[4910-13-U]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [65 FR 19302 4/11/2000]

[Docket No. 99-NM-81-AD; Amendment 39-11660; AD 2000-07-06]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 737-100, -200, -200C, -300, -400, and -500 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to all Boeing Model 737-100, -200, -200C, -300, -400, and -500 series airplanes. This AD requires repetitive inspections to detect cracking of the lower corners of the door frame and cross beam of the forward cargo door, and corrective actions, if necessary. This AD also requires eventual modification of the outboard radius of the lower corners of the door frame and reinforcement of the cross beam of the forward cargo door, which would constitute terminating action for the repetitive inspections. This amendment is prompted by reports indicating that fatigue cracks have been detected in the lower corners of the door frame and cross beam of the forward cargo door. The actions specified by this AD are intended to prevent fatigue cracking of the lower corners of the door frame and cross beam of the forward cargo door, which could result in rapid depressurization of the airplane.

DATES: Effective May 16, 2000.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of May 16, 2000.

ADDRESSES: The service information referenced in this AD may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98134-2207. This information may be examined at the Federal Aviation Administration (FAA), Transport Airplane Directorate, Rules Docket, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Nenita Odesa, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Transport Airplane Directorate, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-2557; fax (425) 227-1181.

SUPPLEMENTARY INFORMATION: A proposal to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) to include an airworthiness directive (AD) that is applicable to all Boeing Model 737-100, -200, -200C, -300, -400, and -500 series airplanes was published in the **Federal Register** on August 20, 1999 (64 FR 45477). That action proposed to require

repetitive inspections to detect cracking of the lower corners of the door frame and cross beam of the forward cargo door, and corrective actions, if necessary. That action also proposed to require eventual modification of the outboard radius of the lower corners of the door frame and reinforcement of the cross beam of the forward cargo door, which would constitute terminating action for the repetitive inspections.

Comments

Interested persons have been afforded an opportunity to participate in the making of this amendment. Due consideration has been given to the comments received.

Request to Allow Repair In Lieu of Replacement

Regarding the proposed requirement to replace any cracked door frame with a new door frame, one commenter questions whether there is no level of damage that can be repaired. The commenter states that it would be preferable for operators to repair a cracked door frame when possible, and only replace the door frame with a new door frame if damage is beyond repair limits.

The FAA infers that the commenter is requesting that paragraph (a)(2)(i) of the proposal be revised to allow repair of the door frame, in lieu of replacement of the door frame with a new door frame, when cracking is within repair limits. The FAA concurs with this request. The FAA finds that it may be possible for damage within certain limits to be repaired. However, no service information that defines allowable limits for repairable damage is available. Without established limits and defined repair procedures, all proposed repairs on the door frame must be approved by the FAA or an authorized Boeing Company Designated Engineering Representative (DER). The FAA has revised paragraph (a)(2)(i) and added paragraphs (a)(2)(i)(A) and (a)(2)(i)(B) to this final rule, to provide repair of a cracked door frame and replacement of a cracked door frame with a new door frame as two alternatives for compliance with paragraph (a)(2)(i) of this AD.

(Operators should note that regardless of which alternative for compliance is accomplished, this AD requires installation of a cross beam repair and reinforcement modification of the cross beam, as specified in paragraph (a)(2)(i) of this AD, and modification of the repaired or replaced door frame, as specified in paragraph (a)(2)(ii) of this AD.)

Request to Increase Threshold for Terminating Action

One commenter requests that the compliance time for the terminating action be increased from four years, as proposed, to 75,000 total flight cycles, as required by AD 90-06-02, amendment 39-6489 (55 FR 8372, March 7, 1990). The commenter states that a compliance threshold based on calendar time, rather than on the total number of flight cycles, is inconsistent, because fatigue cracking is related to cabin pressurization cycles. Further, the commenter states that the proposed threshold of four years will cause unnecessary cost to operators that have relatively new or low-flight-cycle airplanes.

The FAA partially concurs with the commenter's request. The FAA does not concur that a threshold of 75,000 total flight cycles for accomplishment of the terminating action, as currently required by AD 90-06-02, provides an adequate level of safety. However, the FAA does concur that fatigue cracking is a function of pressurization cycles and, thus, a threshold based on flight cycles should be included for the terminating action. Therefore, paragraphs (c)

and (d) of this final rule have been revised to specify accomplishment of the actions required by that paragraph within 4 years or 12,000 flight cycles after the effective date of this AD, whichever occurs later.

Request to Increase Compliance Time

For the initial inspections specified in paragraphs (a) and (b) of the proposal, one commenter requests, for certain airplanes, an increase in the proposed compliance time of one year or 4,500 flight cycles after the effective date of this AD, whichever occurs later, to prior to the accumulation of 12,000 total flight cycles on the cargo door. The commenter states that, "if an operator has accurate accounting of the history of the cargo door, then the number of flight cycles for this door can be determined."

Another commenter requests that the compliance time for the initial inspections specified in paragraphs (a) and (b) of the proposal be increased to between 15,000 and 20,000 total flight cycles. That commenter states that a compliance time of one year or 4,500 flight cycles is "harsh for young aircraft." The commenter also claims that cracking in the door frames does not start until 20,000 to 30,000 total flight cycles.

The FAA does not concur with the commenters' requests to increase the compliance time for the inspections. In the preamble of the proposal, the FAA explained the difference between the compliance time stated in the service bulletin and the proposed compliance time by stating that the number of total flight cycles for an airplane may not be a good indicator of the number of total flight cycles for the forward cargo door. For example, a door may have been removed from an airplane with many total flight cycles and installed on an airplane with fewer total flight cycles. Also, the FAA has received a report indicating that a cracked door frame was found on an airplane that had accumulated 15,700 total flight cycles. This report contradicts the second commenter's claim that cracking of the door frames does not start until 20,000 to 30,000 total flight cycles. In view of the nature of the cracking and the severity of the unsafe condition addressed by this AD (rapid depressurization of the airplane), the FAA finds that it would be inappropriate to extend the compliance time for the actions required by this AD. No change to the final rule is necessary in this regard.

Request for Clarification on Replacement Door Frame

One commenter requests that paragraph (a)(2)(i) of the proposal be revised to specify a part number or modification status for the replacement door frame. The FAA infers that the commenter is stating that, by making the proposed paragraph (a)(2)(i) more specific, paragraph (a)(2)(ii) would be unnecessary and could be removed from the AD. The commenter states that it is not clear why a new door frame should have to be modified, and points out that no specific instructions are provided for modification of new door frames. The commenter also states that introduction of a new door frame that does not require additional modification [such as the modification described in paragraph (a)(2)(ii) of the proposal] is in order.

The FAA does not concur with the commenter's request. To date, the manufacturer has not issued service information that provides specific instructions on how to modify new door frames. Without such instructions, the FAA cannot provide specific instructions for modification of replaced door frames and, therefore, cannot revise paragraphs (a)(2)(i) and (a)(2)(ii) of this AD. The FAA anticipates that the manufacturer will issue a new revision of the service bulletin that, among other things, will include instructions for modification of replaced door frames. However, based on the nature of the cracking and the unsafe condition addressed

by this AD, the FAA finds that it would be inappropriate to delay this AD until the manufacturer issues a new revision of the service bulletin.

With regard to the commenter's question of why it is necessary to modify new door frames, as stated in the preamble of the proposal, the FAA has received reports that cracks have been detected in redesigned door frames, though these frames were supposed to be less susceptible to fatigue cracking. No new design has been developed. Therefore, to prevent any more cracking, the FAA has determined that it is necessary to require a reinforcement modification on newly installed door frames. There is no door frame currently available that is acceptable for installation without such modification. No change to the final rule is necessary in this regard.

Conclusion

After careful review of the available data, including the comments noted above, the FAA has determined that air safety and the public interest require the adoption of the rule with the changes previously described. The FAA has determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Cost Impact

There are approximately 3,100 Model 737-100, -200, -200C, -300, -400, and -500 series airplanes of the affected design in the worldwide fleet. The FAA estimates that 1,400 airplanes of U.S. registry will be affected by this AD, that it will take approximately 1 work hour per airplane to accomplish the required inspections, and that the average labor rate is $60 per work hour. Based on these figures, the cost impact of the inspections required by this AD on U.S. operators is estimated to be $84,000, or $60 per airplane, per inspection cycle.

It will take approximately 38 work hours per airplane to accomplish the required terminating modifications at an average labor rate of $60 per work hour. Required parts will cost $1,865 per airplane. Based on these figures, the cost impact of the terminating modifications required by this AD on U.S. operators is estimated to be $5,803,000, or $4,145 per airplane.

The cost impact figures discussed above are based on assumptions that no operator has yet accomplished any of the requirements of this AD action, and that no operator would accomplish those actions in the future if this AD were not adopted.

Regulatory Impact

The regulations adopted herein 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. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132.

For the reasons discussed above, I certify that this action (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); and (3) 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. A final evaluation has been prepared for this action and it is contained in the Rules Docket. A copy of it may be obtained from the Rules Docket at the location provided under the caption "ADDRESSES."

List of Subjects in 14 CFR Part 39

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

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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. Section 39.13 is amended by adding the following new airworthiness directive:

AIRWORTHINESS DIRECTIVE

Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
Federal Aviation Administration

AD's are posted on the internet at http://av-info.faa.gov

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2000-07-06 BOEING: Amendment 39-11660. Docket 99-NM-81-AD.

Applicability: All Model 737-100, -200, -200C, -300, -400, and -500 series airplanes; certificated in any category.

NOTE 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (e) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent fatigue cracking of the lower corners of the door frame and cross beam of the forward cargo door, which could result in rapid depressurization of the airplane, accomplish the following:

High Frequency Eddy Current Initial/Repetitive Inspections

(a) Within 1 year or 4,500 flight cycles after the effective date of this AD, whichever occurs later, perform a high frequency eddy current (HFEC) inspection to detect cracking of the lower corners (forward and aft) of the door frame of the forward cargo door in accordance with Boeing 737 Nondestructive Test Manual, Part 6, Section 51-00-00, Figure 4 or Figure 23.

(1) If no cracking is detected, repeat the HFEC inspection thereafter at intervals not to exceed 4,500 flight cycles, until the requirements of paragraph (c) of this AD have been accomplished.

(2) If any cracking is detected during any inspection required by paragraph (a) of this AD, prior to further flight, accomplish the requirements of paragraphs (a)(2)(i) AND (a)(2)(ii)

of this AD, which constitute terminating action for the repetitive inspections required by paragraph (a)(1) of this AD.

(i) Accomplish the requirements of paragraph (a)(2)(i)(A) OR (a)(2)(i)(B) of this AD, and install a cross beam repair and reinforcement modification of the cross beam in accordance with Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994.

(A) Repair the door frame of the forward cargo door in accordance with a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA, Transport Airplane Directorate; or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company Designated Engineering Representative (DER) who has been authorized by the Manager, Seattle ACO, to make such findings. For a repair or modification method to be approved by the Manager, Seattle ACO, as required by this paragraph; and paragraphs (a)(2)(ii), (b)(2), (b)(3)(ii), and (c)(2) of this AD; the Manager's approval letter must specifically reference this AD.

(B) Replace the door frame of the forward cargo door with a new door frame in accordance with Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994.

(ii) Modify the repaired or replaced door frame of the forward cargo door in accordance with a method approved by the Manager, Seattle ACO, or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company DER who has been authorized by the Manager, Seattle ACO, to make such findings.

Detailed Visual Initial/Repetitive Inspections

(b) Within 1 year or 4,500 flight cycles after the effective date of this AD, whichever occurs later, perform a detailed visual inspection to detect cracking of the cross beam (i.e., upper and lower chord and web sections) of the forward cargo door in accordance with Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994.

NOTE 2: For the purposes of this AD, a detailed inspection is defined as: "An intensive visual examination of a specific structural area, system, installation or assembly to detect damage, failure or irregularity. Available lighting is normally supplemented with a direct source of good lighting at intensity deemed appropriate by the inspector. Inspection aids such as mirror, magnifying lenses, etc. may be used. Surface cleaning and elaborate access procedures may be required."

(1) If no cracking is detected, repeat the inspection thereafter at intervals not to exceed 4,500 flight cycles until the requirements of paragraph (c) of this AD have been accomplished.

(2) If any cracking is detected on the lower chord section of the cross beam during any inspection required by paragraph (b) of this AD, prior to further flight, repair in accordance with a method approved by the Manager, Seattle ACO, or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company DER who has been authorized by the Manager, Seattle ACO, to make such findings.

(3) If any cracking is detected on any area excluding the lower chord section of the cross beam (i.e., upper chord and web section) during any inspection required by paragraph (b) of this AD, prior to further flight, accomplish the requirements of paragraph (b)(3)(i) or (b)(3)(ii), as applicable, of this AD, which constitute terminating action for the repetitive inspections required by paragraph (b)(1) of this AD.

(i) For airplanes with line numbers 1 through 1231: Install a cross beam repair and preventative modification of the outboard radius of the lower corners (forward and aft) of the door frame in accordance with Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994.

NOTE 3: Due to implications and consequences associated with cracking, this AD does not allow the option of replacing the door frame as an alternative method of compliance to installing the preventative modification.

(ii) For airplanes with line numbers 1232 and subsequent: Install a cross beam repair and preventative modification of the outboard radius of the lower corners (forward and aft) of the door frame in accordance with a method approved by the Manager, Seattle ACO or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company DER who has been authorized by the Manager, Seattle ACO, to make such findings.

Terminating Action

(c) Within 4 years or 12,000 flight cycles after the effective date of this AD, whichever occurs later: Install the preventative modification of the outboard radius of the lower corners (forward and aft) of the door frame and the reinforcement modification of the cross beam of the forward cargo door in accordance with paragraph (c)(1) or (c)(2) of this AD, as applicable. Accomplishment of paragraph (c)(1) or (c)(2) of this AD, as applicable, constitutes terminating action for the repetitive inspections required by paragraphs (a)(1) and (b)(1) of this AD.

(1) For airplanes with line numbers 1 through 1231: Accomplish the preventative modification and the reinforcement modification in accordance with Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994.

(2) For airplanes with line numbers 1232 and subsequent: Accomplish the preventative modification and the reinforcement modification in accordance with a method approved by the Manager, Seattle ACO or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company DER who has been authorized by the Manager, Seattle ACO, to make such findings.

Modifications Previously Accomplished

(d) For all airplanes on which modifications of the forward lower corner of the door frame and the cross beam of the forward cargo door were accomplished in accordance with Boeing Service Bulletin 737-52-1100, dated August 25, 1988, or Revision 1, dated July 20, 1989, or in accordance with the requirements of AD 90-06-02, amendment 39-6489: Within 4 years or 12,000 flight cycles after the effective date of this AD, whichever occurs later, install the reinforcement modification of the aft corner of the door frame of the forward cargo door in accordance with Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994. Accomplishment of such modification constitutes terminating action for the repetitive inspections required by this AD.

NOTE 4: Accomplishment of Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994, does not supersede the requirements of AD 90-06-02, amendment 39-6489.

Alternative Methods of Compliance

(e) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Seattle ACO. Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Seattle ACO.

NOTE 5: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Seattle ACO.

Special Flight Permits

(f) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

Incorporation by Reference

(g) Except as provided by paragraphs (a)(2)(i)(A), (a)(2)(ii), (b)(2), (b)(3)(ii), and (c)(2) of this AD; the actions shall be done in accordance with Boeing Service Bulletin 737-52-1100, Revision 2, dated March 31, 1994; and Boeing 737 Nondestructive Test (NDT) Manual, D6-37239, Part 6, Section 51-00-00, Figure 4 or Figure 23, dated August 5, 1997; as applicable. Boeing 737 NDT Manual contains the following list of effective pages:

Page Number	Revision Level Shown on Page	Date Shown on Page
Title Page	Not Shown	Not Shown
List of Effective Pages Pages 1, 2	Not Shown	August 5, 1997
List of Effective Pages Page 2A	Not Shown	February 5, 1997

This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98134-2207. Copies may be inspected at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

(h) This amendment becomes effective on May 16, 2000.

FOR FURTHER INFORMATION CONTACT:
Nenita Odesa, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Transport Airplane Directorate, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-2557; fax (425) 227-1181.

Issued in Renton, Washington, on March 31, 2000. Donald L. Riggin, Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.