

Airworthiness Directive

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [65 FR 47255 8/2/2000]

[Docket No. 98-NM-285-AD; Amendment 39-11840; AD **2000-15-08**]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 747 Series Airplanes

PDF Copy (If Available):

▼ Preamble Information

AGENCY: Federal Aviation Administration, DOT

ACTION: Final rule

SUMMARY: This amendment supersedes an existing airworthiness directive (AD), applicable to certain Boeing Model 747 series airplanes, that currently requires repetitive inspections for damage or cracking of the aft pressure bulkhead, and cracking of the bulkhead web-to-Y-ring lap joint area and the upper segment of the bulkhead web. That AD also requires certain follow-on actions, if necessary. This amendment requires that a currently required one-time inspection to detect cracking of the upper segment of the bulkhead web be accomplished repetitively, and adds additional repetitive inspections to detect cracking of the upper and lower segments of the aft bulkhead web. The actions specified by this AD are intended to detect and correct fatigue cracking of the bulkhead web, which could result in rapid depressurization of the airplane, and consequent reduced controllability of the airplane.

DATES: Effective September 6, 2000.

The incorporation by reference of certain publications listed in the regulations was approved previously by the Director of the Federal Register as of October 7, 1998 (63 FR 50495, September 22, 1998).

ADDRESSES: The service information referenced in this AD may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207. This information may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Rick Kawaguchi, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Transport Airplane Directorate, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-1153; fax (425) 227-1181.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) by superseding AD 98-20-20, amendment 39-10786 (63 FR 50495, September 22, 1998), which is applicable to certain Boeing 747 series airplanes, was published in the Federal Register on February 2, 2000 (65 FR 4906). The action proposed to continue to require certain actions required by the existing AD. The action proposed to add a requirement that a detailed visual inspection to detect fatigue cracking of the upper segment of the bulkhead web required by the existing AD be accomplished repetitively, along with corrective actions, if necessary. The action also proposed to require additional repetitive surface probe high frequency eddy current (HFEC) inspections to detect cracking of the upper and lower segments of the bulkhead web, and repair, if necessary.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comment received.

Request to Exclude Portion of Inspection Area

One commenter requests that the FAA revise paragraph (h) of the proposed AD to include the following statement: "For the inspection of the lower segment of the bulkhead web, the area between the 149 degree radial zee stiffeners may be omitted. These stiffeners are immediately outboard of pressure pans which reinforce the electrical wires [sic] penetrations, part number 65B02633-xx." The commenter states that this area does not need surface probe HFEC inspections because splice straps and reinforcing doublers installed on the web during production improve the durability of the lap joint and significantly reduce the stress level of the web-to-Y-ring lap joint in this area.

The FAA concurs with the commenter's request and its rationale. The FAA also infers that the commenter's request applies to paragraph (i) as well as paragraph (h), and has revised those paragraphs in this final rule accordingly.

Conclusion

After careful review of the available data, including the comment noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the change previously described. The FAA has determined that this change will neither increase the economic burden on any operator nor increase the scope of the AD.

Cost Impact

There are approximately 671 Model 747 series airplanes of the affected design in the worldwide fleet. The FAA estimates that 149 airplanes of U.S. registry will be affected by this AD. The actions that are currently required by AD 98-20-20 and retained in this AD take approximately 360 work hours per airplane to accomplish, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of the currently required actions on U.S. operators is estimated to be \$3,218,400, or \$21,600 per airplane, per inspection cycle. The new repetitive detailed visual inspections that are required in this AD take approximately 4 work hours per airplane to accomplish, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of this requirement on U.S. operators is estimated to be \$35,760, or \$240 per airplane, per inspection cycle.

The new repetitive HFEC inspections that are required in this AD take approximately 48 work hours per airplane to accomplish, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of this requirement on U.S. operators is estimated to be \$429,120, or \$2,880 per airplane, per inspection cycle.

The cost impact figures discussed above are based on assumptions that no operator has yet accomplished any of the requirements of this AD, and that no operator would accomplish those actions in the future if this AD were not adopted. The cost impact figures discussed in AD rulemaking actions represent only the time necessary to perform the specific actions actually required by the AD. These figures typically do not include incidental costs, such as the time required to gain access and close up, planning time, or time necessitated by other administrative actions.

Regulatory Impact

The regulations adopted herein 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. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132. For the reasons discussed above, I certify that this action (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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the

caption "ADDRESSES."

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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. Section 39.13 is amended by removing amendment 39-10786 (63 FR 50495, September 22, 1998), and by adding a new airworthiness directive (AD), amendment 39-11840, to read as follows:

▼ Regulatory Information

2000-15-08 BOEING: Amendment 39-11840. Docket 98-NM-285-AD. Supersedes AD 98-20-20, Amendment 39-10786.

Applicability: Model 747 series airplanes, line numbers 1 through 671 inclusive; certificated in any category.

NOTE 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (j)(1) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To detect and correct fatigue cracking of the bulkhead web, which could result in rapid depressurization of the airplane, and consequent reduced controllability of the airplane, accomplish the following:

RESTATEMENT OF ACTIONS REQUIRED BY AD 98-20-20, AMENDMENT 39-

10786:
Initial Detailed Visual Inspection

(a) Within 750 landings after December 10, 1987 (the effective date for AD 87-23-10, amendment 39-5758), unless accomplished within the last 1,250 landings [for airplanes subject to a 2,000-landing repeat inspection interval in accordance with paragraph (b) of this AD], or unless accomplished within the last 250 landings [for airplanes subject to a 1,000-landing repeat inspection interval in accordance with paragraph (b) of this AD], perform a detailed visual inspection; in accordance with Boeing Service Bulletin 747-53-2275, dated March 26, 1987, Revision 1, dated August 13, 1987, Revision 2, dated March 31, 1988, Revision 3, dated March 29, 1990, Revision 4, dated March 26, 1992, or Revision 5, dated January 16, 1997, or Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998; of the aft side of the entire Body Station (BS) 2360 aft pressure bulkhead for damage such as dents, tears, nicks, gouges, or scratches; and cracks at splices and doublers, and around the Auxiliary Power Unit pressure pan cutout; and, for Group 4 airplanes only, inspect from the forward side, the area adjacent to the window cutout for damage or cracks.

NOTE 2: Notwithstanding provisions to the contrary in AD 87-23-10, and in Boeing Service Bulletin 747-53-2275, dated March 26, 1987, Revision 1, dated August 13, 1987, Revision 2, dated March 31, 1988, Revision 3, dated March 29, 1990, Revision 4, dated March 26, 1992, and Revision 5, dated January 16, 1997: For Model 747SR airplanes operating at a cabin pressure differential lower than 8.6 pounds-per-square-inch (psi), an adjustment factor of 1.2 shall NOT be used after October 7, 1998 (the effective date for AD 98-20-20), as a multiplier for inspection thresholds and intervals specified in this AD.

NOTE 3: For the purposes of this AD, a detailed visual inspection is defined as: "An intensive visual examination of a specific structural area, system, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at intensity deemed appropriate by the inspector. Inspection aids such as mirror, magnifying lenses, etc. may be used. Surface cleaning and elaborate access procedures may be required."

Repetitive Detailed Visual Inspections

(b) After initial compliance with paragraph (a) of this AD, continue to inspect as follows:
(1) For Group 1 airplanes, repeat the inspections required by paragraph (a) of this AD, at intervals not to exceed 2,000 landings.

(2) For Groups 2 and 3 airplanes, repeat the inspections required by paragraph (a) of this AD, at intervals not to exceed 1,000 landings; or optionally, at the applicable time specified in paragraph (b)(2)(i) or (b)(2)(ii) of this AD.

(i) For Group 2 airplanes that operate the entire interval with aft lavatory complexes or galleys adjacent to bulkheads, repeat the inspections required by paragraph (a) of this AD at intervals not to exceed 2,000 landings.

(ii) For Groups 2 and 3 airplanes that operate the entire interval with an intact protective shield on the lower half of the forward side of the bulkhead, repeat the inspections

required by paragraph (a) of this AD at intervals not to exceed 2,000 landings; and perform a detailed visual inspection of the protective shield for damage in accordance with Boeing Service Bulletin 747-53-2275, dated March 26, 1987, Revision 1, dated August 13, 1987, Revision 2, dated March 31, 1988, Revision 3, dated March 29, 1990, Revision 4, dated March 26, 1992, or Revision 5, dated January 16, 1997, or Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998, at intervals not to exceed 1,000 landings. If damage is found to the protective shield that exceeds the limits indicated in the service bulletin, prior to further flight, repeat the inspection required by paragraph (a) of this AD.

(3) For Group 4 airplanes, repeat the inspections required by paragraph (a) of this AD at intervals not to exceed 1,000 landings.

Repetitive Eddy Current, Ultrasonic, and X-Ray Inspections

(c) Within 750 landings after December 10, 1987, or prior to the accumulation of 20,000 total landings, whichever occurs later, unless accomplished within the last 3,250 landings; and at intervals thereafter not to exceed 4,000 landings; perform eddy current, ultrasonic, and X-ray inspections of the aft side of the BS 2360 aft pressure bulkhead for cracks; in accordance with Boeing Service Bulletin 747-53-2275, dated March 26, 1987, Revision 1, dated August 13, 1987, Revision 2, dated March 31, 1988, Revision 3, dated March 29, 1990, Revision 4, dated March 26, 1992, or Revision 5, dated January 16, 1997, or Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998.

Repetitive Detailed Visual Inspections

(d) Within 750 landings after December 10, 1987, or prior to the accumulation of 20,000 total landings, whichever occurs later, unless accomplished within the last 6,250 landings; and thereafter at intervals not to exceed 7,000 landings until the inspection required by paragraph (g) of this AD is accomplished: Perform a detailed visual inspection to detect cracking of the BS 2360 aft pressure bulkhead web-to-Y-ring lap joint area between radial stiffeners from the forward side of the bulkhead, in accordance with Boeing Service Bulletin 747-53-2275, dated March 26, 1987, Revision 1, dated August 13, 1987, Revision 2, dated March 31, 1988, Revision 3, dated March 29, 1990, Revision 4, dated March 26, 1992, or Revision 5, dated January 16, 1997, or Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998.

Repair

(e) If any cracking or damage is found during any inspection required by paragraph (a), (b), (c), or (d) of this AD, repair prior to further flight in accordance with Boeing Service Bulletin 747-53-2275, dated March 26, 1987, Revision 1, dated August 13, 1987, Revision 2, dated March 31, 1988, Revision 3, dated March 29, 1990, Revision 4, dated March 26, 1992, or Revision 5, dated January 16, 1997, or Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998.

Cabin Pressure Differential

(f) For the purpose of complying with this AD, the number of landings may be determined to equal the number of pressurization cycles where the cabin pressure differential was greater than 2.0 psi.

Initial Detailed Visual Inspection

(g) Perform a detailed visual inspection from the forward side of the bulkhead of the upper segment of the bulkhead web at BS 2360 to detect cracking, in accordance with Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998, at the earlier of the times specified in paragraphs (g)(1) and (g)(2) of this AD. Accomplishment of this inspection terminates the repetitive inspection requirement of paragraph (d) of this AD.

(1) Within 7,000 landings after the most recent detailed visual inspection accomplished in accordance with paragraph (d) of this AD.

(2) At the latest of the times specified in paragraphs (g)(2)(i), (g)(2)(ii), and (g)(2)(iii) of this AD.

(i) Prior to the accumulation of 20,000 total landings.

(ii) Within 1,500 landings after the most recent detailed visual inspection accomplished in accordance with paragraph (d) of this AD.

(iii) Within 90 days after October 7, 1998 (the effective date of AD 98-20-20).

Follow-On Action: High Frequency Eddy Current Inspection

(h) If any cracking is detected during the detailed visual inspections required by paragraph (g) of this AD, prior to further flight, accomplish a surface probe high frequency eddy current (HFEC) inspection from the forward side of the bulkhead to detect cracking of the upper and lower segments of the bulkhead web around the fasteners that attach the web to the outer chord of the Y-ring, in accordance with Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998. For the inspection of the lower segment of the bulkhead web, the area between the 149 degree radial zee stiffeners may be omitted. Repair any cracking, prior to further flight, 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 type certification basis of the airplane approved by a Boeing Company Designated Engineering Representative who has been authorized by the Manager, Seattle ACO, to make such findings.

NEW REQUIREMENTS OF THIS AD:

Repetitive Detailed Visual and HFEC Inspections

(i) If no cracking is detected during the detailed visual inspection required by paragraph (g) of this AD, within 1,500 flight cycles after accomplishment of that inspection or within 250 flight cycles after the effective date of this AD, whichever occurs later: Repeat the detailed visual inspection, as specified in paragraph (g); and perform a surface

probe HFEC inspection from the forward side of the bulkhead to detect cracking of the upper and lower segments of the bulkhead web, in accordance with Figure 15 of Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998. For the inspection of the lower segment of the bulkhead web, the area between the 149 degree radial zee stiffeners may be omitted.

(1) If no cracking is detected, repeat the detailed visual inspection thereafter at intervals not to exceed 1,500 flight cycles; and repeat the surface probe HFEC inspection thereafter at intervals not to exceed 3,000 flight cycles.

Repair

(2) If any cracking is detected, prior to further flight, repair in accordance with a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA, Transport Airplane Directorate, or a Boeing Company Designated Engineering Representative who has been authorized by the FAA 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.

Alternative Methods of Compliance

(j) (1) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Seattle ACO. Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Seattle ACO.

(2) Alternative methods of compliance, approved previously in accordance with AD 98-20-20, amendment 39-10786, are approved as alternative methods of compliance with this AD.

NOTE 4: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Seattle ACO.

Special Flight Permits

(k) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

Incorporation by Reference

(l) Except as provided by paragraphs (h) and (i)(2) of this AD, the actions shall be done in accordance with Boeing Service Bulletin 747-53-2275, dated March 26, 1987; Boeing Service Bulletin 747-53-2275, Revision 1, dated August 13, 1987; Boeing Service Bulletin 747-53-2275, Revision 2, dated March 31, 1988; Boeing Service Bulletin 747-53-2275, Revision 3, dated March 29, 1990; Boeing Service Bulletin 747-53-2275,

Revision 4, dated March 26, 1992; Boeing Service Bulletin 747-53-2275, Revision 5, dated January 16, 1997; or Boeing Alert Service Bulletin 747-53A2275, Revision 6, dated August 27, 1998; as applicable. This incorporation by reference was approved previously by the Director of the Federal Register as of October 7, 1998 (63 FR 50495, September 22, 1998). Copies may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207. Copies may be inspected at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

Effective Date

(m) This amendment becomes effective on September 6, 2000.

▼ Footer Information

Issued in Renton, Washington, on July 26, 2000.
Donald L. Riggan,
Acting Manager, Transport Airplane Directorate,
Aircraft Certification Service.

▼ Comments