

**ACCIDENT**

<b>Aircraft Type and Registration:</b>	Avid Speedwing Mk4, G-BUFV	
<b>No &amp; Type of Engines:</b>	1 BMW R100 piston engine	
<b>Category:</b>	1.3	
<b>Year of Manufacture:</b>	1992	
<b>Date &amp; Time (UTC):</b>	10 June 2005 at 2000 hrs	
<b>Location:</b>	Lough Neagh, Northern Ireland	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - 1
<b>Injuries:</b>	Crew - None	Passengers - None
<b>Nature of Damage:</b>	Ditched	
<b>Commander's Licence:</b>	FAA Private Pilot's Licence	
<b>Commander's Age:</b>	38 years	
<b>Commander's Flying Experience:</b>	135 hours (all on type) Last 90 days - 21 hours Last 28 days - 8 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot and engine examination by AAIB	

After landing from an earlier uneventful 45 minute flight from Toomebridge, the pilot decided to carry out another flight and took off again without having shut down the engine. Shortly after takeoff, at around 300 ft, he noticed a change in engine note and a 'metal ringing' sound. At the same time he noted a loss of engine power, and although the engine still responded to throttle movement with a change in rpm, the aircraft was unable to maintain altitude. The pilot switched both ignition switches off and then on again, and similarly both fuel pumps; he also checked that the fuel was selected on.

The pilot adjusted the pitch attitude to achieve a speed of 65 mph, and selected a field in which to carry out a forced landing. As he approached his selected field he realised that

it was crossed by electricity cables and that there might not be sufficient distance in which to land the aircraft. He then decided that to continue to approach into the field would result in impact with trees and, having enough airspeed to avoid the trees, he accepted that the only alternative was to ditch the aircraft into nearby Lough Neagh.

The aircraft struck the water approximately 150-200 m from the shore above a sandbank with a water depth of around 4 ft. The pilot and passenger were uninjured and able to exit the aircraft through the perspex roof. They stayed with the aircraft and were rescued by the emergency services who had been alerted by a group of people on-shore who had witnessed the accident.

### Description and history

The Avid Speedwing is a high wing kit-built aircraft, with a maximum take-off weight of 463 kg. It has a two seat, side-by-side configuration. Fitted to this aircraft was a R100 BMW air cooled, two cylinder four-stroke, horizontally opposed motorcycle engine. For installation in an aircraft a Rotax gear box is fitted to the crankshaft at the rear of the engine and a tractor propeller attached. The engine is then installed in the reverse orientation to that of the motorcycle installation and so to ensure adequate cooling by the airflow the orientation of the cylinder baffles is reversed.

The aircraft had been operated by this owner since 2001. The engine had completed around 104 hours since its last top overhaul which was when the engine was converted and installed in this aircraft. In April 2005 the engine was removed following alternator problems and at this time the engine mounts were changed. The engine was

taken to a BMW service agent to rectify oil seepage around the alternator, located at the rear of the installed engine, and a gasket was changed.

### Engine Examination

The engine was stripped in the presence of the PFA and representatives from a maintenance organisation specialising in the conversion of BMW motorcycle engines for aircraft installation. The left cylinder rocker cover was removed and the cylinder head nuts that tighten onto the cylinder through studs were removed. The torque values on the cylinder head nuts were noted to be less than that required in the manual (26-29 lbf ft). The cylinder head was then removed and a hole observed around one of the two cylinder head studs where hot gasses had burned through the head gasket and the outer cylinder casing (see figure 1 and 2). The right cylinder head nuts were also found to be tightened to less than the correct torque setting. The engine was otherwise mechanically sound and free to rotate.



**Figure 1**

Left cylinder head showing burn through of the casing around one cylinder head stud



**Figure 2**

Left cylinder head gasket

The engine would have been re-built when it was converted to the aircraft installation by a previous owner. Although there is no specific advice in the overhaul manual, it is normal good engineering practice to check

the torque tightening of cylinder head nuts after an initial run-in period of 5-10 hours, as loosening of the nuts can occur during operation.