

Leaning Toward Good Fuel Management

Good leaning practice maximises fuel efficiency, and improves engine performance and longevity. It also contributes to a stress-free journey. But many pilots don't realise how important it is.

"I was doing an overhead join at Ardmore," says Warren Sattler, Chief Flying Instructor with Ardmore Flying School, "when a Stearman close to Clevedon put out a mayday call saying he was losing power and height, and was considering ditching in a paddock.

"I headed in his direction and suggested he try leaning the aircraft out. In doing that, he was able to get a few more revs and made it back to the airfield."

The story the veteran instructor tells is not uncommon. There are plenty of tales, even among experienced pilots, of suddenly finding they had far less fuel than anticipated, or of aircraft suffering what they thought was fuel starvation.

CAA's Standards Development and Training Officer, Carlton Campbell, says pilots trained at a sea level base and typically not operating above 3000 ft, are not leaning the mixture as a matter of course and often don't think about it.

Adjusting the mixture at altitude to maintain the balance of fuel and air in the engine allows the aircraft to perform with maximum efficiency and power.

But if there is too much fuel (over-rich) or too much air (over-lean) the machine will run rough with power loss. Ironically, a pilot with an over-rich, struggling aircraft might think of fuel starvation, pump more fuel through, and make the situation worse. On the other hand, repeatedly over-leaning may damage the engine.

Further, Warren Sattler tells the following story about how leaning can affect fuel economy:

"A few years ago I flew with a student from Ardmore to Whangarei in a Piper Tomahawk at about 5500 ft. The student

did not lean during that journey and while I was expecting us to use about 30 litres of fuel for that trip, we used 52."

While all experienced fliers will advocate the benefits of leaning, the trouble, as Carlton Campbell says, comes when you ask each of them how to do it.

"If you have 60 pilots in the same room you could get 60 different ways of doing it."

The best way to lean will depend on the aircraft. Some will require the pilot to lean by engine sound and reference to rpm, or by monitoring the exhaust gas temperature gauge. Others will allow the pilot to relax because the aircraft will do it automatically.

Both Warren and Carlton say that in the end, pilots should consult their aircraft Flight Manual.

But whatever you decide, make sure that as soon as you come level, leaning is front and centre of your operating practice.

Remember, if you experience sudden rough running and power loss, it might be nothing more than an unbalanced mixture. In these green and money-conscious days, leaning also means less fuel used and maximum range gained.

And finally, leaning is good for the health of your engine. More money saved!

Further Reading

The CAA's GAP booklet *Fuel Management* can be downloaded from the CAA web site, www.caa.govt.nz, or for printed copies, email: info@caa.govt.nz. ■

