



## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. FAA-2021-0561; Project Identifier AD-2021-00623-T; Amendment 39-21647; AD 2021-14-20]

RIN 2120-AA64

**Airworthiness Directives;** The Boeing Company Airplanes

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

**ACTION:** Final rule; request for comments.

**SUMMARY:** The FAA is adopting a new airworthiness directive (AD) for all The Boeing Company Model 737 airplanes. This AD was prompted by reports of latent failures of the cabin altitude pressure switches. This AD requires repetitive functional tests of the pressure switches, and on-condition actions, including replacement, if necessary. The FAA is issuing this AD to address the unsafe condition on these products.

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

The FAA must receive comments on this 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 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 at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0561.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0561; 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 street address for Docket Operations is listed above.

**FOR FURTHER INFORMATION CONTACT:** Nicole 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:**

### **Background**

The FAA requires every proposed transport category airplane design with a pressurized cabin to include a system that warns the flightcrew of cabin depressurization. 14 CFR 25.841(b). On Boeing Model 737 airplanes, such warning systems include a cabin altitude pressure switch. The functions of this pressure switch are twofold: to detect if a certain cabin pressure altitude has been exceeded; and if so, to send a signal to the parts of the system that provide aural and visual warnings to the flightcrew. When this switch fails, it fails latently; that is, without making the failure known to the flightcrew or maintenance personnel. Due to the importance of the functions provided by this switch, in 2012 the FAA mandated that all Boeing Model 737 airplanes utilize two switches, to provide redundancy in case of one switch's failure. AD 2012-19-11, Amendment 39-17206 (77 FR 60296, October 3, 2012).<sup>1</sup>

The FAA has received reports of latent failures of these cabin altitude pressure switches. In September 2020, an operator reported that on three of its airplanes, both pressure switches failed the on-wing functional test. The affected switches were on three different models of the Boeing 737.

The airplane manufacturer investigated, and initially found, for reasons that included the expected failure rate of the switches, that it did not pose a safety issue. Boeing decided in November 2020 that the failures were not a safety issue. Subsequent investigation and analysis led the FAA and the airplane manufacturer to determine, in May of 2021, that the failure rate of both switches is much higher than initially estimated, and therefore does pose a safety issue.

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<sup>1</sup> This airworthiness directive was eventually superseded by AD 2015-21-11, Amendment 39-18304 (80 FR 65927, October 28, 2015) (AD 2015-21-11).

The FAA does not yet have sufficient information to determine what has caused this unexpectedly high failure rate, so a terminating corrective action cannot yet be developed. However, a latent failure of both pressure switches could result in the loss of cabin altitude warning, which could delay flightcrew recognition of a lack of cabin pressurization, and result in incapacitation of the flightcrew due to hypoxia (a lack of oxygen in the body), and consequent loss of control of the airplane. Therefore addressing these failures requires immediate action. The FAA is issuing this AD to address the unsafe condition on these products.

### **FAA's Determination**

The FAA is issuing this AD because the agency has determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

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

The FAA reviewed Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021. This service information specifies procedures for repetitive functional tests of the cabin altitude pressure switches, on-condition actions including follow-on functional testing and replacement of failed switches, sending a report to Boeing about any pressure switches that fail the initial functional test, and reporting to Boeing the airplanes in the operator's fleet that have been tested. 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.

### **AD Requirements**

This AD requires accomplishing the actions specified in the service information already described, except as discussed under "Differences Between this AD and the Service Information." This AD also requires reporting to Boeing the results of the first

functional test if any pressure switch failed, and sending reports to Boeing of the airplanes in the operator's fleet that have been tested.

### **Effect of Certain Installation Procedures on Accomplishment of AD Requirements**

As previously noted, the FAA issued AD 2015-21-11, applicable to certain Model 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -800, -900, and -900ER series airplanes. AD 2015-21-11 requires, among other actions, the installation of a redundant cabin altitude pressure switch in accordance with specified Boeing service information. The FAA has since approved numerous supplemental type certificates (STCs) and other means for installing the redundant pressure switch. As a result of its oversight of these newly-installed switches, the FAA has determined that use of approved maintenance procedures for the cabin altitude pressure switch functional test other than those specified in the task cards identified in Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, is acceptable for the functional test; therefore, those other procedures do not require approval of an alternative method of compliance (AMOC).

### **Differences Between this AD and the Service Information**

Although Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, affects "all 737CL" airplanes (the 737 Classics include Model 737-100, -200, -200C, -300, -400, and -500), Boeing did not send the MOM to Model 737-100, -200 and -200C operators. Additionally, Boeing did not reference procedures for performing the cabin altitude pressure switch functional test for Model 737-100, -200, and -200C series airplanes. There are no Model 737-100 series airplanes operating worldwide; however, the applicability of this AD includes those airplanes in the event any of those airplanes are returned to service in the U.S. The FAA has also included Model 737-200 and -200C series airplanes in the applicability of this AD. Furthermore, the FAA requested that Boeing make the service information available to Model 737-200 and -200C operators. Boeing Model 737-200 and -200C operators may reference 737-200

Airplane Maintenance Manual (AMM) 21-33-11/501 for additional guidance on performing the cabin altitude pressure switch functional test.

Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, uses permissive language, such as “recommends” and “requesting,” in its “Functional Test Requirements” and “Reporting Requirements” sections. However, the regulatory text in paragraphs (g) and (h) of this AD makes the language in those sections mandatory unless an exception in paragraph (j) of this AD applies.

Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, recommends returning failed pressure switches to the switch manufacturer. Although the FAA also recommends that operators return failed pressure switches in order to provide the switch manufacturer with additional data related to the unsafe condition, this AD does not require that action.

Although Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, identifies specific AMM task cards for use in accomplishing the functional test, paragraph (j)(1) of this AD clarifies that any approved maintenance procedures may be used for the functional test. This provides the operator an option to use the AMM task card or any approved maintenance procedure for the functional test without needing to request an AMOC.

Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, specifies certain on-condition actions, including an additional step while performing the functional test on the switch by increasing the altitude setting on the switch to an altitude of up to 20,000 feet if the cabin altitude warning does not activate by 11,000 feet during the initial functional test. The service information specifies repeating the functional test at intervals, but does not explicitly state that the on-condition additional functional testing is limited to the initial functional test only. Paragraph (j)(3) of this AD requires the on-

condition additional functional test step of increasing the altitude setting to 20,000 feet only during the initial functional test (if applicable).

Although Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, specifies that failed switches be replaced with “new or serviceable” switches, this AD requires replacement with “serviceable” switches, which include any switches that are eligible for installation. This is to ensure that any installed switch is serviceable.

### **Interim Action**

The FAA considers this AD to be an interim action. The reporting that is required by this AD will enable the airplane manufacturer to obtain better insight into the nature, cause, and extent of the switch failures, and eventually to develop final action to address the unsafe condition. Once final action has been identified, the FAA might consider further rulemaking.

### **Justification for Immediate Adoption and Determination of the Effective Date**

Section 553(b)(3)(B) of the Administrative Procedure Act (APA) (5 U.S.C. 551 *et seq.*) authorizes agencies to dispense with notice and comment procedures for rules when the agency, for “good cause,” finds that those procedures are “impracticable, unnecessary, or contrary to the public interest.” Under this section, an agency, upon finding good cause, may issue a final rule without providing notice and seeking comment prior to issuance. Further, section 553(d) of the APA authorizes agencies to make rules effective in less than thirty days, upon a finding of good cause.

An unsafe condition exists that requires the immediate adoption of this AD without providing an opportunity for public comments prior to adoption. The FAA has found that the risk to the flying public justifies forgoing notice and comment prior to adoption of this rule because, as previously noted, the unexpectedly high rate of latent failure, of both pressure switches on the same airplane, could result in the cabin altitude

warning system not activating if the cabin altitude exceeds 10,000 feet, resulting in hypoxia of the flightcrew, and loss of control of the airplane. Accordingly, notice and opportunity for prior public comment are impracticable and contrary to the public interest pursuant to 5 U.S.C. 553(b)(3)(B).

In addition, the FAA finds that good cause exists pursuant to 5 U.S.C. 553(d) for making this amendment effective in less than 30 days, for the same reasons the FAA found good cause to forgo notice and comment.

### **Comments Invited**

The FAA invites you to send any written data, views, or arguments about this final rule. Send your comments to an address listed under ADDRESSES. Include Docket No. FAA-2021-0561 and Project Identifier AD-2021-00623-T at the beginning of your comments. The most helpful comments reference a specific portion of the final rule, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this final rule because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this final rule.

### **Confidential Business Information**

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this AD contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this AD, it is important



that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this AD. Submissions containing CBI should be sent to Nicole 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. Any commentary that the FAA receives that is not specifically designated as CBI will be placed in the public docket for this rulemaking.

**Regulatory Flexibility Act**

The requirements of the Regulatory Flexibility Act (RFA) do not apply when an agency finds good cause pursuant to 5 U.S.C. 553 to adopt a rule without prior notice and comment. Because the FAA has determined that it has good cause to adopt this rule without notice and comment, RFA analysis is not required.

**Costs of Compliance**

The FAA estimates that this AD affects 2,502 airplanes of U.S. registry. The FAA estimates the following costs to comply with this AD:

**Estimated costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Functional test	1 work-hour X \$85 per hour = \$85 per test	\$0	\$85 per test	\$212,670 per test

In addition, the FAA has determined that preparing and sending a monthly report of tested airplanes takes about 1 work-hour per operator. Since operators are required to submit this report for their affected fleet(s), the FAA has determined that a per-operator estimate is more appropriate than a per-airplane estimate. Therefore, the FAA estimates

the average total cost of the monthly report to be \$85 (1 work-hour x \$85) per report, per operator.

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

**On-condition costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>
On-condition functional test and switch replacement	1 work-hour X \$85 per hour = \$85	\$1,278	\$1,363
Reporting	1 work-hour X \$85 per hour = \$85	\$0	\$85

**Paperwork Reduction Act**

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0056. Public reporting for this collection of information is estimated to be approximately 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

**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, and
- (2) Will not affect intrastate aviation in Alaska.

### **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 adding the following new airworthiness directive:

**2021-14-20 The Boeing Company:** Amendment 39-21647; Docket No. FAA-2021-0561; Project Identifier AD-2021-00623-T.

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

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

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

None.

### **(c) Applicability**

This AD applies to all The Boeing Company Model 737 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 latent failures of the cabin altitude pressure switches. The FAA is issuing this AD to address the unexpectedly high rate of latent failure of both pressure switches on the same airplane which could result in the cabin altitude warning system not activating if the cabin altitude exceeds 10,000 feet, resulting in hypoxia of the flightcrew, and loss of control of the airplane.

### **(f) Compliance**

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

### **(g) Repetitive Functional Tests**

Except as specified in paragraph (j) of this AD: At the latest of the times specified in paragraphs (g)(1) through (3) of this AD, perform the initial functional test of the cabin altitude pressure switches, and before further flight, do all applicable on-condition actions, in accordance with the “Functional Test Requirements” section of Boeing Multi

Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021. Repeat the functional test thereafter at intervals not to exceed 2,000 flight hours and do all applicable on condition actions before further flight.

(1) Within 2,000 flight hours since the last functional test of the cabin altitude pressure switches.

(2) Prior to the accumulation of 2,000 total flight hours on the airplane.

(3) Within 90 days after the effective date of this AD.

Note 1 to paragraph (g): Additional guidance for performing the functional test required by paragraph (g) of this AD can be found in 737-200 Airplane Maintenance Manual (AMM) 21-33-11/501, 737CL AMM TASK CARD 31-026-01-01, 737CL AMM TASK CARD 31-010-01-01, 737NG AMM TASK CARD 31-020-00-01, and 737MAX AMM TASK CARD 31-020-00-01, and other approved maintenance procedures.

#### **(h) Reporting for Switch Failure**

If any switch fails the initial functional test required by paragraph (g) of this AD: At the applicable time specified in paragraph (h)(1) or (2) of this AD, report the results of that functional test, in accordance with Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021.

(1) If the functional test was done on or after the effective date of this AD: Submit the report within 10 days after the functional test.

(2) If the functional test was done before the effective date of this AD: Submit the report within 10 days after the effective date of this AD.

#### **(i) Repetitive Reporting of Tested Fleet**

Within 40 days, but no earlier than 30 days, after the effective date of this AD: Send a report to Boeing listing the total number of airplanes, including tail numbers, in the operator's fleet that have been tested since the effective date of this AD, in accordance with Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated

June 23, 2021. Thereafter, send a report for the number of airplanes tested, at intervals of 30 days for a total period of 12 months. A report is not required for any 30-day interval in which no airplanes were tested.

**(j) Exceptions to Service Information Specifications**

(1) Where Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, refers to certain task cards for the functional test, that service information is not required by this AD, and any approved maintenance procedures are acceptable for the functional test.

(2) Where Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, specifies replacing failed switches with “new or serviceable” switches, this AD requires replacement with “serviceable” switches, which include any switches that are eligible for installation.

(3) Where Boeing Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021, specifies the on-condition additional step of increasing the altitude to 20,000 feet if the cabin altitude warning does not activate by 11,000 feet, this AD requires that additional step only during the initial functional test.

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

(1) The Manager, Seattle ACO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information. Information may be emailed to 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

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

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by The Boeing Company Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO Branch, FAA, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

**(l) Related Information**

For more information about this AD, contact Nicole 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.

**(m) 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 Multi Operator Message MOM-MOM-21-0292-01B, dated June 23, 2021.

(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 July 2, 2021.

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

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