Solving Propeller/Aircraft / Engine Performance Problems:

Solving the difficulty

➔Incorrect Static or Level Flight RPM Readings

- Have customer verify TACH readings

  - Mechanical Tachometers are notoriously incorrect, sometimes by as much as 2500 RPM.

  - Verify by the use of a digital or optical hand held TACH.

    - A "VIEW-THRU" or "PROP-TACH" are good choices.

    - Local FBOs generally have a way in which to help a customer check their tach.

- During the TACH verification have the customer try the following:

  - Try to lean the engine. A small amount of leaning should increase the static RPM. If the engine quits after a small amount of leaning then the engine is running to lean. If excessive leaning is required then the engine is running too rich.

  - Pull Carb heat on. If functioning correctly, this should cause a small drop in RPM due to induction air being heated. . If the engine should quit after Carb heat is pulled on then the engine is running to lean.

- Have customer verify that INTERNAL engine timing is correct.

  - Incorrect internal timing can cause serious performance problems such as low Static but correct Flight RPM.

    - Remove upper plug from cylinder #1

    - Remove rocker from cylinder #2

    - Rotate crankshaft until cylinder #1 is at Top Dead Center (TDC)

    - Looking at cylinder #2 rocker arms, rotate the propeller back and forth. You should see one valve opening and the other closed when you rotate in one direction and the opposite value open when the propeller is rotated the other way. This is the overlap area.

    - If the propeller has to be rotated more than 20 degrees to either side of TDC then the timing gears are one (1) tooth out of time. This must be corrected prior to any further diagnostics are performed.

- For **EXPERIMENTAL AIRCRAFT,** have customer verify the following additional checks:

  - Insure that the throttle is connected properly, ie. Does the throttle value open fully when the throttle is the the full RPM position.

  - Insure that the induction system is functioning properly, ie. is the carb heat closing properly (don't want inadvertant heating of the induction air because this causes power loss) or are there any blockages in the induction system.

  - Is the engine fitted with the proper carb. Each installation requires a certain carb and settings based on induction system, exhaust, etc. Have the customer check with the Kit manufacturer (1^{st}) and Lycoming (2^{nd}) to verify proper components.