**ACCIDENT**

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| **Aircraft Type and Registration:** | Reims Cessna FA152 Aerobat, G-LEIC |
| **No & Type of Engines:** | 1 Lycoming O-235-L2C piston engine |
| **Year of Manufacture:** | 1985 |
| **Date & Time (UTC):** | 19 May 2011 at 1400 hrs |
| **Location:** | Field near Kilby, Leicestershire |
| **Type of Flight:** | Training |
| **Persons on Board:** | Crew - 1 Passengers - 1 |
| **Injuries:** | Crew - 1 (Minor) Passengers - 1 (Minor) |
| **Nature of Damage:** | Nose gear leg separated, damage to propeller, upper wing surface and vertical tail |
| **Commander's Licence:** | Commercial Pilot's Licence with Flight Instructor rating |
| **Commander's Age:** | 26 years |
| **Commander's Flying Experience:** | 972 hours (of which 527 were on type)<br>Last 90 days - 73 hours<br>Last 28 days - 33 hours |
| **Information Source:** | Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB |

**Synopsis**

Shortly after takeoff the engine lost power. The pilot pumped the throttle, which produced brief bursts of power but this was insufficient to maintain level flight. The pilot made a successful forced landing into a field but during the ground roll the nosewheel hit a furrow causing the aircraft to invert.

**History of the flight**

Shortly after the aircraft departed Leicester Airport and was climbing through about 1,700 feet, the engine suddenly lost power. The pilot reported that all engine indications had been normal until the engine rpm suddenly dropped from about 2,450 rpm to a near-idle rpm. He tried pumping the throttle and this produced brief bursts of power of up to 2,400 rpm but it was insufficient to maintain level flight. He checked that the mixture was rich, and that the fuel and magnetos were selected ON. He also selected carburettor heat ON. This had no effect so he selected a field and proceeded to set up for a forced landing. The aircraft made a normal touchdown in the field but during the ground roll the nosewheel hit a furrow causing the nose leg to separate and the aircraft to invert. The pilot and his passenger sustained minor injuries and were able to exit the aircraft via the side doors.

The pilot reported that carburettor heat had been applied for a minimum of 15 seconds during the engine run-up checks. He said that he had experienced carburettor icing before and that the sudden loss of engine power in this incident was very different.

**Weather**

The Met Office estimated the surface air temperature in the area at the time of the accident to be about 15°C and the dew point 4°C. According to the CAA's Safety Sense Leaflet 14 in LASORS[1] 2010 on '*Piston engine icing*' this placed the risk of carburettor icing as 'moderate' at cruise power and 'serious' at descent power.

**Aircraft Examination**

The aircraft was recovered and examined by an aircraft maintenance organisation (AMO). The AMO reported that there was sufficient fuel onboard, in excess of about 50 litres. Because the aircraft had inverted they could not easily check for water in the fuel, but the aircraft had flown earlier that day and had not been refuelled so water in the fuel was considered unlikely. The fuel gascolator was removed and found to be clear of debris. The carburettor had been damaged in the impact so it no longer contained any fuel. The engine had not seized and there were 4 quarts of oil onboard. The magnetos were found to be secure. Under the observation of the insurance loss adjuster the carburettor bowl was removed and examined. The float bowl was clean with no evidence of a sticking float.

The Lycoming O-235-L2C engine had accumulated 18 hours since its last overhaul in March 2011. The Precision Airmotive MA-3PA carburettor was overhauled in July 2010 and was fitted to the engine in March 2011, so it had also accumulated 18 hours.

**Analysis**

The examination of the engine by the AMO did not reveal any evidence of an engine fault or fuel issue. The meteorological conditions at the time raised the possibility of carburettor icing but the symptoms reported by the pilot were not consistent with carburettor icing. The fact that the pilot was able to momentarily regain some power by pumping the throttle suggested that the accelerator jet in the carburettor was functioning and that this fuel was reaching the cylinders. This raised the possibility that there was a fuel delivery problem from the main carburettor jet and this caused the initial loss of power. The damage to the carburettor prevented it from being rig tested.

**Footnote**

[1] 'LASORS 2010' is a CAA publication containing information on Licensing, Administration, Standardisation, Operating Requirements, and Safety.