

**SERIOUS INCIDENT**

<b>Aircraft Type and Registration:</b>	Dornier 328-120, D-CTRJ	
<b>No &amp; Type of Engines:</b>	2 Pratt & Whitney Canada PW119C turboprop engines	
<b>Year of Manufacture:</b>	1994 (serial no: 3015)	
<b>Date &amp; Time (UTC):</b>	26 January 2017 at 1513 hrs	
<b>Location:</b>	Sumburgh Airport, Shetland	
<b>Type of Flight:</b>	Certification test flight	
<b>Persons on Board:</b>	Crew - 2	Passengers - 2
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	None	
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence	
<b>Commander's Age:</b>	64 years	
<b>Commander's Flying Experience:</b>	10,379 hours (of which 4,035 were on type) Last 90 days - 75 hours Last 28 days - 16 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and further information from EASA following post-flight data analysis	

**Synopsis**

D-CTRJ touched down in a strong crosswind. The pilot applied full left rudder but the aircraft yawed right. During the rollout, power was increased momentarily and aileron deflection was reversed from a 'roll right' to a 'roll left' sense. The aircraft rolled left, the right main landing gear lifted off the runway and the aircraft yawed into wind. The pilots could not regain control before the aircraft left the right side of the runway and ran onto the grass.

**History of the flight**

The flight was an EASA certification test flight aiming to extend the maximum demonstrated crosswind of the Dornier 328 from 21 kt to 30 kt. The commander of the aircraft occupied the right seat and was pilot monitoring (PM). The pilot flying (PF), sitting in the left seat, was an EASA test pilot who had flown 30 minutes on type.

Three full-stop landings on Runway 09 were accomplished successfully using 20° of flap before the final approach to land was flown with 32° of flap. The weather at Sumburgh Airport was: wind from 160° at 24 kt gusting 36 kt, 8,000 m visibility, and scattered cloud at 1,100 ft agl. The two-minute average wind, passed to the crew by ATC while the aircraft was on final approach, was from 160° at 26 kt.

The PF reported that, on the final landing, the aircraft touched down slightly to the left (downwind) of the runway centreline after which he selected **GROUND IDLE** power. The aircraft moved right, towards the centreline, but, when the PF applied left rudder to maintain runway heading, it had no effect and the aircraft began to drift to the right side of the runway. In an attempt to regain directional control and prevent runway excursion, the pilot applied left brake. At the same time, he inadvertently relaxed his aileron input, and the aileron deflection reversed from a 'roll right' to a 'roll left' sense. This caused the right wing to lift and the right main landing gear to lift off the runway (Figure 1). Thinking that this was due to his brake application, the pilot ceased differential braking and re-applied right aileron. The bank angle reduced and the right mainwheel touched down again. Thinking that he had "applied reverse thrust and that this might have reduced rudder effectiveness", the PF moved the power levers forward to what he thought would be **GROUND IDLE**. In fact, he had moved the power levers to **FLIGHT IDLE**, thereby increasing power, and the PM immediately returned them to **GROUND IDLE** and applied maximum reverse thrust.



**Figure 1**

Right main landing gear lifting off the runway

The aircraft yawed to the left but, despite the application of full left rudder and the intervention of the aircraft commander, the aircraft continued to diverge from the runway centreline. Control could not be regained and the aircraft passed from the runway surface onto the grass at approximately 25 kt. The ground was soft and the aircraft came to a halt abruptly.

### **Flight data**

Flight data showed that, during the first 1.5 seconds after touchdown, aileron deflection increased to approximately 14° in a 'roll right' sense. Over the following 5.5 seconds, the aileron deflection reversed to reach approximately 11° in a 'roll left' sense as the right main landing gear lifted from the runway.

Left rudder was applied progressively, reaching its maximum travel three seconds after the main landing gear touched down, 1.5 seconds after the nose landing gear touched down. Maximum left rudder input was maintained until after the aircraft left the runway.

Recorded flight data did not include information directly from the nosewheel steering system. However, data from the nose landing gear weight-on-wheels switch – which disengages the nosewheel steering when the weight is off the wheels – suggested that the nosewheel steering did not engage after touchdown except for brief periods.

### **Assessment of cause**

The PF stated that he had attempted to regain control on the runway through the application of asymmetric braking and cancellation of reverse thrust. While doing so, he inadvertently relaxed the left aileron input causing the right wing and main landing gear to lift off the ground.

The aircraft commander considered that, when the right main landing gear lifted from the runway, the aircraft began to “weather-cock” into wind. Subsequently, there was insufficient directional control in the strong crosswind conditions to prevent the aircraft from leaving the runway.

It is likely that the nosewheel steering was only engaged intermittently during the landing roll, which would have contributed to the handling difficulties.