Rans S6-ESD Coyote II, G-MYSP

AAIB Bulletin No: 3/2002	**Ref: EW/G2001/10/14**	**Category: 1.4**
Aircraft Type and Registration:	Rans S6-ESD Coyote II, G-MYSP	
No & Type of Engines:	1 Rotax 503 piston engine	
Year of Manufacture:	1992	
Date & Time (UTC):	20 October 2001 at 1330 hrs	
Location:	Sittles Farm, Lichfield, Staffordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Substantial to landing gear, wings, propeller and engine cowling	
Commander's Licence:	Private Pilots Licence	
Commander's Age:	71 years	
Commander's Flying Experience:	645 hours (of which 180 were on type)	
	Last 90 days - 20 hours	
	Last 28 days - 9 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	
	and further enquiries by the AAIB	

The pilot reported that, shortly after take-off, he entered a climbing turn to the right. At about 100 to 150 feet, the engine RPM reduced from 6,200 to 5,000 and the airspeed decayed. The pilot lowered the nose to regain airspeed but the RPM then decayed completely. He lowered the nose still further but, as overhead wires crossed the direction of his flight path, it became necessary to reduce his angle of descent to clear them. This resulted in a loss of airspeed, such that the aircraft was close to the stall.

Once the aircraft had cleared the wires, the pilot attempted to dive to regain airspeed but, as the remaining height was minimal, the aircraft made a very heavy landing. The pilot considered that

had he attempted to land short of the wires, the aircraft, being of a tail-wheel design, would probably have overturned owing to the soft ground in that area.

The pilot commended the design of the aircraft for the way the structure absorbed the impact, enabling both he and his passenger to escape significant injury. He also noted that the pilot of a microlight aircraft, operating from a site nearby, reported that he had experienced carburettor icing during that day.

The pilot subsequently found that the engine of G-MYSP had suffered no significant damage in the impact and remained free to turn. After removal of the broken propeller and clearance of soil from its exhaust pipe it was found possible to run the engine at idle. It was then strip examined in the presence of the local Popular Flying Association (PFA) inspector. No technical defect was identified.

A Met Office aftercast for the area was obtained. This was reviewed together with the METARs for Birmingham and East Midlands airports for the relevant time. The aftercast gave a temperature of 15°C and a dewpoint of 13°C, with a surface humidity of 88%. Birmingham and East Midlands airports recorded temperature and dewpoint readings of 15°C/13°C and 15°C/14°C respectively. These airports are approximately equidistant in opposite directions from the accident site.

A number of charts showing likelihood of icing of different types of piston engine induction systems have been developed as a result of controlled trials carried out over the years. A chart covering behaviour of float carburettor and fuel injection equipped engines of conventional general aviation type aircraft was consulted. This showed that each of the combinations of temperature and humidity listed above would put a typical float carburettor equipped engine well within the region where serious icing could be expected to occur at cruise power settings.

Although the accident aircraft was at take-off/climb throttle setting when the power loss occurred, some icing would almost certainly have been present, having built up while at low throttle openings during ground running. Some slight additional icing may have built up during the take-off and climb. Existing ice may have been able to melt and re-freeze at a more critical location within the air path, thus affecting the conditions within the carburettor. This could well have lead to total power loss in the climb.

This aircraft, together with many other types utilising the Rotax 503 engine, was not equipped with a carburettor heat system.

An external electrically powered heating system is available in the UK for this type of engine. This operates by providing heat to the body of the carburettor. It can utilise current from the engine's magneto generator and its effectiveness is believed to be good if it is used appropriately, i.e. from start-up onwards. Its aim is to prevent ice formation rather than to melt existing ice. It is not possible to check its operation before flight in the conventional way, since the metal surfaces are heated, rather than the airflow. Thus, no engine RPM drop occurs on selection. Instead, an illuminated neon indicator is provided to confirm that the system is operating. The installation of such a system is at the owner's option, but G-MYSP was not so equipped.