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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2022–1422; Project Identifier AD–2022–01208–E; Amendment 39–22413; AD 2023–07–11]

RIN 2120–AA64

Airworthiness Directives; CFM International, S.A. Engines

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain CFM International, S.A. (CFM) Model LEAP–1B engines. This AD was prompted by a report of multiple aborted takeoffs and air turn-backs (ATBs) caused by high-pressure compressor (HPC) stall, which was induced by high levels of non-synchronous vibration (NSV). A subsequent investigation by the manufacturer revealed that wear on the No. 3 bearing spring finger housing can lead to high levels of NSV. This AD requires repetitive calculations of the oil filter delta pressure (OFDP) data and, depending on the results of the calculation, replacement of the No. 3 bearing spring finger housing. This AD also prohibits installation of an engine with an affected No. 3 bearing spring finger housing onto an airplane that already has one engine with an affected No. 3 bearing spring finger housing installed. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective June 13, 2023.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of June 13, 2023.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* by searching for and locating Docket No. FAA–2022–1422; 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.

Material Incorporated by Reference:

- For CFM service information identified in this final rule, contact CFM International Inc., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45215; phone: (877) 432–3272; email: *aviation.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 *regulations.gov* by searching for and locating Docket No. FAA–2022–1422.

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 Model LEAP–1B21, LEAP–1B23, LEAP–1B25, LEAP–1B27, LEAP–1B28, LEAP–1B28B1, LEAP–1B28B2, LEAP–1B28B2C, LEAP–1B28B3, LEAP–1B28BBJ1, and LEAP–1B28BBJ2 engines. The NPRM published in the **Federal Register** on December 1, 2022 (87 FR 73686). The NPRM was prompted by a report of three aborted takeoffs and two ATBs caused by HPC stall, which was induced by high levels of NSV. A subsequent investigation by the manufacturer revealed that wear on the No. 3 bearing spring finger housing can lead to high levels of NSV, which could induce HPC stall. This wear manifests itself early on as higher than typical OFDP loading. As a result of its investigation, the manufacturer published service information that specifies procedures for calculating the OFDP data and replacing the affected No. 3 bearing spring finger housing. In the NPRM, the FAA proposed to require a calculation of the OFDP data and, depending on the results of the calculation, replacement of the No. 3 bearing spring finger housing. In the NPRM, the FAA also proposed to prohibit the installation of an engine with an affected No. 3 bearing spring finger housing onto an airplane that already has one engine with an affected No. 3 bearing spring finger housing 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 four commenters. The commenters were Air Line Pilots Association, International (ALPA), American Airlines (AA), Lynx Air, and an anonymous commenter. ALPA and the anonymous commenter supported the proposed AD without change. AA and Lynx Air requested changes to the proposed AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Include Additional Method To Correct Unsafe Condition

AA requested that the FAA provide an additional solution using Original Equipment Manufacturer (OEM) provided data. AA stated that the OEM, who generates all data plots in CFM Fleet Monitor, should be required to generate a customer notification report (CNR) based on the points specified in the service bulletin (SB). AA stated that this solution would reduce human error of each operator required to access the data and manually complete the assessment. AA also noted that the automated process would provide a more robust and repeatable method for calculating the OFDP rate of change and allow OEM subject matter experts to review the data before releasing the CNR. AA also suggested that the My Fleet Monitor incorporate titles on the graphs to clarify which graph is applicable.

In response to this comment, an operator may apply for an alternative method of compliance (AMOC) in accordance with paragraph (k) of this AD, along with substantiation data to show that the alternative method provides an acceptable level of safety. The FAA cannot require the type certificate holder (TCH) to implement specific actions with respect to an unsafe condition but can mandate that operators perform corrective actions to address an unsafe condition. The FAA did not change this AD as a result of this comment.

Request To Update Paragraph (g)(3)

AA requested that the FAA update paragraph (g)(3) of this AD from: ''during the calculation'' to ''at the time of calculation.'' AA stated that ''during the calculation'' was unclear.

The FAA disagrees with the request to update paragraph (g)(3) of this AD because the language ''during the calculation'' is clear.

Request To Update Paragraphs (g)(1), (2), and (3) of This AD

Lynx Air has requested that the FAA update paragraphs (g)(1) and (2) of this AD to mandate the engine OEM monitor and calculate the operator's OFDP data (similar to existing trend monitoring performed by the engine OEM and subsequent communication to customers via the existing CNR process). Lynx Air also requested that the FAA update paragraph (g)(3) of this AD to mandate the engine OEM notify operators about engines that must be replaced upon the recognition that an engine's OFDP data falls outside of the limits specified in CFM SB LEAP–1B–72–00–0369–01A–930A–D, Issue 001–00, dated August 22, 2022 (CFM SB LEAP–1B–72–00–0369–01A–930A–D). Additionally, Lynx Air has requested that the FAA update paragraph (g)(3) of this AD to require operators replace engines within 25 flight cycles (FCs) of the CNR by the engine OEM. Lynx Air reasoned that operators should not be responsible for engine trend monitoring or demonstration of engine trend monitoring at a defined interval. Instead, solely the engine OEM should manage engine trend monitoring. Lynx Air explained that there is an existing process for transmitting engine trend monitoring alerts from CFM to the engine operators; therefore, there should be no reason for the final rule to require data checks at defined intervals. Lynx Air stated that this AD should be limited to requiring operators to respond to CFM CNRs within an acceptable timeframe.

The FAA disagrees with the request to update paragraphs (g)(1) through (3) of this AD to require the engine OEM monitor and calculate the operator's OFDP data. An operator may apply for an AMOC in accordance with paragraph (k) of this AD. The FAA cannot require the TCH to implement specific actions with respect to an unsafe condition but can mandate that operators perform actions to address an unsafe condition. The FAA did not change this AD as a result of this comment.

Request To Remove the Installation Prohibition Paragraph

Lynx Air requested that the FAA remove paragraph (i), Installation Prohibition, specified in this AD. Lynx Air stated that an AD issued by the ECO Branch, which applies to an engine, should not establish installation restrictions at the aircraft level. If aircraft-level restrictions are to be mandated, the ACO Branch should issue a separate AD applicable to the airframe. Lynx Air reasoned that neither the CFM SB nor the proposed rule would drive the removal of an affected engine from an aircraft equipped with two affected engines as of the effective date of this AD. Lynx Air stated that it is understood that installing an affected engine onto an airplane already equipped with one affected engine would not introduce a less airworthy condition than that of an aircraft equipped with two affected engines installed before the effective date of this AD. Lynx Air clarified that if dual exposure already exists, as written, this AD will allow dual exposure to continue on one aircraft while prohibiting the introduction of dual exposure on a different aircraft.

The FAA disagrees with the request to remove paragraph (i), Installation Prohibition. The requirement in paragraph (i), Installation Prohibition, which prevents installing an engine with an affected No. 3 bearing spring finger housing on an airplane that already has one engine with an affected No. 3 bearing spring finger housing installed, is part of the control plan to correct the unsafe condition. The OEM performed de-twinning as part of its early containment actions and subsequent investigation, which confirmed that there are no airplanes with two affected engines installed; hence, there is no need for a requirement to de-twin such airplanes to address the unsafe condition. The FAA did not change this AD as a result of this comment.

Request To Modify the Installation Prohibition Paragraph

Lynx Air requested that if the FAA rejects the request to remove paragraph (i), Installation Prohibition, the FAA modify paragraph (i), Installation Prohibition, of this AD to allow the installation of an engine with an affected No. 3 bearing spring finger housing onto an airplane that already has one engine with an affected No. 3 bearing spring finger housing installed as long as the engine that is installed, or the opposite engine, has accrued at least 1,000 FCs since new. Lynx Air reasoned that the OEM explains within CFM SB LEAP–1B–72–00–0369–01A–930A–D that the OFDP monitoring may cease after 1,000 FCs. Lynx Air stated that if this is the case, there should be no airworthiness concerns about the movement of an engine with an affected No. 3 bearing spring finger housing onto an airplane on which the other wing position has an engine with an affected No. 3 bearing spring finger housing installed, as long as the engine being installed has accrued at least 1,000 FCs since new. Lynx Air noted that neither paragraph (i), Installation Prohibition, nor paragraph (j), Definition, of this AD clearly define what an engine with a No. 3 bearing spring finger housing that has accrued more than 1,000 FCs refers to. Lynx Air commented that paragraph (i), Installation Prohibition, of the proposed AD is problematic as written, as an affected engine that has accrued more than 1,000 FCs should be eligible for installation onto the pylon opposite from an affected engine.

The FAA disagrees with the request to modify paragraph (i), Installation Prohibition. Accumulating 1,000 FCs on an engine with an affected No. 3 bearing spring finger housing does not constitute a terminating action for that engine. The OFDP monitoring stops at 1,000 FCs since new, due to the potential for false positives after that threshold is reached under normal engine wear. Therefore, the only terminating action is the removal and replacement of the affected No. 3 bearing spring finger housing, as required by paragraphs (g)(3) and (4) of this AD. The FAA did not change this AD as a result of this comment.

Request To Revise Estimated Costs Section

Lynx Air requested that the FAA modify the Estimated Costs section to predict the cost on U.S. operators more accurately. Lynx Air stated that the Estimated Costs section does not effectively capture the cost on U.S. operators. Lynx Air reasoned that the

estimated costs only consider the time to calculate the OFDP data in response to paragraph (g)(1) of the proposed AD and do not consider the time to calculate the OFDP data on a repetitive basis, as specified in paragraph (g)(2) of the proposed AD.

The FAA notes that the Estimated Costs include the costs for a single calculation of OFDP data. In the case of a repetitive calculation, the FAA cannot predict how many repetitive calculations will be performed. The FAA did not change this AD as a result of this comment.

Request To Revise Paragraph (g)(4) of This AD

Lynx Air requested that the FAA revise paragraph (g)(4) of this AD to more closely align with the parallel requirement of EASA AD 2022–0215, paragraph (3). Lynx Air suggested that the FAA update this AD to state that affected engines may not be released from a qualified shop visit with an affected part installed. Lynx Air reasoned that using the words ''next shop visit after the effective date of this AD'' pose problems for owners and operators who obtain previously operated spare engines. Lynx Air noted that, traditionally, engine shop visit records include records that claim previous compliance with AD requirements but do not include the date of the shop visit or the sequential (1st, 2nd, 3rd, etc.) occurrence at which a particular AD paragraph was complied with. Lynx Air reasoned that it becomes difficult, if not impossible, for an operator to demonstrate that a particular engine complied with paragraph (g)(4) of this AD at the next shop visit after the effective date of the AD, especially if the engine was not in their possession at the time in which the AD became effective.

The FAA disagrees with the request to revise paragraph (g)(4) of this AD. Engine shop visit records should specify the date of the shop visit. 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. As discussed in a later comment reply, this definition of an engine shop visit has been added to this AD. The FAA did not change this AD as a result of this comment.

Request To Add a Definition of an ''Affected Engine''

Lynx Air requested that the FAA add a definition of an ''affected engine'' to paragraph (j), Definitions, of this AD. Lynx Air reasoned that affected engines should no longer be considered affected after replacing affected parts. Lynx Air stated that given that Table 1 of CFM SB LEAP–1B–72–00–0369–01A–930A–D includes engine serial numbers (S/Ns), the implication is that those engines remain ''affected'' even after the replacement of the affected No. 3 bearing spring finger housing.

The FAA disagrees with the request to add a definition of ''affected engine'' to paragraph (j), Definitions, of this AD. This AD does not use the term ''affected engine.'' The FAA did not change this AD as a result of this comment.

Request To Add a Definition of an ''Engine Shop Visit''

Lynx Air requested that the FAA add a definition of an ''engine shop visit'' to paragraph (j), Definitions, of this AD. Lynx Air reasoned that operators need to understand what qualifies as a shop visit.

The FAA agrees and has added paragraph (j)(2) to the Definitions paragraph of this AD to state: ''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. The separation of engine flanges solely for the purpose of transportation without subsequent engine maintenance does not constitute an engine shop visit.''

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information Under 1 CFR Part 51

The FAA reviewed CFM SB LEAP–1B–72–00–0369–01A–930A–D, Issue 001–00, dated August 22, 2022. This service information specifies procedures for calculating the OFDP data and replacing the affected No. 3 bearing spring finger housing. This service information also identifies the S/Ns of the affected No. 3 bearing spring finger housings installed on CFM Model LEAP–1B 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 **ADDRESSES**.

Costs of Compliance

The FAA estimates that this AD affects 8 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
Calculate OFDP data	1 work-hour × $85 per hour = $85	$0	$85	$680
Replace No. 3 bearing spring finger housing	17 work-hours × $85 per hour = $1,445	64,590	66,035	528,280

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:

2023–07–11 CFM International, S.A.: Amendment 39–22413; Docket No. FAA–2022–1422; Project Identifier AD–2022–01208–E.

(a) Effective Date

This airworthiness directive (AD) is effective June 13, 2023.

(b) Affected ADs

None.

(c) Applicability

This AD applies to CFM International, S.A. (CFM) Model LEAP–1B21, LEAP–1B23, LEAP–1B25, LEAP–1B27, LEAP–1B28, LEAP–1B28B1, LEAP–1B28B2, LEAP–1B28B2C, LEAP–1B28B3, LEAP–1B28BBJ1, and LEAP–1B28BBJ2 engines with an installed No. 3 bearing spring finger housing, part number 2542M54G01, and serial number identified in Table 1 of CFM Service Bulletin LEAP–1B–72–00–0369–01A–930A–D, Issue 001–00, dated August 22, 2022 (CFM SB LEAP–1B–72–00–0369–01A–930A–D).

(d) Subject

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

(e) Unsafe Condition

This AD was prompted by a report of multiple aborted takeoffs and air turn-backs caused by high-pressure compressor (HPC) stall, which was induced by high levels of non-synchronous vibration, and a subsequent investigation by the manufacturer that revealed wear on the No. 3 bearing spring finger housing. The FAA is issuing this AD to prevent HPC stall. The unsafe condition, if not addressed, could result in engine power loss at a critical phase of flight such as takeoff or climb, loss of thrust control, reduced controllability of the airplane, and loss of the airplane.

(f) Compliance

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

(g) Required Actions

(1) Before the affected No. 3 bearing spring finger housing accumulates 125 flight cycles (FCs) since new, but not before accumulating 75 FCs since new, or within 50 FCs after the effective date of this AD, whichever occurs later, calculate the oil filter delta pressure (OFDP) data in accordance with the Accomplishment Instructions, paragraphs 5.A.(1) through 5.A.(2) or 5.B.(1) through 5.B.(2), of CFM SB LEAP–1B–72–00–0369–01A–930A–D.

(2) Thereafter, at intervals not to exceed 100 FCs from the last calculation of the OFDP data, and until the affected No. 3 bearing spring finger housing accumulates 1,000 FCs since new, repeat the calculation required by paragraph (g)(1) of this AD.

(3) If, during the calculation required by paragraph (g)(1) or (2) of this AD, the OFDP data exceed the limits specified in the Accomplishment Instructions, paragraph 5.A.(3) or 5.B.(3), of CFM SB LEAP–1B–72–00–0369–01A–930A–D, as applicable, within 25 FCs of performing the calculation, replace the affected No. 3 bearing spring finger housing with a part eligible for installation.

(4) During the next engine shop visit after the effective date of this AD, replace the affected No. 3 bearing spring finger housing with a part eligible for installation.

(h) Terminating Action

Replacement of the affected No. 3 bearing spring finger housing with a part eligible for installation, as specified in paragraphs (g)(3) and (4) of this AD, constitutes terminating action for the calculations required by paragraphs (g)(1) and (2) of this AD.

(i) Installation Prohibition

After the effective date of this AD, do not install an engine with an affected No. 3 bearing spring finger housing onto an airplane that already has one engine with an affected No. 3 bearing spring finger housing installed.

(j) Definitions

(1) For the purpose of this AD, a ''part eligible for installation'' is a No. 3 bearing spring finger housing that is not identified in Table 1 of CFM SB LEAP–1B–72–00–0369–01A–930A–D.

(2) 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. The separation of engine flanges solely for the purpose of transportation without subsequent engine maintenance does not constitute an engine shop visit.

(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 it 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 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 Service Bulletin LEAP–1B–72–00–0369–01A–930A–D, Issue 001–00, dated August 22, 2022

(ii) [Reserved]

(3) For CFM service information identified in this AD, contact CFM International Inc., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45215; phone: (877) 432–3272; email: *aviation.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 April 8, 2023.

Christina Underwood,

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

[FR Doc. 2023–09737 Filed 5–8–23; 8:45 am]

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