ACCIDENT

Aircraft Type and Registration:	Flight Design CT2K, G-CBNA
No & Type of Engines:	1 Rotax 912ULS piston engine
Year of Manufacture:	2002
Date & Time (UTC):	3 January 2009 at 1515 hrs
Location:	Hook Norton, near Banbury, Oxfordshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Damage to fin, crack in left wing, engine mounting broken and firewall damaged. Nosewheel assembly and propeller damaged
Commander's Licence:	Private Pilot's Licence
Commander's Age:	44 years
Commander's Flying Experience:	400 hours (of which 170 were on type) Last 90 days - 4 hours Last 28 days - 2 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and repair agency feedback

Synopsis

The pilot departed from a farmstrip for a local flight in cold weather. Whilst in level cruise at 2,500 ft, the engine stopped. The pilot could not restart the engine and carried out a forced landing in a field, resulting in damage to the aircraft but no injuries. The engine failure may have been due to water in the fuel system freezing, or carburettor icing.

History of the flight

The pilot departed from a farmstrip near Hook Norton at 1430 hrs for a local flight. The weather was clear with a light wind from the north and a surface temperature of -2°C. At approximately 1515 hrs, whilst in level cruise at 2,500 ft and two miles to the south of the farmstrip, the engine stopped. The pilot attempted to start the engine and despite it 'turning over' and 'firing' it would not restart. The pilot then carried out a forced landing. During the landing roll the nosewheel assembly failed due to the uneven frozen surface of the field, causing the aircraft to roll over. The pilot exited the aircraft without injury.

Engineering investigation

The aircraft was removed to a repair agency where the engine and fuel system were inspected. The engineers observed rust in the gascolator, suggesting that water had

been present in the fuel at some stage. The fuel tanks had been drained prior to transport without recording the volume remaining in each tank and no sample had been retained for analysis. The pilot reported that both tanks should have been approximately half full at the time the engine power failed and that he had physically confirmed the tank contents, using a fuel level sight glass, prior to departure. He also advised that he routinely checked the aircraft fuel drains every second or third flight and rarely, if ever, observed water in the fuel. He confirmed, though, that the fuel had not been checked for water during his pre-flight routine for the accident flight. To date, all other inspections of the aircraft have revealed no abnormalities and the repair work is ongoing.

The engine has conventional carburettors but no carburettor heat system, relying on the ambient temperature of the air beneath the engine cowls to prevent ice formation. The pilot advised that this system worked well in his experience and that the engine had not demonstrated 'rough running' symptoms, traditionally associated with ice build-up in the carburettor, prior to power failure. He also reported that he had the cabin air heat turned up high during the flight, which draws heat away from the exhaust system, potentially reducing the temperature of the ambient air around the engine.

Analysis

In the absence of a confirmed defect on the aircraft, the most likely causes of the power failure are fuel starvation or carburettor icing. The traces of rust in the gascolator suggest that water may have been present in the fuel system, which was not drained prior to the accident flight. The weather had been particularly cold in the period preceding the flight and this may have resulted in an increased formation of condensation within the fuel system. The air temperature during the flight was cold enough to cause any water in the fuel system to freeze. This may have created a partial or complete blockage in the fuel supply to the engine, causing it to stop and preventing it restarting, despite adequate fuel remaining in the fuel tanks. Ice formed from moisture in the air blocking the carburettor cannot be ruled out either, though this is considered less likely in this accident.