

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2015-3983; Directorate Identifier 2015-NM-141-AD; Amendment 39-18448; AD 2016-07-03]

RIN 2120-AA64

Airworthiness Directives; The Boeing Company Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-300, 747SR, and 747SP series airplanes. This AD was prompted by an evaluation by the design approval holder (DAH) indicating that the upper chords of the upper deck floor beams are subject to widespread fatigue damage (WFD). This AD requires repetitive inspections for cracks at the floor panel attachment fastener holes; repetitive inspections for cracks in the upper and lower chords of the upper deck floor beams at permanent fastener locations; repetitive inspections for cracks in certain repaired and modified areas; and related investigative and corrective actions if necessary. This AD also requires repetitive replacement of the upper chords of the upper deck floor beams, including pre-replacement inspections and corrective action if necessary; and post-replacement repetitive inspections and repair if necessary. We are issuing this AD to detect and correct fatigue cracking of the upper chords of the upper deck floor beams. Undetected cracking could result in large deflection or deformation of the upper deck floor beams, resulting in damage to wire bundles and control cables for the flight control system, and reduced controllability of the airplane. Multiple adjacent severed floor beams could result in rapid decompression of the airplane.

DATES: This AD is effective May 5, 2016.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of May 5, 2016.

ADDRESSES: For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Data & Services Management, P. O. Box 3707, MC 2H-65, Seattle, WA 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet <https://www.myboeingfleet.com>. You may view this referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, WA. For information on the

availability of this material at the FAA, call 425-227-1221. It is also available on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2015-3983.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov> by searching for and locating Docket No. FAA-2015-3983; 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 (phone: 800-647-5527) is Docket 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: Nathan Weigand, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6428; fax: 425-917-6590; email: nathan.p.weigand@faa.gov.

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-300, 747SR, and 747SP series airplanes. The NPRM published in the Federal Register on October 6, 2015 (80 FR 60303) ("the NPRM"). The NPRM was prompted by an evaluation by the DAH indicating that the upper chords of the upper deck floor beams are subject to WFD. The NPRM proposed to require repetitive inspections for cracks at the floor panel attachment fastener holes; repetitive inspections for cracks in the upper and lower chords of the upper deck floor beams at permanent fastener locations; repetitive inspections for cracks in certain repaired and modified areas; and related investigative and corrective actions if necessary. The NPRM also proposed to require repetitive replacement of the upper chords of the upper deck floor beams, including pre-replacement inspections and corrective action if necessary; and post-replacement repetitive inspections and repair if necessary. We are issuing this AD to detect and correct fatigue cracking of the upper chords of the upper deck floor beams. Undetected cracking could result in large deflection or deformation of the upper deck floor beams, resulting in damage to wire bundles and control cables for the flight control system, and reduced controllability of the airplane. Multiple adjacent severed floor beams could result in rapid decompression of the airplane.

Comments

We gave the public the opportunity to participate in developing this AD. The following presents the comments received on the NPRM and the FAA's response to each comment. A member of the public supported the NPRM and an anonymous commenter had no objection to the NPRM.

Request To Clarify Credit for Previous Actions

Boeing requested that we clarify that credit for previous actions is limited to those actions that comply with the new proposed requirements of the NPRM. Boeing noted that paragraph (m) of the proposed AD should provide credit for using Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003, provided the new requirements specified in Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, are met.

We agree that clarification is necessary. Paragraph (m) of this AD, "Credit for Previous Actions," provides credit for actions done before the effective date of this AD using Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003, for the corresponding actions required by paragraphs (g), (h), and (i) of this AD. Paragraphs (g), (h), and (i) of this AD refer to Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, as the appropriate source of service information for accomplishing the actions required by those paragraphs. Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, added certain inspection locations. Therefore, for the added inspection locations specified in Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, paragraph (m) of this AD does not provide credit because Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003, cannot be used for those locations. We have revised paragraph (m) of this AD to clarify that although credit is given for using Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003, actions required by paragraphs (g), (h), and (i) of this AD that are not identified in Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003, must still be done.

Boeing also stated that credit should be given in the NPRM for Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012; and Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012.

We have not included Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012; and Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012; in paragraph (m) of this AD because that service information is already cited in paragraphs (g) through (k) of this AD as the only appropriate source of service information for accomplishing the actions required by this AD. As allowed by the phrase, "unless already done," in paragraph (f) of this AD, if the requirements of this AD have already been accomplished, this AD does not require that those actions be repeated.

Request To Give Credit for Previous Alternative Methods of Compliance (AMOCs)

Boeing requested that previously approved AMOCs for AD 2005-20-29, Amendment 39-14326 (70 FR 59246, October 12, 2005), be approved for the corresponding provisions of the proposed AD, provided the previously approved AMOCs satisfy the inspection locations and compliance times specified by the proposed AD. Boeing noted that AMOCs would be needed for new inspection locations and compliance times specified in the proposed AD.

We acknowledge that certain AMOCs for AD 2005-20-29, Amendment 39-14326 (70 FR 59246, October 12, 2005), might also address the actions and compliance times required by this AD. However, each individual AMOC would need to be evaluated to ensure the identified unsafe condition is addressed. Any person may request approval of an AMOC under the provisions of paragraph (o) of this AD. We have not changed this final rule in this regard.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this AD with the changes described previously—and minor editorial changes. We have determined that these minor changes:

- Are consistent with the intent that was proposed in the NPRM for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM.

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

Related Service Information Under 1 CFR Part 51

We reviewed the following service information.

- Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012. This service information describes procedures for repetitive open hole or surface high frequency eddy current (HFEC) inspections, as applicable, for cracks at the floor panel attachment fastener holes in certain areas and stations; repetitive surface HFEC inspections for cracks in the upper and lower chords of the upper deck floor beams at permanent fastener locations in certain areas and stations; and related investigative and corrective actions. This service information also describes procedures, for airplanes on which certain repairs or modifications are done, for repetitive open hole or surface HFEC inspections, as applicable, for cracks in the repaired and modified areas; and repair.
- Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012. This service information describes procedures for repetitive replacement of the upper chords of the upper deck floor beams, including pre-replacement inspections and corrective action, and post-replacement repetitive inspections and repair.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in the ADDRESSES section.

Costs of Compliance

We estimate that this AD affects 67 airplanes of U.S. registry.

We estimate the following costs to comply with this AD:

Estimated Costs				
Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Inspections specified in Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012	Up to 884 work-hours × \$85 per hour = \$75,140, per inspection cycle	\$0	\$75,140, per inspection cycle	\$5,034,380, per inspection cycle.
Replacement specified in Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012	Up to 696 work-hours × \$85 per hour = \$59,160, per replacement	¹ \$0	\$59,160, per replacement	\$3,963,720, per replacement.
Post-replacement inspections specified in Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012	Up to 586 work-hours × \$85 per hour = \$49,810, per inspection cycle	\$0	\$49,810, per inspection cycle	\$3,337,270, per inspection cycle.

¹ We currently have no specific cost estimates associated with the parts necessary for the replacement.

We have received no definitive data that would enable us to provide cost estimates for the on-condition actions specified in this AD.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: "General requirements." Under that section, Congress charges the FAA with

promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

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

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

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979),
- (3) Will not affect intrastate aviation in Alaska, and
- (4) 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.

List of Subjects in 14 CFR Part 39

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

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive (AD):



2016-07-03 The Boeing Company: Amendment 39-18448 ; Docket No. FAA-2015-3983;
Directorate Identifier 2015-NM-141-AD.

(a) Effective Date

This AD is effective May 5, 2016.

(b) Affected ADs

This AD affects AD 2005-20-29, Amendment 39-14326 (70 FR 59246, October 12, 2005).

(c) Applicability

This AD applies to The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-300, 747SR, and 747SP series airplanes; certificated in any category; as identified in Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012.

(d) Subject

Air Transport Association (ATA) of America Code 53, Fuselage.

(e) Unsafe Condition

This AD was prompted by an evaluation by the design approval holder (DAH) indicating that the upper chords of the upper deck floor beams are subject to widespread fatigue damage (WFD). We are issuing this AD to detect and correct fatigue cracking of the upper chords of the upper deck floor beams. Undetected cracking could result in large deflection or deformation of the upper deck floor beams, resulting in damage to wire bundles and control cables for the flight control system, and reduced controllability of the airplane. Multiple adjacent severed floor beams could result in rapid decompression of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Repetitive Inspections of the Upper Chords of the Upper Deck Floor Beams

At the applicable times specified in Tables 1 through 7 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, except as required by paragraph (l)(1) of this AD: Do the inspections specified in paragraphs (g)(1) and (g)(2) of this AD, and do all applicable related investigative and corrective actions, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, except as required by paragraph (l)(2) of this AD. Repeat the inspections specified in paragraphs (g)(1) and (g)(2) of this AD thereafter at the applicable times specified in Tables 1 through 7 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2452, Revision

1, dated July 16, 2012. Do all applicable related investigative and corrective actions before further flight. Doing the inspections required by paragraphs (g)(1) and (g)(2) of this AD terminates the inspections required by paragraphs (m) and (n) of AD 2005-20-29, Amendment 39-14326 (70 FR 59246, October 12, 2005).

(1) Do an open hole or surface high frequency eddy current (HFEC) inspection, as applicable, for cracks at the fastener holes of the floor panel attachment in the applicable areas and stations identified in Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012.

(2) Do a surface HFEC inspection for cracks in the upper and lower chords of the upper deck floor beams at permanent fastener locations in the applicable areas and stations identified in Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012.

(h) Terminating Modification and Repair for the Inspection Specified in Paragraph (g)(1) of This AD

A fastener hole modification or a fastener hole repair in Area 1 or Area 2 as described in Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, terminates the inspection of the fastener holes of the floor panel attachment required by paragraph (g)(1) of this AD for the repaired or modified area only, provided the modification and repair, including related investigative and corrective actions, are done in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, except as required by paragraph (l)(2) of this AD.

(i) Post Modification/Repair Repetitive Inspections

(1) For airplanes on which any fastener hole modification or any fastener hole repair was done as specified in Boeing Alert Service Bulletin 747-53A2452: Except as required by paragraph (i)(2) of this AD, at the applicable times specified in Tables 8 and 9 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, or within 1,000 flight cycles after the effective date of this AD, whichever occurs later, do an open hole or surface HFEC inspection, as applicable, for cracks in the repaired and modified areas, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012. If any cracking is found, before further flight, repair using a method approved in accordance with the procedures specified in paragraph (o) of this AD. Repeat the applicable inspections thereafter at the times specified in Tables 8 and 9 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012. Doing an inspection required by this paragraph terminates the inspections required by paragraph (p) of AD 2005-20-29, Amendment 39-14326 (70 FR 59246, October 12, 2005).

(2) For any repair #10 or repair #13 done as specified in Boeing Alert Service Bulletin 747-53A2452: Before further flight, do post-repair inspections using a method approved in accordance with the procedures specified in paragraph (o) of this AD.

(j) Replacement of the Upper Chords of the Upper Deck Floor Beams (Includes Pre-Placement Inspections)

Replace the upper chords of the upper deck floor beams by doing the actions required by paragraphs (j)(1) and (j)(2) of this AD at the times specified in those paragraphs. Accomplishing the replacement required by this paragraph terminates the inspections required by paragraphs (g) and (i) of this AD.

(1) Before the accumulation of 30,000 total flight cycles, or within 3,000 flight cycles after the effective date of this AD, whichever occurs later, do an open hole HFEC inspection for cracks at certain fastener locations in the floor beam webs and side of body frames, and do a detailed inspection for cracks of any removed part that will be re-installed, and do all applicable corrective

actions, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012, except as required by paragraph (l)(2) of this AD. Do all applicable corrective actions before further flight.

(2) Before further flight after accomplishing the inspections required by paragraph (j)(1) of this AD, install new upper chords of the upper deck floor beams and reinforcing straps or angles, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012, except as required by paragraph (l)(2) of this AD.

(k) Post-Replacement Repetitive Inspections

For airplanes on which any replacement required by paragraph (j) or (k)(2)(ii) of this AD is done: At the applicable times specified in Tables 2 through 4 in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012, do HFEC inspections for cracks at the permanent fastener holes and the upper chords of the upper deck floor beams, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012.

(1) If any cracking is found during any inspection required by the introductory text of paragraph (k) or paragraph (k)(2)(i) of this AD, before further flight, repair using a method approved in accordance with the procedures specified in paragraph (o) of this AD.

(2) If no cracking is found during any inspection required by the introductory text of paragraph (k) or paragraph (k)(2)(i) of this AD, do the actions required by paragraphs (k)(2)(i) and (k)(2)(ii) of this AD.

(i) Repeat the inspections specified in paragraph (k) of this AD thereafter at the applicable times specified in Tables 8 and 9 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012.

(ii) Within 10,000 flight cycles after accomplishing the initial HFEC inspections required by the introductory text of paragraph (k) of this AD, replace the upper chords of the upper deck floor beams by doing the actions specified in paragraphs (j)(1) and (j)(2) of this AD.

(l) Exceptions to Service Information

(1) Where Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012, specifies a compliance time "after the Revision 1 date of this service bulletin," this AD requires compliance within the specified compliance time after the effective date of this AD.

(2) Where Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012; or Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012; specifies to contact Boeing for appropriate action: Before further flight, repair using a method approved in accordance with the procedures specified in paragraph (o) of this AD.

(m) Credit for Previous Actions

This paragraph provides credit for the actions required by paragraphs (g), (h), and (i) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003. For the actions required by paragraphs (g), (h), and (i) of this AD that are not identified in Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003, those actions must still be done. Boeing Alert Service Bulletin 747-53A2452, dated April 3, 2003, is incorporated by reference in AD 2005-20-29, Amendment 39-14326 (70 FR 59246, October 12, 2005).

(n) Special Flight Permit

Special flight permits, as described in Section 21.197 and Section 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199), are not allowed.

(o) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Seattle Aircraft Certification Office (ACO), FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the ACO, send it to the attention of the person identified in paragraph (p) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(3) An AMOC that provides an acceptable level of safety may be used for any repair, modification, or alteration required by this AD if it is approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) that has been authorized by the Manager, Seattle ACO, to make those findings. To be approved, the repair method, modification deviation, or alteration deviation must meet the certification basis of the airplane, and the approval must specifically refer to this AD.

(p) Related Information

(1) For more information about this AD, contact Nathan Weigand, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6428; fax: 425-917-6590; email: nathan.p.weigand@faa.gov.

(2) Service information identified in this AD that is not incorporated by reference is available at the addresses specified in paragraphs (q)(3) and (q)(4) of this AD.

(q) Material Incorporated by Reference

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

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Boeing Alert Service Bulletin 747-53A2452, Revision 1, dated July 16, 2012.

(ii) Boeing Alert Service Bulletin 747-53A2852, dated June 22, 2012.

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

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

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Renton, Washington, on March 20, 2016.
Michael Kaszycki,
Acting Manager, Transport Airplane Directorate,
Aircraft Certification Service.