

Accident

Aircraft Type and Registration:	Flight Design CTSW, G-CFFJ	
No & Type of Engines:	1 Rotax 912ULS piston engine	
Year of Manufacture:	2008 (Serial no: 8391)	
Date & Time (UTC):	10 October 2024 at 0740 hrs	
Location:	Carlisle Airport, Cumbria	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Serious)	Passengers - N/A
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	66 years	
Commander's Flying Experience:	628 hours (of which 85 were on type) Last 90 days - 14 hours Last 28 days - 8 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft's left cabin door came open in flight shortly after the aircraft became airborne, leading to a loss of control and impact with the ground in which the pilot was seriously injured.

History of the flight

The pilot intended to make an early local flight in fine weather. He completed the pre-flight checks, including latching the left cabin door closed as it had been open when he entered the cockpit. He started the engine and taxied to holding point A for Runway 19, where he completed pre-departure checks. As the flight was being made before the airport's normal opening time, the pilot made blind radio transmissions on the A/G frequency. He called stating that he was entering Runway 19 for a southerly departure and this call was acknowledged by the driver of an airport vehicle that was being used for runway checks.

The pilot applied full power, released the brakes and the aircraft accelerated normally. During the takeoff ground roll, the aircraft ran across a joint in the paved runway surface and the pilot described hearing a rattle from the left cabin door. He glanced down to his left and thought that he may have seen a gap between the bottom of the door and the door aperture, however the aircraft was now at flying speed and he rotated into a climbing attitude. The pilot estimated that the left cabin door suddenly opened whilst the aircraft was passing 50-100 ft in the climbout. He stated "I was hit with tremendous turbulence in the cockpit,

with maps and papers swirling around". He was also concerned about visible flexing to the large cabin door, and the possibility that it might detach and strike the tailplane. He tried to close the cabin door with both hands, whilst holding the control column between his knees, but was unsuccessful and decided to reduce engine power and try again.

During the second attempt to close the door he managed to move the door to its closed position but was unable to move the door locking lever fully forward and during this attempt the aircraft stalled, with the right wing dropping.

The pilot pitched the aircraft nose down and applied full power, however there was insufficient height for a recovery and the aircraft struck an open area of soft ground outside the airport perimeter fence (Figure 1). The pilot received serious facial injuries and fractures to his right foot. No fire occurred and a combination of airport staff and local emergency response vehicles quickly attended the accident site.



Figure 1

G-CFFJ accident site (image courtesy of Cumbria Police)

Aircraft information

The CTSW is a high-wing, three-axis microlight aircraft with a relatively large cabin door on either side of the fuselage. The cabin doors are of the 'gull-wing' type, hinged along their upper edge and assisted in opening with a gas spring. The door latching mechanism consists of three locking pins actuated by a lever at the lower inside edge of the door. The lever is moved forward to lock the door, and aft to unlock. When moved fully forwards, the lever engages into a detent and a light spring pressure biases the lever to remain in the detent position (Figure 2).



Figure 2

CTSW cabin door features (file photographs)

Aircraft examination

The aircraft wreckage was examined by the AAIB following the accident, and significant wear was observed to the door latching pins at the point where the pin bears against the door aperture's composite frame when the door is in the closed position. This prompted a survey of three other similar CTSW and CTLS¹ aircraft, which were found to also exhibit similar wear of the door latch pins. The force required to move the door latch lever, from a closed (but with the lever out of the detent) to open position, was measured and found to be in the range 20-30 N. This represented a positive effort to unlatch the door, and the owners of the three aircraft examined stated that none had suffered from uncommanded door opening when the door was latched closed with the lever in the detent position.

Analysis

The cause of the left cabin door opening during the flight was likely due to it being not fully latched closed, with the latch handle in the closed detent, prior to takeoff. Airframe vibration during the takeoff roll, including that experienced when rolling over joints in the runway's paved surface, probably caused the unlatched lever to migrate sufficiently to allow the door latching pins to disengage from their mating holes in the door aperture frame, allowing the door to open. Once unlatched, opening of the cabin door was assisted by the door gas spring and air loads, causing the rapid door opening experienced by the pilot. The wear observed to the door latching pins was found to be common to other similar aircraft in the fleet and is not considered contributory to the uncommanded door opening.

The unexpected opening of the cabin door created a hazardous situation for the pilot whilst the aircraft was close to the ground, shortly after becoming airborne. His efforts to control the aircraft whilst attempting to close the door were unsuccessful, leading to the aircraft stalling at a height that was insufficient for him to recover.

Footnote

¹ The CTLS is a modernised variant of the CTSW that shares a common design of cabin door.

Conclusion

The aircraft's left cabin door came open in-flight shortly after the aircraft became airborne, leading to a loss of control and impact with the ground in which the pilot was seriously injured. This accident highlights the importance of ensuring that all aircraft hatches and doors are securely closed prior to flight. CAA Safety Sense leaflet 31, '*Distraction and Interruption in General Aviation Operations*²', provides guidance for pilots on the dangers of distraction whilst flying and suggestions for mitigation strategies within a threat and error management (TEM) approach.

Footnote

² Civil Aviation Authority Safety Sense Leaflet 31 Distraction and Interruption in General Aviation Operations May 2023 https://www.caa.co.uk/media/apcbiav3/caa8230_safetysense_31_distraction_aw9.pdf [Accessed 11 February 2025].