

ACCIDENT

Aircraft Type and Registration:	Cessna 210M Centurion, G-TOTN	
No & Type of Engines:	1 Continental Motors Corp IO-520-L piston engine	
Year of Manufacture:	1977	
Date & Time (UTC):	31 October 2005 at 1642 hrs	
Location:	Cambridge City Airport, Cambridgeshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damage to propeller and underside of fuselage	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	48 years	
Commander's Flying Experience:	2,400 hours (of which 150 were on type) Last 90 days - 40 hours Last 28 days - 15 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and report by engineering maintenance facility	

Summary

The aircraft was on a short positioning flight during which the pilot was unable to successfully deploy the landing gear, either by normal control selection or by using the manual pump. The pilot elected to divert to Cambridge City Airport and made a successful gear-up landing; the aircraft sustaining damage to the propeller and the underside of the fuselage. The inability to deploy the landing gear has since been attributed to incorrectly installed wiring for the squat switch on the nose landing gear. The squat switch had recently been replaced.

History of flight

The aircraft was on a short positioning flight to Top Farm. According to the pilot's report he was unable to

successfully deploy the landing gear, either by normal control selection or by using the manual pump. He could see from the wing mounted mirror that the landing gear doors had opened successfully.

The pilot elected to divert to Cambridge City Airport where the visibility was 10 km, with a 4 kt wind and with no significant weather being reported. He made a successful gear-up landing, sustaining damage to the propeller and the underside of the fuselage. No injuries were sustained and the pilot reported that '*ATC and Fire Services were all magnificent*'.

Engineering Investigation

The landing gear had been subjected to recent maintenance and this included the fitting of a new squat switch, which is mounted on the nose gear actuator. This was documented in the airframe log book and was dated 17 October 2005.

After the incident the aircraft was taken to a maintenance facility at Cambridge City Airport where it was jacked for inspection. When the engineers attempted to deploy the gear by operating the gear down switch, they found that the nose gear partially deployed and then started to retract. The nose gear was trapped in a cycle of partial retraction and deployment and this continued until gear up was selected.

Further inspection of the nose gear revealed that the two wires from the squat switch had been incorrectly routed and had become trapped in the nose gear down-lock hook. The spiral wrap that protected the two wires was damaged and they had been squashed exposing the cores. The damaged wires were replaced and the gear was then found to function satisfactorily.

A review of the wiring diagram revealed that if either of the two wires from the squat switch went to earth this would energise the gear up solenoid, causing the gear to retract. There is therefore substantial evidence that the incorrectly routed wiring, which had subsequently become damaged, was causing an earth when the nose gear was partially deployed and that this was causing the gear to become stuck in a cycle of partial retraction and deployment when gear down was selected.

Further analysis of the hydraulic and electric system schematic diagram showed that the relevant circuit breaker would not have tripped in this situation and was not of a type which could be tripped manually. It also showed that the only way that the pilot could have deployed the landing gear was by switching off all the electrics and using the hand pump. There was no operating procedure for this case in the Pilot's Operating Handbook, and the pilot acted in accordance with the Handbook.