

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2008-0273; Directorate Identifier 2007-NM-369-AD; Amendment 39-15566; AD 2008-13-03]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Boeing Model 747-400, 747-400D, and 747-400F Series Airplanes**

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

**ACTION:** Final rule.

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**SUMMARY:** The FAA is superseding an existing airworthiness directive (AD) that applies to all Boeing Model 747-400, 747-400D, and 747-400F series airplanes. That AD currently requires reviewing airplane maintenance records, doing repetitive inspections for cracking of the yaw damper actuator portion of the upper and lower rudder power control modules (PCMs), replacing the PCMs if necessary, and reporting all airplane maintenance records review and inspection results to the manufacturer. This new AD limits the applicability, reduces the initial inspection threshold and repetitive interval, removes the reporting requirement, and requires installation of a secondary retention device for the yaw damper modulating piston. Installation of the secondary retention device terminates the repetitive inspection requirements. This AD results from additional reports of failure or cracking of the PCM manifold in the area of the yaw damper cavity endcap at intervals well below the initial inspection threshold of the existing AD. We are issuing this AD to prevent an uncommanded left rudder hardover in the event of cracking in the yaw damper actuator portion of the upper or lower rudder PCMs, and subsequent failure of the PCM manifold, which could result in increased pilot workload, and possible runway departure upon landing.

**DATES:** This AD becomes effective July 24, 2008.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in the AD as of July 24, 2008.

On October 13, 2006 (71 FR 52999, September 8, 2006), the Director of the Federal Register approved the incorporation by reference of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005.

**ADDRESSES:** For service information identified in this AD, contact Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124-2207.

## **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:** Douglas Tsuji, Aerospace Engineer, Systems and Equipment Branch, ANM-130S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 917-6487; fax (425) 917-6590.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that supersedes AD 2006-18-17, amendment 39-14756 (71 FR 52999, September 8, 2006). The existing AD applies to all Boeing Model 747-400, 747-400D, and 747-400F series airplanes. That NPRM was published in the Federal Register on March 13, 2008 (73 FR 13480). That NPRM proposed to continue to require reviewing airplane maintenance records, doing repetitive inspections for cracking of the yaw damper actuator portion of the upper and lower rudder power control modules (PCMs), and replacing the PCMs if necessary. That NPRM also proposed to add a requirement to install a secondary retention device for the yaw damper modulating piston, and reduce the applicability. Installation of the secondary retention device would terminate the repetitive inspection requirements.

### **Comments**

We provided the public the opportunity to participate in the development of this AD. We have considered the comments that have been received on the NPRM.

### **Support for the NPRM**

Boeing, the National Transportation Safety Board (NTSB), and Northwest Airlines (NWA) support, concur with, or have no objection to the contents of the NPRM.

### **Request To Identify Other Part Numbers (P/Ns) in Parts Installation Paragraph**

Parker Hannifin Corporation, the PCM manufacturer, states that PCMs that have P/Ns 332700-1009 and 333200-1009 should have been included in paragraph (l), "Parts Installation," of the NPRM. Parker states that Parker Service Bulletins 332700-27-166 and 333200-27-167 required the upper and lower PCMs to be marked with these part numbers as a configuration change update. Parker states that it will rescind these service bulletins. If these Parker service bulletins are not accomplished, all identification plates will remain marked as P/Ns 332700-1007 and 333200-1007, which are both P/Ns identified in paragraph (l) of the NPRM. However, Parker points out that it is possible some PCMs have already been re-identified with the-1009 P/Ns. Without including the-1009 P/Ns in paragraph (l) of this AD, these parts would not be inspected and modified in accordance with the AD. Therefore, Parker requests that we change paragraph (l) of this AD to include these additional P/Ns.

We agree with Parker that it is important to ensure that P/Ns 332700-1009 and 333200-1009 are inspected and modified. It is also important to encourage operators to consider this safety issue. These P/Ns have the same potential for failure as the P/Ns listed in paragraph (l) of the NPRM. However, we must allow time for the public to comment on each additional requirement, and adding these P/Ns to paragraph (l) of the AD would increase the scope of the AD by adding a requirement. The degree of urgency associated with the unsafe condition is such that we consider any delay to this action to be inappropriate. Therefore, we have not changed the AD in this regard; however, we will consider additional rulemaking to address P/Ns 332700-1009 and 333200-1009.

### **Request To Clarify On-Airplane Modification**

Air Transport Association (ATA), on behalf of United Airlines (UAL) requests that we re-word paragraph (j) of the NPRM for clarity. UAL indicates that the NPRM should state explicitly that it is acceptable to modify the PCM while it is installed on the airplane. UAL points out that this change would match the "Relevant Service Information" section of the NPRM.

We agree with the commenters' request to clarify this requirement. It is acceptable to modify the PCM while it is installed on the airplane. However, we understand that some operators might prefer the option to do the modification while the PCM is not installed on the airplane. Therefore, we have revised paragraph (j) of the AD to clarify that either method of modification is acceptable.

### **Request To Clarify Correct Service Bulletin Tasks**

ATA on behalf of UAL, requests that we revise the AD to clearly state the correct service bulletin tasks for on-wing testing for PCMs modified on-wing, and shop-level testing for PCMs removed from the airplane. The commenters explain that the NPRM requires or refers to four documents that specify testing methods after modifying the PCM: Two component service bulletins (Parker Service Bulletins 332700-27-312 and 333200-27-314, both dated September 13, 2007), one Boeing service bulletin (Boeing Alert Service Bulletin 747-27A2479, dated November 8, 2007), and the Boeing airplane maintenance manual (AMM). The commenters state that a clarification would avoid compliance issues.

We agree that the numerous documents complicate the requirements. However, the numerous documents are necessary to provide operators with two options to modify the airplane. They can replace the existing PCM with a PCM that has a yaw damper retention device, or install the yaw damper retention device into the existing PCM on the airplane. We disagree that it is necessary to change the AD in this regard. The service information and the associated AMM sections clearly state which tests must be performed, depending on whether the PCM is replaced or modified while installed on the airplane.

### **Conclusion**

We have carefully reviewed the available data, including the comments that have been received, and determined that air safety and the public interest require adopting the AD with the change described previously. We have determined that this change will neither increase the economic burden on any operator nor increase the scope of the AD.

### **Costs of Compliance**

There are about 655 airplanes of the affected design in the worldwide fleet. This AD affects about 86 airplanes of U.S. registry. The following table provides the estimated costs for U.S. operators to comply with this AD. The average labor rate is \$80 per work hour.

### Estimated Costs

Action	Work hours	Parts	Cost per airplane	Fleet cost
Ultrasonic inspection (required by AD 2006–18–17).	4	None	\$320, per inspection cycle.	\$27,520, per inspection cycle.
Option 1—replacement (new action)	Up to 22	Up to \$4,496	Up to \$6,256	Up to \$538,016.
Option 2—modification (new action)	Up to 13	Up to \$722	Up to \$1,762	Up to \$151,532.

### 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

We have determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866;
- (2) 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.

We prepared a regulatory evaluation of the estimated costs to comply with this AD and placed it in the AD docket. See the ADDRESSES section for a location to examine the regulatory evaluation.

### 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 Federal Aviation Administration (FAA) amends § 39.13 by removing amendment 39-14756 (71 FR 52999, September 8, 2006) and by adding the following new airworthiness directive (AD):



**2008-13-03 Boeing:** Amendment 39-15566. Docket No. FAA-2008-0273; Directorate Identifier 2007-NM-369-AD.

#### **Effective Date**

- (a) This AD becomes effective July 24, 2008.

#### **Affected ADs**

- (b) This AD supersedes AD 2006-18-17.

#### **Applicability**

(c) This AD applies to Boeing Model 747-400, 747-400D, and 747-400F series airplanes, certificated in any category, as identified in Boeing Alert Service Bulletin 747-27A2479, dated November 8, 2007.

#### **Unsafe Condition**

(d) This AD results from additional reports of failure or cracking of the power control module (PCM) manifold in the area of the yaw damper cavity endcap at intervals well below the initial inspection threshold of the existing AD. We are issuing this AD to prevent an uncommanded left rudder hardover in the event of cracking in the yaw damper actuator portion of the upper or lower rudder PCMs, and subsequent failure of the PCM manifold, which could result in increased pilot workload, and possible runway departure upon landing.

#### **Compliance**

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

#### **Verification of Rudder PCM/Main Manifold Time-in-Service**

(f) For any affected airplane, if it can be positively verified that any rudder PCM or PCM main manifold installed on that airplane has accumulated a different total of flight hours or flight cycles than the totals accumulated by that airplane, the flight cycles or flight hours accumulated by the rudder PCM or PCM main manifold will be acceptable as valid starting points for meeting the compliance times required by this AD.

#### **Ultrasonic Inspections**

(g) Do an ultrasonic inspection for cracking of the yaw damper actuator portion of the upper and lower rudder PCMs at the applicable times specified in paragraph (g)(1) or (g)(2) of this AD in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005. Doing the installation required by paragraph (j) of this AD ends the inspection requirements of this paragraph for that PCM.

(1) For airplanes that have been inspected before the effective date of this AD in accordance with Boeing Alert Service Bulletin 747-27A2397, dated July 24, 2003; Revision 1, dated March 31, 2005; or Revision 2, dated September 1, 2005: Do the ultrasonic inspection at the later of the times specified in paragraphs (g)(1)(i) and (g)(1)(ii) of this AD. Repeat the inspection thereafter at intervals not to exceed 7,000 flight hours or 1,125 flight cycles, whichever occurs first, until the action required by paragraph (j) of this AD is accomplished.

(i) Within 7,000 flight hours or 1,125 flight cycles after the prior inspection, whichever occurs first.

(ii) Within 6 months after the effective date of this AD.

(2) For airplanes that have not been inspected before the effective date of this AD in accordance with Boeing Alert Service Bulletin 747-27A2397, dated July 24, 2003; Revision 1, dated March 31, 2005; or Revision 2, dated September 1, 2005: Do the ultrasonic inspection at the later of the times specified in paragraphs (g)(2)(i) and (g)(2)(ii) of this AD. Repeat the inspection thereafter at intervals not to exceed 7,000 flight hours or 1,125 flight cycles, whichever occurs first, until the action required by paragraph (j) of this AD is accomplished.

(i) Prior to the accumulation of 14,000 total flight hours or 2,250 total flight cycles, whichever occurs first.

(ii) Within 6 months after the effective date of this AD.

### **Action if No Cracking Is Found**

(h) If no cracking is found during any inspection required by paragraph (g) of this AD: Before further flight, apply sealant and a torque stripe and install a lockwire on the rudder PCM in accordance with the Accomplishment Instructions, and Figure 1 or Figure 2, as applicable, of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005.

### **Action if Cracking Is Found**

(i) If any cracking is found during any inspection required by paragraph (g) of this AD: Before further flight, do the action in paragraph (i)(1) or (i)(2) of this AD.

(1) Replace the affected PCM with a new or serviceable PCM in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005.

(2) Replace the PCM with a PCM that has the new secondary retention device installed as specified in paragraph (j) of this AD.

### **Terminating Action**

(j) Within 24 months or 8,400 flight hours after the effective date of this AD, whichever occurs earlier: Install a new secondary retention device for the yaw damper piston assembly in both the upper and lower PCMs by either replacing the existing PCM with a new improved PCM that already has the new secondary retention device, or by modifying, testing, and re-identifying the existing PCM while the PCM is installed on the airplane. Do the installation in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-27A2479, dated November 8, 2007. Doing the installation terminates the inspection requirements of this AD.

Note 1: Boeing Alert Service Bulletin 747-27A2479 refers to Parker Service Bulletins 332700-27-312 and 333200-27-314, both dated September 13, 2007, as additional sources of service information for modifying the PCM.

## **Prior Accomplishment of Requirements**

(k) Actions accomplished before October 13, 2006 (the effective date of AD 2006-18-17), in accordance with Boeing Alert Service Bulletin 747-27A2397, dated July 24, 2003; or Revision 1, dated March 31, 2005; are considered acceptable for compliance with the corresponding requirements of this AD.

## **Parts Installation**

(l) As of October 13, 2006, no person may install on any airplane a rudder PCM having a top assembly part number (P/N) 332700-1003, -1005, or -1007; or P/N 333200-1003, -1005, or -1007; unless the PCM has been ultrasonically inspected and found to be without cracks; in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005, as specified by paragraph (g) of this AD.

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

(m)(1) The Manager, Seattle Aircraft Certification Office, FAA, has the authority to approve AMOCs for this AD, if requested in accordance with the procedures found in 14 CFR 39.19.

(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 appropriate principal inspector (PI) in the FAA Flight Standards District Office (FSDO), or lacking a PI, your local FSDO.

(3) AMOCs approved previously in accordance with AD 2006-18-17 are approved as AMOCs for the corresponding provisions of paragraphs (g), (h), and (i) of this AD.

## **Material Incorporated by Reference**

(n) You must use Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005; and Boeing Alert Service Bulletin 747-27A2479, dated November 8, 2007; as applicable; to perform the actions that are required by this AD, unless the AD specifies otherwise.

(1) The Director of the Federal Register approved the incorporation by reference of Boeing Alert Service Bulletin 747-27A2479, dated November 8, 2007, in accordance with 5 U.S.C. 552(a) and 1 CFR part 51.

(2) October 13, 2006 (71 FR 52999, September 8, 2006), the Director of the Federal Register approved the incorporation by reference of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005.

(3) Contact Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124-2207, for a copy of this service information. You may review copies at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington; or 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 June 9, 2008.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

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