Air Accident Investigation Unit Ireland

SYNOPTIC REPORT

SERIOUS INCIDENT
Bombardier, BD100 1A10, 9H-VCJ
Dublin Airport
15 January 2017

An Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13[1] to the Convention on International Civil Aviation, Regulation (EU) No 996/2010[2] and Statutory Instrument No. 460 of 2009[3], safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

[1] **Annex 13**: International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.
[2] **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.
[3] **Statutory Instrument (SI) No. 460 of 2009**: Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.

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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents on 19 January 2017, appointed Mr Howard Hughes as the Investigator-in-Charge to carry out an Investigation into this Serious Incident and prepare a Report.

Aircraft Type and Registration:	Bombardier, BD100 1A10, 9H-VCJ	
No. and Type of Engines:	2 x Honeywell HTF7350	
Aircraft Serial Number:	20560	
Year of Manufacture:	2015	
Date and Time (UTC)[4]:	15 January 2017 @ 10.00 hrs approximately	
Location:	5 NM East of Dublin Airport (EIDW), Ireland	
Type of Operation:	Commercial – for hire	
Persons on Board:	Crew - 3	Passengers - 0
Injuries:	Crew - Nil	Passengers - Nil
Nature of Damage:	None	
Commander's Licence:	ATPL[5] issued by the German Federal Aviation Office (LBA)	
Commander's Age:	41 years	
Commander's Flying Experience:	3,432 Hours, of which 548 were on type	
Notification Source:	Occurrence Report submitted by the Operator	
Information Source:	AAIU Report Form and Correspondence Investigation	

[4] **UTC**: Co-ordinated Universal Time. All times in this Report are quoted in UTC. At the time of the incident UTC and local time were coincident.
[5] **ATPL**: Airline Transport Pilot Licence.

SYNOPSIS

The aircraft was on a flight from Riga Airport (EVRA), Latvia, to Dublin Airport (EIDW), Ireland. The flight was uneventful until the aircraft began its final approach into Dublin, at which point the Flight Crew received a warning of a spoiler fault. They carried out the appropriate checklist, which included an increase of 8 kts to the final approach speed. However, at this speed, and with landing flap selected, the Commander, who was Pilot Flying (PF), experienced difficulties controlling the aircraft in roll. The Commander further increased the approach airspeed, which improved controllability, and the aircraft landed normally. There were no injuries.

1. FACTUAL INFORMATION

1.1 History of the Flight / Occurrence

The aircraft, registration 9H-VCJ, departed from EVRA at 07.35 hrs on a positioning flight[6] to EIDW. The flight was uneventful until just before the aircraft intercepted the ILS[7] for runway (RWY) 28 at EIDW. Approach Control at EIDW had cleared the aircraft to descend to 1,500 ft on a heading of 245° (magnetic), to intercept the ILS for RWY 28. As the aircraft was descending through approximately 4,200 ft, ATC requested it to reduce speed to 180 kts. The Commander selected the flight spoilers to assist in speed reduction. When the Commander stowed the flight spoilers, the Flight Crew received a caution message, on the Engine Indicating and Crew Alerting System (EICAS), of a spoiler fault. This was then identified as a right outboard Multi-Function Spoiler (MFS) on the system synoptic page. The aircraft was approximately 15 NM east of EIDW.

The Commander called for the Non-Normal checklist associated with a spoiler fault, and this was completed. The associated checklist included an instruction to fly the final approach at a speed of Vref[8] +8 kts, in this case 133 kts. The approach was continued, and the landing gear and flaps were selected as required. The Commander disengaged the autopilot, and as the aircraft descended through 1,500 ft, at approximately 4.7 NM from RWY 28, he requested landing Flap (30°) to be extended.

As the flaps moved to 30°, and the aircraft speed reduced towards 133 kts, the Commander experienced difficulty controlling the aircraft in roll. Aircraft speed was increased to approximately 160 kts. This improved controllability and the approach was continued. The aircraft landed normally at 10.09 hrs.

Once the aircraft was parked and the engines were shut down, the Commander took a photograph of the right outboard MFS. **Figure No. 1** shows the position of the right outboard MFS, as found by the Commander.

[6] **Positioning flight**: A flight conducted without passengers for the purpose of bringing the aircraft to another airport, for which its services are next required.
[7] **ILS**: Instrument Landing System, a precision runway approach aid which provides both vertical and horizontal guidance during an approach to land.
[8] **Vref**: The reference speed required as the landing runway threshold is crossed at a height of 50 feet, in landing configuration, if the calculated aircraft performance is to be achieved.

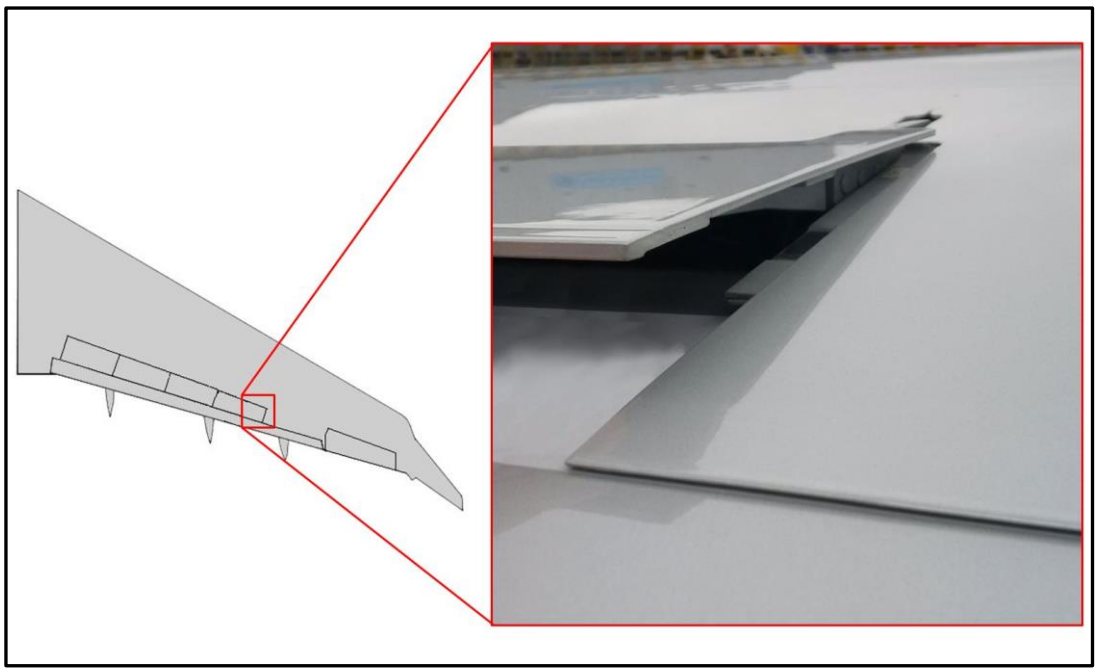

Figure No. 1: Right Outboard Multi-Function Spoiler (post-flight)

1.1.1 Interview with Commander

The Commander stated he was the PF for the subject flight, and that the autopilot was engaged during the descent and initial approach.

He informed the Investigation that the aircraft was being vectored for an ILS onto RWY 28 at Dublin. Approaching the ILS from the north, the aircraft was given a final vector of 245° to intercept the localiser. The aircraft was descending to a cleared altitude of 1,500 ft at this stage. The Commander stated that as they were passing 4,600 ft, with an airspeed of 220 kts, ATC requested the aircraft to reduce speed to 180 kts, and to maintain this speed to 6 NM from the runway. The Commander said he used speed brakes to decelerate the aircraft.

The Commander stated that when the speed brakes were stowed, a '*Spoiler Fault caution*' was displayed on the EICAS. The Commander said that he was not surprised by the fault message, and expected that it would clear after a few seconds. However, he said that there was '*something different this time*'. He informed the Investigation that he could see from his control wheel, that the autopilot was commanding a left roll input, and that the fault did not clear.

The Commander stated that as the aircraft slowed to 180 kts and Flap 10 was selected, he felt that something was wrong, so he requested the Co-Pilot to commence the actions for a '*Spoilers Fault*' from the QRH[9]. The QRH required a final approach speed of Vref +8. The Commander stated that the Vref for Flaps 30°, at the aircraft's actual landing weight, was 125 kts, and therefore they determined that the final approach speed with a spoiler fault would be 133 kts.

[9] **QRH**: Quick Reference Handbook; contains all the procedures applicable for abnormal and emergency conditions in an easy-to-use format.

The Commander informed the Investigation that shortly after the ILS glideslope was intercepted, the autopilot was disconnected and Flap 30° selected. At this point the Commander noted difficulty controlling the aircraft in roll, especially as the speed reduced towards 133 kts.

He informed the Investigation that it felt like '*there were two 'stops' on the control wheel*'. It appeared to the Commander that there was a slight time-lag between inputting more left control wheel, and the aircraft reacting to the input. Thus, as he put more left roll input via the control wheel, it would reach a point where '*it gave too much deflection, and the aircraft would roll too much to the left*'. This required correction to the right, but the Commander believed that with a right flight spoiler already slightly deployed, rolling back to the right would be quite pronounced, requiring left control wheel input again, but with the subsequent lag. The Commander stated that, as a result there was a certain amount of '*pilot-induced oscillation*' occurring.

The Commander informed the Investigation that by increasing speed to just less than 160 kts, controllability improved, and he informed ATC that he would require '*more than the usual amount of runway for landing*'.

The Commander said he considered declaring a PAN[10] due to the control difficulties, but he found the aircraft was controllable at 160 kts, so he elected not to declare a PAN, and continued the approach for a normal landing.

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1.2 Meteorology

The aerodrome meteorological report issued for EIDW on 15 January 2017, at 10.00 hrs was as follows:

METAR EIDW 151000Z 27016KT 9999 FEW007 BKN010 BKN090 09/07 Q1024 BECMG BKN015

1.3 Aircraft Information

1.3.1 General

The Bombardier BD100 1A10[11] is a twin-engine, business/corporate aircraft with a swept wing, and a T-tail with trimmable horizontal stabilizer. The aircraft is equipped with a retractable tricycle landing gear. The subject aircraft was configured to carry eight passengers, and two flight crew members. The aircraft was powered by two rear fuselage mounted Honeywell HTF7350 turbofan engines with reverse thrust capability.

[10] **PAN-PAN**: The phrase Pan-Pan, repeated three times, is the international standard urgency signal that is used by a boat, ship, aircraft, or other vehicle to declare that they have a situation that is urgent, but for the time being, does not pose an immediate danger to anyone's life or to the vessel itself.
[11] Also known as the Challenger-300 or the Challenger-350.

1.3.2 Spoiler System

1.3.2.1 Overview

The fly-by-wire spoiler system has eight spoiler panels arranged as four multi-function flight spoilers (MFS) and four ground spoilers (GS), (**Figure No. 2**).

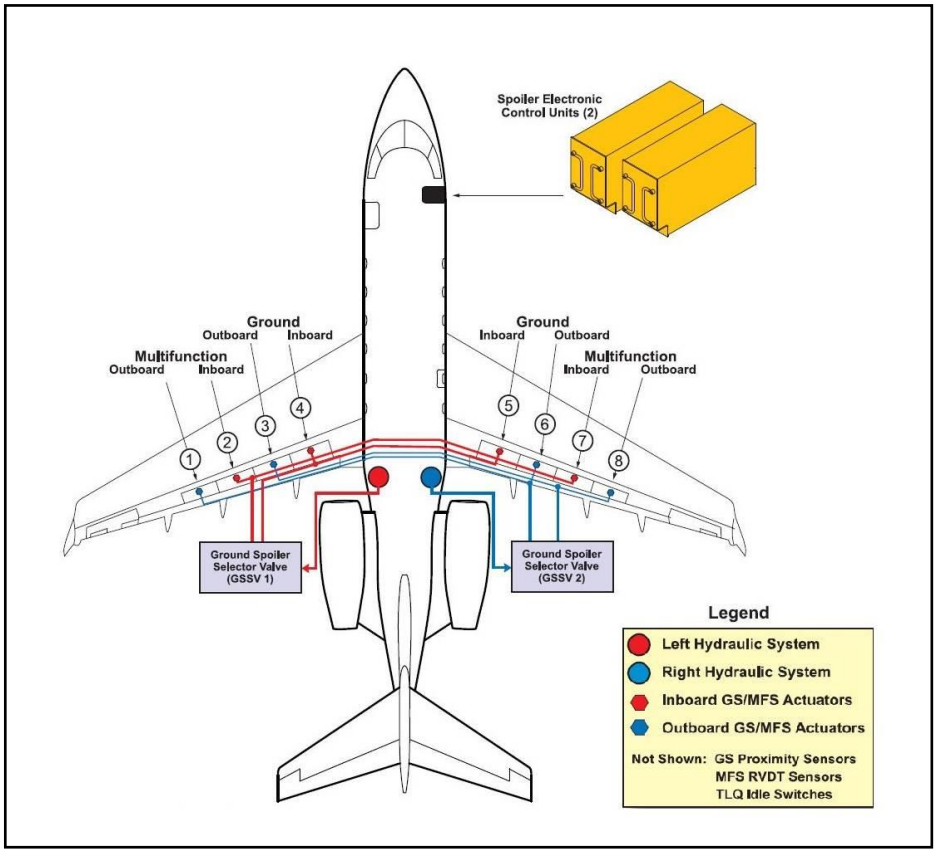


Figure No. 2: Schematic of BD100 1A10 spoiler system (*Manufacturer*)

The spoiler system supports five functions:

- Roll assist and roll control.
- Proportional lift dumping.
- Ground lift dumping.
- EICAS message logic.
- Maintenance and diagnostics.

1.3.2.2 Multi-Function Spoiler System

The Multi-Function Spoilers (MFS) can assist the ailerons or provide full roll control for the aircraft. They also provide proportional lift dumping (speed brakes) and help the ground spoilers with ground lift dumping (on-ground speed brake).

MFS panels 1, 2, 7, and 8 have variable displacement capability and serve as roll assist, proportional lift dumping, and ground lift dumping. (Note: Ground Spoiler panels 3, 4, 5, and 6 have two positions – stowed and fully deployed – and function as ground spoilers only).

Two Spoiler Electronic Control Units (SECUs), control the spoiler system. SECU I and SECU 2 are located inside the pressurized cabin. Additionally, the SECUs provide EICAS messages and synoptics, maintenance diagnostics, and FDR reporting.

The spoiler system includes spoiler position monitoring through a Linear Variable Differential Transformer (LVDT) and malfunction detection with automatic fail-safe shutdown[12] and fault annunciation, via the EICAS.

1.4 Flight Recorders

1.4.1 Cockpit Voice Recorder (CVR)

The aircraft was equipped with an L-3 FA2100-1025 Solid-State CVR, with a capability of recording 120 minutes of high quality sound on four channels. The CVR was removed from the aircraft and successfully downloaded. However, following the occurrence, whilst the aircraft was parked, the aircraft electrical system remained powered. It was later determined that the CVR had continued to record, thus over-writing any recordings made during the occurrence flight.

1.4.2 Flight Data Recorder (FDR)

The aircraft was equipped with an L-3 FA2100-2045 Solid-State FDR. The FDR was removed from the aircraft and successfully downloaded. The data was analysed by the AAIU. The data
7 was also sent to the Aircraft Manufacturer for additional analysis, with the assistance of an Accredited Representative from the Transport Safety Board of Canada.

Figure No. 3 is a graphic representation of the FDR data for the following parameters:

- Flight Spoiler Lever Position.
- Right Outboard MFS Extension.
- Airspeed.
- Commander's Control Wheel Position (labelled '*Wheel Position Left*').
- Flap Extension.
- Autopilot State (Engaged or Disengaged).

The data showed that during flight-spoiler extension all spoilers extended to approximately 45°. Following flight-spoiler retraction, all flight-spoilers retracted to 0°, following which the right outboard MFS initially re-extended to 7.6°. The angle then reduced to approximately 7°, and remained at this angle for the remainder of the flight.

[12] Fail-safe shutdown: the detection of a fault in a spoiler system will shut down the hydraulics to that system; e.g. a fault to a right outboard MFS will activated the 'fail-safe shutdown' of hydraulics to both the left and right outboard MFS.

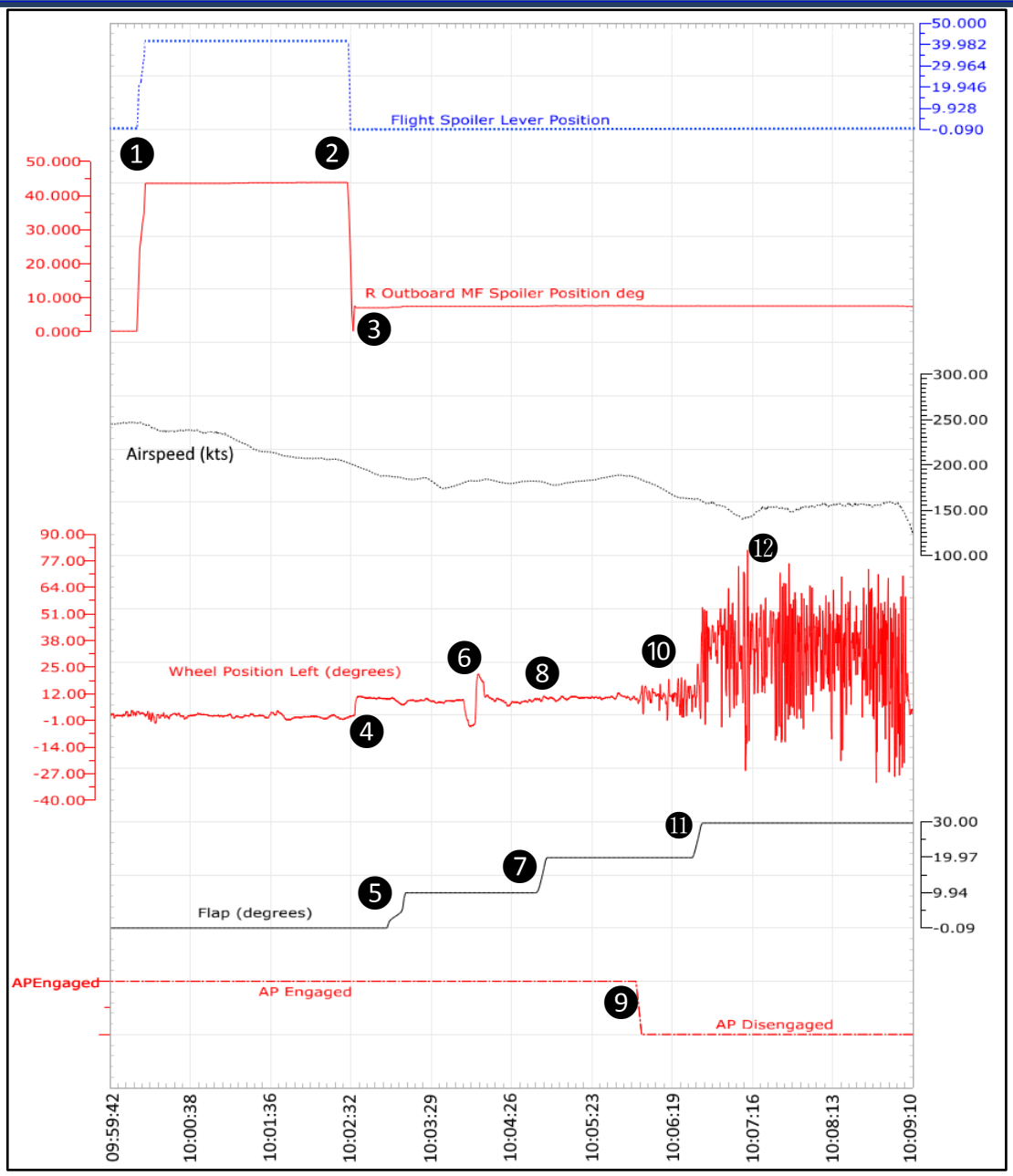


Figure No. 3: Graph of six FDR parameters

Sequence of events as shown on FDR (times are UTC, distances are from RWY 28):

1. At time 10:00:01 the flight spoiler lever was extended.
2. At time 10:02:32, at 15.3 NM, the flight spoiler lever was pushed to zero.
3. At time 10:02:33, at 15.0 NM, the right outer MFS extended up to 7.6°.
4. At time 10:02:33, 10° left control wheel input by autopilot to maintain wings level.
5. At time 10:02:58, at 13.5 NM, Flap 10 was selected.
6. At time 10:03:53, at 10.2 NM, the ILS localiser was captured.
7. At time 10:04:44, at 9.3 NM, Flap 20 was selected.
8. Left control wheel input by autopilot of approximately 10°.
9. At time 10:05:56, at 6.5 NM, the autopilot was disengaged.
10. Manual left and right control wheel inputs, by PF, commenced at up to ± 18°.
11. At time 10:06:33, at 4.77 NM, Flap 30 was selected.
12. Manual left and right control wheel inputs by PF increased significantly, peaking at 80° left control wheel input and 35° right control wheel input.

The FDR recorded Weight-On-Wheels (landing) at time 10:09:05.

1.5 Spoiler Failure Certification

The Aircraft Manufacturer informed the Investigation that during aircraft certification the criteria for a jammed spoiler were determined from certification flight testing of the Challenger-300 with an outboard MFS jammed at its full position (45°). This was considered the critical case for certification, as it would require the maximum corrective control input.

1.6 Actions Following Initial Review of FDR Data

1.6.1 General

Following a review of the data extracted from the FDR, the Aircraft Manufacturer commenced an internal investigation in conjunction with the manufacturer of the spoiler system components, to determine the failure mode for the subject actuator. In addition, in light of the control difficulties reported by the Commander, and confirmed during the AAIU's and the Manufacturer's review of the FDR, the Aircraft Manufacturer sought to determine if a change to the Aircraft Flight Manual (AFM) procedures was warranted. The AAIU was kept informed at all stages of the Manufacturer's investigation. The Aircraft Manufacturer subsequently informed the Investigation that an AFM change was warranted and that a ground rig and a flight test program were to be set up.

1.6.2 Testing of Spoiler Components

A number of scenarios were studied in order to reproduce the event which occurred on the subject aircraft. The tests were able to produce a scenario consistent with the subject event. A synopsis of the test results showed that:

- *The spoiler jam fault in the 9H-VCJ event was associated with the loss of the* [power control unit] *PCU's (spoiler actuator) LVDT primary voltage signal between the SECU#2 (Spoiler Electronic Control Unit - controls the outboard spoiler system panels) and the Right Outboard MFS PCU's LVDT.*
- *This fault was logged on the aircraft's MDC (Maintenance Diagnostic Computer) and the affected SECU NVRAM (Non-Volatile Memory) as a "RightMfsLvdtInput" message.*
- *This NVRAM message had also been logged several times over a period of a week during ground operations prior to the event flight.*
- *During the ground rig testing,* [Aircraft Manufacturer and Component Manufacturer] *focused their efforts on analyzing the signals between the SECU and the Right Outboard MFS PCU.*
- *The ground test rig replicated the* [spoiler] *panel extension from stowed position when an "OPEN" circuit was introduced on either Pa or Pb (excitation supply signals) of the PCU LVDT.*
- *In the test rig environment for the PCU in isolation, this leads to a fully deployed spoiler; however, on the aircraft, the combined system design detects the uncommanded movement and halts it before it goes to full deployment (in the 9H-VCJ event, this was approximately 7 degrees).*

- *On the aircraft, the loss of excitation supply signal to the PCU LVDT would most likely be caused by a wiring or connector issue.*
- *Follow-up with* [the Aircraft Manufacturer's] *customer support group determined that there have been no issues reported to us for this aircraft, since the incident, in which a "RightMfsLvdtInput" message appeared in SECU NVRAM downloads (several have been provided to us for various other snags), and there have been no further reported uncommanded spoiler deployments for this aircraft; therefore* [the Aircraft Manufacturer] *conclude that whatever continuity issue existed in the wiring/connectors at the time of the incident was* […] *fixed as a result of the return-to-service activity at the time.*

The Aircraft Manufacturer concluded that the most likely cause of the uncommanded spoiler deployment was due to a wiring/connector continuity issue with the subject spoiler's PCU. Although this was not identified during the Investigation, the Aircraft Manufacturer noted that any possible wiring/connector continuity issue that may have caused the event was likely to have been cleared during the fault rectification process.

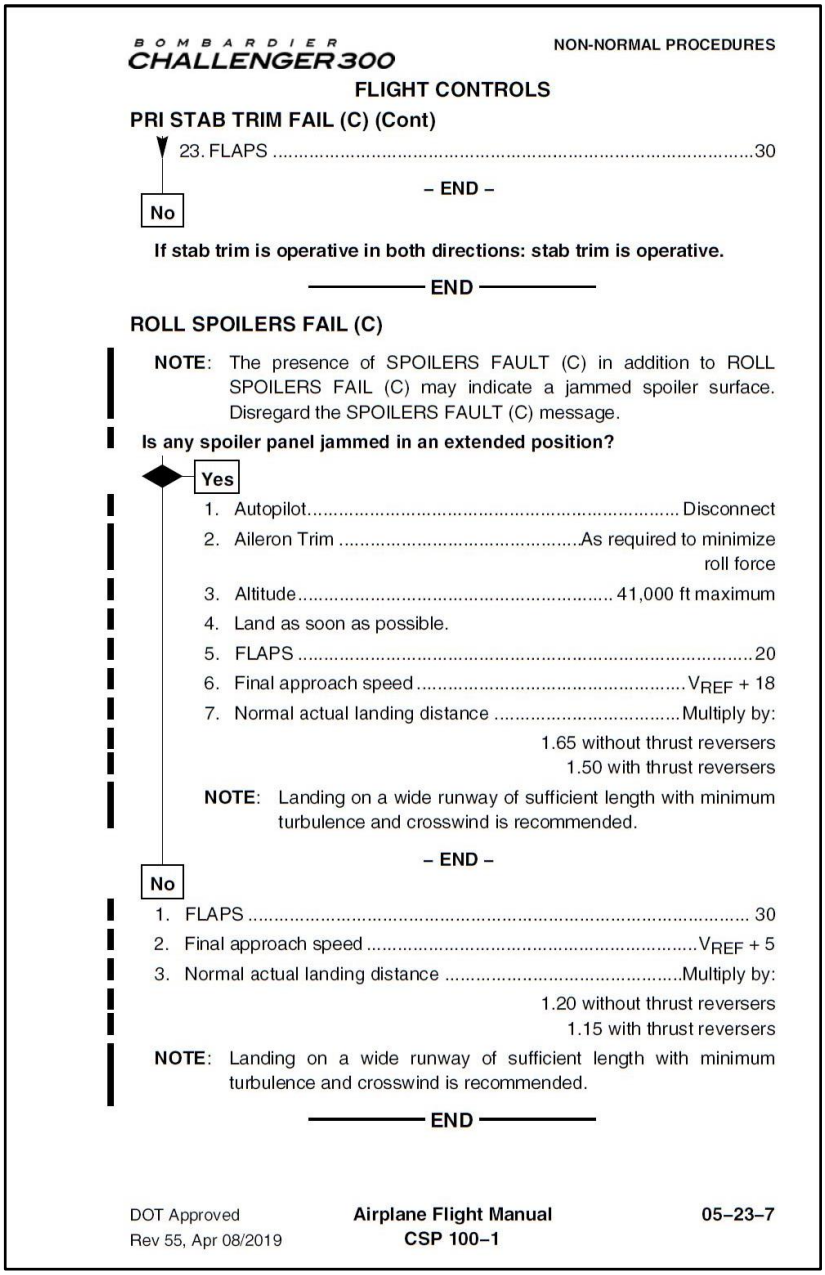
1.6.3 Review of Flight Procedures for Jammed Spoiler

Following the ground rig tests, the Aircraft Manufacturer proceeded with a series of flight tests to assess possible changes to AFM procedures for in-flight spoiler jam. Following completion of these tests, the Aircraft Manufacturer informed the Investigation in December 2018 that:

- *Review of the AFM found several other procedures besides the Spoiler Fault procedure which are impacted by the investigation findings;* […]*, these other procedures* [relate to]*: Spoiler Fail, Roll Spoiler Fail, and Flap and Spoiler Fail.*
- *Flight testing has now been completed in support of all of the required changes to the AFM, and the engineering analysis reports completed.*
- *The revised procedures have been drafted and are currently in review by our design approval organization for signature of the statement of compliance.*
- *We anticipate that the final revised procedures will be submitted to Transport Canada for approval towards the end of January 2019.*
- *Depending* [on the time-frame needed for] *Transport Canada approval (and then EASA and FAA),* [Aircraft Manufacturer] *anticipate that the revised procedures will go into either AFM revision 55 (scheduled for April 8th 2019) or revision 56 (scheduled for July 8th),* [or a possible Temporary Revision].

AFM amendments for the Challenger-300 (AFM revision 55) and Challenger-350 (AFM revision 21) series aircraft were issued by the Aircraft Manufacturer, detailing changes to procedures relating to inflight spoiler failures. The changes to the AFM became the subject of an Airworthiness Directive (AD), issued by Transport Canada on 12 August 2019, and effective on 26 August 2019 (**Appendix A**).

A sample page from a revised Non-Normal Checklist is shown in **Figure No. 4** with the relevant changes annotated by vertical change bars on the left side of the procedure.



BOMBARDIER CHALLENGER 300 NON-NORMAL PROCEDURES

FLIGHT CONTROLS

PRI STAB TRIM FAIL (C) (Cont)

23. FLAPS 30

– END –

No

If stab trim is operative in both directions: stab trim is operative.

END

ROLL SPOILERS FAIL (C)

NOTE: The presence of SPOILERS FAULT (C) in addition to ROLL SPOILERS FAIL (C) may indicate a jammed spoiler surface. Disregard the SPOILERS FAULT (C) message.

Is any spoiler panel jammed in an extended position?

Yes

1. Autopilot ..... Disconnect
2. Aileron Trim ..... As required to minimize roll force
3. Altitude ..... 41,000 ft maximum
4. Land as soon as possible.
5. FLAPS 20
6. Final approach speed ..... V_{REF} + 18
7. Normal actual landing distance ..... Multiply by:

1.65 without thrust reversers
1.50 with thrust reversers

NOTE: Landing on a wide runway of sufficient length with minimum turbulence and crosswind is recommended.

– END –

No

1. FLAPS 30
2. Final approach speed ..... V_{REF} + 5
3. Normal actual landing distance ..... Multiply by:

1.20 without thrust reversers
1.15 with thrust reversers

NOTE: Landing on a wide runway of sufficient length with minimum turbulence and crosswind is recommended.

END

DOT Approved
Rev 55, Apr 08/2019

Airplane Flight Manual
CSP 100–1

05–23–7

11

Figure No. 4: Non-Normal Checklist – Roll Spoilers Fail

2. ANALYSIS

2.1 Uncommanded Spoiler Deployment

The uncommanded spoiler deployment on the aircraft was most likely caused by a failure of the subject spoiler's PCU connection, due to a wiring/connector continuity issue. However, the system functioned per design, detecting the failure, shutting down the hydraulics to the outboard MFS, and reverting to roll assist using the inboard MFS. Although an intermittent fault with the subject spoiler had been logged, during ground operations, in the week prior to this event, it has not recurred and it was not a known issue for the aircraft type. Therefore no Safety Recommendation is made in this regard.

2.2 Control of the Aircraft

The AFM Flight Controls Cautions Procedures for a jammed spoiler were determined from certification flight testing of the Challenger 300 (and by similarity for the Challenger 350) with an outboard MFS jammed at the fully extended position of 45°. This was considered by the Aircraft Manufacturer to be the critical case for certification, as this required the maximum corrective control input. Any airflow separation behind a MFS jammed at 45° would likely have remained detached and subsequent control wheel inputs to correct the lift differential between the affected and unaffected wings would have been consistent and manageable.

However, with the right outboard MFS jammed at approximately 7°, and a Flap selection beyond 20°, it is likely that the subject aircraft experienced an alternating airflow separation and reattachment on the flap behind the jammed MFS. During airflow separation, the lift from the affected wing would decrease, causing the aircraft to roll towards the affected wing. During airflow reattachment, lift on the affected wing would increase. Control inputs, in response to the alternating lift generated by the affected wing, could lead to pilot induced oscillation, especially at lower airspeeds. This was observed in the data gathered from the FDR for the subject aircraft.

During the occurrence, in response to the roll control difficulties he was experiencing, the Commander elected to increase the speed of the aircraft, and found that roll control was more manageable at higher speeds, with Flap 30° selected. The aircraft landed without further incident.

2.3 Safety Actions Taken

In light of the above, an internal investigation by the Aircraft Manufacturer recommended that a review of the existing AFM procedure for '*Spoilers Fault*', '*Roll Spoiler Fail*', and '*Spoiler Fail*' be carried out. Following the review, the Aircraft Manufacturer issued amendments to the AFM Flight Controls Cautions Procedures, to address these spoiler issues. The amendments involved both a change of flap selection, and a change of Vref speed adjustment, in response to a spoiler that has jammed in an extended, or partially extended, position.

The changes to the AFM became the subject of an Airworthiness Directive (AD), issued by Transport Canada on 12 August 2019, and effective on 26 August 2019 (**Appendix A**).

As a result of the Safety Actions taken, the Investigation makes no Safety Recommendation in this regard.

3. CONCLUSIONS

(a) Findings

1. The aircraft flight spoilers (speed brakes) were extended normally to reduce aircraft speed on final approach into EIDW.

2. Following retraction of the flight spoilers, the right outboard MFS extended to, and remained at, approximately 7° for the remainder of the flight.

3. The Flight Crew carried out the associated QRH Non-Normal Checklist, which called for a final approach speed of Vref +8.

4. Data from the FDR and from the Commander's report showed that at a final approach speed of Vref +8, with the right outboard MFS remaining at 7°, the aircraft became difficult to control in roll with flaps extended to 30°.

5. FDR data showed significant left and right control wheel inputs being made after flaps were extended to 30°.

6. The Commander elected to increase the final approach speed above that given in the QRH, in order to manage controllability of the aircraft in roll, and landed the aircraft without further incident.

7. The right outboard MFS uncommanded extension to 7° was most likely caused by a failure of the right outboard MFS PCU connection, due to a wiring/connector continuity fault.

8. Following the event, the Aircraft Manufacturer carried out extensive ground-rig, simulator, and flight testing to evaluate the effects of a MFS fault similar to the subject occurrence.

9. As a result, changes to the AFM were introduced by the Aircraft Manufacturer.

10. An AD (CF-2019-29), effective 26 August 2019, was issued by Transport Canada, outlining the AFM changes.

(b) Probable Cause

Roll control difficulties experienced during approach, resulting from a right outboard MFS which deployed uncommanded, most likely due to a wiring/connector continuity issue, and then remained at seven degrees.

(c) Contributory Cause

QRH guidance available at the time of the occurrence, for approach speed and flap selection following a Multi-Function Spoiler Fault, did not account for a spoiler remaining extended at an intermediate position.

4. SAFETY RECOMMENDATIONS

This Investigation does not sustain any Safety Recommendations.

- END -

Appendix A
Transport Canada Airworthiness Directive

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-2019-29

Effective Date:

26 August 2019

ATA:

27

Type Certificate:

A-234

Subject:

Flight Controls – Multi-Function Spoiler (MFS) Jam

Applicability:

Bombardier Inc. model BD-100-1A10 aeroplanes, serial numbers 20003 through 20788.

Compliance:

Within 30 days from the effective date of this AD, unless already accomplished.

Background:

Transport Canada (TC) has received notice of an in-flight event where a crew observed a SPOILER FAIL message and had difficulties maintaining roll control of the aircraft. They followed the Quick Reference Handbook (QRH) procedure for the SPOILER FAIL message, however, the aircraft experienced a heavy right-wing down roll moment when reducing speed to Vref +8 knots. Post-incident investigation revealed that uncommanded deployment of the MFS at certain positions, in combination with specific flap positions and airspeeds, can create an unacceptably high crew workload in maintaining roll control of the aeroplane.

This AD mandates the incorporation of Airplane Flight Manual (AFM) procedures that will bring the crew workload to an acceptable level during this failure scenario.

Corrective Actions:

A. Amend the applicable TC approved AFM by incorporating Chapter 05 NON-NORMAL PROCEDURES – Flight Controls (section 05-23) as detailed in the table below, or later revisions of these procedures approved by TC:

Aeroplane Serial Numbers	AFM	AFM Revision Number	AFM Revision Date
20003 through 20500	CSP 100-1	Revision 55	8 April 2019
20501 through 20788	CH 350 AFM	Revision 21	8 April 2019

B. Following incorporation of the above-mentioned procedure, advise all flight crews of these changes.

Authorization:

For the Minister of Transport,

ORIGINAL SIGNED BY

Daniel Gosselin
Acting Chief, Continuing Airworthiness
Issued on 12 August 2019

Canada

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

AAIU Reports are available on the Unit website at www.aaiu.ie

An Roinn Iompair
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