



[4910-13-P]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2016-9067; Directorate Identifier 2016-NM-043-AD]**

**RIN 2120-AA64**

**Airworthiness Directives; The Boeing Company Airplanes**

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

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to adopt a new airworthiness directive (AD) for all The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes. This proposed AD was prompted by a report of incidents involving fatigue cracking in transport category airplanes that are approaching or have exceeded their design service objective and a structural reevaluation by the manufacturer that identified additional structural elements that qualify as structural significant items (SSIs). This proposed AD would require revising the maintenance or inspection program, as applicable, to include inspections that will give no less than the required damage tolerance rating (DTR) for certain SSIs, and repairing any cracked structure. This proposed AD would also require inspections to detect cracks of all SSI structure, and repair if necessary. We are proposing this AD to ensure the continued structural integrity of all The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes.

**DATES:** We must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.

- Fax: 202-493-2251.

- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE., Washington, DC 20590.

- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, 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-2016-9067; 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 proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Office (phone: 800-647-5527) is in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

**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.

**SUPPLEMENTARY INFORMATION:**

**Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2016-9067; Directorate Identifier 2016-NM-043-AD” at the beginning of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of this proposed AD. We will consider all comments received by the closing date and may amend this proposed AD because of those comments.

We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. We will also post a report summarizing each substantive verbal contact we receive about this proposed AD.

**Discussion**

On December 26, 2007, we issued AD 2004-07-22 R1, Amendment 39-15326 (73 FR 1052, January 7, 2008); corrected February 14, 2008 (73 FR 8589) (“AD 2004-07-22 R1”); for all The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes. AD 2004-07-22 R1 requires that the maintenance inspection program be revised to include inspections that will give no less than the required DTR for each SSI, and repair of cracked structure. AD 2004-07-22 R1 was prompted by a report of incidents involving fatigue cracking in transport category

airplanes that are approaching or have exceeded their design service objective. We issued AD 2004-07-22 R1 to ensure the continued structural integrity of all Boeing Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes.

#### **Actions Since AD 2004-07-22 R1 Was Issued**

Since we issued AD 2004-07-22 R1, a structural reevaluation by the manufacturer identified additional structural elements that qualify as SSIs. We have determined that supplemental inspections are required for timely detection of fatigue cracking for these additional structural elements.

#### **Related Service Information under 1 CFR part 51**

We reviewed Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013. The service information describes procedures for inspections to detect cracks of all structure identified as SSIs and includes six new SSIs since the last revision.

We also reviewed Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015. The service information describes procedures for inspections of wing, fuselage, and empennage SSIs for Model 747-400 LCF airplanes.

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.

#### **FAA’s Determination**

We are proposing this AD because we evaluated all the relevant information and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

## Proposed AD Requirements

This proposed AD would require revising the maintenance or inspection program, as applicable, to include inspections that will give no less than the required DTR for certain SSIs, and repairing any cracked structure. This proposed AD would also require inspections to detect cracks of all SSI structure, and repair if necessary.

This proposed AD does not supersede 2004-07-22 R1. However, accomplishing the revision specified in paragraph (h) of this proposed AD would terminate the requirements of paragraphs (f), (g), and (h) of AD 2004-07-22 R1. Also, doing an inspection specified in paragraph (i) of this proposed AD would terminate the corresponding inspection required by paragraph (i) of AD 2004-07-22 R1.

## Costs of Compliance

We estimate that this proposed AD affects 118 airplanes of U.S. registry.

We estimate the following costs to comply with this proposed AD:

### Estimated costs

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Revision of maintenance or inspection program	1 work-hour X \$85 per hour = \$85	\$0	\$85	\$10,030

We have not specified cost estimates for the inspection and repair specified in this proposed AD. Compliance with this proposed AD constitutes a method of compliance with the FAA aging airplane safety final rule (AASFR) (70 FR 5518, February 2, 2005) for certain baseline structure of Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes. The AASFR requires certain operators to incorporate damage tolerance inspections into their maintenance inspection programs. These requirements are described in 14 CFR 121.1109(c)(1) and 14 CFR 129.109(b)(1). Accomplishment of the actions

specified in this proposed AD will meet the requirements of these regulations for certain baseline structure. The costs for accomplishing the inspection portion of this proposed AD were accounted for in the regulatory evaluation of the AASFR.

### **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 determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would 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 this proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Is not a "significant rule" under the 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.

#### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 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):

**The Boeing Company:** Docket No. FAA-2016-9067; Directorate Identifier 2016-NM-043-AD.

#### **(a) Comments Due Date**

We must receive comments by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

#### **(b) Affected ADs**

This AD affects AD 2004-07-22 R1, Amendment 39-15326 (73 FR 1052, January 7, 2008); corrected February 14, 2008 (73 FR 8589) (“AD 2004-07-22 R1”).

**(c) Applicability**

This AD applies to all The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes, certificated in any category.

Note 1 to paragraph (c) of this AD: A Model 747-400 LCF airplane is a Model 747-400 series airplane that has been modified from a passenger airplane to a freighter configuration as specified in Boeing Service Bulletin 747-00-2084.

**(d) Subject**

Air Transport Association (ATA) of America Code 53, Fuselage; 54, Nacelles/Pylons; 55, Stabilizers; 57, Wings.

**(e) Unsafe Condition**

This AD was prompted by a report of incidents involving fatigue cracking in transport category airplanes that are approaching or have exceeded their design service objective and a structural reevaluation by the manufacturer that identified additional structural elements that qualify as structural significant items (SSIs). We are issuing this AD to ensure the continued structural integrity of all The Boeing Company Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747-400, 747-400D, 747-400F, 747SR, and 747SP series airplanes.

**(f) Compliance**

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

**(g) Definition of SSI**

For the purposes of this AD, an SSI is defined as a principal structural element (PSE). A PSE is a structural element that contributes significantly to the carrying of flight, ground, or pressurization loads, and whose integrity is essential in maintaining the overall structural integrity of the airplane.



**(h) Maintenance or Inspection Program Revision for All Airplanes**

Prior to reaching the compliance thresholds specified in paragraph (i)(1)(i), (i)(2)(i), (j)(1)(i), or (j)(2)(i) of this AD, as applicable, or within 12 months after the effective date of this AD, whichever occurs later: Incorporate a revision into the maintenance or inspection program, as applicable, that provides no less than the required damage tolerance rating (DTR) for each SSI listed in the applicable service information specified in paragraph (h)(1) or (h)(2) of this AD. The revision to the maintenance or inspection program must include, and must be implemented in accordance with, the procedures in Section 5.0, “Damage Tolerance Rating (DTR) System Application,” of Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013; and Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015; as applicable. Accomplishing the revision required by this paragraph terminates the actions required by paragraphs (f), (g), and (h) of AD 2004-07-22 R1. After accomplishing the revision required by this paragraph, the revisions required by paragraphs (f), (g), and (h) of AD 2004-07-22 R1, as applicable, must be removed.

(1) For all airplanes except Model 747-400 LCF airplanes: SSIs listed in Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013.

(2) For Model 747-400 LCF airplanes: SSIs listed in Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013; and SSIs listed in Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015. For SSIs listed in both Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document –

Appendix A,” dated November 2015; and Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013: Incorporate the SSIs listed Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015.

**(i) Inspection Compliance Times for All Model 747 Airplanes Except Model 747-400 LCF airplanes**

For all Model 747 airplanes except Model 747-400 LCF airplanes: Perform inspections to detect cracks of all structure identified in Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013, at the times specified in paragraph (i)(1), (i)(2), or (i)(3) of this AD, as applicable. Once the initial inspection has been performed, in order to remain in compliance with the maintenance or inspection program, as required by paragraph (h) of this AD, repetitive inspections are required at the intervals specified in Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013. Doing an inspection required by this paragraph terminates the corresponding inspection required by paragraph (i) of AD 2004-07-22 R1.

(1) For wing structure, except as provided by paragraph (i)(3) of this AD: Inspect at the times specified in paragraph (i)(1)(i) or (i)(1)(ii) of this AD, whichever occurs later.

(i) Within the applicable compliance time specified in paragraph (i)(1)(i)(A) or (i)(1)(i)(B) of this AD.

(A) For all Model 747-100, 747-100B, 747-100B SUD, 747-200B, 747-200C, 747-200F, 747-300, 747SR, and 747SP series airplanes: Prior to the accumulation of 20,000 total flight cycles or 100,000 total flight hours, whichever occurs first.

(B) For all Model 747-400, 747-400D, and 747-400F series airplanes: Prior to the accumulation of 20,000 total flight cycles or 115,000 total flight hours, whichever occurs first.

(ii) Within 1,000 flight cycles or 12 months after the effective date of this AD, whichever occurs later.

(2) For all structure other than wing structure, except as provided by paragraph (i)(3) of this AD: At the time specified in paragraph (i)(2)(i) or (i)(2)(ii) of this AD, whichever occurs later.

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

(ii) Within 1,000 flight cycles or 12 months after the effective date of this AD, whichever occurs later.

(3) For any portion of an SSI that has been replaced with new structure: Inspect at the later of the times specified in paragraphs (i)(3)(i) and (i)(3)(ii) of this AD.

(i) At the time specified in paragraph (i)(1) or (i)(2) of this AD, as applicable.

(ii) Within 10,000 flight cycles after the replacement of the part with a new part.

**(j) Inspection Compliance Times for Model 747-400 LCF airplanes**

For Model 747-400 LCF airplanes: Perform inspections to detect cracks of all structure identified in Boeing Document No. D6-35022, "Supplemental Structural Inspection Document for Model 747 Airplanes," Revision H, dated September 2013; and Boeing Document No. D6-35022-1, "747-400 LCF Supplemental Structural Inspection Document – Appendix A," dated November 2015; at the times specified in paragraph (j)(1) or (j)(2) of this AD, as applicable. Once the initial inspection has been performed, in order to remain in compliance with the maintenance or inspection program, as required by paragraph (h) of this AD, repetitive inspections are required at the intervals specified in Boeing Document No. D6-35022, "Supplemental Structural Inspection Document for Model 747 Airplanes," Revision H, dated September 2013; and Boeing Document No.

D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015. Where SSIs are listed in both Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013; and Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015; the SSIs listed in Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015, take precedence. Doing an inspection required by this paragraph terminates the corresponding inspection required by paragraph (i) of AD 2004-07-22 R1.

(1) For wing structure: Inspect at the times specified in paragraph (j)(1)(i) or (j)(1)(ii) of this AD, whichever occurs later.

(i) Prior to the accumulation of 20,000 total flight cycles or 115,000 total flight hours, whichever occurs first.

(ii) Within 1,000 flight cycles or 12 months after the effective date of this AD, whichever occurs later.

(2) For all structure other than wing structure: At the time specified in paragraph (j)(2)(i) or (i)(2)(ii) of this AD, whichever occurs later.

(i) At the earlier of the times specified in paragraphs (j)(2)(i)(A) and (j)(2)(i)(B) of this AD.

(A) Prior to the accumulation of 20,000 total flight cycles.

(B) Within the applicable initial compliance time specified in Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H, dated September 2013; and Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015. Where SSIs are listed in both Boeing Document No. D6-35022, “Supplemental Structural Inspection Document for Model 747 Airplanes,” Revision H,

dated September 2013; and Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015; the SSIs listed in Boeing Document No. D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015, take precedence.

(ii) Within 1,000 flight cycles or 12 months after the effective date of this AD, whichever occurs later.

**(k) Repair**

If any cracked structure is found during any inspection required by paragraph (i) or (j) of this AD, repair before further flight using a method approved in accordance with the procedures specified in paragraph (m) of this AD.

**(l) Inspection Program for Transferred Airplanes**

Before any airplane that is subject to this AD and that has exceeded the applicable compliance times specified in paragraph (i) or (j) of this AD can be added to an air carrier’s operations specifications, a program for the accomplishment of the inspections required by this AD must be established in accordance with paragraph (1)(1) or (1)(2) of this AD, as applicable.

(1) For airplanes that have been inspected as specified in this AD, the inspection of each SSI must be accomplished by the new operator using the previous operator’s schedule and inspection method, or the new operator’s schedule and inspection method, at whichever time would result in the earlier accomplishment for that SSI inspection. The compliance time for accomplishment of this inspection must be measured from the last inspection accomplished by the previous operator. After each inspection has been performed once, each subsequent inspection must be performed using the new operator’s schedule and inspection method.

(2) For airplanes that have not been inspected as specified in this AD, the inspection of each SSI required by this AD must be accomplished either prior to adding

the airplane to the air carrier's operations specification, or using a schedule and an inspection method approved by the Manager, Seattle Aircraft Certification Office (ACO). After each inspection has been performed once, each subsequent inspection must be performed using the new operator's schedule and inspection method.

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

(1) The Manager, Seattle 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 (n)(1) of this AD. Information may be emailed to: 9-ANM-Seattle-ACO-AMOC-Requests@faa.

(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.

(4) AMOCs approved for AD 2004-07-22 R1 are approved as AMOCs for the corresponding provisions of paragraphs (h), (i), and (j) of this AD for the SSIs identified in the AMOC, except for any SSI that has an expanded inspection area identified in Boeing Document No. D6-35022, "Supplemental Structural Inspection Document for Model 747 Airplanes," Revision H, dated September 2013; or Boeing Document No.

D6-35022-1, “747-400 LCF Supplemental Structural Inspection Document – Appendix A,” dated November 2015.

**(n) Related Information**

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

(2) 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.

Issued in Renton, Washington, on August 24, 2016.

John P. Piccola, Jr.,  
Acting Manager,  
Transport Airplane Directorate,  
Aircraft Certification Service.

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