Cessna F172H, G-AZZP

AAIB Bulletin No: 9/97 Ref: EW/G97/06/04Category: 1.3

Aircraft Type and Registration:	Cessna F172H, G-AZZP
No & Type of Engines:	1 Rolls Royce Continental O-300-D piston engine
Year of Manufacture:	1970
Date & Time (UTC):	8 June 1997 at 1230 hrs
Location:	Near Headcorn Airfield, Kent
Type of Flight:	Private
Persons on Board:	Crew - 1 - Passengers - 3
Injuries:	Crew - None - Passengers - 2 (Minor)
Nature of Damage:	Wings, nose gear and fuselage (beyond repair)
Commander's Licence:	Airline Transport Pilot's Licence with Flying Instructor Rating
Commander's Age:	34 years
Commander's Flying Experience:	5,200 hours (of which 215 were on type)
	Last 90 days - 180 hours
	Last 28 days - 60 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and telephone enquiries

The Cessna 172 has a very simple fuel system. One tank in eachwing is connected to a selector valve which has four positions:BOTH, LEFT, RIGHT and OFF. Fuel is gravity fed from both wingtanks to the carburettor via the fuel strainer and there is noelectric fuel pump. An engine primer which draws its fuel fromthe strainer, may be used by the pilot to obtain a rich mixturefor starting a cold engine. A fuel vent pipe which vents bothtanks is connected to a vent on the left wing. When full thisaircraft's tanks held 191 litres of usable fuel; the block fuelconsumption rate was approximately 30 litres per hour.

The pilot arranged to meet with friends at Headcorn airfield andto take them on a short flight around the local area. After briefingand seating his passengers he carried out a pre-flight check whichincluded a visual inspection of the contents of both fuel tanks. Each tank was at least one quarter full and the levels were equalgiving a total of at least 45 litres. The pilot was content thatthis was ample for the 30 minute flight and he decided not torefuel the aircraft because he was

concerned about take-off weightwith four persons on board. The MTOW for this type is 2,300 lb;the actual take-off weight was 2,170 lb.

The aircraft took off at 1305 hrs in CAVOK conditions with a lightsouth westerly wind. In the Folkestone area the pilot checkedthe fuel gauges and noticed nothing amiss or any imbalance. Shortlyafterwards the aircraft returned to Headcorn circuit and positionedonto final approach for Runway 29. At a height of about 500 feeton final approach the engine faltered and stopped. The pilottransmitted a MAYDAY message stating that the aircraft had runout of fuel. With no time for detailed failure analysis, he determinedthat he could not reach the airfield and so he turned downwindand selected a field for a forced landing. The field was quitesmall and although the aircraft touched down near the start, itoverran the available length and came to a sudden stop in thehedge at the far end. The pilot turned off the fuel selector,shut down the electrics, and turned off the ignition before heand his passengers vacated through the right hand exit door.

The airport emergency vehicle arrived at the scene within twoor three minutes; the local authority fire and ambulance servicesarrived soon afterwards. The two front seat occupants were unhurtbut the rear seat passengers were taken to hospital with possibleinjuries. Both were discharged the same day suffering from bruisesinflicted by their lap straps.

A witness on the airfield had seen the aircraft in difficultyand immediately ran to the airfield emergency vehicle in whichhe proceeded to the crash scene with a colleague. On arrivalhe confirmed that the aircraft's fuel and electrical systems hadbeen made safe and he remained with the aircraft until it wasrecovered to a hangar on the airfield. After the accident theaircraft's wings were inclined about 30° left wing low andfuel was dripping steadily from the vent pipe on the left wing. The witness estimated that fuel remained dripping for about 25minutes until the fire service managed to stem the flow. Later,whilst the wings were being removed from the fuselage, the witnesscollected two gallons of fuel in a bucket which came from withinthe left wing structure. After the aircraft had been recoveredto the owner's maintenance facility, a further five gallons offuel was drained from the left wing tank.

The pilot stated that he always flew with the fuel selector atBOTH unless there was a compelling need to select a particulartank to restore an imbalance; in his experience this was seldomif ever necessary. He checked that the selector was at BOTH beforetake-off and had not touched it during flight. He had not usedthe engine primer either because the aircraft had landed a fewminutes before he took off and the engine was still warm.

Because of the inclined wings, the design of the fuel system,and internal damage to the wing structure, it was not possibleto determine from which tank the fuel had leaked. Fuel from theright tank could have migrated to the left via the vent pipe.