

Issued on September 10, 2020.

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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

**[Docket No. FAA-2020-0853; Project Identifier AD-2020-00588-E; Amendment 39-21260; AD 2020-20-04]**

**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; request for comments.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for all Rolls-Royce Corporation (RRC) AE 2100D3 model turboprop engines. This AD requires revising the airworthiness limitations section (ALS) of the RRC AE 2100D3 Maintenance Manual and the operator's approved continuous airworthiness maintenance program. 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 address the unsafe condition on these products.

**DATES:** This AD is effective October 14, 2020.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of October 14, 2020.

The FAA must receive comments on this AD by November 13, 2020.

**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 <https://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:* U.S. Department of Transportation, Docket Operations, M-

30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

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](mailto:CMSEindyOSD@rolls-royce.com); internet: [www.rolls-royce.com](http://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-2020-0853.

#### **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-2020-0853; 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 street address for the Docket Operations is listed above.

**FOR FURTHER INFORMATION CONTACT:** Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO, 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:**

##### **Background**

The FAA was informed by the manufacturer that a PGB development test was stopped due to high vibration caused by a fatigue crack that initiated in the PGB shaft and carrier assembly. The fatigue crack initiated in a broach slot of the PGB shaft. The manufacturer determined the need to apply life limits to the PGB shaft and carrier assembly, which has not previously been a life-limited part. To track these parts, the manufacturer determined the need to assign usage hours to PGB shaft and carrier assemblies that already have time in service.

An examination by the manufacturer of Material Review Board records also identified two PGB shaft and carrier assemblies that were accepted with reduced material properties prior to their reclassification as a life limited part requiring reduced lives. The manufacturer applied reduced life limits to these PGB shaft and carrier

assemblies. In addition, a review of shop repair records by the manufacturer identified a number of PGB shaft and carrier assemblies that received a keylock stud repair introducing unacceptable unused "keyslots" that can cause stress concentration and reduced life. The manufacturer requires either rework or removal of these PGB shaft and carrier assemblies.

The FAA determined that updating the ALS of the RRC AE 2100D3 Maintenance Manual and the continued airworthiness maintenance program for the affected RRC 2100D3 model turboprop engines is the most effective way to address the unsafe condition pertaining to fatigue cracks in the PGB shaft and carrier assembly. These ALS updates apply life limits to PGB shaft and carrier assemblies installed on RRC AE 2100D3 model turboprop engines. Certain part numbered PGB shaft and carrier assemblies with reduced material properties were assigned reduced life limits. To track these parts, the ALS updates require assignment of usage hours to the PGB shaft and carrier assembly no later than the next engine shop visit for all RRC AE model turboprop engines. Depending on the part and serial number of the PGB shaft and carrier assembly, the updates to the ALS requires reidentification or removal of the PGB shaft and carrier assembly.

This condition, if not addressed, could result in loss of the propeller, damage to the engine, and damage to the airplane. The FAA is issuing this AD to address the unsafe condition on these products.

#### **FAA's Determination**

The FAA is issuing this AD because the agency 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.

#### **Related Service Information Under 14 CFR Part 51**

The FAA reviewed Task 05-11-00-800-801, dated June 20, 2018 of the Airworthiness Limitations System Description Section-801, RRC AE 2100D3 Maintenance Manual ("Task 05-11-00-800-801") and Task 05-12-11-800-802, dated June 1, 2020 of the Propeller Gearbox System Component Life Limits Systems Description Section-802, RRC AE 2100D3 Maintenance Manual ("Task 05-12-11-800-802").

Task 05-11-00-800-801 specifies: (1) Assignment of usage hours to the PGB shaft and carrier assemblies; (2) reworking confirmed blind hole configured PGB shaft and carrier

assemblies to the through-hole controlled keyslot configuration; and (3) reidentifying through-hole PGB shaft and carrier assemblies to a new part number.

Task 05-12-11-800-802 specifies: (1) Assignment of new life limits to the PGB shaft and carrier assemblies; (2) decreasing the life limit for PGB shaft and carrier assemblies found to have reduced material properties; and (3) replacing PGB shaft and carrier assemblies that have received a keylock stud repair which introduced unacceptable unused keyslots.

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 RRC Alert Service Bulletin (ASB) AE2100D3-A-72-256, Revision 3, dated January 15, 2018; AE 2100D3-A-72-313, Revision 1, dated May 28, 2018; RRC ASB AE 2100D3-A-72-314, Revision 0, dated January 15, 2018; RRC ASB AE 2100D3-A-72-315, Revision 2, dated July 13, 2018; RRC ASB AE 2100D3-A-72-324, Revision 0, dated November 26, 2019; and RRC ASB AE 2100D3-A-72-325, Revision 0, dated November 26, 2019.

RRC ASB AE2100D3-A-72-256, Revision 3, dated January 15, 2018, describes procedures for re-work of certain PGB shaft and carrier assemblies.

RRC ASB AE 2100D3-A-72-313 describes procedures for assigning usage hours to the PGB shaft and carrier assemblies.

RRC ASB AE 2100D3-A-72-314 describes procedures for reworking PGB shaft and carrier assemblies from the blind hole to the preferred through hole controlled keyslot configuration.

RRC ASB AE 2100D3-A-72-315 describes procedures for reidentifying PGB shaft and carrier assemblies which are of the preferred through hole controlled keyslot configuration.

RRC ASB AE 2100D3-A-72-324 establishes a decrease in life limit of 10,525 hours for PGB shaft and carrier assemblies, with (S/Ns) CU32063 and CU32071, which were found to have reduced material properties.

RRC ASB AE 2100D3-A-72-325 describes procedures for reworking or

replacing PGB shaft and carrier assemblies, listed in Table 1 of RRC ASB AE 2100D3-72-A-325, that have received a keylock stud repair which introduced unacceptable unused keyslots.

**AD Requirements**

This AD requires revising the ALS of the AE 2100D3 Maintenance Manual and the operator’s approved continuous airworthiness maintenance program.

**Justification for Immediate Adoption and Determination of the Effective Date**

Section 553(b)(3)(B) of the Administrative Procedure Act (APA) (5 U.S.C.) authorizes agencies to dispense with notice and comment procedures for rules when the agency, for “good cause,” finds that those procedures are “impracticable, unnecessary, or contrary to the public interest.” Under this section, an agency, upon finding good cause, may issue a final rule without providing notice and seeking comment prior to issuance. Further, section 553(d) of the APA authorizes agencies to make rules effective in less than 30 days, upon a finding of good cause.

The FAA has found the risk to the flying public justifies waiving notice and comment prior to adoption of this rule because no domestic operators use this product. It is unlikely that the FAA will receive any adverse comments or useful information about this AD from U.S. operators. Accordingly, notice and opportunity for prior public comment are unnecessary, pursuant to 5 U.S.C. 553(b)(3)(B). In addition, for the foregoing reasons, the FAA finds that good cause exists pursuant to 5 U.S.C. 553(d) for making this amendment effective in less than 30 days.

**Comments Invited**

The FAA invites you to send any written data, views, or arguments about this final rule. Send your comments to an address listed under the **ADDRESSES** section. Include the docket number FAA-2020-0853 and Project Identifier AD-2020-00588-E at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this final rule because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The FAA will also post a report summarizing each substantive verbal contact received about this final rule.

**Confidential Business Information**

Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this final rule contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this final rule, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this final rule. Submissions containing CBI should be sent to Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO, FAA, 2300 E Devon Ave., Des Plaines, IL 60018. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

**Regulatory Flexibility Act**

The requirements of the Regulatory Flexibility Act (RFA) do not apply when an agency finds good cause pursuant to 5 U.S.C. 553 to adopt a rule without prior notice and comment. Because the FAA has determined that it has good cause to adopt this rule without notice and comment, RFA analysis is not required.

**Costs of Compliance**

The FAA estimates that this AD affects 0 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
Insert Task 05-12-11-800-801 into RRC AE 2100D3 Maintenance Manual.	0.5 work-hours × \$85 per hour = \$42.50.	\$0	\$42.50	\$0

## ESTIMATED COSTS—Continued

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Insert Task 05–12–11–800–802 into RRC AE 2100D3 Maintenance Manual.	0.5 work-hours × \$85 per hour = \$42.50.	0	42.50	0

**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, and
- (2) Will not affect intrastate aviation in Alaska.

**List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

**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):

**2020–20–04 Rolls-Royce Corporation (Type Certificate previously held by Allison Engine Company):** Amendment 39–21260; Docket No. FAA–2020–0853; Project Identifier AD–2020–00588–E.

**(a) Effective Date**

This AD is effective October 14, 2020.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to all Rolls-Royce Corporation (RRC) AE 2100D3 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 fatigue crack that initiated in the propeller shaft during a propeller gearbox (PGB) development test that induced high vibrations. 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) Within 30 days after the effective date of this AD, revise the RRC AE 2100D3 Maintenance Manual ("the Manual") and the operator's existing approved continuous airworthiness maintenance program by inserting:

(i) Task 05–11–00–800–801, dated June 20, 2018, into Airworthiness Limitations System Description Section-801; and

(ii) Task 05–12–11–800–802, dated June 1, 2020, into Propeller Gearbox System Component Life Limits Systems Description Section-802 in the Manual.

(2) Thereafter, except as provided in paragraph (h) of this AD, no alternative replacement times or structural inspection intervals may be approved for this PGB shaft and carrier assembly.

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

(1) The Manager, Chicago ACO, 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 (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 Kyri Zaroyiannis, Aerospace Engineer, Chicago ACO, FAA, 2300 E. Devon Avenue, Des Plaines, IL 60018; phone: (847) 294–7836; fax: (847) 294–7834; email: [kyri.zaroyiannis@faa.gov](mailto:kyri.zaroyiannis@faa.gov).

**(j) 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) Task 05–11–00–800–801, dated June 20, 2018 of Airworthiness Limitations System Description Section-801, Rolls-Royce Corporation (RRC) AE 2100D3 Maintenance Manual.

(ii) Task 05–12–11–800–802, dated June 1, 2020 of Propeller Gearbox System Component Life Limits Systems Description Section-802, RRC AE 2100D3 Maintenance Manual.

(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](mailto:CMSEindyOSD@rolls-royce.com); internet: [www.rolls-royce.com](http://www.rolls-royce.com).

(4) You may view this referenced 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.

(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](mailto:fedreg.legal@nara.gov), or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on September 18, 2020.

**Lance T. Gant,**

*Director, Compliance & Airworthiness Division, Aircraft Certification Service.*

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