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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2006-23873; Directorate Identifier 2005-NM-110-AD; Amendment 39-14756; AD 2006-18-17]

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.

SUMMARY: The FAA is superseding an existing airworthiness directive (AD), which applies to certain Boeing Model 747-400, 747-400D, and 747-400F series airplanes. The existing AD currently requires reviewing airplane maintenance records; inspecting the yaw damper actuator portion of the upper and lower rudder power control modules (PCMs) for cracking, and replacing the PCMs if necessary; and reporting all airplane maintenance records review and inspection results to the manufacturer. This new AD expands the applicability and discontinues certain requirements of the existing AD. This AD adds repetitive inspections of the PCMs, and replacement of the PCMs if necessary. This AD results from manufacturer findings that the inspections required by the existing AD must be performed at regular intervals. We are issuing this AD to detect and correct cracking in the yaw damper actuator portion of the upper and lower rudder PCMs, which could result in an uncommanded left rudder hardover, consequent increased pilot workload, and possible runway departure upon landing.

DATES: This AD becomes effective October 13, 2006.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in the AD as of October 13, 2006.

ADDRESSES: You may examine the AD docket on the Internet at *http://dms.dot.gov* or in person at the Docket Management Facility, U.S. Department of Transportation, 400 Seventh Street SW., Nassif Building, Room PL-401, Washington, DC.

Contact Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124-2207, for service information identified in this AD.

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:

Examining the Docket

You may examine the airworthiness directive (AD) docket on the Internet at *http://dms.dot.gov* or in person at the Docket Management Facility office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Docket Management Facility office (telephone (800) 647-5227) is located on the plaza level of the Nassif Building at the street address stated in the ADDRESSES section.

Discussion

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to include an AD that supersedes AD 2003-23-01, amendment 39-13364 (68 FR 64263, November 13, 2003). The existing AD applies to certain Boeing Model 747-400, 747-400D, and 747-400F series airplanes. That NPRM was published in the Federal Register on February 13, 2006 (71 FR 7446). That NPRM proposed to continue to require certain requirements of the existing AD. That NPRM also proposed to expand the applicability and discontinue certain requirements of the existing AD. That NPRM also proposed to require repetitive inspections of the power control modules (PCMs) and replacement of the PCMs if necessary.

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

One commenter, Northwest Airlines (NWA), expresses support for the NPRM, stating that the type of failure event addressed in the NPRM has occurred on a NWA airplane.

Request to Cite Revised Service Information

Three commenters, Boeing, South African Airways, and NWA request that we revise the NPRM to refer to current service information. The commenters state that Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005, has been issued.

We agree with this request. We have determined that Boeing Service Bulletin 747-27A2397, Revision 2, shows changes of operators in the effectivity and clarifies the compliance information, but does not add any further actions or increase the economic burden on operators. Therefore, we have revised the AD to refer to Boeing Service Bulletin 747-27A2397, Revision 2, as the appropriate source of service information for accomplishing the requirements of the AD. We have also revised paragraph (k) of the AD to indicate that actions done previously in accordance with Boeing Alert Service Bulletin 747-27A2397, Revision 1, dated March 31, 2005, are also acceptable for compliance with the corresponding requirements of this AD.

Request to Remove Certain Part Numbers (P/Ns)

One commenter, Boeing, requests that two P/Ns be removed from the NPRM. Boeing states that P/Ns 332700-1009 and 333200-1009 are internal supplier P/Ns that are stamped on the PCM manifold and are not PCM top assembly P/Ns. Boeing states that these P/Ns are not referenced on the equipment identification plate for either the upper or lower PCM.

We agree with this request. Though all revisions of the Boeing service bulletin specify P/Ns 332700-1009 and 333200-1009 as replacement P/Ns for cracked PCMs, we have determined that these P/Ns do not refer to PCM top assemblies; instead, these P/Ns refer only to the PCM manifolds. Only top assembly P/Ns of the upper or lower rudder PCMs should be identified in the AD; that is P/N 332700-1003, -1005, or -1007; or P/N 333200-1003, -1005, or -1007. Therefore, to prevent confusion on the part of operators attempting to track PCM installations, we have removed the reference to P/Ns 332700-1009 and 333200-1009 as top assembly P/Ns from paragraph (l) of the AD.

Request to Revise Paragraph (j)(2) of the NPRM

One commenter, Fortner Engineering, requests that we revise paragraph (j)(2) of the NPRM to read "PCMs or manifolds" rather than "PCMs" only. Fortner Engineering states that certified repair stations in addition to Parker Hannifin, which is the PCM original equipment manufacturer (OEM), overhaul the valve (manifold) and that those repair stations should not be required to send the entire PCM to the OEM if a crack is discovered in the manifold. Fortner Engineering asserts that, as long as all information required by paragraph (j)(1) of the NPRM is included with the manifold, there is no need to send the entire PCM to the OEM.

We agree with this request. The intent of paragraph (j)(2) of this AD is to return PCMs having cracked manifolds to the manufacturer for analysis of the cause of the cracking. If the PCM can be returned to service with a new or serviceable manifold, there is no need to send the entire assembly to the OEM. Therefore, we have revised paragraph (j)(2) of the AD to read "PCMs or manifolds."

Request to Revise Paragraph (l) of the NPRM

The same commenter requests that we delete the phrase, "either by the operator or the supplier" from paragraph (l), "Parts Installation," of the NPRM. Fortner Engineering asserts that the operator should be free to determine whether the PCMs will be inspected by the operator, the supplier, or any other appropriately rated and equipped facility.

We agree with this request. The intent of paragraph (l) of the AD is to ensure that all affected PCMs are inspected for cracks before any return to service. The primary concern is not which facility inspects the PCMs, but rather that the inspections are performed by properly equipped and authorized facilities in accordance with the applicable service information. Therefore, we have revised paragraph (l) by deleting the phrase specified by Fortner Engineering.

Request to Include Alternative Method of Inspection

The same commenter requests that we include an alternative method of inspecting for cracking of the manifolds of suspected PCMs. Fortner Engineering states that a dye penetrant inspection performed in accordance with ASTM-E474, Type 1, Method A, Sensitivity Level 4, will better ensure detection of any manifold defects. Further, Fortner Engineering asserts that the OEM, Parker Hannifin, has already received approval of this dye penetrant method as an alternative method of compliance (AMOC) with AD 2003-23-01.

We agree that a dye penetrant inspection is an acceptable alternative to the ultrasonic inspection specified by the AD, because the dye penetrant technique provides a more thorough method for

detecting cracking of the area of interest on the PCM manifold. However, we do not agree that ASTM-E474, Type 1, Method A, Sensitivity Level 4, has already been approved as an AMOC with AD 2003-23-01. In fact, the AMOC using dye penetrant inspection that was requested by Parker Hannifin and approved as of November 21, 2003, was in accordance with ASTM-E1417, Type 1, Method A, Sensitivity Level 4, and does not actually specify that it applies to the manifold. We are not aware of the dye penetrant inspection specification ASTM-E474, Type 1, Method A, Sensitivity Level 4; therefore, no change is necessary to the AD in this regard. However, as specified in paragraph (m) of the AD, a further AMOC may be requested if data are submitted to substantiate that ASTM-E474, Type 1, Method A, Sensitivity Level 4, specifies an acceptable method of inspection for compliance with the requirements of this AD.

Notification of Compliance Time Conflict

The Air Transport Association (ATA), on behalf of its member NWA, states that there are errors in a chronology described in the preamble of the NPRM. NWA points out an apparent conflict between the compliance times specified in different sections of the NPRM. NWA notes that the third paragraph of the "Actions Since Existing AD Was Issued" section of the preamble states, "The compliance time for the initial inspection (for airplanes not previously inspected as required by AD 2003-23-01) has been revised to the earlier of 56,000 total flight hours or 9,000 total flight cycles * * *." NWA then notes that paragraph (h) of the NPRM states, "For airplanes not inspected prior to the effective date of this AD as specified in paragraph (g) of this AD: At the later of the times specified * * * prior to the accumulation of 56,000 total flight hours or 9,000 total flight cycles * * *."

We acknowledge NWA's concern; however, we do not agree that there is a conflict in the compliance time statements. Paragraph (h) of the AD more fully states, "For airplanes not inspected prior to the effective date of this AD as specified in paragraph (g) of this AD, At the later of the times specified in paragraph (h)(1) or (h)(2) of this AD * * *." Paragraph (h)(1) of the AD states, "Prior to the accumulation of 56,000 total flight hours or 9,000 total flight cycles, whichever occurs first." Paragraph (h)(2) of the AD states, "Within 24 months after the effective date of this AD." The "later of the times" statement of paragraph (h) refers to the relationship between paragraphs (h)(1) and (h)(2). In paragraph (h)(1), the statement, "whichever occurs first" is consistent with the statement "the earlier of" that appears in the "Actions Since Existing AD Was Issued" section of the preamble. Paragraph (h)(2) is the grace period for airplanes not inspected prior to the effective date of the AD. No change is needed to the AD in this regard.

Request to Withdraw NPRM

ATA, on behalf of its member United Airlines (UAL), states that it is opposed to the NPRM. UAL states that, based on the original AD 2003-23-01, there have been no further reports of cracked PCM manifolds. UAL asserts that the original incident of a cracked PCM manifold airplane failure was an isolated event, and further asserts that the event was controllable. Although UAL made no specific statement to this effect, we infer that UAL considers the AD to be unnecessary and requests us to withdraw the NPRM.

We do not agree with this request. Although UAL correctly states that no other cracked PCM manifolds have been discovered since the release of AD 2003-23-01, the root cause for the premature fatigue failure of the lower rudder PCM on the event airplane has yet to be determined; and although analysis of the results of accomplishing AD 2003-23-01 did not yield that root cause, that analysis highlighted a previously unidentified single point failure of the PCMs. This new AD is intended to protect against such a single point failure occurring on the upper rudder PCM. Without the on-going inspections required by this AD, a developing crack of either the upper or lower PCM could remain latent and grow to the point of failure, which, under certain phases of flight, could be catastrophic.

For these reasons, we have determined that this AD is necessary to maintain safety of the fleet and will not be withdrawn. Further, the inspection reports required by this AD will enable the manufacturer to obtain better insight into the nature, cause, and extent of the cracking, and to possibly develop final action to address the unsafe condition. Once final action has been identified, we may consider further rulemaking.

Recommendation to Develop In-Flight Procedures to Deal with a Failed PCM

Air Line Pilots Association (ALPA) recommends that procedures to deal with an in-flight situation of a failed rudder PCM be developed and provided to the flightcrews. ALPA states that this procedure would aid pilot workload in the event of a failed rudder PCM. ALPA submitted the same comment to the docket for AD 2003-23-01, asserting that "industry must develop a set of operational procedures to allow flightcrews to deal with such an in-flight situation." ALPA states that no such procedures have yet been provided and reiterates its recommendation that industry supply such procedures.

We acknowledge ALPA's concern. We understand that any such procedures would be provided by industry; in this case, Boeing. However, we have concluded, and Boeing concurs, that the repetitive inspections required by this AD will detect any cracking or potential cracking of the PCM before any PCM failure. Therefore, non-normal operational procedures are not needed to maintain fleet safety in this regard. As ALPA did not request any specific change to the NPRM, we have not changed the AD as regards this comment.

Request to Reduce Compliance Time

The same commenter, ALPA, requests that we change the compliance time of the NPRM from 24 months to 12 months. ALPA states that the potential hazard for an "uncommanded rudder hardover, consequent increased pilot workload, and possible runway departure upon landing" warrants a more conservative initial inspection period. ALPA asserts that allowing a longer initial time period may allow failed yaw damper actuators to remain in operation much longer than necessary and put may aircraft at risk of experiencing a failure similar to the one on the incident airplane.

We do not agree. AD 2003-23-01 has already required the inspection of Model 747-400 airplanes with suspected high usage rudder PCMs, and the compliance period to complete the original inspections has passed with no additional failures detected. This, along with the knowledge the rudder PCMs have undergone extensive investigation, provides us with a degree of confidence that there are no imminent failures predicted. Instead, we have determined that on-going inspections are needed because the root cause for the premature fatigue failure on the incident airplane has not been determined. Further, this AD is intended to protect against a failure condition not previously analyzed: failure of the upper rudder PCM. The existing initial compliance time of 24 months provides a balance between further possible failures due to the unknown cause of the failed part and the additional burden of on-going inspections. No revision is needed to the AD in this matter.

Clarification of Parts Installation Paragraph

The clear intent of this AD is that PCMs having cracked manifolds must be removed from service and replaced with serviceable PCMs having manifolds without cracks. To prevent confusion and ensure conformity with the intent of the AD, we have added the phrase "and found to be without cracks" to paragraph (l) of the AD.

Conclusion

We have 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 changes described previously. We have determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Interim Action

Because the root cause of the cracking addressed in AD 2003-23-01 has not yet been determined, we consider this AD to be interim action and have continued the requirement to return cracked PCMs or manifolds to Parker Hannifin in paragraph (j)(2) of this AD. If final action is later identified, we may consider further rulemaking then.

Costs of Compliance

There are approximately 636 airplanes of the affected design in the worldwide fleet. We estimate that 86 airplanes of U.S. registry will be affected by this AD, and that it will take approximately 4 work hours per airplane to accomplish the ultrasonic inspection, at an average labor rate of $65 per work hour. Based on these figures, the cost impact of the inspection is estimated to be $22,360, or $260 per airplane, per inspection cycle.

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 39-13364 (68 FR 64263, November 13, 2003) and adding the following new airworthiness directive (AD):

2006-18-17 Boeing: Amendment 39-14756. Docket No. FAA-2006-23873; Directorate Identifier 2005-NM-110-AD.

Effective Date

(a) This AD becomes effective October 13, 2006.

Affected ADs

(b) This AD supersedes AD 2003-23-01.

Applicability

(c) This AD applies to all Boeing Model 747-400, 747-400D, and 747-400F series airplanes, certificated in any category.

Unsafe Condition

(d) This AD results from manufacturer findings that the inspections required by AD 2003-23-01 must be performed at regular intervals. We are issuing this AD to detect and correct potential cracking in the yaw damper actuator portion of the upper and lower rudder power control modules (PCMs), which could result in an uncommanded left rudder hardover, consequent 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.

Inspection Accomplished Prior to the Issuance of This AD

(g) For airplanes which, prior to the effective date of this AD, have received an ultrasonic inspection for cracking of the yaw damper actuator portion of the upper and lower rudder PCM, in accordance with Boeing Alert Service Bulletin 747-27A2397, dated July 24, 2003, as required by AD 2003-23-01: Do paragraphs (g)(1), (g)(2), (g)(3), and (g)(4) of this AD, as applicable, in accordance

with the Accomplishment Instructions of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005.

(1) Perform the ultrasonic inspection described in paragraph (g) of this AD at the later of the times specified in paragraph (g)(1)(i) or (g)(1)(ii) of this AD, then do paragraph (g)(2) or (g)(3) of this AD, as applicable; and paragraph (g)(4) of this AD.

(i) Within 28,000 flight hours or 4,500 flight cycles after the date of the prior inspection, whichever occurs first.

(ii) Within 24 months after the effective date of this AD.

(2) If no cracking is found during any inspection required by paragraph (g)(1) or (h) of this AD: 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.

(3) If any cracking is found during any inspection required by paragraph (g)(1) or (h) of this AD: Before further flight, replace the affected PCM with a new or serviceable PCM and submit the report required by paragraph (i) of this AD.

(4) Repeat the ultrasonic inspection described in paragraph (g) of this AD at intervals not to exceed 28,000 flight hours or 4,500 flight cycles, whichever occurs first, and repeat the actions in paragraph (g)(2) or (g)(3) of this AD, as applicable.

Initial Inspection

(h) For airplanes not inspected prior to the effective date of this AD as specified in paragraph (g) of this AD: At the later of the times specified in paragraph (h)(1) or (h)(2) of this AD, perform an ultrasonic inspection for cracking of the yaw damper actuator portion of the upper and lower rudder PCM main manifold; and do the actions specified in paragraph (g)(2) or (g)(3) of this AD, as applicable; in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005. Repeat the inspection thereafter at intervals not to exceed 28,000 flight hours or 4,500 flight cycles, whichever occurs first.

(1) Prior to the accumulation of 56,000 total flight hours or 9,000 total flight cycles, whichever occurs first.

(2) Within 24 months after the effective date of this AD.

Reporting Requirements and Damaged Parts Disposition

(i) For all airplanes: At the applicable time specified in paragraph (i)(1) or (i)(2) of this AD, accomplish the actions in paragraph (j) of this AD.

(1) If the inspection was done after the effective date of this AD: Submit the report and part, if applicable, within 30 days after the inspection.

(2) If the inspection was done before the effective date of this AD: Submit the report and part, if applicable, within 30 days after the effective date of this AD.

(j) At the applicable time specified in paragraph (i) of this AD: Do the requirements of paragraphs (j)(1) and (j)(2) of this AD. Information collection requirements contained in this regulation have been approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.) and have been assigned OMB Control Number 2120-0056.

(1) If any inspection required by this AD reveals any indication of a cracked or broken part, submit a report to: The Boeing Company, Service Engineering–Mechanical Systems. The report must contain the airplane and rudder PCM serial numbers, the total flight hours and flight cycles for each rudder PCM (and rudder PCM main manifold, if known), and a description of any damage found.

Submission of the Inspection Report Form (Figure 3 of Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005) is one acceptable method of complying with this requirement.

(2) Send any cracked or broken PCMs or manifolds to Parker Hannifin Corporation in accordance with the shipping instructions specified in Appendix A of Boeing Alert Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005.

Prior Accomplishment of Requirements

(k) Actions accomplished before the effective date of this AD 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 the effective date of this AD, no person shall 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.

Alternative Methods of Compliance (AMOCs)

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

(2) Before using any AMOC approved in accordance with 14 CFR 39.19 on any airplane to which the AMOC applies, notify the appropriate principal inspector in the FAA Flight Standards Certificate Holding District Office.

(3) AMOCs approved previously according to AD 2003-23-01 are approved as AMOCs with this AD.

Material Incorporated by Reference

(n) You must use Boeing Service Bulletin 747-27A2397, Revision 2, dated September 1, 2005, to perform the actions that are required by this AD, unless the AD specifies otherwise. The Director of the Federal Register approved the incorporation by reference of this document in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. 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 Docket Management Facility, U.S. Department of Transportation, 400 Seventh Street, SW., Room PL-401, Nassif Building, Washington, DC; on the Internet at *http://dms.dot.gov*; or at the National Archives and Records Administration (NARA). For information on the availability of this material at the NARA, call (202) 741-6030, or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*.

Issued in Renton, Washington, on August 30, 2006.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E6-14782 Filed 9-7-06; 8:45 am]