

# **Jodel D9 Bebe, G-AXOI, 2 March 1996**

**AAIB Bulletin No: 5/96 Ref: EW/C96/3/1 Category: 1.3**

**Aircraft Type and Registration:**Jodel D9 Bebe, G-AXOI

**No & Type of Engines:**1 Volkswagen 1834 piston engine

**Year of Manufacture:**1971

**Date & Time (UTC):**2 March 1996 at 1250 hrs

**Location:**Shoreham Airport, West Sussex

**Type of Flight:**Private

**Persons on Board:**Crew - 1 Passengers - None

**Injuries:**Crew - 1 fatal Passengers - N/A

**Nature of Damage:**Aircraft destroyed

**Commander's Licence:**Private Pilot's Licence

**Commander's Age:**36 years

**Commander's Flying Experience:**701 hours (of which 1 hour was on type)

Last 90 days - 20 hours

Last 28 days - 7 hours

**Information Source:**AAIB Field Investigation

## **History of flight**

The aircraft had been recently purchased and, on the morning of Saturday 2 March, the pilot and the new owner went to Clip Gate Farm, Canterbury to take possession of it. The aircraft was checked thoroughly and, at 1115 hrs the pilot took off for a 20 minute test flight, landing at 1135 hrs; the flight included general handling, stalling and steep turns. No problems were experienced and, having topped up the fuel tank with MOGAS, the pilot took off again at 1150 hrs for a flight to Shoreham Airport; the cruise level was 2,400 feet.

The surface wind at Shoreham was 060°/7 kt, the temperature 6°C and the dew point 1°C. At 1246 hrs, 'OI' joined the visual circuit to Runway 03 and was number 4 to land. Shortly afterwards a Luton Minor, G-BBCY, landed and blocked the runway because its engine stopped when the pilot closed the throttle. When, at 1248 hrs, 'OI' called late downwind he was told to expect a go-around and to

report on final approach. The Luton Minor was pushed clear of the runway, however, when 'OI' reported final approach, the vehicle which had been sent to assist was still on the runway; 'OI' was told to go around and the instruction was acknowledged. The frequency was then blocked for about 20 seconds by a helicopter requesting lift off; when the transmission finished 'OI' called "engine stop" followed by about 4 seconds of open microphone during which the sound of the engine, which could be heard quite clearly on previous transmissions, was not evident. This transmission, the last recorded from the aircraft, was at 1250 hrs.

Eyewitnesses saw the aircraft pass over a residential area and, when it was over the field between the houses and the railway embankment which crosses the undershoot to Runway 03, it was seen to bank right and then steeply left. The aircraft descended rapidly in the left turn and struck the ground in a steep nose down attitude, slightly over the vertical with the underside of the fuselage towards the airfield.

Several bystanders ran to give assistance; fuel was leaking over the engine from the tank which was quickly removed and placed a safe distance from the wreckage. The police helicopter which is based at Shoreham Airport was at the site by 1254 hrs. The fuselage and wings were pulled clear so that the paramedic from the helicopter could gain better access. The pilot's harness was unfastened. However, no signs of life were evident.

### **Pilot's experience**

The pilot started flying in July 1978 at Biggin Hill Airport and passed his flight test for the award of a PPL in May 1981; headed an IMC rating in December 1982. Most of his early flying was done in Cessna 150 aircraft, however, in June 1984 he converted to the Condor which he flew as his main type until July 1993 when he joined a group flying the Luton Minor, G-BBCY. He flew the aircraft regularly from that time, building hours towards the Commercial Pilot's Licence for which he was studying; his last flight in this aircraft was on 17 February 1996 by which time he had accrued about 350 hours on the Luton Minor and a grand total of 699:45 hours.

### **Medical and pathology**

The flight was conducted in temperatures at or just above 0°C in an open, unheated cockpit. The pilot would have been exposed to cold temperatures even on the ground for a period of at least 2 hours. The clothing he wore consisted of under clothes covered top and bottom by a fleece, quilted anorak and jeans, two pairs of thick socks, shoes, and a flying suit and cloth helmet with boom microphone. This clothing was considered to have been adequate and it is thought unlikely that he would have suffered any degree of hypothermia which may have affected his flying skills or judgement.

Spectacles were found in a position in the wreckage which suggested that the pilot was wearing them at the time of the accident as required by his medical certificate.

The pilot suffered major injuries to the head and neck which caused his death; the only other significant injury was a fracture of the right ankle which could suggest that he had right rudder applied at impact in an attempt to recover from what appears to have been the incipient stage of a spin to the left. The post mortem examination and a review of the pilot's medical history revealed no pre-existing condition which would have contributed to the accident.

### **Engineering investigation**

The aircraft struck the ground pitched steeply nose down, slightly beyond the vertical, and slightly left wing low. The impact resulted in total disruption of the nose and cockpit area, and separation of the fuel tank; however, there was no fire.

The aircraft was complete and structurally intact at impact. All flying control circuits were connected and operable. The propeller leading edge and tip sections were almost totally undamaged, consistent with the engine having been stopped at impact. Examination of the fuel system on site revealed the presence of clean fuel in both the filter bowl and the fuel delivery line to the engine driven mechanical fuel pump; the filter element was clean. The fuel tank was deformed and punctured during the impact, but approximately 2 litres of clean fuel was nevertheless recovered from it.

The engine was recovered to the AAIB facility at Farnborough, where it was subject to limited strip examination and component testing. The carburettor heat control was set fully to hot at impact, and full throttle was set. The choke was 'IN'. There were no mechanical disconnections in the engine, and turning the engine over by hand confirmed that the drives to the valve gear, magnetos, and mechanical fuel pump were intact. Compression was evident at each cylinder.

Clean fuel was present in the chamber of the mechanical fuel pump, and manual operation of the pump resulted in a satisfactory delivery of fuel. The carburettor bowl was broken during the impact, but with this exception the carburettor appeared to be serviceable. In particular, the main jet was clear of obstruction, the needle was in good condition and the diaphragm was intact.

The spark plugs from the front cylinders were heavily contaminated with oil which had seeped into the cylinders after the accident. The condition of the remaining plugs varied somewhat: most were of normal appearance; the others were somewhat sooted, but not to any extent which would suggest any significant abnormality. The impulse mechanism on each magneto produced a healthy spark at the plug end of each HT lead when cranked manually, and both magnetos produced effective sparks when driven at speed on a test bench.

It is possibly relevant that the reported air temperature and dew point at the time of the accident were such that severe carburettor icing would have been predicted at cruise power for engines running on AVGAS. In this case, the engine was running on MOGAS which is known to make increase the propensity for carburettor icing compared with AVGAS. It therefore follows that in the conditions pertaining at the time of the accident, carburettor icing even at high power settings would almost certainly have been present without regular use of an effective hot air system. Although in this case the evidence suggests that the carburettor heat control was set to hot at the time of impact, it is not known when this selection was made; nor is it entirely clear how effective the carburettor heat system on this particular installation would have been in the conditions of the day.