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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-0515; Project Identifier AD-2022-00287-E; Amendment 39-22140; AD 2022-17-02]

RIN 2120-AA64

Airworthiness Directives; CFM International, S.A. Turbofan Engines

AGENCY:

Federal Aviation Administration (FAA), DOT.

ACTION:

Final rule.

SUMMARY:

The FAA is adopting a new airworthiness directive (AD) for certain CFM International, S.A. (CFM) LEAP-1B model turbofan engines. This AD was prompted by multiple commanded in-flight shutdowns (IFSDs) due to inner radial drive shaft (RDS) failure. This AD requires initial and repetitive inspections of the transfer gearbox (TGB) scavenge screens and, depending on the results of the inspections, replacement or rework of the affected inner RDS. As a mandatory terminating action to the initial and repetitive inspections of the TGB scavenge screens, this AD requires replacement or rework of the affected inner RDS. This AD also prohibits the installation of an engine with an affected inner RDS onto an airplane that already has one engine with an affected inner RDS installed. The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective October 20, 2022.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of October 20, 2022.

ADDRESSES:

For service information identified in this final rule, contact CFM International, S.A., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: fleetsupport@ge.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 (817) 222-5110. It is also available at www.regulations.gov by searching for and locating Docket No. FAA-2022-0515.

Examining the AD Docket

You may examine the AD docket at www.regulations.gov by searching for and locating Docket No. FAA-2022-0515; 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:

Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7743; email: Mehdi.Lamnyi@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 certain CFM LEAP-1B21, LEAP-1B23, LEAP-1B25, LEAP-1B27, LEAP-1B28, LEAP-1B28B1, LEAP-1B28B2, LEAP-1B28B2C, LEAP-1B28B3, LEAP-1B28BBJ1, and LEAP-1B28BBJ2 (LEAP-1B) model turbofan engines. The NPRM published in the **Federal Register** on June 06, 2022 ([87 FR 34221](#)). The NPRM was prompted by reports of multiple IFSDs on CFM LEAP-1B model turbofan engines beginning in August 2018. The manufacturer's investigations determined that some of these IFSD events were the result of inadequate oil flow to the RDS bearing, which caused the RDS bearing and RDS bearing cage to fail. The FAA issued AD 2019-12-01, Amendment 39-19656 ([84 FR 28202](#), June 18, 2019), which required initial and repetitive inspections of the TGB scavenge screens and, depending on the results of the inspection, possible removal of the engine from service.

After the FAA issued AD 2019-12-01, further investigation by the manufacturer identified an additional contributing factor to the RDS bearing failures. The manufacturer revised the service information to include a repetitive TGB screen inspection until the RDS accumulates 1,500 flight hours (FHs) since new and borescope inspections of the RDS bearing at 1,500 FHs since new and 6,000 FHs since new. The FAA superseded AD 2019-12-01 by issuing AD 2020-06-01, Amendment 39-21103 ([85 FR 14413](#), March 12, 2020), which requires revision to the airworthiness limitations section (ALS) of the applicable engine shop manual to incorporate the new inspections.

Since the FAA issued AD 2020-06-01, the FAA received further reports of commanded IFSDs due to inner RDS failure. The manufacturer initiated an investigation and identified a subpopulation of inner RDS susceptible to rivet fatigue failure occurring after the inspection thresholds required by the ALS

revision in AD 2020-06-01. In the NPRM, the FAA proposed to require initial and repetitive inspections of the TGB1 and TGB2 scavenge screens and, depending on the results of the inspections, replacement or rework of the affected inner RDS. As a mandatory terminating action to the initial and repetitive inspections of the TGB1 and TGB2 scavenge screens, the FAA proposed to require replacement or rework of the affected inner RDS. The FAA also proposed prohibiting the installation of an engine with an affected inner RDS onto an airplane that already has one engine with an affected inner RDS installed. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from three commenters. Commenters included The Boeing Company, Air Line Pilots Association, International, and United Airlines. All commenters supported the NPRM without change.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety requires adopting the AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, this AD is adopted as proposed in the NPRM.

Related Service Information Under [1 CFR Part 51](#)

The FAA reviewed CFM Service Bulletin (SB) LEAP-1B-72-00-0258-01A-930A-C, Issue 002, dated September 15, 2020. This service information specifies procedures for replacement or rework of the inner RDS. The FAA also reviewed CFM SB LEAP-1B-72-00-0365-01A-930A-D, Issue 003-00, dated April 26, 2022. This service information identifies the affected serial numbers of the inner RDS susceptible to rivet fatigue failure and specifies procedures for performing inspections of TGB1 and TGB2 scavenge screens. This service information also specifies procedures for accomplishing applicable corrective actions if metallic particles are found. 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 **ADDRESSES**.

Costs of Compliance

The FAA estimates that this AD affects 34 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

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspect TGB1 and TGB 2 scavenge screens	1 work-hour × \$85 per hour = \$85	\$0	\$85	\$2,890

For either replacement or rework of the inner RDS, depending on the option selected by the operator to comply with this AD, the FAA estimates the following costs:

Action	Labor cost	Parts cost	Cost per product
Replace inner RDS	600 work-hours × \$85 per hour = \$51,000	\$60,000	\$111,000
Rework inner RDS	600 work-hours × \$85 per hour = \$51,000	54,000	105,000

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

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:

2022-17-02 CFM International, S.A.: Amendment 39-22140; Docket No. FAA-2022-0515; Project Identifier AD-2022-00287-E.

(a) Effective Date

This airworthiness directive (AD) is effective October 20, 2022.

(b) Affected ADs

None.

(c) Applicability

This AD applies to CFM International, S.A. (CFM) LEAP-1B21, LEAP-1B23, LEAP-1B25, LEAP-1B27, LEAP-1B28, LEAP-1B28B1, LEAP-1B28B2, LEAP-1B28B2C, LEAP-1B28B3, LEAP-1B28BBJ1, and LEAP-1B28BBJ2 model turbofan engines with an installed inner radial drive shaft (RDS) with a serial number listed in Additional Information, paragraph 6.A., Table 1, of CFM Service Bulletin (SB) LEAP-1B-72-00-0365-01A-930A-D, Issue 003-00, dated April 26, 2022 (CFM SB LEAP-1B-72-00-0365-01A-930A-D).

(d) Subject

Joint Aircraft System Component (JASC) Code 7260, Turbine Engine Accessory Drive.

(e) Unsafe Condition

This AD was prompted by multiple commanded in-flight shutdowns (IFSDs) due to inner RDS failure. The FAA is issuing this AD to prevent failure of the inner RDS and subsequent IFSDs. The unsafe condition, if not addressed, could result in failure of one or more engines, loss of thrust control, and loss of the airplane.

(f) Compliance

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

(g) Required Actions

(1) Before exceeding 50 flight hours (FHs) after the effective date of this AD, and thereafter at intervals not to exceed 50 FHs from the previous inspection, inspect the transfer gearbox (TGB) TGB1 and TGB2 scavenge screens in accordance with the Accomplishment Instructions, paragraph 5.A.(1), of CFM SB LEAP-1B-72-00-0365-01A-930A-D.

(2) If, during any inspection required by paragraph (g)(1) of this AD, any metallic particles are found, before further flight, perform the actions in the Accomplishment Instructions, paragraphs 5.A.(2) and (3), of CFM SB LEAP-1B-72-00-0365-01A-930A-D. Where paragraph 5.A.(3)(b) of CFM SB LEAP-1B-72-00-0365-01A-930A-D specifies to remove the engine, this AD instead requires replacement or rework of the inner RDS in accordance with the Accomplishment Instructions, paragraph 5.A., of CFM SB LEAP-1B-72-00-0258-01A-930A-C Issue 002, dated September 15, 2020 (CFM SB LEAP-1B-72-00-0258-01A-930A-C).

(h) Mandatory Terminating Action

As a mandatory terminating action to the initial and repetitive inspections of the TGB1 and TGB2 scavenge screens required by paragraph (g)(1) of this AD, at the next piece-part exposure after the effective date of this AD, replace or rework the inner RDS in accordance with the Accomplishment Instructions, paragraph 5.A., of CFM SB LEAP-1B-72-00-0258-01A-930A-C.

(i) Installation Prohibition

After the effective date of this AD, do not install an engine with an affected inner RDS onto an airplane that already has one engine with an affected inner RDS installed.

(j) Definitions

For the purpose of this AD, “piece-part exposure” is when the fan frame shroud is separated from the fan hub.

(k) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO 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 (l) of this AD and email to: ANE-AD-AMOC@faa.gov.

(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.

(l) Related Information

For more information about this AD, contact Mehdi Lamnyi, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7743; email: Mehdi.Lamnyi@faa.gov.

(m) 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) CFM International, S.A. Service Bulletin LEAP-1B-72-00-0258-01A-930A-C, Issue 002, dated September 15, 2020.

(ii) CFM International, S.A. Service Bulletin LEAP-1B-72-00-0365-01A-930A-D, Issue 003-00, dated April 26, 2022.

(3) For service information identified in this AD, contact CFM International, S.A., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: fleetsupport@ge.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 (817) 222-5110.

(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: fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on August 2, 2022.

Christina Underwood,

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

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