



# AIRWORTHINESS DIRECTIVE

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*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-2023-18

**Effective Date:**

23 March 2023

**ATA:**

36

**Type Certificate:**

A-177

**Subject:**

Pneumatic – Non-Conforming Bleed Air Leak Detection System Sensing Elements

**Replacement:**

Supersedes AD CF-2022-36, issued 4 July 2022.

**Applicability:**

Bombardier Inc. model BD-700-2A12 aeroplanes, serial numbers 70005 and subsequent.

**Compliance:**

As indicated below, unless already accomplished.

**Background:**

Bombardier Inc. (BA) received disclosure letters from the supplier of overheat detection sensing elements which reported a manufacturing quality escape in which some sensing elements were manufactured with insufficient salt fill. As these sensing elements are used by the bleed air leak detection system for temperature detection in the event of a hot bleed air leak, this insufficient salt fill can result in an inability to detect hot bleed air leaks, which can cause damage to surrounding structures and systems that can prevent continued safe flight and landing.

To mitigate this unsafe condition, AD CF-2022-36 prohibited installation of any sensing element that may have insufficient salt fill and required operators to operate their aeroplanes in a manner that will prevent an aeroplane dispatching with an active bleed air leak.

Since AD CF-2022-36 was issued, BA released a service bulletin (SB) that tests affected overheat detection sensing elements for insufficient salt fill and requires the replacement of discrepant sensing elements with serviceable parts. This AD mandates incorporation of this BA SB to restore bleed air leak detection capabilities and supersedes the requirements of AD CF-2022-36 in consideration of this BA SB.

**Corrective Actions:**

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

**BA SB:** 700-36-7503 Basic Issue, dated 23 December 2022, or later revisions approved by the Chief, Continuing Airworthiness, Transport Canada.

**LTS SB:** Liebherr-Aerospace Toulouse SAS (LTS) SB CFD-F1958-26-01, as referenced in Section 1.K. of the BA SB.

**Kidde SB:** Kidde Aerospace and Defense SB CFD-26-1, as referenced in Section 1.K. of the BA SB, or earlier revisions of the Kidde SB.

**Affected part:** A sensing element marked with a date code before A2105 and having an LTS or Kidde part number as defined in the LTS SB, unless that sensing element:

- a. Has been tested in accordance with the Accomplishment Instructions (Section 3) of the Kidde SB and found to be serviceable; and
- b. Has been marked on one face of its connector hex nut in accordance with Section 3.C. of the Accomplishment Instructions – Identification Procedure of the Kidde SB.

OR

- c. Has been tested and found to be serviceable in accordance with Part IV of this AD; and
- d. Has been marked with one (1) green mark on one (1) face of one (1) connector hex nut, in accordance with Figure 33 in the Accomplishment Instructions of the BA SB.

**Serviceable part:** A sensing element that is not an affected part.

**Group A aeroplanes:** Model BD-700-2A12 aeroplanes having serial numbers 70005 through 70096. Group A aeroplanes had affected parts installed during manufacturing.

**Group B aeroplanes:** Model BD-700-2A12 aeroplanes having serial numbers 70097 and subsequent. Group B aeroplanes did not have affected parts installed during manufacturing but may have had affected parts installed after delivery.

### **Part I – Parts Installation Prohibition – Applicable to Group A and B Aeroplanes**

As of the effective date of AD CF-2022-36 (18 July 2022), it is prohibited to install any affected part unless it is a serviceable part.

### **Part II – Maintenance Program Verification and Rework – Applicable to Group B Aeroplanes Whose Aeroplane Date of Manufacture is On or Before the Effective Date of AD CF-2022-36 (18 July 2022)**

- A. Within 60 days from the effective date of AD CF-2022-36 (18 July 2022), verify the aeroplane maintenance records to confirm if any affected part has been installed since the aeroplane date of manufacture, as identified on the identification plate of the aeroplane or within the aeroplane log book.
- B. If the maintenance records verification confirms that an affected part has been installed, or if it cannot be confirmed that an affected part has not been installed, then for each location at which an affected part is or may have been installed:
  - a. Part III of this AD must be complied with; and
  - b. Part IV of this AD must be complied with.
- C. If the maintenance records confirm that no affected parts have been installed since aeroplane date of manufacture, then Part III and Part IV of this AD are not applicable.

### **Part III – Master Minimum Equipment List (MMEL) Operational Restrictions – Applicable to All Group A Aeroplanes and to Certain Group B Aeroplanes as Required by Part II of this AD**

- A. As of 90 days after the effective date of AD CF-2022-36 (18 July 2022), it is prohibited to dispatch an aeroplane under MMEL items 21-0425, 30-0055, 30-0060, 30-0090, 30-0095, 36-0050, and 36-0105, unless the aeroplane is operated in accordance with the dispatch instructions contained in Appendix A of this AD.
- B. Part III of this AD is not applicable to aeroplanes that have completed Part IV of this AD.

### **Part IV – Testing and Replacement of Affected Overheat Detection Sensing Elements – Applicable to All Group A Aeroplanes and to Group B Aeroplanes as Required by Part II of this AD**

- A. For Group A aeroplanes: Within 3500 hours air time or 120 months, whichever occurs first, from the effective date of this AD, test affected overheat detection sensing elements for insufficient salt fill in accordance with the Accomplishment Instructions of the BA SB.
- B. For Group B aeroplanes at locations as identified by the maintenance records check carried out under Part II of this AD: Within 3500 hours air time or 120 months, whichever occurs first, from the effective date of this AD, test affected overheat detection sensing elements for insufficient salt fill in accordance with the Accomplishment Instructions of the BA SB.
- C. For each sensing element that meets the PASS criteria of the BA SB, before further flight, mark the sensing element with a witness mark in accordance with the Accomplishment Instructions of the BA SB.

- D. For each sensing element that meets the FAIL criteria of the BA SB, before further flight, replace the sensing element with a serviceable part in accordance with the Accomplishment Instructions of the BA SB.

## Appendix A

### M MEL Item 21-0425

Crew Alerting System (CAS) Message	1. Repair Category	2. Dispatch Consideration
21 AIR COND / PRESS – TRIM LOOP ONE ELEMENT INOP	C	(O) May be displayed provided none of the following messages are displayed: <ul style="list-style-type: none"> <li>– 21 AIR COND / PRESS – IASC 1B INOP</li> <li>– 21 AIR COND / PRESS – IASC 2B INOP</li> <li>– 21 AIR COND / PRESS – IASC 1B FAULT</li> <li>– 21 AIR COND / PRESS – IASC 2B FAULT</li> </ul>

#### 1. OPERATIONS (O)

Before each flight:

- (1) Make sure that the aeroplane is not powered on and that engines and APU are OFF.

- a. Connect electrical power to the aeroplane as follows:

Note: Do not use a Jet Airstart Cart or High Pressure Ground Cart.

- i. Connect external AC power, OR

- ii. Start the APU as follows:

1. On the ELECTRICAL control panel, set the MAIN BATT and APU BATT switches to ON.
2. On the BLEED/AIR COND control panel, make sure that the APU BLEED switch is set to OFF.
3. On the APU control panel, turn the APU switch to START.

- b. When external AC power is on or APU is running, wait a minimum of 6 minutes.

- c. After 6 minutes, check for the 21 AIR COND / PRESS – TRIM LOOP ONE ELEMENT INOP info message as follows:

- i. If the 21 AIR COND / PRESS – TRIM LOOP ONE ELEMENT INOP info message shows – DISPATCH IS PERMITTED.

Note: The INFO message confirms it is not heat related and therefore cannot be a potential leak in the presence of an affected part.

- ii. If the 21 AIR COND / PRESS – TRIM LOOP ONE ELEMENT INOP info message does not show – DISPATCH IS NOT PERMITTED.

Note: No INFO message confirms that it is heat related and therefore could be a potential leak in the presence of an affected part.

- d. If required, remove external AC power from the aeroplane.

- e. If required, set APU BLEED to AUTO.

- (2) On the INFO synoptic page, make sure that the messages that follow do not show:

Note: Confirm the aeroplane has electrical power to activate the synoptic page.

- 21 AIR COND / PRESS – IASC 1B INOP info
- 21 AIR COND / PRESS – IASC 2B INOP info
- 21 AIR COND / PRESS – IASC 1B FAULT info
- 21 AIR COND / PRESS – IASC 2B FAULT info

## MMEL Item 30-0055

CAS Message	1. Repair Category	2. Dispatch Consideration
30 ICE PROT – L WING LOOP ONE ELEMENT INOP	C	(O) May be displayed provided none of the following messages are displayed: <ul style="list-style-type: none"> <li>– 21 AIR COND / PRESS – IASC 1B INOP</li> <li>– 21 AIR COND / PRESS – IASC 2B INOP</li> <li>– 21 AIR COND / PRESS – IASC 1B FAULT</li> <li>– 21 AIR COND / PRESS – IASC 2B FAULT</li> </ul>

1. OPERATIONS (O)

Before each flight:

(1) Make sure that the aeroplane is not powered on and that engines and APU are OFF.

a. Connect electrical power to the aeroplane as follows:

Note: Do not use a Jet Airstart Cart or High Pressure Ground Cart.

i. Connect external AC power, OR

ii. Start the APU as follows:

1. On the ELECTRICAL control panel, set the MAIN BATT and APU BATT switches to ON.
2. On the BLEED/AIR COND control panel, make sure that the APU BLEED switch is set to OFF.
3. On the APU control panel, turn the APU switch to START.

b. When external AC power is on or APU is running, wait a minimum of 6 minutes.

c. After 6 minutes, check for the 30 ICE PROT – L WING LOOP ONE ELEMENT INOP info message as follows:

i. If the 30 ICE PROT – L WING LOOP ONE ELEMENT INOP info message shows – DISPATCH IS PERMITTED.

Note: The INFO message confirms it is not heat related and therefore cannot be a potential leak in the presence of an affected part.

ii. If the 30 ICE PROT – L WING LOOP ONE ELEMENT INOP info message does not show – DISPATCH IS NOT PERMITTED.

Note: No INFO message confirms that it is heat related and therefore could be a potential leak in the presence of an affected part.

d. If required, remove external AC power from the aeroplane.

e. If required, set APU BLEED to AUTO.

(2) On the INFO synoptic page, make sure that the messages that follow do not show:

Note: Confirm the aeroplane has electrical power to activate the synoptic page.

- 21 AIR COND / PRESS – IASC 1B INOP info
- 21 AIR COND / PRESS – IASC 2B INOP info
- 21 AIR COND / PRESS – IASC 1B FAULT info
- 21 AIR COND / PRESS – IASC 2B FAULT info

## MMEL Item 30-0060

CAS Message	1. Repair Category	2. Dispatch Consideration
30 ICE PROT – L WIPS LOOP ONE ELEMENT INOP	C	(O) May be displayed provided none of the following messages are displayed: <ul style="list-style-type: none"> <li>– 21 AIR COND / PRESS – IASC 1B INOP</li> <li>– 21 AIR COND / PRESS – IASC 2B INOP</li> <li>– 21 AIR COND / PRESS – IASC 1B FAULT</li> <li>– 21 AIR COND / PRESS – IASC 2B FAULT</li> </ul>

1. OPERATIONS (O)

Before each flight:

(1) Make sure that the aeroplane is not powered on and that engines and APU are OFF.

a. Connect electrical power to the aeroplane as follows:

Note: Do not use a Jet Airstart Cart or High Pressure Ground Cart.

i. Connect external AC power, OR

ii. Start the APU as follows:

1. On the ELECTRICAL control panel, set the MAIN BATT and APU BATT switches to ON.

2. On the BLEED/AIR COND control panel, make sure that the APU BLEED switch is set to OFF.

3. On the APU control panel, turn the APU switch to START.

b. When external AC power is on or APU is running, wait a minimum of 6 minutes.

c. After 6 minutes, check for the 30 ICE PROT – L WIPS LOOP ONE ELEMENT INOP info message as follows:

i. If the 30 ICE PROT – L WIPS LOOP ONE ELEMENT INOP info message shows – DISPATCH IS PERMITTED.

Note: The INFO message confirms it is not heat related and therefore cannot be a potential leak in the presence of an affected part.

ii. If the 30 ICE PROT – L WIPS LOOP ONE ELEMENT INOP info message does not show – DISPATCH IS NOT PERMITTED.

Note: No INFO message confirms that it is heat related and therefore could be a potential leak in the presence of an affected part.

d. If required, remove external AC power from the aeroplane.

e. If required, set APU BLEED to AUTO.

(2) On the INFO synoptic page, make sure that the messages that follow do not show:

Note: Confirm the aeroplane has electrical power to activate the synoptic page.

– 21 AIR COND / PRESS – IASC 1B INOP info

– 21 AIR COND / PRESS – IASC 2B INOP info

– 21 AIR COND / PRESS – IASC 1B FAULT info

– 21 AIR COND / PRESS – IASC 2B FAULT info

## MMEL Item 30-0090

CAS Message	1. Repair Category	2. Dispatch Consideration
30 ICE PROT – R WING LOOP ONE ELEMENT INOP	C	(O) May be displayed provided none of the following messages are displayed: <ul style="list-style-type: none"> <li>– 21 AIR COND / PRESS – IASC 1B INOP</li> <li>– 21 AIR COND / PRESS – IASC 2B INOP</li> <li>– 21 AIR COND / PRESS – IASC 1B FAULT</li> <li>– 21 AIR COND / PRESS – IASC 2B FAULT</li> </ul>

1. OPERATIONS (O)

Before each flight:

(1) Make sure that the aeroplane is not powered on and that engines and APU are OFF.

a. Connect electrical power to the aeroplane as follows:

Note: Do not use a Jet Airstart Cart or High Pressure Ground Cart.

i. Connect external AC power, OR

ii. Start the APU as follows:

1. On the ELECTRICAL control panel, set the MAIN BATT and APU BATT switches to ON.

2. On the BLEED/AIR COND control panel, make sure that the APU BLEED switch is set to OFF.

3. On the APU control panel, turn the APU switch to START.

b. When external AC power is on or APU is running, wait a minimum of 6 minutes.

c. After 6 minutes, check for the 30 ICE PROT – R WING LOOP ONE ELEMENT INOP info message as follows:

i. If the 30 ICE PROT – R WING LOOP ONE ELEMENT INOP info message shows – DISPATCH IS PERMITTED.

Note: The INFO message confirms it is not heat related and therefore cannot be a potential leak in the presence of an affected part.

ii. If the 30 ICE PROT – R WING LOOP ONE ELEMENT INOP info message does not show – DISPATCH IS NOT PERMITTED.

Note: No INFO message confirms that it is heat related and therefore could be a potential leak in the presence of an affected part.

d. If required, remove external AC power from the aeroplane.

e. If required, set APU BLEED to AUTO.

(2) On the INFO synoptic page, make sure that the messages that follow do not show:

Note: Confirm the aeroplane has electrical power to activate the synoptic page.

– 21 AIR COND / PRESS – IASC 1B INOP info

– 21 AIR COND / PRESS – IASC 2B INOP info

– 21 AIR COND / PRESS – IASC 1B FAULT info

– 21 AIR COND / PRESS – IASC 2B FAULT info

## MMEL Item 30-0095

CAS Message	1. Repair Category	2. Dispatch Consideration
30 ICE PROT – R WIPS LOOP ONE ELEMENT INOP	C	(O) May be displayed provided none of the following messages are displayed: <ul style="list-style-type: none"> <li>– 21 AIR COND / PRESS – IASC 1B INOP</li> <li>– 21 AIR COND / PRESS – IASC 2B INOP</li> <li>– 21 AIR COND / PRESS – IASC 1B FAULT</li> <li>– 21 AIR COND / PRESS – IASC 2B FAULT</li> </ul>

1. OPERATIONS (O)

Before each flight:

(1) Make sure that the aeroplane is not powered on and that engines and APU are OFF.

a. Connect electrical power to the aeroplane as follows:

Note: Do not use a Jet Airstart Cart or High Pressure Ground Cart.

i. Connect external AC power, OR

ii. Start the APU as follows:

1. On the ELECTRICAL control panel, set the MAIN BATT and APU BATT switches to ON.

2. On the BLEED/AIR COND control panel, make sure that the APU BLEED switch is set to OFF.

3. On the APU control panel, turn the APU switch to START.

b. When external AC power is on or APU is running, wait a minimum of 6 minutes.

c. After 6 minutes, check for the 30 ICE PROT – R WIPS LOOP ONE ELEMENT INOP info message as follows:

i. If the 30 ICE PROT – R WIPS LOOP ONE ELEMENT INOP info message shows – DISPATCH IS PERMITTED.

Note: The INFO message confirms it is not heat related and therefore cannot be a potential leak in the presence of an affected part.

ii. If the 30 ICE PROT – R WIPS LOOP ONE ELEMENT INOP info message does not show – DISPATCH IS NOT PERMITTED.

Note: No INFO message confirms that it is heat related and therefore could be a potential leak in the presence of an affected part.

d. If required, remove external AC power from the aeroplane.

e. If required, set APU BLEED to AUTO.

(2) On the INFO synoptic page, make sure that the messages that follow do not show:

Note: Confirm the aeroplane has electrical power to activate the synoptic page.

– 21 AIR COND / PRESS – IASC 1B INOP info

– 21 AIR COND / PRESS – IASC 2B INOP info

– 21 AIR COND / PRESS – IASC 1B FAULT info

– 21 AIR COND / PRESS – IASC 2B FAULT info

## MMEL Item 36-0050

CAS Message	1. Repair Category	2. Dispatch Consideration
36 BLEED – L BLEED LOOP ONE ELEMENT INOP	C	(O) May be displayed provided none of the following messages are displayed: <ul style="list-style-type: none"> <li>– 21 AIR COND / PRESS – IASC 1B INOP</li> <li>– 21 AIR COND / PRESS – IASC 2B INOP</li> <li>– 21 AIR COND / PRESS – IASC 1B FAULT</li> <li>– 21 AIR COND / PRESS – IASC 2B FAULT</li> </ul>

1. OPERATIONS (O)

Before each flight:

(1) Make sure that the aeroplane is not powered on and that engines and APU are OFF.

a. Connect electrical power to the aeroplane as follows:

Note: Do not use a Jet Airstart Cart or High Pressure Ground Cart.

i. Connect external AC power, OR

ii. Start the APU as follows:

1. On the ELECTRICAL control panel, set the MAIN BATT and APU BATT switches to ON.

2. On the BLEED/AIR COND control panel, make sure that the APU BLEED switch is set to OFF.

3. On the APU control panel, turn the APU switch to START.

b. When external AC power is on or APU is running, wait a minimum of 6 minutes.

c. After 6 minutes, check for the 36 BLEED – L BLEED LOOP ONE ELEMENT INOP info message as follows:

i. If the 36 BLEED – L BLEED LOOP ONE ELEMENT INOP info message shows – DISPATCH IS PERMITTED.

Note: The INFO message confirms it is not heat related and therefore cannot be a potential leak in the presence of an affected part.

ii. If the 36 BLEED – L BLEED LOOP ONE ELEMENT INOP info message does not show – DISPATCH IS NOT PERMITTED.

Note: No INFO message confirms that it is heat related and therefore could be a potential leak in the presence of an affected part.

d. If required, remove external AC power from the aeroplane.

e. If required, set APU BLEED to AUTO.

(2) On the INFO synoptic page, make sure that the messages that follow do not show:

Note: Confirm the aeroplane has electrical power to activate the synoptic page.

– 21 AIR COND / PRESS – IASC 1B INOP info

– 21 AIR COND / PRESS – IASC 2B INOP info

– 21 AIR COND / PRESS – IASC 1B FAULT info

– 21 AIR COND / PRESS – IASC 2B FAULT info



## MMEL Item 36-0105

CAS Message	1. Repair Category	2. Dispatch Consideration
36 BLEED – R BLEED LOOP ONE ELEMENT INOP	C	(O) May be displayed provided none of the following messages are displayed: <ul style="list-style-type: none"> <li>– 21 AIR COND / PRESS – IASC 1B INOP</li> <li>– 21 AIR COND / PRESS – IASC 2B INOP</li> <li>– 21 AIR COND / PRESS – IASC 1B FAULT</li> <li>– 21 AIR COND / PRESS – IASC 2B FAULT</li> </ul>

1. OPERATIONS (O)

Before each flight:

(1) Make sure that the aeroplane is not powered on and that engines and APU are OFF.

a. Connect electrical power to the aeroplane as follows:

Note: Do not use a Jet Airstart Cart or High Pressure Ground Cart.

i. Connect external AC power, OR

ii. Start the APU as follows:

1. On the ELECTRICAL control panel, set the MAIN BATT and APU BATT switches to ON.

2. On the BLEED/AIR COND control panel, make sure that the APU BLEED switch is set to OFF.

3. On the APU control panel, turn the APU switch to START.

b. When external AC power is on or APU is running, wait a minimum of 6 minutes.

c. After 6 minutes, check for the 36 BLEED – R BLEED LOOP ONE ELEMENT INOP info message as follows:

i. If the 36 BLEED – R BLEED LOOP ONE ELEMENT INOP info message shows – DISPATCH IS PERMITTED.

Note: The INFO message confirms it is not heat related and therefore cannot be a potential leak in the presence of an affected part.

ii. If the 36 BLEED – R BLEED LOOP ONE ELEMENT INOP info message does not show – DISPATCH IS NOT PERMITTED.

Note: No INFO message confirms that it is heat related and therefore could be a potential leak in the presence of an affected part.

d. If required, remove external AC power from the aeroplane.

e. If required, set APU BLEED to AUTO.

(2) On the INFO synoptic page, make sure that the messages that follow do not show:

Note: Confirm the aeroplane has electrical power to activate the synoptic page.

– 21 AIR COND / PRESS – IASC 1B INOP info

– 21 AIR COND / PRESS – IASC 2B INOP info

– 21 AIR COND / PRESS – IASC 1B FAULT info

– 21 AIR COND / PRESS – IASC 2B FAULT info

**Authorization:**

For the Minister of Transport,

*ORIGINAL SIGNED BY*

Jenny Young  
Chief, Continuing Airworthiness  
Issued on 9 March 2023

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