

Avid Speed Wing, G-BURW

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Aircraft Type and Registration:	Avid Speed Wing, G-BURW
No & Type of Engines:	1 Hirth F30
Year of Manufacture:	1994
Date & Time (UTC):	7 June 1996 at 1620 hrs
Location:	Sparwood Farm, Plaistow
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - 1
Injuries:	Crew - Serious - Passengers - Minor
Nature of Damage:	Extensive
Commander's Licence:	Private Pilot's Licence (A)
Commander's Age:	59 years
Commander's Flying Experience:	753 hours (of which 49 were on type) Last 90 days - 8 hours Last 28 days - 3 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot, examination of engine by pilot in conjunction with AAIB

The Avid aircraft is a home-built aircraft type in widespread use. G-BURW was, however, unusual in being powered by the Hirth engine type, used in very few aircraft in the UK.

This engine is a 4 cylinder air-cooled 2 stroke unit having dual ignition, high tension current being supplied by a system of 4 coils. Independence of ignition is achieved by routing the high-tension current from each coil simultaneously to 2 plugs, positioned in different cylinders. This arrangement results in each plug firing twice during an operating cycle, once when the relevant piston is close to top-dead centre, thus initiating the power stroke, and once when close to bottom dead centre, at which time no combustible mixture is present in the cylinder, so the operation is not affected. The pilot/owner of G-BURW was the UK agent for the Hirth engine type.

On the accident flight, the pilot carried out the normal pre-flight checks before initiating a take-off from his private strip. At the start of the take-off run, he confirmed that full power was available (i.e. the engine was operating at 5,400 RPM). The take-off run took longer than expected, the pilot

initially attributing this to a slight tail-wind component and high ambient temperature. After lift-off the nose was initially held down before being raised at an IAS of 65 mph with the intention of establishing the normal climb at 70 mph. It quickly became apparent that normal climb power was not available as the aircraft could not accelerate to 70 mph and the pilot lowered the nose to maintain flying speed.

After the flight had been underway for about a minute the pilot was aware that the aircraft was at about 150 feet AGL and descending. He selected a field and, once safely above it, pulled the throttle back to idle. Being a small field, he expected to run into the far hedge, however, as he attempted to flare, the aircraft failed to respond to elevator control and continued to descend straight into the ground, coming to a halt after a short ground-slide.

A strip examination of the engine revealed no immediate evidence of mechanical failure. The fuel pumps within the carburetors were full and there was no evidence of contamination in any of the fuel lines, filters or jets. There was, however, evidence that the engine had been running on only 3 cylinders. A witness who arrived on the scene shortly after the accident reported noting that the plug-cap had come away from one of the plugs on the cylinder which was found during the later strip examination to contain evidence of not firing. The pilot recalled that this plug cap had come away from its plug on a previous occasion and was thereafter always the subject of a special check for security before each flight.

The pilot / owner carried out some tests after the engine strip which indicated electrical anomalies with a number of plug-caps including the cap of the other plug in the non firing cylinder. There was some evidence that the plug-cap behaviour was influenced by temperature. It was not, however, possible to carry out fully representative tests of caps connected to leads, coils, and plugs (i.e. with the latter operating under representative high power cylinder pressures and with all components at temperatures representative of flight). It was not therefore clear whether the problems were sufficient to affect plug performance during full throttle engine operation.