No: 3/85 **Ref: EW/C904**

Aircraft type and registration:	Piper PA28-180 Cherokee G-AZDW (light single engined fixed wing aircraft)
Year of Manufacture:	1971
Date and time (GMT):	18 February 1985 at 1633 hrs
Location:	Hayling Island, Hants
Type of flight:	Private (pleasure)
Persons on board:	Crew — 1 Passengers — 1
Injuries:	Crew — 1 (minor) Passengers — 1 (serious)
Nature of damage:	Aircraft destroyed
Commander's Licence:	Private Pilot's Licence
Commander's Age:	34 years
Commander's total flying experience:	69 hours (of which 4 were on type)
Information Source:	AIB Field Investigation

The aircraft took-off from Chichester (Goodwood) at 1535 hrs on a sight-seeing flight. It flew over the Isle of Wight, Southampton and Winchester, close to Petersfield and then via the eastern edge of Portsmouth to the south-east corner of Hayling Island. The height of the aircraft varied with terrain between 3000 feet, where the outside air temperature was —3°C, and 1000 feet, where the temperature was —1°C. Surface temperature was 3°C, the dew point was —6°C, and there was no low cloud. Twice during this flight the pilot carried out descents using between 1000 and 1200 engine rpm; once from 3000 to 1000 feet using carburettor hot air, and once from 3000 to 2000 feet with carburettor cold air selected. At no time did the engine show symptoms of carburettor icing.

Over Hayling Island at 1632 hrs the pilot started another descent from 2000 feet in a gentle right turn, again using between 1000 and 1200 rpm and carburettor cold air. When he opened the throttle at 1500 feet to level off, the engine 'popped' and failed to respond. He selected carburettor hot air, switched on the auxiliary fuel pump and pumped the throttle several times. The engine 'popped' twice more as he pumped the throttle but gave no further response. The pilot picked a field for an emergency landing, transmitted a Mayday message, and attempted to restart the engine. He then changed fuel tanks and again operated the starter but without success.

He realised during the approach to his selected field that he would not reach it in a flapless glide so he elected to land in the other clear space he could see, which was an area of gardens between the backs of a row of houses and a small copse. Having reduced his airspeed to a minimum with flaps up, he landed the aircraft in a fully stalled attitude in the gardens. The aircraft passed through a fence and a wooden shed before coming to rest against another fence after a ground run of 10 metres. On impact the left wing root was severely damaged by a fence post and the right wing was separated from the aircraft. Both fuel tanks were ruptured. The occupants were wearing shoulder restraint harnesses and, although injured, were able to vacate the aircraft without assistance.

The pilot later stated that during his pre-flight inspection both fuel gauges had read about $\frac{1}{4}$ full, a reading that tended to be confirmed by the evidence of two other pilots who had flown the aircraft on the two preceding flights. He put in 12 gallons of fuel, 6 in each wing, and found that after take-off both gauges showed about $\frac{3}{4}$ full. He then flew the whole of the flight from take-off to the engine failure on the right fuel tank. The passenger recollected seeing a reading of between $\frac{1}{4}$ and $\frac{1}{2}$ full on both fuel gauges shortly before the engine stopped. A pilot who frequently flew the aircraft believed that, although the fuel gauges seemed to be fairly accurate on the ground, they overread by about 3 gallons a side in the air.

There is evidence that the fuel tanks were last filled on 1 January 1985, when the total fuel contents were said to be just over 30 gallons. From then until the time of the accident, the aircraft had flown for a recorded time of 19 hours 22 minutes between take-offs and landings, all on fairly short local flights. Fuel receipts for this period showed a total uptake of 127 gallons, including the 12 gallons put in by the pilot on the day of the accident. The average fuel consumption of the aircraft over this period could not be ascertained, nor could the balance of fuel between the two wing tanks. However, regular users of the same model of aircraft estimate that its fuel consumption can vary from as little as $7\frac{1}{4}$ gallons per hour in touring use in weak mixture to 9 gallons per hour in typical training use.

After the accident the aircraft was recovered to an engineering facility where the engine and its associated systems were examined in detail. As a result of this fuel was found in the carburettor, fuel filter, and some pipelines — all of which were determined to be free from obstruction. It was also established that the fuel selector, and both electric and mechanical fuel pumps were serviceable. No faults, however, were discovered in the engine which could have caused it to fail in flight.