



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2020-0687; Project Identifier AD-2020-00571-E; Amendment 39-21314; AD 2020-22-18]

RIN 2120-AA64

Airworthiness Directives; Rolls-Royce Corporation (Type Certificate previously held by Allison Engine Company) Turboprop Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for all Rolls-Royce Corporation (RRC) AE 2100A, AE 2100D2, AE 2100D2A, and AE 2100P model turboprop engines. This AD was prompted by a report of a propeller gearbox (PGB) development test conducted by the manufacturer, in which high vibration occurred due to a fatigue crack that initiated in the PGB shaft and carrier assembly. This AD requires assignment of usage hours to the PGB shaft and carrier assembly at the next engine shop visit and replacement of PGB shaft and carrier assemblies prior to exceeding the new life limits established by the manufacturer. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Rolls-Royce Corporation, 450 South Meridian Street, Mail Code NB-01-06, Indianapolis, IN 46225; phone: 317-230-1667; email: CMSEindyOSD@rolls-royce.com; internet: www.rolls-royce.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For

information on the availability of this material at the FAA, call 781-238-7759. It is also available on the internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0687.

Examining the AD Docket

You may examine the AD docket on the internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0687; 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 final rule, any comments received, and other information. The address for Docket Operations is 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: Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO Branch, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018; phone: 847-294-7836; fax: 847-294-7834; email: kyri.zaroyiannis@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to all RRC AE 2100A, AE 2100D2, AE 2100D2A, and AE 2100P model turboprop engines. The NPRM published in the *Federal Register* on August 11, 2020 (85 FR 48482). The NPRM was prompted by a report of a PGB development test conducted by the manufacturer, in which high vibration occurred due to a fatigue crack that initiated in the PGB shaft and carrier assembly. In the NPRM, the FAA proposed to require the assignment of usage hours to the PGB shaft and carrier assembly at the next engine shop visit and replacement of PGB shaft and carrier assemblies before exceeding the new life limits established by the manufacturer. The FAA is issuing this AD to address the unsafe condition on these products.

Comments

The FAA gave the public the opportunity to participate in developing this final rule. The FAA received no comments on the NPRM or on the determination of the cost to the public.

Conclusion

The FAA reviewed the relevant data and determined that air safety and the public interest require adopting this AD as proposed except for minor editorial changes. The FAA has determined that these minor changes:

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

Related Service Information under 1 CFR part 51

The FAA reviewed RRC Alert Service Bulletin (ASB) AE 2100A-A-72-322/AE 2100P-A-72-047, Revision 1 (single document), dated May 11, 2018, and RRC ASB AE 2100D2-A-72-111/AE 2100D3-A-72-313/AE 2100J-A-72-111, Revision 1 (single document), dated May 28, 2018. RRC ASB AE 2100A-A-72-322/AE 2100P-A-72-047 describes procedures for assigning usage hours to the PGB shaft and carrier assemblies on RRC AE 2100A and AE 2100P model engines. RRC ASB AE 2100D2-A-72-111/AE 2100D3-A-72-313/AE 2100J-A-72-111 describes procedures for verifying the PGB shaft and carrier assembly serial numbers and assigning usage hours to the PGB shaft and carrier assemblies on RRC AE 2100D2 and AE 2100D2A model 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.

Other Related Service Information

The FAA reviewed Task 05-10-00-800-801 of RRC AE 2100A Engine Maintenance Manual (MM) CSP31005, Revision 57, dated August 15, 2019, and Task 05-12-11-800-802 of RRC AE 2100A Engine MM CSP31005, Revision 57, dated August 15, 2019. Task 05-10-00-800-801 of RRC AE 2100A Engine MM provides information for determining the usage hours and engine cycles for each life-limited part on RRC AE 2100A model engines. Task 05-12-11-800-802 of RRC AE 2100A Engine MM specifies the PGB shaft and carrier assembly life limits.

The FAA reviewed Task 05-11-00-800-801 of RRC AE 2100D2 and AE 2100D2A Engine MM CSP34081, Revision 64, dated June 1, 2020, and Task 05-12-11-800-802 of RRC AE 2100D2 and AE 2100D2A Engine MM CSP34081, Revision 64, dated June 1, 2020. Task 05-11-00-800-801 of RRC AE 2100D2 and AE 2100D2A Engine MM provides information for determining the usage hours and engine cycles for each life-limited part on RRC AE 2100D2 and AE 2100D2A model engines. Task 05-12-11-800-802 of RRC AE 2100D2 and AE 2100D2A Engine MM specifies the PGB shaft and carrier assembly life limits.

The FAA reviewed Task 05-10-00-800-801 of RRC AE 2100P Engine MM CSP31015, Revision 15, dated May 15, 2018. Task 05-10-00-800-801 of RRC AE 2100P Engine MM provides information for determining the usage hours and engine cycles for each life-limited part on RRC AE 2100P model engines. Task 05-12-11-800-802 of RRC AE 2100P Engine MM specifies the PGB shaft and carrier assembly life limits.

Costs of Compliance

The FAA estimates that this AD affects 18 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Assign usage hours to PGB shaft and carrier assembly	3 work-hours X \$85 per hour = \$255	\$0	\$255	\$4,590
Remove and replace PGB shaft and carrier assembly	15 work-hours X \$85 per hour = \$1,275	\$49,952	\$51,227	\$922,086

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.

The FAA is 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

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) Will not affect intrastate aviation in Alaska, 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.

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 adding the following new airworthiness directive (AD):

2020-22-18 Rolls-Royce Corporation (Type Certificate previously held by Allison Engine Company): Amendment 39-21314; Docket No. FAA-2020-0687; Project Identifier AD-2020-00571-E.

(a) Effective Date

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Rolls-Royce Corporation (RRC) (Type Certificate previously held by Allison Engine Company) AE 2100A, AE 2100D2, AE 2100D2A, and AE 2100P model turboprop engines.

(d) Subject

Joint Aircraft System Component (JASC) Code 7210, Turbine Engine Reduction Gear.

(e) Unsafe Condition

This AD was prompted by a report of a propeller gearbox (PGB) development test in which high vibration occurred due to a fatigue crack that initiated in the propeller shaft. The FAA is issuing this AD to prevent loss of the propeller. The unsafe condition, if not addressed, could result in 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) No later than the next shop visit for the engine with the PGB, or the next shop visit for the PGB only, whichever shop visit occurs first after the effective date of this AD, assign usage hours to the installed PGB shaft and carrier assembly using RRC Alert Service Bulletin (ASB) AE 2100A-A-72-322/AE 2100P-A-72-047, Revision 1 (single document), dated May 11, 2018, or RRC ASB AE 2100D2-A-72-111/AE 2100D3-A-72-313/AE 2100J-A-72-111, Revision 1 (single document), dated May 28, 2018.

(2) After the effective date of this AD, before exceeding the life limit (usage hours) specified in Table 1 to paragraph (g)(2) (Table 1) of this AD, remove the PGB shaft and carrier assembly, identified by part numbers (P/Ns) in Table 1, from service and replace with a part eligible for installation.

Table 1 to Paragraph (g)(2) – Life Limits

Engine model	PGB Shaft and Carrier Assembly P/Ns	Life limit (usage hours)
AE 2100A	23056553, 23061011, 23088746, 23088595, 23087076, 23087077, 23089419, 23088757, 23092770, 23092769	100,000
AE 2100P	23056553, 23061011, 23088746, 23088595, 23087076, 23087077, 23089419, 23088757, 23092770, 23092769	100,000
AE 2100D2/D2A	23061011, 23088746, 23088595, 23087076, 23087077, 23089419, 23088757, 23092770, 23092769	30,000

(h) No Reporting Requirement

The reporting requirements in RRC ASB AE 2100A-A-72-322/AE 2100P-A-72-047, Revision 1 (single document), dated May 11, 2018, and RRC ASB AE 2100D2-A-72-111/AE 2100D3-A-72-313/AE 2100J-A-72-111, Revision 1 (single document), dated May 28, 2018, are not required by this AD.

(i) Credit for Previous Actions

You may take credit for assigning the usage hours required by paragraph (g) of this AD if you performed the action before the effective date of this AD using RRC ASB AE 2100A-A-72-322/AE 2100P-A-72-047, original issue (single document), dated January 15, 2018, or RR AE 2100D2-A-72-111/AE 2100D3-A-72-313/AE 2100J-A-72-111, original issue (single document), dated January 15, 2018.

(j) 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 (k).

(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.

(k) Related Information

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

(l) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Rolls-Royce Corporation (RRC) Alert Service Bulletin (ASB) AE 2100A-A-72-322/AE 2100P-A-72-047, Revision 1 (single document), dated May 11, 2018.

(ii) RRC ASB AE 2100D2-A-72-111/AE 2100D3-A-72-313/AE 2100J-A-72-111, Revision 1 (single document), dated May 28, 2018.

(3) For RRC service information identified in this AD, contact Rolls-Royce Corporation, 450 South Meridian Street, Mail Code NB-01-06, Indianapolis, IN 46225; phone: 317-230-1667; email: CMSEindyOSD@rolls-royce.com; internet: www.rolls-royce.com.

(4) You may view this service information at FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call 781-238-7759.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: fedreg.legal@nara.gov, or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on October 23, 2020.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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