

ACCIDENT

Aircraft Type and Registration:	Cessna F150L, G-AZXC
No & Type of Engines:	1 Continental Motors O-200-A piston engine
Year of Manufacture:	1972
Date & Time (UTC):	25 May 2006 at 1440 hrs
Location:	500 metres south-west of Netherthorpe Airfield, Nottinghamshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - 1 (Minor) Passengers - 1 (Minor)
Nature of Damage:	Beyond economic repair
Commander's Licence:	Private Pilot's Licence
Commander's Age:	65 years
Commander's Flying Experience:	656 hours (of which 642 were on type) Last 90 days - 6 hours Last 28 days - 3 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

Shortly after takeoff the engine failed and a forced landing was made in a field beyond the end of the runway. The aircraft landed heavily causing the nose gear to collapse and the aircraft to flip upside down. The engine failure was caused by excessive water in the fuel. It was not possible to determine how the water entered the fuel system but it is probable that the heavy rainfall during the week leading up to the accident flight, while the aircraft was parked outside, was a contributory factor.

History of the flight

The pilot was planning a flight to Sherburn-in-Elmet with one passenger who was also a private pilot. The weather was good with a visibility greater than 10 km and no cloud below 2,500 ft. The wind was from 250° at 5 to 10 kt. During the pre-flight checks the passenger removed the lockable fuel caps (which are used to secure the tanks overnight) and replaced them with the aircraft's standard fuel caps. The pilot reported that he drained a fuel sample from each wing tank and from the gascolator beneath the engine and confirmed that no water was present. The aircraft had approximately 96 litres of fuel onboard (total capacity was 144 litres) which was sufficient for the flight so no refuelling was carried

out. The pilot started the engine and taxied the aircraft to a holding point to carry out the engine checks. The magneto check produced a 100 rpm drop when selecting both left and right magnetos, which the pilot considered to be more than usual but still within limits. The engine backfired when the throttle lever was reduced to IDLE but then ran normally at 600 rpm.

After waiting for another aircraft to land, the pilot taxied onto Runway 24 (grass) and initiated the takeoff. The aircraft accelerated normally and reached 40 KIAS before the runway intersection¹. The pilot rotated at

50 KIAS and then, after lift off, he held the aircraft in ground effect until reaching 60 KIAS. At 60 KIAS he initiated a climb and shortly thereafter the engine noise suddenly faded and stopped. The pilot reported that the engine failure was as sudden as someone pulling the mixture lever to IDLE-CUTOFF. He pumped the throttle but this had no effect so he lowered the nose to maintain airspeed and aimed for a field directly ahead. There was a hedge-lined road just short of the field so the pilot raised the nose to try to clear it. The aircraft cleared the hedge but then touched down heavily in the field. The nose gear collapsed and the aircraft flipped upside down and came to rest. Both the pilot and passenger were able to exit the aircraft unassisted via the right door.

Footnote

¹ The pilot reported that it was his normal procedure to abort a takeoff if 40 KIAS had not been attained at the point of runway intersection.

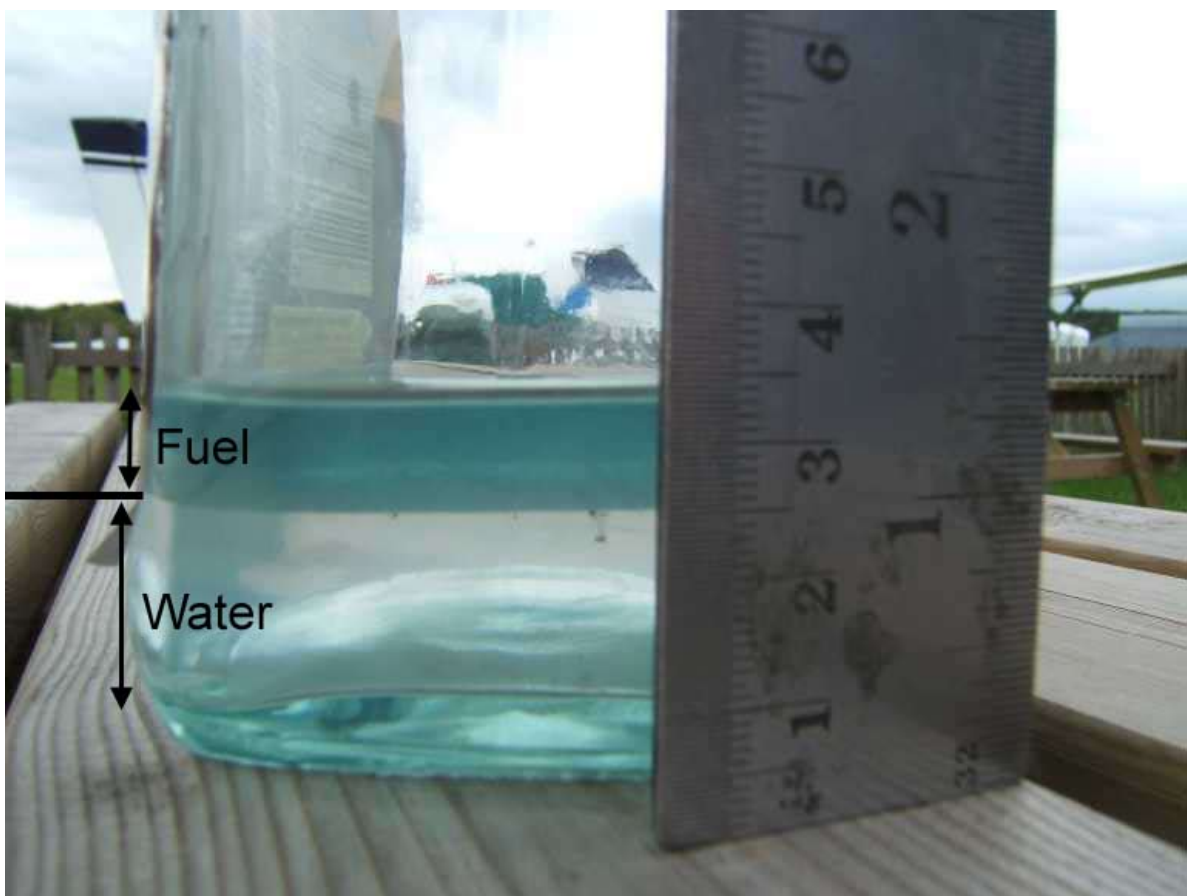


Figure 1

Contents of the fuel gascolator bowl

Aircraft examination

The maintenance engineer for the flying club recovered the aircraft to a hangar and drained the fuel from the wing tanks into a container which already contained some fuel. The aircraft was then left to await inspection by an insurance assessor. The insurance assessor removed the fuel gascolator bowl and emptied the contents into a jar (see Figure 1). Approximately two-thirds of the gascolator bowl's contents was water and only one-third was fuel. A few days later the maintenance engineer removed the wings of the aircraft and when the right wing was placed on the ground a small amount of a water/fuel mixture drained out of the right wing tank's fuel line. No fuel or water was seen to drain from the left tank when the left wing was removed. The pilot reported that the aircraft had been parked slightly right wing down.

The aircraft's previous flight before the accident flight was on 18 May 2006. During the ensuing seven days the aircraft was parked outside and there was a significant amount of rainfall. A weather station 20 nm south of Netherthorpe reported a total rainfall of 43.6 mm

between 18 May and 25 May 2006 and a weather station 31 nm to the west reported a total rainfall of 46 mm for the same period.

The insurance assessor examined the standard fuel caps that were installed on the aircraft and also examined the lockable fuel caps that had been removed. He reported that the rubber seals on all four fuel caps appeared satisfactory and he could not explain how water might have entered the fuel tanks.

Analysis

The sudden engine failure after takeoff was probably caused by excessive water in the fuel. Water is heavier than aviation fuel and will settle in the bottom of a fuel tank. The pilot reported that he carefully drained both wing tanks and the gascolator but did not find any water. However, the aircraft had been parked right wing low and therefore it is possible that the right tank drain was not at the lowest location when the sample was taken. It was not possible to determine how the water entered the fuel but it is probable that the heavy rainfall during the week leading up to the accident flight, while the aircraft was parked outside, was a contributory factor.