ACCIDENT

Aircraft Type and Registration:	Piper PA-28RT-201, G-MERL
No & Type of Engines:	1 Lycoming IO-360-C1C6 piston engine
Year of Manufacture:	1979
Date & Time (UTC):	10 April 2006 at 1725 hrs
Location:	Cardiff Airport
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Bent propeller, scraped engine cowling and nose landing gear doors
Commander's Licence:	Private Pilot's Licence
Commander's Flying Experience:	1,625 hours (of which 1,230 were on type) Last 90 days - 1.5 hours Last 28 days - 1 hour
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The nose landing gear collapsed following a normal landing. An examination of the aircraft after the accident revealed no obvious fault that would have prevented the landing gear from extending, or the indicating lights from illuminating.

History of the flight

On returning to Cardiff Airport, following an uneventful flight to Bristol Filton, the pilot was instructed to orbit in the local area before being cleared to join the circuit on the base leg. The aircraft was established on the final approach to Runway 30 at a speed of 75 to 80 kt with two stages of flap (25º) selected. As the aircraft entered the flare the pilot became aware of a beeping noise that she thought was the stall warner. She checked the air speed, which was satisfactory, and continued with the landing. The aircraft landed normally on the mainwheels and as the nose was lowered it sank onto the ground. The pilot made the aircraft safe and then with the passenger vacated the aircraft through the normal exit.

The airport fire service responded to the incident and helped in the recovery of the aircraft by raising the nose and pulling the nose landing gear into the extended position. When the pilot later entered the aircraft she noted that the landing gear lever was in the extended position.

Aircraft damage

The damage was restricted to a bent propeller blade and abrasion damage to the engine cowling and nose

landing gear door. The engineer who undertook the assessment was of the opinion that the damage was consistent with the nose being lowered gently onto the runway. The engineer also inspected and tested the undercarriage operating and warning system and could find no faults or obvious reason as to why the nose gear would have collapsed.

Aircraft information

The aircraft is equipped with a tricycle retractable landing gear, operated by an electrically driven hydraulic pump. In flight the landing gear is held in the retracted position by hydraulic pressure acting on the jacks. The landing gear selector handle is mounted on the instrument panel. The position of the gear is indicated by three green lights that illuminate when the landing gear is down and locked. A red light illuminates when the gear is in an unsafe position. The red light and a warning horn operate if the power is reduced below 14 inches of manifold pressure and the landing gear has not reached the down and locked position. The landing gear warning horn emits a 90 Hz beeping sound, whereas the stall warner emits a continuous sound.

The aircraft is also equipped with a backup gear extender which automatically lowers the landing gear, independently of the landing gear selector, when the aircraft speed drops below 95 kt with the engine power set at idle. The actual extension speed varies between 75 and 95 kt and is dependent on the altitude, airspeed and engine power due to propeller slipstream effects. The system operates by sensing the static and dynamic pressure at a probe mounted on the side of the fuselage. This operates a pressure switch that releases the hydraulic pressure in the jacks, thereby allowing the landing gear to extend, under gravity, to the down and locked position.

Comments

It would appear that the pilot misinterpreted the undercarriage warning horn as the stall warner and consequently landed the aircraft with the nose landing gear in an unsafe condition. Consideration was given to the aircraft landing with the gear selector in the UP and DOWN positions. Had the selector been left in the UP position then the backup system would have automatically extended the landing gear. However, with power applied during the descent, the automatic lowering of the landing gear and operation of the warning horn might not have occurred until the aircraft was in the flare and the throttle was moved to the idle position. It is then possible that whilst the main landing gear had sufficient time to extend, and lock, the nose leg was still moving into the downlock when the wheel made contact with the ground. It is also possible that the selector had been moved to the DOWN position, but that the nose leg failed to engage the downlock. In that case, the warning horn would have operated when the power was reduced below 14 inches. With both scenarios at least one of the green landing gear indication lights would not have been illuminated during the approach and landing.

The pilot considered herself to be very conscientious and meticulous in undertaking her pre-landing checks. However, she believes that on this occasion it is probable that she did not observe three green lights before landing the aircraft.