

SERIOUS INCIDENT

Aircraft Type and Registration:	Morane Saulnier MS.315E D2, G-BZNK	
No & Type of Engines:	1 Rotec R3600 piston engine	
Year of Manufacture:	1932 (Serial no: 354)	
Date & Time (UTC):	5 May 2018 at 1400 hrs	
Location:	Sidmouth Beach, Devon	
Type of Flight:	Unknown	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	None reported	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	46 years	
Commander's Flying Experience:	493 hours (of which 12 were on type) Last 90 days - 20 hours Last 28 days - 8 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft made a successful forced landing on a beach following a loss of engine power. A spring in the fuel primer operating system had become disconnected, causing the primer to continue operating and resulting in the available fuel being consumed faster than expected.

History of the flight

The aircraft was returning to Branscombe airfield, Devon from a fly-in at Bodmin, Cornwall. The wind was light and variable, and visibility in flight was good. At a height of approximately 1,200 ft, whilst flying a short distance off the coast near Sidmouth, the engine lost power. The terrain inland was undulating and crossed by hedges and wires, so the pilot determined that the most favourable option for a forced landing was an adjacent south-facing beach.

The pilot reported that the long straight beach appeared clear of people and easily within gliding distance. Approaching the western end of the beach he noticed several bystanders watching from the water's edge and positioned the aircraft to avoid them, landing in a short distance on the surface of pebbles and sand. The pilot and passenger disembarked unaided and without injury, and pushed the largely undamaged aircraft above the high tide mark with the assistance of those present. Emergency responders attended later.

When inspected afterwards the aircraft's fuel tank contained approximately two litres of fuel.

Aircraft information

The Morane Saulnier MS.315 is a high wing monoplane first flown in 1932 (Figure 1). G-BZNK is fitted with a Rotec R3600 nine-cylinder radial engine which is of modern design and similar in appearance to the original it replaced¹.



Figure 1

Morane Saunier MS.315 G-BZNK.
(Photograph used with permission)

In this installation, fuel is supplied to the throttle body via a fuel pressure regulator that incorporates a primer button (Figure 2). When depressed, the primer button overrides the regulator and allows fuel to flow freely into the throttle body for engine starting.

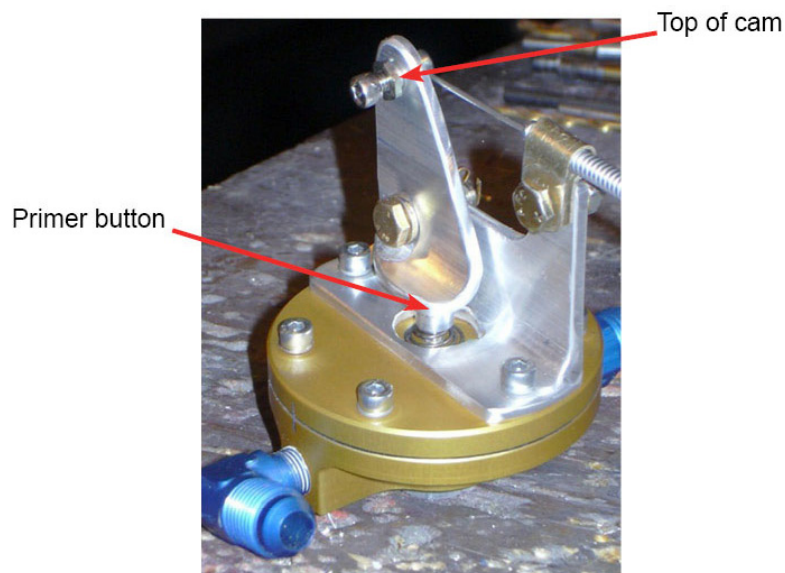


Figure 2

Example fuel pressure regulator and primer button.
(Image produced by Rotec Aerosport Pty Ltd and used with permission)

Footnote

¹ Morane Saulnier MS.315 aircraft are fitted with a variety of engines. The findings of this investigation are most relevant to Rotec R3600 engine installations equipped with a throttle body injector system.

The primer button on G-BZNK is depressed by a cam, operated from the cockpit by a lever and pull cable (Figure 3). A return spring, acting against the cable at the top of the cam, is intended to release the primer button when the priming lever is not being pulled.

The pilot stated that the fuel contents gauge was not reliable, sometimes indicating that the tank was full throughout a flight. The aircraft was not equipped with a fuel flow indicator.



Figure 3

Priming lever as found in the cockpit of G-BZNK

Aircraft examination

A Light Aircraft Association (LAA) inspector, who examined the aircraft after its forced landing, noticed that the cable attached to the cockpit priming lever appeared slack and found that the return spring had become disconnected. Consequently, the priming button remained depressed even when the priming lever was not operated.

The inspection did not determine why the spring was disconnected, and the fuel tank and supply system appeared otherwise intact.

Black soot was present on the landing gear struts behind the engine exhaust pipes in a location not visible from the cockpit in flight.

Forced landing

The pilot commented that he had been taught to look for places to land throughout a flight, and not only if there were indications of an impending loss of engine power. During the 12 hours he had operated G-BZNK he practiced forced landings to become familiar with its gliding characteristics. He said this enabled him to identify possible landing sites readily and gave him confidence to select the beach as the most suitable option.

Fuel consumption

The engine manufacturer stated that the R3600 consumes 27 litres/hr during operation at 75% power. On any flight, some additional fuel is required for start-up, taxi, takeoff and climb. The pilot calculated actual fuel consumption by dividing the amount uplifted by the number of hours flown, and found that it was not significantly greater than the manufacturer's estimate. Accordingly, he believed that when full the 135-litre fuel tank fitted to the aircraft would provide an endurance of almost 5 hours.

The pilot stated that the aircraft was fully refuelled at Branscombe before its flight to Bodmin, and that the flight time to Bodmin was 52 minutes. Therefore, he expected that the fuel contents would be sufficient for the return flight.

The total flight time from refuelling at Branscombe until the forced landing was 1 hour 52 minutes.

Information provided by the LAA indicated that the engine would continue to run with the primer button depressed but with fuel consumption several times greater than in normal operation. Incomplete combustion of the excess fuel would produce black soot in the exhaust flow.

Analysis

The contents of a full fuel tank should have been sufficient for the intended return flight. In the absence of a leak (for which there was no evidence) all the available fuel must have been consumed by the engine, and the fuel was exhausted in less than half the expected time.

The spring intended to release the primer button was found disconnected. Soot found on the landing gear struts behind the exhaust pipes indicated excess fuel supply to the engine. It is therefore likely that the primer button remained depressed, allowing a significantly greater flow of fuel to the engine than normal.

The pilot had not noticed excessive fuel consumption prior to the flights to and from Bodmin, so it is likely the spring had only recently become detached.

Conclusion

The engine lost power when no useable fuel remained in the tank. Fuel consumption was significantly greater than expected because the primer return spring was not connected, allowing the primer to continue operating.

The pilot completed a successful forced landing because his training and practice enabled him to identify a suitable landing site within the gliding capability of the aircraft.

Safety actions

The LAA stated that it will recommend priming installations of this type be configured so that normal operation of the fuel pressure regulator is restored if the primer operating mechanism fails.