i) Remove 3rd-stage turbine wheels, P/N 23065818, and perform a visual inspection and an FPI on the removed turbine wheels for cracks at the trailing edge of the turbine blades, near the fillet at the rim.

(ii) Thereafter, re-inspect the affected turbine wheels every 1,775 hours since last inspection (HSLI).

(2) Any time the turbine is disassembled, perform a visual inspection and an FPI on 3rd-stage turbine wheels, P/N 23065818, for cracks at the trailing edge of the turbine blades, near the fillet at the rim.

(3) Do not return to service any turbine wheels found to have cracks at the trailing edge, near the fillet at the rim, of the turbine blades.

(4) Within 1,775 HSLI, or at the next engine shop visit, whichever occurs later, remove 4th-stage turbine wheels, P/N 23055944, from service.

(5) Within 2,025 HSLI, or at the next engine shop visit, whichever occurs later, remove 4th-stage turbine wheels, P/N RR30000240, from service.

(g) 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 does not constitute an engine shop visit.

(h) Alternative Methods of Compliance (AMOCs)

(1) The Manager, FAA, Chicago ACO Branch, Compliance and Airworthiness Division, 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 ACO Branch, send it to the attention of the person identified in [paragraph \(i\)](#) 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.

(i) Related Information

For more information about this AD, contact John Tallarovic, Aerospace Engineer, FAA, Chicago ACO Branch, Compliance and Airworthiness Division, 2300 E. Devon Ave., Des Plaines, IL 60018; phone: 847-294-8180; fax: 847-294-7834; email: john.m.tallarovic@faa.gov.

(j) Material Incorporated by Reference

None.

Issued in Burlington, Massachusetts, on August 31, 2017.

Robert J. Ganley,
Manager, Engine and Propeller Standards Branch,
Aircraft Certification Service.