



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2023-0157; Project Identifier AD-2022-01309-T; Amendment 39-22466; AD 2023-12-08]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain The Boeing Company Model 747-8 series airplanes. This AD was prompted by a report of stress corrosion cracking in certain stringers and end stringer splice assemblies. This AD requires repetitive inspections of the stringers and end stringer splice assemblies for any crack, shim, or gap, and applicable on-condition actions. 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:

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2023-0157; 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 service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195. It is also available at regulations.gov under Docket No. FAA-2023-0157.

FOR FURTHER INFORMATION CONTACT: Stefanie N. Roesli, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: 206-231-3964; email: Stefanie.N.Roesli@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 The Boeing Company Model 747-8 series airplanes. The NPRM published in the *Federal Register* on February 15, 2023 (88 FR 9773). The NPRM was prompted by a report indicating cracks found on end stringers of two Model 747-8 airplanes at station (STA) 2285, left and right sides, during foreign object debris (FOD) inspections in preparation for airplane modification. The cracks were not visually detectable until the stringer splice assemblies were removed. The root cause was found to be stress corrosion cracking caused by excessive and sustained internal tensile stresses that were due to no shim being installed or shimmed gaps exceeding engineering limits at production. In the NPRM, the FAA proposed to require repetitive

inspections of the stringers and end stringer splice assemblies for any crack, shim, or gap, and applicable on-condition actions. The FAA is issuing this AD to prevent cracks in a stringer or end stringer splice assembly increasing in length and going undetected. This condition, if not addressed, could result in the inability of a structural element to sustain limit load and could adversely affect the structural integrity of the airplane.

Discussion of Final Airworthiness Directive

Comments

The FAA received a comment from The Boeing Company who supported the NPRM without change.

The FAA received an additional comment from an individual commenter. The following presents the comment received on the NPRM and the FAA's response to the comment.

Request for Root Cause of Stress Corrosion Cracks (SCCs)

The individual commenter requested if Boeing provided heat treatment specification as a root cause of SCCs and the quality process for verification of SCC nucleation was within their shelf life. The individual indicated a larger production deficiency for an airplane that has been out of production, and stated that this unsafe condition should not be treated as widespread fatigue damage.

During the root-cause investigation to determine the appropriate corrective actions, the FAA considered material changes and evaluated the manufacturing and assembly process. This evaluation would have included any necessary changes to treatment specifications and quality inspections. The FAA has not changed this AD.

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, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Clarification of Terminating Action

Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, contains a terminating action flagnote (b) in Tables 1 through 4 of the Accomplishment Instructions that specifies “Doing the detailed and High Frequency Eddy Current (HFEC) inspections and finding no crack as a result of the inspection is terminating action to Requirements Bulletin 747-53A2909 RB for that affected end stringer splice assembly.” However, the flagnote “(b)” is located with certain conditions in Tables 1 through 4 and appears to be contradictory in certain locations, e.g., “Condition 8.2: No crack found as a result of option 2 inspections” specifies to do repetitive inspections; however the option 2 inspections are the detailed and HFEC inspections, which the flagnote specifies is terminating action. The FAA has clarified the terminating action in paragraphs (g)(1) through (4) of this AD to confirm that no action is required for an end stringer splice assembly on which no cracking is found after the specified option 2 inspections are done.

Related Service Information under 1 CFR Part 51

The FAA reviewed Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022. This service information specifies procedures for repetitive detailed inspections of the stringers and the end stringer splice assemblies at stringers S-17 to S-25 from STA 2285 to STA 2300 main entry door #5 cutout aft edge frame for any crack, any shim between a stringer and bear strap, and any gap within the fastener-joint-to-bear-strap joint, and applicable on-condition actions. On-condition actions include detailed inspections of the stringers and end stringers splice assemblies located between STA 2285 and STA 2300 from stringers S-17L to S-25L/S-17R to S-25R, open hole high

HFEC inspection of the fastener holes of the skin common to the end stringer splice fitting for cracks, and repair of cracked stringer/end stringer splice fittings.

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 2 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
Detailed Inspection (S-17L to S-25L) and (S-17R to S-25R)	4 work-hours X \$85 per hour = \$340 per inspection cycle	\$0	\$340 per inspection cycle	\$680 per inspection cycle

The FAA estimates the following costs to do any necessary on-condition actions that would be required based on the results of the proposed inspection. The agency has no way of determining which, if any, of the affected airplanes might need these on-condition actions:

On-condition costs

Action	Labor cost	Parts cost	Cost per product
Detailed Inspection and Open Hole HFEC Inspection per side	54 work-hours X \$85 per hour = \$4,590	\$0	\$4,590
Repair of cracked stringer/end stringer splice fitting	13 work-hours X \$85 per hour = \$1,105	\$600	\$1,705

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some or all of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected operators.

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:

2023-12-08 The Boeing Company: Amendment 39-22466; Docket No. FAA-2023-0157; Project Identifier AD-2022-01309-T.

(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 The Boeing Company Model 747-8 series airplanes, certificated in any category, as identified in Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022.

(d) Subject

Air Transport Association (ATA) of America Code 53, Fuselage.

(e) Unsafe Condition

This AD was prompted by a report of stress corrosion cracking in the stringers and end stringer splice assemblies located between station (STA) 2285 and STA 2300 from stringers S-17 to S-25 on the left and right sides of the airplane caused by excessive

and sustained internal tensile stresses that were due to no shim being installed or shimmed gaps exceeding engineering limits at production. A crack in a stringer or end stringer splice assembly could grow in length and go undetected. The unsafe condition, if not addressed, could result in the inability of a structural element to sustain limit load and could adversely affect the structural integrity of the airplane.

(f) Compliance

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

(g) Required Actions

Except as specified by paragraph (h) of this AD: At the applicable times specified in the “Compliance” paragraph of Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022. For this AD, terminating action for certain end stringer springer splice assemblies are specified in paragraphs (g)(1) through (4) of this AD.

Note 1 to paragraph (g): Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin 747-53A2909, dated September 21, 2022, which is referred to in Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022.

(1) For any end stringer splice assembly on which no cracking is found after accomplishing CONDITION 3 (OPTION 2) (ACTION 1) and CONDITION 3 (OPTION 2) (ACTION 2) inspections specified in Table 1 of the Accomplishment Instruction of Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, no further action is required by this AD for that end stringer splice assembly.

(2) For any end stringer splice assembly on which no cracking is found after accomplishing CONDITION 6 (OPTION 2) (ACTION 1) and CONDITION 6

(OPTION 2) (ACTION 2) inspections specified in Table 2 of the Accomplishment Instruction of Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, no further action is required by this AD for that end stringer splice assembly.

(3) For any end stringer splice assembly on which no cracking is found after accomplishing CONDITION 8 (OPTION 2) (ACTION 1) and CONDITION 8 (OPTION 2) (ACTION 2) inspections specified in Table 3 of the Accomplishment Instruction of Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, no further action is required by this AD for that end stringer splice assembly.

(4) For any end stringer splice assembly on which no cracking is found after accomplishing CONDITION 10 (OPTION 2) (ACTION 1) and CONDITION 10 (OPTION 2) (ACTION 2) inspections specified in Table 4 of the Accomplishment Instruction of Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, no further action is required by this AD for that end stringer splice assembly.

(h) Exceptions to Service Information Specifications

(1) Where the Compliance Time column and certain notes of the tables in the “Compliance” paragraph of Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, use the phrase “the original issue date of Requirements Bulletin 747-53A2909 RB,” this AD requires using “the effective date of this AD.”

(2) Where Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022, specifies contacting Boeing for repair instructions: This AD requires doing the repair using a method approved in accordance with the procedures specified in paragraph (i) of this AD.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Continued Operational Safety 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 responsible Flight Standards 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. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Continued Operational Safety Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(j) Related Information

For more information about this AD, contact Stefanie N. Roesli, Aviation Safety Engineer, FAA, 2200 South 216th Street, Des Moines, WA 98198; phone: 206-231-3964; email: Stefanie.N.Roesli@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) Boeing Alert Requirements Bulletin 747-53A2909 RB, dated September 21, 2022.

(ii) [Reserved]

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; website myboeingfleet.com.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

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

Issued on June 13, 2023.

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

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