**[4910-13-P]**

**Federal Aviation Administration**

**14 CFR Part 39**

**[Docket No. FAA-2013-0625; Directorate Identifier 2013-NM-013-AD]**

**RIN 2120-AA64**

**Airworthiness Directives;** The Boeing Company

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

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

**SUMMARY:** We propose to supersede an existing airworthiness directive (AD) that applies to certain The Boeing Company Model 747 series airplanes. The existing AD currently requires repetitive detailed inspections to detect cracking in certain fuselage upper deck tension ties, repair or modification of any cracked tension ties, and repetitive inspections of repaired and modified tension ties and repair or modification if necessary. The existing AD also provides for optional terminating action for the repetitive detailed inspections of tension ties that have not been repaired or modified. This proposed AD was prompted by an evaluation by the design approval holder indicating that the upper deck tension ties of the fuselage are subject to widespread fatigue damage. This proposed AD would retain the repetitive inspections, mandate the previously optional terminating modification, and add, for tension ties that have not been repaired or modified, repetitive inspections that must be done concurrently with the existing repetitive inspections. We are proposing this AD to prevent widespread fatigue damage of certain fuselage upper deck tension ties, which could result in reduced structural integrity of the airplane.

**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 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 review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Ave., SW, Renton, Washington. 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; 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, 1601 Lind Avenue SW., Renton, Washington 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 proposed AD. Send your comments to an address listed under the ADDRESSES section. Include "Docket No. FAA-2013-0625; Directorate Identifier 2013-NM-013-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 June 14, 1994, we issued AD 94-13-06, Amendment 39-8946 (59 FR 32879, June 27, 1994), for certain Boeing Model 747 series airplanes. That AD requires inspections to detect cracking in certain fuselage upper deck tension ties, and repair or modification of any cracked tension ties. That AD resulted from reports of fatigue cracking in tension ties. We issued that AD to prevent failure of two or more tension ties and the resultant rapid decompression of the airplane.

### Actions Since Existing AD (59 FR 32879, June 27, 1994) Was Issued

AD 94-13-06, Amendment 39-8946 (59 FR 32879, June 27, 1994), provides a terminating modification as an option. We have determined that it is necessary to mandate this modification to adequately address the identified unsafe condition.

We can better ensure long-term continued operational safety by design changes to remove the source of the problem, rather than by repetitive inspections. Long-term

inspections may not provide the degree of safety necessary for the transport airplane fleet. This determination, along with a better understanding of the human factors associated with numerous continual inspections, has led us to consider placing less emphasis on inspections and more emphasis on design improvements. The proposed modification requirement is consistent with these conditions.

**WFD Program**

Structural fatigue damage is progressive. It begins as minute cracks, and those cracks grow under the action of repeated stresses. This can happen because of normal operational conditions and design attributes, or because of isolated situations or incidents such as material defects, poor fabrication quality, or corrosion pits, dings, or scratches. Fatigue damage can occur locally, in small areas or structural design details, or globally. Global fatigue damage is general degradation of large areas of structure with similar structural details and stress levels. Multiple-site damage is global damage that occurs in a large structural element such as a single rivet line of a lap splice joining two large skin panels. Global damage can also occur in multiple elements such as adjacent frames or stringers. Multiple-site-damage and multiple-element-damage cracks are typically too small initially to be reliably detected with normal inspection methods. Without intervention, these cracks will grow, and eventually compromise the structural integrity of the airplane, in a condition known as widespread fatigue damage (WFD). As an airplane ages, WFD will likely occur, and will certainly occur if the airplane is operated long enough without any intervention.

The FAA's WFD final rule (75 FR 69746, November 15, 2010) became effective on January 14, 2011. The WFD rule requires certain actions to prevent structural failure due to WFD throughout the operational life of certain existing transport category airplanes and all of these airplanes that will be certificated in the future. For existing and future airplanes subject to the WFD rule, the rule requires that design approval holders

(DAHs) establish a limit of validity (LOV) of the engineering data that support the structural maintenance program. Operators affected by the WFD rule may not fly an airplane beyond its LOV, unless an extended LOV is approved.

The WFD rule (75 FR 69746, November 15, 2010) does not require identifying and developing maintenance actions if the DAHs can show that such actions are not necessary to prevent WFD before the airplane reaches the LOV. Many LOVs, however, do depend on accomplishment of future maintenance actions. As stated in the WFD rule, any maintenance actions necessary to reach the LOV will be mandated by airworthiness directives through separate rulemaking actions.

In the context of WFD, this action is necessary to enable DAHs to propose LOVs that allow operators the longest operational lives for their airplanes, and still ensure that WFD will not occur. This approach allows for an implementation strategy that provides flexibility to DAHs in determining the timing of service information development (with FAA approval), while providing operators with certainty regarding the LOV applicable to their airplanes.

**Relevant Service Information**

We reviewed Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012. For information on the procedures and compliance times, see this service information at http://www.regulations.gov by searching for Docket No. FAA-2013-0625.

**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**

Although this proposed AD does not explicitly restate the requirements of AD 94-13-06, Amendment 39-8946 (59 FR 32879, June 27, 1994), this proposed AD would retain all of the requirements of AD 94-13-06. Those requirements are referenced in the service information identified previously, which, in turn, is referenced in paragraphs (g) and (i) of this proposed AD. Paragraph (h) of this proposed AD would mandate the previously optional terminating modification for the inspections of tension ties that have not been repaired or modified. Paragraph (g) of this proposed AD would also add, for tension ties that have not been repaired or modified, repetitive high frequency eddy current inspections to be done concurrently with the existing detailed inspections specified in for tensions ties that have not been repaired or modified. This proposed AD would require accomplishing the actions specified in the service information described previously, except as discussed under "Differences Between the Proposed AD and the Service Information."

In addition, the phrase "corrective actions" is used in this proposed AD. "Corrective actions" are actions that correct or address any condition found. Corrective actions in an AD could include, for example, repairs.

**Differences Between the Proposed AD and the Service Information**

Table 3 in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012, specifies repeating the detailed inspection for cracks in the tension ties; however, that inspection is incorrect. This section of the service information should specify a high frequency eddy current inspection (HFEC) inspection, as specified in the other related sections. Therefore, the inspection required by this proposed AD is an HFEC inspection, performed in accordance with Part 4 and Figure 8 of this service bulletin. This service information is being revised to specify the correct inspection type. This difference has been coordinated with Boeing.

The service bulletin specifies to contact the manufacturer for instructions on how to repair certain conditions, but this proposed AD would require repairing those conditions in one of the following ways:

• In accordance with a method that we approve; or

• Using data that meet the certification basis of the airplane, and that have been approved by the Boeing Commercial Airplanes Organization Designation Authorization (ODA) whom we have authorized to make those findings.

**Explanation of Compliance Time**

The compliance time for the modification specified in this proposed AD for addressing WFD was established to ensure that discrepant structure is modified before WFD develops in airplanes. Standard inspection techniques cannot be relied on to detect WFD before it becomes a hazard to flight. We will not grant any extensions of the compliance time to complete any AD-mandated service bulletin related to WFD without extensive new data that would substantiate and clearly warrant such an extension.

**Clarification of Applicability**

We have revised the applicability of existing AD 94-13-06, amendment 39-8946 (59 FR 32879, June 27, 1994), to identify model designations as published in the most recent type certificate data sheet for the affected models.

**Costs of Compliance**

We estimate that this proposed AD affects 113 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 |
|---|---|---|---|---|
| Detailed inspections [retained action from existing AD 94-13-06, amendment 39-8946 (59 FR 32879, June 27, 1994)] | 5 work-hours X $85 per hour = $425 | $0 | $425 per inspection cycle | $48,025 per inspection cycle |
| Post-mod/repair inspections | 1 work-hour X $85 per hours = $85 | $0 | $85 | $9,605 |
| Modification [new proposed action] | Up to 112 work-hours X $85 per hour = up to $9,520 | $0 | Up to $9,520 | Up to $1,075,760 |

We have received no definitive data that would enable us to provide cost estimates for the on-condition actions specified in this proposed 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 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 that the 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 removing airworthiness directive (AD) 94-13-06, Amendment 39-8946 (59 FR 32879, June 27, 1994), and adding the following new AD:

**The Boeing Company**: Docket No. FAA-2013- 0625; Directorate Identifier 2013-NM-013-AD.

**(a) Comments Due Date**

The FAA must receive comments on this AD action by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

This AD supersedes AD 94-13-06, Amendment 39-8946 (59 FR 32879, June 27, 1994).

**(c) Applicability**

This AD applies to The Boeing Company Model 747-100, 747-200B, and 747-200F series airplanes, certificated in any category, as listed in Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012.

**(d) Subject**

Joint Aircraft System Component (JASC)/Air Transport Association (ATA) of America Code 53, Fuselage.

**(e) Unsafe Condition**

This AD was prompted by an evaluation by the design approval holder indicating that the upper deck tension ties of the fuselage are subject to widespread fatigue damage. We are issuing this AD to prevent widespread fatigue damage of certain fuselage upper deck tension ties, which could result in reduced structural integrity of the airplane.

**(f) Compliance**

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

**(g) Inspections and Repair/Modification**

Except as required by paragraph (k)(3) of this AD, at the applicable time specified in Tables 1 and 3 of paragraph 1.E., "Compliance" of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012: Do detailed and surface high frequency eddy current (HFEC) inspections for cracks in the tension ties, as applicable, and do all applicable corrective actions, in accordance with the Accomplishment

Instructions of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012, except as required by paragraph (k)(2) of this AD. The effective date of AD 94-13-06, Amendment 39-8946 (59 FR 32879, June 27, 1994) is July 27, 1994. Do all applicable corrective actions before further flight. Repeat the detailed and HFEC inspection thereafter at the time specified in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012, except as specified in paragraph (k)(1) of this AD. Repair of a tension tie, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012, except as required by paragraph (k)(2) of this AD, terminates the requirements of this paragraph for that tension tie only.

**(h) Modification**

Except as provided by paragraph (k)(3) of this AD, at the applicable time specified in Table 3 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012: Modify the tension ties, including doing an open-hole HFEC inspection for cracks before enlarging the hole, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012. Modification of the tension ties terminates the requirements of paragraph (g) of this AD. If any cracking is found, before further flight, do the repair using a method approved in accordance with the procedures specified in paragraph (l) of this AD.

**(i) Post-Repair/Modification Inspections**

At the applicable time specified in Table 2 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012: Do a detailed inspection of all repaired and modified tension ties, and do all applicable corrective actions, except as required by paragraph (k)(2) of this AD, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2371,

Revision 2, dated December 11, 2012, except as required by paragraph (k)(2) of this AD. Repeat the inspection thereafter at the times specified in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012. Do all applicable corrective actions before further flight.

**(j) Credit for Previous Actions**

This paragraph provides credit for the modification required by paragraphs (g) and (h) of this AD if that modification was done before the effective date of this AD using Boeing Service Bulletin 747-53-2371, dated July 29, 1993; or Boeing Alert Service Bulletin 747-53A2371, Revision 1, dated April 27, 1995; which are not incorporated by reference in this AD.

**(k) Exception to Service Information**

(1) Where Row 2 of Table 3 of paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012, specifies repeating a "detailed" inspection, "as given in Part 4" of this service information, the repetitive inspections required by this AD are "HFEC" inspections, done in accordance with Part 4 and Figure 8 of Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012.

(2) Where Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012, specifies contacting Boeing for repair instructions, or does not include repair instructions for a crack found in an area other than the aft tension tie area: Before further flight, do the repair using a method approved in accordance with the procedures specified in paragraph (l) of this AD.

(3) Where Boeing Alert Service Bulletin 747-53A2371, Revision 2, dated December 11, 2012 specifies a compliance time of "after the Revision 2 date of this service bulletin," this AD requires compliance within the specified compliance time after the effective date of this AD.

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

(1) The Manager, Seattle Aircraft Certification Office (ACO), 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 the Related Information section 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 the Boeing Commercial Airplanes 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 94-13-06, Amendment 39-8946 (59 FR 32879, June 27, 1994), are approved as AMOCs for the corresponding actions required by paragraphs (g), (h), and (i) of this AD.

**(m) 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, Washington 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,

Washington 98124-2207; telephone 206-544-5000, extension 1; fax 206-766-5680; Internet https://www.myboeingfleet.com.

You may review copies of the referenced service information at the FAA, Transport Airplane Directorate, 1601 Lind Avenue SW., Renton, Washington. For information on the availability of this material at the FAA, call 425-227-1221.

Issued in Renton, Washington, on July 12, 2013.

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

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