

Rans S6-ESD XL, G-MZBD

AAIB Bulletin No: 12/98 **Ref:** EW/G98/07/25 **Category:** 1.4

Aircraft Type and Registration: Rans S6-ESD XL, G-MZBD

No & Type of Engines: 1 Rotax 503 piston engine

Year of Manufacture: 1996

Date & Time (UTC): 19 July 1998 at 1700 hrs

Location: Sittles Field, Nr Lichfield, Staffordshire

Type of Flight: Private

Persons on Board: Crew - 1 - Passengers - 1

Injuries: Crew - None - Passengers - None

Nature of Damage: Significant damage to the landing gear and cockpit floor

Commander's Licence: Private Pilot's Licence

Commander's Age: 42 years

Commander's Flying Experience: 226 hours (of which 25 were on type)
Last 90 days - 32 hours
Last 28 days - 20 hours

Information Source: Aircraft Accident Report Form submitted by the pilot
telephone enquiries with owner, aircraft repairer and other agencies

The pilot reported that during the final leg of a cross-country flight, whilst flying at approximately 1000 feet amsl, the engine RPM decreased from 5,800 to approximately 3,800 and the unit began to run very roughly. Various throttle positions were tried, none of which improved the situation. After some 30 seconds the engine stopped completely, the height by then being 750 feet agl or less.

In view of this low height, no attempt was made to re-start the engine. The pilot judged that the only safe landing field available was directly beneath the aircraft and accordingly he commenced a steep right-hand turn through 360 degrees to position the aircraft into wind and facing up the local slope. Unfortunately, after straightening out the aircraft, insufficient airspeed and height remained

to enable the aircraft to round-out into the uphill flight-path necessary for a landing. The aircraft stalled whilst about 10 feet agl.

Examination of the engine subsequently revealed that a needle in the jet of one of the carburettors had detached and fallen into the jet area. It detached as a result of breaking in the plane of the locating groove after severe machining type wear had been inflicted as a result of continuing rotation of the needle relative to its mounting circlip. This problem has been encountered in the past; it occurs under certain conditions of vibration and resonance. It led to the fatal accident of the similarly powered Colb Twin-Star, G-MWWF, in 1994, see AAIB Bulletin 11/94. As a result of that accident, the AAIB made the following comments and recommendation to the CAA:-

"The cause of the partial engine failure was that the needle on the rear carburettor had worn through at the circlip and had dropped into the carburettor jet, restricting the flow of fuel to the rear cylinder. The needle was retained in position by a circlip which was split at the apex of the hole holding the needle; the edges of the split had 'machined' away the groove in the needle as it rotated under the forces generated by vibration. This problem is well known and both the UK distributor and the manufacturer (Rotax) have issued safety bulletins calling for a 50 hour inspection of the needle and an ultimate life of 150 hours.

Rotax are developing a modification for new production which will introduce an 'O' ring to each side of the circlip to prevent the needle rotating. The modification is due on the production line at the end of the year. It is therefore recommended that:-

94-35 The CAA require that the modification to the carburettor needle fixture on Rotax engines be made retrospective and mandatory, and that in the meantime the 50 hour check be also made mandatory."

The CAA did not accept this recommendation. Their reasons were stated in their document 'Follow-Up Action On Occurrence Report ' No F30/94.

The modification ultimately engineered by the manufacturer is slightly different from that described above. It has now been available (at minimal cost) for retrospective installation for approximately 18 months. It is installed on current production engines, although the fact that suppliers and builders of kits frequently store engines for extensive periods results in new aircraft continuing to come into use with engines which may have been built before the modification became part of the production standard.

The aircraft involved in this accident is understood to have completed 49 hours total flying at the time of the accident.