


Reiff Preheat Systems

Long Engine Life Starts With Reiff

WARNING

“Failure to properly pre-heat a cold engine could result in damage to the engine and subsequent engine failure.”



Continental engine operator's manual

We manufacture FAA approved engine preheat systems and related products to improve your safety, help your expensive engine last longer, and simplify your winter flying.

Our preheat system is the first choice of mechanics and aircraft owners all over the world. Why? Because it's the best system in the world. We are the innovation leader who has set the new standard. Unlike competitive systems, we heat ALL your cylinders and don't use your CHT ports to do it - no messing around with expensive band-aid fixes to allow your CHT gauge or engine analyzer to work.

Why preheat your aircraft engine?

- Preheating can save you big money by reducing the damage caused by cold starts, by extending your engine's life and reducing your expense at overhaul time. If you extend the life of your \$20,000 engine just 10% our system will have paid for itself several times.

But of course, we're biased. So don't take our word for it...look what some experts have to say:

Al Beech, Director of Engineering Service Programs, Teledyne Continental Motors:

"Significant engine wear can occur at startup, because the oil circulation system has not had a chance to pump oil to the engine parts. The thicker the oil, the longer this will take, resulting in less oil on running surfaces during the startup sequence. Preheating during extremely cold

temperatures is one of those "ounces of prevention" that can keep cold starts from damaging your engine. Cold temperatures not only slow the initial movement of the oil but the differential thermal expansion of engine materials (aluminum and steel) decreases engine clearances, creating the potential for more accelerated wear during cold startups." <From American Bonanza Society Magazine, Nov. 1997>

Ben Visser, Staff Research Engineer, Shell Oil:

"Preheating your engine makes a world of difference. It heats the oil so the oil is thin enough to flow through the engine and properly lubricate all of the critical wear surfaces. Preheating also heats the metal parts in the engine. That's important because aluminum crankcases have a higher coefficient of thermal expansion than iron crankshafts. This means as your engine cools down, the clearance is reduced. And as a result, you may not have sufficient oil film thickness for proper hydrodynamic lubrication at very cold temperatures. In other words, the wear rate is going up. If you're using [an electric] heater, make sure it's a system that heats the whole engine, not just the oil." <From Shell Oil advertisement>

- Lycoming and Continental Operator's Manuals mandate preheating at cold temperatures: **"WARNING - Failure to properly pre-heat a cold-soaked engine could result in oil congealing within the engine, oil hoses and oil cooler with subsequent loss of oil pressure, possible internal damage to the engine and subsequent engine failure."** (from Continental IO-550 manual). Operation contrary to their instructions may also void the warranty.
- Increased safety. Cold starting and inadequate preheating can and has caused [in-flight engine failures!](#)
- Often preheating is the only way to get a cold engine started, because cold engines are stiff, cold fuel doesn't vaporize well, and spark plugs frost.
- Easier starting saves your starter and battery.
- Reduces costly warm-up and run-up time, which wastes your engine and fuel.
- Increased utility of your airplane during cold winter months. You don't have to put your expensive airplane into hibernation during the winter. An easy to use, effective engine heater allows you to enjoy winter flying.

Why buy a Reiff Preheat System?

THE MODULAR ADVANTAGE

- Our innovative and unique modular design lets you tailor a preheat system to meet your needs and budget. Want the best? Choose one of our integrated multipoint systems using both cylinder and oil heaters. Already have an oil sump heater? Then just get the cylinder heat system - it will work with any oil heater. Live in a mild climate? Then perhaps our oil sump heater is all you need. We let you do it YOUR way, and we are the only preheater company that gives you a choice. Others sell only oil heaters, or only multi-point systems.
- Here are the options:
 1. [Turbo XP System](#) - For **X-treme Performance**, the fastest and warmest preheat available. Same as Turbo System, except cylinder heaters are upgraded from 50w to 100w per cylinder.
 2. [Turbo System](#) - Same as the Standard System, but "Turbocharged" with doubled wattage on the oil sump, plus thermostat protection for the oil.

3. **Standard System** - Integrated system using the HotBand cylinder heaters and the HotStrip oil heater.
 4. **HotBand Cylinder Heat System** - use alone or with any oil sump heater.
 5. **HotStrip Oil Sump Heater System** - use alone or with the HotBand system.
- Any system can be easily upgraded to a higher system at any time.

PERFORMANCE

- We let you choose the level of performance you need.
- [Comparison vs. other brand](#)
- **NO BS WARRANTY**
- **The best [warranty](#) in the industry.**
- 2 years of coverage, not 1 year as other brands have.
- We do not require installation by an A&P for warranty coverage to apply, as other brands do.
- We do not exclude warranty coverage for installation mistakes, as other brands do.

QUALITY & RELIABILITY

- Highest quality components used for long life in hot and cold environments, such as Teflon insulated wiring.
- Designed for continuous use.
- All units 100% inspected and tested before shipment.
- Our system will continue functioning even if one or more of the heating elements should quit working. Individual elements can be easily replaced at a reasonable cost.

EASY INSTALLATION

- Fast and simple to install. Unlike the other brand, we do not require installation by an FAA licensed mechanic for the warranty to be valid.
- No STC or Form 337 required, just a logbook entry.
- No engine or airframe modification required.
- Very lightweight (under 2 lbs).

CONVENIENCE

- Reiff preheat systems are installed on your aircraft, like the engine block heater on a car, so they go with you wherever you fly. All you need is an extension cord.
- No more waiting for an FBO preheat.
- No more being stranded at distant airports because the FBO isn't open or doesn't have preheat.
- Can be used with a timer, thermostat, portable generator, telephone or beeper activated switch, and auto or truck cigarette lighter (with adapter).
- 120 or 220 V available.

SAFE

- FAA-PMA approved.
- Works by conduction, the safest form of heat - much safer than gas flame heaters, space heaters, or light bulbs.
- External ground wire allows the engine and airframe to be grounded to the electrical outlet for safety.
- UL and CSA approved components.

ECONOMICAL

- Whether you want just an oil heater or a complete multi-point system, we have the best prices in the business.
- Costs about 3 cents per hour to operate.
- Pays for itself quickly since no more expensive FBO preheats are needed, and your engine life is extended.
- An engine heater purchase should be considered an INVESTMENT, not an expense. If preheating extends your engine's life just 10%, the preheat system will have paid for itself several times over.

PROVEN

- We have been producing engine preheaters for 20 yrs and electric preheaters since 1992. With over 14,000 systems in service all over the world, we have a track record you can have confidence in.
- Developed by a Master's degreed engineer who has over 25 years of experience as a cold weather pilot.

Standard, Turbo, & Turbo XP Systems

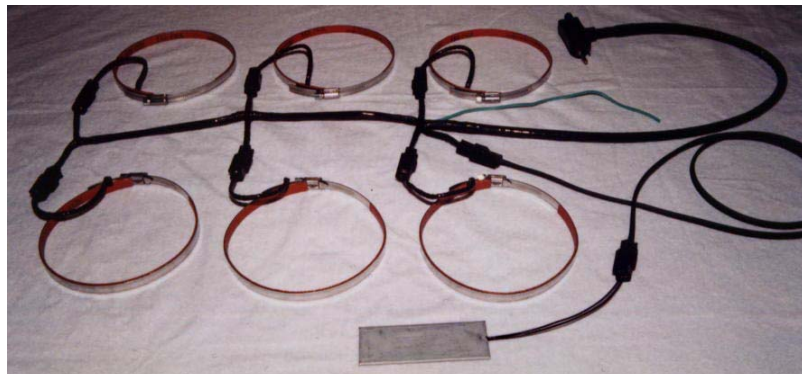
Buy It & Try It...Risk Free.

If you aren't satisfied for any reason, return it within 30 days for a full refund.

These are integrated multipoint systems using the [HotBand Cylinder Heater System](#) and [HotStrip Oil Sump Heater](#)

All systems include what is shown, plus the epoxy for bonding the oil sump heater. **Standard System**

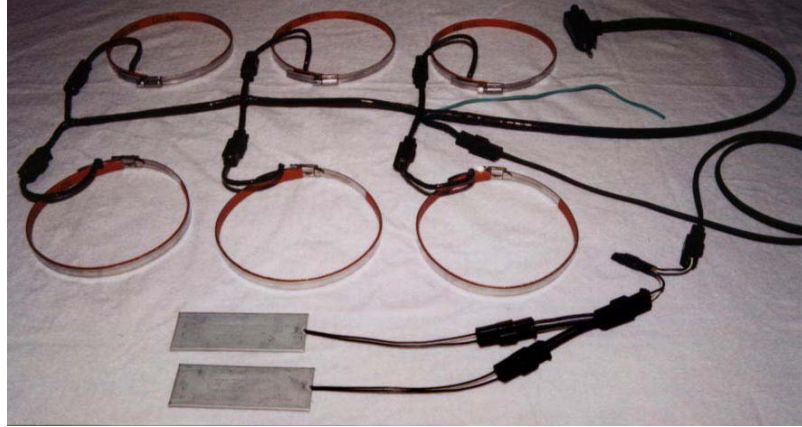
Band heaters clamp around the cylinders and a HotStrip element epoxies to the oil sump.



Turbo & Turbo XP Systems

Same as the Standard System but "Turbocharged" with extra power for faster & warmer preheats.

Turbo XP is our best system, for **X-treme Performance**



Thermostat limits the oil temp to about 150°F

Specifications

| | Standard System | Turbo System | Turbo XP System |
|--------------------|-----------------|--------------|-----------------|
| Watts per cylinder | 50w | 50w | 100w |
| Watts on oil sump | 100w | 200w | 200w |
| Engine & Cyl Temp* | 81 °F | 86 °F | 119 °F |
| Oil Temp* | 88 °F | 110 °F | 128 °F |

* Temps are °F rise above ambient after 12 hrs, in a hangar with cowl plugs and a blanket laid over the top of the cowling

Performance Comparison of Systems

12 hrs elapsed time on Lyc. O-540

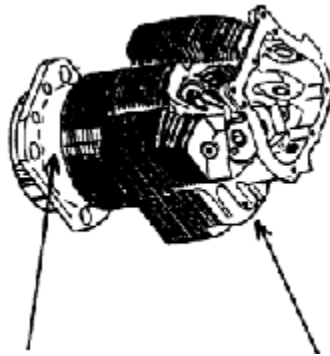
°F Rise Above Ambient Temperature

| | Engine | Oil |
|------------------------|--------|-----|
| Turbo XP System | 119 | 128 |
| Turbo System | 86 | 110 |
| Standard System | 81 | 88 |
| HotBand System | 60 | 46 |
| HotStrip System | 37 | 80 |

How fast will it heat? *

| | Standard System | | Turbo XP System | |
|---------------|-----------------|--------|-----------------|--------|
| ELAPSED HOURS | CYLINDERS °F | OIL °F | CYLINDERS °F | OIL °F |
| 0 | 22 | 22 | 22 | 22 |
| 1 | 35 | 52 | 41 | 66 |
| 2 | 46 | 63 | 60 | 84 |
| 3 | 57 | 73 | 77 | 100 |
| 5 | 74 | 87 | 105 | 123 |
| 12 | 103 | 110 | 147 | 156 |

* Actual temps on Lyc 0-540 at 22 °F ambient, in a hangar with cowl plugs and a blanket laid over the top of the cowling



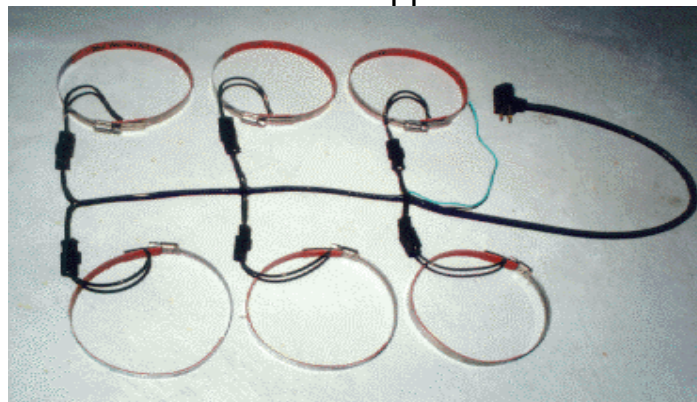
Our band heater puts the heat around the cylinder, and does not interfere with the CHT sensor.

The other brand heats the head with a bolt heater in the hole intended for the CHT sensor.

HotBand Cylinder Heater System

U.S. Patent 6,018,137, other Patents Pending

FAA-PMA Approved



| |
|----------------------------------------------------------------|
| 50w per cylinder |
| Heats the engine about 60 °F and oil about 46 °F above ambient |

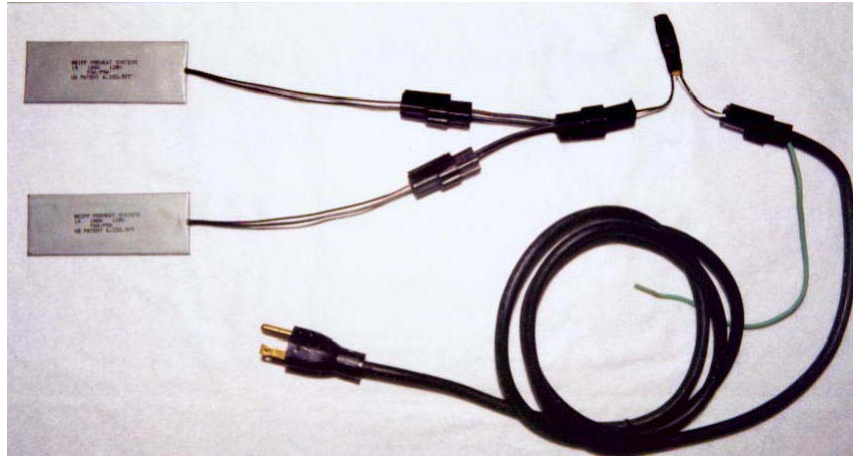
FEATURES

- Our innovative hose clamp style band heater is clamped around the non-finned portion of each cylinder to distribute the heat gently and evenly all around the cylinder. This is an advantage over probe type heaters that concentrate the heat source at a single point in the cylinder head. Lycoming's VP of Engineering says "It is preferable to distribute the heat over a large area to reduce thermal stress".
- Does not interfere with the use of a cylinder head temperature (CHT) gauge, electronic engine analyzer, or Lasar system as the other brand does. Their cylinder heater is a probe that screws into the holes in the cylinder heads that are intended for CHT thermocouple sensors. That means any cylinders with CHT probes installed cannot be heated, unless you buy their optional rocker cover gasket type heaters or heater/thermocouple elements at an additional cost of \$135 - \$170 **per cylinder**. The dual-purpose elements or the optional sparkplug washer type thermocouples may also affect the accuracy of your electronic engine analyzer and void the warranty. At least one of the major manufacturers does not approve the use of the dual purpose elements, saying "transient voltage or failure may fry the engine monitor."
- May be used with any oil sump heater.
- HotStrip oil sump heater(s) may be added at any time (plugs into connector on harness)
- Non-invasive, unlike rocker gasket heaters which require removal of valve covers to install.
- No chance of oil leaks, unlike a rocker gasket heater.
- Wire harness mounts on the **top** of the engine where incoming air keeps it cool, rather than down below in close proximity to the exhaust pipes and turbos as the other brand does. This keeps the harness cooler for longer life. Even though we use high temperature Teflon insulated wiring and silicone coated fiberglass sleeving, keeping it cool is the best protection against heat degradation. Top mounting also simplifies installation and keeps it out of the way when doing spark plug changes. With our system, you won't need to replace any heating elements due to breaking the wires off with your sparkplug wrench.
- Our wire harness is much simpler than the other brand's harness. This means your time or labor cost to install it should be less.
- Our wire harness is top quality and built rugged - custom made for us by the same company that makes them for Teledyne Continental Motors, Caterpillar, and for tanks and other military vehicles.
- Band heaters install easily. Because they are thin (1/16"), they easily slide between the cylinder and the baffling. It is not necessary to remove or modify any cylinder baffles.
- Band heaters can be re-used at overhaul time. Screw-in probe type elements often become seized in the CHT port and have to be drilled out (brass fitting in your aluminum cylinder head = galvanic corrosion).
- Provides faster, warmer preheats and more uniform heating than an oil heater alone, because it gets more heat to the cylinders and upper crankcase than is possible using an oil heater alone (regardless of the brand).
- Gives you the option of first trying an inexpensive oil sump type engine heater, and adding cylinder heaters later if more heat or faster preheating is needed.
- Two band sizes to fit virtually any engine (including large radials):
 - 3/8" x 20" (50 & 100 w)
 - 3/8" x 16" (50 & 100 w)

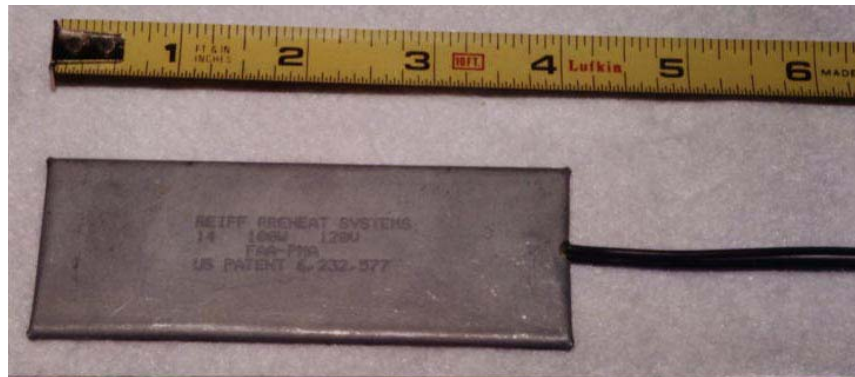
Our newest innovation makes silicone pads obsolete!!

HotStrip Oil Sump Heater

US Patent 6,232,577
FAA-PMA Approved



The HotStrip System includes two 100w elements, thermostat, power cord, epoxy. Heats the engine about 37 °F and oil about 80 °F above ambient.



The steel HotStrip element is 4" x 1.5" x 1/8" and only 2 ounces

FEATURES

- Thin and lightweight like a silicone pad, but made of **steel** for maximum durability.
- Installs faster and easier than silicone pads with a high tech thermally conductive **epoxy** that heat cures in just a few minutes by plugging in the heater after taping it to the sump

with high temp foil tape provided. No need to tie up your airplane and your mechanic's shop for a day or two waiting for the adhesive to cure.

- Works either as a stand-alone oil sump heater (the HotStrip System), or integrated with the [HotBand](#) Cylinder Heating System in the [Standard, Turbo, and Turbo XP](#) Systems.
- Bonds to the bottom or side of the oil sump and electrically heats the oil. Heat is then transferred by conduction and convection to the rest of the engine (an engine cover or blanket over the cowling is recommended for best results).
- Better heat transfer than silicone pads - steel conducts heat **300** times better than silicone.
- Thermostat bonds to sump and limits oil temp to about 150° F (Turbo System and HotStrip System). Mounting it remotely on the sump rather than built-in to the heater means it measures the oil temp more accurately, and allows easy replacement if needed.
- Unique modular design allows adding heaters if extra heat is needed, and allows easy component replacement.
- Dual heating elements for redundancy - if one fails you don't lose all your heat.
- Can be removed and rebonded at overhaul time (silicone pad heaters usually can't).
- This is the best oil sump heater on the market. Due to the metal construction it is much more durable and more tolerant of high heat and installation errors than silicone pads are, and it is lighter and less bulky than thick metal plate heaters.