



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2020-0371; Project Identifier AD-2019-00124-E; Amendment 39-21405; AD 2021-03-02]

RIN 2120-AA64

Airworthiness Directives; General Electric Company Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain General Electric Company (GE) CF6-80C2A1, CF6-80C2A2, CF6-80C2A3, CF6-80C2A5, CF6-80C2A5F, CF6-80C2A8, CF6-80C2B1, CF6-80C2B1F, CF6-80C2B2, CF6-80C2B2F, CF6-80C2B4, CF6-80C2B4F, CF6-80C2B5F, CF6-80C2B6, CF6-80C2B6F, CF6-80C2B6FA, CF6-80C2B7F, CF6-80C2B8F, and CF6-80C2D1F model turbofan engines. This AD was prompted by reports of incidents that resulted in a significant fuel loss during flight and an in-flight shutdown (IFSD) of the engine. This AD requires initial and repetitive shim checks of the hydromechanical unit/main engine control (HMU/MEC) idler adapter on the accessory gearbox (AGB) assembly and, depending on the results of the shim check, possible replacement of the inserts on the HMU/MEC idler adapter. As a terminating action, this AD requires a protrusion check and a pull-out test, and the replacement of inserts on the HMU/MEC idler adapter that fail either test. 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 a certain publication 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 General Electric Company, 1 Neumann Way, Cincinnati, OH, 45215; phone: (513) 552-3272; 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 (781) 238-7759. It is also available at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0371.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0371; 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: Kevin M. Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: kevin.m.clark@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 GE CF6-80C2A1, CF6-80C2A2, CF6-80C2A3, CF6-80C2A5, CF6-80C2A5F, CF6-80C2A8, CF6-80C2B1, CF6-80C2B1F, CF6-80C2B2, CF6-80C2B2F, CF6-80C2B4, CF6-80C2B4F, CF6-80C2B5F, CF6-80C2B6, CF6-80C2B6F, CF6-80C2B6FA, CF6-80C2B7F, CF6-80C2B8F, and CF6-80C2D1F model turbofan engines. The NPRM published in the *Federal Register* on April 10, 2020 (85 FR 20211). The NPRM was prompted by reports of incidents that resulted in a significant fuel loss during flight and an IFSD of the engine. The incidents resulted from inserts on the HMU/MEC idler adapter on the AGB assembly pulling out of the housing. An investigation by the manufacturer discovered improperly cut threads on

the inserts and erroneous instructions in the maintenance manual, which contributed to poor thread engagement. In the NPRM, the FAA proposed to require initial and repetitive shim checks of the HMU/MEC idler adapter on the AGB assembly and, depending on the results of the shim check, possible replacement of the inserts on the HMU/MEC idler adapter. As a terminating action to the repetitive shim checks, the NPRM proposed to require a protrusion check and a pull-out test, and the replacement of inserts on the HMU/MEC idler adapter that fail either test. 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 All Nippon Airways (ANA), Delta Air Lines, Inc. (DAL), FedEx Express (FedEx), and Japan Airlines (JAL). All commenters requested changes, some of which resulted in changes to this AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

Request to Update the Applicability

DAL requested that paragraph (c), Applicability, of this AD be updated to align with the effectivity in GE CF6-80C2 Service Bulletin (SB) 72-1577 R01, dated August 16, 2019 (GE CF6-80C2 SB 72-1577 R01), which includes the part numbers (P/Ns) of the affected HMU/MEC idler adapters.

The FAA agrees. The FAA confirmed with the manufacturer that only the P/Ns of the HMU/MEC idler adapter listed in GE CF6-80C2 SB 72-1577 R01 are affected. The FAA updated the applicability of this AD to include the P/Ns of the affected HMU/MEC idler adapter. The number of engines affected by this AD is unchanged from the NPRM.

Request to Update Terminating Action

DAL requested that paragraph (h), Terminating Action, of this AD also terminate the initial shim check of the HMU/MEC idler adapter inserts required by paragraph (g)(1) of this AD. DAL reasoned that since the NPRM proposed to allow for terminating the repetitive shim checks of the HMU/MEC idler adapter inserts, that this AD should add a

terminating action for the initial shim check of the HMU/MEC idler adapter inserts if the action was performed within 1,200 flight hours (FHs) after the effective date of this AD.

The FAA agrees. The FAA updated paragraph (h) of this AD to terminate the actions required by paragraph (g) of this AD.

Request to Remove the Shim Check

DAL requested that the FAA remove the shim check of the HMU/MEC idler adapter inserts in paragraph (g)(3)(ii) of the NPRM. DAL reasoned that performing this shim check is not necessary because the (g)(3)(ii) shim check is already required by paragraph (g)(3)(i) of this AD. Additionally, DAL stated that referencing paragraph (g)(1) of this AD to perform the shim check may confuse operators as paragraph (g)(1) of this AD includes the requirement to perform the shim check within 1,200 FHs after the effective date of this AD. Therefore, DAL suggested that paragraph (g)(3)(ii) of this AD should only address the requirement to perform the terminating action if the shim check fails.

The FAA partially agrees. The FAA disagrees that paragraph (g)(3)(ii) of this AD should only address the requirement to perform the terminating action if the shim check of the HMU/MEC idler adapter inserts fails. After retorque of the bolts at each bolt location that failed the shim check, operators must perform the shim check again. If that shim check fails, then the terminating action is required. The FAA agrees that referencing paragraph (g)(1) of this AD may confuse operators whether to perform the shim check after the aircraft operated for some time or within 1,200 FHs after the effective date of this AD. The FAA updated paragraph (g)(3)(ii) of this AD to reference the service information when performing the shim check rather than paragraph (g)(1) of this AD.

Request to Update Credit for Previous Actions

ANA, DAL, FedEx, and JAL requested updates to paragraph (i), Credit for Previous Actions, of this AD. ANA requested adding credit for the repetitive shim checks of the HMU/MEC idler adapter inserts and terminating action. DAL and FedEx requested credit for the terminating action. JAL requested credit for the repetitive shim checks of the HMU/MEC idler adapter inserts, retorque of the bolts that failed the shim check, and the terminating action. The commenters reasoned that GE CF6-80C2 SB 72-1577 R00,

dated October 31, 2018 (GE CF6-80C2 SB 72-1577 R00), instructs the operator to perform the same tasks required by GE CF6-80C2 SB 72-1577 R01. Therefore, credit should be allowed for initial and repetitive shim checks of the HMU/MEC idler adapter inserts and the terminating action.

The FAA agrees. The FAA reviewed GE CF6-80C2 SB 72-1577 R00, and determined that the instructions are consistent with GE CF6-80C2 SB 72-1577 R01. The FAA updated this AD to allow credit for the initial and repetitive shim checks of the HMU/MEC idler adapter inserts, retorque of the bolts that failed the shim check, and the terminating action, if performed before the effective date of this AD using GE CF6-80C2 SB 72-1577 R00.

Request for an Alternate Marking Area

ANA requested that the FAA approve an alternate marking area to show compliance with performing the terminating action of this AD. ANA stated that the marking areas indicated in GE CF6-80C2 SB 72-1577 R01, are difficult to access because many components are installed to AGB assembly.

The FAA disagrees with approving an alternate marking area. The manufacturer provided two possible marking areas in GE CF6-80C2 SB 72-1577 R01, and confirmed the suitability of the areas.

Request to Not Mandate the Marking Requirement

DAL requested that the FAA not mandate the provision in GE CF6-80C2 SB 72-1577 R01 to mark the HMU/MEC idler adapter to show compliance with the terminating actions of this AD. DAL reasoned that the NPRM did not propose to apply to all engines and therefore should not be required.

The FAA disagrees. Marking the HMU/MEC idler adapter identifies if the terminating action of this AD has been completed. As noted in a previous comment response, the FAA revised the applicability of this AD to limit applicability to affected engines with certain HMU/MEC idler adapter P/Ns installed. Operators who determine that their engines are not applicable to this AD do not need to perform the terminating action or mark the HMU/MEC idler adapter.

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 GE CF6-80C2 SB 72-1577 R01, dated August 16, 2019. The SB describes procedures for performing shim checks of the HMU/MEC idler adapter and for replacing the HMU/MEC idler adapter inserts. 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 555 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
Shim check	1 work-hour x \$85 per hour = \$85	\$0	\$85	\$47,175
Protrusion check/pull-out test	4 work-hours x \$85 per hour = \$340	\$0	\$340	\$188,700

The FAA estimates the following costs to do any necessary replacements that are required based on the results of the shim check. The agency 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
Replace HMU/MEC idler	4 work-hours x \$85 per hour = \$340	\$50	\$390

adapter insert			
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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:
2021-03-02 General Electric Company: Amendment 39-21405; Docket No. FAA-2020-0371; Project Identifier AD-2019-00124-E.

(a) Effective Date

This airworthiness directive (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 General Electric Company (GE) CF6-80C2A1, CF6-80C2A2, CF6-80C2A3, CF6-80C2A5, CF6-80C2A5F, CF6-80C2A8, CF6-80C2B1, CF6-80C2B1F, CF6-80C2B2, CF6-80C2B2F, CF6-80C2B4, CF6-80C2B4F, CF6-80C2B5F, CF6-80C2B6, CF6-80C2B6F, CF6-80C2B6FA, CF6-80C2B7F, CF6-80C2B8F, and CF6-80C2D1F model turbofan engines that underwent an engine shop visit before November 1, 2018, and with accessory gearbox (AGB) adapter hydromechanical unit (HMU)/main engine control (MEC) idler adapter with part number (P/N) 9395M78G01, P/N 9395M78G02, P/N 9395M78G04, P/N 9395M78G05, P/N 9395M78G08, or P/N 9395M78G10, installed.

(d) Subject

Joint Aircraft System Component (JASC) Code 7321, Fuel Control/Turbine Engines.

(e) Unsafe Condition

This AD was prompted by failure of the HMU/MEC on the AGB assembly. The FAA is issuing this AD to prevent failure of the HMU/MEC. The unsafe condition, if not addressed, could result in engine fire and damage to the airplane.

(f) Compliance

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

(g) Required Actions

(1) Perform a shim check of the HMU/MEC idler adapter inserts using paragraph 3.B.(1) of GE CF6-80C2 Service Bulletin (SB) 72-1577 R01, dated August 16, 2019 (the SB), within 1,200 flight hours (FHs) after the effective date of this AD.

(2) Thereafter, perform a repetitive shim check of the HMU/MEC idler adapter inserts using paragraph 3.B.(1) of the SB within every 1,200 FHs since the last shim check.

(3) If any HMU/MEC idler adapter insert fails the shim check required by paragraph (g)(1) or (2) of this AD, perform the following before further flight:

(i) Retorque the bolts at each bolt location that failed the shim check using paragraph 3.B.(1)(c) of the SB.

(ii) Perform the shim check again using paragraph 3.B.(1)(b) of the SB. If the shim check fails, perform the terminating action required by paragraph (h) of this AD.

(h) Terminating Action

As a terminating action to the requirements of paragraph (g) of this AD, perform the following:

(1) Do a protrusion check at all eight bolt locations using paragraph 3.C.(3) of the SB.

(2) Do a pull-out test at all eight bolt locations using paragraph 3.C.(4) of the SB.

(3) If the inserts on the HMU/MEC idler adapter fail the protrusion check or pull-out test required by paragraph (h)(1) or (2) of this AD, replace the inserts using paragraph 3.C.(5) of the SB. After replacement of the inserts is accomplished, the requirements of this AD have been met and no further action is required.

(4) If the inserts on the HMU/MEC idler adapter pass both the protrusion check and the pull-out test required by paragraphs (h)(1) and (2) of this AD, the requirements of this AD have been met and no further action is required.

(i) Credit for Previous Actions

(1) You may take credit for any shim check of the HMU/MEC idler adapter required by paragraph (g) of this AD if you performed this shim check before the effective date of this AD using GE CF6-80C2 SB 72-1577 R00, dated October 31, 2018.

(2) You may take credit for the terminating action required by paragraph (h) of this AD if you performed this action before the effective date of this AD using GE CF6-80C2 SB 72-1577 R00, dated October 31, 2018.

(j) Definition

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 case flanges, except separation of engine flanges solely for the purposes of transportation of the engine without subsequent maintenance, which 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 Related Information. 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.

(l) Related Information

For more information about this AD, contact Kevin M. Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: kevin.m.clark@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) General Electric Company (GE) CF6-80C2 Service Bulletin 72-1577 R01, dated August 16, 2019.

(ii) [Reserved]

(3) For GE service information identified in this AD, contact General Electric Company, 1 Neumann Way, Cincinnati, OH, 45215; phone: (513) 552-3272; 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 (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 January 21, 2021.

Ross Landes, Deputy Director for Regulatory Operations,
Compliance & Airworthiness Division,
Aircraft Certification Service.

[FR Doc. 2021-03606 Filed: 2/23/2021 8:45 am; Publication Date: 2/24/2021]