

Aircraft Locations

- Arrow 31386 CHD
..... T-Shades; Spot #2

- Archer 47601 CHD
..... T-Shades; Spot #10

- Comanche 9014PDVT
..... West Hangar #7-12

- Archer 30749DVT
..... East Hangar #9-9

The next rotation of the Arrow and Comanche will be in early January.

Maintenance

BOB SKALKA

30749

- Overhead light cover missing
- Cracked interior plastic in several areas
- Oil changed
- Flaps sticky on retraction during preflight

31386

- 100-hour AD's completed
- Replaced both main gear indicator switches

47601

- Battery replaced
- Engine maintenance completed; break-in period nearly complete

9014P

- 100-hour AD's completed
- Flap position indicator only shows half down when fully extended
- Oh, and the windshield still leaks

Our newest members

We wish to welcome our two newest members to the club, Eric Roesler and Curt Gilman. Eric attended a couple of board meetings and decided he liked what he saw. He will be flying out of CHD as a student pilot. Curt moved to Arizona from Virginia a couple of years back. He received his Private certificate last summer at Westwind.

Next board meeting

The next meeting of the board of directors will be held at Chandler Municipal Airport in the pilot's lounge on Tuesday, November 28th, at 7:30 PM. As always, members and guests are welcome to attend.

Mike Quill solos

Al Galvi reports that Mike Quill has completed a first solo flight in October in N47601. Congratulations Mike. Now the fun really begins. Well done.

Economical engine operation

BOB SKALKA

A member asked if there was any club information on engine operation for best economy. The question came to me and I offered to do a bit of research. What I found out is that there is not really much to it, at least from the very tangible point of fuel consumption.

Without a doubt, all other factors being equal, the best fuel economy, miles per gallon, is obtained when the engine is operated at 55% power and leaned to peak EGT. That should not be surprising to anyone. The airspeed versus power curve is not linear at any given altitude. An Archer at 8000' MSL on a standard day will see an airspeed increase of only 20% when the power is increased from 55% to 75%, a 36% increase in power; however fuel consumption increases by 40% for that power increase. Those percentages will be typical of all our aircraft.

All of that is interesting information but, most of us fly to go fast. Flying is not cheap and the delta cost for fuel to go faster is probably not going to make or break the organization. It is my recommendation that you use the highest power setting possible up to 75% for cruise and that you properly lean the engine to maximize the efficiency at that cruise setting. There are other factors that have an impact on engine life and operating cost beyond the power setting that we can all observe without sacrificing speed. **Continued on back page ...**

The Safety Corner

ROD JOHNSON

There are benefits to the panel mounted GPS that may help save your butt someday that we don't often think about. And I'm talking about using a TSO'd, properly installed, IFR GPS. The type we have in three aircraft.

This one is for the IFR types or those working on their instrument rating. We're all supposed to be competent in flying a no-gyro, non-precision approach. In fact you would expect that on an instrument practical test. Try this sometime.

First, fly a non-precision approach (GPS, LOC only, VOR or whatever) with both the attitude and directional gyros covered and the GPS engaged and activated for the approach you're using. It is difficult, but as usual the GPS guidance provides a ton of situational awareness that pretty much eliminates the need for timed turns, glancing up at the whiskey compass less, not more, and generally establishing exactly where you are and where you're going. What a tremendous benefit in a pretty dire situation if it was for real.

Now do the same approach without the GPS. What a whole different story! So, God forbid, if you lose your vacuum gyros in IMC and you have one, thank your good buddy, GPS. It would probably be a little dicey to try and select and activate an approach while in a no-gyro state, but if there is no other real choice, it has to be worth the effort. You might practice that also. Remember, with no gyros, heading hold on the autopilot is probably useless, but the NAV function might help. Finally, remember if you lose vacuum in IMC to **cover those gauges up! I say again, cover them up! It is a real emergency!**

Happy Flying

Thank you, Copperstate volunteers

Thanks go out to Bob Ballou, Damon Kelling, Matt Kerby, Hutchinson Persons, Bob Skalka, Dan Streufert and Neil Tracht for their assistance during the Copperstate fly-in. It's appreciated.

Economical Engine Operation

Continued from front page ... Leaning of the fuel air mixture will definitely have a big impact on fuel consumption. For instance, the Archers running full rich at 75% power will consume about 14 GPH. Compare that to 10.5 GPH when the mixture is properly leaned. All of our aircraft can be leaned when they are producing 75% power or less. You can start leaning when the aircraft has passed through 5000' after takeoff, but since the engine is still producing more than 75% power don't be overly aggressive. Make sure that you stay at least 100 degrees on the rich side of peak EGT. It is important to not run our engines on the lean side of peak. We do not have the instrumentation necessary to do that. I typically use 50 degrees rich of peak for cruise and about 100 degrees rich of peak for full power climb above 5000 ft.

Although the engine maintenance that was recently performed on N47601 wasn't attributed to any pilot-induced abuse, the question I received on economical engine operation led me to consider longer term economical considerations for engine operation that all members should be observing. I offer the following:

- Starting the engine – You should have your starting technique honed to where it starts quickly each time. Excessive cranking wears out the starters. You should also be able to start the engines with a minimum throttle setting. There is no lubrication in the engine when it first starts. If it starts at a high RPM, there will be more wear of the cam and lifters. This is one of the reasons preheat is a must when the engine is very cold.
- Engine warm-up - This isn't much of an issue in the summer in Phoenix, but when the weather is cool, give the engine some time to warm up before taking off. The oil temperature should definitely be in the green before applying takeoff power.
- Power change management – All throttle settings should be made gradually and in increments whenever possible. Temperature changes due to abrupt power changes can cause cracking in the cylinder heads.
- Mixture management – Beyond proper leaning, fuel injected engines are susceptible to head cracking if the fuel mixture is suddenly enriched. The fuel injector squirts fuel on the back of the intake valve. A sudden increase of relatively cool fuel stresses the metal in that area.
- Power setting – Aircraft with variable pitch propellers, 14P and 386, have a large range of RPM and manifold pressure settings that can be used to obtain a given power output. I am sure that most of you realize that operating the engine at the lowest RPM setting minimizes the tach time and thus your cost per actual hour. Operating the engine “over square” is certainly allowable, but is not recommended by our engine mechanic. Operating at “square” would be 22” IMP and 2200 RPM while “over-square” would be 22” IMP and 2100 RPM. Internal cylinder pressure increases when RPM is decreased and manifold pressure is increased to maintain constant power. Higher pressure means more force on the rings and greater cylinder wear. That in turn means shorter engine life. The engine operating manuals allow over-square operation, but I recommend we always use square as the limit for long engine life.
- Oil level – There is no advantage to having lots of oil in the engine sump unless the aircraft is using oil at the rate of a quart per hour or so. There is some certification reason that the sumps hold as much oil as they do. Oil above the limits mentioned below increases the amount that blows out of the crankcase. The maximum oil level in the Archers and Arrow for Club operation is 6 quarts and for the Comanche it is 9 quarts. Don't add oil until the level is a full quart below the maximum level. The oil level is checked with the dipstick screwed down. There is no need to wipe the dipstick to check the oil level. Just unscrew it and look at where the oil level is before each flight. One additional note, do not over-tighten the dipstick. Several of us have had to use pliers to loosen a dipstick. Simply screw it snug. It can't come out and nothing bad would happen if it loosened up.
- Adding oil – There are funnels for adding oil to the aircraft. Make absolutely certain the funnel is clean before using it. Use a paper towel to wipe any dirt or debris from the funnel before use.

I am sure there are other items that could be addressed, but none on my immediate list. If there are questions or other issues, let me know and I will try to get the answers for you.