

ACCIDENT

Aircraft Type and Registration:	Jodel D120 (Modified), G-AVYV	
No & Type of Engines:	1 Continental Motors Corp C90-14F piston engine	
Year of Manufacture:	1964 (Serial no: 252)	
Date & Time (UTC):	3 June 2018 at 1255 hrs	
Location:	Sandown Airfield, Isle of Wight, Hampshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Minor)	Passengers - N/A
Nature of Damage:	Left wing, engine, landing gear and fuselage damaged	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	51 years	
Commander's Flying Experience:	331 hours (of which 143 were on type) Last 90 days - 9 hours Last 28 days - 9 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

The engine failed at 200 ft during a go-around and the pilot made a forced landing without serious injury on an adjacent golf course. The cause of the engine failure could not be determined but may have been carburettor icing or fuel vapour interrupting the fuel flow.

History of the flight

On 3 June, the pilot planned to fly G-AVYV from Shifnal Airfield, Shropshire, where the aircraft is based, to Sandown, Isle of Wight. The pilot had originally planned to fly to Dunkeswell Airfield, Devon, but changed his plan due to the weather forecast in that area.

The pre-flight, taxi and power checks at Shifnal were all normal. The grass was wet so the pilot selected carburettor heat HOT for a prolonged period during the power check to clear any of ice before the takeoff.

The aircraft took off at approximately 0955 hrs. At approximately 400 ft, the engine started to run roughly so the pilot reduced power slightly and applied carburettor heat, the engine returned to normal and the pilot continued the climb. The remainder of the flight towards the Isle of Wight was uneventful, flying initially at 3,000 ft and later at 2,500 ft due to lowering cloud base.

After crossing the Solent at 1,600 ft the pilot climbed the aircraft to 2,000 ft to join overhead Runway 05 at Sandown. Once overhead he selected the fuel pump ON and carburettor heat HOT, descended on the dead side¹ then positioned downwind. As the pilot commenced his downwind checks, he noticed the engine running slightly rough. He confirmed the mixture was rich, both magnetos and fuel pump were ON and the carburettor heat was selected HOT. To locate the fault, he tried increasing rpm slightly and selected the fuel pump OFF. These actions appeared to return the engine to smooth operation. The pilot did not recall switching the fuel pump back ON.

The pilot continued the approach, reducing speed to 50 kt to maintain spacing behind another aircraft. At 150 ft agl he selected the carburettor heat to COLD. On landing the aircraft bounced on first contact and floated along the runway. As the aircraft touched down again, it hit a bump and “jumped” back into the air. The pilot decided to execute a go-around, applied full power and started to climb away.

At approximately 200 ft agl, the engine rpm rapidly reduced and then stopped. The pilot applied carburettor heat and the engine briefly recovered before stopping again. He lowered the nose and identified a suitable strip of grass on rising ground to the right. He made a brief radio call then focused on the landing. The aircraft landed firmly and skidded for approximately 20 ft before stopping. The pilot selected the master switch OFF and exited the aircraft unaided.

The pilot later returned to the aircraft to switch the fuel and magnetos off.

Accident site

The aircraft landed on the fairway of the 8th hole at the Shanklin and Sandown golf course, on sloping ground bounded on several sides by wooded areas (Figure 1).

There was significant damage to the left wing, undercarriage, fuselage and engine (Figure 2).

Aircraft information

The Jodel D120 is a two-seat, tailwheel aircraft of wooden construction, powered by a Continental C90 engine. The fuel system has an engine driven fuel pump and an electrical fuel pump. G-AVYV used Mogas².

Aircraft examination

The aircraft was recovered by the insurance company to a maintenance facility. The maintenance company confirmed that the engine rotated freely, there was fuel in the fuel tank, fuel filters were clean and both fuel pumps were full of fuel.

Footnote

¹ The side of the runway opposite that of the normal circuit. A diagram published by the CAA is available at: https://publicapps.caa.co.uk/docs/33/ga_srgwebStandardOverheadJoinPosterJan09.pdf (accessed on 7 August 2018).

² Automotive gasoline.



Figure 1

Aircraft and initial impact marks



Figure 2

G-AVYV after the accident

Weight and balance

The aircraft took off with approximately 105 litres of Mogas giving a takeoff weight of 561kg. The pilot estimated there were 60 litres of fuel remaining when the accident occurred.

Meteorology

METARs for RAF Cosford, Gloucester, Southampton and Bournemouth airports were obtained at the approximate time G-AVYV was passing these airfields. Weather information was not available for Sandown.

RAF Cosford (EGWC) 030950Z 03003KT 9999 FEW025 20/// Q1020

Gloucester (EGBJ) 031050Z 00000KT 9999 SCT020 21/16 Q1019

Southampton (EGHI) 031150Z VRB02KT 9999 FEW035 23/12 Q1018

Bournemouth (EGHH) 031150Z 17009KT 9999 FEW032 23/13 Q1018

Other information

Use of Mogas

The LAA publish guidance on the use of Mogas in technical leaflet TL 2.26 – ‘*Procedures for use of E5 Unleaded MOGAS to EN228*’.

Analysis

After a long floating landing and second bounce at Sandown the pilot’s decision to go around was logical. The engine failed at approximately 200 ft. With limited time and wooded areas ahead and to both sides the pilot selected the only available clear landing site. The pilot’s focus on flying the aircraft first assisted a safe outcome.

The pilot believed the engine failure occurred due to ice forming in the carburettor during the landing. This possibility is consistent with the engine briefly recovering on selection of carburettor heat. He reflected that having experienced carburettor icing during the descent to circuit height he should have left the carburettor heat selected ON for longer during the final descent. Weather reports from Southampton and Bournemouth indicated a temperature of 23°C and a dew point of 12-13°C. CAA Safety Sense Leaflet 14 – ‘*Piston Engine Icing*’³ includes a chart indicating that, at this temperature and dew point, moderate icing is likely at cruise power and serious icing is likely at descent power. Carburettor icing is more likely with Mogas. However, the pilot did follow the guidance given in a Safety Sense Leaflet for use of carburettor heat during the approach.

It is also possible that fuel vapour formed in the fuel system. Engines running on Mogas fuel can be susceptible to fuel vapour particularly in warm weather. The pilot selected the electric fuel pump OFF whilst diagnosing the rough running engine on the downwind leg. The reduction in fuel pressure without the electric fuel pump would increase the likelihood of fuel vapour interrupting fuel flow. The pilot noted that he was careful where he purchased fuel to ensure it had a low ethanol content and added fresh fuel before each flight as recommended in the LAA guidance.

Footnote

³ <http://publicapps.caa.co.uk/docs/33/20130121SSL14.pdf> (accessed on 7 August 2018).

Conclusion

The cause of the engine failure could not be determined, but may have been carburettor icing or fuel vapour interrupting the fuel flow. The CAA provides guidance on carburettor icing, and the LAA provides information about the increased likelihood of carburettor icing and fuel vapour-lock when using Mogas.