

# Short Finals and No Fuel



*The aircraft was on final approach to aerodrome YY when its engine stopped through fuel exhaustion. The student pilot made a successful forced landing just short of the aerodrome.*

The Cessna 172 aircraft had been “topped up” at aerodrome XX by the student during the dual portion of a cross-country training flight (YY-XX-YY) earlier in the day. The fuel tanks, however, were not dipped, and the instructor did not sight the fuel level in the tanks at the time. The instructor assumed that the student had filled them to capacity, but in fact they had been filled only to approximately one inch (2.5 cm) below the tank filler neck.

The tanks were subsequently dipped by the student at 90 litres useable prior to the student departing YY on the solo section of the cross-country exercise. This allowed little margin above VFR minimum fuel reserves. The student advised the fuel quantity to the instructor and they discussed it, but the flight was still authorised.

The engine fitted to this aircraft was modified for increased power and it was known to thus have a higher fuel consumption rate than a standard Cessna 172 engine. The student pilot was aware of this, having been alerted by the aircraft’s operator (which was not the instructor’s club). The operator had also made a point of telling the student pilot that the engine must be leaned in the cruise. The instructor was not aware of the higher-than-normal fuel consumption. Because of traditional thinking, the student was discouraged from leaning unless above 3000 feet.

The student became aware of the aircraft’s low fuel state approximately 30 nautical miles south of YY but was reluctant to land at a nearby suitable aerodrome because re-calculation of the total fuel remaining (based on the original 90 litres useable fuel and the nominated fuel consumption rate) showed that there was sufficient to make YY. It was not until approximately 10 miles from YY that the student became extremely concerned about the fuel state.

Unexpected headwinds, some slight alterations to the planned track, and the failure to lean, eventually combined to result in fuel exhaustion. The engine stopped while on final approach to YY. A successful forced landing was made just short of the runway.

## Vector Comment

Failure to ensure that sufficient fuel reserves (more than the legal 30-minute minimum) were on board, inadequate supervision by the instructor, incorrect leaning of the mixture, and a reluctance to divert to the nearest aerodrome, all combined to cause this incident.

Incorrect leaning of the mixture, unexpected headwinds, alterations to track, and poor fuel log management have led to many a surprised pilot urgently looking for somewhere to land – especially when the flight was planned with minimum fuel reserves.

The insistence by some flight training organisations that, in particular, the engine should not be leaned until above 3000 feet has been implicated in other fuel exhaustion incidents. Student pilots must be adequately briefed on why it is important to lean the mixture at any cruising altitude and how it should be accomplished (refer to the aircraft Flight Manual for advice on specifically recommended engine leaning practices). In addition, they should be encouraged to carry at least one hour’s fuel in reserve, be reminded to dip fuel tanks accurately before every flight, and be taught to keep an accurate in-flight fuel log. It is up to the supervising instructor to ensure that the student does all of these things religiously.

It is also good practice to dip the aircraft fuel tanks accurately after a flight (or at an aerodrome en route) in order to calculate the fuel burnt and thus the fuel consumption rate. There could be quite a difference between this figure and the consumption rate used for flight planning. (Individual aircraft of the same type can have different fuel consumption rates; power settings and altitude will also have a bearing on the amount of fuel burnt.) Whenever you make an intermediate landing on a cross-country flight, always double-check your fuel consumption, especially in an aircraft you have not flown before.

A simple consumption check at either YY or XX could well have prevented this particular occurrence.

Instructors must thoroughly check that all pilot-in-command responsibilities and requirements are met by their students before authorising solo flights. There is a significant risk that assumptions made about a student’s experience, competency, or thoroughness can lead to an incident or accident – for which the instructor can be held accountable. You are largely responsible for your student’s safe flight.

Students need to remember that they are the pilot in command when on a solo training flight, and that common sense must prevail when it comes to in-flight decision-making. If something doesn’t seem right – assess the situation and take action. Once the words “maybe” or “I think it will be okay” creep into your thoughts – beware. It is time to act positively.

The lessons from this incident do not apply just to instructors and students. We should all take note of the need to be meticulous when it comes to flight planning and in-flight fuel management. ■