

# Advisory Wire

REFERENCE NO:	AW300-32-0143, Rev 4	INFORMATION TYPE:	Maintenance Operational
ATA:	32-51	EFFECTIVITY:	Challenger 300 (20003 to 20500) Challenger 350 (20501 to 20745)
SUBJECT:	<b>Runway Landing Excursion</b>		

## 1. REFERENCES:

- 1.1. Transportation Safety Board of Canada (TSB) Aviation Investigation Report A11Q0052  
The report is available on Transportation Safety Board's website <http://www.bst-tsb.gc.ca> within Investigations > Investigation Reports > Aviation
- 1.2. Service Bulletin (SB) 100-32-25 – Special check / Modification – Nosewheel-Steering Control System – Replacement of the Steering Manifold. Released September 24, 2014
- 1.3. Airworthiness Directive (AD) CF-2016-24. Effective date: 2 September 2016
- 1.4. Service Bulletin (SB) 100-32-31 – Modification - Nosewheel-Steering Control System - Addition of a Filter in the Nosewheel Steering Hydraulic System. Released January 4 2018
- 1.5. Service Bulletin (SB) 350-32-007 – Modification - Nosewheel-Steering Control System - Addition of a Filter in the Nosewheel Steering Hydraulic System. Released January 4 2018
- 1.6. Airworthiness Directive (AD) CF-2018-11 – Landing Gear – Uncommanded Nose Wheel Steering Due to Failure of the Steering Selector Valve. Effective date: 19 April 2018

## 2. INTRODUCTION:

The revision to this Advisory Wire is to inform Operators about the release of Ref. 1.4 and 1.5 Service Bulletins.

## 3. DESCRIPTION:

The Transportation Safety Board of Canada (TSB), with the assistance of Bombardier and the landing gear manufacturer, Safran Landing Systems, has conducted a safety investigation on a Challenger 300 aircraft that experienced a directional pull to the right after landing. The aircraft exited the runway to the right and skid marks left by the nose wheel tires on the runway showed that the nose wheel was incorrectly orientated.

The TSB investigation concluded that the accident was caused by a combination of two malfunctioning components:

- § The Electro Hydraulic Servo Valve (EHSV) of the steering manifold did not respond to the steering command from the Steering Electronic Control Unit (ECU).
- § The Steering Selector Valve (SSV) did not close, preventing the Nose Wheel Steering System (NWSS) from operating in free casting mode.

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The subsequent analysis revealed that the design of the steering manifold (P/N 40750-101) can allow moisture to enter the EHSV torque motor housing through the connector installation and seize the servo mechanism below freezing temperatures.

It was also determined that contaminated hydraulic fluid can cause the SSV to be blocked in the open position, leaving the system unprotected in case a failure in a NWSS component is detected. A potential source of contaminants was identified in a direct line that runs between the LH DCMP and the SSV that supplies unfiltered hydraulic fluid to the nosewheel steering system.

In light of these findings, two modifications are introduced:

- Reference 1.2 was released to address the EHSV moisture ingress by incorporating an O-ring between the connector and an EHSV valve cap. Aircraft 20384 and up are fitted with the redesigned part in production.
- References 1.4 and 1.5 were released to address the unfiltered hydraulic fluid supply line to the SSV by installing a filter. Aircraft 20745 and up are fitted with the new filter assembly in production.

Airworthiness Directives (references 1.3 and 1.6) have been issued regarding these modifications.

#### 4. ACTION:

Operators should schedule their aircraft for incorporation of SB100-32-31, 350-32-007 & SB100-32-25 per the recommended AD compliance time.