



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2025-2546; Project Identifier AD-2025-01060-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 supersede Airworthiness Directive (AD) 2024-19-14, which applies to certain The Boeing Company Model 777-200, 777-200LR, 777-300, 777-300ER, and 777F series airplanes. AD 2024-19-14 requires repetitive inspections and bond resistance measurement of the bonding jumpers on the first fuel feed tube installed immediately forward of the wing front spar at the left and right main fuel tank penetrations, and applicable corrective actions. Since the FAA issued AD 2024-19-14, the FAA determined that additional inspections are required to address the unsafe condition. This proposed AD would require repetitive detailed inspections (DET), repetitive bond resistance measurement, and applicable on-condition actions. This proposed AD would also expand the applicability and require revising the existing maintenance or inspection program, as applicable, to incorporate a certain airworthiness limitation. 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 [regulations.gov](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.

*AD Docket:* You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2025-2546; 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.

*Material Incorporated by Reference:*

- For Boeing material identified in this proposed 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](https://myboeingfleet.com).

- You may view this material 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](https://www.regulations.gov) under Docket No. FAA-2025-2546.

**FOR FURTHER INFORMATION CONTACT:** Samuel Dorsey, Aviation Safety Engineer, FAA, 2200 South 216th St, Des Moines, WA 98198; phone: 206-231-3415; email: [samuel.j.dorsey@faa.gov](mailto:samuel.j.dorsey@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 using a method listed under the ADDRESSES section. Include “Docket No. FAA-2025-2546; Project Identifier AD-2025-01060-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 this 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 regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

### **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 Samuel Dorsey, Aviation Safety Engineer, FAA, 2200 South 216th St, Des Moines, WA 98198; phone: 206-231-3415; email: samuel.j.dorsey@faa.gov. Any commentary that the FAA receives

that is not specifically designated as CBI will be placed in the public docket for this rulemaking.

## **Background**

The FAA issued AD 2024-19-14, Amendment 39-22856 (89 FR 80077, October 2, 2024) (AD 2024-19-14), for certain The Boeing Company Model 777-200, 777-200LR, 777-300, 777-300ER, and 777F series airplanes. AD 2024-19-14 was prompted by a report of potential latent failures of the lightning protection features for the engine fuel feed system. AD 2024-19-14 requires repetitive inspections and bond resistance measurement of the bonding jumpers on the first fuel feed tube installed immediately forward of the wing front spar at the left and right main fuel tank penetrations, and applicable corrective actions. The agency issued AD 2024-19-14 to address such latent failures.

As discussed in the preamble to AD 2024-19-14, the electrical bonding of the engine fuel feed tube penetrating the fuel tanks of Boeing Model 777 airplanes and other Boeing airplane models is the primary design feature to prevent the development of an ignition source inside the fuel tank during a lightning strike to the engine nacelle. The electrical protective features include the spar bulkhead fitting bond that redirects the majority of current during a lightning event. Separate bonding jumpers outside and inside the fuel tank provide additional electrical paths for current from lightning strikes. Poor electrical bonding of the spar bulkhead fitting and bonding jumpers has been reported on Model 747 and Model 777 airplanes.

In related rulemaking, the FAA issued AD 2023-23-14, Amendment 39-22616 (88 FR 83494, November 30, 2023) (AD 2023-23-14), to address this unsafe condition on Model 747 airplanes.

An additional non-electrical feature, an encapsulation seal over the side of the spar bulkhead fitting inside the fuel tank, provides additional protection from sparking at

that location. The bulkhead fitting's encapsulation is designed to isolate any sparks or arcing generated at the bulkhead fitting during a lightning strike because of failed electrical bonds from flammable fuel vapors in the tank. This fitting, including the in-tank coupler connecting the fuel feed tube to the fitting, is the most probable location for sparking when electrical bonding is poor. Therefore, a failed encapsulation significantly increases the risk of a fuel tank explosion following a lightning strike to the engine nacelle on an airplane with poor electrical bonding. Analysis has shown that at least a subset of the encapsulation failures seen on Model 747 airplanes is expected on Model 777 airplanes.

The observed encapsulation failures are frequently associated with inadequate application of the encapsulation sealant. While failures are partly attributable to the design of the fitting and its associated coupler, sealant is frequently applied too thinly, does not cover the entire fitting and coupler, does not extend sufficiently onto the fuel feed tube, or the relevant surfaces are inadequately cleaned prior to application, preventing proper sealant adhesion.

The bulkhead fitting encapsulation is a unique sealant task. Most sealing tasks focus on fluid-tightness or other environmental protection between joined pieces of structure. The lightning protection function and complex shape of the bulkhead fitting encapsulation installation render it difficult to apply sealant properly using general sealing instructions. The manufacturer has communicated that it intends to publish an improved set of maintenance instructions in the Aircraft Maintenance Manual (AMM) to improve the consistency of encapsulation application. The sealant application instructions in the service information required by this proposed AD, as well as the revised Critical Design Configuration Control Limitation (CDCCL) specified in this proposed AD, are detailed and should be given special attention by maintenance personnel to ensure proper application of the bulkhead fitting encapsulation.

## **Actions Since AD 2024-19-14 Was Issued**

Since the FAA issued AD 2024-19-14, the FAA determined that 777-300 Model airplanes, as well as airplanes equipped with Pratt and Whitney engines or Rolls-Royce engines, are also subject to the unsafe condition. As discussed in the Background section of the preamble to AD 2024-19-14, Model 777 series airplanes powered by Pratt & Whitney and Rolls-Royce engines are equipped with an additional fuel feed tube bonding jumper located in the engine nacelle strut that provides additional electrical bonding and therefore reduces the risk associated with the unsafe condition. As a result, urgent action was not required for those airplanes. No Model 777-300 series airplanes are equipped with GE90 series engines; therefore, none lack the additional bonding jumper in the nacelle strut, so no Model 777-300 series airplanes were included in the applicability of AD 2024-19-14. However, all Model 777-200, 777-200LR, 777-300, 777-300ER, and 777F series airplanes share the same general fuel feed tube lightning protection design and are therefore subject to the unsafe condition addressed by this AD.

Additionally, since AD 2024-19-14 was issued, the manufacturer has developed a Requirements Bulletin intended to replace the Multi Operator Message (MOM) required by AD 2024-19-14. This proposed AD would replace AD 2024-19-14's requirement to inspect the fuel feed tube bonding jumper located in the wing leading edge in accordance with Boeing multi operator message MOM-MOM-24-0463-01B, dated September 4, 2024, with the requirement to perform a similar inspection in accordance with the new Boeing Requirements Bulletin 777-28A0097 RB, dated August 14, 2025.

Further, based on analysis of reports submitted in connection with AD 2023-23-14, the FAA has determined that additional inspections are necessary to address the unsafe condition. These inspections are broadly similar to those required on Boeing Model 747 series airplanes by AD 2023-23-14. These additional inspections, contained in Boeing Requirements Bulletin 777-28A0098 RB, dated August 15, 2025,

address the electrical bonding of in-tank fuel feed tube components, as well as the integrity of the encapsulation seal surrounding the fuel feed tube bulkhead fitting.

Finally, the FAA has determined that a new requirement in CDCCL airworthiness limitation (AWL) 28-AWL-05 is needed to address the unsafe condition. The encapsulating sealant surrounding the bulkhead fitting inside the fuel tank is a common CDCCL across many Boeing models. After reviewing the relevant Model 777 CDCCL, 28-AWL-05, it was discovered that the AWL lacks the requirement to reapply the encapsulation after disassembly of the fitting (which necessitates removal of the encapsulation). Failure to reapply the sealant after removal would result in the unsafe condition addressed by this proposed AD. The FAA is proposing an amendment to CDCCL 28-AWL-05 to address this deficiency. Additionally, the CDCCL was also discovered to not properly account for a difference in in-tank bonding jumper configurations beginning at airplane line number 830 and on. The revised CDCCL now accounts for both jumper configurations. Normally, the FAA would require the incorporation of the information contained in a revision of the relevant airworthiness limitations document from the manufacturer into the airplane maintenance or inspection program to address this requirement. However, such a document is not anticipated to be available in time to support this proposed AD.

The FAA is proposing this AD to address latent failures. A lightning strike to an engine nacelle combined with latent failures of the lightning protection features for the engine fuel feed system, if not addressed, could result in the potential for ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

## **FAA's Determination**

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type of design.

## **Material Incorporated by Reference Under 1 CFR Part 51**

The FAA reviewed Boeing Alert Requirements Bulletin 777-28A0097 RB, dated August 14, 2025. This material specifies procedures for repetitive DET of the bonding jumpers installed between the engine fuel feed tube and the wing structure immediately forward of the front spar at the left and right main fuel tank penetrations, saddle clamps, and tube clamps for any damage; repetitive DET for any loose bonding jumper lugs or tube clamps (rotation when rotating with light finger pressure); repetitive DET for any missing bonding jumpers or tube clamps; and repetitive measurements of the electrical bonding resistance between the wing structure and engine fuel feed tube; and applicable on-condition actions. Damage includes bonding jumpers that have one or more broken strands in wire braid, saddle clamps with split, cracked, broken rubber parts or any contact between saddle clamps' metal with the fuel tube, and tube clamps being cracked, broken or having a screw hole elongated. On-condition actions include removing, cleaning, and re-installing bonding jumpers and related hardware, and replacing damaged and missing saddle clamps, bonding jumpers and tube clamps.

The FAA also reviewed Boeing Alert Requirements Bulletin 777-28A0098 RB, dated August 15, 2025. This material specifies procedures for, depending on configuration, repetitive measurement of electrical bonding resistance between the front spar and the threaded portion of the front spar bulkhead fitting outside the fuel tank at the left and right main fuel tank penetrations; repetitive DET of the bonding jumper and tube clamps installed between the engine fuel feed tube and the engine nacelle strut for each of the left and right engines for correct installation; repetitive measurement of electrical



bonding resistance between the nacelle strut structure and out-tank engine fuel feed tube; and applicable on-condition actions. On-condition actions include:

- A DET of the front spar bulkhead fitting and coupling inside the fuel tank for any area without sealant, any damaged (crack or void in sealant, disbonded sealant, or any exposed underlying metallic surface) sealant, and any insufficient sealant.
- Removing existing sealant and re-applying sealant inside the fuel tank.
- For Group 1 airplanes, a DET of the bonding jumper and tube clamps installed between the first engine fuel feed tube and the structure inside the fuel tank for correct installation, and an electrical bonding resistance measurement between the first engine fuel feed tube and the structure inside the fuel tank.
- For Group 2 airplanes, a DET of the bonding jumper and tube clamps that are installed between the first engine fuel feed tube connected to the front spar bulkhead fitting inside the fuel tank and the second AFT in-tank engine fuel feed tube for correct installation, and an electrical bonding resistance measurement between the first engine fuel feed tube connected to the front spar bulkhead fitting inside the fuel tank and the second AFT in-tank engine fuel feed tube.
- For Group 2 airplanes, a DET of the bonding jumper and tube clamps installed between the second AFT in-tank engine fuel feed tube and the structure inside the fuel tank for correct installation, and an electrical bonding resistance measurement between the second AFT in-tank engine fuel feed tube and the structure inside the fuel tank.
- Removing out-tank (engine nacelle strut) and/or in-tank bonding jumpers and tube clamps, cleaning electrical bond surfaces, and installing new or serviceable bonding jumpers and tube clamps.

This material 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.

## Proposed AD Requirements in This NPRM

This proposed AD would retain certain requirements of AD 2024-19-14. This proposed AD would require accomplishing the actions specified in the material already described, except for any differences identified as exceptions in the regulatory text of this proposed AD. For information on the procedures and compliance times, see this material at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2025-2546.

### Interim Action

The FAA considers that this proposed AD would be an interim action. The manufacturer is currently developing a modification that will address the unsafe condition identified in this AD. Once this modification is developed, FAA-approved, and available, the FAA might consider additional rulemaking.

### Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 325 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
Inspections and measurements (777-28A0097 RB)	3 work-hours X \$85 per hour = \$255 per inspection cycle	\$0	\$255 per inspection cycle	\$82,875 per inspection cycle
Inspections and measurements (777-28A0098 RB)	4 work-hours X 85 per hour = 340 per inspection cycle	36	376 per inspection cycle	122,200 per inspection cycle

The FAA has determined that revising the existing 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 FAA 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 on-condition actions that would be required based on the results of the proposed inspection. The agency has no way of determining the number of aircraft that might need these on-condition actions:

#### **On-condition costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>
Bonding jumper cleaning and installation; saddle clamp, bonding jumper, tube clamp replacement (777-28A0097 RB)	2 work-hours X \$85 per hour = \$170	\$26	\$196
DET for encapsulation sealant application	18 work-hours X 85 per hour = 1,530	0	1,530
Encapsulation sealant reapplication	1 work hour X 85 per hour = 85	75	160
In-tank engine fuel feed tube bonding jumper DET and bonding resistance measurement	1 work-hour X 85 per hour = 85	0	85
In-tank engine fuel feed tube bonding jumper rework and bonding resistance measurement	1 work-hour X 85 per hour = 85	23	85
Nacelle strut engine fuel feed tube bonding jumper rework and bonding resistance measurement;	1 work-hour X 85 per hour = 85	47	132

## **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:

a. Removing Airworthiness Directive (AD) 2024-19-14, Amendment 39-22856 (89 FR 80077, October 2, 2024), and

b. Adding the following new AD:

**The Boeing Company:** Docket No. FAA-2025-2546; Project Identifier

AD-2025-01060-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**

This AD replaces AD 2024-19-14, Amendment 39-22856 (89 FR 80077, October 2, 2024) (AD 2024-19-14).

#### **(c) Applicability**

This AD applies to The Boeing Company Model 777-200, -200LR, -300, -300ER, and 777F series airplanes, certificated in any category, as identified in Boeing Alert Requirements Bulletin 777-28A0097 RB, original issue, dated August 14, 2025.

#### **(d) Subject**

Air Transport Association (ATA) of America Code 28, Fuel.

**(e) Unsafe Condition**

This AD was prompted by a report of potential latent failures of the lightning protection features for the engine fuel feed system. The FAA is issuing this AD to address such latent failures. A lightning strike to an engine nacelle combined with latent failures of the lightning protection features for the engine fuel feed system, if not addressed, could result in the potential for ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

**(f) Compliance**

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

**(g) Required Actions**

(1) Except as specified by paragraph (h) of this AD: At the applicable times specified in the “Compliance” paragraph of Boeing Alert Requirements Bulletin 777-28A0097 RB, dated August 14, 2025, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin 777-28A0097 RB, dated August 14, 2025.

**Note 1 to paragraph (g)(1):** Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin 777-28A0097, dated August 14, 2025, which is referred to in Boeing Alert Requirements Bulletin 777-28A0097 RB, dated August 14, 2025.

(2) Except as specified by paragraph (h) of this AD: At the applicable times specified in the “Compliance” paragraph of Boeing Alert Requirements Bulletin 777-28A0098 RB, dated August 15, 2025, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin 777-28A0098 RB, dated August 15, 2025.

**Note 2 to paragraph (g)(2):** Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin 777-28A0098, dated August 15, 2025, which is referred to in Boeing Alert Requirements Bulletin 777-28A0098 RB, dated August 15, 2025.

**(h) Exceptions to Requirements Bulletin Specifications**

(1) Where the Compliance Time columns of Tables 1 and 2 in the “Compliance” paragraph of Boeing Alert Requirements Bulletin 777-28A0097, dated August 14, 2025, refer to the original issue date of Requirements Bulletin 777-28A0097, this AD requires using a date of October 17, 2024 (the effective date of AD 2024-19-14).

(2) Where the Compliance Time columns of Tables 3 and 4 in the “Compliance” paragraph of Boeing Alert Requirements Bulletin 777-28A0097, dated August 14, 2025, refer to the original issue date of Requirements Bulletin 777-28A0097, this AD requires using the effective date of this AD.

(3) Where the Compliance Time columns of the tables in the “Compliance” paragraph of Boeing Alert Requirements Bulletin 777-28A0098, dated August 15, 2025, refer to the original issue date of Requirements Bulletin 777-28A0098, dated August 15, 2025, this AD requires using the effective date of this AD.

**(i) Critical Design Configuration Control Limitations (CDCCLs)**

Within 60 days after the effective date of this AD, revise the existing maintenance or inspection program, as applicable, to incorporate the information specified in Figure 1 and Figure 2 to paragraph (i) of this AD.

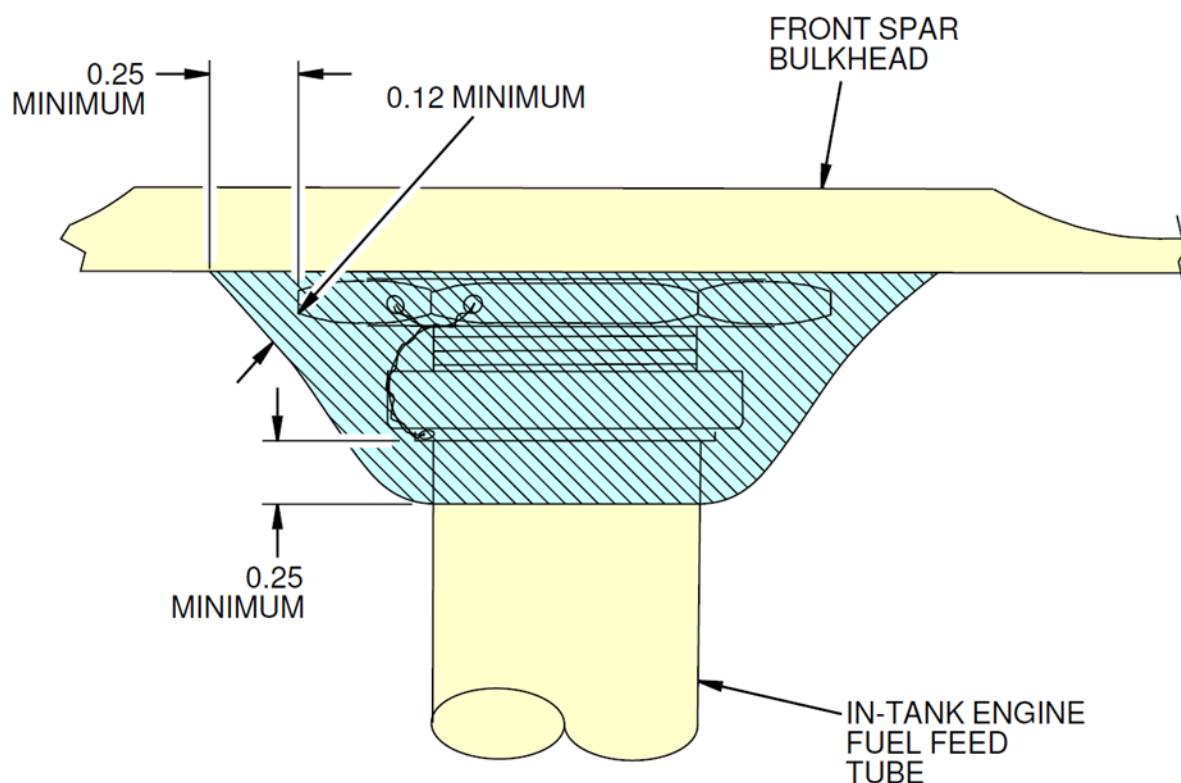
**Figure 1 to paragraph (i) – 28-AWL-05**

AWL NUMBER	TASK	INTERV AL	APPLICABILI TY	DESCRIPTION
28-AWL-05	CDCC L	N/A	ALL	<p>Lightning Protection – Engine Fuel Feed Line Fuel Tank Penetration Bonding to Spar</p> <p>Concern: Potential for arcing or sparking inside the tank at the interface between the bulkhead fitting and the spar during a lightning strike event.</p> <p>The following design features must be verified (refer to Boeing AMM 28-22-15) if the bulkhead fitting or attached tubing is removed and reinstalled or replaced:</p> <ol style="list-style-type: none"> <li>1. A fay sealed fay surface bond is installed between the bulkhead fitting and the front spar inside the tank.</li> <li>2. The electrical bonding resistance across the fay surface between the bulkhead fitting and the front spar inside the tank is 0.0010 ohm (1.0 milliohm) or less.</li> <li>3. Bonding jumpers are installed as follows. <ol style="list-style-type: none"> <li>a. For airplane line numbers 1-829: <ol style="list-style-type: none"> <li>i. A bonding jumper is installed between the first fuel tube mating with the bulkhead fitting and structure inside the tank. <ol style="list-style-type: none"> <li>1. If the tube-to-structure bonding jumper was removed and reinstalled or replaced, the electrical bonding resistance between the structure and the first fuel tube mating with the bulkhead fitting inside the tank is 0.0100 ohm (10.0 milliohms) or less.</li> </ol> </li> </ol> </li> <li>b. For airplane line numbers 830 and on: <ol style="list-style-type: none"> <li>i. A bonding jumper is installed between the first fuel tube mating with the bulkhead fitting and the second AFT fuel tube inside the tank. <ol style="list-style-type: none"> <li>1. If the tube-to-tube bonding jumper was removed and reinstalled or replaced, the electrical bonding resistance between the first fuel tube mating with the bulkhead fitting and second AFT fuel tube</li> </ol> </li> </ol> </li> </ol> </li> </ol>



				<p>inside the tank is 0.0100 ohm (10.0 milliohms) or less.</p> <p>ii. A bonding jumper is installed between the second AFT fuel tube and structure inside the tank.</p> <p>1. If the tube-to-structure bonding jumper was removed and reinstalled or replaced, the electrical bonding resistance between the structure and the second AFT fuel tube inside the tank is 0.0100 ohm (10.0 milliohms) or less.</p> <p>4. A full-bodied fillet seal is installed that encapsulates the bulkhead fitting to the front spar and the coupling nut inside the tank (Refer to Boeing SB 777-28A0098 as an accepted procedure).</p> <p>a. The sealant is smooth and the sealant meets the required dimensions as specified in the accompanying figure.</p> <p>i. Sealant is considered sufficiently thick when the outline of the coupling or fitting hardware is not visible under the sealant.</p> <p>b. Each sealant interface passes an adhesion test using a Frixion eraser.</p> <p>i. Peeling of the brushcoat is not considered a failure if the peeling stops before the Class B seal.</p>
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**Figure 2 to paragraph (i) – Fuel Feed Encapsulation**



**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, AIR-520, 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 (k)(1) of this AD. Information may be emailed to:

AMOC@faa.gov. Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(2) 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, AIR-520, 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.

(3) AMOCs approved for AD 2024-19-14 are not approved as AMOCs for the corresponding provisions of Boeing Alert Requirements Bulletin 777-28A0097, original issue, dated August 14, 2025, that are required by paragraph (g) of this AD.

**(k) Related Information**

(1) For more information about this AD, contact Samuel Dorsey, Aviation Safety Engineer, FAA, 2200 South 216th St, Des Moines, WA 98198; phone: 206-231-3415; email: [samuel.j.dorsey@faa.gov](mailto:samuel.j.dorsey@faa.gov).

(2) Material identified in this AD that is not incorporated by reference is available at the address specified in paragraph (l)(3) of this AD.

**(l) Material Incorporated by Reference**

(1) The Director of the Federal Register approved the incorporation by reference of the material listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this material as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Alert Requirements Bulletin 777-28A0097, dated August 14, 2025.

(ii) Boeing Alert Requirements Bulletin 777-28A0098, dated August 15, 2025.

(3) For Boeing material 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](http://myboeingfleet.com).

(4) You may view this material 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 material at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, visit [www.archives.gov/federal-register/cfr/ibr-locations](http://www.archives.gov/federal-register/cfr/ibr-locations) or email [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov).

Issued on September 11, 2025.

Peter A. White,  
Deputy Director, Integrated Certificate Management Division,  
Aircraft Certification Service.  
[FR Doc. 2025-17781 Filed: 9/12/2025 8:45 am; Publication Date: 9/15/2025]