

Frigid Flight: A Minnesotan talks about flying canards in the winter

So why do people live on the frozen tundra anyway? For the six months of lousy weather? For the reported joy of something called “ice fishing”? Where you go out onto a frozen lake and sit on an upside down bucket? While simultaneously trying avoid frostbite and hoping to awake fish from their winter nap? For the flying?

Well, for this Minnesotan, after many years of trying, the best (and sometimes only) flying during the winter is flying SOUTH! To get away from this COLD! Geez!

Here's a short list of the problems with winter flying:

- Outside of just being COLD, the weather is usually fast changing and blustery. High winds and low ceilings are common. Icing is a constant worry.
- To even try to go flying involves shoveling out the hangar door, and your hangar's access to the ramp (while freezing your hands and feet).
- Keeping in mind that we Velocity pilots have free castering nosewheels, assuming you can get the airplane started, steering and taxiing on snowpacked, frozen, icy taxiways can be anything from challenging to impossible.
- Trying to get heated oil to flow through the thick goo oil between the vernatherm and the oil cooler before the oil in the crankcase exceeds redline.
- Then theres trying to heat the cockpit. More on this later.
- And keep in mind this; any off field landing in frigid temperatures is inherently less survivable.

Cabin heat is a real challenge in a pusher aircraft. Getting useable heat from the standard nose mounted oil cooler is not very workable at “Minnesota Cold” temperatures for several reasons. First, operationally, what you will see is that, as mentioned, the crankcase oil temps will spike, sometimes dramatically, after the vernatherm has opened and before the oil pump is sucessfull at pushing the cold oil sludge through that long line forward to the cooler (and then back again). Often times I've been forced to reduce power during climb to keep the oil temps below the 240F maximums while waiting (and hoping) for the flow to start.

Once the oil does start flowing through the forward cooler, and assuming you cooling system is set up for normal spring/summer/fall flying, your oil temperatuer will drop like a rock. With the vernatherm open and the oil flowing, you may have trouble keeping the oil above the 180 F required to even keep the vernatherm open, even with the cooler blocked off.

The net of this is that in really cold temperatures, getting cabin heat from the nose mounted oil cooler system on our pusher aircraft just doesn't work, or works only very marginally, in extreme conditions. I gave up and removed the flapper valve on mine several years ago.

Various discussions pop up regarding electric heat systems. I've yet to see one work as a Minnesota cockpit heater, and (to me), the reason is fairly straight forward. Here's a thought experiment... let's say you beleive you'd need about the same heat for your cockpit as, say, your wife's 1000 watt hairdryer

puts out. OK... hmmm, 1000 watts... 1000 watts at 12 volts... ugh... that'd require 83 amps! Even 500 watts of heat, at 100% efficiency, and at 14 volts is 35 amps. I just don't see it, and I've yet to hear of a successful installation.

The only heat systems I've seen reliably work in canard pushers in the northland involve setting up a separate oil loop from the sump, through an auxilliary pump and a stand alone nose mounted heater coil (with a fan). Drill and tap a couple of new holes in your sump below the "waterline", get a electric oil pump, cooler, add the plumbing, and you can get heat even when the oil is less than 180F. I've had friends do this, and it can be made to work.

To me, given the challenges I mention above regarding winter flying, I chose not to install, carry around, and maintain that extra system. Instead, here are my solutions.

I flew my bird from Minnesota to southwest Florida this past week. On the drive to the airport, my car thermometer, which is usually pretty accurate, showed 16 below F. That's COLD. That's Minnesota COLD! Here's how I handle it:

- I have really worked hard to seal my cockpit. Cold air infiltration MUST be eliminated. If you carefully do this, in my experience, you won't even need cabin heat on a sunny day down into the teens F. Even after all the work I've done on sealing my cockpit, I still carry a roll or two of vinyl electrician's tape in the cockpit to temporarily tape over anywhere the air is getting in.
- I dress for it. This is especially important to me because of my worries about survivability in an off field landing in these bitter cold temperatures. I had on two pairs of long johns (bottoms and tops), along with a thick shirt, a sweatshirt, and a light jacket on my Florida flight. I use "winter golfing gloves) for my hands, but I also had charcoal heater packs in my pockets to keep my hands warm. Last, I use electrically heated shoe pads (or electric socks) to keep my toes warm. Needless to say, layers of clothes work well, since you can always peel 'em off.
- I "heat soak" the airplane the night before a flight... I leave the thermostat in our heated hangar set to about 65 F. This helps the oil to flow through the cooler a bit quicker.
- I have electrically heated seats. I don't often use them, but they can really help on the bitter cold days. On other "mild" days, when I'm not all dressed up for the cold, they are really nice.
- When it's really cold I use a car (12V) electric blanket wrapped around my legs.
- Try to pick altitudes and routes where you'll have sun. Sun really makes a huge difference in cabin temperature.
- *And head towards warmer weather!*

On this flight I didn't see outside air temperatures above 10 F until I was in Tennessee. Yet... because I was prepared, I was never uncomfortable. The extra clothes came off in layers as the temps warmed up, and overall, my winter flying worked out great! I know people are working hard on installation of electrical heaters, secondary loop oil heaters, and more, and I hope every one of them finds success. I'd love a system that really works in truly bitter conditions - so please go for it!

My two cents,

Dave