



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-2024-36

Effective Date:

5 November 2024

ATA:

27

Type Certificate:

A-236

Subject:

Flight Controls – Primary Flight Control Computer (PFCC) software deficiencies

Replacement:

Supersedes AD CF-2022-64, issued 17 November 2022.

Applicability:

Airbus Canada Limited Partnership (ACLP) (formerly C Series Aircraft Limited Partnership (CSALP), Bombardier Inc.) aeroplanes:

Model BD-500-1A10, serial numbers 50001 through 50078,

Model BD-500-1A11, serial numbers 55001 through 55298.

Compliance:

As indicated below, unless already accomplished.

Background:

There have been multiple in-service reports associated with PFCC software deficiencies leading to nuisance messages on engine-indicating and crew-alerting system (EICAS) such as RUDDER FAIL, AILERON FAIL, GND SPOILER FAIL, and FLT CTRL FAULT due to erroneous transmissions from the remote electronic unit (REU). Investigations also indicated design deficiencies in the PFCC software such as an incorrectly implemented built-in test which is unable to detect a failed REU internal hold-up capacitor or non-implemented self-tests and monitoring mechanisms to prevent erroneous computations to be transmitted to consumers. Other in-service events indicated a lack of software robustness which may not prevent an un-announced deployment of ground spoilers or an inadvertent autopilot engagement during the take-off roll. To mitigate some of the above-mentioned issues, Transport Canada previously issued Civil Aviation Safety Alert (CASA) No. 2021-10, to raise awareness of occurrences of takeoff with incorrect throttle setting, and AD CF-2022-64, requiring an amendment to the Airplane Flight Manual (AFM) to include a new warning regarding autopilot engagement on take-off.

These deficiencies and lack of PFCC software robustness, if not corrected, could lead to increased flight crew workload as well as a large reduction of safety margins. Additionally, during specific flight phases or in combination with other failures, these conditions could lead to loss of control of the aeroplane.

To address these unsafe conditions, this AD mandates the installation of PFCC software update, PFCC part number (P/N) 810-0337-009, which will become the new production baseline. Affected aeroplanes may have concurrent requirements to be incorporated as pre-requisites to the installation of PFCC software update.

This AD maintains the requirements of AD CF-2022-64, which is superseded, to amend the applicable AFM, section Limitations, on aeroplanes prior to the installation of the PFCC software update, but terminates those requirements on aeroplanes following the software installation mandated by this AD.

Corrective Actions:**Part I – AFM Revision**

- A. Within 7 days from the effective date of AD CF-2022-64, 18 November 2022, amend the applicable AFM, section Limitations, to incorporate the limitation as specified in Figure 1 of this AD. This may be accomplished by inserting a copy of this AD into the existing AFM of the aeroplane. Carrying this AD on board the aeroplane separately from the AFM in either electronic or physical form is also acceptable for compliance with this Corrective Action.

Figure 1 – AFM Limitation

<p style="text-align: center;">AUTOPILOT ENGAGEMENT</p> <p style="text-align: center;">WARNING</p> <p style="text-align: center;">Autopilot engagement during takeoff roll can result in premature rotation, possibly leading to tail-strike, inability to climb or loss of control. Immediate crew intervention is required.</p>

- B. Using an AFM revision which includes information identical to that indicated in Paragraph A, Part I, of this AD is acceptable for compliance with the requirement of Paragraph A, Part I, of this AD.
- C. Inform all flight crews of the new limitation and thereafter operate the aeroplane accordingly.

Part II – PFCC Software Installation

- A. Within 24 months from the effective date of this AD, install PFCC software P/N 810-0337-009 on the three (3) PFCCs in accordance with the procedure in section 3 of the Accomplishment Instructions of ACLP Service Bulletin BD500-270022, Issue 001, dated 25 July 2024 or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.
- B. Accomplishment of Paragraph A, Part II, of this AD terminates the AFM amendment requirements of Part I of this AD.

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Jenny Young
Chief, Continuing Airworthiness
Issued on 22 October 2024

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