

How to operate your geared Lycoming aircraft engine

Editor's note: The following article, by Chris Schuermann, was found on the Aero Commander Website (www.aerocommander.com). It appears to be a valid document that carefully explains the proper way to operate a GO-480-B engine. If these rules are followed, the engine will last a long time. The editor highly recommends operating the GO-480-B as described below. My thanks to Chris for sharing his knowledge.

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The Lycoming geared engines have acquired a bad reputation over the years - quite undeserved. These are very solid, reliable engines, but only if operated correctly! If operated like the engine on your Cessna, they have a tendency to be quite short-lived and very expensive. Treated with tender care and flown by someone, who knows how to operate the engine, they reliably make TBO time and time again. So, here are my tips to make TBO:

This information has been derived from MANY conversations with MANY very knowledgeable people including freight operators, air-taxi seaplane pilots in Alaska, Lycoming engineers, and Aero Commander "old-timers" from Oklahoma City. Many Lycoming shops have verified this also.

In a nutshell, the secret to long life of your GO-series Lycoming is to NEVER EVER let the air turn the prop! Although the Lycoming planetary gearbox is pretty stout, things really begin to bang and clatter if you don't have a solid, positive power setting.

→ **ALWAYS keep the manifold pressure up.**

You'll be able to hear the gearbox "whining" if you come down final at too low a throttle setting.

→ **Don't push the prop levers forward upon arrival at an airport.**

I know this probably goes against everything you were ever told by your instructors, but when running a GO-series engine, you'll be doing the gearbox a BIG favor by keeping the RPM back to 2700-2800 until landing. If you need to go around, it's perfectly safe to advance the throttle fully before bringing the RPM up – unless you're running a "blown" (turbo-charged) engine. ie: GSO-480, etc.

→ **Keep your idle speed up.**

Much below a 1500 RPM idle will "chatter" the gearbox causing VERY rapid wear of the outer planetary "ring-gear". This is a horribly expensive part to replace by the way. Last new one I found was \$3500!

→ **Move the throttle levers VERY slowly!**

Lycoming recommends a MINIMUM of 30 seconds from fast idle to takeoff power. FOLLOW THIS RULE! When going the other way, go even slower :-)

→ **If your GO-series engine has a Bendix pressure carburetor...**

...Follow the operator's book: maintain FULL power during climb. The Bendix carburetor has an "auto-rich" compensation circuit that allows the engine to run rich at full throttle setting. If you pull the throttle back during initial climb, the carburetor goes "auto-lean" and you will risk over-tempering the engine. Again, follow the book!

→ **Fly often**

This is the single biggest killer of any aircraft engine in my honest opinion. Lycoming engines especially, suffer greatly from non-use. Corrosion on the cam lobes, cylinder rust, and valve damage occur rapidly on engines that don't run frequently.

How to tell if you need an overhaul

There is a Lycoming service bulletin that specifies an allowable play measured on the prop. You are allowed 1/2" play at a location 4 feet from the center of the prop (radius). Just take a tape measure, make a pencil mark at the point on the blade 4 feet out from the center of the spinner. Place the tape measure on the ground with one prop blade in the horizontal position and measure how much "slop" you have in the gearbox. Having been through several gearboxes, there is another issue that I have noted. If you have a distinctive "stop" at each end of the range of movement of the prop, then chances are that everything in the gearbox is OK. If there is more than one "clank" or contact when moving the blade around, the plate that holds the stationery gear may have partially sheared the attach bolts. Worn gears are not going to self-destruct, but if that stationary gear shears the bolts, then the whole gearbox may come completely unglued! Although I have not witnessed this myself, I have heard that it can be pretty exciting.

A "CW turn-clunk, CCW turn-clunk" check is always part of my preflight.

So, there you have it. Follow the above steps, and you will have a happy motor. I won't guarantee TBO, but I can assure you that your next overhaul will be much cheaper if you don't have to replace everything inside of that expensive nose case!

Chris

PS: If you are the owner of a geared Lycoming, please drop me a quick note and tell me the model (ie: GO-435-C2B2) and what it's installed on. I'm trying to make a table that might be useful for those of us trying to find parts!