ACCIDENT

Aircraft Type and Registration:	Mooney 201 M20J, N321KL
No & Type of Engines:	1 Lycoming IO-360 SER A&C piston engine
Year of Manufacture:	1981
Date & Time (UTC):	28 December 2009 at 1500 hrs
Location:	Stapleford Aerodrome, Essex
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Damage to propeller, aerials and abrasions to the underside of the fuselage
Commander's Licence:	Private Pilot's Licence
Commander's Age:	46 years
Commander's Flying Experience:	351 hours (of which 10 were on type) Last 90 days - 11 hours Last 28 days - 1 hour
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

Following a pre-flight inspection, during which a small quantity of water was found in the left fuel tank, the aircraft took off and the landing gear was retracted. At about 50 ft the engine lost power and the pilot made a forced landing on an adjacent grass runway but had insufficient time to lower the landing gear. Subsequent maintenance activity identified a loose-fitting filler cap on the left fuel tank and a significant quantity of water also present in that tank and throughout the fuel system. No water was found in the right fuel tank. Since its previous uneventful flight the aircraft had been parked outside for about three weeks during which the weather conditions had included snow and rain.

History of the flight

During the pre-flight inspection, the pilot noticed that the fuel sample from the left fuel tank contained a small amount of water. Two further samples were taken before the pilot judged that the fuel was clear of water. No water was evident in the sample taken from right fuel tank. He started the engine with the right fuel tank selected, before switching to the left tank prior to taxi. The pilot allowed the engine temperature to normalise before the engine power checks were completed and the aircraft lined up for takeoff from Runway 22L at Stapleford. The takeoff appeared normal and the landing gear was retracted but at a height of about 50 ft the engine suddenly lost power. The stall warning activated and the pilot pitched the aircraft nose down,

during which the engine was felt to surge before losing power again. The pilot closed the throttle and elected to land back on the runway, but there was insufficient time to extend the landing gear. The aircraft touched down on the adjacent grass Runway 22R and, following a ground slide of approximately 100 metres, came to a stop with 170 metres of runway remaining. The uninjured pilot vacated the aircraft through the cabin door. The aircraft sustained damage to the propeller, underside-mounted aerials and abrasions to the lower fuselage.

Pilot's comments

The pilot stated that some weeks prior to the accident, the aircraft had been flown to Thurrock Aerodrome where the aircraft's annual inspection had been carried out. At the same time, sections of the aircraft were repainted, including the area around the left fuel tank filler port. The aircraft was then parked outside for about ten days. On 4 December 2009 the pilot arrived to reposition the aircraft to Stapleford Aerodrome. The left fuel tank was visually confirmed as being empty and 50 litres of fuel were uploaded. The pilot recalled carrying out a water drain check of both fuel tanks and that he found no evidence of water. He also recalled that the flight to Stapleford Aerodrome was conducted on the right fuel tank. The aircraft remained parked outside until the accident flight on 28 December 2009. Weather conditions in the weeks prior to the accident had included both rain and snow.

Following the accident, the aircraft was recovered to a maintenance organisation where the left fuel tank filler cap was found to be incorrectly fitted. The pilot stated that almost immediately after the accident he had visually checked the left fuel tank quantity, but could not recall finding the left tank filler cap loose or if he had then replaced the cap correctly. Both fuel tanks were drained and the contents examined. In addition to about 50 litres of fuel in the left tank, that tank also contained about 500 ml of water. Water was also found throughout the fuel system, up to the fuel injectors. A very small amount of water was recovered from the right fuel tank.

It was not possible to determine why the pilot's pre-flight inspection had failed to identify the presence of the significant quantity of water that was subsequently found in the left fuel tank. A search of the AAIB and CAA databases for this aircraft type revealed four events between 1984 and 2002 relating to contamination of fuel tanks with water. The aircraft manufacturer's Service and Maintenance Manual contains the following relevant warning:

> *'Water can enter the fuel tank through a loose fitting or damaged cap. This should be corrected as soon as possible.'*