

## De-icing and Anti-icing Systems

indicates the operating current. Other than a momentary fluctuation as the timer cycles to another element, the ammeter needle should always be in the shaded area when the system is activated. Prior to engine start, a low battery may cause the needle to be slightly below the shaded area. The ammeters in some systems won't show any flicker at all, and some systems don't even have an ammeter, so you need to understand the telltale signs for your own system. Rounding out the system is the circuit breaker, on/off switch, and the wiring harness.

### Preflight

Propeller de-ice should be checked prior to every flight during winter months and, provided your aircraft is certified for it, whenever you are going to fly into known icing conditions. The rest of the time you should preflight check it at least once a week. The prudent pilot will follow what the aircraft's pilot's operating handbook (POH) says about preflighting propeller de-icers. While there are differences among aircraft, here are some general items to check:

Visually inspect the rubber elements carefully. Look for wrinkles, debonding, rips, impact damage, cracks, or erosion of the rubber surface. Several leading-edge tapes designed to reduce erosion are available. If they are specifically approved by the propeller or aircraft manufacturer, that's fine; they've been tested and proven effective. Otherwise, do not use them. There has been research conducted on several brands of these tapes and they have been found, in some cases, to have insufficient thermal conductivity, resulting in a lower surface temperature than may be required to shed ice!

After a good visual inspection, activate the system and put your hands on the elements. You should feel them get warm in a few seconds; if not, there is a problem. On the opposite end of the spectrum, if you put small barbecue grill marks on your hand, I'd check to see if there was a little amperage output problem with the GPU. In either case, turn off the system to prevent burning out the de-icer. In fact, prolonged use also will cause significant battery drain, and the elements can do serious damage to nonmetal propeller blades.

Finally, with some systems it is possible to conduct an operational check and see an indication on the ammeter. It is important to know what to expect from your system, as not all systems react the same way. With systems that do show an indication on an ammeter, with the engine running, turn on the de-icing system and observe the ammeter. Every 34 seconds, the needle should deflect momentarily, indicating that the timer is cycling and putting out power. It is important to understand that this doesn't necessarily mean the elements are getting the power; it only means that the timer is turning it on.

### System Maintenance

With all of that slapping, scraping, rotating, and vibrating going on, there is more than just a chance things won't work exactly right. To head off trouble, you should have your mechanic do both 50-hour and 100-hour inspections; it's the cheapest insurance you can get.

The 50-hour inspection determines whether all of the current actually is getting to all of the de-icing elements at the right time. The mechanic will inspect the wiring harness care-