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Winter Flying Tips for the PA46 Pilot

By Dick Rochfort, ATP, MCFI, CFII

Even if cold weather does not warm your heart, winter is a great time for flying. Cold air makes for better performance, and VFR visibilities soar. But a dark side potentially lurks behind the allure of robust climbs and cool oil temperatures. While the following comments by no means constitute a complete list of observations, I would like to emphasize some of the most important considerations that I believe bear repeating about winter and airplanes. So, as fall soon will yield to the next season, below I offer you the 10 items that top my list for aviating in winter:

Night flying skills - Winter begins at the solstice, December 21, when the sun is tracking its southernmost arc across the sky. This means shorter days, longer nights and more night flying. You should not shy away from winter night flights, which can lead to some of the best experiences you will have as a pilot. But brush up on your night physiology, and get those three full-stop landings under your belt to stay legal. Consider using the OBS feature on your Garmin to help with the clear dark night visual approaches. You do have a Garmin or two, right? Compute a visual descent point (VDP) for every approach, visual or otherwise, so that you are mentally prepared for the options. Have the anticipated actions required for each option firmly in mind.

Airframe ice - Every year I get a call or two from pilots who ask me how much frost or snow is OK for takeoff. I received just such a call last winter from a conscientious pilot, whom I will call Bill, because that is his name. He was standing on the ramp in Vail in falling snow. Bill's circumstances were compelling, but the answer is always the same: none, nada, nyet. None is acceptable. When you leave your aircraft on the ramp, ask yourself about the overnight weather. Will the night be clear and cold? Do the right thing: spring for a hanger or plan for de-icing. Do not presume that snow will blow off on the takeoff roll. If snow is falling, have the de-icing done with engine running and clearance delivered. Be sure to shut the inflow valve prior to de-icing to prevent that nasty glycol odor from permeating the cabin. If the ambient temperature is below freezing at the surface, and if time permits, consider doing the following: dry the aircraft in a heated hanger, then pre-cool the plane by raising the hanger door, which usually shuts off the heaters as well, for an hour or so. Preflight and load the passengers inside the hangar, and have the aircraft towed out for the start. Get the clearance first so you have no delay.

Induction ice - We all know that induction ice is the bane of the piston pilot. I am surprised by the number of pilots who fail to share my enthusiasm for the mechanics of this sinister phenomenon. If you encounter visible moisture while in flight in a Malibu or Mirage, open the alternate air door. Do not wait for a manifold pressure drop to verify induction ice. The aircraft will not know the reason for the loss of airflow to the engine and will presume you are climbing into less dense air. The waste gate controller will then command a new waste gate position to compensate for the loss of airflow. This cycle will continue until the waste gate is fully closed. Once the waste gate is fully closed, the manifold pressure will begin to fall, but that indication is now too late, as the engine can do no more, being configured as if at critical altitude. Moving the alternate air door at this late stage may send some of the ice clinging to the back of the filter

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through the turbochargers in an attempt to make Margaritas... que lastima! Do not close the alternate air door until you are safely on the ground and the turbochargers are spooled down, or you are *absolutely* sure no residual ice remains behind the filter in the plenum. And from now on, tell your bartender you want your whiskey "neat," because ice gives you a headache.

Braking action - If, while listening to ATIS for your arrival, you hear the phrase, "*breaking action advisories are in effect*," be alert for poor or nil braking. Plan accordingly. You should also be prepared to report your experience to ATC, that is, if your braking action was good, fair, poor or nil. Be careful approaching hold-short lines when operating on ice and snow. It is entirely possible to enter the runway environment inadvertently by sliding past the line. If you are landing, be vigilant for other aircraft that may have crossed into your runway environment the same way; be wire-sprung to go around.

Runway and taxiway obstructions - Watch out for snow berms and drifts on or near runways and taxiways. Remember your radar pod under the right wing.

Visibility - Visibility can vary greatly and change quite suddenly in winter. Anticipate what you need to see and when you need to see it in all phases of flight. Always check for, and use, departure procedures. Remember, visibility is only one of three items needed to descend below DH or MDA. Can you name the other two? If you arrive at the middle marker on an ILS with a visibility minimum of 1/2 statute mile, and you cannot see the threshold, in most cases you do not have the visibility required to continue the approach. Consider planning and filing an alternate airport for every flight, even if not legally required. Know what pitch and power settings you will use for the missed approach so that you will be confident to miss when the time comes. Train with, and use the autopilot.

Engine wear - Many have said that most engine damage occurs upon start up in normal operations. Considering the temperature changes, lubrication and vibration extremes, this is probably true. Shutting down must rate a close second. Yet I have observed pilots who gladly start the engine twice for every flight to save 50 cents per gallon on self-serve fuel. Well, OK, so maybe a dollar or more now, but starting the engine costs money in wear and tear. Some pilots routinely use the battery to start their turbines seemingly unaware of the huge benefits of a free 28 volt start, including longer battery and starter life and cooler starts to name a few.

You use your aircraft with the understanding that doing so will, eventually, cause the engine and airframe to wear out, or at the very least, look and perform somewhat less than perfectly. This is the tradeoff brought along by the joy of flight. Fortunately, to some extent the wear can be mitigated. Consider using a heated hanger. That might be the single most important investment you 9) will make in maintaining the health and well-being of your aircraft. Extreme cold has ill effects that go beyond battery performance; the impact on avionics and gyros certainly comes to mind.

Battery condition - When my daughters reached driving age, the family fleet expanded to three cars, and our AAA membership grew to four souls. The fleet has aged a bit, but up until this winter, our rides have been exceedingly reliable. So I did not renew the AAA membership, which of course was a big mistake. Within two weeks we had three separate "failure to start" events and enough tow truck bills and inconvenience to pay for AAA for three years. This experience, and several similar events in aviation, has led me to conclude that batteries contain evil magic, which in unknown ways causes failure without the tell-tale sounds of impending doom.

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The condition of your aircraft battery will change over time, and may, in fact probably will, fail at the least convenient time. Consider changing out the battery or batteries every two to three years. Try to avoid applying loads to the battery routinely before engine start without the assistance of a GPU. Know that in most applications a GPU will charge the battery unprotected: do not go to lunch with one plugged in. I suspect most pilots know by now that, without modification, the nose baggage area light in our PA46 does not time out, so if you leave the nose baggage door open the light will remain on. JetProp puts a switch on that light so the baggage door can be left open without draining the battery.

Deep cycling of the battery is bad. Newer battery designs have lower rates of internal resistance and trace amounts of Antimony to help control evaporation. The failures will occur with less warning. One subtle but sure sign of pending failure is a battery that does not take a charge from the alternator or generator, or does so incompletely or unusually slowly. Pay careful attention to how the battery recovers from the start sequence, and note any trends.

Dress to survive - As you prepare for your flight, look at the terrain to be crossed and ask yourself the following question: if I were on the ground anywhere along my route of flight, uninjured, with passengers, **at** night, for 12 hours or so, what would I want to be wearing? Carry everything the survival experts suggest is not always practical, and, as a former Green Beret, I can tell you that survival is 90% mental attitude. But you should plan to participate in your own rescue. Consider purchasing and registering a Personal Locator Beacon or PLB. You can mitigate a whole lot of risk with a PLB for about \$600. McMurdo makes one called a GPS FastFind, which is registered in your name with SARSAT. The unit pretty much guarantees the arrival of a helicopter within 30 meters of your location in about two hours. I fly over 450 hours per year in Malibu, Mirage and Meridian aircraft, and I have to tell you that, since I no longer carry a UHF radio and smoke grenades, I always have my McMurdo PLB with me on each flight.

Aircraft limits - Review your POH. If you do not have a copy for your home or office, get one, along with a current FAR/AIM as well. I was attending the PT6 School at Pratt & Whitney a few years ago when a pilot in the class blurted out in dismay that he was unaware that the Meridian had a temperature limit for operations. Since he lived in Canada he would be operating below the minimum temperature about half of the year. The earlier Meridians have a temperature limit of -34 degrees Celsius, while the JetProp does not. Both aircraft use Jet A. No matter what airplane you fly, keep in mind that the temperature limit at that magic number is specified by Jet A refiners. As an aside, I should note that Jet A1 contains less water, useful for lowering the temperature limits, but is largely unavailable to civilian pilots in the United States. Heaters, fuel temperature gauges and header tanks notwithstanding, you might be wise to consider complying with aircraft limits. Ignoring them may very well be safe, but surely not legal. Incidentally, adding Prist does not create Jet A1 fuel from Jet A, nor does the addition change the -34 deg C limit, even though it may postpone the potential outcome.

Winter flying can be sale and fun; you just need to accommodate the vagaries of the season.

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