DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2020-0341; Product Identifier 2020-NM-017-AD]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for certain The Boeing Company Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes. This proposed AD was prompted by significant changes made to the airworthiness limitations (AWLs) related to fuel tank ignition prevention and the nitrogen generation system. This proposed AD would require revising the existing maintenance or inspection program, as applicable, to incorporate the latest revision of the AWLs. The FAA is proposing this AD to address the unsafe condition on these products.

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

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

• Federal eRulemaking Portal: Go to https://www.regulations.gov. Follow the instructions for submitting comments.

• Fax: 202-493-2251.
• Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

• Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; internet https://www.myboeingfleet.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

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-2020-0341; 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. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: Christopher Baker, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3556; email: Christopher.R.Baker@faa.gov.
SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2020-0341; Product Identifier 2020-NM-017-AD” at the beginning of your comments. The FAA specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this NPRM. The FAA will consider all comments received by the closing date and may amend this NPRM because of those comments.

The FAA will post all comments received, without change, to https://www.regulations.gov, including any personal information you provide. The FAA will also post a report summarizing each substantive verbal contact received about this NPRM.

Discussion

The FAA has examined the underlying safety issues involved in fuel tank explosions on several large transport airplanes, including the adequacy of existing regulations, the service history of airplanes subject to those regulations, and existing maintenance practices for fuel tank systems. As a result of those findings, the FAA issued a final rule titled “Transport Airplane Fuel Tank System Design Review, Flammability Reduction and Maintenance and Inspection Requirements” (66 FR 23086, May 7, 2001). In addition to new airworthiness standards for transport airplanes and new maintenance requirements that rule included Amendment 21-78, which established Special Federal Aviation Regulation No. 88 (“SFAR 88”) at 14 CFR part 21. Subsequently, SFAR 88

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

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

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

The FAA issued AD 2008-10-10 R1, Amendment 39-16164 (75 FR 1529, January 12, 2010) (“AD 2008-10-10 R1”) and AD 2018-20-24, Amendment 39-19458 (83 FR 51815, October 15, 2018) (“AD 2018-20-24”), which apply to certain The Boeing Company Model 737-600, -700, -700C, -800, and -900 series airplanes. AD 2008-10-10 R1 and AD 2018-20-24 require incorporation of fuel system AWLs and also require an initial inspection to phase in certain repetitive inspections, and repair if necessary. The fuel system AWLs were developed to satisfy SFAR 88 requirements and included in the Airworthiness Limitations Section (ALS) of the manufacturer’s Instructions for Continued Airworthiness. Since AD 2008-10-10 R1 and AD 2018-20-24 were issued, the ALS has been significantly revised by the manufacturer to correct technical and editorial errors and also to add new requirements. Those changes affect the fuel system and nitrogen generation system AWLs.

The FAA proposes to adopt this new AD to require revising the maintenance or inspection program, as applicable, to incorporate the latest revision of the AWLs. The FAA is proposing this AD to prevent the potential for ignition sources inside the fuel tanks and also to prevent increasing the flammability exposure of the center fuel tank caused by latent failures, alterations, repairs, or maintenance actions, which could result in a fuel tank explosion and consequent loss of an airplane.

The FAA has determined that accomplishing the revision required by paragraph (g) of this proposed AD would terminate the following requirements for that airplane:

- All requirements of AD 2008-10-10 R1.
• The revision required by paragraphs (h) and (h)(1) of AD 2008-06-03, Amendment 39-15415 (73 FR 13081, March 12, 2008).

• The revision required by paragraph (g) of AD 2008-17-15, Amendment 39-15653 (73 FR 50714, August 28, 2008).

• The revision required by paragraph (k) of AD 2011-18-03, Amendment 39-16785 (76 FR 53317, August 26, 2011).

• All requirements of AD 2013-15-17, Amendment 39-17533 (78 FR 52838, August 27, 2013).

• All requirements of AD 2018-20-24.

**Related Service Information under 1 CFR part 51**

The FAA reviewed Boeing 737-600/700/700C/800/900/900ER Special Compliance Items/Airworthiness Limitations, D626A001-9-04, dated April 2019. This service information describes AWLs that include airworthiness limitation instructions (ALIs) and critical design configuration control limitations (CDCCLs) tasks related to fuel tank ignition prevention and the nitrogen generation system. 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.

**FAA’s Determination**

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

This proposed AD would require revising the existing maintenance or inspection program, as applicable, to incorporate new or more restrictive airworthiness limitations.

This proposed AD would require revisions to certain operator maintenance documents to include new actions (e.g., inspections) and CDCCLs. Compliance with these actions and CDCCLs is required by 14 CFR 91.403(c). For airplanes that have been previously modified, altered, or repaired in the areas addressed by this proposed AD, the operator may not be able to accomplish the actions described in the revisions. In this situation, to comply with 14 CFR 91.403(c), the operator must request approval for an alternative method of compliance according to paragraph (k) of this proposed AD.

Differences Between this Proposed AD and the Service Information

The “description” column of AWL No. 28-AWL-20 identifies certain operational tests. However, airplanes on which the actions specified in paragraph (g)(2)(ii) of AD 2011-20-07, Amendment 39-16818 (76 FR 60710, September 30, 2011), have been done are not required to do the operational test for left center tank fuel boost pump relay R54 and right center tank fuel boost pump relay R55.

Paragraph (g) of this proposed AD would require operators to revise their existing maintenance or inspection program by incorporating, in part, AWL No. 28-AWL-05, “Wire Separation Requirements for New Wiring Installed in Proximity to Wiring That Goes Into the Fuel Tanks” in Boeing 737-600/700/700C/800/900/900ER Special Compliance Items/Airworthiness Limitations, D626A001-9-04, dated April 2019. Paragraph (h) of this proposed AD would allow certain changes to be made to the requirements specified in AWL No. 28-AWL-05 as an option.
Clarification of the Service Information

The “applicability” column of AWL No. 28-AWL-19 identifies affected airplanes. For airplanes on which the actions specified in paragraph (s) of AD 2011-18-03 have been done, incorporation of Boeing Service Bulletin 737-28A1206 is not required. Therefore, those airplanes are not affected by AWL No. 28-AWL-19 and are not required to do the functional test.

The “applicability” column of AWL No. 28-AWL-23 identifies affected airplanes. For airplanes on which the actions specified in paragraph (s) of AD 2011-18-03 have been done, incorporation of Boeing Service Bulletin 737-28A1248 is not required. Therefore, those airplanes are not affected by AWL No. 28-AWL-23 and are not required to do the functional test.

Costs of Compliance

The FAA estimates that this proposed AD affects 2,057 airplanes of U.S. registry. The FAA estimates the following costs to comply with this proposed AD:

The FAA 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. In the past, the FAA estimated that this action takes 1 work-hour per airplane. Since operators incorporate maintenance or inspection program changes for their affected fleet(s), the FAA 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).
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) 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 Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):

The Boeing Company: Docket No. FAA-2020-0341; Product Identifier 2020-NM-017-AD.

(a) Comments Due Date

The FAA must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD affects the ADs specified in paragraphs (b)(1) through (6) of this AD.


(2) AD 2008-10-10 R1, Amendment 39-16164 (75 FR 1529, January 12, 2010) (“AD 2008-10-10 R1”).


(c) Applicability

This AD applies to The Boeing Company Model 737-600, -700, -700C, -800, -900, and -900ER series airplanes, certificated in any category, with an original airworthiness certificate or original export certificate of airworthiness issued on or before December 18, 2019.

(d) Subject

Air Transport Association (ATA) of America Code 71, Powerplant.

(e) Unsafe Condition

This AD was prompted by significant changes made to the airworthiness limitations (AWLs) related to fuel tank ignition prevention and the nitrogen generation system. The FAA is issuing this AD to address the development of an ignition source inside the fuel tanks and also to prevent increasing the flammability exposure of the center fuel tank, which could lead to fuel tank explosion and consequent loss of the airplane.
(f) Compliance

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

(g) 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 specified in Section A, including Subsections A.1., A.2., and A.3, of Boeing 737-600/700/700C/800/900/900ER Special Compliance Items/Airworthiness Limitations, D626A001-9-04, dated April 2019; except as provided by paragraph (h) of this AD. The initial compliance times for the airworthiness limitation instruction (ALI) tasks are within the applicable compliance times specified in in paragraphs (g)(1) through (14) of this AD.

(1) For AWL No. 28-AWL-01, “External Wires Over Center Fuel Tank:” Within 120 months after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, or within 120 months after the most recent inspection was performed as specified in AWL No. 28-AWL-01, whichever is later.

(2) For AWL No. 28-AWL-03, “Fuel Quantity Indicating System (FQIS)-Out Tank Wiring Lightning Shield to Ground Termination:” Within 120 months after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, or within 120 months after the most recent inspection was performed as specified in AWL No. 28-AWL-03, whichever is later.

(3) For AWL No. 28-AWL-19, “Center Tank Fuel Boost Pump Automatic Shutoff System:” Within 12 months after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, within 12 months after accomplishment of the actions specified in Boeing Service Bulletin 737-
28A1206, or within 12 months after the most recent inspection was performed as
specified in AWL No. 28-AWL-19, whichever is latest. This AWL does not apply to
airplanes that have complied with paragraph (s) of AD 2011-18-03.

(4) For AWL No. 28-AWL-20, “Over-Current and Arcing Protection Electrical
Design Features Operation-Boost Pump Ground Fault Interrupter (GFI):” Within 12
months after the date of issuance of the original airworthiness certificate or the original
export certificate of airworthiness, within 12 months after accomplishment of the actions
specified in Boeing Service Bulletin 737-28A1201, or within 12 months after the most
recent inspection was performed as specified in AWL No. 28-AWL-20, whichever is
latest. For airplanes that have complied with paragraph (g)(2)(ii) of AD 2011-20-07,
Amendment 39-16818 (76 FR 60710, September 30, 2011), the operational test for left
center tank fuel boost pump relay R54 and right center tank fuel boost pump relay R55
does not apply.

(5) For AWL No. 28-AWL-23, “Center Tank Fuel Boost Pump Power Failed On
Protection System:” Within 12 months after the date of issuance of the original
airworthiness certificate or the original export certificate of airworthiness, within 12
months after accomplishment of the actions specified in Boeing Service Bulletin 737-
28A1248, or within 12 months after the most recent inspection was performed as
specified in AWL No. 28-AWL-23, whichever is latest. This AWL does not apply to
airplanes that have complied with paragraph (s) of AD 2011-18-03.

(6) For AWL No. 28-AWL-24, “Spar Valve Motor Operated Valve (MOV)
Actuator-Lightning and Fault Current Protection Electrical Bond:” Within 72 months
after accomplishment of the actions specified in Boeing Service Bulletin 737-28A1207,
or within 72 months after the most recent inspection was performed as specified in AWL No. 28-AWL-24, whichever is later.

(7) For AWL No. 28-AWL-29, “Full Cushion Clamps and Teflon Sleeving (If Installed) Installed on Out-of-Tank Wire Bundles Installed on Brackets that are Mounted Directly on the Fuel Tanks:” For airplanes having line numbers (L/N) 1 through 1754 inclusive, within 120 months after accomplishment of the actions specified in Boeing Service Bulletin 737-57A1279. For airplanes having L/N 1755 and subsequent, within 120 months after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, or within 48 months after the effective date of this AD, whichever is later.

(8) For AWL No. 28-AWL-35, “Fuel Quantity Indicating System (FQIS) - Center Fuel Tank In-Tank Component and Wire Harness Protection Features - Separation from Center Tank Internal Structure:” For airplanes that have incorporated Boeing Service Bulletin 737-28-1356, within 120 months after accomplishment of the actions specified in Boeing Service Bulletin 737-28-1356, or within 120 months after the most recent inspection was performed as specified in AWL No. 28-AWL-35, whichever is later.

(9) For AWL No. 28-AWL-37, “Fuel Quantity Indicating System (FQIS) - Built in Test Equipment (BITE) Test:” For airplane L/Ns 6987 and 7000 and subsequent, within 750 flight hours since the date the most recent BITE test was accomplished as specified in AWL No. 28-AWL-37, or within 750 flight hours after the effective date of this AD, whichever is later.

(10) For AWL No. 47-AWL-04, “Nitrogen Generation System-Thermal Switch:” Within 22,500 flight hours after the date of issuance of the original airworthiness
certificate or the original export certificate of airworthiness, within 22,500 flight hours after accomplishment of the actions specified in Boeing Service Bulletin 737-47-1003, or within 22,500 flight hours after the most recent inspection was performed as specified in AWL No. 47-AWL-04, whichever is latest.

(11) For AWL No. 47-AWL-06, “Nitrogen Generation System (NGS)-Cross Vent Check Valve:” Within 13,000 flight hours after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, within 13,000 flight hours after accomplishment of the actions specified in Boeing Service Bulletin 737-47-1003, or within 13,000 flight hours after the most recent inspection was performed as specified in AWL No. 47-AWL-06, whichever is latest.

(12) For AWL No. 47-AWL-07, “Nitrogen Generation System (NGS)-Nitrogen Enriched Air (NEA) Distribution Ducting Integrity:” Within 6,500 flight hours after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, within 6,500 flight hours after accomplishment of the actions specified in Boeing Service Bulletin 737-47-1003, or within 6,500 flight hours after the most recent inspection was performed as specified in AWL No. 47-AWL-07, whichever is latest.

(13) For AWL No. 47-AWL-09, “Nitrogen Generation System - Oxygen Sensor:” Within 18,000 flight hours after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness, or within 18,000 flight hours after the most recent replacement was performed as specified in AWL No. 47-AWL-09, or within 12 months after the effective date of this AD, whichever is latest.

(14) For AWL No. 28-AWL-101, “Engine Fuel Suction Feed Operational Test:”
Within 7,500 flight hours or 36 months, whichever occurs first, after the date of issuance of the original airworthiness certificate or the original export certificate of airworthiness; or within 7,500 flight hours or 36 months, whichever occurs first, after the most recent inspection was performed as specified in AWL No. 28-AWL-101; whichever is later.

(h) Additional Acceptable Wire Types and Sleeving

As an option, when accomplishing the actions required by paragraph (g) of this AD, the changes specified in paragraphs (h)(1) and (2) of this AD are acceptable.

(1) Where AWL No. 28-AWL-05 identifies wire types BMS 13-48, BMS 13-58, and BMS 13-60, the following wire types are acceptable: MIL-W-22759/16, SAE AS22759/16 (M22759/16), MIL-W-22759/32, SAE AS22759/32 (M22759/32), MIL-W-22759/34, SAE AS22759/34 (M22759/34), MIL-W-22759/41, SAE AS22759/41 (M22759/41), MIL-W-22759/86, SAE AS22759/86 (M22759/86), MIL-W-22759/87, SAE AS22759/87 (M22759/87), MIL-W-22759/92, and SAE AS22759/92 (M22759/92); and MIL-C-27500 and NEMA WC 27500 cables constructed from these military or SAE specification wire types, as applicable.

(2) Where AWL No. 28-AWL-05 identifies TFE-2X Standard wall for wire sleeving, the following sleeving materials are acceptable: Roundit 2000NX and Varglas Type HO, HP, or HM.

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

Except as provided in paragraph (h) of this AD, after the existing maintenance or inspection program has been revised as required by paragraph (g) 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 (k) of this AD.

(j) Terminating Action for Certain AD Requirements

Accomplishment of the revision required by paragraph (g) of this AD terminates the requirements specified in paragraphs (j)(1) through (6) of this AD for that airplane.

(1) The revision required by paragraphs (h) and (h)(1) of AD 2008-06-03.
(2) All requirements of AD 2008-10-10 R1.
(3) The revision required by paragraph (g) of AD 2008-17-15.
(4) The revision required by paragraph (k) of AD 2011-18-03.
(5) All requirements of AD 2013-15-17.
(6) All requirements of AD 2018-20-24.

(k) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or 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 (l)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

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

1) Related Information

(1) For more information about this AD, contact Christopher Baker, Aerospace Engineer, Propulsion Section, FAA, Seattle ACO Branch, 2200 South 216th St., Des Moines, WA 98198; phone and fax: 206-231-3556; email: Christopher.R.Baker@faa.gov.

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster Blvd., MC 110-SK57, Seal Beach, CA 90740–5600; telephone 562-797-1717; internet https://www.myboeingfleet.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206-231-3195.

Issued on April 23, 2020.

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