



AIRWORTHINESS DIRECTIVE

This Airworthiness Directive (AD) is issued pursuant to Canadian Aviation Regulation (CAR) 521.427. No person shall conduct a take-off or permit a take-off to be conducted in an aircraft that is in their legal custody and control, unless the requirements of CAR 605.84 pertaining to ADs are met. Standard 625 - Aircraft Equipment and Maintenance Standards Appendix H provides information concerning alternative means of compliance (AMOC) with ADs.

Number:

CF-2024-46

Effective Date:

6 January 2025

ATA:

27

Type Certificate:

A-27

Subject:

Flight Controls – Horizontal Stabilizer Actuator – Missing Lock Ring

Applicability:

De Havilland Aircraft of Canada Limited (formerly Viking Air Limited and Bombardier Inc.) model DHC-3 aeroplanes, all serial numbers.

Compliance:

As indicated below, unless already accomplished.

Background:

A fatal DHC-3 aeroplane accident occurred on 4 September 2022 at Mutiny Bay, near Freeland, Washington, U.S.A. Witnesses reported that the aircraft was in level flight before it entered a slight climb, then pitched down in a near-vertical descent until it impacted water resulting in fatal injuries to the pilot and the nine passengers.

The National Transportation Safety Board (NTSB) carried out the accident investigation and released a final investigation report on 29 September 2023. The NTSB noted in the report that the stabilizer actuator clamp nut on the accident aeroplane separated from the stabilizer barrel by unthreading and the lock ring securing the clamp nut to the barrel was missing. The NTSB also found an unapproved moisture seal had been installed on the stabilizer actuator, which is not part of the aeroplane's type design, leading to increased rotational friction between the clamp nut and eye bolt, which has the potential to increase the rate of separation between the clamp nut and barrel in the absence of the lock ring.

The absence of the lock ring, if not detected and corrected, could lead to the unthreading of the clamp nut. Since the top eye end of the actuator acts as the rear attachment for the stabilizer, separation of the clamp nut from the actuator barrel will result in the stabilizer being attached only by the two forward pivot points, resulting in a free-floating stabilizer with the potential of reduction or loss of pitch control and consequent loss of control of the aeroplane.

To address this unsafe condition, this AD mandates initial and repetitive inspections of the stabilizer actuator to confirm that the stabilizer actuator lock ring is present, correctly seated in the groove in the upper housing, and fully engaged in the clamp nut. This AD also mandates the application of a witness mark and prohibits the installation of a stabilizer actuator that has not been inspected in accordance with this AD or has not been marked. If the lock ring is missing or incorrectly installed, this AD mandates the rectification of the actuator in accordance with the Viking Service Letter (SL) DHC3-SL-27-001 or replacement with a serviceable actuator.

The incorporation of an approved secondary retention feature to retain the actuator lock ring or clamp nut constitutes an optional terminating action to this AD.

Corrective Actions:

For the purpose of this AD, the following definitions apply:

Applicable SL: Viking Service Letter DHC3-SL-27-001 issue 1, dated 25 October 2022.

Serviceable part: A stabilizer actuator that has completed the actions of Part I and Part II of this AD or a stabilizer actuator that has an approved secondary retention feature listed in Part V of this AD.

Part I – Initial Inspection

- A. Within 25 hours air time or 90 days, whichever occurs first, from the effective date of this AD, perform a visual inspection to confirm that the stabilizer actuator lock ring is present, correctly seated in the groove in the upper housing, and fully engaged in the clamp nut in accordance with the inspection instructions of the applicable SL.
- B. If the lock ring is missing or incorrectly installed, before further flight, rectify in accordance with the instructions of the applicable SL or replace the stabilizer actuator with a serviceable part.

Part II – Addition of Witness Mark

Within 25 hours air time or 90 days, whichever occurs first, from the effective date of this AD, unless already accomplished, apply a witness mark perpendicular across the clamp nut, lock ring and upper housing barrel with a semi-permanent method such as indelible ink or paint marker. This witness mark serves as an indicator of the relative position of the lock ring and the clamp nut when the lock ring is fully engaged.

Part III – Repetitive Inspection

- A. At intervals not exceeding 110 hours air time after completion of the actions of Part I and Part II of this AD, perform a visual inspection to confirm that the stabilizer actuator lock ring is present, correctly seated in the groove in the upper housing and fully engaged in the clamp nut in accordance with the inspection instructions of the applicable SL, and verify that the witness mark is intact.
- B. If the lock ring is missing, incorrectly installed or the clamp nut shows signs of rotation based on the witness mark, before further flight, rectify in accordance with the instructions of the applicable SL or replace the stabilizer actuator with a serviceable part.
- C. If the witness mark is missing or not intact, reapply a witness mark in accordance with Part II of this AD. Any residue from the previous witness mark shall be removed prior to the reapplication.

Part IV – Parts Installation Prohibition

As of the effective date of this AD, it is prohibited to install any stabilizer actuator on De Havilland Aircraft of Canada model DHC-3 aeroplanes unless it is a serviceable part.

Part V – Optional Terminating Action

The initial inspection, the addition of a witness mark and the repetitive inspection requirements of Part I, Part II and Part III of this AD are no longer required for aeroplanes that have incorporated an approved secondary retention feature, namely Transport Canada Supplemental Type Certificate (STC) No. SA23-26 (FAA STC SA02761SE) or Part Design Approval No. PDA23-10, to retain the stabilizer actuator lock ring or clamp nut. Any other modification, approved by Transport Canada, to retain the stabilizer actuator lock ring or clamp nut shall be approved as an AMOC to be considered as terminating action.

Note: Any movement of the lock ring and/or the witness mark is a reportable service difficulty as defined in CAR 101.01 and should be reported via the Transport Canada Web Service Difficulty Reporting System (WSDRS).

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Jenny Young
Chief, Continuing Airworthiness
Issued on 23 December 2024

Contact:

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