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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2008-0269; Directorate Identifier 2007-NM-320-AD; Amendment 39-16395; AD 2010-17-05]**

**RIN 2120-AA64**

#### **Airworthiness Directives; The Boeing Company Model 737-600, -700, -700C, -800, and -900 Series Airplanes**

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

**ACTION:** Final rule.

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**SUMMARY:** We are adopting a new airworthiness directive (AD) for certain Model 737-600, -700, -700C, -800, and -900 series airplanes. This AD requires replacement of the power control relays in the P91 and P92 power distribution panels for the fuel boost and override pumps with new, improved relays having a ground fault interrupter (GFI) feature, or installation and maintenance of universal fault interrupters (UFIs) using a certain supplemental type certificate. This AD results from fuel system reviews conducted by the manufacturer. We are issuing this AD to prevent pump housing burn-through due to electrical arcing, which could create a potential ignition source inside a 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 September 22, 2010.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in the AD as of September 22, 2010.

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

#### **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 (telephone 800-647-5527) is the 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:** Georgios Roussos, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 917-6482; fax (425) 917-6590.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an airworthiness directive (AD) that would apply to certain Model 737-600, -700, -700C, -800, and -900 series airplanes. That NPRM was published in the Federal Register on March 11, 2008 (73 FR 12910). That NPRM proposed to require replacement of the power control relays in the P91 and P92 power distribution panels for the fuel boost and override pumps with new, improved relays having a ground fault interrupter (GFI) feature. That NPRM also proposed to require a revision to the Airworthiness Limitations (AWLs) section of the Instructions for Continued Airworthiness to incorporate AWL No. 28-AWL-20.

### **Actions Since NPRM Was Issued**

To avoid including redundant requirements in this AD, we have removed the proposed requirement to revise the AWL section of certain maintenance documents to include new repetitive operational checks of the ground fault interrupter (GFI) for all alternating current fuel tank boost pumps to ensure continued functionality of the GFI circuit. This AWL revision is already required by AD 2008-10-10 R1, Amendment 39-16164 (75 FR 1529, January 12, 2010), for certain Model 737-600, -700, -700C, -800, and -900 series airplanes with an original standard airworthiness certificate or original export certificate issued before March 31, 2006. Airplanes with a certificate issued on or after March 31, 2006, must already be compliant with the AWL because those limitations were applicable as part of the airworthiness certification of those airplanes. We have removed the AWL revision requirement from this AD (specified in paragraph (g) of the NPRM), the related requirement to obtain FAA approval for any alternative inspections or inspection intervals (specified in paragraph (h) of the NPRM), and Note 1 of the NPRM. We have re-identified subsequent paragraphs accordingly.

Boeing has issued Revision 1, dated May 28, 2009, to Boeing Alert Service Bulletin 737-28A1201. (The NPRM referred to Boeing Alert Service Bulletin 737-28A1201, dated February 19, 2007.) We have revised paragraphs (c) and (f) of this AD to reference Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, and have added new paragraph (g) of this AD to provide credit (with certain provisions) for Boeing Alert Service Bulletin 737-28A1201, dated February 19, 2007. Revision 1 corrects the wiring configuration group for some airplanes, adds and corrects some figures and references and adds a resistance check between the GFI relay's mounting flange and a point on the panel cross member of the P91 and P92 panels. Revision 1 also adds a resistance measurement for airplanes that have accomplished the actions specified in Boeing Alert Service Bulletin 737-28A1201, dated February 19, 2007.

Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, refers to Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62, both Revision 5, both dated May 25, 2009, as additional sources of guidance for accomplishing a resistance check between the GFI relay's mounting flange and a point on the panel cross member of the P91 and P92 panels. Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, refers to Honeywell Service Bulletin 1151932-24-61, Revision 5, dated May 25, 2009, as an additional source of guidance for

replacing the power control relays in the P91 power distribution panel. Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, also refers to Honeywell Service Bulletin 1151934-24-62, Revision 5, dated May 25, 2009, as an additional source of guidance for replacing the power control relays in the P92 power distribution panels.

Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, references an incorrect date for Revision 5 of Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62. Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, states January 22, 2009, for Revision 5 of Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62. The correct date for Revision 5 of Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62 is May 25, 2009.

## **Comments**

We gave the public the opportunity to participate in developing this AD. We considered the comments received from the eight commenters.

## **Support for the Proposed AD**

Ermelinda Villagomez, a private citizen, supports the NPRM.

## **Request To Revise References of Part Numbers**

Continental Airlines (CAL) requests that we prevent future part number problems by removing reference to the part number of the panel assemblies and adding reference to the GFI relay part number that is installed. CAL states that there is a possibility that P91 and P92 panels can have internal components and wiring modified without the FAA's knowledge or approval.

We infer that CAL is requesting that references to the part numbers be changed due to concerns about the need for AMOC requests. We agree that references to the part numbers need to be changed from the panel part numbers to the GFI relay part number. Otherwise, AMOC approval would be needed for any change to the P91 and P92 panels. The NPRM did not reference panel part numbers, but referenced Boeing Alert Service Bulletin 737-28A1201, dated February 19, 2007, which did reference those panel part numbers. Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, also references those panel part numbers. We have revised paragraph (f) of this AD to reference the part number of the GFI relay that is installed at certain relay positions in the P91 and P92 panels.

## **Requests To Cite Later Revision of Honeywell Service Bulletins**

Boeing, CAL, SkyEurope Airlines, and Japan Airlines request that we revise Note 2 of the NPRM to reference the current revision (Revision 4, dated March 25, 2008; or Revision 3, dated June 22, 2007; respectively), of Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62. Boeing requests that we reference the latest revised Honeywell service bulletins and notes that the latest revisions were being submitted for FAA approval. Japan Airlines also notes that the original issue, dated November 10, 2006, of the Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62, could not be applied to actual airplanes due to a parts interference problem.

We concur with the intent of the requests. Since the four commenters submitted their comments, Honeywell has issued Revision 5, dated May 25, 2009, of Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62. Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62, both Revision 5, both dated May 25, 2009, were described previously in the "Actions Since NPRM Was Issued" section of this AD. We have revised Note 1 of this AD (Note 2 of the NPRM) to reference Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62, both Revision 5, both dated May 25, 2009.

## **Request To Justify Need for Rulemaking**

AirTran Airways (AirTran) requests that we confirm that adequate analysis was performed to justify this rulemaking. AirTran believes that fuel pump arcing issues have been addressed by current rulemaking and that there is no need to retrofit airplanes with GFI relays. AirTran references AD 2002-19-52, Amendment 39-12900 (67 FR 61253, September 30, 2002) (for all Model 737-600, -700, -700C, -800, and -900 series airplanes; Model 747 series airplanes; and Model 757 series airplanes), as an example of an AD issued against the fuel pump motor-impeller assembly to ensure that the wire routing mitigates arcing. AirTran also states that in order for an ignition source to enter the fuel tank, it believes significant arcing would have to occur on one or more phases of the circuit to burn through the motor-impeller assembly and through the housing. AirTran asserts that an arc of this significance would trip the currently installed circuit breakers without the need for a GFI relay.

We disagree with AirTran's assessment. We have examined the underlying safety issues involved in fuel tank explosions as detailed in the Discussion section in the NPRM. We have determined that an additional layer of protection is needed to mitigate potential ignition sources within the fuel tanks due to certain electrical failures internal to the fuel pumps. Standard circuit breakers are not designed to detect arcing events nor are they able to trip in time to protect the fuel pumps under these arcing conditions. The primary function of the circuit breakers is to protect the wiring. We have not changed the AD in this regard.

## **Requests To Permit Installation of Supplemental Type Certificate (STC) ST02076LA as a Means of Compliance**

TDG Aerospace, Southwest Airlines, CAL, and the Air Transport Association (ATA) on behalf of its member American Airlines, request that we allow the installation of TDG Aerospace STC ST02076LA as a means of compliance for providing electrical fault protection for the center override boost pumps. All four commenters state that the universal fault interrupter (UFI) has been demonstrated and approved as equivalent to or better than the protection provided by a standard GFI relay.

TDG Aerospace points out that UFIs have been approved as alternative method of compliance (AMOCs) for paragraph (b) of AD 2002-24-51, Amendment 39-12992 (68 FR 10, January 2, 2003) (for all Model 737-600, -700, -700C, -800, and -900 series airplanes; Model 747 series airplanes; and Model 757 series airplanes), and paragraph (a) of AD 2001-08-24, Amendment 39-12201 (66 FR 20733, April 25, 2001) (for all Model 737 series airplanes). TDG Aerospace adds that, for airplanes with STC ST02076LA installed, mandating the installation of GFI relays at center override boost pump positions R54 and R55 duplicates protection, adds unnecessary costs, and could generate nuisance events in the UFI system. TDG also points out that referencing STC ST02076LA in the AD would save the FAA and operators time and effort spent on coordinating multiple AMOC requests.

We agree with the commenters' requests. We have evaluated the STC and agree that installing and maintaining the TDG Aerospace UFI using STC ST02076LA is an acceptable alternative means of addressing the unsafe condition identified in this AD. We have revised paragraph (f) of this AD to require replacement of the power control relays in accordance with Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, or installation of the STC.

## **Request To Extend Proposed Compliance Time for Installation**

The ATA, on behalf of its member American Airlines, requests that we extend the compliance time for replacing the power control relays from 60 months to 72 months. American Airlines states that this extension would allow operators to align the modification with the industry-standard heavy maintenance visit interval of 72 months. American Airlines also points out that a 60-month compliance time will increase out-of-service time due to unscheduled modifications.

We disagree with this request. In developing an appropriate compliance time for installing new fuel pump control GFI relays, we considered the safety implications and the practical aspect of accomplishing the installation within a period of time that corresponds to the normal scheduled maintenance for most affected operators. In consideration for these items, we have determined that a 60-month compliance time will ensure an acceptable level of safety and allow the installation to be done during scheduled maintenance intervals for most affected operators. However, under the provisions of paragraph (h) of this AD, we will consider requests for approval of an AMOC if sufficient data are submitted to substantiate that the request would provide an adequate level of safety. We have not changed the AD in this regard.

### **Request To Reference Other Maintenance Procedures**

CAL requests that we revise the reference to Airworthiness Limitation (AWL) 28-AWL-20. CAL notes that the maintenance documentation for AWL 28-AWL-20 is too generic to show each specific requirement as detailed in the airplane's center tank pump override relay configuration.

We disagree with CAL's assertion that AWL 28-AWL-20 is insufficient. That AWL identifies a section of the airplane maintenance manual (AMM) as a document that provides appropriate guidance for doing GFI operational checks. However, to avoid including redundant requirements in this AD, we have removed the proposed requirement to revise the AWL section of certain maintenance documents to include AWL 28-AWL-20 (which would require repetitive operational checks of the GFI for all alternating current fuel tank boost pumps to ensure continued functionality of the GFI circuits). This AWL revision is already required by AD 2008-10-10 R1, Amendment 39-16164, for certain Boeing Model 737-600, -700, -700C, -800, and -900 series airplanes with an original standard airworthiness certificate or original export certificate issued before March 31, 2006. Airplanes with a certificate issued on or after March 31, 2006, must already be compliant with the AWL revision because those limitations were applicable as part of the airworthiness certification of those airplanes. We have removed the AWL revision requirement from this AD (which was specified in paragraph (g) of the NPRM) and re-identified subsequent paragraphs.

### **Request To Clarify the Use of GFIs**

CAL questions the use of GFIs for protection against arcing conditions identified in the NPRM. CAL contends that the use of arc fault circuit interrupters (AFCIs) is the appropriate device to protect pumps from damage due to arcing. CAL states that its understanding of the GFI is that GFIs are used to disconnect a circuit whenever it detects that the current flow is not balanced. When a ground fault above a prescribed threshold level and time duration is detected, the GFI relay is tripped. CAL also states that electrical arcing (that the NPRM actions are supposed to prevent) is a localized, high-energy event and the GFI relay is not an AFCI that is designed to prevent fires by detecting those electrical arcs and disconnecting power before the arc starts a fire.

We find that we need to clarify the use of the GFI relay. We have determined that the GFI is an appropriate method to protect the fuel pumps from other electrical faults, and from damage caused by electrical arcs that result from wiring coming in contact with the housing of the fuel pump. The proposed AFCI are susceptible to nuisance tripping. These circuit breakers are not yet recommended for use in airplane systems, especially systems that perform functions essential to the safe flight and landing of the aircraft. However, under the provisions of paragraph (h) of this AD, we will consider requests to approve different solutions if sufficient data are submitted to substantiate that the change would provide an acceptable level of safety. We have not changed the AD in this regard.

### **Requests To Consider Other Methods of Compliance**

CAL is concerned that the FAA did not give enough attention to solutions other than that specified in Boeing Alert Service Bulletin 737-28A1201, dated February 19, 2007. TDG Aerospace

is curious why the NPRM did not simply state the requirement for GFI at the six fuel pump positions and then list the approved solutions for each position.

We infer that CAL and TDG Aerospace request that we evaluate solutions from other companies to address the unsafe condition addressed by this AD. We evaluated the proposed solution from Boeing and verified that it addresses the unsafe condition. In addition, as explained under the previous header "Requests to Permit Installation of Supplemental Type Certificate (STC) ST02076LA as a Means of Compliance," we agree that installing and maintaining the TDG Aerospace UFI in accordance with that STC is an acceptable means of addressing the unsafe condition identified in this AD.

We cannot address all possible solutions in an AD in a timely manner. It is more practical from a workload and cost-effectiveness standpoint to make the AD applicable generally to the affected fleet and to deal with other possible solutions individually via the AMOC process. Under the provisions of paragraph (h) of this AD, we will consider requests to approve different solutions if sufficient data are submitted to substantiate that the change would provide an acceptable level of safety. We have not changed the AD in this regard.

### **Request To Correct a Typographical Error**

Boeing requests that we correct a typographical error. Boeing states that paragraph (h) of the NPRM references paragraph (j) instead of paragraph (i) of the NPRM, and points out that there is no paragraph (j) in the NPRM.

We agree. However, as explained previously, we have removed paragraph (h) of the NPRM. No further change to the AD is necessary in this regard.

### **Explanation of Change to Applicability**

We have revised this AD to identify the legal name of the manufacturer as published in the most recent type certificate data sheet for the affected airplane models.

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

### **Explanation of Change to Costs of Compliance**

Since issuance of the NPRM, we have increased the labor rate used in the Costs of Compliance from \$80 per work-hour to \$85 per work-hour. The Costs of Compliance information, below, reflects this increase in the specified hourly labor rate.

### **Costs of Compliance**

We estimate that this AD would affect 754 products of U.S. registry. The following table provides the estimated costs, at an average labor rate of \$85 per hour, for U.S. operators to comply with this AD.

<b>Action</b>	<b>Work hours</b>	<b>Parts</b>	<b>Cost per product</b>	<b>Fleet cost</b>
Installation of GFI relays	8	\$11,010	\$11,690	\$8,814,260

## 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), 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.

You can find our regulatory evaluation and the estimated costs of compliance in the AD Docket.

## 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 AD:



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**2010-17-05 The Boeing Company:** Amendment 39-16395. Docket No. FAA-2008-0269; Directorate Identifier 2007-NM-320-AD.

**Effective Date**

- (a) This airworthiness directive (AD) is effective September 22, 2010.

**Affected ADs**

- (b) None.

**Applicability**

(c) This AD applies to The Boeing Company Model 737-600, -700, -700C, -800, and -900 series airplanes, certificated in any category; as identified in Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009.

**Unsafe Condition**

(d) This AD results from fuel system reviews conducted by the manufacturer. We are issuing this AD to prevent pump housing burn-through due to electrical arcing, which could create a potential ignition source inside a fuel tank. This condition, in combination with flammable fuel vapors, could result in a fuel tank explosion and consequent loss of the airplane.

**Compliance**

- (e) Comply with this AD within the compliance times specified, unless already done.

**Replacement or Installation**

(f) Within 60 months after the effective date of this AD, do the actions required in paragraph (f)(1) or (f)(2) of this AD.

(1) Replace the power control relays that are located in the R18, R19, R20, R21, R54, and R55 positions in the P91 and P92 power distribution panels for the fuel boost and override pumps with new, improved relays, part number KDAG-X4F-001, having a ground fault interrupter (GFI) feature, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009.

(2) Install and maintain TDG Aerospace universal fault interrupters (UFIs) using Supplemental Type Certificate ST02079LA.

**Note 1:** Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, refers to Honeywell Service Bulletin 1151932-24-61 and Honeywell Service Bulletin 1151934-24-62, both Revision 5, both dated May 25, 2009, as additional sources of guidance for replacement of the power control relays in the P91 and P92 power distribution panels.

(g) Actions done before the effective date of this AD in accordance with Boeing Alert Service Bulletin 737-28A1201, dated February 19, 2007, are acceptable for compliance with the requirements of paragraph (f) of this AD, provided that Revision 5 of Honeywell Service Bulletins 1151932-24-61 and 1151934-24-62, both dated May 25, 2009, are used as additional sources of guidance.

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

(h)(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. Send information to ATTN: Georgios Roussos, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 917-6482; fax (425) 917-6590. Or, e-mail information to 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) To request a different method of compliance or a different compliance time for this AD, follow the procedures in 14 CFR 39.19. Before using any approved AMOC on any airplane to which the AMOC applies, notify your principal maintenance inspector (PMI) or principal avionics inspector (PAI), as appropriate, or lacking a principal inspector, your local Flight Standards District Office. The AMOC approval letter must specifically reference this AD.

### **Material Incorporated by Reference**

(i) You must use Boeing Alert Service Bulletin 737-28A1201, Revision 1, dated May 28, 2009, to do the actions required by this AD, unless the AD specifies otherwise.

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

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

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

(4) You may also review copies of the 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/code\\_of\\_federal\\_regulations/ibr\\_locations.html](http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html).

Issued in Renton, Washington, on July 27, 2010.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 2010-19696 Filed 8-17-10; 8:45 am]

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