[4910-13-P]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2017-0473; Product Identifier 2016-NM-195-AD; Amendment 39-19124; AD 2017-25-10]

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 all The Boeing Company Model 737-100, -200, -200C, -300, -400, and -500 series airplanes. This AD was prompted by a report indicating that wear of the bearing plate slider bushings could cause disconnection of certain elevator hinges, which could excite the horizontal stabilizer under certain in-flight speed/altitude conditions and lead to degradation of the structure. This AD requires repetitive inspections and checks of certain elevator hinges and related components, repetitive replacements and tests of the bearing plate, and related investigative and corrective actions, if necessary. We are issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster Blvd., MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet https://www.myboeingfleet.com. You may view this service information at the FAA, Transport Standards Branch, 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-2017-0473.

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-2017-0473; 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 final rule, 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: George Garrido, Aerospace Engineer, Airframe Section, FAA, Los Angeles ACO Branch, 3960 Paramount Boulevard,

Lakewood, CA 90712-4137; phone: 562-627-5357; fax: 562-627-5210; email: george.garrido@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 all The Boeing Company Model 737-100, -200, -200C, -300, -400, and -500 series airplanes. The NPRM published in the Federal Register on May 18, 2017 (82 FR 22763). The NPRM was prompted by a report indicating that analysis following a special certification review of the horizontal stabilizer determined that wear of the bearing plate slider bushings could cause disconnection of elevator hinge number 4 or number 6. This disconnection could excite the horizontal stabilizer under certain in-flight speed/altitude conditions and lead to degradation of the structure due to tab flutter, hinge wear, spar chord corrosion, hinge rib web chafing, hinge rib chord cracking, and inspar lower skin cracking. The NPRM proposed to require repetitive inspections and checks of elevator hinge numbers 4 and 6 and related components, repetitive replacements and tests of the bearing plate, and related investigative and corrective actions if necessary.

We are issuing this AD to detect and correct wear of the bearing plate slider bushings, which could result in heavy airplane vibration and damage and could lead to departure of the elevator and/or horizontal stabilizer from the airplane, and loss of continued safe flight and landing.

Comments

We gave the public the opportunity to participate in developing this final rule. The following presents the comments received on the NPRM and the FAA's response to each comment.

Support for the NPRM

Air Line Pilots Association, International (ALPA) concurred with the content of the NPRM.

Request to Change Paragraph (g) of This AD

Boeing stated that no inspections are specified in Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, for Group 1 airplanes and requested that the reference to Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, be removed from paragraph (g) of this AD.

The European Aviation Safety Agency (EASA) observed that in paragraph (g) of the proposed AD, the reference to Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, for Group 1 airplanes, is not consistent with the Accomplishment Instructions of Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, which states only that Group 1 airplanes have exceeded their limit of validity (LOV) and gives no further advice.

We agree with the commenters. We have removed the reference to Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, from the compliance requirements specified in paragraph (g) of this AD.

Request to Extend Inspections and Checks to All Hinges

EASA suggested that the inspections and checks in the proposed AD be extended to all hinges because any other loose hinge could create overloading in adjacent hinges, and therefore could contribute to the failure of hinges 4 and 6.

We do not agree with the commenter's assessment. We have consulted with Boeing and confirmed the following information.

Hinge fittings 1 and 2 support thrust loads only and do not have the sliding bearing plates. Therefore, these fittings do not need inspections to address the unsafe condition.

Boeing's flutter analysis shows that failure (disconnect) at either hinge 4 or 6 is flutter critical. However, a failed hinge 3 or 5, with the shorter span between adjacent hinges, will have less weight relative to stiffness, such that instability does not occur.

The fatigue loads on the affected Model 737 airplane elevator are not substantial. If hinge 3 or 5 becomes loose, the load increase on hinge 4 or 6 is insignificant. If hinge 3 or 5 fails, the inspection and replacement program in Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, will still detect any crack at hinge 4 or 6 before it becomes critical. In addition, the normal maintenance procedure of hinge lubrication per the Maintenance Planning Document during a C check should detect a failed hinge 3 or 5.

We have not changed this AD in this regard.

Request for Clarification of Group 2, Configuration 1 Instructions

EASA requested clarification of the reason that paragraph (i) of the proposed AD includes no repeat instruction for Group 2, Configuration 1 airplanes, regarding bearing plate replacement.

Group 2, Configuration 1 airplanes are not included in paragraph (i) of this AD, which contains requirements for repetitive bearing plate replacements and tests, because these airplanes do not have the bearing plates. We have not changed this AD regarding this issue.

Request for Confirmation of Sufficient Access

EASA requested confirmation that sufficient access exists to adequately inspect and test all areas via the methods defined.

Boeing has confirmed that sufficient access exists. Additionally, Boeing has released 737-55A1099 Information Notice 01, dated May 23, 2017, to notify operators that hinge 4 inspections cannot be accomplished if existing repairs are installed in accordance with Boeing Special Attention Service Bulletin 737-55-1059, Revision 1, dated April 6, 2016. In that case, alternative inspection procedures must be approved in accordance with the procedures specified in paragraph (m) of this AD.

Effect of Winglets on Accomplishment of the Proposed Actions

Aviation Partners Boeing stated that accomplishing the Supplemental Type Certificate (STC) ST01219SE does not affect the actions specified in the NPRM.

We concur with the commenter. We have redesignated paragraph (c) of the proposed AD as paragraph (c)(1) and added paragraph (c)(2) to this AD to state that installation of STC ST01219SE does not affect the ability to accomplish the actions required by this AD. Therefore, for airplanes on which STC ST01219SE is installed, a

"change in product" alternative method of compliance (AMOC) approval request is not necessary to comply with the requirements of 14 CFR 39.17.

Conclusion

We reviewed the relevant data, considered the comments received, and determined that air safety and the public interest require adopting this final rule 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 final rule.

Related Service Information under 1 CFR part 51

We reviewed Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016. The service information describes procedures for repetitive inspections and checks of elevator hinge numbers 4 and 6 and related components, repetitive replacements and tests of the bearing plate, and related investigative and corrective actions. 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 192 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
Elevator hinge high frequency eddy current (HFEC) inspection, loose bolt check	15 work-hours X $85 per hour = $1,275 per inspection/check cycle	$0	$1,275 per inspection/check cycle	$244,800 per inspection/check cycle
Horizontal stabilizer HFEC and low frequency eddy current (LFEC) inspection, loose bolt check	13 work-hours X $85 per hour = $1,105 per inspection/check cycle	$0	$1,105 per inspection/check cycle	$212,160 per inspection/check cycle
Horizontal stabilizer detailed corrosion inspection	5 work-hours X $85 per hour = $425 per inspection cycle	$0	$425 per inspection cycle	$81,600 per inspection cycle
Elevator general visual inspection for ply damage	Up to 4 work-hours X $85 per hour = $340 per inspection cycle	$0	Up to $340 per inspection cycle	Up to $65,280 per inspection cycle
Elevator skin tap test inspection for delamination	Up to 6 work-hours X $85 per hour = $510 per inspection cycle	$0	Up to $510 per inspection cycle	Up to $97,920 per inspection cycle
Elevator hinge bearing plate replacement and binding test	Up to 20 work-hours X $85 per hour = $1,700 per replacement/test cycle	$4,860	Up to $6,560 per replacement/test cycle	Up to $1,259,520 per replacement/test cycle

Action	Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Elevator hinge fitting HFEC inspection	Up to 5 work-hours X $85 per hour = $425 per inspection cycle	$0	Up to $425 per inspection cycle	Up to $81,600 per inspection cycle

We estimate the following costs to do any necessary related investigative and corrective actions that would be required based on the results of the inspection. We have no way of determining the number of aircraft that might need these actions:

On-condition costs

Action	Labor cost	Parts cost	Cost per product
Elevator hinge conditional inspections, measurements, replacements, and repairs	28 work-hours X $85 per hour = $2,380	$0 [1]	$2,380
Horizontal stabilizer conditional inspections, replacements, and repairs	28 work-hours X $85 per hour = $2,380	$0 [1]	$2,380

[1] We have received no definitive data that would enable us to provide cost estimates for the parts for on-condition repairs.

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.

This AD is issued in accordance with authority delegated by the Executive Director, Aircraft Certification Service, as authorized by FAA Order 8000.51C. In accordance with that order, issuance of ADs is normally a function of the Compliance and Airworthiness Division, but during this transition period, the Executive Director has delegated the authority to issue ADs applicable to transport category airplanes to the Director of the System Oversight Division.

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):

2017-25-10 The Boeing Company: Amendment 39-19124; Docket No. FAA-2017-0473; Product Identifier 2016-NM-195-AD.

(a) Effective Date

This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

(1) This AD applies to all The Boeing Company Model 737-100, -200, -200C, -300, -400, and -500 series airplanes, certificated in any category.

(2) Installation of Supplemental Type Certificate (STC) ST01219SE (http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgstc.nsf/0/ebd1cec7b301293e862

57cb30045557a/$FILE/ST01219SE.pdf) does not affect the ability to accomplish the actions required by this AD. Therefore, for airplanes on which STC ST01219SE is installed, a "change in product" alternative method of compliance (AMOC) approval request is not necessary to comply with the requirements of 14 CFR 39.17.

(d) Subject

Air Transport Association (ATA) of America Code 55, Stabilizers.

(e) Unsafe Condition

This AD was prompted by a report indicating that wear of the bearing plate slider bushings could cause disconnection of elevator hinge number 4 or number 6, which could excite the horizontal stabilizer under certain in-flight speed/altitude conditions and lead to degradation of the structure, departure of the elevator or horizontal stabilizer from the airplane, and loss of continued safe flight and landing.

(f) Compliance

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

(g) Actions for Group 1 Airplanes

For airplanes identified as Group 1 in Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016: Within 120 days after the effective date of this AD, do inspections and checks of the elevator and horizontal stabilizer at elevator hinge numbers 4 and 6 and the replacement and test of the bearing plate at elevator hinge numbers 4 and 6, and do all applicable related investigative and corrective actions, using a method approved in accordance with the procedures specified in paragraph (m) of this AD.

(h) Inspections and Checks for Groups 2 and 3 Airplanes

For airplanes identified as Groups 2 and 3 in Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016: Except as required by paragraph (j)(1) of this AD, at the applicable time specified in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, do the applicable inspections and checks of elevator hinge numbers 4 and 6 and related components specified in paragraphs (h)(1) through (h)(8) of this AD, and do all applicable related investigative and corrective actions, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, except as required by paragraph (j)(2) of this AD. Do all applicable related investigative and corrective actions before further flight. Repeat the actions specified in paragraphs (h)(1) through (h)(8) of this AD thereafter at the applicable times specified in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016.

(1) For Groups 2 and 3 airplanes: A high frequency eddy current (HFEC) inspection for cracking of the elevator hinge numbers 4 and 6.

(2) For Groups 2 and 3 airplanes: A loose bolt check at elevator hinge numbers 4 and 6.

(3) For Groups 2 and 3 airplanes: An HFEC inspection and low frequency eddy current (LFEC) inspection for cracking of the horizontal stabilizer forward of elevator hinge numbers 4 and 6.

(4) For Groups 2 and 3 airplanes: A loose bolt check of horizontal stabilizer attach plates at elevator hinge numbers 4 and 6.

(5) For Groups 2 and 3 airplanes: A detailed inspection of the horizontal stabilizer rear spar outer mold line, gusset plate, and inspar skin for any corrosion.

(6) For Group 2, Configuration 2, and Group 3 airplanes: A general visual inspection of the elevator front spar around hinge numbers 4 and 6 for any ply damage.

(7) For Group 2 and 3 airplanes: A tap test inspection of the elevator skin for any delamination at elevator hinge numbers 4 and 6.

(8) For Group 2, Configuration 2, and Group 3 airplanes on which elevator hinge fitting assembly 65C31307-() is installed at elevator hinge number 6: An HFEC inspection of the hinge fitting for any crack.

(i) Repetitive Bearing Plate Replacement and Test

For airplanes identified as Group 2, Configuration 2, and Group 3 in Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016: Except as required by paragraph (j)(1) of this AD, at the applicable time specified in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, do the actions specified in paragraphs (i)(1) and (i)(2) of this AD, and do all applicable related investigative and corrective actions, in accordance with the Accomplishment Instructions of Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, except as required by paragraph (j)(2) of this AD. All applicable related investigative and corrective actions must be done before further flight. Repeat the actions specified in paragraphs (i)(1) and (i)(2) of this AD thereafter at the applicable time specified in paragraph 1.E., "Compliance," of Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016.

(1) Replace the bearing plates at elevator hinge numbers 4 and 6.

(2) Do an elevator hinge bearing plate binding test at elevator hinge numbers 4 and 6.

(j) Exceptions to Service Information Specifications

(1) Where Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, specifies a compliance time "after the original issue date of this Service Bulletin," this AD requires compliance within the specified compliance time after the effective date of this AD.

(2) Although Boeing Alert Service Bulletin 737-55A1099, Revision 1, dated October 21, 2016, specifies to contact Boeing for repair instructions, and specifies that action as "RC" (Required for Compliance), this AD requires repair before further flight using a method approved in accordance with the procedures specified in paragraph (m) of this AD.

(k) Parts Installation Limitation

As of the effective date of this AD: A horizontal stabilizer, an elevator, or a bearing plate may be installed on any airplane, provided the actions required by paragraphs (h) and (i) of this AD are done within the applicable compliance times specified in paragraphs (h) and (i) of this AD.

(l) Credit for Previous Actions

This paragraph provides credit for the actions specified in paragraphs (h) and (i) of this AD, if those actions were performed before the effective date of this AD using Boeing Alert Service Bulletin 737-55A1099, dated July 5, 2016.

(m) Alternative Methods of Compliance (AMOCs)

(1) The Manager, Los Angeles ACO Branch, 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 certification office, send it to the attention of the person identified in paragraph (n) of this AD. Information may be emailed to: 9-ANM-LAACO-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, Los Angeles ACO Branch, 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) Except as required by paragraph (j)(2) of this AD: For service information that contains steps that are labeled as Required for Compliance (RC), the provisions of paragraphs (m)(4)(i) and (m)(4)(ii) of this AD apply.

(i) The steps labeled as RC, including substeps under an RC step and any figures identified in an RC step, must be done to comply with the AD. If a step or substep is labeled "RC Exempt," then the RC requirement is removed from that step or substep. An

AMOC is required for any deviations to RC steps, including substeps and identified figures.

(ii) Steps not labeled as RC may be deviated from using accepted methods in accordance with the operator's maintenance or inspection program without obtaining approval of an AMOC, provided the RC steps, including substeps and identified figures, can still be done as specified, and the airplane can be put back in an airworthy condition.

(n) Related Information

For more information about this AD, contact George Garrido, Aerospace Engineer, Airframe Section, FAA, Los Angeles ACO Branch, 3960 Paramount Boulevard, Lakewood, CA 90712-4137; phone: 562-627-5357; fax: 562-627-5210; email: george.garrido@faa.gov

(o) 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 737-55A1099, Revision 1, dated October 21, 2016.

(ii) Reserved.

(3) For service information identified in this AD, contact Boeing Commercial Airplanes, Attention: Contractual & Data Services (C&DS), 2600 Westminster Blvd.,

MC 110-SK57, Seal Beach, CA 90740-5600; telephone 562-797-1717; Internet https://www.myboeingfleet.com.

(4) You may view this service information at the FAA, Transport Standards Branch, 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 December 4, 2017.

Jeffrey E. Duven,
Director,
System Oversight Division,
Aircraft Certification Service.
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