[Federal Register Volume 85, Number 49 (Thursday, March 12, 2020)]
[Rules and Regulations]
[Pages 14413-14416]
From the Federal Register Online via the Government Publishing Office [www.gpo.gov]
[FR Doc No: 2020-04997]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2019-1093; Project Identifier AD-2019-00144-E; Amendment 39-21103; AD 2020-06-01]

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 all CFM International S.A. (CFM) LEAP-1B21, -1B23, -1B25, -1B27, -1B28, -1B28B1, -1B28B2, -1B28B2C, -1B28B3, -1B28BBJ1, and -1B28BBJ2 model turbofan engines. This AD was prompted by reports of two new unsafe conditions and the need to supersede corrective actions for two previously addressed unsafe conditions. This AD supersedes AD 2018-25-09 and AD 2019-12-01, which apply to the affected LEAP-1B model turbofan engines. This AD requires revising the Airworthiness Limitations Section (ALS) of the applicable CFM LEAP-1B Engine Shop Manual and the operator's approved continuous airworthiness maintenance program. The FAA is issuing this AD to address the unsafe conditions on these products.

DATES: This AD is effective April 16, 2020.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of April 16, 2020.

ADDRESSES: For service information identified in this final rule, contact CFM International, Inc., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: 877-432-3272; fax: 877-432-3329; email: aviation.fleetsupport@ge.com. You may view this service information at the FAA, Engine and Propeller Standards 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-2019-1093.

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-2019-1093; 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: Christopher McGuire, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7120; fax: 781-238-7199; email: chris.mcguire@faa.gov.

SUPPLEMENTARY INFORMATION:
Discussion

The FAA published a Notice of Proposed Rulemaking (NPRM) in the Federal Register on January 23, 2020 (85 FR 3871), prompted by reports of two new unsafe conditions affecting CFM LEAP-1B model turbofan engines: (1) Increased fuel flow through certain fuel nozzles due to fuel nozzle coking, potentially causing distress to the static structures of the high-pressure turbine (HPT) and in-flight shutdown (IFSD) of one or more engines; and (2) the potential for undetected subsurface anomalies formed during the manufacturing process that could result in uncontained failure of the HPT stage 2 disk.

The NPRM also resulted from additional information related to two unsafe conditions previously addressed by AD 2018-25-09, Amendment 39-19520 (83 FR 63559, December 11, 2018) ("AD 2018-25-09"), and AD 2019-12-01, Amendment 39-19656 (84 FR 28202, June 18, 2019) ("AD 2019-12-01"), regarding: (1) Icing in the pressure sensor lines, potentially causing inaccurate pressure sensor readings and loss of thrust control; and (2) inadequate oil flow to the radial drive shaft (RDS) bearing, which can cause failure of the bearing and IFSD of one or more engines. AD 2018-25-09 applied to all CFM LEAP-1B21, -1B23, -1B25, -1B27, -1B28, -1B28B1, -1B28B2, -1B28B2C, -1B28B3, -1B28BBJ1, and -1B28BBJ2 model turbofan engines. AD 2019-12-01 applied to CFM LEAP-1B21, -1B23, -1B25, -1B27, -1B28, -1B28B1, -1B28B2, -1B28B3,-1B28B2C, -1B28BBJ1, and -1B28BBJ2 model turbofan engines with certain RDS bearings installed. Thus, the FAA also proposed to supersede the two previously issued ADs addressing icing in the pressure sensor lines and inadequate oil flow to the RDS bearing.

The NPRM proposed to require revising the ALS of the applicable CFM LEAP-1B Engine Shop Manual and the operator's approved continuous airworthiness maintenance program to: (1) Add an ultrasonic inspection of the HPT stage 2 disk to detect subsurface anomalies formed during manufacturing; (2) add an inspection of the RDS bearing to address inadequate oil flow to the RDS bearing; (3) require monitoring and inspections of the fuel nozzle to address the potential distress to HPT static structures due to nozzle coking; and (4) update the electronic engine control (EEC) system software to address potential for icing in the pressure sensor lines.

The FAA is issuing this AD to address the unsafe conditions on these products.

Comments

The FAA 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 Use CFM Diagnostics for Engine Monitoring To Detect Fuel Nozzle Coking

A commenter asked whether CFM Diagnostics reporting is an acceptable method of compliance for CFM Service Bulletin (SB) LEAP-1B-73-00-0030-01A-930A-D, Issue 001, dated January 8, 2020 ("SB 73-0030"). The commenter stated that CFM Diagnostics has created a diagnostic report that includes the limits published in SB 73-0030.

The FAA agrees that use of CFM Diagnostics is an acceptable method of compliance for the engine monitoring in the ALS revisions required by this AD. This AD requires revising the ALS to include paragraph 6.B.(1) of CFM Engine Shop Manual (ESM) Data Module LEAP-1B-05-29-00-01A-281B-C, Issue 001, dated January 9, 2020 ("ESM 05-29"), which requires either engine monitoring or repetitive borescope inspections specified in SB 73-0030 to detect fuel nozzle coking. Given that SB 73-0030 recommends the use of CFM Diagnostics to perform engine monitoring, no change to this AD is necessary.

The commenter also asked whether switching between the engine monitoring and borescope inspection requirements is acceptable, because SB 73-0030 says that "You must do the trend monitoring or BSI of the turbine hardware," which implies that only one of the two methods must be used. The commenter indicated that there may be scenarios when a data interruption occurs and they need to switch from engine condition monitoring to a borescope inspection.

The FAA agrees that switching between the engine monitoring and borescope inspection requirements is acceptable because the FAA has previously approved SB 73-0030, which allows operators to use either option. Based on the foregoing, no change to this AD is necessary.

Request for Credit for Inspections of Transfer Gearbox (TGB) Related to Inadequate Oil Flow to RDS Bearing

A commenter requested that the AD provide credit for inspections of the TGB performed in accordance with CFM SB LEAP-1B-72-00-0222-01A-930A-D, Issue 007, dated May 17, 2019 ("SB 72-0222"). The commenter indicated that, although the service bulletins refer to different maintenance manual tasks, both SB 72-0222 and CFM SB LEAP-1B-72-00-0317-01A-930A-D, Issue 001, dated January 9, 2020 ("SB 72-0317"), require inspections meeting the same criteria.

The FAA agrees. This AD requires revising the ALS to include paragraph 6.B.(2) of ESM 05-29, which requires inspections of the RDS bearing as specified in SB 72-0317. SB 72-0317 provides the conditions for taking credit for inspections accomplished before the issuance of SB 72-0317, including inspections accomplished using SB 72-0222. Operators who meet the conditions specified in SB 72-0317 may take credit for previous inspections as part of their maintenance program. However, no change to this AD is necessary. Once an operator revises the ALS as required by this AD, the operator has fully complied with this AD. Compliance with the inspections remains mandatory as part of the ALS.

Support for the AD

The Boeing Company and the Air Line Pilots Association expressed support for the AD as written.

No Comments on the AD

United Airlines Engineering commented that it reviewed the NPRM and had no comments.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD as proposed.

Related Service Information Under 1 CFR Part 51

The FAA reviewed CFM ESM Data Module LEAP-1B-05-21-03-01A-281B-C, Issue 002, dated January 9, 2020 ("ESM 05-21"); and ESM 05-29. ESM 05-21 contains procedures for an ultrasonic inspection of the HPT stage 2 disk. ESM 05-29 contains procedures for inspection of the RDS bearing, monitoring and inspections of the fuel nozzle, and the required version of EEC system software. 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.

Costs of Compliance

The FAA estimates that this AD affects 162 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
Update ALS	4 work-hours × $85 per hour = $340	$0	$340	$55,080
TGB Screen Inspection	1 work-hour × 85 per hour = 85	0	85	13,770
HPT stage 2 Disk Inspection	6 work-hours × 85 per hour = 510	0	510	82,620
Fuel Nozzle Inspection	6 work-hours × 85 per hour = 510	0	510	82,620
Pressure Sub-system Software Upgrade	0.5 work-hours × 85 per hour = 42.50	0	42.50	6,885
RDS Borescope Inspection	2 work-hours × 85 per hour = 170	0	170	27,540

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the inspection. The FAA has no way of determining the number of aircraft that might need these replacements:

On-Condition Costs

Action	Labor cost	Parts cost	Cost per product
RDS Replacement	200 work-hours × $85 per hour = $17,000	$30,500	$47,500
HPT stage 2 Disk Replacement	1 work-hour × $85 per hour = $85	225,000	225,085
Replace Set of Fuel Nozzles	40 work-hours × $85 per hour = $3,400	120,000	123,400

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

The FAA has 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) 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:

a. Removing Airworthiness Directive (AD) 2018-25-09, Amendment 39-19520 (FAA-2018-1023, December 11, 2018), and AD 2019-12-01, Amendment 39-19656 (84 FR 28202, June 18, 2019); and

b. Adding the following new AD:

2020-06-01 CFM International, S.A.: Amendment 39-21103; Docket No. FAA-2019-1093; Project Identifier AD-2019-00144-E.

(a) Effective Date

This AD is effective April 16, 2020.

(b) Affected ADs

This AD replaces AD 2018-25-09, Amendment 39-19520 (83 FR 63559, December 11, 2018), and AD 2019-12-01, Amendment 39-19656 (84 FR 28202, June 18, 2019).

(c) Applicability

This AD applies to all CFM International S.A. (CFM) LEAP-1B21, -1B23, -1B25, -1B27, -1B28, -1B28B1, -1B28B2, -1B28B3, -1B28B2C, -1B28BBJ1, and -1B28BBJ2 model turbofan engines.

(d) Subject

Joint Aircraft System Component (JASC) Code, 7200 (Turbine/Turboprop).

(e) Unsafe Condition

(1) This AD was prompted by multiple reports of engine in-flight shutdowns (IFSDs) and defects in the related applicable systems and one report of a melt-related defect of the high-pressure turbine (HPT) stage 2 disk material. The FAA is issuing this AD to prevent:

(i) Increased fuel flow through certain fuel nozzles leading to distress of the HPT static structures and IFSD of one or more engines;

(ii) Undetected subsurface anomalies formed during the manufacturing process that could lead to uncontained HPT disk failure;

(iii) Icing in the pressure sensor lines, inaccurate pressure sensor readings and loss of thrust control; and

(iv) Inadequate oil flow to the radial drive shaft (RDS) bearing, failure of the bearing, and IFSD of one or more engines.

(2) These unsafe conditions, if not addressed, could result in IFSD or 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

Within 15 days after the effective date of this AD, revise the Airworthiness Limitations Section (ALS) of the applicable CFM LEAP-1B Engine Shop Manual and the operator's existing approved continuous airworthiness maintenance program by inserting the following changes:

(1) Paragraph 6.B.(2) of the CFM Engine Shop Manual (ESM) Data Module LEAP-1B-05-21-03-01A-281B-C, Issue 002, dated January 9, 2020; and

(2) Paragraphs 6.B.(1), 6.B.(2), and 6.C.(1) of the CFM ESM Data Module LEAP-1B-05-29-00-01A-281B-C, Issue 001, dated January 9, 2020.

(h) No Alternative Procedures or Intervals

After the revisions required by paragraph (g) of this AD have been made, no alternative inspections, procedures, or intervals may be used unless approved as an alternative method of compliance in accordance with the procedures specified in paragraph (i) of this AD.

(i) 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 (j) of this AD. You may email your request 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.

(j) Related Information

For more information about this AD, contact Christopher McGuire, Aerospace Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: 781-238-7120; fax: 781-238-7199; email: chris.mcguire@faa.gov.

(k) 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. (CFM) Engine Shop Manual (ESM) Data Module, LEAP-1B-05-21-03-01A-281B-C, Issue 002, dated January 9, 2020; and

(ii) CFM ESM Data Module LEAP-1B-05-29-00-01A-281B-C, Issue 001, dated January 9, 2020.

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

(4) You may view this service information at FAA, Engine & Propeller Standards 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 March 5, 2020.

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