ENGINE RUN-UP AND ASSOCIATED ROUGH RUN

Rough engine run during aviation piston engine run-up is quite common. Reason is the formation of the lead and soot deposits on engine spark plugs. Most common cause for the formation of deposits is flight with unleaned mixture (traffic circuit, forced landing- and stall exercises)

Rough run occurs most often when testing magnetos. Engine starts to run roughly and shakes, engine sound starts to pop and crack. RPM often drops below maximum allowed.

Usually spark plug deposits can be removed and proper engine run recovered by running engine at high RPM and leaning mixture to reach highest cylinder temperature. Following instructions are of general nature and based on experience. Before attempting deposit burn-off, always refer to your aircraft flight manual for more detailed information!

Spark plug deposit burn-off:

1) Set mixture rich
2) Ensure, that the aircraft will not move during run-up (icy or wet surface) Set RPM ca. 400 rpm higher than normal run-up (typically 2000-2200 rpm)
3) Lean mixture by using fuel flow, EGT indicator or tachometer to the highest rpm value
4) Keep high rpm for 20...40 seconds
5) Set mixture rich and set normal run-up rpm.
6) Redo engine run-up. If rough run still appears, you may redo deposit burn-off. If second try will not recover smooth engine run, cancel flight and contact service!

MIXTURE LEANING DURING FLIGHT

Fuel economy and reliability of aviation piston engines can be greatly improved by leaning fuel mixture during flight. Leaning can be done by using fuel flow indicator, exhaust gas temperature indicator or engine rpm. Following instructions are of general nature and suitable for Cessna 150/152/172 aircraft. Consult your aircraft flight manual for more detailed information!

In TTT - Aviation operations, mixture shall be leaned except during traffic circuit flights.

LEANING BY USING ENGINE RPM

After reaching cruise flight with proper power setting, pull mixture knob carefully backwards and monitor engine rpm. When reaching highest rpm, turn mixture knob ca. half a turn towards rich mixture to reach "best economy" setting.

LEANING BY USING FUEL FLOW INDICATOR

If your aircraft is equipped with a fuel flow indicator, consult your AFM to find correct power setting and corresponding fuel flow. Set correct fuel flow by using mixture knob.

LEANING BY USING EXHAUST GAS TEMPERATURE

If your aircraft is equipped with an EGT indicator, use the following procedure: pull mixture knob carefully backwards and monitor EGT indication. When reaching highest EGT, turn mixture knob ca. half a turn towards rich mixture to decrease EGT 25-50°. This is the "best economy" setting.

ATT! When leaning mixture during flight, use mixture knob carefully. It is possible to pull setting knob to "mixture lean" and to stop the engine accidentally. When leaning, the movement of the mixture knob should be ca. 5 cm from full forward position.

Approved for operational use 15.8.2011

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