

Fuel Selectors



Graeme O'Neill, CFI of the South Canterbury Aero Club, recently contacted us to share this scary experience with Vector readers.

I had been in the circuit at night for about 40 minutes, and we planned to do only a couple more before heading back to the aero club.

My student had over 100 hours total time, with some 20 hours on type (PA 28-181) and more than enough night hours to meet the PPL night-rating requirement.

Mid downwind, during his drills, the student said he was “changing from the LEFT tank to the RIGHT tank” – this involved switching the selector from the 12 o’clock to the 3 o’clock position. We continued downwind, and he proceeded to set the aircraft up for the approach.

A few moments later I noticed that the rpm was a little low, too low for a powered approach. My student also realised this, attributing it to having set the power too low for the downwind leg, and consequently he began to open the throttle again.

As I watched his hand moving the throttle forward I was starting to think that very little was happening. There was not a lot of noise coming from up front.

I took control of the aircraft and opened the throttle myself, but still nothing happened. By this time we were well downwind.

The reality of the situation **began to well and truly hit home**, so I turned the aircraft straight for the aerodrome, while carrying out my checks to restore power.

I checked what instruments and controls I could see in the dark, while my student located his torch to check the fuel selector position. I made sure that the carburettor heat was ON, the mixture was RICH, the electric fuel pump was ON, and that we had fuel pressure – but **there wasn’t any**. Before I could suggest to the student that perhaps he had selected an empty tank, or turned the fuel OFF, he had found the problem for himself.



This fuel selector belongs to a British PA28-140 that experienced in-flight fuel selection problems. The selection lever could not be fully rotated to the righthand tank position due to a loose trim screw jamming its tail-end. Fortunately, there was sufficient fuel in the lefthand tank to complete the flight safely. Aircraft fuel selection units certainly do warrant an inspection from time-to-time to check their function and condition.

With a quick turn of the selector handle, engine power was restored within a few moments and a safe landing was carried out at the aerodrome.

From the point of engine failure to when power was restored probably took up to a minute – in that time we had lost 600 feet and were not looking like making it back to the aerodrome.

This experience has been very useful to me. In over 5000 hours instructing I have never experienced an engine failure – and I still haven’t really – it was **pilot failure** (as most are).

I had assumed that my student knew where each tank position was on the selector, which he did, but he somehow got it wrong on this particular occasion – even though he had a reasonable amount of experience on type. I failed to confirm his cockpit check actions because of this assumption.

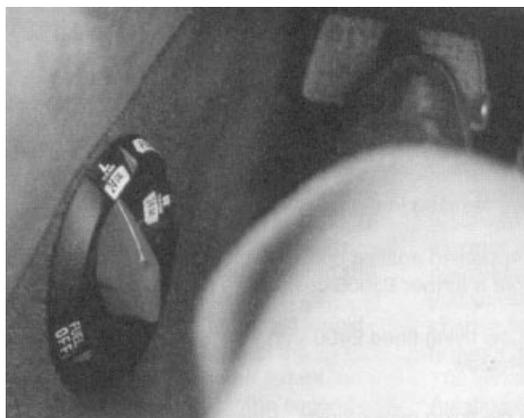
I was unaware of this problem that allowed the detent [a small spring loaded cam device that has to be indented to allow further travel of the selector handle] to be overridden and allow the fuel supply to be inadvertently turned to the OFF position. Perhaps I should have known of such a problem, but as a pilot I have had little need to turn the fuel off, and such failures had never been reported to me in the past.

This incident could have easily resulted in a serious accident was it not for the quick actions of the instructor in completing the engine trouble checks to restore the fuel flow. Inadvertent fuel tank selection, or indeed turning the fuel to the OFF position, is often a causal factor in engine failure situations. This is particularly true for multi-engine aircraft and those with more than two fuel tanks. The more complex the fuel system, the greater the need for pilot familiarity of that fuel system.

If we become accustomed to changing fuel tanks by relying on the ‘feel of the fuel selector lever’ without confirming its position visually (and the Piper Archer in the above incident has the fuel selector out-of-sight by the pilot’s left leg), then we run the risk of making an inadvertent fuel position selection – especially if the fuel selector mechanism fails, or it is dark in the cockpit for example.

We would like to emphasise that **both visual and ‘hands on’** physical confirmation of all control positions when carrying out any drills, or cockpit procedures, is **an absolute must** to reduce the chances of getting something wrong. Cockpit checks should not be carried out in an automatic fashion, but instead require a moment’s thought as to whether the control selection you are about to make is going to achieve the desired result – particularly if you are not especially current or totally familiar with the aircraft type.

We also suggest that it is **not advisable** to change fuel tanks just prior to takeoff, or at any other point where you are so low to the ground that you will be unable to rectify a fuel-flow problem should it develop. Whenever fuel tanks changes are made, the electric fuel pump (if fitted) should be turned ON, and fuel pressure should be monitored after the new tank has been selected. ■



The fuel tank selector on the PA28-181 involved in this incident is located in a position such that it can be difficult to see at night without the pilot having to hunch forward.

Photographs courtesy of General Aviation Safety Information Leaflet.