ACCIDENT

Aircraft Type and Registration:	Cessna FA152 Aerobat, G-WACH
No & Type of Engines:	1 Lycoming O-235-N2C piston engine
Year of Manufacture:	1986 (Serial no: 425)
Date & Time (UTC):	7 May 2019 at 0950 hrs
Location:	Field near Quainton, Buckinghamshire
Type of Flight:	Training
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Nose and wings damaged
Commander's Licence:	Private Pilot's Licence
Commander's Age:	59 years
Commander's Flying Experience:	1,890 hours (of which 480 were on type) Last 90 days - 87 hours Last 28 days - 35 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot, AAIB enquiries and examination of the engine

Synopsis

The aircraft struck a hedge and concealed ditch while making a forced landing in a field following a loss of engine power. There were no injuries. Examination of the engine did not identify any technical reason for the loss of power and the flying school considered insufficient or inconsistent fuel flow to the engine as a likely cause. Additionally, the possibility of carburettor icing could not be excluded.

History of the flight

The training flight was planned as a navigation progress check, during which the student pilot was to be assessed on his ability to navigate and make command decisions. Before departure the flying instructor performed an initial walk-round inspection which included a visual check of fuel and oil levels. The student then performed a detailed walk-round using the checklist and took readings of the fuel and oil levels using calibrated dip sticks.

The navigation task was conducted at an altitude of 2,500 ft and the flight initially proceeded uneventfully but during the return to Wycombe Air Park, the instructor noticed the engine speed begin to fluctuate between 2,200 and 1,900 rpm.

The instructor reported that he took control, applied more carburettor heat and gently increased the throttle but the engine speed continued to fluctuate and then gradually decreased, settling in the range of 1,500 to 1,800 rpm. He initially decided to perform a

precautionary landing with power-on, on the cross runway at Westcott, a disused airfield, and positioned the aircraft downwind accordingly. It became clear to him that there was insufficient power available to safely complete the landing and he elected instead to perform a forced landing with power-off, having identified a suitable field ahead in which to land. He made a MAYDAY call to ATC at Oxford Airport and prepared the aircraft for landing.

After avoiding telegraph wires in the selected field, the instructor carried out an uneventful touchdown. Despite applying braking, its effectiveness was limited by damp grass and he was unable stop the aircraft before it struck the perimeter hedge and a concealed ditch (Figure 1) at low speed. Both occupants were uninjured and exited the aircraft without assistance.

Figure 1
G-WACH after coming to rest

Aircraft information

The most recent maintenance check was a 150-hour check completed on 3 March 2019. Since then, the aircraft had accumulated 7 flying hours. The technical log indicated that there were 60 litres of fuel on board prior to the flight and there were no relevant defects recorded.

Flying school's internal investigation

Following the accident, the flying school's maintenance organisation undertook a detailed examination of the aircraft and engine. Approximately 12 litres of fuel were drained from the aircraft at the accident site. Fuel was also present in the gascolator and carburettor; no evidence of water, or other contaminants was found. Examination of the fuel, oil and ignition systems did not identify any anomalies and cylinder compression ratios were good. The carburettor was removed and sent to specialist maintenance facility for operational and leak testing and no anomalies were noted.

The flying school considered that the loss of engine power was most likely caused by insufficient or inconsistent fuel flow to the engine.

Meteorological information

Although not specifically noted by the instructor in his report, weather information provided by Oxford ATC indicated that at the time of the accident the surface temperature was 12°C and the dewpoint was 5°C. Figure 2 illustrates the probability of carburettor icing for values of air temperature and dewpoint. Assuming a reducing temperature and similar dewpoint above the surface, this indicates that the flight was operating in the blue region: 'serious icing at any power'.

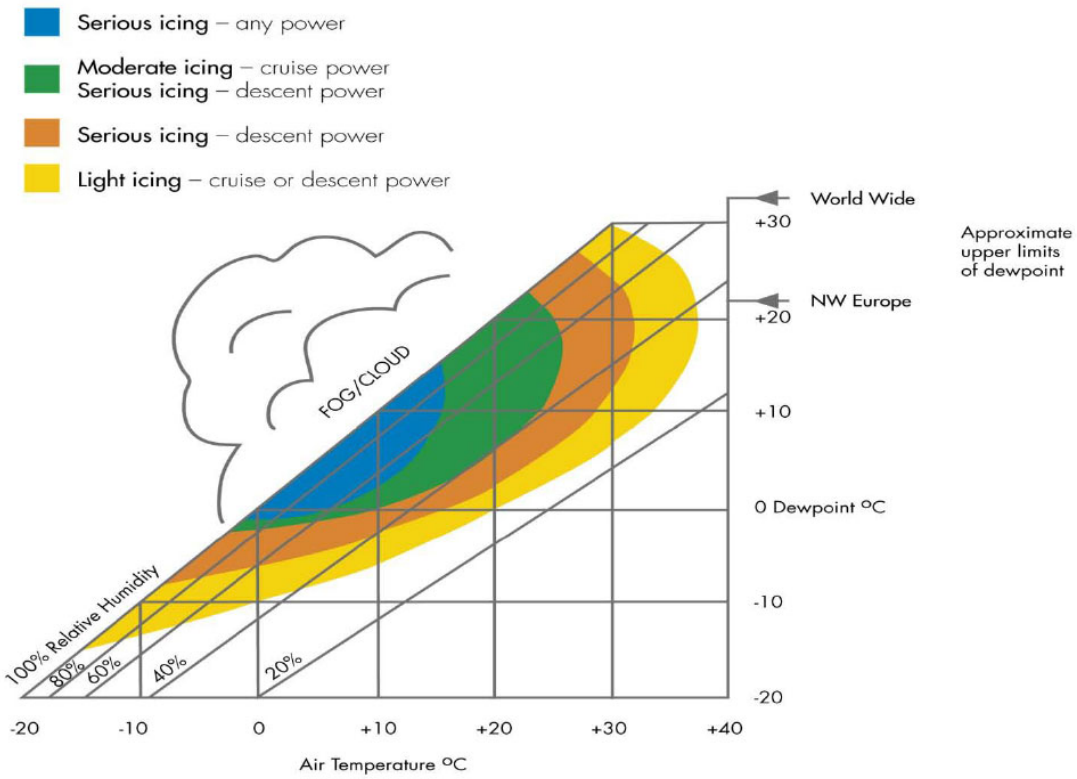

Figure 2

Carburettor icing probability chart

Other information

The instructor commented that the flying school's normal procedure during cruise is to select carburettor heat to ON for a period of 30 seconds, every 15 minutes. He recalled discussing the risk of carburettor icing with the student prior to departure but noted during the flight that the student was not applying carburettor heat as often as he should. The instructor did not consider that these intervals were sufficiently long to be detrimental to the flight but documented it as a debrief point for the student. He stated that the student had completed a carburettor heat check just prior to the onset of engine speed fluctuations.

The instructor also commented that when he had previously experienced serious carburettor icing the engine response had been different to that experienced on the accident flight. But acknowledged that, given the probability of serious carburettor icing on the day, it was not possible to rule out the presence of carburettor icing.

Discussion

The flying school considered that the engine speed fluctuations were probably caused by insufficient or inconsistent fuel flow, but its maintenance organisation did not identify any technical findings which could have led to the loss of power.

The weather conditions prevalent at the time of the accident were conducive to the formation of serious carburettor icing at any power setting. Although the instructor reported the use of carburettor heat both prior to, and following the onset of engine speed fluctuations, the possibility that carburettor icing may have contributed to the loss of engine power could not be excluded.

CAA Safety Sense Leaflet 14, *'Piston Engine Icing'*, contains useful information and guidance concerning induction system icing, including the recommend technique for use of carburettor heat in different phases of flight.

Conclusion

The reason for the loss of engine power was not identified but a fuel flow anomaly or carburettor icing were considered possible.

The instructor made a successful forced landing because his training and practice enabled him to identify a suitable landing site within the glide range of the aircraft. Braking action was less effective than anticipated due to the damp grass surface causing the aircraft to strike a hedge and concealed ditch.