



# 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) to ADs.*

**Number:**

CF-2017-05R2

**Effective Date:**

4 October 2019

**ATA:**

28

**Type Certificate:**

A-142

**Subject:**

Fuel System – Motive Flow Line Fouling, Motive Flow Line and Pressure Relief Line Broken P-Clamps, and Vent Line Teflon™ Sleeve Installation

**Revision:**

Supersedes AD CF-2017-05R1, issued 20 September 2017.

**Applicability:**

De Havilland Aircraft of Canada Limited (formerly Bombardier Inc.) model DHC-8-400, -401 and -402 aeroplanes, serial numbers 4001, 4003 and subsequent.

**Compliance:**

As indicated below, unless already accomplished.

**Background:**

Some operators have reported broken P-clamps on the pressure relief line and the motive flow line in the left and right fuel tanks. Fouling conditions were also reported to exist between the motive flow line and the collector tank partition wall in both fuel tanks. These issues affect the integrity of the electrical bonding paths throughout the fuel lines, which in turn may lead to lightning strike induced fuel tank ignition.

AD CF-2017-05 mandated design changes that mitigate the risk of lightning strike induced fuel tank ignition.

Between the issuance of AD CF-2017-05 and AD CF-2017-05R1, Transport Canada (TC) became aware that Bombardier (BA) Service Bulletin (SB) 84-28-19 Revision A, dated 4 November 2016, and the initial issue of BA SB 84-28-19, dated 16 August 2016, do not instruct operators to support the motive flow line and vent line at wing stations -371.019 and 371.019 in the left-hand (LH) and right-hand (RH) fuel tanks, respectively, and do not instruct operators to maintain appropriate clearance between the fuel tubes and their support brackets at wing stations -371.019 and -209.019 in the LH fuel tank and wing stations 371.019 and 209.019 in the RH fuel tank. AD CF-2017-05R1 introduced Part III, which requires operators to inspect and correct the fuel tube installation on affected aeroplanes, as required, to maintain fuel tube support and clearance between the fuel tubes and their support brackets. AD CF-2017-05R1 also updated SB references.

Since AD CF-2017-05R1 was issued, TC became aware that BA SB 84-28-19 was missing instructions to relocate certain Teflon™ sleeves and that inaccurate production and maintenance manual instructions may have caused Teflon™ sleeves to be incorrectly installed on the vent line. The incorrect installation of Teflon™ sleeves could lead to arcing between the vent line and aeroplane structure, resulting in possible fuel tank ignition, in the event of a lightning strike.

BA revised SB 84-28-19 and issued SB 84-28-24 and SB 84-28-25 to provide instructions to ensure that Teflon™ sleeves are installed appropriately on the vent line. To ensure adequate electrical isolation is maintained, to preclude the risk of lightning strike induced fuel tank ignition, this AD revision, CF-2017-05R2, requires inspection and relocation, if required, of all Teflon™ sleeves on the vent line, and installation of Teflon™ sleeves on the vent line at additional wing stations. AD CF-2017-05R2 also adds additional aeroplane serial numbers to its applicability, requires incorporation of Airworthiness Limitations into the TC approved maintenance schedule, prohibits the use of certain maintenance procedures, and updates SB references.

#### **Corrective Actions:**

#### **Part I – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 through 4525 – Modification of Hole Size on Collector Tank Partition Wall to Resolve Chafing Condition with Motive Flow Line:**

Within 6000 hours air time or 36 months, whichever occurs first, from the effective date of AD CF-2017-05, 6 February 2017, increase the hole size in the collector tank partition wall, inspect the motive flow line for damage, and replace the associated grommet and motive flow line, as required, in accordance with Section 3.B. of BA SB 84-28-18 Revision B, dated 20 April 2017, or later revisions approved by the Chief, Continuing Airworthiness, TC.

Compliance with the initial issue of BA SB 84-28-18, dated 20 April 2016, or BA SB 84-28-18 Revision A, dated 14 November 2016, satisfies the requirements of Part I of this AD.

#### **Part II – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 through 4533 That Have NOT Incorporated the Initial Issue of BA SB 84-28-19 or BA SB 84-28-19 Revision A – Introduction of Revised P-Clamp Installation at Affected Left and Right Wing Stations on the Motive Flow Line and Pressure Relief Line:**

- A. Within 6000 hours air time or 36 months, whichever occurs first, from the effective date of AD CF-2017-05, 6 February 2017, replace the affected single nut plate brackets and standoffs at the affected left and right wing stations on the motive flow line and pressure relief line, in accordance with Section 3.B. and Section 3.C. of BA SB 84-28-19 Revision D, dated 16 February 2018, or later revisions approved by the Chief, Continuing Airworthiness, TC.

Compliance with BA SB 84-28-19 Revision B, dated 28 July 2017, or Revision C, dated 1 September 2017, also satisfies the requirements of Part II of this AD.

- B. Repair Drawing (RD) 8/4-28-018 Issues 01 through 04, dated 30 October 2017, 12 June 2018, 21 June 2018, and 3 August 2018, respectively, are approved as alternate means of compliance to Part II Paragraph A. of this AD for the replacement of the affected single nut plate brackets and standoffs on the motive flow line and vent line at LH and RH wing stations  $Y_w \pm 209.019$  and  $Y_w \pm 317.019$  only. If incorporated prior to the effective date of this AD, incorporation of the above-mentioned RD according to any of the above-mentioned revisions, along with the replacement of the affected single nut plate brackets and standoffs on the motive flow line, vent line, pressure relief line, and scavenge line at LH and RH wing stations  $Y_w \pm 209.019$ ,  $Y_w \pm 317.019$ , and  $Y_w \pm 371.019$  in accordance with Part II Paragraph A. of this AD, satisfies the requirements of Part II of this AD.

#### **Part III – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 through 4533 That Have Incorporated the Initial Issue of BA SB 84-28-19 or BA SB 84-28-19 Revision A – Inspection of Motive Flow Line and Vent Line at Wing Stations -371.019 and 371.019 in the LH and RH Fuel Tanks, Respectively, For Adequate Support, and Inspection of Fuel Tubes to Verify Appropriate Fuel Tube to Fuel Tube Support Bracket Clearance:**

Within 6000 hours air time or 36 months, whichever occurs first, from the effective date of AD CF-2017-05R1, 4 October 2017, inspect the motive flow line and vent line at wing stations -371.019 and 371.019 in the LH and RH fuel tanks, respectively, to ensure that these fuel tubes are adequately supported, and inspect the fuel tubes to verify that an appropriate clearance has been maintained between the fuel tubes and their support brackets, in accordance with Section 3.B. Step (13) and Section 3.C. of BA SB 84-28-19 Revision D, dated 16 February 2018, or later revisions approved by the Chief, Continuing Airworthiness, TC.

Inspection and rectification in accordance with Section 3.A., Section 3.B. Step (13), and Section 3.C. of BA SB 84-28-19 Revision B, dated 28 July 2017, or Revision C, dated 1 September 2017, satisfies the requirements of Part III of this AD.

#### **Part IV – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 through 4572 – Repositioning, Introduction, and Verification of Teflon™ Sleeve Installation on the Vent Line**

Note: For the purpose of Part IV, Part V and Part VI of this AD, the following definition applies: **Prohibited tasks:** The BA Aircraft Maintenance Manual (AMM) and Maintenance Task Card Manual (MTCM) tasks identified in Part VIII Paragraphs A. and B. of this AD, respectively, or any procedure or task that requires fuel tank access that uses non-manufacturer-approved procedures.

- A. Within 8000 hours air time or 48 months, whichever occurs first, from the effective date of this AD, install Teflon™ sleeves on the vent line at wing stations  $Y_w \pm 209.019$  and  $Y_w \pm 371.019$  in the LH and RH fuel tanks, inspect the Teflon™ sleeve installation on the vent line at wing stations  $Y_w \pm 317.019$  in the LH and RH fuel tanks, and reposition the Teflon™ sleeves at the aforementioned wing stations, as required, in accordance with Section 3.B. and Section 3.C. of the initial issue of BA SB 84-28-24, dated 27 November 2017, or later revisions approved by the Chief, Continuing Airworthiness, TC. BA SB 84-28-19 or ModSum 4Q113904 (any revision) are pre-requisites to BA SB 84-28-24 and must be incorporated prior to the incorporation of BA SB 84-28-24 in order to satisfy the requirements of this paragraph.
- B. Credit for previous actions: Incorporation of any of the three options identified in (a) below, prior to the effective date of this AD, also satisfies the requirements of Part IV Paragraph A. of this AD, provided that all conditions identified in (b) below are satisfied.
  - a. Options:
    - i. Incorporation of both ModSum IS4Q2800023 (Revisions A, B, C, D, E, F, G, H, or J) and ModSum IS4Q2800025 (Revisions A, B, C, D, or E); or
    - ii. Incorporation of both ModSum IS4Q2800030 (Revisions A or B) and ModSum IS4Q2800025 (Revisions A, B, C, D, or E); or
    - iii. Incorporation of ModSum IS4Q2800027 (Revisions A, B, or C).
  - b. Conditions for credit for previous actions identified in (a) Options i., ii., and iii.:
    - i. It can be confirmed that none of the **prohibited tasks** were performed during or after the incorporation of any of the applicable ModSums listed in (a) above; and
    - ii. It can be confirmed that BA SB 84-28-19 or ModSum 4Q113904 (any revision) were incorporated prior to the incorporation of any of the applicable ModSums listed in (a) above; and
    - iii. It can be confirmed that ModSum IS4Q2800023 (Revisions A, B, C, D, E, F, G, H, and J), ModSum IS4Q2800030 (Revisions A and B), ModSum IS4Q2800025 (Revisions A, B, C, D, and E), and ModSum IS4Q2800027 (Revisions A and B) were not incorporated during or after the incorporation of Part V of this AD.

**Part V – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 through 4575 – Inspection and Repositioning of the Teflon™ Sleeve Installation on the Vent Line**

Within 8000 hours air time or 48 months, whichever occurs first, from the effective date of this AD, inspect the Teflon™ sleeve installation on the vent line in the LH and RH fuel tanks for correct installation and damage, and replace and reposition the Teflon™ sleeves, as required, in accordance with Section 3.B. and Section 3.C. of the initial issue of BA SB 84-28-25, dated 27 November 2017, or later revisions approved by the Chief, Continuing Airworthiness, TC. BA SB 84-28-19 or ModSum 4Q113904 (any revision) are pre-requisites to BA SB 84-28-25 and must be incorporated prior to the incorporation of BA SB 84-28-25 in order to satisfy the requirements of this Part.

**Part VI – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 and Subsequent – Maintenance Program Verification and Rework**

For Serial Numbers 4001, 4003 through 4575:

- A. For aeroplanes that have complied with Part IV Paragraphs A. or B. of this AD or Part V of this AD prior to the effective date of this AD, within 60 days from the effective date of this AD, verify the aeroplane maintenance records to confirm if any of the **prohibited tasks** were accomplished during or after the incorporation of Part IV Paragraphs A. or B. of this AD or Part V of this AD.
- B. Within 8000 hours air time or 48 months, whichever occurs first, from the effective date of this AD:
  - a. If any of the **prohibited tasks** were accomplished during or after incorporation of Part IV Paragraphs A. or B. of this AD, or if it cannot be confirmed that they were not accomplished during or after incorporation of Part IV Paragraphs A. or B. of this AD, repeat the inspection and rectification of the Teflon™ sleeve installation on the vent line in the left and right fuel tanks in accordance with Part IV Paragraph A. of this AD; and

- b. If any of the **prohibited tasks** were accomplished during or after incorporation of Part V of this AD, or if it cannot be confirmed that they were not accomplished during or after incorporation of Part V of this AD, repeat the inspection and rectification of the Teflon™ sleeve installation on the vent line in the left and right fuel tanks in accordance with Part V of this AD.

For Serial Numbers 4573 and subsequent with an aeroplane date of manufacture, as identified on the identification plate of the aeroplane, dated prior to the effective date of this AD:

- C. Within 60 days from the effective date of this AD, verify the aeroplane maintenance records to confirm if any of the **prohibited tasks** were accomplished on or after the aeroplane date of manufacture.
- D. If any of the **prohibited tasks** were accomplished on or after the aeroplane date of manufacture, or if it cannot be confirmed that they were not accomplished on or after the aeroplane date of manufacture, rework is required to verify the Teflon™ sleeve installation on the vent line. Within 8000 hours air time or 48 months, whichever occurs first, from the effective date of this AD, contact De Havilland Aircraft of Canada Limited for approved instructions. Incorporation of these approved instructions within 8000 hours air time or 48 months, whichever occurs first, from the effective date of this AD, satisfies the requirements of this paragraph.

**Part VII – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 and Subsequent – TC Approved Maintenance Schedule Revision:**

Within 30 days from the effective date of this AD:

- A. Amend the TC approved maintenance schedule by incorporating Fuel System Limitations (FSL) 284000-406 and 284000-418, as identified in Temporary Revision (TR) ALI-0192, dated 24 April 2018, of the DHC-8-400 Maintenance Requirements Manual (MRM), PSM 1-84-7, dated 21 July 2016; and
- B. Amend the TC approved maintenance schedule to revise the Critical Design Configuration Control Limitations (CDCCLs) by incorporating TR ALI-0193, dated 24 April 2018, of the DHC-8-400 MRM, PSM 1-84-7, dated 21 July 2016.

Compliance with superseding TRs or DHC-8-400 MRM, Part 2 – Airworthiness Limitation Items, Revision 9, PSM 1-84-7, dated 10 July 2018, or later revisions approved by TC, also satisfies the requirements of Part VII of this AD.

Compliance with FSL 284000-406 and FSL 284000-418 is required as indicated within DHC-8-400 MRM, PSM 1-84-7.

The CDCCLs identified in TR ALI-0193, dated 24 April 2018, of the DHC-8-400 MRM, PSM 1-84-7, and superseding TRs or DHC-8-400 MRM, Part 2 – Airworthiness Limitation Items, Revision 9, PSM 1-84-7, dated 10 July 2018, or later revisions approved by TC, are effective as of their date of incorporation into the TC approved maintenance schedule.

**Part VIII – Applicable to DHC-8-400, -401 and -402 Aeroplanes, Serial Numbers 4001, 4003 and Subsequent – Maintenance Tasks**

As of the effective date of this AD:

- A. It is prohibited to use the following BA AMM tasks appearing in Revision 59 of the Dash 8 Series 400 AMM, PSM 1-84-2, dated 5 October 2017, or earlier revisions of these tasks, on De Havilland Aircraft of Canada Limited model DHC-8-400, DHC-8-401, and DHC-8-402 aeroplanes. TRs of these AMM tasks, dated 27 November 2017 or earlier, are also prohibited for use unless excepted below:
  - a. 28-10-00-280-806 Detailed Inspection of the Teflon™ Sleeve on the Fuel Tank Vent Line, LH and RH (FSL#284000-406) with the exception of TR 28-145 dated 21 November 2017; and
  - b. 28-12-06-000-801 Removal of the Outboard Vent Line with the exception of TR 28-146 dated 21 November 2017; and
  - c. 28-12-06-400-801 Installation of the Outboard Vent Line with the exception of TR 28-147 dated 21 November 2017; and
  - d. 28-12-01-000-801 Removal of the Inboard Vent Line with the exception of TR 28-148 dated 24 November 2017; and
  - e. 28-12-01-400-801 Installation of the Inboard Vent Line with the exception of TR 28-149 dated 27 November 2017.
- B. It is prohibited to use the following BA MTCM task cards appearing in Revision 42 of the Dash 8 Series 400 MTCM, PSM 1-84-7TC, dated 5 November 2017, or earlier revisions or Amendments of these task cards, on De Havilland Aircraft of Canada Limited model DHC-8-400, DHC-8-401, and

DHC-8-402 aeroplanes. Earlier revisions or Amendments of these MTCM task cards, dated 21 November 2017 or earlier, are also prohibited for use unless excepted below:

- a. 000-28-520-704 Detailed Inspection of the Teflon™ Sleeve on the Fuel Tank Vent Line (LH) with the exception of 000-28-520-704 (Config A01), Revision 42, Amendment 0002, dated 21 November 2017; and
- b. 000-28-620-704 Detailed Inspection of the Teflon™ Sleeve on the Fuel Tank Vent Line (RH) with the exception of 000-28-620-704 (Config A01), Revision 42, Amendment 0002, dated 21 November 2017.

**Authorization:**

For the Minister of Transport,

*ORIGINAL SIGNED BY*

Rémy Knoerr  
Chief, Continuing Airworthiness  
Issued on 20 September 2019

**Contact:**

Hilary Ross, Continuing Airworthiness, Ottawa, telephone 888-663-3639, facsimile 613-996-9178 or e-mail [AD-CN@tc.gc.ca](mailto:AD-CN@tc.gc.ca) or any Transport Canada Centre.