T-41C Special Instructions

- The engine requires more manual adjustment of the mixture than the typical general aviation airplane. In May 2018, we replaced the engine driven fuel pump that had a pressure-driven aneroid. This older model may have helped adjust the fuel flow during changes in altitude. This much newer model does not have this feature. Perhaps for this reason, as well as other engine design decisions, pilots need to work a bit harder than "normal" to keep the mixture adjusted. With the warmer weather frequently giving us 2,000' density altitudes, the mixture must be leaned a bit for normal takeoff and climbout. Turning the mixture knob four times through 180 degrees (half-turns) seems to be a good estimated setting for these atmospheric conditions. The most accurate setting is really done with the Exhaust Gas Temperature (EGT) Gauge. An approximation of peak EGT is shown in the gauge below by the red needle.

This needle is pilot adjustable and may be set as a reference, and it seems to be quite helpful if used for recording peak EGT. The small tic marks on the scale represent 25 degrees F, while the largest marks indicate 100 degrees F. These older Continental (and Lycoming) engines have similar operating characteristics. Maximum power occurs at 125 – 150 degrees rich of peak EGT. So, if the red needle is a good reference, maximum power should occur with the white needle at about the third tic from the left (low end) of the scale. This engine doesn't seem to suffer from easy overheating, but if that is a concern, you could make the mixture a little richer (another 50 degrees perhaps) to aid in engine cooling. This change would put the white needle at the first or second tic from the left.

This gauge is your primary reference to ensure that the engine is running neither too rich, nor too lean. Pilots need to cross check the gauge either when beginning takeoff or

immediately after becoming airborne. Operating within approximately 100 degrees of peak at high power settings can induce detonation and ruin the engine in a matter of minutes depending on how high the RPM is. As another cross-reference, you should see the fuel flow gauge display about 15 gallons per hour on takeoff and initial climbout.

Leaning for cruise is accomplished normally by turning the knob counter-clockwise until peak EGT is reached. This is a little bit of a challenge to get exactly correct. In this airplane, you will notice a large change in fuel flow as you lean the mixture. While doing this, engine power will decrease a bit and the RPM will drop by 50 – 100. The aircraft will also slow a little, further decreasing RPM since this airplane has a fixed-pitch prop. Through some trial and error, it appears that 2500 RPM, 5 gallons per hour fuel flow, and an EGT setting of 200 degrees from the bottom of the scale provides a nice cruise engine setting.

The fuel flow gauge most likely reads 2-3 gallons per hour too low. So, don't use those displayed numbers to change your in-flight estimates of your burn rate. The best current estimate of the burn rate for the settings above is about 7.5 gallons per hour. If you increase the RPM to 2600, you may see a burn rate closer to 9 gallons per hour and a slightly higher EGT. Let us know if your experience is different.

When returning to the pattern, set the mixture as you would for takeoff. This may mean leaning a little. Again, keeping track of how many times you twist the mixture knob will help you set the mixture quickly.

- The next major difference is not surprising given the engine's 210 HP rating. When leveling off, pilots must take care not to overspeed the engine. Climbing out at Vy (95 MPH) at full power, expect to see 2600 RPM. After level-off at full power, it may only take 20-30 seconds to accelerate to 2800 RPM (red-line). Clearly, exceeding this ops limit is a major concern for a long list of reasons. Pilots may want to consider reducing power slightly during level-off to lessen the possibility of overspeeding the engine.

- This airplane's stall characteristics are more similar to a somewhat higher performing aircraft than a training aircraft. If the pilot does not recover at the first indication of an aerodynamic stall, a rather abrupt right wing drop will occur from a level, straight ahead stall. If a pilot were to make the severe mistake of using rudder into a turn, aileron away from the turn (cross control), while running the airplane out of airspeed and stalling it, the airplane will drop off into the beginnings of a spin with the nose pointing nearly straight down. If this happens and recovery is initiated immediately and skillfully, the

plane will lose at least 300'. This scenario has happened during turns from base to final in many aircraft, often with fatal consequences. With just a bit of training and experience this scenario is easily avoided. The airplane's controls feel very sloppy approaching stall making it easy to be aware of the slow airspeed, which, in turn, allows an early recovery. Unfortunately, the stall warning horn, while functional, is difficult to hear. Any demonstration of these stall/spin characteristics is only to be conducted with an instructor.

- The Garmin COM/NAV instrument is very difficult to read in bright light, either direct or reflected. In bright light, you may want to make COM 2 your primary radio. If you do, currently, the strobes create a distracting noise over the intercom.

- If you fly solo, use a container to catch the fuel that you drain from the fuel strainer. Do not just dump fuel onto the ground. Don't forget that there are 5 places to drain fuel from when you do a preflight.

- The T-41C is normally parked close to the fuel pump so that pilots may easily use the ladder to check the fuel levels and put clean fuel back in the tanks after draining from the fuel system during preflight.

- The oil access door on top of the cowling must be opened by a standard screwdriver. There should be a bit for this in the small fuel tester in the box in the baggage compartment.

- The VOR and localizer instrument on top (NAV 1) works very well. All the controls are on the instrument itself, not with the communications radio.

- The tire pressures should be about 32 psi. The maintenance manual recommendations for the mains of 24 psi and 26 for the nose are too low.

- Idle RPM is set at about 700 RPM for a properly leaned engine. This setting is consistent with the maintenance manual and is different than the -1 (POH) ops limit of 850 RPM.

- You may need to use the throttle friction adjustment to keep the throttle from creeping closed at higher power settings.