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When wet snow comes into contact with our aircraft on the ground, the water in the snow has a tendency to freeze and form ice on the wings that impair a wing's ability to produce lift.

Another form of icing known as "carburetor ice" can also prey upon our aircraft while in flight. When operating normally aspirated aircraft in temperatures between 0 C – 20C and when relative humidity is greater than 50%, ice can form within the throat of the carburetor and cause loss of power and/or engine failure. In aircraft with fixed-pitch propellers, ice can be detected through a reduction in engine RPM. If equipped with a constant-speed propeller, ice can be noticed through a reduction in manifold pressure. At first indication of carburetor ice, apply full carburetor heat until the engine has smoothed itself out. This may take a few minutes of full carburetor heat to completely remove the ice. Operations at low power settings increases the possibility of carburetor icing, and some manufacturers even recommend use of carburetor heat during all power reductions.

I have observed that thorough aircraft and preflight preparation are key elements to a safe and enjoyable winter flying season. A college professor of mine once said, "If you fail to prepare, then you prepare to fail." I didn't find it very useful to his class, but immediately took the good advice and realized that mindful preparation can and will save your life in an airplane!

Be sure you have obtained the most up to date, hourly, weather briefings and pilot reports (PIREPS) along your route of flight to assure you are keeping tabs on good ole "Jack Frost." A thorough preflight inspection will assure that the aircraft's airframe, pitot-static system, and fuel tanks are thoroughly checked and/or de-iced before each flight. An appointment with your mechanic will ensure that engine oil, breather lines, control cables, battery, tires, etc. are properly prepared for cold weather operations.

How about packing a winter survival kit?

This would entail warm clothes, matches, flares, blankets, etc. to keep you from falling victim to the elements when waiting to be rescued in a rugged or rural part of the country.

The winter months offer a unique beauty as we coast over the snowy landscape. The colder and clearer air adds punch to aircraft performance and improved visibility. Don't be surprised that your horizons will seem much clearer and points of interest are viewed with greater depth than ever before. It is a great time of the year to fly. Added a few extra precautions, the season offers many rewards for us to aim our noses skyward once more!

EDITOR'S NOTE: Christopher Fostiak is a licensed Commercial and Instrument rated pilot who holds an Advanced Ground Instructor designation with over 10 years flying experience in various model aircraft. He also has over 6 years experience within the aviation insurance industry as an underwriter and broker. Currently, he provides aviation insurance services and risk solutions as an account executive for Johnson Aviation Insurance in Madison, Wisconsin. ❑

Wing Upper Surface Ice Accumulation Alert

WASHINGTON, D.C. – The National Transportation Safety Board has long been concerned about the insidious nature of the effects of small amounts of ice accumulated on an airplane's upper wing surface. The Safety Board's preliminary investigation of the November 28, 2004 accident involving a Bombardier Challenger 604 in Montrose, Colorado, has revealed that atmospheric conditions conducive to upper wing surface ice accumulation existed at the time of the accident (airplane performance issues, including the possibility of upper wing ice contamination, are being investigated).

For years most pilots have understood that visible ice contamination on a wing can cause severe aerodynamic and control penalties. However, it has become apparent that many pilots do not recognize that minute amounts of ice adhering to a wing can result in similar penalties. Research results have shown that fine particles of frost or ice, the size of a grain of table salt and distributed as sparsely as one per square centimeter over an airplane wing's upper surface, can destroy enough lift to prevent that airplane from taking off.

NTSB has commented on the hazards of upper wing ice accumulation in several previous aircraft accident reports, and has noted (among other things) that according to wind tunnel data, a wing upper surface roughness caused by particles of only 1-2 mm [millimeter] in diameter [the size of a grain of table salt], at a density of about one particle per square centimeter, can cause lift losses of about 22 to 33 percent, in ground effect and free air, respectively. Therefore, NTSB has urged pilots to conduct visual and tactile (touch) inspections of airplane wing upper surfaces in past safety recommendations.

For additional information refer to the NTSB website at www.ntsb.gov. ❑

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