Iowa Wing, CIVIL AIR PATROL

United States Air Force Auxiliary

SAFETY BRIEFING for September, 2002

Carburetor Icing: While carburetor icing can occur almost anytime, there's no time like the present to review this insidious hazard. Carburetor icing is the number-one cause of icing accidents. Close monitoring of engine instruments and quick corrective measures are the keys to coping with this threat.

As air is drawn into the small throat of a carburetor, the venturi effect accelerates the air and cools it. It cools even further when mixed with vaporized fuel. When this moist air reaches the freezing point of 32° F, the ice particles that begin to form deposit themselves on the throttle plate. The carburetor can then become choked by this ice to the point that the engine receives less air than is required for full power. The once explosive air/fuel mixture becomes so rich from excess fuel that the engine ceases to fire. What conditions are conducive for carburetor icing? It's possible for carburetor ice to form even when the skies are clear and the outside air temperature is as high as 90° F, if the relative humidity is 50% or more – especially when operating at reduced power settings. The envelope for the most severe buildups of carburetor ice is between 65% and 100% relative humidity and 25°F to 65° F. In other words, carbureted engines are susceptible to icing almost anytime.

Now, let's look at how to detect carburetor icing. On the ground during engine run-up, ice is easy to positively identify and remove. On a Cessna, for example, at 1,700 RPM, the carburetor heat control is pulled out fully to the hottest position. Because air entering the carburetor after application of carb heat is warm (from the engine compartment) and less dense, you will notice an RPM decrease of 100 to 300 RPM, and the RPM should remain low until the carburetor heat control is pushed all the way back in. However, if the RPM decrease is noted, but slowly begins to increase so that when the carb heat control is pushed back in and the RPM reads more than the original 1,700 RPM, you had carb ice.

There are two opportunities to detect the subtle indication of developing carb ice while airborne. The subtlety is a gradual, small drop in RPM on a fixed-pitch prop aircraft, a gradual, small drop in manifold pressure (MP) indicates carb ice while in flight. If detected early and dealt with correctly you can easily prevent an untimely engine stoppage. The bottom line in carb ice prevention is to use carb heat:

- During the before takeoff check (as required by your aircraft POH), but not during takeoff.
- When conditions are conducive for icing.
- When operating at reduced power during descents or on approach.
- In the full-on position. Don't use partial carb heat settings.