



## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. FAA-2020-0848; Product Identifier 2020-NM-088-AD; Amendment 39-21486; AD 2021-07-09]

RIN 2120-AA64

**Airworthiness Directives;** The Boeing Company Airplanes

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

**ACTION:** Final rule.

**SUMMARY:** The FAA is superseding Airworthiness Directive (AD) 2007-07-03, which applied to certain The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes. AD 2007-07-03 required repetitive tests to detect hot air leaking from the trim air diffuser ducts or sidewall riser duct assemblies (collectively referred to as TADDs), related investigative actions, and corrective actions if necessary. AD 2007-07-03 also provided an optional terminating action for the repetitive tests. This AD requires repetitive inspections of all TADD material for damage and applicable on-condition actions. This AD was prompted by reports that high temperature composite material TADDs installed as specified in AD 2007-07-03 have also failed. The FAA is issuing this AD to address the unsafe condition on these products.

**DATES:** This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** 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; 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. It is also available on the Internet at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2020-0848.

### **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-2020-0848; 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.

**FOR FURTHER INFORMATION CONTACT:** Nicole S. Tsang, Aerospace Engineer, Cabin Safety and Environmental Systems Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3959; email: [nicole.s.tsang@faa.gov](mailto:nicole.s.tsang@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Discussion**

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2007-07-03, Amendment 39-15003 (72 FR 14395, March 28, 2007) (AD 2007-07-03). AD 2007-07-03 applied to certain The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400,

747-400D, 747-400F, 747SR, and 747SP series airplanes. The NPRM published in the *Federal Register* on September 22, 2020 (85 FR 59451). The NPRM was prompted by reports of sealant deteriorating on the outside of the center wing fuel tank and analysis showing that sealant may deteriorate inside the tank due to excess heat from TADDs. The NPRM was also prompted by reports indicating that the high temperature composite material TADDs installed as specified in AD 2007-07-03 have also failed. The NPRM proposed to require repetitive inspections of all TADD material for damage and applicable on-condition actions. The FAA is issuing this AD to address potential hot air leakage from original fiberglass fabric material or high temperature composite material TADDs that can cause damage to the center wing fuel tank secondary fuel barrier coating and primary sealant, which can cause fuel leakage into an ignition zone, possibly resulting in a fire or explosion.

### **Comments**

The FAA gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM and the FAA's response to each comment.

### **Support for the NPRM**

Air Line Pilots Association, International (ALPA), Boeing, and Jesse Addo expressed support for the NPRM.

### **Requests to Extend Compliance Times for Initial and Repetitive Inspections**

Cathay Pacific Airways Limited (CPA), Lufthansa German Airlines (Lufthansa), and SFN requested that the compliance time for the initial and repetitive inspection be extended. Lufthansa suggested that an interval of 11,000 flight hour (FH) would still provide a sufficient level of safety based on its fleet reliability data. Lufthansa stated that the proposed interval is not comprehensible based on its data and would result in an extension of each A-check by 200 percent of normal and generate a very high economic

impact. SFN agreed with Lufthansa's analysis and requested an interval of 10,000 FH to coincide with the C-check, because doing the inspection at the 1,200 FH interval would require the inspection be done at each A-check (1,000 FH). SFN comments that this would be problematic for two reasons: it would generate a very high economic impact, and it would result in a higher frequency of floor panel removal/installation that would increase the risk of wire damage over the center fuel tank. CPA requested that the compliance time for the initial inspection be extended. CPA asserted that the replacement of the TADDs at the initial inspection, to extend the next inspection to 16,000 FH, would not be possible due to availability of spare TADDs and base maintenance scheduling. CPA also noted that the 1,200 FH repetitive inspection interval will impose a huge burden on essential cargo operations. The commenters noted that the inspections were not suitable for the line maintenance environment due to the extensive access portion of the inspection.

The FAA disagrees with the requests. In developing an appropriate compliance time, the FAA considered the safety implications, parts availability, normal maintenance schedules, and the manufacturer's recommendations, and determined that the 1,200 FH compliance time would allow for an adequate level of safety. After initial installation of high temperature TADDs, operators may avoid repeat inspections at 1,200 FH intervals by installing new high temperature TADDs at each 16,000 FH interval, without an alternative method of compliance (AMOC) or additional rulemaking, as long as required actions are completed at that interval. However, under the provisions of paragraph (h) of this AD, the FAA will consider requests for approval of an extension of the compliance time if sufficient data are submitted to substantiate that the extension would provide an acceptable level of safety. Additionally, as noted in the NPRM, the FAA considers this AD interim action. The manufacturer is currently developing a modification. Once the

modification is developed, approved, and available, the FAA might consider additional rulemaking. We have not changed this AD with regard to this request.

### **Request to Allow AMOC for Access and Inspection**

KLM Royal Dutch Airlines (KLM) requested that the NPRM be revised to allow an AMOC to use holes at certain locations in the floor for access and a borescope for the inspection. KLM outlined a method for accessing the inspection area more quickly and with less disruption using borescopes and examination holes in the floor panels, if Boeing modified the panels. KLM noted that currently more than 38 work hours are required to remove and replace floor panels—a huge effort for a 5-hour inspection that is repeated frequently. KLM recalled that a similar inspection using access holes and borescopes was used in the 1980s to inspect the floors under toilets.

The FAA disagrees with the need for an alternate inspection method. Note that this AD does not mandate how to access the inspection site, it only mandates a detailed inspection of the affected parts. However, the FAA is not aware of Boeing developing any new design for the floor panels that includes pluggable holes. As noted, this AD is considered interim action and if any new design is developed, the FAA might consider further rulemaking. This AD has not been changed with regard to this request.

### **Request to Simplify Language in NPRM**

One commenter requested that the NPRM be written in language more understandable to the average person to help clarify the unsafe condition. The commenter stated that the SUMMARY section may be unclear and confusing and argued that it is the FAA's duty to present the issues pertaining to TADDs in a more comprehensible way in order to emphasize the importance and urgency of the identified unsafe condition. The commenter asserted that the FAA does not clearly explain why hot air leakage from the TADDs as a result of hot trim air causing the material properties to degrade is potentially dangerous or creates an unsafe condition. Therefore, the commenter stated that the FAA

should describe in more detail the dangers and unsafe conditions the TADDs, especially the high temperature composite material TADDs, present. The commenter further argued that the FAA should better break down the focal component of the proposed and former rules, which is the TADD, and do it while making the terms and concepts understandable to the layperson.

The FAA disagrees with changing the nature of the language in this final rule. The FAA strives to follow guidelines as outlined in FAA Order 1000.36, FAA Writing Standards,<sup>1</sup> as well as using plain language principles<sup>2</sup> to draft regulations, but a certain level of subject matter knowledge is assumed on the part of the reader. As noted by the commenter, ADs are written for the owners and operators of the affected airplanes, for the purpose of increasing aviation safety. Therefore, it is important that the content of an AD is written for the understanding of those individuals required to comply with the requirements of the AD.

It is also important to note that information that is appropriate for inclusion in the SUMMARY section of a rule is driven by the Office of the Federal Register (OFR)<sup>3</sup>. Additional detail may not be added to the SUMMARY. Additional detail in the Discussion is also unnecessary. The unsafe condition was clearly stated in the proposed AD to be damage to the center wing fuel tank secondary fuel barrier coating and primary sealant, which can cause fuel leakage into an ignition zone, possibly resulting in a fire or explosion—caused by potential hot air leakage from original fiberglass fabric material or high temperature composite material TADDs.

We have not changed this AD in this regard.

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<sup>1</sup> FAA Order 1000.36, FAA Writing Standards, dated March 31, 2003 ([https://rgl.faa.gov/Regulatory\\_and\\_Guidance\\_Library/rgOrders.nsf/0/880c01691d0546c386256cfc005ec613/\\$FILE/Order\\_1000.36.pdf](https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgOrders.nsf/0/880c01691d0546c386256cfc005ec613/$FILE/Order_1000.36.pdf)).

<sup>2</sup> Plain Writing Act of 2010 (<https://www.plainlanguage.gov/>).

<sup>3</sup> This information may be found in the OFR's Document Drafting Handbook (<https://www.archives.gov/files/federal-register/write/handbook/ddh.pdf>).

## **Request to Clarify Necessity for Supersedure of AD 2007-07-03**

A commenter also requested that the NPRM be revised to clearly state why it is necessary to supersede AD 2007-07-03, given the high labor costs of performing the newly required actions.

The FAA agrees to clarify the need to supersede AD 2007-07-03. The FAA issues ADs, including any necessary supersedures, whenever there is an unsafe condition that must be addressed. As described under the section, “Actions Since AD 2007-07-03 Was Issued,” operators reported that high temperature composite material TADDs installed as specified in AD 2007-07-03 have also failed. Further inspection showed that the high temperature composite material TADDs were ruptured, with damaged insulation in poor condition. Analysis showed that hot trim air was causing material properties degradation of both the original fiberglass fabric material and high temperature composite material TADDs, which potentially causes hot air leakage from the TADD(s). Since the unsafe condition has been reported even with AD 2007-07-03 in effect, the FAA has determined that it is necessary to issue this AD, which supersedes AD 2007-07-03, to adequately address possible hot air leaks that can damage the secondary fuel barrier of the center wing fuel tank. As noted in this final rule, a damaged fuel barrier could allow fuel to leak into an area where it may cause a fire or explosion. The FAA has not changed this AD with regard to this request.

### **Conclusion**

The FAA reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD as proposed, except for minor editorial changes. The FAA has determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for addressing the unsafe condition; and

- Do not add any additional burden upon the public than was already proposed in the NPRM.

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

The FAA reviewed Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020. The service information describes procedures for repetitive detailed inspections of TADDs made of original fiberglass fabric material and high temperature composite material for damage and applicable on-condition actions. On-condition actions include TADD replacement, detailed inspection of the center wing tank secondary fuel barrier and the center wing tank primary sealant for damage, a measurement of the electrical conductivity change of the upper skin of the center wing tank for indications of damage, other replacement as applicable, and repair. 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.

### **Interim Action**

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

### **Costs of Compliance**

The FAA estimates that this AD affects 188 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

#### **Estimated costs for required actions**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Repetitive inspections	Up to 44 work-hours X \$85 per hour = Up to \$3,740 per inspection cycle	\$0	Up to \$3,740 per inspection cycle	Up to \$703,120 per inspection cycle

The FAA has received no definitive data that would enable providing cost estimates for the on-condition actions specified in this AD.

### **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 has determined that 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.

## **Adoption of 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:

a. Removing Airworthiness Directive (AD) 2007-07-03, Amendment 39-15003 (72 FR 14395, March 28, 2007), and

b. Adding the following new AD:

**2021-07-09 The Boeing Company:** Amendment 39-21486 ; Docket No. FAA-2020-0848; Product Identifier 2020-NM-088-AD.

#### **(a) Effective Date**

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

#### **(b) Affected ADs**

This AD replaces AD 2007-07-03, Amendment 39-15003 (72 FR 14395, March 28, 2007).

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

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

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

Air Transport Association (ATA) of America Code 21, Air conditioning.

**(e) Unsafe Condition**

This AD was prompted by reports of sealant deteriorating on the outside of the center wing fuel tank and analysis showing that sealant may deteriorate inside the tank due to excess heat from leaking trim air diffuser ducts or sidewall riser duct assemblies (collectively referred to as TADDs). This AD was also prompted by reports indicating that the high temperature composite material TADDs installed as specified in AD 2007-07-03 have also failed. The FAA is issuing this AD to address potential hot air leakage from original fiberglass fabric material or high temperature composite material TADDs that can cause damage to the center wing fuel tank secondary fuel barrier coating and primary sealant, which can cause fuel leakage into an ignition zone, possibly resulting in a fire or explosion.

**(f) Compliance**

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

**(g) Required Actions**

Except as specified by paragraph (h) of this AD: At the applicable times specified in the “Compliance,” paragraph of Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020, do all applicable actions identified in, and in accordance with, the Accomplishment Instructions of Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020.

Note 1 to paragraph (g): Guidance for accomplishing the actions required by this AD can be found in Boeing Alert Service Bulletin 747-21A2577, dated February 18, 2020, which is referred to in Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020.

### **(h) Exceptions to Service Information Specifications**

(1) Where Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020, uses the phrase “the original issue date of Requirements Bulletin 747-21A2577 RB,” this AD requires using “the effective date of this AD.”

(2) Where Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020, specifies contacting Boeing for repair instructions: This AD requires doing the repair before further flight using a method approved in accordance with the procedures specified in paragraph (j) of this AD.

### **(i) Parts Installation Prohibition**

As of the effective date of this AD, no person may install an original fiberglass fabric material TADD assembly, having a part number listed in Appendix A of Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020, on any airplane.

### **(j) 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 local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (k)(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 local flight standards district office/certificate holding district 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.

**(k) Related Information**

(1) For more information about this AD, contact Nicole S. Tsang, Aerospace Engineer, Cabin Safety and Environmental Systems Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3959; email: nicole.s.tsang@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (l)(3) and (4) of this AD.

**(l) Material Incorporated by Reference**

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

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

(i) Boeing Alert Requirements Bulletin 747-21A2577 RB, dated February 18, 2020.

(ii) [Reserved]

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminister Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet <https://www.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, email [fedreg.legal@nara.gov](mailto:fedreg.legal@nara.gov), or go to: <https://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued on March 22, 2021.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

[FR Doc. 2021-07034 Filed: 4/6/2021 8:45 am; Publication Date: 4/7/2021]