

Hi Cub drivers,

The following are a few notes on operation of the Cub, penned by Ian Wayman with just a few edits from me and from Mike Donnelly. I'd very much appreciate your attention to this, it's a different and very useful perspective. How will you change your behavior after reading this? I suggest you make a note of it.

■ Jim Densmore, 11 July 2015

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Opening the hangar. It's nice to have the lock facing with the numbers up. In order to accomplish this, the last person locking the hangar would have to install the lock through the hole from the left to the right. It's one of those little things.

The airplane will hopefully be wiped down to a presentable condition. That is, the windshield cleaned and the oil wiped off from the boot cowl forward and the leading edges cleaned of bugs. One of the reasons I like to start with a clean airplane is that if you develop an oil leak or gas leak or other leak of some sort, it should be more obvious on a clean airplane. If the airplane is an oily mess, you may not notice a potential problem developing. It also looks better when a "civilian" comes out to watch the operation.

I like to see the handheld radio pouch on the tail. It reminds me to grab the radios for the ground crews (I have a good memory, it's just really short). Hopefully the handhelds were placed in their proper chargers (two of the same Icoms go into the charging mounts, the others use the small plug). Make sure the radios are off when you bring them to the hangar at the end of the day in case the charger doesn't work for some reason. That way they may be still usable for the next day.

During your preflight, make sure if the airplane is fueled previously, that the vented gas cap on the left wing is facing forward into the airflow. That provides a little positive head pressure for the fuel system. To do otherwise could suck the fuel out the vent during flight. Which would really suck!

This is a good place to talk about the hinged right side window, which of course is heavily used. When lifting and latching the hinged window, please open the latch on the bottom of the wing with one finger while engaging the window frame. We are often finding the latch assembly bent. This means that some pilots are slamming the window frame into the little latch. If this continues, we will continue to bend the latch assembly at the wing and eventually snap it off, or at least continue to bend it out of adjustment. Another result is that the window comes down on top of your hand or your head. It's happened to me a few times. Let's be careful with that latch.

After your preflight you hope that the previous pilot did not park the Cub main gear in the depressions in the asphalt. The airplane has plenty of room in the hangar even when parked slightly forward of those wheel depressions, but it is much easier to get it rolling out the hangar if it is NOT in those holes. When you park it for the end of the day, try not to put the chocks behind those holes so that it stops prior to rolling back into those holes. Then remember ... a chocked airplane is a happy airplane (even when inside the hangar).

Mike reminds us here that when clamping the tow bar to the tailwheel axle bolt, please put the clamp close to the wheel AND put the jaws of the clamp completely over the tow bar so that it does not pop off. Some pilots put the little rubber yellow pads on the tow bar tubes themselves. The clamp can come off in that position.

Depending on the temperature, I usually give it one or maybe two pumps of the throttle in the morning on the first start, and start it with the throttle just barely cracked. As soon as it starts you should not see more than about 600 RPM or so until you have good oil pressure. Keep it at idle for a few minutes before you add any power. Throughout the day when you are stopped and waiting for a tow, or when not needing thrust, or just after starting it during the day, the power should be at IDLE. It's better for the engine and it saves gas and it will pick up fewer rocks into the prop. To start it throughout the day in between tows, I give it one pump of the throttle and just crack the throttle for the start. No pumping, no high throttle setting. Once it starts, make sure you are on the idle stop. If you JUST shut it down, no pump is required.

(If you have a starting method that works consistently for you, great. However, if it involves lots of throttle pumping and/or starter grinding, then it's not working for you. Give this a try please. –Jim)

The carburetor on this airplane is NOT adjusted correctly. I have flown it in the full rich position all day and it never loads up the plugs. So based on that information I am very conservative with the leaning. I never lean it more than about a single finger width. We work this little thing hard, and I would rather have a little richer mixture than too lean. It might cost a little more gas, but it will run cooler which is better for the engine than running hot. I also monitor the #3 position on the EGT/CHT gage. It seems to be about the hottest reading. The mixture at full rich should be loading up and fouling plugs like crazy at our altitude. But it doesn't. The idle mixture is off too. From a full rich position at idle to idle cut off should get a rise of at least 50 rpm or so. It doesn't do that either. So the thing is too lean as it is. Mark D suggested a finger width on the mixture during climb which gives about 30-50 rpm rise. I HIGHLY recommend NOT leaning beyond that.

I see as much as 230 degrees on the oil temp, and 470 on the hottest cyl (#3). 230 is high but it is within limits. We normally see over 220 only on a hot day. Bottom line, if the oil gets too hot then ask the glider to release in a safe location and let the oil cool. Check the oil level upon landing and add a quart if necessary. The 470 is much too high, but we do not believe this is the real temperature. Given the physics, though, it should be proportional. You can use the CHT as a relative guide.

When I see and feel the glider release I immediately slip the cub and pull the power back only slightly. I try to keep the rpm about 2500 initially and am in a full slip with no flaps at this time. Always be gentle with the power reductions at this point. It's an air cooled engine and big power changes after a hot climb are very hard on it. Bring the power back about another 100 rpm after a minute or so, and then repeat. That is, ~~keep it out of the caution range where there is an engine harmonic [see next paragraph for why this is lined out]~~, but back it down slowly as you are able to prevent shock cooling. I am usually back down to about 8000 feet on the altimeter when I get to just above the yellow caution rpm range. At this point I usually transition out of the slip, pull the rpm to 2000 (through and below the yellow caution range) and go to full flaps.

Mike informs me (7/11) that according to the engine rebuilder, the engine/crank no longer has the RPM restriction shown on our tachometer. This restriction exists on many of these engines, but according the overhauler, there is no RPM restriction on our serial number. Mike says that the Cubs at the Academy

do not have the caution range on the Tach either. That means that in the context of the preceding paragraph, you can simply back the RPM off about 100 RPM every 20 seconds until you're down to 2000 RPM and cooled down, slipping as you descend (which prevents speed buildup which keeps the airflow low; if descent rate is such that you take 2 minutes to get to 1000 feet AGL (from 3000), the "math" works out. This is about as kind as we can get to this engine in terms of cooling shock.

One other thing you can do during the descent: I (Jim) pull the mixture back until I actually lose 100 RPM at 2100 RPM, that is very lean. Ian notes earlier that we are not getting carbon buildup, so not sure this is necessary but I run very lean in descents on all airplanes, especially at altitude, so I maintain this habit. If you do this, don't forget to enrichen the mixture before landing so that you have full power available for any necessary go around.

(Back to Ian now!) I fly the approach at about 45 indicated if it's not in gusty conditions. The airspeed will be sensitive to vibration especially during the descent and go full scale speed. That can be fixed by grabbing the instrument panel by the airspeed gage. By grabbing the panel with your right hand, it stops the vibration and the airspeed will read properly.

Do not wheel land the cub on the turf strip. There is no need to, and in fact it's much harder on the airplane and its gear. You are going to pound along the runway for a longer time and you might have more weight on the gear as it is pounding along on the turf. You will be pounding the gear for a longer distance and longer time. That equates to more abuse on the poor airplane. You should be doing full stall landings for the gears sake and the brakes sake much less every other little bolt and nut and wing fitting and.....

The goal is to get it done with as little gas and as little brake as possible.

When I approach the glider for a tow, I like to taxi close enough so that the ground guy can grab my rope close to my tail. A good ground guy/gal will have you taxi while they are near the wing tip of the glider. That way, when they stop you and then hook up the glider, the rope will be pointing out towards the glider wing and that makes it much much easier to taxi forward and remove the slack in the tow rope by looking at it in the mirror. It's a good idea to try to brief your ground handler about this if you remember.

That briefing also can help with this: we need to teach the ground handlers to try not to make the tow plane stop when he comes to get the rope. It's easier on the prop and everything else on the cub if we can just taxi in front of the glider and keep that momentum going to near the starting point.

When you get gas, I recommend because of this crappy (read unpredictable Colorado winds) weather, that you park the cub at the gas pit so that if it decides to roll around on its own, the wings will miss the gas pumps. If you park with the wing abeam the gas pump area, it should not be able to crash into the pumps. Here is where some common sense goes a long way to preventing wing tip damage.

When I bring the airplane back to the hangar I try to remember to make sure the Mag switch actually shuts off the mags. When it is at idle, I momentarily kill both mags just to make sure they work properly. I will then do a normal shut down using the idle cut off. I have noticed lately that it doesn't shut off well and sputters a bit. All you need to do is add a little more air by advancing the throttle a little. That will help it to shut down better if it's still popping along.

If you need help, did you remember to get someone to come over and help push the airplane into the hangar? If so, you should be the guy steering. Use the quik grip clamp so that its bar is above the tow bar and isn't prone to coming off. Don't clamp down too tightly using the quik grip, it wears the tailwheel itself.

Now you can wipe her down (including the bugs on all the leading edges) and get her ready for the next guy. Fill out the notebook with the start and stop times and the tach time when you fueled it would be nice. If it's totally full or totally empty, it is hard to tell on the fuel gage. Include any squawks you may have noticed.

Closing the hangar door, Mike reminds us that when closing the South side hangar door, do not "slam" it into the cupped metal receiver on the door jam. This bends it open, at which point it will not keep the last section of the door closed. Several times the door section has been found open due to bent metal.

Remember, try to treat it like it was your airplane.

Happy and safe flying!