

Stampe SV4C, G-AYZI

AAIB Bulletin No: 12/2004	Ref: EW/G2004/06/09	Category: 1.3
Aircraft Type and Registration:	Stampe SV4C, G-AYZI	
No & Type of Engines:	1 Renault 4PO3 piston engine	
Year of Manufacture:	1951	
Date & Time (UTC):	13 June 2004 at 1215 hrs	
Location:	Three miles east of Sheffield City Airport, Sheffield	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Structural damage to fuselage and wings	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	33 years	
Commander's Flying Experience:	563 hours (of which 9 were on type)	
	Last 90 days - 165 hours	
	Last 28 days - 73 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further AAIB enquiries	

History of the flight

The pilot reported that a thirty minute local flight was planned from Sheffield City Airport, and that the fuel tank contained approximately 50 litres of fuel, this was checked visually. Local weather conditions were fine, with no significant cloud and a surface wind from 320°(M) at 7 kt. Approximately 20 minutes into the flight, with the aircraft established in a 45 to 60 degree banked turn to the right, and just as full power was applied, the engine started to run roughly. The pilot returned the aircraft to straight flight and reduced the throttle setting, normal running was restored after several seconds. At this point the fuel gauge indicated approximately 25 litres of fuel and fuel pressure indicated a normal value.

The pilot commenced recovery to Sheffield City Airport, establishing the aircraft on a long final to Runway 28 at approximately 2,000 feet aal. Shortly afterwards, the fuel pressure was seen to fluctuate with accompanying changes in engine noise. Then, when the aircraft was approximately 3 miles from the runway, the fuel pressure dropped to zero. The pilot decided to set up for a forced landing and declared his intention on the Sheffield City Air/Ground radio frequency. Cockpit drills were carried out, and the engine was secured on finals to the selected field. However, it became

apparent that the intended field, which had trees at its far end, had a significant down-slope which made it unsuitable for landing. The pilot adjusted his approach to aim for the field beyond, though this field contained a standing crop. The aircraft touched down at a low forward speed but hit a surface irregularity and pitched nose down, coming to rest inverted. The landing roll had been approximately 20 metres. The pilot and his passenger, who were both wearing five point harnesses, were able to vacate the aircraft without difficulty.

The pilot reported that he considered fuel starvation to be a likely cause of the engine failure.

Examination of the aircraft

An examination was made of the fuel and ignition systems. Fuel was present in the fuel lines, carburettor bowl and engine driven fuel pumps; approximately 20 litres of fuel was later drained from the tank. There were no indications of a fuel leak. The magnetos, which had recently been overhauled by a company specialising in vintage aircraft, were inspected and found to be in good condition. All spark plugs and leads were correctly installed and in good condition. The engine showed no signs of mechanical failure.

Aircraft fuel state

A full fuel tank equates to 90 litres of fuel which at a consumption rate of 32 litre/hr at 2,100 RPM, would be expected to give an endurance of approximately 2 hours 50 minutes. The accident flight was the aircraft's fourth flight since being refuelled to full. During the three previous flights, which all took place during the morning of the day of the accident, the aircraft logged a total of 1 hour and 5 minutes airborne time. The 50 litres of fuel remaining should have provided approximately 1 hour 25 minutes flying time.

Aircraft fuel tank

The fuel pick up in the fuel tank is by means of a weighted flexible hose which ensures fuel feed during inverted flight. However, this arrangement can lead to a greater amount of unusable fuel when compared to the alternative gravity feed system. The flexible hose is situated on the left of the tank, when viewed from the rear of the aircraft, and baffles in the fuel tank may prevent the flexible tube from taking up fuel when at relatively low fuel states during manoeuvring or unbalanced flight. The gravity feed system is selectable by means of a fuel cock, but this is not accessible to the pilot in flight.

Analysis

The amount of fuel drained from the tank supports the airborne check of 25 litres. However, this is at variance to the pre-flight check of 50 litres, which would have equated to about 40 litres after 20 minutes flying. As there were no indications of a fuel leak, it is probable that before flight there was somewhat less fuel in the tank than the pilot believed, though still sufficient for the flight. Given the limitations of the flexible hose arrangement at relatively low fuel states during manoeuvring or unbalanced flight, it would have been possible for the fuel pick-up to become uncovered. This would have caused the fuel pressure fluctuations and rough running experienced by the pilot.