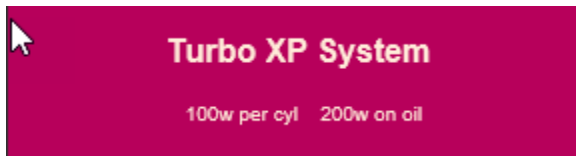


# Mighty Mule Flying Club

Piper Cherokee PA-28-180

November 13, 2018

Has installed:



<http://reiffpreheat.com/product.htm>



**Long Engine Life Starts With Reiff**

HEATING TIME - Fahrenheit						
Actual temps (not rise above ambient). Test method and conditions as stated below.						
ELAPSED HOURS	Turbo XP System 100w per cyl 200w on oil		Standard System 50w per cyl 100w on oil		HotStrip System 200w on oil	
	CYLINDERS °F	OIL °F	CYLINDERS °F	OIL °F	CYLINDERS °F	OIL °F
0	22	22	22	22	22	22
1	41	66	35	52	26	66
2	60	84	46	63	33	80
3	77	100	57	73	37	87
5	105	123	74	87	46	96
12	147	156	103	110	60	104

<b>HEATING TIME - Centigrade</b>						
Actual temps (not rise above ambient). Test method and conditions as stated below.						
	<b>Turbo XP System</b> 100w per cyl 200w on oil			<b>Standard System</b> 50w per cyl 100w on oil		<b>HotStrip System</b> 200w on oil
<b>ELAPSED HOURS</b>	<b>CYLINDERS °C</b>		<b>OIL °C</b>	<b>CYLINDERS °C</b>	<b>OIL °C</b>	<b>CYLINDERS °C</b>
0	-6		-6	-6	-6	-6
1	5		19	2	11	-3
2	16		29	8	17	1
3	25		38	14	23	3
5	41		51	23	31	8
12	64		69	39	43	16

**What size extension cord do I need? (how many watts/amps is my system?)**

The wattage and/or amperage rating is on every extension cord. Get one that is rated for at least the wattage of the preheat system(s) you have.

	WATTS	AMPS	
		120 v	240 v
HotStrip Oil Sump Heater	200	1.7	0.8
Standard System - 4 cylinders	300	2.5	1.25
Standard System - 6 cylinders	400	3.3	1.7
Turbo System - 4 cylinders	400	3.3	1.7
Turbo System - 6 cylinders	500	4.2	2.1
Turbo XP System - 4 cylinders	600	5	2.5
Turbo XP System - 6 cylinders	800	6.7	3.3

**Why preheat your aircraft engine?**

Teledyne-Continental Service Information Letter No. SIL 03-1  
**COLD WEATHER OPERATION – ENGINE PREHEATING**

Preheating is required whenever the engine has been exposed to temperatures at or below 20° Fahrenheit / -7 degrees Centigrade (wind chill factor) for a period of two hours or more.

Failure to properly preheat a cold-soaked engine may result in oil congealing within the engine, oil hoses, and oil cooler with subsequent loss of oil flow, possible internal damage to the engine, and subsequent engine failure.

Superficial application of preheat to a cold soaked engine can cause damage to the engine. An inadequate application of preheat may warm the engine enough to permit starting but will not de-congeal oil in the sump, lines, cooler, filter, etc. Congealed oil in these areas will require considerable preheat.

The engine may start and appear to run satisfactorily, but can be damaged from lack of lubrication due to the congealed oil blocking proper oil flow through the engine. The amount of damage will vary and may not become evident for many hours. However, the engine may be severely damaged and may fail shortly following application of high power. Proper procedures require thorough application of preheat to all parts of the engine.

Do not operate the engine at speeds above 1700 RPM unless oil temperature is 75°Fahrenheit or higher and oil pressure is within specified limits of 30-60 PSI.

Operation of the engine above 1700 RPM before reaching minimum oil temperature may result in engine malfunction, engine failure, injury or death.

In extremely low temperatures, oil congeals, battery capacity is lowered, and the starter can be overworked. Improper cold weather starting can result in abnormal engine wear, reduced performance, shortened time between overhauls, or failure for the engine to operate properly.

The use of pre-heat will facilitate starting during cold weather, and is required when the engine has been allowed to drop to temperatures below +10° F/-12°C (+20°F/-6°C for -76 series engine models).

Note the Continental and Lycoming preheat temperature requirements above are just MINIMUM standards. Just like many people change their oil more often than the engine manufacturers require, we advocate preheating more often than they require and suggest preheating whenever the engine is below 50 or 60F.

### **Harold Tucker, Director of Technical Information and Training, ConocoPhillips Commercial Lubricants:**

"It is generally accepted that a cold startup is considered to be anything below 60 F. However, an engine at rest is always cold relative to its normal operating temperatures; therefore, the oil is also thick relative to its designed operating viscosity." <From [Aircraft Maintenance Technology](#) magazine, [Sept 2008](#)>

- Preheating can save you big money by reducing the damage caused by cold starts, thereby extending your engine's life and reducing your expense at overhaul time. Factory overhauls cost \$20,000 to \$50,000, so if you can extend the life of your engine just 10% our system will have paid for itself several times.

**"There are several reasons that TBO is such a flawed concept. One is that engine life has very little to do with engine hours in service. Hours do not limit the life of our engines. The biggest life-limiting factor is exposure to corrosive environments during periods of disuse. The next biggest is operator abuse, particularly cold starts...".** ("When to Overhaul" by Mike Busch, [Sport Aviation](#) magazine, [Feb. 2012](#), pg 52)

- 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.

### Using the Engine Heater on N7412W:

1. There is a blue extension cord stored in the aircraft cargo compartment.
2. Run the extension cord up by the nose gear into the Right engine compartment.
3. Open the Right Engine Cowling.
4. Plug the extension cord to the REIFF Engine Heater plug that is secured to a support cross-beam inside the Right Engine Cowling.
5. Close the Engine Cowling.
6. Run the extension cord to the west hangar wall to the electrical plug in.
7. Note the “heating times” listed on the charts above.
8. Unplug the extension cord and secure all equipment before starting.

Example: I scheduled to fly at 1500 hours the other day. It wasn't that cold (low 50s) but the over-night temperatures got down into the 30s. I felt like I had a “cold-soaked-engine”. I stopped by the hanger about 0700 and plugged in the REIFF Heater. When I returned at 1500 the engine was a nice warm 120 degrees. The starting was so easy!!

David Key