



No.	CF-2010-35R1	1/5
Issue Date	28 June 2011	

AIRWORTHINESS DIRECTIVE

The following airworthiness directive (AD) may be applicable to an aircraft which our records indicate is registered in your name. ADs are issued pursuant to **Canadian Aviation Regulation (CAR) 521 Division X**. Pursuant to **CAR 605.84** and the further details of **CAR Standard 625, Appendix H**, the continuing airworthiness of a Canadian registered aircraft is contingent upon compliance with all applicable ADs. Failure to comply with the requirements of an AD may invalidate the flight authorization of the aircraft. Alternative means of compliance shall be applied for in accordance with **CAR 605.84** and the above-referenced **Standard**.

This AD has been issued by the Continuing Airworthiness Division (AARDG), National Aircraft Certification Branch, Transport Canada, Ottawa, telephone 613 952-4357.

Number: CF- 2010-35R1

Subject: Hydraulic Accumulators – Screw Cap/End Cap Failure

Effective: 21 July 2011

Revision: Supersedes Airworthiness Directive CF-2010-35.

Applicability: Bombardier Inc. Aeroplane:
Model CL-600-2C10, Serial Numbers 10003 through 10314;
Models CL-600-2D15 and CL-600-2D24, Serial Numbers 15001 through 15259

Compliance: As indicated below, unless already accomplished.

Background: Seven cases of on-ground hydraulic accumulator screw cap/end cap failure have been experienced on CL-600-2B19 aeroplanes resulting in loss of the associated hydraulic system and high-energy impact damage to adjacent systems and structure. The lowest number of flight cycles accumulated at the time of failure, to date, has been 6991 flight cycles.

Although there have been no failures to date on any CL-600-2C10, CL-600-2D15 or CL-600-2D24 aeroplanes, similar accumulators to those installed on the CL-600-2B19, are installed. The part numbers (P/Ns) of the accumulators installed on CL-600-2C10, CL-600-2D15 and CL-600-2D24 aeroplanes are 900096-1 (Hydraulic System No. 1 and Hydraulic System No. 2 accumulators), 900097-1 (Hydraulic System No. 3 accumulator) and 08-60204-001 (Inboard Brake and Outboard Brake accumulators).

A detailed analysis of the calculated line of trajectory of a failed screw cap/end cap for each of the accumulators has been conducted, resulting in the identification of several areas where systems and/or structural components could potentially be damaged. Although all of the failures to date have occurred on the ground, an in-flight failure affecting such components could potentially have an adverse effect on the controllability of the aeroplane.

This directive gives instructions to conduct repetitive ultrasonic inspections of the Hydraulic System No. 1, Hydraulic System No. 2, Hydraulic System No. 3, Inboard Brake and Outboard Brake accumulators, P/Ns 900096-1, 900097-1, and 08-60204-001, that are not identified by the letter "M" or "T" after the S/N on the identification plate.

Revision 1 of this directive was issued to amend the aeroplane applicability and to provide terminating actions to this directive.

Pursuant to **CAR 202.51** the registered owner of a Canadian aircraft shall, within seven days, notify the Minister in writing of any change of his or her name or address.

To request a change of address, contact the Civil Aviation Communications Centre (AARC) at Place de Ville, Ottawa, Ontario K1A 0N8, or 1-800-305-2059, or www.tc.gc.ca/civilaviation/communications/centre/address.asp

**Corrective
Actions:**

Part I: Initial Ultrasonic Inspections of Hydraulic System No. 1, Hydraulic System No. 2, Hydraulic System No. 3, Inboard Brake and Outboard Brake Accumulators

A. Inspection Schedule

1. For each accumulator P/Ns 900096-1, 900097-1, or 08-60204-001 not identified by the letter "M" or "T" after the serial number (S/N) on the identification plate and with more than 4500 flight cycles, inspect the accumulator within 500 flight cycles after the effective date of the original issue of this directive (28 October 2010), in accordance with Part I, Paragraph B of this directive.
2. For each accumulator P/Ns 900096-1, 900097-1, or 08-60204-001 not identified by the letter "M" or "T" after the S/N on the identification plate and with 4500 or less flight cycles, inspect the accumulator before it has accumulated 5000 flight cycles, in accordance with Part I, Paragraph B of this directive.
3. If it is not possible to determine the flight cycles accumulated for any accumulator P/Ns 900096-1, 900097-1, or 08-60204-001 that is not identified by the letter "M" or "T" after the S/N on the identification plate, inspect the accumulator within 500 flight cycles after the effective date of the original issue of this directive (28 October 2010), in accordance with Part I, Paragraph B of this directive.

B. Inspection Procedures

1. Inspect each accumulator in accordance with Part B of the Accomplishment Instructions in the applicable Bombardier Aerospace Alert Service Bulletin (ASB) listed below, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Accumulator	ASB	Date
Hydraulic System No.1	A670BA-29-011, Revision A	27 July 2010
Hydraulic System No.2	A670BA-29-011, Revision A	27 July 2010
Hydraulic System No. 3	A670BA-29-012, Revision A	27 July 2010
Inboard Brake	A670BA-32-021, Revision C	27 July 2010
Outboard Brake	A670BA-32-021, Revision C	27 July 2010

Inspection in accordance with Part B of the Accomplishment Instructions in the following ASBs also meet the requirements of this paragraph.

Accumulator	ASB	Date
Hydraulic System No.1	A670BA-29-011, Original Issue	18 October 2007
Hydraulic System No.2	A670BA-29-011, Original Issue	18 October 2007
Hydraulic System No. 3	A670BA-29-012, Original Issue	13 March 2008

Inboard Brake	A670BA-32-021, Revision B Revision A Original Issue	18 October 2007 7 March 2007 21 November 2006
Outboard Brake	A670BA-32-021, Revision B Revision A Original Issue	18 October 2007 7 March 2007 21 November 2006

2. Inspect each accumulator in accordance with the Accomplishment Instructions in the applicable Bombardier Aerospace Service Bulletin (SB) listed below, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Accumulator	SB	Date
Hydraulic System No.1	670BA-29-013, Revision A	27 July 2010
Hydraulic System No.2	670BA-29-013, Revision A	27 July 2010
Inboard Brake	670BA-32-026, Revision A	27 July 2010
Outboard Brake	670BA-32-026, Revision A	27 July 2010

Inspection in accordance with the Accomplishment Instructions in the following SBs also meet the requirements of this paragraph.

Accumulator	SB	Date
Hydraulic System No.1	670BA-29-013, Original Issue	29 January 2010
Hydraulic System No.2	670BA-29-013, Original Issue	29 January 2010
Inboard Brake	670BA-32-026, Original Issue	29 January 2010
Outboard Brake	670BA-32-026, Original Issue	29 January 2010

3. If there is no indication of a crack, proceed to Part II of this directive for future repeat ultrasonic inspection requirements.
4. If there is an indication of a crack, before further flight, replace the accumulator with a new accumulator of the same part number, identified by the letter "M" or "T", as applicable, after the S/N on the identification plate, or as follows:
- (a) For Hydraulic System No. 1 and Hydraulic System No. 2 accumulators, replace with a new accumulator P/N 900121-1 in accordance with Bombardier SB 670BA-29-014, dated 22 December 2010, or later revisions approved by Chief, Continuing Airworthiness, Transport Canada.
 - (b) For Hydraulic System No. 3 accumulator, replace with a new accumulator P/N 900122-1 in accordance with part V of this directive.

- (c) For Inboard Brake and Outboard Brake accumulators, replace with a new accumulator P/N 90006691 in accordance with Part VI of this directive .

Note: The letter "M" after the S/N on the identification plate is applicable to accumulators P/Ns 900096-1 and 900097-1 on Hydraulic Systems No. 1, No. 2, and No. 3

The letter "T" after the S/N on the identification plate is applicable to accumulators P/N 08-60204-001 on the Brake System

Part II: Repeat Ultrasonic Inspections of Hydraulic System No. 1, Hydraulic System No. 2, Hydraulic System No. 3, Inboard Brake and Outboard Brake Accumulators

- A. For each accumulator P/Ns 900096-1, 900097-1, or 08-60204-001 not identified by the letter "M" or "T" after the S/N on the identification plate, inspect the accumulator within 500 flight cycles after the previous ultrasonic inspection, in accordance with Part I, Paragraphs B.1. and B.2. of this directive.
- B. If there is no indication of a crack, refer to Part II, Paragraph A, of this directive for future repeat ultrasonic inspection requirements.
- C. If there is an indication of a crack, before further flight, replace the accumulator with a new accumulator of the same part number, identified by the letter "M" or "T", as applicable, after the S/N on the identification plate, or as follows:
1. For Hydraulic System No. 1 and Hydraulic System No. 2 accumulators, replace with a new accumulator P/N 900121-1 in accordance with Bombardier SB 670BA-29-014, dated 22 December 2010, or later revisions approved by Chief, Continuing Airworthiness, Transport Canada.
 2. For Hydraulic System No. 3 accumulator, replace with a new accumulator P/N 900122-1 in accordance with part V of this directive.
 3. For Inboard Brake and Outboard Brake accumulators, replace with a new accumulator P/N 90006691 in accordance with Part VI of this directive.

Note: The letter "M" after the S/N on the identification plate is applicable to accumulators P/Ns 900096-1 and 900097-1 on Hydraulic Systems No. 1, No. 2, and No. 3

The letter "T" after the S/N on the identification plate is applicable to accumulators P/N 08-60204-001 on the Brake System

Part III: Replacement of Hydraulic System No. 1 and Hydraulic System No. 2 Accumulators – Applicable to P/N 900096-1 with no letter "M" after the S/N on the identification Plate

In accordance with the following schedule:

1. For each accumulator with more than 19 500 flight cycles, within 500 flight cycles from the previous ultrasonic inspection performed as required by this directive;
2. For each accumulator with 19 500 flight cycles or less, before it has accumulated 20 000 flight cycles;
3. For any Hydraulic System No.1 and No. 2 accumulator, if it is not possible to determine the flight cycles accumulated, within 500 flight cycles from the previous

ultrasonic inspection performed as required by Part I or Part II of the directive.

Replace each Hydraulic System No. 1 and No. 2 Accumulator, P/N 900096-1 not identified by the letter "M" after the S/N on the identification plate with a new accumulator identified by the letter "M" after the S/N on the identification plate, or a new accumulator P/N 900121-1 in accordance with Bombardier SB 670BA-29-014, dated 22 December 2010, or later revisions approved by Chief, Continuing Airworthiness, Transport Canada.

Part IV: Hydraulic System No. 1 and Hydraulic System No. 2 Accumulators Safe Life Limit Introduction – Applicable to P/N 900096-1 identified by the letter "M" after the S/N on the Identification Plate

- A. Within 60 days after the effective date of this directive, amend the Transport Canada approved maintenance schedule by incorporating the safe life limit for the Hydraulic System No. 1 and No. 2 Accumulators, P/N 900096-1, as introduced in CL-600-2C10, CL-600-2D15 and CL-600-2D24 Maintenance Requirements Manual, CSP B-053, Revision 11, Section 1.3 Safe Life Components.
- B. Compliance in accordance with superseding Temporary Revisions or later revisions of the CL-600-2C10, CL-600-2D15 and CL-600-2D24 Maintenance Requirements Manual, CSP B-053, approved by Transport Canada also satisfy the requirements of this part.

Part V: Replacement of Hydraulic System No. 3 Accumulator

Within 4000 flight cycles or 24 months, whichever comes first, after the effective date of this directive, replace accumulator P/N 900097-1 with a new accumulator P/N 900122-1 in accordance with the Accomplishment Instructions of SB 670BA-29-015, dated 22 December 2010, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Part VI: Replacement of Inboard Brake and Outboard Brake Accumulators

Within 4000 flight cycles or 24 months, whichever comes first, after the effective date of this directive, replace each accumulator P/N 08-60204-001 with a new accumulator P/N 90006691 in accordance with the Accomplishment Instructions of SB 670BA-32-028, dated 22 December 2010, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

Part VII: Terminating Actions

Parts III, IV, V, and VI constitute terminating actions to this directive.

Authorization: For the Minister of Transport, Infrastructure and Communities

ORIGINAL SIGNED BY

Derek Ferguson
Chief, Continuing Airworthiness

Contact: Miss Helen Tsai, Continuing Airworthiness, Ottawa, telephone 613-952-4357, facsimile 613-996-9178 or e-mail CAWWEBFeedback@tc.gc.ca or any Transport Canada Centre.