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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2022-0814; Project Identifier AD-2022-00205-A; Amendment 39-22397; AD 2023-06-11]**

**RIN 2120-AA64**

### **Airworthiness Directives; Viking Air Limited (Type Certificate Previously Held by Bombardier Inc. and de Havilland Inc.) Airplanes**

#### **AGENCY:**

Federal Aviation Administration (FAA), DOT.

#### **ACTION:**

Final rule.

#### **SUMMARY:**

The FAA is adopting a new airworthiness directive (AD) for Viking Air Limited (type certificate previously held by Bombardier Inc. and de Havilland Inc.) Model DHC-2 Mk. I airplanes with Supplemental Type Certificate (STC) No. SA01324CH installed. This AD was prompted by a report of damage in the main wing spar. This AD requires inspecting the wing structure for damage (drill starts, corrosion, cracks, and improperly installed fasteners), repairing damage, and reporting the inspection results if necessary. The FAA is issuing this AD to address the unsafe condition on these products.

## **DATES:**

This AD is effective April 28, 2023.

## **ADDRESSES:**

*AD Docket:* You may examine the AD docket at *regulations.gov* by searching for and locating Docket No. FAA-2022-0814; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is 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:**

Tim Eichor, Aviation Safety Engineer, Chicago ACO Branch, FAA, 2300 E Devon Avenue, Des Plaines, IL 60018; phone: (847) 294-7141; email: [tim.d.eichor@faa.gov](mailto:tim.d.eichor@faa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Background**

The FAA issued a notice of proposed rulemaking (NPRM) to amend [14 CFR part 39](#) by adding an AD that would apply to Viking Air Limited (type certificate previously held by Bombardier Inc. and de Havilland Inc.) Model DHC-2 Mk. I airplanes with STC No. SA01324CH installed. The NPRM published in the **Federal Register** on July 8, 2022 ([87 FR 40749](#)). The NPRM was prompted by a report that during an annual inspection of a Viking Air Limited Model DHC-2 Mk. I airplane, a gap was noted between the doubler and wing near station 42.5, requiring partial removal of the doubler and removal of the sealant between the doubler and the wing skin. Further inspection of the internal wing structure of that area with a borescope found damage in the forward spar caused by a drill during initial installation of the doubler. The doubler was installed as part of Wipaire, Inc. (Wipaire), STC No. SA01324CH. Inspection of the rest of the operator's fleet of airplanes with STC No. SA01324CH installed found a total of 7 out of 28 wings with drill start damage in the same area. Later inspections on these same airplanes on the outboard end of the doubler installation revealed improperly installed fasteners. As only a small fraction of the affected fleet has been inspected, the possible extent of damage in the field is unknown. Accordingly, the FAA determined that in addition to inspecting for drill starts and improperly installed fasteners, inspecting for corrosion and cracks is necessary. Damage of the main structural members of the wing could adversely affect the structural integrity of the airplane and could result in loss of control of the airplane.

### **Discussion of Final Airworthiness Directive**

## Comments

The FAA received comments from Wipaire. The following presents the comments received on the NPRM and the FAA's response to each comment.

### Request Regarding Changing the Unsafe Condition

Wipaire requested that the unsafe condition statement in the Background section and paragraph (e) of the proposed AD be changed from “Damage of the main structural members of the wing could adversely affect the structural integrity of the airplane and could result in loss of control of the airplane” and suggested the wording “This condition, if not addressed, could have a slight adverse effect on the structural integrity of the airplane.” Wipaire stated that although the unsafe condition statement in the NPRM is technically correct, it is misleading to operators affected by the proposed AD. Wipaire noted that a structural analysis performed and approved by an FAA Designated Engineering Representative (DER) showed that this type of damage at this location had no appreciable effect on the overall strength of the spar. Wipaire explained that the doubler is installed inboard of the wing strut on the upper section of the wing and in this configuration the spar is predominately loaded compression so crack growth would be slow and detectable.

The FAA disagrees with the commenter's request. As only a small fraction of the affected fleet has been inspected, the extent of damage in the field is unknown. Accordingly, it is not accurate to say that the damage of the main structural members of the wing will not adversely affect the structural integrity of the wing, resulting in both the loss of the wing and loss of control of the airplane. No change was made to this AD regarding this issue.

### Request Regarding Background Section

Wipaire requested the Background section of the NPRM be changed from “6 out of 14 wings with drill start damage,” which is based off of inspection results of a single operator to the broader inspection results of “7 out of 28 wings with drill start damage,” because these results are based on Wipaire's record of inspections performed by multiple operators. Wipaire stated that, while still a statistically small sample size, the rewording to specify 28 wings provides a more accurate representation of the potential for damage existing fleet wide. Wipaire also mentioned that it hoped the FAA did not issue the NPRM using calculations based on “6 out of 14 wings.”

The FAA agrees with the commenter's statement that, in total, 7 wings were found to be damaged based on inspection results provided by Wipaire on January 26, 2022. The FAA has revised the Background section of this final rule to read “Inspection of the rest of the operator's fleet of airplanes with STC No. SA01324CH installed found a total of 7 out of 28 wings with drill start damage in the same area.”

Regarding issuing the AD based on the data of “6 out of 14 wings,” the FAA clarifies that under [14 CFR 39.5](#), issuance of an AD is based on the finding that an unsafe condition exists in a product and that condition is likely to exist or develop in other products of the same type design. The FAA does not issue an AD based upon a sample size of airplanes. The unsafe condition addressed in this AD is based on

a report of damage in the main wing spar. This condition, if not addressed, could adversely affect the structural integrity of the airplane and result in loss of control of the airplane. Inspections and repair are therefore necessary to detect and correct damage in the main wing spar before it leads to structural failure.

#### **Request Regarding Costs of Compliance: Increase Estimated Work Hours**

Wipaire requested that the work-hours for doing the inspection be increased from 6 work-hours for a single side of the wing (left or right) to 12 work-hours for both sides of the wing. Wipaire justified the request by stating that due to the inspection requirement including the complete area under the doubler, the estimate should be increased.

The FAA agrees with the commenter's request and has increased the estimated work-hours for the inspection from 6 to 12 in the Costs of Compliance section in this AD.

#### **Request Regarding Costs of Compliance: Add Costs for Developing and Approving Repair Scheme**

Wipaire requested that estimated costs for developing a repair scheme and obtaining repair scheme approval be included in the Costs of Compliance section. Wipaire stated that these are additional costs on operators that were not accounted for in the NPRM.

The FAA acknowledges the commenter's concerns. The FAA recognizes that in accomplishing the requirements of any AD, operators might incur "incidental" costs in addition to the "direct" costs that are reflected in the cost analysis presented in the AD. However, the cost analysis in ADs typically does not include incidental costs. No change was made to this AD regarding this issue.

#### **Request Regarding Reducing the Inspection Areas**

Wipaire requested that the FAA understand the feasibility of inspecting every bay (both forward and aft the spar) across the entire area and adjust the inspection requirements accordingly. Wipaire stated that the requirement to visually inspect the aircraft structure underneath the entire doubler between wing stations 30.26 and 126.36 may not be able to be accomplished without removal of the wing skins and that there are bays, especially on the forward side of the spar, that have very limited access through a combination of existing access panels and lightening holes in structural members. Wipaire recommended focusing the inspection only on areas where data and prior inspections support that damage have been found (fastener locations near the spar) because a smaller area of focus will lead to more thorough inspections and easier compliance for operators in the field. Wipaire further stated that the Background section of the NPRM indicated damage was found on the inboard side of the doubler and improperly installed fasteners on the outboard side of the doubler and recommended focusing on those areas for inspection.

The FAA disagrees with the commenter's request because there is other airplane structure under the doublers that could be damaged by the installation of STC No. SA01324CH. No change was made to this AD regarding this issue.

### **Comment Regarding the Visual Inspection**

Wipaire stated that a borescope is needed to comply with the visual inspection requirement specified in the proposed AD. Wipaire explained that a borescope would be needed in order to view the area of inspection because there are multiple 90-degree bends due to access bays and lightening holes. Wipaire further stated that based on its experience, operators in Alaska might not have borescope equipment and personnel able to use that equipment readily available, which could lead to the inability to comply with the proposed AD as written.

The FAA acknowledges the commenter's concern. While a borescope inspection is acceptable, paragraph (g) of this AD states that a borescope, flashlight and mirror, or equivalent, may be used to do the visual inspection. The FAA's intent is that any inspection method that allows for visual inspection of 100 percent of the airplane structure complies with the visual inspection requirement. This AD also provides time to transport the airplane to a location with the resources and personnel to appropriately inspect the airplane. No change was made to this AD regarding this issue.

### **Request Regarding Required Actions**

Wipaire requested that the FAA reword the proposed inspection requirement to “. . . visually inspect for drill starts, improperly installed fasteners, and corrosion or cracks related to the damage caused by any drill starts or improperly installed fasteners” because the wording for the proposed requirement to inspect for corrosion and cracks could be interpreted broadly and could be extended beyond the scope of the proposed AD. Wipaire stated that the proposed requirement to inspect generally for corrosion and cracks may lead to operators being less likely to comply with the requirements specified in the proposed AD in a timely manner.

The FAA disagrees with the commenter's request. Any crack or corrosion that is found, regardless if it is related to damage caused by any drill start or improperly installed fastener, must be addressed to keep the airplane in an airworthy condition. No change was made to this AD regarding this issue.

### **Request Regarding Special Flight Permit**

Wipaire requested that, if no cracks are found during the visual inspection specified in paragraph (g) of the proposed AD, special flight permits be allowed so an airplane can fly to a maintenance facility for repair work. Wipaire stated that the language in paragraph (g) of the proposed AD and the special flight permit prohibition in paragraph (i) of the proposed AD are not supported by the data it gathered during its investigation into this issue.

The FAA disagrees with the commenter's request to allow a special flight permit to repair the aircraft as long as cracks are not found. Drill starts, corrosion, and improperly installed fasteners contribute to the unsafe condition as well as cracks, and if any of these are found during the inspection, then they must be corrected before further flight after the inspection. The compliance time of this AD is 12 months and was established to coincide with the next annual inspection. Therefore, at the time of the inspection, the airplane should

already be at a facility where the repair could be done. Thus, a special flight permit is not justified. No change was made to this AD regarding this issue.

## **Conclusion**

The FAA reviewed the relevant data, considered any comments received, and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, and any other changes described previously, this AD is adopted as proposed in the NPRM. None of the changes will increase the economic burden on any operator.

## **Related Service Information**

The FAA reviewed a Wipaire letter, dated September 7, 2021. This letter requests that operators inspect the front wing spar (strap) and front (forward) spar aft flange for drill holes due to the installation of the top wing strap installed using Wipaire Drawing 5D1-790, which is an attachment to the letter. This letter also requests reporting all findings of damage to Wipaire.

## **Differences Between This AD and the Service Information**

The Wipaire letter, dated September 7, 2021, specifies inspecting the front spar and front spar aft flange between wing stations 42.5 and 56. This AD requires inspecting all airplane structure under the installed doubler between wing stations 30.26 and 126.36.

## **Impact on Intrastate Aviation in Alaska**

Airplanes modified by Wipaire STC No. SA01324CH are often used to transport cargo and supplies to remote areas of Alaska. The FAA estimates that roughly half of the U.S.-registered airplanes modified by STC No. SA01324CH are operating in Alaska. Since damage to the main structural members of the wing could result in loss of the airplane wing and therefore, loss of control of the airplane, the FAA has determined that the need to correct the unsafe conditions outweighs any impact on aviation in Alaska.

## **Costs of Compliance**

The FAA estimates that this AD affects 96 airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

### **Estimated Costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Inspection	12 work-hours × \$85 per hour = \$1,020	Not Applicable	\$1,020	\$97,920

The FAA estimates the following costs to do any necessary repairs that would be required based on the results of the inspection. The agency has no way of determining the number of airplanes that might need these repairs.

### **On-Condition Costs**

<b>Action</b>	<b>Labor cost</b>	<b>Parts cost</b>	<b>Cost per product</b>
Repair damage	100 work-hours × \$85 per hour = \$8,500	\$35,000	\$43,500
Report inspection results	1 work-hour × \$85 per hour = \$85	Not Applicable	85

### **Paperwork Reduction Act**

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0056. Public reporting for this collection of information is estimated to take approximately 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Aviation Administration, 10101 Hillwood Parkway, Fort Worth, TX 76177-1524.

### **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.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is

within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

## Regulatory Findings

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, and
- (2) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## List of Subjects in [14 CFR Part 39](#)

- Air transportation
- Aircraft
- Aviation safety
- Incorporation by reference
- Safety

## The 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:



**2023-06-11 Viking Air Limited (Type Certificate Previously Held by Bombardier Inc. and de Havilland Inc.):**  
Amendment 39-22397; Docket No. FAA-2022-0814; Project Identifier AD-2022-00205-A.

**(a) Effective Date**

This airworthiness directive (AD) is effective April 28, 2023.

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to Viking Air Limited (type certificate previously held by Bombardier Inc. and de Havilland Inc.) Model DHC-2 Mk. I airplanes, all serial numbers, certificated in any category, with Supplemental Type Certificate (STC) No. SA01324CH installed.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 5711, Wing Spar.

**(e) Unsafe Condition**

This AD was prompted by a report of damage in the main wing spar. The FAA is issuing this AD to detect and address damage (drill starts, corrosion, cracks, and improperly installed fasteners) to the main structural members of the wing. This condition, if not addressed, could adversely affect the structural integrity of the airplane and result in loss of control of the airplane.

**(f) Compliance**

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

**(g) Required Actions**

Within 12 months after the effective date of this AD, using a borescope, flashlight and mirror, or equivalent, visually inspect the aircraft structure under the installed doubler between wing stations 30.26 and 126.36 for drill starts, corrosion, cracks, and improperly installed fasteners. Pay particular attention to the spar cap, spar flange, and stringers, and include all structural items in the wing. If there is a drill start, any corrosion, a crack, or an improperly installed fastener, before further flight, repair using a method approved by the

Manager, Chicago ACO Branch, FAA. For a repair method to be approved by the Manager, Chicago ACO Branch, as required by this paragraph, the Manager's approval letter must specifically refer to this AD.

**Note 1 to paragraph (g):** Wipaire, Inc., letter, dated September 7, 2021, provides additional information on this subject, including examples of damage.

#### **(h) Reporting Requirement**

If, during the inspection required by paragraph (g) of this AD, any damage is found, within 30 days after doing the inspection or within 30 days after the effective date of this AD, whichever occurs later, report the following information to the person identified in paragraph (k)(1) of this AD:

(1) Name and address of owner.

(2) Date of the inspection.

(3) Name, address, telephone number, and email address of person submitting the report.

(4) Airplane serial number, registration number, STC installation date, and total hours time-in-service on the airplane at the time of the inspection.

(5) Description of damage. Include affected structure, location, dimensions, and photos of damage (or sketches, if photos are not possible).

#### **(i) Special Flight Permit**

Special flight permits are prohibited.

#### **(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Chicago 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 (k)(1) of this AD.

(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.

**(k) Related Information**

(1) For more information about this AD, contact Tim Eichor, Aviation Safety Engineer, Chicago ACO Branch, FAA, 2300 E Devon Avenue, Des Plaines, IL 60018; phone: (847) 294-7141; email: [tim.d.eichor@faa.gov](mailto:tim.d.eichor@faa.gov).

(2) For service information identified in this AD that is not incorporated by reference, contact Wipaire, Inc., 1700 Henry Avenue, Fleming Field (KSGS), South St. Paul, MN 55075; phone: (651) 451-1205; fax: (651) 457-7858; email: [switte@wipaire.com](mailto:switte@wipaire.com); website: [wipaire.com](http://wipaire.com). You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 901 Locust, Kansas City, MO 64106. For information on the availability of this material at the FAA, call (817) 222-5110.

**(l) Material Incorporated by Reference**

None.

Issued on March 20, 2023.

Christina Underwood,

Acting Director, Compliance & Airworthiness Division, Aircraft Certification Service.

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