

## SUPER CONTAMINATION

At our airfield there is a quite new Eurofox with a Rotax 912ULS having only about 150 hours, which is shared by three friends. Recently it was refuelled from almost empty, which resulted in the two wing tanks being refilled while the 5 litre header tank behind the seats retained the left over fuel from the previous filling.

Recently one of the three pilots decided to go flying and for whatever reason, he spent quite a long time on the ground with the engine running before getting airborne. Shortly after take off and during the climb out the engine started to lose power and could hardly maintain 4000 rpm, so he made a quick return to land safely, whereupon the engine died and couldn't be restarted. The aircraft was pushed back to the hangar and thereafter further attempts to get the engine running proved fruitless.

The next day I was requested by the Eurofox group members to investigate possible causes. Each time we tried to start the engine, which would only fire up with choke applied, it ran for about 5 seconds and then died. I was standing to one side during these attempts and could easily see that whatever was emanating from the exhaust wasn't simply unburned fuel, but was much whiter and making wisps of steam just like a kettle.

Further investigations were made to eliminate various causes and it soon became obvious that the fuel system was clean and unobstructed from one end to the other with full flow delivery to the carburettors. The ignition systems were perfect, airflow was unobstructed, compressions were perfect, coolant level was fine with no suggestion of leakage into the cylinder heads, oil system and everything forward of the firewall was excellent.

We then did fuel testing in a graduated glass tube, which disclosed that the fuel was an unusual straw/yellow colour and that the test for ethanol was inconclusive. Also when shaken, there were a lot of foamy "soapy" bubbles at the interface between fuel and water, which took 10 minutes to dissipate. I queried the fuel colour which was different from the usual clear appearance of regular unleaded and was somewhat surprised to find that the group was using Super Unleaded, in the misplaced belief that it contains less/no ethanol.

At this stage I phoned the excellent Rotax guru Kevin Dilks, who unhesitatingly assured me that the fuel was contaminated. This was met with some disbelief by the group members and others. I also consulted Andy Draper at the LAA, who advised me that while it is permissible to use Super Unleaded, it also contains ethanol and he can't see any particular reason for its use in a Rotax 912.

The main tanks were switched off, the header tank drained and filled with fresh ordinary unleaded fuel. After a couple of attempts the engine started and ran beautifully. Thanks again to Kevin for saving the group a lot of expense and anguish.

The petrol station from which the Super Unleaded fuel was purchased doesn't have as great a sales turnover as a nearby supermarket and I suspect that its turnover of expensive Super Unleaded is almost zero. This all goes to emphasise the importance of the original concession to use unleaded fuel, which stressed buying fuel from a high turnover source !

