

Accident to the ROBIN - DR400-160 registered F-GMRV

on 13 September 2020
at Caussou (Ariège)

⁽¹⁾ Except where otherwise indicated, the times in this report are in local time.

Time	Around 16:13 ⁽¹⁾
Operator	Aéroclub de Pamiers les Pujols
Type of flight	Introductory flight
Persons on board	Pilot and three passengers
Consequences and damage	Aeroplane substantially damaged
This is a courtesy translation by the BEA of the Final Report on the Safety Investigation published in June 2021. As accurate as the translation may be, the original text in French is the work of reference.	

Management of the fuel selector, unpriming of the fuel system, reduction in engine power, forced landing on the side of a hill, during an introductory flight

1 - HISTORY OF THE FLIGHT

Note: the following information is principally based on statements.

The pilot arrived at the club at the start of the afternoon to prepare the aeroplane in order to make an introductory flight with three passengers, lasting around 30 minutes. He checked the quantity of fuel on board. He estimated that three of the four tanks were half full, i.e. approximately 80 litres, corresponding to three flight hours and therefore compatible with the planned flight.

The pilot, accompanied by the passengers, took off at around 15:45 from Pamiers les Pujols aerodrome (Ariège) and headed south to fly over the Cathar castles.

After around 25 minutes, the plane was flying at an altitude of 6,500 ft in the vicinity of Montségur Castle, in the direction of Luzenac situated to the south-west. The pilot planned to fly back towards Foix Castle. He then observed an intermittent reduction in engine power and added that indicator lights had lit up on the warning bar. He could not remember which lights these were.

He operated the electric pump and stated that he switched from the main tank to the LH auxiliary tank. However, this seemed to make no difference. Considering the site he was flying over to be suitable for a forced landing, the pilot turned around to face the upward-sloping and obstacle-free area. He prepared the plane by extending the flaps then turned the fuel selector to the closed position. Just before contact with the ground, he positioned the mixture switch to idle cut-off and cut the magneto contacts.

The plane touched down, bounced then rolled around 20 metres before coming to a stop. The three landing gears were broken.



Source: BEA

Figure 1: Accident site

2.1 Aeroplane information

The plane is equipped with a Lycoming O-320 160 hp engine. The engine had flown 2,098 flight hours since the last overhaul. The plane had flown 17 flight hours since the last maintenance inspection.

The plane was within the weight and balance envelope defined by the flight manual.

The plane is equipped with four tanks which have the following specifications:

GAUGE SETTING AND LOW FUEL LEVEL WARNING				
TYPE OF TANK	TOTAL CAPACITY	UNUSABLE QUANTITY	LOW LEVEL QUANTITY	QUANTITY AT INDICATION "0"
AEROPLANE MAIN TANK S/N post S/N 2212	110 litres	1 litre	16 to 18 litres	1 to 3 litres min.
AEROPLANE WING TANK S/N post S/N 2212	40 litres	1 litre	7 to 8 litres	1 to 3 litres
OPTIONAL ADDITIONAL TANK	50 litres	0 litres	No low level warning	0 to 2 litres

Source: Robin Plane

Figure 2: Excerpt from the DR400 flight manual (Translated by the BEA)

⁽²⁾ It is not possible to visually assess the quantity of fuel in the main tank. This can be checked using the gauge but this information is inaccurate.

According to the pilot, the two wing tanks (front LH and front RH) and the main tank⁽²⁾ contained half of their capacity, approximately 20 litres (x2) and 55 litres respectively.

The additional tank (rear) supplies the main tank by gravity when the pilot activates a command located on the instrument panel. This tank was not generally used by the club. It contained no fuel.

The consumption of this plane for the climb to FL 65 in the conditions on the day is 8 litres to which 12 litres is added in cruise consumption, i.e. around 20 litres for this 28-minute flight.

A low fuel level warning indicator light is associated with each of the front tanks.

2.2 Examination of site and wreckage

The accident site is a low mountain area, on a slope. The distance between the first impact and the wreckage was around 20 metres.

The damage observed on the propeller is compatible with the lack of power at landing.

The tank selector was found blocked⁽³⁾ in the closed position. The LH wing tank contained 0.6 litres of fuel, the RH wing tank contained around 15 litres and the main tank contained 74 litres. The tanks were not deformed and were not leaking.

The examination of the engine on a test bench revealed that its performance was nominal at all ratings when it was supplied with fuel.

The reduction in power observed by the pilot was attributable to a fuel supply failure caused by a fuel depletion in the selected tank.

2.3 Pilot information

The 79-year-old pilot held a Private Pilot Licence - Aeroplanes (PPL(A)) and had logged around 4,500 flight hours, 77 of which in the last three months, all on type. He held a mountain rating.

2.4 Meteorological information

The meteorological conditions estimated by Météo-France at the accident site were as follows: dominant wind direction south-south-westerly, calm at the bottom of the valley, light slope breeze, CAVOK, temperature 21 °C, dew point temperature 12 °C, QNH 1,021.



Source: flying club

Figure 3: Fuel selector of F-GMRV

⁽³⁾ Due to the stresses and deformations suffered by the plane during forced landing.

⁽⁴⁾The consumption for the flight was estimated to be approximately 20 litres. The main tank contained 74 litres after the accident. If the flight had been made entirely using the main tank, the quantity present at departure would have been 94 litres and the gauge would have displayed a level close to full and not half as stated by the pilot.

2.5 Statements

The pilot stated that the fuel selector had been positioned on the main tank⁽⁴⁾ throughout the flight and that he had then selected the LH wing tank by activating the electric pump, then closed the fuel selector just before landing.

The pilot and the front passenger remembered seeing the indicator lights light up on the warning panel during the reduction in power but were unable to specify which indicator lights these were.

At no time, during the flight or after the flight, did the pilot consider a fuel depletion.

3 - CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation. They are not intended to apportion blame or liability.

Scenario

The lack of fuel in the LH tank and the correct operation of the engine proven during a test bench examination led to the conclusion that the engine stopped following unpriming of the fuel system due to fuel depletion of the LH wing tank. These observations are not consistent with the statement of the pilot, who thought he had flown using the main tank.

It is very likely that the low fuel level warning indicator light for the LH front tank lit up during the flight.

Contributing factors

The following factors may have contributed to the fuel failure:

- the denial of the fuel failure justified by a fuel quantity at departure more than sufficient to make the planned flight.

Safety lessons

A reduction in engine power following fuel unpriming may take a long time after the tank change before the engine delivers power again.

Stresses associated with introductory flights - consideration of passengers, explanation of the various flight elements - can result in a pilot paying less attention to carrying out certain actions that are essential to the flight.

Taking into account the terrain being flown over, the pilot focused on managing the path rather than identifying or dealing with the failure. This enabled him to keep control of the plane and preserve the life of the passengers by landing in an area clear of major obstacles.