Old Man Winter

AeroTherm's Deuce Engine Heater Keeps Winter's Cold at Bay

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If your airport is covered with snow right now, or worse – your airplane is out on the ramp and looks like the photo below – then you are in desperate need of a good quality engine heater to keep you flying all winter long. Some of the best flying of the year can be done during those frigid cold, winter days when the air is smooth and performance is outstanding.

It is critical, however, to start those flights with an adequately warmed engine. That usually means a considerably better process than having your FBO blow hot air through the cowl inlets for 45 minutes or an hour (if the lineman even lasts *that* long).

We all know the importance of having the *entire* engine thoroughly warmed up before scraping those dissimilar metals together during a cold weather start-up. Aluminum crankcases have a significantly different coefficient of thermal expansion than iron crankshafts. Inside a cold engine, the clearance between these parts is reduced to where they can very nearly be touching. Now, imagine cranking that engine over while thick oil is slowly trying to find its way to the places it is needed most. It will get there eventually but not without significant engine wear first.

Lycoming and Continental operator's manuals both warn that failure to properly preheat a cold-soaked engine can result in possible internal engine damage and even engine failure. It's been said that in less than a minute, a single cold start without proper preheating can produce more wear on your piston aircraft engine than 500 hours of normal cruise operation. If it's cold enough, a single cold start can cause the catastrophic destruction of an engine shortly after takeoff.

NTSB accident reports have noted several cases of engine failure due to improper preheating. One describes a Comanche's engine that was preheated for about 25 minutes before taking off in 2°F weather. The pilot let the engine run 10-15 minutes prior to applying take-off power. All engine instruments appeared to be normal and "in the green". The engine failed catastrophically only minutes into the flight. Line personnel told investigators they had not been able to position the heating ducts to direct heat on the oil sump.

An Aztec departed Palwaukee airport in Wheeling, IL and lost power on both engines within a few minutes after take off into IFR conditions. The pilot told investigators he estimated the engines were preheated 35-45 minutes before startup, and in addition there was a 10-15 minute delay prior to takeoff during which the engines ran. All the engine instruments were "in the green" and no problems of any kind were suspected. The plane crashed after only a few minutes into the flight and both engines had broken connecting rods and gaping holes in their crankcases. The temperature at the time of the accident was -15°F.

A Bonanza with an otherwise good engine departed Jackson Hole, WY when OAT was -19°F. It was preheated for over 30 minutes and the pilot allowed what he thought was adequate ground warm-up time. He reported all engine instruments "in the green". The engine failed catastrophically just minutes into the flight and the failure was attributed to lack of proper oil flow due to extremely low temps.

It's a good bet that I will never be flying on a -20°F day but I have have heard some folks claim that even at 60°F you should consider preheating. In my part of the country, I'm afraid if I adhered to that rule, I'd could be preheating all year long! I have set my own personal minimum at 40°F

and any flight at or below that temperature requires preheat.

So what is the best way to preheat? If you asked 10 pilots, you will likely get 10 different answers For me, it's not preheating per se but rather keeping my engine constantly warmed to about 70°. No, I don't have a heated hangar but I think I have found the next best thing – AeroTherm's Deuce engine heater.

Working off the same principle as a heated hangar, the Deuce continuously recirculates heat covering the engine compartment evenly, including the oil. Thankfully, there are no propane tanks to keep refilling and hauling around. Been there, done that. Rather, the Deuce uses two 800 watt heating elements with an easy-to-set thermostat that maintains the desired temperature automatically. AeroTherm's heater can be plugged in all winter long, keeping the engine warm and ready to go at a moment's notice.

The Deuce consists of very durable components; a 40,000-hour high output CFM fan from Germany, a 100,000-cycle thermostat and a back-up reset thermostat. All components are modular and easy to replace. When it's plugged in, the AeroTherm Deuce supplies 6500 BTUs of heat at 210ºF to the engine compartment. It then draws the same heat out of the compartment and back through the heater, until the desired temperature is reached – much like your home furnace.

When used as a preheater, the engine will be warm enough to start in about 90 minutes. Testing in harsh, winter climates (their operation is in Spearfish, South Dakota) the heater is capable of heating an engine completely, including the oil, in three hours at 0ºF outside temperature.

Weighing just 11 pounds, the AeroTherm Deuce comes with two hoses, a nylon suspension band that allows the unit to hang from the prop of your aircraft, carrying tubes and four sponges to seal the engine intakes. It's portable enough to take with you.

I inherited an earlier version of AeroTherm's engine heater called the Classic. Unfortunately, it lasted only one season for me but in all fairness, I have no idea how long it had been in service or how it had been used or treated by its previous owner. I was completely satisfied with the Classic's performance and relied on it constantly to have me ready for those early morning instrument lessons last winter.

AeroTherm declares the new Deuce model to be superior to the Classic in every way. So far, with my usage, I would agree. One thing that is still exactly the same is the ease of use – thankfully. With its thermostat set to 70°, I turn it on and forget about it.

Removing it for flight is simple. For short flight, I don't even turn it off. I pull the sponges from the inlets and let the hoses drop to the floor. Holding the motor with one hand, I reach up and release the nylon straps connector, carry the entire unit to a table out of the way and then pull the plane out of the hangar for preflight and start-up.

Post flight set up is just as easy. Hang the unit over the prop, stuff the sponges around the hoses in each inlet and you're good to go. Quick. Easy. Effective.

While the unit is a little pricey at $499 plus $20 shipping, it is money well spent, in my opinion – especially if you baby your plane's engine like I do. If you can get even 10% more engine life before TBO, it seems well worth the expense.

If you're interested in having remote starting capabilities, there is an option available. This requires buying a remote switch unit and an annual paging service charge. Once set up, a call from your cell phone will activate the heater. A second call will shut if off.

AeroTherm's Ryan Hill was friendly and responsive to several questions I asked him by email. While I opted to have the unit shipped, I did condsider flying to Spearfish from Denver (just for the fun of it). They were more than willing to meet me or even have a unit waiting for me to pick up at the airport. Nice folks.

I asked Ryan if AerTherm would be willing to offer a BAC discount to any members purchasing a unit. He gladly agreed to a 10% discount, knocking $50 dollars of the price for us. Generous, indeed.

For more information on AeroTherm's Deuce engine heater visit their web site at www.aerothermheaters.com An email address and phone number can be found on their Contact page. If you have access to an electric outlet, AeroTherm Deuce heater will work very well for you. They make a good product and I would recommend it to anyone.