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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

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

**[Docket No. FAA-2014-0170; Directorate Identifier 2013-NM-169-AD; Amendment 39-18027; AD 2014-23-11]**

**RIN 2120-AA64**

#### **Airworthiness Directives; The Boeing Company Airplanes**

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

**ACTION:** Final rule.

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**SUMMARY:** We are superseding Airworthiness Directive (AD) 2005-13-05, which applied to certain Boeing Model 747-400F series airplanes. AD 2005-13-05 required inspections for cracking of the web, upper chord, and upper chord strap of the upper deck floor beams, and repair of any cracking. AD 2005-13-05 also required a preventive modification of the upper deck floor beams, and repetitive inspections for cracking after accomplishing the modification. This new AD retains these actions and requires a second modification, repetitive inspections for cracking, and repair if necessary. This AD was prompted by a determination that the upper chords of the upper deck floor beams at certain stations are structures that are susceptible to widespread fatigue damage, and that certain airplanes with an initial modification require a second modification for the airplane to meet its limit of validity (LOV). We are issuing this AD to detect and correct fatigue cracking in certain upper chords of the upper deck floor beam, which could result in reduced structural integrity of the airplane and rapid decompression or reduced controllability of the airplane.

**DATES:** This AD is effective December 31, 2014.

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of December 31, 2014.

The Director of the Federal Register approved the incorporation by reference of a certain other publication listed in this AD as of July 27, 2005 (70 FR 35989, June 22, 2005).

**ADDRESSES:** 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>. 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.

## **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-2014-0170; 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 (ACO), 1601 Lind Avenue SW., Renton, WA 98057-3356; phone: 425-917-6428; fax: 425-917-6590; email: [Nathan.P.Weigand@faa.gov](mailto:Nathan.P.Weigand@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005). AD 2005-13-05 applied to certain Boeing Model 747-400F series airplanes. The NPRM published in the Federal Register on March 25, 2014 (79 FR 16241). The NPRM was prompted by a determination that the upper chords of the upper deck floor beams at certain stations are structures that are susceptible to widespread fatigue damage, and that certain airplanes with an initial modification require a second modification for the airplane to meet its LOV. The NPRM proposed to continue to require inspections for cracking of the web, upper chord, and upper chord strap of the upper deck floor beams, and repair of any cracking; a preventive modification of the upper deck floor beams; and repetitive inspections for cracking after accomplishing the modification. The NPRM proposed to also require a second modification, repetitive inspections for cracking, and repair if necessary. We are issuing this AD to detect and correct fatigue cracking in certain upper chords of the upper deck floor beam, which could result in reduced structural integrity of the airplane and rapid decompression or reduced controllability 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 (79 FR 16241, March 25, 2014) and the FAA's response to each comment.

### **Request To Clarify Post-Modification Inspection Options**

Boeing requested that we revise paragraphs (j) and (l) of the NPRM (79 FR 16241, March 25, 2014) to clarify that the inspection options of paragraphs (j)(2) and (l)(2) are applicable only when the primary preventative modification option has been accomplished. Boeing stated that Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, added an alternative preventative modification option for which the inspection options of paragraphs (j)(2) and (l)(2) of this AD are not viable.

We agree with the commenter's request because these words add clarity as to which inspection option should be used. We have revised paragraphs (j) and (l) of this AD by stating that, as of the effective date of this AD, for airplanes on which the alternative preventative modification has been

accomplished, only the inspection methods specified by paragraphs (j)(1) and (l)(1), respectively, of this AD may be used.

## Conclusion

We reviewed the relevant data, considered the comment 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 (79 FR 16241, March 25, 2014) for correcting the unsafe condition; and
- Do not add any additional burden upon the public than was already proposed in the NPRM (79 FR 16241, March 25, 2014).

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

## Costs of Compliance

We estimate that this AD affects 13 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
Pre-modification inspections (retained actions from AD 2005-13-05, Amendment 39-14141 ( <a href="#">70 FR 35989</a> , June 22, 2005))	11 work-hours × \$85 per hour = \$935	\$0	\$935	\$12,155.
Modification/inspections done during modification (retained actions from AD 2005-13-05, Amendment 39-14141 ( <a href="#">70 FR 35989</a> , June 22, 2005))	Up to 524 work-hours × \$85 per hour = \$44,540	Up to \$14,874	59,414	\$772,382.
Post-modification inspections (retained actions from AD 2005-13-05, Amendment 39-14141 ( <a href="#">70 FR 35989</a> , June 22, 2005))	66 work-hours × \$85 per hour = \$5,610	\$0	5,610	\$72,930.
Zero-Timing Procedure Option 1 (including inspections) (new action)	71 work-hours × \$85 per hour = \$6,035	\$0	6,035	Up to \$78,455.
Zero-Timing Procedure Option 2 (including inspections) (new action)	103 work-hours × \$85 per hour = \$8,755	\$0	8,755	Up to \$113,815.

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**

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),
- (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 removing Airworthiness Directive (AD) 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005), and adding the following new AD:



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**2014-23-11 The Boeing Company:** Amendment 39-18027 ; Docket No. FAA-2014-0170;  
Directorate Identifier 2013-NM-169-AD.

**(a) Effective Date**

This AD is effective December 31, 2014.

**(b) Affected ADs**

This AD replaces AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005).

**(c) Applicability**

This AD applies to The Boeing Company Model 747-400F series airplanes, certificated in any category, as identified in Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013.

**(d) Subject**

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

**(e) Unsafe Condition**

This AD was prompted by a report indicating that the upper chords of the upper deck floor beams at stations (STA) 340 through 520 have been determined to be structures that are susceptible to widespread fatigue damage, and airplanes that had an initial modification done before 15,000 total flight cycles require a second fastener hole zero-timing modification for the airplane to meet its limit of validity (LOV). We are issuing this AD to detect and correct fatigue cracking in certain upper chords of the upper deck floor beam, which could result in reduced structural integrity of the airplane and rapid decompression or reduced controllability of the airplane.

**(f) Compliance**

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

**(g) Retained Inspections With Revised Service Information**

This paragraph restates the requirements of paragraph (g) of AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005), with revised service information. Before the accumulation of 15,000 total flight cycles, or within 1,000 flight cycles after July 27, 2005 (the effective date of AD 2005-13-05), whichever is later: Accomplish detailed and open-hole high frequency eddy current (HFEC) inspections for cracking of the web, upper chord, and upper chord strap of the upper deck floor beams, by doing all the applicable actions in accordance with Part 3.B.1. of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, dated May 9, 2002; or Part 1 of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated

August 2, 2013. As of the effective date of this AD, only Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, may be used.

**(h) Retained Repair With Revised Service Information and Revised Repair Approval Language**

This paragraph restates the requirements of paragraph (h) of AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005), with revised service information and revised repair approval language. If any crack is found during any inspection required by paragraph (g) of this AD: Before further flight, accomplish the actions required by paragraph (h)(1) and (h)(2) of this AD.

(1) Repair in accordance with the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, dated May 9, 2002; or the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013; except where these service bulletins specify to contact Boeing for appropriate action, before further flight, repair the cracking using a method approved in accordance with the procedures specified in paragraph (o) of this AD. As of the effective date of this AD, only Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, may be used.

(2) Accomplish the inspections and preventive modification of the floor beams by doing all the actions in accordance with Part 3.B.2. or Part 3.B.3., as applicable, of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, dated May 9, 2002; or Part 2 or Part 3, as applicable, of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013. If any crack is found during any inspection, before further flight, repair as required by paragraph (h)(1) of this AD. As of the effective date of this AD, only Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, may be used.

**(i) Retained Modification With Revised Service Information**

This paragraph restates the requirements of paragraph (i) of AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005), with revised service information. If no crack is found during any inspection required by paragraph (g) of this AD: Accomplish the actions required by either paragraph (i)(1) or (i)(2) of this AD, at the time specified.

(1) Before further flight: Accomplish the inspections and preventive modification of the floor beam by doing all the actions in accordance with Part 3.B.2 or Part 3.B.3., as applicable, of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, dated May 9, 2002; or Part 2 or Part 3, as applicable, of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013. If the preventive modification is performed concurrently with the inspections required by paragraph (g) of this AD, the upper chord straps must be removed when performing the open-hole HFEC inspection. If any crack is found during any inspection, before further flight, repair as required by paragraph (h)(1) of this AD. As of the effective date of this AD, only Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, may be used.

(2) Before the accumulation of 20,000 total flight cycles, or within 1,000 flight cycles after July 27, 2005 (the effective date of AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005)), whichever is later: Accomplish the inspections and preventive modification of the upper deck floor beams, by doing all the actions in accordance with Part 3.B.2. or 3.B.3. as applicable, of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, dated May 9, 2002; or Part 2 or Part 3, as applicable, of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013. If any crack is found during any inspection, before further flight, repair as required by paragraph (h)(1) of this AD. As of the effective date of this AD, only Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, may be used.

**(j) Retained Post-Modification Inspections With Revised Service Information**

This paragraph restates the requirements of paragraph (j) of AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005), with revised service information. Within 15,000 flight cycles

after accomplishing the applicable preventive modification required by paragraph (h)(2), (i)(1), or (i)(2) of this AD: Accomplish the applicable inspections required by either paragraph (j)(1) or (j)(2) of this AD; if any crack is found during any inspection, before further flight, repair as required by paragraph (h)(1) of this AD. As of the effective date of this AD, for airplanes on which the alternative preventive modification, as identified in the NOTE after step 3. of "PART 2–INSPECTION AND PREVENTIVE MODIFICATION," or as identified in the NOTE after step 4. of "PART 3–INSPECTION AND PREVENTIVE MODIFICATION," of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, has been done, only the inspection specified by paragraph (j)(1) of this AD may be used.

(1) Accomplish detailed and surface HFEC inspections for cracking of the web, upper chord, and upper chord strap of the upper deck floor beams, by doing all the applicable actions in accordance with Part 3.B.4. of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, dated May 9, 2002; or Part 4 of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013. If no crack is found, repeat the inspections at intervals not to exceed 1,000 flight cycles. As of the effective date of this AD, only Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, may be used.

(2) Accomplish detailed and open-hole HFEC inspections for cracking of the web, upper chord, and strap of the upper deck floor beams, by doing all the applicable actions in accordance with Part 3.B.5. of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, dated May 9, 2002; or Part 5 of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013. If no crack is found, repeat the inspections at intervals not to exceed 5,000 flight cycles. As of the effective date of this AD, only Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, may be used.

#### **(k) New Floor Beam Hole Zero-Timing**

Within 20,000 flight cycles after accomplishing the preventive modification of the Station 340 to Station 520 upper deck floor beams specified in paragraph (h)(2), (i)(1), or (i)(2) of this AD, or within 1,000 flight cycles after the effective date of this AD, whichever occurs later: Accomplish the floor beam hole zero-timing, in accordance with Part 6 of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013.

#### **(l) New Post-Modification Floor Beam Hole Zero-Timing Inspections**

Within 15,000 flight cycles after accomplishing the floor beam hole zero-timing required by paragraph (k) of this AD: Accomplish the applicable inspections required by paragraph (l)(1) or (l)(2) of this AD; if any cracking is found during any inspection, before further flight, repair as required by paragraph (h)(1) of this AD. As of the effective date of this AD, for airplanes on which the alternative preventive modification, as identified in the NOTE after step 3. of "PART 2–INSPECTION AND PREVENTIVE MODIFICATION," or as identified in the NOTE after step 4. of "PART 3–INSPECTION AND PREVENTIVE MODIFICATION," of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, has been done, only the inspection method specified by paragraph (l)(1) of this AD may be used.

(1) Accomplish detailed and surface HFEC inspections for cracking of the web, upper chord, and straps of the Station 340 to Station 520 upper deck floor beams, by doing all the applicable actions, in accordance with Part 4 of the Accomplishment Instructions of Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013. If no cracking is found, repeat the inspections at intervals not to exceed 1,000 flight cycles.

(2) Accomplish detailed and open-hole HFEC inspections for cracking of the web, upper chord, and straps of the Station 340 to Station 520 upper deck floor beams, by doing all the applicable actions, in accordance with Part 5 of the Accomplishment Instructions of Boeing Service Bulletin

747-53A2443, Revision 2, dated August 2, 2013. If no cracking is found, repeat the inspections at intervals not to exceed 5,000 flight cycles.

**(m) Exception to Service Information**

Where Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013, specifies a compliance time "after the revision date on this service bulletin," this AD requires compliance within the specified compliance time after the effective date of this AD.

**(n) Credit for Previous Actions**

This paragraph provides credit for the inspections, repairs, and modification required by paragraphs (g) through (j) of this AD, if the corresponding actions were performed before the effective date of this AD using Boeing Service Bulletin 747-53A2443, Revision 1, dated June 25, 2009.

**(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)(1) 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 required by this AD if it is approved by Boeing Commercial Airplanes Organization Designation Authorization (ODA) that 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.

(4) AMOCs approved for AD 2005-13-05, Amendment 39-14141 (70 FR 35989, June 22, 2005), are approved as AMOCs for the corresponding requirements of paragraphs (g) through (j) (the retained actions) of 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 (ACO), 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)(5) and (q)(6) 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.

(3) The following service information was approved for IBR on December 31, 2014.

(i) Boeing Service Bulletin 747-53A2443, Revision 2, dated August 2, 2013.

(ii) Reserved.

(4) The following service information was approved for IBR on July 27, 2005 (70 FR 35989, June 22, 2005).

(i) Boeing Service Bulletin 747-53A2443, dated May 9, 2002.

(ii) Reserved.

(5) 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>.

(6) You may view this 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.

(7) 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 November 6, 2014.

Jeffrey E. Duven,  
Manager, Transport Airplane Directorate,  
Aircraft Certification Service.