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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2022-0101; Project Identifier AD-2021-01456-E; Amendment 39-21949; AD 2022-04-07]**

**RIN 2120-AA64**

### **Airworthiness Directives; General Electric Company Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule; request for comments.

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**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for certain General Electric Company (GE) GEnx-1B64, -1B64/P1, -1B64/P2, -1B67, -1B67/P1, -1B67/P2, -1B70, -1B70/75/P1, -1B70/75/P2, -1B70/P1, -1B70/P2, -1B70C/P1, -1B70C/P2, -1B74/75/P1, -1B74/75/P2, -1B76/P2, -1B76A/P2, GEnx-2B67, -2B67B, and -2B67/P model turbofan engines. This AD was prompted by an in-flight shutdown (IFSD) of an engine and subsequent investigation by the manufacturer that revealed an improperly torqued fuel metering unit (FMU) bypass valve (BPV) plug. This AD requires a shim check inspection of the FMU BPV plug and, depending on the results of the inspection, replacement of the FMU. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective March 9, 2022.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of March 9, 2022.

The FAA must receive comments on this AD by April 8, 2022.

**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: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

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@ae.ge.com](mailto:aviation.fleetsupport@ae.ge.com); website: <https://www.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 <https://www.regulations.gov> by searching for and locating Docket No. FAA-2022-0101.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2022-0101; 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:** Alexei Marqueen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7178; email: [Alexei.T.Marqueen@faa.gov](mailto:Alexei.T.Marqueen@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Background**

On July 20, 2021, a Boeing model 747-8F airplane, powered by GENx-2B67/P model turbofan engines, flying from Hong Kong to Dubai, experienced N1 overspeed and fire warnings that resulted in an IFSD and air turnback (ATB) to Hong Kong. After landing, the engine reignited and emergency crews extinguished the fire. The investigation led by the National Transportation Safety Board found several fuel system leaks including at the FMU supply pressure (P1) BPV pressure port with a loose FMU BPV plug safety cabled in place. Because a safety cable was in place, the investigation concluded that the FMU BPV plug might not have been torqued properly during production or during an engine shop visit. During the investigation, GE discovered that another operator, operating a Boeing model 787-10 airplane, powered by GENx-1B74/75/P2 model turbofan engines, found a fuel system leak related to a loose FMU BPV plug in August 2020 during a walk-around after a flight. As a result of the investigation, the manufacturer published GE GENx-1B Service Bulletin (SB) 73-0100 R00, dated December 3, 2021, and GE GENx-2B SB 73-0092 R00, dated December 3, 2021, specifying procedures to inspect the FMU BPV plug and, depending on the results of the inspection, replacement of the FMU. This condition, if not addressed, could result in loss of engine thrust control, IFSD, and reduced control of the aircraft. 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 has determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

#### **Related Service Information Under 1 CFR Part 51**

The FAA reviewed GE GENx-1B SB 73-0100 R00, dated December 3, 2021, and GE GENx-2B SB 73-0092 R00, dated December 3, 2021. These SBs specify procedures for inspecting the FMU BPV plug and replacing the FMU on GE GENx-1B and GENx-2B model turbofan 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.

## **AD Requirements**

This AD requires a shim check inspection of the FMU BPV plug and, depending on the results of the inspection, replacement of the FMU.

## **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. 551 et seq.) 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 thirty days, upon a finding of good cause.

An unsafe condition exists that requires the immediate adoption of this AD without providing an opportunity for public comments prior to adoption. The FAA has found that the risk to the flying public justifies foregoing notice and comment prior to adoption of this rule. On July 20, 2021, a Boeing model 747-8F airplane, powered by GENx-2B67/P model turbofan engines, experienced an IFSD and ATB due to a fuel system leak. This unsafe condition, caused by improper torquing of the FMU BPV plug, may result in the loss of engine thrust control, IFSD, and reduced control of the aircraft.

The FAA considers inspection of the FMU BPV plug to be an urgent safety issue. Inspection of the FMU BPV plug must be accomplished within 150 flight cycles after the effective date of this AD. The FAA estimates that engines affected by this AD will accumulate 150 flight cycles within approximately 90 days of the effective date of this AD. These conditions still exist, therefore, notice and opportunity for prior public comment are impracticable and contrary to the public interest pursuant to 5 U.S.C. 553(b)(3)(B).

In addition, 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, for the same reasons the FAA found good cause to forego notice and comment.

## **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 ADDRESSES. Include “Docket No. FAA-2022-0101 and Project Identifier AD-2021-01456-E” at the beginning of your comments. The most helpful comments reference a specific portion of the final rule, 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 agency will also post a report summarizing each substantive verbal contact received about this final rule.

## **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 AD 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 AD, 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 AD. Submissions containing CBI should be sent to Alexei Marqueen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. 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 FAA has determined that it has good cause to adopt this rule without prior notice and comment, RFA analysis is not required.

### Costs of Compliance

The FAA estimates that this AD affects 114 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 inspection of FMU BPV plug	0.50 work-hours × \$85 per hour = \$42.50	\$0	\$42.50	\$4,845

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

#### On-Condition Costs

Action	Labor cost	Parts cost	Cost per product
Replace the FMU with a FMU that has undergone packing replacement	8 work-hours × \$85 per hour = \$680	\$200	\$880
Replace the FMU	7 work-hours × \$85 per hour = \$595	727,317	727,912

### 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:



**2022-04-07 General Electric Company:** Amendment 39-21949; Docket No. FAA-2022-0101; Project Identifier AD-2021-01456-E.

**(a) Effective Date**

This airworthiness directive (AD) is effective March 9, 2022.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to all General Electric Company (GE) GEnx-1B64, GEnx-1B64/P1, GEnx-1B64/P2, GEnx-1B67, GEnx-1B67/P1, GEnx-1B67/P2, GEnx-1B70, GEnx-1B70/75/P1, GEnx-1B70/75/P2, GEnx-1B70/P1, GEnx-1B70/P2, GEnx-1B70C/P1, GEnx-1B70C/P2, GEnx-1B74/75/P1, GEnx-1B74/75/P2, GEnx-1B76/P2, GEnx-1B76A/P2, GEnx-2B67, GEnx-2B67B, and GEnx-2B67/P model turbofan engines with:

(1) A fuel metering unit (FMU) VIN 8062-1094 part number (P/N) 2122M20P07, VIN 8062-1176 P/N 2122M20P08, VIN 8062-1106 P/N 2459M17P01, or VIN 8062-1177 P/N 2459M17P02, installed; and

(2) An FMU having a serial number (S/N) identified in Paragraph 4, Appendix A, Table 1, of either GE GEnx-1B Service Bulletin (SB) 73-0100 R00, dated December 3, 2021 (GEnx-1B SB 73-0100), or GE GEnx-2B SB 73-0092 R00, dated December 3, 2021 (GEnx-2B SB 73-0092).

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7320, Fuel Controlling System.

**(e) Unsafe Condition**

This AD was prompted by an in-flight shutdown (IFSD) of an engine and subsequent investigation by the manufacturer that revealed an improperly torqued FMU bypass valve (BPV) plug. The FAA is issuing this AD to prevent fuel system leakage from the FMU. The unsafe condition, if not addressed, could result in the loss of engine thrust control, IFSD, and reduced control of the aircraft.

**(f) Compliance**

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

## **(g) Required Actions**

(1) Within 150 flight cycles after the effective date of this AD, perform either an on-wing or off-wing shim check inspection using a 0.005 inch feeler gauge of the FMU BPV plug to verify the FMU BPV plug is properly installed using the Accomplishment Instructions, paragraph 3.A.(4) or paragraph 3.B.(3), of GENx-1B SB 73-0100 (for GENx-1B models) or the Accomplishment Instructions, paragraph 3.A.(4) or paragraph 3.B.(3), of GENx-2B SB 73-0092 (for GENx-2B models), as applicable. Perform the shim check inspection on any flat side of the FMU BPV plug.

(2) If, during the inspection required by paragraph (g)(1) of this AD, the 0.005 inch feeler gauge can fit between the FMU BPV plug and the FMU housing on the flat side, before further flight, remove the FMU and replace with an FMU eligible for installation.

## **(h) Definitions**

For the purpose of this AD, an “FMU eligible for installation” is:

(1) An FMU having a S/N that is not identified in Paragraph 4, Appendix A, Table 1, of GENx-1B SB 73-0100 or GENx-2B SB 73-0092;

(2) An FMU having a S/N identified in Paragraph 4, Appendix A, Table 1, of GENx-1B SB 73-0100 or GENx-2B SB 73-0092 that passes the shim check inspection required by paragraph (g)(1) of this AD; or

(3) An FMU having a S/N identified in Paragraph 4, Appendix A, Table 1, of GENx-1B SB 73-0100 or GENx-2B SB 73-0092 that fails the shim check inspection required by paragraph (g)(1) of this AD but has had the packing of the FMU BPV plug replaced per the Accomplishment Instructions, paragraph 3.C. of GENx-1B 73-0100 or GENx-2B 73-0092.

## **(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 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.

## **(j) Related Information**

For more information about this AD, contact Alexei Marqueen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7178; email: Alexei.T.Marqueen@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) General Electric Company (GE) GENx-1B Service Bulletin (SB) 73-0100 R00, dated December 3, 2021.

(ii) GE GENx-2B SB 73-0092 R00, dated December 3, 2021.

(3) For service information identified in this AD, contact General Electric Company, 1 Neumann Way, Cincinnati, OH 45215; phone: (513) 552-3272; email: [aviation.fleetsupport@ae.ge.com](mailto:aviation.fleetsupport@ae.ge.com); website: <https://www.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](mailto:fr.inspection@nara.gov), or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on February 15, 2022.

Ross Landes,

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

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