

ACCIDENT

Aircraft Type and Registration:	Druine D.31 Turbulent, G-ARNZ	
No & Type of Engines:	1 Volkswagen 1600 piston engine	
Year of Manufacture:	1961 (Serial no: PFA 579)	
Date & Time (UTC):	18 October 2020 at 1510 hrs	
Location:	Damyns Hall Aerodrome, Upminster	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Minor)	Passengers - N/A
Nature of Damage:	Extensive damage	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	26 years	
Commander's Flying Experience:	391 hours (of which 21 were on type) Last 90 days - 32 hours Last 28 days - 9 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

When approaching the airfield to rejoin the circuit, the aircraft's engine began to run rough then lost power completely. During the subsequent forced landing the aircraft came to rest inverted and the pilot sustained minor injuries. A post-accident inspection of the engine revealed a crack on the plastic rocker arm in the fuel pump. After the accident, the LAA issued an Airworthiness Information Leaflet which requires plastic rocker arms to be replaced with metal rocker arms in affected aircraft.

History of the flight

The aircraft took off from Damyns Hall Aerodrome Runway 03 at 1250 hrs. The pilot reported sufficient fuel on board and that the aircraft was within its weight and balance limits.

After flying locally for approximately 1 hr 20 minutes, the aircraft approached Damyns Hall from the south-east. The pilot intended to join overhead for a right-hand circuit to Runway 03 and land.

The pilot had the airfield in sight at an altitude of 1,100 ft when the engine began to run rough, and declared a MAYDAY, citing a partial engine failure, following which the engine failed completely.

The pilot visually identified an area with fields and a golf course ahead, aimed the nose towards it and prepared for a forced landing. The pilot recalled from training “to go under 50 kt can be dangerous” and reported maintaining 55-60 kt.

The pilot further stated that due to the short wings, the Turbulent has a relatively poor glide capability and therefore assessed the golf course was too far. The pilot decided to aim for a nearer field which initially appeared relatively level and smooth. As the aircraft descended, the field began to look boggy with overgrown vegetation.

The aircraft touched down approximately 1.3 nm from the airfield at 1425 hrs. It “flipped over” to the left and came to rest inverted.

The pilot released the harness, switched the magnetos and electrics OFF and vacated the aircraft. There was no fire.

The pilot was airlifted from the accident site 30 minutes later having suffered only minor cuts and bruises. The aircraft sustained damage.

Aircraft description

The Druine D.31 Turbulent is a single seat, low wing monoplane with a conventional landing gear, consisting of two main wheels and a skid. It is fitted with a modified air-cooled, four-stroke automotive engine. A mechanically driven fuel pump supplies fuel to the engine.

The fuel pump fitted to G-ARNZ was a sealed unit and the aircraft had flown 30 hours since its installation. It had a plastic rocker arm which according to the LAA is a recent introduction to after-market pumps for this type of engine. Formerly it was normal for these pumps to have a metal rocker arm. No other fuel pump was installed in G-ARNZ.

The aircraft was operating on a Permit to Fly and its Certificate of Validity was in date.

Aircraft examination

A post-accident engineering inspection revealed the plastic cam driven rocker arm in the mechanical fuel pump had cracked (Figure 1).



Figure 1

Plastic fuel pump rocker arm

Conclusion

The plastic rocker arm in the fuel pump cracked, causing the pump to fail. No other fuel pump was fitted, so this resulted in a loss of engine power and the pilot performed a forced landing.

Safety action

In response to the event, the LAA issued the following Airworthiness Information Leaflet (AIL):

LAA Airworthiness Information Leaflet (AIL) LAA/MOD/ENG/VW/001 Issue 1, applicable to all LAA aircraft operating with Volkswagen (VW) derivative engines states:

'mechanical fuel pumps using a plastic rocker arm must not be used on VW derivative engines operating under an LAA administered Permit to Fly'

'it must be established beyond doubt whether or not the mechanical fuel pump fitted to the engine uses a plastic rocker arm'

This AIL requires inspections to be carried out within five flying hours of its issue and must be signed off by a suitable LAA Inspector.