

[Federal Register: June 26, 2002 (Volume 67, Number 123)]
[Rules and Regulations]
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[DOCID:fr26jn02-3]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2001-NM-233-AD; Amendment 39-12785; AD 2002-12-13]

RIN 2120-AA64

Airworthiness Directives; Boeing Model 727 Series Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to all Boeing Model 727 series airplanes, that requires a review of maintenance records or a one-time test to determine if elevator hinge support ribs on the trailing edge of the horizontal stabilizer are made from a certain material, and follow-on repetitive inspections for corrosion or cracking of the elevator hinge support ribs, if necessary. For airplanes with the affected ribs installed, this AD eventually requires replacement of all affected ribs with new, improved ribs.

This action is necessary to prevent cracking of the elevator hinge support ribs, which could lead to vibration of the airframe during flight and consequent damage to the elevator and horizontal stabilizer, potentially resulting in loss of controllability of the airplane. This action is intended to address the identified unsafe condition.

DATES: Effective July 31, 2002.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of July 31, 2002.

ADDRESSES: The service information referenced in this AD may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207. 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: Technical Information: Duong Tran, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-2773; fax (425) 227-1181.

Other Information: Judy Golder, Airworthiness Directive Technical Editor/Writer; telephone (425) 687-4241, fax (425) 227-1232. Questions or comments may also be sent via the Internet using the following address: judy.golder@faa.gov. Questions or comments sent via the Internet as attached electronic files must be formatted in Microsoft Word 97 for Windows or ASCII text.

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 727 series airplanes was published in the Federal Register on November 28, 2001 (66 FR 59382). That action proposed to require a review of maintenance records or a one-time test to determine if elevator hinge support ribs on the trailing edge of the horizontal stabilizer are made from a certain material, and follow-on repetitive inspections for corrosion or cracking of the elevator hinge support ribs, if necessary. For airplanes with the affected ribs installed, the action also proposed to eventually require replacement of all affected ribs with new, improved ribs.

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.

One commenter, an operator, notes how the proposed AD will affect its fleet but makes no request for any change to the proposed AD.

Require Only Inspections or Extend Compliance Time for Replacement of Ribs

One commenter believes that the adoption of the proposed AD at this stage would be premature. The commenter states that it is not aware of any instance of in-service or operational problems related to stress corrosion cracking in the elevator hinge support ribs. The commenter acknowledges the inherent potential for stress corrosion cracking of 7079-T6 material, as well as the potential for airframe vibration if the hinge support ribs no longer provide the required stiffness for the elevator support. However, the commenter points to the fact that, in more than 30 years of service of Model 727 series airplanes, "no major irregularities" have been found on airplanes with the subject ribs installed. The commenter states that, if the FAA determines that rulemaking is indeed necessary at this time, the proposed AD should be revised to require only repetitive inspections, with no requirement for replacement of the subject ribs with improved ribs. The commenter goes on to suggest that, if the FAA decides to require replacement of the subject ribs, the compliance time for such replacement should be extended from 48 months to 60 months after the effective date of this AD. The commenter explains that a compliance time of 60 months would be more consistent with the manufacturer's ability to deliver the necessary replacement part, and would allow the majority of operators to accomplish the rib replacement during a regularly scheduled "D" check, which would reduce the cost impact of the proposed AD on affected operators.

The FAA partially concurs. We do not concur that repetitive inspections alone will provide an acceptable level of safety for the affected airplane fleet. Mandating the replacement of subject elevator hinge support ribs is based on our determination that, in this case, long-term continued operational safety will be better assured by design changes to remove the source of the problem, rather than repetitive inspections. Repetitive inspections alone may not provide the degree of safety assurance necessary for the transport airplane fleet. This, coupled 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 replacement of elevator hinge support ribs required by this AD is consistent with these conditions.

However, we do concur with the commenter's request to extend the compliance time for the rib replacement from 48 months to 60 months. We find that the justification provided by the commenter is reasonable. Further, we find that repetitive inspections at the intervals required by this AD, along with adequate maintenance, will provide an acceptable level of safety over the 60-month compliance period. We have revised paragraph (d) of this final rule accordingly.

Extend Compliance Time for Inspection

Two commenters request that we extend the 180-day compliance time for the proposed inspection for corrosion or cracking of elevator hinge support ribs made from 7079-T6 material. Both commenters request extension of the compliance time to coincide with a regularly scheduled "C" check. One commenter states that a 180-day compliance time would be appropriate for airplanes on which the subject ribs have never been inspected, but requests a compliance time of 18 months or 4,000 flight hours (which would correspond to the industry standard for "C" checks) for airplanes on which the subject ribs have been inspected previously. This commenter concludes that previous zonal inspections, which many operators have been performing at three to six year intervals, have been adequate to ensure some degree of safety. The commenter bases its conclusion on the low incidence of cracked ribs with no flight control anomalies attributed to cracked ribs. The commenter also notes that the proposed AD would mandate inspections of the subject ribs significantly more frequently than specified by current maintenance programs. The second commenter also considers the proposed 180-day compliance time unduly restrictive considering the service history of the affected airplanes. The second commenter asserts that the proposed compliance time would add a significant cost burden for operators in the form of out-of-service costs and costs associated with gaining access and closing up outside of a regularly scheduled maintenance visit.

We partially concur with the commenters' request. We do not concur that it is appropriate to extend the initial compliance time for the inspection for cracking or corrosion on all airplanes. In developing an appropriate compliance time for this AD, we considered not only the manufacturer's recommendation, as presented in the referenced service bulletin, but the degree of urgency associated with addressing the subject unsafe condition, as well as the nature of the unsafe condition. Given the potential hazards associated with stress corrosion cracking of multiple elevator hinge support ribs, we find that it is important for the subject ribs to be inspected in a timely manner, so that any cracks may be found and fixed. Therefore, for airplanes with multiple ribs made from 7079-T6 material, we find that the 180-day compliance time for the initial inspection is warranted, in that it represents an appropriate interval of time allowable for affected airplanes to continue to operate without compromising safety.

However, we find that the compliance time may be extended somewhat for the initial inspection for cracking or corrosion on airplanes with no more than one rib made of 7079-T6 material per side of the horizontal stabilizer. For these airplanes, the potential for cracking of multiple ribs is low. Thus, we have determined that the initial inspection for cracking or stress corrosion may be deferred until 18 months after the effective date of this AD without jeopardizing the continued safety of the airplane fleet. Accordingly, paragraph (b) has been revised and paragraphs (b)(1) and (b)(2) have been added in this final rule.

Extend Repetitive Inspection Interval

Two commenters request that we extend the interval for the repetitive inspections for corrosion or cracking of all elevator hinge support ribs made from 7079-T6 material from every 180 days to every "C" check (i.e., approximately every 18 months). One commenter states that a previous AD, AD 77-18-06 R1, amendment 39-3048, requires repetitive inspections every 3,200 flight hours or 18 months for parts made from 7079-T6 material on the center section of the front spar fitting of the horizontal stabilizer. The commenter also refers to AD 75-09-04 R1, amendment 39-2142, stating

that it requires repetitive inspections every 3,000 flight hours of the center section of the rear spar fitting of the horizontal stabilizer (which is made from 7079-T6 material). The other commenter refers to the satisfactory service history of Model 767 series airplanes with hinge support ribs made from 7079-T6 material as justification for extending the proposed inspection interval to correspond to the "C" check interval of the majority of operators. That commenter states that the proposed 180-day repetitive interval would necessitate special maintenance visits and increase the cost impact on affected operators.

We partially concur. With regard to the ADs that the commenter refers to as justification for extending the repetitive interval of this AD, we note that the repetitive intervals to which the commenter refers are only applicable under certain conditions. In this AD, we find that the proposed repetitive interval of 180 days is important to ensure that any crack on an affected rib will be found and fixed in a timely manner. If not found and fixed in a timely manner, propagation of cracks on multiple ribs could decrease the stiffness of the elevator support, resulting in vibration of the airframe during flight and consequent damage to the elevator and horizontal stabilizer, which could result in loss of controllability of the airplane.

However, we find that the repetitive interval may be extended somewhat for airplanes with no more than one rib made of 7079-T6 per side of the horizontal stabilizer. As discussed previously, for these airplanes, the potential for cracking of multiple ribs is low. Thus, we have determined that the repetitive inspections for cracking or stress corrosion may be performed on these airplanes at 18-month intervals without jeopardizing the continued safety of the airplane fleet. Paragraphs (b), (b)(1), and (b)(2) of this final rule have been revised accordingly.

Allow Repair Per Structural Repair Manual

One commenter requests that we revise paragraph (c) of the proposed AD, which specifies that any discrepancy must be repaired before further flight according to a method approved by the Manager of the FAA's Seattle Aircraft Certification Office (ACO) or an authorized Boeing Designated Engineering Representative (DER). The commenter states that the current Boeing 727 Structural Repair Manual (SRM) contains appropriate repair data for certain cracks of the hinge support ribs, and requests that we clarify that applicable repairs per the SRM are acceptable for compliance with paragraph (c) of the proposed AD. The commenter also states that Boeing should provide additional repairs for small flange or web cracks that will be acceptable in the interim until subject ribs are replaced.

We partially concur with the commenter's request. The Accomplishment Instructions of Boeing Alert Service Bulletin 727-55A0091, including Appendix A, dated August 16, 2001, refer to Boeing 727 SRM Chapter 55, Subject 55-10-4, as an acceptable source of service information for repair of "some" cracks. We find that repairs included in that chapter of the SRM are acceptable for compliance with this AD. However, for necessary repairs not included in that section, the repair must be accomplished according to a method approved by the Manager, Seattle ACO, or an authorized DER. Paragraph (c) of this AD has been revised accordingly, and a new Note 3 has been added to this final rule (and subsequent notes reidentified accordingly) to specify that the service bulletin refers to Boeing 727 SRM Chapter 55, Subject 55-10-4, as an acceptable source of service information for certain repairs.

With regard to the commenter's concern about flange and web cracks, the manufacturer has not provided us with any procedures for repair of such cracks, so we cannot evaluate such repairs. If procedures for such repairs are submitted to us as provided by paragraph (f) of this AD, we will consider approving them as an alternative method of compliance for paragraph (c) of this AD. No further change to the final rule is necessary in this regard.

Require Repetitive Inspections and Replacement Only for Group 1

One commenter requests that we revise the proposed AD to make the repetitive inspection and replacement requirements applicable only to airplanes listed in Group 1 in the referenced service bulletin. The commenter notes that airplanes in Group 1, which were delivered with elevator hinge support ribs made from 7079-T6 material installed at all 14 elevator station locations, are at a significantly higher risk to have multiple cracked ribs and consequent damage than are airplanes in Groups 2 and 3, which have only one or two subject ribs. The commenter concludes that there is no airworthiness concern for airplanes in Groups 2 and 3; thus, there is no justification for including them in the proposed AD.

We do not concur. As explained in the preamble of the proposed AD, airplanes in Groups 2 and 3 may have had ribs replaced after delivery with ribs made from 7079-T6 material, so these airplanes may have more than "one or two" subject ribs. Further, even if only one subject rib is installed on each side of the horizontal stabilizer, failure of one of these ribs could lead to failure of adjacent ribs and result in the unsafe condition addressed by this AD. However, we acknowledged previously in this final rule that failure of multiple ribs is somewhat less likely on airplanes with no more than one subject rib on each side of the horizontal stabilizer. Thus, as explained above, we have extended the repetitive inspection interval to 18 months for airplanes with no more than one rib made of 7079-T6 material on each side of the horizontal stabilizer. No further change to the final rule is necessary in this regard.

Explanation of Additional Change to Final Rule

For clarification, we have made minor revisions to the service information citations in paragraph (a) of this final rule. These revisions are strictly editorial; no substantive change has been made.

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. We have 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 1,383 Model 727 series airplanes of the affected design in the worldwide fleet. The FAA estimates that 915 airplanes of U.S. registry will be affected by this AD.

This AD offers two alternatives for compliance with the requirement for an initial inspection to determine whether elevator hinge support ribs made from 7079-T6 material are installed. Estimates of the cost of these actions are provided below.

The review of maintenance records, which is one alternative for compliance, will take approximately 1 work hour per airplane, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of this review is estimated to be \$60 per airplane.

In lieu of the review of maintenance records (i.e., if the review of maintenance records is not sufficient to make a determination), the inspection of the ribs to determine if they are made from 7079-T6 material will take approximately 1 work hour per airplane, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of this inspection is estimated to be \$60 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. The cost impact figures discussed in AD rulemaking actions represent only the time necessary to perform the specific actions actually required by the AD. These figures typically do not include incidental costs, such as the time required to gain access and close up, planning time, or time necessitated by other administrative actions.

Should an operator be required to accomplish the repetitive detailed inspections, these inspections will take approximately 13 work hours per airplane, at an average labor rate of \$60 per work hour. Based on these figures, the cost impact of this inspection, if required, will be \$780 per airplane, per inspection cycle.

Should an operator be required to accomplish the replacement of the elevator hinge support ribs, it will take approximately 722 work hours per airplane for replacement of all ribs (on both the left- and right-hand sides of the airplane, excluding the time for gaining access and closing up), at an average labor rate of \$60 per work hour. Required parts will cost approximately \$70,000 per airplane. Based on these figures, the cost impact of the replacement, if required, will be \$113,320 per airplane.

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.

Sec. 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**

We post ADs on the internet at "www.airweb.faa.gov/rgl"

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).

2002-12-13 Boeing: Amendment 39-12785. Docket 2001-NM-233-AD.

Applicability: All Model 727 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 (f) 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 cracking of the elevator hinge support ribs, which could lead to vibration of the airframe during flight and consequent damage to the elevators and horizontal stabilizer, potentially resulting in loss of controllability of the airplane, accomplish the following:

One-Time Inspection

(a) Within 180 days after the effective date of this AD, review the airplane's maintenance records to determine whether any elevator hinge support rib on the trailing edge of the horizontal stabilizer is made from 7079-T6 material; OR, if the material cannot be conclusively determined from the maintenance records, do a one-time electrical conductivity test of the elevator hinge support ribs to determine whether any are made from 7079-T6 material; according to Part 6, Section 51-00-00, Figure 20, of Boeing Document D6-48875, Boeing 727 Non Destructive Test Manual, dated December 5, 1999; and Table I, page 12 of Boeing Process Specification BAC 5946, Revision (AA), dated July 9, 2001.

- (1) If no ribs are made from 7079-T6 material, no further action is required by this AD.
- (2) If any ribs are made from 7079-T6 material, do paragraph (b) of this AD.

Follow-on Repetitive Inspections

(b) At the applicable times specified in paragraph (b)(1) or (b)(2) of this AD: Perform a detailed inspection for corrosion or cracking of all elevator hinge support ribs made from 7079-T6 material, according to Boeing Alert Service Bulletin 727-55A0091, including Appendix A, dated August 16, 2001.

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) For airplanes with no more than one elevator hinge support rib made of 7079-T6 material on each side of the horizontal stabilizer: Do the initial inspection for cracking or stress corrosion within 18 months after the effective date of this AD, and repeat this inspection every 18 months, until paragraph (d) of this AD has been done.

(2) For airplanes with more than one elevator hinge support rib made of 7079-T6 material on either side of the horizontal stabilizer: Do the initial inspection for corrosion or cracking within 180 days after the effective date of this AD, and repeat this inspection every 180 days, until paragraph (d) of this AD has been done.

Repair

(c) If any corrosion or cracking is found during any inspection required by paragraph (b) of this AD: Before further flight, repair according to Boeing Alert Service Bulletin 727-55A0091, including Appendix A, dated August 16, 2001, as applicable; or according to a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA; or according to 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. Where applicable repair procedures are not included in the section of the Boeing Structural Repair Manual referred to in the service bulletin, and the service bulletin specifies to write to Boeing for repair instructions, repair according to a method approved by the Manager, Seattle ACO, or according to 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. For a repair method to be approved as required by this paragraph, the approval letter must specifically reference this AD.

Note 3: Boeing Alert Service Bulletin 727-55A0091, including Appendix A, dated August 16, 2001, refers to Boeing 727 Structural Repair Manual Chapter 55, Subject 55-10-4, as a source of service information for repair of certain cracks.

Replacement

(d) For airplanes on which any ribs made from 7079-T6 material are found: Within 60 months after the effective date of this AD, replace all elevator hinge support ribs made from 7079-T6 material with new, improved ribs, according to a method approved by the Manager, Seattle ACO, or according to 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. For a repair method to be approved by the Manager, Seattle ACO, as required by this paragraph, the Manager's approval letter must specifically reference this AD. Such replacement terminates the repetitive inspections required by paragraph (b) of this AD.

Spares

(e) After the effective date of this AD, no one may install an elevator hinge support rib made from 7079-T6 material on any airplane.

Alternative Methods of Compliance

(f) 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 4: 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

(g) 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

(h) Except as provided by paragraphs (c) and (d) of this AD, the actions shall be done in accordance with Part 6, Section 51-00-00, Figure 20, of Boeing Document D6-48875, Boeing 727 Non Destructive Test Manual, dated December 5, 1999; Table I, page 12 of Boeing Process Specification BAC 5946, Revision (AA), dated July 9, 2001; and Boeing Alert Service Bulletin 727-55A0091, including Appendix A, dated August 16, 2001; as applicable. Boeing Document D6-48875, Boeing 727 Non Destructive Test Manual, contains the following list of effective pages:

Page title and number	Date shown on page
List of Effective Pages Pages 1, 2, 2A	April 5, 2002

Boeing Process Specification BAC 5946 contains the following list of effective pages:

Page number	Revision level shown on page	Date shown on page
Contents Pages 2, 3	(AA)	July 9, 2001

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 Airbus Industrie, 1 Rond Point Maurice Bellonte, 31707 Blagnac Cedex, France. 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.

Effective Date

(i) This amendment becomes effective on July 31, 2002.

Issued in Renton, Washington, on June 12, 2002.

Ali Bahrami,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 02-15366 Filed 6-25-02; 8:45 am]

BILLING CODE 4910-13-P