



Accident to the CESSNA - F152
registered **F-GMOU**
on 10 July 2022
off the coast of île de Ré

Time	Around 10:20 ¹
Operator	Aéroclub du Poitou Marcel Goux
Type of flight	Cross country
Persons on board	Pilot
Consequences and damage	Aeroplane destroyed

This is a courtesy translation by the BEA of the Final Report on the Safety Investigation. As accurate as the translation may be, the original text in French is the work of reference.

Engine failure in cruise, ditching

1 HISTORY OF THE FLIGHT

Note: the following information is principally based on statements, radio-communication recordings and radar data.

The planned flight was a circular cross-country flight departing from Poitiers-Biard airport (Vienne) and passing via La Roche-sur-Yon (Vendée), Les Sables-d'Olonne (Vendée), La Tranche-sur-Mer (Vendée) and La Rochelle (Charente-Maritime). The pilot arrived at the flying club at around 07:45, prepared the flight and carried out the pre-flight inspection of the aeroplane. He replenished the aircraft with fuel. The fuel uplift was 95 l, i.e. an endurance of 3 h 30 min. He then carried out the engine tests without observing any anomaly. The pilot took off from Poitiers at 09:05 and climbed to approximately 3,000 ft, the cruise altitude chosen for this cross-country flight. The flight proceeded normally.

After passing abeam Tranche-sur-Mer, the pilot heard a "slight" engine misfire. He checked the parameters and did not observe any anomaly.

A short time later, at 10:17:19, he heard a second engine misfire and immediately informed the air traffic control service at La Rochelle-île de Ré airport of the engine problems and of his intention to land there (see Figure 1, point ①).

A few seconds later, the pilot heard engine misfires again. This time they were louder and at closer intervals. He saw the tachometer pointer rapidly oscillating between 2,200 and 2,400 rpm, checked the position of the magnetos, pushed the richness control and increased engine power. It seemed to him that the engine did not react.

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

The tachometer was still rapidly oscillating between 2,200 and 2,400 rpm. The pilot explained that the engine misfires continued and then the engine shut down. The propeller continued to turn with the relative wind.

At 10:17:53, the pilot informed the air traffic control at La Rochelle that his engine had shut down (point ②). The pilot tried to start up the engine but without success. He adjusted the pitch attitude to adopt and hold the best glide speed of 60 kt.

Estimating that he was closer to Ile de Ré than Rochelle airport, the pilot headed towards the island to attempt a forced landing in the fields (point ③).

He realised that he would not be able to reach the island and prepared himself to ditch. He emphasized that he checked that there was no boat in the flight path. The aeroplane came into contact with the surface of the water and tipped forward. The pilot quickly evacuated the aeroplane just before it sunk vertically. The skipper of a sailing boat close to the accident site headed towards the pilot and took him aboard his boat.

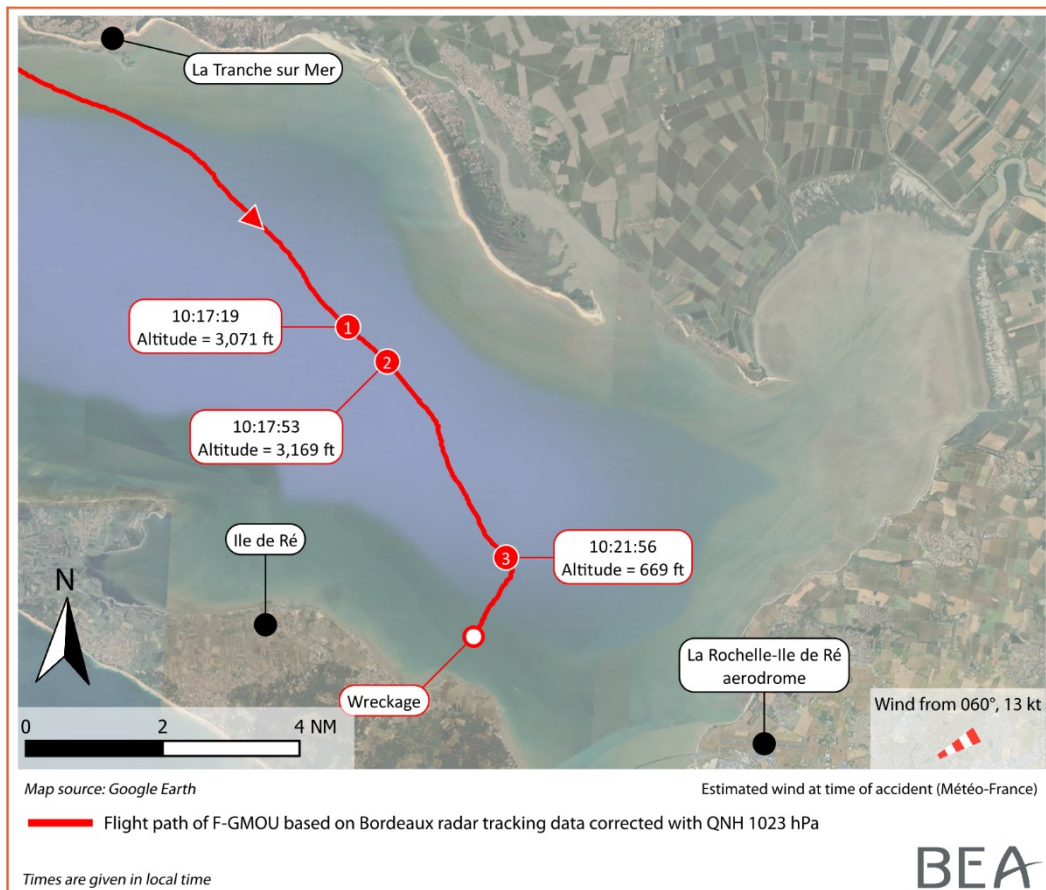


Figure 1: flight path of F-GMOU based on radar data (source: BEA)

2 ADDITIONAL INFORMATION

2.1 Aircraft information

The aeroplane was a Cessna F152 built in 1982 by Reims Aviation and equipped with a Lycoming O-235-L2C engine developing a maximum power of 110 hp at a speed of 2,550 rpm. The engine had logged approximately 925 operating hours at the time of the occurrence. The maximum capacity of the fuel tank was 98 litres including 6 unusable litres.

The last maintenance inspection which corresponded to the 100-hour scheduled inspection was carried out on 22 June 2022. Since this operation, the aeroplane had flown 33 hours 50 minutes. The study of the maintenance documents did not show any deviation from the specified programme and did not reveal any anomaly concerning the engine.

The maximum lift-to-drag ratio of the aeroplane was 10 without flaps with an indicated airspeed of 60 kt. In the event of an engine failure at 3,000 ft, a Cessna 152 can cover a distance of around 5 NM without wind.

2.2 Pilot information

The 50-year-old pilot held a LAPL(A) obtained on 27 June 2022. He had logged a total of 65 flight hours, including 33 hours on the Cessna 152 or 150. He had flown 8 hours as pilot-in-command including 7 hours on the Cessna 152 during his training. The accident flight was the pilot's first flight since obtaining his licence.

2.3 Meteorological information

The meteorological conditions estimated by the French met office, Météo-France, close to Ile de Ré at the time of the occurrence, were as follows:

- wind from 060°, 13 kt;
- visibility 9 km;
- clear sky;
- air temperature 25°C and dew point 14°C.

The wind at 2,500 ft was estimated as being from 070° of 18 kt.

The sea was calm with no swell.

2.4 Examination of the aircraft

After being located, the wreckage was raised on 21 July 2022, i.e. 11 days after ditching.

The fuel system was continuous. The fuel tanks contained a mixture of fuel and seawater. Based on the flight time from take-off and the aeroplane's fuel consumption, the estimated remaining quantity at the time of the engine shutdown was around 65 l.

The other examinations of the airframe and engine carried out the day the wreckage was recovered did not find any particular anomaly. The magnetos and the carburettor were removed for additional examinations.

2.4.1 Examination of carburettor

The carburettor could not be tested on a specific test bench because of it being contaminated by seawater. After disassembly, a visual examination was carried out. All the carburettor components were in place. The settings were nominal. No damage prior to the immersion of the aeroplane were identified.

2.4.2 Examination of magnetos

The two magnetos were tested on a specific test bench. The test found that the LH magneto was not functional below 1,500 rpm and the RH magneto was not functional below 2,000 rpm. Owing to this last finding, each magneto was disassembled and visually examined. The visual examination found that a tooth of the rotor gear of the LH magneto was offset making the magneto inoperative below 1,500 rpm. However, this defect did not affect the magneto's operation above 1,500 rpm. This offset could only have been created during a maintenance operation on the magneto². A substantial amount of corrosion and oxidation was observed. It was not possible to make a distinction between the level of oxidation and corrosion caused by the prolonged immersion of the wreckage and the condition of the magnetos before the accident.

The two magnetos were cleaned and the magneto with the gear offset was readjusted. Each magneto was then tested a second time, and the results were nominal.

The observations made during the functional tests of the magnetos explained neither the substantial drops in engine speed nor the engine shutdown.

3 CONCLUSIONS

The conclusions are solely based on the information which came to the knowledge of the BEA during the investigation.

Scenario

The pilot took off for a circular cross-country flight departing from Poitiers-Biard airport. After a flight time of approximately one hour, when he was passing abeam Tranche-sur-Mer and heading towards La Rochelle, the pilot heard engine misfires. These intensified a short time later, then the engine shut down. The pilot initially decided to glide to La Rochelle-île de Ré airport but seeing that he would not be able to reach the airport, he changed heading in order to try to join Ile de Ré to carry out a forced landing. When he understood that he could not reach firm ground, he prepared to ditch. The pilot ditched and then evacuated the aeroplane.

The investigation was not able to determine the cause of the engine misfires or of its shutdown.

The BEA investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liabilities.

² The position of the internal components of the magneto could not have been modified during the accident and the offset observed required the disassembly of the magneto.