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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2004-19495; Directorate Identifier 2003-NM-180-AD; Amendment 39-14019; AD 2005-06-11]**

**RIN 2120-AA64**

**Airworthiness Directives; Boeing Model 747-100, -100B, -100B SUD, -200B, and -300 Series Airplanes; and Model 747SR and 747SP 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), which applies to certain Boeing Model 747-100, -100B, -100B SUD, -200B, and -300 series airplanes; and Model 747SR and 747SP series airplanes. That AD currently requires repetitive inspections to detect fatigue cracking in the upper deck floor beams located at certain body stations, and repair, if necessary. This new AD lowers the threshold for the existing inspections and requires new repetitive inspections of previously repaired areas, and repair if necessary. This AD is prompted by the results of an additional detailed analysis that indicate fatigue cracks can initiate sooner than has previously been observed. We are issuing this AD to prevent failure of the upper deck floor beams at certain body stations due to fatigue cracking, which could result in rapid decompression and reduced controllability of the airplane.

**DATES:** This AD becomes effective April 25, 2005.

The incorporation by reference of a certain publication listed in the AD is approved by the Director of the Federal Register as of April 25, 2005.

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

*Docket:* The AD docket contains the proposed AD, comments, and any final disposition. You can examine the 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 U.S. Department of Transportation, 400 Seventh Street, SW., room PL-401, Washington, DC. This docket number is FAA-2004-19495; the directorate identifier for this docket is 2003-NM-180-AD.

**FOR FURTHER INFORMATION CONTACT:** Ivan Li, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Transport Airplane Directorate, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 917-6437; fax (425) 917-6590.

**SUPPLEMENTARY INFORMATION:** The FAA proposed to amend part 39 of the Federal Aviation Regulations (14 CFR Part 39) with an AD to supersede AD 2000-04-17, amendment 39-11600 (65 FR 10695, February 29, 2000). The existing AD applies to certain Boeing Model 747-100, -100B, -100B SUD, -200B, and -300 series airplanes; and Model 747SR and 747SP series airplanes. The proposed AD was published in the Federal Register on November 3, 2004 (69 FR 63965), to continue to require repetitive inspections to detect fatigue cracking in the upper deck floor beams located at certain body stations, and repair, if necessary. The action also proposed to lower the threshold for the existing repetitive inspections. In addition, the action also proposed to require new repetitive inspections of previously repaired areas, and repair of any crack.

## Comments

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

## Request To Exclude Counting of Certain Flight Cycles

One commenter, the airplane manufacturer, requests that paragraph (g) of the proposed AD be revised to exclude counting of flight cycles with a cabin differential pressure of 2.0 pounds per square inch (psi) or less when determining the number of flight cycles to be used to determine the inspection compliance threshold and repeat intervals for the proposed actions. The commenter notes that this would align with the requirements of paragraph (c) of AD 2004-03-11, amendment 39-13455 (69 FR 5920, February 9, 2004). The commenter states that the fatigue and crack growth behavior at the floor panel holes in the upper chord of the upper deck floor beams, which are the subject of the proposed AD, is caused by tension stresses in the floor beam upper chords. The tension stresses in the 747 upper deck floor beams at stations 340, 360, and 380 are almost entirely the result of reacting load due to cabin differential pressure. Thus, the commenter concludes that it is technically correct to not count flights, which have a low cabin differential pressure and do not significantly contribute to fatigue and crack growth.

We do not agree with the commenter's request. Although we discussed the matter of not granting credit for pressurization cycles less than 2.0 psi in the "Differences Between the Proposed AD and Service Bulletin" section of the proposed AD, we find that further clarification is necessary.

The commenter correctly notes that the requirements of paragraph (c) of AD 2004-03-11 exclude counting pressurization cycles less than 2.0 psi. We acknowledge the commenter's technical rationale for not counting the pressurization cycles less than 2.0 psi in this AD. However, we do not agree with the commenter's request for the following reasons:

- There have been several instances on other in-service issues where analytical rationales, similar to that of the commenter, have indicated that pressurization cycles less than 2.0 psi should not be counted. However, when fleet records have been examined, the airplanes engaging in such operations are having the same or greater occurrences of crack findings compared to those on which all pressurized flights are counted. As a result, we carefully consider such matters based on all available factors, including individual operators' specific maintenance programs, technical rationale, and fleet experience.
- We have found that such provisions are applicable only to a small number of operators that may not pressurize their airplanes above 2.0 psi in all their flights. We have determined that the best way to handle such circumstances is for operators to request an alternative method of compliance (AMOC) in accordance with paragraph (n) of this AD, rather than increasing the complexity of the AD by addressing each operator's unique situation.

## **Request To Allow Changing of Inspection Methods**

The same commenter requests that paragraph (h) of the proposed AD be revised to allow changing repetitive inspection methods in paragraph (h)(1) or (h)(2) of the proposed AD no matter which inspection method was used previously, provided that the corresponding repetitive inspection interval of 3,000 flight cycles or 750 flight cycles, respectively, is imposed. The commenter notes that this is allowed in Figure 1 of Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002 (referenced as the appropriate source of service information for accomplishing the proposed actions).

We agree. We have determined that, after accomplishing any inspection required by paragraph (h)(1) or (h)(2) of this AD, accomplishing any subsequent inspection using the alternate inspection method is adequate to detect cracking, provided that its corresponding repetitive interval is used. We have revised paragraph (h) of this AD accordingly.

## **Changes to Delegation Authority**

Boeing has received a Delegation Option Authorization (DOA). We have revised certain new requirements in this final rule to delegate the authority to approve an alternative method of compliance for any repair required by this AD to the Authorized Representative for the Boeing DOA Organization rather than the Designated Engineering Representative. We have also revised certain requirements of AD 2000-04-17, which are retained in this final rule, to provide this delegation authority as an option.

## **Conclusion**

We have carefully reviewed the available data, including the comments that have been submitted, 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.

## **Costs of Compliance**

There are about 539 Model 747-100, -100B, -100B SUD, -200B, and -300 series airplanes; and Model 747SR and 747SP series airplanes worldwide of the affected design. This AD will affect about 168 airplanes of U.S. registry.

The actions that are currently required by AD 2000-04-17 and retained in this AD take about 15 work hours per airplane, at an average labor rate of \$65 per work hour. Based on these figures, estimated cost of the currently required actions is \$163,800, or \$975 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. 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 FAA amends § 39.13 by removing amendment 39-11600 (65 FR 10695, February 29, 2000), and by adding the following new airworthiness directive (AD):

# AIRWORTHINESS DIRECTIVE



Aircraft Certification Service  
Washington, DC

U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

*We post ADs on the internet at "www.faa.gov"*

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The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

**2005-06-11 Boeing:** Amendment 39-14019. Docket No. FAA-2004-19495; Directorate Identifier 2003-NM-180-AD.

## Effective Date

- (a) This AD becomes effective April 25, 2005.

## Affected ADs

- (b) This AD supersedes AD 2000-04-17, amendment 39-11600 (65 FR 10695, February 29, 2000).

## Applicability

- (c) This AD applies to Boeing Model 747-100, -100B, -100B SUD, -200B, and -300 series airplanes; and Model 747SR and 747SP series airplanes; certificated in any category; as identified in Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002.

## Unsafe Condition

- (d) This AD was prompted by the results of an additional detailed analysis that indicate fatigue cracks can initiate sooner than has previously been observed. We are issuing this AD to prevent failure of the upper deck floor beams at certain body stations (BS) due to fatigue cracking, which could result in rapid decompression and reduced controllability of the airplane.

## 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.

## New Initial Compliance Time

- (f) At the earlier of the times specified in paragraphs (f)(1) and (f)(2) of this AD, do the actions specified in paragraph (h) of this AD.

(1) Before the accumulation of 28,000 total flight cycles, or within 60 days after March 15, 2000 (the effective date of AD 2000-04-17, amendment 39-11600), whichever occurs later.

(2) Before the accumulation of 18,000 total flight cycles, or within 1,000 flight cycles after the effective date of this AD, whichever occurs later.

## **Determining Number of Flight Cycles for Compliance Time**

(g) For the purposes of calculating the compliance threshold for the actions required by paragraph (f) of this AD, all pressurized flight cycles, including the number of flight cycles in which cabin differential pressure is at 2.0 pounds per square inch (psi) or less, must be counted when determining the number of flight cycles that have occurred on the airplane. Where the service bulletin and this AD differ, the AD prevails.

## **Requirements of AD 2000-04-17 and New Repair Method**

(h) At the time specified in paragraph (f) of this AD, perform the actions required by either paragraph (h)(1) or (h)(2) of this AD. After any inspection, operators may conduct the subsequent inspection using the alternate inspection method provided that its corresponding repetitive inspection interval is used, rather than the interval for the previous inspection method.

(1) Gain access to the upper deck floor beams from above the upper deck floor, and perform an open-hole high frequency eddy current (HFEC) inspection to detect cracking of the upper deck floor beams at BS 340 and 360, and on both the left and right sides of the floor beam at BS 380 between buttock lines (BL) 40 and 76; in accordance with Part 1 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002.

(i) If no cracking is found, perform the actions required by paragraph (h)(1)(i)(A), (h)(1)(i)(B), or (h)(1)(i)(C) of this AD, in accordance with the alert service bulletin.

(A) Repeat the inspection required by paragraph (h)(1) of this AD at intervals not to exceed 3,000 flight cycles.

(B) Modify (oversize) the floor panel attachment fastener holes as specified in Figure 5 of the alert service bulletin, and repeat the inspection required by paragraph (h)(1) of this AD within 10,000 flight cycles. Repeat the inspection at intervals not to exceed 3,000 flight cycles.

(C) Do the applicable repair procedures shown in Part 3 of the Accomplishment Instructions of the alert service bulletin; except where the alert service bulletin specifies to contact Boeing for appropriate action, before further flight, repair in accordance with paragraph (h)(1)(ii)(A) of this AD.

(ii) If any cracking is found, before further flight, do the action specified in either paragraph (h)(1)(ii)(A) or (h)(1)(ii)(B) of this AD.

(A) Repair in accordance with a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA, Transport Airplane Directorate; or in accordance with data meeting the certification basis of the airplane approved by a Boeing Company Designated Engineering Representative (DER) or Authorized Representative (AR) for the Boeing Delegation Option Authorization (DOA) who has been authorized by the Manager, Seattle ACO to make such findings. For a repair method to be approved by the Manager, Seattle ACO, as required by this paragraph, the Manager's approval letter must specifically reference this AD.

(B) Repair in accordance with Part 3 of the Accomplishment Instructions of the alert service bulletin; except where the alert service bulletin specifies to contact Boeing for appropriate action, before further flight, repair in accordance with paragraph (h)(1)(ii)(A) of this AD.

(2) Gain access to the upper deck floor beams from below the upper deck floor; and perform a surface HFEC inspection to detect cracking of the floor beams at BS 340 and 360, and on both the left and right sides of the floor beam at BS 380 between BL 40 and 76; in accordance with Part 2 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002.

(i) If no cracking is found, repeat the inspection required by paragraph (h)(2) of this AD at intervals not to exceed 750 flight cycles.

(ii) If any cracking is found, before further flight, do the action specified in paragraph (h)(1)(ii) of this AD.

## **New Post-Repair Inspection**

(i) For areas repaired in accordance with paragraph (h)(1)(i)(C) or (h)(1)(ii)(B) of this AD: Before the accumulation of the applicable threshold specified in the "New Inspection Threshold" column in Table 1 of Part 3 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002, after accomplishing the repair; or within 1,000 flight cycles after the effective date of this AD; whichever occurs later: Do the actions specified in paragraphs (i)(1) through (i)(3) of this AD, as applicable.

(1) For locations that have been repaired by oversizing the fastener holes only (i.e., repair strap and/or clip not installed) as shown in Part 3 of the Accomplishment Instructions of Revision 1 or 2 of the alert service bulletin: Perform an open-hole HFEC inspection to detect cracking of the upper deck floor beams, in accordance with Part 1 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002.

(2) For locations previously repaired as shown in Figure 8 of Revision 1 or 2 of the alert service bulletin: Do an open-hole HFEC inspection to detect cracks at the fastener holes of the floor panel attachment and the inboard and outboard end fastener locations common to the repair strap, in accordance with Part 4 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002.

(3) For locations previously repaired as shown in Figure 9 or Figure 10 of Revision 1 or 2 of the alert service bulletin: Do a surface HFEC inspection to detect cracks at the upper chord along the edge of the trimmed surface; and perform an open-hole HFEC inspection to detect cracks at the fastener holes of the floor panel attachment and the inboard and outboard end fastener locations common to the repair strap, in accordance with Part 4 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002.

(j) If no crack is detected during any inspection required by paragraphs (i)(1) through (i)(3) of this AD, repeat the applicable inspection thereafter at intervals not to exceed 3,000 flight cycles.

(k) If any crack is detected during any inspection required by paragraph (i)(1) through (i)(3) of this AD, before further flight, do the action specified in paragraph (h)(1)(ii)(A) of this AD.

(l) For areas repaired in accordance with paragraph (h)(1)(ii)(A) of this AD that do not have a post-repair inspection program approved by the Manager, Seattle ACO, or according to data meeting the certification basis of the airplane approved by an AR for the Boeing DOA Organization who has been authorized by the Manager, Seattle ACO, to make those findings: Do the actions specified in paragraph (h) of this AD at the time specified in that paragraph.

## **Credit for Previous Released Alert Service Bulletin**

(m) Actions accomplished before the effective date of this AD per Boeing Alert Service Bulletin 747-53A2431, dated February 10, 2000; or Revision 1, dated March 8, 2001; are acceptable for compliance with the applicable requirements of this AD.

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

(n)(1) The Manager, Seattle 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) An AMOC that provides an acceptable level of safety may be used for any repair required by this AD, if it is approved by an AR for the Boeing DOA Organization who 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.

(3) AMOCs, approved previously per AD 2000-14-17, amendment 39-11600, are approved as AMOCs with paragraph (h)(1)(ii)(A) of this AD, provided that a post-repair inspection program has been approved by the Manager, Seattle ACO, or by a Boeing Company Designated Engineering Representative or an AR for the Boeing DOA Organization who has been authorized by the Manager, Seattle ACO, to make those findings.

### **Material Incorporated by Reference**

(o) You must use Boeing Alert Service Bulletin 747-53A2431, Revision 2, dated June 13, 2002, to perform the actions that are required by this AD, unless the AD specifies otherwise. The Director of the Federal Register approves the incorporation by reference of this document in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. For copies of the service information, contact Boeing Commercial Airplanes, P.O. Box 3707, Seattle, Washington 98124-2207. For information on the availability of this material at the National Archives and Records Administration (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). You may view the AD docket at the Docket Management Facility, U.S. Department of Transportation, 400 Seventh Street SW, room PL-401, Nassif Building, Washington, DC.

Issued in Renton, Washington, on March 9, 2005.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 05-5386 Filed 3-18-05; 8:45 am]

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