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**ACCIDENT**

<b>Aircraft Type and Registration:</b>	Flight Design CTSW, G-CERA	
<b>No &amp; Type of Engines:</b>	1 Rotax 912ULS piston engine	
<b>Year of Manufacture:</b>	2007	
<b>Date &amp; Time (UTC):</b>	30 June 2009 at 1101 hrs	
<b>Location:</b>	North-east of Barton Aerodrome, Manchester	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - 1 (Minor)	Passengers - 1 (Minor)
<b>Nature of Damage:</b>	Damaged beyond economic repair	
<b>Commander's Licence:</b>	National Private Pilot's Licence	
<b>Commander's Age:</b>	19 years	
<b>Commander's Flying Experience:</b>	46 hours (of which 2 were on type) Last 90 days - 12 hours Last 28 days - 5 hours	
<b>Information Source:</b>	AAIB Field Investigation	

**Synopsis**

The aircraft suffered a loss of engine power shortly after takeoff and crashed in a built-up area. The two occupants received minor injuries, but no one on the ground was injured. No mechanical defects were found during strip-examination of the engine. There was insufficient evidence to establish the cause of the loss of power, but an interruption in the fuel supply is believed to be the most likely cause.

The pre-flight and power checks were carried out satisfactorily, with the magneto drops within limits. The flaps were set to 15 degrees for the takeoff. The pilot carried out a rolling takeoff on Runway 09, which was initially normal. However, part-way into the takeoff roll the engine briefly shuddered and coughed, prompting the pilot to check the choke control, which was in the OFF position.

**History of the flight**

The pilot had intended to fly to Sherburn-in-Elmet. During his pre-flight inspection he confirmed that there was sufficient fuel on-board for the flight. The reported air temperature was 23°C and there was a light breeze from the east.

The shuddering then ceased and as the airspeed had reached 40 kt, the pilot elected to continue with the takeoff. The climb was normal until about 300 ft, when the engine once again began to shudder and then lose power. As the pilot was in the process of raising the flaps, he completed the action; this further reduced the

climb rate. He confirmed that the throttle was fully open, the choke was OFF, the fuel was selected ON and the magneto switch was set to '1+2'.

The aircraft then began losing height, so the pilot turned it to the left, in the direction of a sports field. On realising that the aircraft would not reach the field, he headed towards a gap between two houses and transmitted a distress call. The aircraft struck telephone wires as the pilot attempted to manoeuvre it to avoid a house and it came to rest in a domestic garden with its forward section completely detached. The passenger escaped and then freed the semi-conscious pilot from the wreckage.

### **Powerplant description**

The aircraft is of a high-wing layout. It has a fuel tank built into the leading edge of each of the inboard wing sections supplying fuel by gravity feed to a selector valve behind the engine. A mechanical fuel pump is mounted at the front of the engine crankcase. A fuel pipe is routed over the top of the engine to the pump, whilst a further pipe is routed from the pump to the rear-mounted carburettors. This second pipe also passes above the engine. On this aircraft type a fuel bleed return line is connected between the downstream side of the fuel pump and the fuel drain sump, such that a steady flow of fuel is maintained through the fuel pipes. This reduces the temperature of the fuel in the pipes in the hot areas, reducing the propensity for vapour lock to occur after extended periods of running at low power.

Previous power loss incidents on this aircraft type have been attributed by some to the fuel outlets in the tanks becoming uncovered due to fuel sloshing during uncoordinated turns with low fuel levels, resulting in fuel starvation. In this case the aircraft reportedly had significant fuel on board and was not manoeuvring.

### **Wreckage examination**

The aircraft wreckage was examined by the AAIB. All the damage to the engine and fuel supply system was consistent with the effects of impact. A strip-examination of the engine was carried out in conjunction with the UK agent for the engine manufacturer. No evidence was found of any internal engine defects.

### **Discussion**

The absence of any evidence of engine mechanical failure casts suspicion on the fuel supply. No other aircraft operating locally were reported to have had similar problems, so the possibility of contamination of the local bulk fuel supply is discounted. The possibility of vapour lock was considered, but the engine had not been run at low power for an extensive period; this therefore seems unlikely. Other possibilities include contamination of the fuel due to the presence of water, debris in the fuel system or carburettor icing. However, there was insufficient evidence to determine which of these scenarios was most likely.