

ACCIDENT

Aircraft Type and Registration:	Cessna F177RG Cardinal, G-BFPZ	
No & Type of Engines:	1 Lycoming IO-360-A1B6D piston engine	
Year of Manufacture:	1973	
Date & Time (UTC):	28 November 2005 at 1639 hrs	
Location:	Swansea Airport, West Glamorgan	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to propeller, engine cowlings, nose gear doors and nose landing gear. Engine shock loaded	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	53 years	
Commander's Flying Experience:	666 hours (of which 125 were on type) Last 90 days - 14 hours Last 28 days - 3 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft was returning to Swansea from Exeter following repairs after a heavy landing. After completing one 'touch and go' the pilot rejoined the circuit. When the landing gear was selected 'down' the pilot observed a 'gear unsafe' warning light. After recycling the landing gear, the control tower reported that the nose leg had not extended. The pilot then made several unsuccessful attempts to lower it using the normal electrically powered system, before trying the emergency hand pump. After several minutes of pumping the control tower advised that the nose gear was only partially extended. The pilot then elected to carry out a landing with the nose landing gear in this condition, but it collapsed as the nose wheel touched the runway. With the possible exception of the landing

gear system circuit breaker, no pre-accident defects were identified with the landing gear operating system.

History of flight

On 28 November 2005, following completion of maintenance work at Exeter Airport, the aircraft departed for Swansea with no reported problems. The pilot joined the circuit at Swansea and carried out an uneventful 'touch and go' on Runway 28. On the aircraft's second approach, the pilot observed a landing gear 'unsafe' light together with a 'low voltage' warning light and a 'burning' smell, after he selected the landing gear down; the landing gear circuit breaker had also tripped. The pilot then reset the circuit breaker and recycled the gear.

The main landing gear units extended normally but the 'gear unsafe' light remained illuminated. The control tower then reported that the nose landing gear (NLG) had not extended.

The pilot carried out a go-around and tried, unsuccessfully, to lower the NLG by recycling the landing gear selector lever several times. He then used the emergency hand pump to extend the landing gear. During this time the pilot made several passes of the control tower, to confirm that the landing gear was extending, but was told that the NLG had only partially extended. When subsequently informed by the control tower that there appeared to be no further extension of the NLG, despite continued use of the hand pump, the pilot elected to land the aircraft with the NLG partially extended.

The touchdown was normal, with the pilot holding the aircraft's nose high until the elevator became ineffective as the aircraft's speed decreased. As the nose lowered, the NLG collapsed, causing the propeller and forward fuselage to strike the runway. The aircraft came to rest on the runway and both occupants left the aircraft unaided. There was no fire.

Previous maintenance activity

On the 1 November 2005, the owner of the aircraft called his maintenance organisation at Exeter Airport to report that the aircraft had suffered a heavy landing at Swansea Airport. The aircraft was inspected by the maintenance organisation on 9 November 2005, and no obvious damage to the airframe or landing gear was observed, with the exception of the nose wheel. This was found to be fractured and replaced. On 16 November 2005, the aircraft was flown 'gear down' to Exeter Airport for a routine 50 hour check and a more detailed inspection of the landing gear and aircraft structure. No further

damage was identified during the inspection; however, the NLG drag links and main attachment bolts were replaced as a precaution. The landing gear was tested using both the normal and emergency systems and found to function correctly.

Aircraft examination

Immediately after the accident, the aircraft was inspected at Swansea by its maintenance organisation and the insurer's loss adjuster. The aircraft was jacked up and the main landing gear (MLG) was found to be fully down and locked in position. However, the NLG was jammed in the nose gear bay by the remains of the NLG bay doors. After these were removed, the NLG was released from the bay but, due to a damaged torque link, caused by the NLG collapse, its oleo had become overextended and had to be restrained to prevent it falling from the landing gear leg. The NLG was found to retract normally, using the normal electric system, although the overextended oleo and damage to the NLG bay door mechanisms resulted in it becoming jammed in the bay. After freeing the NLG, an attempt was made to extend it electrically. No movement of the NLG occurred until the landing gear circuit breaker was rocked from side to side, after which the NLG extended normally. The NLG was partially retracted and then extended, using the emergency hand pump, to the fully down and locked position with no apparent problems.

Current status

At the time of writing, the aircraft is still at Swansea, awaiting repair, after which it is to be ferried to Exeter to further investigate the failure of the NLG to extend normally. The outcome of this will be reviewed, and any relevant information will be published as an addendum to this report in a future edition of the AAIB Bulletin.