



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2008-0847; Directorate Identifier 2008-NM-056-AD;**

**Amendment 39-17375; AD 2013-05-03]**

**RIN 2120-AA64**

**Airworthiness Directives;** The Boeing Company Airplanes

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

**ACTION:** Final rule.

**SUMMARY:** We are adopting a new airworthiness directive (AD) for certain The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes. This AD was prompted by fuel system reviews conducted by the manufacturer. This AD requires doing an inspection to identify the part number of the motor-operated valve (MOV) actuators of the main and center fuel tanks; replacing certain MOV actuators with new MOV actuators; and measuring the electrical resistance of the bond from the adapter plate to the airplane structure, and doing corrective actions if necessary. We are issuing this AD to prevent electrical current from flowing through an MOV actuator into a fuel tank, which could create a potential ignition source inside the fuel tank. This condition, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

**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 the AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, WA. For information on the availability of this material at the FAA, call 425-227-1221.

### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The address for the Docket Office (phone: 800-647-5527) is Document Management Facility, 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:** Rebel Nichols, Aerospace Engineer, Propulsion Branch, ANM-140S, Seattle Aircraft Certification Office (ACO), FAA, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6509; fax: 425-917-6590; email: [rebel.nichols@faa.gov](mailto:rebel.nichols@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Discussion**

We issued a supplemental notice of proposed rulemaking (SNPRM) to amend 14 CFR part 39 to include an airworthiness directive (AD) that would apply to the specified products. That SNPRM published in the Federal Register on December 23, 2010 (75 FR 80738). The original NPRM (73 FR 45893, August 7, 2008) proposed to require doing an inspection of the MOV actuators of the main and center fuel tanks for a certain part

number (P/N); replacing the MOV actuator with a new MOV actuator if necessary; and measuring the electrical resistance of the bond from the adapter plate to the airplane structure, and corrective actions if necessary. The original NPRM also proposed to require revising the Airworthiness Limitations section of the Instructions for Continued Airworthiness. The SNPRM proposed to revise the original NPRM by adding airplanes and removing the requirement for revising the Airworthiness Limitations section of the Instructions for Continued Airworthiness.

### **Comments**

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the SNPRM (75 FR 80738, December 23, 2010) and the FAA's response to each comment.

### **Support for the SNPRM (75 FR 80738, December 23, 2010)**

Continental Airlines has no technical objections, issues, or comments to the SNPRM (75 FR 80738, December 23, 2010).

### **Request to Revise Applicability to Include Part Number**

Boeing requested that the applicability of the SNPRM (75 FR 80738, December 23, 2010) be revised to include the phrase, "with MOV actuator part number MA20A1001-1 installed." Boeing stated that the change will avoid future alternative methods of compliance (AMOC) requests.

We disagree with revising the applicability of this AD because paragraph (c) of this AD clearly defines the airplanes affected by this AD. For those affected airplanes, paragraph (g) of this AD requires inspection of the MOV actuators to determine their part number. If an MOV actuator with P/N MA20A1001-1 is found, that actuator must be replaced, as required by paragraph (h) of this AD. No change has been made to the AD in this regard.

### **Request to Allow Installation of Certain Parts**

Boeing requested that, if the applicability of the SNPRM (75 FR 80738, December 23, 2010) is not revised, we add a statement allowing MOV actuators certified after P/N MA30A1001 to be installed without AMOC approval. Boeing stated that this would allow normal maintenance to resume once P/N MA20A1001-1 is removed. Boeing stated that the aircraft configuration with an MOV actuator having P/N MA30A1001 becomes the mandated configuration, because the SNPRM requires the installation of that specific part number. Boeing stated that the SNPRM would not allow the installation of actuators approved after P/N MA30A1001 without AMOC approval.

We agree with the commenter's request. In the case of this MOV actuator, we will allow—without AMOC approval—replacement of the affected MOV actuator with a Boeing part. The replacement part must be fully interchangeable with the part specified in Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010, and must be approved by the FAA after September 20, 2010. Paragraph (h) of this AD has been revised to include this provision.

### **Request for Further Investigation**

China Southern Airlines requested that we further investigate the ignition potential of P/N MA20A1001-1 to find a better solution that does not require installing the new P/N MA30A1001. The commenter stated that it would like to see P/N MA30A1001 experience better reliability than P/N MA20A1001 before we require a big cost burden on operators.

We disagree with the request to further investigate P/N MA20A1001-1. That part number was identified as unsafe during the Special Federal Aviation Regulation No. 88 (SFAR 88) (66 FR 23086, May 7, 2001) system safety assessment reviews conducted by the manufacturer and must be replaced. Steps have been taken to improve the reliability

of P/N MA30A1001, and that part does not have the identified unsafe condition that is the subject of this AD. No change has been made to this AD in this regard.

**Request to Remove Paragraph (i) of the SNPRM (75 FR 80738, December 23, 2010)**

United Airlines (UAL) requested that we remove paragraph (i) of the SNPRM (75 FR 80738, December 23, 2010), which prohibits installation of MOV actuators having P/N MA20A1001-1 on any airplane as of the effective date of this AD. UAL stated that the 777 Aircraft Maintenance Manual (AMM) does not provide sufficient replacement instructions for operators to maintain compliance with paragraph (i) of the SNPRM. UAL stated that the proposed rule will cause undue economic hardship on operators. UAL also noted that similar ADs do not contain a similar parts prohibition paragraph. UAL also stated that paragraph (h) of the SNPRM specifies to do “all applicable corrective actions before further flight”; therefore, an operator would have to replace all MOV actuators at the same time.

We disagree with the request to remove paragraph (i) of this AD. Because an unsafe condition has been identified on P/N MA20A1001-1, we have determined that P/N MA20A1001-1 cannot be allowed for installation. This AD requires the replacement of all affected MOV actuators from an operator’s fleet within the specified compliance time; however, the AD does not require replacement of all affected MOV actuators on an airplane at the same time. Operators are allowed to replace only one MOV actuator and then bring the aircraft back into service. Paragraph (h) of this AD does specify doing all applicable corrective actions before further flight, but the applicable corrective actions are those associated with the measurement of the electrical resistance of the bond. If an operator encountered unscheduled removal of P/N MA20A1001-1, that part should be replaced with a part having an accepted part number (i.e., P/N MA30A1001 or other FAA-approved replacement). However, according to the provisions of paragraph (m) of this AD, operators may request approval of an AMOC if the request is submitted with

substantiating data that prove the requested action will provide an adequate level of safety. No change has been made to the AD in this regard.

**Request to Revise Proposed Costs of Compliance**

UAL requested that we revise or clarify the Costs of Compliance section of the SNPRM (75 FR 80738, December 23, 2010). UAL considered that the maximum costs are understated in the SNPRM. UAL stated that, since there are 11 actuators on each airplane, the parts costs need to be changed to include 11 actuators.

We agree to revise the cost of parts in the Costs of Compliance section of this AD. Since the labor cost is based on the total number of work-hours required to replace all 11 actuators, the parts cost should also be based on the total cost of 11 actuators. The Costs of Compliance section has been revised accordingly.

**Request to Permit Omission of Parts Inspection or Record Check**

UAL requested that paragraph (g) of the SNPRM (75 FR 80738, December 23, 2010) be revised to include an additional paragraph that permits operators to omit the parts inspection or records check and to permit removal of the installed MOV, regardless of the part number, and install the new part number, in accordance with Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010. UAL stated that this will allow operators to avoid costs associated with inspections and records checks while achieving the same level of safety by ensuring that P/N MA30A1001 is installed.

We agree to add replacement of the MOV actuators as an optional method of compliance with the inspection or records check required by paragraph (g) of this AD. Replacing actuators with actuators having part numbers other than P/N MA20A1001-1 addresses the identified unsafe condition. We have added new paragraph (l) to this AD to allow the option. We have re-identified subsequent paragraphs accordingly.

### **Request to Incorporate New Information in Information Notice**

UAL requests that operators be allowed to incorporate the information contained in Boeing Service Bulletin Information Notice (IN) 777-28A0034 IN 04, dated January 6, 2011, as an option for compliance with the SNPRM (75 FR 80738, December 23, 1010).

We agree that certain information identified in Boeing Service Bulletin IN 777-28A0034 IN 04, dated January 6, 2011, should be included in this AD. We have added paragraph (k)(1) to this AD to specify the correct equipment number in the title of the work package specified in the Accomplishment Instructions of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010. Boeing Service Bulletin IN 777-28A0034 IN 04, dated January 6, 2011, also clarifies certain weight and balance changes; however, because this AD does not refer to that section of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010, no change to this AD is necessary in this regard.

### **Other Changes Made to This AD**

We have added paragraph (k)(2) to this AD to exclude airplanes with Airline Information Management System (AIMS) V1 installed from the requirement to replace actuators at the spar valve location. The currently available MOV actuator installed in those locations presents a risk of a latent failure of the indication portion of the actuator, which could lead to the inability to shut fuel off to an engine. For AIMS V1-equipped airplanes, the risk associated with the creation of an ignition source inside the fuel tank will need to be eliminated by means other than replacing the actuator with P/N MA30A1001. Future rulemaking for the AIMS V1-equipped airplanes might be needed to address this SFAR 88 (66 FR 23086, May 7, 2001) issue. We have coordinated this issue with Boeing.

We have also clarified paragraph (j) of this AD by specifying that credit is given for certain actions done “before the effective date of this AD” using specific service information. We have also revised the heading and wording of paragraph (j) of this AD. This change does not affect the intent of that paragraph.

**Conclusion**

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the SNPRM (75 FR 80738, December 23, 2010) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the SNPRM (75 FR 80738, December 23, 2010).

We also determined that these changes will not increase the economic burden on any operator or increase the scope of the AD.

**Costs of Compliance**

We estimate that this AD will affect 127 airplanes of U.S. registry. We estimate the following costs to comply with this AD:

| <b>Estimated costs</b>      |  |                   |                         |                               |
|-----------------------------|--|-------------------|-------------------------|-------------------------------|
| <b>Action</b>               | <b>Labor cost</b>                          | <b>Parts cost</b> | <b>Cost per product</b> | <b>Cost on U.S. operators</b> |
| Inspection of MOV Actuators | Up to 6 work-hours X \$85 per hour = \$510 | \$0               | Up to \$510             | Up to \$64,770                |

We estimate the following costs to do any necessary replacements that would be required based on the results of the inspection. We have no way of determining the number of aircraft that might need these replacements.

**On-condition costs**

| <b>Action</b>  | <b>Labor cost</b>                               | <b>Parts cost</b> | <b>Cost per product</b> |
|--|---|-------------------|-------------------------|
| Replacement of 11 MOV Actuators Without Fuel Tank Access | Up to 47 work-hours X \$85 per hour = \$3,995   | Up to \$60,247    | Up to \$64,242          |
| Replacement of 11 MOV Actuators With Fuel Tank Access    | Up to 423 work-hours X \$85 per hour = \$35,955 | Up to \$60,247    | Up to \$96,202          |

**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.

We are 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) Is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),

(3) Will not affect intrastate aviation in Alaska, and

(4) 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 adding the following new airworthiness directive (AD):

**2013-05-03 The Boeing Company:** Amendment 39-17375; Docket No. FAA-2008-0847; Directorate Identifier 2008-NM-056-AD.

**(a) Effective Date**

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

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to The Boeing Company Model 777-200, -200LR, -300, and -300ER series airplanes, certificated in any category, as identified in Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010.

**(d) Subject**

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

**(e) Unsafe Condition**

This AD results from fuel system reviews conducted by the manufacturer. The Federal Aviation Administration is issuing this AD to prevent electrical current from flowing through a motor-operated valve (MOV) actuator into a fuel tank, which could create a potential ignition source inside the fuel tank. This condition, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

**(f) Compliance**

You are responsible for having the actions required by this AD performed within the compliance times specified, unless the actions have already been done.

**(g) Inspection**

Except as provided by paragraph (l) of this AD: Within 60 months after the effective date of this AD, do an inspection of the MOV actuators of the main and center fuel tanks for part number (P/N) MA20A1001-1, in accordance with the Accomplishment Instructions of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010. A review of airplane maintenance records is acceptable in lieu of this inspection if the part number can be conclusively determined from that review.

**(h) Replacement**

Except as provided by paragraphs (k)(1) and (k)(2) of this AD, if any MOV actuator having P/N MA20A1001-1 is found during the inspection required by paragraph

(g) of this AD, within 60 months after the effective date of this AD, replace the MOV actuator with either a new or serviceable MOV actuator having P/N MA30A1001, or with an MOV actuator that meets the criteria specified in paragraphs (h)(1) and (h)(2) of this AD; and, as applicable, measure the electrical resistance of the bond from the adapter plate to the airplane structure and do all applicable corrective actions; in accordance with the Accomplishment Instructions of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010. Do all applicable corrective actions before further flight.

(1) The replacement MOV actuator must be a Boeing part that is approved after the issuance of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010, by the Manager, Seattle Aircraft Certification Office (ACO), FAA; or the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO, to approve the part.

(2) The replacement MOV actuator must be fully interchangeable with the part specified in Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010.

**(i) Part Installation Prohibition**

As of the effective date of this AD, no person may install an MOV actuator, P/N MA20A1001-1, on any airplane.

**(j) Credit for Previous Actions**

This paragraph provides credit for the actions required by paragraphs (g) and (h) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 777-28A0034, dated August 2, 2007; or Boeing Alert Service Bulletin 777-28A0034, Revision 1, dated May 20, 2010; except that replacement of an MOV actuator must also include cap sealing the bonding jumper, as described in Boeing Alert Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010; and provided that the replacement is an MOV actuator identified in paragraph (j)(1) or (j)(2)

of this AD. Boeing Alert Service Bulletin 777-28A0034, dated August 2, 2007; and Boeing Alert Service Bulletin 777-28A0034, Revision 1, dated May 20, 2010; are not incorporated by reference in this AD.

(1) An MOV actuator that has P/N MA30A1001.

(2) An MOV actuator that has a part number other than P/N MA20A1001-1 and meets the criteria specified in paragraphs (h)(1) and (h)(2) of this AD.

**(k) Exceptions to Service Information**

(1) Work Package 9 of the Accomplishment Instructions of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010, refers to an incorrect part number, P/N V8166; the correct part number that must be used is P/N V28166.

(2) For airplanes with Airline Information Management System (AIMS) V1 installed: MOV actuators at the spar valve locations (Work Packages 1 and 2 of the Accomplishment Instructions of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010), are not required to be replaced.

**(l) Optional Method of Compliance**

Replacing all MOV actuators at the main and center fuel tanks, as specified in Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010, with new or serviceable MOV actuators identified in paragraph (l)(1) or (l)(2) of this AD; and, as applicable, measuring the electrical resistance of the bond from the adapter plate to the airplane structure and doing all applicable corrective actions; in accordance with the Accomplishment Instructions of Boeing Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010; is an acceptable method of compliance with the actions required by paragraph (g) of this AD.

(1) MOV actuators that have P/N MA30A1001.

(2) MOV actuators that have a part number other than P/N MA20A1001-1 and meet the criteria specified in paragraphs (h)(1) and (h)(2) of this AD.

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

(1) The Manager, Seattle Aircraft Certification Office (ACO), 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 ACO, send it to the attention of the person identified in the Related Information section of this AD. Information may be emailed to:

[9-ANM-Seattle-ACO-AMOC-Requests@faa.gov](mailto: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 required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO, to make those findings. For a repair method to be approved, the repair must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

**(n) Related Information**

(1) For more information about this AD, contact Rebel Nichols, Aerospace Engineer, Propulsion Branch, ANM-140S, FAA, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6509; fax: 425-917-6590; email: [rebel.nichols@faa.gov](mailto:rebel.nichols@faa.gov).

(2) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>.

**(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 Service Bulletin 777-28A0034, Revision 2, dated September 20, 2010.

(ii) Reserved.

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>.

(4) You may view this service information at FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, WA. For information on the availability of this material at the FAA, call 425-227-1221.

(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, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Renton, Washington, on February 25, 2013.

Ali Bahrami,  
Manager,  
Transport Airplane Directorate,  
Aircraft Certification Service.

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