Accident

Aircraft Type and Registration:	Tecnam P2002-EA Sierra, G-TESI
No & type of Engines:	1 Rotax 912 ULS piston engine
Year of Manufacture:	2006
Date & Time (UTC):	17 September 2006 at 1300 hrs
Location:	Draycott Farm, Swindon, Wiltshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Fuselage, engine frame, nosewheel, left wing and propeller
Commander's Licence:	Private Pilot's Licence
Commander's Age:	63 years
Commander's Flying Experience:	196 hours (of which 55 were on type) Last 90 days - 30 hours Last 28 days - 13 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

Immediately after lifting off from an undulating grass airstrip, the aircraft rolled to the left and landed heavily some 25 m to the left of the runway.

History of the flight

The aircraft departed Hinton-in-the-Hedges with a total fuel load of around 75 litres, giving an endurance of approximately three and a half hours. The aircraft was equipped with a fuel tank in each wing, each placarded at 50 litres, but which the pilot stated actually held 55 litres. After an uneventful fight and landing at Draycott Farm, Swindon, the pilot and his passenger spent a couple of hours socialising, after which the pilot offered one of their company a flight.

Having boarded the aircraft with his new passenger, the pilot carried out his usual checks in preparation for the flight, during which everything appeared normal, including an engine magneto check at 4,000 rpm. The fuel selector was set to allow the engine to draw fuel from both wing tanks. The runway in use comprised a recently cut grass strip, aligned 180º/360º, some 700 m long by 25 m wide, and with what the pilot described as two pronounced "rises and falls" some 3 to 4 m in height, spaced at even intervals along its length. The temperature was 21ºC to 22ºC and the wind was reported by RAF Lyneham, some 10 miles distant, as 222º at 10 kt. This was well within the aircraft's crosswind limit.

The acceleration during the takeoff roll felt normal and, as the indicated airspeed passed 55 kt, the pilot eased back the stick. The aircraft lifted off normally at the top of the first rise in the runway but, once airborne, it banked steeply left and stopped accelerating. The pilot confirmed that the throttle was fully open, but realising that he was not going to climb away, he initiated a landing. By this stage, the aircraft was some 10 m to the left of the strip, and approximately 6 ft above the ground. Just before contacting the ground, the pilot reported that he remembered the engine was still running and shutting the throttle.

The aircraft subsequently touched down heavily, with little flare, approximately 25 m to the left of the strip, in the area of the first hollow in the ground, approximately 100 m from the point of lift off. The nose landing gear dug into the soft ground and collapsed, but the aircraft came to rest with neither occupant having suffered injury. After shutting off the fuel and all electrical systems, both occupants vacated the aircraft without difficulty.

Aircraft examination

The pilot reported the accident to the AAIB and was given permission to move the aircraft. Some three hours later, with the aid of a digger, and some canvas straps secured to the structure in the centre fuselage, the aircraft was recovered. During the lifting process, the pilot noted that, with the aircraft thus suspended, it hung noticeably left wing low. He calculated that the fuel burn on the outbound leg from Hinton-in-the Hedges would have left approximately 55 litres of fuel on board the aircraft at the time of his subsequent takeoff attempt. Having noted the aircraft's lateral imbalance during the recovery, he subsequently checked the fuel tank contents visually through the tank filler apertures. A quantity of fuel had apparently been lost via the tank vents, but the pilot estimated that the left tank contained about 40 litres, whereas no fuel was visible in the right tank. Some time later, when the tanks were drained in preparation for disassembly of the aircraft, 35 litres were recovered from the left tank but the right tank was found to be empty. When he inspected the engine, he found that both carburettors float bowls contained fuel.

The pilot paced out the length of his takeoff run and estimated that it had been of the order of 280 m to 300 m, compared with a normal takeoff distance, on a tarmac runway, of less than 200 m[1]. On reflecting further upon the circumstances of the accident, and the fuel imbalance he found subsequently, the pilot realised that, after landing at Draycott Farm, the aircraft had been parked on a slight side-slope, right wing high, and that both fuel taps had been left in the ON position. The capacity of the left tank alone would have been sufficient to accommodate the estimated total fuel load of 55 litres on board at that time, and he considered that this had allowed the whole of the right tank's contents to transfer into the left tank under gravity, via the open fuel taps. This would have created a lateral imbalance, which the pilot considered could have been sufficient to cause his control problems after lift off.

A photograph taken of the aircraft after the accident, showed damage to the propeller that was consistent with the engine not turning at the time the aircraft struck the ground. This lack of evidence of rotation raised the possibility that the engine might have lost power during the takeoff, albeit unnoticed by the pilot, and then failed, although the pilot reported that he was not aware of any change in the note of the engine. If this were so, then, in the absence of any reported engine defect, the possibility that the engine fuel supply had been affected by the right tank being empty and with both tanks having been selected for the takeoff, could not be dismissed.

Footnote

[1] The CAA Safety Sence Leaflet 7c indicates that a takeoff on dry grass may result in a 20% increase in the takeoff distance to 50 ft, when compared with a takeoff from a paved surface, although the effect on the groundroll would be greater.