[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2021-0877; Project Identifier AD-2020-01316-T]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for certain The Boeing Company Model 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747SP, 747-400, 747-400D, and 747-400F series airplanes. This proposed AD was prompted by a determination that a certain fastener type that penetrates the fuel tank walls has insufficient bond to the structure, and energy from a lightning strike or high-powered short circuit could cause arcing to occur at the ends of fasteners in the fuel tanks. This proposed AD would require, for certain airplanes, reconfiguring the clamps of certain wire bundles, applying sealant to certain fasteners that penetrate the fuel tank walls, installing cushion clamps and polytetrafluoroethylene (TFE) sleeves, inspecting to determine if sealant was applied to certain fasteners, and applying sealant if necessary. This proposed AD would also require, for all airplanes, revising the maintenance or inspection program, as applicable, to incorporate new, more restrictive airworthiness limitations. The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

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 NPRM, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet https://www.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. Boeing Special Attention Service Bulletin 747-57-2327, Revision 8, dated November 13, 2020, is also available on the Internet at https://www.regulations.gov by searching for and locating Docket No. FAA-2021-0877.

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-2021-0877; 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 NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

FOR FURTHER INFORMATION CONTACT: Rose Len, Aerospace Engineer,

Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3604; email: rose.len@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include "Docket No. FAA-2021-0877; Project Identifier AD-2020-01316-T" at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, 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 the proposal 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 proposed AD.

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 NPRM 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 NPRM, 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 NPRM. Submissions containing CBI should be sent to Rose Len,

Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3604; email: rose.len@faa.gov. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

The FAA has examined the underlying safety issues involved in fuel tank explosions on several large transport airplanes, including the adequacy of existing regulations, the service history of airplanes subject to those regulations, and existing maintenance practices for fuel tank systems. As a result of those findings, the FAA issued a final rule titled "Transport Airplane Fuel Tank System Design Review, Flammability Reduction, and Maintenance and Inspection Requirements" (66 FR 23086, May 7, 2001). In addition to new airworthiness standards for transport airplanes and new maintenance requirements, that rule included Amendment 21-78, which established Special Federal Aviation Regulation No. 88 ("SFAR 88") at 14 CFR part 21. Subsequently, SFAR 88 was amended by Amendment 21-82 (67 FR 57490, September 10, 2002; corrected at 67 FR 70809, November 26, 2002) and Amendment 21-83 (67 FR 72830, December 9, 2002; corrected at 68 FR 37735, June 25, 2003, to change "21-82" to "21-83").

Among other actions, SFAR 88 requires certain type design (i.e., type certificate (TC) and supplemental type certificate (STC)) holders to substantiate that their fuel tank systems can prevent ignition sources in the fuel tanks. This requirement applies to type design holders for large turbine-powered transport airplanes and for subsequent modifications to those airplanes. It requires them to perform design reviews and to develop design changes and maintenance procedures if their designs do not meet the new fuel tank safety standards. As explained in the preamble to the final rule published on May 7, 2001, the FAA intended to adopt airworthiness directives to mandate any changes found necessary to address unsafe conditions identified as a result of these reviews.

In evaluating these design reviews, the FAA has established four criteria intended to define the unsafe conditions associated with fuel tank systems that require corrective actions. The percentage of operating time during which fuel tanks are exposed to flammable conditions is one of these criteria. The other three criteria address the failure types under evaluation: single failures, combination of failures, and unacceptable (failure) experience. For all three failure criteria, the evaluations included consideration of previous actions taken that may mitigate the need for further action.

The FAA has determined that the actions identified in this proposed AD are necessary to reduce the potential of ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in fuel tank explosion or fire.

The FAA has received a report indicating that a certain type of fastener used in the fuel tank walls of Model 747 airplanes is insufficiently bonded to the airplane structure. Further, these fasteners do not have sufficient electrical insulation applied inside the fuel tanks to prevent arcing in the event of a lightning strike or high-powered short circuit. This condition, if not corrected, could result in a fuel tank explosion or fire.

Related Service Information under 1 CFR Part 51

The FAA reviewed Boeing Special Attention Service Bulletin 747-57-2327, Revision 8, dated November 13, 2020. This service information describes procedures for reconfiguring the clamps of certain wire bundles, applying sealant to certain fasteners that penetrate the fuel tank walls, and installing cushion clamps and TFE sleeves on the wire bundles of the front spars and rear spars of the wings.

The FAA also reviewed Boeing Service Bulletin 747-57-2326, Revision 1, dated January 31, 2008. This service information describes procedures for, among other actions, applying sealant to certain fasteners.

The FAA also reviewed The Boeing Company 747-400 Maintenance Planning Data (MPD) Document, Section 9, Airworthiness Limitations (AWL) and Certification

Maintenance Requirements (CMRs), D621U400-9, Revision February 2020, which includes revised AWL tasks 28-AWL-33, 28-AWL-34, and 28-AWL-37; and The Boeing Company 747-100/200/300/SP/SR Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D6-13747-CMR, Revision September 2020, which includes revised AWL tasks 28-AWL-25, 28-AWL-27, and 28-AWL-28. The revised AWL tasks describe fuel airworthiness limitation items (ALIs) and critical design configuration control limitations (CDCCLs) that address fuel tank systems. These documents are distinct because they apply to different airplane models. The new AWLs include:

- An ALI (periodic inspections) of the cushion clamps and teflon sleeving installed on out-of-tank wire bundles installed on brackets that are mounted directly on the fuel tanks;
- A CDCCL for the cushion clamps and teflon sleeving installed on out-of-tank wire bundles installed on brackets that are mounted directly on the fuel tanks; and
- A CDCCL for lightning, fault current or hot short protection features.

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.

Other Relevant Rulemaking

AD 2007-20-01, Amendment 39-15211 (72 FR 54533, September 26, 2007) (AD 2007-20-01), requires actions in accordance with Boeing Service Bulletin 747-57-2326, dated January 4, 2007; and Boeing Service Bulletin 747-57-2327, Revision 1, dated July 10, 2006. AD 2007-20-01 applies to certain The Boeing Company Model 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747SP, 747-400, 747-400D, and 747-400F series airplanes. The FAA has determined that AD 2007-20-01 did not fully address the unsafe condition for Model 747-100B SUD, 747-200B,

747-200C, 747-200F, 747-300, 747SP, 747-400, 747-400D, and 747-400F series airplanes. The service information for AD 2007-20-01 has been revised and contains additional work as described previously.

FAA's Determination

The FAA is proposing this AD because the agency evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements

This proposed AD would require, for certain airplanes, reconfiguring the clamps of certain wire bundles, applying sealant to certain fasteners that penetrate the fuel tank walls, installing cushion clamps and TFE sleeves, inspecting to determine if sealant was applied to certain fasteners, and applying sealant if necessary. This proposed AD would also require, for all airplanes, revising the maintenance or inspection program, as applicable, to incorporate new, more restrictive airworthiness limitations.

Differences Between this Proposed AD and the Service Information

Boeing Special Attention Service Bulletin 747-57-2327, Revision 8, dated November 13, 2020, specifies a compliance time of 60 months to accomplish Work Packages 13 through 20 and a compliance time of 27 months to accomplish Work Package 21. The FAA has determined that all work packages may be done within 60 months as it is not necessary to accomplish Work Package 21 prior to the other work packages. The FAA has determined that the 60-month compliance time is appropriate and will not adversely affect safety.

In The Boeing Company 747-100/200/300/SP/SR Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D6-13747-CMR, Revision September 2020, the "Applicability" of airworthiness limitations 28-AWL-25 and 28-AWL-27 specifies "ALL" and "NOTE." The FAA has determined that the

applicability should be “Airplanes L/N 645 and on” as those limitations do not apply to airplanes having line numbers 1 through 644 inclusive. In addition, the “Applicability Note” in the Description column does not apply. This difference is specified in paragraph (h)(2) of the proposed AD.

Costs of Compliance

The FAA estimates that this proposed AD affects 104 airplanes of U.S. registry. The FAA estimates the following costs to comply with this proposed AD:

Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Reconfiguring clamps, inspections, applying sealant, and installing clamps and TFE sleeves	Up to 30 work-hours X $85 per hour = Up to $2,550	Up to $2,004	Up to $4,554	Up to $473,616

The FAA has determined that revising the maintenance or inspection program takes an average of 90 work-hours per operator, although the agency recognizes that this number may vary from operator to operator. Since operators incorporate maintenance or inspection program changes for their affected fleet(s), the FAA has determined that a per-operator estimate is more accurate than a per-airplane estimate. Therefore, the agency estimates the average total cost per operator to be $7,650 (90 work-hours x $85 per work-hour).

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

On-condition costs

Action	Labor cost	Parts cost	Cost per product
Applying sealant	Up to 102 work-hours X $85 per hour = Up to $8,670	Up to $6,813	Up to $15,483

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some or all of the costs of this proposed 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

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would 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 this proposed regulation:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Would not affect intrastate aviation in Alaska, and

(3) Would 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 Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 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:

The Boeing Company: Docket No. FAA-2021-0877; Project Identifier AD-2020-01316-T.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to The Boeing Company Model 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747SP, 747-400, 747-400D, and 747-400F series airplanes, certificated in any category, having line numbers 645 and subsequent.

(d) Subject

Air Transport Association (ATA) of America Code 57, Wings.

(e) Unsafe Condition

This AD was prompted by fuel system reviews conducted by the manufacturer. The FAA is issuing this AD to address arcing in the event of a lightning strike or high-powered short circuit, which could result in a fuel tank explosion or fire.

(f) Compliance

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

(g) Reconfiguration of Wire Bundle Clamps, Sealant Application, Installation of Clamps and Sleeves, Inspections, and Corrective Actions

(1) For Group 1 through 9, 11, and 16 through 45 airplanes identified in Boeing Special Attention Service Bulletin 747-57-2327, Revision 8, dated November 13, 2020: Within 60 months after the effective date of this AD, reconfigure the clamps of the specified wire bundles, apply sealant to the specified fasteners that penetrate the fuel tank walls, and install cushion clamps and polytetrafluoroethylene (TFE) sleeves on the wire bundles of the front spars and rear spars of the wings, as applicable, in accordance with Work Packages 13 through 21, as applicable, of the Accomplishment Instructions of Boeing Special Attention Service Bulletin 747-57-2327, Revision 8, dated November 13, 2020.

(2) For airplanes on which the actions specified in Work Package 7, 8, or 9 of Boeing Special Attention Service Bulletin 747-57-2327 have been done: Within 60 months after the effective date of this AD: Inspect to determine if the fillet sealant identified in step 5 of Figure 23 of Boeing Special Attention Service Bulletin 747-57-2327, Revision 8, dated November 13, 2020, was applied to fully encapsulate the fastener penetrating the fuel tank; and if the sealant does not fully encapsulate the fastener, before further flight, apply sealant as specified in step 5 of Figure 23, except where note (f) of Figure 23 specifies to “make sure to apply the fillet sealant on the

fastener," this AD requires applying the fillet sealant to fully encapsulate the fastener penetrating the fuel tank.

(3) For Group 2 airplanes identified in Boeing Service Bulletin 747-57-2326, Revision 1, dated January 31, 2008: Within 60 months after the effective date of this AD, inspect to determine if all fasteners identified in Figures 4 and 5 of Boeing Service Bulletin 747-57-2326, Revision 1, dated January 31, 2008, have been sealed; and if any fasteners are not sealed, before further flight, apply sealant in accordance with Figure 1 of Boeing Service Bulletin 747-57-2326, Revision 1, dated January 31, 2008.

(h) Maintenance or Inspection Program Revision

(1) For Model 747-400, 747-400D, and 747-400F series airplanes: Within 60 days after the effective date of this AD: Revise the existing maintenance or inspection program, as applicable, by incorporating the information in airworthiness limitations 28-AWL-33, 28-AWL-34, and 28-AWL-37 of The Boeing Company 747-400 Maintenance Planning Data (MPD) Document, Section 9, Airworthiness Limitations (AWL) and Certification Maintenance Requirements (CMRs), D621U400-9, Revision February 2020. The initial compliance time for doing the tasks is at the time specified in Boeing 747-400 MPD Document, Section 9, AWL and CMRs, D621U400-9, Revision February 2020, or within 60 days after the effective date of this AD, whichever occurs later.

(2) For Model 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, and 747SP series airplanes: Within 60 days after the effective date of this AD: Revise the existing maintenance or inspection program, as applicable, by incorporating the information in airworthiness limitations 28-AWL-25, 28-AWL-27, and 28-AWL-28 of The Boeing Company 747-100/200/300/SP/SR Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D6-13747-CMR, Revision September 2020; except where the "Applicability" of airworthiness limitations 28-AWL-25 and 28-

AWL-27 specifies “ALL” and “NOTE,” replace “ALL” and “NOTE” with “Airplanes L/N 645 and on” and remove the “Applicability Note” from the Description column of 28-AWL-25 and 28-AWL-27. The initial compliance time for doing the tasks is at the time specified in The Boeing Company Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D6-13747-CMR, Revision September 2020, or within 60 days after the effective date of this AD, whichever occurs later.

(i) No Alternative Actions, Intervals, and Critical Design Configuration Control Limitations (CDCCLs)

After the maintenance or inspection program has been revised as required by paragraph (h)(1) or (2) of this AD, no alternative actions (e.g., inspections), intervals, and CDCCLs may be used unless the actions, intervals, and CDCCLs are approved as an alternative method of compliance (AMOC) in accordance with the procedures specified in paragraph (k) of this AD.

(j) Credit for Previous Actions

(1) This paragraph provides credit for the Work Package 13 actions specified in paragraph (g)(1) of this AD, if those actions were performed before the effective date of this AD using the service information specified in paragraphs (j)(1)(i) through (iv) of this AD.

(i) Boeing Special Attention Service Bulletin 747-57-2327, Revision 4, dated August 26, 2010.

(ii) Boeing Special Attention Service Bulletin 747-57-2327, Revision 5, dated September 20, 2011.

(iii) Boeing Special Attention Service Bulletin 747-57-2327, Revision 6, dated February 21, 2013.

(iv) Boeing Special Attention Service Bulletin 747-57-2327, Revision 7, dated November 30, 2017.

(2) This paragraph provides credit for the Work Package 14, 15, and 16 actions specified in paragraph (g)(1) of this AD, if those actions were performed before the effective date of this AD using the service information specified in paragraphs (j)(2)(i) through (iii) of this AD.

(i) Boeing Special Attention Service Bulletin 747-57-2327, Revision 5, dated September 20, 2011.

(ii) Boeing Special Attention Service Bulletin 747-57-2327, Revision 6, dated February 21, 2013.

(iii) Boeing Special Attention Service Bulletin 747-57-2327, Revision 7, dated November 30, 2017.

(3) This paragraph provides credit for the Work Package 17 actions specified in paragraph (g)(1) of this AD, if those actions were performed before the effective date of this AD using the service information specified in paragraphs (j)(3)(i) or (ii) of this AD.

(i) Boeing Special Attention Service Bulletin 747-57-2327, Revision 6, dated February 21, 2013.

(ii) Boeing Special Attention Service Bulletin 747-57-2327, Revision 7, dated November 30, 2017.

(4) This paragraph provides credit for the Work Package 18, 19, and 20 actions specified in paragraph (g)(1) of this AD, if those actions were performed before the effective date of this AD using Boeing Special Attention Service Bulletin 747-57-2327, Revision 7, dated November 30, 2017.

(k) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO 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 (l)(1) 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, Seattle ACO 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.

(l) Related Information

(1) For more information about this AD, contact Rose Len, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3604; email: rose.len@faa.gov.

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster Blvd., MC 110 SK57, Seal Beach, CA 90740-5600; telephone 562 797 1717; Internet https://www.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.

Issued on October 8, 2021.

Gaetano A. Sciortino, Deputy Director for Strategic Initiatives,
Compliance & Airworthiness Division,
Aircraft Certification Service.
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