



“Serving to Serve Again”

**RECOMMENDED ENGINE PROCEDURES FOR  
AN O-470-U/TS, O-520-F/TS, O-520-U/TS  
AND O-550-F/TS**

**Care:** The care of the engine is basically the same as a 0-470. The oil and filter should be changed every twenty-five hours after break-in. The break-in period, about fifty hours, should be operated with 50 weight mineral oil. This oil should be changed at about 5-10 hours, 15-25 hours and again at 50 hours. At fifty hours, start using Ashless Dispersant (AD) oil of 50 weight. We recommend single grade oil rather than multi-viscosity. Always use aviation grade oil. Never use automotive oil.

**Starting Engine:** Use the same starting procedure as used with the 0-470. It is all right to prime the engine if necessary. A good priming procedure is to use the throttle. Start the engine turning with the starter. Pump the throttle while the engine is turning. When you have enough fuel in the cylinders, enough priming, the engine will start.

Allow the engine to warm at not more than 1400 RPM. Run it fast enough to be smooth. The carburetor is set very rich, the same as the 0-470 carburetor, only more so. Proper leaning will assist in smooth engine operation. Consult your Cessna Pilot Operating Handbook for further leaning information while on the ground.

**Taxiing:** Heat is the enemy of your engine. Avoid excessive ground operation if possible. The engine cooling depends upon airflow through the cowling. Not enough air comes from the propeller. The engine needs ram air to pass through the cowling in order to cool properly. After the coolest cylinder reaches about 200°F, the engine is ready for full power.

**Pre-take-off Check:** Mags may be checked anywhere above 1400 RPM. Lower RPM will produce more noticeable vibration if a cylinder is completely dead on one mag. Higher RPM will show more mag drop in the event of a weak mag or dirty plugs.

When carburetor heat is applied during the pre-flight check, the engine will probably become very rough. That's normal. The mixture becomes even more rich when carb heat is applied. This means the carb heat is working. If you want the engine to run smooth with carb heat on, lean the mixture.



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**Cycle the Propeller:** The propeller dome should be full of oil in order to have proper propeller control. This is why you cycle the propeller. During periods of non-operation, the oil drains out of the prop dome, back into the engine. To start a take-off roll without oil in the propeller dome will cause an unpleasant surge of the propeller.

Here's what happens. The prop control is set for take-off, 2700 RPM. You add full throttle; the engine accelerates to more than 2700 RPM before the prop governor tries to control the over-speeding propeller. The governor sends more oil to the prop dome, the propeller blade angle increases, too much, and the RPM decreases, probably too much. One or two surges and everything is back to normal.

No, you didn't hurt anything. Cycle the prop ONE TIME before take-off. If it operates one cycle properly, it is ready to fly. Don't try to see how low the RPM will go. That's bad for the engine. You are lugging it. Just be sure the prop RPM decreases 100-200 RPM. That's enough.

**Take-off:** Not only do you want to "Check Density Altitude", you may want to "Lean for Best Power".

Apply full throttle. Use 3-4 seconds for full throttle from idle. Remember, the mixture is deliberately set rich, to keep the engine cool. Keep the throttle fully open while you are taking off and any time you are climbing. Retarding the throttle will close an enrichment valve in the carburetor. This enriched fuel mixture helps keep the engine cool. Leave the throttle open, all the way. Retard the throttle if you are going too fast.

When the engine becomes too rich during your climb, remember you probably have full rich mixture and the throttle fully open, use the mixture control to achieve smooth operation. Too rich is when the engine "stumbles" or loses power because it is too rich.

Again, the engine operates and is controlled the same as a 0-470, only more so.

**After Take-off Climb:** The airplane will probably climb best at about 100 KIAS or 115-MPH IAS. No, that isn't what the POH said, but give it a try. Also, this will change with different flight conditions and gross weight. You will also be able to see over the nose much better.

The take-off and initial climb should be made at 2700 RPM. After a comfortable and safe altitude is reached, reduce the RPM to 2600. Stay with full throttle. Remember; climb with full throttle for better cooling. After more speed and altitude is attained, reduce RPM to 2550 and later 2500.



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**Cruise:** The engine RPM should be from 2400 to 2500 for normal cruise. If you want to fly slower, reduce the power with the throttle. Maximum engine efficiency and "torque" is achieved at 2400-2500 RPM.

Lower RPM means greater propeller blade angle. This gives greater blasts of air against the airframe. Sometimes these blasts "puffs" of air against the airframe causes undesirable harmonic vibrations. Higher RPM "less blade angle" usually gives smoother operation.

From take-off to cruising altitude, you have gradually reduced engine RPM from 2700 to about 2400-2500. Yes, this is different from the 0-470. You probably noticed the takeoff and climb was also different. But, we are basically controlling the engine in the same manner. The power settings are different.

You have probably leaned the mixture one or more times. Now you want the most speed for the amount of fuel burned.

**Leaning Procedure:** A good rule of thumb, "*lean it until it gets rough, then richen it until it gets smooth, then just a little bit more*". If you do this at 8500', full throttle, 2400 RPM, the engine will be using about 14 GPH. I won't argue with 13-15. Most 520 and 550 engines will be in this area of fuel burn.

Most of us have heard that we should run the EGT 100° Rich of Peak. That is true in some instances, but not all. If you are operating the engine at low power settings, as in high altitude, and peak EGT is only 1200°F, you would then be operating at 1100°F EGT.

It is not "Peak" that burns up a cylinder. It is "High Temperature". The manufacturer says to not exceed 1600°F EGT. We have set the carburetor very rich and probably you can't get to 1600°.

If you have a six probe EGT system, lean the engine and watch for the EGT's to stop increasing and start to decrease. You have found "Peak". If peak is only 1400°F, you probably should stay there. Remember 1600 is maximum. Normally the engine should be operated at 1475°F or below. At higher altitude, the temperature will not be that high. Run closer to peak or at peak.

**Descending:** When descending for prolonged periods of time, keep the engine pulling by decreasing RPM. Reduce throttle to control speed, richen the mixture to maintain proper EGT. Close the cowl flaps to maintain proper CHT and oil temp. Do not fail to richen the mixture. With the reduced throttle setting and increased air to the engine at lower altitude, the engine may stop running. Richen the mixture for restart.



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**Landing:** Upon Reaching Traffic Pattern altitude, gradually increase engine RPM with the prop control, to maximum RPM. Open cowl flaps, switch to fuel tank as per POH and be prepared for a full throttle go-around. If you are landing at an airport with high field elevation, again check density altitude and lean the engine for best power if a go-around is required.

**Taxiing:** Again, it operates the same as the 0-470. Consult POH.

