



# 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-2022-24R1

**Effective Date:**

28 October 2022

**ATA:**

27

**Type Certificate:**

A-234

**Subject:**

Flight Controls – Stabilizer Trim Switch Failure

**Revision:**

Supersedes AD CF-2022-24, issued 2 May 2022.

**Applicability:**

Bombardier Inc. model BD-100-1A10 aeroplanes, all serial numbers.

**Compliance:**

As indicated below, unless already accomplished.

**Background:**

There have been several in-service events, where following a STAB TRIM FAULT advisory message and an Auto-Pilot disconnect, both pilot and co-pilot commands to trim the horizontal stabilizer nose-up resulted in a nose-down movement of the horizontal stabilizer. In two events, the horizontal stabilizer reached the full travel nose-down position before the crew recognized the nature of the problem. As a result, this led to increased crew workload and reduced safety margins.

If not correctly managed by the flight crew, the horizontal stabilizer motion in the direction opposite to the command could result in the stabilizer reaching its full travel position. Under these conditions, the crew may not be able to regain control of the horizontal stabilizer, resulting in reduced controllability of the aeroplane and high control forces.

Subsequent investigation by Bombardier and the supplier of the horizontal stabilizer pitch trim switch (trim switch), determined that one of the springs within the trim switch had failed. The supplier of the spring was changed in 2019. The majority of observed trim switch failures occurred in trim switches that were manufactured after 2019. Bombardier also identified an existing issue with the trim switch wiring installation that was the main cause of the in-service events. Additional corrective action will follow in the near future to address this non-compliant wiring installation.

AD CF-2022-03 mandated the introduction of an Expanded Pitch Trim Pre-Flight Check; the introduction of Trim Malfunction procedures; the revision of the AP STAB TRIM FAIL caution procedure; the revision of the STAB TRIM FAULT advisory procedure; and a periodic pre-flight briefing on selected procedures, to address this unsafe condition. The corrective action required by AD CF-2022-03 will remain in place until the trim switch installation wiring is modified through future mandatory action.

AD CF-2022-24 mandated the replacement of affected trim switches with trim switches that have a more reliable spring.

This AD revision, CF-2022-24R1, corrects the Bombardier Service Bulletin (SB) revision date reference and adds statements to Table 2 below allowing the use of later revisions of the Bombardier SBs approved by the Chief, Continuing Airworthiness, Transport Canada.

**Corrective Actions:****Part I – Verification of the Aeroplane Technical Records**

Within 200 hours air time or 6 months, whichever occurs first, from the effective date of this AD, verify the aeroplane technical records:

- A. If the pilot or co-pilot trim switch or control wheels were removed after 1 January 2019 and the replacement trim switches have serial numbers 02000 and subsequent, then no further action is required other than compliance with Part IV of this AD.
- B. For aeroplanes with serial numbers 20003 through 20780. If no pilot or co-pilot trim switch or control wheels were replaced after 1 January 2019, then no further action is required other than compliance with Part IV of this AD.
- C. For aeroplanes with serial numbers 20901 through 20936. If no pilot or co-pilot trim switch or control wheels were replaced after entry-into-service, then no further action is required other than compliance with Part IV of this AD.
- D. For aeroplanes with serial numbers 20501 and subsequent, if leather covered control wheels part number (P/N) 83912156 (pilot side) and P/N 83912157 (co-pilot side) are installed, proceed to Part III of this AD.
- E. For all other aeroplanes not affected by Parts I.A., I.B., I.C., or I.D. of this AD, proceed to Part II and Part IV of this AD.

**Part II – Removal, Inspection, and Re-Installation / Replacement of Horizontal Stabilizer Pitch Trim Switches**

Within 200 hours air time or 6 months, whichever occurs first, from the effective date of this AD, remove and inspect both the pilot and co-pilot trim switches in accordance with Section 2.B. of the Accomplishment Instructions of the applicable Bombardier SB listed in Table 2 below.

- i. If the pilot or co-pilot trim switch has a serial number that is **not** listed in Table 1 of this AD, re-install the trim switch in accordance with Section 2.B. of the Accomplishment Instructions of the applicable Bombardier SB listed in Table 2 below.
- ii. If the pilot or co-pilot trim switch has a serial number listed in Table 1 of this AD, before further flight, replace the trim switch in accordance with Section 2.B. of the Accomplishment Instructions of the applicable Bombardier SB listed in Table 2 below.
- iii. Perform the operational test in accordance with Section 2.C. of the Accomplishment Instructions of the applicable Bombardier SB listed in Table 2 below.

**Table 1 – Serial Numbers of Affected Horizontal Stabilizer Pitch Trim Switches to be Removed and Replaced**

<b>Part Number</b>	<b>Serial Number</b>
83452541	01583 through 01604 01610 through 01622 01628 through 01635
83452548	00001 through 01999

**Table 2 – Applicable Bombardier SBs**

<b>Bombardier SB</b>	<b>Aeroplane Serial number</b>
100-27-21- SPECIAL CHECK/MODIFICATION – PITCH TRIM SYSTEM – REPLACEMENT OF PITCH TRIM SWITCHES ON PILOT AND CO-PILOT CONTROL WHEELS, dated 21 March 2022, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.	20003 through 20500
350-27-011- SPECIAL CHECK/MODIFICATION – PITCH TRIM SYSTEM – REPLACEMENT OF PITCH TRIM SWITCHES ON PILOT AND CO-PILOT CONTROL WHEELS, dated 21 March 2022, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.	20501 through 20936

**Part III – Applicable to Aeroplanes with Serial Numbers 20501 and Subsequent with Leather Covered Control Wheels, P/N 83912156 (pilot side) and P/N 83912157 (co-pilot side) – Removal, Inspection and Replacement of Trim Switches**

Within 200 hours air time or 6 months, whichever occurs first, from the effective date of this AD, remove and inspect both the pilot and co-pilot trim switches to determine the P/N of the trim switch in accordance with Section 2.B. of the Accomplishment Instructions of the applicable Bombardier SB listed in Table 2 above.

- i. If trim switch P/N 83452548 is found installed in either the pilot or the co-pilot control wheel, before further flight, replace the trim switch in accordance with Section 2.B. of the Accomplishment Instructions of the applicable Bombardier SB listed in Table 2 above.
- ii. If trim switch P/N 83452541 is found installed in either the pilot or the co-pilot control wheel, before further flight, replace it with trim switch P/N 83452548 in accordance with Section 2.B. of the Accomplishment Instructions of the applicable Bombardier SB listed in Table 2 above.
- iii. Perform the operational test in accordance with Section 2.C. of the Accomplishment Instructions of the applicable Bombardier SB.

**Part IV – Installation Prohibition of Components**

As of the effective date of this AD, trim switch P/N 83452548 and P/N 83452541 with serial number listed in Table 1 of this AD, are not eligible for installation on model BD-100-1A10 aeroplanes.

**Authorization:**

For the Minister of Transport,

*ORIGINAL SIGNED BY*

Philippe Ngassam  
Director, National Aircraft Certification  
Issued on 14 October 2022

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