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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-0810; Project Identifier AD-2021-01238-T; Amendment 39-22329; AD 2023-03-04]

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 all The Boeing Company Model 777 airplanes. This AD was prompted by fuel system reviews conducted by the manufacturer. This AD requires, depending on the airplane configuration, installation of Teflon sleeves, cap sealing of fasteners, detailed inspections, and corrective actions. This AD also requires revising the existing maintenance or inspection program, as applicable, to incorporate more restrictive airworthiness limitations (AWLs). The FAA is issuing this AD to address the unsafe condition on these products.

DATES:

This AD is effective April 4, 2023.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of April 4, 2023.

ADDRESSES:

AD Docket: You may examine the AD docket at *regulations.gov* under Docket No. FAA-2022-0810; 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-2022-0810.

FOR FURTHER INFORMATION CONTACT:

Kevin Nguyen, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3555; email: kevin.nguyen@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 all The Boeing Company Model 777 airplanes. The NPRM published in the **Federal Register** on July 26, 2022 ([87 FR 44285](#)). The NPRM was prompted by fuel system reviews conducted by the manufacturer. In the NPRM, the FAA proposed to require, depending on the airplane configuration, installation of Teflon sleeves, cap sealing of fasteners, detailed inspections, and corrective actions. The FAA also proposed to require revising the existing maintenance or inspection program, as applicable, to incorporate more restrictive AWLs. The FAA is issuing this AD to address arcing inside the main and center fuel tanks in the event of a fault current or lightning strike, which, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

Discussion of Final Airworthiness Directive

Comments

The FAA received a comment from The Air Line Pilots Association, International (ALPA), who supported the NPRM without change.

The FAA received additional comments from seven commenters, including American Airlines (AAL), Boeing, Emirates, Royal Dutch Airlines (KLM), Air France Industries (AFA), FedEx, and United Airlines (UAL). The following presents the comments received on the NPRM and the FAA's response to each comment.

Request To Require a Later Revision of the Service Information

AFA, KLM, and UAL requested that Boeing Alert Service Bulletin 777-57A0050, Revision 7 (SB 777-57A0050, Revision 7), be mandated by the final rule instead of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021 (SB 777-57A0050, Revision 6). AFA asserted that following release of SB 777-57A0050, Revision 6, they discussed with Boeing certain errors in SB 777-57A0050, Revision 6, that will be corrected in SB 777-57A0050, Revision 7.

KLM explained that the NPRM contains technical detail that should not be included in a high level regulation such as an AD, and that it could possibly lead to confusion and mistakes by airline staff. KLM stated that, for example, in paragraphs (h)(2), (3), and (4) of the proposed AD, it does not specify exactly which seven fasteners should be inspected and sealed. KLM noted that according to Figures 172, 173, 174, 175, 176, 179 and 180 of SB 777-57A0050, Revision 6, there are more than seven fasteners located on the inboard side of rib no. 9 and the proposed AD does not specify exactly which seven fasteners should be inspected/sealed. KLM requested that the FAA clarify which seven fasteners should be inspected/sealed exactly and recommend that the service information should first be revised by the original equipment manufacturer (OEM) and requested that the FAA allow the OEM to revise the service information before issuing the final rule.

UAL requested that the final AD mandate SB 777-57A0050, Revision 7, to ensure an additional work package is included for airplanes that accomplished SB 777-57A0050, Revision 6, without the exceptions specified in paragraph (h) of the proposed AD. UAL explained that paragraph (h) of the proposed AD provides exceptions to SB 777-57A0050, Revision 6, for known errors within the service bulletin. UAL stated that since SB 777-57A0050, Revision 6, was an alternative method of compliance (AMOC) to paragraphs (g)(1), (i), (j), and (k)(1) through (3) of AD 2017-11-14, Amendment 39-18913 ([82 FR 25954](#), June 6, 2017) (AD 2017-11-14), operators may have previously complied with it without the deviations or exceptions provided in paragraph (h) of the proposed AD. UAL stated this proposed AD does not address how to correct that condition. UAL noted that Boeing is developing SB 777-57A0050, Revision 7, to address the exceptions in paragraph (h) of the proposed AD, and to include new Groups and Configurations for airplanes that have accomplished SB 777-57A0050, Revision 6. UAL further stated that an additional work package is required to inspect and/or correct the erroneous work instructions from SB 777-57A0050, Revision 6.

The FAA does not agree with the request to refer to SB 777-57A0050, Revision 7, because it is not known when Revision 7 will be available. The FAA is aware of the errors of SB 777-57A0050, Revision 6, as identified by the commenters, and the exceptions specified in paragraph (h) of this AD address errors that affect addressing the unsafe condition. The FAA notes that paragraphs (h)(2) through (4) of the proposed AD provided adequate information to identify the location of the fasteners in Figures 172, 173, 174, 175, 176, 179 and 180 of SB 777-57A0050, Revision 6. However, the FAA has added additional information to paragraphs (h)(2) through (4) of this AD to help clarify the location of the affected fasteners by specifying if the fasteners are adjacent to the right or left side of the identified fasteners. As specified in the comment responses that follow, other errors are addressed by the exceptions specified in paragraphs (h)(5) through (7) of this AD. The FAA considers SB 777-57A0050, Revision 6, and the information provided in paragraphs (h)(2) through (7) of this AD as adequate accomplishment instructions to correct the unsafe condition. As specified in paragraph (l)(1) of this AD, accomplishment of the actions required by paragraph (g) of this AD terminates the requirements

of paragraphs (g)(1), (i), and (j) of AD 2017-11-14. Therefore, the FAA considers that delaying this AD action until the availability of Revision 7 of SB 777-57A0050 would not be warranted.

Request To Include Service Bulletin Revision Information

AFA expressed that certain airplane maintenance manual (AMM) task instructions relating to “POST-SB” should include information about the revision of Boeing Alert Service Bulletin 777-57A0050 that was accomplished. As part of AFA's request to mandate SB 777-57A0050, Revision 7, AFA explained that the AMM TASK 28-22-00-210-801 instructions, related to Airworthiness Limitations (AWLs) 28-AWL-31 and 28-AWL-32, depend on the service bulletin status. However, AFA noted the AMM task is only marked “POST-SB,” and there is no mention of the service bulletin revision.

The FAA does not agree with this request because AMM task 28-22-00-210-801 is not required by this AD. AMM task 28-22-00 is referenced in AWLs 28-AWL-31 and 28-AWL-32, which specify in the applicability column “Airplanes that have incorporated Service Bulletin 777-57A0050.” As required by paragraph (i) of this AD, operators must revise the existing maintenance or inspection program, as applicable, to incorporate the information for 28-AWL-31 and 28-AWL-32. However, AWLs 28-AWL-31 and 28-AWL-32 do not specify the service bulletin revision in the applicability column; therefore, there is not a requirement to identify AMMs as “POST-SB” with a service bulletin revision. No changes have been made to this AD based on this request.

Request To Clarify Compliance Time

AFA requested additional clarification of the compliance time. AFA stated that earlier revisions of SB 777-57A0050, have different scheduling rules, and that the instructions given in SB 777-57A0050, Revision 6, depend on the accomplished work.

The FAA agrees with providing clarification regarding the compliance time. The FAA has previously issued AD 2011-26-03, Amendment 39-16893 ([76 FR 78138](#), December 16, 2011) (AD 2011-26-03), which mandated Boeing Alert Service Bulletin 777-57A0050, Revision 2, dated May 14, 2009 (SB 777-57A0050, Revision 2). Boeing Alert Service Bulletin 777-57A0050, Revision 3, dated February 18, 2014 (777-57A0050, Revision 3) was approved as an AMOC with the requirements of AD 2011-26-03. That AD was superseded by AD 2017-11-14, which retained the requirements of AD 2011-26-03 and also mandated Boeing Alert Service Bulletin 777-57A0050, Revision 4, dated September 28, 2015 (SB 777-57A0050, Revision 4) for certain groups of airplanes specified in that revision. After issuance of AD 2017-11-14, the FAA determined that a new AD would be necessary to mandate a later revision of Boeing Alert Service Bulletin 777-57A0050 because more airplanes are affected by the identified unsafe condition, and additional work is required for airplanes on which earlier revisions of the service information has been incorporated.

Paragraph 1.E., “Compliance,” of SB 777-57A0050, Revision 6, specifies the compliance times for all groups and configurations, except as specified in paragraph (h)(1) of this AD. For example, for those airplanes in SB 777-57A0050, Revision 6, that have already been identified in SB 777-57A0050, Revisions 2, 3, or 4, the compliance times specified in AD 2017-11-14 would apply. Specifically, for airplanes identified in SB 777-57A0050, Revision 2 or 3, the actions specified in SB 777-57A0050, Revision 2 or 3 should have been accomplished within 60 months after January 20, 2011 (the effective date of AD 2010-24-12, Amendment 39-16531 ([75 FR 78588](#), December 16, 2010)). For airplanes identified in SB 777-57A0050, Revision 4 but not in earlier revisions, the actions specified in SB 777-

57A0050, Revision 4 should have been accomplished within 60 months after July 11, 2017 (the effective date of AD 2017-11-14). For the rest of the airplane groups and configurations identified in SB 777-57A0050, Revision 6, the actions specified must be accomplished within 60 months after the effective date of this AD. Operators should also note that paragraph (l)(1) of this AD explains that accomplishment of the actions required by paragraph (g) of this AD terminates paragraphs (g)(1), (i), and (j) of AD 2017-11-14.

Request To Add Credit for Previous Actions

FedEx requests the addition of a “Credit for Previous Action” paragraph to any final AD to ensure previous modifications per SB 777-57A0050, Revision 5, or earlier revisions do not have to be repeated. FedEx stated that they are already doing the applicable added tasks from the SB 777-57A0050, Revision 6, which has been approved as an AMOC to AD 2017-11-14 and expressed concern that the required actions in paragraph (g) of the proposed AD do not account for prior maintenance actions done to comply with AD 2017-11-14.

The FAA declines to provide credit for the accomplishment of an earlier service bulletin revision, because accomplishing the actions specified in a revision earlier than SB 777-57A0050, Revision 6, on an airplane does not necessarily mean that all applicable actions specified in SB 777-57A0050, Revision 6, were accomplished on that airplane to address the unsafe condition. The groups and configuration in SB 777-57A0050, Revision 6, are dependent on which actions have already been accomplished in accordance with earlier revisions. Operators are required to determine whether additional work is required by SB 777-57A0050, Revision 6, on each affected airplane that has incorporated the actions specified in an earlier revision of the service bulletin. If no additional work is required to address the unsafe condition, then that airplane is in compliance with this new AD. This AD has not been changed with regard to this request.

Request To Include a New Exception

AAL requested that paragraph (h) of the proposed AD include an exception to exclude Group 1 through 4 from Work Package 28 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, because that work package is not applicable to Groups 1 through 4. AAL stated that Boeing has confirmed this to be accurate. AFA also stated that Work Package 28 is not applicable to Group 1 through 4.

The FAA has confirmed with Boeing that the error described by the commenters exists in the service information. The FAA has added paragraph (h)(5) to this AD, which reads “Where Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, specifies Work Package 28 as applicable to Group 1 through 4, and Group 8, this AD does not require accomplishment of Work Package 28 for Group 1 through 4.”

Request To Clarify Access Steps for Work Packages 37, 38 and 39

AFA requested that the access steps for Work Packages 37, 38, and 39 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, be clarified. AFA stated that for Model 777-200, -200ER, and -300 series airplanes, the rib 9 cap sealing location is located in the dry-bay. AFA stated that Boeing confirmed that access door 532AB for the dry bay should be used to access the location for Figure 172, and confirmed fuel tank purging is not necessary for Work Package 37. AFA also stated that for Model 777-200LR and -300ER series airplanes, the rib 9 cap sealing location is located in the center fuel tank.

AFA stated that Boeing confirmed that access door 531AB for the center fuel tank should be used to access the location for Figure 172, and confirmed the center fuel tank should be purged for Work Package 37.

AFA also stated that for Group 12, 14 through 41, 44 through 48, 55 through 57, 59-83, in Work Packages 38 and 39 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, Boeing agreed that at the rib 9 front spar location, access door 531CB/631CB would be sufficient, and purge/ventilation of the center tank would be necessary.

The FAA acknowledges that different access doors might be used for certain airplanes for a given work package. As specified in Note 11. of paragraph 3.A. "General," of Boeing Alert Service Bulletin 777-57A0050, Revision 6: "If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts." The removal of access doors and purging of fuel tanks are not actions that address the identified unsafe condition. The FAA has determined delaying this final rule by adding exceptions to identify applicable access doors and corresponding fuel tanks, as well as corresponding procedures, is not warranted. The FAA has not changed this AD in this regard. However, in order to not purge a specific tank that is specified in a work package or purge the tank for a different access door, the FAA has added paragraph (h)(7) to this AD that specifies "Where the Accomplishment Instructions of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, specifies to purge specific fuel tanks (right, left, or center), operators must purge the applicable fuel tank for which access inside the fuel tank is needed to apply cap sealing on the affected fasteners."

Request To Not Require Work Package 38 for Certain Groups

AFA stated that Boeing confirmed that for Group 1 through 4 airplanes, Work Package 38 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, provides the same instructions as Work Package 37, and is not needed if Work Package 37 is accomplished.

The FAA confirmed with Boeing that Work Package 38 is not necessary for Group 1 to 4 provided Work Package 37 has been accomplished. The FAA has added paragraph (h)(6) to this AD to clarify that for Group 1 through 4 airplanes on which Work Package 37 has been accomplished, Work Package 38 is not required.

Request To Refer to Latest Maintenance Planning Document (MPD) or Delay Publication of the Final Rule

Boeing, and Emirates requested that the proposed AD be revised to refer to the latest MPD. In addition, KLM, requested that the final rule be delayed until a later MPD is published that addresses certain discrepancies.

Boeing requested that the final rule be issued after the latest MPD revision has been approved by the FAA and published, and that paragraph (j) of the proposed AD be deleted. Boeing requested that the AD be posted following the approval of the revised MPD. Boeing explained that paragraph (j) of the proposed AD refers to changes prescribed by the FAA within AWL No. 28-AWL-31 and 28-AWL-32. Since these changes will have likely been approved by the FAA and published in the 777 MPD prior to

the AD being posted, Boeing asserted that there will be no need for these AWL sub-paragraphs to be specifically called out in the AD.

Emirates requested that the Boeing MPD document D622W001-9, dated March 2022, referenced in paragraphs (i) and (j) of the proposed AD be replaced by the revision dated July 2022. Emirates explained that paragraphs (i) and (j) of the proposed AD refer to “Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, dated March 2022” while the latest revision of this MPD document is dated July 2022.

KLM requested that the AD not be issued until after the subject MPD is revised by the OEM or that the FAA explain the reason why it should not be delayed.

The FAA agrees to refer to the latest MPD. Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, dated August 2022, of Boeing 777 200/200LR/300/300ER/777F Maintenance Planning Data (MPD) Document, has been published, and it contains corrections that address the exceptions given in paragraph (j) of the proposed AD. Paragraph (i) of this AD has been updated to include this revision. Paragraph (j) of this AD has also been changed to give credit for the March 2022, June 2022, and July 2022 revisions of the MPD, provided that the corrections specified in paragraphs (j)(1) through (4) of this AD are met.

Request To Clarify Applicability for an AWL Task

KLM requested that the FAA clarify an applicability for an AWL task. KLM stated paragraphs (j)(1) through (4) of the proposed AD provides details of changes to the content of the MPD document (ALI and CMR), which includes changes to the applicability for certain paragraphs of that document. KLM stated AWL 28-AWL-32 was already part of AD 2021-24-12, Amendment 39-21833 ([86 FR 73660](#), December 28, 2021) (AD 2021-24-12), which has an applicability of “The Boeing Company Model 777-200, -200LR, -300, -300ER, and 777F series airplanes, certificated in any category, having line numbers (L/Ns) 1 through 1609 inclusive.” KLM stated paragraphs (j)(1) through (4) of the proposed AD narrow this applicability down or widens it without AD 2021-24-12 being superseded. KLM concluded this will lead to confusion.

The FAA notes that paragraph (j) of the proposed AD does not affect any aspect of AD 2021-24-12. The applicability of AD 2021-24-12 identifies the airplanes affected by the requirements of that AD. Paragraph (j) of the proposed AD clarifies information for certain steps within an AWL. Compliance with each AWL must be accomplished based on the applicability specified in the Applicability block of each AWL. The applicability of the AD affects whom must incorporate that AWL into their maintenance or inspection program. The applicability of an AWL neither affects nor is affected by the applicability of the AD that mandated the incorporation of that AWL into the maintenance or inspection program, unless specifically stated in an exception of the regulatory text of an AD.

Paragraph (j) of the proposed AD does not change the applicability block of AWL No. 28-AWL-31 and No. 28-AWL-32. Paragraph (j) of the proposed AD is just intended to provide a clear definition of the affected models and affected airplane line number ranges for certain paragraphs or steps within AWL No. 28-AWL-31 and 28-AWL-32. Due to unclear title descriptions, there was confusion as to what the applicable affected models were for those paragraphs. As a result, paragraph (j) was added to the proposed AD to provide clarification on the affected models.

As stated previously, the FAA has redesignated paragraph (j) of the proposed AD as a credit paragraph since the latest revision of the MPD incorporates those changes. The information in paragraph (j) of this AD will only be necessary if an MPD dated earlier than August 2022 is used. Compliance with the requirements of both paragraph (i) of this AD and paragraph (g) of AD 2021-24-12 can be accomplished by using Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, dated August 2022, of Boeing 777 200/200LR/300/300ER/777F Maintenance Planning Data (MPD) Document. Paragraph (l)(2) of this AD specifies that accomplishment of the revision required by paragraph (i) of this AD to incorporate the information for 28-AWL-31 and 28-AWL-32 terminates the requirements of paragraphs (g)(6) and (h) of AD 2021-24-12.

Request for Clarification of Compliance Time

Emirates asked whether airplanes need to be inspected again within 60 months after the effective date of the proposed AD per paragraph (i)(2) of the proposed AD when those airplanes have already been inspected in accordance with AWL No. 28-AWL-32 based on the initial compliance time specified in paragraph (g)(6) of AD 2021-24-12. Emirates did not ask for any specific change.

Although the commenter did not ask for a change, the FAA notes that paragraph (i)(1) and (2) of the proposed AD should provide credit for the inspection that has already been performed under the initial compliance time specified in paragraph (g)(6) of AD 2021-24-12. Without this credit, an airplane inspected under the initial compliance time specified in paragraph (g)(6) of AD 2021-24-12 may need to be re-inspected under the initial compliance time specified in paragraph (i)(1) or (2) of the proposed AD. This is not the intent of paragraphs (i)(1) and (2) of the proposed AD. To give credit for the inspection already accomplished under the initial compliance time specified in paragraph (g)(6) of AD 2021-24-12, the FAA has revised paragraphs (i)(1) and (2) of this AD to include “within 3,750 days after the most recent inspection was performed as specified in AWL No. 28-AWL-32” as part of the initial compliance time.

Request for Alternate Teflon Sleeve Solution

Emirates stated that an alternate sleeve should be part of the next service bulletin revision, and accepted as an alternative in the proposed AD. Emirates stated that following release of SB 777-57A0050, Revision 6, there was a worldwide material shortage of TFE-2X Standard Wall—TEFLON SLEEVE 1 inch diameter. Emirates stated that Boeing identified M23053/12 Class 2 and M23053/12 Class 5 as suitable alternatives, depending on the diameter of the wire bundles.

According to Emirates, Boeing stated the following: M23053/12 Class 2 sleeves are a suitable alternative for the TFE-2X Standard Wall sleeve for wire bundles up to 1 inch in diameter and noted the sleeves are listed as an alternative in the standard wiring practices manual (SWPM) Section 20-00-11 Table 31. Boeing advised that they are working on a Global AMOC for alternative sleeve options for wire bundles greater than 1 inch in diameter. For the larger bundles, Boeing proposed using thinner M23053/12 Class 5 sleeves (for example M23053/12-519-C) and wrapping them twice around the bundle, which provides the same wall thickness as the Class 2 Standard Wall sleeves. Boeing concluded that because this double-wrapped installation will require an FAA AMOC approval, Boeing needs to be notified of this deviation.

The FAA does not agree to include alternative sleeving in this AD. The FAA will review alternative sleeving if it is included in the next service bulletin revision or if Boeing or an operator submits an AMOC request under the provisions of paragraph (m) of this AD. The FAA will consider requests for alternate sleeving if sufficient data are submitted to substantiate that the change would provide an acceptable level of safety.

Request To Remove “Before Further Flight”

FedEx objected to the last sentence of paragraph (g) of the proposed AD, “Do all applicable corrective actions before further flight.” The FAA infers that FedEx requested that the FAA remove the sentence. FedEx asserted that the last sentence of paragraph (g) of the proposed AD is ambiguous since SB 777-57A0050, Revision 6, does not specifically define what actions are “corrective actions,” and it has the potential to immediately ground aircraft. As an example, FedEx noted that for Work Package 23 of the Accomplishment Instructions of SB 777-57A0050, Revision 6, requires installation of teflon sleeves in accordance with multiple figures without any prior inspection. Thus, Work Package 23 could be interpreted as a “corrective action” which is required prior to further flight. FedEx stated that the requirement in paragraph (g) of the proposed AD to “do all applicable actions” is sufficient since the associated service bulletin has specific actions to cap seal fasteners before putting the aircraft back to a serviceable condition.

The FAA acknowledges that the last sentence in paragraph (g) of the proposed AD, “Do all applicable corrective actions before further flight,” is confusing as used in this AD. In certain ADs, the standard language, “corrective actions,” is defined in the preamble of the AD and those are typically “on-condition” actions required to be performed after the primary action (*e.g.*, inspections). The “before further flight” compliance time is included to make sure that the corrective actions would be accomplished without any delay once the inspection is accomplished. The FAA has determined that this requirement is not necessary for this AD. The service information mandated by this AD requires an inspection for certain groups of airplanes to determine the installation configuration. Such an inspection is not required for certain other groups of airplanes since their installation configuration is already known. For all groups of airplanes, the FAA has determined that accomplishing all applicable actions within the compliance time would adequately address the safety concern. Therefore, the FAA has removed the sentence “Do all applicable corrective actions before further flight” from paragraph (g) of this AD. The “applicable corrective actions” are included in the “all applicable actions (*i.e.*, installation of Teflon sleeves, cap sealing of fasteners, detailed inspections, and corrective actions)” language specified in paragraph (g) of this AD and therefore must be done within the applicable compliance time specified in Boeing Alert Service Bulletin 777-57A0050, Revision 6.

Conclusion

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

Related Service Information Under [1 CFR Part 51](#)

The FAA reviewed Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021. This service information specifies applicable actions that vary depending on the airplane configuration, such as procedures for the installation of Teflon sleeves, cap sealing of fasteners, detailed inspections, and corrective actions. The detailed inspection of and installation of Teflon sleeves includes various locations, such as the rear spar wire bundles, inboard and outboard front spar wire bundles, wing-to-body fairing and environmental control system (ECS) bay wire bundles, front and rear spar bulkhead wire bundles, and wing rear spar wire bundles. The detailed inspection of and cap sealing of fasteners include fasteners in the center fuel tank, left and right main fuel tanks, and right cheek portion of the center fuel tank. Corrective actions include installing Teflon sleeve, installing clamp, and cap sealing fasteners.

The FAA also reviewed Section 9, Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, dated August 2022, of Boeing 777 200/200LR/300/300ER/777F Maintenance Planning Data (MPD) Document. This service information specifies, among other airworthiness limitations, 28-AWL-31 and 28-AWL-32 that address cushion clamps and Teflon sleeving installed on out-of-tank wire bundles installed on brackets that are mounted directly on the fuel tanks. 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 282 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
Installations, cap sealing, and inspections	Up to 545 work-hours × \$85 per hour = \$46,325	Up to \$3,510	Up to \$49,835	Up to \$14,053,470.

** Table does not include estimated costs for revising the existing maintenance or inspection program.*

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 × \$85 per work-hour).

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

On-Condition Costs

Action	Labor cost	Parts cost	Cost per product
Corrective actions	Up to 26 work-hours × \$85 per hour = \$2,210	Up to \$3,510	Up to \$5,720.

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:

2023-03-04 The Boeing Company: Amendment 39-22329; Docket No. FAA-2022-0810; Project Identifier AD-2021-01238-T.

(a) Effective Date

This airworthiness directive (AD) is effective April 4, 2023.

(b) Affected ADs

(1) This AD affects AD 2017-11-14, Amendment 39-18913 ([82 FR 25954](#), June 6, 2017) (AD 2017-11-14).

(2) This AD also affects AD 2021-24-12, Amendment 39-21833 ([86 FR 73660](#), December 28, 2021) (AD 2021-24-12).

(c) Applicability

This AD applies to all The Boeing Company Model 777-200, -200LR, -300, -300ER, and 777F series airplanes, certificated in any category.

(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 prevent arcing inside the main and center fuel tanks in the event of a fault current or lightning strike, 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 for Certain Airplanes

For airplanes identified in Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021: Except as specified in paragraph (h) of this AD, at the applicable times specified in paragraph 1.E., “Compliance,” of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021,

do all applicable actions (*i.e.*, installation of Teflon sleeves, cap sealing of fasteners, detailed inspections, and corrective actions) identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021.

(h) Exceptions to Service Information Specifications

(1) Where Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, uses the phrase “the revision 5 date of this service bulletin” or “the revision 6 date of this service bulletin,” this AD requires using “the effective date of this AD.”

(2) Where circle symbol 1 of sheet 2 of Figures 172, 173, and 174 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, points to the outboard side of rib no. 9 for the locate and cap seal task or the inspection task, as applicable, in step 1 of sheet 3, for this AD, circle symbol 1 points to the seven fasteners located at the inboard side of rib no. 9 (adjacent to the right side of the identified seven fasteners).

(3) Where circle symbol 1, next to the text “7 locations,” of sheet 2 of Figure 175 and Figure 176 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, points to the outboard side of rib no. 9 for the locate and cap seal task or the inspection task, as applicable, in step 1 of sheet 3, for this AD, circle symbol 1, next to the text “7 locations,” points to the seven fasteners located at the inboard side of rib no. 9 (adjacent to the right side of the identified seven fasteners).

(4) Where circle symbol 1, next to the text “7 locations,” of sheet 4 of Figure 179 and Figure 180 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, points to the outboard side of rib no. 9 for the locate and cap seal task or the inspection task, as applicable, in step 1 of sheet 6, for this AD, circle symbol 1, next to the text “7 locations,” points to the seven fasteners located at the inboard side of rib no. 9 (adjacent to the left side of the identified seven fasteners).

(5) Where Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, specifies Work Package 28 is applicable to Group 1 through 4, and Group 8, this AD does not require accomplishment of Work Package 28 for Group 1 through 4 only.

(6) For Group 1 through 4 airplanes identified in Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, on which the actions specified in Work Package 37 of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, have been accomplished, the actions specified in Work Package 38 are not required.

(7) Where the Accomplishment Instructions of Boeing Alert Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021, specifies to purge specific fuel tanks (right, left, or center), operators must purge the applicable fuel tank for which access inside the fuel tank is needed to apply cap sealing to the affected fasteners.

(i) Maintenance or Inspection Program Revision

Within 60 days after the effective date of this AD, revise the existing maintenance or inspection program, as applicable, to incorporate the information for 28-AWL-31 and 28-AWL-32 specified in Section D, “Airworthiness Limitations-Systems,” including Subsections D.1, of Section 9, Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, dated August 2022, of Boeing 777-200/200LR/300/300ER/777F Maintenance Planning Data

(MPD) Document. The initial compliance time for doing airworthiness limitation instructions (ALI) task 28-AWL-32 is at the applicable time specified in paragraph (i)(1) or (2) of this AD:

(1) For airplanes having line number (L/Ns) 1 through 503 inclusive: Within 3,750 days after accomplishment of the actions specified in Boeing Service Bulletin 777-57A0050; within 60 months after the effective date of this AD; or within 3,750 days after the most recent inspection was performed as specified in AWL No. 28-AWL-32; whichever is latest.

(2) For airplanes having L/Ns 504 and subsequent: Within 3,750 days after the date of issuance of the original airworthiness certificate or the date of issuance of the original export certificate of airworthiness; within 60 months after the effective date of this AD; or within 3,750 days after the most recent inspection was performed as specified in AWL No. 28-AWL-32; whichever is latest.

(j) Credit for Previous Actions

This paragraph provides credit for the maintenance or inspection program revision specified in paragraph (i) of this AD, if the revision was performed before the effective date of this AD using Section 9, Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, dated March 2022, dated June 2022, or dated July 2022, of Boeing 777 200/200LR/300/300ER/777F Maintenance Planning Data (MPD) Document; provided that the corrections specified in paragraphs (j)(1) through (4) of this AD were also incorporated. The following exceptions apply to 28-AWL-31 and 28-AWL-32 of Section D, “Airworthiness Limitations—Systems,” including Subsections D.1 of Section 9, Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, of Boeing 777-200/200LR/300/300ER/777F Maintenance Planning Data (MPD) Document.

(1) In paragraph 1.i., change “Front Spar Bulkhead (Center Tank)” to “Front Spar Bulkhead (Center Wing Tank Fuel Quantity Greater than 12,400 Gallons).”

(2) In paragraph 1.i.II, change “For 777-200, 777-200LR, 777-300, and 777-300ER airplanes, L/N 562 and on” to “L/N 562 and on, except 777F.”

(3) In paragraph 1.i.III., change “For 777F airplanes, L/N 718 and on” to “For 777F airplanes.”

(4) In paragraph 1.j., change “Rear Spar Bulkhead (Center Tank)” to “Rear Spar Bulkhead (Center Wing Tank Fuel Quantity Greater than 12,400 Gallons).”

(k) No Alternative Actions, Intervals, or Critical Design Configuration Control Limitations (CDCCLs)

After the existing maintenance or inspection program has been revised as required by paragraph (i) of this AD, no alternative actions (*e.g.*, inspections), intervals, or 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 (m) of this AD.

(l) Terminating Action for Certain Requirements of AD 2017-11-14 and AD 2021-24-12

(1) Accomplishment of the actions required by paragraph (g) of this AD terminates the requirements of

paragraphs (g)(1), (i), and (j) of AD 2017-11-14.

(2) Accomplishment of the revision required by paragraph (i) of this AD terminates the requirements of paragraphs (g)(6) and (h) of AD 2021-24-12.

(m) 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 (n) 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.

(n) Related Information

For more information about this AD, contact Kevin Nguyen, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3555; email: kevin.nguyen@faa.gov.

(o) 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 Service Bulletin 777-57A0050, Revision 6, dated August 18, 2021.

(ii) Section 9, Airworthiness Limitations (AWLs) and Certification Maintenance Requirements (CMRs), D622W001-9, dated August 2022, of Boeing 777 200/200LR/300/300ER/777F Maintenance Planning Data (MPD) Document.

(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 February 2, 2023.

Christina Underwood,

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

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