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[Page 58043-58047]
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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2002-NM-126-AD; Amendment 39-13808; AD 2004-20-03]
RIN 2120-AA64

Airworthiness Directives; Bombardier Model DHC-8-101, -102, -103, -106, -201, -202, -301, -311, and -315 Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This amendment adopts a new airworthiness directive (AD), applicable to all Bombardier Model DHC-8-101, -102, -103, -106, -201, -202, -301, -311, and -315 airplanes. This amendment requires a detailed inspection of the wing leading edge de-icer boots to determine if they comply with certain patch limits in the critical zone; and corrective action, if necessary. This action is necessary to prevent reduced aerodynamic smoothness of the wing leading edge de-icer boots and possible reduced stall margin, which could result in a significant increase in stall speeds, leading to a possible stall prior to activation of the stall warning. This action is intended to address the identified unsafe condition.

DATES: Effective November 3, 2004.

ADDRESSES: The service information referenced in this AD may be obtained from Bombardier, Inc., Bombardier Regional Aircraft Division, 123 Garratt Boulevard, Downsview, Ontario M3K 1Y5, Canada. 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 FAA, New York Aircraft Certification Office, 1600 Stewart Avenue, suite 410, Westbury, New York.

FOR FURTHER INFORMATION CONTACT: Ezra Sasson, Aerospace Engineer, Systems and Flight Test Branch, ANE-172, FAA, New York Aircraft Certification Office, 1600 Stewart Avenue, suite 410, Westbury, New York, 11590; telephone (516) 228-7320; fax (516) 794-5531.

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 Bombardier Model DHC-8-101, -102, -103, -106, -201, -202, -301, -311, and -315 airplanes was published in the Federal Register on December 18, 2003 (68 FR 70469). That action proposed to require a detailed inspection of the wing leading edge de-icer boots to determine if they comply with the patch size and/or patch number limits in the critical zone as defined in the aircraft maintenance manual; and corrective action, if necessary.

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 Reference New Temporary Revisions

One commenter, an airplane operator, states that the proposed rule requires inspections using limits that were published in the aircraft maintenance manual (AMM) in October 2001. The commenter notes that these limits have all been revised, and now all have revision dates in 2003. In addition, the commenter states that if the new limits are not included in the proposed rule, then operators would be required to find and re-insert the older data into the AMM, which would negate two years of progress in maintaining the leading edge de-icer boots.

We infer that the commenter is requesting that we use the revisions that were published in 2003. We partially agree with the commenter's request. We have not revised paragraph (a) of the final rule to include the new AMM revisions because another suggestion by the same commenter (see "Request to Insert Limits Directly Into Final Rule") makes including a reference to these revisions in that paragraph unnecessary. However, we have listed these revisions in new Table 3 of new paragraph (c)(3) of the final rule (see "Explanation of New Paragraph (c)(3) of the Final Rule"). In addition, because the requirements in the new revisions are less restrictive, those operators who have complied with the limits published in the 2001 revisions are still compliant with the intent of the final rule. Therefore, we have added new Table 4 and new paragraph (e) to the final rule that gives credit to operators who have accomplished the required actions in accordance with the 2001 revisions of the AMM.

Request To Insert Limits Directly Into Final Rule

The same commenter suggests that, rather than referencing the AMMs for the necessary limits in paragraph (a) of the proposed rule, the FAA insert the necessary limits directly into paragraph (a). The commenter states that the chapters of the AMM referenced in paragraph (a) of the proposed rule contain significantly more information than apply to the patch limits that affect the stall margin. The commenter further states that the limits can be addressed concisely and, therefore, proposes that we specify the actual acceptance criteria in the proposed rule. The commenter states that this would allow operators to revise the AMMs as necessary to provide current information, yet would still mandate
the limits that are required. The commenter also suggests that if paragraph (a) is changed as suggested, all references to the AMM in the proposed rule be changed to refer to paragraph (a).

We agree with the commenter's request to change paragraph (a) of the final rule and all references to it in the final rule for the stated reasons. Paragraph (a) has been revised to more clearly define the term, "patch limits" and to specify those specific limits. Additionally, all references to the AMM have been changed to refer to paragraph (a). We also have revised the Summary of the final rule to remove the reference to the limits in the critical zone "as defined in the AMM."

Request To Allow Ferry Flights

The same commenter requests that we add a new paragraph to the final rule regarding ferry flights. The proposed paragraph would allow operators of any airplane that has de-icer boots that do not meet the AMM limits to ferry the airplane to a location where repairs can be made, provided the airplane is operated under the limits in Table 2 of the proposed rule. We infer that the operator would like the flexibility to move airplanes to convenient locations for repair without the need to request a special flight permit.

We partially agree with the commenter's request to add a paragraph regarding ferry flights to the final rule. On July 10, 2002, we issued a new version of 14 CFR part 39 (67 FR 47997, July 22, 2002), which governs the FAA's airworthiness directives system. The regulation now includes material that relates to special flight permits for ferry flights. As stated in 14 CFR 39.23: "[T]he operations specifications giving some operators authority to operate include a provision that allow(s) them to fly their aircraft to a repair facility to do the work required by an airworthiness directive. If you do not have this authority, the local Flight Standards District Office of FAA may issue you a special flight permit unless the airworthiness directive states otherwise. To ensure aviation safety, FAA may add special requirements for operating your aircraft to a place where the repairs or modifications can be accomplished. FAA may also decline to issue a special flight permit in particular cases if we determine you cannot move the aircraft safely." If an operator does not have the specified authority and requires a special flight permit, we will evaluate any request for a special flight permits on a case by case basis at the time of the request. We do not find it necessary to change the final rule in this regard.

Request To Address Varying Levels of Degradation

Another commenter is concerned about varying levels of degradation of the de-icer boots in the affected fleet of airplanes. The commenter states that there may be airplanes in operation that do not exceed the limits in the proposed rule, but still have leading edge de-icer boots that are in a state of repair that may degrade the aerodynamic performance of the wing more than other airplanes with less damage.

We infer that the commenter is requesting that we revise the proposed rule to address airplanes that carry varying levels of degradation. We do not agree. The limits in the final rule address the worst-case patch size and patch limits in the wing critical zone. In devising these limits, we assessed the amount of damage that is acceptable for safe flight without the performance penalties cited in Table 2 of this AD. These limits take into account the airplane aerodynamic characteristics and the smoothness of the boots. We have not changed the final rule in this regard.

Request To Clarify Applicability of Performance Penalties

The same commenter states that it is unclear if the performance penalties cited in Table 2 of the proposed rule are to be included only in the airplane flight manuals (AFM) of airplanes that have boot patches that exceed the patch-number limits, or if the penalties will be applicable to all Model DHC-8 airplanes in a given operator's fleet until all of the proposed inspections and replacements are completed.

From these statements, we infer that the commenter is requesting that we clarify the applicability of the performance penalties listed in Table 2 of the proposed rule. We do not agree that is necessary to change the applicability of the final rule to make this clarification. As stated in paragraph (c) of the final rule, the performance penalties apply only to airplanes that require corrective actions. Airplanes that require corrective actions are those that have boot patches that exceed the limits specified in the AMM. We have not changed the final rule in this regard. However, we have clarified paragraphs (c) and (c)(1) of the final rule based on the addition of a new paragraph (c)(3) to the final rule. These changes are described below in "Explanation of New Paragraph (c)(3) of the Final Rule" and "Explanation of Clarifications Made in Paragraphs (c) and (c)(1) of the Final Rule."

Request To Reduce Compliance Time for Replacements

The same commenter requests that we reduce the 24-month compliance time replacing the wing de-icer boots, which is specified in paragraph (c)(2) of the proposed rule. The commenter states that a 24-month compliance time could allow some airplanes to be exposed to icing conditions for up to three icing seasons.

We do not agree with the request for a shorter compliance time in paragraph (c)(2) of the final rule. In developing the proposed compliance time, we considered the fact that there have been no occurrences of stall problems in the past, and that an airplane that requires corrective action is bound to the performance penalties in Table 2 of the final rule during this 24-month period. We determined that the compliance is appropriate in consideration of the safety implications, the average utilization rate of the affected fleet, the practical aspects of an orderly inspection of the fleet, and the availability of required modification parts. We have not changed the final rule in this regard.

Request for Ongoing Monitoring Program

The same commenter requests that there be a clearly delineated ongoing program included in the proposed rule to monitor the number and size of patches on the new boots in order to stay in compliance with AMM limits. The commenter is concerned that the proposed rule is not clear about how operators should monitor the number and size of boot patches on the new boots after replacement, and still stay in compliance with the AMM limits.

We do not agree that it is necessary to delineate a monitoring program. Paragraph (d) of the final rule states that "as of the effective date of this AD, no person may install–on any airplane–a de-icer boot patch in the critical zone of the wing de-icer boots that exceeds the patch limits specified in paragraph (b) of this AD." Paragraph (d) of this AD is intended to prevent the installation of any patches beyond the specified limits. Therefore, after the boot replacements have been made, it is unnecessary to institute an ongoing monitoring program. We have not changed the final rule in this regard.

Conclusion

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

Explanation of New Paragraph (c)(3) of the Final Rule

Paragraph (c)(3) of the final rule gives operators two methods to choose from for replacing the de-icer boots:

In accordance with a method approved by either the Manager, Systems and Flight Test Branch, ANE-172, FAA, New York Aircraft Certification Office; or

In accordance with a method approved by Transport Canada Civil Aviation (or its delegated agent).

The paragraph further states that the applicable chapter of the AMM referenced in Table 3 of paragraph (c)(3) of the final rule is "one approved method."

We find that allowing operators to accomplish the actions according to one of the cited methods will not impose additional burden for operators to comply with the actions in the AD.

Explanation of Clarifications Made in Paragraphs (c) and (c)(1) of the Final Rule

Adding paragraph (c)(3) to this final rule made it necessary to clarify the statements in paragraphs (c) and (c)(1) of the final rule. Paragraph (c) of the final rule now specifically requires operators of airplanes that require corrective actions to do the actions in paragraphs (c)(1) and (c)(2). Paragraph (c)(1) of the final rule now also refers to airplanes that have findings that exceed the patch limits in accordance with paragraph (b)(2) of the final rule.

Cost Impact

We estimate that 200 airplanes of U.S. registry will be affected by this AD, that it will take approximately 2 work hours per airplane to accomplish the required actions, and that the average labor rate is $65 per work hour. Based on these figures, the cost impact of the AD on U.S. operators is estimated to be $26,000, or $130 per airplane.

The cost impact figure discussed above is 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.

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

We post ADs on the internet at "www.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).

2004-20-03 Bombardier, Inc. (Formerly de Havilland, Inc.): Amendment 39-13808. Docket 2002-NM-126-AD.

Applicability: All Model DHC-8-101, -102, -103, -106, -201, -202, -301, -311, and -315 airplanes; certificated in any category.

Compliance: Required as indicated, unless accomplished previously.

To prevent reduced aerodynamic smoothness of the wing leading edge de-icer boots and possible reduced stall margin, which could result in a significant increase in stall speeds, leading to a possible stall prior to activation of the stall warning; accomplish the following:

Critical Zone Limits and Patch Limits

(a) For the purposes of this AD, the "critical zone" and "patch limits" are defined in accordance with paragraphs (a)(1) and (a)(2) of this AD.

(1) The wing "critical zone" is the area of the leading edge assemblies that represents 3% of the chord. The critical zone may be found by measuring from the aft edge of a leading edge assembly, going forward on the upper surface and lower surface. The measurements identify the aft limits of the critical zone, as shown in Table 1 of this AD.

Table 1.–Limits of Critical Zone
[In inches]

Spanwise region	Measured along lower surface	Measured along upper surface
YW63.00–YW139.00	13.0	131⁄4
YW202.00–YW288.00	101⁄4	101⁄2
YW288.00–YW326.00	91⁄2	93⁄4
YW326.00–YW405.00	8.0	81⁄4
YW405.00–YW790.00	61⁄2	63⁄4
YW490.00–YW520.00 (series 300 only)	61⁄4	61⁄2

(2) "Patch limits" regarding the number and size of patches are defined as follows:

(i) Three small 1\1/4\ x 2\1/2\ inch (3.17 x 6.35 centimeters (cm)) patches for each 12-inch square (929.0 square cm).

(ii) Two medium 2\1/2\ x 5 inch (6.35 x 12.70 cm) patches for each 12-inch square.

(iii) One large 5 x 10 inches (12.70 x 25.40 cm) patch for each 12-inch square.

(3) "Patch limits" regarding the number or total percentage of patches that may be concentrated together in one area of the wing de-icer boot are defined as follows: The spanwise length of each patch in the critical zone, added together, may be no greater than 62.5% of the total length of the boot. A patch is considered to be in the critical zone if any part of the patch is in the critical zone. Patches may be concentrated together in one area of the boot as long as one patch is not applied over part of another patch; patches may not overlap.

Detailed Inspection

(b) Within 60 days after the effective date of this AD: Perform a detailed inspection of the wing leading edge de-icer boots to determine if the de-icer boots comply with the patch limits in the wing critical zone as defined in paragraph (a) of this AD.

Note 1: 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 all de-icer boots are within the patch limits in the critical zone, no further action is required by this paragraph.
(2) If any de-icer boot exceeds the patch limits in the critical zone, accomplish the corrective actions required by paragraph (c) of this AD.

Corrective Actions

(c) For airplanes that require corrective actions, as described in paragraph (b)(2) of this AD, do the actions in paragraphs (c)(1) and (c)(2) of this AD.

(1) Before further flight after the finding of any de-icer boot that exceeds the patch limits per paragraph (b)(2) of this AD: Insert the contents of Table 2 of this AD in the Limitations Section of the aircraft flight manual (AFM) and advise flightcrews to comply with the performance penalties in Table 2 of this AD.
(2) Within 24 months after the effective date of this AD, replace all wing de-icer boots that exceed the patch limits in the critical zone as defined in paragraph (a) of this AD, with new de-icer boots, per paragraph (c)(3) of this AD. Remove the contents of Table 2 of this AD from the AFM, and terminate the requirements to comply with the performance penalties after all replacements are accomplished.

Table 2.–Performance Penalties

AFM sections	AFM limits with de-ice boot patch limits exceeded (Note: Flap settings as applicable to aircraft model)
T/O Speed: Sub-Section 5–2:	
V1, Vr & V2	Add: 5 kt (flap 0°); 5 kt (flap 5°); 5 kt (flap 10°); 5 kt (flap 15°).
Final T/O Climb Speed	Add: 5 kt (flap 0°).
T/O WAT Limit: Sub-Section 5–3:	
Note: Weight reduction not required when limited by maximum structural weight.	Subtract: 18 kg, 400 lb. (flap 0°); 90 kg, 200 lb. (flap 5°); No change (flap 10°); No change (flap 15°).
T/O Climb: Sub-Section 5–4:	
1st Seg. Gradient	Subtract: 0.008 (flap 0°); 0.004 (flap 5°); 0.004 (flap 10°); 0.004 (flap 15°).
2nd Seg. Gradient	Subtract: 0.005 (flap 0°); 0.002 (flap 5°); 0.002 (flap 10°); 0.002 (flap 15°).
Final Seg. Gradient	Subtract: 0.009 (flap 0°).
T/O Field Length: Sub-Section 5–5:	
TOR, TOD & ASD	Add: 16% (flap 0°); 16% (flap 5°); 16% (flap 10°); 16% (flap 15°).
Net T/O Flight Path: Sub-Section 5–6:	
Ref Gradient	Subtract: 0.005 (flap 0°); 0.002 (flap 5°); 0.002 (flap 10°); 0.002 (flap 15°).
4th Seg. Net Gradient	Subtract: 0.012 (flap 0°).
Flap Retraction Initiation Speed	Add: 5 kt (flap 5°); 5 kt (flap 10°); 5 kt (flap 15°).
Enroute Climb Data: Sub-Section 5–7:	
Enroute Climb Speed	Add: 5 kt.
Net Climb Gradient	Subtract: 0.004.
OEI-Climb Ceiling	Subtract: 1,200 ft.
Landing Speed: Sub-Section 5–8:	
Approach, Go-around & Vref	Add: 5 kt (flap 5°); 5 kt (flap 10°); 5 kt (flap 15°); 5 kt (flap 35°).
Landing WAT Limit: Sub-Section 5–9:	
Note: Weight reduction not required when limited by maximum structural weight.	Subtract: 860 kg, 1,900 lb.(flap 10°); 225 kg, 500 lb. (flap 15°); 180 kg, 400 lb. (flap 35°).
Landing Climb Data: Sub-Section 5–10:	
Approach Gross Climb Gradient	Subtract: 0.010 (flap 5°); 0.003 (flap 10°); 0.002 (flap 15°).
Balked Landing Gross Climb Gradient	Subtract: 0.035 (flap 10°); 0.017 (flap 15°); 0.016 (flap 35°).
Landing Field Length: Sub-Section 5–11:	Add: 23% (flap 10°); 16% (flap 15°); 10% (flap 35°).
Brake Energy: Sub-Section 5–12:	
Accel/Stop B.E	Add: 7% (flap 0°); 7% (flap 5°); 7% (flap 10°); (flap 15°).
Landing B.E	Add: 30% (flap 10°); 20% (flap 15°); 8% (flap 35°).

(3) Do the replacements described in paragraph (c)(2) of this AD per a method approved by either the Manager, Systems and Flight Test Branch, ANE-172, FAA, New York Aircraft Certification Office (ACO), or Transport Canada Civil Aviation (TCCA) (or its delegated agent). The applicable chapter of the applicable Bombardier Aircraft Maintenance Manual (AMM) or in the temporary revision listed in Table 3 of this AD is one approved method.

Table 3.–AMM Reference

Model	AMM	Product support manual (PSM)	Chapter	Temporary revision (TR)	Date
DHC–8–101, –102, –103, and –106	Series 100	1–8–2	30–10–48	TR 30–35	October 28, 2003.
DHC–8–201, and –202	Series 200	1–82–2	30–12–00	TR 30–025	August 28, 2003.
DHC–8–301, –311, and –315	Series 300	1–83–2	30–10–48	TR 30–25	October 21, 2003.

Parts Installation

(d) As of the effective date of this AD, no person may install–
on any airplane–a de-icer boot patch in the critical zone of the wing de-icer boots that exceeds the patch limits specified in paragraph (a) of this AD.

Actions Accomplished Previously

(e) Actions that were accomplished before the effective date of this AD per the applicable chapters of the following AMMs is acceptable for compliance with the corresponding action in this AD: DHC-8-101, -102, and -106 Series 100 AMM, PSM 1-8-2, Chapter 30-10-48, Revision 49, dated October 3, 2001; DHC-8-201, and -202 Series 200 AMM, PSM 1-82-2, Chapter 30-12-00, Revision 11, dated October 19, 2001; and Temporary Revision 30-21 to the DHC-8-301, -311, and -315 Series 300 AMM, PSM 1-83-2, Chapter 30-10-48, dated October 30, 2001.

Alternative Methods of Compliance

(f) In accordance with 14 CFR 39.19, the Manager, New York ACO, FAA, is authorized to approve alternative methods of compliance for this AD.

Note 2: The subject of this AD is addressed in Canadian airworthiness directive CF-2001-43, dated November 23, 2001.

Effective Date

(g) This amendment becomes effective on November 3, 2004.

Issued in Renton, Washington, on September 16, 2004.
Ali Bahrami,
Manager, Transport Airplane Directorate, Aircraft Certification Service.
[FR Doc. 04-21646 Filed 9-28-04; 8:45 am]
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